930-940

Station	Main Studio	Freq	Power	Date
CFBC	Saint John, NB	930	50 kW	12/5/77
CJCA	Edmonton, AB	930	5/10 kW/DA-N	3/23/59
CJYQ	St. John's, NF	930	10 kW/DA-N	10/24/58
CKNS	Elliot Lake, ON	930	10 kW/DA-N	11/24/75
NEW	Centerville, IN	930	0.5 kW/DA-D	6/16/59
KAGI	Grants Pass, OR	930	5/1 kW/DA-N	7/3/57
KHJ	Los Angeles, CA	930	5 kW/DA-N	1/75
KCCW	Terrell Hills, TX	930	1 kW/DA-N	8/29/57
KIUP	Durango, CO	930	1/5 kW/DA-N	8/18/76
KOGA	Ogallala, NE	930	0.5 kW/DA-N	3/3/76
KSDN	Aberdeen, SD	930	1/5 kW/DA-2	4/7/76
KSEI	Pocatello, ID	930	5 kW/DA-N	3/12/46
KWOC	Poplar Bluff, MO	930	0.5/1 kW/DA-2	5/9/51
WBCK	Battle Creek, MI	930	1/5 kW/DA-2	11/17/58
WBEN	Buffalo, NY	930	5 kW/DA-N	1/22/71
WCNR	Bloomsburg, PA	930	0.5/1 kW/DA-N	9/27/78
WEKO	Cabo Rojo, PR	930	0.5 kW/DA-2	9/28/79
WEOL	Elyria, OH	930	1 kW/DA-2	4/68
WFMD	Frederick, MD	930	1/5 kW/DA-2	10/6/71
WGNT	Huntington, WV	930	1/5 kW/DA-N	3/30/62
WHAN	Haines City, FL	930	0.5 kW/DA-D	6/16/59
WHON	Centerville, IN	930	0.5 kW/DA-D	7/24/63
WITN	Washington, NC	930	1/5 kW/DA-N	5/49
WIZR	Johnstown, NY	930	1 kW/DA-D	6/16/59
WJAX	Jacksonville, FL	930	5 kW/DA-N	5/3/57
WKCT	Bowling Green, KY	930	0.5/1 kW/DA-N	12/29/65
WKXY	Sarasota, FL	930	0.5/1 kW/DA-2	5/25/62

930-940

Station	Main Studio	Freq	Power	Date
WKY	Oklahoma City, OK	930	5 kW/DA-N	5/45
WMGR	Bainbridge, GA	930	0.5/5 kW/DA-N	5/28/59
WPAT	Paterson, NJ	930	5 kW/DA-2	5/27/66
WSLI	Jackson, MS	930	5 kW/DA-N	6/47
WSOC	Charlotte, NC	930	5/1 kW/DA-N	6/30/49
WTAD	Quincy, IL	930	1/5 kW/DA-N	8/18/58
WTHD	Milford, DE	930	0.5 kW/DA-D	3/4/53
WWNH	Rochester, NY	930	5 kW/DA-N	6/16/59
NEW	Richmond, BC	940	2.5 kW/DA-1	1/8/79
CBM	Montreal, QU	940	50 kW/DA-1	4/7/78
CJGX	Yorkton, Sask.	940	10 kW/DA-N	10/2/64
CJIB	Vernon, BC	940	10 kW/DA-N	11/22/71
KFRE	Fresno, CA	940	50 kW/DA-2	3/7/49
KHOS	Tucson, AZ	940	0.25/1 kW/DA-2	11/24/70
KIOA	Des Moines, IA	940	5/10 kW/DA-2	10/22/75
KIXZ	Amarillo, TX	940	1/5 kW/DA-2	6/18/75
KTON	Belton, TX	940	1 kW/DA-D	6/14/61
WCIT	Lima, OH	940	0.25 kW/DA-D	6/28/67
WCPC	Houston, MS	940	0.5/50 kW/DA-2	11/29/68
WEOO	Smithfield, VA	940	10 kW/DA-D	9/27/78
WEOO	Smithfield, VA	940	1 kW/DA-D	9/19/74
WESA	Charleroi, PA	940	1 kW/DA-D	6/28/78
WFAW	Fort Atkinson, WI	940	0.5 kW/DA-D	11/29/66
WFNC	Fayetteville, NC	940	1/50 kW/DA-N	10/1/75
WFNC	Fayetteville, NC	940	1/10 kW/DA-N	7/26/61
WGRP	Greenville, PA	940	1 kW/DA-D	7/20/61
WINZ	Miami, FL	940	10/50 kW/DA-2	6/19/74

930-940

Station	Main Studio	Freq	Power	Date
WIPR	San Juan, PR	940	10 kW/DA-1	1/25/49
WJOR	South Haven, MI	940	1 kW/DA-D	5/28/59
WKYK	Burnsville, NC	940	0.25/1 kW/DA-N	7/1/77
WMAZ	Macon, GA	940	10 kW/DA-2	3/46
WMIX	Mount Vernon, IL	940	0.5/5 kW/DA-2	2/26/75
WNAL	Nelsonville, OH	940	0.25 kW/DA-D	1/30/67
WYLD	New Orleans, LA	940	0.5/10 kW/DA-2	4/10/61
WYLD	New Orleans, LA	940	0.5/1 kW/DA-N	5/27/60

DIRECTIONAL ANTENNA DESCRIPTION SHEET

CFBC

Revised July 21, 1977

Station:	CFBC	Power:	50 kW Day & Night
Main Studio:	Saint John, NB.	Class:	III
Frequency:	930 kHz	Time:	Unlimited
Notification List No. 369		Date:	December 5, 1977

Geographical Location: Latitude 45° 13' 55" N
Longitude 66° 06' 15" W

Antenna System: Six elements, guyed, uniform cross-section, base insulated, series feed. No top loading.

Tower No.	1	2	3	4	5	6
Height above insulators	(90°) 264.4'	(90°) 264.4'	(90°) 264.4'	(90°) 264.4'	(60°) 176.3'	(60°) 176.3'
Overall Height	270.0'	270.0'	270.0'	270.0'	181.0'	181.0'
Spacing:	REF.	45°	201.23°	180.0°	186.3°	45°
Orientation:	REF.	10°	66.03°	78.0°	91.98°	167°
Day Field Ratio:	1.0	-	-	0.75	0.75	1.133
Day Phase	REF.	-	-	-77°	98°	166.5°
Night Field Ratio	1.0	1.0	1.0	1.0	-	-
Night Phase	REF.	-162°	-158°	+4.0°	-	-

Ground System:

Effective area of 120 radials, 0.4 wavelengths long, No.10 AWG soft drawn copper wire, buried 8 inches below ground surface.

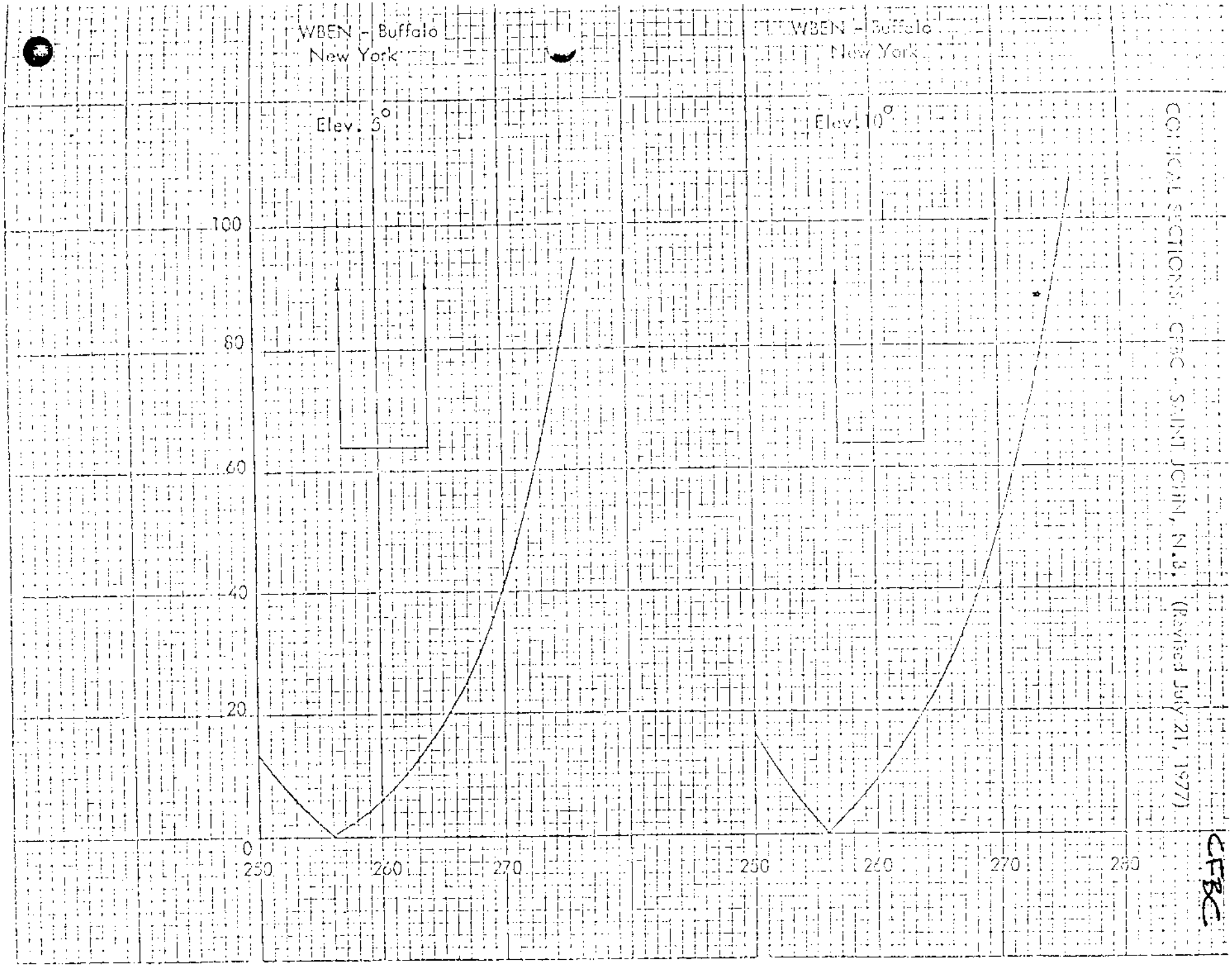
Predicted Effective Field

Day: 1370.00 mV/m at 1 mile for 50 kW
193.75 mV/m at 1 mile for 1 kW

Night: 1320.00 mV/m at 1 mile for 50 kW
186.68 mV/m at 1 mile for 1 kW

MISSING

Please retain the day and night horizontal radiation patterns notified for CFBC in Canadian Change List No. 353 dated April 1, 1976. This notification involves an increase of height of towers # 2 and # 3 which are used for the night pattern only. Revised vertical sections for the night pattern are attached.

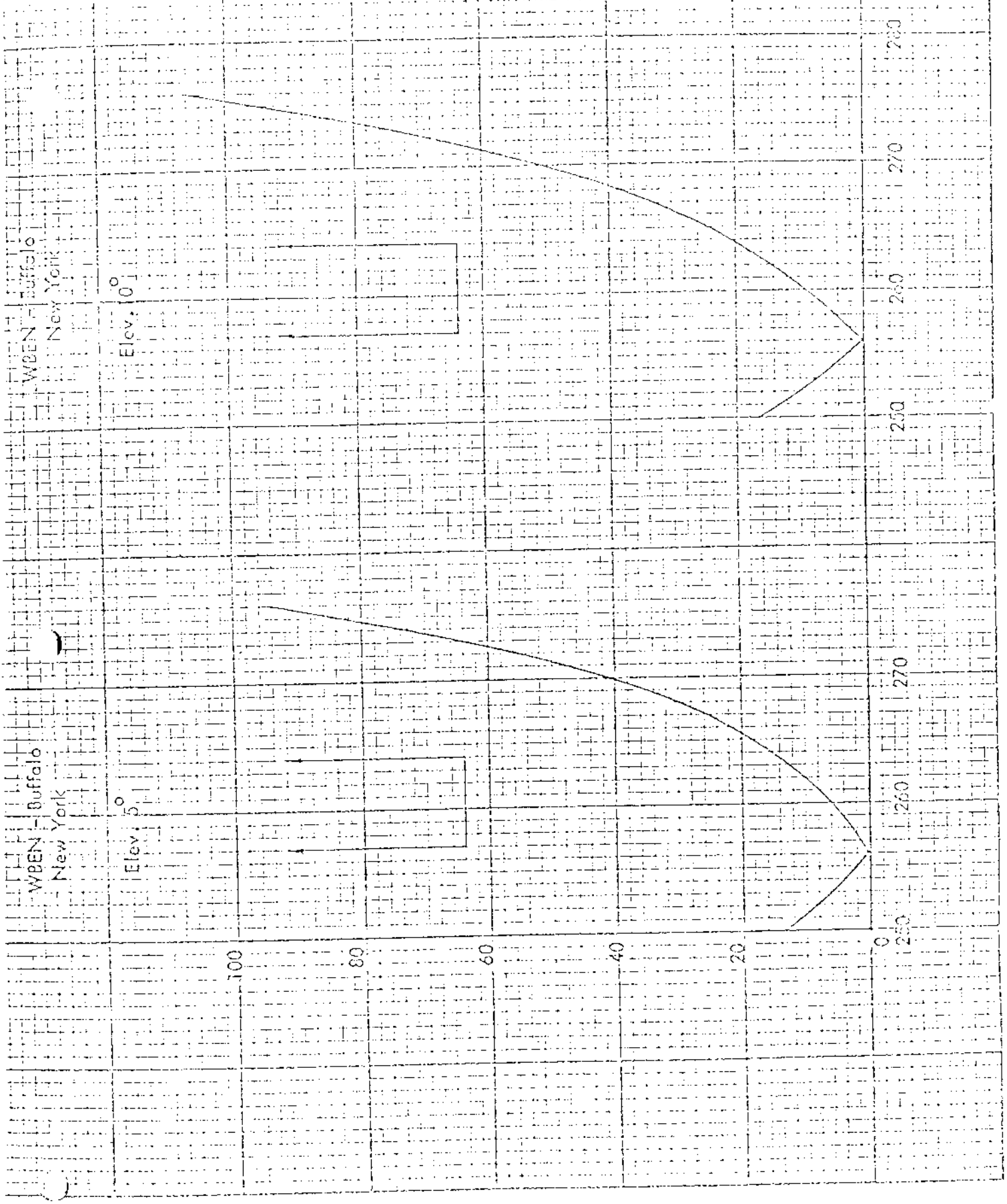


CONICAL SECTIONS, CFBC - SAINT JOHN, N.B. (Revised July 21, 1977)

CFBC

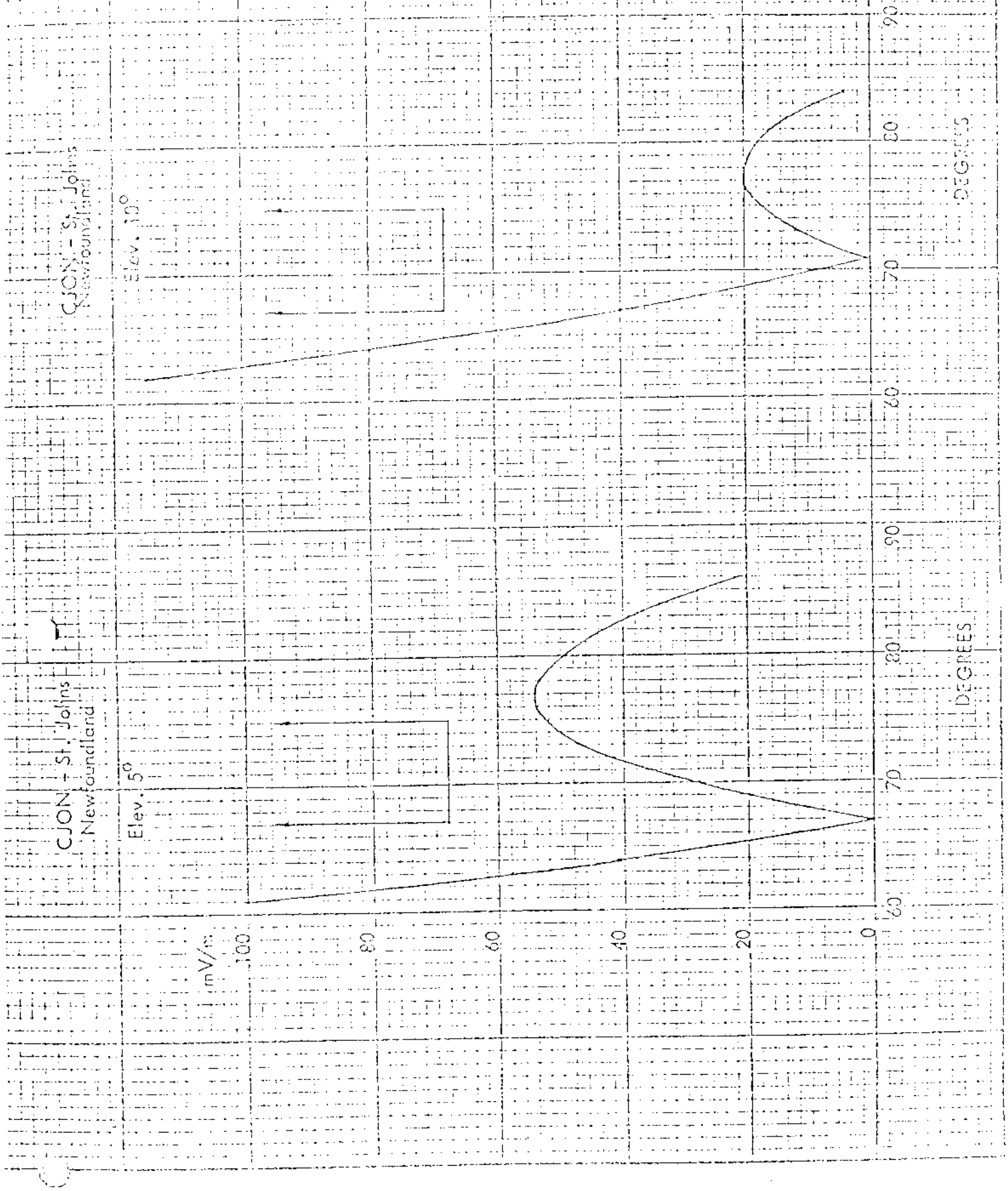
CONICAL SECTIONS: CFBC - SAINT JOHN, N.B. (Revised July 21, 1977)

CFBC



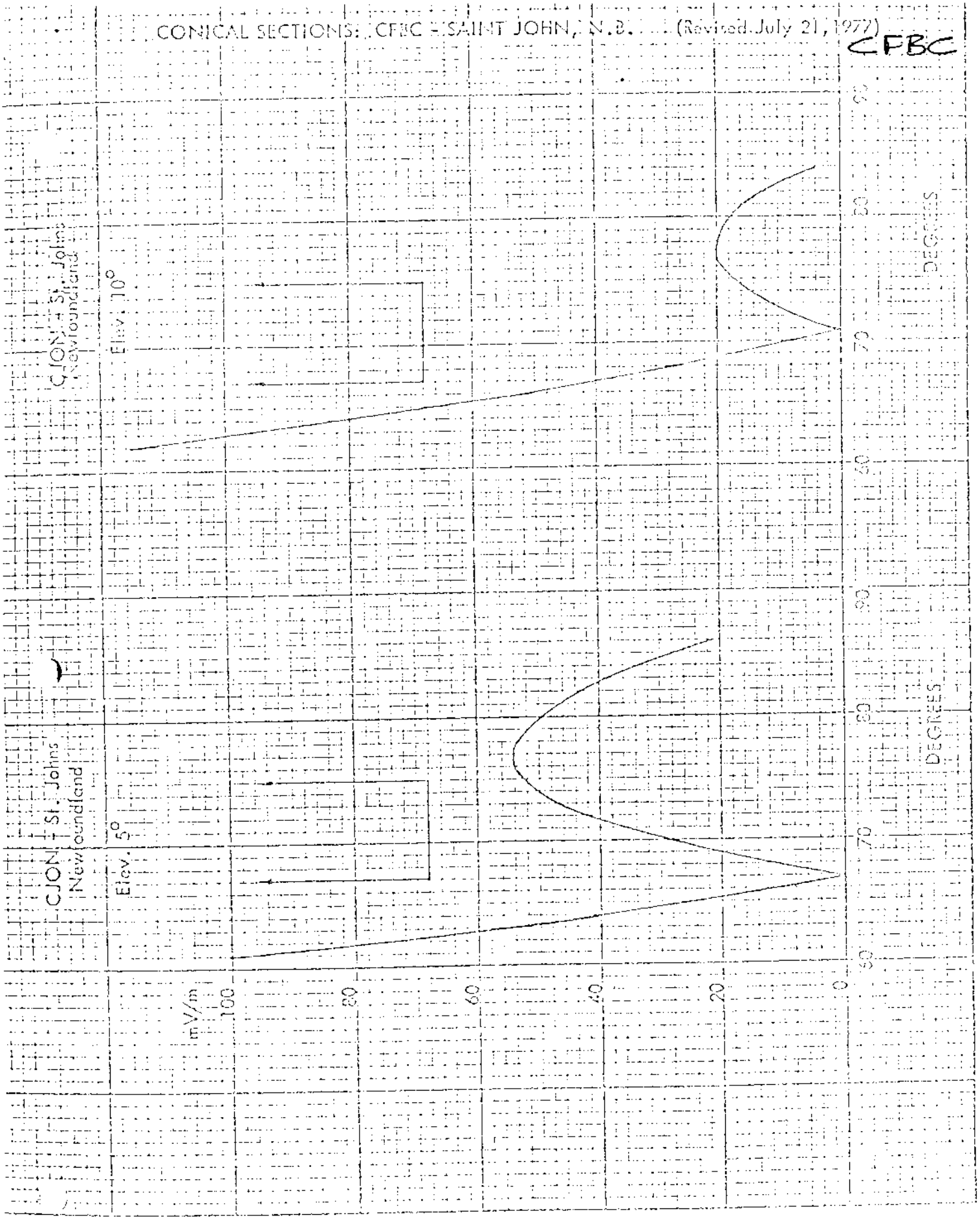
CONICAL SECTIONS: CFBC - SAINT JOHN, N.B. (Revised July 21, 1977)

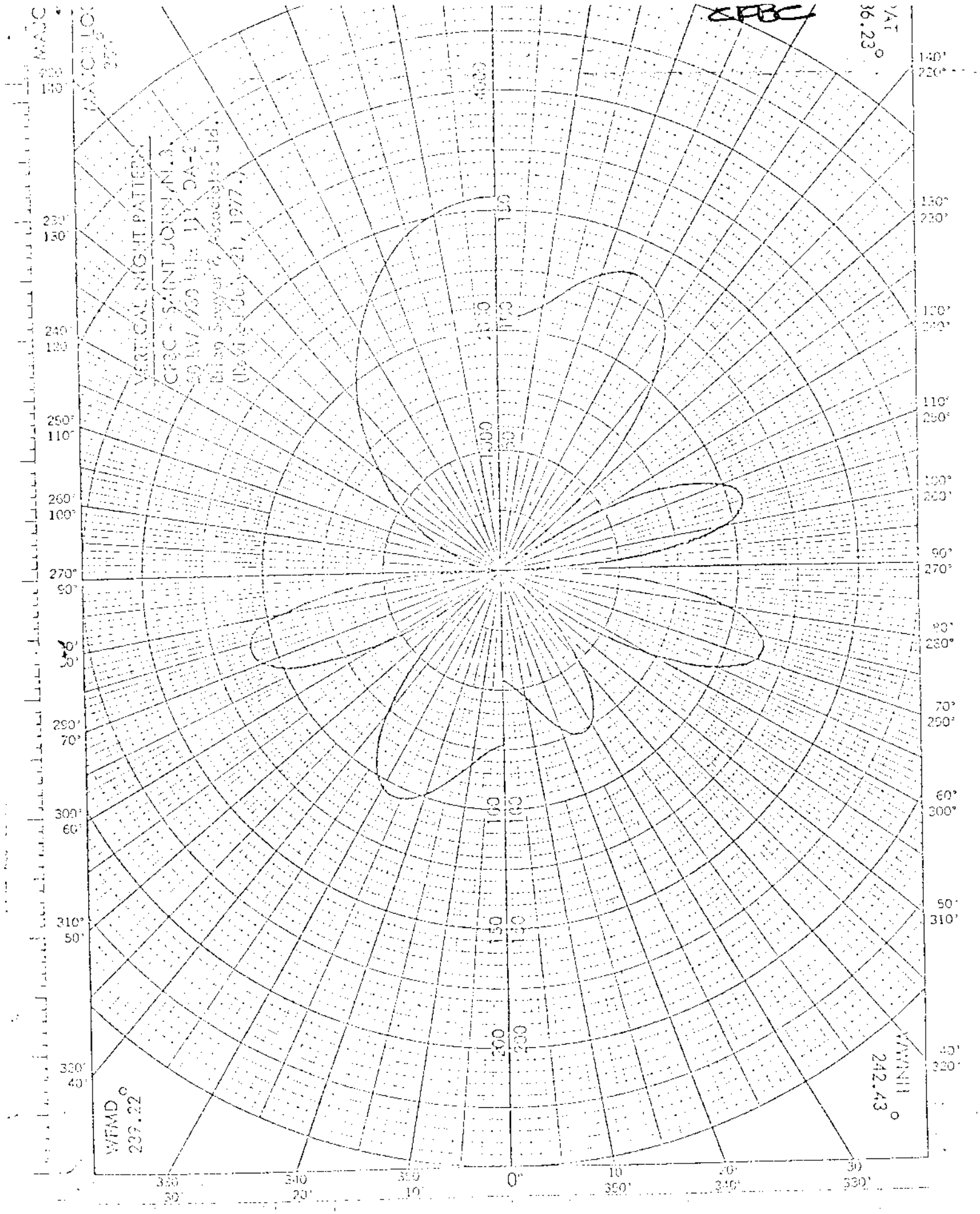
CFBC



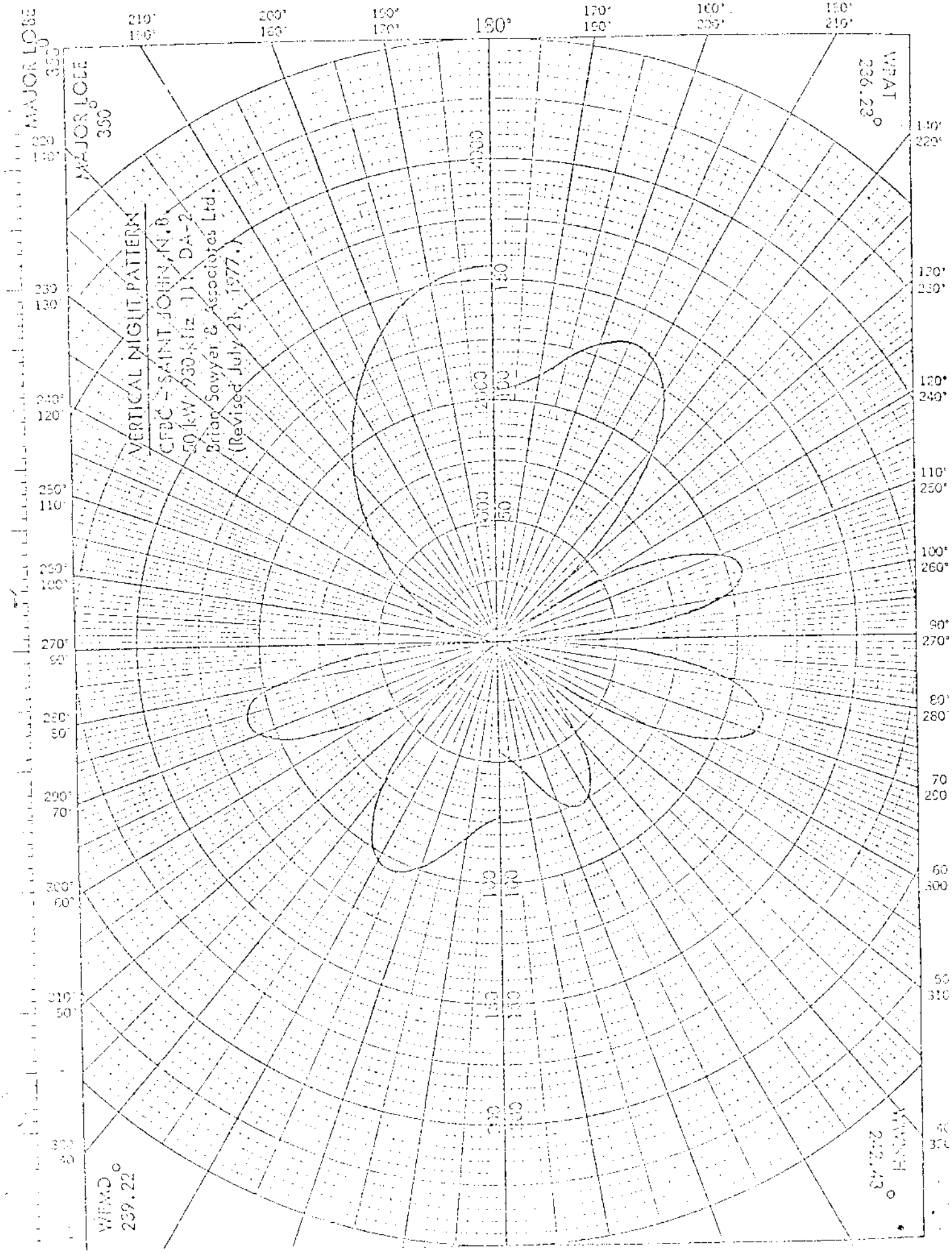
CONICAL SECTIONS: CFBC - SAINT JOHN, N.B. (Revised July 21, 1977)

CFBC




VERTICAL NIGHT PATTERN
CPBC
36.23°
242.43°
WTMD
239.22°
0°
10
350°
20
340°
30
330°
140°
720°
150°
230°
120°
240°
110°
250°
100°
260°
90°
270°
80°
280°
70°
290°
60°
300°
50°
310°
40°
320°

CFBC


VERTICAL NIGHT PATTERN
CFBC - SAINT JOHN, N.B.
50 kW 930 kHz DA-2
Brian Sawyer & Associates Ltd.
(Revised July 21, 1977.)
MAJOR LOBE
350°
WBAT
236.23°
WBAD
239.22°
WBAH
242.43°
180°

46 4410

CFBC

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Revised July 21, 1977

Station:	CFBC	Power:	50 kW Day & Night
Main Studio:	Saint John, NB.	Class:	III
Frequency:	930 kHz	Time:	Unlimited
Notification List No. 369		Date:	December 5, 1977

Geographical Location: Latitude 45° 13' 55" N
Longitude 66° 06' 15" W

Antenna System: Six elements, guyed, uniform cross-section, base insulated, series feed. No top loading.

Tower No.	1	2	3	4	5	6
Height above insulators	(90°) 264.4'	(90°) 264.4'	(90°) 264.4'	(90°) 264.4'	(60°) 176.3'	(60°) 176.3'
Overall Height	270.0'	270.0'	270.0'	270.0'	181.0'	181.0'
Spacing:	REF.	45°	201.23°	180.0°	186.3°	45°
Orientation:	REF.	10°	66.03°	78.0°	91.98°	167°
Day Field Ratio:	1.0	-	-	0.75	0.75	1.133
Day Phase	REF.	-	-	-77°	98°	166.5°
Night Field Ratio	1.0	1.0	1.0	1.0	-	-
Night Phase	REF.	-162°	-158°	+4.0°	-	-

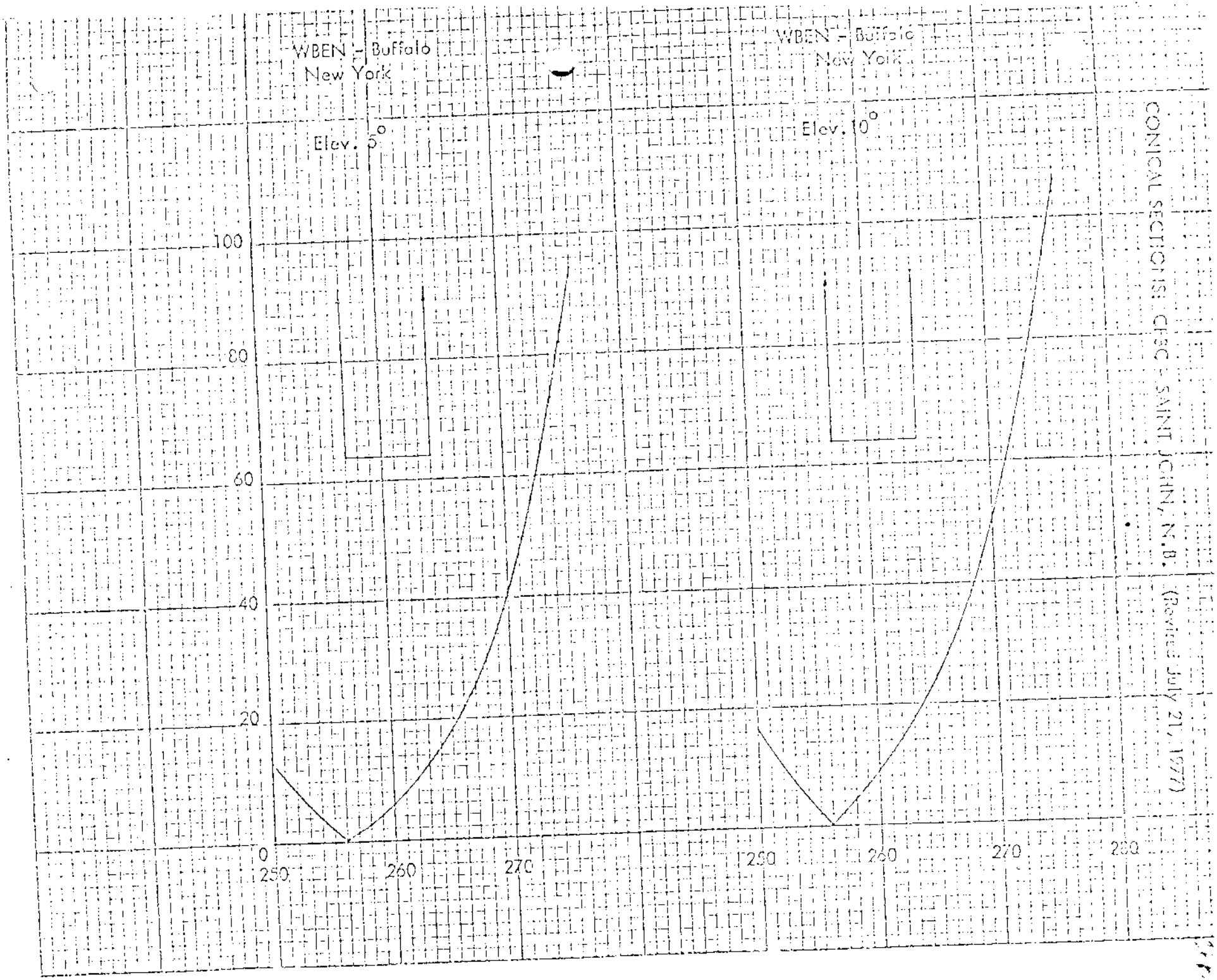
Ground System: Effective area of 120 radials, 0.4 wavelengths long, No.10 AWG soft drawn copper wire, buried 8 inches below ground surface.

Predicted Effective Field

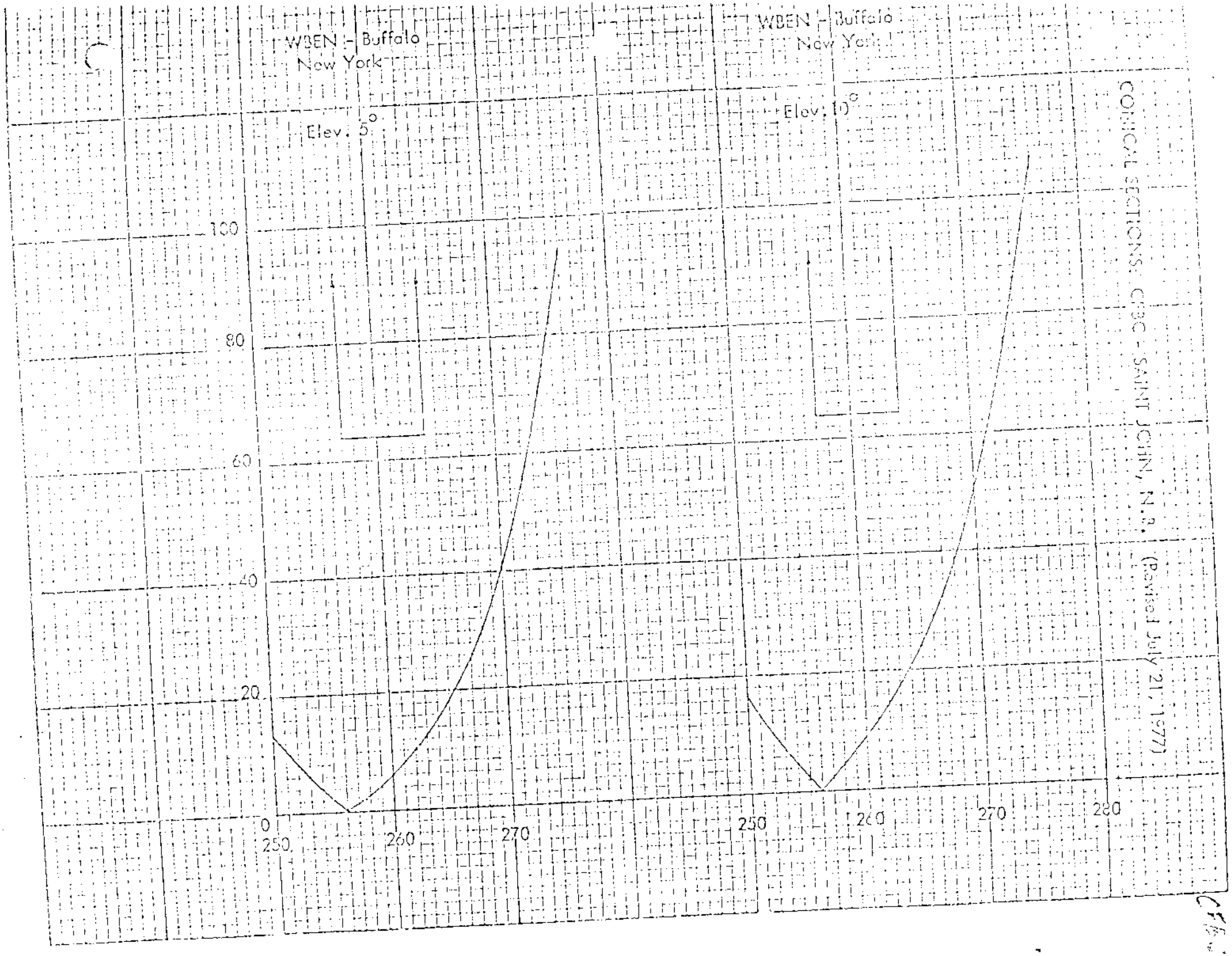
Day: 1370.00 mV/m at 1 mile for 50 kW
193.75 mV/m at 1 mile for 1 kW

Night: 1320.00 mV/m at 1 mile for 50 kW
186.68 mV/m at 1 mile for 1 kW

Please retain the day and night horizontal radiation patterns notified for CFBC in Canadian Change List No. 353 dated April 1, 1976. This notification involves an increase of height of towers # 2 and # 3 which are used for the night pattern only. Revised vertical sections for the night pattern are attached.

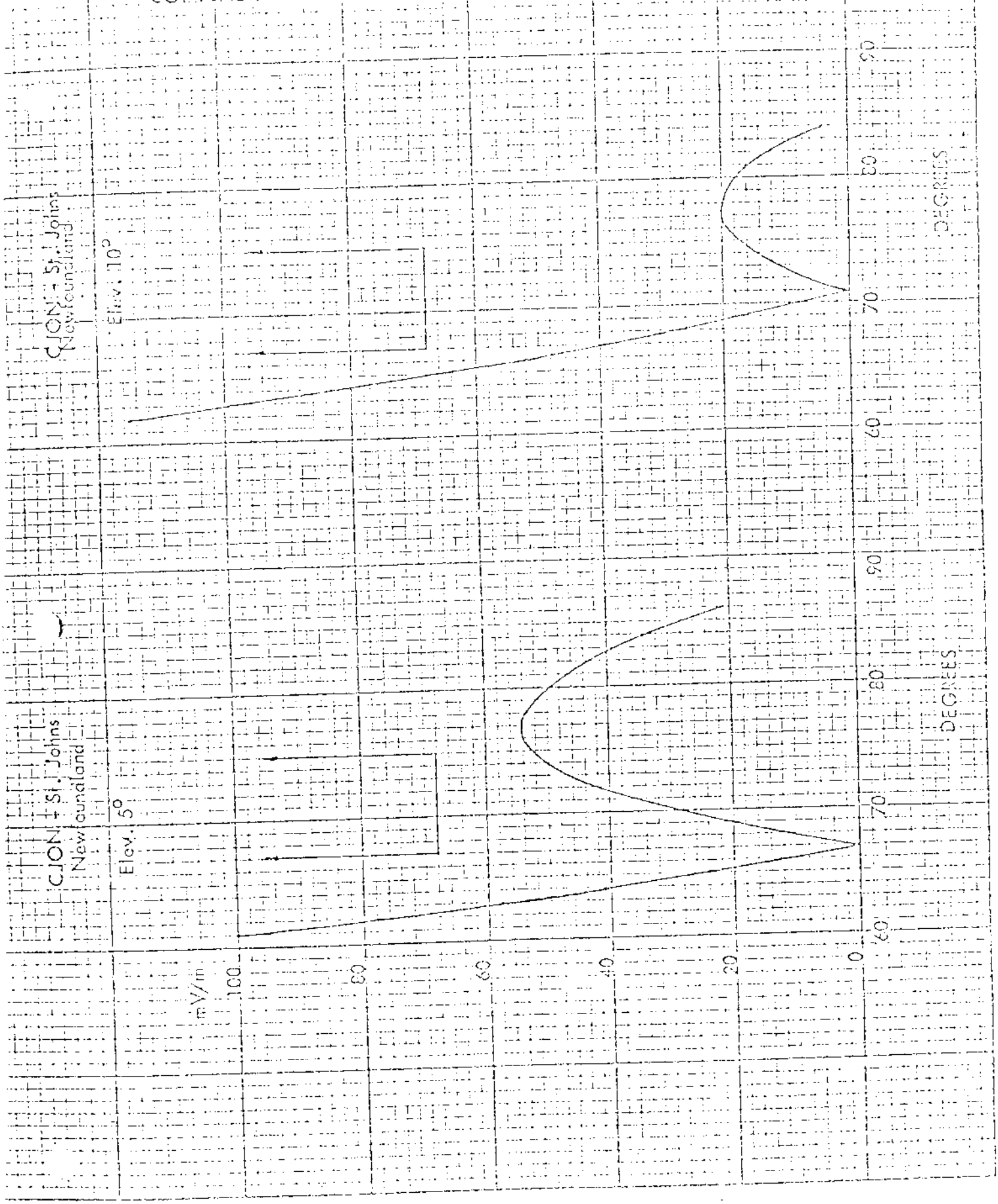


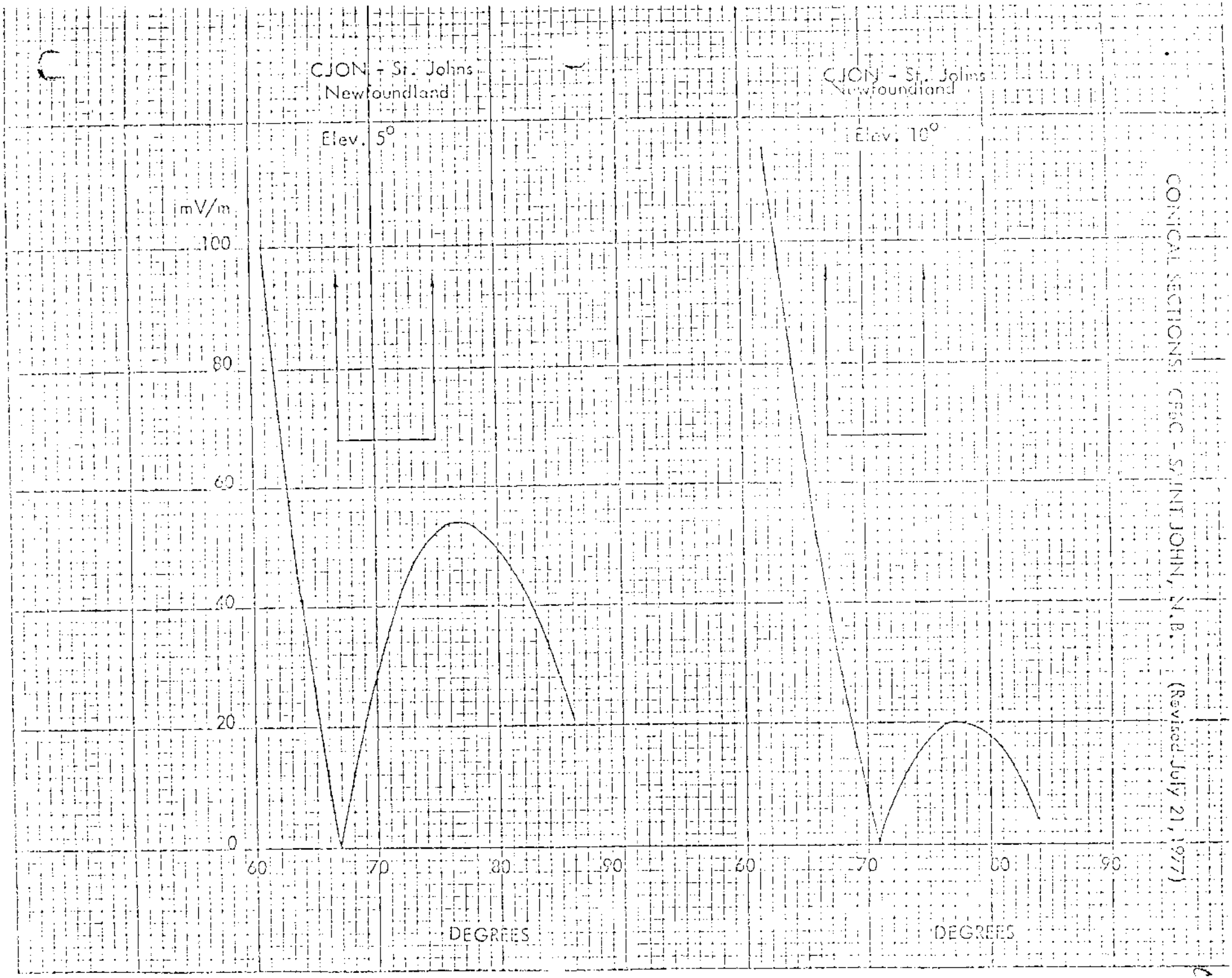
CONICAL SECTIONS: CFBC - SAINT JOHN, N.B. (Revised July 21, 1977)



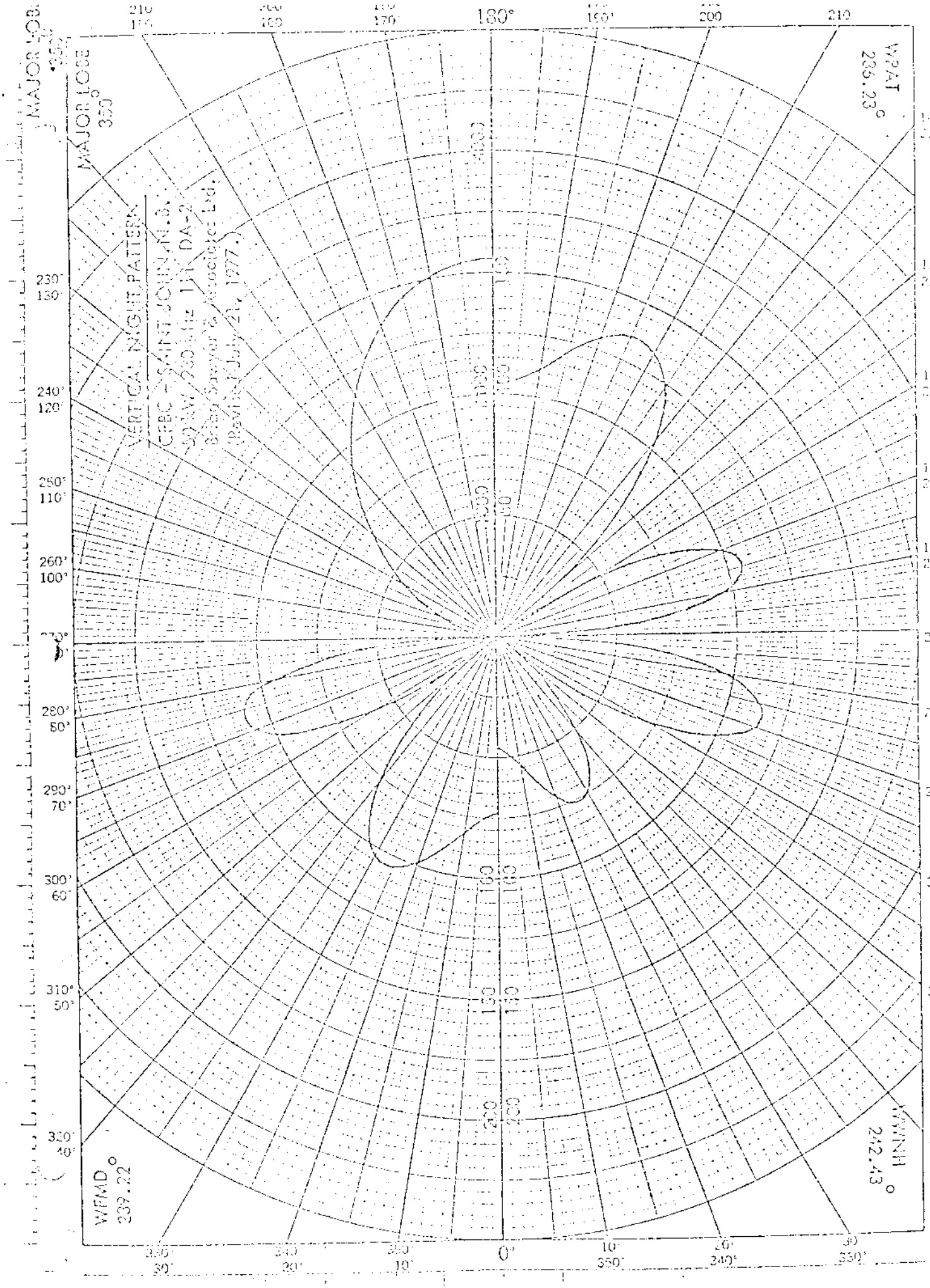
CONICAL SECTIONS: CBC - SAINT JOHN, N.B. (Revised July 21, 1977)

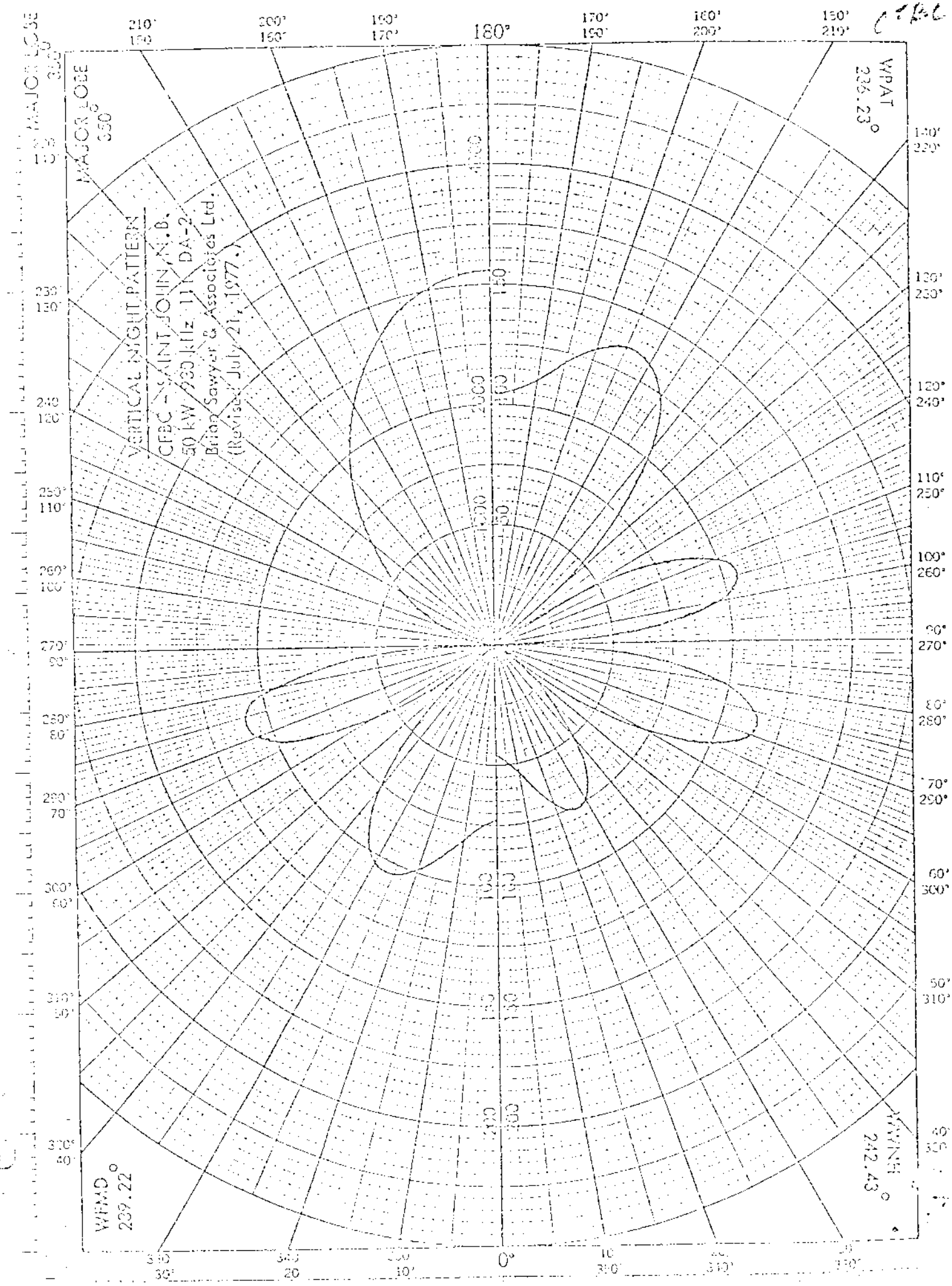
CONICAL SECTIONS: CFBC - SAINT JOHN, N.B. (Revised July 21, 1977)





CONICAL SECTIONS CFBC - SAINT JOHN, N.B. (Revised July 21, 1977)


VERTICAL NIGHT PATTERN
CFBC - SAINT JOHN, N.B.
50 kW, 230 kHz
Date: July 21, 1977
MAJOR LOBE
350°
WPAT
235.23°
WFMD
239.22°
WNNH
242.43°
180°
0°


VERTICAL NIGHT PATTERN
CFBC - SAINT JOHN, N.B.
50 kW 930 kHz 111 DA-2
Brian Sawyer & Associates Ltd.
(Revised July 21, 1977.)
MAJOR LOBE
330°
WPAT
236.23°
WPNH
242.43°
WPMD
239.22°
180°
0°
46 4410

#122

CJCA

DESCRIPTION SHEET
(3-23-59g)

Station CJCA 5kw, 10kw-LS, DA-N,U, Class III
Edmonton, Alberta, Canada 930 KC

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CJCA

Main Studio: Edmonton, Alberta

Frequency: 930 kc.

