860-910

Station	Main Studio	Freq	Power	Date
CFPR	Prince Rupert, CN	860	10/2.5 kW	3/21/83
CBH	Halifax, NS	860	10 kW/DA-N	11/30/61
CFNS	Saskatoon, Sask.	860	10 kW/DA-2	5/10/77
CFPR	Prince Rupert, BC	860	10 kW/DA-1	10/30/63
CHAK	Inuvik, NWT	860	1 kW	9/4/59
CJBC	Toronto, ON	860	50 kW	11/20/52
CKKC	Nelson, BC	860	1 kW	4/5/82
CMBL	Habana, CU	860	15 kW	6/19/47
KOAM	Pittsburg, KS	860	5 kW/DA-N	
KOAM	Pittsburg, KS	860	5/10 kW/DA-N	5/47
KONO	San Antonio, TX	860	1/5 kW/DA-N	9/29/64
KTRB	Modesto, CA	860	1/10 kW/DA-2	9/28/79
KTRB	Modesto, CA	860	1 kW/DA-N	9/26/41
KTRB	Modesto, CA	860	1/10 kW/DA-2	11/16/42
WAMO	Pittsburgh, PA	860	1 kW/DA-D	8/18/58
WAYE	Baltimore, MD	860	1 kW/DA-D	7/29/70
WAZE	Dunedin, FL	860	0.5 kW/DA-2	8/22/80
WAZE	Dunedin, FL	860	0.5 kW/DA-D	2/2/59
WDMG	Douglas, GA	860	5 kW/DA-N	7/27/56
WKKO	Cocoa, FL	860	1 kW/DA-N	11/29/66
WGOM	Marion, IN	860	0.25 kW/DA-D	7/13/54
WTEL	Philadelphia, PA	860	10 kW/DA-D	11/29/68
XERPN	Ciudad Juarez, Chihuahua	860	0.5/1 kW/DA-N	12/27/68
NEW	Colton, CA	860	5 kW/DA-D	9/25/58
XENL	Monterrey, Nuevo Leon, MX	860	5 kW/DA-N	7/13/53

860-910

Station	Main Studio	Freq	Power	Date
XERSV	Ciudad Obregon, Sonora	860	0.25 kW/DA-N	3/22/71
XEUN	Mexico, DF	860	25/45 kW/DA-2	1/22/71
XEZR	Zaragoza, Coahuila	860	0.25 kW/DA-N	3/22/71
KAIM	Honolulu, HI	870	50 kW/DA-1	9/28/79
WHOA	San Juan, PR	870	5 kW/DA-1	5/28/63
WKAR	East Lansing, MI	870	10 kW/DA-D	7/28/69
WWL	New Orleans, LA	870	50 kW/DA-1	12/24/75
NEW	St. George, UT	870	10/50 kW/DA-N	11/17/75
XEACF	Irapuato, Gto.	870	1 kW/DA-D	10/16/68
KRVN	Lexington, NE	880	50 kW/DA-N	9/25/70
CKTS	Sherbrooke, QU	900	10 kW/DA-2	11/29/66
CKVD	Val d'Or, PQ	900	2.5/10 kW/DA-1	8/28/64
KBIF	Fresno, CA	900	1 kW/ND	5/11/55
CJER	St. Jerome, QU	900		5/4/82
NEW	Penticton, BC	900	1 kW/DA-1	6/23/71
CHML	Hamilton, ON	900	5 kW/DA-N	4/2/53
CHML	Hamilton, ON	900	50 kW/DA-2	6/27/77
CHNO	Sudbury, ON	900	1/10 kW/DA-2	3/28/60
CJBR	Rimouski, QU	900	10 kW/DA-N	12/5/80
CJER	St. Jerome, QU	900		4/5/82
CJVI	Victoria, BC	900	10 kW/DA-1	2/28/64
CKBI	Prince Albert, Sask.	900	10 kW/DA-2	1/10/58
CKDH	Amherst, NS	900	1 kW/DA-2	11/27/64
CKDR	Dryden, ON	900	0.25/1 kW/U	6/29/64
CKJL	St. Jerome, QU	900	1 kW/DA-1	11/30/61
CKTS	Sherbrooke, QU	900	10 kW/DA-2	1/16/81
KBUL	Wichita, KS	900	0.25 kW/DA-D	11/29/57

860-910

Station	Main Studio	Freq	Power	Date
KGRB	West Covina, CA	900	0.5 kW/DA-D	12/16/75
KGRB	West Covina, CA	900	0.25 kW/DA-D	11/29/63
KIKR	Conroe, TX	900	0.5 kW/DA-D	5/24/50
WFLN	Philadelphia, PA	900	1 kW/DA-D	9/11/58
WFRO	Fremont, OH	900	0.5 kW/DA-D	5/16/49
WGOK	Mobile, AL	900	1 kW/DA-D	10/12/56
WLMD	Laurel, MD	900	1 kW/DA-D	2/28/66
WODY	Bassett, VA	900	0.5 kW/DA-D	1/17/61
CBO	Ottawa, ON	910	5 kW/DA-1	1/19/55
CFJC	Kamloops, BC	910	1/10 kW/U	6/16/59
CFSX	Stephenville, NF	910	0.5 kW	4/1/63
CHRL	Roberval, QU	910	10 kW/DA-N	3/28/79
CHRL	Roberval, QU	910	10/2.5 kW/DA-N	2/21/73
CJDV	Drumheller, AB	910	10 kW/U	9/25/81
CJDV	Drumheller, AB	910	10/5 kW/DA-2	4/1/76
CKDQ	Drumheller, AB	910	10 kW	11/30/82
CKDQ	Drumheller, AB	910	50 kW/DA-2	9/23/82
CKLY	Lindsay, ON	910	1 kW/DA-1	6/21/55
CKLY	Lindsay, ON	910	5/10 kW/DA-2	4/29/69
CKLY	Lindsay, ON	910	1 kW/DA-1	5/3/55
CKVO	Clarenville, NF	910	10 kW/DA-1	3/19/75
CMCF	Havana, CU	910	10 kW/DA-1	10/22/52
NEW	Volga, SD	910	1/5 kW/DA-2	9/28/79
KALL	Salt Lake City, UT	910	1/5 kW/DA-N	2/17/61
KAMD	Camden, AR	910	1/5 kW/DA-2	10/25/61
KAMD	Camden, AR	910	0.5/5 kW/DA-2	6/29/64
KAMD	Camden, AR	910	0.5/1 kW/DA-N	11/28/55

860-910

Station	Main Studio	Freq	Power	Date
KBIM	Roswell, NM	910	0.5/5 kW/DA-N	10/26/65
KCJB	Minot, ND	910	1/5 kW/DA-2	10/2/74
KDEO	El Cajon, CA	910	1/5 kW/DA-2	6/28/68
KGLO	Miami, OK	910	1 kW/DA-1	4/21/48
KIKM	Sherman, TX	910	1 kW/DA-1	7/1/55
KINA	Salina, KS	910	0.5 kW/DA-D	9/11/58
KISN	Vancouver, WA	910	5 kW/DA-2	12/29/66
KIXI	Seattle, WA	910	1 kW/DA-1	10/6/55
KJJJ	Phoenix, AZ	910	5 kW/DA-N	11/47
KMJC	El Cajon, CA	910	5 kW/DA-2	5/81
KNEW	Oakland, CA	910	5 kW/DA-1	4/15/53
KOXR	Oxnard, CA	910	1/5 kW/DA-2	10/26/65
KRIO	McAllen, TX	910	5 kW/DA-2	10/26/62
KRIO	McAllen, TX	910	1 kW/DA-1	
WABI	Bangor, ME	910	5 kW	10/46
WAKO	Lawrenceville, IL	910	0.5 kW/DA-D	11/30/54
WAVL	Apollo, PA	910	5 kW/DA-D	10/27/78
WBRJ	Marietta, OH	910	5 kW/DA-D	8/24/62
WFDF	Flint, MI	910	1/5 kW/DA-2	6/17/57
WGAF	Valdosta, GA	910	5 kW/DA-N	10/29/51
WJCW	Johnson City, TN	910	1/5 kW/DA-N	6/23/77
WLAS	Jacksonville, NC	910	5 kW/DA-N	9/28/79
WLCS	Baton Rouge, LA	910	1 kW/DA-1	4/19/50
WORD	Spartanburg, SC	910	1/5 kW/DA-2	5/15/59
WORD	Spartanburg, SC	910	1 kW/DA-2	8/29/50
WPLA	Plant City, FL	910	1 kW/DA-1	8/30/78
WRCQ	New Britain, CT	910	5 kW/DA-2	9/46

860-910

Station	Main Studio	Freq	Power	Date
WRKL	New City, NY	910	1 kW/DA-D	6/64
WRNL	Richmond, VA	910	5 kW/DA-N	6/70
WSBA	York, PA	910	1 kW/DA-2	1/49
WSBA	York, PA	910	1/5 kW/DA-2	12/12/58
WSUI	Iowa City, IA	910	5 kW/DA-2	3/7/49
NEW	Jacksonville, NC	910	5 kW/DA-D	1/28/70

CFPR

IFRB Serial No. 1 2 1 2 7

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT

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

860

PART I GENERAL INFORMATION

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

Assigned frequency (kHz)		(02)	860
Transmitting station	Name of the station	(03)	PRINCE RUPERT
	Call sign	(04)	CFPR
	Additional identification	(05)	
	Station class	(06)	A
	Operational Status	(07)	P
Country		(08)	CAN
Geographical coordinates of the transmitting station		(09)	130W2228 54N1708

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

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

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

STATION PARAMETERS		DAYTIME OPERATION		NIGHT-TIME OPERATION
Station power (kW)	(21)	10.	(31)	2.5
r.m.s. value of radiation for station power (mV/m at 1km)	(25)	933.22	(35)	466.61
Antenna type	(26)	A	(36)	A
Simple vertical antenna electrical height (degrees)	(27)	84.8	(37)	84.8

(44) Remarks

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

163

CBH

Description Sheet
(11-30-61ct)

Station CBH
Halifax, N.S.

10kw,DA-N,U,Class II
860 kc

CANADIAN BROADCASTING CORPORATION

ENGINEERING DIVISION MONTREAL

TITLE

DWG. No.
DATE ISS.
ENG. APP.

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

Station Call: CBH

Main Studio: Halifax, N.S.

Frequency: 860 kc/s

Power: 10 kw

Class: II

Time: Day and night operation (DA-N)

Notification List No. 163 Date: Sept. 15, 1961

Geographical Location of Antenna System: North Latitude: 44° 38' 09"

West Longitude: 63° 41' 46"

Antenna Characteristics:	1 (East)	2 (West)
Height:	275 ft. (90°)	275 ft.
Spacing	286½ ft. (90°)	
Night Phasing	0	-90°
Night Field Ratio:	1.0	1.0

Orientation: Along a line bearing 89.5° true.

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

Expected Efficiency: Night: 620 mv/m at rated power (196 mv/m for 1 kw)

Day: 585 mv/m at rated power (185 mv/m for 1 kw)

Ground System: 120 radials per tower, spaced 3° and averaging 450' long (0.39λ).

Transmission & Development Department

C.B.C.-252A

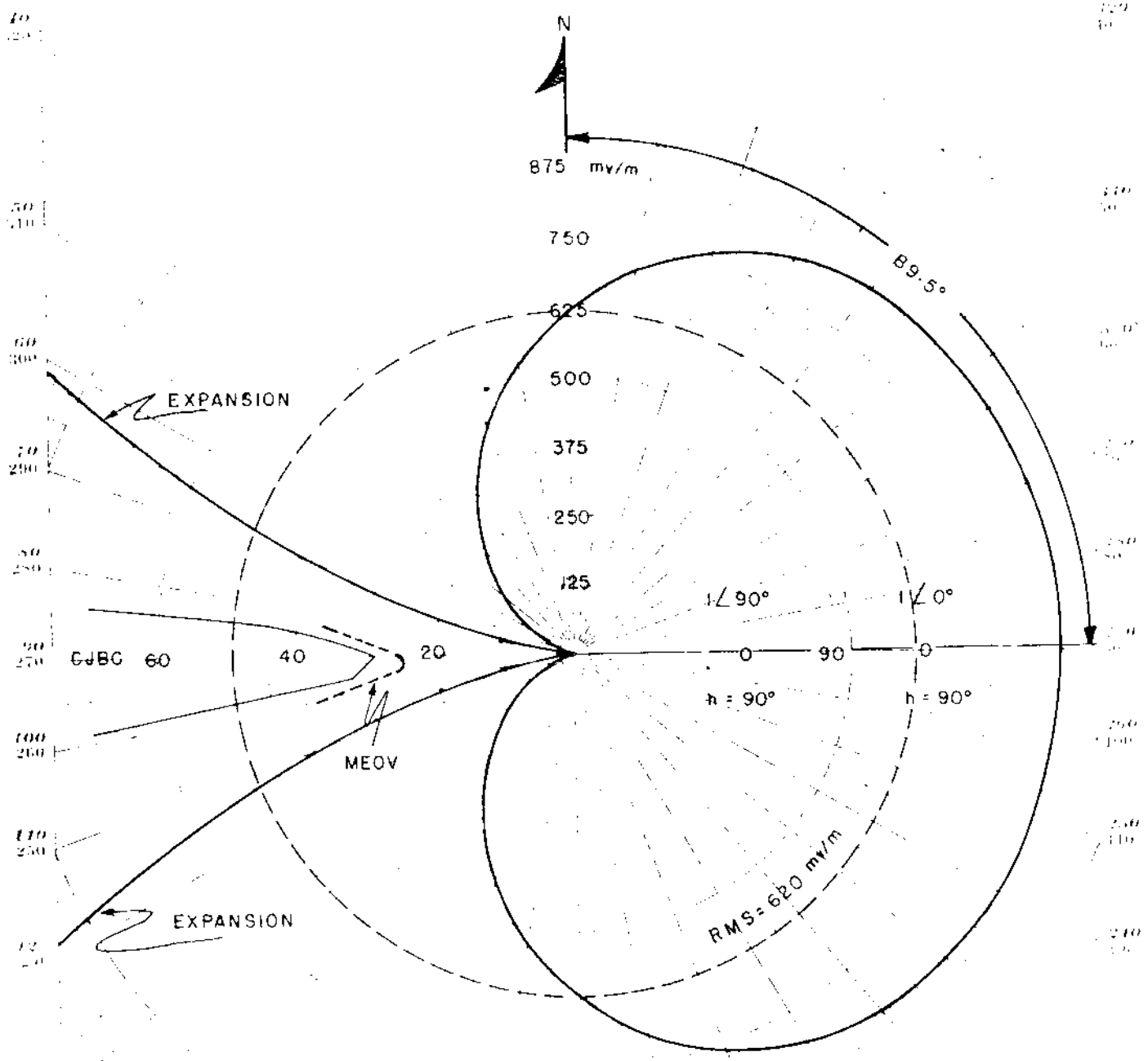
#163

CBH

Proposed Night
(11-30-61ct)

Station CBH
Halifax, N.S.

10kw,DA-N,U,Class II
860 kc



HORIZONTAL RADIATION PATTERN
PROPOSED CBH, HALIFAX, N.S.
860 Kc/s, 10 Kw, DA-N, CLASS II

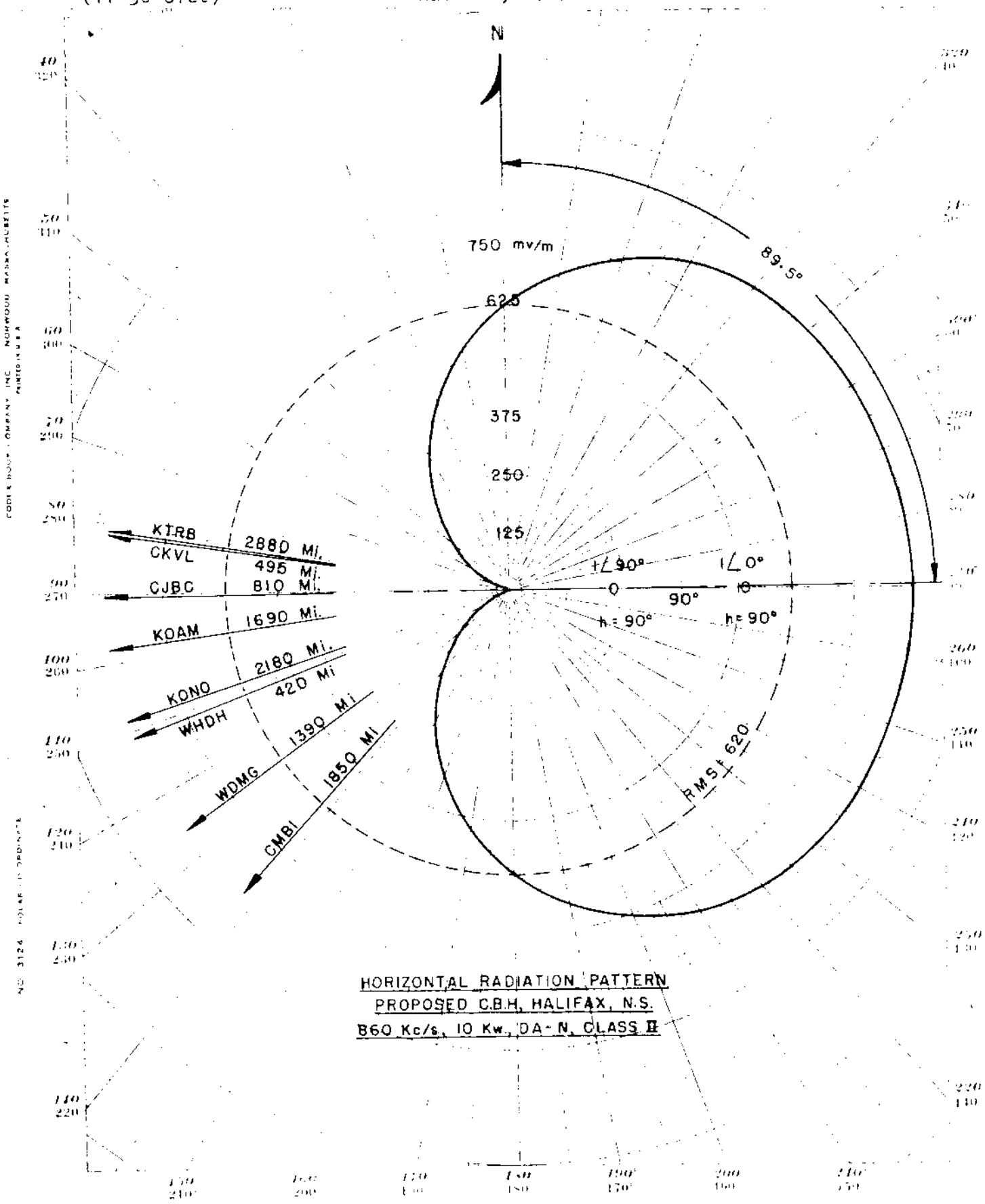
#163

CBH

Proposed Night
(11-30-61ct)

Station CBH
Halifax, N.S.

10kw,DA-N,U,Class II
860 kc



HORIZONTAL RADIATION PATTERN
PROPOSED CBH, HALIFAX, N.S.
860 Kc/s, 10 Kw, DA-N, CLASS II

CFNS

PROJECT #10308-B

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

STATION: CFNS

STATION LOCATION: Saskatoon, Sask.

FREQUENCY: 860 kHz

POWER: 10 kW CLASS II

NOTIFICATION LIST NO: 363

DATE: May 10, 1977

GEOGRAPHICAL LOCATION: 52° 15' 00" North Latitude
106° 39' 33" West Longitude

ANTENNA CHARACTERISTICS:

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

Tower	#1 (SE)	#2 (NE)	#3 (SW)	#4 (NW)
Height above Base Insulators:	280'(88°)	280'	280'	280'
Overall Height:	285'	285'	285'	285'
Day Field Ratio:	1.0	-	.75	-
Day Phasing:	0°	-	45°	-
Night Field Ratio:	1.0	1.1	0.9	0.7
Night Phasing:	0°	-161°	45°	-134°
Orientation:	Ref.	3°T	273°T	307°T
Spacing:	Ref.	286.1'(90°)	429.2'(135°)	511.8'(161°)

GROUND SYSTEM: 120 equally spaced radials of No. 10 B & S gauge bare soft copper wire per tower, buried approximately 8". Length of radials, 458', (0.4 wavelength), with the exception of those joined along the common chords.

Predicted Effective Night Field:

625 mV/m at 1 mile for 10 kW
198 mV/m at 1 mile for 1 kW

Predicted Effective Day Field:

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

February 1, 1975
Revised February 28, 1977

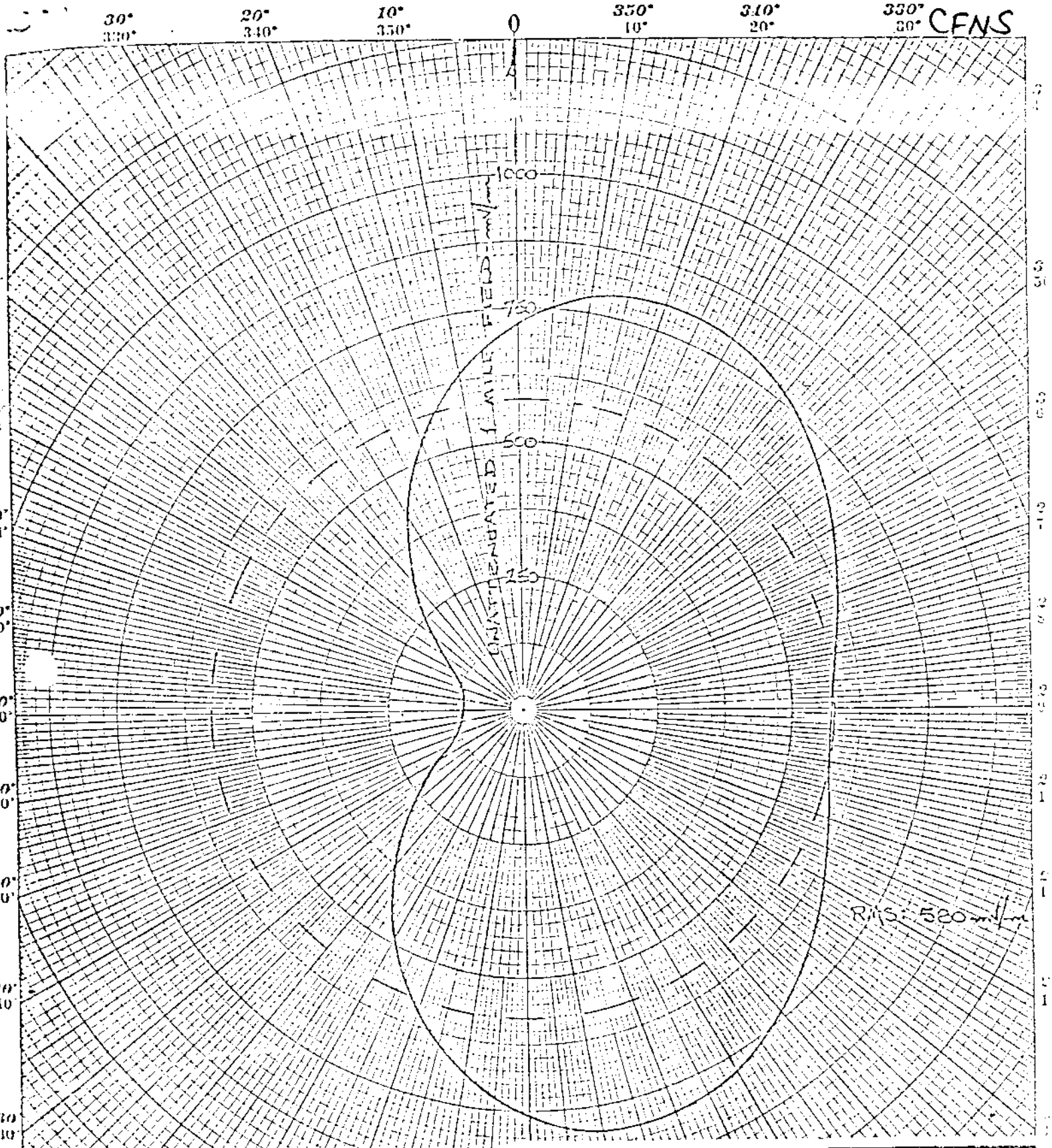


FIGURE 3

HORIZONTAL RADIATION PATTERN
DAYTIME - POLAR PLOT

CFNS SASKATOON, SASK.
360 kHz 10 kW DA-2 CLASS II

PROJECT #10308-B REV. FEB. 28, 1977

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

CFNS

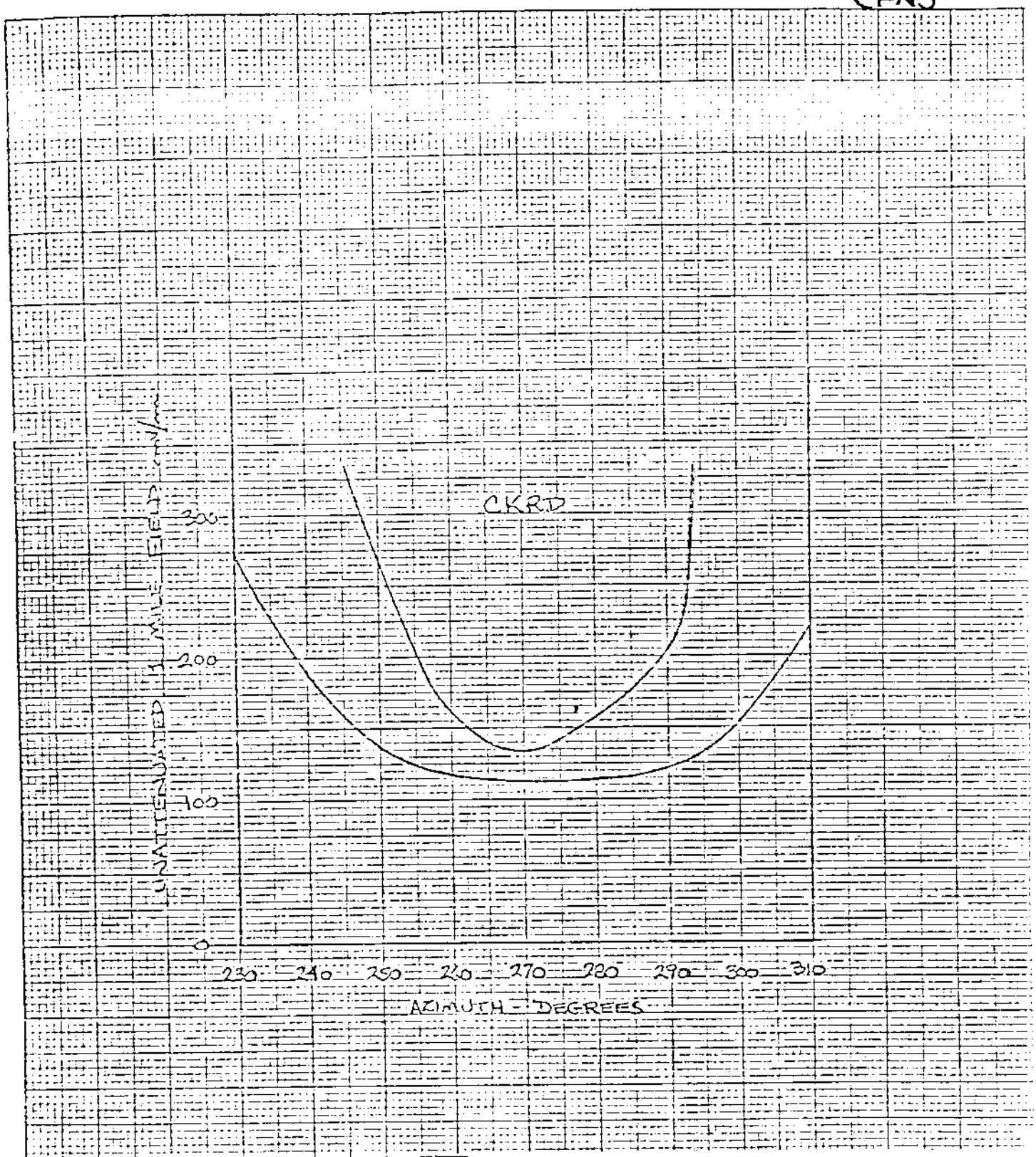


FIGURE 4

HORIZONTAL RADIATION PATTERN
DAYTIME - EXPANDED PLOT

CFNS SASKATOON, SASK.
860 kHz 10 kW DA-2 CLASS II

PROJECT #10308-B REV. FEB. 28, 1977

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

SEP. 30 1963

CFPR

CANADIAN BROADCASTING CORPORATION
ENGINEERING DIVISION MONTREAL
TITLE ENGINEERING BRIEF FOR PRINCE RUPERT B.C.

DWG. NO.
DATE SEPT. 17/63 ISS. 2
ENG. J.H.S. APP. R.E.S.

ANTENNA DESCRIPTION SHEET

Station: CFPR

Main Studio: Prince Rupert, B.C.

Frequency: 860 kc/s

Power: 10 kw Class: II

Geographical Location of Centre of Antenna:

Latitude: 54° 17' 08" N.
Longitude: 130° 22' 28" W.

Antenna Characteristics:

Day and Night Operation: DA-1

Number of Elements: 2

Type of Elements: Series fed, uniform cross-section guyed, vertical steel towers.

Towers:	1 (N.E.)	2 (S.W.)
Height above Insulators:	270' (84.8°)	270' (84.8°)
Phasing:	137°	0°
Field Ratio:	1.5	1.0

Spacing and Orientation: Elements are spaced 234 ft. apart and lie on a line bearing 55° true north.

Ground System: 120 radials per tower spaced at 3°. The radials will run to the edge of the transmitter site, and will be bonded together in the area between the towers

Antenna Efficiency: 570 mv/m at 1 mile for 10 kw
180 mv/m at 1 mile for 1 kw.

Notification List No. 181

Date: September 30, 1963.

Transmission & Development Department

C.B.C.-491A

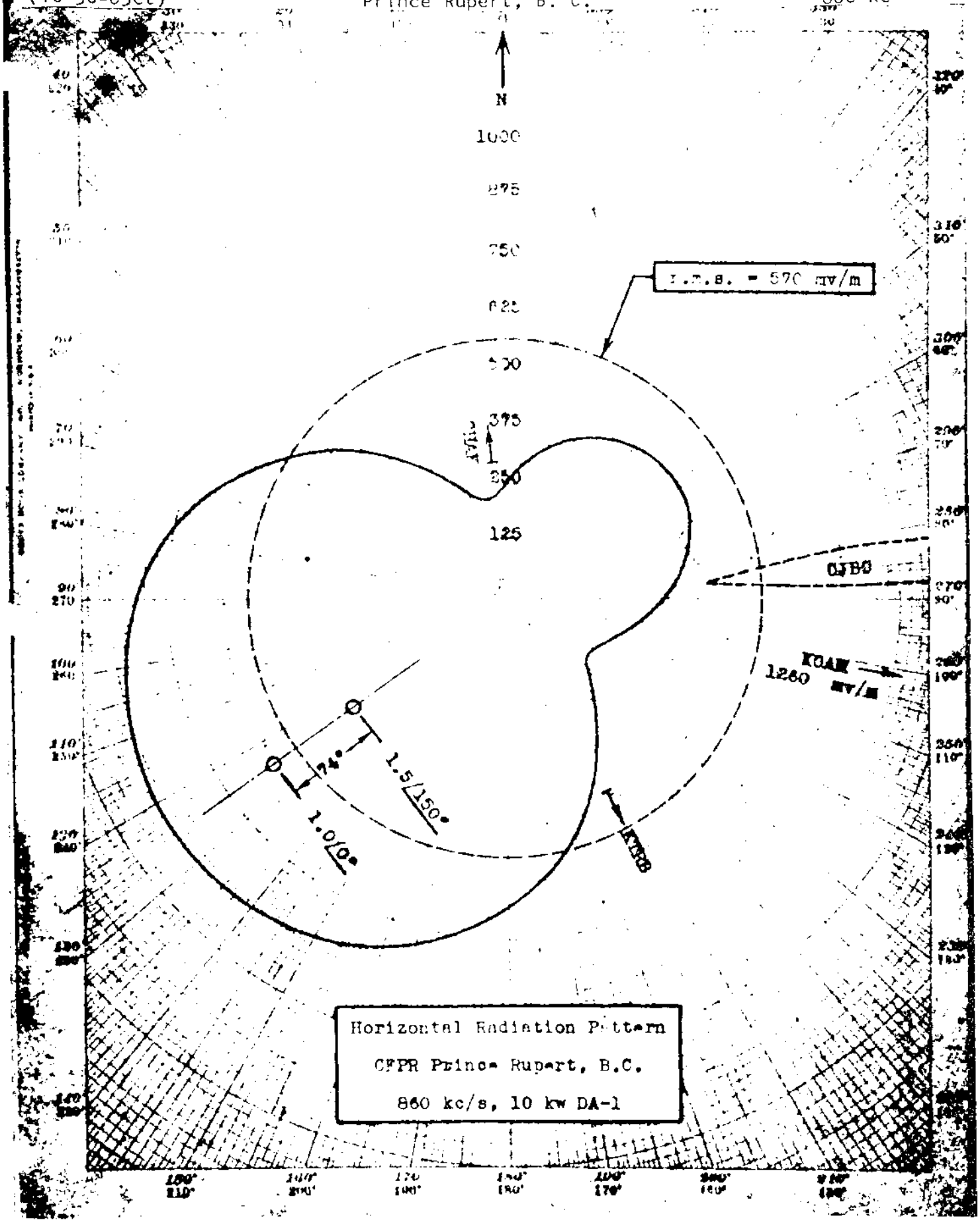
SEPT. 30 1963

CFPR

Proposed Day & Night
(10-30-63ct)

Station CFPR
Prince Rupert, B. C.

10kw,DA-1,U,Class II
860 kc



38

CHAK

DESCRIPTION SHEET
(11-16-59g)

AIR SERVICES
TELECOMMUNICATIONS BRANCH

Station CHAK 1kw,U,Class II
Inuvik, Northwest Territories, Canada 860 KC

REFER TO FILE NUMBER

CANADA

DEPARTMENT OF TRANSPORT

DESCRIPTIVE SHEET - OMNIDIRECTIONAL ANTENNA

Station Call:	CHAK
Main Studio:	Inuvik, Northwest Territories
Frequency:	860 kcs.
Power:	1 kw
Class:	II
Time:	Unlimited
Notification List No:	138, Date; September 4, 1959
Geographical Location:	
North Latitude:	68° 20' 41''
West Longitude:	133° 40' 59''
Antenna Characteristics:	
Electrical Height:	190' (60°)
Expected Efficiency:	185 mv/m at 1 mile for 1 kw
Ground System:	120 radials, 458' (0.4 w.l.) in length
Type of Element:	Single element, series fed, guyed, constant cross-section, insulated.

Nov 20-52

CJBC
860

REFER TO FILE NUMBER

Air Services
Telecommunications Division
(5-10-56)

CANADA

DEPARTMENT OF TRANSPORT
OTTAWA

DESCRIPTIVE SHEET - OMNIDIRECTIONAL ANTENNA

Station Call: CJBC

Main Studio: Toronto, Ontario.

Frequency: 860 Kc/s.

Power: 50 Kw.

Class: I-A

Time: U

Notification Reference: NARBA Annex 3

Geographical Location:

North Latitude: 43° 34' 32"

West Longitude: 79° 49' 03"

Antenna Characteristics:

Height: 645 ft. 213.3 degrees

Expected Efficiency: 1826 mv/m at 1 mi. for 50 Kw.

or: 260.5 mv/m at 1 mi. for 1 Kw.

Ground System:

120 radials 645 feet long. No ground screen used.

Type of Element:

1 element, uniform square cross-section, insulated, guyed and series fed.

November 20, 1952

IFRB Serial No. 7083

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT

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

CKKC 860 kHz

PART I GENERAL INFORMATION

(01) Administration: CANADA Sheet No. 41/v Date 82.4.5

Assigned frequency (kHz)		(02)	860
Transmitting station	Name of the station	(03)	NELSON BC
	Call sign	(04)	CKKC
	Additional Identification	(05)	
	Station class	(06)	B
	Operational Status	(07)	P
Country		(08)	CAN
Geographical coordinates of the transmitting station		(09)	117W1552 49N3049

(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: 82 09 01 (Year Month Day)

STATION PARAMETERS		DAYTIME OPERATION		NIGHT-TIME OPERATION
Station power (kW)	(21)	1.	(31)	1.
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: Change from theoretical to expanded directional pattern

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 BROADC ING STATION IN THE BAND 535 - 1605 kHz

IFRB Serial No. 708

PART II Section I

Description of a directional antenna consisting of vertical conductors

Sheet No. 411

Date

(01) NELSON BC
Name of transmitting station

(02) CAN
Country

(03) HJ
Hours of operation

(04) 2
Total number of towers

(05) Tower No.	(06) Tower field ratio	(07) Phase difference at 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		60	
2	.8	-157	60	196		60	

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

(17) SUPPLEMENTARY INFORMATION

CKKC
860 kHz

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

IFRB S No. 7083

PART II Section I

Description of a directional antenna consisting of vertical conductors

Sheet No. 411

Date

(01) NELSON BC
Name of transmitting station

(02) CAN
Country

(03) HN
Hours of operation

(04) 2
Total number of towers

(05) Tower No.	(06) Tower field ratio	(07) Phase difference of the field (± degrees)	(08) Electrical tower spacing (degrees)	(09) Angular tower orientation (degrees)	(10) Reference tower indicator	(11) Electrical height of tower (degrees)	(12) Tower structure
1	1	0	0	0		60	
2	.8	-157	60	176		60	

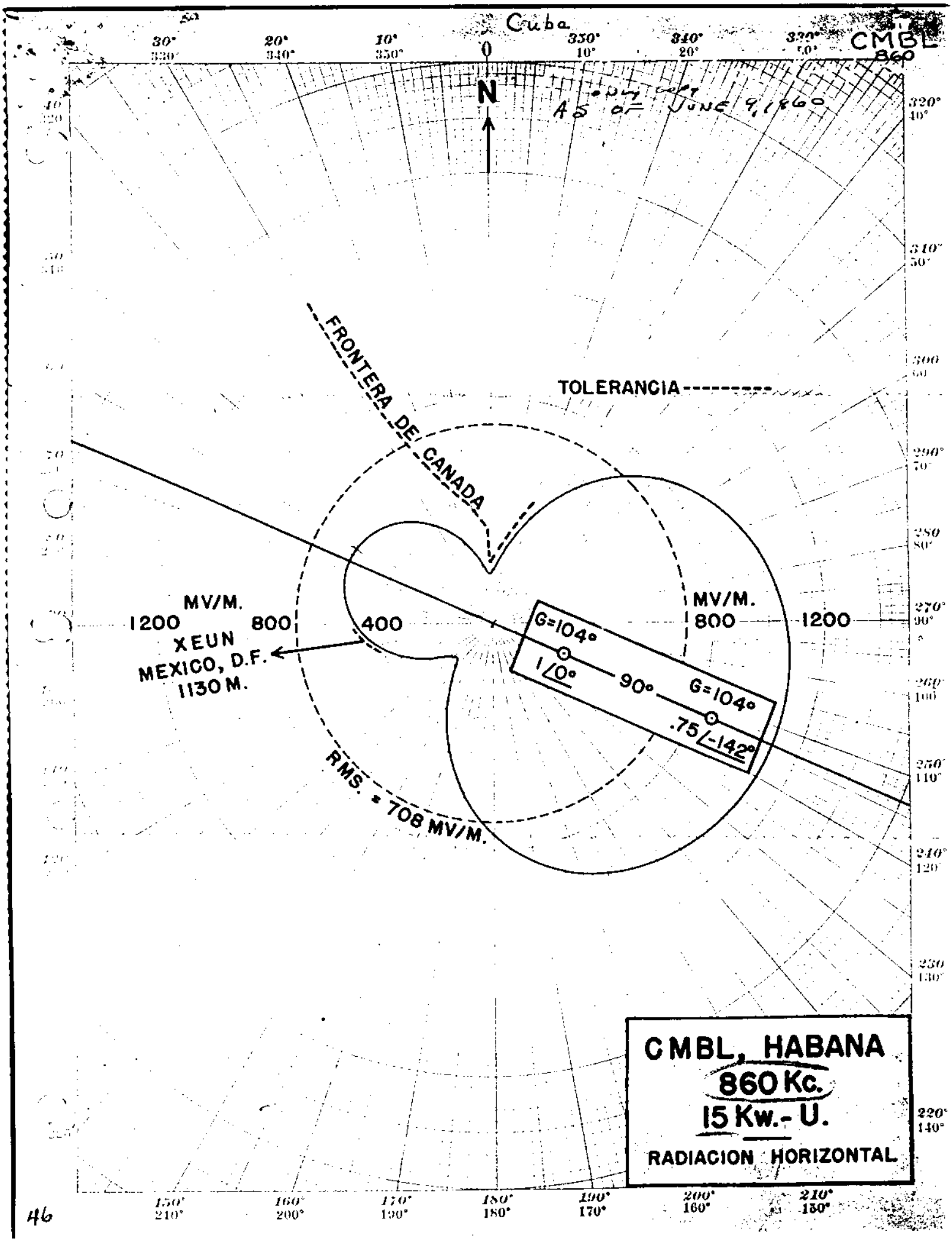
(14) r.m.s. value of radiation: 310.54 mV/m at 1 km

(15) Type of pattern: E

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

(17) SUPPLEMENTARY INFORMATION

CKRC 860 kHz


Cuba
CMBL
860
N
As of June 9, 1960
FRONTERA DE CANADA
TOLERANCIA
MV/M.
1200
800
400
XEUN
MEXICO, D.F.
1130 M.
MV/M.
800
1200
G=104°
1∠0°
90°
G=104°
.75∠-142°
RMS. = 708 MV/M.
CMBL, HABANA
860 Kc.
15 Kw.- U.
RADIACION HORIZONTAL

PATTERN No.: 411006
SUPERSEDES:

KOAM——860

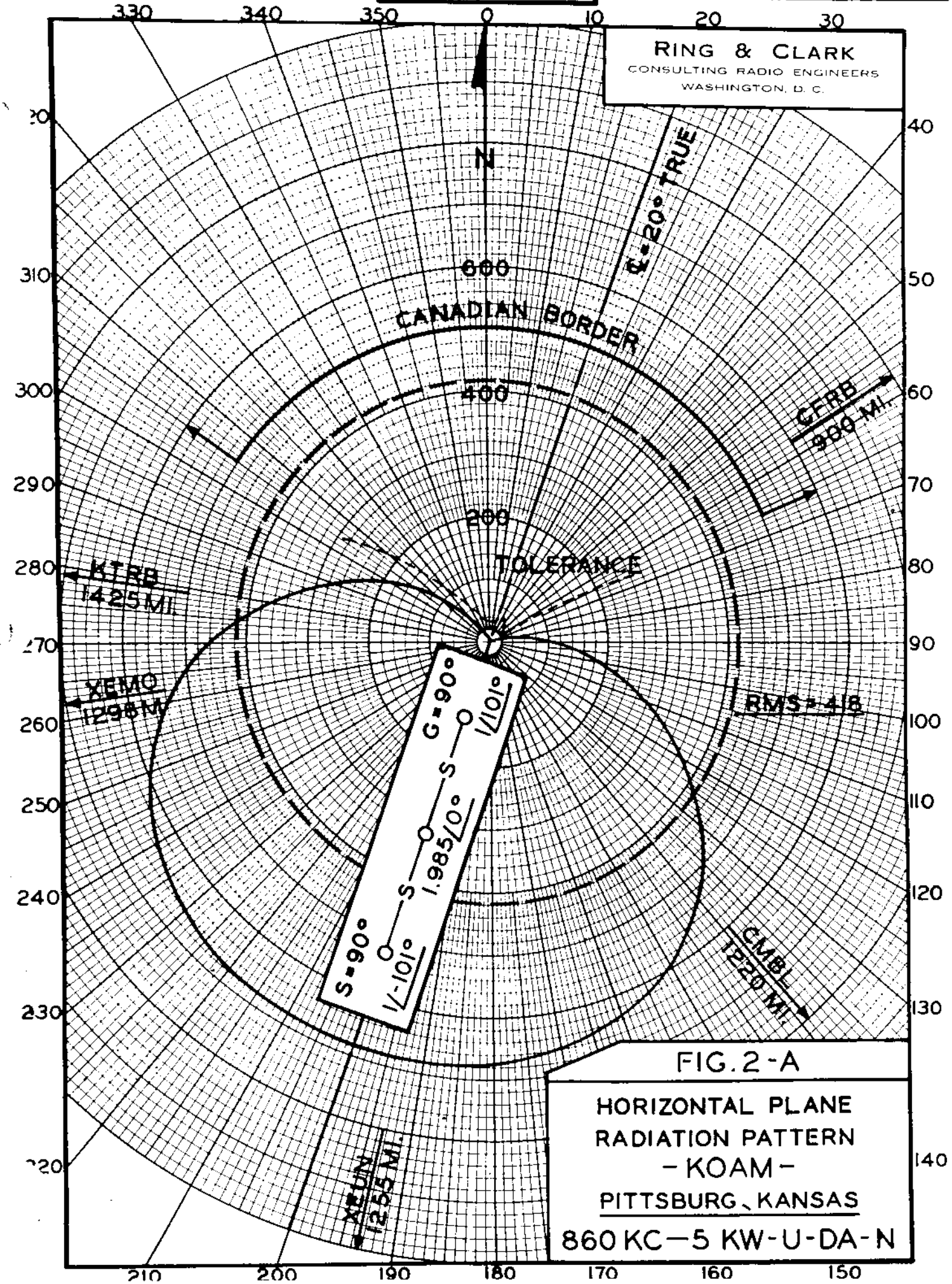


FIG. 2-A

HORIZONTAL PLANE
RADIATION PATTERN
- KOAM -
PITTSBURG, KANSAS
860 KC—5 KW-U-DA-N

PROPOSED NIGHT NULLS

Station KOAM
Pittsburg, Kansas

ATTERN No.: 411006
UPERSEDES:

5kw, DAN KOAM——860
KOAM

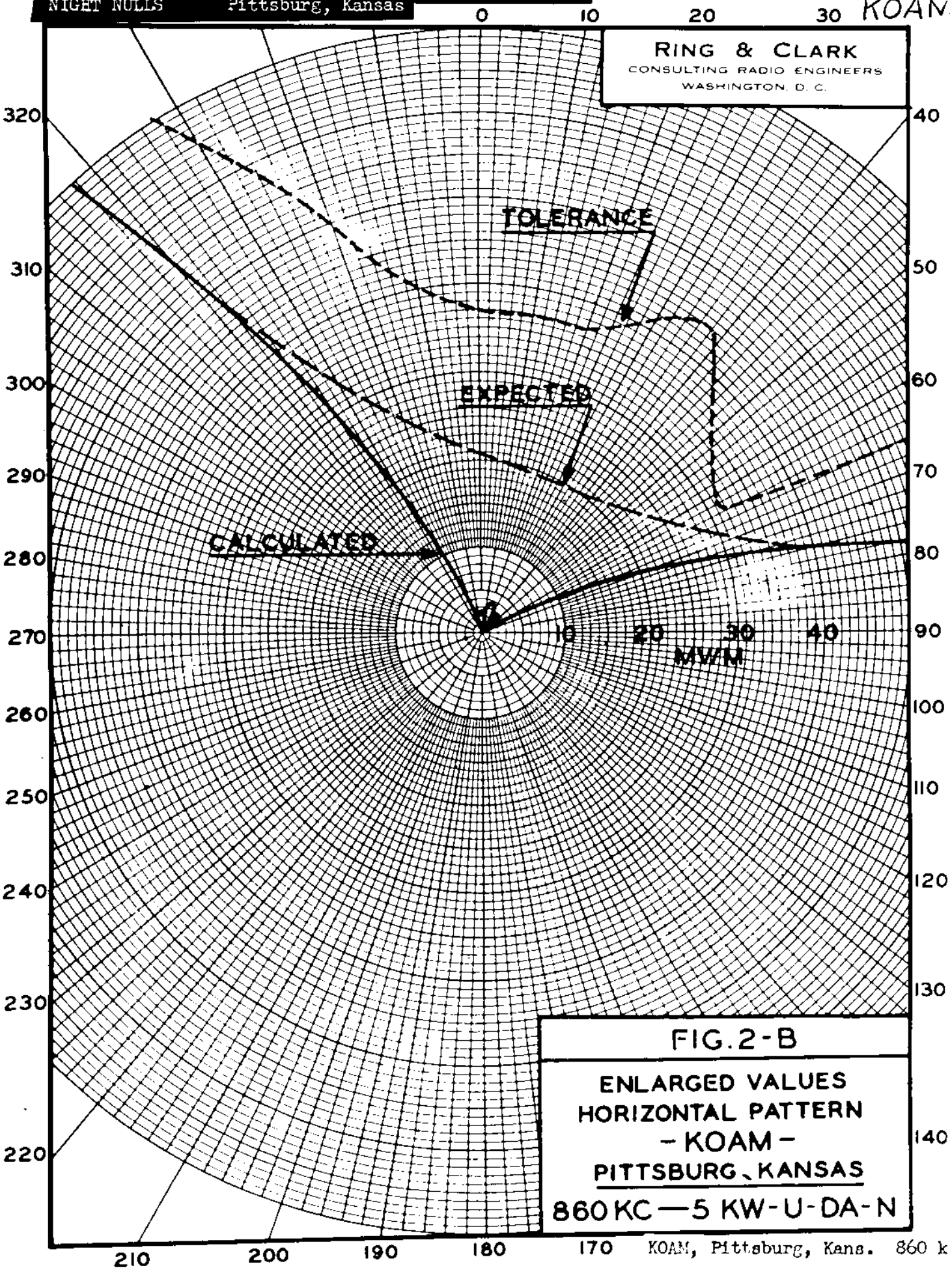
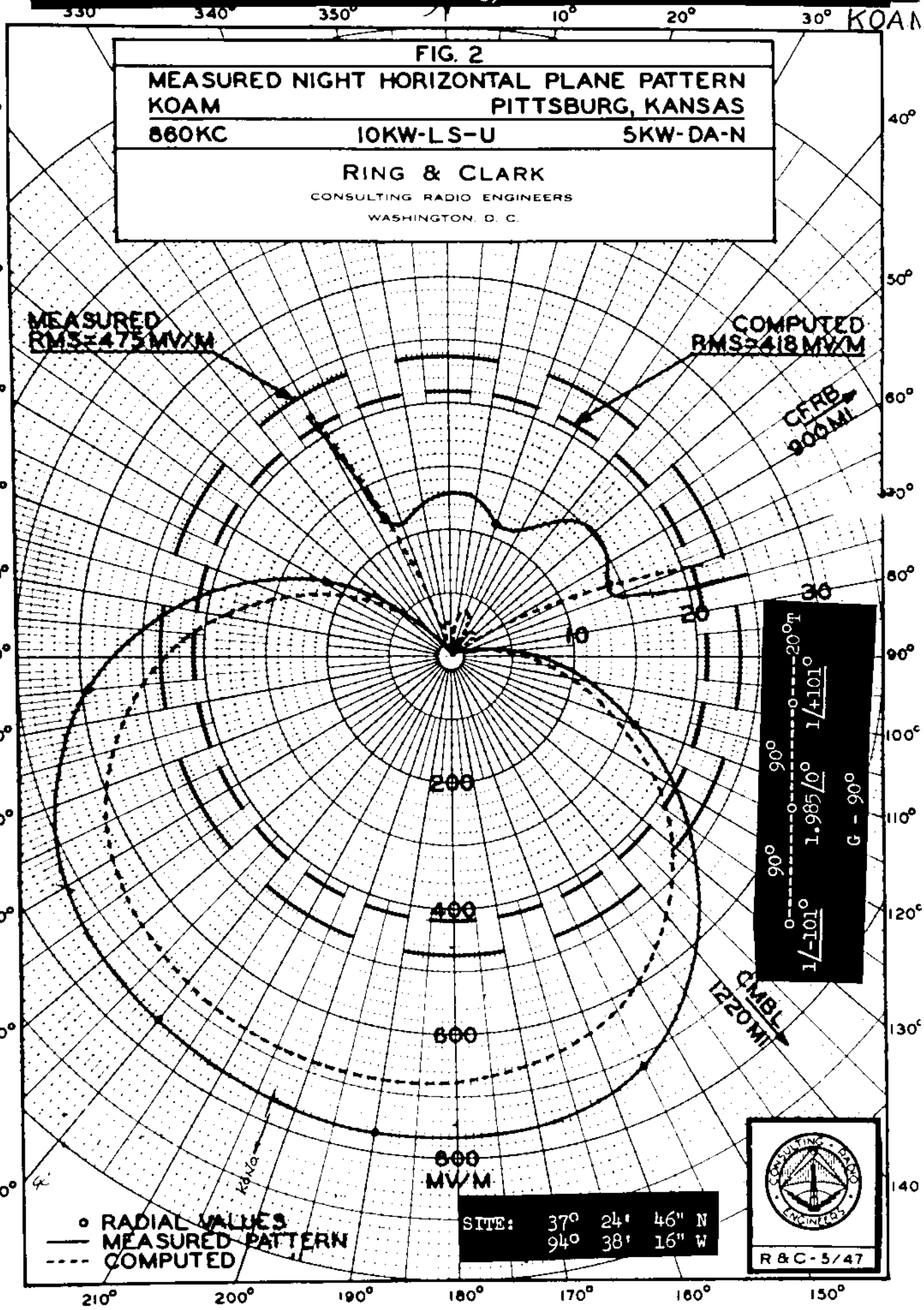


FIG. 2-B

ENLARGED VALUES
HORIZONTAL PATTERN
- KOAM -
PITTSBURG, KANSAS
860 KC — 5 KW-U-DA-N

KOAM, Pittsburg, Kans. 860 k

MEASURED NIGHT | Station KOAM Pittsburg, Kansas | 5kw,10kw-LS, DA-N,U 860 KC



[redacted] KOAM-860KC

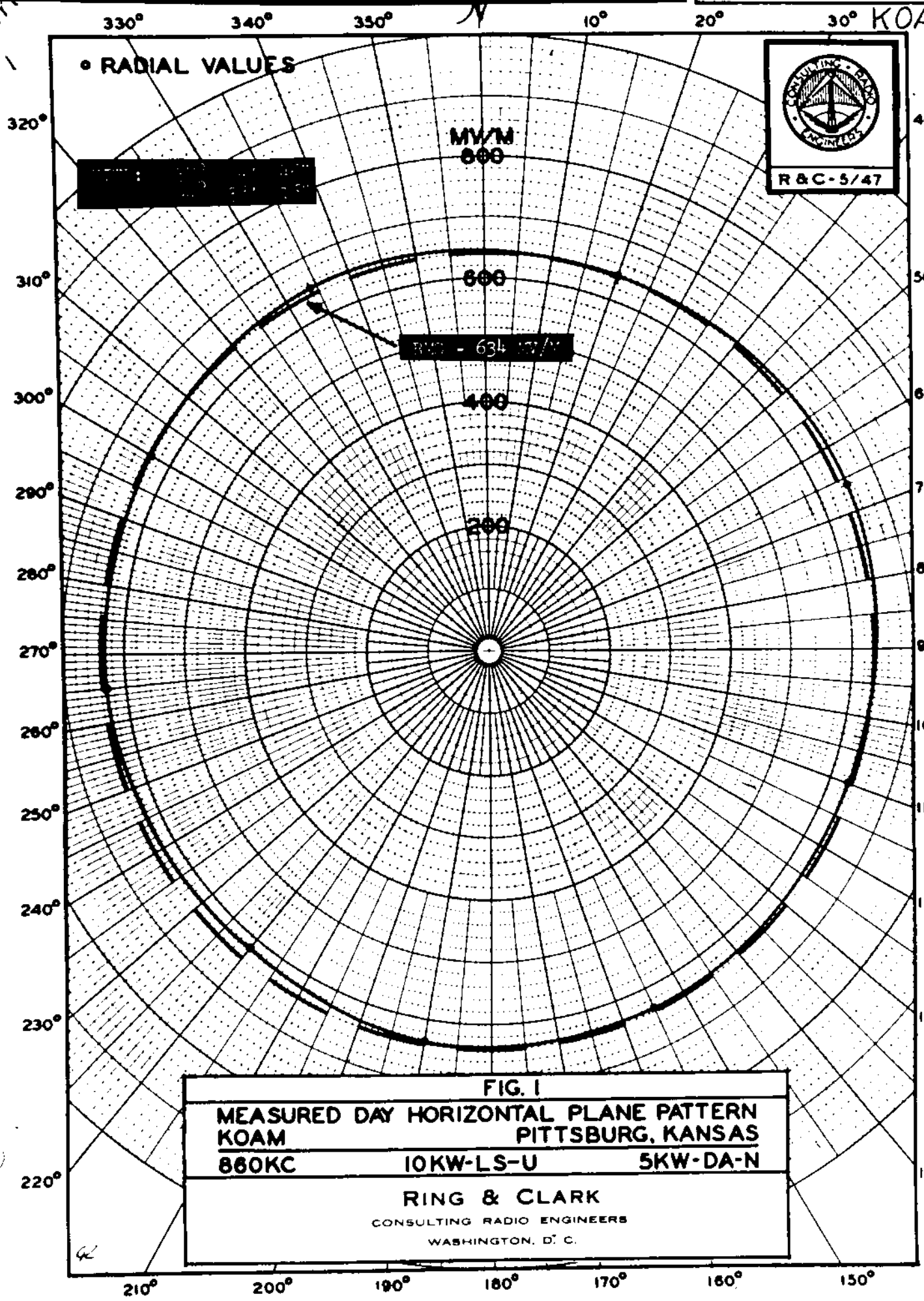


FIG. 1

MEASURED DAY HORIZONTAL PLANE PATTERN

KOAM PITTSBURG, KANSAS

860KC 10KW-LS-U 5KW-DA-N

RING & CLARK

CONSULTING RADIO ENGINEERS

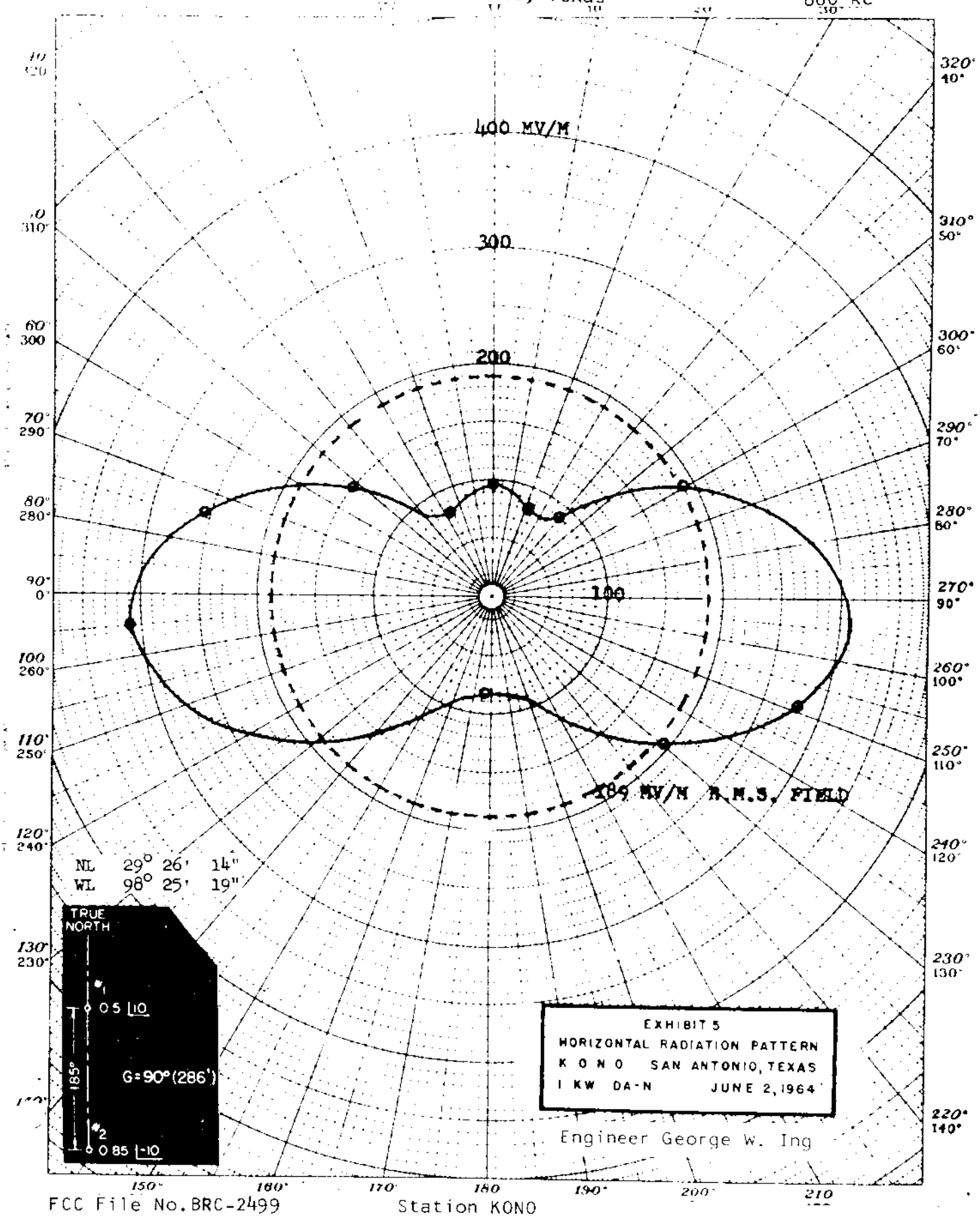
WASHINGTON, D. C.

KONO

Measured Night
(9-29-64ct)

Station KONO
San Antonio, Texas

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



FCC File No.BRC-2499
Accepted

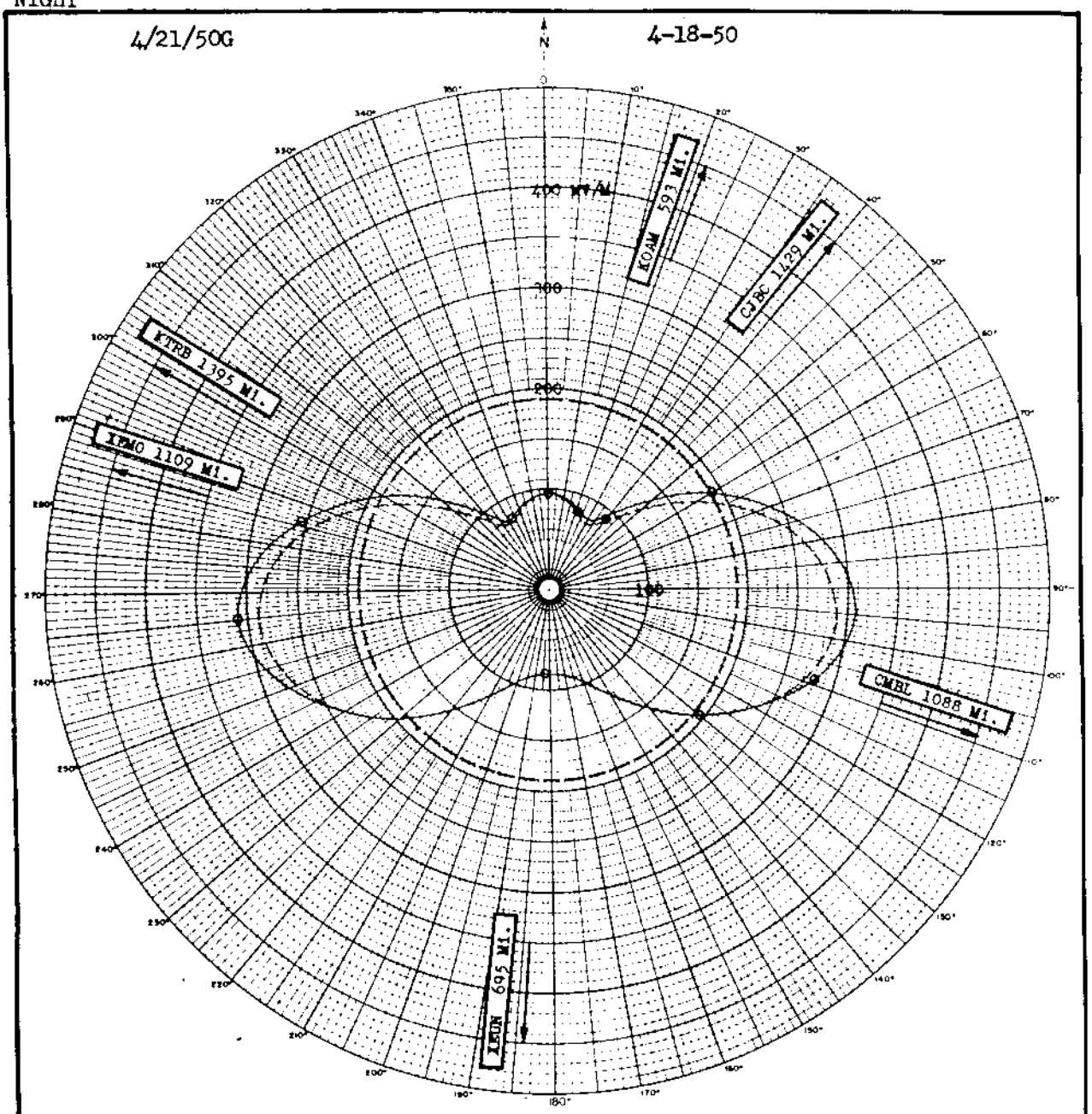
Station KONO
San Antonio, Texas

860 kc

MEASURED
NIGHT

KONO, SAN ANTONIO, TEX.

1kw,5kw-LS,DAN 860 kc



KONO

HORIZONTAL RADIATION PATTERN

MEASURED ——— CALCULATED — — —

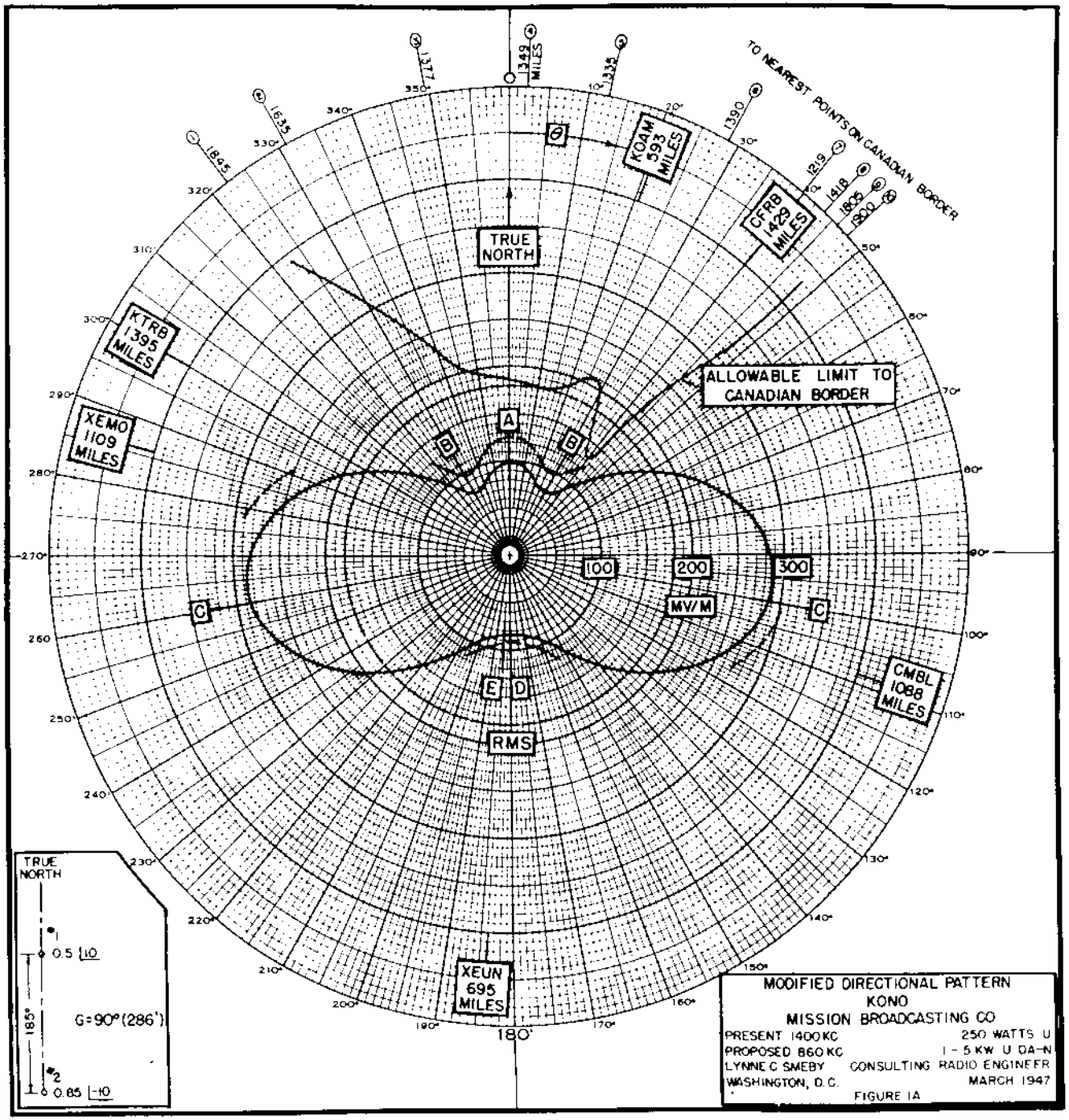
ANTENNA	NO. 1 (N)	NO. 2 (S)	NO. 3	NO. 4	NO. 5	NO. 6
PHASE DEG	0°	-20°				
HEIGHT DEG	90°	90°				
FIELD RATIO	1.0	1.7				
NON-DA ANT.		*				

ORIENTATION OF True SPACING 185°

FREQUENCY 860 KC
ASSIGNMENT 5 Kw.-LS, 1 Kw.-N (DA-N)
LONGITUDE 98 DEG 25 MIN 18.5 SEC.
LATITUDE 29 DEG 26 MIN 14.3 SEC.
WHEN USED: NIGHTTIME
R.M.S. FIELD 189 MV/M (Measured)
DATE APRIL 1950

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

KONO, San Antonio, Tex. 860 kc


TO NEAREST POINTS ON CANADIAN BORDER
1349 MILES
1335
1390
1219
1418
1805
1800
1771
1635
1845
KOAM 593 MILES
CFRB 429 MILES
TRUE NORTH
KTRB 1395 MILES
XEMO 1109 MILES
ALLOWABLE LIMIT TO CANADIAN BORDER
A
B
B
C
C
100
200
300
MV/M
E
D
RMS
CMBL 1088 MILES
XEUN 695 MILES
180°
TRUE NORTH
0.5 10
185°
G=90°(286')
0.85 -10
MODIFIED DIRECTIONAL PATTERN
KONO
MISSION BROADCASTING CO
PRESENT 1400 KC
250 WATTS U
PROPOSED 860 KC
1 - 5 KW U DA-N
LYNNE C SMEBY
CONSULTING RADIO ENGINEER
WASHINGTON, D.C.
MARCH 1947
FIGURE 1A

KTRB

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station : KTRB Main Studio: Modesto, California

Frequency : 860 KHz Power : 1 kW Night 10 kW Day

Notification : 1780 Date : Sept. 28, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude:	37	42	32
West Longitude:	120	43	27

ANTENNA CHARACTERISTICS

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

TOWER :	E(#1)	EC(#2)	WC(#3)	W(#4)		
HEIGHT ABOVE INSULATORS :	280'	280'	280'	280'	(88.1°)	
NIGHT PHASING :	0°	-150°	+60°	-90°		
NIGHT FIELD RATIO:	1.0	2.8	2.80	1.00		
DAY PHASING :		0°	+14°	-87.5°		
DAY FIELD RATIO :		1.0	0.79	0.56		

SPACING AND ORIENTATION : Towers in a row are spaced 254.2' (80°) on a line bearing 255° true.

GROUND SYSTEM : 120 - 350 equally spaced copper radials plus 200 - 60' interspaced radials elevated seven feet above the ground and bonded to the ground, about each tower. Radials are shortened and bonded to a trasverse strap along intersections between towers.

KTRB

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

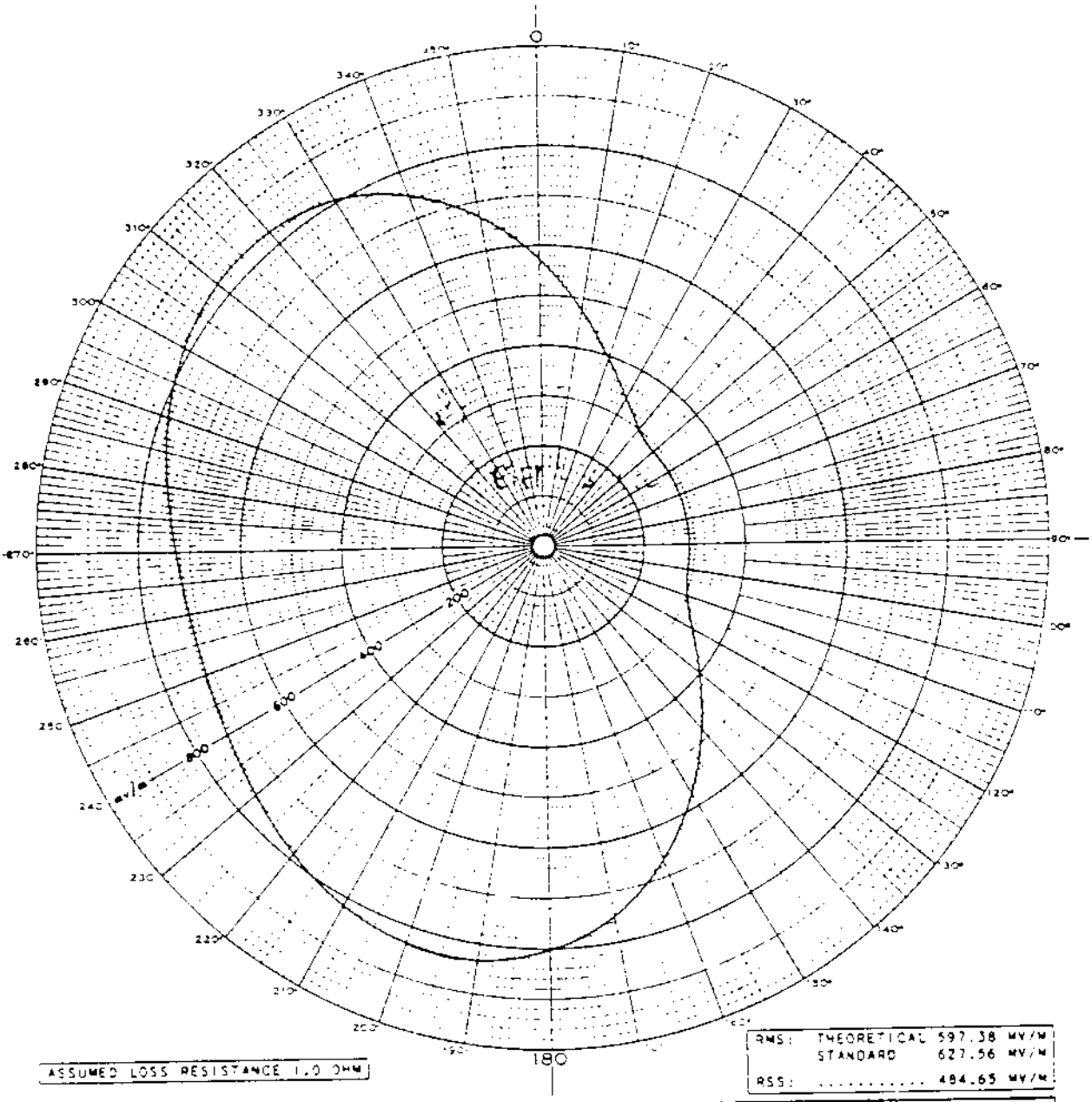
	THEORETICAL		STANDARD
	RMS	RSS	RMS
Day	597.4 mV/m	484.65 mV/m	627.6 mV/m
Night	207.0 mV/m	470.56 mV/m	217.6 mV/m

Note:

KTRB

STD

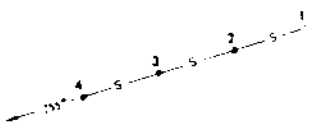
PROPOSED DAYTIME | **STANDARD PATTERN**



ASSUMED LOSS RESISTANCE 1.0 OHM

RMS:	THEORETICAL	597.38 MV/M
	STANDARD	627.56 MV/M
RSS:	.....	484.65 MV/M

TOWER PLACEMENT SKETCH



S - 254.2 (180°)

PATTERN PARAMETERS

TOWER No.	ELECTRICAL HEIGHT (°)	TRUE TOWER ORIENTATION (°)	SPACING (°)	PHASING (°)	HORIZONTAL FIELD RATIO (F)	FIELD RATIO (F)
1	90	0	0			
2	90	255	80	0.0		1.00
3	90	255	160	140		.79
4	90	255	240	-87.5		.56
5						
6						
7						
8						

ELEV. ANT. (M)	ELEVATION OF PHASE CENTER (M)
10	

STATION DATA

CALL	KTRB
FREQUENCY	880 kc
POWER	1.0 / 10 LS kw
TIME OF OPERATION	UNL
TYPE OF OPERATION	DA-2
DAYTIME TOWERS	2 - 3 - 4
NIGHTTIME TOWERS	1 - 2 - 3 - 4
NO. RADIALS PER TOWER	
LENGTH OF RADIALS	m
GROUND SYSTEM DIMENSION	
LAT	37 42 32
LONG	120 43 27
SUPERSEDES	
PATTERN No.	TB0830

DECAL LYNCH CONSULTING ENGINEER
MODESTO, CALIFORNIA

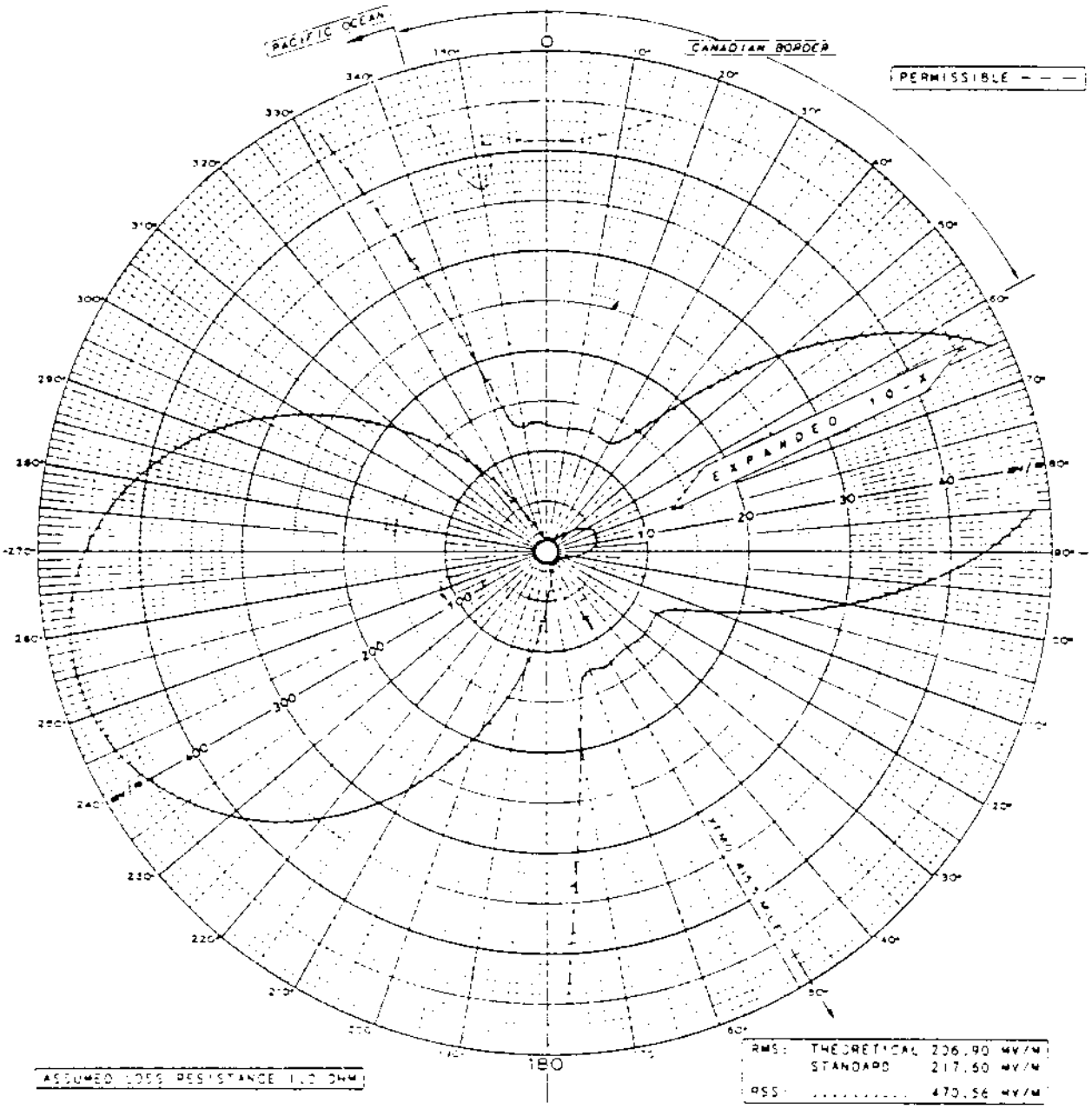
RADIO STATION KTRB
BIG VALLEY BROADCASTING, INC.
MODESTO, CALIFORNIA

FIGURE 6

KTRB

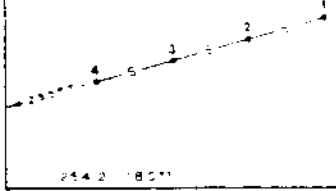
STD.

PROPOSED NIGHTTIME N **STANDARD PATTERN**



ASSUMED LOSS RESISTANCE 1.0 OHM

RMS: THEORETICAL 206.90 MV/M
STANDARD 217.60 MV/M
RSS: 470.56 MV/M

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	STATION DATA
		

Tower	Current Ratio	Phase Angle	Spacing	Azimuth	Horizontal Field Ratio
1	90	0	0	0	1.0
2	90	255	80	-150	2.8
3	90	255	160	60	2.8
4	90	255	240	-90	1.0
5					
6					
7					
8					

Call	KTRB
Frequency	860 kc
Power	0/10 KS kw
Time of operation	UNL
Type of operation	DA-2
Daytime towers	2-3-4
Nighttime towers	1-2-3-4
No. radials per tower	
Length of radials	ft
Ground screen dimension	ft
Lat.	37 42 32
Long.	120 43 27
Superpower	
Pattern No.	780830

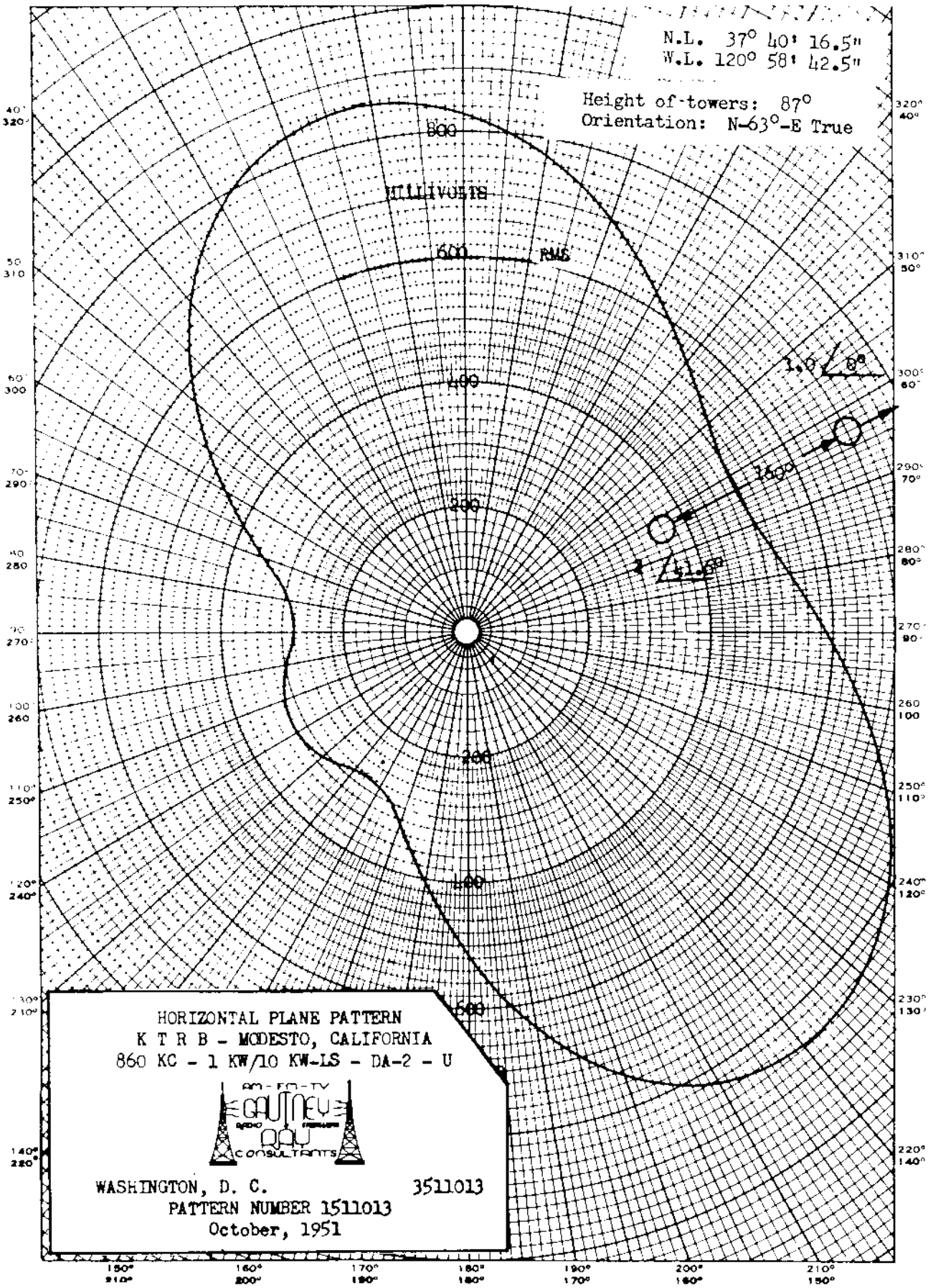
CECIL LYNCH CONSULTING ENGINEER
MODESTO, CALIFORNIA

RADIO STATION KTRB
BIG VALLEY BROADCASTING, INC.
MODESTO, CALIFORNIA

FIGURE 7

KTRB

PROPOSED DAY | KTRB, MODESTO, CALIF. 11/14/51G | 1 KW, 10KW-LS, U, DA-2 | 860 KC



AMD RECD 10/24/51 ACC 11/2/51 BP-7947 Amd. KTRB, MODESTO, CALIF. 860 KC .

KTRB

MEASURED
DAY (4/1/43)

KTRB, MODESTO, CALIF.

1kw, 10kw-LS, U, DA-2 860 kc

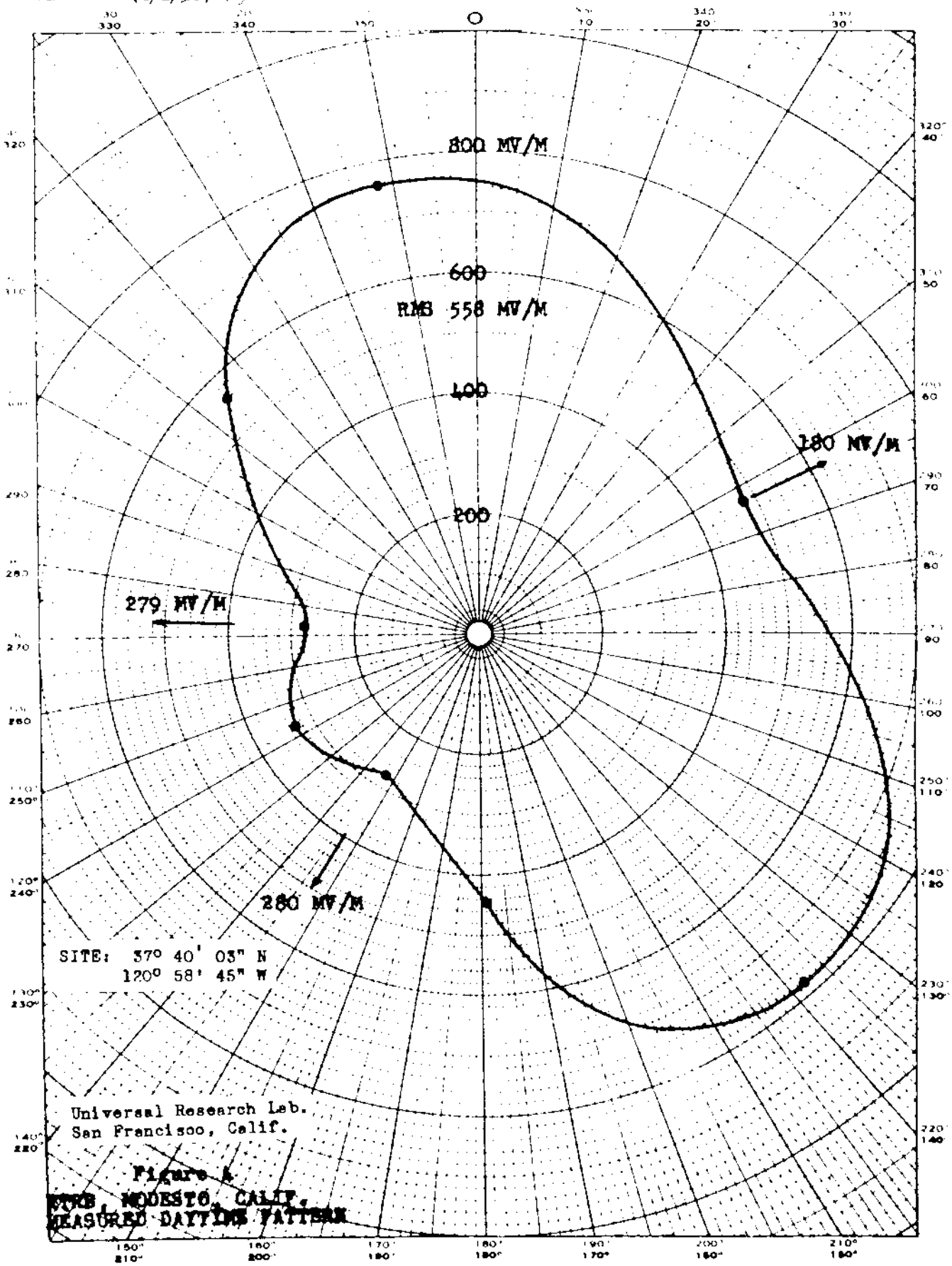
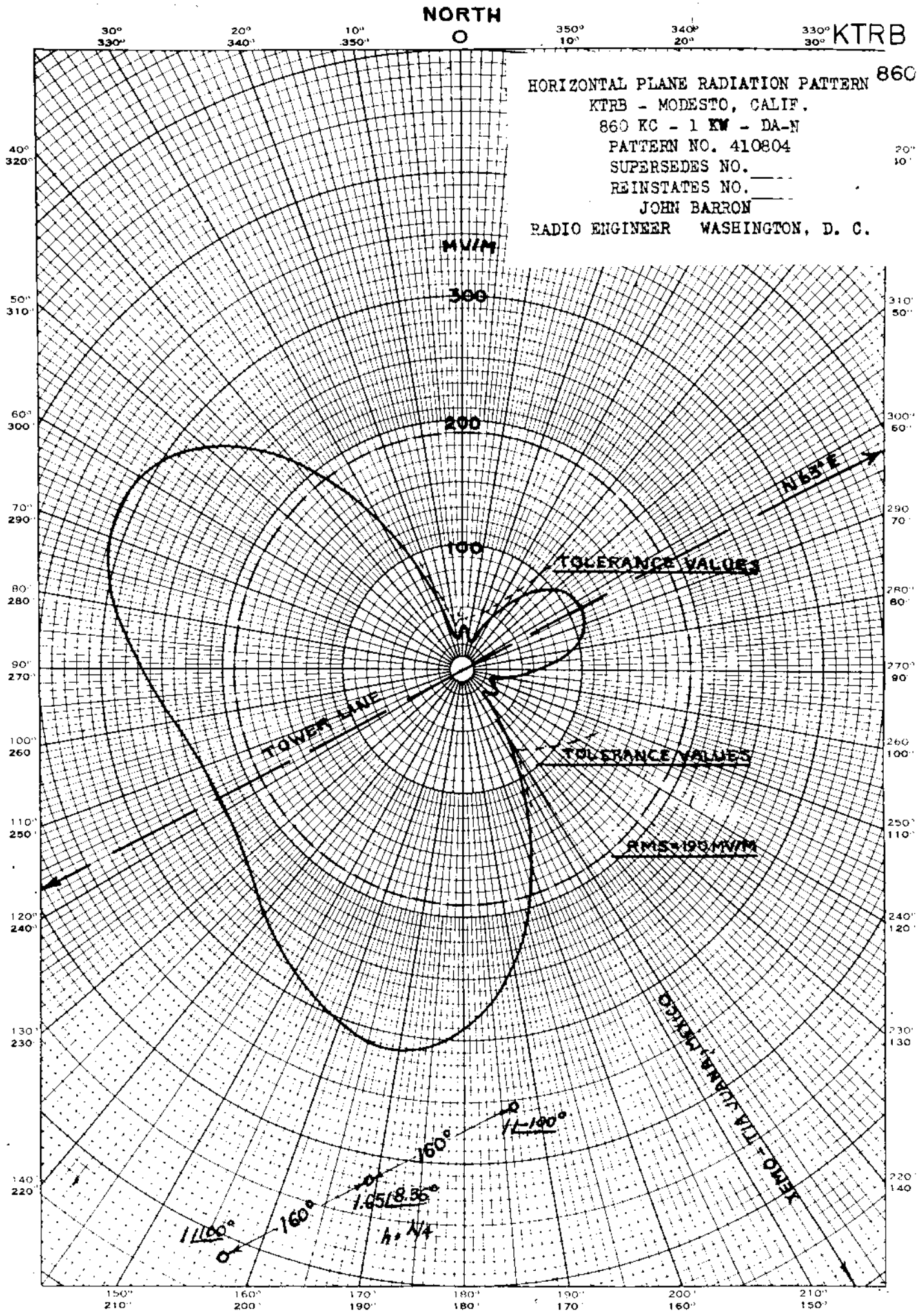


Figure A
KTRB, MODESTO, CALIF.
MEASURED DAYTIME PATTERN

FCC FILE NO. BL-4913 Date Accepted 3/2/53

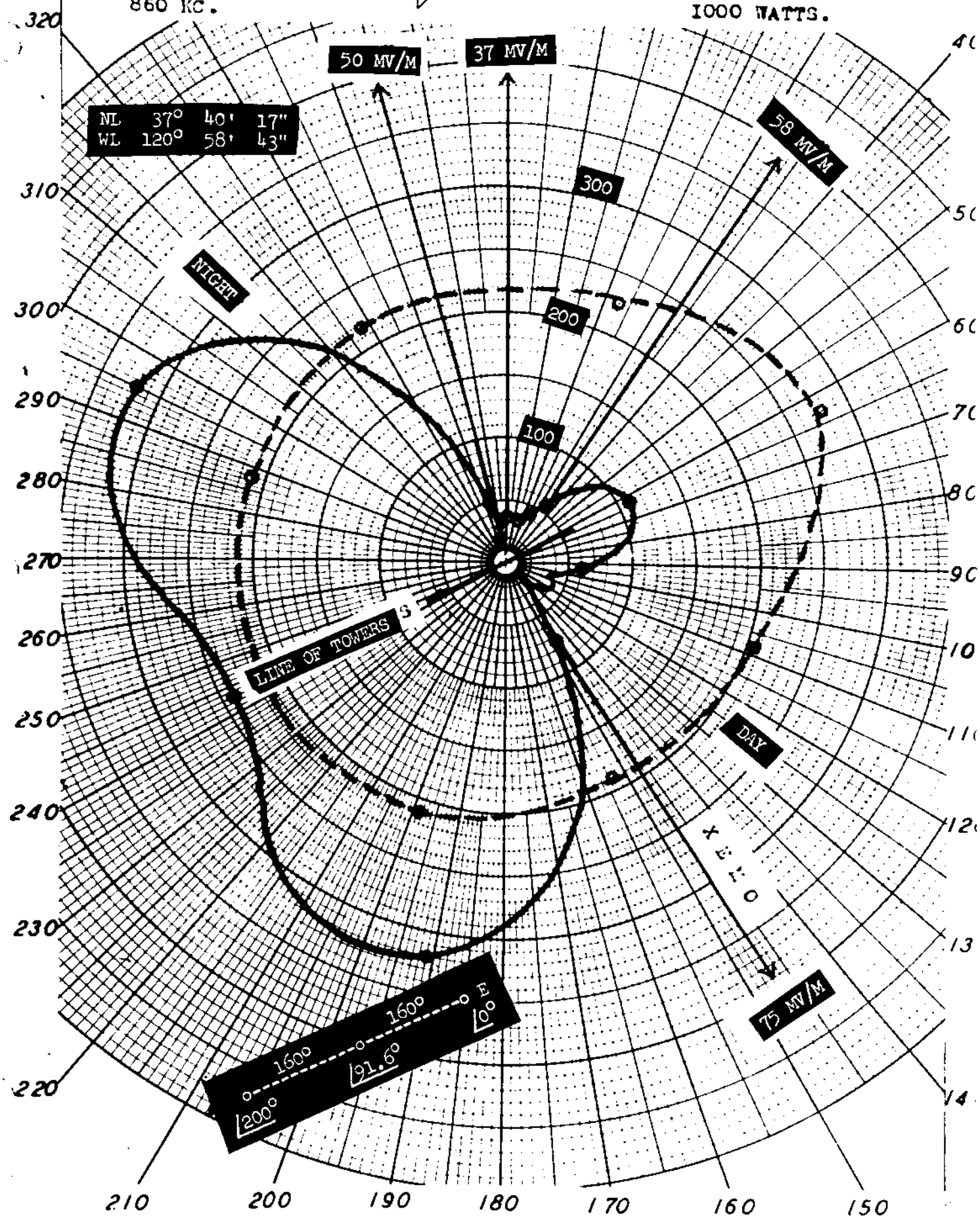
KTRB, Modesto, Calif. 860 kc


NORTH
KTRB
860
HORIZONTAL PLANE RADIATION PATTERN
KTRB - MODESTO, CALIF.
860 KC - 1 KW - DA-N
PATTERN NO. 410804
SUPERSEDES NO.
REINSTATES NO.
JOHN BARRON
RADIO ENGINEER WASHINGTON, D. C.
MV/M
300
200
100
N65°E
TOLERANCE VALUES
TOWER LINE
TOLERANCE VALUES
RMS=190 MV/M
XEMO - TIA JUANA, MEXICO
160°
1/-100°
160°
1.65/8.36°
h, N/4
1/100°
0°
EUGENE DIETZGEN CO.
NO. 340-P DIETZGEN GRAPH PAPER
POLAR CO-ORDINATE

KTRB

MEASURED NIGHT | Station KTRB Modesto, California | 1kw,10kw-LS, DA-2,U 860 KC

MEASURED UNATTENUATED DAY AND NIGHT SIGNAL AT ONE MILE
RADIO STATION K T R B, MODESTO CALIFORNIA
860 KC. 1000 WATTS.

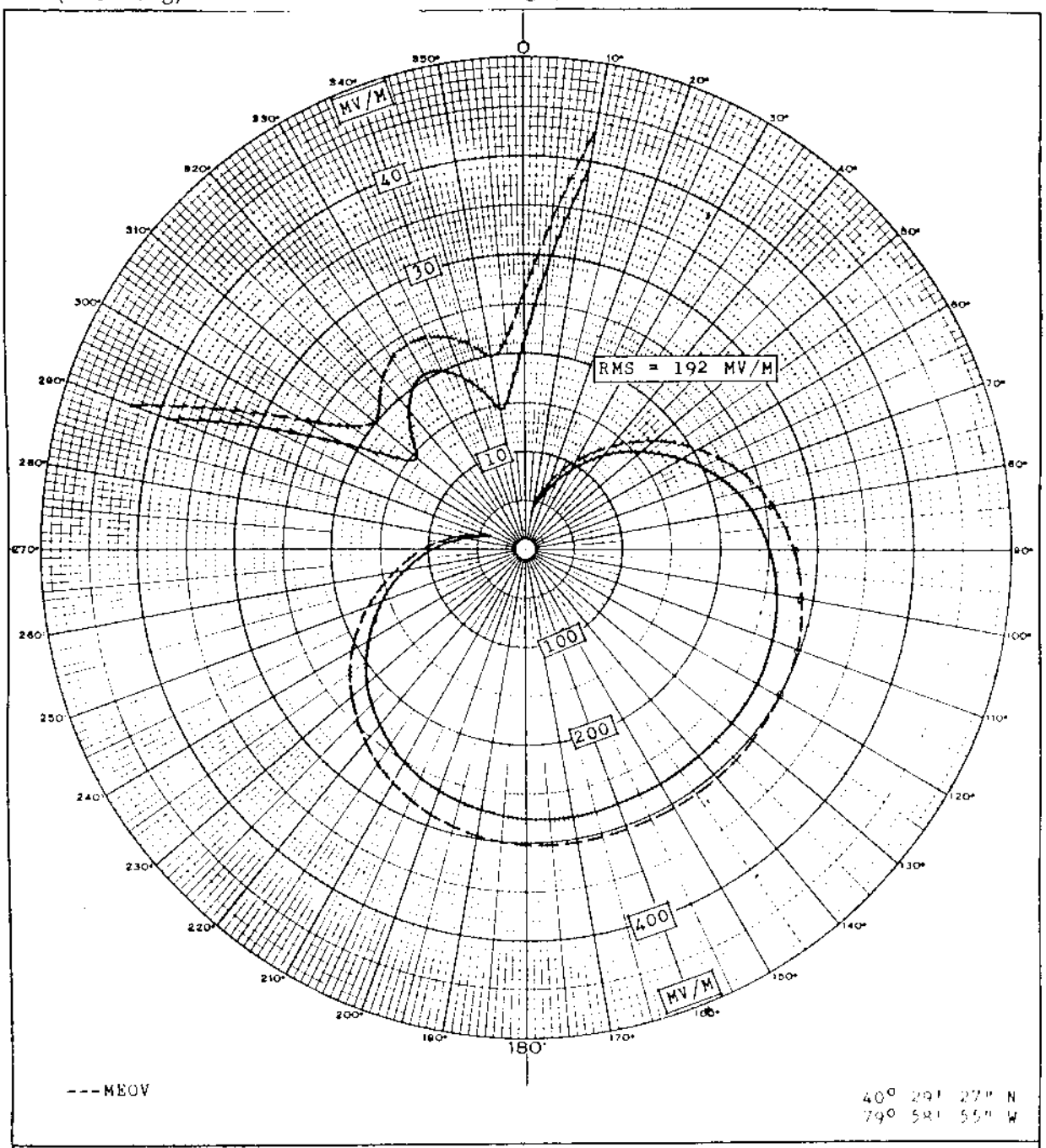


Rec'd 11-16-42

WAMO

PROPOSED DAY
(8-18-58g)

Station WAMO 1kw, DA-D, D
Pittsburgh, Pennsylvania 860 KC



granted CP to increase power to 1 kw + install DA 12-22-59

FCC File No. BP-12133
Accepted 8-7-58

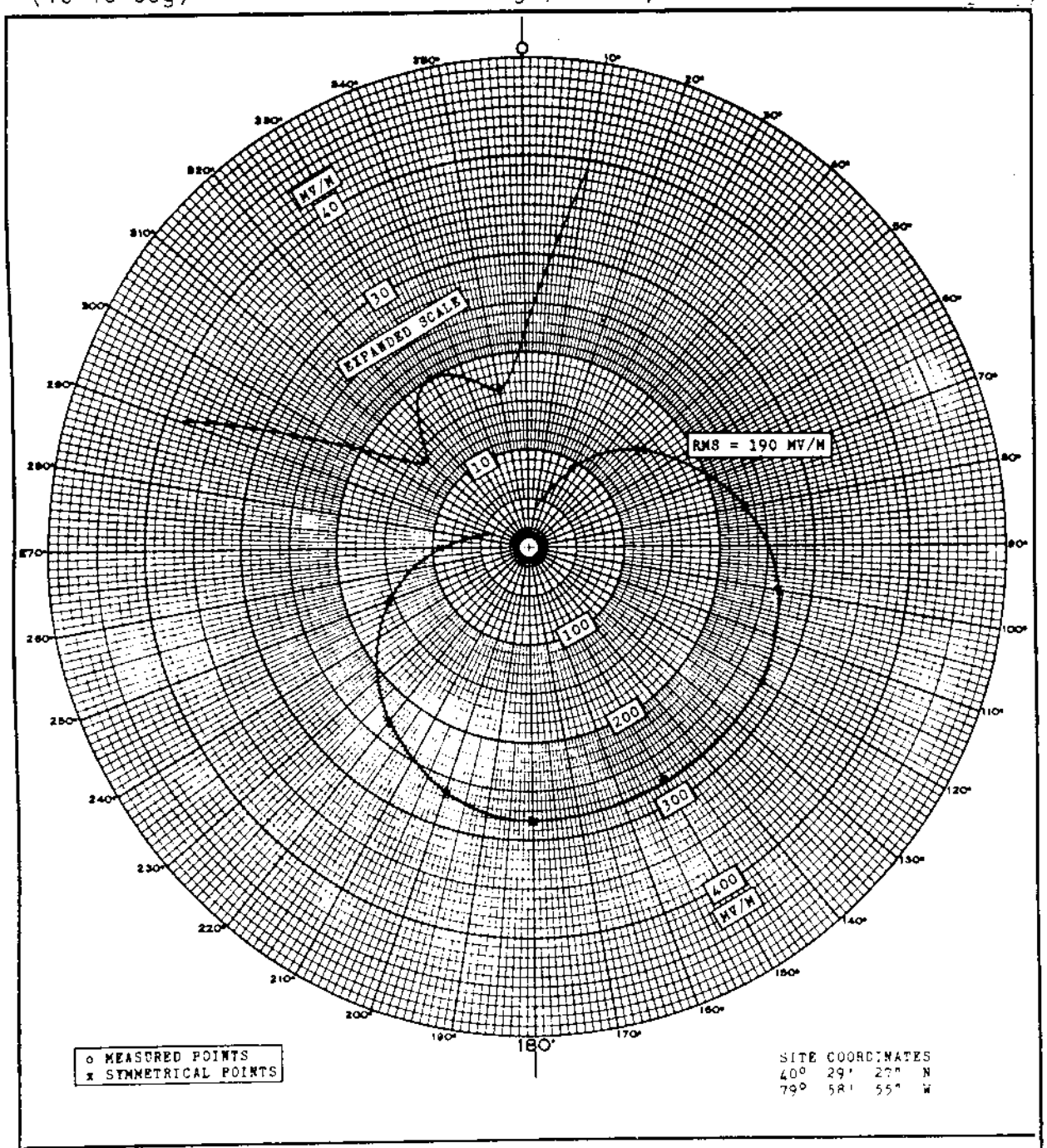
WAMO
Pittsburgh, Pennsylvania 860 KC

WAMC

MEASURED DAY
(10-18-60g)

Station WAMO
Pittsburgh, Pennsylvania

1kw, DA-D,D
860 KC



MEASURED DIRECTIONAL HORIZONTAL PLANE RADIATION PATTERN

330° True (2) 0.9/96° 90° (1) 1.0/0° 83.9°	DYNAMIC BR ADCASTING, INC. PITTSBURGH, PENNSYLVANIA Jules Cohen Consulting Electronic Engineer	RADIO STATION WAMO 860 KC 1 KW D DA SEPTEMBER, 1960

FCC File No. BL-8118
Accepted 9-29-60

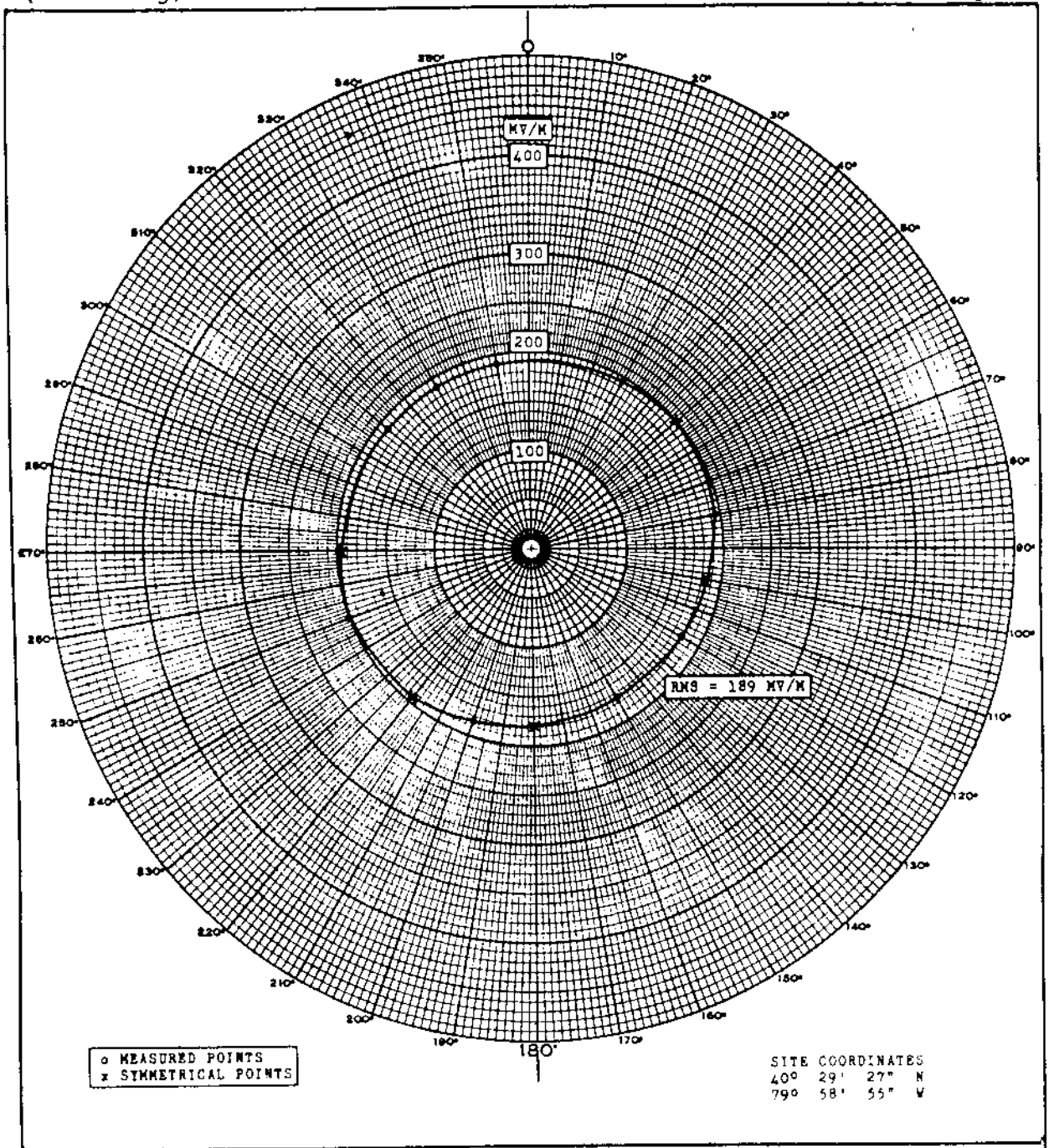
WAMO
Pittsburgh, Pennsylvania 860 KC

WAMO

MEASURED NON-DA
(10-18-60g)

Station WAMO
Pittsburgh, Pennsylvania

1kw, DA-D,D
860 KC



MEASURED NONDIRECTIONAL HORIZONTAL PLANE RADIATION PATTERN

330° True

(2)

90°

(1)

22.9°

DYNAMIC BROADCASTING, INC.
PITTSBURGH, PENNSYLVANIA

Jules Cohen
Consulting Electronic Engineer

RADIO STATION WAMO
860 KC
1 KW D DA
SEPTEMBER, 1960

FCC File No. BL-8118
Accepted 9-29-60

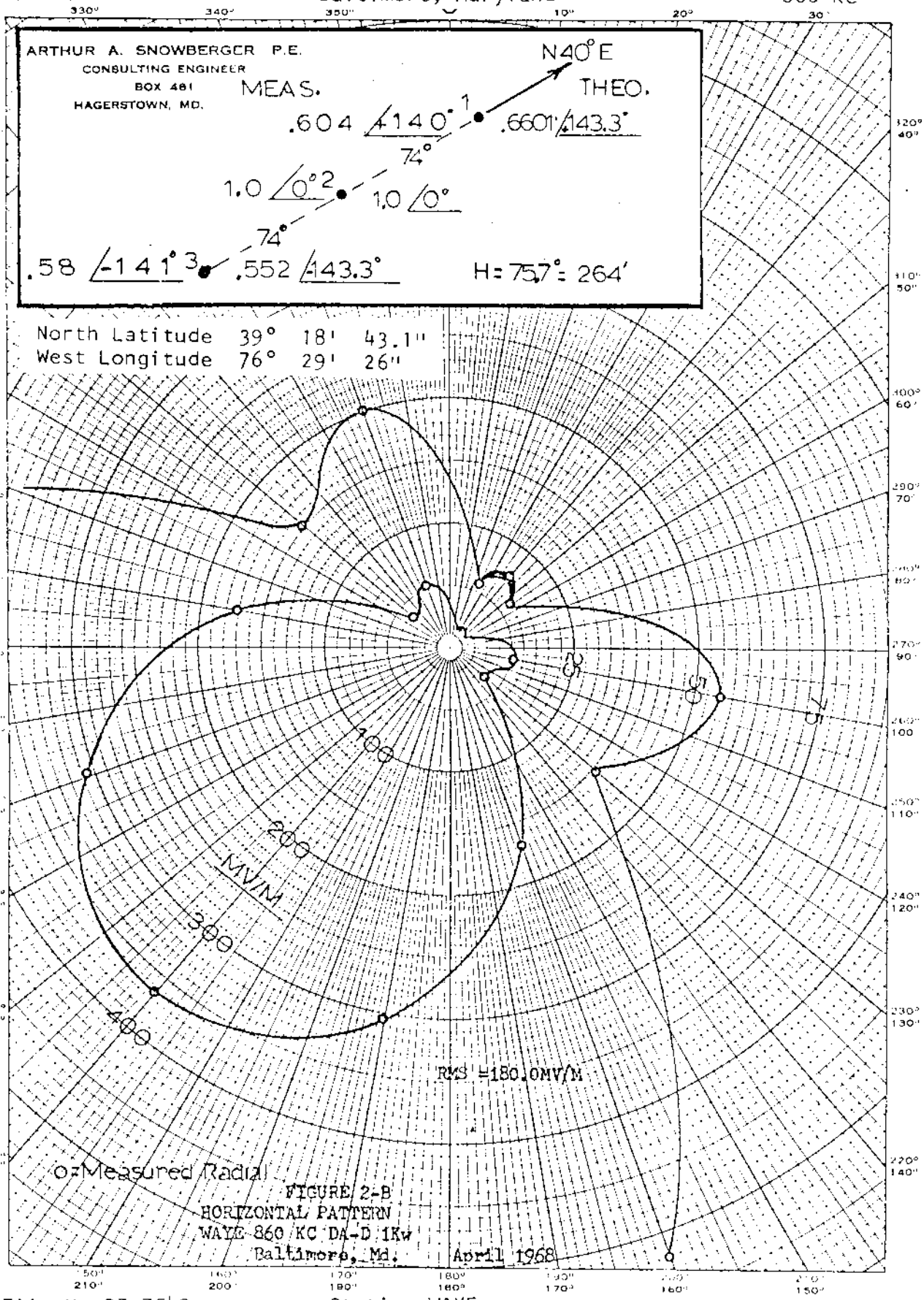
WAMO
Pittsburgh, Pennsylvania 860 KC

WAYE

Measured Day
(7-29-70ct)

Station WAYE
Baltimore, Maryland

1kw,DA-D,D
860 kc



FCC File No.BZ-7549
Accepted 7-15-70

Station WAYE
Baltimore, Maryland

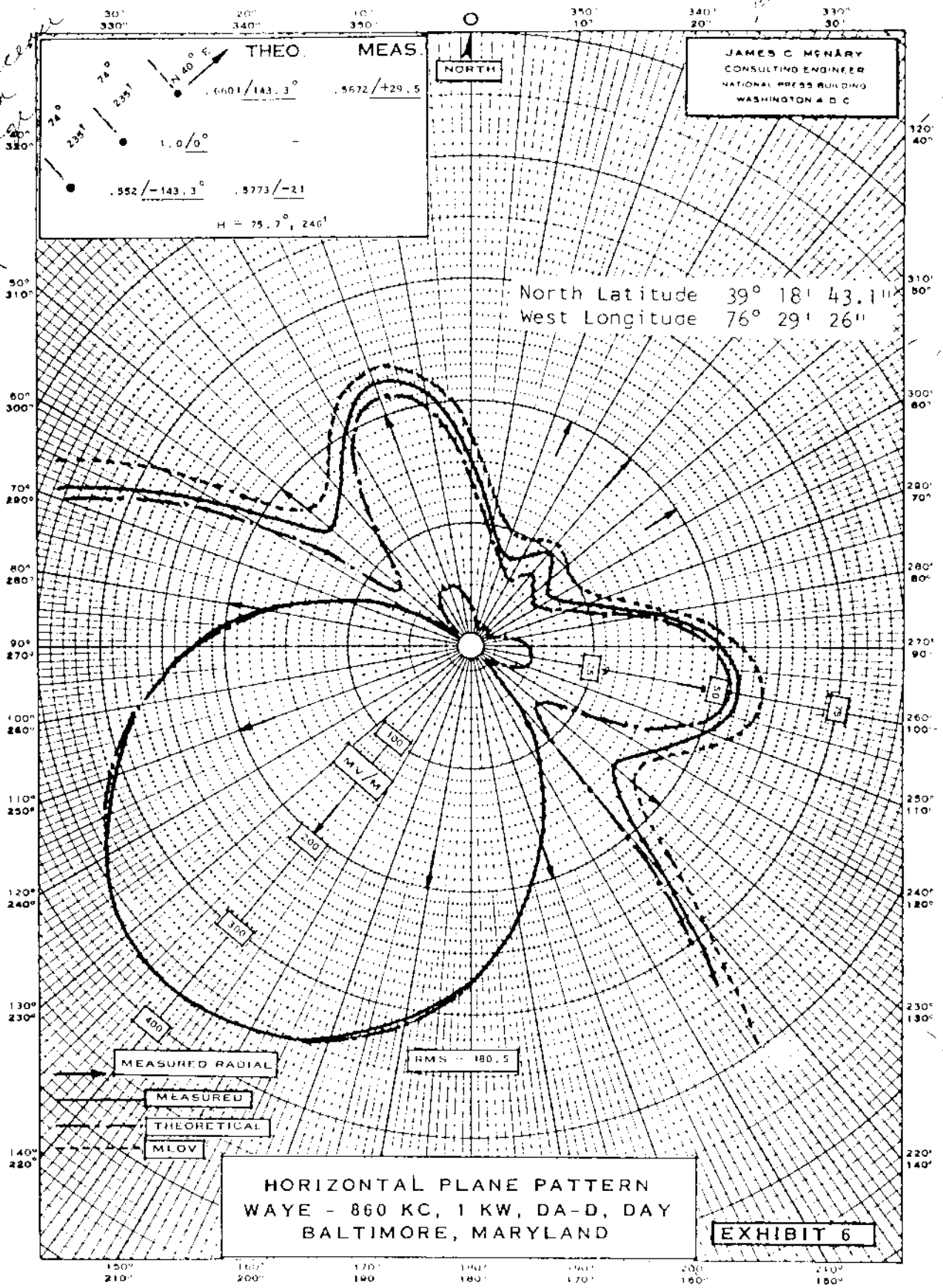
860 kc

WAYE

Measured Day
(1-29-64ct)

Station WAYE
Baltimore, Maryland

1kw,DA-D,D
860 kc



HORIZONTAL PLANE PATTERN
WAYE - 860 KC, 1 KW, DA-D, DAY
BALTIMORE, MARYLAND

EXHIBIT 6

FCC File No.BL-10341
Accepted 1-14-64

Station WAYE
Baltimore, Maryland

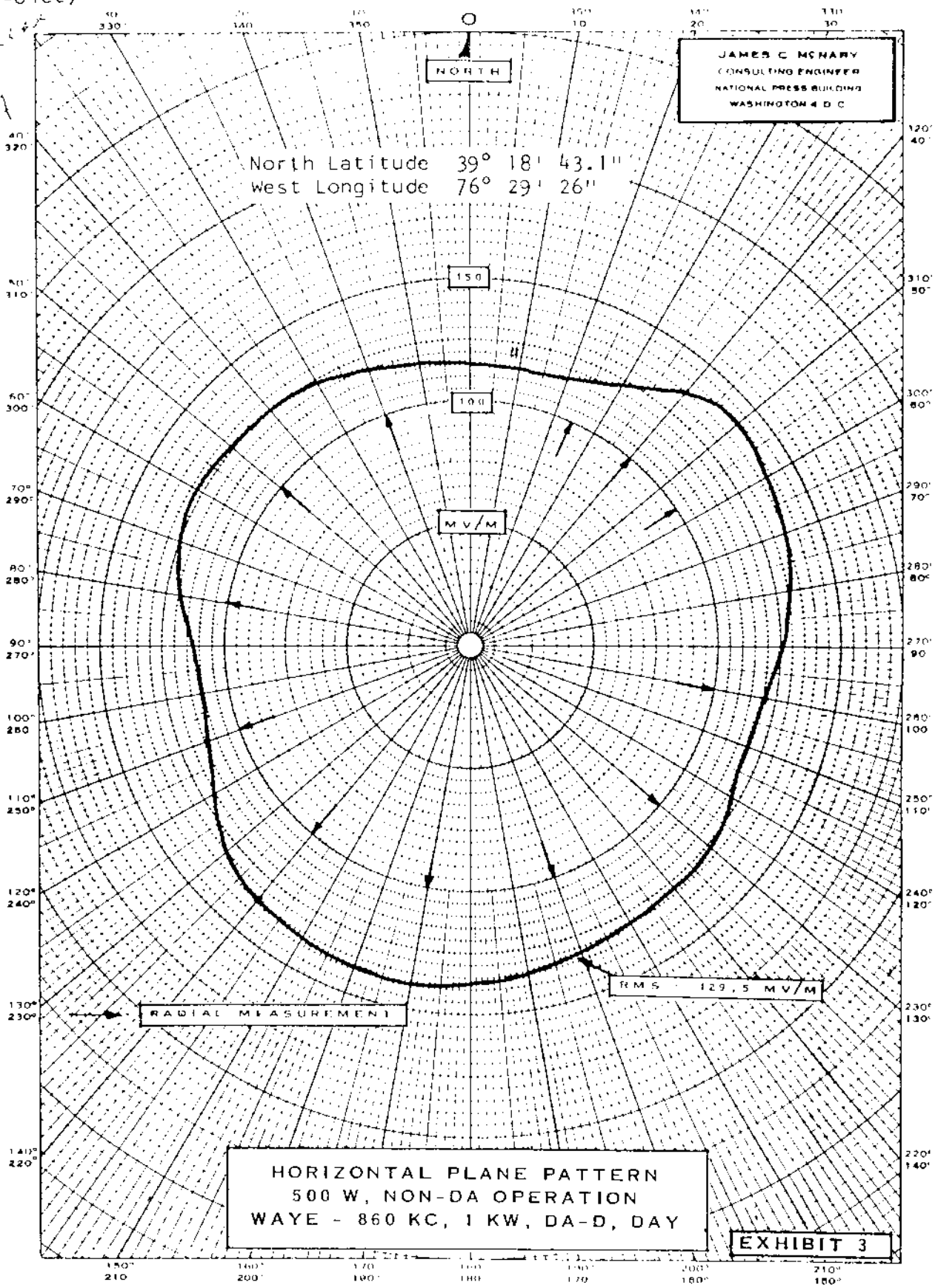
860 kc

WAYE

Measured Non-DA
(1-29-64ct)

Station WAYE
Baltimore, Maryland

1kw,DA-D,D
860 kc



FCC File No.BL-10341
Accepted 1-14-64

Station WAYE
Baltimore, Maryland

860 kc

WAZE
860KHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WAZE

Main Studio: Dunedin, Florida

Frequency: 860 kHz

Power: 0.5kw Night 0.5kw Day

Notification List No. 1788

Date: August 22, 1980 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 27° 59' 55"
West Longitude: 82° 42' 01"

ANTENNA CHARACTERISTICS

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

TOWER:	SE(#1)	SW(#2)	NW(#3)	NE(#4)
HEIGHT ABOVE INSULATORS:	280'	280'	280'	280' (88.1°)
NIGHT PHASING;	0°	-171°	+163°	-26°
NIGHT FIELD RATIO:	1.0	0.64	0.57	0.89
DAY PHASING:	0°	-91.5°	-115.6°	-12°
DAY FIELD RATIO:	1.0	0.53	0.55	0.98

SPACING AND ORIENTATION: The towers are located at the vertices of a parallelogram the long sides of which are 549.6' (173°) in length on a line bearing 349° true. The short sides are 270' (85°) in length on a line bearing 266° true.

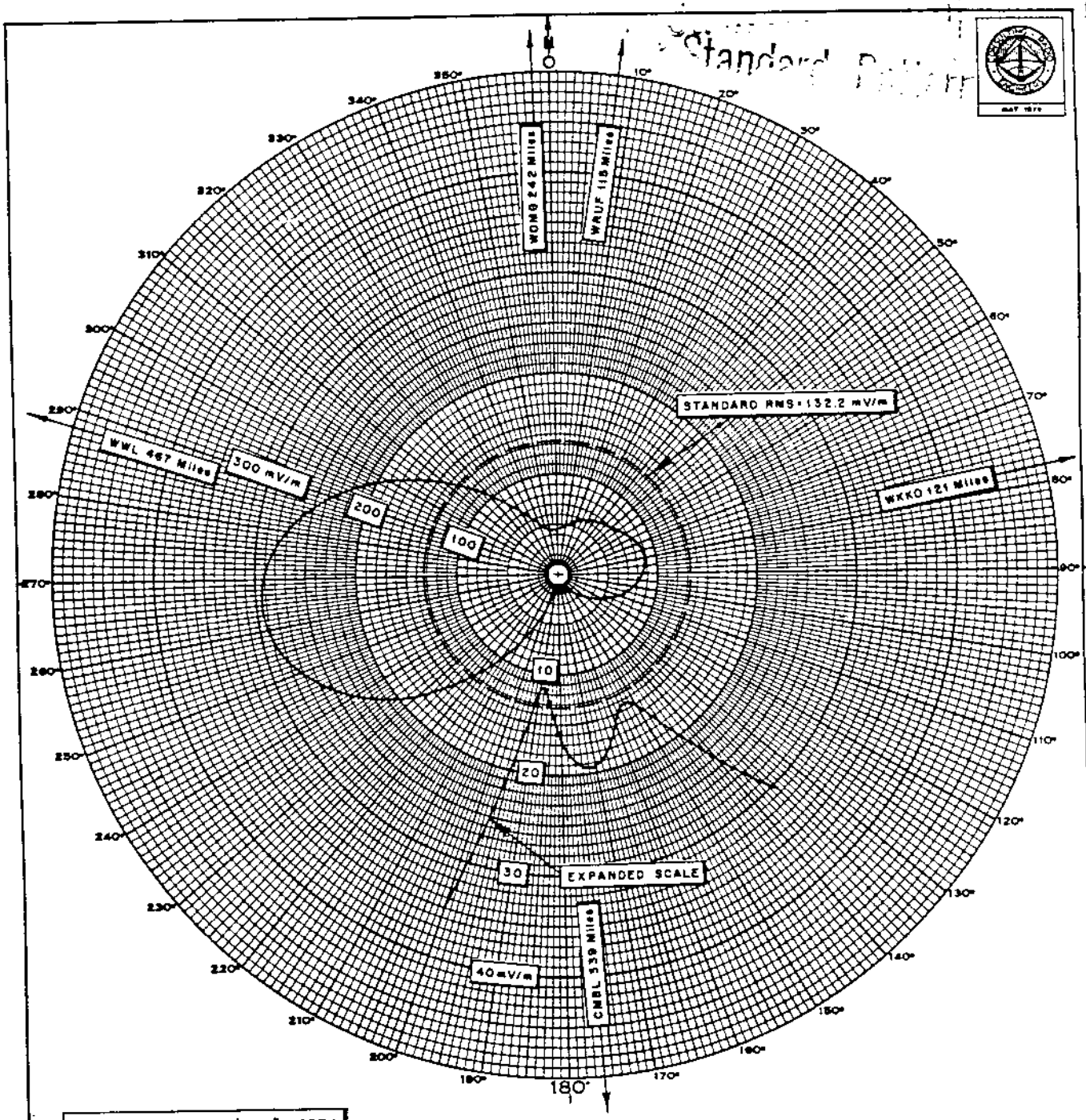
GROUND SYSTEM: 120 - 300' equally spaced copper radials plus a 32' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	125.8 mv/m	146.9 mv/m	132.2 mv/m
Night	139.1 mv/m	183 mv/m	146.2 mv/m

WAZE
860 kHz
DA-D

Standard Pattern



LATITUDE 27° 59' 55" NORTH
LONGITUDE 82° 42' 01" WEST

Standard Pattern

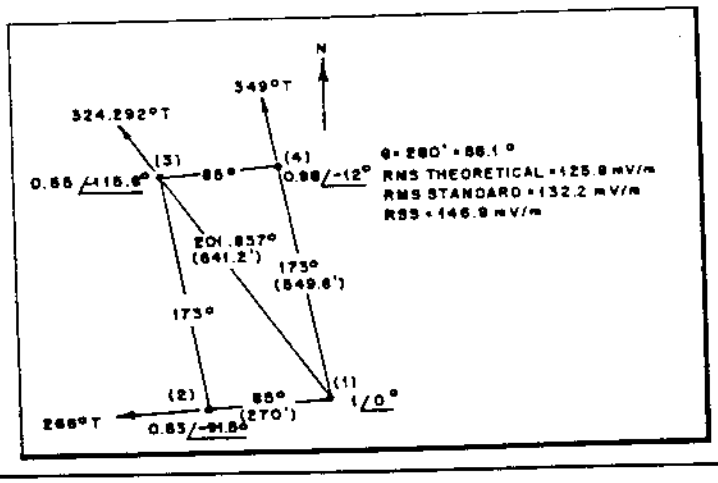


Figure 1

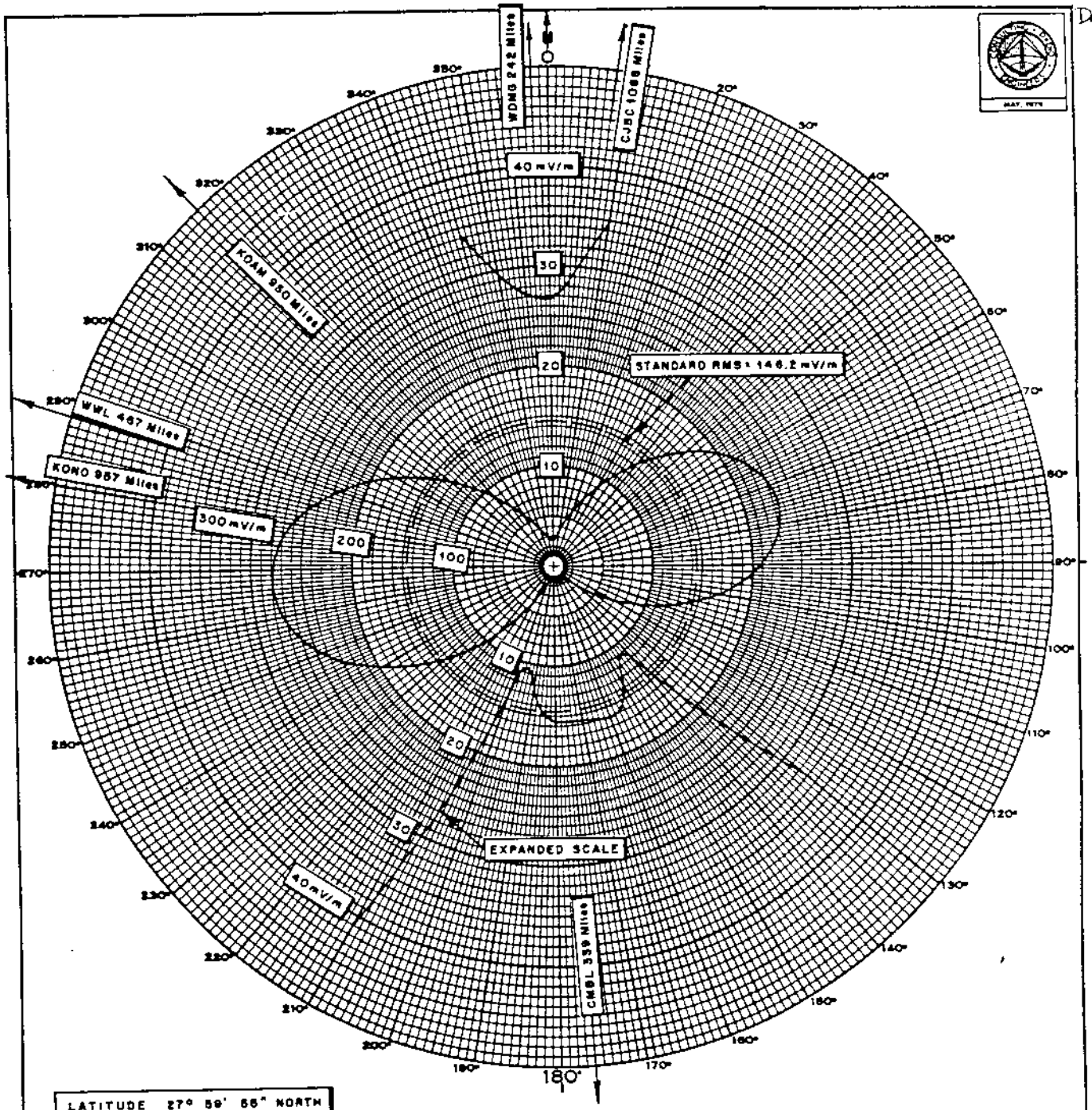
PROPOSED DAYTIME HORIZONTAL PLANE STANDARD RADIATION PATTERN

STATION WAZE
RADIO CLEARWATER, INC.
DUNEDIN, FLORIDA

PRESENT :	860 kHz	500 WATTS	DA-D
PROPOSED:	860 kHz	500 WATTS	DA-2

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

WACE
860kHz
DA-N



LATITUDE 27° 59' 56" NORTH
LONGITUDE 82° 42' 01" WEST

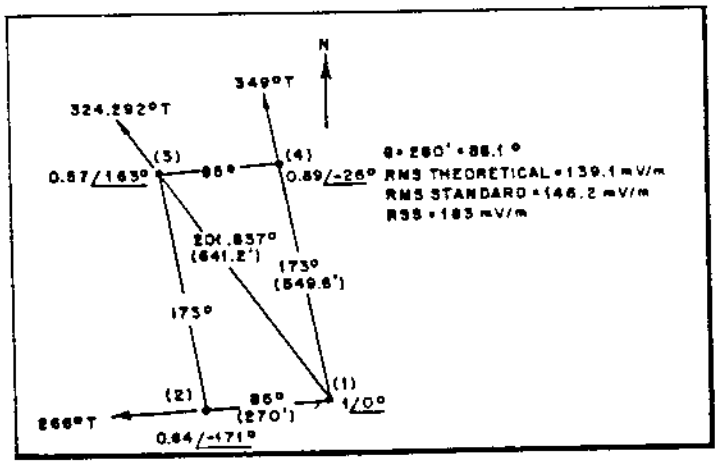


Figure 2

PROPOSED NIGHTTIME HORIZONTAL PLANE STANDARD RADIATION PATTERN

STATION WAZE
RADIO CLEARWATER, INC.
DUNEDIN, FLORIDA

PRESENT :	860 kHz	500 WATTS	DA-D
PROPOSED:	860 kHz	500 WATTS	DA-2

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

Clearwater, Fla.

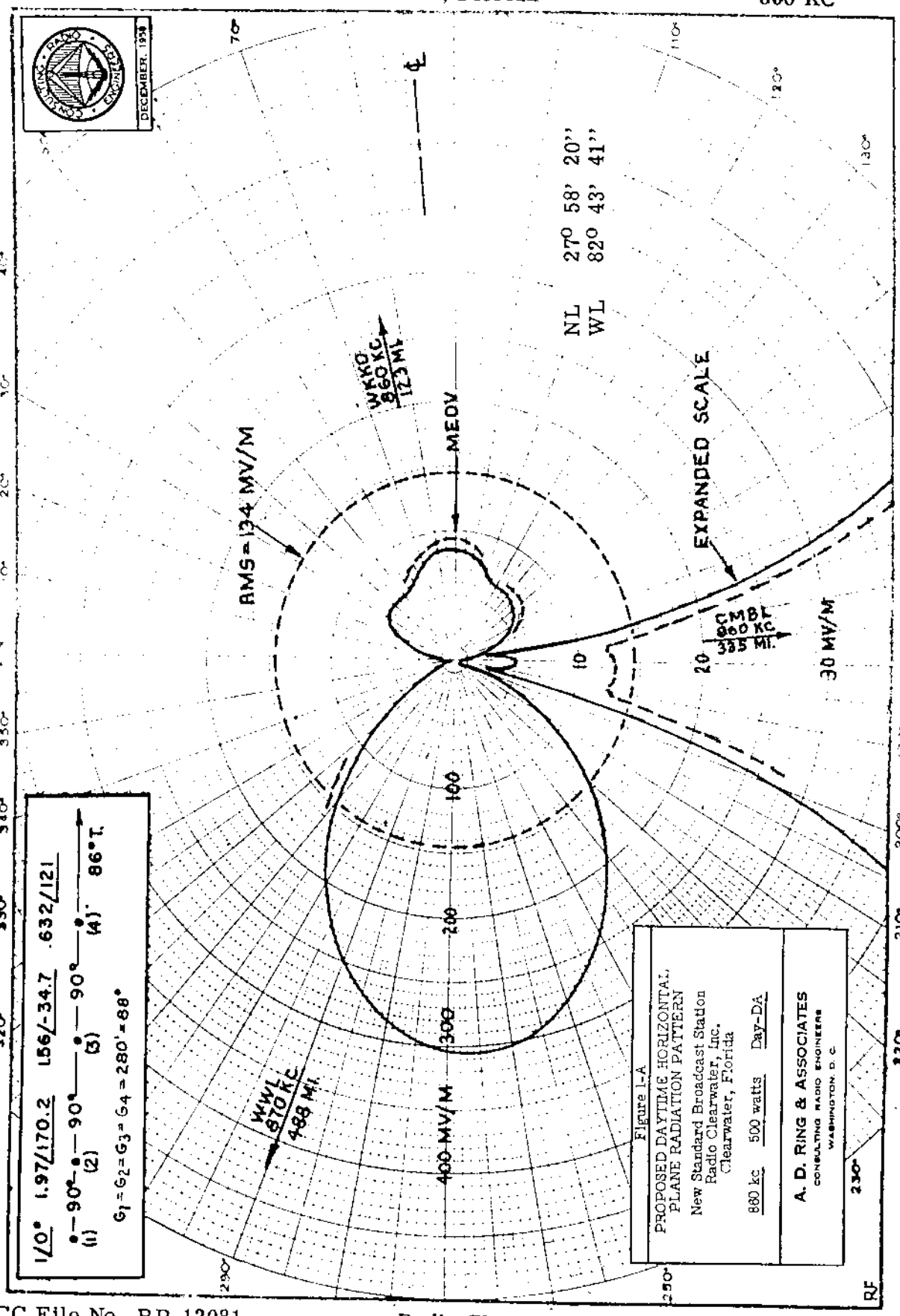
WAZE

PROPOSED DAY
(2-2-59g)

New; Radio Clearwater, Inc.
Clearwater, Florida

500w, DA-D,D
860 KC

Granted CP (2/11/59) for a new station



granted w/ for new station 6-21-60

A. D. RING & CO - 1/52 - 1000

FCC File No. BP-12081
Accepted 1-16-59 (Amended)

Radio Clearwater, Incorporated
Clearwater, Florida

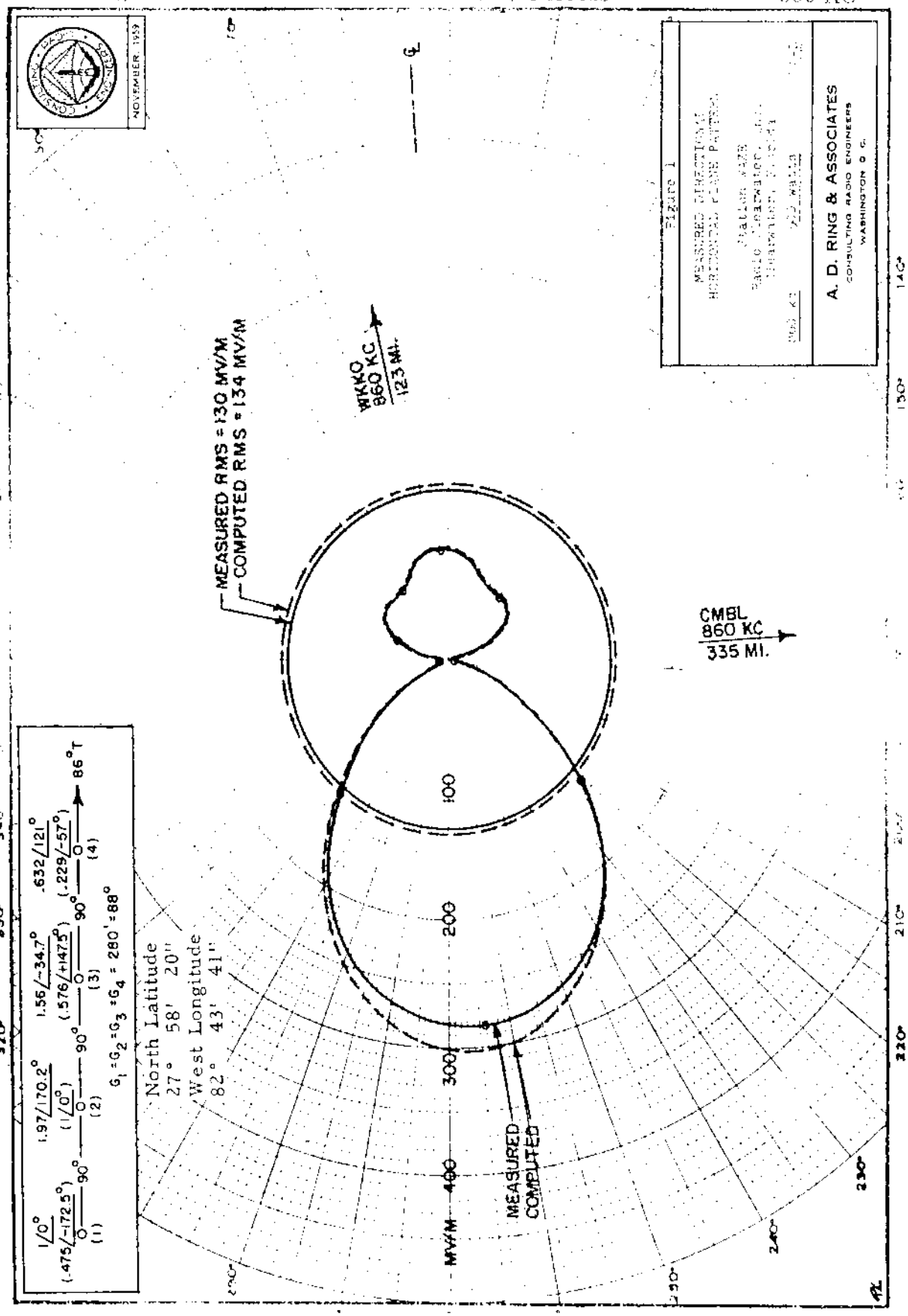
860 KC

WAZE

MEASURED DAY
(12-21-59g)

Station WAZE
Clearwater, Florida

500w, DA-D, D
860 KC



FCC File No. BL-7727
Accepted 11-30-59

WAZE
Clearwater, Florida

860 KC

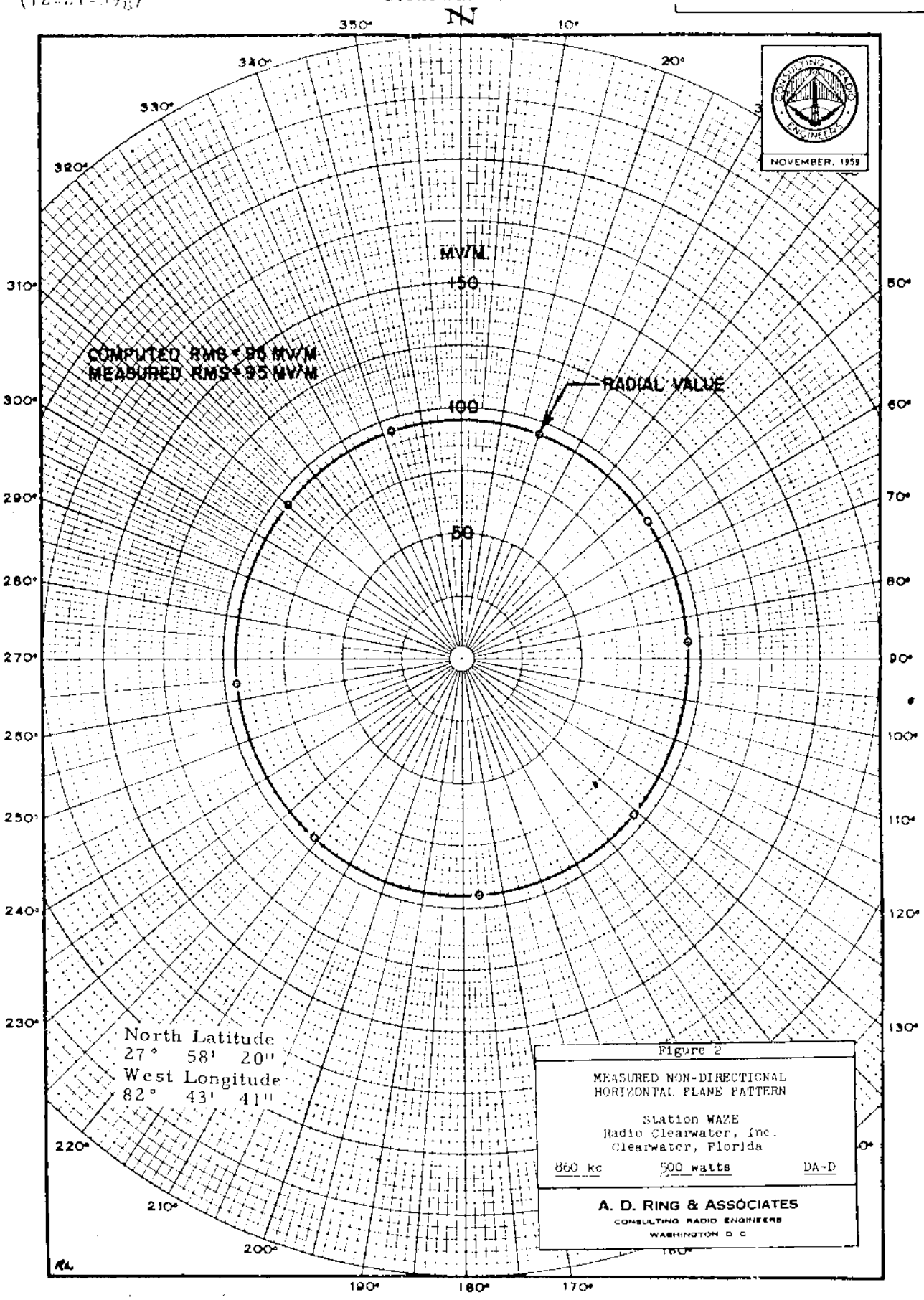
Granted for full Station
0-21-60

WAZE

MEASURED NON-DA
(12-21-59)

Station WAZE
Clearwater, Florida

500w, DA-D, D
860 KC



FCC File No. BL-7727
Accepted 11-30-59

WAZE
Clearwater, Florida

860 KC

WDMG

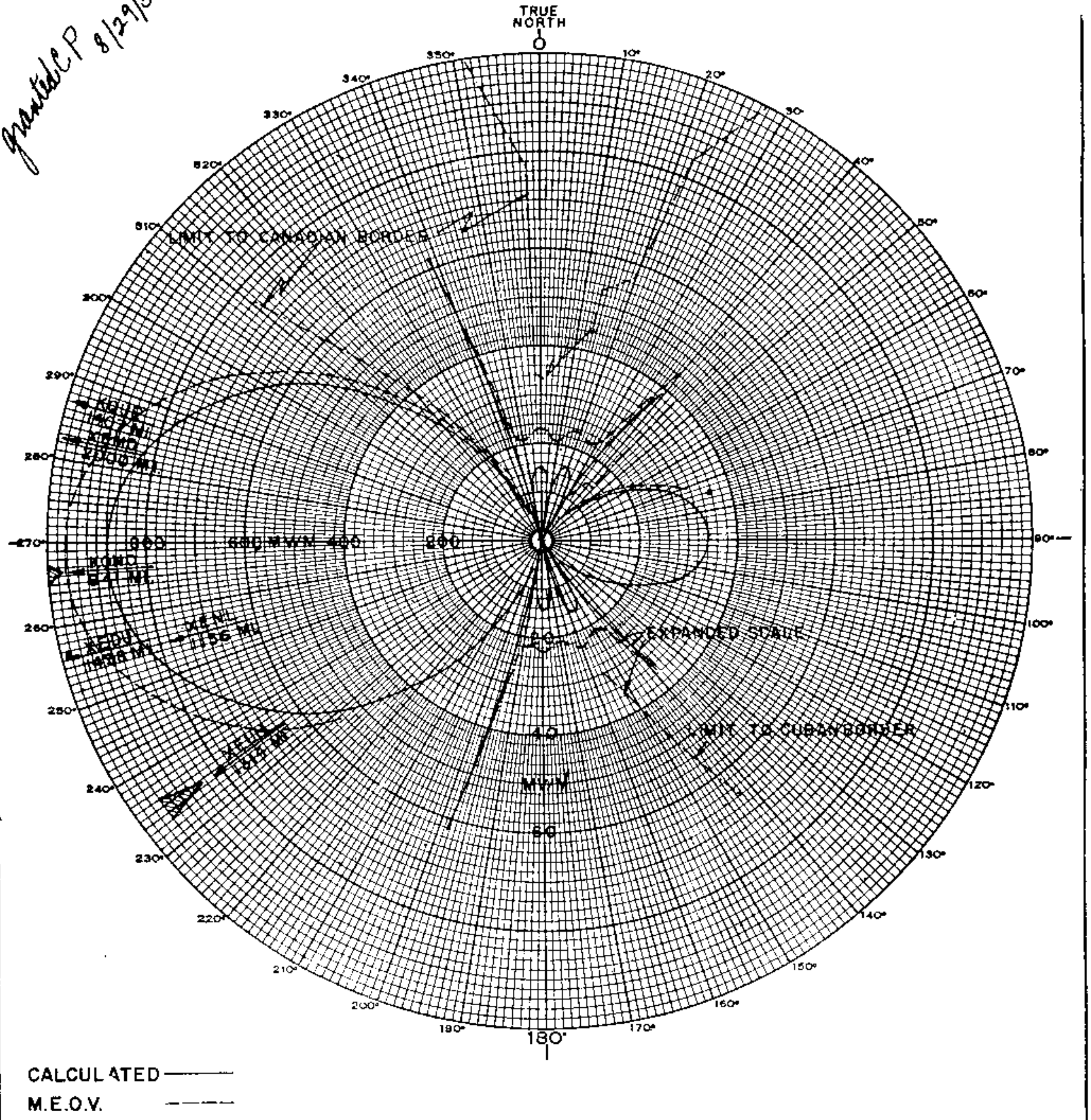
PROPOSED
NIGHT (7-27-56)

granted CP 8/29/56

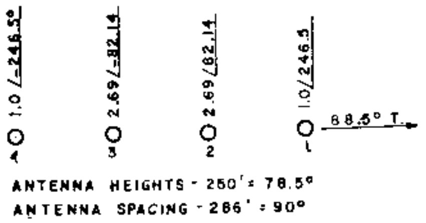
STATION WDMG
DOUGLAS, GA.

5 KW
DA-N, U

860 KC



FIELD INTENSITY VERSUS AZIMUTH



ANTENNA HEIGHTS - 250' = 78.5°
ANTENNA SPACING - 266' = 90°

ELEVATION ANGLE 0°
RMS 410 MV/M

N. LATITUDE 31°-30'-26"
W. LONGITUDE 82°-48'-46"

SUPERSEDES 560404
PATTERN NO. 560627

RADIO STATION WDMG
DOUGLAS, GEORGIA

PROPOSED
5KW NIGHTTIME PATTERN

RUSSELL P. MAY
CONSULTING RADIO ENGINEER
WASHINGTON 5, D.C.

