640-680

Station	Main Studio	Freq	Power	Date
CBN	St. John's, NF	640	10 kW/U	1/24/57
CMHQ	Santa Clara, Las Villas	640	15 kW/DA-1	7/52
WHLO	Akron, OH	640	1 kW/DA-1	
XEEMM	Salamanca, Gto	640	1 kW/DA-D	1/75
KYAK	Anchorage, AK	650	25/50 kW/DA-2	8/26/70
CFFR	Calgary, AB	660	50 kW/DA-2	11/8/82
CMCU	Havana, CU	660	5 kW/DA-1	3/4/53
WESC	Greenville, SC	660	10 kW/DA-D	11/29/65
XERPM	Mexico, DF	660	5/50 kW/DA-N	8/15/66
NEW	Musgravetown, NF	660	10 kW/DA-2	9/6/74
KBOI	Boise, ID	670	25/50 kW/DA-N	7/29/64
CMKP	Holguin, Oriente	670	1 kW/DA-1	3/27/53
CFDR	Darmouth, NS	680	10/50 kW/DA-2	10/31/73
CFTR	Toronto, ON	680	50 kW/DA-2	7/31/80
CFTR	Toronto, ON	680	25 kW/DA-2	3/22/74
CFTR	Toronto, ON	680	25/10 kW/DA-2	4/29/70
CFTR	Toronto, ON	680	50/25 kW/DA-2	11/23/79
CHFA	Edmonton, AB	680	10 kW/DA-1	2/7/75
CHLO	St. Thomas, ON	680	1/10 kW/DA-2	7/15/57
CJCN	St. John's, NF	680	10 kW/DA-2	1/29/64
CJOB	Winnipeg, MB	680	50/25 kW/DA-2	3/8/78
CKGB	Timmons, ON	680	10 kW/DA-2	3/28/60
KFEQ	St. Joseph, MO	680	5 kW/DA-2	3/16/49
KKYX	San Antonio, TX	680	10/50 kW/DA-N	3/14/44
KWKA	Clovis, NM	680	0.5 kW/DA-1	9/27/60
WCAW	Charleston, WV	680	50/0.25 kW/DA-2	3/76
WCAW	Charleston, WV	680	0.25/1 kW/DA-N	10/26/64

640-680

Station	Main Studio	Freq	Power	Date
WCAW	Charleston, WV	680	0.25/10 kW/DA-N	10/26/64
WCBM	Baltimore, MD	680	5/10 kW/DA-2	8/26/66
WCTT	Corbin, KY	680	1 kW/DA-N	1/13/50
WDBC	Escanaba, MI	680	1/10 kW/DA-2	2/28/68
WINR	Binghampton, NY	680	0.5/1 kW/DA-2	6/26/57
WMPS	Memphis, TN	680	5/10 kW/DA-N	8/47
WPTF	Raleigh, NC	680	50 kW/DA-N	7/13/50
WRGC	Sylva, NC	680	0.25/1 kW/DA-N	7/26/78
WRKO	Boston, MA	680	50 kW/DA-2	8/26/66
WRKO	Boston, MA	680	50 kW/DA-1	
WRNG	North Atlanta, GA	680	10/25 kW/DA-N	11/9/79
XELG	Leon Guanajuato	680	10 kW/DA-N	7/31/47

#86

Canada

CBN
640

TELECOMMUNICATIONS Branch

CANADA

DEPARTMENT OF TRANSPORT

REVISED DESCRIPTIVE SHEET - OMNIDIRECTIONAL ANTENNA

Station Call:	CBN
Main Studio:	St.John's, Newfoundland
Frequency:	640 kc/s
Power:	10 kw
Class:	1-B
Time:	U
Notification List No.	85 Dated: July 14, 1954.
Geographical Location:	North Latitude: 47° 30' 10"
	West Longitude: 52° 48' 07"
Antenna Characteristics:	
Type:	Constant cross-section tower, guyed, base-insulated, series fed.
Electrical Height:	300 feet (74 degrees) .205 λ 183/kw 578 mv/m
Height above Ground:	305 feet
Height above Sea Level:	780 feet plus or minus 15 feet
Efficiency:	591 mv/m at one mile for 10 kw 187 mv/m at one mile for 1 kw
Ground System:	120 equally spaced copper radials 0.25 wavelengths in length.

January 24, 1957.

Cuba

CMHQ

640

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CMHQ	Main Studio: Santa Clara, Las Villas
Frequency: 640 Kcs.	Power: 15 kw
	Date: July 1952 Class: I-C
GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:	North Latitude: 22° 26' 35"
	West Longitude: 79° 54' 06"

ANTENNA CHARACTERISTICS

Authorized for Day and Night operation. (DA-1)
Number of elements: Two (2)
Type of elements: Series-fed, uniform cross-section, guyed vertical steel towers.

TOWER:	North	South
HEIGHT ABOVE GROUND	300' (70.3')	300' (70.3')
SPACING:	(515' or 120° between adjacent towers)	
PHASING:	0°	-95°
FIELD RATIO:	1	.57

ORIENTATION: (Elements on a line bearing 346° true.)

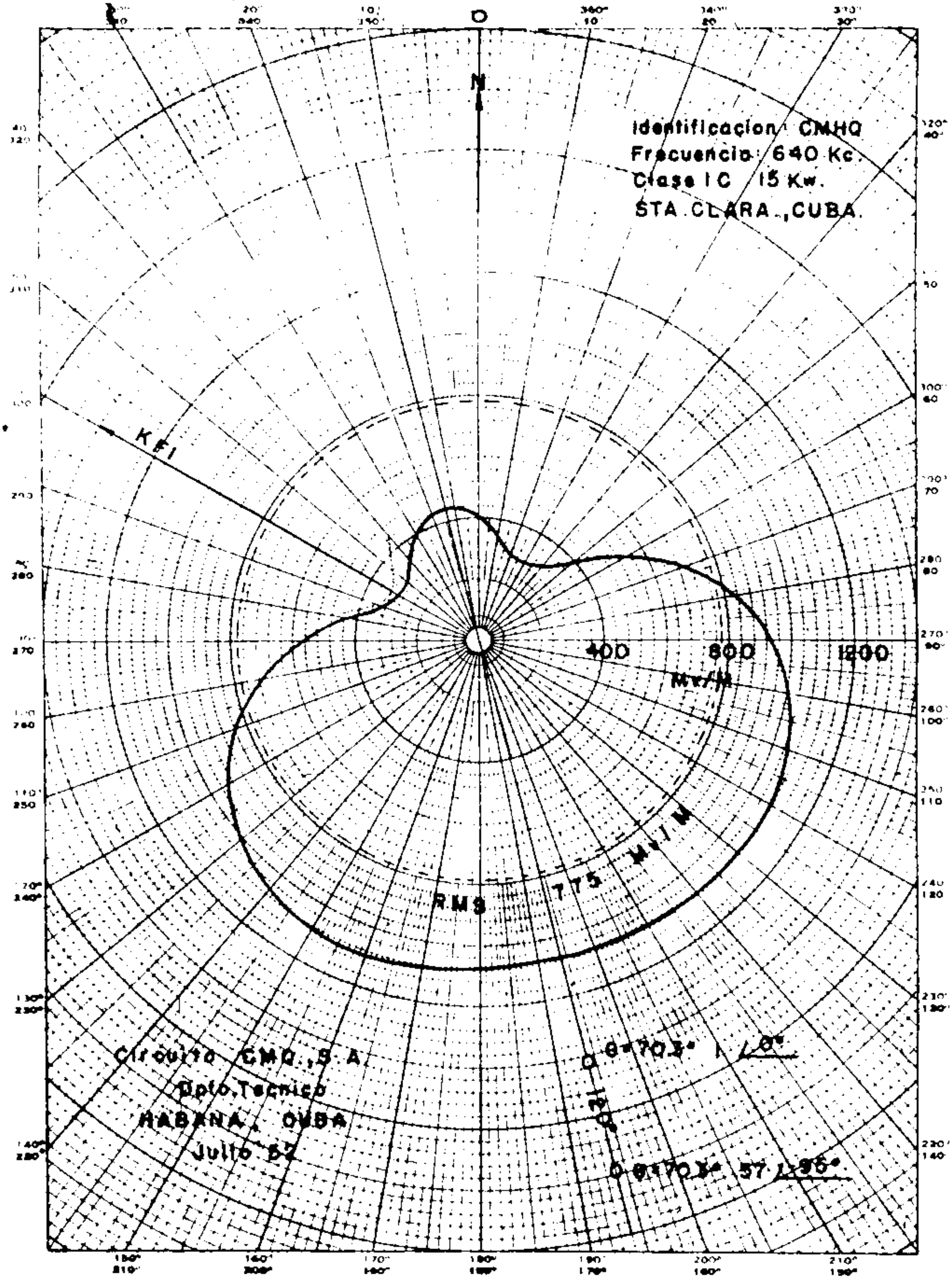
Predicted effective Field: 775 mv/m (at rated power)

Cuba

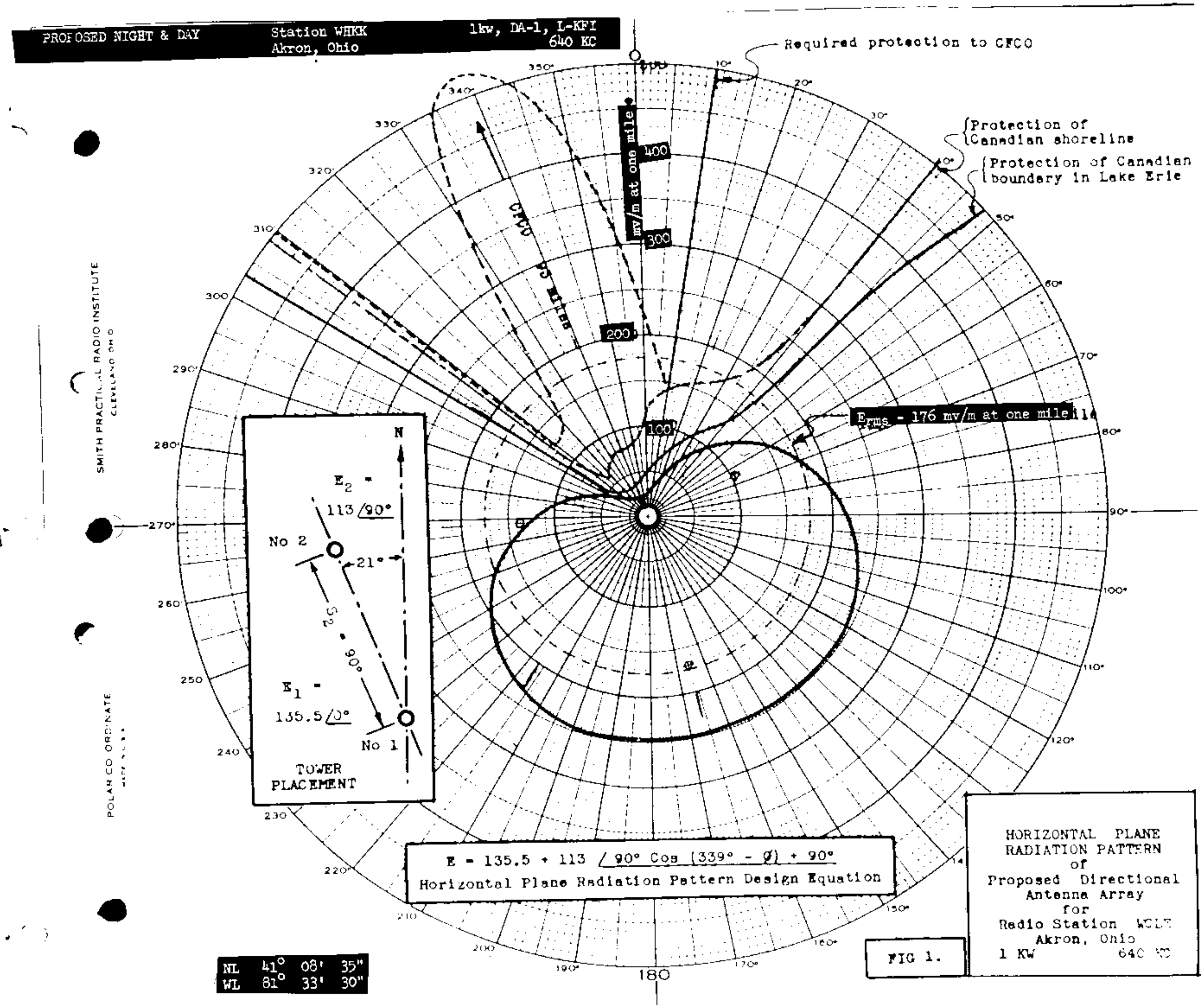
CMHQ

PROPOSED
DAY & NIGHT (3/18/53G)

CMHQ, SANTA CLARA, L. V. 15 kw, DA-1 640 kc



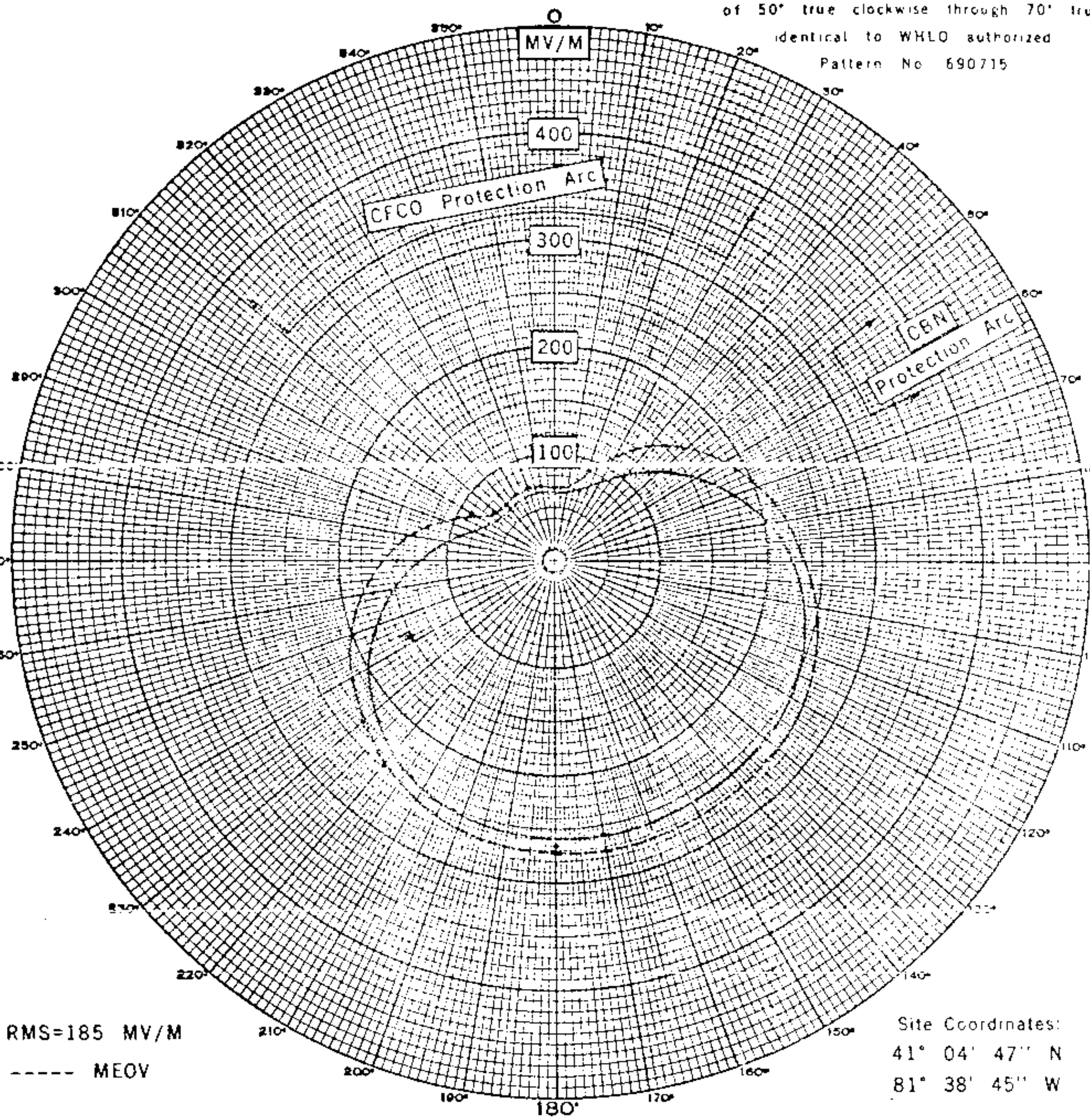
CMHQ, Santa Clara, L.V. 640 kc



PROPOSED NIGHT & DAY
Station WHKK
Akron, Ohio
1kw, DA-1, L-KFI
640 KC
Required protection to CFCO
Protection of Canadian shoreline
Protection of Canadian boundary in Lake Erie
mv/m at one mile
400
300
200
100
CFCO
E_{rms} - 176 mv/m at one mile
N
E_2 = 113 /90°
No 2
21°
S_2 = 90°
E_1 = 135.5 /0°
No 1
TOWER PLACEMENT
E = 135.5 + 113 /90° Cos (339° - Ø) + 90°
Horizontal Plane Radiation Pattern Design Equation
NL 41° 08' 35"
WL 81° 33' 30"
HORIZONTAL PLANE RADIATION PATTERN of Proposed Directional Antenna Array for Radio Station WCLT Akron, Ohio
1 KW 640 KC
SMITH PRACTICAL RADIO INSTITUTE
CLEVELAND OHIO
POLAR CO ORDINATE
180

FIG 1.

MEOV radiation between bearings of 50° true clockwise through 70° true identical to WHLO authorized Pattern No. 690715



RMS=185 MV/M

----- MEOV

Site Coordinates:
41° 04' 47'' N
81° 38' 45'' W

PROPOSED HORIZONTAL PLANE RADIATION PATTERN

339° TRUE

1.65/97.8° (2)

90°

G=No.1 62.3°
No.2 81.2°

1/0 (1)

RADIO AKRON, INC.
RADIO STATION WHLO
AKRON, OHIO

Jules Cohen & Associates
Consulting Electronics Engineers

640 KHZ

1 KW DA-1 (L-KFI)

Pattern No. 760209B

XEEMM

DIRECTIONAL ANTENNA DESCRIPTION SHEET

tion: XLEHM		Main Studio: Salamanca, GTO.	
quency: 640 kHz		Power: 1kw	
ification List No. 273		Date: January 1975	Class: II

GRAPHICAL LOCATION OF THE
TER OF THE ANTENNA SYSTEM:

North Latitude: 20° 33' 47"
West Longitude: 101° 12' 58"

ANTENNA CHARACTERISTICS

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

R:	#1 NE)	#2(SW)
GHT ABOVE LATORS:	384.5'	384.5' (90°)
ING:	0°	+125°
D R IO:	1	1

ING AND NTATION: The towers are spaced 256.3' (60°) on a line bearing 208° true.

ND SYSTEM: 120 - 328' equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

ICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL
RMS

180 mv/m

XEEMM

HOJA DESCRIPTIVA DEL SISTEMA RADIADOR DIRECCIONAL DE LA ESTACION

LISTA DE CAMBIOS	: 273
FECHA	: ENERO-75
FRECUENCIA	: 640 KHz
DISTINTIVO	: XEEMM
POBLACION	: SALAMANCA, GTO.
UBICACION	: LW 101° 12' 55" LN 20° 35' 45"
POTENCIA	: 1 kW
CLASE	: II

CARACTERISTICAS TECNICAS DEL RADIADOR.

TIEMPO DE OPERACION	: DIURNO
SISTEMA RADIADOR	: AD-D
NUMERO DE ELEMENTOS	: 2

TIPO DE ELEMENTOS RADIADORES

.	TIPO DE ALIMENTACION	: SERIE EN LA BASE
.	SECCION TRANSVERSAL	: TRIANGULAR DIMENSIONES: 0.60 m/ lado
.	TIPO DE ELEMENTO RADIADOR	VERTICAL
.	TIPO DE SOPORTE	: RETENIDAS TIPO DE RETENES: cable 1/4"
.	LONGITUD DE COPETE CAP.	: NO HAY
.	SEPARACION ENTRE TORRES	: 60° (78.125 m)
.	NUMERO DE ELEMENTOS	: 2
.	ALTURA SOBRE EL AISLADOR	: 117.18 m (90°)
).	DEFASAMIENTO	: 125°
.	RELACION DE CORRIENTES	: 1 : 1
?.	DESCRIPCION DE LA ORIENTACION DEL SISTEMA RADIADOR	: 208° DE AZIMUT (Ver patrón horizontal)

SISTEMA DE TIERRA

3.	No. DE RADIALES POR ELEMENTO	: 120
4.	LONGITUD DE RADIALES	: 100 m.
5.	TIPO DE RADIAL	: ALAMBRE DE COBRE # 10

RADIACION DEL SISTEMA

6.	INTENSIDAD DE CAMPO TEORICO (OMNIDIRECCIONAL) DE LA POTENCIA RADIADA (RCM)	: 180 mV/m
7.	INTENSIDAD DE CAMPO EFECTIVO TEORICO A 1609 m POR KILOWATT DE POTENCIA RADIADA	: 180 mV/m

Departamento de [illegible]

Oficina de [illegible]

APROBO

PERITO EN TELECOMUNICACIONES

ING. JOSE LUIS GONZALEZ CORTES.

Registro # 026

XEEMM

PATRON DE RADIACION HORIZONTAL TABULADO.

XEEMM
640 KHZ.

1000 Watts

SALAMANCA, GTO.

OPERACION DIURNA

$$E = 237.7370\sqrt{1 + \cos(60^\circ \cos\varphi + 125^\circ)}$$

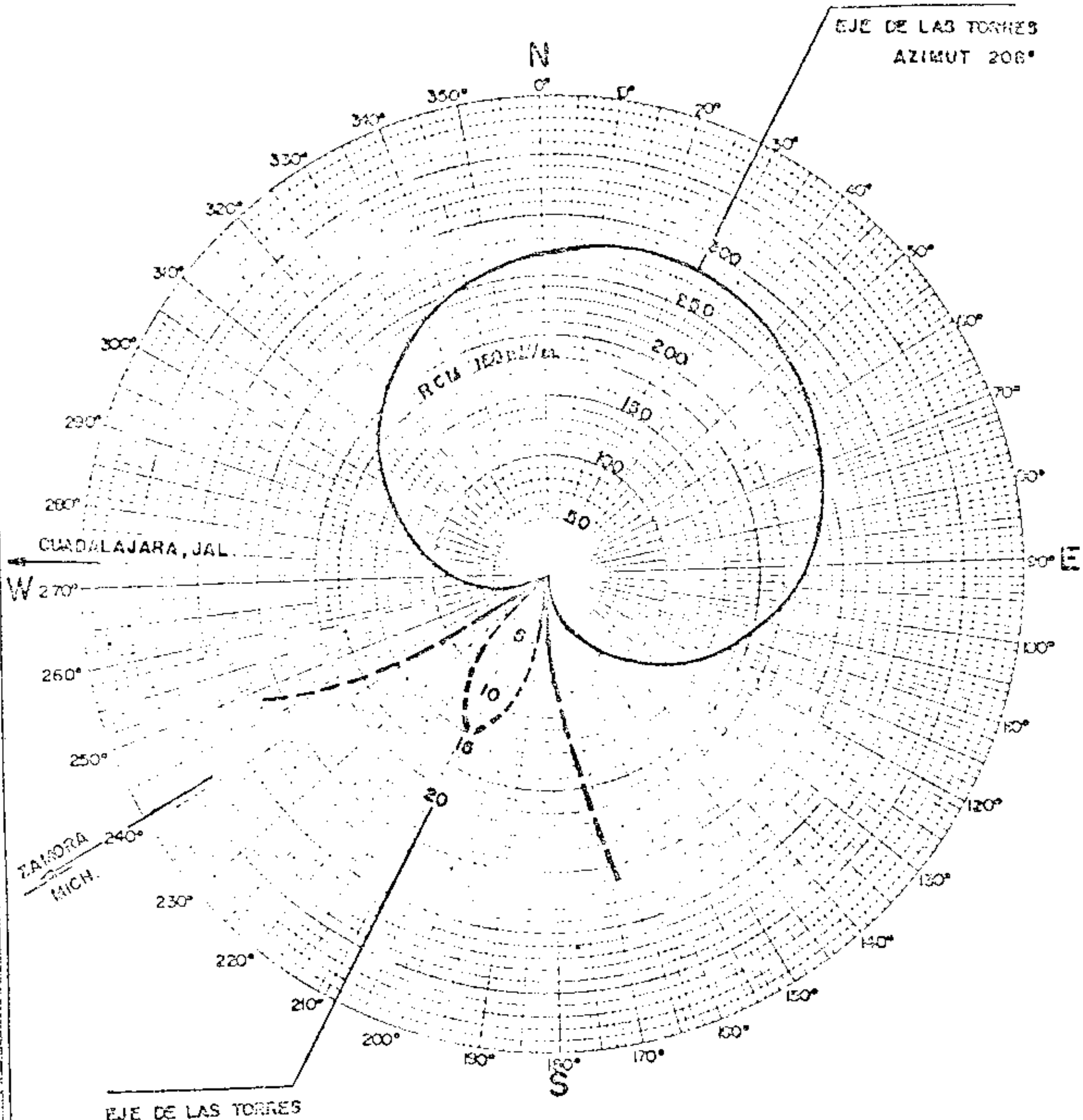
AZIMUT		A	B	C	D
Ø	φ	60 COS φ	COS(A+125°)	$\sqrt{1+B}$	237.7370 C
208°	0°	60.00000	-0.99619	0.06172	14.6731
218°	10°	59.08846	-0.99745	0.05049	12.0033
228°	20°	56.38155	-0.99970	0.01732	4.1176
238°	30°	51.96152	-0.99859	0.03754	8.9246
248°	40°	45.96266	-0.98758	0.11144	27.1971
258°	50°	38.56725	-0.95915	0.20211	48.0490
268°	60°	30.00000	-0.90630	0.30610	72.3613
278°	70°	20.52120	-0.82433	0.41913	99.6427
288°	80°	10.41889	-0.71225	0.53642	127.5268
298°	90°	0.00000	-0.57357	0.65301	155.2446
308°	100°	-10.41889	-0.41598	0.76421	181.6809
318°	110°	-20.52120	-0.25002	0.86601	205.8802
328°	120°	-30.00000	-0.08715	0.95543	227.1410
338°	130°	-38.56725	0.06222	1.03064	245.0212
348°	140°	-45.96266	0.19016	1.09094	259.3560
356°	150°	-51.96152	0.29172	1.13653	270.1952
8°	160°	-56.38155	0.36457	1.16814	277.7100
18°	170°	-59.08846	0.40814	1.18665	282.1106
28°	180°	-60.00000	0.42261	1.19273	283.5560

Oficina de

REVISO

APROBO

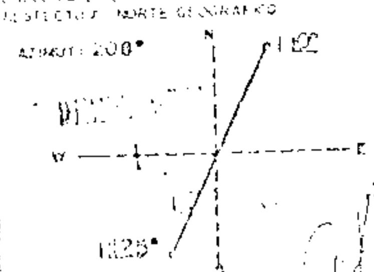
XEEMN



OPERACION DIURNA

PATRON DE RADIACION HORIZONTAL CALCULADO EN mV/m. A 1600 M

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



SALAMANCA, GTO.

640 KHZ.

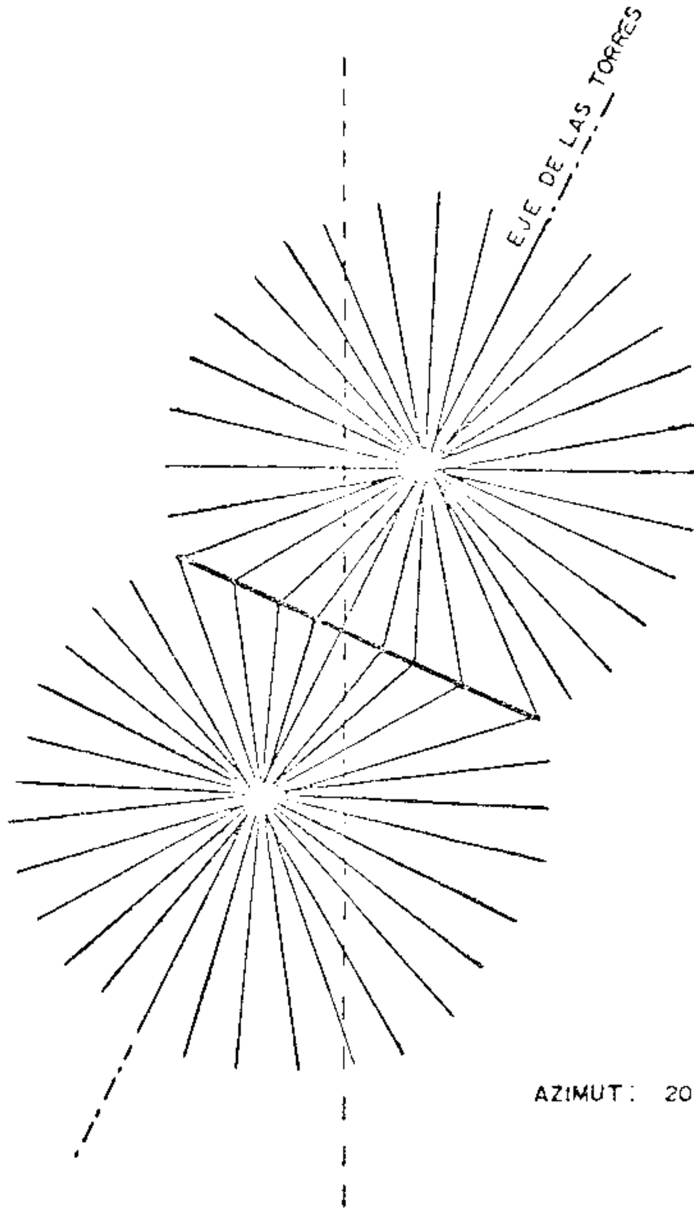
POTENCIA:

1KW. AD/D.

PERITO EN TELECOMUNICACIONES
ING. J. LUIS GONZALEZ CORTES
REGISTRO No. 025

A. P. L.

XEEMM



SISTEMA DE TIERRA

120 RADIALES DE ALAMBRE DE COBRE No.10 EN CADA TORRE DE 100 MTS. DE LONGITUD CADA UNO, UNIDOS AL CENTRO COMO LO INDICA LA FIGURA, POR ALAMBRE DEL MISMO MATERIAL TIPO CO. TODO EL SISTEMA ESTA ENTERRADO 0.30 MTS.

XEEMM

SALAMANCA GTO.

FRECUENCIA Y POTENCIA
640 KHZ.
1KW. AD-D.

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

DIBUJO:
A.P.L.

REVISO

APROBO

SEE REVERSE SIDE

KYAK

25kw,50kw-LS,DA-2,U
650 kc

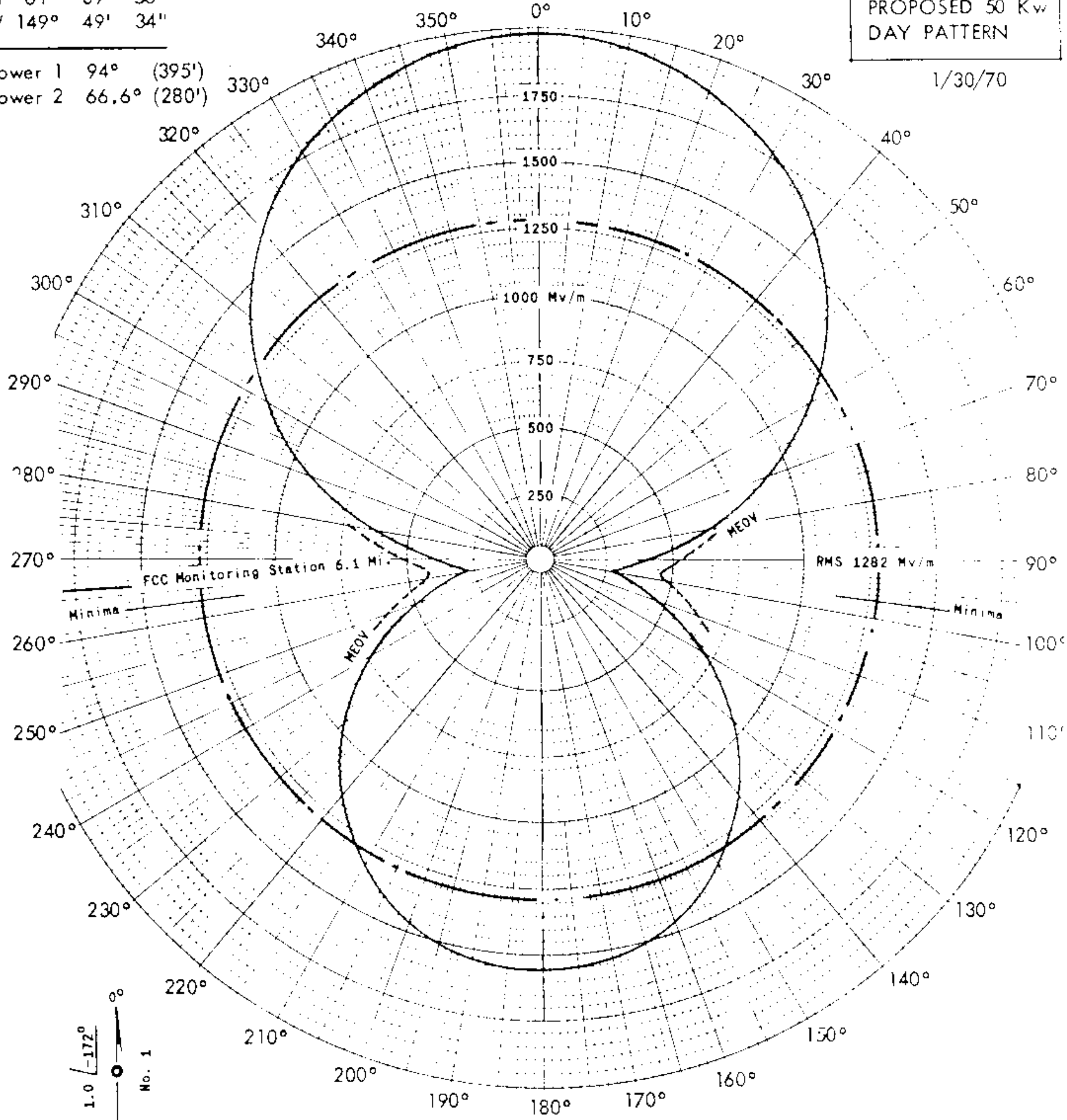
KYAK 650 Khz
PROPOSED 50 Kw
DAY PATTERN

1/30/70

Proposed Day
(8-26-70ct)
N 61° 09' 58"
W 149° 49' 34"

Tower 1 94° (395')
Tower 2 66.6° (280')

Station KYAK
Anchorage, Alaska



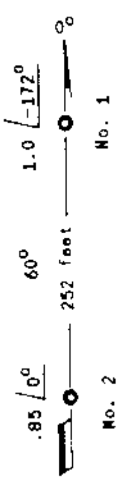


EXHIBIT No. 8

BIG COUNTRY RADIO, INC.
Anchorage, Alaska

KYAK PROPOSED
50 KW DAY, 25 KW NIGHT, DA-2

KENNETH WILLIAMS, JR., P.E.
321 SOUTH 11th STREET
TACOMA, WASHINGTON 98402
CONSULTING ENGINEERS

FCC File No.BP-18746
Accepted 8-7-70

Station KYAK
Anchorage, Alaska

650 kc

SEE REVERSE SIDE

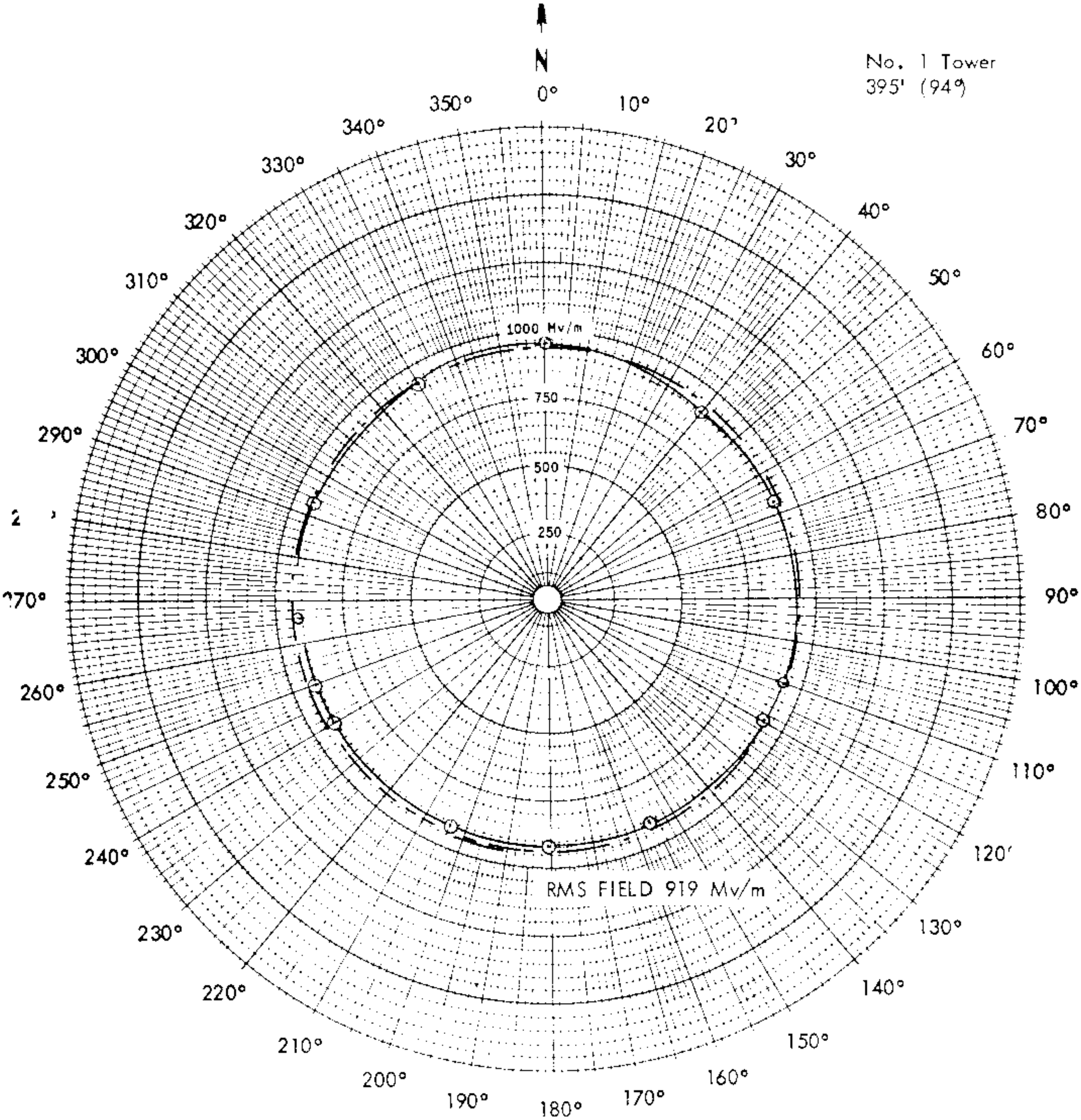
KYAK

Measured Non-DA
(8-26-70ct)

Station KYAK
Anchorage, Alaska

25kw, DA-1, U
650 kc

No. 1 Tower
395' (94°)



NON DIRECTIONAL HORIZONTAL PLANE PATTERN

MEASURED INVERSE FIELD ————

R M S FIELD —- · — · —

K Y A K, [redacted]
Anchorage, Alaska
September 22, 1969

FCC File No. BL-12460
Accepted

Station KYAK
Anchorage, Alaska

650 kc

SEE REVERSE SIDE

KYAK

Measured Day & Night
(8-26-70ct)

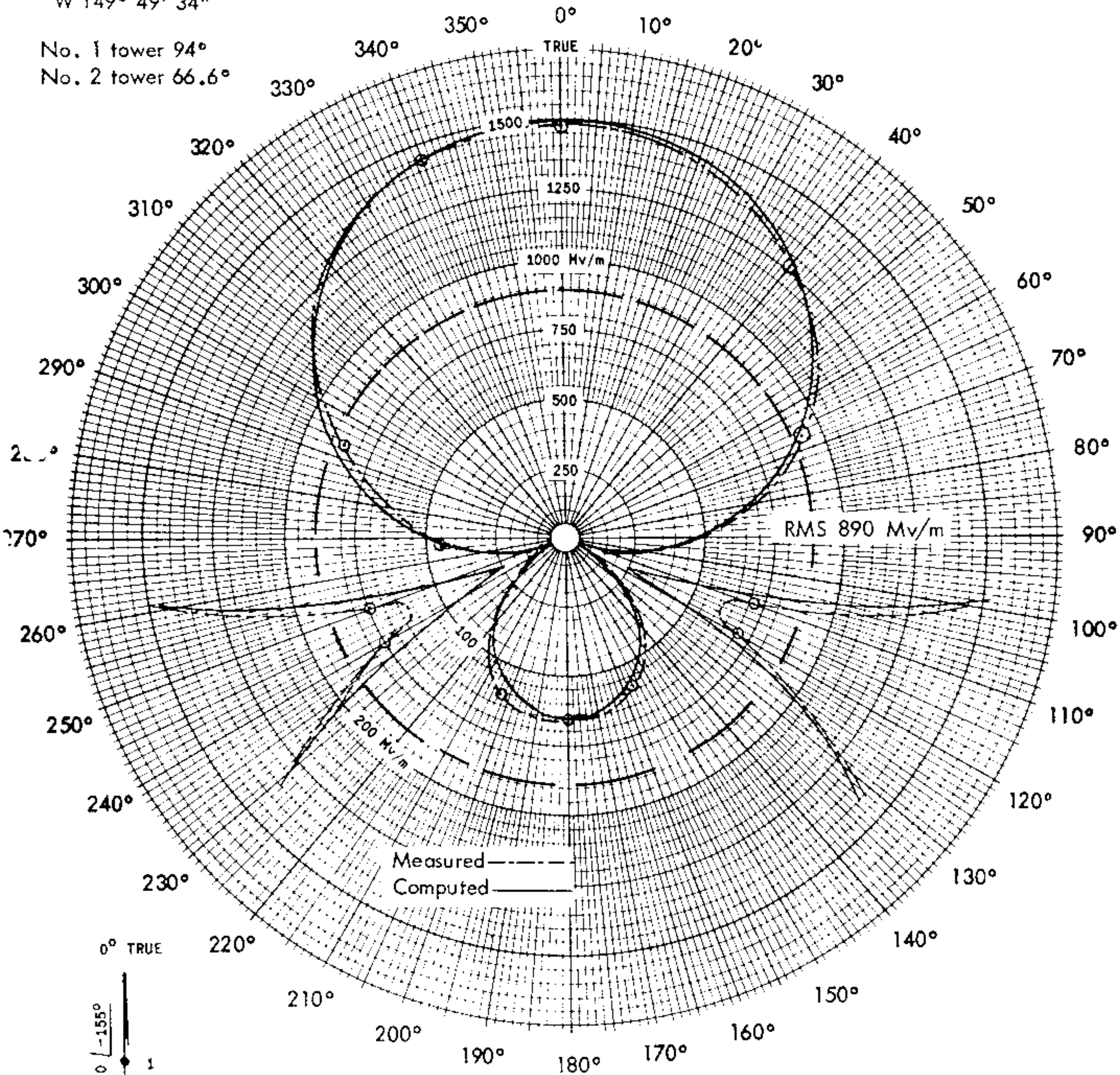
Station KYAK
Anchorage, Alaska

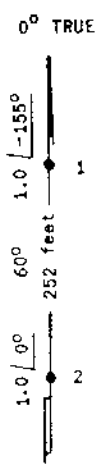
25kw,DA-1,U
650 kc

K Y A K 650 Khz 25 KW DA-1

N 61° 09' 58"
W 149° 49' 34"

No. 1 tower 94°
No. 2 tower 66.6°





KENNETH WILLIAMS, JR., P.E.
321 SOUTH 11th STREET
TACOMA, WASHINGTON 98402
CONSULTING ENGINEERS

K Y A K, [redacted]
Anchorage, Alaska
September 22, 1969

FCC File No.BL-12460
Accepted

Station KYAK
Anchorage, Alaska

650 kc

KYAK

Proposed Day & Night
(10-28-68ct)

Station KYAK
Anchorage, Alaska

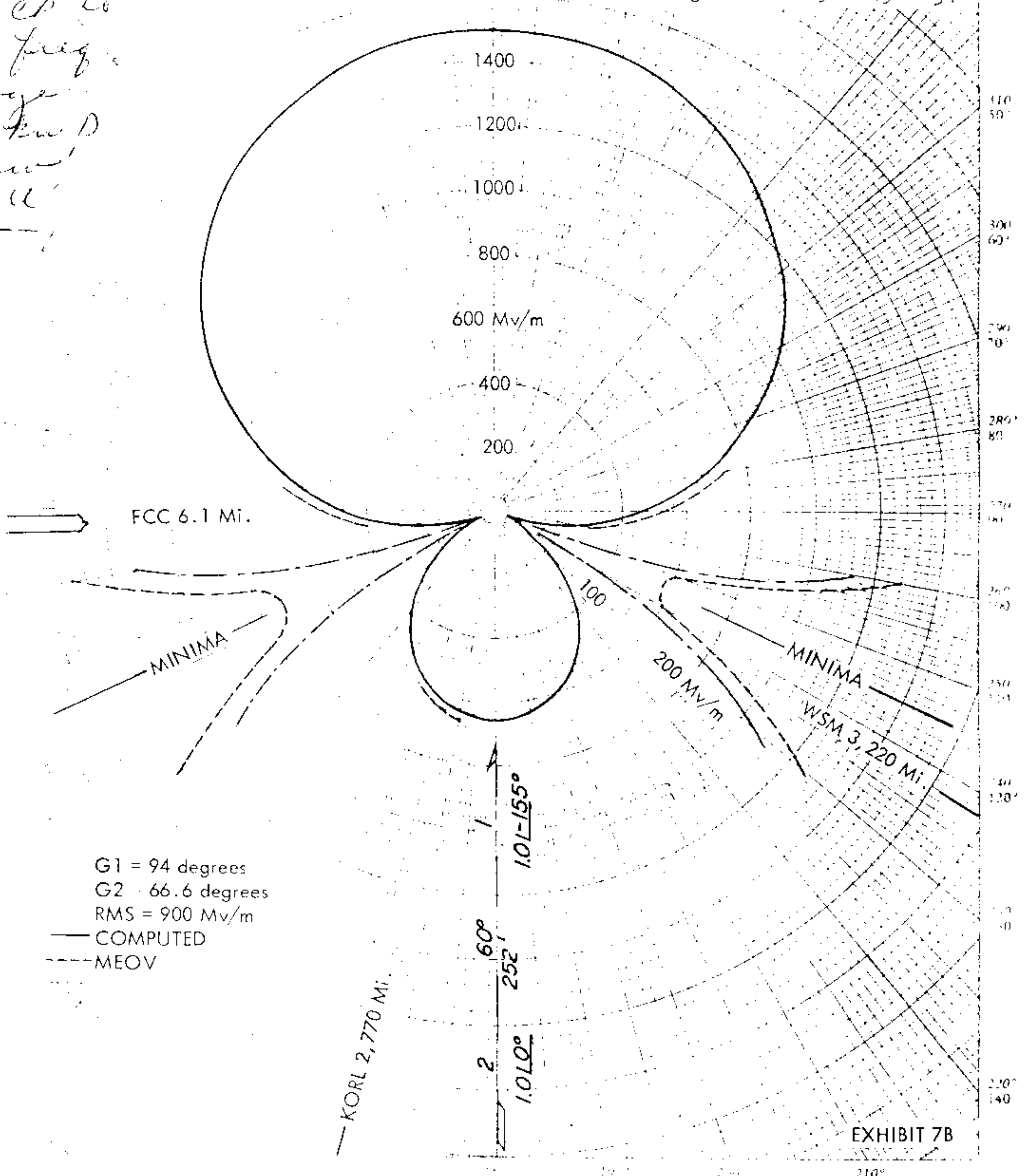
25kw, DA-1, U
650 kc

KENNETH WILLIAMS, JR., P.E.
Consulting Engineers

KYAK, Inc. 9/23/68
(amended Pattern)
650 Kc 25 Kw DA-1

North Latitude 61° 09' 58"
West Longitude 149° 49' 34"

BP-18050 Granted
6-4-69 CP to
change freq.
& change
pwr 5kw D
to 25kw
DA-1, U



FCC File No. BP-18050
Accepted 10-17-68 Amended

Station KYAK
Anchorage, Alaska

650 kc

CHFR
660

IFRB Serial No. 1 2 4 5 6

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. 414 | Date 821108

Assigned frequency (kHz)		02	6 6 0
Transmitting station	Name of the station	03	C A L G A R Y A B
	Call sign	04	C F F R
	Additional identification	05	
	Station class	06	B
	Operational Status	07	P
Country		08	CAN
Geographical coordinates of the transmitting station		09	1 1 4 W 0 3 4 2 5 0 N 4 5 2 7

(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	5 0 .	31	5 0 .
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	X							

IFRB S[illegible]al No. 12456

FORM FOR THE APPLICATION OF [illegible]TICLE 4 OF THE AGREEMENT
CHARACTERISTICS OF A REGION 2 BROADCA[illegible]TING STATION IN THE BAND 535 - 1605 kHz

PART II Section I

Description of a directional antenna consisting of vertical conductors

Sheet No.: 414

Date: 821108

(01) Name of transmitting station: CALGARY AB

(02) Country: CAN

(03) Hours of operation: HN

(04) Total number of towers: 6

(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	1.73	-126.5	90.	4.	0	90.	0
3	.77	108.	180.	6.	0	90.	0
4	.77	-67.	205.	326.	0	90.	0
5	1.3	175.	281.4	337.4	0	90.	0
6	.7	53.	364.1	343.7	0	90.	0
	.	.	.	.		.	
	.	.	.	.		.	
	.	.	.	.		.	
	.	.	.	.		.	
	.	.	.	.		.	
	.	.	.	.		.	

(14) r.m.s value of radiation: 2082.05 mV/m at 1 km

(15) Type of pattern: E

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

(17) SUPPLEMENTARY INFORMATION

CFFR
660

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. 12456

PART II Section I

Description of a directional antenna consisting of vertical conductors

Sheet No. 414

Date 821108

01 Name of transmitting station: CALGARY AB

02 Country: CAN

03 Hours of operation: HJ

04 Total number of towers: 3

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	1.2	0.	0.	0.	0	90.	0
2	1.	-87.	90.	4.	0	90.	0
3	.9	-85.	205.	326.	0	90.	0

14 r.m.s value of radiation: 2016.1 mV/m at 1 km

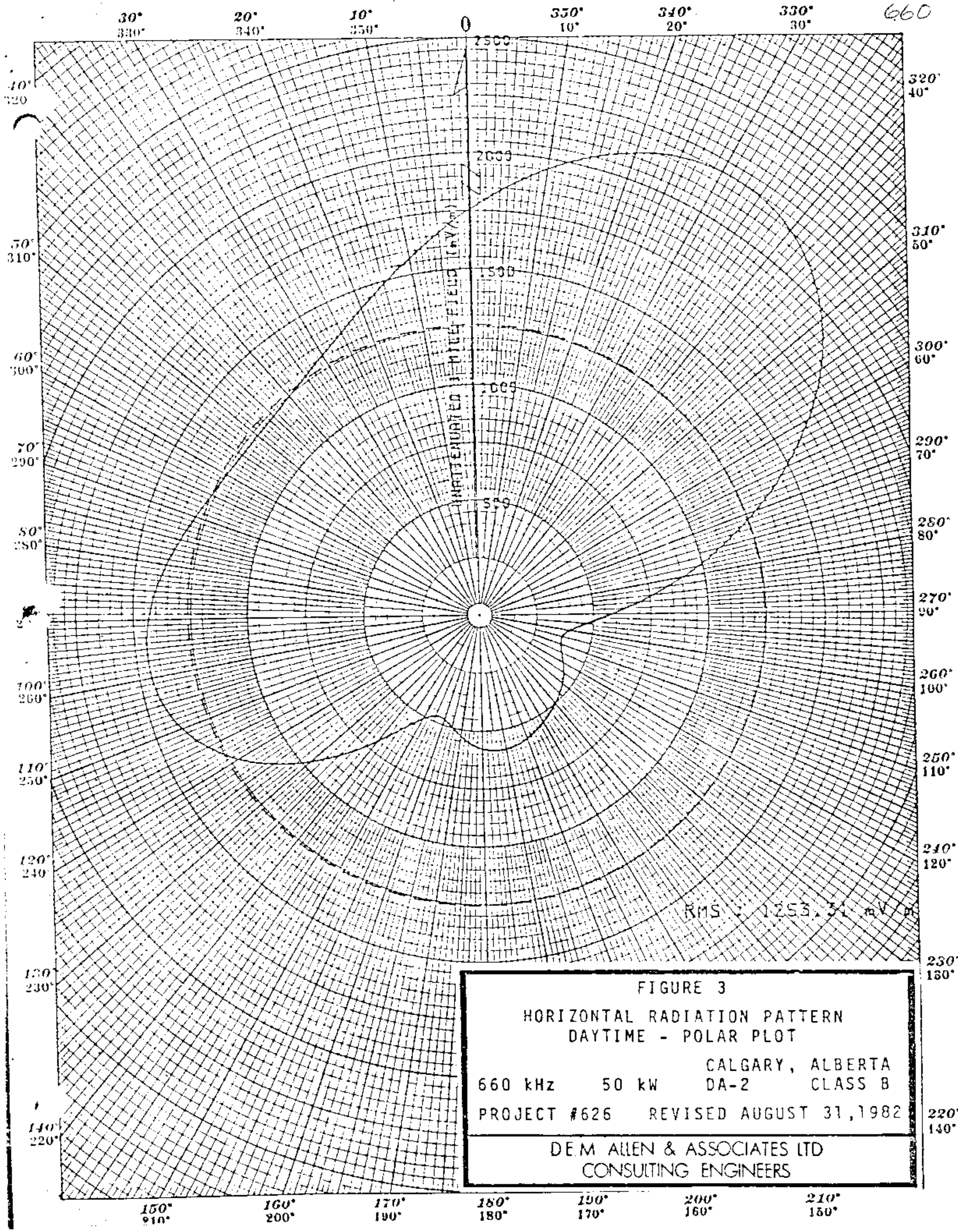
15 Type of pattern: E

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

17 SUPPLEMENTARY INFORMATION

CFFR
660

CFFR
660


0
2500
2000
1500
1000
500
UNATTENUATED 1 MILE FIELD (mV/m)
RMS : 1253.31 mV/m
FIGURE 3
HORIZONTAL RADIATION PATTERN
DAYTIME - POLAR PLOT
CALGARY, ALBERTA
660 kHz 50 kW DA-2 CLASS B
PROJECT #626 REVISED AUGUST 31,1982
D.E.M. ALLEN & ASSOCIATES LTD
CONSULTING ENGINEERS

CFFK
660

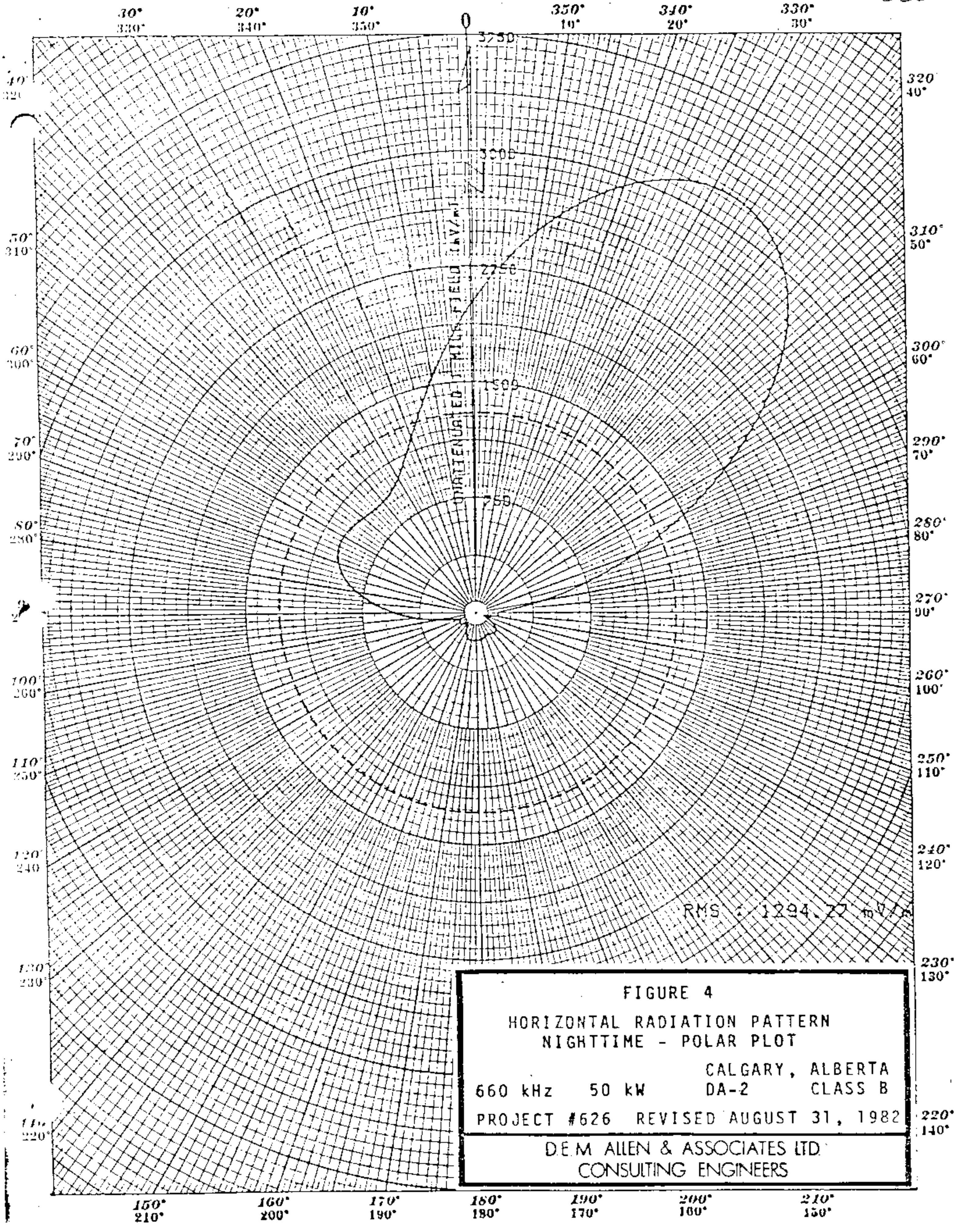


FIGURE 4

HORIZONTAL RADIATION PATTERN
NIGHTTIME - POLAR PLOT

CALGARY, ALBERTA
660 kHz 50 kW DA-2 CLASS B
PROJECT #626 REVISED AUGUST 31, 1982

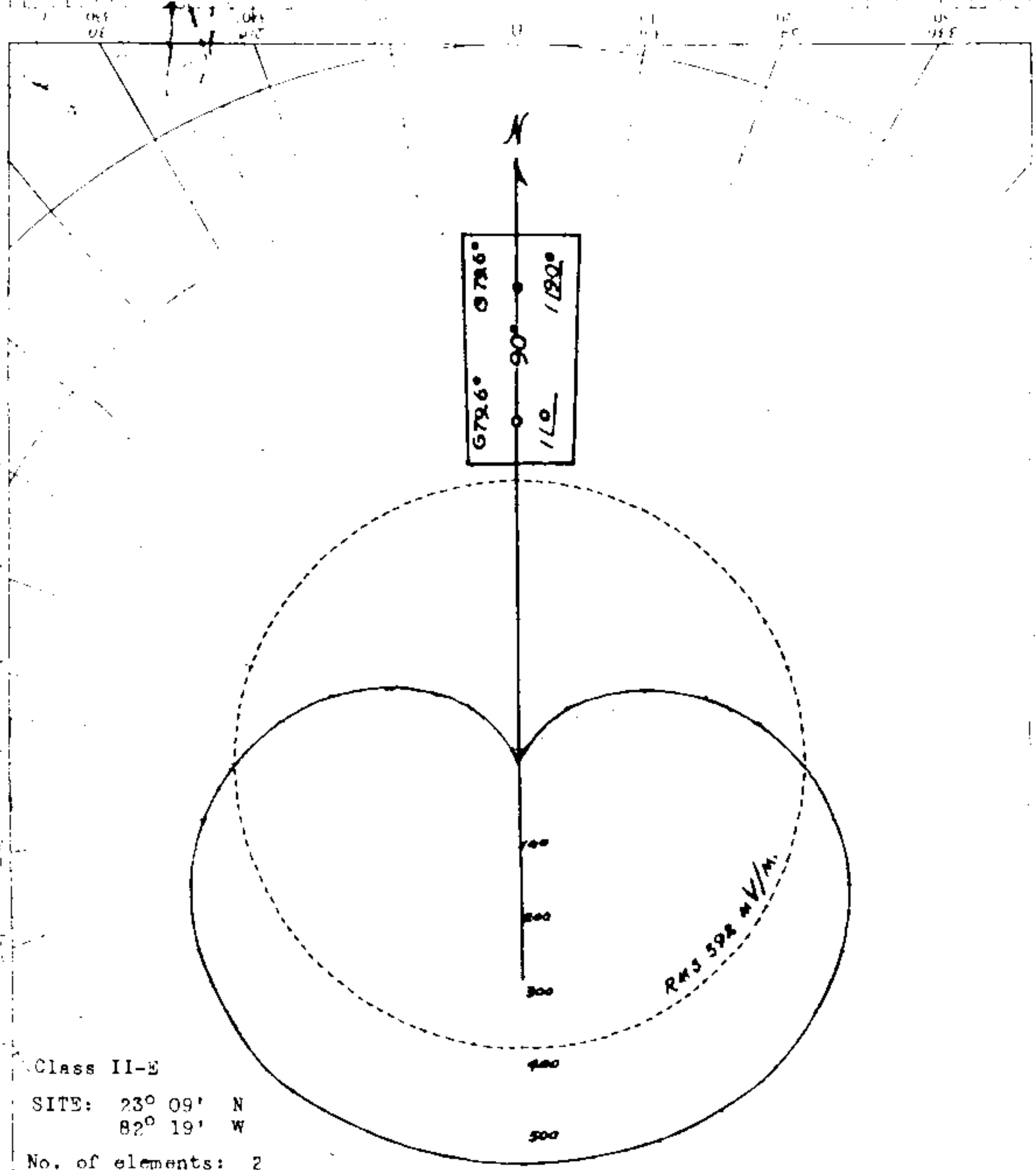
D.E.M. ALLEN & ASSOCIATES LTD.
CONSULTING ENGINEERS

Cuba

CMCU

660

PROPOSED   CMCU, HAVANA, CUBA 5kw, DA-1   660 kc/s
DAY & NIGHT (3/4/53G)



Class II-E

SITE: 23° 09' N
       82° 19' W

No. of elements: 2
Type: Series-fed
Towers: North   South
Ht. Above
Insulators: 300'   300' (79.6°)
Spacing: 372.7' or 90° between adjacent towers.
Phasing: 90°   0°
Field Ratio: 1.0   1.0
Orientation: Elements on a line bearing 0° true.
Ground System: 120 equally spaced radials about each tower base. Radials are shortened and bonded by a transverse strap along intersections between towers.
Predicted effective Field: 392 mv/m at rated power

CMCU, LA HABANA
660 Kc/s.
RADIACION HORIZONTAL
DA-1

No file No. Received FCC 1/23/53   CMCU, Havana, Cuba   660 kc/s

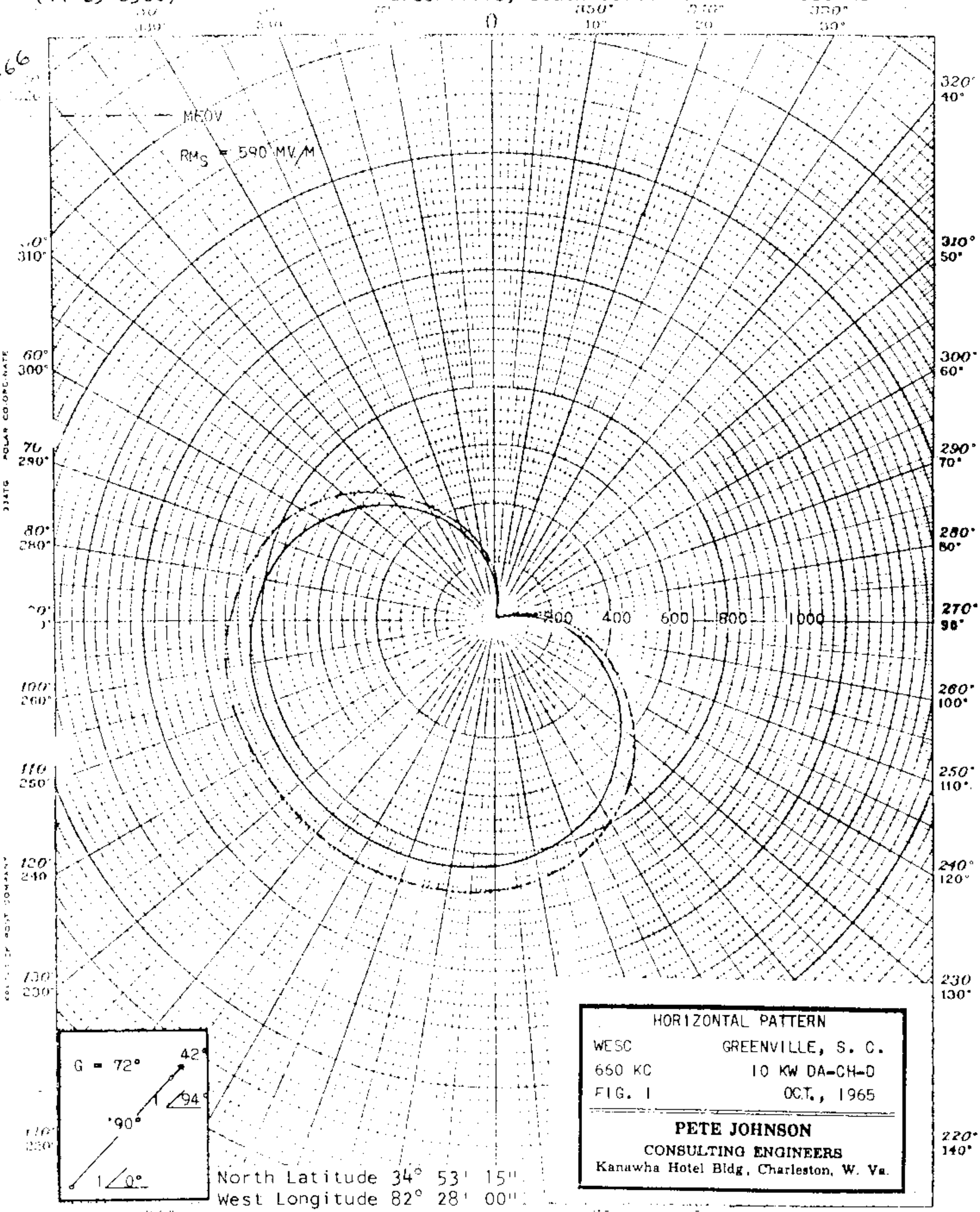
WESC

Proposed Day (CH)
(11-29-65ct)

Station WESC
Greenville, South Carolina

10kw,DA-CH,D
660 kc

P 6-15-66



HORIZONTAL PATTERN
WESC GREENVILLE, S. C.
660 KC 10 KW DA-CH-D
FIG. 1 OCT., 1965

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

North Latitude 34° 53' 15"
West Longitude 82° 28' 00"

FCC File No. BMP-9208
Accepted 11-2-65 Amended

Station WESC
Greenville, South Carolina 660 kc

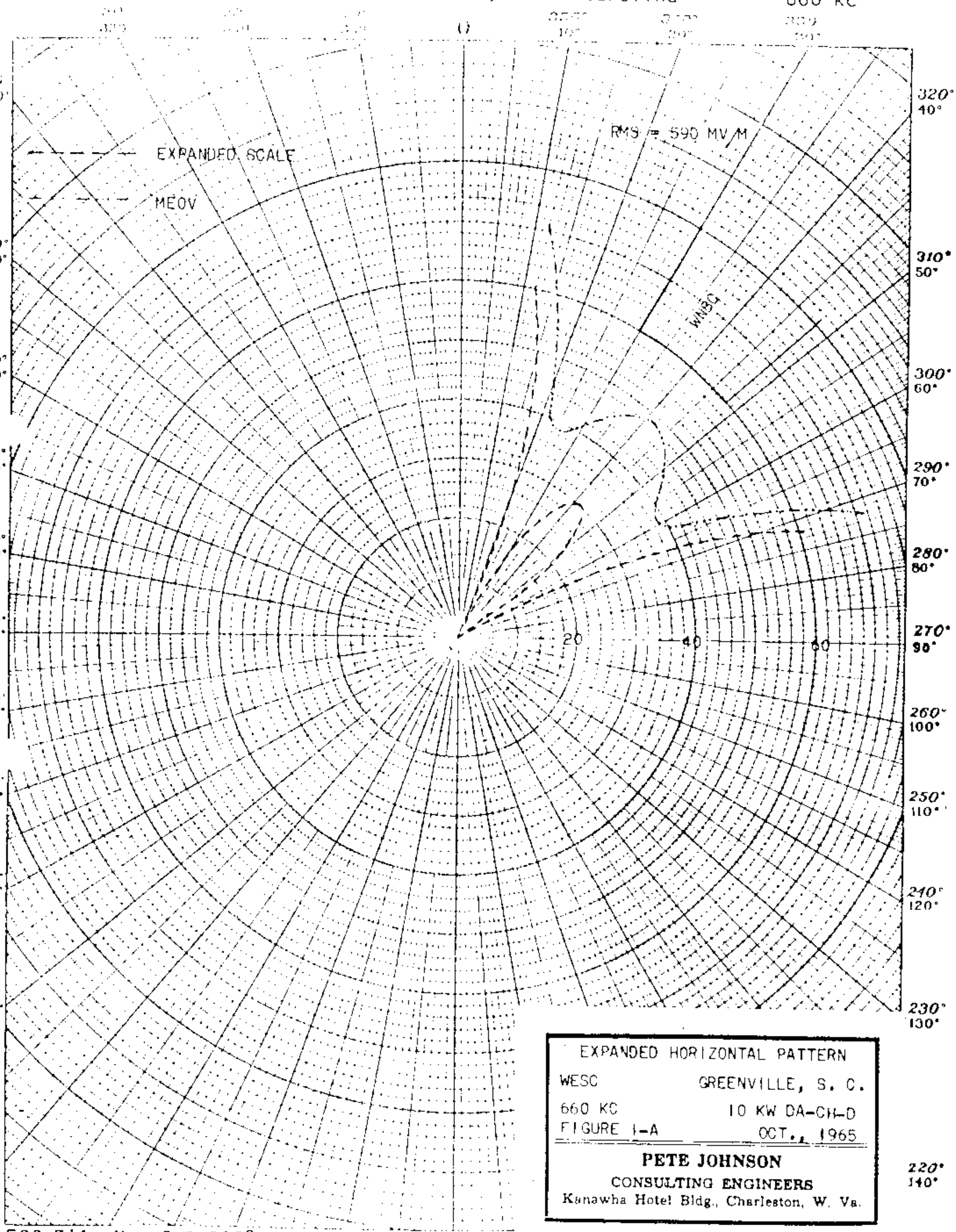
WESC

Proposed Day Nulls (CH)
(11-29-65ct)

Station WESC
Greenville, South Carolina

10kw,DA-CH,D
660 kc

6-15-66



EXPANDED HORIZONTAL PATTERN

WESC GREENVILLE, S. C.

660 KC 10 KW DA-CH-D

FIGURE 1-A OCT., 1965

PETE JOHNSON

CONSULTING ENGINEERS

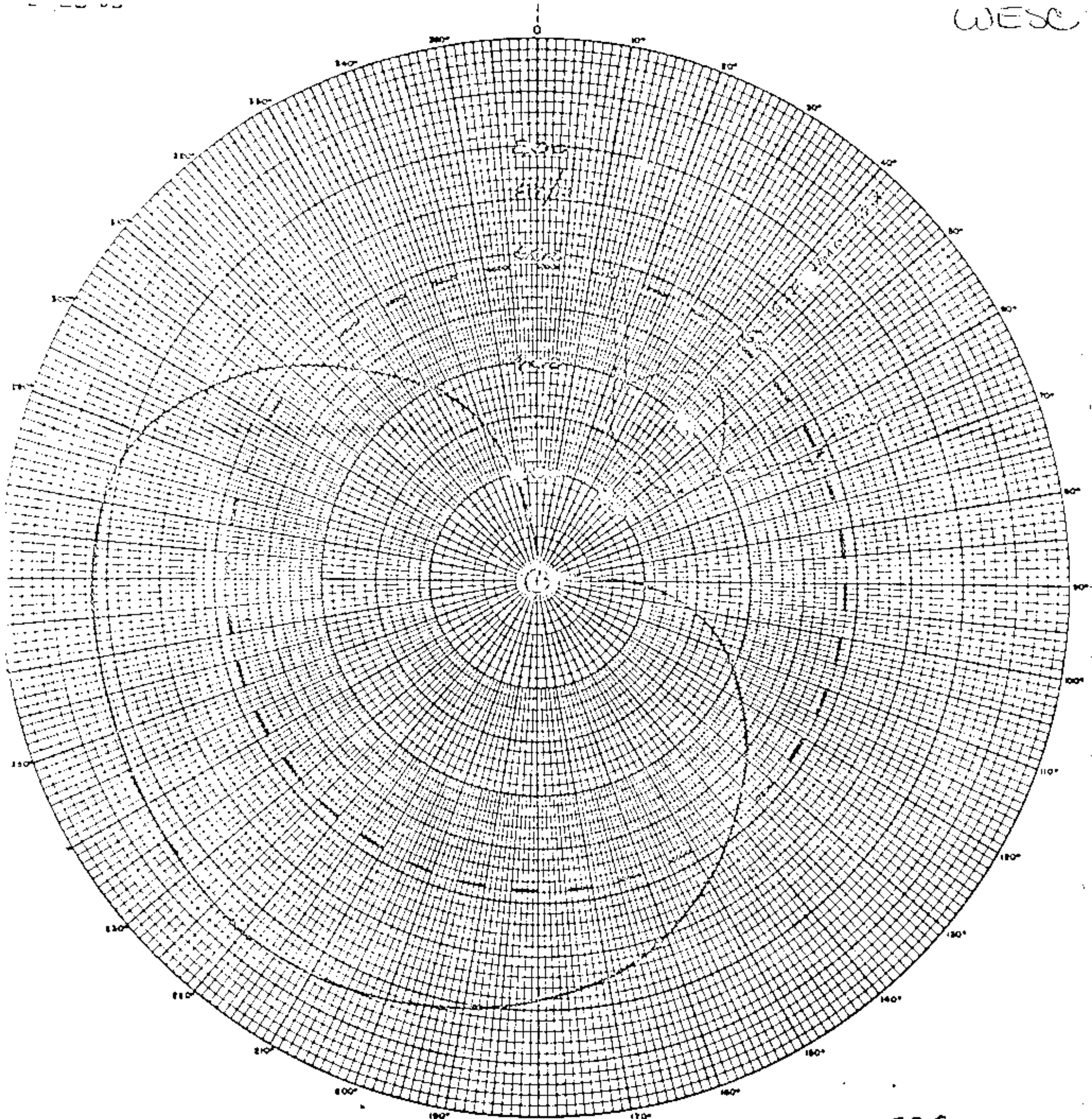
Kanawha Hotel Bldg., Charleston, W. Va.

FCC File No. BMP-9208
Accepted 11-2-65 Amended

Station WESC
Greenville, South Carolina

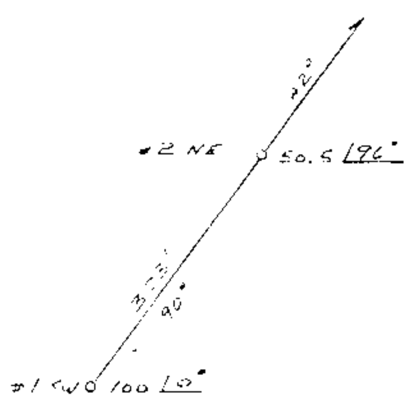
660 kc

WESC



- Rms 576mv/m

BL-13,522



MEASURED

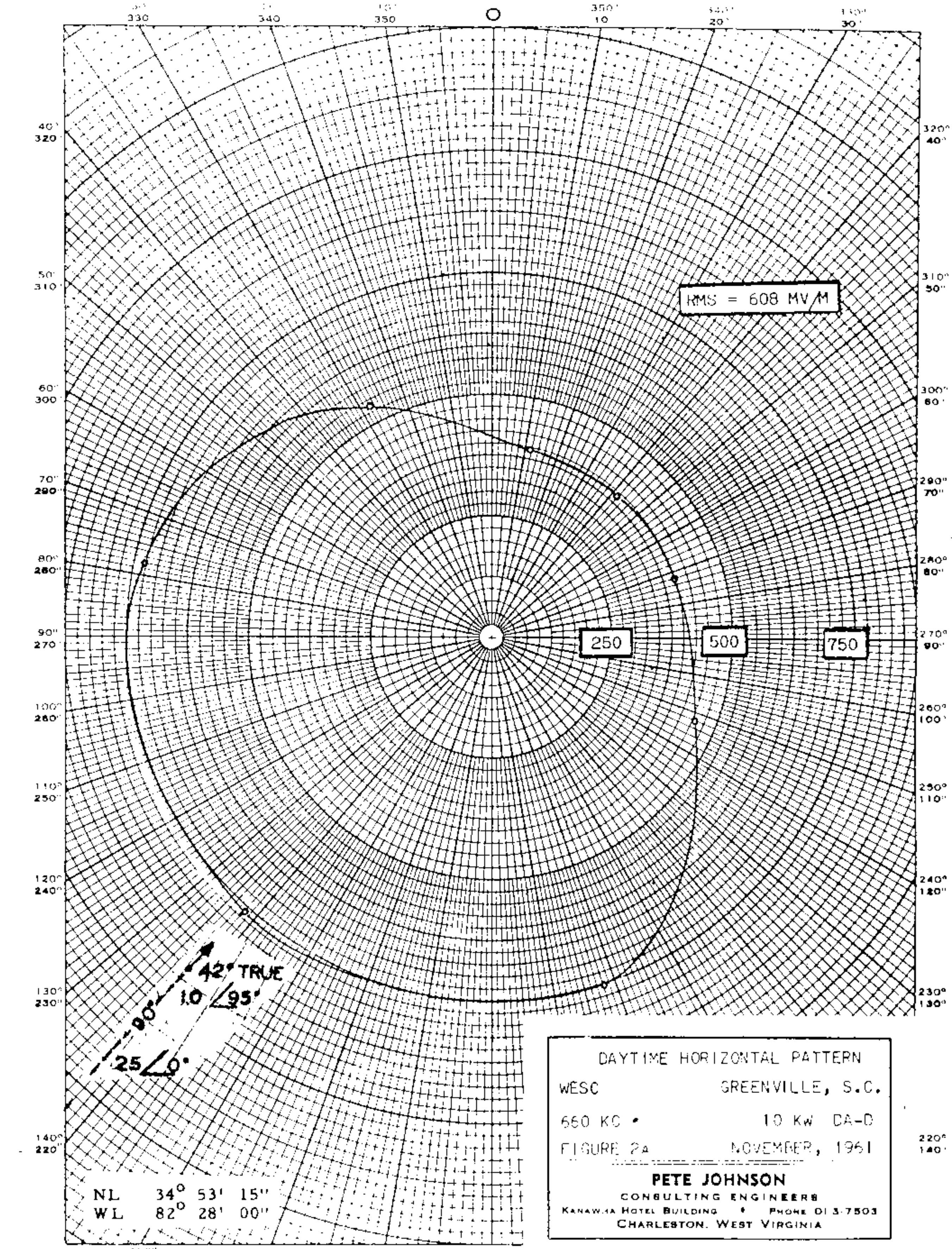
FIG. 3		
BROADCASTING COMPANY OF THE CAROLINAS		
RADIO STATION WESC		
GREENVILLE, S.C.		
560 kHz	10 kW	DA-CH
MEASURED DIRECTIONAL PATTERN		

WESC

Proposed Day
(12-19-61ct)

Station WESC
Greenville, South Carolina

10kw,DA-D,D
660 kc



DAYTIME HORIZONTAL PATTERN

WESC GREENVILLE, S.C.

660 KC 10 KW DA-D

FIGURE 2A NOVEMBER, 1961

PETE JOHNSON
CONSULTING ENGINEERS
KANAWHA HOTEL BUILDING • PHONE DI 3-7503
CHARLESTON, WEST VIRGINIA

FCC File No.BMP-9916
Accepted 11-21-61

Station WESC
Greenville, South Carolina

660 kc

WESC

MEASURED DAY
(7-26-61ct)

Station WESC 10kw, DA-D,D
Greenville, South Carolina 660 KC.

-8-62
ented L for DA-
increase in power

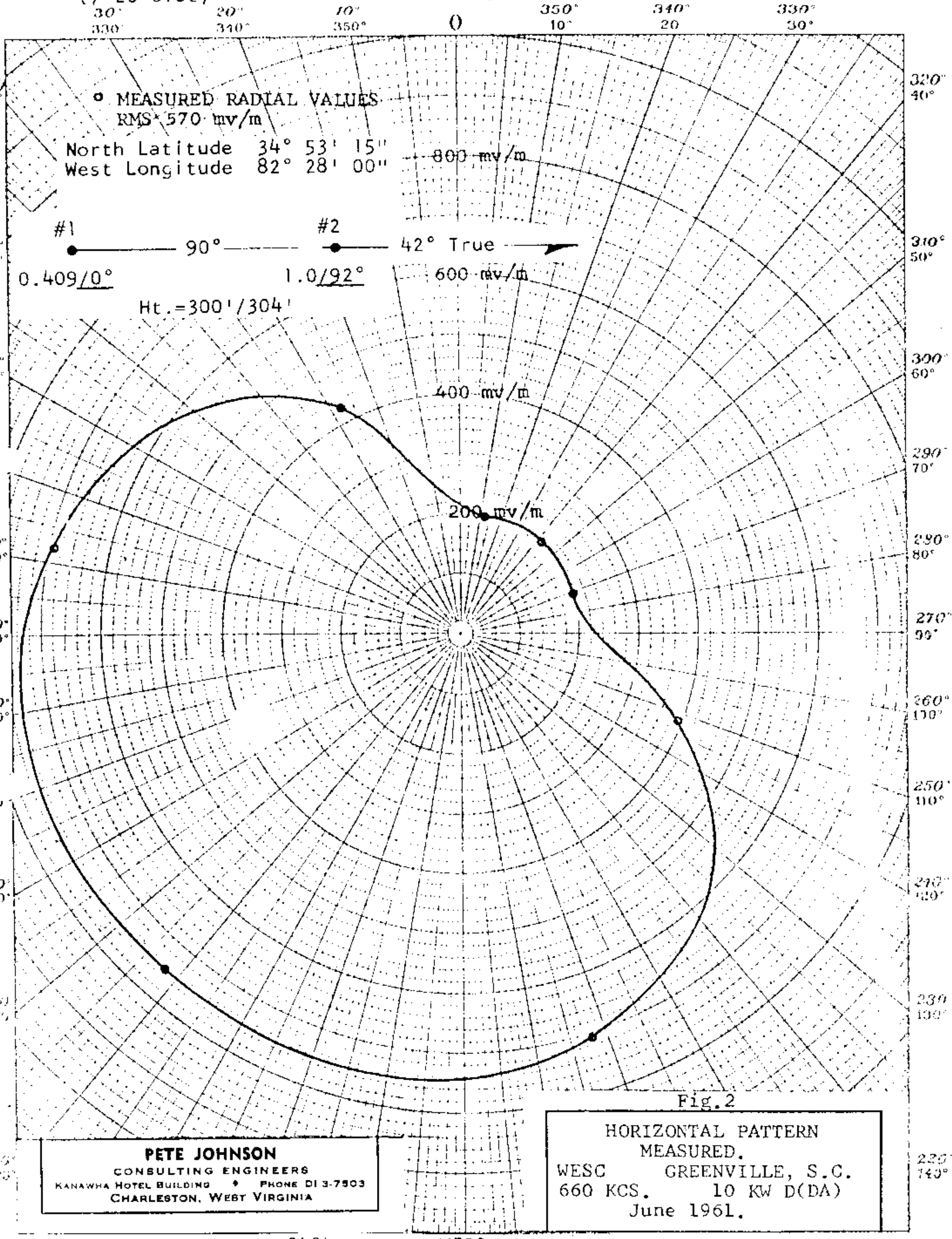


Fig.2

HORIZONTAL PATTERN
MEASURED.
WESC GREENVILLE, S.C.
660 KCS. 10 KW D(DA)
June 1961.

PETE JOHNSON
CONSULTING ENGINEERS
KANAWHA HOTEL BUILDING • PHONE DI 3-7503
CHARLESTON, WEST VIRGINIA

FCC File No. BL-8484
Accepted 7-20-61

WESC
Greenville, South Carolina 660 KC

XERPM ~~XEBZ~~ 660 KC

OIR/NARBA/3P5-28 Mexico

/EBZ

Descripción del

SISTEMA DE ANTENA DIRECCIONAL

para la

Estación Radiodifusora Comercial "XEBZ",

de la ciudad de México, D.F.

1.- SITUACIÓN DE LA ESTACIÓN RADIODIFUSORA:

Latitud: 19° 24' 49'' N
Longitud: 99° 07' 08" W

2.- ESPECIFICACIONES MECANICAS DE LA ANTENA:

a).- Número de elementos: 2 (dos).
b).- Tipo de contrucción: auto-sostenidos.
c).- Velocidad del viento: hasta 100 km. por hora.
d).- Altura total sobre la tierra: 113.64 m. (90°eléctricos).

3.- ESPECIFICACIONES ELECTRICAS DE LA ANTENA:

a).- Altura eléctrica de las torres: 90°(0.25 de longitud de onda).
b).- Orientación de la línea de torres: 39°N.E.
c).- Separación entre torres: 113.64 m. (90°eléctricos).
d).- Fase: Torre nor-oriental, 0°; Torre sudoccidental, -90°.
e).- Proporción de las corrientes: 1 (uno).

4.- SISTEMA DE TIERRA: 120 radiales de un cuarto de onda.

5.- CABLE DE TRASMISION:
Concéntrico de 2 1/2" aproximadamente, de 70 ohms.

6.- METODO EMPLEADO PARA OBSERVAR EL FUNCIONAMIENTO DE LA ANTENA DIRECCIONAL.- :

a).- Para gobernar la fase: espiras al pie de cada antena, para tomar la tensión de radio-frecuencia necesaria para alimentar el monitor de fase R.C.A. Tipo 300-A, que se une a cada torre con cables de transmisión de 1/4 de".
b).- Para gobernar la magnitud de las corrientes: se usarán termocouples operados a control remoto.

7.- ESTACION DE LA MISMA FRECUENCIA QUE SE PROTEGE: "WEAF".

a).- Situación geográfica de la antena:
Latitud: 40°50'51" N.
Longitud: 73°42'10" W.
b).- Azimut calculado: 39°N.E.

México D.F., 18 de Julio de 1944.

LAZARO BARAJAS GUTIERREZ.- I.M.E. (Rúbrica).

XERPM

Description Sheet
(8-26-66ct)

Station XERPM
Mexico, Federal District

5kw,50kw-LS,DA-N,U,Class II
660 kc

DIRECTIONAL ANTENNA DESCRIPTION SHEET

(Issued August 15,1966)

Station: XERPM(previously XEBZ)

Main Studio: Mexico,Federal District

Frequency: 660 kc/s

Power: 5kw Night 50kw Day

Notification List No. 235(*)

Date: (*)

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 19° 29' 13"

West Longitude: 99° 02' 33"

ANTENNA CHARACTERISTICS

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

Tower:	#1(N)	#2(S)	
Height above insulators:	377.3'	377.3'	(91.45°)
Phasing:	+52°	0°	
Field Ratio:	1	1	

Spacing and Orientation: Elements are spaced 562.77'(135°) on a line bearing 10° true.

Ground System: 120-377.3' equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers. Centers of systems are bonded together.

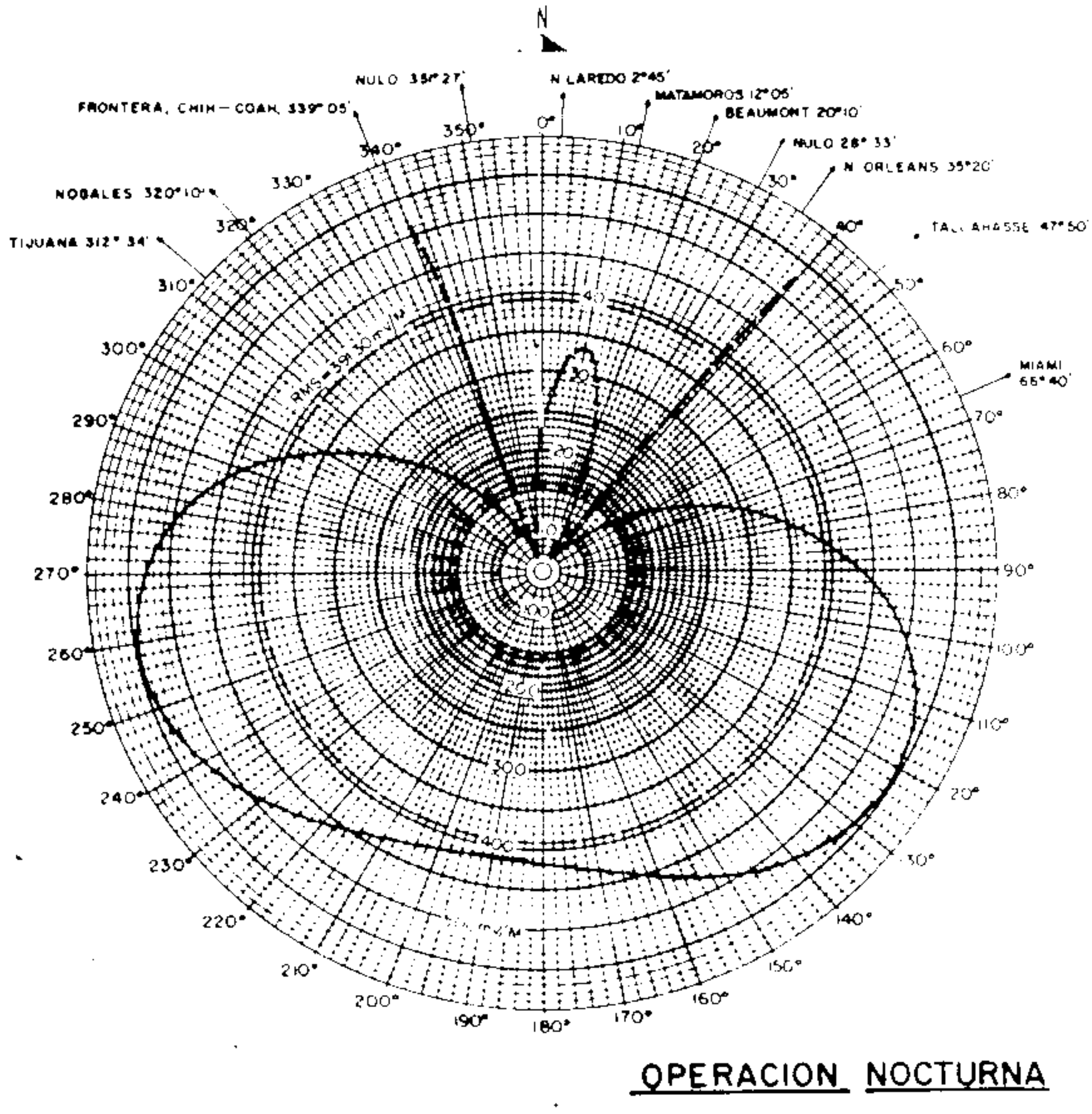
Predicted effective Night Field: 391.30 mv/m at rated power.

(*) FCC Note: This supplementary information was not previously issued because of an inconsistancy in the notification in Mexican Change List No. 172 which is clarified in Change List No. 235.

Proposed Night
(8-26-66ct)

Station XERPM
Mexico, Federal District

5kw,50kw-LS,DA-N,U,Class II
660 kc



PATRON DE RADIACION HORIZONTAL CALCULADO EN mV/M A UNA MILLA

ESQUEMA DE LAS TORRES Y SU ORIENTACION CON RESPECTO AL NTE. ASTRONOMICO.

RADIODIFUSORA	660 KHz. 5,000 Watts.
XEBZ	L. VASQUEZ ORTIZ
VOCERO MEXICANO, S.A. México, D. F.	Pasante Ing Comunicaciones

Dib E. Sesma

REVISO:

APROBO:

ANTENNA SPECIFICATION SHEET

DIRECTIONAL DA-2

FREQUENCY:	670 kc/s
STATION CALL:	
LOCATION:	Musgravetown, Newfoundland.
POWER:	10,000 watts
CLASS:	II
TIME:	Unlimited

NOTIFICATION REFERENCE: List No. 330 dated September 6, 1974

GEOGRAPHICAL COORDINATES: Lat 48°28'10", Lon 53°55'00"

ARRAY CHARACTERISTICS: Two elements, guyed, uniform cross section, both insulated, series fed. Height 265 feet or 65 degrees. No antenna top loading.