Power: 10 kw D/5 kw N, Class: III

Notification List No. 122

Date: May 27th, 1958

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM

North Latitude: 53° 25' 45"
West Longitude: 113° 29' 30"

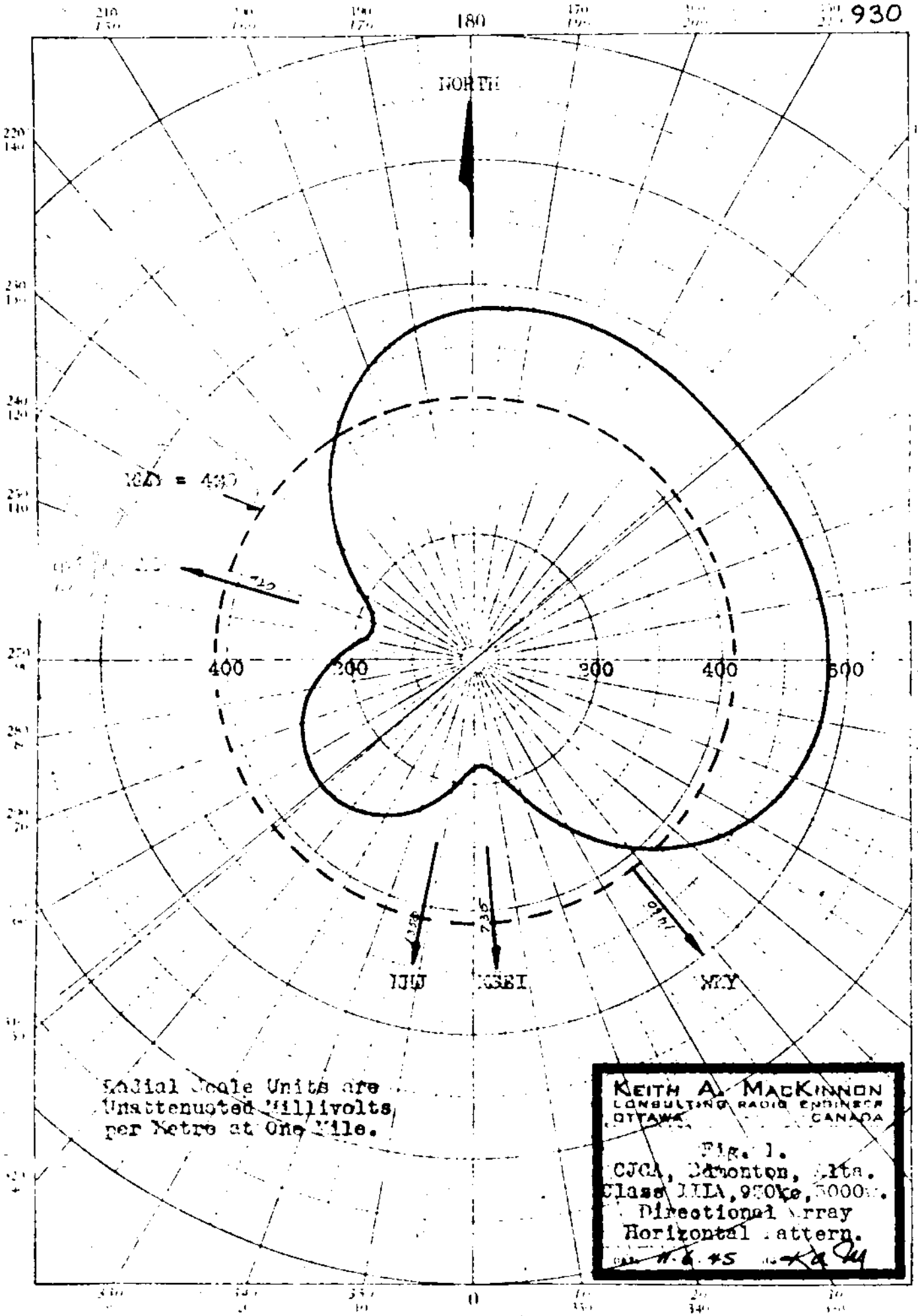
ANTENNA CHARACTERISTICS

Mode of operation: DA-N
Number of elements: Two
Type of elements: guyed, series fed, no top loading.

TOWER:	Northeast	Southwest
HEIGHT ABOVE INSULATORS:	265' (90°)	265'
SPACING:	397'(135°)	
PHASING:	104.5° lag	0°
FIELD RATIO:	0.535	1.0
ORIENTATION:	Centre line through towers bears N 51.5° E.	
GROUND SYSTEM:	400' radials spaced 3°	400' radials spaced 3°

Predicted Effective Field: 420 mv/m at 1 mile (188 for 1 kw)

CJCA 930


180
NORTH
400
200
200
400
600
IJW
KSBI
WKY
Radial Scale Units are Unattenuated Millivolts per Metre at One Mile.
KEITH A. MACKINNON
CONSULTING RADIO ENGINEER
OTTAWA CANADA
Fig. 1.
CJCA, Edmonton, Alta.
Class IIIA, 930Kc, 5000W.
Directional Array
Horizontal Pattern.

#123

CJYQ ~~CJON~~

DESCRIPTION SHEET
(10-24-58g)

Station CJON
St. John's, Newfoundland

10kw, DA-N,U,Class III
930 KC

Station: C J O N

Main Studio: St. John's, Newfoundland

Frequency: 930 kcs.

Power: 10 kw

Class: III

Notification List No. 123

Date: July 2, 1958

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

North Latitude: 47° 34' 45"

West Longitude: 52° 47' 15"

ANTENNA CHARACTERISTICS

Mode of Operation: DA-N
Number of elements: Two (2)
Type of elements: Series fed, no top loading.

TOWER:	#1 (SW)	#2 (NE)
HEIGHT ABOVE INSULATORS:	177'	177' (60°)
OVERALL HEIGHT:	181	181
SPACING:	180°	
PHASING:	0.0°	-90° (lag)
FIELD RATIO:	1.0	0.51

ORIENTATION: On a line bearing 20° East of True North

GROUND SYSTEM: The ground system presently installed consists of 120 radials for each tower, spaced every 3°. Each radial is 424' long and buried to a depth of approximately 8" (#10 soft copper wire used)

Predicted effective field 570 mv/m (180 for 1 kw)

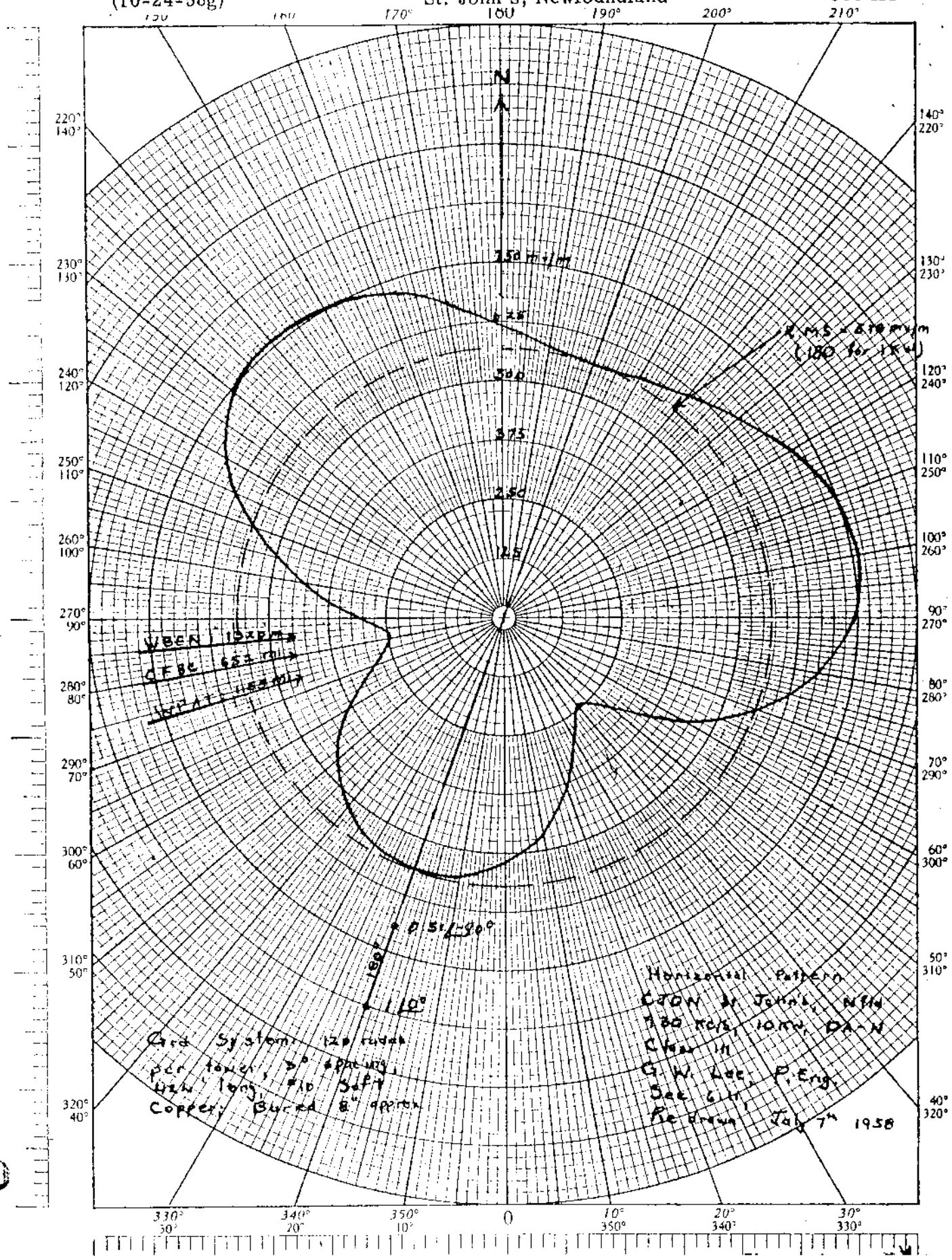
#123

CJON ~~CJON~~

PROPOSED NIGHT
(10-24-58g)

Station CJON
St. John's, Newfoundland

10kw, DA-N,U, Class III
930 KC



CKNS NEW

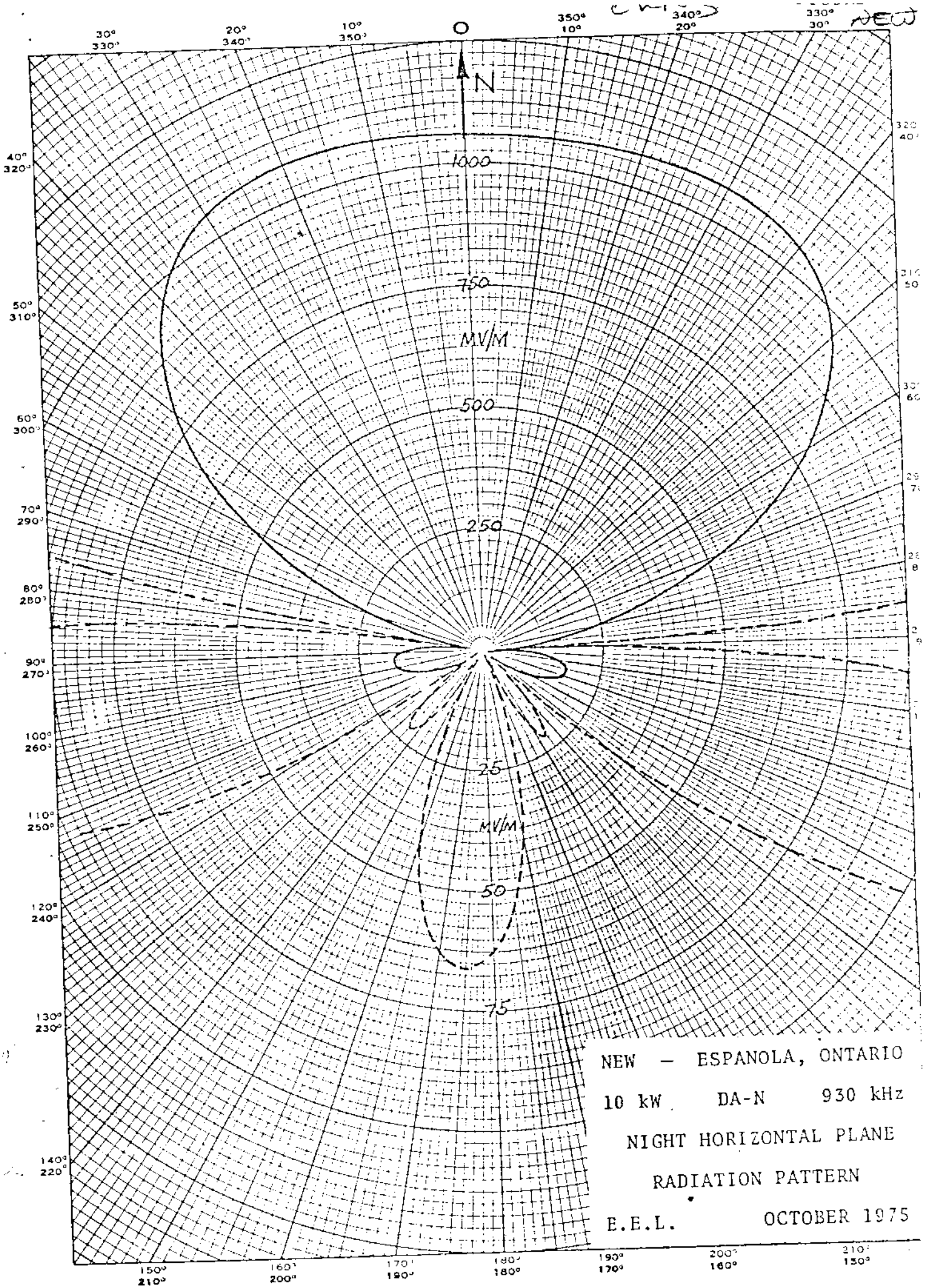
TABLE 1

ANTENNA DESCRIPTION SHEET

STATION CALL:	NEW
MAIN STUDIO:	ESPANOLA, ONTARIO
ALTERNATE STUDIO:	ELLIOT LAKE, ONTARIO
FREQUENCY:	930 kHz
POWER:	10 kW
CLASS:	III
MODE:	DA-N
TIME:	UNLIMITED
NOTIFICATION LIST NO.:	347 DATE: 11/24/75
GEOGRAPHICAL LOCATION:	Latitude: 46° 14' 29" North Longitude: 81° 46' 36" West
ARRAY CHARACTERISTICS:	Four guyed steel towers of uniform cross section and equal height; base insulated; series fed; no top loading; overall height above ground 255'; height above base insulator 250' or 85°.

TOWER NUMBER:	1	2	3	4
ORIENTATION(DEGREES TRUE):	0°	185°	185°	185°
SPACING } DEGREES:	0°	130°	260°	390°
SPACING } FEET:	0'	381.9'	763.8'	1145.7'
NIGHT FIELD RATIO:	1.00	1.79	1.79	1.00
NIGHT PHASE ANGLE:	0°	109.8°	240.2°	350°

GROUND SYSTEM:	120 equally spaced radial wires per tower of #10 AWG bare copper buried 6" - 12" below grade; of average length 423'(0.4λ) excluding those along common chords.
PREDICTED EFFECTIVE FIELD: (UNATTENUATED AT 1 MILE)	DAY OMNI: 590 mV/m or 186.5 mV/m for 1 kW NIGHT PATTERN: 600 mV/m or 189.5 mV/m for 1 kW



NEW — ESPANOLA, ONTARIO

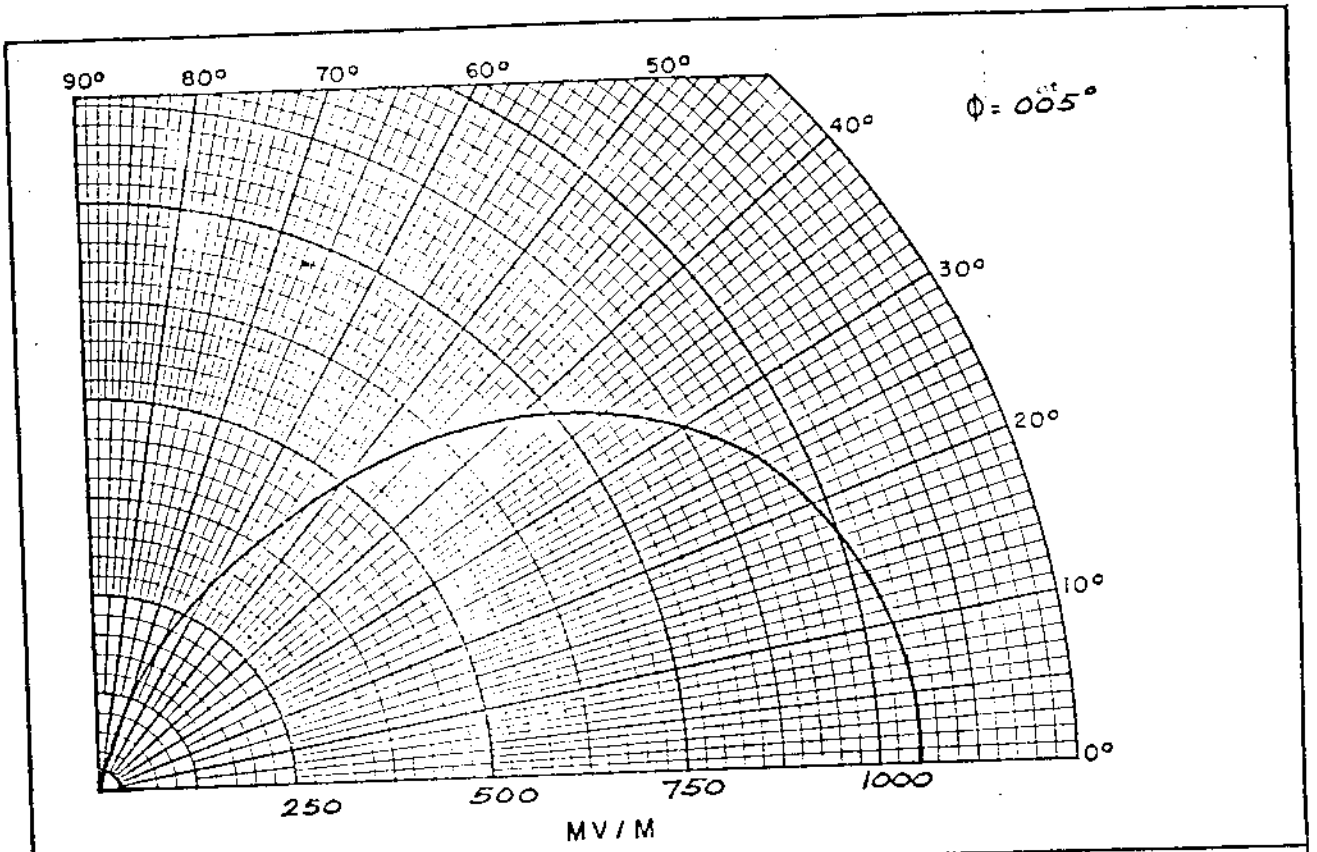
10 kW DA-N 930 kHz

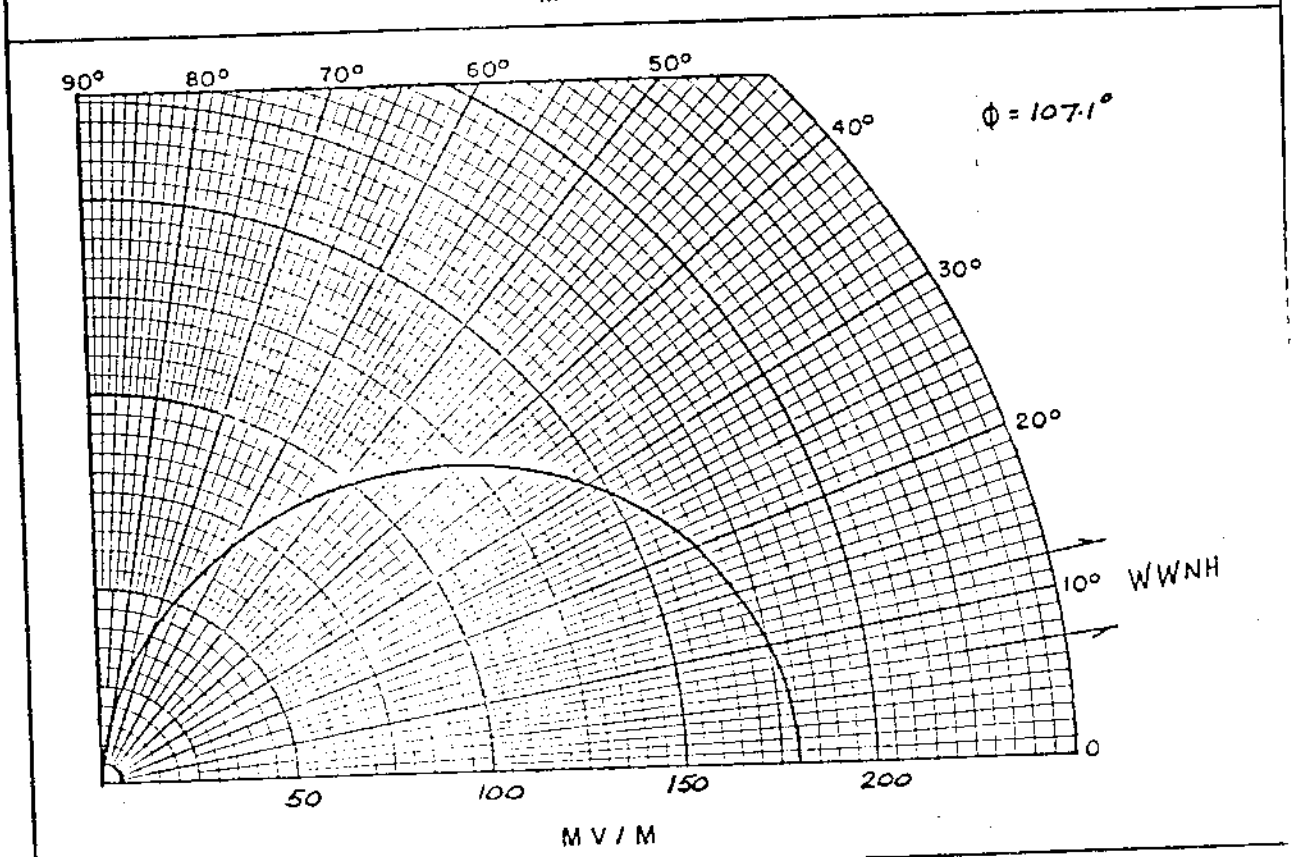
NIGHT HORIZONTAL PLANE

RADIATION PATTERN

E.E.L. OCTOBER 1975

FIGURE 2-3





VERTICAL RADIATION PATTERNS

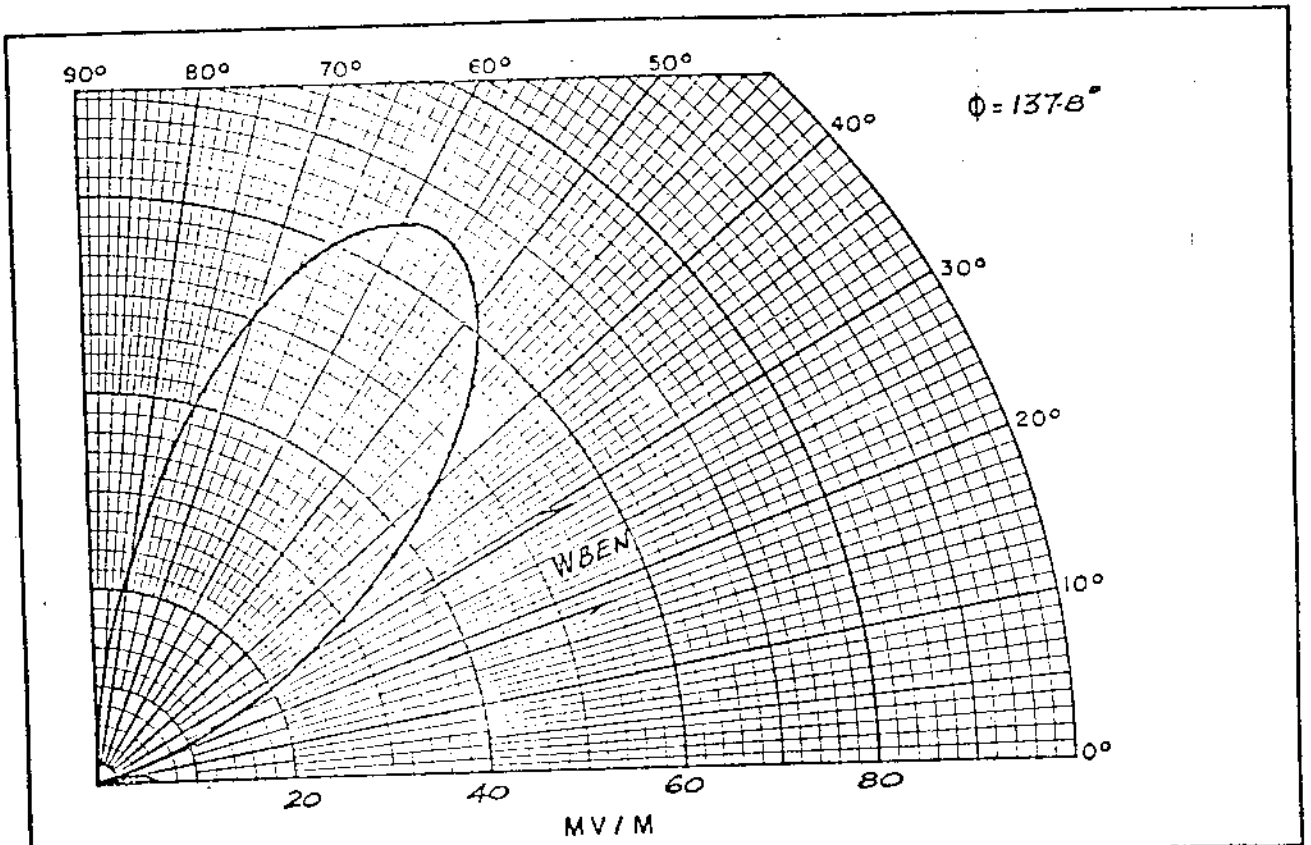
NEW — ESPANOLA, ONTARIO

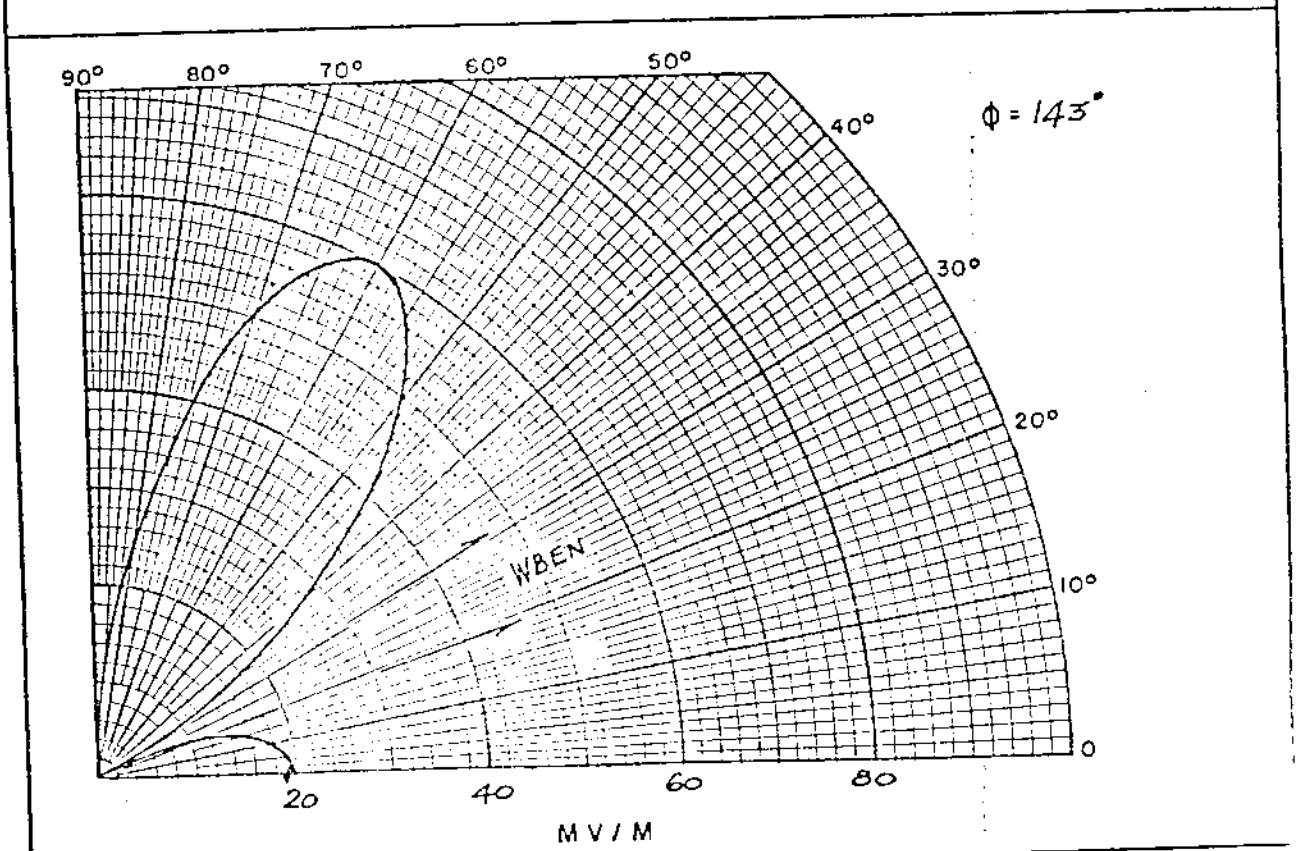
10 kW DA-N 930 kHz

E.E.L. OCTOBER 1975

NEW

FIGURE 2





VERTICAL RADIATION PATTERNS

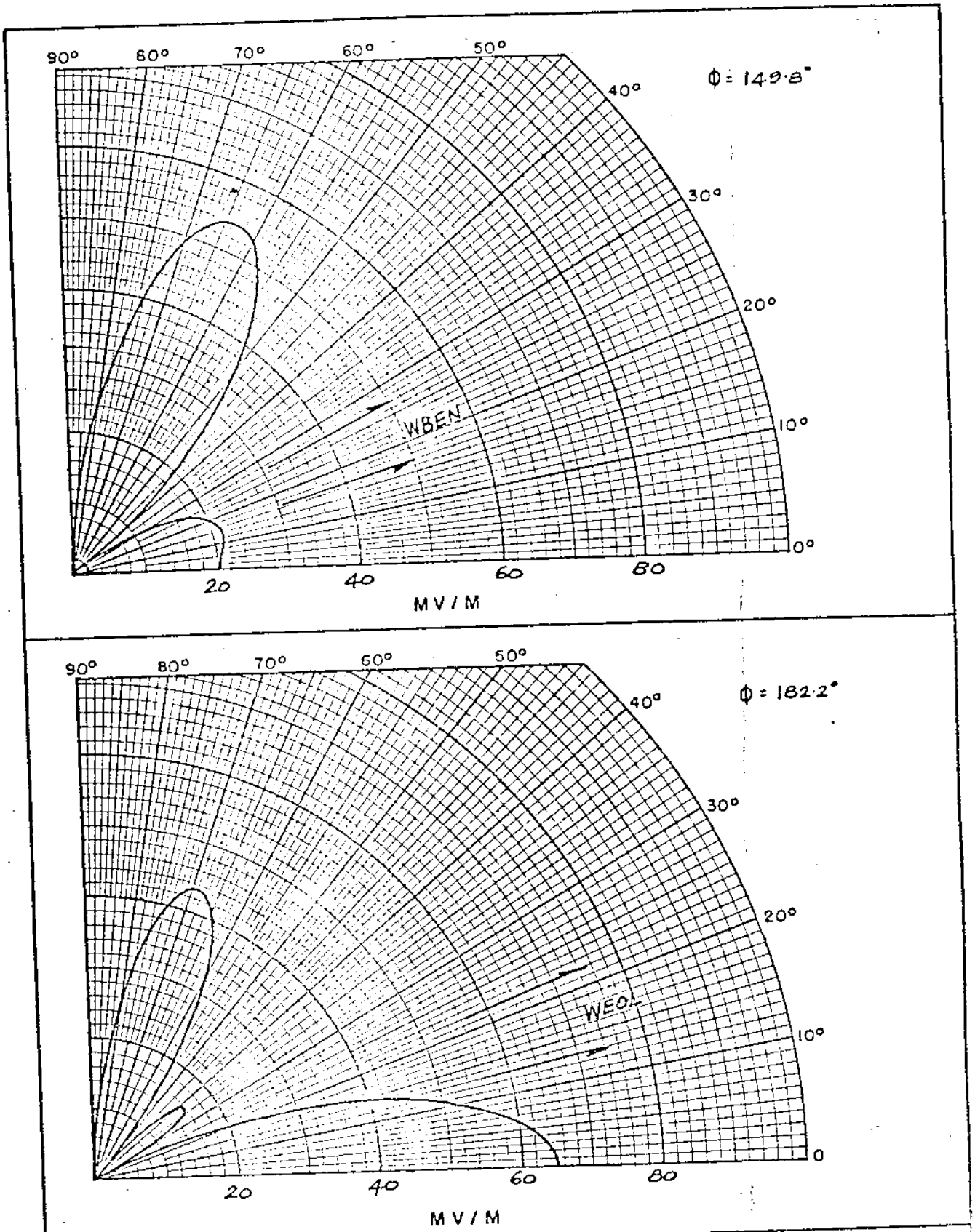
NEW – ESPANOLA, ONTARIO

10 kW DA-N 930 kHz

E.E.L. OCTOBER 1975

NEW

FIGURE 2-3



VERTICAL RADIATION PATTERNS

NEW — ESPANOLA, ONTARIO

10 kW DA-N 930 kHz

E.E.L. OCTOBER 1975

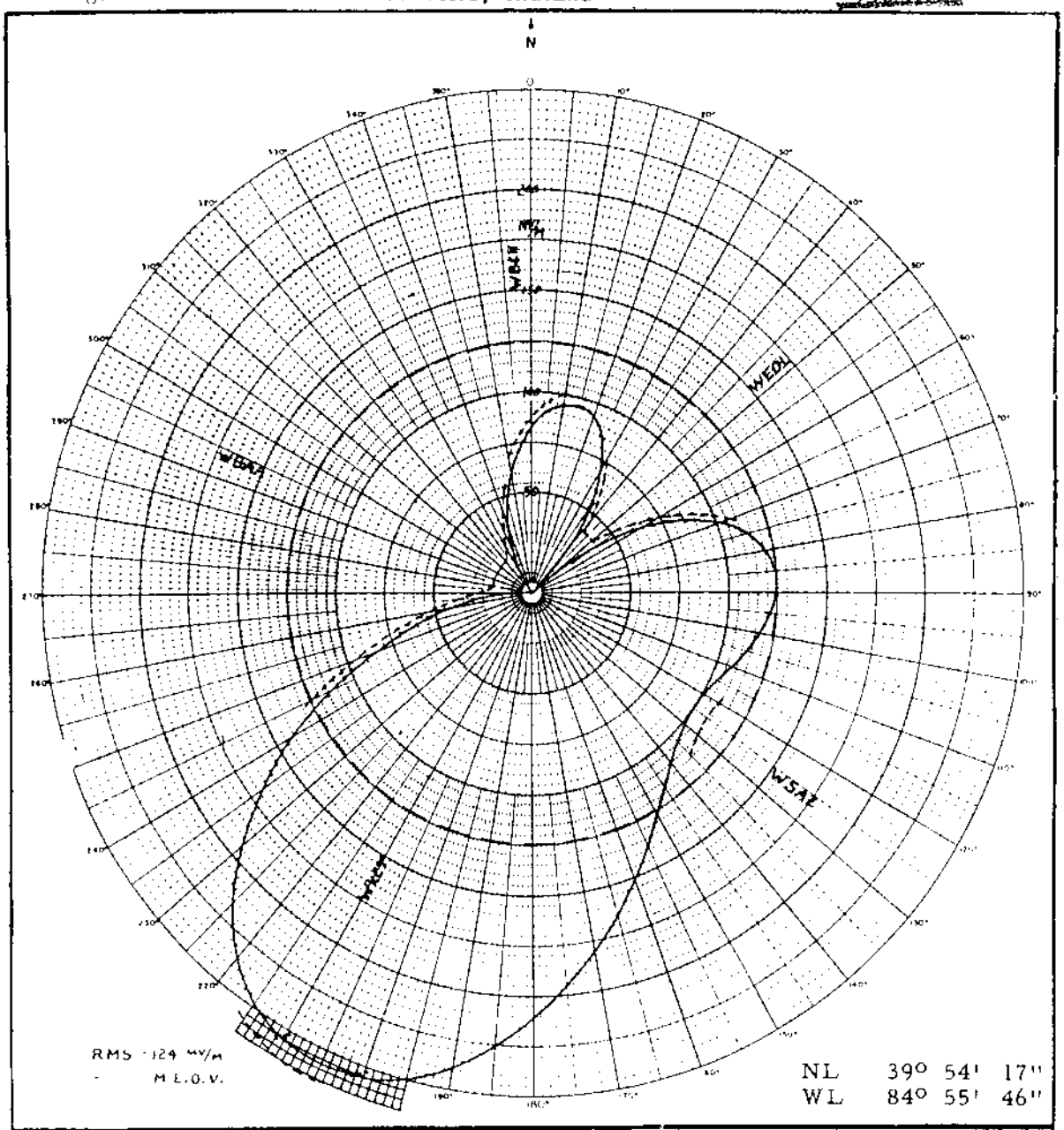
CENTERVILLE, IND

PROPOSED DAY
(6-16-59g)

New; Richmond B/C Co.
Centerville, Indiana

500w, DA-D, D
930 KC

3-6-63 granted CP for new station.



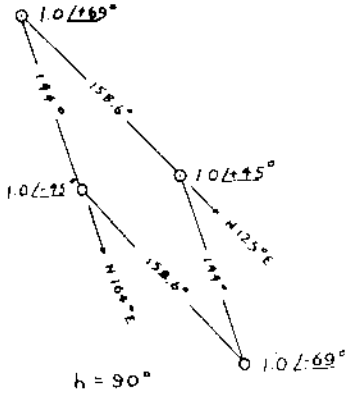


EXHIBIT 11
HORIZONTAL RADIATION PATTERN
RICHMOND BROADCASTING COMPANY
930 KC 500 W DA-DAY CENTERVILLE, IND.