FIGURE NO. 1A

WDMG

MEASURED NIGHT
(12-20-57g)

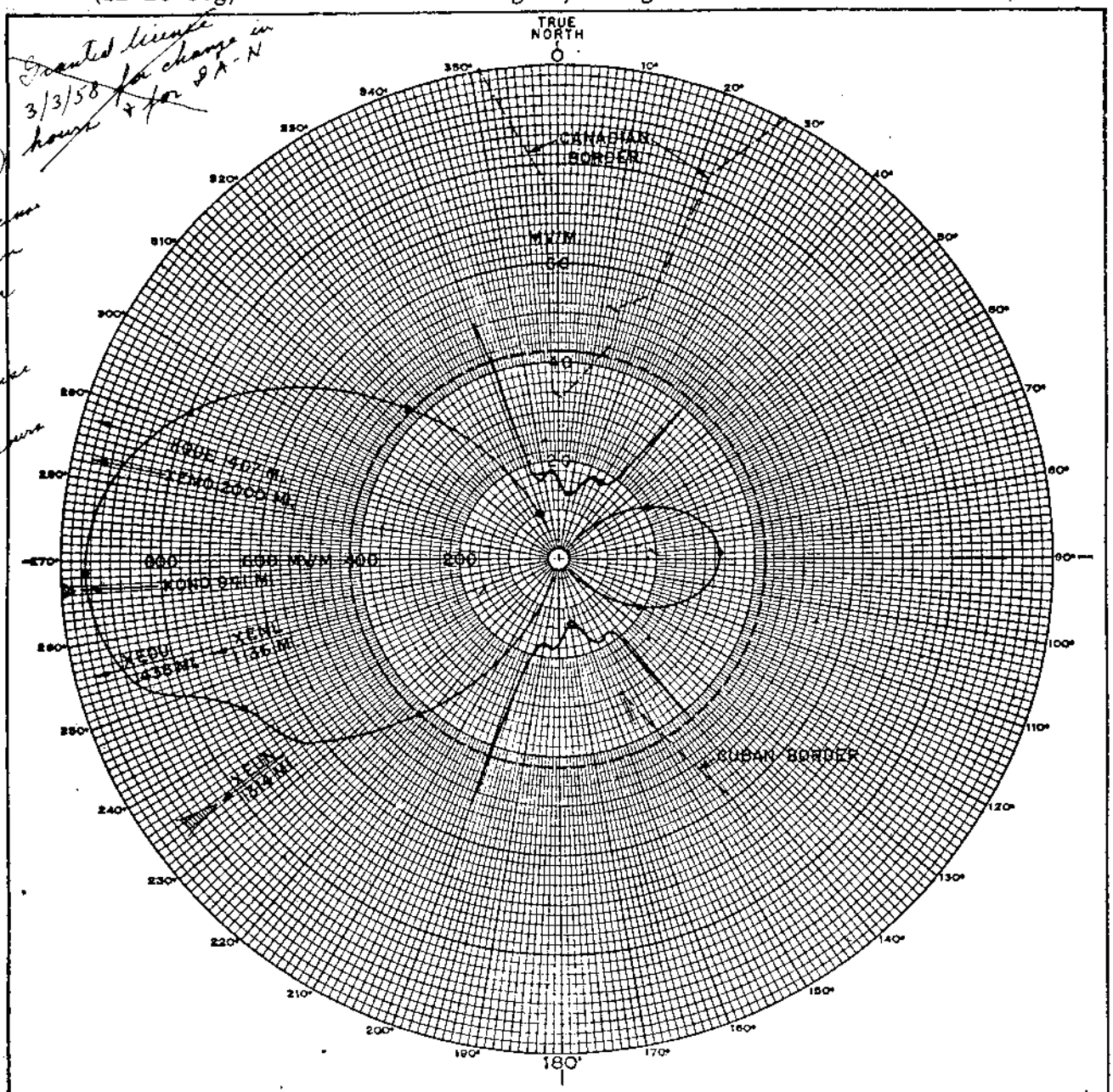
Station WDMG
Douglas, Georgia

5kw, DA-N,U
860 KC

Granted license 3/3/58 for change in hours & for DA-N

Rescinded action (4/11/58) of 3/3/58 grant of license for change in hours & for DA-N

Granted license 6/3/58 for change in hours & DA-N



4 O 1.0 ∠246.5°	FIELD INTENSITY VERSUS AZIMUTH	
3 O 2.69 ∠82.14	ELEVATION ANGLE 0°	RADIO STATION WDMG
2 O 2.69 ∠82.14	RMS 422 MV/M	DOUGLAS, GEORGIA
1 O 1.0 ∠246.5	N. LATITUDE 31°-30'-26"	860 KC - 5 KW - (DA-N)
88.5° T.	W. LONGITUDE 82°-48'-46"	MEASURED
ANTENNA HEIGHTS - 250' = 78.5°		5 KW NIGHTTIME PATTERN
ANTENNA SPACING - 286' = 90°	PATTERN NO. 570919	
	RUSSELL P. MAY CONSULTING RADIO ENGINEER WASHINGTON 5, D.C.	FIGURE NO. 5

File No. BL-6586
Accepted 11-29-57

WDMG
Douglas, Georgia

860 KC

WDMG

MEASURED NON-DA
(12-20-57g)

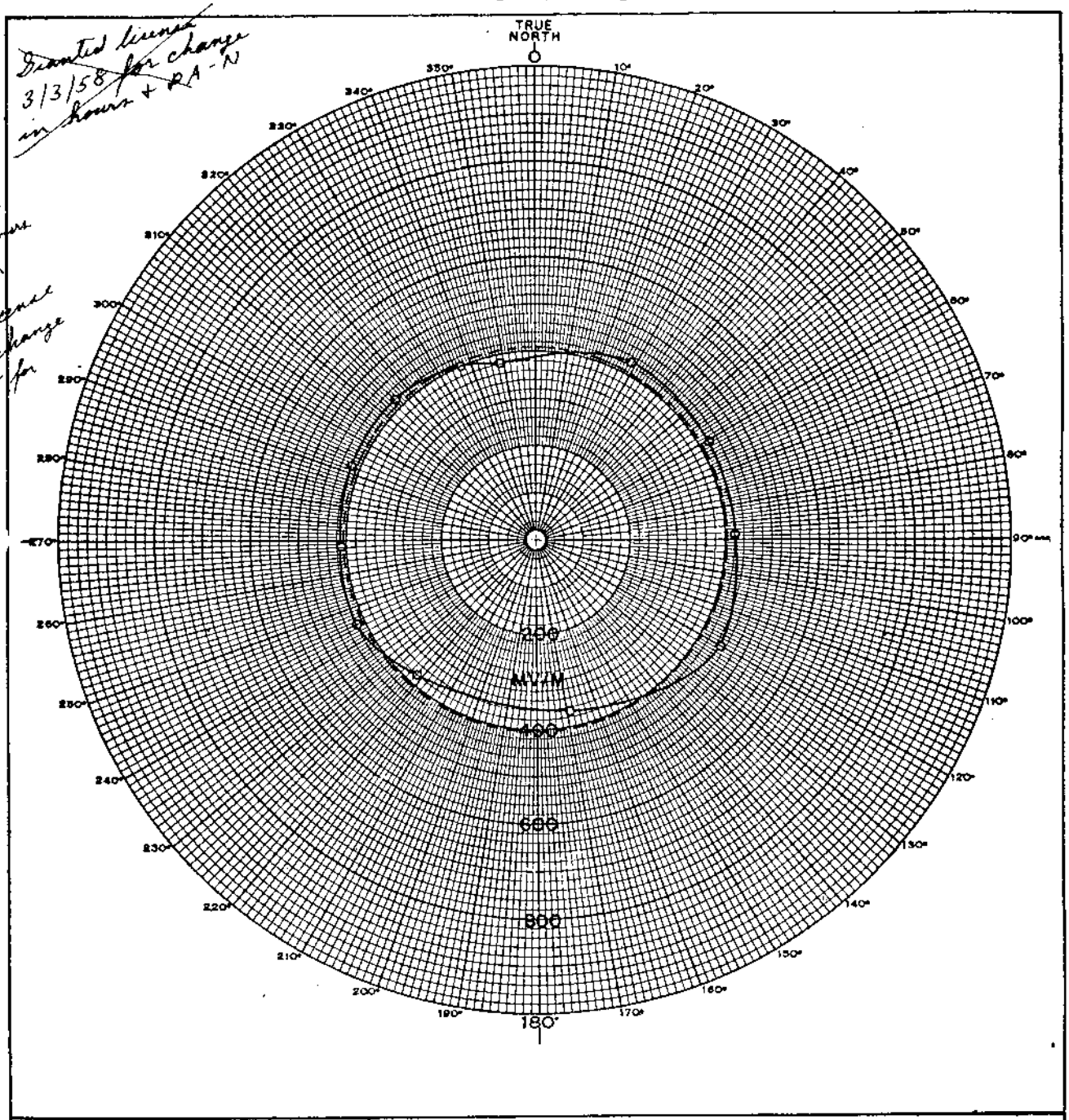
Station WDMG
Douglas, Georgia

5kw, DA-N,U
860 KC

~~Granted license 3/3/58 for change in hours + DA-N~~

Rescinded action (4/1/58) of 3/3/58 grant of license for change in hours + DA-N

Granted license 6/3/58 for change in hours & for DA-N



	FIELD INTENSITY VERSUS AZIMUTH	
	ELEVATION ANGLE 0° RMS 405 MV/M	RADIO STATION WDMG DOUGLAS, GEORGIA 860 KC - 5 KW - (DA-N)
	N. LATITUDE 31° 30' 26" W. LONGITUDE 82° 48' 46"	MEASURED NON-DIRECTIONAL PATTERN
	SUPERSEDES PATTERN NO. 570919	
	RUSSELL P. MAY *CONSULTING RADIO ENGINEER* *WASHINGTON 5, D.C.*	FIGURE NO. 4

File No. BL-6586
Accepted 11-29-57

WDMG
Douglas, Georgia

860 KC

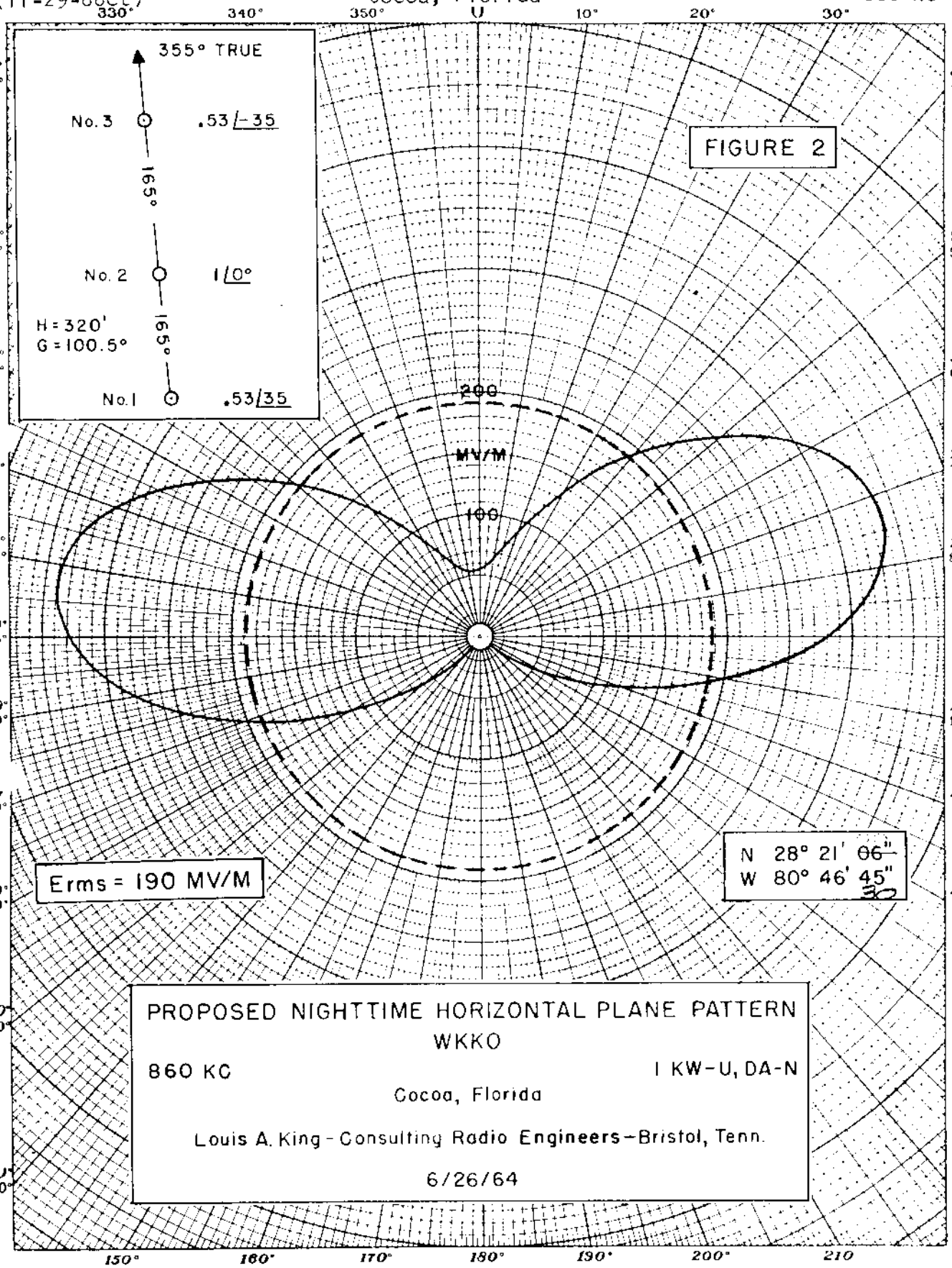
BP-16887
GRANTED CP
7-25-67

WKKO

Proposed Night
(11-29-66ct)

Station WKKO
Cocoa, Florida

1kw,DA-N,U OVER
860 kc



FCC File No. BP-16887
Accepted 11-23-66

Station WKKO
Cocoa, Florida

860 kc

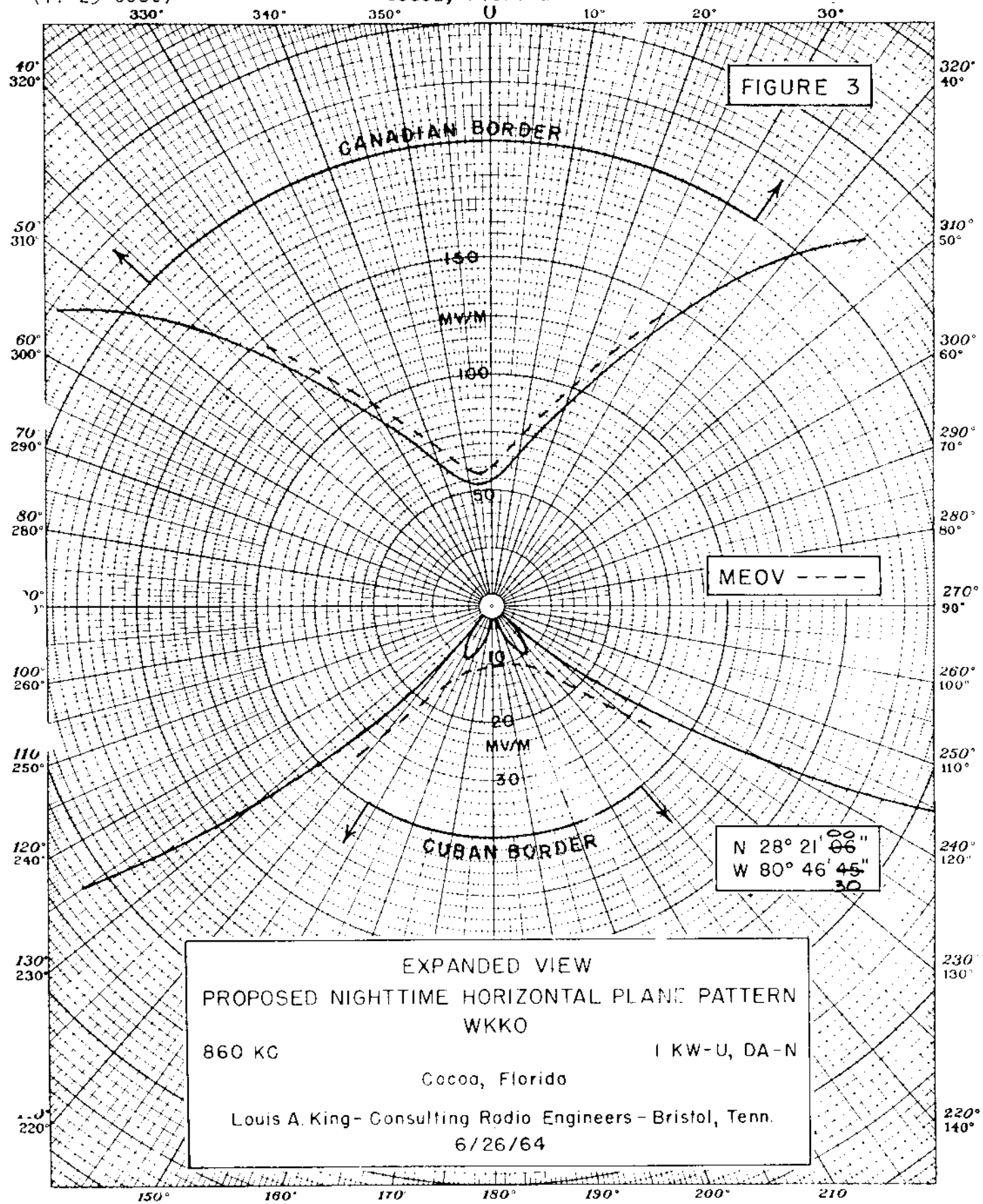
BP-16887
GRANTED CP
7-25-67

WKKO

Proposed Night Nulls
(11-29-66ct)

Station WKKO
Cocoa, Florida

1kw,DA-N,U
860 kc



FCC File No. BP-16887
Accepted 11-23-66

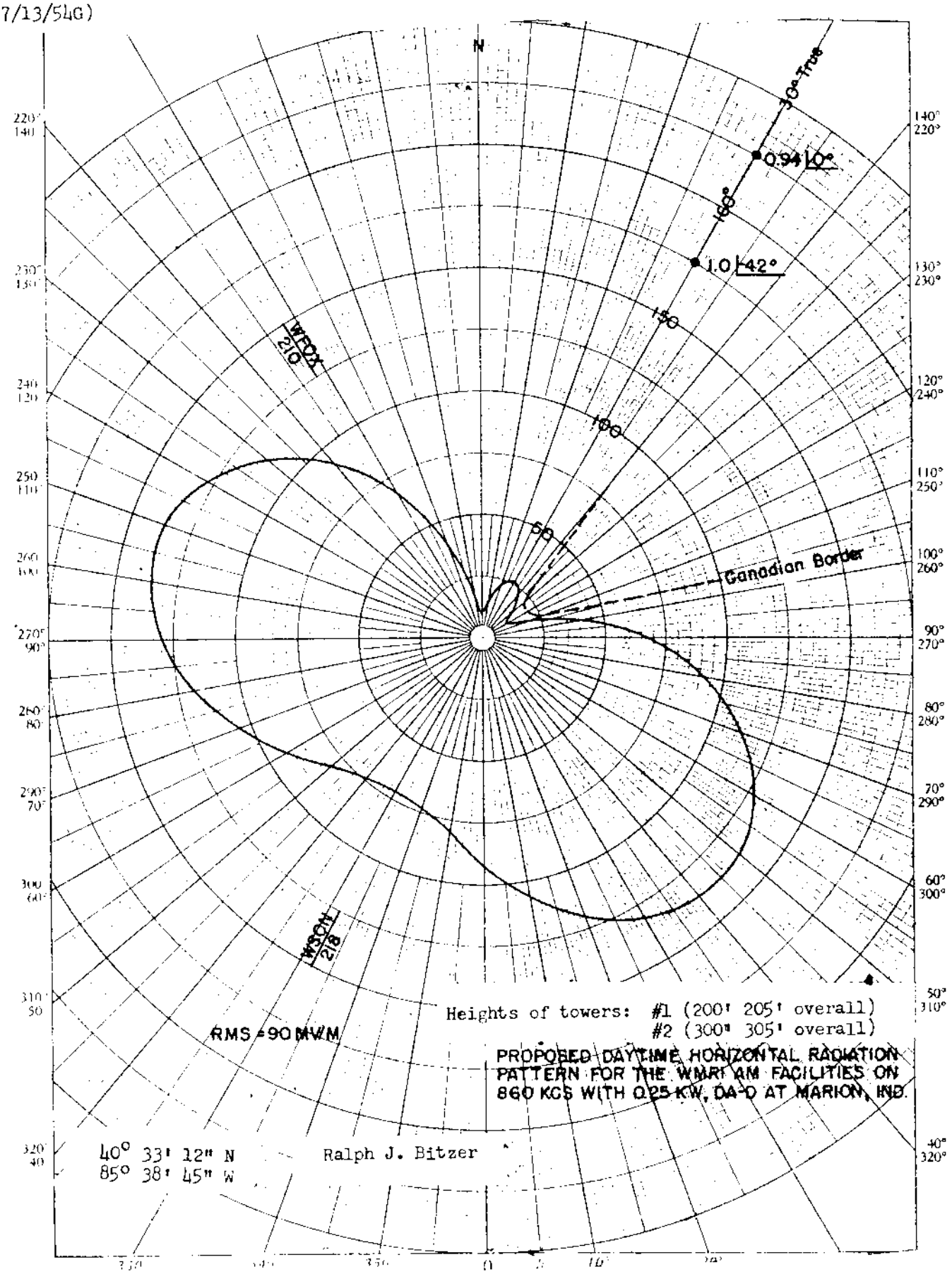
Station WKKO
Cocoa, Florida

860 kc

WGOM

MARION, IND.

PROPOSED DAY (7/13/54G) Chronicle Publishing Co. Marion, Ind. 250W, D, DA-D 860 kc



860 kc

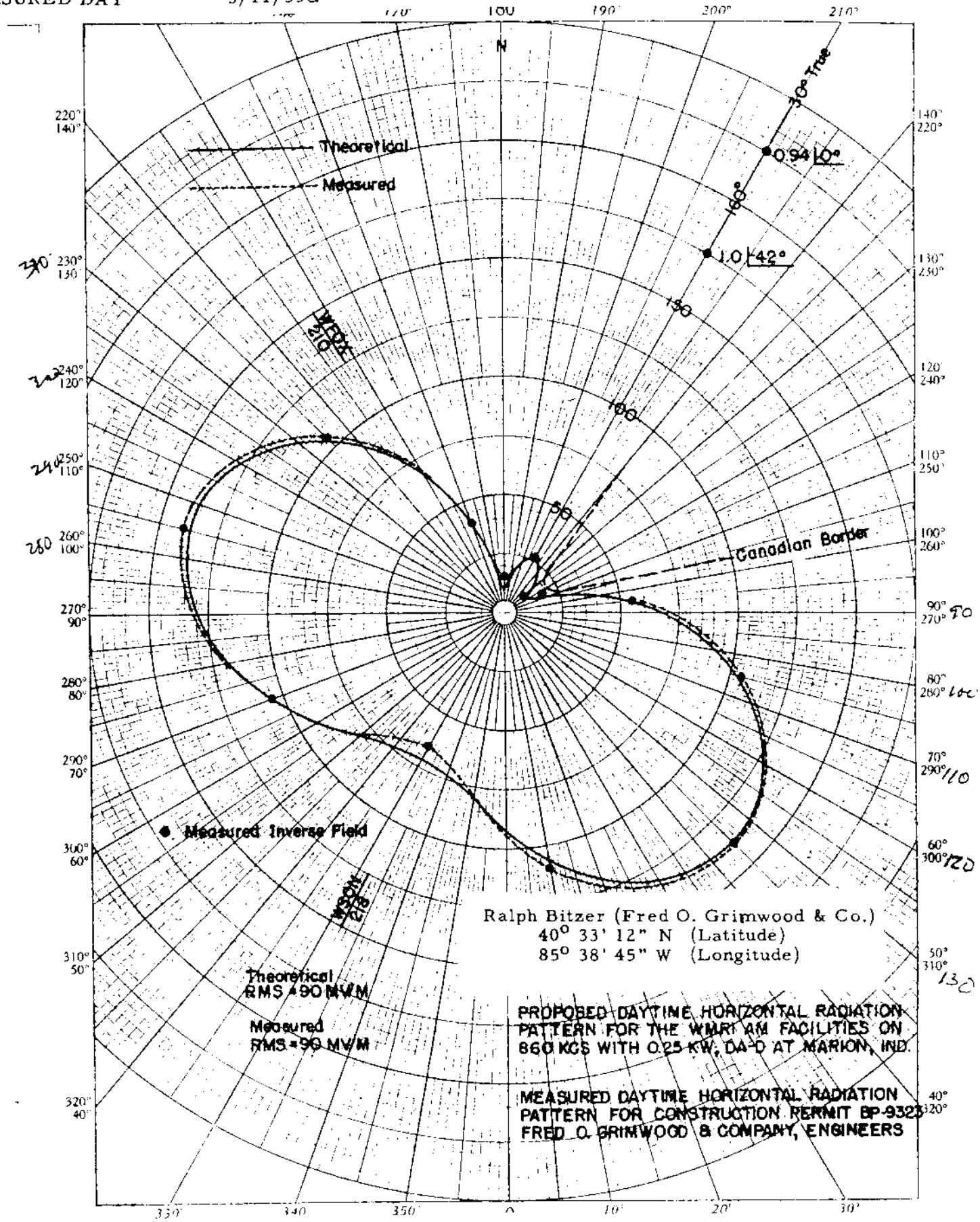
FCC File No. BL-9323 Accepted 6/11/54

PROPOSED AND MEASURED DAY

WMRI, MARION, IND.
5/11/55G

D, DA-D
250 KW

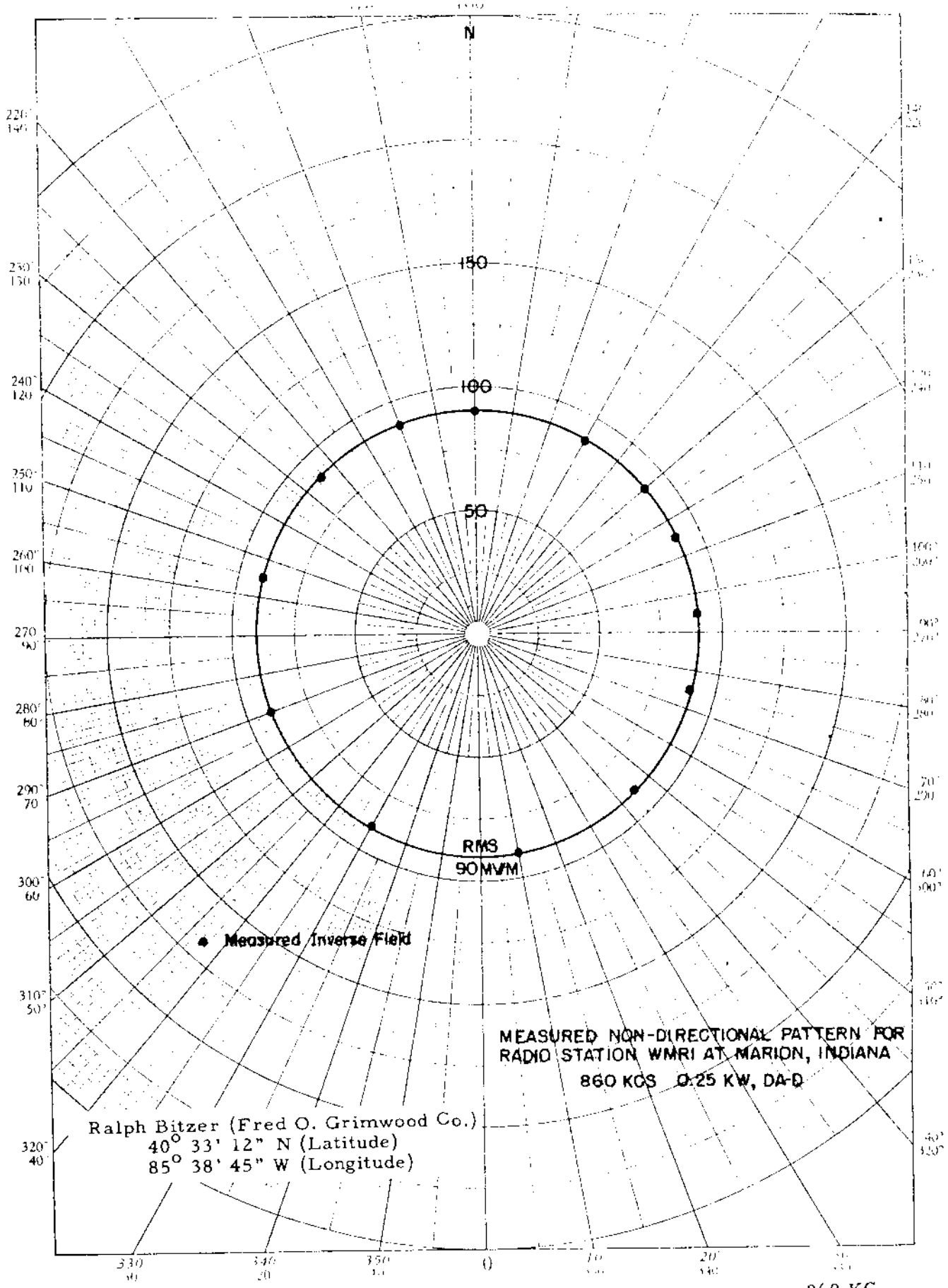
860 KC



FCC File No. BL-5712 Accepted 5-6-55 WMRI, MARION, IND. 860 KC

WMRI

MEASURED NON-DA | WMRI, MARION, IND. 5/11/55G | D, DA-D 250 KW | 860 KC



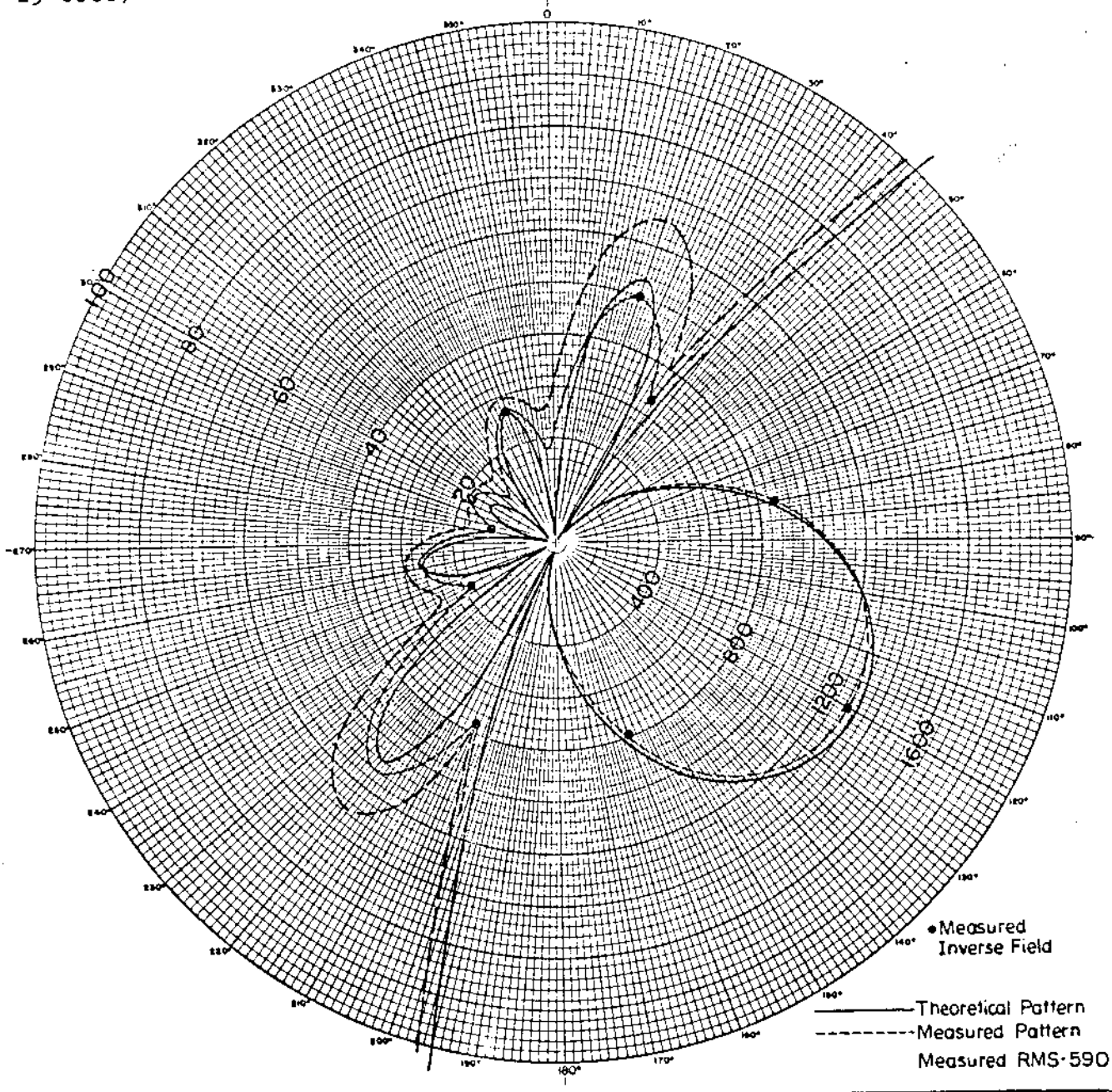
File No. BL-5712 Accepted 5-6-55 WMRI, MARION, IND. 860 KC

WTEL

Measured Day
(11-29-68ct)

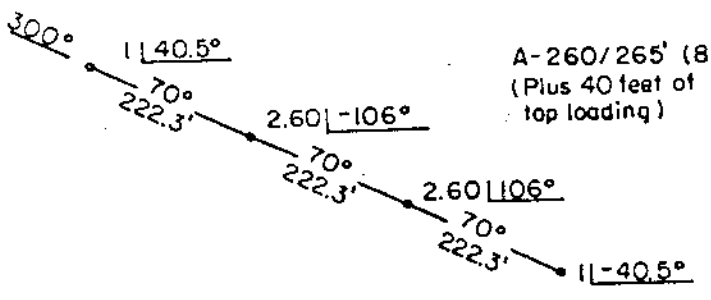
Station WTEL
Philadelphia, Pennsylvania

10kw, DA-D, D
860 kc



HORIZONTAL RADIATION PATTERN

BMP-12,220



APPLICANT	WTEL, Inc
LOCATION	Philadelphia, Pa.
FREQUENCY	860 KC/S
POWER	10 KW
LATITUDE	40 DEG 09 MIN 15 SEC
LONGITUDE	75 DEG 22 MIN 10 SEC
WHEN USED	Daytime
R.M.S. FIELD	605 Theoretical
DATE	12/15/66
Proof	9/12/68 RALPH J. BITZER CONSULTING RADIO ENGINEERS

FCC File No. BL-12161
Accepted 11-13-68

Station WTEL
Philadelphia, Pennsylvania

860 kc

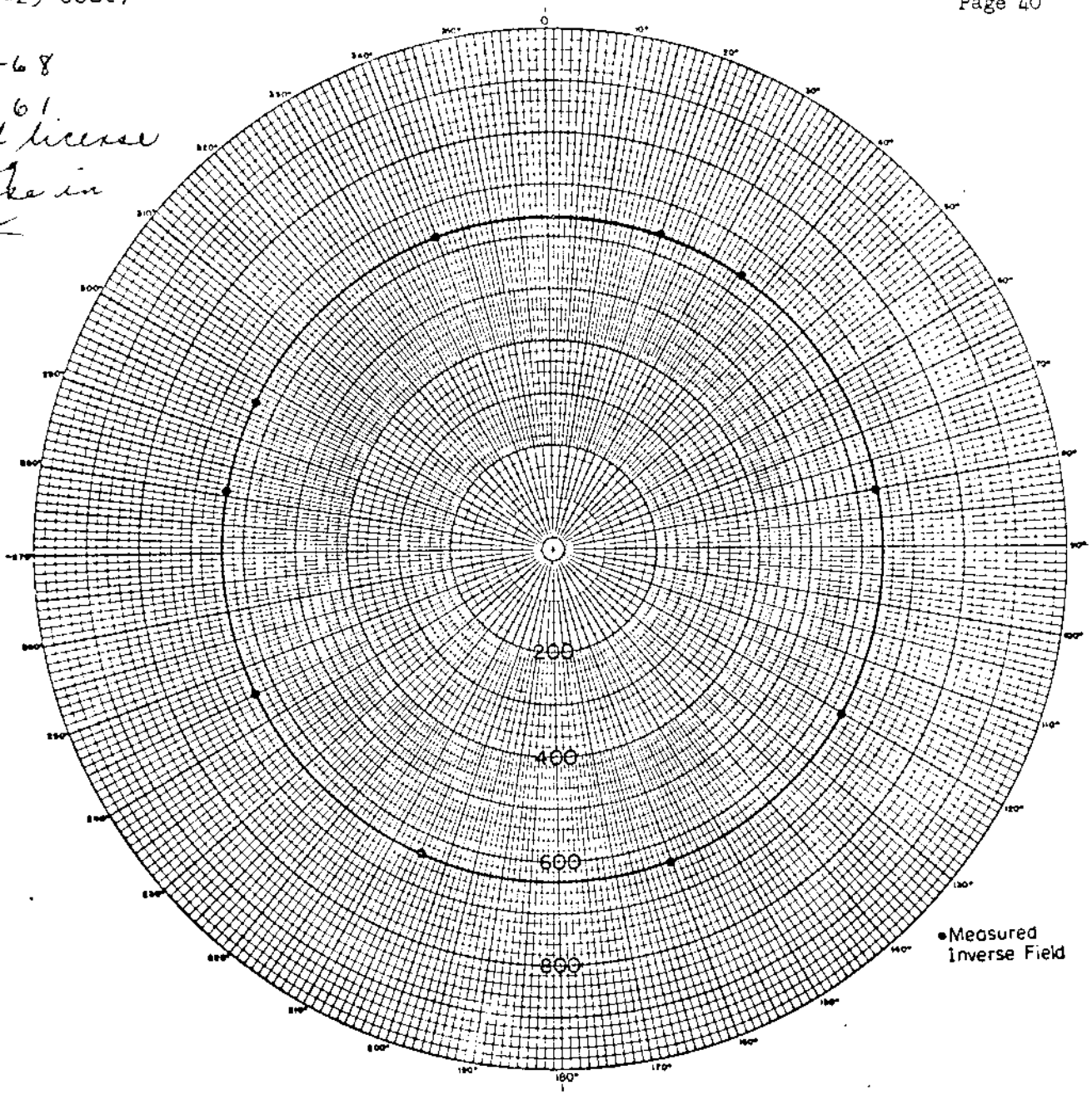
WTEL

Measured Non-DA
(11-29-68ct)

Station WTEL
Philadelphia, Pennsylvania

10kw,DA-D,D
860 kc

11-22-68
BL-12161
Granted license
covering
increase in
power



HORIZONTAL RADIATION PATTERN

BMP-12,220

APPLICANT	:WTEL
LOCATION	:Philadelphia, Pa.
FREQUENCY	:820 KC/S
POWER	:10 KW, Non-D
LATITUDE	:40 DEG 09 MIN. 15 SEC
LONGITUDE	:75 DEG. 22 MIN. 10 SEC.
WHEN USED	:Non-D Proof Only
R.M.S. FIELD	:640
DATE	:9/12/68

RALPH J. BITZER
CONSULTING RADIO ENGINEERS

FCC File No.BL-12161
Accepted 11-13-68

Station WTEL
Philadelphia, Pennsylvania

860 kc

WTEL

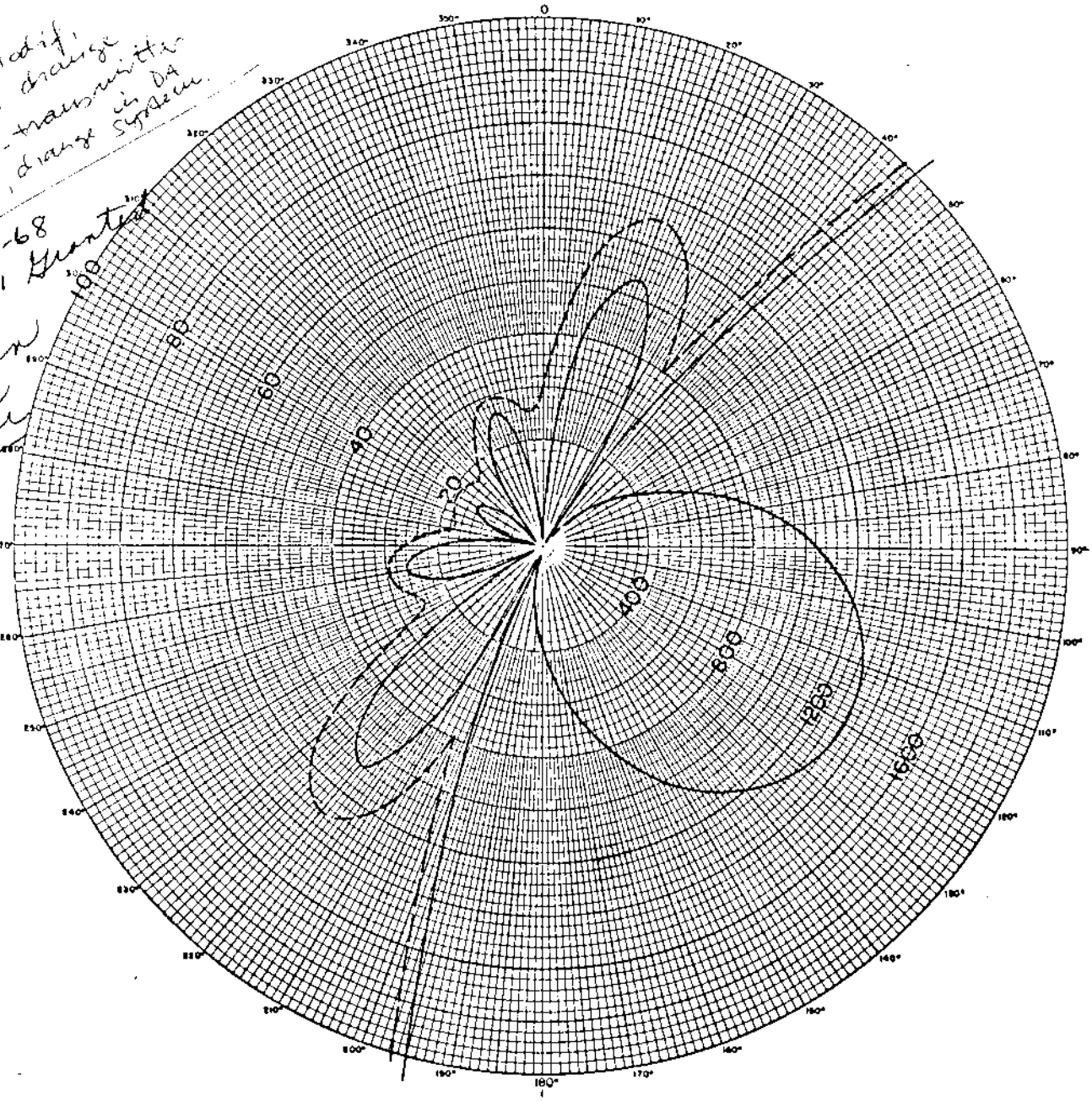
Proposed Day
(8-28-67ct)

Station WTEL
Philadelphia, Pennsylvania

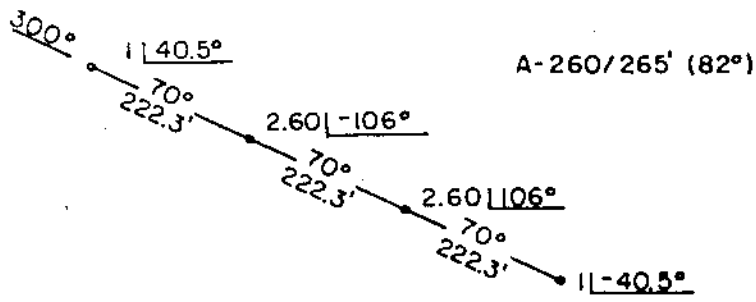
10kw,DA-D,D
860 kc

9-6-67 Granted modif. of CP to change antenna-transmitter location, change in DA system.

11-22-68 BL-12161 Granted license covering an increase in power



HORIZONTAL RADIATION PATTERN



APPLICANT	WTEL, Inc
LOCATION	Philadelphia, Pa.
FREQUENCY	860 KC/S
POWER	10 KW
LATITUDE	40 DEG. 09 MIN. 15 SEC.
LONGITUDE	75 DEG. 22 MIN. 10 SEC.
WHEN USED	Daytime
R.M.S. FIELD	605
DATE	12/15/66

RALPH J. BITZER
CONSULTING RADIO ENGINEERS

FCC File No.BMP-12145
Accepted 8-25-67

Station WTEL
Philadelphia, Pennsylvania

860 kc

XERPN

'escription Sheet
(12-27-68ct)

Station XERPN 500w,1kw-LS,DA-N,U,Class II
Ciudad Juarez, Chihuahua 860 kc

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: XERPN

Main Studio: Ciudad Juarez, Chihuahua

Frequency: 860 kc/s

Power: 0.5 kw Night 1 kw Day

Notification List No. 228

Date: December 15, 1962

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 31 ° 42 ' 18 "
West Longitude: 106 ° 30 ' 05 "

ANTENNA CHARACTERISTICS

Authorized for Nighttime operation. (DA-N)
Number of elements: 2
Type of elements: Guyed, vertical towers.

TOWER:	#2(NW)	#1(SE)
HEIGHT ABOVE INSULATORS:	286.1'	286.1' (90°)
PHASING:	+21°	0°
FIELD RATIO:	1	1

SPACING AND ORIENTATION: Elements are spaced 292.47' (92°) on a line bearing 118.5° true.

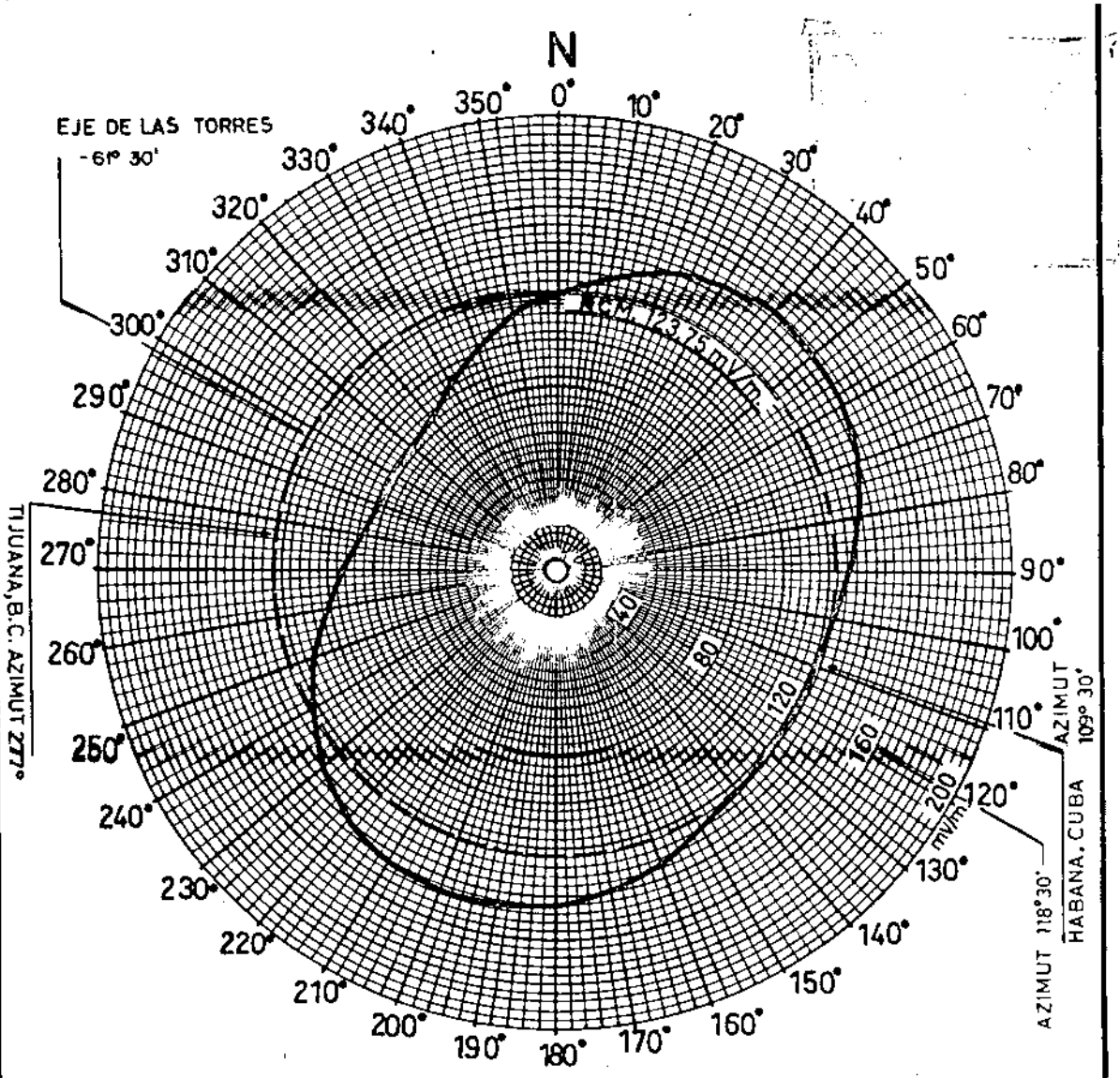
GROUND SYSTEM: 120-286' eqully spaced copper radials about each tower. Radials are shortened and bonded to transverse strap along intersections between towers.

Predicted effective Night Field: 123.75 mv/m at rated power.

XERPN

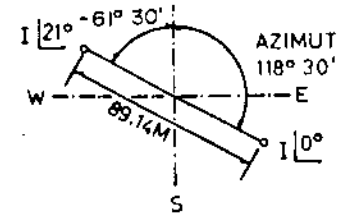
Proposed Night
(12-27-68ct)

Station XERPN 500w,1kw-LS,DA-N,U,Class II
Ciudad Juarez, Chihuahua 860 kc



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

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



RADIODIFUSORA

XERPN

CD. JUAREZ, CHIH.

860 KCS.
1000 W-DIA
500 W-NOCHE AD-N.

DISEÑO:
ING. ALBERTO PEREZ A.
CERTIFICADO DE 1a. No. 1122

DIBUJO:
L.E.O.

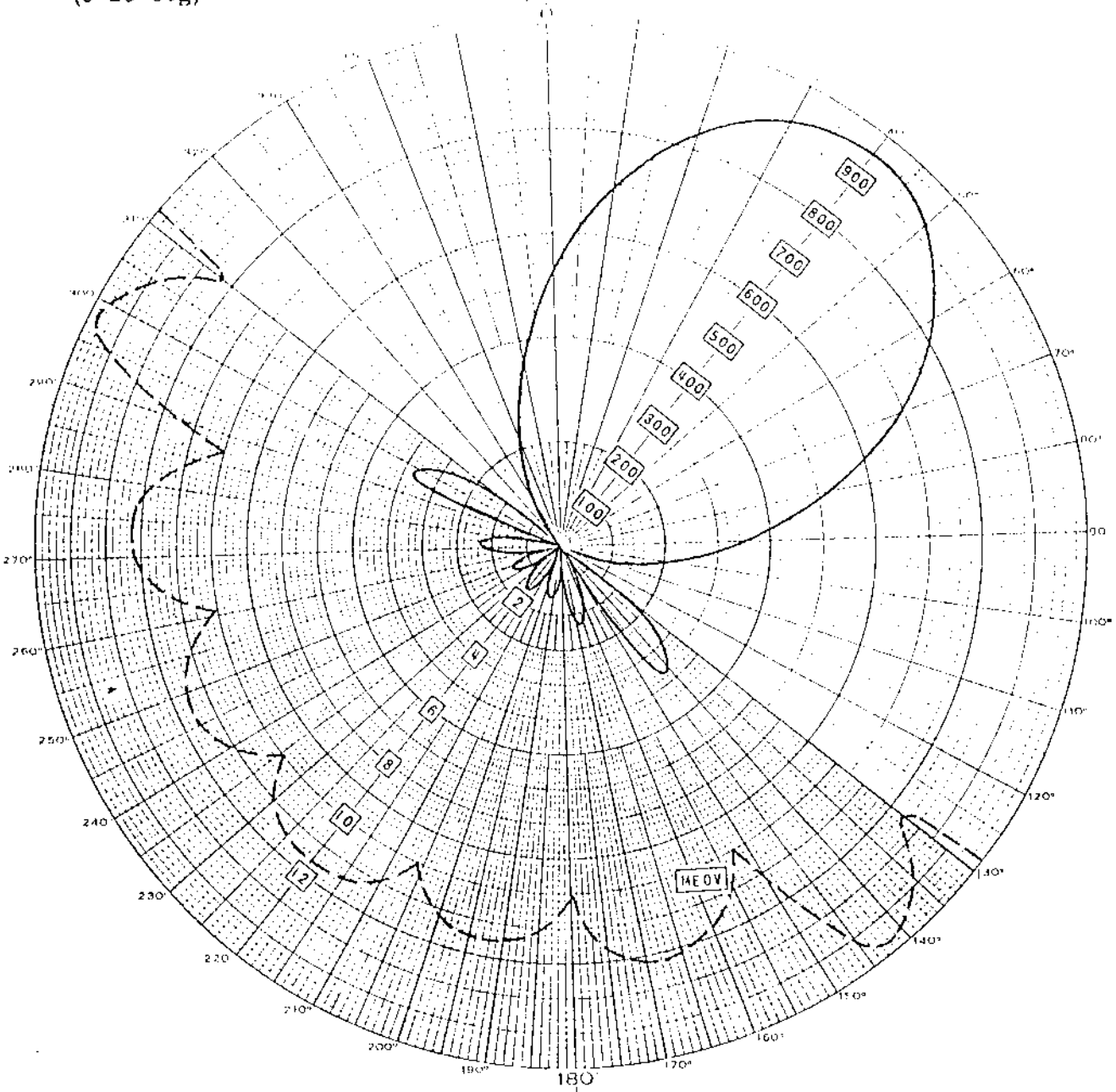
115

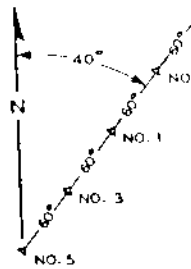
Colton, Calif.

PROPOSED DAY
(9-25-58g)

New; Gordon A. Rogers
Colton, California

5kw, DA-D,D
860 KC



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS								STATION DATA	
	TOWER	ELECTRICAL HEIGHT	TOWER ORIENTATION	SPACING	PHASING	HORIZONTAL FIELD	FIELD RATIO	FIELD ANGLE	ELEVATION		
		°	°	°	°	mv/m		°	°	CALL	NEW
	1	120	0	0	0	1436	5.43		403	FREQUENCY	860
	2	120	40	60	-148.64	981	3.71			POWER	5.0
	3	120	220	60	148.64	981	3.71			TIME OF OPERATION	DAYTIME
	4	120	40	120	63.0	264.5	1.000			TYPE OF OPERATION	DA
	5	120	220	120	-63.0	264.5	1.000			DAYTIME TOWERS	5
										NIGHTTIME TOWERS	—
										NO. RADIALS PER TOWER	240
										LENGTH OF RADIALS	70FT 300FT
										LAT	33 ° 55 ' 37 "
										LONG	117 ° 24 ' 18 "
										DATE	04 15 58
										PATTERN No.	09 08 58

NO. 1 NO. 2 NO. 3 NO. 4 NO. 5 N 40° 60° 60° 60° 60°

CORDON ROGERS	EXHIBIT V-IC	DAWKINS ESPY
NEW 860 KC 5000-D(DA) COLTON, CALIF.	PROPOSED HORIZONTAL RADIATION PATTERN	CONSULTING RADIO ENGINEERS BEVERLY HILLS, CALIF. SEPTEMBER 8, 1958

FCC File No. BP-11,209
Accepted 9-23-58 Amended

Gordon A. Rogers
Colton, California

860 KC

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: XENL Main Studio: Monterrey, N.L.

Frequency: 960 Power: 5Kw

Notification List No. 161 Date: July 13, 1953 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 25° 43' 33"

West Longitude: 100° 16' 02"

ANTENNA CHARACTERISTICS

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

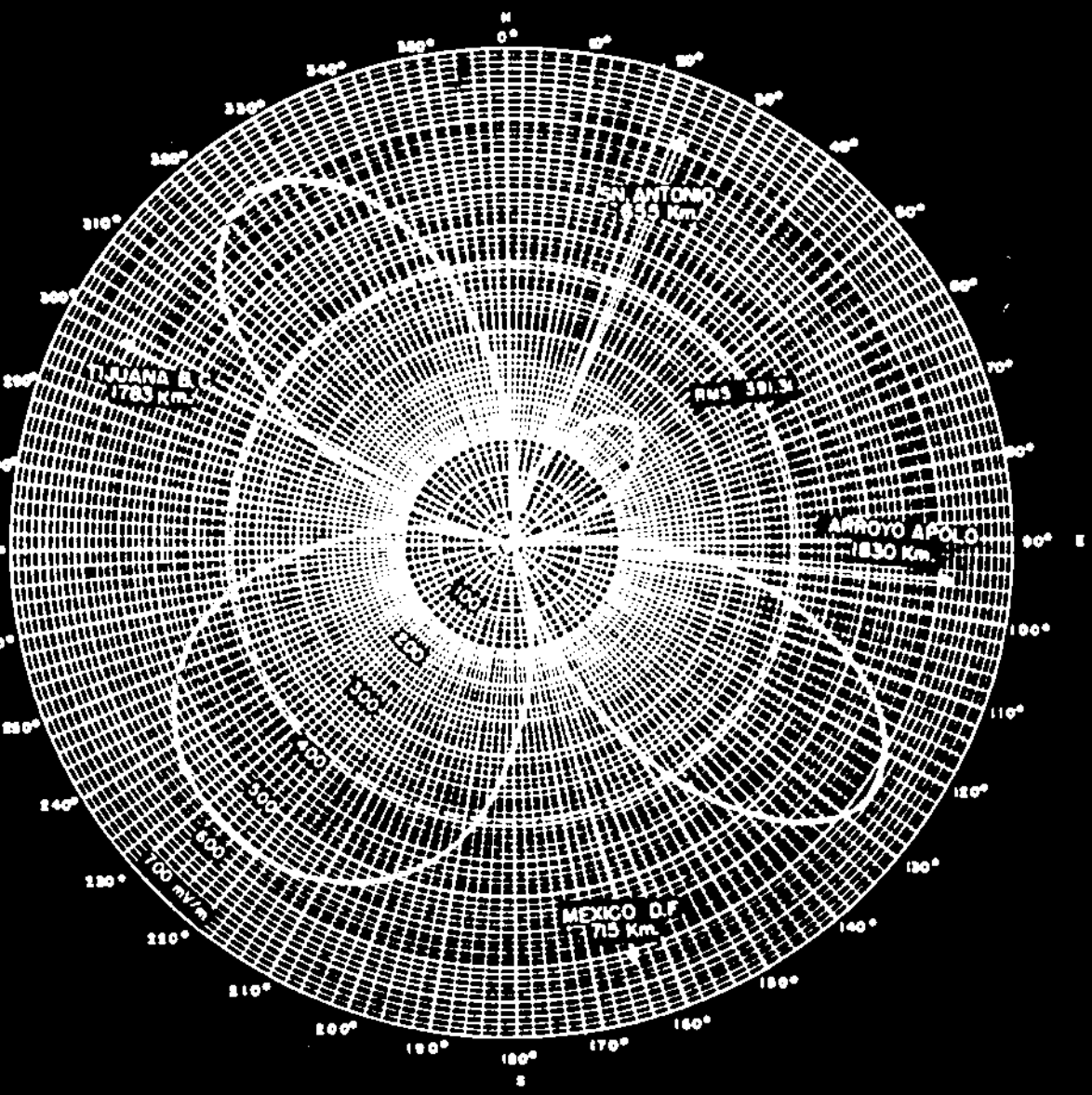
TOWER:	N. E.	S. W.
HEIGHT ABOVE INSULATORS:	285.9' (90°)	285.9' (90°)
PHASING:	0°	45°
FIELD RATIO:	1.0	1.0

SPACING AND ORIENTATION: Elements are spaced 858' (270°) on a line bearing 44°39'21" true.

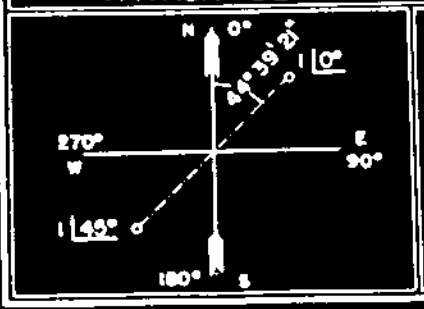
GROUND SYSTEM: A grid 858'X286.4', composed of wires intersecting at 4 meter intervals, extends from tower base to tower base. Center line through grid is coincident with line of towers. 60-143.2' radials at each tower base cover arcs of 90° on each side of line of towers at opposite ends of system in areas not occupied by grid.

Predicted effective Field: 391.31 mv/m (at rated power)

DESCRIPTION SHEET Station XENL 5kw, DA-N, Class II
Monterrey, Nuevo Leon 860 KC



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



CADENA RADIOTELEVISORA DEL NORTE S.A.
RADIO PROGRAMAS DE MEXICO

XENL

Monterrey N.L.

860 Kc.
5000 Watts.

ARTURO AMADOR
MANUEL CASTELLANOS
Pasantes Ing. COMUNICACIONES

DIRECTIONAL ANTENNA DESCRIPTION SHEET
(Issued: March 22, 1971)

Station: XERSV | Main Studio: Ciudad Obregon, Sonora

Frequency: 810 kHz | Power: 0.25kw Night

Notification List No. (*) | Date: (*) | Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:
North Latitude: 27° 30' 50"
West Longitude: 109° 56' 16"

ANTENNA CHARACTERISTICS

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

TOWER:	NW(#2)	C(#1)	SE(#3)
HEIGHT ABOVE INSULATORS:	304'	304'	304' (90°)
NIGHT PHASING:	+90°	0°	-90°
NIGHT FIELD RATIO:	0.5	1	0.5

SPACING AND ORIENTATION: Adjacent elements are spaced 304' (90°) on a line bearing 145° true.

GROUND SYSTEM: 120 - 304' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of systems are bonded together.

Predicted effective Night Field: 99.39 mv/m at rated power.

(*) FCC Note: Notification of basic information for this change in a Notification List has not been received as of this issue date. Supplementary information was transmitted by letter of February 25, 1971, in accordance with provisional procedures for exchange of notifications established in a Memorandum of Understanding between Delegations of the United States and Mexico signed in Washington on November 27, 1968.

CTR NO 20478A3

XERSV

Proposed Night
(3-22-71ct)

Station XERSV
Ciudad Obregon, Sonora

250w,DA-N,N,Class II
860 kc

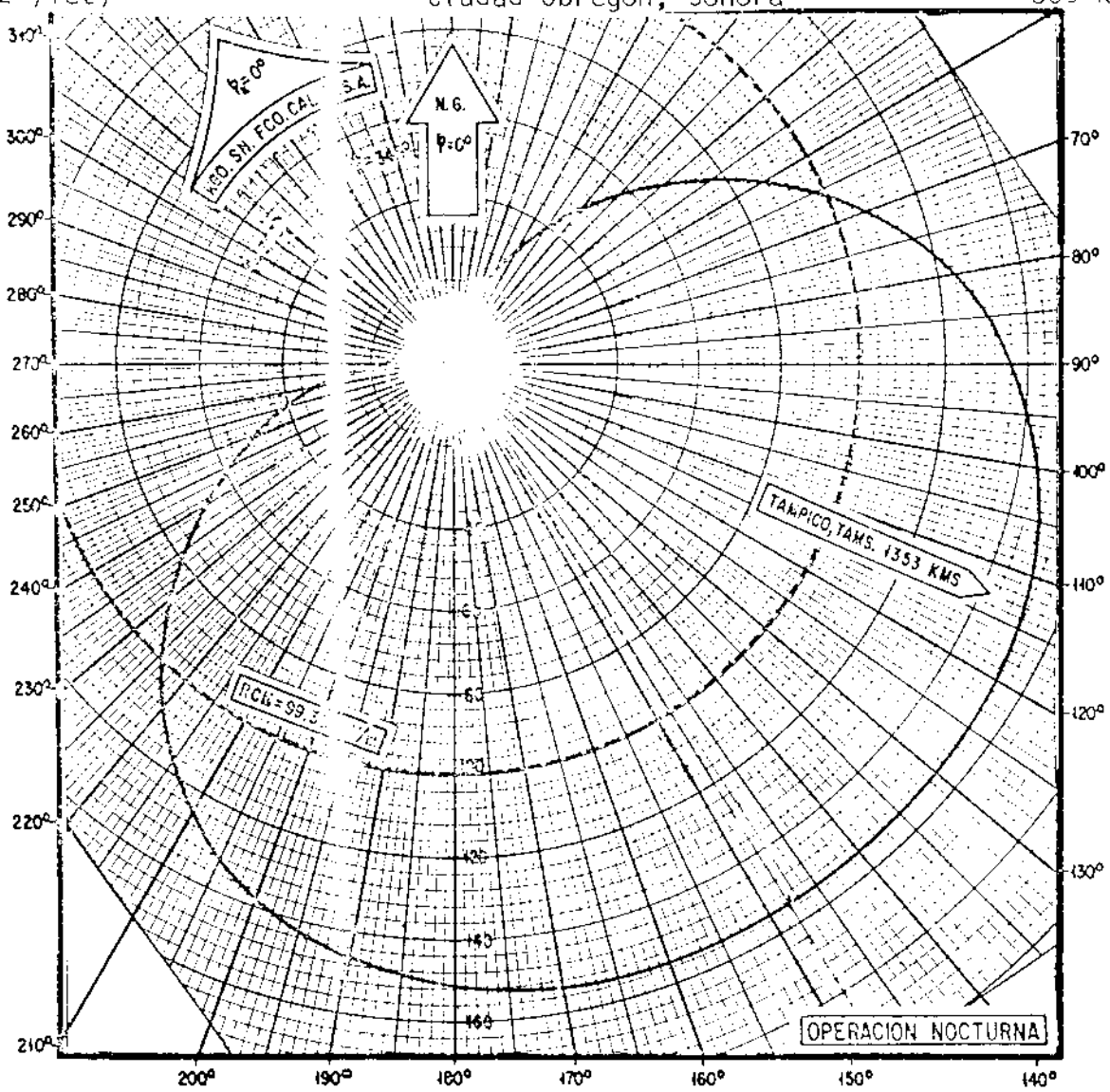
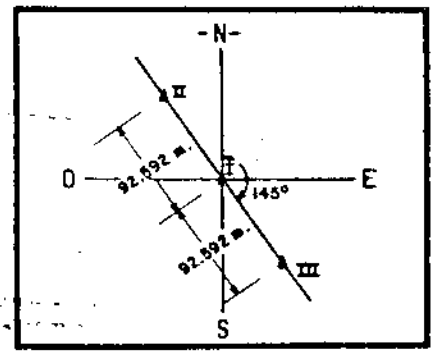


DIAGRAMA DE RADIACION HORIZONTAL CALCULADO EN mV/m A 1609 MTS.



-XERSV-

810 Kc/s.

Cd. Obregón, Son.
Méx.

Potencia:
250 WATTS. N.

Calculó:
Ing. Melesio Fernández Q
Ced. Prof. No. 165454

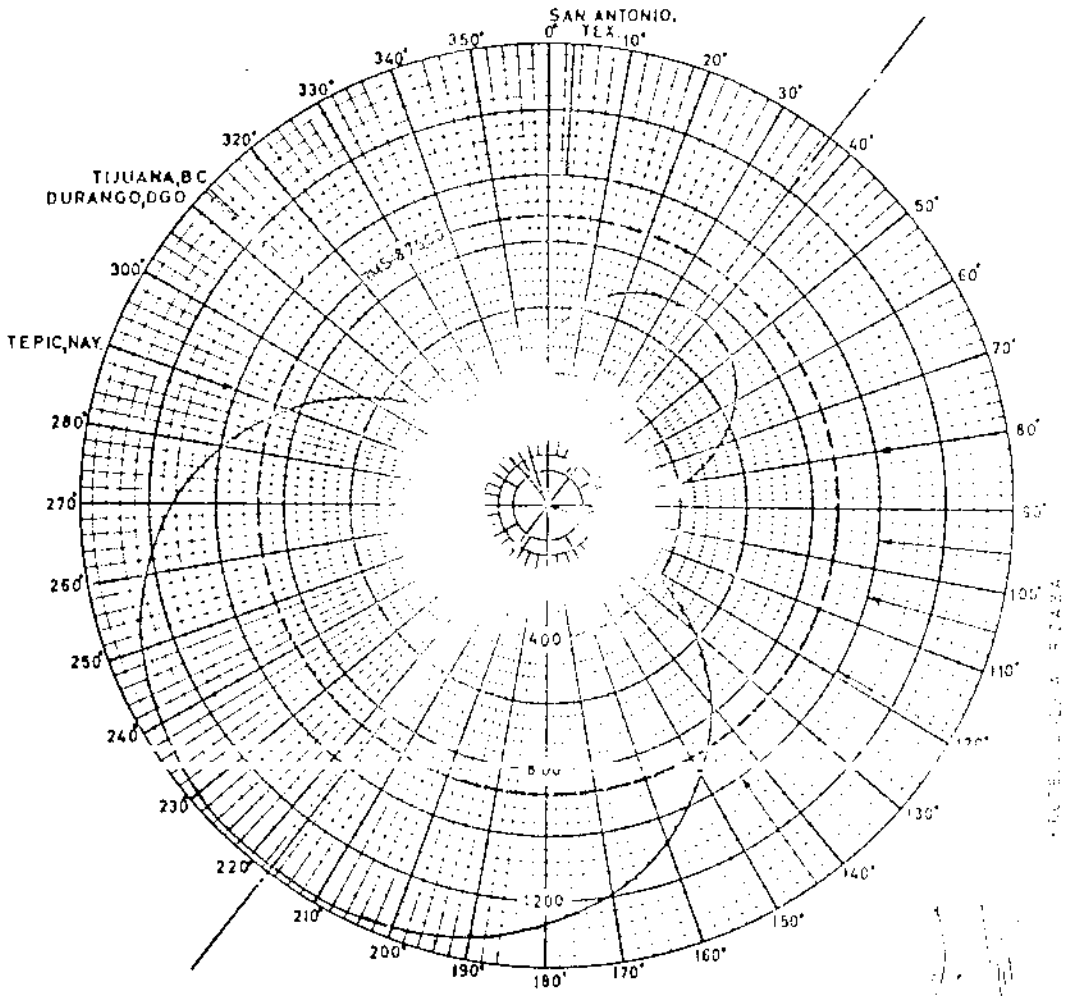
Dibujó:
J. M. H. D.

XEUN

Proposed Night
(1-22-71ct)

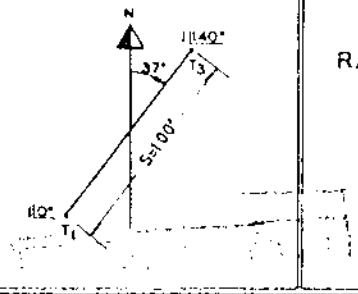
Station XEUN
Mexico, D. F.

25kw,45kw-LS,DA-2,U,Class II
860 kc



LOBULO NOCTURNO.

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



RADIO UNIVERSIDAD

X E U N

México, D. F.

860 Khz.
25 000 Watts

DISEÑO:

DYCE, S. de R. L.

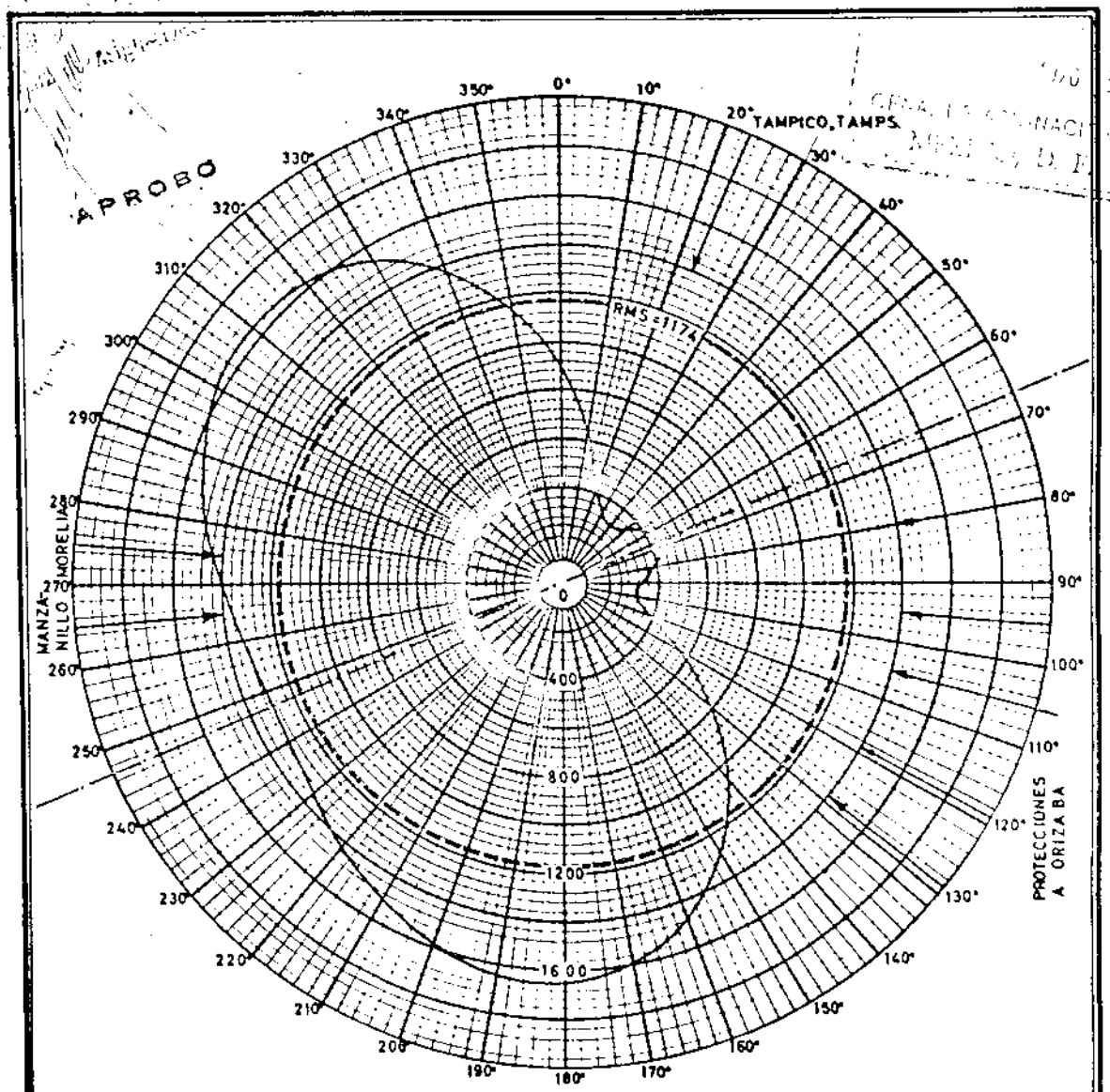
Dibujo J. de J. Sánchez Cruz

XEUN

Proposed Day
(1-22-71ct)

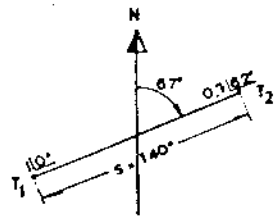
Station XEUN
Mexico, D. F.

25kw,45kw-LS,DA-2,U,Class II
860 kc



LOBULO DIURNO.

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



RADIO UNIVERSIDAD

X E U N

México, D.F.

860 Khz
45000 Watts

DISEÑO:

DYCE, S. de R.L.

Dibujó J. de J. Sánchez R.

XEUN

Description Sheet
(1-22-71ct)

Station XEUN
Mexico, D. F.

25kw,45kw-LS,DA-2,U,Class II
860 kc

DIRECTIONAL ANTENNA DESCRIPTION SHEET
(ISSUED DECEMBER 11, 1970)

Station: XEUN

Main Studio: Mexico, D.F.

Frequency: 860 kHz

Power: 25 Kw Night 45 Kw Day

Notification List No. (None)*

Date: (None)*

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 19° 31' 10"
West Longitude: 99° 10' 08"

ANTENNA CHARACTERISTICS

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

TOWER:	SW(#1)	N(#3)	E(#2)	
HEIGHT ABOVE INSULATORS:	286'	286'	286'	(90°)
NIGHT PHASING:	0°	+140°	----	
NIGHT FIELD RATIO:	1	1	----	
DAY PHASING:	0°	----	+ 62°	
DAY FIELD RATIO:	1	----	0.71	

SPACING AND ORIENTATION: Daytime, elements #1 and #2 are spaced 445' (140°) on a line bearing 67° true.

Nighttime, elements #1 and #3 are spaced 318' (100°) on a line bearing 37° true.

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

Predicted effective Night Field: 875.0 mv/m at rated power.

Predicted effective Day Field: 1173.9 mv/m at rated power.

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* FCC Note: Notification of basic information for XEUN has been received informally by telegram, only, dated November 12, 1970.

DIRECTIONAL ANTENNA DESCRIPTION SHEET
(Issued: March 22, 1971)

Station: XEZR

Main Studio: Zaragoza, Coahuila

Frequency: 860 kHz

Power: 0.25kw Night

Notification List No. (*)

Date: (*)

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 28° 29' 00"
West Longitude: 100° 54' 00"

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:	N(#1)	S(#2)	
HEIGHT ABOVE INSULATORS:	286'	286'	(90°)
NIGHT PHASING:	0°	+30°	
NIGHT FIELD RATIO:	1	1	

SPACING AND ORIENTATION: Elements are spaced 553' (174°) on a line bearing 350° true.

GROUND SYSTEM: 120 - 286' equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

Predicted effective Night Field: 99 mv/m at rated power.

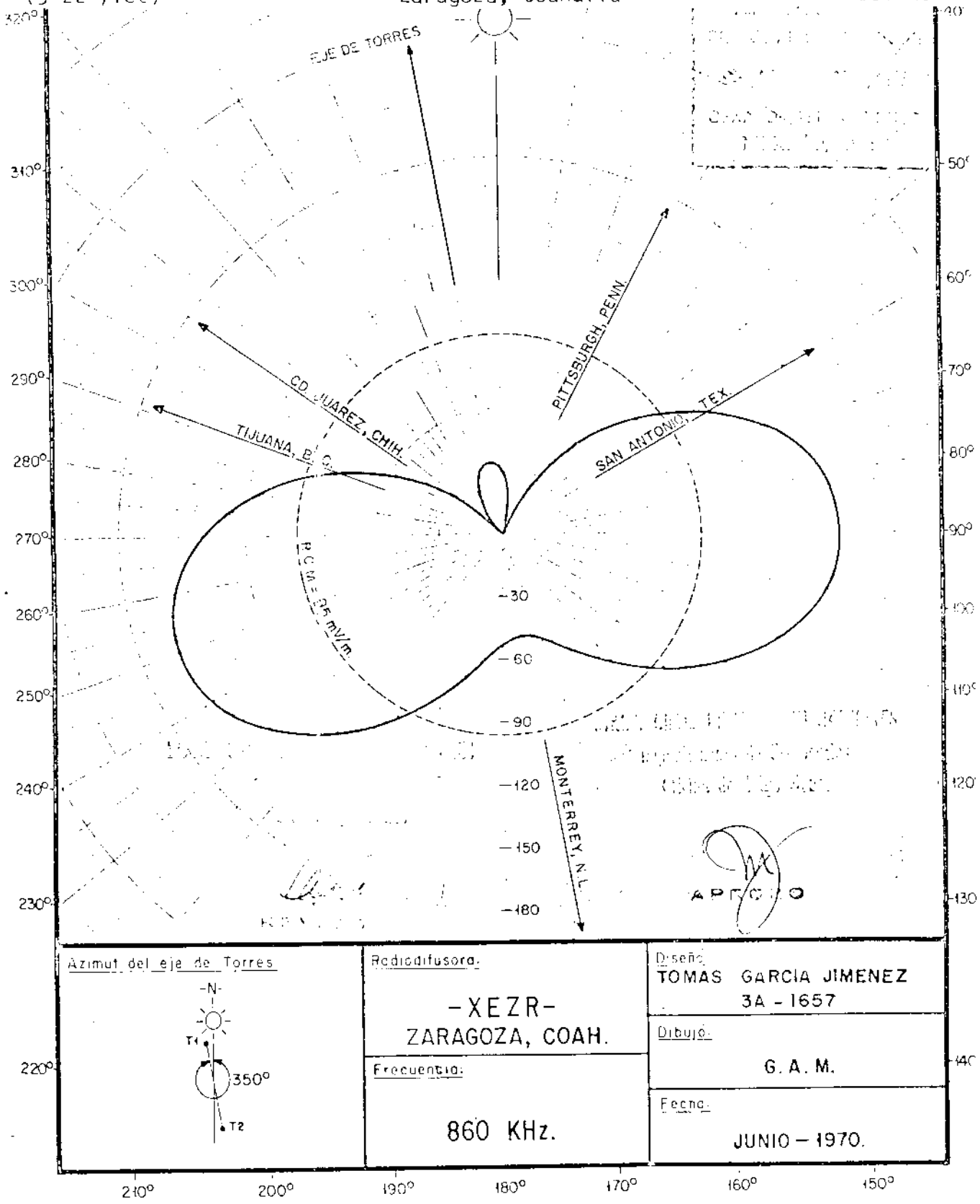
(*) FCC Note: Notification of basic information for this change in a Notification List has not been received as of this issue date. Supplementary information was transmitted by letter of March 13, 1971, in accordance with provisional procedures for exchange of notifications established in a Memorandum of Understanding between the Delegations of the United States and Mexico signed in Washington on November 27, 1968.

CTR NO 20617A3

Proposed Night
(3-22-71ct)

Station XEZR
Zaragoza, Coahuila

250w, DA-N, N, Class II
860 kc



Azimut del eje de Torres	Radiodifusora:	Diseño:
	-XEZR- ZARAGOZA, COAH.	TOMAS GARCIA JIMENEZ 3A - 1657
	Frecuencia:	Dibujó: G. A. M.
	860 KHz.	Fecha: JUNIO - 1970.

KAIM

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station	: KAIM	Main Studio:	Honolulu, Hawaii
Frequency	: 870 KHz	Power	: 50 kW Night 50 kW Day
Notification	: 1780	Date	: Sept. 28, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude:	21	10	56
West Longitude:	157	13	27

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-1)
Number of elements: 2
Type of elements : Series excited, uniform cross-section, guyed, Shunt excited, Self supporting, tapered, vertical steel towers.

TOWER	:	S(#1)	N(#2)				
HEIGHT ABOVE INSULATORS	:	286.1'	286.1'	(90°)			
PHASING	:	0°	+100°				
FIELD RATIO	:	1.0	0.9				

SPACING AND ORIENTATION : Towers in a row are spaced 220' (70°) on a line bearing 50° true.

GROUND SYSTEM : 120 - 220' equally spaced copper radials plus about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

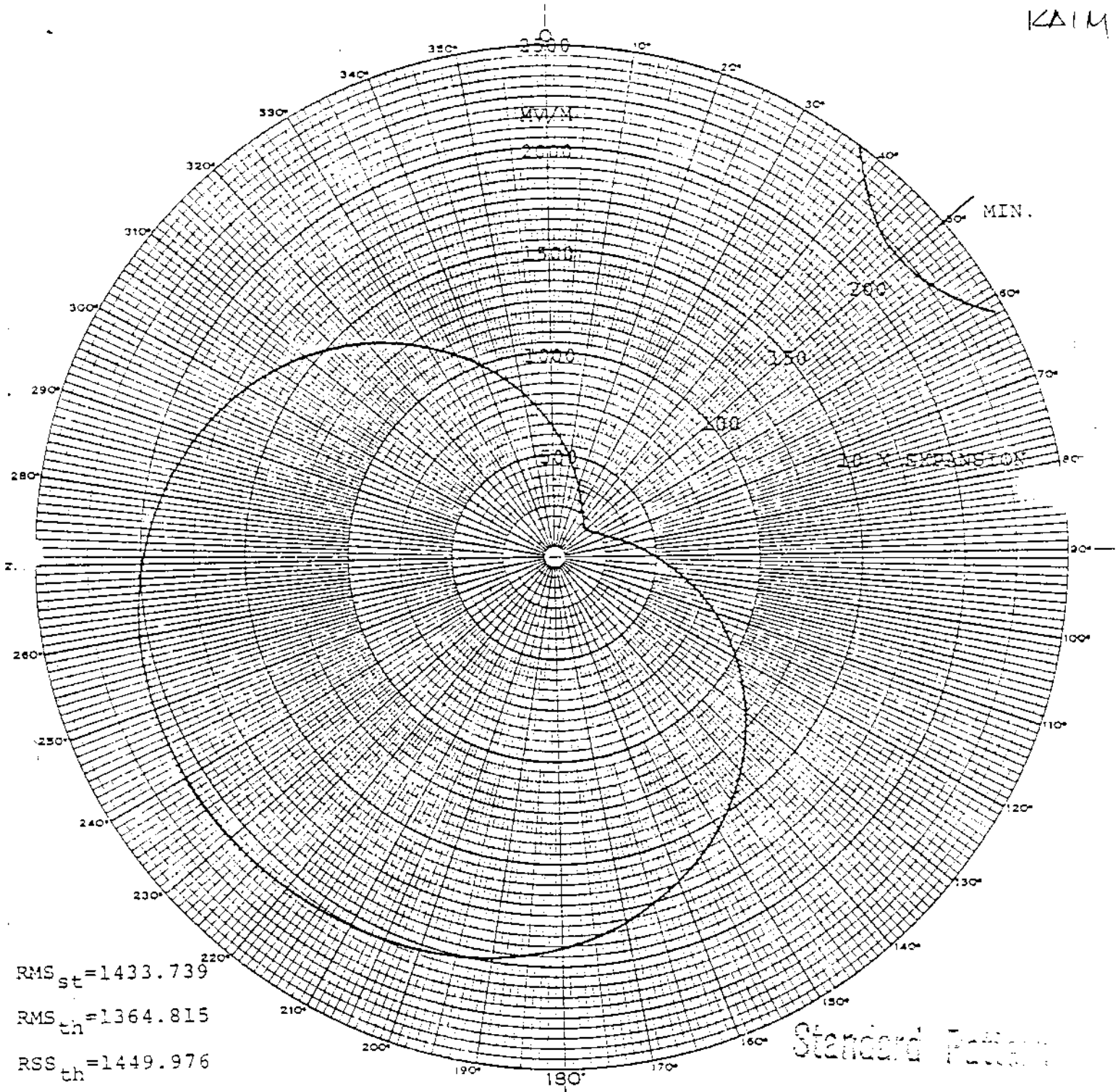
KAIM

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL		STANDARD
	RMS	RSS	RMS
Day and Night	1364.815 mV/m	1449.976 mV/m	1443.739 mV/m

Note:

KAIM



RMS_{st}=1433.739

RMS_{th}=1364.815

RSS_{th}=1449.976

Standard Pattern

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 3A	STATION DATA
G's = 90° S = 70°	TOWER No.	ELECTRICAL HEIGHT	SPACING	PHASING	FIELD RATIO	PROPOSED DA-1 RADIATION FOR KAIM HONOLULU, HAWAII	CALL KAIM
50°	1	90°	–	–	1.0		FREQ 870 kHz
#2	2	90°	70°	100°	0.9		POWER 50 kW
S	3						TYPE DA-1
#1	4					JULY 1977	TIME UNLIMITED
	5						LAT. N 21°10'56"
	6						LONG. W 157°13'27"
	DAYTIME OPERATION ☒			NIGHTTIME OPERATION ☒		θ° 0°	E. HAROLD MUNN, JR. & ASSOCIATES, INC. COLDWATER, MICH.

WHOA

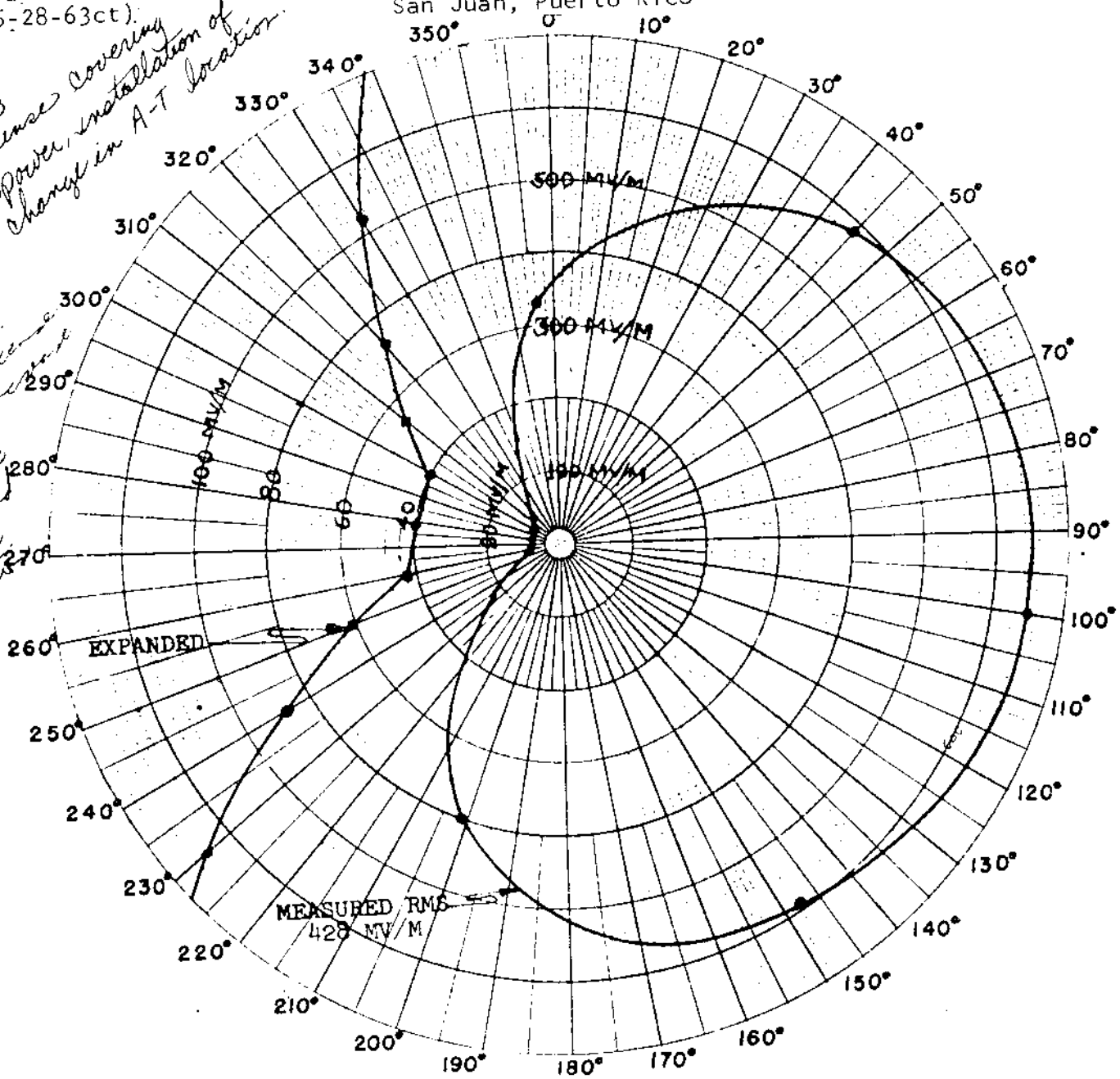
Measured Day & Night
(5-28-63ct).

6-20-63
Granted license covering increase in power, installation of DA-N, and change in A-T location

5-1-63
Granted license covering increase in power, installation of DA-1 and change in A-T location

Station WHOA
San Juan, Puerto Rico

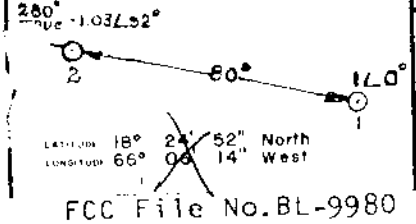
5kw, DA-1, U
870 kc



HORIZONTAL RADIATION PATTERN

EXHIBIT No. 3

ANTENNA PLACEMENT SKETCH



DIRECTIONAL ANTENNA PARAMETERS

STATION WHOA — LOCATION SAN JUAN, PUERTO RICO
FREQUENCY 870 KC — RATED POWER 5 KW

Antenna No.	True Bearing	Spacing	Phasing	Field Ratio	Horizontal Field Intensity	Electrical Height
1	0°	80°	0°	1	428 MV/M RMS	67°
2	280°	80°	92°	1.03		67°

FCC File No. BL-9980
Accepted 5-9-63

Station WHOA
San Juan, Puerto Rico

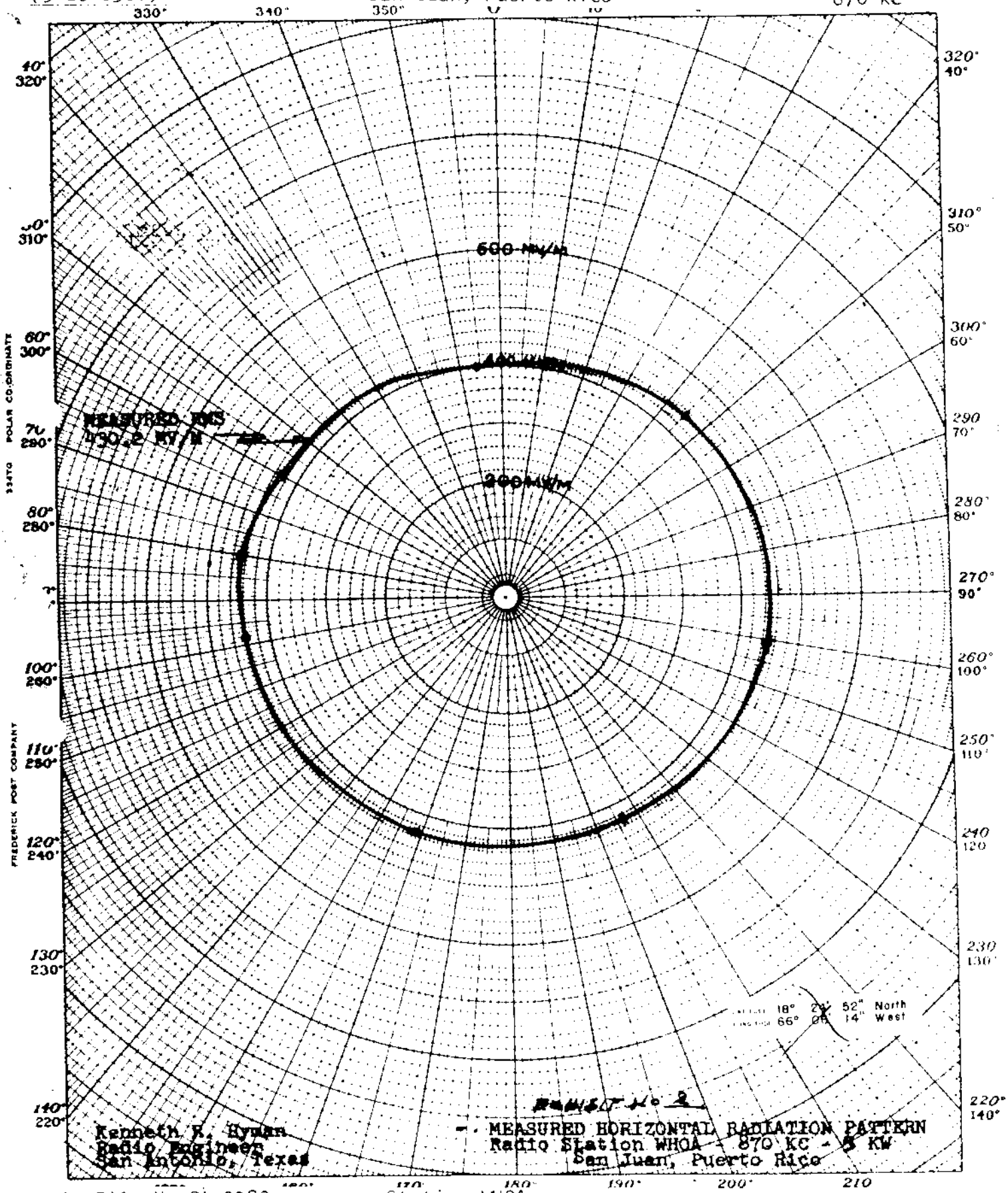
870 kc

WHOA

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

Station WHOA
San Juan, Puerto Rico

5kw,DA-1,U
870 kc



FCC File No.BL-9980
Accepted 5-9-63

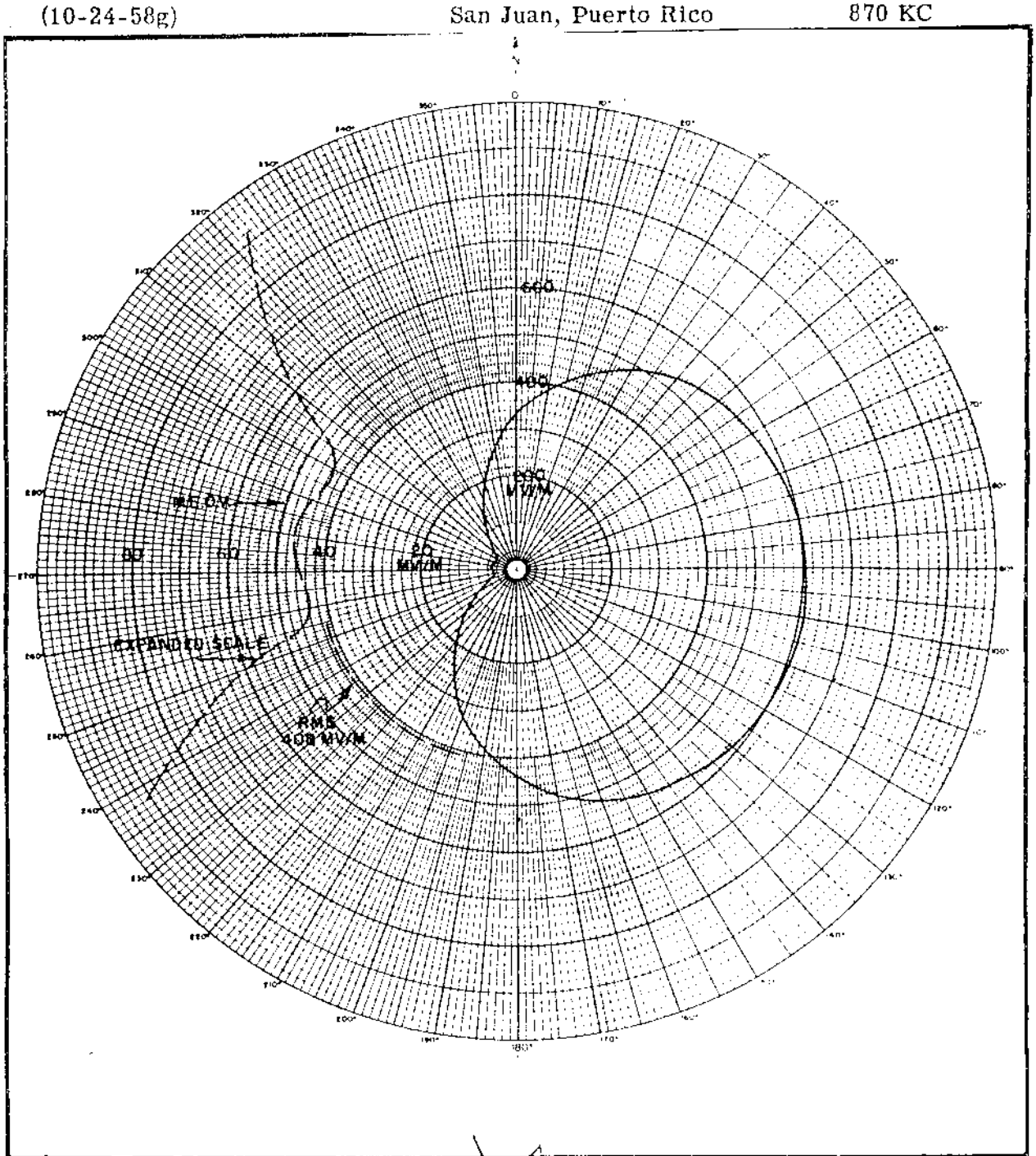
Station WHOA
San Juan, Puerto Rico

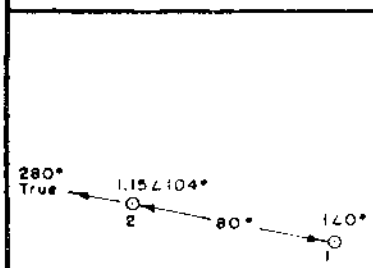
870 kc

San, Juan, P.R. WHOA

PROPOSED DAY & NIGHT (10-24-58g)

Station WHOA San Juan, Puerto Rico 5kw, DA-1,U 870 KC





LATITUDE 18° 24' 52" North
LONGITUDE 66° 06' 14" West

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	RATIO	MOMENT FOR 1 KW	HEIGHT
1	SEE	SEE	0	0	180	67°
2	DIAGRAM	DIAGRAM	104	1.15	180	67°

PROPOSED
HORIZONTAL PLANE PATTERN
FOR
WHOA
SAN JUAN, PUERTO RICO
870 KC 5 KW DA-1
580929

KEAR AND KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D.C.

FCC File No. BP-10,489
Accepted 10-16-58 (Amended)

WHOA
San Juan, Puerto Rico 870 KC

4-12-62 - granted cp for change in ant location. BMP-10205
NL 18-22-17
WL 66-12-17

Granted cp to change ant. and install DA 1-20-60

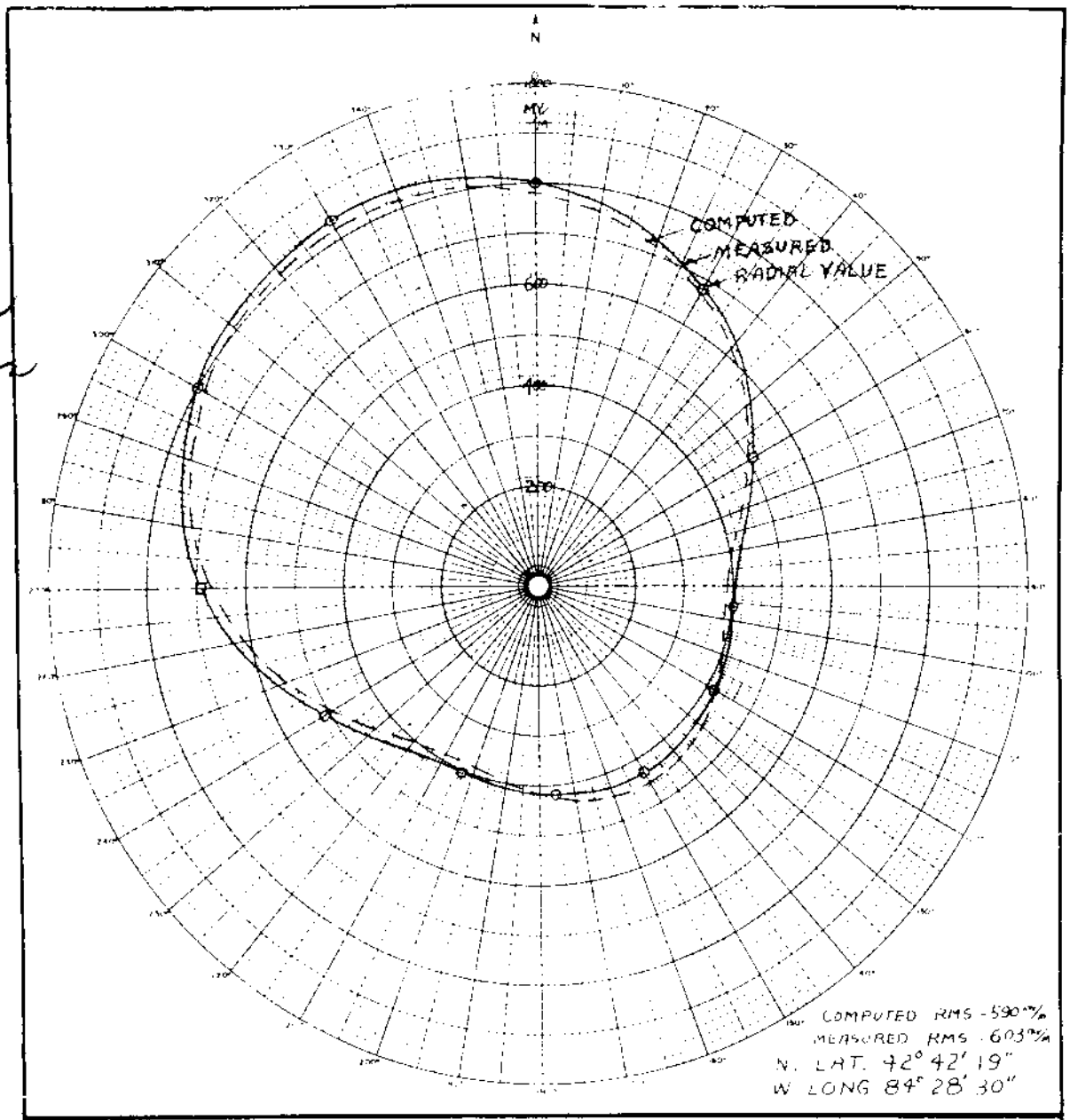
WKAR

Measured Day
(7-28-69ct)

Station WKAR
East Lansing, Michigan

10kw,DA-D,D
870 kc

BL-12408
Granted
10-3-69
license
covering
increase
in power
- installation
of DA-D. D.



N 330°E

CALCULATED 0.4/-134°
MEASURED 0.39/+168°

80'

H = 306 FT.

0 1.0/0°

STAR CITY

DAY AND DIRECTIONAL HORIZONTAL
PLANE RADIATION PATTERN

STATION WKAR
EAST LANSING, MICHIGAN
Present 870kc. 5kw-Day
Proposed 870kc. 10kw-Day

WILLIAM L. FOSS, INC.
Electronic Consultants
WASHINGTON 5, D. C.
827 15th Street, N. W. RE. 1843

PATTERN NO 2569
SUPERSEDES
APP

FCC File No.BL-12408
Accepted 7-15-69

Station WKAR
East Lansing, Michigan

870 kc

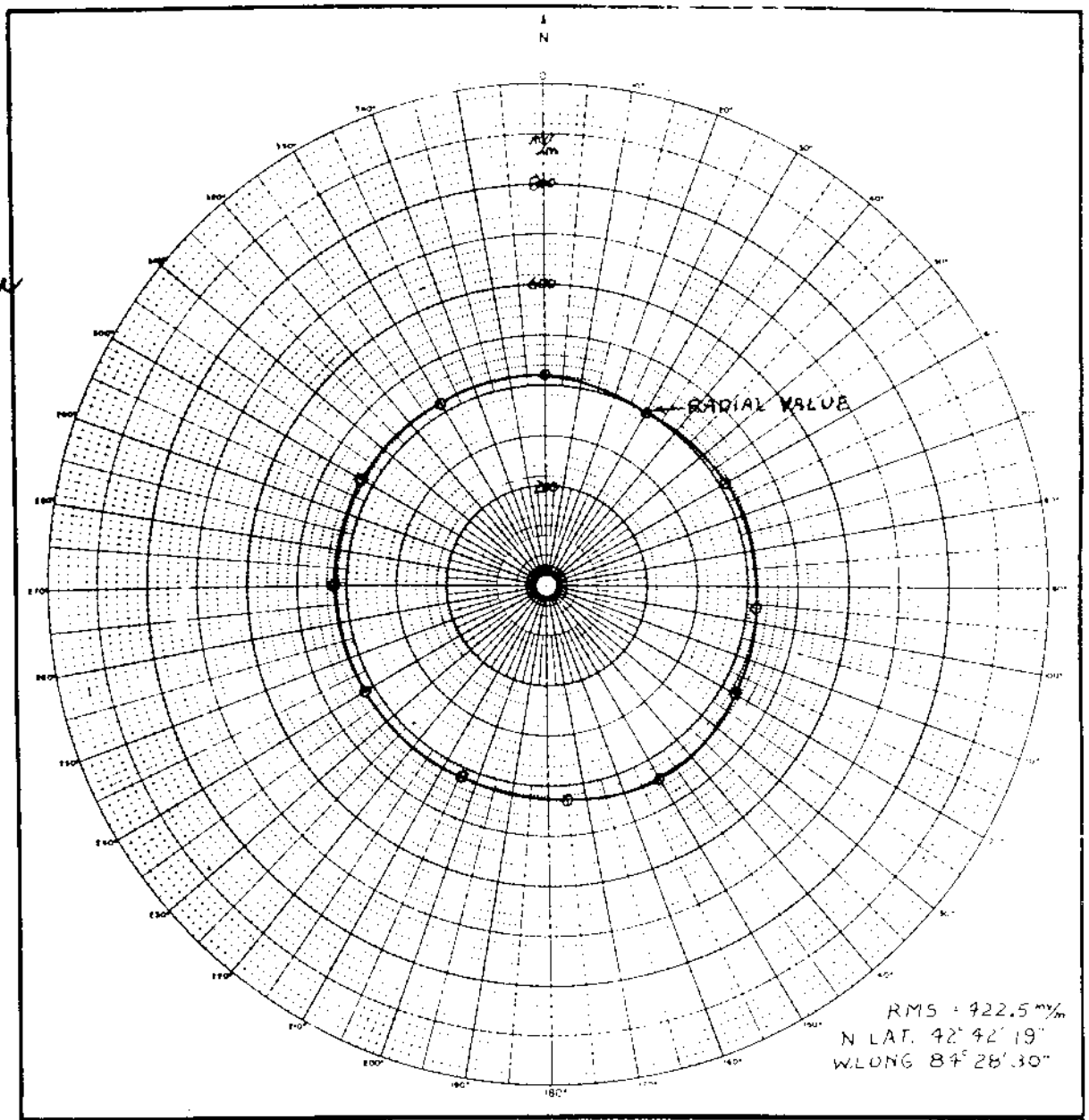
WKAR

Measured Non-DA
(7-28-69ct)

Station WKAR
East Lansing, Michigan

10kw, DA-D, D
870 kc

BL-12408
Granted
8-3-69
license
covering
increased
power &
installation
of DA-D, D.



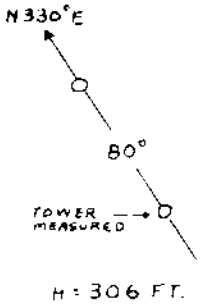


FIGURE XLIII

MEASURED NON-DIRECTIONAL HORIZONTAL PLANE RADIATION PATTERN

STATION WKAR
EAST LANSING, MICHIGAN
Present 870kc. 5kw-Day
Proposed 870kc. 10kw-DA-Day

WILLIAM L. FOSS, INC.
Electronic Consultants
WASHINGTON 5, D. C.
927 15th Street N.W. RE 1883

PATTERN NO 1569
SUPERSEDES
APP

FCC File No. BL-12408
Accepted 7-15-69

Station WKAR
East Lansing, Michigan

870 kc

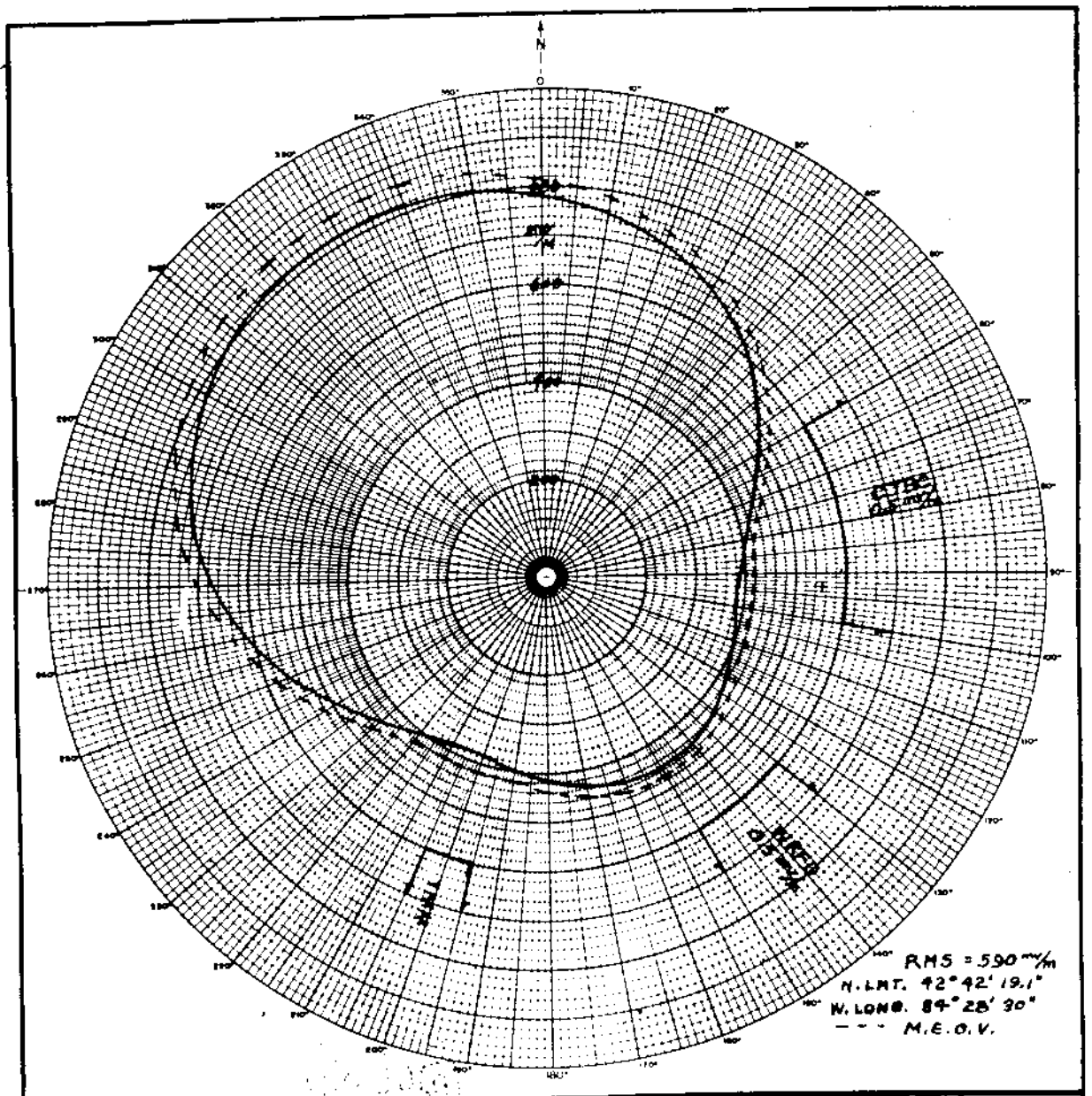
WKAR

Proposed Day
(9-28-65ct)

Station WKAR
East Lansing, Michigan

10kw,DA-D,D
870 kc

P 6-2-66



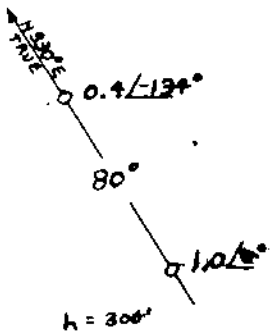


EXHIBIT IX

HORIZONTAL RADIATION PATTERN

WKAR STATION WKAR
870KC 10KW-DA-DAY EAST LANSING, MICH.

WILLIAM L. FOSS, INC.
Electronic Consultants
WASHINGTON 6, D. C.

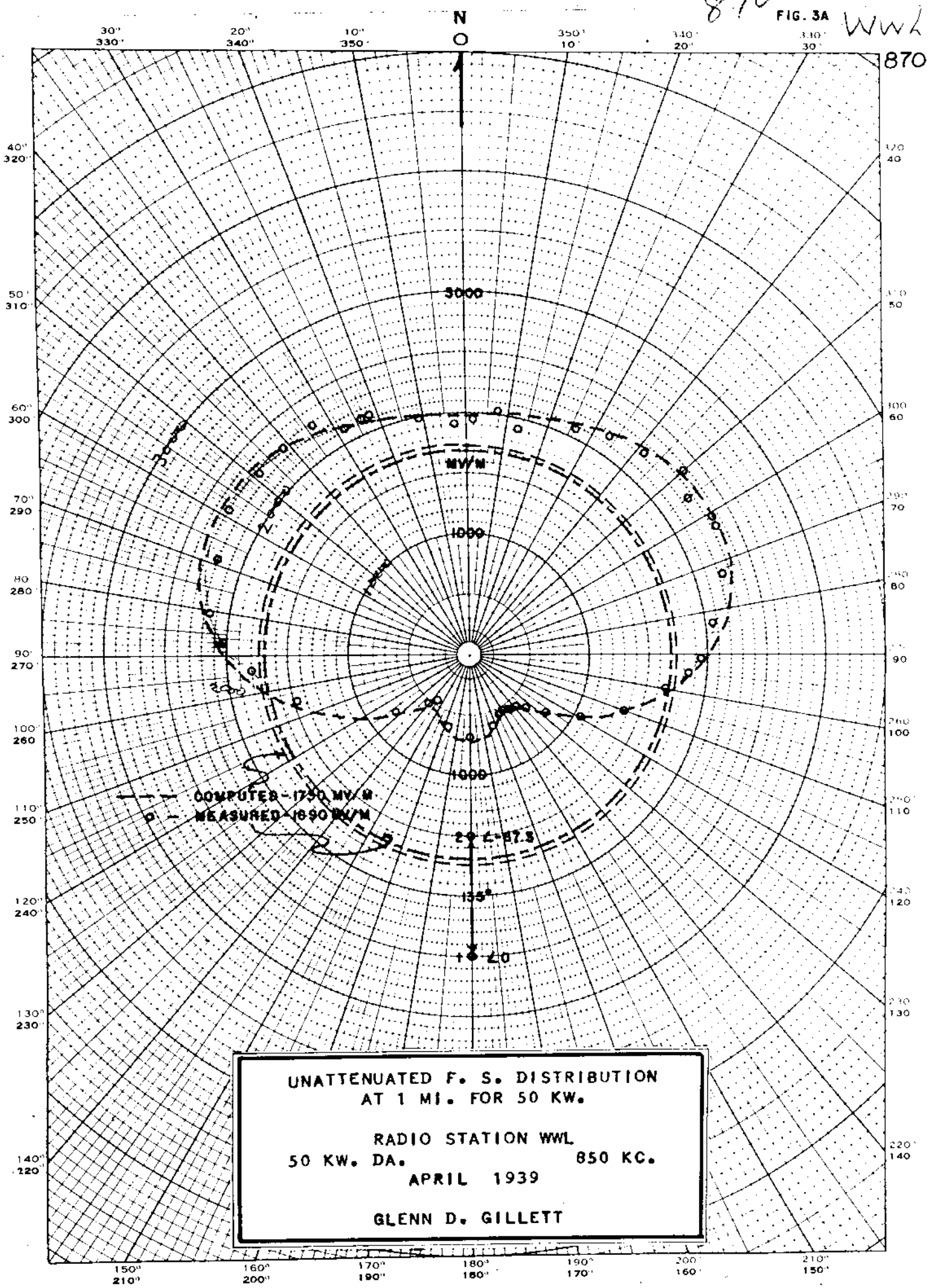
PATTERN NO. 65615
SUPERSEDES
APP.

FCC File No. BP-10035
Accepted 8-10-65 Amended

Station WKAR
East Lansing, Michigan

870 kc

870 FIG. 3A WWL



WWL

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WWL

Main Studio: New Orleans, Louisiana

Frequency: 870 kHz

Power: 50 kW

Notification List No. 1664

Date: December 24, 1975

Class: I-A

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 29° 50' 14"
West Longitude: 90° 07' 55"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-1)
Number of elements: 2
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers, top loaded by a 16.33' diameter top hat to an effective electrical height of 194.8°.(*)

TOWER:	N(#1)	S(#2)	
HEIGHT ABOVE INSULATORS:	572'	572'	(*)
PHASING:	0°	+67°	
FIELD RATIO:	1.0	1.25	

SPACING AND ORIENTATION: Elements are spaced 433.45' (138°) on a line bearing 180° true.

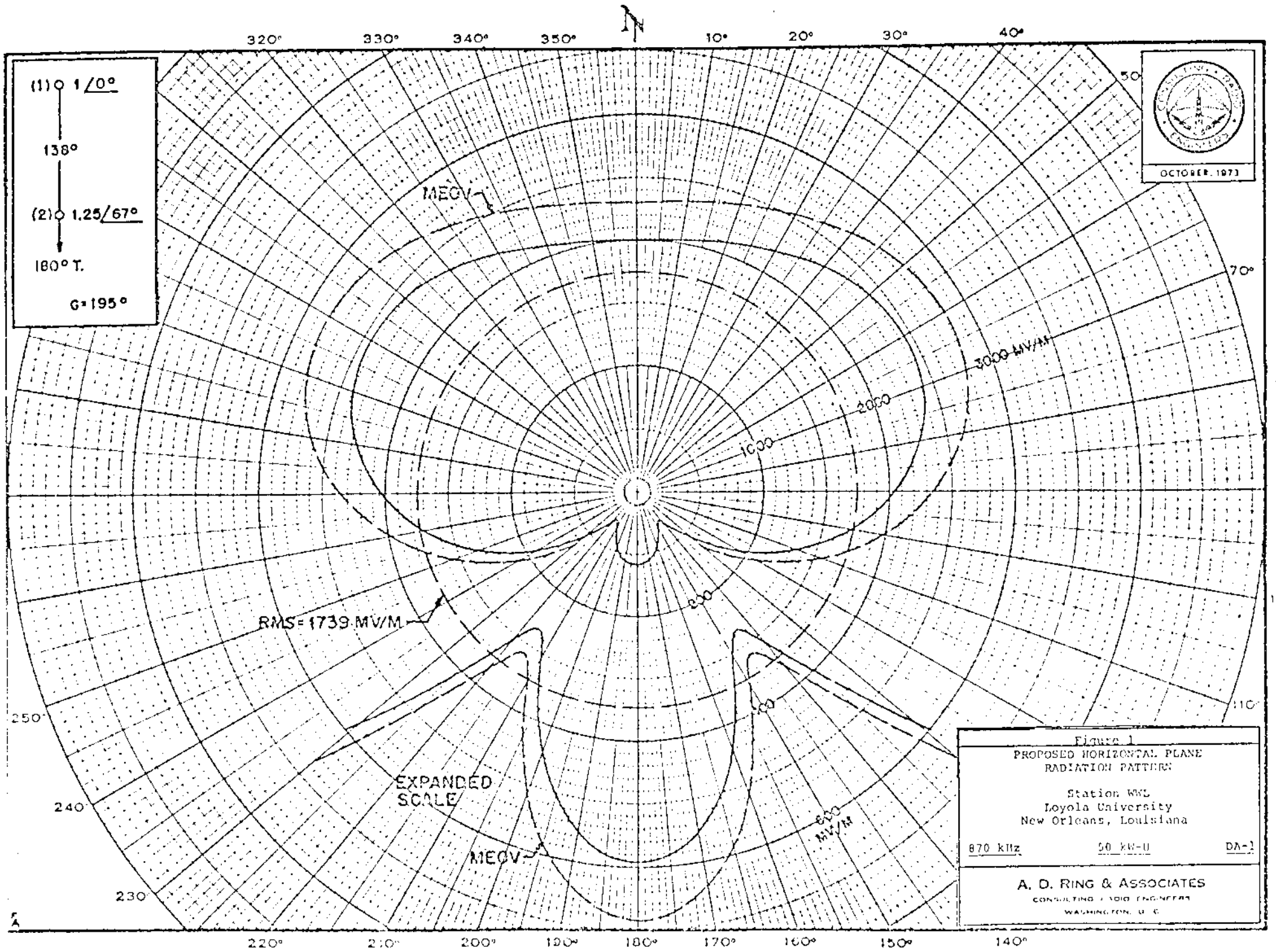
GROUND SYSTEM: 120-600' equally spaced copper radials plus a 40' square elevated ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers. Centers of systems are bonded together.

Predicted effective Field: 1739 mv/m at rated power.

Note: Please retain the directional antenna radiation patterns notified for station WWL in United States Change List Number 1568 dated February 21, 1974 and attach to this Revised Description Sheet. This notification concerns only a change in the antenna system to shorten the towers and add top loading to produce an equivalent electrical height to that previously notified.

CTR NO 31226A4

A. D. RING & ASSOCIATES · 5/67 · 500



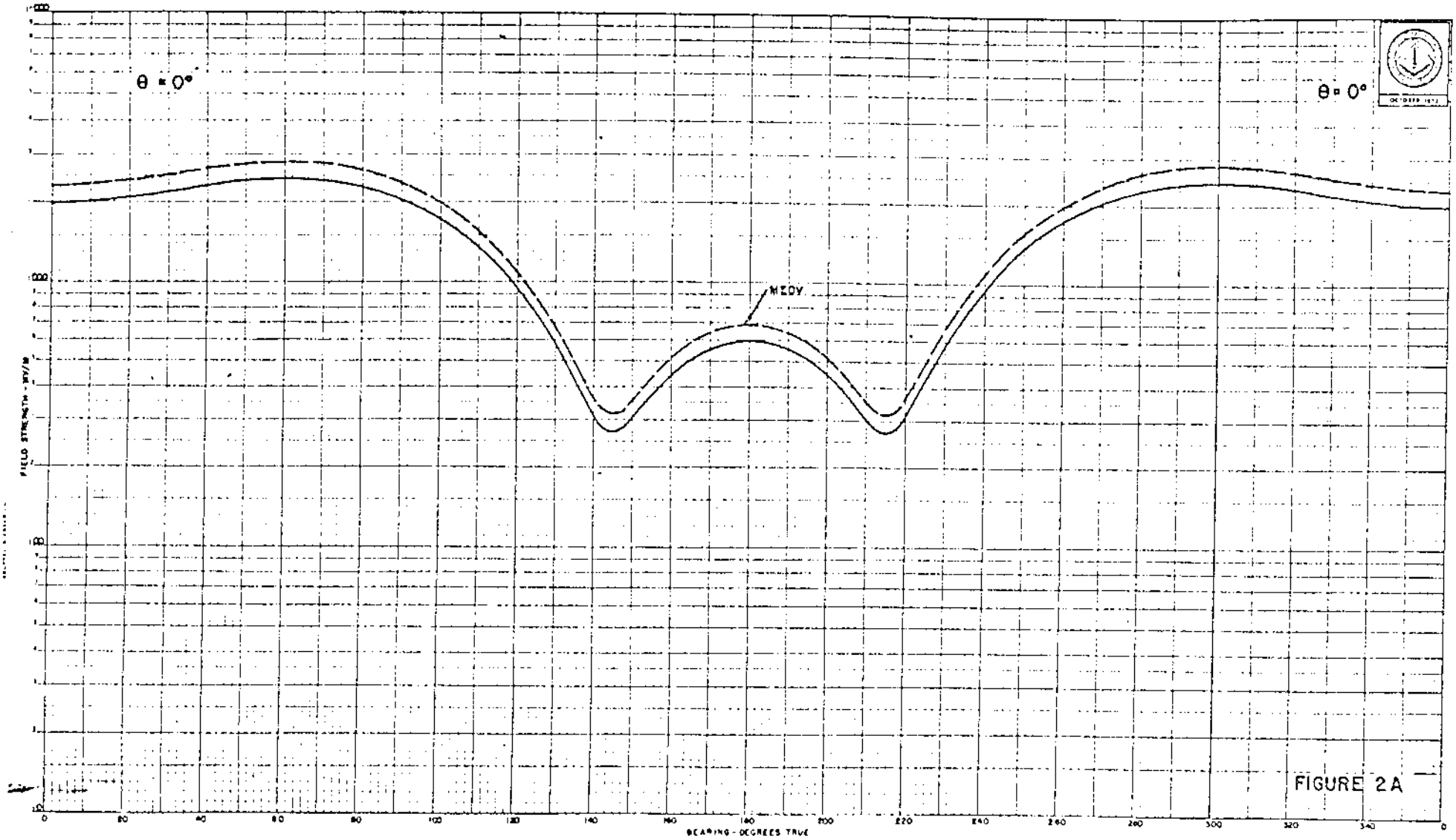

θ = 0°
θ = 0°
MEDV
FIELD STRENGTH - MV/M
BEARING - DEGREES TRUE
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0

FIGURE 2A

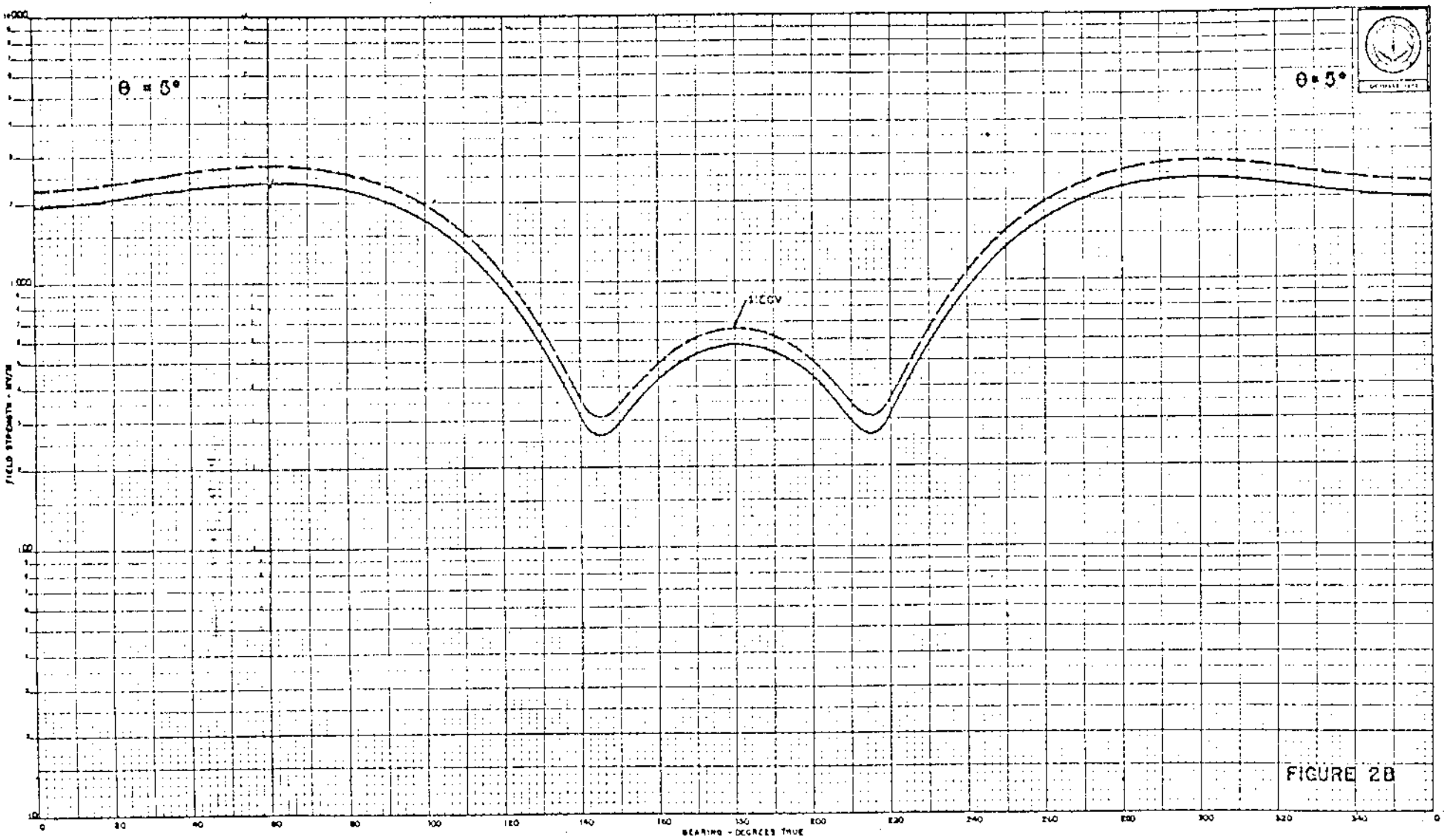

θ = 5°
θ = 5°
1LCOV
FIELD STRENGTH - MV/M
BEARING - DEGREES TRUE
0
30
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0

FIGURE 2B

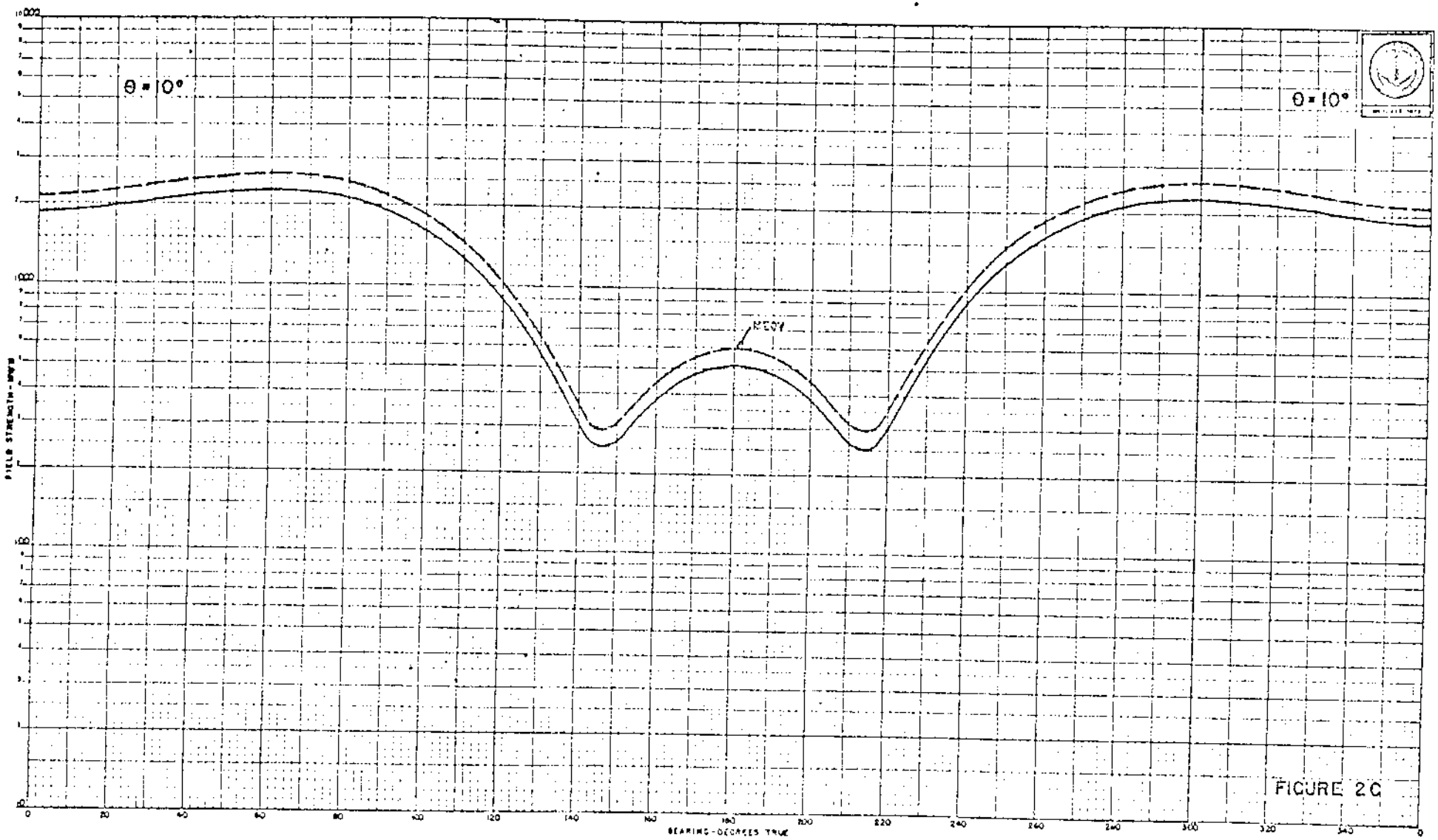

θ = 10°
θ = 10°
MEDV
FIELD STRENGTH - MV/M
BEARING - DEGREES TRUE
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0

FIGURE 2C

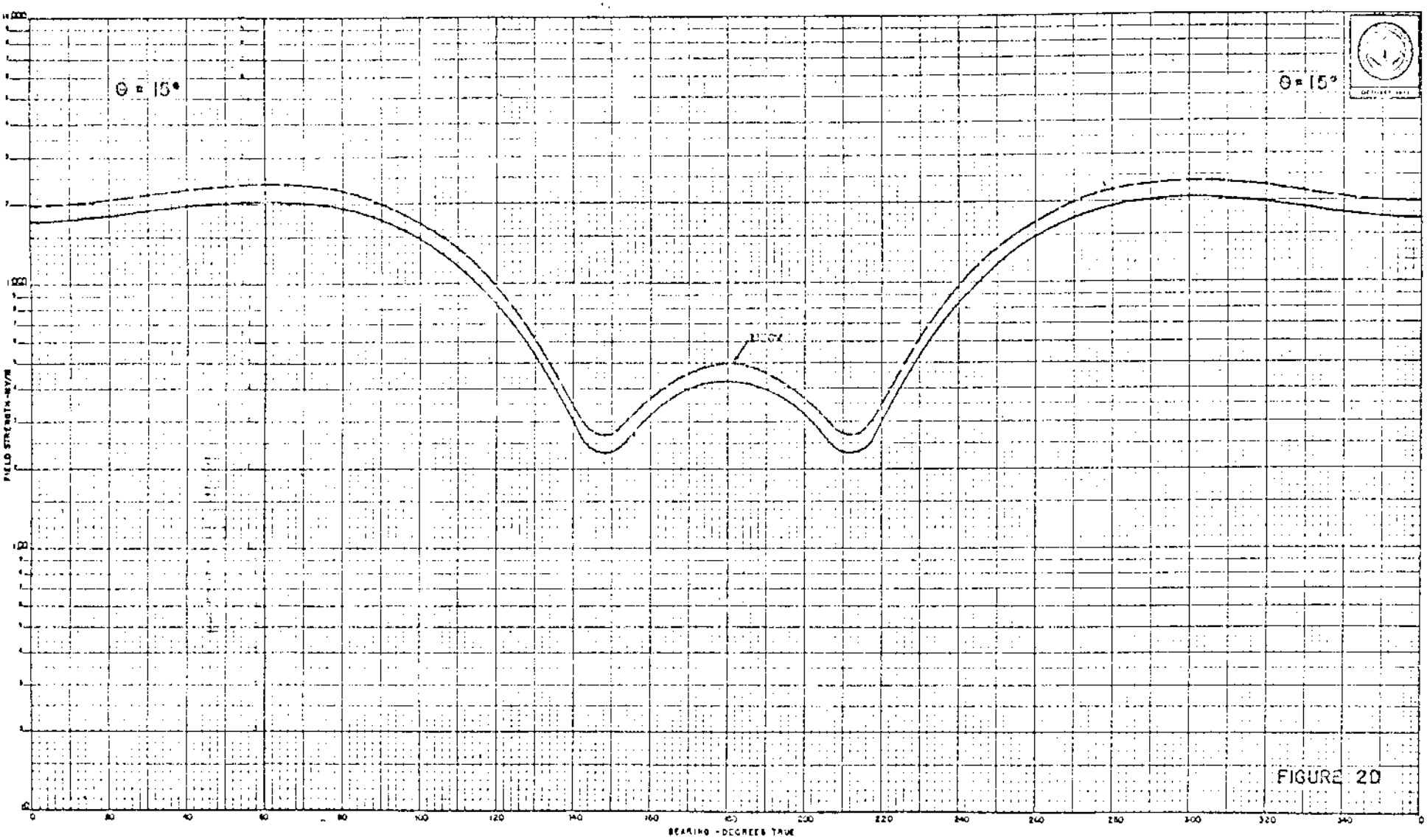

θ = 15°
θ = 15°
FIELD STRENGTH - MV/M
BEARING - DEGREES TRUE
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0

FIGURE 20

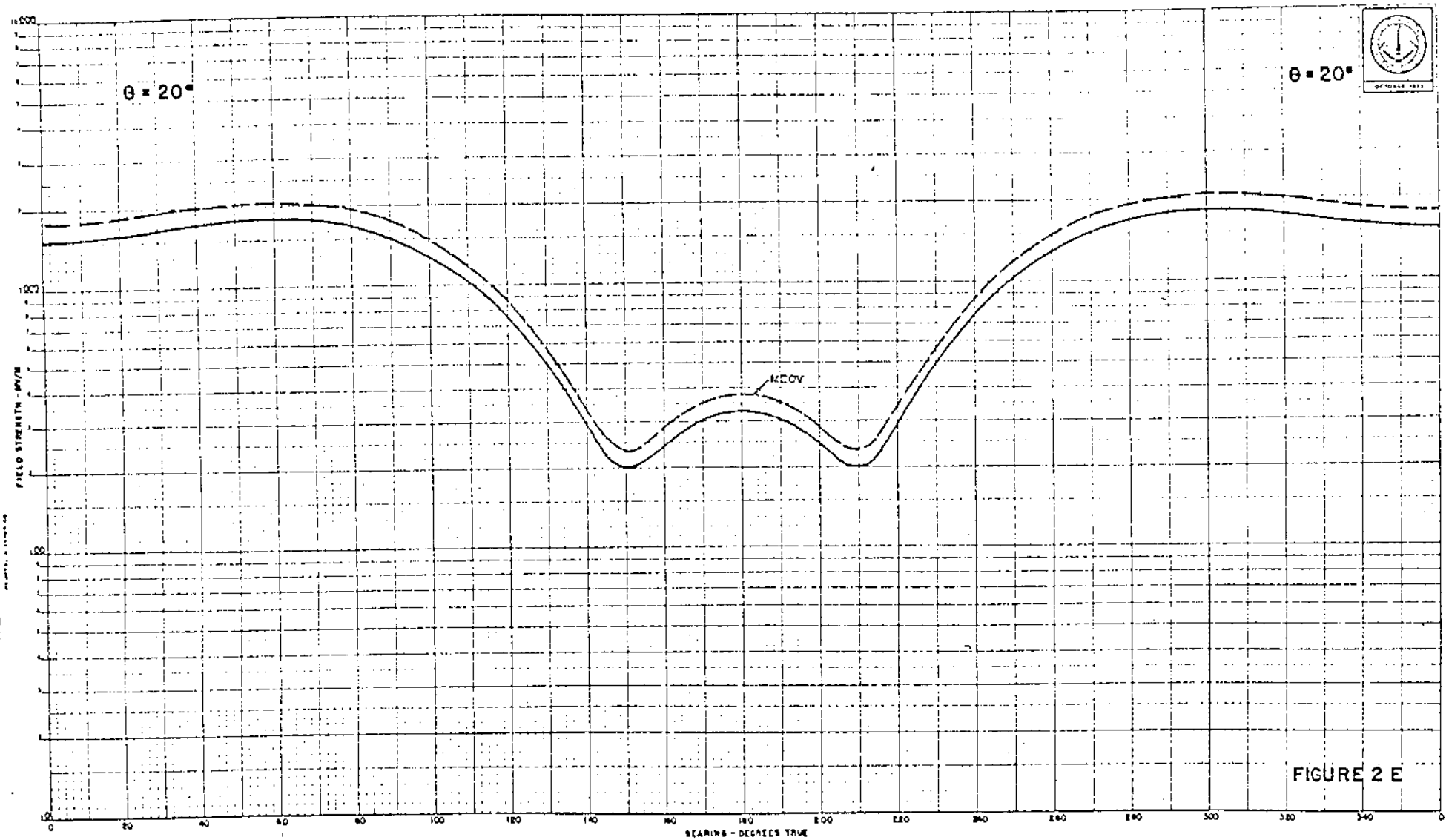


FIGURE 2 E

WWT

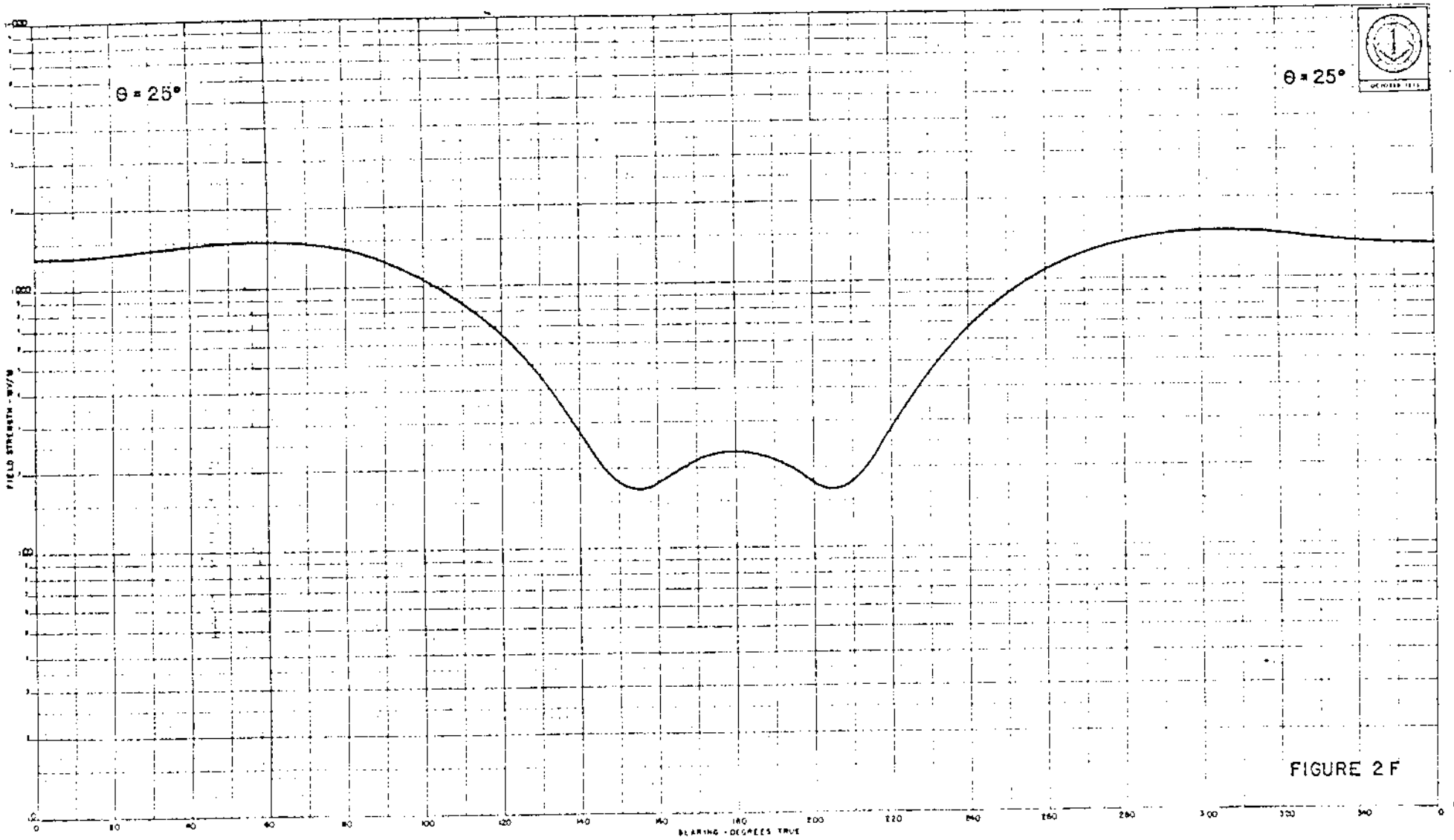

θ = 25°
θ = 25°
FIELD STRENGTH - MV/M
BEARING - DEGREES TRUE
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
360

FIGURE 2 F

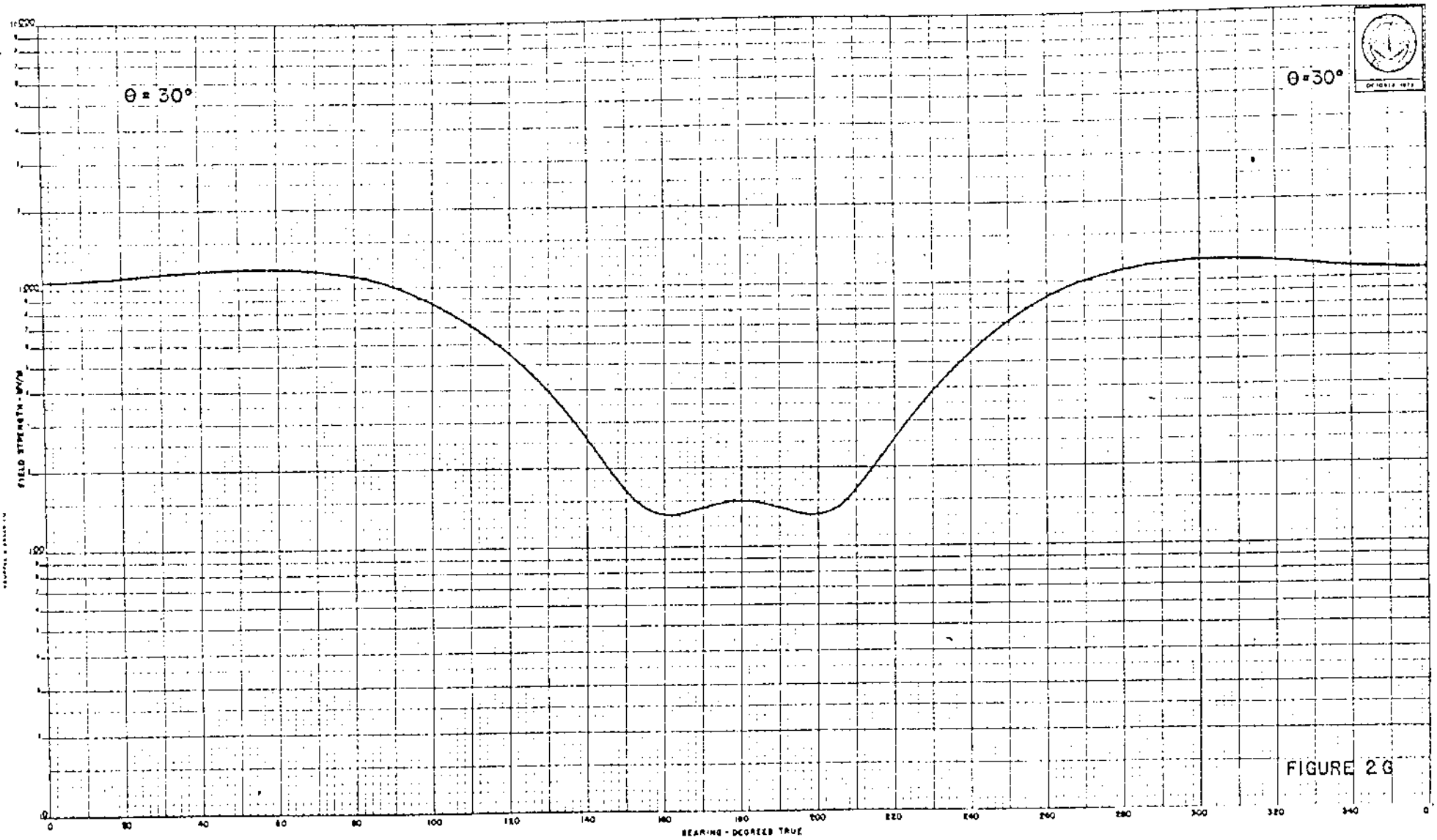

θ = 30°
θ = 30°
FIELD STRENGTH - MV/M
BEARING - DEGREES TRUE
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0

FIGURE 2G

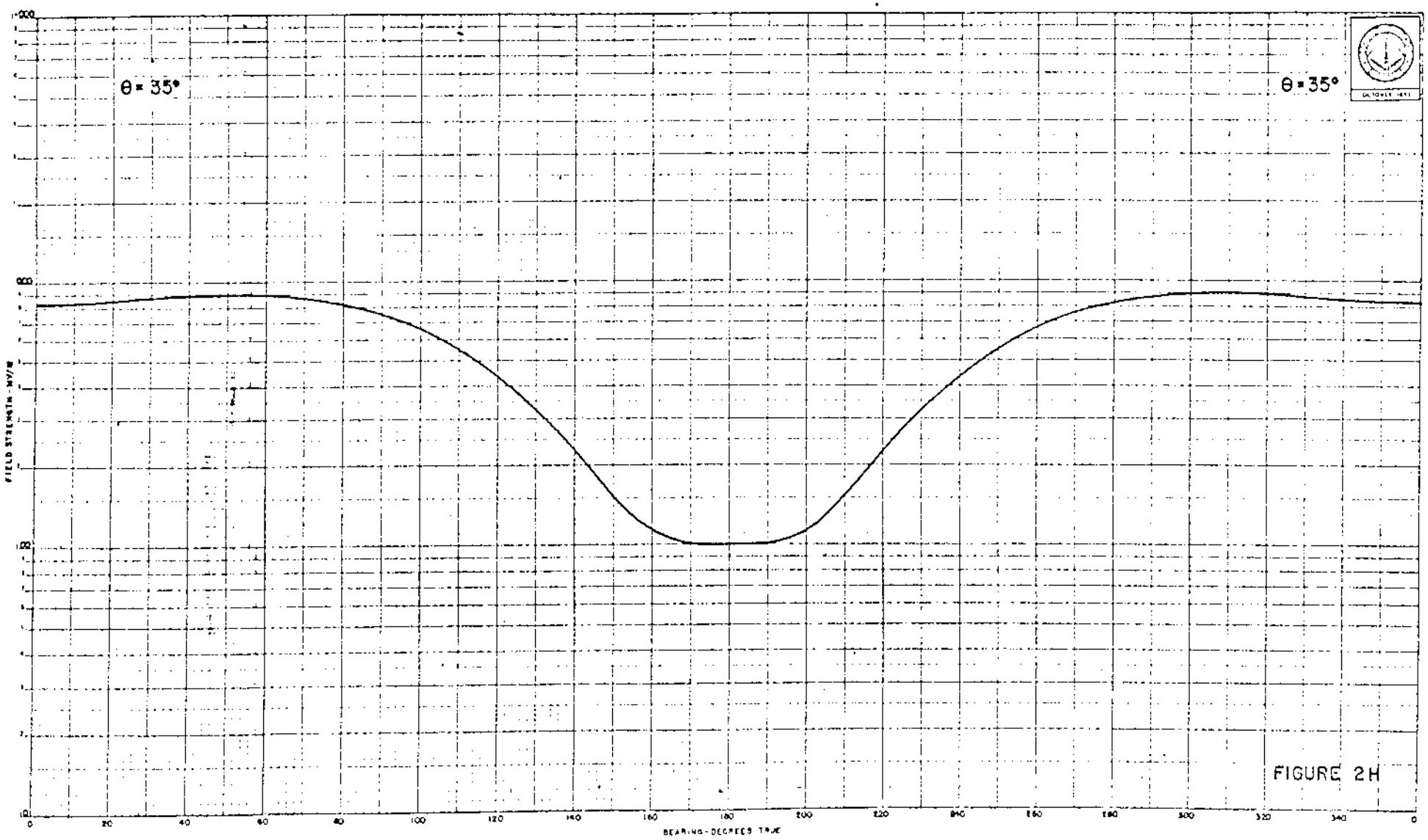

θ = 35°
θ = 35°
FIELD STRENGTH - MV/M
BEARING - DEGREES TRUE
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0

FIGURE 2H

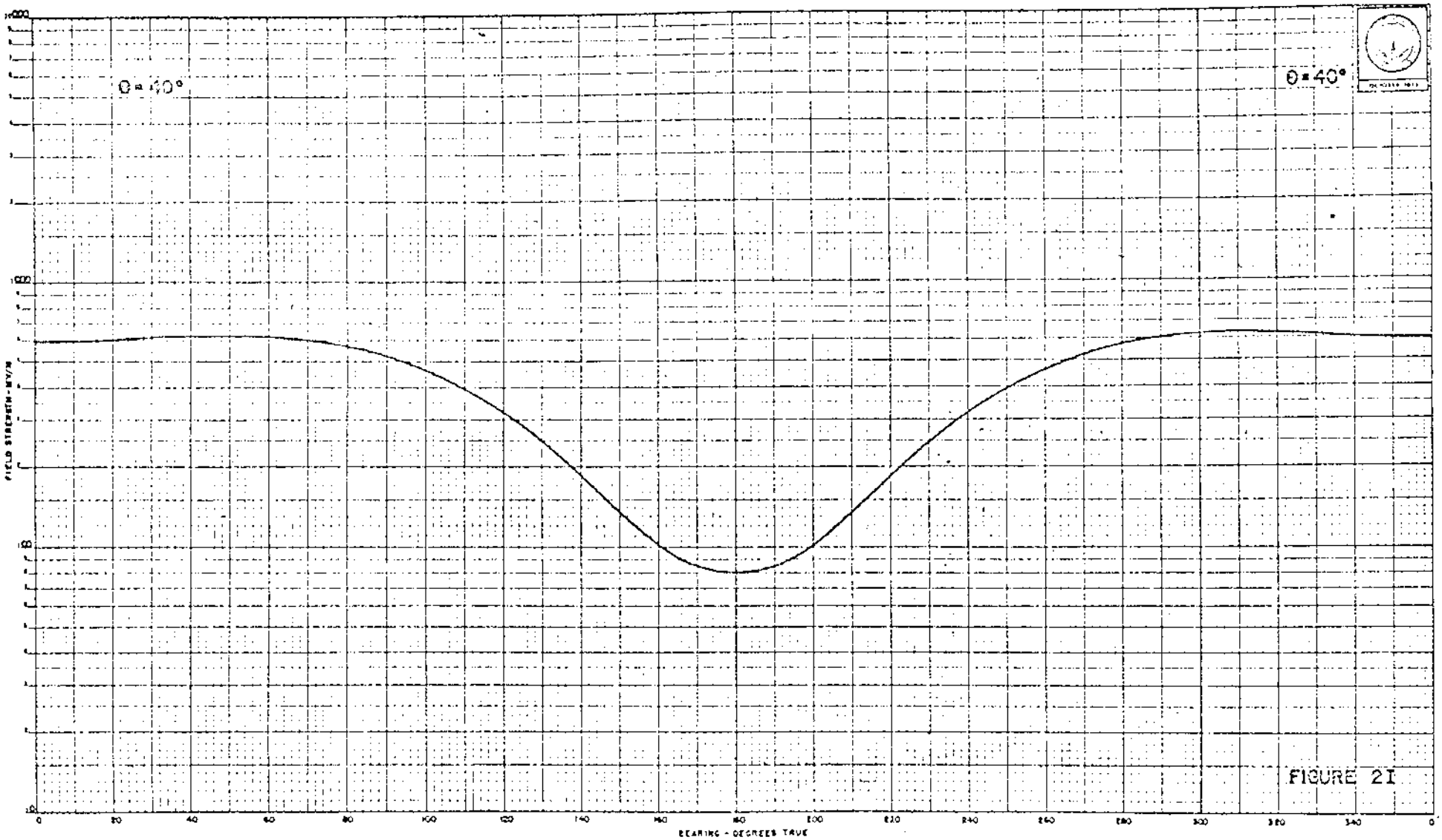

θ = 40°
θ = 40°
FIELD STRENGTH - MV/M
BEARING - DEGREES TRUE
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0

FIGURE 2I

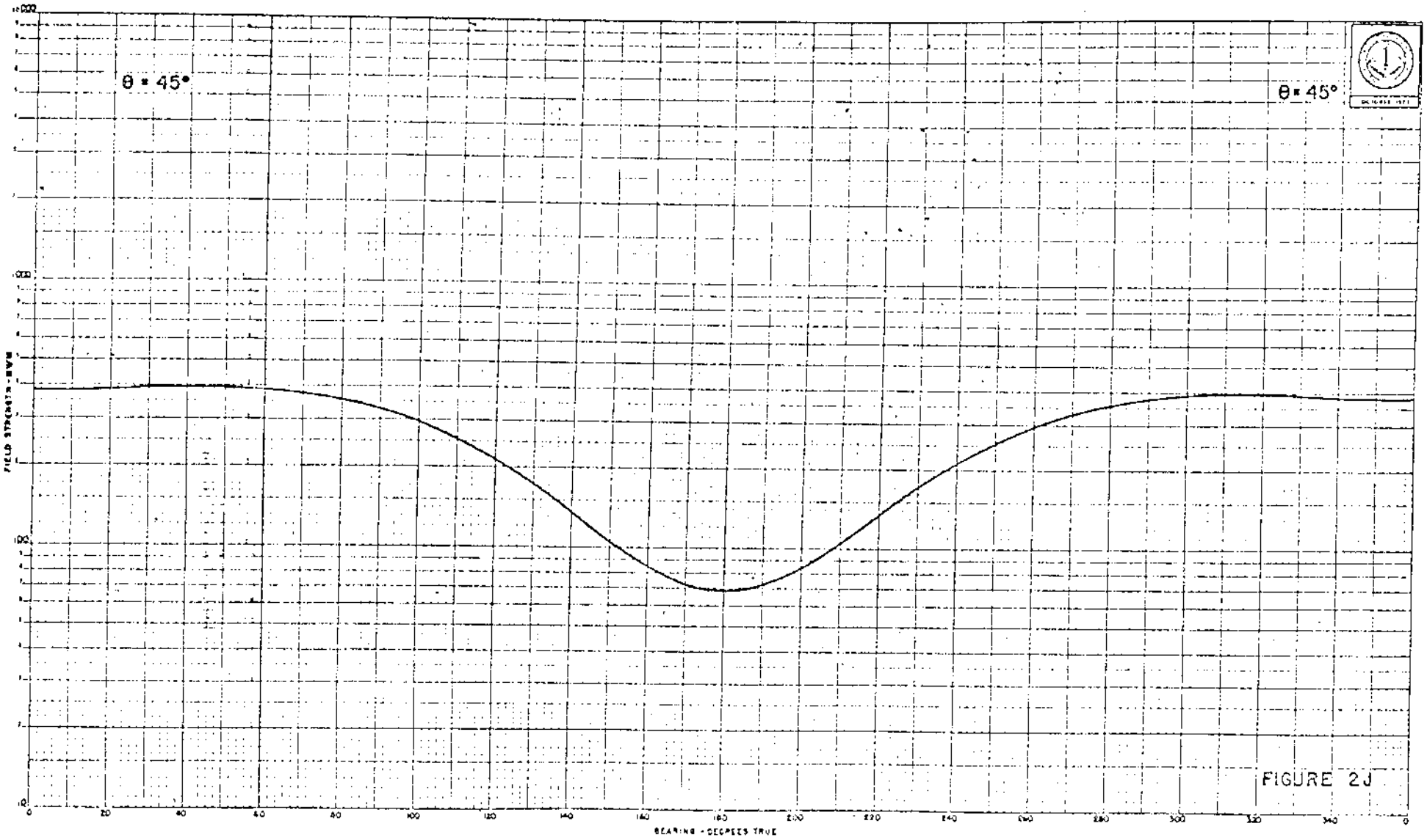

θ = 45°
θ = 45°
FIELD STRENGTH - MVM
BEARING - DEGREES TRUE
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0

FIGURE 2J

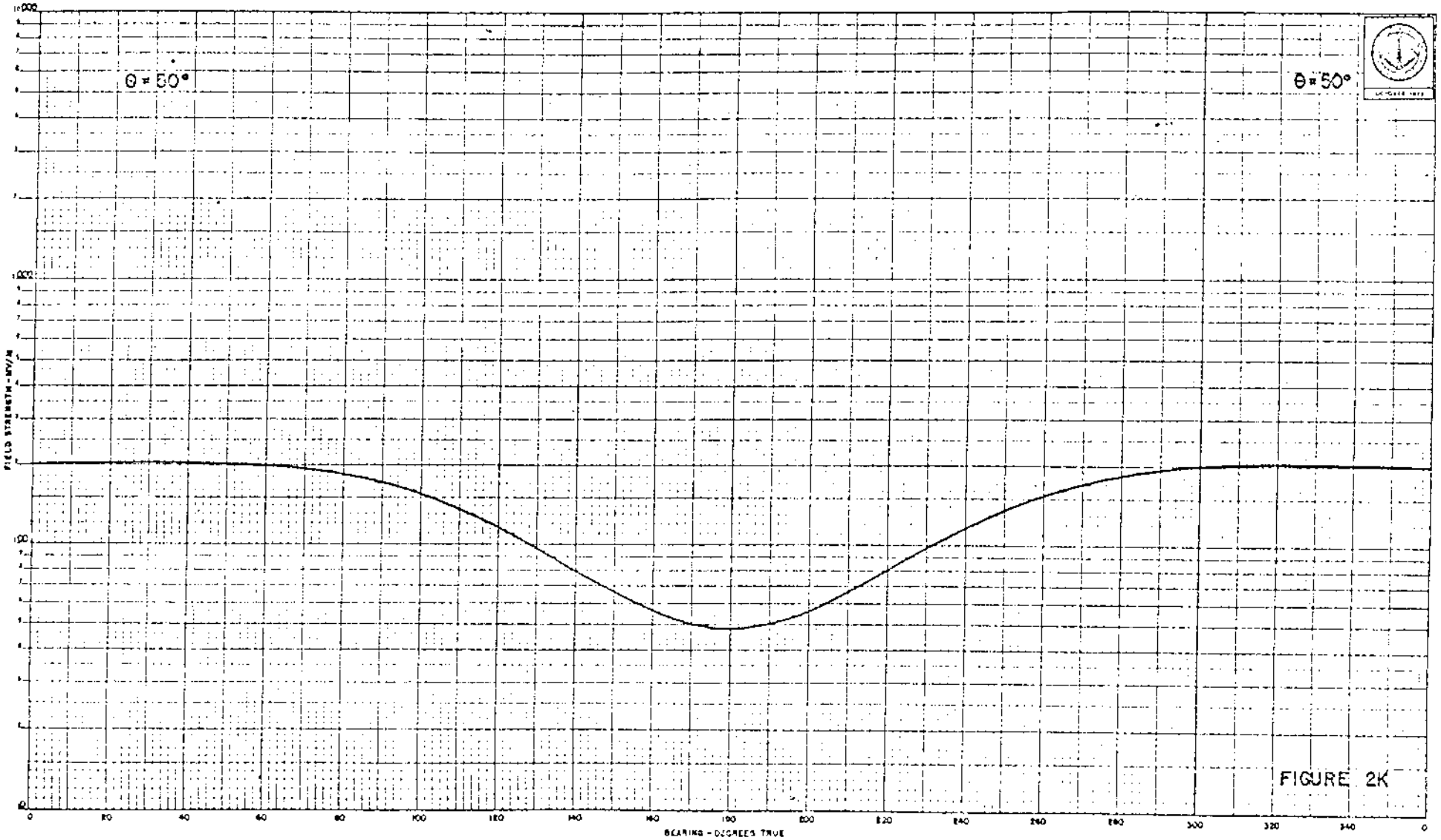


FIGURE 2K

K-E 359-4

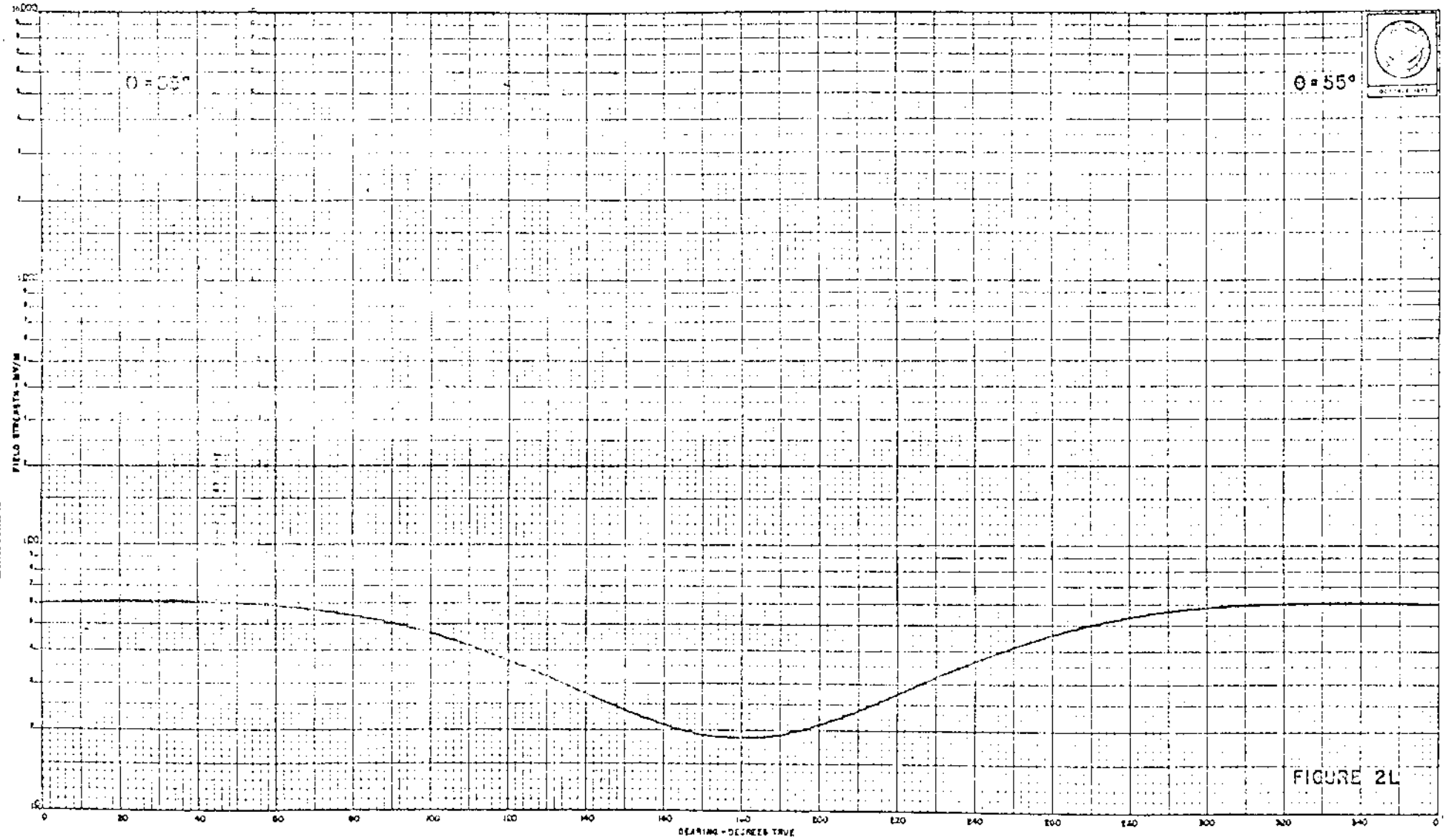

θ = 55°
θ = 55°
FIELD STRENGTH - MV/M
BEARING - DEGREES TRUE
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0

FIGURE 2L

K-E

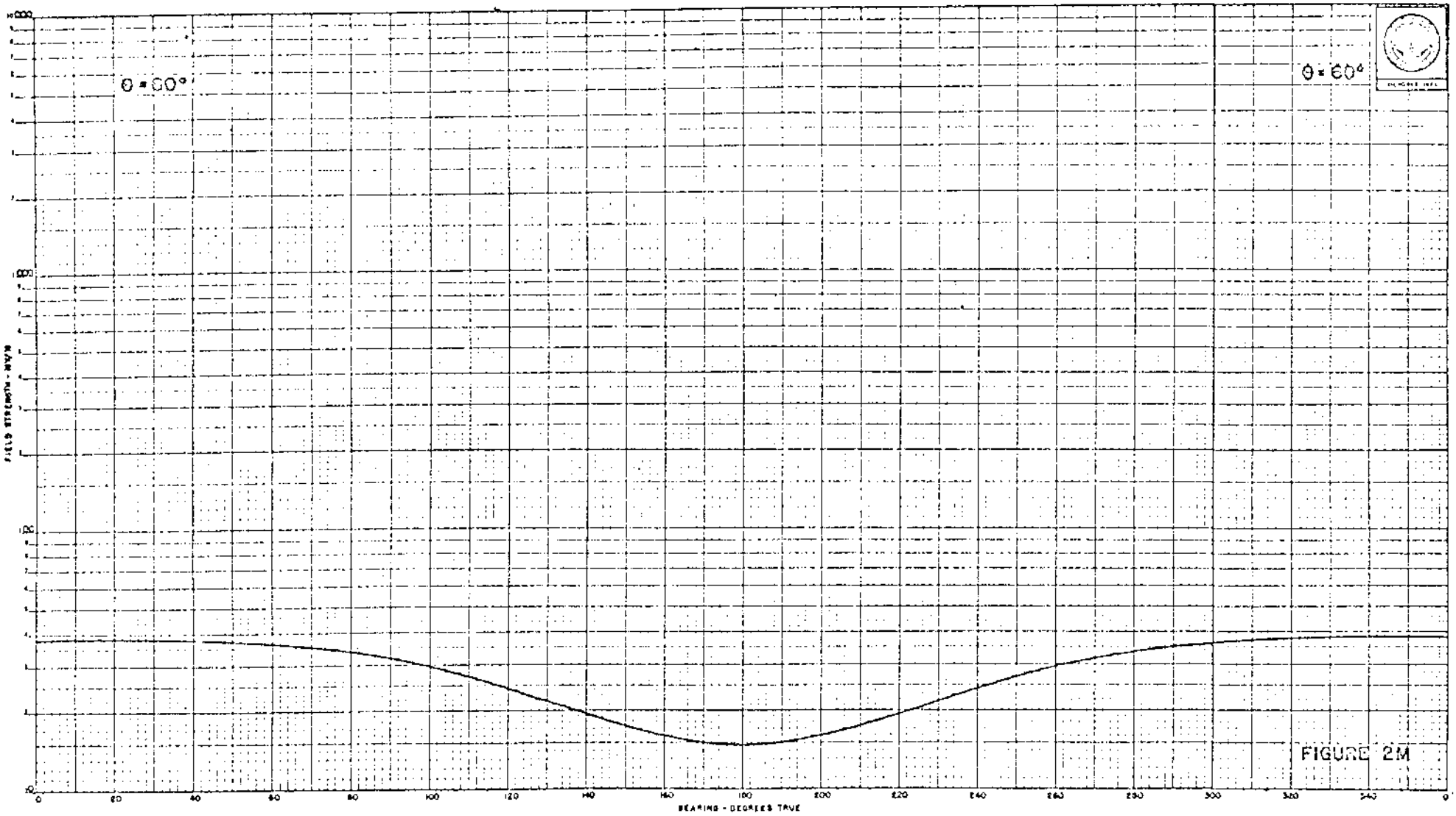

θ = 00°
θ = 60°
FIELD STRENGTH - MV/M
BEARING - DEGREES TRUE
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360

FIGURE 2M

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WWL

Main Studio: New Orleans, Louisiana

Frequency: 870 kHz

Power: 50kw

Notification List: 1754

Date: October 27, 1977

Class: I-

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 29° 50' 17"
West Longitude: 90° 07' 55"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-1)
Number of elements: 2
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers, top loaded by a 16.33' diameter top hat to an effective electrical height of 194.8°. (*)

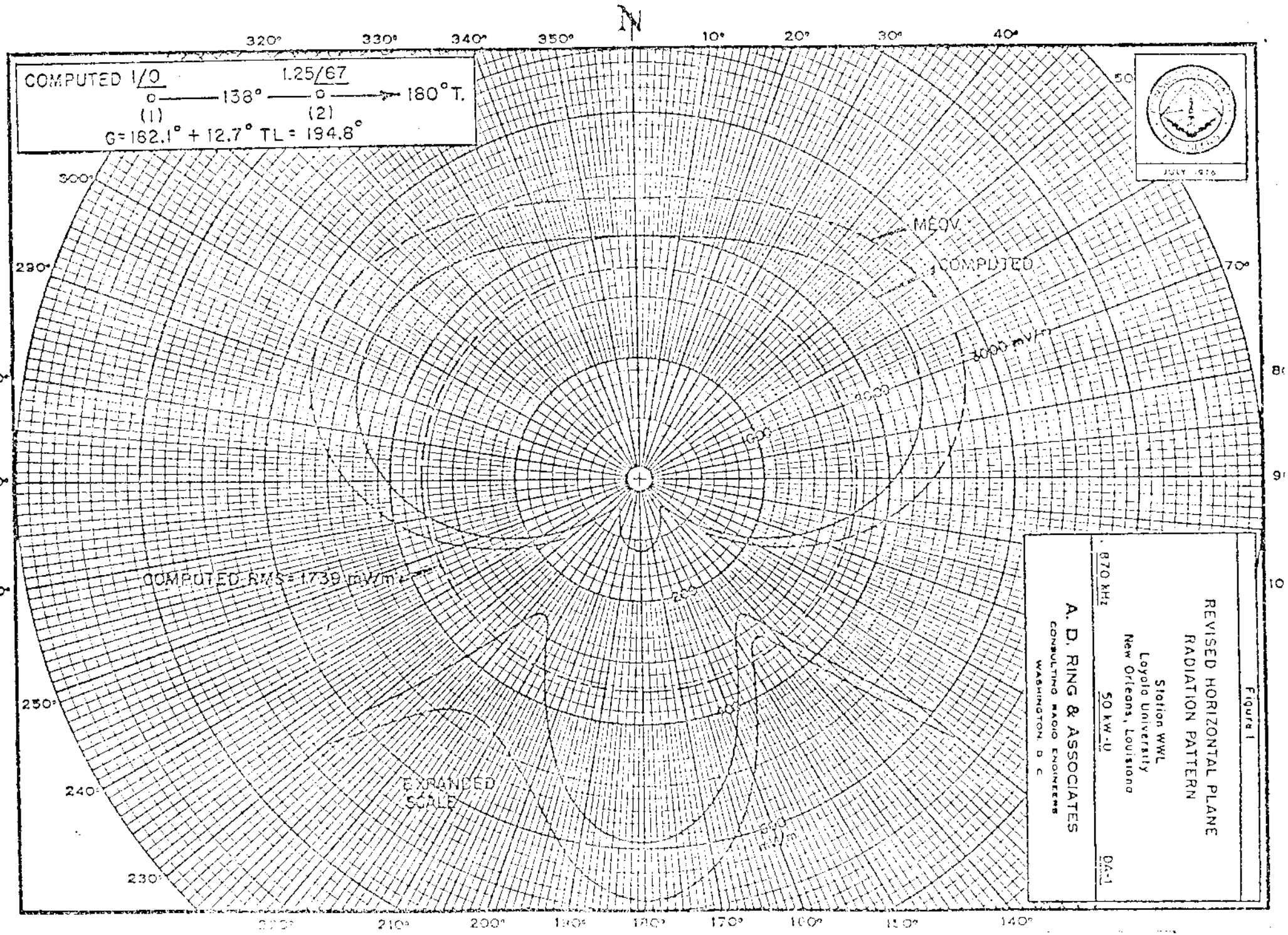
TOWER:	N(#1)	S(#2)	
HEIGHT ABOVE INSULATORS:	572'	572'	(*)
PHASING:	0°	+67°	
FIELD RATIO:	1.0	1.25	

SPACING AND ORIENTATION: Elements are spaced 433.45' (138°) on a line bearing 180° true.