ELEMENT	ONE	TWO
spacing	ref	550.9' 135°
bearing	ref	080°
Day R	1.00	0.30
ø	00°	-47°
Night R	1.00	0.94
ø	00°	-47°

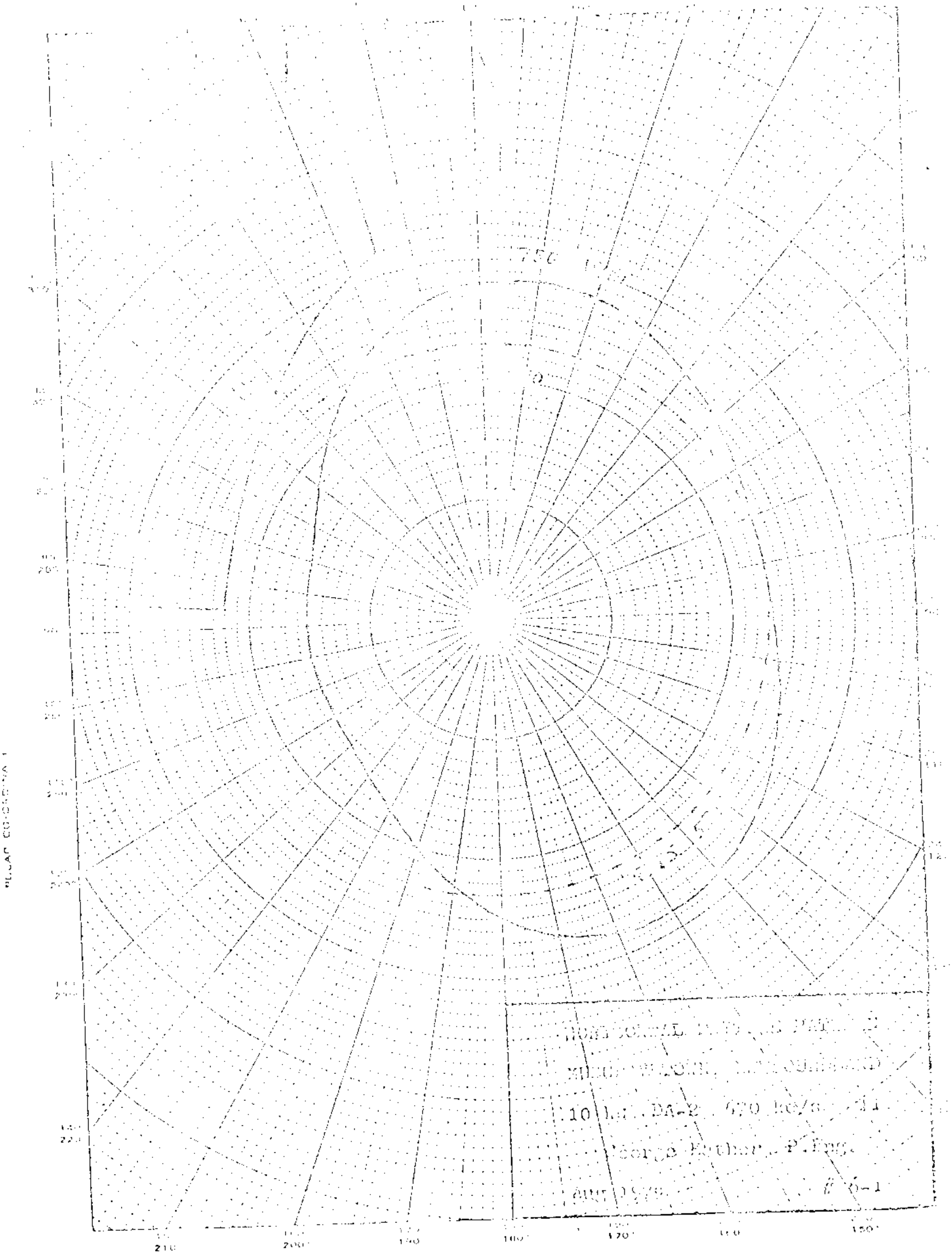
Ground System: 120 radials per tower. #10 AWG bare, soft copper wire, spaced uniformly, depth approximately 8 inches. Radials bonded along line between towers and bonded to soft copper straps at tower bases. Maximum length 587 feet

Predicted RMS: 575 mV/m at 1 mile for 10 kw

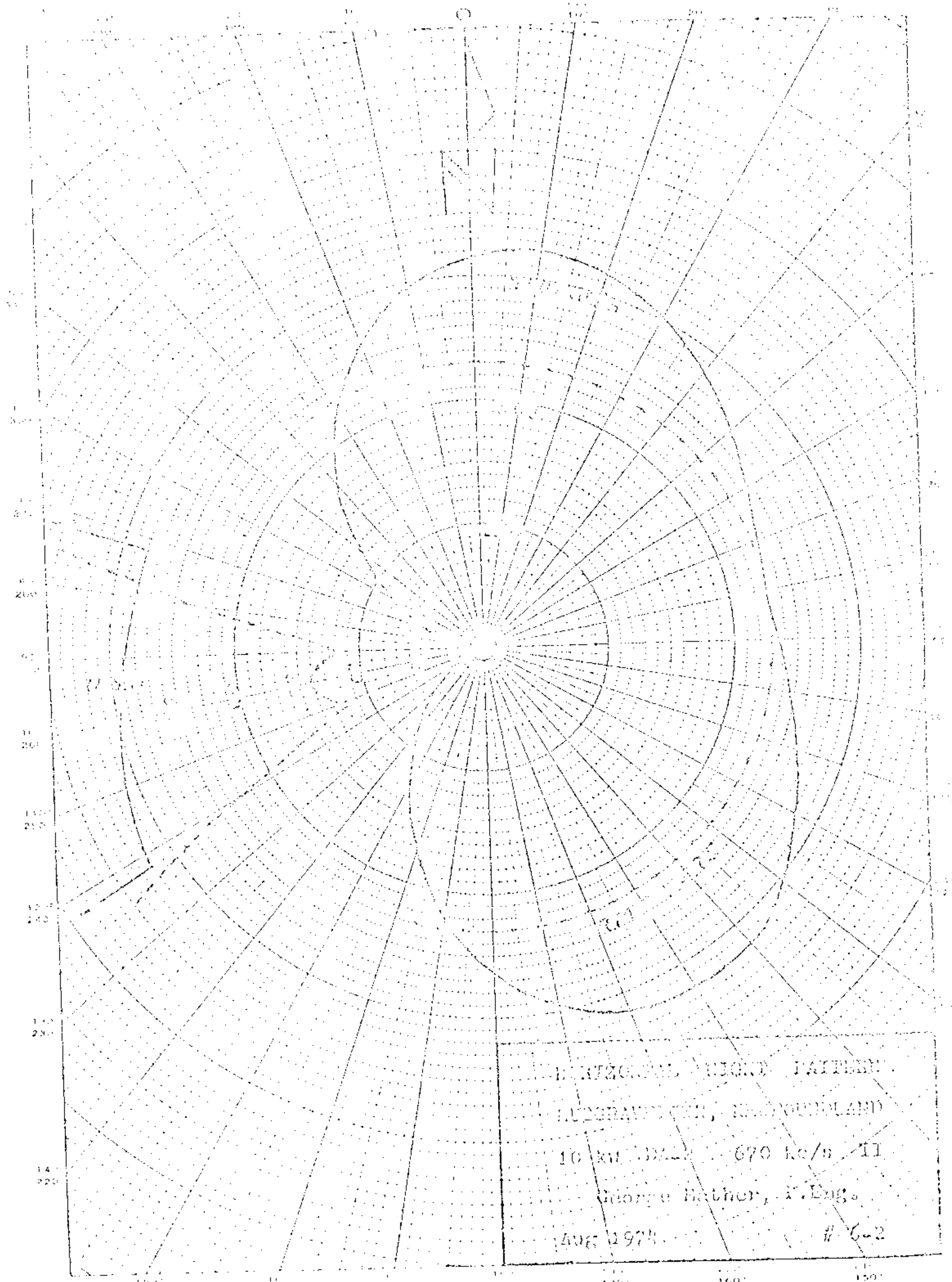
182 mV/m at 1 mile for 1 kw

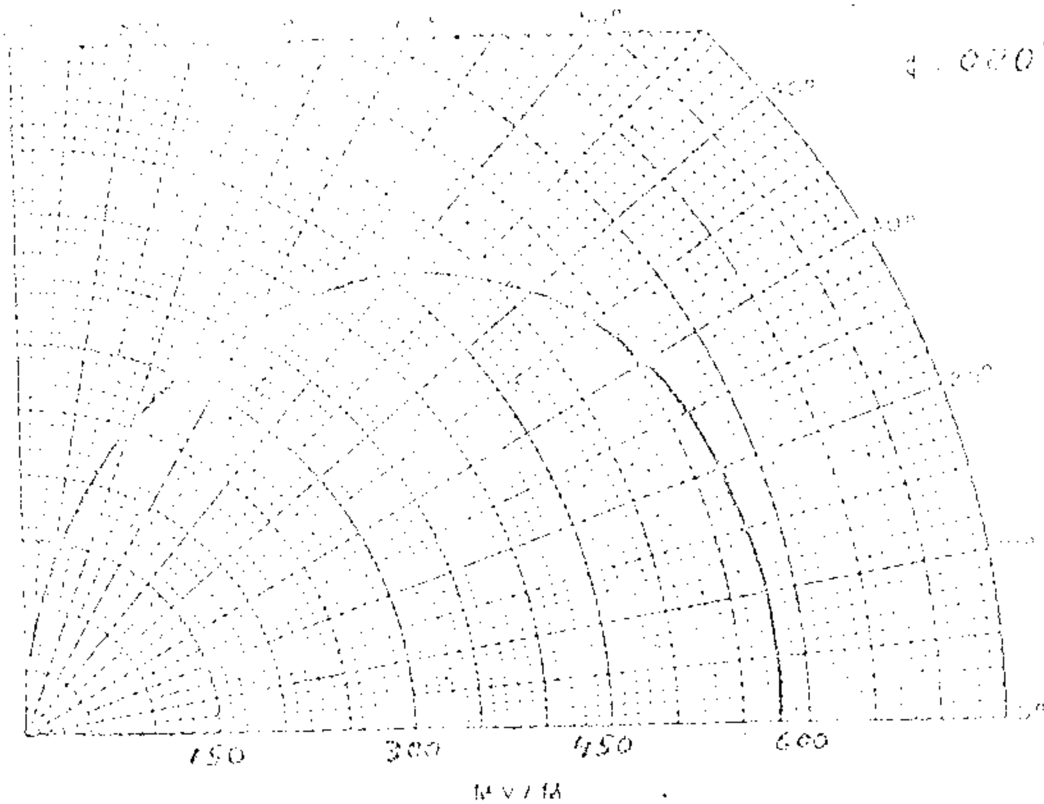
Aug 1974

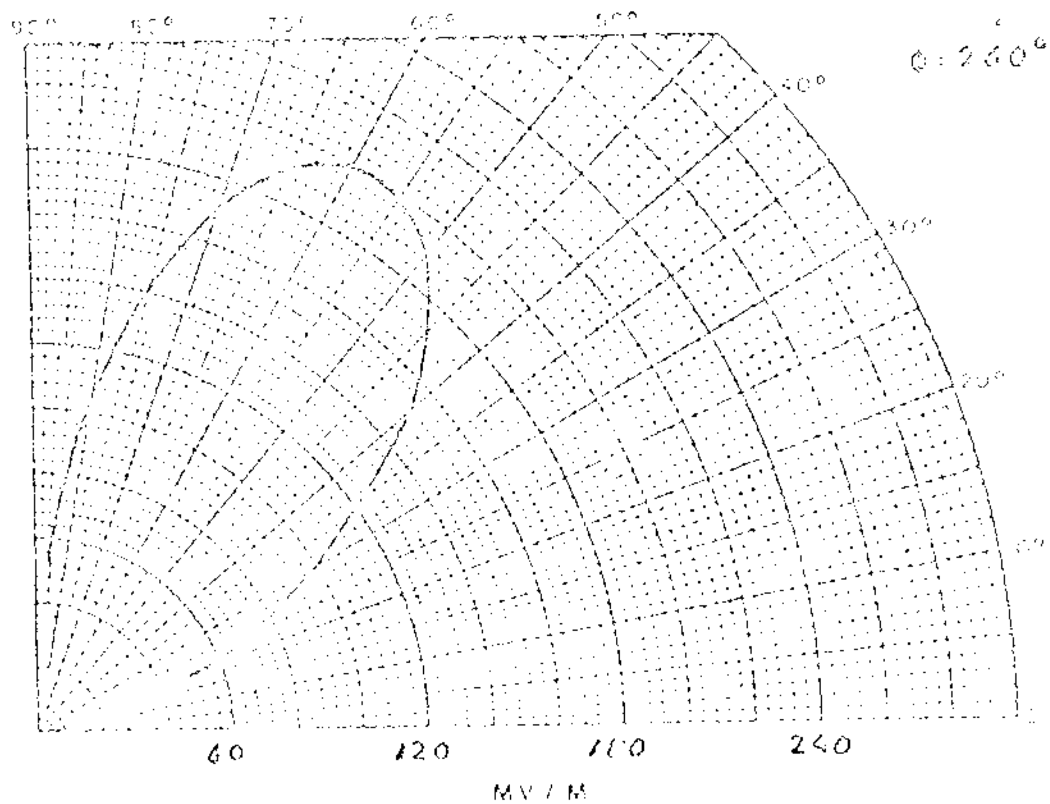
5



750
10
DA-2
P.Eng.
210
200°
190
180°
170°
150°


10 kW 670 kc/s II
George Mather, P.Eng.
Aug 1974
6-2





VERTICAL RADIATION PATTERNS

MUSGRAVETOWN, NEWFOUNDLAND
10 kw DA-2 670 kc/s 11
George Mather, P.Eng.

Aug 1976

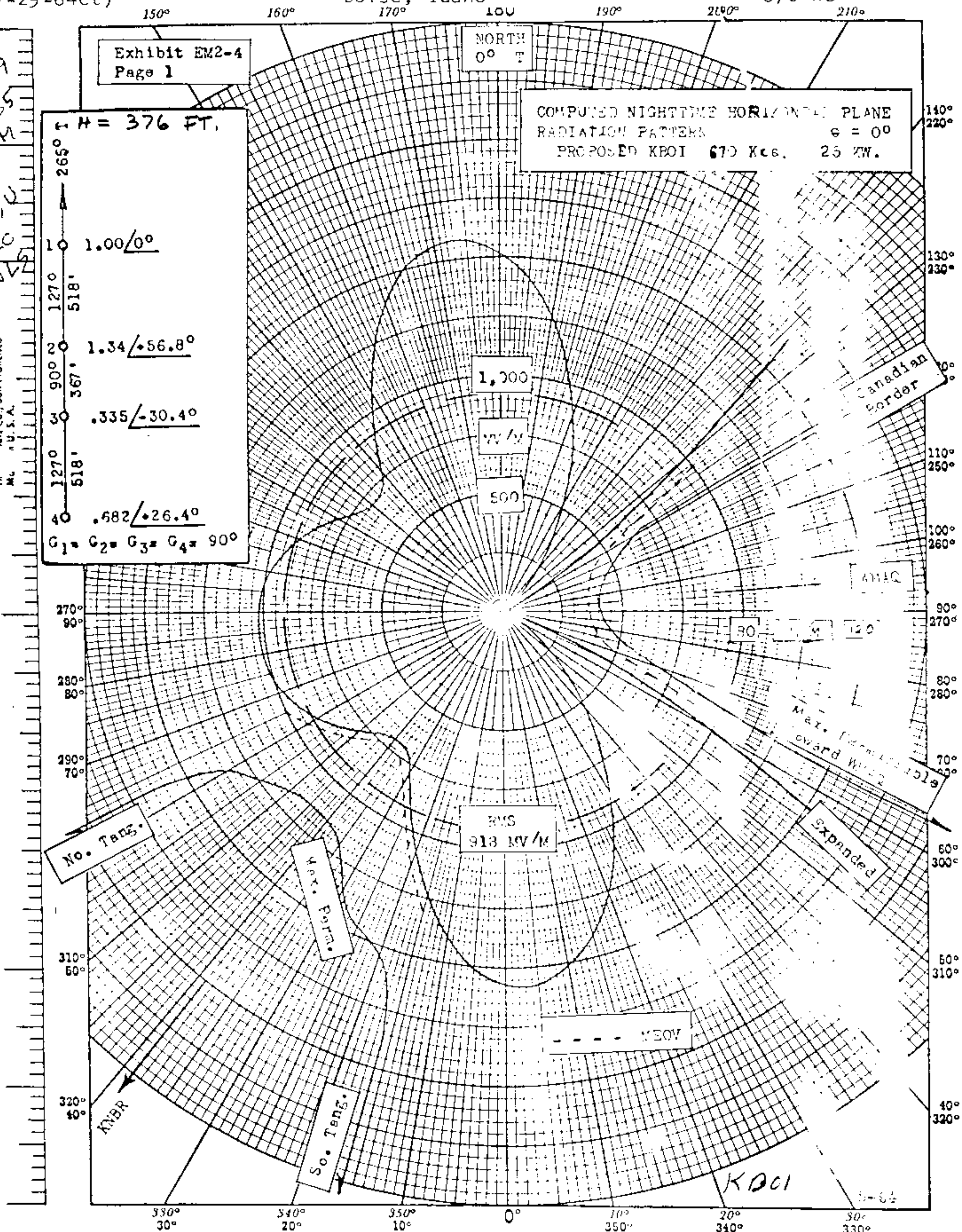
KBOI

Proposed Night
(7-29-64ct)

Station KBOI
Boise, Idaho

25kw,50kw-LS,DA-N,U
670 kc

BP-15769
A 2-24-65
CHG FROM
950KC
5KW,DA-N,U
TO 670KC
25KW,50KW-LS
DA-N,U
OVER



FCC File No.BP-15769
Accepted 7-9-64 Amended

Station KBOI
Boise, Idaho

670 kc

BL 12017
Granted (4-20-70) License covering CP to reduce Nighttime from 50 kw to 25 kw and make changes in DA Pattern

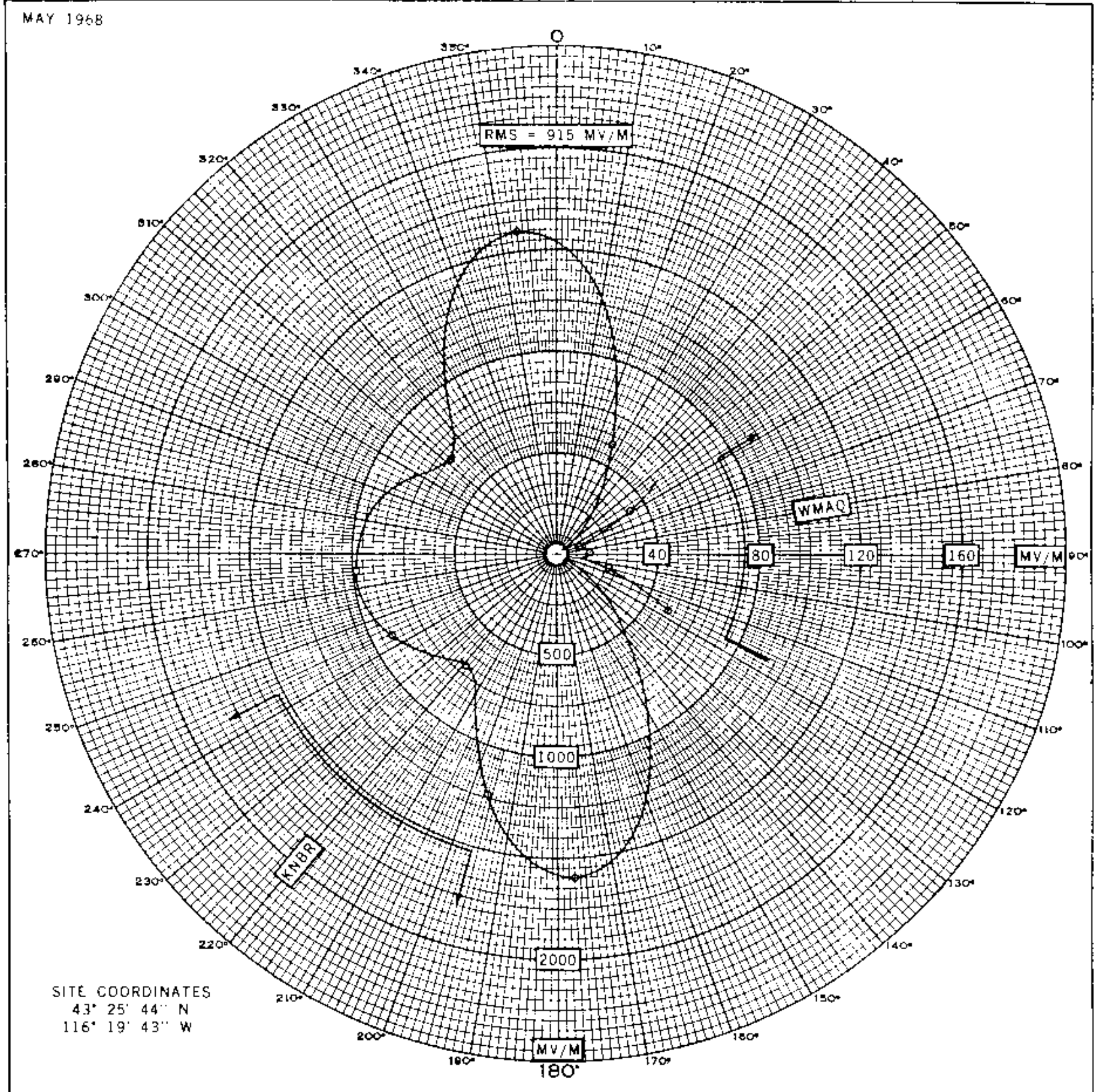
KBOI

Measured Night (7-29-68ct)

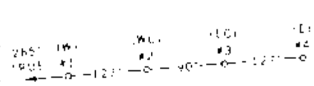
Station KBOI
Boise, Idaho

25kw,50kw-LS,DA-N,U
670 kc

Figure 10



MEASURED NIGHTTIME HORIZONTAL PLANE RADIATION PATTERN



#1 0.746∠-56.8
#2 1.00/0
#3 0.250∠-87.2
#4 0.309∠-30.4°

BOISE VALLEY BROADCASTERS, INC.

BOISE, IDAHO

Jules Cohen & Associates

Consulting Electronics Engineers

RADIO STATION KBOI

670 KHZ

25 KW 50 KW LS U DA N

PATTERN 680522

FCC File No.BL-12017
Accepted 7-10-68

Station KBOI
Boise, Idaho

670 kc

BL 12081
GR (4-20-70) Lic. Covering CP To reduce nighttime power fr. 50kw to 25kw and make changes in DA Pattern

KBOI

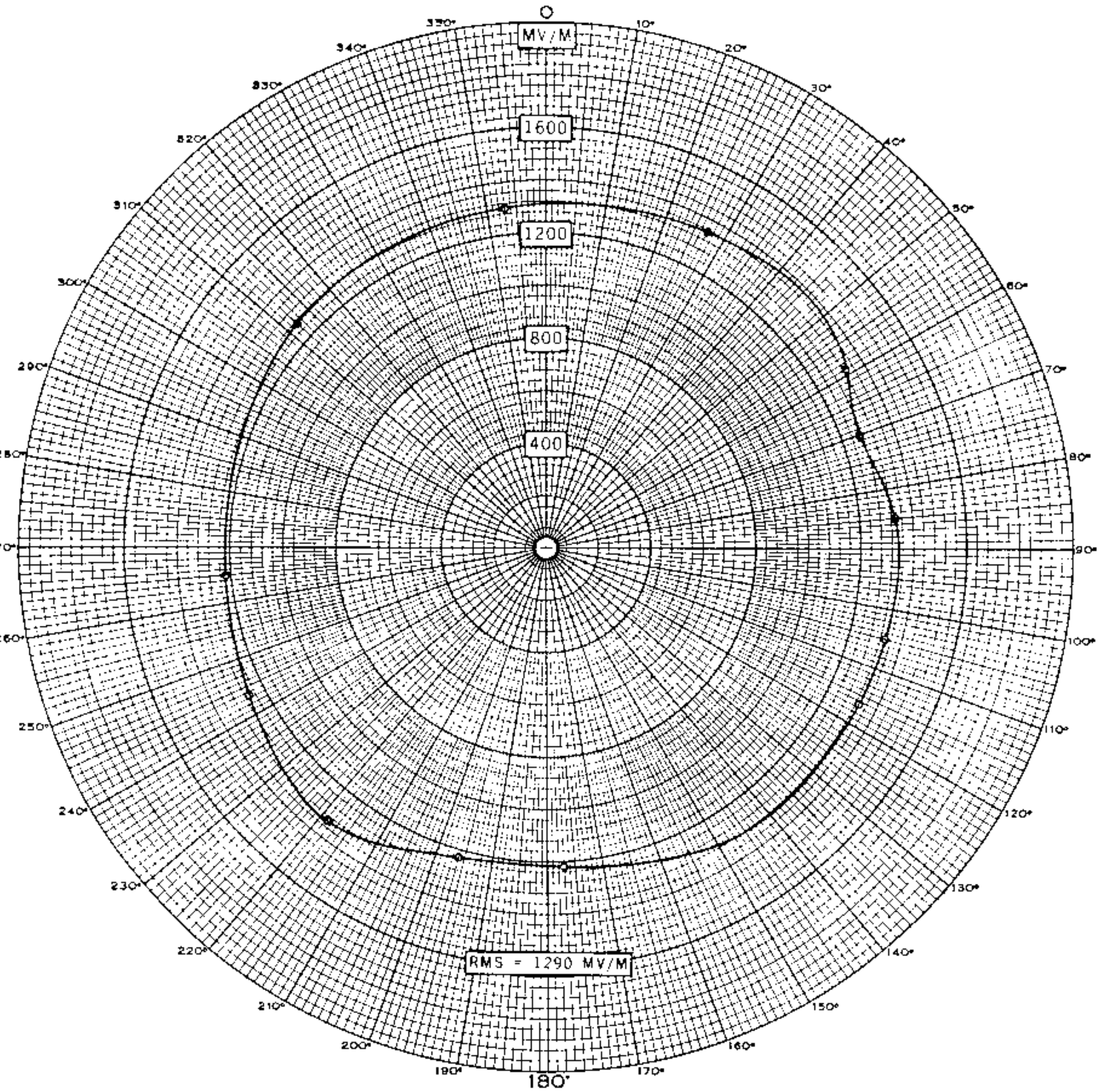
Measured Non-DA
(7-29-68ct)

Station KBOI
Boise, Idaho

25kw,50kw-LS,DA-N,U
670 kc

Figure 8

MAY 1968



MEASURED NONDIRECTIONAL HORIZONTAL PLANE RADIATION PATTERN

#1 (WEST) TOWER USED FOR NONDIRECTIONAL OPERATION	BOISE VALLEY BROADCASTERS, INC. BOISE, IDAHO Jules Cohen & Associates Consulting Electronics Engineers	RADIO STATION KBOI 670 KHZ 25 KW 50 KW LS, U, DA N

FCC File No.BL-12017
Accepted 7-10-68

Station KBOI
Boise, Idaho

670 kc

CMKP

80092

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CMKP | Main Studio: Holguin, Oriente

Frequency: 670kc/s | Power 1kw

Date Received March 27, 1953 Class: III-E

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

North Latitude: 20° 50' 30"
West Longitude: 76° 17' 00"

ANTENNA CHARACTERISTICS

Authorized for Day and Night operation. (DA-1)
Number of elements: two (2)
Type of elements: Series-fed, self-supporting, tapered vertical steel towers.

Tower:	North	South
Height Above Insulators:	300'	300' (73.6°)

Spacing: 367.16' or 90° between adjacent towers.

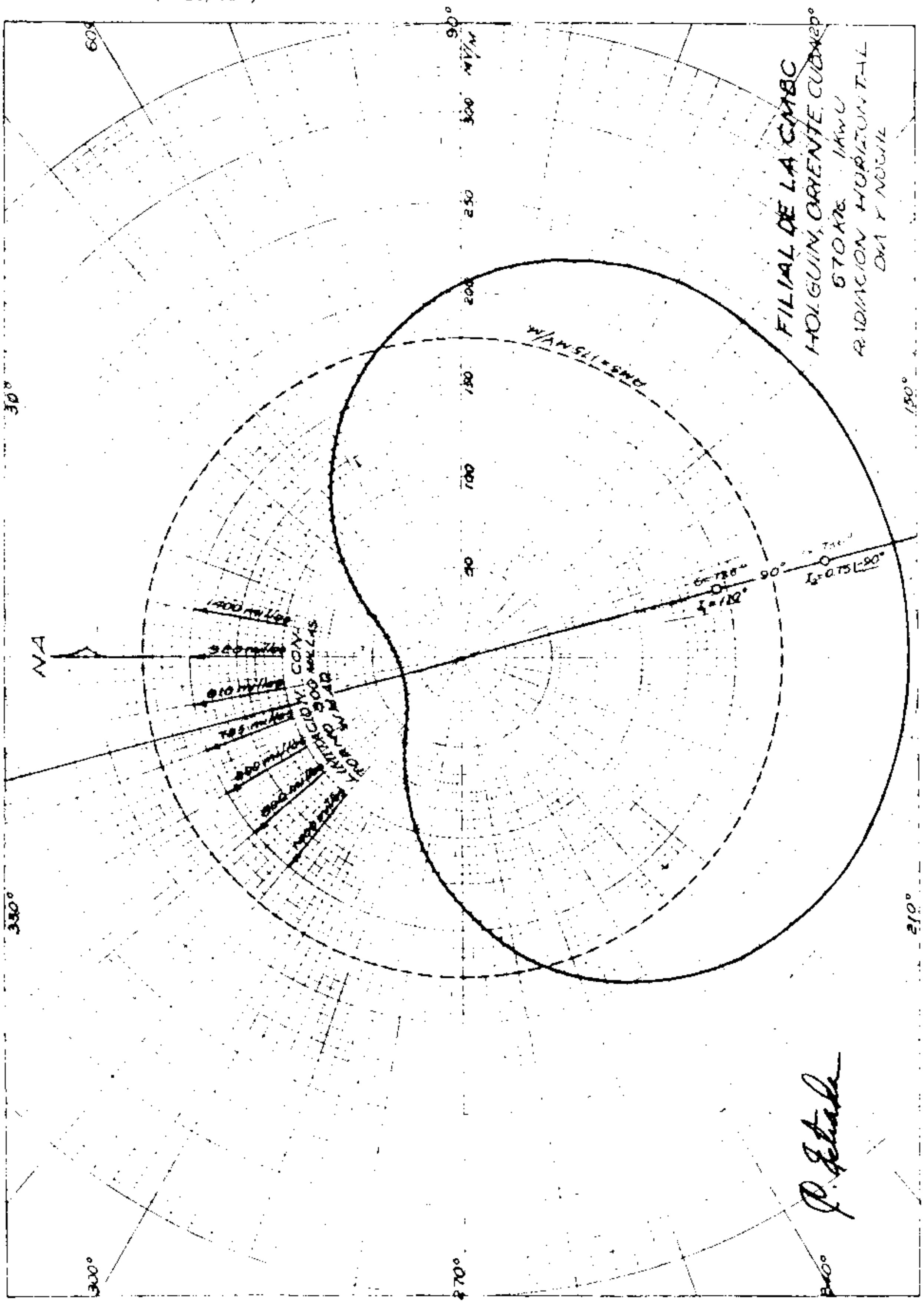
Phasing:	0°	-90°
Field Ratio:	1	0.75

Orientation: Elements on a line bearing 165° true.

Predicted effective Field 175 mv/m at rated power.

F.C.C. Note: This pattern supplements the particulars for this station set forth in Annex 3 to the North American Regional Broadcasting Agreement, Washington, D. C. 1950.

PROPOSED CMKP, HOLGUIN, ORIENTE, CUBA 1kw, DA-1 670kc
DAY & NIGHT (4/15/53G)



#316

CFDR - 680

TABLE 1

ANTENNA DESCRIPTION SHEET

STATION CALL: CFDR

MAIN STUDIO: DARTMOUTH, NOVA SCOTIA

FREQUENCY: 680 kHz

POWER: 10N/50D kW

CLASS: II

MODE: DA-2

TIME: UNLIMITED

NOTIFICATION LIST NO.: 316.... DATE: Oct. 31. 1973.

GEOGRAPHICAL LOCATION: Latitude 44° 42' 08" North
Longitude 63° 41' 58" West

ARRAY CHARACTERISTICS: Four guyed steel towers of uniform cross section; base insulated series fed; tower #1 top loaded using the upper guy wires to an effective height of approximately 87°.

		1(N)	2(C)	3(S)	4(SW)
	TOWER NUMBER:	1(N)	2(C)	3(S)	4(SW)
	HEIGHT ABOVE INSULATOR:	320'(79.6°)	350'	350'	350'(87.1°)
	OVERALL HEIGHT ABOVE GRADE:	325'	355'	355'	355'
DAY	FIELD RATIO:	-	-	1.00	1.00
	PHASE ANGLE:	-	-	0°	51°
NIGHT	FIELD RATIO:	1.00	1.95	1.00	-
	PHASE ANGLE:	306°	153°	0°	-
	SPACING:	160° 642.8'	80° 321.4'	0° -	120° 482.1'
	ORIENTATION:	315°	315°	ref.	275°

GROUND SYSTEM: 120 equally spaced radial wires per tower of #10 AWG bare copperweld wire, buried where possible and otherwise secured in place; of average effective length 580'(0.4λ) excluding those along common chords; minimum effective length 363'(0.25λ)

PREDICTED EFFECTIVE FIELD: (UNATTENUATED AT ONE MILE)
1308 mV/m for 50 kW day or
185 mV/m per kW
569.2 mV/m for 10 kW night or
180 mV/m per kW

ELDER ENGINEERING LIMITED

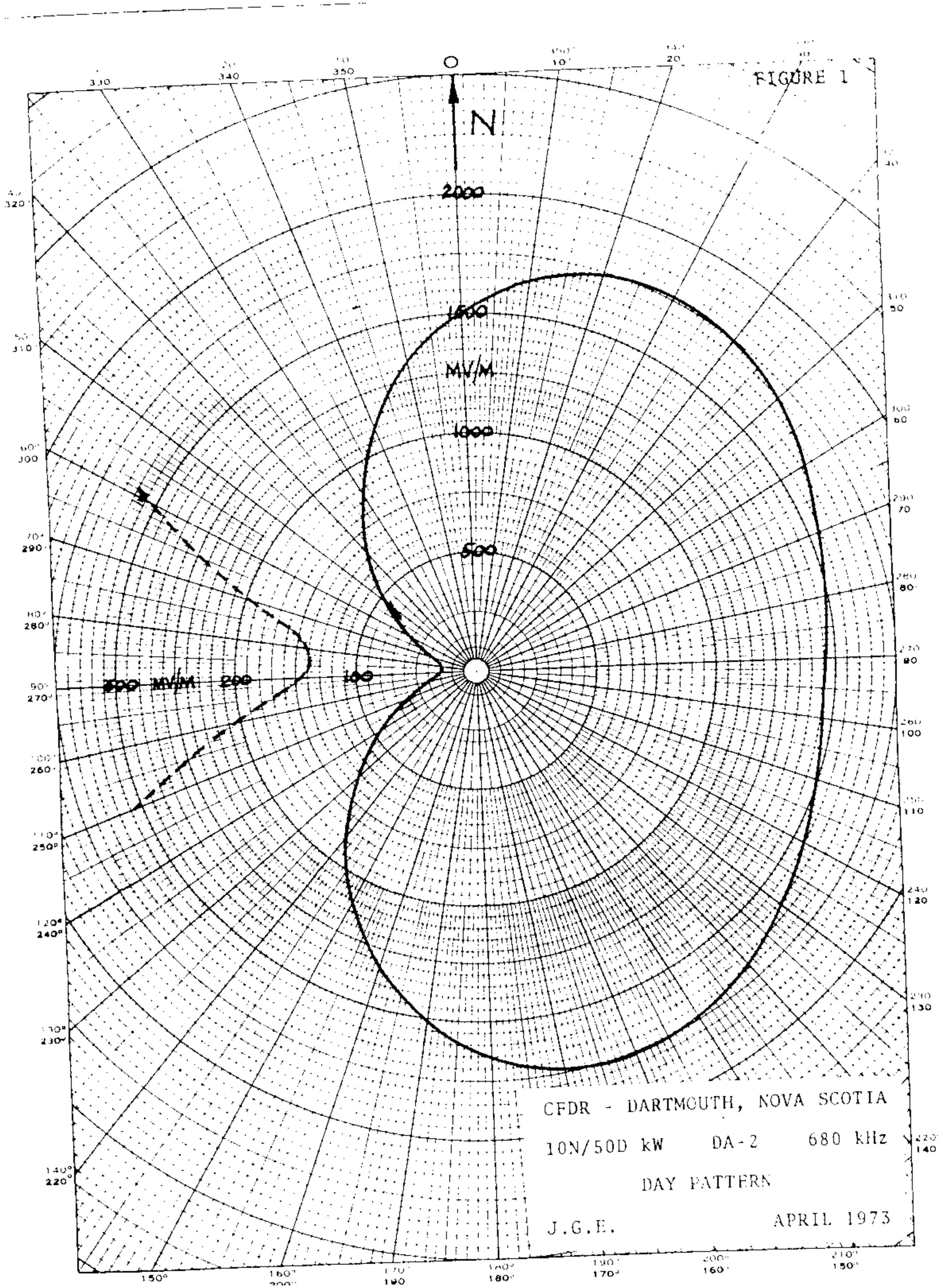


FIGURE 1
N
2000
1500
MV/M
1000
500
100
200
300
MV/M
CFDR - DARTMOUTH, NOVA SCOTIA
10N/50D kW DA-2 680 kHz
DAY PATTERN
J.G.E.
APRIL 1973

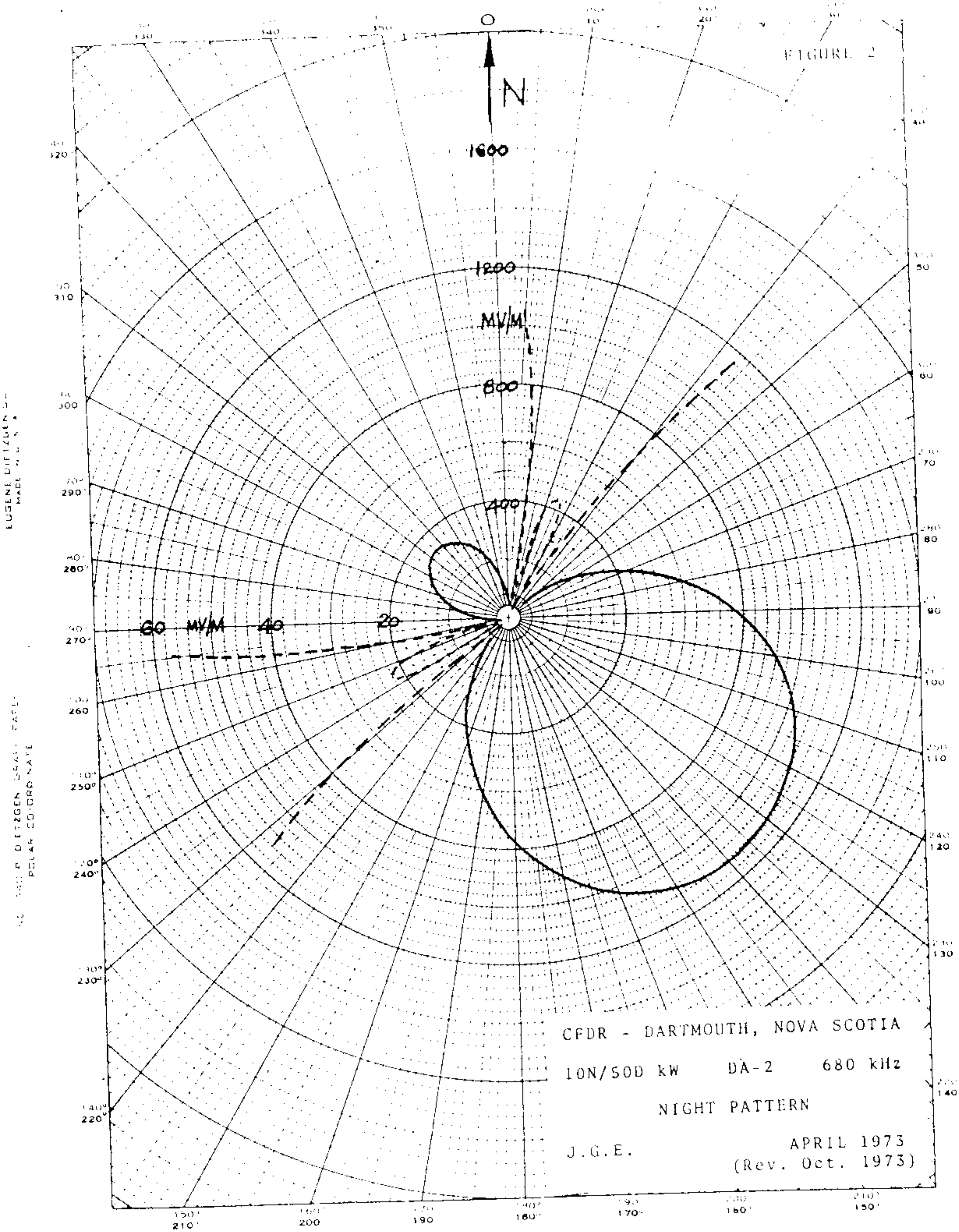
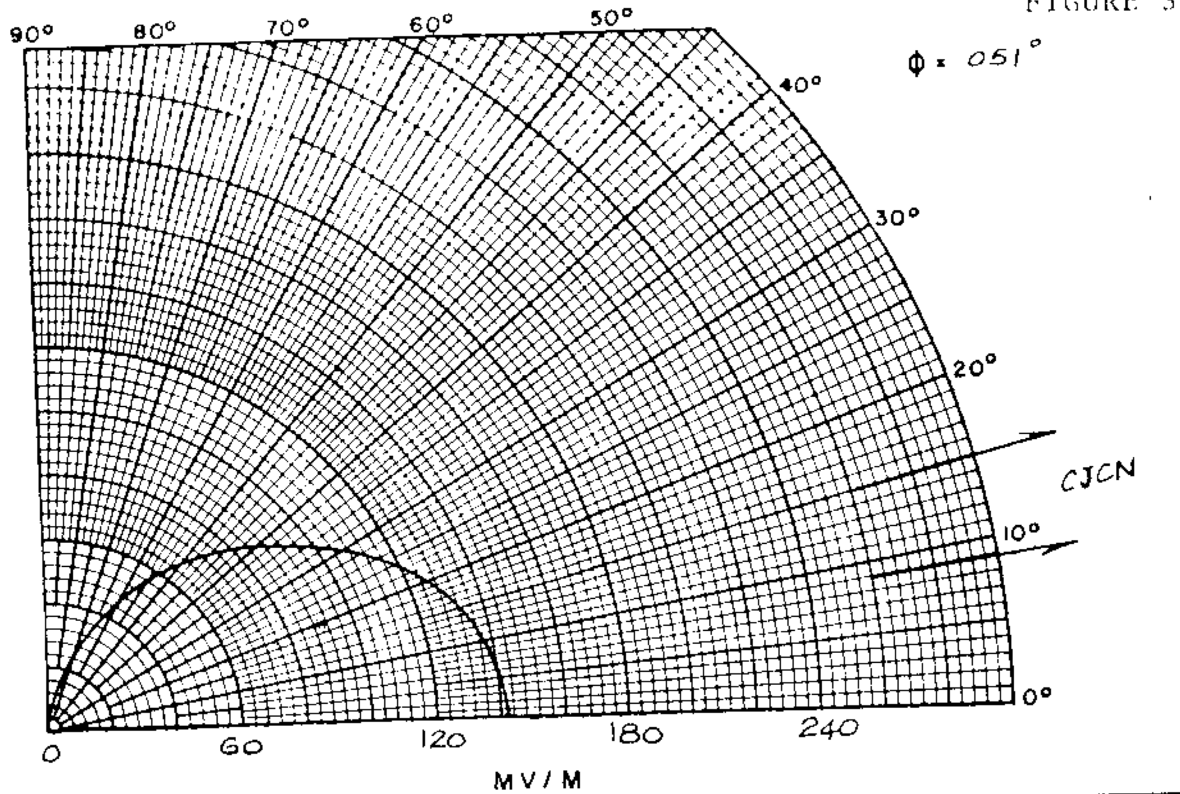
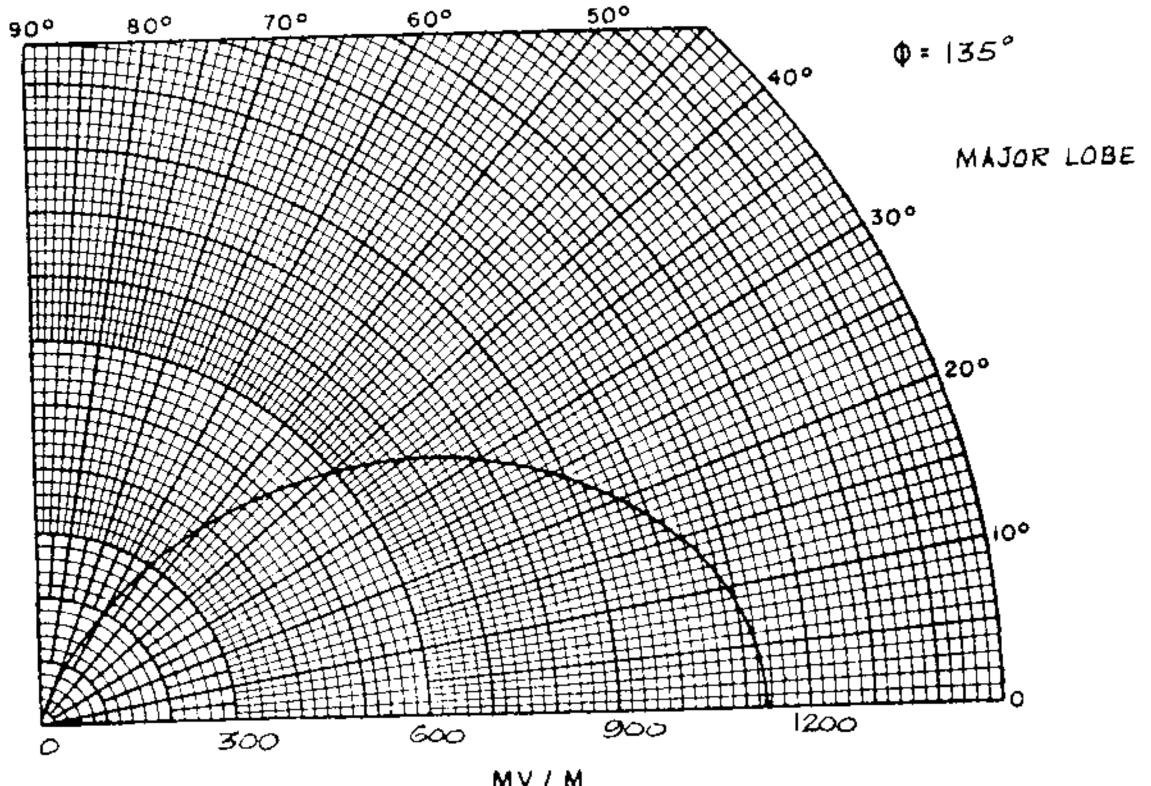


FIGURE 2
N
1600
1200
MV/M
800
400
60 MV/M 40 20
CFDR - DARTMOUTH, NOVA SCOTIA
10N/50D kW DA-2 680 kHz
NIGHT PATTERN
J.G.E.
APRIL 1973
(Rev. Oct. 1973)

FIGURE 3-1





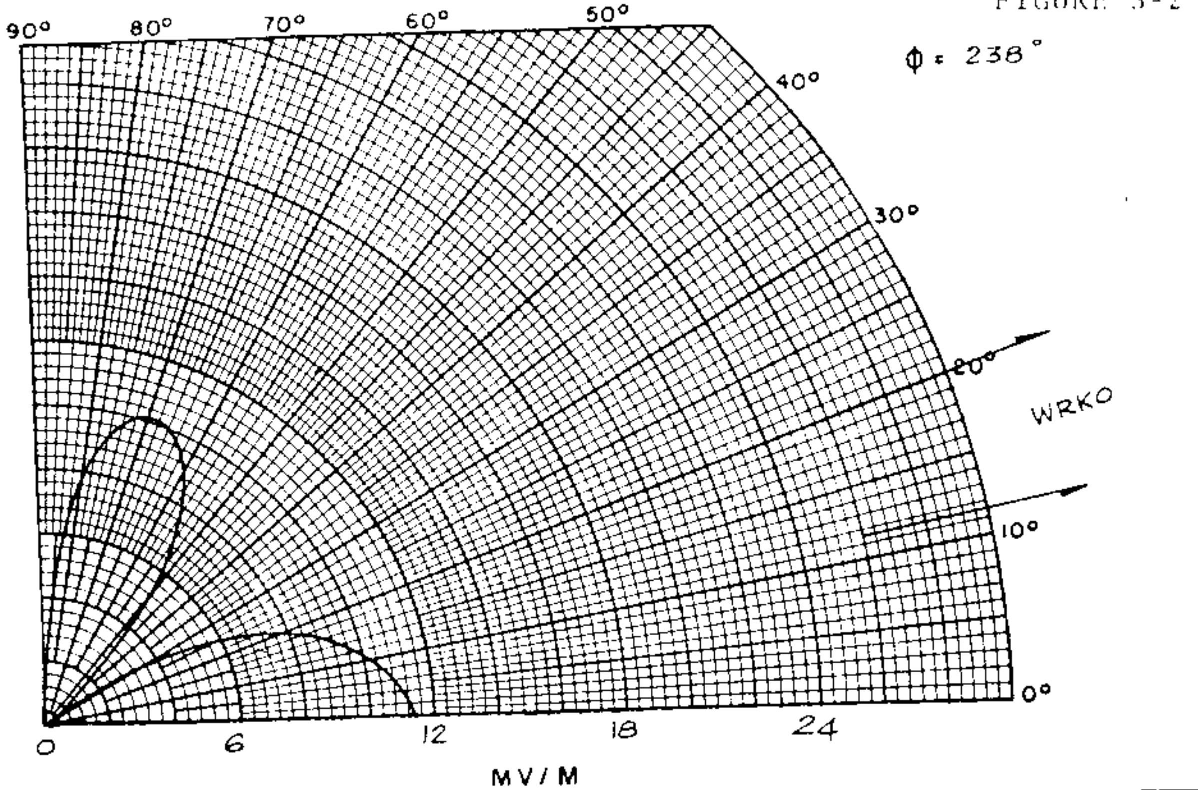
VERTICAL RADIATION PATTERNS

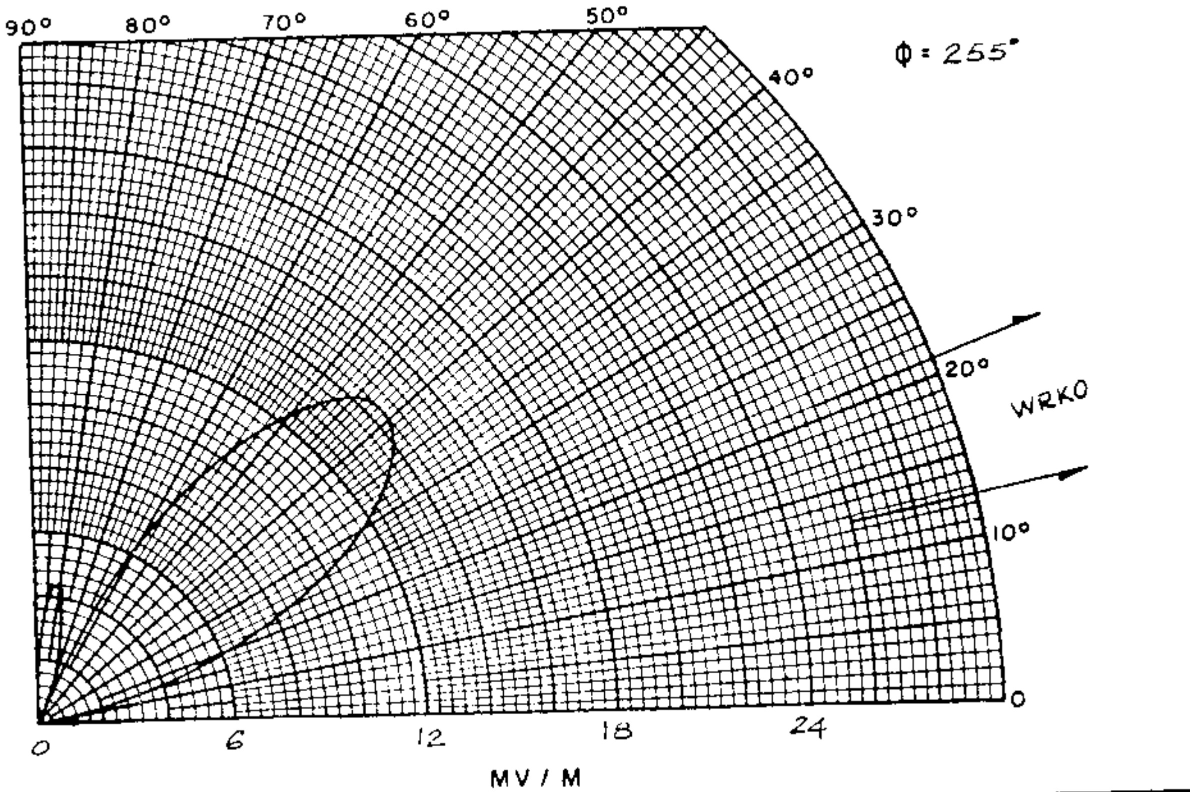
CFDR - DARTMOUTH, NOVA SCOTIA

10N/50D kW DA-2 680 kHz

J.G.E. APRIL 1973

FIGURE 3-2





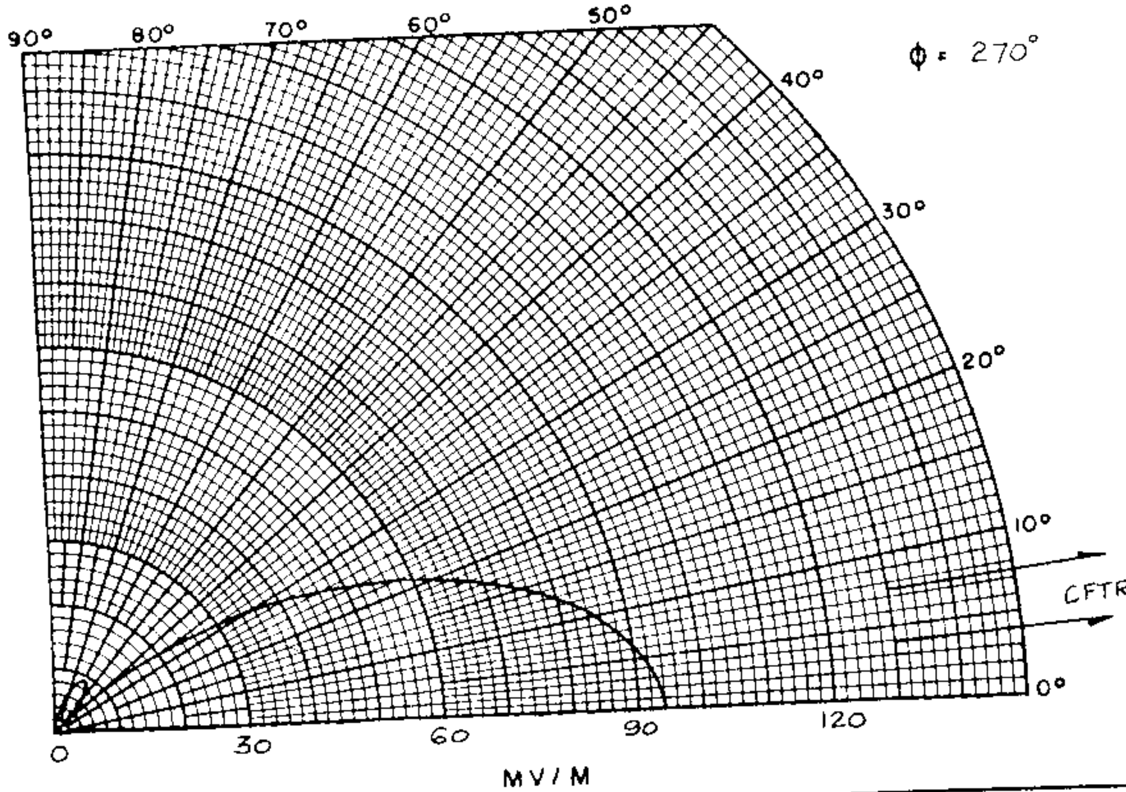
VERTICAL RADIATION PATTERNS

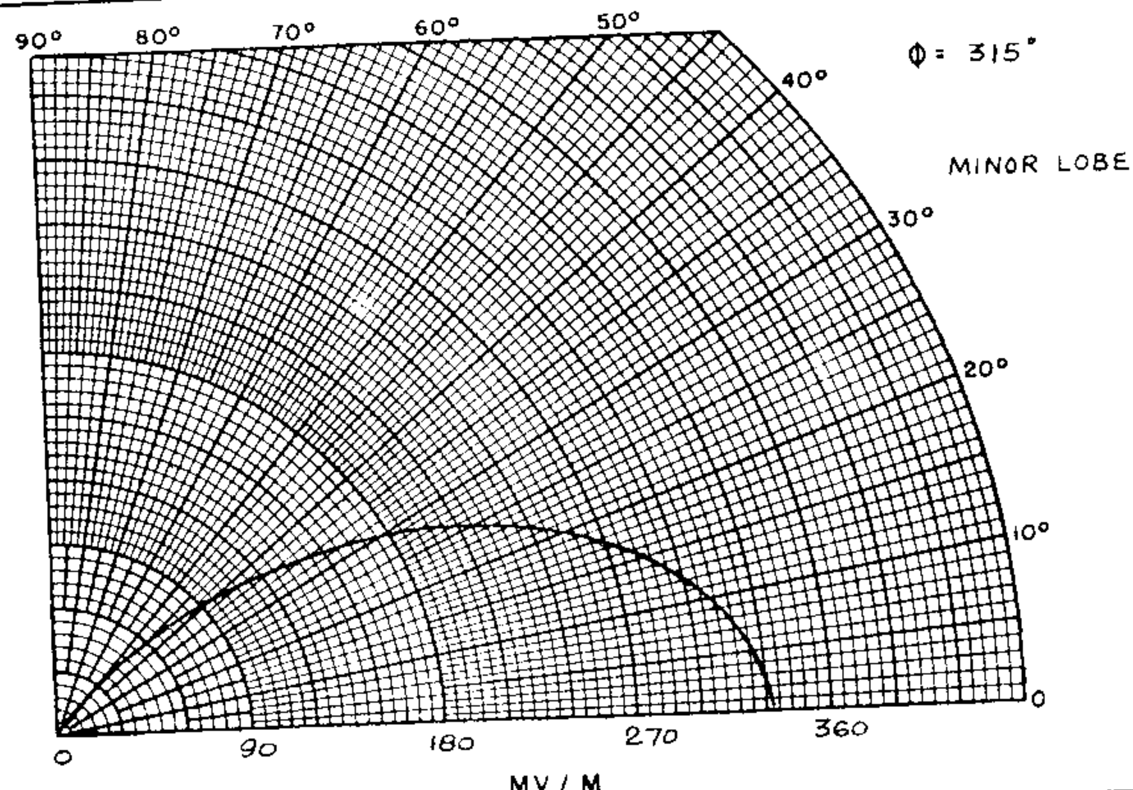
CFDR - DARTMOUTH, NOVA SCOTIA

10N/50D kW DA-2 680 kHz

J.G.E. APRIL 1973

FIGURE 3-3





VERTICAL RADIATION PATTERNS

CFDR - DARTMOUTH, NOVA SCOTIA

10N/50D kW DA-2 680 kHz

J.G.E. APRIL 1973

CFTR
680

IFRB Serial No. 12079

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)	680
Transmitting station	Name of the station	(03)	TORONTO ON
	Call sign	(04)	CFTR
	Additional Identification	(05)	
	Station class	(06)	B
	Operational Status	(07)	P
Country		(08)	CAN
Geographical coordinates of the transmitting station		(09)	79W3630 43N1250

(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)	50. No change
r.m.s. value of radiation for station power (mV/m at 1 km)	(25)	2034.58	(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. 12079

PART II Section I

Description of a directional antenna consisting of vertical conductors

Sheet No. 421

Date 830726

(01) TORONTO ON — Name of transmitting station

(02) CAN — Country

(03) D — Hours of operation

(04) 8 — 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	.338	169.2	0.	0.		99.5	
2	.999	129.2	154.	292.5		99.5	
3	1.003	89.2	308.	292.5		99.5	
4	.339	51.3	462.	292.5		99.5	
5	.336	-39.	485.782	303.013		99.5	
6	1.	0.	335.546	307.816		99.5	
7	1.001	38.4	191.338	320.088		99.5	
8	.339	78.7	90.	12.5		98.5	
	.	.	.	.		.	
	.	.	.	.		.	
	.	.	.	.		.	
	.	.	.	.		.	

(14) r.m.s value of radiation: 2034.88 mV/m at 1 km

(15) Type of pattern: E

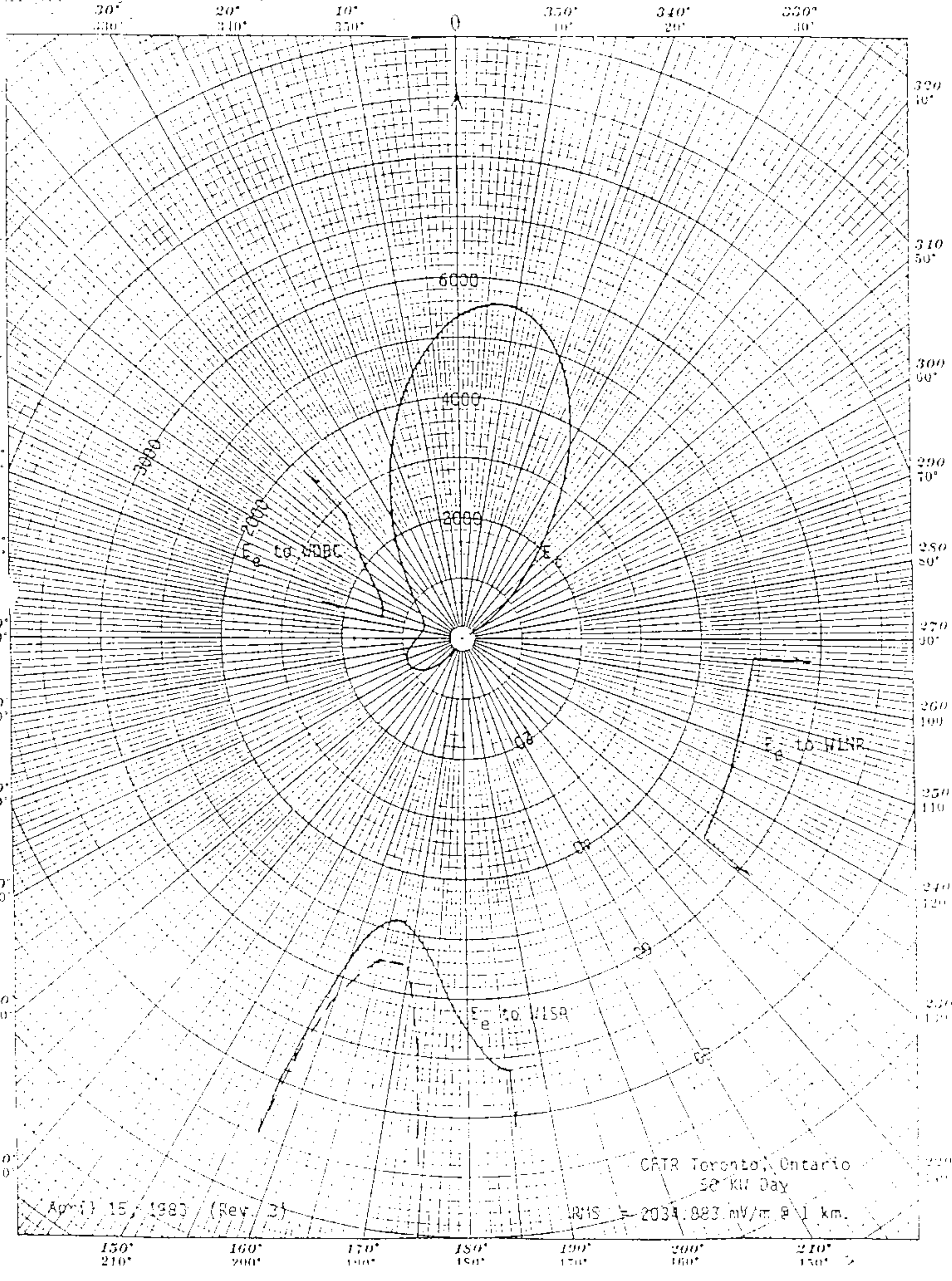
(16) Special quadrature factor: 40.6 mV/m at 1 km

(17) SUPPLEMENTARY INFORMATION

CFTR 680

CFTR
680

E. W. Horrigan & Associates Limited



CFTR
680KHz

E.W. Horrigan & Associates Limited

Section 2.9 - Description of Array (Revised July 31, 1980)

Station: CFTR | Frequency: 680 KHz | Time: Unlimited

Main Studio: Toronto, Ontario | Power: 50 KW | Class: II

Notification List: 398 | Date: August 29, 1980

Antenna Site Co-ordinates: 43° 12' 52" North Latitude, 79° 36' 20" West Longitude

Mode of Operation: DA-2 | Number of Elements: 8

Type of Elements: guyed, uniform cross-section, base insulated, series fed, no top loading.

Tower Height: 400 feet (99.5°) above insulators
410 feet above ground

			Day		Night	
Tower #	Orientation (degrees)	Distance (degrees)	Field Ratio	Phase (degrees)	Field Ratio	Phase (degrees)
1	0.0	0.0	0.338	168.7	0.43	119.3
2	292.5	154.0	1.000	129.4	1.00	103.3
3	292.5	308.0	1.000	90.1	1.00	95.1
4	292.5	462.0	0.338	50.8	0.43	79.1
5	303.013	485.782	0.338	320.7	0.43	344.0
6	307.816	335.546	1.000	0.0	1.00	0.0
7	320.088	191.388	1.000	39.3	1.00	8.2
8	12.5	90.0	0.338	78.6	0.43	24.2

Predicted RMS Field: Day 1264.495 mV/m at 1 mile;
178.827 mV/m at 1 mile for 1 KW.

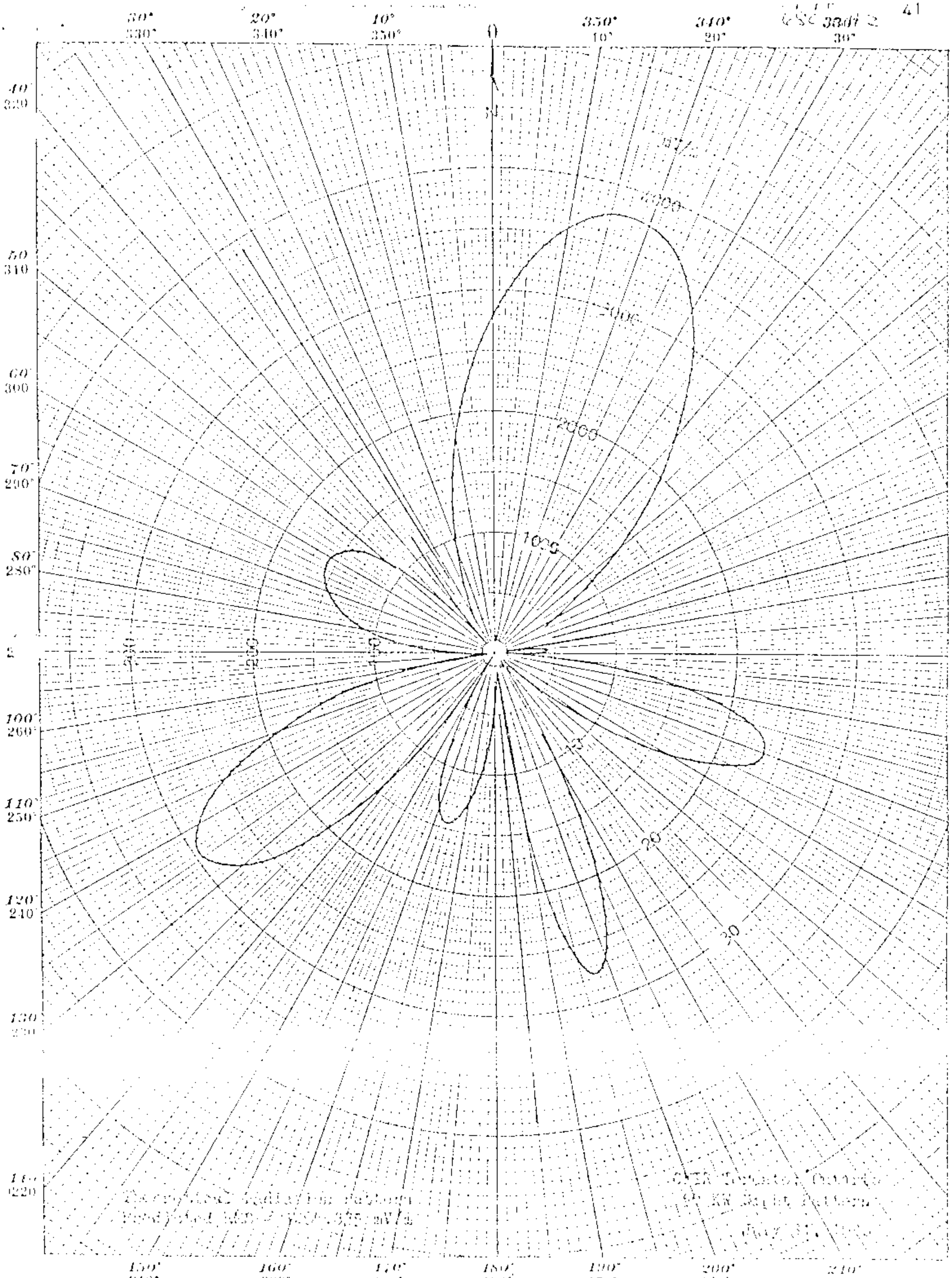
Night 1265.335 mV/m at 1 mile;
178.945 mV/m at 1 mile for 1 KW.

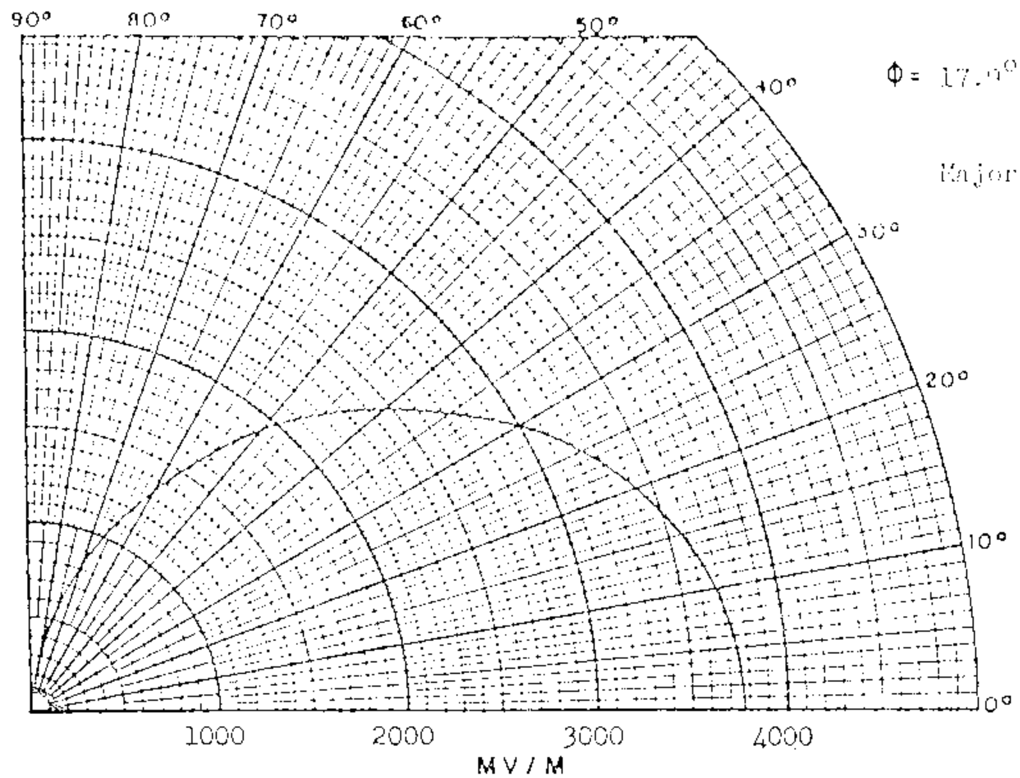
RSS/RMS: Day 1.08568 | Q (θ = 0°) Day 3.79 mV/m

Night 1.13717 | Night 31.7 mV/m

Ground System: 120 radials of #10 AWG soft drawn copper wire from [illegible] [illegible] connected by 2" x 1/16" copper strap. Radials running between towers bonded to #4 AWG stranded copper wire. The effective length of the radials is 0.4λ.

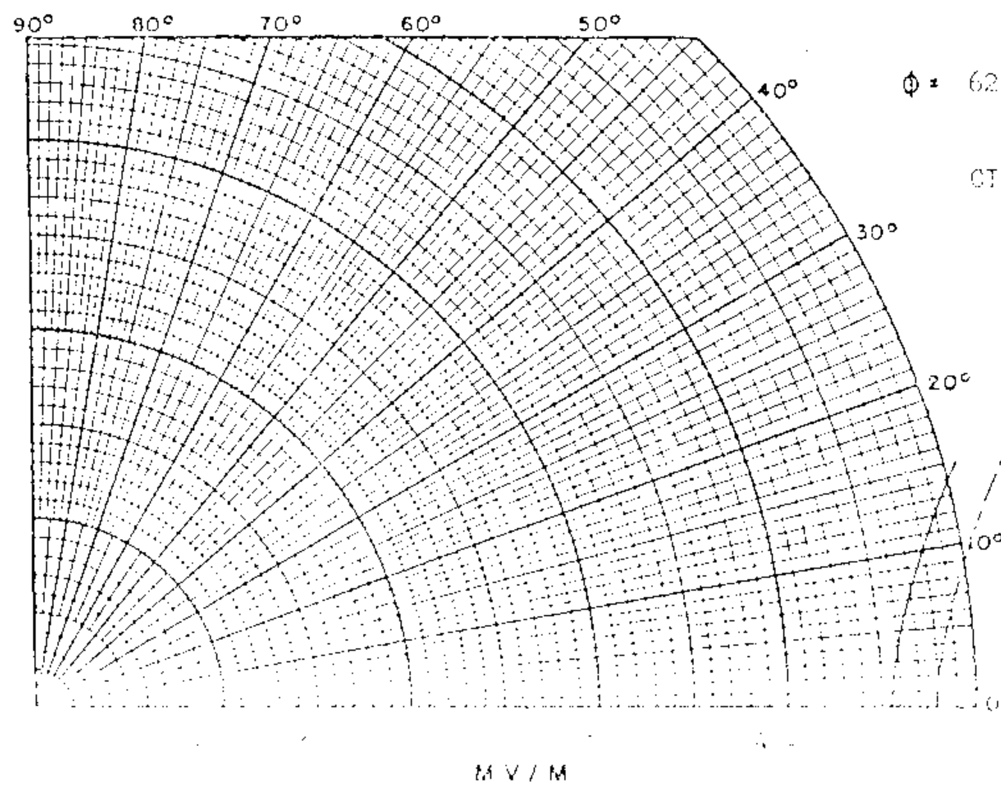
This notification involves a change in the proposed night-time directional antenna radiation pattern. Please retain the day-time pattern notified in Change List 392 dated December 7, 1979.





Φ = 17.0°

Major Lobe



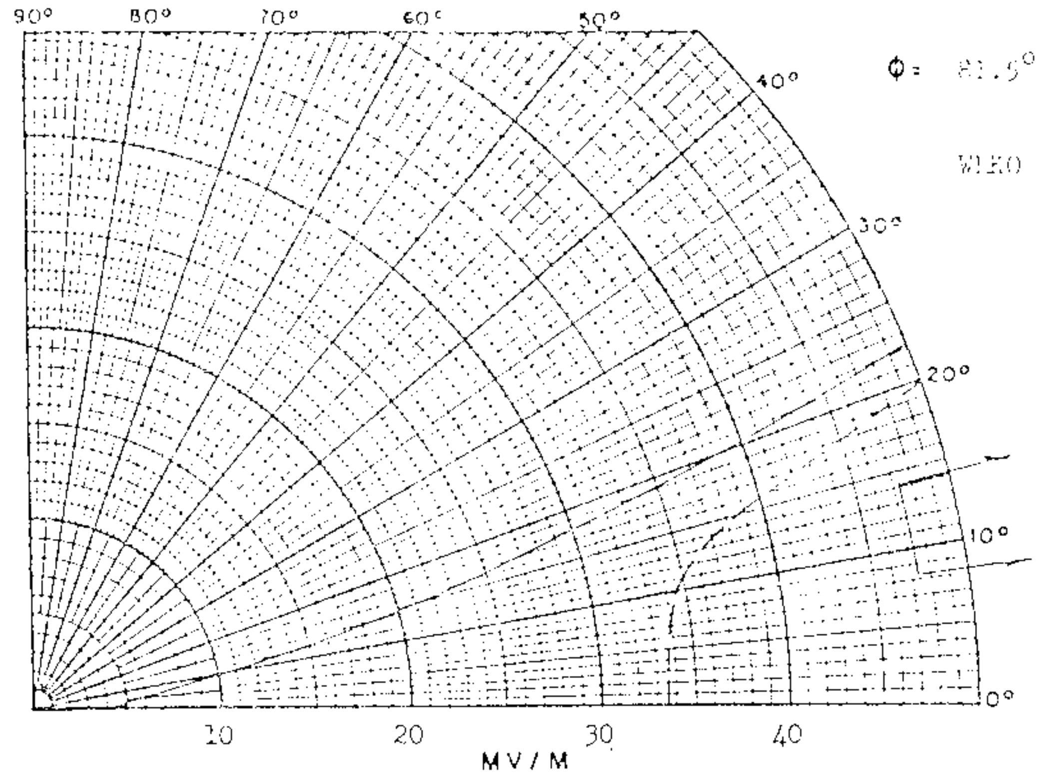
Φ = 62.0°

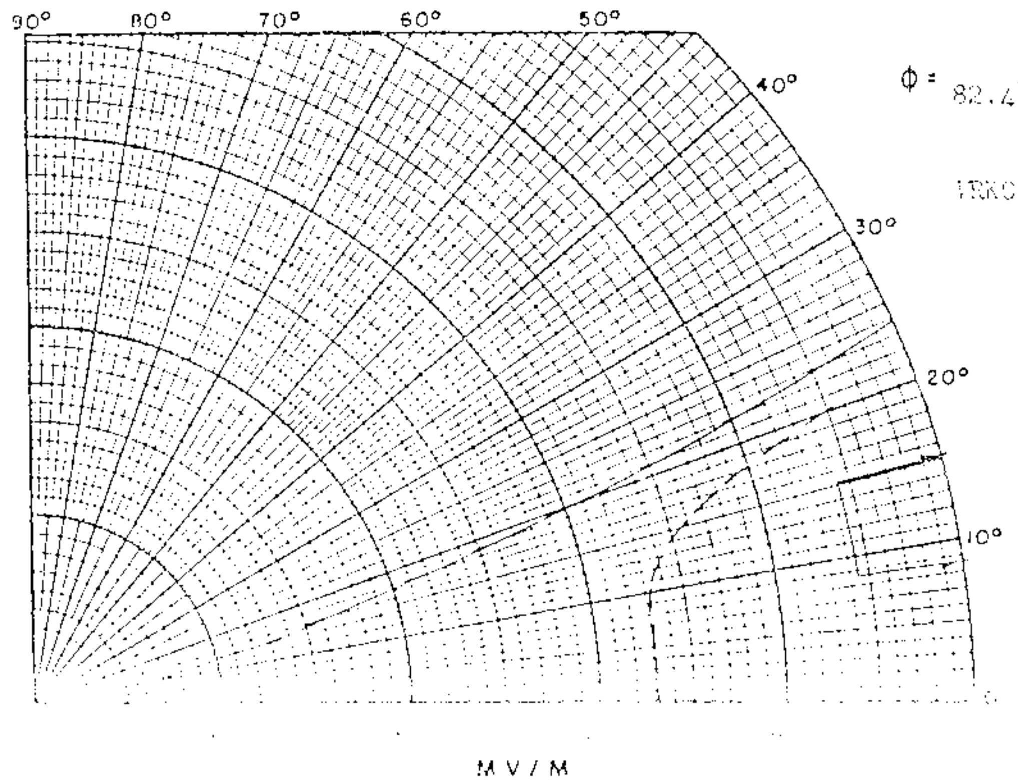
CIYQ

VERTICAL RADIATION PATTERNS

CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

——— E_ϕ — — — E_θ



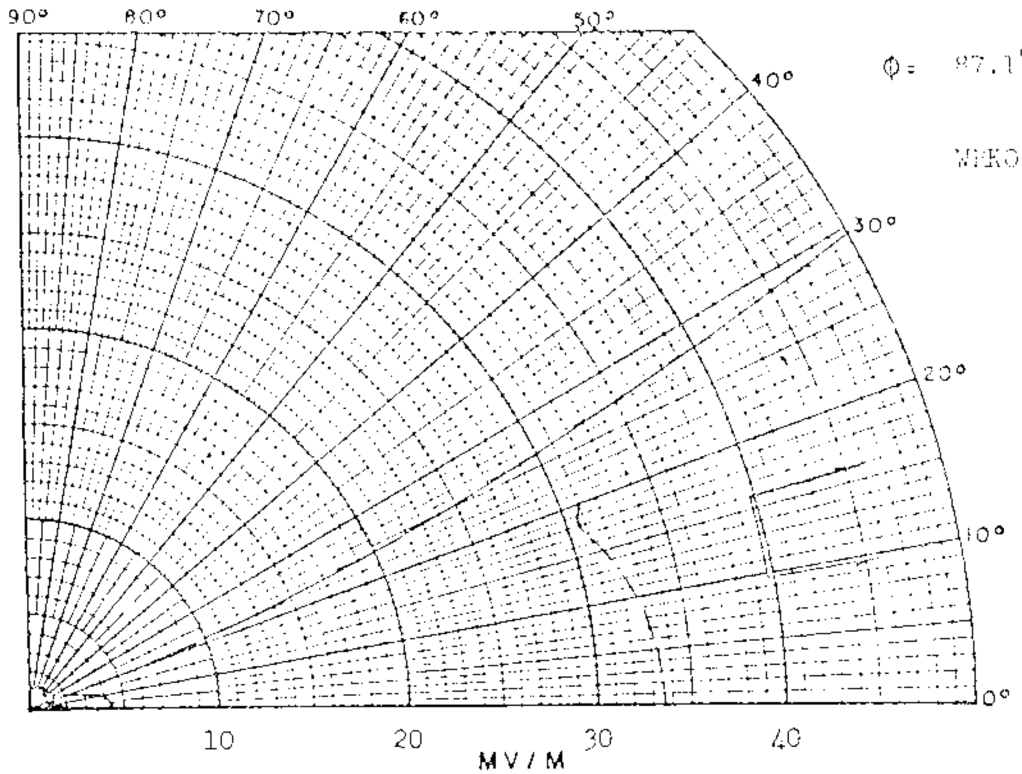


VERTICAL RADIATION PATTERNS

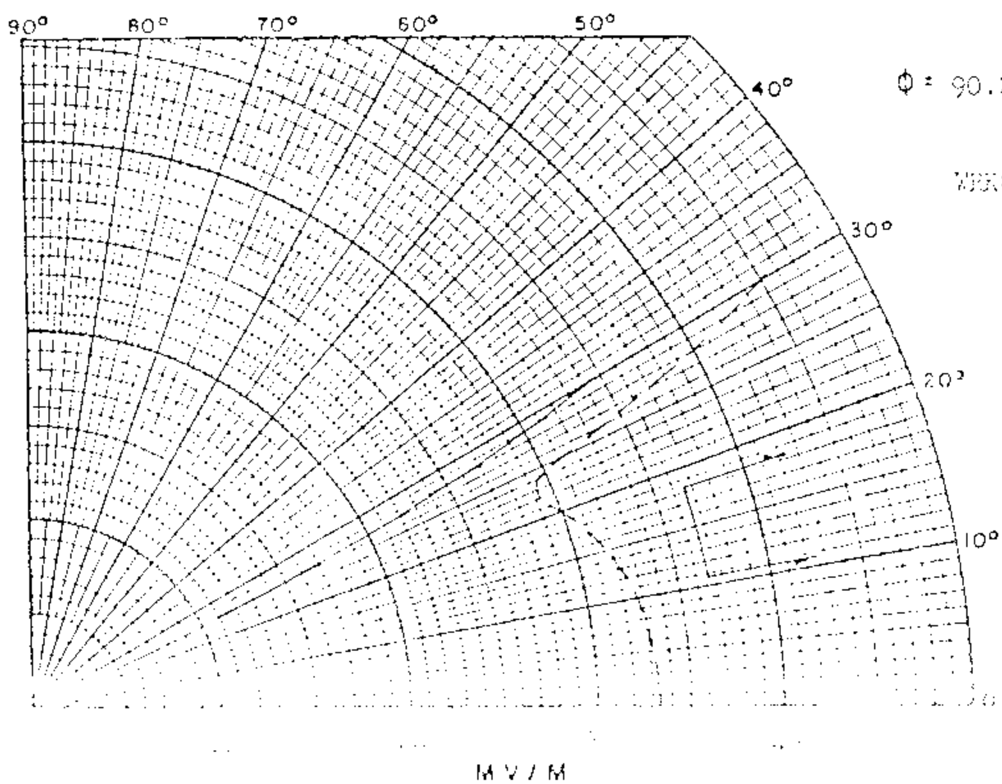
CFTR Toronto, Ontario

680 KHz 50 KW DA-2 U Class II

——— E   - - - E



$\phi = 97.1°$



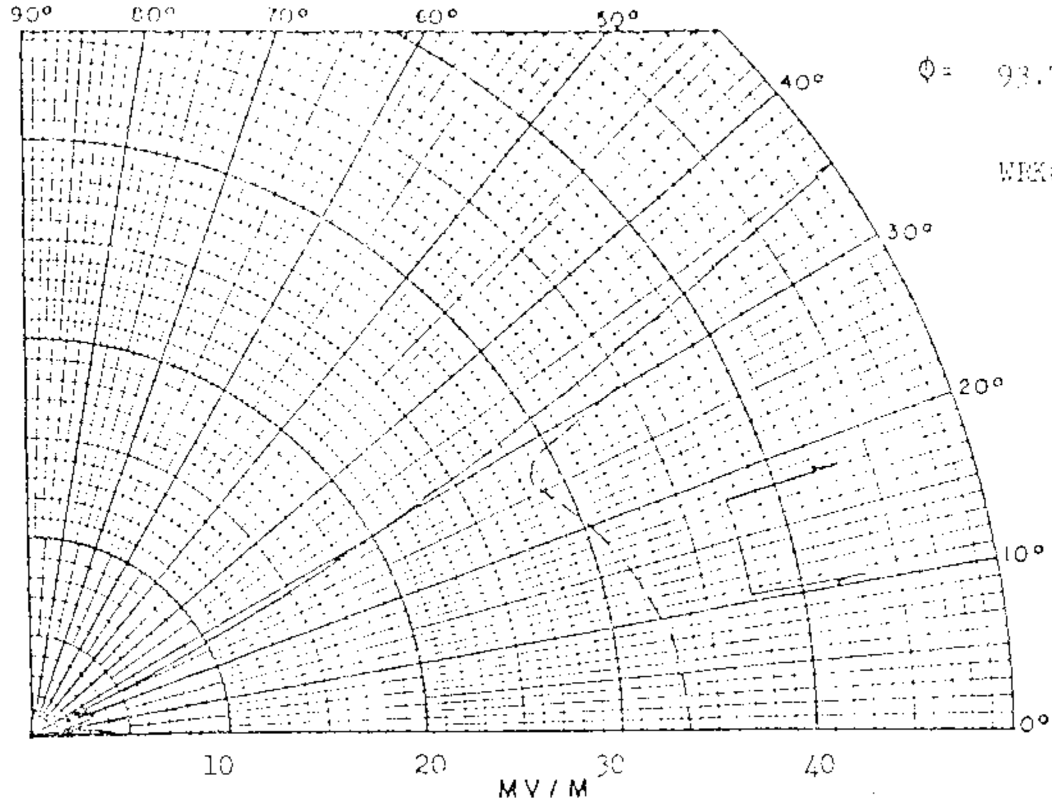
$\phi = 90.2°$

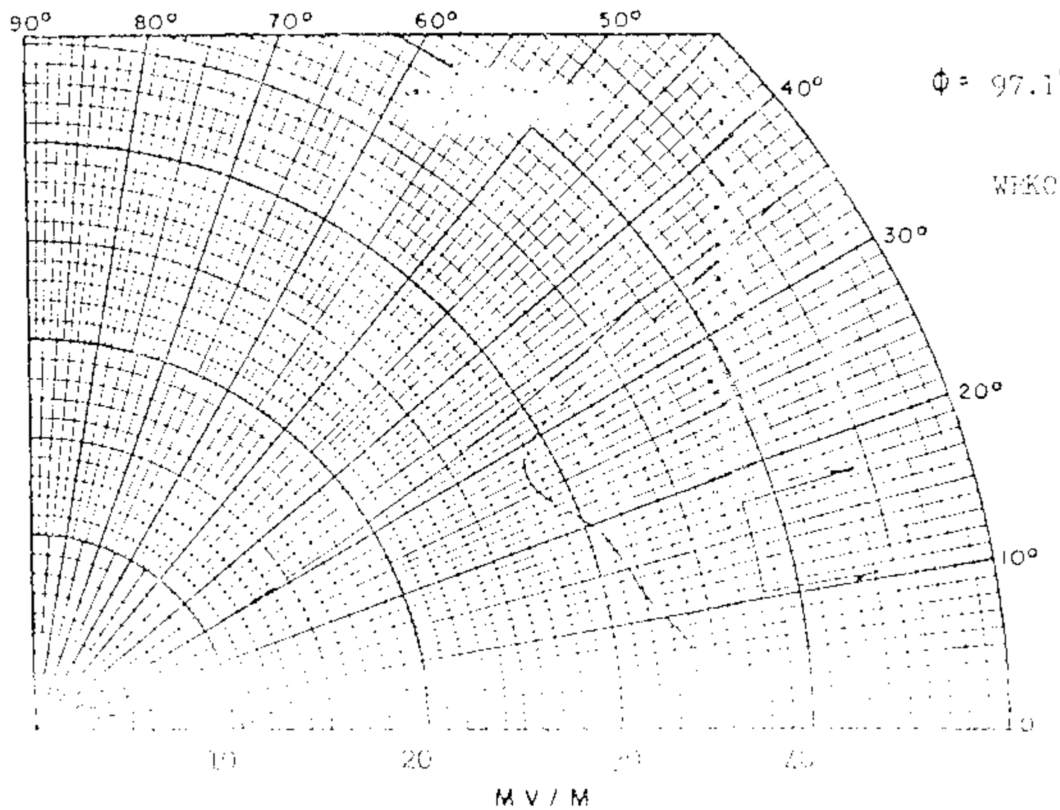
VERTICAL RADIATION PATTERNS

CFTR Toronto, Ontario

680 KHz 50 KW DA-? ? Class II

——— E ——— F





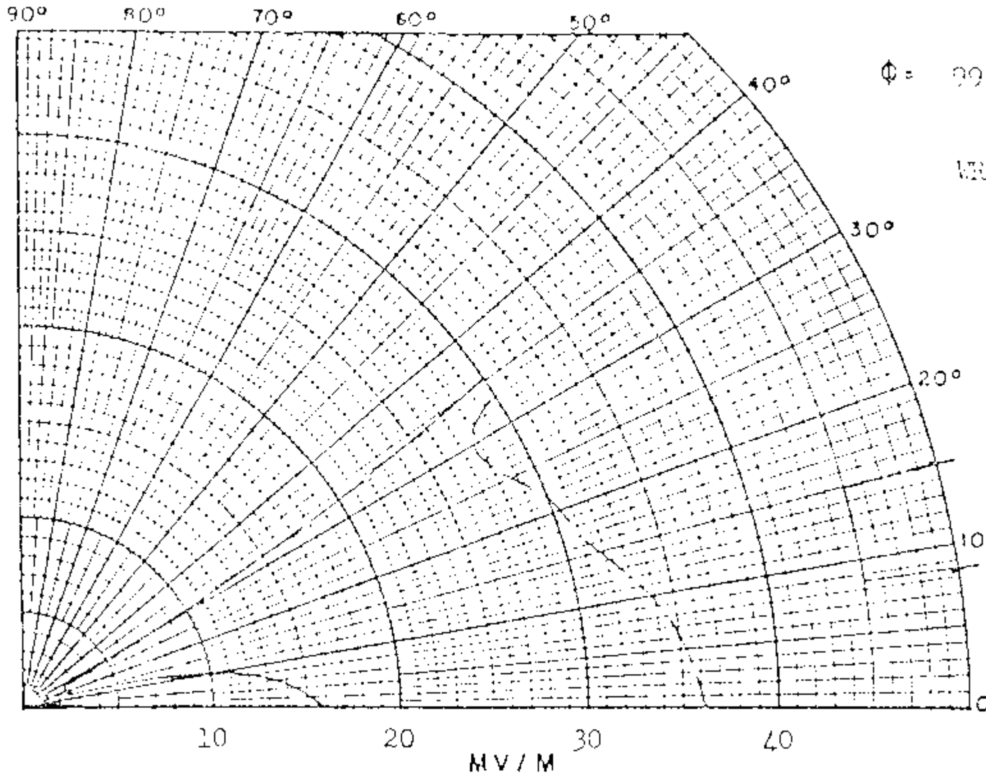
VERTICAL RADIATION PATTERNS

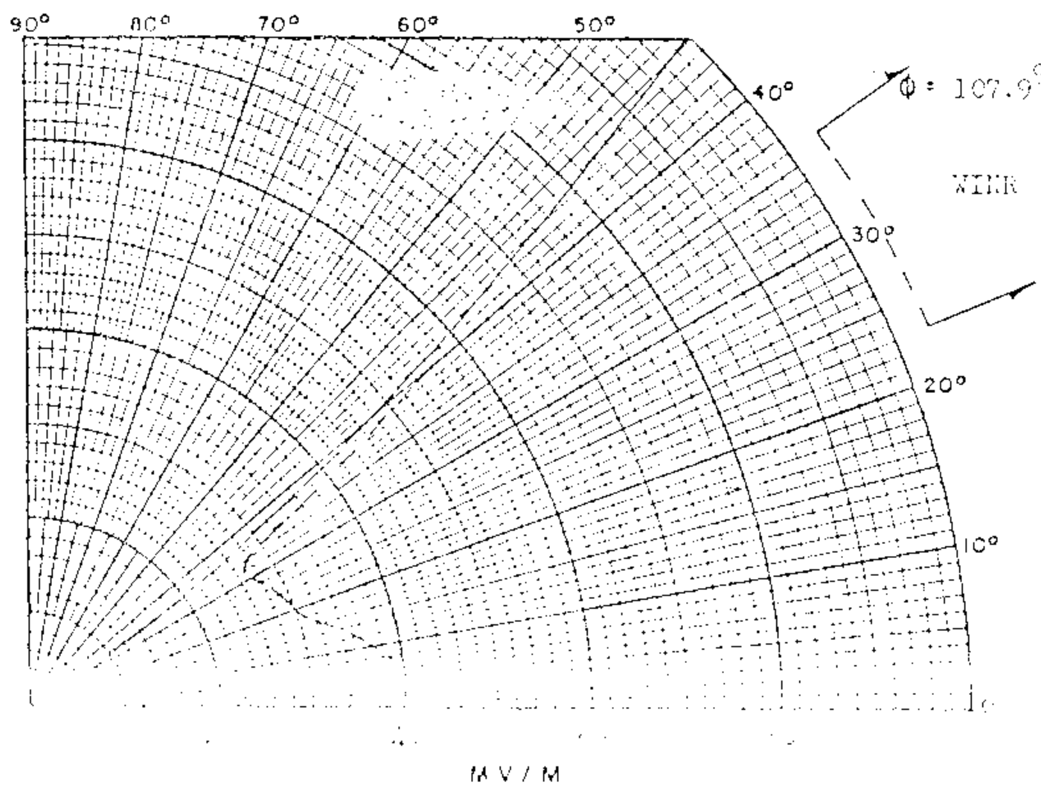
CFTR Toronto, Ontario

680 KHz 50 KW DA-1 U Class II

E_1 E_A

July 21





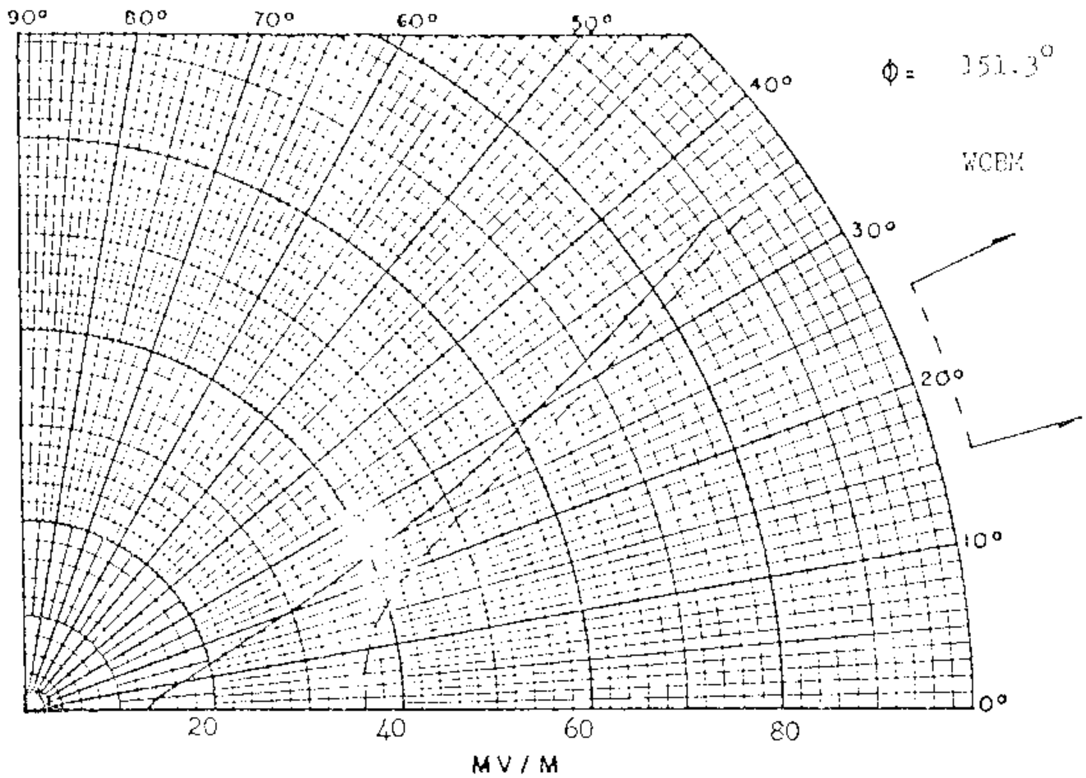
VERTICAL RADIATION PATTERNS

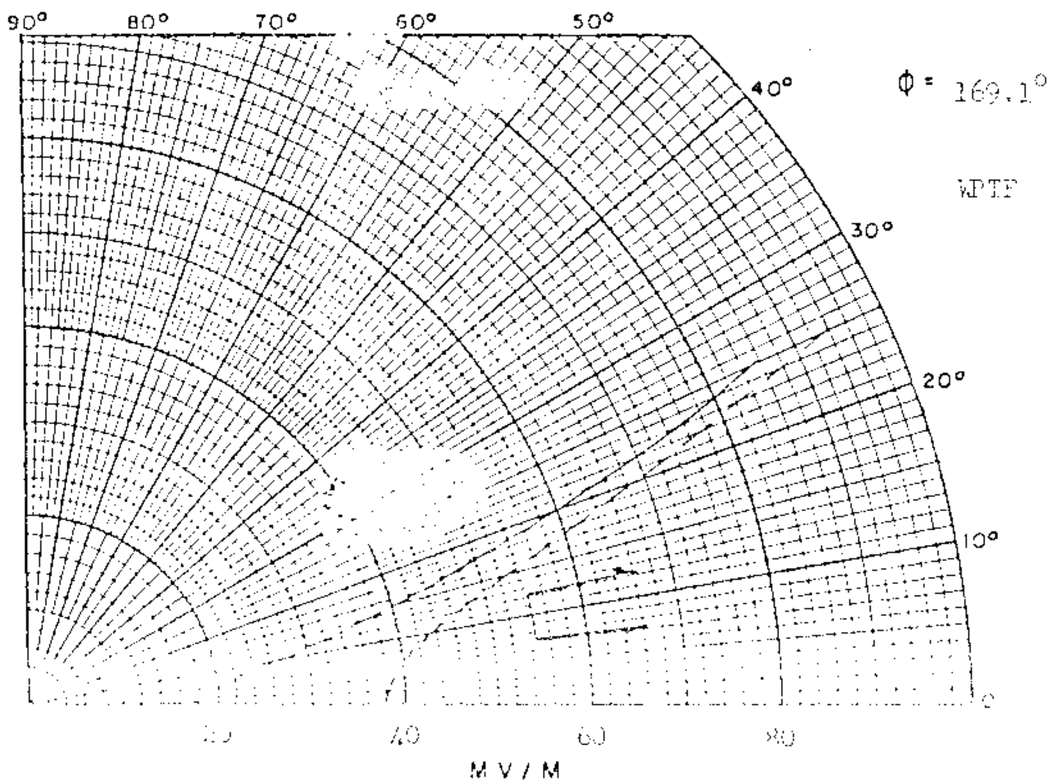
CFTR Toronto, Ontario

680 KHz 50 KW DA-2 U Class II

——— E_v - - - - E_h July [illegible], [illegible]