WILLIAM L. FOSS, INC.
Electronic Consultants
WASHINGTON 5, D. C.
927 15th Street, N.W. RE 3063

PATTERN NO
SUPERSEDES
APP

FCC File No. BP-11625
Accepted 5-18-59 (Amended)

Richmond Broadcasting Company
Centerville, Indiana
930 KC

KA9-1

PROPOSED NIGHT
(7/3/57g)

Station KUIN
Grants Pass, Oregon

5kw-LS/1kw-U/DA-N,U
930 KC

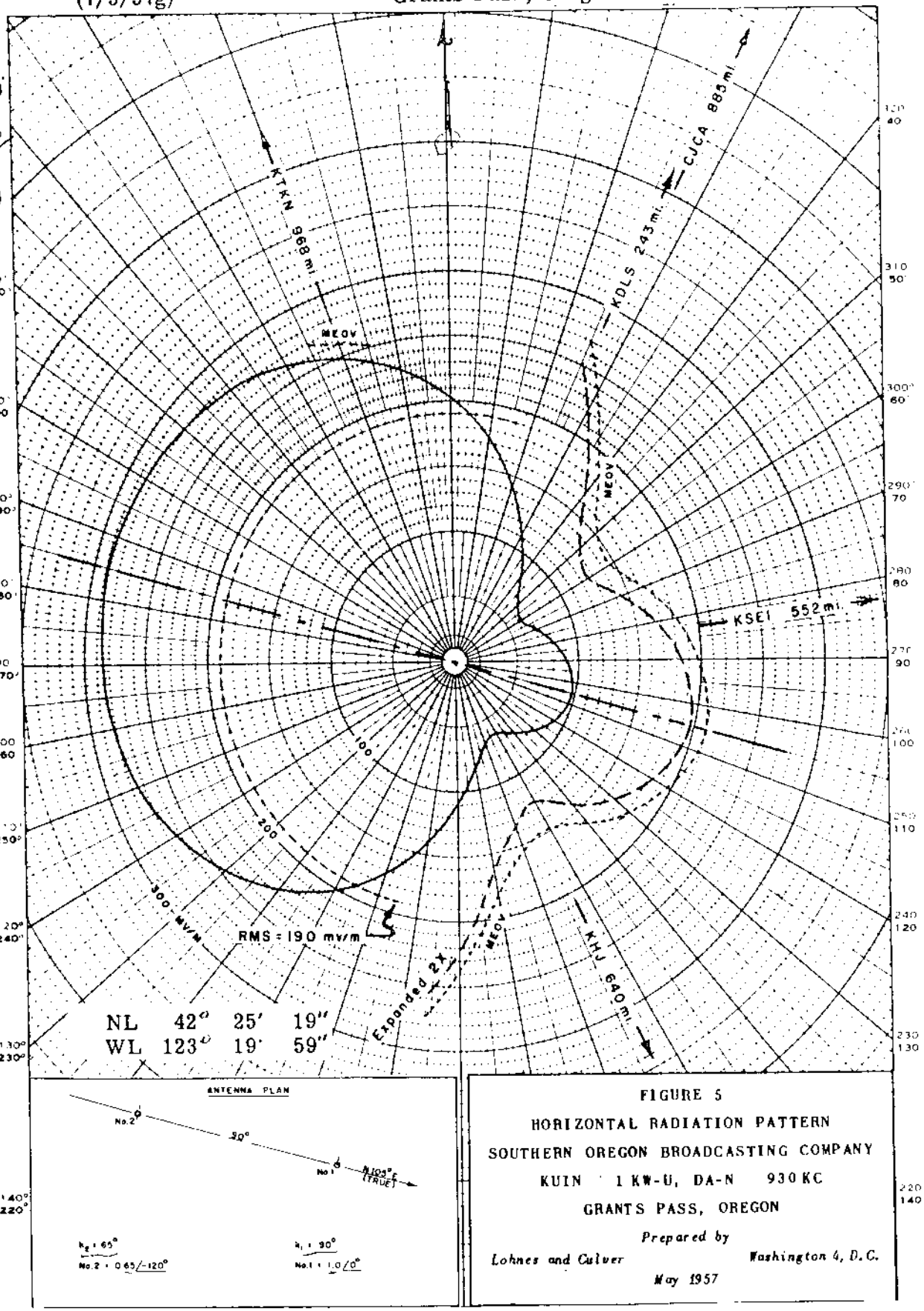


FIGURE 5
HORIZONTAL RADIATION PATTERN
SOUTHERN OREGON BROADCASTING COMPANY
KUIN 1 KW-U, DA-N 930 KC
GRANTS PASS, OREGON
Prepared by
Lohnes and Culver *Washington 4, D.C.*
May 1957

FCC File No. BP-11,359
Accepted 6/25/57

KUIN
Grants Pass, Oregon

930 KC

MEASURED NIGHT
(7-8-59g)

Station KAGI
Grants Pass, Oregon

1kw DA-N, U
930 KC

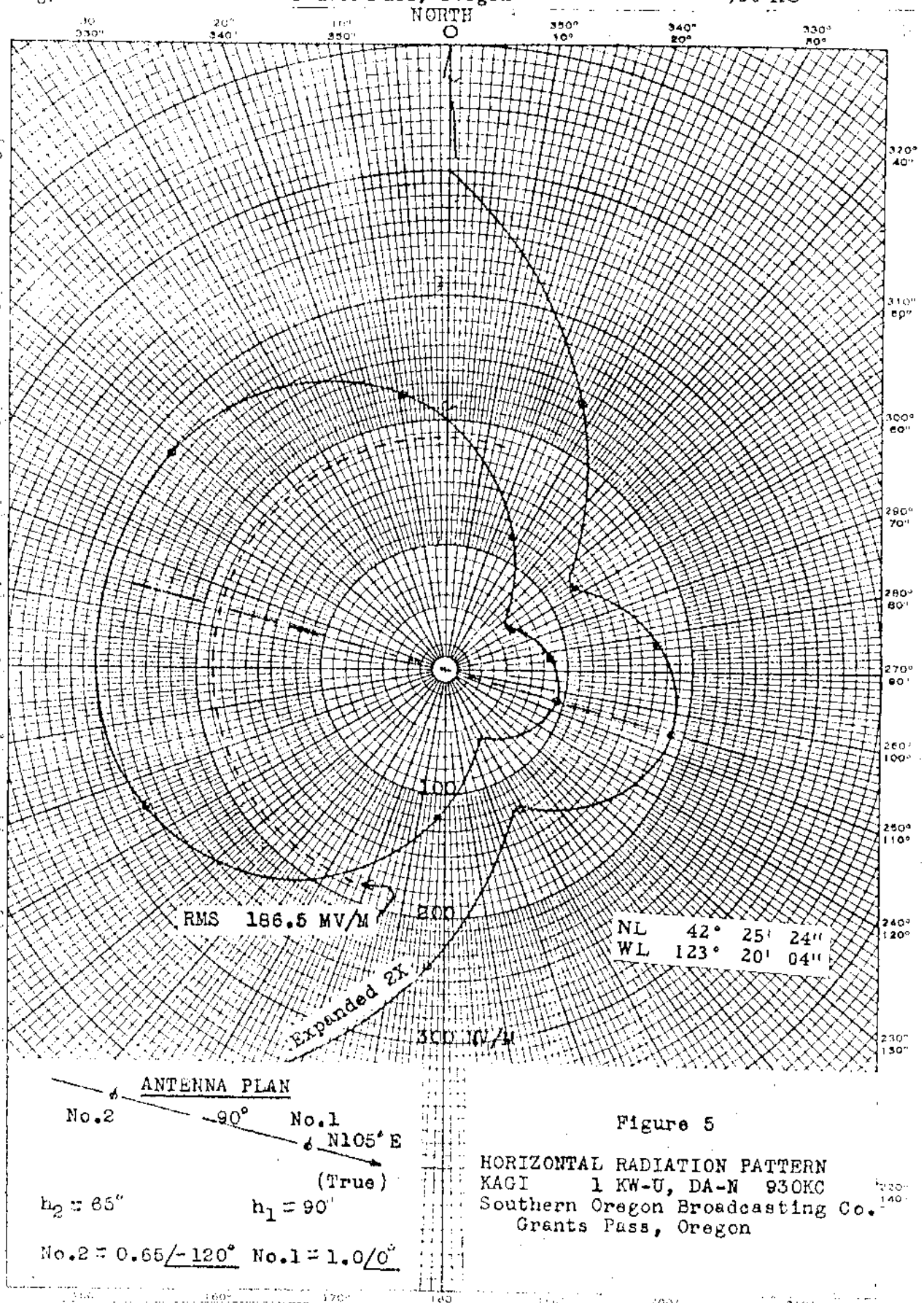


Figure 5

HORIZONTAL RADIATION PATTERN
KAGI 1 KW-U, DA-N 930KC
Southern Oregon Broadcasting Co.
Grants Pass, Oregon

FCC File No. BL-7490
Accepted 6-16-59

KAGI
Grants Pass, Oregon

930 KC

MEASURED NON-DA
(7-8-59g)

Station KAGI
Grants Pass, Oregon

1kw, DA-N, U
930 KC

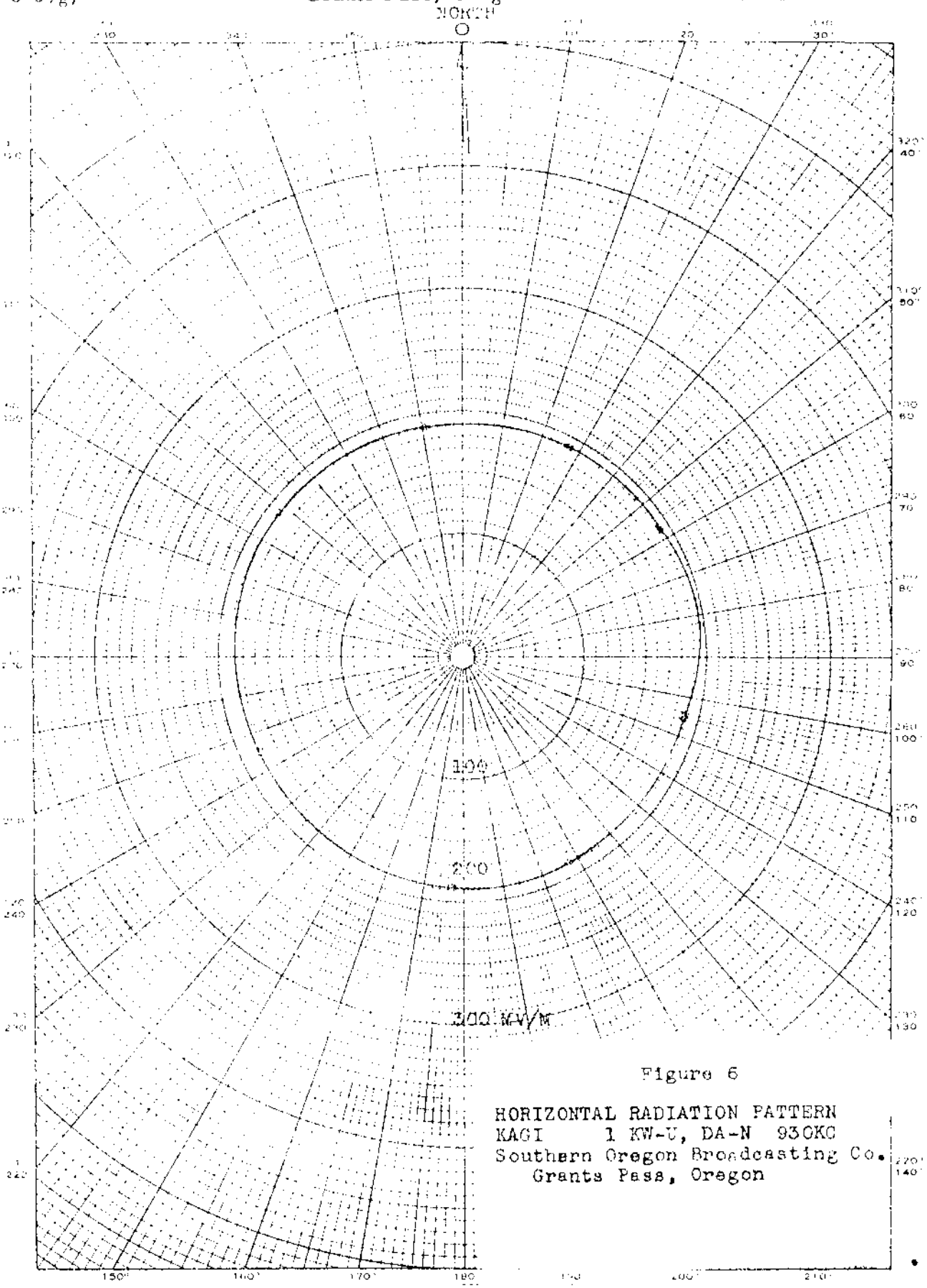


Figure 6

HORIZONTAL RADIATION PATTERN
KAGI 1 KW-U, DA-N 930KC
Southern Oregon Broadcasting Co.
Grants Pass, Oregon

FCC File No. BL-7490
Accepted 6-16-59

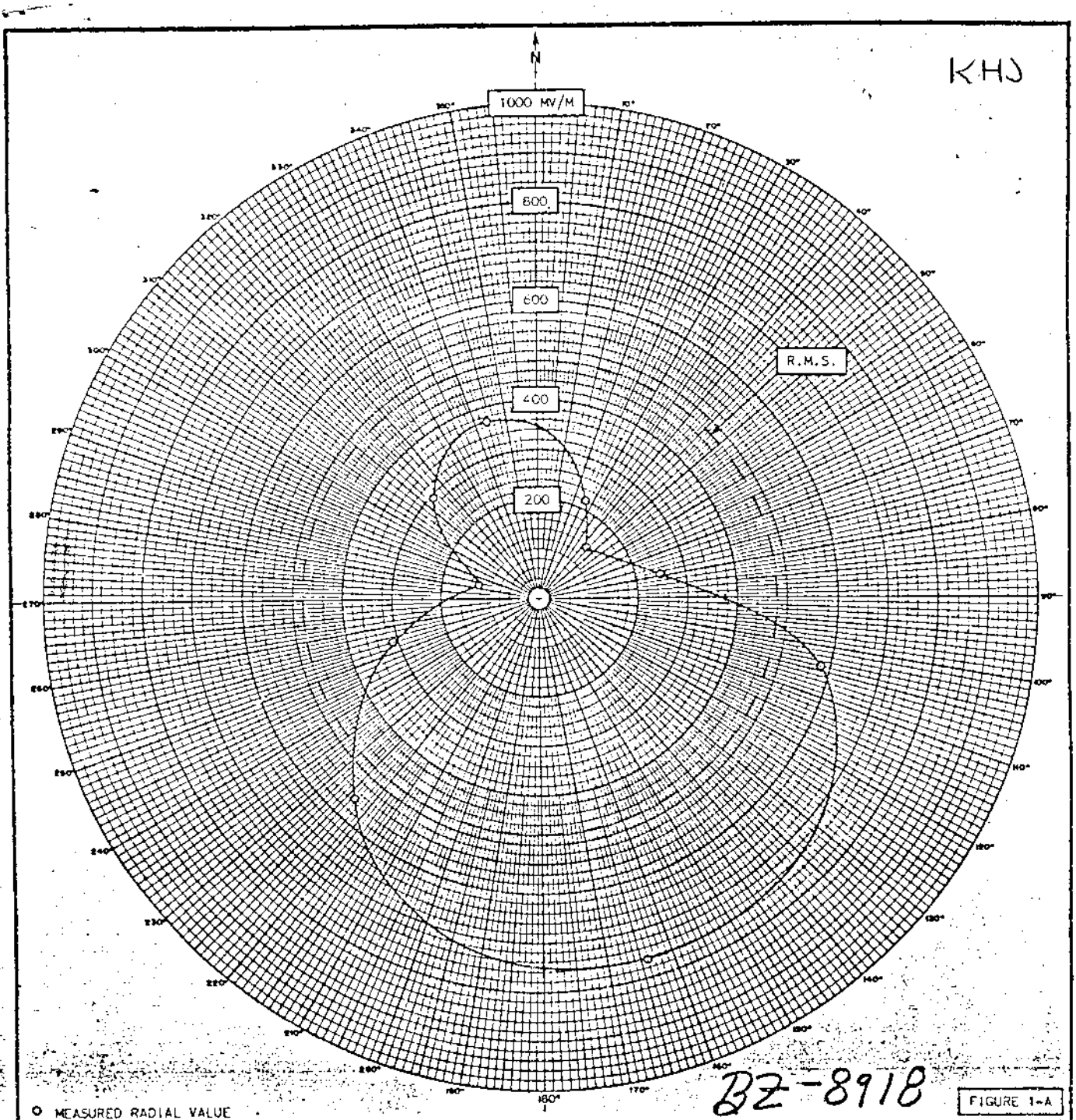
KAGI
Grants Pass, Oregon

930 KC

granted license for DA-N

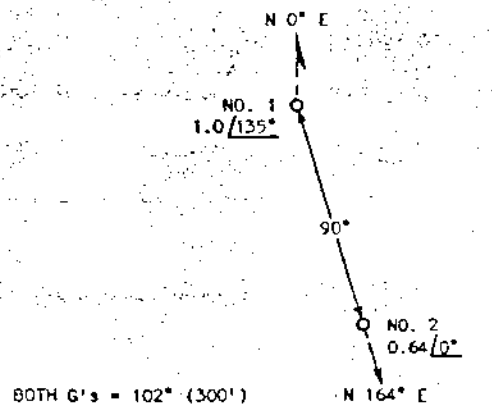
Minimum ratio required by (ND) permit 10.5 RW 6-25-60

KHJ



HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION



APPLICANT	: RKO GENERAL, INC. (KHJ)
LOCATION	: LOS ANGELES, CALIFORNIA
FREQUENCY	: 930 KC/S
POWER	: 5 KW – U (DA-N)
LATITUDE	: 34 DEG. 02 MIN. 26 SEC.
LONGITUDE	: 118 DEG. 22 MIN. 16 SEC.
WHEN USED	: NIGHTTIME
R.M.S. FIELD	: 479.0 MV/M (MEASURED)
DATE	: JANUARY 1975

SILLIMAN, MOFFET & KOWALSKI

CONSULTING RADIO ENGINEERS

WASHINGTON, D.C.

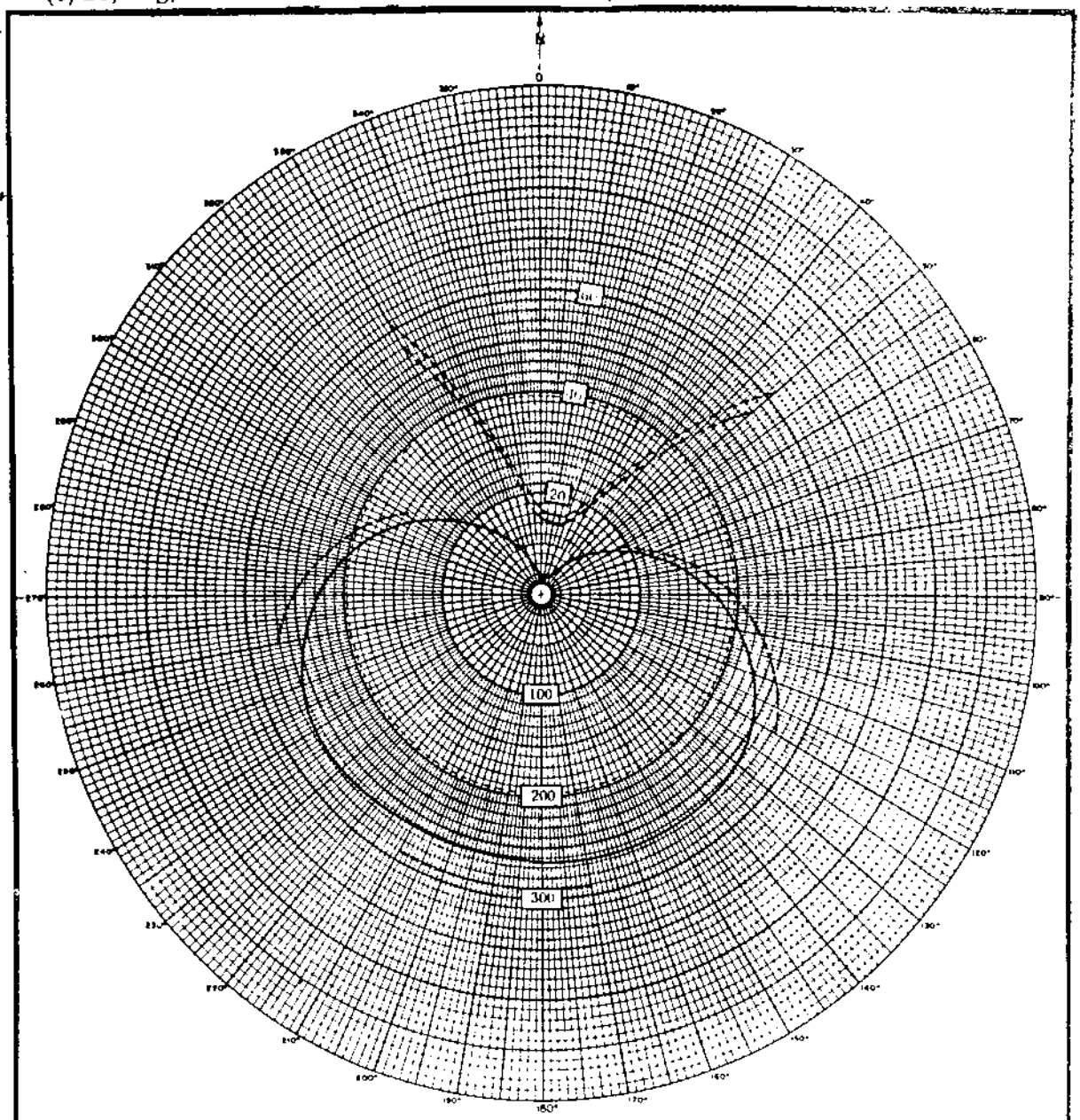
KCCW ~~KITE~~

PROPOSED NIGHT
(8/29/57g)

Station KITE
Terrell Hills, Texas

1kw, DA-N,U
930 KC

Granted CP 4/8/58 to install DA-N, increase power & to move studio location to Terrell Hills, Texas

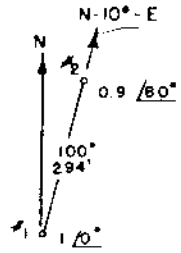


E_{RMS} = 196 MV/M

-----MEOV
—·-EXPANDED SCALE

LATITUDE 29° 31' 0.5 8"
LONGITUDE 98° 24' 25"

ANTENNA PARAMETERS



G = 76.3° + T.L

FIGURE 4

NIGHTTIME HORIZONTAL PLANE PATTERN (GROUND)
RADIO STATION KITE
TERRELL HILLS, TEXAS

930 KC 1 KW-DA-N

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

FCC File No. BMP-7805
Accepted 8/16/57

KITE
Terrell Hills, Texas

930 KC

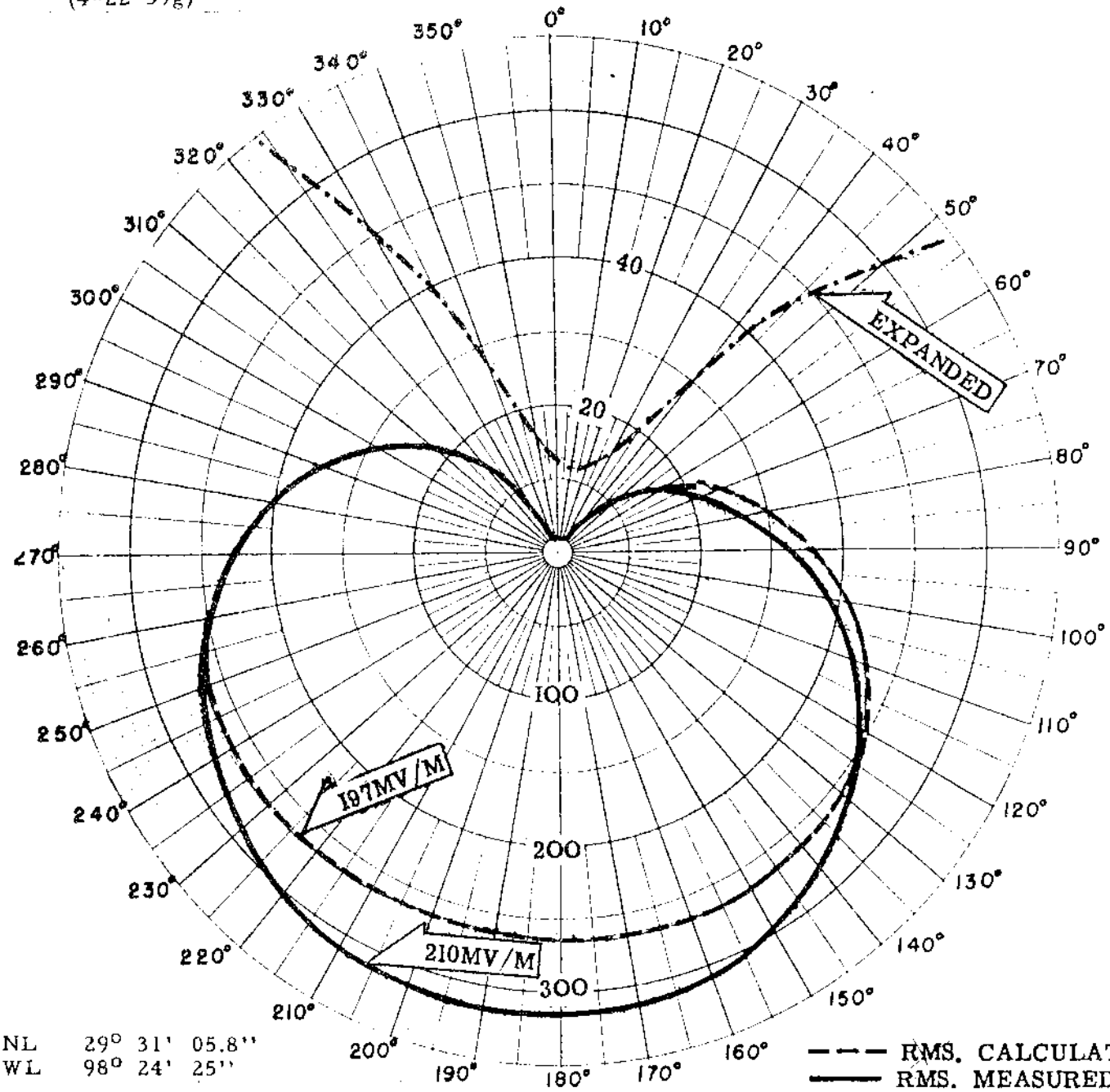
KITE

MEASURED NIGHT
(4-22-59g)

Station KITE
Terrell Hills, Texas

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

7-14-59 recd. to grant for chng of facilities and DAN

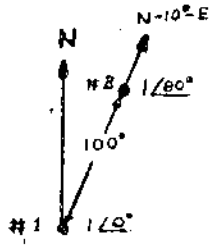


NL 29° 31' 05.8''
WL 98° 24' 25''

— — — RMS. CALCULATED
——— RMS. MEASURED

HORIZONTAL RADIATION PATTERN

Granted K. to change facilities + install DA 7-10-59

ANTENNA PLACEMENT SKETCH	DIRECTIONAL ANTENNA PARAMETERS						
	Station KITE Frequency 930 KC		Location SAN ANTONIO, TEXAS Rated Power 1 Kw. D 5 KW. N				
	Antenna No.	True Bearing	Spacing	Phasing	Field Ratio	Horizontal Field Intensity	Electrical Height
	1	10°	100°	0°	1	205MV/M RMS	76.3° + 15° Top Loadi.
	2	190°	100°	80°			

FCC File No. BL-7391
Accepted 4-3-59

KITE
Terrell Hills, Texas

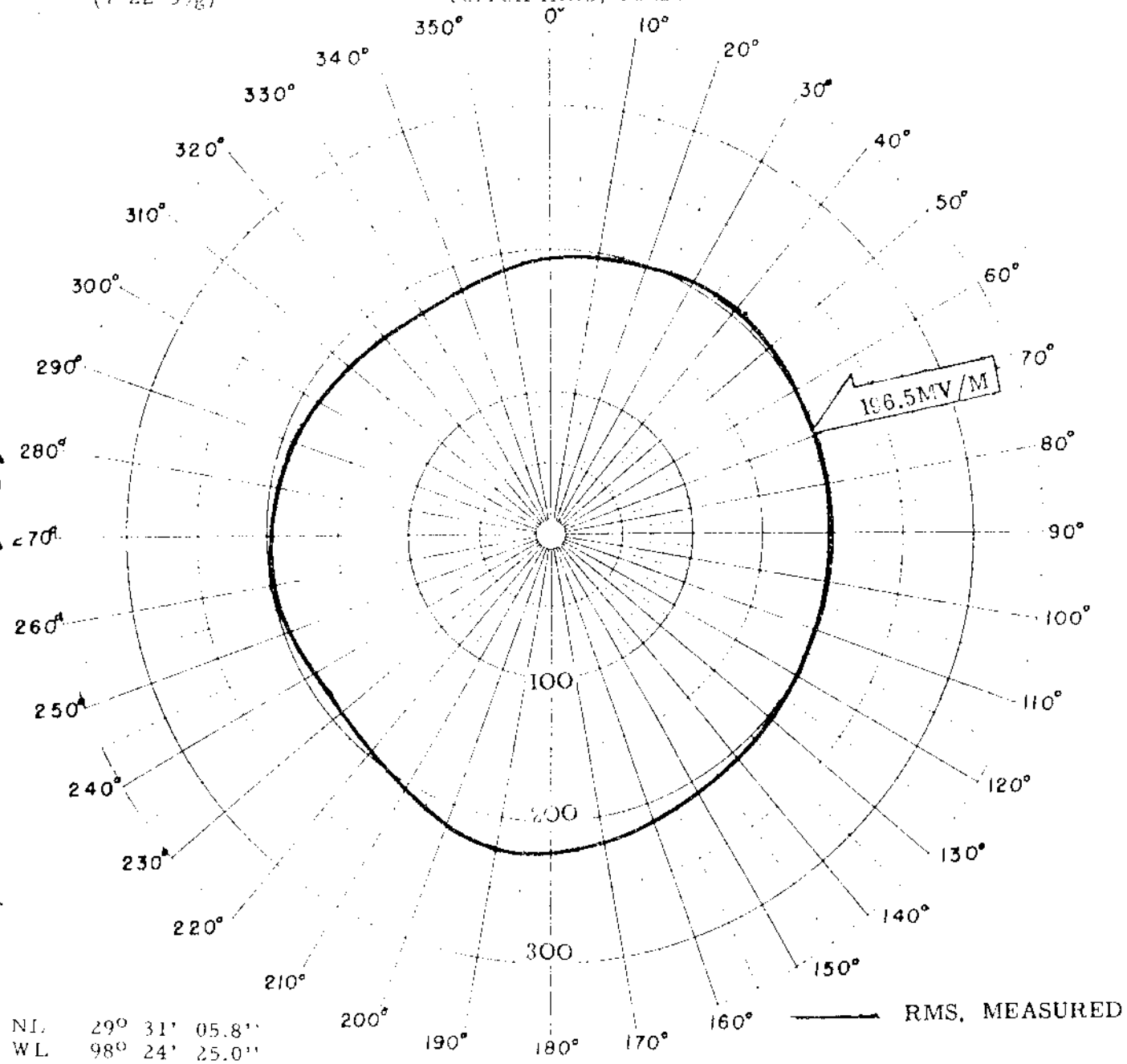
930 KC

KITE

MEASURED NON-DA
(4-22-59g)

Station KITE
Terrell Hills, Texas

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



NL 29° 31' 05.8''
WL 98° 24' 25.0''

7-14-59 recorded grant for change of facilities & DA-N

Granted - to run standard antenna but in full DA - 7-16-59

HORIZONTAL RADIATION PATTERN

NON DIRECTIONAL ANTENNA POLAR PATTERN

Station KITE	Location SAN ANTONIO, TEXAS
Frequency 930 KC	Rated Power 1 Kw. D 5 KW. N

Kenneth R Hyman
Radio Engineer
San Antonio, Texas

Exhibit No.- 8

FCC File No. BL-7391
Accepted 4-3-59

KITE
Terrell Hills, Texas

930 KC

SUPPLEMENTAL DIRECTIONAL ANTENNA
DESCRIPTION SHEET

Station: KIUP

Main Studio: Durango, Colorado

Frequency: 930 kHz

Power: 1 kW Night 5 kW Day

Notification List No. 1698

Date: August 18, 1976 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM: North Latitude: 37° 13' 45"

West Longitude: 107° 51' 49"

Authorized for Night operation (DA-N).

Predicted effective Day Field: (omnidirectional) 425 mv/m at rated power.

Note: Please retain the description sheet and directional antenna radiation patterns notified for station KIUP in United States Change List Number 361, dated May 18, 1950, and attach to this supplemental Description Sheet. This notification is for the purpose of indicating only a change or correction in the geographical coordinates of the center of the antenna system.

CTR NO 30762A4

EXHIBIT NO. E-15

KIUP

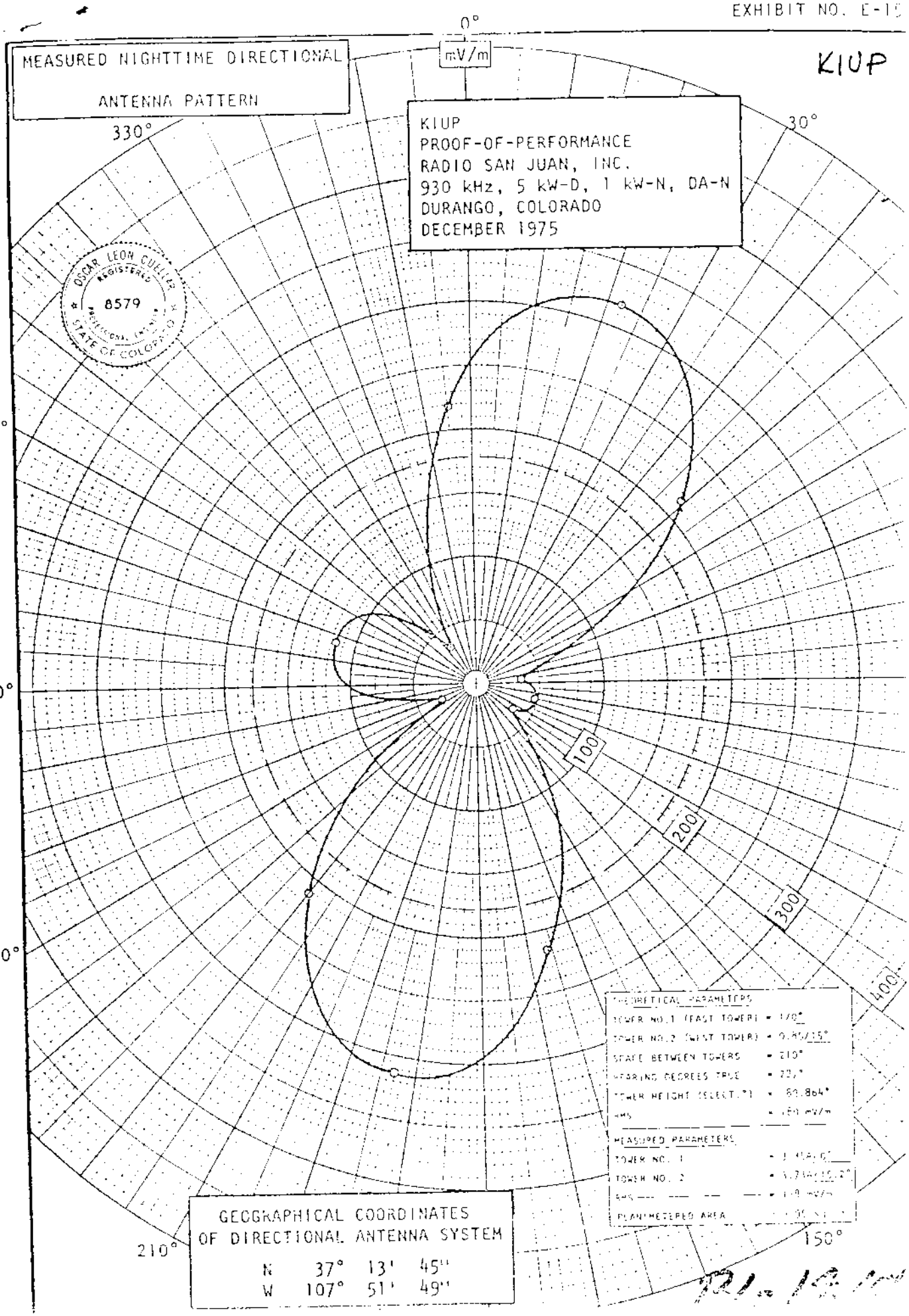
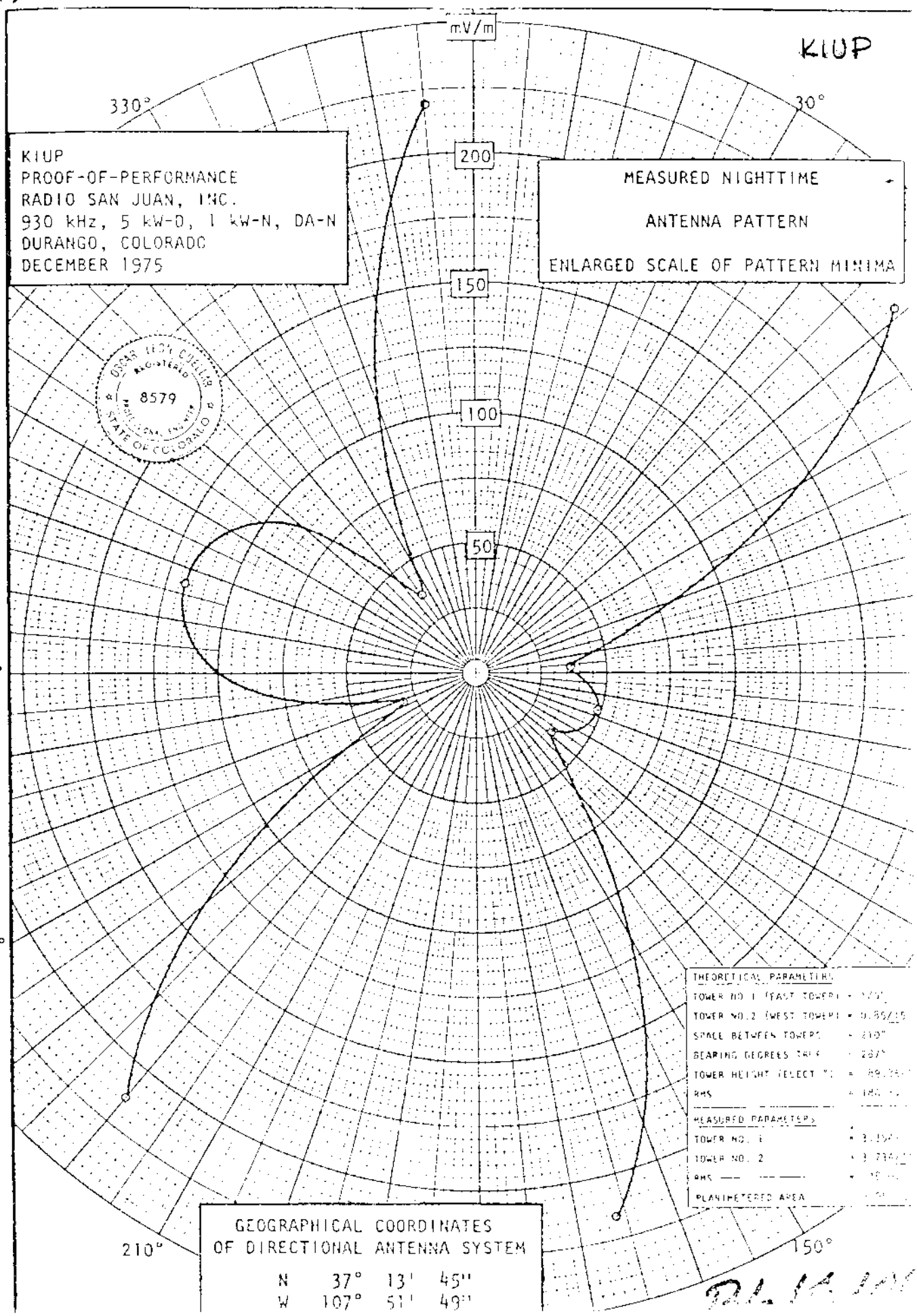
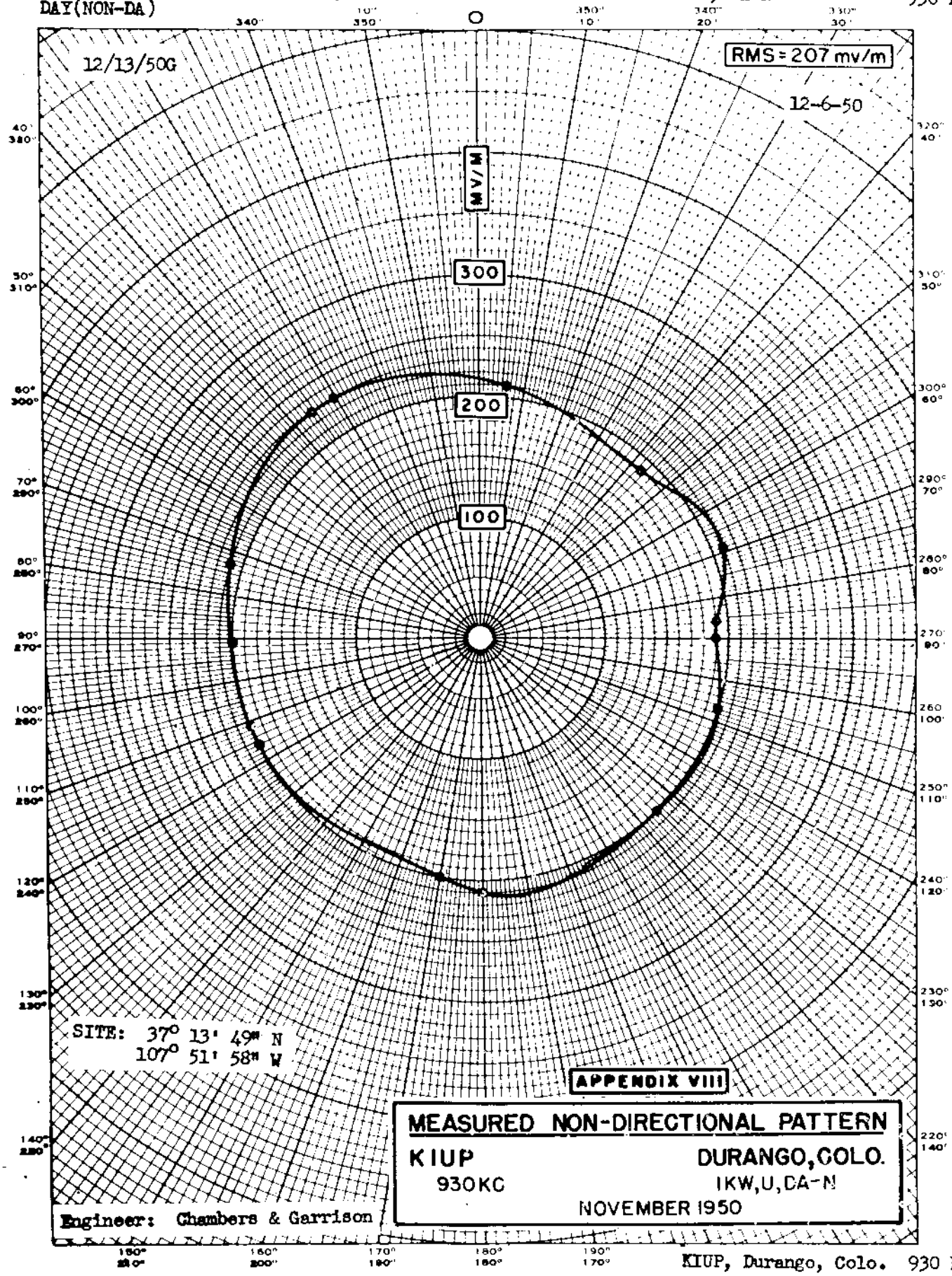


EXHIBIT NO. E-1



KIUP

MEASURED DAY(NON-DA) KIUP, DURANGO, COLO. 1kw, DA-N 930 kc



KIUP, Durango, Colo. 930 kc

KOGA

SUPPLEMENTAL DIRECTIONAL ANTENNA
DESCRIPTION SHEET

Station: KOGA

Main Studio: Ogallala, Nebraska

Frequency: 930 kHz

Power: 0.5 kW

Notification List No. 1674

Date: March 3, 1976

Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 41° 08' 32"
West Longitude: 101° 42' 48"

Authorized for Nighttime operation (DA-N).

Predicted effective Day Field: (omnidirectional) 133 mv/m at rated power.

Note: Please retain the description sheet and directional antenna radiation patterns notified for station KOGA in United States Change List Number 1598, dated September 19, 1974 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.

CTR NO 30212A4

KOGA

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KOGA

Main Studio: Ogallala, Nebraska

Frequency: 930 kHz

Power: 0.5 kW

Notification List No. 1598

Date: September 19, 1974

Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 41° 08' 26"
West Longitude: 101° 42' 22"

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(#1)	C(#2)	E(#3)
HEIGHT ABOVE INSULATORS:	250'	300' (102.1°)	250' (85.1°)
NIGHT PHASING:	+321°	+22°	+34°
NIGHT FIELD RATIO:	0.56	0.97	0.51

SPACING AND ORIENTATION: Elements #1 and #2 are spaced 503.8' (171.4°) and elements #2 and #3 are spaced 595.5' (202.6°). All elements on a line bearing 98° true.

GROUND SYSTEM: 120-265' equally spaced copper radials plus 120-50' interspaced radials about each tower. Centers of systems are bonded together.

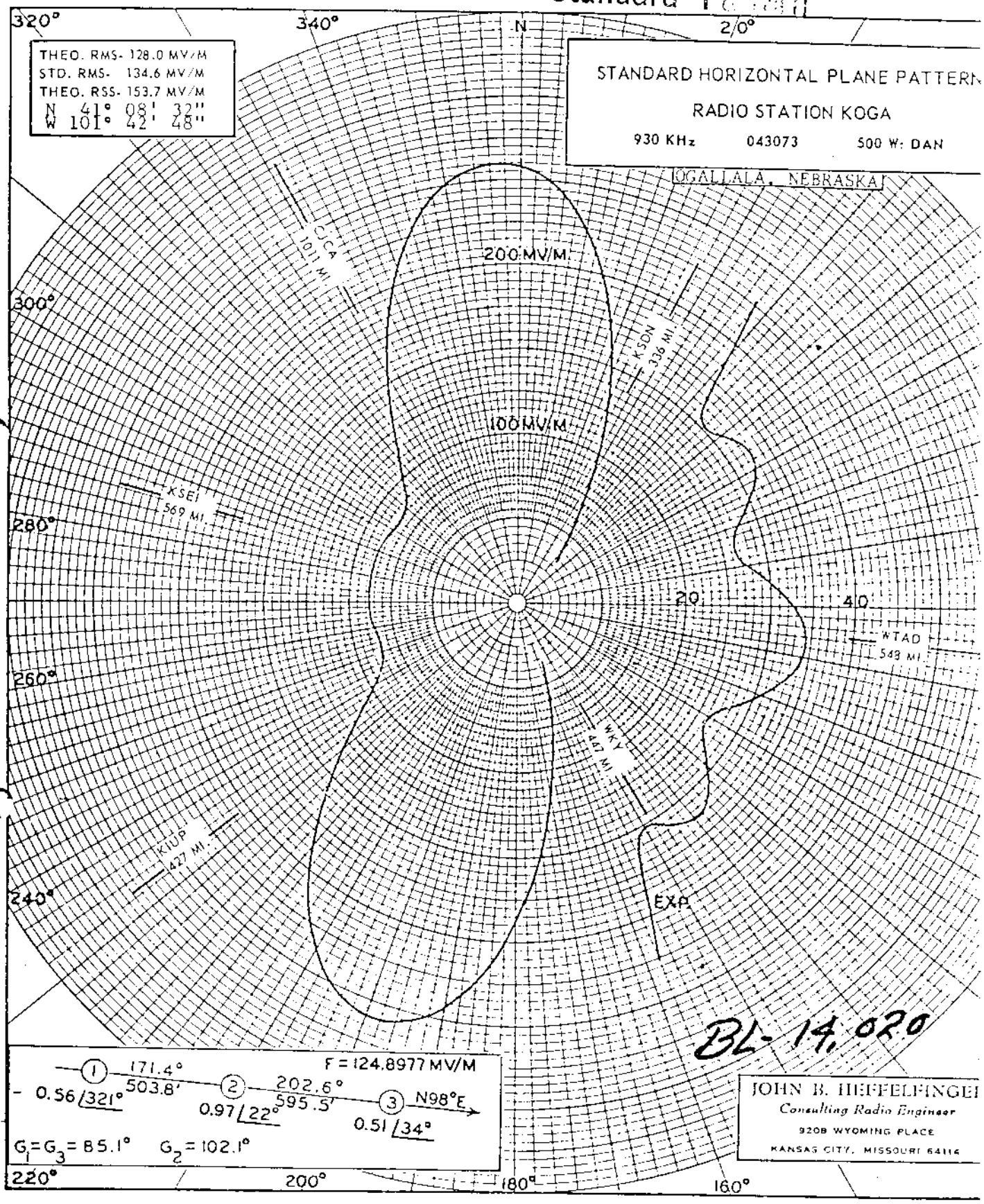
PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL		STANDARD
	RMS	RSS	RMS
Night	128.0 mv/m	153.7 mv/m	134.6 mv/m
Day	133 mv/m	---	---

CTR NO 30212A3

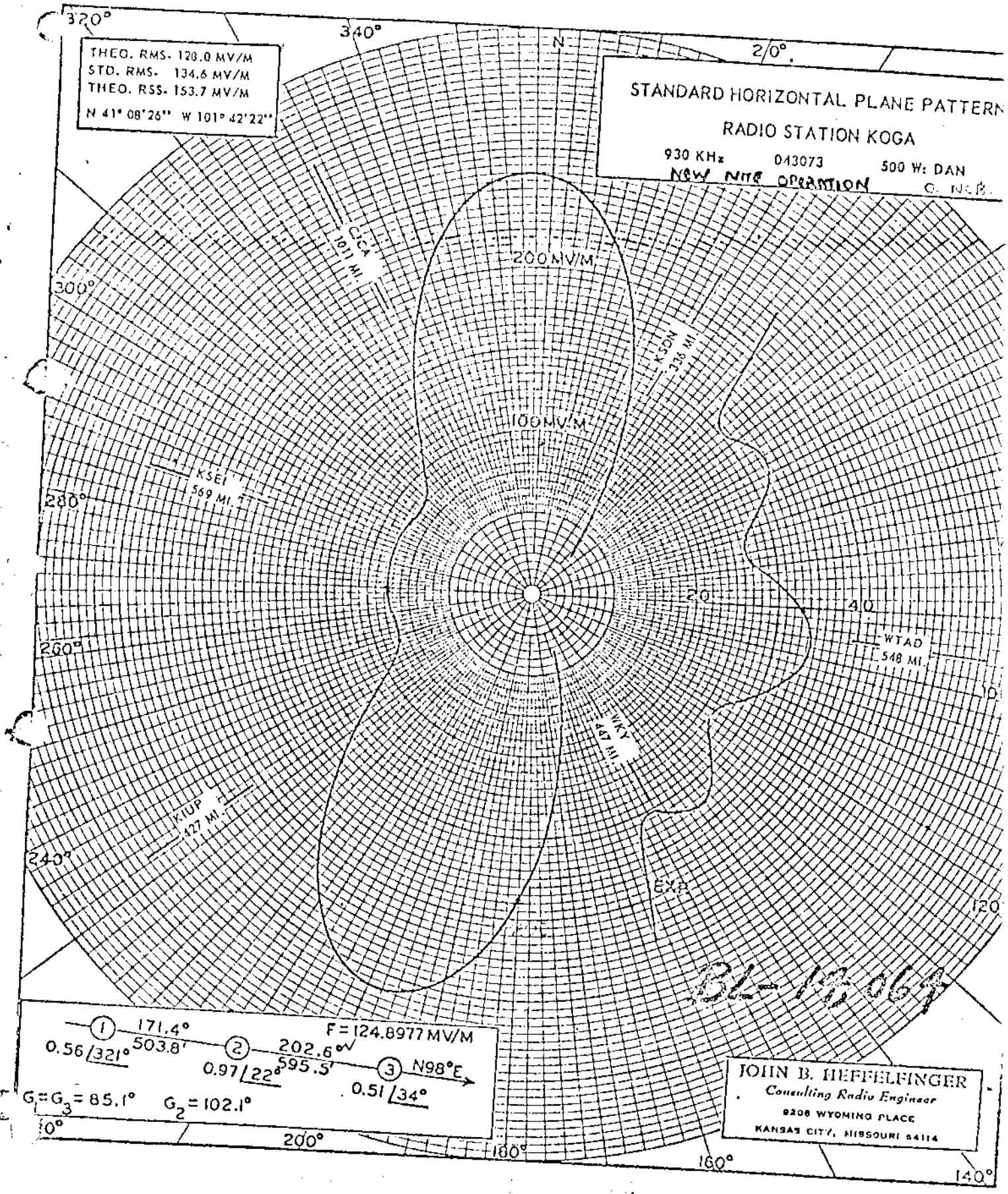
KOGA

Standard Pattern



KOGA

Standard Pattern



KSDN

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KSDN

Main Studio: Aberdeen, South Dakota

Frequency: 930 kHz

Power: 1 kW Night 5 kW Day

Notification List No. 1679

Date: April 7, 1976

Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 45° 25' 24"
West Longitude: 98° 31' 10"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-2)
Number of elements: 5
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	SW(#1)	SE(#4)	C(#2)	NE(#3)	NW(#5)
HEIGHT ABOVE INSULATORS:	All towers 265' (90°)				
NIGHT PHASING:	-18°	---	+170.75°	+18°	---
NIGHT FIELD RATIO:	1.0	---	1.687	1.0	---
DAY PHASING:	---	+84.5°	0°	---	-88.5°
DAY FIELD RATIO:	---	2.26	1.00	---	1.09

SPACING AND ORIENTATION: Daytime twers #4, #2 and #5 are spaced 264' (90°) on a line bearing 315° true. Nighttime, towers #1, #2 and #3 are spaced 264' (90°) on a line bearing 45° true.

GROUND SYSTEM: 120-265' equally spaced copper radials plus a 48' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of system are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	445.64 mv/m	401.41 mv/m	468.14 mv/m
Night	195 mv/m		

(Cont'd.)

KSDN

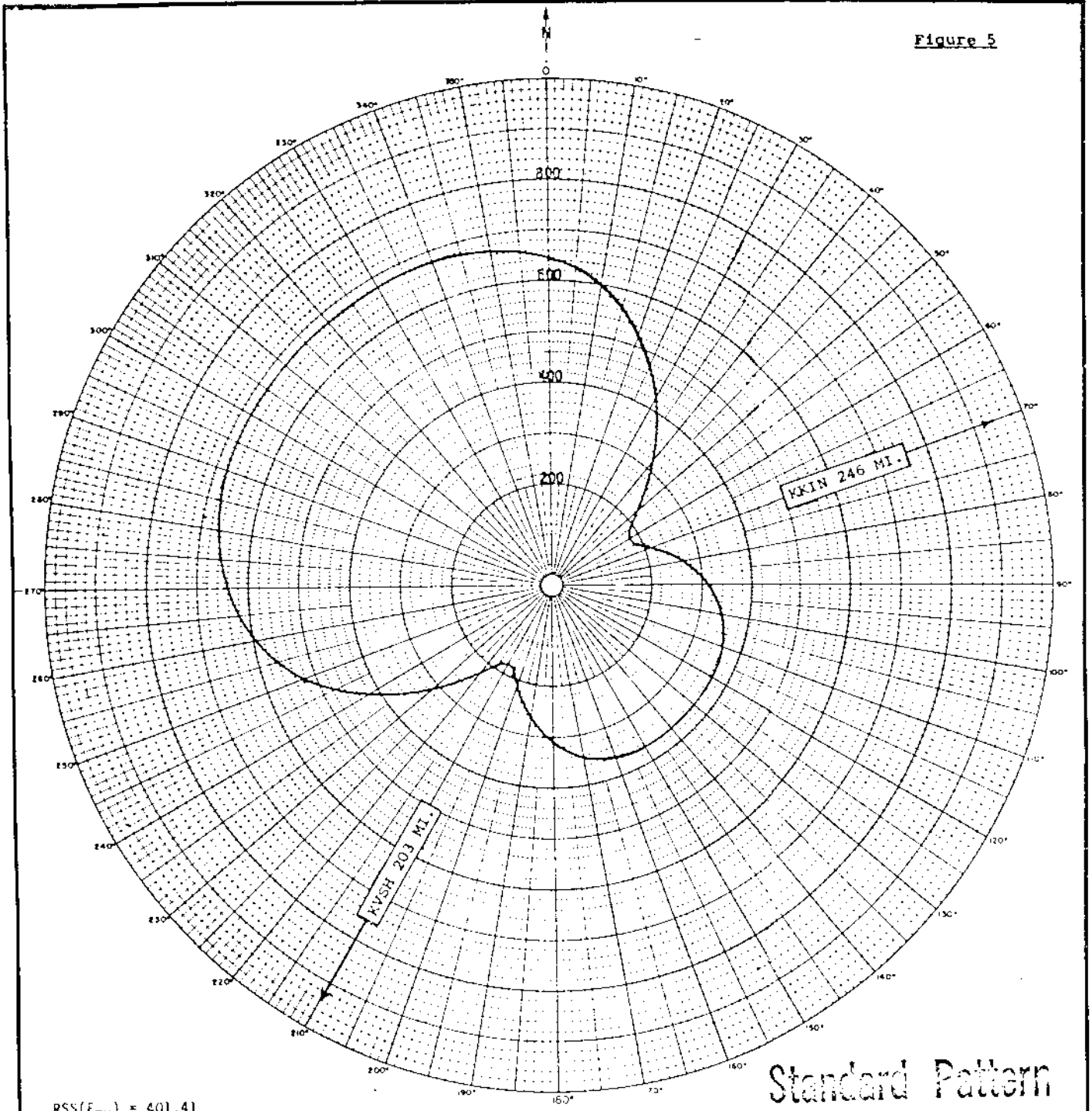
KSDN
Aberdeen, South Dakota
930 kHz

Note: Please retain the Nighttime directional antenna radiation pattern notified for Station KSDN in United States Change List Number 223 dated April 18, 1947, and attach to this Revised Description Sheet and Daytime pattern. This notification concerns only a change in the Daytime operation of the station with Nighttime operation continued as previously notified.