GROUND SYSTEM: 120-600' equally spaced copper radials plus a 40' square elevated ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers. Centers of systems are bonded together.

Predicted effective Field: 1739 mv/m at rated power.

Note: Please retain the directional antenna description sheet notifed for WWL in United States Change List No. 1664 dated December 24,1975 and the vertical angle directional antenna radiation patterns notified for WWL in United States Change List No. 1568 dated February 21, 1974 and attach to this Revised Description Sheet and horizontal pattern. This notification concerns only a minor change in the m.e.o.v.s of radiation.


COMPUTED 1/0 1.25/67
138°
180° T.
(1)
(2)
G=162.1° + 12.7° TL = 194.8°
N
MEOV
COMPUTED
3000 mV/m
COMPUTED RMS=1739 mV/m
EXPANDED SCALE
REVISED HORIZONTAL PLANE RADIATION PATTERN
Station WWL
Loyola University
New Orleans, Louisiana
870 kHz
50 kW-U
DA-1
A. D. RING & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.
Figure 1

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: (New)

Main Studio: St. George, Utah

Frequency: 890 kHz

Power: 10 kW Night 50 kW Day

Notification List No. 1659

Date: November 17, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 37° 02' 51"
West Longitude: 113° 31' 40"

ANTENNA CHARACTERISTICS

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

TOWER:	W(#2)	C(#1)	E(#3)
HEIGHT ABOVE INSULATORS:	276.7'	276.7'	276.7' (90°)
PHASING:	-90°	0°	+90
FIELD RATIO:	0.625	1	0.400

SPACING AND ORIENTATION: Adjacent elements are spaced 276.7' (90°) on a line bearing 70° true.

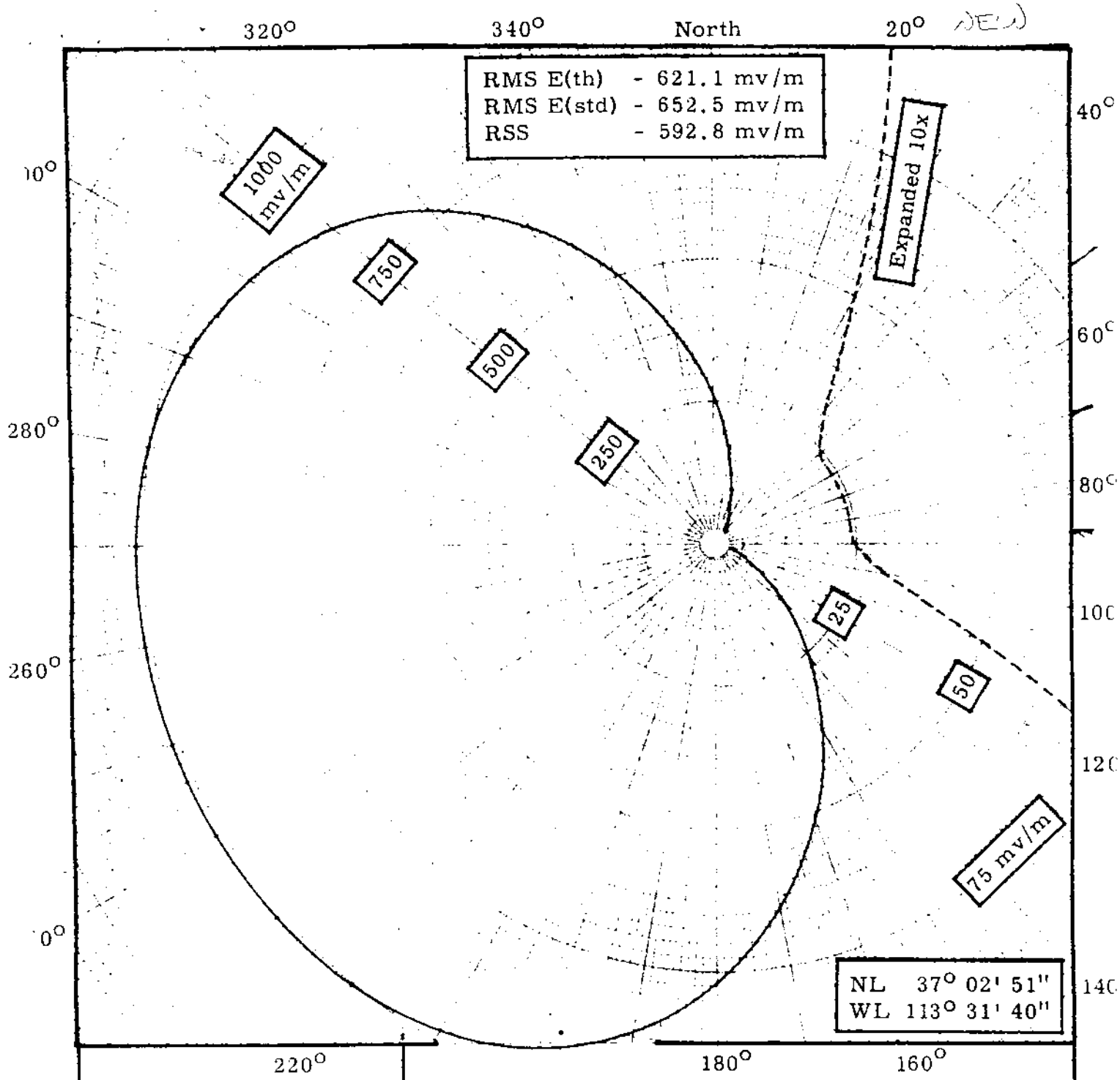
GROUND SYSTEM: 120-276.7' plus 120-75' interspaced radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of systems are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	1344 mv/m	-	-
Night	621.1 mv/m	592.8 mv/m	652.5 mv/m

CTR NO 30402A3

COHEN AND DIPPELL
PROVED
MAY 1976
WASHINGTON, D.C.



70°T

3 0.400/90°

S

1 1.000/0°

S

2 0.625/-90°

G - 90° - 276.7'
S - 90° - 276.7'

STANDARD HORIZONTAL PLANE PATTERN

ALBERT L. CRAIN
PROPOSED RADIO STATION
ST. GEORGE, UTAH
890 KHZ 50/10 KW, DA-N

030874

FIGURE 5
(Modified)

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

Standard Pattern

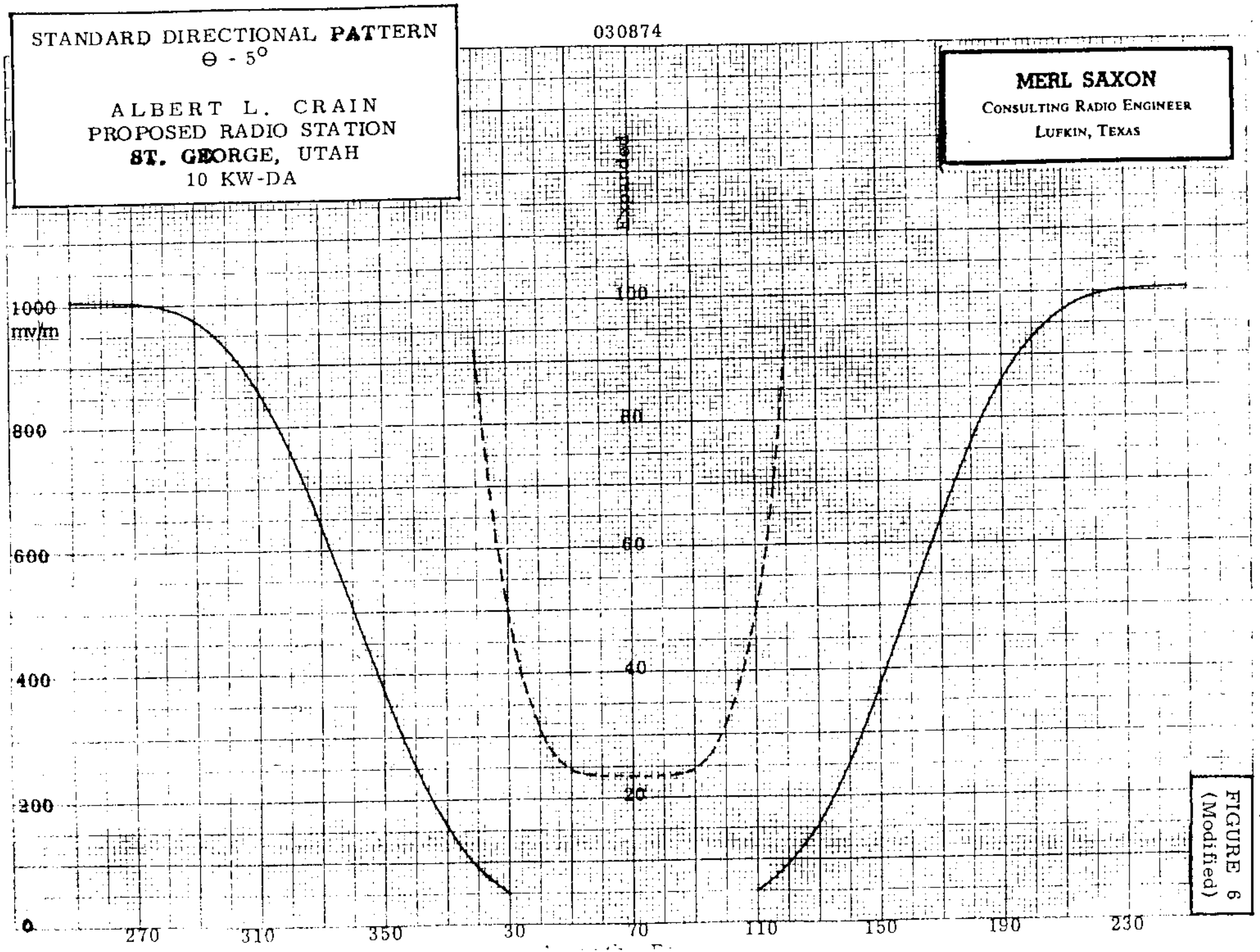


FIGURE 6
(Modified)

Standard Pattern

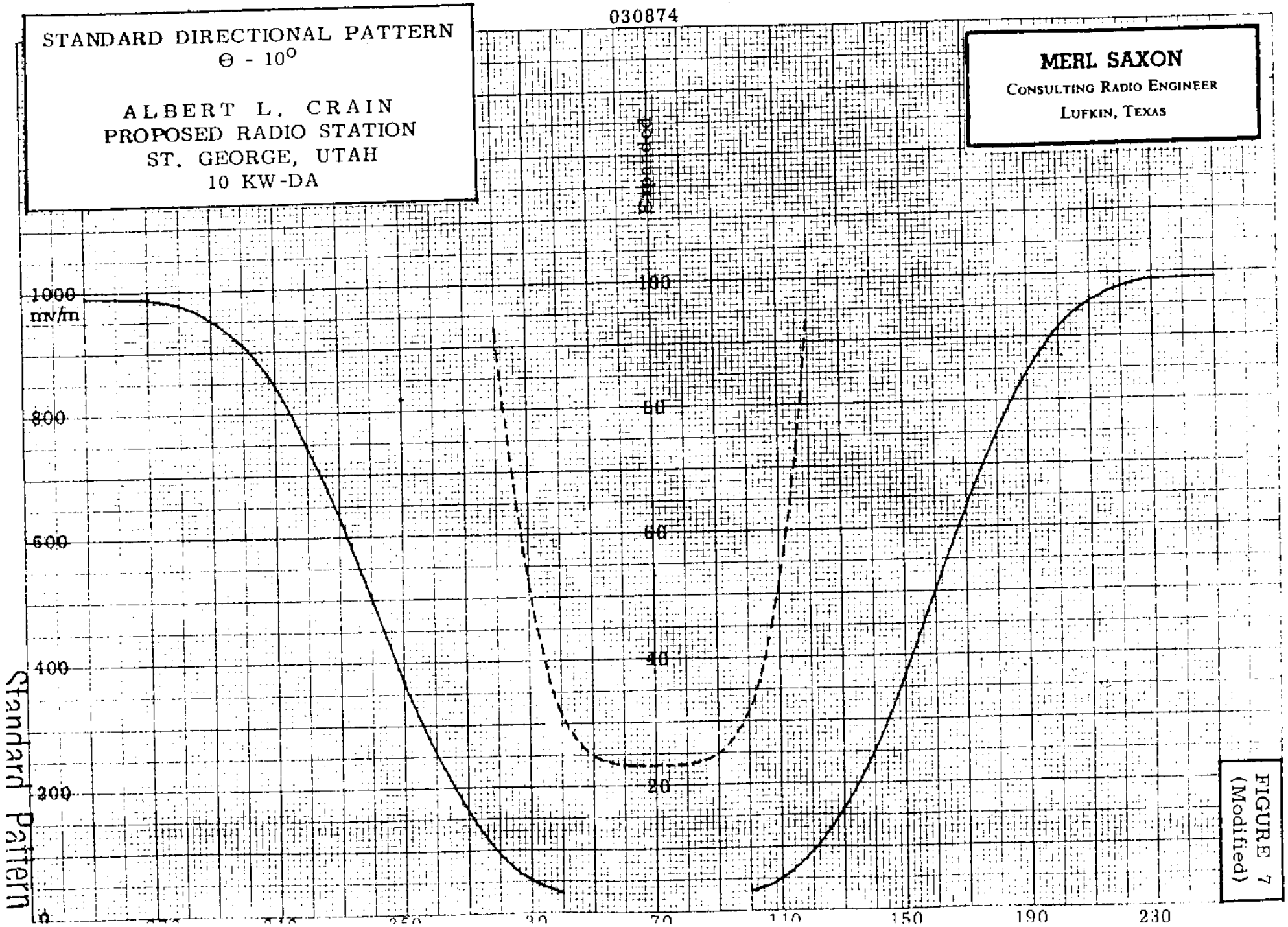


FIGURE 7
(Modified)

030874

STANDARD DIRECTIONAL PATTERN
Θ - 15°

ALBERT L. CRAIN
PROPOSED RADIO STATION
ST. GEORGE, UTAH
10 KW-DA

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

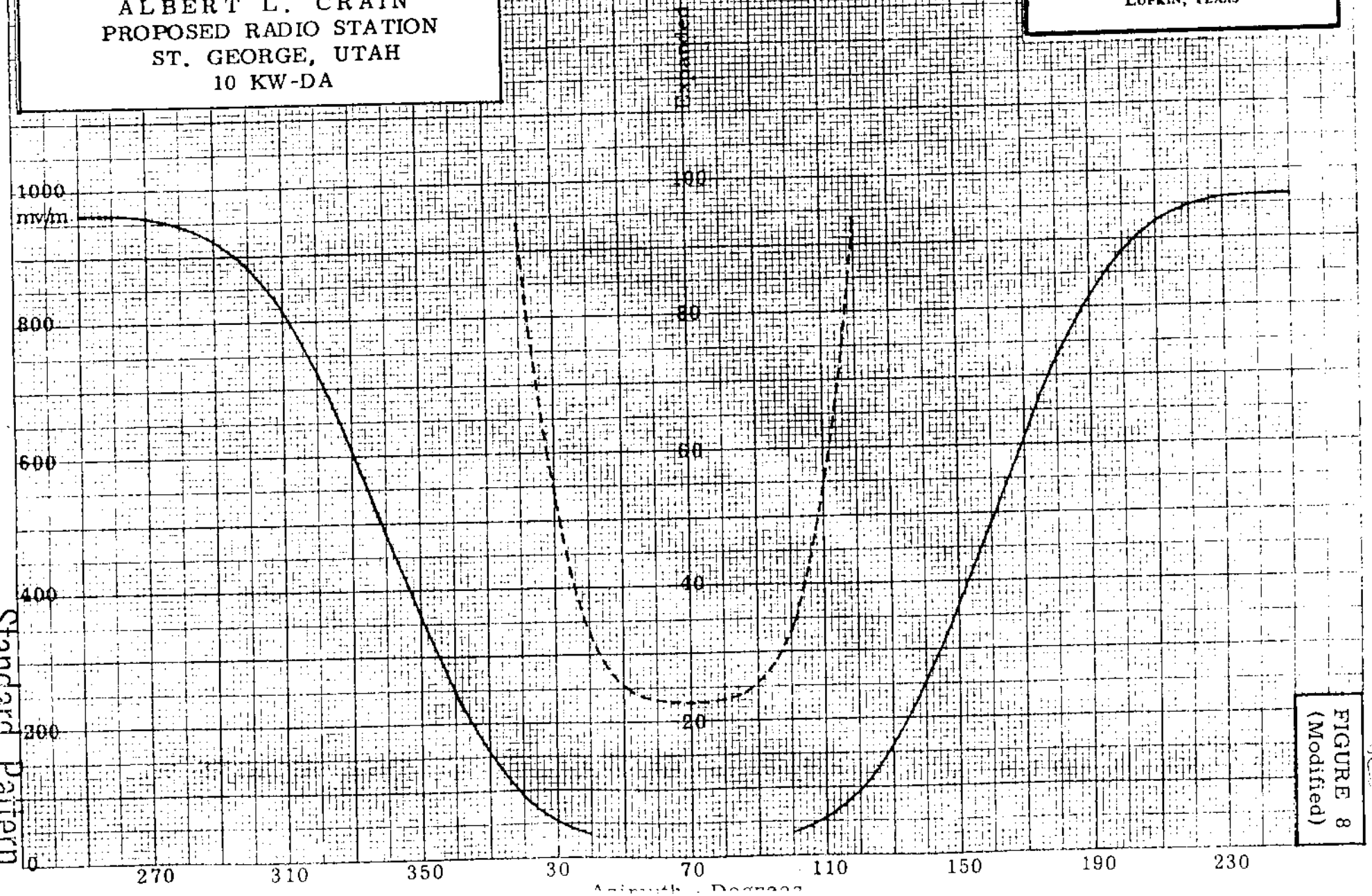


FIGURE 8
(Modified)

Standard Pattern

030874

STANDARD DIRECTIONAL PATTERN
Θ - 20°

ALBERT L. CRAIN
PROPOSED RADIO STATION
ST. GEORGE, UTAH
10 KW-DA

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

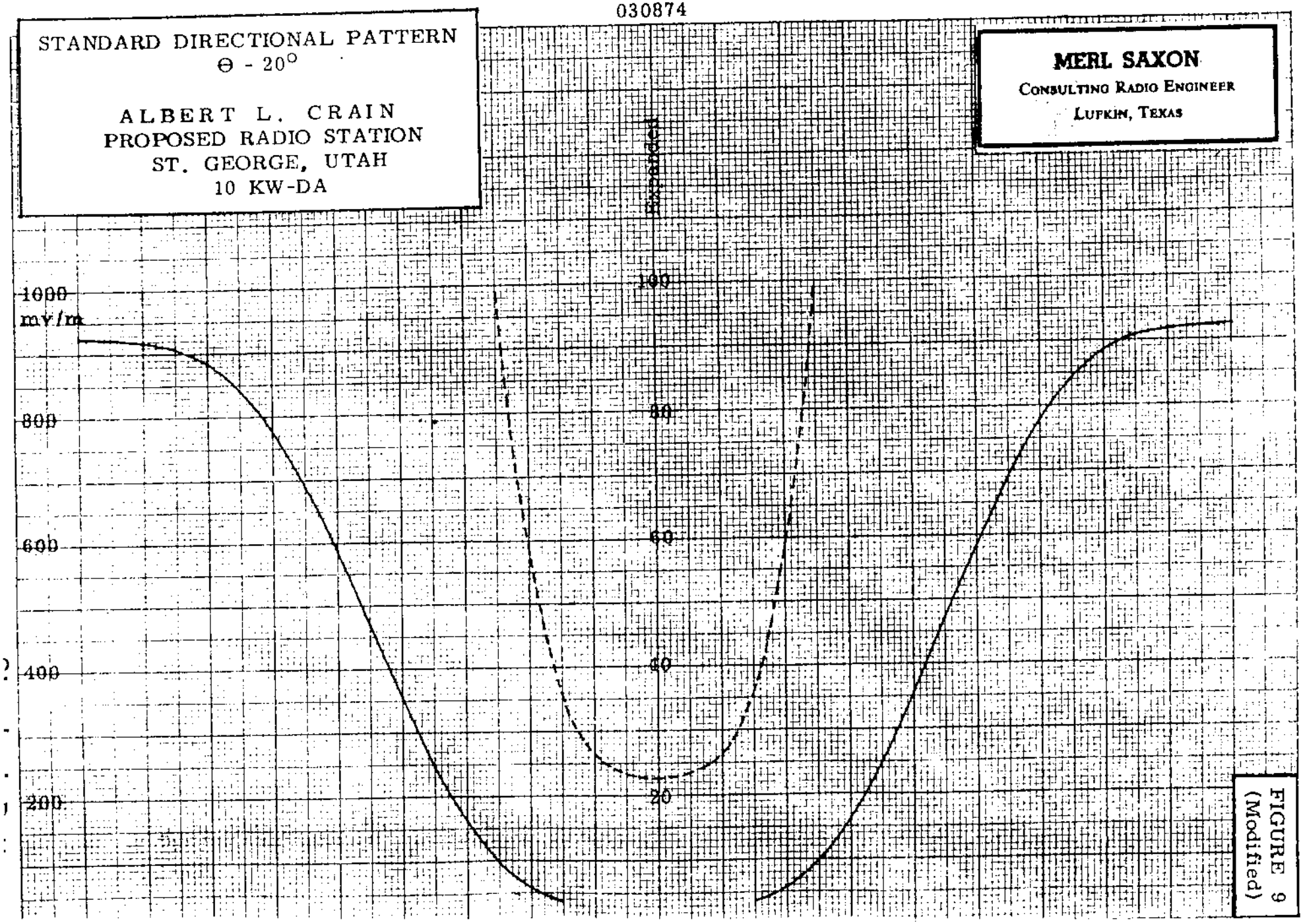


FIGURE 9
(Modified)

030874

STANDARD DIRECTIONAL PATTERN
θ - 25°

ALBERT L. CRAIN
PROPOSED RADIO STATION
ST. GEORGE, UTAH
10 KW-DA

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

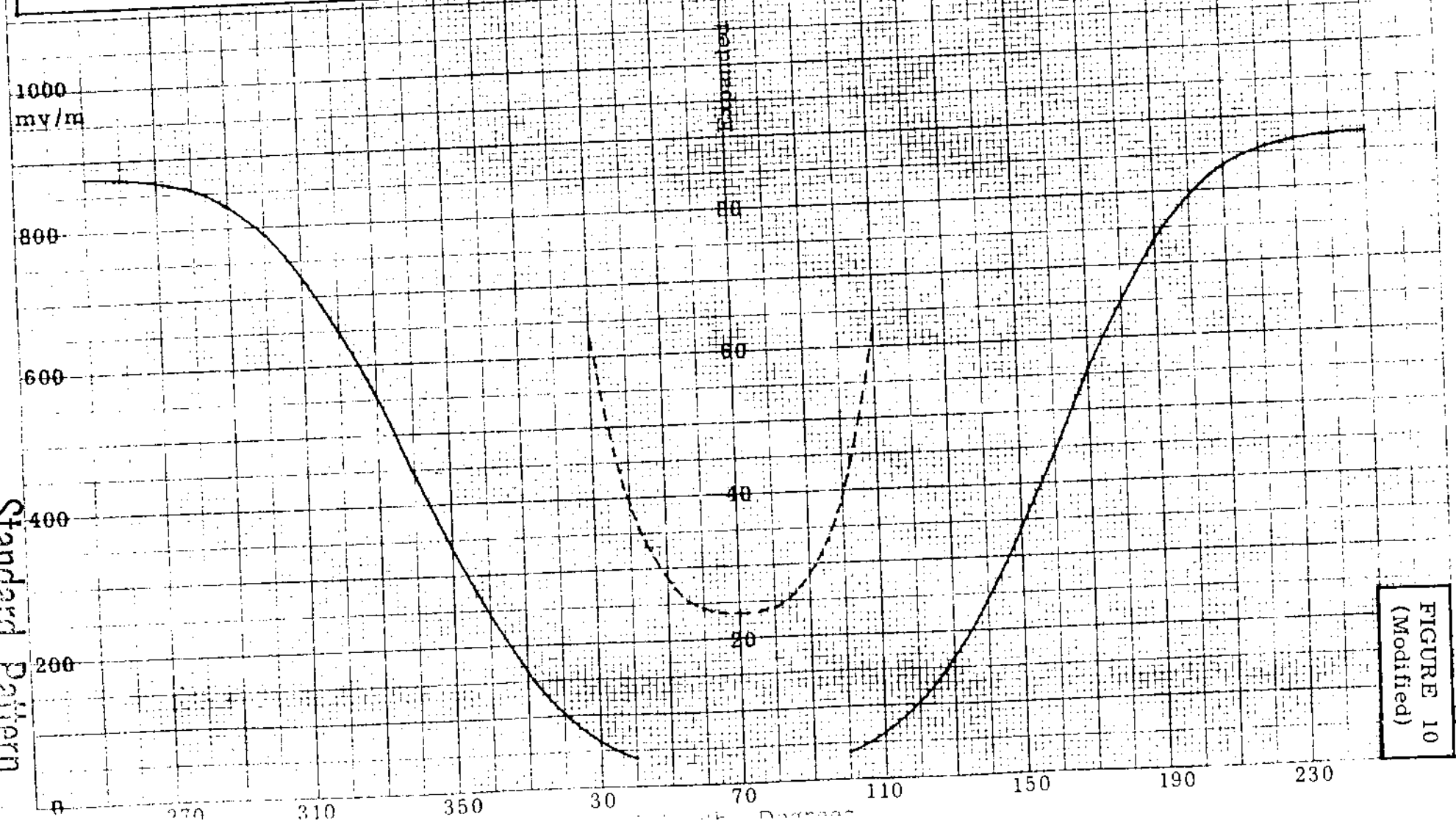


FIGURE 10
(Modified)

Standard Pattern

030874

STANDARD DIRECTIONAL PATTERN
Θ - 30°

ALBERT L. CRAIN
PROPOSED RADIO STATION
ST. GEORGE, UTAH
10 KW-DA

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

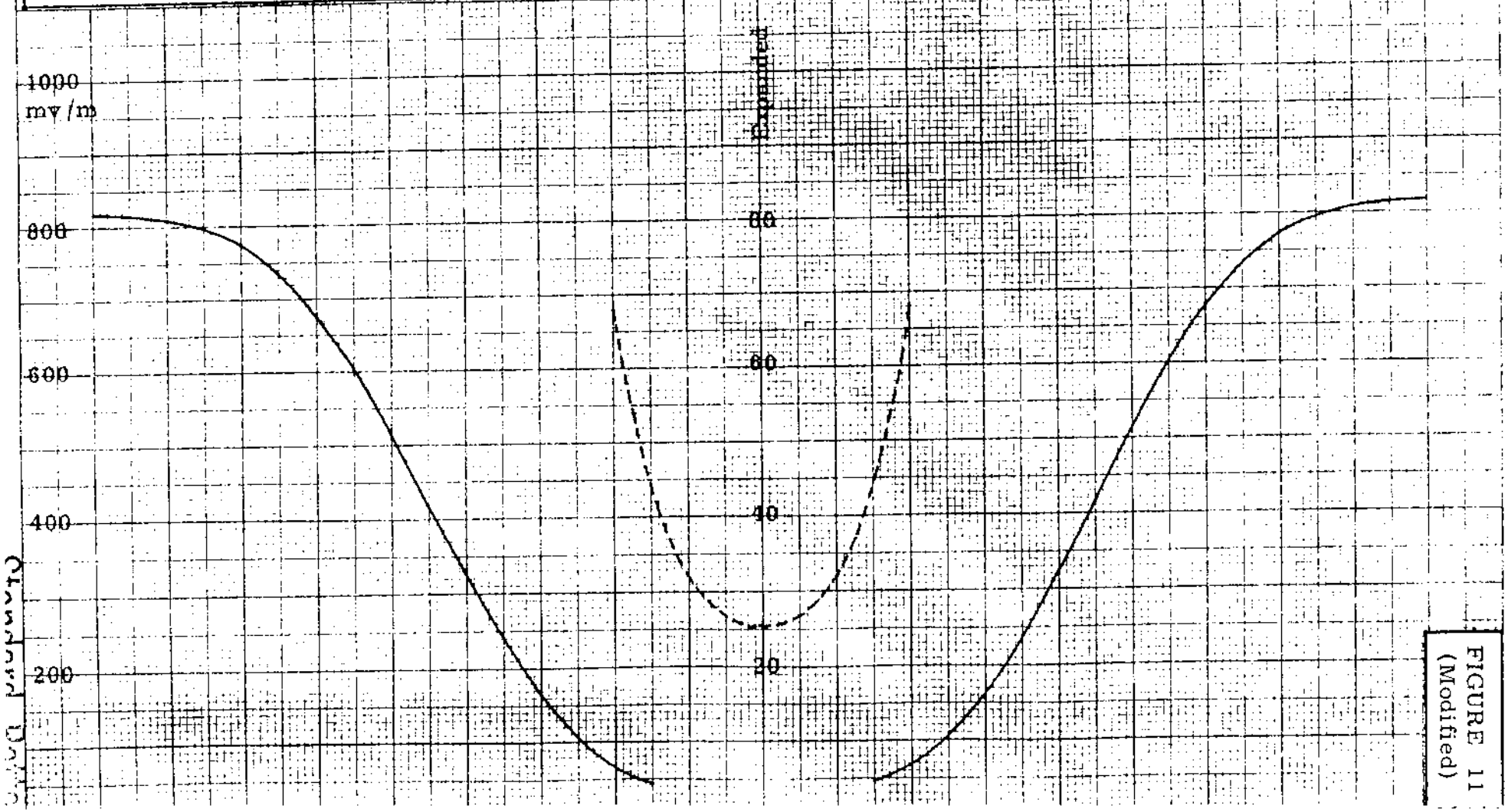


FIGURE 11
(Modified)

030874

STANDARD DIRECTIONAL PATTERN
Θ - 35°

ALBERT L. CRAIN
PROPOSED RADIO STATION
ST. GEORGE, UTAH
10 KW-DA

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

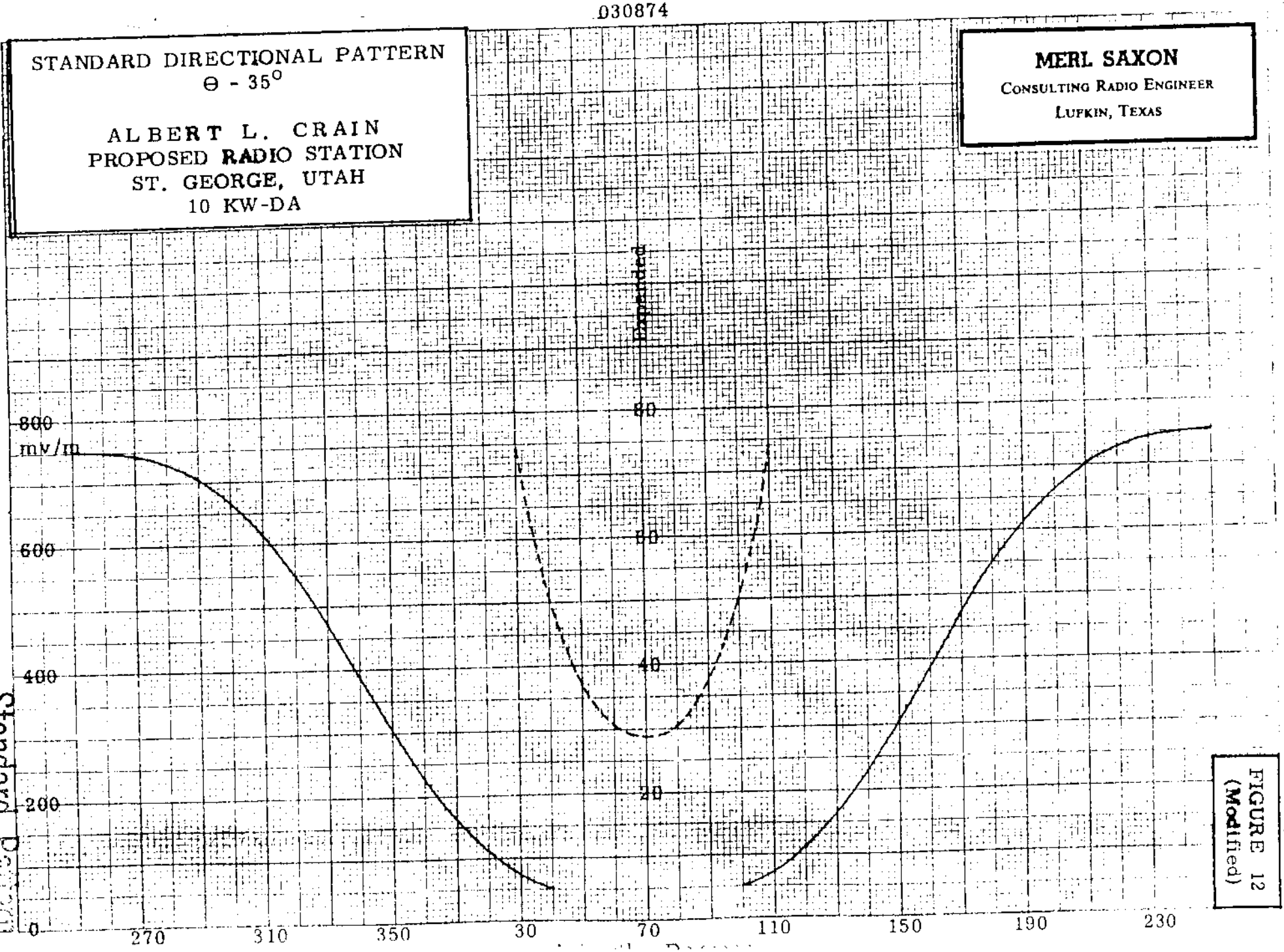


FIGURE 12
(Modified)

Standard Pattern

030874

STANDARD DIRECTIONAL PATTERN
Θ - 40°

ALBERT L. CRAIN
PROPOSED RADIO STATION
ST. GEORGE, UTAH
10 KW-DA

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

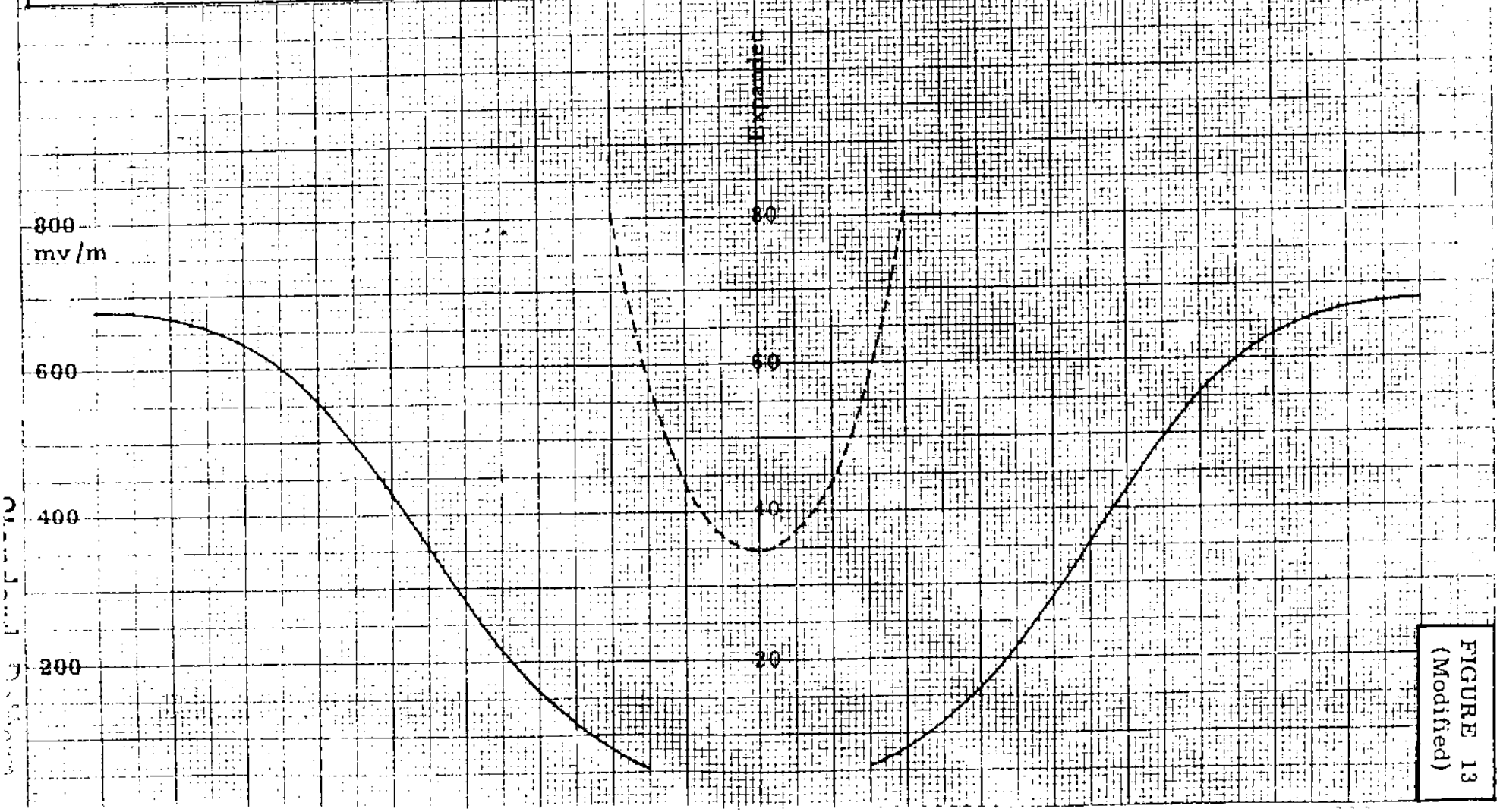


FIGURE 13
(Modified)

030874

STANDARD DIRECTIONAL PATTERN
Θ - 45°

ALBERT L. CRAIN
PROPOSED RADIO STATION
ST. GEORGE, UTAH
10 KW-DA

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

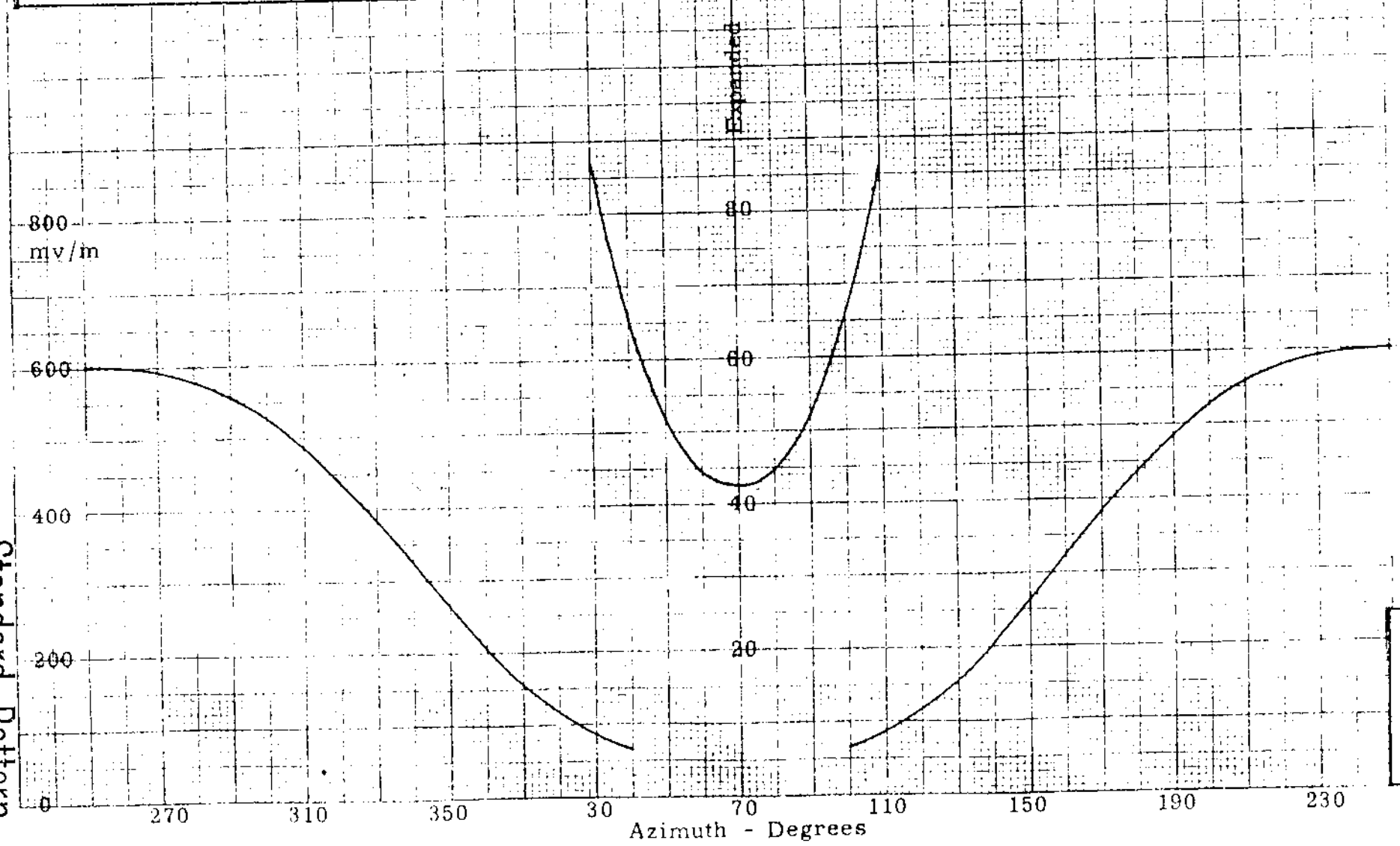


FIGURE 14
(Modified)

Standard Pattern

030874

STANDARD DIRECTIONAL PATTERN
Θ - 50°

ALBERT L. CRAIN
PROPOSED RADIO STATION
ST. GEORGE, UTAH
10 KW-DA

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

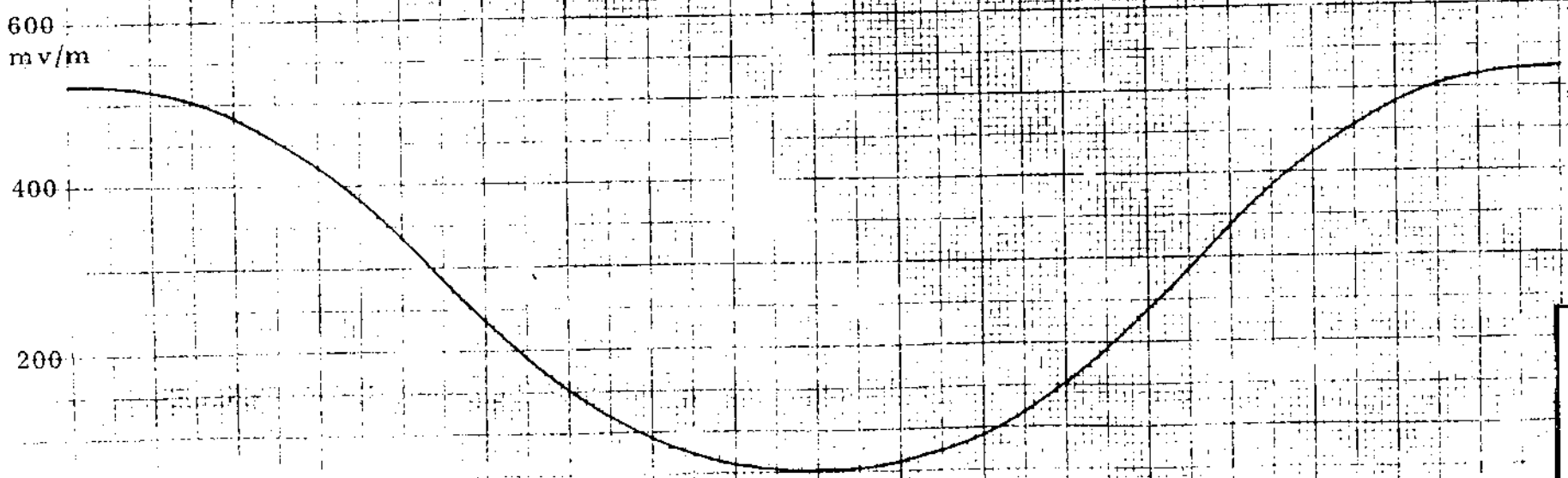


FIGURE 15
(Modified)

030874

STANDARD DIRECTIONAL PATTERN
θ - 55°

ALBERT L. CRAIN
PROPOSED RADIO STATION
ST. GEORGE, UTAH
10 KW-DA

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

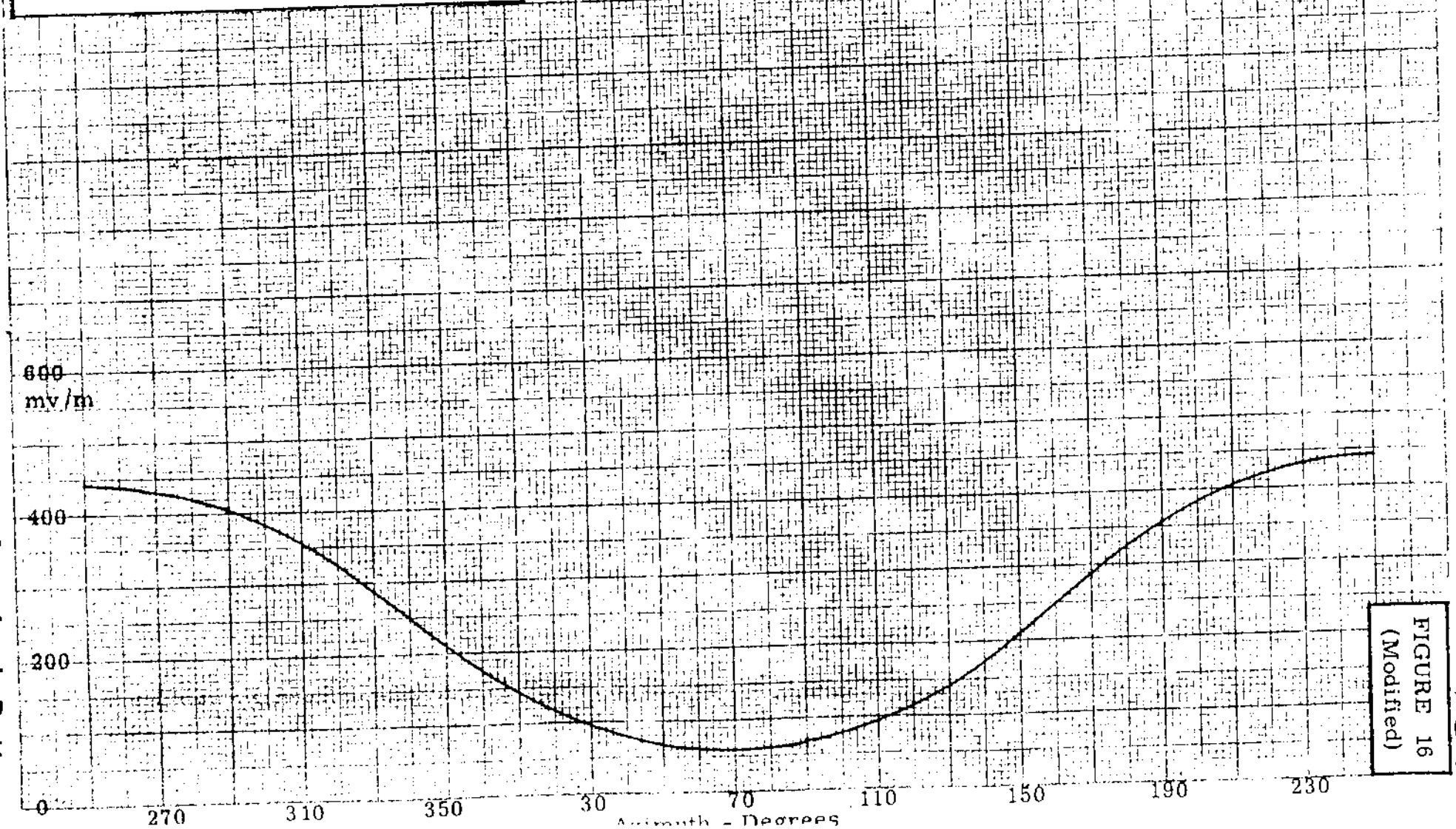


FIGURE 16
(Modified)

Standard Pattern

030874

STANDARD DIRECTIONAL PATTERN
Θ - 60°

ALBERT L. CRAIN
PROPOSED RADIO STATION
ST. GEORGE, UTAH
10 KW-DA

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

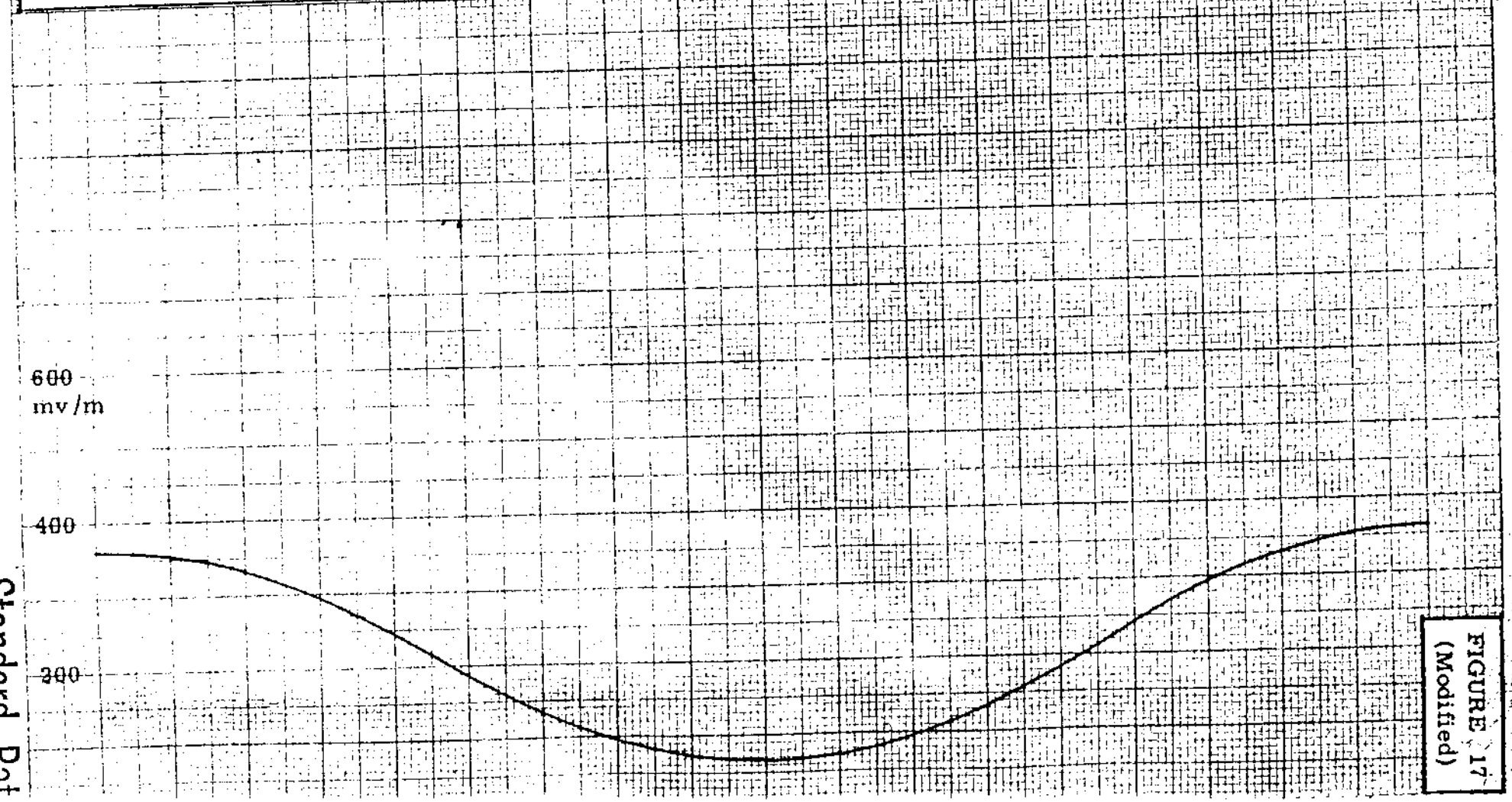


FIGURE 17
(Modified)

Standard Pat

XEACF

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: XEACF

Main Studio: Irapuato, Gto.

Frequency: 870 kHz

Power: 1 kW

Notification List No. 250

Date: October 16, 1968

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 20° 37' 25"
West Longitude: 101° 21' 03"

ANTENNA CHARACTERISTICS

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

TOWER:	N	S
HEIGHT ABOVE INSULATORS:	86.2M	86.2M (90°)
PHASING:	0°	+125°
FIELD RATIO:	1	1

SPACING AND ORIENTATION: Elements are spaced 57.47M (60°) on a line bearing 170° true.

GROUND SYSTEM: 120-86.2M equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

Predicted effective Field: 190 mv/m at rated power.

FCC Note: The attached supplementary information was transmitted by Mexican letter dated June 25, 1976.

XEACF

Oficina de Asignaciones

REVISO

EJE DE LAS TORRES

N

0° 10° 20° 30° 40° 50° 60° 70° 80° 90° E 100° 110° 120° 130° 140° 150° 160° 170° 180° S 190° 200° 210° 220° 230° 240° 250° 260° W 270° 280° 290° 300° 310° 320° 330° 340° 350°

250 200 150 100 50 5 10 20

ARCO PROTEGIDO

ING. LEOPOLDO PEÑA JIMENEZ

PERITO EN TELECOMUNICACIONES

REG. DGT NO. 113

OPERACION DIURNA

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

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

AZIMUT: 110° N

DIRECC. GRAL. DE TELECOMUNICACIONES

Departamento de Concesiones

Oficina de Asignaciones

S

APROBO

XEACF

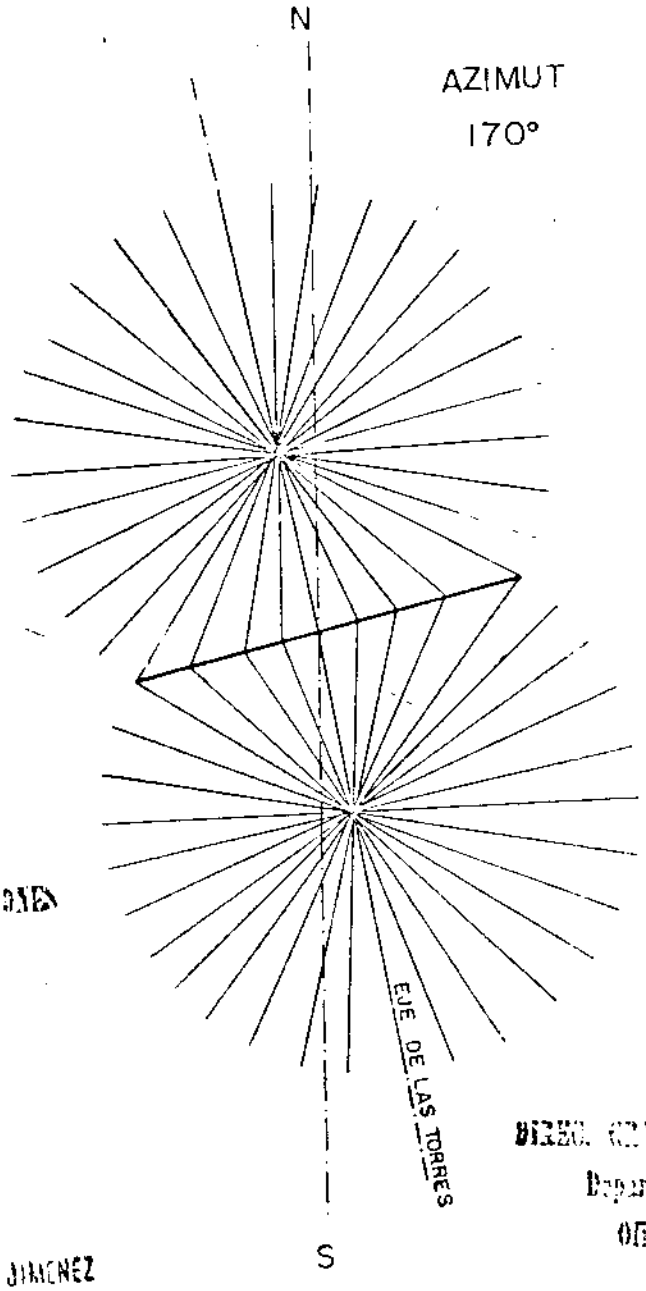
IRAPUATO, GTO.

FRECUENCIA: 870 KHZ.

DISEÑO: PERITO EN TELECOMS ING. L. PEÑA JIMENEZ REGISTRO No. 113

DIBUJO: A.P.L.

XEACF



DIRECCIÓN GRAL. DE TELECOMUNICACIONES
Departamento de Frecuencias
Oficina de Asignaciones

APROBO

ING. LEOPOLDO PEÑA JIMENEZ
PERITO EN TELECOMUNICACIONES
REG. DGT NUM. 113

17 ABR. 1976

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

REVISO

SISTEMA DE TIERRA

120 RADIALES DE ALAMBRE DE COBRE No.10 EN CADA TORRE DE 86.2 MTS. DE LONGITUD CADA UNO, UNIDOS AL CENTRO COMO LO INDICA LA FIGURA, POR ALAMBRE DEL MISMO MATERIAL TIPO 00. TODO EL SISTEMA ESTA ENTERRADO 0.30 MTS.

XEACF

IRAPUATO, GTO.

FRECUENCIA Y POTENCIA:
870 KHZ.
1 KW. AD-D.

DISEÑO:
PERITO EN TELECOMS
ING. L. PEÑA JIMENEZ
REGISTRO No. 113

DIBUJO:
A.P.L.

XEACF

PATRON DE RADIACION HORIZONTAL TABULADO.

XEACF — 1000 Watts

870 KHZ — IRAPUATO, GTO.

ING. LEOPOLDO PEÑA JIMENEZ
PERITO EN TELECOMUNICACIONES
C. DGT NUM. 113
ABR. 1976

OPERACION DIURNA

$$E = 250.95726\sqrt{1+\cos(60^\circ \cos\varphi + 125^\circ)}$$

AZIMUT		A	B	C	D
Ø	φ	60 COS φ	COS(A+125°)	$\sqrt{1+B}$	250.95726C
170°	0°	60.00000	−0.99619	0.06172	15.489082
180°	10°	59.08846	−0.99745	0.05049	12.67083
190°	20°	56.38155	−0.99970	0.01732	4.34657
200°	30°	51.96152	−0.99859	0.03754	9.42093
210°	40°	45.96266	−0.98758	0.11144	27.96667
220°	50°	38.56725	−0.95915	0.20211	50.72097
230°	60°	30.00000	−0.90630	0.30610	76.81801
240°	70°	20.52120	−0.82433	0.41913	105.18371
250°	80°	10.41889	−0.71225	0.53642	134.61849
260°	90°	0.00000	−0.57357	0.65301	163.87760
270°	100°	−10.41889	−0.41598	0.76421	191.78404
280°	110°	−20.52120	−0.25002	0.86601	217.33149
290°	120°	−30.00000	−0.08715	0.95543	239.77209
300°	130°	−38.56725	0.06222	1.03064	258.64659
310°	140°	−45.96266	0.19016	1.09093	273.77931
320°	150°	−51.96152	0.29172	1.13653	285.22045
330°	160°	−56.38155	0.36457	1.16814	293.15321
340°	170°	−59.08846	0.40814	1.18663	297.79843
350°	180°	−60.00000	0.42261	1.19273	299.32425

Oficina de Asignaciones

Oficina de Asignaciones

APROBO

REVISO

XEACF

DESCRIPCION DEL SISTEMA DIRECCIONAL DE RADIACION.

OPERACION DIURNA

ESTACION: XEACF UBICACION: IRAPUATO, GTO.

FRECUENCIA: 870 KHZ. POTENCIA: 1 KW.

LISTA DE NOTIFICACIONES: No. 250; 16 Octubre 1968. CLASE: II

LOCALIZACION GEOGRAFICA DEL SISTEMA RADIADOR: LONGITUD O: 101° 21' 03" LATITUD N: 20° 37' 25"

CARACTERISTICAS DEL SISTEMA

ING. LEOPOLDO PEÑA JIMENEZ
PERITO EN TELECOMUNICACIONES
REG. DGT NCOL 103

AUTORIZADO PARA OPERACION: AD-D.

NUMERO DE ELEMENTOS RADIADORES: DOS.

TIPO DE ELEMENTOS RADIADORES: TORRES VERTICALES CON RETENIDAS.

	TORRE NORTE	TORRE SUR
ALTURA SOBRE LOS AISLADORES:	90°(86.2M)	90°(86.2M)
SEPARACION ENTRE TORRES:	60°(57.47 M).	
MAGNITUDES RELATIVAS DE CORRIENTES	1	1
DEFASAMIENTO:	0°	125°
AZIMUT DEL EJE DE LAS TORRES:	170°	
RAIZ CUADRATICA MEDIA TEORICA	190 MV/M.	

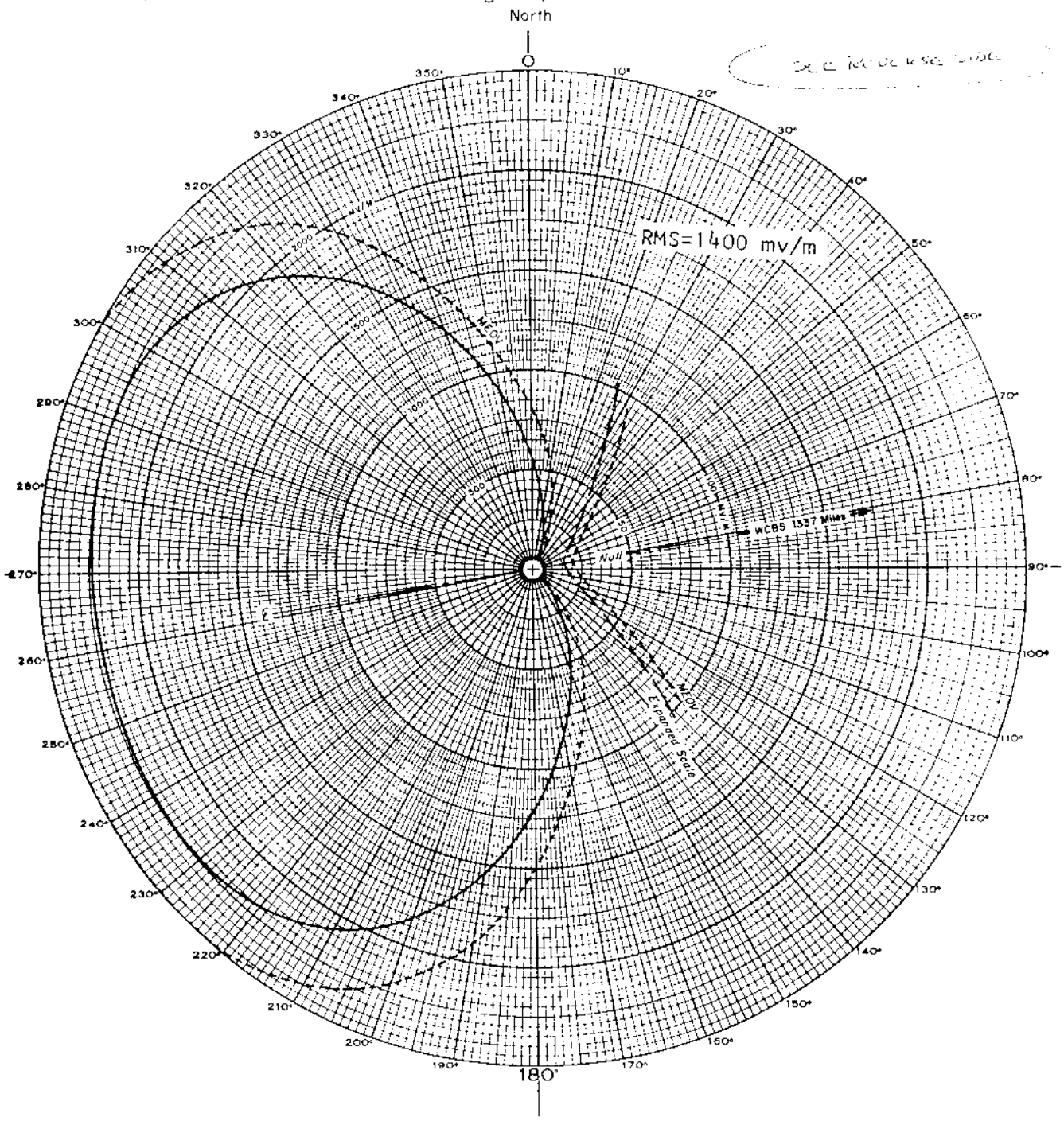
INTENSIDAD DE CAMPO R.C.M. NO ATENUADO A 1509 MTS. POR KW. DE POTENCIA RADIADA: 190 MV/M.

Departamento de Frecuencias
Oficina de Asignaciones

KRVN
50kw, DA-N, U
880 kc

Proposed Night
(9-25-70ct)

Station KRVN
Lexington, Nebraska



North Latitude 40° 31' 03"
West Longitude 99° 23' 20"

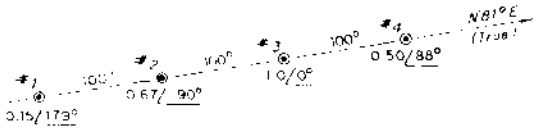


FIGURE 1
NIGHTTIME HORIZONTAL PLANE
RADIATION PATTERN
KRVN 50 KW, DA-N 880 KC
LEXINGTON, NEBRASKA

Prepared by
Lohnes and Culver Washington, D.
August, 1970

FCC File No. BMP-13084
Accepted 9-10-70

Station KRVN
Lexington, Nebraska

880 kc

BMP-12942
GRL (1-3-70) Mod of CP to change from 5 kw, DA-2, U to 50 kw, DA-2, U

KRVN

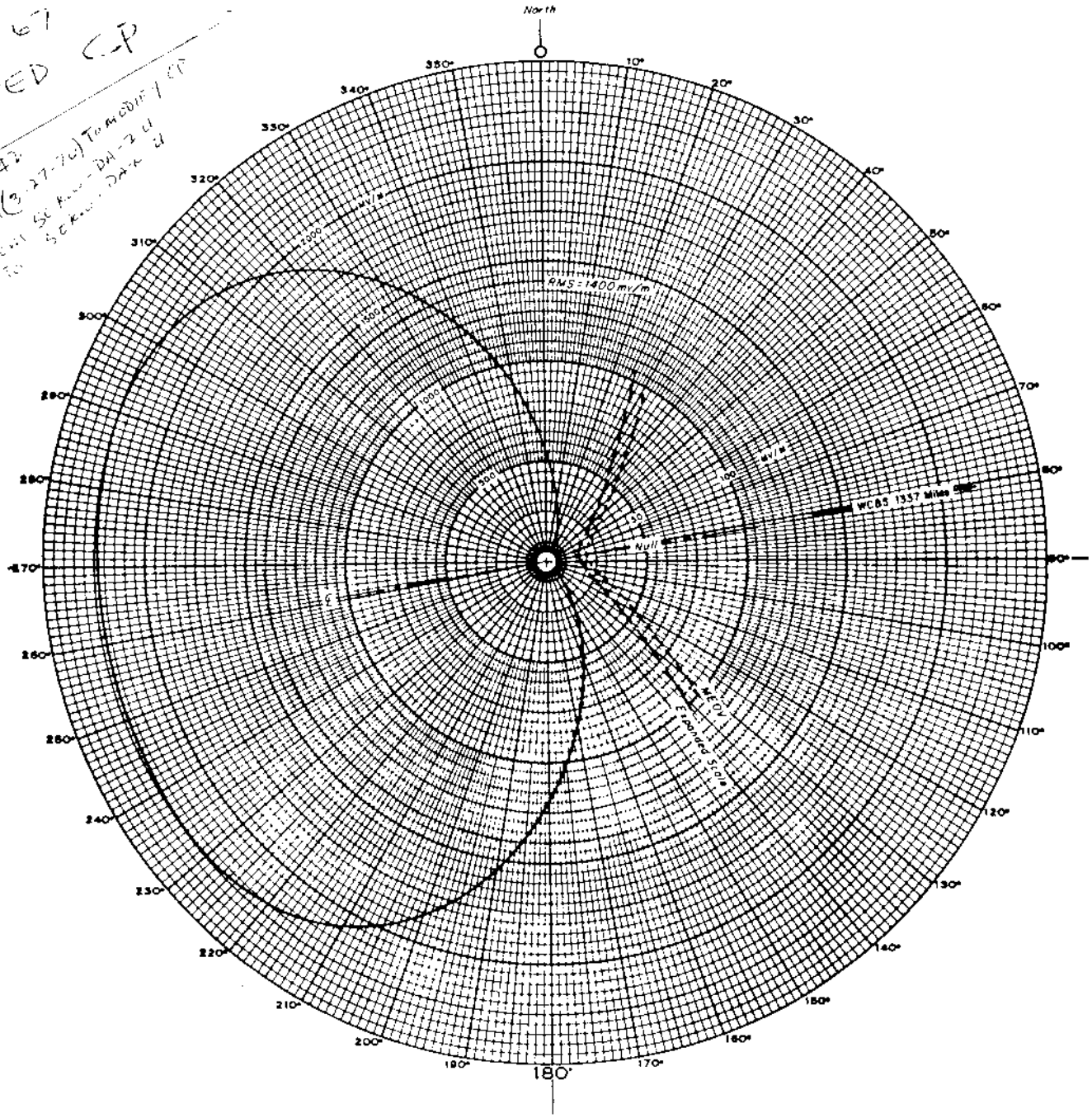
Proposed Night
(3-30-64ct)

Station KRVN
Lexington, Nebraska

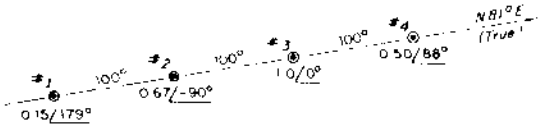
50kw, DA-2, U
880kc

10-11-67
GRANTED C.P.

BMP-12942
Appl. Accepted (3-27-70) To modify CP
To change from 5 kw, DA-2, U
To 50 kw, DA-2, U



North Latitude 40° 31' 03"
West Longitude 99° 23' 20"



AMENDED FIGURE 4
NIGHTTIME HORIZONTAL PLANE
RADIATION PATTERN
KRVN 50 KW-U, DA-2 880 KC
LEXINGTON, NEBRASKA
Prepared by
Lohnes and Culver Washington 4, D.C.
November 1963

h - 96.6°

FCC File No. BP-15348
Accepted 3-3-64 Amended

Station KRVN
Lexington, Nebraska

880kc

217

CKTS

Description Sheet
(11-29-66ct)

Station CKTS
Sherbrooke, Quebec

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

DIRECTIONAL ANTENNA DESCRIPTION SHEET

STATION: CKTS

FREQUENCY: 900 KHz

NOTIFICATION LIST NO: 217

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

MAIN STUDIO: Sherbrooke, Que.

POWER: 10 kW, DA-2

CLASS: II

DATE: October 7, 1966.

North Latitude: 45° 26' 29"
West Longitude: 72° 00' 35"

ANTENNA CHARACTERISTICS

MODE OF OPERATION: 10 kW, DA-2 (directional antenna, different pattern for day and night).

NUMBER OF ELEMENTS: Five (5)

TYPE OF ELEMENTS: Uniform cross-section, guyed steel towers, base insulated for series feed, no top-loading.

TOWER	No.1	No.2	No. 3	No. 4	No. 5
HEIGHT ABOVE INSULATORS	60°(182')	60°(182')	60°(182')	60°(182')	60°(182')
OVERALL HEIGHT	187'	187'	187'	187'	187'
FIELD RATIO					
DAY	1	0.95	1.4	0	0
NIGHT	1	0	1	1	1
PHASING DAY	0	184°	334°	0	0
NIGHT	0	0	23°	169.4°	146.4°
SPACING DAY	0	86°	172°	-	-
NIGHT	0	-	172°	209°	75°
ORIENTATION					
DAY	0	265°	265°	-	-
NIGHT	0	-	265°	284.8°	335.6°

GROUND SYSTEM: 120 equiangularly spaced radials extending from each tower base to approximately 0.4 Wavelength. Length added to some radials to compensate for shorter radials limited by terrain.

PREDICTED EFFECTIVE FIELD: 570 mV/m for 10 Kw.
180 mV/m for 1 Kw.

COTE, LECLAIR, LANGLOIS, BOISVERT & ASSOCIES
CONSULTING ENGINEERS

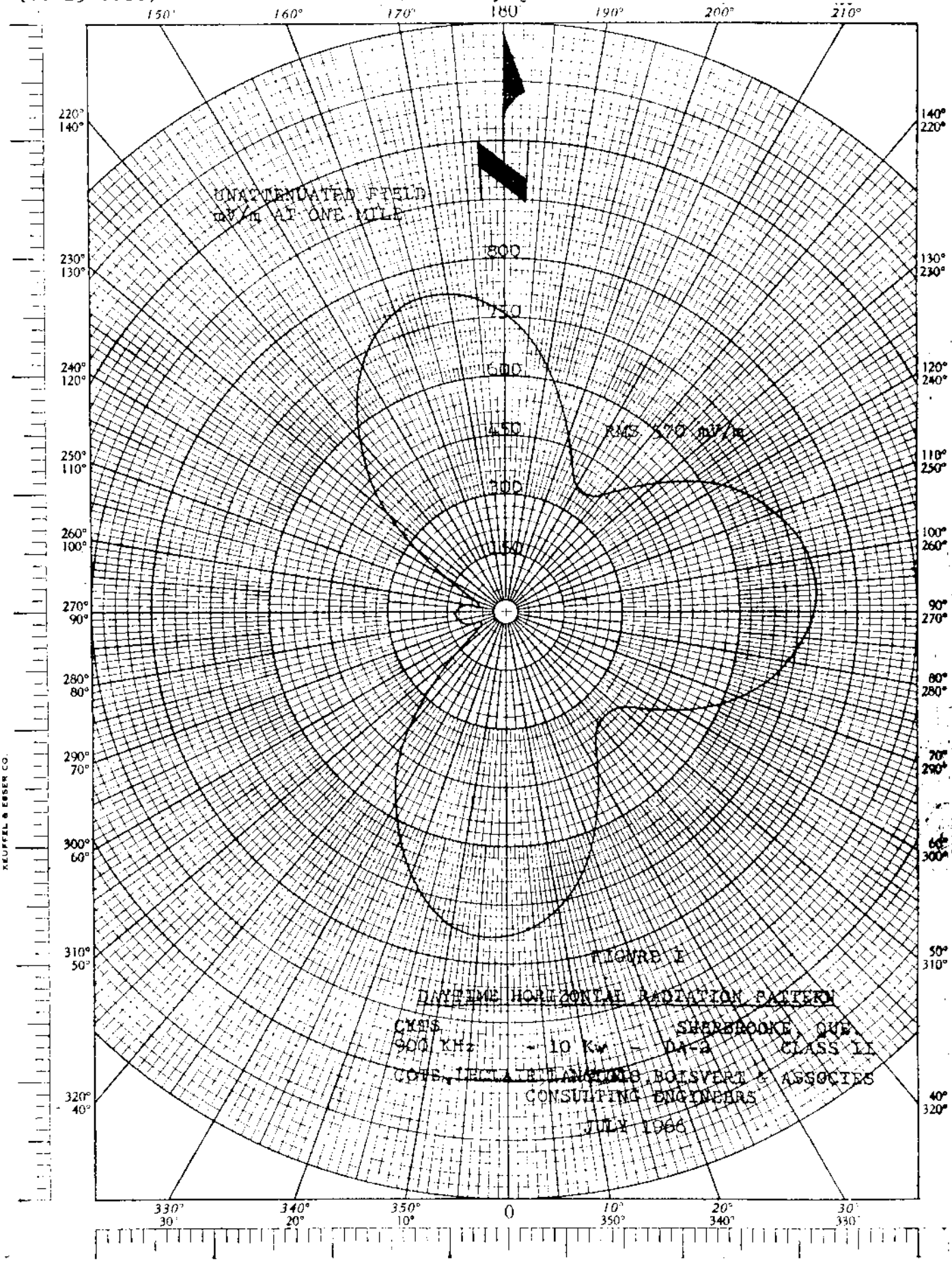
217

CKTS

Proposed Day
(11-29-66ct)

Station CKTS
Sherbrooke, Quebec

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



K+E POLAR COORDINATE 46 4413
KEUFFEL & ESSER CO.

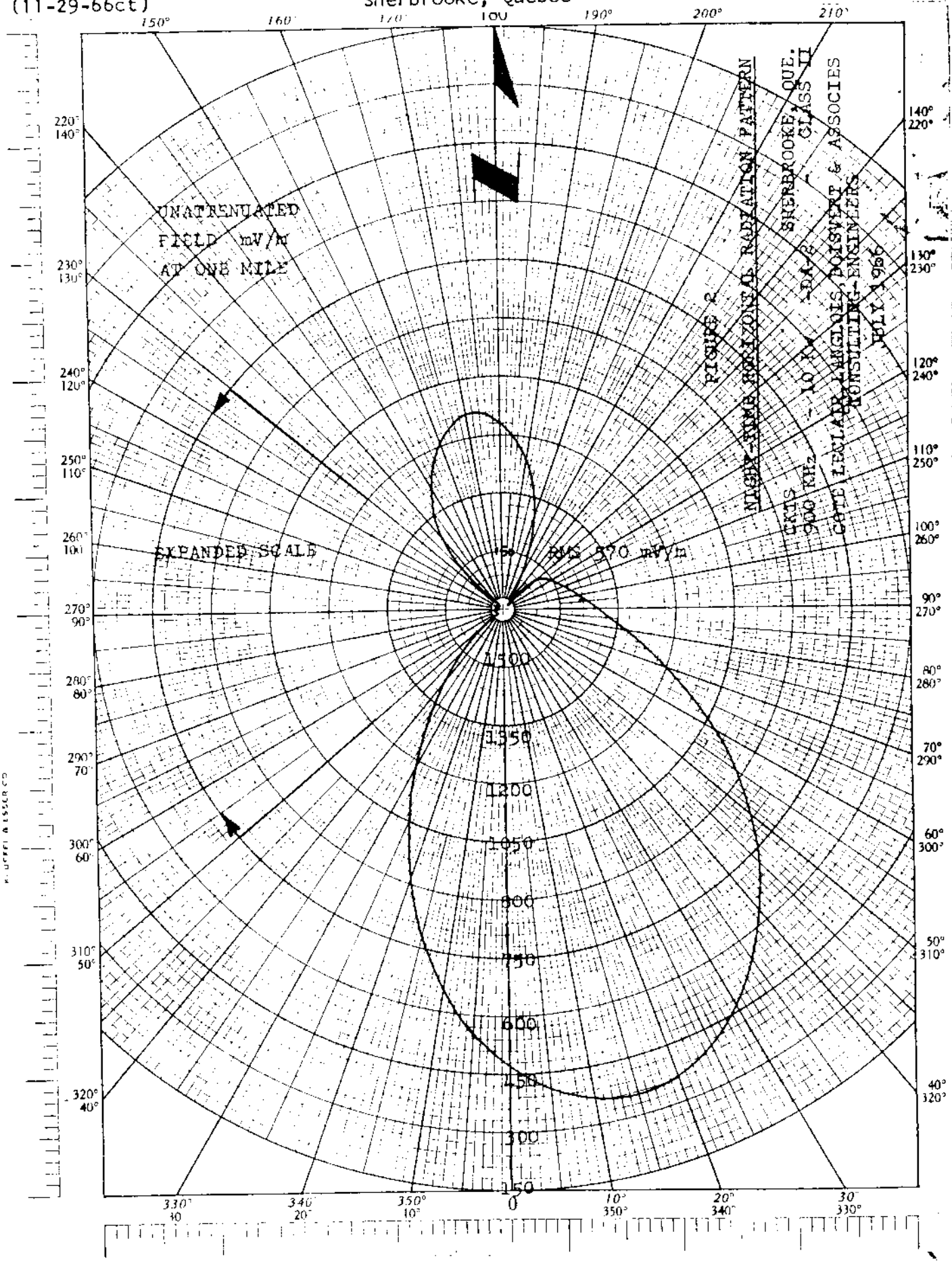
217

CKTS

Proposed Night
(11-29-66ct)

Station CKTS
Sherbrooke, Quebec

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



Proposed Night Nulls
(11-29-66ct)

Station CKTS
Sherbrooke, Quebec

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

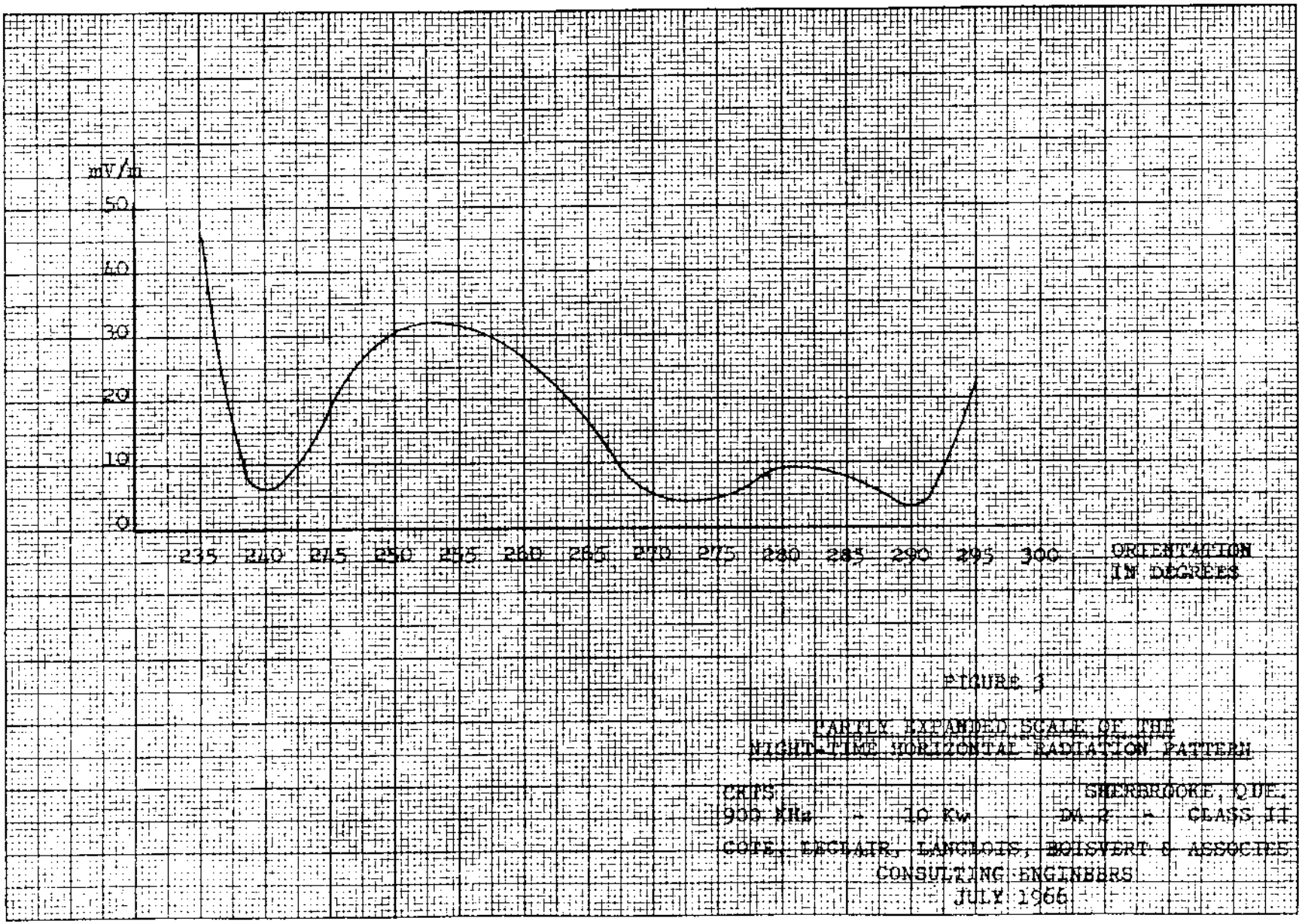


FIGURE 3

PARTLY EXPANDED SCALE OF THE NIGHT-TIME HORIZONTAL RADIATION PATTERN

CKTS
900 KHz - 10 Kw - DA 2 - CLASS II

SHERBROOKE, QUE.

COTE, LACLAIR, LANGLOIS, BOISVERT & ASSOCIES
CONSULTING ENGINEERS
JULY 1966

217

CKTS

94 SEE 211

~~CHLT~~ - 900 kc
CKTS

Description of Directional Antenna.

CHLT - Sherbrooke, Que. 900 kc., 1 kw.

Number of elements: 2
Type: Uniform cross-section, insulated
Top loading: None.
Height: 196 feet
Orientation: 36° east of True North.
Current ratio: 0.77
Spacing: 364 feet (120°)
Phasing: Current in North tower 141° ahead of that in South tower.
Ground: 120 radials from each radiator 4.5 feet long.
Proposed operation: Non-directional daytime.

Oficina Interamericana de Radio (OIR)
OIR/NARBA/384-527 CANADA.
La Habana, 8 [illegible] 1946

Enviado con C 527.
Sent with C 527.
Envoyés avec C 527.

16

J.F.L

1945

CKTS ~~CHLT~~
900

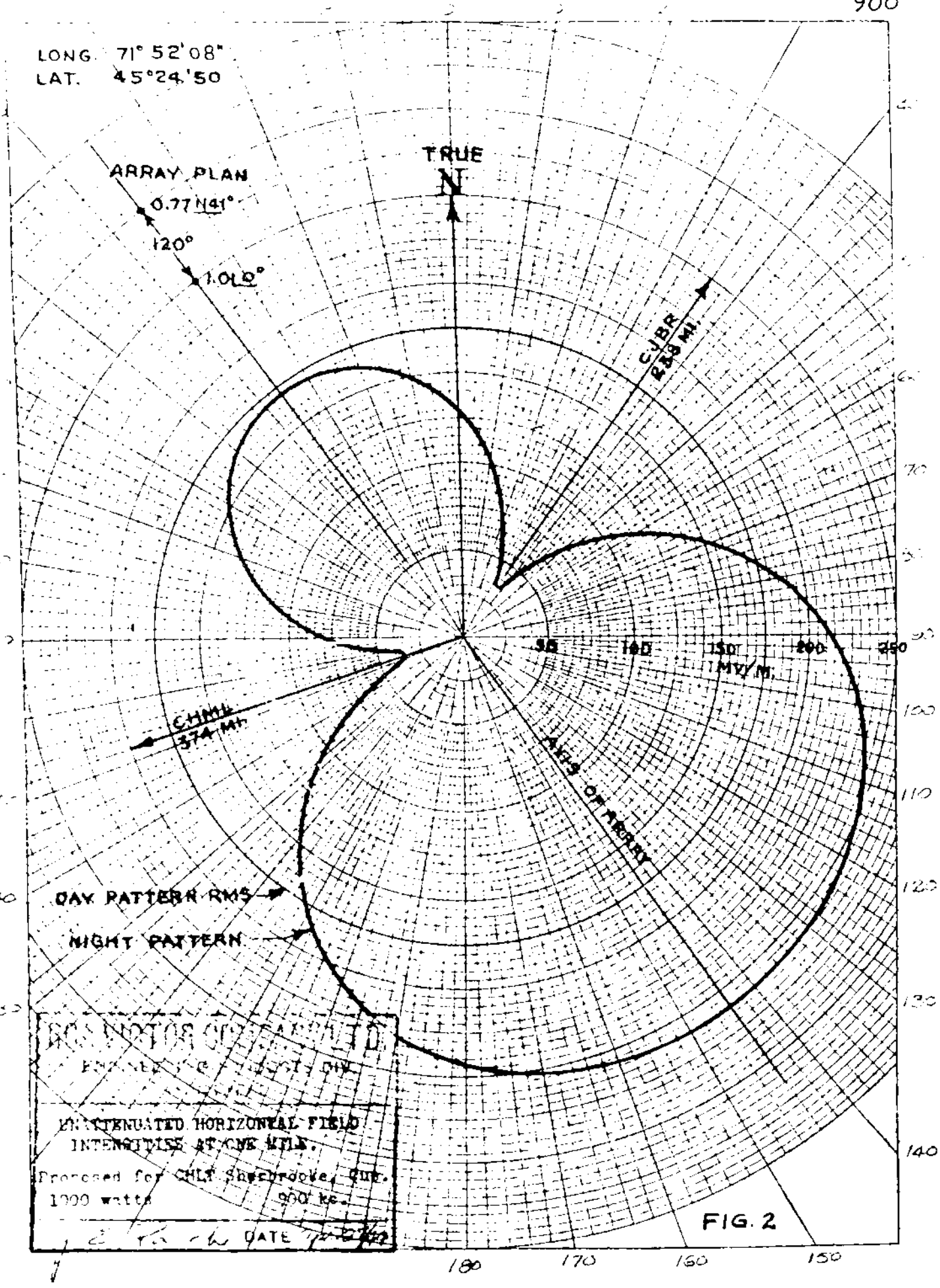


FIG. 2

16"

189

2.5KW CKVD

Description Sheet
(8-28-64ct)

Station CKVD
Val d'Or, P. Q.

~~250w~~ 10kw-LS,DA-1,U,Class II
900 kc

DIRECTIONAL ANTENNA DESCRIPTION SHEET

STATION: CKVD

MAIN STUDIO: VAL D'OR, QUE

FREQUENCY: 900Kc

POWER: 10KwD/2.5KwN CLASS

NOTIFICATION LIST NO: 189

DATE: July 20, 1964

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

North Latitude: 48° 04' 53"
West Longitude: 77° 42' 25"

ANTENNA CHARACTERISTICS

Mode of Operation: DA-1 (same diagram day and night)

Number of elements: Five (5)

Type of elements: Uniform cross-section, guyed steel towers, base insulated for series feed.

TOWER:	No.1	No.2	No.3	No.4	No.5
HEIGHT ABOVE INSULATORS	200' (65.8°)	200' (65.8°)	200' (65.8°)	200' (65.8°)	200' (65.8°)
SPACING	ref.	90° (273')	180° (546')	252° (765')	180° (546')
PHASING	0°	-135°	-265°	-130°	0°
FIELD RATIO	1	1.89	.89	.75	.75
ORIENTATION	ref.	319°	319°	288.63°	274°

GROUND SYSTEM: Most of the 120 equiangularly spaced radials extend from the base of each tower to a distance of 438 feet (0.4 wavelength) except those joined at a common chord.

PREDICTED EFFECTIVE FIELD:

182 MV/M at 1 mile for 1 Kw
288 MV/M at 1 mile for 2.5 Kw
575 MV/M at 1 mile for 10 Kw

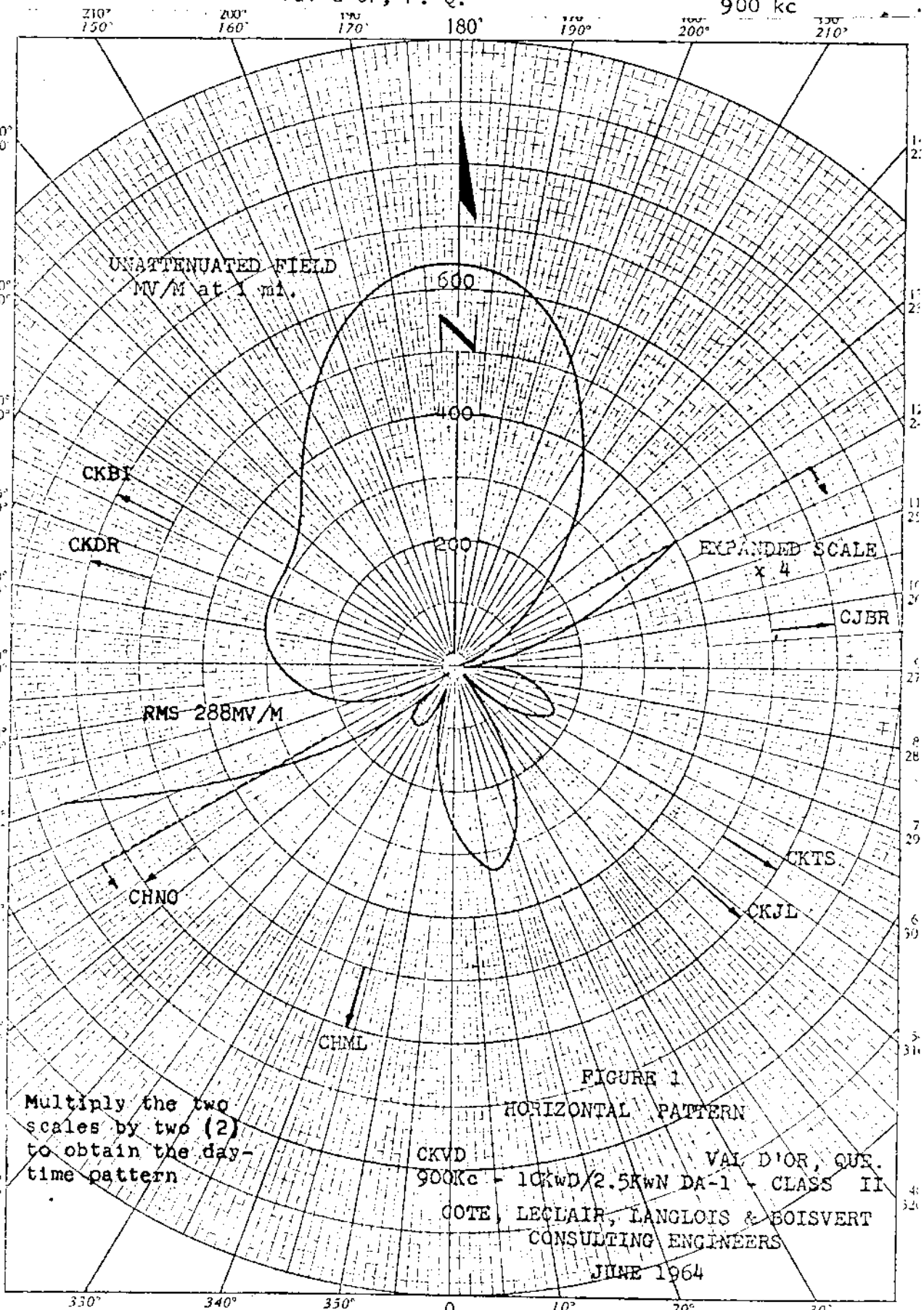
F.189

CKVD

Proposed Day & Night
(8-28-64ct)

Station CKVD
Val d'Or, P. Q.

250w,10kw-LS,DA-1,U,Class II
900 kc



Multiply the two scales by two (2) to obtain the day-time pattern

FIGURE 1
HORIZONTAL PATTERN

CKVD
900Kc - 10KwD/2.5KwN DA-1 - CLASS II

VAL D'OR, QUE.

COTE, LECLAIR, LANGLOIS & BOISVERT
CONSULTING ENGINEERS

JUNE 1964

KBIF

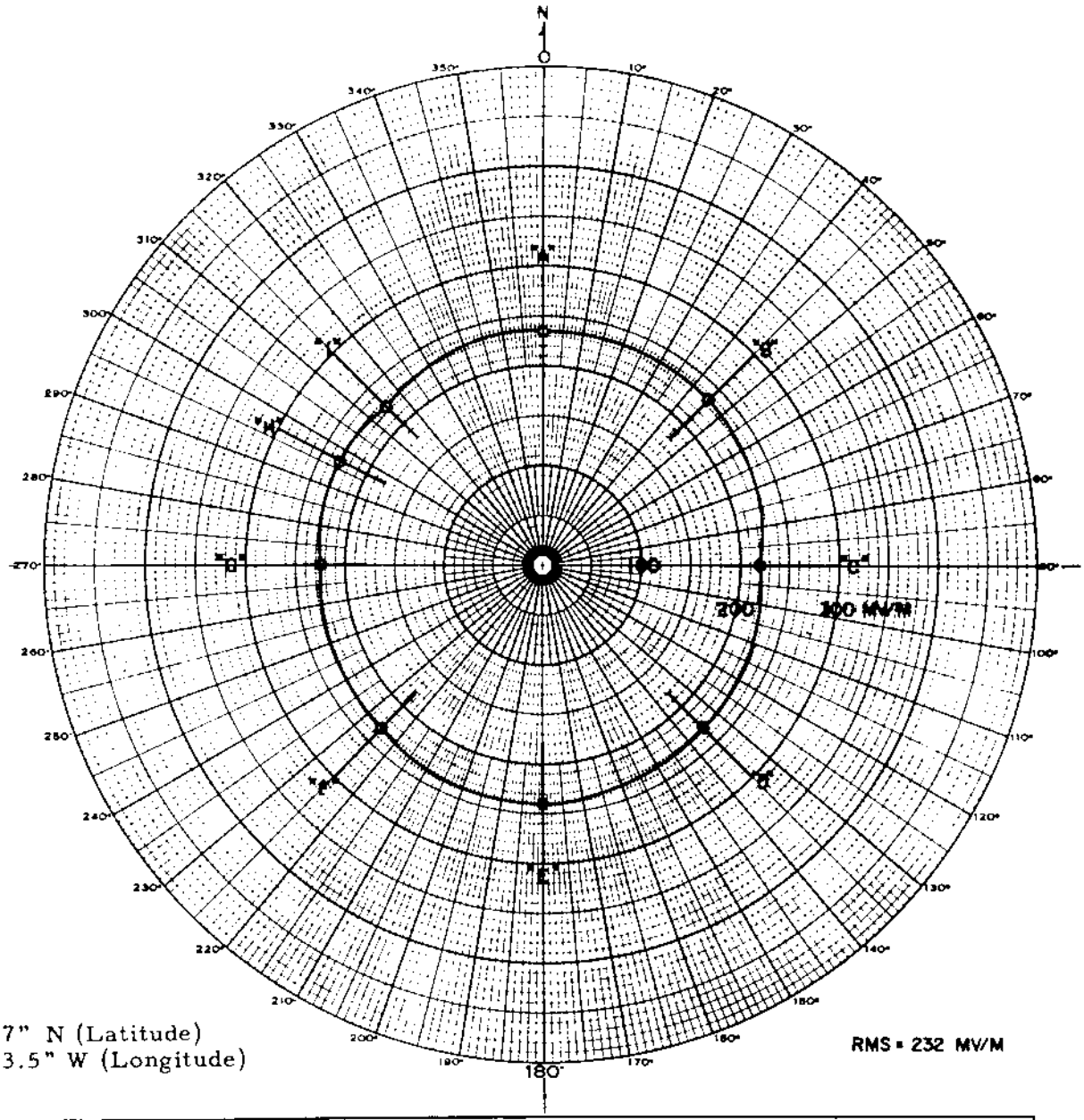
MEASURED
NON-DIRECTIONAL

KBIF, FRESNO, CALIF.
5/11/55G

D, Non-Da
1 KW

900 KC

POLAR CO ORDINATE NO. 10 HP CLEVELAND INSTITUTE OF RADIO ELECTRONICS CLEVELAND OHIO



36° 41' 27" N (Latitude)
119° 40' 43.5" W (Longitude)

RMS = 232 MV/M

FIGURE NO. 5

STATION KBIF — 900 KC — 1 KW — DAYTIME

PATTERN BASED ON FIELD INTENSITY MEASUREMENTS

FRESNO, CALIFORNIA

MARCH ——1955

T & T RADIO MEASUREMENTS CO.

2997 ATLANTIC AVENUE
LONG BEACH 6, CALIFORNIA

Radio Engineering Consultants

FCC File No. BL-5698 Accepted 4-25-55 KBIF, FRESNO, CALIF. 900 KC

CJEK

IFRB Serial No. 12140

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT

CHARACTERISTICS OF A REGION 2 BROADCASTING STATION IN THE BAND 535 - 1605 kHz 900 kHz

PART I GENERAL INFORMATION

(01) Administration: CANADA Sheet No. 412 Date 820504

Assigned frequency (kHz)	(02)	900
Transmitting station: Name of the station	(03)	ST JEROME QU
Transmitting station: Call sign	(04)	CJER
Transmitting station: Additional identification	(05)	
Transmitting station: Station class	(06)	
Transmitting station: Operational Status	(07)	
Country	(08)	CAN
Geographical coordinates of the transmitting station	(09)	W N

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

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

Call sign

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

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

(44) Remarks

COORDINATION UNDER ARTICLE 4:	
COUNTRY	USA
IN PROGRESS	
ACCEPTANCE OBTAINED	

4/8/77

CFBR, SUBBURY, ON

Coor 46 26 10
80 58 30

DA2

Power: 1KW, Night

RMS 189

TWRS 2

Freq: 900

	1	2
Field Ratio	1.0	0.75
Height	107	56
Phase	0	265
Orientation	0	312
Spacing	0	105

CKVD, Val D'or, QU
900 kHz

Coor. 48 04 53
77 42 25

Power 2.5 kW night
RMS 288
Tiers 5

	1	2	3	4	5
Field Ratio	1.0	1.89	.89	.15	.75
Height	65.8	65.8	65.8	65.8	65.8
phase	0	225	115	230	0
Orientation	0	319	319	288.63	274
Space	0	90	180	252	180

DESCRIPTION SHEET

STATION: NEW

MAIN STUDIO: Penticton, B. C.

FREQUENCY: 900 KHz.

POWER: 1 kw

TIME: UNLIMITED

DATE: FEBRUARY 1971

NOTIFICATION LIST NO: 280

DATE: June 23, 1971

GEOGRAPHIC LOCATION: N. 49° 29' 54"
W. 119° 38' 32"

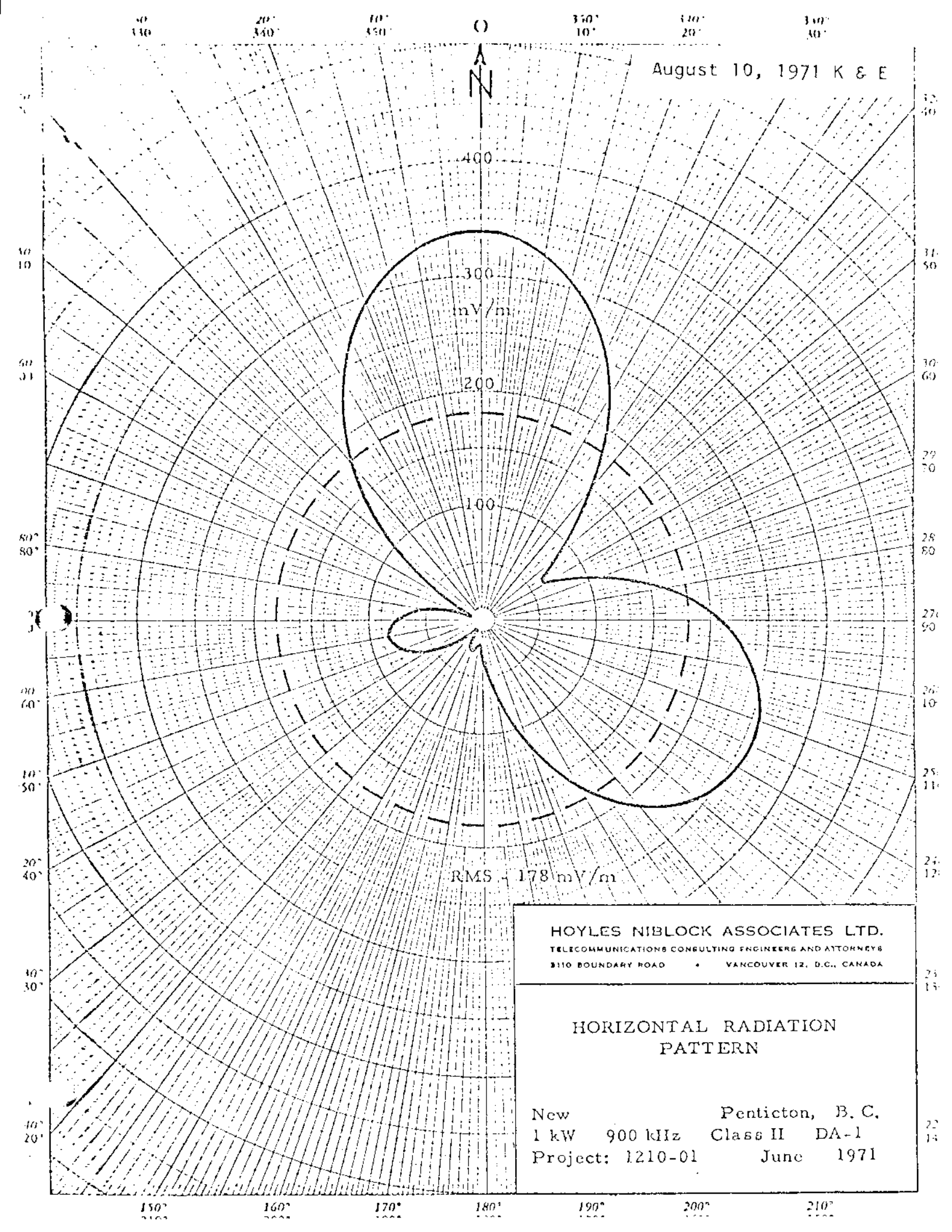
ANTENNA SYSTEM: Mode of Operation: DA-1

Elements - Four (4) guyed towers. Uniform cross section. Series fed, base insulated.

TOWERS:	1	2	3	4
Height overall	217'	217'	217'	217'
Height above insulator	212.6'	212.6'	212.6'	212.6'
Height electrical	70°	70°	70°	70°
Current - Phase	0°	-144°	-247.5°	-103.5°
Ratio	1.0	0.83	0.83	1.0
Spacing	Ref.	80°	68.388°	95°
Orientation	Ref.	-59°	20.191°	76°

Ground System: The ground system shall consist of 120 copper radials uniformly spaced about each tower base at least 8" below grade. The area covered is equivalent to a 0.4 λ length system.

Predicted Effective Field:
178 mv/m at 1 mile for 1 kw.


August 10, 1971 K & E
N
400
300
mV/m
200
100
RMS - 178 mV/m
HOYLES NIBLOCK ASSOCIATES LTD.
TELECOMMUNICATIONS CONSULTING ENGINEERS AND ATTORNEYS
3110 BOUNDARY ROAD • VANCOUVER 12, B.C., CANADA
HORIZONTAL RADIATION PATTERN
New Penticton, B. C.
1 kW 900 kHz Class II DA-1
Project: 1210-01 June 1971

1953

~~CHM~~
CHML

DESCRIPTION OF ANTENNA ARRAY

Station: CHMD

Main Studio: Hamilton, Ontario

Power: 5 Kw.

Frequency 900 Kc. Class II

Operation DA-N

Time: U

Location: North Latitude: 43° 10' 52"

West Longitude: 79° 41' 07"

ANTENNA: Two elements of uniform cross section, guyed, insulated at base for series feed. No top loading.

TOWER:	South	North
HEIGHT ABOVE INSULATORS:	175' (60°)	175' (60°)
SPACING:	682' (225°)	
PHASING:	0	+5°
FIELD RATIO:	1.00	0.85

GROUND SYSTEM: Each radiator has a ground system comprising 120 radials each 400 ft. long spaced every 3° about the tower and buried to a depth of 8 to 12 inches. All intersecting radials are bonded together.

Effective Field: Predicted pattern RMS of 380 mv/m at one mile

ORIENTATION: Center line of tower along line bearing N 28° E.

NOTE: This descriptive sheet and attached pattern correct information previously notified.

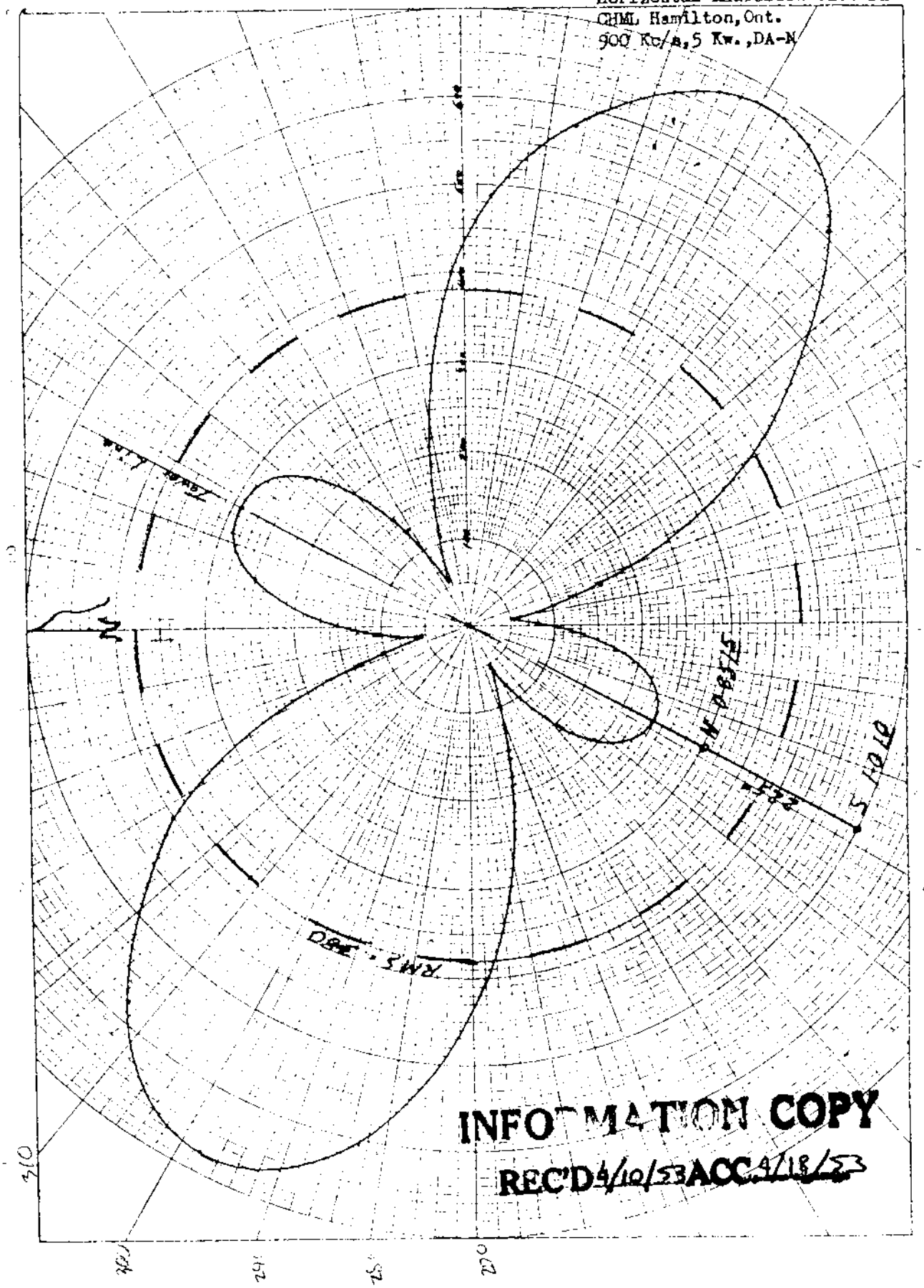
APR 2 1953

1953

CHML

PROPOSED ~~CHMD,~~ HAMILTON, ONTARIO 5 kw, U, DA-N 900 kc
NIGHT (4/29/53G)

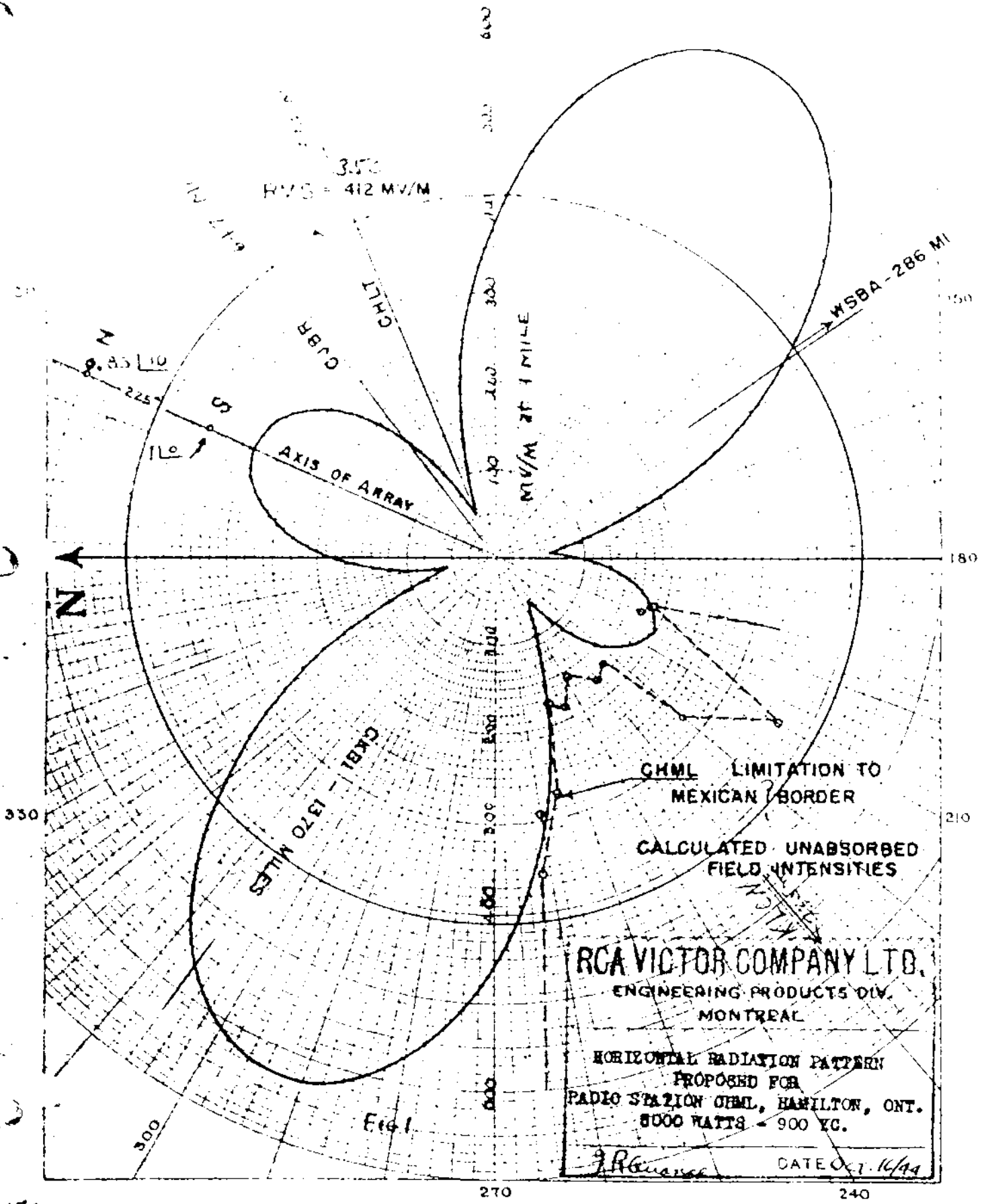
CHML 900 Kc/s
Horizontal Radiation Pattern
CHML Hamilton, Ont.
900 Kc/s, 5 Kw., DA-N



CHMD, Hamilton, Ontario 900 kc

1946 superseded by 4/2 9/53 but retained for added info.

CHML
900



17a

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

CHML

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CHML
Main Studio: Hamilton, Ontario
Frequency: 900 Khz
Power: 50 KW
Time: Unlimited
Class: II
Notification List: 364
Date: June 27, 1977
Geographical Location: 43 - 20 - 00 North
80 - 07 - 15 West

Operation: DA/2

Antenna System:
The array consists of 8 guyed, steel, uniform towers 275' or 90.7 electrical degrees high. The overall height over grade is 280'.

Tower Parameters:

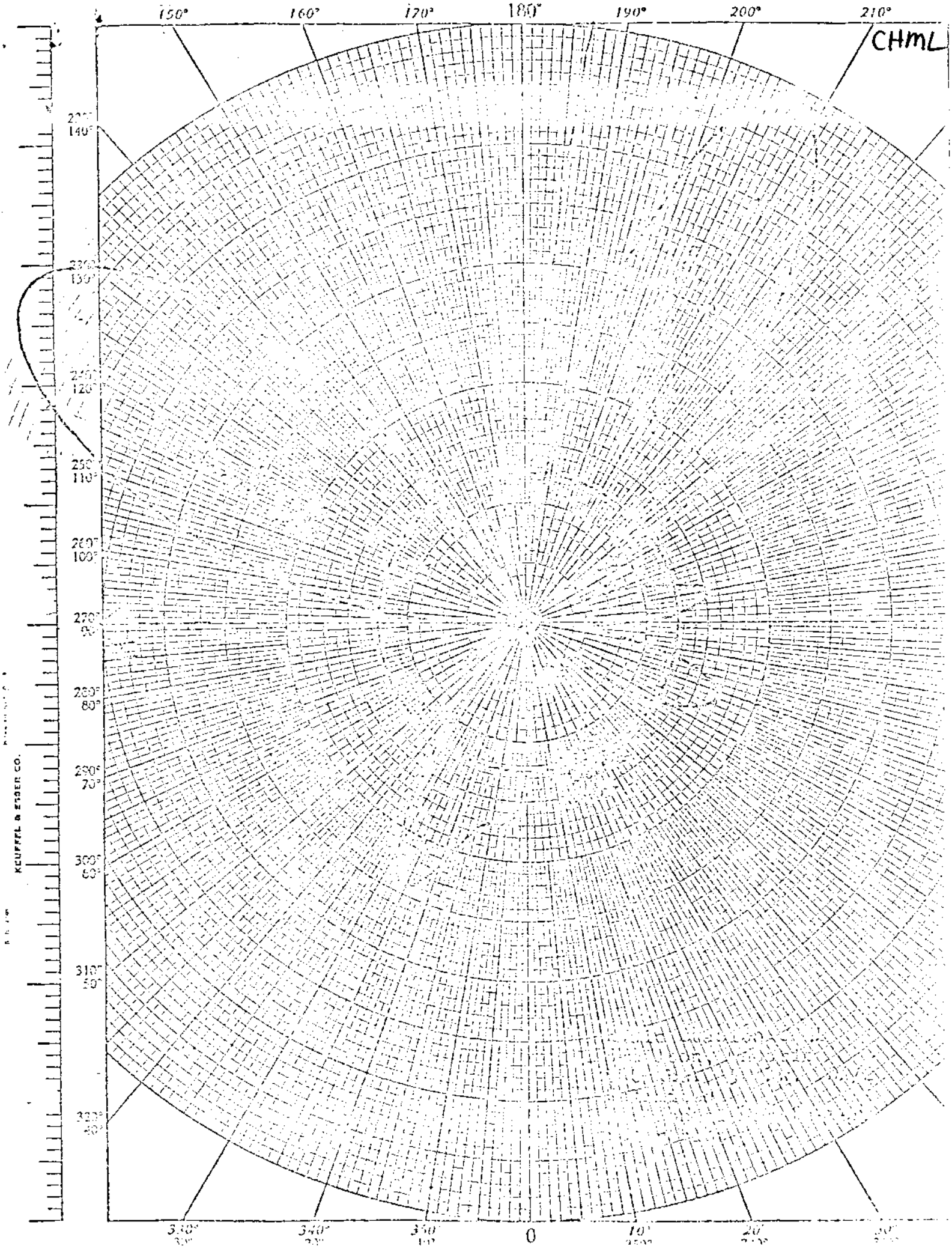
Tower	Orientation (degrees)	Spacing (degrees)	Daytime Ratio	Daytime Phase	Nightime Ratio	Nightime Phase
1	0.0000	0.0000	1.0000	0.0000	1.0000	0.0000
2	23.0000	270.0000	1.8412	18.2696	1.7619	9.6007
3	23.0000	540.0000	1.7375	40.7970	1.6953	35.7590
4	23.0000	810.0000	0.6885	59.1695	0.9032	46.0000
5	318.0000	95.0000	0.8250	103.0000	0.9500	148.0000
6	7.4850	321.8780	1.6123	120.2696	1.6738	157.6007
7	14.5580	586.5030	1.4500	141.7470	1.6105	183.7590
8	17.2170	854.4970	0.6500	160.7500	0.8580	194.0000

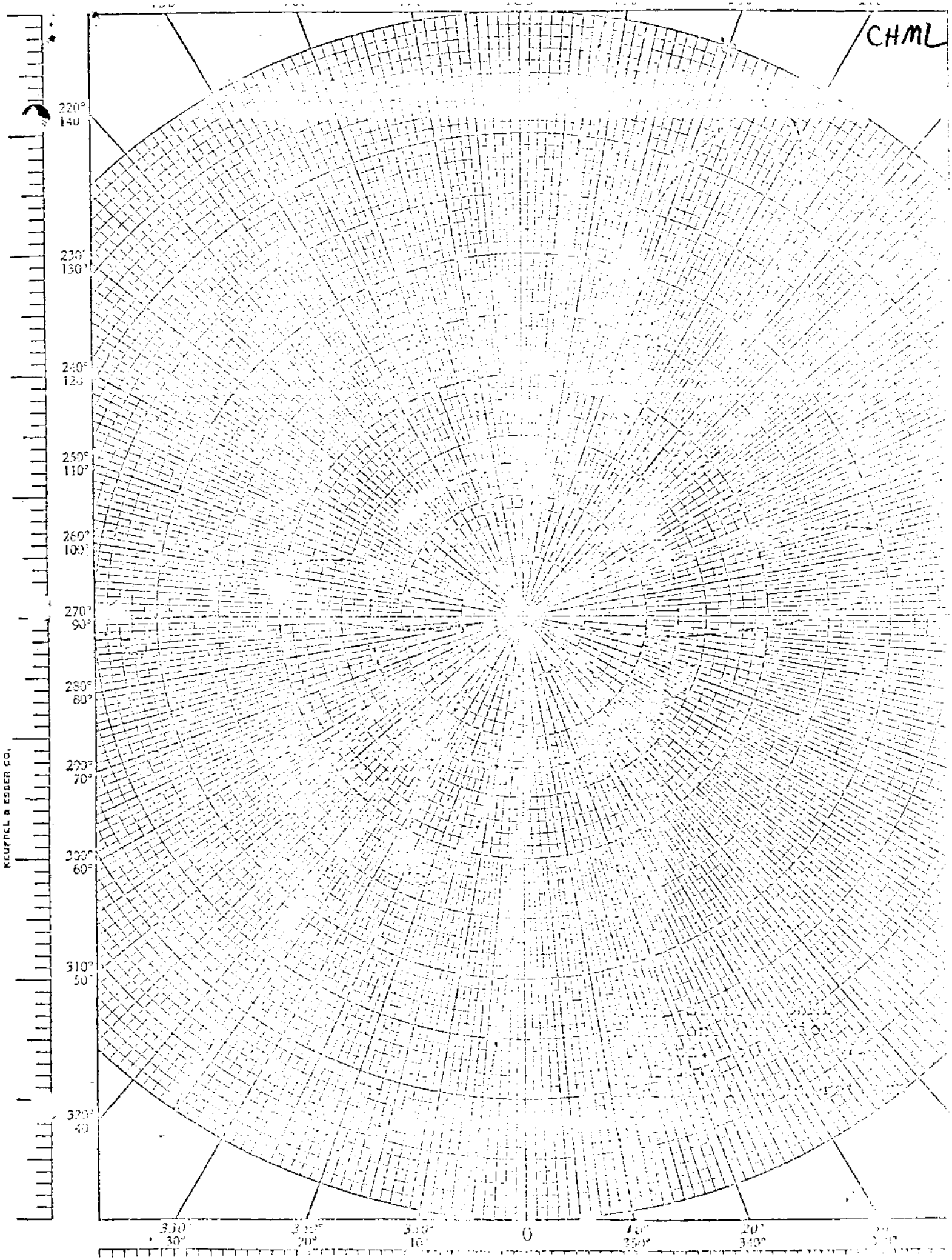
Ground System:
The ground system is to consist of 120 radials per tower buried 8 - 10". Each radial to be 436' (0.4 wavelength) long. In addition a further 120 radials 50' long will be added to each antenna. All ground wire is #10 AWG. Radials will be bonded to common chords at all junctions.

Efficiency:
Expected Daytime: 1237.430 mv/m @ 1 mi. for 50 KW
175.000 mv/m @ 1 mi. for 1 KW

Expected Nightime: 1277.000 mv/m @ 1 mi. for 50 KW
180.595 mv/m @ 1 mi. for 1 KW

Consultant: D. B. Williamson, P. Eng.
D. B. Williamson Communication Consultants Ltd.
P. O. Box 3037, Station B
Calgary, Alberta T2M 4L6


150°
160°
170°
180°
190°
200°
210°
CHML
140°
130°
120°
110°
100°
90°
80°
70°
60°
50°
40°
0
KEUFFEL & ESSER CO.


CHML
220°
140
230°
130°
240°
120
250°
110°
260°
100°
270°
90°
280°
80°
290°
70°
300°
60°
310°
50°
320°
40
30°
20°
10°
0
350°
340°
KEUFFEL & ESSER CO.

CHML

SUPPLEMENTAL DIRECTIONAL

ANTENNA DESCRIPTION SHEET

Station: CHML

Main Studio: Hamilton, Ontario

Frequency: 900 kHz

Power: 50 kW, Class II

Notification List No.: 365

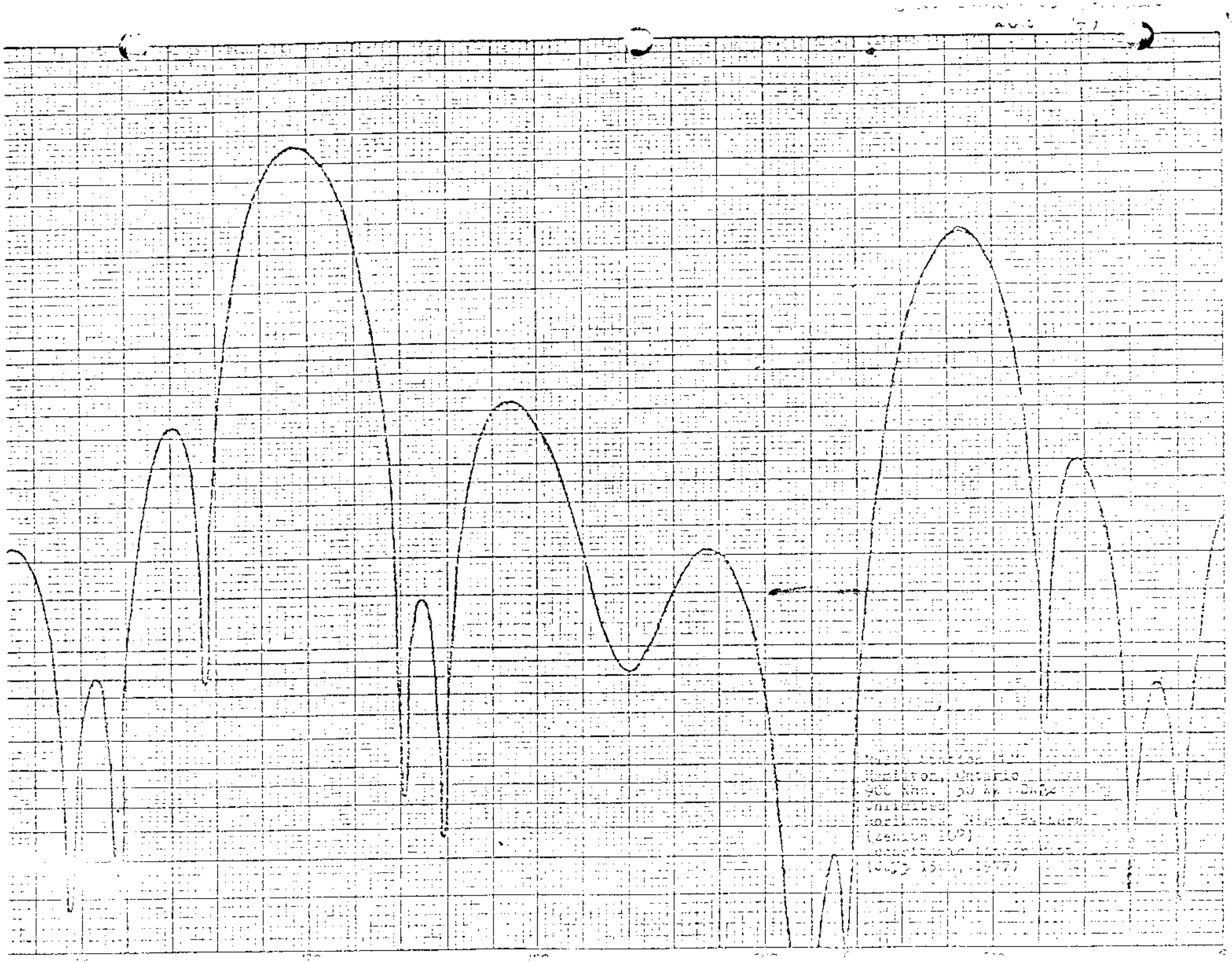
Date: July 29, 1977

Geographical Location of
the Center of the Antenna System:

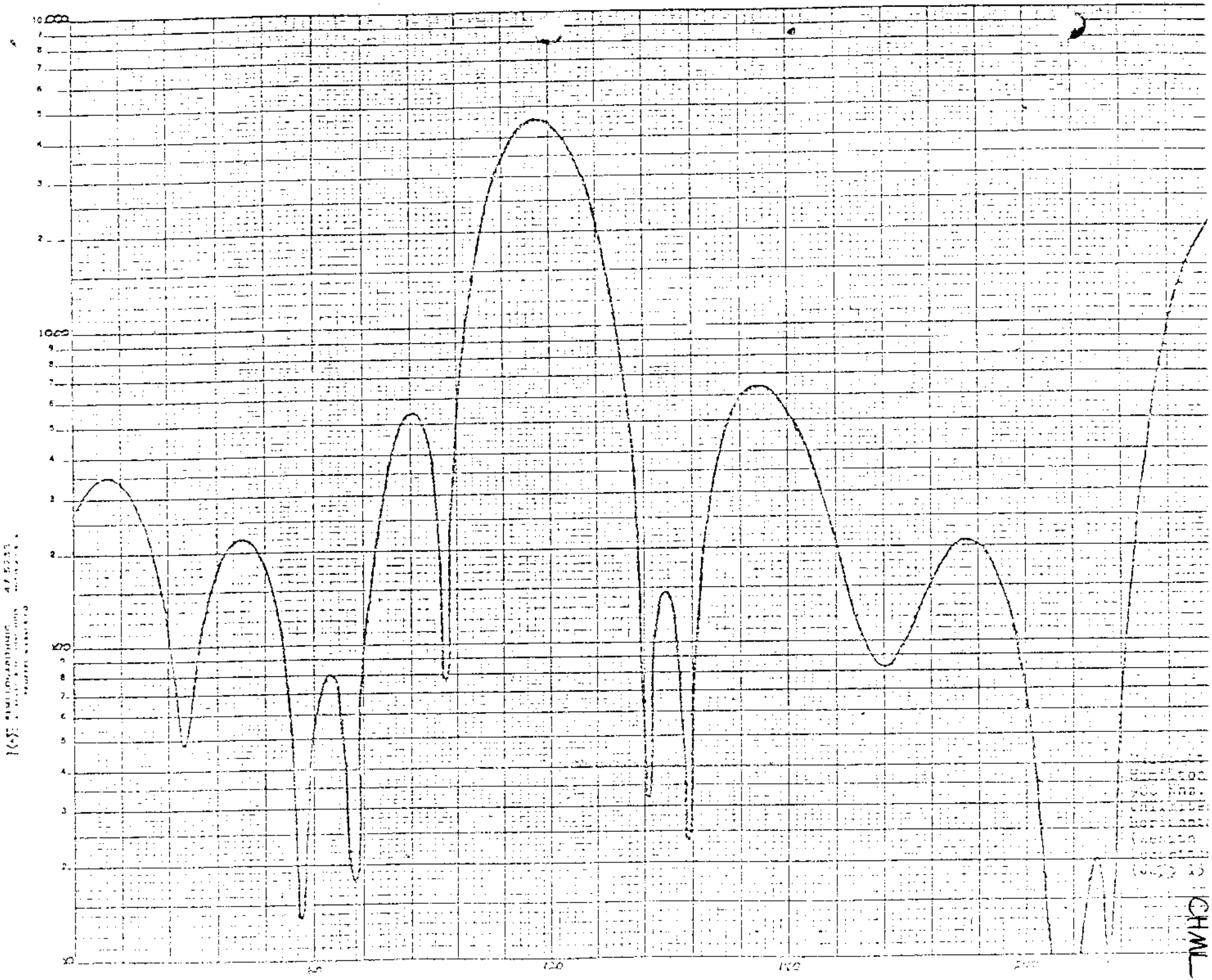
North Latitude: 43° 20' 00"
West Longitude: 80° 07' 15"

Mode of Operation - DA-2

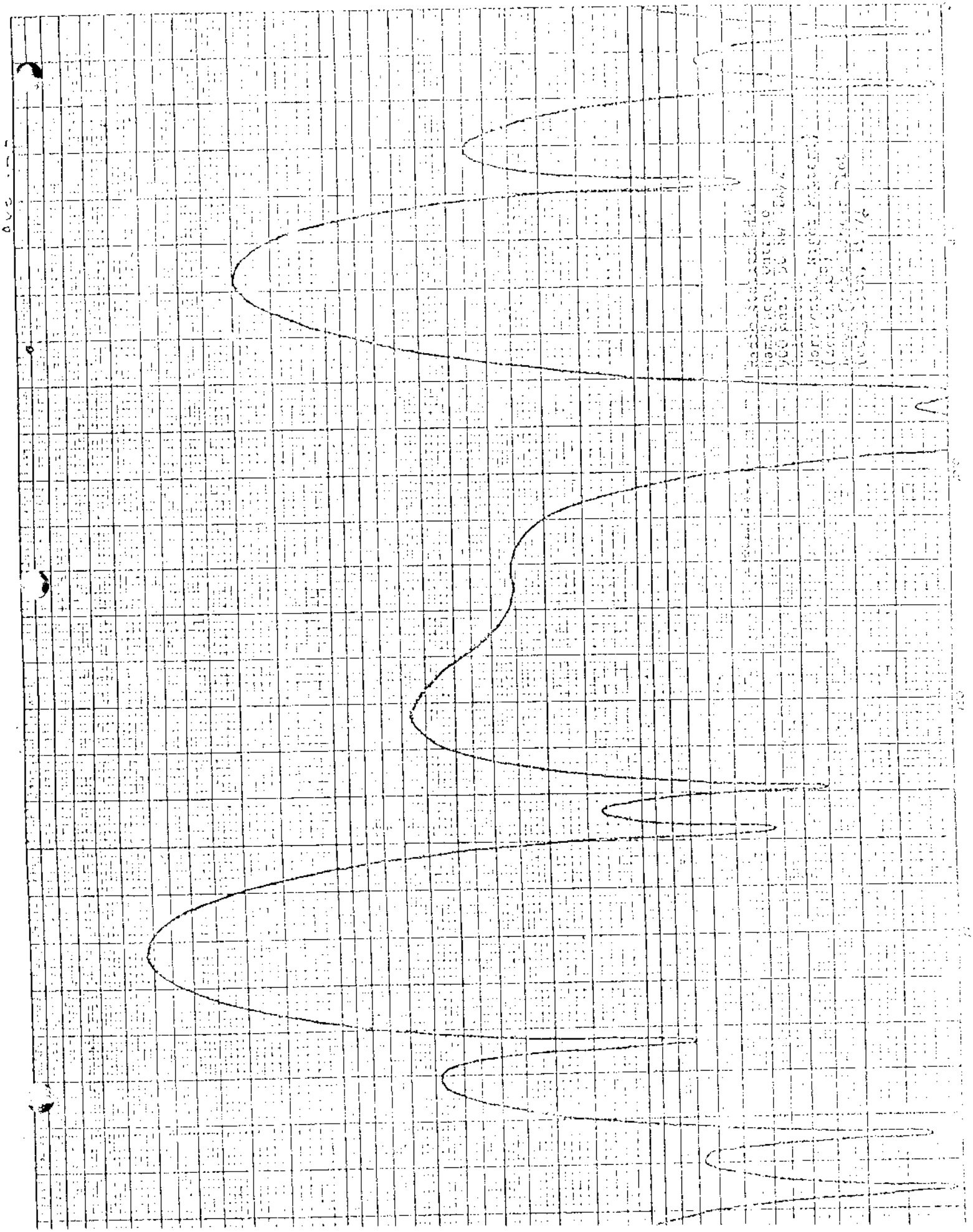
Note: Please retain the description sheet and directional antenna radiation patterns notified for station CHML in Canadian Change List Number 364 dated June 27, but replace the vertical radiation patterns with the attached. This notification is only for the purpose of forwarding the corrected vertical radiation patterns.



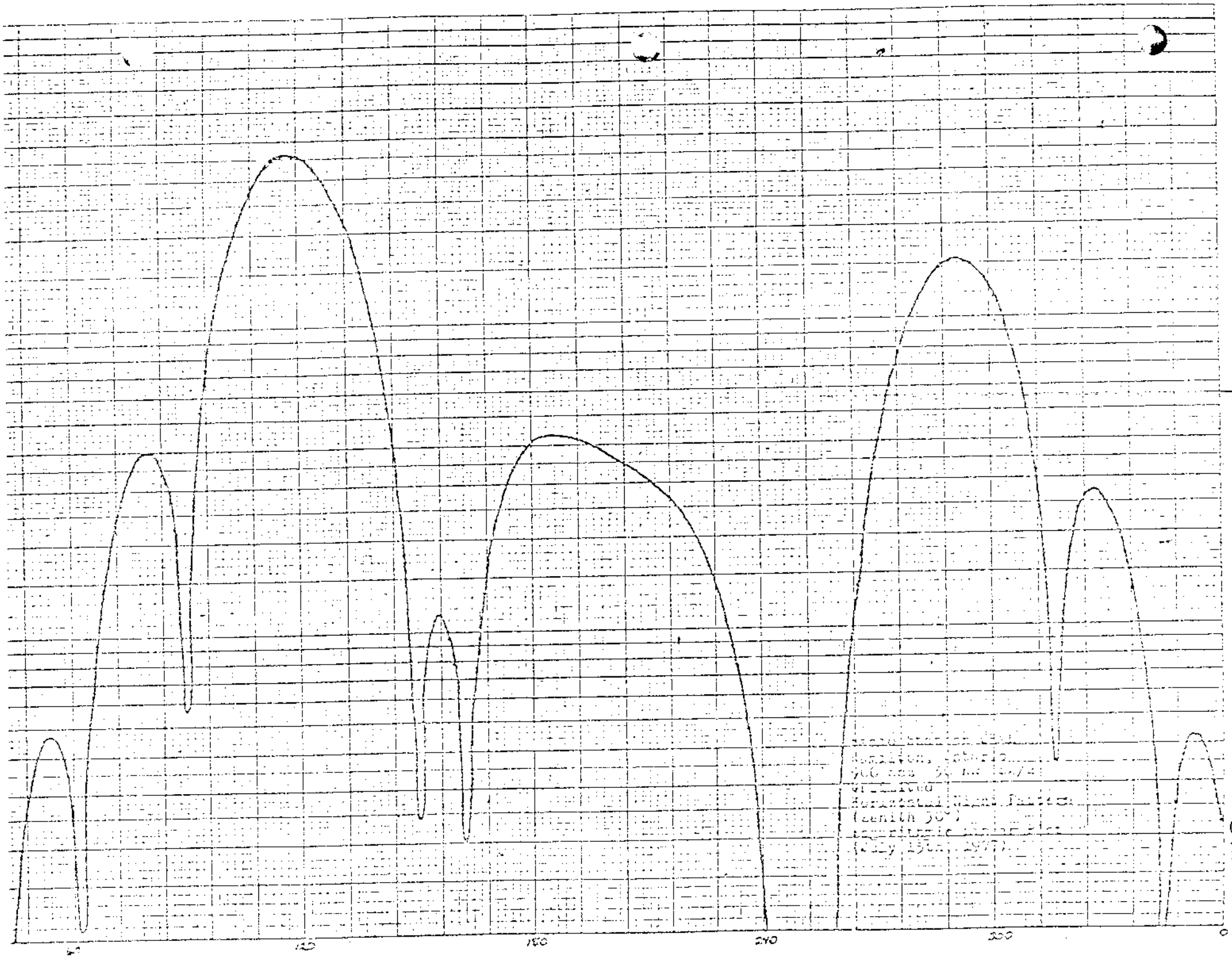
CHML


10,000
1000
100
50
100
150
200

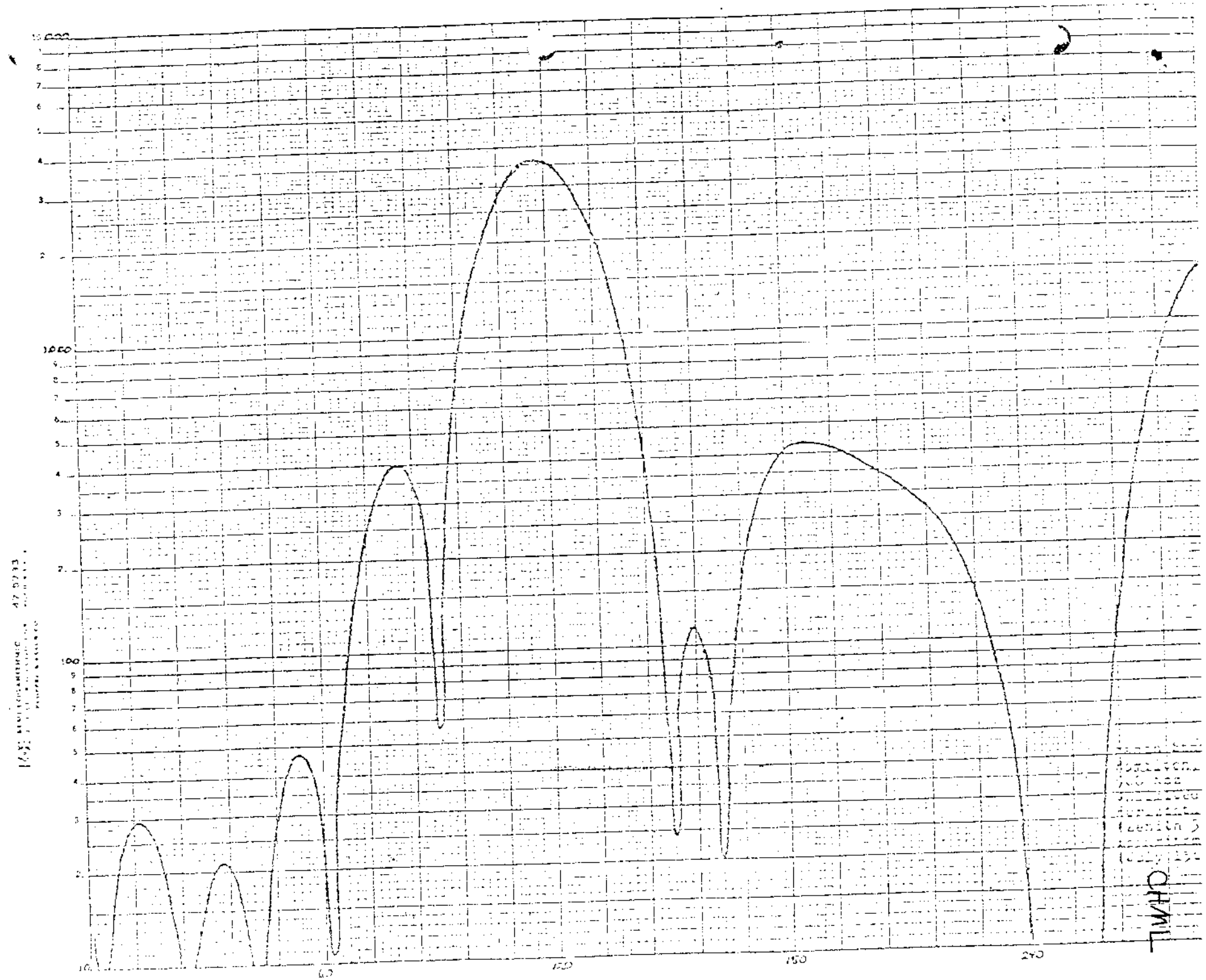
CHML



CH/ML



CHML


10000
1000
100
10
50
100
150
200
CHWL

CHNO

27

DESCRIPTION SHEET (No. 1)
(3-28-60g)

Station CHNO 1kw,10kw-LS, DA-2,U, Class II
Sudbury, Ontario, Canada 900 KC

REVISED
DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CHNO

Main Studio: Sudbury

Frequency: 900 Kc/s

Power: 10 Kw, D Class: II
1 Kw, N

Notification List No.: 127

Date: November 28, 1958

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

North Latitude: 46° 26' 10"

West Longitude: 80° 56' 30"

ANTENNA CHARACTERISTICS

Mode of Operation: DA-2
Number of Elements: 3
Type of elements: Guyed elements, uniform cross section, base insulated, series fed.

TOWER:		#2 North West	#1 South East	#3 North
HEIGHT ABOVE INSULATORS:		170' (56°)	325' (107°)	325' (107°)
OVERALL HEIGHT:		175'	327'	327'
SPACING:			318.5' (105°)	425' (140°)
PHASING:	Day		0	275.5°
	Night	-95°	0	
FIELD RATIO:	Day		1.0	0.9
	Night	0.75	1.0	

ORIENTATION: Radiators #1 and #2 on a line bearing 48° west of north.
Radiators #1 and #3 on a line bearing due north.

GROUND SYSTEM: see below

Predicted effective field Day: RMS 610 mv/m (193 for 1Kw)
Night: RMS 189 mv/m (189 for 1 Kw)

The existing ground system has 120 radials of #10 AWG soft drawn bare copper wire running from towers #1 and #2 and terminating at the boundary of the property, approximately 890' x 1934'. Radials running, between towers are bonded to a #4 AWG stranded soft drawn copper wire.

Revised May, 1959. Day Pattern Revision

CHNO

The proposed ground will have 120 radials of #10 soft drawn bare copper wire running from #3 tower and terminating at the property boundary on the east, north and west and bonded on the south to the existing ground radials of tower #1 by a #4 AWG stranded soft drawn copper wire running at right angles to a line between towers #1 and #3.

Effective length of proposed ground system is 0.646 wave lengths.

CHNO : Sudbury, Ontario
900 kcs, 10 kw D/1 kw N, DA-2
Revision May, 1959

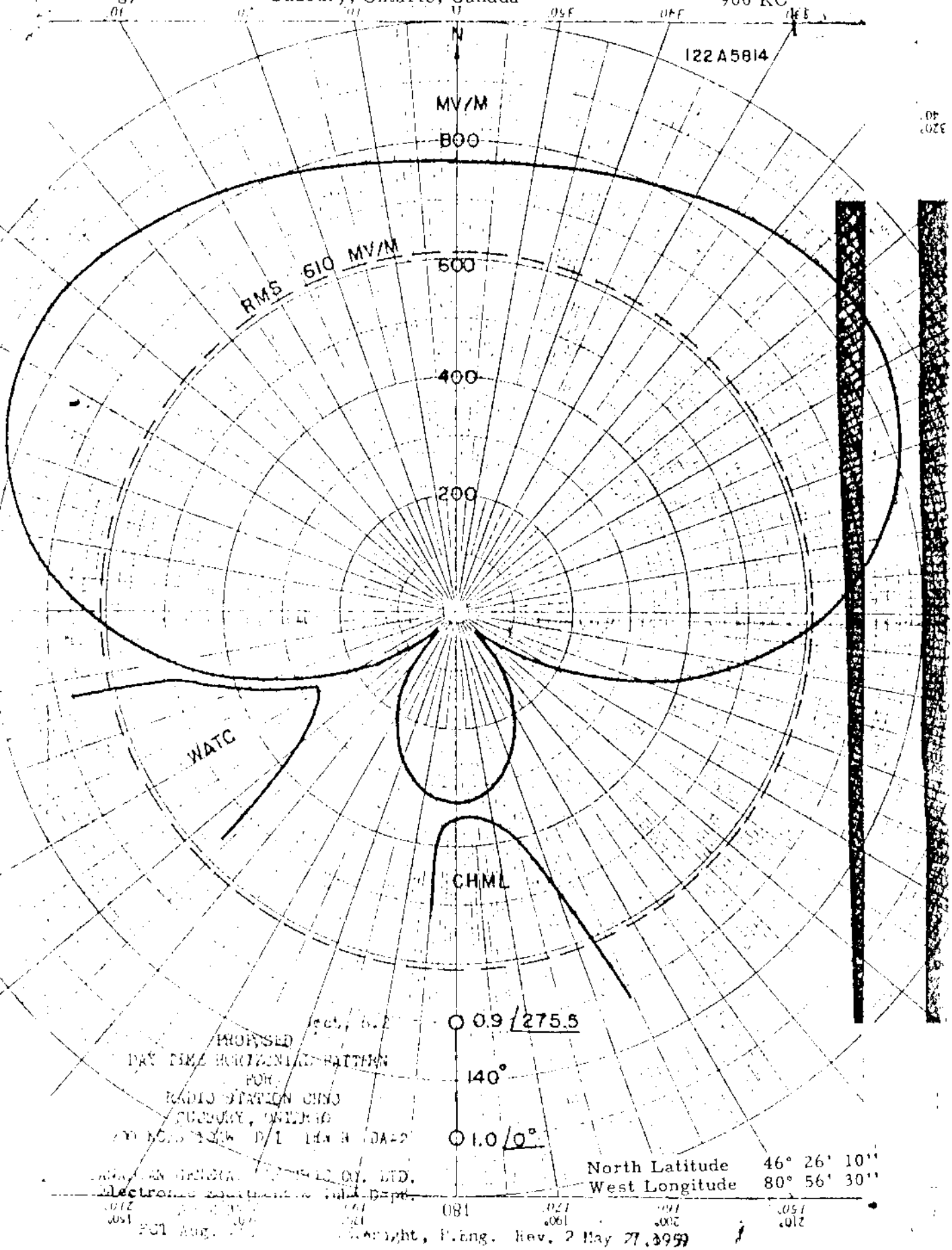
127

CHNO

PROPOSED DAY
(3-28-60g)

Station CHNO
Sudbury, Ontario, Canada

1kw, 10kw-LS, DA-2, U, Class II
900 KC



PROPOSED
DAY TIME HORIZONTAL PATTERN
FOR
RADIO STATION CHNO
SUDBURY, ONTARIO
900 KC 1kw 10kw DA-2

North Latitude 46° 26' 10"
West Longitude 80° 56' 30"

Electronics Engineering Dept.