E. W. Horrigan & Associates Limited





VERTICAL RADIATION PATTERNS

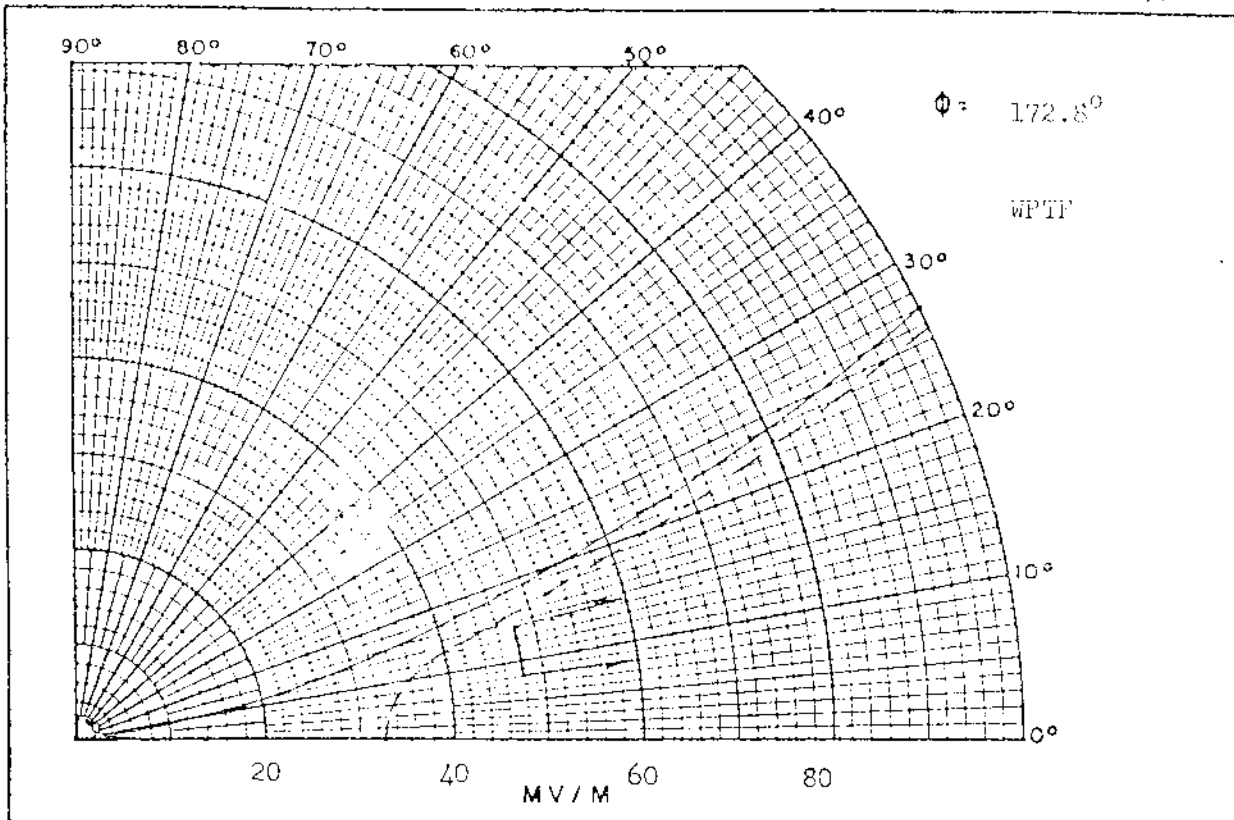
CFTR Toronto, Ontario

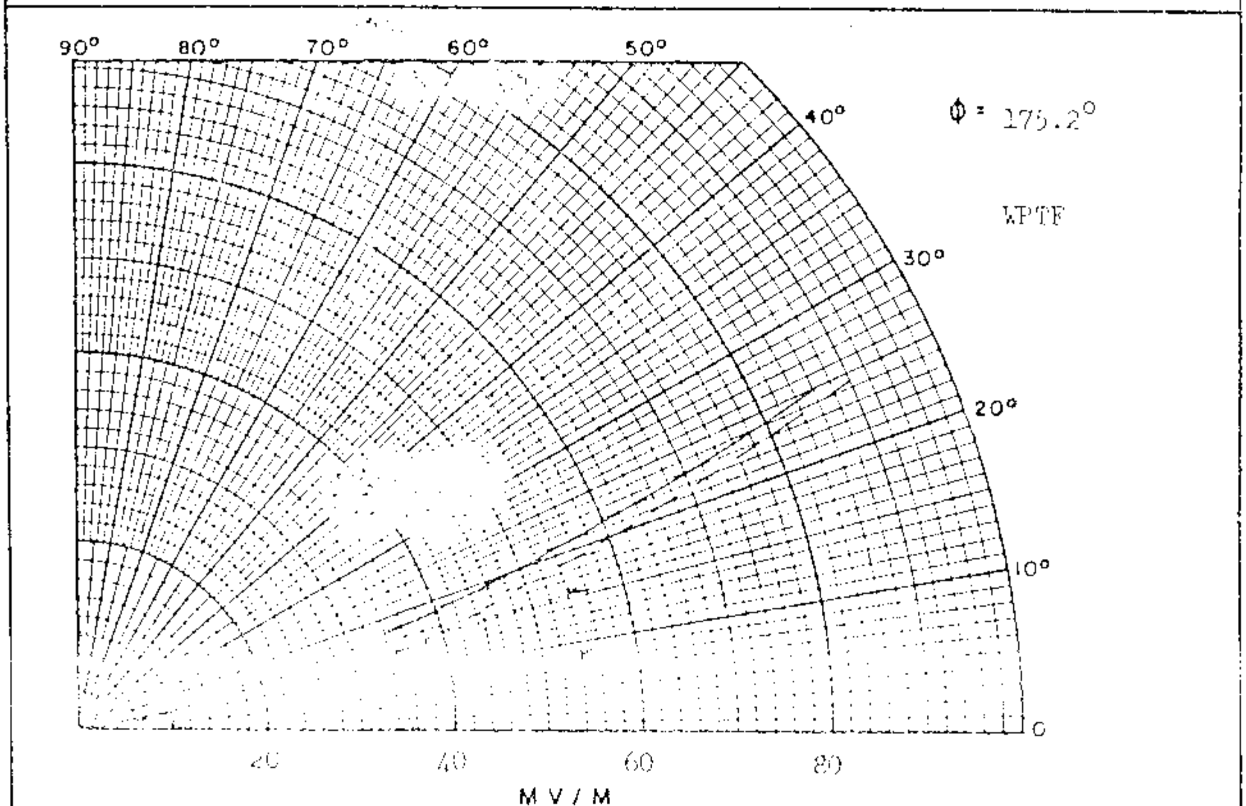
680 KHz 50 KW DA-1 U Class II

——— E_t - - - - E_a

July [illegible]

E. W. Horrigan & Associates Limited





VERTICAL RADIATION PATTERNS

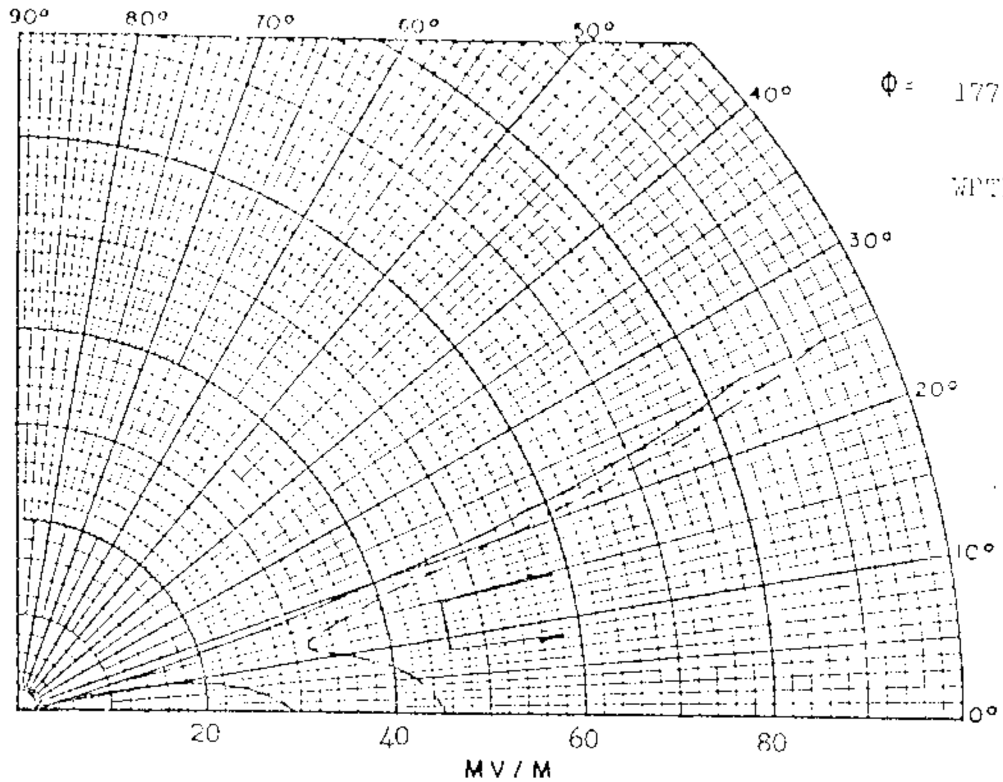
CFTR Toronto, Ontario

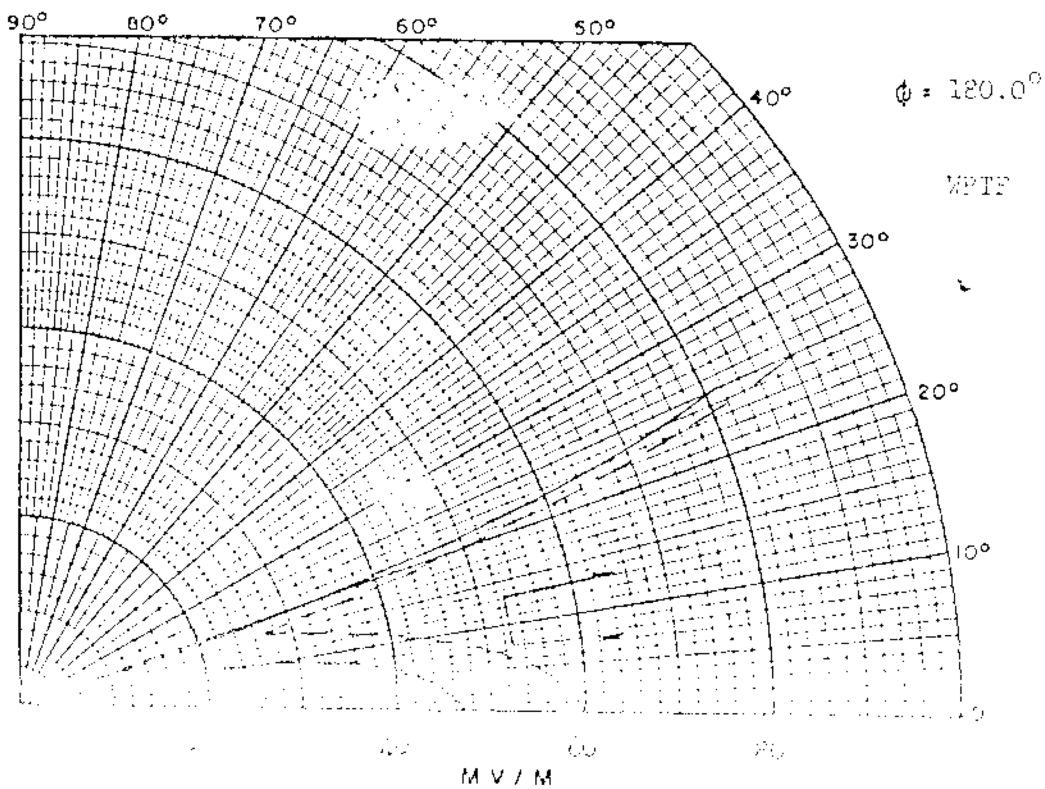
680 KHz 50 KW DA-2 U Class II

——— E_t - - - - E_a

July 21, 1980

E. W. Herrigan & Associates Limited





VERTICAL RADIATION PATTERNS

CFTR Toronto, Ontario

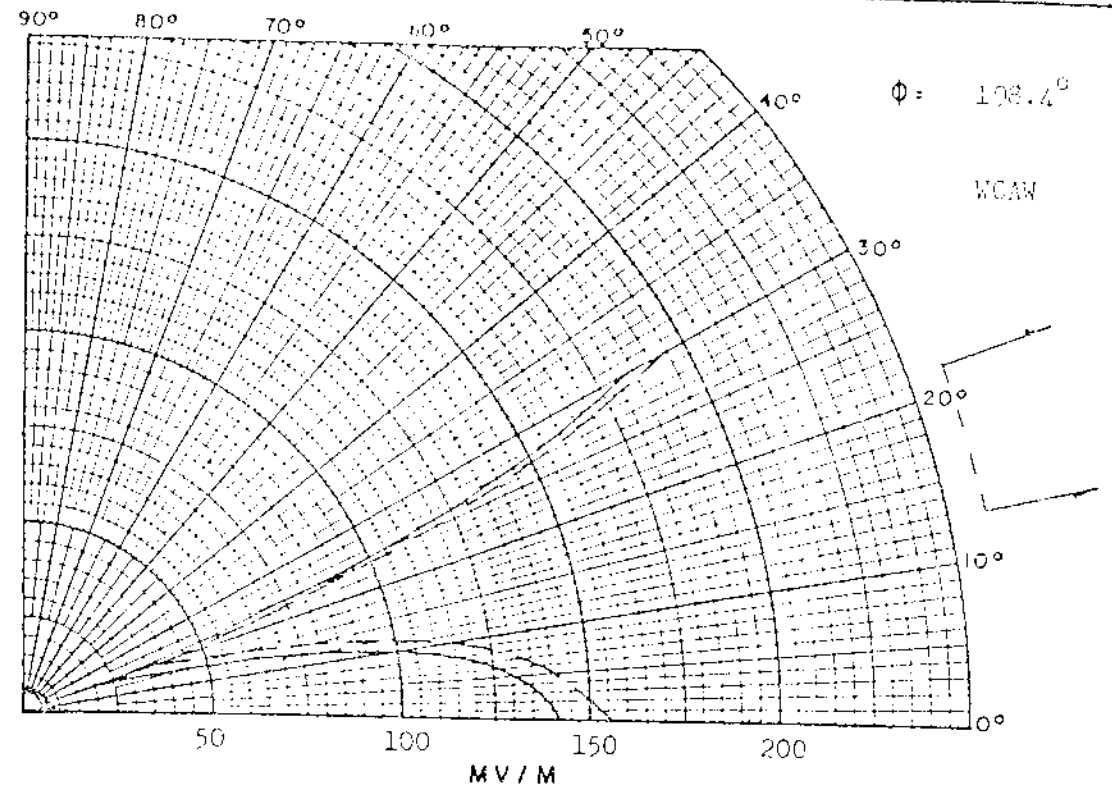
680 KHz 50 KW DA-2 U Class II

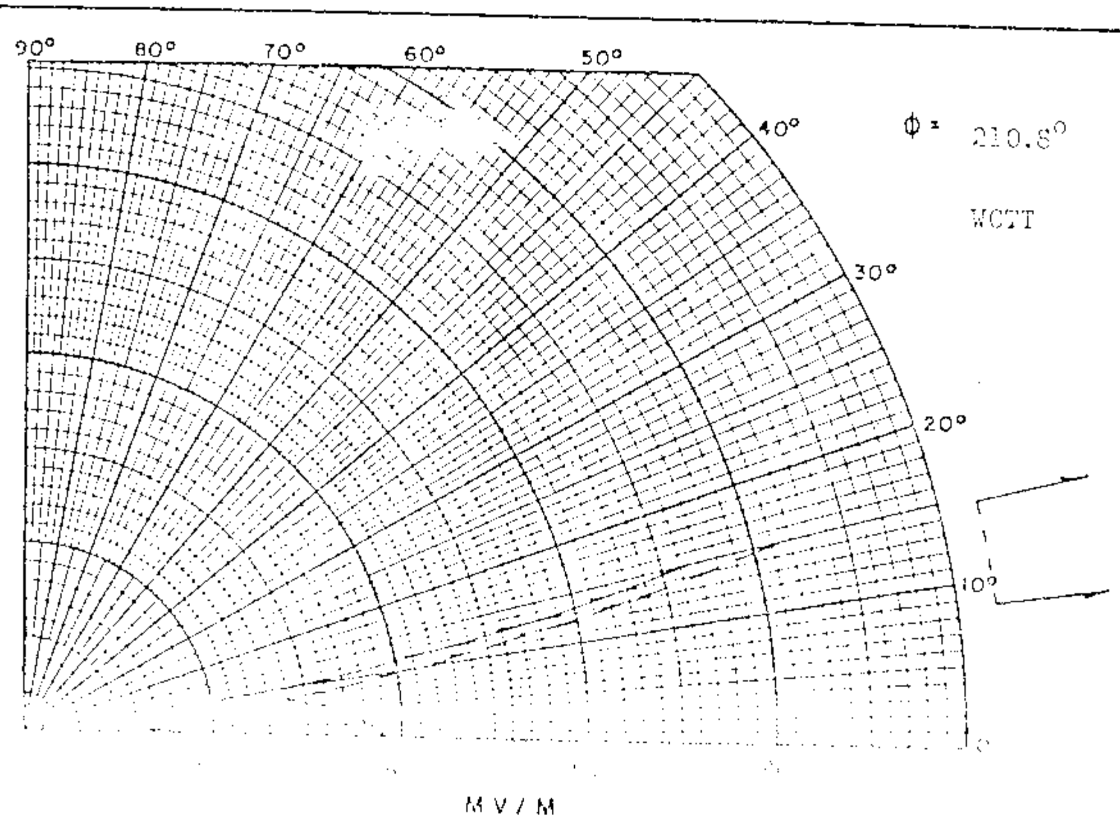
———— E_L – – – – E_u

July 31, 19[illegible]

CFTR
680 KHZ

E. W. Horrigan & Associates Limited





VERTICAL RADIATION PATTERNS

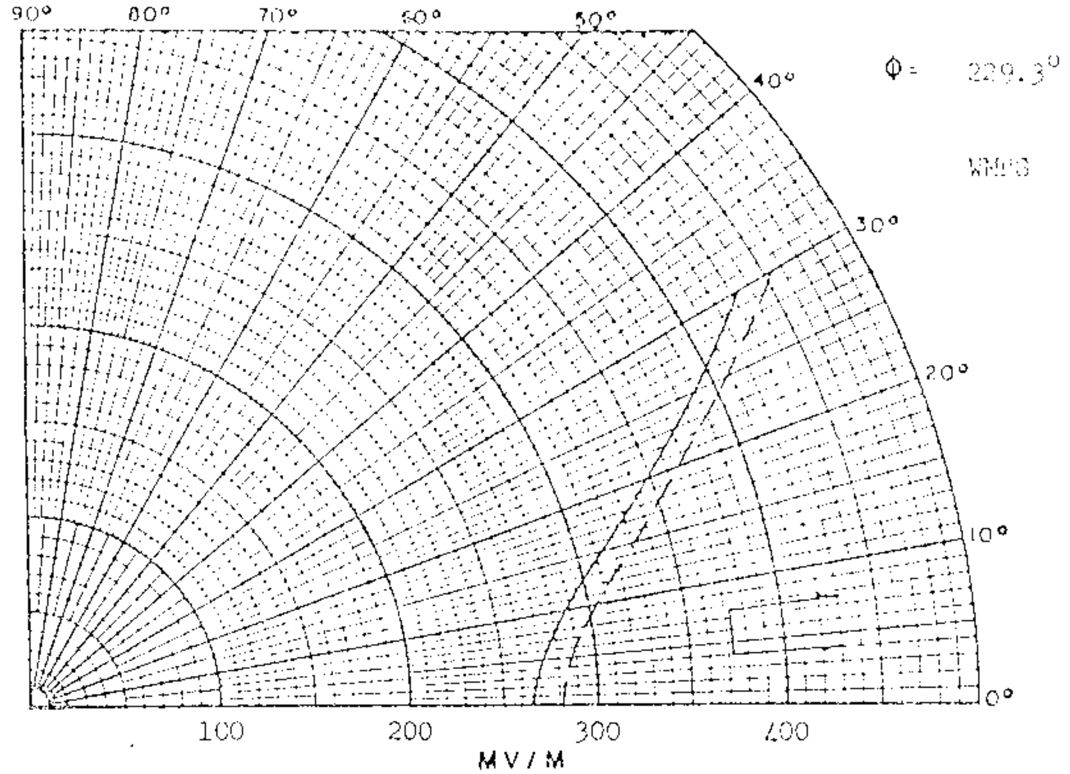
CFTR Toronto, Ontario

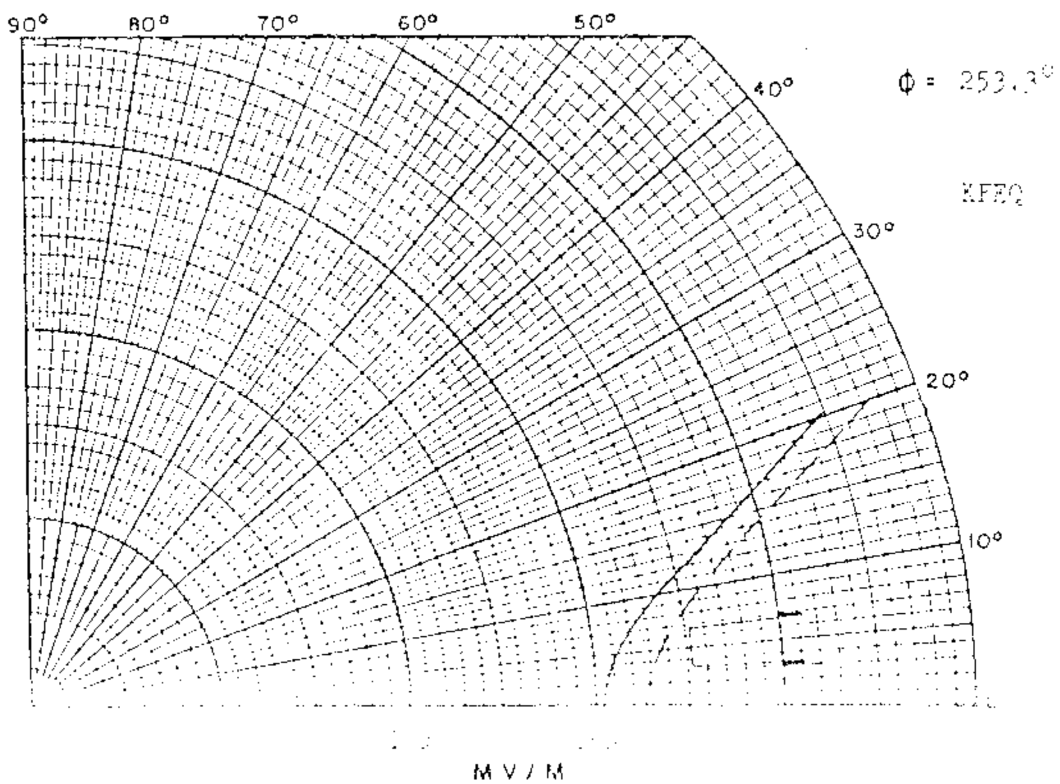
680 KHz 50 KW DA-2 U Class II

———— E_u – – – – E_a

July 21, 1980

E. W. Horrigan & Associates Limited





VERTICAL RADIATION PATTERNS

CFTR Toronto, Ontario

680 KHz 50 KW DA-2 U Class II

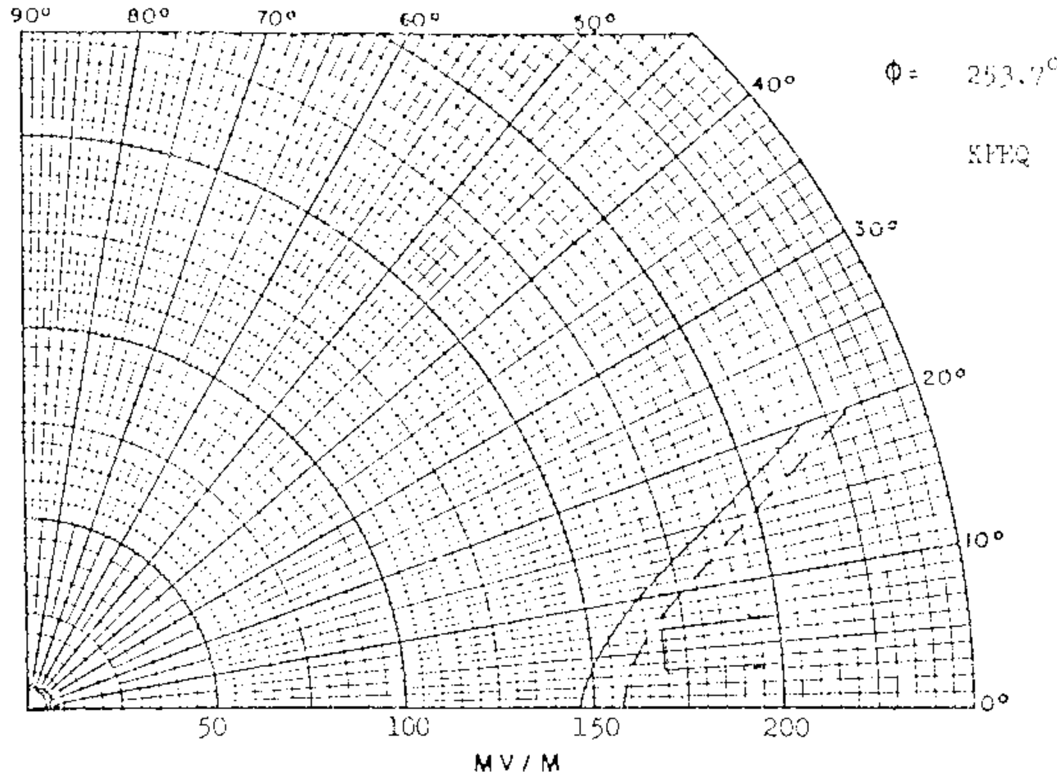
——— E_t - - - E_u

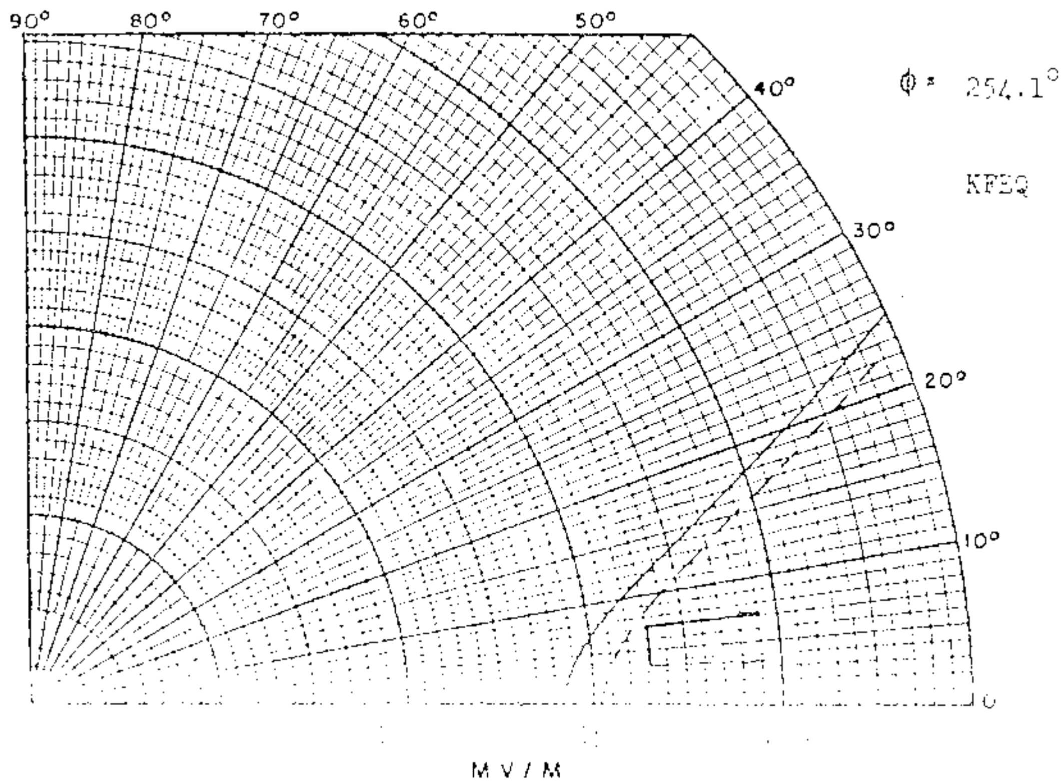
E. W. Horrigan & Associates Limited

CLEVELAND INSTITUTE OF RADIO ELECTRONICS
CLEVELAND, OHIO

NO. 10 LV

POLAR CO-ORDINATE





VERTICAL RADIATION PATTERNS

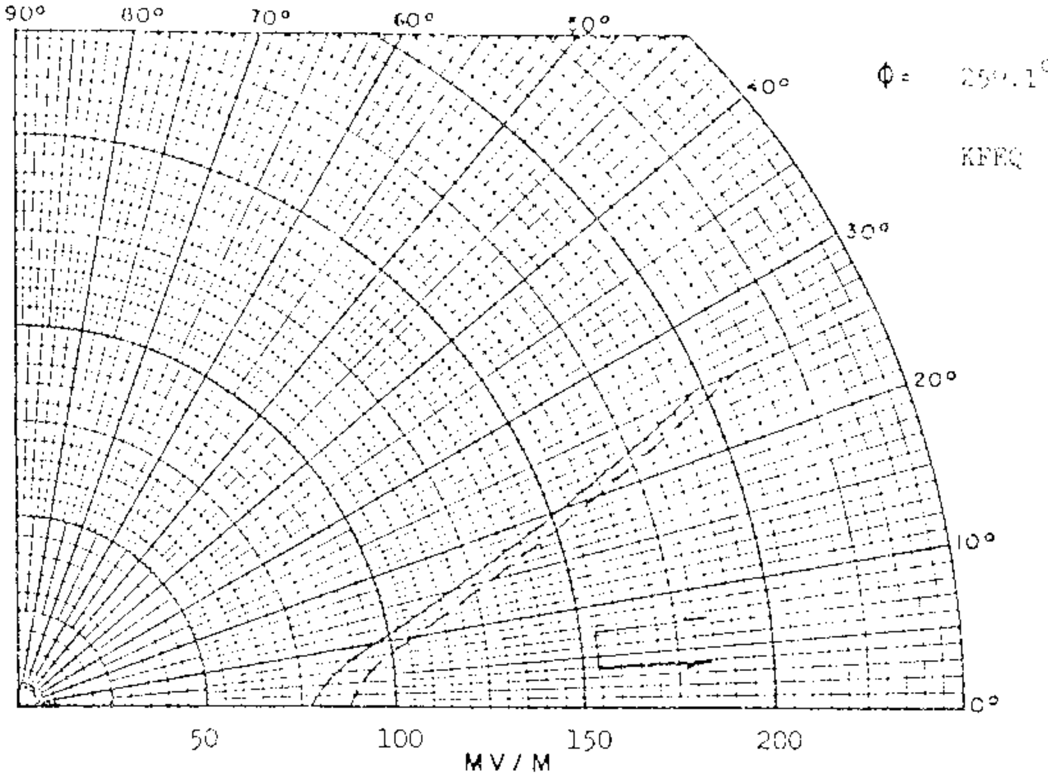
CFTR, Toronto, Ontario

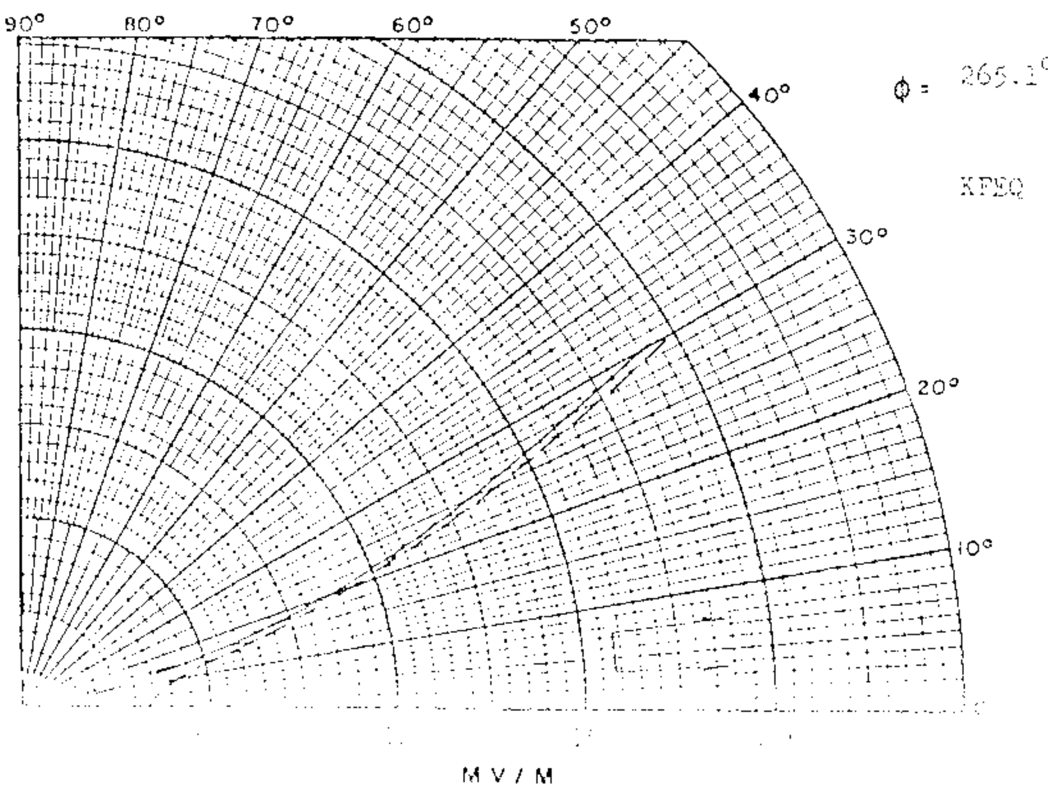
680 KHz 50 KW DA-2 U Class II

——— E_1 — — — E_q

July 31, 19[illegible]

CFTR
680 KHz
5°





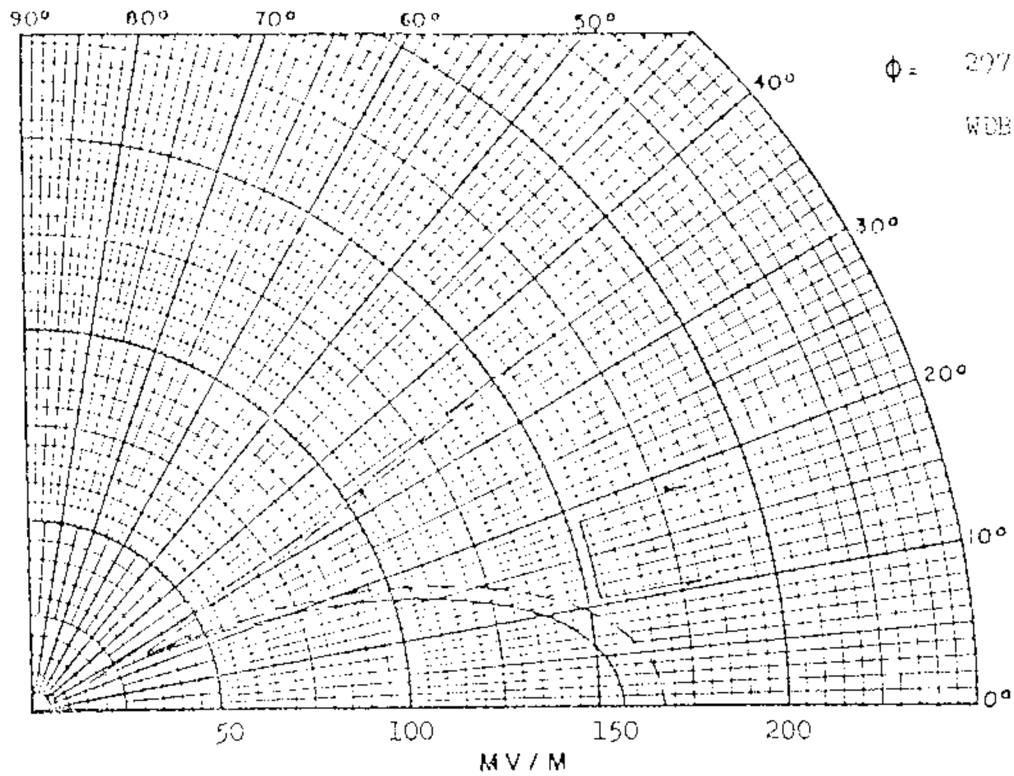
VERTICAL RADIATION PATTERNS

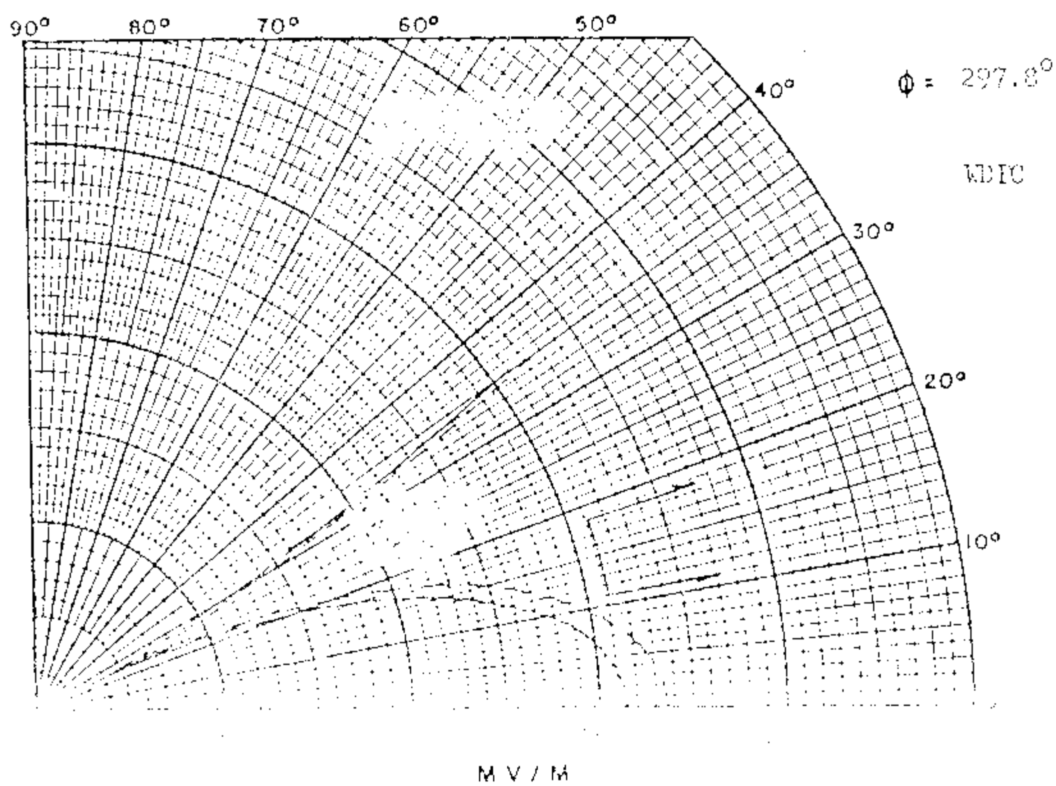
CFTR Toronto, Ontario

680 KHz 50 KW DA-2 U Class II

———— E_t – – – – E_a

July 21, 19[illegible]





VERTICAL RADIATION PATTERNS

CFTR Toronto, Ontario

680 KHz 50 KW DA-2 U Class II

———— E_1 - - - - E_2

July [illegible]

CFTR
680 KHZ
55

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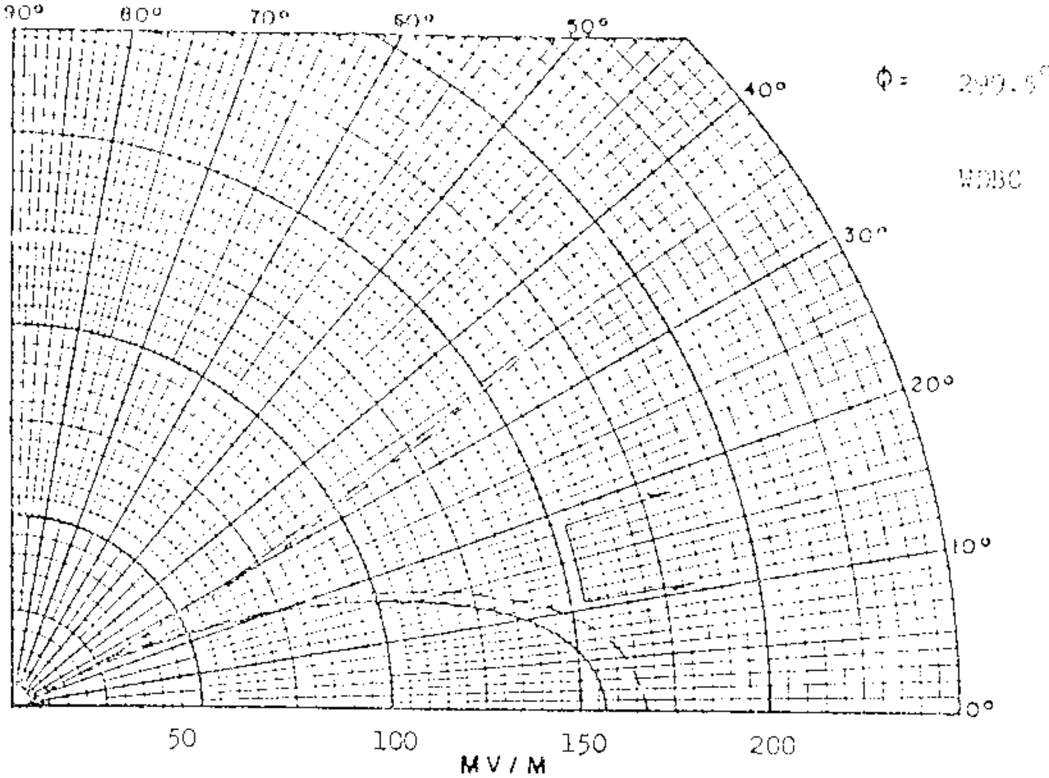
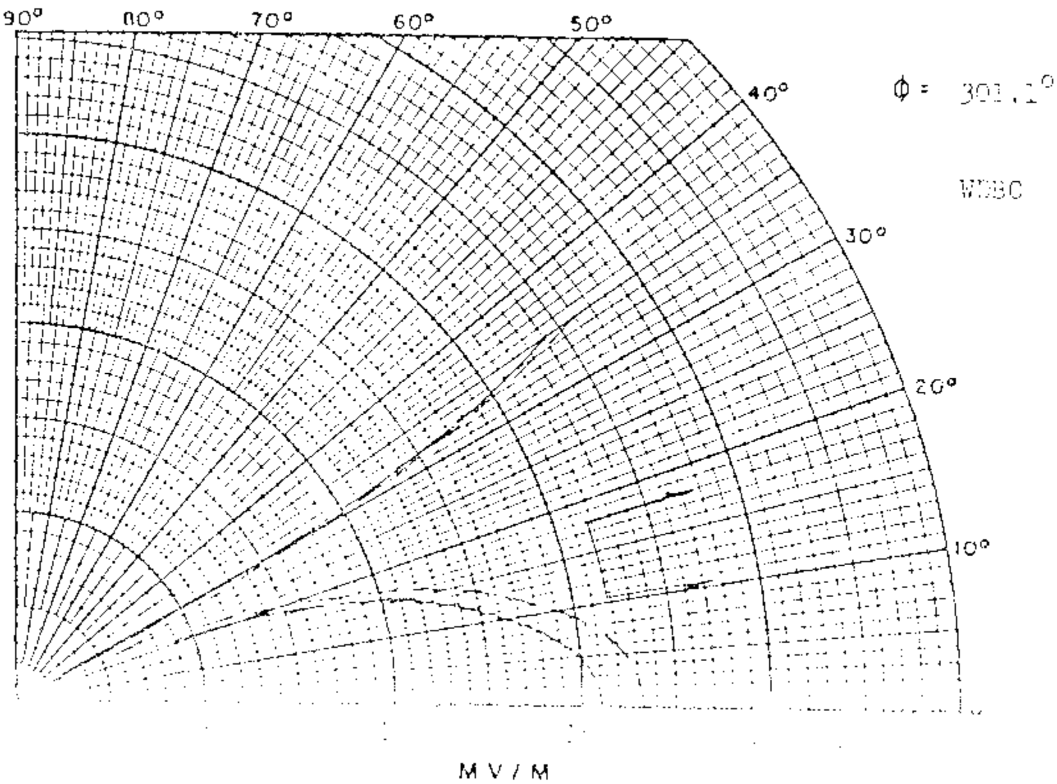




VERTICAL RADIATION PATTERNS

CFTR Toronto, Ontario

680 KHz 50 KW DA-2 U Class II

———— E_t - - - - E_u

[illegible]

CFTR

DESCRIPTION OF ARRAY

Station:	C F T R	Main Studio:	Toronto, Ontario
Frequency:	680 KHz	Power:	25 KW D/25 KW N
Time:	Unlimited	Class:	II
Notification List #	321	Date:	March 22, 1974
Geographic Location:		43° 34' 48" N. Lat.	
		79° 38' 30" W. Long.	

ARRAY CHARACTERISTICS

Mode of Operation:	DA-2		
Number of elements:	13		
Type of elements:	guyed, uniform cross section, series fed, no top loading		
Tower height:	300' (74.6°)	above insulators	(all towers)
	309'	above ground	(all towers)

CFTZ

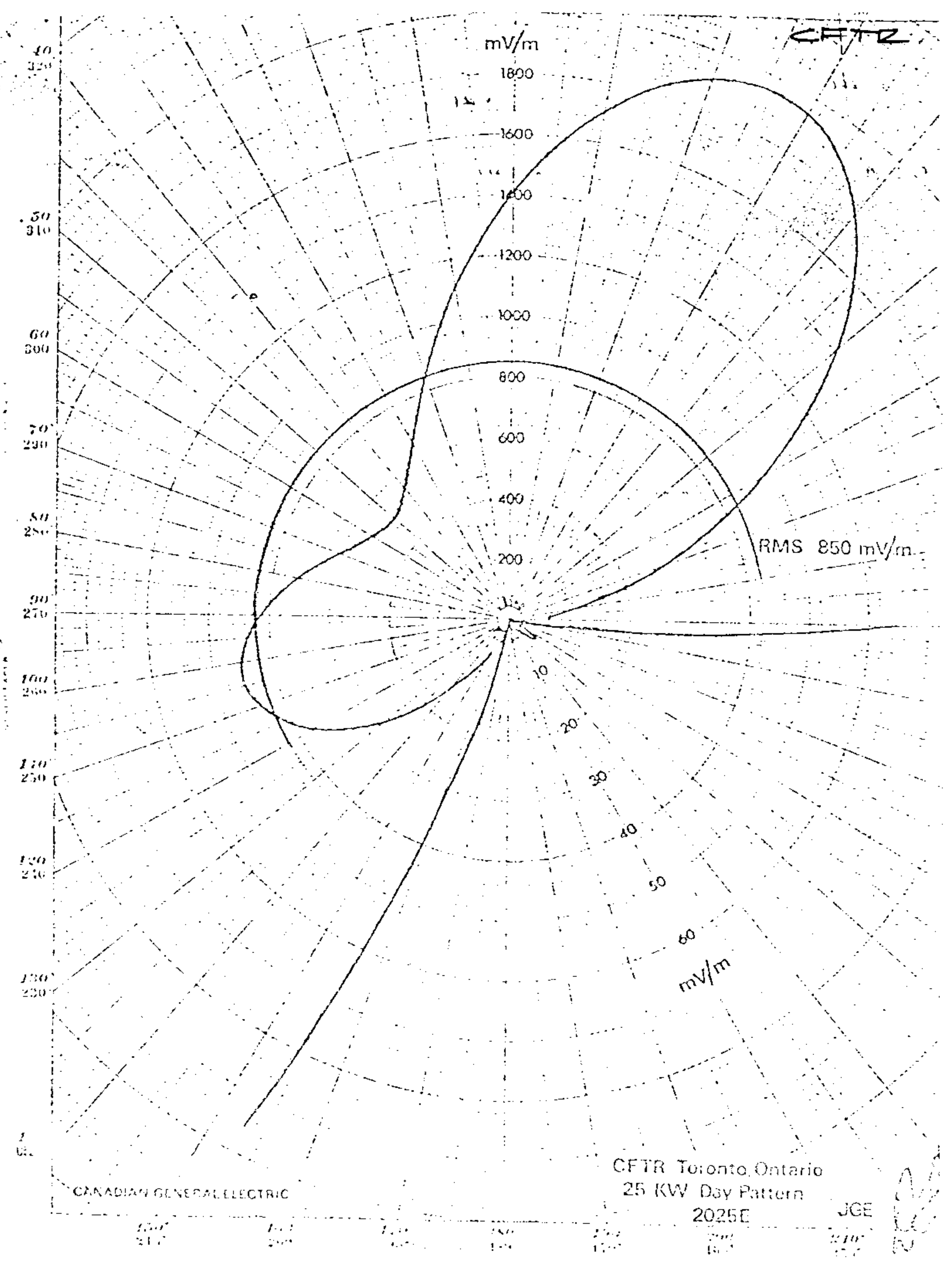
Tower #	Azimuth Degrees	Spacing Degrees	Field Day	Ratio Night	Day	Phasing (degrees) Night
1	ref.	ref.	1.00	1.000	0.	0.
2a	310.0000	155.0000	1.989		-37.	
2	310.0000	220.0000		1.900		355.
3a	310.0000	310.0000	1.00		-74.	
3	310.0000	440.0000		1.000		351.
4a	2.7214	100.4028	1.00		-80.	
4	43.0000	80.0000		1.280		-163.
5	330.3137	230.1256	1.989	2.432	-117.	-168.
6a	322.1583	379.3216	1.00		-154.	
6	320.3878	443.0751		1.280		-172.
7	43.0000	160.0000		1.000		-313.
8	347.0533	265.1708		1.900		-318.
9	330.3137	460.2511		1.000		-322.

Predicted RMS Field:

Day	850 mV/m	170 mV/M for 1 KW
Night	960 Mv/M	192 mV/m for 1 KW

Ground System:

120 radials of #10 AWG soft drawn copper wire from the perimeter of an elevated counterpoise 70' in diameter at each tower. Tower interconnected by 1-1/2" x 1/16" copper strap. Radials running between towers bonded to #4 AWG stranded copper wire. The effective length of the radials is 0.4 λ .



CFTR
mV/m
1800
1600
1400
1200
1000
800
600
400
200
RMS 850 mV/m
10
20
30
40
50
60
mV/m
CANADIAN GENERAL ELECTRIC
CFTR Toronto, Ontario
25 KW Day Pattern
2025E
JGE

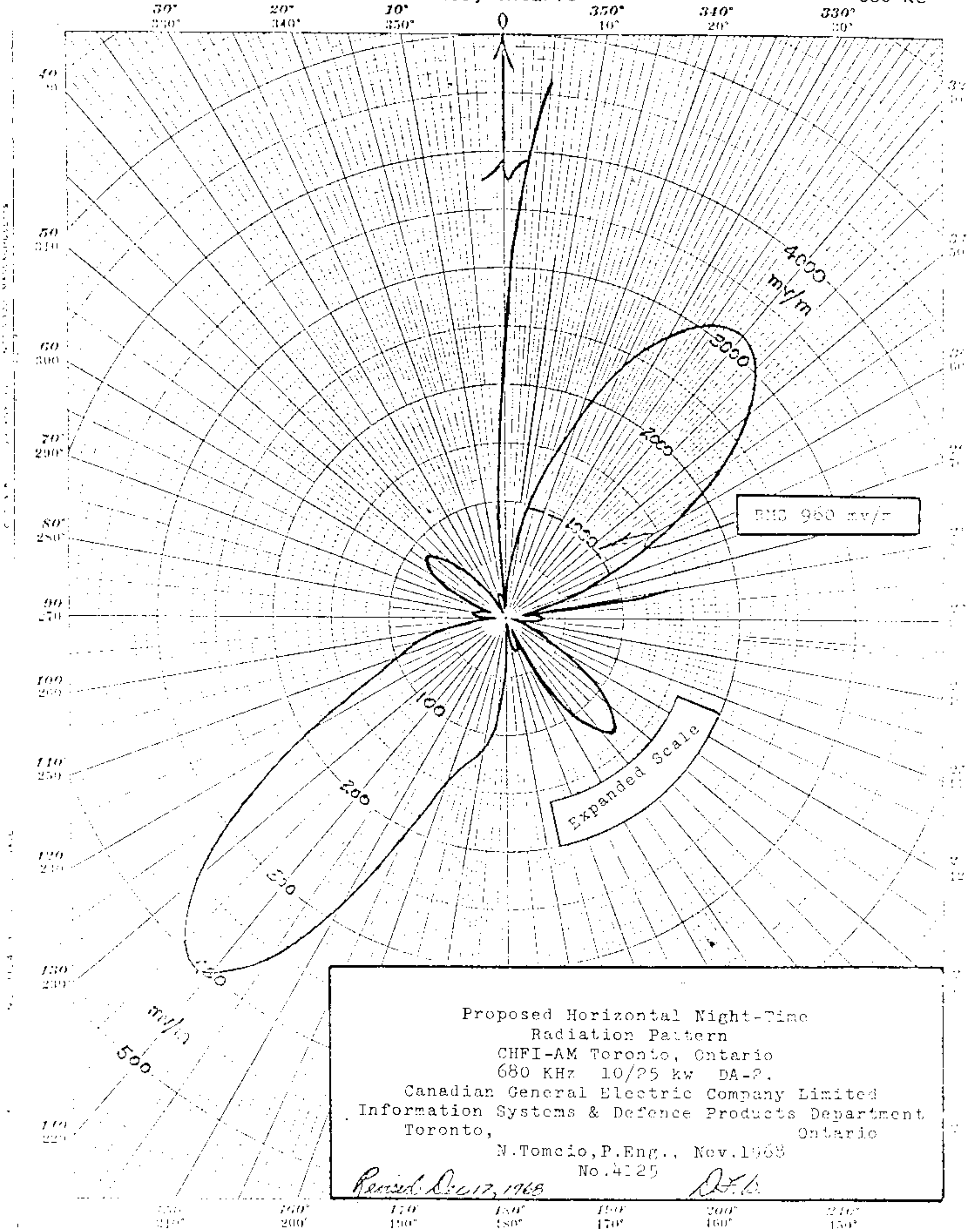
CFTR

~~CHFI~~

Proposed Night (4-29-70ct)

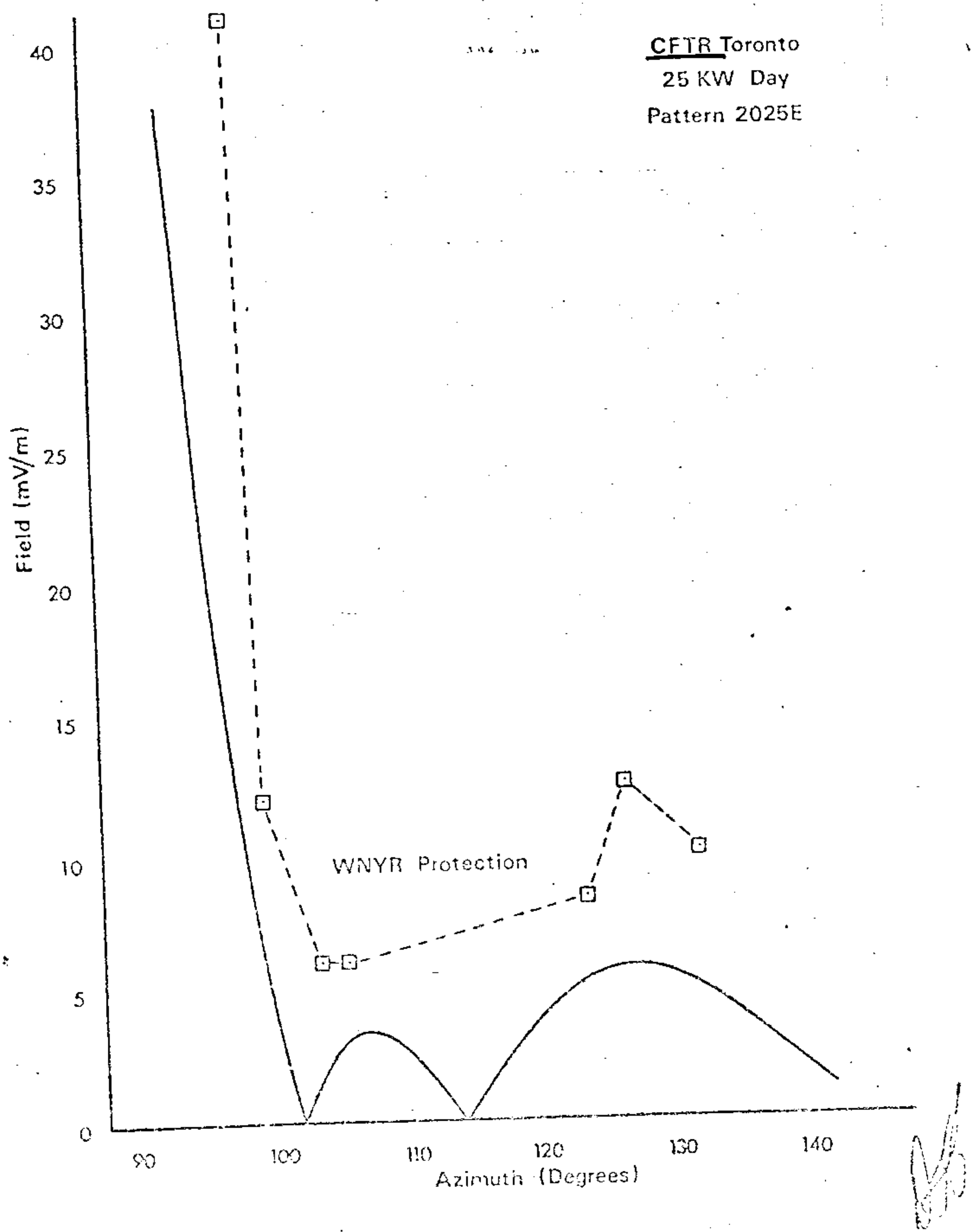
Station CHFI
Toronto, Ontario

25kw,10kw-LS,DA-2,U,Class II
680 kc



Proposed Horizontal Night-Time
Radiation Pattern
CHFI-AM Toronto, Ontario
680 KHz 10/25 kw DA-2.
Canadian General Electric Company Limited
Information Systems & Defence Products Department
Toronto, Ontario
N.Tomcio,P.Eng., Nov.1968
No.4125

Revised Dec 17, 1968



CFTR Toronto
25 KW Day
Pattern 2025E
WNYR Protection
Field (mV/m)
0
5
10
15
20
25
30
35
40
90
100
110
120
130
140
Azimuth (Degrees)

E.W. Horrigan & Associates Limited

Section 2.9 - Description of Array

Station: CFTR
Main Studio: Toronto, Ontario
Notification List: 392
Antenna Site Co-ordinates:

Frequency: 680 KHz   Time: Unlimited
Power: 50 KW   Class: II
Date: December 7, 1979

43° 12' 52" North Latitude
79° 36' 20" West Longitude

Number of Elements: 8

Mode of Operation: DA-2

Type of Elements: guyed, uniform cross-section, base insulated, series fed, no top loading.

Tower Height: 400 feet (99.5°) above insulators
410 feet above ground

			Day		Night	
Tower #	Orientation (degrees)	Distance (degrees)	Field Ratio	Phase (degrees)	Field Ratio	Phase (degrees)
1	0.0	0.0	0.338	168.7	0.40	120.0
2	292.5	154.0	1.000	129.4	0.95	104.0
3	292.5	308.0	1.000	90.1	1.00	95.0
4	292.5	462.0	0.338	50.8	0.44	76.0
5	303.013	485.782	0.338	320.7	0.44	341.0
6	307.816	335.546	1.000	0.0	1.00	0.0
7	320.088	191.388	1.000	39.3	0.95	9.0
8	12.5	90.0	0.338	78.6	0.40	24.0

Predicted RMS Field: Day 1264.495 mV/m at 1 mile;
178.827 mV/m at 1 mile for 1 KW.

Night: 1280.229 mV/m at 1 mile;
181.052 mV/m at 1 mile for 1 KW.

Unitary RSS: Day 2.11116
Night: 2.12419

Unitary RMS: Day 1.94454
Night: 1.86941

RSS/RMS: Day 1.08568
Night: 1.13629

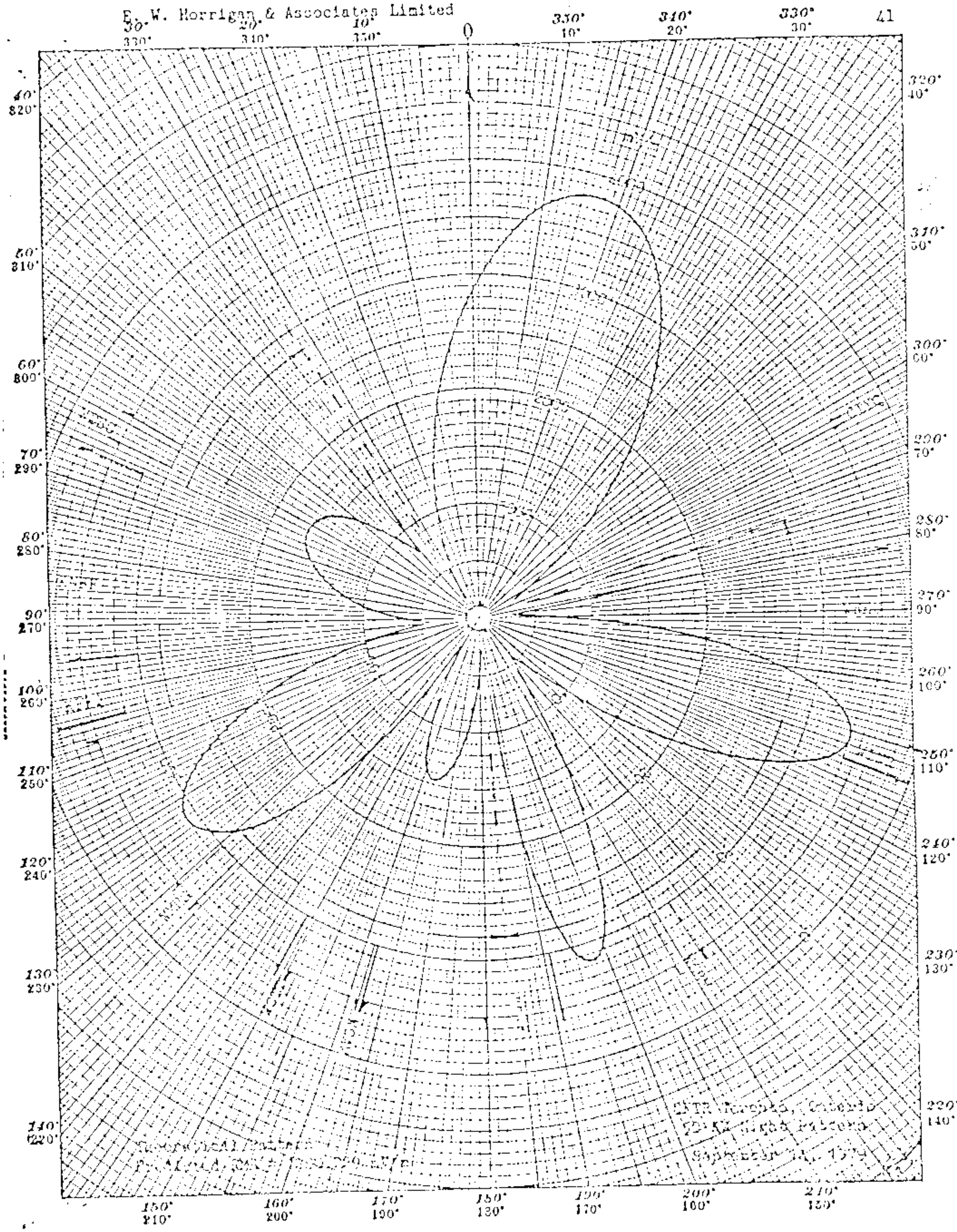
Scale Factor: Day 650.279
Night: 684.830

Ground System: 120 radials of #10 AWG soft drawn copper wire from the perimeter of an elevated counterpoise 100 feet in diameter at the base of each tower. Towers inter-connected by 2" x 1/16" copper strap. Radials running between towers bonded to #4 AWG stranded copper wire. The effective length of the radials is 0.4λ.

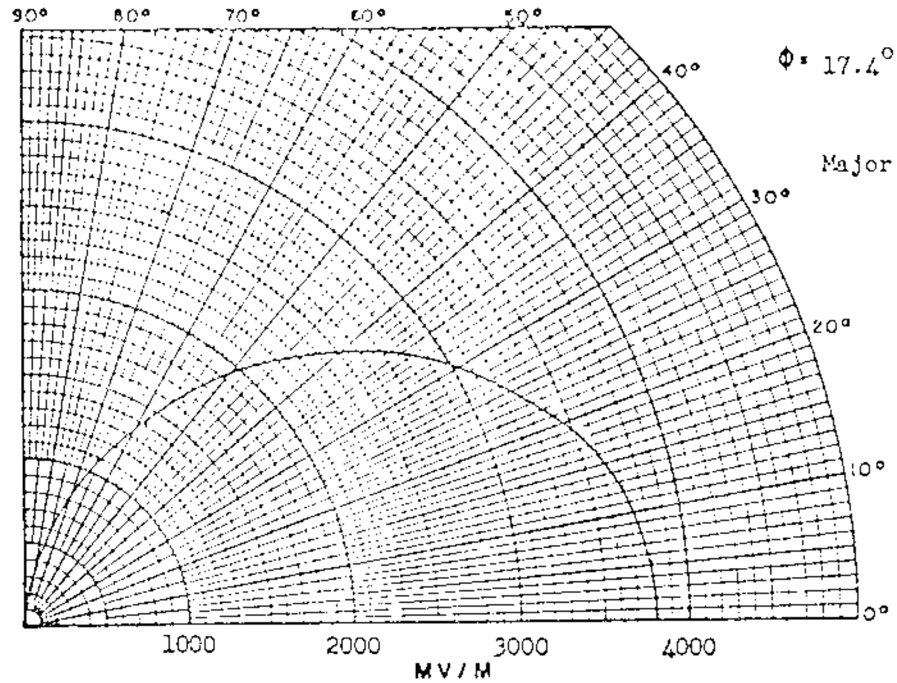
Reduced design tolerance: Day Q = 3.79 mV/m
Night Q = 28.74 mV/m

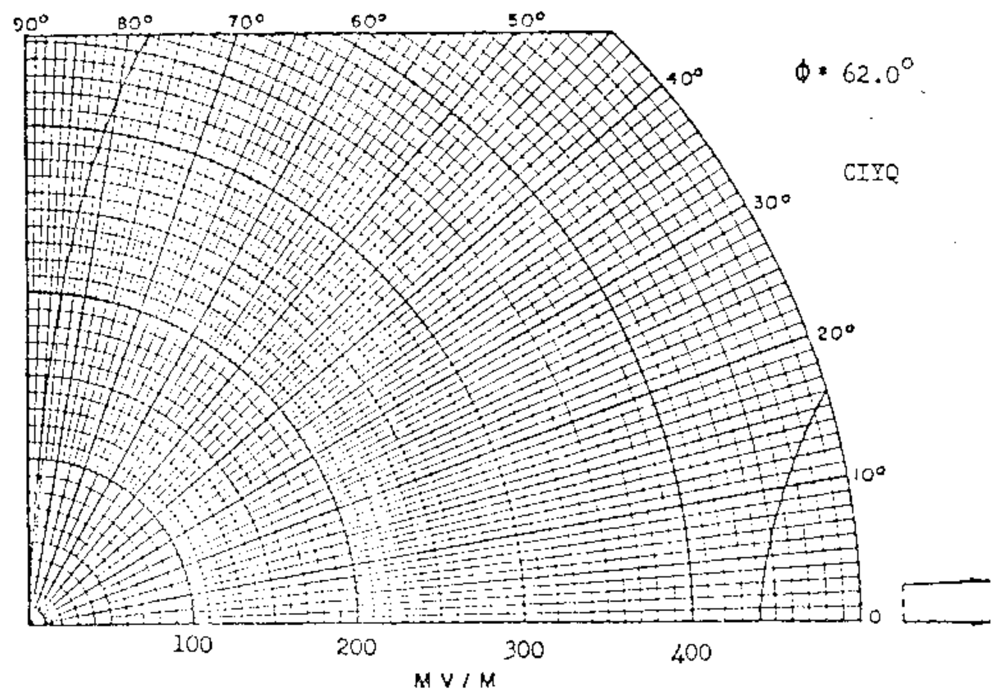
CFTR

E. W. Horrigan & Associates Limited



CFTR





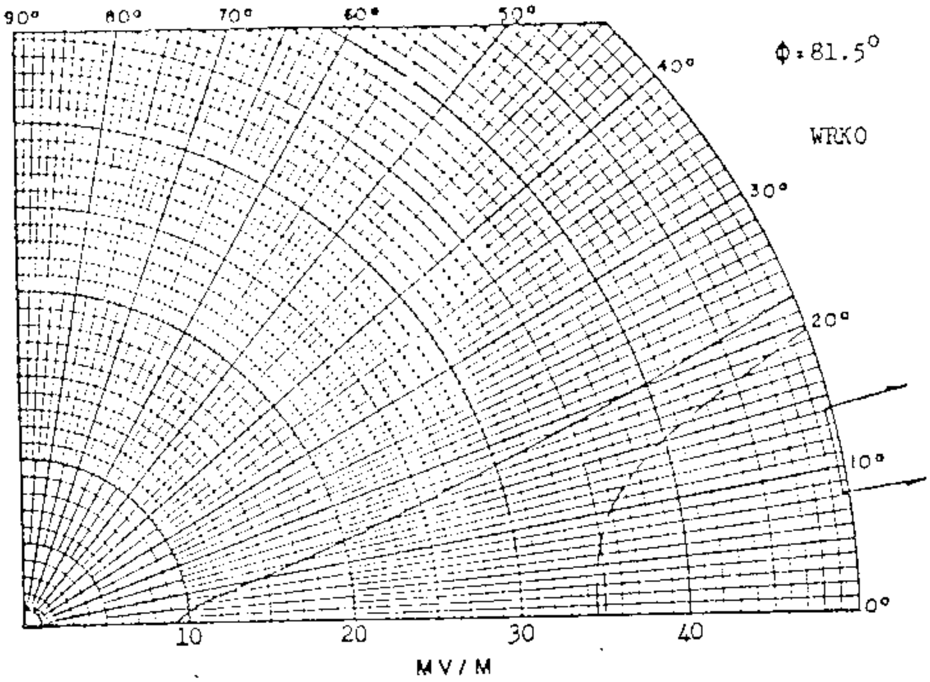
VERTICAL RADIATION PATTERNS

CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

———— E_t - - - - E_a

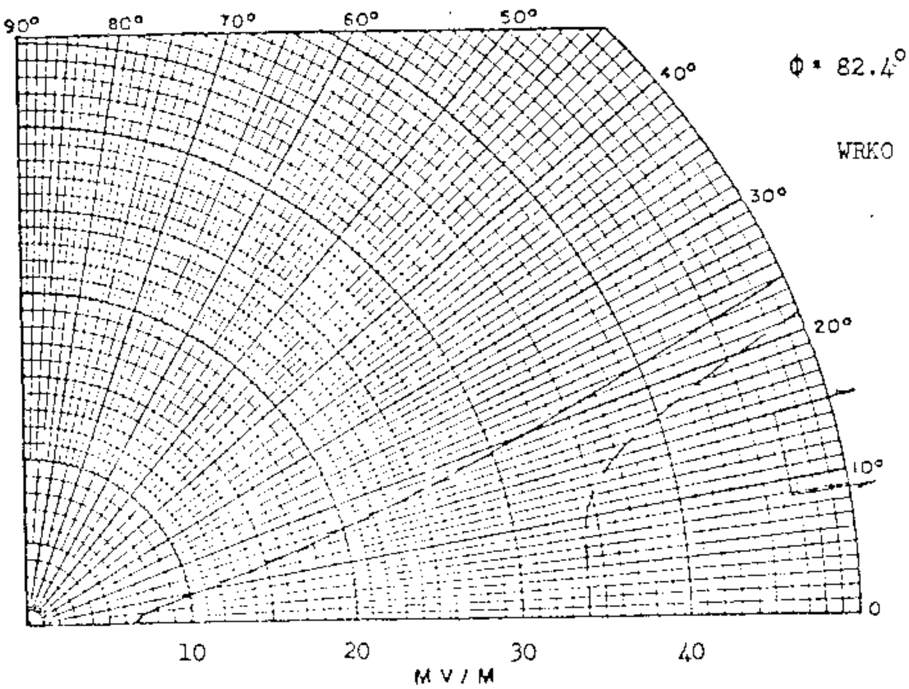
September 14, 1979

CFTK



Φ = 81.5°

WRKO



Φ = 82.4°

WRKO

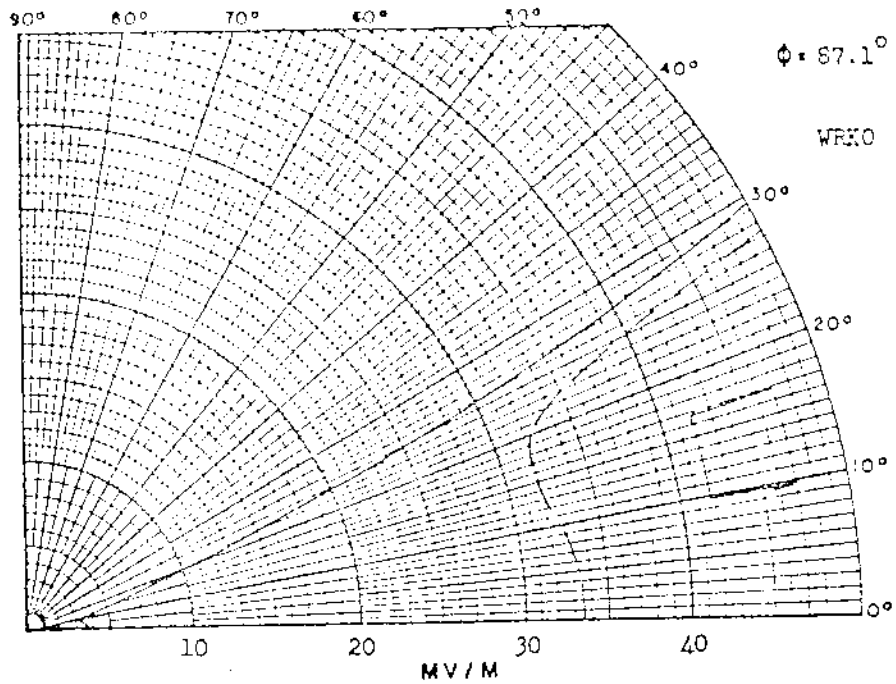
VERTICAL RADIATION PATTERNS

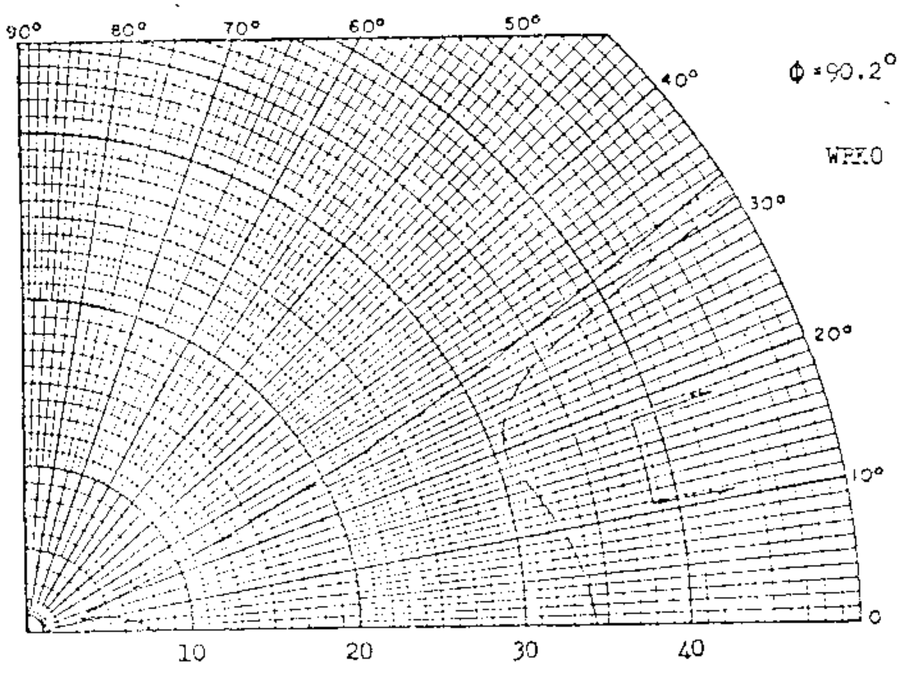
CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

———— E_t - - - - E_a

September 14, 1979

E. W. Horrigan & Associates Limited





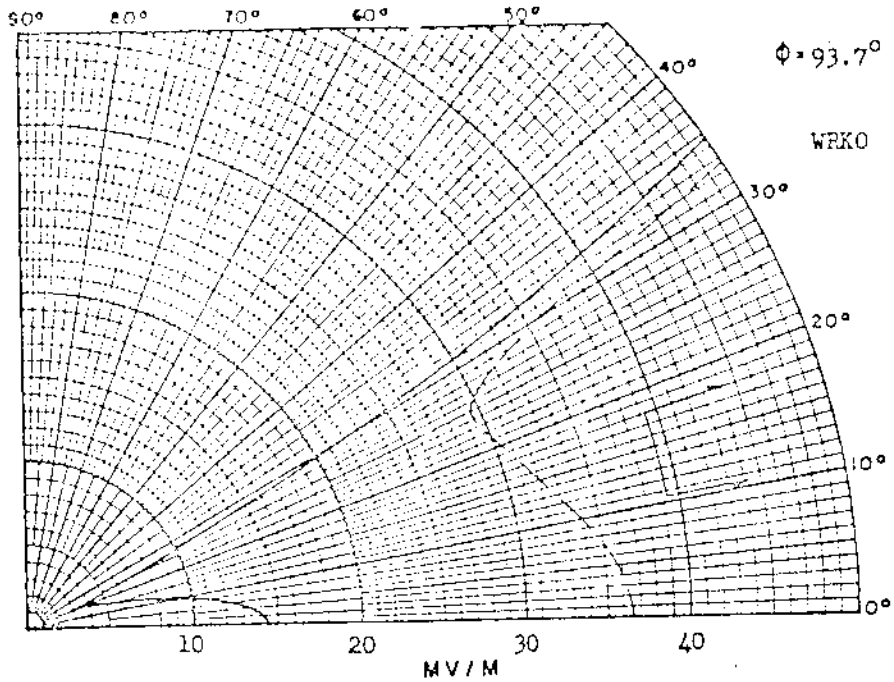
VERTICAL RADIATION PATTERNS

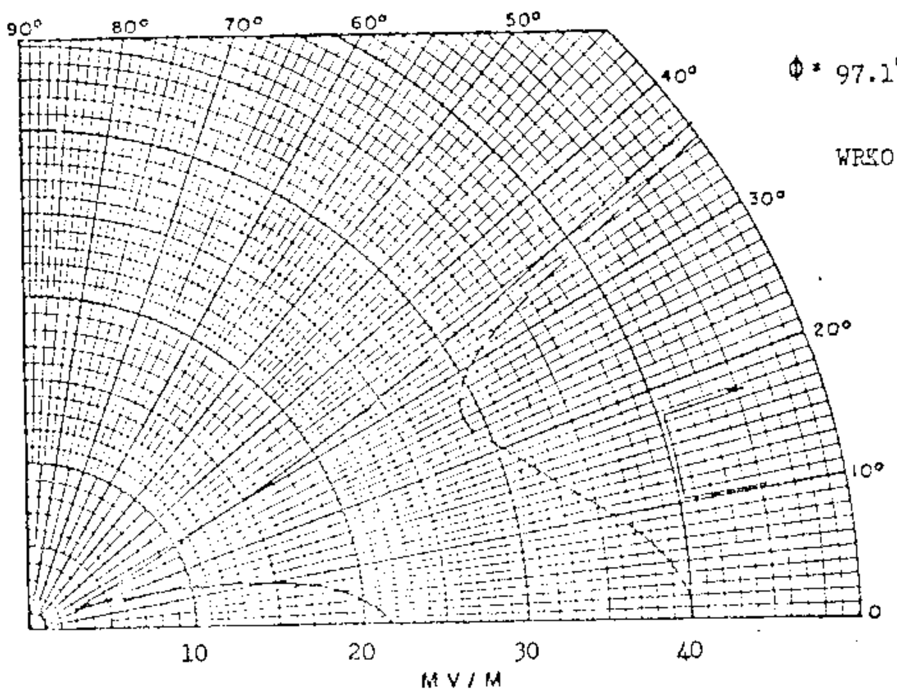
CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

——— E_t - - - - E_a

September 14, 1979

CFTR





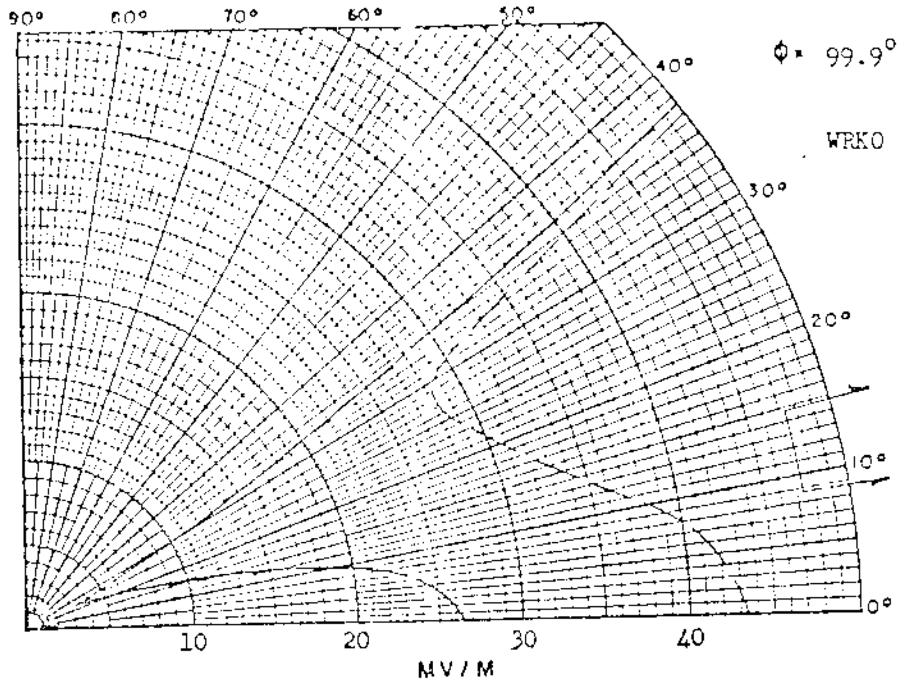
VERTICAL RADIATION PATTERNS

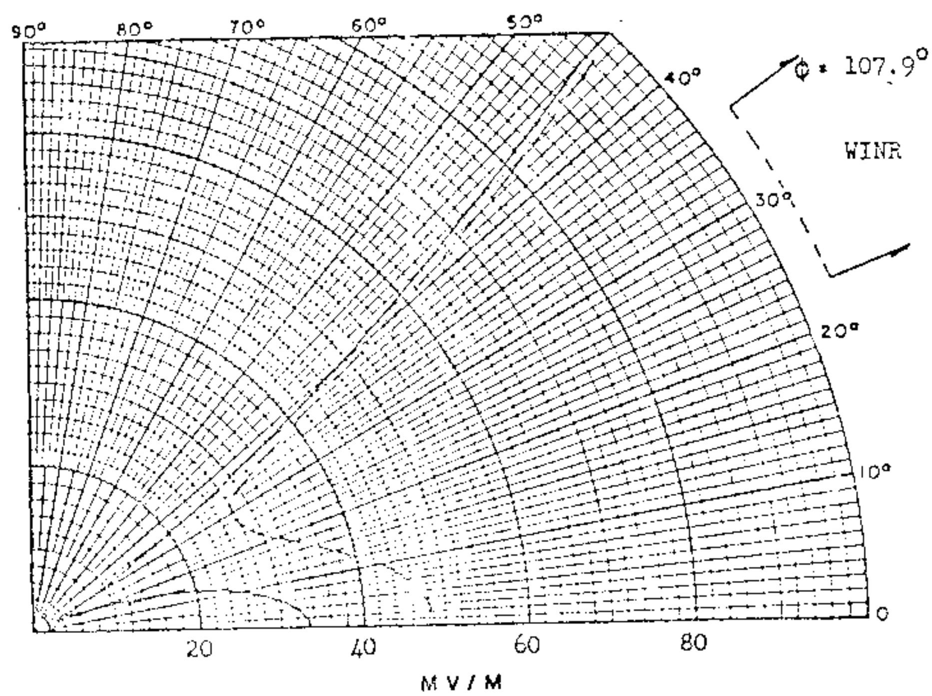
CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

———— E_t - - - - E_a

September 14, 1979

CFTK





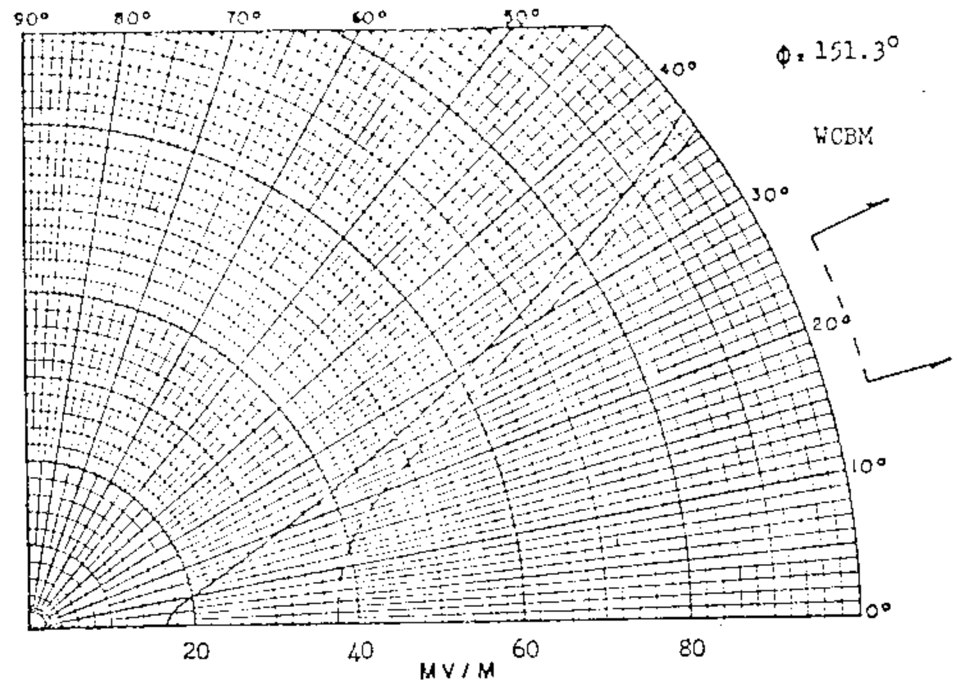
VERTICAL RADIATION PATTERNS

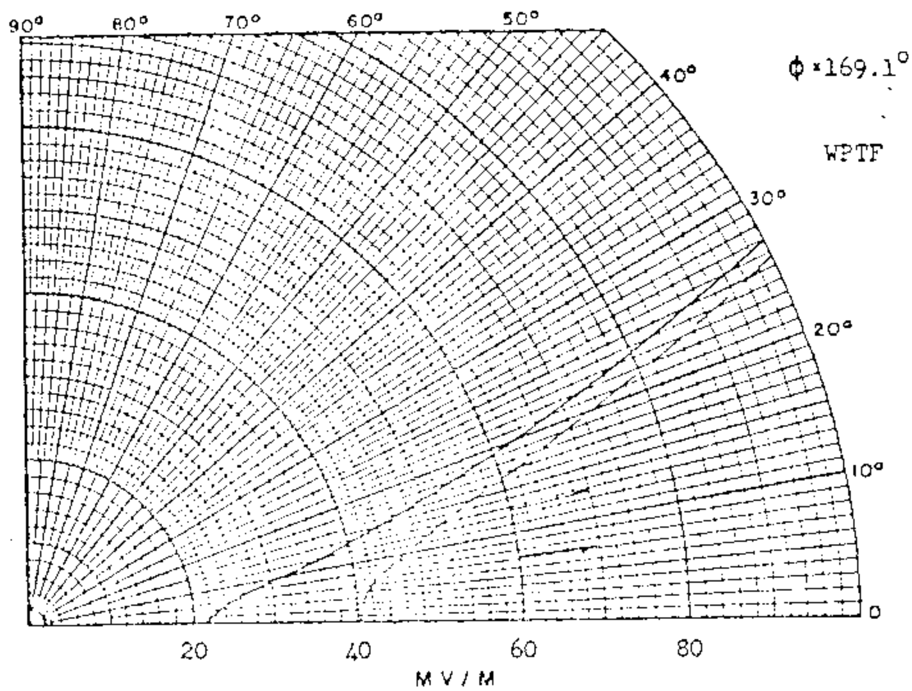
CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

——— E_t - - - - E_a

September 14, 1979

CFTK





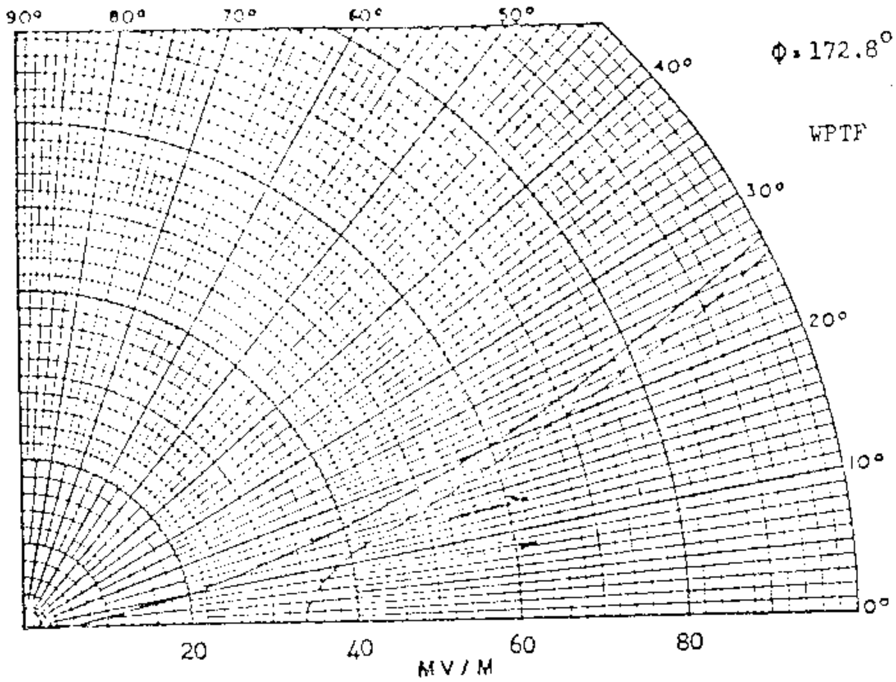
VERTICAL RADIATION PATTERNS

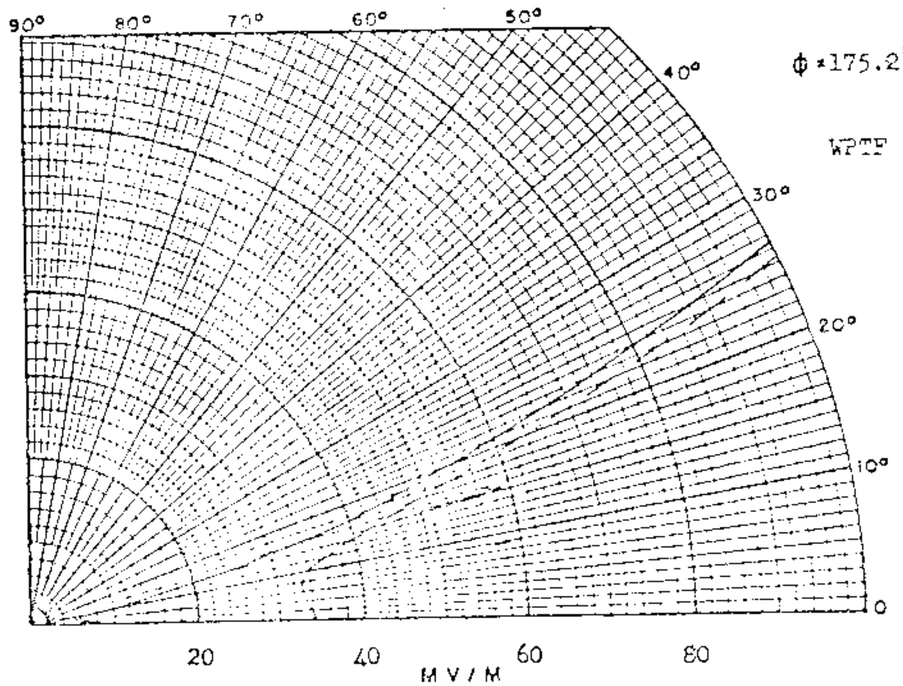
CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