CTR NO 30778A4

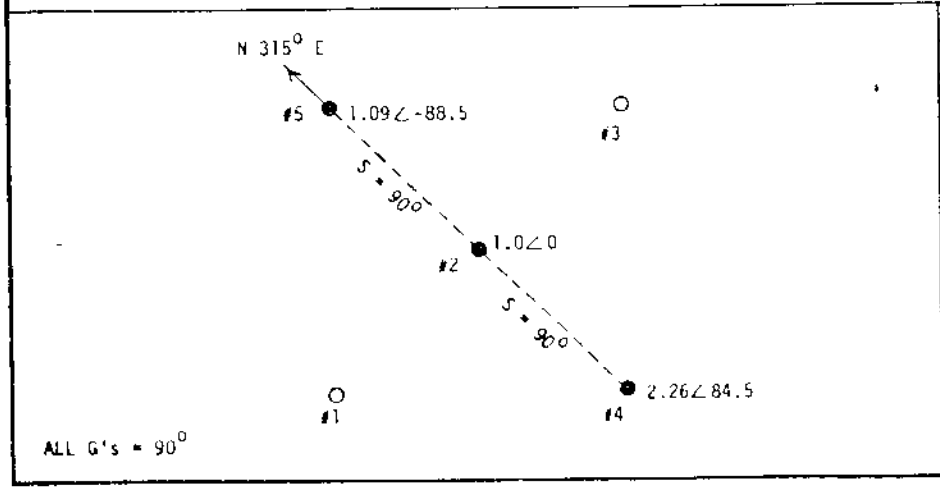
KSDN

Figure 5



$RSS(E_{TH}) = 401.41$

PROPOSED STANDARD HORIZONTAL RADIATION PATTERN



APPLICANT	KSDN
LOCATION	ABERDEEN, S.D.
FREQUENCY	930 KC/S
POWER	5 KW - PROPOSED
LATITUDE	45 DEG 25 MIN 24 SEC
LONGITUDE	98 DEG 31 MIN 10 SEC
RMS USED	DAY DIRECTIONAL
RMS FIELD	THEO: 445.64 STAND: 468.14
DATE	JULY, 1975

RALPH E. EVANS ASSOCIATES

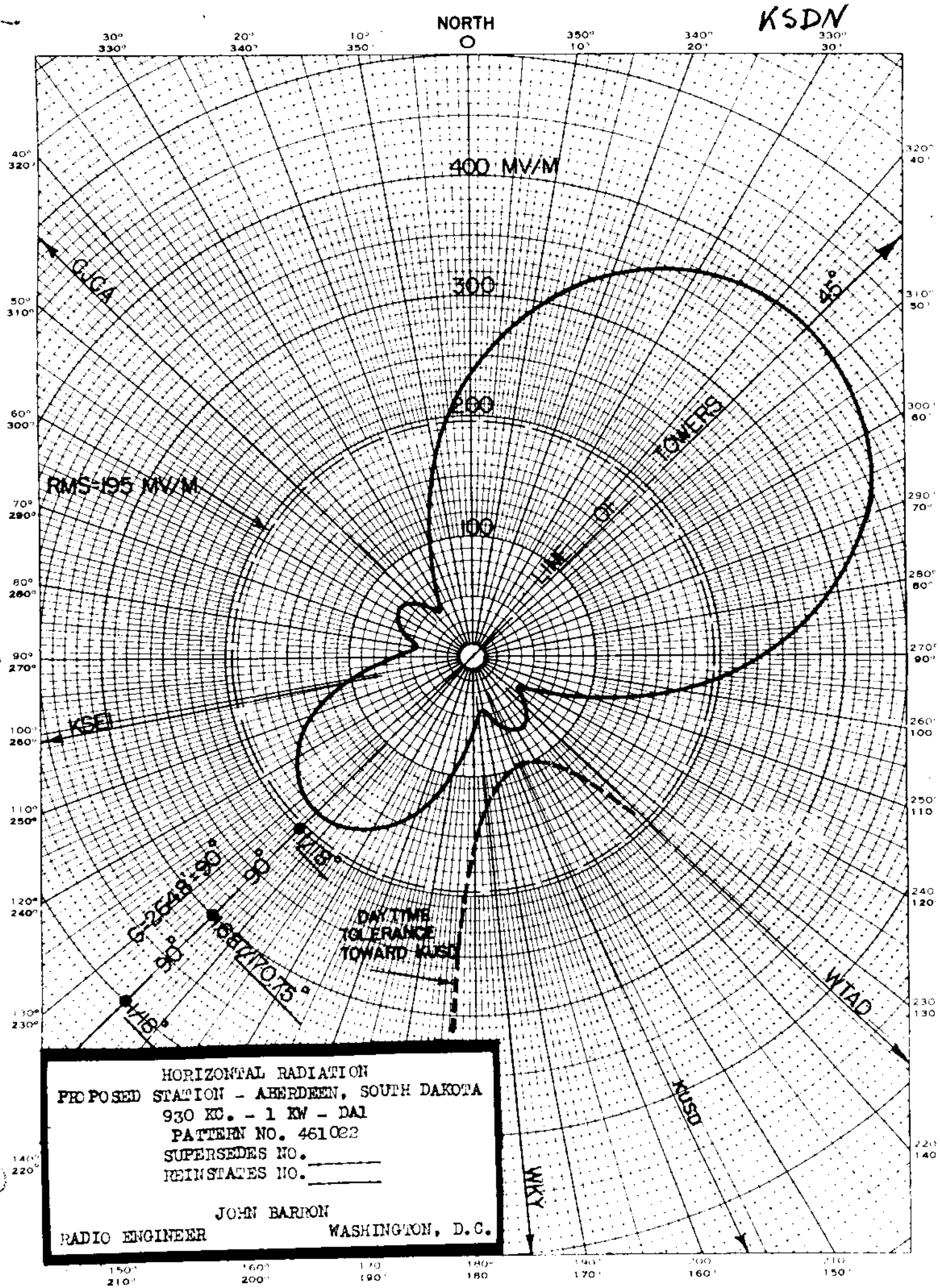
Consulting Radio Engineers

5500 North Sherman Boulevard

Milwaukee, Wisconsin 53216

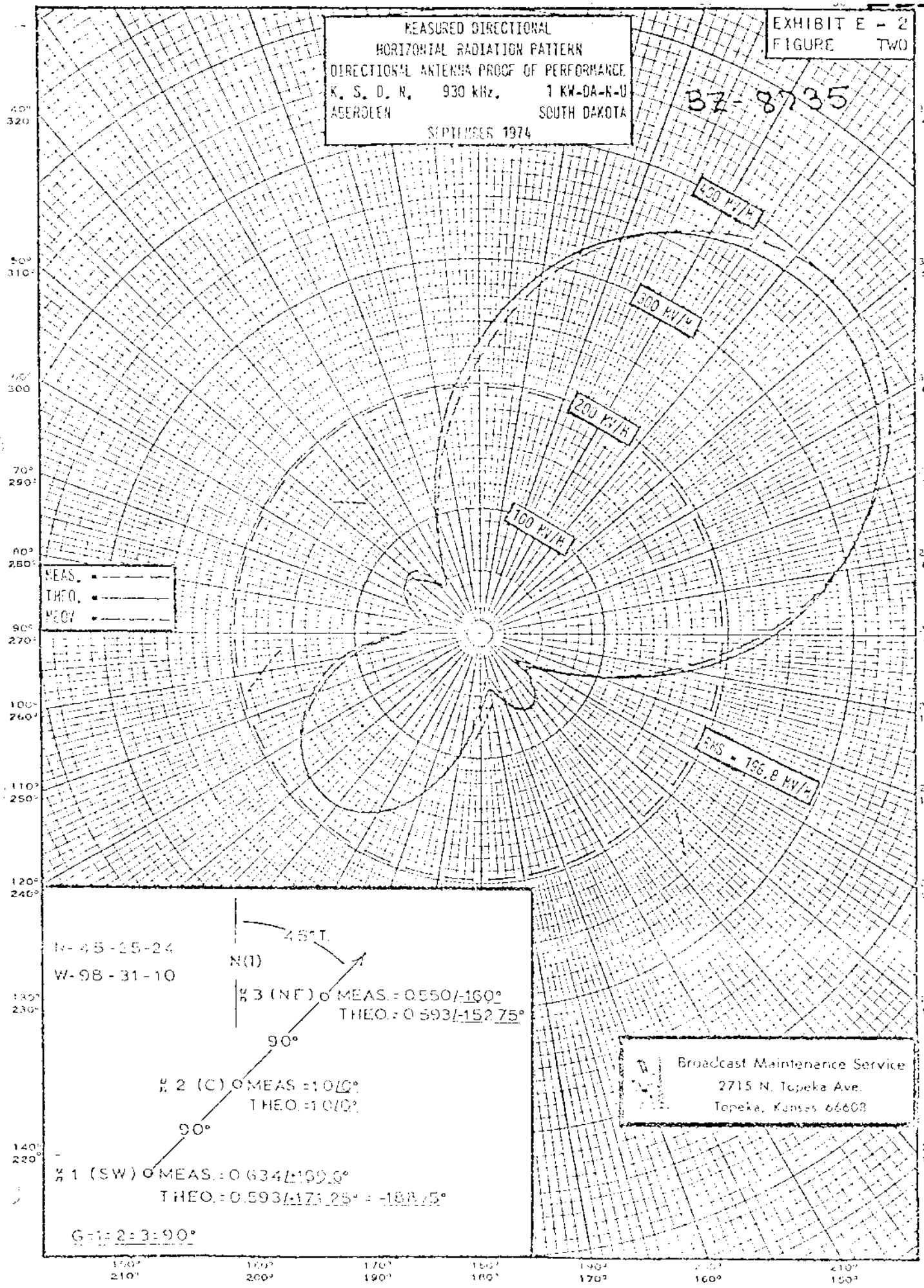
Telephone 442-4210 (Area Code 414)

KSDN

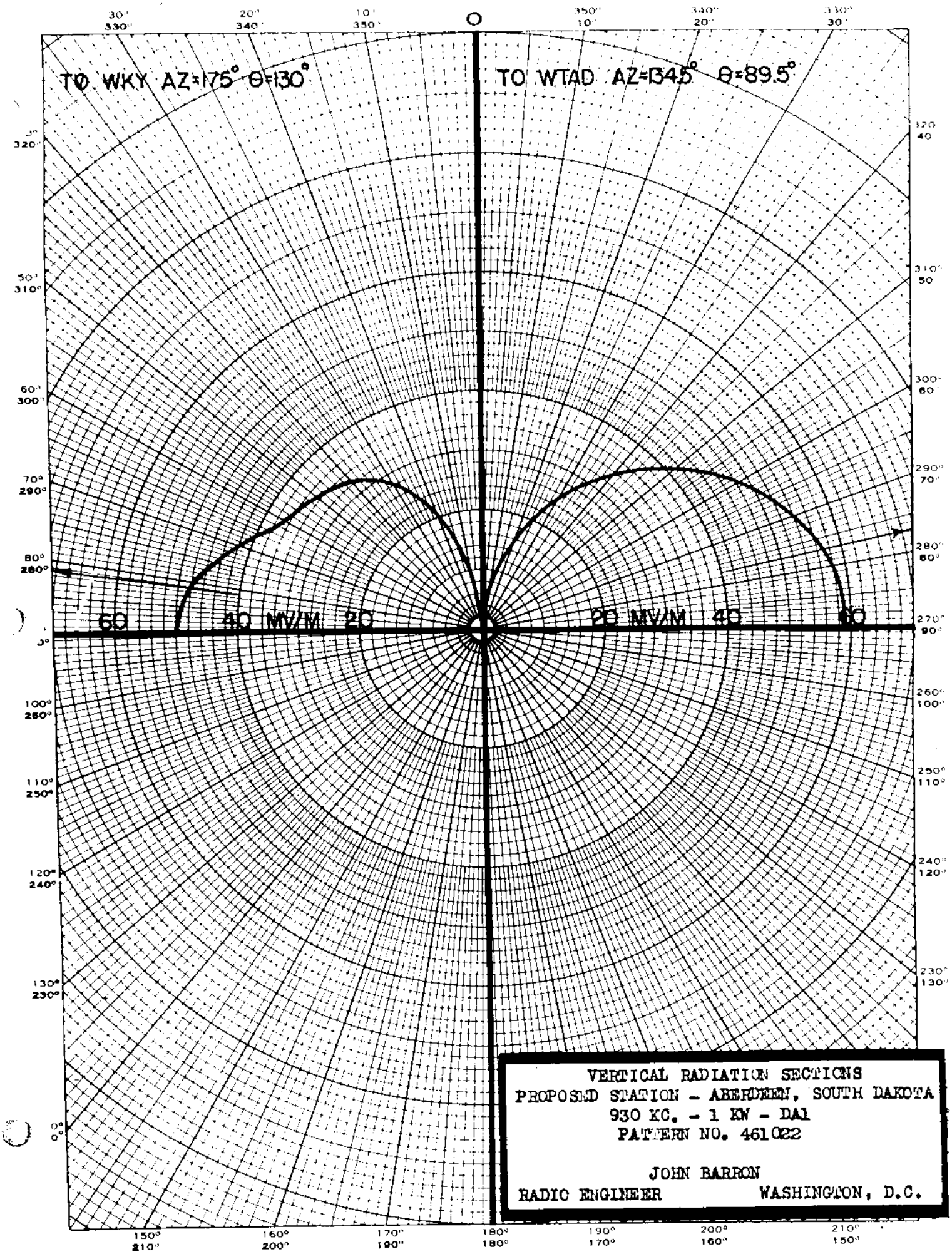


HORIZONTAL RADIATION
PROPOSED STATION - ABERDEEN, SOUTH DAKOTA
930 KC. - 1 KW - DA1
PATTERN NO. 461022
SUPERSEDES NO._____
REINSTATES NO._____

JOHN BARRON
RADIO ENGINEER WASHINGTON, D.C.

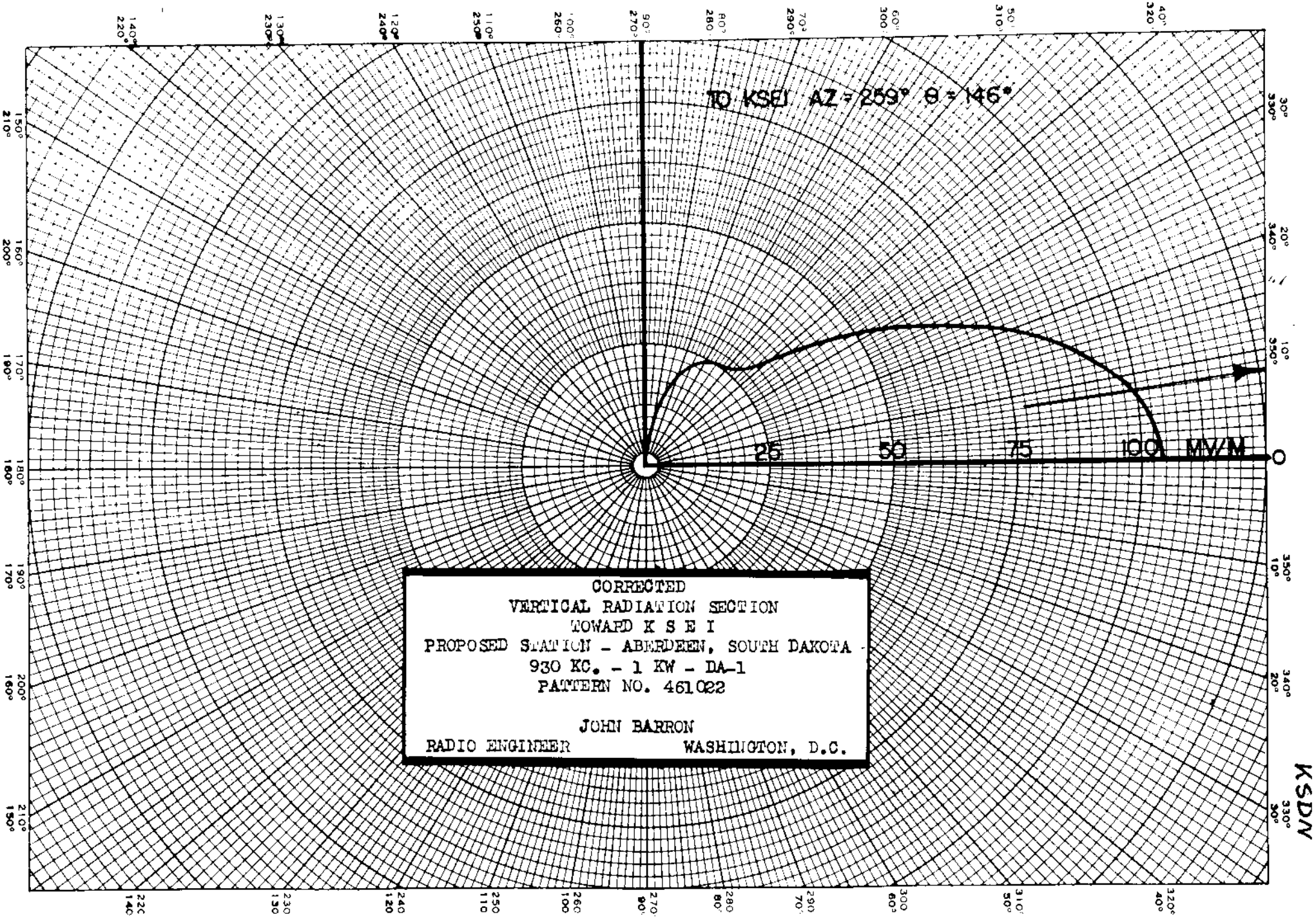

MEASURED DIRECTIONAL
HORIZONTAL RADIATION PATTERN
DIRECTIONAL ANTENNA PROOF OF PERFORMANCE
K. S. D. N. 930 kHz. 1 KW-DA-N-U
ABERDEEN SOUTH DAKOTA
SEPTEMBER 1974
EXHIBIT E - 2
FIGURE TWO
BZ-8735
400 MV/M
300 MV/M
200 MV/M
100 MV/M
RMS = 166.8 MV/M
MEAS.
THEO.
MEOV
N-45-25-24
W-98-31-10
45°T.
N(1)
3 (NE) MEAS.=0.550/-160°
THEO.=0.593/-152.75°
90°
2 (C) MEAS.=1.0/0°
THEO.=1.0/0°
90°
1 (SW) MEAS.=0.634/-199.0°
THEO.=0.593/-171.25° = -188.75°
G-1:2:3:90°
Broadcast Maintenance Service
2715 N. Topeka Ave.
Topeka, Kansas 66608

KSDN



VERTICAL RADIATION SECTIONS
PROPOSED STATION - ABERDEEN, SOUTH DAKOTA
930 KC. - 1 KW - DA1
PATTERN NO. 461022

JOHN BARRON
RADIO ENGINEER WASHINGTON, D.C.



CORRECTED
VERTICAL RADIATION SECTION
TOWARD K S E I
PROPOSED STATION - ABERDEEN, SOUTH DAKOTA
930 KC. - 1 KW - DA-1
PATTERN NO. 461022

JOHN BARRON
RADIO ENGINEER WASHINGTON, D.C.

KSDN

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KSDN

Main Studio: Aberdeen, South Dakota

Frequency: 930 kHz

Power: 1 kW Night 5 kW Day

Notification List No. 1701

Date: September 8, 1976

Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 45 ° 25 ' 24 "
West Longitude: 98 ° 31 ' 10 "

ANTENNA CHARACTERISTICS

Daytime and
Authorized for Nighttime operation. (DA-2)
Number of elements: 5
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	SW(#1)	SE(#4)	C(#2)	NE(#3)	NW(#5)
HEIGHT ABOVE INSULATORS:	All Towers 265' (90°)				
NIGHT PHASING:	-18°	-	+170.75°	+18°	-
NIGHT FIELD RATIO:	1.0	-	1.687	1.0	-
DAY PHASING:	-	+82.5°	0°	-	-89.3°
DAY FIELD RATIO:	-	2.252	1.0	-	1.072

SPACING AND ORIENTATION: Daytime, from tower #2, tower #5 is spaced 255.7' (87°) on a line bearing 315° true and tower #4 is spaced 305.5' (104°) a line bearing 135° true. Nighttime, towers #1, #2 and #3 are spaced on a line bearing 45° true.

GROUND SYSTEM: 120-265' equally spaced copper radials plus a 48' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of system are bonded together.

(Over)

KSDN

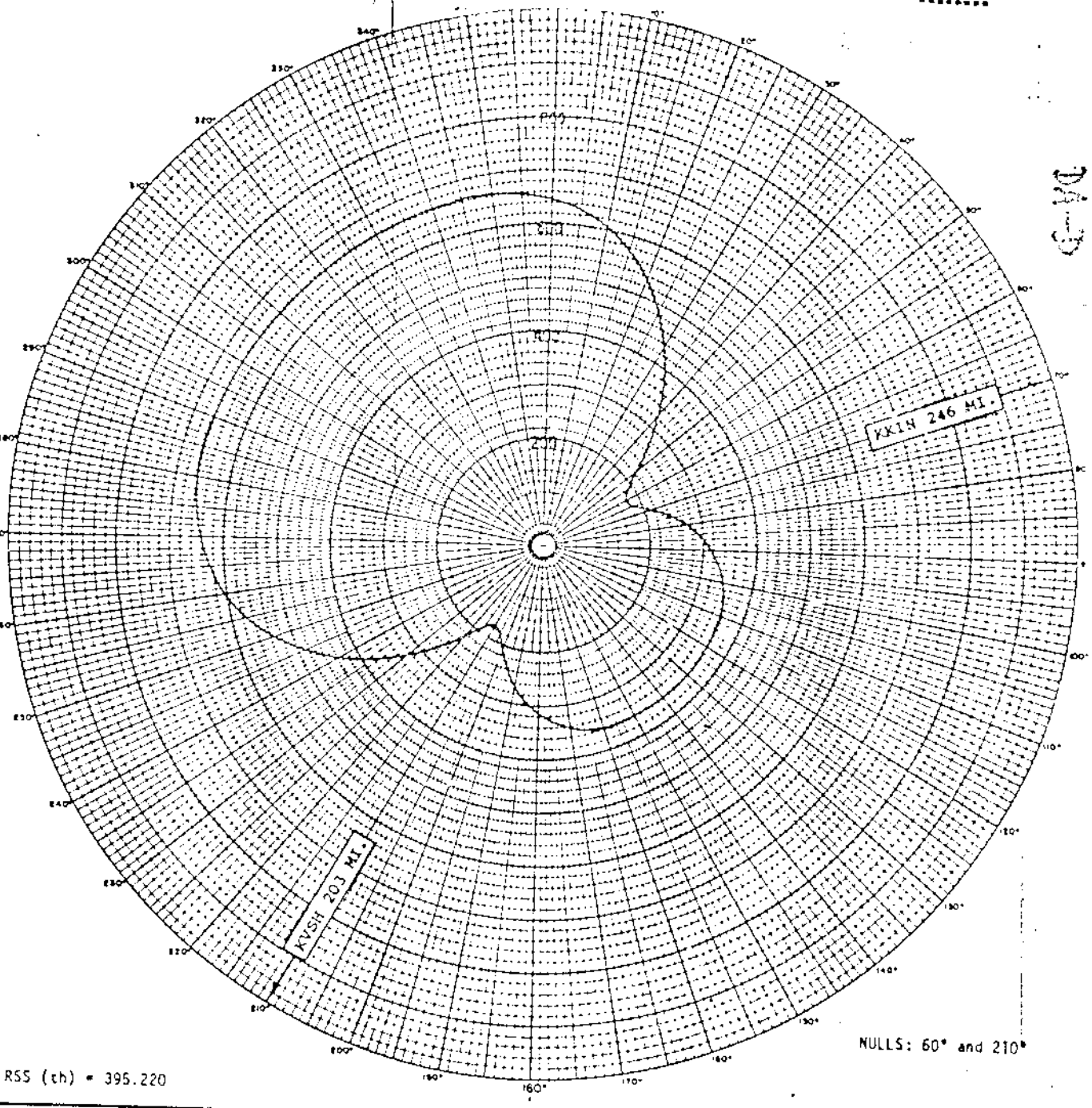
PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	443.5 mv/m	395.2 mv/m	466.0 mv/m
Night	195 mv/m	-	-

Note: Please retain the Nighttime directional antenna radiation pattern notified for Station KSDN in United States Change List Number 223 dated April 18, 1947 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 Nighttime previously notified.

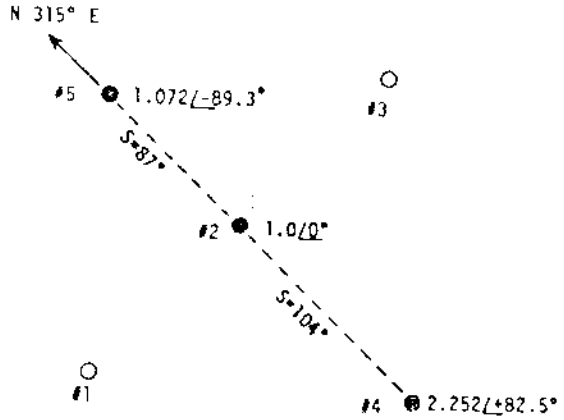
CTR NO 30778A4

KSON



RSS (th) = 395.220

PROPOSED STANDARD HORIZONTAL RADIATION PATTERN



ALL G's = 90°

APPLICANT	KSON
LOCATION	ABERDEEN S.D.
FREQUENCY	930 KC/S
POWER	5 KW.
LATITUDE	45 DEG 25 MIN 24 SEC
LONGITUDE	98 DEG 31 MIN 10 SEC
WHEN USED	DAY
RMS FIELD	THEO: 443.52 STAND: 550.00
DATE	MAY, 1976

RALPH E. EVANS ASSOCIATES

Consulting Radio Engineers

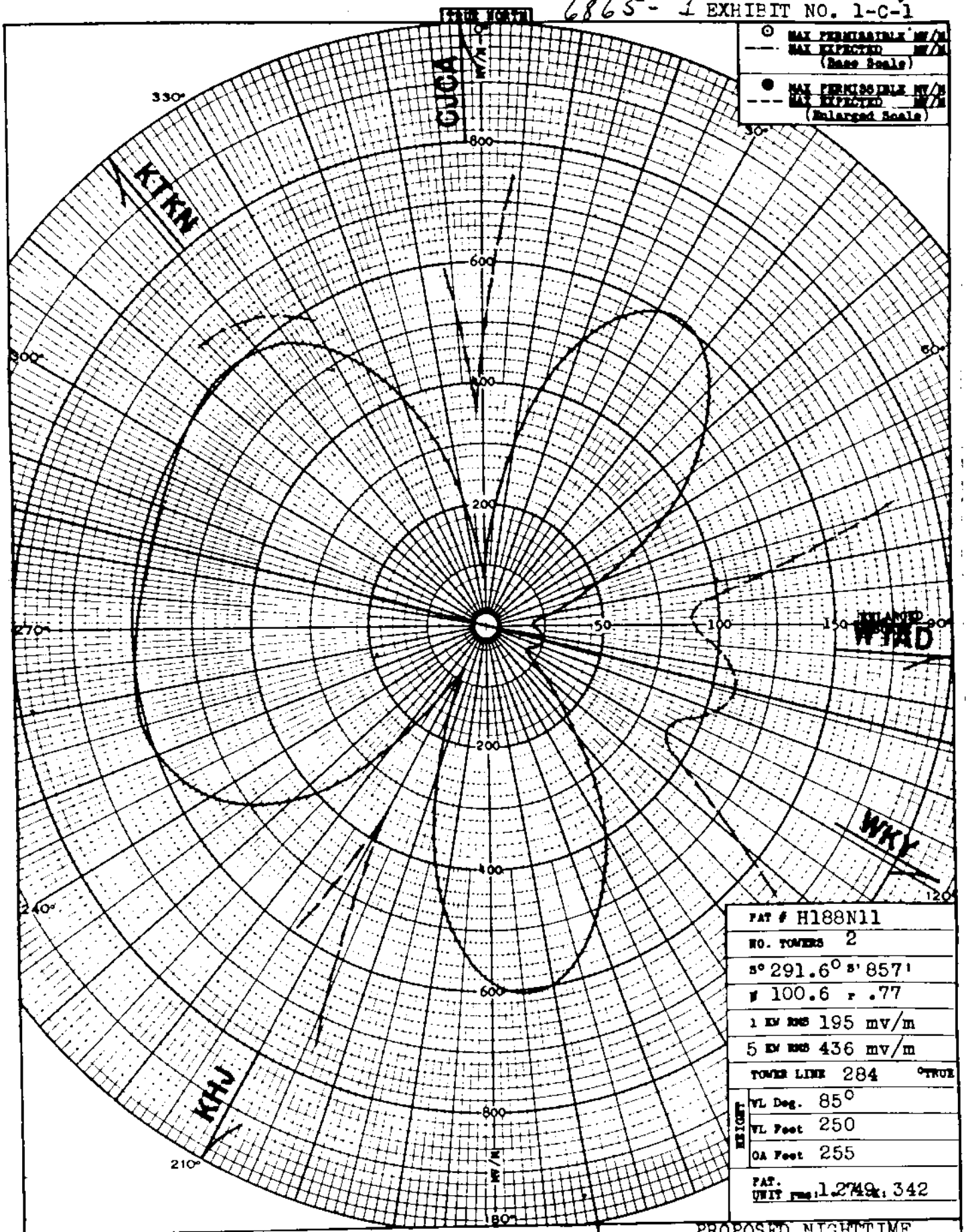
3500 North Sherman Boulevard

Milwaukee, Wisconsin 53216

Telephone 442-4210 (Area Code 414)

KSEI POCATELLO 930 KC

6865 - 1 EXHIBIT NO. 1-C-1



PAT #	H188N11
NO. TOWERS	2
S° 291.6° S' 857'	
W 100.6 R .77	
1 KW RMS	195 mv/m
5 KW RMS	436 mv/m
TOWER LINE	284 °TRUE
HEIGHT VL Deg.	85°
HEIGHT VL Feet	250
HEIGHT OA Feet	255
PAT. UNIT RMS	1.2749 K: 342

COMMERCIAL RADIO EQUIPMENT CO.

RADIO ENGINEERING CONSULTANTS

KANSAS CITY WASHINGTON, D.C. HOLLYWOOD

PATTERN: PROPOSED NIGHTTIME

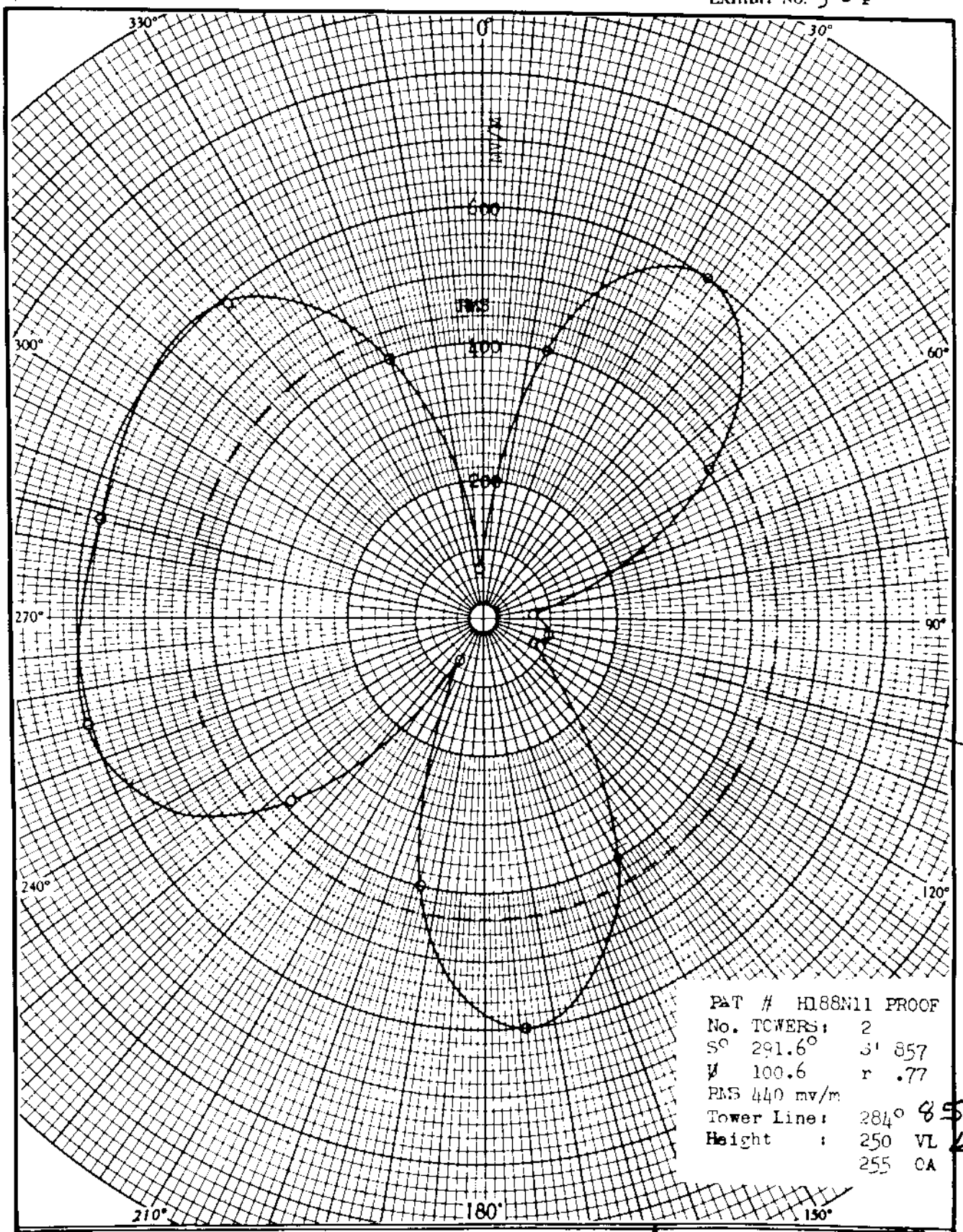
FOR: POCATELLO, IDAHO

POWER: 5 KW, DA-N FREQ: 930 KC

DATE: 3/12/46 BY: ELD

KSEI
930

EXHIBIT NO. 3 - F



COMMERCIAL RADIO EQUIPMENT CO.

Consulting Radio Engineers

KANSAS CITY WASHINGTON, D. C. HOLLYWOOD

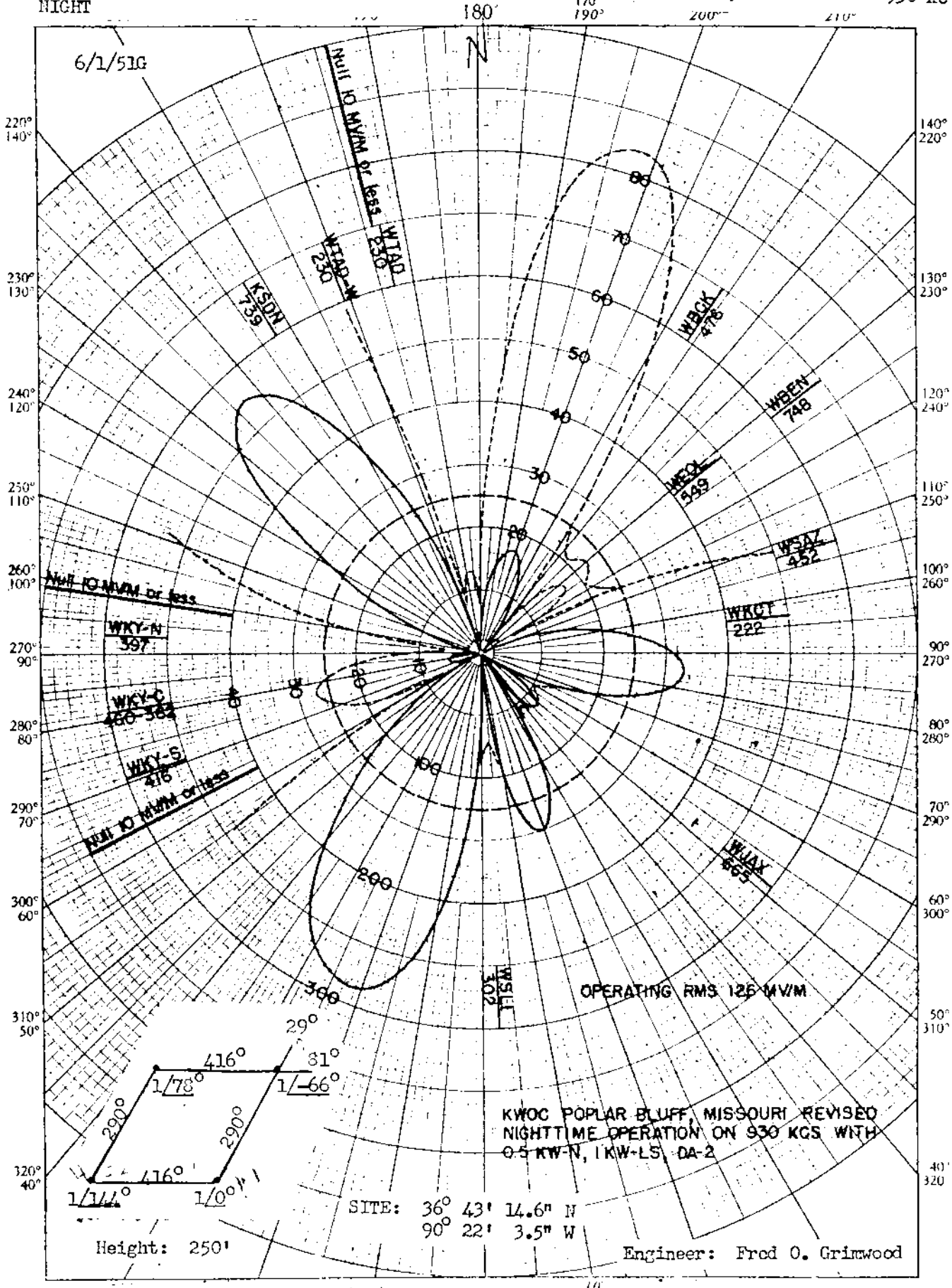
FOR: KSEI POCATELLO IDAHO

DATE: AUG 5, 1947 BY: R.H

5 KW Day-N 930 KC

KWOC

PROPOSED NIGHT — KWOC, POPLAR BLUFF, MO. — 500w, 1kw-LS, DA-2 — 930 kc



AMENDMENT RECD 5/9/51 ACC 5/25/51 BP-7342 KWOC, Poplar Bluff, Mo. 930 kc

KWOC

MEASURED
NIGHT

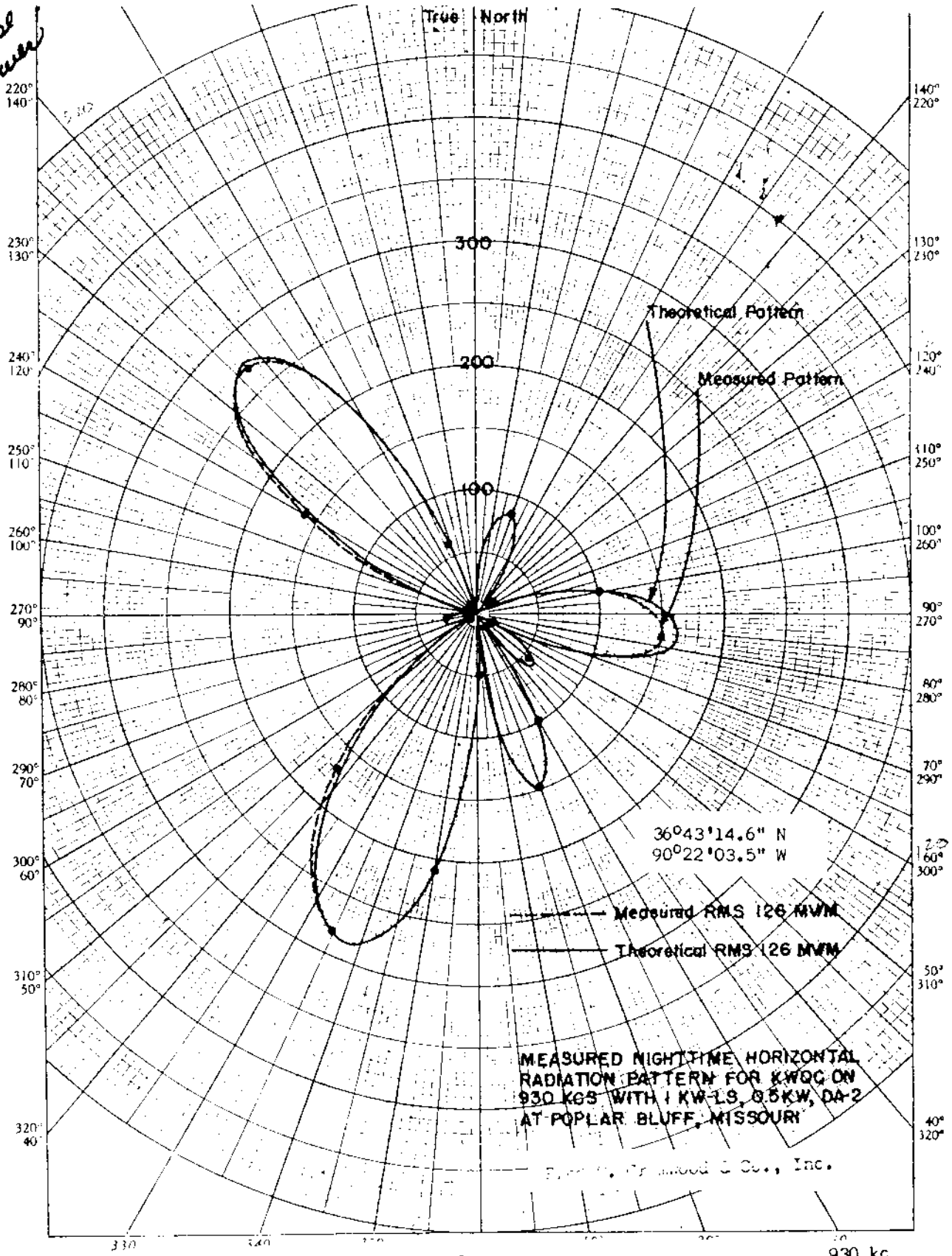
KWOC, POPLAR BLUFFS, MISSOURI

500W, ~~1KW~~ 5KW-LS, DA-2

930 kc

(7/14/53G)

2-25-63
granted increase
in day ND power
to 5KW



FCC File No. BL-4969

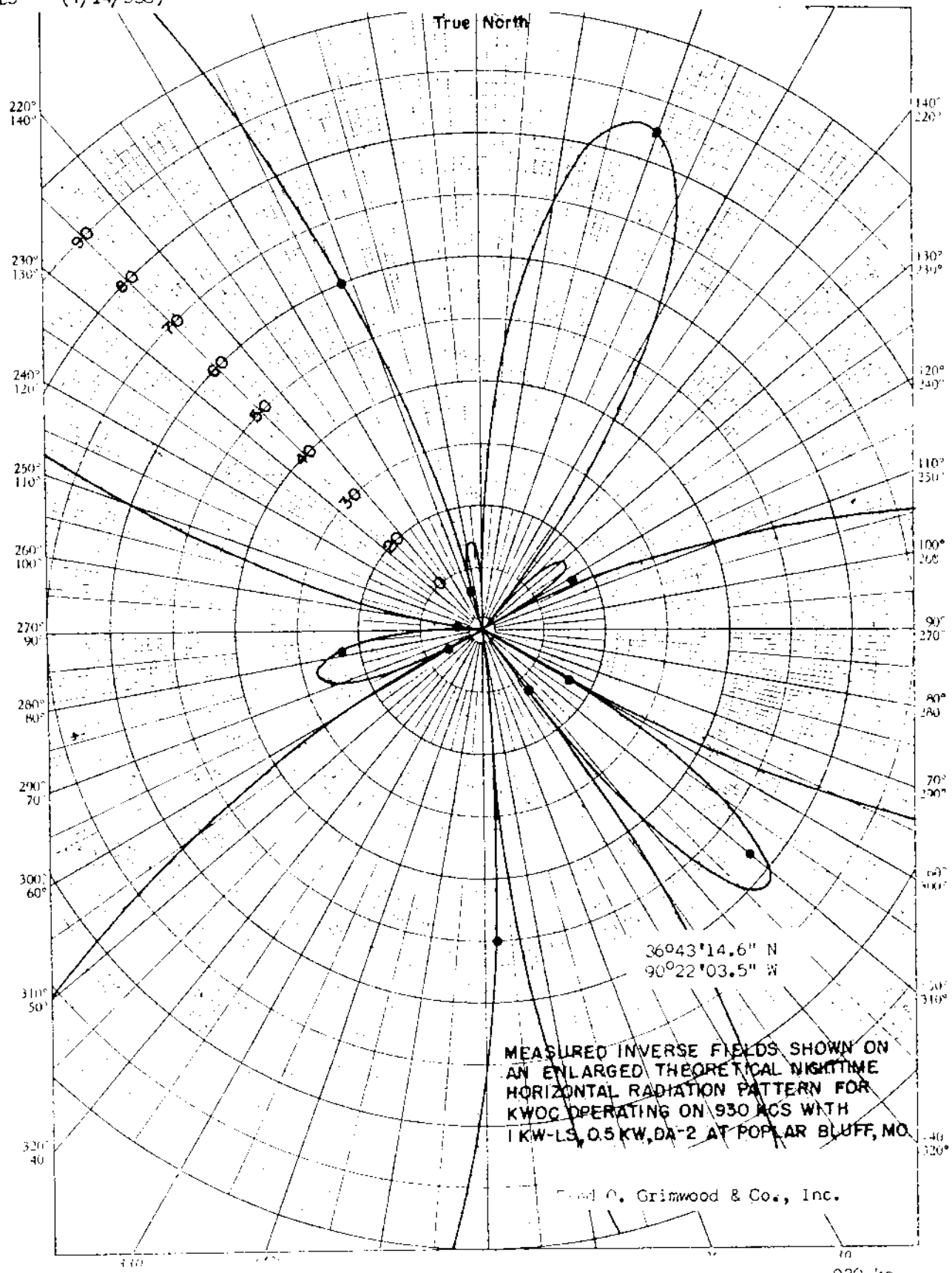
KWOC, POPLAR BLUFFS, MISSOURI

930 kc

KWOC

MEASURED NIGHT NULLS (7/14/53G)

KWOC, POPLAR BLUFFS, MISSOURI 500W,1KW-LS, DA-2 930 kc



930 kc

FCC File No. BL-4969 KWOC, POPLAR BLUFFS, MISSOURI

WBCK

PROPOSED DAY (11-17-58g)

Station WBCK Battle Creek, Michigan

1kw, 5kw-LS, DA-2, U 930 KC

#202 10-19-64 granted mod. to change in studio location

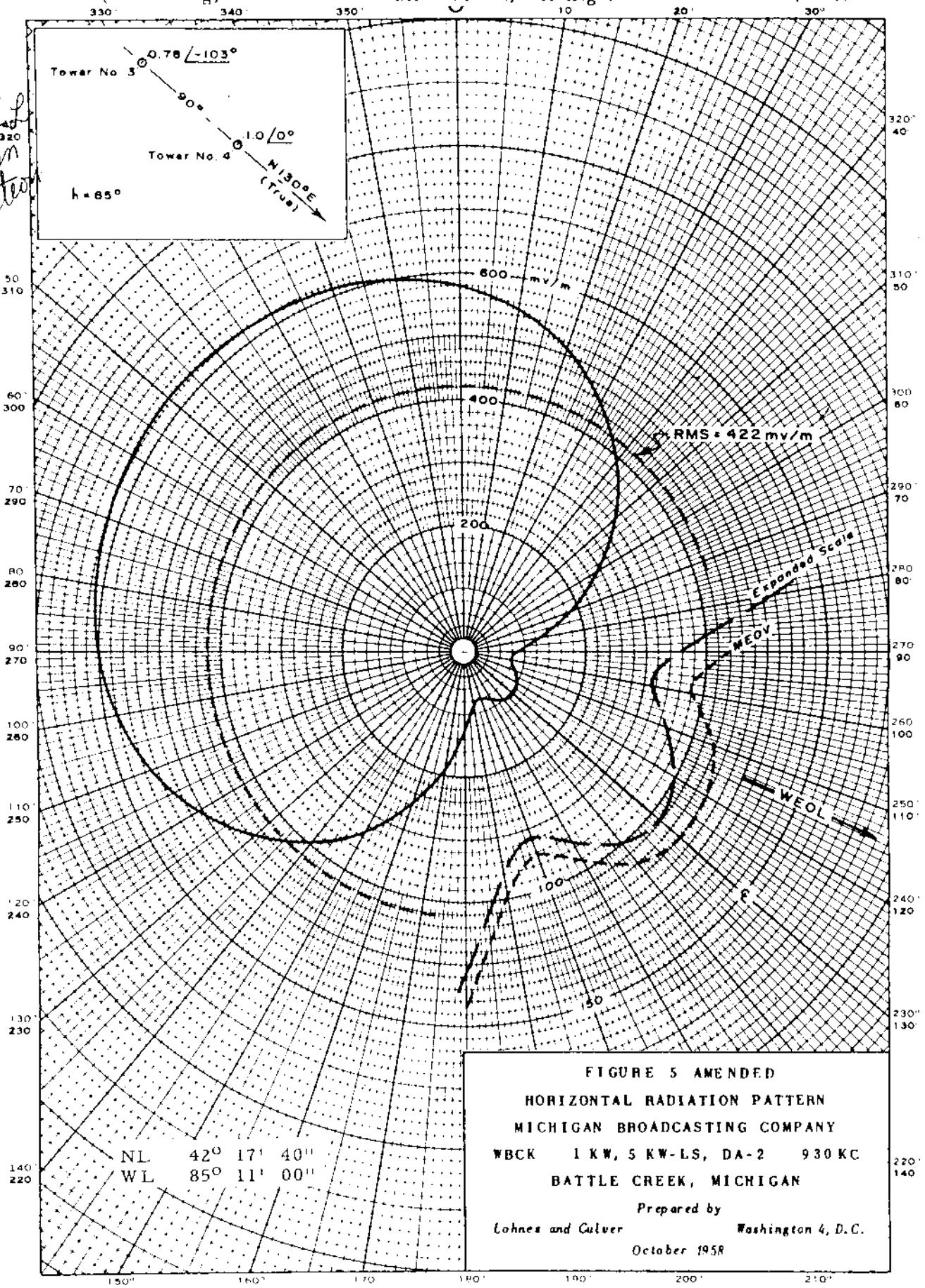


FIGURE 5 AMENDED

HORIZONTAL RADIATION PATTERN

MICHIGAN BROADCASTING COMPANY

WBCK 1 KW, 5 KW-LS, DA-2 930 KC

BATTLE CREEK, MICHIGAN

Prepared by

Lohnes and Culver Washington 4, D.C.