Aug. ... Wright, P.Eng. Rev. 2 May 27, 1959

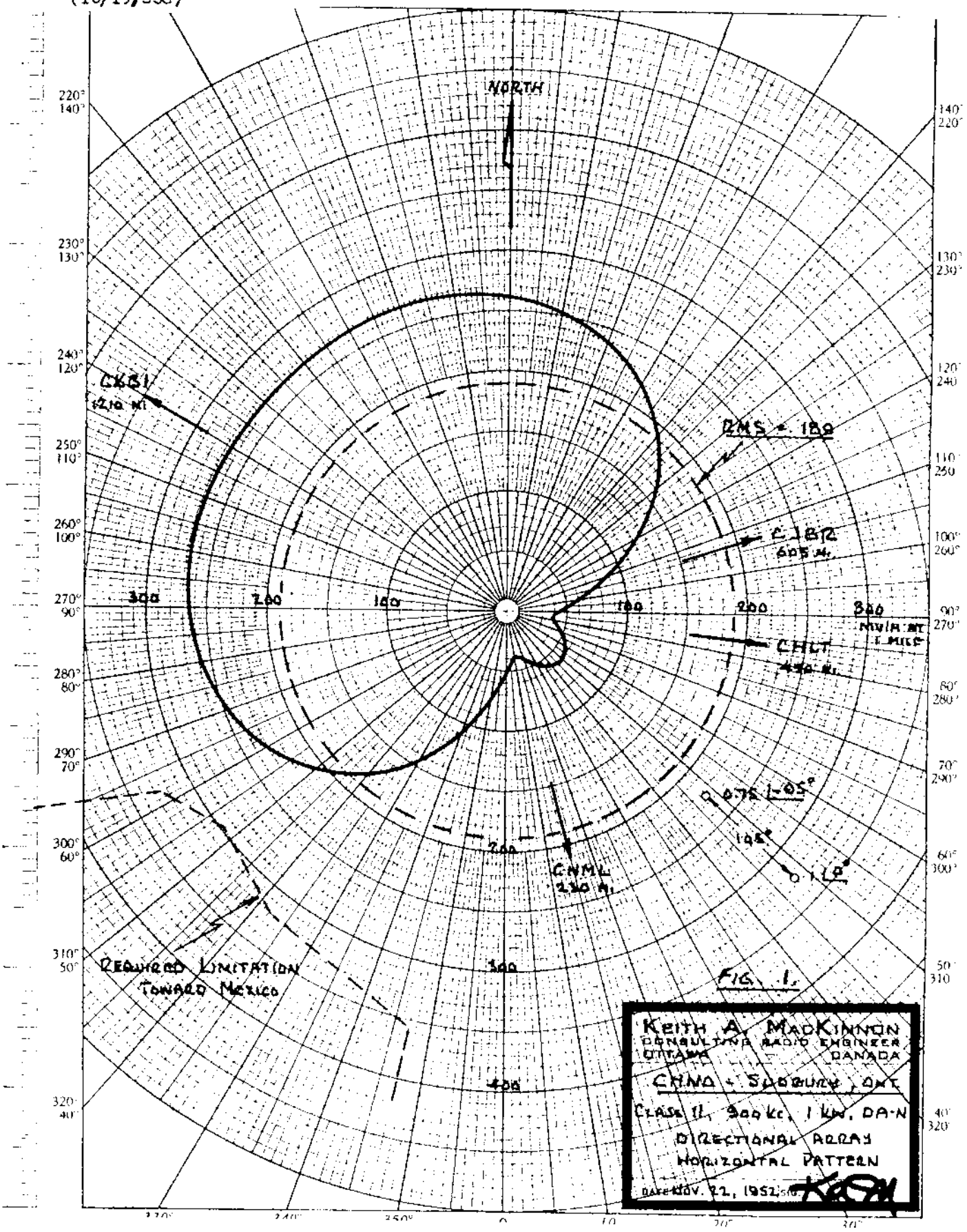
1962

CHNO

PROPOSED NIGHT

CHNO, SUDBURY, ONTARIO
(10/19/53G)

900 kc



CHNO, SUDBURY, ONTARIO

900 kc

CJBR
900kHz

SUPPLEMENTAL DIRECTIONAL

ANTENNA DESCRIPTION SHEET

Station: CJBR

Main Studio: Rimouski, Quebec

Frequency: 900 kHz

Power: 10 kW, Class II

Notification List No.: 401

Date: December 5, 1980

Mode of operation: DA-N, ND-D-214

Geographical Location of
the Center of the Antenna System:

North Latitude: 48° 26' 27"
West Longitude: 68° 34' 42"

Note: Please retain the description sheet and directional antenna radiation patterns notified for station CJBR in Canadian Change List Number 87 dated September 30, 1954 and attach to this supplemental description sheet. This notification is for the purpose of indicating only a correction in the geographical coordinates, and in day-time RMS. The RMS of the night-time directional antenna pattern, 176 mV/m at 1 mile, had been incorrectly notified as the day-time radiation value.

CJBR
900KHZ

I - DESCRIPTION DU SYSTEME A ANTENNE DIRECTIONNELLE

1. INDICATIF D'APPEL: CJBR

2. EMPLACEMENT: Rimouski, Qué.

3. FREQUENCE: 900 KHz

4. PUISSANCE: 10 KW jour et nuit

5. CLASSE: II (illimitée)

6. NOTIFICATION NO: 404 DATE: 5 mai 1981

7. COORDONNEES: Latitude nord: 48° 26' 37"
Longitude ouest: 68° 34' 42"

8. SYSTEME D'ANTENNE:

a) Fonctionnement: directionnel AD-N

b) Type: deux (2) éléments à section carrée, isolés à la base, haubanés et alimentés en série, sans charge au sommet.

c) Mise à la terre: 120 fils de 500' et 120 fils de 45' par élément, espacés également avec courroies d'interconnexion, le tout enfoui sous la surface.

9. MATS D'ANTENNE:

		No.1 (SO)	No.2 (NE)
Orientation (Az):		Réf.	50°
Hauteur au-dessus de l'isolateur:		194' (64°)	300' (99°)
Espacement:		136.5' (45°)	
Phasage:	Nuit:	0°	-143.5°
Rapport d'intensité de champ:	Nuit:	0.973	1.000

10. EFFICACITE MESUREE:

a) Jour: 605.0 mV/m à 1 mille pour 10 KW
191.3 mV/m à 1 mille pour 1 KW

b) Nuit: 541.0 mV/m à 1 mille pour 10 KW
171.1 mV/m à 1 mille pour 1 KW

YVES R. HAMEL
INGENIEUR-CONSEIL

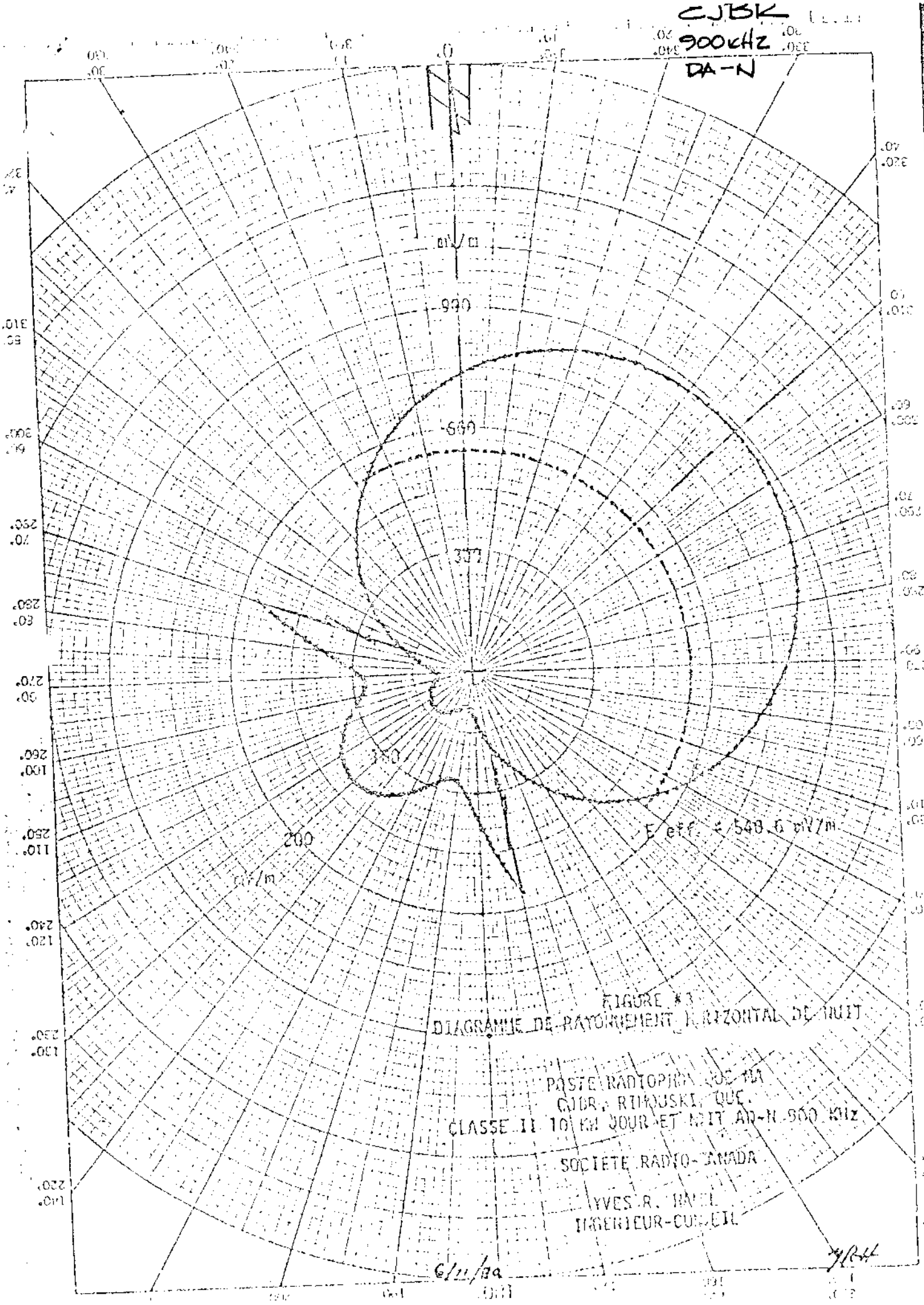


FIGURE #3
DIAGRAMME DE RAYONNEMENT HORIZONTAL DE NUIT

POSTE RADIOPHONIQUE
CJBR, RIMOUSKI, QUE.
CLASSE II 10 KW JOUR ET NUIT AD-N 900 KHz

SOCIETE RADIO-CANADA

YVES R. HAMEL
INGENIEUR-CONSEIL

6/11/80

#87

CJBR

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CJBR

Main Studio: Rimouski, P.Q.

Frequency: 900 Kc.

Power: 10 Kw. **Class:** II

Notification List No.: 87

Date: September 30, 1954

Geographical Location of the Centre of the Antenna System:

North Latitude: 48° 26' 37"
West Longitude: 68° 34' 37"

Antenna:

Mode of Operation: DA-N

Elements: Two guyed, series-fed, no top loading.

Towers:	North-East		South-West
Height above Insulator:	496'		194'
Spacing:		136.5' (45°)	
Phasing:	0°		139° lead
Field Ratio:	1.0		0.77
Orientation:	Line through towers bears N 50° E		
Ground System:	500' radials spaced 3° 45' radials spaced 3°		400' radials spaced 3°

Predicted Effective Field: 556 mv/m at 1 mile (176 per kw.)

#87

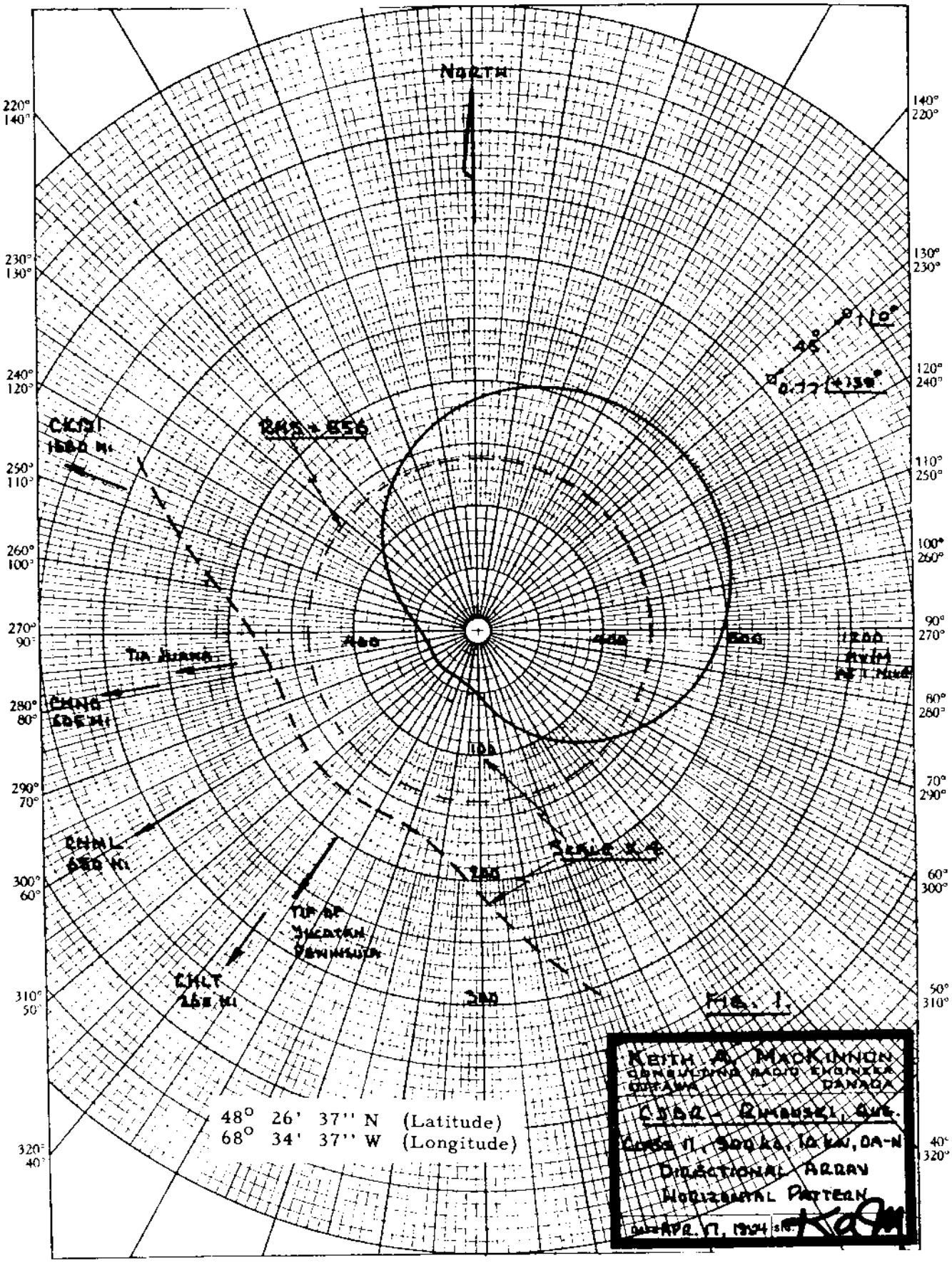
CJBR

PROPOSED NIGHT
(11/18/54G)

CJBR
RIMOUSKI, P.Q.

10 KW
DA-N, CLASS II

900 KC



Notification List No. 87 September 30, 1954

CJBR
RIMOUSKI, P. Q.

900 KC

4/8/87

CJER ST JEROME, QU,

Freq. 900 kHz

Coordinates: 45 49 01
74 02 10

Unl DA1

#TWRs 3

Power 1 kW

RMS 179

	(1)	(2)	(3)
Fill Ratio	1.0	0.6201	0.6200
Height	60°	60°	60°
Phase	0	42	318
Orientation	0	67.005	247.005
Spacing	0	200	200

4/8/87

CJBR, Rimouski, QU (operating)

Freq 900 kHz

Coordinates 48 26 27
68 34 42

TWRS : 2

RMS 556, 10 KW

	①	②
Field Ratio	1.0	0.77
Height	163.28	63.86
Phase	0	139
Orientation	0	230
Spacing	0	45

(proposal)

CJBR, Rimouski, QU

Freq 900 kHz, 10 KW

Coord 48 26 27
68 34 42

TWR 2

RMS 541

	①	②
Field Ratio	0.873	1.0
Height	64	99
Phase	0	−143.5
Orientation	0	50
Spacing	0	45

IFRB Serial No. 12140

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT

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

CJER 900 kHz

PART I GENERAL INFORMATION

(01) Administration: CANADA Sheet No. 411 Date 82.4.5

Assigned frequency (kHz)		(02)	900
Transmitting station	Name of the station	(03)	ST. JEROME QU
	Call sign	(04)	CJER
	Additional identification	(05)	
	Station class	(06)	
	Operational Status	(07)	
Country		(08)	CAN
Geographical coordinates of the transmitting station		(09)	W N

(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 [X] No [ ]

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

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

(44) Remarks

COORDINATION UNDER ARTICLE 4:								
COUNTRY	USA							
IN PROGRESS								
ACCEPTANCE OBTAINED								

#184

CJVI

Description Sheet
(2-28-64ct)

Station CJVI
Victoria, B.C.

10kw,DA-1,U, Class II
900kc

Description of Array

Station : CJVI Main Studio : Victoria, B. C.

Frequency : 900 kc Power : 10 kw Class : II

Notification List : 184 Date : February 10, 1964

Geographical Location
of Antenna System : N. Lat. 48° 26' 28" , W. Lng. 123° 15' 13"

Antenna Characteristics : Mode of Operation : DA-1
Number of Elements : 2
Type of Element : guyed, uniform cross-section, series-fed, no top loading

	West Tower	East Tower
Height above insulator	273' (90°)	273'
Spacing	273'	
Field Ratio	0.86	1.0
Phasing	113° lag	0°

Ground System : 120 radials extending to sea or to 400', and 120 radials, 40' long, equally spaced about each tower base.

Orientation of Towers : Line through towers bears 115°.

Predicted Effective Field : 611 mv/m at 1 mile (193 per kw)

.....

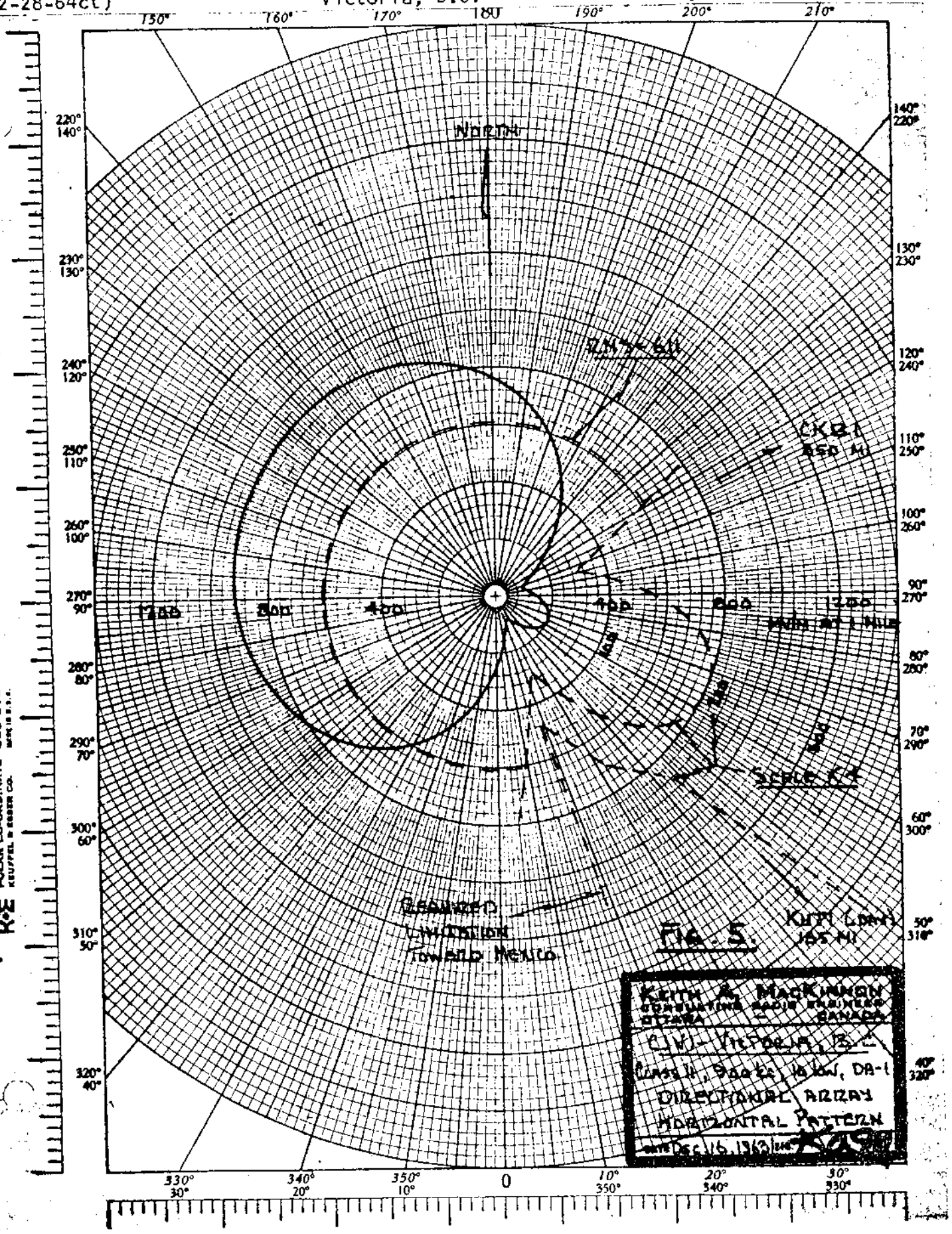
184

CJVI

Proposed Day & Night
(2-28-64ct)

Station CJVI
Victoria, B.C.

10kw,DA-1,U, Class II
900kc



#107

CKBI

DESCRIPTION SHEET (1-10-58g) Station CKBI Prince Albert, Saskatchewan, Canada 10kw, DA-2, Class II 900 KC

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CKBI

Main Studio: Prince Albert, Sask.

Frequency: 900 kc.

Power: 10 kw Class: II

Notification No: 107

Dated: December 10, 1956.

Location:

North Latitude: 53° 06' 13"

West Longitude: 105° 45' 30"

Antenna: Mode of Operation: DA-2

Two elements, uniform cross-section, guyed, series-fed, no top loading.

TOWERS:	South #1	North #2
HEIGHT ABOVE INSULATOR:	300' (99°)	300'
SPACING:	273' (90°)	
DAY PHASING:	-135°	0°
DAY FIELD RATIO:	0.35	1.0
NIGHT PHASING:	0°	-100°
NIGHT FIELD RATIO:	1.0	0.70

GROUND SYSTEM: 440' radials spaced every 3° about each tower, 45' radials spaced every 1½° about each tower.

Predicted Effective Field: Day - 620 mv/m (196 mv/m for 1 kw.)
Night - 609 mv/m (192 mv/m for 1 kw.)

Orientation: On a line 005° true.

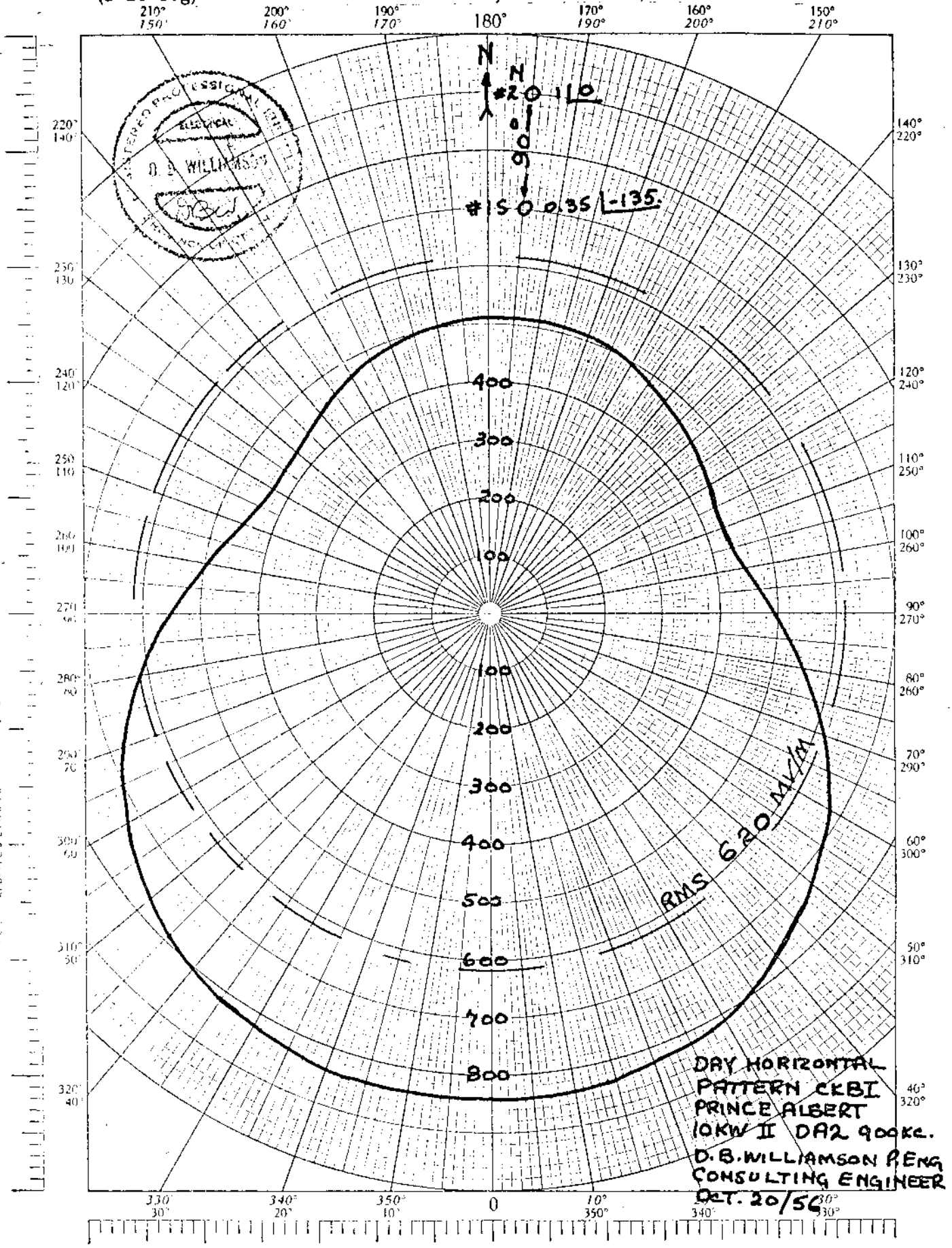
CKBI

#107

PROPOSED DAY (1-10-58g)

Station CKBI **Prince Albert, Saskatchewan, Canada**

10kw, DA-2, Class II **900 KC**



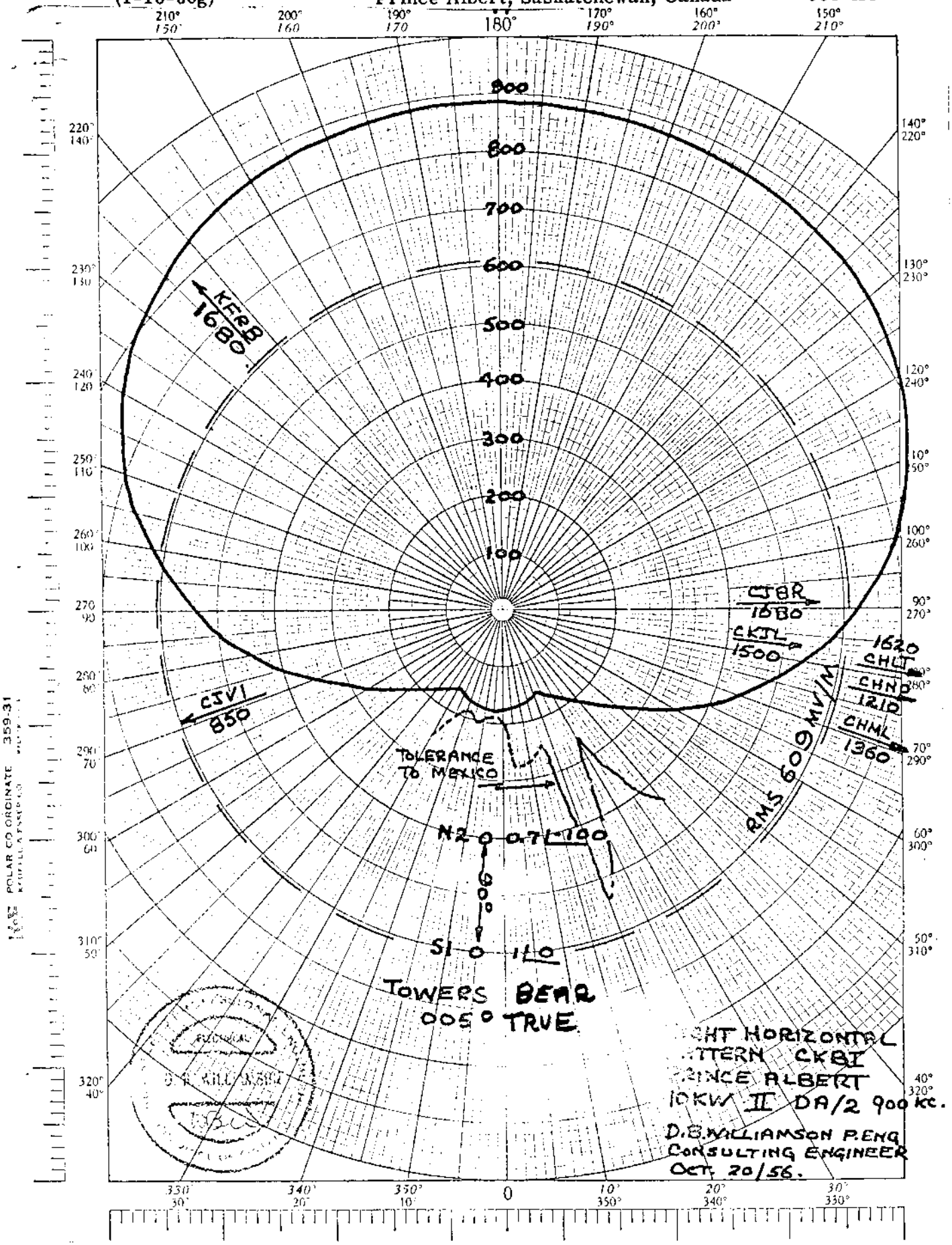
CKBI

#107

PROPOSED NIGHT
(1-10-58g)

Station CKBI
Prince Albert, Saskatchewan, Canada

10kw, DA-2, Class II
900 KC



191

DESCRIPTION SHEET
(11-27-64ct)

Station CKDH
Amherst, N. S., Canada

CKDH
1kw,DA-2,U,Class II
900 kc

(d) DESCRIPTION OF ARRAY

STATION: CKDH

MAIN STUDIO: Amherst, N. S.

FREQUENCY: 900 Kc/s

POWER: 1000 Watts

Class II

GEOGRAPHICAL LOCATION:

45 - 50 - 42 North

64 - 12 - 41 West

NOTIFICATION LIST # 191

OCTOBER 16,1964

ANTENNA CHARACTERISTICS

Mode of operation - DA/2
Number of Elements - 2
Type of Elements - Guyed, uniform cross section, base insulated, no top loading.

TOWER:	# 1 (NW)	# 2 (SE)
HEIGHT OVER INSULATORS:	182' (60°)	182' (60°)
SPACING:	273' (90°)	
ORIENTATION:	Reference	111° TRUE
NIGHT PHASING:	0	- 100°
NIGHT RATIO:	1.00	0.817
DAY PHASING:	0	- 100°
DAY RATIO:	1.00	0.300

GROUND SYSTEM: 120 Radials per tower spaced 3°, bonded to common chord, each radial 0.4 wavelength. System buried in salt marsh 8".

PREDICTED FIELD: 185 mv/m. @ 1 mi. for 1 KW Day
180 mv/m. @ 1 mi. for 1 KW Night

PLEASE RETAIN NIGHTTIME DESCRIPTION SHEETS. THIS CHANGE CONCERNS A CHANGE FROM DA-N to DA-2 ONLY.

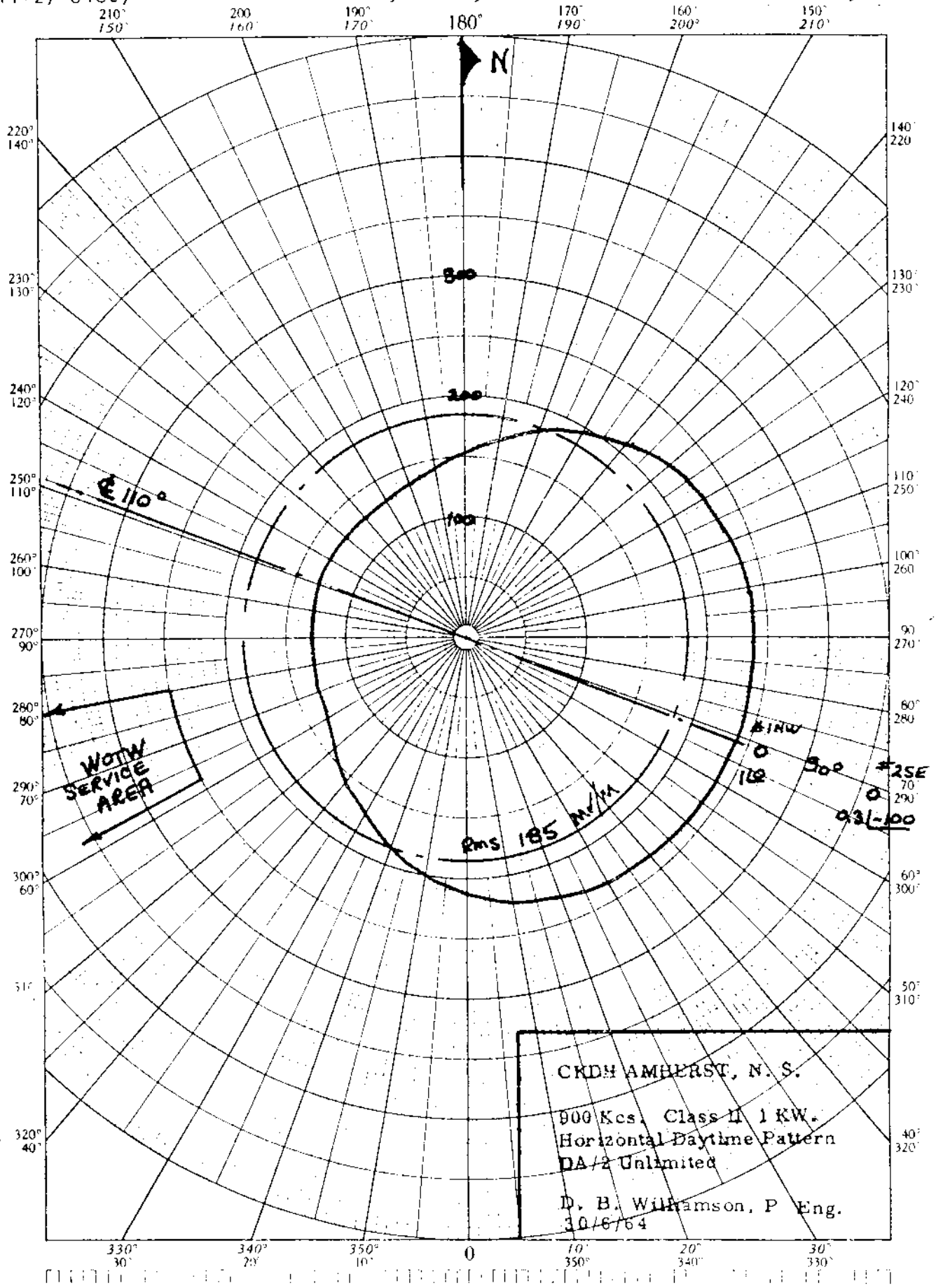
#191

CKDH

Proposed Day
(11-27-64ct)

Station CKDH
Amherst, N. S., Canada

1kw,DA-2,U,Class II
900 kc



#184

CKDH

Description Sheet (2-28-64ct) | Station CKDH Amherst, N.S. | 1kw,DA-N,U, Class II 900kc

3.....

(d) DESCRIPTION OF ARRAY

STATION CKDH

MAIN STUDIO: Amherst, N. S.

FREQUENCY: 900 Kcs

POWER: 1000 watts

Class II

GEOGRAPHICAL LOCATION:

45 - 50 - 42 North

64 - 12 - 41 West

ANTENNA CHARACTERISTICS

Mode of operation - DA/N
Number of Elements - 2
Type of Elements - Guyed, uniform cross section, base insulated, no top loading.

TOWER	# 1 (NW)	2 (SE)
HEIGHT OVER INSULATORS:	182' (60°)	182' (60°)
OVERALL HEIGHT:	186'	186'
SPACING:	273' (90°)	
ORIENTATION:	Reference	111° TRUE
NIGHT PHASING:	0	-100°
NIGHT RATIO:	1.00	0.847

GROUND SYSTEM: 120 radials per tower spaced 3°, bonded to common chord, each radial 0.4 wavelength. System buried in salt marsh 8"

PREDICTED FIELD: 180 mv/m @ 1 mi for 1 KW day & night

NOTIFICATION LIST NO. 184 DATE February 10, 1964

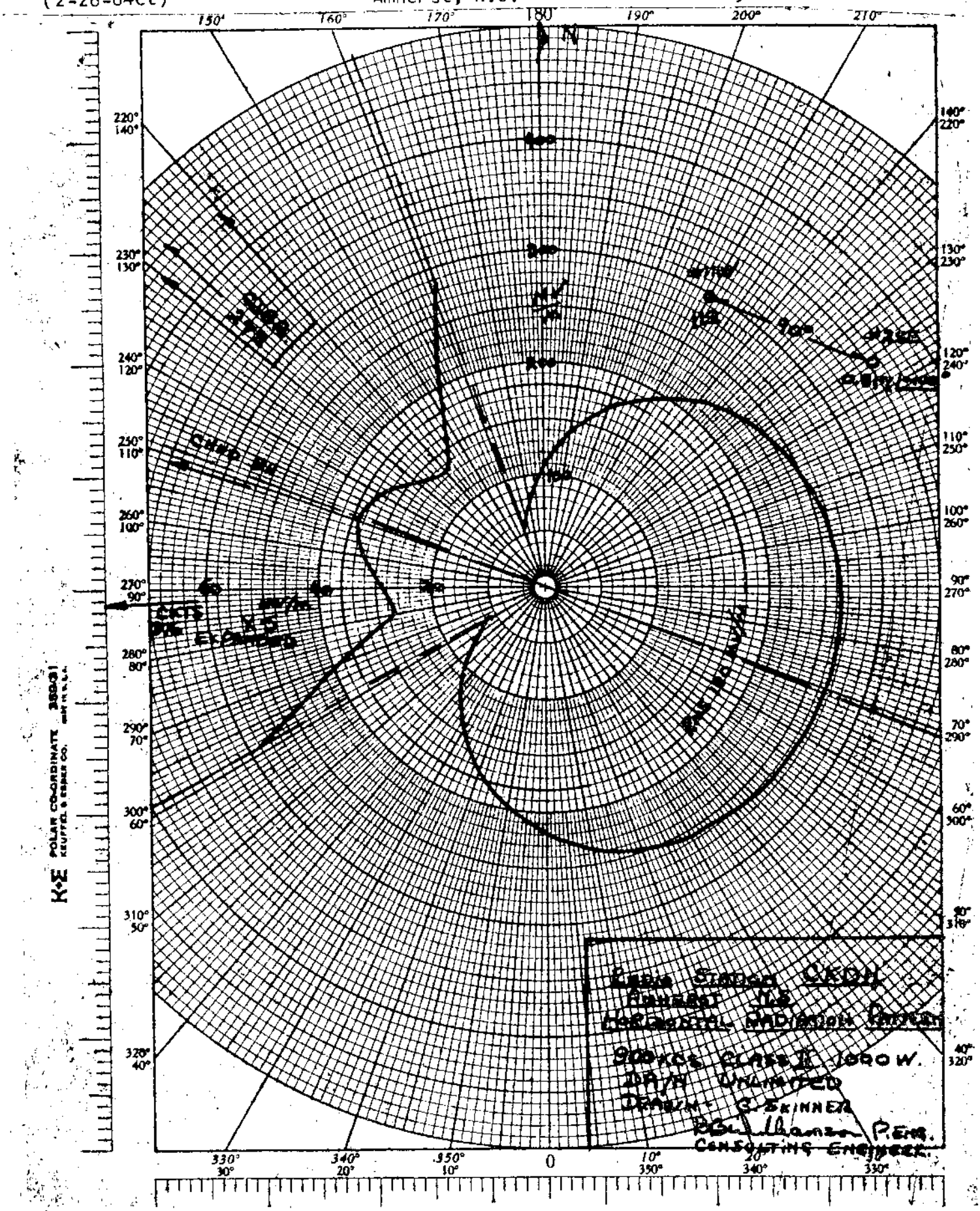
#18A

CKDH

Proposed Night
(2-28-64ct)

Station CKDH
Amherst, N.S.

1kw,DA-N,U, Class II
900kc



#188

CKDR

Description Sheet
(6-29-64ct)

Station CKDR
Dryden, Ontario

250w,1kw-LS,U,Class II
900 kc

OMNI-DIRECTIONAL ANTENNA DESCRIPTION SHEET

STATION: CKDR

MAIN STUDIO: Dryden, Ontario.

FREQUENCY: 900 KC/S

POWER: 1 KWD/0.25 KWN

CLASS: II

TIME: Unlimited

NOTIFICATION REFERENCE: 188

DATE: May 22, 1964

GEOGRAPHICAL LOCATION:

49° 48' 47" N. LATITUDE
92° 49' 45" W. LONGITUDE

ANTENNA CHARACTERISTICS

HEIGHT: 273' (90°)

EXPECTED EFFICIENCY: 95 mv/m at 1 mile for 250 watts
190 mv/m at 1 mile for 1 Kw.

GROUND SYSTEM: 120 equally spaced radials the north and south radials are greater than .25 wavelength long (273') all westerly radials are longer than 0.4 wavelength (436') to provide an equivalent 0.4 wavelength ground system.

TYPE OF ELEMENT: Uniform cross section guyed steel tower, base insulated for series feed.

RCA VICTOR COMPANY, LTD.
MONTREAL, QUEBEC.
Project 4080-A.

Revised March 5, 1964.

#92

CKJL

Description Sheet
(11-30-61ct)

Station CKJL
St. Jerome, Quebec

1kw,DA-1,U,Class II
900 kc

CORRECTED

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CKJL

Main Studio: St. Jerome, Quebec

Frequency: 900 kc.

Power: 1 kw

Notification List No. 92

Date: March 29, 1955

Class:

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

North Latitude: 45° 49' 06"

West Longitude: 74° 02' 01"

ANTENNA CHARACTERISTICS

Authorized for Day and Night operation. (DA-1)
Number of elements: Three.
Type of elements: Series fed, uniform square cross-section, guyed, vertical steel towers, base-insulated, no top loading.

TOWERS:	WEST	CENTRAL	EAST
Height of radiator:	182' (60°)	182'	182'
Overall height:	186'	186'	186'
Spacing:	608' (200°)	608' (200°)	
Phasing:	42° lag	0°	42° lead
Field Ratio:	0.62	1.00	0.62

Ground System: 120 radials, [illegible]' long, equally spaced by 3° around each tower, with the exception of those joining intermediate along common chord. Wires continuous or bonded together at junction points, buried at a depth of eight inches.

Orientation of towers: Towers on a line bearing 67° 00' 20" east of true north.

Predicted effective field: 179 mv/m (179 mv/m for 1 kw)

NOTE: This corrected description sheet and antenna pattern replace those previously supplied for station CKJL and concern only a small correction in the orientation of the antenna towers, with the pattern being changed accordingly.

October 27, 1961.

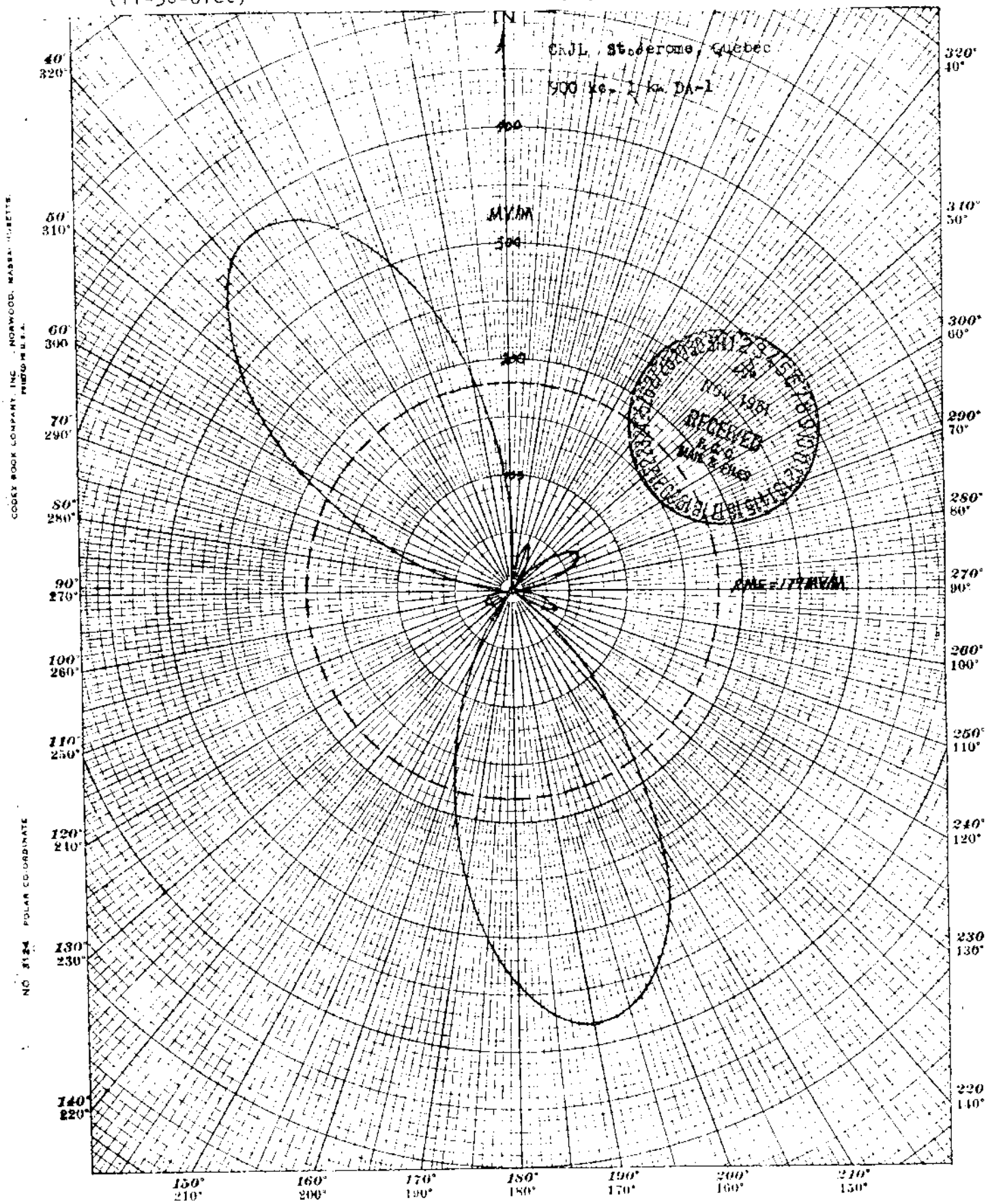
CKJL

#92

Proposed Day & Night
(11-30-61ct)

Station CKJL
St. Jerome, Quebec

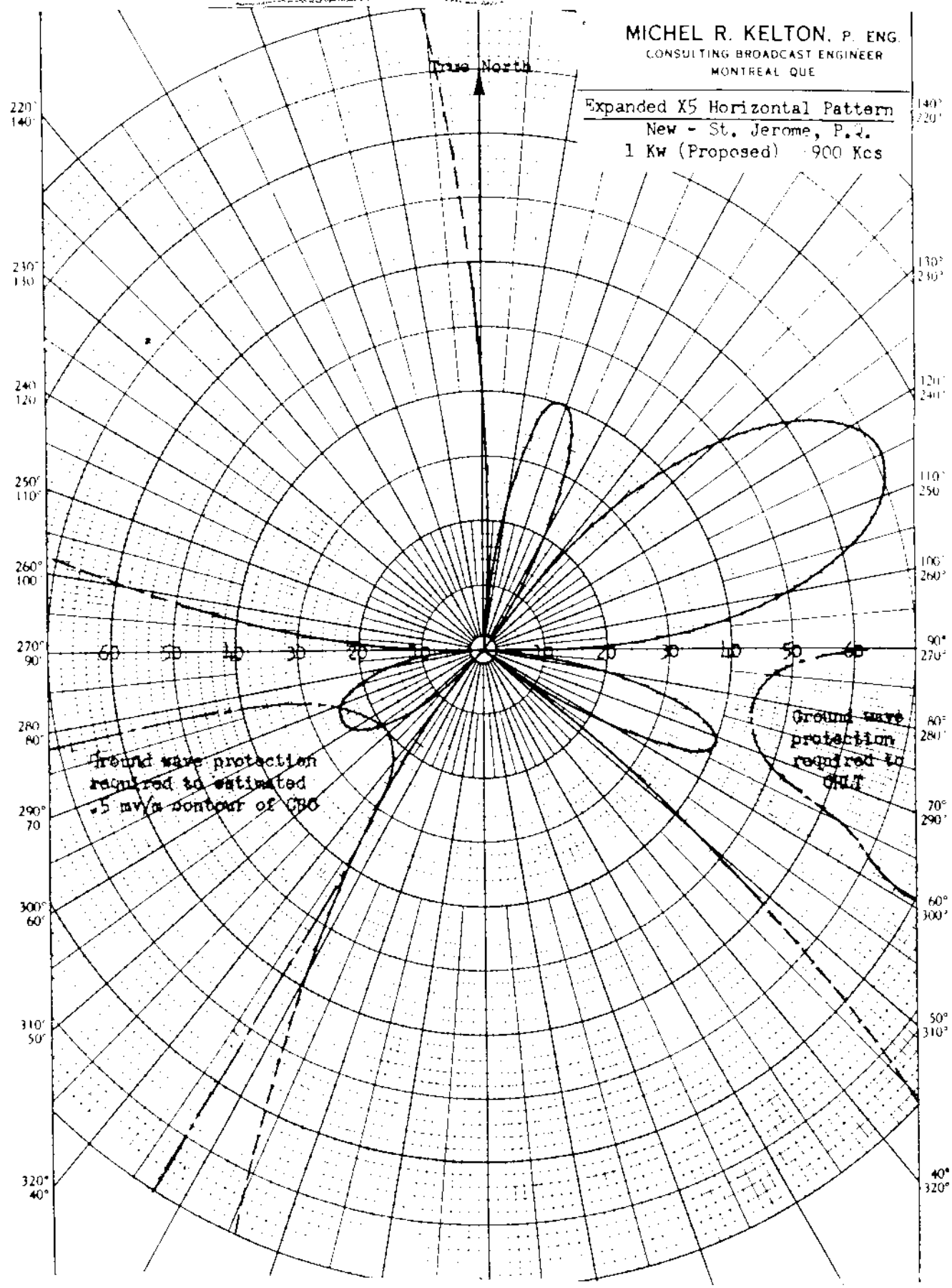
1kw,DA-1,U,Class II
900 kc



55

CKJL

PROPOSED DAY & NIGHT NULLS STATION NEW 1KW
(5/3/55G) ST. JEROME, P.Q., CANADA DA-1, CLASS II 900 KC



NOTIFICATION LIST NO. 92 DATE: 3/29/55 NEW, St. Jerome, P.Q. 900 KC

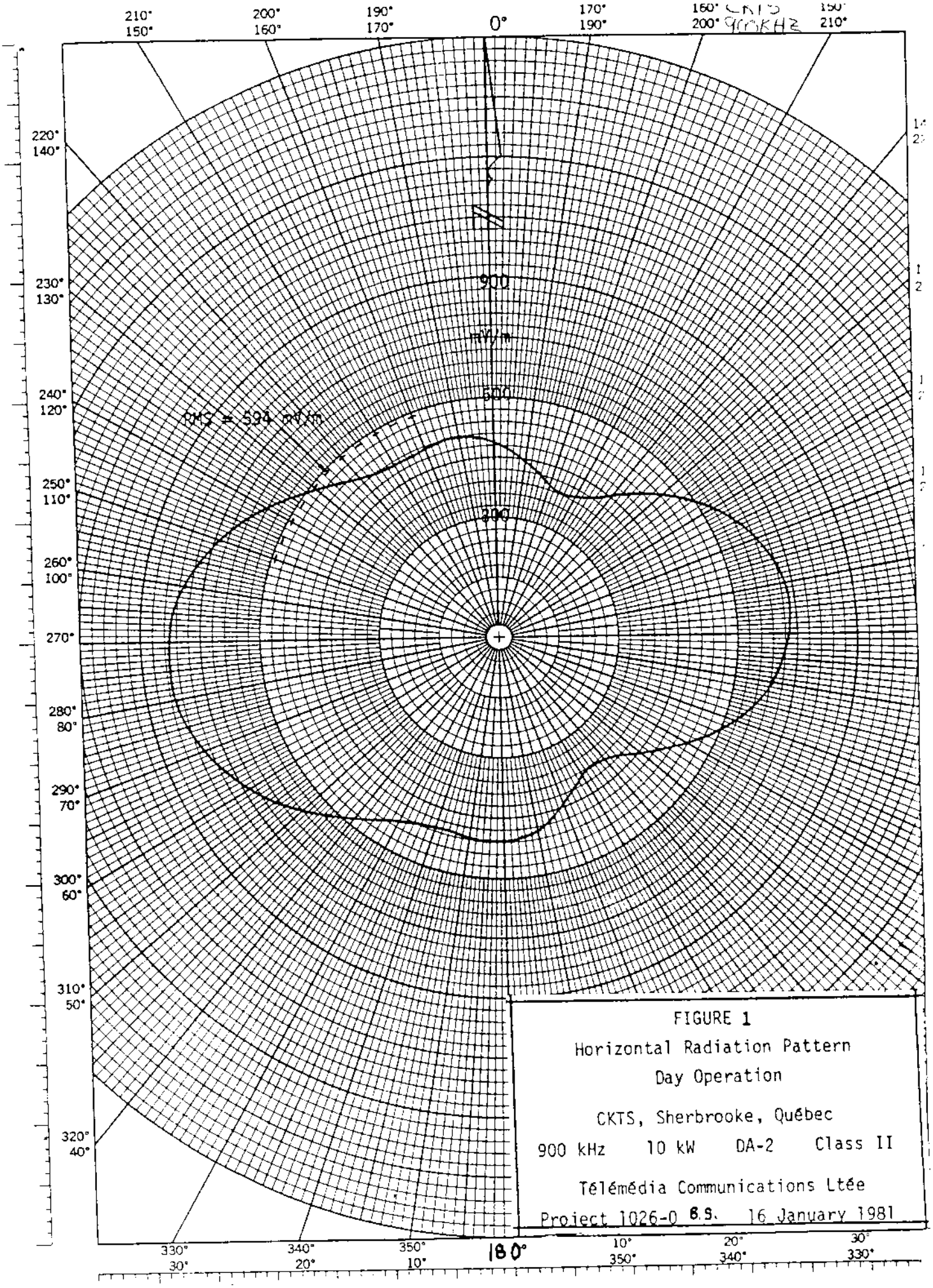


FIGURE 1

Horizontal Radiation Pattern

Day Operation

CKTS, Sherbrooke, Québec

900 kHz 10 kW DA-2 Class II

Télémédia Communications Ltée

Project 1026-0 B.S. 16 January 1981

CKTS
900 KHZ

PROJECT 1026-0

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station:	CKTS	Main Studio:	Sherbrooke, Qué.
Frequency:	900 kHz	Power:	10 kW
		Class:	II
Notification List No:	406	Date:	July 20, 1981
Geographical Location of the Antenna System:		North Latitude:	45° 26' 28"
		West Longitude:	72° 00' 35"

ANTENNA CHARACTERISTICS

Mode of Operation:	DA-2
Number of Elements:	Five (5)
Type of Elements:	Uniform cross-section, guyed steel towers, base insulated for series feed, no top-loading.

TOWER	1	2	3	4	5
Height above insulator	182'(60°)	182'	182'	182'	182'
Overall Height	187'	187'	187'	187'	187'
Field Ratio					
Day	1	0.711	0.3	-	-
Night	1	-	1	1	1
Phasing					
Day	REF	-173.8°	0°	-	-
Night	REF	-	23°	169.4°	146.4°
Spacing					
Day	REF	86°	172°		
Night	REF	-	172°	209°	75°
Orientation					
Day	REF	265°	265°		
Night	REF	-	265°	284.8°	335.6°

Ground System: 120 equiangularly spaced radials extending from each tower base to approximately 0.4 wavelength. Length added to some radials to compensate for shorter radials limited by terrain.

PREDICTED EFFECTIVE FIELD:

Daytime:	594 mV/m at 1 mile for 10 kW
	187.8 mV/m at 1 mile for 1 kW
Nighttime:	570 mV/m at 1 mile for 10 kW
	180.25 mV/m at 1 mile for 1 kW

16/01/81

Granted CP (4/16/58) for a new AM station

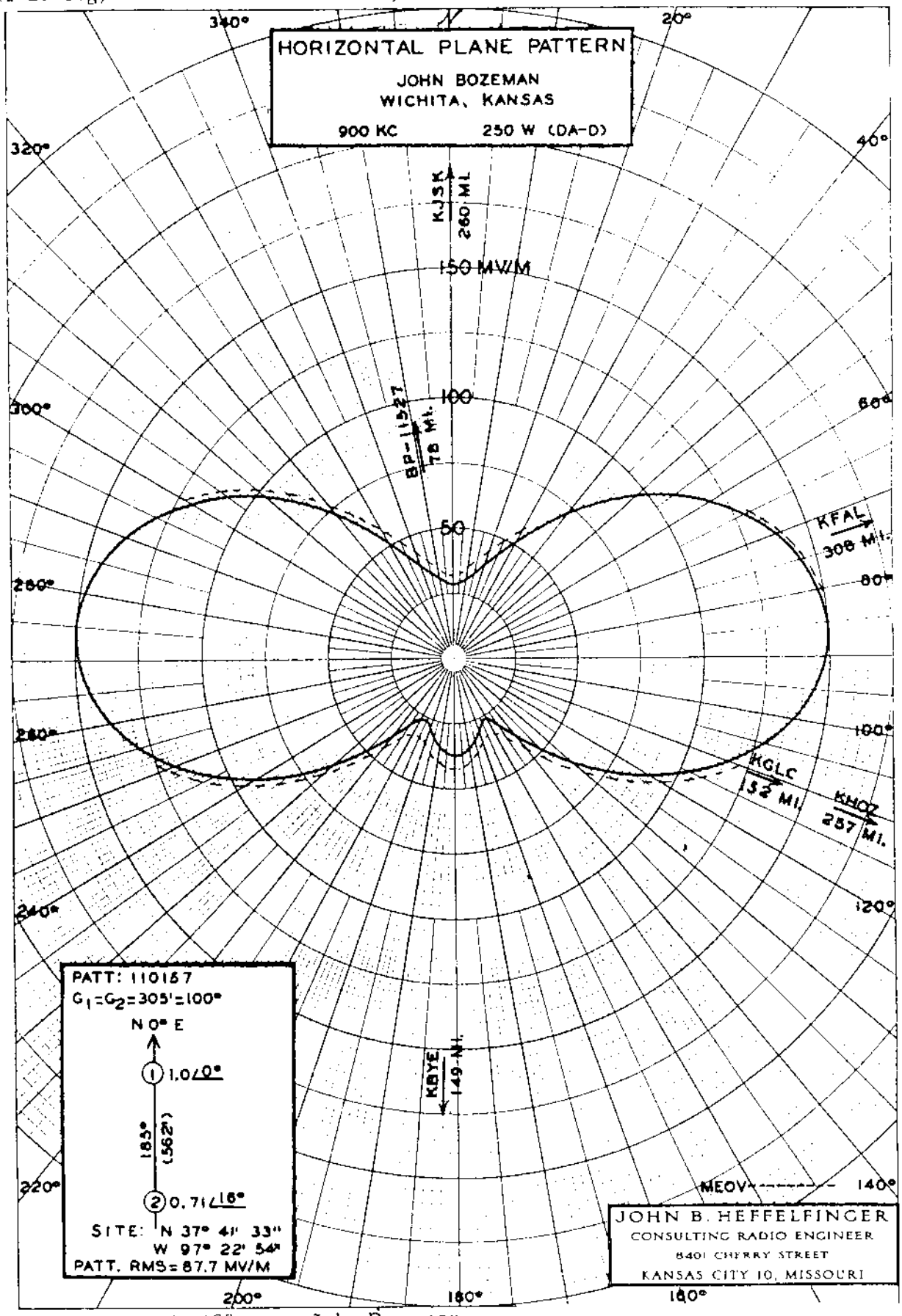
Wichita, Kan.

KBUL

PROPOSED DAY
(11-29-57g)

New; John Bozeman
Wichita, Kansas

250w, DA-D,D
900 KC



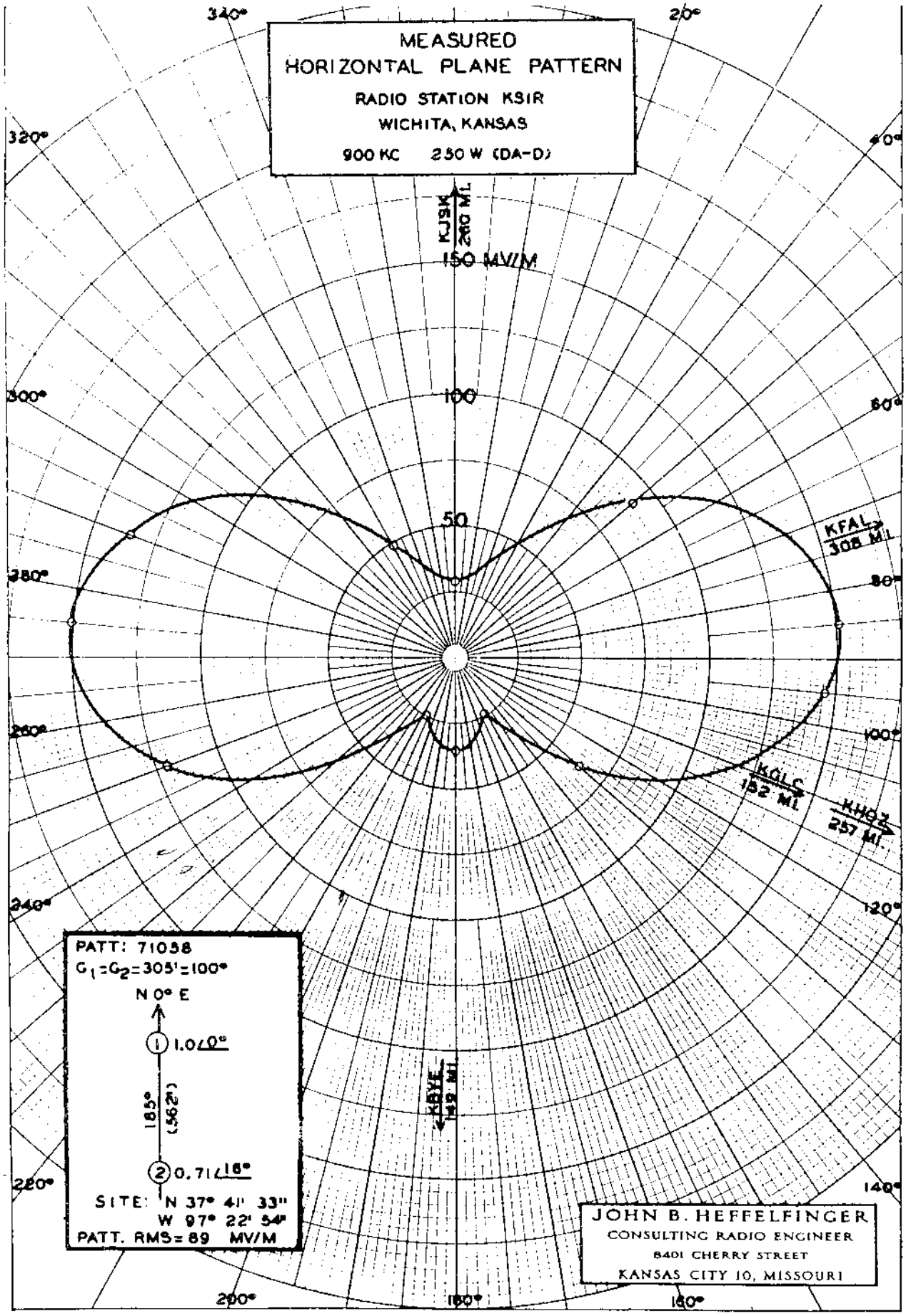
FCC File No. BP-11,188
Accepted 11-21-57 (Amended)

John Bozeman
Wichita, Kansas

900 KC

KBUL

MEASURED DAY (9-11-58g) | Station KSIR Wichita, Kansas | 250w, DA-D,D 900 KC



wanted license 8/15/58

FCC File No. BL-7175 Accepted 8-22-58 | KSIR Wichita, Kansas | 900 KC

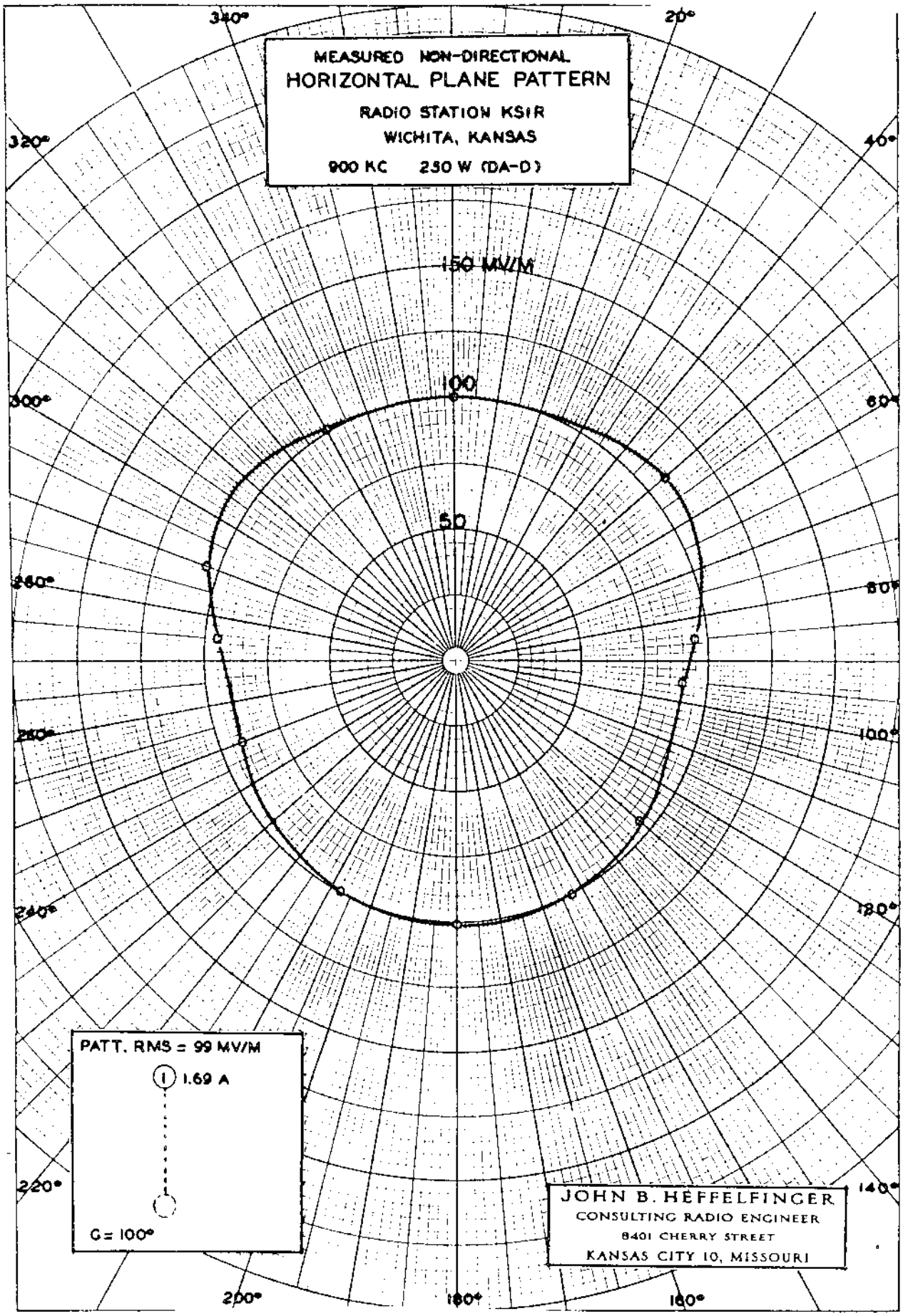
KBUL

MEASURED NON-DA
(9-11-58g)

Station KSIR
Wichita, Kansas

250w, DA-D,D
900 KC

Granted license 10/15/58



FCC File No. BL-7175
Accepted 8-22-58

KSIR
Wichita, Kansas

900 KC

KGRB

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KGRB

Main Studio: West Covina, California

Frequency: 900 kHz

Power: 0.5 kW

Notification List No. 1663

Date: December 16, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 34° 01' 54"
West Longitude: 117° 56' 06"

ANTENNA CHARACTERISTICS

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

TOWER:	NW(#2)	SE(#1)	
HEIGHT ABOVE INSULATORS:	240'	240'	(79°)
PHASING:	-63°	0°	
FIELD RATIO:	1	1	

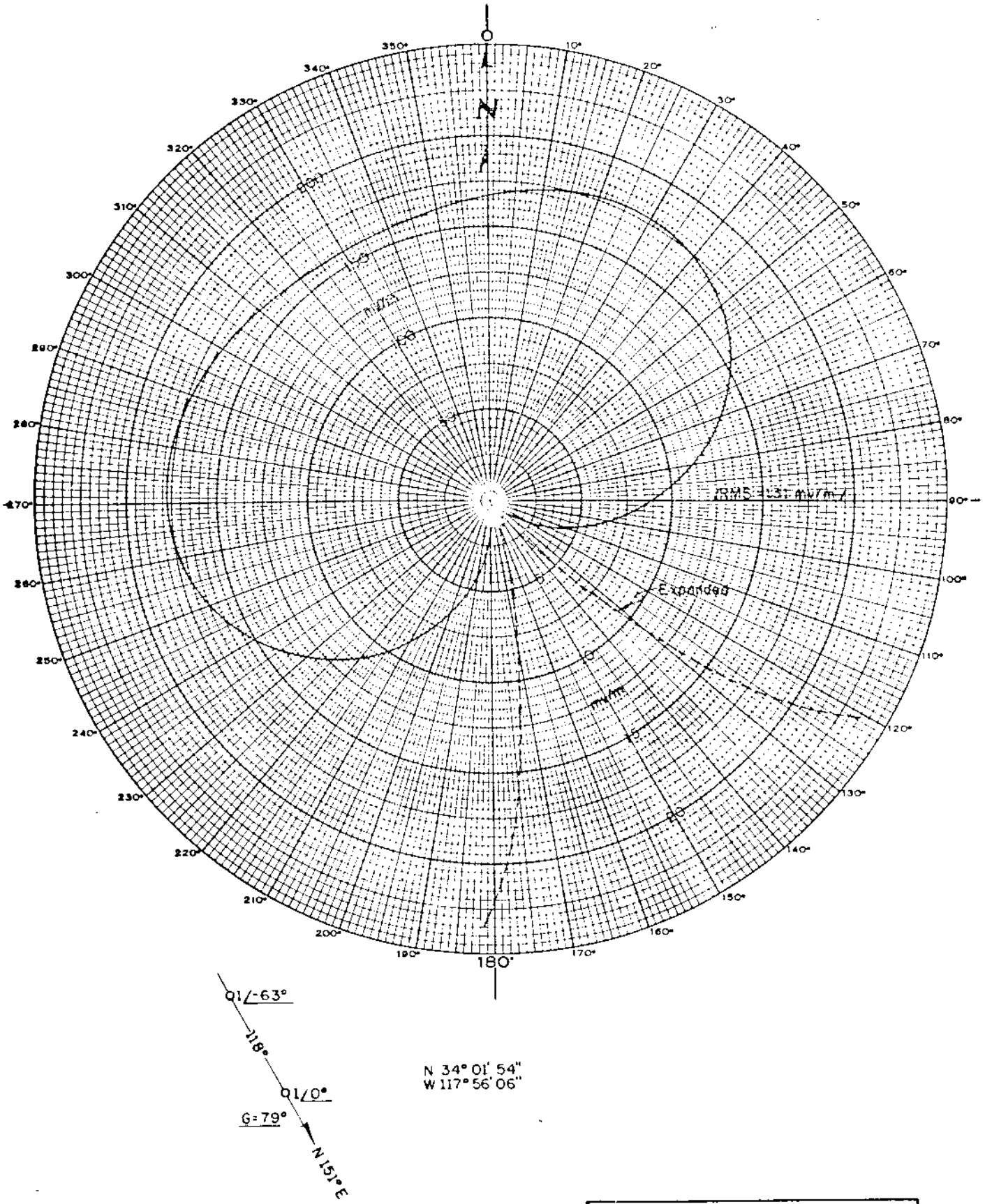
SPACING AND ORIENTATION: Elements are spaced 358' (118°) on a line bearing 151° true.

GROUND SYSTEM: 120-260' to 280' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

Predicted effective Field: 131 mv/m at rated power.

Note: This notification concerns an increase in power from 0.25 kW and changes in the directional antenna system.

KGRB



N 34° 01' 54"
W 117° 56' 06"

DAVID L. STEEL, SR.
BROADCAST CONSULTING ENGINEER
2014 CONNECTICUT AVENUE, N. W.
WASHINGTON, D. C. 20008

Figure 1, Page 3
Proposed Daytime Horizontal Plane
Radiation Pattern
Robert Burdette & Associates, Inc.
West Covina, California
900 Kc 500 Watts DA-D
July 1965

KGRB

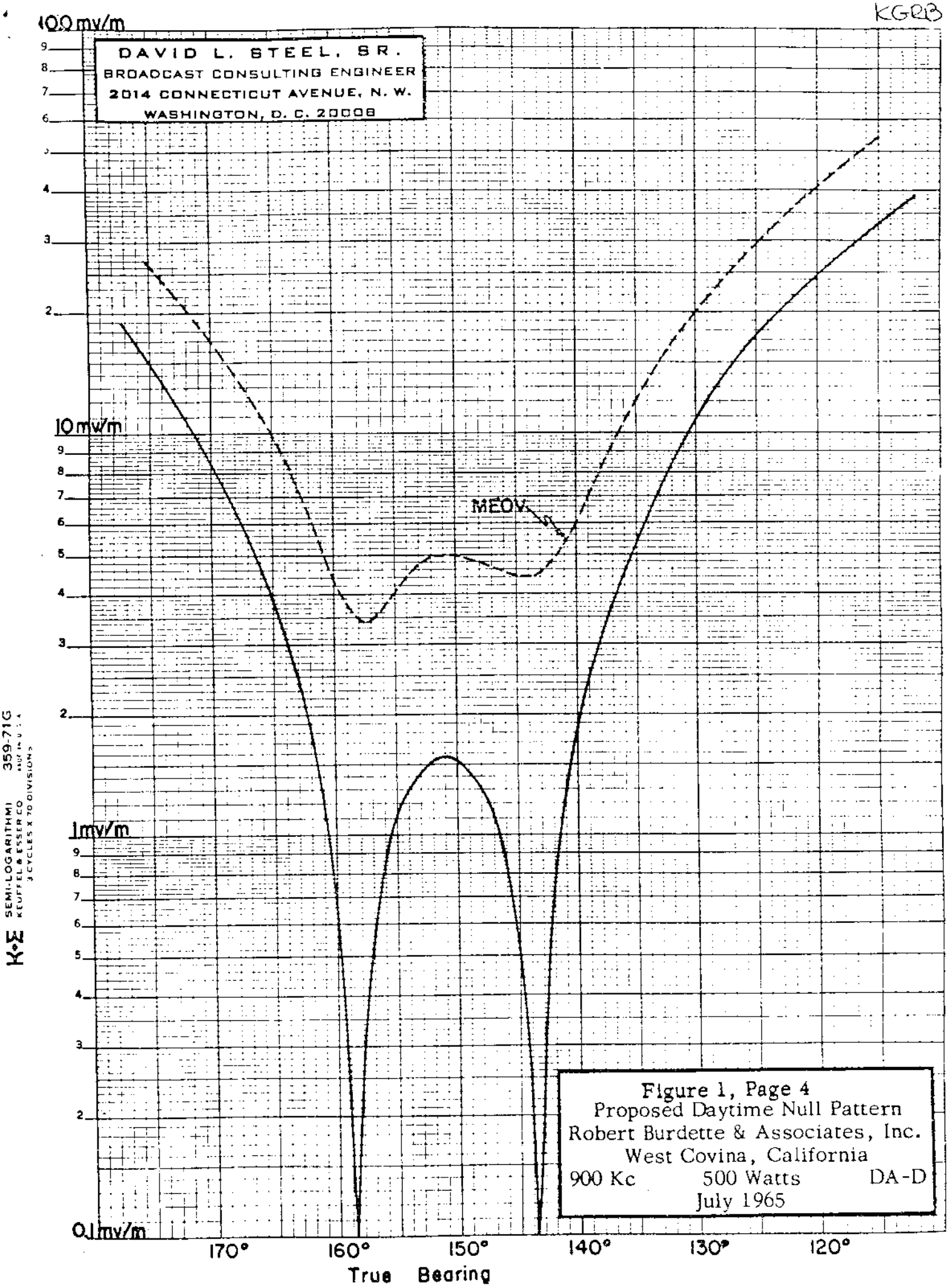


Figure 1, Page 4
Proposed Daytime Null Pattern
Robert Burdette & Associates, Inc.
West Covina, California
900 Kc 500 Watts DA-D
July 1965

KGRB

Measured Day
(11-29-63ct)

Station KGRB
West Covina, California

250w, DA-D,D
900 kc

2-13-64
Granted
license for
new station

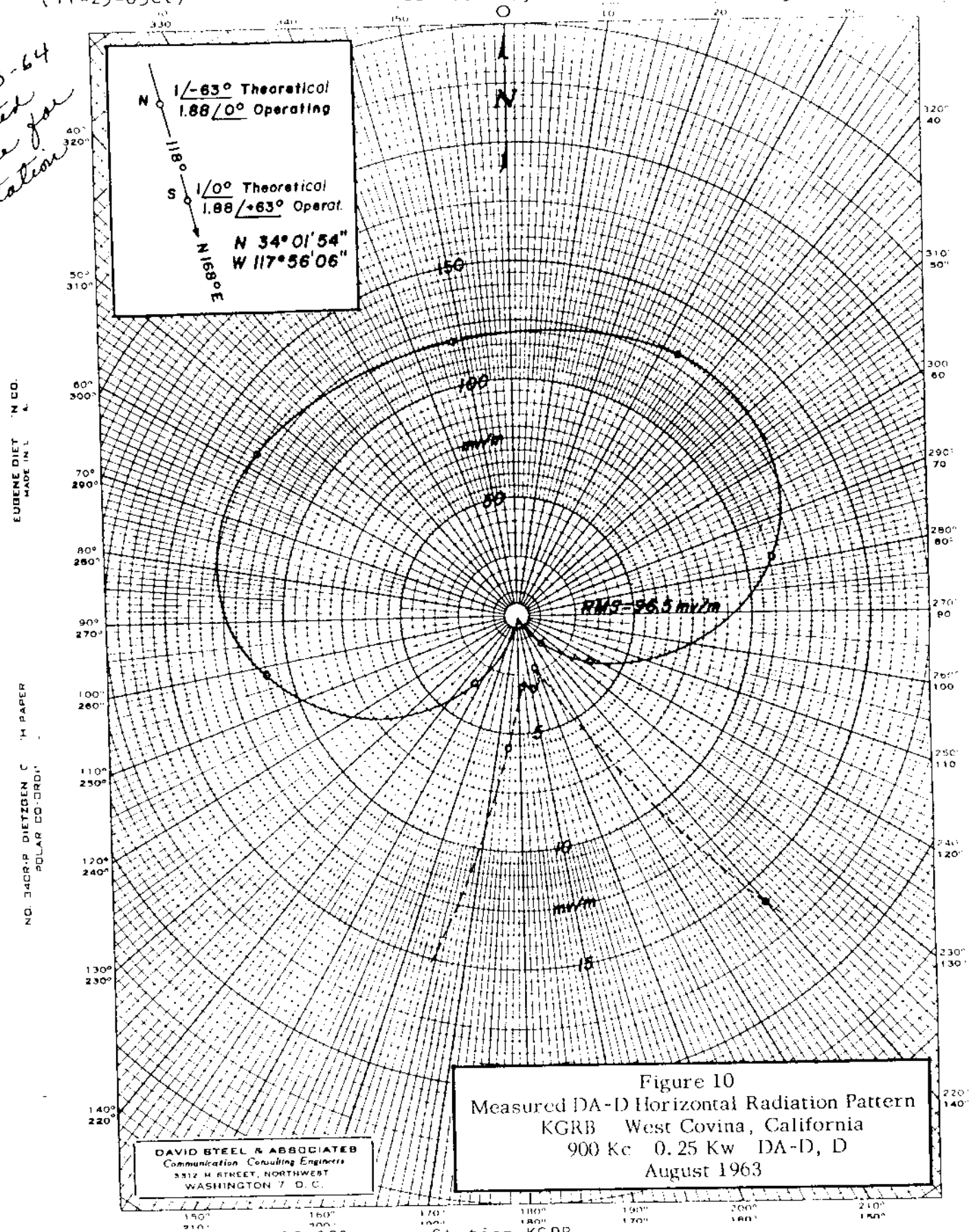


Figure 10
Measured DA-D Horizontal Radiation Pattern
KGRB West Covina, California
900 Kc 0.25 Kw DA-D, D
August 1963

FCC File No. BL-10,309
Accepted 11-5-63

Station KGRB
West Covina, California

900 kc

WEST COVINA CAL.

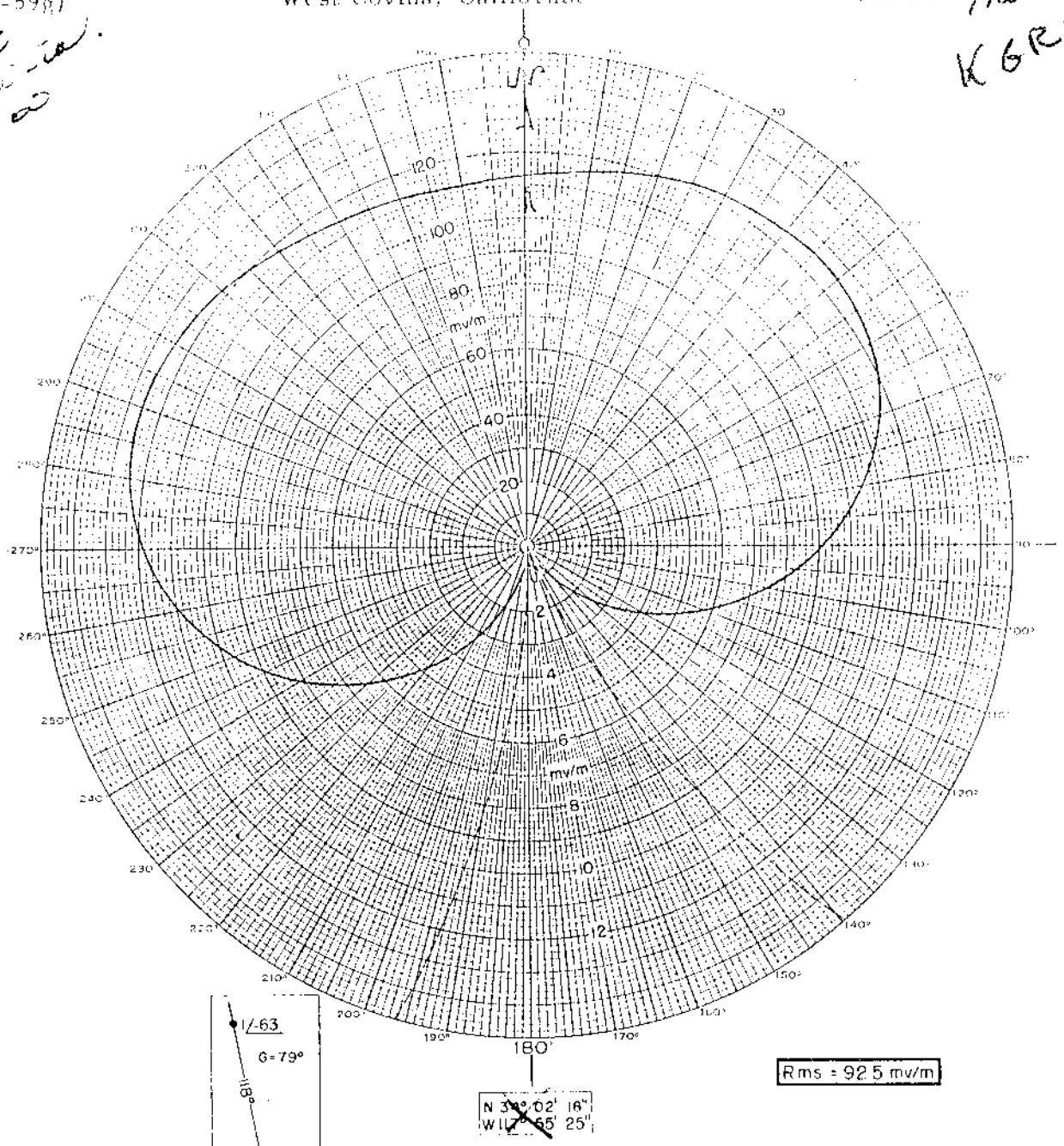
KWCR

PROPOSED DAY
(12-21-59g)

New; Robert Burdette & Assoc.
West Covina, California

250w, DA-D, D
900 KC

Now KGRB



Rms = 92.5 mv/m

5-28-61
granted MCP to change
T-Mir Station:
NL 34-01-54
WL 117-56-00

PAGE, CREUTZ, STEEL & WALDSCHMITT
Consulting Engineers
1132 K STREET, NORTHWEST
WASHINGTON 5, D. C.

Figure 3 (Amended)
Proposed Horizontal Pattern
Robert Burdette & Associates, Inc.
West Covina, California
900 KC 250 Watts D A-D
BP-12,471 Amended February 1959

FCC File No. BP-12471 (Amended)
Accepted 11-18-59 (Docket 12689)

Robert Burdette & Associates
West Covina, California

900 KC

KG-P

Measured Non-DA
(11-29-63ct)

Station KGRB
West Covina, California

250w,DA-D,D
900 kc

2-13-64 Grantee license for new station

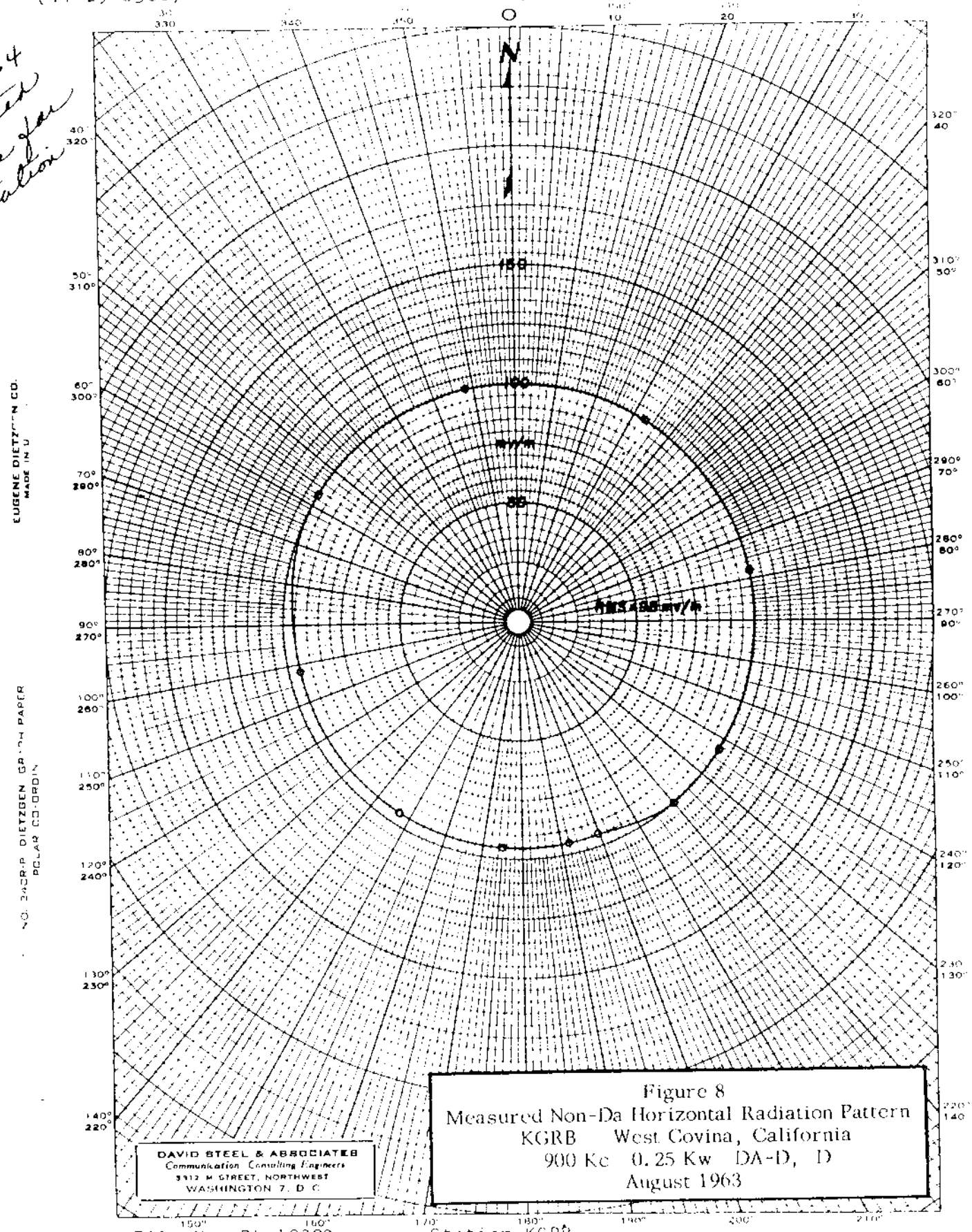


Figure 8
Measured Non-Da Horizontal Radiation Pattern
KGRB West Covina, California
900 Kc 0.25 Kw DA-D, D
August 1963

FCC File No. BL-10309
Accepted 11-5-63

Station KGRB
West Covina, California

900 kc

KGRB

Proposed Day Nulls
(9-25-63ct)

Station KGRB
West Covina, California

250w,DA-D,D
900 kc

9-19-63 Granted Mod of CP to make changes in DA-D.

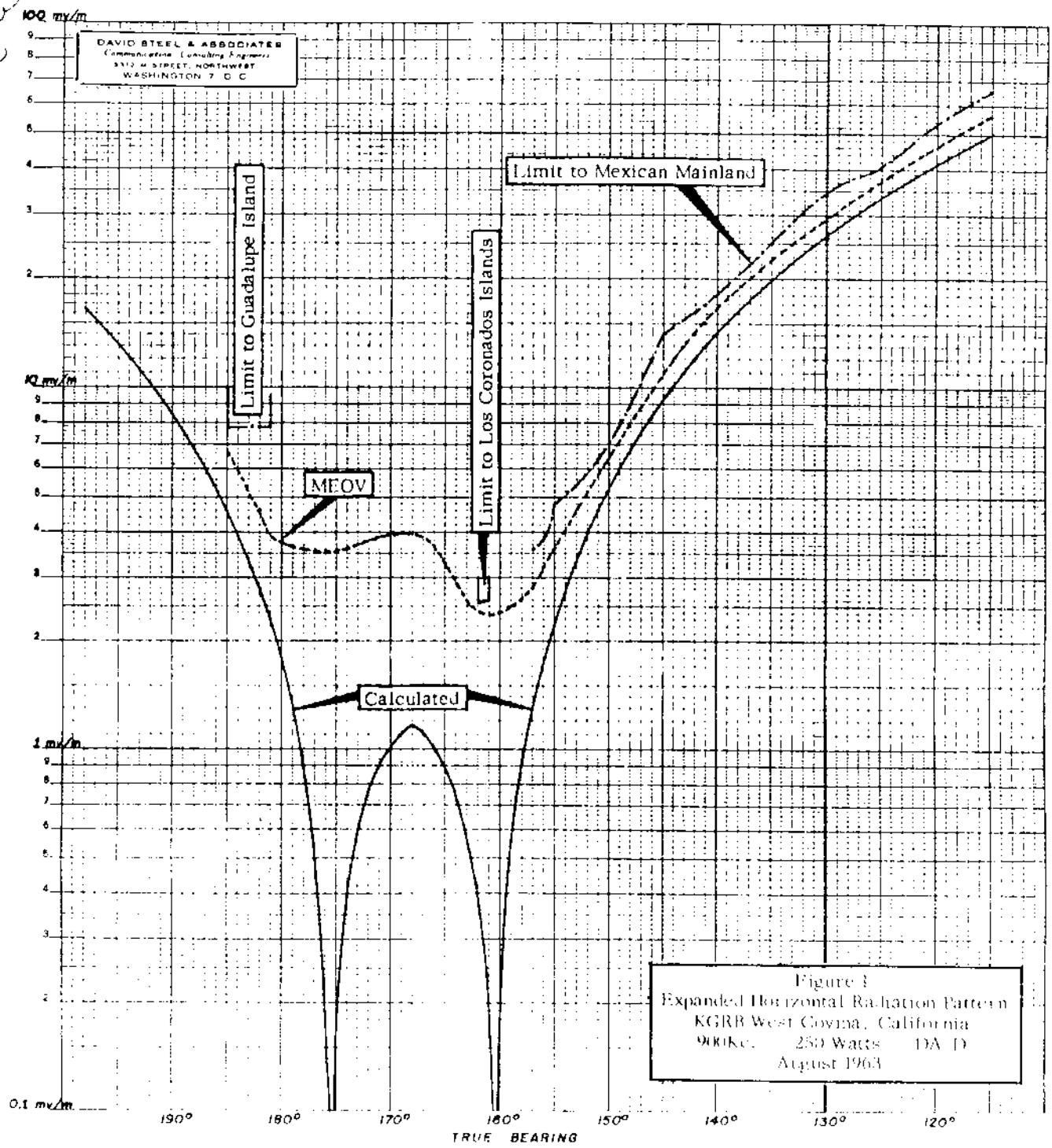


Figure 1
Expanded Horizontal Radiation Pattern
KGRB West Covina, California
900Kc 250 Watts DA D
August 1963

FCC File No.BMP-10979
Accepted 9-17-63 Amended

Station KGRB
West Covina, California

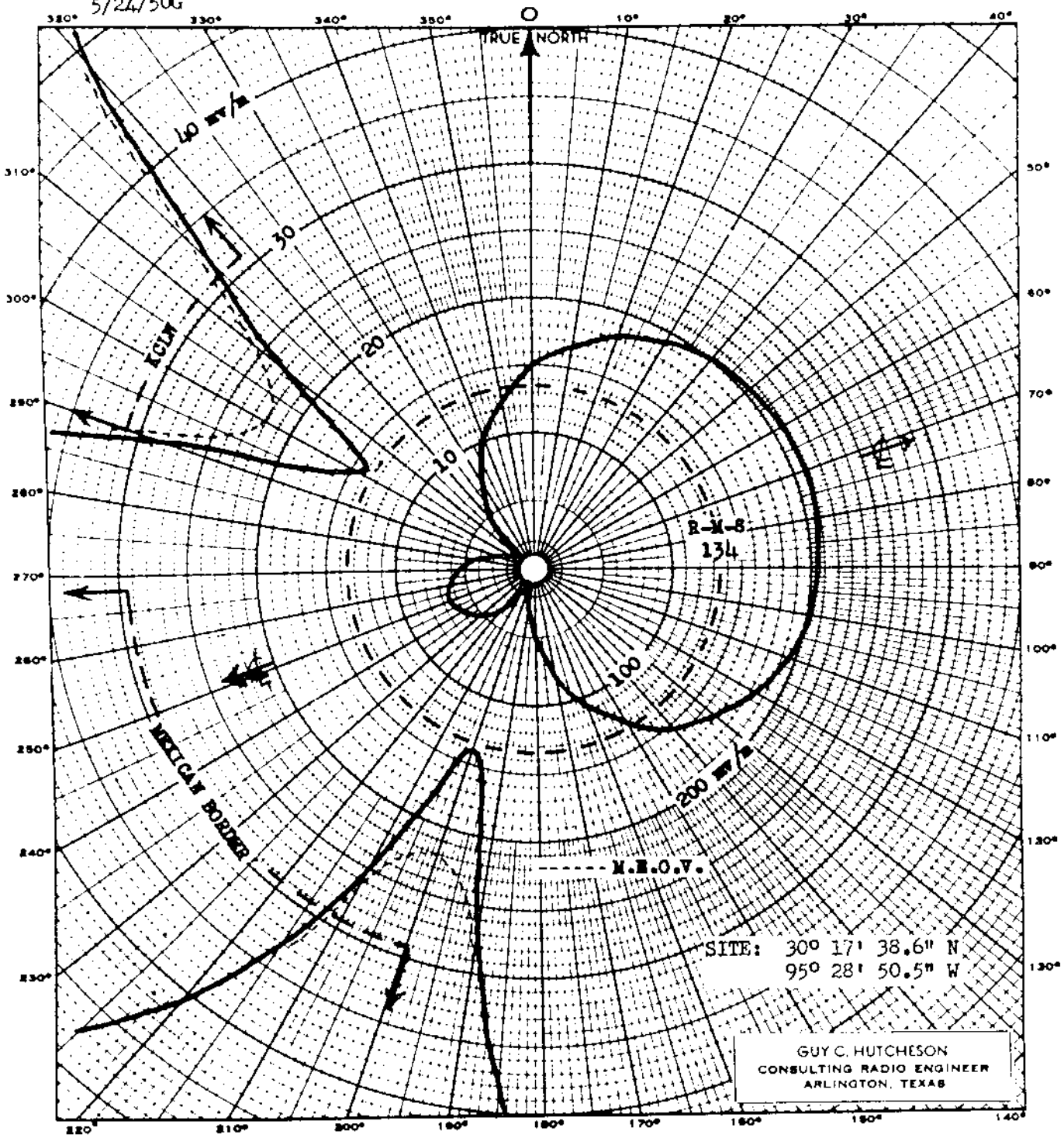
900 kc

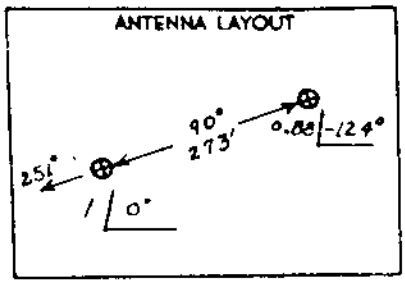
KIKR

PROPOSED NEW, CONROE, TEXAS 500w, DA, D 900 kc
DAY (Montgomery County Bg. Co.)

HORIZONTAL RADIATION PATTERN 5-22-50

5/24/50G



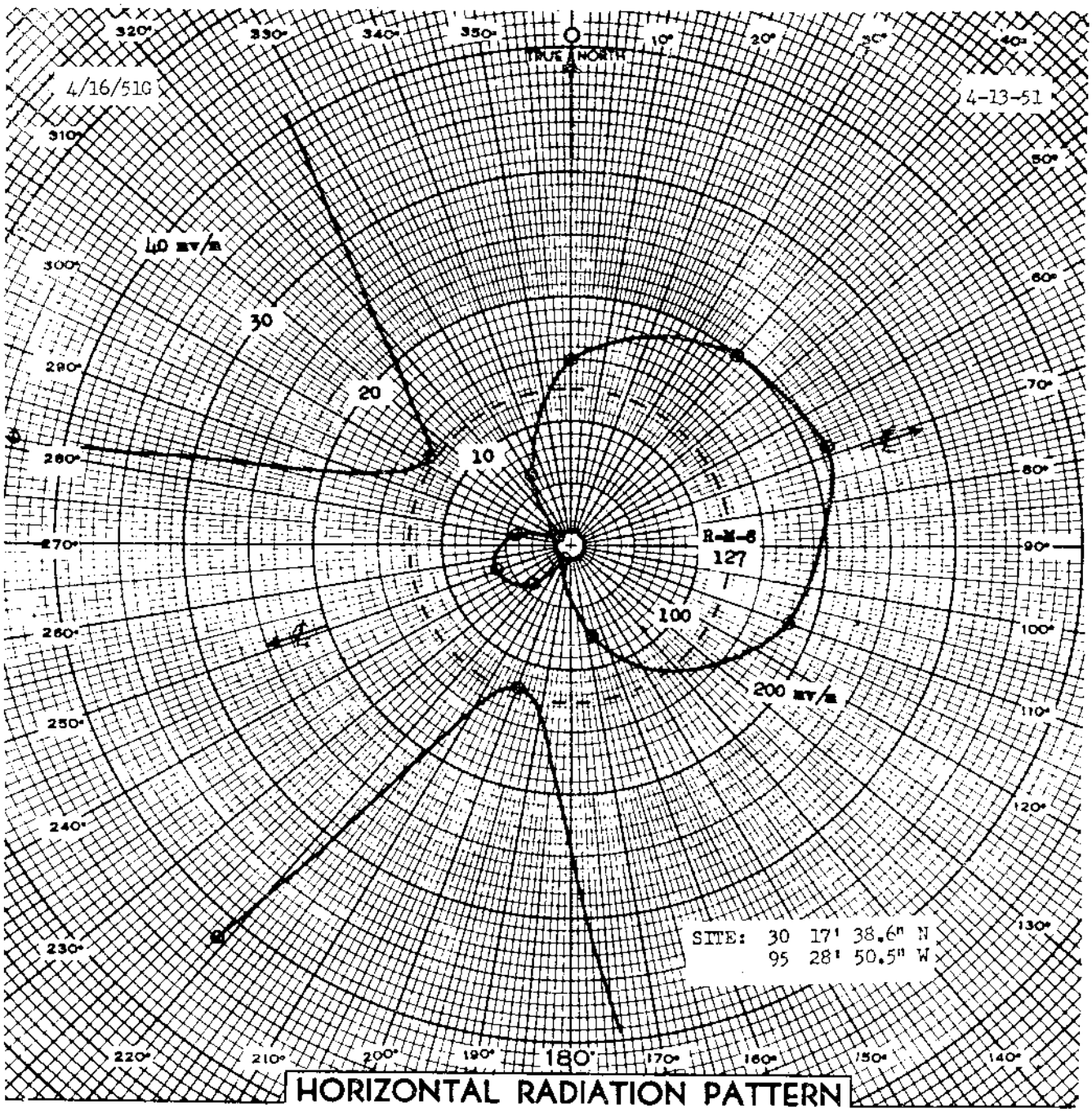


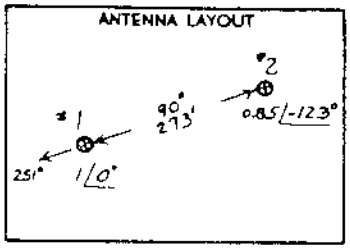
New	CONROE, TEXAS	
Station: 900 kc	0.5 kw	Location: 134 mv/m (190/kw)
Frequency: 2	Power	R-M-S Field: 245 feet, 0.224 λ or 80.5°
No. of Elements	Height of Antenna	
MEASURED ☐	CALCULATED ☐	500506.1
Pattern		No.
DAYTIME PATTERN		
Remarks		

Fig. 1
NEW, Conroe, Texas 900 kc

KIKR

MEASURED DAY KMCO, CONROE, TEXAS 500w, DA-D 900 kc





KMCO (Station)	Conroe, Texas (Location)	
900 kc (Frequency)	0.5 kw (Power)	127 mv/m (180/kw) (R-M-S Field)
2 (No. of Elements)	245 feet, 0.224 λ or 80.5° (Height of Antenna)	
MEASURED ☐	CALCULATED ☐ (Pattern)	510404.14 (No.)
DA DAYTIME PATTERN (Remarks)		

GUY C. HUTCHESON
CONSULTING RADIO ENGINEER
ARLINGTON, TEXAS

Fig. 14

KMCO, Conroe, Texas 900 kc

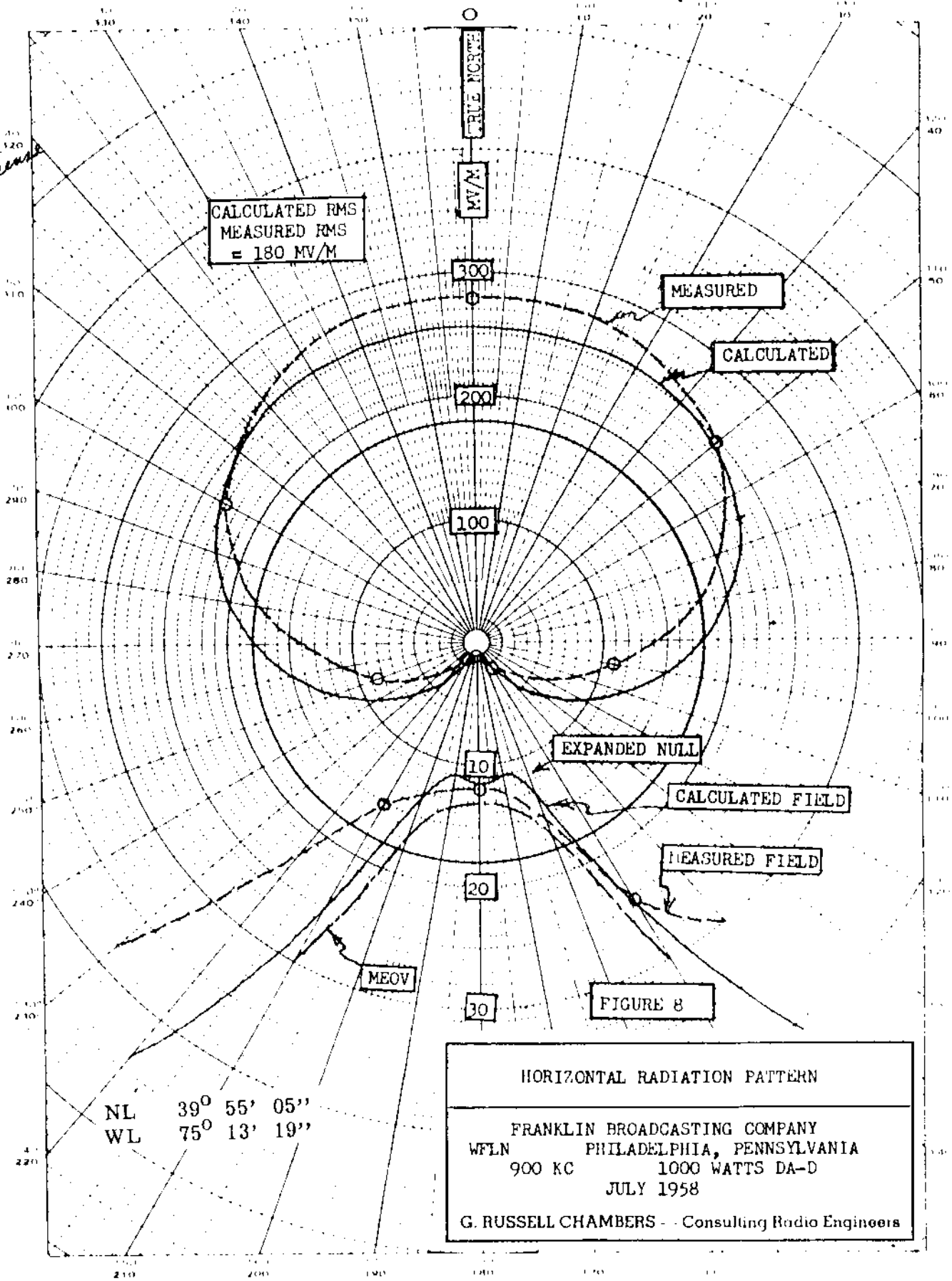
WFLN

MEASURED BAY
(9-11-58g)

Station WFLN
Philadelphia, Pennsylvania

1kw, DA-D,D
900 KC

Granted license 12/15/58



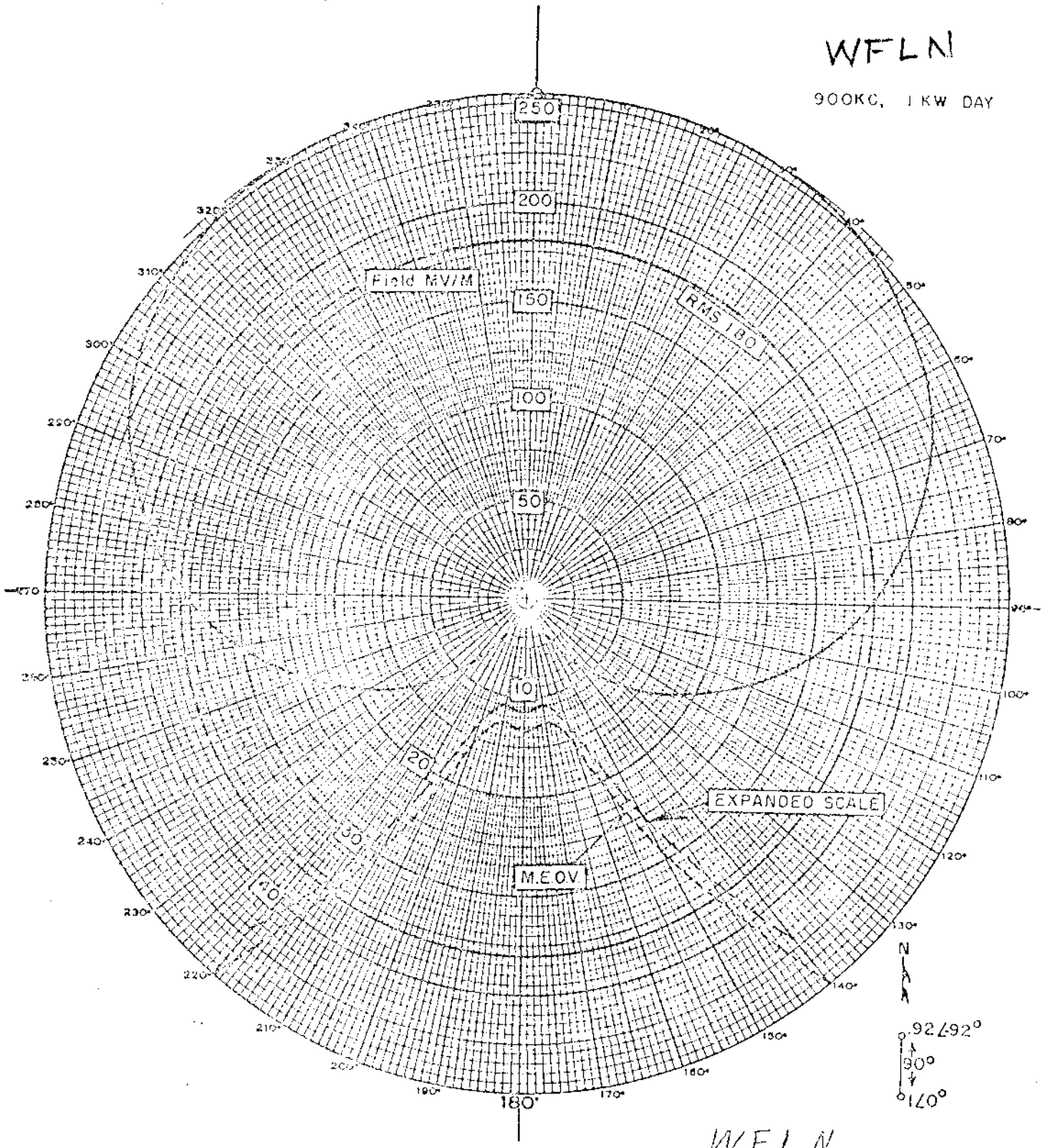
FCC File No. BL-7158
Accepted 8-21-58

WFLN
Philadelphia, Pennsylvania

900 KC

WFLN

900KC, 1 KW DAY



WFLN

WFLN

FRANKLIN BROADCASTING CO. PHILADELPHIA, PENNSYLVANIA	Figure 1
	900 KC 1000 WATTS DAY
DIRECTIONAL ANTENNA PATTERN	FRANK H. McINTOSH & ASSOCIATES Consulting Radio Engineers Wyatt Building Washington, D. C.

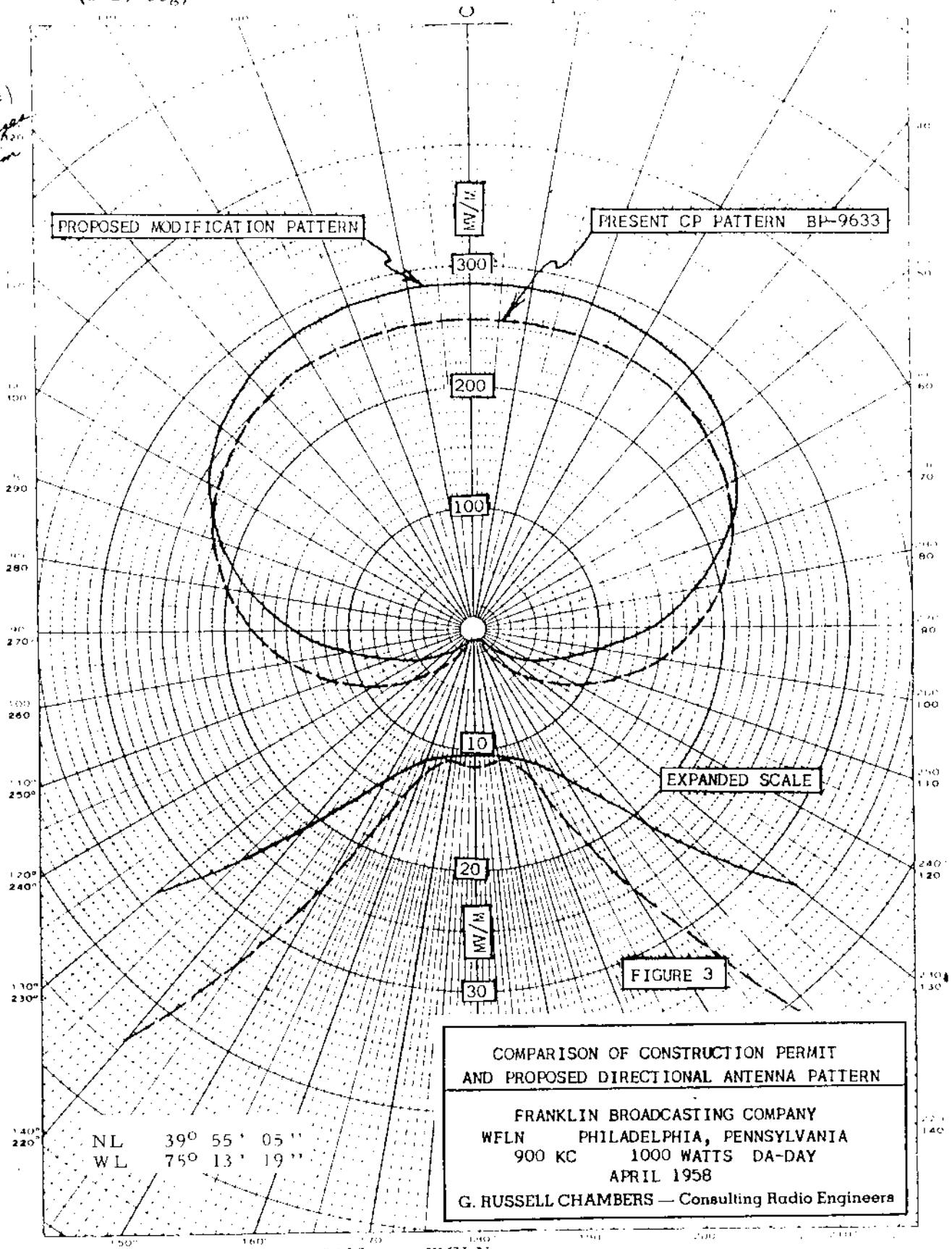
WFLN

PROPOSED DAY (Comparison) (5-29-58g)

Station WFLN Philadelphia, Pennsylvania

1kw, DA-D,D 900 KC

Granted mod of CP (5/15/58) to make change in the DA system



FCC File No. BMP-8132
Accepted 5-14-58

WFLN
Philadelphia, Pennsylvania

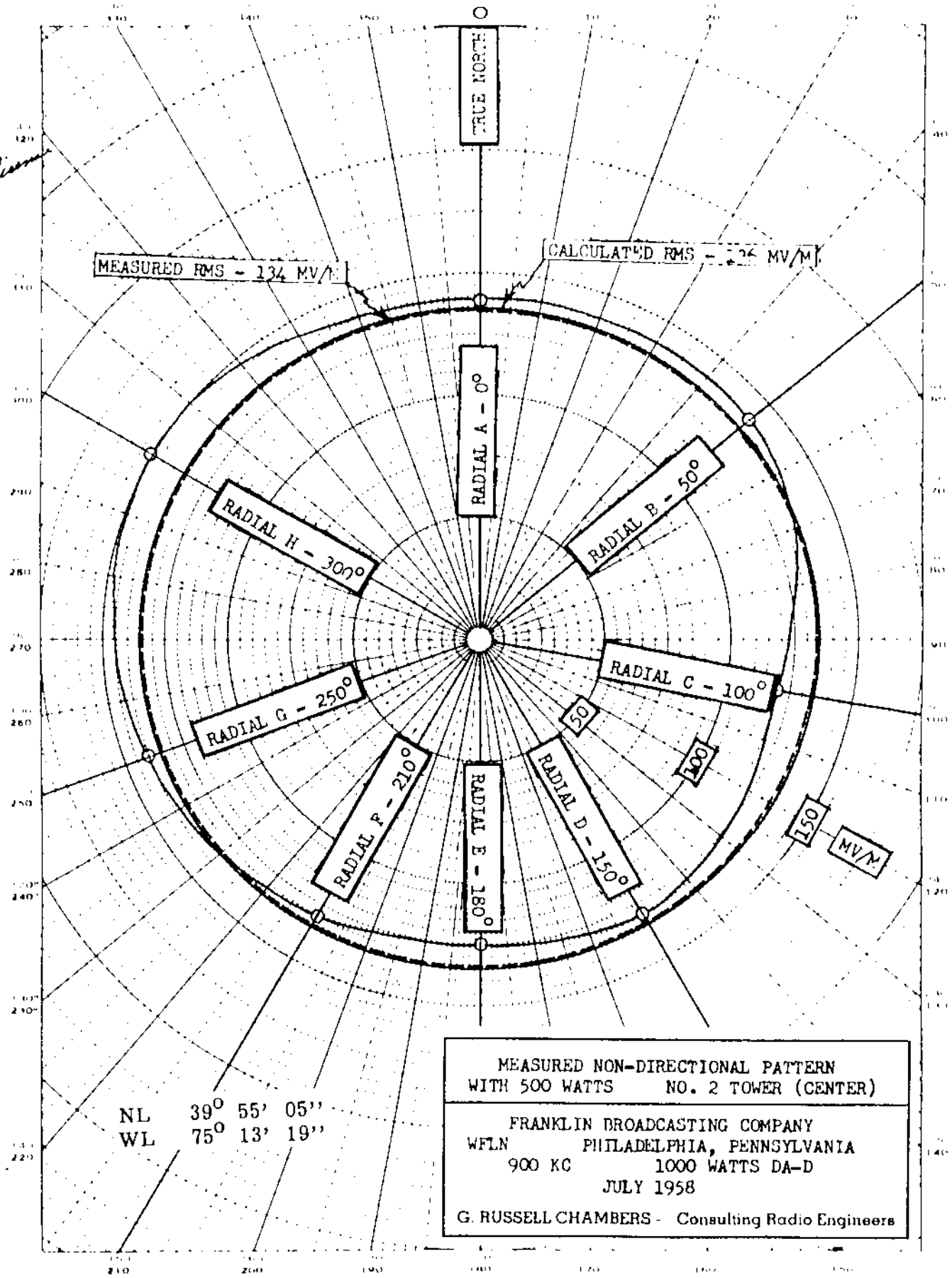
900 KC

WFLN

MEASURED NON-DA
(9-11-58g)

Station WFLN 1kw, DA-D,D
Philadelphia, Pennsylvania 900 KC

Granted license 12/15/58



FCC File No. BL-7158
Accepted 8-21-58

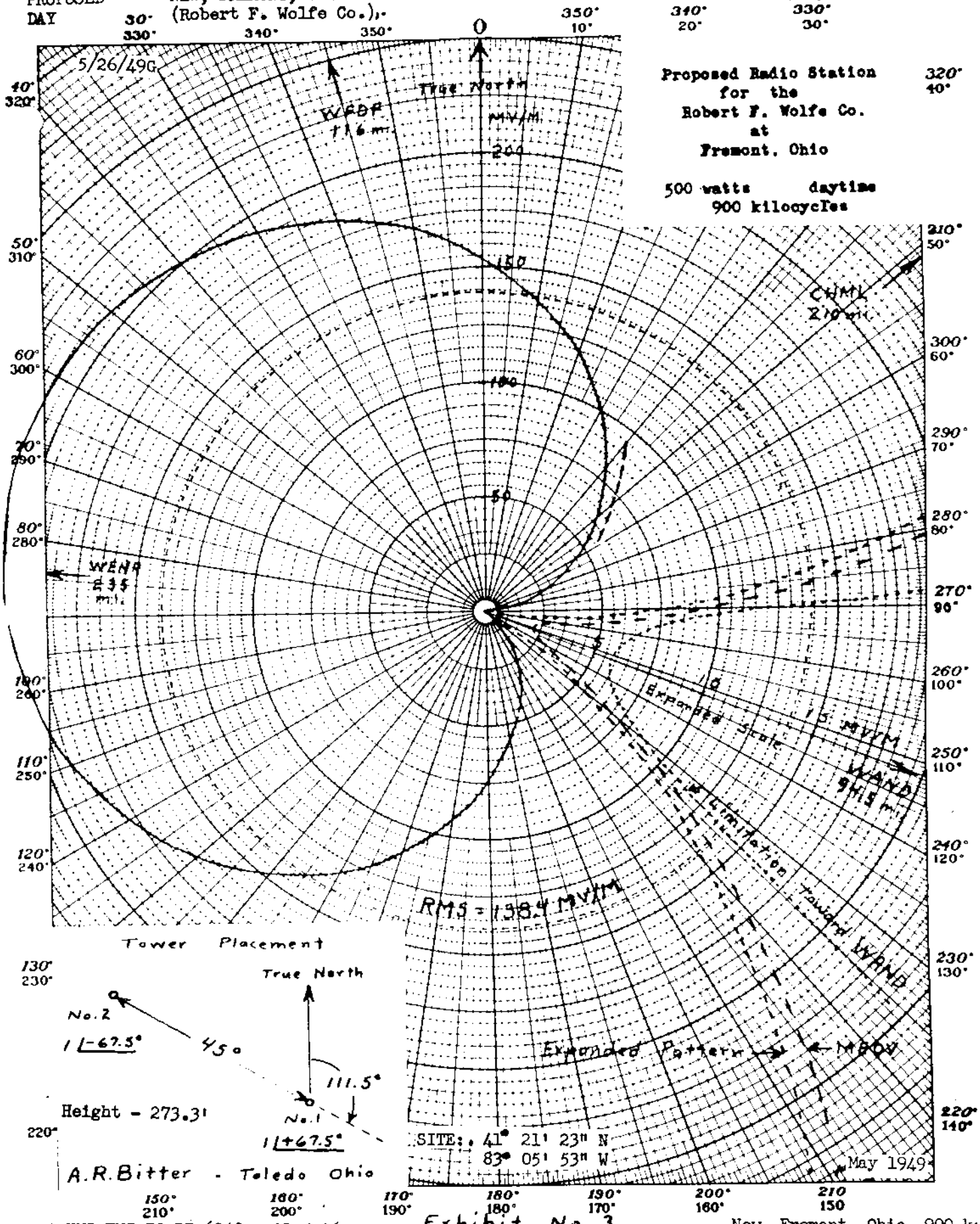
WFLN
Philadelphia, Pennsylvania 900 KC

WFOB
FREMONT, O.

PROPOSED DAY

NEW, FREMONT, OHIO
(Robert F. Wolfe Co.),

500w, D, DA 900 kc



Proposed Radio Station
for the
Robert F. Wolfe Co.
at
Fremont, Ohio

500 watts daytime
900 kilocycles

AMENDMENT TO BP-6240 RECD 5-16-49

Exhibit No. 3

New, Fremont, Ohio 900 kc

WFRO

MEASURED
DAYTIME

WFRO, FREMONT, OHIO

500w, DA-D

900 kc

1/19/50G

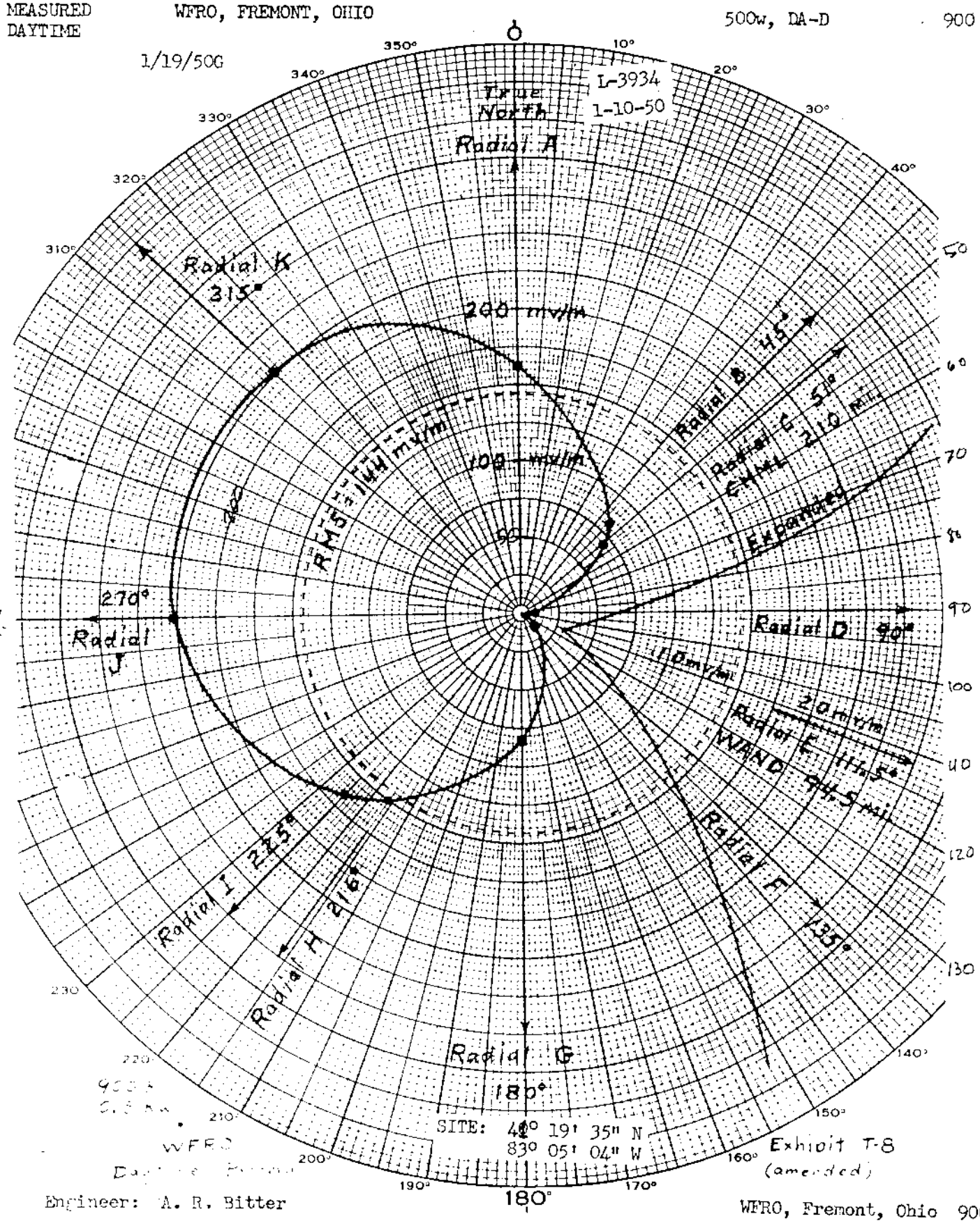


Exhibit T-8
(amended)

Engineer: A. R. Bitter

WFRO, Fremont, Ohio 900 kc

WGOK

SUPPLEMENTAL AND CORRECTED
DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: W G O K

Main Studio: Mobile, Alabama

Frequency: 900 kHz

Power: 1 kW Day

Notification List No. 1779

Date: September 27, 1978 Class: II

GEOGRAPHICAL LOCATION OF THE
CENTER OF THE ANTENNA SYSTEM:

North Latitude: 30° 42' 27"
West Longitude: 88° 03' 55"

Note: Please retain the description sheet and directional antenna radiation patterns notified for station new in United States Change List Number 722, dated September 11, 1957 and attach to this supplemental Description Sheet. This notification is for the purpose of indicating only a correction in the geographical coordinates of the center of the antenna system.

MOBILE, AL
WGOK 900 KC
~~980 K C~~

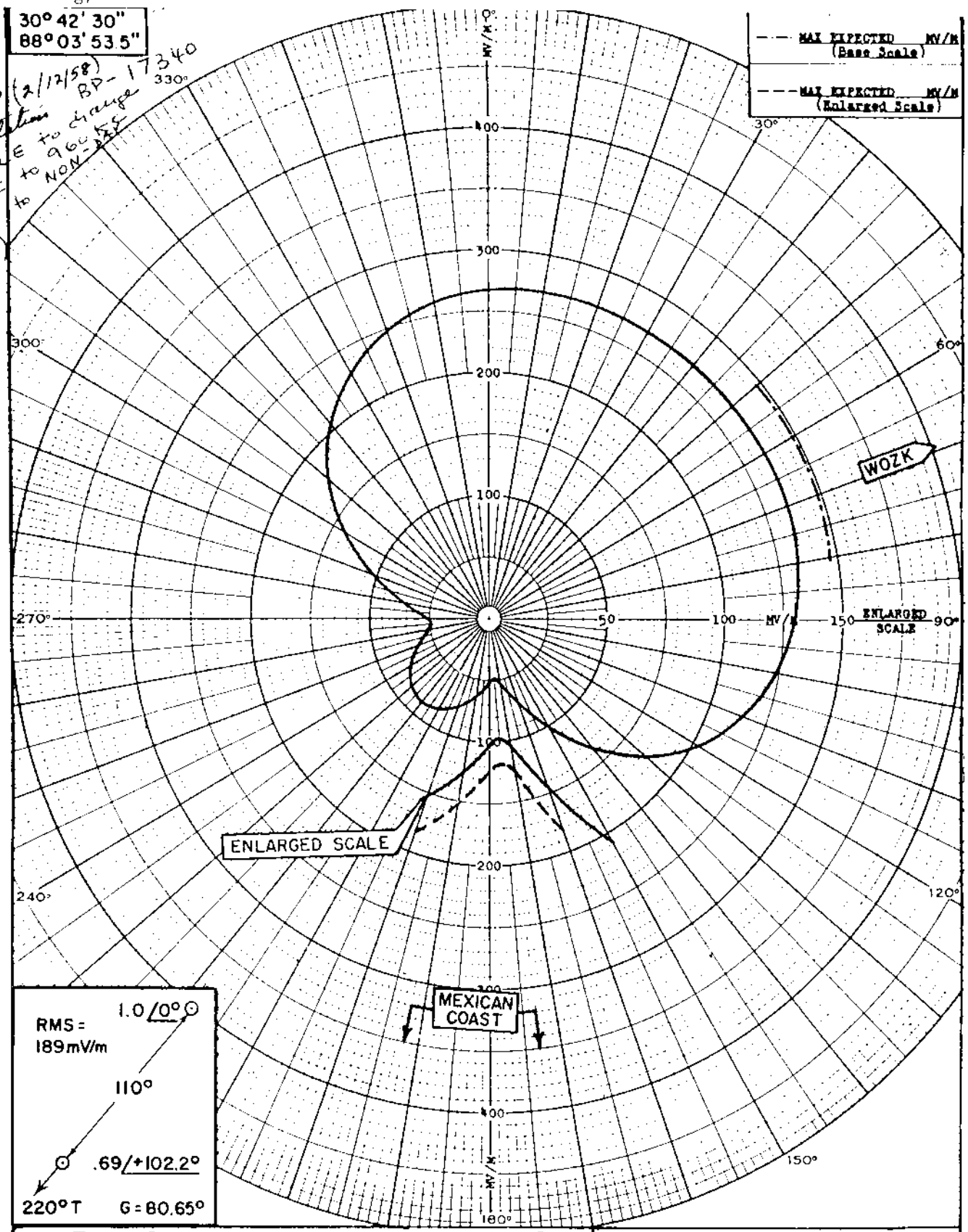
PROPOSED DAY
(10-12-56g)

OK B/C Company
Mobile, Alabama

1 KW-D, DA-D

30° 42' 30"
88° 03' 53.5"

Granted CP (2/12/58) BP-17340 for new station
APPL. ON FILE to change from 900 KC to 960 KC and DA-D to NON-DA
(1-6-67)



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

PATTERN: PROPOSED DAYTIME
FOR: MOBILE, ALABAMA
POWER: 1 KW-D FREQ: 900KC
DATE: 9/19/56 BY: EFL

FCC File No.
BP-10,590(Amended)

Accepted 10-4-56

OK B/C Company
Mobile, Alabama

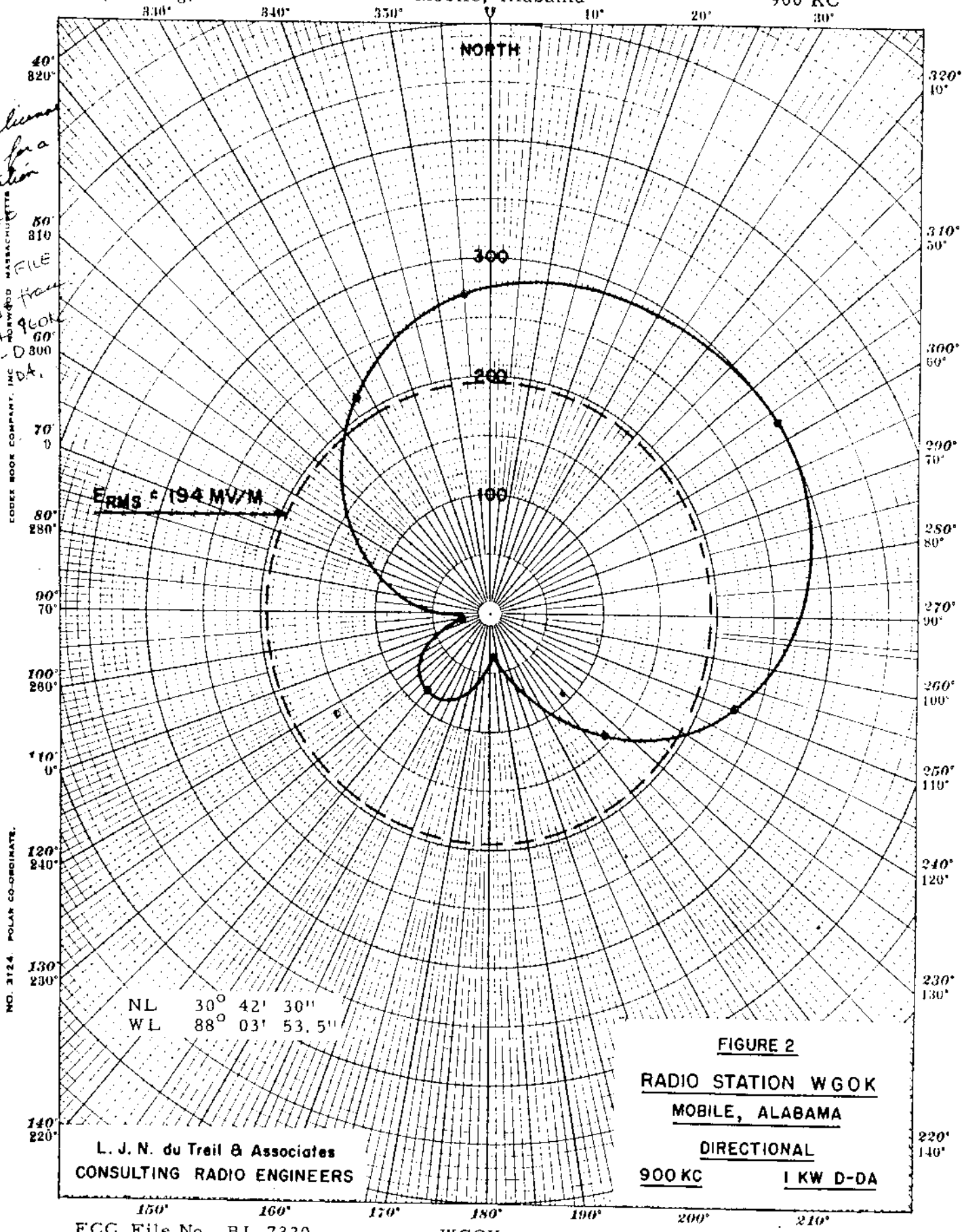
~~980 K C~~

WGOK

MEASURED DAY
(1-8-59g)

Station WGOK
Mobile, Alabama

1kw, DA-D, D
900 KC



FCC File No. BL-7320
Accepted 12-28-58

WGOK
Mobile, Alabama

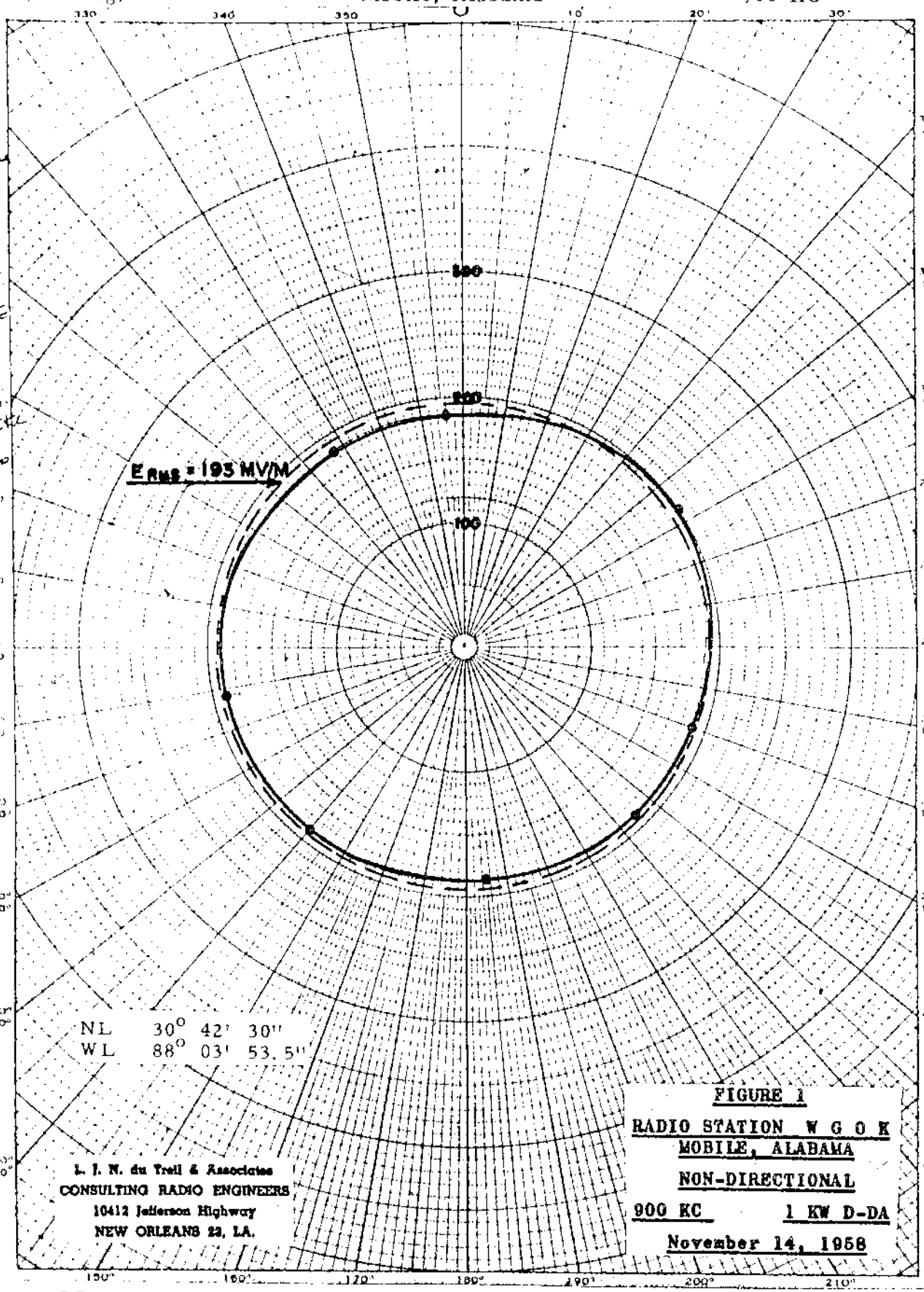
900 KC

WGOK

MEASURED NON-DA (1-8-59g)

Station WGOK
Mobile, Alabama

1kw, DA-D, D
900 KC



Granted license 3/9/59 for a new station

BP-17340 1-6-67

APPL. ON FILE to change from 900 KC to 960 KC and DA-D to NON-DA

FCC FileNo. BL-7320
Accepted 12-28-58

WGOK
Mobile, Alabama

900 KC

WLMD

Measured Day
(2-28-66ct)

Station WLMD
Laurel, Maryland

1kw, DA-D, D
900 kc

P 7-15-64
C 10-4-66

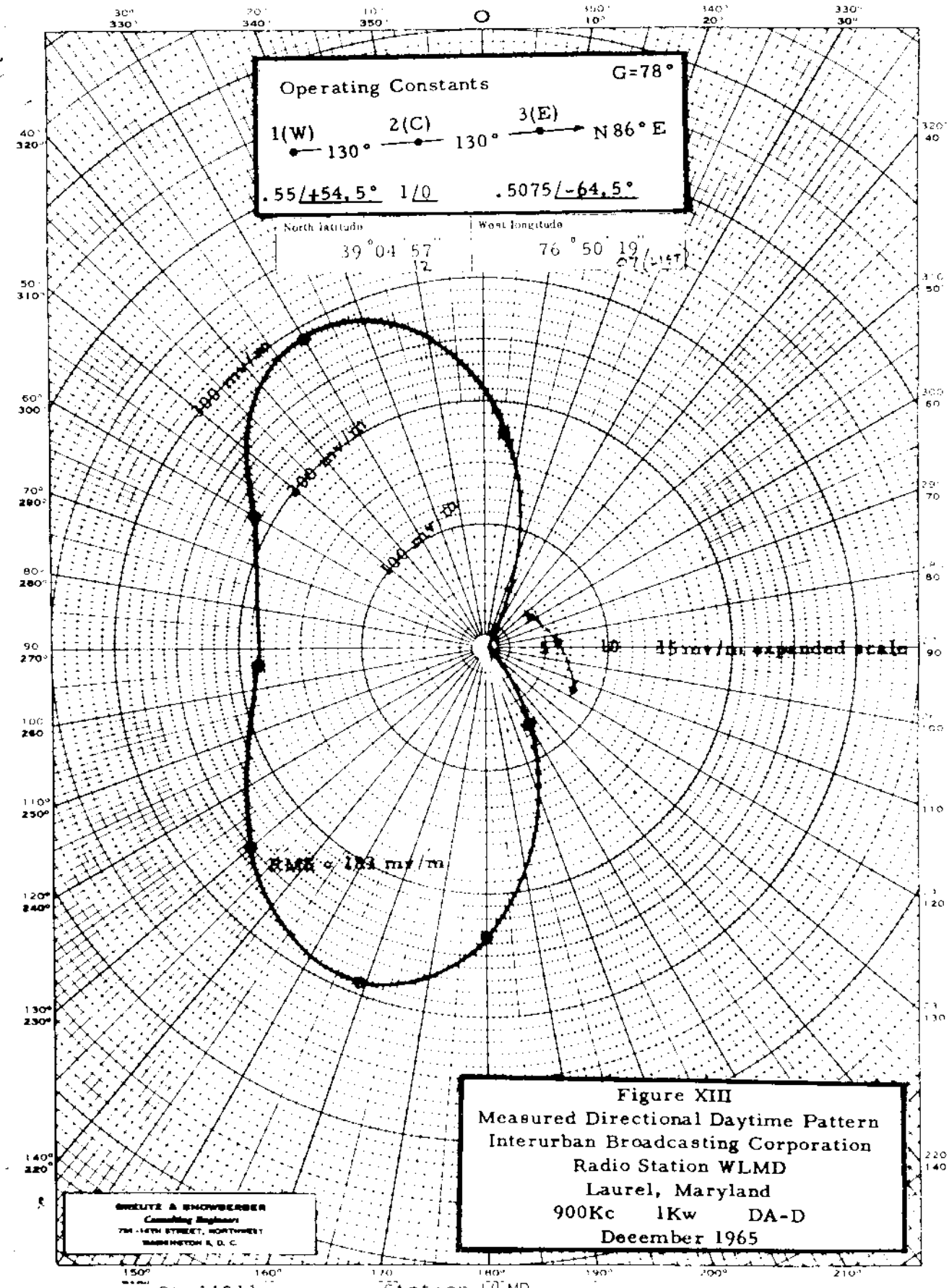


Figure XIII
Measured Directional Daytime Pattern
Interurban Broadcasting Corporation
Radio Station WLMD
Laurel, Maryland
900Kc 1Kw DA-D
December 1965

FCC File No. BL-11211
Accepted 2-9-66

Station WLMD
Laurel, Maryland

900 kc

WLMD

Measured Non-DA
(2-28-66ct)

Station WLMD
Laurel, Maryland

1kw,DA-D,D
900 kc

-IC 10-4-66

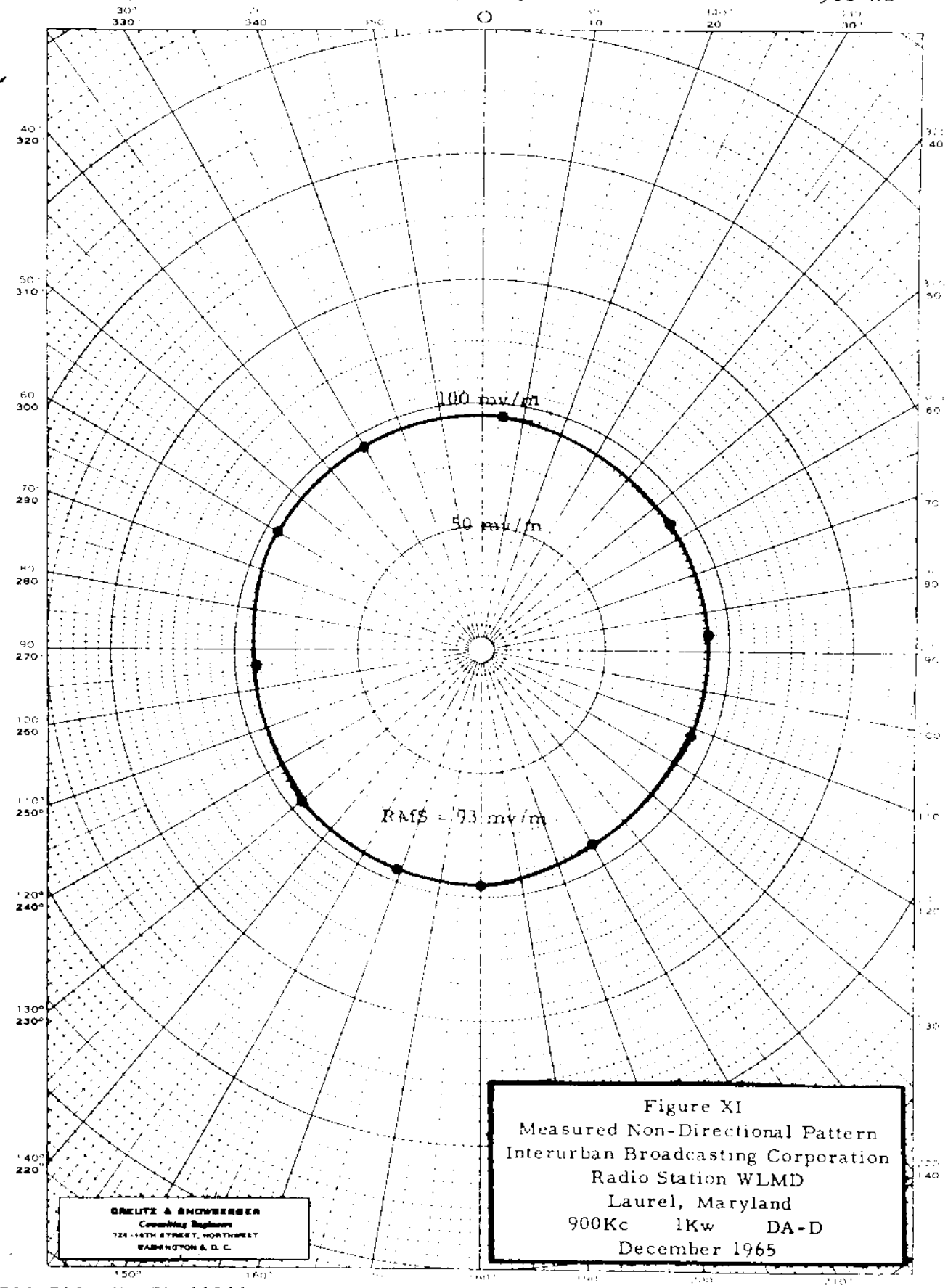


Figure XI
Measured Non-Directional Pattern
Interurban Broadcasting Corporation
Radio Station WLMD
Laurel, Maryland
900Kc 1Kw DA-D
December 1965

FCC File No.BL-11211
Accepted 2-9-66

Station WLMD
Laurel, Maryland

900 kc

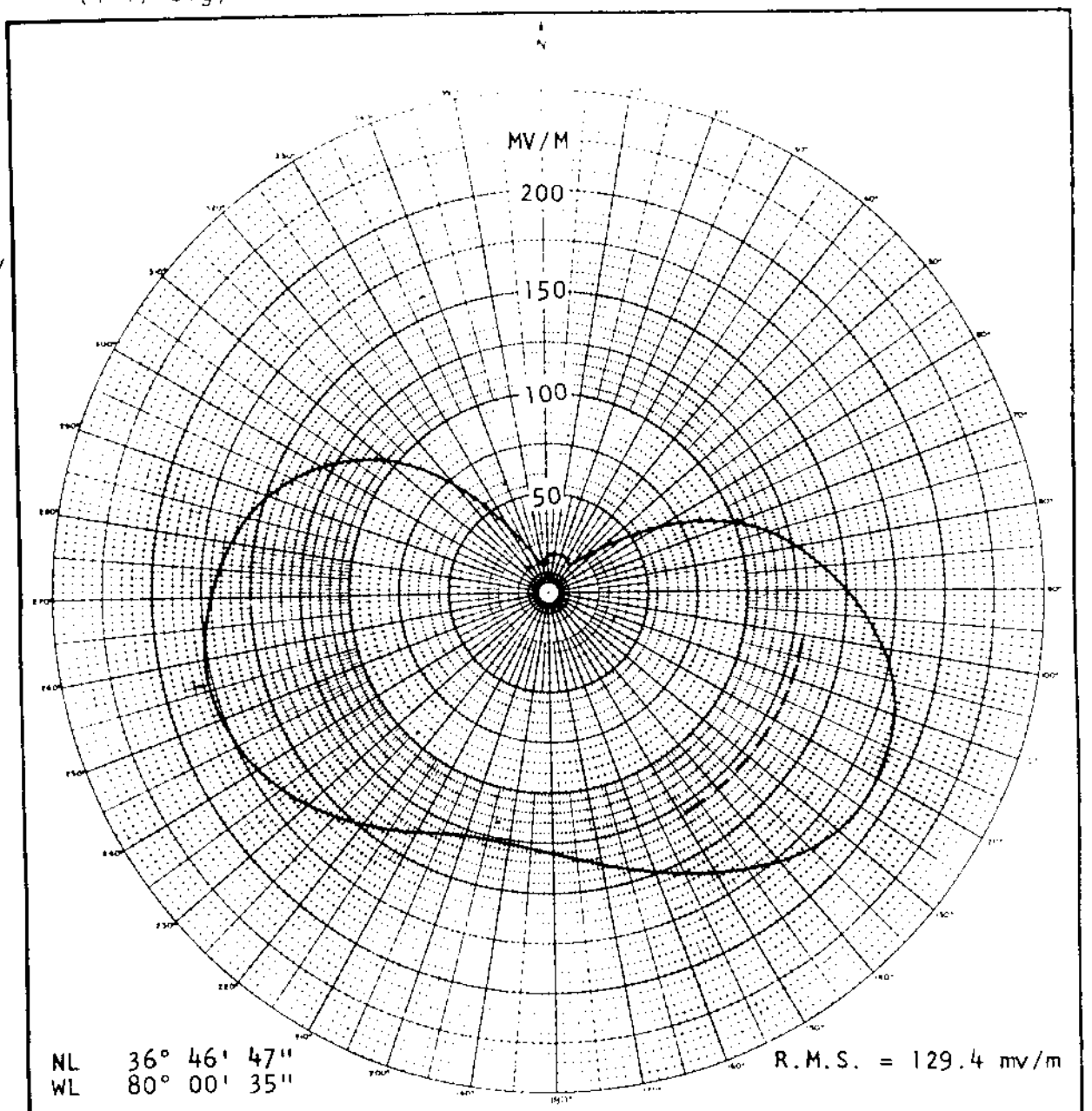
WODY

PROPOSED DAY
(1-17-61g)

Station WODY
Bassett, Virginia

500w, DA-D,D
900 KC

-27-62
rented CP
for increase
power from
50 w to 500w



N 10° E

0.95/0°

140°

1.0/-49°

WILLIAM L. FOSS, INC.
Electronic Consultants
WASHINGTON 5 D C

PATTERN NO
SUPERSEDES
AMP

FCC File No. BP-14525
Accepted 1-9-61

WODY
Bassett, Virginia

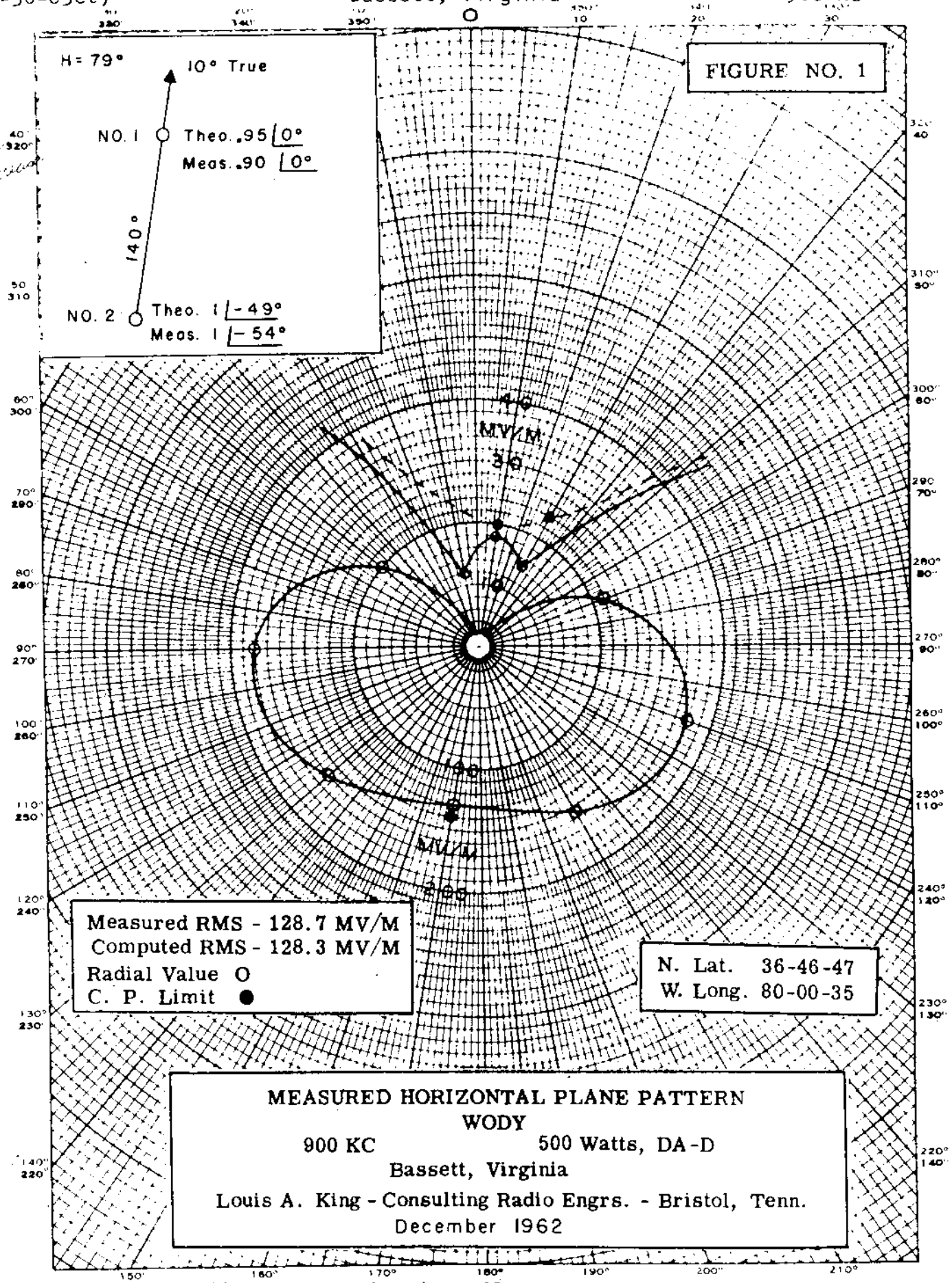
900 KC

WODY

Measured Day
(4-30-63ct)

Station WODY
Bassett, Virginia

500w,DA-D,D
900 kc



5-6-63 carried lic. during increase power

FCC File No.BL-9911
Accepted 4-12-63

Station WODY
Bassett, Virginia

900 kc

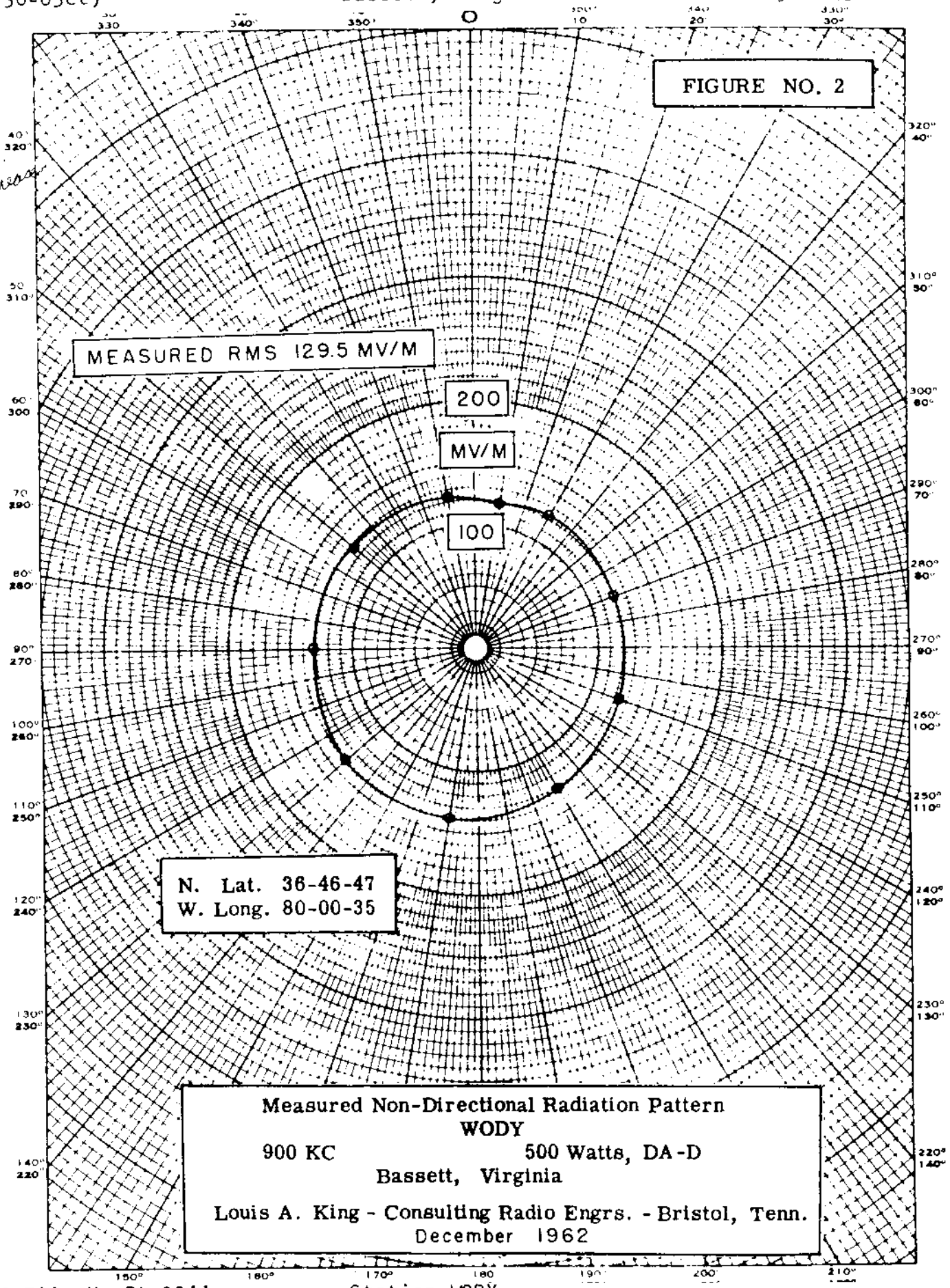
Measured Non-DA
(4-30-63ct)

Station WODY
Bassett, Virginia

500w,DA-D,D
900 kc

WODY

5-6-63 granted lic. covering increase in power



FCC File No.BL-9911
Accepted 4-12-63

Station WODY
Bassett, Virginia

900 kc

-19-55

CBO

PROPOSED DAY & NIGHT (2/18/55G)

STATION CBO
OTTAWA, ONTARIO

5 KW
DA-1, Class III

910 KC

ENGINEERING DIVISION MONTREAL

TITLE CBO, Ottawa, Ontario.
910 kc/s - 5 kw - DA-1 - Class III.