——— E_t - - - - E_a

September 14, 1979

CFTK





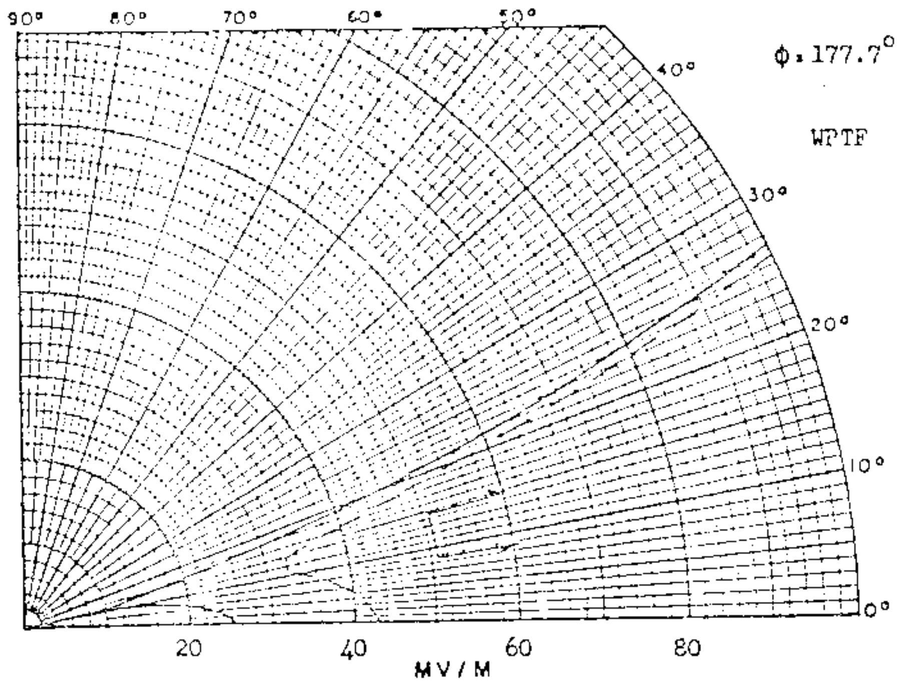
VERTICAL RADIATION PATTERNS

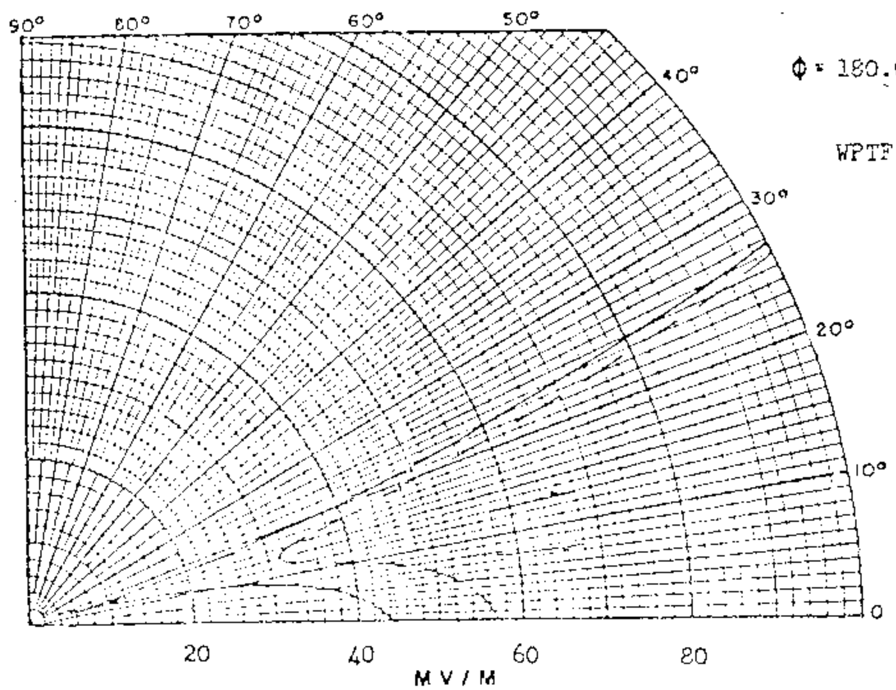
CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

———— E_t - - - - E_a

September 14, 19[illegible]

CFTR





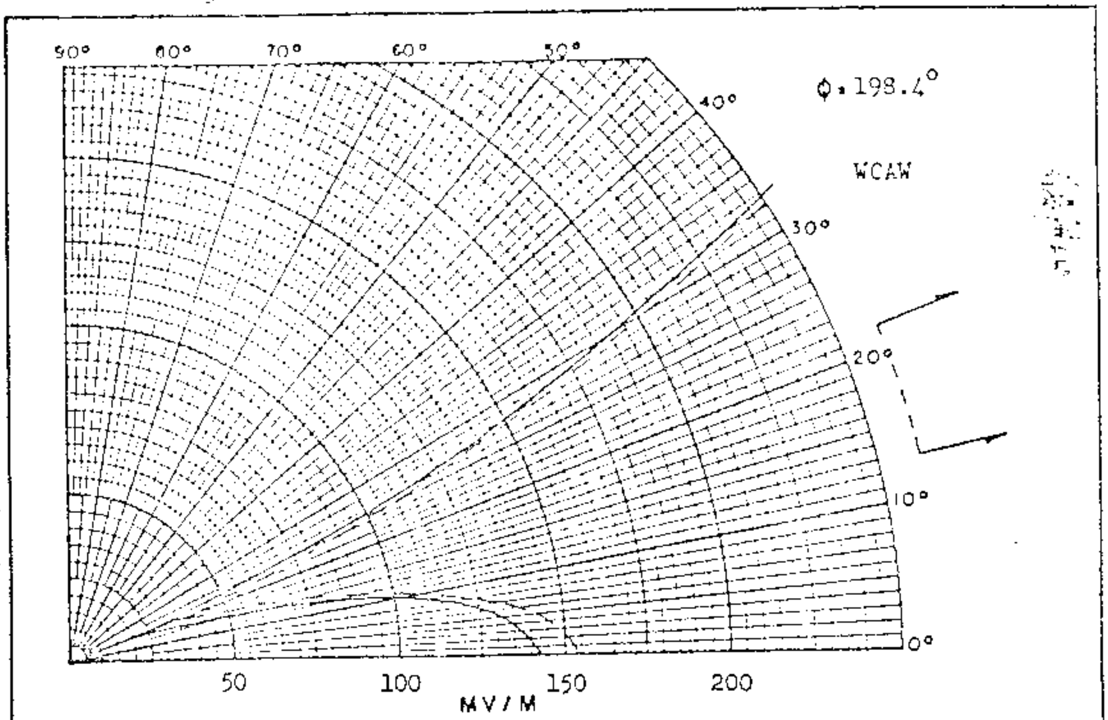
VERTICAL RADIATION PATTERNS

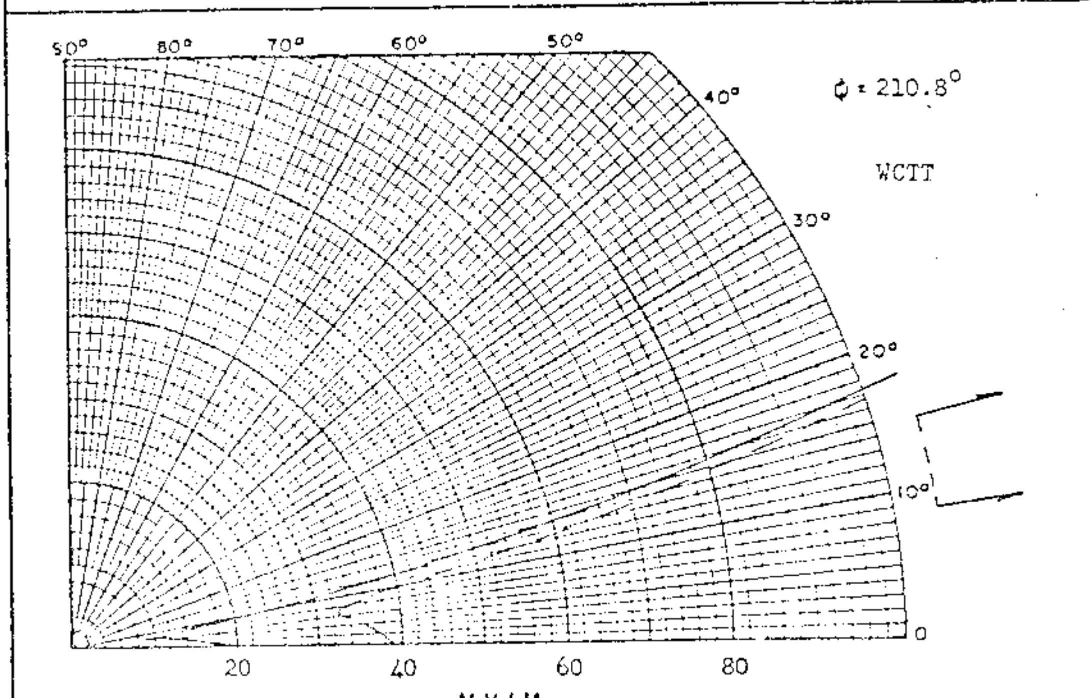
CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

———— E_t — — — — E_a

September 14, 1979

CFTK





VERTICAL RADIATION PATTERNS

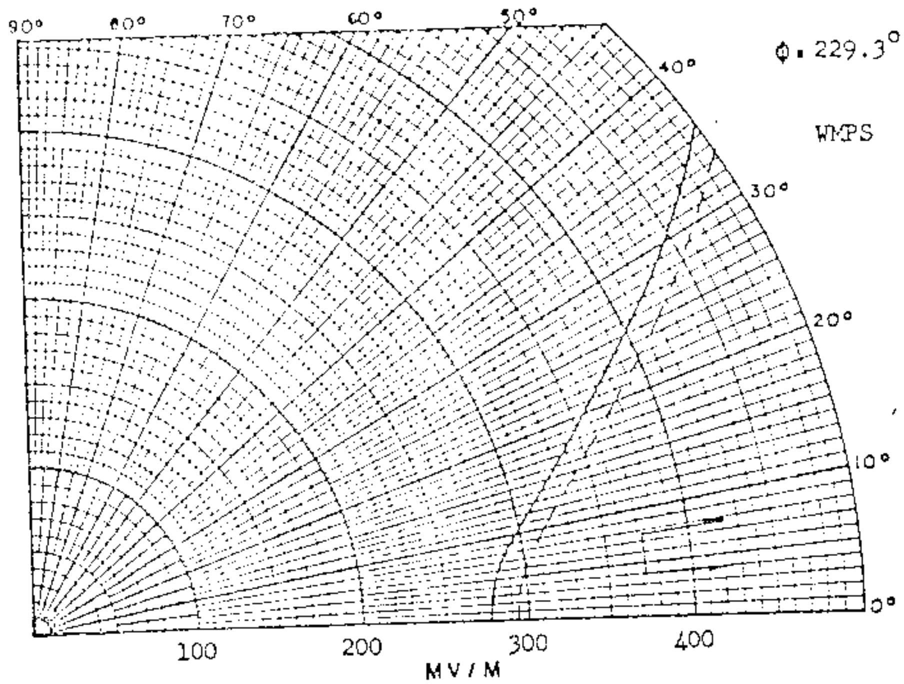
CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

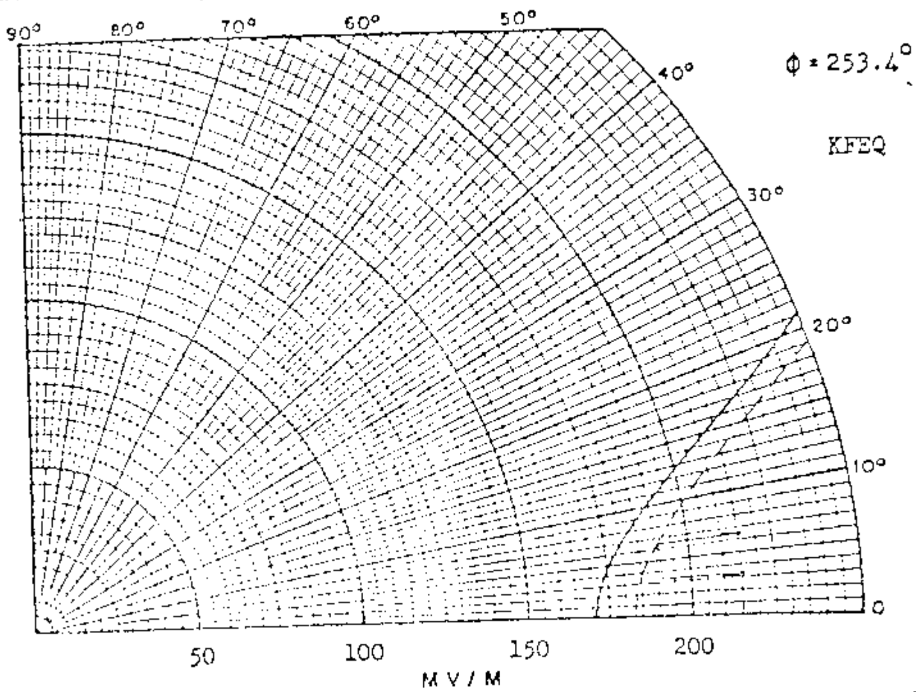
———— E_t - - - - E_A

September 14, 1979

CFTK

E. W. Horrigan & Associates Limited





VERTICAL RADIATION PATTERNS

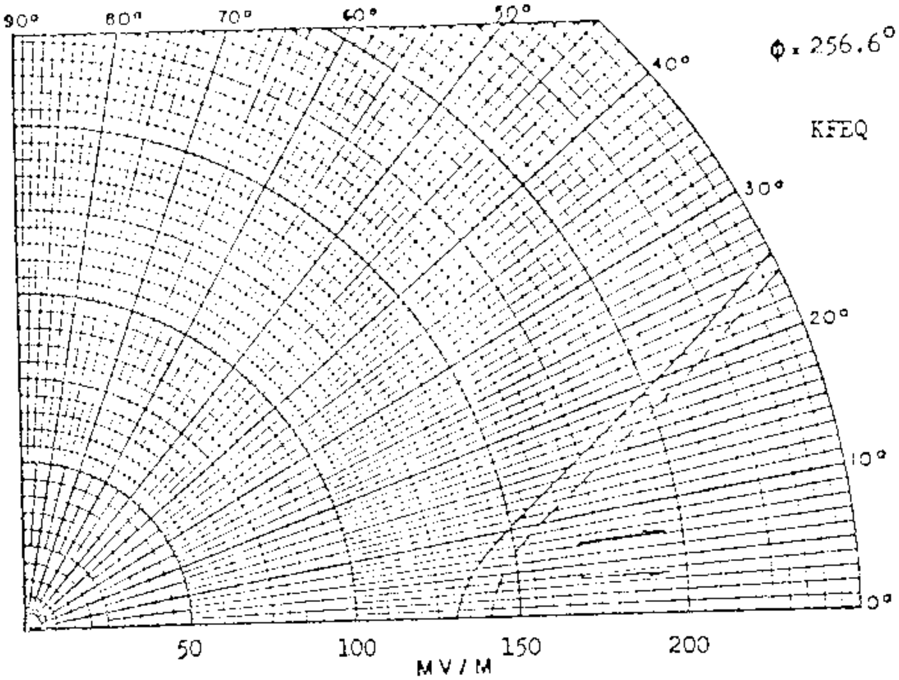
CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

———— E_t - - - - E_a

September 14, 1979

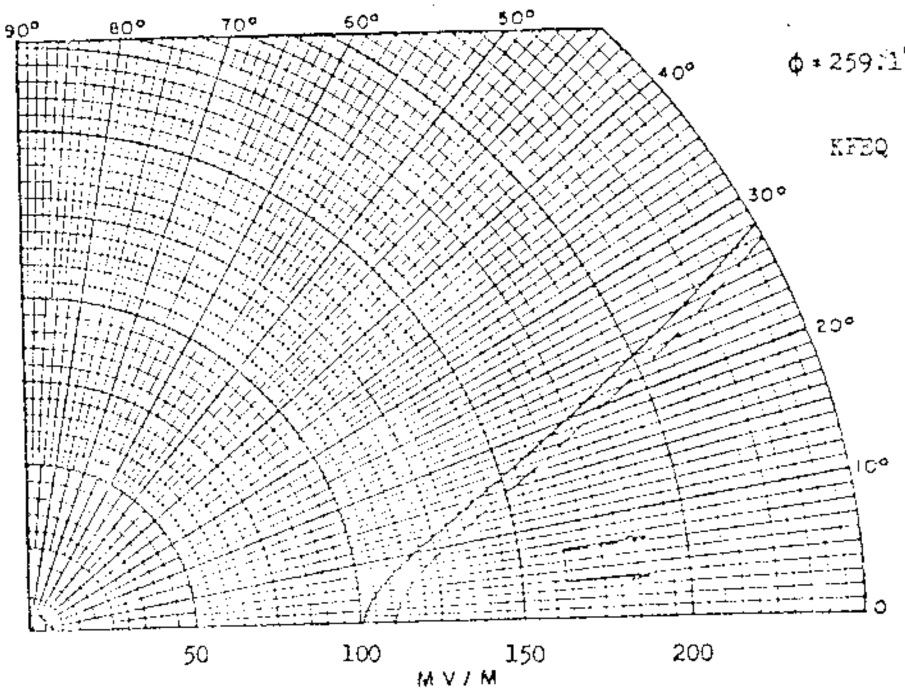
CFTK

E. W. Horrigan & Associates Limited



ϕ = 256.6°

KFEQ



ϕ = 259.1°

KFEQ

VERTICAL RADIATION PATTERNS

CFTR Toronto, Ontario

680 KHz 50 KW DA-2 U Class II

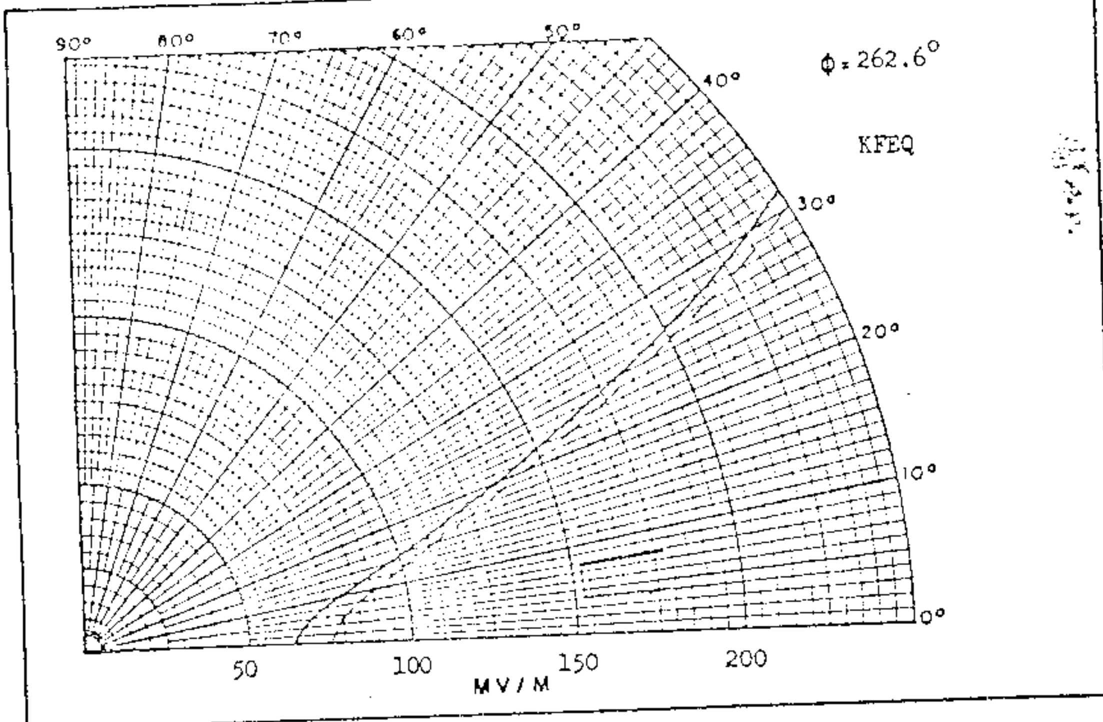
——— E_t - - - - E_a

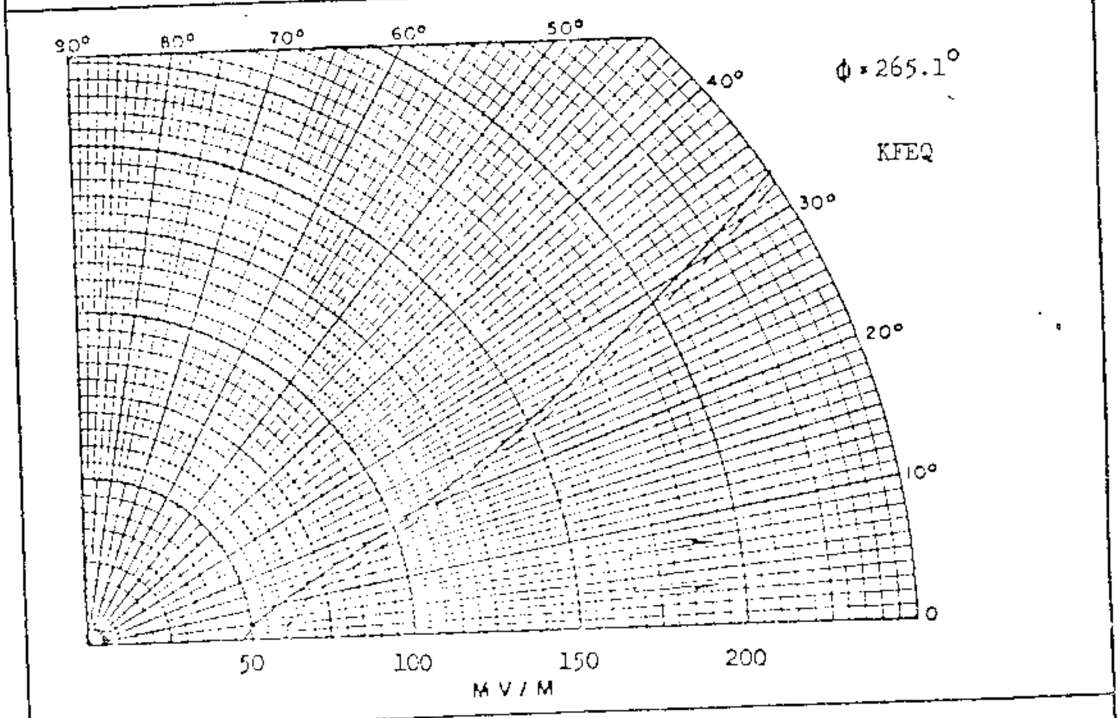
DW

September 14, 19[illegible]

CFTR

E. W. Horrigan & Associates Limited





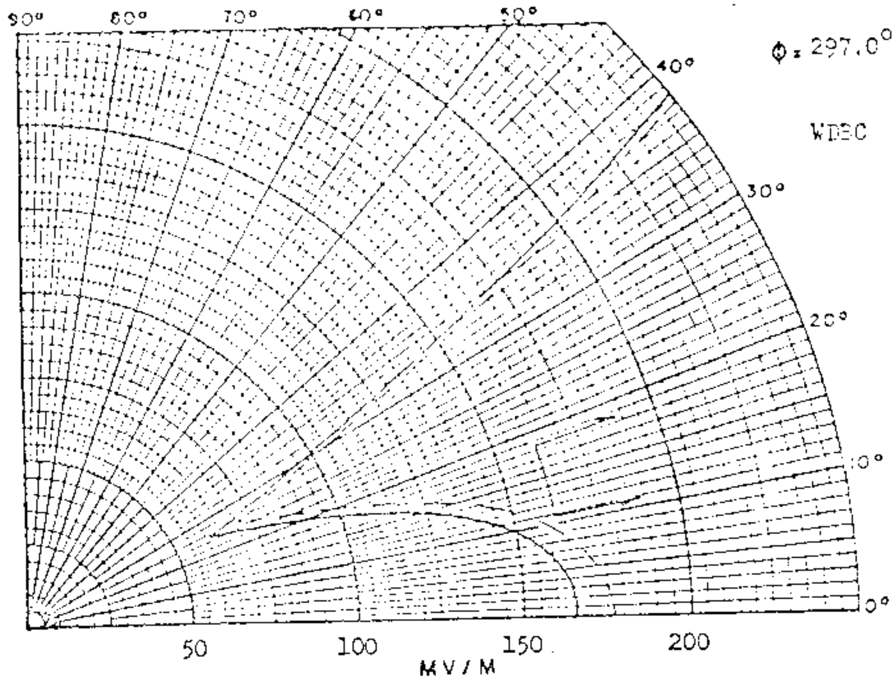
VERTICAL RADIATION PATTERNS

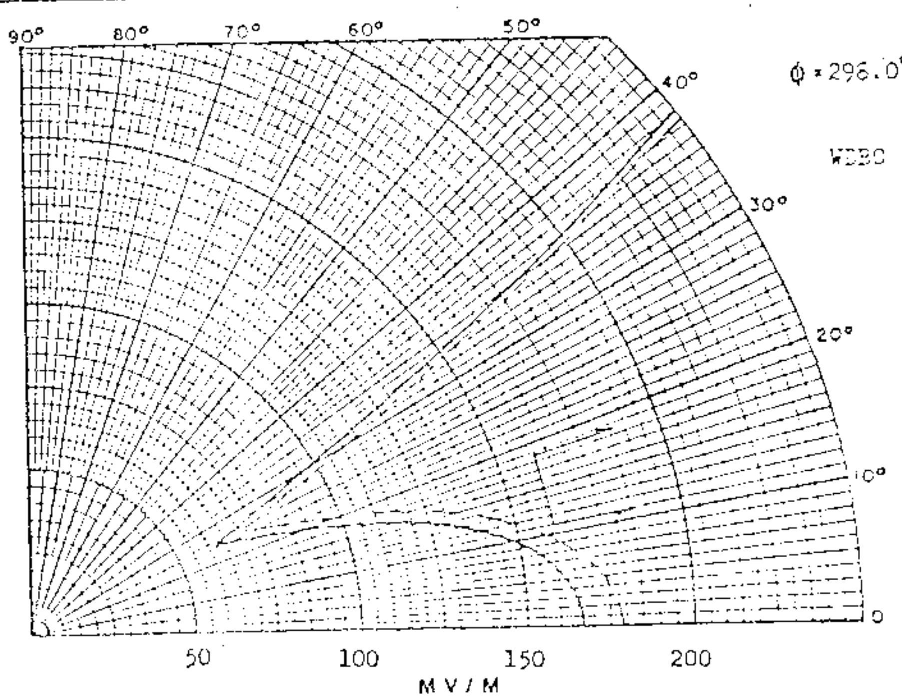
CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

———— E_t - - - - E_a

September 14, 1979

CFTK





VERTICAL RADIATION PATTERNS

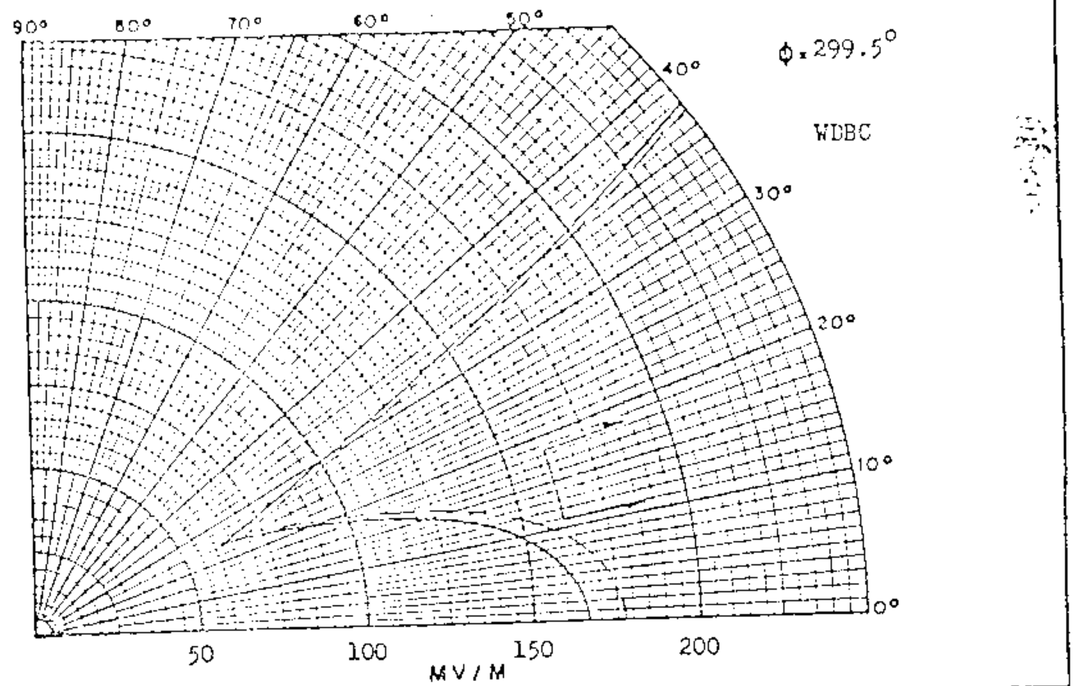
CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

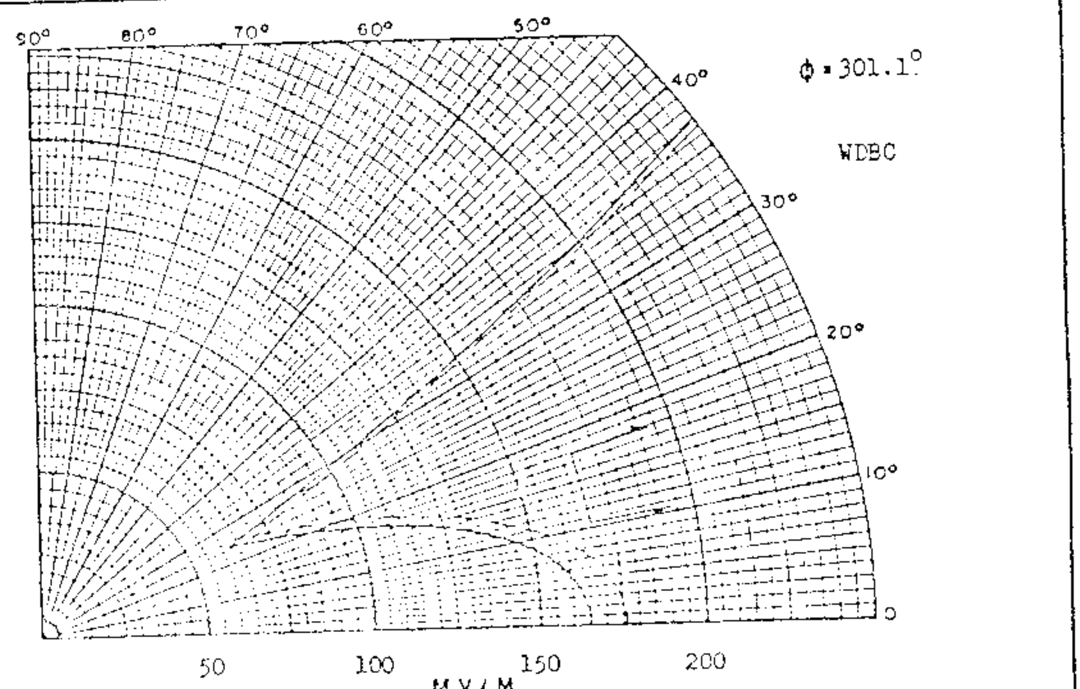
———— E_t - - - - E_a

September 14, 1979

CFTK

E. W. Horrigan & Associates Limited





VERTICAL RADIATION PATTERNS

CFTR Toronto, Ontario
680 KHz 50 KW DA-2 U Class II

——— E_t - - - - E_a

September 14, 1972

Section 2.9 - Description of Array

Station: CFTR Frequency: 680 KHz Time: Unlimited

Main Studio: Toronto, Ontario Power: 50 D/25 N Class: II

Notification List: 391 Date: November 23, 1979

Antenna Site Co-ordinates: (Day) 43° 12' 52" North Latitude
79° 36' 20" West Longitude

Mode of Operation: DA-2 Number of Elements: (Day) 8

Type of Elements: guyed, uniform cross-section, base insulated, series fed, no top loading.

Tower Height: (Day) 400 feet (99.5°) above insulators
410 feet above ground

Tower #	Orientation (degrees)	Distance (degrees)	Field Ratio	Phase (degrees)
1	0.0	0.0	0.338	168.7
2	292.5	154.0	1.000	129.4
3	292.5	308.0	1.000	90.1
4	292.5	462.0	0.338	50.8
5	303.013	485.782	0.338	320.7
6	307.816	335.546	1.000	0.0
7	320.088	191.388	1.000	39.3
8	12.5	90.0	0.338	78.6

Predicted RMS Field: Day 1264.495 mV/m at 1 mile;
178.827 mV/m at 1 mile for 1 KW.

Reduced Design Tolerance Q = 3.79 mV/m

Unitary RSS: Day 2.11116 Unitary RMS: Day 1.94454

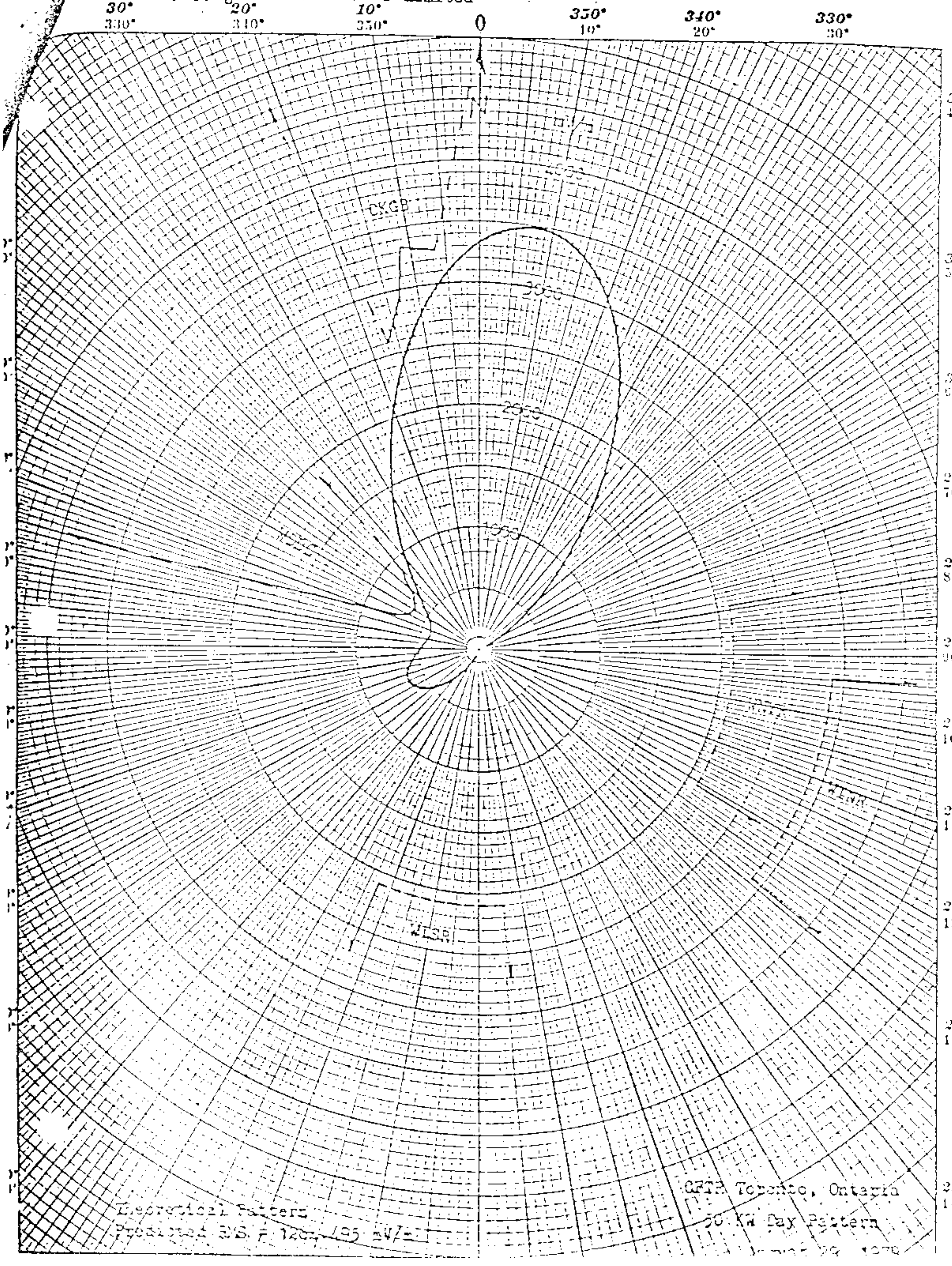
RSS/RMS: Day 1.08568 Scale Factor: Day 650.279

Ground System: 120 radials of #10 AWG soft drawn copper wire from the perimeter of an elevated counterpoise 100 feet in diameter at the base of each tower. Towers interconnected by 2" x 1/16" copper strap. Radials running between towers bonded to #4 AWG stranded copper wire. The effective length of the radials is 0.4λ.

Note: This notification concerns a change to the Day-time array only. Please retain the description sheet and radiation patterns notified for the night-time operation of CFTR in Canadian Change List 321 dated March 22, 1974

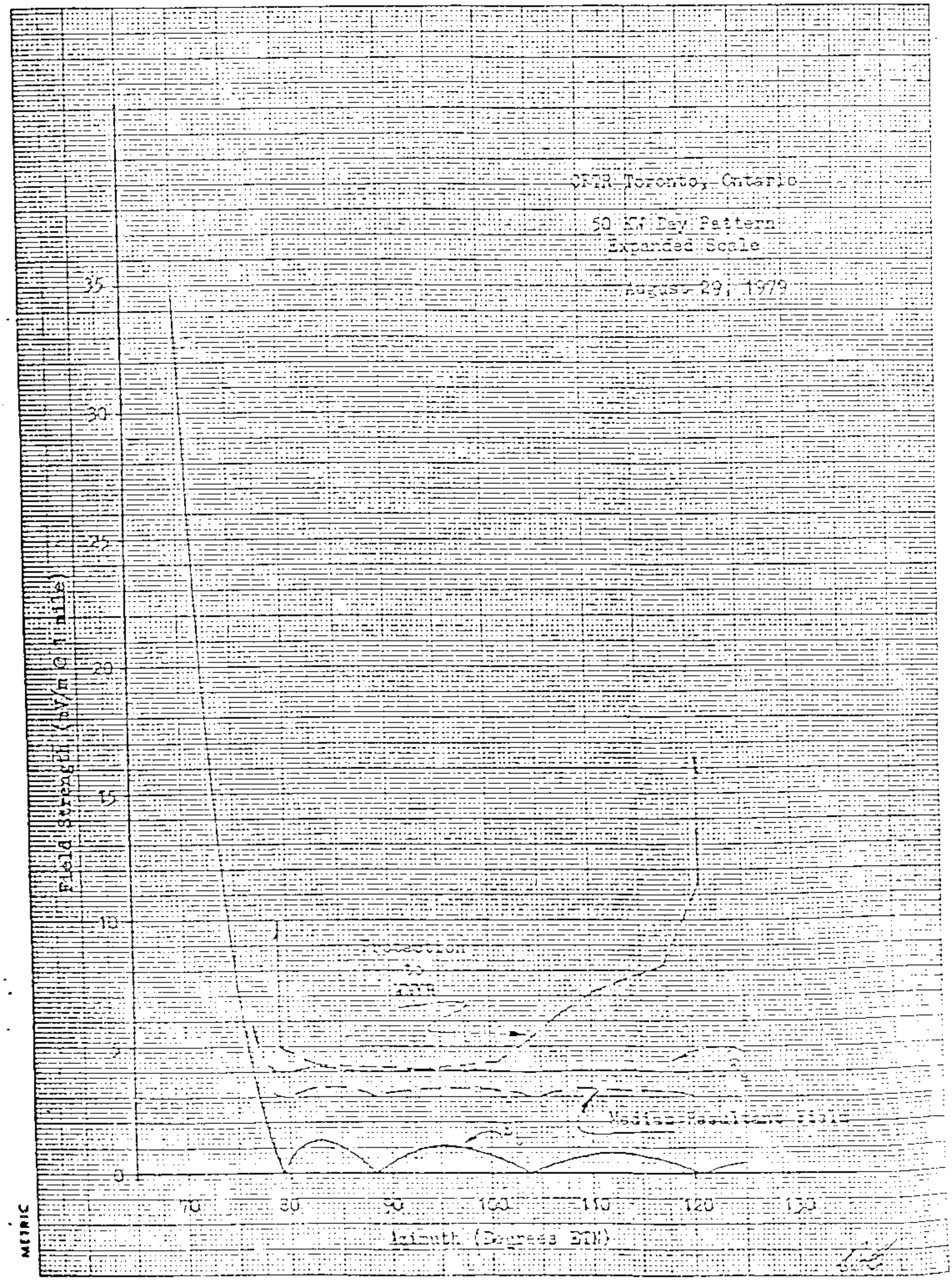
E. W. Horrigan & Associates Limited

CFTR



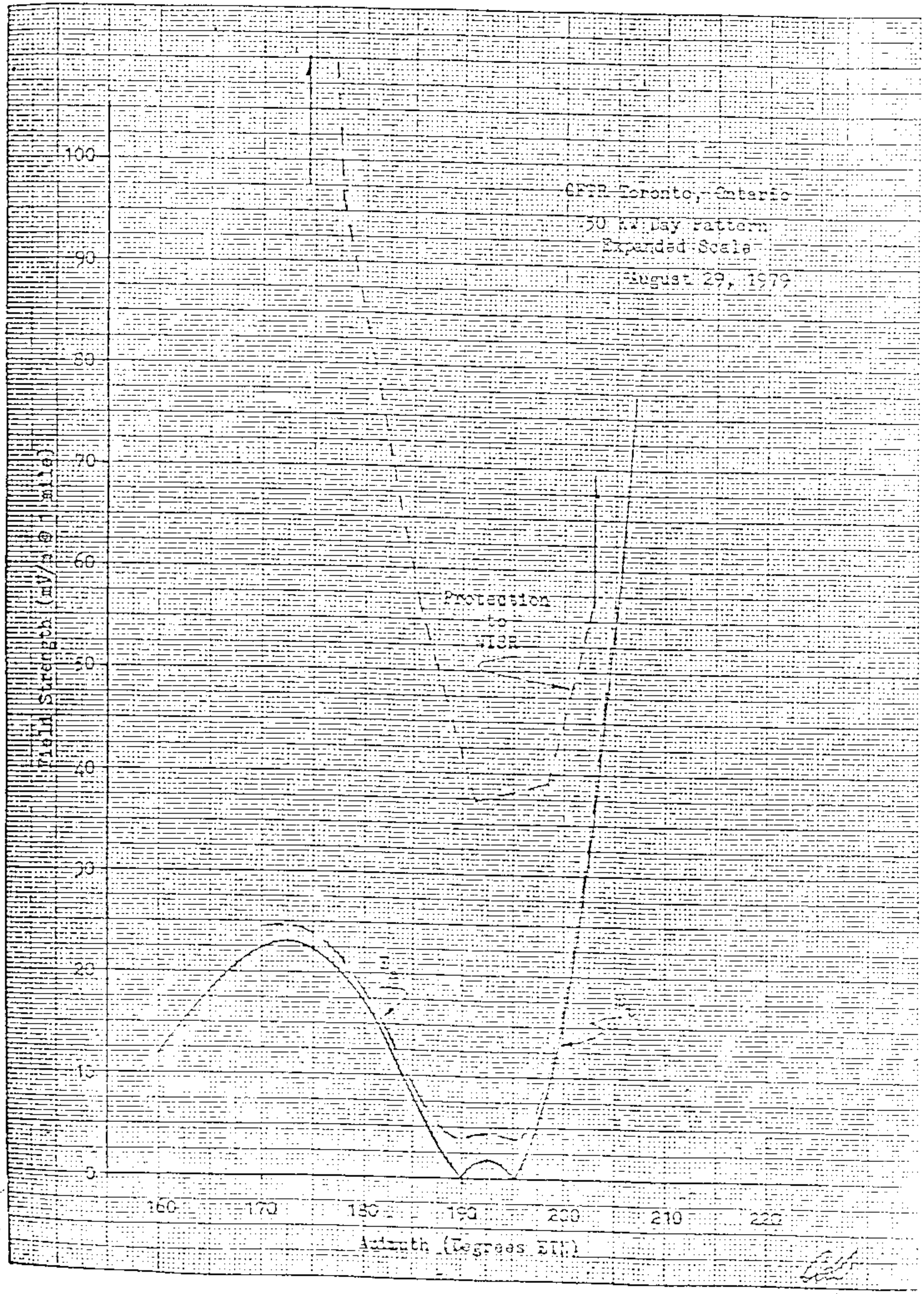
E. W. Horrigan & Associates Limited

CFTK



E. W. Horrigan & Associates Limited

CFTR



PROJECT #10309-B

CHFA

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

STATION: CHFA

MAIN STUDIO: EDMONTON, ALBERTA

FREQUENCY: 680 kHz

POWER: 10 kW CLASS: II

NOTIFICATION LIST NO: 338

DATE: February 7, 1975.

GEOGRAPHICAL LOCATION: Latitude 53° 24' 23" North
Longitude 113° 36' 41" West

ANTENNA CHARACTERISTICS:

Mode of Operation: DA-1

Number of Elements: 3 (Three)

Type of Elements: Guyed steel towers, uniform cross-section, base insulated for series feed

Tower	#1 (South)	#2 (Centre)	#3 (North)
Height above base insulator:	285' (70.9°)	285' (70.9°)	285' (70.9°)
Overall height:	290'	290'	290'
Field Ratio:	.538	1.0	.484
Phasing:	97.5°	0°	-97.5°

GROUND SYSTEM: 120 equally spaced radials per tower of No. 10 B & S gauge bare soft copper wire, buried approximately 8". Length of radials 579' (0.4 wavelength) with the exception of those joined along the common chords.

SPACING AND ORIENTATION OF TOWERS:

The towers are equally spaced on a line bearing 10.5°. The spacing between the towers is 362' (90°).

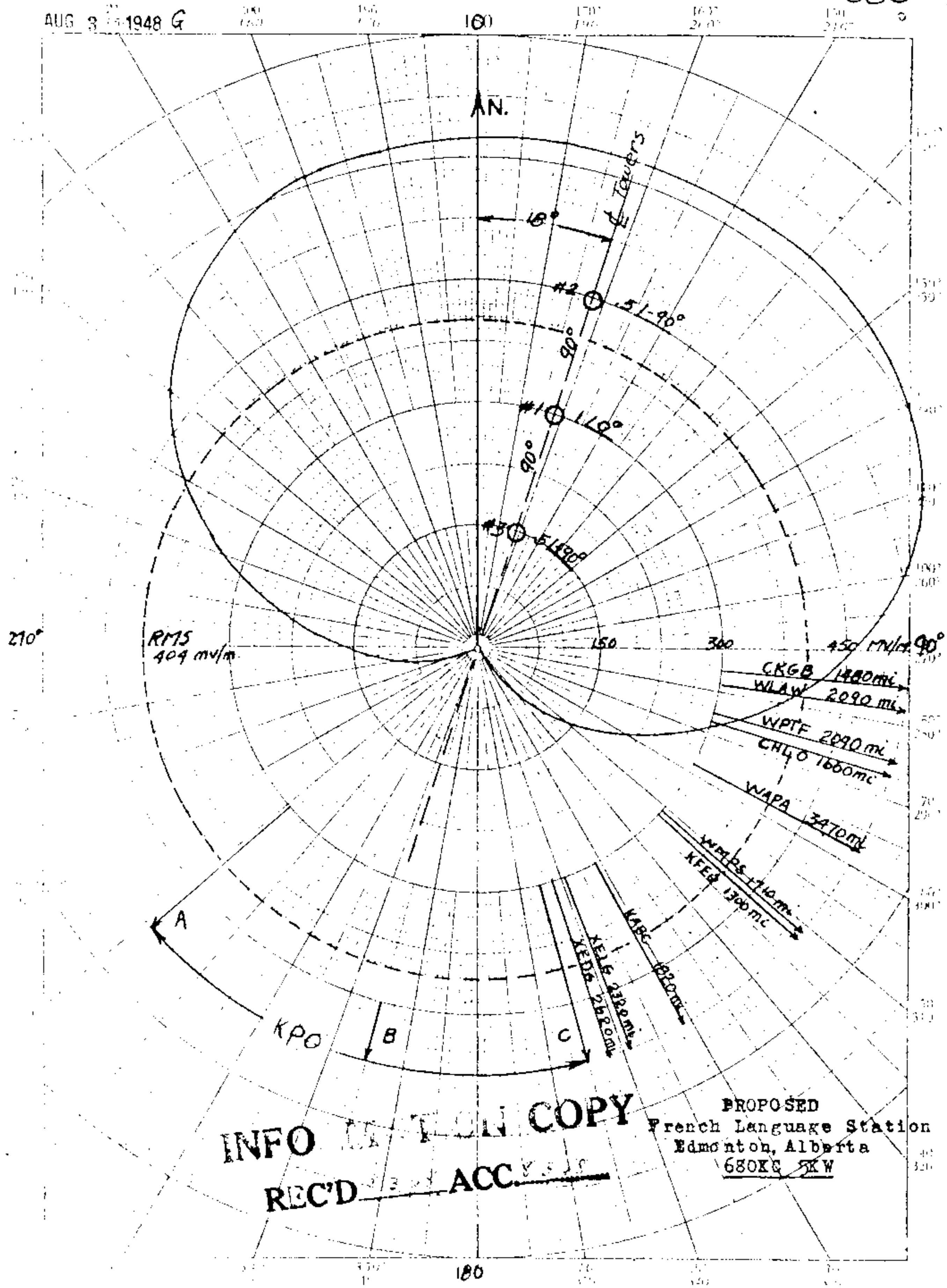
PREDICTED EFFECTIVE FIELD:

593 mV/m at 1 mile for 10 kW
188 mV/m at 1 mile for 1 kW

May 15, 1974

~~CEHA~~ CHF
EDMONTON, ALTA
680

AUG 3 1948 G



PROPOSED
French Language Station
Edmonton, Alberta
680KC 5KW

INFO[illegible] COPY

REC'D [illegible] ACC. [illegible]

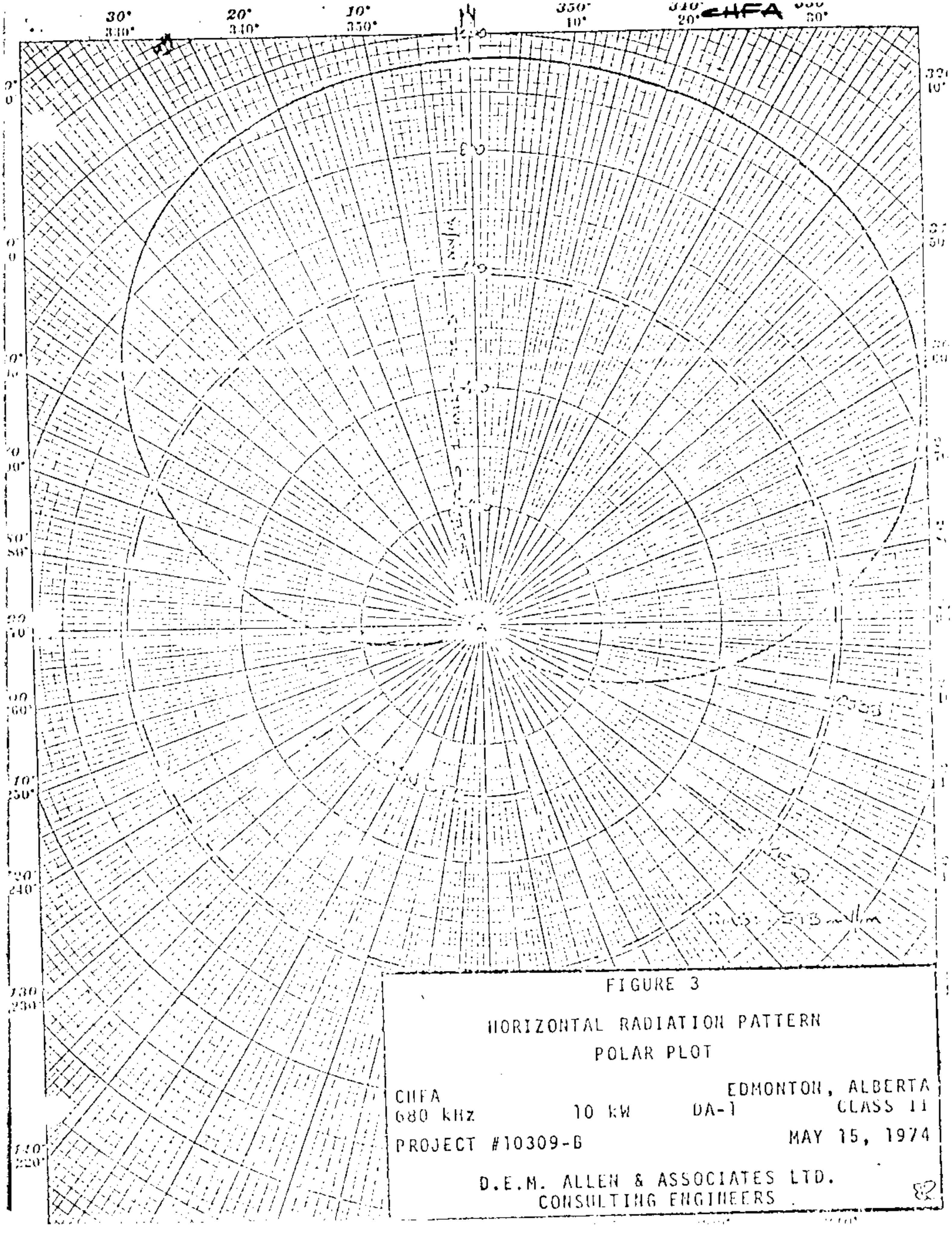


FIGURE 3

HORIZONTAL RADIATION PATTERN

POLAR PLOT

CHFA
680 kHz 10 kW DA-1

EDMONTON, ALBERTA
CLASS II

PROJECT #10309-B

MAY 15, 1974

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

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CHFA

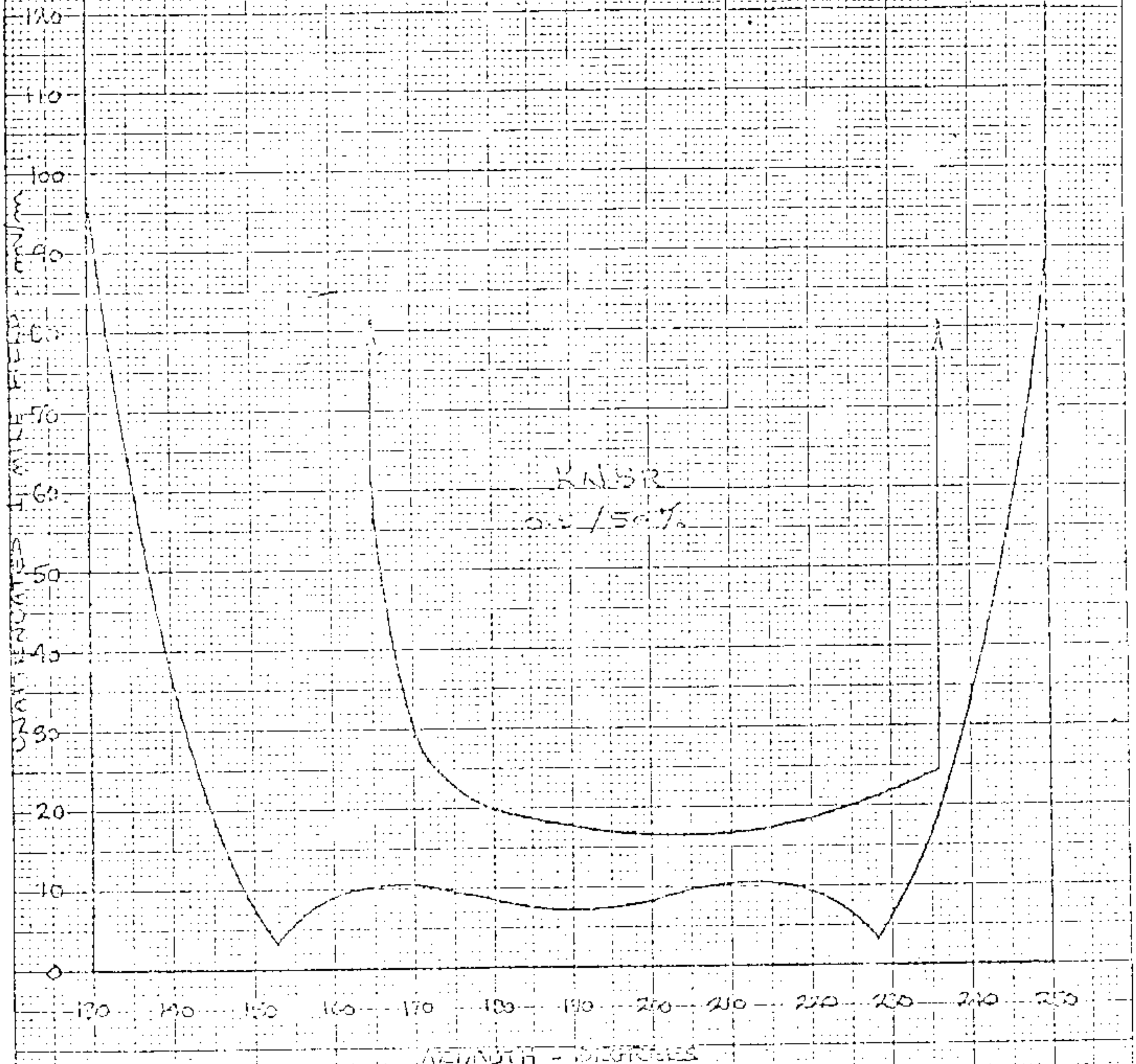


FIGURE 4

HORIZONTAL RADIATION PATTERN

EXPANDED PLOT

CHFA
680 kHz 10 KW

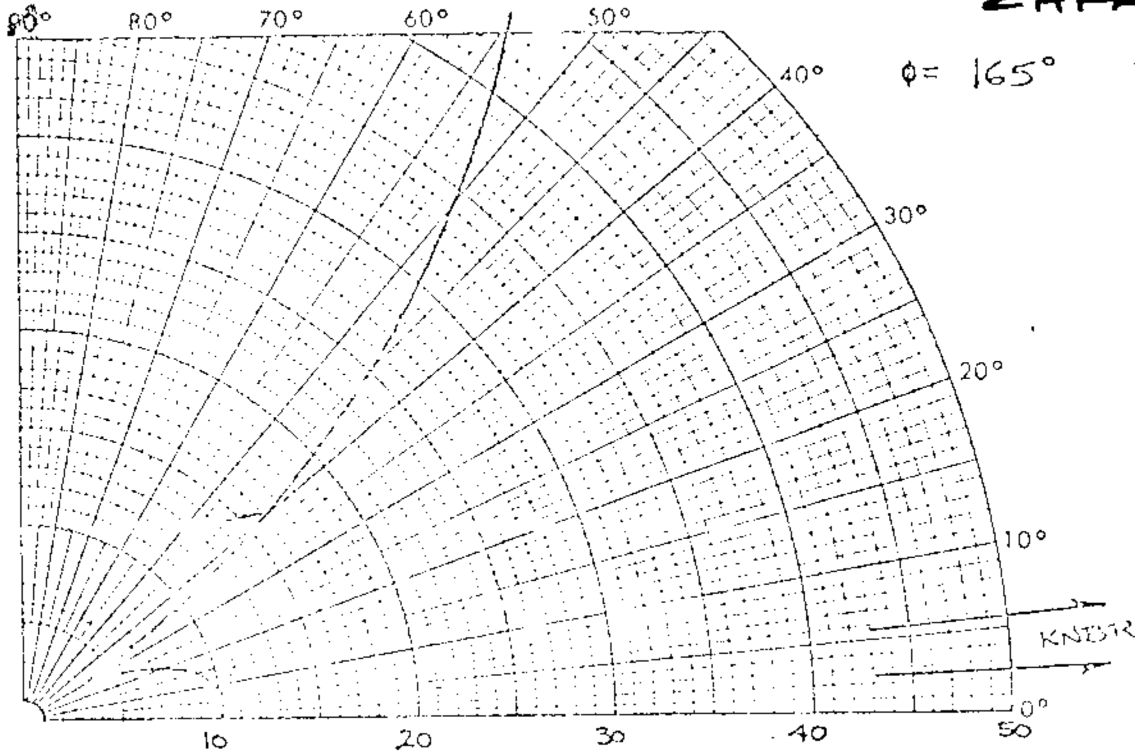
EDMONTON, ALBERTA
DA-1 CLASS II

PROJECT #10309-B

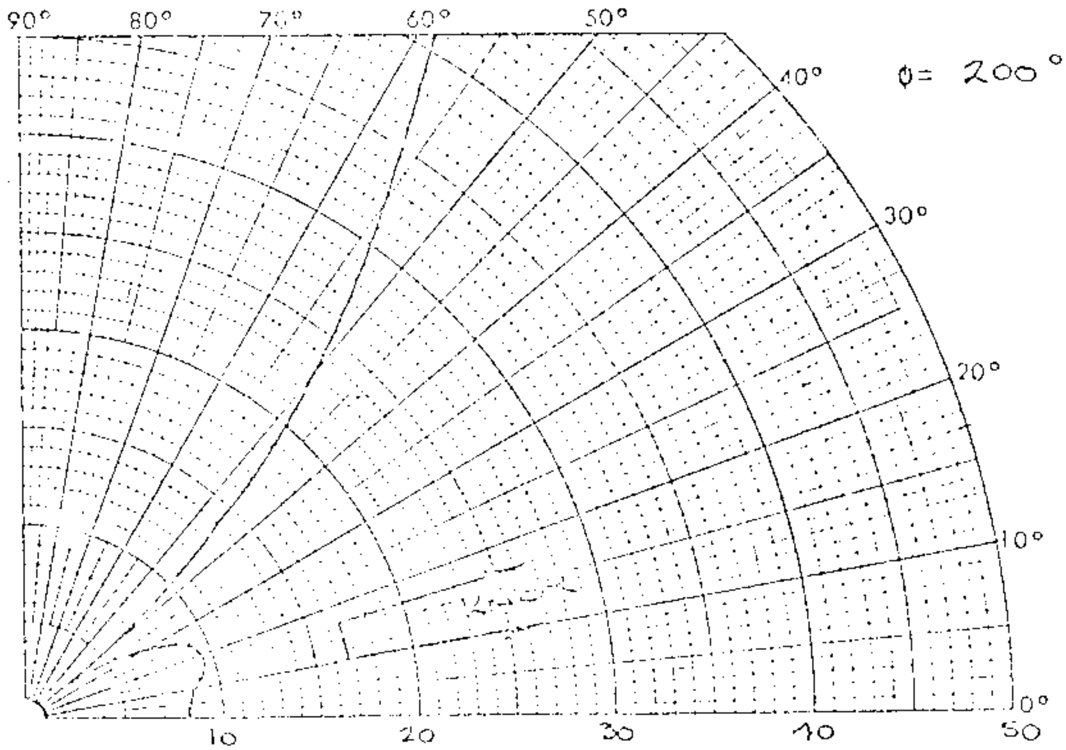
MAY 15, 1974

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

CHFA



UNATTENUATED (MVM) 1 MILE FIELD

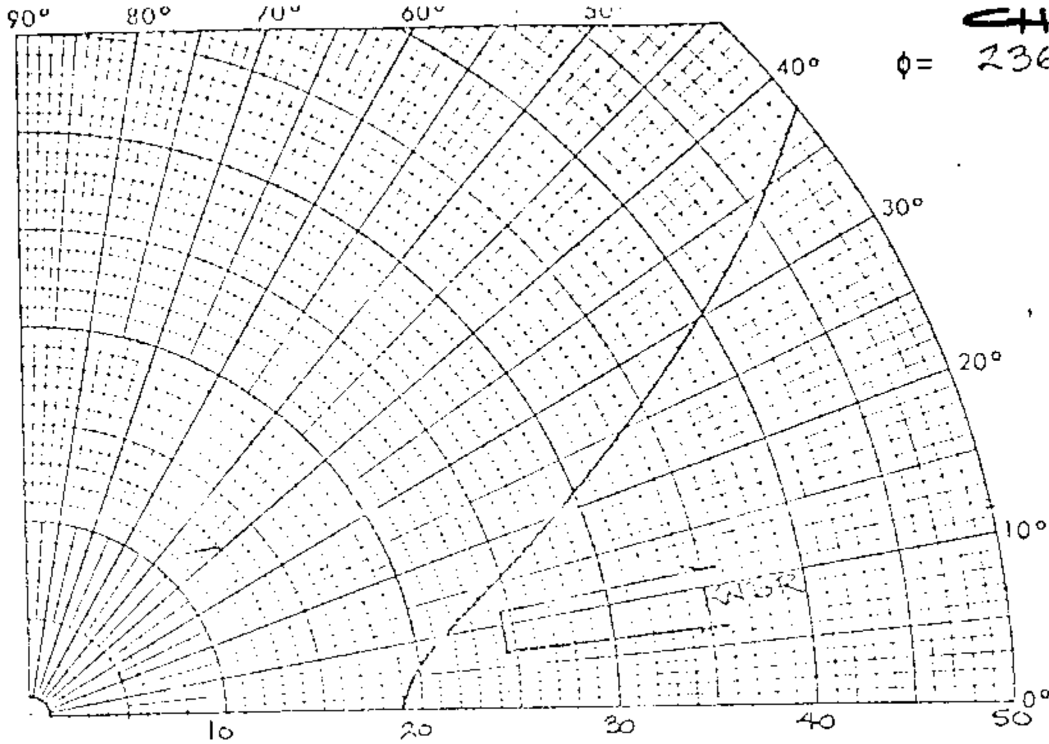


UNATTENUATED (MVM) 1 MILE FIELD

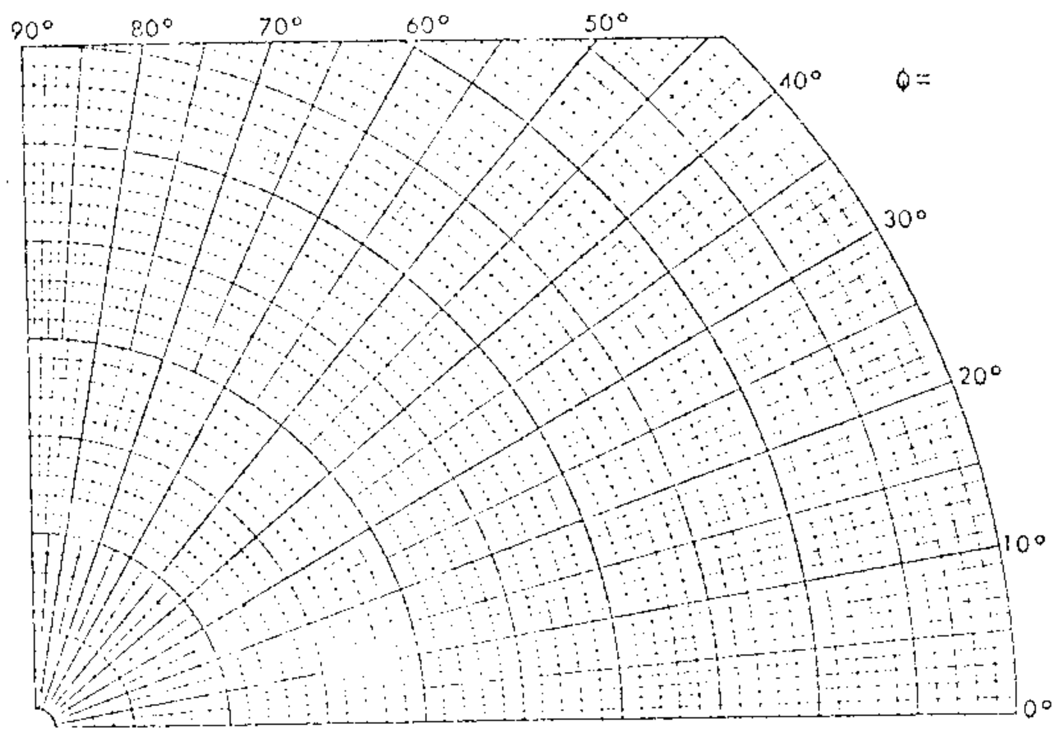
VERTICAL RADIATION PATTERNS

FIGURE 6

CHFA EDMONTON, ALBERTA
680 kHz 10 kW DA-1 CLASS II
PROJECT #10309-B MAY 15, 1974
D.E.N. ALLEN & ASSOCIATES LTD., CONSULTING ENGINEERS



UNATTENUATED (MVM) 1 MILE FIELD



UNATTENUATED (MVM) 1 MILE FIELD

VERTICAL RADIATION PATTERNS

FIGURE 7

CHFA
680 kHz 10 kW DA-1
PROJECT #10309-B

EDMONTON, ALBERTA
CLASS II
MAY 15, 1974

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

112

CHLO

DESCRIPTION SHEET (7/15/57g) | Station CHLO St. Thomas, Ontario, Canada | 1kw, 10kw-LS, DA-2,U 680 KC

DESCRIPTION SHEET

DIRECTIONAL ANTENNA SYSTEM

Station CHLO — Main Studio - St. Thomas, Ontario

Power 10 KW Day/1 KW Night — Class II

Frequency 680 KC

Notification List No. 112 Dated: May 24, 1957.

Location North Latitude 42° 50' 40"
West Longitude 81° 08' 40"

Antenna Mode of Operation, DA-2
6 guyed elements, base insulated, series fed.
No top loading.

Tower	# 1(NW)	#2(SW)	#3(NE)	#4(SE)	#5(SE) center	#6(SE south)
Height above Insulators	241'(60°)	241'(60°)	241'(60°)	241'(60°)	241'(60°)	241'(60°)
Overall Height	245'	245'	245'	245'	245'	245'
Night Field Ratio	1.0	1.0	1.0	1.0	Unused	Unused
Night Phasing	-122.75°	-19.07°	+ 19.07°	+ 122.75°		
Day Field Ratio	Unused	Unused	Unused	0.52	1.0	0.52
Day Phasing	Unused	Unused	Unused	-50°	0°	+ 50°

Ground System 120 radials per tower of #10 AWG soft copper, spaced every 3° and burred 6" approx. Radials 575' long except for shorter radials between towers, bonded at intersections.

Predicted Effective Field Day 175 MV/M for 1 KW
553 MV/M for 10 KW

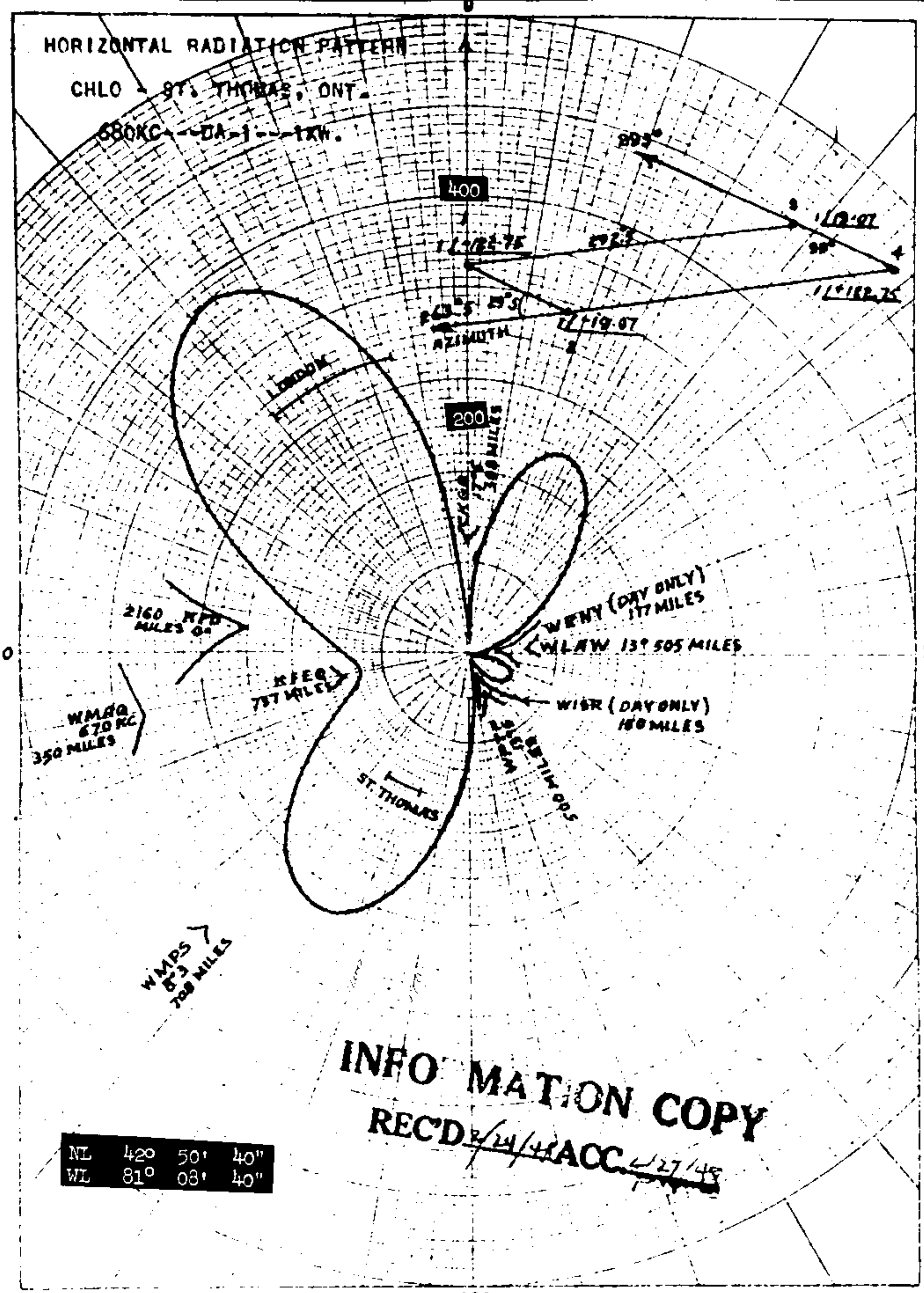
Orientation of Towers

Towers 1, 2, 3, 4 form the corners of a parallelogram. Towers 1 & 3 and 2 & 4 are 292.5° apart (1175.2') on a bearing of 263.5° true. Towers 1 & 2 and 3 & 4 are 90° apart (361') on a bearing of 293° true. Towers 4, 5 and 6 are on a line bearing 300° true and are spaced 155° (620') apart, Towers 5 and 6 being south east of Tower 4.

Note:"The Federal Communications Commission has object to this pattern."

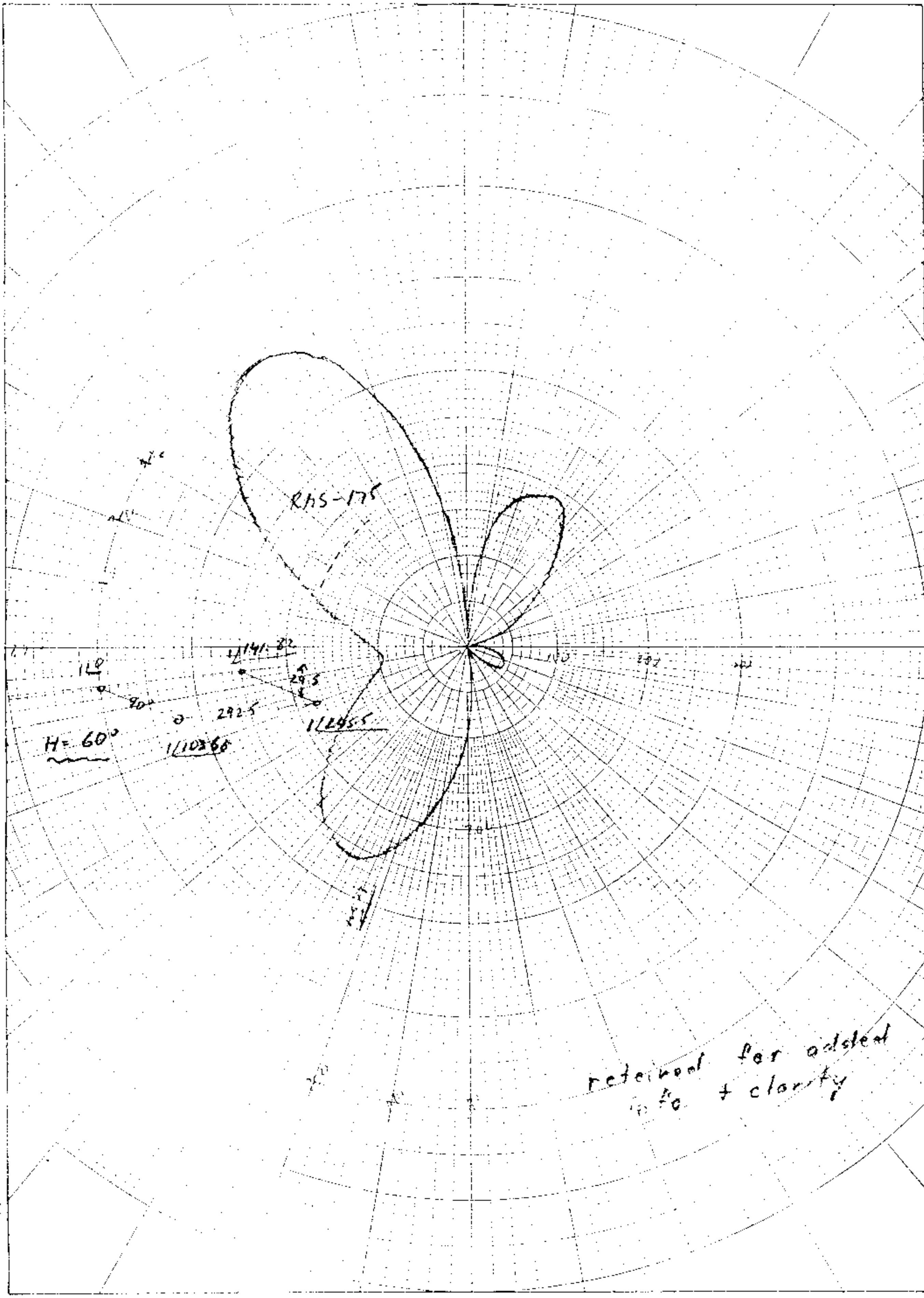
CHLO

PROPOSED	NIGHT	Station CHLO St, Thomas, Ontario	1kw, DA-1, Class II 680 KC



Prop. Night

680 VC



$E = 392 \cos(146.25 \cos\theta + 70.91) \cos(45 \cos[\theta - 29.5] + 51.84)$

$\theta - 83.5°$ CW

KEUFFEL & ESSER CO. N.Y. NO 343A
POLAR COORDINATE

3-15-49

183

CJCN

Description Sheet
(1-29-64ct)

New Station
GRAND FALLS ~~Central~~ Newfoundland

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

Description of Array

STATION: New (Rebroadcasting station of CJON) MAIN STUDIO: St. John's, Nfld.

SECONDARY STUDIO: Grand Falls, Nfld.

POWER: 10 Kw FREQUENCY: 680 Kc/s CLASS: II

LOCATION: GRAND FALLS, ~~Central Newfoundland~~

Notification List No. 183.

NORTH LATITUDE: 49° 01' 40"

Date: December 16, 1963.

WEST LONGITUDE: 55° 26' 45"

ANTENNA:

MODE OF OPERATION: DA-2 (Directional day and night with different patterns)

ELEMENTS: Three, uniform cross-sections, guyed steel towers, base insulated for series feed.

TOWER:	#1 (SW)	#2 (N)	#3 (E)
HEIGHT ABOVE INSULATORS:	250' (62°)	250' (62°)	250' (62°)
SPACING:	Ref.	120° (482')	120° (482')
ORIENTATION:	Ref.	350°	65°
DAY PHASING:	0°	-60	Not
DAY FIELD RATIO:	1.0	.76	Used
NIGHT PHASING:	0°	Not	-60
NIGHT FIELD RATIO:	1.0	Used	.76

GROUND SYSTEM: 120 equangularly spaced radials from the base of each tower to a distance of 578 feet (0.4 wavelength) with the exception of those joined along the common chords.

PREDICTED EFFECTIVE FIELD:
DAY AND NIGHT OPERATION:
555 mv/m at 1 mile for 10 Kw.
175 mv/m at 1 mile for 1 Kw.

Revised December 5, 1963.

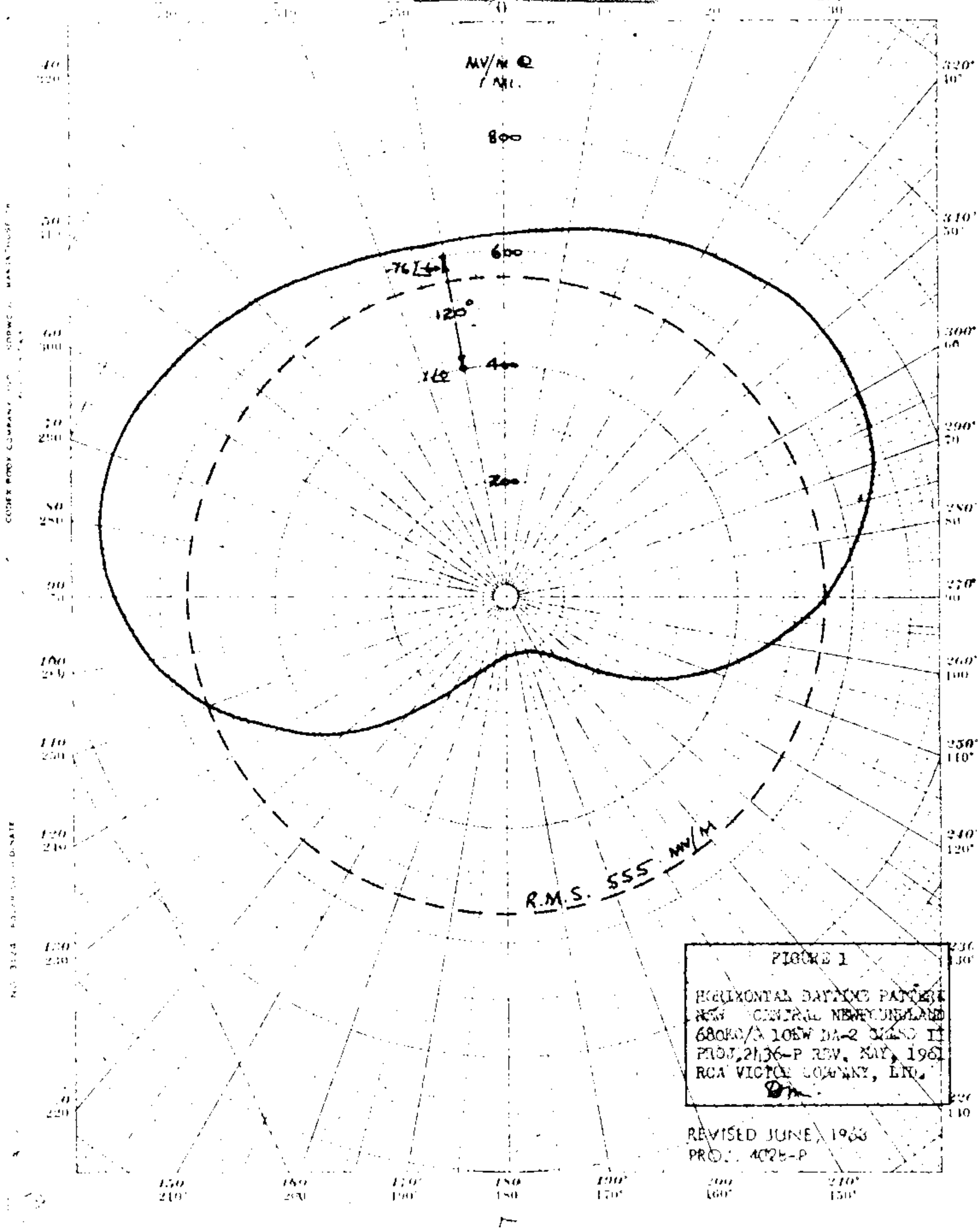
183

CJCN

Proposed Day
(1-29-64ct)

New Station
Grand Falls ~~Central~~, Newfoundland

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

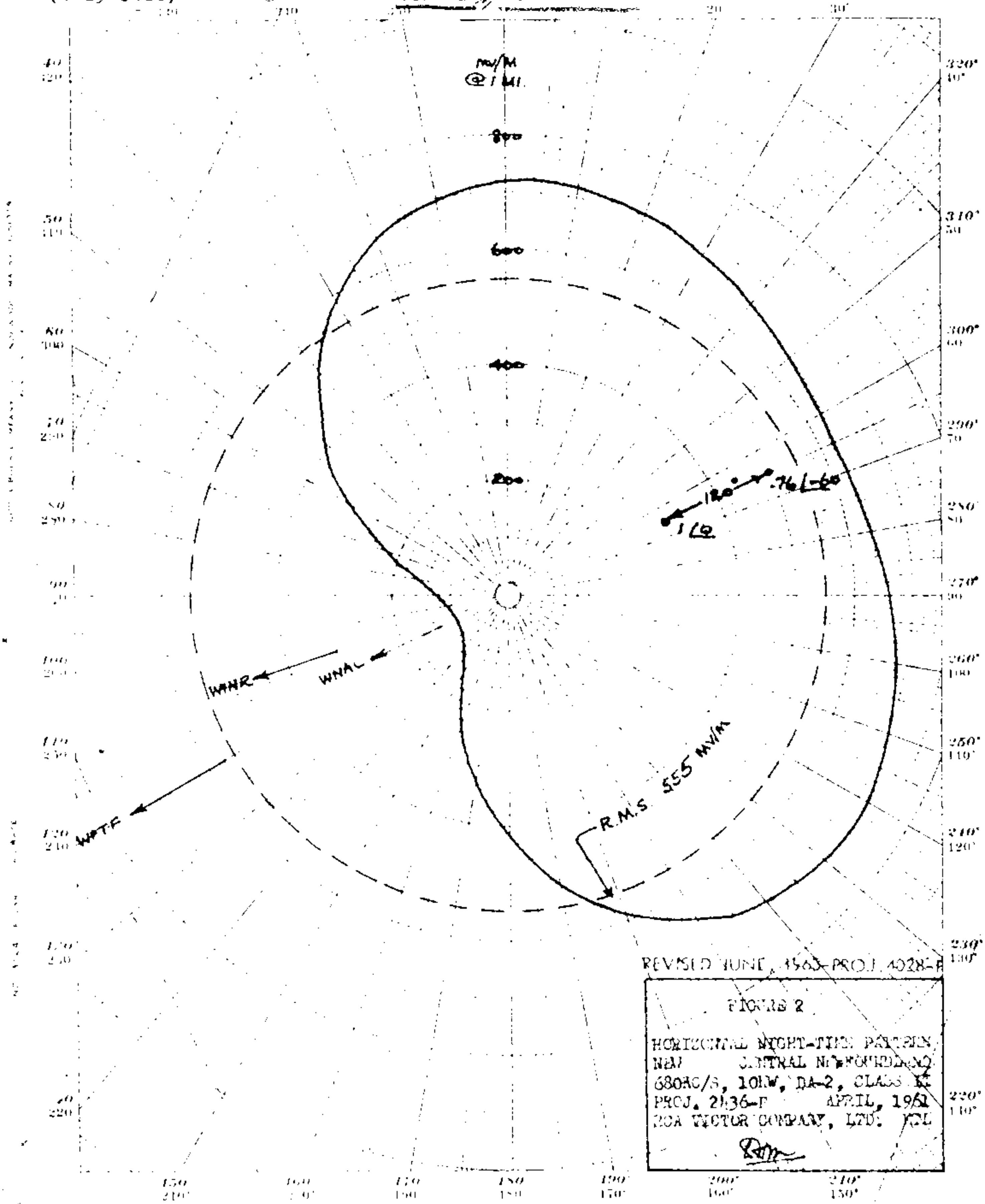


CJCN

Proposed Night
(1-29-64ct)

New Station
GRAND FALLS ~~Central~~ Newfoundland

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



REVISED JUNE, 1963-PROJ. 4028-R

FIGURE 2

HORIZONTAL NIGHT-TIME PATTERN
NEW CENTRAL NEWFOUNDLAND
680KC/S, 10KW, DA-2, CLASS II
PROJ. 2436-F APRIL, 1962
RCA VICTOR COMPANY, LTD. KCL

IFRB Serial No. 1,2,0,7,5 CJOB 680

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT

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

CORRECTION 41.

PART I GENERAL INFORMATION

(01) Administration: CANADA | Sheet No. 419 | Date 830606

Assigned frequency (kHz)		(02)	680
Transmitting station	Name of the station	(03)	WINNIPEG MB
	Call sign	(04)	CJOB
	Additional identification	(05)	
	Station class	(06)	B
	Operational Status	(07)	O
Country		(08)	CAN
Geographical coordinates of the transmitting station		(09)	97W1130 49N3914

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

Correction to List 417 dated 830321.

(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)	50.0	(31)	50.0
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 ART E 4 OF THE AGREEMENT
CHARACTERISTICS OF A REGION 2 BROADCASTING STATION IN THE BAND 535 - 1605 kHz

IFRB Seri No. 12075

PART II Section I

Description of a directional antenna consisting of vertical conductors

Sheet No. 419

Date 830606

(01) WINNIPEG MB
Name of transmitting station

(02) CAN
Country

(03) N
Hours of operation

(04) 6
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	0.495	0.0	0.0	0.0	0	92.0	0
2	0.506	7.7	175.0	285.0	0	92.0	0
3	0.950	-108.0	90.0	20.0	0	92.0	0
4	1.000	-106.7	190.0	313.3	0	92.0	0
5	0.520	-214.8	180.0	20.0	0	80.0	0
6	0.506	-218.0	240.0	333.5	0	80.0	0

(14) r.m.s value of radiation	(15) Type of pattern	(16) Special quadrature factor
2093. mV/m at 1 km	M	40.2 mV/m at 1 km

(17) SUPPLEMENTARY INFORMATION

Correction to spacing for Tower #2.

CJOB
680
CORRECTION 41

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT 12075

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

CJOB
680

PART I GENERAL INFORMATION

(α) Administration: CANADA | Sheet No. 417 | Date 830321

Assigned frequency (kHz)		02	680
Transmitting station	Name of the station	03	WINNIPEG MB
	Call sign	04	CJOB
	Additional Identification	05	
	Station class	06	B
	Operational Status	07	0
Country		08	CAN
Geographical coordinates of the transmitting station		09	97W11 30 49N39 14

(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	50.0	31	50.0
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							

IFRB Serial No. 12 75

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT
CHARACTERISTICS OF A REGION 2 BROAD STING 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: WINNIPEG MB

(02) Country: CAN

(03) Hours of operation: D

(04) Total number of towers: 3

(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	0.29	-104.0	0.0	0.0	0	92.0	0
2	0.68	118.5	90.0	20.0	0	92.0	0
3	1.00	0.0	180.0	20.0	0	80.0	0

(14) r.m.s value of radiation: 2188. mV/m at 1 km

(15) Type of pattern: E

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

(17) SUPPLEMENTARY INFORMATION

680

IFRB Serial No. 12 75

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT
CHARACTERISTICS OF A REGION 2 BROAD ITING 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) WINNIPEG MB
Name of transmitting station

(02) CAN
Country

(03) N
Hours of operation

(04) 6
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 [illegible]	(11) Electrical height of tower (degrees)	(12) Tower structure
1	0.495	0.0	0.0	0.0	0	92.0	0
2	0.506	7.7	75.0	285.0	0	92.0	0
3	0.950	-108.0	90.0	20.0	0	92.0	0
4	1.000	-106.7	190.0	313.3	0	80.0	0
5	0.520	-214.8	180.0	20.0	0	80.0	0
6	0.506	-218.0	240.0	333.5	0	80.0	0
	.	.	.	.		.	
	.	.	.	.		.	
	.	.	.	.		.	
	.	.	.	.		.	
	.	.	.	.		.	
	.	.	.	.		.	

(14) r.m.s value of radiation	(15) Type of pattern	(16) Special quadrature factor
2093. mV/m at 1 km	M	40.2 mV/m at 1 km

(17) SUPPLEMENTARY INFORMATION

cdo B
680

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

1 2 0 5

IFRB SERIAL NO

PART III

DESCRIPTION OF THE PARAMETERS OF DIRECTIONAL ANTENNA SYSTEMS WITH EXPANDED AND AUGMENTED (MODIFIED EXPANDED) PATTERNS, TO BE SUBMITTED WHENEVER THE SYMBOL M IS ENTERED IN PART II SECTION I BOX 15

01 Name of Transmitting Station	02 Country	Sheet No.	03 Hours of Operation	04 Total number of augmentations
WINNIPEG MB	CAN	417	N	02

05 Augmentation Number	06 Radiation at Central azimuth of augmentation (mV/m at 1 km)	07 Central azimuth of augmentation (Degrees)	08 Total Span of Augmentation (Degrees)
01	190.0	190.0	40.0
02	119.0	210.0	20.0
03	.	.	.
04	.	.	.
05	.	.	.
06	.	.	.
07	.	.	.
08	.	.	.
09	.	.	.
10	.	.	.
11	.	.	.
12	.	.	.
13	.	.	.
14	.	.	.
15	.	.	.
16	.	.	.
17	.	.	.
18	.	.	.
19	.	.	.
20	.	.	.

(Use a supplementary sheet in cases where there are more than 20 augmentations)

09 SUPPLEMENTARY INFORMATION

C 40B
680

CJOB

PROJECT #2713

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

STATION: CJOB

MAIN STUDIO: Winnipeg, Manitoba

FREQUENCY: 680 kHz

POWER: 50 kW D/25 kW N CLASS: II

NOTIFICATION LIST NO: 371

DATE: March 8, 1978

GEOGRAPHICAL LOCATION: Latitude 49° 39' 14" North
Longitude 97° 11' 30" West

ANTENNA CHARACTERISTICS:

Mode of Operation: DA-2 DA-2
Number of Elements: 6 (Six)
Type of Elements: Guyed steel towers, uniform cross-section, base insulated for series feed

TOWER:	#1 (SE)	#2 (SW)	#3 (E)	#4 (W)	#5 (NE)	#6 (NW)
HEIGHT ABOVE BASE INSULATOR:	370' (92°)	370' (92°)	370' (92°)	370' (92°)	322' (80°)	322' (80°)
OVERALL HEIGHT:	375'	375'	375'	375'	327'	327'
FIELD RATIO:						
Nighttime	.5	.506	.95	1.0	.525	.506
Daytime	.29	-	.68	-	1.0	-
PHASING:						
Nighttime	0°	7.7°	-108°	-106.7°	-214.8°	-217°
Daytime	-104°	-	118.5°	-	0°	-
ORIENTATION:	Ref.	285°	20°	313.3°	20°	333.5°
SPACING:	Ref.	175° (703.6')	90° (361.8')	190° (763.9')	180° (723.6')	240° (964.9')

GROUND SYSTEM: 120 equally spaced radials of #10 copper wire from the base of each tower. Radials extend to a length of 578.9' (0.4 wavelength), with the exception of those joined along the common chords.