October 1958

FCC File No. BP-11,439
Accepted 10-31-58 Amended

WBCK
Battle Creek, Michigan 930 KC

WBCK

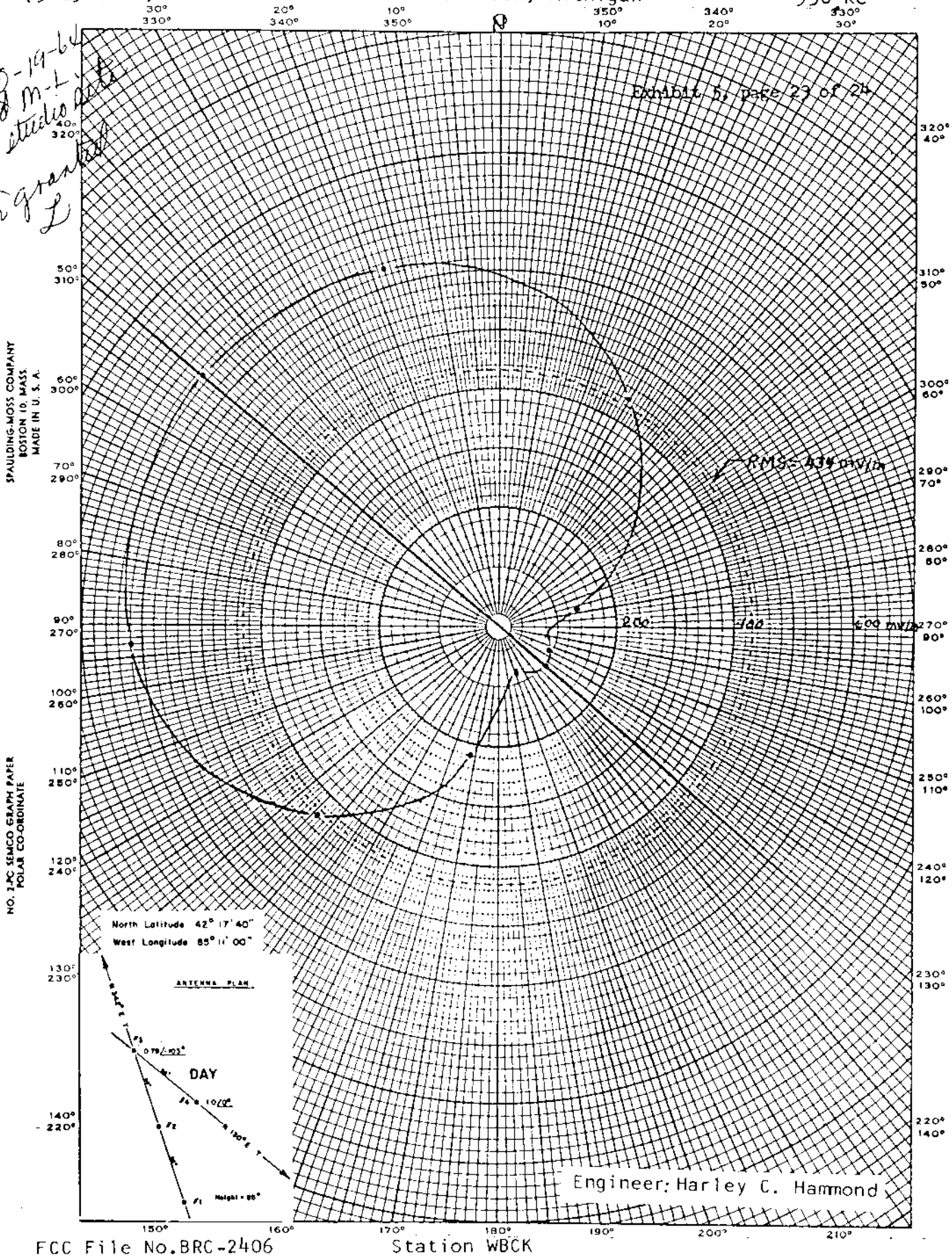
Measured Day
(9-29-64ct)

Station WBCK
Battle Creek, Michigan

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

302-10-19-64
granted M-L
change studio
5-16-62 granted
L

Exhibit 5, Page 23 of 24



FCC File No.BRC-2406
Accepted

Station WBCK
Battle Creek, Michigan

930 kc

WBCK

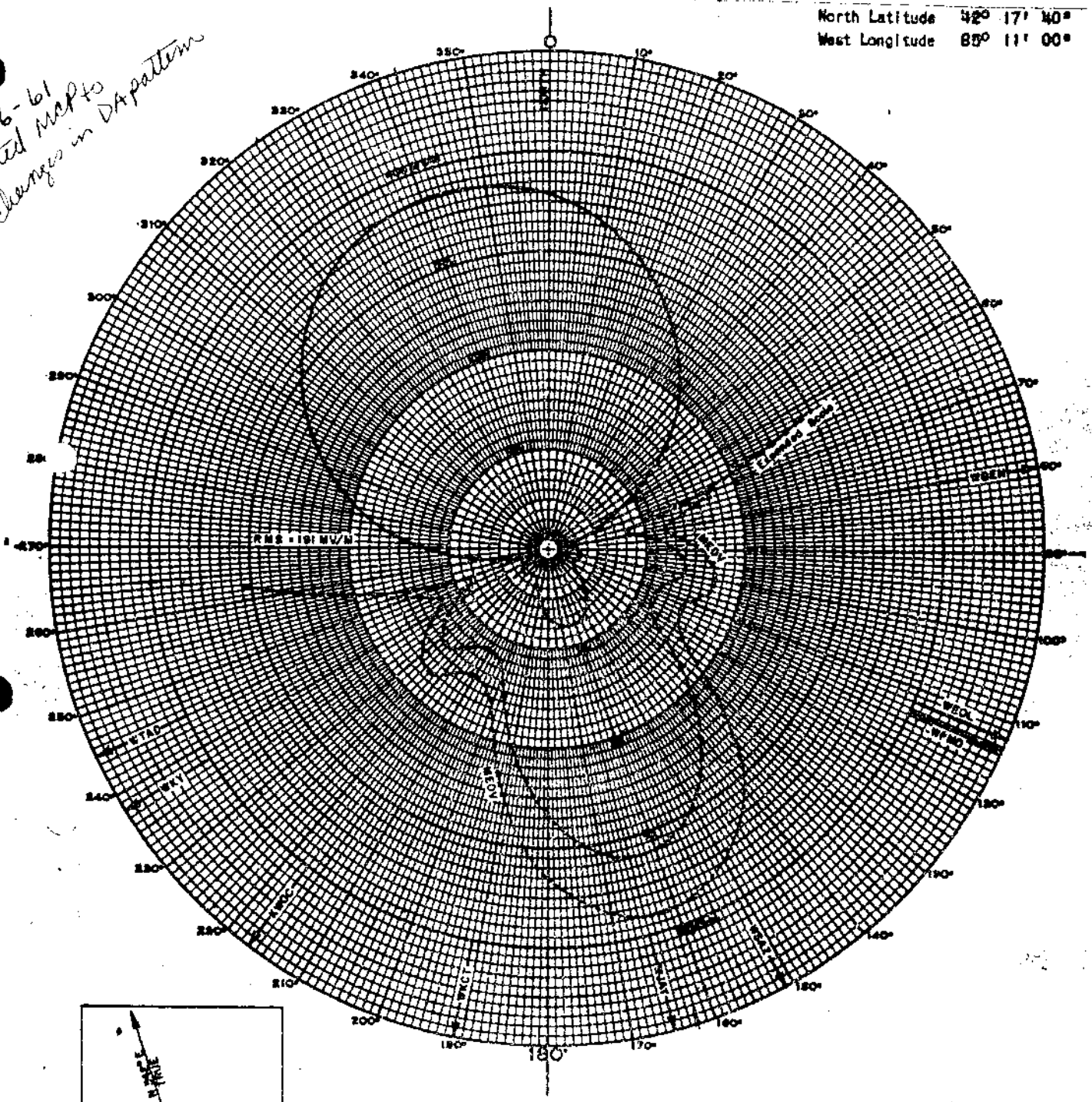
PROPOSED NIGHT
(10-25-61ct)

Station WBCK
Battle Creek, Michigan

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

North Latitude 42° 17' 40"
West Longitude 85° 11' 00"

12-6-61 granted mod to make changes in DA pattern



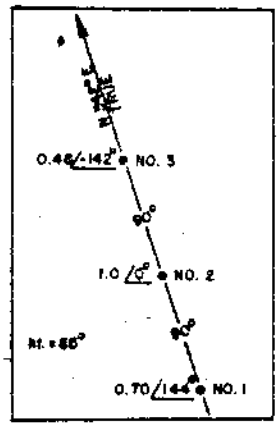


FIGURE 1
HORIZONTAL RADIATION PATTERN
MICHIGAN BROADCASTING COMPANY
WBCK 5 KW-LS, 1 KW-N, DA-2 930 KC
BATTLE CREEK, MICHIGAN

Prepared by

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

August 1961

FCC File No. BMP-9770
Accepted 9-20-61

Station WBCK
Battle Creek, Michigan

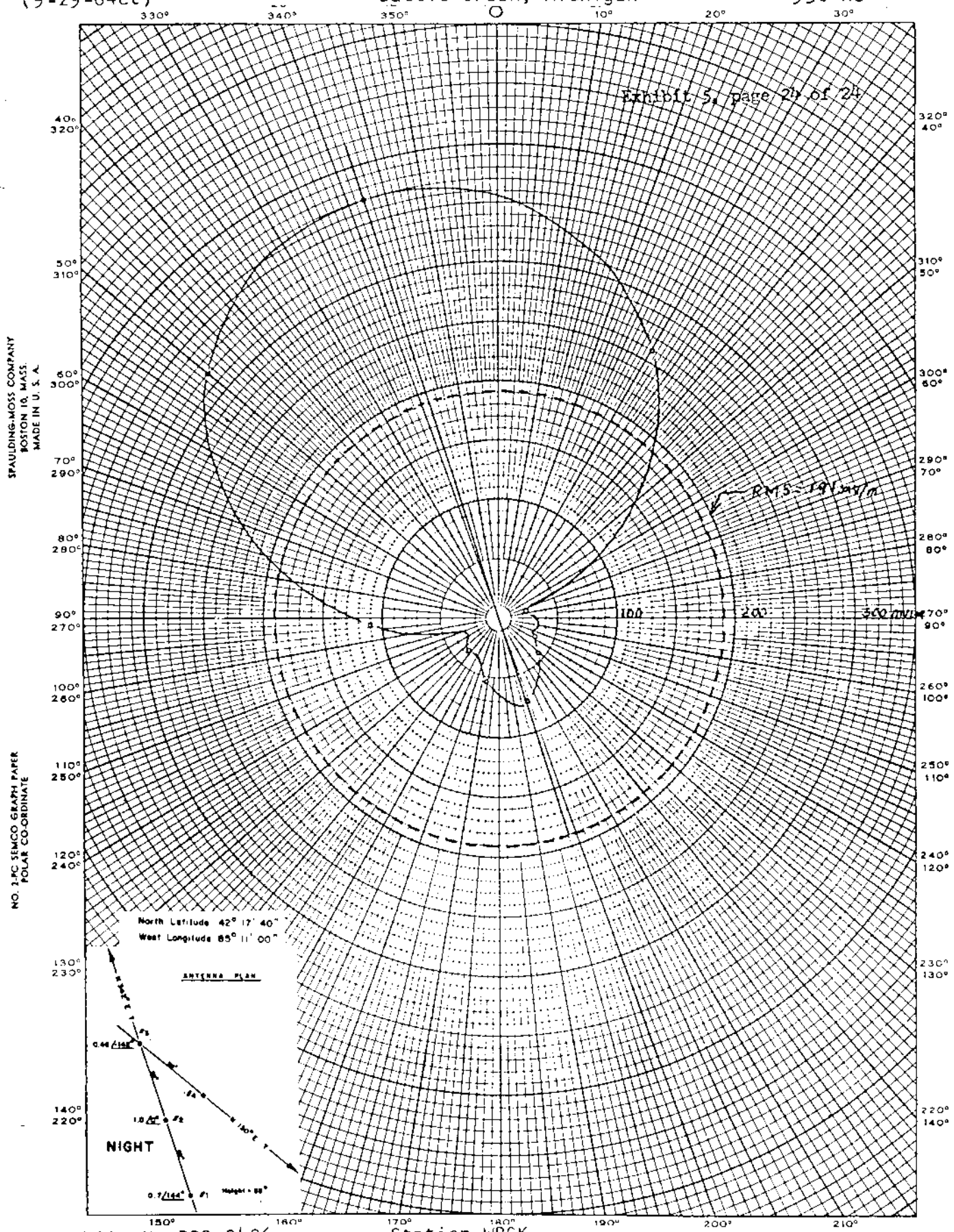
930 kc

WBCK

Measured Night
(9-29-64ct)

Station WBCK
Battle Creek, Michigan

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



FCC File No.BRC-2406
Accepted

Station WBCK
Battle Creek, Michigan

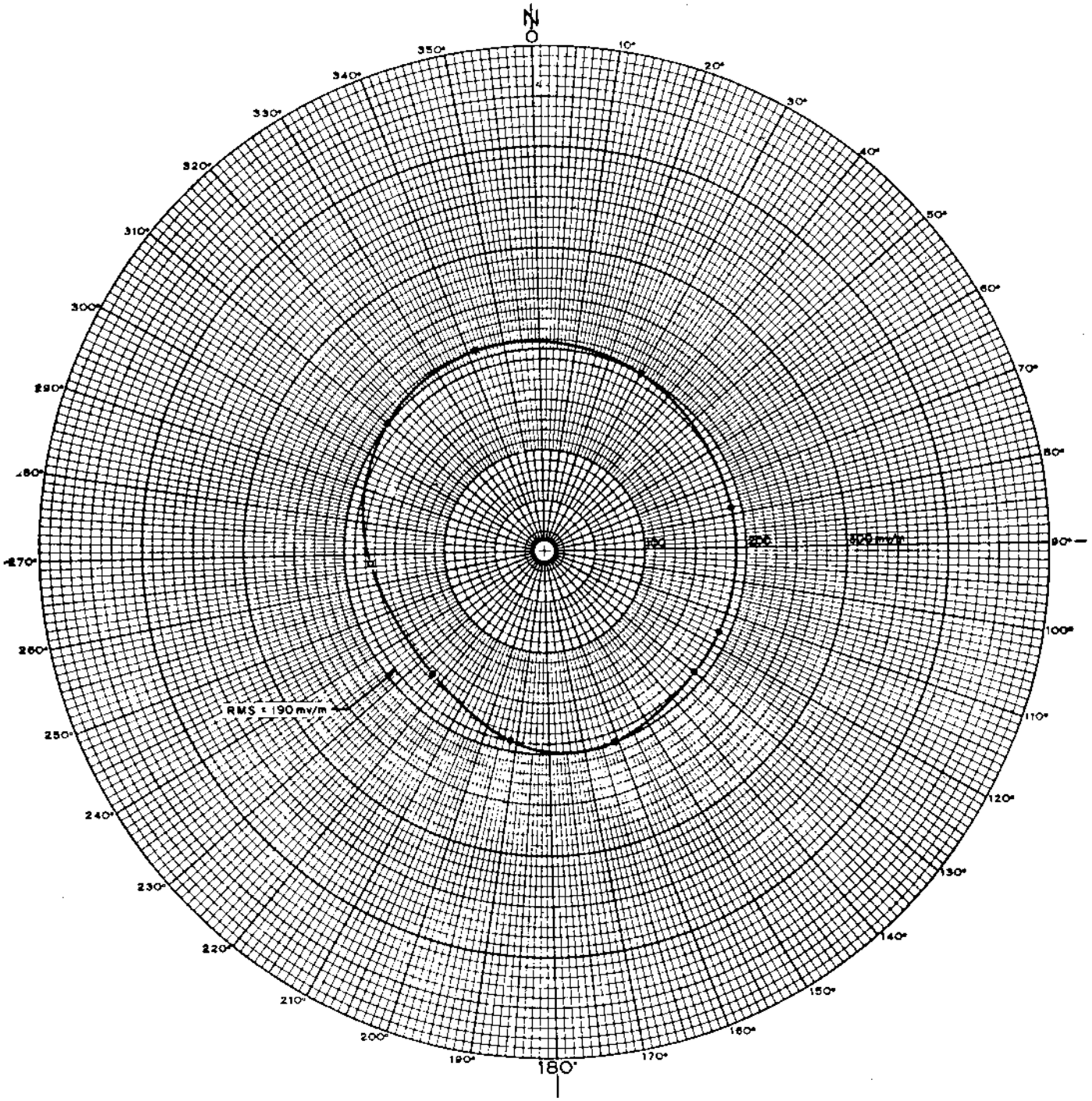
930 kc

WBCK

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

Station WBCK
Battle Creek, Michigan

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



North Latitude 42° 17' 40"
West Longitude 85° 11' 00"

FIGURE 8
HORIZONTAL RADIATION PATTERN
(NON-DIRECTIONAL #2 TOWER TEST OPERATION)
MICHIGAN BROADCASTING COMPANY
WBCK 1 KW, 5 KW-LS, DA-2 930 KC
BATTLE CREEK, MICHIGAN

Prepared by

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

January 1962

FCC File No.BL-9161
Accepted 4-18-62

Station WBCK
Battle Creek, Michigan

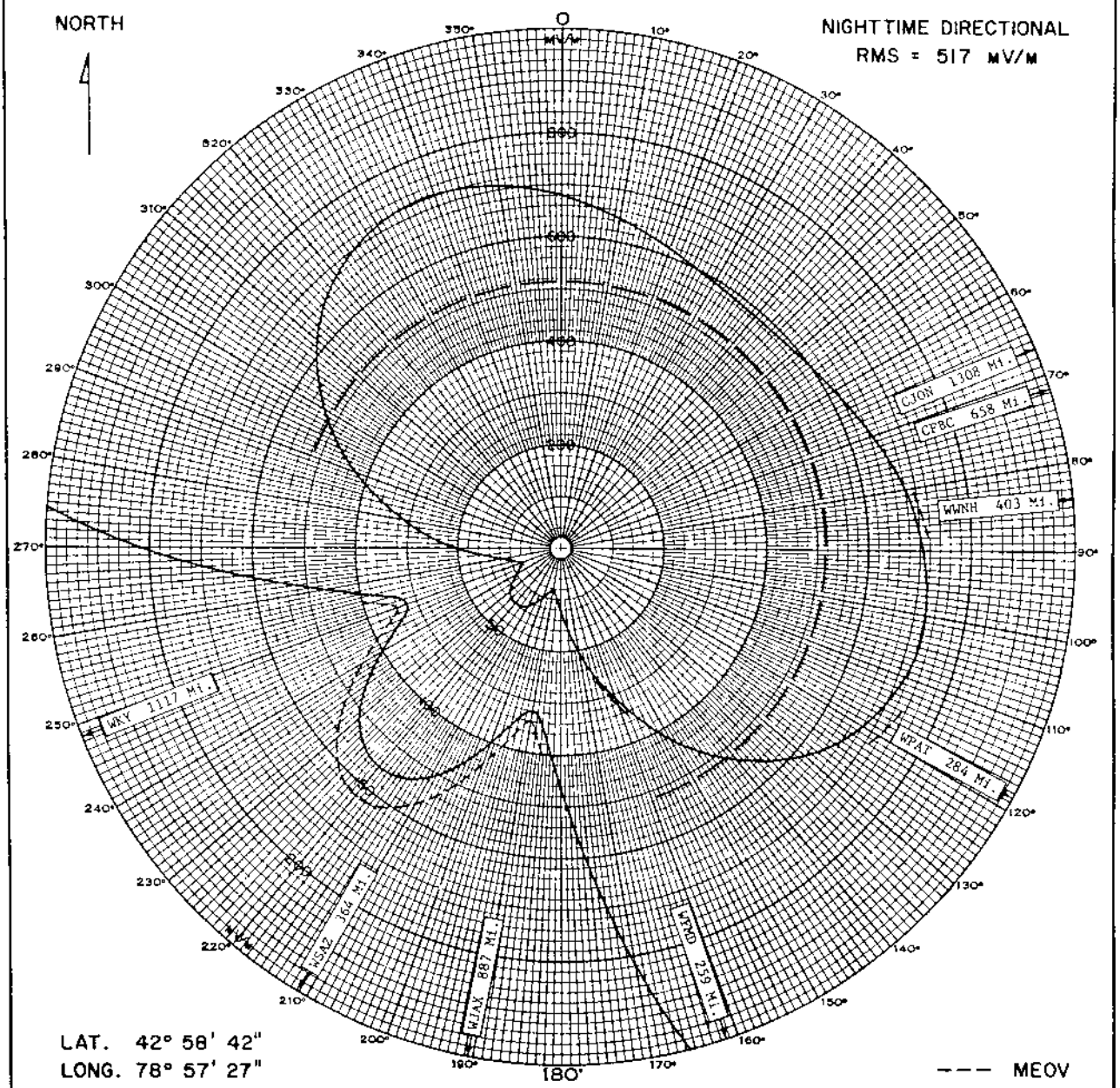
930 kc

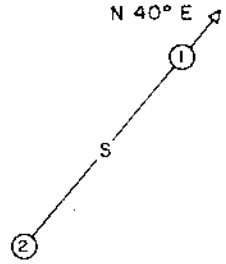
WBEN

Proposed Night
(1-22-71ct)

Station WBEN
Buffalo, New York

5kw, DA-N, U
930 kc





S = 397' = 135°
G = 470' = 160°
(193° WITH TOP LOADING)

THEORETICAL ANTENNA PARAMETERS

TOWER	FIELD	PHASE
1	1.00	0.0°
2	0.80	63.0°

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

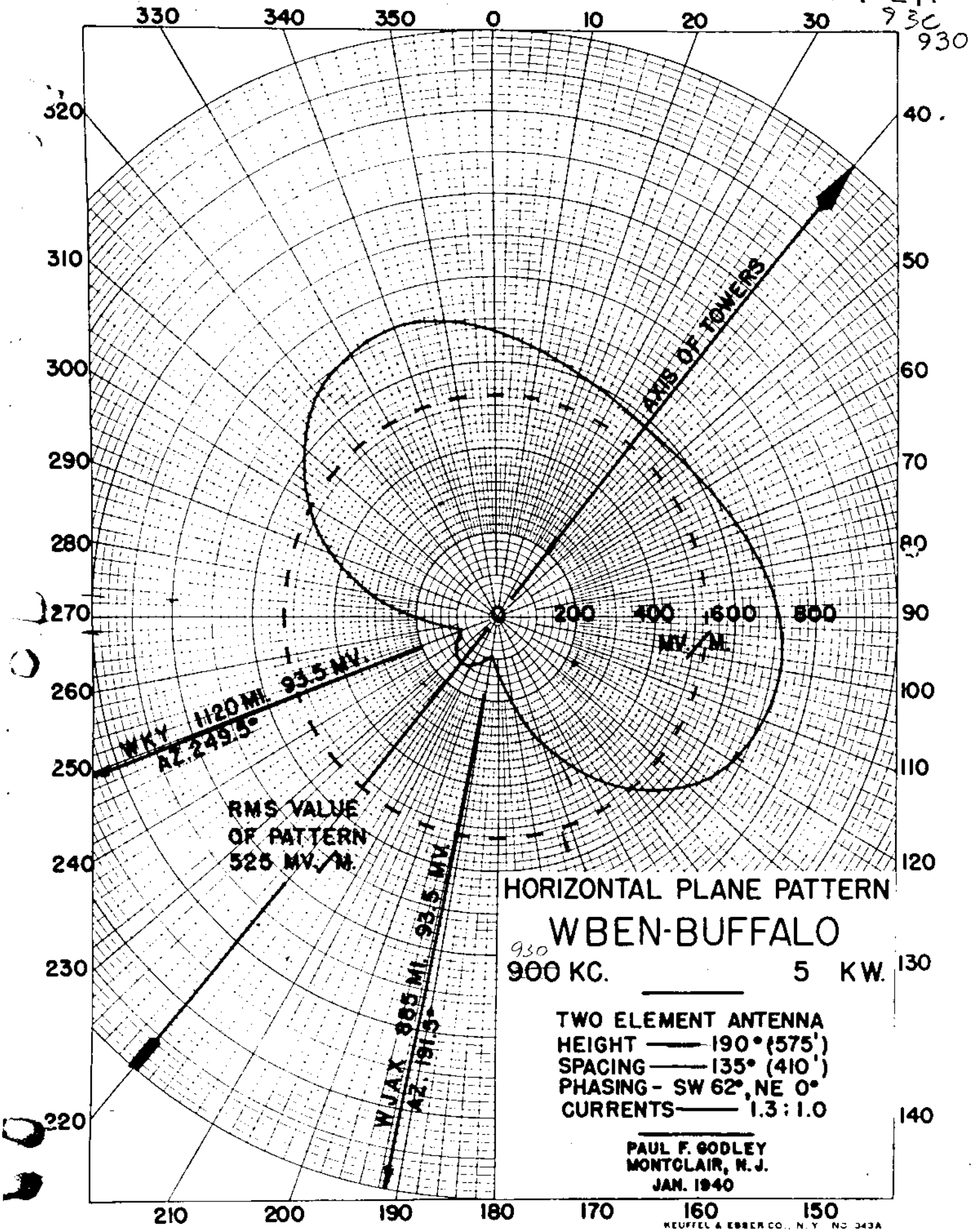
RADIO STATION WBEN
930 kHz 5 kW DA-N
700710 FIGURE 3

FCC File No. BML-2335
Accepted

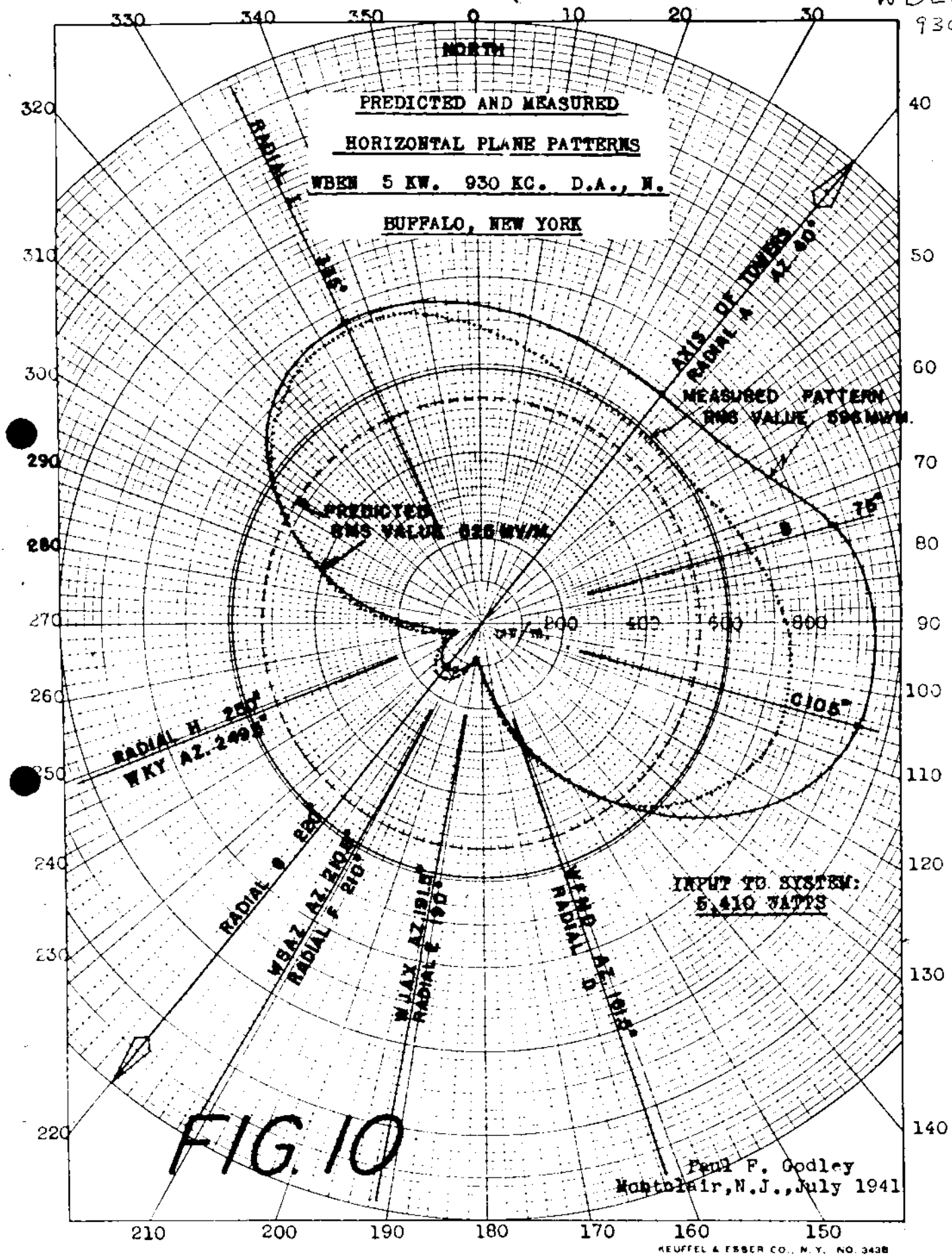
Station WBEN
Buffalo, New York

930 kc

WBEN
930
930



E = 500 1.035 [illegible] 1.25 [illegible]


WBEN
930
NORTH
PREDICTED AND MEASURED
HORIZONTAL PLANE PATTERNS
WBEN 5 KW. 930 KC. D.A., N.
BUFFALO, NEW YORK
AXIS OF TOWERS
RADIAL A AZ. 40°
MEASURED PATTERN
RMS VALUE 596 MV/M.
PREDICTED
RMS VALUE 626 MV/M.
RADIAL H. 250°
WKY AZ. 249.5°
RADIAL B. 220°
WGAR AZ. 210.5°
RADIAL F. 210°
WJAY AZ. 191.5°
RADIAL E. 190°
WEMP AZ. 181.5°
RADIAL D.
INPUT TO SYSTEM:
5,410 WATTS
FIG. 10
Paul F. Godley
Montclair, N.J., July 1941
KEUFFEL & ESSER CO., N.Y. NO. 3438
POLAR CO-ORDINATE
MADE IN U.S.A.

WBEN
930

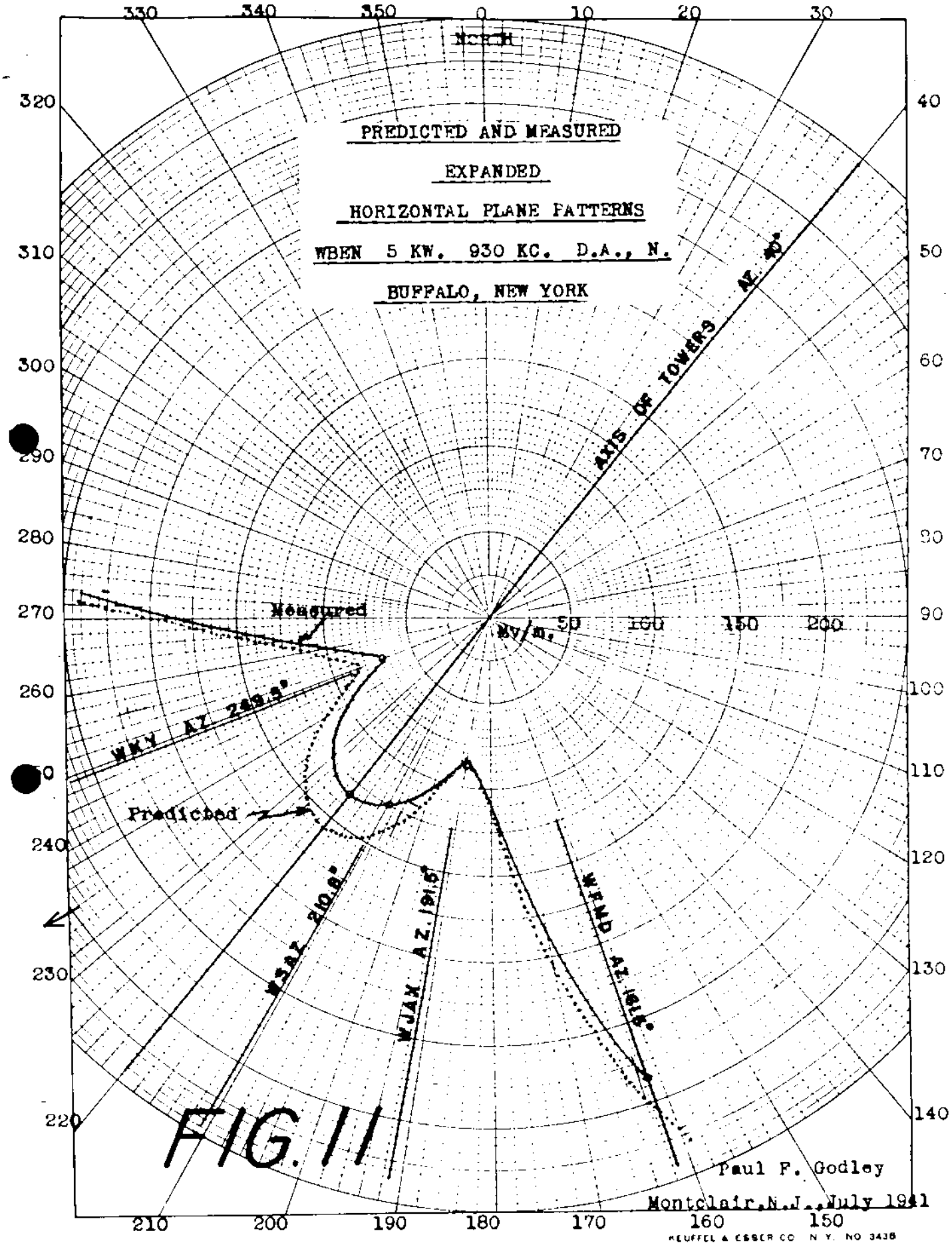


FIG. 11

Paul F. Godley

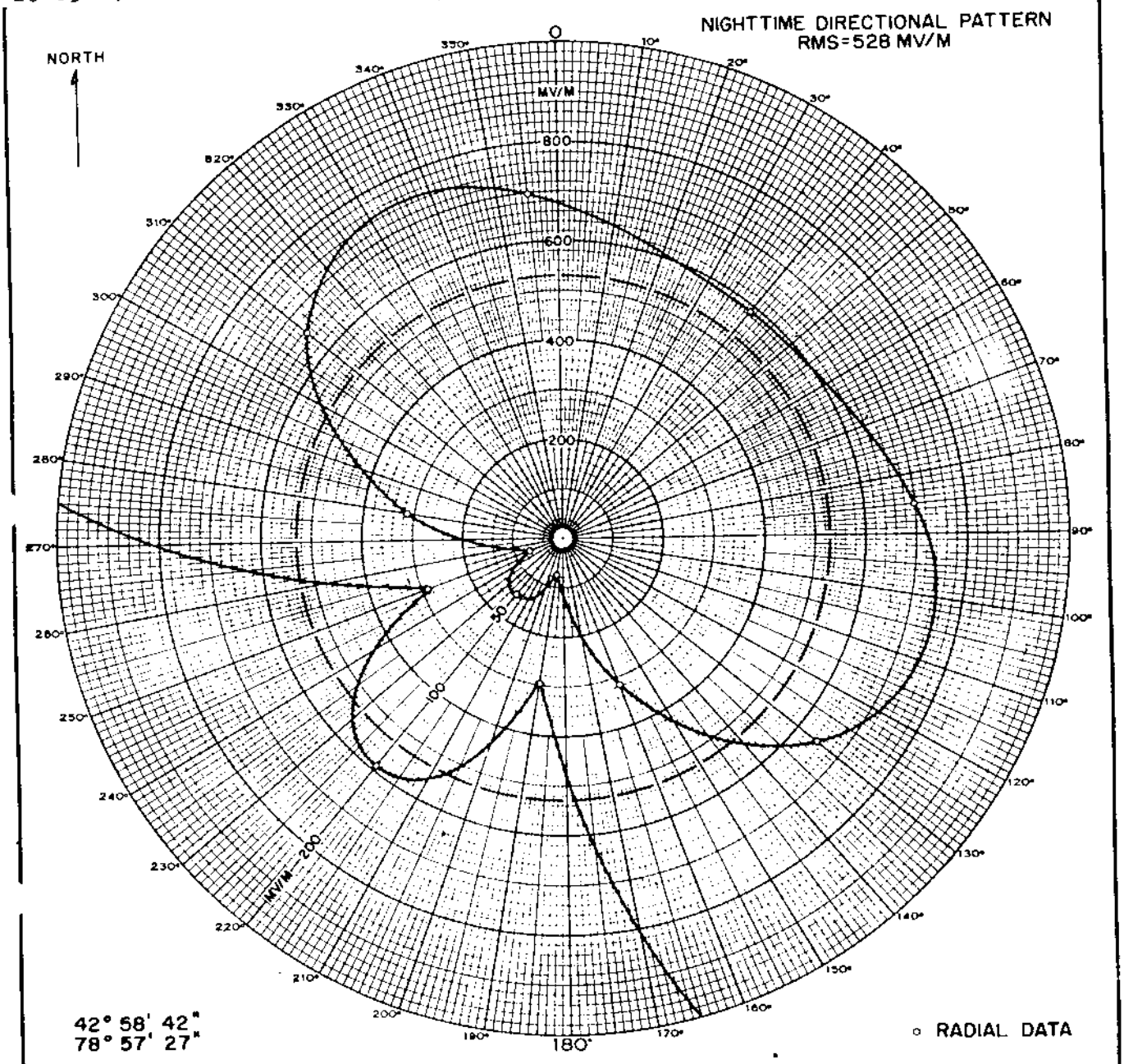
Montclair, N.J., July 1941

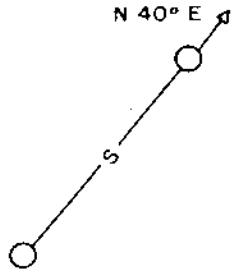
WBEN

Measured Night
(5-28-63ct)

Station WBEN
Buffalo, New York

5kw, DA-N, U
930 kc





S = 410' = 139.5°
G = 470' = 160°
(193° WITH TOP LOADING)

DIRECTIONAL ANTENNA PARAMETERS

TOWER	THEORETICAL FIELD	THEORETICAL PHASE	INDICATED FIELD	INDICATED PHASE
NORTHEAST	1.00	0°	1.00	0°
SOUTHWEST	.86	61°	.787	68°

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

RADIO STATION WBEN
930 KC 5 KW DA-N
630120 FIGURE 2B

FCC File No. BZ-4911
Accepted 5-9-63

Station WBEN
Buffalo, New York

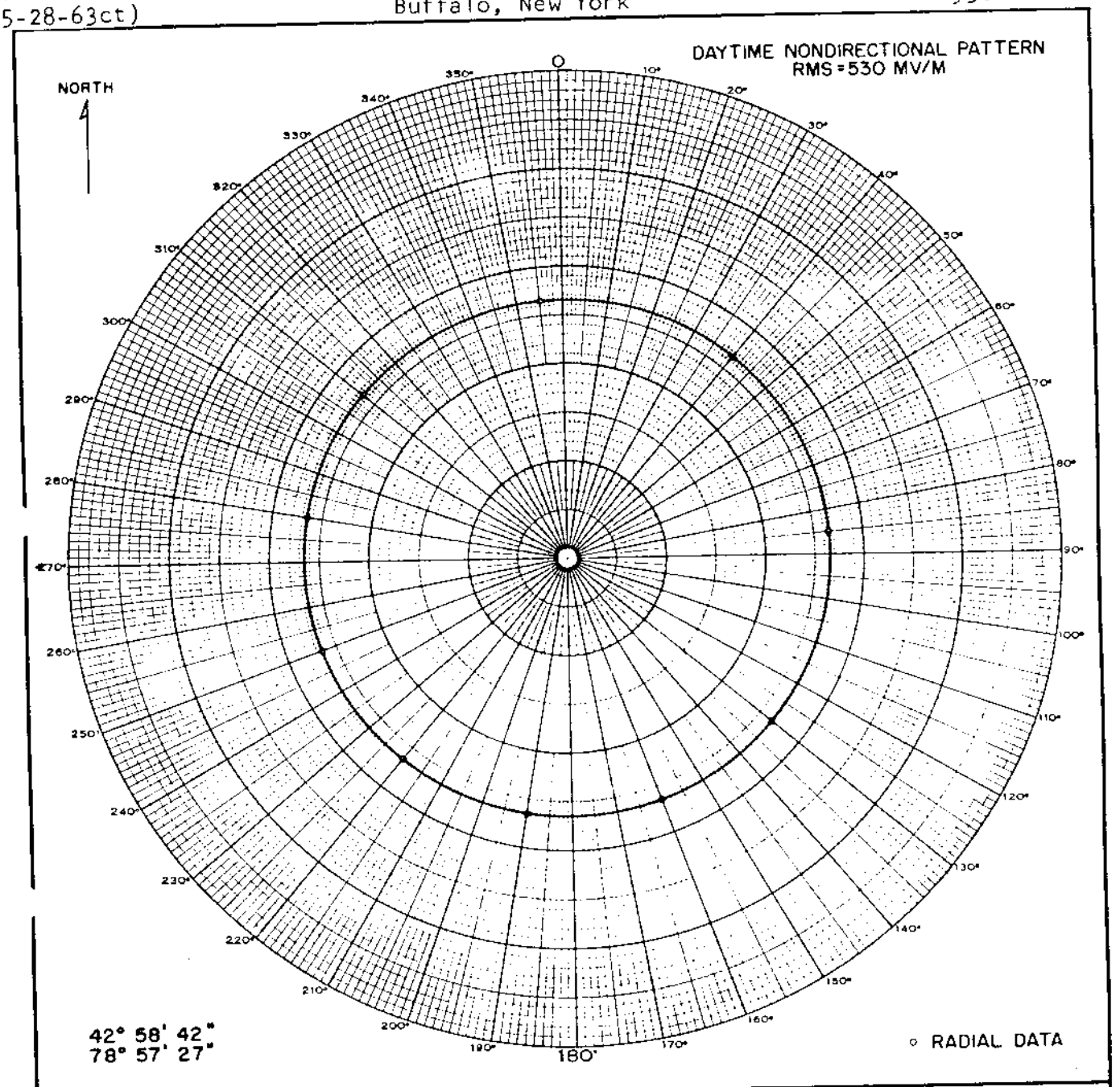
930 kc

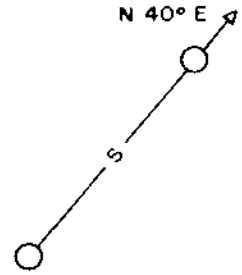
WBEN

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

Station WBEN
Buffalo, New York

5kw,DA-N,U
930 kc





S = 410' = 139.5°
G = 470' = 160°
(193° WITH TOP LOADING)

NONDIRECTIONAL ANTENNA

TOWER	OPERATION
NORTHEAST SOUTHWEST	SERIES FED DETUNED

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

RADIO STATION WBEN

930 KC 5 KW DA-N
630120 FIGURE 2A

FCC File No. BZ-4911
Accepted 5-9-63

Station WBEN
Buffalo, New York

930 kc

PROPOSED & MEASURED NON-DA | Station WBEN Buffalo, New York | 5 KW, DA-N,U 930 KC

930 Buffalo, N.Y. WBE

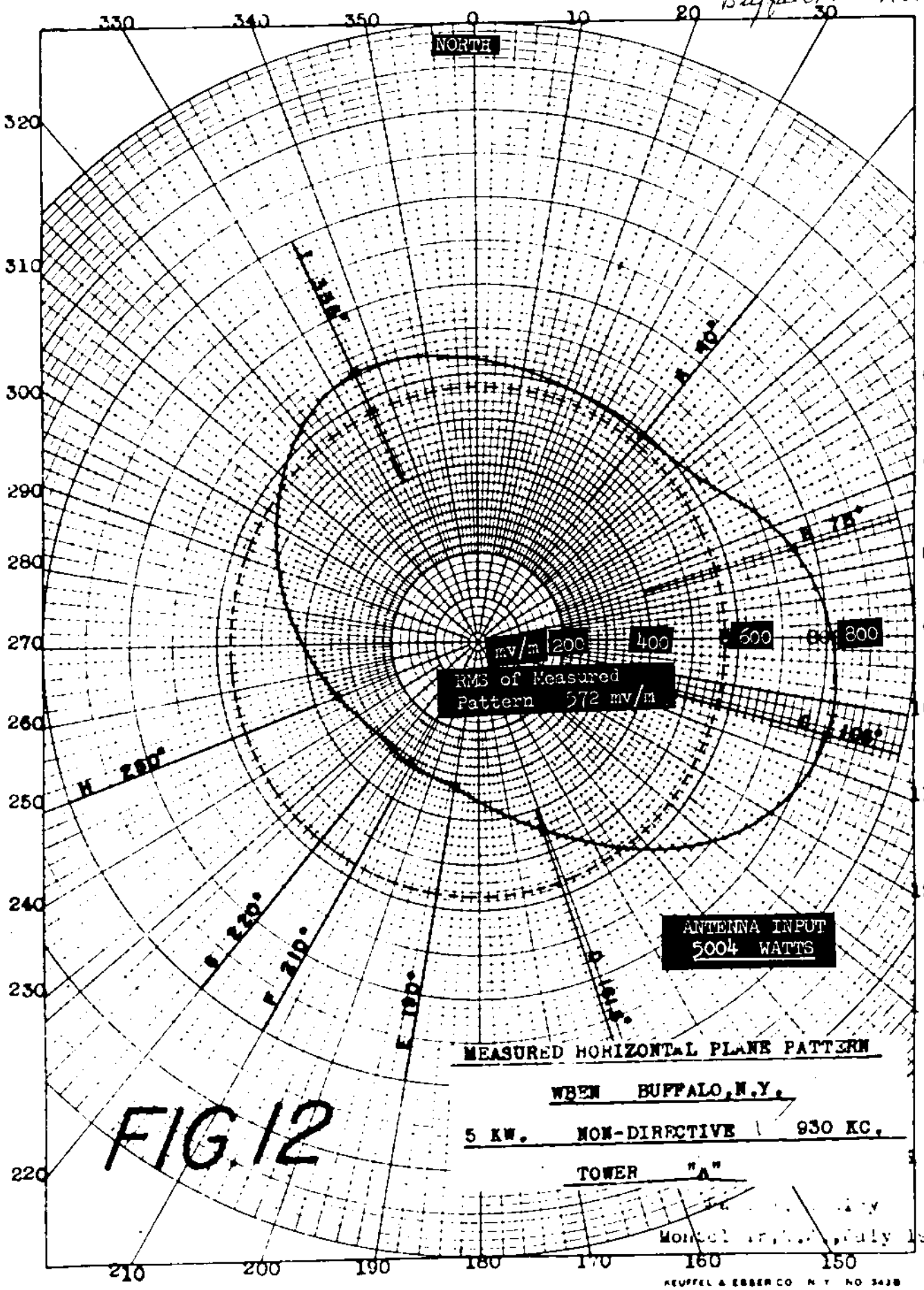


FIG. 12

WCNR

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WCNR

Main Studio: Bloomsburg, Pennsylvania

Frequency: 930 KHz

Power: 0.5 kW Night 1 kW Day

Notification: 1779

Date: September 27, 1978 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 41° 01' 14"
West Longitude: 76° 25' 16"

Predicted Daytime non-directional effective field at rated power 190 $\frac{mv}{m}$

ANTENNA CHARACTERISTICS

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

TOWER	:	SW (#3)	C (#1)	NE (#2)			
HEIGHT ABOVE INSULATORS	:	260'	260'	260' (88.5°)			
PHASING	:	+167.3	0	-145.6			
FIELD RATIO	:	0.56	1	0.5			

SPACING AND ORIENTATION : With the Center (#1) tower as reference the SW (#3) tower is spaced 236.5' (80.5°) on a line bearing 228.4° true, and the NE (#2) tower is spaced 238.8' (81.3°) on a line bearing 65.5° true.