DWG. NO.
DATE Jan. 19/55 ISS.
ENG. J.K.C. APP. R.E.S.

Description of Array

Station: CBO Main Studio: Ottawa, Ont.

Power: 5 kw. Frequency: 910 kc/s Class: III

Location: Ramsayville, Ontario.

North Latitude: 45° 22' 48"

West Longitude: 75° 33' 19"

Antenna:

Mode of Operation: DA-1

Three elements: uniform cross section guyed, base insulated for series feed.

Tower:	North	Centre	South
Height above insulator	~~87.5°~~ (250')	~~87.5°~~ (250')	~~87.5°~~ (250')
Spacing:-	90° (270')		90° (270')
Phasing:	0	151.2°	302.4°
Field Ratio:	1.0	1.18	0.70

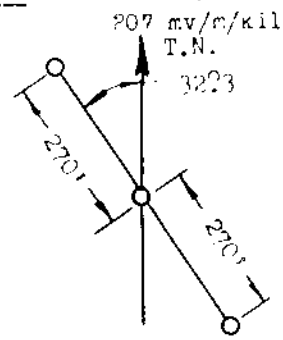
Note 250' = 83.3°

Ground System:

120 radials per tower spaced 3° and extending to a distance of 430 feet (0.4λ) except where limited by property boundaries or common bonding strip between towers.

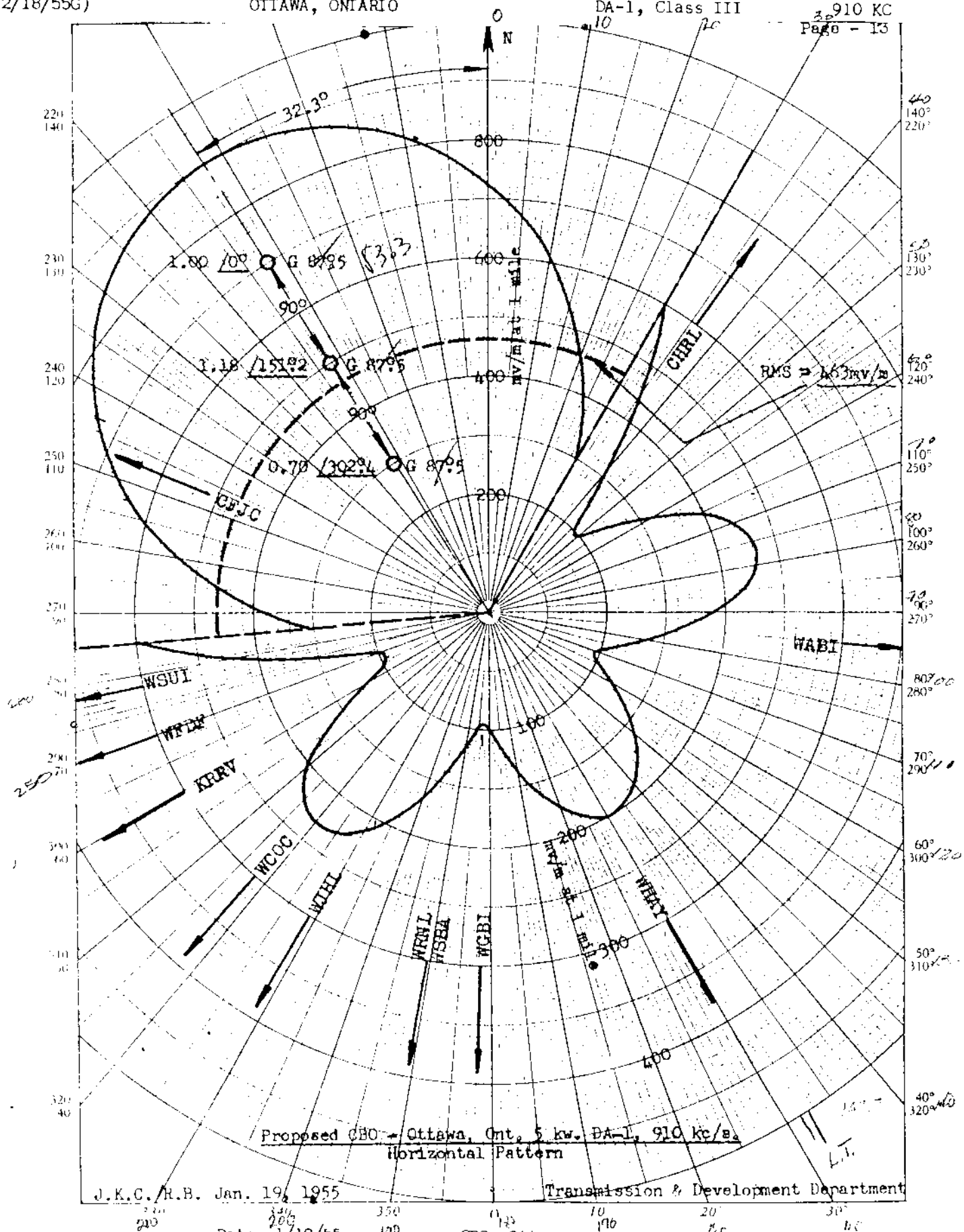
Predicted Effective Field: 463 mv/m at 1 mile
207 mv/m/kilowatt.

Orientation:



CBO

PROPOSED DAY & NIGHT STATION CBO 5 KW
(2/18/55G) OTTAWA, ONTARIO DA-1, Class III 910 KC
Page - 13



Proposed CBO - Ottawa, Ont. 5 kw. DA-1, 910 kc/s.
Horizontal Pattern

J.K.C./R.B. Jan. 19, 1955 Transmission & Development Department

Date: 1/19/55 CBO, Ottawa, Ontario 910 KC

#123

CFJC

DESCRIPTION SHEET
(6-16-59g)

Station CFJC 1kw, 10kw-LS, U, Class III
Kamloops, British Columbia, Canada 910 KC

DESCRIPTION SHEET - OMNIDIRECTIONAL ANTENNA

Station Call: CFJC

Main Studio: Kamloops, British Columbia

Frequency: 910 Kc/s

Power: 10 Kw Day/1 Kw Night

Class: III

Time: Unlimited

Notification List No. 123 Date: July 2, 1958

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

North Latitude: 50° 43' 24"

West Longitude: 120° 20' 26"

ANTENNA CHARACTERISTICS:

Height: 250 feet 84 degrees

Type of Element: Uniform steel vertical radiator guyed, no top loading, series fed.

Ground System: 120 radials 0.4 wavelength long.

Expected Efficiency:

591 mv/m at 1 mile for 10 Kw.

or: 187 mv/m at 1 mile for 1 Kw.

F176

CFSX

Description Sheet
(3-30-63ct)

New Station
Stephenville, Nfld.

0.5kw,U,Class II
910 kc

DESCRIPTION SHEET - OMNIDIRECTIONAL ANTENNA

Station Call: NEW Rebroadcast Station of CFCX

Main Studio: Corner Brook, Nfld. Transmitter site Stephenville, Newfoundland

Frequency: 910 Kc/s

Power: .5 Kw

Class: III

Time: U

Notification List No. 176

Date: February 26, 1963

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

North Latitude: 48° 31' 34"

West Longitude: 58° 29' 28"

ANTENNA CHARACTERISTICS:

Height: 180 feet 60 degrees

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

Ground System: 120 radials of no. 10 AWG soft drawn copper wire buried 8" and of length 433'. (0.4λ)

Expected Efficiency:

128 mv/m at 1 mile for .5 Kw

or 180 mv/m at 1 mile for 1 Kw

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

Station Call : CHRL Main Studio : Roberval, Qué.

Frequency : 910 KHz Power : 10 KW Class : III

Geographical Co-ordinates of the Antenna System : 48° 26' 25" N. Latitude; 72° 06' 47" W. Longitude

Notification List No. : 383 Date : March 28, 1979

Antenna Characteristics :

Mode of Operation : DA-N

Number of Elements : 3 (Three)

Type of Elements : Uniform cross-section, guyed, base insulated, series fed vertical radiators; no top loading.

Tower	No. 1 (S)	No. 2 (C)	No. 3 (N)
Height above Insulators	200' (66.7°)	200'	200'
Overall Height	205'	205'	205'
Spacing	Ref.	90° (270')	180°
Orientation	Ref.	5° T	5° T
Phasing	0°	-134°	-256°
Field Ratio	1	1.76	0.94

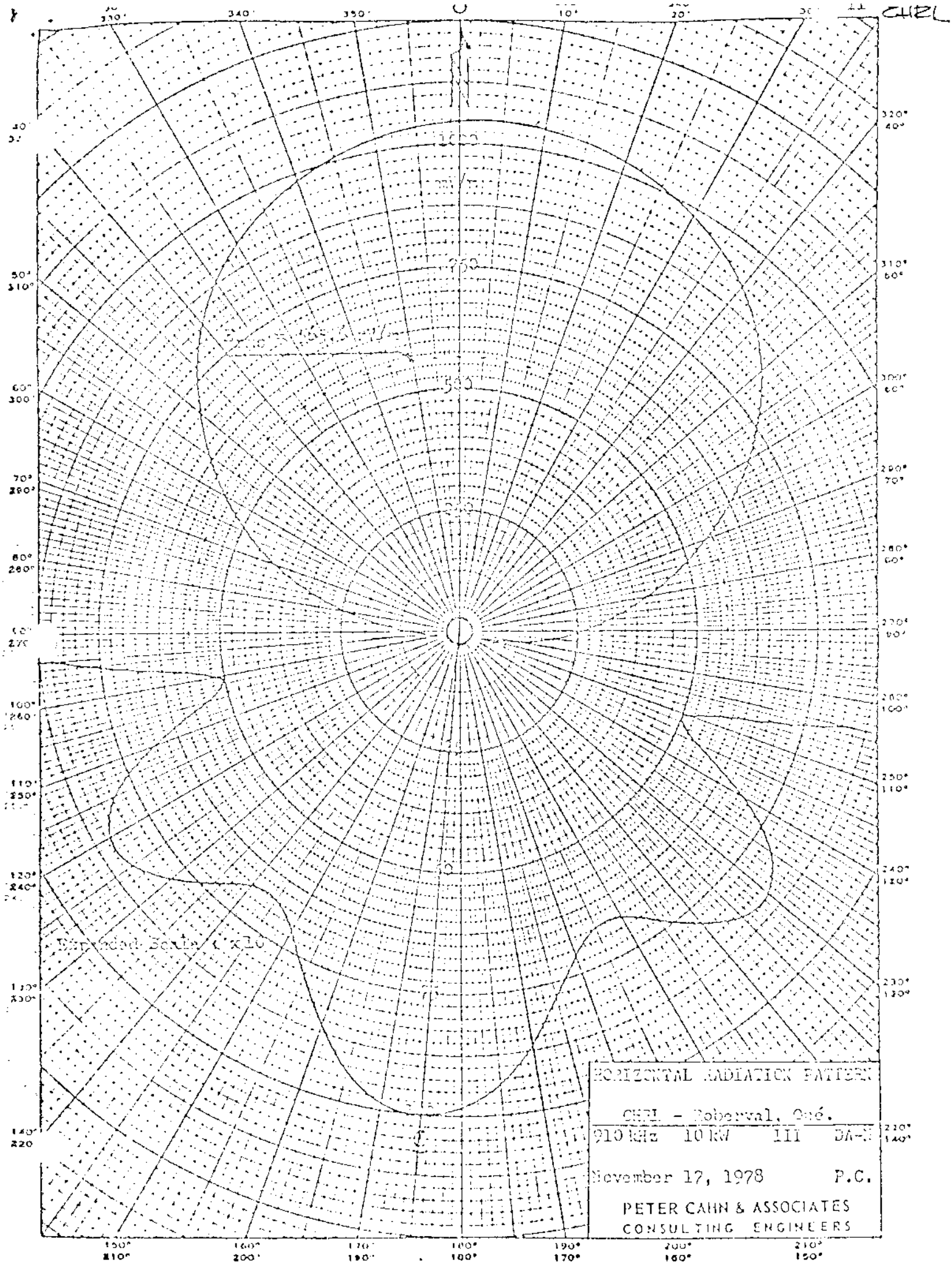
Ground System : 120 equiangularly spaced radials per tower of No. 10 B&S gauge bare, soft-drawn, copper wire, buried approx. 8". Lenth of radials 432 ft(0.4λ) with the exception of those joined along common chords.

Predicted Efficiency : 577 mV/m at 1 mile for 10 KW radiated, or 182.5 mV/m at 1 mile for 1 KW - DAY

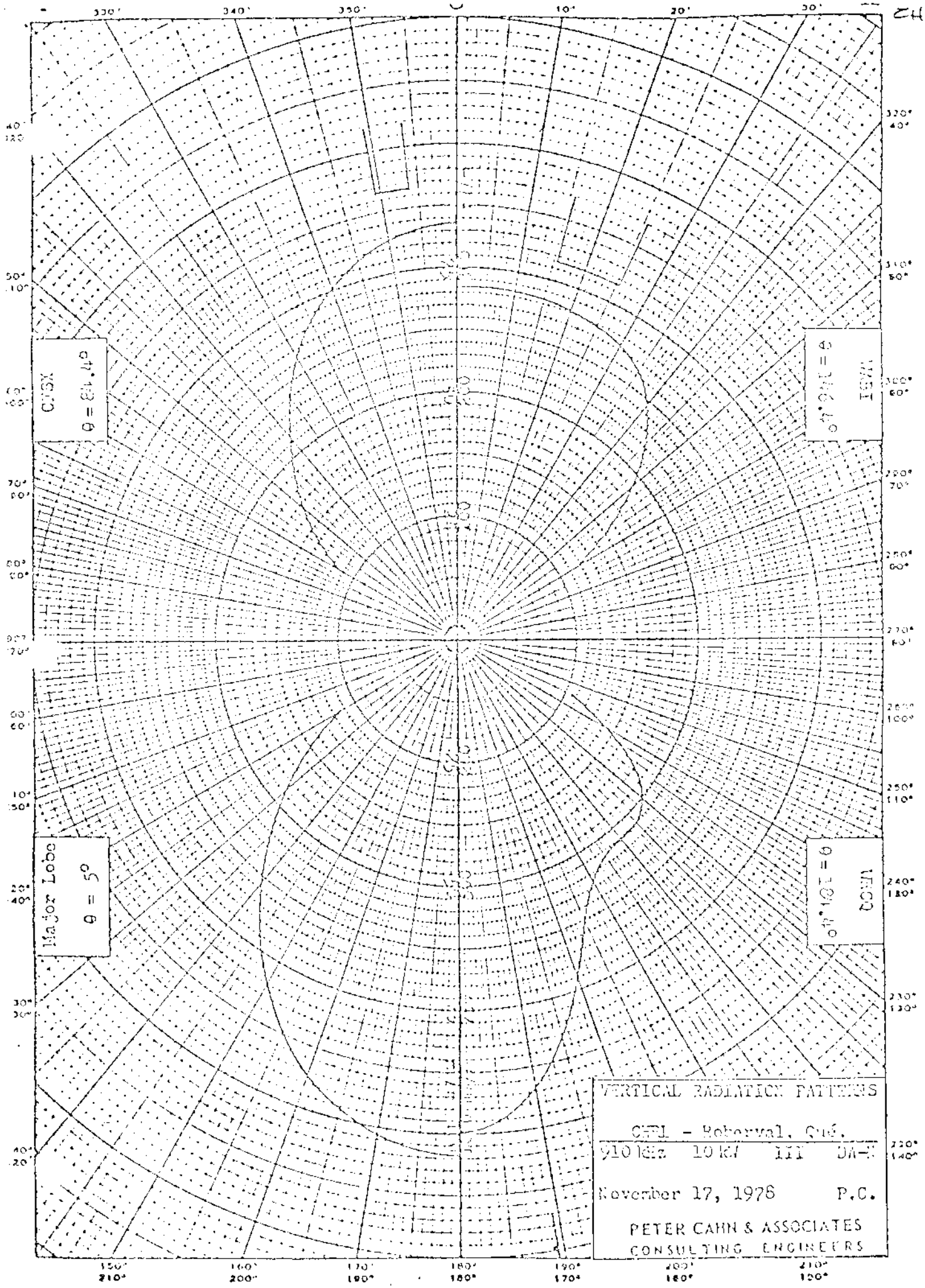
(Theoretical) 565.6 mV/m at 1 mile for 10 KW radiated, or 178.9 mV/m at 1 mile for 1 KW - NIGHT

(Standard) 594.2 mV/m at 1 mile for 10 KW radiated.

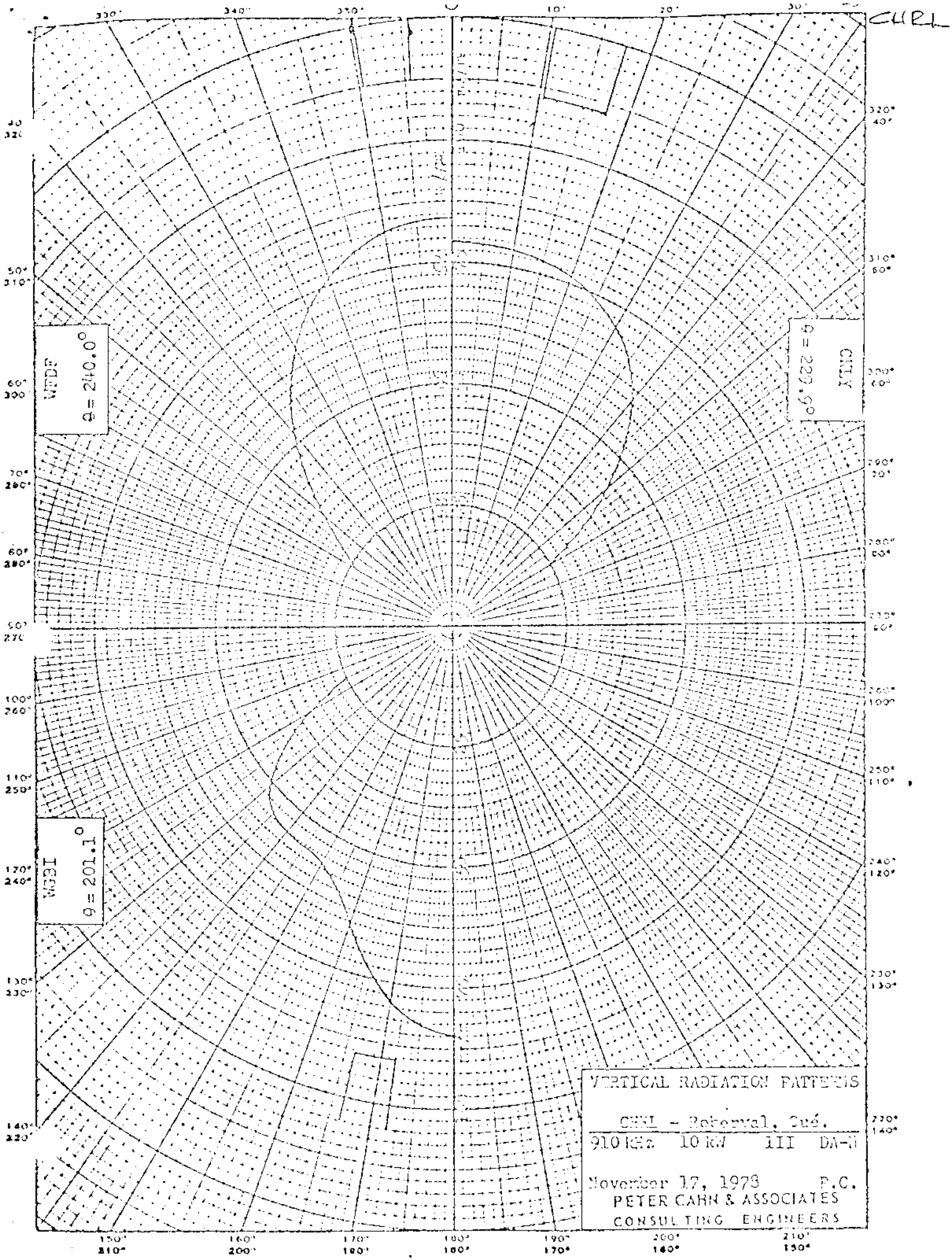
CHEL


1000
750
500
250
10
Expanded Scale (x10)
HORIZONTAL RADIATION PATTERN
CHEL - Roberval, Qué.
910 kHz 10 kW III DA-N
November 17, 1978 P.C.
PETER CAHN & ASSOCIATES
CONSULTING ENGINEERS

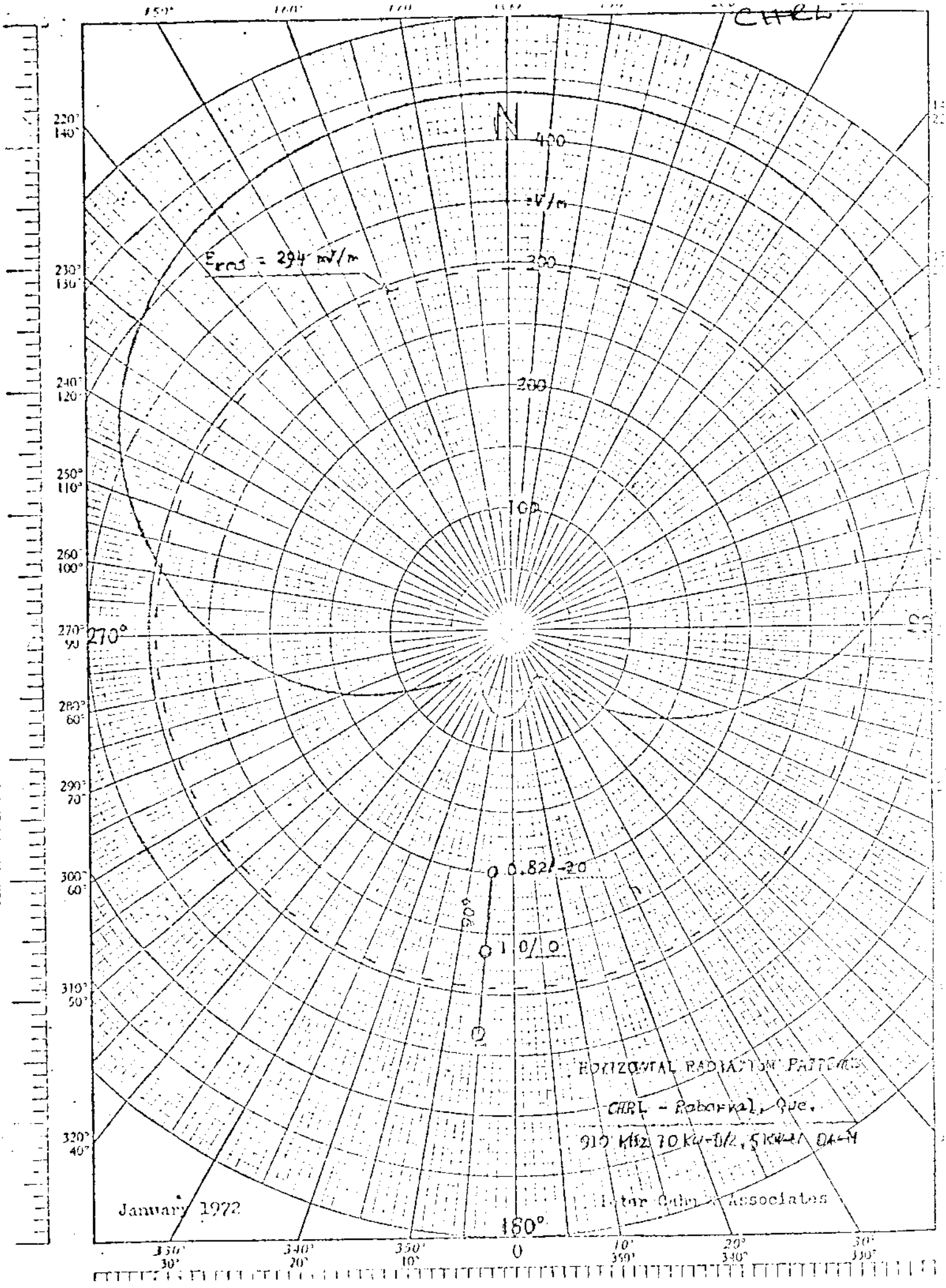
CHRL


CUSX
θ = 47.13°
ISWX
θ = 47.13°
Major Lobe
θ = 5°
DCUM
θ = 101.40°
VERTICAL RADIATION PATTERNS
CHRL - Roberval, Qué.
910 kHz 10 kW III DA-N
November 17, 1978 P.C.
PETER CAHN & ASSOCIATES
CONSULTING ENGINEERS

CHRL


MEAN
θ = 240.0°
CHLY
θ = 229.9°
MEAN
θ = 201.1°
VERTICAL RADIATION PATTERNS
CHRL - Roberval, Qué.
910 kHz 10 kW III DA-N
November 17, 1978 P.C.
PETER CAHN & ASSOCIATES
CONSULTING ENGINEERS

CHRL


CHRL
N
400
mV/m
300
200
100
E_{rms} = 294 mV/m
270°
0.82/-20
1.0/0
HORIZONTAL RADIATION PATTERN
CHRL - Rouyn, Que.
910 KHz 10 KW-D/2.5 KW-N DA-N
January 1972
Lotar Cohen Associates
180°
0
220° 140°
230° 130°
240° 120°
250° 110°
260° 100°
270° 90°
280° 80°
290° 70°
300° 60°
310° 50°
320° 40°
350° 30°
340° 20°
350° 10°
10° 350°
20° 340°
30° 330°

CJDV
910KHZ

ANTENNA DESCRIPTION SHEET DIRECTIONAL DA-2

Station Call	C J D V
Location	Drumheller, Alberta.
Frequency	910 khz
Power	10,000 watts
Class	III
Time	Unlimited

Notification Reference List No. 408, September 25, 1981

Geographical Coordinates Lat 51°24'50", Lon 112°44'10"

Array Characteristics Four elements, guyed, uniform cross section, base insulated, series feed. No top loading.

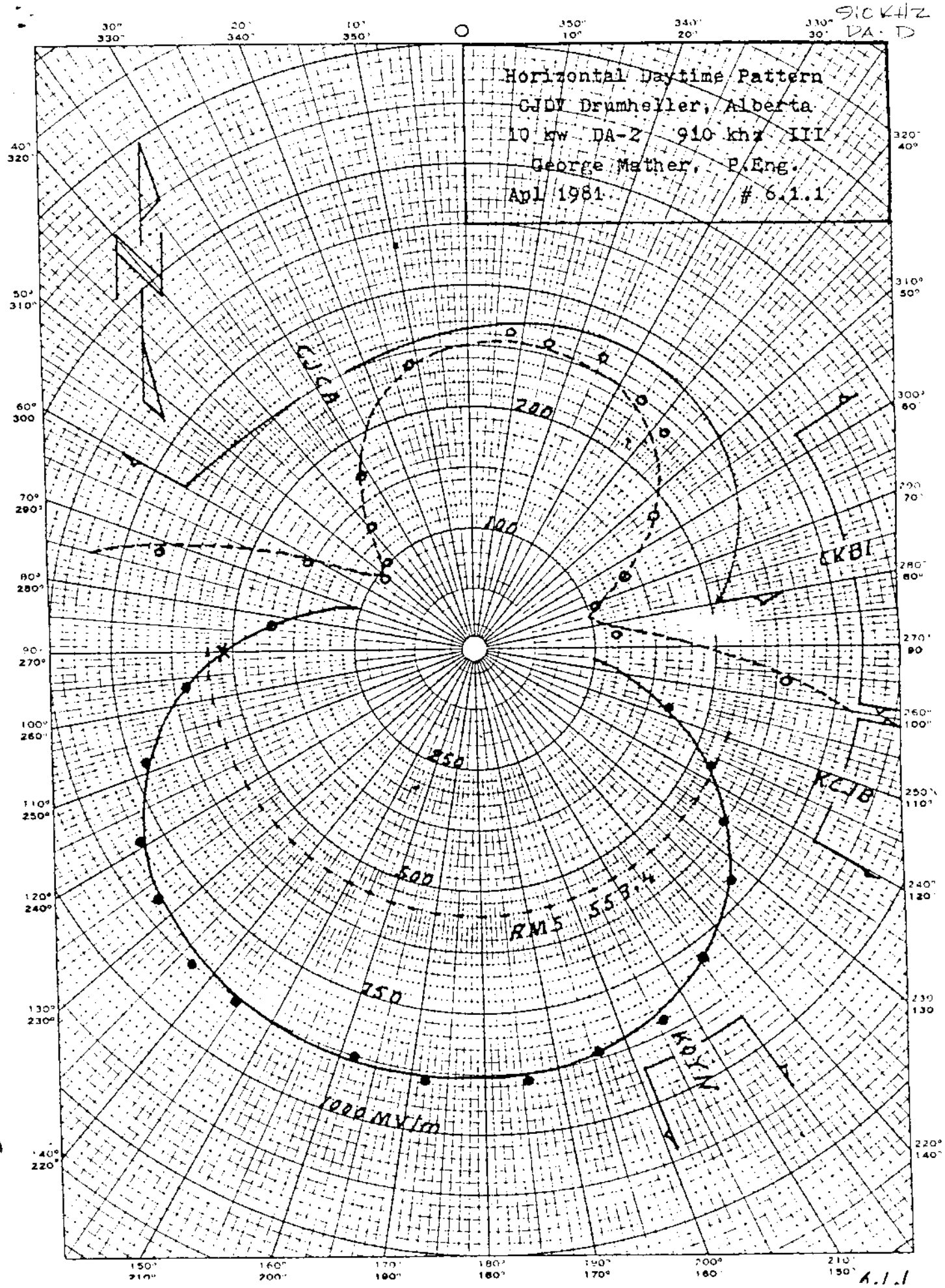
Element		One	Two	Three	Four
Height		182' 60°	182' 60°	182' 60°	182' 60°
Bearing		Ref	192.9°	192.9°	173.0°
Spacing		Ref	270' 90°	480' 160°	495' 165°
Day	R	1.000	1.248	1.000	---
	ø	0°	-101°	-178°	---
Night	R	0.91	0.84	---	0.99
	ø	0°	54°	---	107°

Ground System 120 radials per tower, #10 AWG bare, soft copper wire, spaced uniformly, depth of 8 inches approximately. Radials bonded along lines between towers and bonded to soft copper straps at tower bases. Maximum radial length 436 feet.

RMS Day 553.4 mv/m at 1 mile for 10 kw
175.0 mv/m at 1 mile for 1 kw

Night 550.2 mv/m at 1 mile for 10 kw
174.0 mv/m at 1 mile for 1 kw

CJDV
910 KHz
DA-D



CJDV

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CJDV

Notification No. 353

Frequency: 910 kc/s

Main Studio: Drumheller, Alberta

Date: April 1, 1976

Power: 10D/5N Class: III

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

North Latitude: 51° 24' 50"

West Longitude: 112° 44' 10"

ANTENNA CHARACTERISTICS:

Mode of Operation: DA-2

Number of Elements: Four

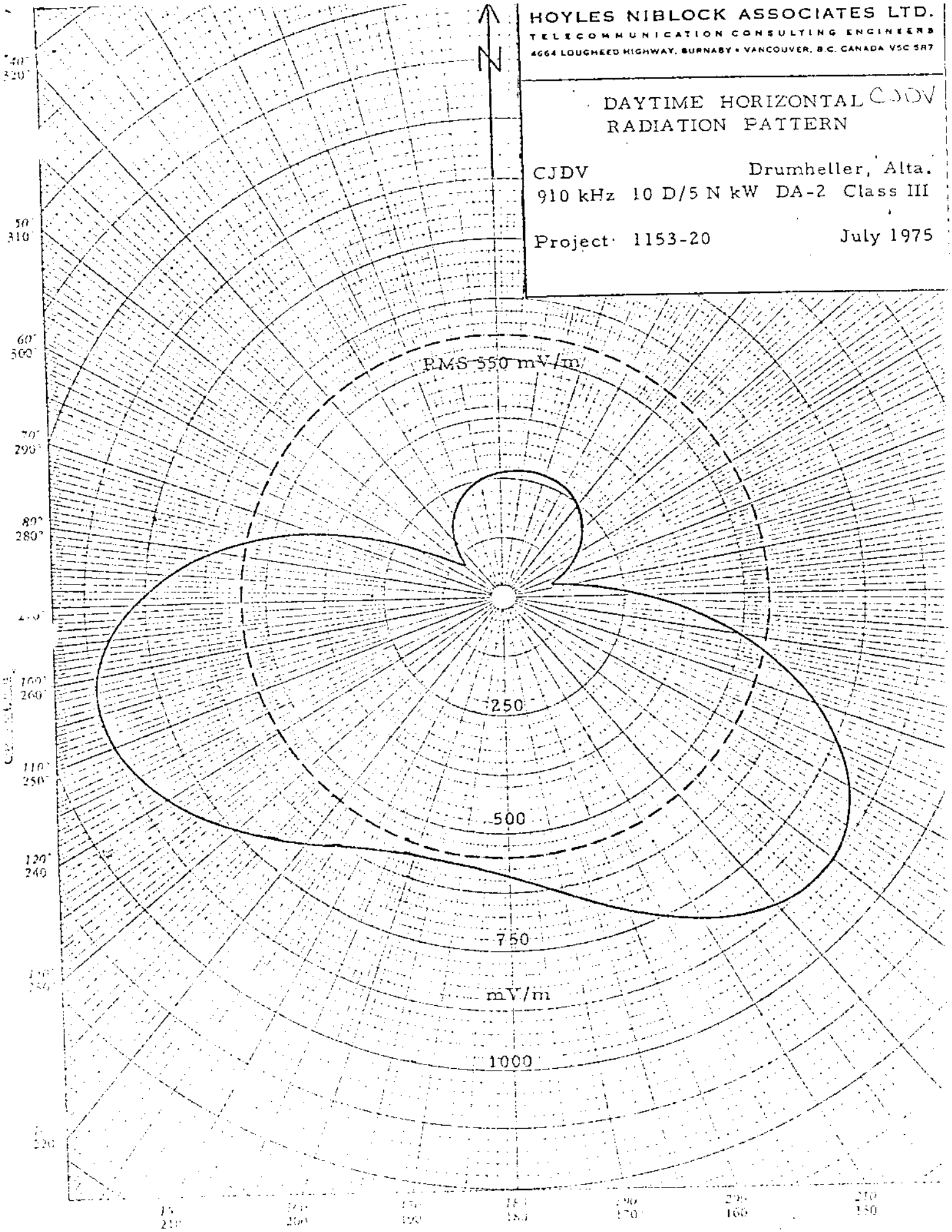
Type of Elements: Guyed, uniform cross section, base insulated, series fed.

TOWER:		No. 1 North	No. 2 North Center	No. 3 South Center	No. 4 South
HEIGHT ABOVE INSULATORS:		182' (60°)	182'	182'	182'
OVERALL HEIGHT:		186'	186'	186'	186'
SPACING:		90° (270')	70° (210')	130° (391')	
PHASING:	Day	93°	0°	Not used	-62°
	Night	-146°	0°	156°	Not used
FIELD RATIO:	Day	0.9	1.6	Not used	0.8
	Night	1.	2.	1	Not used

ORIENTATION: Towers on line bearing 12.9° East of true North.

GROUND SYSTEM: 120 radials of No. 10 AWG soft drawn copper wire spaced evenly around the base of each tower and buried to a depth of 8". Radials bonded to No. 4 AWG copper busses positioned at right angles to towers. Radial length 436'.

Predicted Effective Field: Day 550 mv/m (174 mv/m for 1 kW)
Night 403 mv/m (180 mv/m for 1 kW)


HOYLES NIBLOCK ASSOCIATES LTD.
TELECOMMUNICATION CONSULTING ENGINEERS
4664 LOUGHEED HIGHWAY, BURNABY • VANCOUVER, B.C. CANADA V5C 5R7
DAYTIME HORIZONTAL CJDV
RADIATION PATTERN
CJDV
Drumheller, Alta.
910 kHz 10 D/5 N kW DA-2 Class III
Project 1153-20
July 1975
N
RMS 550 mV/m
250
500
750
mV/m
1000

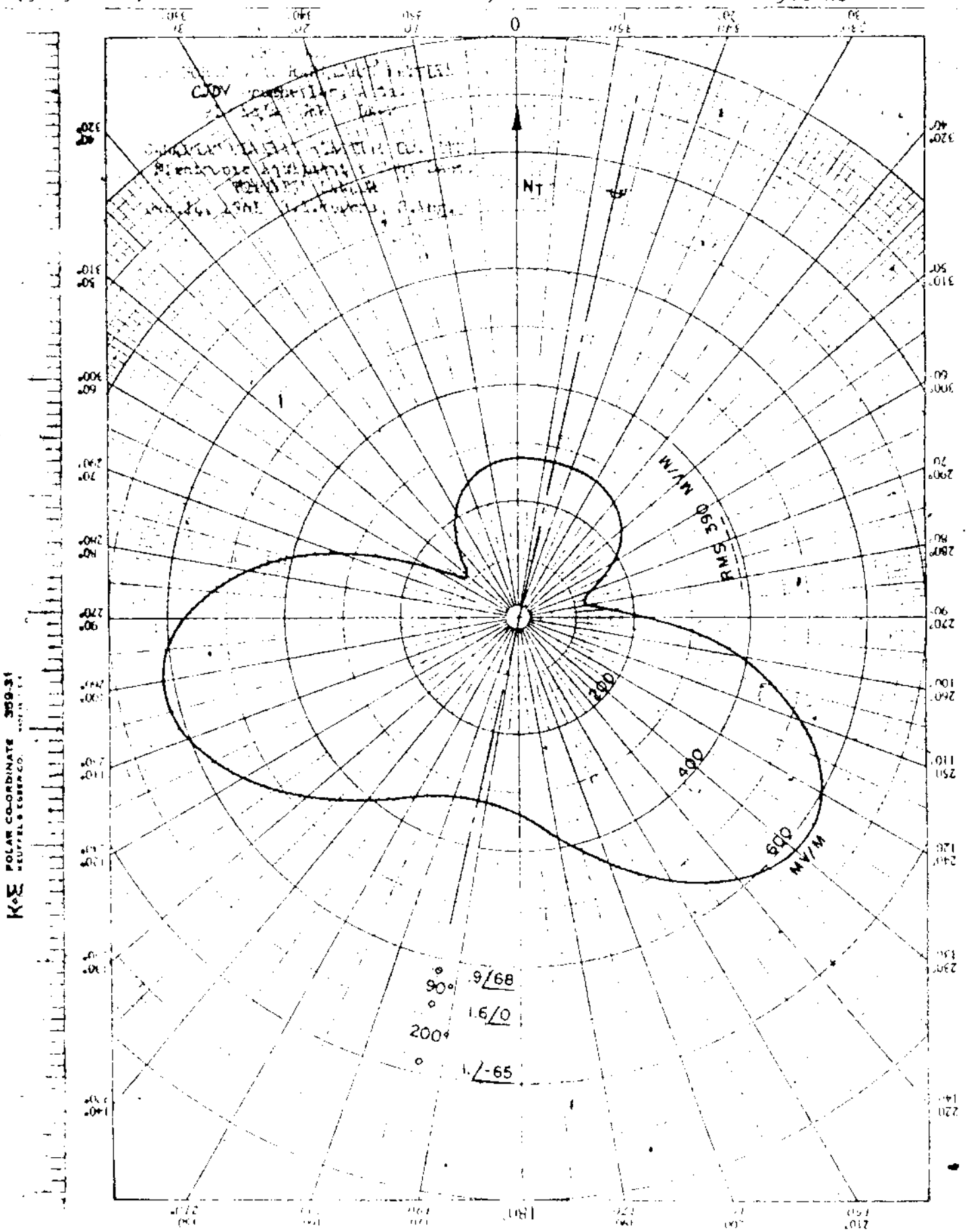
#168

CJDV

Proposed Day
(9-29-64ct)

Station CJDV
Drumheller, Alberta

5kw,DA-2,U,Class III
910 kc



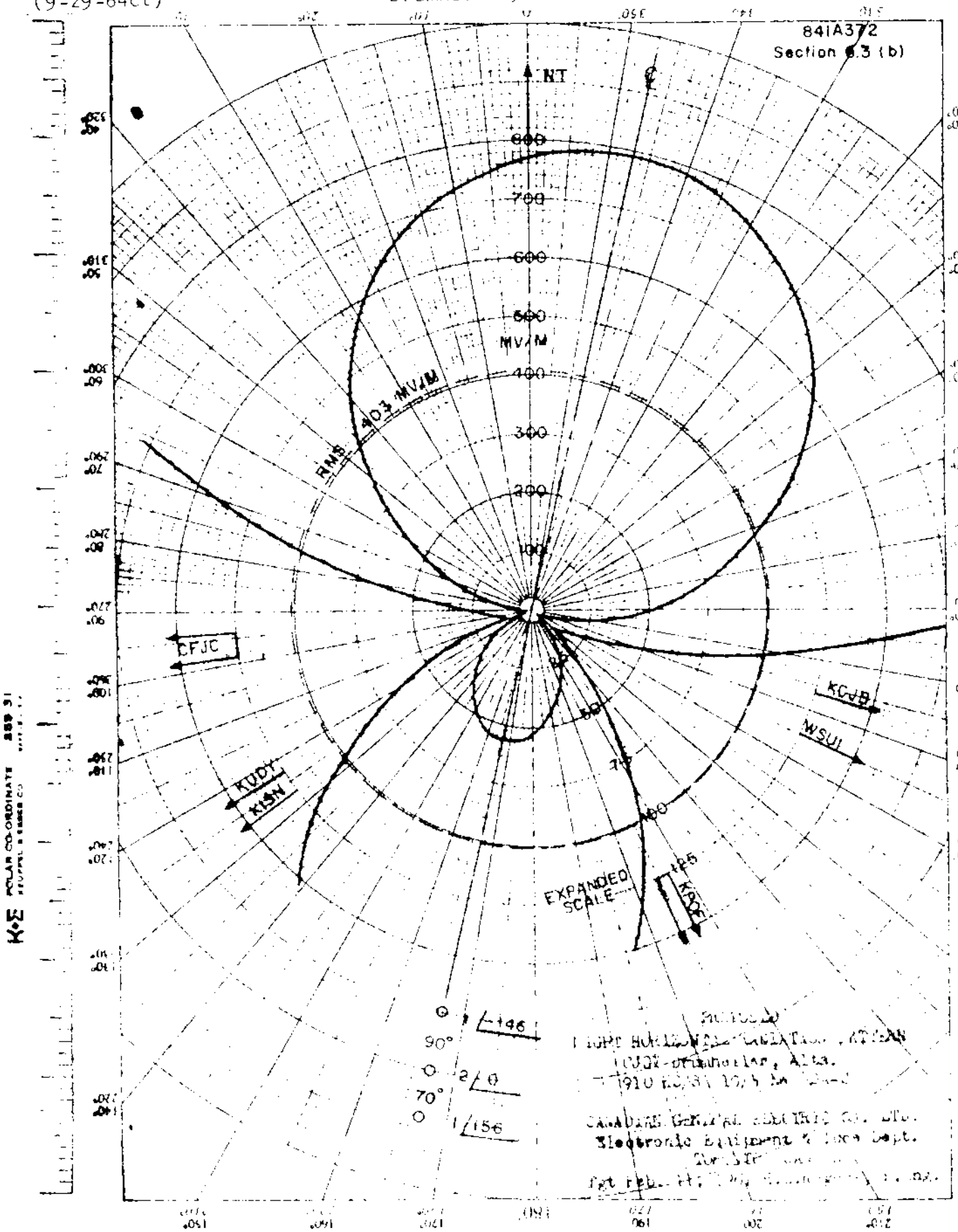
F168

CJDV

Proposed Night
(9-29-64ct)

Station CJDV
Drumheller, Alberta

5kw,DA-2,U,Class III
910 kc



CJDV

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CJDV

Main Studio: Drumheller, Alberta

Frequency: 910 kc/s

Power: 10 kW Class: III

Notification No: 365

Date: July 29, 1977

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

North Latitude: 51° 24' 50"
West Longitude: 112° 44' 10"

ANTENNA CHARACTERISTICS:

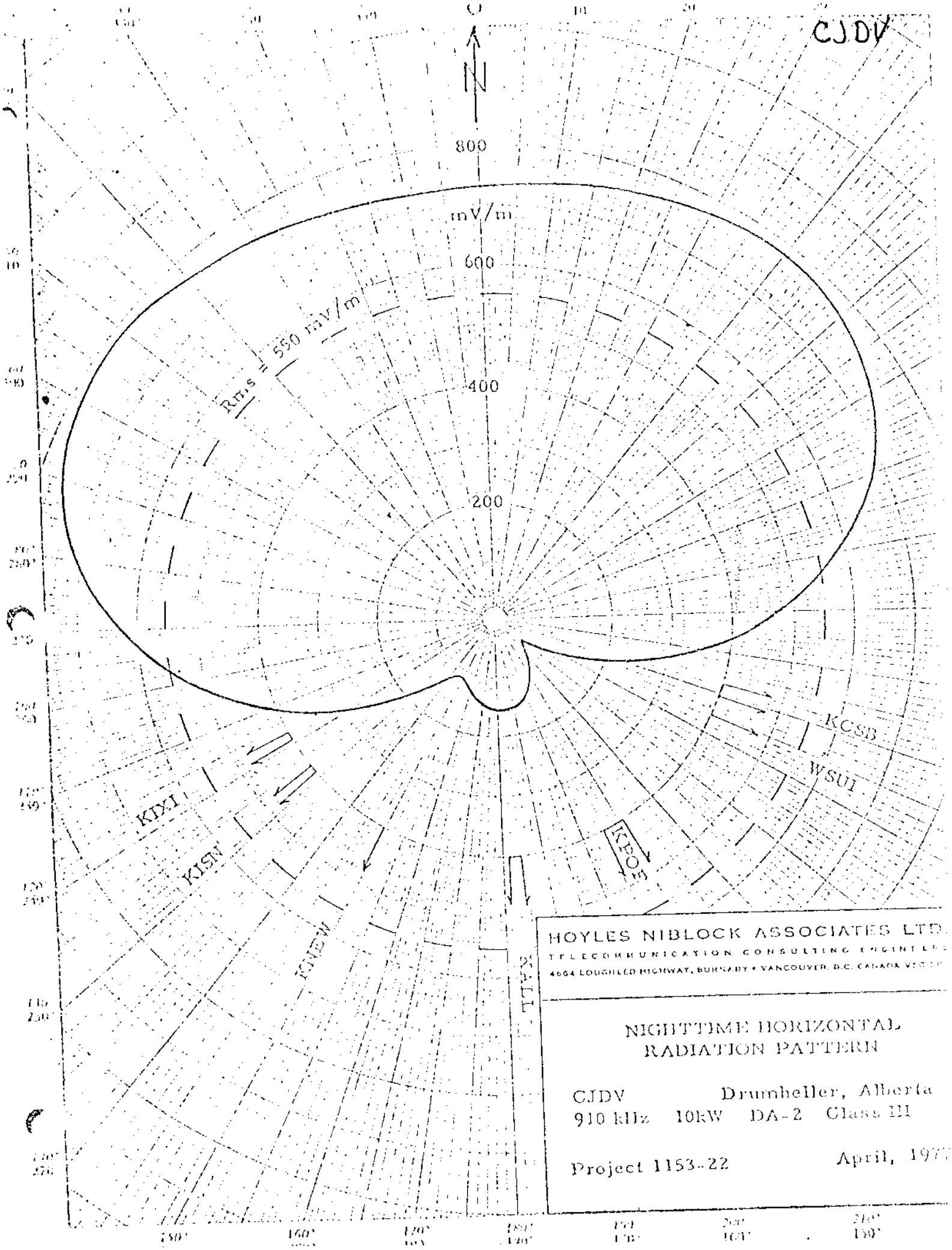
Mode of Operation: DA-2
Number of Elements: Four
Type of Elements: Guyed, uniform cross section, base insulated, series fed.

TOWER:		No. 1 North	No. 2 North Center	No. 3 South Center	No. 4 South
HEIGHT ABOVE INSULATORS:		182' (60°)	182'	182'	182'
OVERALL HEIGHT:		186'	186'	186'	186'
SPACING:		REF	90°	165°	290°
PHASING:	Day	93°	0°	Not used	-62°
	Night	0°	54°	107°	Not used
FIELD RATIO:	Day	0.9	1.6	Not used	0.8
	Night	0.91	0.84	0.99	Not used
ORIENTATION:		REF	192.9	173.0	192.9

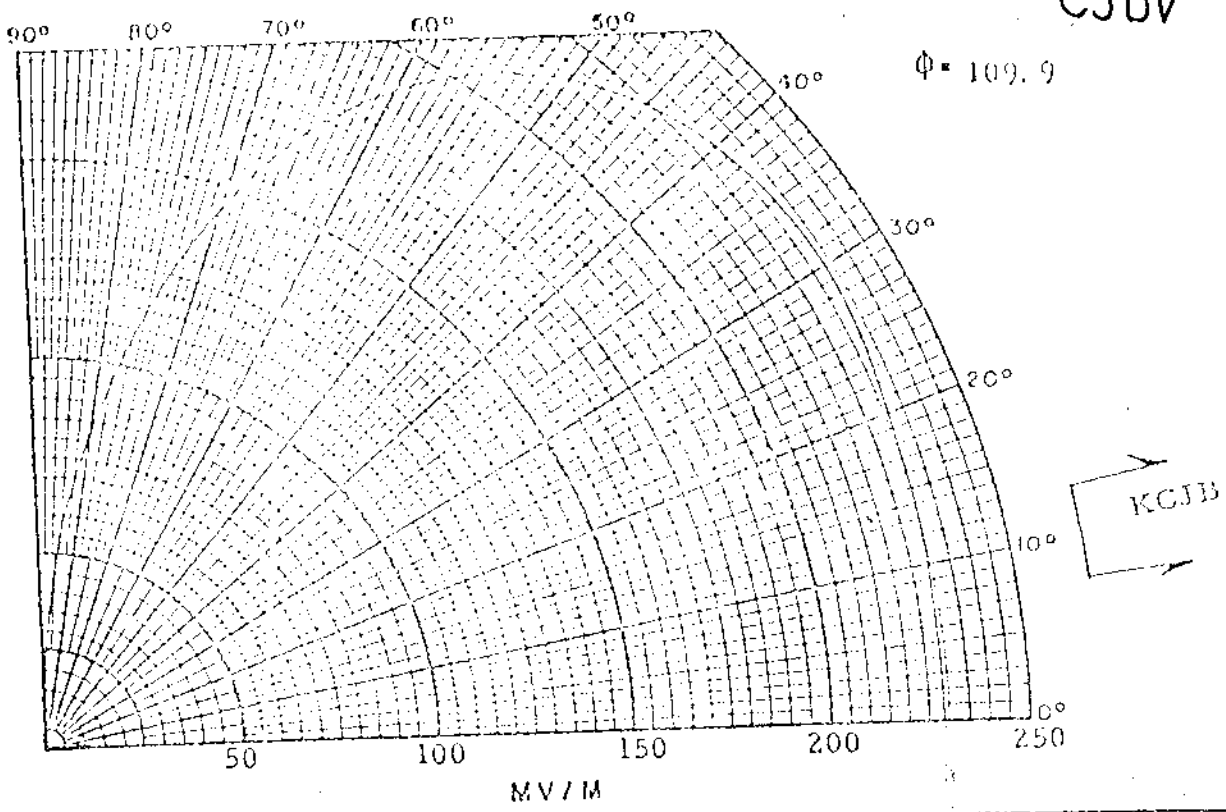
GROUND SYSTEM: 120 radials of No. 10 AWG soft drawn copper wire spaced evenly around the base of each tower and buried to a depth of 8". Radials bonded to No. 4 AWG copper busses positioned at right angles to towers. Radial length 436'.

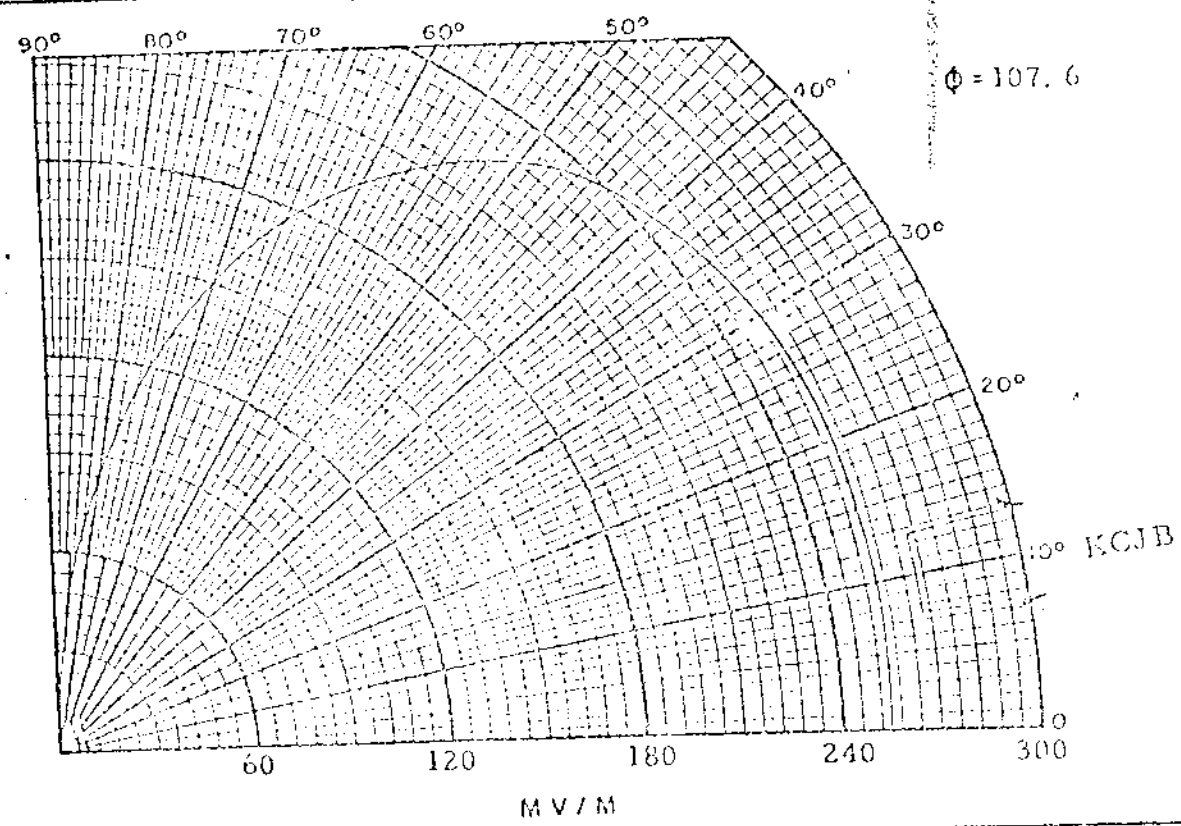
PREDICTED EFFECTIVE FIELD: 550 mv/m (174 mv/m for 1 kW)

This notification is for a change of night-time operation only. Please retain the day-time radiation pattern notified for CJDV in Canadian Change List No. 353 dated April 1, 1976.


CJDV
N
800
mV/m
600
400
200
Rms = 550 mV/m
KCSB
WSUI
KPOE
KIXI
KISN
KNEW
KALL
HOYLES NIBLOCK ASSOCIATES LTD.
TELECOMMUNICATION CONSULTING ENGINEERS
4604 LOUGHEED HIGHWAY, BURNABY • VANCOUVER, B.C. CANADA
NIGHTTIME HORIZONTAL
RADIATION PATTERN
CJDV Drumheller, Alberta
910 kHz 10kW DA-2 Class III
Project 1153-22
April, 197

CJDV





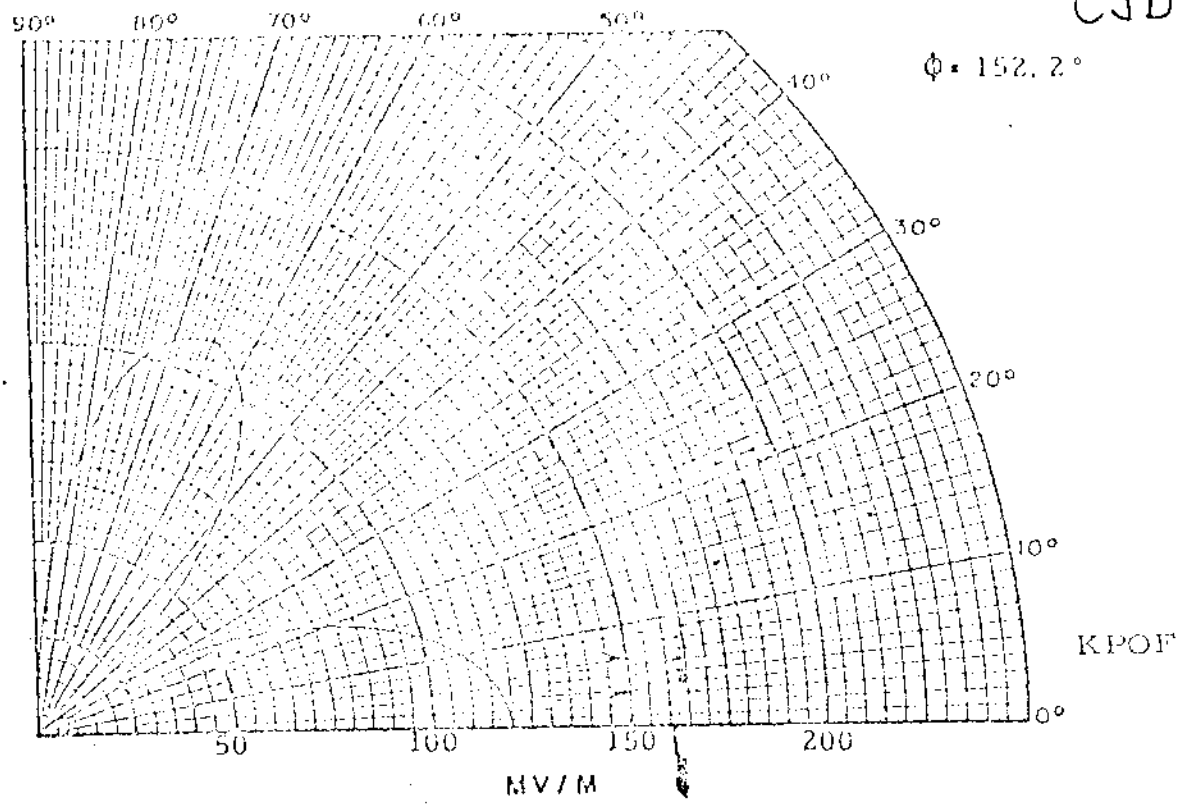
VERTICAL RADIATION PATTERNS

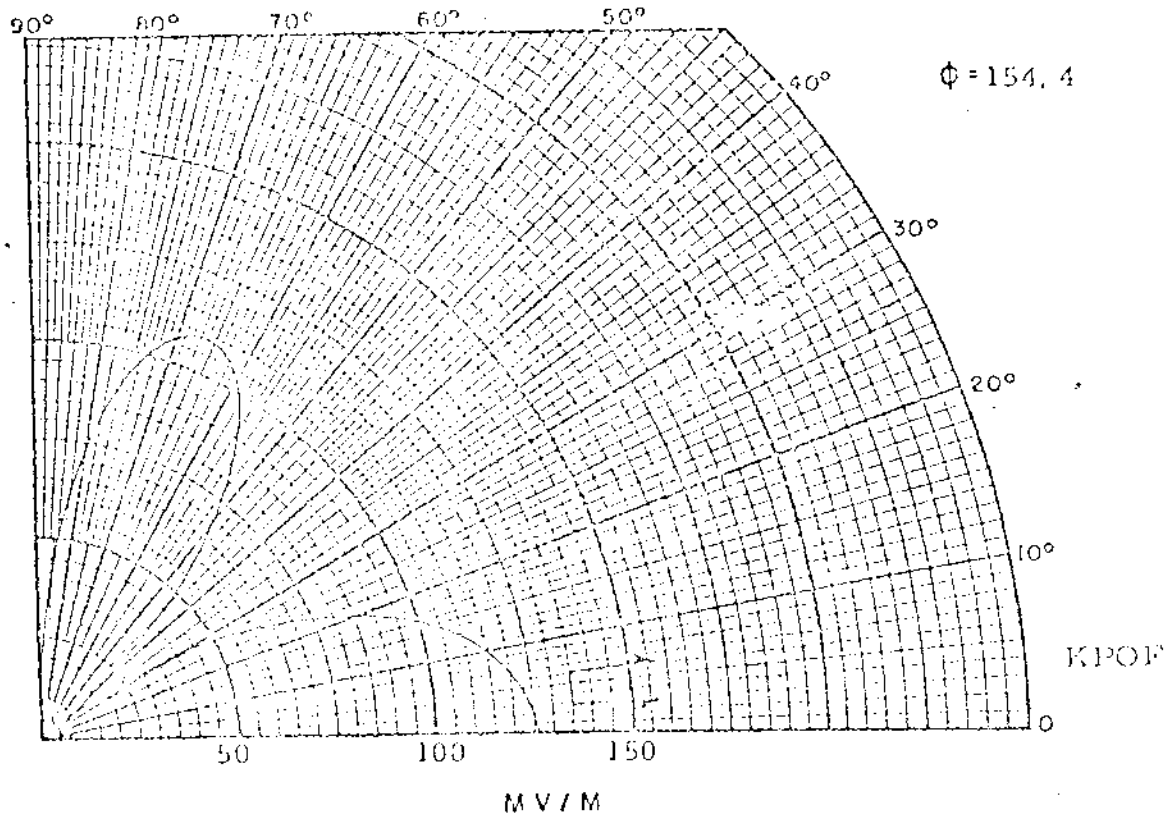
CJDV Drumheller, Alberta
910 kHz 10 kW DA-2 Class III

Project 1153-22 April, 1977

HOYLES NIBLOCK ASSOCIATES LTD.

CJDV





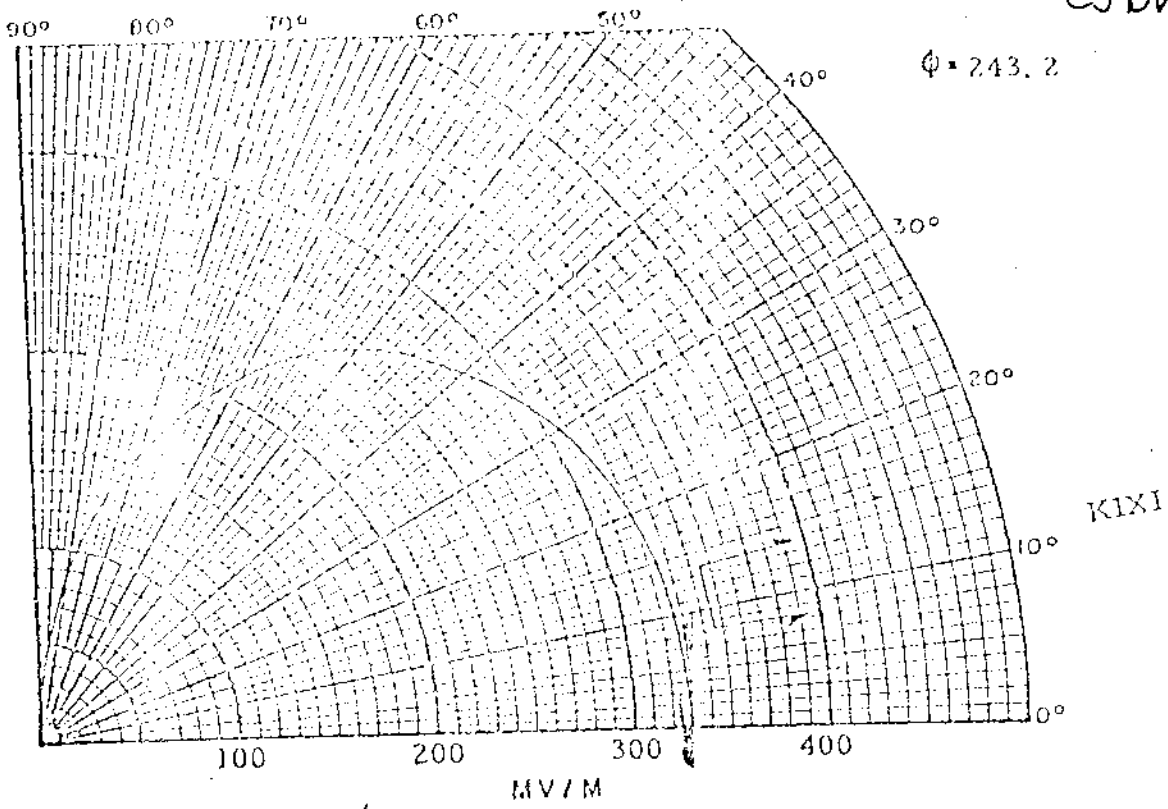
VERTICAL RADIATION PATTERNS

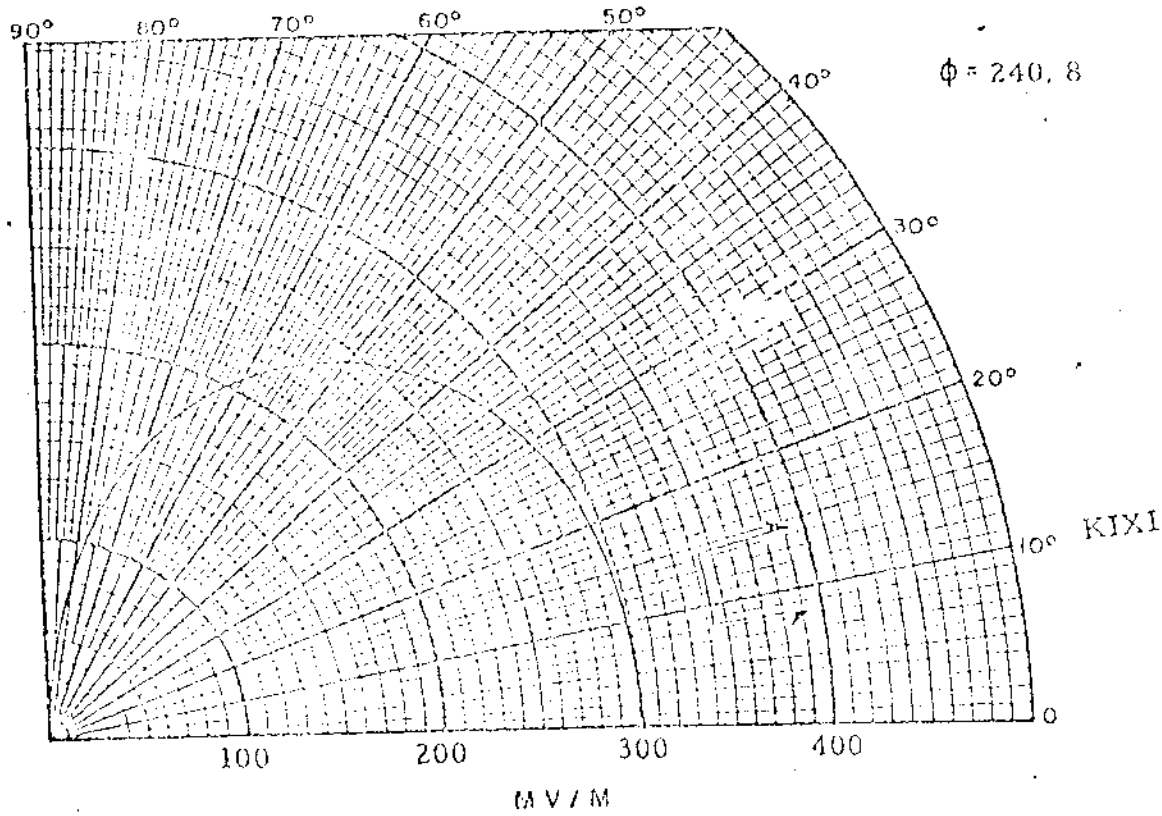
CJDV Drumheller, Alberta
910 kW 10 kW DA-2 Class III

Project 1153-22 April, 1977

HOYLES NIBLOCK ASSOCIATES LTD. | CONSULTING ENG

CJDV



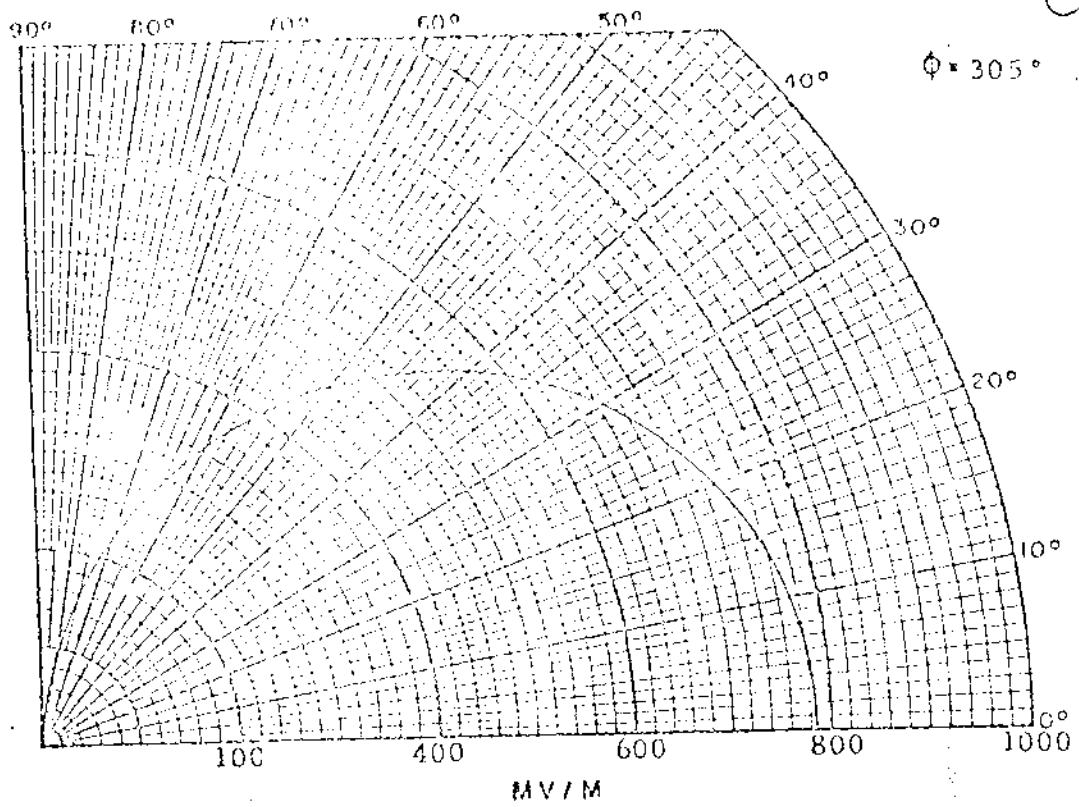


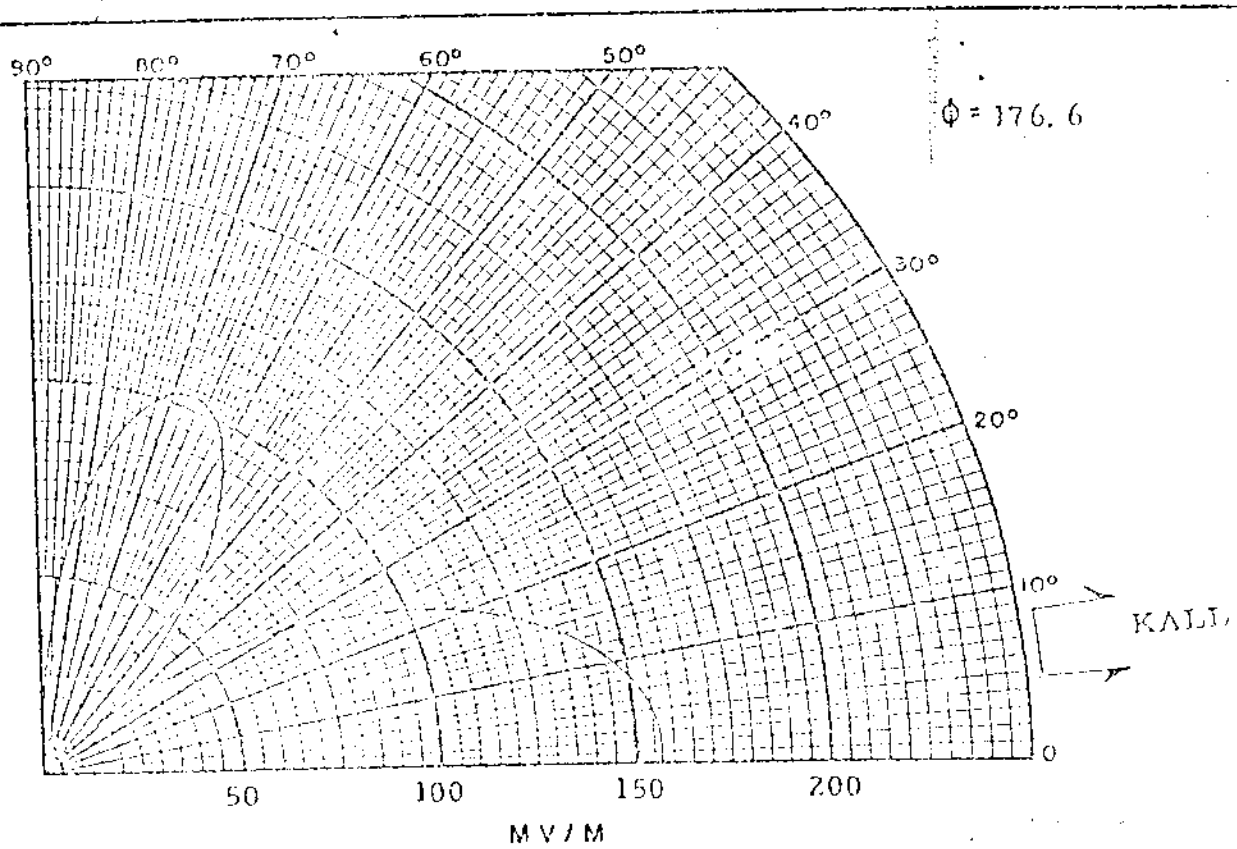
VERTICAL RADIATION PATTERNS

CJDV Drumheller, Alberta
910 kHz 10 kW DA-2 Class III

Project 1153-22 April, 1977

CJDV





VERTICAL RADIATION PATTERNS

CJDV Drumheller, Alberta
910 kHz 10 kW DA-2 Class III

Project 1153-22 April, 1977

HOYLES NIBLOCK ASSOCIATES LTD.

CKDQ
415
DELETE 50KW DA

IFRB Serial No. 7093

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.: 415 Date: 821130

Assigned frequency (kHz)		(02)	910
Transmitting station	Name of the station	(03)	DRUMHELLER AB
	Call sign	(04)	CKDQ
	Additional identification	(05)	
	Station class	(06)	B
	Operational Status	(07)	O
Country		(08)	CAN
Geographical coordinates of the transmitting station		(09)	112W441 0 51N2415 0

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

Withdraw proposed 50 kW operation

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

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

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

(44) Remarks

COORDINATION UNDER ARTICLE 4:									
COUNTRY	USA								
IN PROGRESS									
ACCEPTANCE OBTAINED									

CKDQ

IFRB Serial No. 910

7093

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.: 413 Date: 82-09-23

Assigned frequency (kHz)	(02)	910
Transmitting station: Name of the station	(03)	DRUMHELLER AB
Transmitting station: Call sign	(04)	CKDQ
Transmitting station: Additional identification	(05)	
Transmitting station: Station class	(06)	B
Transmitting station: Operational Status	(07)	P
Country	(08)	CAN
Geographical coordinates of the transmitting station	(09)	113W2400 50N5800

(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	X							
ACCEPTANCE OBTAINED								

FORM FOR THE APPLICATION OF ARTICLE 4 OF T E AGREEMENT
CHARACTERISTICS OF A REGION 2 BROAD TING STATIO N IN THE BAND 5 -160 kHz

IFRB Sr No. 709

PART II Section I

Description of a directional antenna consisting of vertical conductors

Sheet No. 413

Date

(01) DRUMHELLER AB
Name of transmitting station

(02) CAN
Country

(03) 11 N
Hours of operation

(04) 4
Total number of towers

(05) Tower No.	(06) Tower field ratio	(07) Phase difference of the field (± degrees)	(08) Electrical tower spacing (degrees)	(09) Angular tower orientation (degrees)	(10) Reference tower indicator	(11) Electrical height of tower (degrees)	(12) Tower structure
1	1	0	0	0	—	90	—
2	1.1	-99	90	353.5		90	
3	1.2	-95	180	353.5		90	
4	1.312	-1194	270	353.5		90	

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

(17) SUPPLEMENTARY INFORMATION

CKDP 910

FORM FOR THE APPLICATION OF ARTICLE 4 OF TH E AGREEMENT
CHARACTERISTICS OF A REGION 2 BROADC ING STATION IN THE BAND 53 -1605 kHz

IFRB Se No. 709

PART II Section I

Description of a directional antenna consisting of vertical conductors

Sheet No. 413

Date

(01) DRUMHELLER AB — Name of transmitting station

(02) CAN — Country

(03) H J — Hours of operation

(04) 3 — Total number of towers

(05) Tower No.	(06) Tower field ratio	(07) Phase difference of the field (± degrees)	(08) Electrical tower spacing (degrees)	(09) Angular tower orientation (degrees)	(10) Reference tower indicator	(11) Electrical height of tower (degrees)	(12) Tower structure
1	1.	0.	0.	0.		90.	
2	.158	-148.	90.	353.5		90.	
3	.35	-34.	180.	353.5		90.	
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(14) r.m.s value of radiation: 1991. mV/m at 1 km

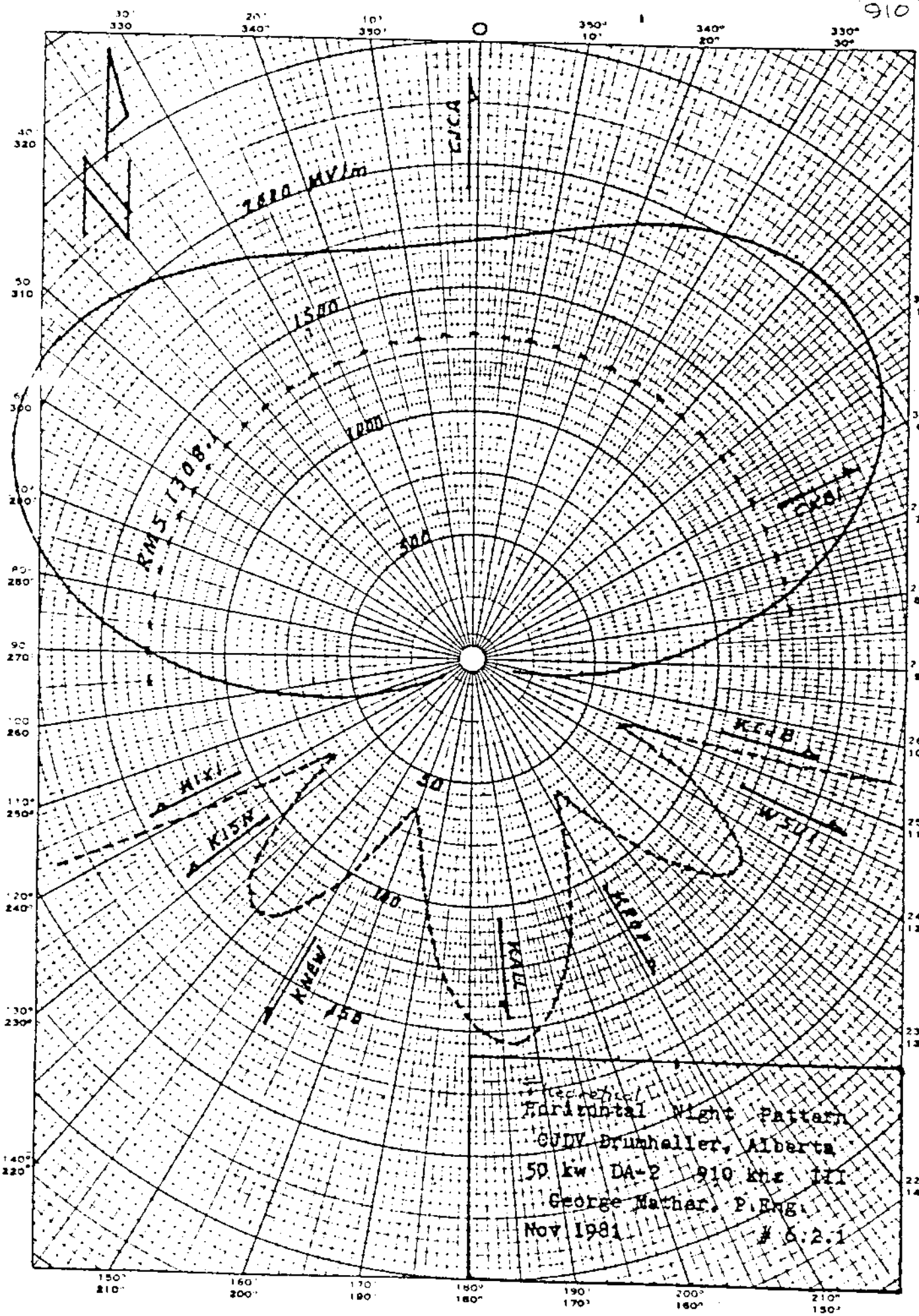
(15) Type of pattern: E

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

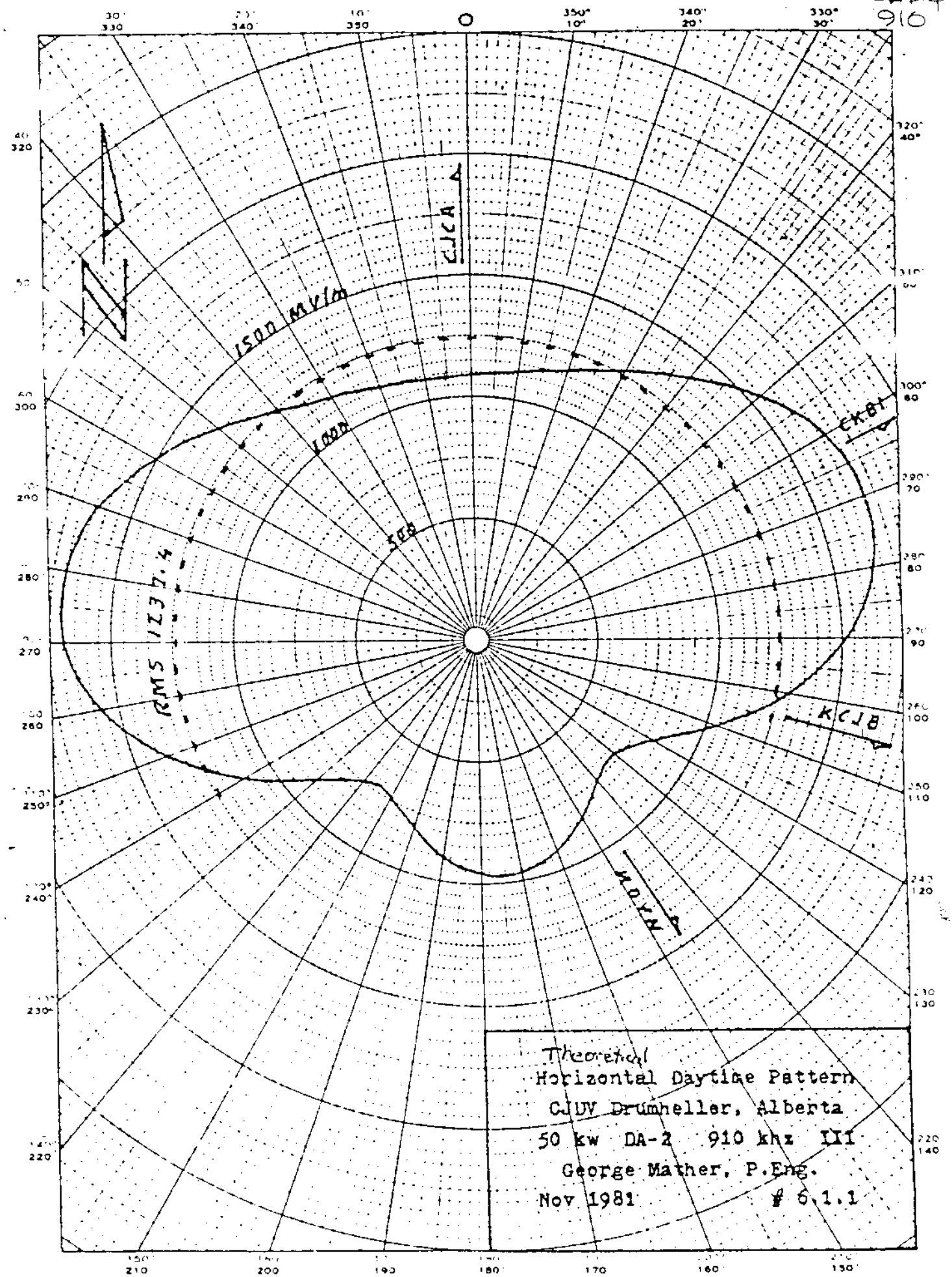
(17) SUPPLEMENTARY INFORMATION

CKDO 910

CKDQ
910


N
2610 MV/m
1500
1000
500
CJCA
CKBI
KM5 (308°)
KCJB
WSUI
KI5N
KNEW
KFOR
50
100
150
Horizontal Night Pattern
CJDV Drumheller, Alberta
50 kw DA-2 910 khz III
George Mather, P.Eng.
Nov 1981
6.2.1

CKDQ
910



Theoretical
Horizontal Daytime Pattern
CJUV Drumheller, Alberta
50 kw DA-2 910 khz III
George Mather, P.Eng.
Nov 1981 # 6.1.1

#92 Lindsay, Ont. CKLY

PROPOSED DAY & NIGHT (6/21/55G) CORRECTED DESCR. SHEET | STATION NEW LINDSAY, ONTARIO | 1000W DA-1, CLASS III | 910 KC

DESCRIPTION SHEET

Description of Array

Station Lindsay, Ontario. Main Studio - Lindsay, Ontario.

Class III

Power 1000W Mode DA-1

Frequency 910kc/s

NOTIFICATION LIST NO.: 92 DATE: March 29, 1955

Location Lindsay, Ontario
North Latitude 44° 16' 41"
West Longitude 78° 41' 57"

Tower	#1 (North-West)	#2 (Centre)	#3 (South-East)
Electrical Height	82°	82°	82°
Physical Height above Insulators	246'	246'	246'
Overall Height	250'	250'	250'
Spacing	78°(234')	78°(234')	
Field Ratio	1.15	1.8	0.85
Phasing	-148	0°	+150

Ground System

120 radials per tower #10 AWG Bare Soft Copper Wire, uniformly spaced, depth 8" approx.

Radial length 432' except for shorter radials between towers, bonded at intersection.

Predicted Effective Field 187.5 mv/m for 1Kw.

Orientation of Towers On a line bearing 338° East of true North.

CKLY

TABLE 1

ANTENNA DESCRIPTION SHEET

STATION CALL: CKLY
MAIN STUDIO: LINDSAY, ONTARIO
FREQUENCY: 910 kHz
POWER: 5N/10D kW
CLASS: III
MODE: DA-2
TIME: UNLIMITED

NOTIFICATION LIST NO.: ..253... DATE: February 21, 1969

GEOGRAPHICAL LOCATION: Latitude: 44° 16' 41" North
Longitude: 78° 41' 57" West

ARRAY CHARACTERISTICS: Four guyed steel towers of uniform cross section; base insulated, series fed, no top loading.

TOWER NO.:	1 S	2 SC	3 NC	4 N
HEIGHT:	250'	250'	250'	250'(82°)
SPACING:	ref.	78° 234'	156° 468'	234° 702'
ORIENTATION:	ref.	338°	338°	339.7°
DAY CURRENT:	0.730	2.20	2.45	1.00
DAY PHASE:	113°	315.5°	157°	5°
NIGHT CURRENT:	1.00	2.68	2.68	1.00
NIGHT PHASE:	95°	303.3°	152°	3.7°

GROUND SYSTEM: 120 uniformly spaced soft drawn #10 AWG copper radial wires per tower, buried approximately 8", of average length 432'(0.4λ).

PREDICTED EFFICIENCY: 175 mV/m for 1 kW
or 392 mV/m for 5 kW night
and 554 mV/m for 10 kW day

NOTE: Please retain the daytime and nighttime horizontal radiation patterns and attach to this corrected description sheet and vertical patterns. This concerns only corrections to the orientation of tower No. 4 and the day and night field ratios and phasings.

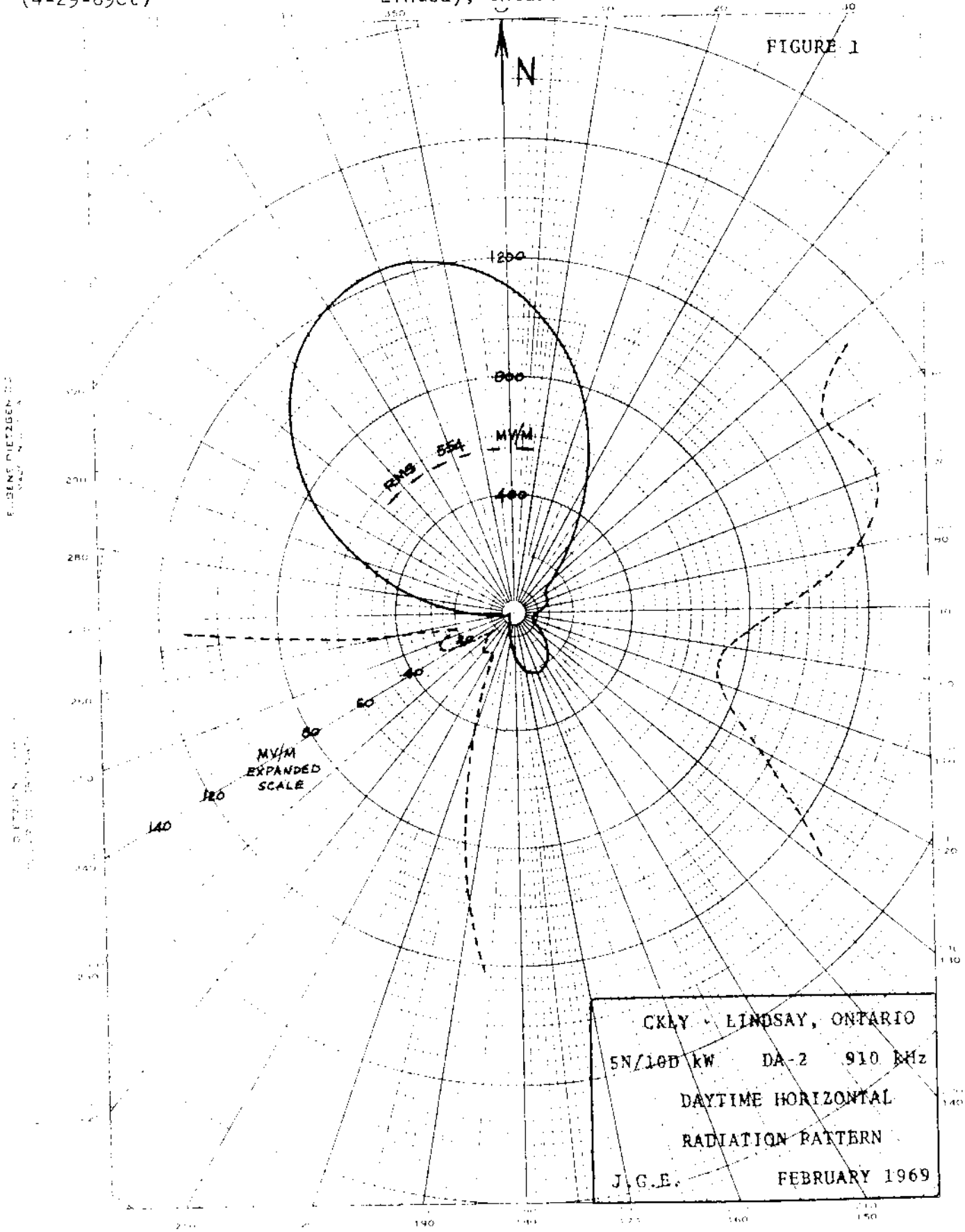
CKLY

Proposed Day
(4-29-69ct)

Station CKLY
Lindsay, Ontario

5kw,10kw-LS,DA-2,U,Class III
910 kc

FIGURE 1



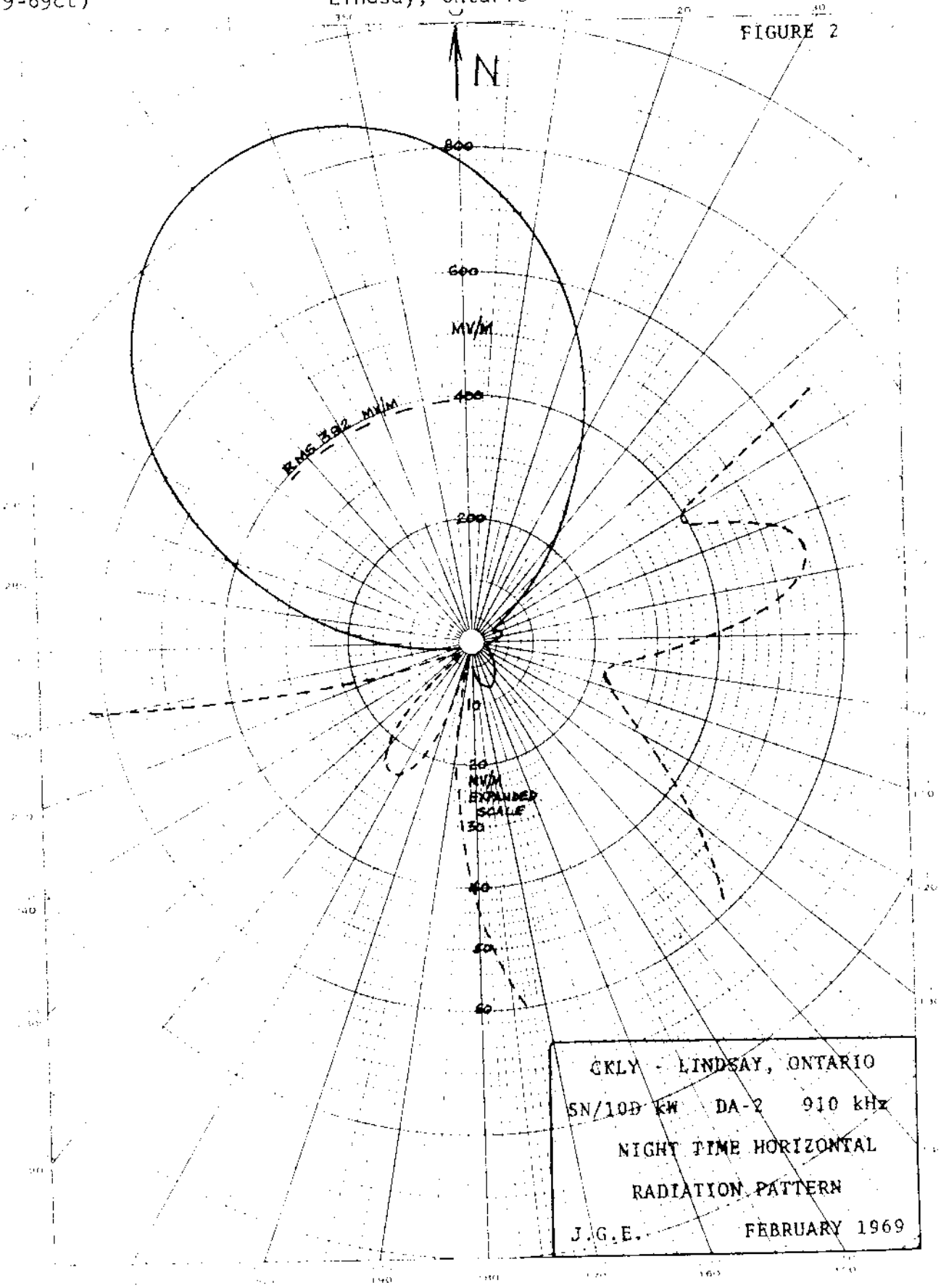
CKLY

Proposed Night
(4-29-69ct)

Station CKLY
Lindsay, Ontario

5kw,10kw-LS,DA-2,U,Class III
910 kc

FIGURE 2



#92

Lindsay, Ont.

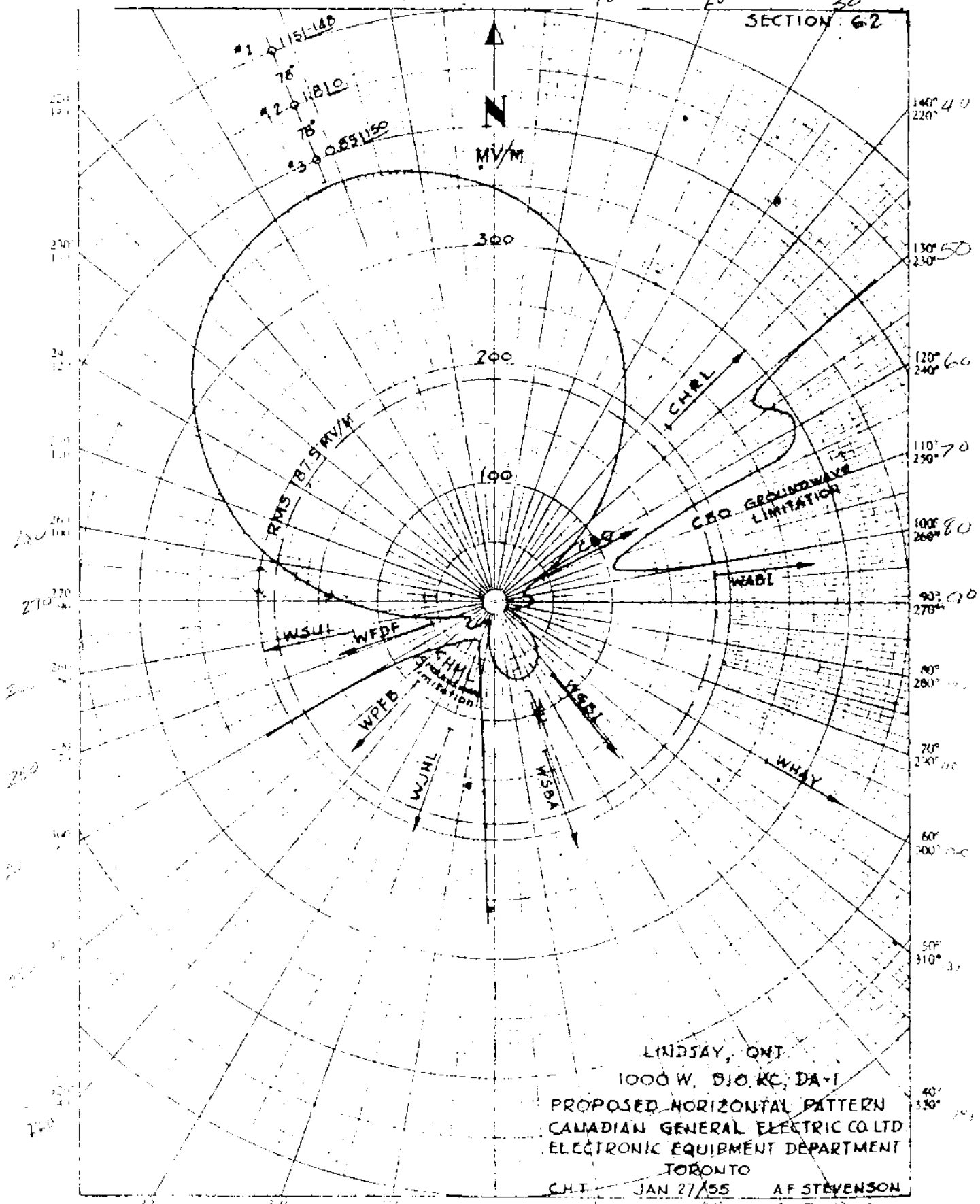
CKLY

PROPOSED DAY & NIGHT
(5/3/55G)

STATION NEW
LINDSAY, ONTARIO

1000W
DA-1, CLASS III

910 KC



NOTIFICATION LIST NO. 92 DATE: 3/29/55 NEW, Lindsay, Ontario 910 KC

CKLY

ANTENNA DESCRIPTION SHEET

STATION CALL: CKLY

MAIN STUDIO: LINDSAY, ONTARIO

FREQUENCY: 910 kHz

POWER: 10D/5N kW

CLASS: III

MODE: DA-2

TIME: UNLIMITED

NOTIFICATION LIST NO.: 364 DATE: June 27, 1977

GEOGRAPHICAL LOCATION: Latitude: 44° 16' 41" North
Longitude: 78° 41' 57" West

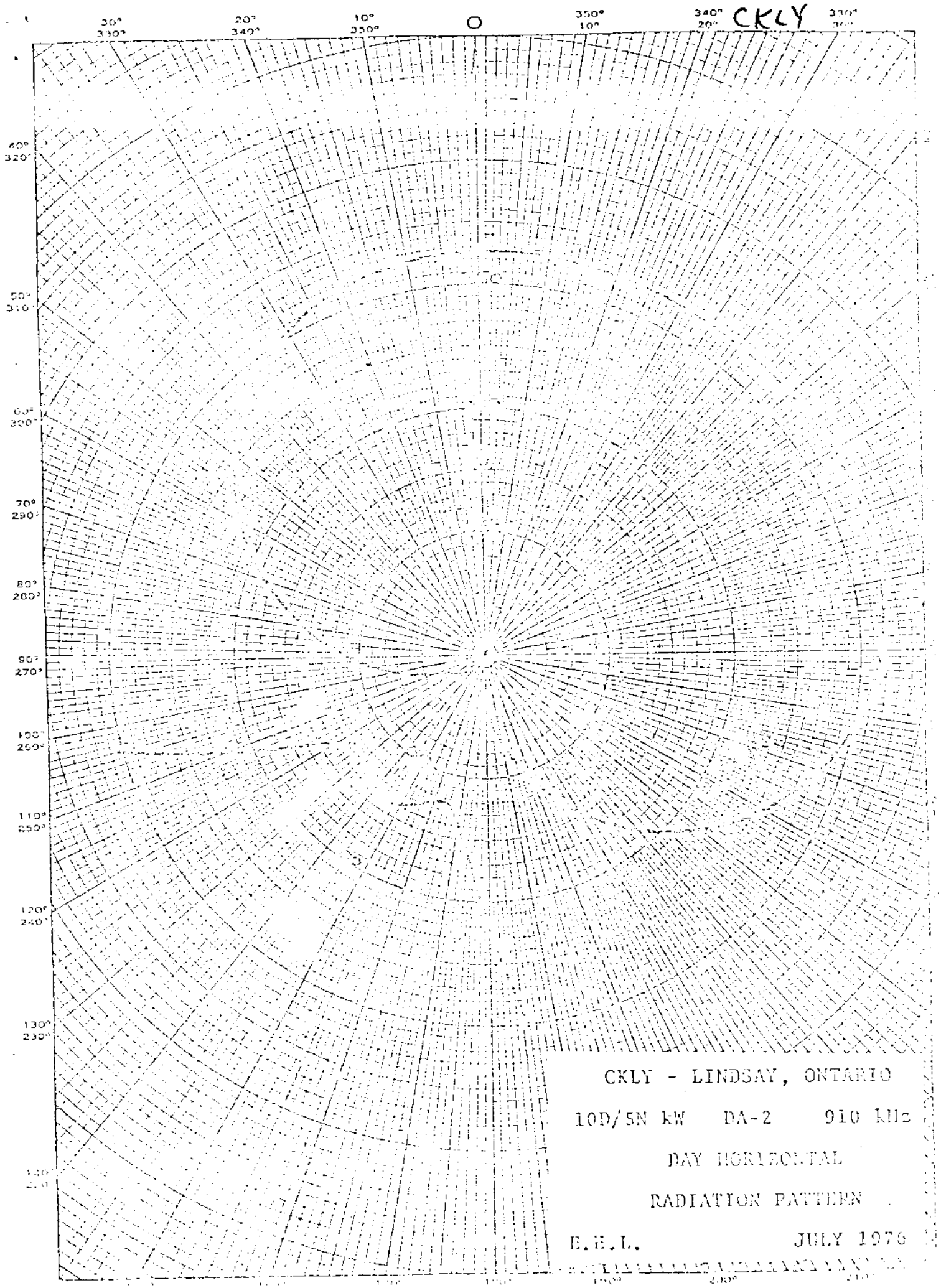
ARRAY CHARACTERISTICS: Five guyed steel towers of uniform cross section; base insulated; series fed; no top loading; overall height 259'; electrical height 246' (82°).

TOWER NUMBER:	1	2	3	4	5
SPACING:	ref.	78.3° 234.9'	234° 702'	298.4° 895.2'	100° 300'
ORIENTATION:	ref.	163.1°	159.7°	162.7°	215°
DAY FIELD RATIO:	1.00	-	-	-	0.86
DAY PHASE ANGLE:	0.0°	-	-	-	85.0°
NIGHT FIELD RATIO:	0.77	1.00	0.93	0.60	
NIGHT PHASE ANGLE:	-144.6°	0.0°	121.7°	-98.7°	-

GROUND SYSTEM: 120 equally spaced radials per tower of #10 AWG soft drawn bare copper buried 6" to 18" deep where possible, of approx. length 432' (0.4λ), excluding those along common chords.

PREDICTED EFFICIENCY: Day Pattern
588 mV/m (185.0 mV/m for 1 kW)

Night Pattern
450 mV/m (201.2 mV/m for 1 kW)


CKLY
0
350°
10°
340°
20°
330°
30°
60°
320°
50°
310°
70°
290°
80°
280°
90°
270°
100°
260°
110°
250°
120°
240°
130°
230°
POLAR CO-ORDINATE
CKLY - LINDSAY, ONTARIO
10D/5N kW DA-2 910 kHz
DAY HORIZONTAL
RADIATION PATTERN
E.H.L. JULY 1976

CKLY

FIGURE 1-2

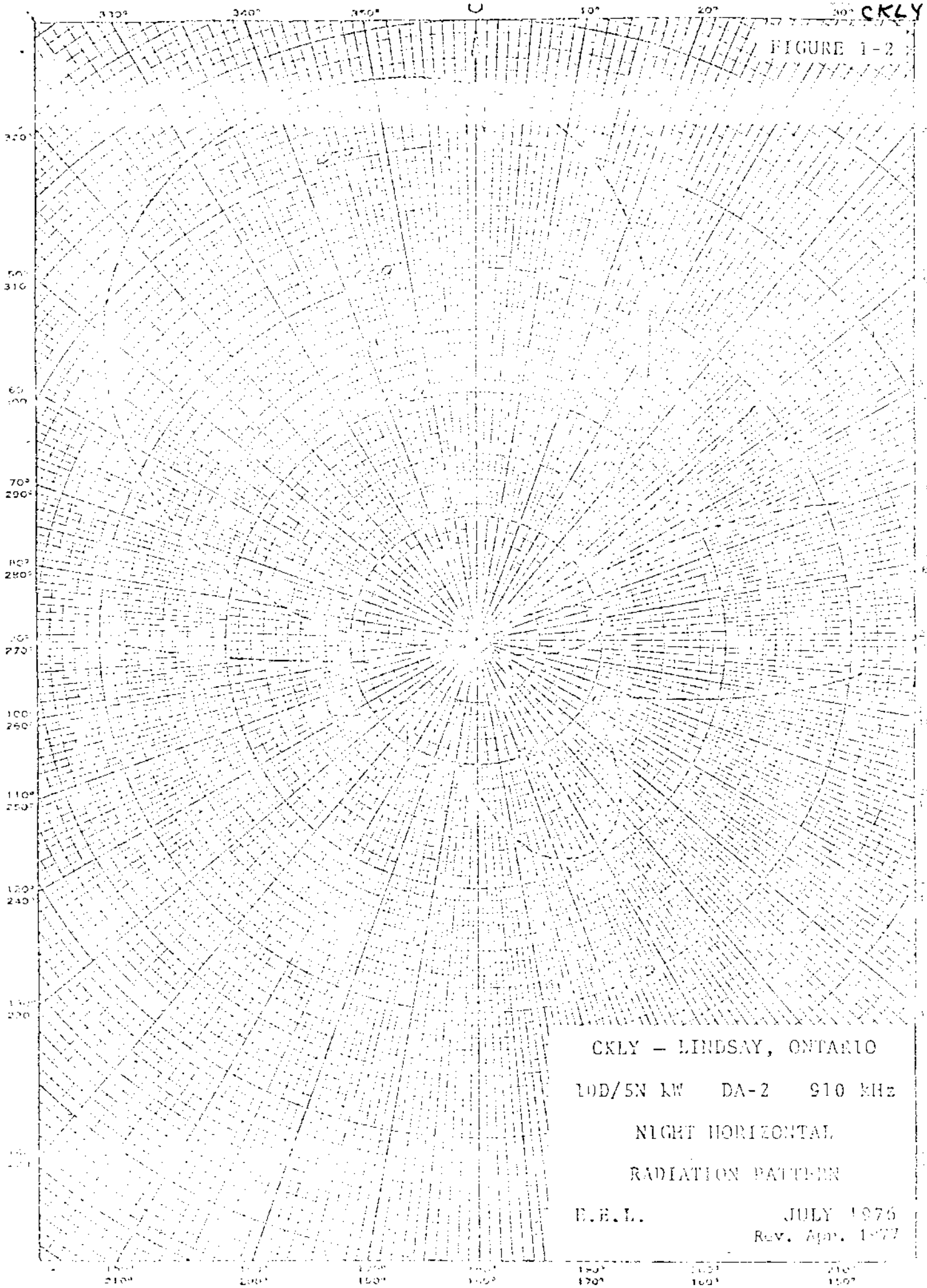
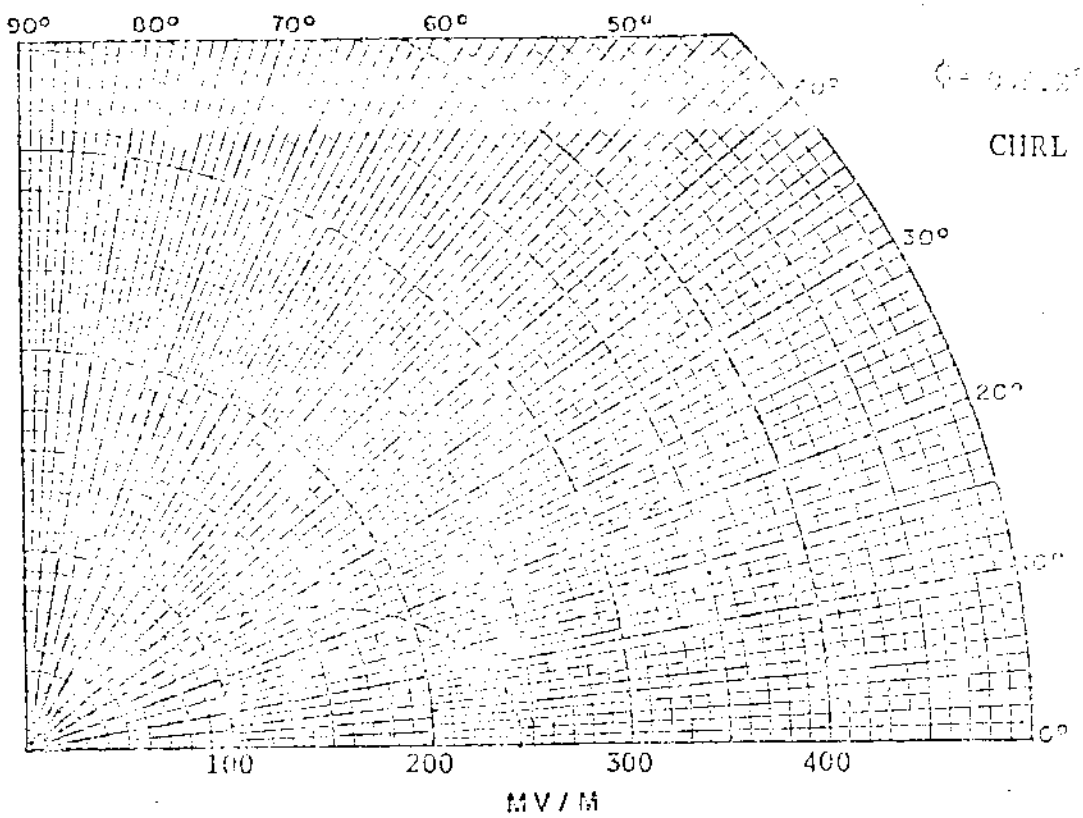
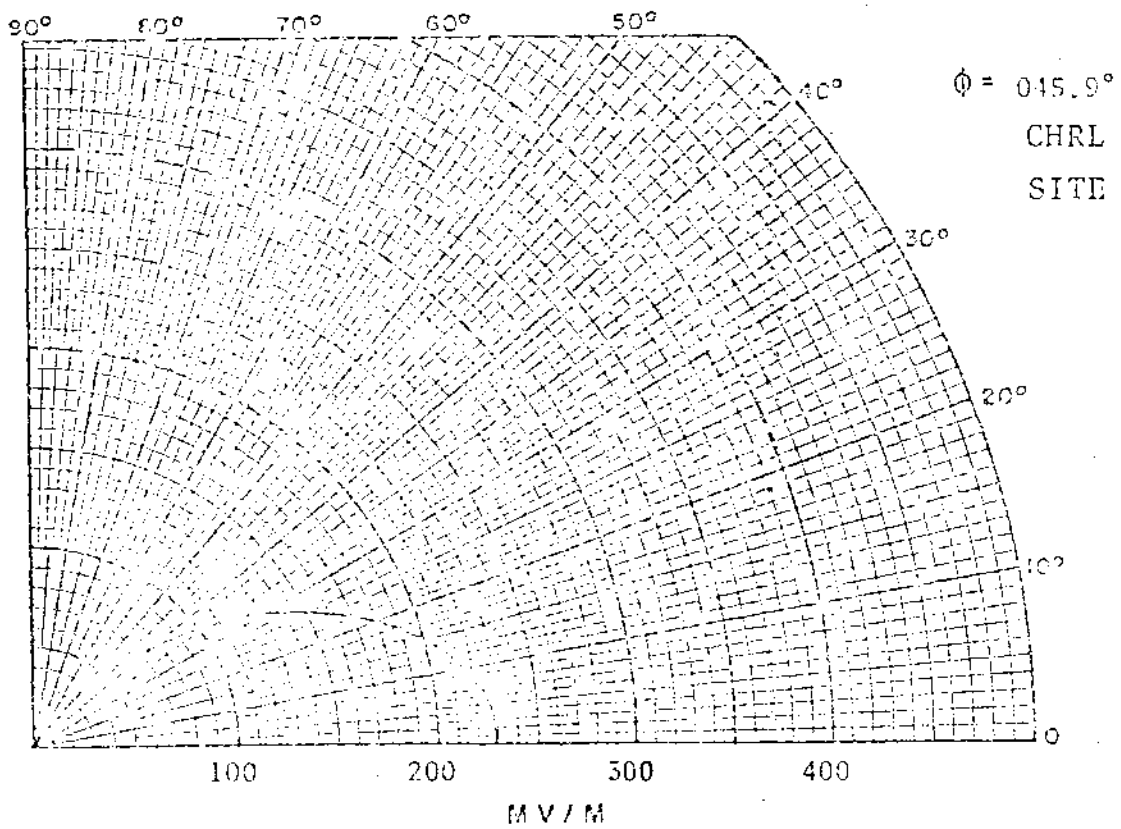


FIGURE 3-1
CKLY

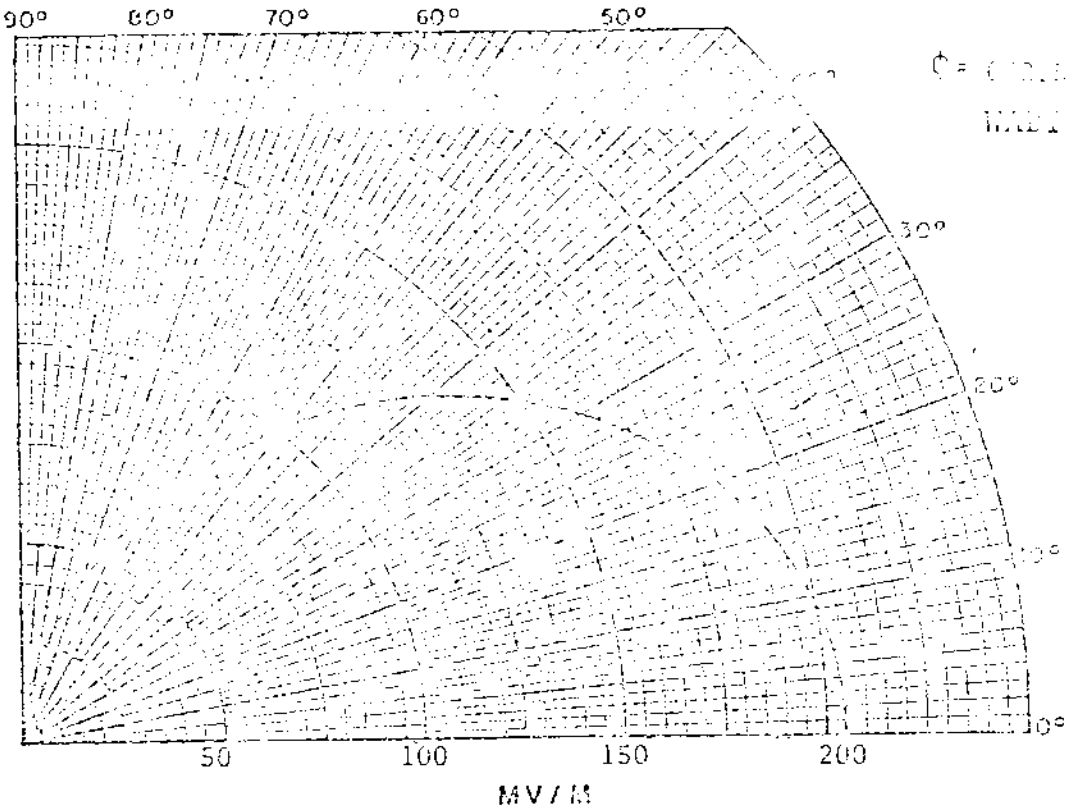


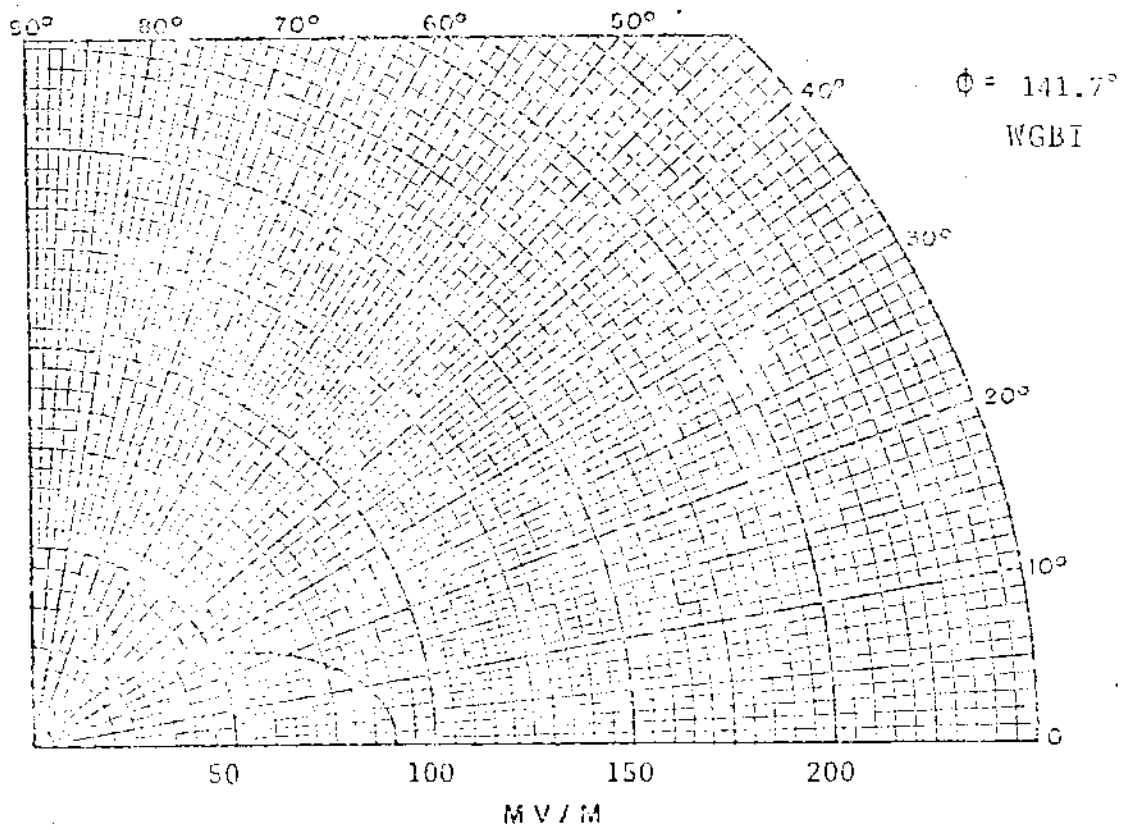


VERTICAL RADIATION PATTERNS

CKLY - LINDSAY, ONTARIO
10D/5N kW DA-2 910 kHz
E.E.L. JULY 1976

CKLY





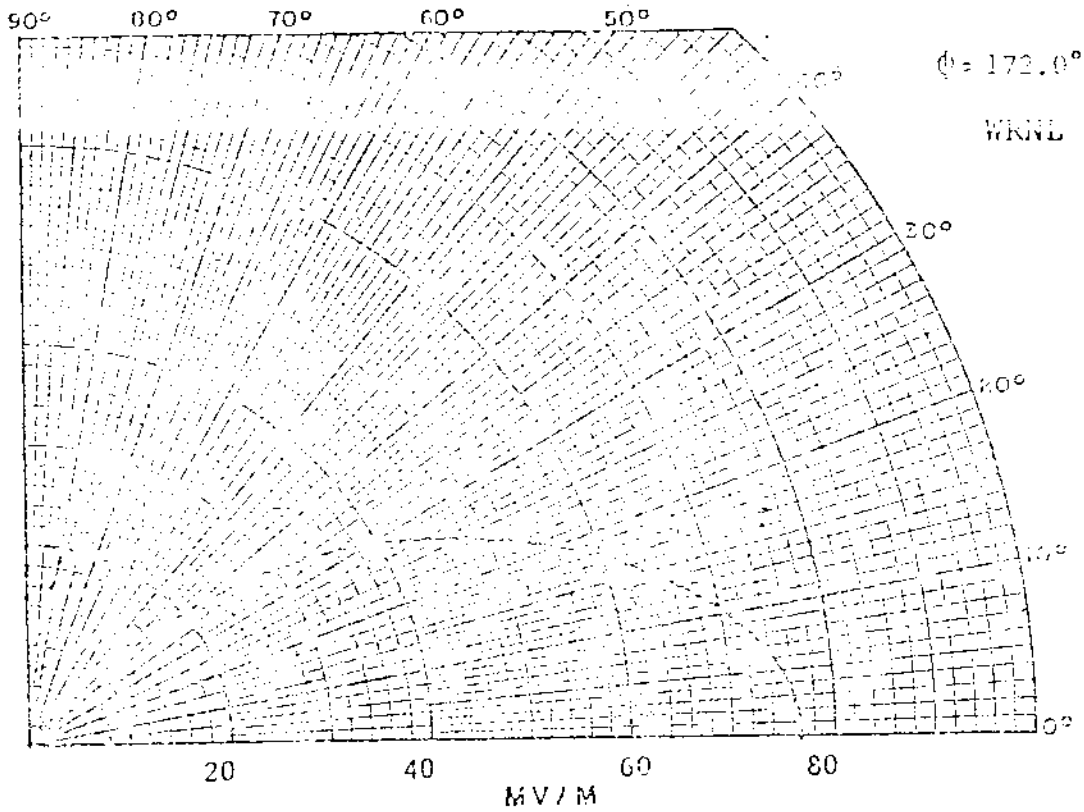
VERTICAL RADIATION PATTERNS

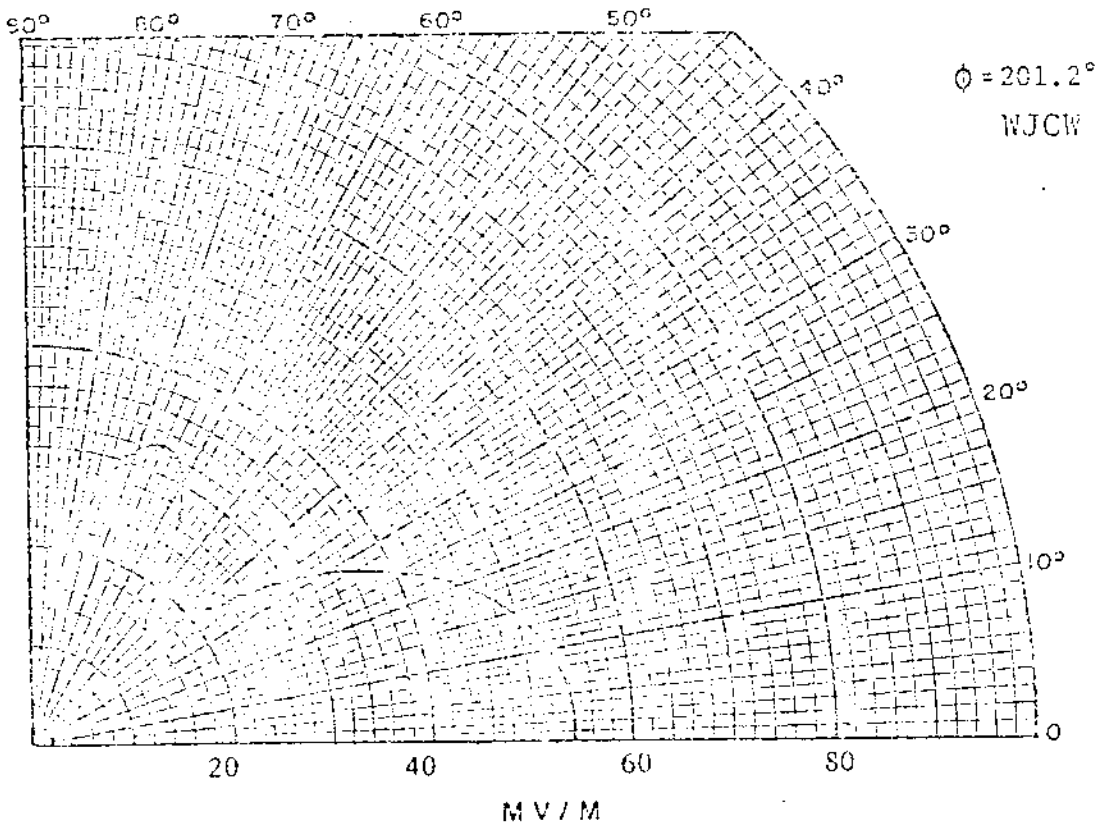
CKLY - LINDSAY, ONTARIO

10D/5N KW DA-2- 910 KHz

E.E.L. JULY 1976

CKLY





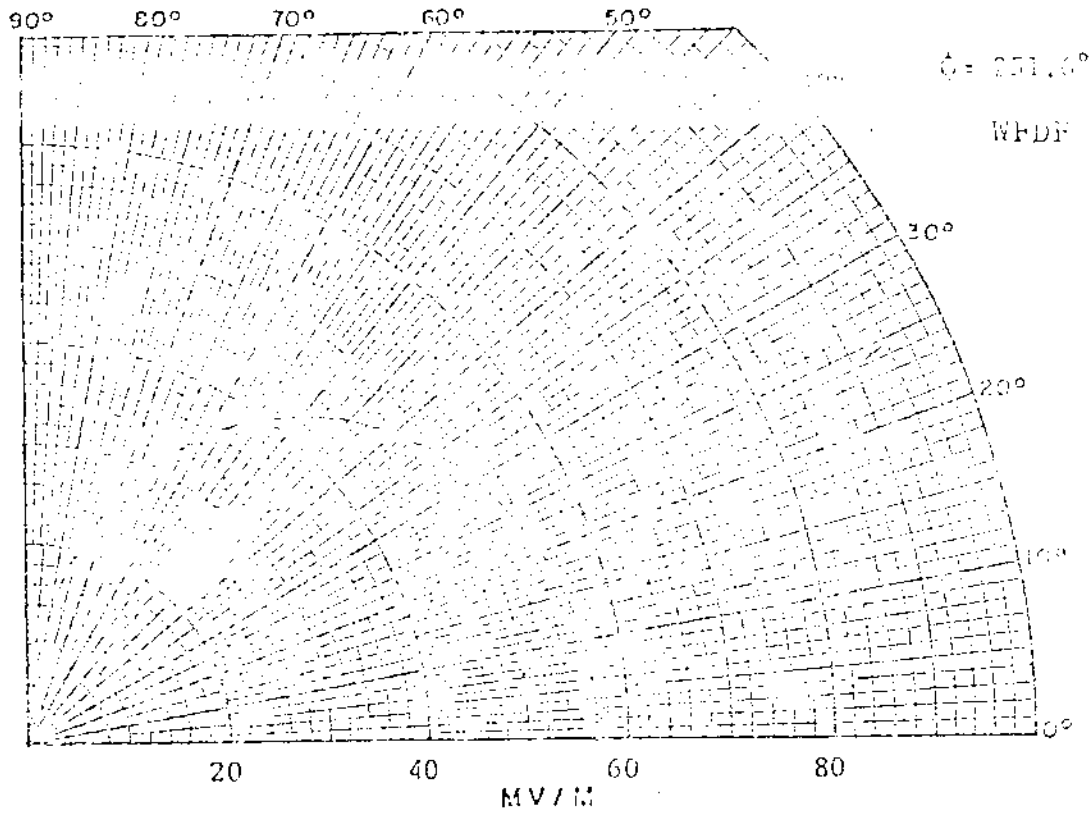
VERTICAL RADIATION PATTERNS

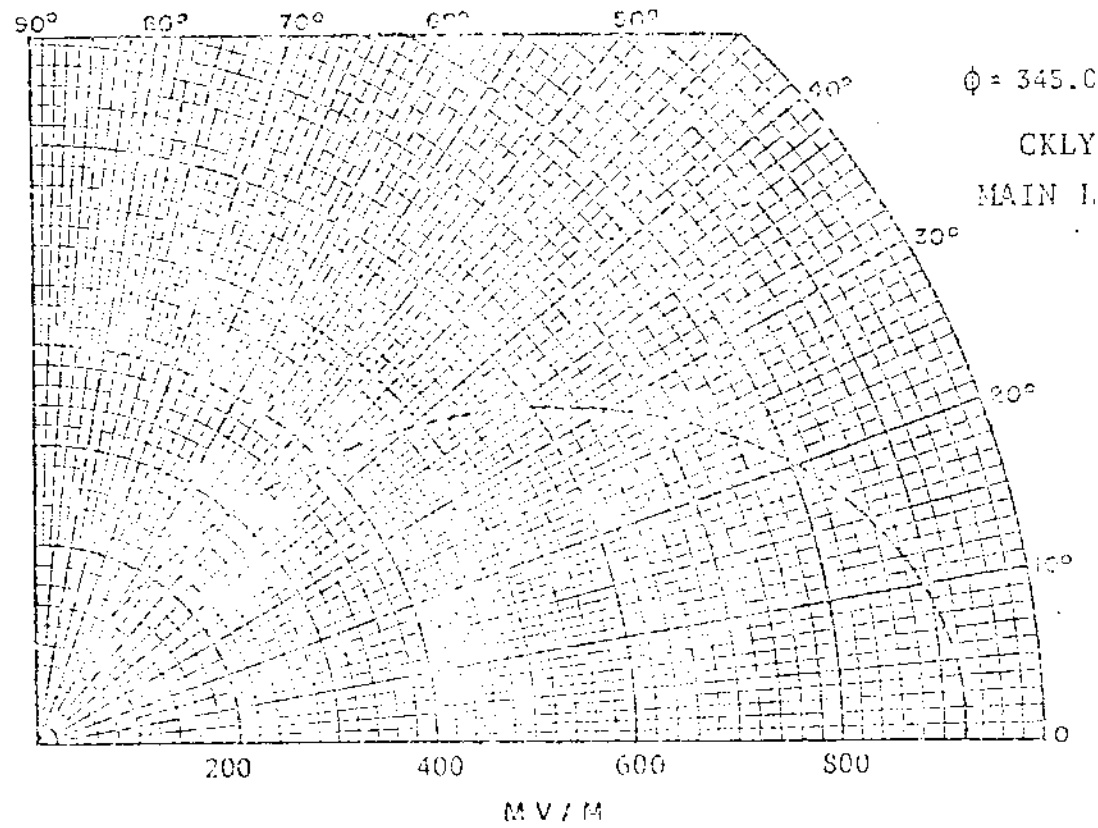
CKLY - LINDSAY, ONTARIO

10D/5N KW DA-2 910 KHz

E.E.L. JULY 1976

CKLY





VERTICAL RADIATION PATTERNS

CKLY - LINDSAY, ONTARIO

10D/5N KW DA-2 910 KHz

E.E.L. JULY 1976

[redacted]
CKVO

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

Call Sign : CKVO Location : Clarenville, Nfld.

Frequency : 710 kHz Class : II Power : 10 kW

Notification List No. : 339 Date : March 19, 1975

Geographical Co-ordinates of the Antenna Array : 48° 08' 36" North Latitude, 53° 57' 44" West Longitude

Antenna Characteristics :

Mode of Operation	: DA-1	
Number of Elements	: Two (2)	
Type of Elements	: Uniform cross-section, triangular, guyed, series fed. No top loading.	
Tower No.	: 1 (W)	2 (E)
Height above Insulator	: 261.78 ft. (68°)	261.78 ft. (65°)
Spacing	: 461.97 ft. (120°)	
Phasing	: Ref	- 62°
Field Ratio	: 1	0.94
Orientation	: Towers on a line 80° E of T.N.	
Ground System	: 120 equiangularly spaced radials per mast extending to a maximum of 554.7' (0.4λ) and consisting of No. 10 AWG bare soft-drawn copper wire, buried approx. 8" in the ground. The radials to be bonded at the intersection on a common chord; towers to be joined by a No. 4 AWG bare copper wire.	
Expected Efficiency	: 566 mV/m at 1 mile for 10 kW, or 179 mV/m at 1 mile for 1 kW.	

Cuba

CMCF

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CMCF

Frequency: 910 Kcs

Main Studio: Havana, Cuba

Power: 10 kw

Received: October 22, 1952 **Class III-E**

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

North Latitude: 23° 06'

West Longitude: 82° 23'

ANTENNA CHARACTERISTICS

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

TOWER:	East	West
HEIGHT ABOVE GROUND:	320'	320' (196.4°)
SPACING:	332.5' or 110.6° between adjacent towers)	
PHASING:	-145°	0°
FIELD RATIO:	0.5	1
ORIENTATION:	(Elements on a line bearing 103° true.)	

Predicted effective Field: 600 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.

Cuba

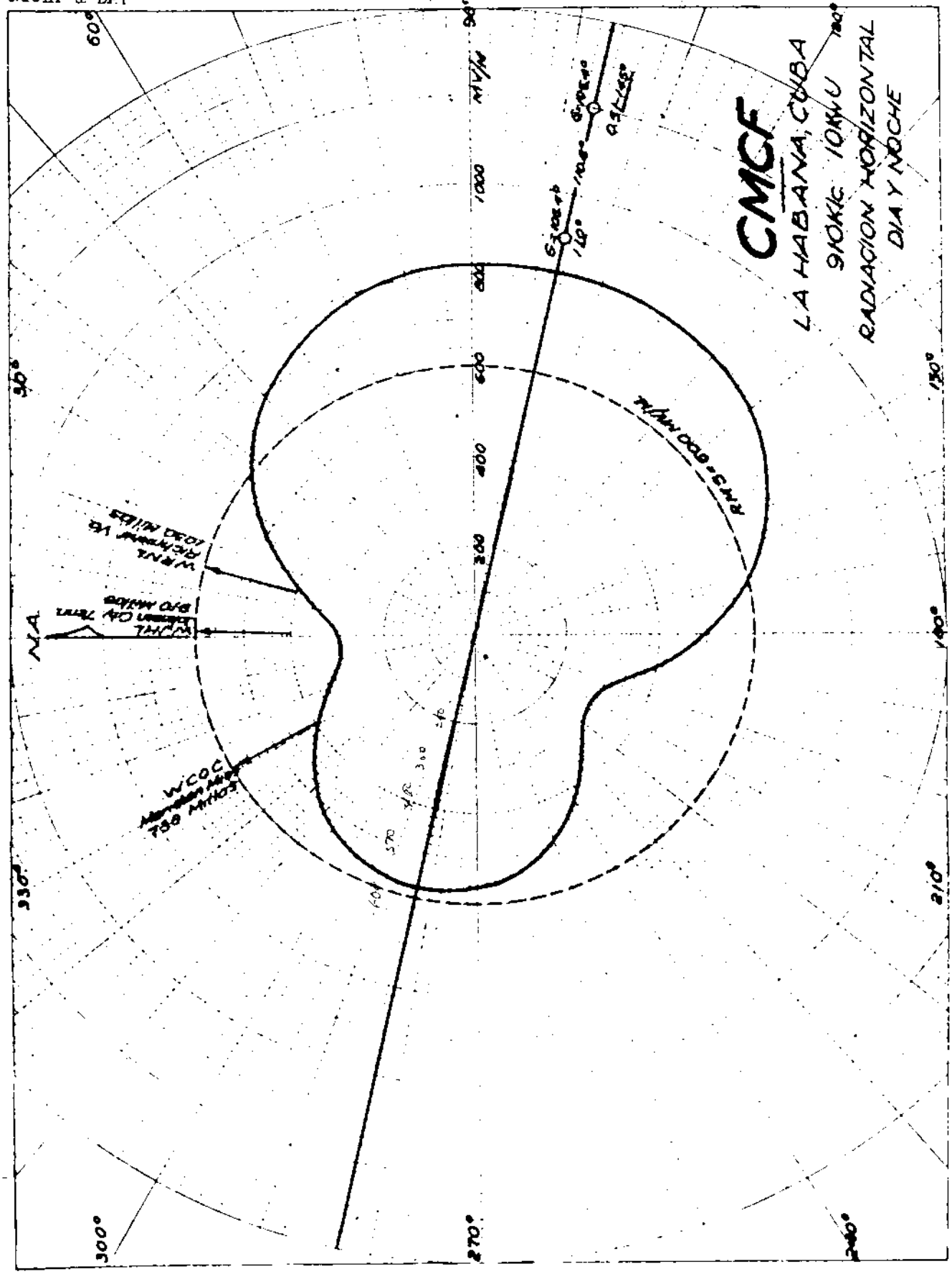
CMCF

PROPOSED
NIGHT & DAY

CMCF, HAVANA, CUBA (5/13/53G)

10 kw, DA-1

910 kc



This pattern replaces that dated (3/18/53G)

CMCF, HAVANA, CUBA

910 kc

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station : (new) Main Studio: Volga, South Dakota

Frequency : 910 kHz Power : 1 kW Night 5 kW Day

Notification : 1780 Date : Sept. 28, 1979 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude:	44	16	18
West Longitude:	96	57	38

ANTENNA CHARACTERISTICS

Authorized for Nighttime and Daytime operation. (DA-2)
Number of elements: 6
Type of elements : Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER :	E(#1)	EC(#2)	WC(#3)	W(#4)	N(#5)	S(#6)
HEIGHT ABOVE INSULATORS :	270'	270'	270'	270'	270'	270'(90°)
NIGHT PHASING :		+140°			0°	+280°
NIGHT FIELD RATIO:		1.225			1	0.639
DAY PHASING :	0°	+56.4°	+117.7°	+174.1°		
DAY FIELD RATIO :	1.0	1.724	1.207	0.342		

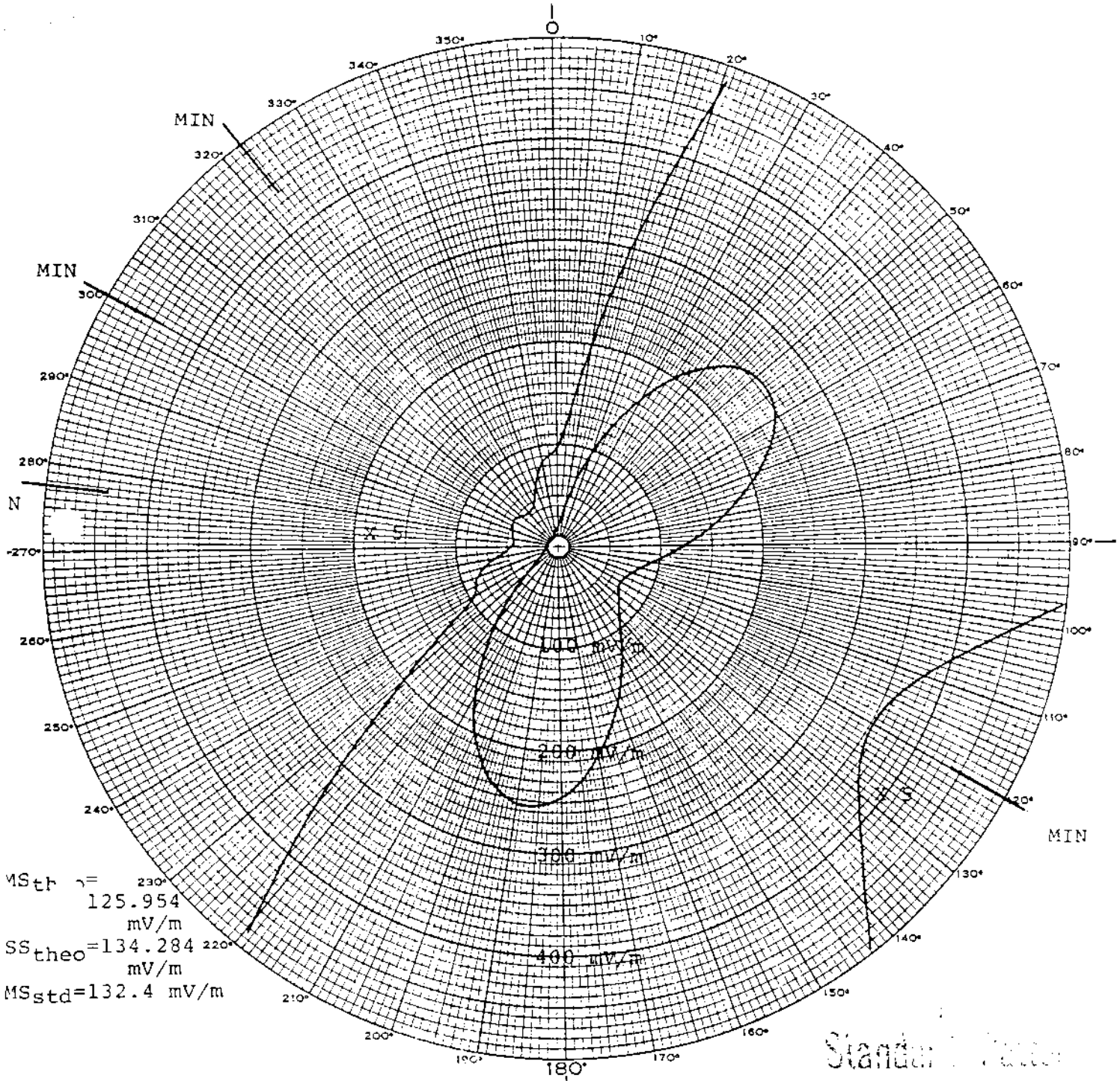
SPACING AND ORIENTATION : (Daytime) four towers in a row are spaced 465.5' (155°) on a line bearing 300° true. (Nighttime) three towers in a row are spaced 270' (90°) on a line bearing 20° true.

GROUND SYSTEM : 120 - 270 equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL		STANDARD
	RMS	RSS	RMS
Day	125.95 mV/m	134.28 mV/m	132.4 mV/m
Night	175.00 mV/m	253.21 mV/m	183.87 mV/m

Note:

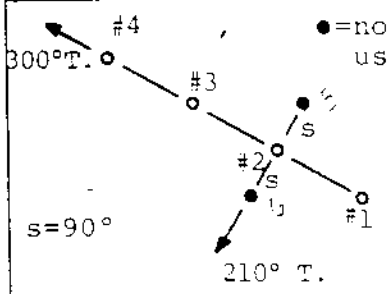


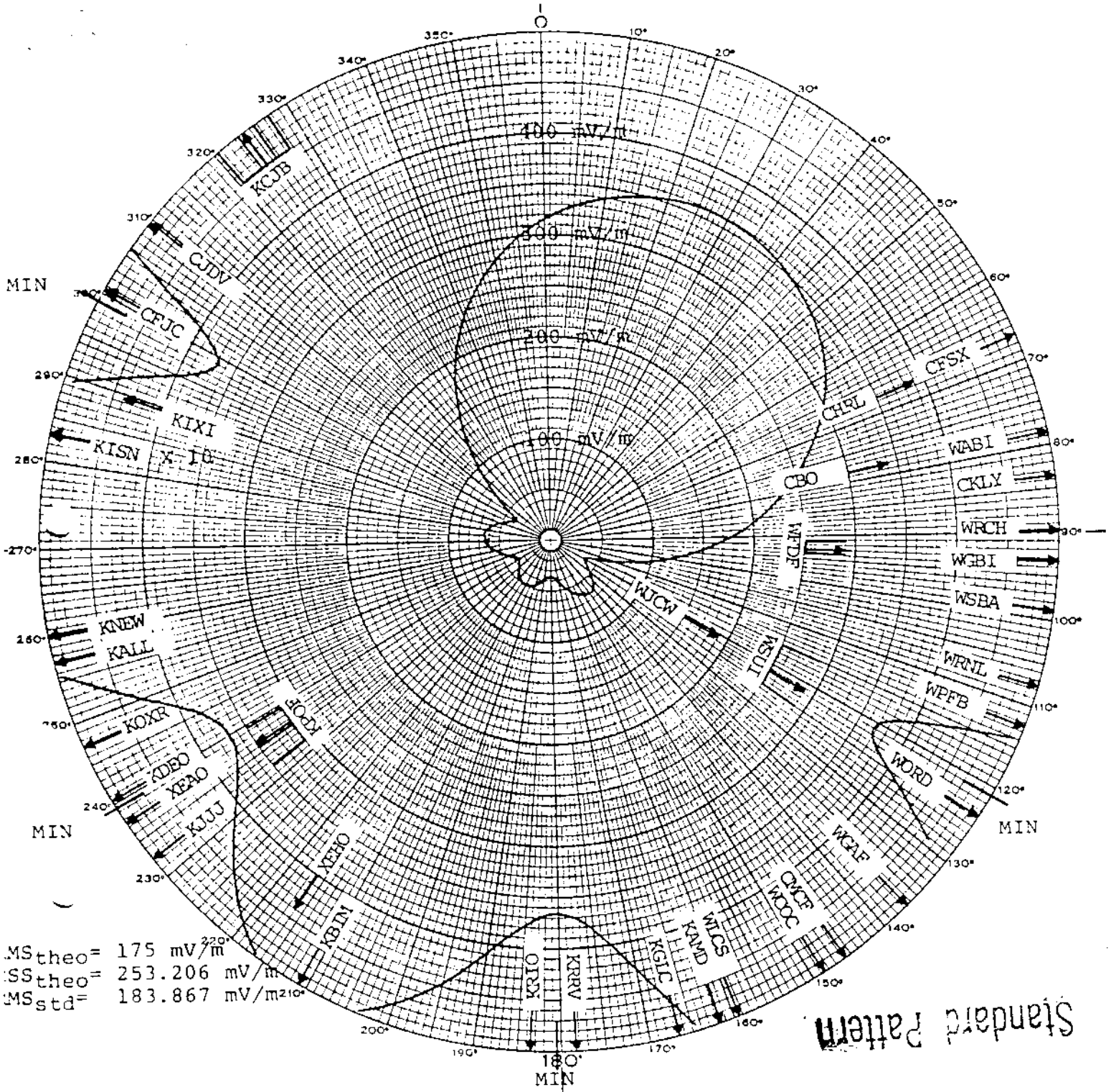
MS_{theo}= 125.954 mV/m

SS_{theo}=134.284 mV/m

MS_{std}=132.4 mV/m

Standard Pattern

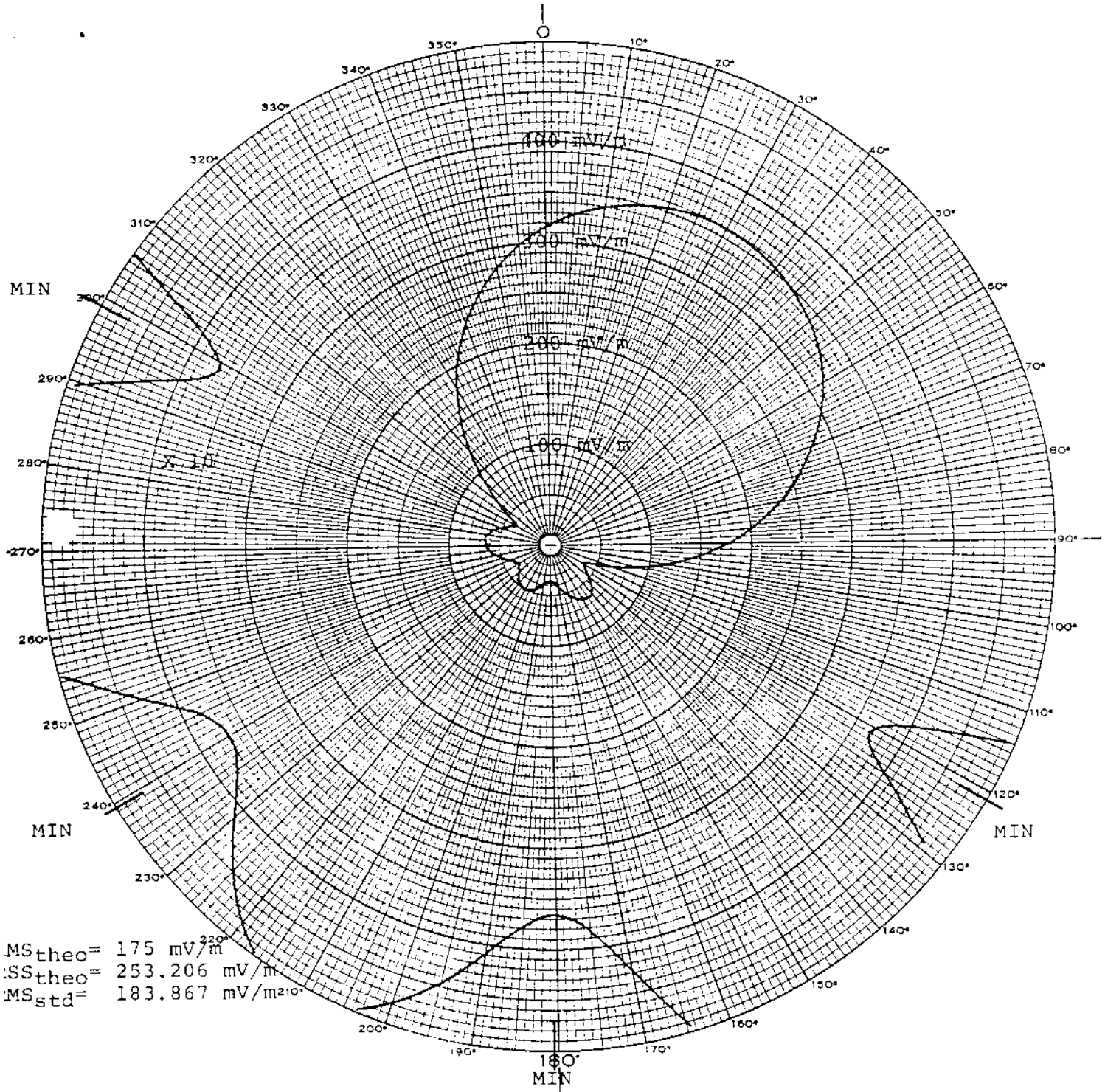
TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 4	STATION DATA
	TOWER No.	ELECTRICAL HEIGHT °	SPACING S°	PHASING ψ°	FIELD RATIO F	PROPOSED STANDARD RADIATION PATTERN	CALL PROPOSED
	1	90	0	0	1.000		FREQ 910 kHz
	2	90	155	56.4	1.724		POWER 0.5 kW
	3	90	310	117.7	1.207		TYPE DA-2
	4	90	465	174.1	0.342		TIME DAY
						VOLGA, S. DAKOTA	LAT. 44-16-18
							LONG. 96-57-38
						JUNE, 1976	E. HAROLD MUNN, JR. & ASSOCIATES, INC. COLDWATER, MICH.
						$\theta^\circ = 0$	



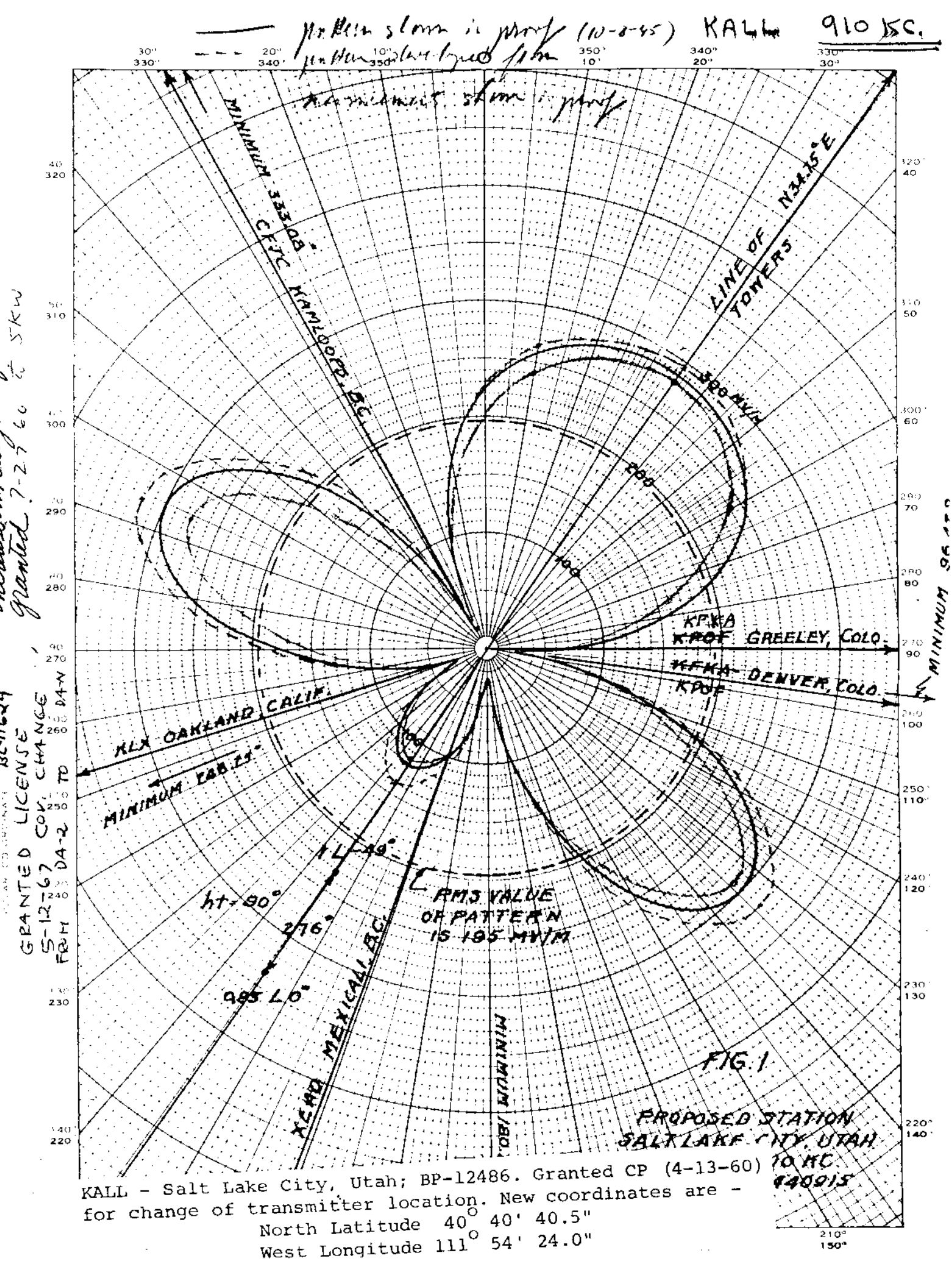
MS_{theo}= 175 mV/m
SS_{theo}= 253.206 mV/m
MS_{std}= 183.867 mV/m

Standard Pattern

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 14	STATION DATA
300° T. ● =not used; #1, #2, #3; s; s=155°; 210° T.	TOWER No	ELECTRICAL HEIGHT G°	SPACING S°	PHASING V°	FIELD RATIO F	PROPOSED STANDARD RADIATION PATTERN	CALL PROPOSED
	1	90	0	0	1.00		FREQ 910 kHz
	2	90	90	140	1.225		POWER 1 kW
	3	90	180	280	0.639	VOLGA, S. DAKOTA	TYPE DA-2
	4						TIME NIGHT
	5						LAT. N44°16'18"
	6					JUNE, 1976	LONG. W96°57'38"
						θ°= 0	E. HAROLD MUNN, JR. & ASSOCIATES, INC. COLDWATER, MICH.