PREDICTED EFFECTIVE FIELD:

Nighttime 921 mV/m at 1 mile for 25 kW
184.2 mV/m at 1 mile for 1 kW

Daytime 1360 mV/m at 1 mile for 50 kW
192.3 mV/m at 1 mile for 1 kW

August 19, 1977

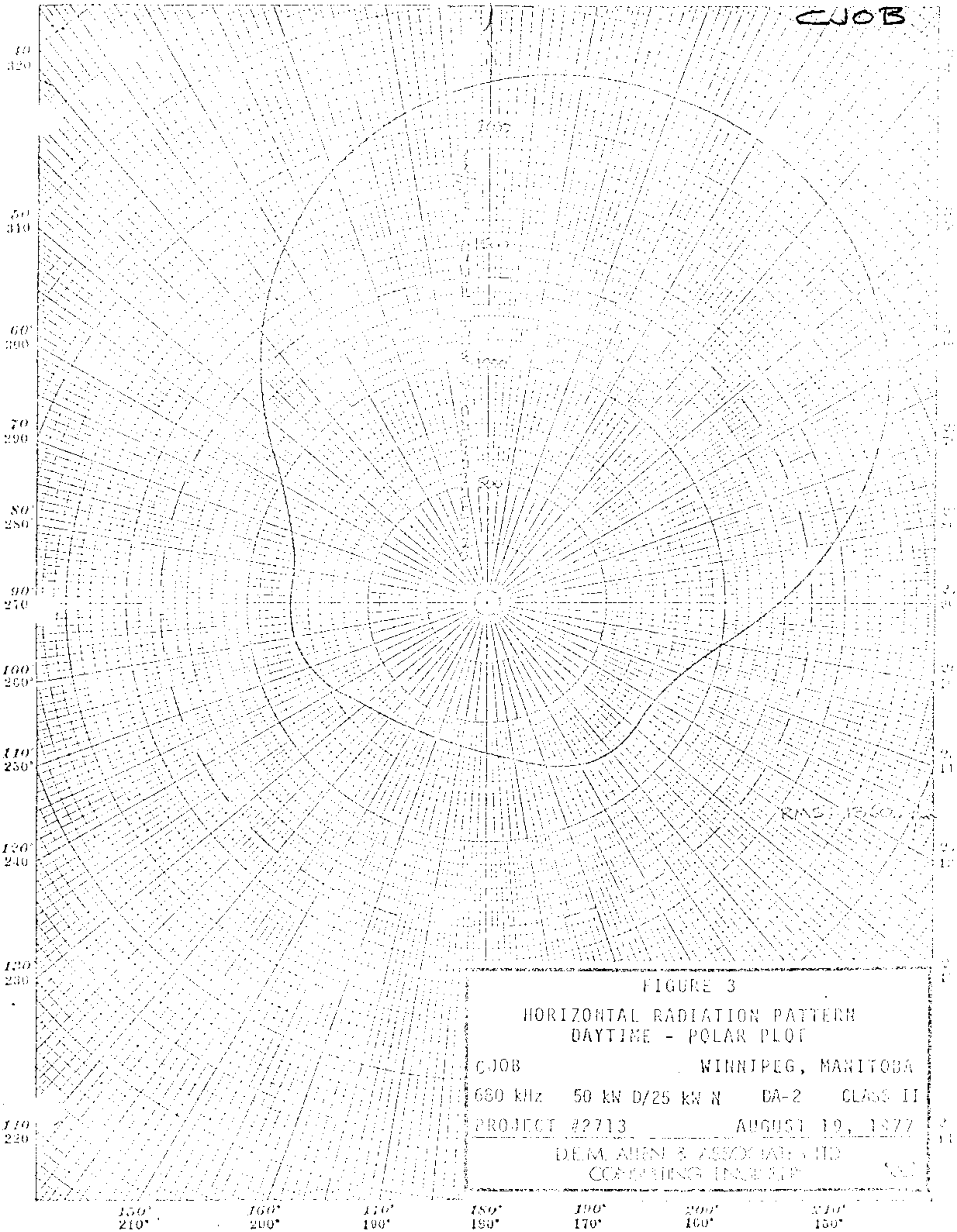


FIGURE 3

HORIZONTAL RADIATION PATTERN
DAYTIME - POLAR PLOT

CJOB WINNIPEG, MANITOBA

680 kHz 50 kW D/25 kW N DA-2 CLASS II

PROJECT #2713 AUGUST 19, 1977

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

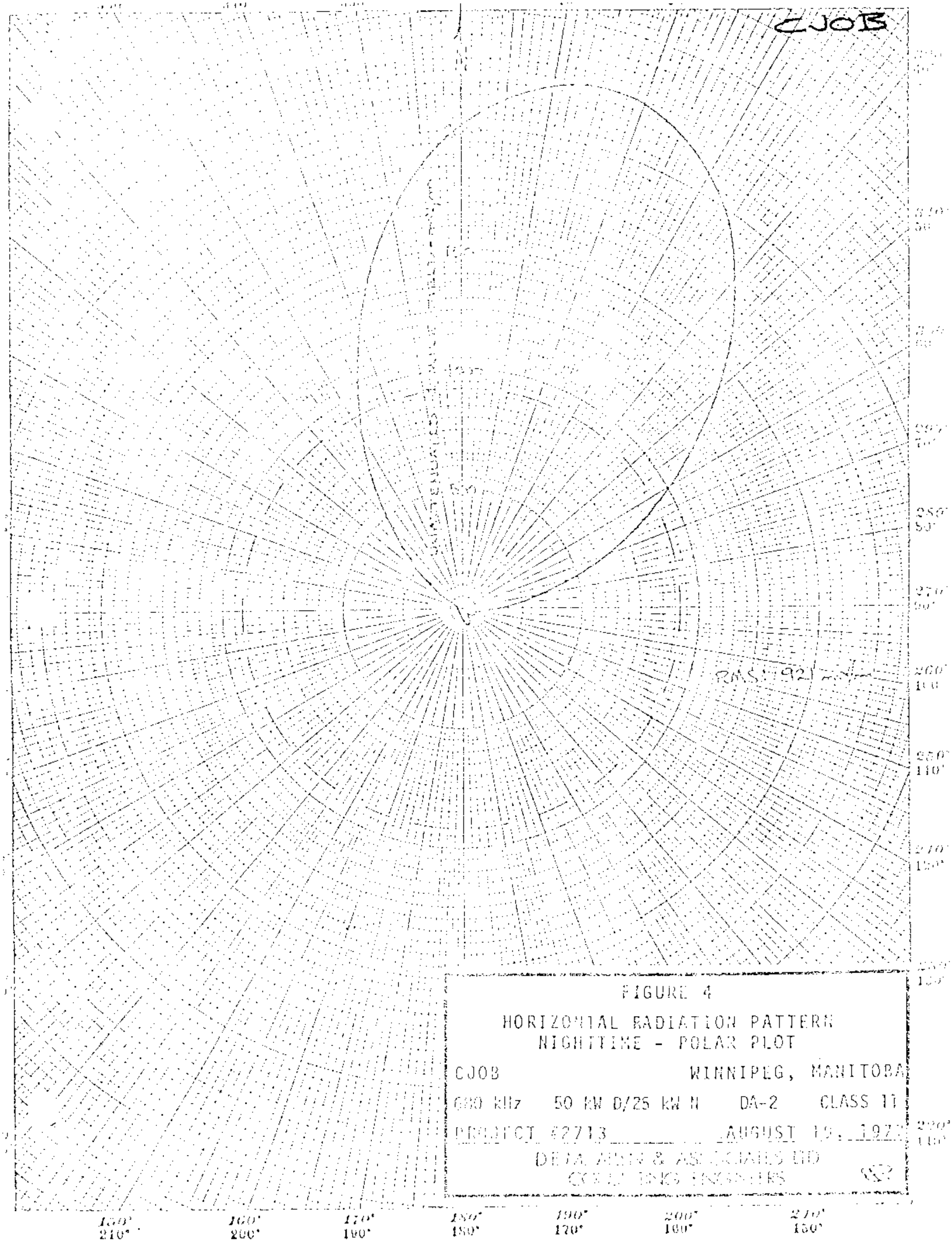


FIGURE 4

HORIZONTAL RADIATION PATTERN
NIGHTTIME - POLAR PLOT

CJOB WINNIPEG, MANITOBA

680 kHz 50 KW D/25 KW N DA-2 CLASS II

PROJECT #2713 AUGUST 19, 197

DELTA ... & ASSOCIATES LTD
CONSULTING ENGINEERS

FIGURE 5

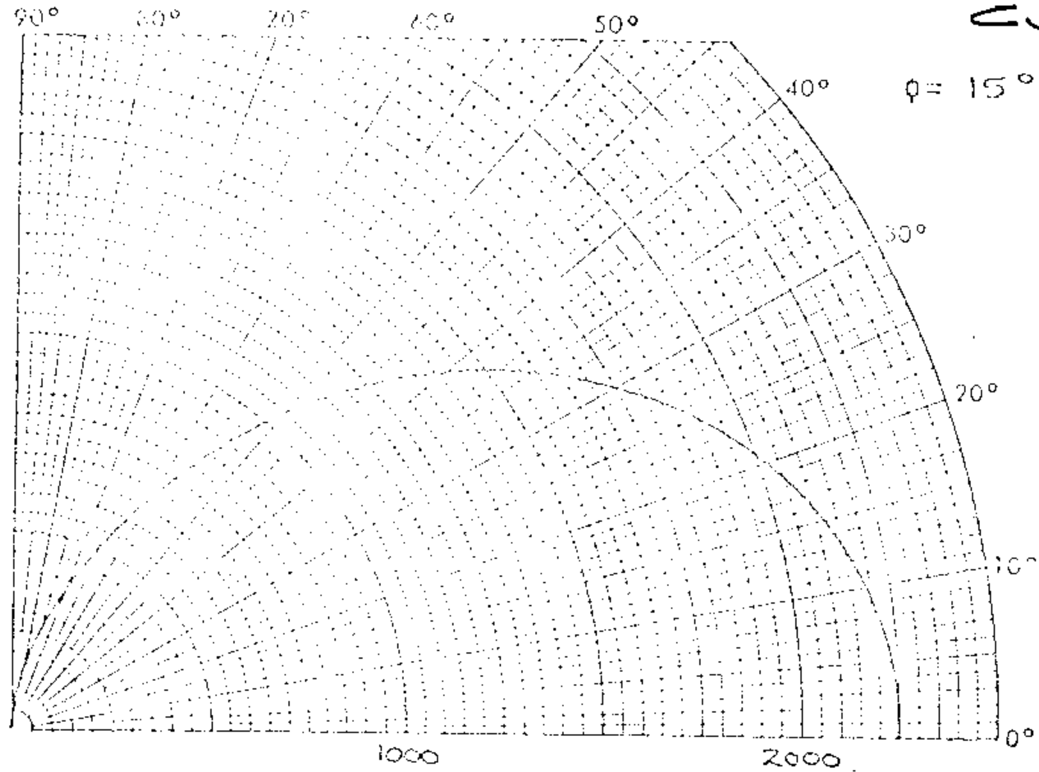
HORIZONTAL RADIATION PATTERN
NIGHTTIME - EXPANDED PLOT

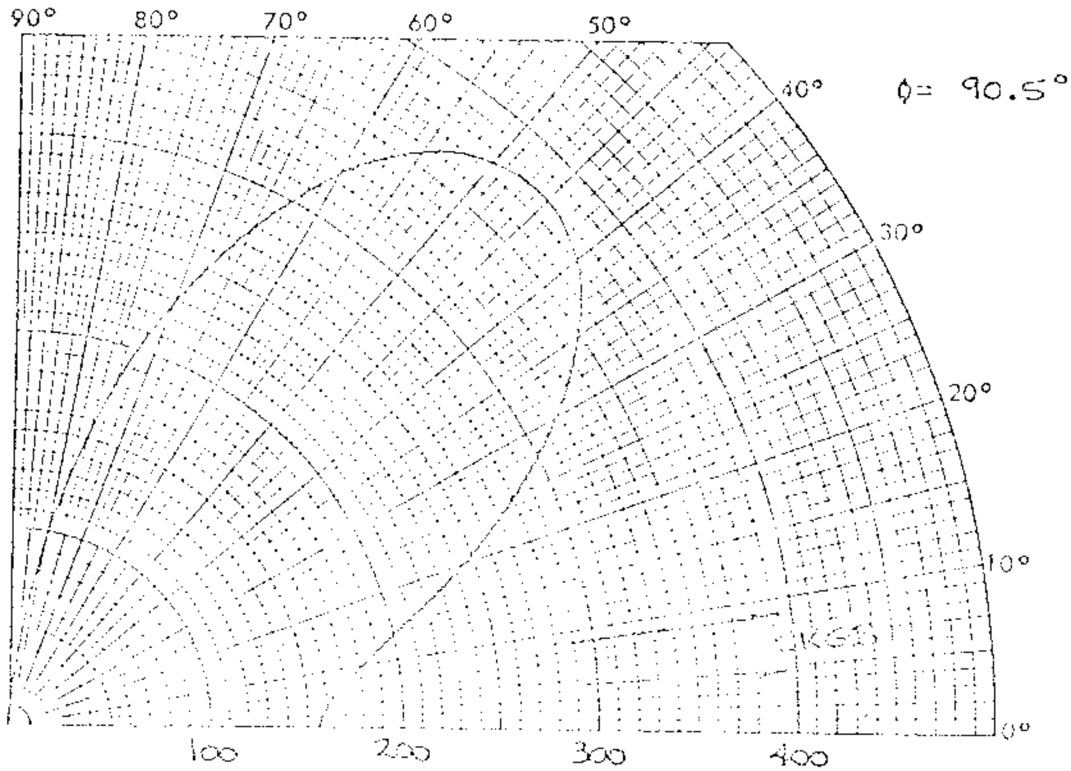
CJOB WINNIPEG, MANITOBA

680 kHz 50 kW D/25 kW N DA-2 CLASS II

PROJECT #2713 AUGUST 19, 1977

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

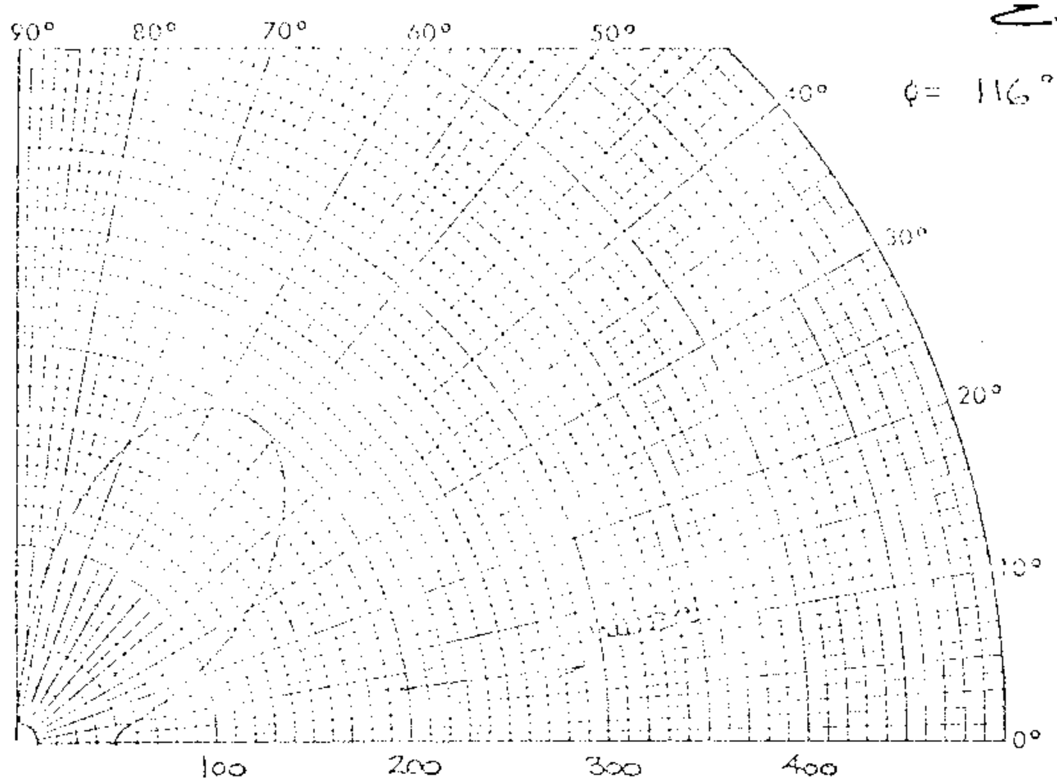




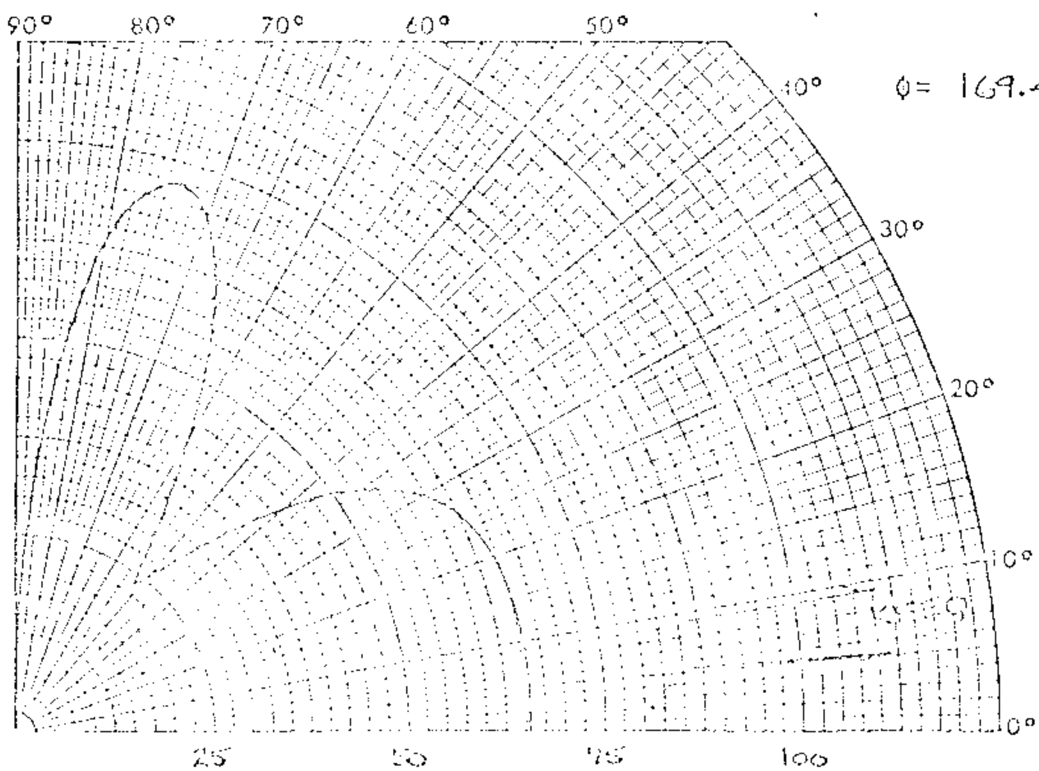
VERTICAL RADIATION PATTERNS

FIGURE 6

CJOB
680 kHz 50 kW D/25 kW N DA-2
PROJECT #77/13
WINNIPEG, MANITOBA
CLASS II
AUGUST 19, 1977
D. E. M. ALLEN & ASSOCIATES LTD., CONSULTING ENGINEERS



UNATTENUATED (MV/M) ONE MILE FIELD

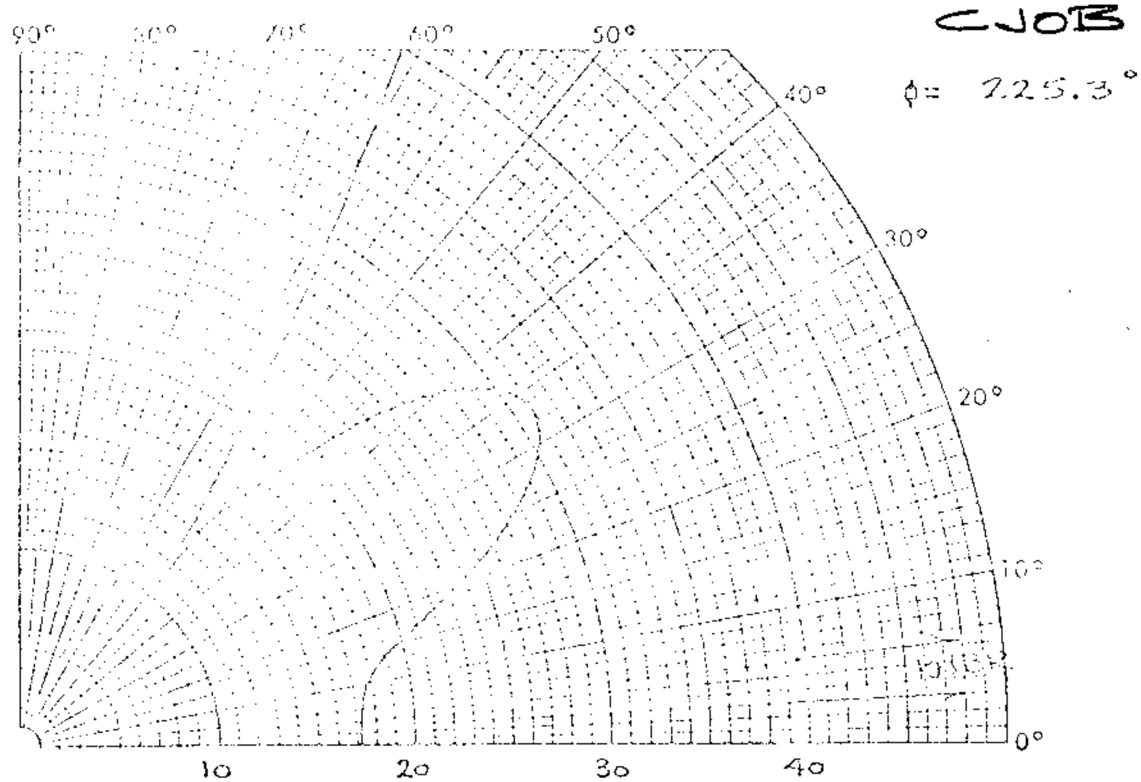


UNATTENUATED (MV/M) ONE MILE FIELD

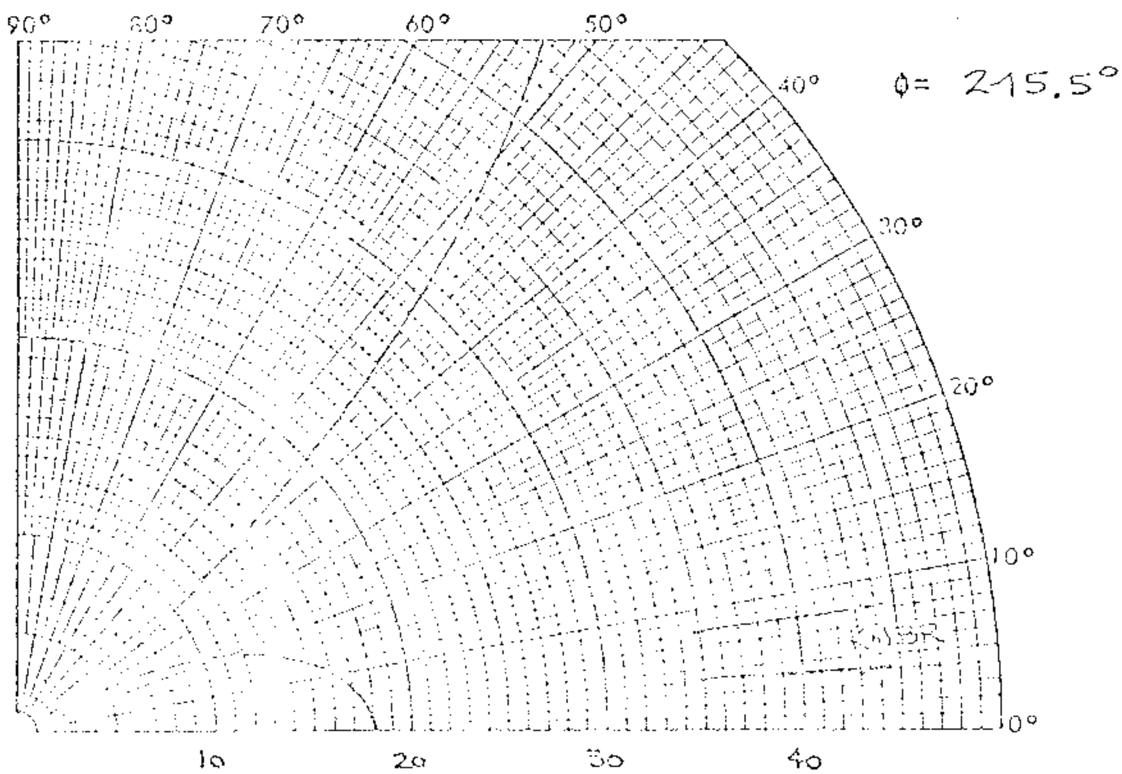
VERTICAL RADIATION PATTERNS

FIGURE 7

CJOB WINNIPEG, MANITOBA
680 kHz 50 kW D/25 kW N DA-2 CLASS II
PROJECT #2713 AUGUST 19, 1977
D. E. H. ALLEN & ASSOCIATES LTD., CONSULTING ENGINEERS



UNATTENUATED (MV/M) ONE MILE FIELD



UNATTENUATED (MV/M) ONE MILE FIELD

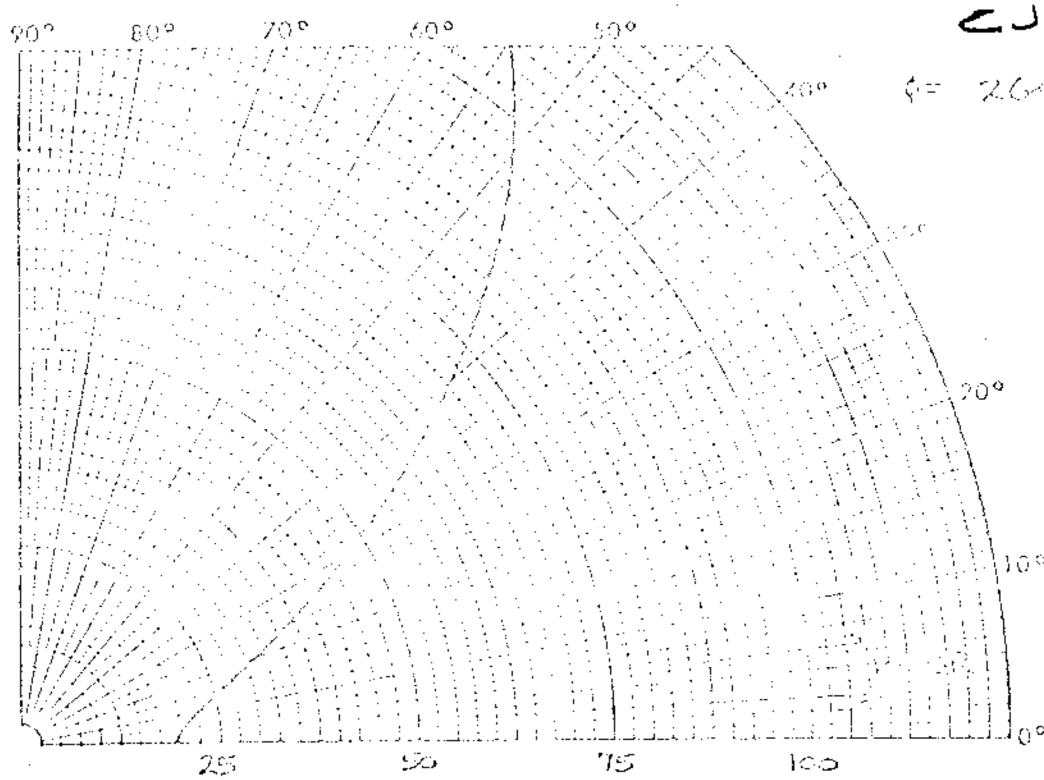
VERTICAL RADIATION PATTERNS

FIGURE 8

CJOB			WINNIPEG, MANITOBA
680 kHz	50 kW D/25 kW N	DA-2	CLASS II
PROJECT #2713			AUGUST 19, 1977

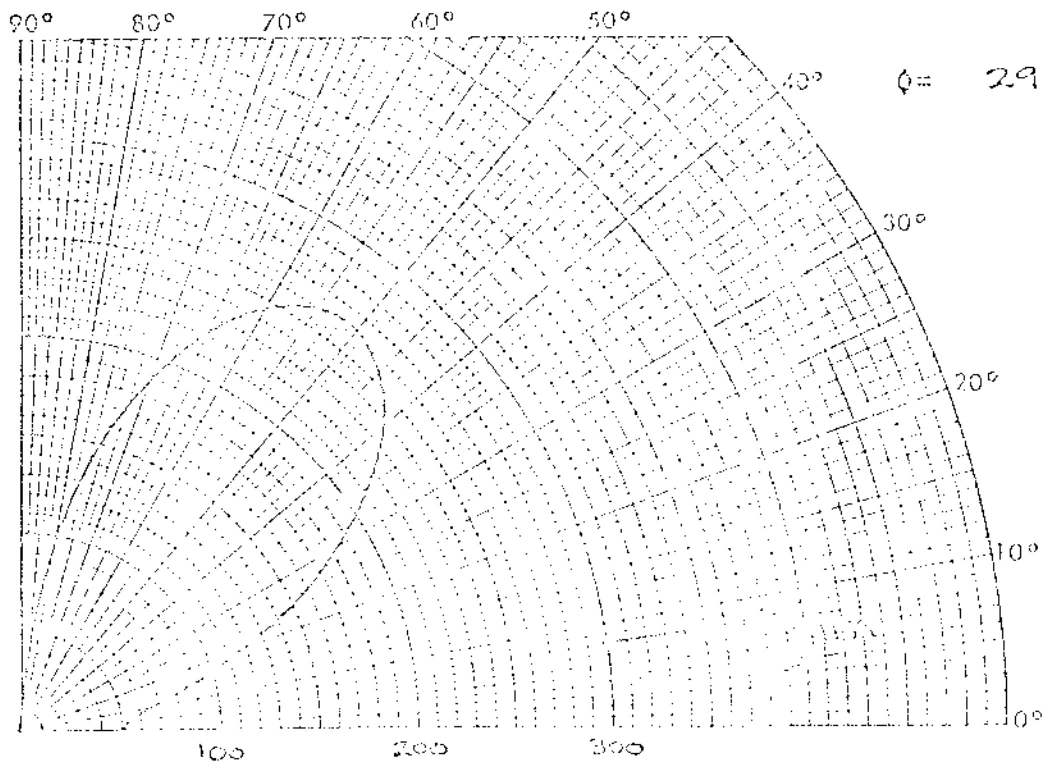
D. E. M. ALLEN & ASSOCIATES LTD., CONSULTING ENGINEERS

CJOB



$\phi = 264.9°$

UNATTENUATED (MV/M) ONE MILE FIELD



$\phi = 296.5°$

UNATTENUATED (MV/M) ONE MILE FIELD

VERTICAL RADIATION PATTERNS

FIGURE 9

CJOB WINNIPEG, MANITOBA
680 KHz 50 KW D/25 KW N DA-2 CLASS II
PROJECT #2713 AUGUST 19, 1977
D. E. M. ALLEN & ASSOCIATES LTD., CONSULTING ENGINEERS

PROJECT #2717

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

STATION: CJOB — MAIN STUDIO: Winnipeg, Manitoba

FREQUENCY: 680 kHz — POWER: 50 kW — CLASS: II

NOTIFICATION LIST NO: 390 — DATE: October 5, 1979

GEOGRAPHICAL LOCATION: Latitude 49° 39' 14" North
Longitude 97° 11' 30" West

ANTENNA CHARACTERISTICS:

Mode of Operation: DA-2 — DA-2
Number of Elements: 6 (Six)
Type of Elements: Guyed steel towers, uniform cross-section, base insulated for series feed

TOWER:	#1 (SE)	#2 (SW)	#3 (E)	#4 (W)	#5 (NE)	#6 (NW)
HEIGHT ABOVE BASE INSULATOR:	370' (92°)	370' (92°)	370' (92°)	370' (92°)	322' (80°)	322' (80°)
OVERALL HEIGHT:	375'	375'	375'	375'	327'	327'
FIELD RATIO:						
Nighttime	.495	.506	.95	1.0	.52	.506
Daytime	.29	-	.68	-	1.0	-
PHASING:						
Nighttime	0°	7.7°	-108°	-106.7°	-214.8°	-218°
Daytime	-104°	-	118.5°	-	0°	-
ORIENTATION:	Ref.	285°	20°	313.3°	20°	333.5°
SPACING:	Ref.	175° (703.6')	90° (361.8')	190° (763.9')	180° (723.6')	240° (964.9')

GROUND SYSTEM: 120 equally spaced radials of #10 copper wire from the base of each tower. Radials extend to a length of 578.9' (0.4 wavelength), with the exception of those joined along the common chords.

PREDICTED EFFECTIVE FIELD:

Nighttime	1302	mV/m at 1 mile for 50 kW
	184.2	mV/m at 1 mile for 1 kW
Daytime	1360	mV/m at 1 mile for 50 kW
	192.3	mV/m at 1 mile for 1 kW

REDUCED NIGHT-TIME Q = 25 mV/m

This proposal concerns a change of the night-time operation only of CJOB. Please retain the day-time directional radiation pattern notified in Canadian Change List 371 dated March 8, 1978.

CJOB

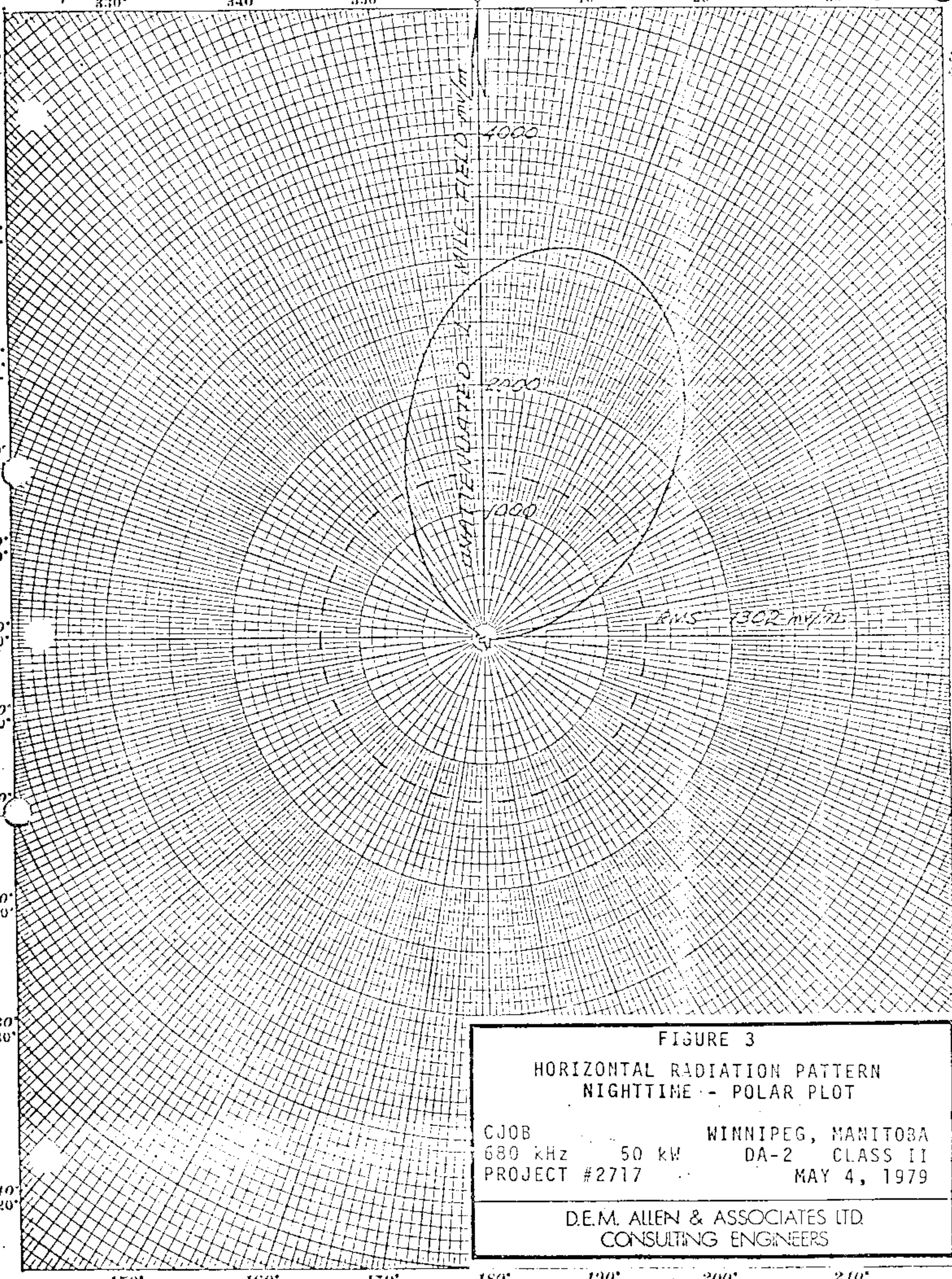


FIGURE 3

HORIZONTAL RADIATION PATTERN
NIGHTTIME - POLAR PLOT

CJOB WINNIPEG, MANITOBA
680 kHz 50 kW DA-2 CLASS II
PROJECT #2717 MAY 4, 1979

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

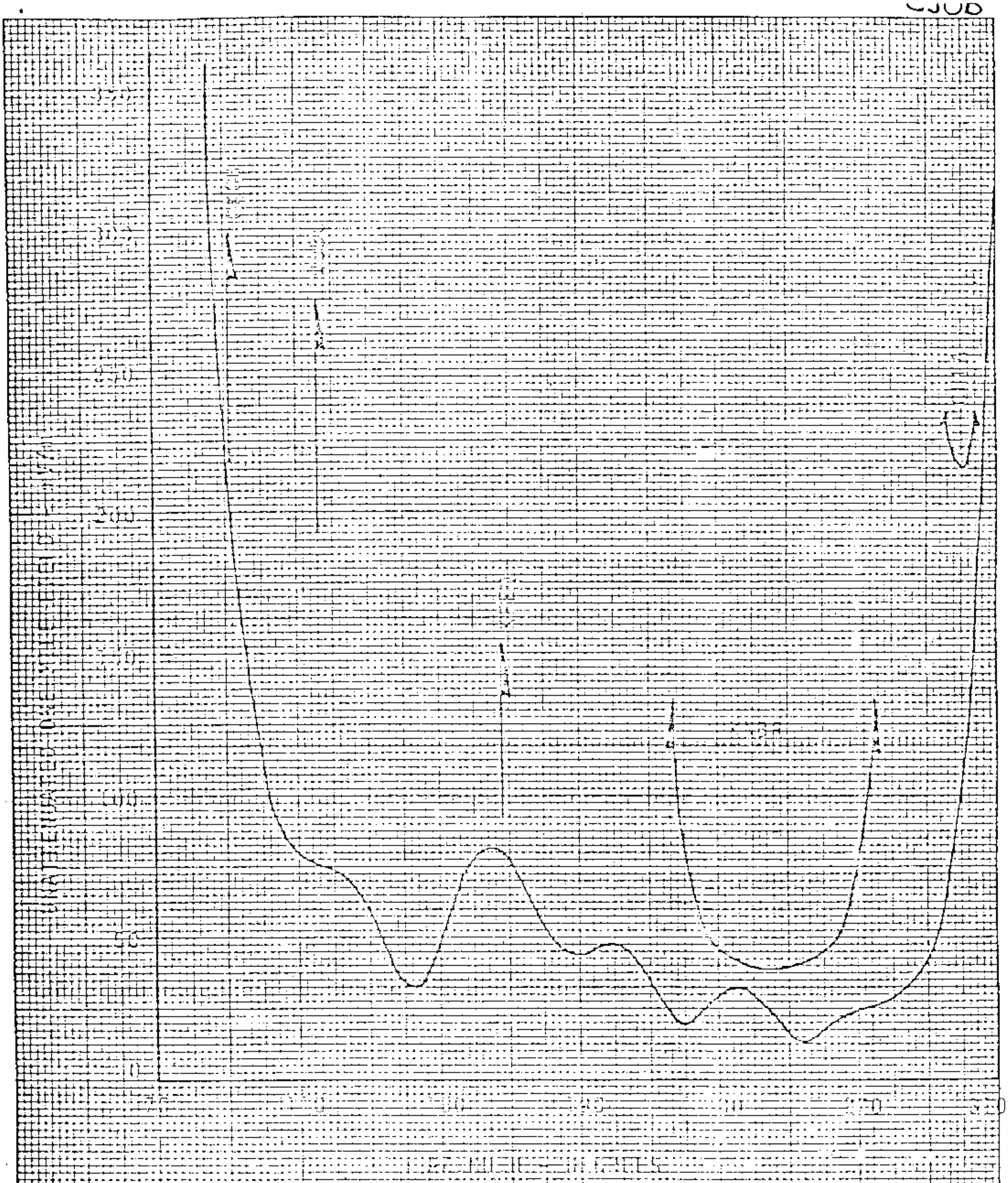
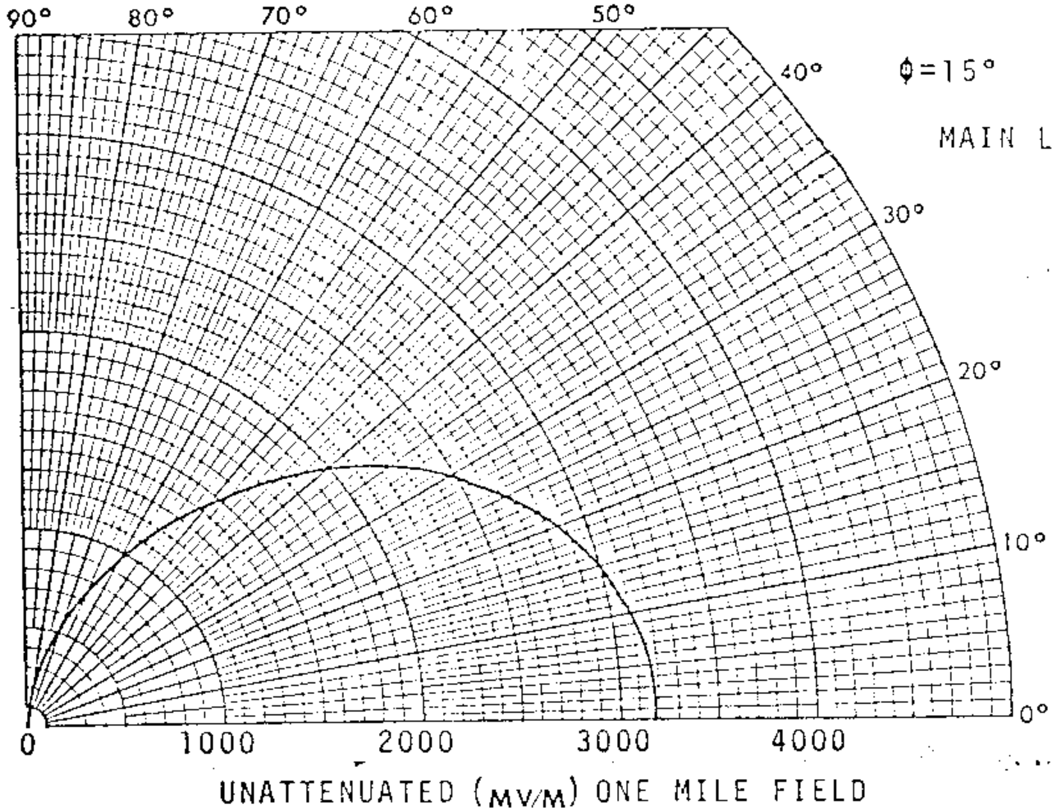


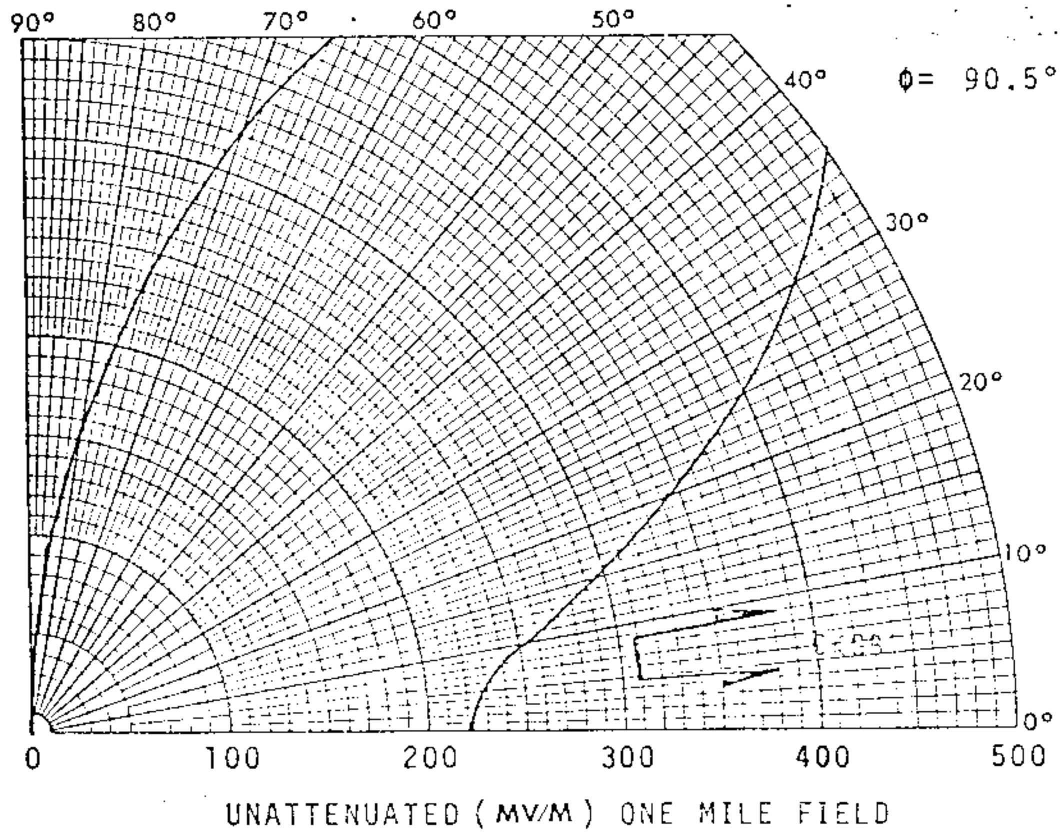
FIGURE 4

HORIZONTAL RADIATION PATTERN
NIGHTTIME - EXPANDED PLOT

CJOB WINNIPEG, MANITOBA
680 kHz 50 kW DA-2 CLASS II
PROJECT #2717 MAY 4, 1979
REVISED AUGUST 10, 1979

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



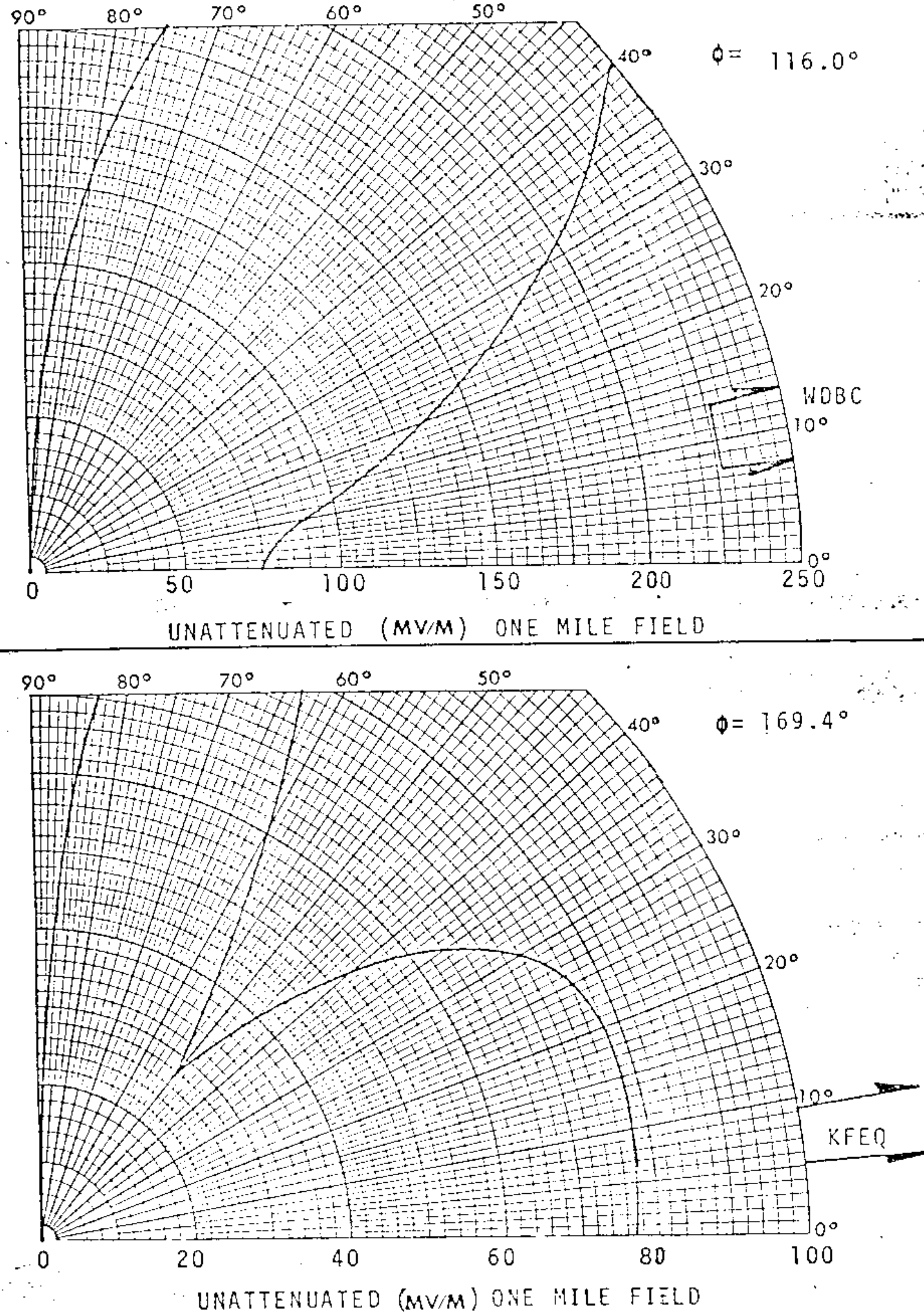


VERTICAL RADIATION PATTERNS

FIGURE 5

CJOB			WINNIPEG, MANITOBA
680 kHz	50 kW	DA-2	CLASS II
PROJECT #2717		MAY 4, 1979	REVISED AUGUST 10, 1979

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



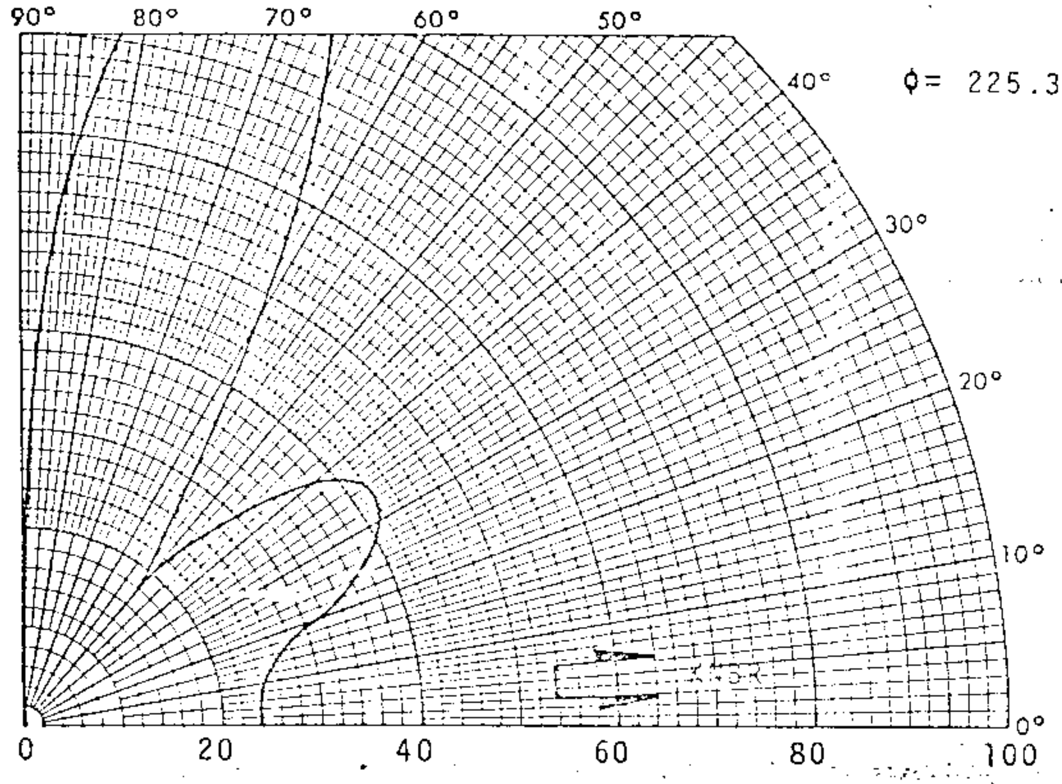
VERTICAL RADIATION PATTERNS

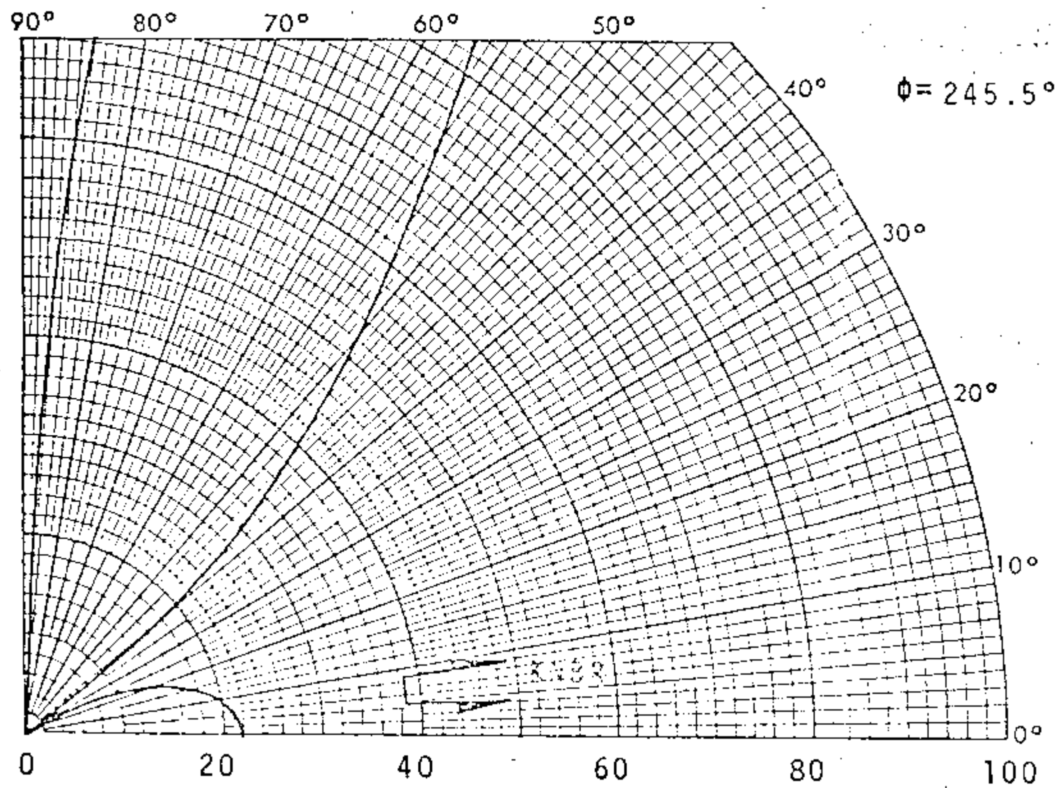
FIGURE 6

CJOB WINNIPEG, MANITOBA
680 kHz 50 kW DA-2 CLASS II
PROJECT #2717 MAY 4, 1979 REVISED AUGUST 10, 1979

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

CJOB



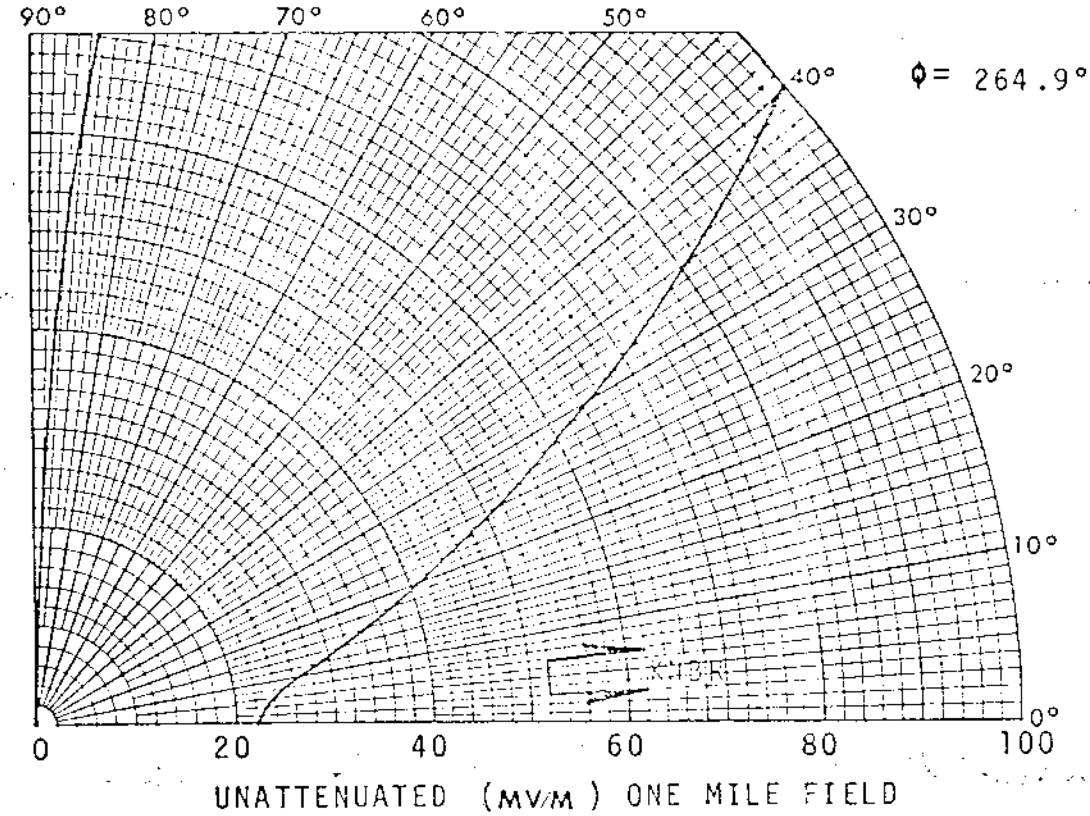


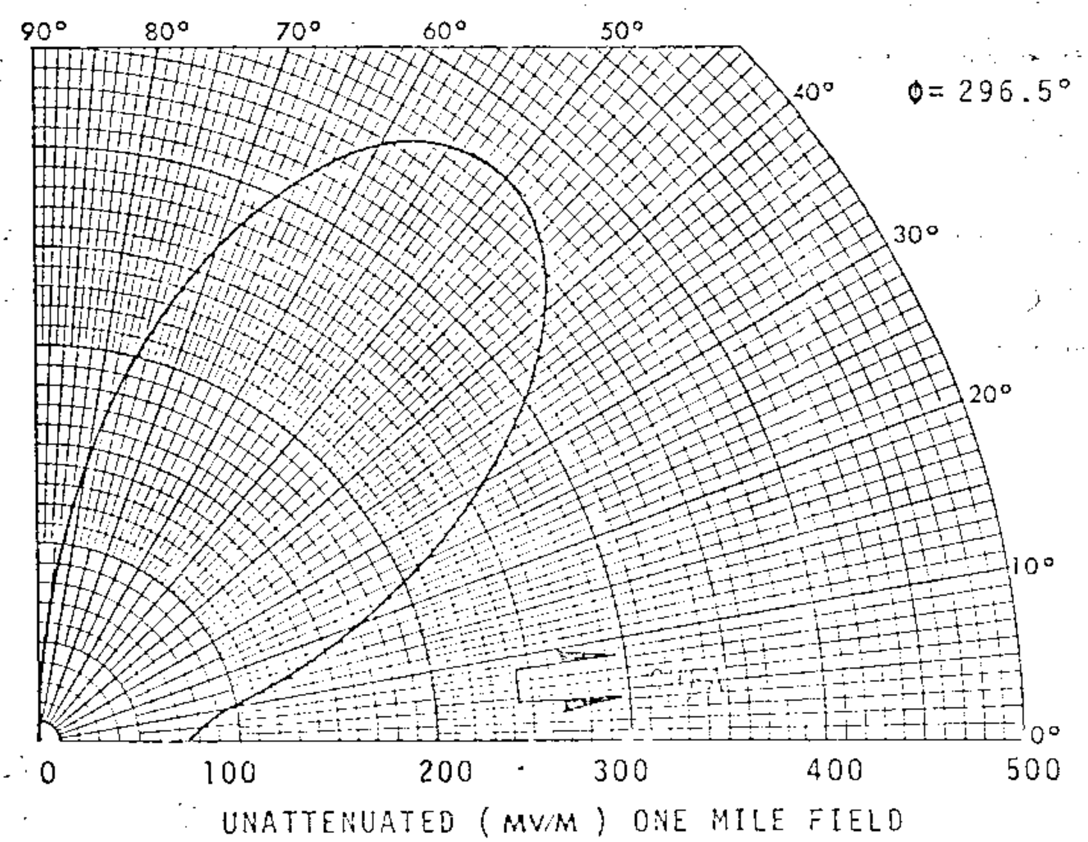
VERTICAL RADIATION PATTERNS

FIGURE 7

CJOB WINNIPEG, MANITOBA
680 kHz 50 kW DA-2 CLASS II
PROJECT #2717 MAY 4, 1979 REVISED AUGUST 10, 1979

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





VERTICAL RADIATION PATTERNS

FIGURE 8

CJOB			WINNIPEG, MANITOBA
680 kHz	50 kW	DA-2	CLASS II
PROJECT #2717		MAY 4, 1979	REVISED AUGUST 10, 1979

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

PROJECT #2713

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

STATION: CJOB

MAIN STUDIO: Winnipeg, Manitoba

FREQUENCY: 680 kHz

POWER: 50 kW D/25 kW N CLASS: II

NOTIFICATION LIST NO: 371

DATE: March 8, 1978

GEOGRAPHICAL LOCATION: Latitude 49° 39' 14" North
Longitude 97° 11' 30" West

ANTENNA CHARACTERISTICS:

Mode of Operation: DA-2 DA-2
Number of Elements: 6 (Six)
Type of Elements: Guyed steel towers, uniform cross-section, base insulated for series feed

TOWER:	#1 (SE)	#2 (SW)	#3 (E)	#4 (W)	#5 (NE)	#6 (NW)
HEIGHT ABOVE BASE INSULATOR:	370' (92°)	370' (92°)	370' (92°)	370' (92°)	322' (80°)	322' (80°)
OVERALL HEIGHT:	375'	375'	375'	375'	327'	327'
FIELD RATIO:						
Nighttime	.5	.506	.95	1.0	.525	.506
Daytime	.29	-	.68	-	1.0	-
PHASING:						
Nighttime	0°	7.7°	-108°	-106.7°	-214.8°	-217°
Daytime	-104°	-	118.5°	-	0°	-
ORIENTATION:	Ref.	285°	20°	313.3°	20°	333.5°
SPACING:	Ref.	175° (703.6')	90° (361.8')	190° (763.9')	180° (723.6')	240° (964.9')

GROUND SYSTEM: 120 equally spaced radials of #10 copper wire from the base of each tower. Radials extend to a length of 578.9' (0.4 wavelength), with the exception of those joined along the common chords.

PREDICTED EFFECTIVE FIELD:

Nighttime 921 mV/m at 1 mile for 25 kW
184.2 mV/m at 1 mile for 1 kW

Daytime 1360 mV/m at 1 mile for 50 kW
192.3 mV/m at 1 mile for 1 kW

August 19, 1977

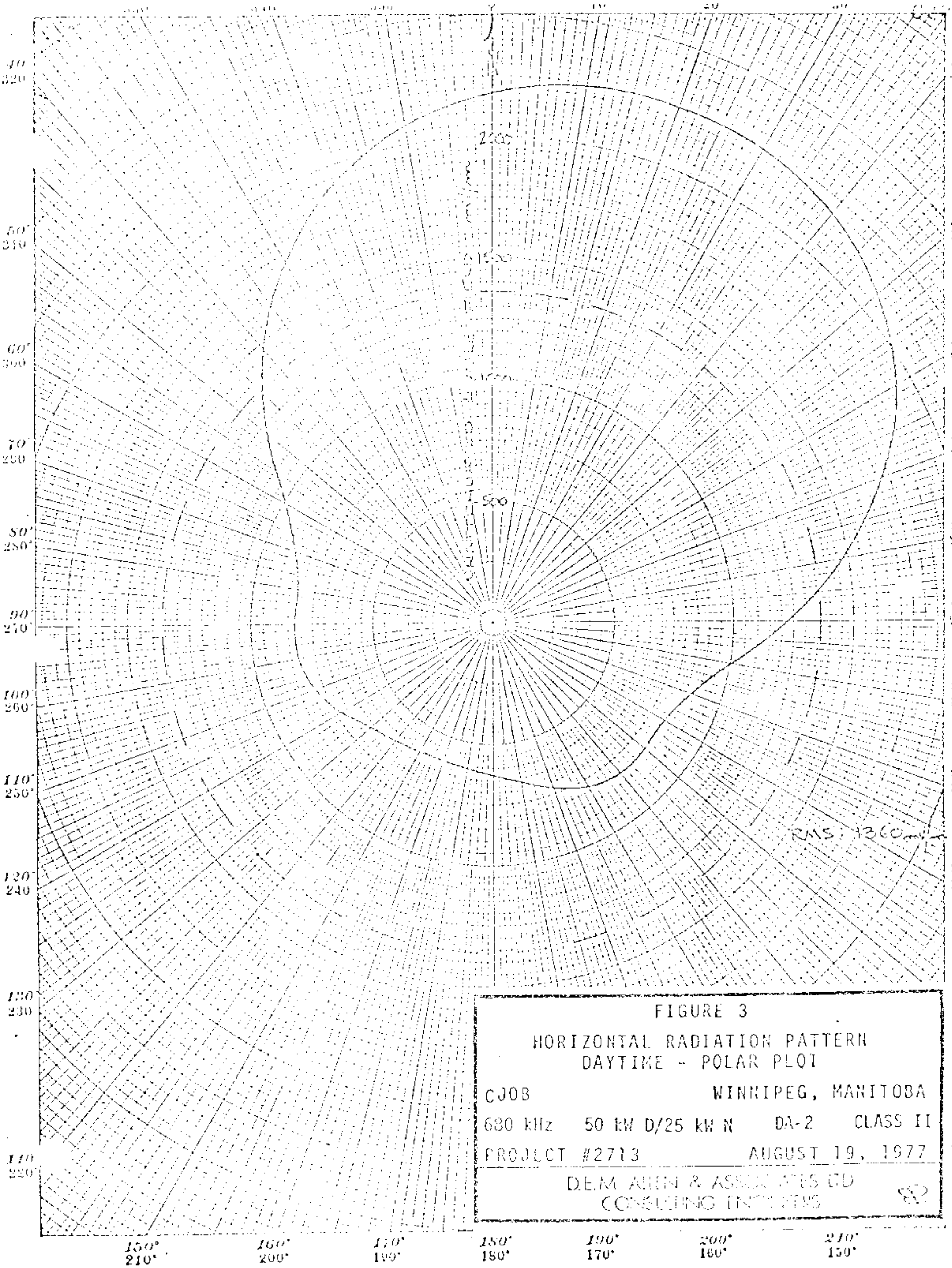


FIGURE 3
HORIZONTAL RADIATION PATTERN
DAYTIME - POLAR PLOT
CJOB
WINNIPEG, MANITOBA
680 kHz
50 kW D/25 kW N
DA-2
CLASS II
PROJECT #2713
AUGUST 19, 1977
D.E.M. ALLEN & ASSOCIATES LTD
CONSULTING ENGINEERS
RMS 1360 mV
2000
1500
1000
500

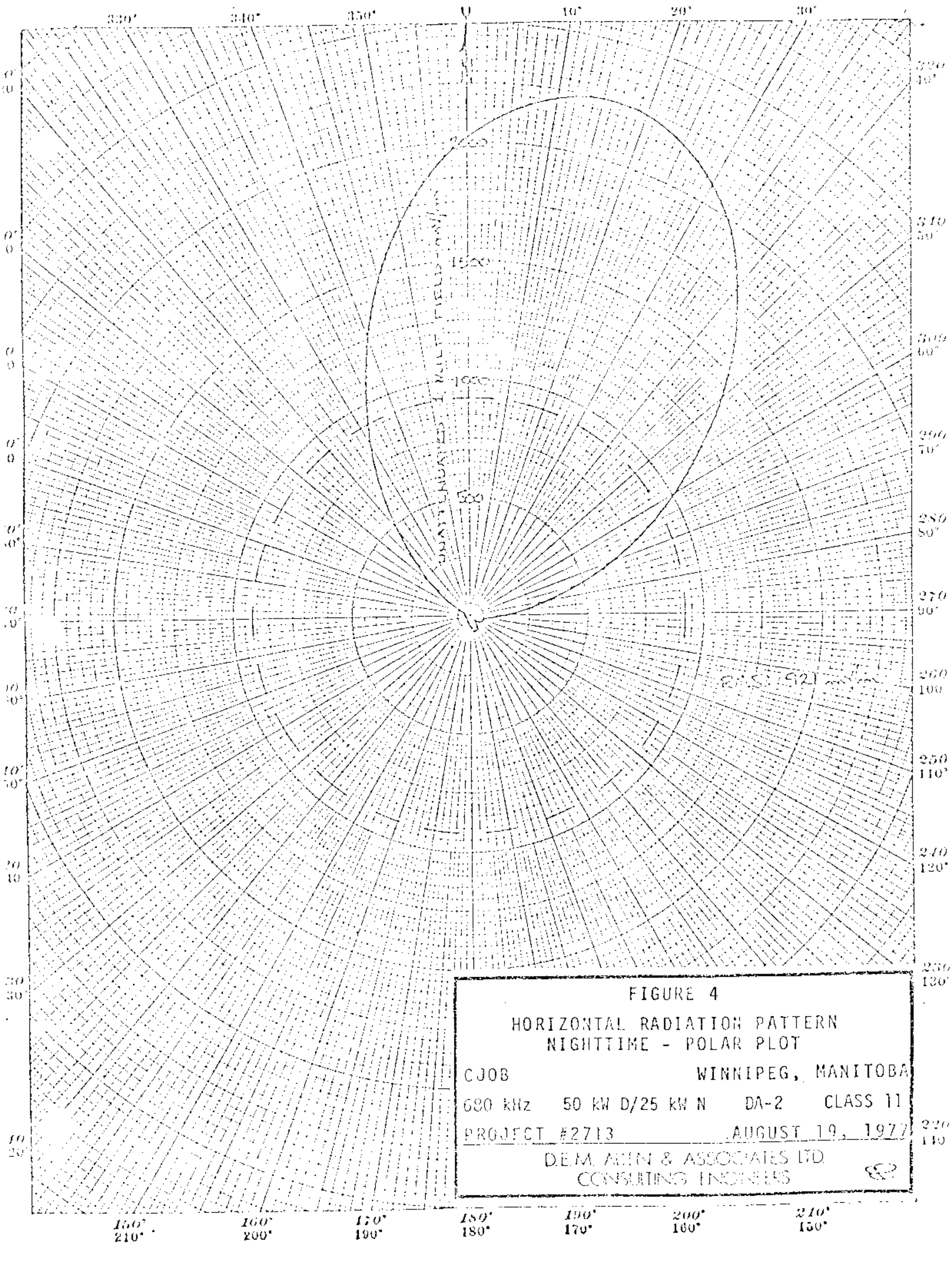


FIGURE 4

HORIZONTAL RADIATION PATTERN
NIGHTTIME - POLAR PLOT

CJOB	WINNIPEG, MANITOBA

680 kHz 50 KW D/25 KW N DA-2 CLASS II

PROJECT #2713 AUGUST 19, 1977

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

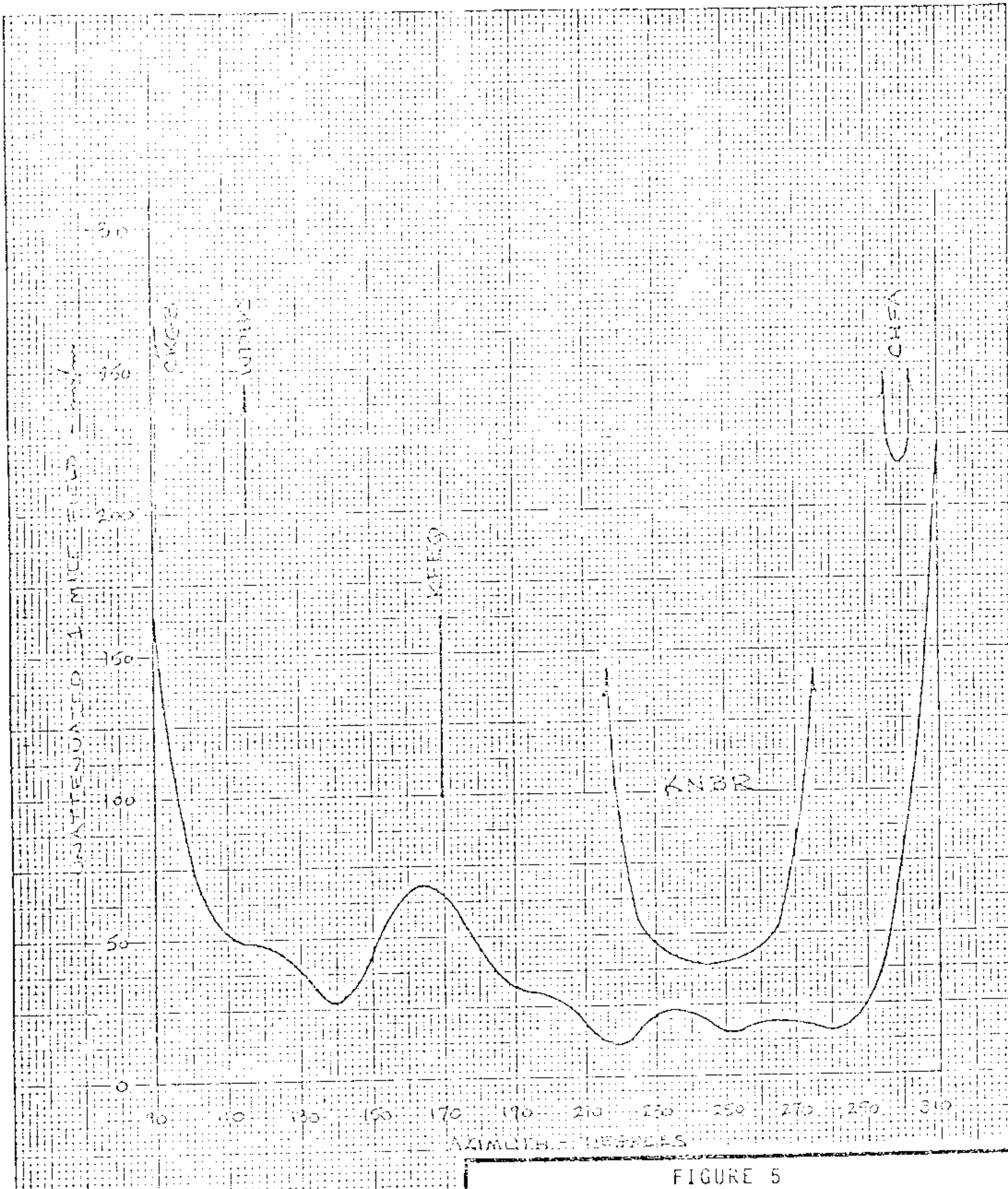
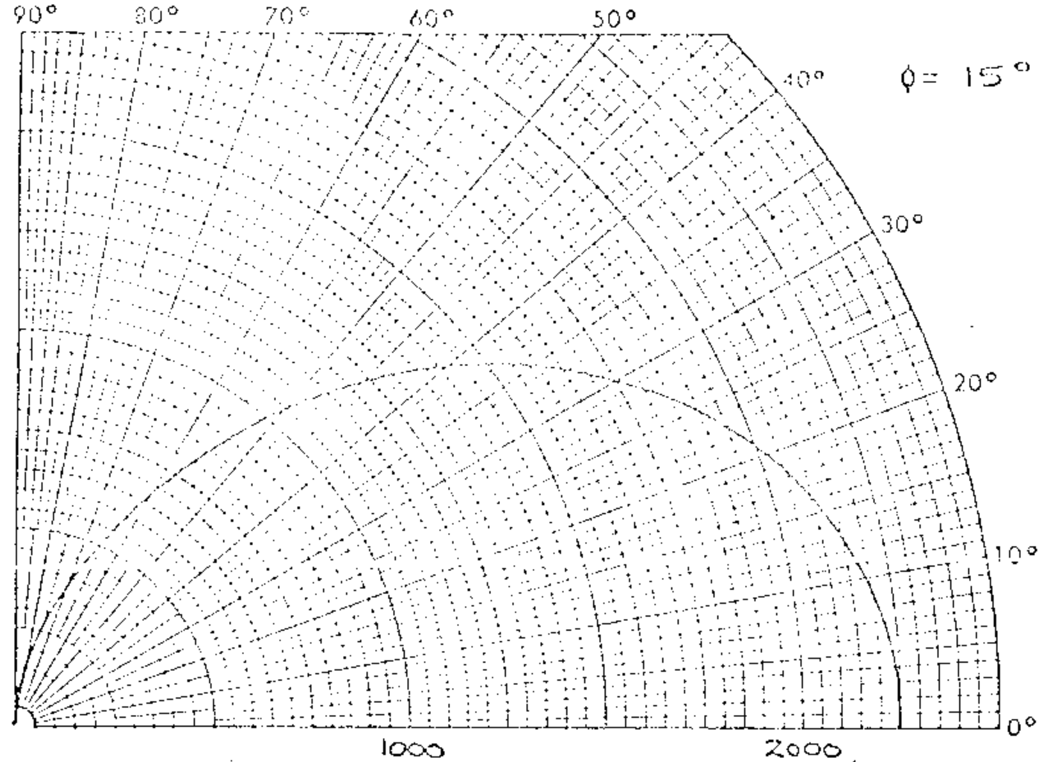


FIGURE 5

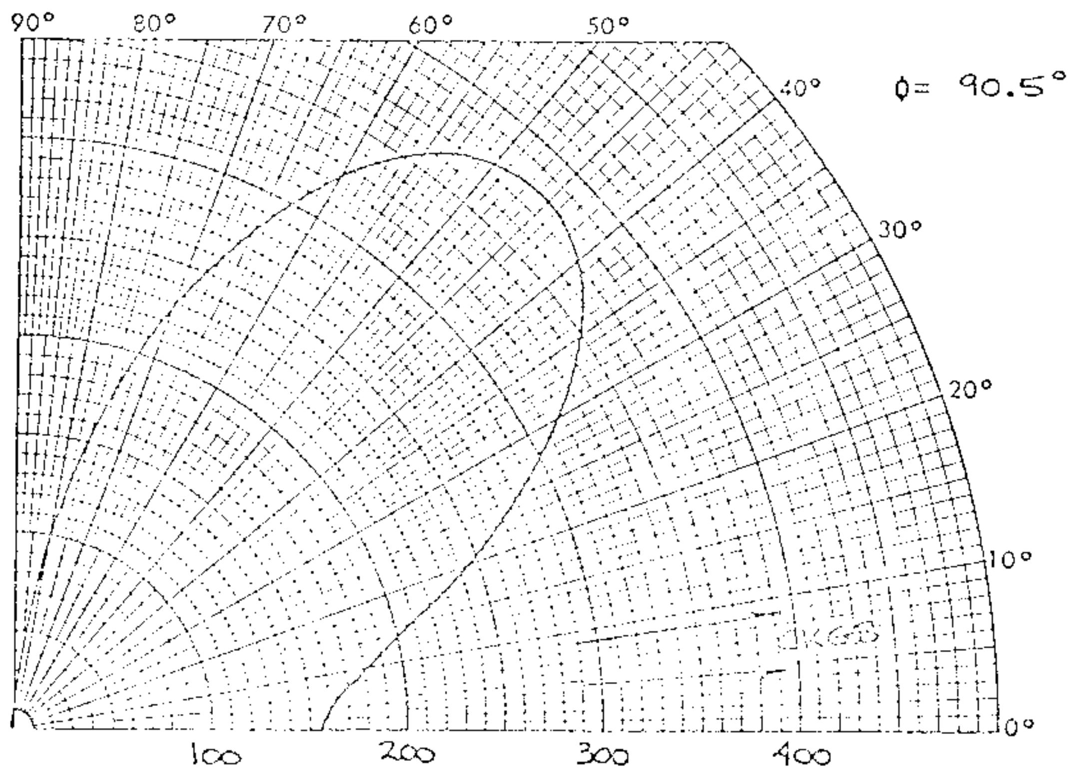
HORIZONTAL RADIATION PATTERN
NIGHTTIME - EXPANDED PLOT

CJOB			WINNIPEG, MANITOBA
680 kHz	50 kW D/25 kW N	DA-2	CLASS II
PROJECT #2713			AUGUST 19, 1977

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



UNATTENUATED (MV/M) ONE MILE FIELD



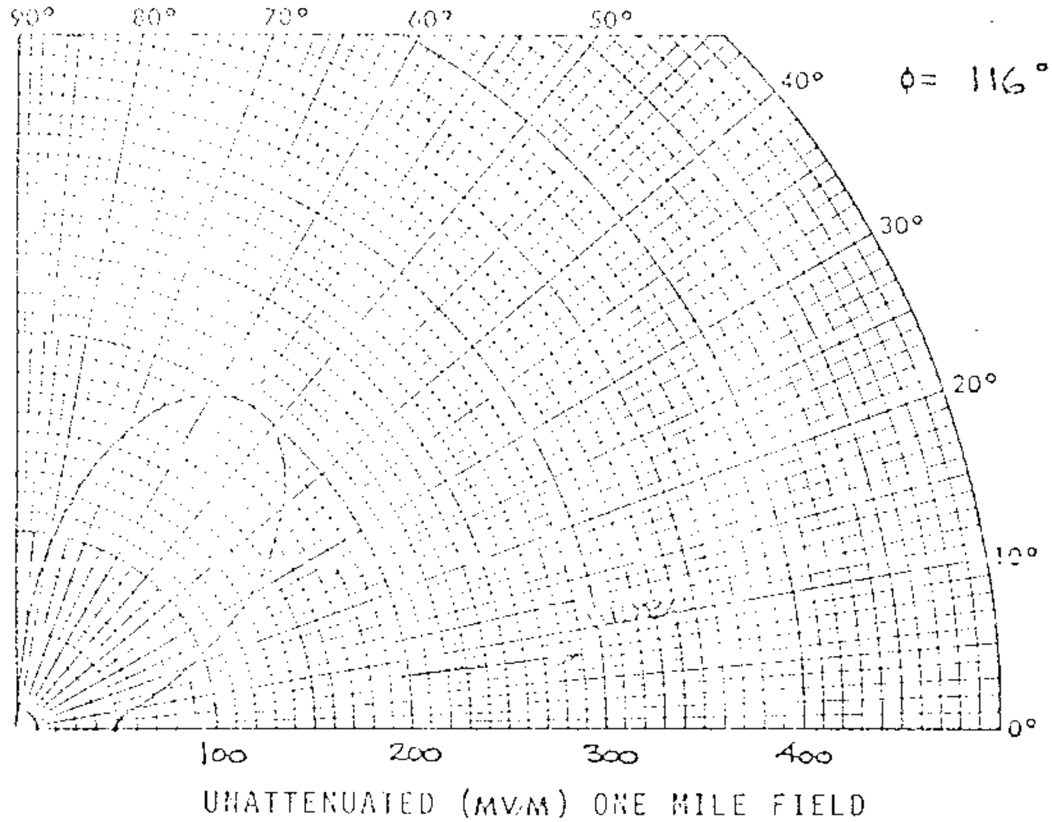
UNATTENUATED (MV/M) ONE MILE FIELD

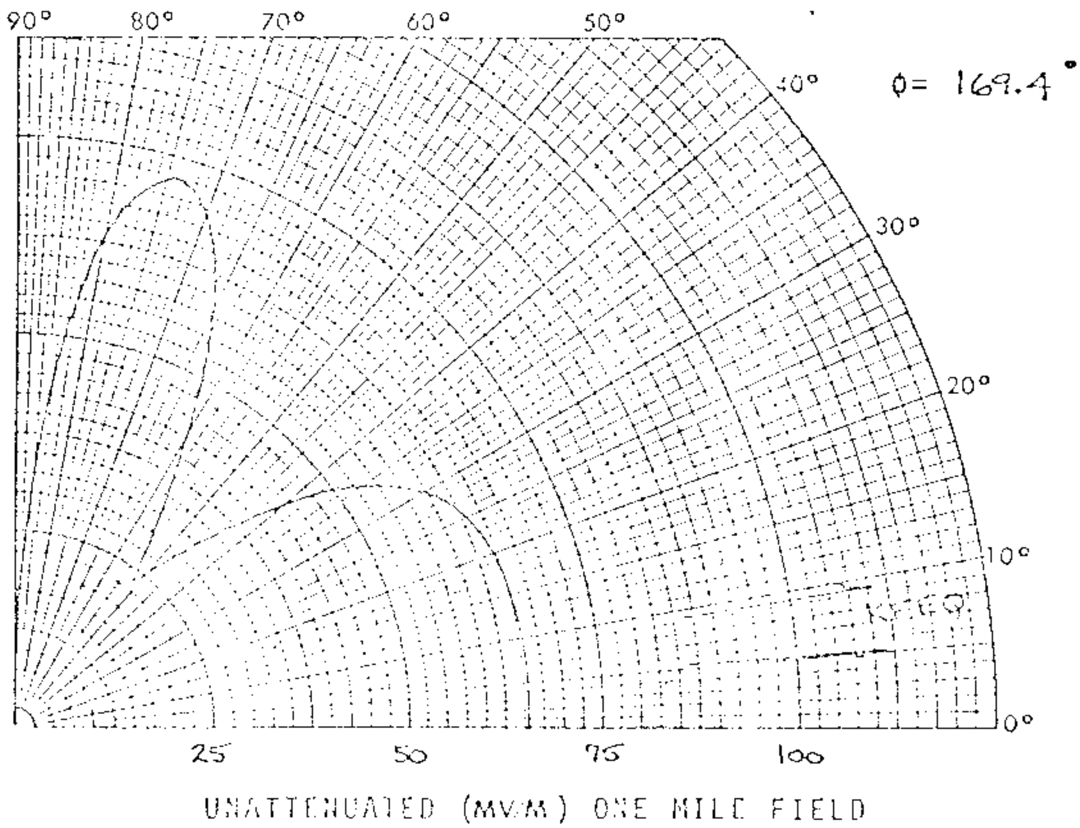
VERTICAL RADIATION PATTERNS

FIGURE 6

CJOB			WINNIPEG, MANITOBA
680 kHz	50 kW D/25 kW N	DA-2	CLASS II
PROJECT #2713			AUGUST 19, 1977

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

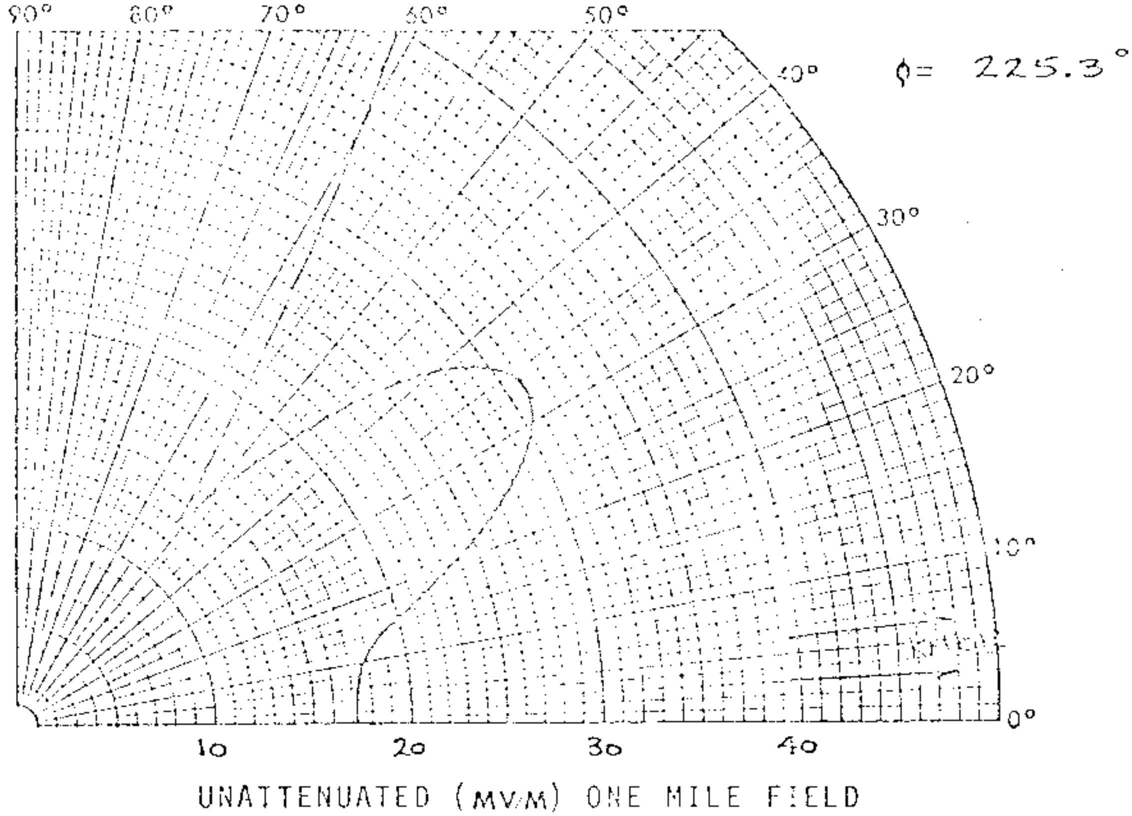


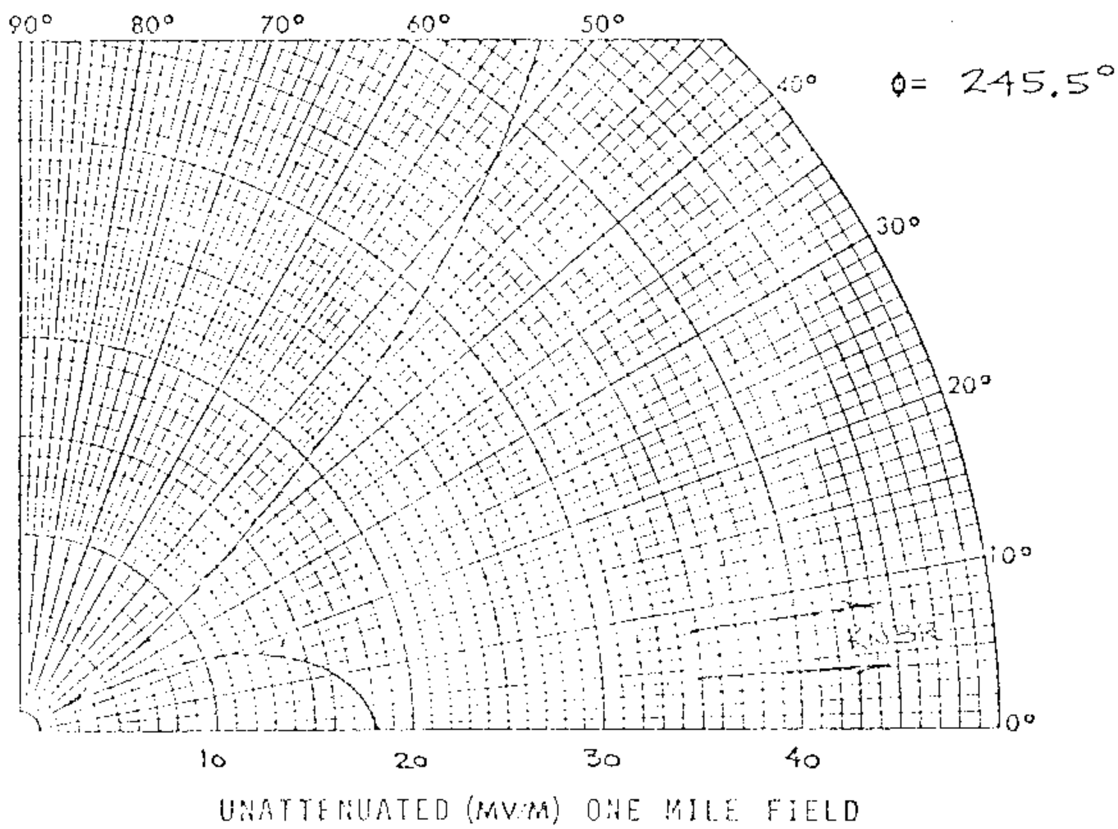


VERTICAL RADIATION PATTERNS

FIGURE 7

CJOB WINNIPEG, MANITOBA
680 kHz 50 kW D/25 kW N DA-2 CLASS II
PROJECT #2713 AUGUST 19, 1977
D. E. M. ALLEN & ASSOCIATES LTD., CONSULTING ENGINEERS



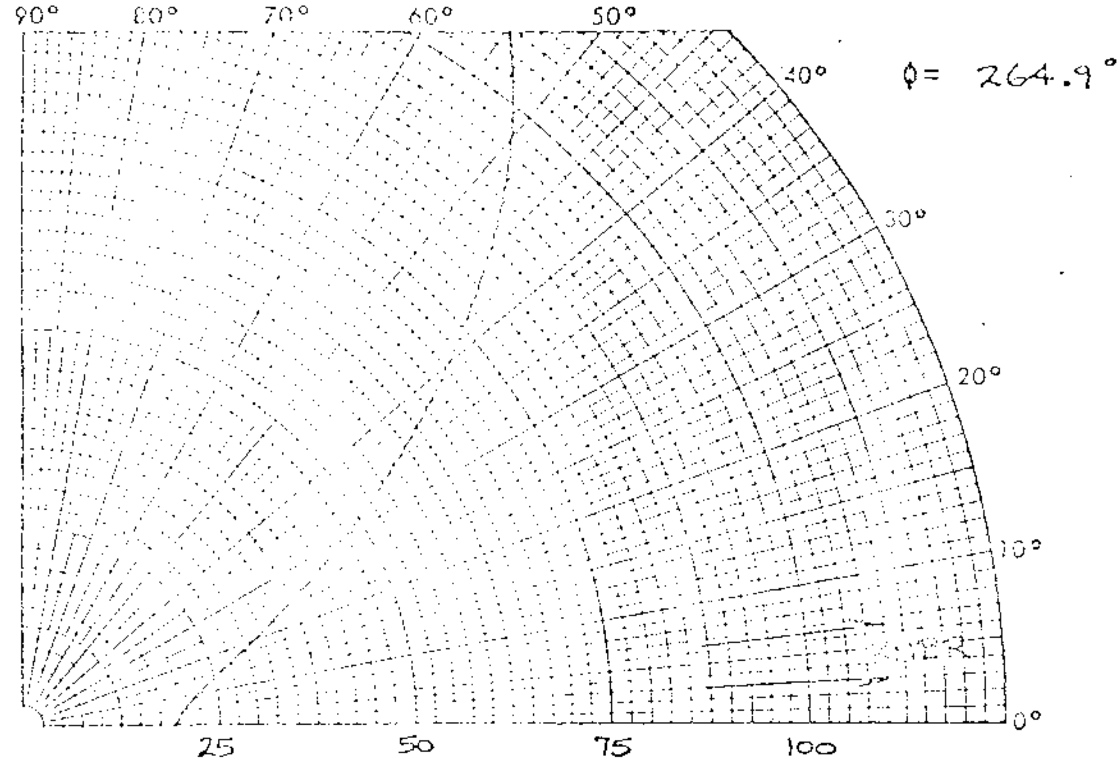


VERTICAL RADIATION PATTERNS

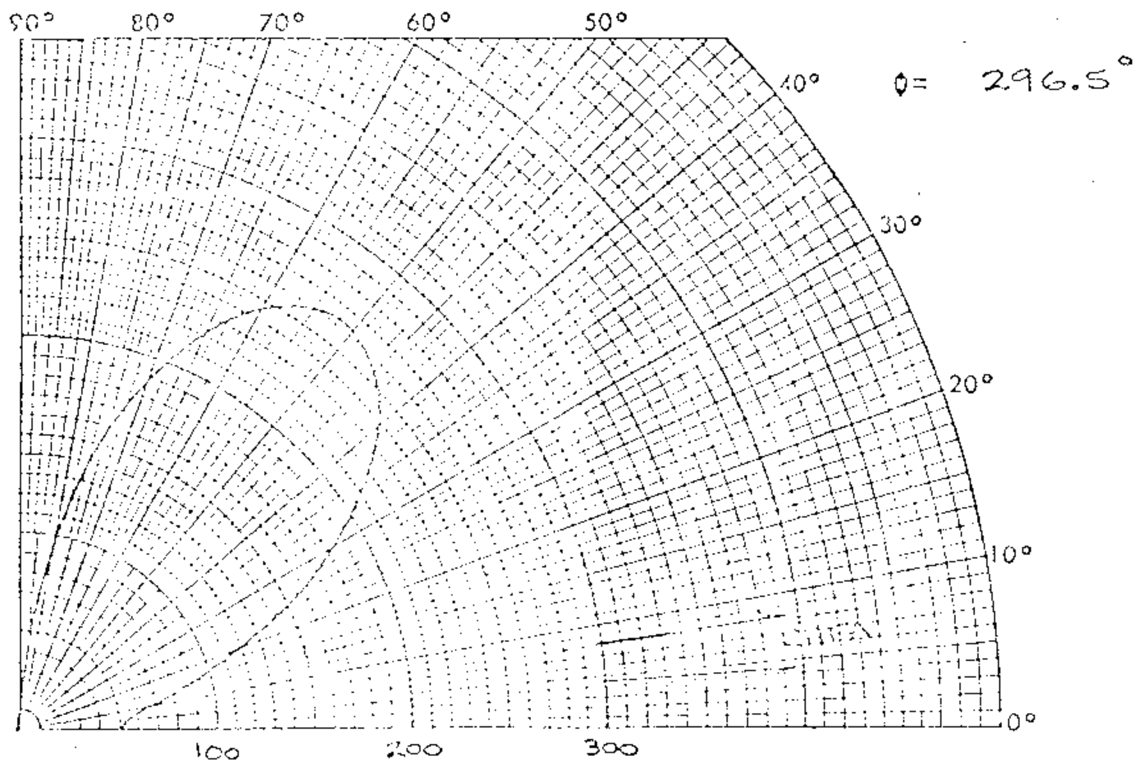
FIGURE 8

CJOB — WINNIPEG, MANITOBA
680 kHz — 50 KW D/25 KW N — DA-2 — CLASS II
PROJECT #2713 — AUGUST 19, 1977

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



UNATTENUATED (MV/M) ONE MILE FIELD



UNATTENUATED (MV/M) ONE MILE FIELD

VERTICAL RADIATION PATTERNS

FIGURE 9

CJOB WINNIPEG, MANITOBA
680 KHz 50 KW D/25 KW N DA-2 CLASS II
PROJECT #2713 AUGUST 19, 1977
D. E. M. ALLEN & ASSOCIATES LTD., CONSULTING ENGINEERS

134 CKGB

DESCRIPTION SHEET
(3-28-60g)

Station CKGB 10kw, DA-2,U, Class II
Timmons, Ontario, Canada 680 KC

[illegible]

DESCRIPTION SHEET

DIRECTIONAL ANTENNA SYSTEM

STATION:	CKGB	MAIN STUDIO:	TIMMINS, ONTARIO	
POWER:	10 KW	FREQUENCY:	680 KC	CLASS: II

GEOGRAPHICAL LOCATION OF CENTER OF NIGHT ANTENNA SYSTEM: N. LAT. 48° 28' 25"
W. LONG. 81° 26' 24"

ANTENNA:

MODE OF OPERATION: DA-2 three element, uniform cross-section guyed steel towers, base insulated for series feed.