WCNR

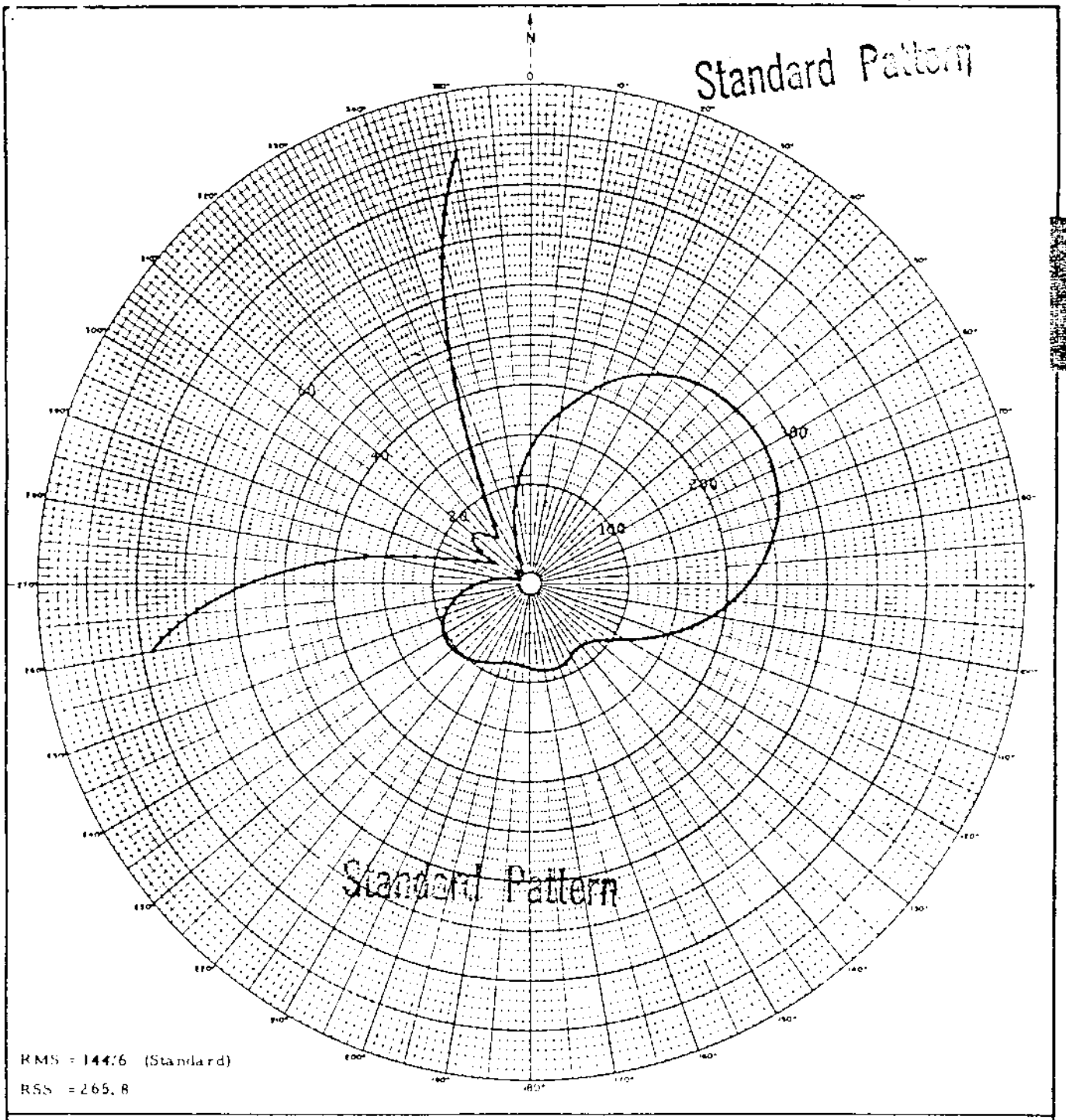
GROUND SYSTEM: 120 - 270' equally spaced copper radials about each tower plus 50 - 50' interspaced radials about the C (#1) tower and 120 - 50' interspaced radials about the NE (#2) and SW (#3) towers. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of system are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL		STANDARD
	RMS	RSS	RMS
Night	137.6 mv/m	265.8 mv/m	144.6 mv/m

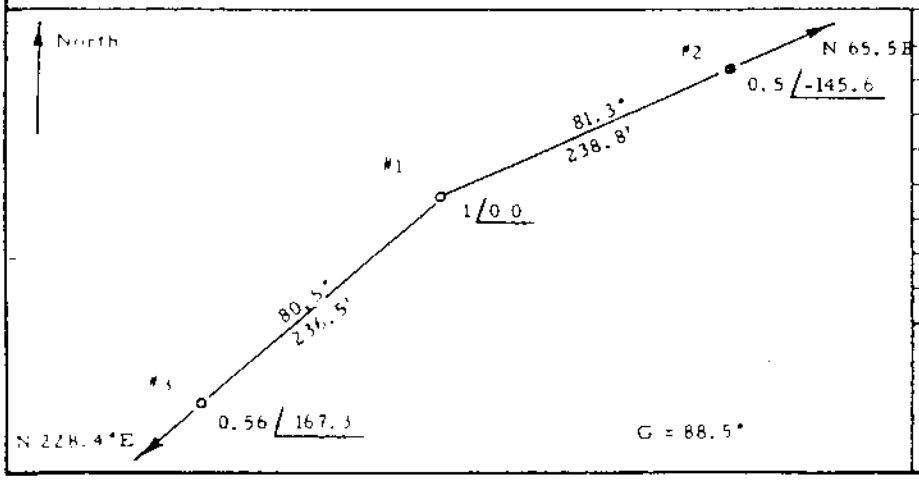
Note: This notification concerns only a change in the Nighttime operation of the station with Daytime operation continued as previously notified.

WCNR



HORIZONTAL RADIATION PATTERN

FIGURE 1A



APPLICANT	RADIO STATION WCNR
LOCATION	BLOOMSBURG, PA.
FREQUENCY	930 KHz
POWER	0.5 KW
LATITUDE	41 DEG 01 MIN 14 SEC
LONGITUDE	76DEG 25 MIN 16 SEC
WHEN USED	NIGHTTIME
RMS FIELD	137.6 MV/M (Theoretical)
DATE	November 1977

ROBERT L. PURCELL

WASHINGTON D C

WEKO

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station : WEKO Main Studio: Cabo Rojo, Puerto Rico

Frequency : 930 KHz Power : 0.5 kW Night 0.5 kW Day

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

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude:	18	06	05
West Longitude:	67	09	17

ANTENNA CHARACTERISTICS

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

TOWER :	S(#1)	N(#2)				
HEIGHT ABOVE INSULATORS :	160	160(54.5°)				
NIGHT PHASING :	0°	+160°				
NIGHT FIELD RATIO:	1.0	1.2				
DAY PHASING :	0	+147°				
DAY FIELD RATIO :	1.0	0.706				

SPACING AND ORIENTATION : Towers in a row are spaced 235' (80°) on a line bearing 15° true.

GROUND SYSTEM : 120 - 264 equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shrtened and bonded to a transverse strap along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL		STANDARD
	RMS	RSS	RMS
Day 1/	124 mV/m		
Night 1/	130.3 mV/m	189.1 mV/m	136.9 mV/m

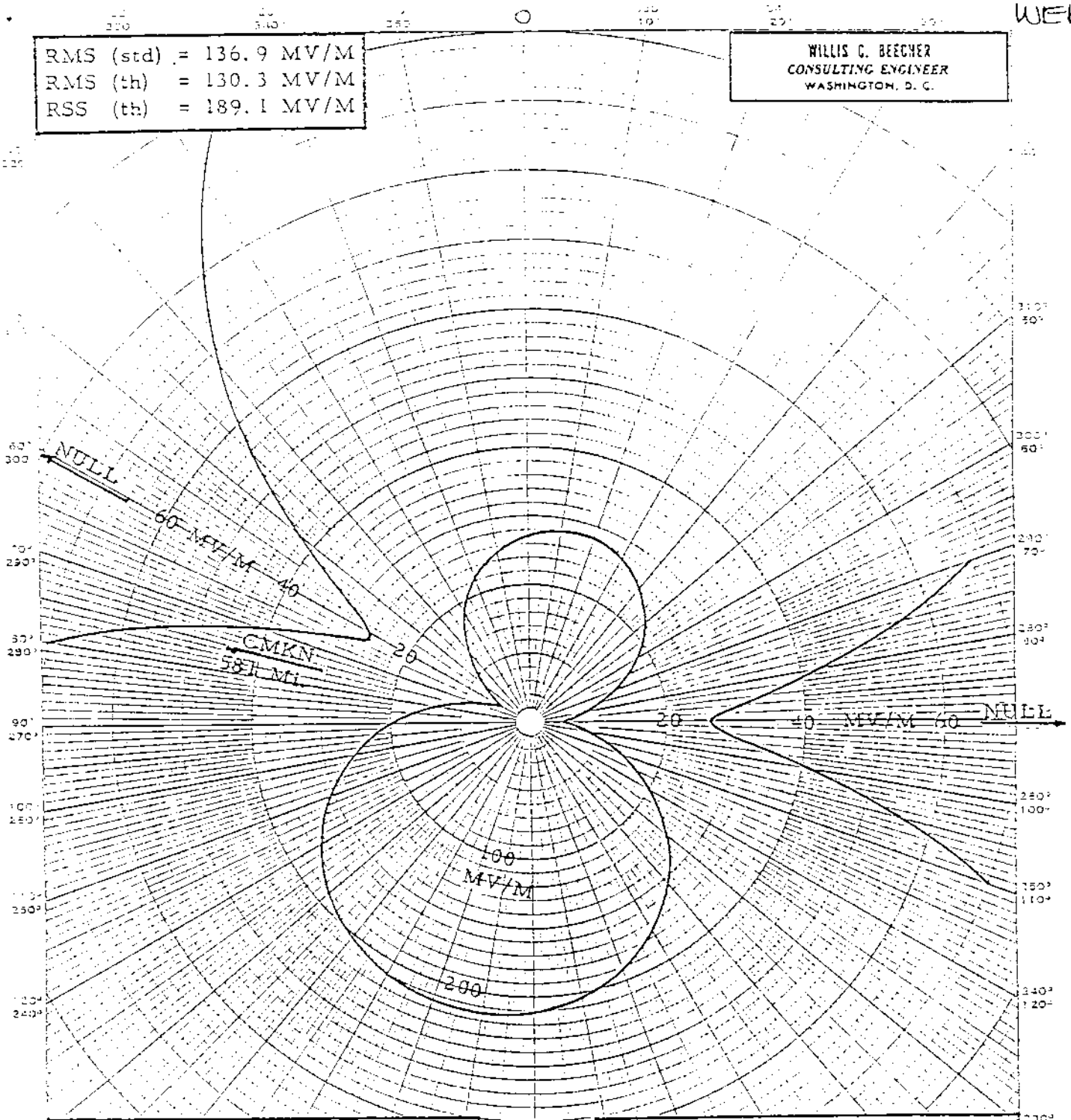
1/ By adjustment of input power.

Note: Please retain the Daytime directional antenna radiation pattern notified for Station WEKO in United States Change List Number 1611 dated December 17, 1974 and attach to this Revised Description Sheet and Nighttime patterns. This nofification concerns only a change in the Daytime and Nighttime transmitter location and a change in the Nighttime antenna system with Daytime operation continued as previously notified at the new transmitter location.

WEKC

RMS (std) = 136.9 MV/M
RMS (th) = 130.3 MV/M
RSS (th) = 189.1 MV/M

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



15° T

2 ⊙ 1.2 ∠ 160°

80°

h = 160'
G = 54.5°

1 ⊙ 1.4 0°

18° 06' 05", 67° 09' 17"

Figure 7

Nighttime Standard

Horizontal Radiation Pattern

David Ortiz Radio Corporation

WEKO, Cabo Rojo, Puerto Rico

930 KHz 0.5 KW U, DA-2

August 1976

WEKO

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WEKO

Main Studio: Cabo Rojo, Puerto Rico

Frequency: 930 kHz

Power: 0.5 kW

Notification List No. 1611

Date: December 17, 1974

Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 18° 05' 50"
West Longitude: 67° 07' 48"

MODIFIED STANDARD PATTERN NIGHTTIME

ANTENNA CHARACTERISTICS

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

TOWER:	S(#1)	N(#2)
HEIGHT ABOVE INSULATORS:	160'	160' (54.5°)
NIGHT PHASING:	0°	+150°
NIGHT FIELD RATIO:	1.0	1.0
DAY PHASING:	0°	+147°
DAY FIELD RATIO:	1.0	0.706

SPACING AND ORIENTATION: Elements are spaced 235' (80°) on a line bearing 15° true.

GROUND SYSTEM: 120-264' equally spaced copper radials plus a 30' square 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 FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
NIGHT	129.9 mv/m	182.4 mv/m	136.5 mv/m
DAY	124 mv/m	----	----

MODIFIED PATTERN AUGMENTATION

Azimuth of Maximum Augmentation	Augmented Radiation E_2	Span of Augmentation From	To
83°	30.7 mv/m	63° -	103°

(Cont'd.)

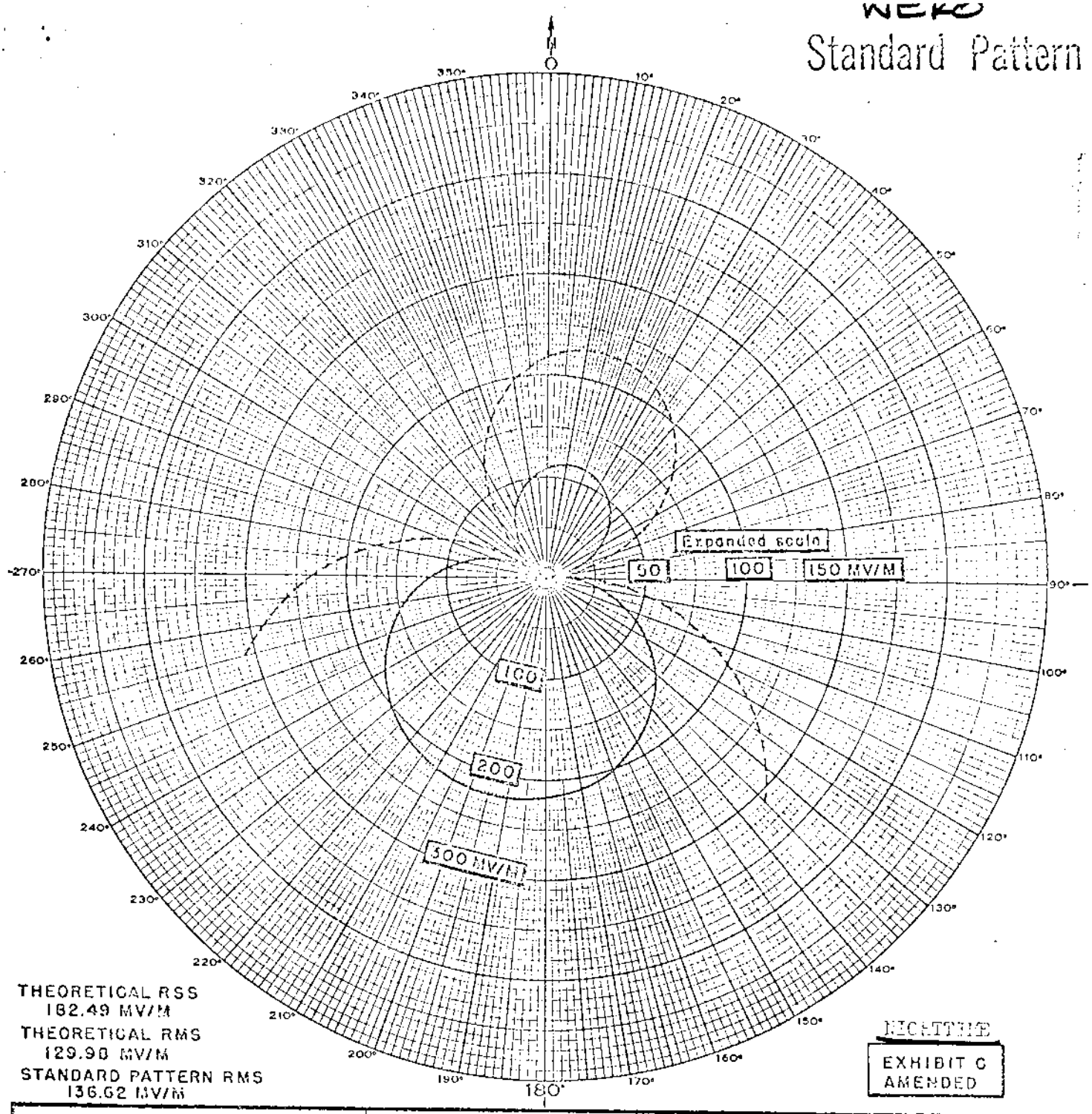
WEKO

Note: Please retain the Daytime directional antenna radiation pattern notified for a new Station at Cabo Rojo, Puerto Rico in United States Change List Number 1309, dated February 26, 1969, and attach to this Revised Description Sheet and Nighttime patterns. This notification concerns only a change to modify the Nighttime Standard Pattern with Daytime operation continued as previously notified.

CTR NO 30230A4

WEKO

Standard Pattern



THEORETICAL RSS
182.49 MV/M
THEORETICAL RMS
129.90 MV/M
STANDARD PATTERN RMS
136.62 MV/M

NIGHTTIME

EXHIBIT C
AMENDED

15° True

N

1∠150° ⊙ TOWER NO. 2

80° 235'

1∠0° ⊙ TOWER NO. 1

H = 54.5° 160.1'

LATITUDE 18° 05' 50." North
LONGITUDE 67° 07' 48.5" West

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG
1	0	0	0	1.0	—	54.5
2	15	80	150	1.0	—	54.5

STANDARD HORIZONTAL
RADIATION PATTERN
WEKO

CABO ROJO, PUERTO RICO

930 kHz 500 w DA-2-U

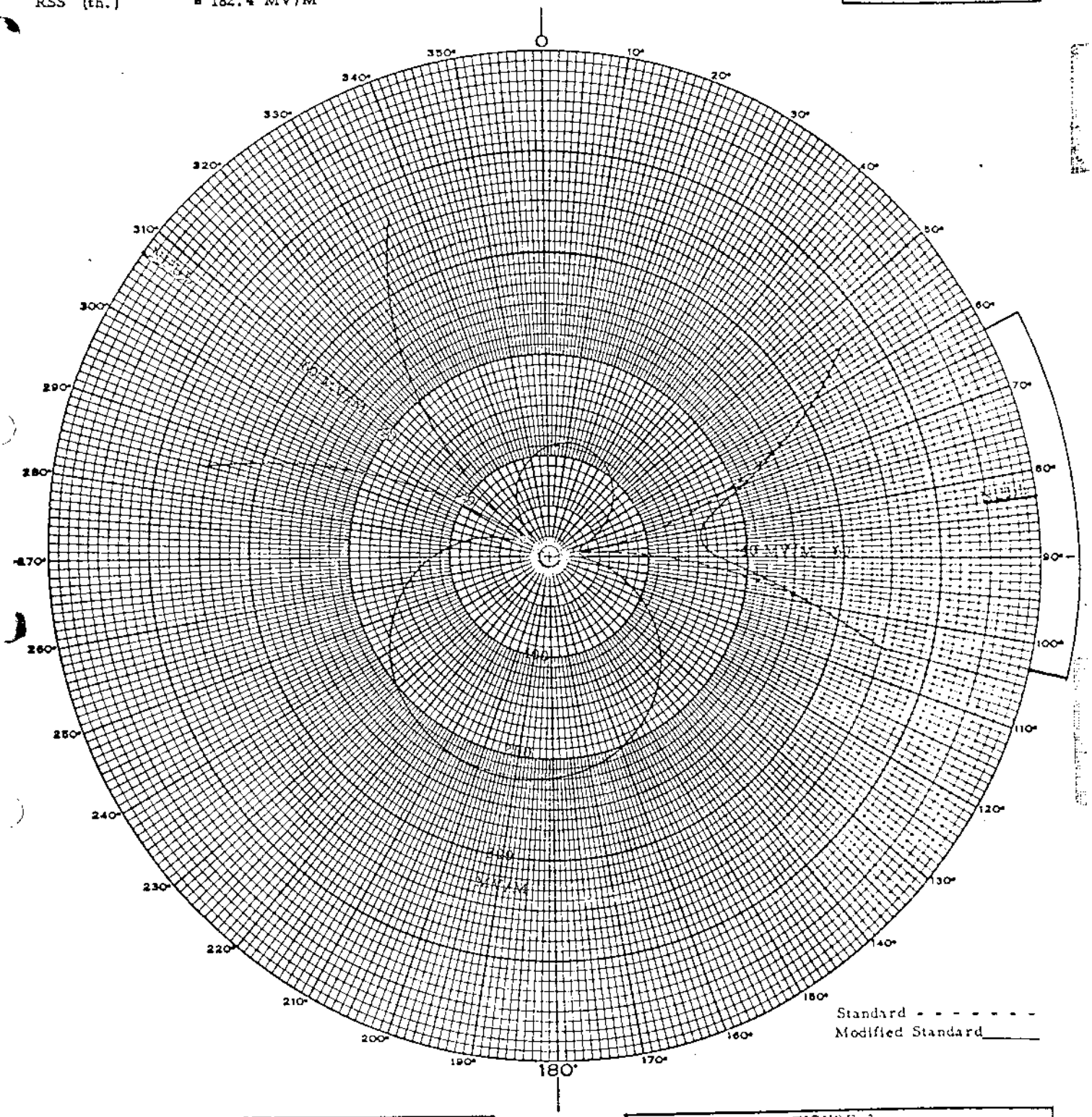
740215

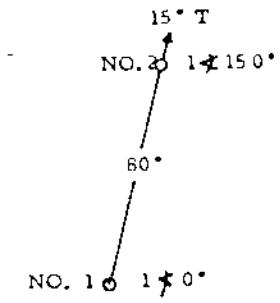
KEAR & KENNEDY ASSOCIATES, INC.
Consulting Radio Engineers
WASHINGTON, D. C.

WEKO
Standard Pattern

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

RMS (mod. std.) = 136.7 MV/M
RMS (std.) = 136.5 MV/M
RMS (th.) = 129.9 MV/M
RSS (th.) = 182.4 MV/M





Lat: 18° 05' 50"

Long: 67° 07' 48"

h = 160', G = 54.5°

FIGURE 3

CALCULATED NIGHTTIME

MODIFIED STANDARD HORIZONTAL PATTERN

DAVID ORTIZ RADIO CORPORATION

WEKO, CABO ROJO, PUERTO RICO

930 KHz 500 WATTS U, DA-2

OCTOBER 1974

WEKO

Proposed Day
(11-29-66ct)

New; David Ortiz Radio Corp.
Cabo Rojo, Puerto Rico

500w,DA-D,D
930 kc

BP 17347 Granted 1-26-69 application for CP for a new AM broadcast station

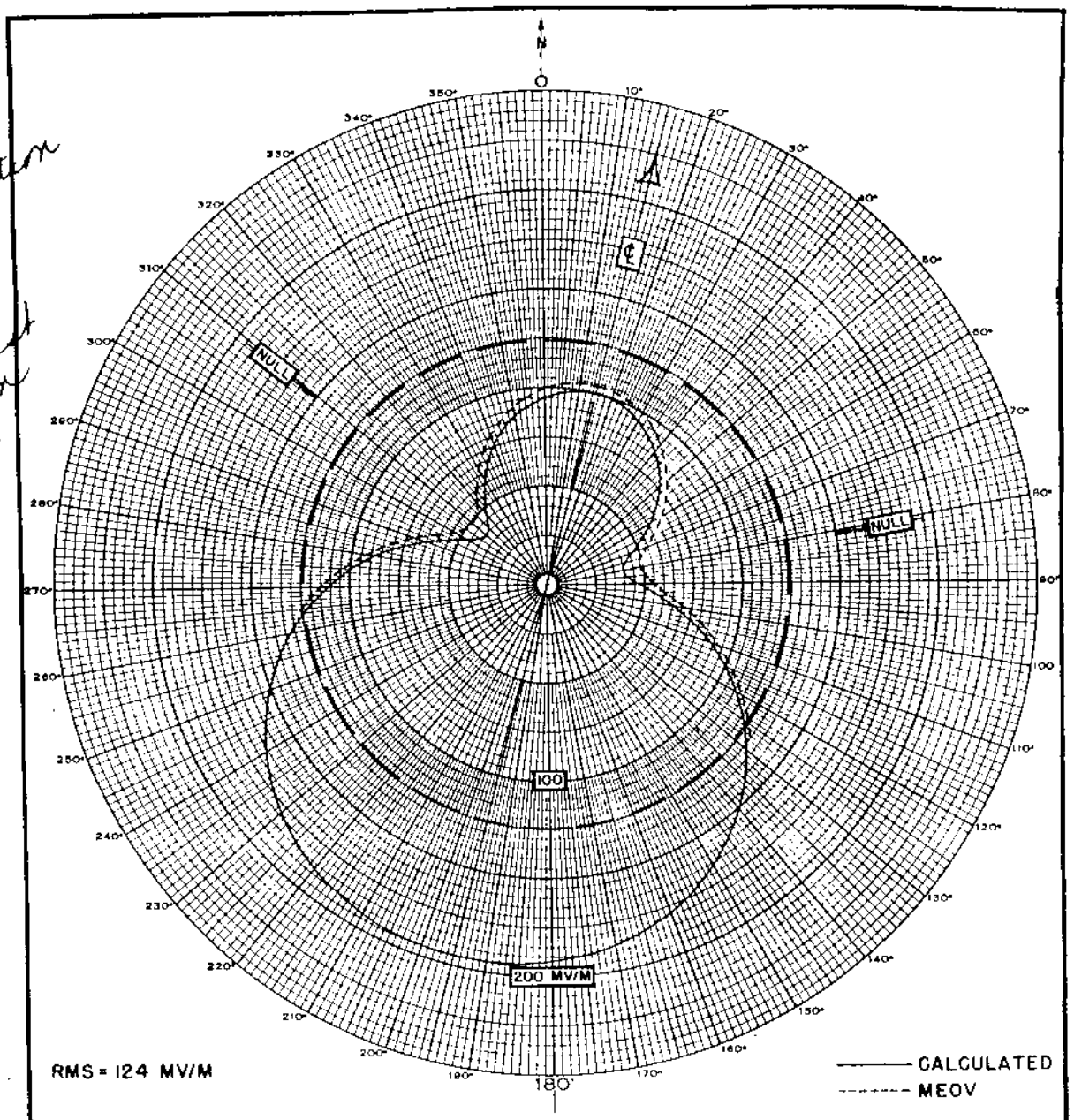
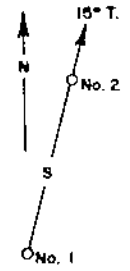


FIGURE 2



S = 80° = 234' θ = 54.5° = 160'

LATITUDE 18° 05' 50.4" N.
LONGITUDE 67° 07' 48.5" W.

ANTENNA NUMBER #	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG
1	–	–	0°	1.0	–	54.5°
2	15° T	80°	147°	0.706	–	54.5°

HORIZONTAL PLANE PATTERN
FOR
PROPOSED STATION
CABO ROJO, PUERTO RICO
930 KC 500 W DA-D
660713

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON D C

FCC File No.BP-17347
Accepted 11-18-66

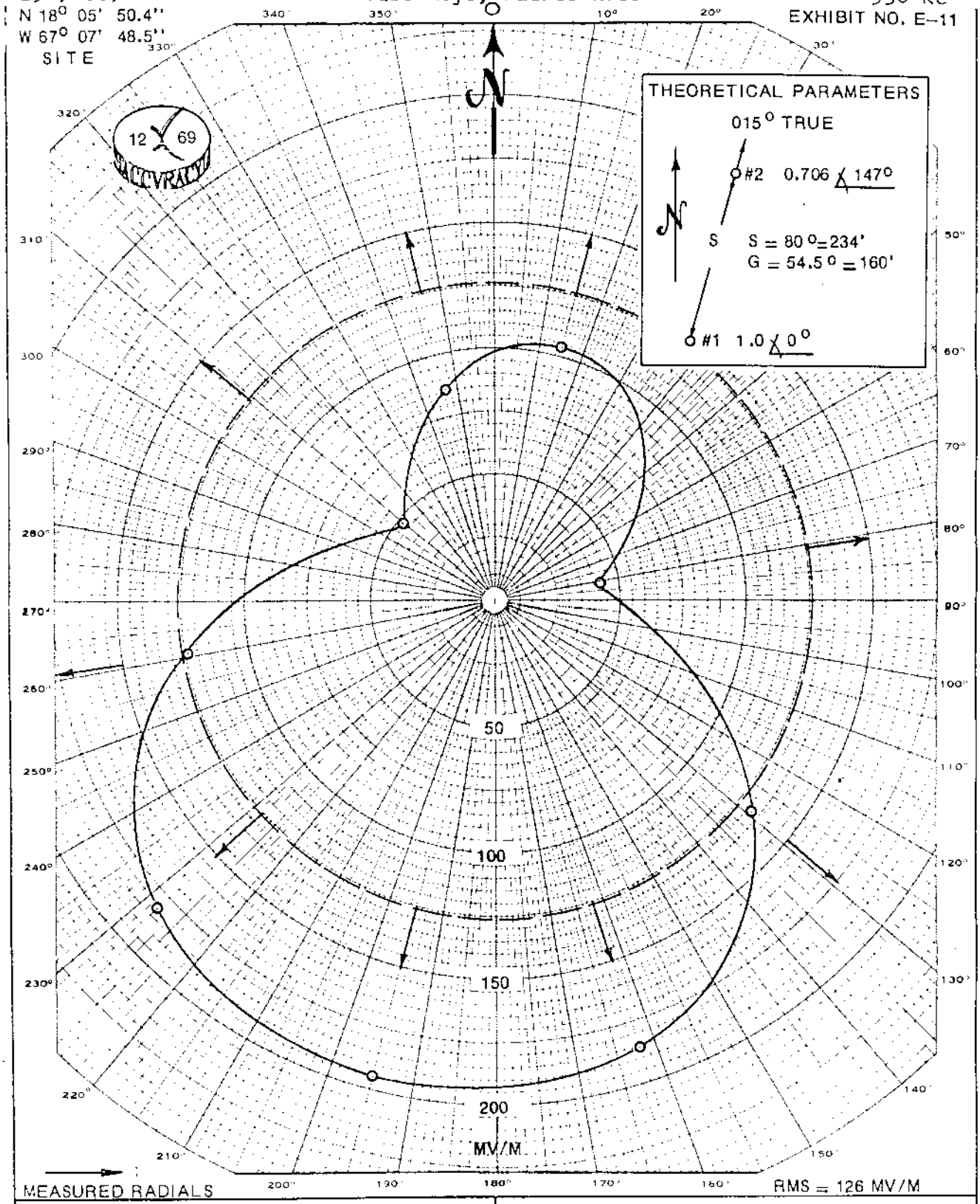
New; David Ortiz Radio Corp.
Cabo Rojo, Puerto Rico

930 kc

Measured Day
(4-29-70ct)

Station WEKO
Cabo Rojo, Puerto Rico

WEKO
500w, DA-D, D
930 kc
EXHIBIT NO. E-11



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

MEASURED HORIZONTAL DIRECTIONAL
ANTENNA RADIATION PATTERN
WEKO CABO ROJO, PUERTO RICO
930 kHz 500 WATTS, DA-D

FCC File No.BL-12579
Accepted 4-6-70

Station WEKO
Cabo Rojo, Puerto Rico

930 kc

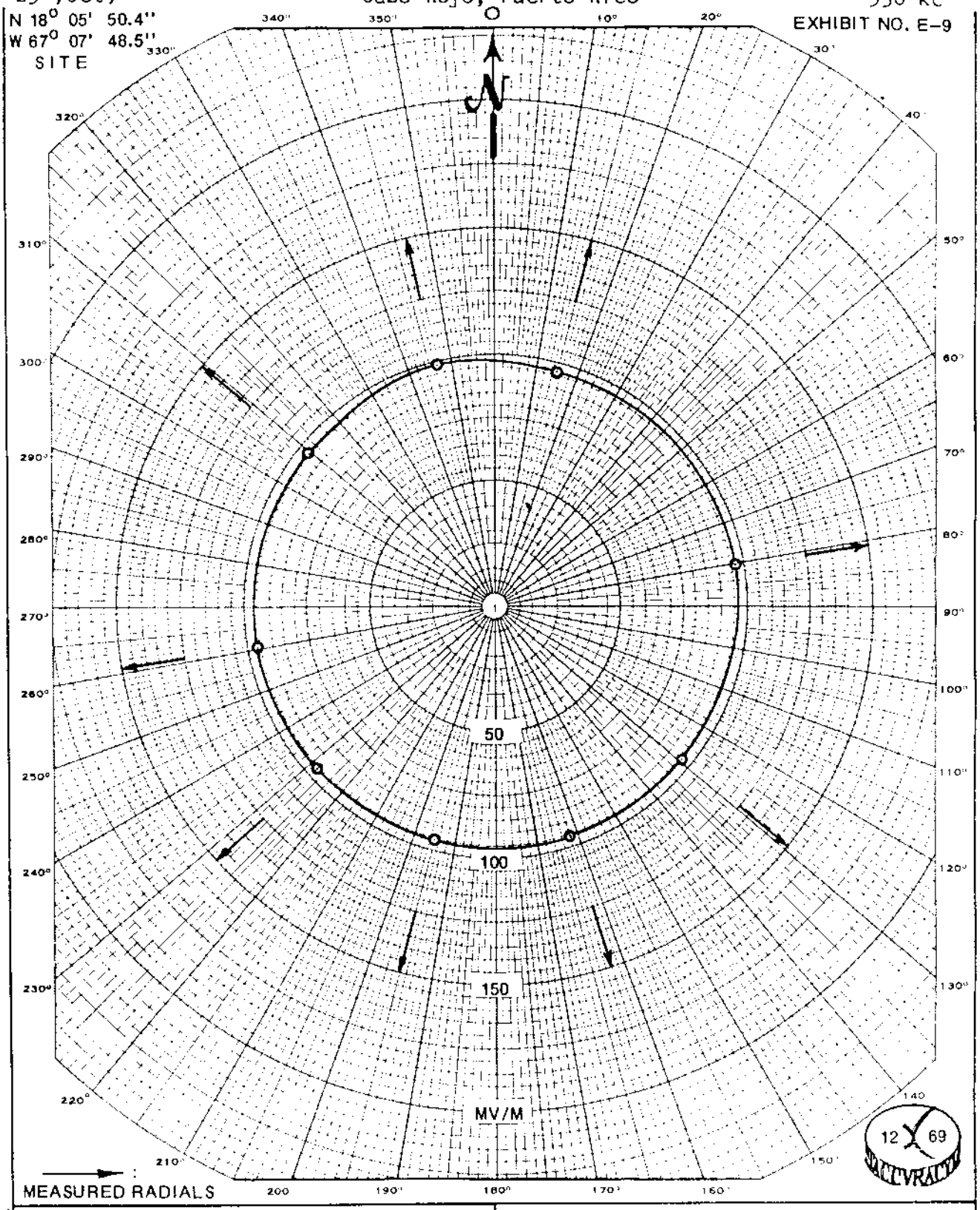
WEKO

Measured Non-DA
(4-29-70ct)

Station WEKO
Cabo Rojo, Puerto Rico

500w, DA-D, D
930 kc

EXHIBIT NO. E-9



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

MEASURED HORIZONTAL NON-DIRECTIONAL
ANTENNA RADIATION PATTERN
WEKO CABO ROJO, PUERTO RICO
930 kHz 500 WATTS, DA-D

FCC File No. BL-12579
Accepted 4-6-70

Station WEKO
Cabo Rojo, Puerto Rico

930 kc

WEOL

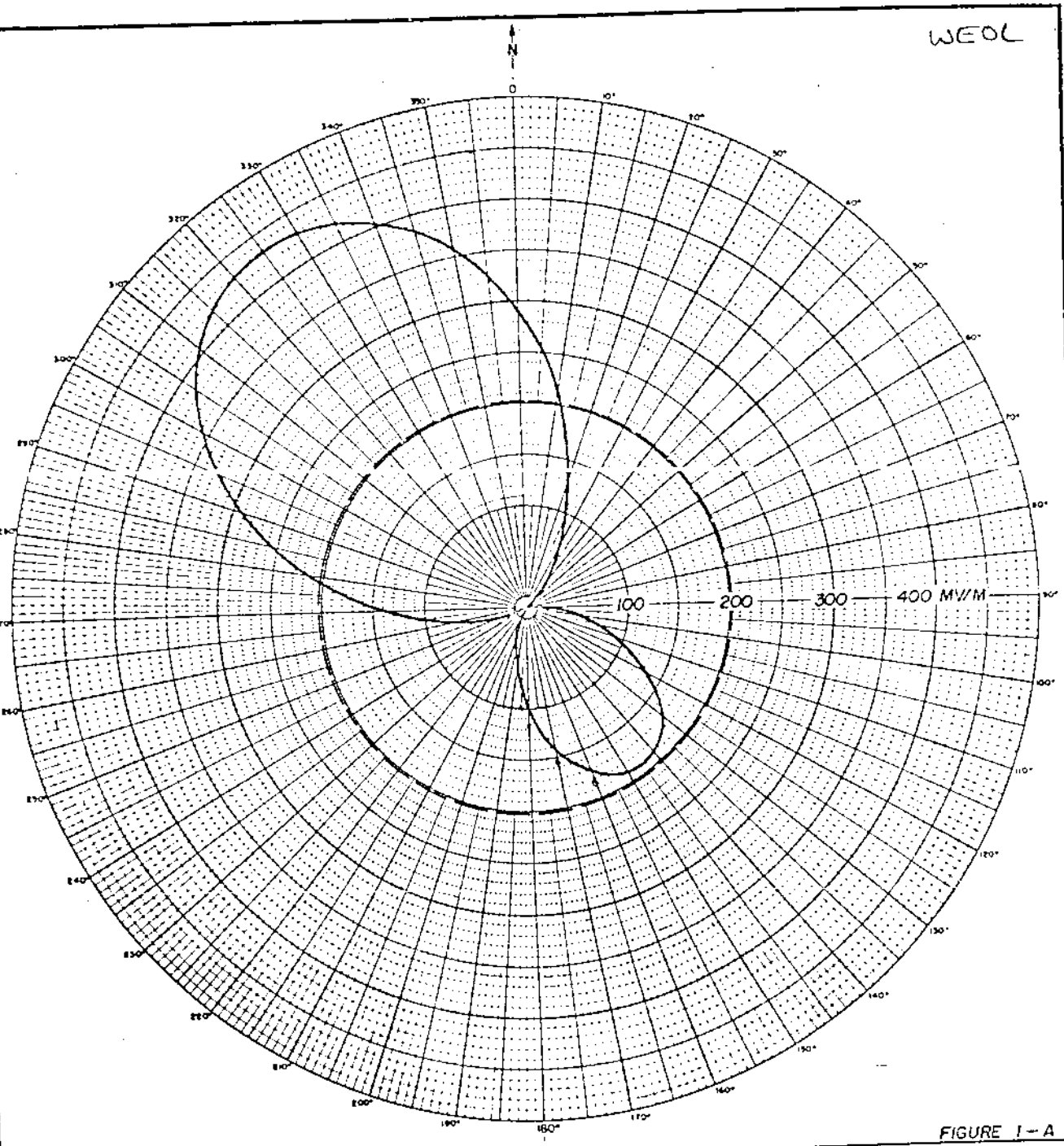
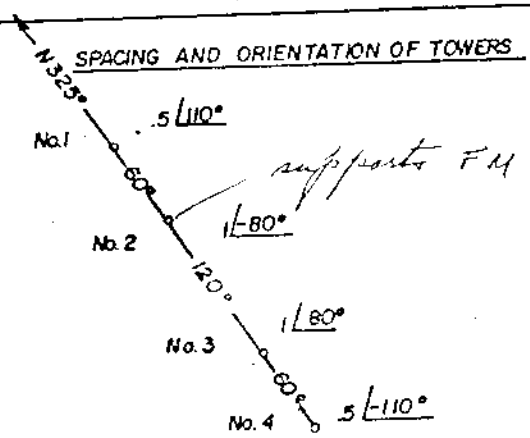


FIGURE 1-A

--- RMS

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION OF TOWERS



$G_1 = G_4 = 90°$

$G_2 = G_3 = 108°$

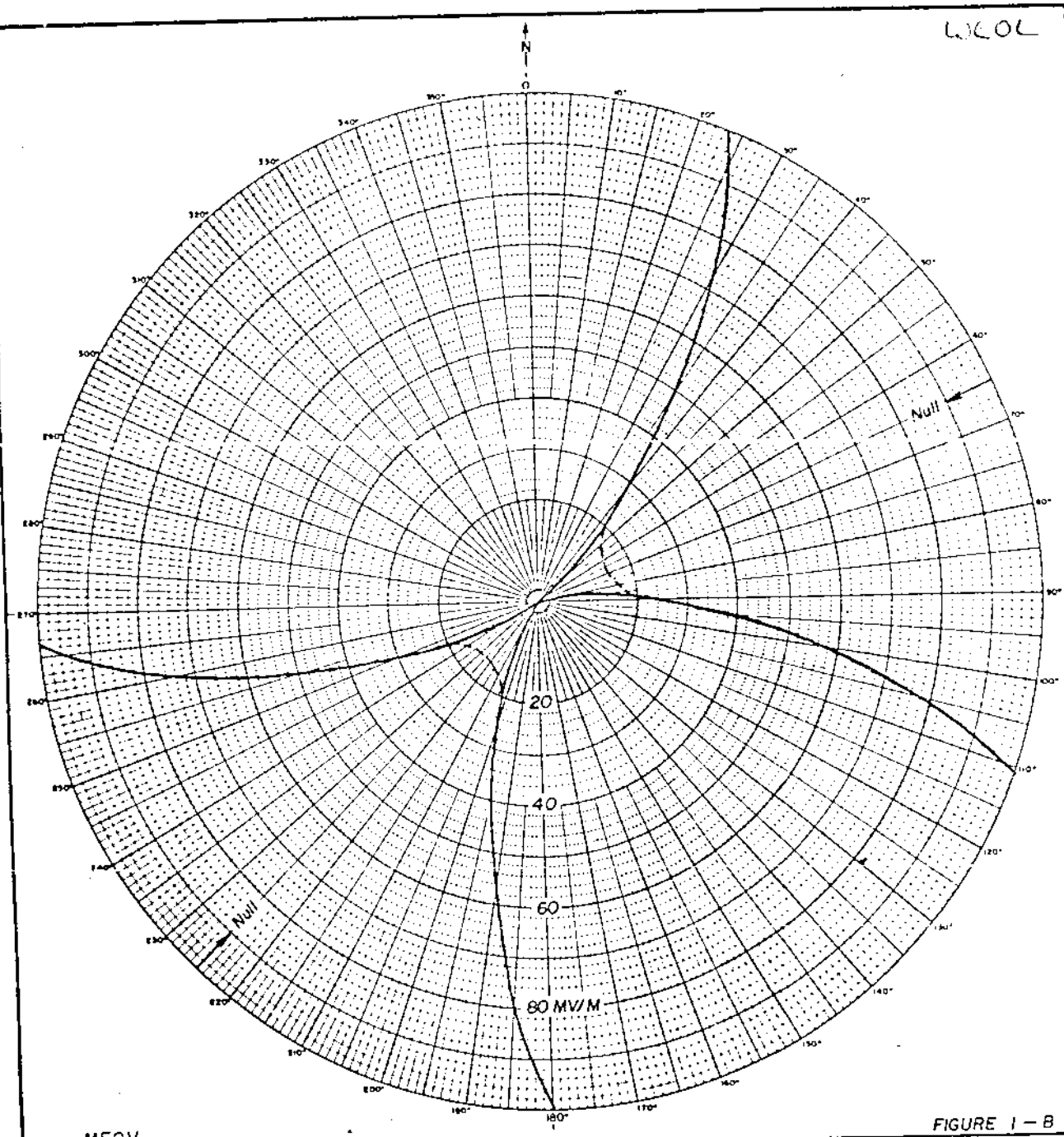
APPLICANT	WEOL
LOCATION	ELYRIA, OHIO
FREQUENCY	930 KC/S
POWER	1 KW
LATITUDE	41 DEG 16 MIN 10 SEC
LONGITUDE	82 DEG 00 MIN 21 SEC
WHEN USED	NIGHTTIME
RMS FIELD	202 MV/M
DATE	APRIL 1968

RAYMOND E. ROHRER & ASSOCIATES

CONSULTING RADIO ENGINEERS

WASHINGTON D C

WCOL



— — MEOV

FIGURE 1 – B

EXPANDED VIEW

(DA–NIGHT)

RAYMOND E. ROHRER & ASSOCIATES

CONSULTING RADIO ENGINEERS

WASHINGTON D. C.

WEOL

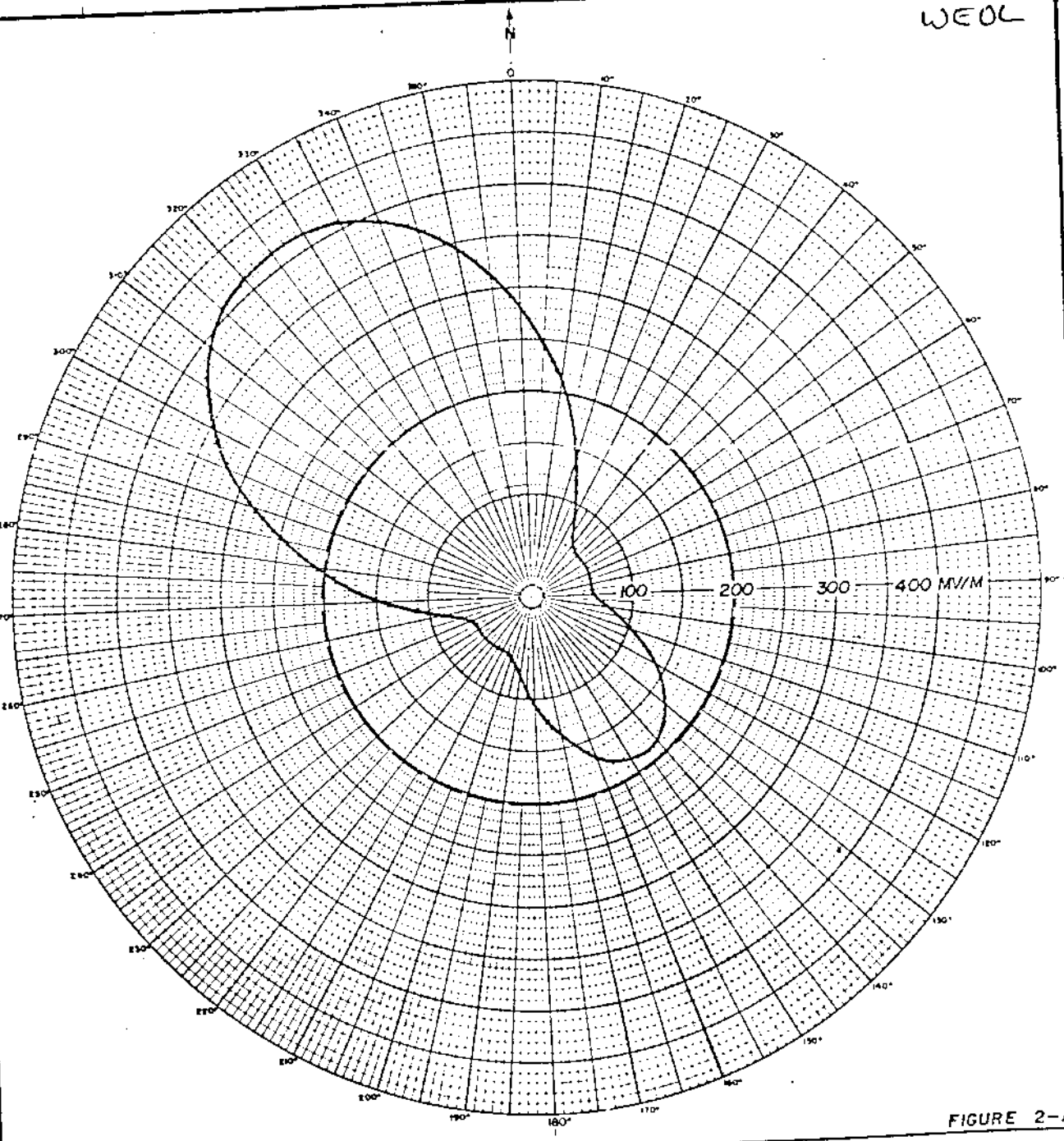
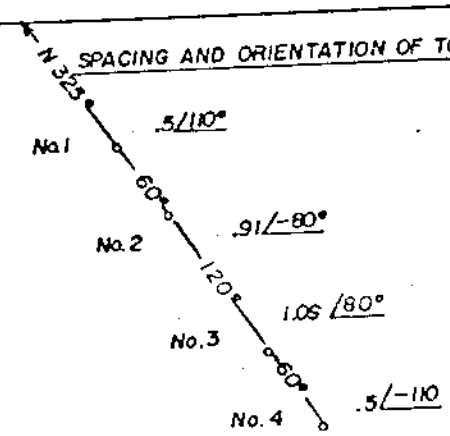


FIGURE 2-A

--- RMS

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION OF TOWERS



$G_1 = G_4 = 90°$

$G_2 = G_3 = 108°$

APPLICANT	WEOL
LOCATION	ELYRIA, OHIO
FREQUENCY	930 KC/S
POWER	1 KW
LATITUDE	41 DEG 16 MIN 10 SEC
LONGITUDE	82 DEG 00 MIN 21 SEC
WHEN USED	DAYTIME
RMS FIELD	201 MV/M
DATE	APRIL 1968

RAYMOND E. ROHRER & ASSOCIATES

CONSULTING RADIO ENGINEERS

WASHINGTON D C

WEOL

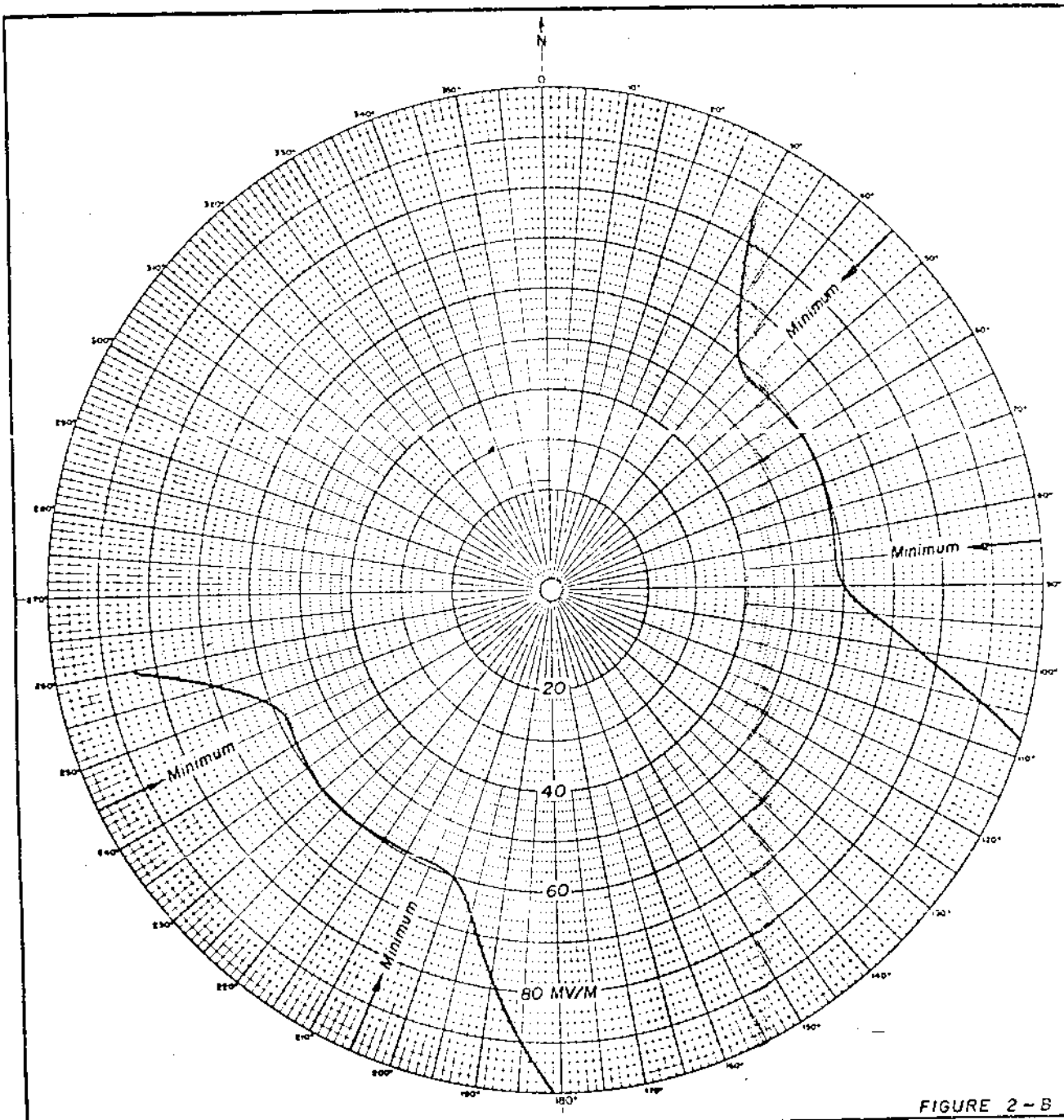


FIGURE 2 – B

EXPANDED VIEW

(DA – DAY)

RAYMOND E. ROHRER & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON D. C.