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 14A	STATION DATA
300° T. ● =not used; #1, #2, #3; s; s=155°; 210° T.	TOWER No.	ELECTRICAL HEIGHT °	SPACING °	PHASING °	FIELD RATIO	PROPOSED STANDARD RADIATION PATTERN	CALL PROPOSED
	1	90	0	0	1.00		FREQ 910 kHz
	2	90	90	140	1.225		POWER 1 kW
	3	90	180	280	0.639		TYPE DA-2
	4						TIME NIGHT
	5					VOLGA, S. DAKOTA	LAT. N44°16'18"
	6						LONG. W96°57'38"
	7					JUNE, 1976	E. HAROLD MUNN, JR. & ASSOCIATES, INC. COLDWATER, MICH.
	8					$\theta^{\Delta} = 0$	



KALL - Salt Lake City, Utah; BP-12486. Granted CP (4-13-60) for change of transmitter location. New coordinates are -

North Latitude 40° 40' 40.5"

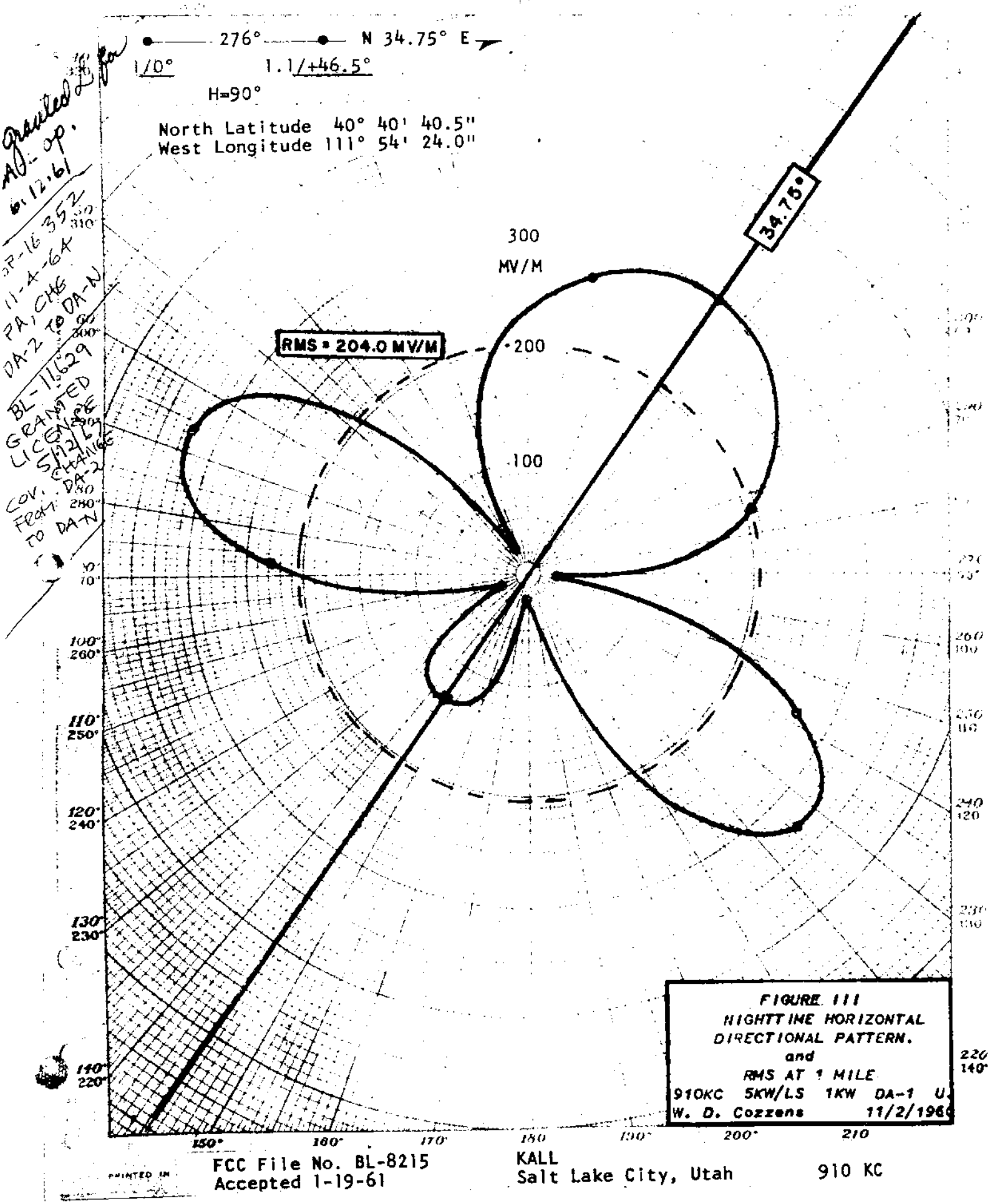
West Longitude 111° 54' 24.0"

KALL

MEASURED NIGHT (2-17-61g)

Station KALL
Salt Lake City, Utah

1kw,5kw-LS, DA-N, U
910 KC



FCC File No. BL-8215
Accepted 1-19-61

KALL
Salt Lake City, Utah

910 KC

KALL

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

Station KALL
Salt Lake City, Utah

1kw,5kw-LS, ~~DA-2~~ DA-N,U
910 KC

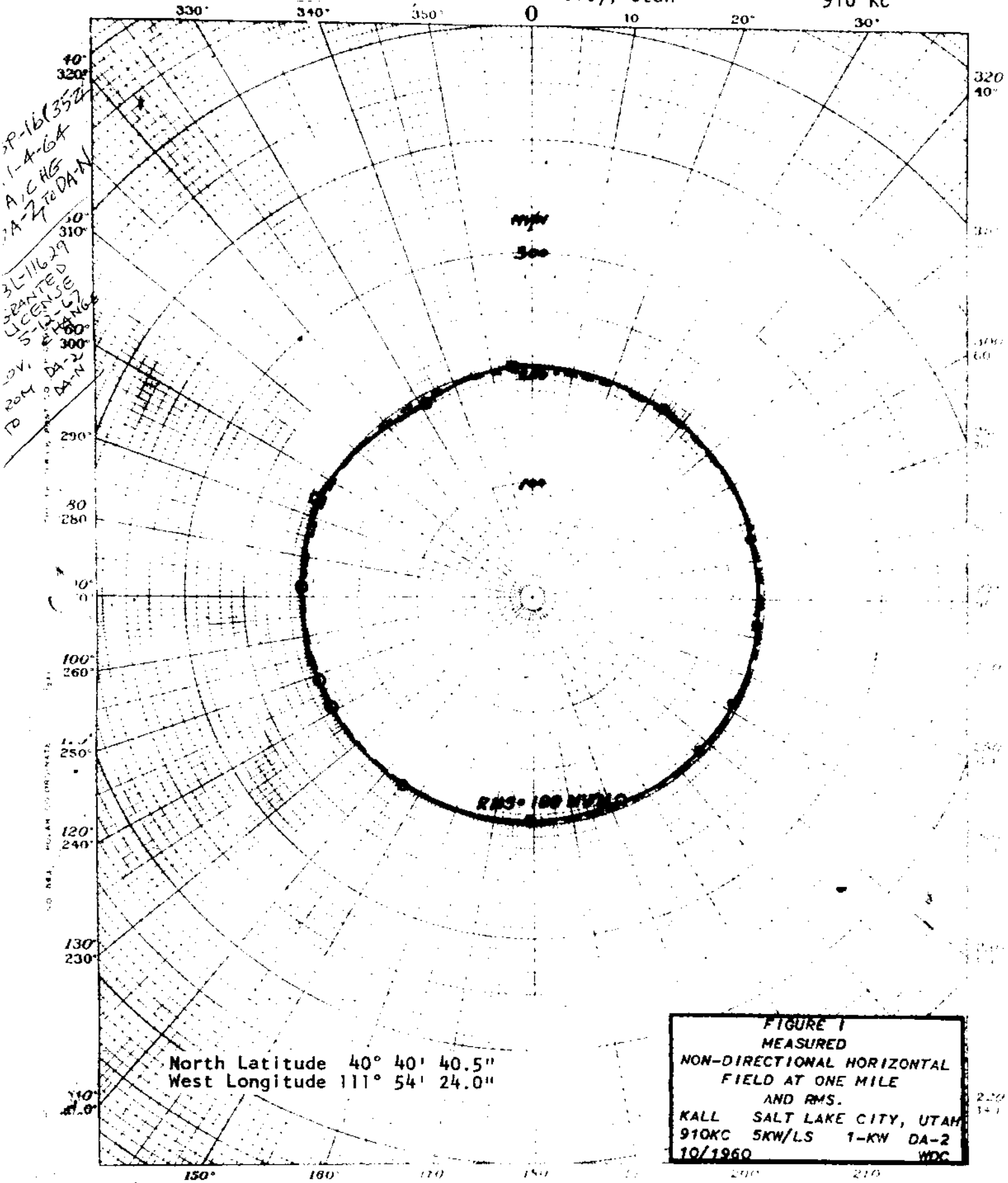


FIGURE 1
MEASURED
NON-DIRECTIONAL HORIZONTAL
FIELD AT ONE MILE
AND RMS.
KALL SALT LAKE CITY, UTAH
910KC 5KW/LS 1-KW DA-2
10/1960 WDC

FCC File No. BL-8215
Accepted 1-19-61

KALL
Salt Lake City, Utah 910 KC

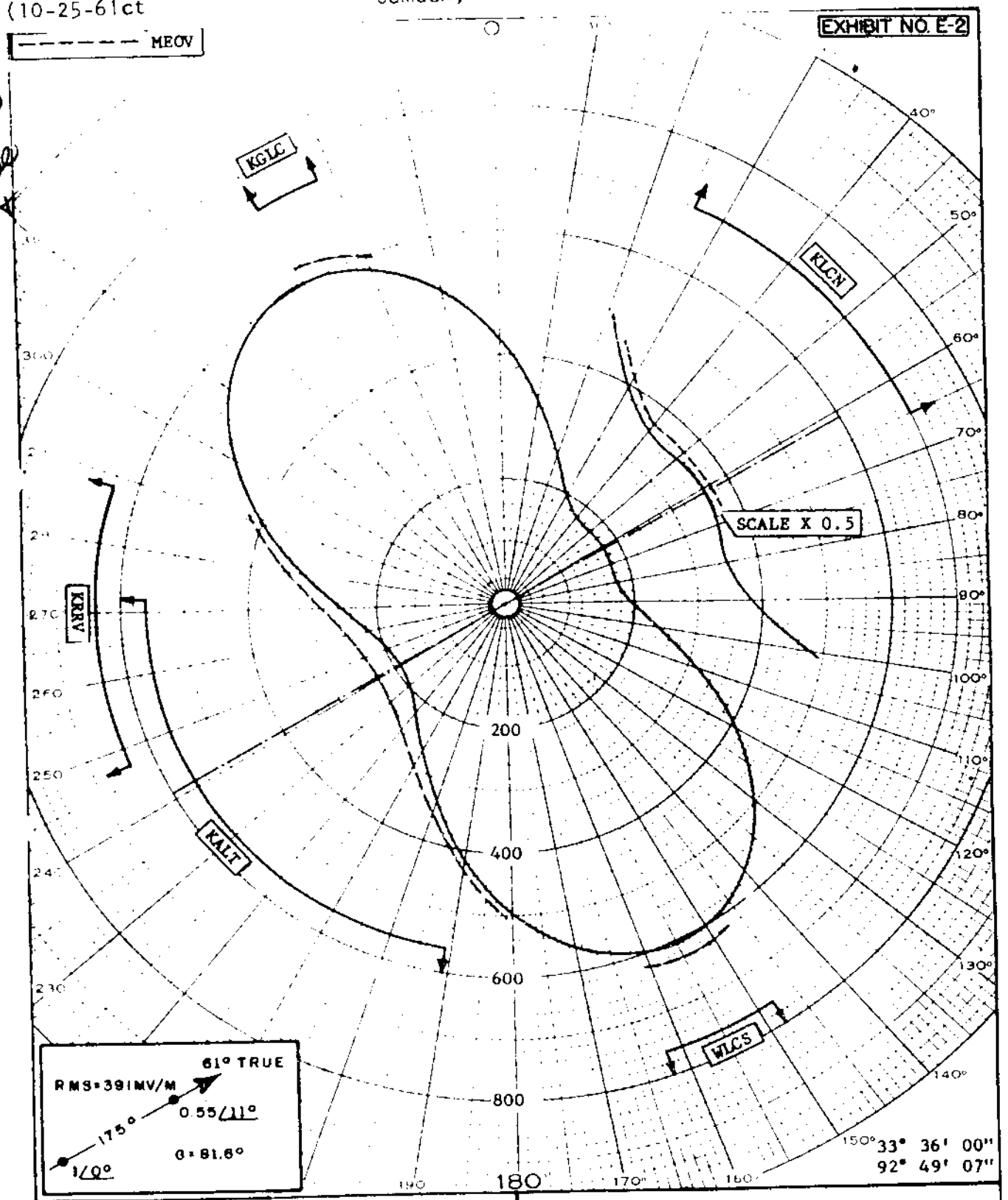
KAMD

1kw,5kw-LS,DA-2,U
910 kc

PROPOSED DAY
(10-25-61ct

Station KAMD
Camden, Arkansas

3-6-63 granted CP to increase sy power DA-2



COMMERCIAL RADIO EQUIPMENT CO.
Radio Engineering Consultants
WASHINGTON, D.

PROPOSED KAMD OPERATION
CAMDEN, ARKANSAS
910 KC, 5 KW-D, 500 W-N, DA-2

August 1961

FCC File No.BP-15067
Accepted 9-18-61

Station KAMD
Camden, Arkansas

910 kc

KAMD

Measured Day
(6-29-64ct)

Station KAMD
Camden, Arkansas

500w,5kw-LS,DA-2,U
910 kc

#201
9-1-64 - granted
R. for DA-2 &
5 KW-LS

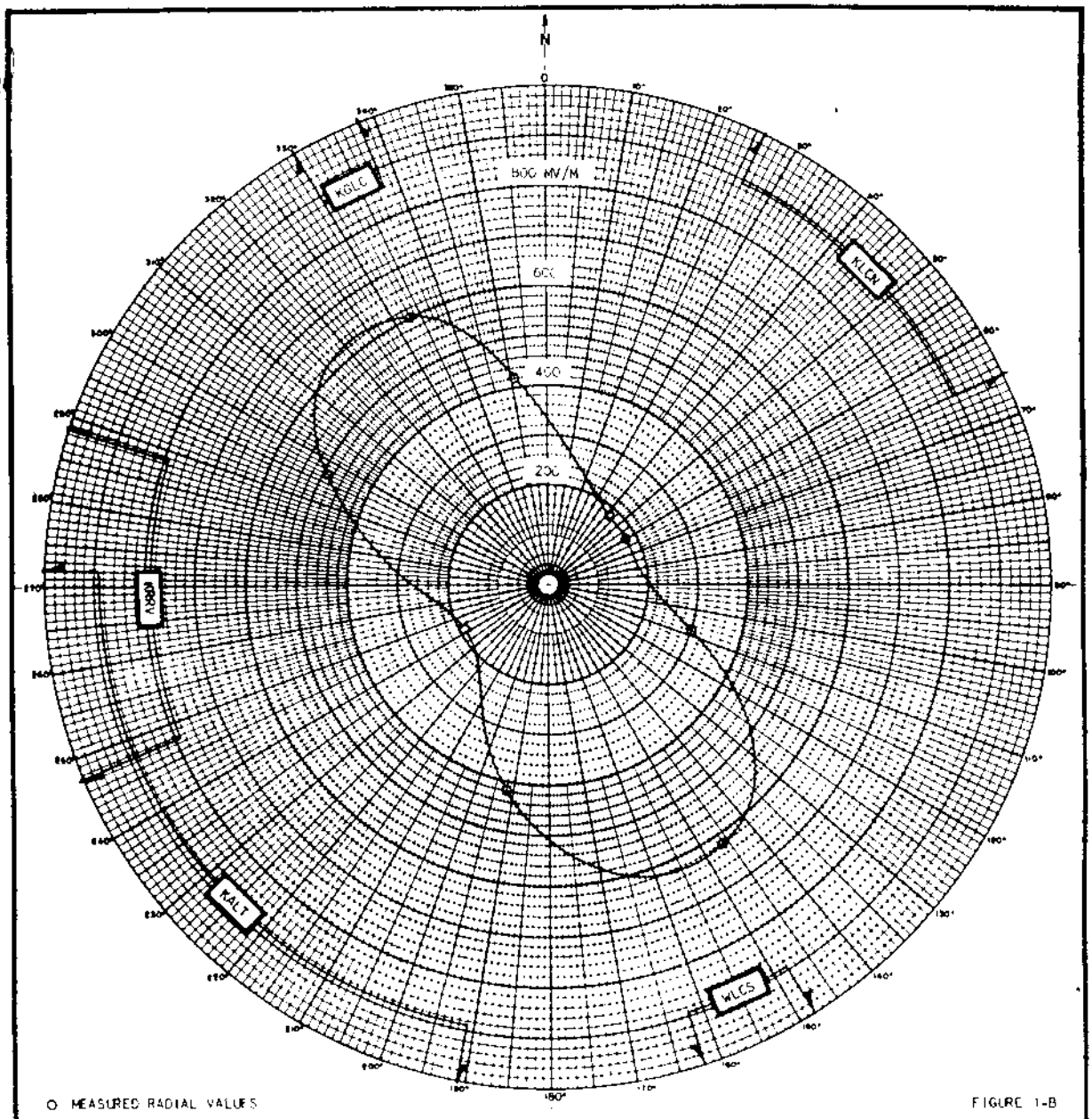
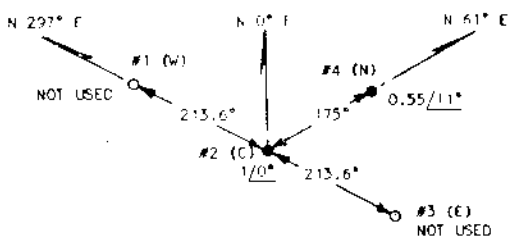


FIGURE 1-B

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION



G - ALL TOWERS = 81.6° (245')

APPLICANT	CAMDEN RADIO, INC. (KAMD)
LOCATION	CAMDEN, ARKANSAS
FREQUENCY	910 KC/S
POWER	5 KW-LS, 0.5 KW-N (DA-2)
LATITUDE	33 DEG 36 MIN. 00 SEC.
LONGITUDE	92 DEG 49 MIN 07 SEC.
WHEN USED	DAYTIME
RMS FIELD	401 MV/M (MEASURED)
DATE	MARCH 1964

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

FCC File No.BL-10593
Accepted 5-25-64

Station KAMD
Camden, Arkansas

910 kc

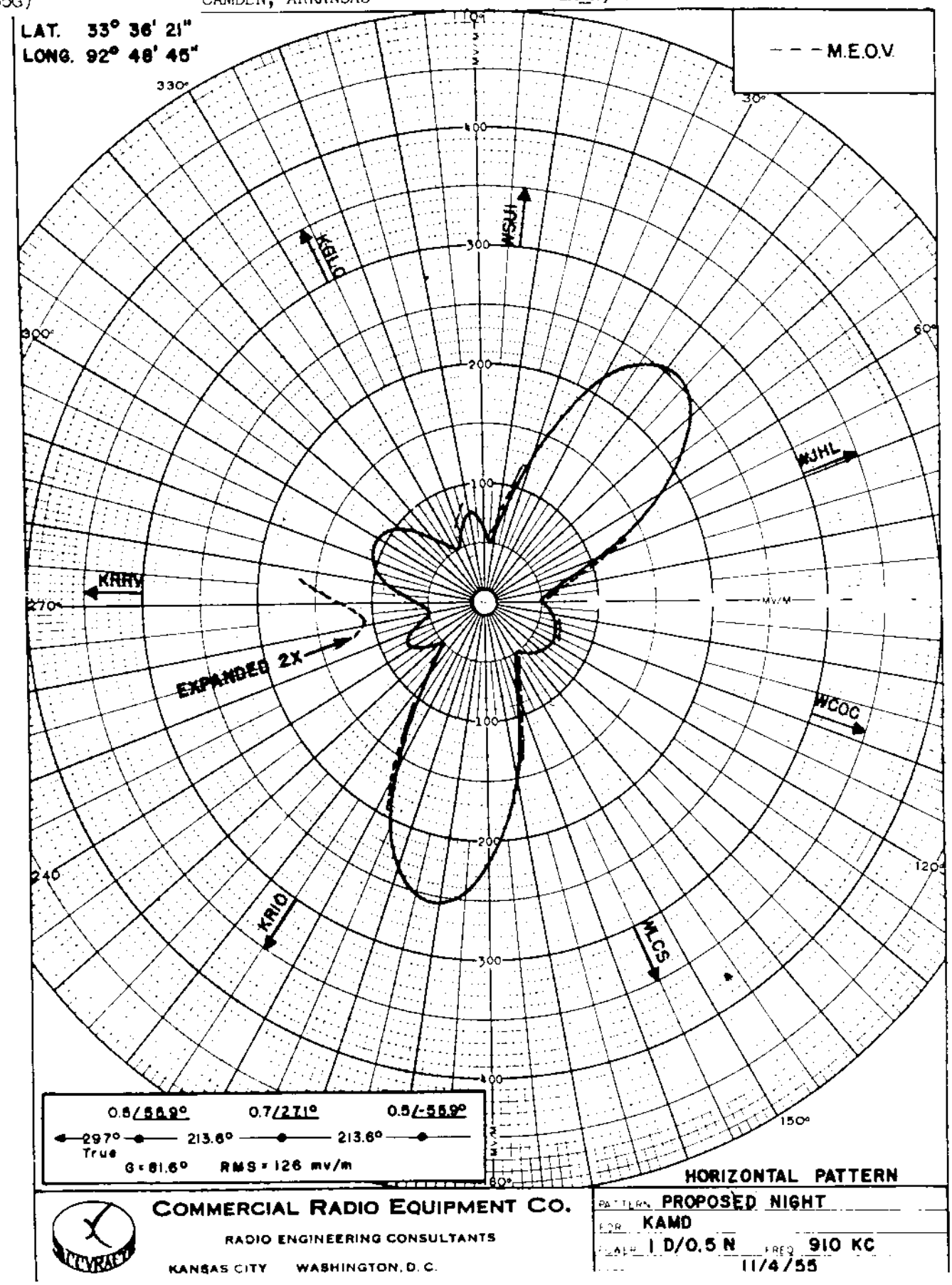
KAMD

PROPOSED NIGHT
(11--28-55G)

STATION KAMD
CAMDEN, ARKANSAS

500W, 1KW-LS
DA-N, U

910 KC



FILE NO. BP-10,027(Amended) ACCEPTED 11-17-55 FCC

KAMD, Camden, Arkansas 910 KC

KAMD

Measured Night
(6-29-64ct)

Station KAMD
Camden, Arkansas

500w,5kw-LS,DA-2,U
910 kc

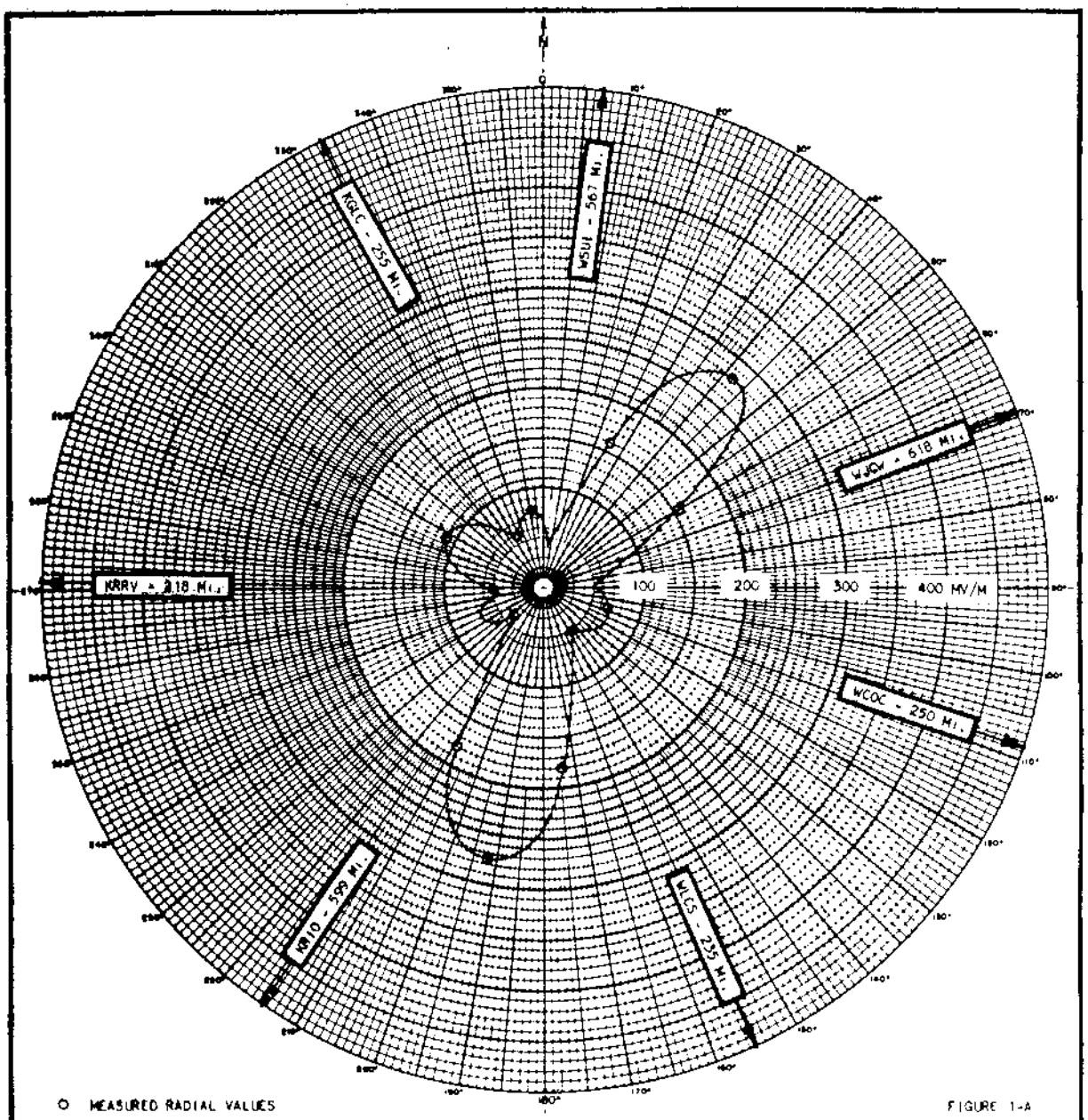
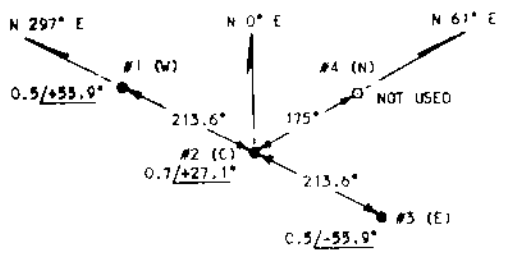


FIGURE 1-A

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION



Θ - ALL TOWERS = 81.6° (245')

APPLICANT	CAMDEN RADIO, INC. (KAMD)
LOCATION	CAMDEN, ARKANSAS
FREQUENCY	910 KC/S
POWER	5 KW-LS, 0.5 KW-N (DA-2)
LATITUDE	33 DEG 36 MIN 00 SEC
LONGITUDE	92 DEG 49 MIN 07 SEC
WHEN USED	NIGHTTIME
R M S FIELD	129 MV/M (MEASURED)
DATE	MARCH 1964

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

FCC File No.BL-10593
Accepted 5-25-64

Station KAMD
Camden, Arkansas

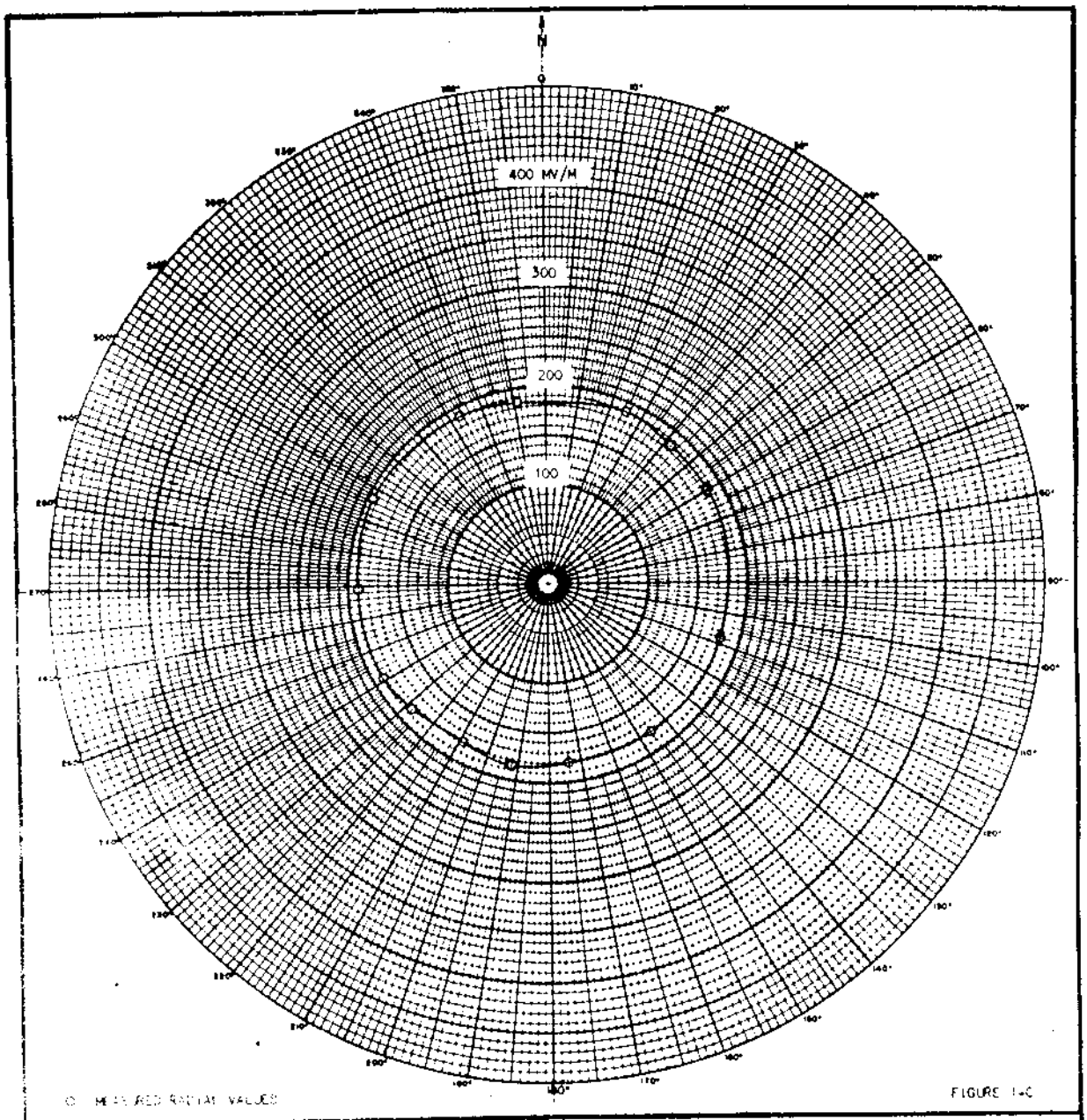
910 kc

KAMD

Measured Non-DA
(6-29-64ct)

Station KAMD
Camden, Arkansas

500w,5kw-LS,DA-2,U
910 kc



HORIZONTAL RADIATION PATTERN

NON - DIRECTIONAL SURVEY

APPLICANT	CAMDEN RADIO, INC. (KAMD)
LOCATION	CAMDEN, ARKANSAS
FREQUENCY	910 KC/S
POWER	1 KW
LATITUDE	33 DEG 36 MIN 00 SEC.
LONGITUDE	92 DEG 49 MIN. 07 SEC
WHEN USED	NON-DIRECTIONAL SURVEY ONLY
H M S FIELD	185.1 MV/M (MEASURED)
DATE	MARCH 1964

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

FCC File No.BL-10593
Accepted 5-25-64

Station KAMD
Camden, Arkansas

910 kc

KBIM

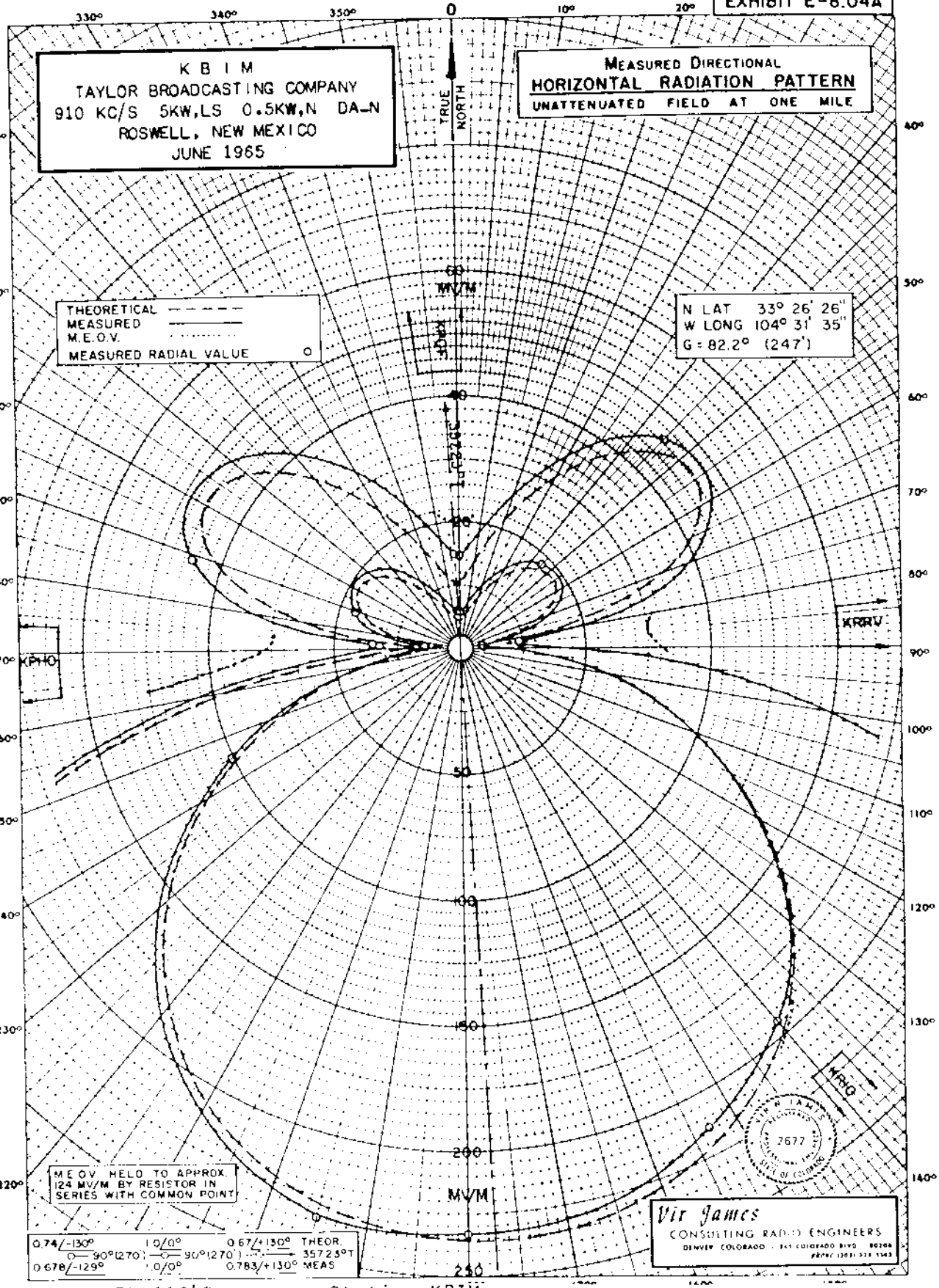
Measured Night
(10-26-65ct)

Station KBIM
Roswell, New Mexico

500w,5kw-LS,DA-N,U
910 kc

EXHIBIT E-8.04A

IC 10-20-65
-HG-HRS, LOC,
DA-N



FCC File No. BL-11049
Accepted 10-5-65

Station KBIM
Roswell, New Mexico

910 kc

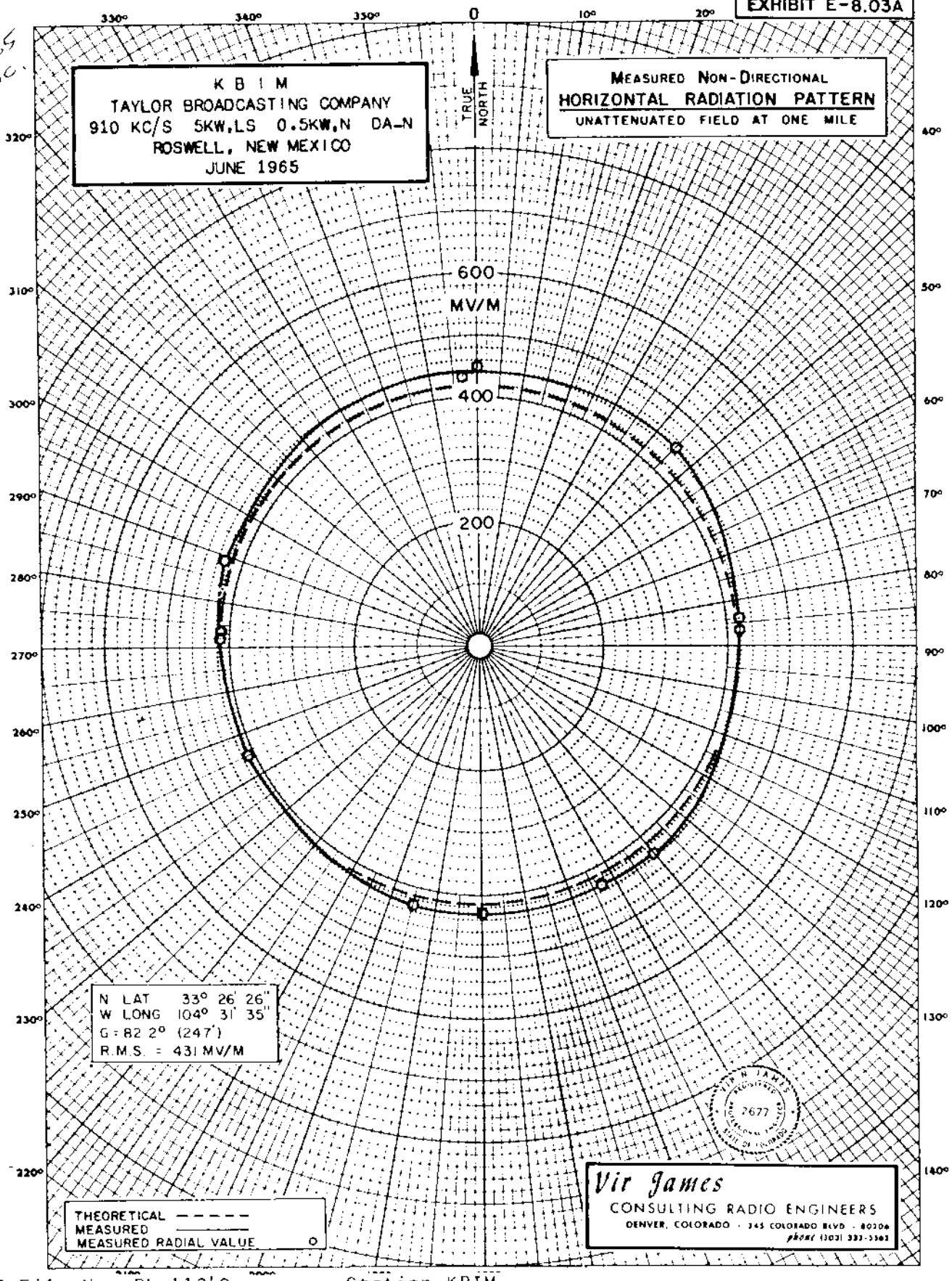
KBIM

Measured Non-DA
(10-26-65ct)

Station KBIM
Roswell, New Mexico

500w,5kw-LS,DA-N,U
910 kc

EXHIBIT E-8.03A



FCC File No. BL-11049
Accepted 10-5-65

Station KBIM
Roswell, New Mexico

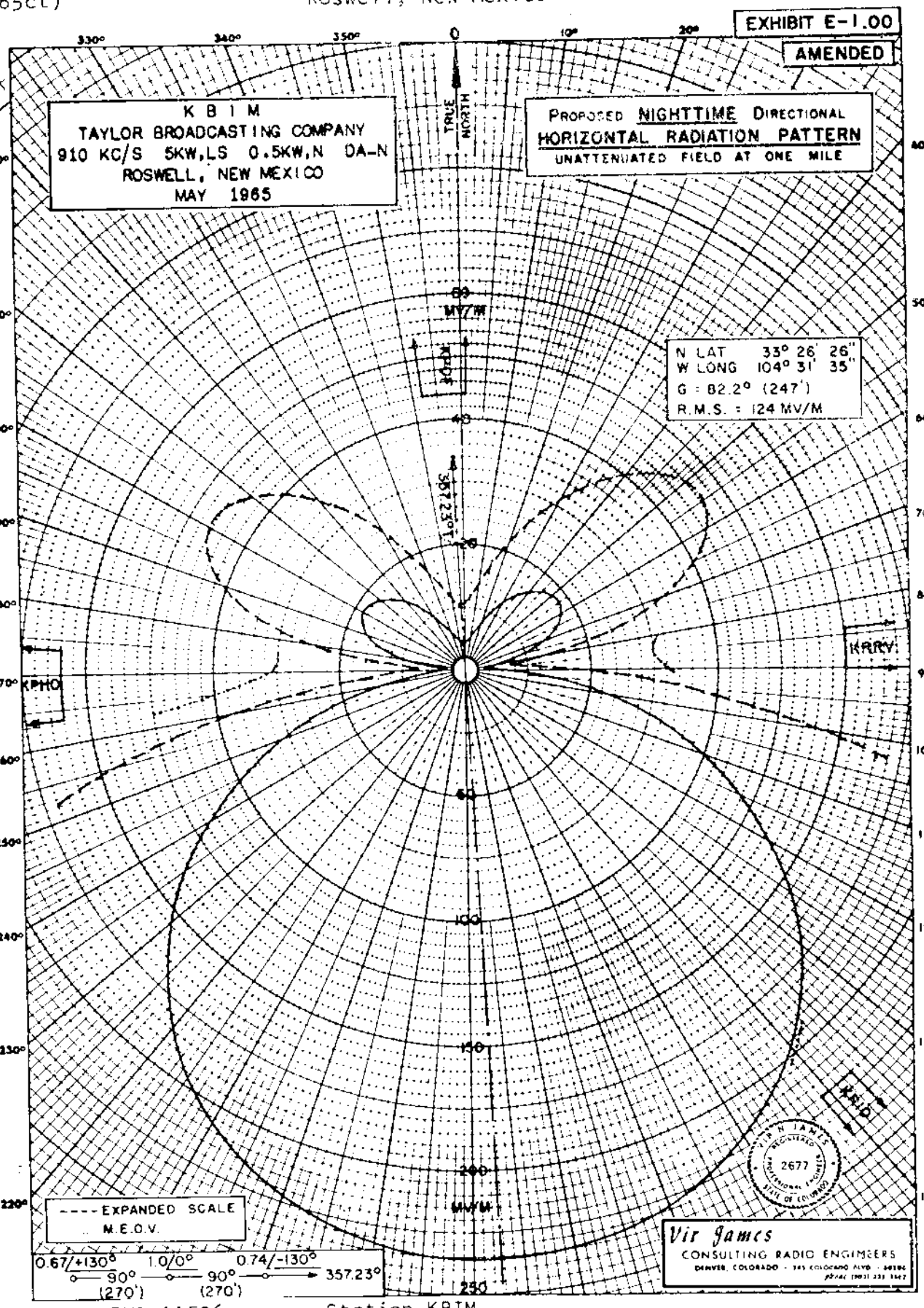
910 kc

KBIM

Proposed Night
(6-28-65ct)

Station KBIM
Roswell, New Mexico

500w,5kw-LS,DA-N,U
910 kc



FCC File No. BMP-11526
Accepted 6-16-65

Station KBIM
Roswell, New Mexico

910 kc

KCJB

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KCJB

Main Studio: Minot, North Dakota

Frequency: 910 kHz

Power: 1 kW Night 5 kW Day

Notification List No. 1600

Date: October 2, 1974

Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 48° 11' 57".
West Longitude: 101° 17' 37"

ANTENNA CHARACTERISTICS

STANDARD PATTERN DAYTIME

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

TOWER:	W(#3)	N(#1)	S(#2)
HEIGHT ABOVE INSULATORS:	245'	245'	245' (81.6°)
NIGHT PHASING:	---	+44°	0°
NIGHT FIELD RATIO:	---	0.7	1.0
DAY PHASING:	0°	+123.6°	---
DAY FIELD RATIO:	1.00	1.36	---

SPACING AND ORIENTATION: Nighttime elements #1 and #2 are spaced 811' (270°) on a line bearing 345° true. Daytime elements #1 and #3 are spaced 180.2' (60°) on a line bearing 23° true.

GROUND SYSTEM: 120-270' equally spaced copper radials plus 120-50' inter-spaced radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers. Centers of systems are bonded together.

Note: Please retain the Nighttime directional antenna radiation pattern notified for Station KCJB in United States Change List Number 354 dated March 6, 1950, and attach to this Revised Description Sheet and Daytime pattern. This notification concerns only a change in the Daytime operation of the station with Nighttime operation continued as previously notified.

(Cont'd.)

KCJB

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL		STANDARD
	RMS	RSS	RMS
Daytime	427.6 mv/m	548.8 mv/m	448.9 mv/m
Nighttime	188 mv/m	----	----

CTR NO 30505A0

KCJB
MINOT, N.D.
1kw, DAN 910 kc

PROPOSED
NIGHT

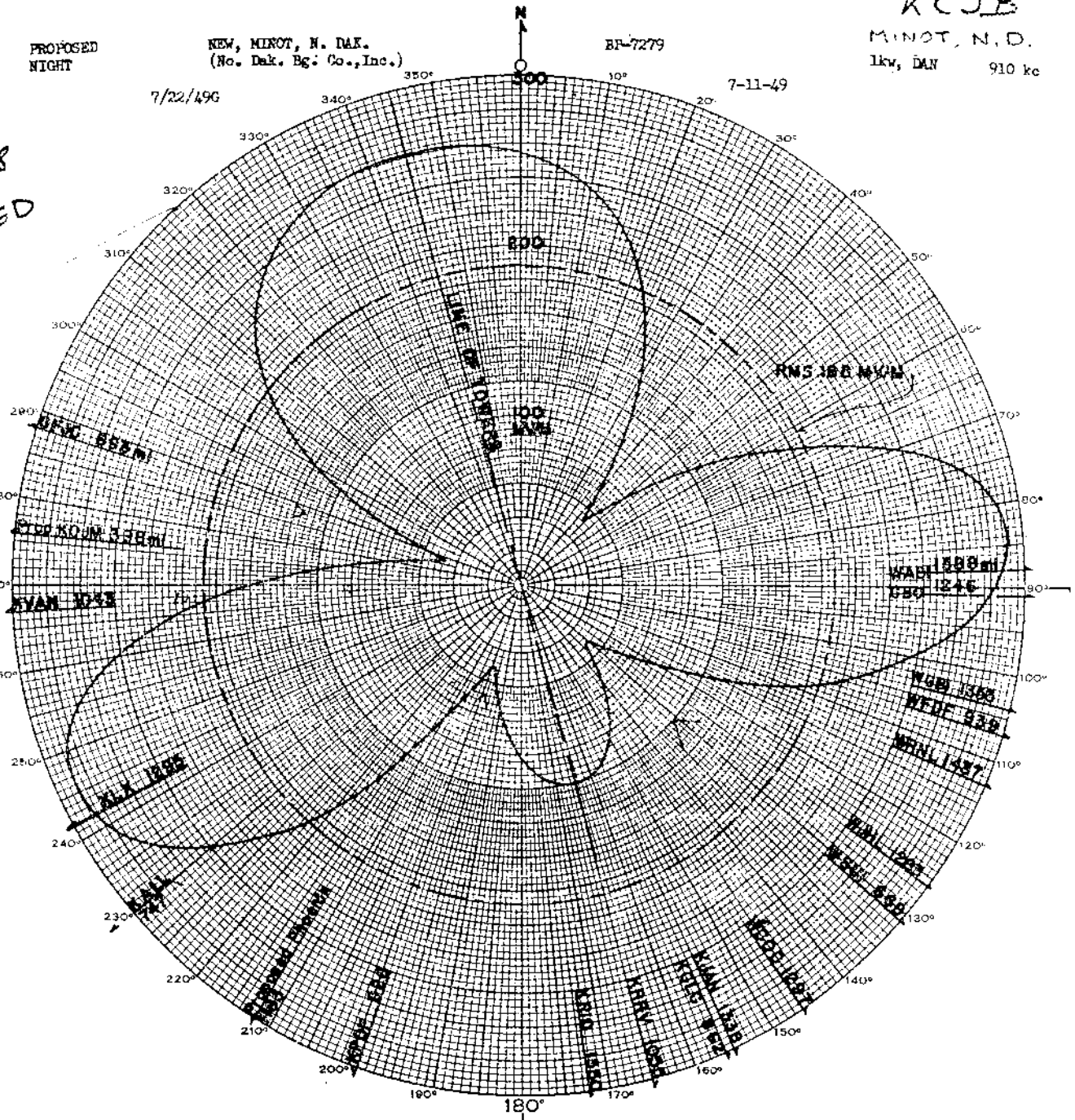
NEW, MINOT, N. DAK.
(No. Dak. Bg. Co., Inc.)

BP-7279

7/22/49G

7-11-49

4-19-68
GRANTED
CP



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS								STATION DATA
.7 44 G=81.7° N 270° 15° 1.0 0	TOWER No.	ELECTRICAL HEIGHT G°	TRUE TOWER ORIENTATION β°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV. ANGLE θ°	ELEVATION RMS FIELD mv/m E_θ
	1	81.7	0	-	0	170	1.0	0	
	2	81.7	335	270	44	119	0.7	10	
	3							20	
	4							30	
	5							40	
	6							50	
	7							60	
	8							70	
	9							80	
	10							E_θ =	mv/m
	DAYTIME OPERATION ☐			NIGHTTIME OPERATION ☑				P_θ =	kw

CALL Proposed Minot
FREQUENCY 910 kc
POWER 1.0 kw
TIME OF OPERATION U
TYPE OF OPERATION DA-N
DAYTIME TOWERS 1
NIGHTTIME TOWERS 2
No. RADIALS PER TOWER 120
LENGTH OF RADIALS 90 270 ft.
GROUND SCREEN DIMENSION 50 ft. R
LAT. 48° 11' 57"
LONG. 101° 17' 37"
SUPERSEDES
PATTERN No. 52704

HORIZONTAL PLANE PATTERN

PROPOSED STATION

MINOT, N. DAK.

LLOYD R. AMOO
RADIO ENGINEER
DES MOINES, IOWA

New, Minot, N. D. 910 kc

KCJB

MEASURED NIGHT

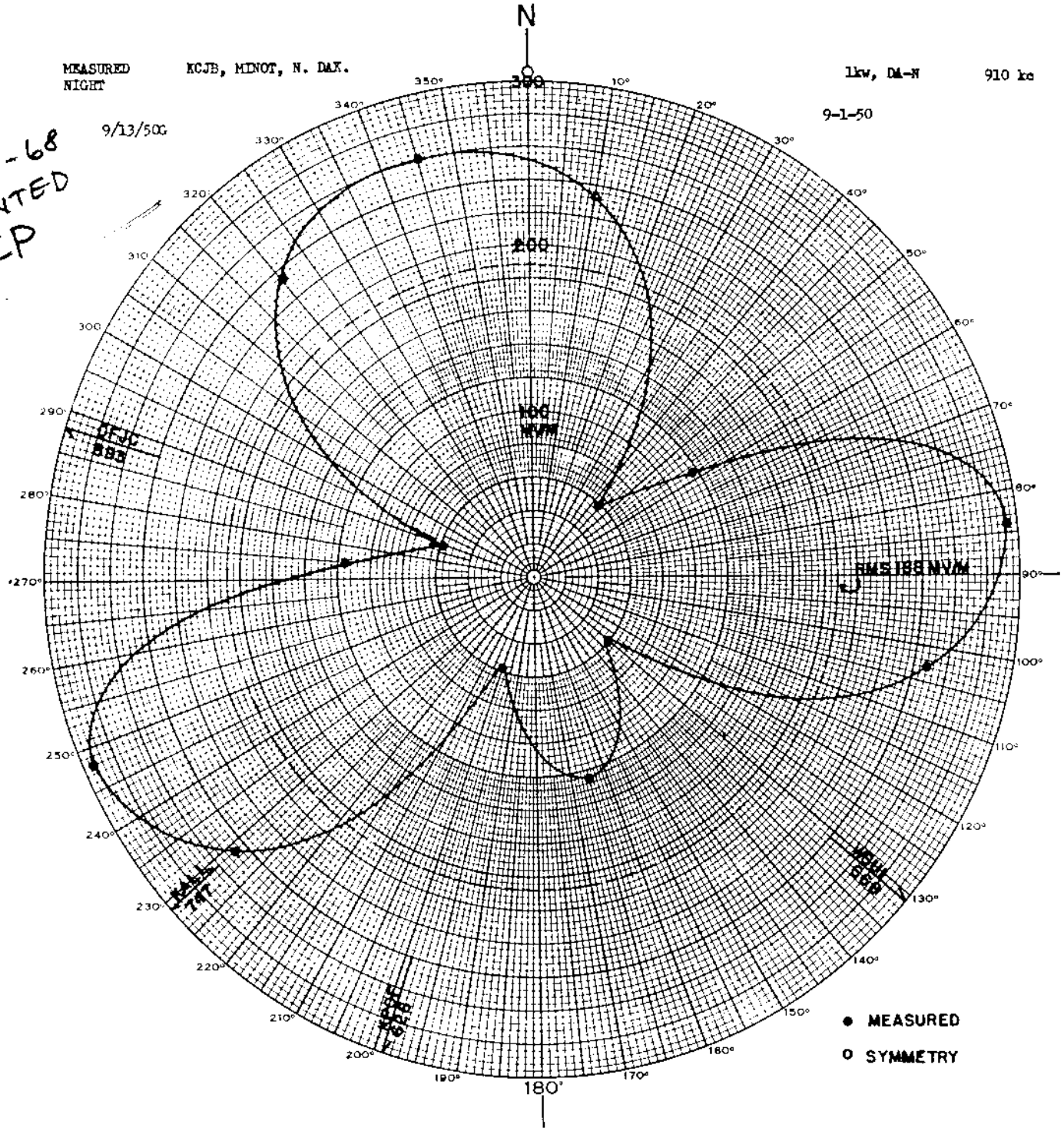
KCJB, MINOT, N. DAK.

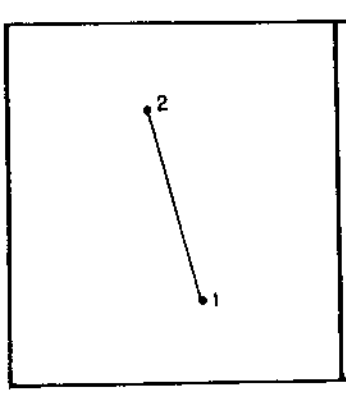
1kw, DA-N 910 kc

9-1-50

9/13/50

4-19-68 GRANTED CP





LATITUDE 48° 11' 57" N
LONGITUDE 101° 17' 37" W

ANTENNA	1	2
G	81.7°	81.7°
FIELD RATIO	1.000	0.700
PHASE	0	44°
SPACING	—	270°
AZIMUTH	—	345°
		DAY

MEASURED
HORIZONTAL PLANE PATTERN

KCJB

MINOT, N. DAK.

910 KC 1 KW DA-N

LLOYD R. AMOO
Consulting Radio Engineer

KCJB, Minot, N. Dak. 910 kc

KCJB

Proposed Day
(7-26-67ct)

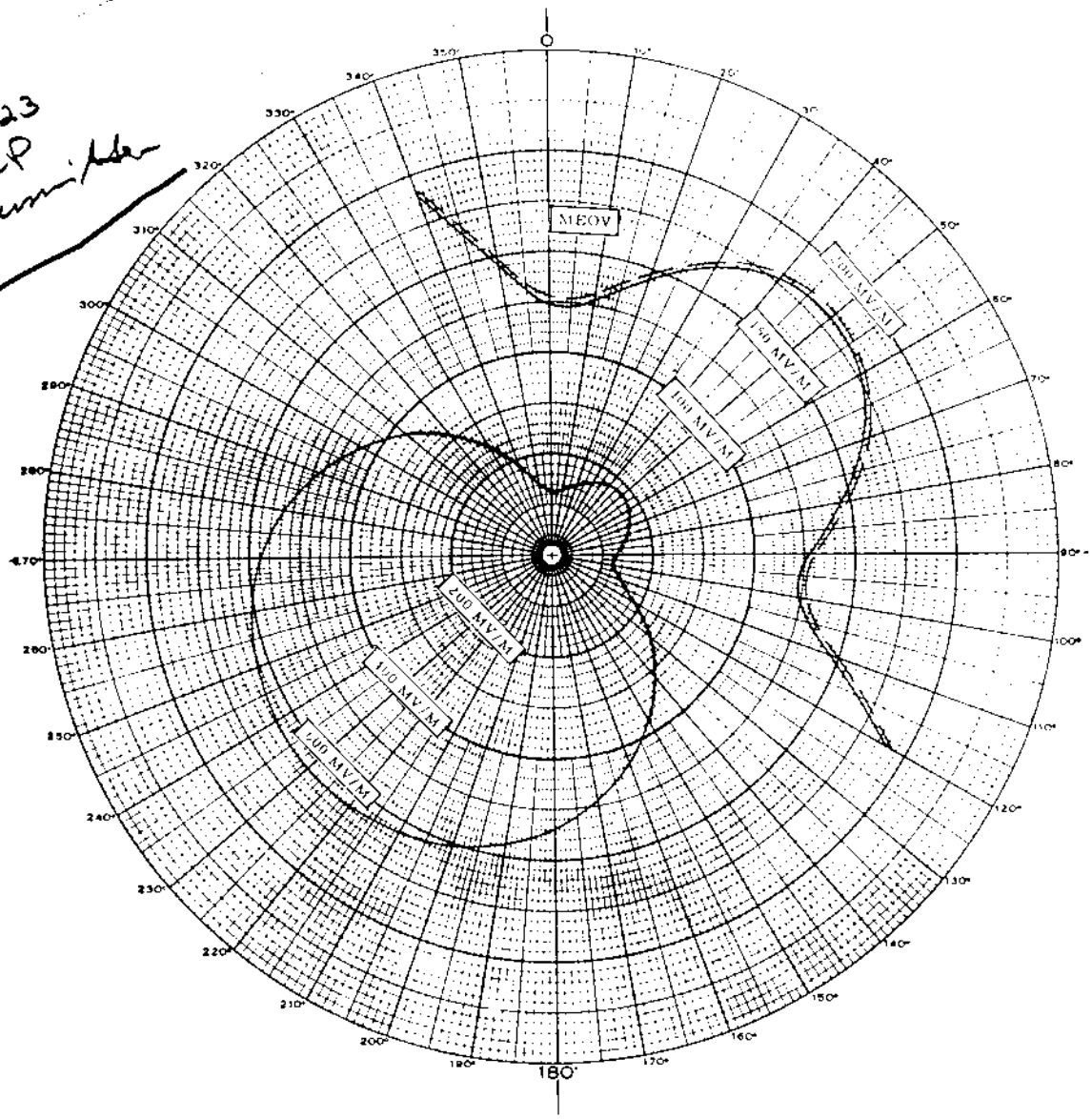
Station KCJB
Minot, North Dakota

1kw,5kw-LS,DA-2,U
910 kc

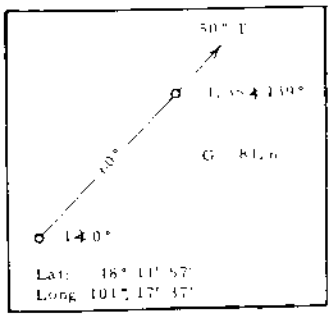
4-19-68
GRANTED CP

6-18-68
BMP-12423
GRANTED CP
to change ANT. transmitter location.

OVER



RMS 466 MV/M



WILLIS C. BEECHER
CONSULTING ENGINEER
WASHINGTON D.C.

FIGURE 1
CALCULATED DAY TIME HORIZONTAL
PLANE RADIATION PATTERN
MG K, INC.
KCJB, MINOT, NORTH DAKOTA
910KC 1KW, 5KW-LS, U, DA-2
DECEMBER 1966

FCC File No.BP-17695
Accepted 6-7-67

Station KCJB
Minot, North Dakota

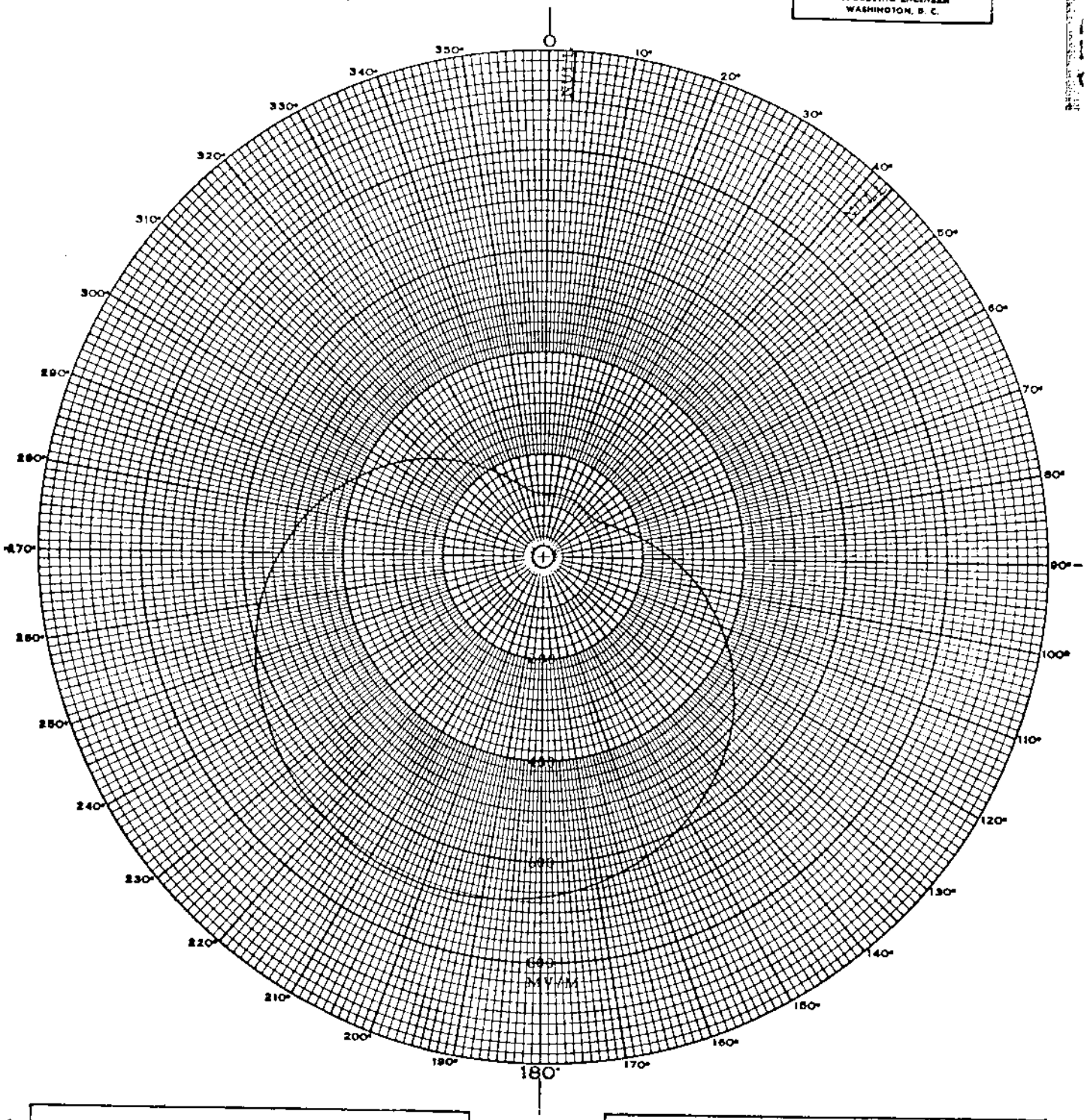
910 kc

Standard Pattern

KCJB

RMS(std.) = 448.9 MV/M
RMS (th.) = 427.6 MV/M
RSS (th.) = 548.8 MV/M

WILLIS C. HEECKER
CONSULTING ENGINEER
WASHINGTON, D. C.



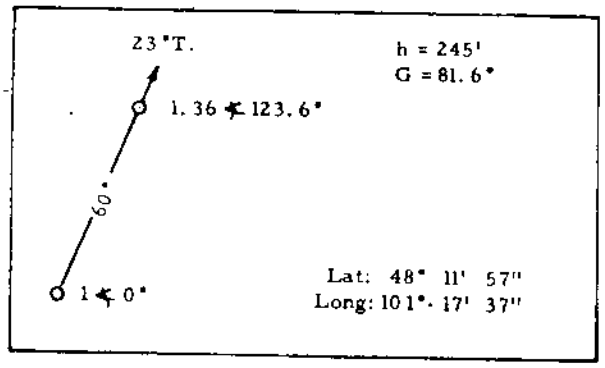


FIGURE 6

CALCULATED DAYTIME

STANDARD HORIZONTAL RADIATION PATTERN

BIG K, INC.

KCJB, MINOT, NORTH DAKOTA

910 KHz 1KW, 5KW-LS U, DA-2

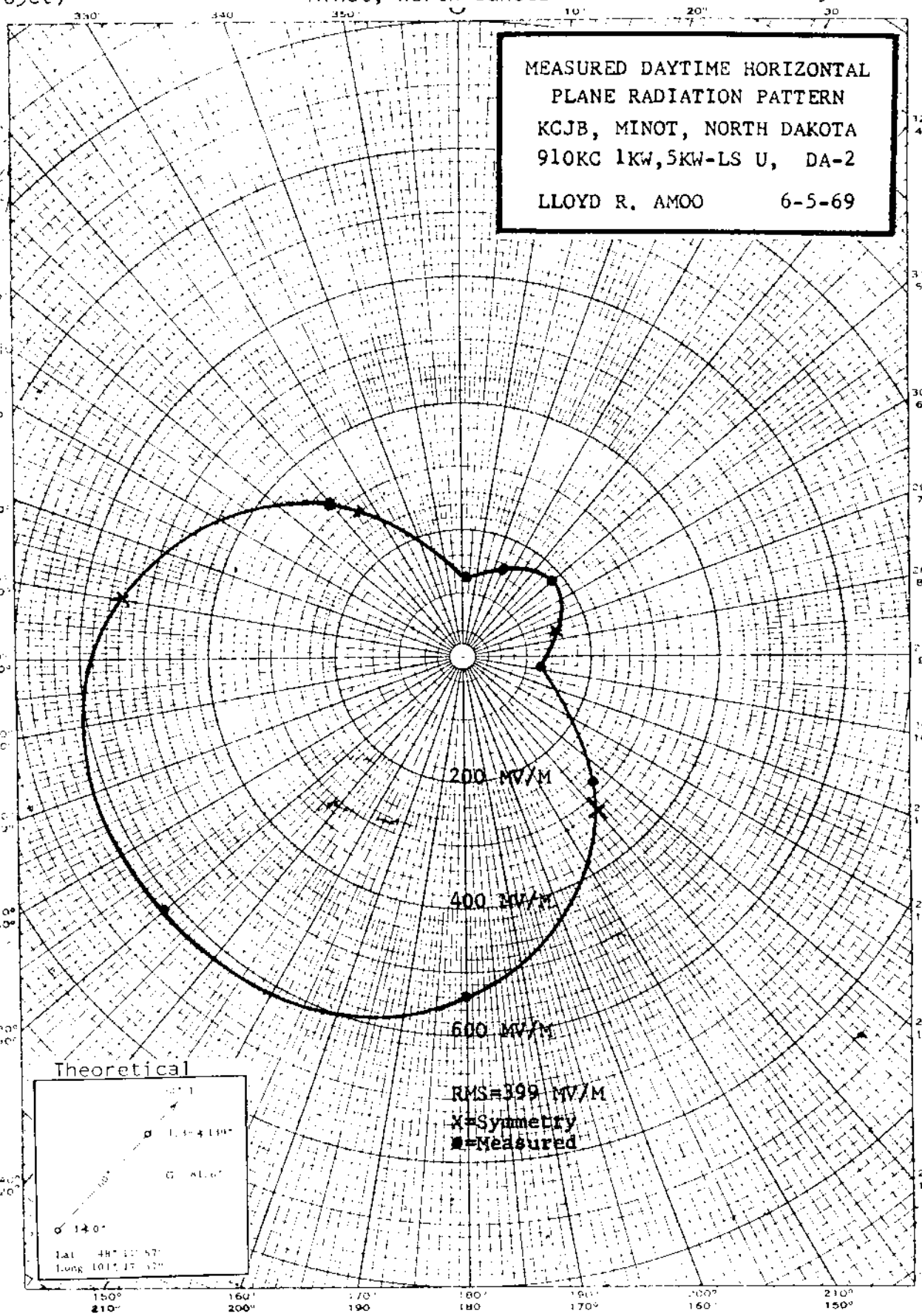
MAY 1974

KCJB

Measured Day
(8-22-69ct)

Station KCJB
Minot, North Dakota

1kw,5kw-LS,DA-2,U
910 kc



FCC File No.BL-12417
Accepted 8-14-69

Station KCJB
Minot, North Dakota

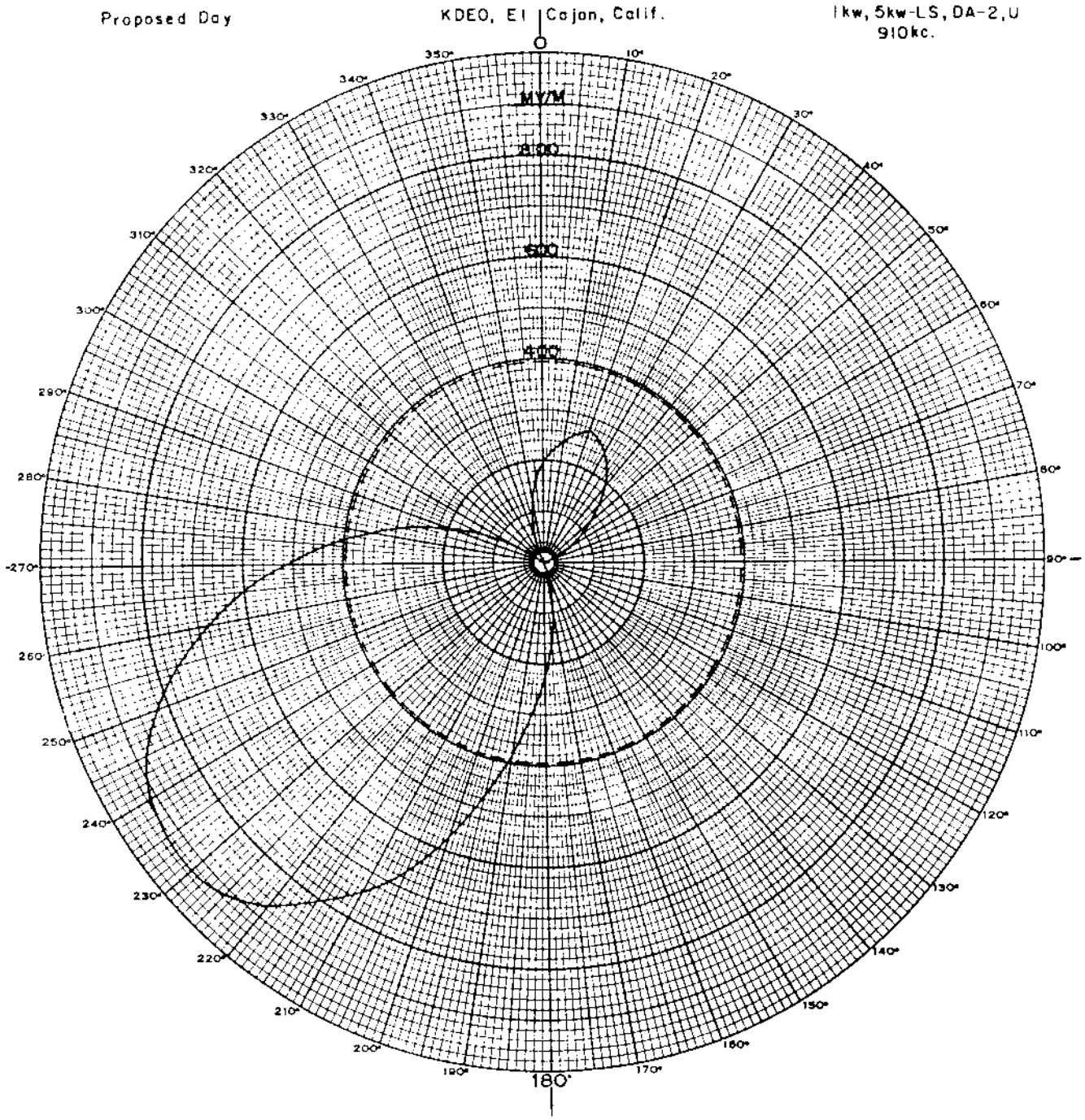
910 kc

KDE

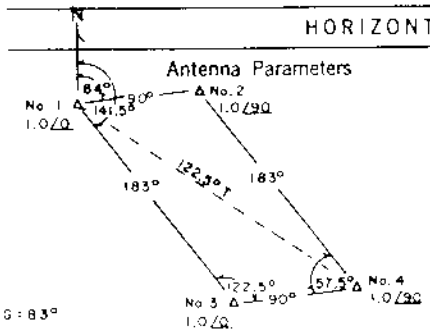
Proposed Day
(6-28-68ct)

Station KDEO
El Cajon, California

1kw, 5kw-LS, DA-2, U
910 kc



HORIZONTAL RADIATION PATTERN—FIGURE No. 5



Floyd Hall
Radio Engineering
Consultant

Applicant: KDEO, TULLIS & HEARNE BCNG. CO.
Location: El Cajon, California
Freq: 910kc's Power 5.0kw
Lat.: 32° 51' 37" N Long. 116° 58' 09" W
Time of operation: Day
Type of operation: DA-2
RMS Field: 396.0 mv/m
Pattern No. 660612 Supersedes:
Date: 2-25-66 By:

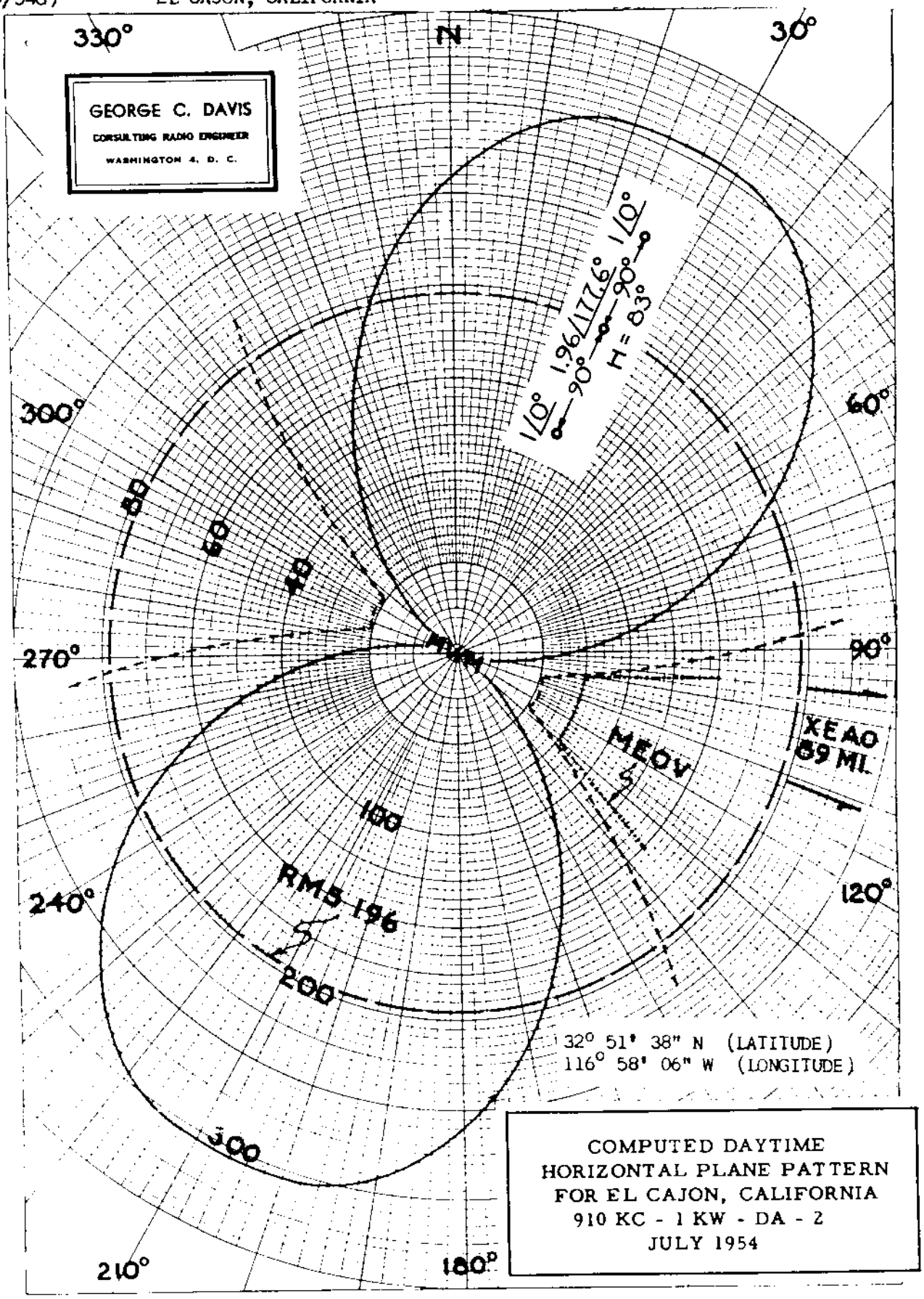
FCC File No. BP-18151
Accepted 6-11-68

Station KDEO
El Cajon, California

910 kc

KDEO EL CAJON, CAL

PROPOSED DAY (8/19/54G) BABCOCK B/C CORP EL CAJON, CALIFORNIA 1KW DA-2 UNLIMITED 910 KC



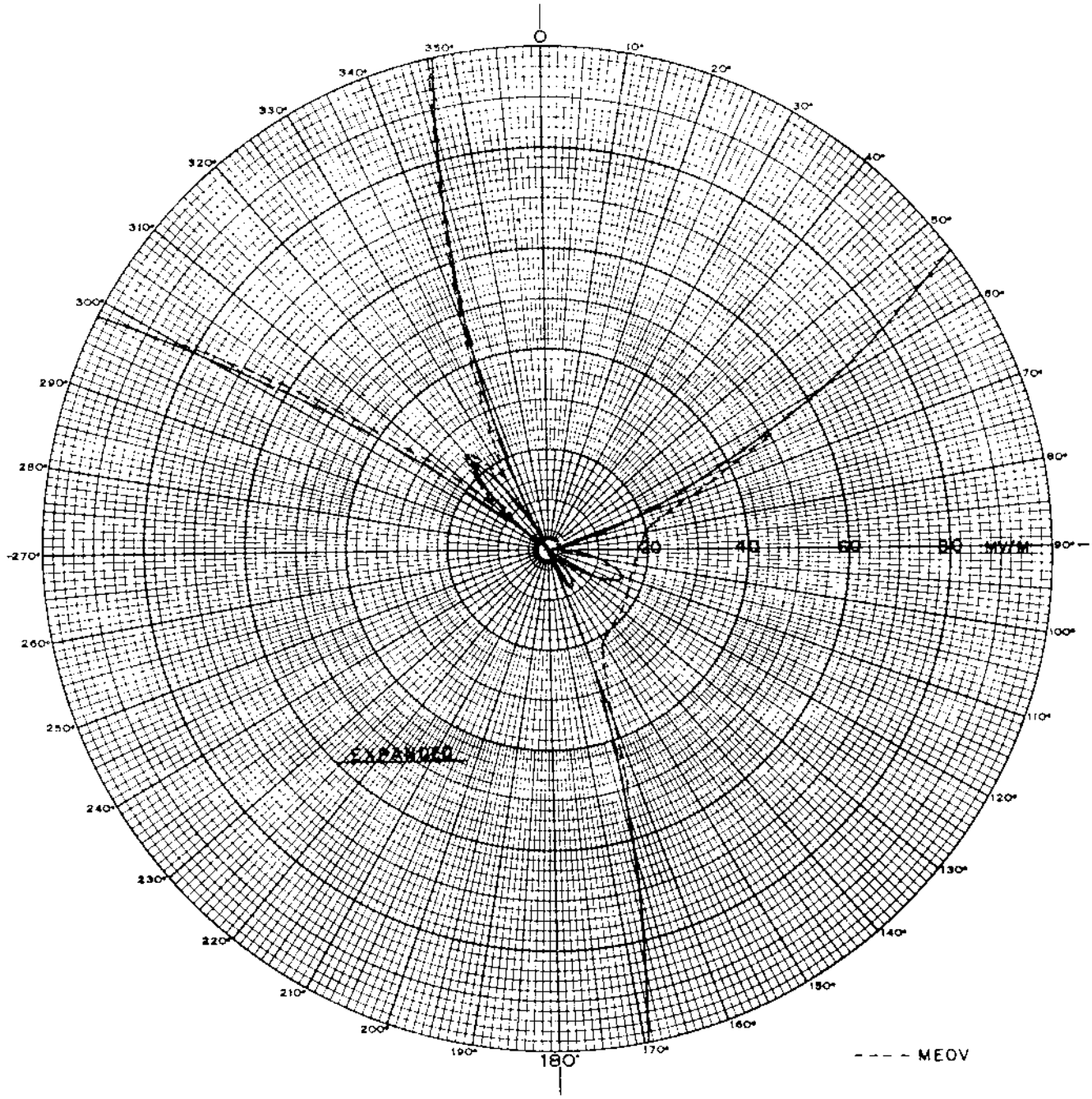
FCC FILE NO. BP-9321 (AMENDED)

KDEO

Proposed Day Nulls
(6-28-68ct)

Station KDEO
El Cajon, California

1kw,5kw-LS,DA-2,U
910 kc



HORIZONTAL RADIATION PATTERN—FIGURE No. 6

Antenna Parameters		
	Floyd Hall Radio Engineering Consultant	Applicant: KDEO Location: El Cajon, Calif. Freq: 910kc. Power 5.0kw Lat.: Long.: Time of operation: Type of operation: RMS Field: Pattern No. 660612 Supersedes: Date: 2-25-66 By

FCC File No.BP-18151
Accepted 6-11-68

Station KDEO
El Cajon, California

910 kc

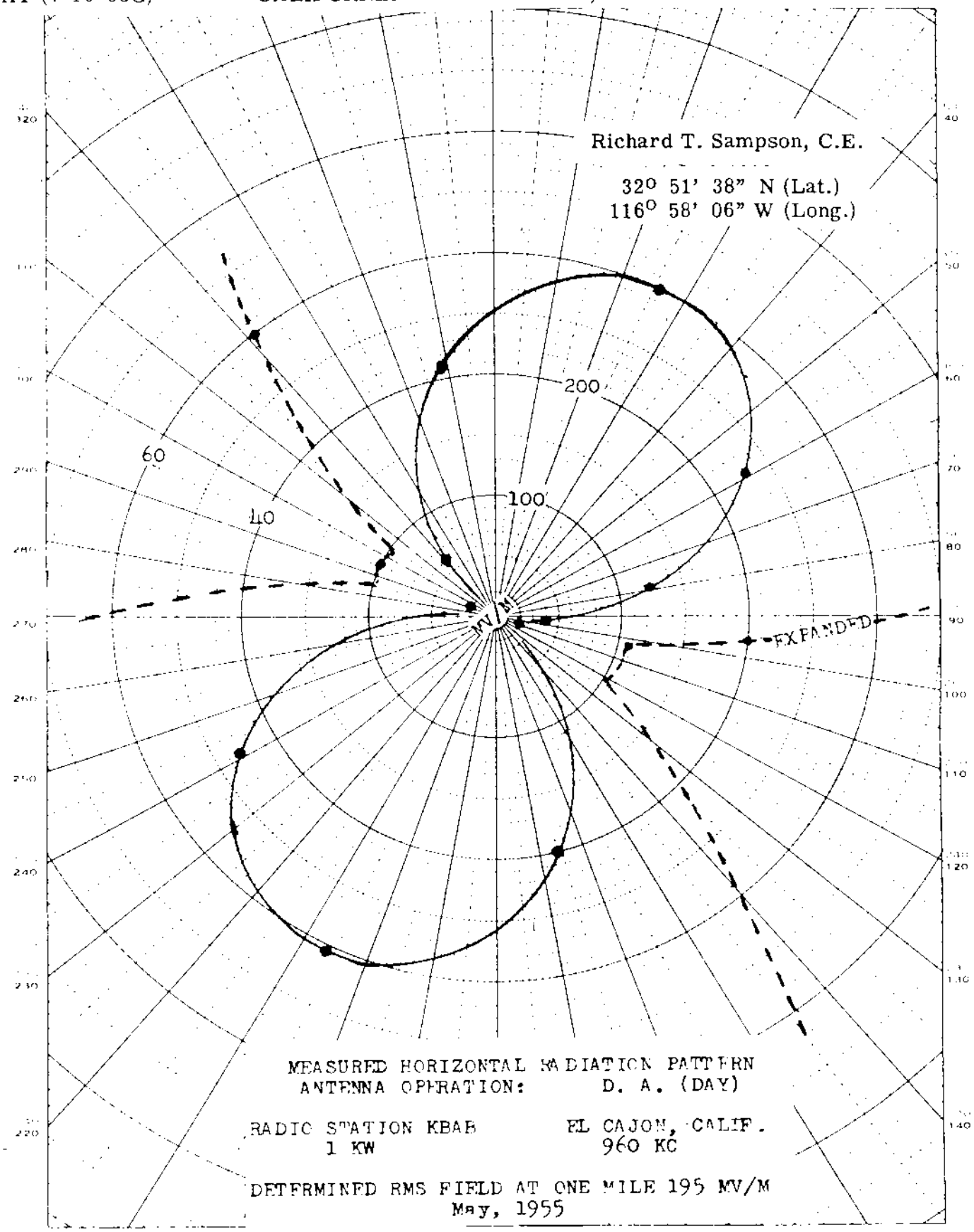
KDEO

MEASURED
DAY (7-18-55G)

KBAB, EL CAJON
CALIFORNIA

1 KW
DA-2, U

910 kc

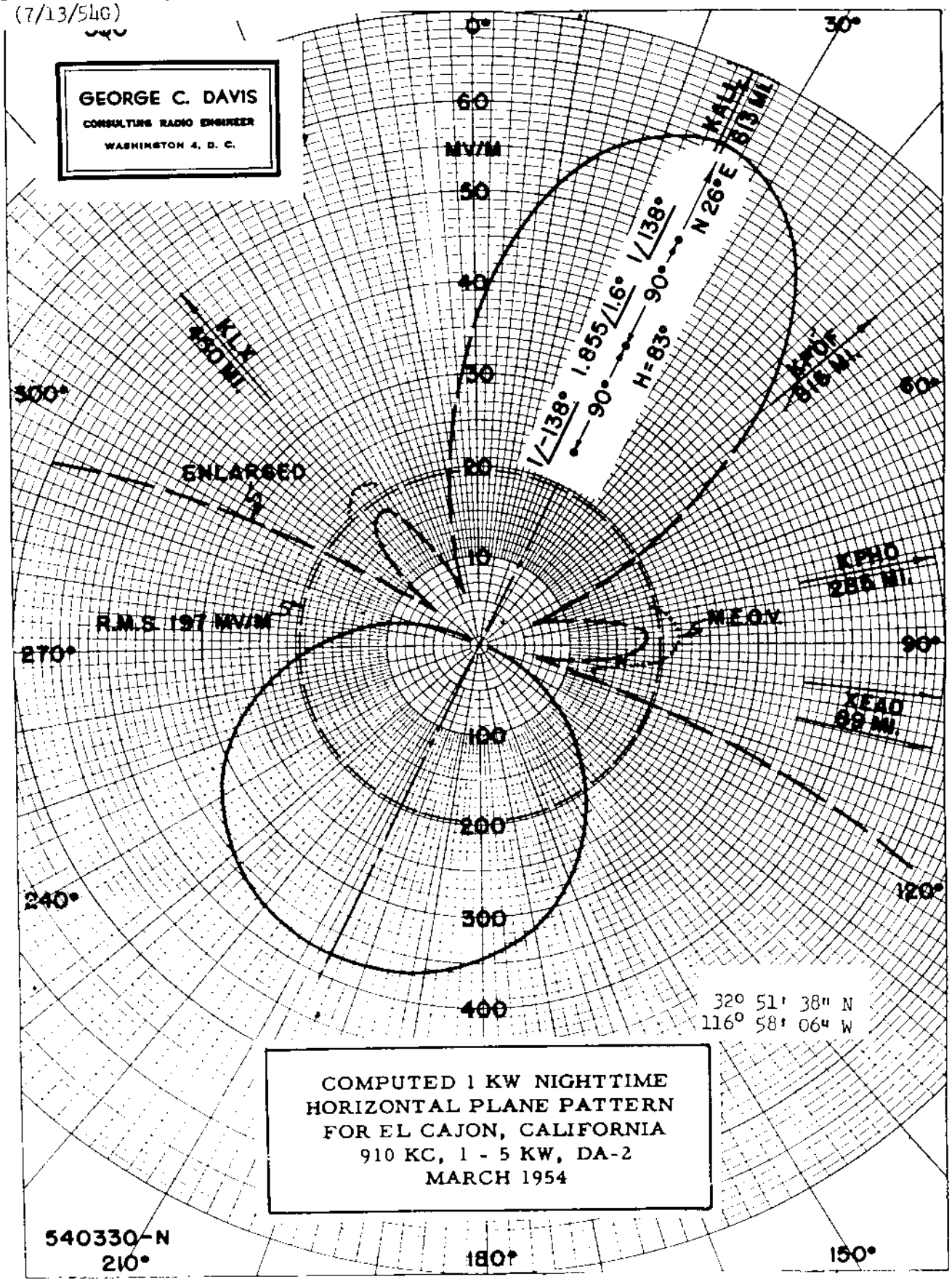


File BL-5721 Accepted 7-1-55 FCC KBAB, El Cajon, Calif. 910 kc

KDEO

910 kc

PROPOSED BABCOCK B/C CORP. El Cajon, Calif. 1KW-5KW-LS, U, DA-2
NIGHT (7/13/54G)



910 kc

FCC File No. BP-9321 Accepted 6/11/54

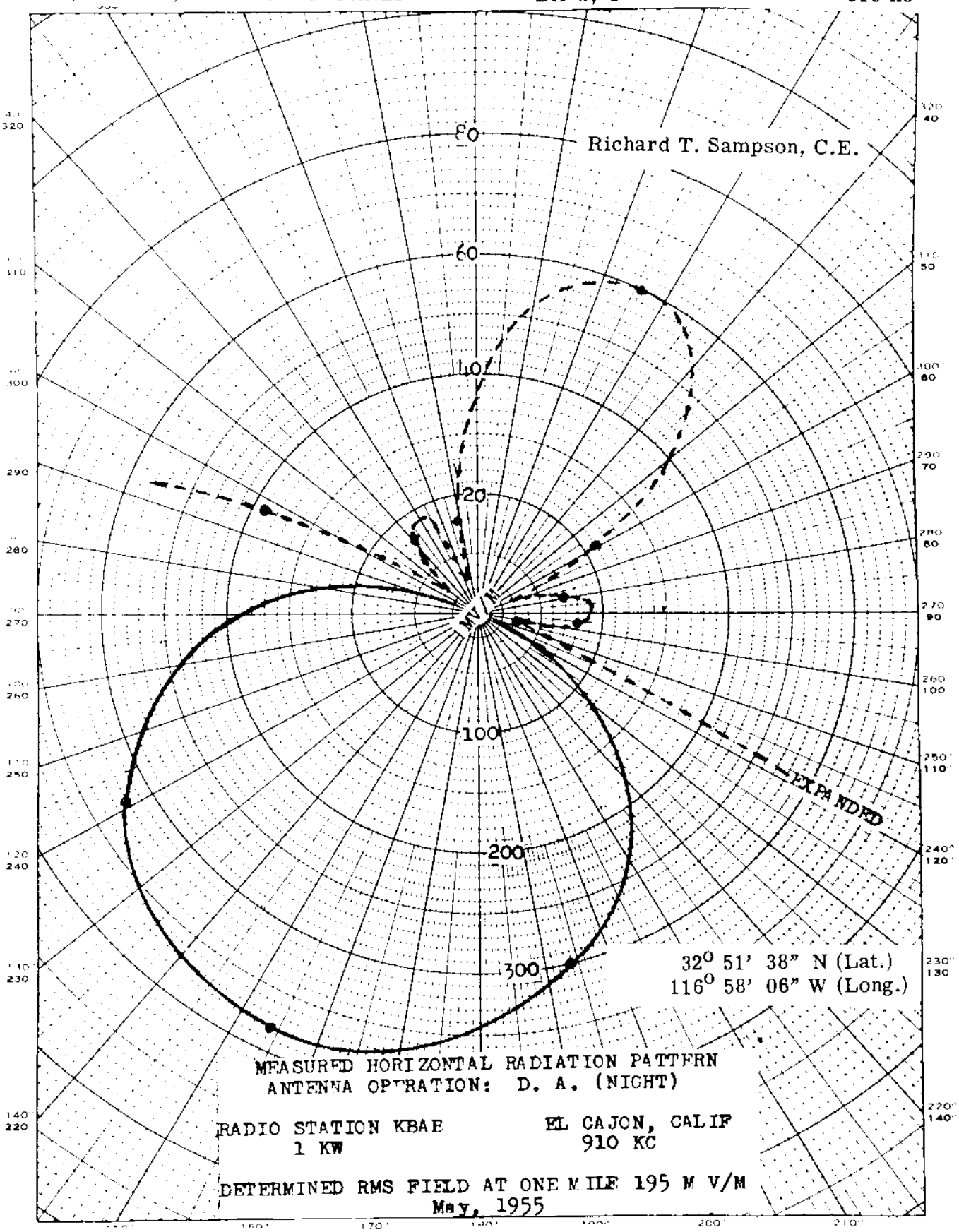
KDEO

MEASURED
NIGHT (7-18-55G)

KBAB, EL CAJON
CALIFORNIA

1 KW
DA-2, U

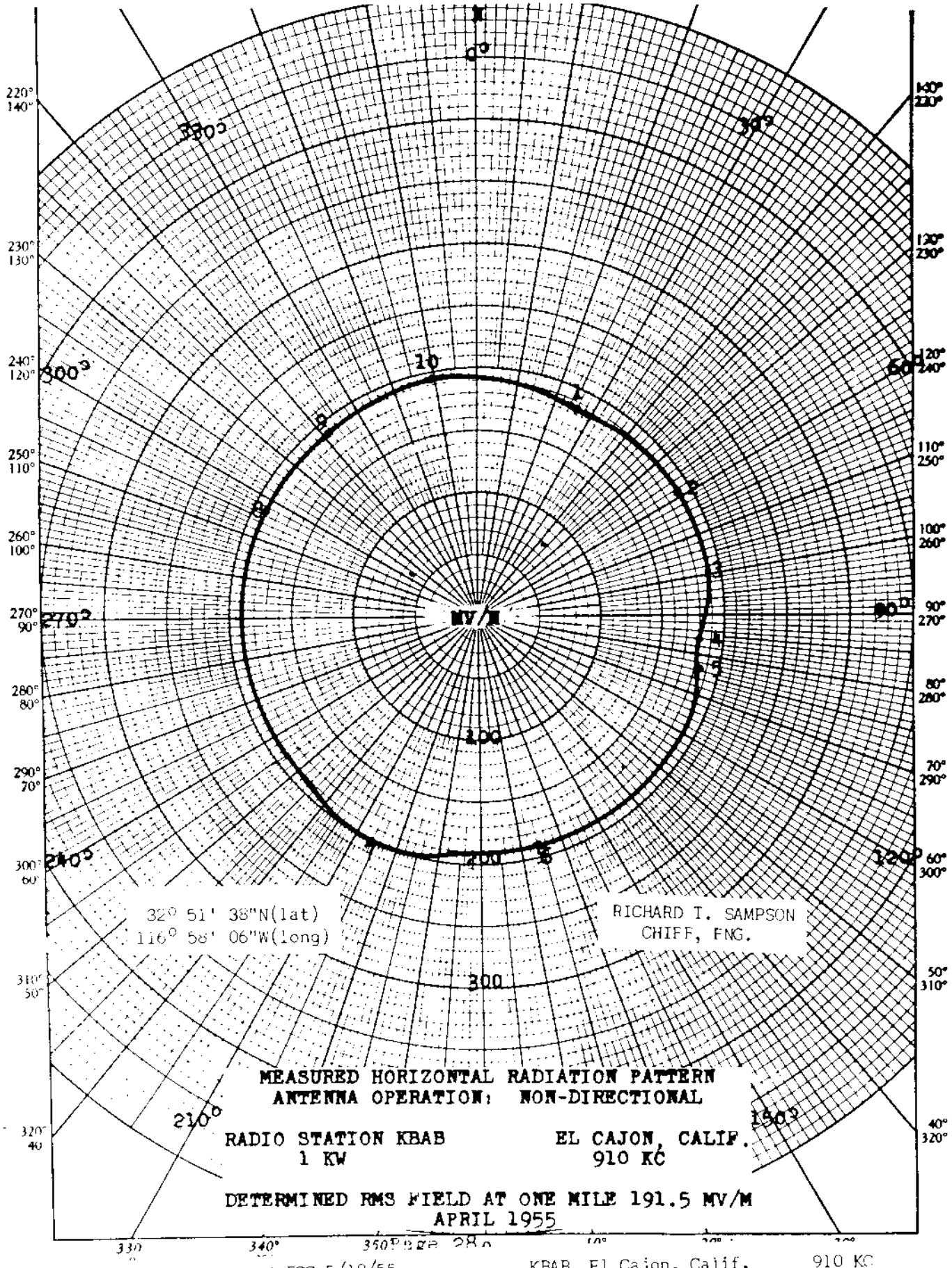
910 kc



File BL-5721 Accepted 7-1-55 FCC KBAB, El Cajon, Calif. 910 kc

KDEO

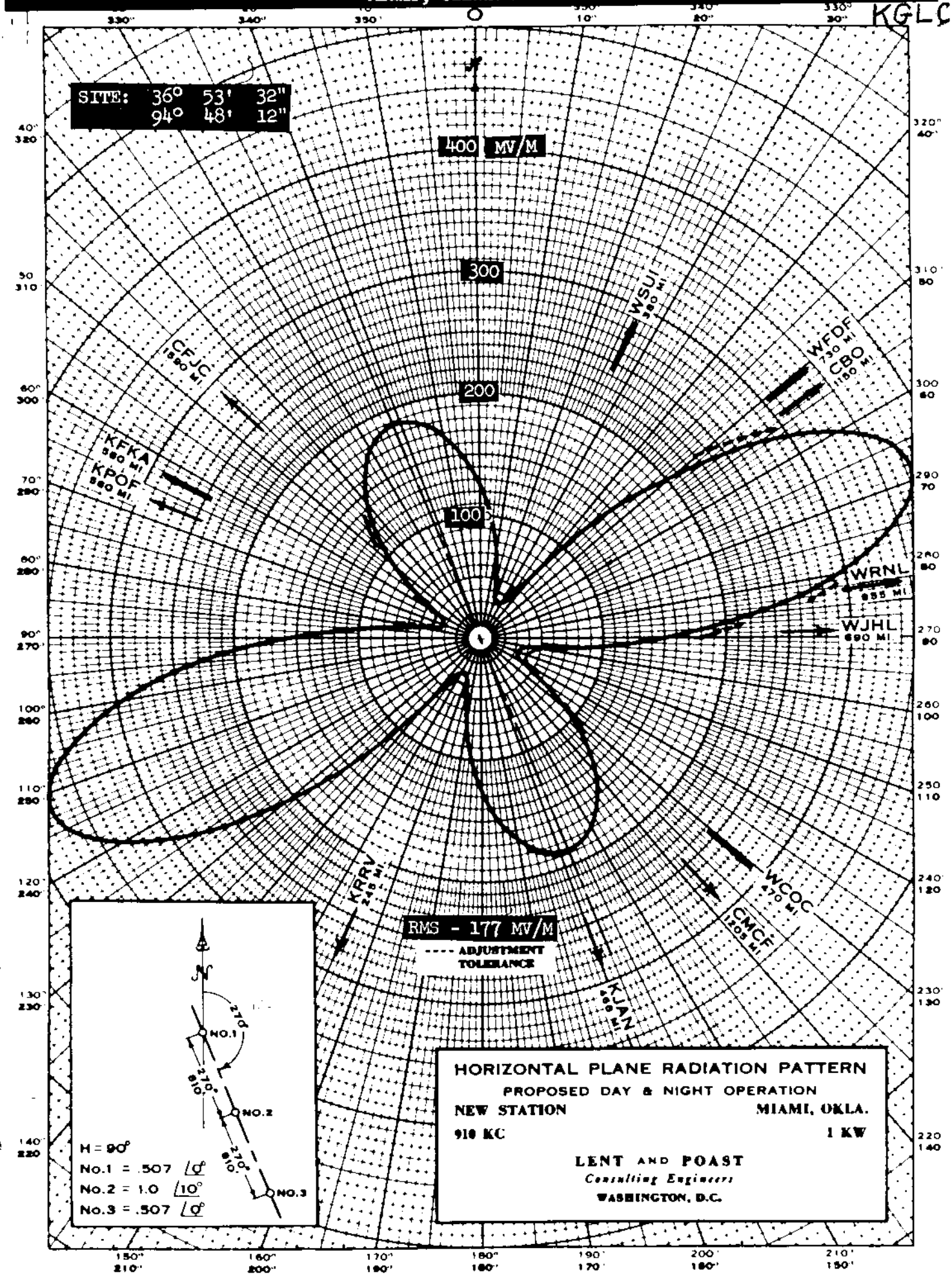
MEASURED NON-DIRECTIONAL (6/6/55G) RADIO STATION KBAB EL CAJON, CALIFORNIA 1 KW DA-2, U 910 KC



FILE NO. BL-5721 Accepted FCC 5/18/55 KBAB, El Cajon, Calif. 910 KC

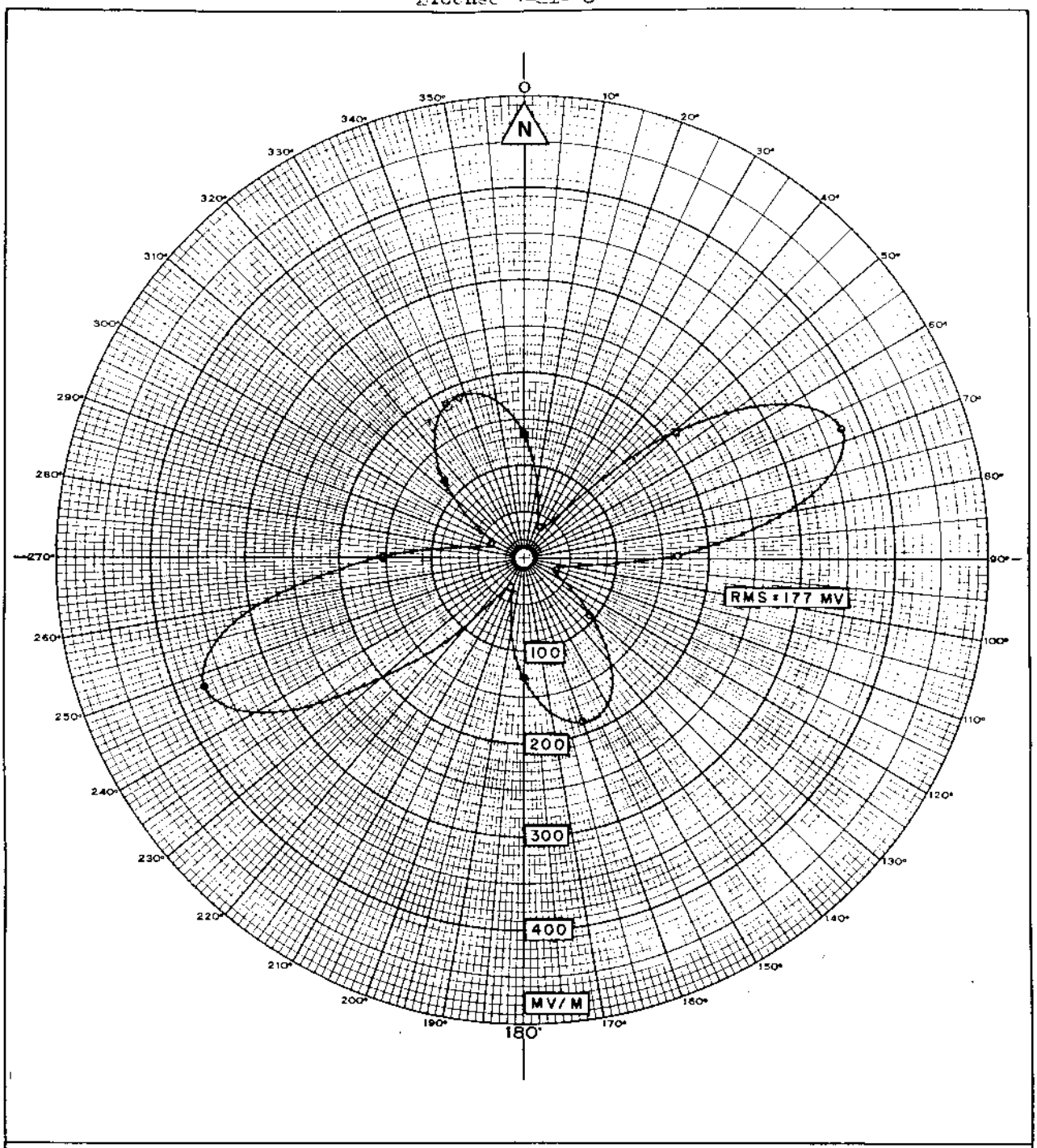
PROPOSED DAY & NIGHT Station KGLC 1kw, DA-1,U
Miami, Oklahoma 910 KC

KGLC

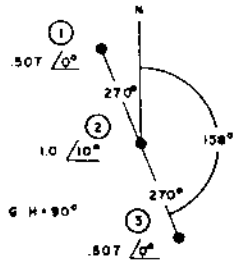


KGLC
910

License 4-21-48



MEASURED HORIZONTAL PLANE RADIATION PATTERN



MIAMI BROADCASTING COMPANY

MIAMI, OKLAHOMA

WELDON & CARR

CONSULTING RADIO ENGINEERS

WASHINGTON D C

KGLC

MIAMI, OKLAHOMA

910 KC 1 KW-U DA-1

D 480416 A

License 4-21-48

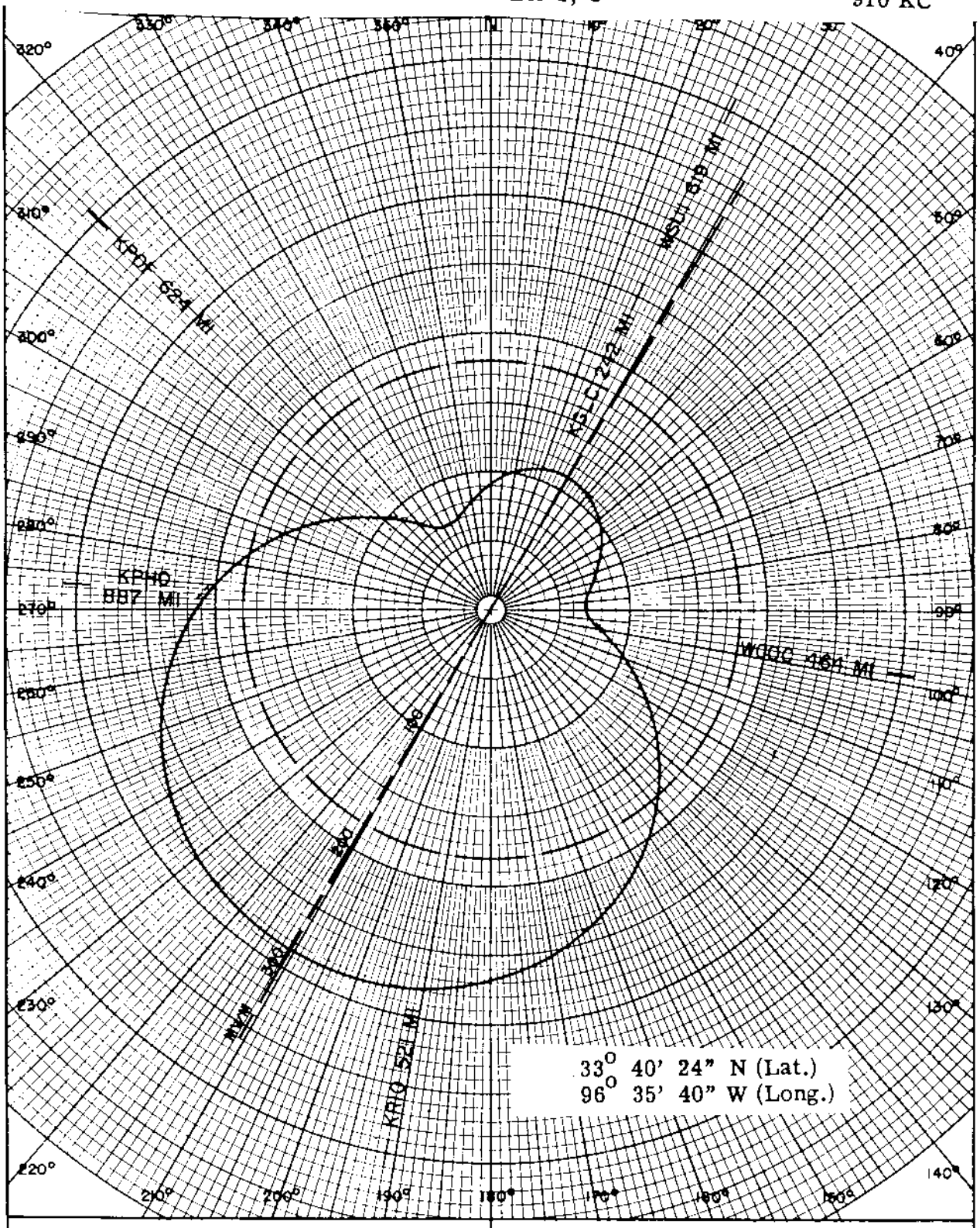
PROPOSED DAY & NIGHT (7-18-55G)

KRRV, SHERMAN TEXAS

1 KW
DA-1, U

910 KC

KIKM



S = 60° = 180 3'

N 30.5° E

-- M.E.O.V

1.0°

S

0.70 ∠-146.5°

R.M.S = 180 MV/M

G'S = 93.1° = 280'

J. G. ROUNTREE
CONSULTING RADIO ENGINEER
4515 PRENTICE STREET
DALLAS 6, TEXAS

RADIO STATION KRRV
SHERMAN, TEXAS
910 KC, 1000 W, DA-1

550625

FIGURE 2A

File BP-9873 Accepted 7-1-55 FCC KRRV, Sherman, Texas 910 KC

KIKM

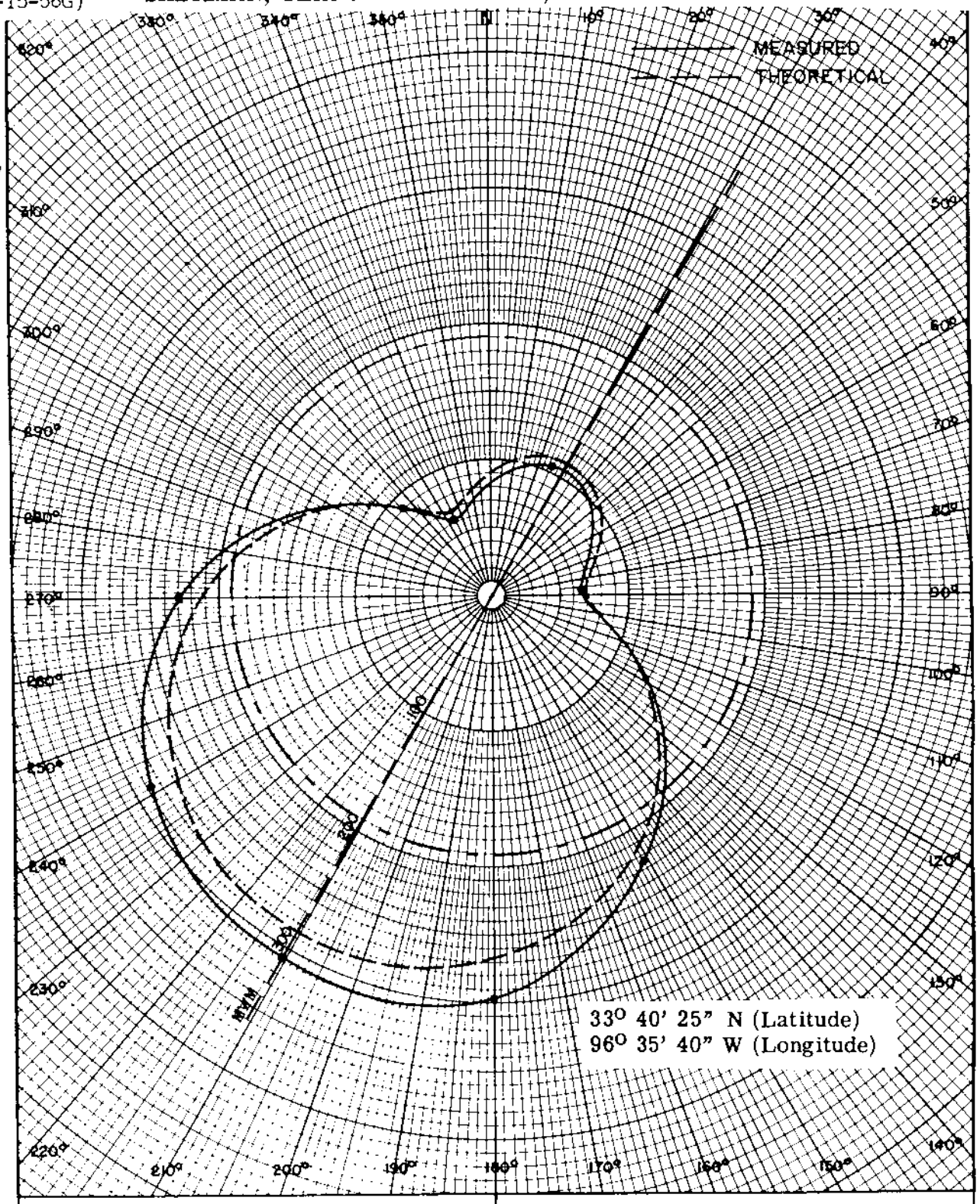
MEASURED NIGHT & DAY (5-15-56G)

STATION KRRV
SHERMAN, TEXAS

1 KW
DA-1,U

910 KC

granted license for change in DA



MEASURED DA PATTERN

N 30.5° E

NO. 1

S

NO. 2

SEE FIGURE 2 FOR OPERATING PARAMETERS

RMS = 191 MV/M

S = 60° = 180.3'

J. G. ROUNTREE
CONSULTING RADIO ENGINEER
5622 DYER STREET
DALLAS 6, TEXAS

RADIO STATION KRRV
SHERMAN, TEXAS
910 KC, 1000 W, DA-1

560215

FIGURE 3B

FCC File No. BL-6136 Accepted 5-8-56

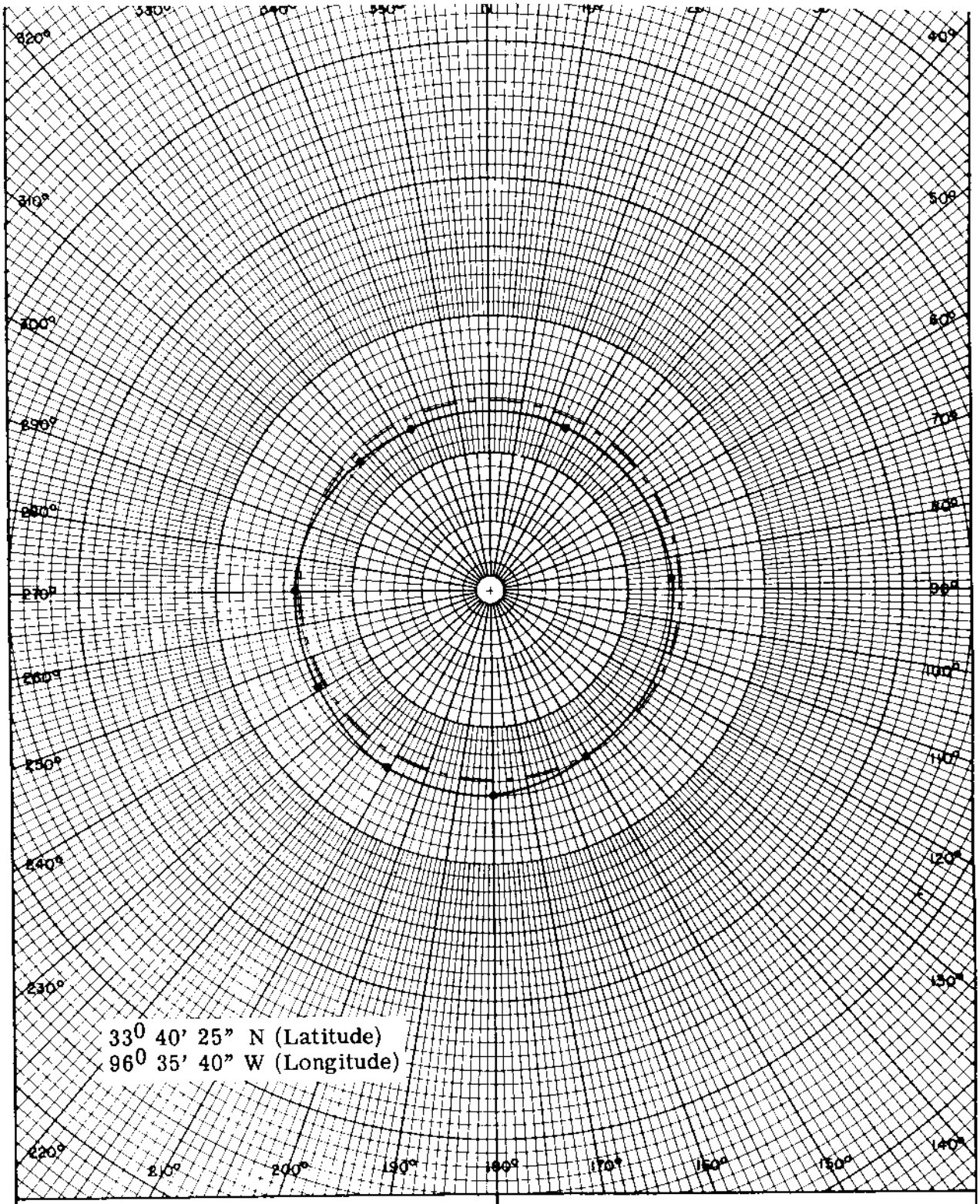
KRRV, Sherman, Texas

910 KC

k KIKM ✓

Measured Non-Directional (5/15/56g) | STATION KRRV SHERMAN, TEXAS | 1 KW DA-1,U | 910 KC

granted license 4/19/57 for change in DA



MEASURED ND PATTERN

N 30.5° E

NO. 1

S

NO. 2 DETUNED

RMS = 138 MV/M

S = 60° = 180.3'

J. G. ROUNTREE
CONSULTING RADIO ENGINEER
5622 DYER STREET
DALLAS 6, TEXAS

RADIO STATION KRRV
SHERMAN, TEXAS
910 KC, 1000 W, DA-1

560215

FIGURE 3A

FCC File No. BL-6136 Accepted 5-8-56 KRRV, Sherman, Texas 910 KC

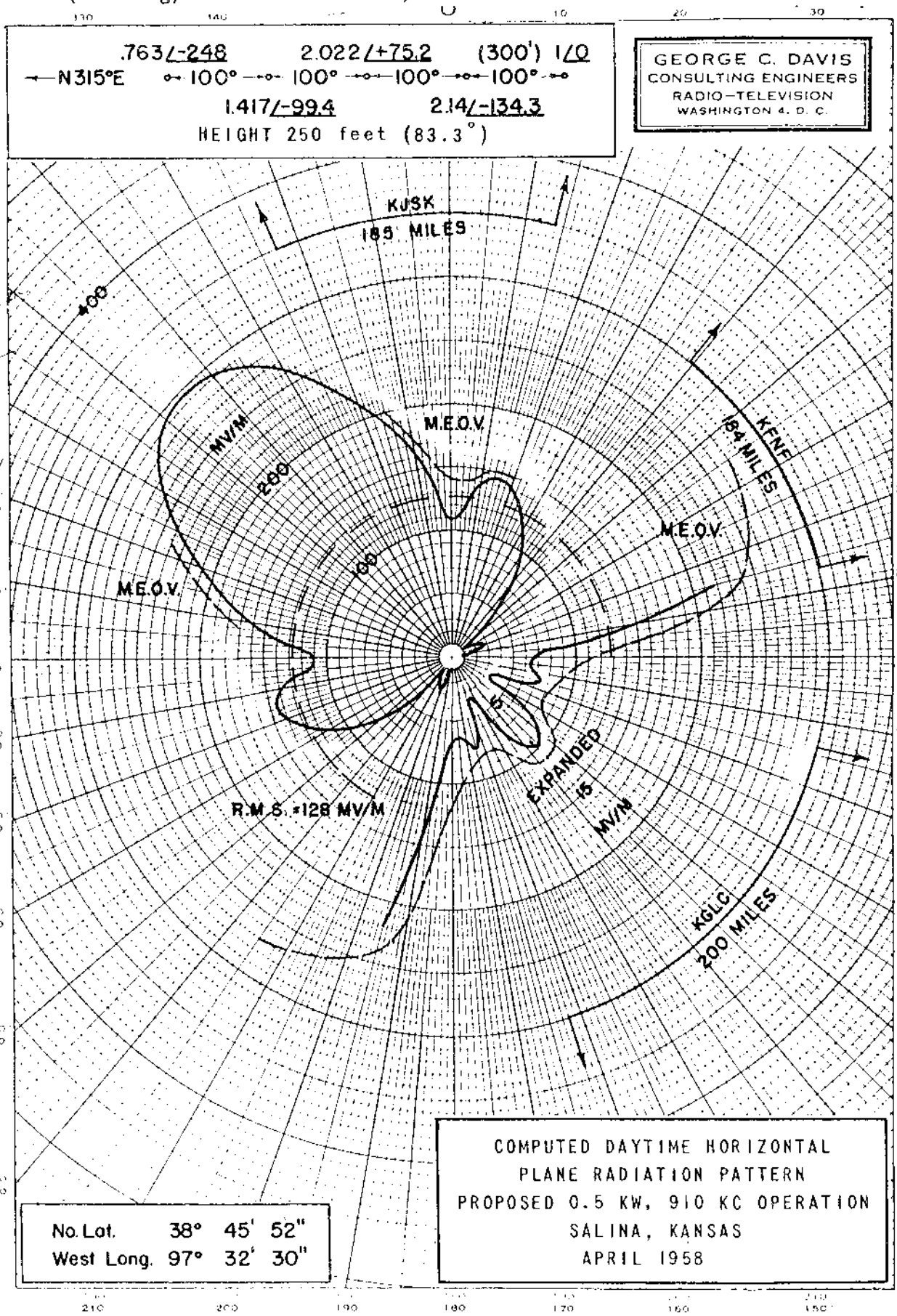
Salina, Kan.

~~KLSI~~ K/14

PROPOSED DAY
(9-11-58g)

New; Salina Radio, Inc.
Salina, Kansas

500w, DA-D,D
910 KC



7-25-62 granted CP for new station

12-4-63 [illegible]

#202 - 7-25-62 granted LP for new station

FCC File No. BP-11,802
Accepted 8-8-58 Amended

Salina Radio, Incorporated
Salina, Kansas

910 KC

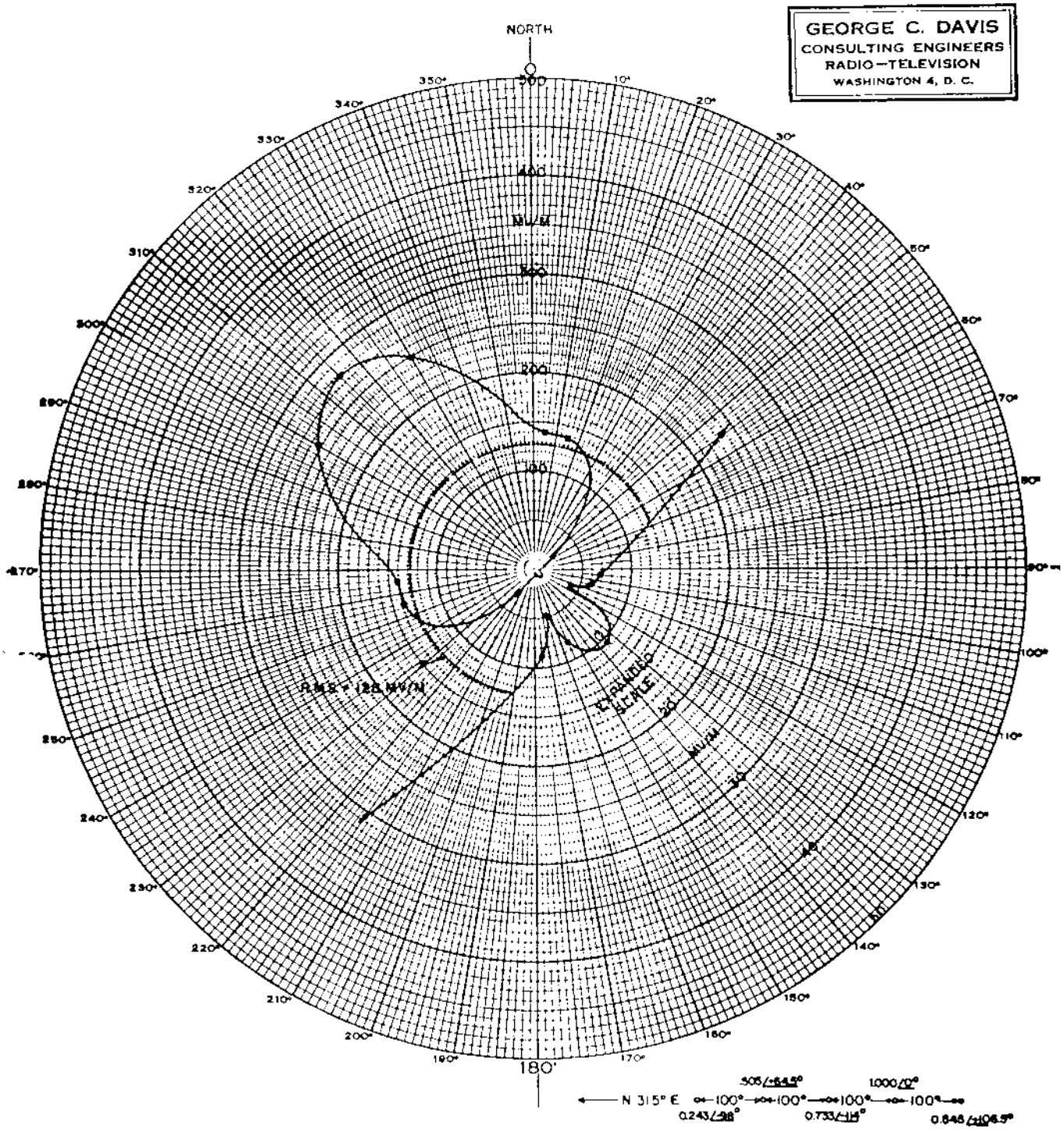
KINA

Measured Day
(7-29-64ct)

Station KLSI
Salina, Kansas

500w,DA-D,D
670 kc

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



NORTH LAT. 38° 45' 52"
WEST LONG. 97° 32' 30"

MEASURED
HORIZONTAL PLANE PATTERN
FOR DIRECTIVE DAYTIME OPERATION
KLSI, SALINA, KANSAS
910 KC - 0.5 KW - DA-D
APRIL 1964

FCC File No.BL-10626
Accepted 7-9-64

Station KLSI
Salina, Kansas

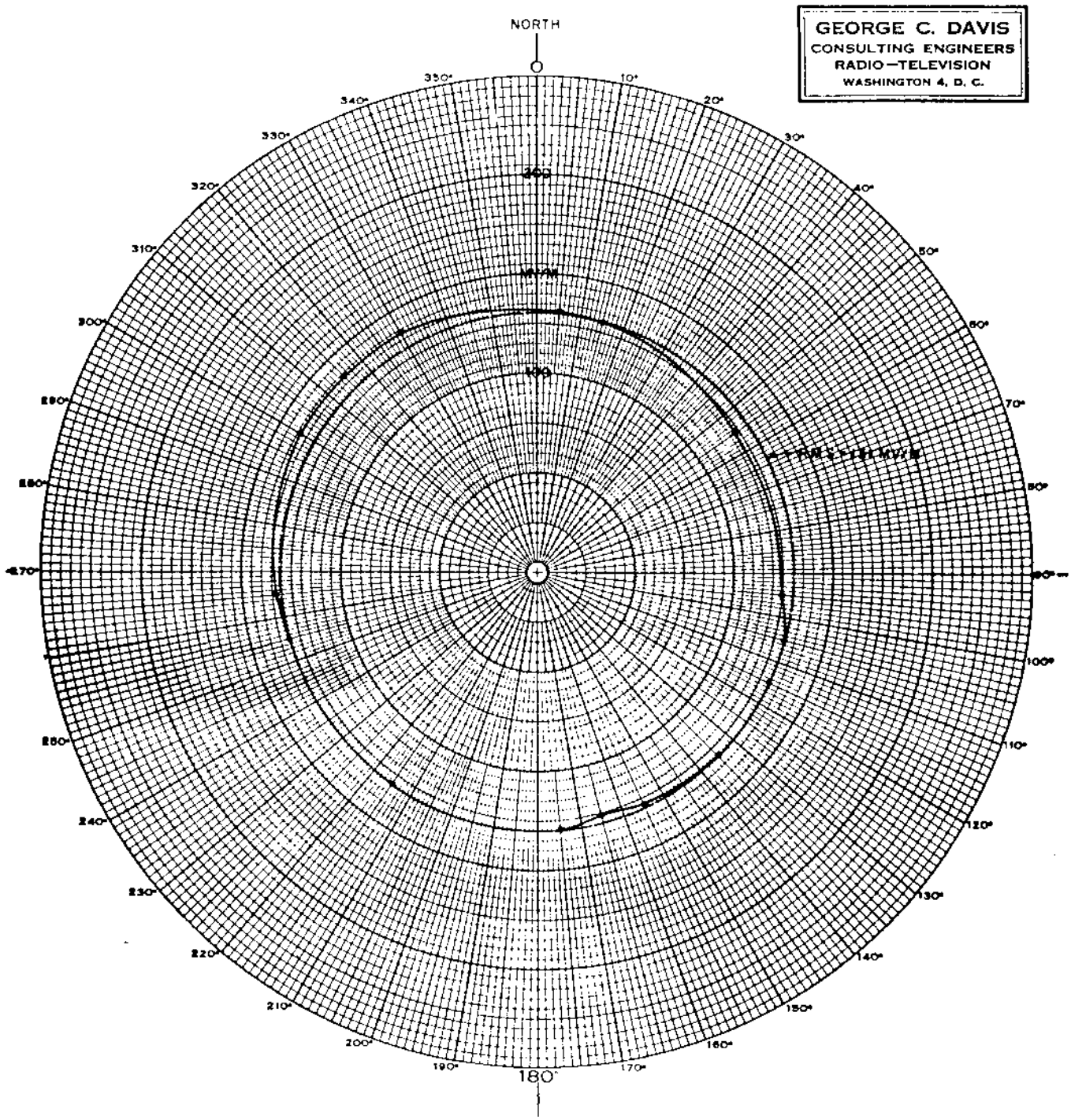
670 kc

KINA

Measured Non-DA
(7-29-64ct)

Station KLSI
Salina, Kansas

500w,DA-D,D
670 kc



MEASURED
HORIZONTAL PLANE PATTERN
FOR NON-DIRECTIVE OPERATION
KLSI, SALINA, KANSAS
910 KC - 0.5 KW - DA-D
APRIL 1964

FCC File No.BL-10626
Accepted 7-9-64

Station KLSI
Salina, Kansas

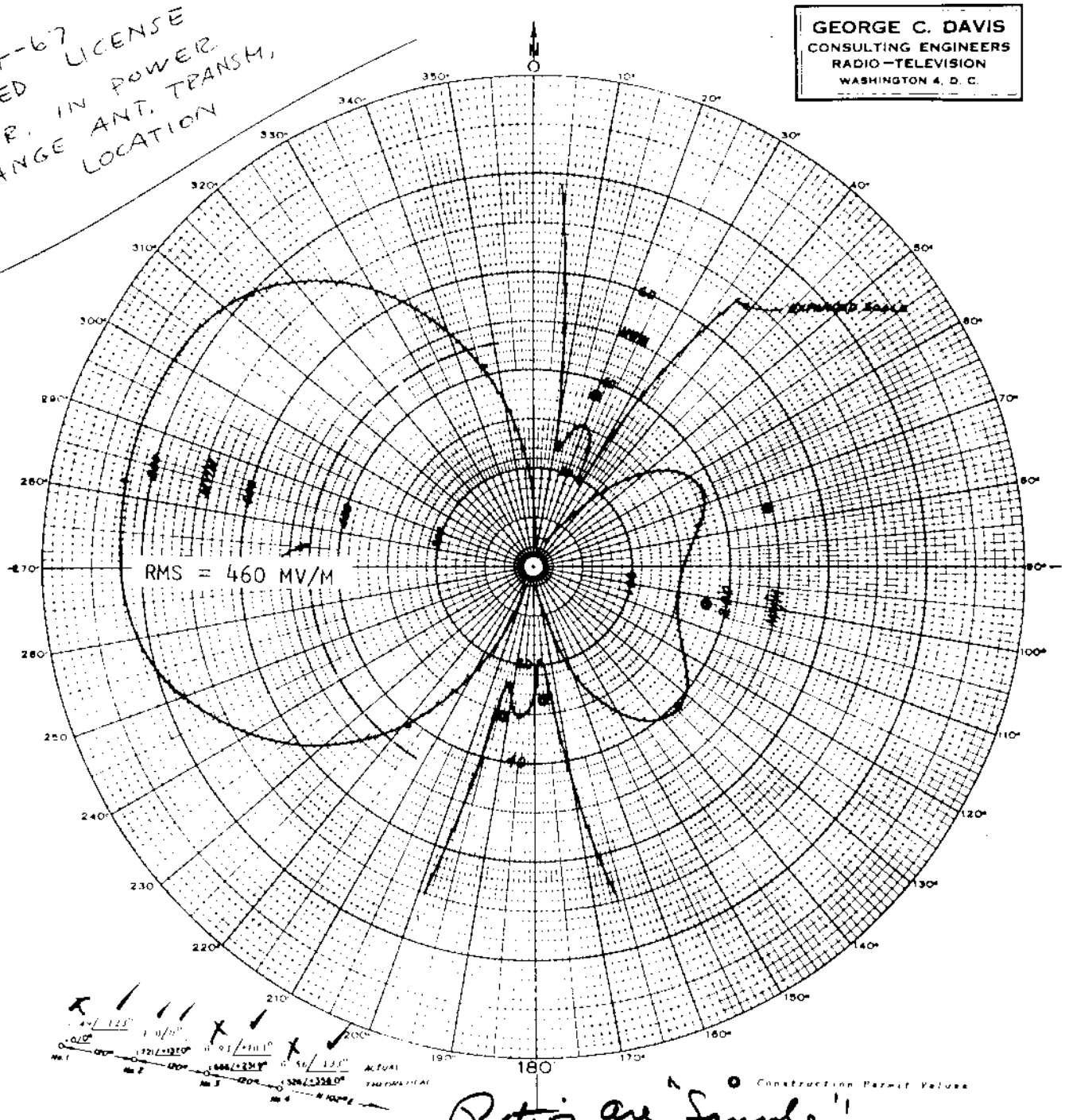
670 kc

Measured Night
(12-29-66ct)

Station KISN
Vancouver, Washington

5kw,DA-2,U
910 kc

8-14-67
GRANTED LICENSE
INCR. IN POWER,
CHANGE ANT. TRANSM.
LOCATION



Ratios are "Sample"!
9-26-66

MEASURED HORIZONTAL PLANE RADIATION PATTERN
FOR NIGHTTIME OPERATION OF
KISN, VANCOUVER, WASHINGTON
910 KC - 5 KW - DA-2
SEPTEMBER 1966

NORTH LATITUDE 45° 35' 26"
WEST LONGITUDE 122° 50' 06"

FCC File No.BL-11471
Accepted 12-6-66

Station KISN
Vancouver, Washington

910 kc

KISN

Proposed Night
(4-28-65ct)

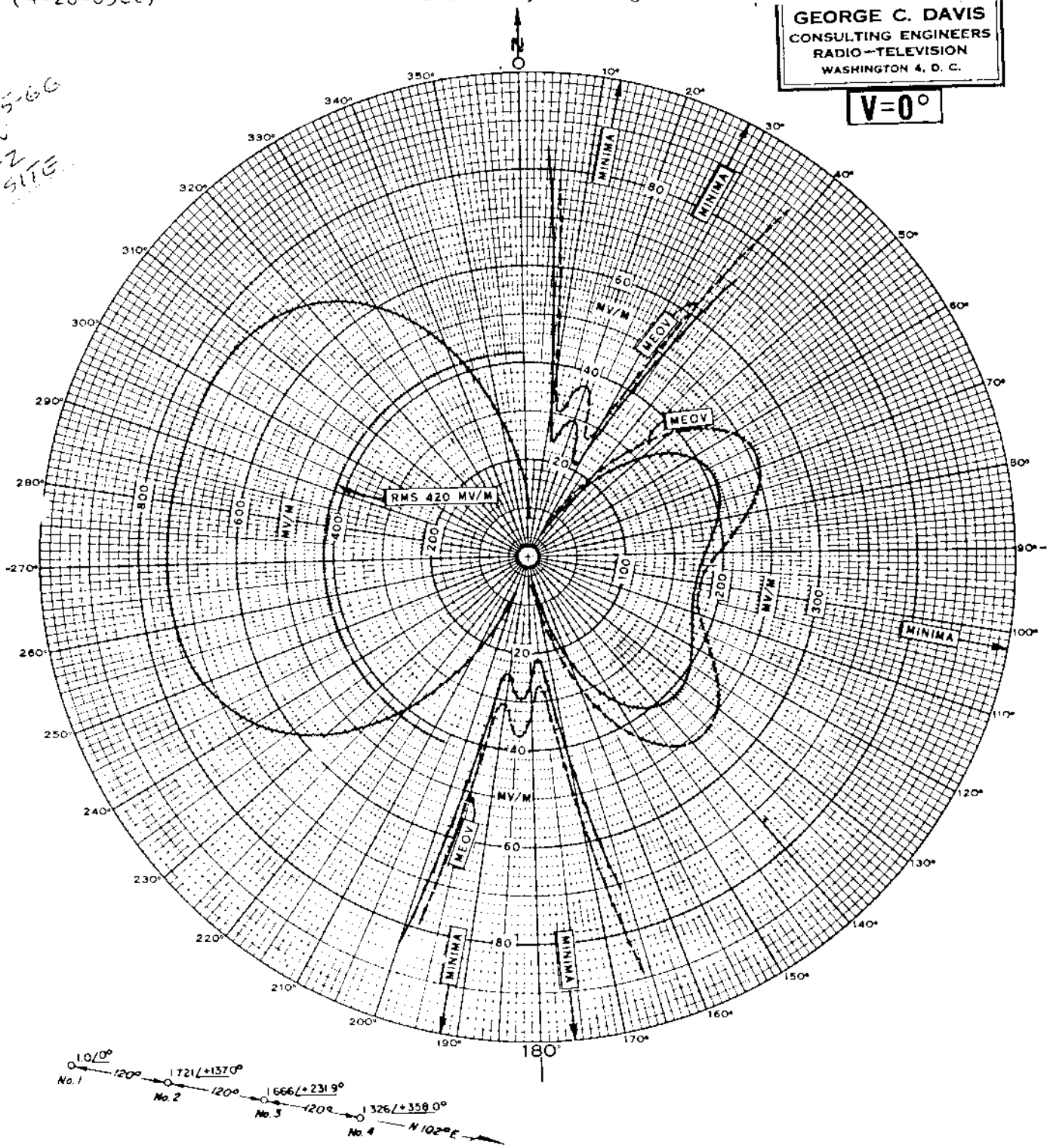
Station KISN
Vancouver, Washington

5kw,DA-2,U
910 kc

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

V=0°

BP 1-5-66
5KW
DA-2
CHG. SITE



H = 90° = 270'
S = 120° = 360.2'

NORTH LATITUDE 45° 33' 28"
WEST LONGITUDE 122° 50' 09"

COMPUTED HORIZONTAL PLANE PATTERN FOR PROPOSED NIGHTTIME OPERATION OF KISN, VANCOUVER, WASHINGTON
910 KC - 5 KW - DA-2 U
DECEMBER 1964

FCC File No. BP-16517
Accepted 3-30-65

Station KISN
Vancouver, Washington

910 kc

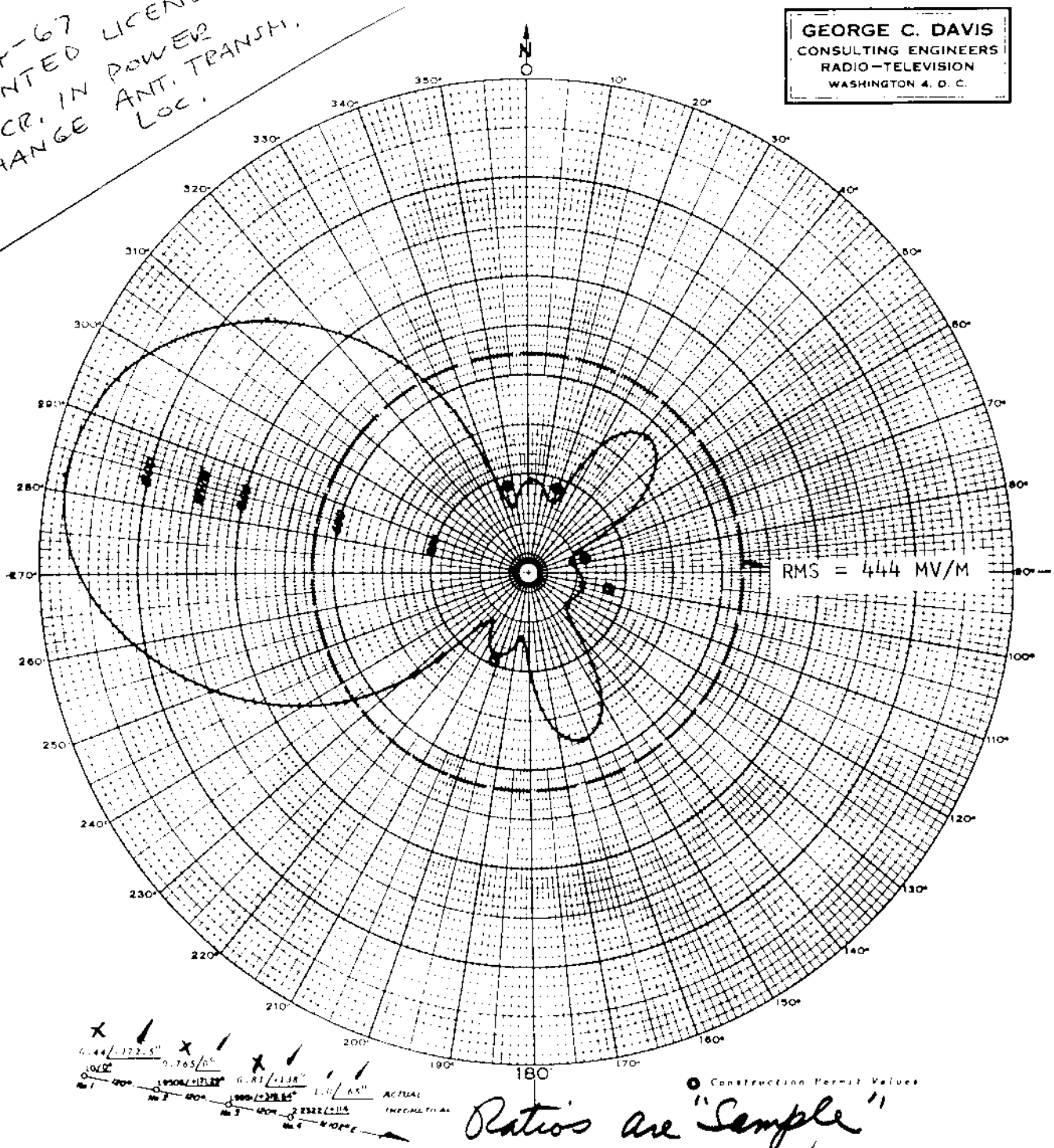
KISN

Measured Day
(12-29-66ct)

Station KISN
Vancouver, Washington

5kw,DA-2,U
910 kc

8-14-67
GRANTED LICENSE
INCR. IN POWER
CHANGE ANT. TRANSM.
LOC.



Ratios are "Sample"

MEASURED HORIZONTAL PLANE RADIATION PATTERN
FOR DAYTIME OPERATION OF
KISN, VANCOUVER, WASHINGTON
910 KC - 5 KW - DA-2
SEPTEMBER 1966

9-26-66

FCC File No.BL-11471
Accepted 12-6-66

Station KISN
Vancouver, Washington

910 kc

KISN

Proposed Day
(4-28-65ct)

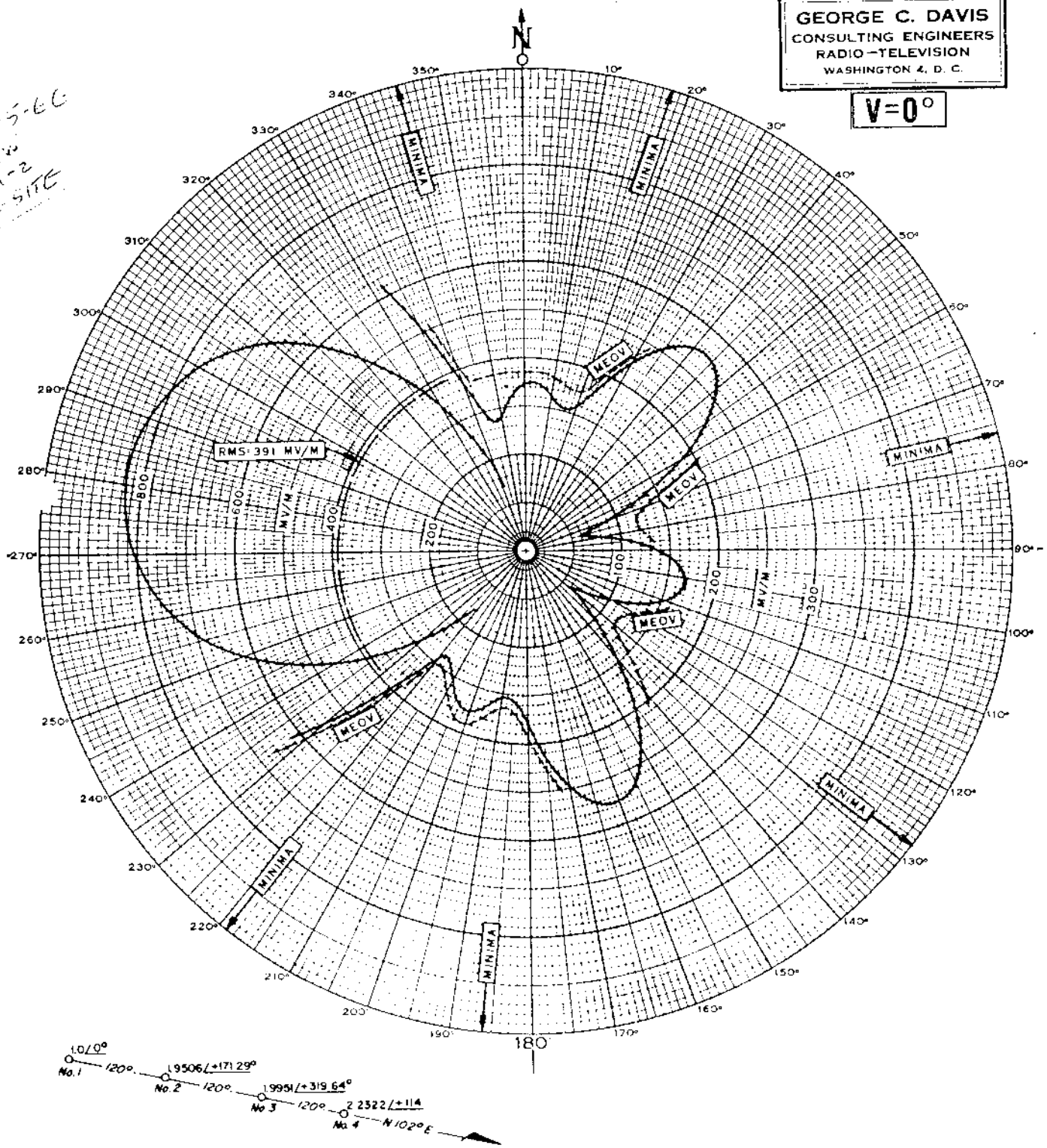
Station KISN
Vancouver, Washington

5kw,DA-2,U
910 kc

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

V=0°

CP 1-5-66
5KW
DA-2
CHE SITE



H = 90° = 270'
S = 120° = 360.2'

NORTH LATITUDE 45° 33' 28"
WEST LONGITUDE 122° 30' 09"

COMPUTED HORIZONTAL PLANE PATTERN FOR PROPOSED DAYTIME OPERATION OF KISN, VANCOUVER, WASHINGTON 910 KC - 5 KW - DA-2 U DECEMBER 1964

FCC File No. BP-16517
Accepted 3-30-65

Station KISN
Vancouver, Washington

910 kc

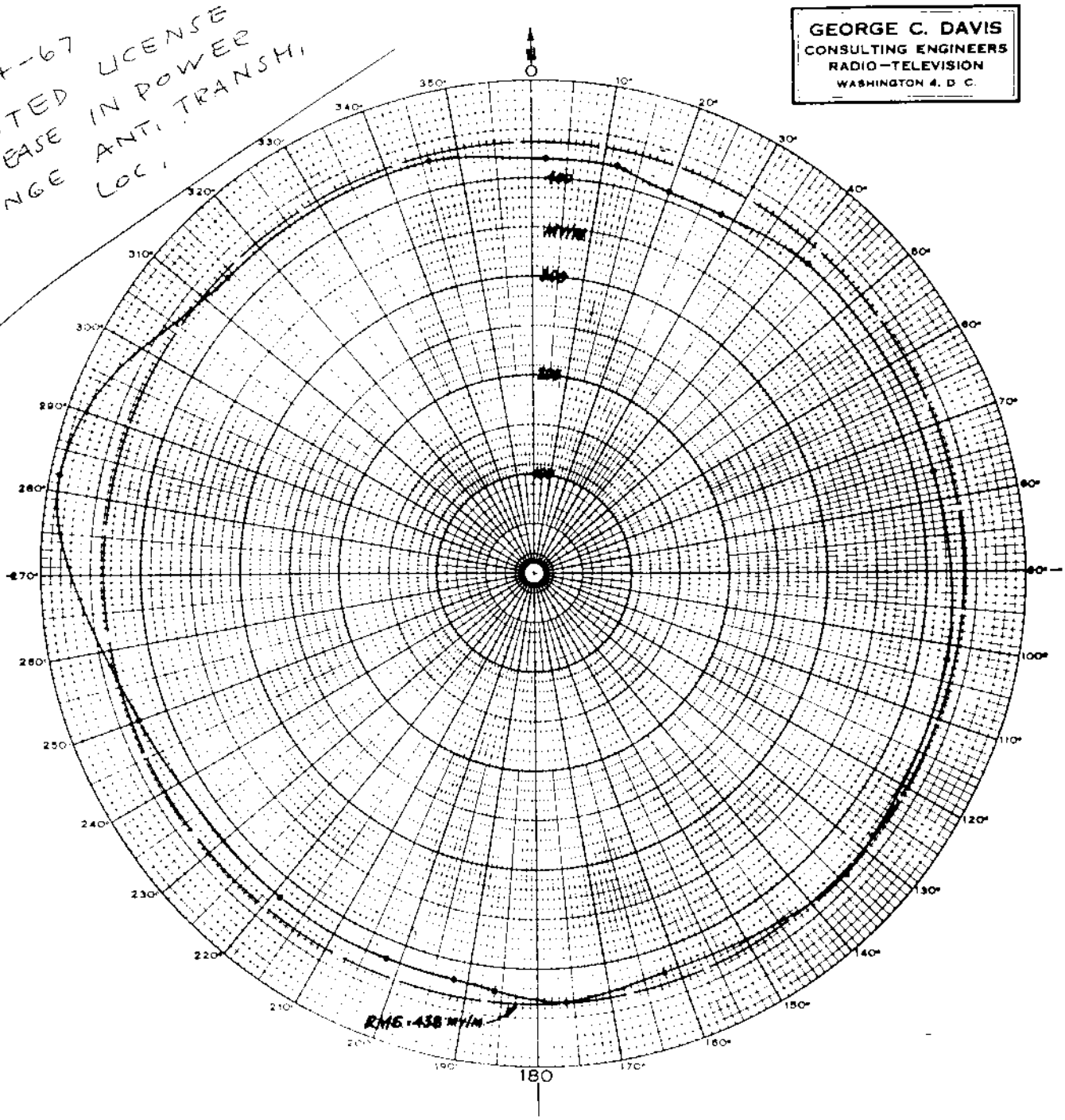
KISN

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

Station KISN
Vancouver, Washington

5kw,DA-2,U
910 kc

8-14-67
GRANTED LICENSE
INCREASE IN POWER
CHANGE ANT. TRANSM.
LOC.