		SOUTH	CENTER	NORTH
TOWER:		SOUTH	CENTER	NORTH
HEIGHT ABOVE INSULATORS:		200' (50°)	200' (50°)	200' (50°)
SPACING		606' (151°)	606' (151°)	
PHASING:	DAY	0°	-75°	not used
	NIGHT	+90.5	0	-96.5
FIELD RATIO:	DAY	1	0.19	not used
	NIGHT	0.95	1.625	1.0

ORIENTATION: Line of Towers: 15° 28' East of North

GROUND SYSTEM: 120 equiangularly spaced radial wires extending from the base of each tower to a distance of approx. 540 feet (0.375 wavelength) with the exception of those wires joined along the common chords. The ground wires consist of solid copper wire #10 B & S gauge, and are buried to a depth of approximately 6 to 8 inches.

PREDICTED EFFECTIVE FIELD:

DAY 571 MV/M at 1 mile for 10 KW
or 180.5 MV/M at 1 mile for 1 KW

NIGHT 565 MV/M at 1 mile for 10 KW
178.5 MV/M at 1 mile for 1 KW

NOTIFICATION LIST NO. [illegible]
DATE: June 5, [illegible]

This [illegible]

RCA VICTOR COMPANY, LTD.
MONTREAL QUEBEC
FEB. 24, 1959

REVISED AUG. 19/59.

CKGB

PROPOSED DAY
(3-28-60g)

Station CKGB
Timmons, Ontario, Canada

10kw, DA-2,U, Class II
680 KC

North Latitude 48° 28' 25''
West Longitude 81° 26' 24''

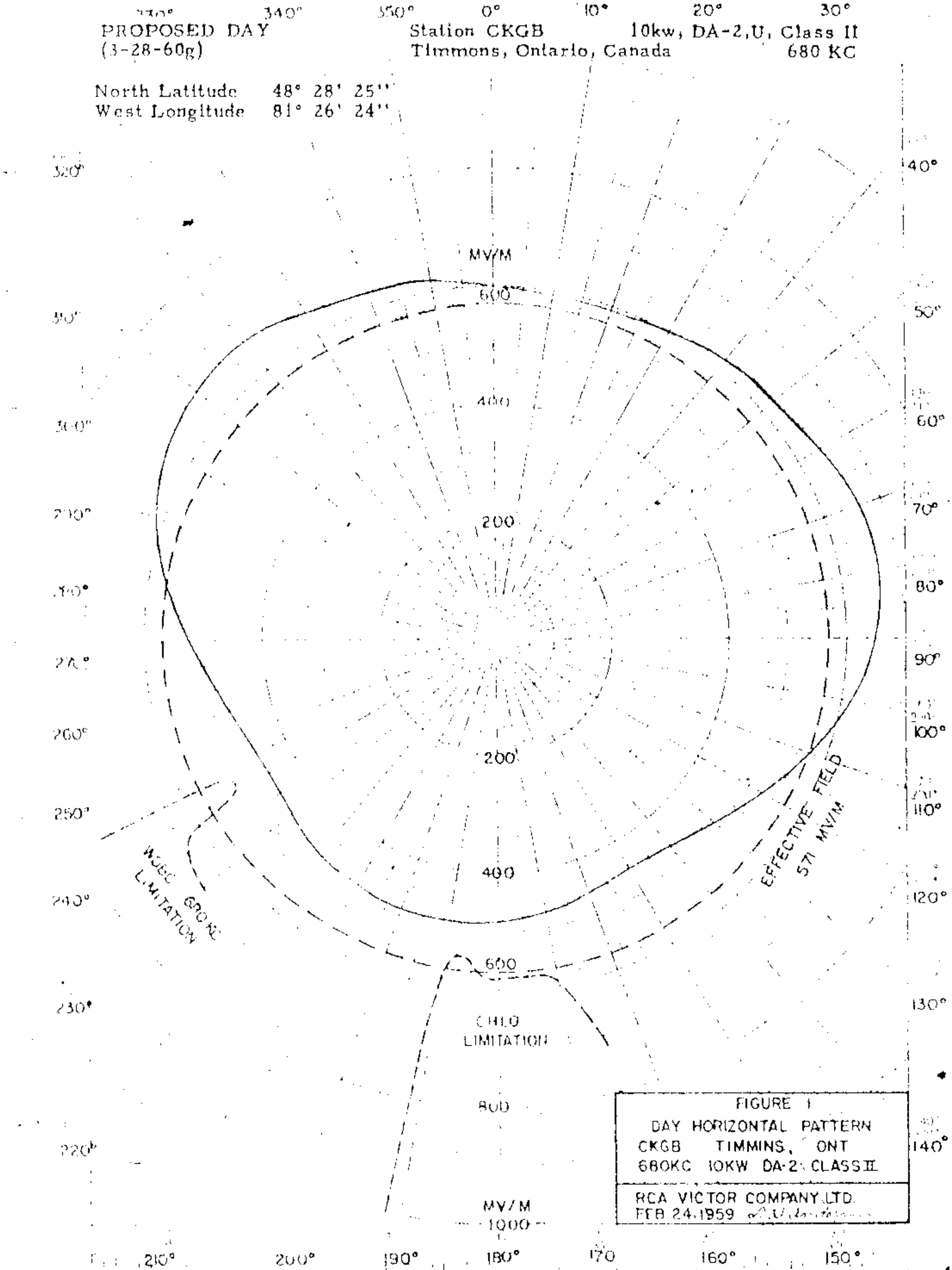


FIGURE 1
DAY HORIZONTAL PATTERN
CKGB TIMMINS, ONT
680KC 10KW DA-2 CLASS II

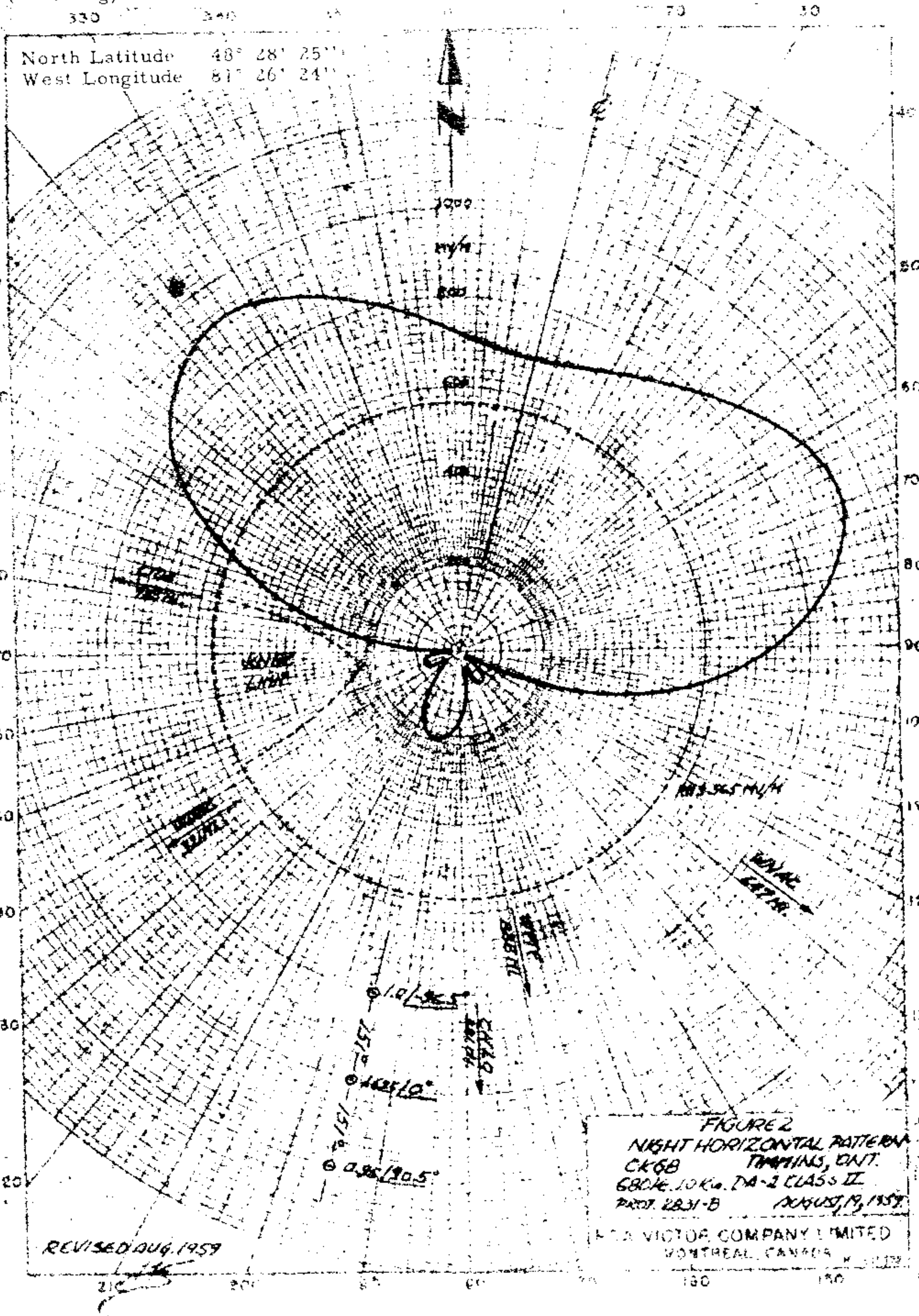
RCA VICTOR COMPANY LTD.
FEB 24 1959

13A

CKGB

PROPOSED NIGHT
(3-28-60g)

Station CKGB 10kw, DA-2,U, Class II
Timmins, Ontario, Canada 680 KC

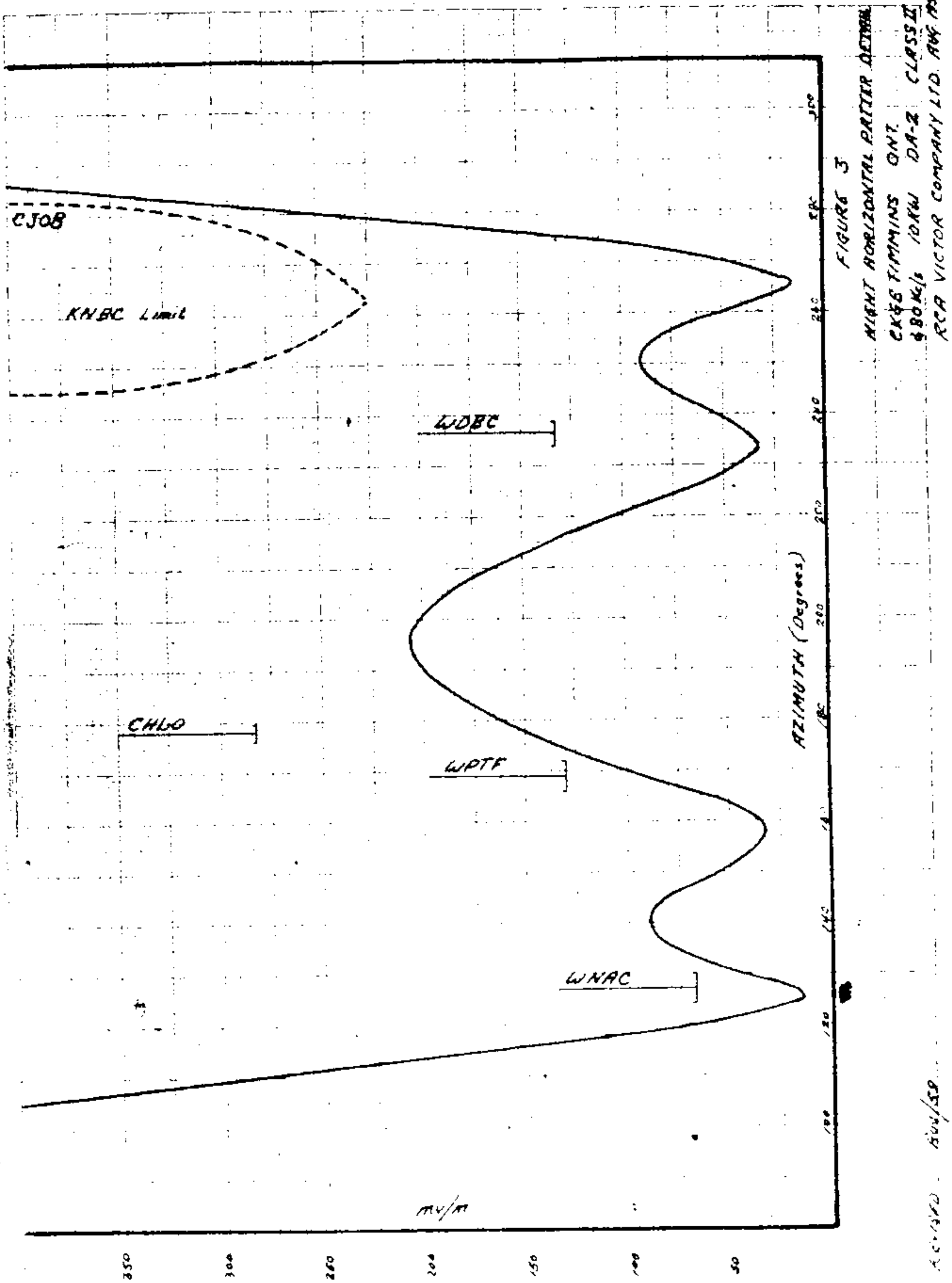


CKGB

PROPOSED NIGHT NULLS
(3-28-60g)

Station CKGB
Timmons, Ontario, Canada

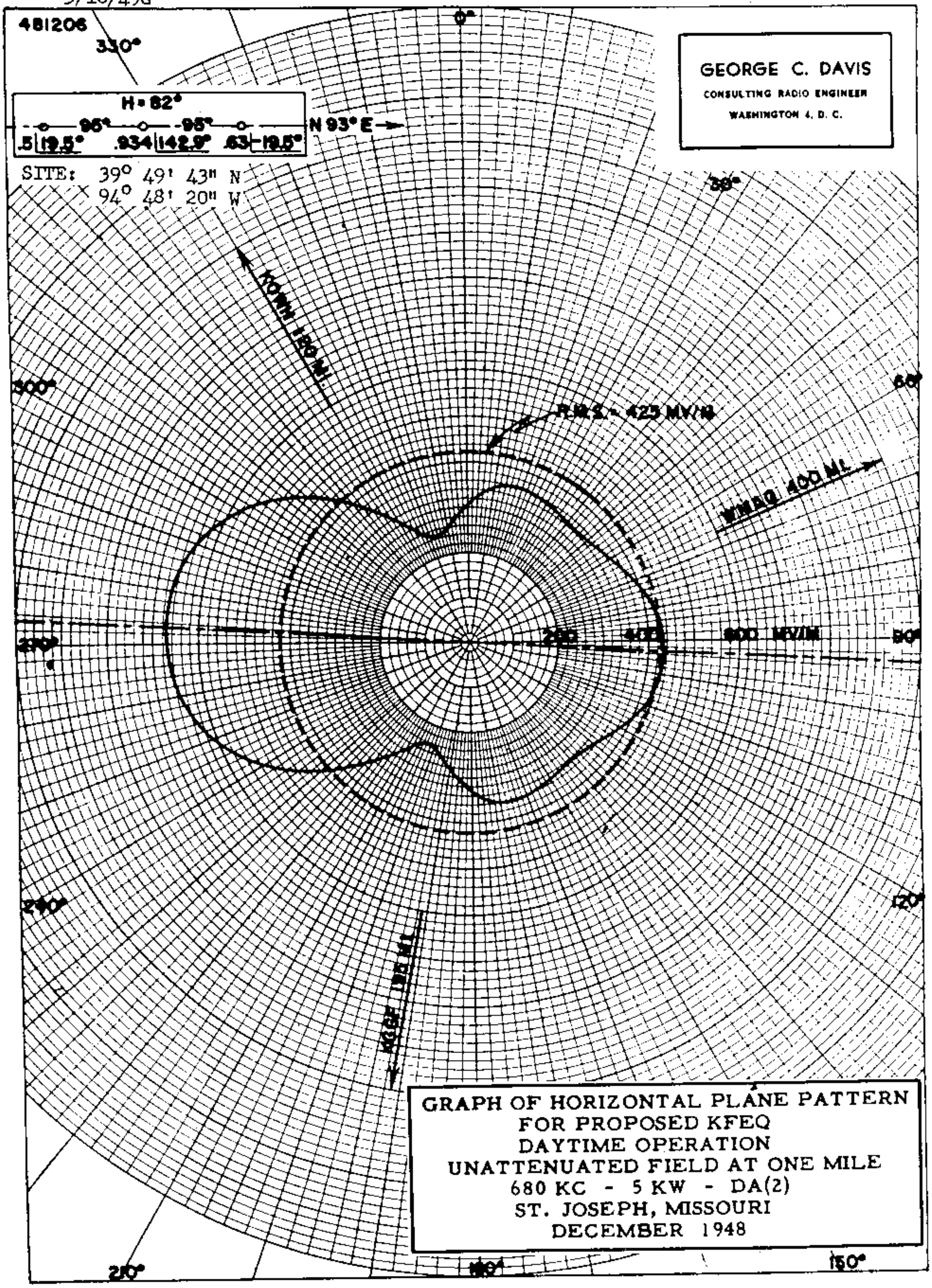
10kw, DA-2, U, Class II
680 KC



KFEQ

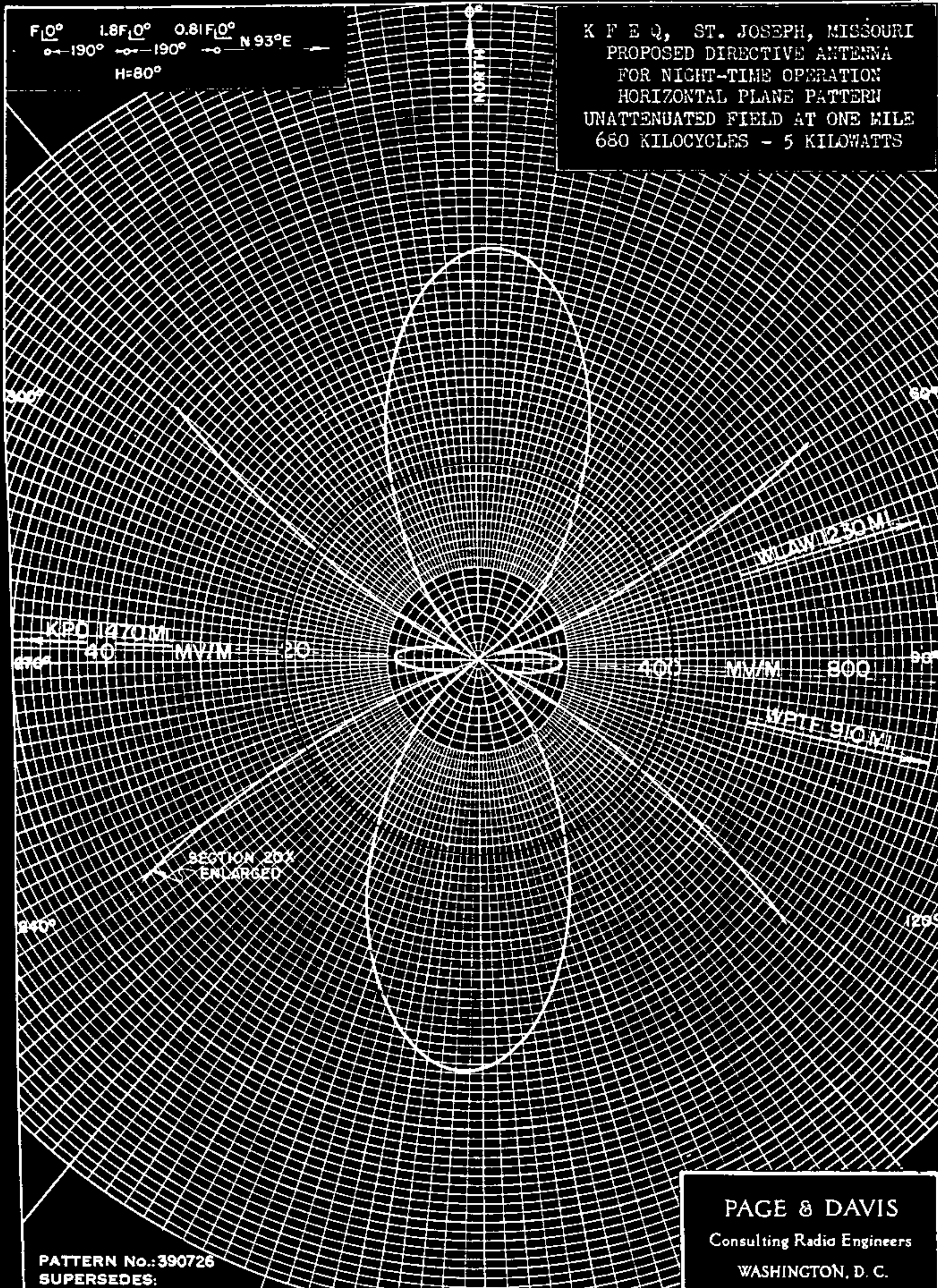
PROPOSED DAY KFEQ, ST. JOSEPH, MO. 5kw, DA2 680kc

3/16/49G 3-14-49 BP-7149

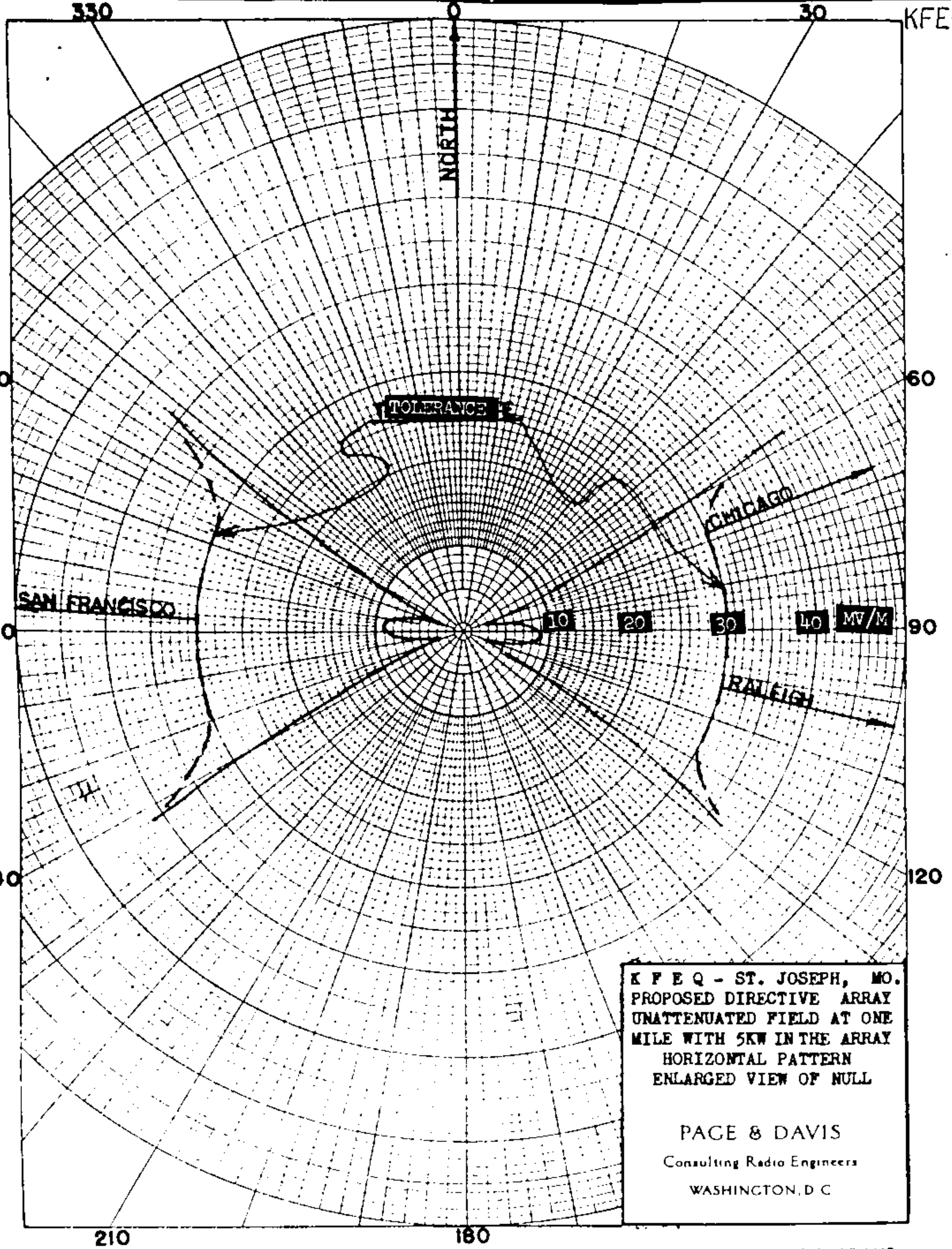


GRAPH OF HORIZONTAL PLANE PATTERN
FOR PROPOSED KFEQ
DAYTIME OPERATION
UNATTENUATED FIELD AT ONE MILE
680 KC - 5 KW - DA(2)
ST. JOSEPH, MISSOURI
DECEMBER 1948

KFEQ, St. Joseph, Mo. 680 kc


K F E Q, ST. JOSEPH, MISSOURI
PROPOSED DIRECTIVE ANTENNA
FOR NIGHT-TIME OPERATION
HORIZONTAL PLANE PATTERN
UNATTENUATED FIELD AT ONE MILE
680 KILOCYCLES - 5 KILOWATTS
F|0° 1.8F|0° 0.81F|0° N 93°E
190° 190°
H=80°
NORTH
0°
60°
90°
120°
180°
240°
270°
300°
KPO 1470 MI.
40
MV/M
20
400
MV/M
800
WLAW 1230 MI.
WPTF 910 MI.
SECTION 20X ENLARGED
PATTERN No.: 390726
SUPERSEDES:
REINSTATES:
PAGE & DAVIS
Consulting Radio Engineers
WASHINGTON, D. C.

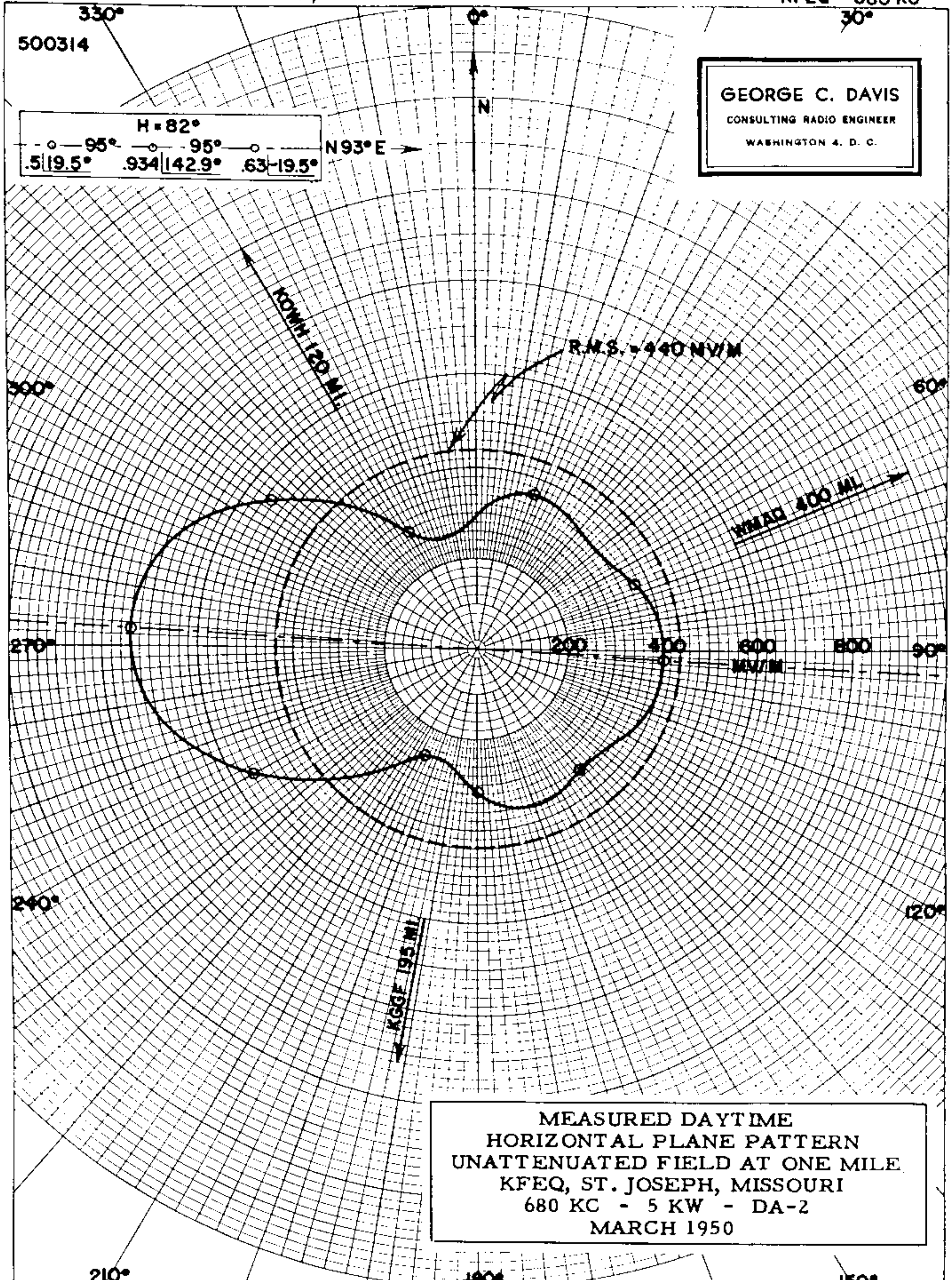
PROPOSED NIGHT NULLS   Station KFEQ   5KW, DA-2,0
St. Joseph, Missouri   680 KC



K F E Q - ST. JOSEPH, MO.
PROPOSED DIRECTIVE ARRAY
UNATTENUATED FIELD AT ONE
MILE WITH 5KW IN THE ARRAY
HORIZONTAL PATTERN
ENLARGED VIEW OF NULL

PAGE & DAVIS
Consulting Radio Engineers
WASHINGTON, D C

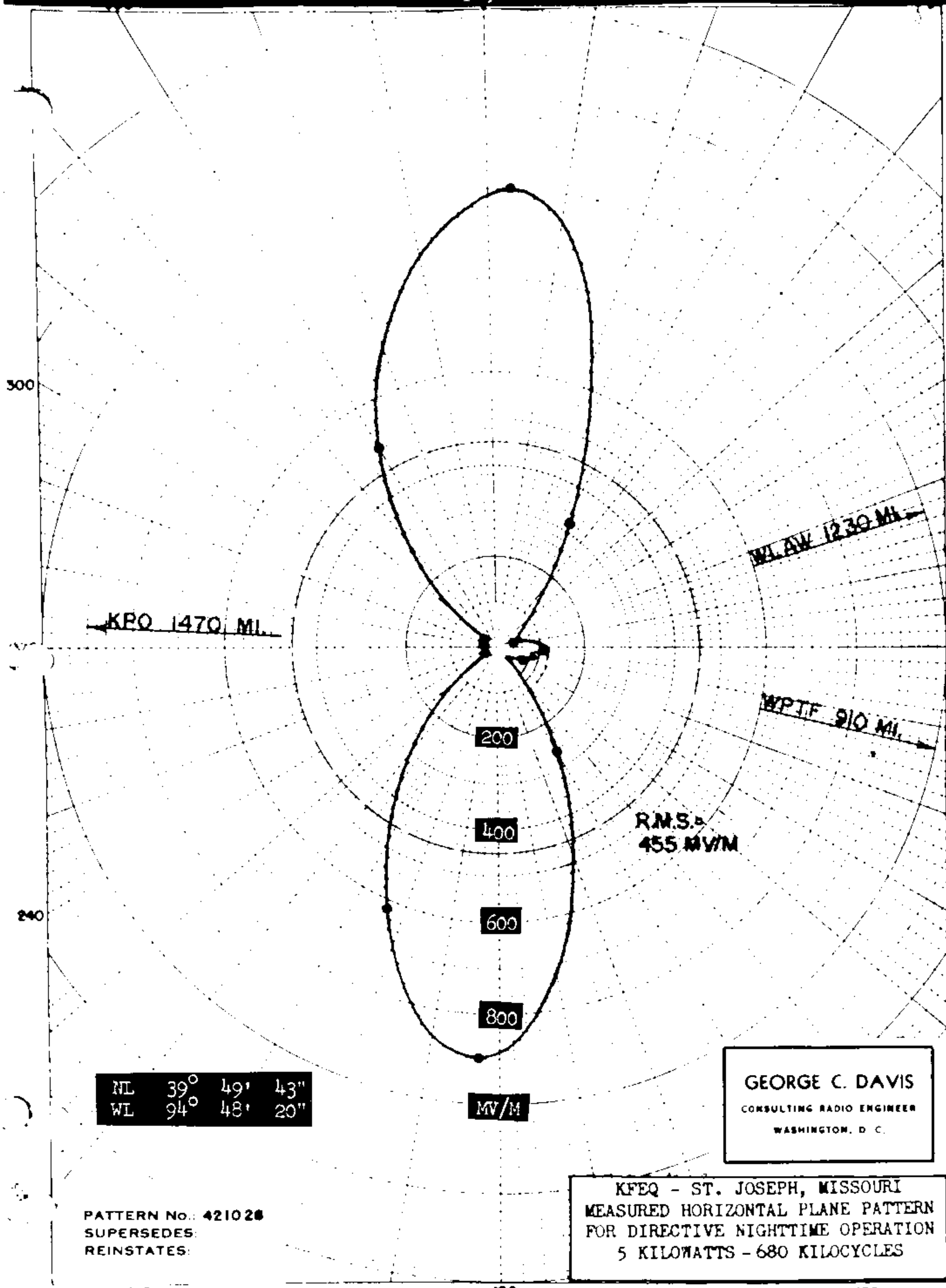
39-44-43
94-48-20



MEASURED DAYTIME
HORIZONTAL PLANE PATTERN
UNATTENUATED FIELD AT ONE MILE
KFEQ, ST. JOSEPH, MISSOURI
680 KC - 5 KW - DA-2
MARCH 1950

KFEQ

MEASURED NIGHT | Station KFEQ St. Joseph, Missouri | 5kw, DA-2,U 680 KC



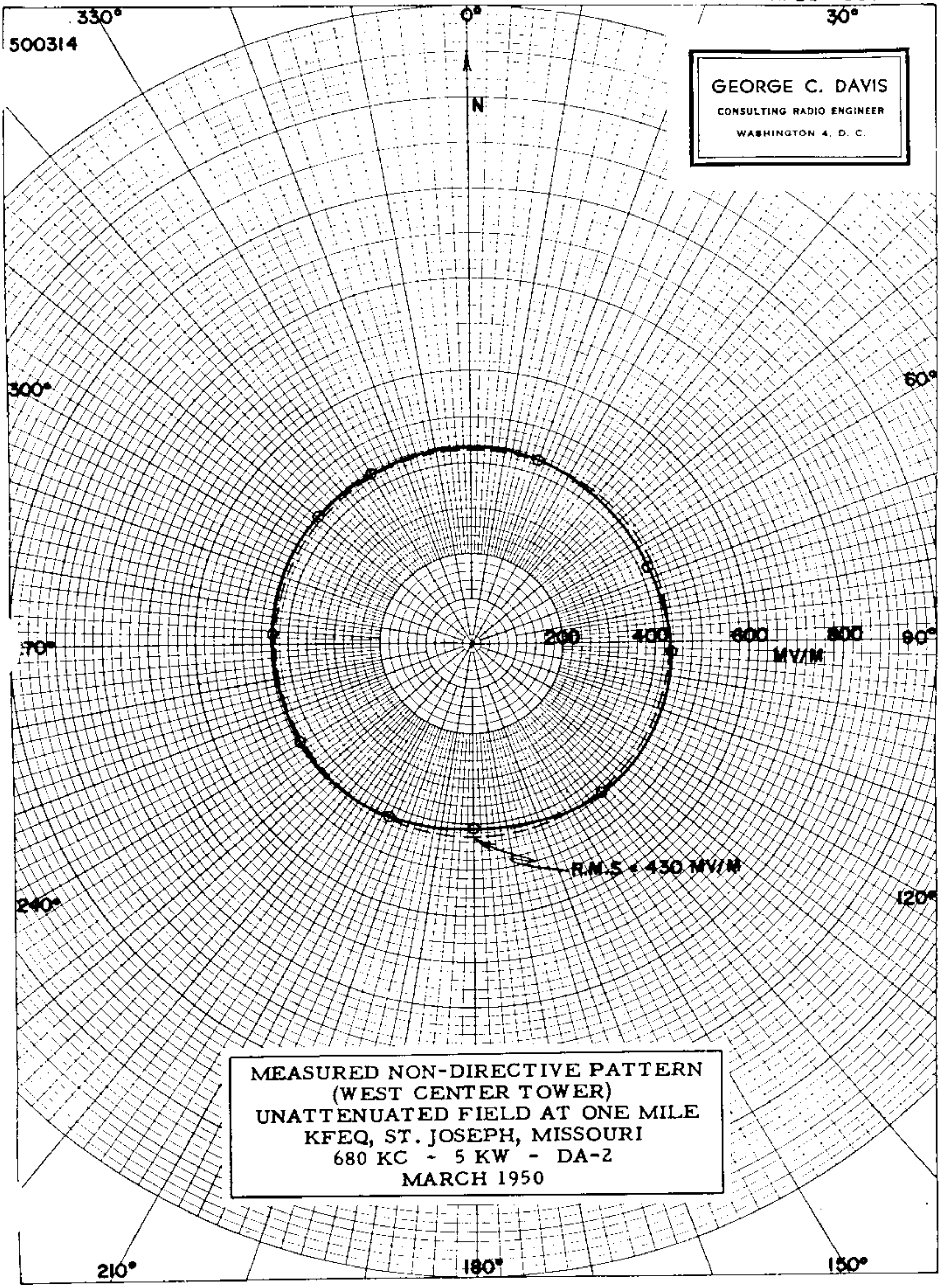
GEORGE C. DAVIS
CONSULTING RADIO ENGINEER
WASHINGTON, D. C.

PATTERN No.: 421026
SUPERSEDES:
REINSTATES:

KFEQ - ST. JOSEPH, MISSOURI
MEASURED HORIZONTAL PLANE PATTERN
FOR DIRECTIVE NIGHTTIME OPERATION
5 KILOWATTS - 680 KILOCYCLES

KEUFFEL & ESSER CO. N. Y. NO. 343A
POLAR CO-ORDINATE

KFEQ - 680 KC



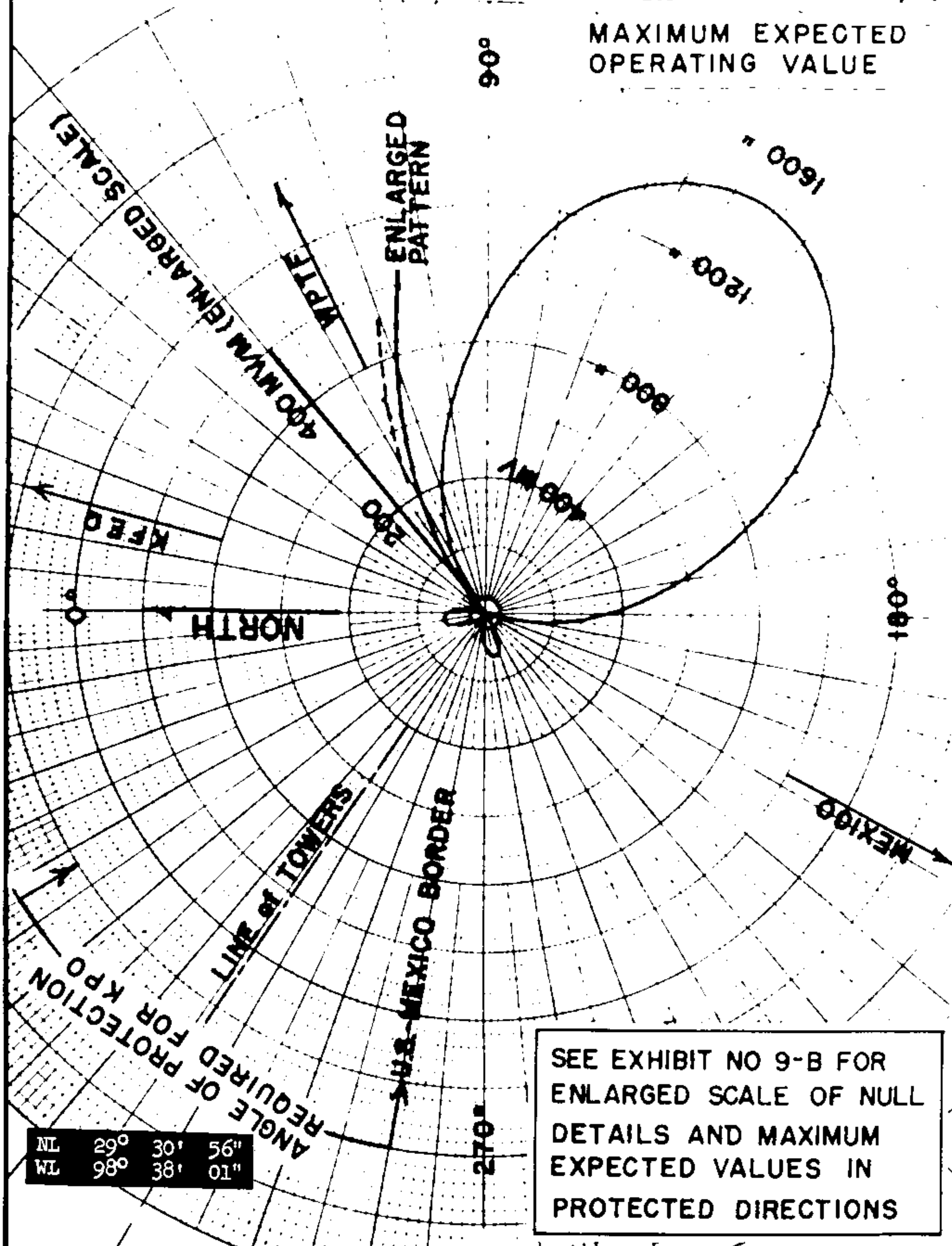
MEASURED NON-DIRECTIVE PATTERN
(WEST CENTER TOWER)
UNATTENUATED FIELD AT ONE MILE
KFEQ, ST. JOSEPH, MISSOURI
680 KC - 5 KW - DA-2
MARCH 1950

PROPOSED NIGHT Station KENS 10Kw,50Kw-LS, DA-N,U
San Antonio, Texas 680 KC

HORIZONTAL PATTERN

KKYX

MAXIMUM EXPECTED
OPERATING VALUE



SEE EXHIBIT NO 9-B FOR
ENLARGED SCALE OF NULL
DETAILS AND MAXIMUM
EXPECTED VALUES IN
PROTECTED DIRECTIONS

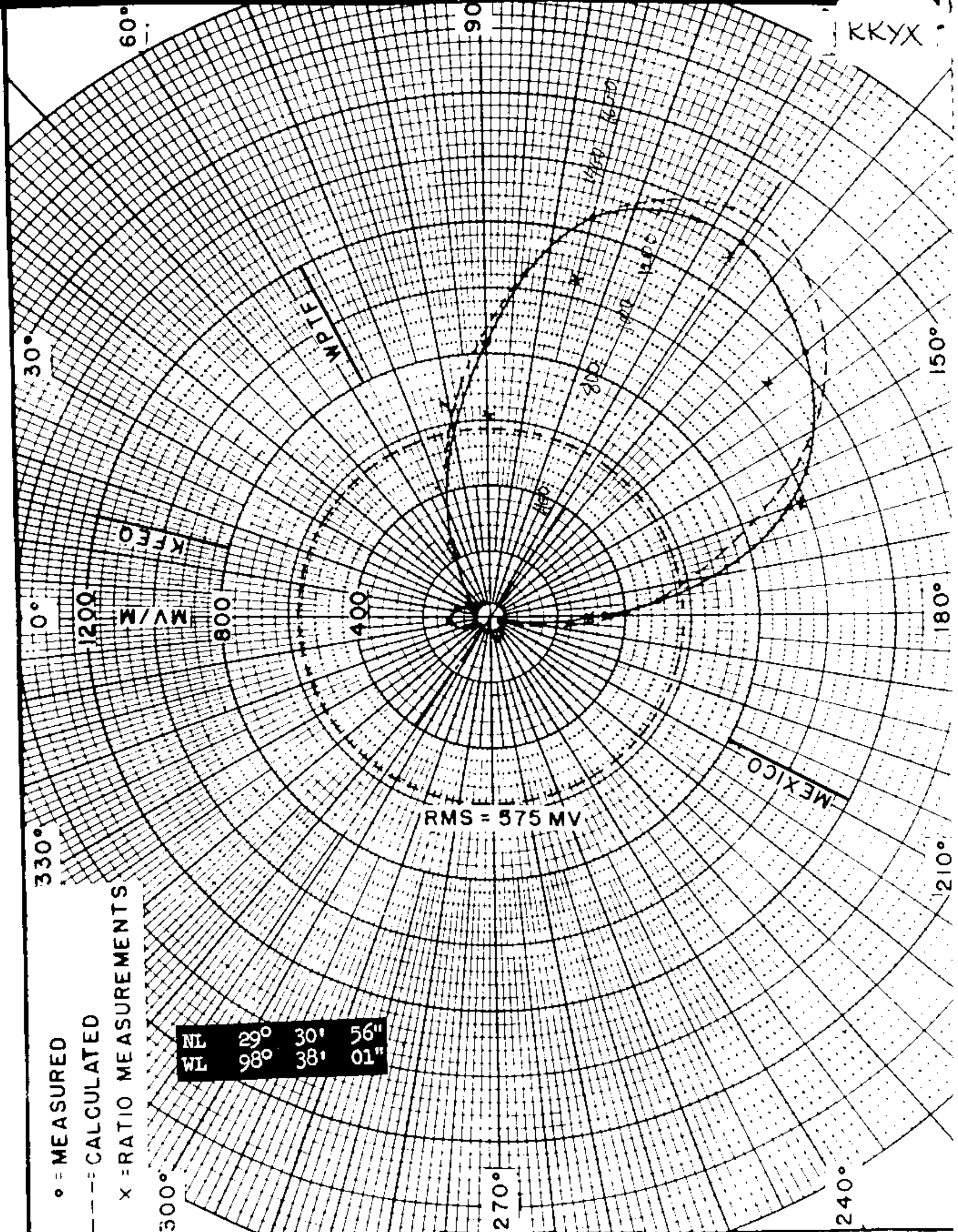
NL	29°	30'	56"
WL	98°	38'	01"

COMMERCIAL RADIO EQUIPMENT CO.
RADIO ENGINEERING CONSULTANTS
KANSAS CITY WASHINGTON, D. C. HOLLYWOOD

FOR [illegible]-680 kcs
DATE 3/14/44 BY ELD
SCALE

MEASURED NIGHT Station KENS 10kw,50kw-LS, DA-N,U
San Antonio, Texas 680 KC

KKYX



COMMERCIAL RADIO EQUIPMENT CO.

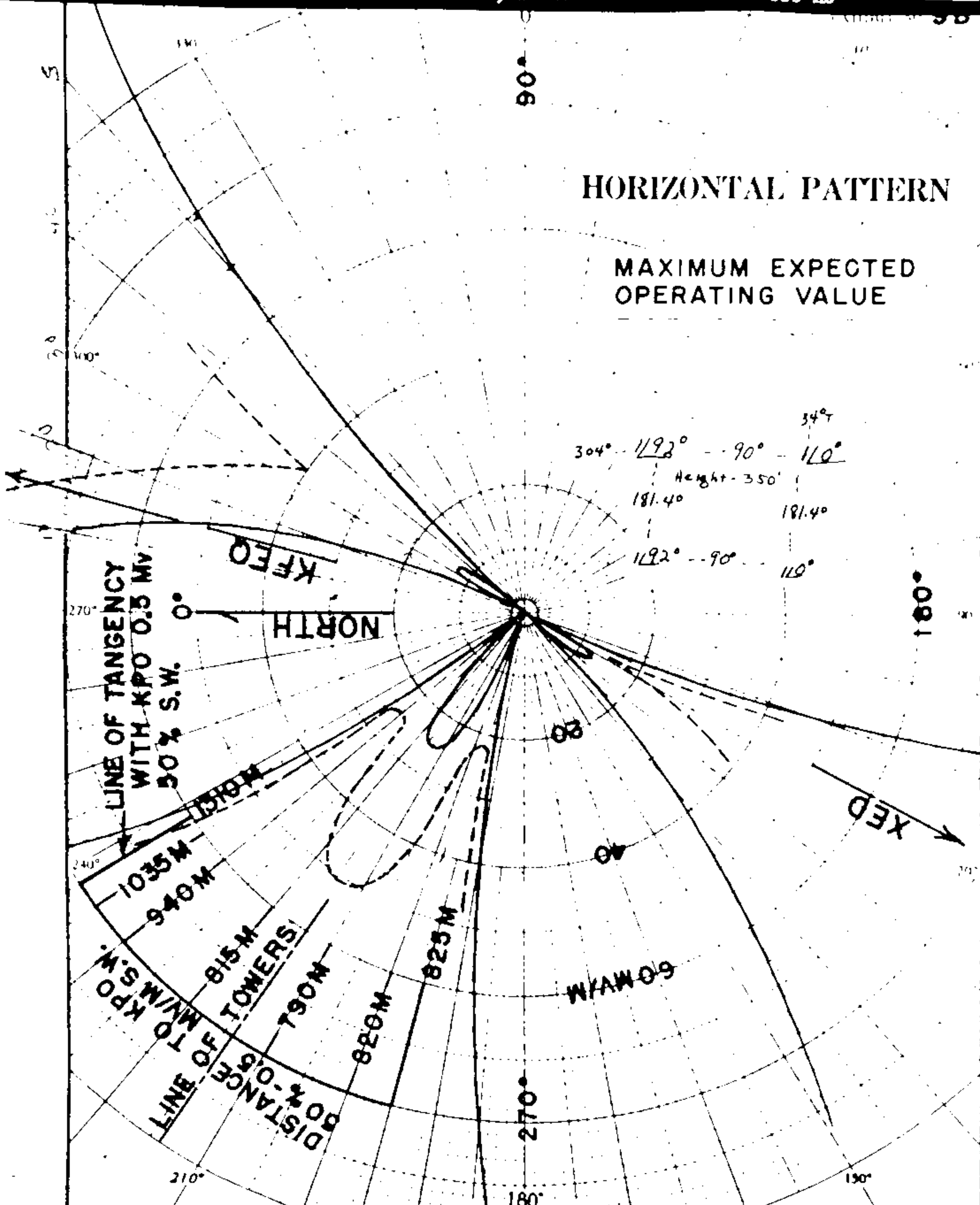
RADIO ENGINEERING CONSULTANTS

KANSAS CITY WASHINGTON, D.C. HOLLYWOOD

FOR [illegible] 680 KC	
DATE 4-22-46	BY M.W.
10 KW DA	

PROPOSED NIGHT NULLS . Station KENS 10kw,50kw-LS, DA-N,U
San Antonio, Texas 680 KC

KKYX



COMMERCIAL RADIO EQUIPMENT CO.

RADIO ENGINEERING CONSULTANTS

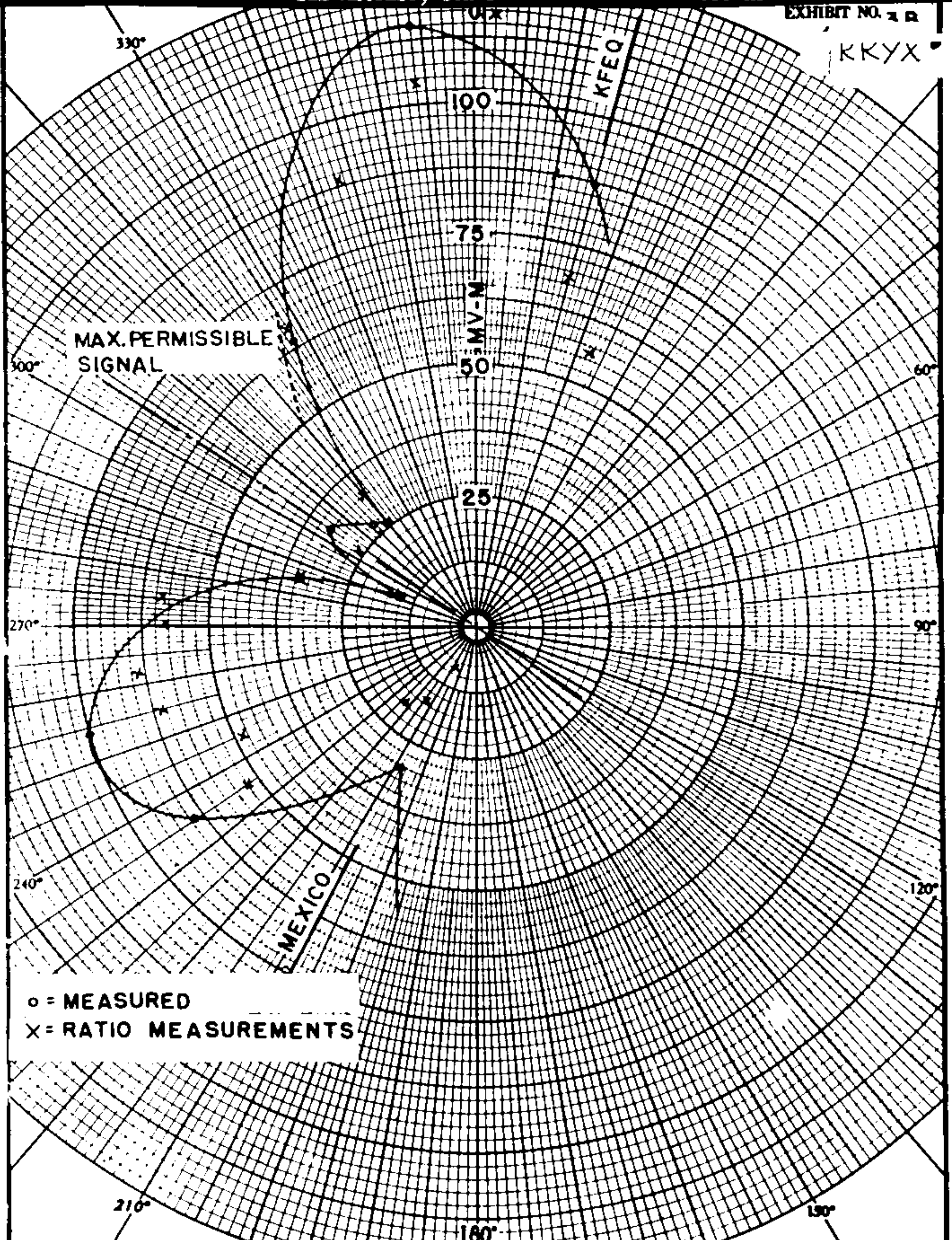
KANSAS CITY WASHINGTON, D.C. HOLLYWOOD

FOR KENS-680KC	
DATE 3/14/44	BY ELD
SCALE ENLARGED PAT	

MEASURED NIGHT NULLS Station KENS 10kw,50kw-LS, DA-N,U
San Antonio, Texas 680 KC

EXHIBIT NO. 3 B

KKYX



COMMERCIAL RADIO EQUIPMENT CO.

RADIO ENGINEERING CONSULTANTS

KANSAS CITY WASHINGTON, D. C. HOLLYWOOD

FOR ~~KARO~~ 680KC	
DATE 4-24-46	BY M.W.
10 KW DA	

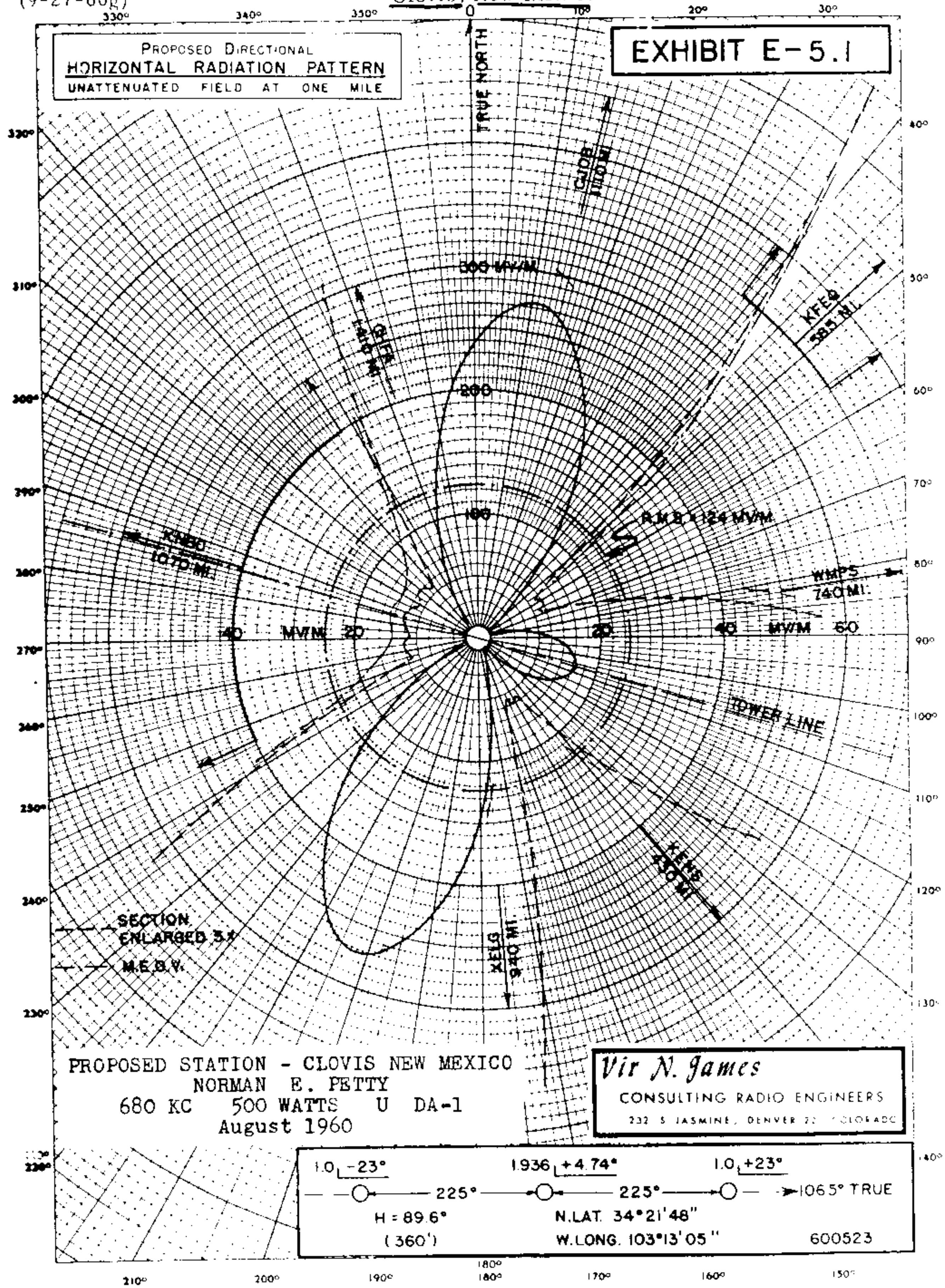
SEE REVERSE SIDE

KWKA

PROPOSED DAY & NIGHT
(9-27-60g)

New; Norman E. Petty
Clovis, New Mexico

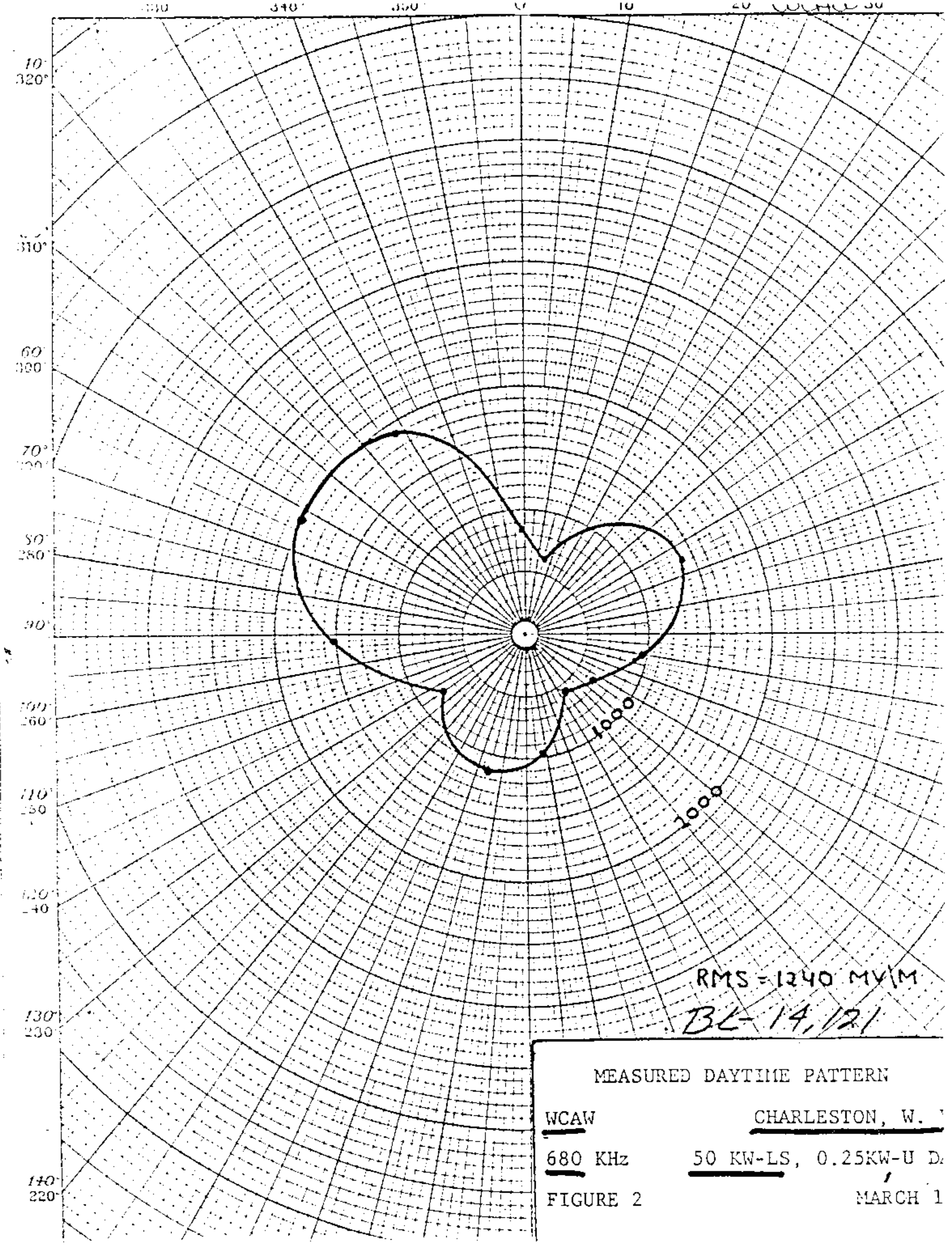
500w, DA-1,U
680 KC



FCC File No. BP-13333
Accepted 9-13-60 (Amended)

Norman E. Petty
Clovis, New Mexico

680 KC



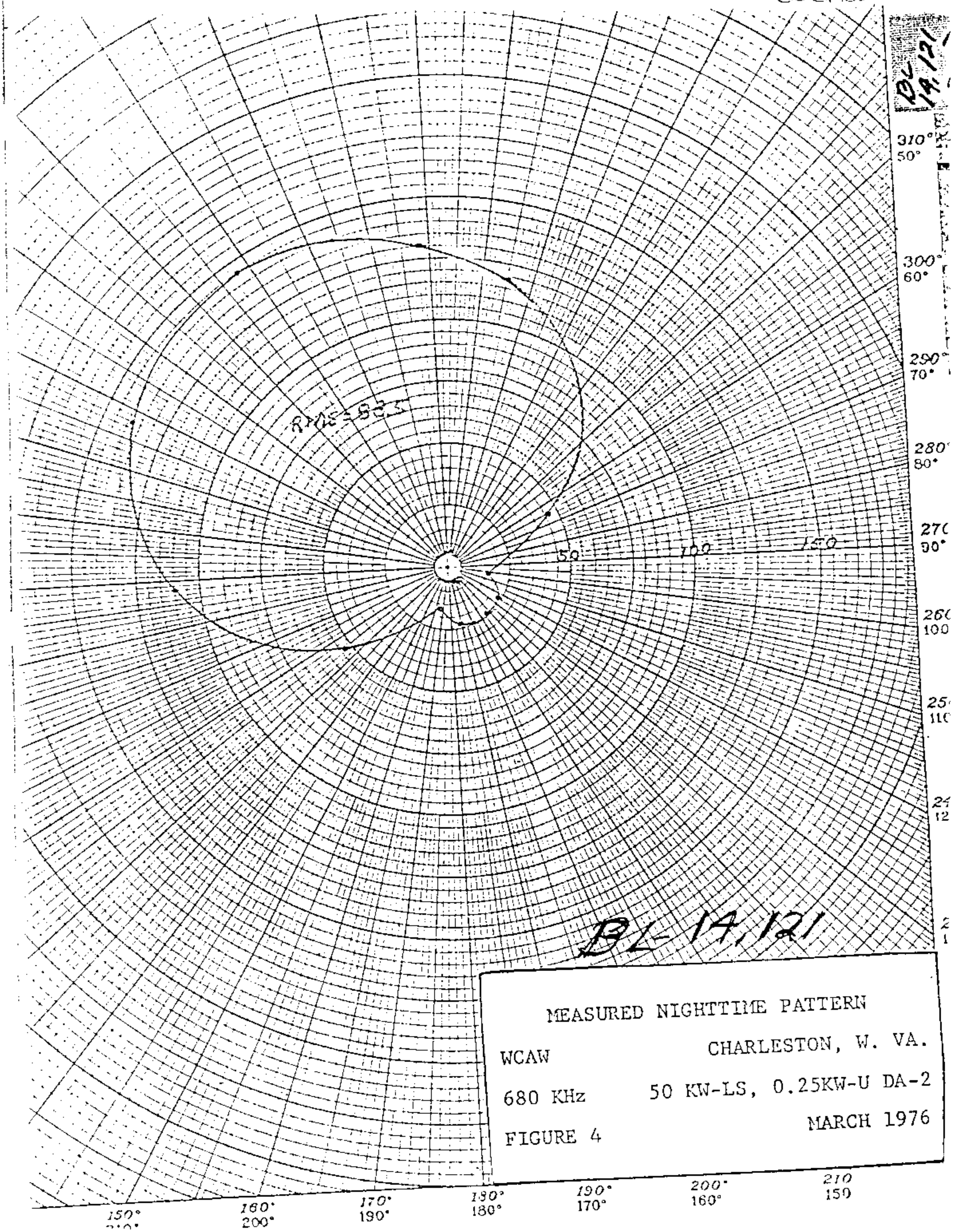
MEASURED DAYTIME PATTERN

WCAW CHARLESTON, W.

680 KHz 50 KW-LS, 0.25KW-U D

FIGURE 2 MARCH 1

WCAW



MEASURED NIGHTTIME PATTERN

WCAW CHARLESTON, W. VA.

680 KHz 50 KW-LS, 0.25KW-U DA-2

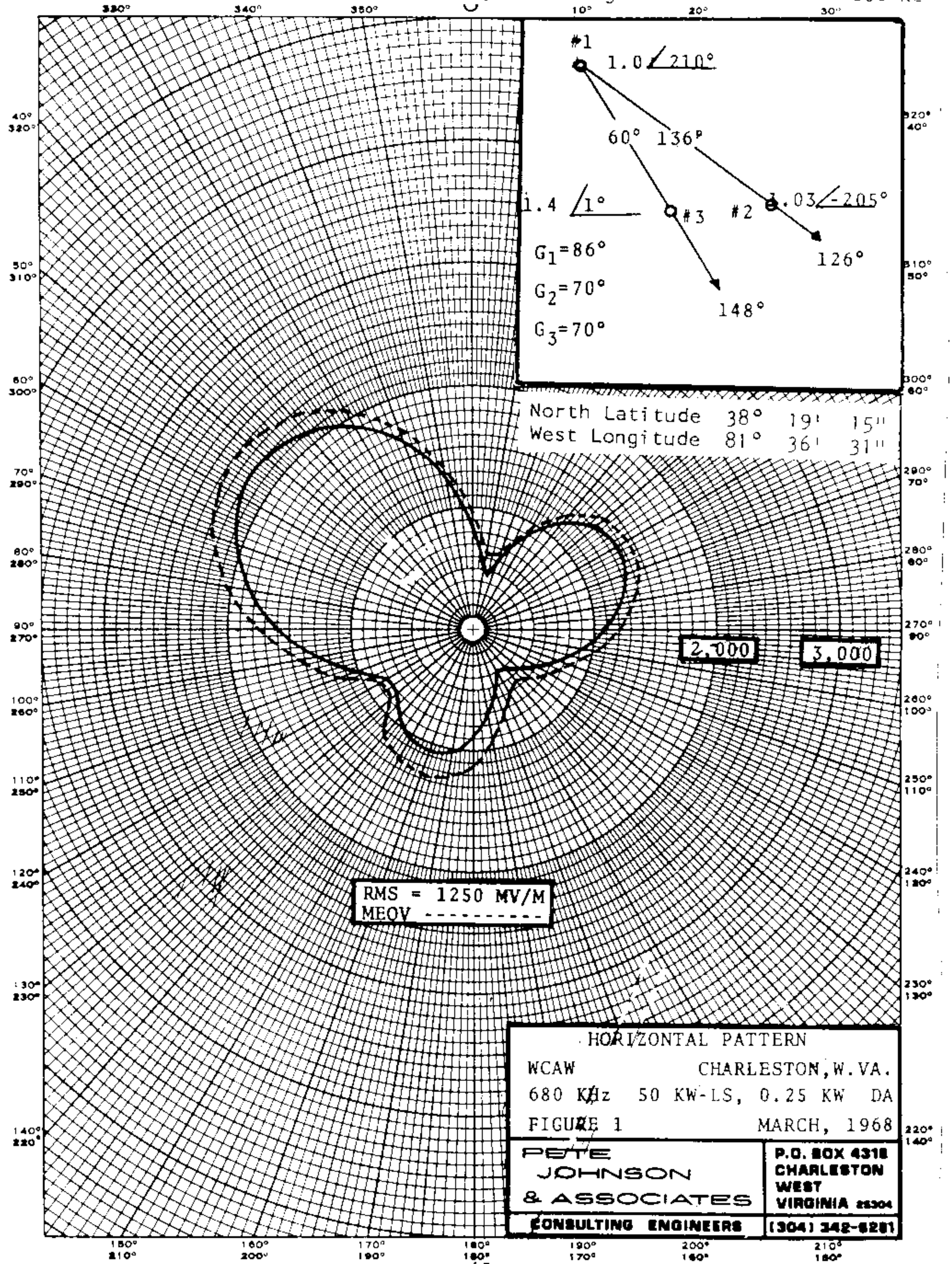
FIGURE 4 MARCH 1976

WCAW

Proposed Day
(3-28-69ct)

Station WCAW
Charleston, West Virginia

250w,50kw-LS,DA-2,U
680 kc



FCC File No.BP-18309
Accepted 3-20-69

Station WCAW
Charleston, West Virginia

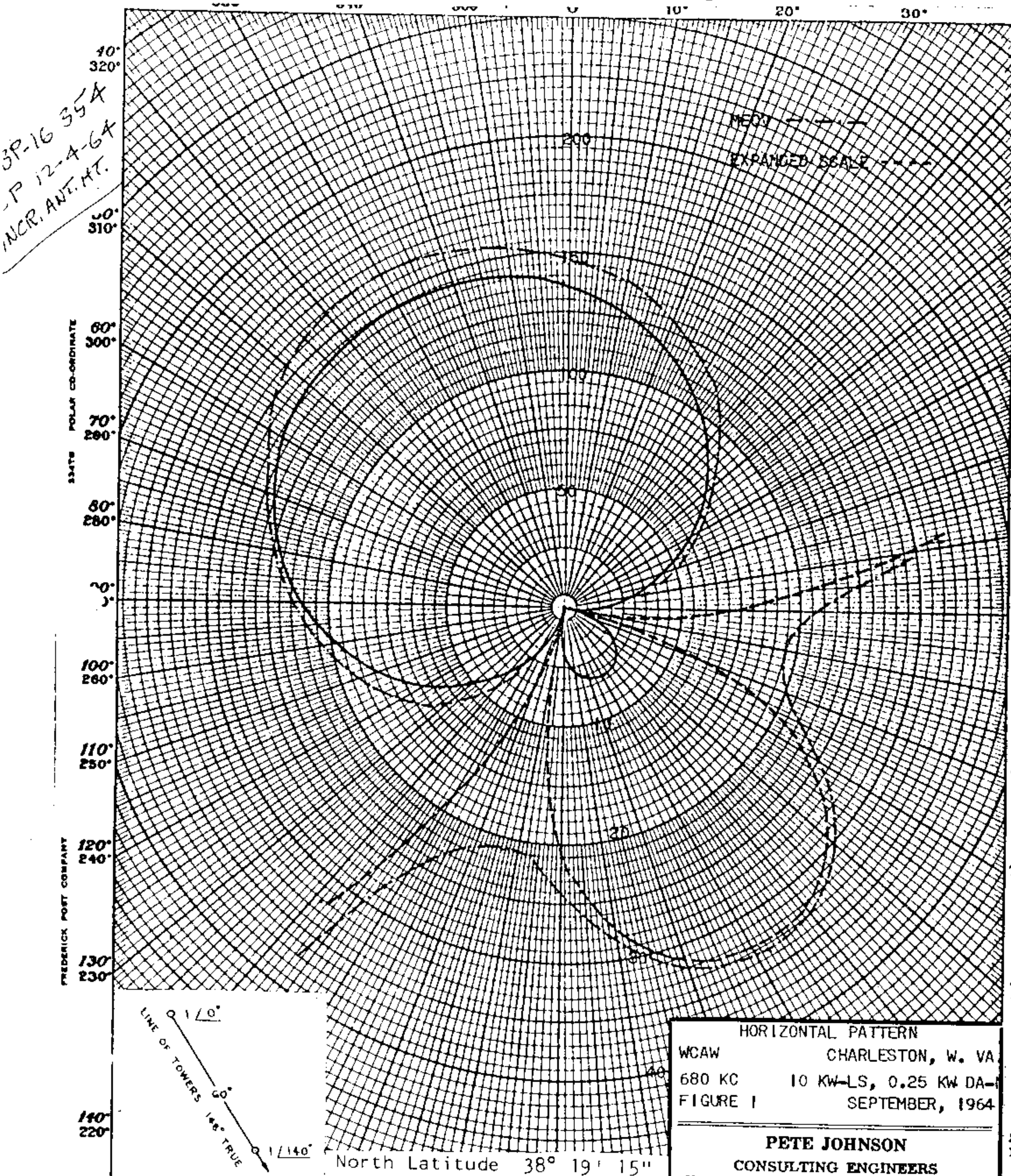
680 kc

WCAW

Proposed Night
(10-26-64ct)

Station WCAW
Charleston, West Virginia

250w,10kw-LS,DA-N,U
680 kc



North Latitude 38° 19' 15"
West Longitude 81° 36' 31"

FCC File No. BP16354
Accepted 10-22-64

Station WCAW
Charleston, West Virginia

680 kc

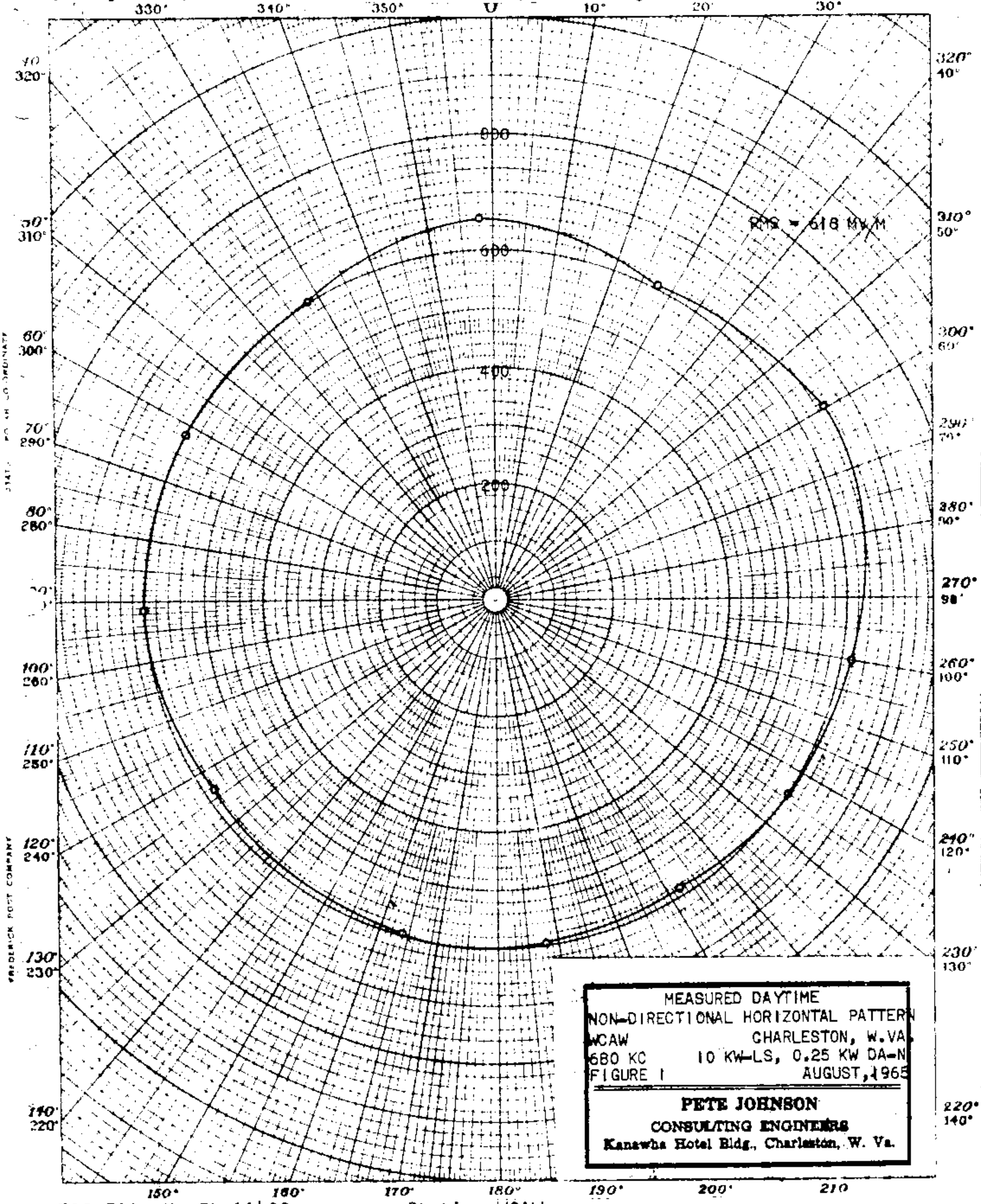
WCAW

Measured Non-DA
(12-29-66ct)

Station WCAW
Charleston, West Virginia

250w,10kw-LS,DA-N,U
680 kc

GRANTED LICENSE (10-18-66)



FCC File No.BL-11430
Accepted

Station WCAW
Charleston, West Virginia

680 kc

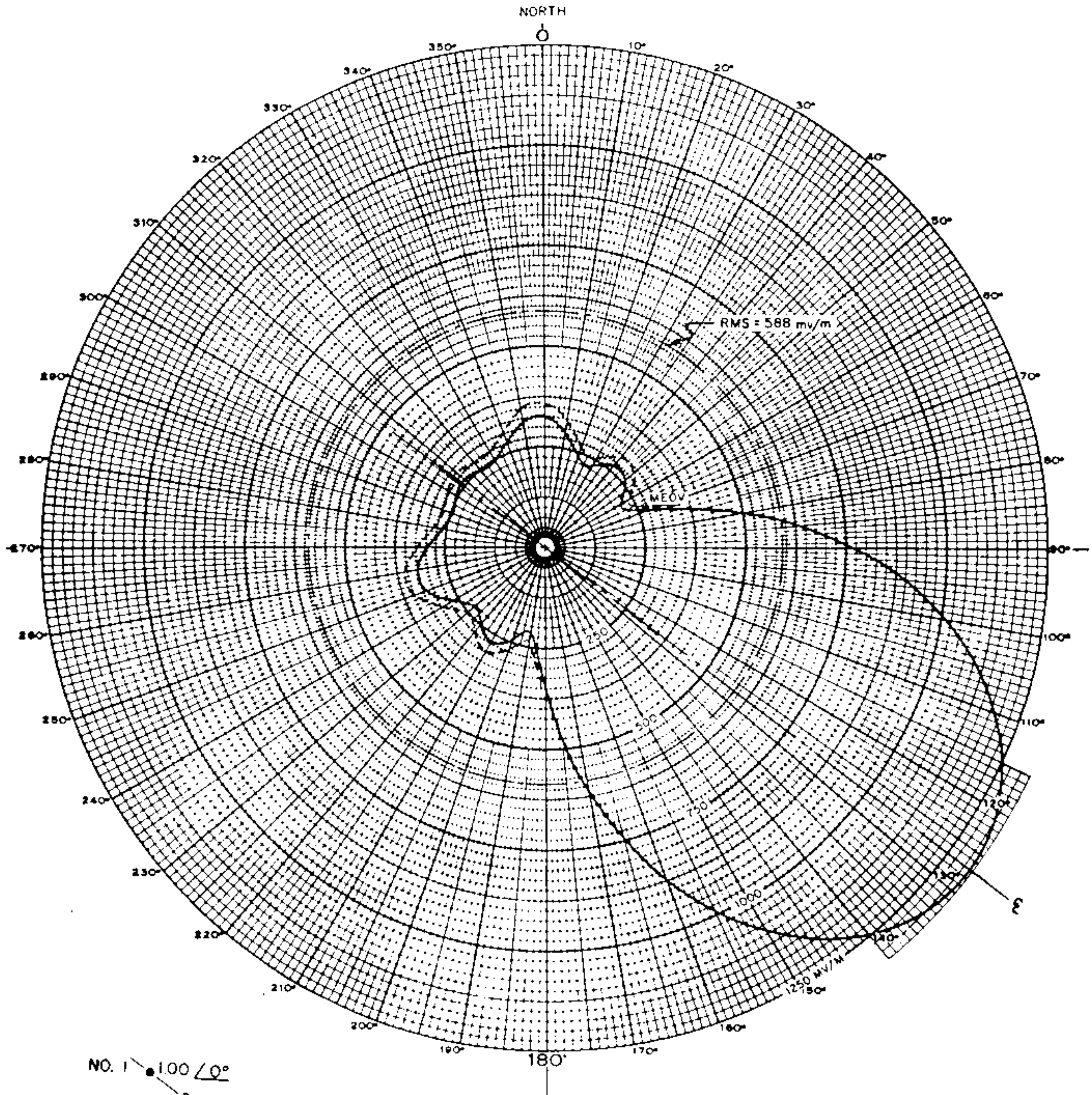
WCBM

Proposed Day
(8-26-66ct)

Station WCBM
Baltimore, Maryland

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

BP 17313
P 8-17-66



NO. 1 • 1.00 /0°
90°
NO. 2 • 2.56 /159°
90°
NO. 3 • 3.22 /45°
90°
NO. 4 • 2.44 /-114°
N 127° E (T)

HGT. = 92°

North Latitude 39° 24' 30"
West Longitude 76° 46' 34"

FIGURE 1
PROPOSED DAYTIME HORIZONTAL
PLANE RADIATION PATTERN
WCBM 5 KW, 10 KW-LS DA-2 680 KC
BALTIMORE, MARYLAND

Prepared by
Lohnes and Culver Washington, D. C.
June, 1966

FCC File No. BP-17313
Accepted 8-11-66

Station WCBM
Baltimore, Maryland

680 kc

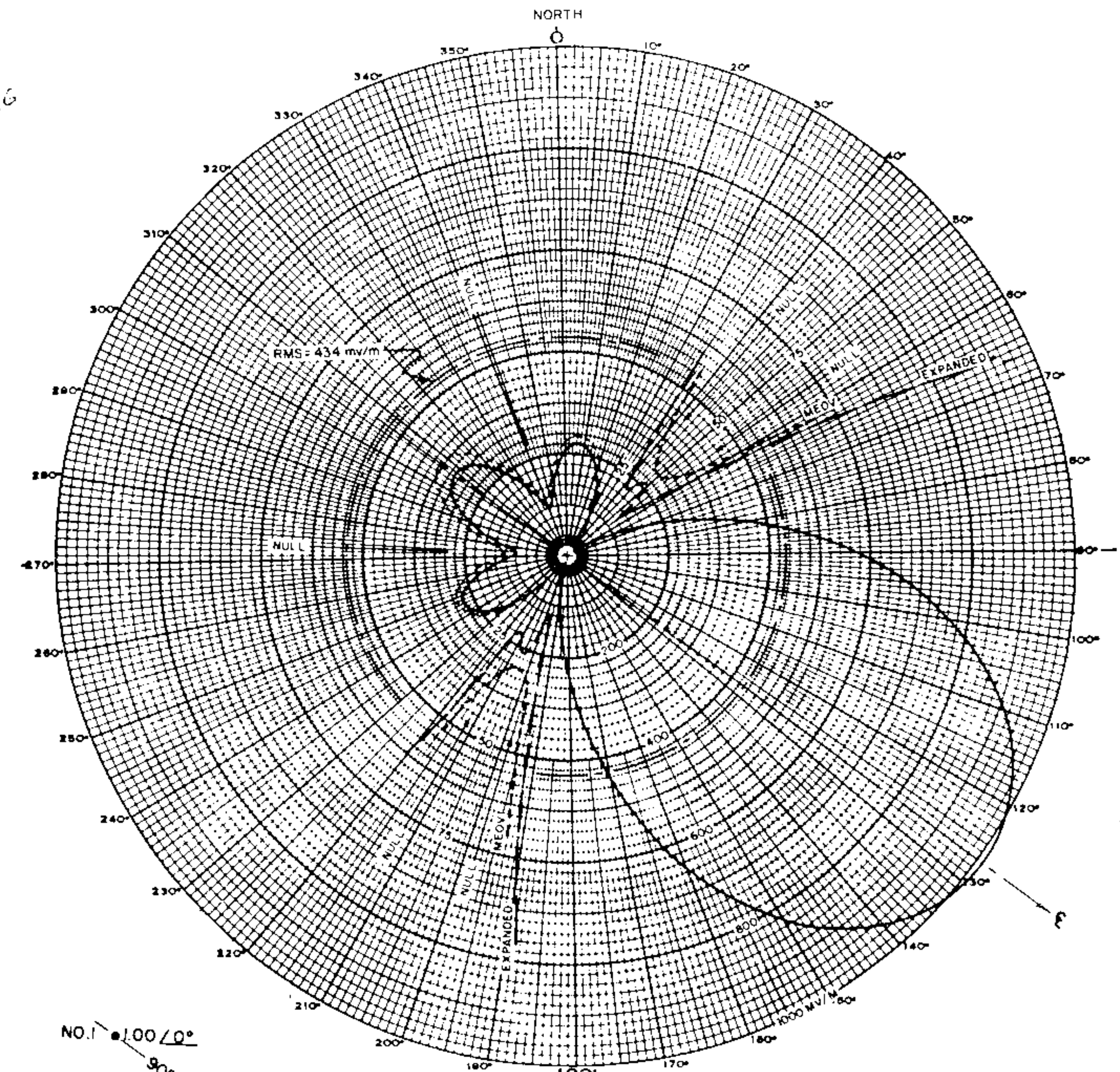
WCBM

Proposed Night
(8-26-66ct)

Station WCBM
Baltimore, Maryland

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

3P 17313
-P 8-17-66



NO.1 • 1.00 /0°
90°
NO. 2 • 2.05 /-165°
90°
NO. 3 • 2.15 /34.5°
90°
NO. 4 • 0.95 /-140.5
N 127° E (T)

HGT. = 92°

FIGURE 7
PROPOSED NIGHTTIME HORIZONTAL
PLANE RADIATION PATTERN
WCBM 5 KW, 10 KW-LS DA-2 680 KC
BALTIMORE, MARYLAND

Prepared by
Lohnes and Culver Washington, D. C.
June, 1966

North Latitude 39° 24' 30"
West Longitude 76° 46' 34"

FCC File No. BP-17313
Accepted 8-11-66

Station WCBM
Baltimore, Maryland

680 kc

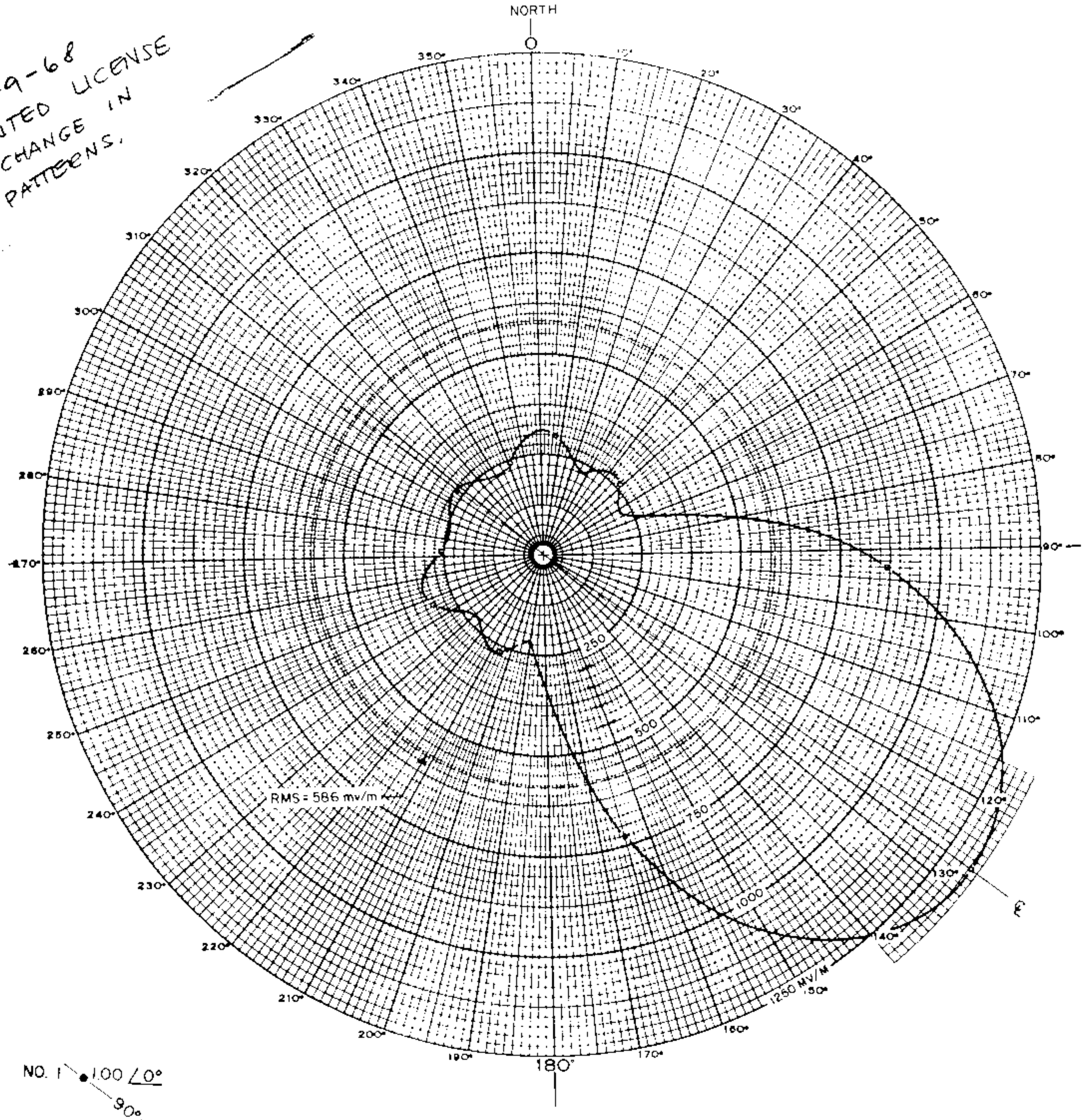
WCBM

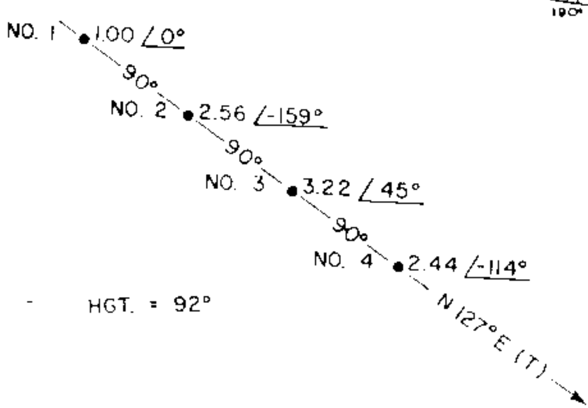
Measured Day
(12-28-67ct)

Station WCBM
Baltimore, Maryland

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

4-9-68
GRANTED LICENSE
COV. CHANGE IN
DA PATTERNS.