WEOL

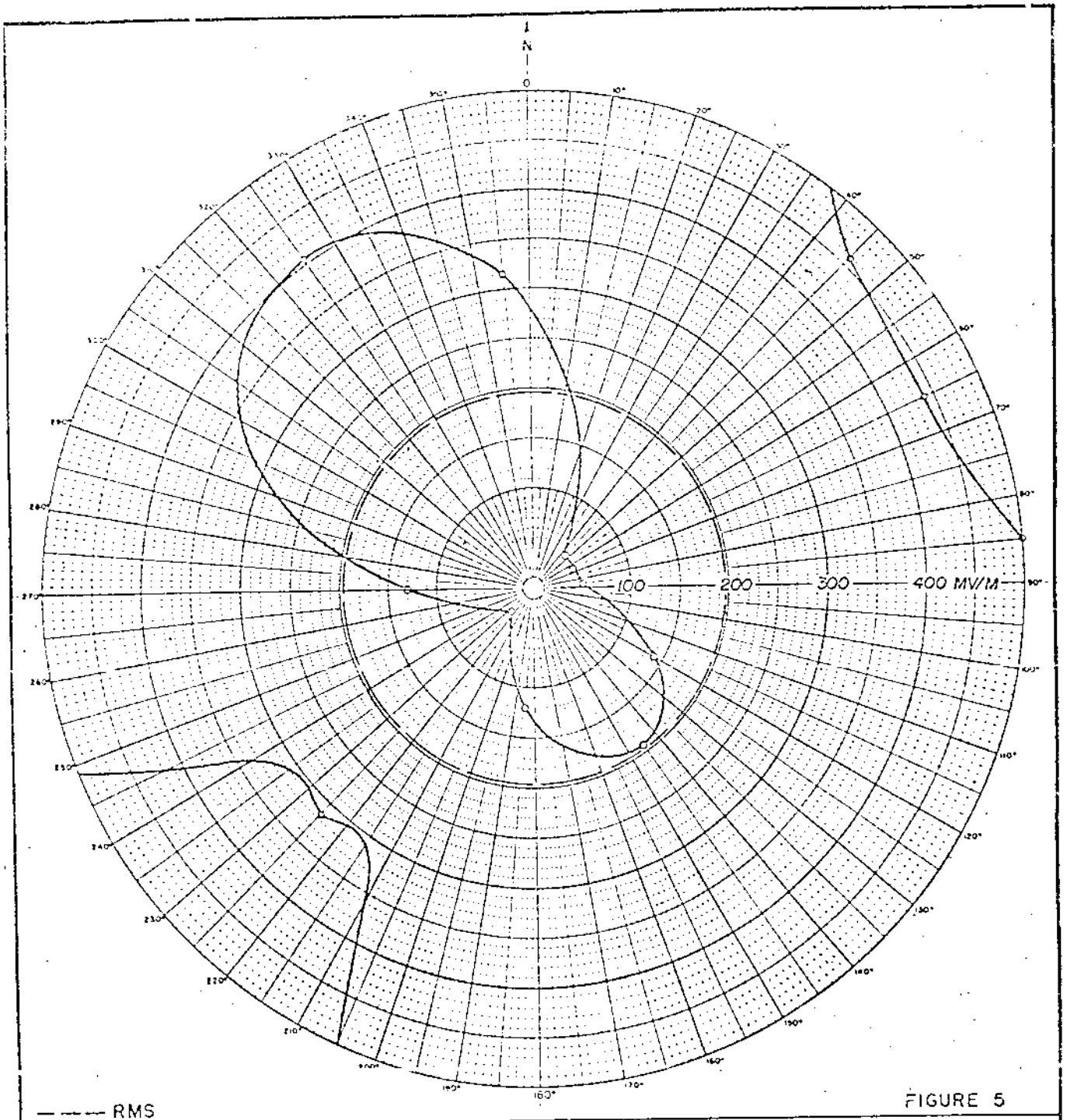
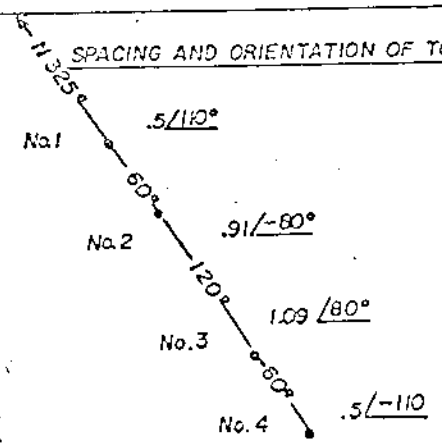


FIGURE 5

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION OF TOWERS



$G_1 = G_4 = 90°$

$G_2 = G_3 = 108°$

APPLICANT	WEOL
LOCATION	ELYRIA, OHIO
FREQUENCY	930 KC/S
POWER	1 KW
LATITUDE	41 DEG 16 MIN 10 SEC
LONGITUDE	82 DEG 00 MIN 21 SEC
WHEN USED	DAYTIME
RMS FIELD	197.7 MV/M
DATE	NOVEMBER 1968

RAYMOND E. ROHRER & ASSOCIATES

CONSULTING RADIO ENGINEERS

WASHINGTON, D. C.

WEOL

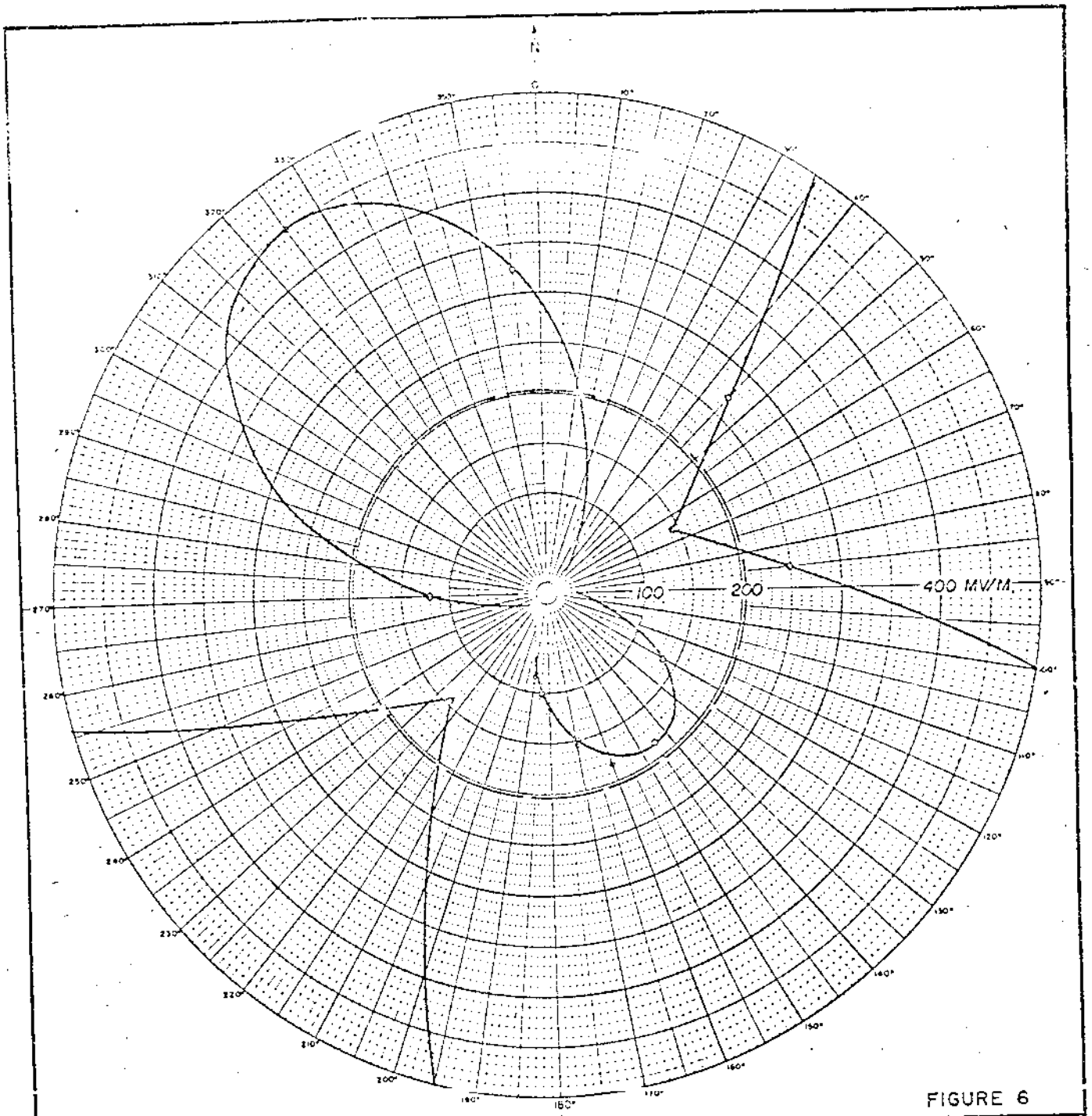
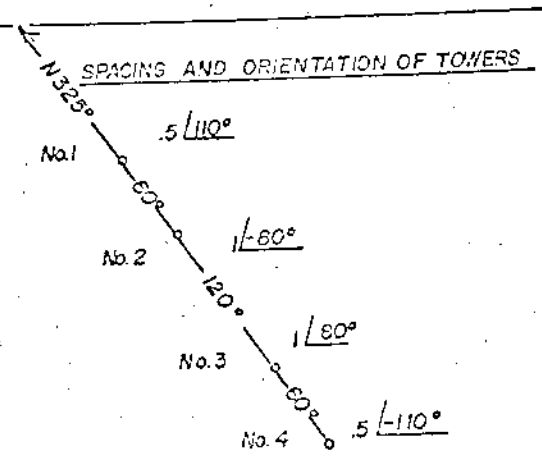


FIGURE 6

— — — RMS

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION OF TOWERS



$G_1 = G_4 = 90°$

$G_2 = G_3 = 108°$

APPLICANT	WEOL
LOCATION	ELYRIA, OHIO
FREQUENCY	930 KC/S
POWER	1 KW
LATITUDE	41 DEG 16 MIN 10 SEC
LONGITUDE	82 DEG 00 MIN 21 SEC
WHEN USED	NIGHTTIME
R.M.S. FIELD	204.1 MV/M
DATE	NOVEMBER 1968

RAYMOND E. ROHRER & ASSOCIATES

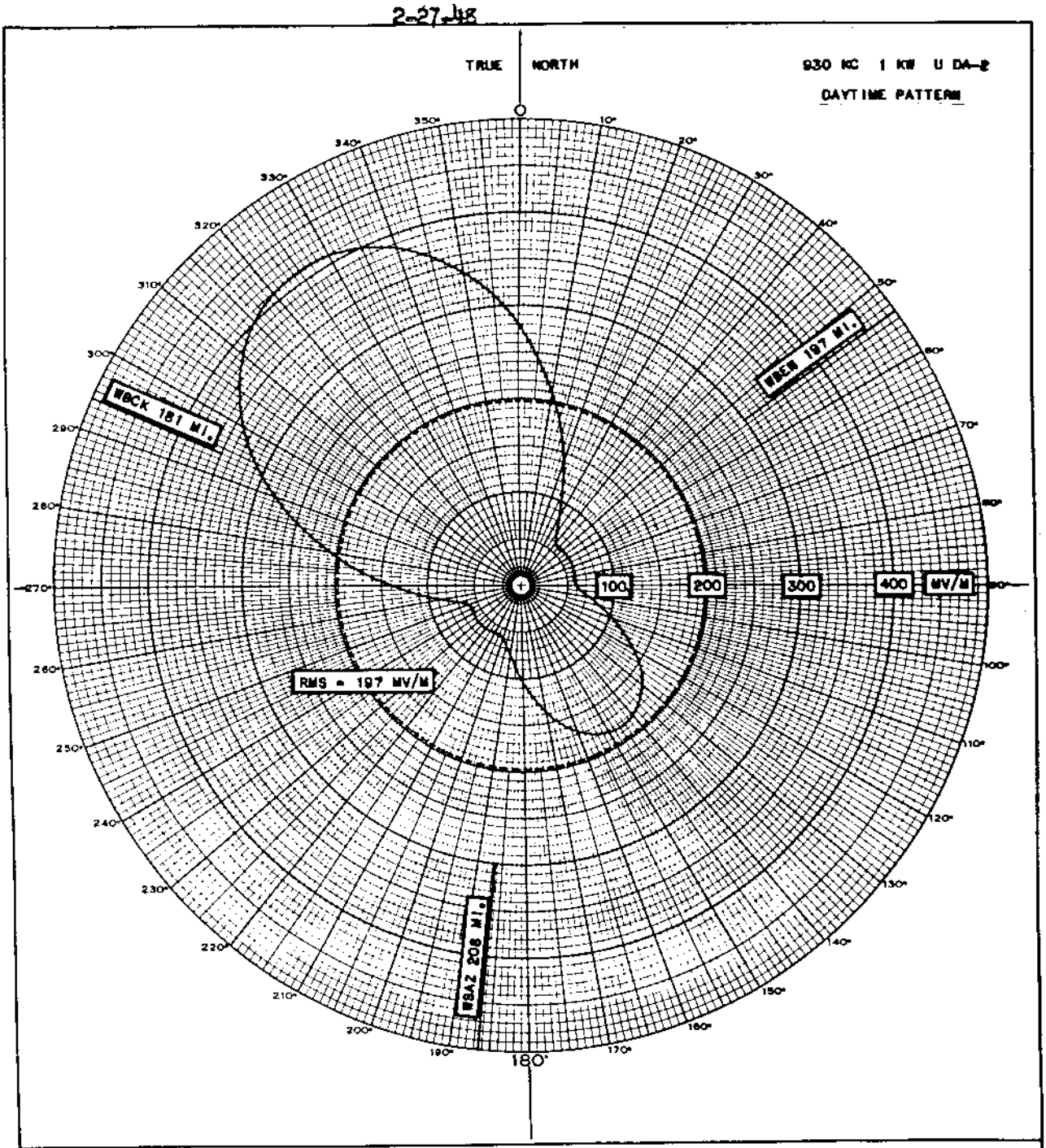
CONSULTING RADIO ENGINEERS

WASHINGTON, D. C.

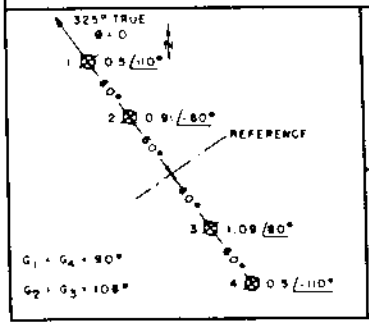
WEOL
930

FIGURE 16

2-27-48



CALCULATED HORIZONTAL PLANE RADIATION PATTERN FOR DAYTIME OPERATION



	ELYRIA-LORAIN BROADCASTING COMPANY ELYRIA OHIO	RADIO STATION WEOL ELYRIA OHIO
	WELDON & CARR CONSULTING RADIO ENGINEERS WASHINGTON DC	930 KC 1 KW U DA-2 4802110 SUPERSEDES 4701168

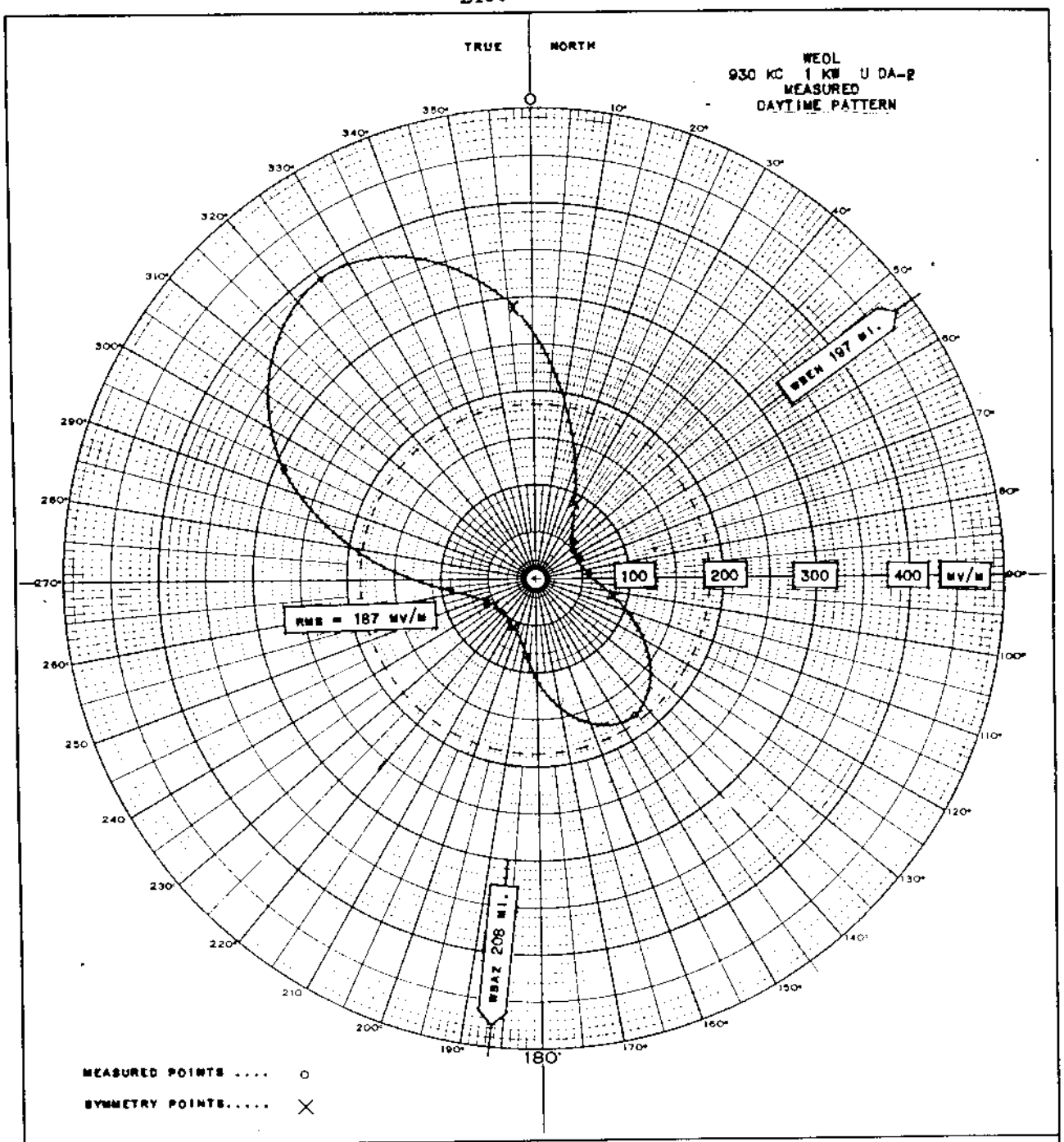
2-27-48

10/5/48 G

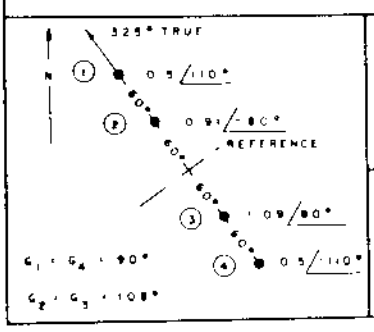
License 9-30-48

FIGURE 13

WEOL
930



MEASURED HORIZONTAL PLANE RADIATION PATTERN FOR DAYTIME OPERATION



ELYRIA-LORAIN BROADCASTING COMPANY

WEOL

WELDON & CARR

CONSULTING RADIO ENGINEERS

WASHINGTON DC

WEOL

930 KC 1 KW U DA-2

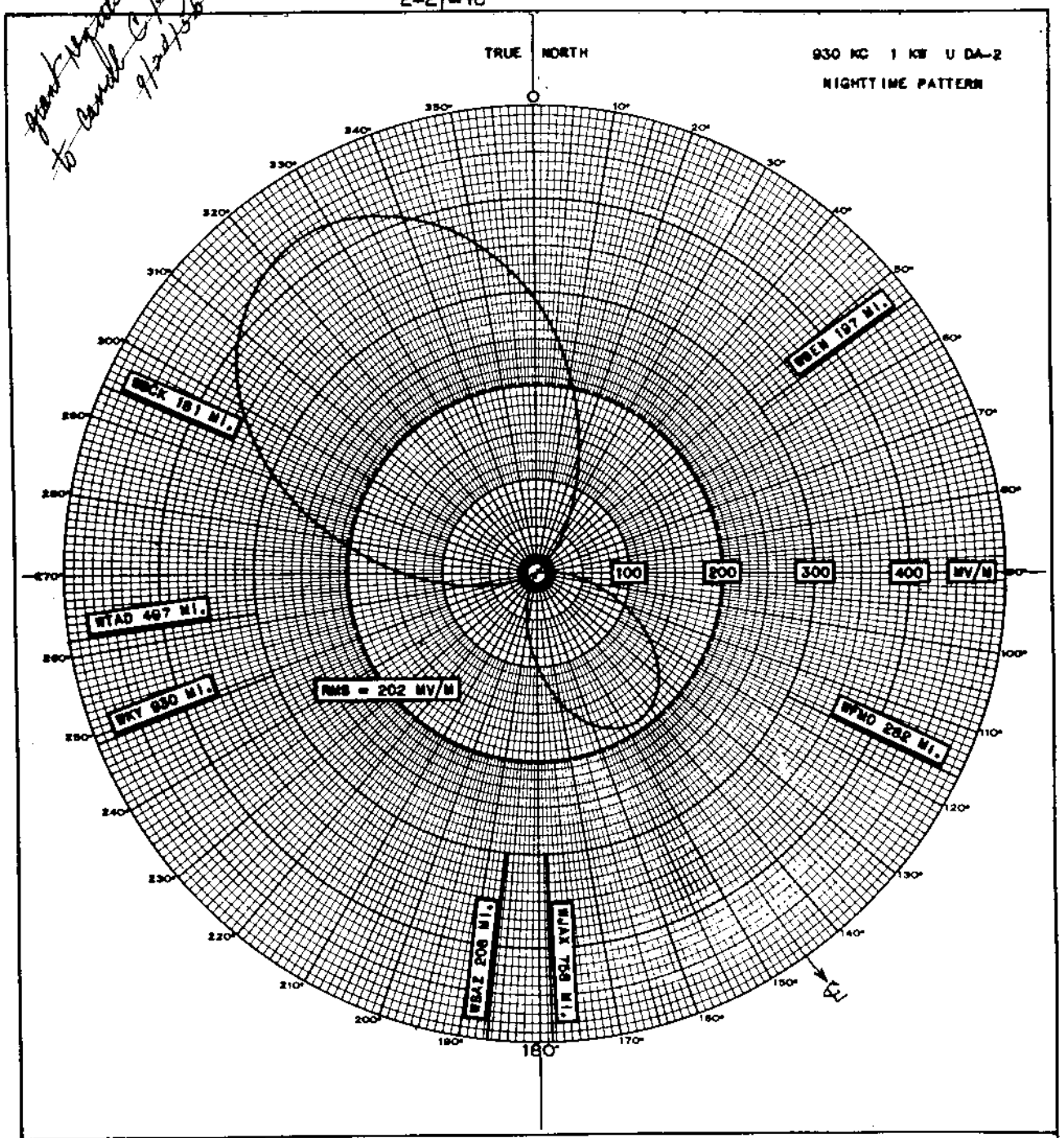
480922 D

WEOL
930

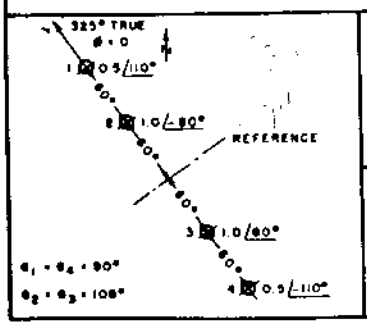
FIGURE 7

2-27-48

grant upgraded to Cancel C.P. 9/24/56



CALCULATED HORIZONTAL PLANE RADIATION PATTERN FOR NIGHTTIME OPERATION

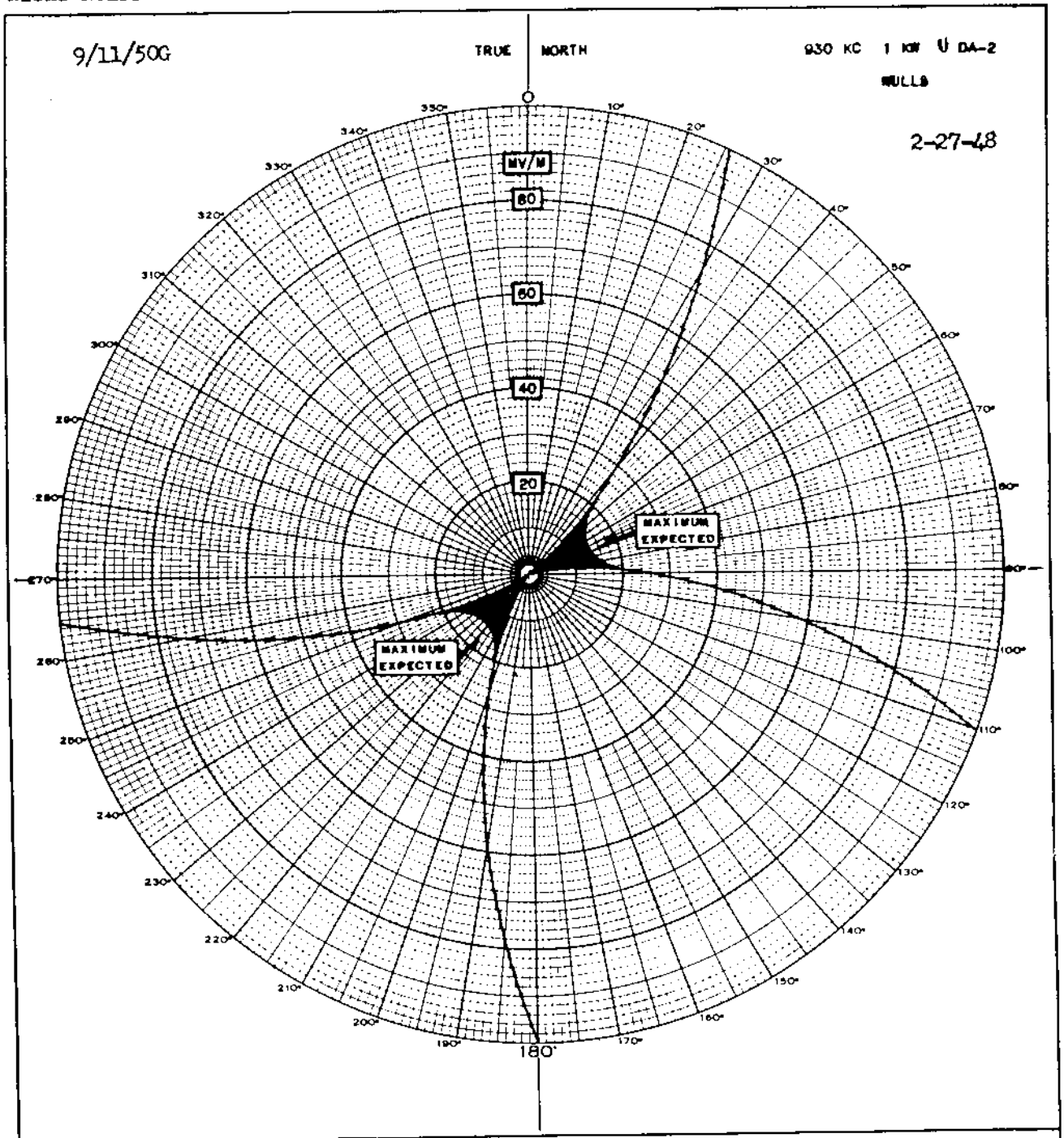


	ELRYIA-LORAIN BROADCASTING COMPANY ELYRIA OHIO	RADIO STATION WEOL ELYRIA OHIO
	WELDON & CARR CONSULTING RADIO ENGINEERS WASHINGTON DC	930 KC 1 KW U DA-2 480211C SUPERSEDES 470117A

2-27-48

WEOL

PROPOSED NIGHT NULLS WEOL, ELYRIA, O. 1kw, DA-2 930 kc



CALCULATED HORIZONTAL PLANE RADIATION PATTERN FOR NIGHTTIME OPERATION

DETAIL IN NULLS	ELYRIA-LORAIN BROADCASTING COMPANY ELYRIA OHIO	Figure 8 RADIO STATION WEOL ELYRIA OHIO
	WELDON & CARR CONSULTING RADIO ENGINEERS WASHINGTON DC	930 KC 1 KW U DA-2 480211B SUPERSEDES 470116A

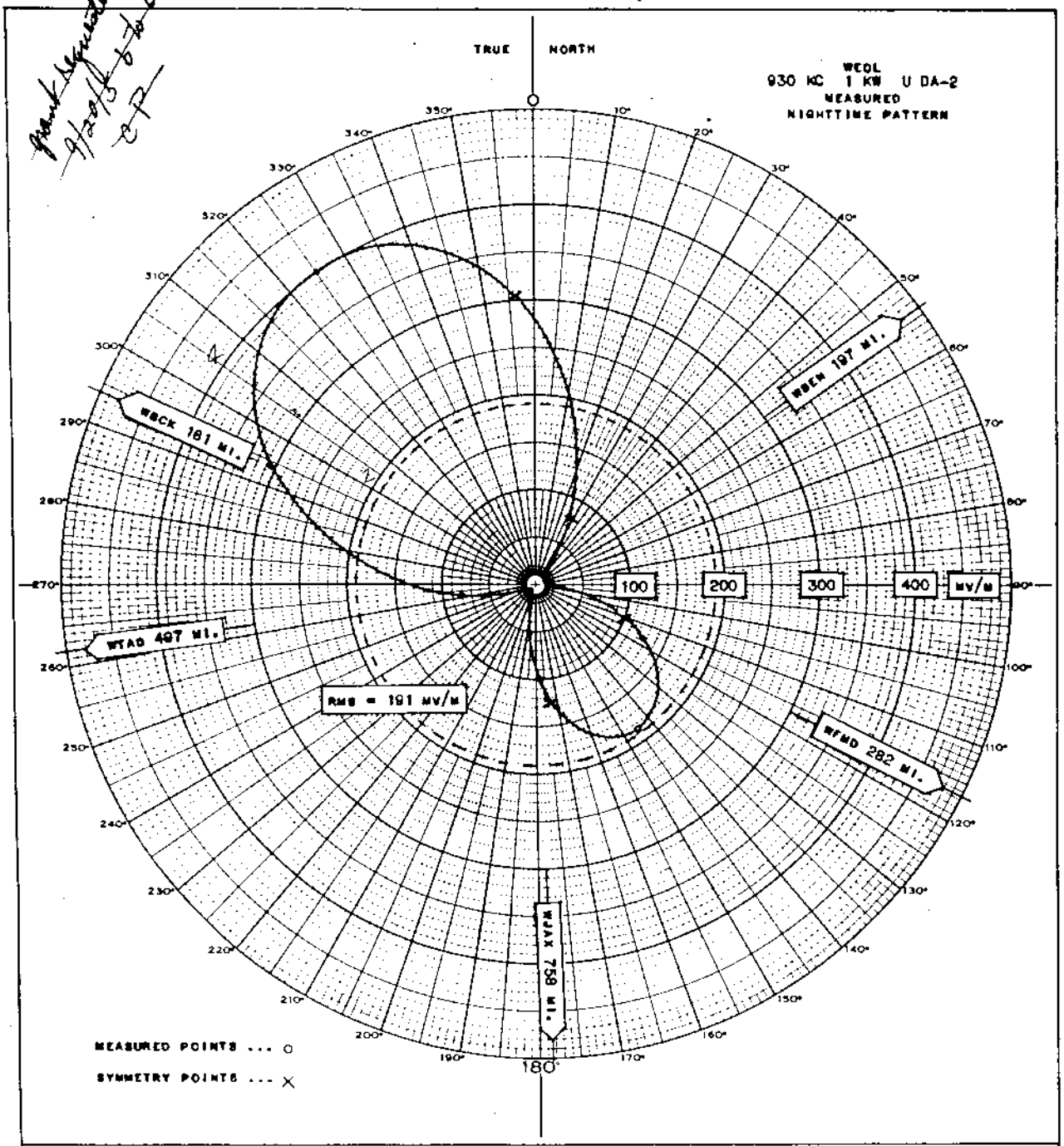
WEOL, Elyria, O. 930 k

10/5/88 G Cancel

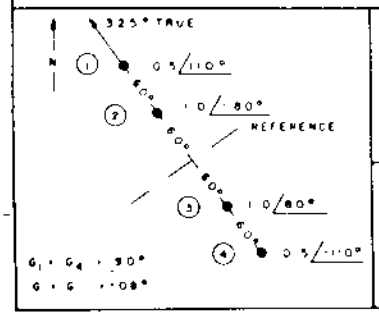
License 9-30-48

WEOL
930

FIGURE 9



MEASURED HORIZONTAL PLANE RADIATION PATTERN FOR NIGHTTIME OPERATION

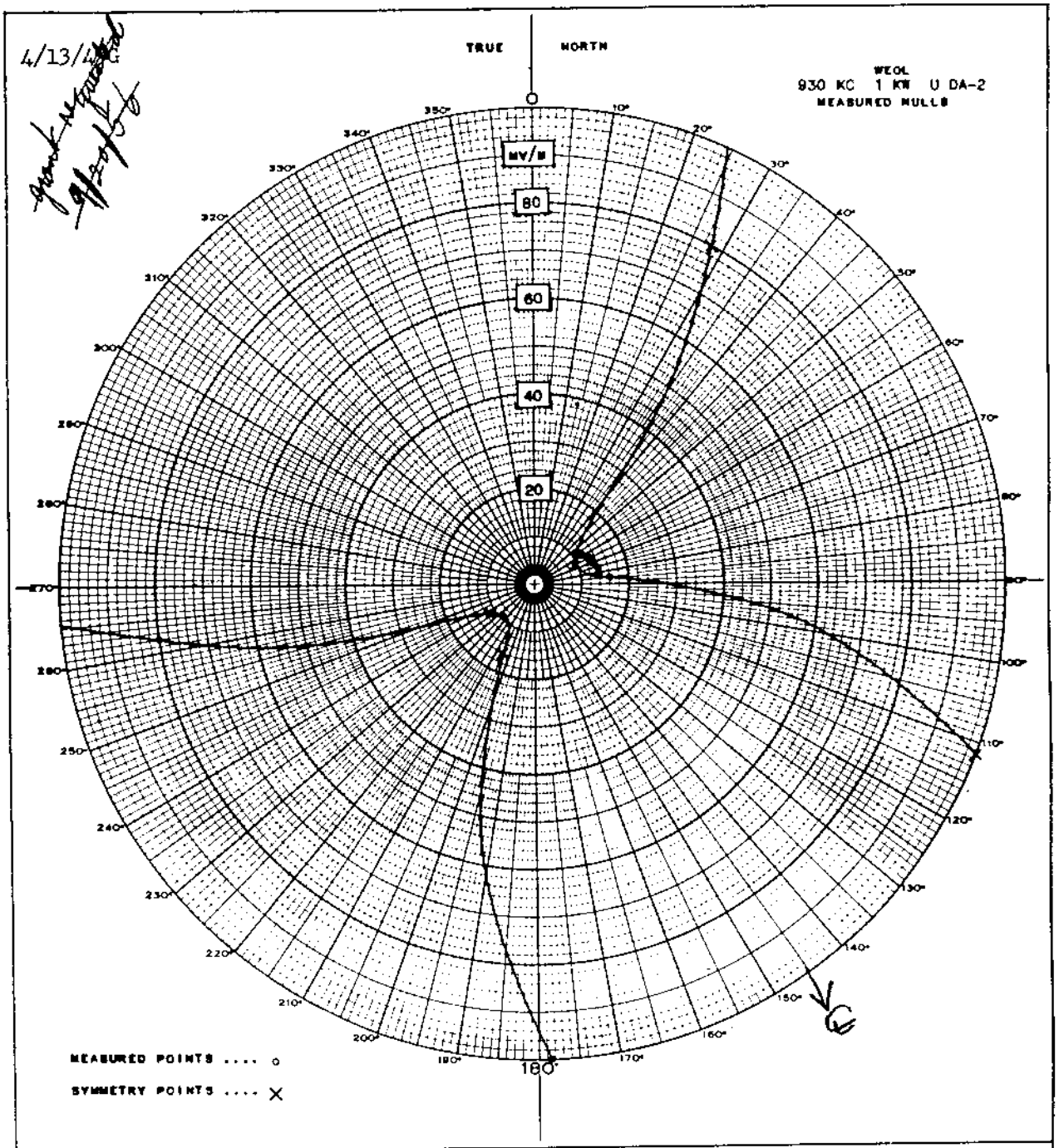


	ELYRIA-LORAIN BROADCASTING COMPANY WEOL	WEOL 930 KC 1 KW U DA-2
	WELDON & CARR CONSULTING RADIO ENGINEERS WASHINGTON DC	480922 C

WEOL

MEASURED NIGHT NULLS

WEOL, ELYRIA, OHIO License 9-29-48 1kw, DA2 FIGURE 10 930 kc



MEASURED HORIZONTAL PLANE RADIATION PATTERN FOR NIGHTTIME OPERATION

SITE: 41° 16' 10" N 82° 00' 21" W DETAIL IN NULLS	ELYRIA-LORAIN BROADCASTING COMPANY WELDON & CARR CONSULTING RADIO ENGINEERS WASHINGTON DC	WEOL 930 KC 1 KW U DA-2 480922 B

FREDERICK, MARYLAND WFMD

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WFMD

Main Studio: Frederick, Maryland

Frequency: 930 kHz

Power: 1kw Night 5kw Day

Notification List No. 1445

Date: October 6, 1971

Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 39° 24' 55"
West Longitude: 77° 27' 41"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-2)
Number of elements: 4
Type of elements: Series-excited, Self-supporting, tapered, vertical steel towers.

TOWER:	NW(#4)	NC(#1)	SC(#2)	SF(#3)
HEIGHT ABOVE INSULATORS:	250'	250'	250'	250' (85°)
NIGHT PHASING:	+140°	0°	+217°	+77°
NIGHT FIELD RATIO:	0.41	1.0	1.0	0.45
DAY PHASING:	-134°	0°	+134°	----
DAY FIELD RATIO:	0.3388	0.8375	1.0	----

SPACING AND ORIENTATION: Adjacent elements numbers 4, 1, and 2 are spaced 293.8' (100°) on a line bearing 295° true. Tower #3 is spaced 514.2' (175°) on a line bearing 122.4° true from tower #1.

GROUND SYSTEM: 120 - 175' to 265' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

Predicted effective Night Field: 221 mv/m at rated power.

Predicted effective Day Field: 420 mv/m at rated power.

Note: Please retain the Nighttime directional antenna radiation pattern notified for Station WFMD in United States Change List Number 306 dated May 17, 1949 and attach to this Revised Description Sheet and Daytime pattern. This notification concerns only a change to add meov's of radiation in the daytime pattern with Nighttime operation continued as previously notified.

CTR NO 30769A3

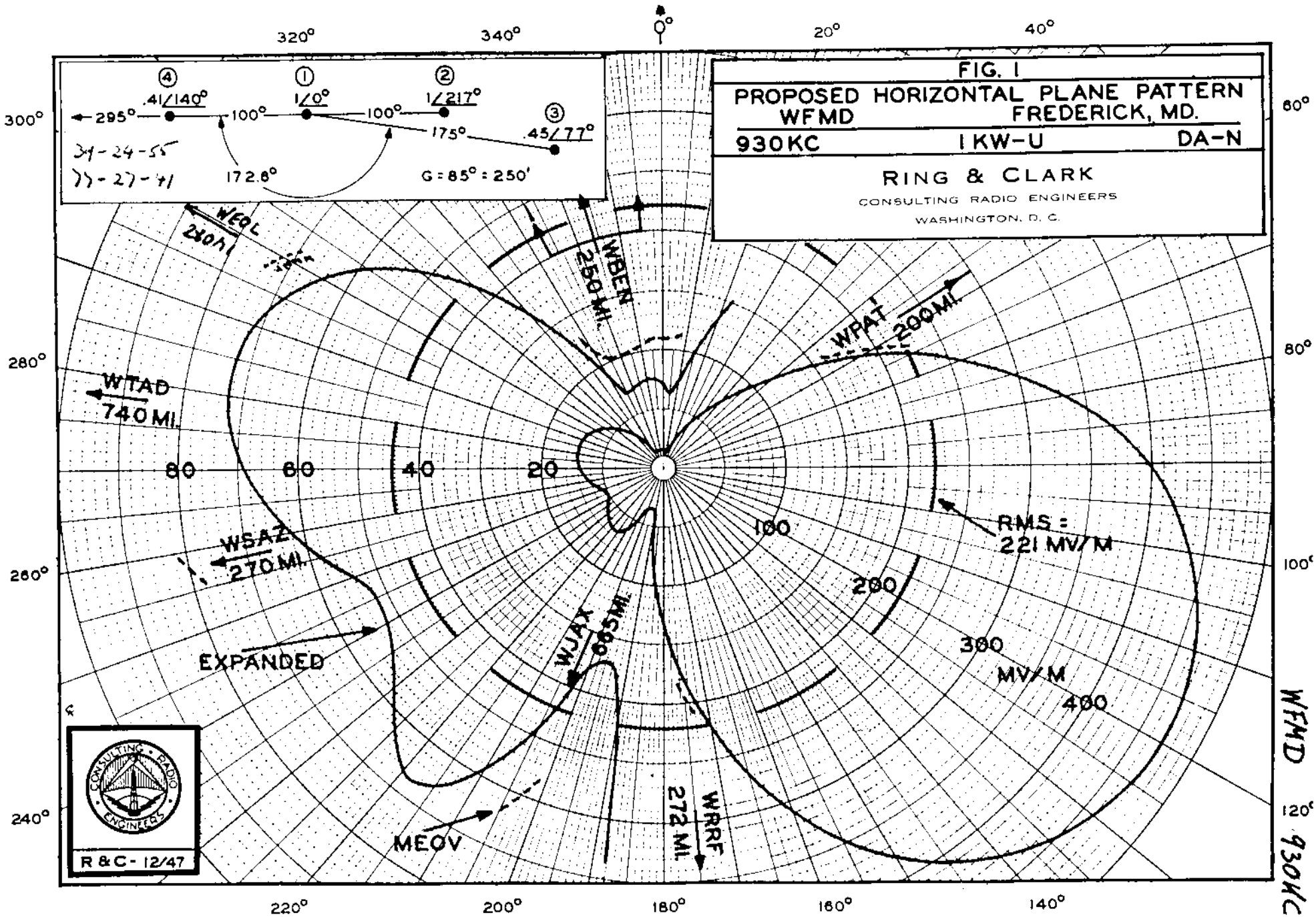


FIG. 1
PROPOSED HORIZONTAL PLANE PATTERN
WFMD FREDERICK, MD.
930KC 1 KW-U DA-N
RING & CLARK
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.
④ .41/140°
① 1/0°
② 1/217°
③ .45/77°
295°
100°
100°
175°
172.8°
G = 85° : 250'
WEOL 230 MI.
WBEN 250 MI.
WPAT 200 MI.
WTAD 740 MI.
WSAZ 270 MI.
WJAX 685 MI.
WRRF 272 MI.
MEOV
EXPANDED
RMS = 221 MV/M
100
200
300
400
MV/M
80
60
40
20
R & C - 12/47
WFMD 930 KC

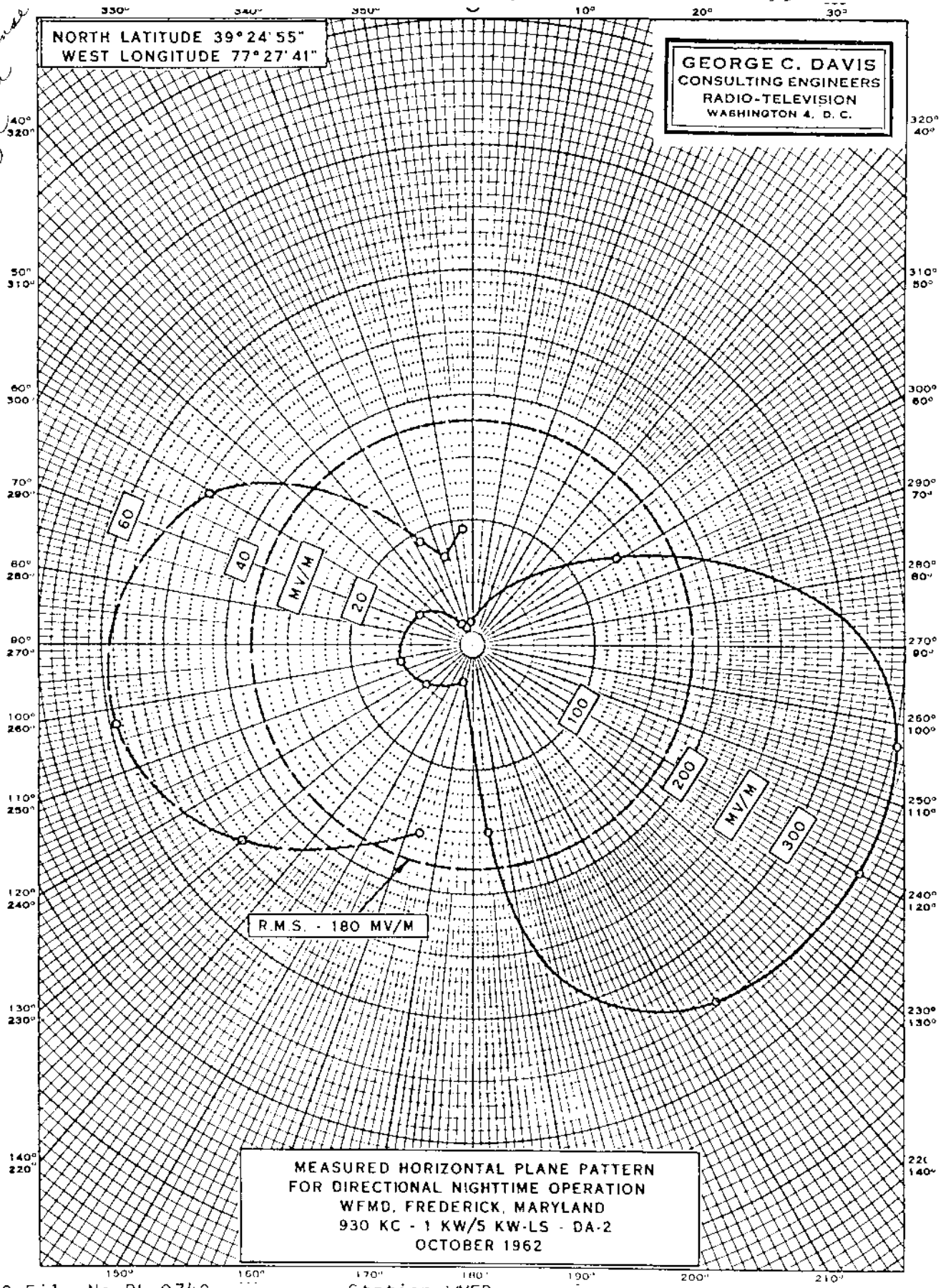
WFMD

Measured Night
(2-26-63ct)