MEASURED HORIZONTAL PLANE RADIATION PATTERN
FOR NON-DIRECTIVE OPERATION OF
KISN, VANCOUVER, WASHINGTON
910 KC - 5 KW - DA-2
SEPTEMBER 1966

FCC File No.BL-11471
Accepted 12-6-66

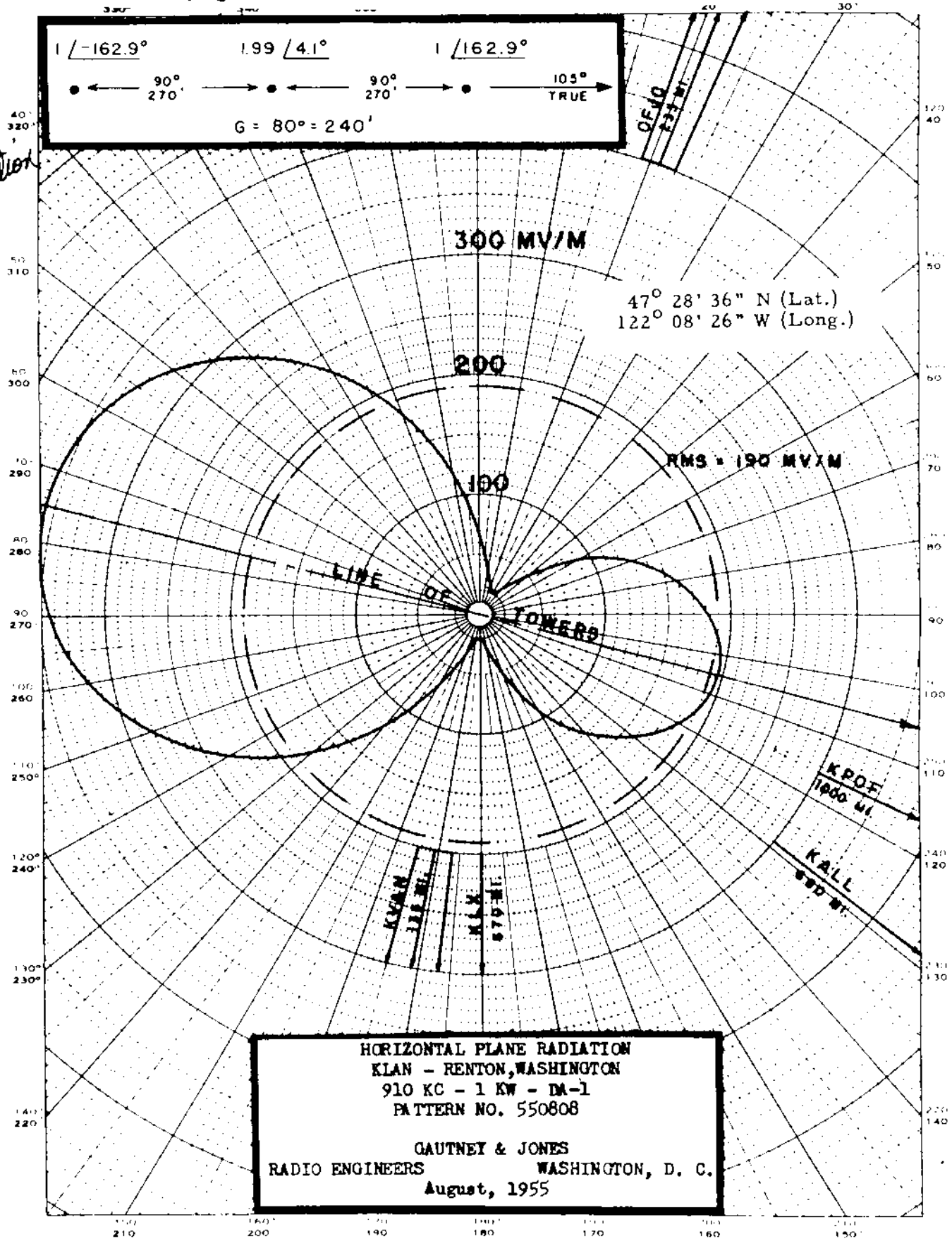
Station KISN
Vancouver, Washington

910 kc

KIXI

PROPOSED NIGHT & DAY 10/6/55G Seattle STATION ~~KLAN~~ KUDY ~~RENTON,~~ WASH. 1 KW DA-1, U 910 KC

12-7-60 granted CP change location to Seattle



File No. BP-9337 Amended Accepted 9/13/55 KLAN, RENTON, WASH. 910 KC

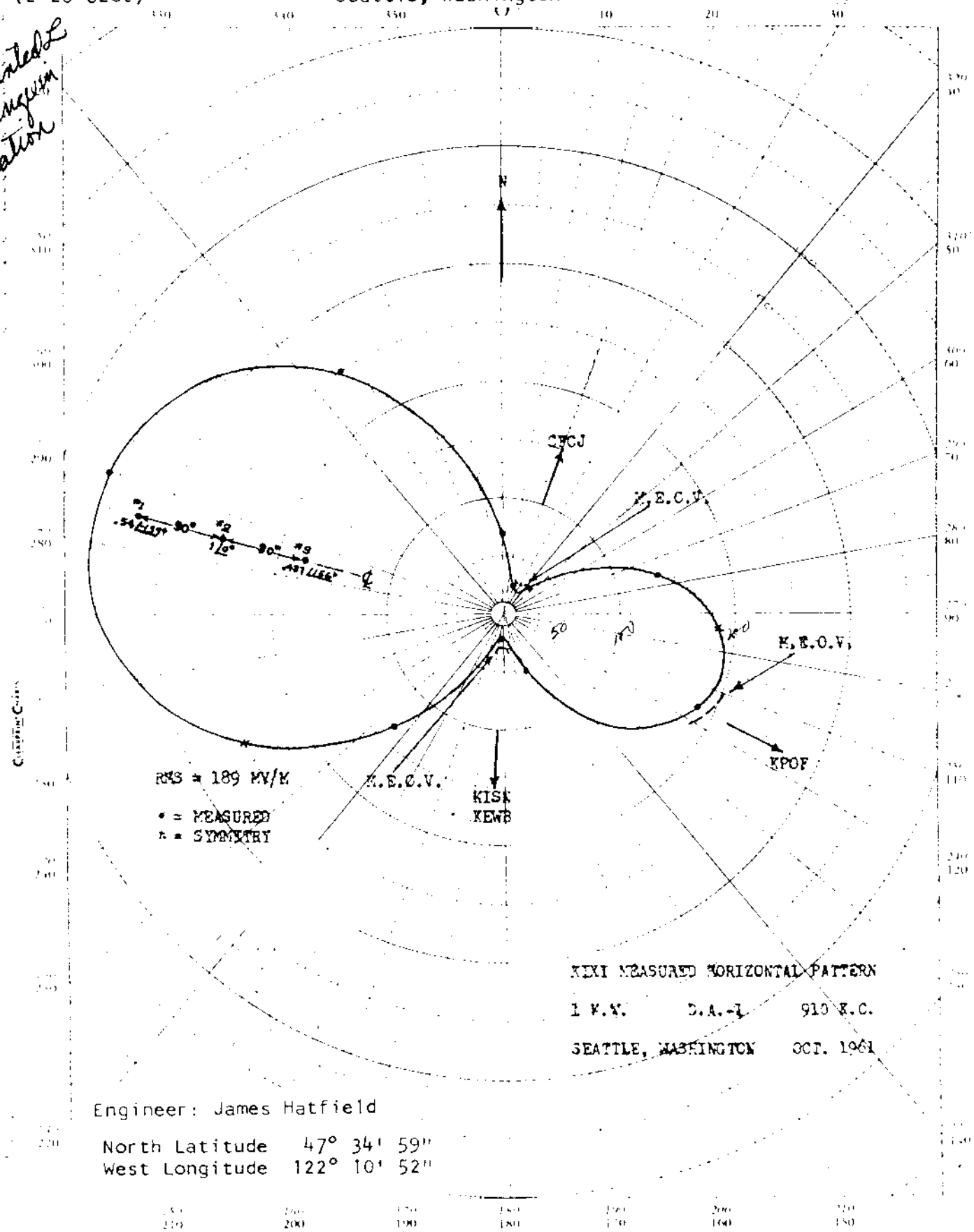
KIXI

Measured Day & Night
(2-28-62ct)

Station KIXI
Seattle, Washington

1kw,DA-1,U
910 kc

5-12-62 granted L
owning changing
Xmtr location



Engineer: James Hatfield

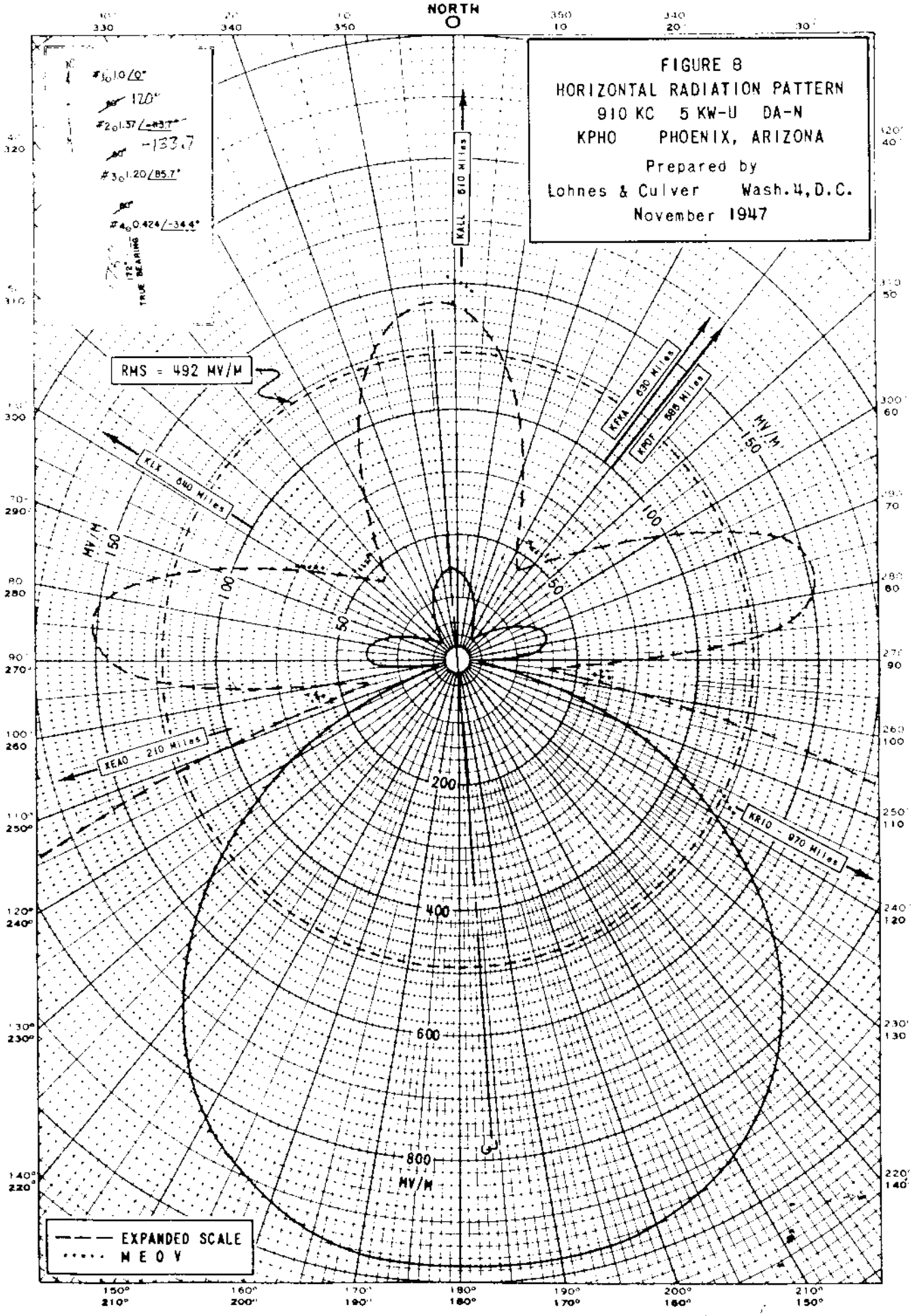
North Latitude 47° 34' 59"
West Longitude 122° 10' 52"

FCC File No.BL-8907
Accepted 2-8-62

Station KIXI
Seattle, Washington

910 kc

KJJJ


NORTH
FIGURE 8
HORIZONTAL RADIATION PATTERN
910 KC 5 KW-U DA-N
KPHO PHOENIX, ARIZONA
Prepared by
Lohnes & Culver Wash.4,D.C.
November 1947
#1 1.0/0°
120°
#2 1.37/-133.7°
#3 1.20/85.7°
#4 0.424/-34.4°
172° TRUE BEARING
RMS = 492 MV/M
KALL - 610 Miles
KFKA - 630 Miles
KPOF - 585 Miles
KLX 640 Miles
XEAO - 210 Miles
KRIO - 970 Miles
MV/M
50
100
150
200
400
600
800
EXPANDED SCALE
M E O V

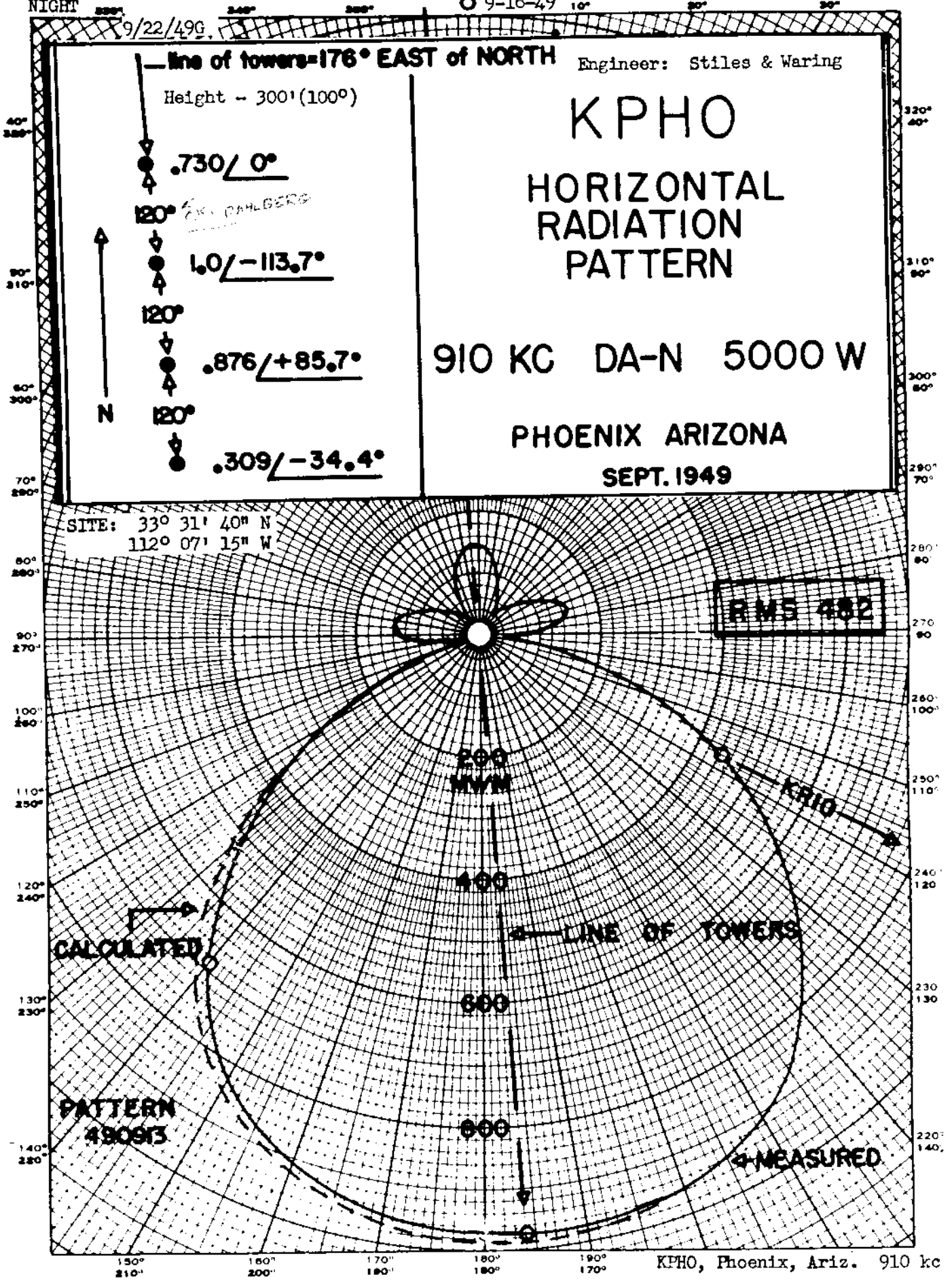
KJJJ

MEASURED NIGHT 9/22/49G

KPHO, PHOENIX, ARIZ.

O 9-16-49

5kw, D...



KPHO, Phoenix, Ariz. 910 kc

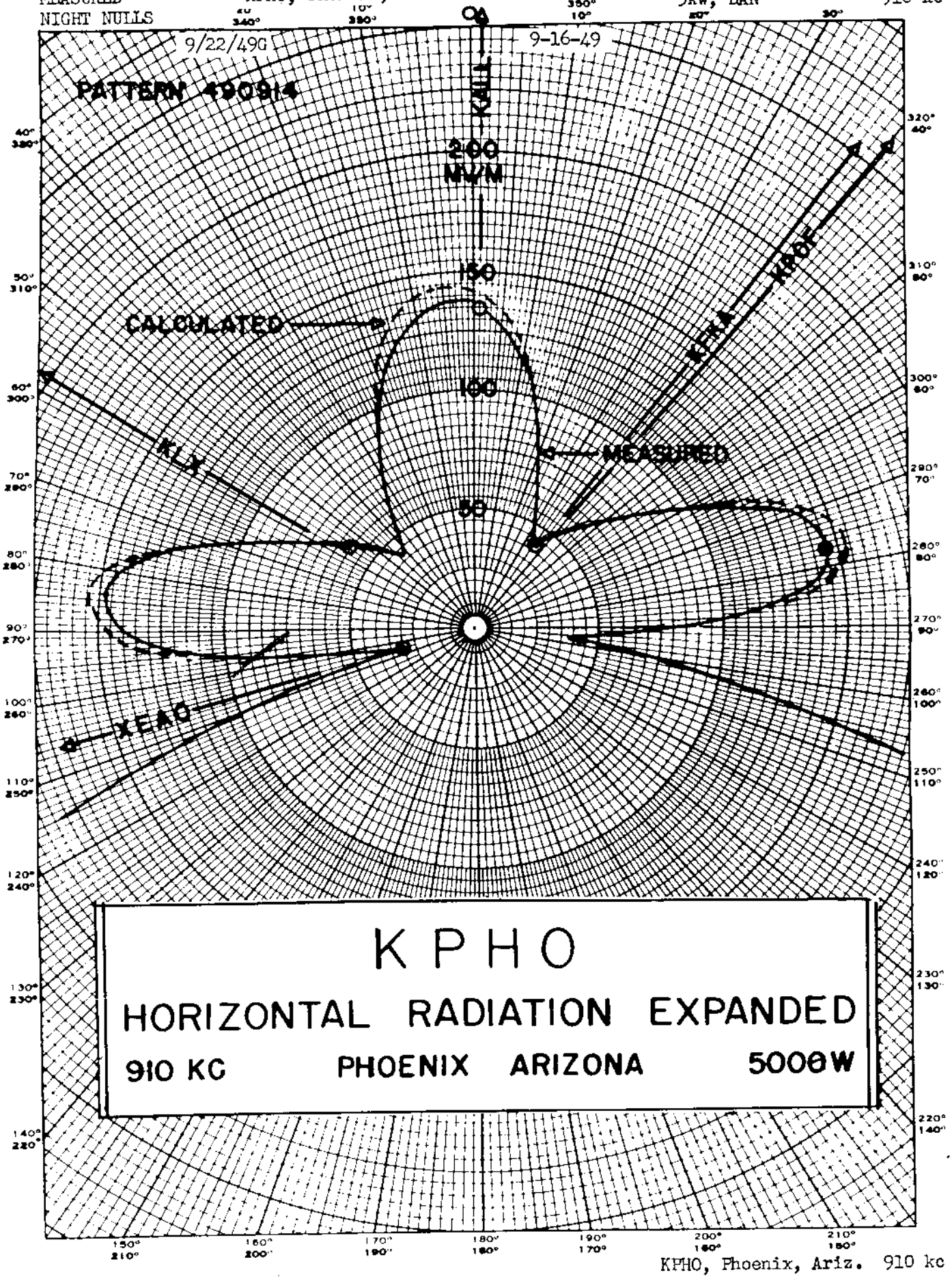
KJJJ

MEASURED NIGHT NULLS

KPHO, PHOENIX, ARIZ.

5kw, DAN

910 kc



KPHO, Phoenix, Ariz. 910 kc

KJJJ

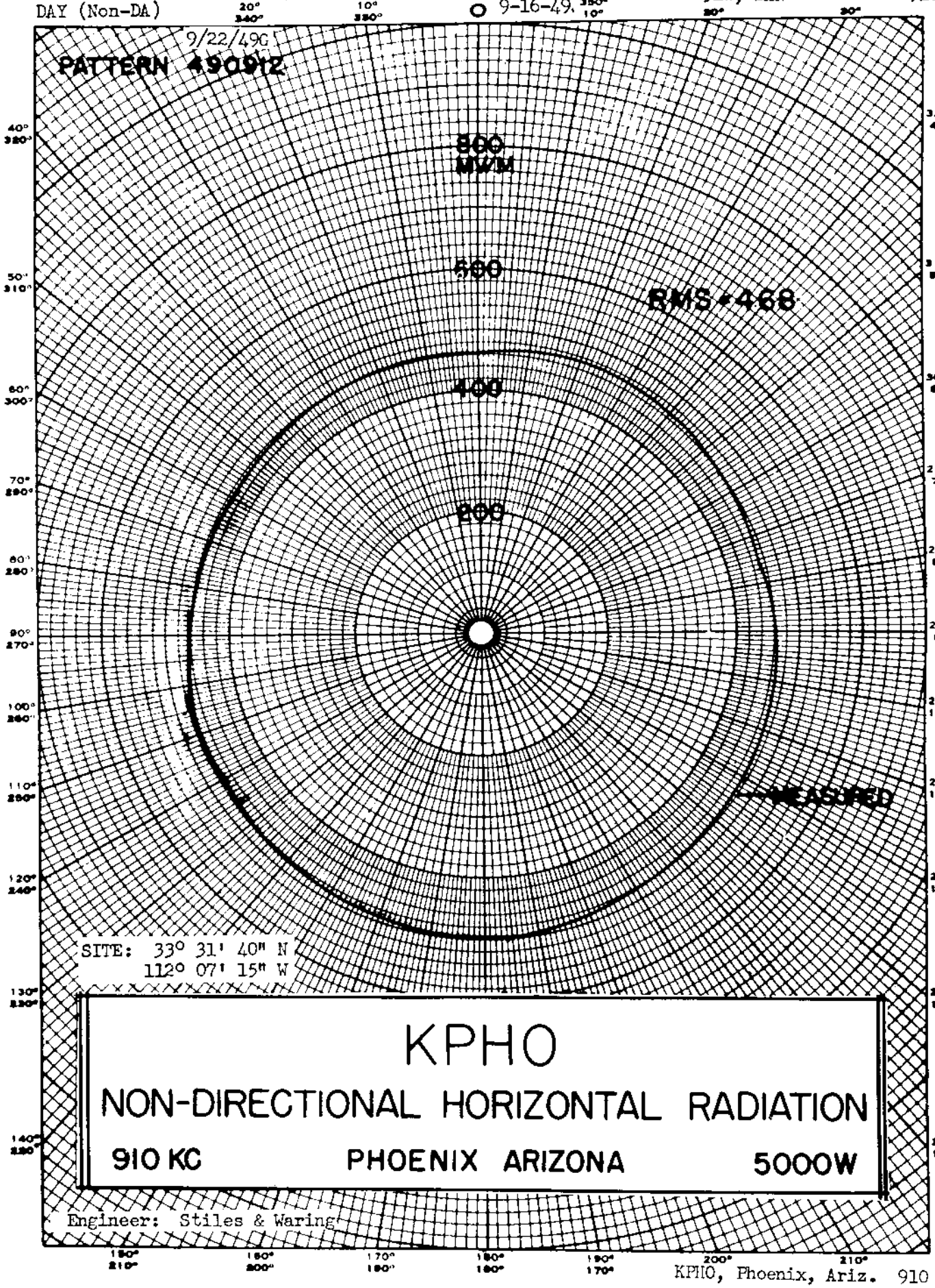
MEASURED
DAY (Non-DA)

KPHO, PHOENIX, ARIZ.

9-16-49

5kw, DAN

910 kc

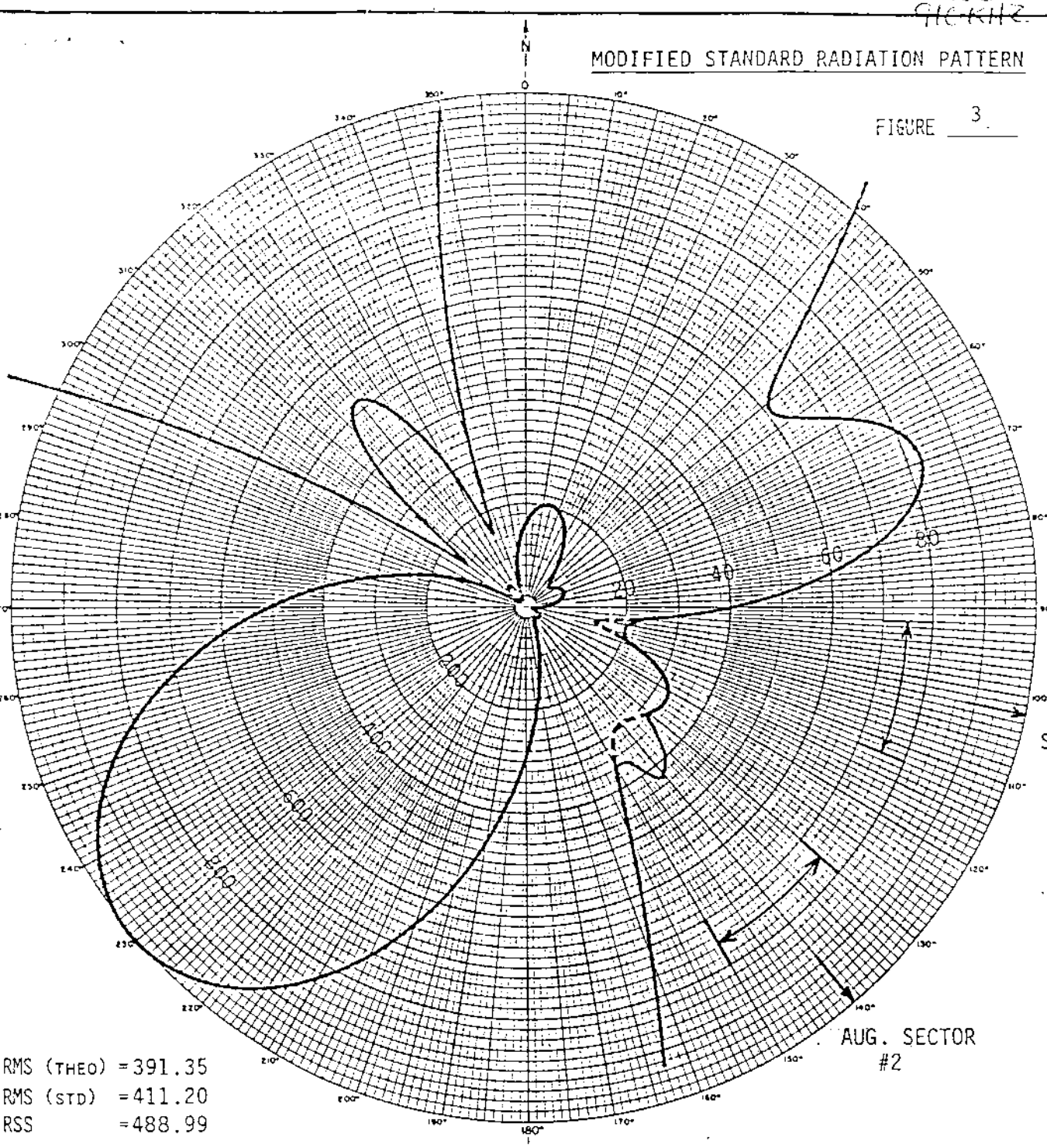


KPHO, Phoenix, Ariz. 910 kc

KMJC
910 KHZ

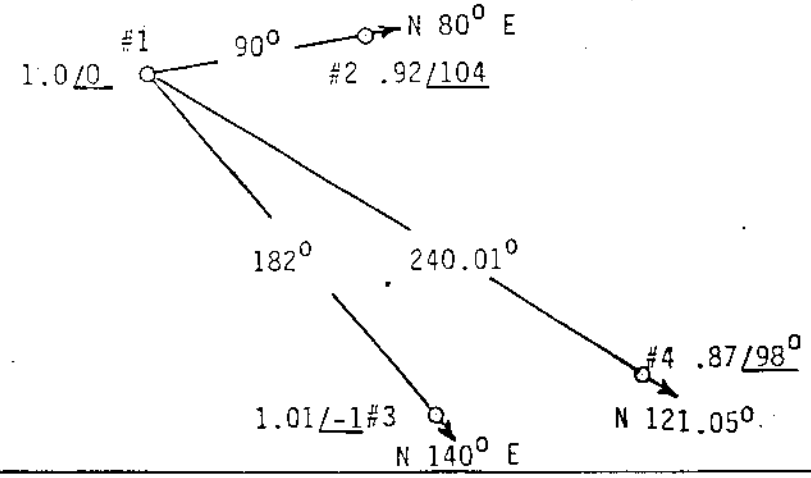
MODIFIED STANDARD RADIATION PATTERN

FIGURE 3



RMS (THEO) =391.35
RMS (STD) =411.20
RSS =488.99

X STANDARD AUGMENTED HORIZONTAL RADIATION PATTERN ND X DA X DAY NITE



APPLICANT :	KMJC
LOCATION :	EL CAJON, CA.
FREQUENCY :	910 Khz
POWER :	5 Kw.
LATITUDE	32 DEG. 53 MIN. 38 SEC.
LONGITUDE	116 DEG. 55 MIN. 35 SEC.
VERTICAL ANGLE:	
R.M.S. FIELD:	
DATE :	May 1981

RALPH E. EVANS ASSOCIATES
Consulting Communications Engineers
216 North Green Bay Road, Suite 208
Thiensville, Wisconsin 53092

KMJC
910KHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KMJC

Main Studio: El Cajon, California

Frequency: 910 kHz

Power: 5kw Night 5kw Day

Notification List No. 1785

Date: November 16, 1979, Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 32° 53' 39"
West Longitude: 116° 55' 34"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-2)
Number of elements: 7
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWERS:	#1	#2	#3	#4	#5	#6	#7
HEIGHT ABOVE INSULATORS:	270'	270'	270'	270'	270'	270'	270' (90°)
NIGHT PHASING:	---	0°	---	---	+214°	68.5°	+283.5°
NIGHT FIELD RATIO:	---	1.0	---	---	2.49	2.48	1.035
DAY PHASING:	0°	+104°	-1°	+98	---	---	---
DAY FIELD RATIO:	1.0	0.92	1.01	0.87	---	---	---

SPACING AND ORIENTATION:

DAY: With tower #1 as reference, tower #2 is spaced 90° on a line bearing 80° true, tower #3 is spaced 182° on a line bearing 140° true, and tower #4 is spaced 240.01° on a line bearing 121.05° true.

NIGHT: Adjacent towers in a row are spaced 90° on a line bearing 227° true.

GROUND SYSTEM: 120 - 270' equally spaced copper radials plus 120-50' interspaced radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

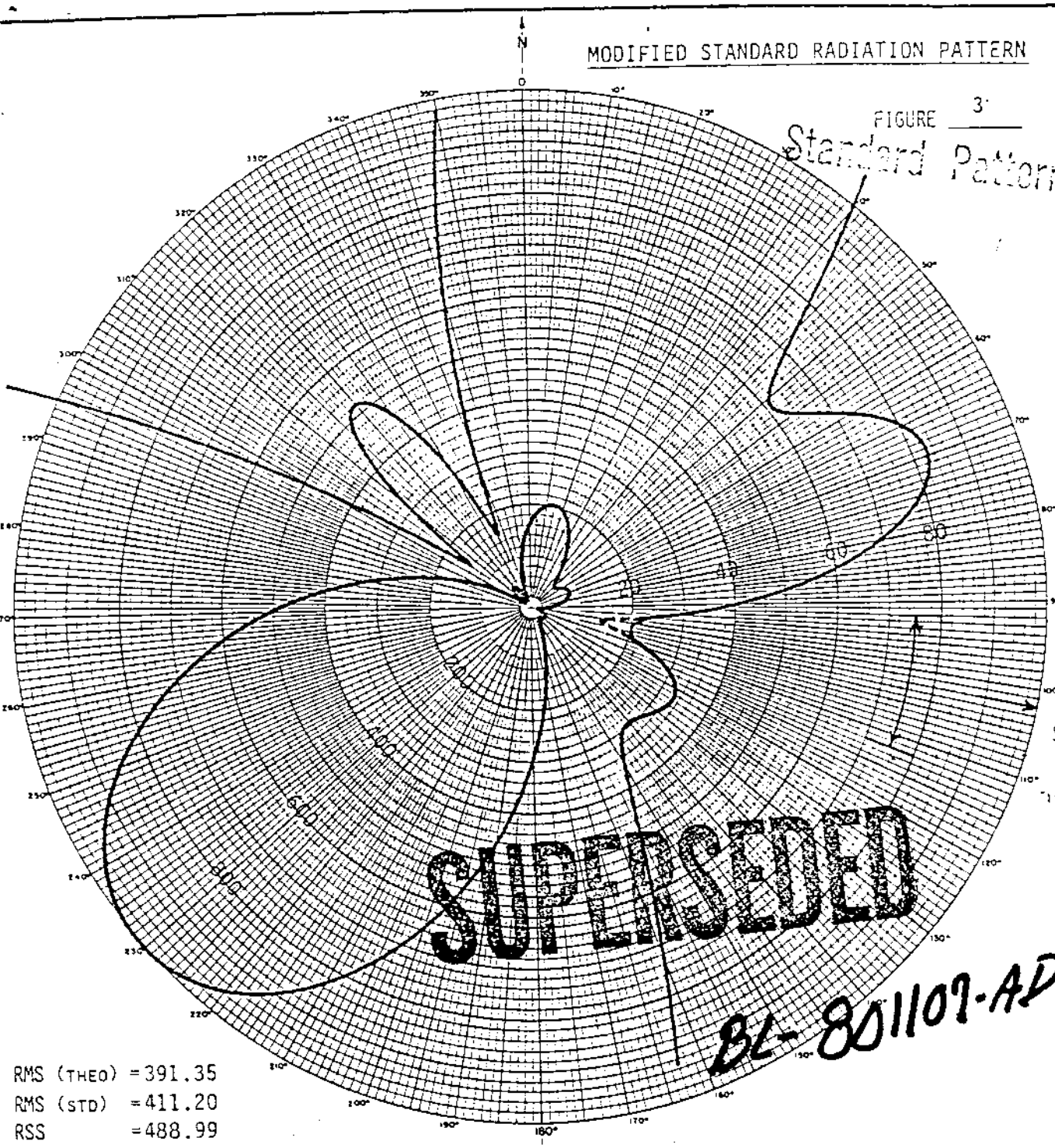
	THEORETICAL REM	THEORETICAL RSS	STANDARD RMS
Day	391.35 mv/m	489 mv/m	411.16 mv/m
Night	391.3 mv/m	704.24 mv/m	406.4 mv/m

KMJC
910 KHZ

MODIFIED STANDARD RADIATION PATTERN

FIGURE 3

Standard Pattern



SUPERSEDED

BL-801107-AD

RMS (THEO) =391.35
RMS (STD) =411.20
RSS =488.99

X STANDARD AUGMENTED HORIZONTAL RADIATION PATTERN ___ ND X DA X DAY ___ NITE

#1 1.0/0

90° → N 80° E

#2 .92/104

182°

240.01°

#4 .87/98°

N 121.05°

1.01/-1 #3

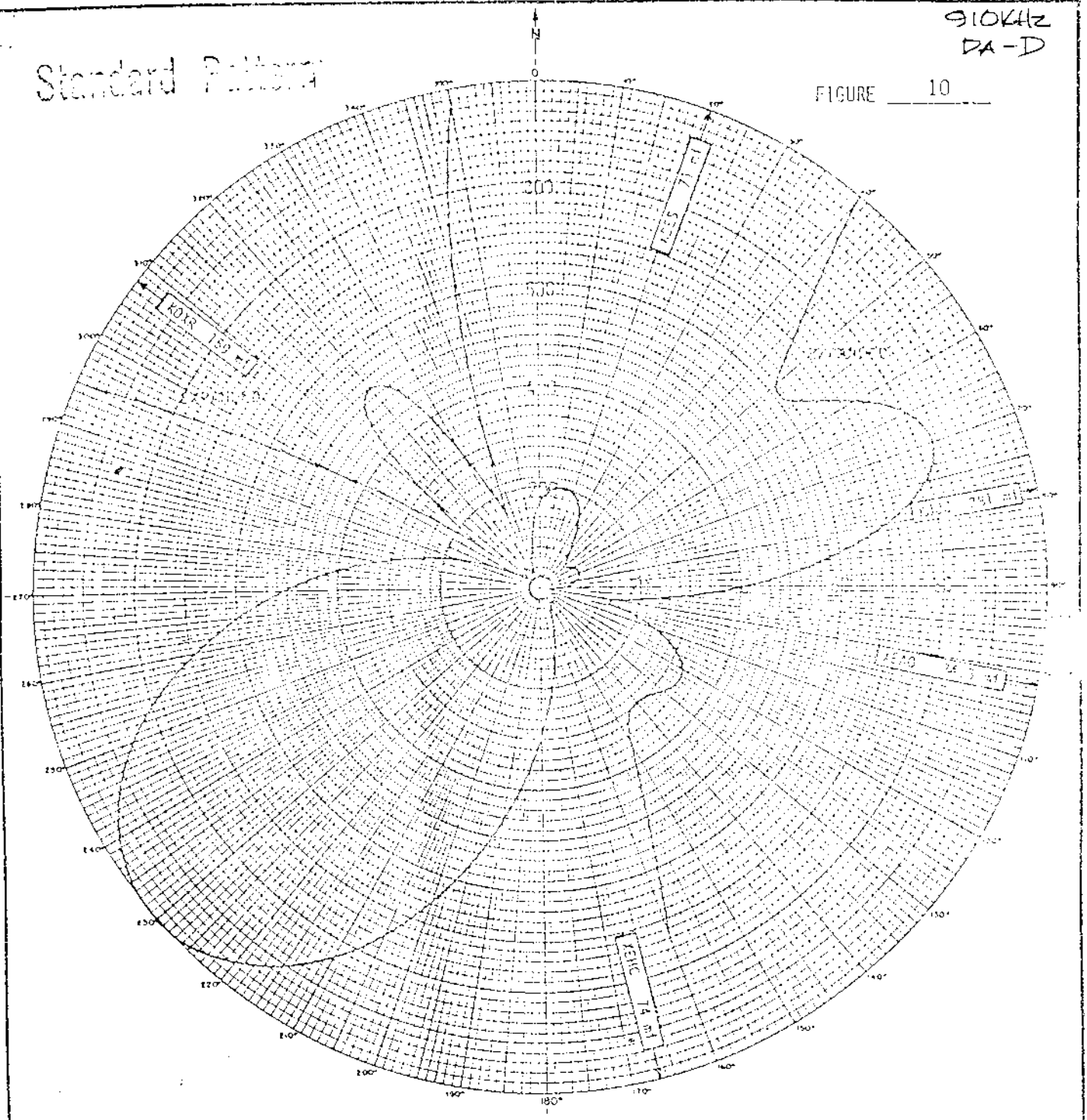
APPLICANT :	KMJC
LOCATION :	EL CAJON, CA.
FREQUENCY :	910 Khz
POWER	5 Kw.
LATITUDE	32 DEG. 53 MIN. 38 SEC.
LONGITUDE :	116 DEG. 55 MIN. 35 SEC.
VERTICAL ANGLE:	
R.M.S. FIELD:	
DATE :	DEC. 1980

RALPH E. EVANS ASSOCIATES
Consulting Communications Engineers
216 North Green Bay Road, Suite 208
Thiensville, Wisconsin 53092

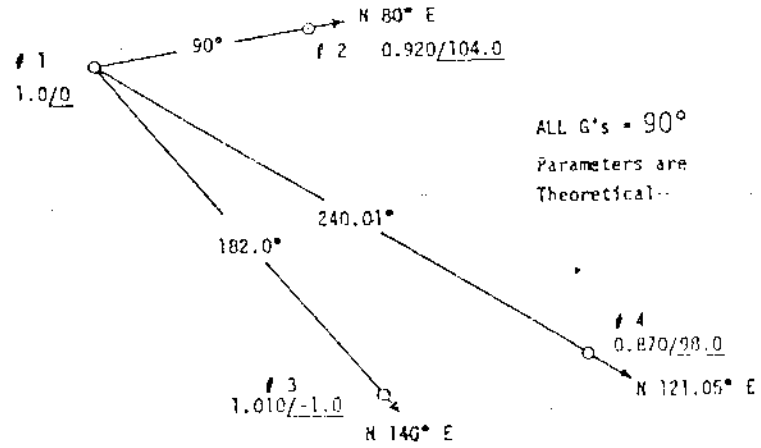
KMJC
910KHz
DA-D

Standard Pattern

FIGURE 10



STANDARD HORIZONTAL RADIATION PATTERN



APPLICANT	RADIO STATION KMJC
LOCATION	EL CAJON, CALIFORNIA
FREQUENCY	910 KC/S
POWER	5000 WATTS
LATITUDE	32 DEG 55 MIN 59 SEC
LONGITUDE	116 DEG 55 MIN. 34 SEC.
WHEN USED	DAYTIME
RMS FIELD:	IH: 391.35 SY: 411.16
DATE	11/78

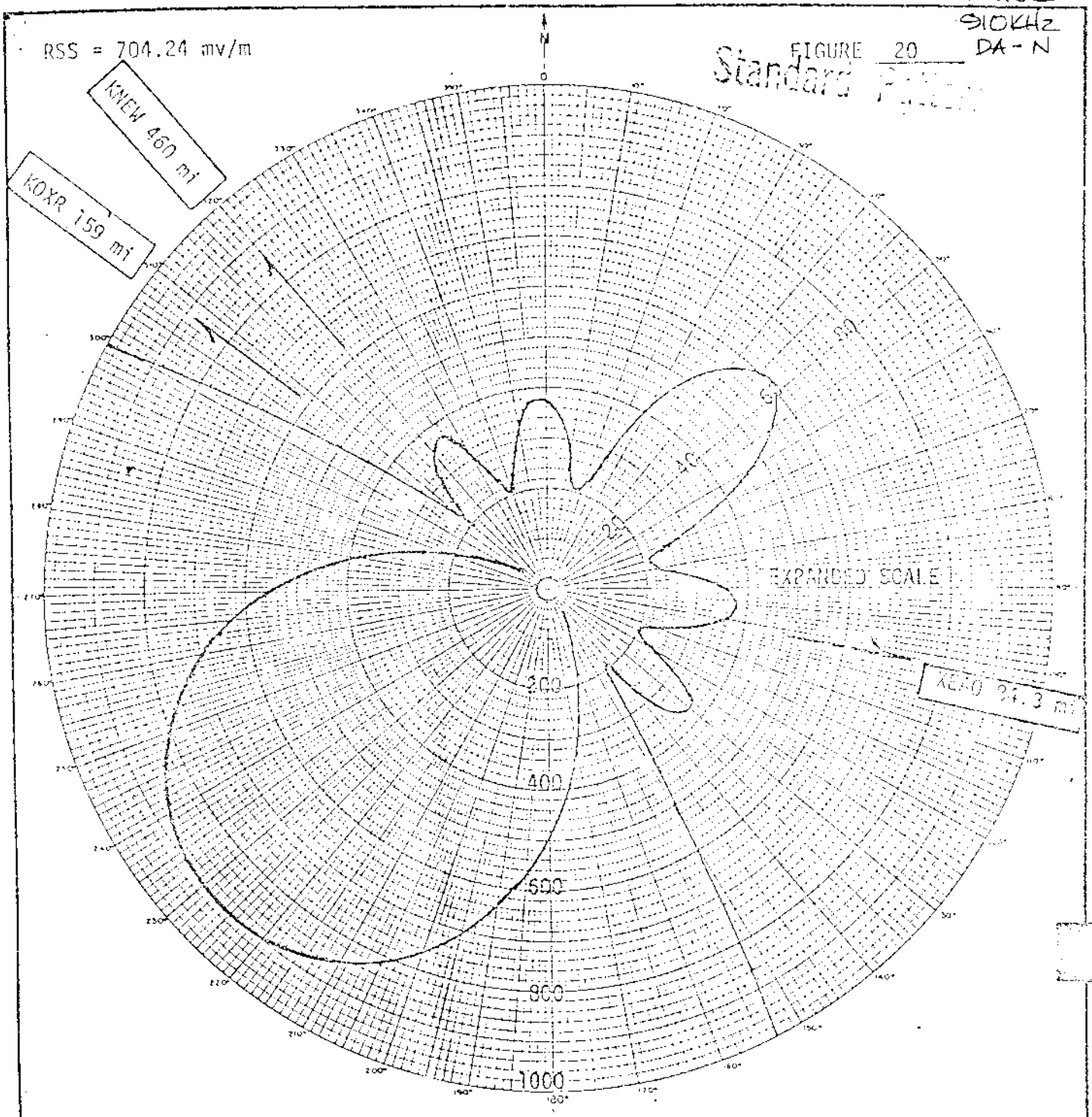
RALPH E. EVANS ASSOCIATES
Consulting Communications Engineers
216 North Green Bay Road Suite 208
Thiensville, Wisconsin 53092

KMJC
910KHz
DA-N

RSS = 704.24 mv/m

FIGURE 20

Standard Pattern



STANDARD HORIZONTAL RADIATION PATTERN θ = Zero Degrees

#1 ○ (detuned)

● #2 = 1/0

ALL G's = 90°

Night Pattern
Spacings equal
90° Between
Adjacent
Elements

● #5 = 2.49/214

● #6 = 2.48/68.5

(detuned)○ #4

(detuned)○ #3

● #7 = 1.035/283.5

array axis = 227°

APPLICANT	KMJC
LOCATION	EL CAJON, CALIF
FREQUENCY	910 KC/S
POWER	5000 watts
LATITUDE	32 DEG 53 MIN 39 SEC
LONGITUDE	116 DEG 55 MIN 34 SEC
WHEN USED	NIGHTTIME
RMS FIELD	theo: 391.3, st: 406.4
DATE	NOVEMBER, 1978

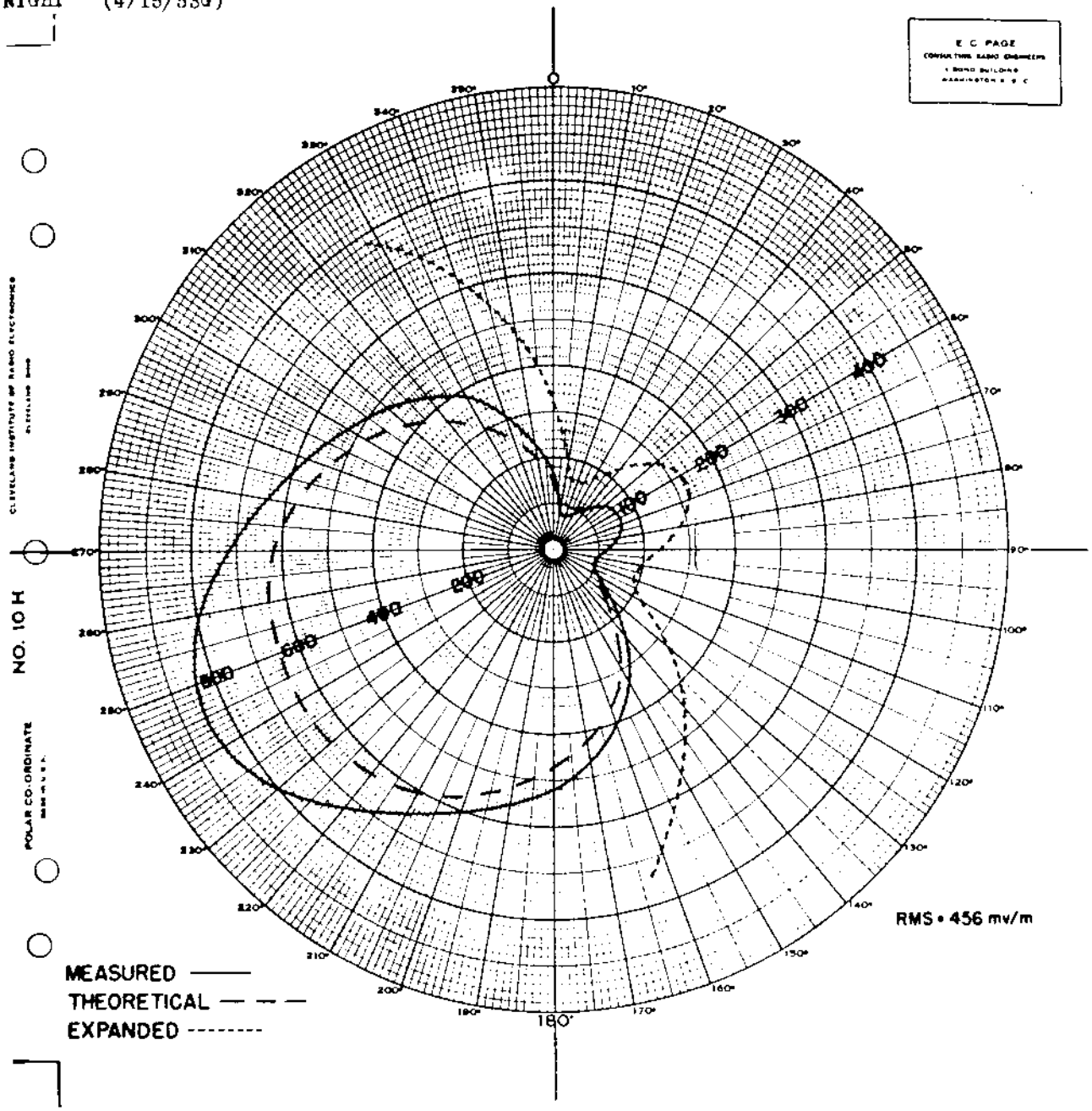
RALPH E. EVANS ASSOCIATES
Consulting Radio Engineers

KNEW

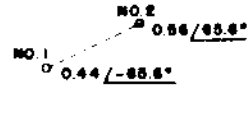
MEASURED KLX, OAKLAND, CALIF. 5kw, U, ~~DA-1~~ DA-N 910 kc

~~DAY &~~ NIGHT (4/15/53G)

BML-1913
1-28-65
DISMISSED
MOVE TO
S. FRANCISCO



LAT. 37° 53' 42.22"
LONG. 122° 19' 24.08"



θ = 90°

FIGURE 1
Horizontal Sky Radiation Pattern
KLX Oakland, California
Tribune Building Company
910kc 5Kw-U DA-N
DFB-41 February 27, 1953

FCC FILE NO. BL-4958 Date Accepted 4/1/53 KLX, Oakland, Calif. 910 kc

KNEW

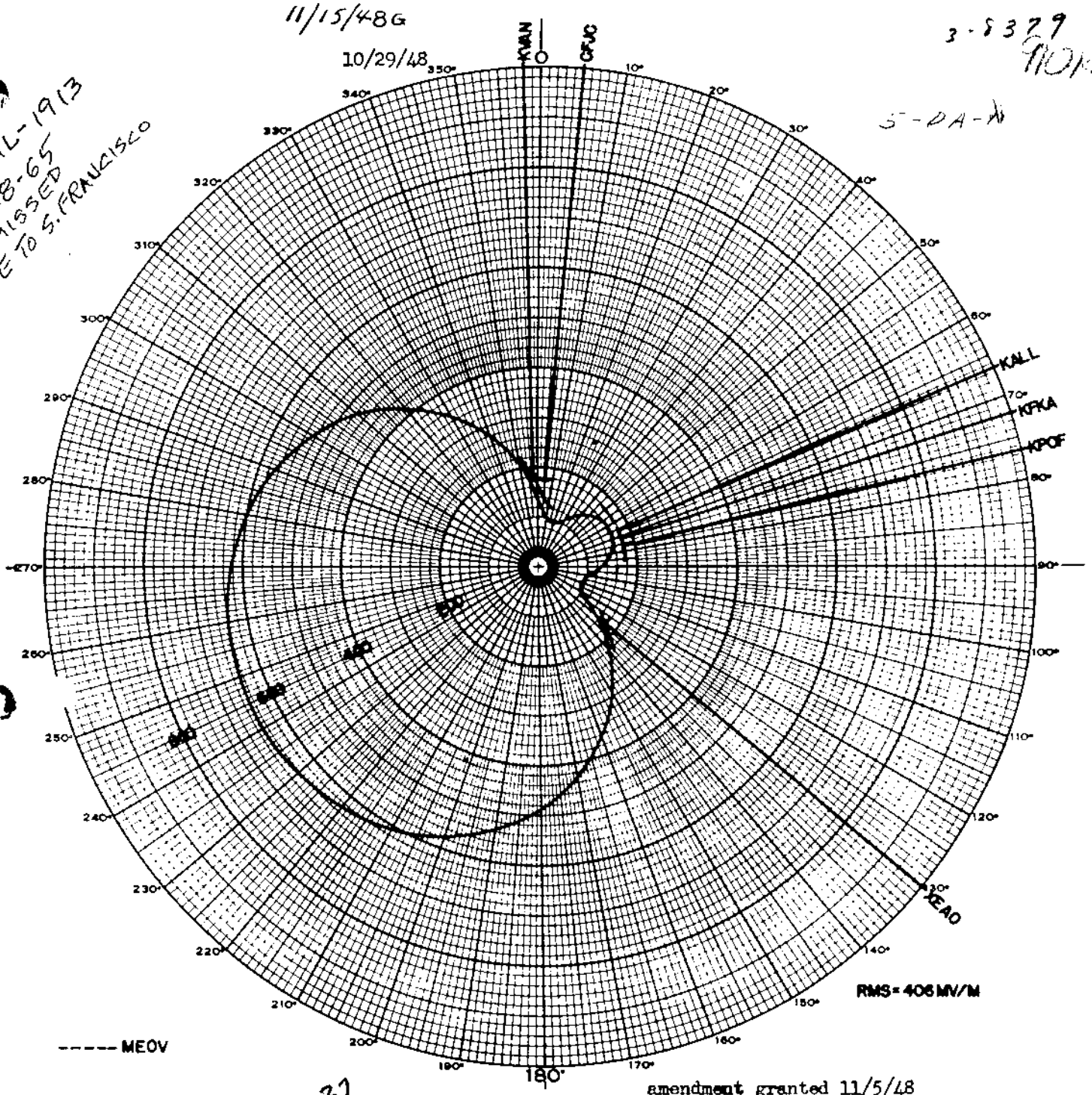
11/15/48G

3-8329

10/29/48

BML-1913
1-28-65
DISMISSED
MOVE TO S. FRANCISCO

5-DA-N

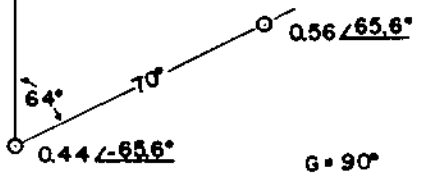


37

amendment granted 11/5/48

TRUE NORTH

SITE: 36° 51' 50.5" N.Lat.
122° 19' 35" W.Long.



G = 90°

Amended Ex. E-5a(B)
Horizontal Plane Radiation Pattern
Proposed KLX, Oakland, Calif.
TRIBUNE BUILDING COMPANY
910kc 5 Kw U (DA-1)
RWM:fl Aug. 8, 1948

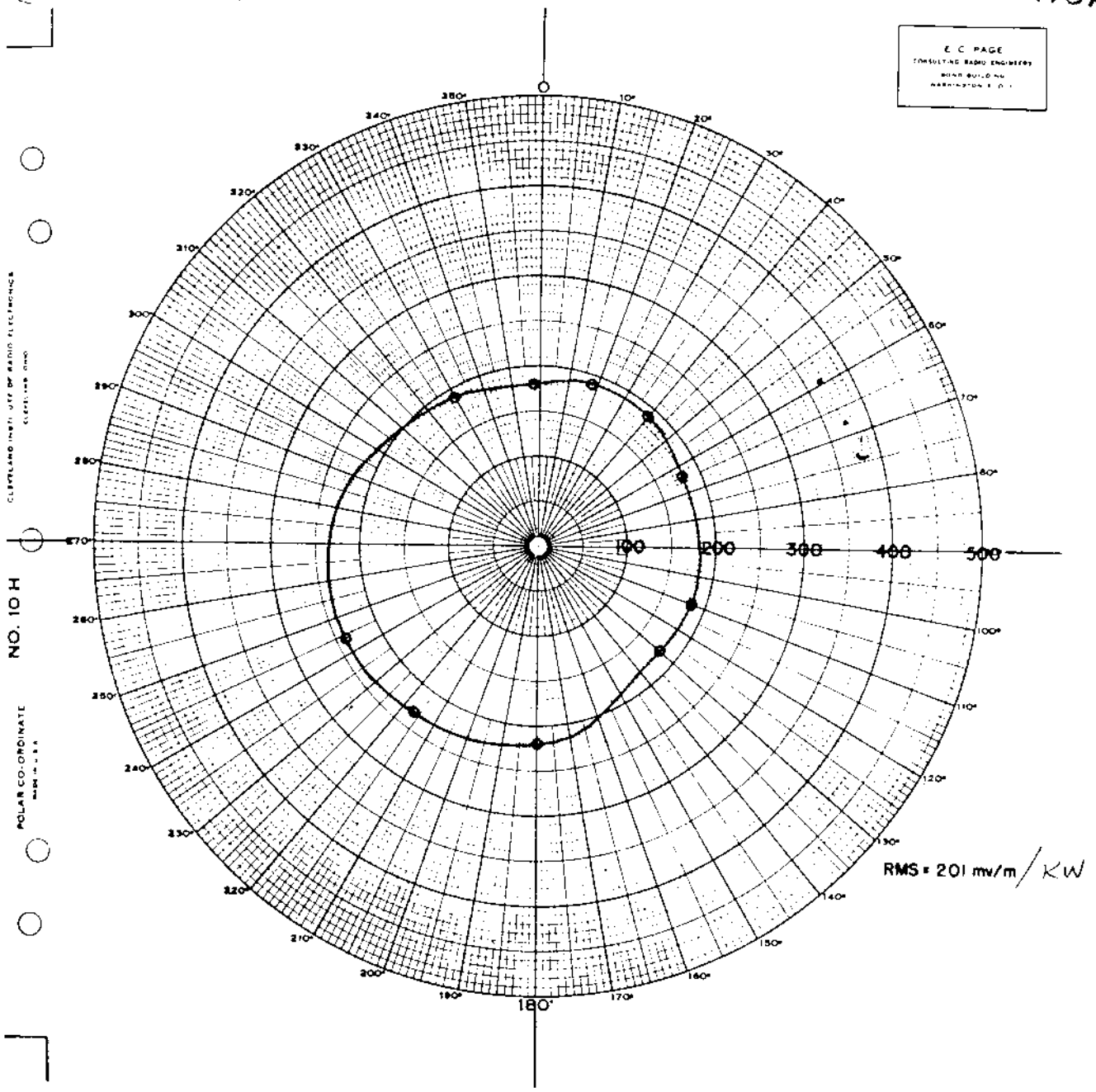
E C PAGE
CONSULTING RADIO ENGINEERS
BOND BUILDING
WASHINGTON 5 D C

KNEW

MEASURED KLX, OAKLAND, CALIF. 5kw, U, DA-2 910 kc 910KC

DAY [redacted] NON-DA (4/15/53G)

BML-1913
1-28-65
DISMISSED
MOVE TO
S.FRANCISCO



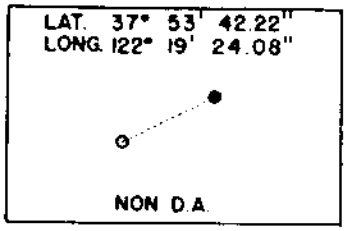


FIGURE 2
Measured Non-Directional
Horizontal Plane Radiation Pattern
KLX Oakland, California
Tribune Building Company
910kc 5Kw-U DA-1
DFB/dl February 27, 1953

FCC FILE NO. BL-4958 Date Accepted 4/1/53 KLX, Oakland, Calif. 910 kc

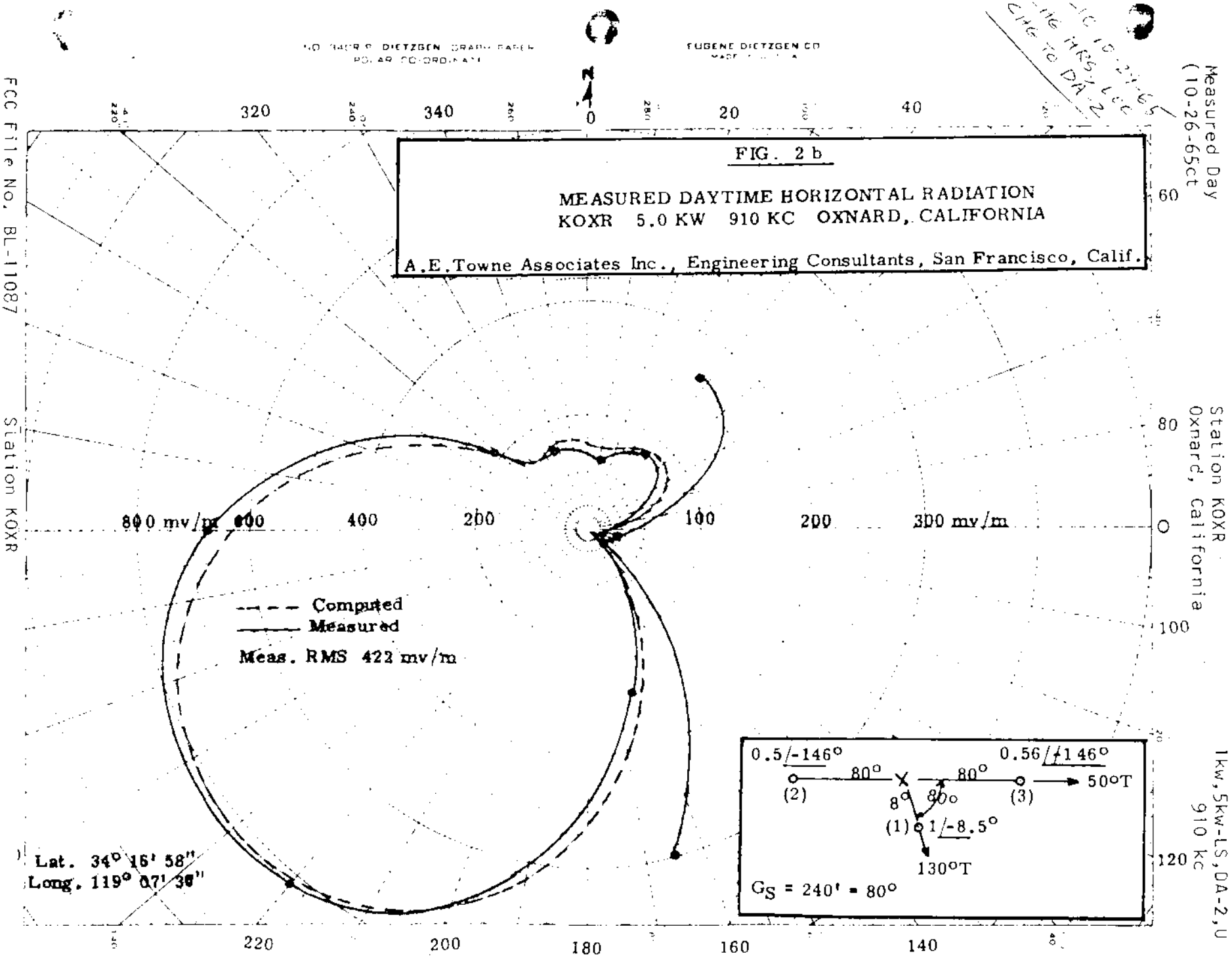


FIG. 2 b
MEASURED DAYTIME HORIZONTAL RADIATION
KOXR 5.0 KW 910 KC OXNARD, CALIFORNIA
A.E.Towne Associates Inc., Engineering Consultants, San Francisco, Calif.
Computed
Measured
Meas. RMS 422 mv/m
800 mv/m
600
400
200
100
200
300 mv/m
0.5/-146°
0.56/-146°
80°
80°
50°T
(2)
(3)
(1)
1/-8.5°
130°T
Gs = 240' = 80°
Lat. 34° 16' 58"
Long. 119° 07' 36"
910 kc
Station KOXR
Oxnard, California
FCC File No. BL-11087
Accepted 10-18-65
Measured Day
(10-26-65ct
1kw,5kw-LS,DA-2,U
910 kc
KOXR

KOXR

Measured Night
(10-26-65ct)

Station KOXR
Oxnard, California

1kw,5kw-LS,DA-2,U
910 kc

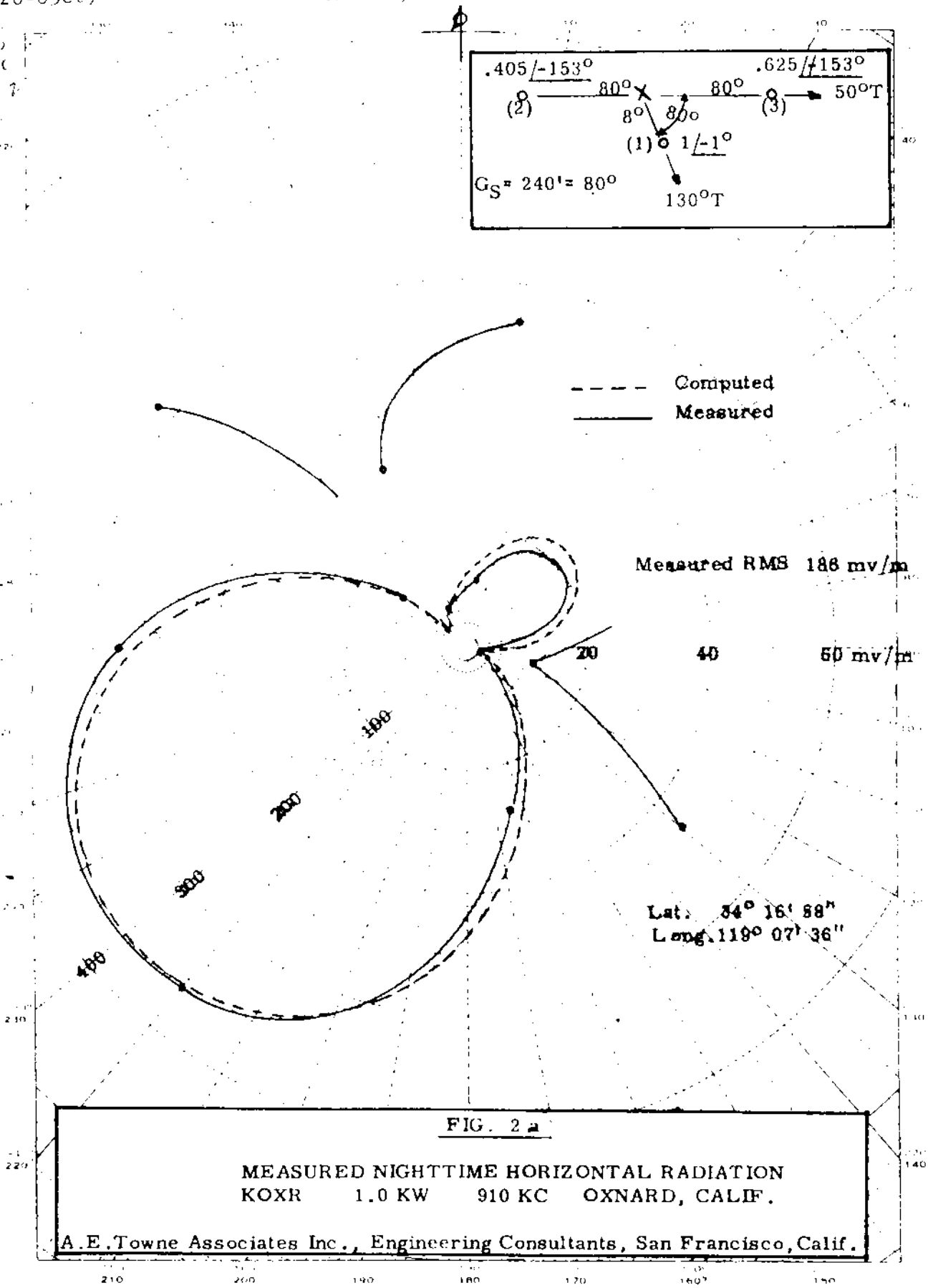


FIG. 2a

MEASURED NIGHTTIME HORIZONTAL RADIATION
KOXR 1.0 KW 910 KC OXNARD, CALIF.

A.E.Towne Associates Inc., Engineering Consultants, San Francisco, Calif.

FCC File No. BL-11087
Accepted 10-18-65

Station KOXR
Oxnard, California

910 kc

KOXR

Measured Non-DA
(10-26-65ct)

Station KOXR
Oxnard, California

1kw,5kw-LS,DA-2,U
910 kc

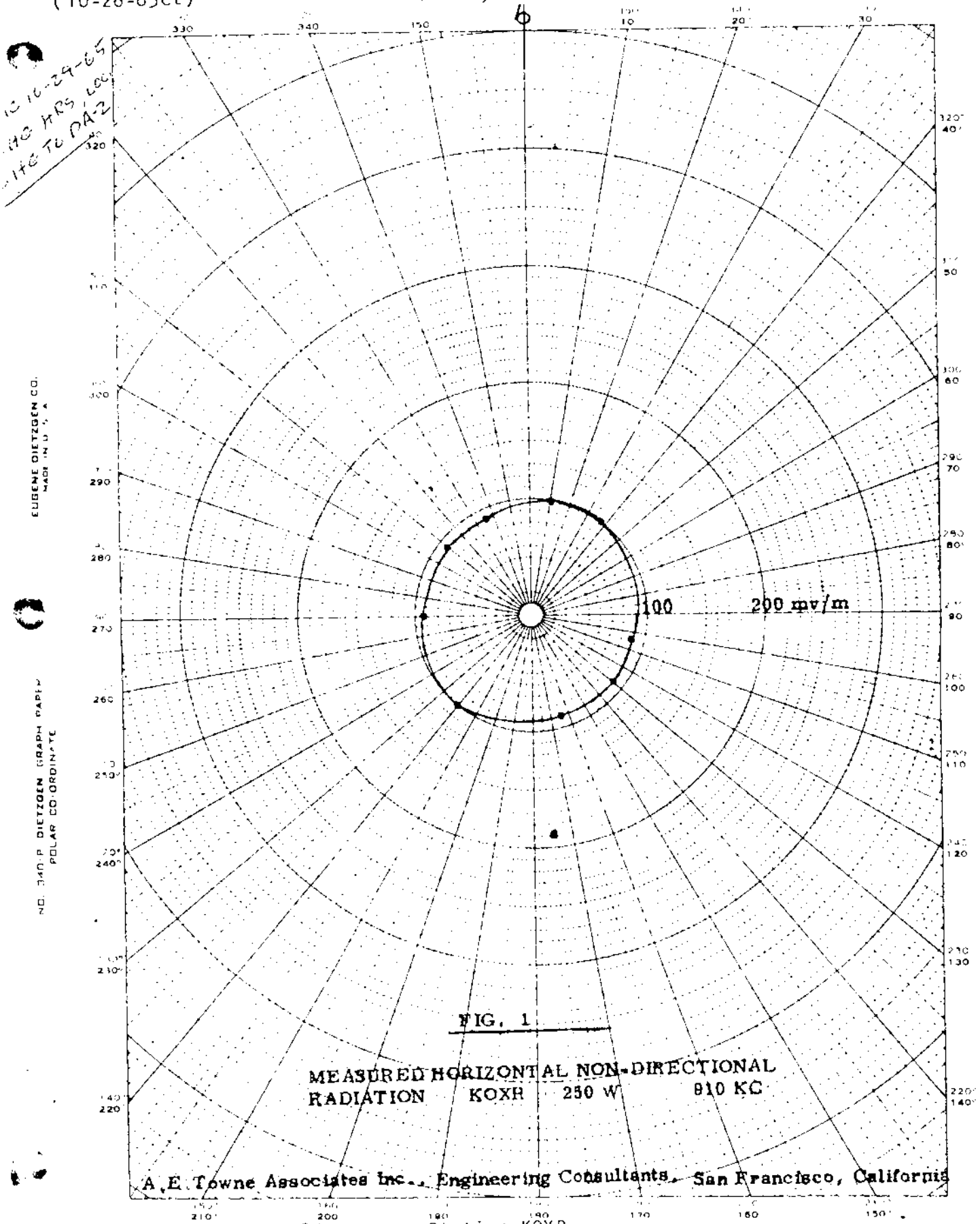


FIG. 1

MEASURED HORIZONTAL NON-DIRECTIONAL
RADIATION KOXR 250 W 910 KC

A.E. Towne Associates Inc., Engineering Consultants, San Francisco, California

FCC File No. BL-11087
Accepted 10-18-65

Station KOXR
Oxnard, California

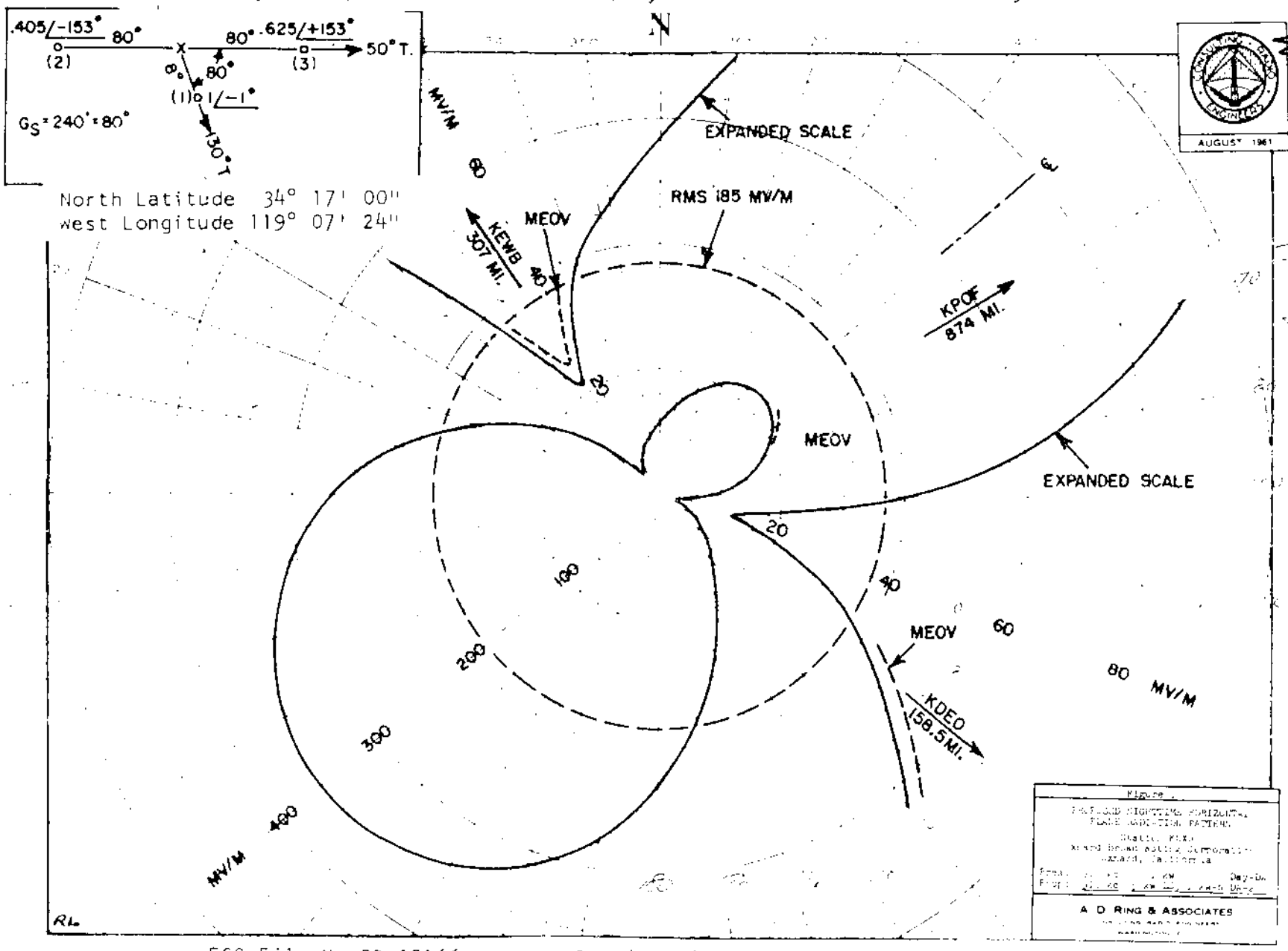
910 kc

A D RIN

Proposed Night
(11-30-61ct)

Station KOXR
Oxnard, California

1kw,5kw-LS,DA-2,U
910 kc



North Latitude 34° 17' 00"
west Longitude 119° 07' 24"

FCC File No.BP-15166
Accepted 11-9-61

Station KOXR
Oxnard, California

910 kc

183 CT
3-13-63
Amend to: 34-16-58
119-07-36
NL
WL

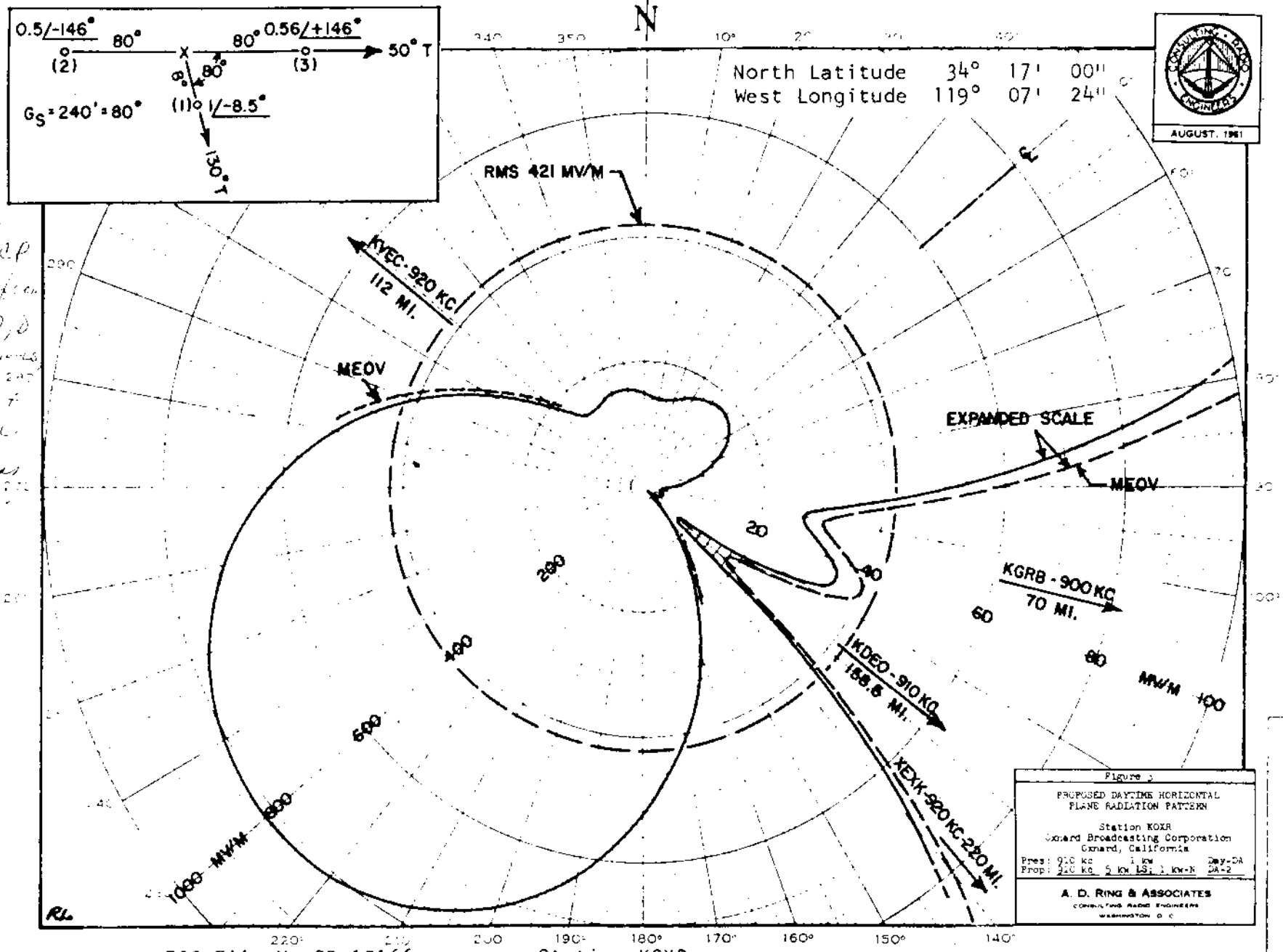
KOXR
910 kc

A. D. R

Proposed Day
(7-29-64ct)

Station KOXR
Oxnard, California

1kw,5kw-LS,DA-2,U
910 kc



7/7/64
constructed CP
change power
w, DA-D, D
1kw, 5kw
A-2, U
change
nt-tran
ocation

FCC File No.BP-15166
Accepted 11-9-61

Station KOXR
Oxnard, California

910 kc

Day

KOXR

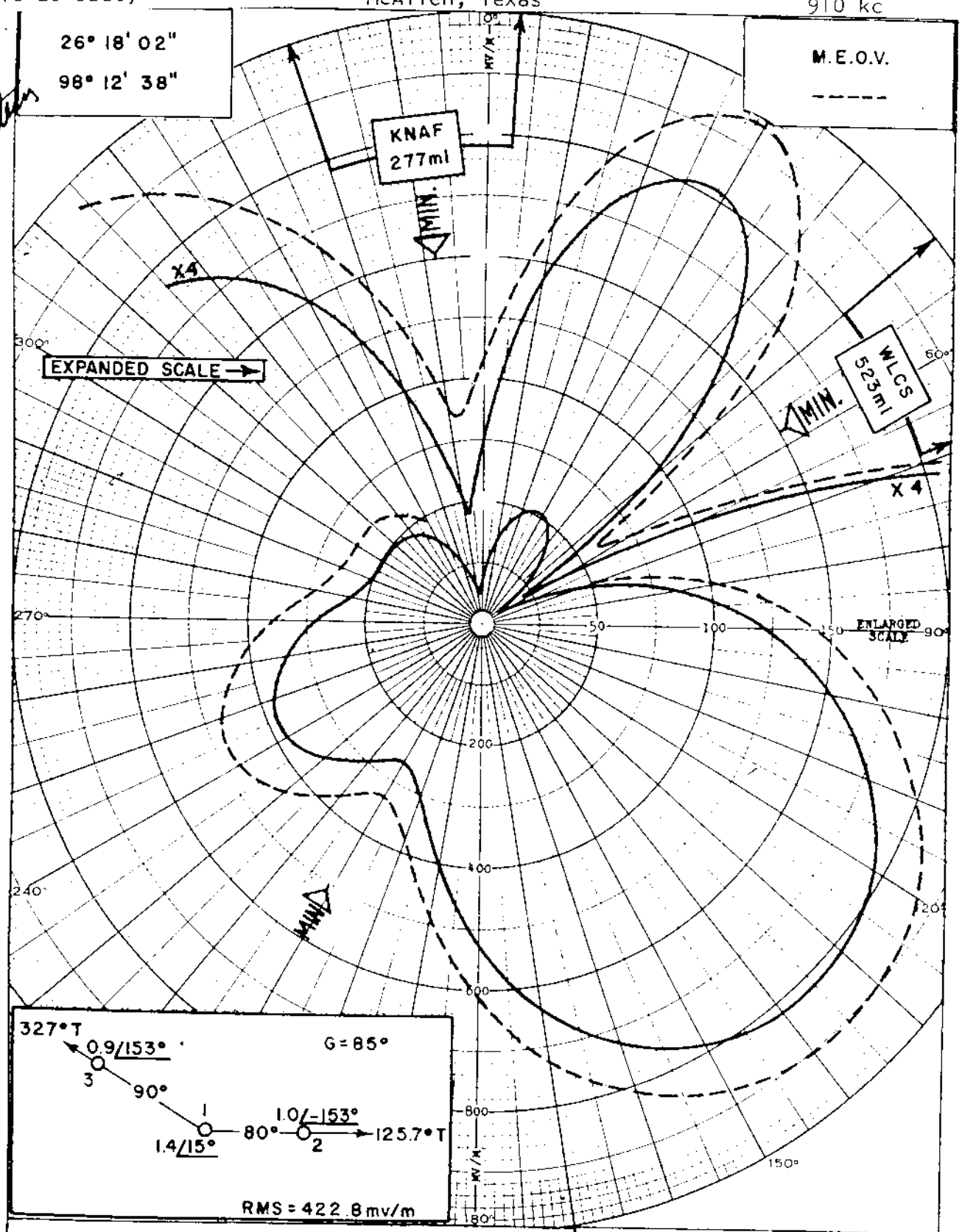
KRIO

Proposed Day
(10-26-62ct)

Station KRIO
McAllen, Texas

1kw,5kw-LS,DA-2,U
910 kc

9-28-62
Granted MCP
exchanges in pattern



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

PATTERN: PROPOSED DAY HORIZONTAL
FOR: KRIO - McALLEN, TEXAS
POWER: 5 KW FREQ: 910 KC.
DATE: 8/23/62

FCC File No.BMP-10545
Accepted 9-21-62

Station KRIO
McAllen, Texas

910 kc

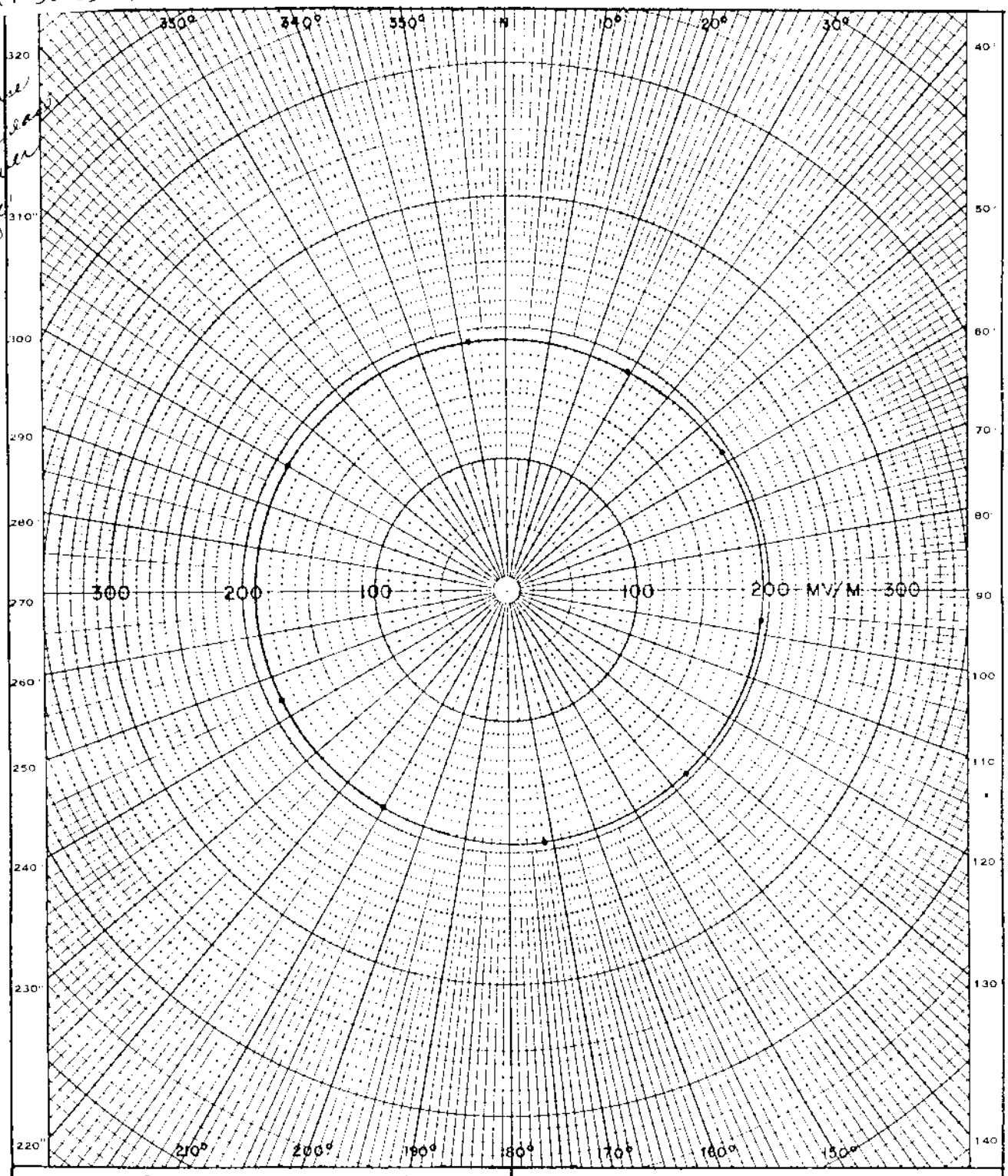
KRIO

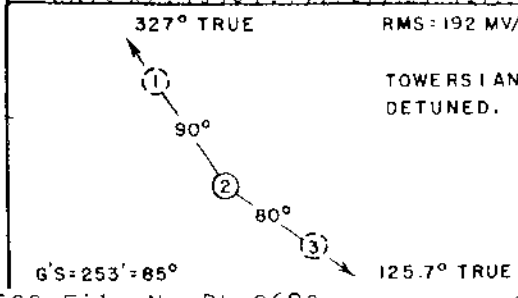
Measured Non-DA
(1-30-63ct)

Station KRIO
McAllen, Texas

1kw,5kw-LS,DA-2,U
910 kc

2-63
ated license
viewing increase
day power
d change
on DA-1
DA-2





RMS: 192 MV/M

TOWERS 1 AND 3
DETUNED.

J. G. ROUNTREE
CONSULTING ENGINEER
P. O. BOX 1044
AUSTIN 17, TEXAS

RADIO STATION KRIO
MC ALLEN, TEXAS
MEASURED NDPATTERN

620910

FIGURE 2A

FCC File No.BL-9683
Accepted 1-15-63

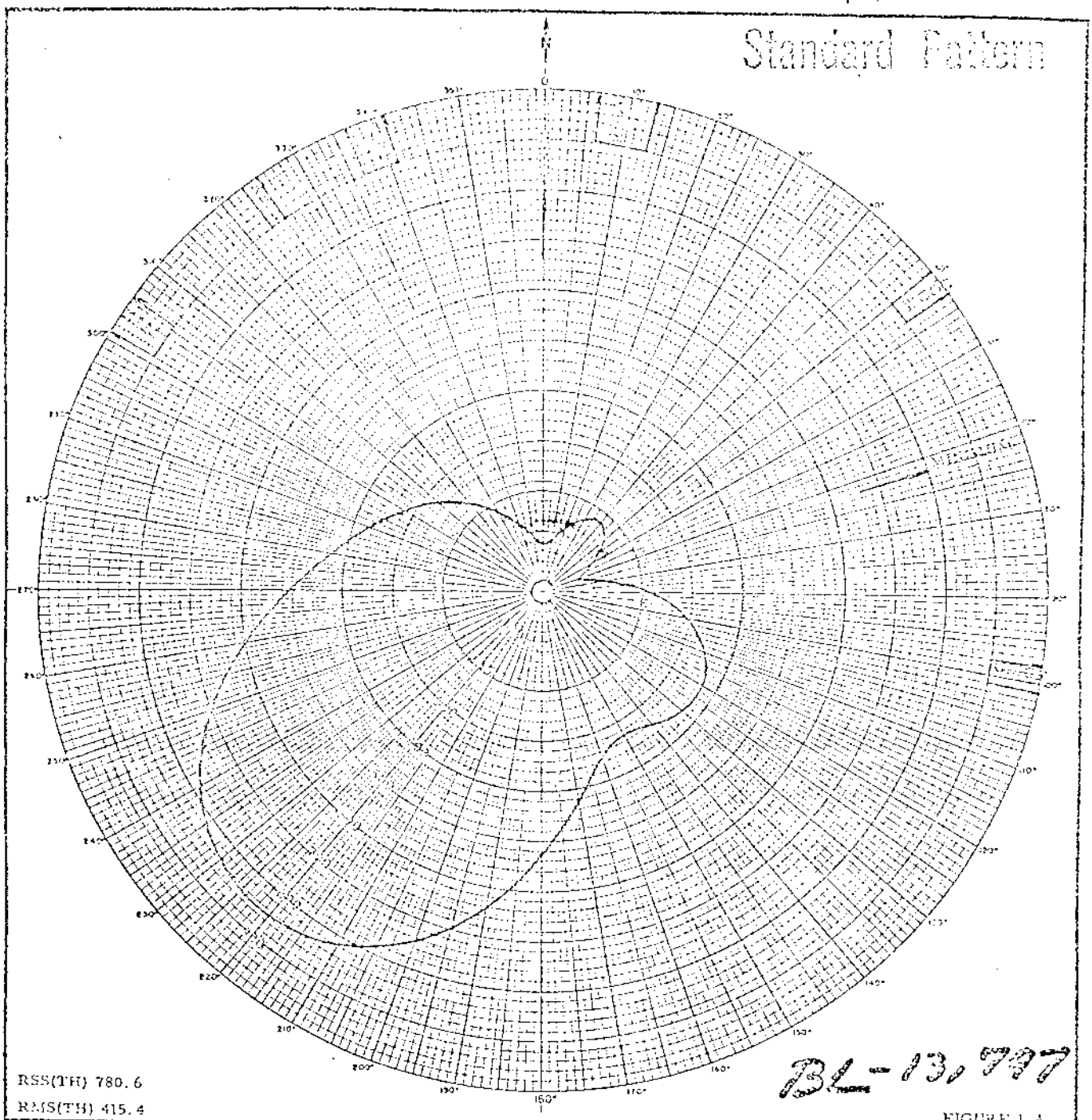
Station KRIO
McAllen, Texas

910 kc

KRIO

KRIO

Standard Pattern



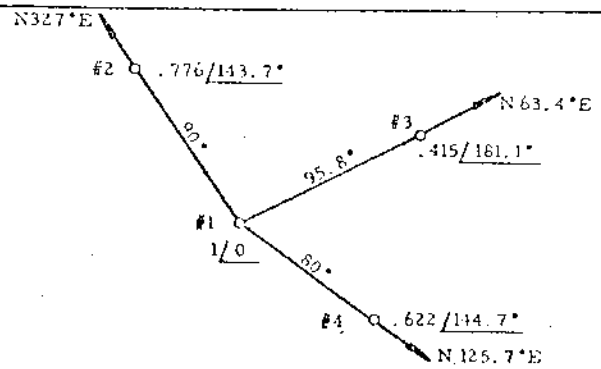
RSS(TH) 780.6

RMS(TH) 415.4

BL-13,797

FIGURE 1-A

HORIZONTAL RADIATION PATTERN

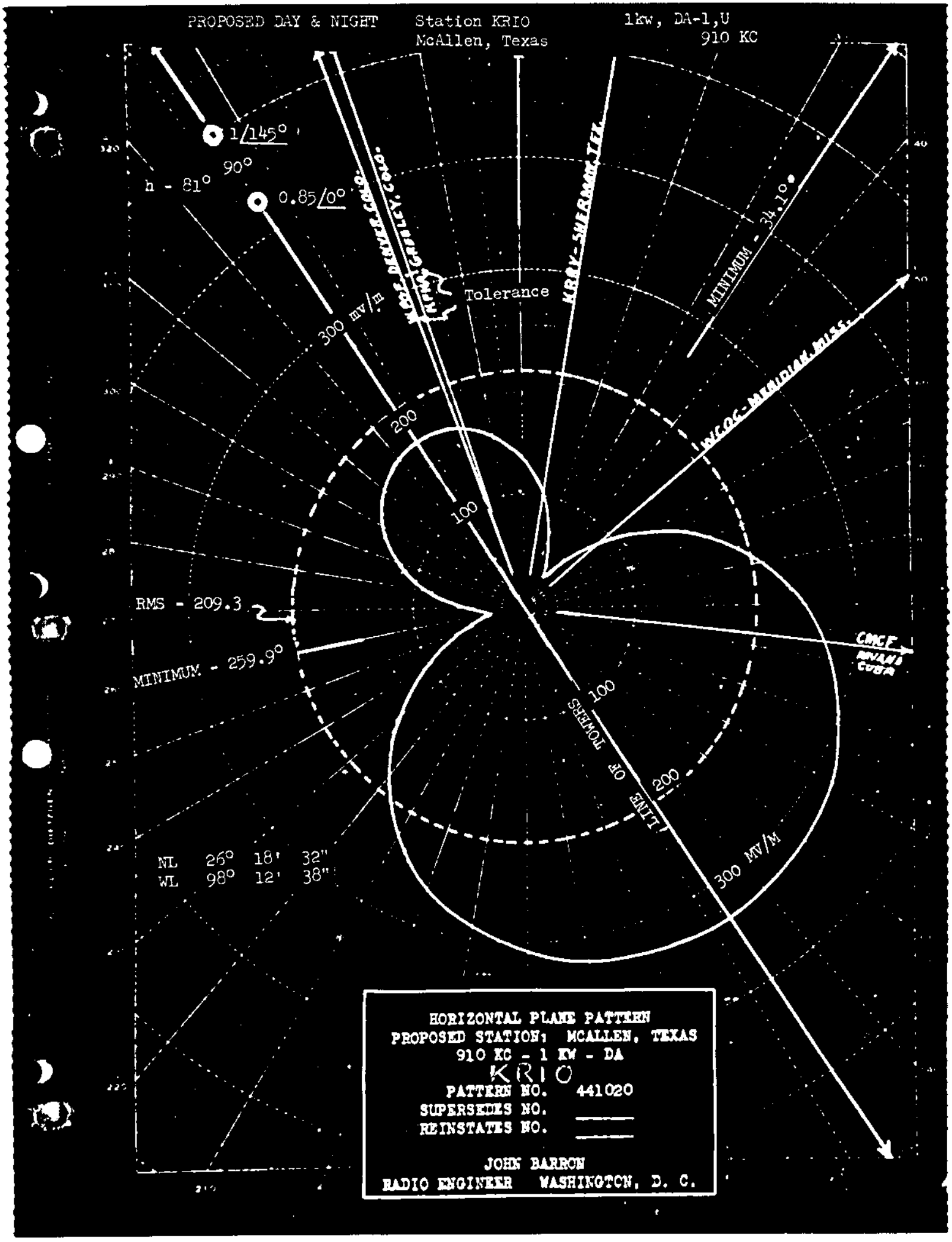


G = 85°

APPLICANT	KRIO INC.
LOCATION	McALLEN, TEXAS
FREQUENCY	910 KC/S
POWER	5000 Watts
LATITUDE	26 DEG. 18 MIN. 02 SEC.
LONGITUDE	98 DEG. 12 MIN. 38 SEC.
WHEN USED	NIGHT
R.M.S. FIELD	436 MV/M (STANDARD)
DATE	JUNE 1973

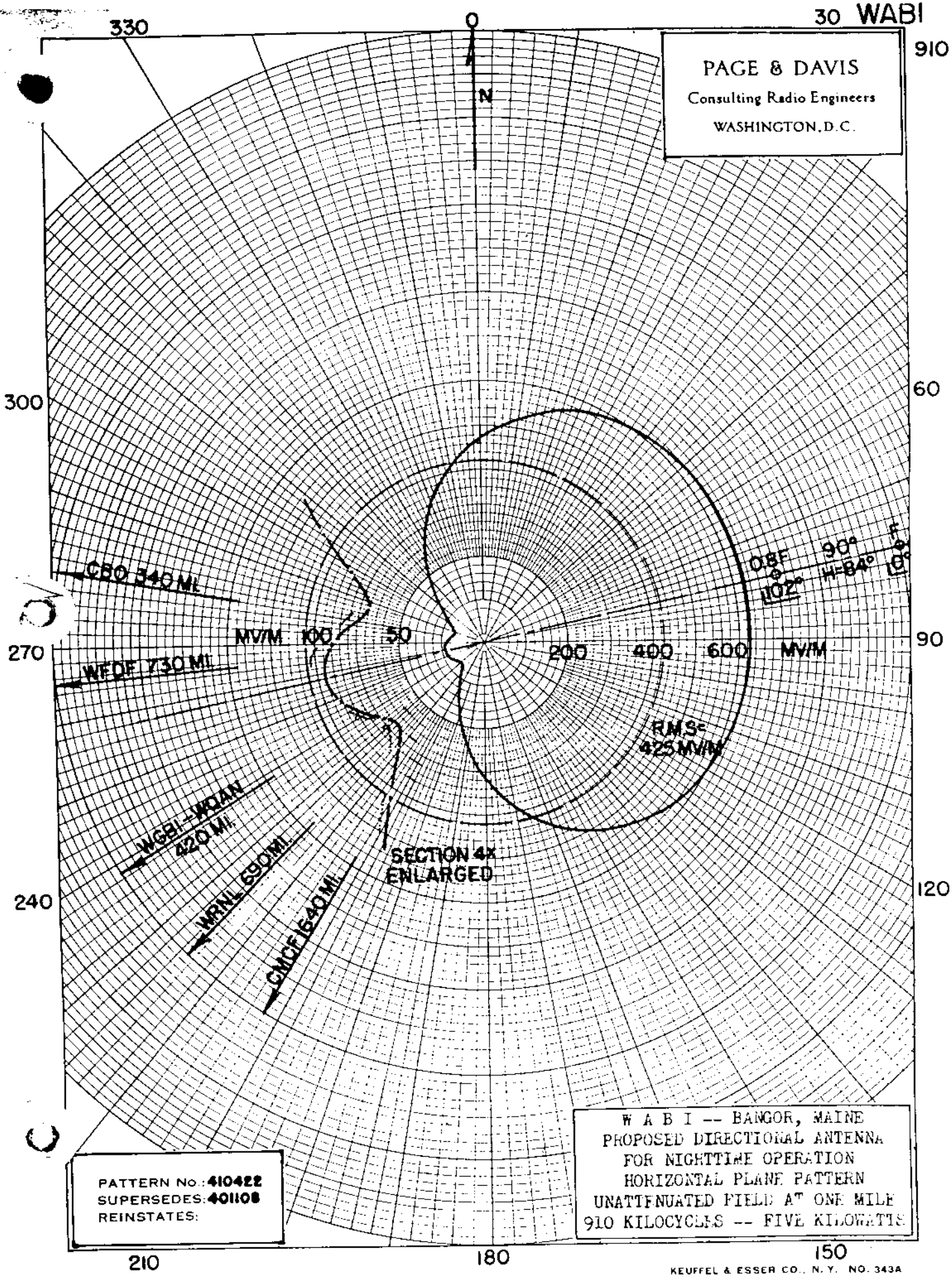
ROBERT L. PURCELL

WASHINGTON, D. C.

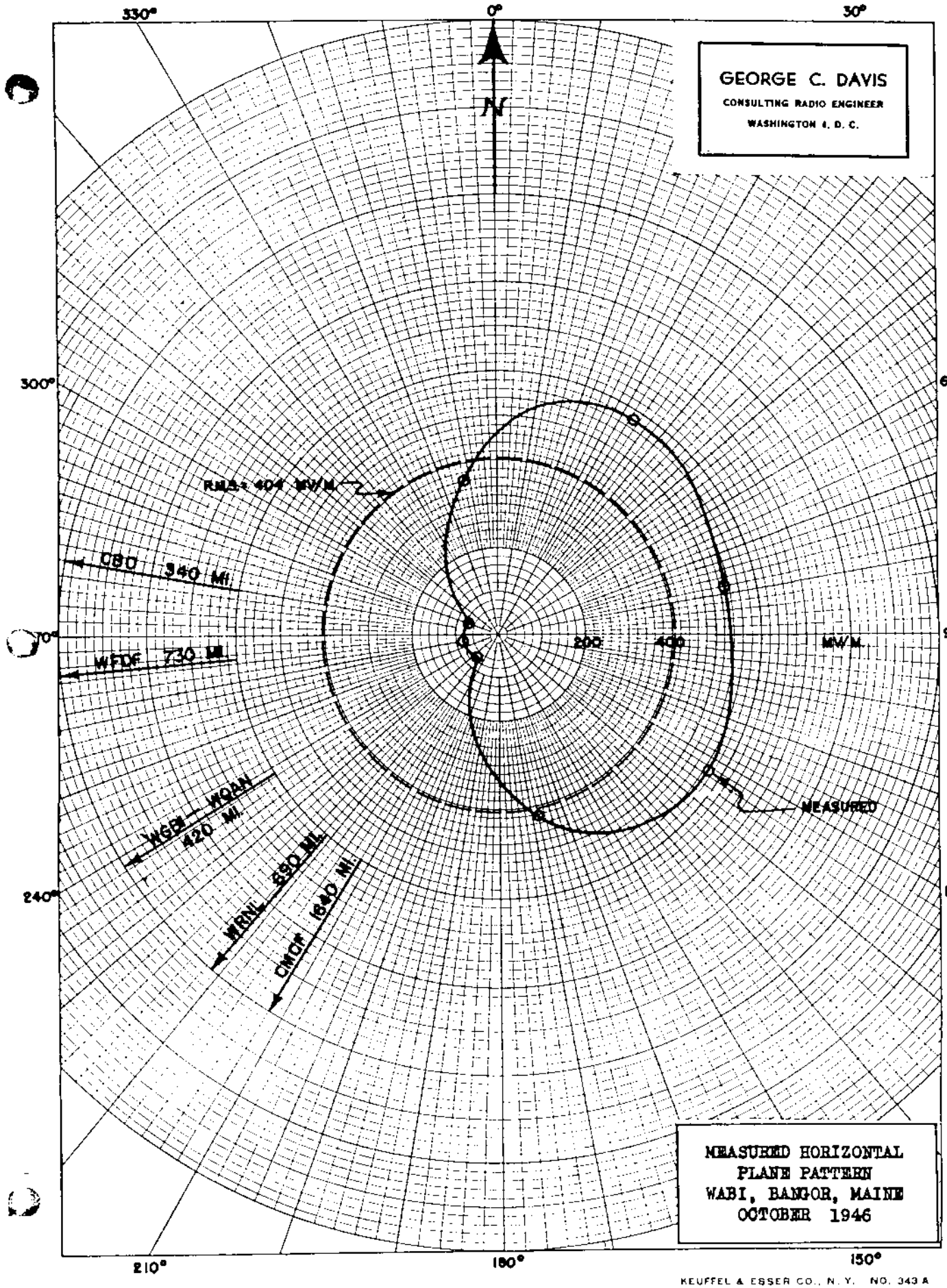


HORIZONTAL PLANE PATTERN
PROPOSED STATION: MCALLEN, TEXAS
910 KC - 1 KW - DA
KRIO
PATTERN NO. 441020
SUPERSEDES NO. ———
REINSTATES NO. ———

JOHN BARRON
RADIO ENGINEER WASHINGTON, D. C.



WABI 91(



MEASURED HORIZONTAL
PLANE PATTERN
WABI, BANGOR, MAINE
OCTOBER 1946

KEUFFEL & ESSER CO., N. Y. NO. 343 A
POLAR CO-ORDINATE
MADE IN U. S. A.

Lawrenceville, Ill.

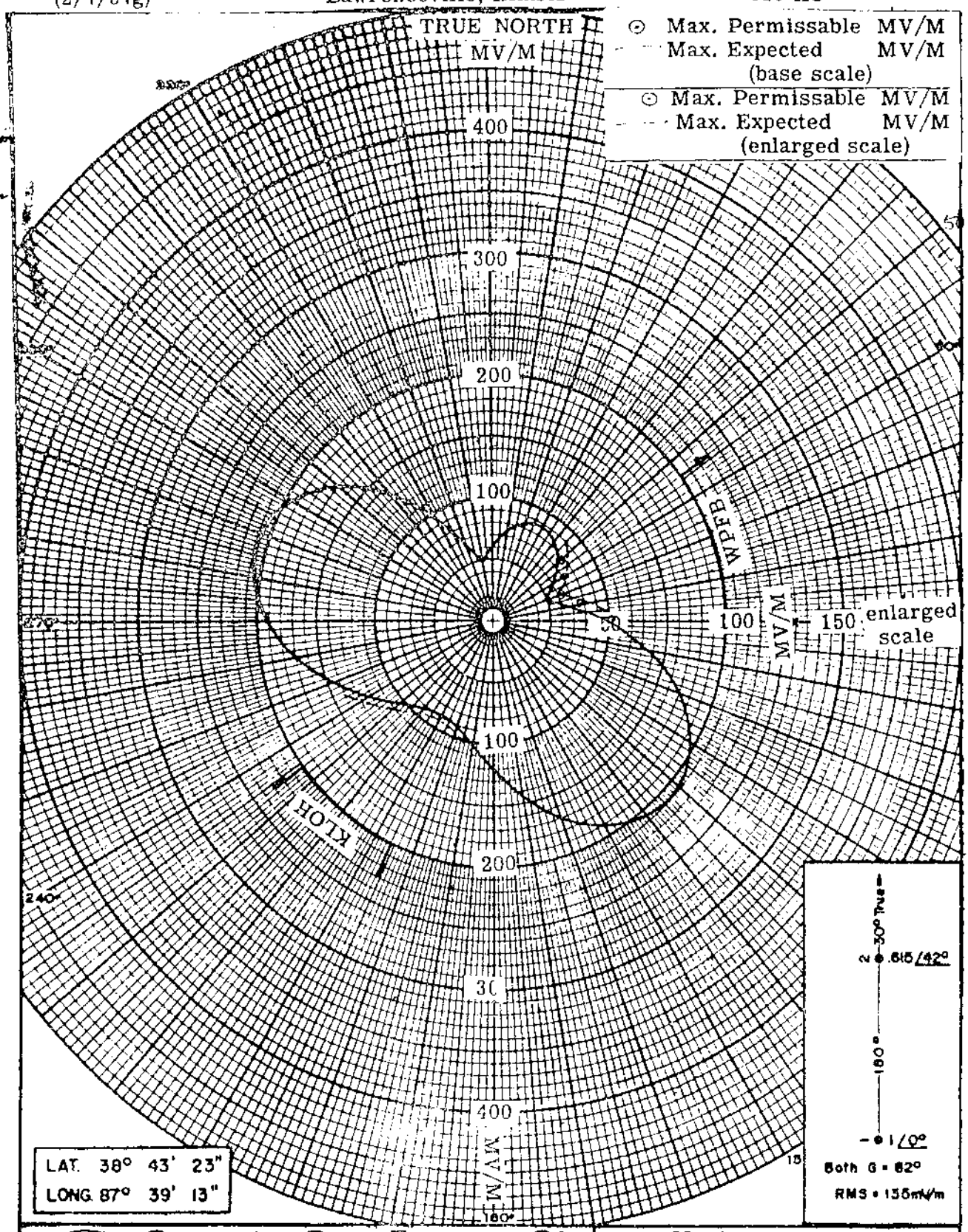
WAKO

PROPOSED DAY
(2/7/57g)

Lawrenceville B/C Co.
Lawrenceville, Illinois

500w, DA-D,D
910 KC

Granted CP 6/26/58 for new AM station. Sec 3.28(c) of Comm. rules was waived



COMMERCIAL RADIO EQUIPMENT CO.
RADIO ENGINEERING CONSULTANTS

PATTERN: PROPOSED DAYTIME
FOR: LAWRENCEVILLE, ILLINOIS
POWER: 500 W FREQ: 910 KC

FCC File No. BP-9583
Accepted 11/30/54

Lawrenceville B/C Co.
Lawrenceville, Illinois

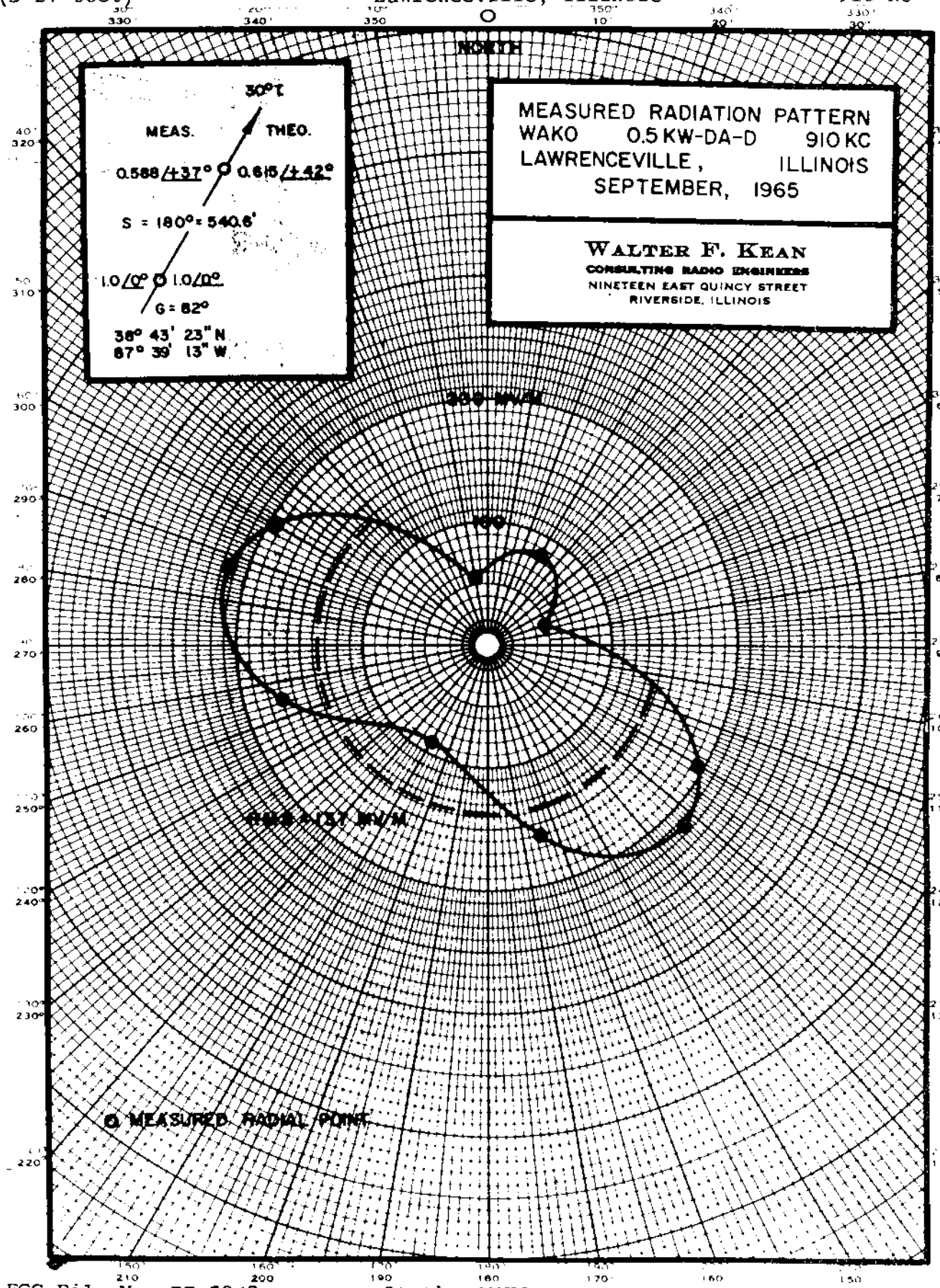
910 KC

WAKO

Measured Day
(5-27-66ct)

Station WAKO
Lawrenceville, Illinois

500w,DA-D,D
910 kc



FCC File No. BZ-5948
Accepted 4-29-66

Station WAKO
Lawrenceville, Illinois

910 kc

WAVL

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station	: WAVL	Main Studio:	Apollo, Pennsylvania
Frequency	: 910 kHz	Power	: 5kw
Notification List No.:	1754	Date	: October 27, 1978 Class: III

GEORGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude:	40°	35'	01"
West Longitude:	79°	31'	34"

ANTENNA CHARACTERISTICS

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

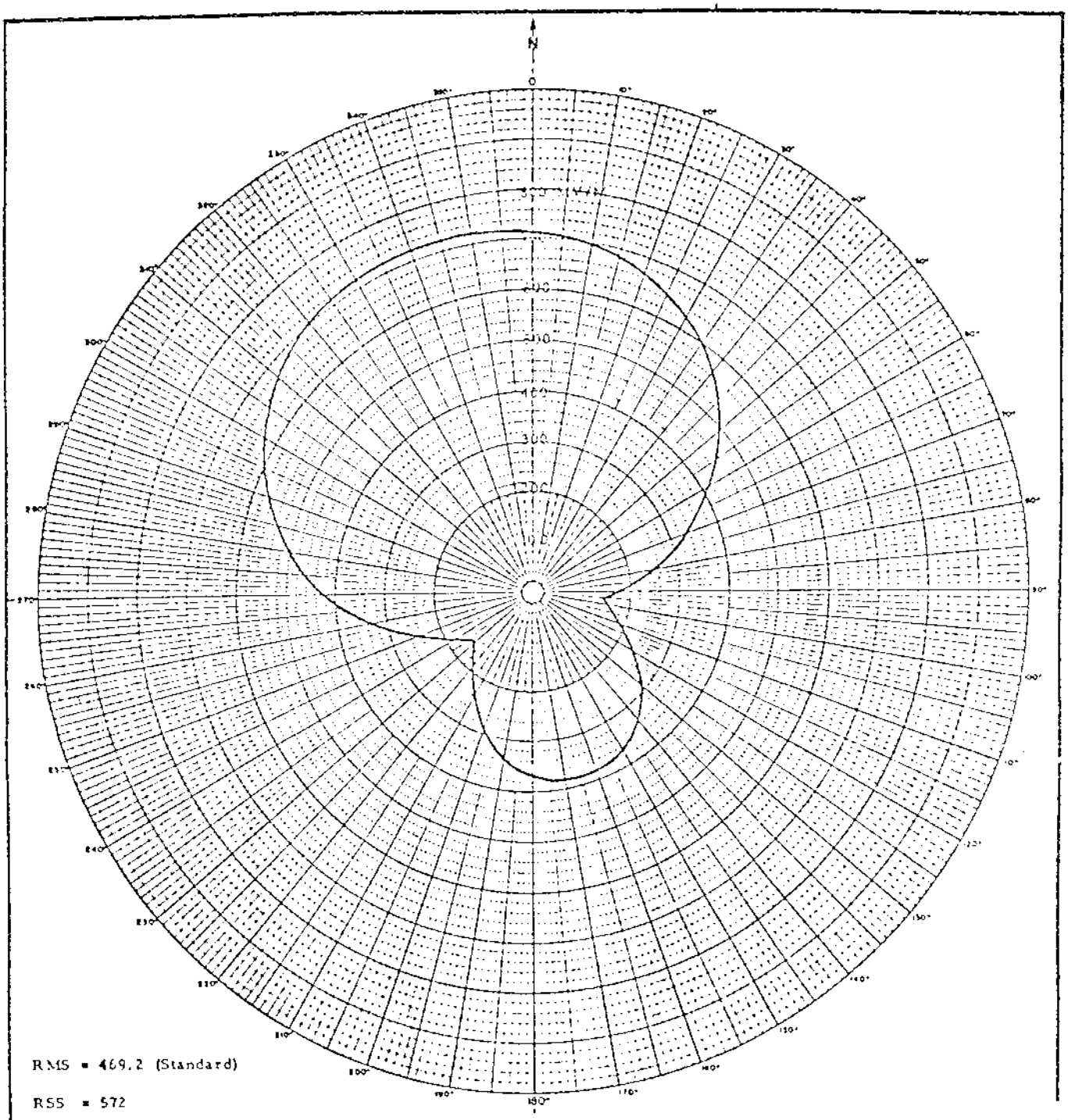
TOWER :	N(#1)	S(#2)
HEIGHT ABOVE INSULATORS :	250'	250' (83.3°)
PHASING :	0°	+145.3°
FIELD RATIO:	1	1.45

SPACING AND ORIENTATION: Towers are spaced 255.2' (85°) on a line bearing 345° true.

GROUND SYSTEM: 120 - 270' equally spaced copper radials plus 120 - 50' interspaced radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

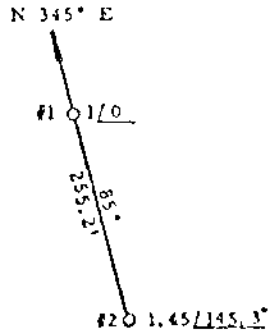
PREDICTED EFFECTIVE FIELDS AT RATED POWER:	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	442.9 mv/m	572 mv/m	469.2 mv/m

Note: This notification concerns an increase in power and a change from omnidirectional to a directional antenna system.



HORIZONTAL RADIATION PATTERN

FIGURE 1



G = 83.3°

APPLICANT :	WAVL
LOCATION :	APOLLO, PENNSYLVANIA
FREQUENCY :	910 KHz
POWER :	5.0 KW
LATITUDE :	40 DEG 35 MIN 01 SEC
LONGITUDE :	79 DEG 31 MIN 34 SEC
WHEN USED :	Daytime
RMS FIELD :	442.9 (Theoretical)
DATE :	November 1976

ROBERT L. PURCELL

WASHINGTON, D. C.

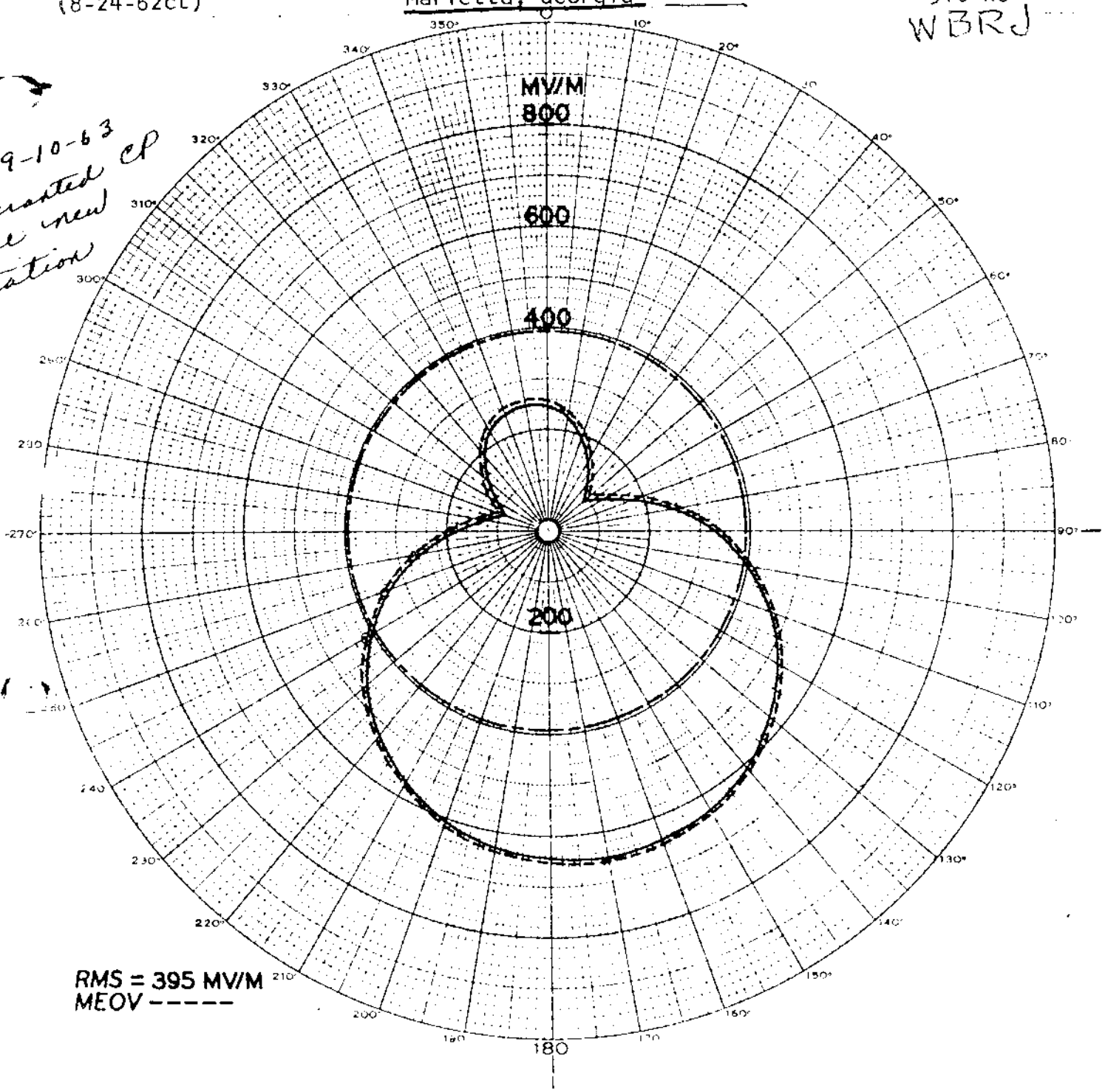
~~WBRG~~

Proposed Day
(8-24-62ct)

New; The Radiocasters
Marietta, ~~Georgia~~ Ohio

5kw,DA-D,D
910 kc
WBRJ

9-10-63
Granted CP
as new
station



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 9	STATION DATA
350° T. NO. 2 0.81/150° 60° G=66.5° NO. 1 1.0/0°	TOWER No. / ELECTRICAL HEIGHT / SPACING / PHASING / FIELD RATIO 1 2 3 4 5 6 7 8 9 10 DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐	PROPOSED DAYTIME DIRECTIONAL MARIETTA, OHIO θ° 0°	CALL NEW FREQ 910 KC POWER 5 Kw TYPE DA-D TIME DAYTIME LAT. N 39-26-07 LONG. W 81-28-01 E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BP-15265
Accepted 7-26-62 Amended

New; The Radiocasters
Marietta, Georgia

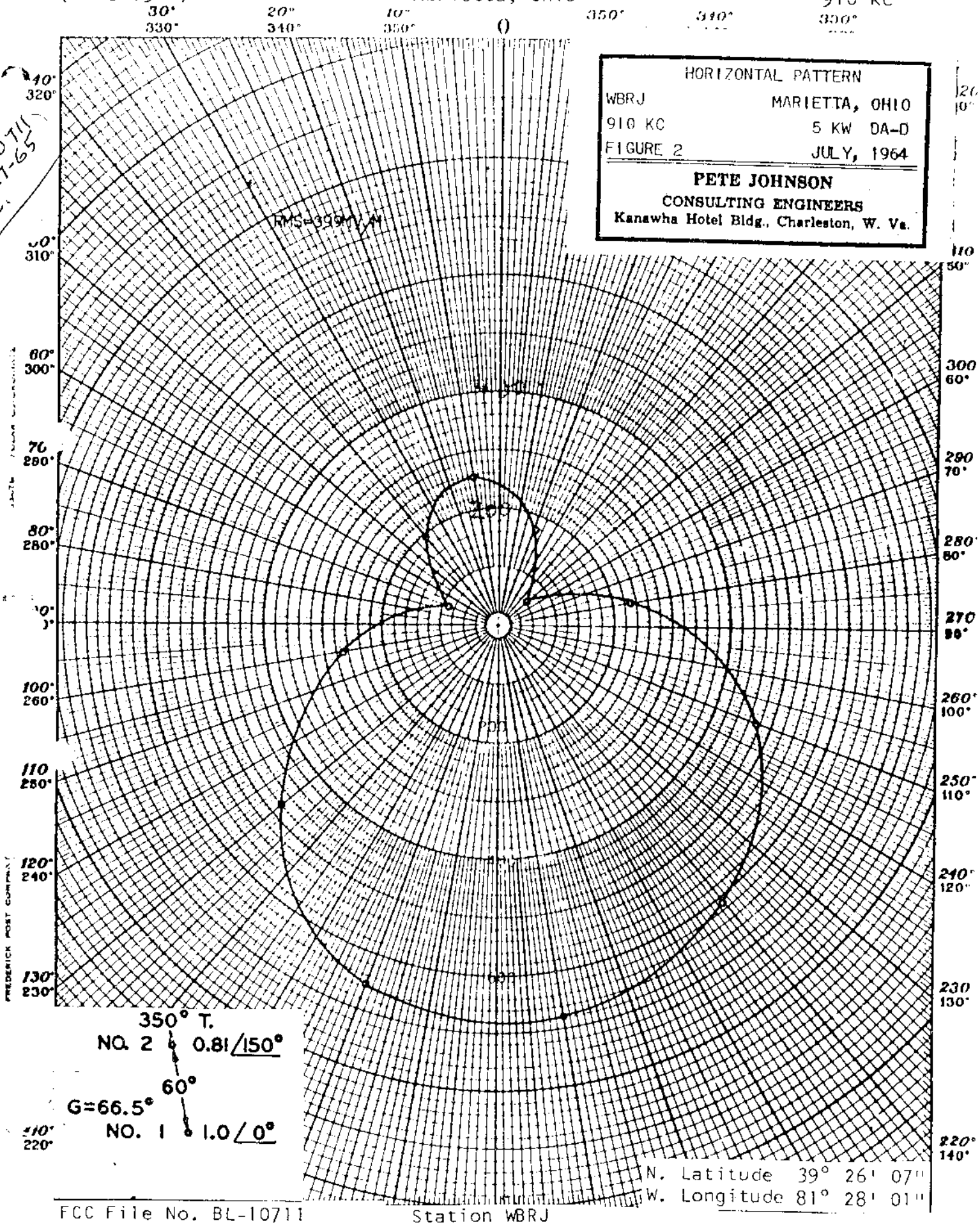
910 kc

WBRJ

Measured Day
(1-28-65ct)

Station WBRJ
Marietta, Ohio

5kw,DA-D,D
910 kc



N. Latitude 39° 26' 07"
W. Longitude 81° 28' 01"

FCC File No. BL-10711
Accepted 12-22-64

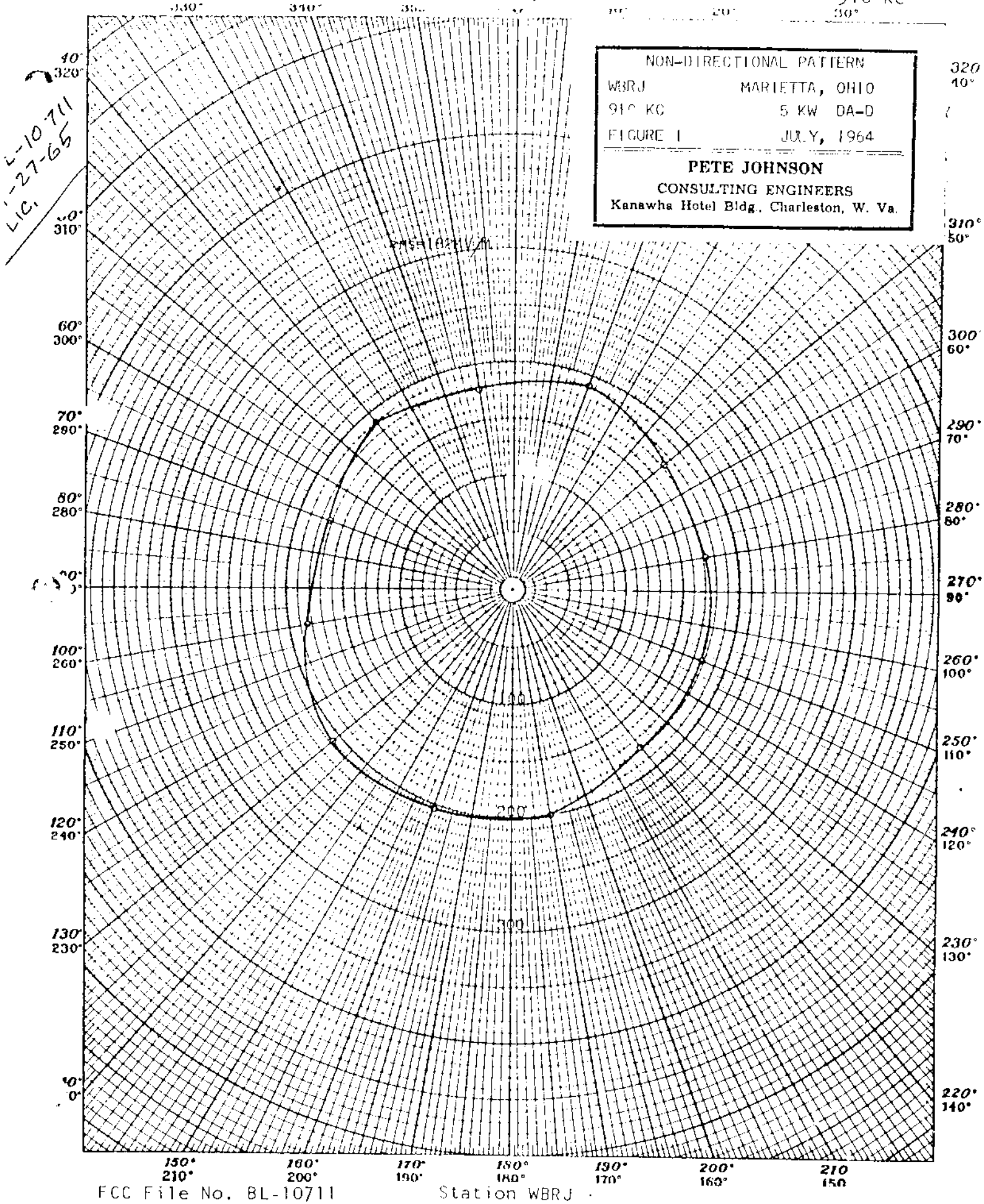
Station WBRJ
Marietta, Ohio

910 kc

Measured Non-DA
(1-28-65ct)

Station WBRJ
Marietta, Ohio

WBRJ
5kw,DA-D,D
910 kc



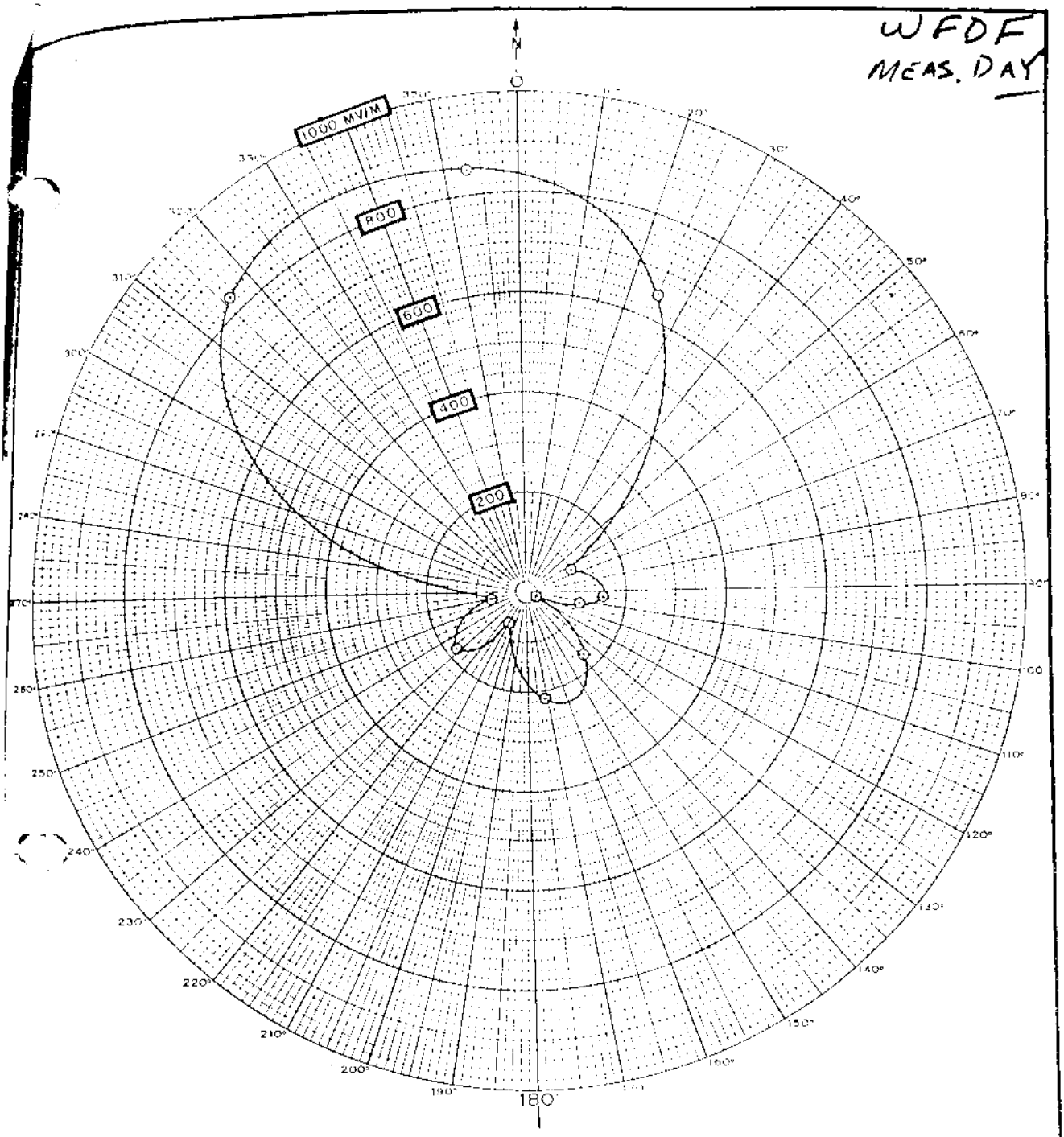
L-10711
1-27-65
LIC.

FCC File No. BL-10711
Accepted 12-22-64

Station WBRJ
Marietta, Ohio

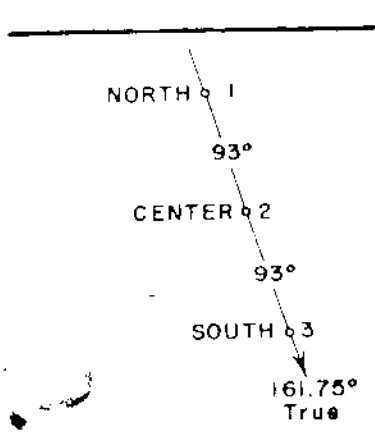
WFDF
MEAS. DAY

PERIOD 7-1-66 To



RMS = 444 MV/M

EXHIBIT H



LATITUDE	42°	58'	12"	North
LONGITUDE	83°	37'	24"	West

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASE DEG	I.E.R. RATIO	MV/M FOR 1 KW	HEIGHT DEG
1	SEE DIAGRAM	SEE DIAGRAM	57°	1.0		85°
2			201.55°	1.641		85°
3			0°	1.0		85°

MEASURED DAYTIME DIRECTIONAL
5 KW
HORIZONTAL RADIATION PATTERN
FOR

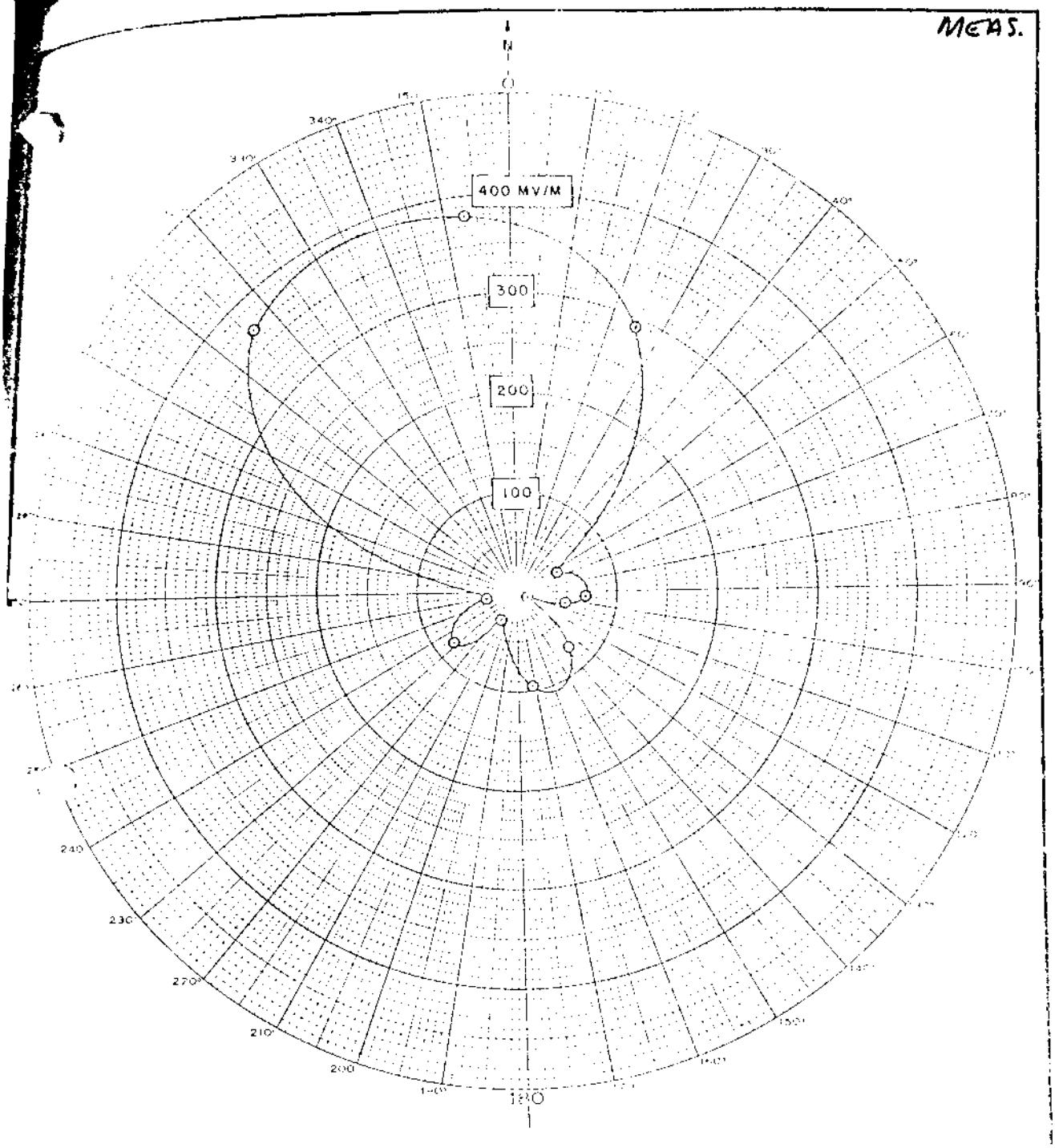
WFDF
FLINT, MICHIGAN
910 KC 1-5 KW DA-2
660920

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D.C.

WFDF

MEAS. NIGHT

PERIOD 7-1-66 To



RMS = 198 MV/M

LAMBERT

NORTH 0 1

93°

CENTER 2

93°

SOUTH 3

75°

1	SEE DIAGRAM	SEE DIAGRAM	47°	0	85°
2			20.55°	.64	95°
3			0°	1.0	85°

MEASURED NIGHTTIME DIRECTIONAL
KA

WFDF
FLINT, MICHIGAN
910 KC 1-5 KW DA-2

KEAR & KENNEDY
WASHINGTON D.C.

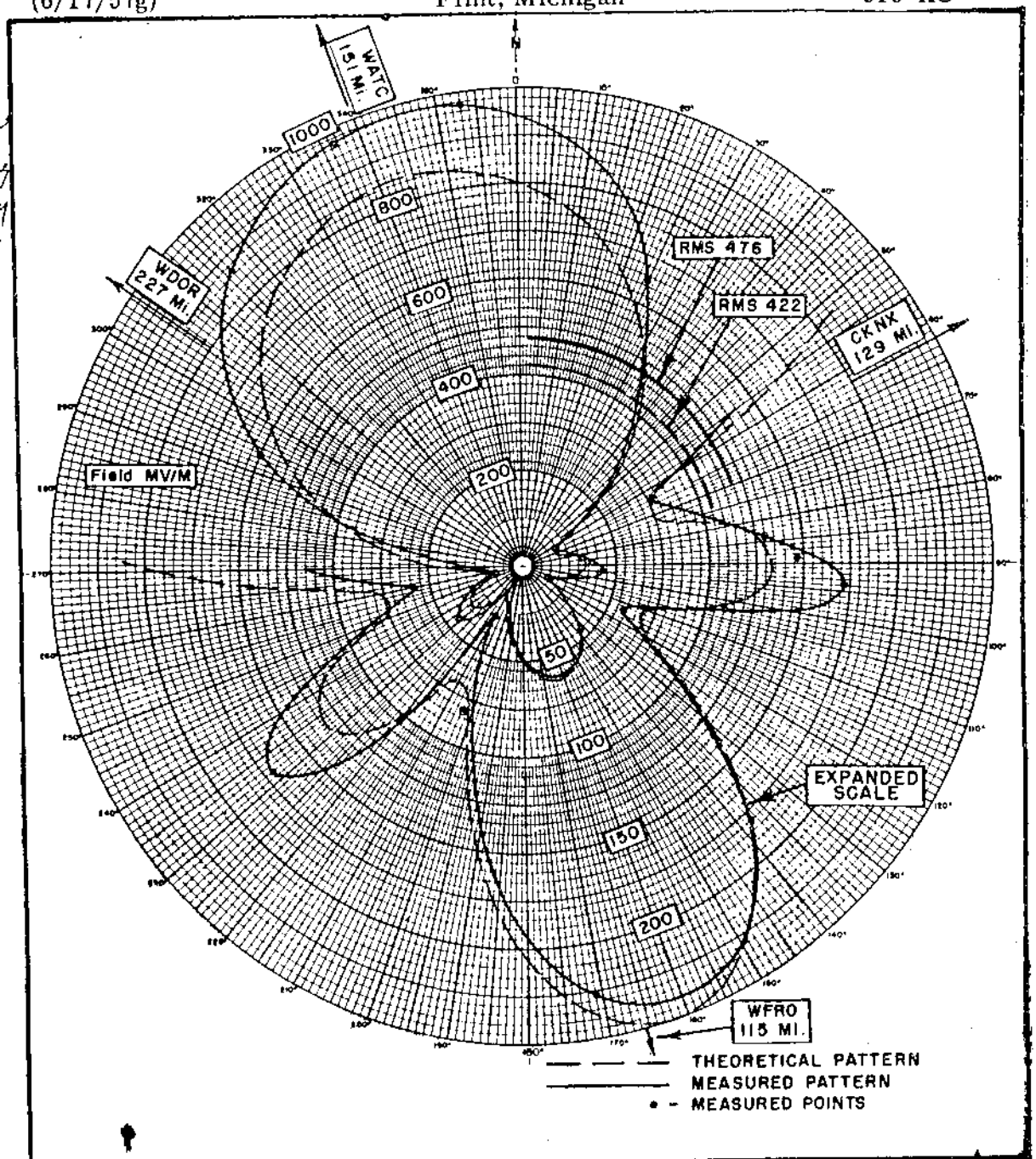
WFDF

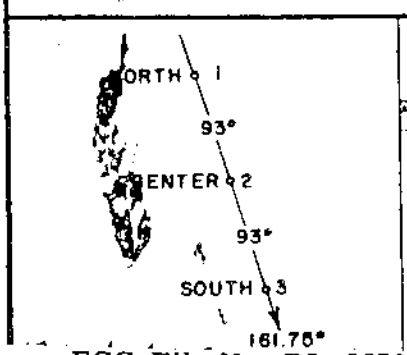
MEASURED DAY
(6/17/57g)

Station WFDF
Flint, Michigan

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

Granted license 8/1/57 covering increase in day power, & from DA-1 to DA-2





LATITUDE 42° 58' 12"
LONGITUDE 83° 37' 24"

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG
1	SEE DIAGRAM	SEE DIAGRAM	57	1	194	65
2			201.55	1.641	194	65
3			0	1	194	65

MEASURED DAYTIME HORIZONTAL RADIATION PATTERN
WFDF
FLINT, MICHIGAN
910 KC 1KW,5KW-LS,U, DA-2
570520

KEAR AND KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D.C.

FCC File No. BL-6650
Accepted 6/12/57

WFDF
Flint, Michigan

910 KC

WFDF

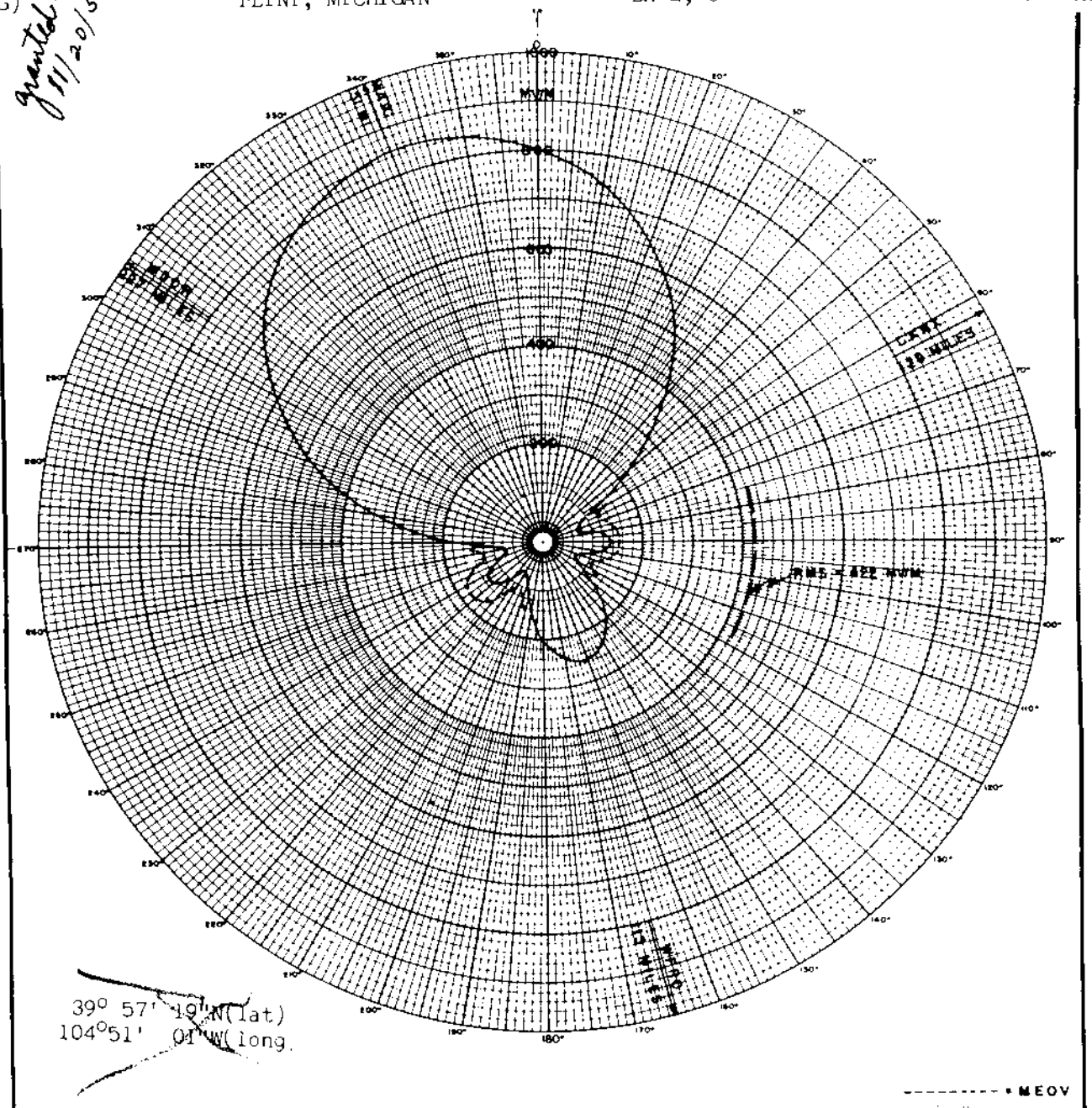
PROPOSED DAY
(2-21-56G)

Granted CP 11/20/56

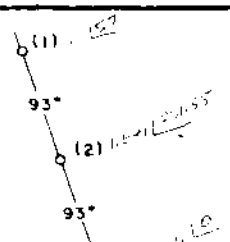
STATION WFDF
FLINT, MICHIGAN

1KW,5KW-LS
DA-2, U

910 KC



COMPUTED FROM PRESENT THEORTICAL 1KW. PATTERN



LATITUDE N. 42° 58' 12"
LONGITUDE W. 83° 37' 24"

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG
1	SEE DIAGRAM	SEE DIAGRAM	57°	1.0		85°
2			201.55°	1.641		85°
3			0°	1.0		85°

HORIZONTAL DAYTIME PATTERN
FOR
PROPOSED WFDF
910 KC. 1KW, 5KW-LS. U, DA-2
FLINT, MICHIGAN
551222

KEAR AND KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D.C

FILE NO. BP-10,327 ACCEPTED 2-6-56 FCC

WFDF, Flint, Michigan 910 KC

WFDF

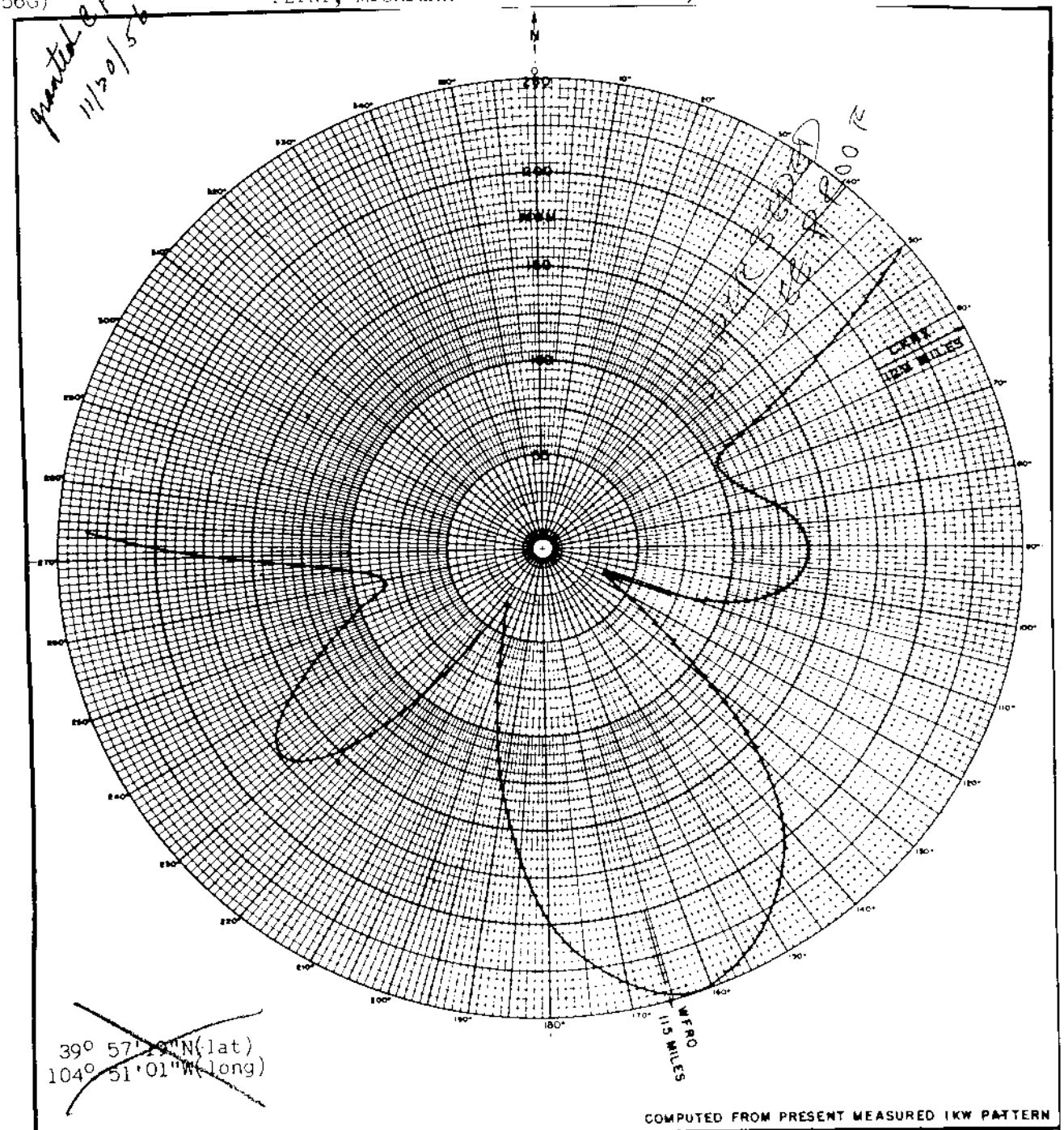
PROPOSED DAY NULLS
(2-21-56G)

STATION WFDF
FLINT, MICHIGAN

1KW, 5KW-LS
DA-2, U

910 KC

granted CP 11/30/56



COMPUTED FROM PRESENT MEASURED 1KW PATTERN

LATITUDE
LONGITUDE

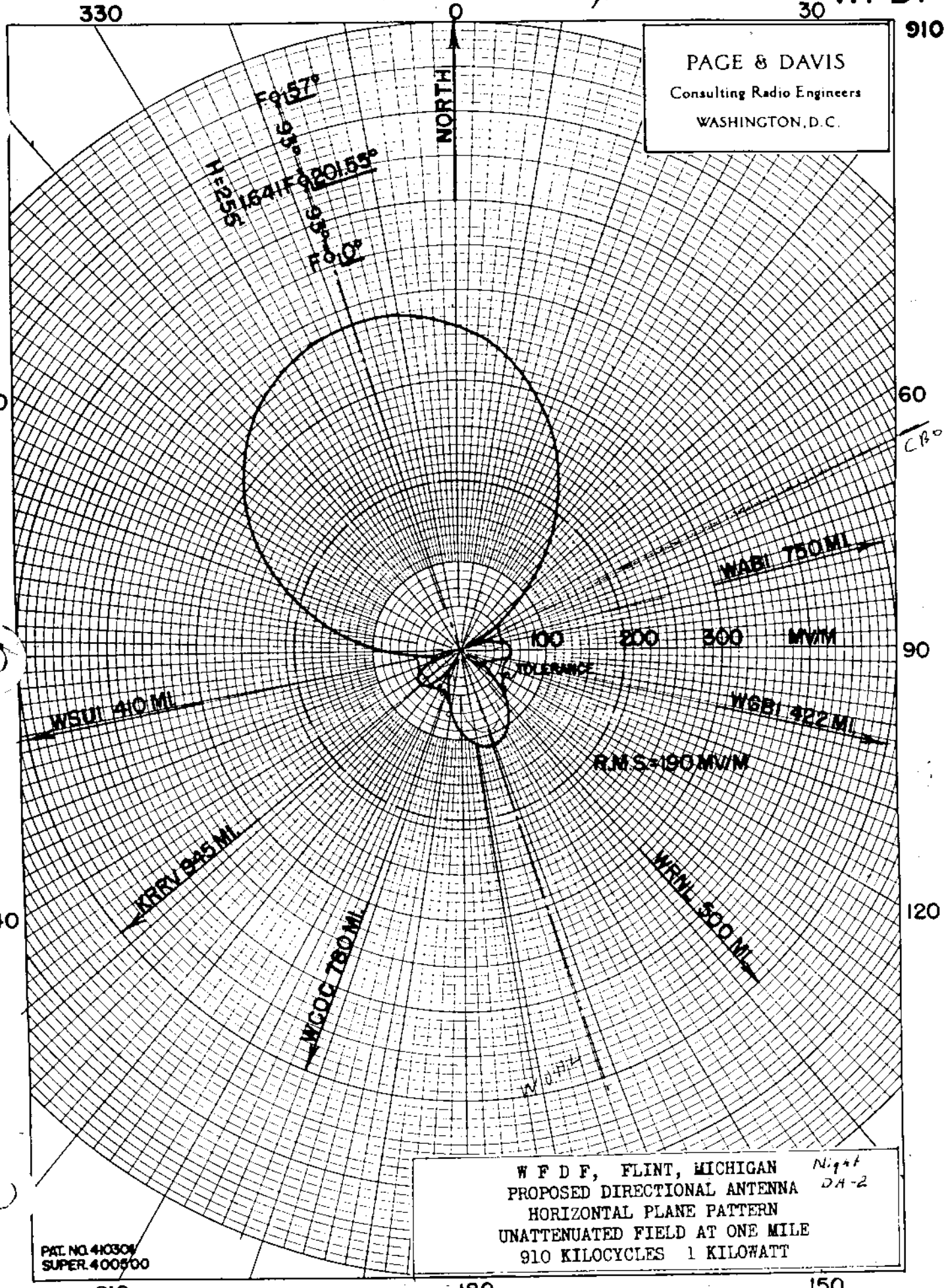
ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG

EXPANDED SCALE
HORIZONTAL DAYTIME PATTERN
FOR
PROPOSED WFDF
910 KC. 1KW, 5KW-LS U,DA-2
FLINT, MICHIGAN
551222

KEAR AND KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D C

See Pl Plan.

WFDF



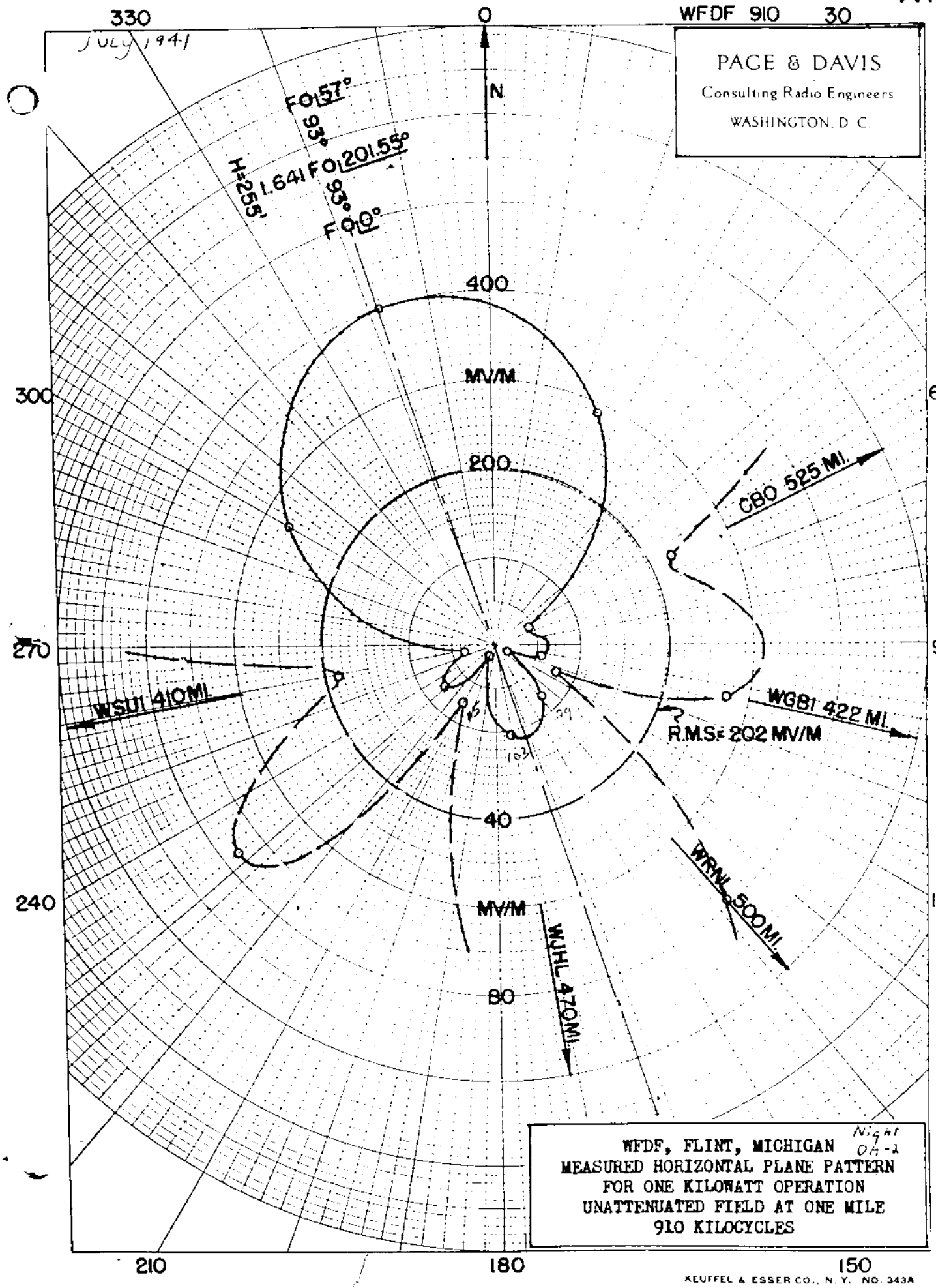
W F D F, FLINT, MICHIGAN
PROPOSED DIRECTIONAL ANTENNA
HORIZONTAL PLANE PATTERN
UNATTENUATED FIELD AT ONE MILE
910 KILOCYCLES 1 KILOWATT

Night DA-2

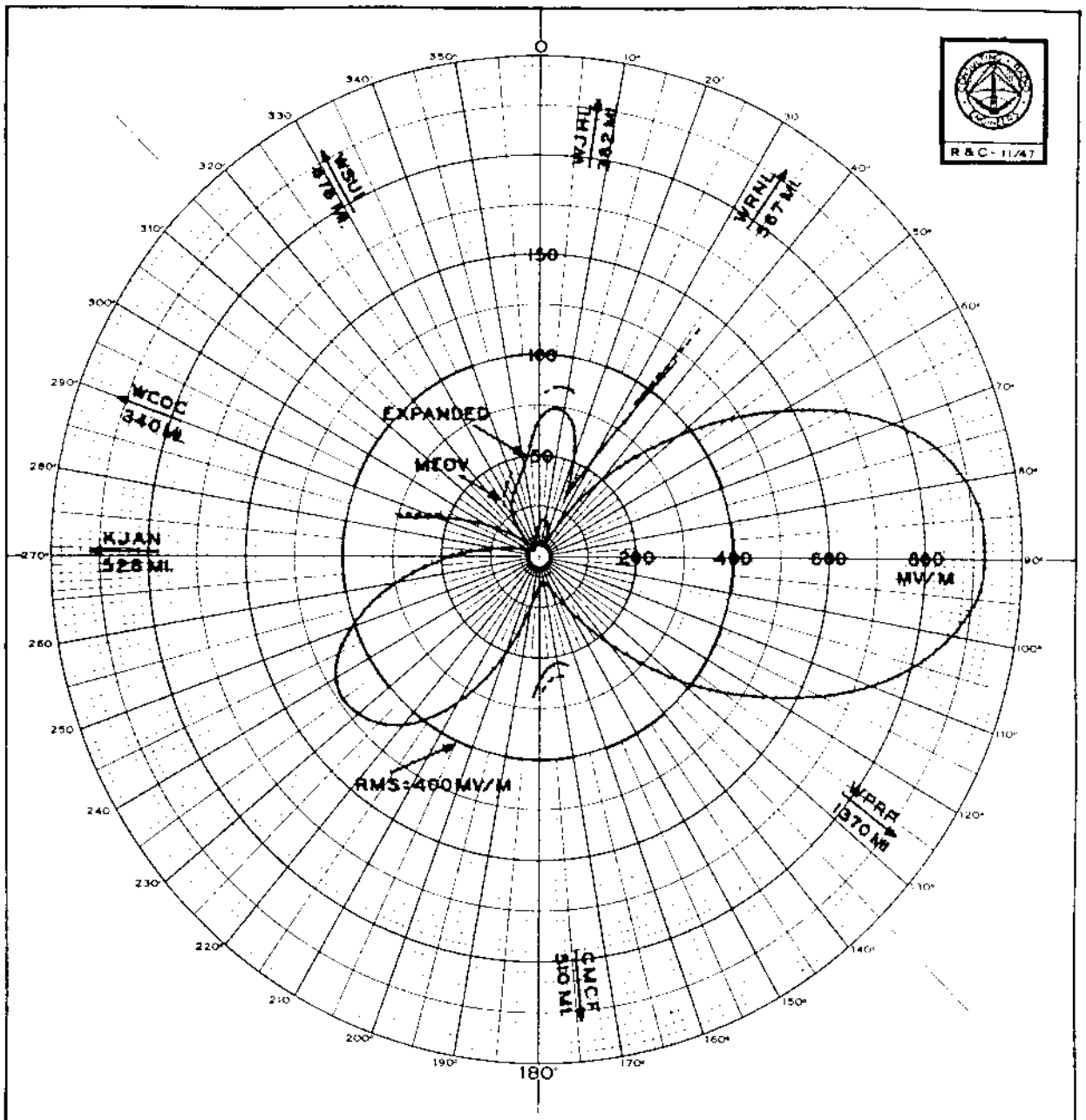
PAT. NO. 410301
SUPER. 400500

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

WFDF 910


PAGE & DAVIS
Consulting Radio Engineers
WASHINGTON, D. C.
WFDF 910
July 1941
N
0
30
60
90
120
150
180
210
240
270
300
330
400
200
40
80
MV/M
MV/M
CBO 525 MI.
WGBI 422 MI.
WRNI 500 MI.
WJHL 470 MI.
WSUI 410 MI.
R.M.S.= 202 MV/M
F0 57°
63°
H=255'
1.641 F0 201.55°
63°
F90°
WFDF, FLINT, MICHIGAN
MEASURED HORIZONTAL PLANE PATTERN
FOR ONE KILOWATT OPERATION
UNATTENUATED FIELD AT ONE MILE
910 KILOCYCLES
Night
OA-2
KEUFFEL & ESSER CO., N. Y. NO. 343A
POLAR CO-ORDINATE

WGAF
VALDOSTA, GA.
910



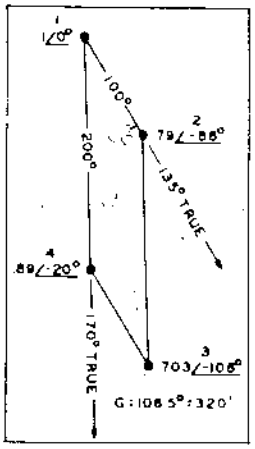
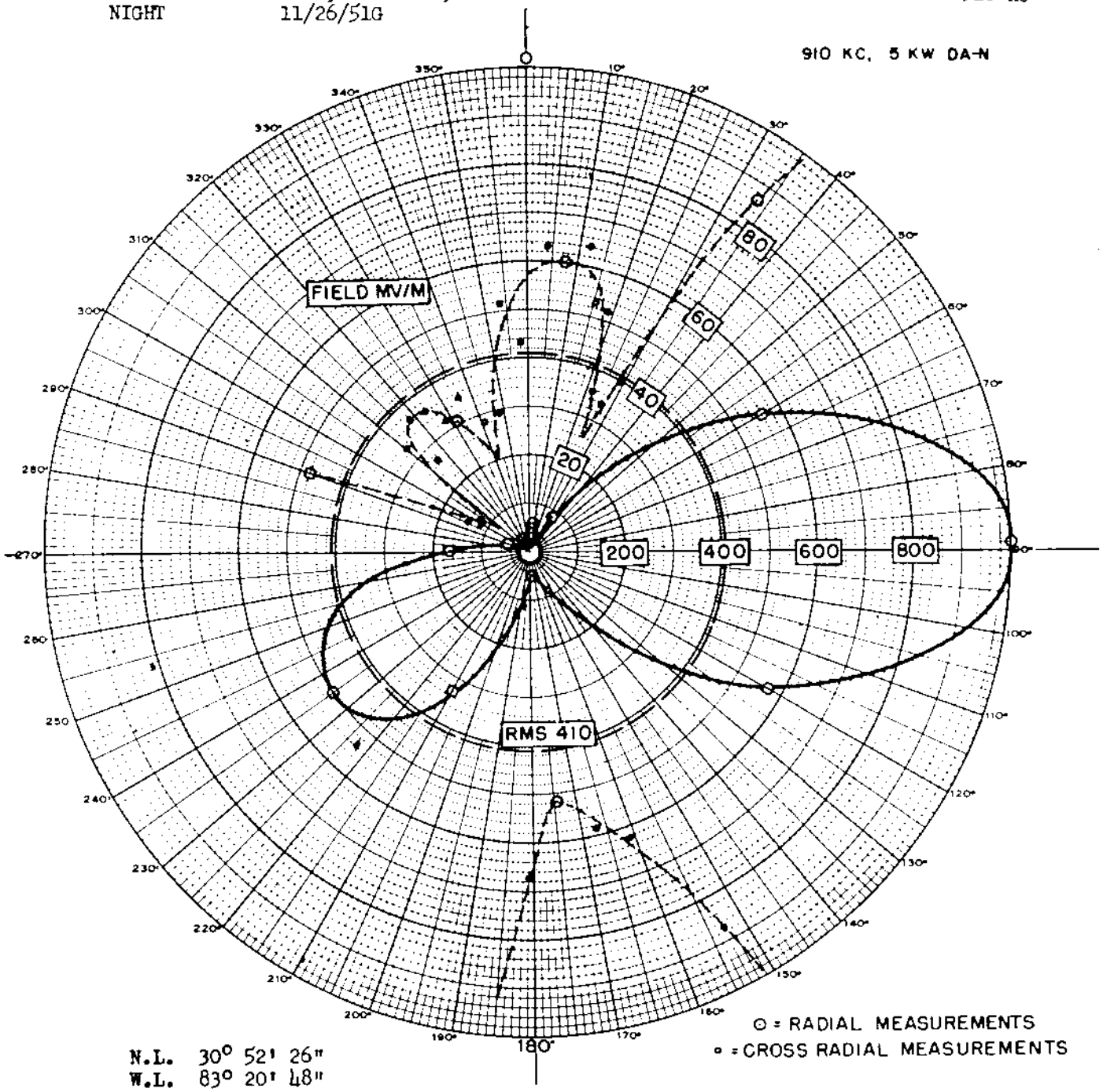


FIG. 1-C		
PROPOSED		
HORIZONTAL PLANE PATTERN		
NEW STATION		VALDOSTA, GA.
910 KC	5KW-U	DA-N
RING & CLARK		
CONSULTING RADIO ENGINEERS		
WASHINGTON D.C.		