North Latitude 39° 24' 38"
West Longitude 76° 46' 34"

FIGURE 8
HORIZONTAL RADIATION PATTERN
DA-DAYTIME
WCBM 5 KW, 10 KW-LS, DA-2 680 KC
METROMEDIA, INC.
BALTIMORE, MARYLAND

Prepared by
Lohnes and Culver Washington, D. C.
September 1967

FCC File No.BL-11830
Accepted 12-12-67

Station WCBM
Baltimore, Maryland

680 kc

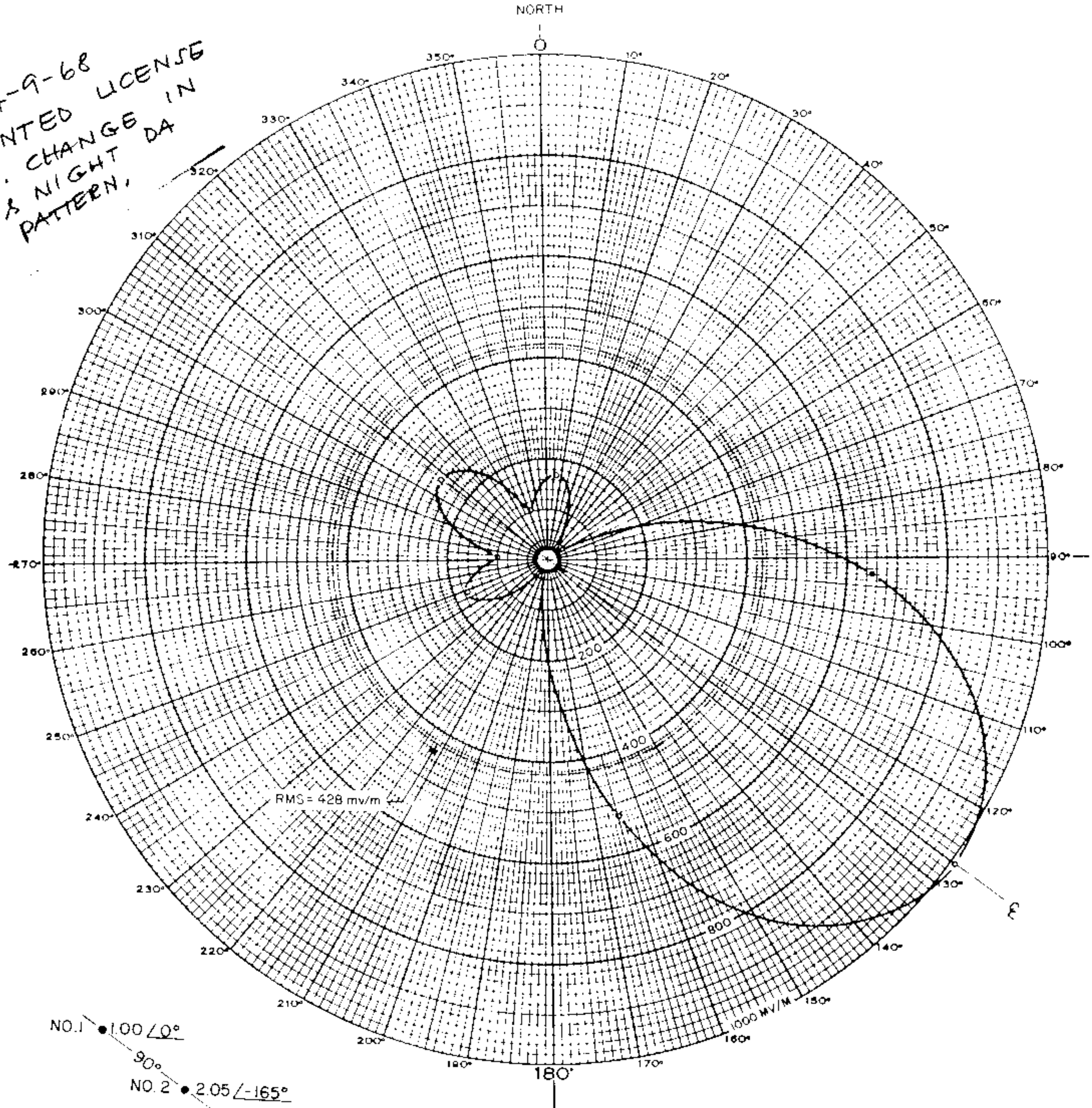
WCBM

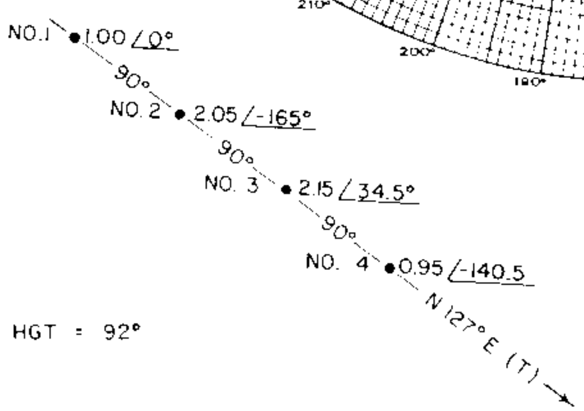
Measured Night
(12-28-67ct)

Station WCBM
Baltimore, Maryland

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

4-9-68
GRANTED LICENSE
COV. CHANGE IN
DAY & NIGHT DA
PATTERN,





HGT = 92°

FIGURE 9
HORIZONTAL RADIATION PATTERN
DA-NIGHTTIME
WCBM 5 KW, 10 KW-LS, DA-2 680 KC
METROMEDIA, INC.
BALTIMORE, MARYLAND

Prepared by
Lohnes and Culver Washington, D. C.

North Latitude 39° 24' 30"
West Longitude 76° 46' 34"

FCC File No.BL-11830
Accepted 12-12-67

Station WCBM
Baltimore, Maryland

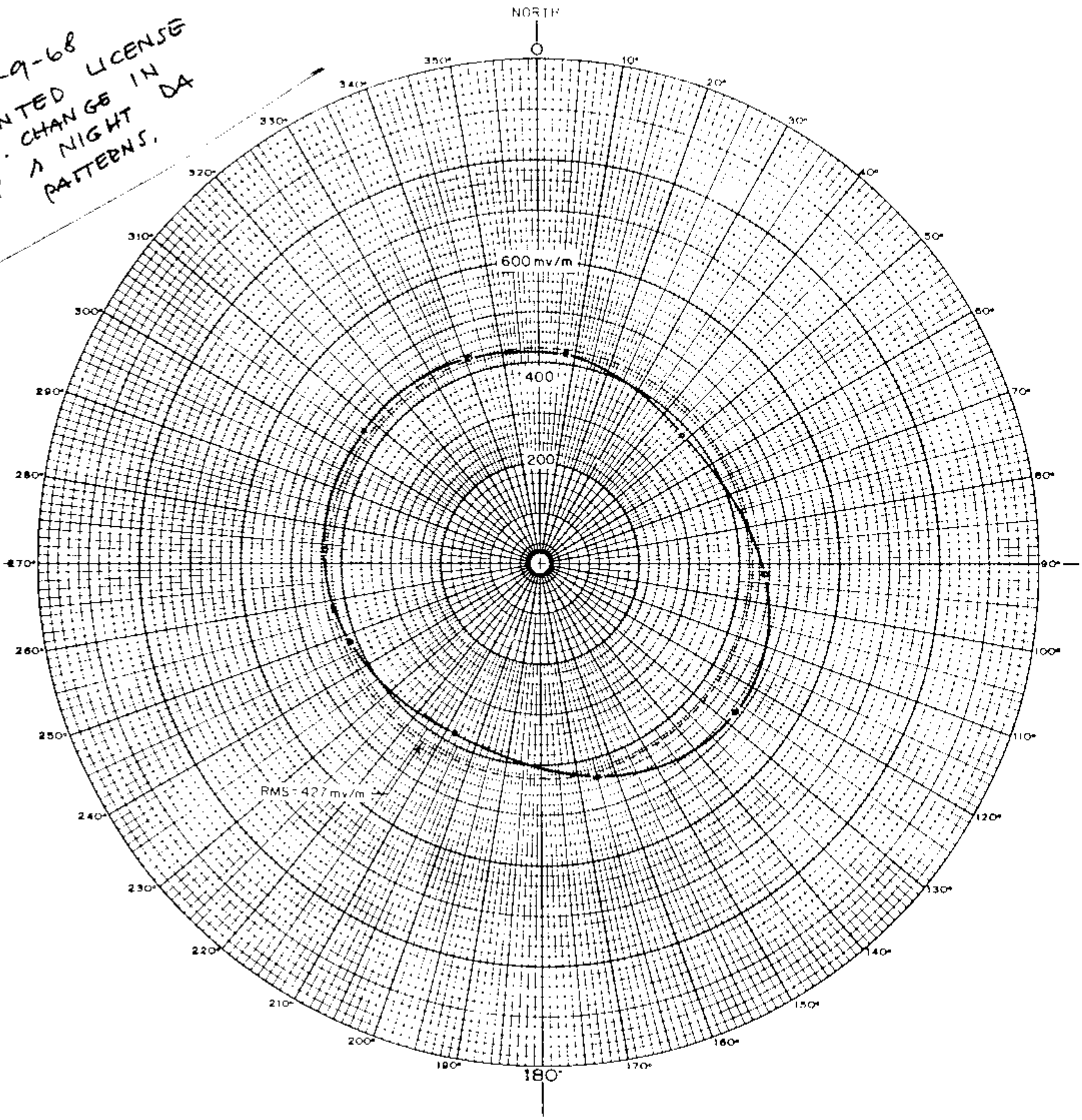
680 kc

Measured Non-DA
(12-28-67ct)

Station WCBM
Baltimore, Maryland

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

4-9-68
GRANTED LICENSE
COV. CHANGE IN
DAY & NIGHT DA
PATTERNS.



North Latitude 39° 24' 30"
West Longitude 76° 46' 34"

FIGURE 4
NON-DA RADIATION PATTERN
TOWER NO. 2
WCBM 5 KW, 10 KW-LS, DA-2 680 KC
METROMEDIA, INC.
BALTIMORE, MARYLAND

Prepared by
Lohnes and Culver Washington, D. C.

FCC File No.BL-11830
Accepted 12-12-67

Station WCBM
Baltimore, Maryland

680 kc

WCBM

MEASURED
DAY

WCBM, BALTIMORE, MD.

8/31/50G

5kw, 10kw-LS, DA-2

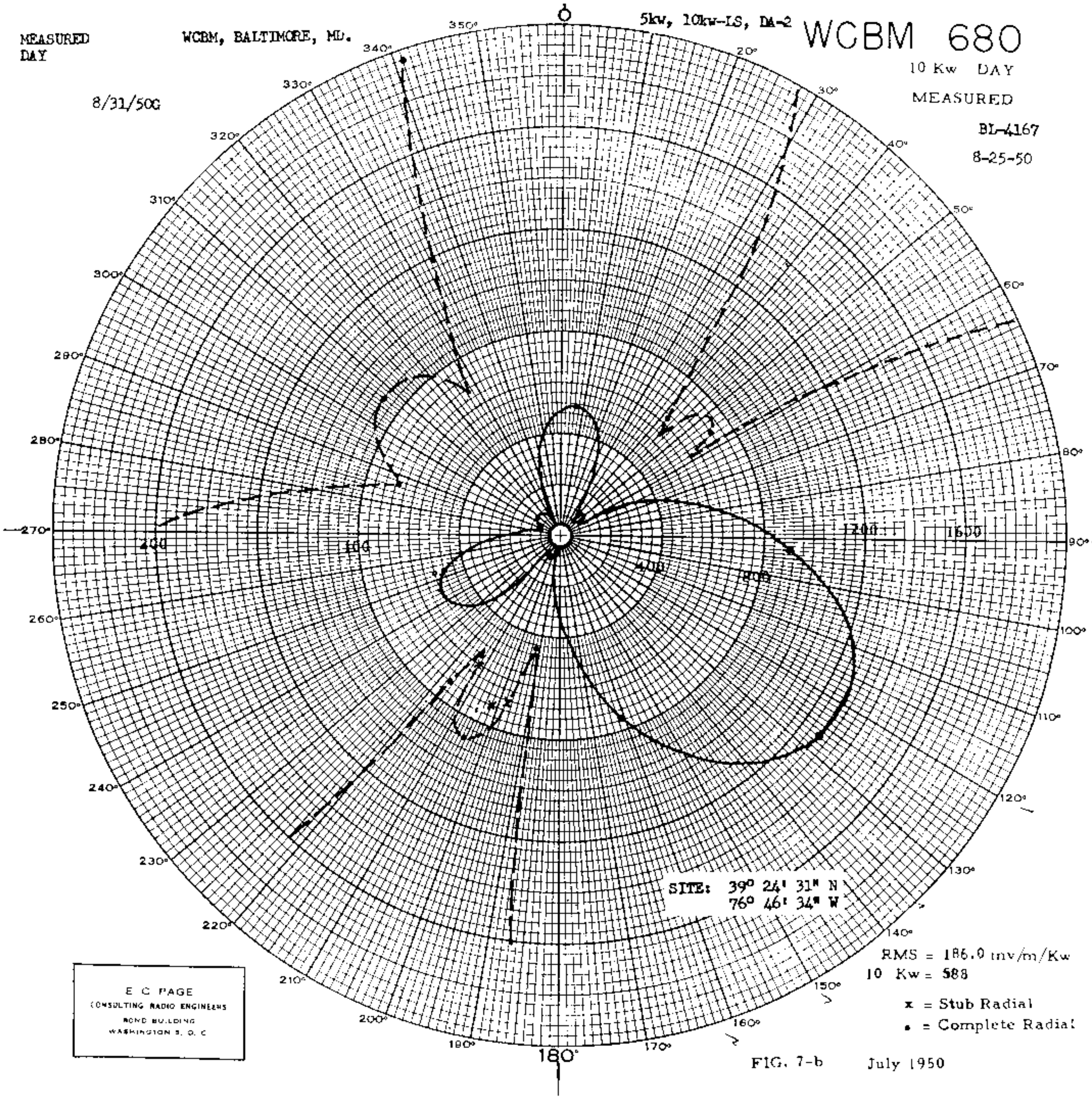
WCBM 680

10 Kw DAY

MEASURED

BL-4167

8-25-50



E C PAGE
CONSULTING RADIO ENGINEERS
BOND BUILDING
WASHINGTON 5, D. C.

RMS = 186.0 mv/m/Kw
10 Kw = 588

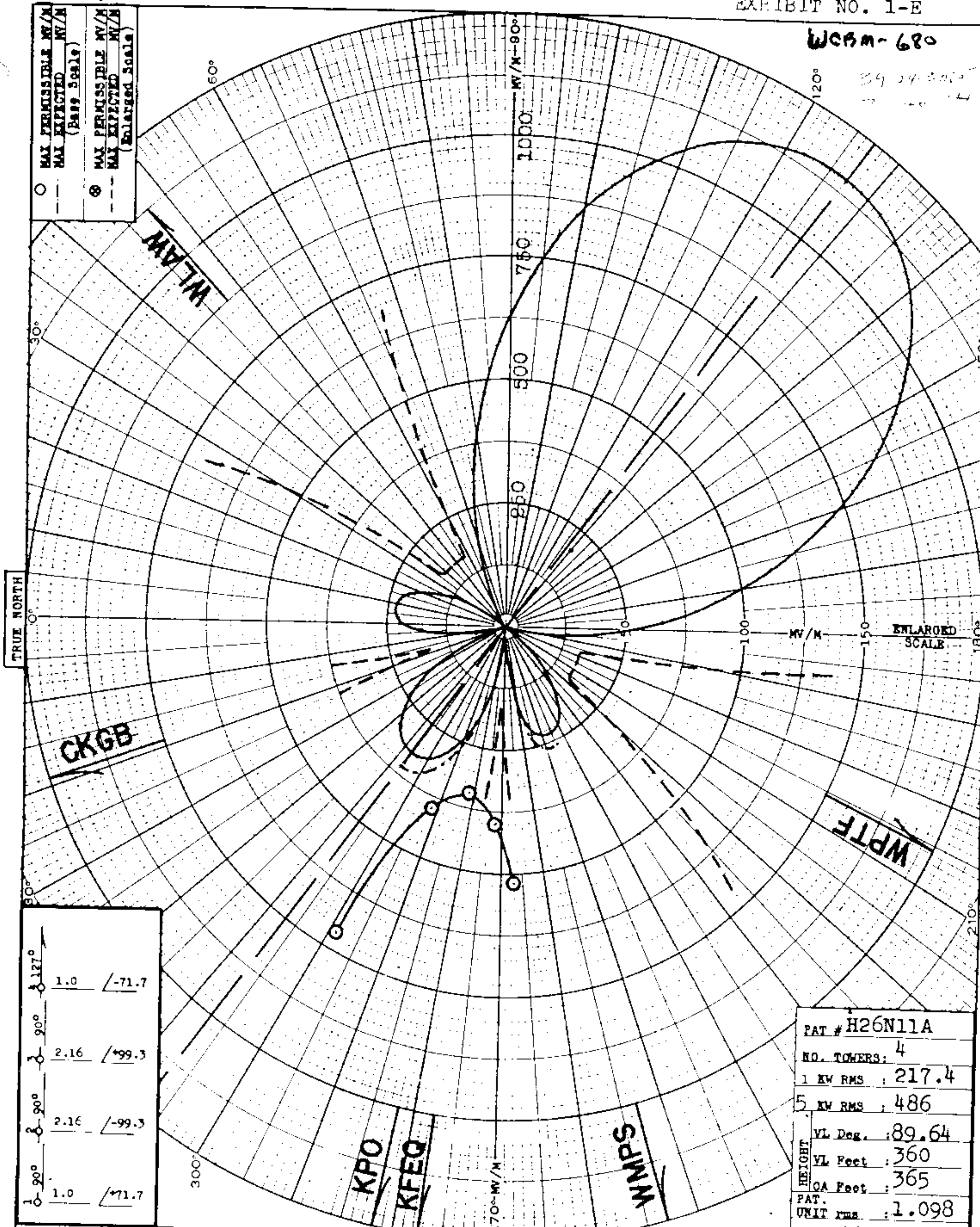
x = Stub Radial
• = Complete Radial

FIG. 7-b July 1950

Prop Nite

EXHIBIT NO. 1-E

WCBM-680



PAT # H26N11A
NO. TOWERS: 4
1 KW RMS : 217.4
5 KW RMS : 486
HEIGHT
VL Deg. : 89.64
VL Feet : 360
OA Feet : 365
PAT. UNIT rms : 1.098
K: 442.6

COMMERCIAL RADIO EQUIPMENT CO.

RADIO ENGINEERING CONSULTANTS

KANSAS CITY WASHINGTON, D.C. HOLLYWOOD

PATTERN: PROPOSED NIGHTTIME
FOR: WCBM, BALTIMORE, MD.
POWER: 5 KW FREQ: 680 KC
DATE: APRIL 3, 1946 BY: ITN

WCBM

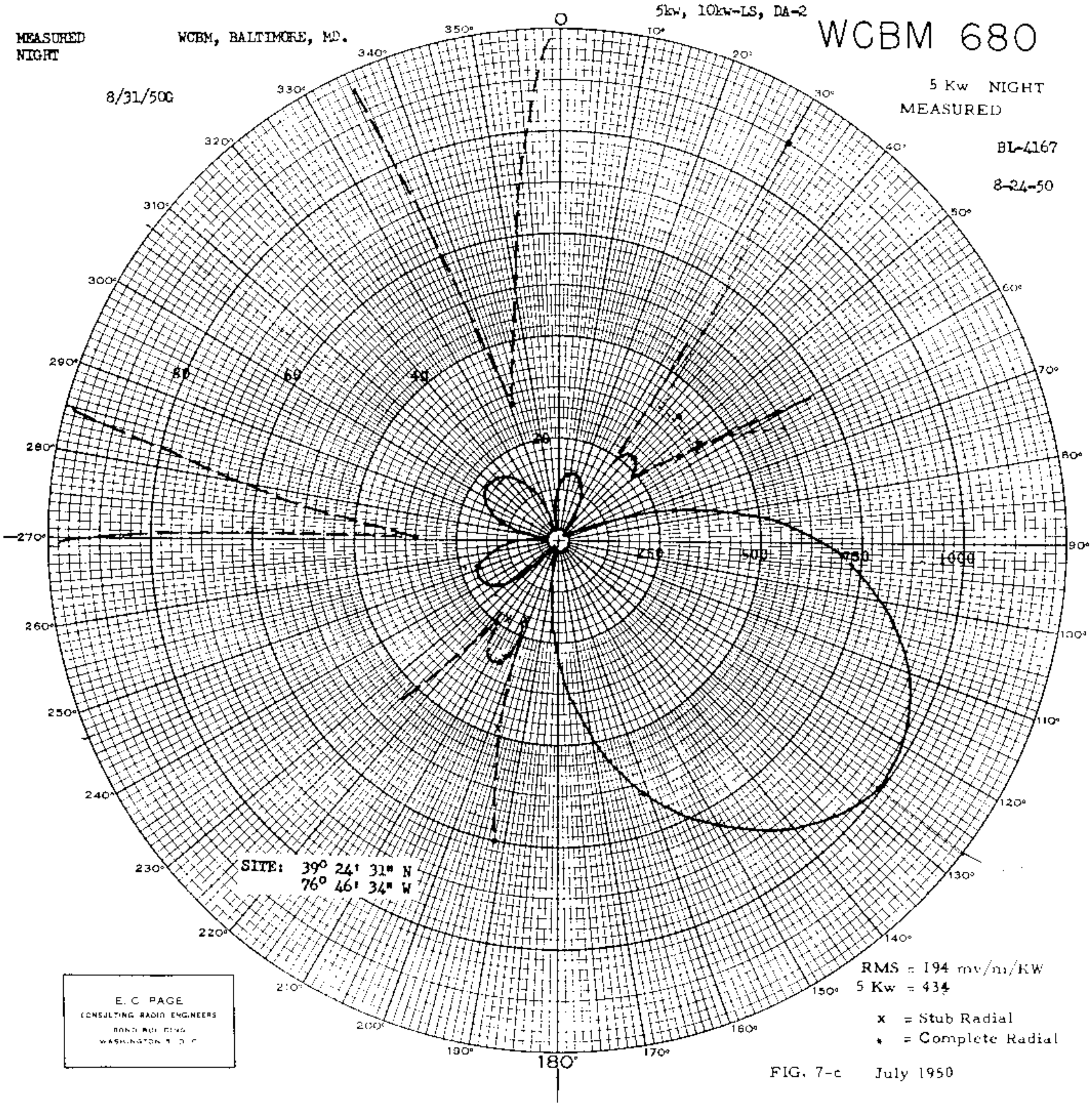
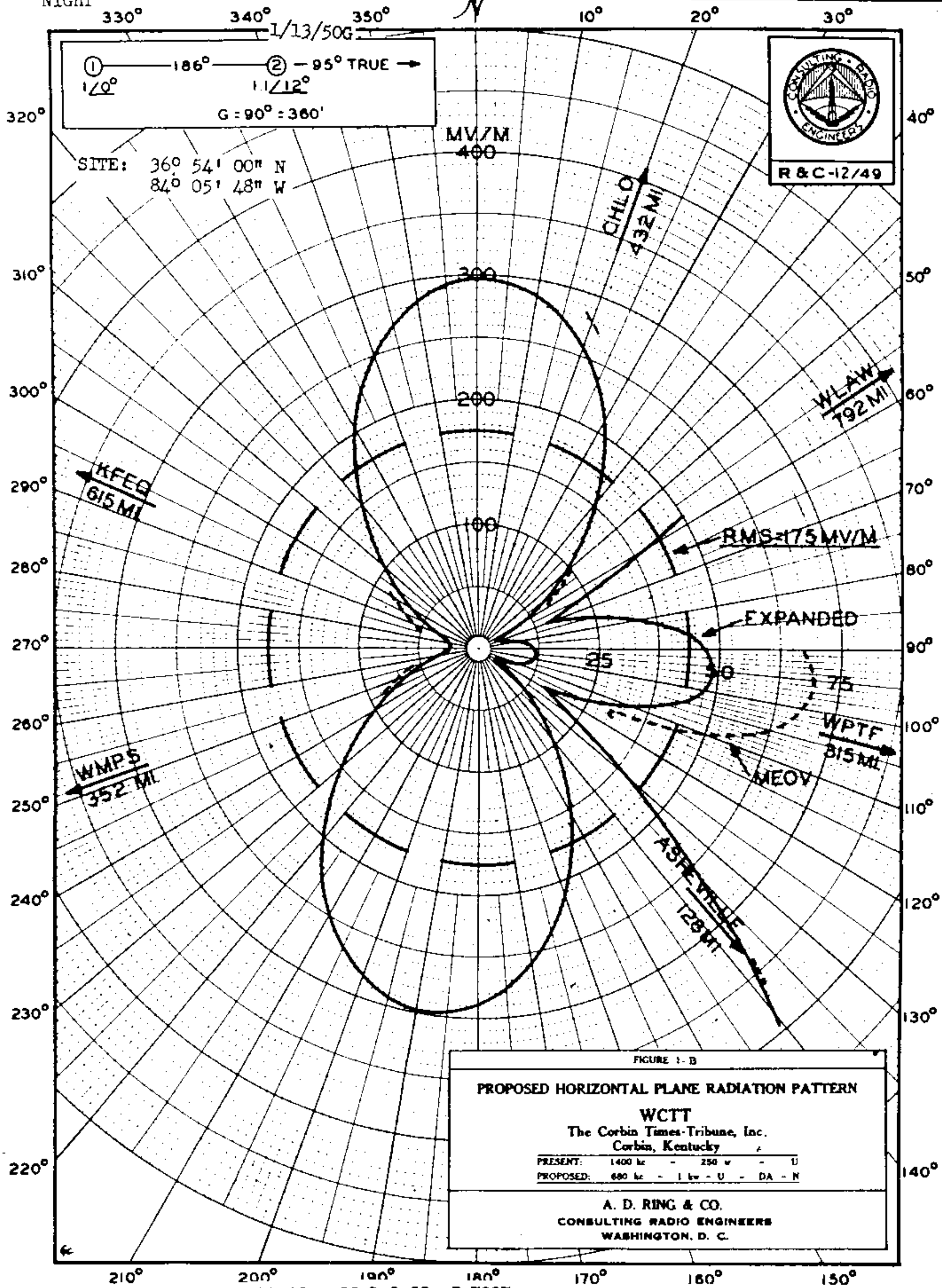


FIG. 7-c July 1950

WCBM, Baltimore, Md. 680 kc

WCTT

PROPOSED NIGHT | WCTT, CORBIN, KY. | 1kw, DAN | WCTT-680KC



AMENDMENT RECD 12-30-49 ACC 1-3-50 P-7037

WCTT, Corbin, Ky. 680 kc

WCTT

MEASURED
NIGHT WCTT, CORBIN, KENTUCKY 1 kw, U, DA-N 680 kc

7/13/51G

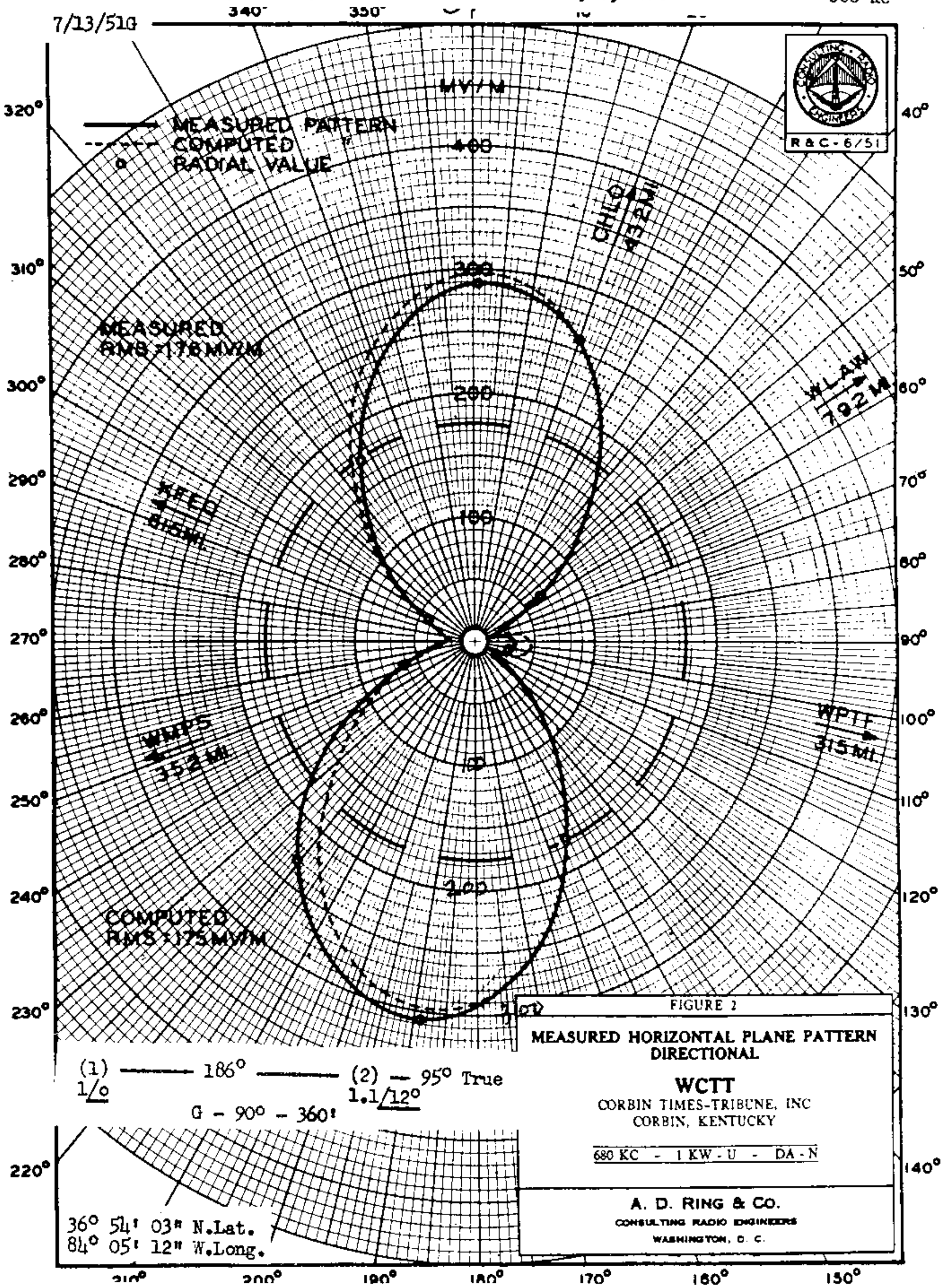


FIGURE 2

MEASURED HORIZONTAL PLANE PATTERN
DIRECTIONAL

WCTT

CORBIN TIMES-TRIBUNE, INC
CORBIN, KENTUCKY

680 KC - 1 KW - U - DA - N

A. D. RING & CO.
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

APPL RECD 7/3/51

WCTT, CORBIN, KY. 680 Kc

MEASURED
NIGHT
NON-DA WCTT, CORBIN, KENTUCKY 1 KW, U, DA-N 680 KC

WCTT

7/13/51G

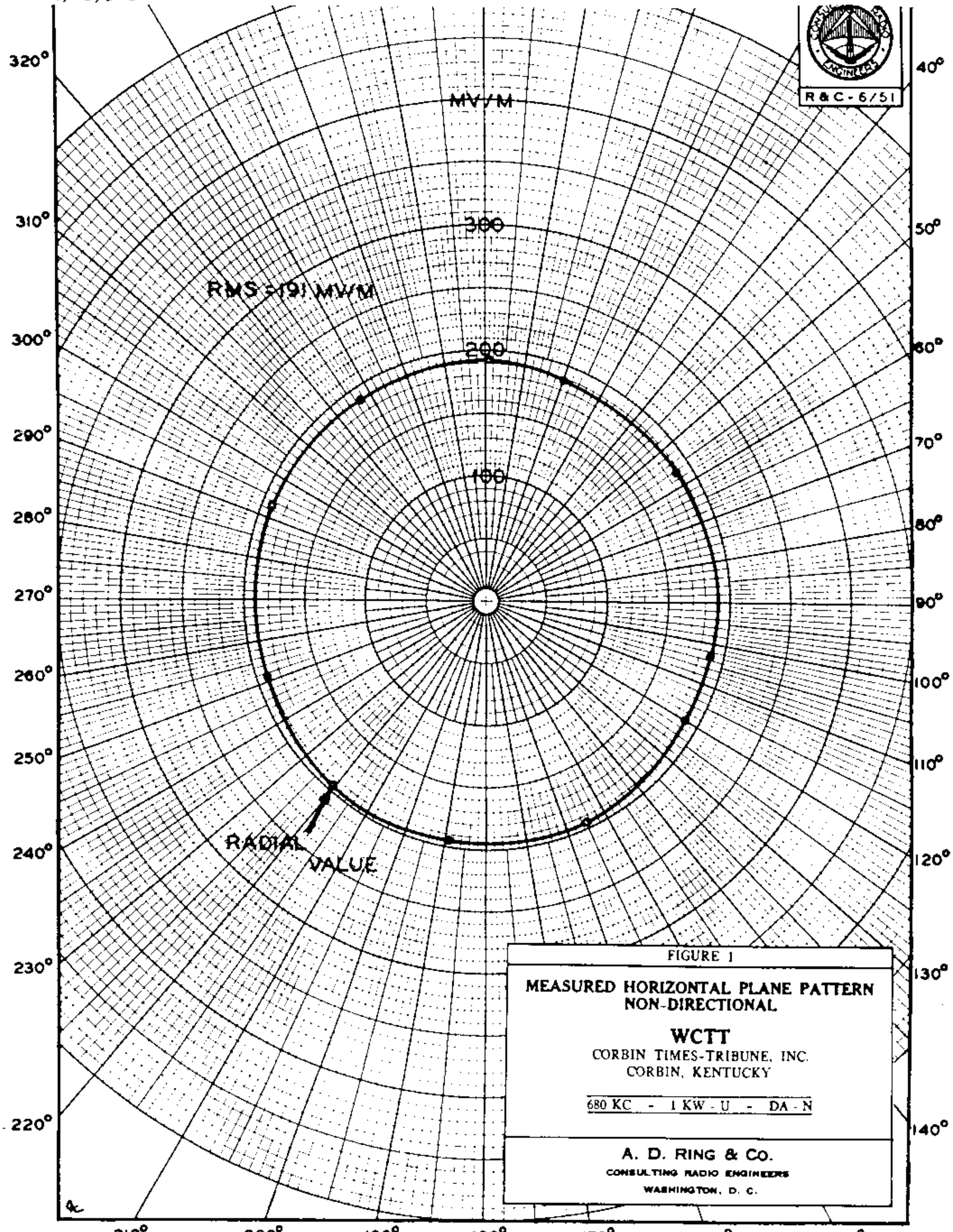


FIGURE 1

MEASURED HORIZONTAL PLANE PATTERN NON-DIRECTIONAL

WCTT

CORBIN TIMES-TRIBUNE, INC.
CORBIN, KENTUCKY

680 KC - 1 KW - U - DA - N

A. D. RING & Co.
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

APPL RECD 7/3/51 WCTT, CORBIN, KY. 680 KC

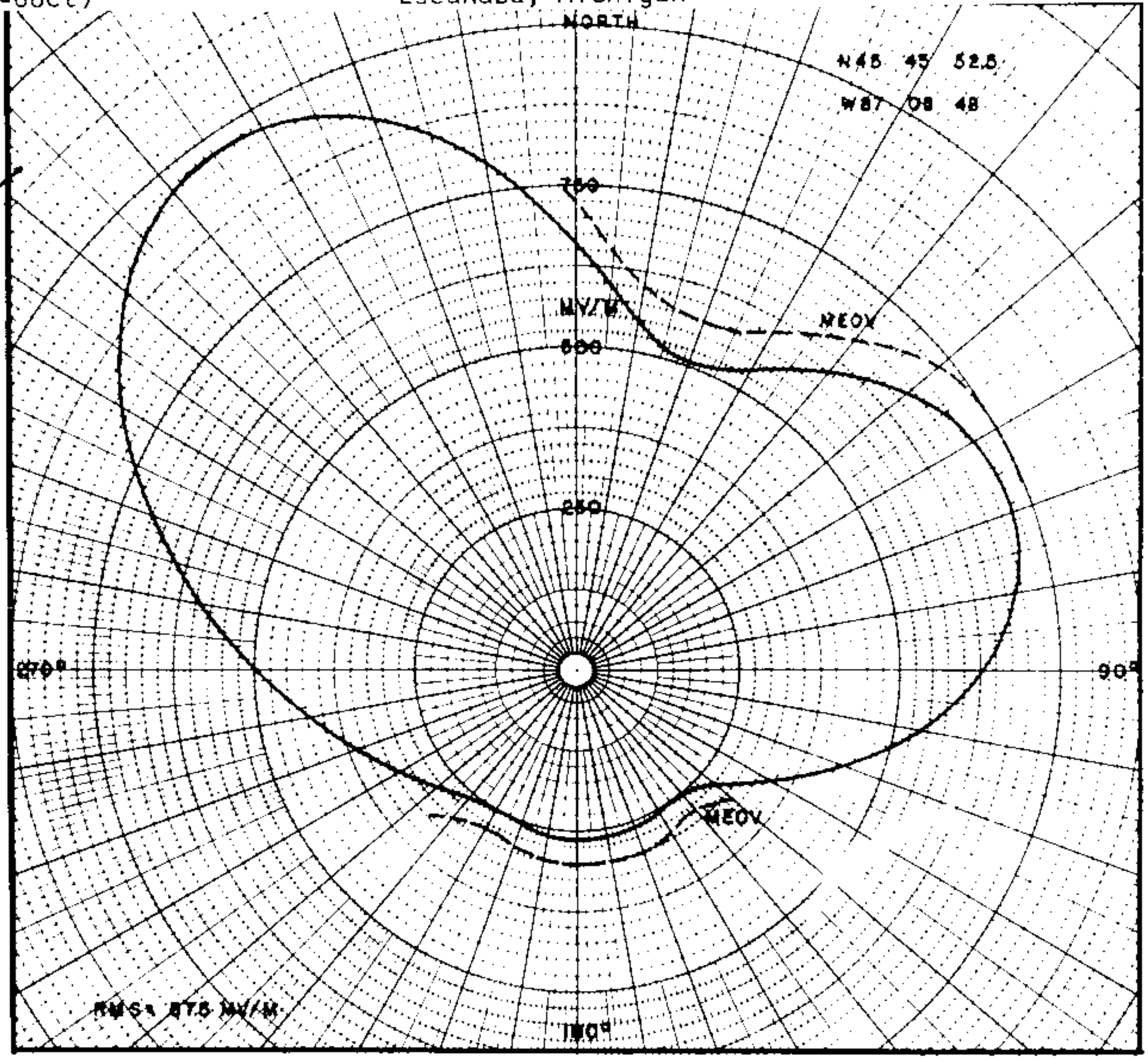
WDBC

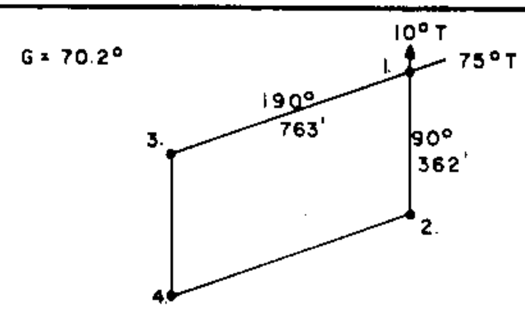
Proposed Day
(2-28-68ct)

Station WDBC
Escanaba, Michigan

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

2-13-68
GRANTED CP
to change DAYT.
direct. antenna.
8-28-68





TOWER 1. = 1.000 /0°
2. = .613 /75°
3. = .312 /-70°
4. = .192 /5°

WDBC

CALCULATED DAY PATTERN

680 KHZ 10/1.0KW DA-2

ESCANABA, MICHIGAN

OCTOBER, 1967

ROBERT A. JONES
CONSULTING ENGINEERS
LA GRANGE, ILLINOIS

FCC File No. BMP-12282
Accepted 2-5-68

Station WDBC
Escanaba, Michigan

680 kc

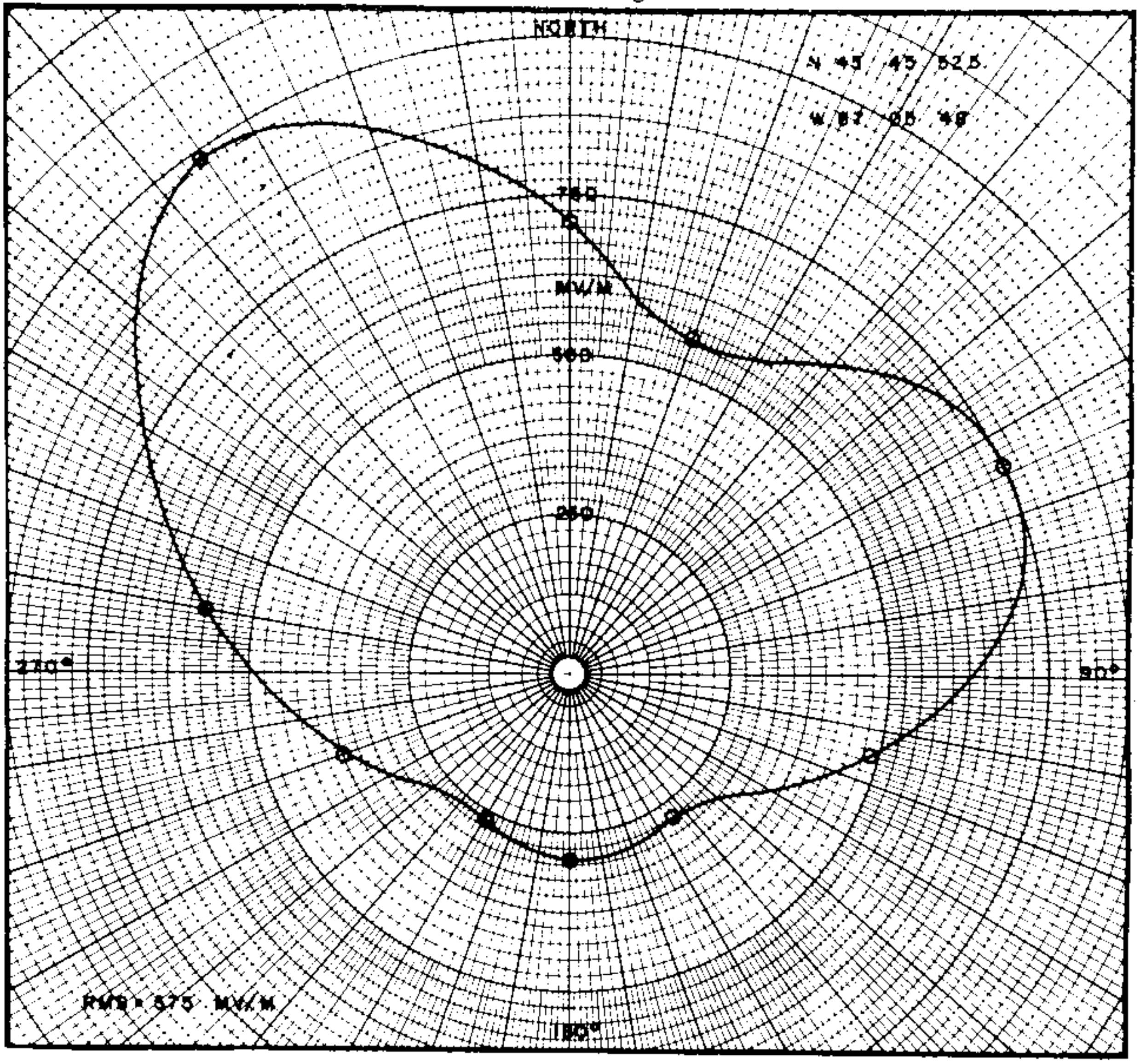
WDBC

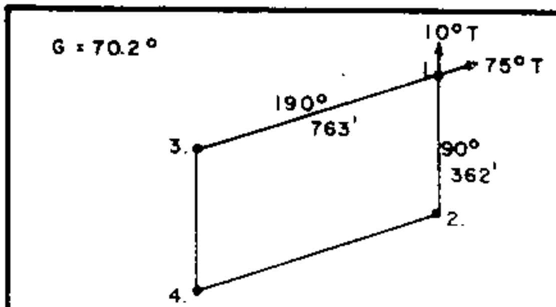
Measured Day
(6-28-68ct)

Station WDBC
Escanaba, Michigan

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

8-28-69
BL-11965
GRANTED
6-25-69
LICENSE
COVERING
CHANGES





TOWER 1. = 1.000 /0° CALC., 1.000 /0° MEAS.
" 2. = .613 /75° " , .558 /75° "
" 3. = .312 /-70° " , .264 /-48° "
" 4. = .192 /5° " , .223 /17° "

WDBC

MEASURED DAY PATTERN

680 KHZ 10/1.0 KW DA-2

ESCANABA , MICHIGAN

NOV., 1967

ROBERT A. JONES
CONSULTING ENGINEERS
LA GRANGE, ILLINOIS

FCC File No. BL-11965
Accepted 6-11-68

Station WDBC
Escanaba, Michigan

680 kc

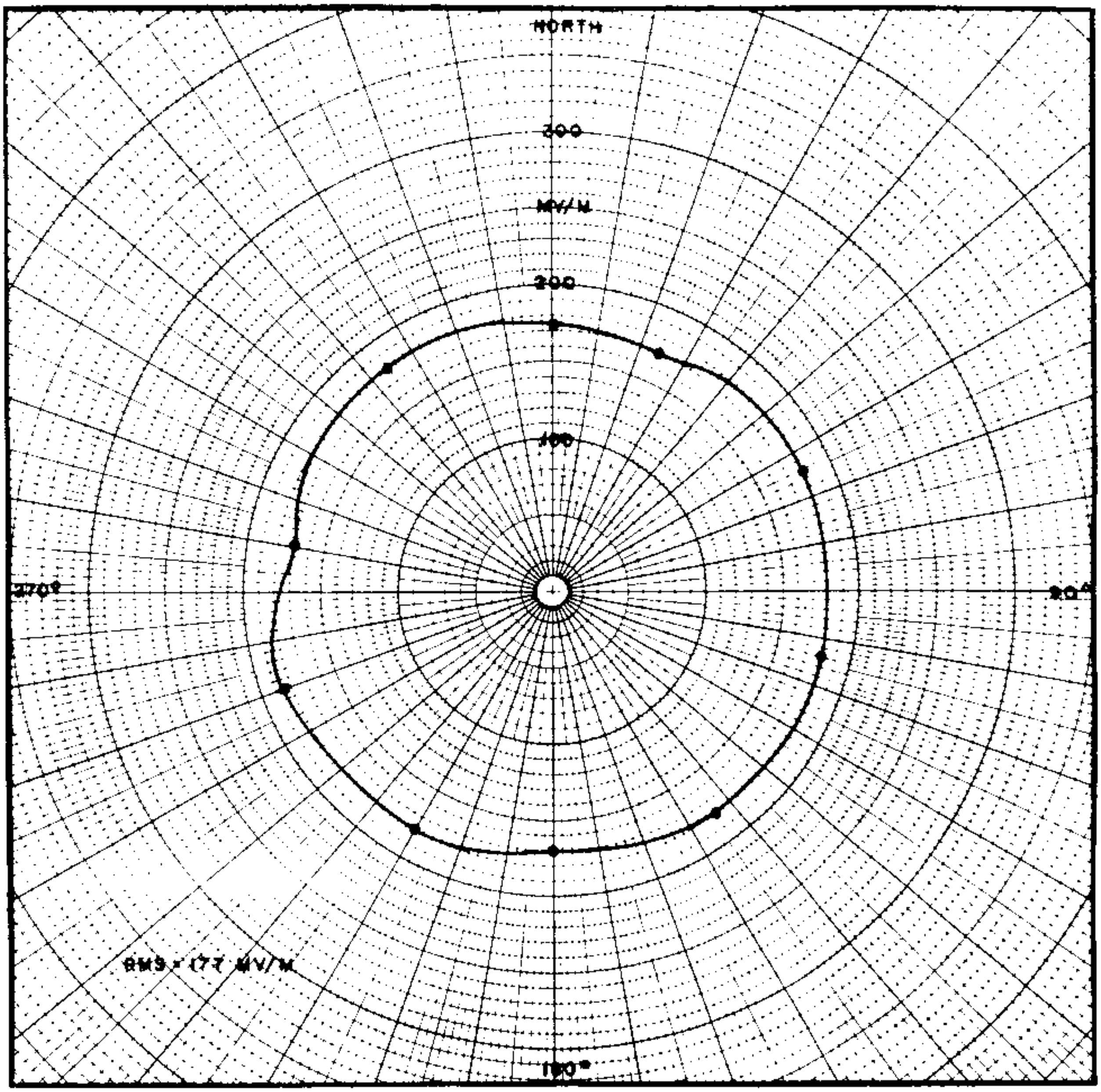
W DBC

Measured Non-DA
(6-28-68ct)

Station WDBC
Escanaba, Michigan

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

BL-11965
GRANTED
(6-25-68)
LICENSE
COVERING
CHANGES.



WDBC
NON-DIRECTIONAL PROOF

1.0 KW 680 KHZ

ESCANABA, MICHIGAN
JULY, 1967

ROBERT A. JONES
CONSULTING ENGINEERS
LA GRANGE, ILLINOIS

FCC File No. BL-11965
Accepted 6-11-68

Station WDBC
Escanaba, Michigan

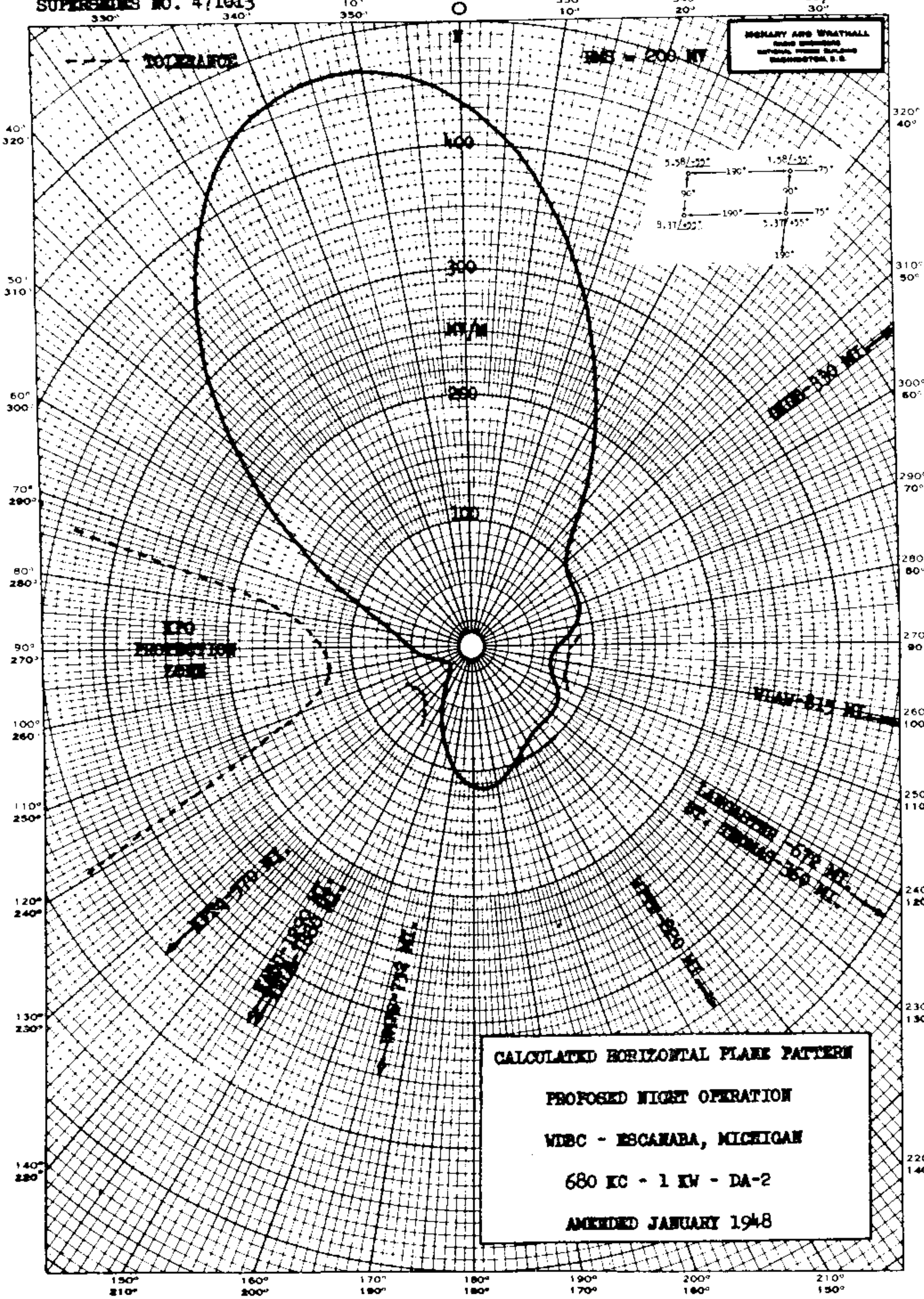
680 kc

WDBC
680

PATTERN NO. 480106
SUPERSEDES NO. 471013

Rec'd 1-19-48

P-6219



CALCULATED HORIZONTAL PLANE PATTERN

PROPOSED NIGHT OPERATION

WDBC - ESCANABA, MICHIGAN

680 KC - 1 KW - DA-2

AMENDED JANUARY 1948

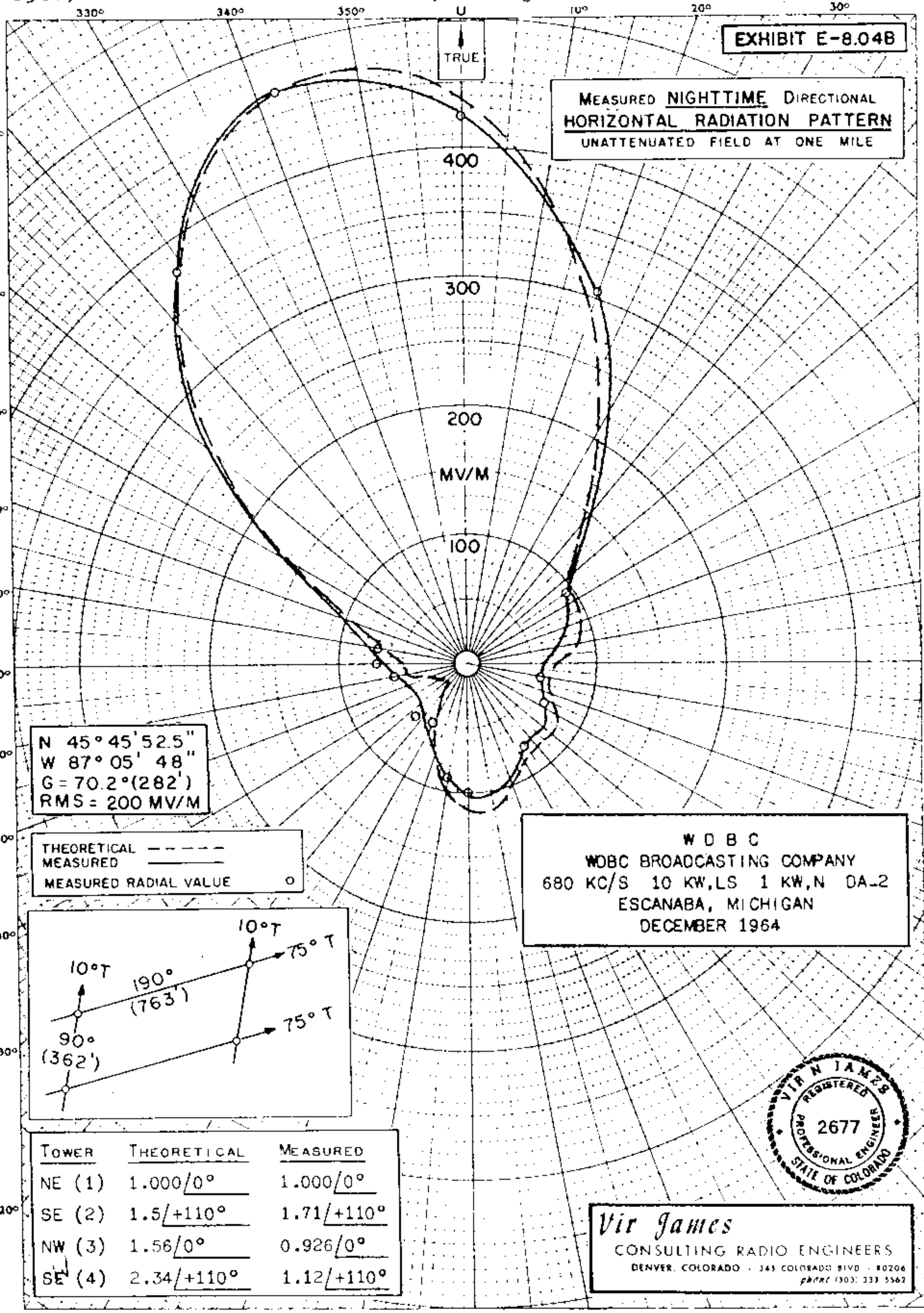
WDBC

Measured Night
(4-28-65ct)

Station WDBC
Escanaba, Michigan

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

BL-10840
4-22-65
LIC. INCR. DAY PWR.



Tower	Theoretical	Measured
NE (1)	1.000/0°	1.000/0°
SE (2)	1.5/+110°	1.71/+110°
NW (3)	1.56/0°	0.926/0°
SE (4)	2.34/+110°	1.12/+110°

FCC File No. BL-10840
Accepted 3-30-65

Station WDBC
Escanaba, Michigan

680 kc

WINR

PROPOSED DAY
(6/26/57g)

Station WINR
Binghampton, New York

500w, 1kw-LS, DA-2,U
680 KC

Granted CP 6/27/57 to change DA pattern

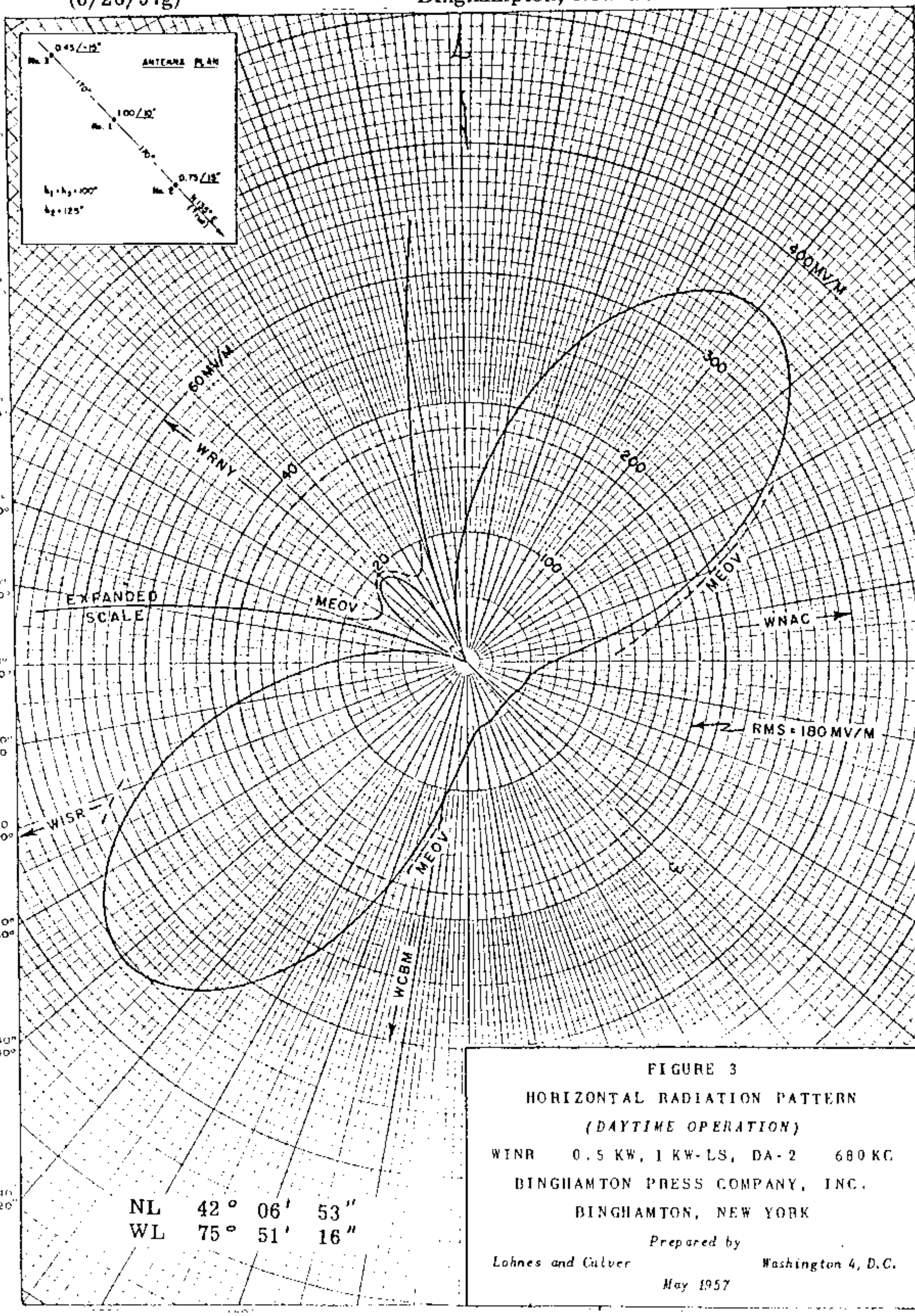


FIGURE 3

HORIZONTAL RADIATION PATTERN

(DAYTIME OPERATION)

WINR 0.5 KW, 1 KW-LS, DA-2 680 KC

BINGHAMTON PRESS COMPANY, INC.

BINGHAMTON, NEW YORK

Prepared by

Lohnes and Culver *Washington 4, D.C.*

May 1957

FCC File No. BP-11,342
Accepted 6/20/57

WINR
Binghampton, New York 680 KC

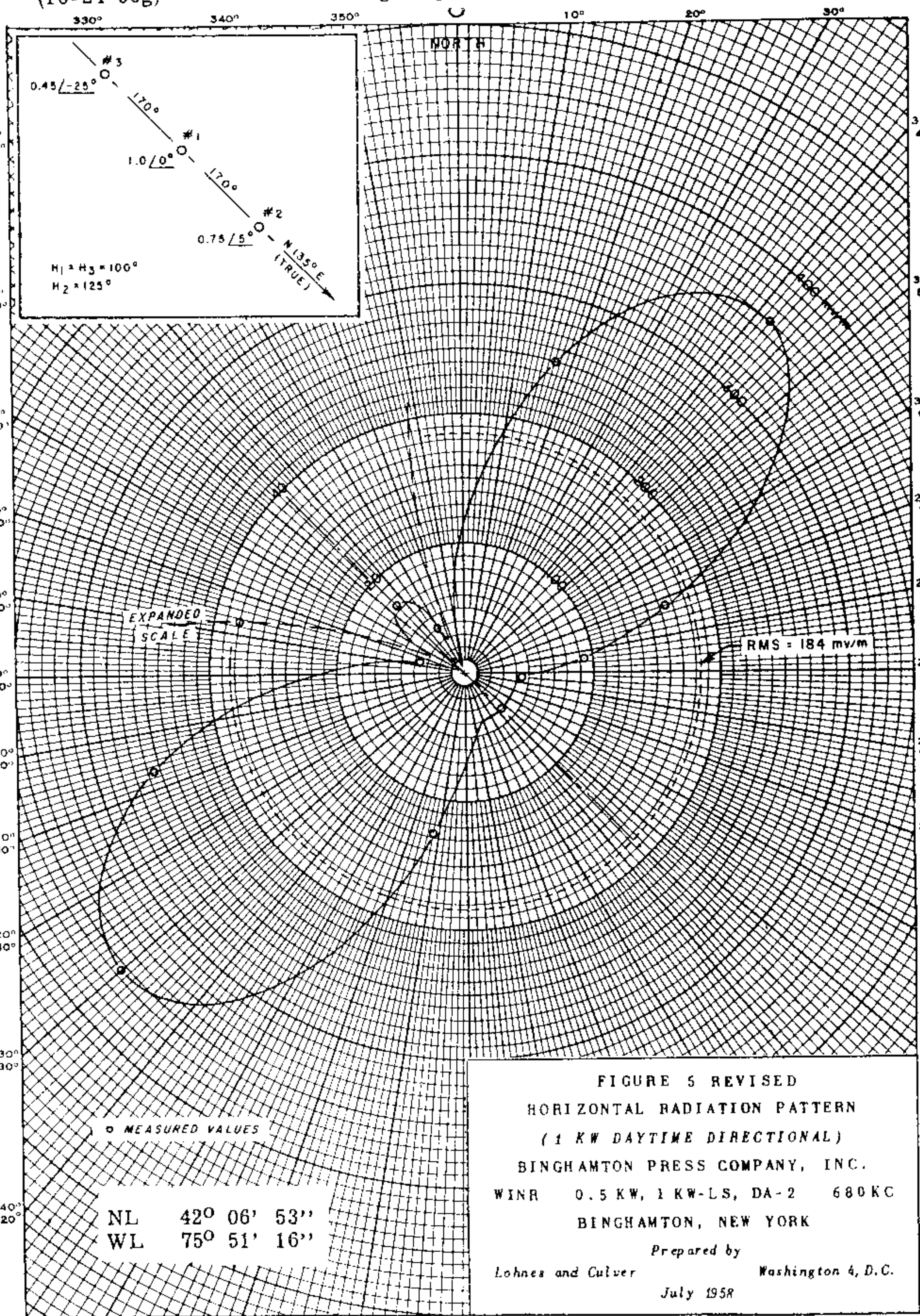
WINR

MEASURED DAY
(10-24-58g)

Station WINR
Binghampton, New York

500w, 1kw-LS, DA-2, U
680 KC

Granted license 10/23/58



FCC File No. BL-7190
Received 10-6-58 Amended

WINR
Binghampton, New York

680 KC

WINR

PROPOSED NIGHT
(6/26/57g)

Station WINR — 500w, 1KW-LS, DA-2,U
Binghampton, New York — 680 KC

Granted CP 6/27/57 to change DA pattern

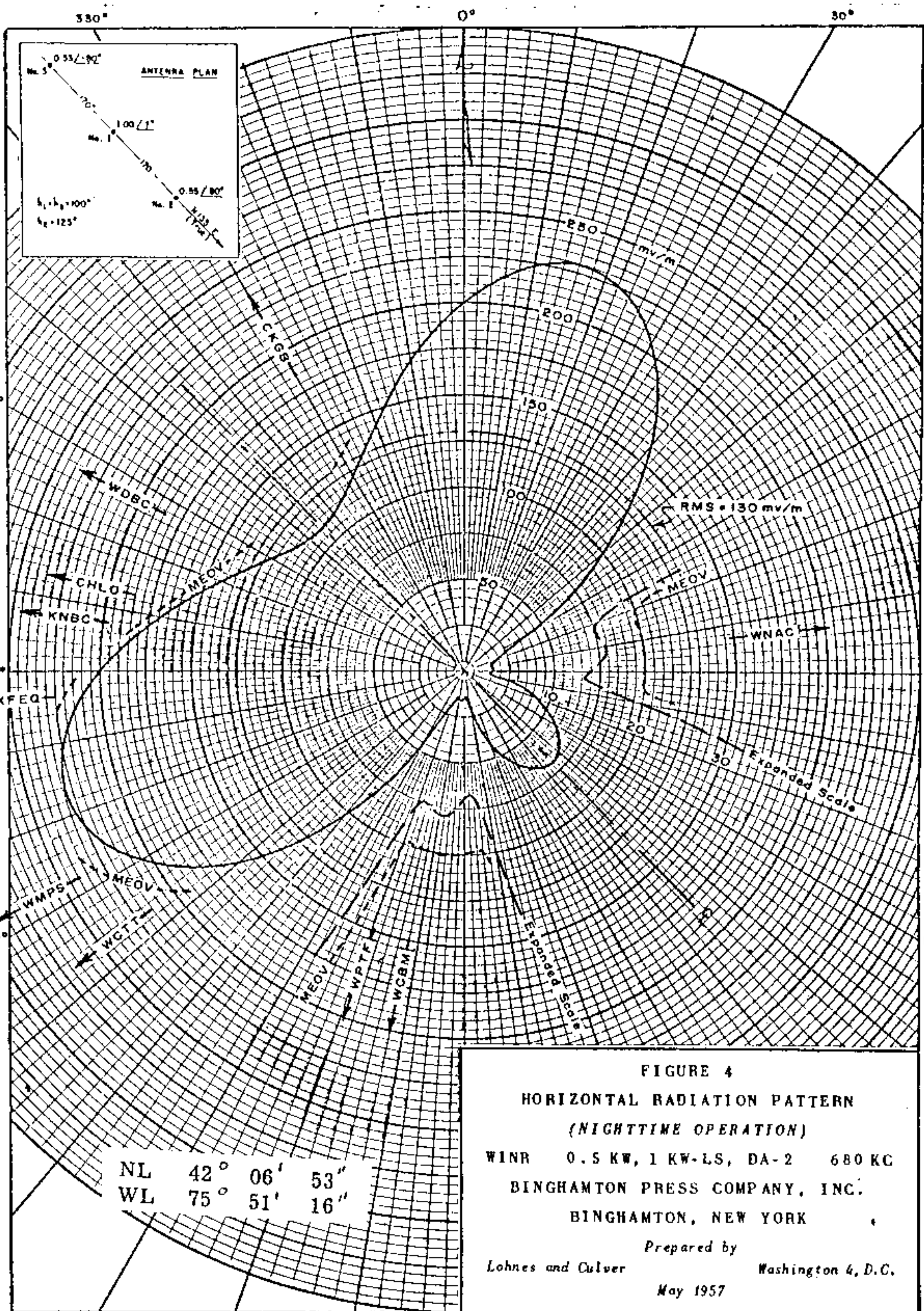


FIGURE 4
HORIZONTAL RADIATION PATTERN
(NIGHTTIME OPERATION)
WINR 0.5 KW, 1 KW-LS, DA-2 680 KC
BINGHAMTON PRESS COMPANY, INC.
BINGHAMTON, NEW YORK
Prepared by
Lohnes and Culver — Washington 4, D.C.
May 1957

FCC File No. 11,342
Accepted 6/20/57

WINR
Binghampton, New York — 680 KC

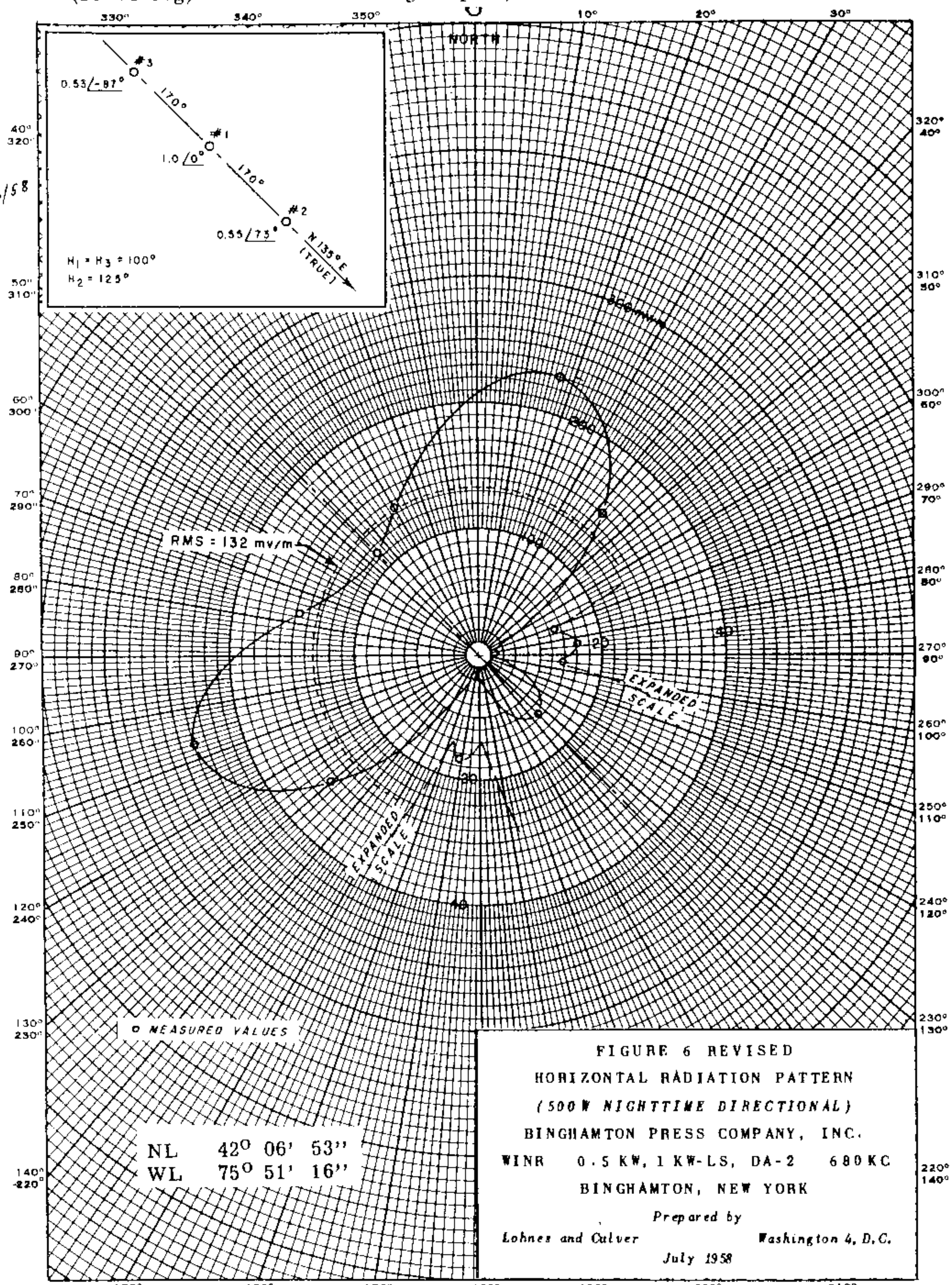
WINK

MEASURED NIGHT
(10-24-58g)

Station WINR
Binghampton, New York

500w,1kw-LS, DA-2,U
680 KC

Granted license 10/23/58



FCC File No. BL-7190
Received 10-6-58 Amended

WINR
Binghampton, New York

680 KC

WINR

MEASURED NON-DA
(10-24-58g)

Station WINR
Binghampton, New York

500w, 1kw-LS, DA-2,U
680 KC

Granted license 10/23/58

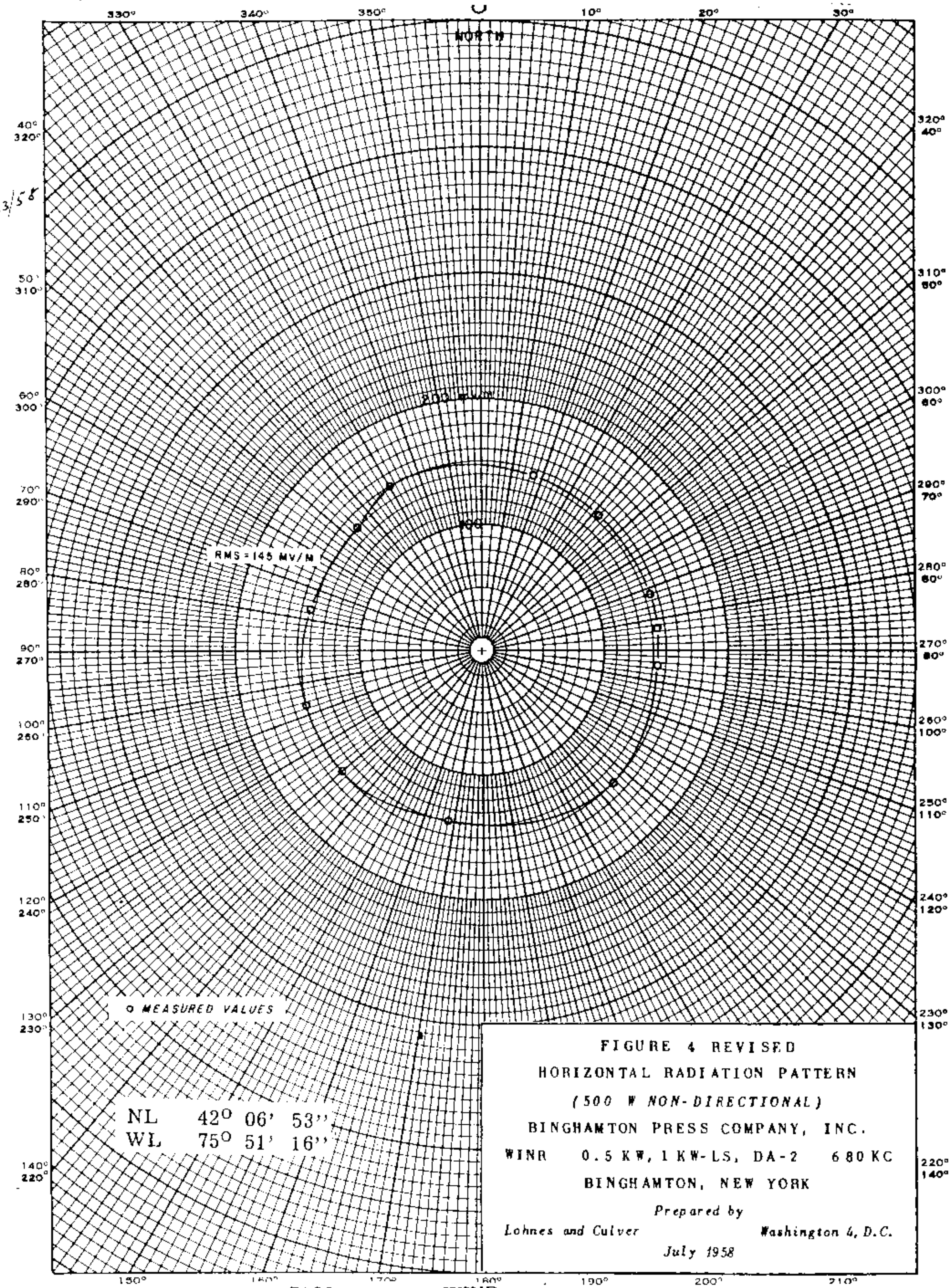


FIGURE 4 REVISED
HORIZONTAL RADIATION PATTERN
(500 W NON-DIRECTIONAL)
BINGHAMTON PRESS COMPANY, INC.
WINR 0.5 KW, 1 KW-LS, DA-2 680 KC
BINGHAMTON, NEW YORK
Prepared by
Lohnes and Culver *Washington 4, D.C.*
July 1958

FCC File No. BL-7190
Received 10-6-58 Amended

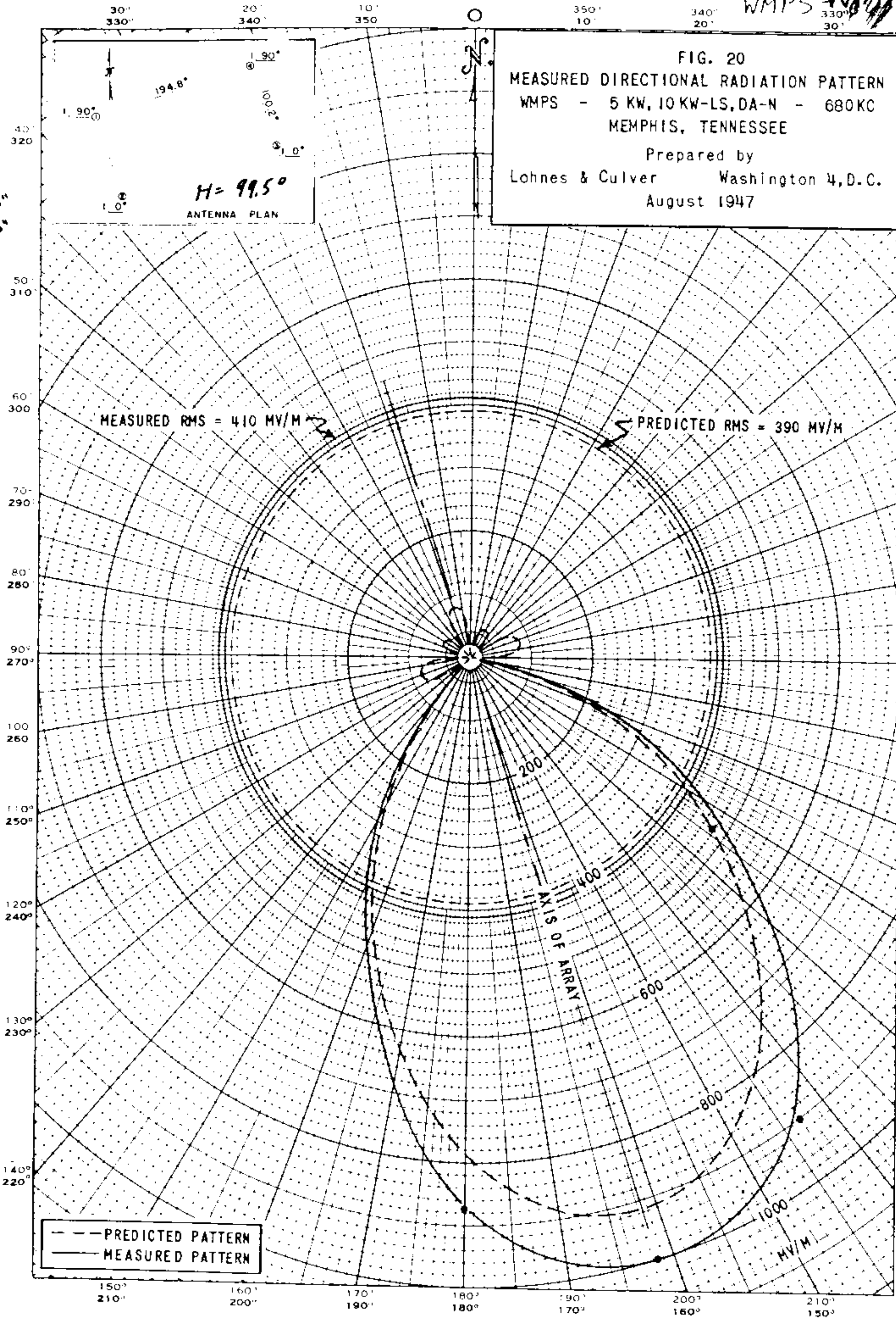
WINR
Binghampton, New York

680 KC

WMPS WMPS

680

35° 13' 23"
90° 02' 53"



Proposed and measured night

WMPS WMPS

680

35°13'23"
90°02'33"

Prepared and measured night null

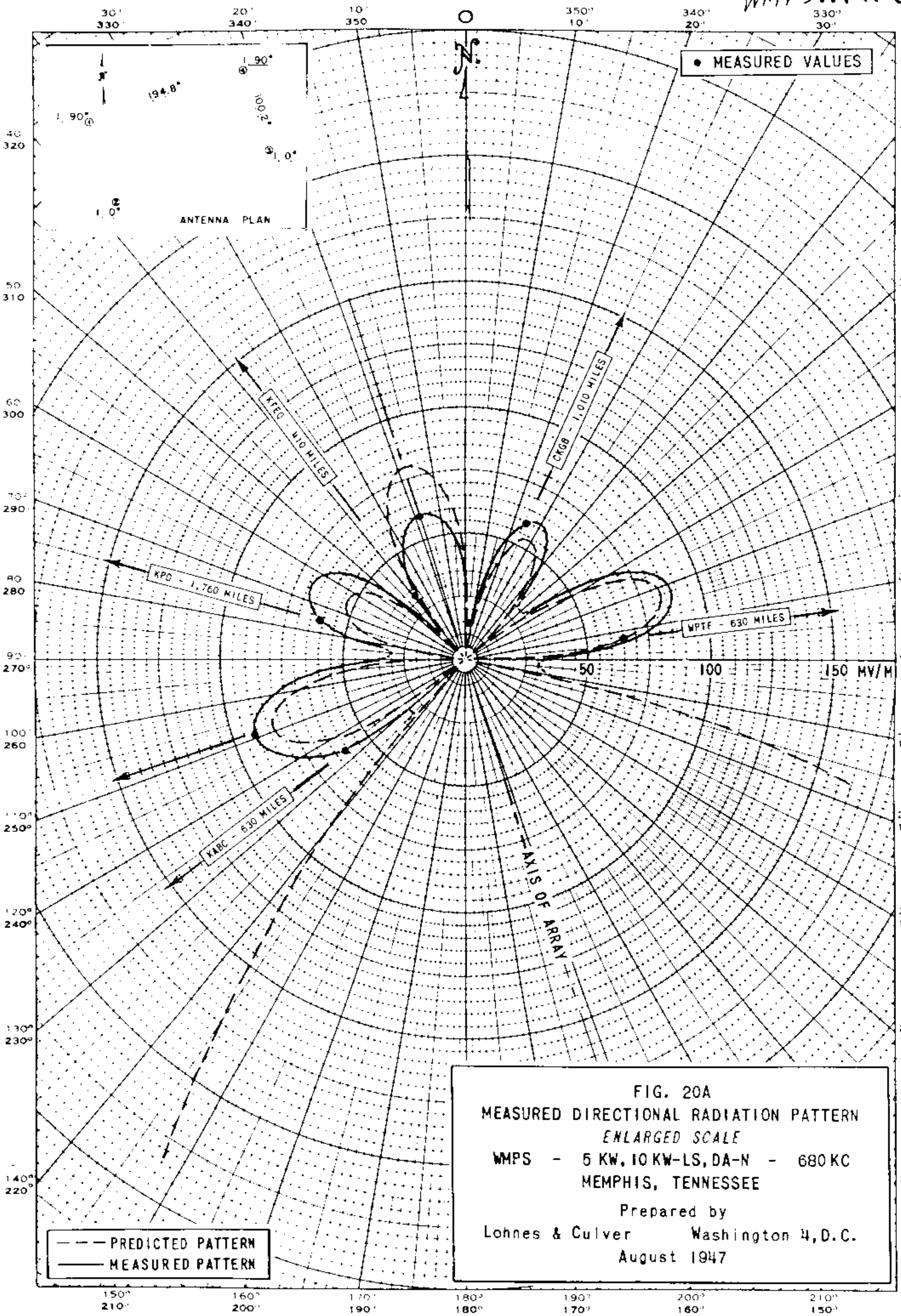


FIG. 20A
MEASURED DIRECTIONAL RADIATION PATTERN
ENLARGED SCALE
WMPS - 5 KW, 10 KW-LS, DA-N - 680 KC
MEMPHIS, TENNESSEE
Prepared by
Lohnes & Culver Washington 4, D.C.
August 1947

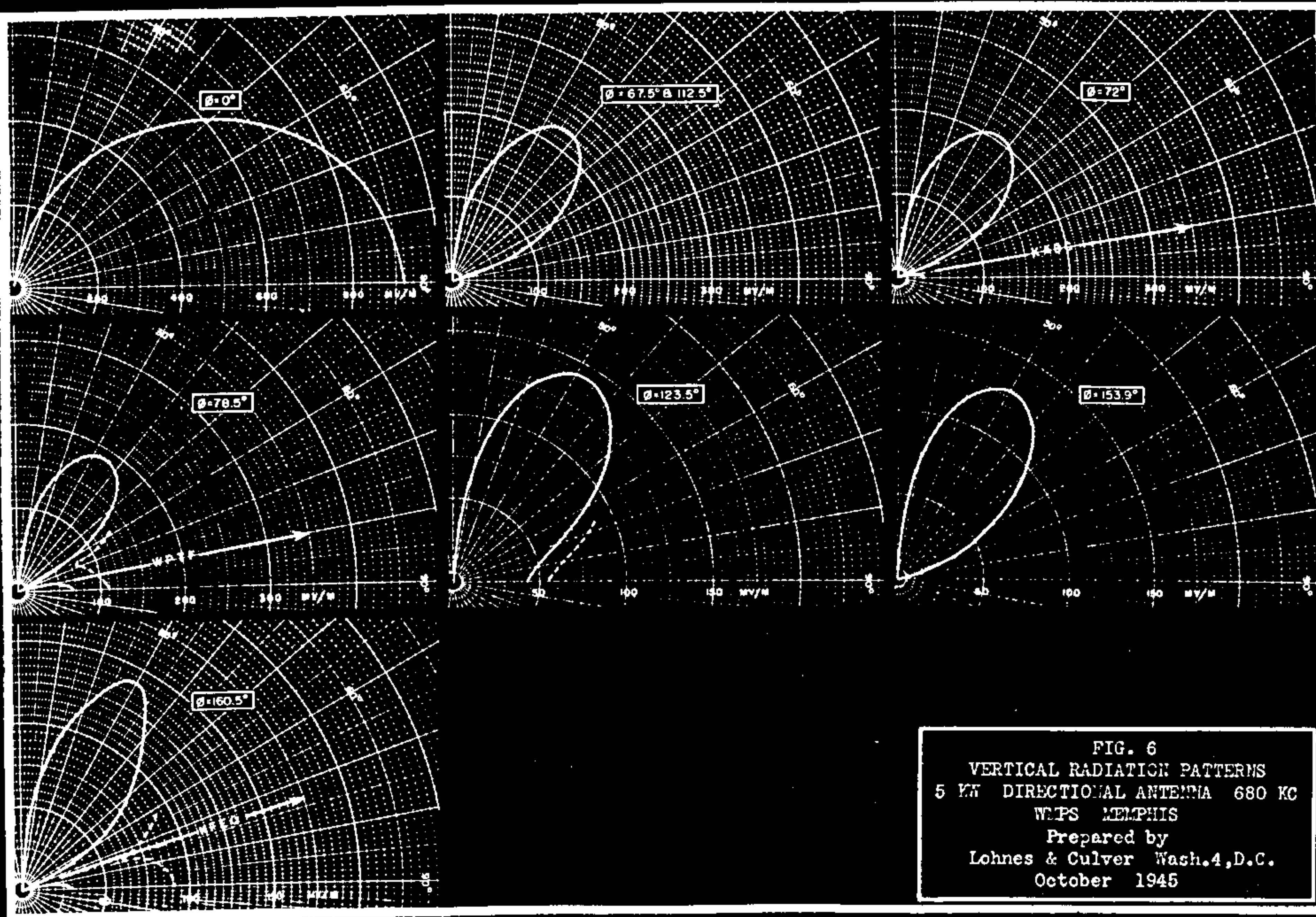


FIG. 6
VERTICAL RADIATION PATTERNS
5 KW DIRECTIONAL ANTENNA 680 KC
WMPS MEMPHIS
Prepared by
Lohnes & Culver Wash.4,D.C.
October 1945

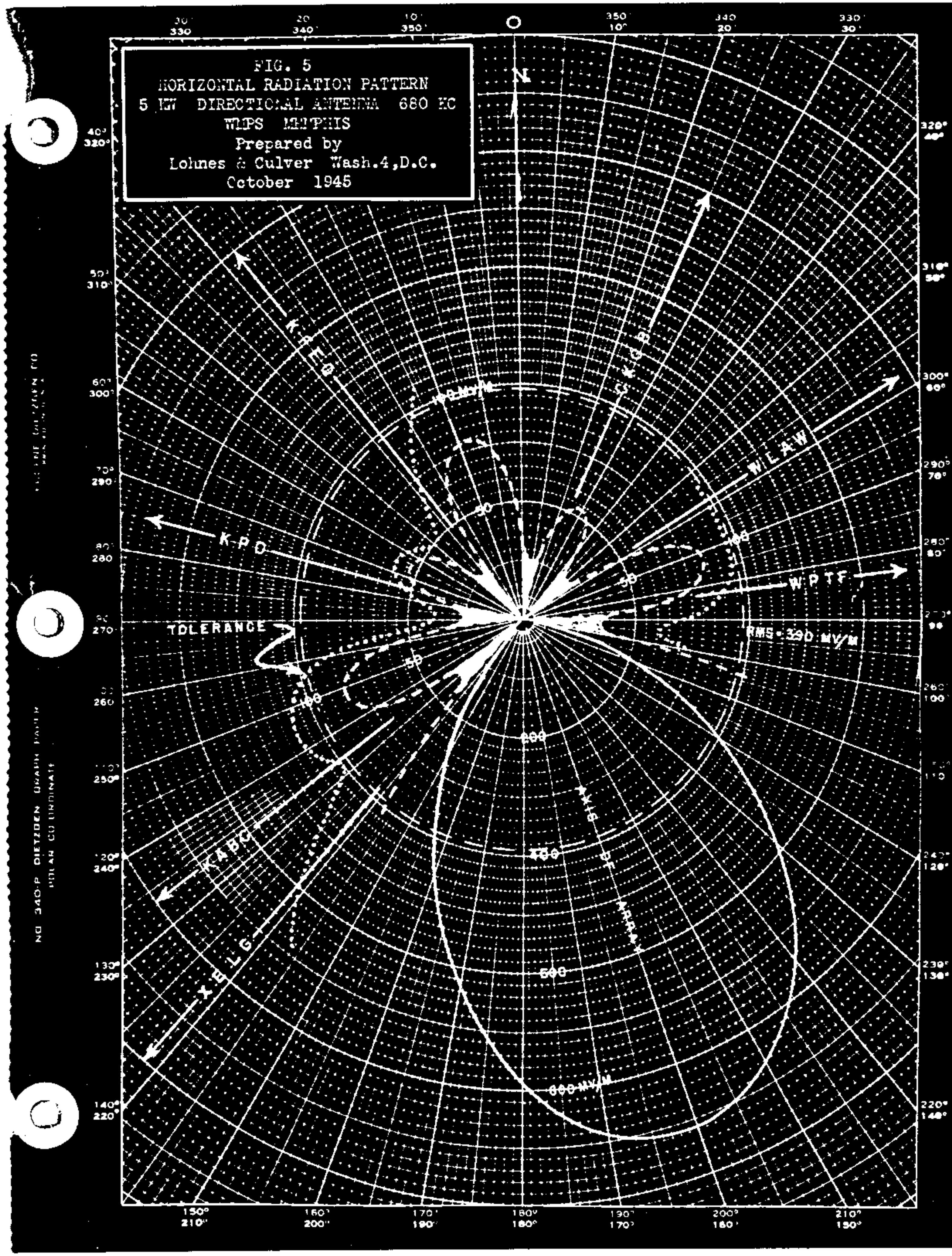


FIG. 5
HORIZONTAL RADIATION PATTERN
5 KW DIRECTIONAL ANTENNA 680 KC
WMPS MEMPHIS
Prepared by
Lohnes & Culver Wash.4,D.C.
October 1945

WPTF

PROPOSED NIGHT

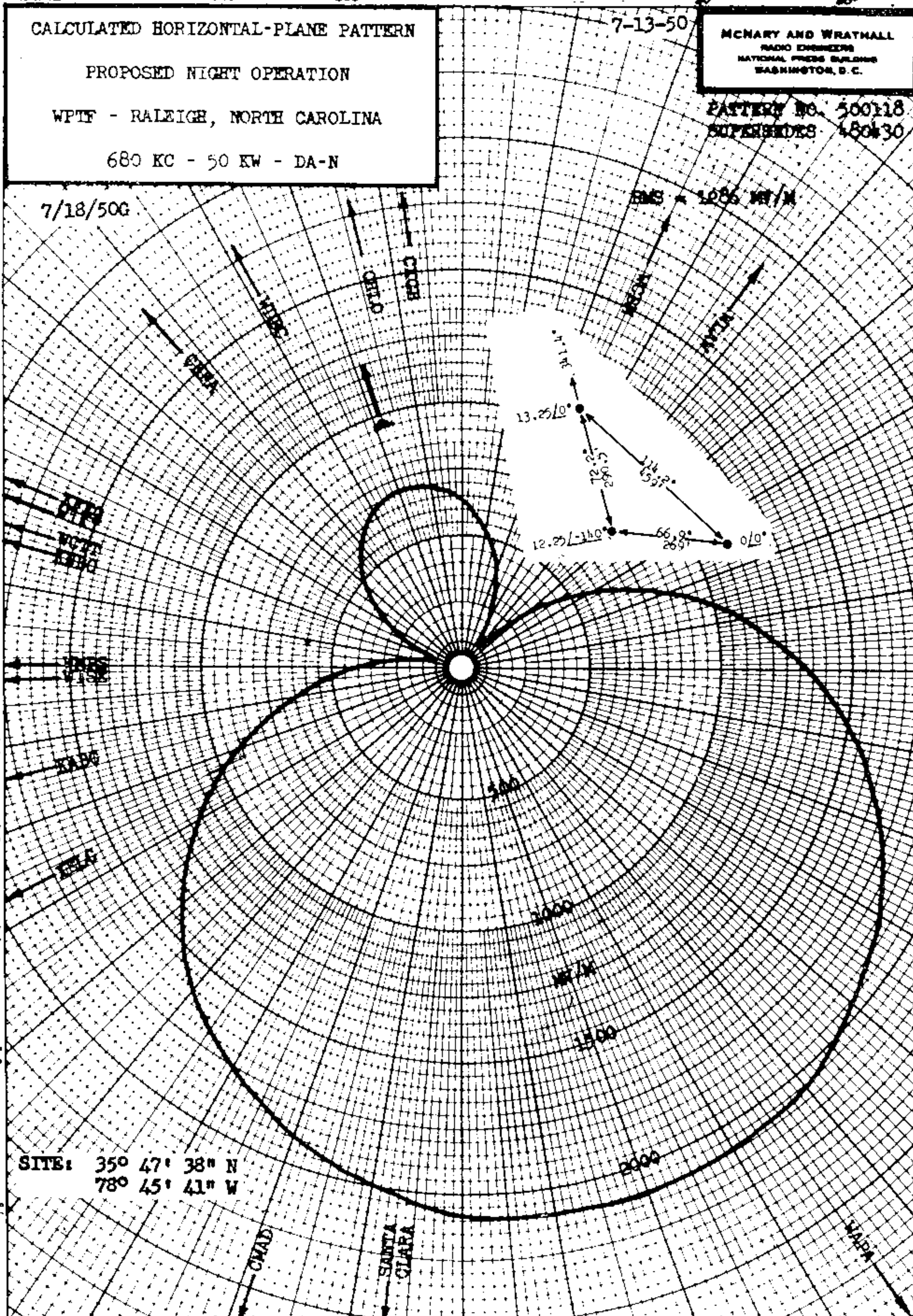
WPTF, RALEIGH, N. C. EXHIBIT NO. 5 50kw, DAN 680 kc

CALCULATED HORIZONTAL-PLANE PATTERN

PROPOSED NIGHT OPERATION

WPTF - RALEIGH, NORTH CAROLINA

680 KC - 50 KW - DA-N



WPTF, Raleigh, N. C. 680 kc

H = 525 ft = 131° 207 mv/m/kw 1465 mv/m

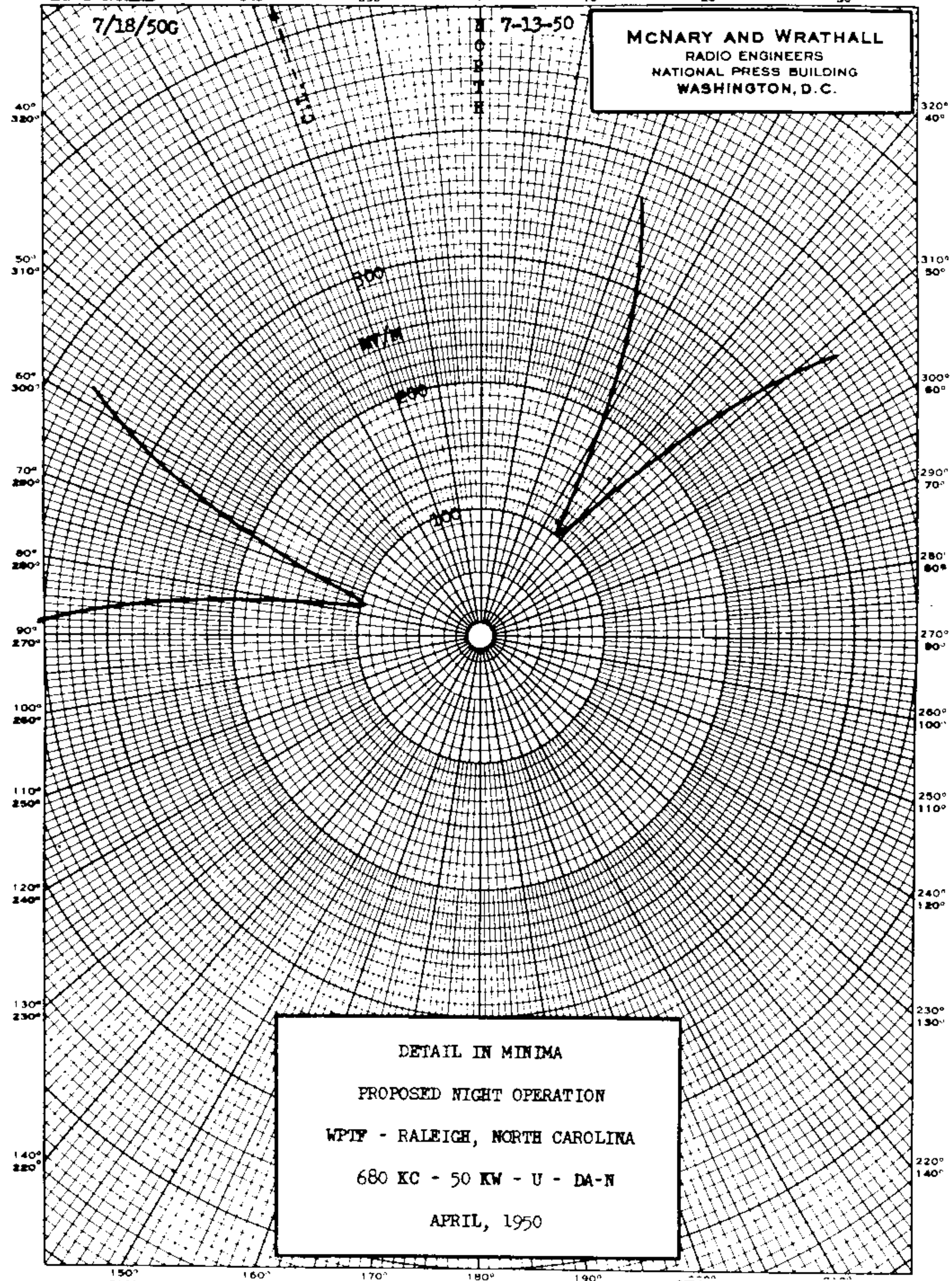
WPTF

PROPOSED
NIGHT NULLS

WPTF, RALEIGH, N. C.

50kw, DAN

680 kc



DETAIL IN MINIMA

PROPOSED NIGHT OPERATION

WPTF - RALEIGH, NORTH CAROLINA

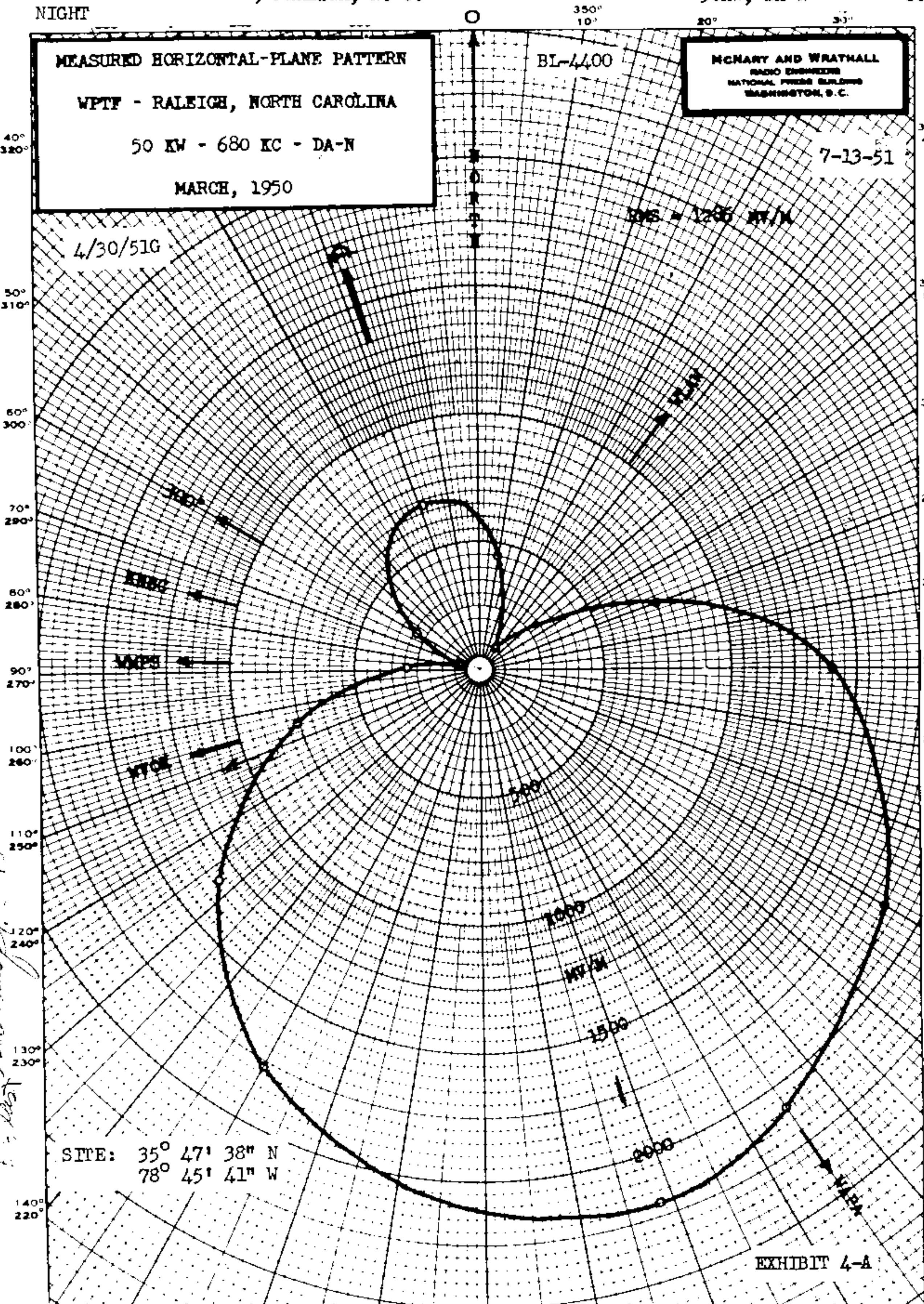
680 KC - 50 KW - U - DA-N

APRIL, 1950

WPTF, Raleigh, N. C. 680 kc

Proof

MEASURED NIGHT — WPTF, RALEIGH, N. C. — 50kw, DA-N — 680 kc



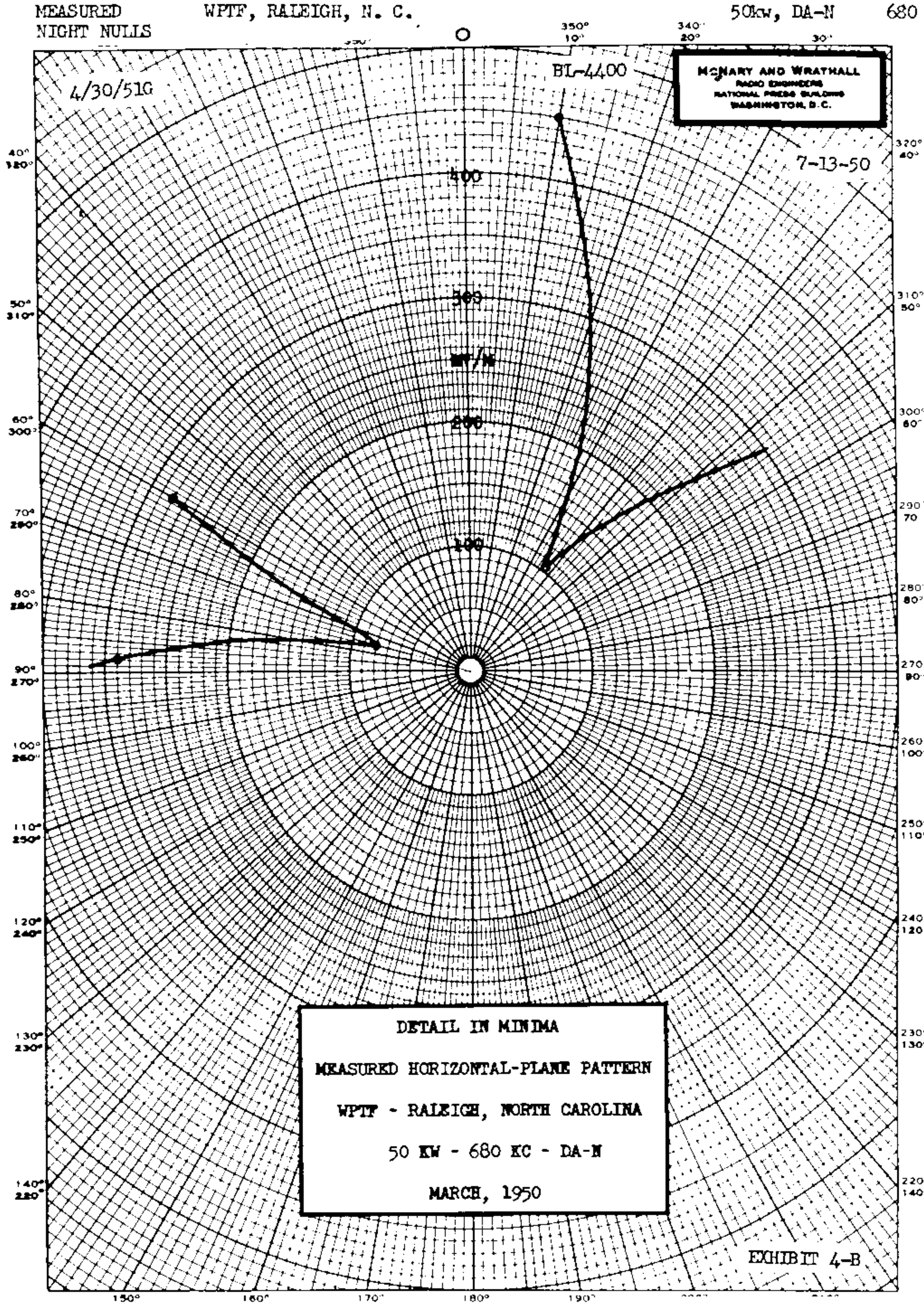
H = 370 - 374 = 92.2°

WPTF, Raleigh, N. C. 680 kc

MEASURED NIGHT NULLS

WPTF, RALEIGH, N. C.

50kw, DA-N 680 kc



WPTF, Raleigh, N. C. 680 kc

WRGC

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WRGC

Main Studio: Sylva, North Carolina

Frequency: 680 kHz

Power: 0.25kw Night 1 kw Day

Notification List No. 1777

Date: July 26, 1978 Class: II

GEOGRAPHICAL LOCATION OF THE CENTERS OF THE DAYTIME AND NIGHTTIME ANTENNA SYSTEMS:

Daytime Site		Nighttime Site	
North Latitude:	35° 23' 09"	North Latitude:	35° 23' 35"
West Longitude:	83° 15' 55"	West Longitude:	83° 11' 38"

NIGHTTIME ANTENNA CHARACTERISTICS

Authorized for Nighttime operation (DA-N)
Number of elements: 2
Type of elements: Uniform cross-section, guyed, Shunt excited, folded unipole, toploaded, vertical steel towers.

TOWER:	S (#2)	N (#1)
HEIGHT ABOVE INSULATORS:	241	241 (60° plus 20° top loading)
PHASING:	0	+160°
FIELD RATIO:	1.0	1.0

SPACING AND ORIENTATION: Towers are spaced 241' (60°) on a line bearing 15° true.

GROUND SYSTEM: 120 - 362' equally spaced copper radials plus 30 - 120' to 220' interspaced radials 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	THEORETICAL RSS	STANDARD RMS
Night	90.1 mv/m		

WRGC

DAYTIME ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (ND-D)
Number of elements: 1
Type of elements: Uniform cross-section, guyed, Shunt excited, vertical steel towers.

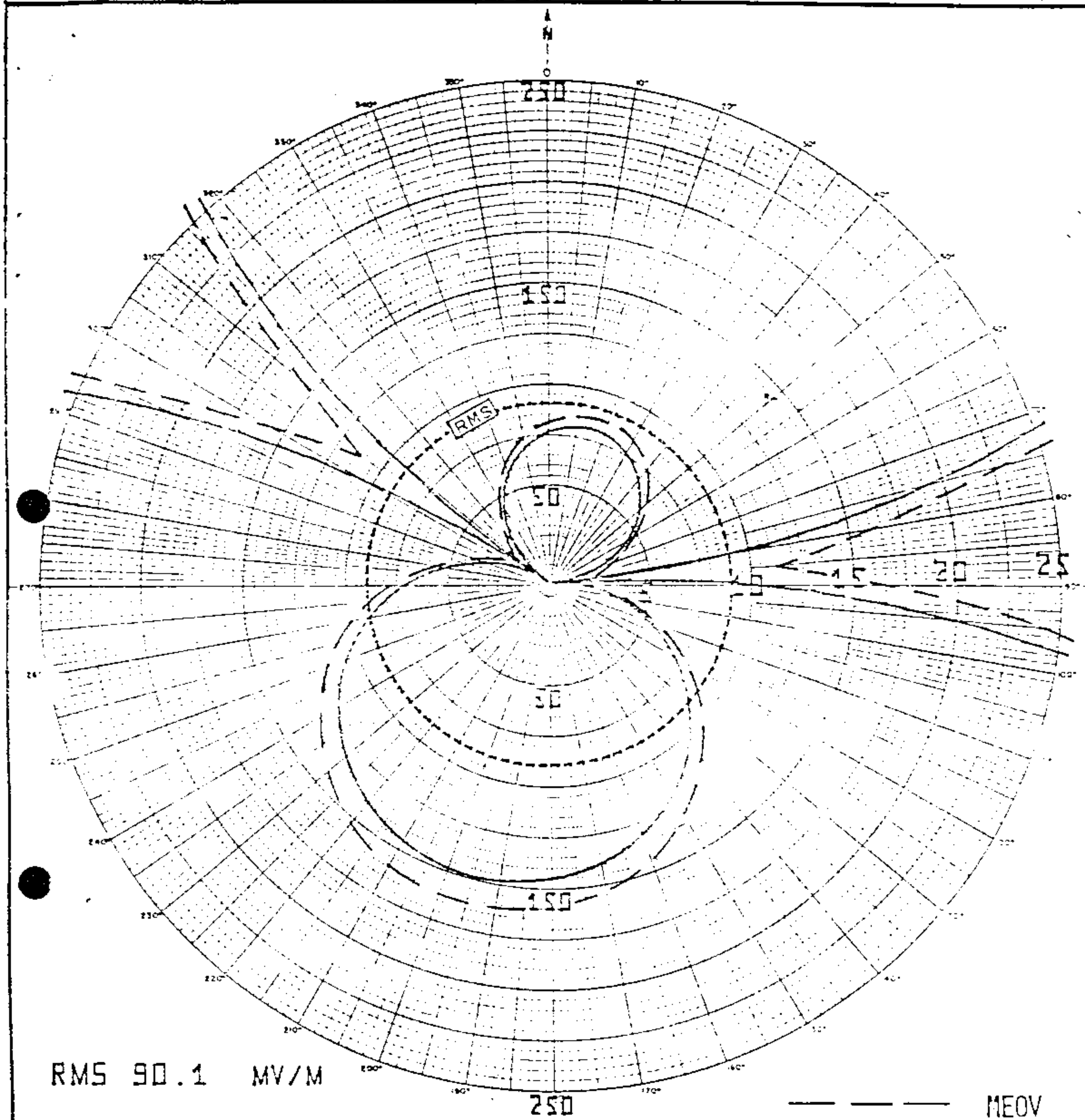
HEIGHT ABOVE INSULATORS: 247' (61.6°)

GROUND SYSTEM: 120-360' equally spaced copper radials plus a 24' square ground screen about the tower.

PREDICTED EFFECTIVE DAYTIME FIELD AT RATED POWER: 179 $\frac{mV}{m}$

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

WRGC



LBA

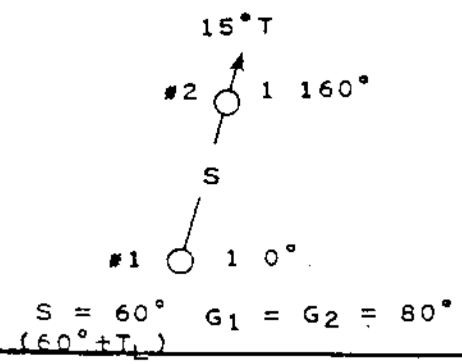


FIGURE 4A

RADIO STATION WRGC
SYLVA, NORTH CAROLINA

680 KHZ, 0.25 KW DA-N

LATITUDE: 35° 23' 35"
LONGITUDE: 83° 11' 38"

8-77

WRGC

SUPPLEMENTAL DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WRGC

Main Studio: Sylva, North Carolina

Frequency: 680 kHz

Power: 0.25 kW Night 1 kW Day

Notification List No. 1737

Date: June 9, 1977 Class: II

GEOGRAPHICAL LOCATIONS OF THE CENTERS OF THE DAY AND NIGHT ANTENNA SYSTEMS:

Daytime				Nighttime			
North Latitude:	35°	23'	09"	North Latitude:	35°	23'	35"
West Longitude:	83°	15'	55"	West Longitude:	83°	11'	38"

Authorized for Nighttime operation (DA-N).

Predicted effective Day Field: (omnidirectional) 179 mv/m at rated power.

Note: Please retain the description sheet and directional antenna radiation patterns notified for station WMSJ (now WRGC) in United States Change List Number 1680, dated April 14, 1976 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 daytime antenna system.

WRGC

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WMSJ

Main Studio: Sylva, North Carolina

Frequency: 680 kHz

Power: 0.25 kW Night 1 kW Day

Notification List No. 1680

Date: April 14, 1976 Class: II

GEOGRAPHICAL LOCATION OF THE CENTERS OF THE DAY AND NIGHT ANTENNA SYSTEMS:

Daytime				Nighttime			
North Latitude	35°	23'	11"	North Latitude	35°	23'	35"
West Longitude	83°	15'	53"	West Longitude	83°	11'	38"

Authorized for Nighttime operation. (DA-N)

NIGHTTIME ANTENNA CHARACTERISTICS
Number of elements: 2
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	S(#1)	N(#2)	
HEIGHT ABOVE INSULATORS:	241'	241'	(60°)
NIGHT PHASING:	0°	+160°	
NIGHT FIELD RATIO:	1.0	1.0	

SPACING AND ORIENTATION: Towers are spaced 241' (60°) on a line bearing 15° true.

NIGHTTIME GROUND SYSTEM: 120-362' 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 NIGHT FIELD AT RATED POWER: 89 mv/m

DAYTIME ANTENNA CHARACTERISTICS
Type of element: Shunt excited, uniform cross-section, guyed, folded unipole, vertical steel towers.

HEIGHT ABOVE INSULATORS: 247' (61.6°)

GROUND SYSTEM: 120-360' equally spaced copper radials plus a 24' square ground screen about the tower.

PREDICTED EFFECTIVE DAY FIELD AT RATED POWER: 179 mv/m

(Cont'd.)

WRGC

WMSJ 680 KHz
Sylva, North Carolina

Note: Please retain the Nighttime Vertical angle directional antenna radiation patterns at 40°, 45°, 50°, 55° and 60° notified for Station WMSJ in United States Change List Number 1369, dated April 22, 1970 and the horizontal and vertical radiation patterns notified in Change List Number 1603, dated October 22, 1974, and attach to this Revised Description Sheet. This notification concerns only a change in the Daytime operation of the station with Nighttime operation continued as previously notified.

CTR NO 30005A4

WRGC

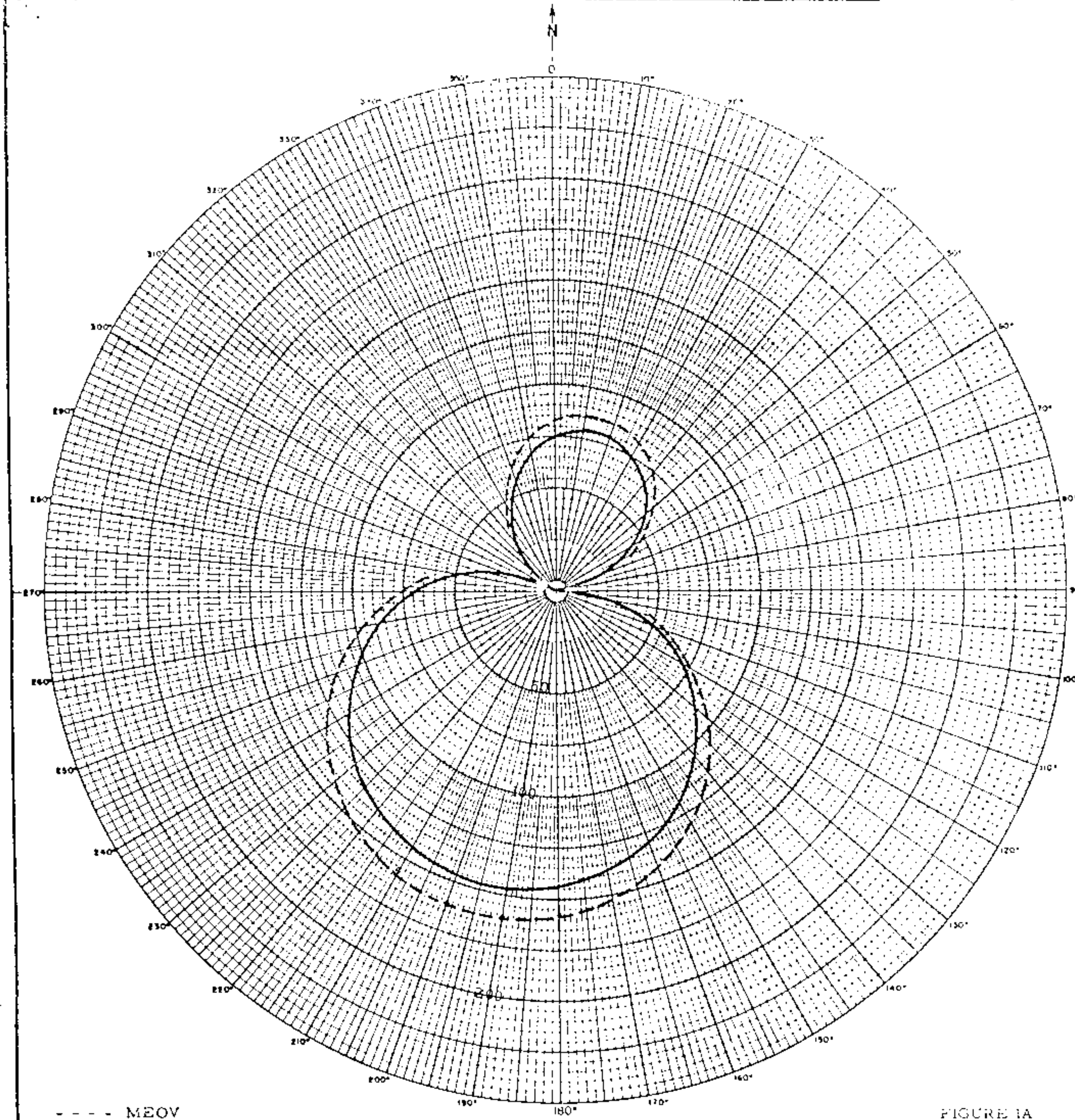
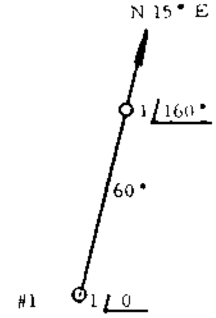


FIGURE 1A

HORIZONTAL RADIATION PATTERN



G = 60°

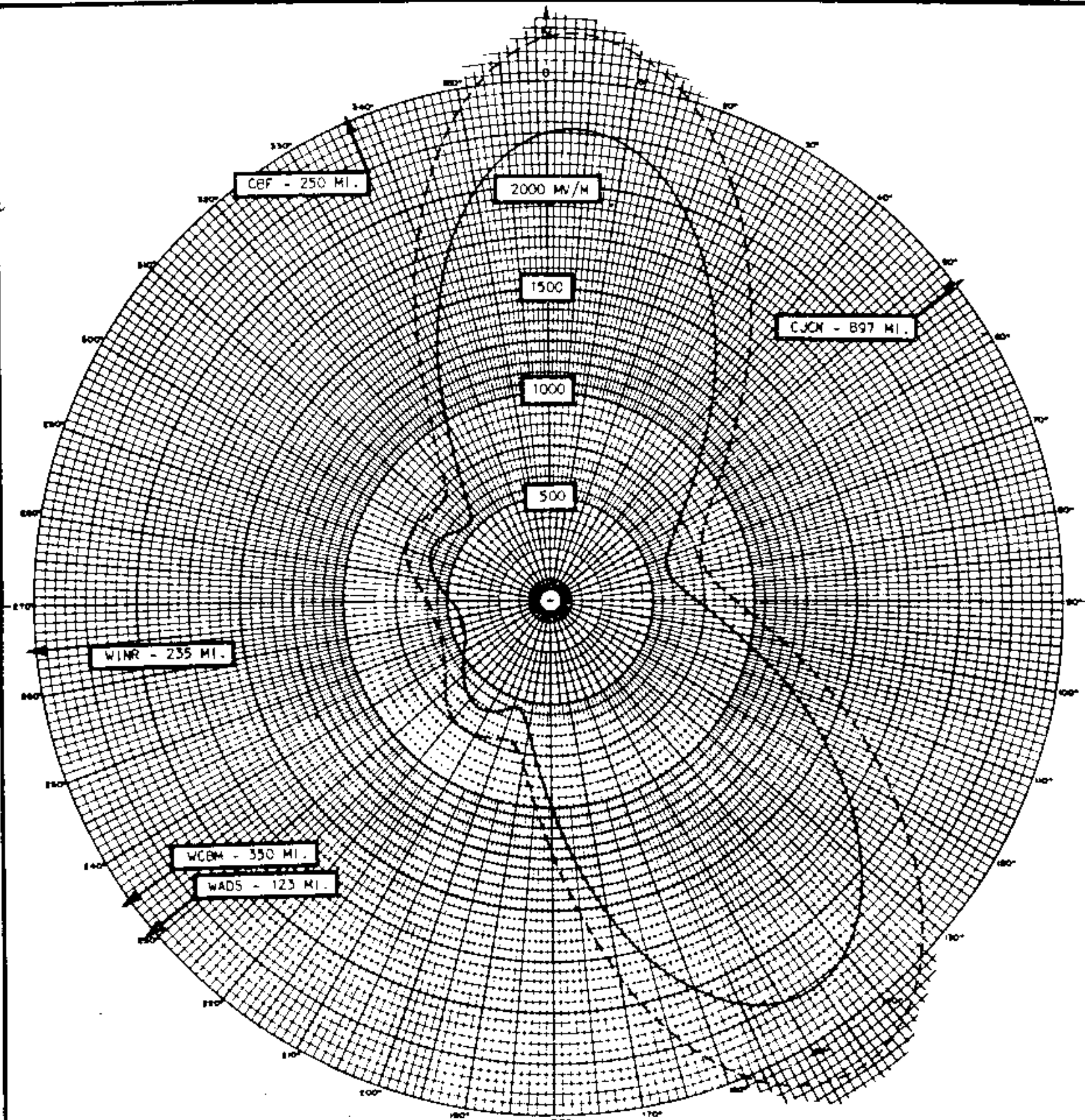
APPLICANT	Radio Station WMSJ
LOCATION	Sylva, North Carolina
FREQUENCY	680 KC/S
POWER	25 KW
LATITUDE	35 DEG 23 MIN 35 SEC
LONGITUDE	83 DEG 11 MIN 36 SEC
WHEN USED	Night
R.M.S FIELD	89 MV/M
DATE	April 1974

ROBERT L. PURCELL

WASHINGTON, D.C.

Proposed Day (8-26-66ct)	Station WNAC Boston, Massachusetts	50kw,DA-2,U 680 kc

granted CP
to change from
DA-1 to
DA-2
2-23-67

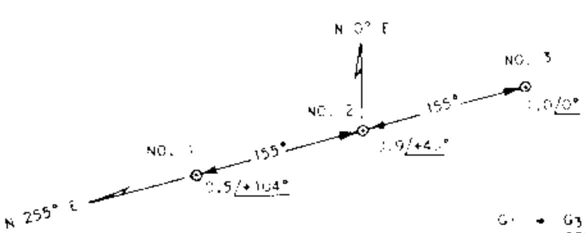


— — — MAXIMUM EXPECTED OPERATING VALUES

FIGURE 1-A

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION



G1 = G3 = 108°
G2 = 97°

APPLICANT	RKO GENERAL, INC. (WNAC)
LOCATION	BOSTON, MASS.
FREQUENCY	680 KC/S
POWER	50 KW - U - DA-2
LATITUDE	42 DEG 29 MIN 25 SEC
LONGITUDE	71 DEG 23 MIN 05 SEC
WHEN USED	DAYTIME
RMS FIELD	1280 MV/M
DATE	SEPTEMBER 1965

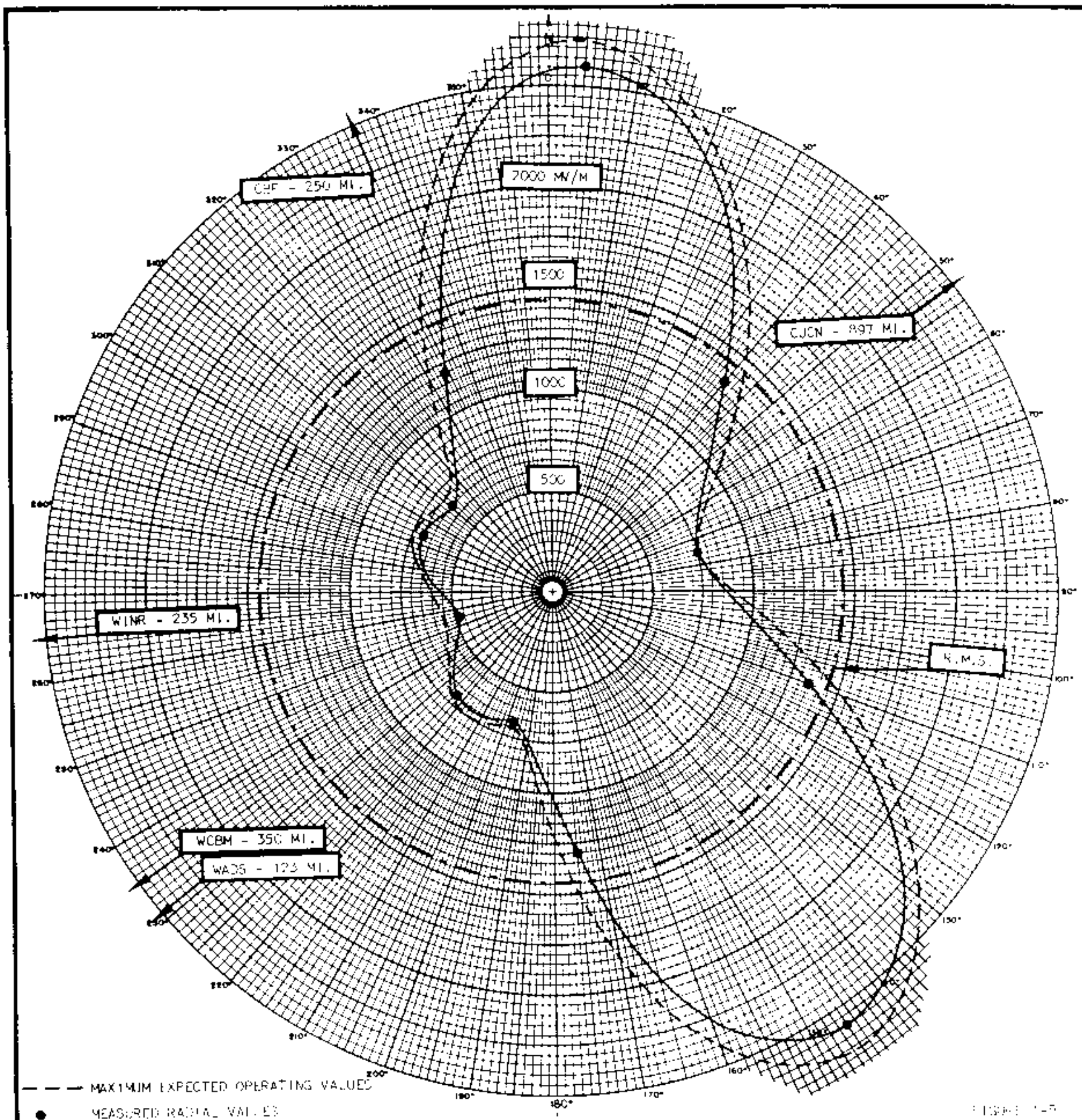
SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No.BP-17026 Accepted 8-1-66	Station WNAC Boston, Massachusetts	680 kc

WRKO

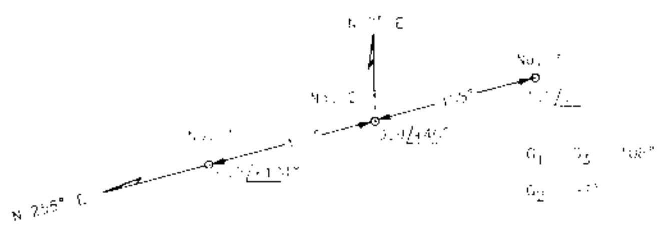
Measured Day (4-29-68ct)	Station WRKO Boston, Massachusetts	50kw,DA-2,U 680 kc

BL-11950
GRANTED
(6-25-68)
LICENSE
COVERING
CHANGES



HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION



APPLICANT	RKO GENERAL, INC. (WRKO)
LOCATION	BOSTON, MASS.
FREQUENCY	[illegible] KC/S
POWER	50 KW - U - DA-2
LATITUDE	42 DEG [illegible] MIN [illegible] SEC.
LONGITUDE	71 DEG [illegible] MIN [illegible] SEC
WHEN USED	DAYTIME
RMS FIELD	144[illegible] MV/M [illegible]
DATE	MARCH 19[illegible]

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

FCC File No.BL-11950 Accepted 4-18-68	Station WRKO Boston, Massachusetts	680 kc

WRKO

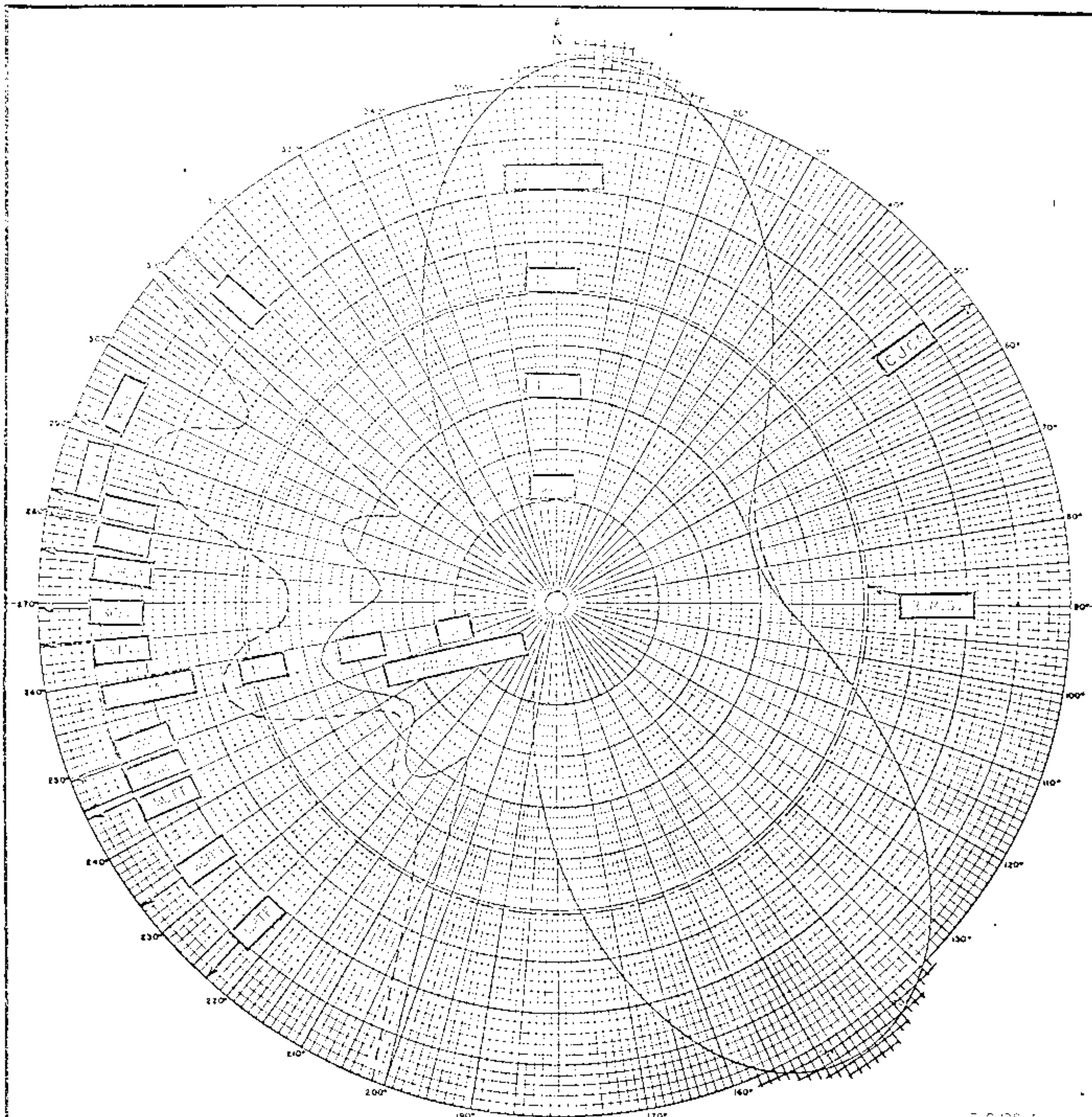
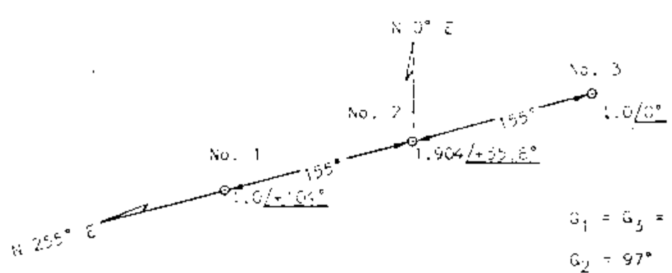


FIGURE 1

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION



$G_1 = G_3 = 108°$

$G_2 = 97°$

APPLICANT :	RKO GENERAL, INC. (WRKO)
LOCATION :	BOSTON, MASS.
FREQUENCY :	680 KC/S
POWER :	50 KW - U - DA-2
LATITUDE :	42 DEG 29 MIN. 25 SEC.
LONGITUDE :	71 DEG. 13 MIN. 05 SEC.
WHEN USED :	NIGHTTIME
R.M.S. FIELD :	1520 MV/M
DATE :	APRIL 1968

SILLIMAN, MOFFET & KOWALSKI

CONSULTING RADIO ENGINEERS

WASHINGTON, D.C.

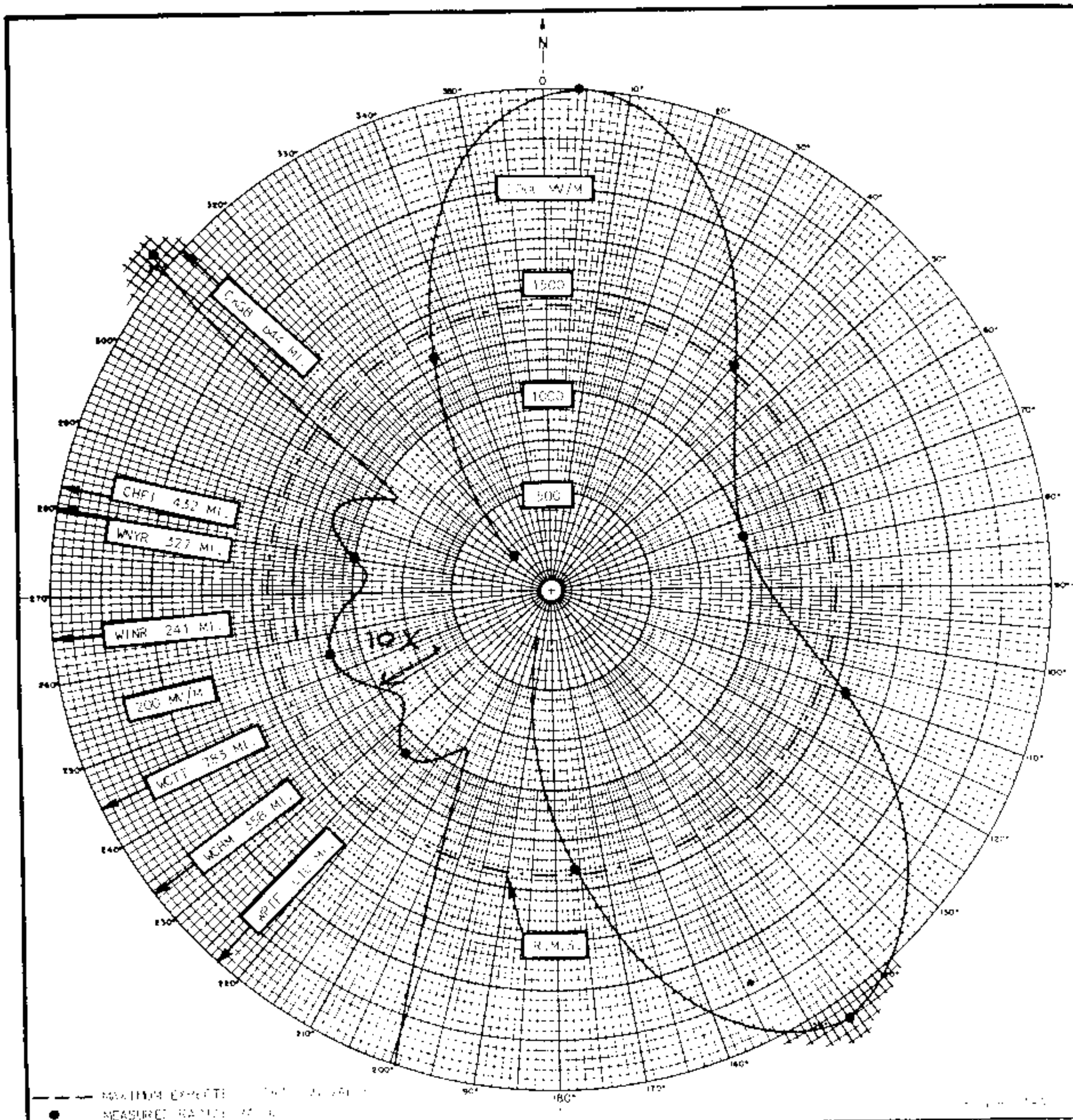
WRKO

Measured Night
(4-29-68ct)

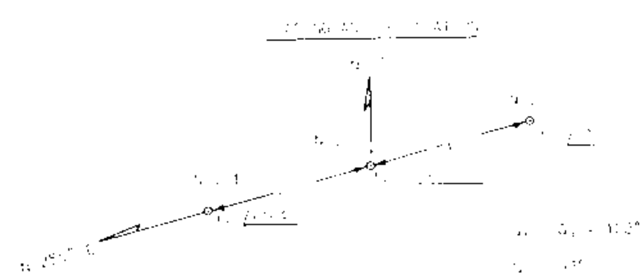
Station WRKO
Boston, Massachusetts

50kw,DA-2,U
680 kc

BL-11950
GRANTED
6-25-68
LICENSE
COVERING
CHANGES



HORIZONTAL RADIATION PATTERN



APPLICANT	RKO GENERAL, INC. (WRKO)
LOCATION	
FREQUENCY	KC/S
POWER	
LATITUDE	DEG MIN SEC
LONGITUDE	DEG MIN SEC
WHEN USED	
R.M.S. FIELD	
DATE	MARCH

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

FCC File No.BL-11950
Accepted 4-18-68

Station WRKO
Boston, Massachusetts

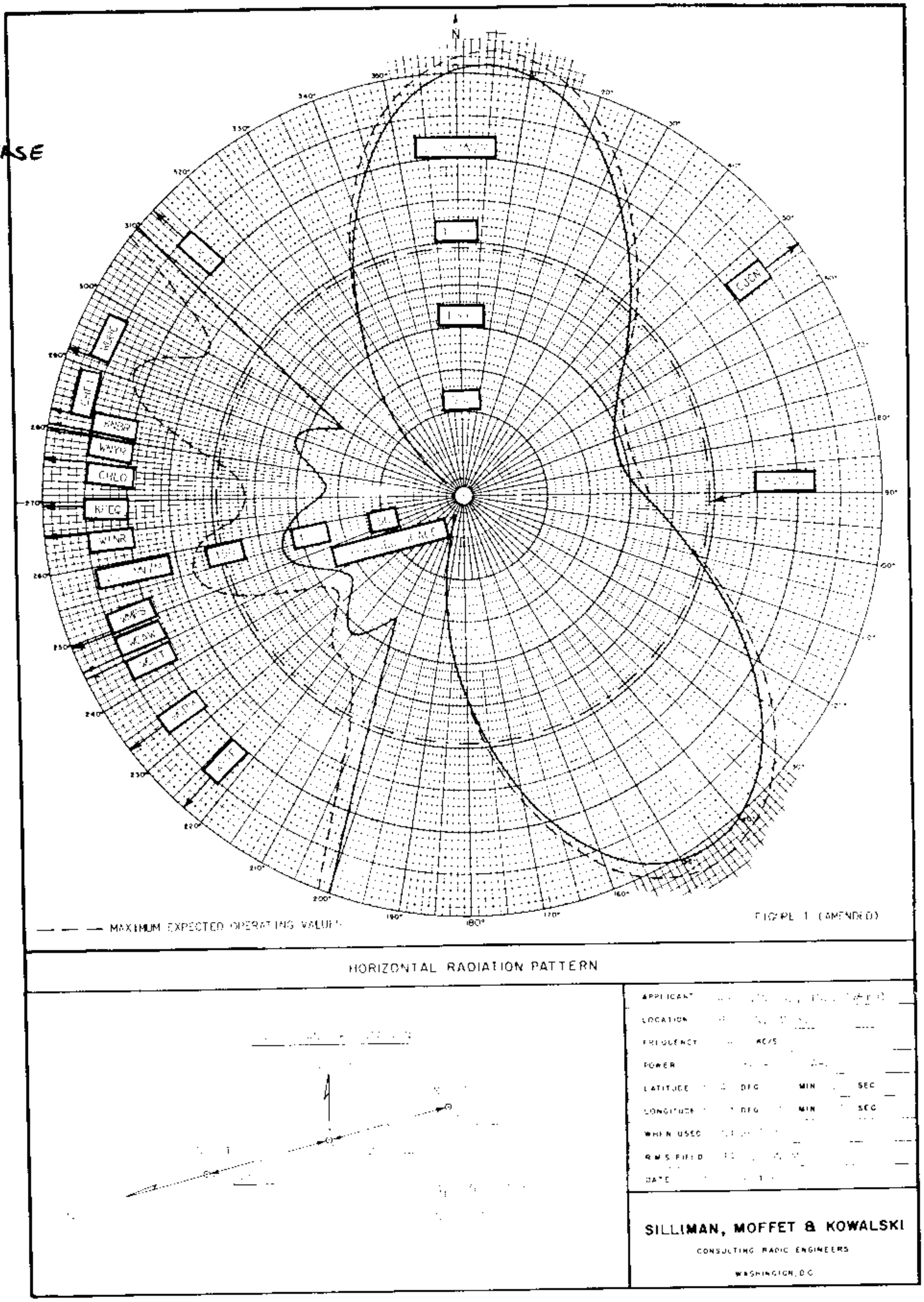
680 kc

Proposed Night
(9-26-68ct)

Station WRKO
Boston, Massachusetts

50kw,DA-2,U
680 kc

BP-18263
GRANTED
9-5-68
CP TO INCREASE
NIGHTTIME
MEOV.



FCC File No.BP-18263
Accepted 9-3-68

Station WRKO
Boston, Massachusetts

680 kc

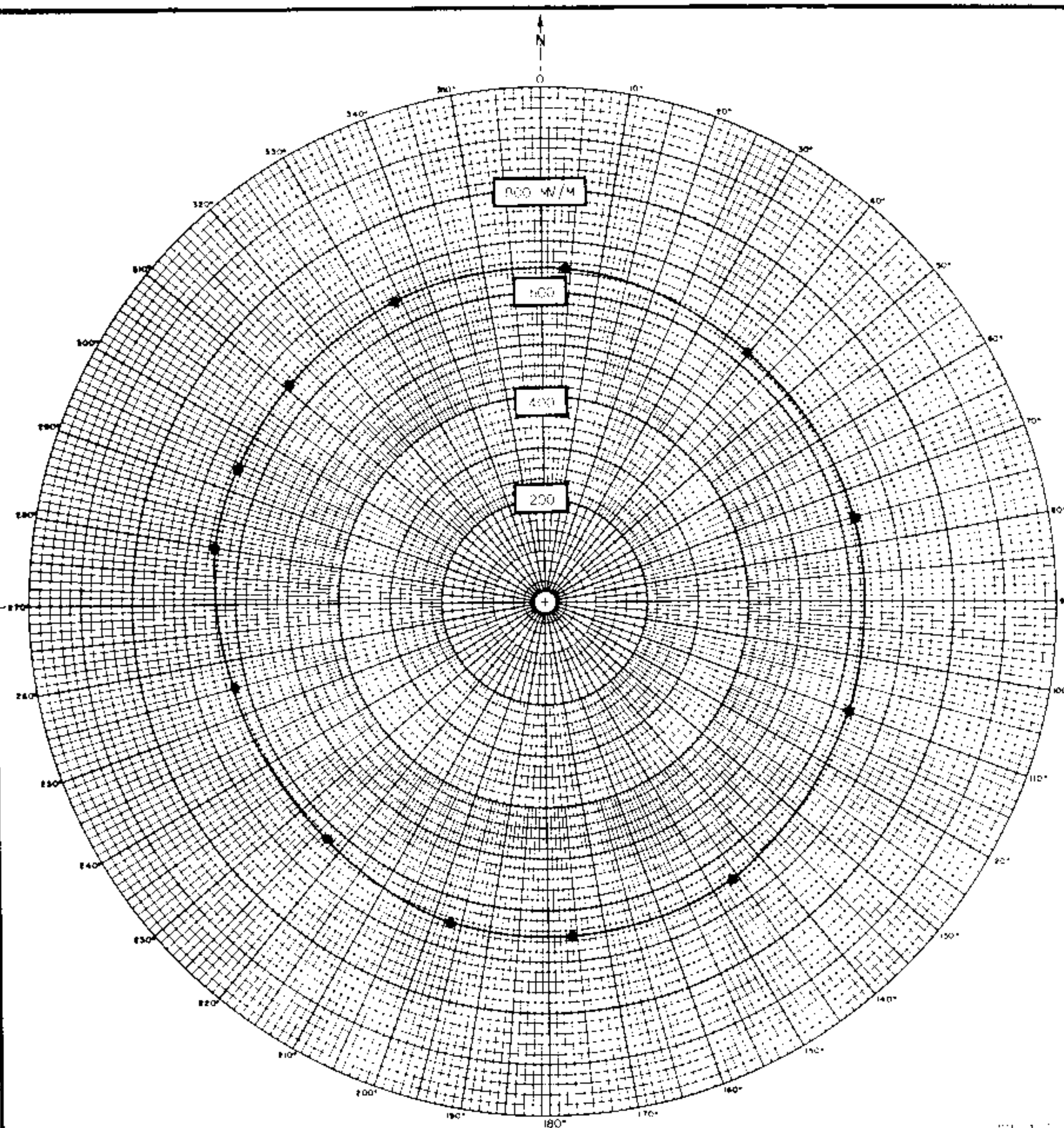
WKKO

Measured Non-DA
(4-29-68ct)

Station WRKO
Boston, Massachusetts

50kw, DA-2, U
680 kc

BL-11950
GRANTED
(6-25-68)
LICENSE
COVERING
CHANGES



● MEASURED RADIAL VALUE

HORIZONTAL RADIATION PATTERN

APPLICANT [illegible] GENERAL, [illegible]

LOCATION [illegible]

FREQUENCY [illegible] KC/S

POWER [illegible]

LATITUDE [illegible] DEG [illegible] MIN [illegible] SEC

LONGITUDE 71 DEG [illegible] MIN [illegible] SEC.

WHEN USED [illegible]

RMS FIELD [illegible]

DATE [illegible]

NON-DIRECTIONAL SURVEY

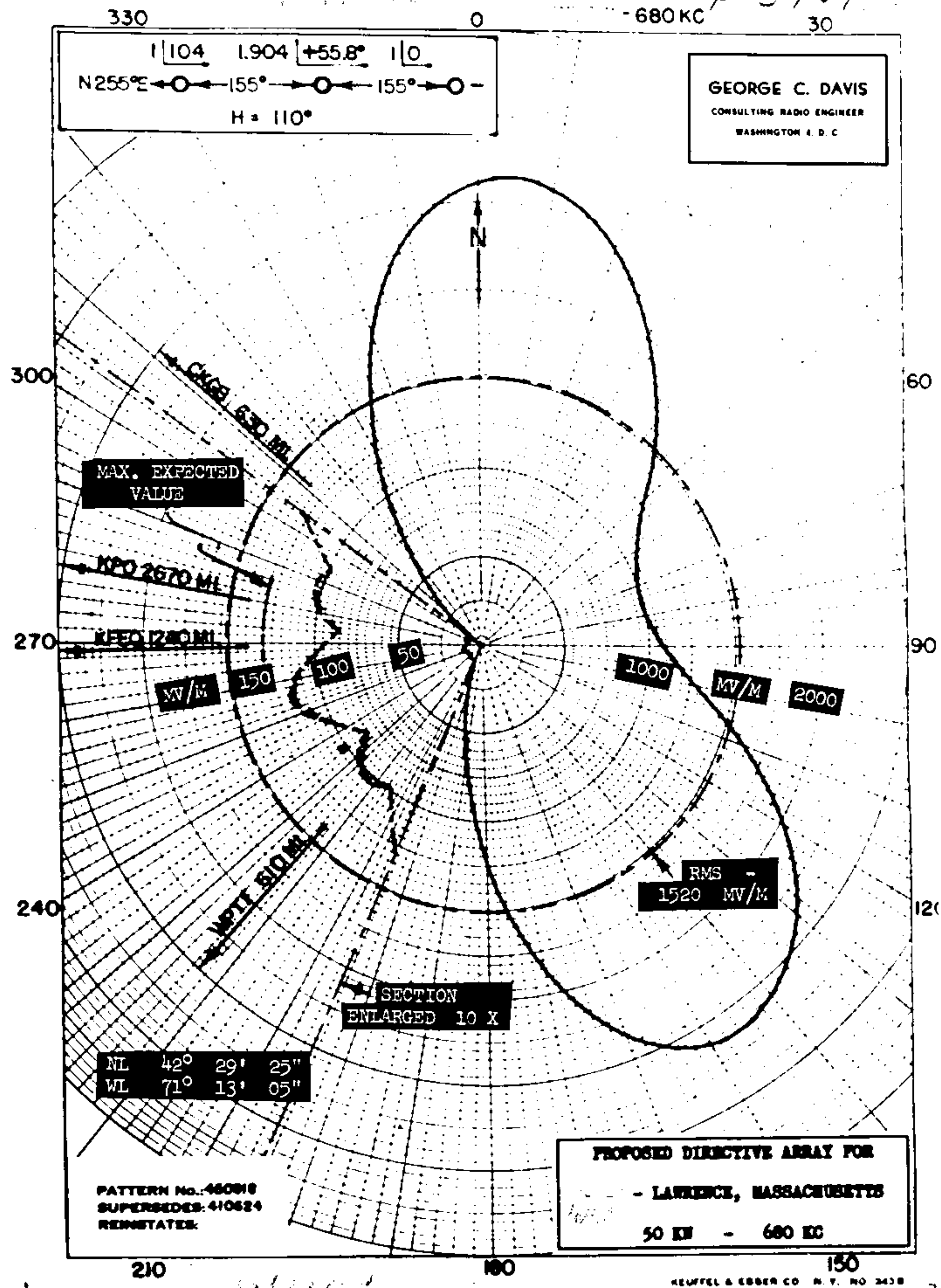
SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No. BL-11950
Accepted 4-18-68

Station WRKO
Boston, Massachusetts

680 kc

PROPOSED NIGHT & DAY | Station WNAC | 50kw, DA-1,U
Boston, Massachusetts | 680 KC



WNAC

43

WRNG
680KHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WRNG

Main Studio: North Atlanta, Georgia

Frequency: 680 kHz

Power: 10kw Night 25kw Day

Notification List No. 1784

Date: November 9, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTERS OF THE DAY AND NIGHT ANTENNA SYSTEMS:

Daytime

North Latitude: 33° 48' 35"
West Longitude: 84° 21' 14"

Nighttime

North Latitude: 33° 57' 42"
West Longitude: 84° 15' 48"

ANTENNA CHARACTERISTICS

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

TOWER:	SW(#1)	(#2)	(#3)	NW(#4)	SE(#5)	(#6)	(#7)	NE(#8)
HEIGHT ABOVE INSULATORS:	All towers 319' (79.4°)							
NIGHT PHASING:	0°	+80.66°	+187.11°	+300.00°	+104.00°	+184.65°	+291.11°	+404.00°
NIGHT FIELD RATIO:	1.000	1.650	1.188	0.735	1.000	1.650	1.188	0.735

SPACING AND ORIENTATION: From reference tower #1; Tower #2 is spaced 675' (168°) on a line bearing 336° true, tower #3 is spaced 1350' (336°) on a line bearing 336° true, tower #4 is spaced 2025' (504°) on a line bearing 336° true, tower #5 is spaced 321.43' (80°) on a line bearing 70° true, tower #6 is spaced 727.11' (180.97°) on a line bearing 2.37° true, tower #7 is spaced 1365.75' (339.92°) on a line bearing 349.59° true, and tower #8 is spaced 2028.09' (504.77°) on a line bearing 345.1° true.

GROUND SYSTEM: 120 - 362' 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. Centers of system are bonded together.

WRNG
680KHz

DAYTIME ANTENNA CHARACTERISTICS

Number of elements: 1
Type of elements: Series excited, uniform cross-section guyed, vertical steel tower.

HEIGHT ABOVE INSULATORS: 275' (68.4°)

GROUND SYSTEM: 120 - 360' equally spaced copper radials plus a 100' square ground screen about the tower.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	905 mV/m		
Night	578.34 mV/m	644.56 mV/m	607.6 mV/m

NOTIFIED PATTERN AUGMENTATION

AZIMUTH OF MAXIMUM AUGMENTATION	AUGMENTED RADIATION E_2	SPAN OF AUGMENTATION FROM - TO
32°	32 mV/m	17° - 47°

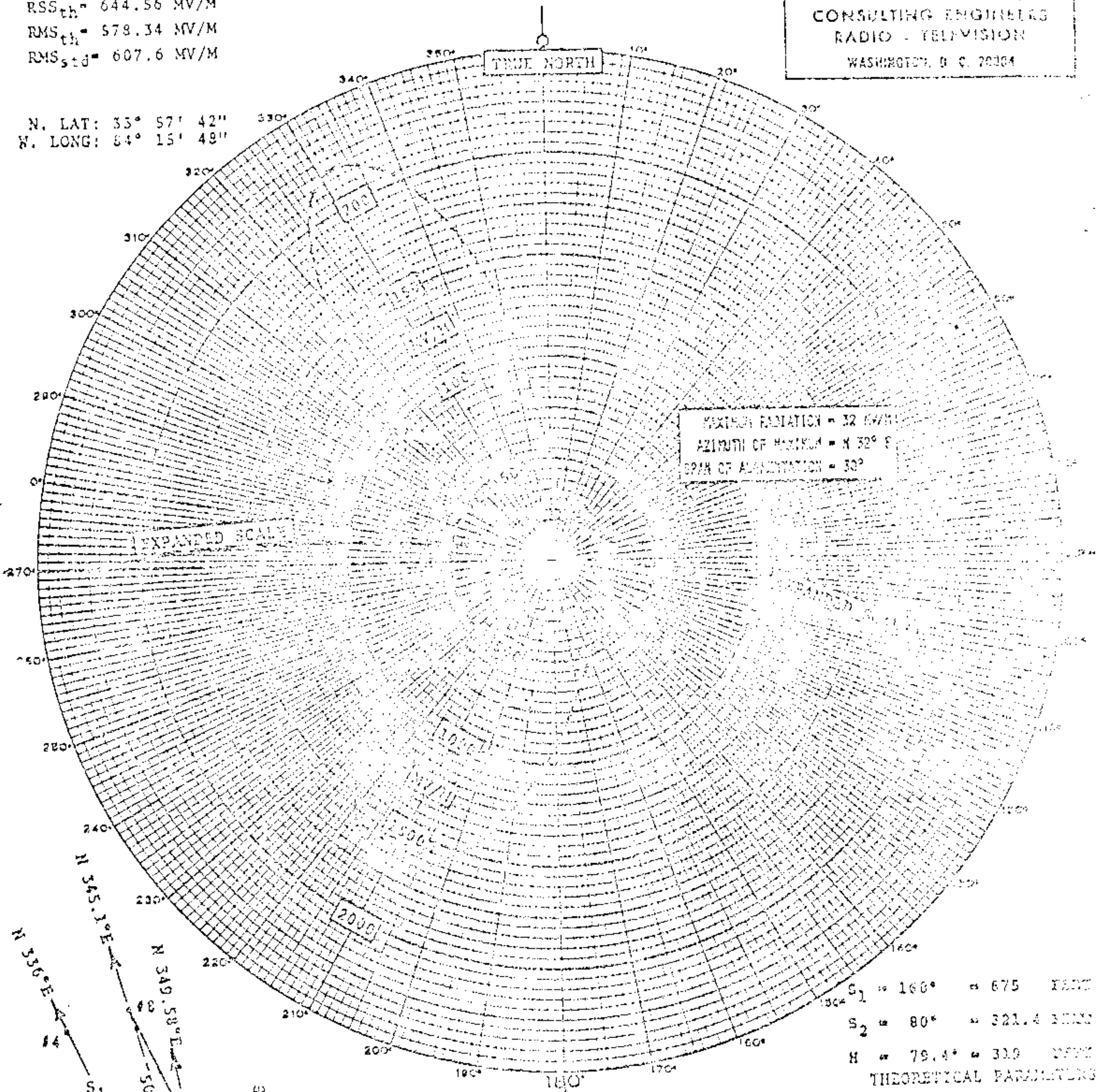
Note: This notification concerns only a change in the Nighttime operation to add Pattern Augmentation. Daytime operation continued as previously notified.

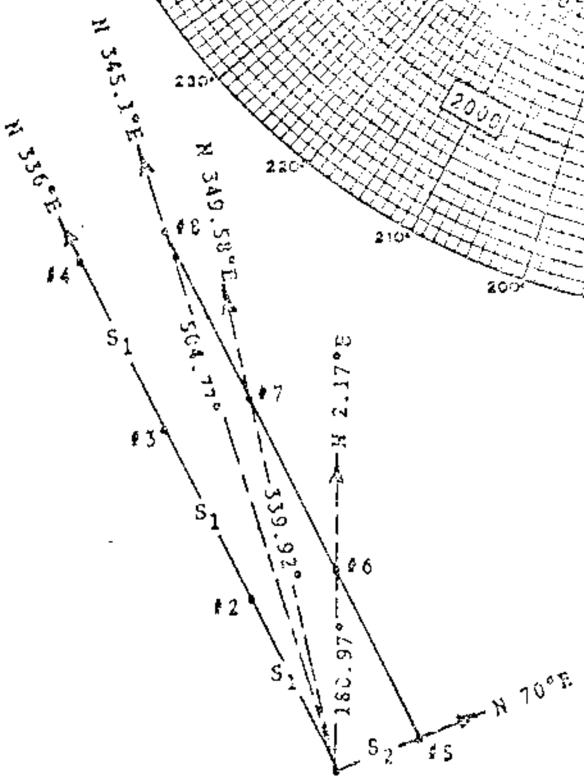
WKNG
680KHz

RSS/RMS = 1.11 MV/M
RSS_{th} = 644.56 MV/M
RMS_{th} = 578.34 MV/M
RMS_{std} = 607.6 MV/M

N. LAT: 33° 57' 42"
W. LONG: 84° 15' 48"

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





S_1 = 160° = 675 FEET
S_2 = 80° = 321.4
H = 79.4° = 319

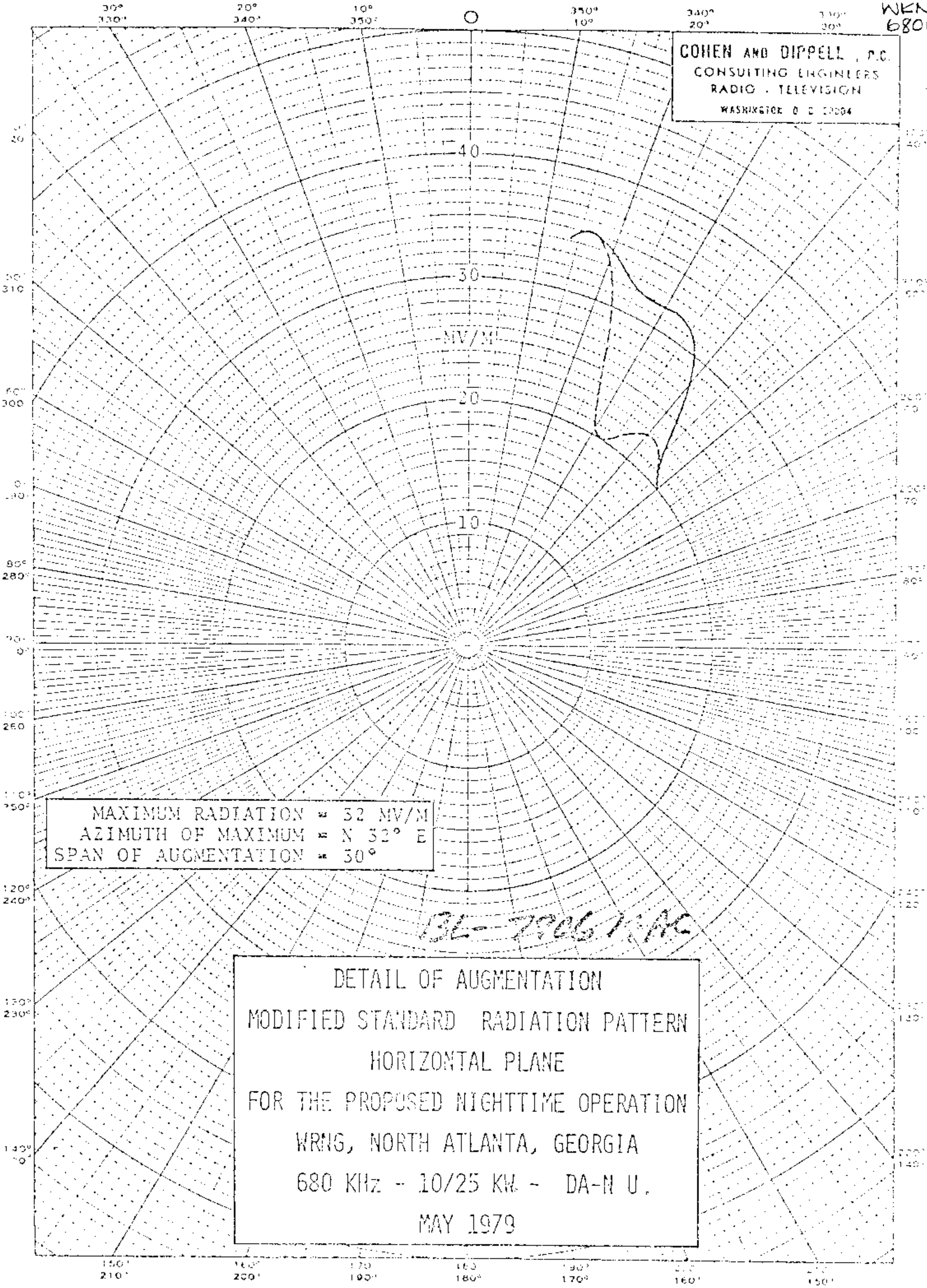
THEORETICAL PARAMETERS

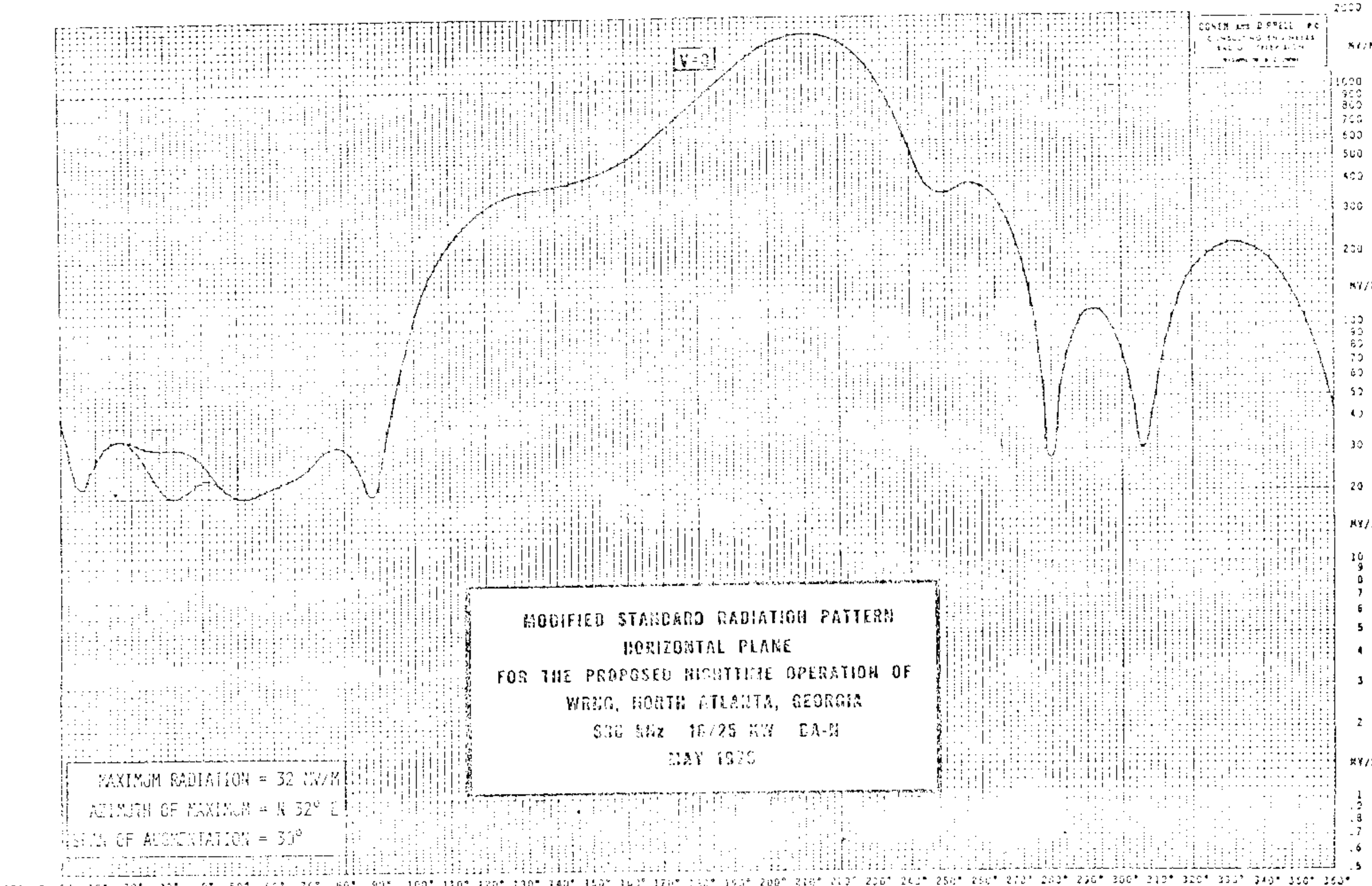
#1 1/0°
#2 1.65/60.66°
#3 1.188/187.11°
#4 0.735/300°
#5 1/104°
#6 1.65/184.66°
#7 1.188/291.11°
#8 0.735/404°

BL-790614AC

MODIFIED STANDARD RADIATION PATTERN
HORIZONTAL PLANE
FOR THE PROPOSED NIGHTTIME OPERATION
WKNG, NORTH ATLANTA, GEORGIA
680 KHz - 10/25 KW - DA-N U
MAY 1979

WKNG
680KHz


COHEN AND DIPPELL, P.C.
CONSULTING ENGINEERS
RADIO - TELEVISION
WASHINGTON D C 20004
40
30
MV/M
20
10
MAXIMUM RADIATION = 32 MV/M
AZIMUTH OF MAXIMUM = N 32° E
SPAN OF AUGMENTATION = 30°
BL-79661AC
DETAIL OF AUGMENTATION
MODIFIED STANDARD RADIATION PATTERN
HORIZONTAL PLANE
FOR THE PROPOSED NIGHTTIME OPERATION
WRNG, NORTH ATLANTA, GEORGIA
680 KHz - 10/25 KW - DA-N U.
MAY 1979



V-3
MODIFIED STANDARD RADIATION PATTERN
HORIZONTAL PLANE
FOR THE PROPOSED NIGHTTIME OPERATION OF
WRNG, NORTH ATLANTA, GEORGIA
kHz 10/25 KW DA-N
MAY
MAXIMUM RADIATION = 32 MV/M
AZIMUTH OF MAXIMUM = N 32° E
OF AUGMENTATION = 30°

WRNG
680kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WQXI (?) WANG

Frequency: 680 kHz

Notification List No. 1766

Main Studio: North Atlanta, Georgia

Power: 10kw Night 25kw Day

Date: January 18, 1978 Class: II

GEOGRAPHICAL LOCATION OF THE CENTERS OF THE DAY AND NIGHT ANTENNA SYSTEMS:

DAYTIME				NIGHTTIME			
North Latitude:	33°	48'	36"	North Latitude:	33°	57'	42"
West Longitude:	84°	21'	14"	West Longitude:	84°	15'	48"

Authorized for Nighttime operation (DA-N)

NIGHTTIME ANTENNA CHARACTERISTICS

Number of elements: 8
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWERS:	SW(#1)	(#2)	(#3)	NW(#4)	SE(#5)	(#6)	(#7)	NE(#8)
HEIGHT ABOVE INSULATORS:	All towers 319' (79.4°)							
PHASING:	0°	+80.66°	+187.11°	+300.00°	+104.66°	+184.66°	+291.11°	+404.00°
FIELD RATIO:	1.000	1.650	1.188	0.735	1.000	1.650	1.188	0.735

SPACING AND ORIENTATION: From reference tower #1; tower #2 is spaced 675' (168°) on a line bearing 336° true, tower #3 is spaced 1350'(336°) on a line bearing 336° true, tower #4 is spaced 2025' (504°) on a line bearing 336° true, tower #5 is spaced 321.43' (80°) on a line bearing 70° true, tower #6 is spaced 727.11' (180.97°) on a line bearing 2.17° true, tower #7 is spaced 1365.75' (339.92°) on a line bearing 349.55° true and tower #8 is spaced 2028.09' (504.77°) on a line bearing 345.1° true.

GROUND SYSTEM: 120 - 362' 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. Centers of system are bonded together.

DAYTIME ANTENNA CHARACTERISTICS

Number of elements: 1
Type of element: Series excited, uniform cross-section, guyed, vertical steel tower.

HEIGHT: 275' (68.4°)

GROUND SYSTEM: 120 - 360' equally spaced copper radials plus a 100' square ground screen about the tower.

cont'd

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

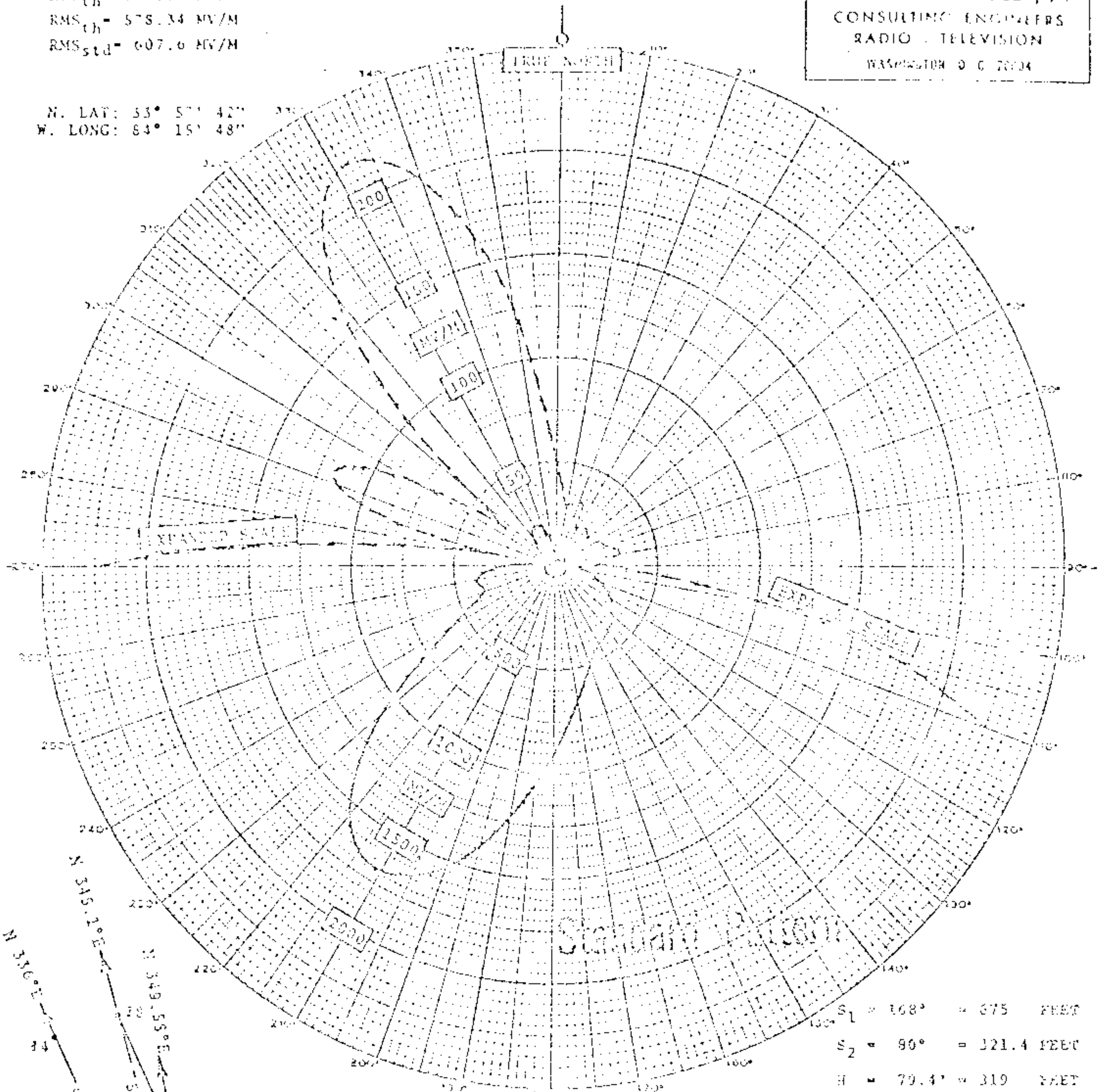
	THEORETICAL		STANDARD
	RMS	RSS	RMS
Day	905 mv/m	--	--
Night	578.34 mv/m	644.56 mv/m	607.6 mv/m

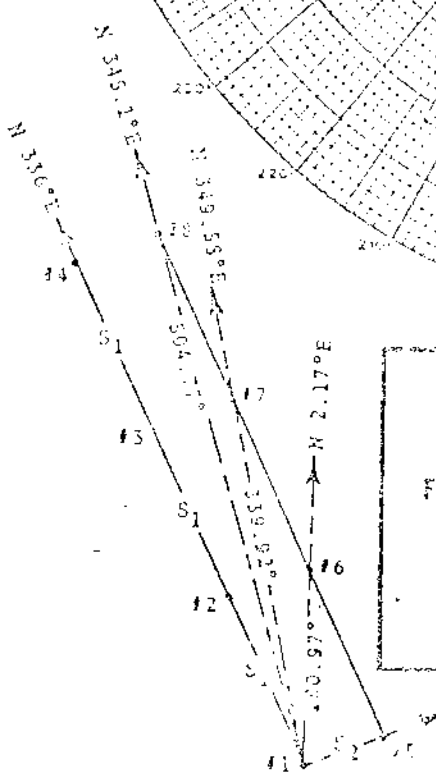
This notification concerns only a change in the Nighttime operation of the station with Daytime operation continued as previously notified.

RSS/RMS = 1.11 MV/M
RSS_{th} = 644.56 MV/M
RMS_{th} = 575.34 MV/M
RMS_{std} = 607.6 MV/M

N. LAT: 33° 5[illegible]' 42"
W. LONG: 84° 15' 48"

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

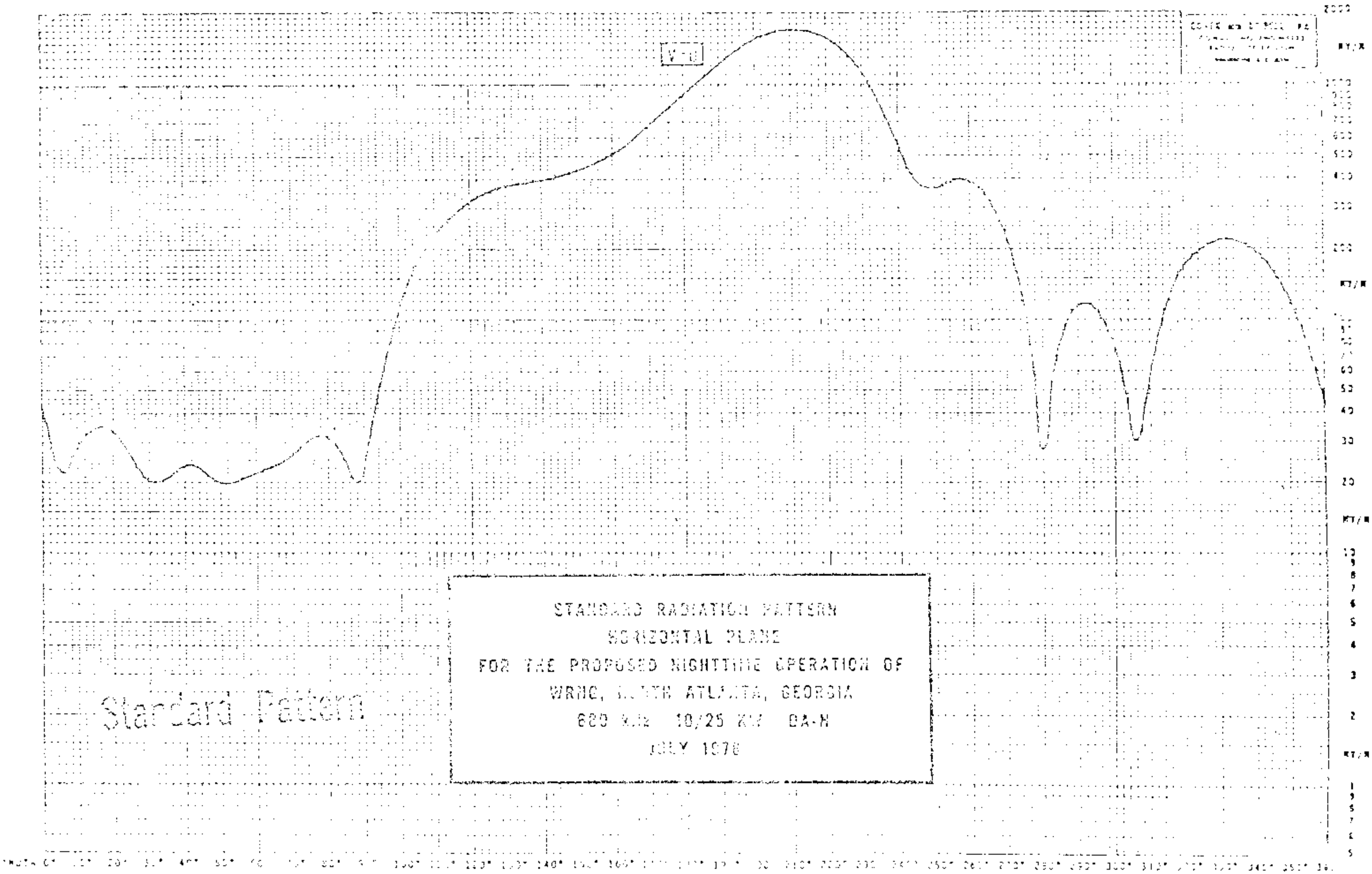




S_1 = 168° = 675 FEET
S_2 = 80° = 321.4 FEET
H = 79.4° = 319 FEET
THEORETICAL PARAMETERS

#1 1/0°
#2 1.65/80.65°
#3 1.188/187.11°
#4 0.735/300°
#5 1/104°
#6 1.65/[illegible].65°
#7 1.188/[illegible].11°
#8 0.735/[illegible]°

STANDARD RADIATION PATTERN
HORIZONTAL PLANE
FOR THE PROPOSED NIGHTTIME OPERATION OF
WRNG, NORTH ATLANTA, GEORGIA
680 KHz 10/25 KW DA-N
JULY 1976


STANDARD RADIATION PATTERN
HORIZONTAL PLANE
FOR THE PROPOSED NIGHTTIME OPERATION OF
680 kHz 10/25 KW DA-N
Standard Pattern

XELG
680

X E L G

LEON, Guanajuato
(México)

DATOS EN QUE SE BASA EL DISEÑO

1.- UBICACION Y CARACTERISTICAS DE LA ESTACION "XELG"
(León, Guanajuato, México):

101° 49'
21°

Longitud: 100° 30' 40" W — en error
Latitud: 21° 07' 22" N

Clase: II, 1 KW DA-N
Potencia proyectada: 5,000 watts, DA-N
Sistema radiador actual: 2 torres de 90° de altura, en línea N-S geográfico
Sistema radiador proyectado: el mismo, mecánicamente, con las características eléctricas apropiadas.

2.- ESTACIONES QUE DEBEN PROTEGERSE

KPO (S[redacted] Francisco, Cal., E.U.A.)
Longitud: 122° 14' 00" W
Latitud: 37° 32' 30" N

Estación Clase I-B, 50,000 watts.
Contorno de protección: 500 microvolts por metro (onda reflejada, 50% del tiempo)
Señal interferente permisible: 25 microvolts por metro (onda reflejada, 10% del tiempo)
Azimut calculado: 316° 20'
Distancia calculada: 1,725 millas.
Angulo que debe protegerse: 23° 40'

KABC (San Antonio, Tex., E.U.A)
Longitud: 98° 37' 56" W
Latitud: 29° 31' 01" N

Estación Clase II, 10 KW DA-N, 50 KW LS
Contorno de protección: 2,500 microvolts por metro (onda de tierra).
Señal interferente permisible: 125 microvolts por metro (onda reflejada, 10% del tiempo)
Azimut calculado 11°
Distancia calculada: 586 millas

X E L G

LEON, Guanajuato
(México)

CARACTERISTICAS DEL SISTEMA DE ANTENA DIRECCIONAL CALCULADO

I.- TORRES

Número de elementos: 2

Tipo: cuadrangulares, de sección uniforme, soportadas sobre aisladores de vidrio, con cinco juegos de retenidas seccionadas y aisladas.

Altura sobre tierra: 90° eléctricos (110 metros)

Separación: 90° eléctricos (110 metros)

Ubicación: instaladas en línea N-S geográfico.

Alimentación:

	Torre (1) Norte	Torre (2) Sur
Relación de corrientes:	1	1
Fase:	0	-105°

II.- SISTEMA DE TIERRA

90 radiales de 90° (110 metros alrededor de cada torre.)

III.- RESULTADOS

Valor cuadrático medio precalculado (R.M.S.) :392 mV/m, sin atenuación, a una milla.

Se incluye: 1.- Gráfica de radiación horizontal calculada con los datos anteriores.
2.- Gráficas de radiación vertical calculada para los azimutes de 11° (KABC, San Antonio, Tex.), 316° (KPO, San Francisco, Cal.) y 340° (tangente al contorno de 500 microvolts por metro de KPO).
3.- Valores calculados para el trazo de las gráficas anteriores.

México, D.F., a 8 de abril de 1947.

LAZARO BARAJAS G.
I.M.E.

XELG
680

10 11

X E L G

LEON, Guanajuato

(México)

RADIACION HORIZONTAL CALCULADA.

$G = 90^\circ$ $S = 90^\circ$ $\alpha = 105^\circ$

θ	E_θ
0 (360)	7.8
5 (255)	75.2
10 (250)	70.0
11 (249)	69.4
15 (345)	6.2
30 (330)	15.4
45 (315)	58.7
60 (300)	153.5
75 (285)	259.0
90 (270)	361.0
105 (255)	447.5
120 (240)	512.5
135 (225)	554.0
150 (210)	576.0
165 (195)	585.0
180 (180)	587.0
195	585.0
210	576.0
225	554.0
240	512.5
255	447.5
270	361.0
285	259.0
300	153.5
315	58.7
31[illegible]	52.7
330	15.4
340	49.8
345	6.2

XELG

X E L G

LEON, Guanajuato

(México)

RADIACION VERTICAL CALCULADA.

	$\theta = 11^\circ$	$\theta = 316^\circ$	$\theta = 340^\circ$
Θ	E_ϕ	E_ϕ	E_ϕ
0°	69.4	52.7	49.7
5°	67.7	53.7	48.5
10°	61.0	56.8	42.3
15°	54.0	61.2	33.4
20°	37.8	67.1	21.6
25°	22.7	72.7	8.2
30°	5.8	77.5	7.7
35°	10.3	85.0	22.0
40°	26.7	92.2	20.2
45°	41.0	93.7	49.2
50°	52.2	94.0	58.0
55°	63.2	95.5	68.8
60°	66.0	90.0	70.0
65°	67.0	83.7	69.5
70°	63.3	74.0	65.0
75°	53.3	58.8	55.2
80°	39.7	43.2	40.8
85°	26.5	27.2	26.5
90°	0.0	0.0	0.0

XELG 680

Official pattern - rec'd 1/1/47