WGAF

MEASURED WGAF, VALDOSTA, GA. 5 KW, U, DA-N 910 KC
NIGHT 11/26/51G



N.L. 30° 52' 26"
W.L. 83° 20' 48"

STATION WGAF VALDOSTA, GEORGIA	Figure 5 B Series C511023 910 KC 5000 WATTS DA-N
MEASURED DIRECTIONAL ANTENNA PATTERN	McINTOSH & INGLIS *Consulting Radio Engineers* Washington, D.C.

APPL RECD 10/29/51 BL-4586 WGAF, VALDOSTA, GA. 910 KC

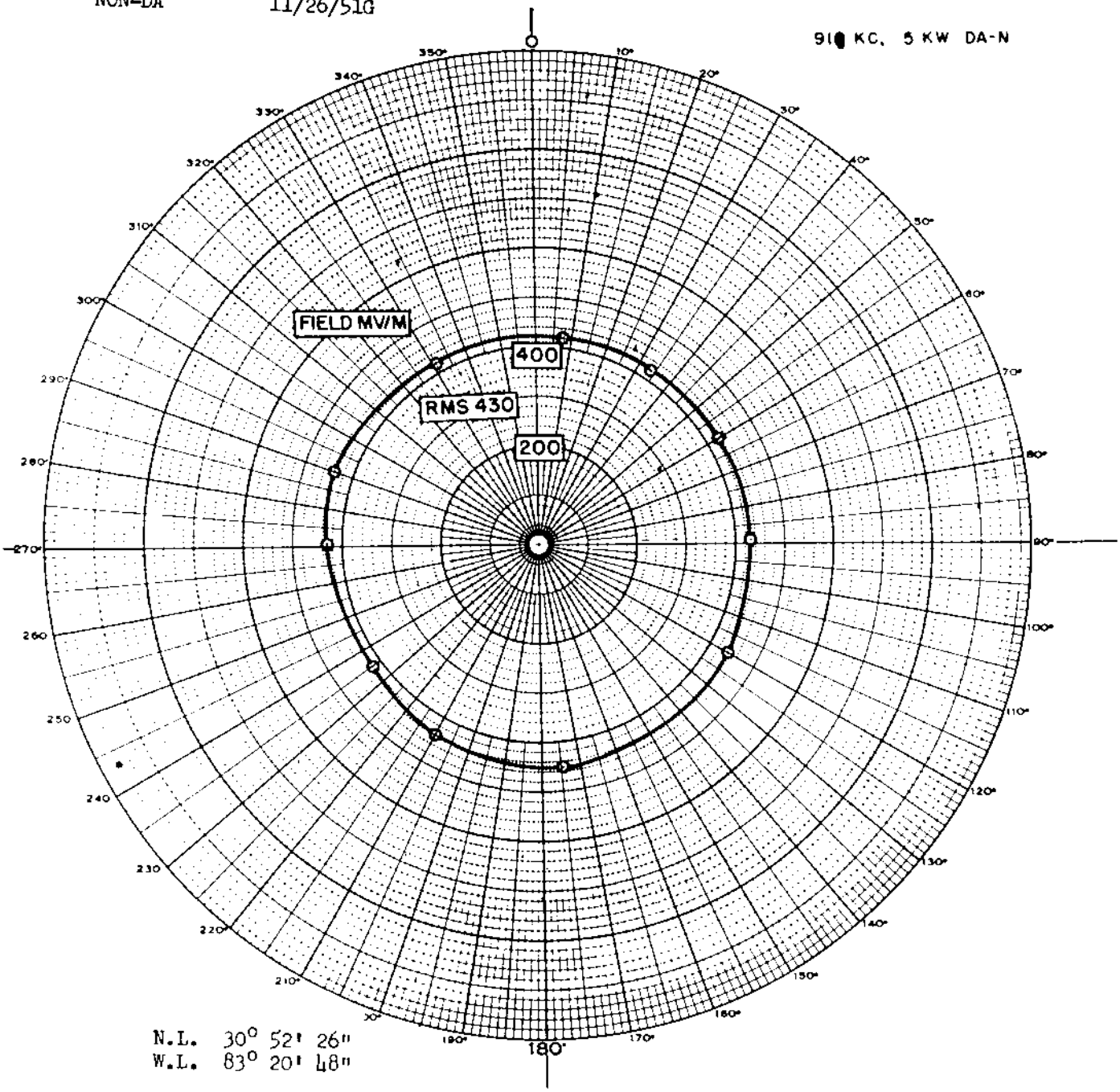
WGAF

MEASURED
NON-DA

WGAF, VALDOSTA, GA.
11/26/51G

5 KW, U, DA-N

910 KC



STATION WGAF VALDOSTA, GEORGIA	Figure 5A Series C511023 910 KC 5000 WATTS DA-N
MEASURED NON-DIRECTIONAL ANTENNA PATTERN	McINTOSH & INGLIS *Consulting Radio Engineers* Washington, D.C.

APPL RECD 10/29/51 BL-4586

WGAF, VALDOSTA, GA.

910 KC

WJCW

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WJCW

Main Studio: Johnson City, Tennessee

Frequency: 910 kHz

Power: 1 kW Night 5 kW Day

Notification List No. 1738

Date: June 23, 1977

Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 36° 24' 37"
West Longitude: 82° 27' 13"

ANTENNA CHARACTERISTICS

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

TOWER:	NW(#1)	C(#2)	S(#3)
HEIGHT ABOVE INSULATORS:	390'	390'	390' (130°)
PHASING:	0.0°	+212.7°	+62.0°
FIELD RATIO:	1.000	1.835	1.623

SPACING AND ORIENTATION: Towers #1, and #3 are spaced 510' (169.7°) on a line bearing 148° true. From the midpoint between towers #1 and #3, tower #2 is spaced 21.4' (7.14°) on a line bearing 12.94° true.

GROUND SYSTEM: 120-270' equally spaced copper radials plus a 40' square ground screen about each tower. Radials are shortened and bond to transverse straps along intersections between towers. Cente of system are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS
Day	462 mv/m
Night	221 mv/m

Note: Please retain the Nighttime directional antenna radiation pattern notified for Station WJCW in United States Change List Number 1648

(Cont'd)

WJCW

dated September 5, 1975 and attach to this Revised Description Sheet. This notification conerns only a change in the Daytime operation of the station with Nighttime operation continued as previously notified.

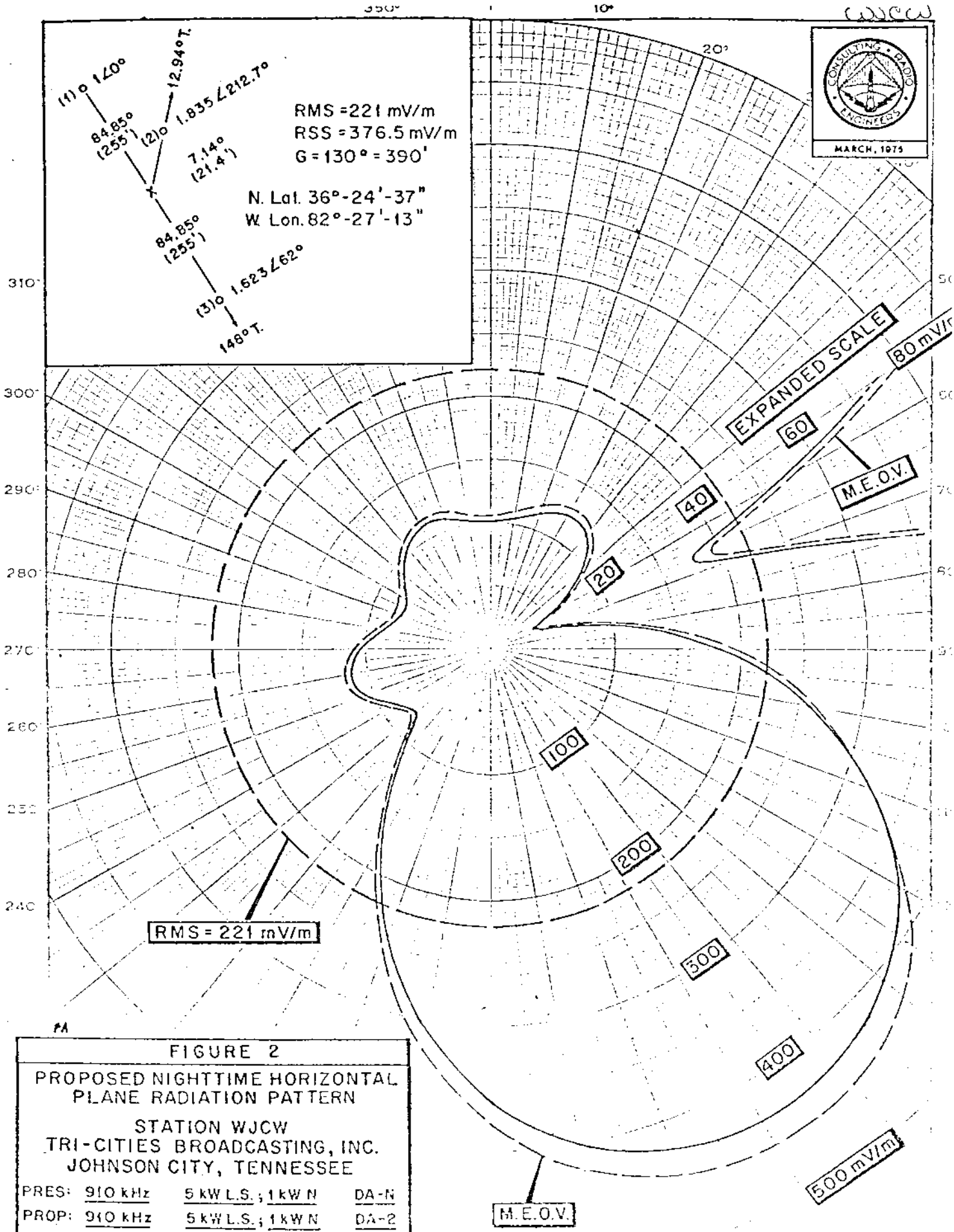


FIGURE 2

PROPOSED NIGHTTIME HORIZONTAL PLANE RADIATION PATTERN

STATION WJCW
TRI-CITIES BROADCASTING, INC.
JOHNSON CITY, TENNESSEE

PRES:	910 kHz	5 kW L.S.; 1 kW N	DA-N
PROP:	910 kHz	5 kW L.S.; 1 kW N	DA-2

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

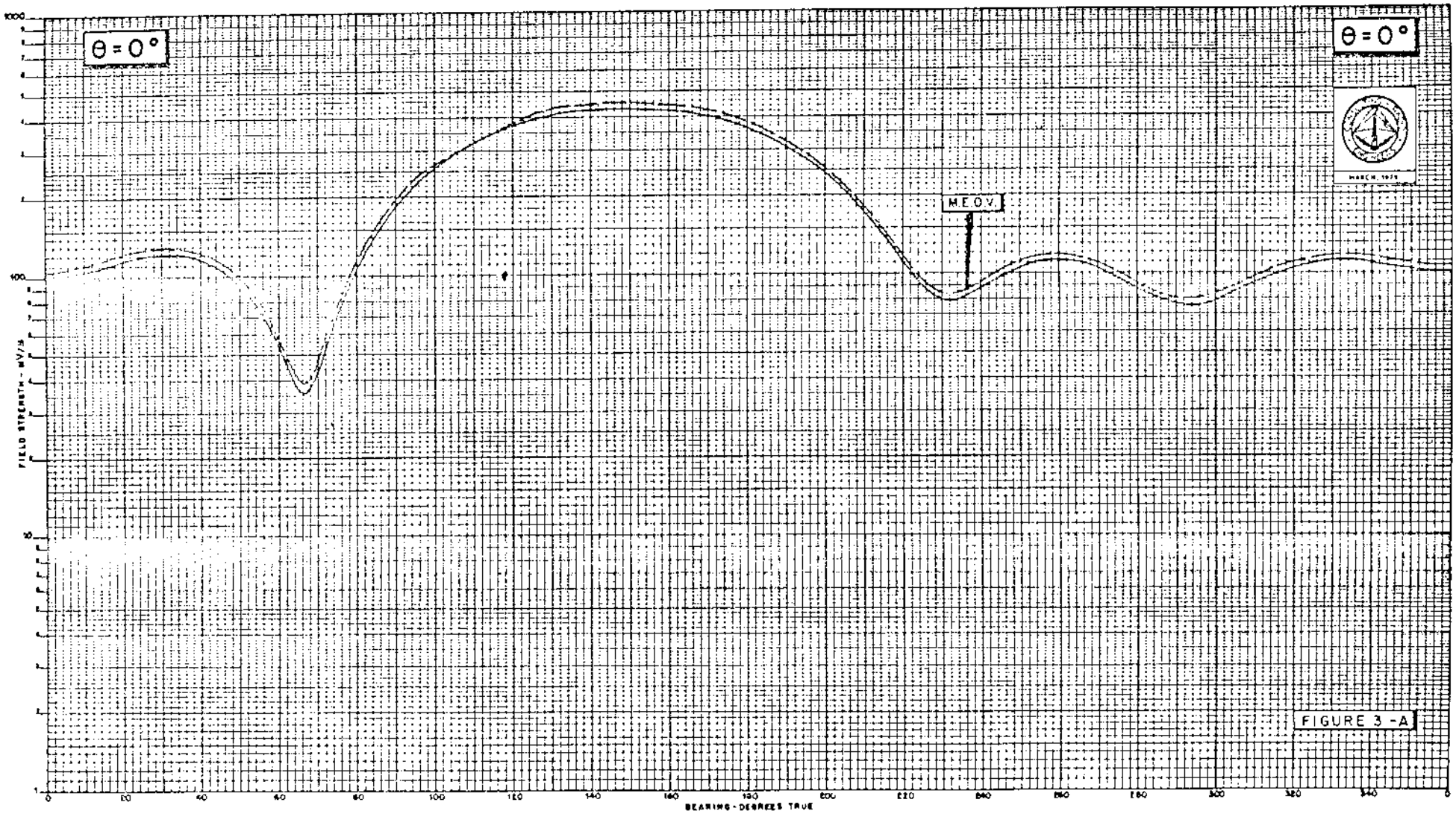

θ = 0°
θ = 0°
M.E.O.V.
FIELD STRENGTH - μV/m
1000
100
10
1
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0
BEARING - DEGREES TRUE

FIGURE 3 -A

WLAS

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station	: WLAS	Main Studio:	Jacksonville, North Carolina
Frequency	: 910 KHz	Power	: 5 kW Night 5kW Day
Notification	: 1780	Date	: Sept. 28, 1979 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude:	34	47	31
West Longitude:	77	29	40

Predicted Daytime Nighttime effective field (omnidirectional): 425 mV/m at rated power.

ANTENNA CHARACTERISTICS

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

TOWER :	SE(#1)	C(#2)	NW(#3)			
HEIGHT ABOVE INSULATORS :	270'	310'	(103.2°)	270'	(89.9°)	
PHASING :	0°	+129°	-102°			
FIELD RATIO :	1.0	1.6038	1.81			

SPACING AND ORIENTATION : Adjacent towers in a row are spaced 270' (89.9°) on a line bearing 294.5° true.

GROUND SYSTEM : 120 - 270 equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse tstrap along intersections between towers.

WLAS

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL
Night	RMS
	424 mV/m

Note: Please retain the Nighttime vertical section directional antenna radiation patterns notified for Station WLAS in United States Change List Number 1564 dated January 23, 1974 and attach to this Revised Description Sheet and Nighttime horizontal.

WLAS

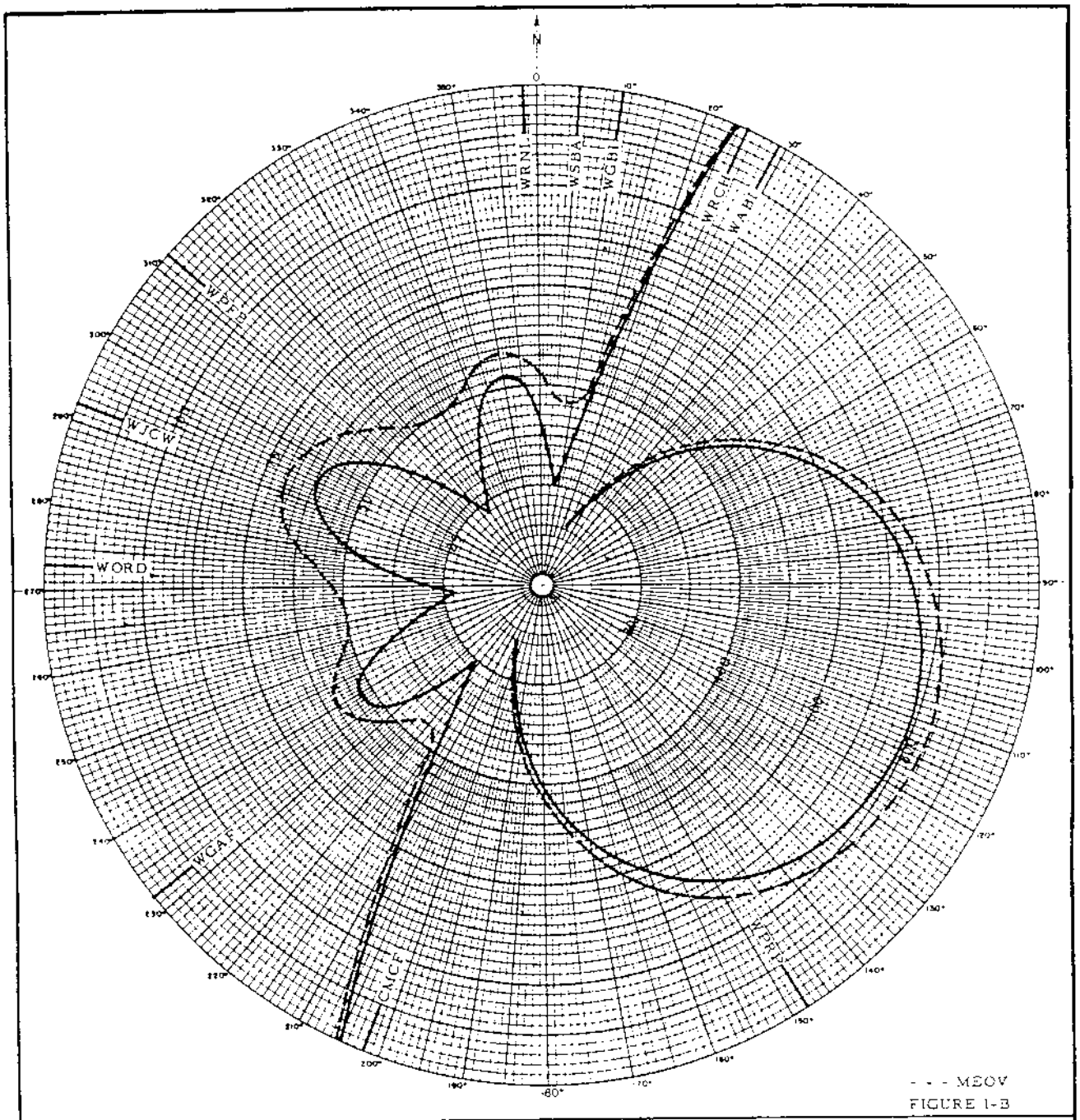
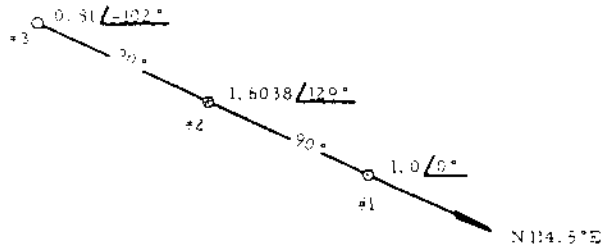


FIGURE 1-B

HORIZONTAL RADIATION PATTERN



G1 270° 100°
G2 310° 103°
G3 270° 10°

APPLICANT	Radio Station WLAS
LOCATION	Jacksonville, N. C.
FREQUENCY	910 KC/S
POWER	5 KW
LATITUDE	34 DEG. 47 MIN 31 SEC
LONGITUDE	77 DEG 29 MIN 40 SEC
WHEN USED	Nighttime
RMS FIELD	424 MV/M
DATE	November 1978

ROBERT L. PURGELL

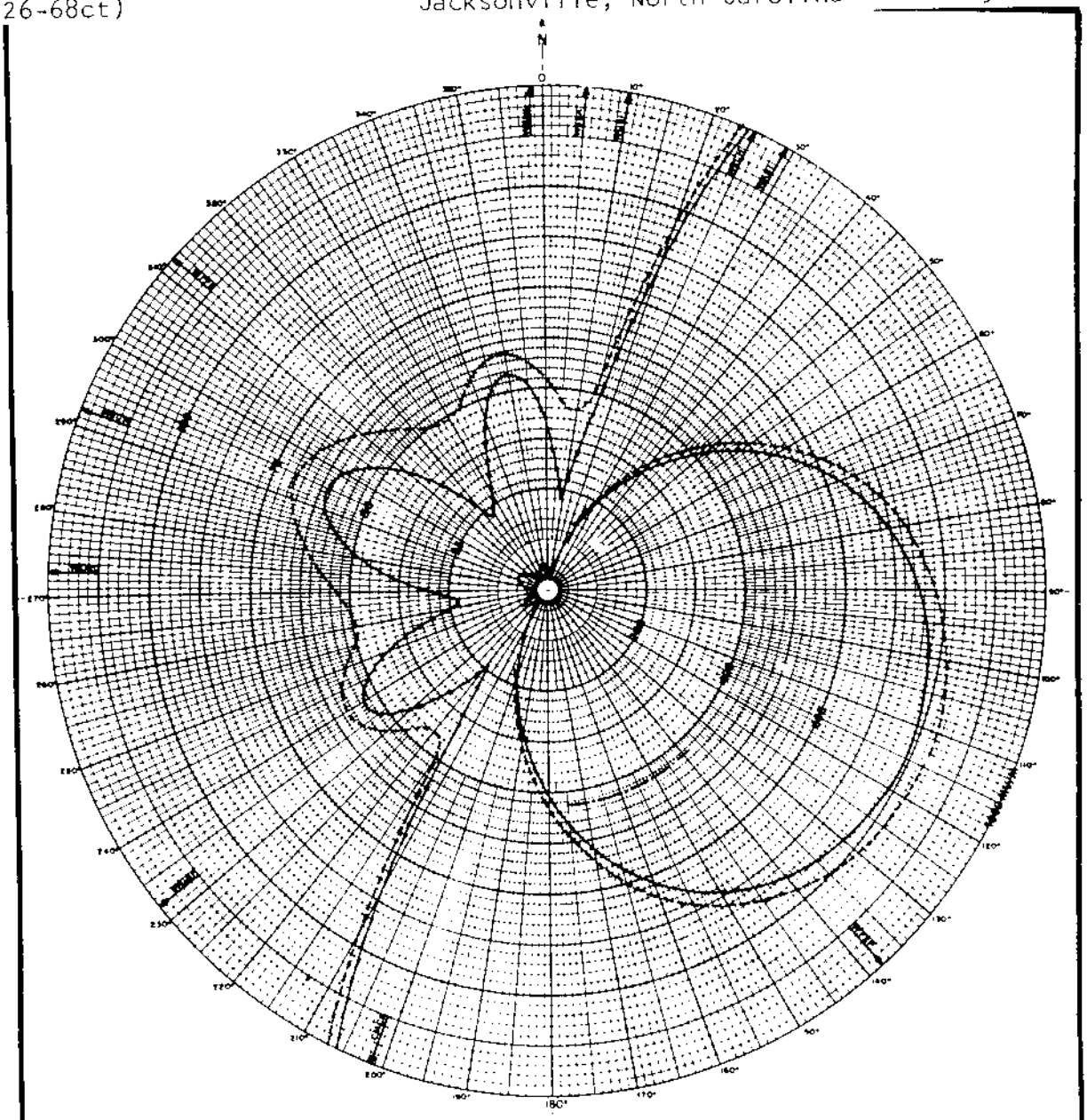
WASHINGTON, D. C.

WLAS

Proposed Night
(9-26-68ct)

Station WLAS
Jacksonville, North Carolina

5kw, DA-N, U
910 kc



LATITUDE: 34° 47' 31"

LONGITUDE: 77° 29' 40"

L. J. N. du Treil & Associates, Inc.
CONSULTING RADIO ENGINEERS
201 Nelson Drive
NEW ORLEANS, LA 70123

ANTENNA PARAMETERS

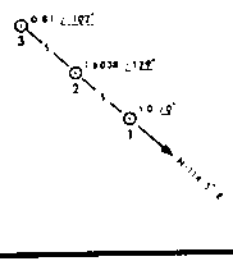


FIGURE 4

PROPOSED NIGHTTIME
DIRECTIONAL PATTERN

RADIO STATION WLAS
JACKSONVILLE, NORTH CAROLINA

910 KHZ 5 KW, DA-N, U

FCC File No.BP-18203
Accepted 9-4-68

Station WLAS
Jacksonville, North Carolina

910 kc

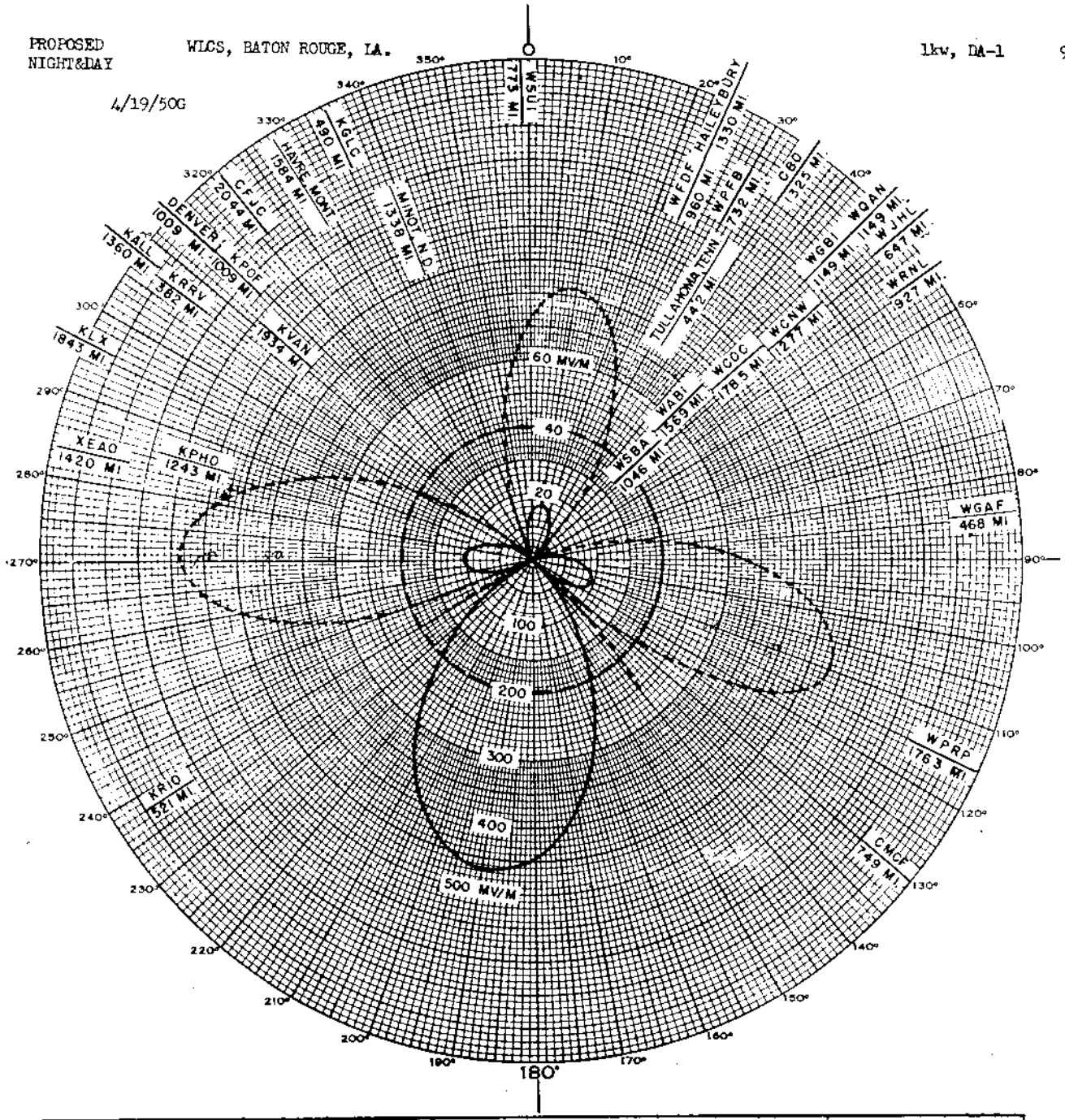
WLCS

PROPOSED
NIGHT&DAY

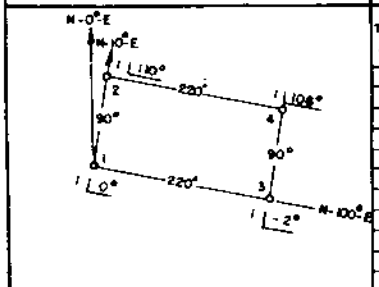
WLCS, BATON ROUGE, LA.

1kw, DA-1 910 kc

4/19/50G



TOWER PLACEMENT SKETCH



PATTERN PARAMETERS

TOWER No.	ELECTRICAL HEIGHT θ°	TRUE TOWER ORIENTATION θ°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV. ANGLE θ°	ELEVATION RMS FIELD mv/m E_θ
1	90	10	0	0		1	0	179
2	90	10	90	110		1	10	
3	90	100	220	-2		1	20	
4	90	100	238	108		1	30	
5							40	
6							50	
7							60	
8							70	
9							80	
10							E_θ°	mv/m
							P_θ°	kw

DAYTIME OPERATION ☐ NIGHTTIME OPERATION ☐

STATION DATA

CALL	WLCS
FREQUENCY	910 kc
POWER	1 kw
TIME OF OPERATION	U
TYPE OF OPERATION	DA-1
DAYTIME TOWERS	1, 2, 3, & 4
NIGHTTIME TOWERS	1, 2, 3, & 4
No. RADIALS PER TOWER	120
LENGTH OF RADIALS	90 + 270 ft
GROUND SCREEN DIMENSION	48 SQ.
LAT.	30° 34' 48"
LONG.	91° 07' 50"
SUPERSEDES	490926
PATTERN No.	500406

Consulting Radio Engineers
DIXIE B. McKEY & ASSOCIATES

RADIO STATION WLCS
BATON ROUGE, LA.

AMENDMENT RECD 4-11-50 ACC 4-14-50 BP-7013

WLCS, Baton Rouge, La. 910 kc

WLCS

Measured Day & Night
(6-28-65ct)

Station WLCS
Baton Rouge, Louisiana

1kw,DA-1,U
910 kc

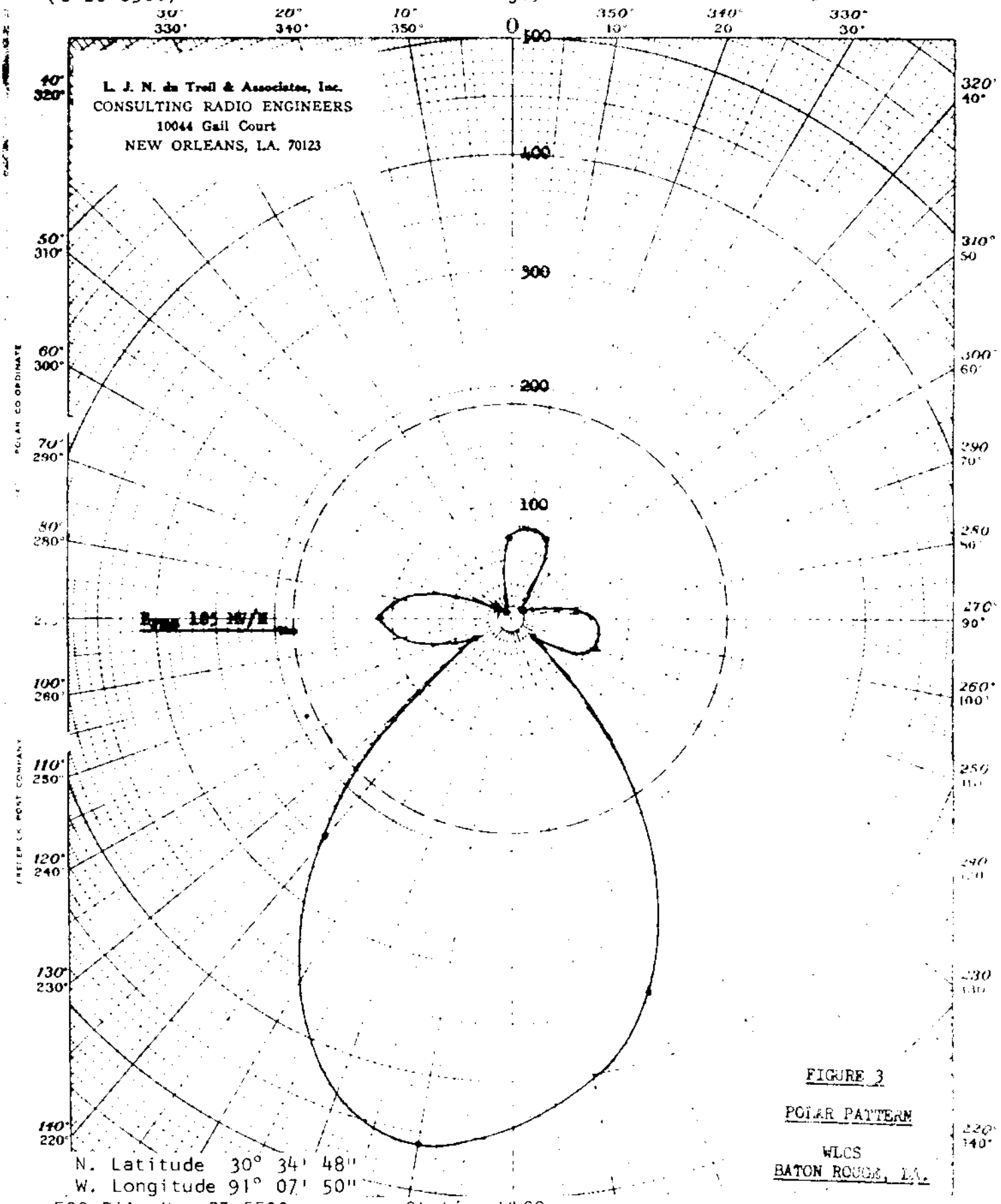


FIGURE 3

POLAR PATTERN

WLCS
BATON ROUGE, LA.

N. Latitude 30° 34' 48"
W. Longitude 91° 07' 50"

FCC File No. BZ-5532
Accepted 6-11-65

Station WLCS
Baton Rouge, Louisiana

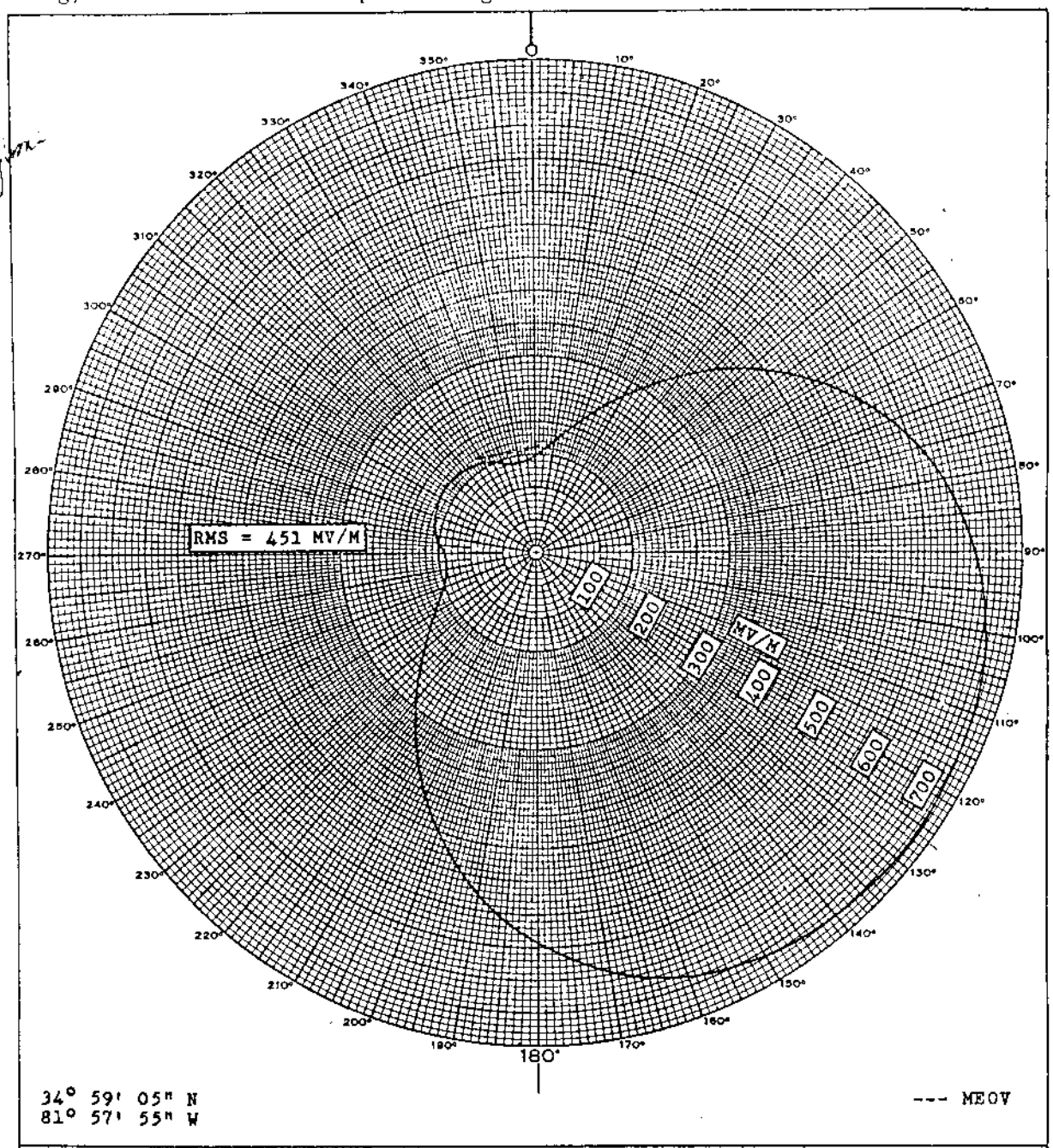
910 kc

WORD

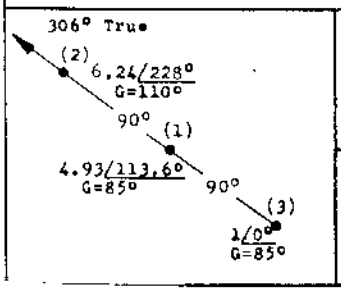
PROPOSED DAY
(5-28-59g)

Station WORD
Spartanburg, South Carolina

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



PROPOSED HORIZONTAL PLANE RADIATION PATTERN, DAYTIME



	WORD, INC. RADIO STATION WORD SPARTANBURG SOUTH CAROLINA	Proposed Operation 910 kc
	Vandivere and Cohen Consulting Electronic Engineers	1 KW, 5 KW-LS DA-2 May, 1959

FCC File No. BP-12537
Accepted 5-15-59 (Amended)

WORD
Spartanburg, South Carolina

910 KC

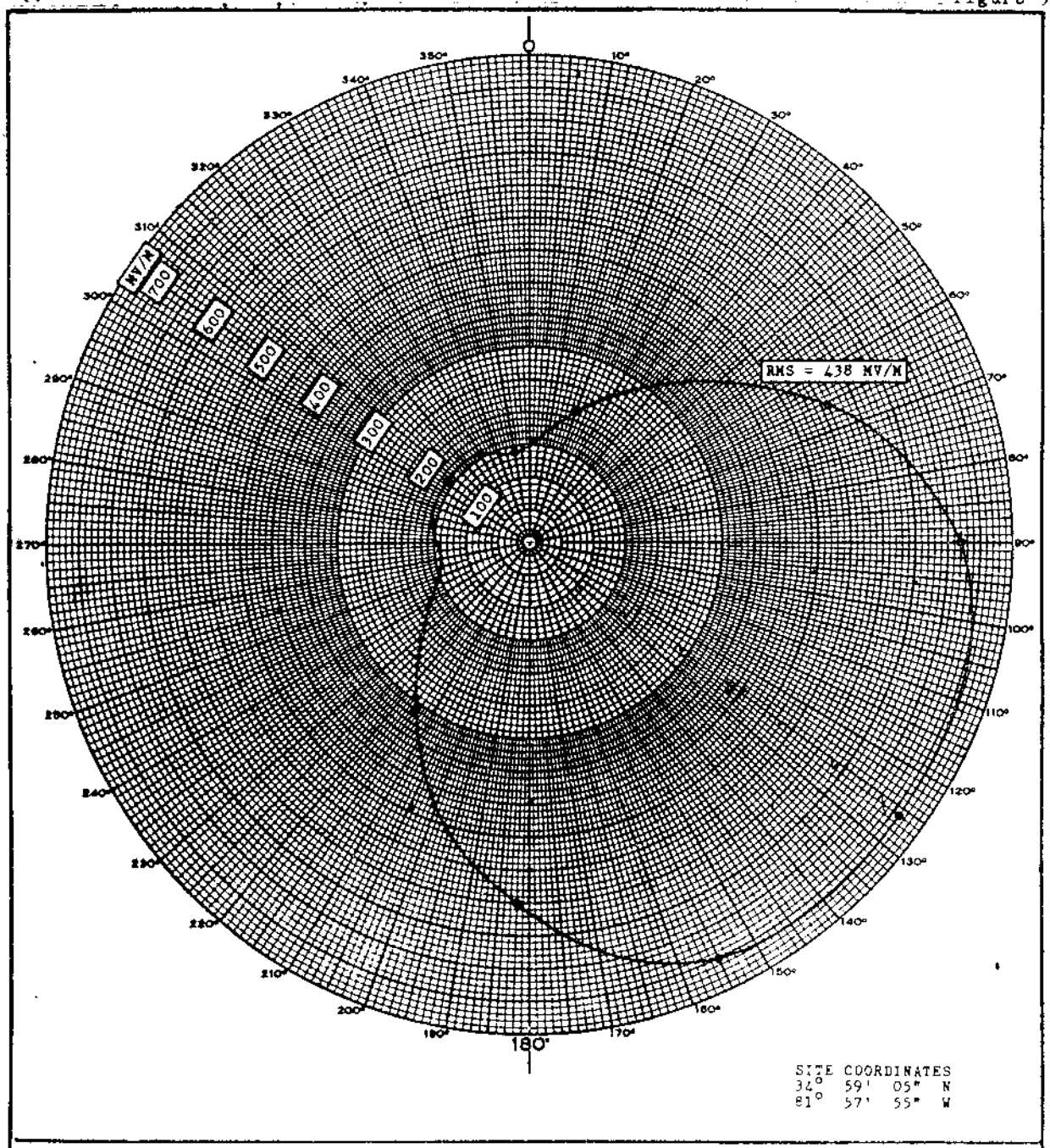
WORD

granted of its sub change in system

MEASURED DAY
(7-26-61ct)

Station WORD 1kw,5kw-LS,DA-2,U
Spartanburg, South Carolina 910 KC

Figure 9



MEASURED DAYTIME DIRECTIONAL HORIZONTAL PLANE RADIATION PATTERN

306°
6.24/228°
G = 110°
(2)
90°
(1)
4.93/113.6°
G = 85°
90°
(3)
1/0°
G = 85°

WORD, INC.
SPARTANBURG, SOUTH CAROLINA

Jules Cohen
Consulting Electronic Engineer

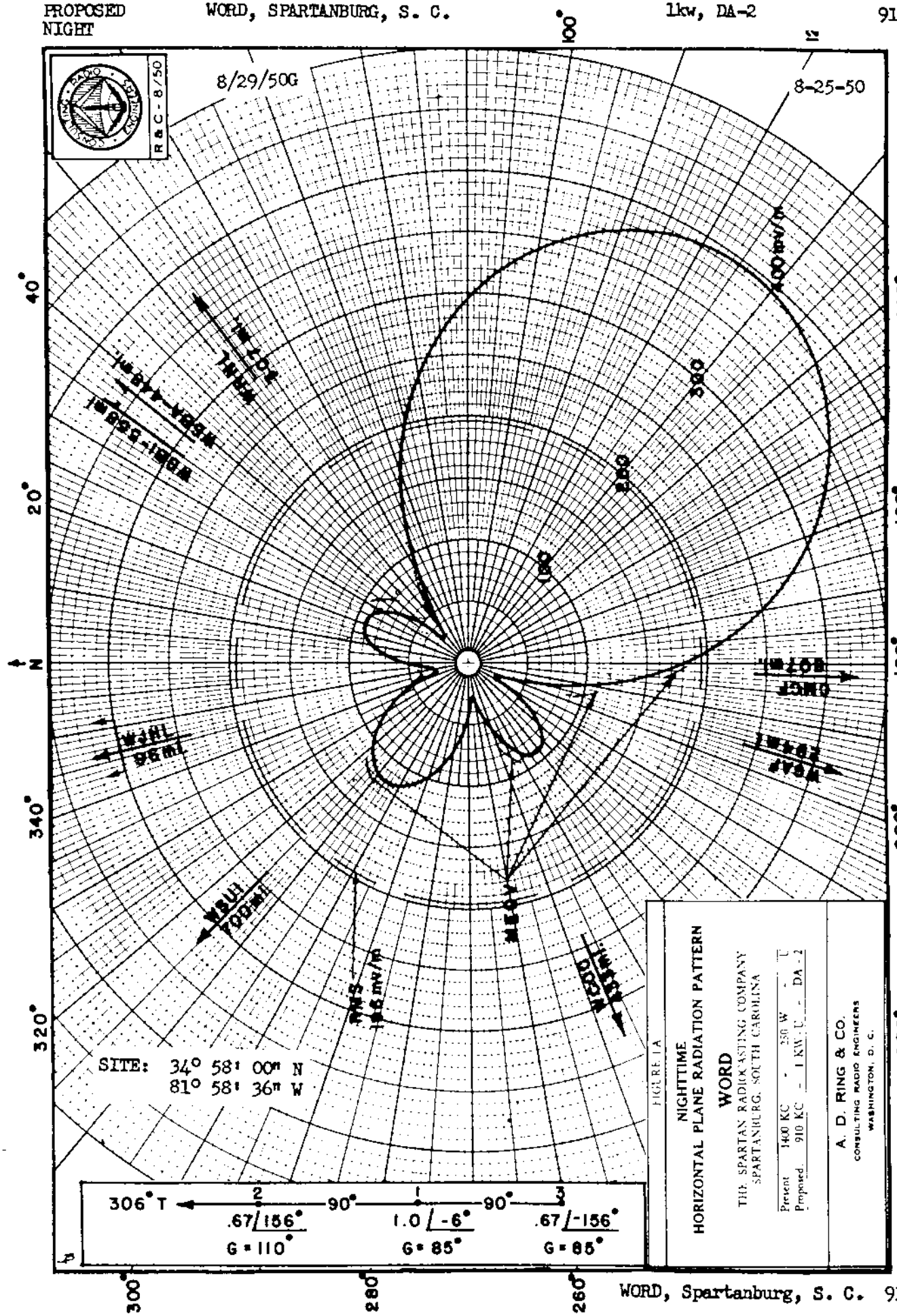
RADIO STATION WORD
910 KC
1 KW, 5 KW-LS U DA-2
Pattern 610406

FCC File No. BL-8378
Accepted 6-26-61

WORD
Spartanburg, South Carolina 910 KC

WORD

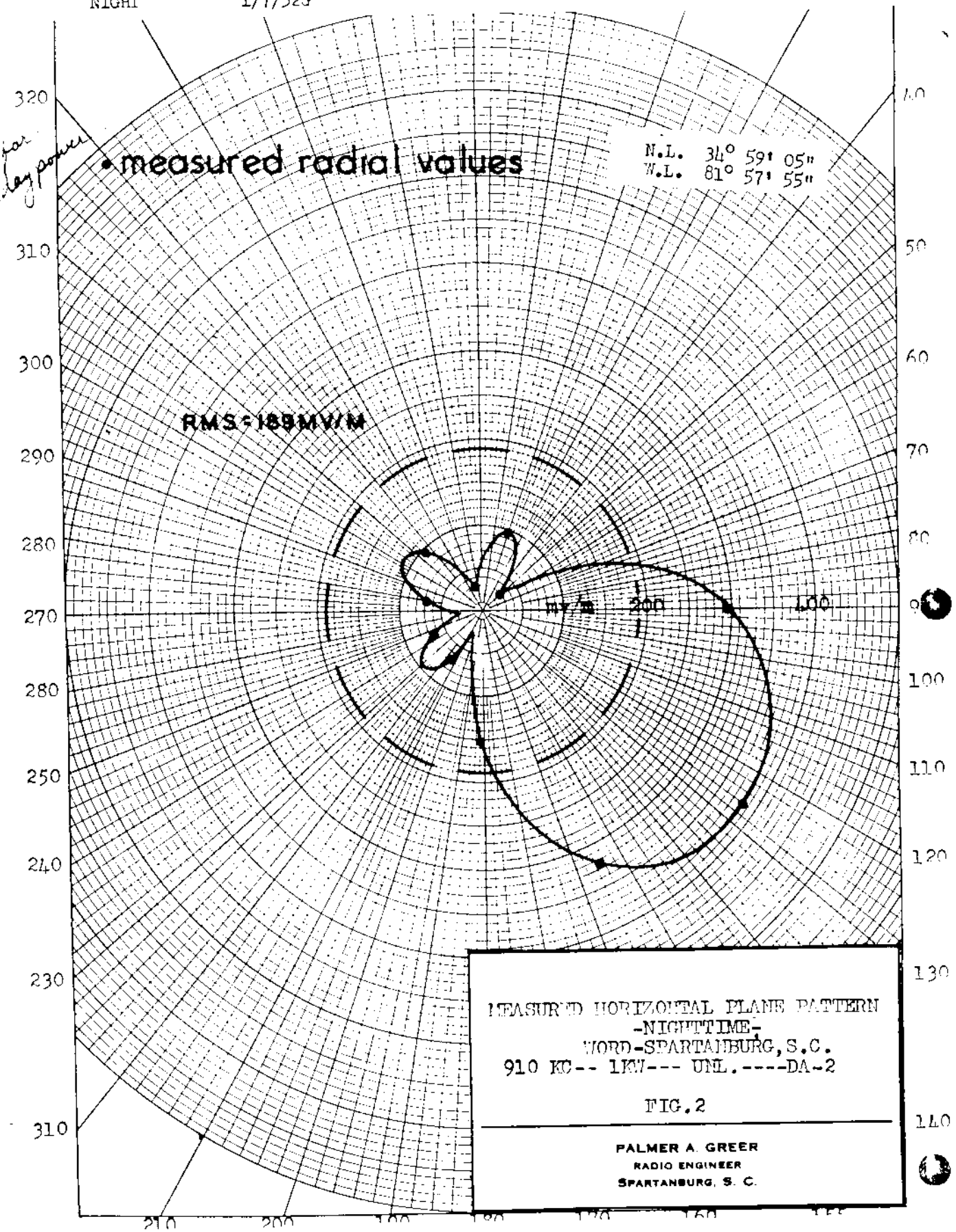
PROPOSED NIGHT — WORD, SPARTANBURG, S. C. — 1kw, DA-2 — 910 kc



WORD, Spartanburg, S. C. 910 kc

WORD

MEASURED NIGHT | WORD, SPARTANBURG, S. C. 1/7/52G | 1 KW, U, DA-2 | 910 KC



MEASURED HORIZONTAL PLANE PATTERN
-NIGHTTIME-
WORD-SPARTANBURG, S.C.
910 KC-- 1KW--- UNL.----DA-2

FIG. 2

PALMER A. GREER
RADIO ENGINEER
SPARTANBURG, S. C.

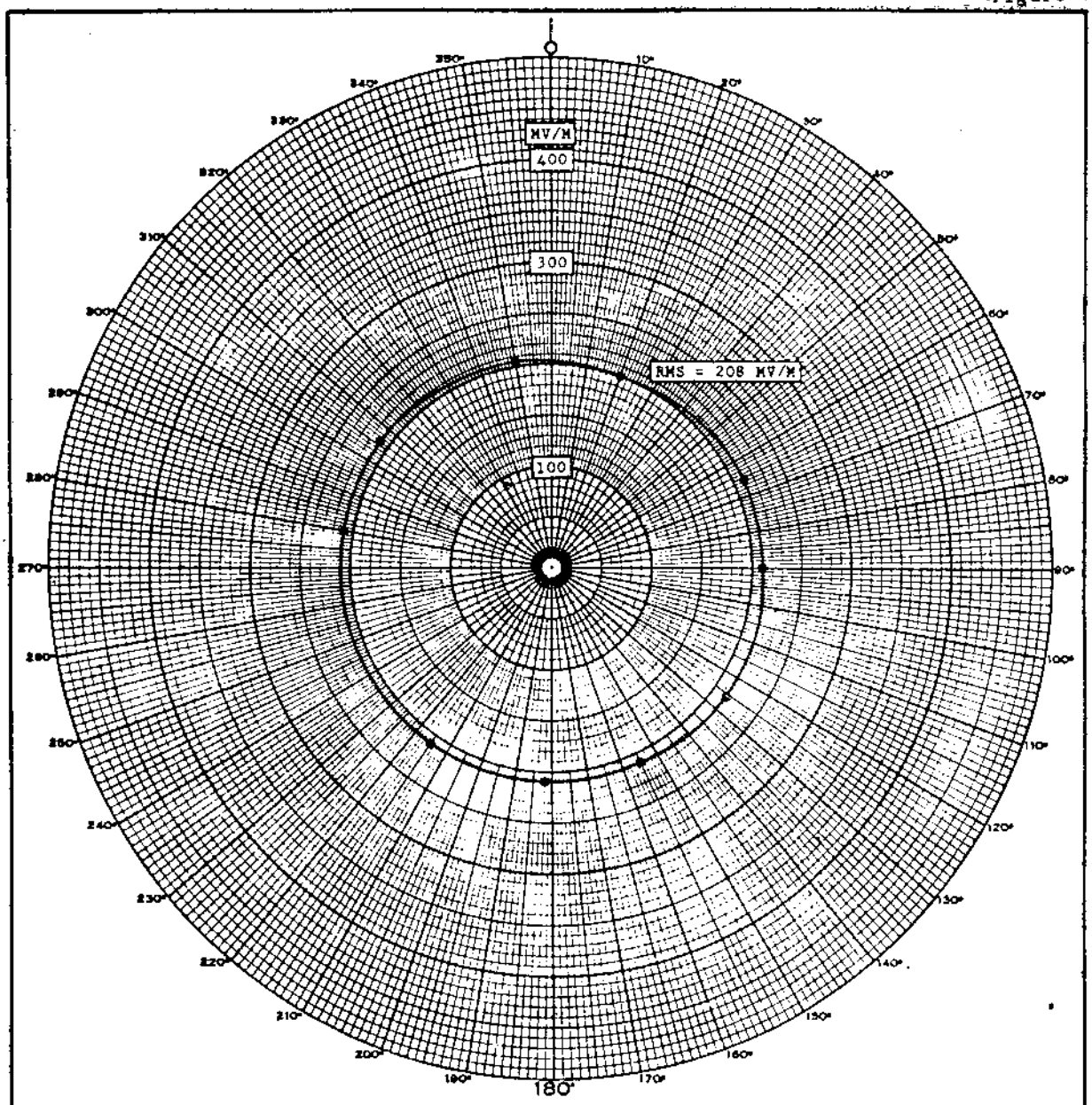
APPL RECD FCC 11/29/51 ACC 12/26/51 BL-4624 WORD, SPARTANBURG, S. C. 910 KC

WORD

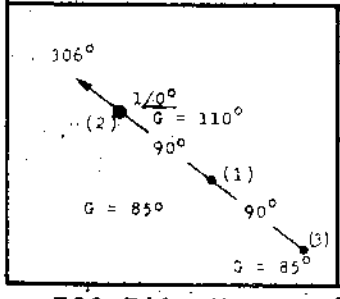
MEASURED NON-DA (7-26-61ct)

Station WORD 1kw,5kw-LS, DA-2,U
Spartanburg, South Carolina 910 KC

Figure 7



MEASURED DAYTIME NONDIRECTIONAL HORIZONTAL PLANE RADIATION PATTERN



WORD, INC.
SPARTANBURG, SOUTH CAROLINA

Jules Cohen
Consulting Electronic Engineer

RADIO STATION WORD
910 KC
1 KW, 5 KW-LS U DA-2
April, 1961

FCC File No. BL-8378
Accepted 6-26-61

WORD
Spartanburg., South Carolina 910 KC

WPLA

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WPLA

Main Studio: Plant City, Florida

Frequency: 910 KHz

Power: 1 Kw Night 1 Kw Day

Notification: 1778

Date: August 30, 1978 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 27° 59' 26"
West Longitude: 82° 12' 31"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-1)
Number of elements: 2
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER	:	S (#1)	N (#2)				
HEIGHT ABOVE INSULATORS	:	270'	270'	(90°)			
PHASING	:	0°	+26.1°				
FIELD RATIO	:	1	0.85				

SPACING AND ORIENTATION : Towers in a row are spaced 642.5' (214°) on a line bearing 345° true.

WPLA

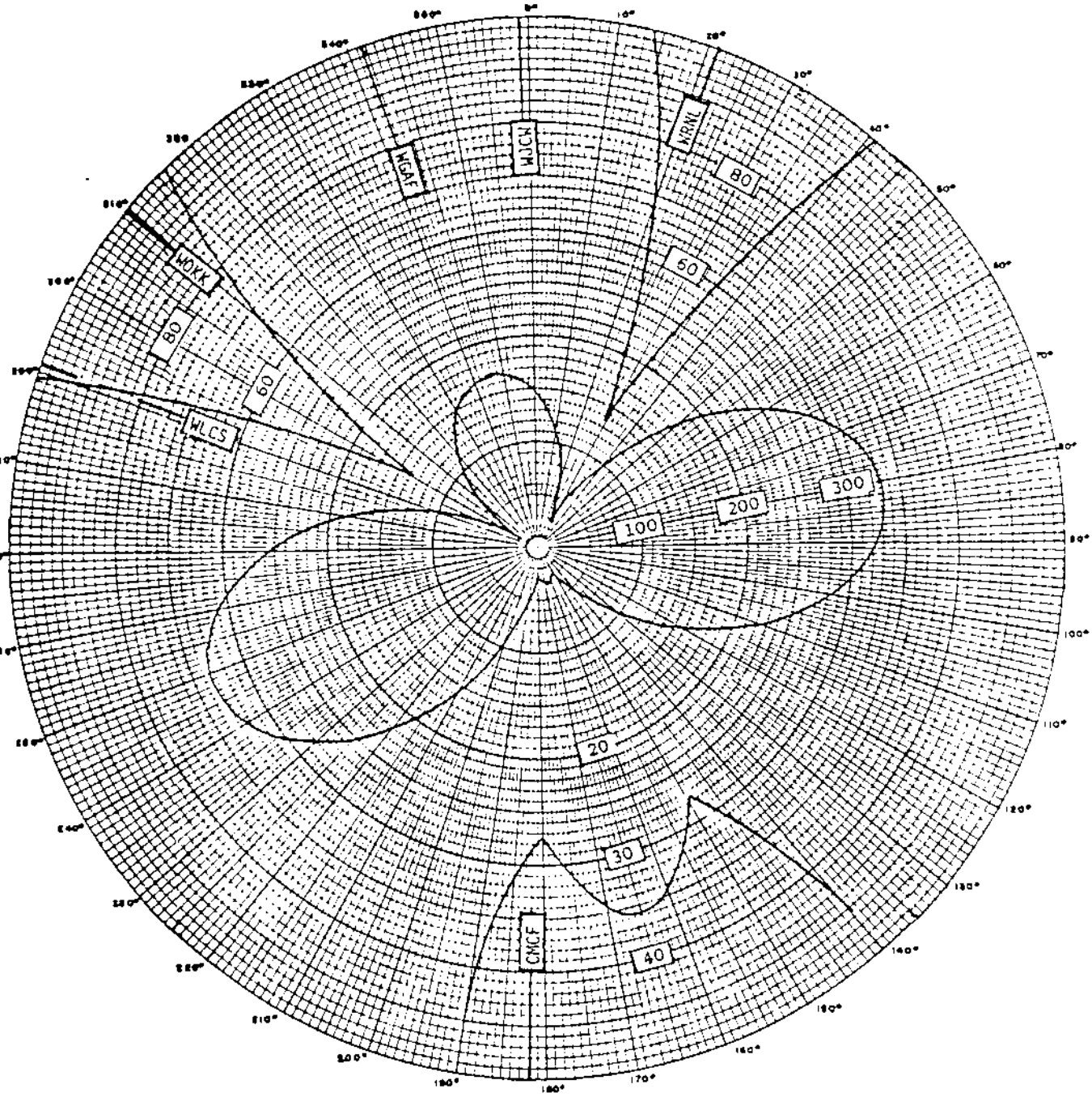
GROUND SYSTEM: 120 - 270' equally spaced copper radials plus 120 - 50' interspaced radials about each tower. Center of system are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
180.75 mv/m	225.11 mv/m	189.89 mv/m
_____ mv/m	_____ mv/m	_____ mv/m

Note: This notification concerns a change in the Daytime operation of the station to use a directional antenna system and to add nighttime operation using the same antenna system. Also a change in transmitter location.

WPLA



STANDARD HORIZONTAL PLANE PATTERN

0.85/26.1°

1/0°

TOWER	AZIMUTH	SPACING	HEIGHT
1	0	0	90°
2	345°	214°	90°

RMS STANDARD	180.75
RMS THEORETICAL	189.89
RSS THEORETICAL	225.11
N. LATITUDE	26° 59' 26"
W. LONGITUDE	80° 12' 31"
DATE	JUNE 10, 1976
SUPERSEDES	

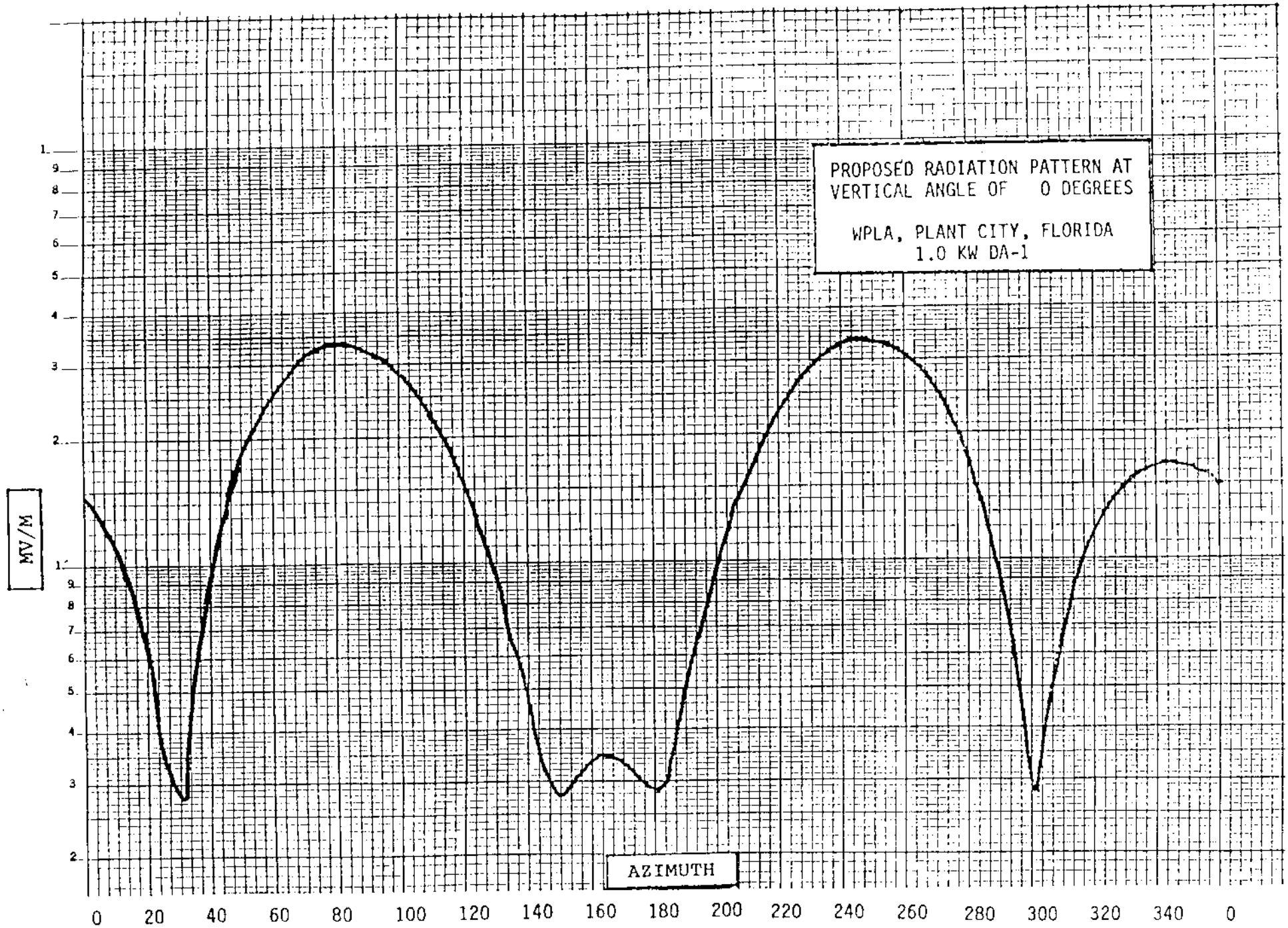
RADIO STATION WPLA

PLANT CITY, FLORIDA

PROPOSED

1.0 KW DA-1 U

JAMES M. JOHNSON & ASSOCIATES
RADIO ENGINEERING
WEST PALM BEACH, FLORIDA


PROPOSED RADIATION PATTERN AT
VERTICAL ANGLE OF 0 DEGREES
WPLA, PLANT CITY, FLORIDA
1.0 KW DA-1
MV/M
AZIMUTH
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 0

WPLA

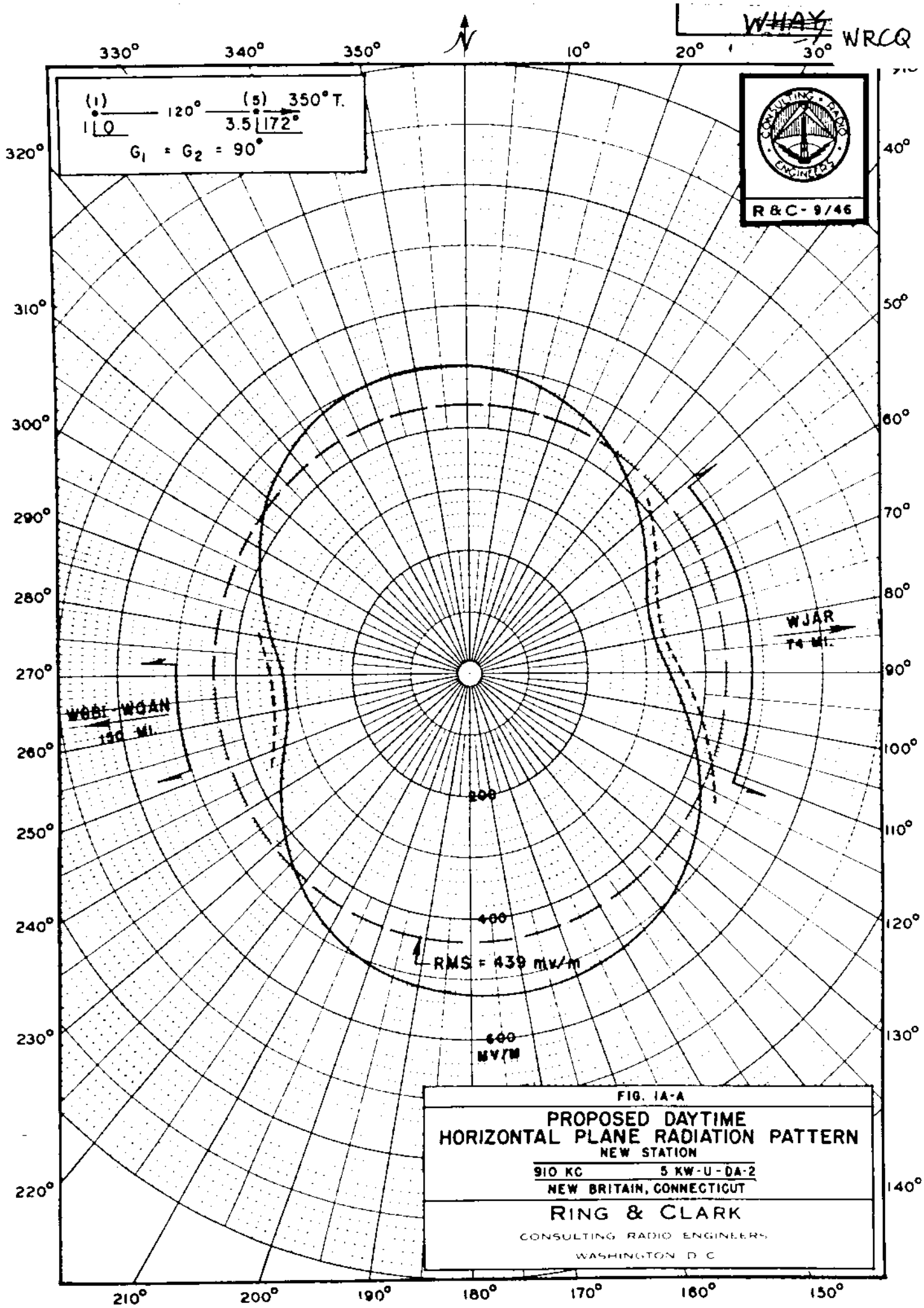


FIG. 1A-A

PROPOSED DAYTIME
HORIZONTAL PLANE RADIATION PATTERN
NEW STATION

910 KC 5 KW-U-DA-2

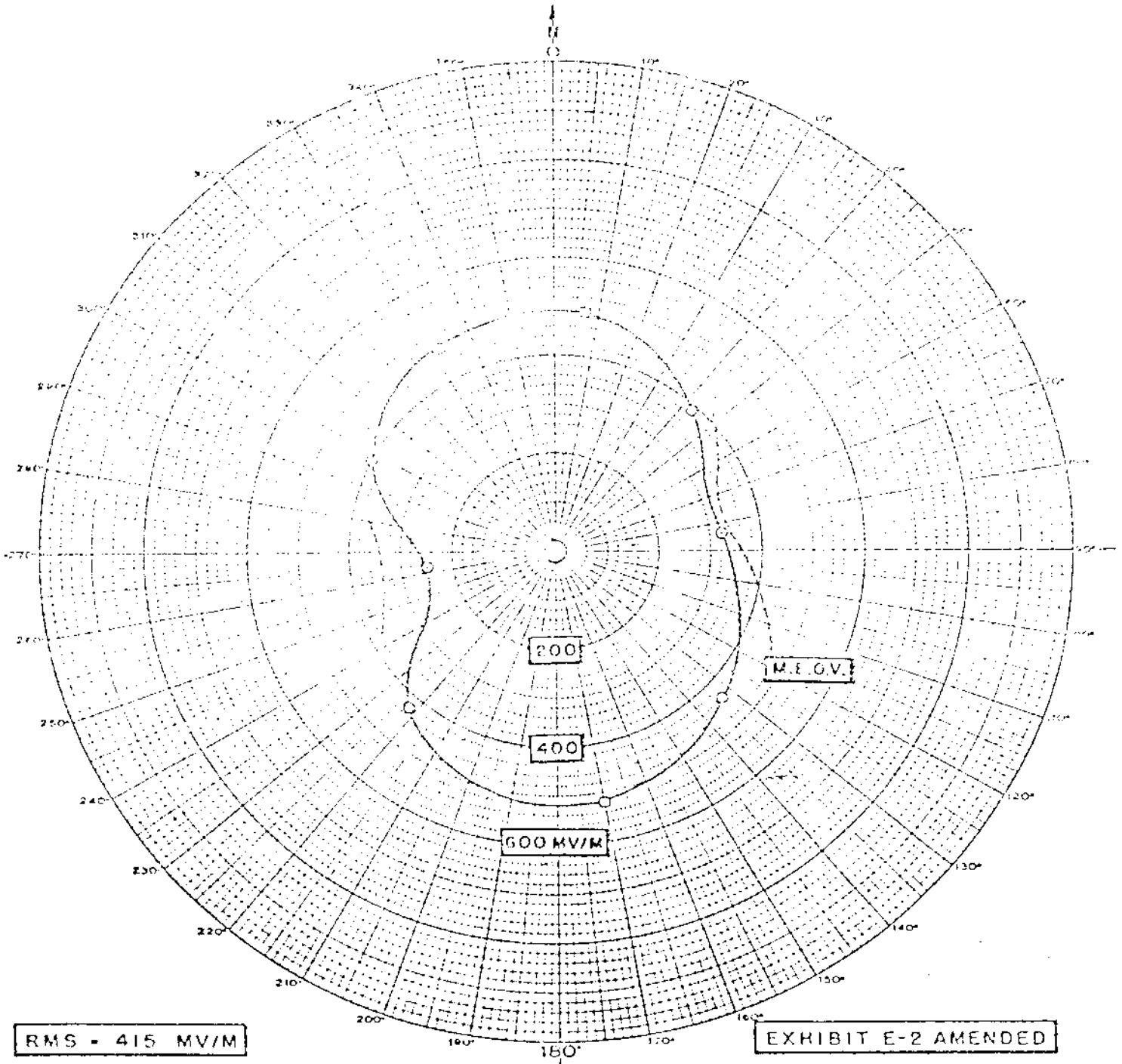
NEW BRITAIN, CONNECTICUT

RING & CLARK

CONSULTING RADIO ENGINEERS

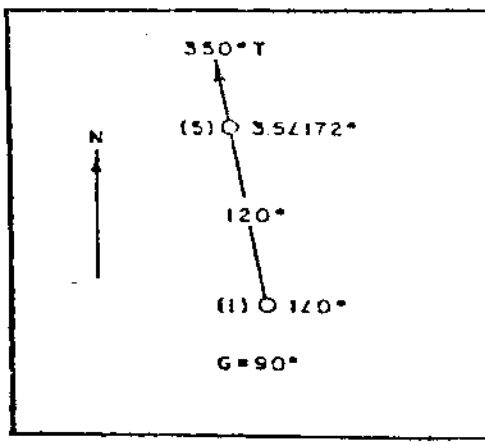
WASHINGTON D. C.

WRCQ



RMS = 415 MV/M

EXHIBIT E-2 AMENDED



LATITUDE 41° 42' 57.5" North
LONGITUDE 72° 48' 38" West

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASE DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG

MEASURED DAYTIME
HORIZONTAL PLANE
RADIATION PATTERN
WRCH
NEW BRITAIN, CONNECTICUT
910 KHZ, 5 KW-U, DA-2
740111

KEAR & KENNEDY ASSOCIATES, INC
Consulting Radio Engineers
WASHINGTON, D. C.

BZ-8564

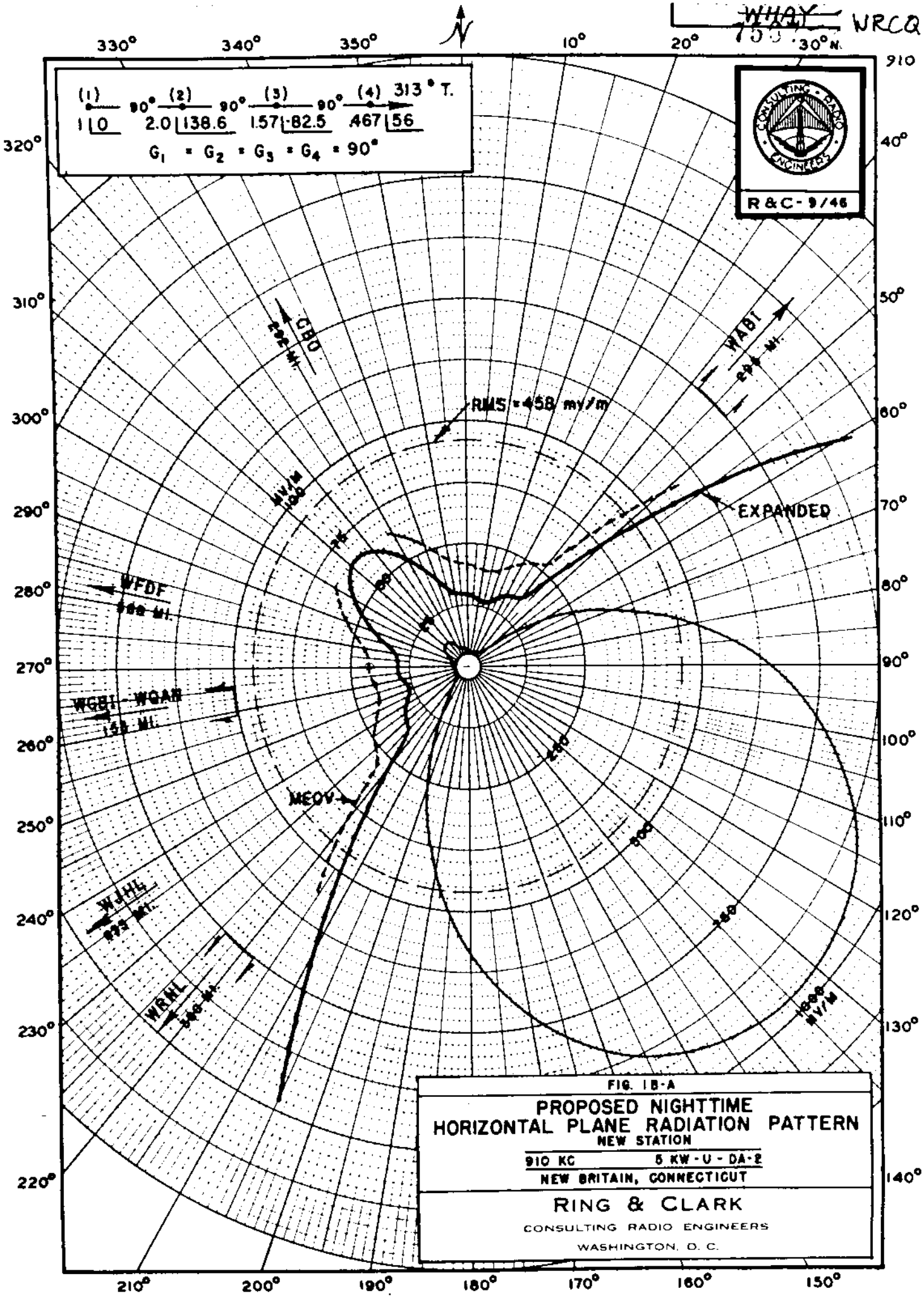


FIG. 1B-A

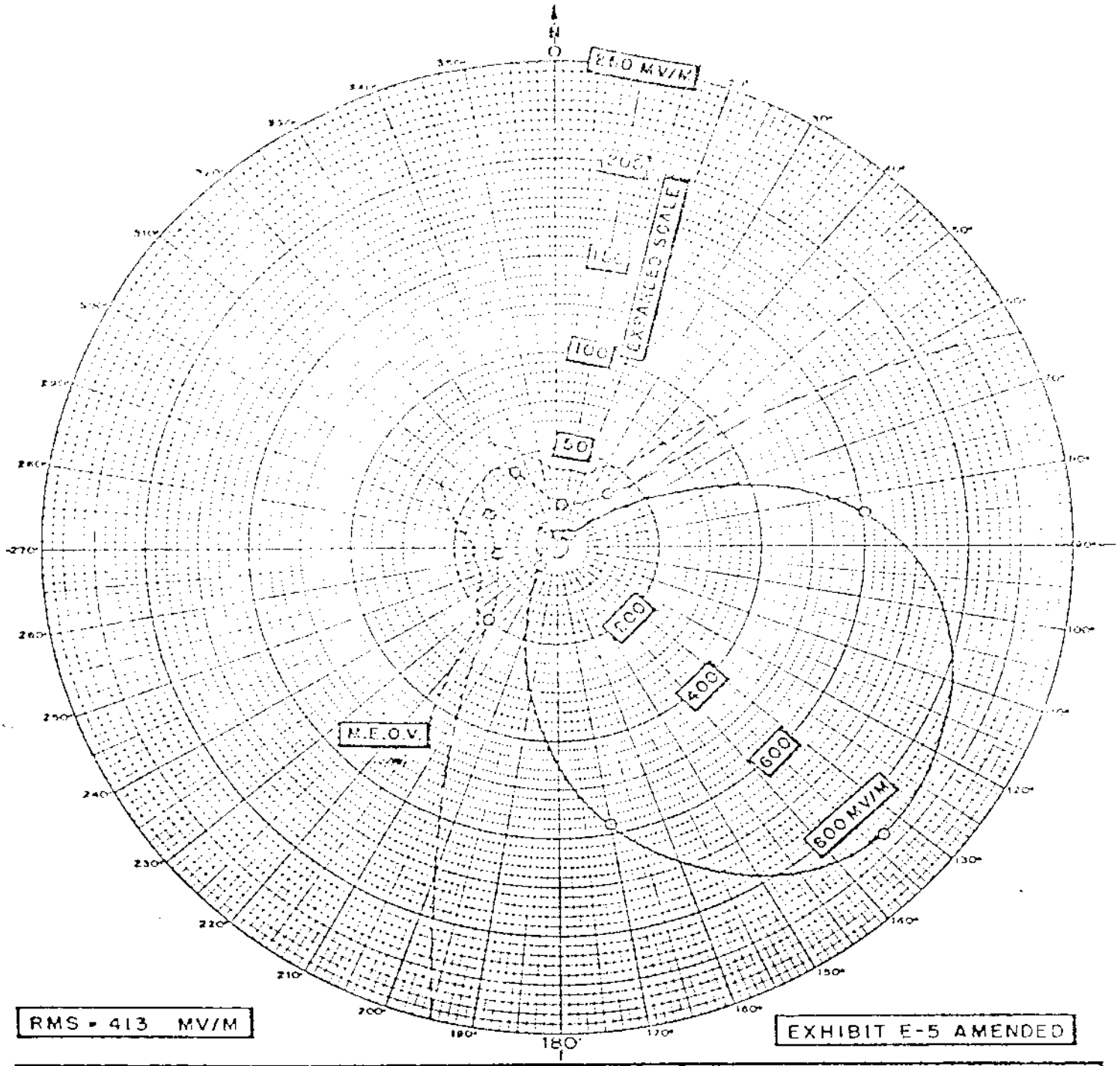
PROPOSED NIGHTTIME
HORIZONTAL PLANE RADIATION PATTERN
NEW STATION

910 KC 5 KW-U-DA-2

NEW BRITAIN, CONNECTICUT

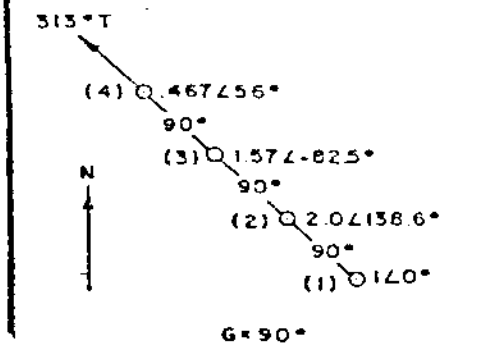
RING & CLARK
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

WRCQ 1



RMS = 413 MV/M

EXHIBIT E-5 AMENDED



LATITUDE 41° 42' 57.5" North
LONGITUDE 72° 48' 38" West

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG

MEASURED NIGHTTIME
HORIZONTAL PLANE
RADIATION PATTERN
WRCH

NEW BRITAIN, CONNECTICUT
910 KHZ, 5 KW-U, DA-2

740111

KEAR & KENNEDY ASSOCIATES, INC
Consulting Radio Engineers
WASHINGTON, D. C.

BZ-8564

WRKL

Measured Day
(12-22-64ct)

Station WRKL
New City, New York

1kw, DA-D, D
910 kc

1-12-65
GRANTED LIC.

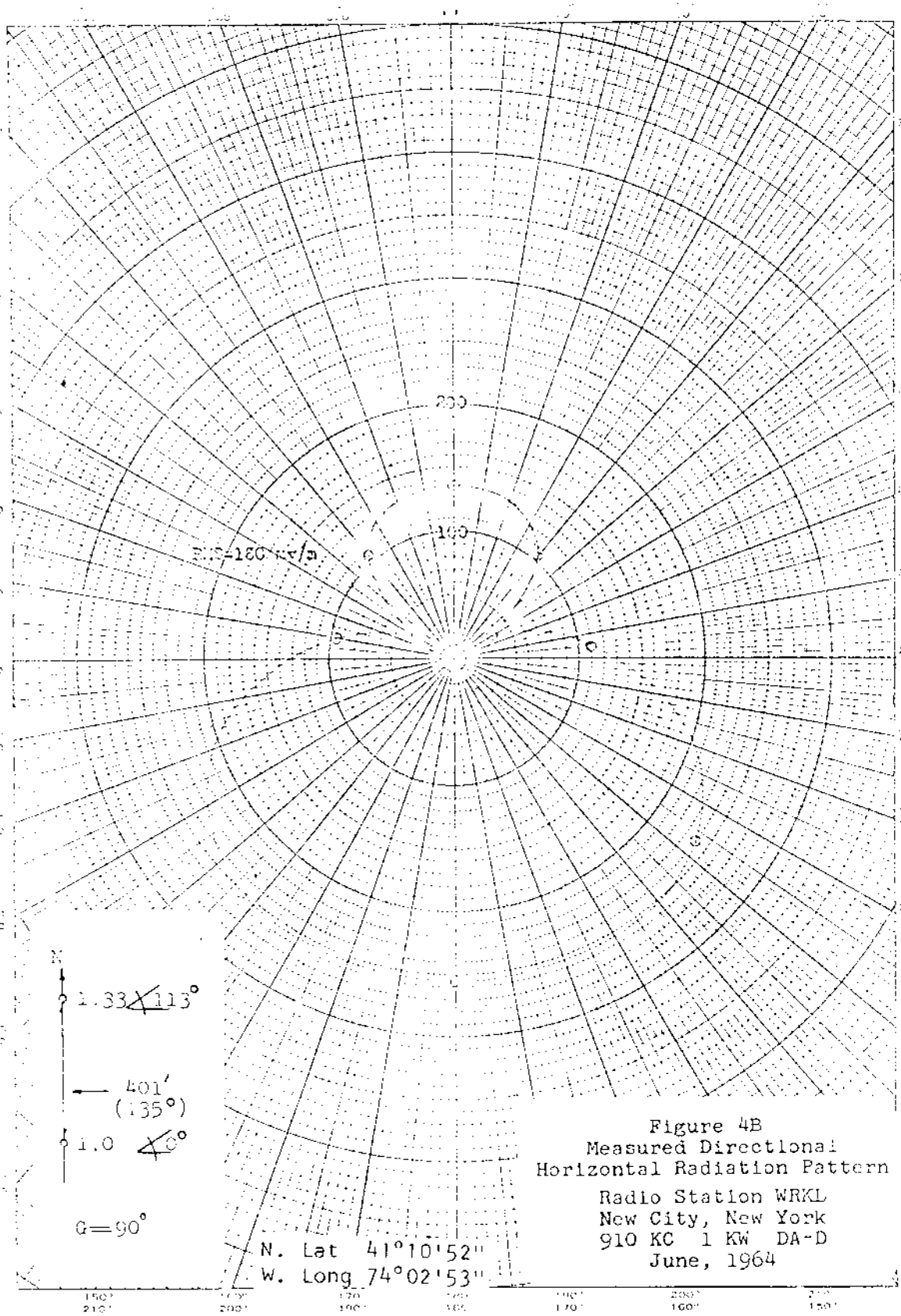


Figure 4B
Measured Directional
Horizontal Radiation Pattern

Radio Station WRKL
New City, New York
910 KC 1 KW DA-D
June, 1964

FCC File No. BL-10695
Accepted 12-1-64

Station WRKL
New City, New York

910 kc

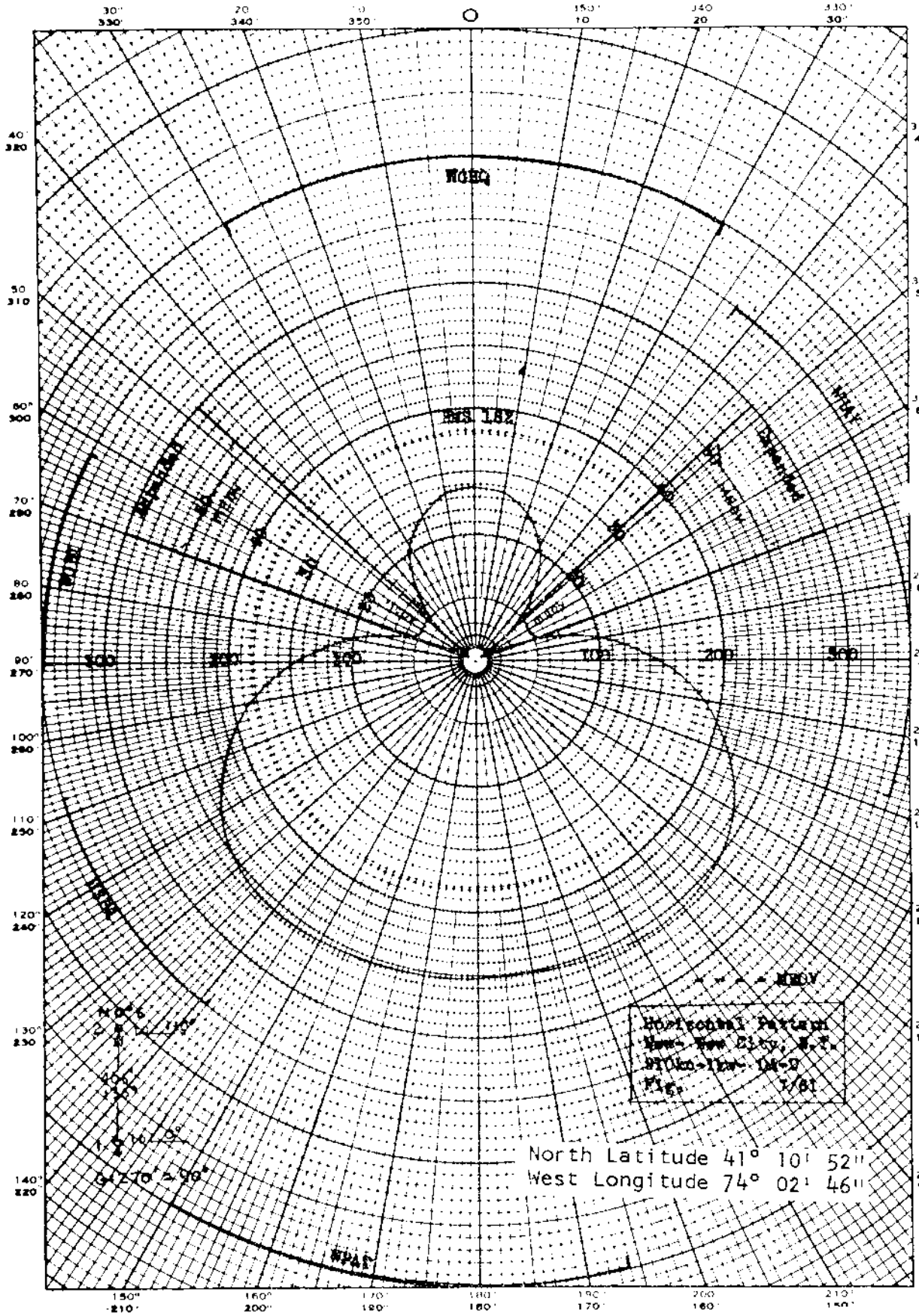
WRKL

PROPOSED DAY
(10-25-61ct)

New; Rockland Broadcasters
New City, New York

1kw,DA-D,D
910 kc

12-11-62 granted CP for new station
1-12-65 GRANTED LIC.



FCC File No. BP-13953
Accepted 9-29-61

New; Rockland Broadcasters
New City, New York

910 kc

WRKL

Measured Non-DA
(12-22-64ct)

Station WRKL
New City, New York

1kw,DA-D,D
910 kc

LICENSE
1-12-65

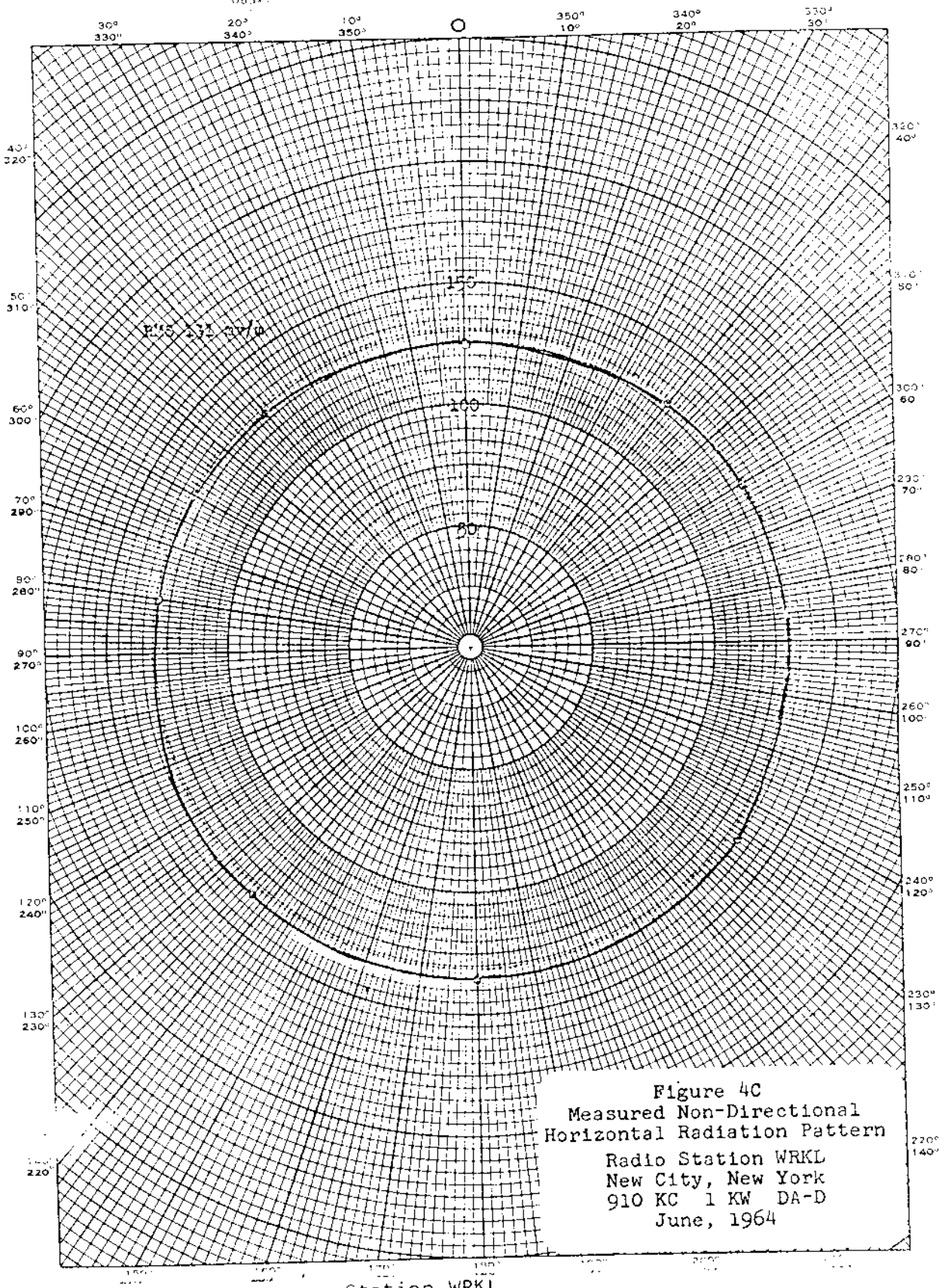


Figure 4C
Measured Non-Directional
Horizontal Radiation Pattern
Radio Station WRKL
New City, New York
910 KC 1 KW DA-D
June, 1964

FCC File No. BL-10695
Accepted 12-1-64

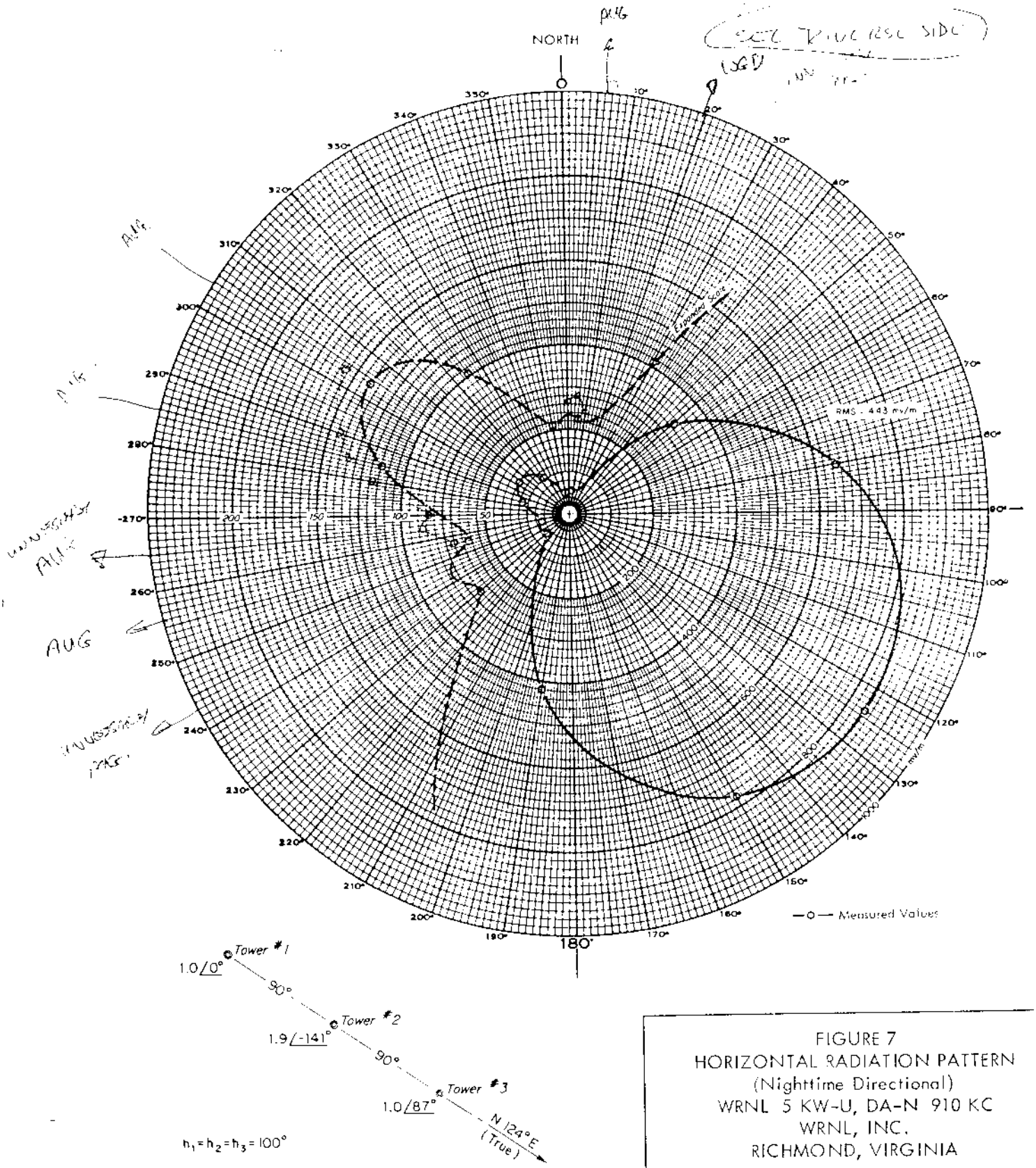
Station WRKL
New City, New York

910 kc

Measured Night
(8-26-70ct)

Station WRNL
Richmond, Virginia

WRNL
5kw, DA-N, U
910 kc



NORTH LATITUDE 37° 36' 52"
WEST LONGITUDE 77° 30' 49"

FIGURE 7
HORIZONTAL RADIATION PATTERN
(Nighttime Directional)
WRNL 5 KW-U, DA-N 910 KC
WRNL, INC.
RICHMOND, VIRGINIA

Prepared by
Lohnes and Culver Washington, D. C.
June, 1970

FCC File No. BL-12696
Accepted 8-13-70

Station WRNL
Richmond, Virginia

910 kc

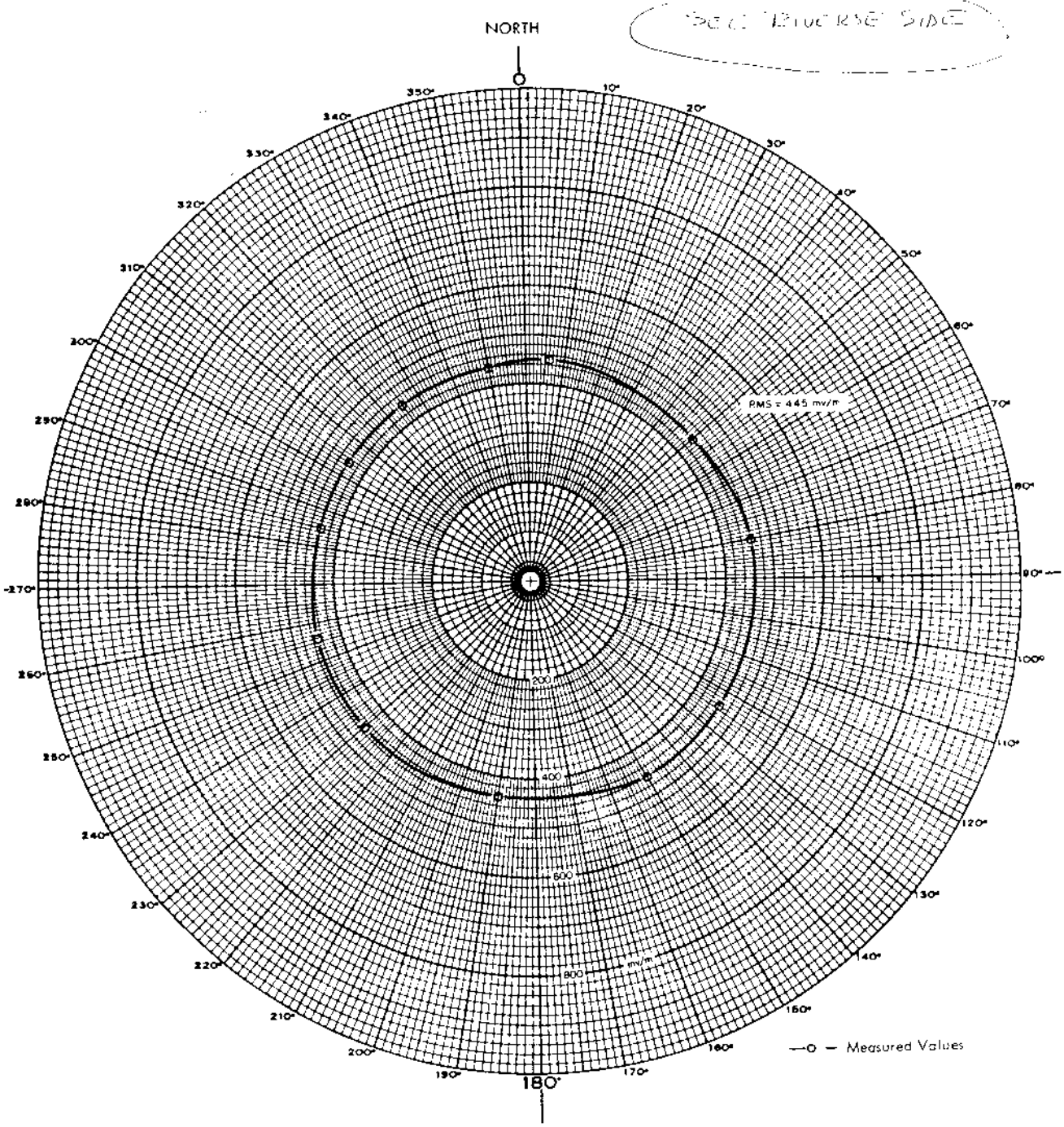
WRNL

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

Station WRNL
Richmond, Virginia

5kw, DA-N, U
910 kc

SEE REVERSE SIDE



NORTH LATITUDE 37° 36' 52"
WEST LONGITUDE 77° 30' 49"

FIGURE 6
HORIZONTAL RADIATION PATTERN
(Non-Directional)
WRNL 5 KW-U, DA-N 910 KC
WRNL, INC.
RICHMOND, VIRGINIA

Prepared by
Lohnes and Culver Washington, D. C
June, 1970

FCC File No. BL-12696
Accepted 8-13-70

Station WRNL
Richmond, Virginia

910 kc

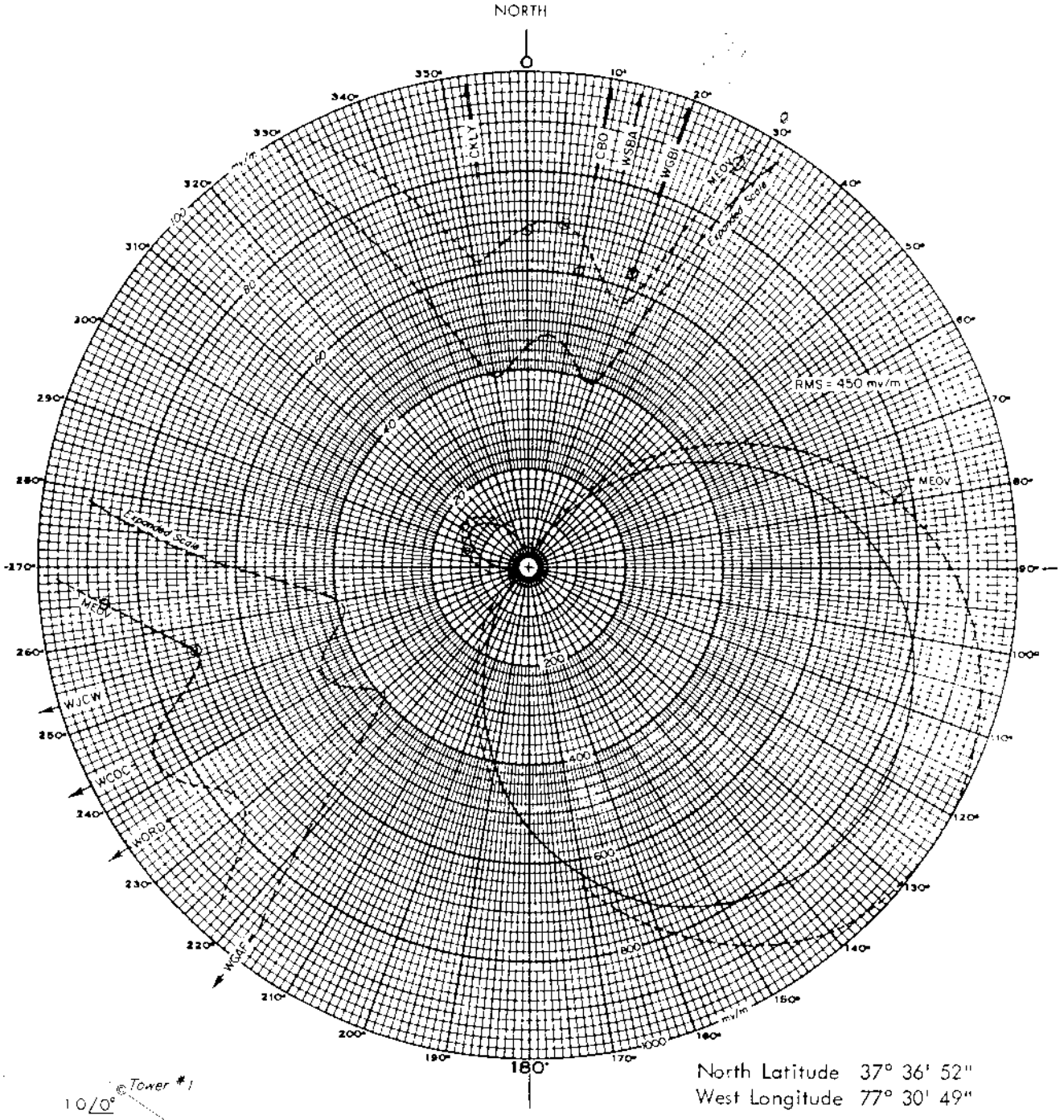
BP-18743
GRT.(4-3-70) CP To Change MEOV

WRNL

Proposed Night
(4-29-70ct)

Station WRNL
Richmond, Virginia

5kw, DA-N, U
910 kc



North Latitude 37° 36' 52"
West Longitude 77° 30' 49"

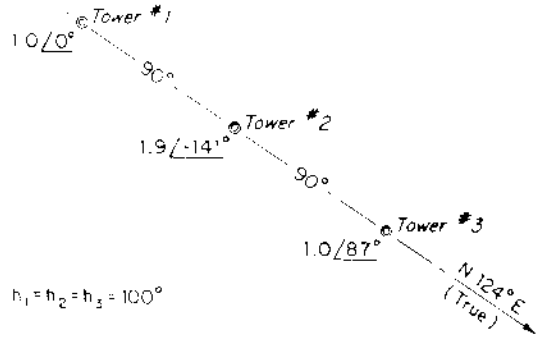


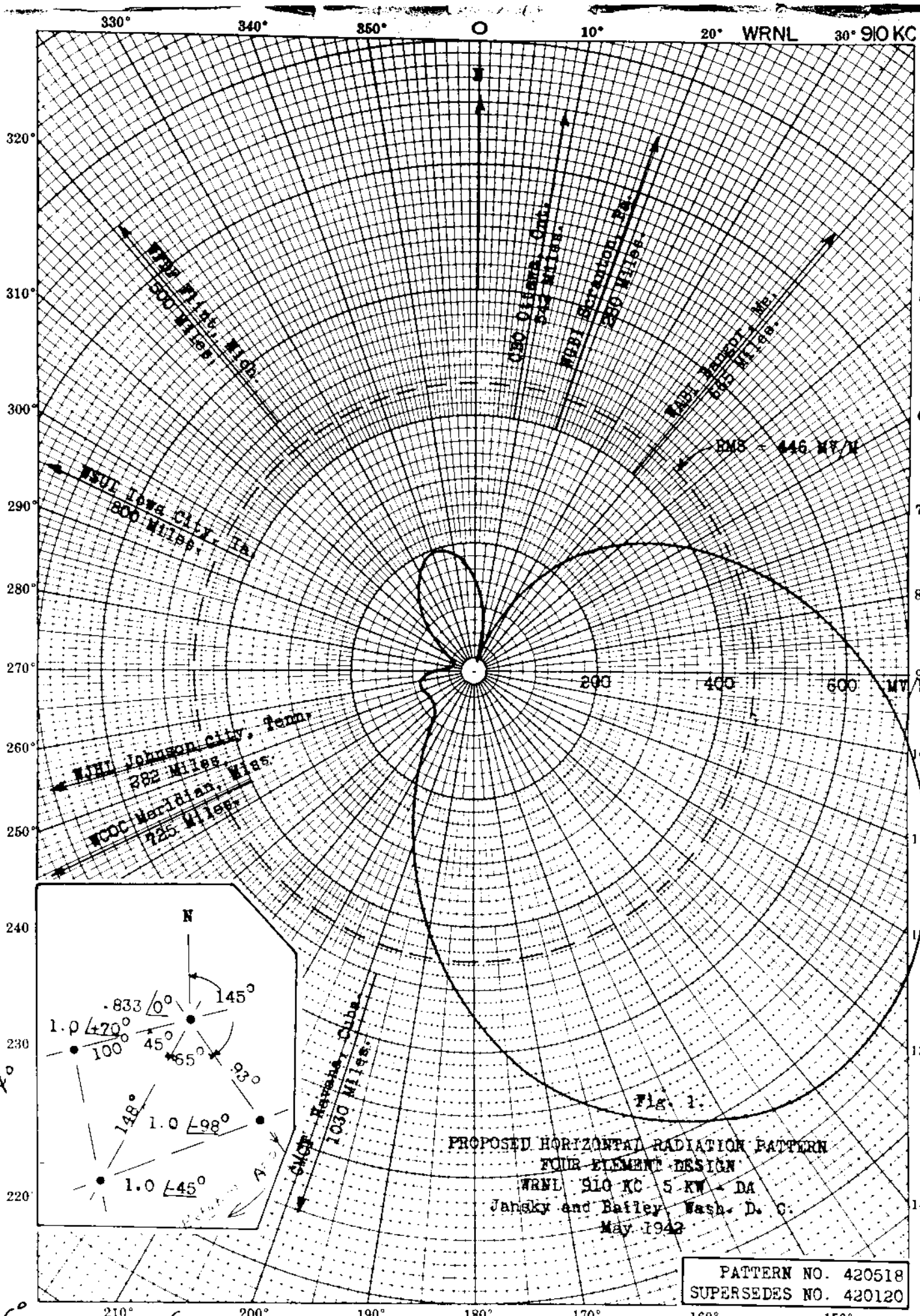
FIGURE 1 (Amended)
HORIZONTAL PLANE
NIGHTTIME RADIATION PATTERN
WRNL 5 KW-DA-N 910 KC
WRNL, INC.
RICHMOND, VIRGINIA

Prepared by
Lohnes and Culver Washington, D. C.
February, 1970

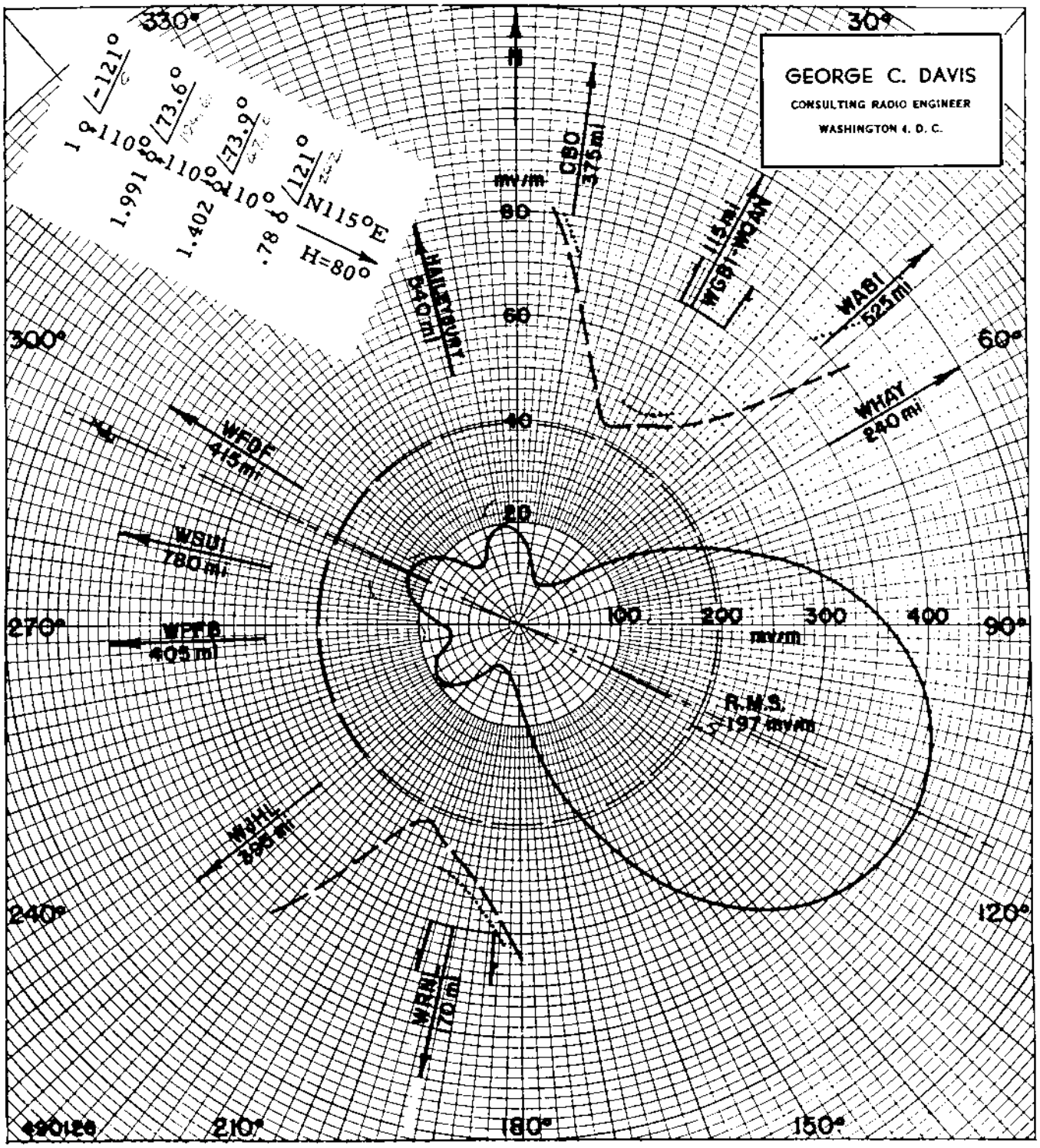
FCC File No. BP-18743
Accepted 4-2-70

Station WRNL
Richmond, Virginia

910 kc

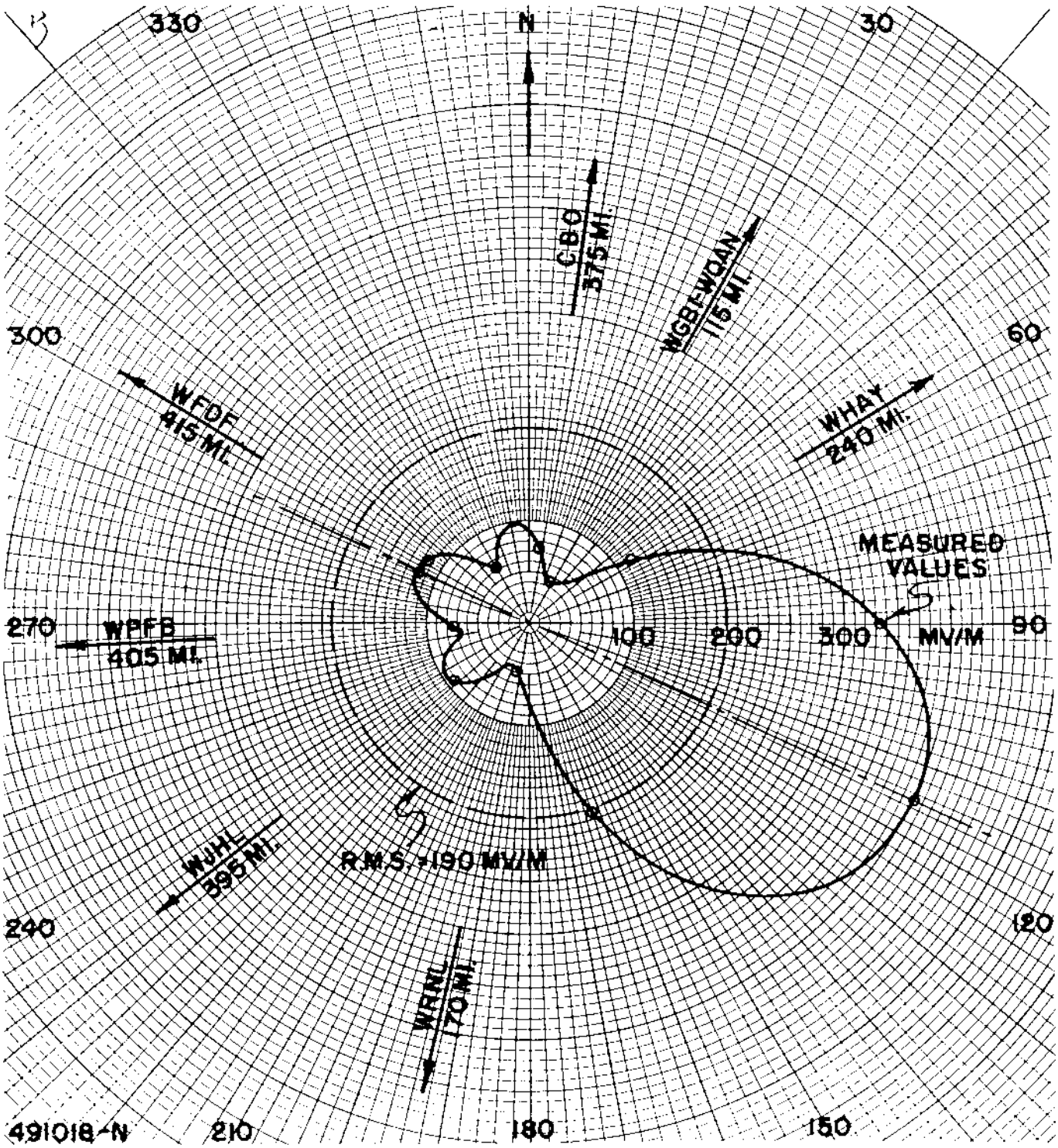


$E = 227\left(.833\angle 0 + 1\angle -98 + 93\cos A + 1\angle -45 + 148\cos(A-65) + 1\angle +70 + 100\cos(A-110)\right)$



GRAPH OF HORIZONTAL PLANE PATTERN FOR
PROPOSED WSBA NIGHTTIME DIRECTIVE ARRAY
UNATTENUATED FIELD AT ONE MILE
YORK, PENNSYLVANIA
910 KC - 1 KW - DA(2)
JANUARY 1949

— — ENLARGED SECTION
····· MAXIMUM EXPECTED VALUES



GEORGE C. DAVIS
CONSULTING RADIO ENGINEER
WASHINGTON 4, D. C.

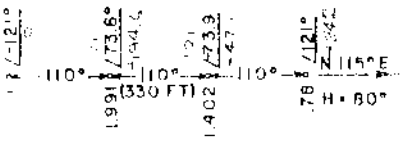
MEASURED NIGHTTIME
HORIZONTAL PLANE PATTERN
UNATTENUATED FIELD AT ONE MILE
WSBA, YORK, PENNSYLVANIA
910 KC - 1 KW - DA-2
OCTOBER 1949

WSBA

PROPOSED DAY
(1-8-59g)

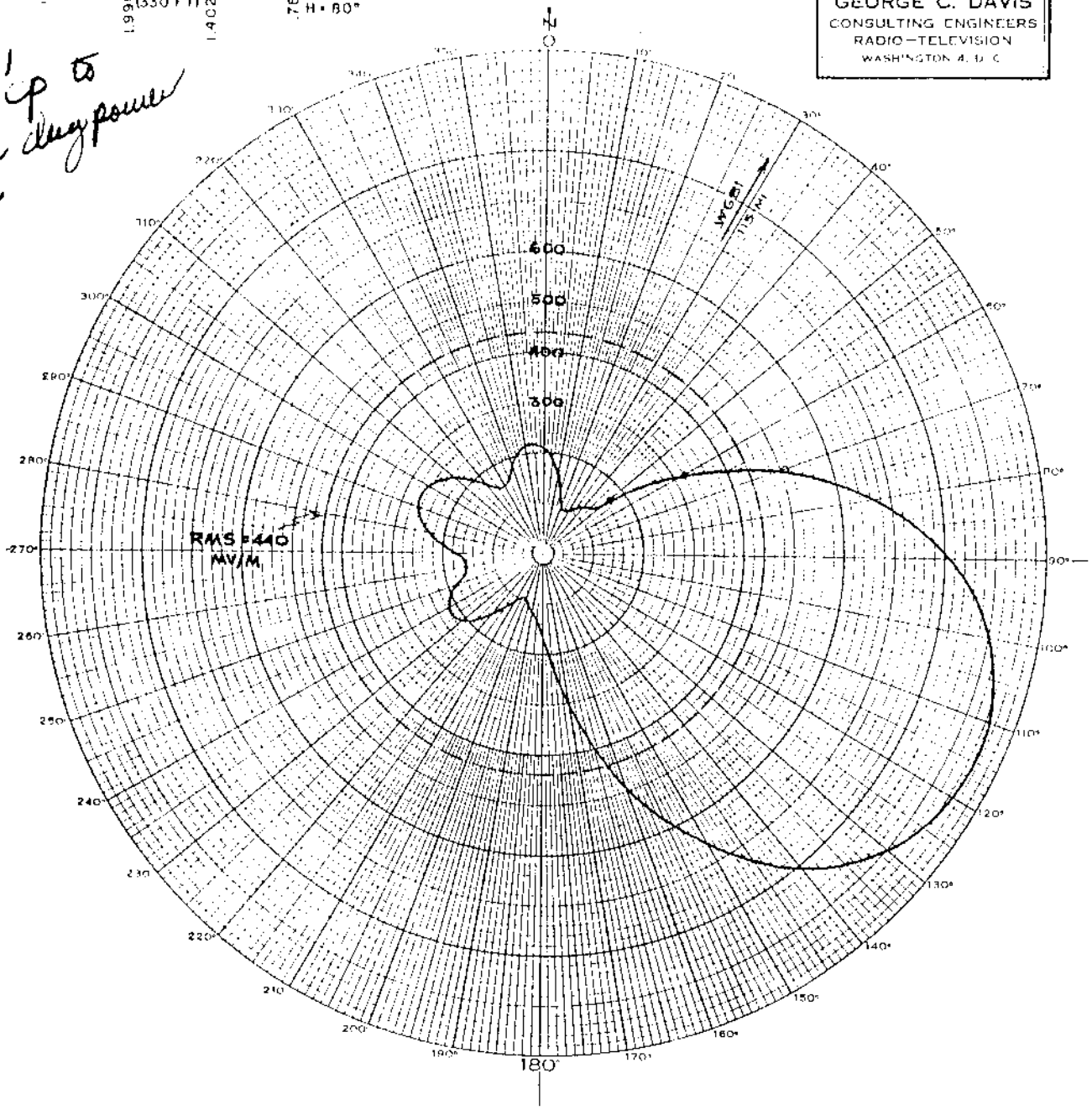
Station WSBA
York, Pennsylvania

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



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

4-26-61 granted to increase day power to 5 KW,



NL 39° 59' 53"
WL 76° 44' 42"

HORIZONTAL PLANE PATTERN
FOR PROPOSED 5 KW DAYTIME OPERATION
WSBA, 910 KC, YORK PENNSYLVANIA
NOVEMBER 1958

FCC File No. BP-12609
Accepted 12-12-58

WSBA
York, Pennsylvania

910 KC

Measured Day;Measured Night (12-19-61ct)

St .on WSBA
York, Pennsylvania

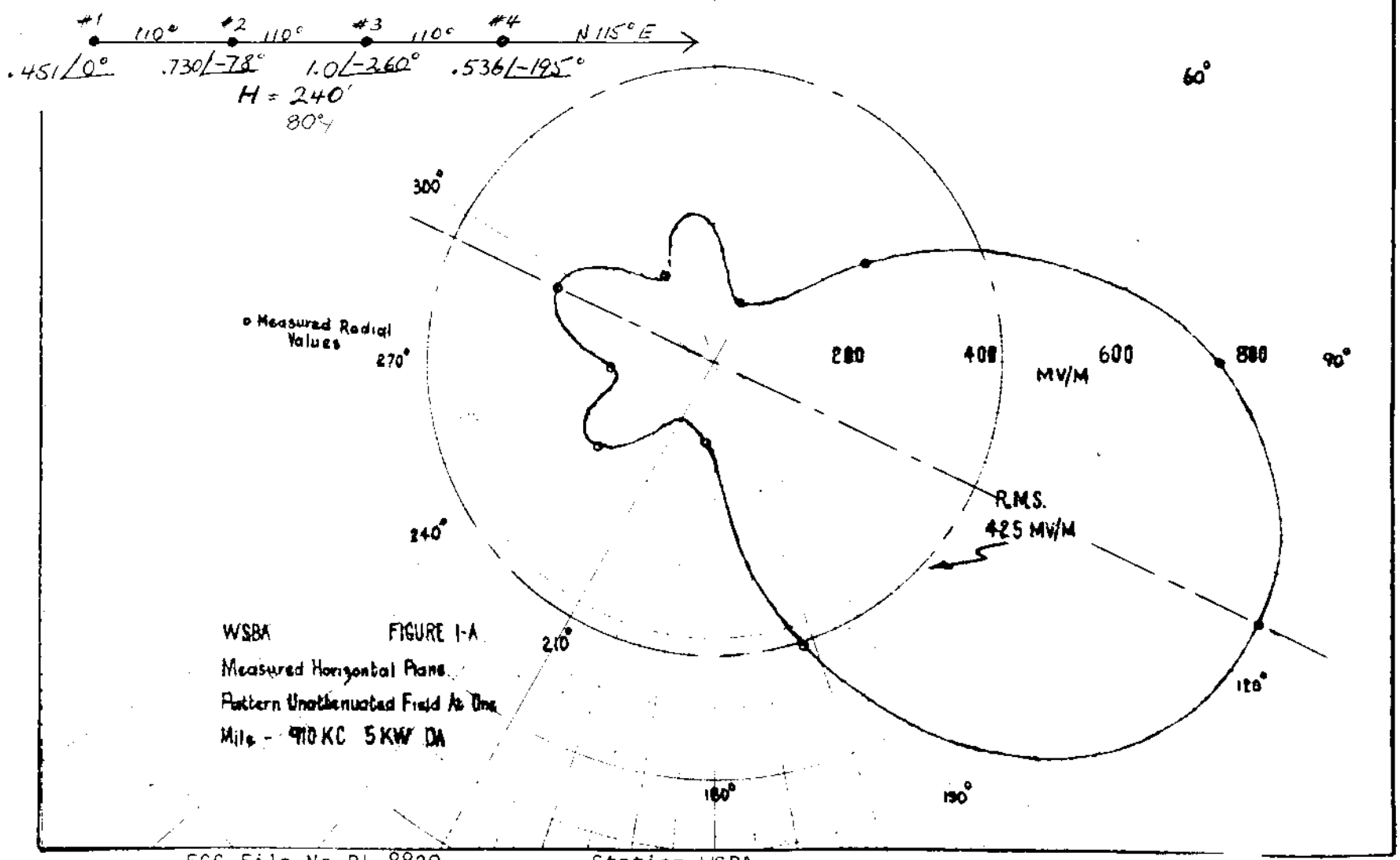
1kw,5kw-LS,DA-2,U
910 kc

2-5-62 Granted to correct increase in day pattern & change in day pattern

Day and Night Patterns are identical, therefore, WSBA requests they be required to make measurements on Daytime operation only.

North Latitude 39° 59' 53"
West Longitude 76° 44' 42"

Engineer: Glenn Winter



FCC File No.BL-8829
Accepted 11-29-61

Station WSBA
York, Pennsylvania

910 kc

WSBA
910KC

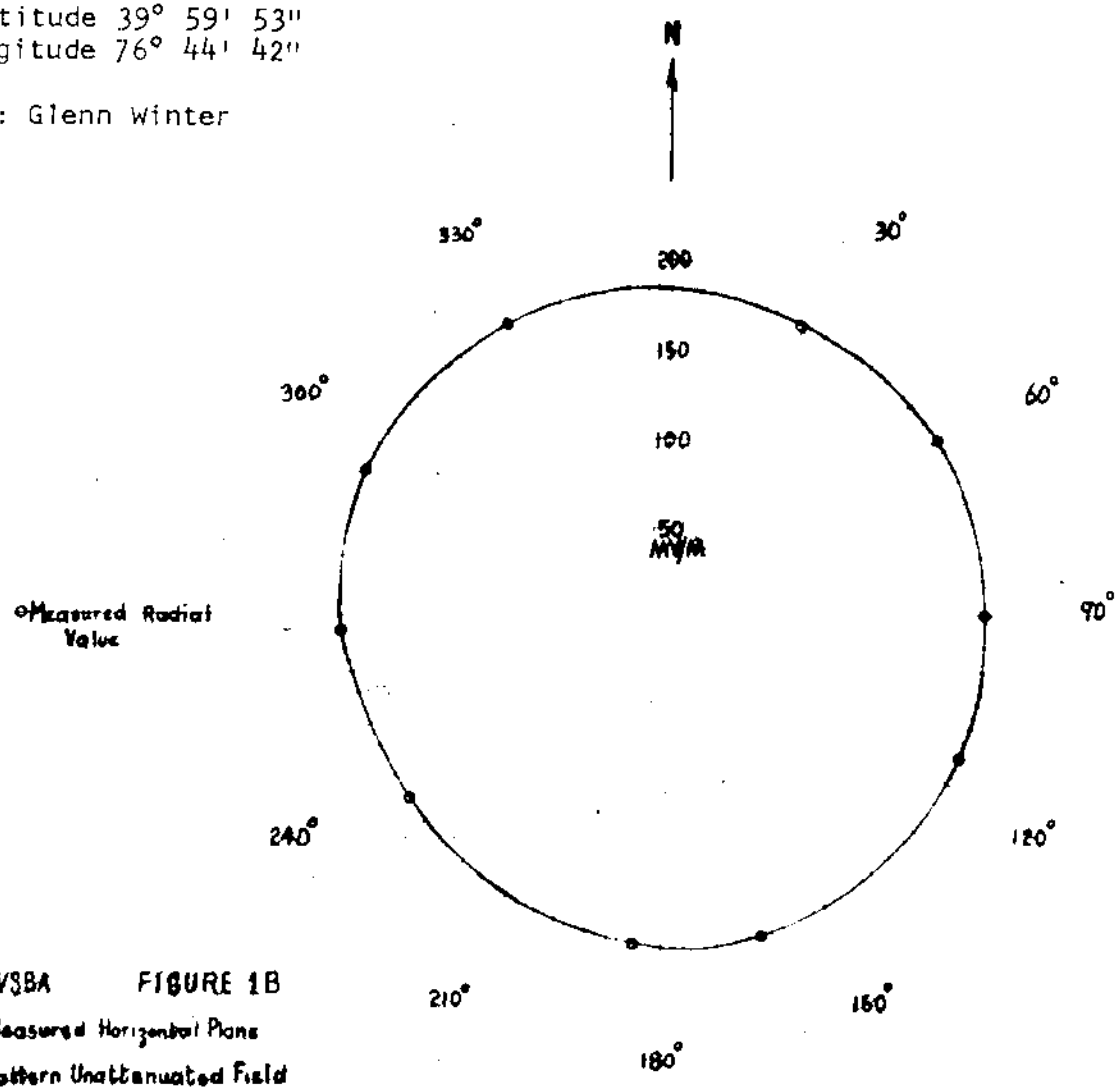
Measured Non-DA
(12-19-61ct)

Station WSBA
York, Pennsylvania

1kw,5kw-LS,DA-2,U
910 kc

North Latitude 39° 59' 53"
West Longitude 76° 44' 42"

Engineer: Glenn Winter



WSBA FIGURE 1B
Measured Horizontal Plane
Pattern Unattenuated Field
At One Mile - 910 KC 1K ND

FCC File No.BL-8829
Accepted 11-29-61

Station WSBA
York, Pennsylvania

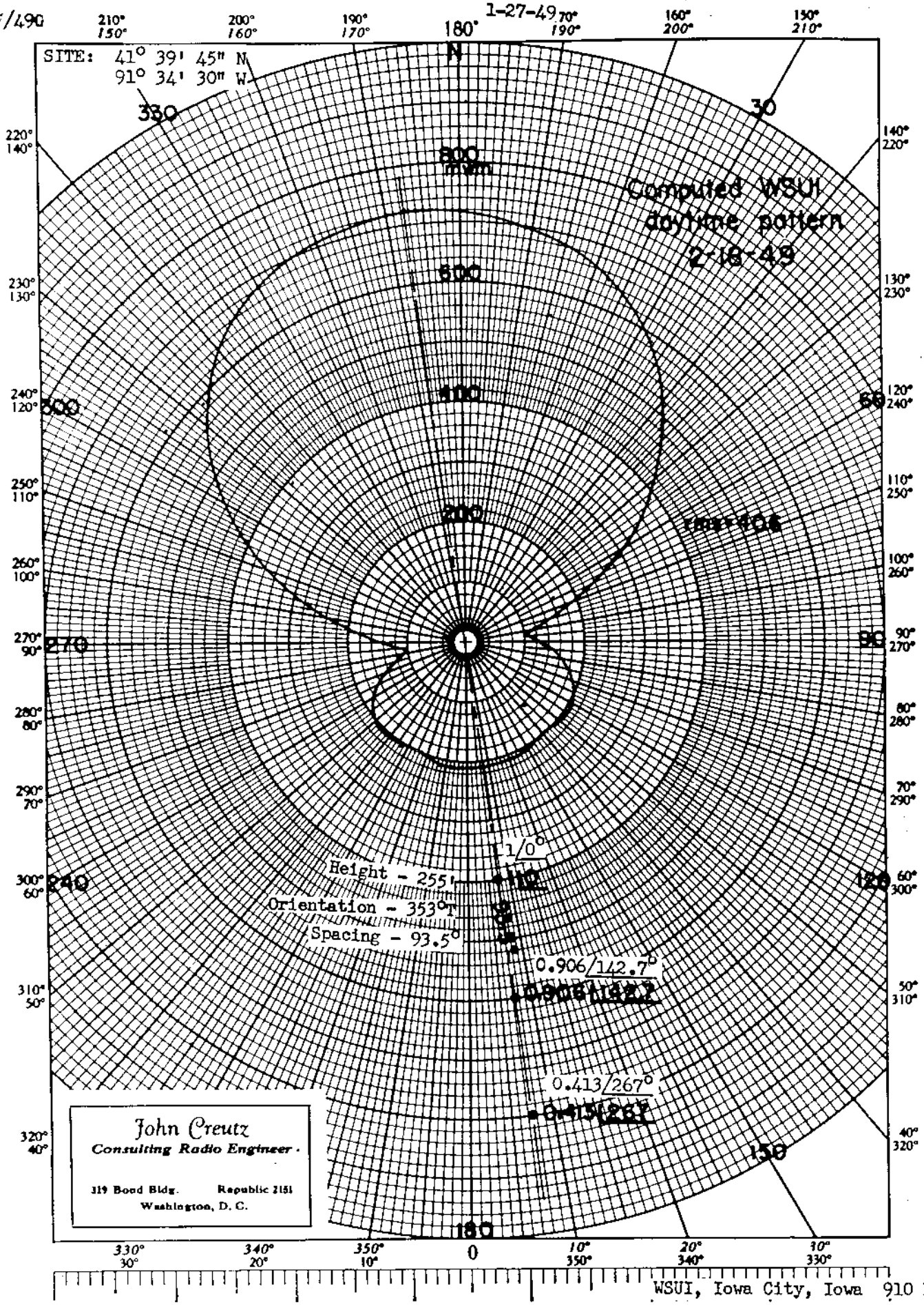
910 kc

WSBA
910 KC

WSUI

PROPOSED WSUI, IOWA CITY, IOWA 5kw, DA2 910 kc

DAY 3/7/49G 1-27-49



WSUI, Iowa City, Iowa 910 kc

Measured Day
(4-30-63ct)

Station WSUI
Iowa City, Iowa

5kw,DA-2,U WSUI
910 kc

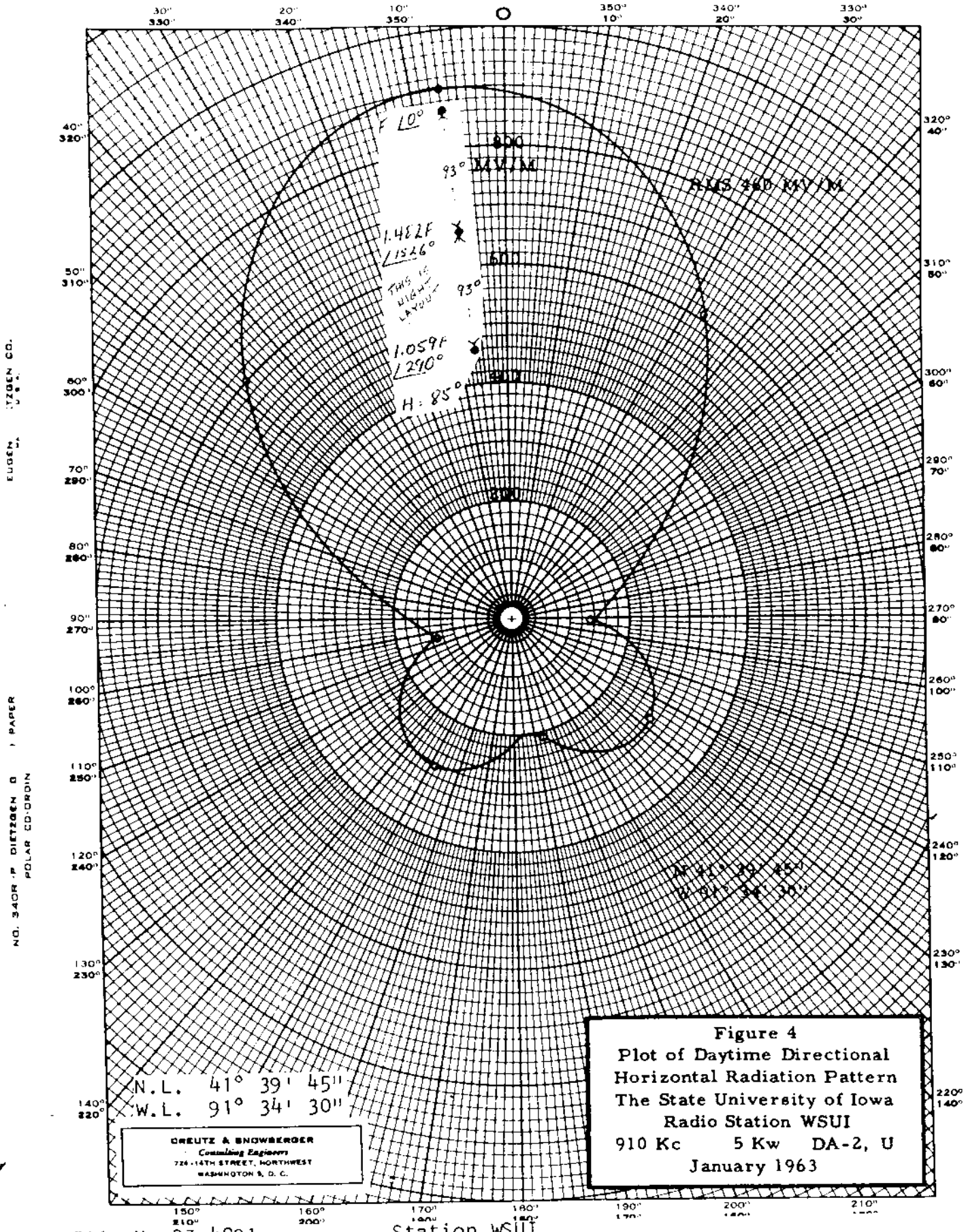
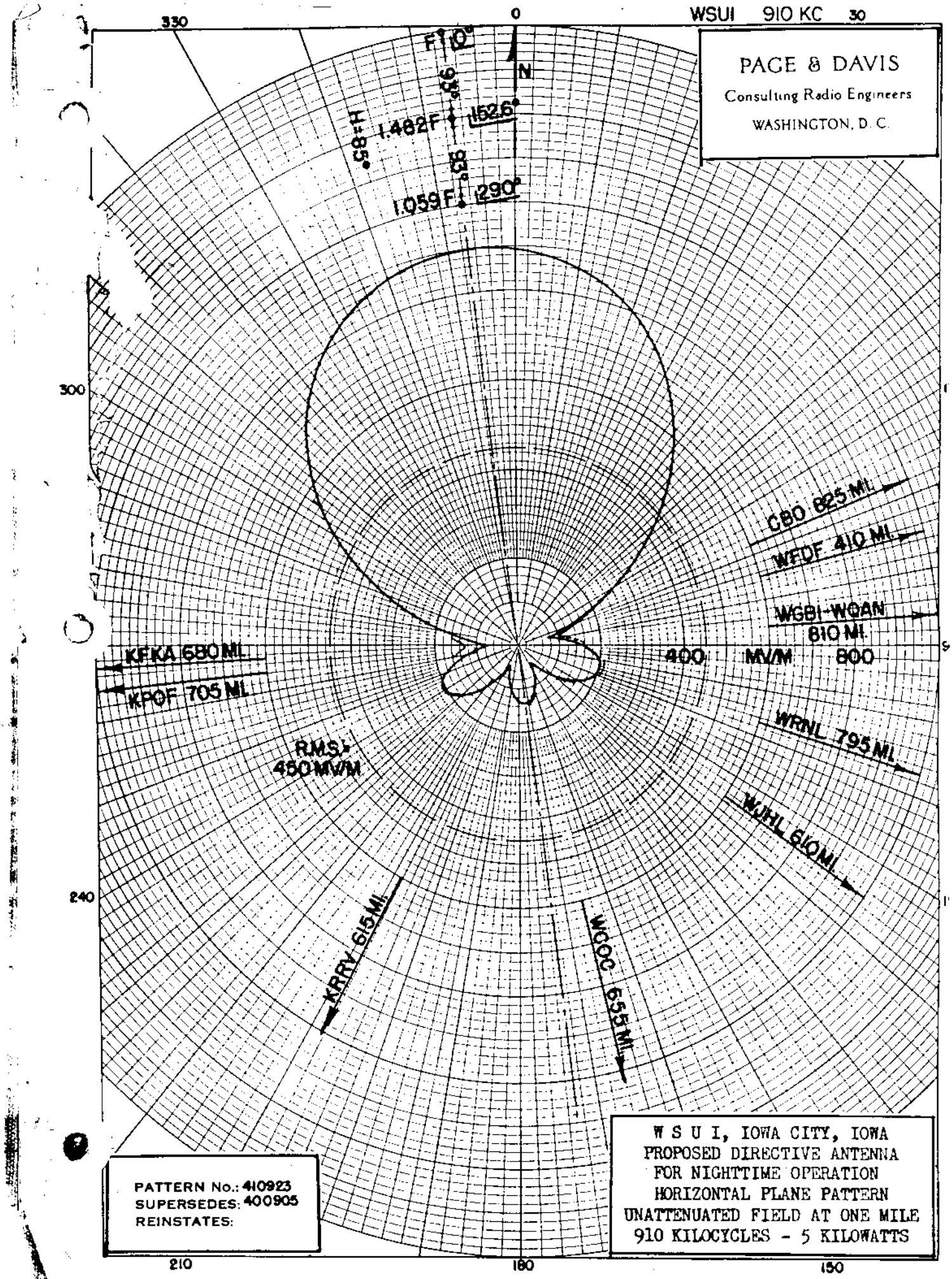


Figure 4
Plot of Daytime Directional Horizontal Radiation Pattern
The State University of Iowa
Radio Station WSUI
910 Kc 5 Kw DA-2, U
January 1963

FCC File No.BZ-4891
Accepted 4-22-63

Station WSUI
Iowa City, Iowa

910 kc


WSUI 910 KC 30
PAGE & DAVIS
Consulting Radio Engineers
WASHINGTON, D. C.
0
N
330
300
240
210
180
150
F 1.0°
H=.85°
1.482F 152.6°
.95°
.63°
1.059F 290°
CBO 825 MI.
WFDF 410 MI.
WGBI-WQAN
810 MI.
400 MV/M 800
KFKA 680 MI.
KPOF 705 MI.
WRNL 795 MI.
RMS
450 MV/M
WJHL 610 MI.
KRRV 615 MI.
WCOC 655 MI.
PATTERN No.: 410923
SUPERSEDES: 400905
REINSTATES:
W S U I, IOWA CITY, IOWA
PROPOSED DIRECTIVE ANTENNA
FOR NIGHTTIME OPERATION
HORIZONTAL PLANE PATTERN
UNATTENUATED FIELD AT ONE MILE
910 KILOCYCLES - 5 KILOWATTS
KEUFFEL & ESSER CO., N. Y. NO. 343A

WSUI

Measured Night
(4-30-63ct)

Station WSUI
Iowa City, Iowa

5kw,DA-2,U
910 kc

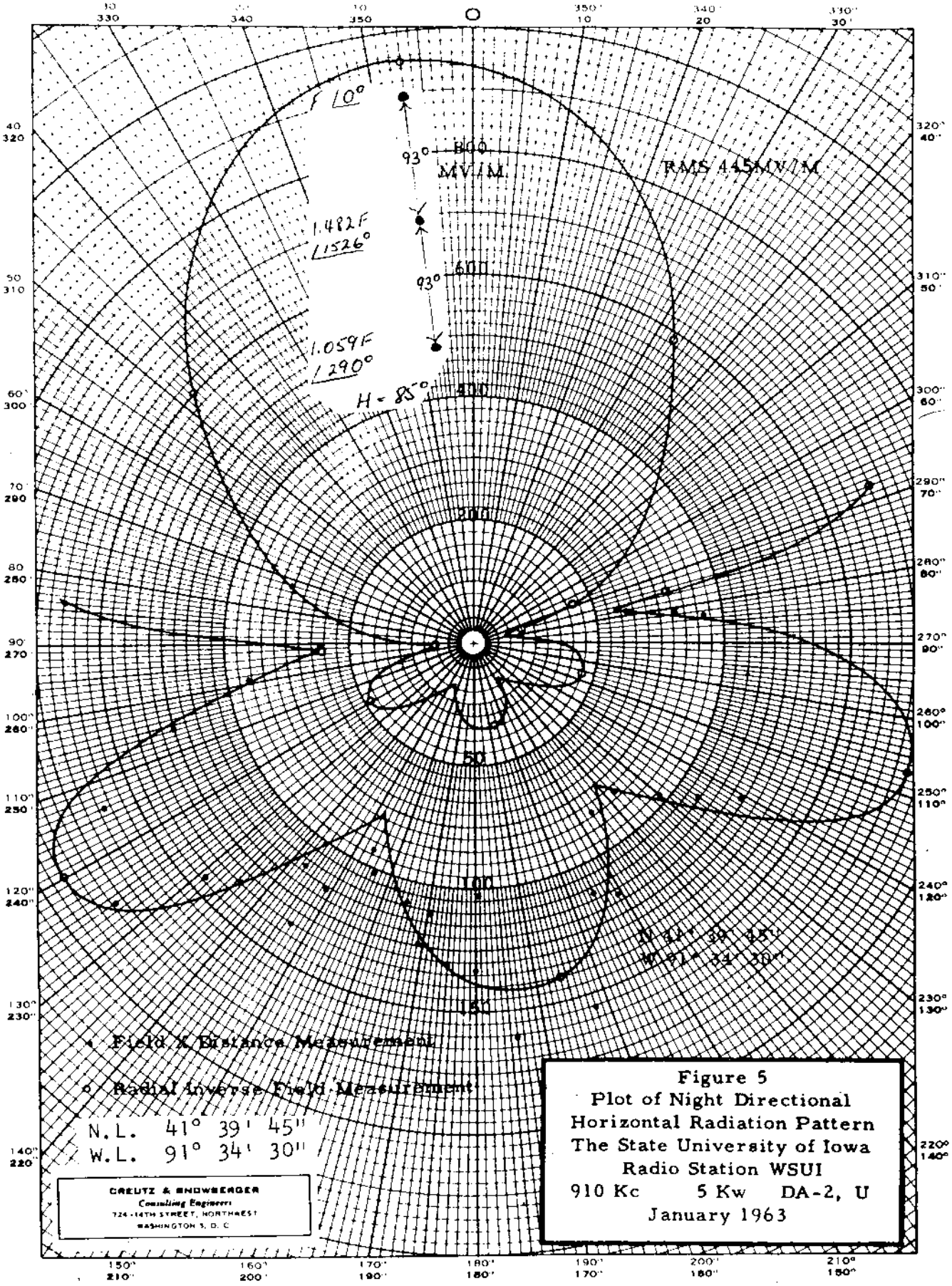


Figure 5
Plot of Night Directional Horizontal Radiation Pattern
The State University of Iowa
Radio Station WSUI
910 Kc 5 Kw DA-2, U
January 1963

FCC File No.BZ-4891
Accepted 4-22-63

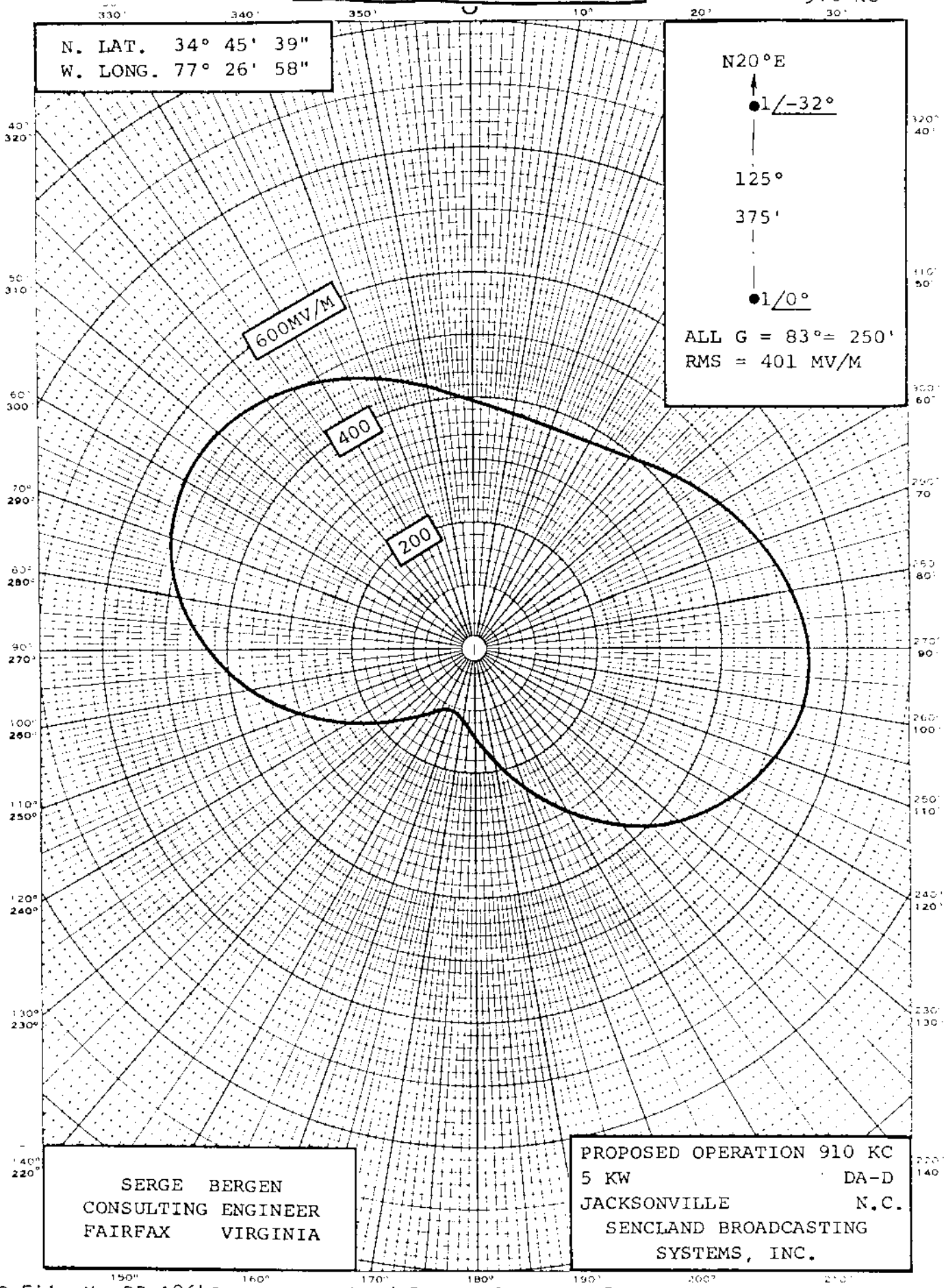
Station WSUI
Iowa City, Iowa

910 kc

Proposed Day
(1-28-70ct)

Sencland Bcstg. Systems, Inc.
Jacksonville, North Carolina

NEW
5kw, DA-D, D
910 kc



FCC File No.BP-18649
Accepted 1-14-70

Sencland Bcstg. Systems, Inc.
Jacksonville, North Carolina

910 kc