Station WMFD
Frederick, Maryland

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

Exhibit
Granted license
for increase
power & change
to DA-2



FCC File No.BL-9742
Accepted 2-18-63

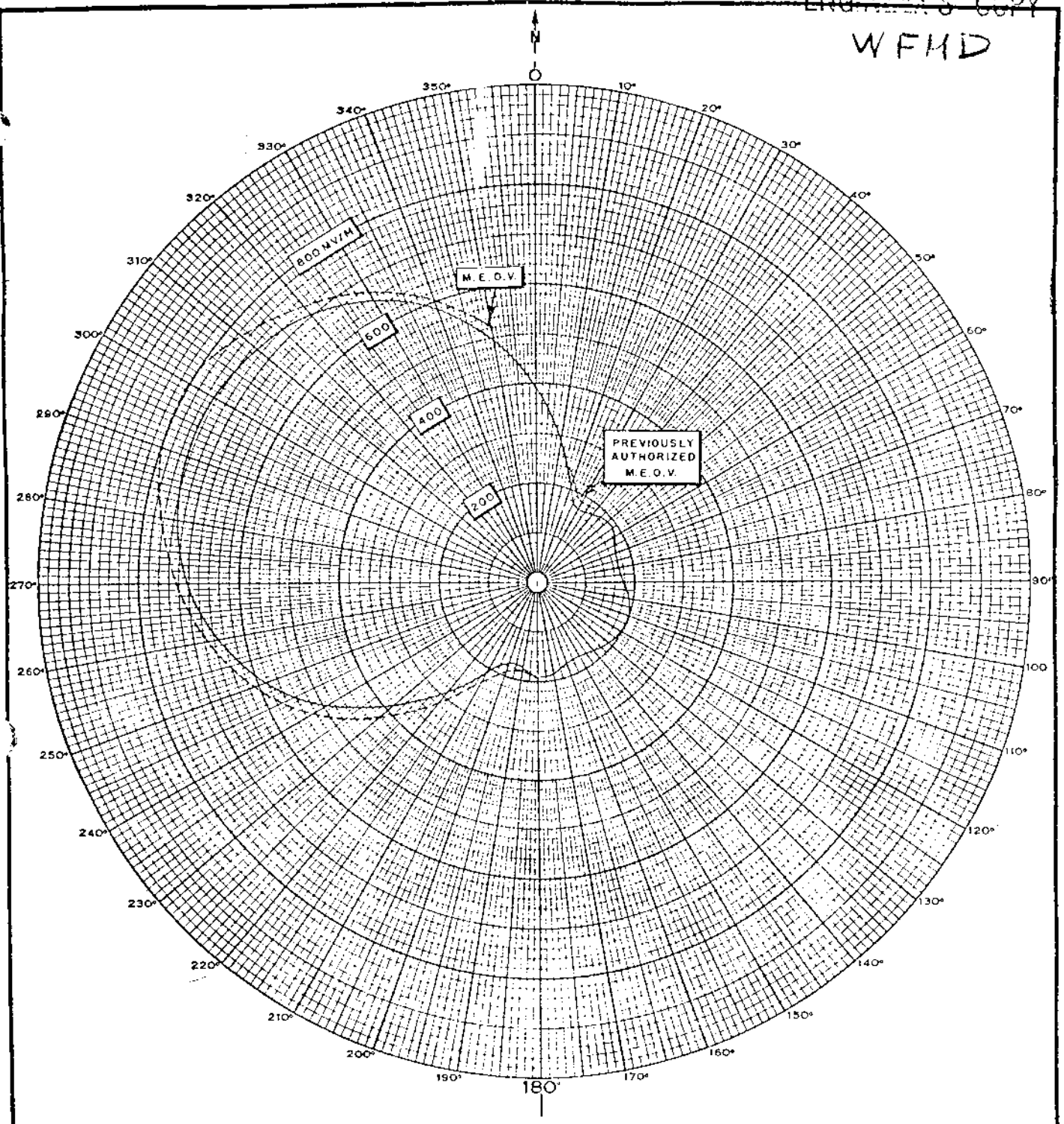
Station WMFD
Frederick, Maryland

930 kc

FREDERICK, MARYLAND

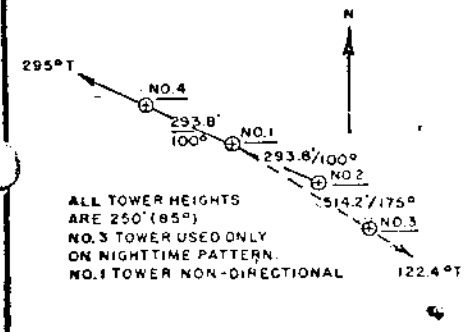
ENGINEER'S COPY

WFMD



RMS = 420 MV/M

EXHIBIT B



LATITUDE 39° 24' 55" NORTH
LONGITUDE 77° 27' 41" WEST

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG
1	SEE DIAGRAM	SEE DIAGRAM	0°	0.8375	—	85°
2			+134°	1.0	—	85°
4			-134°	0.3388	—	85°

THEORETICAL DIRECTIONAL

HORIZONTAL PLANE PATTERN
(DAYTIME OPERATION)
WFMD, FREDERICK, MARYLAND
930 KHZ - 1KW/5KW-LS DA-2

710825

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D C

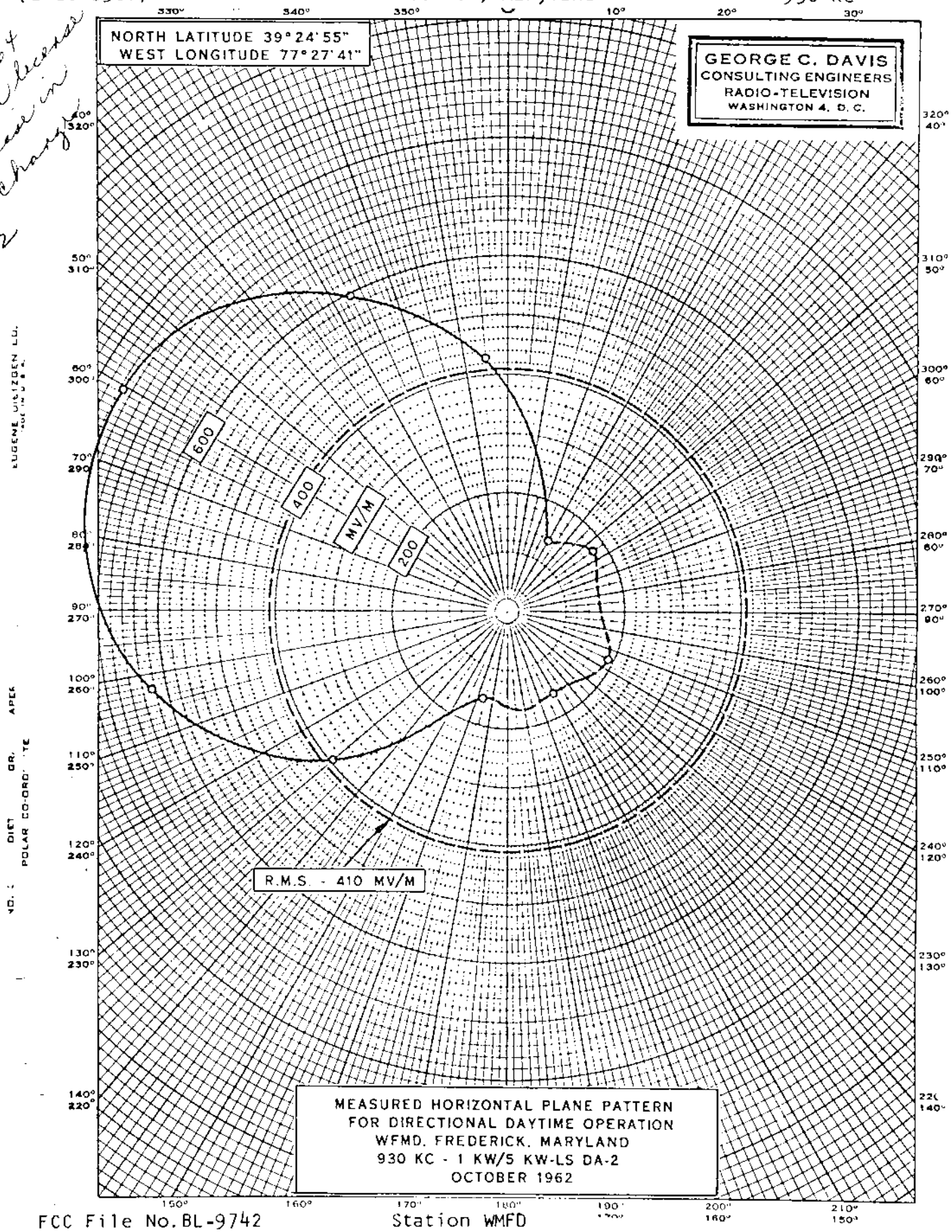
WFMD

Measured Day
(2-26-63ct)

Station WMFD
Frederick, Maryland

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

5/20/64 granted license increase power & change to DA-2



FCC File No. BL-9742
Accepted 2-18-63

Station WMFD
Frederick, Maryland

930 kc

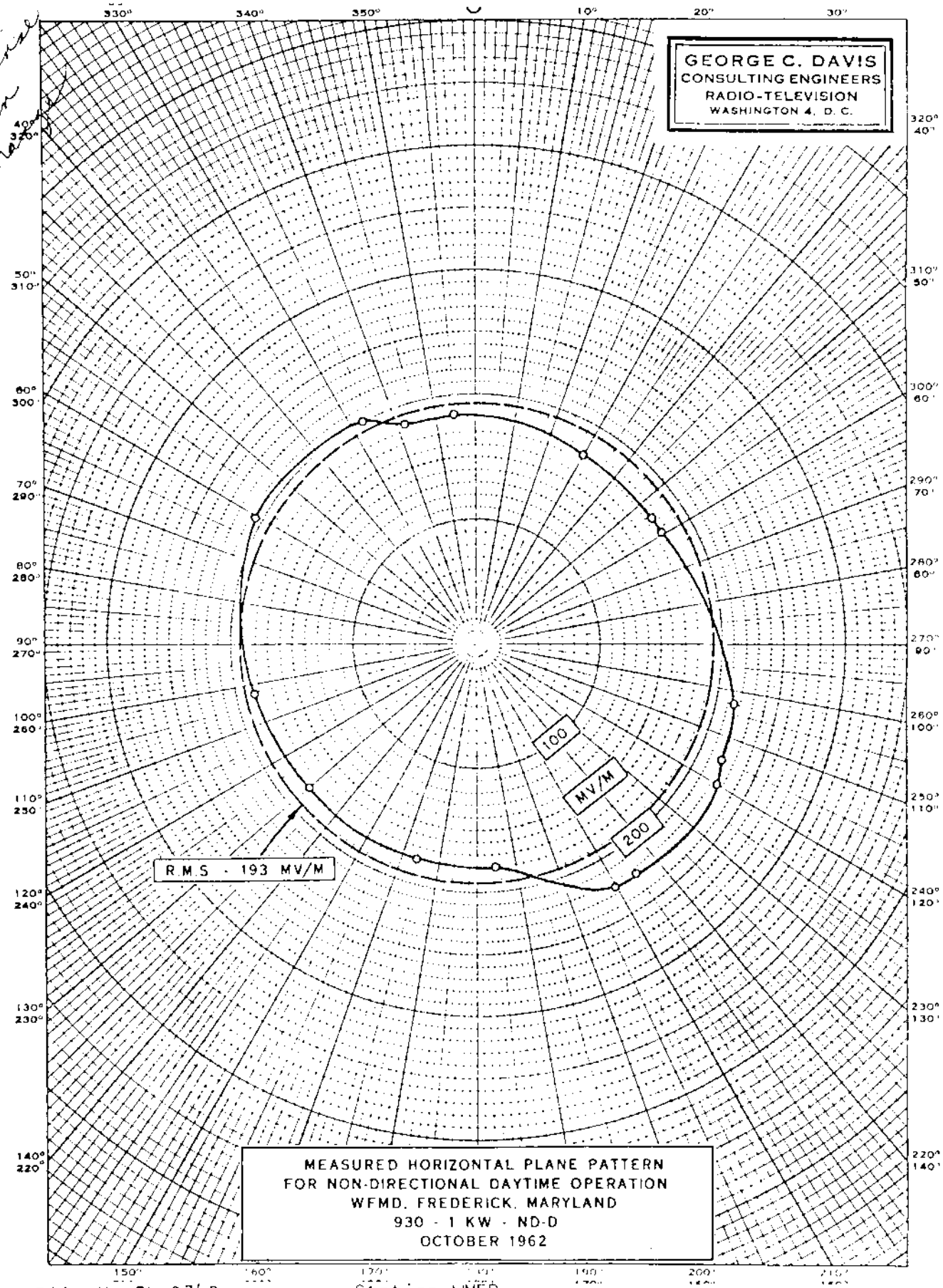
WFMD

Measured Non-DA
(2-26-63ct)

Station WMFD
Frederick, Maryland

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

5/20/64 granted license for increase power and change to DA-2



FCC File No.BL-9742
Accepted 2-18-63

Station WMFD
Frederick, Maryland

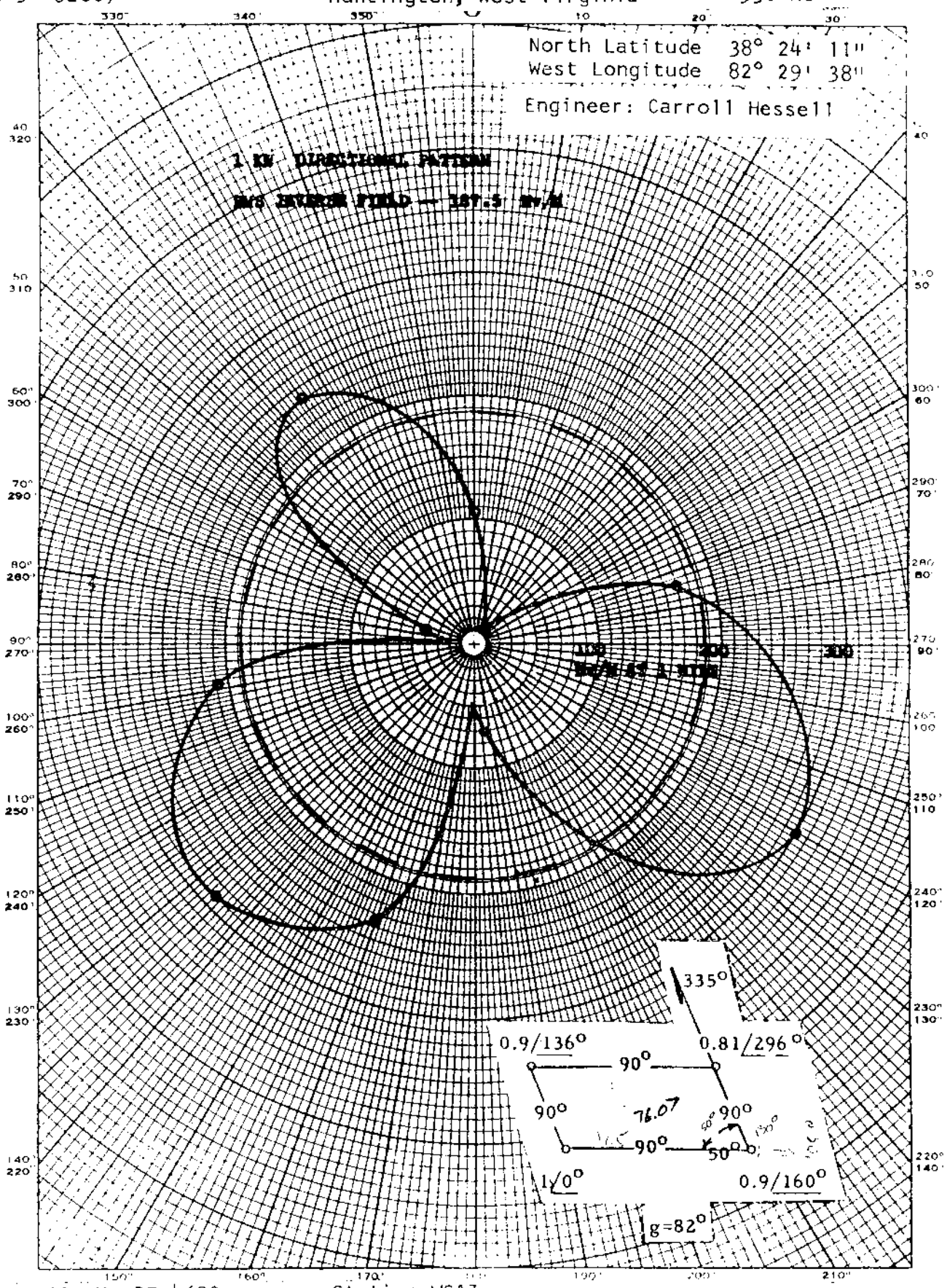
930 kc

WGNT

Measured Night
(3-30-62ct)

Station WSAZ
Huntington, West Virginia

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



FCC File No.BZ-4603
Accepted 3-1-62

Station WSAZ
Huntington, West Virginia

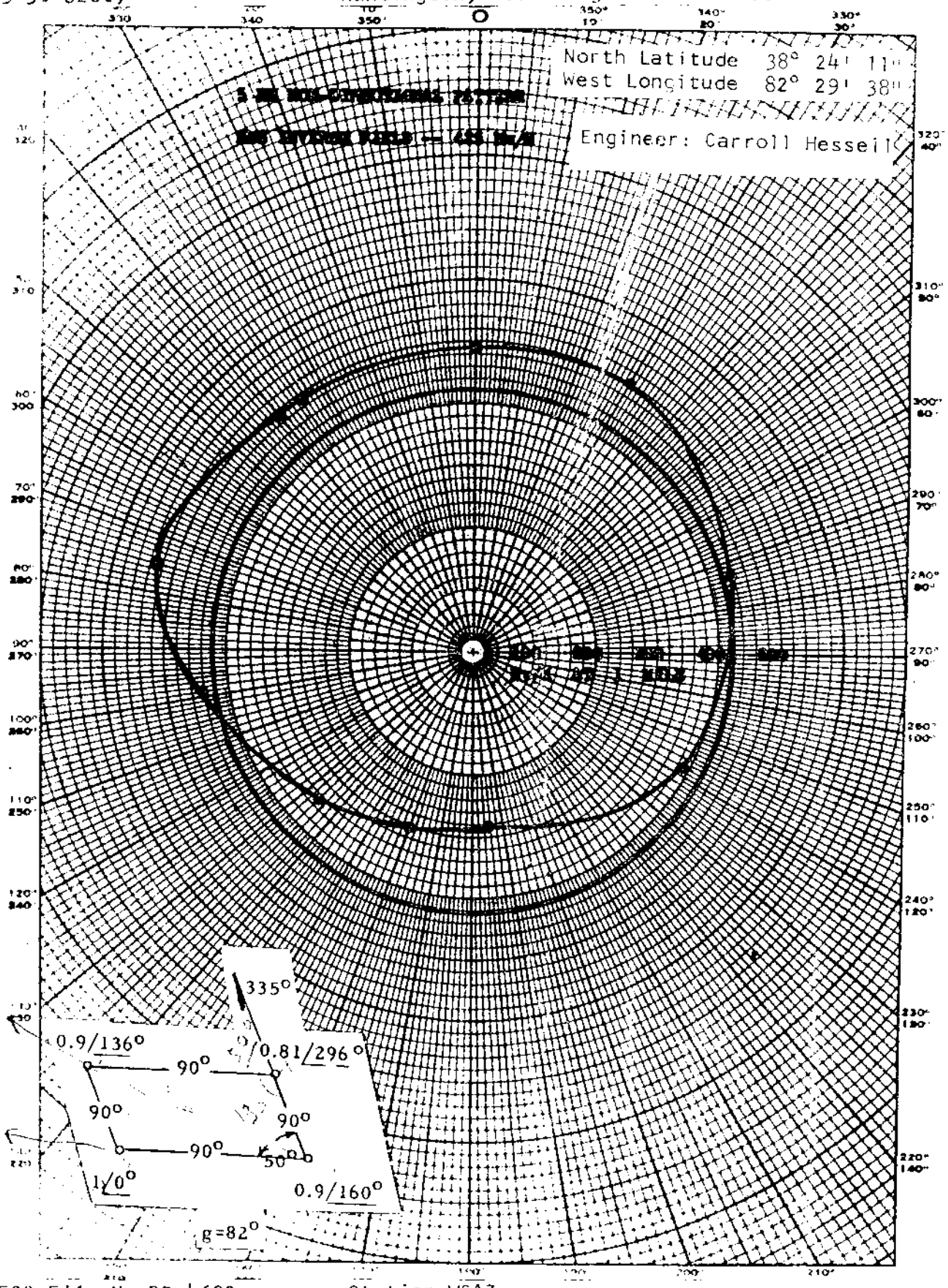
930 kc

1 WGNT

Measured Non-DA
(3-30-62ct)

Station WSAZ
Huntington, West Virginia

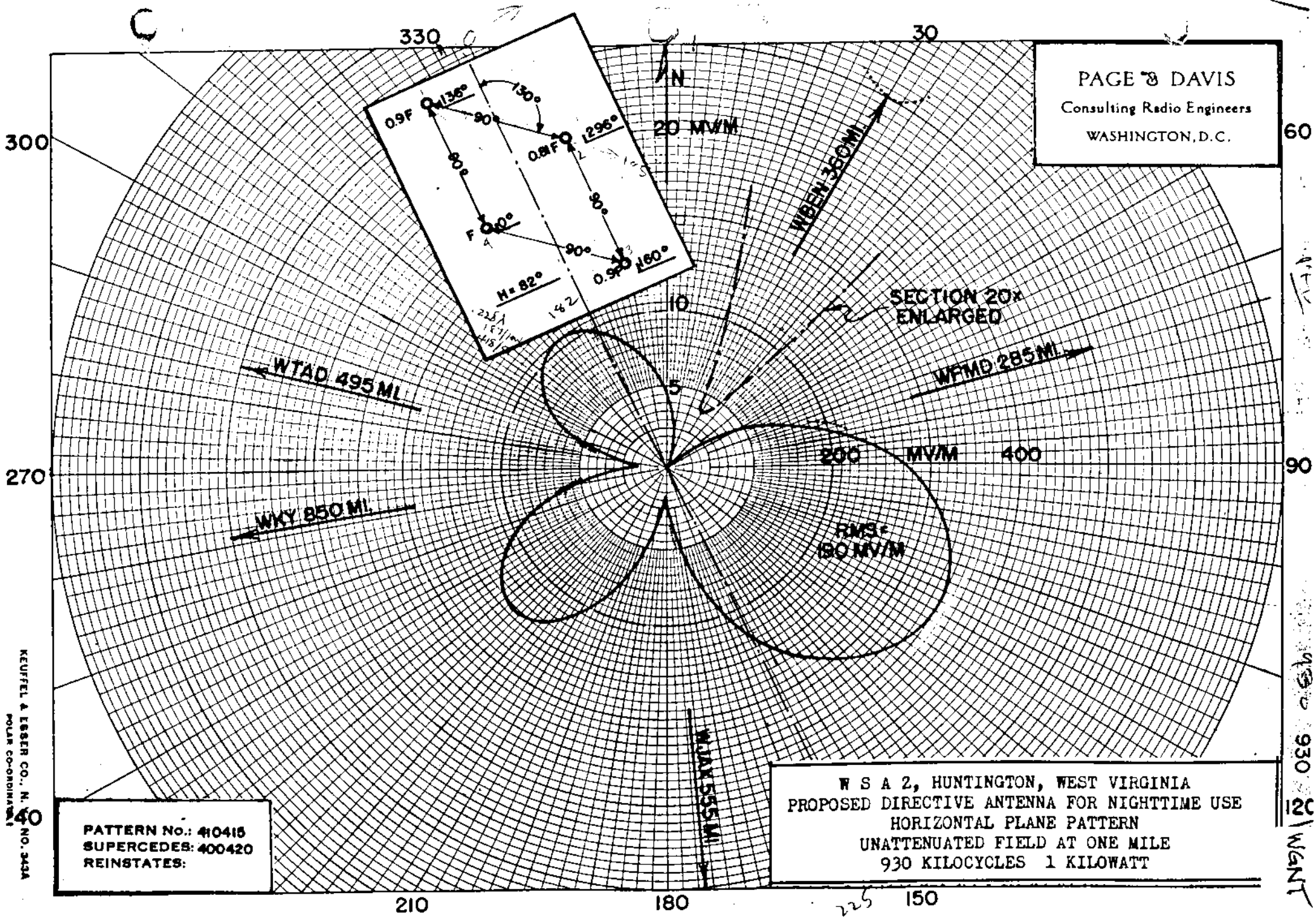
1kw,5kw-LS,DA-N,U
930 kc



FCC File No.BZ-4603
Accepted 3-1-62

Station WSAZ
Huntington, West Virginia

930 kc


PAGE & DAVIS
Consulting Radio Engineers
WASHINGTON, D.C.
N
20 MV/M
10
5
200 MV/M 400
330
30
300
60
270
90
240
120
210
180
150
WBEN 360 MI.
WFMD 285 MI.
WTAD 495 MI.
WKY 850 MI.
WJAX 555 MI.
SECTION 20x ENLARGED
RMS = 150 MV/M
0.9F
136°
130°
90°
0.8F
296°
F
0°
H = 82°
0.9F
160°
W S A 2, HUNTINGTON, WEST VIRGINIA
PROPOSED DIRECTIVE ANTENNA FOR NIGHTTIME USE
HORIZONTAL PLANE PATTERN
UNATTENUATED FIELD AT ONE MILE
930 KILOCYCLES 1 KILOWATT
PATTERN No.: 410415
SUPERCEDES: 400420
REINSTATES:
KEUFFEL & ESSER CO., N. Y. NO. 343A
POLAR CO-ORDINATES

PATTERN No 430428
SUPERSEDES 410415

WGNT - 930 KC

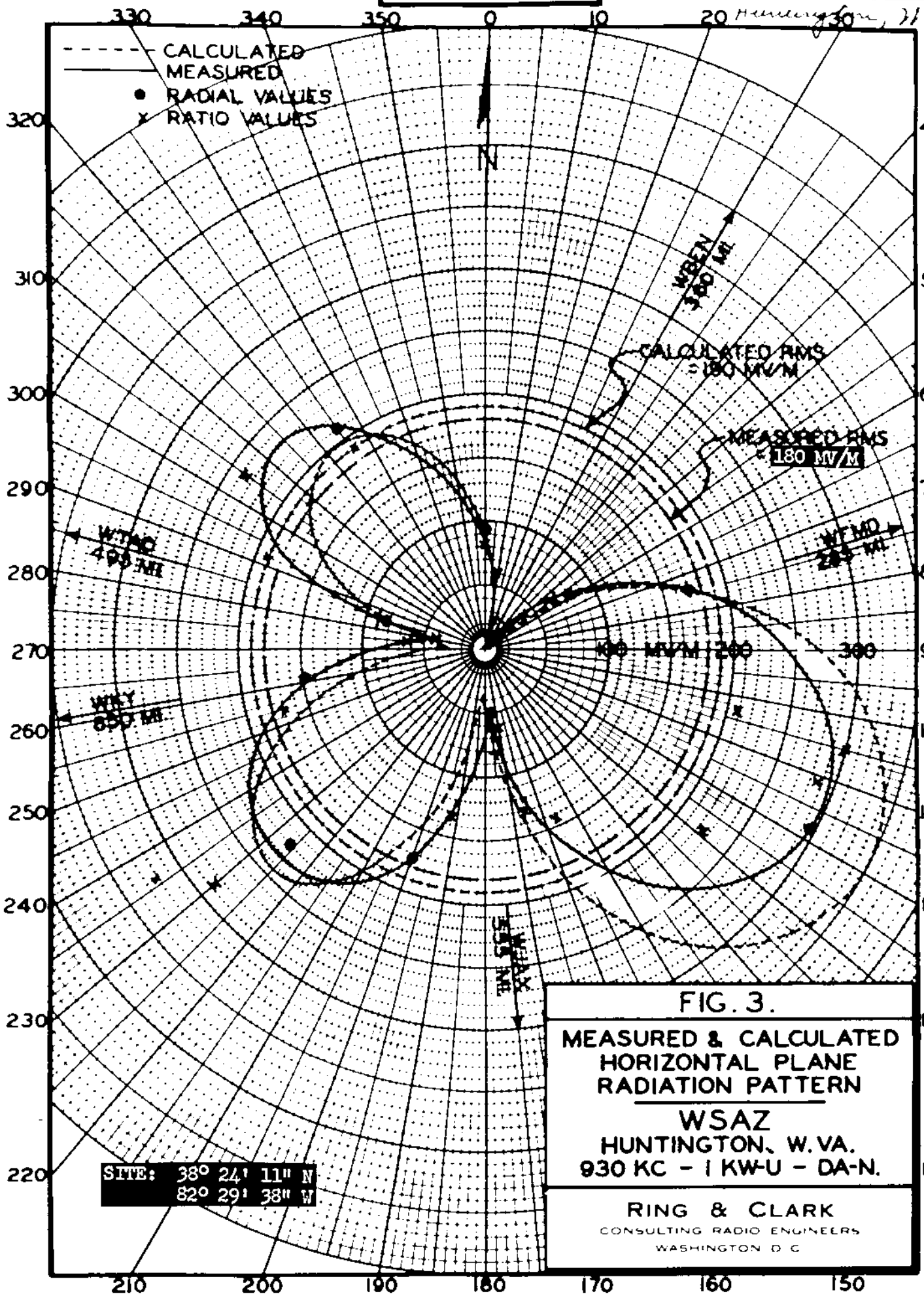


FIG. 3.

MEASURED & CALCULATED HORIZONTAL PLANE RADIATION PATTERN

WSAZ
HUNTINGTON, W. VA.
930 KC - 1 KW-U - DA-N.

RING & CLARK
CONSULTING RADIO ENGINEERS
WASHINGTON D C

HAINES CITY, FLA. WHAN

PROPOSED DAY
(6-16-59g)

New; Haines City B/Cstrs.
Haines City, Florida

500w, DA-D, D
930 KC

Granted for new station 1-13-60

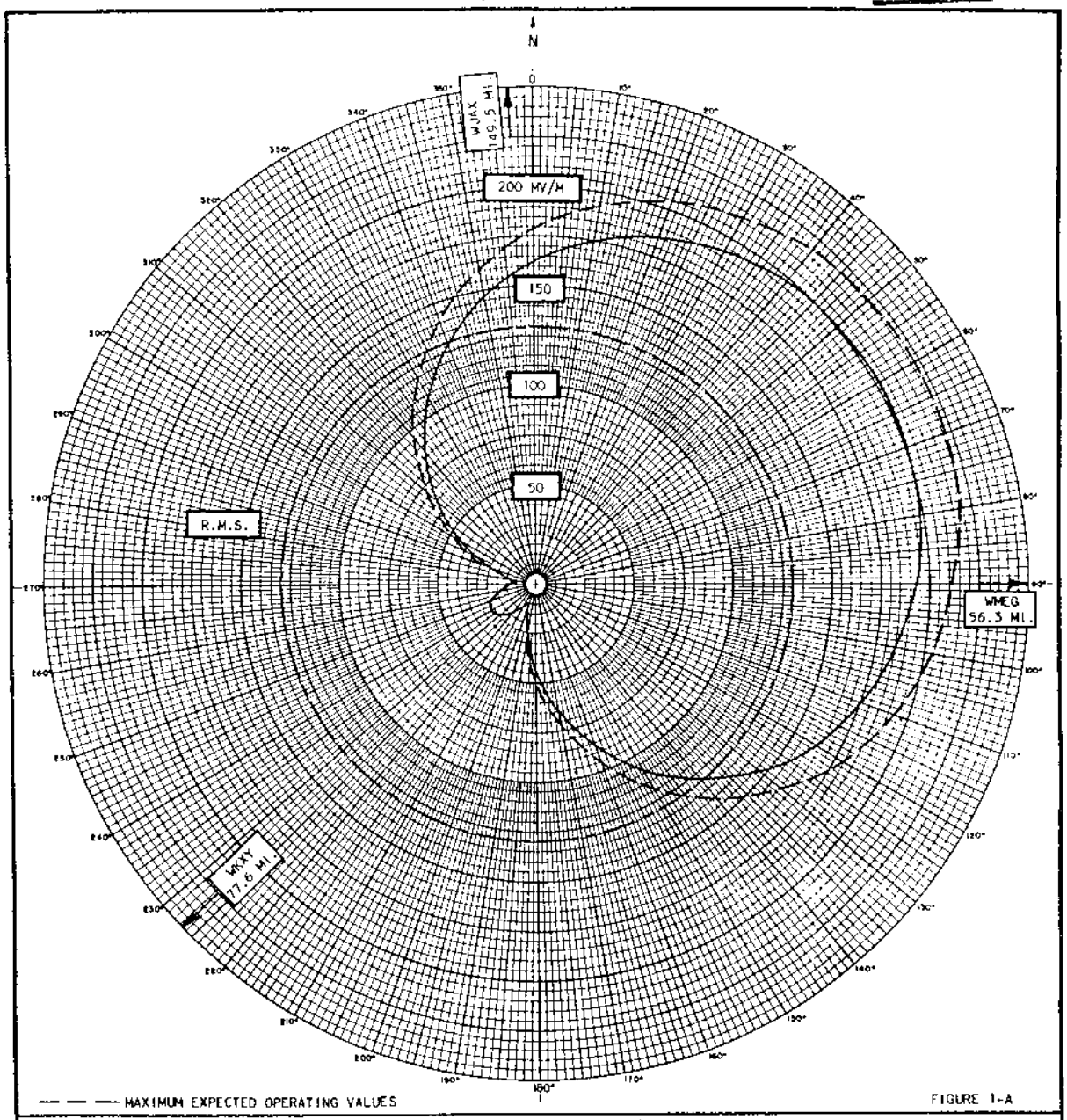
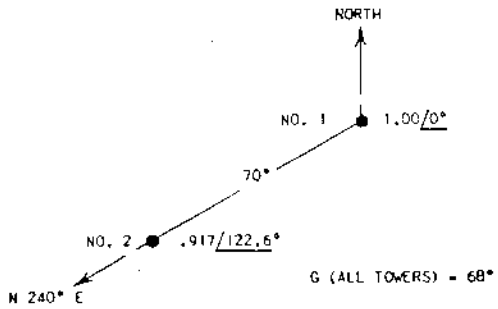


FIGURE 1-A

HORIZONTAL RADIATION PATTERN

PATTERN NO. 55592-D

SPACING AND ORIENTATION



APPLICANT	HAINES CITY BROADCASTERS
LOCATION	HAINES CITY, FLORIDA
FREQUENCY	930 KC/S
POWER	500 W-D (DA)
LATITUDE	28 DEG. 04 MIN 55 SEC.
LONGITUDE	81 DEG 38 MIN 23 SEC.
WHEN USED	DAYTIME HOURS
RMS FIELD	128.5 MV/M
DATE	MAY 1959

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

FCC File No. BP-11783
Accepted 5-18-59 (Amended)

Haines City Broadcasters
Haines City, Florida

930 KC

granted CP for new station 1-13-60

HAINES CITY FLA

WHAN

PROPOSED DAY NULLS
(6-16-59R)

New; Haines City B/Cstrs.
Haines City, Florida

500w, DA-D, D
930 KC

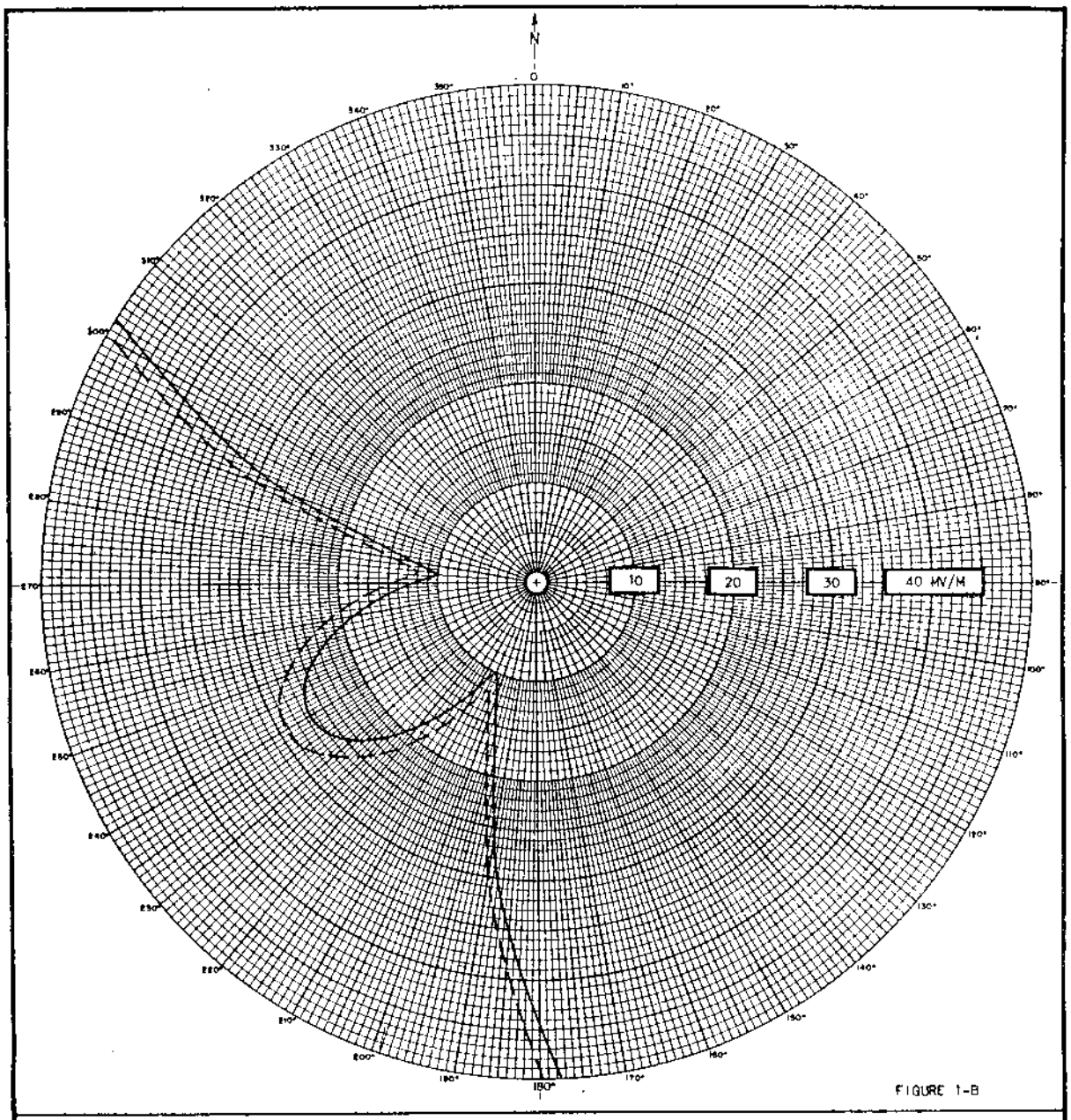


FIGURE 1-B

EXPANDED VIEW

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

FCC File No. BP-11783
Accepted 5-18-59 (Amended)

Haines City Broadcasters
Haines City, Florida

930 KC

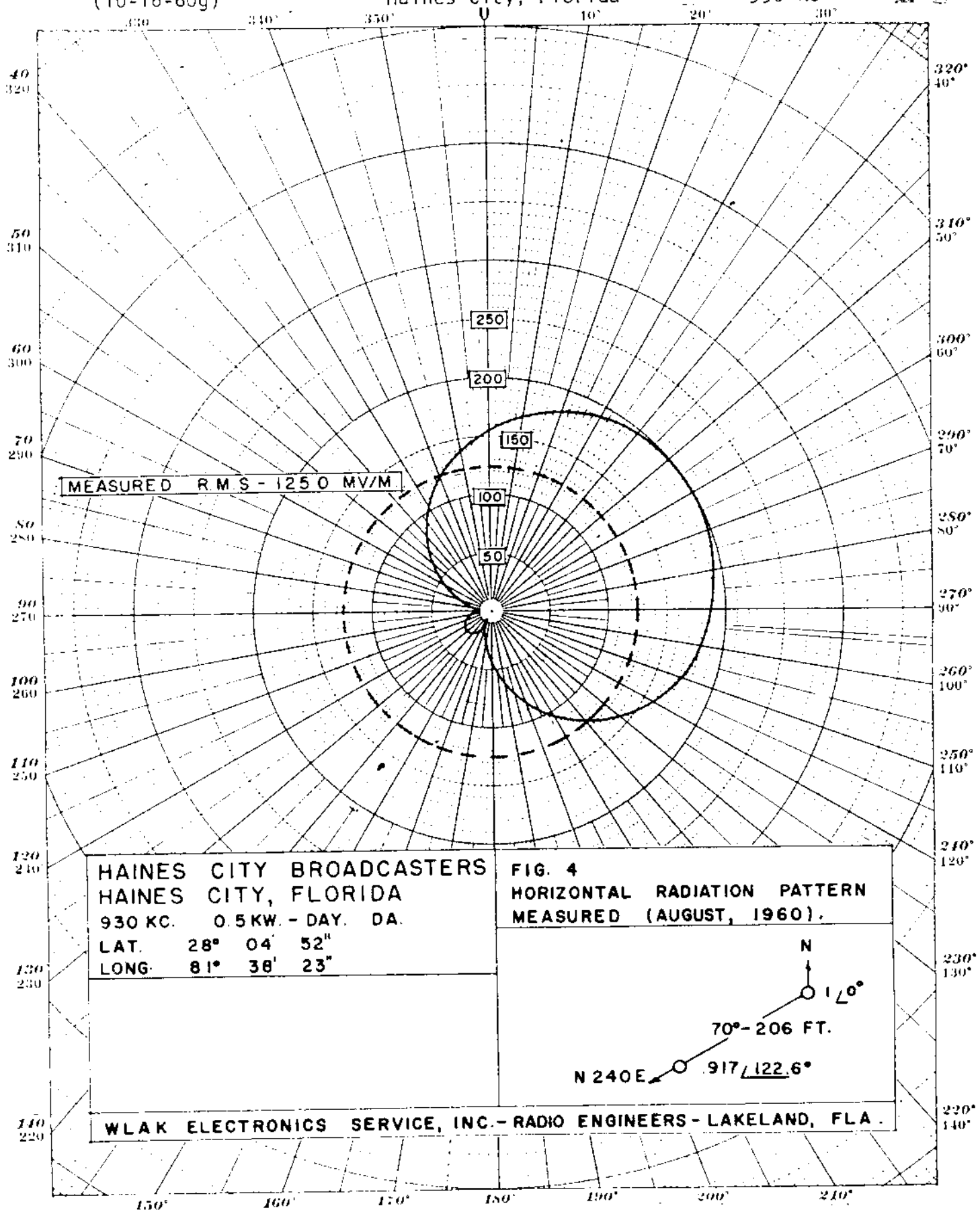
WHAN

43

MEASURED DAY
(10-18-60g)

Station WHAN
Haines City, Florida

500w, DA-D.D
930 KC



FCC File No. BL-8094
Accepted 9-23-60

WHAN
Haines City, Florida 930 KC

2-2-01 previous station

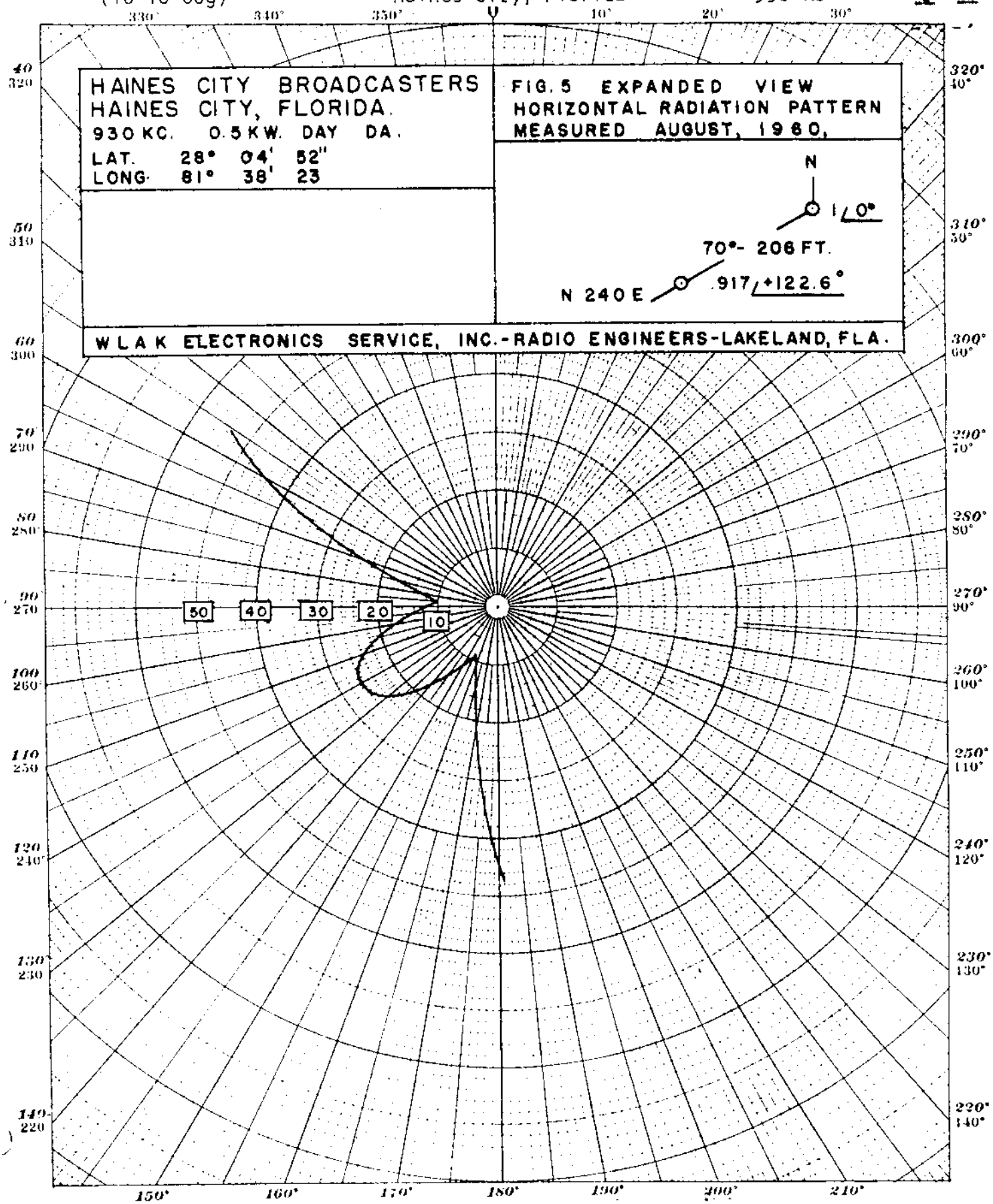
WHAN

44

MEASURED DAY NULLS
(10-18-60g)

Station WHAN
Haines City, Florida

500w, DA-D,D
930 KC



FCC File No. BL-8094
Accepted 9-23-60

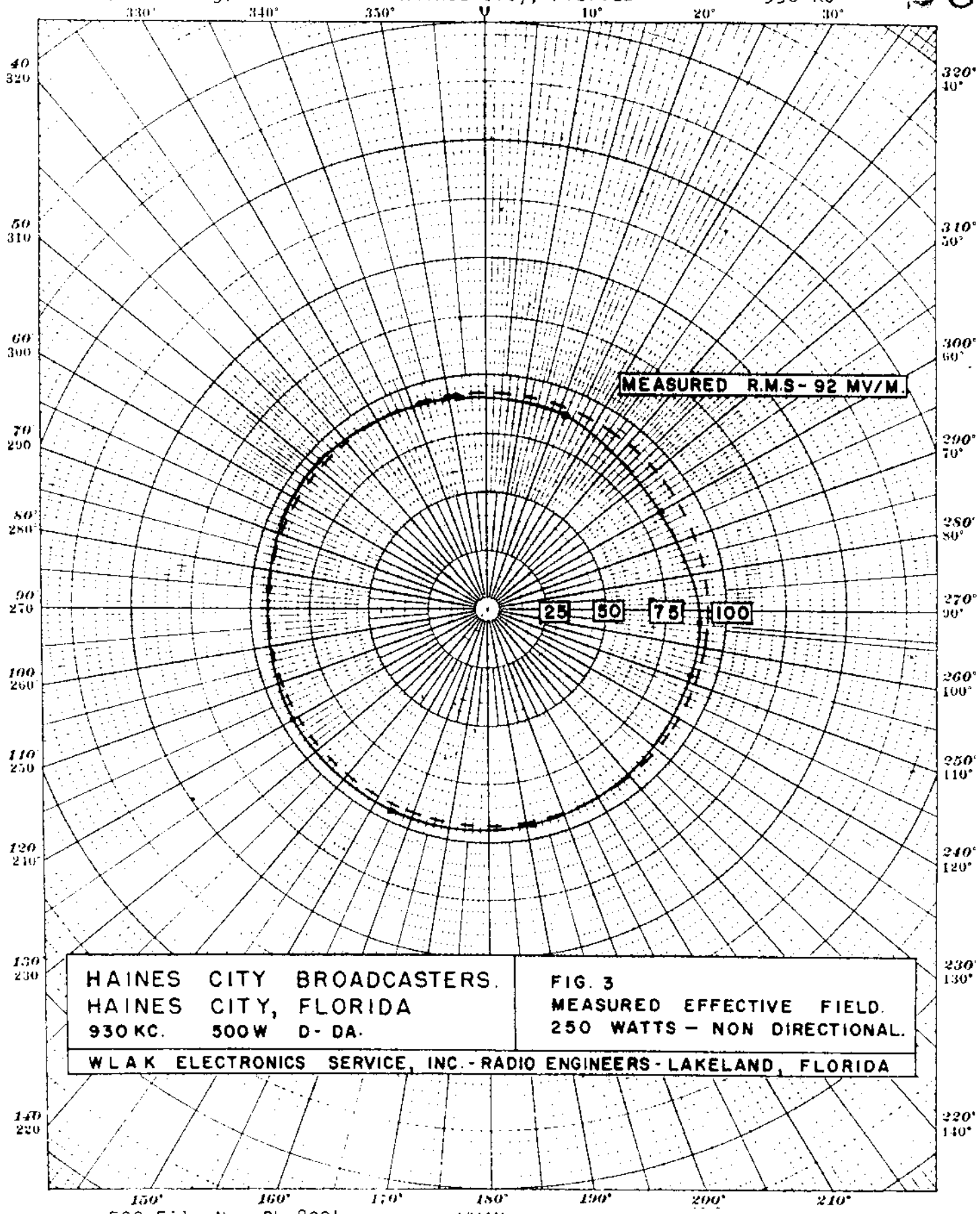
WHAN
Haines City, Florida 930 KC

WHAN

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

Station WHAN
Haines City, Florida

500w, DA-D,D
930 KC



FCC File No. BL-8094
Accepted 9-23-60

WHAN
Haines City, Florida 930 KC

WHON

Proposed Day
(7-24-63ct)

Station WHON
Centerville, Indiana

500w,DA-D,D
930 kc

North Latitude 39° 53' 33"
West Longitude 84° 56' 09"

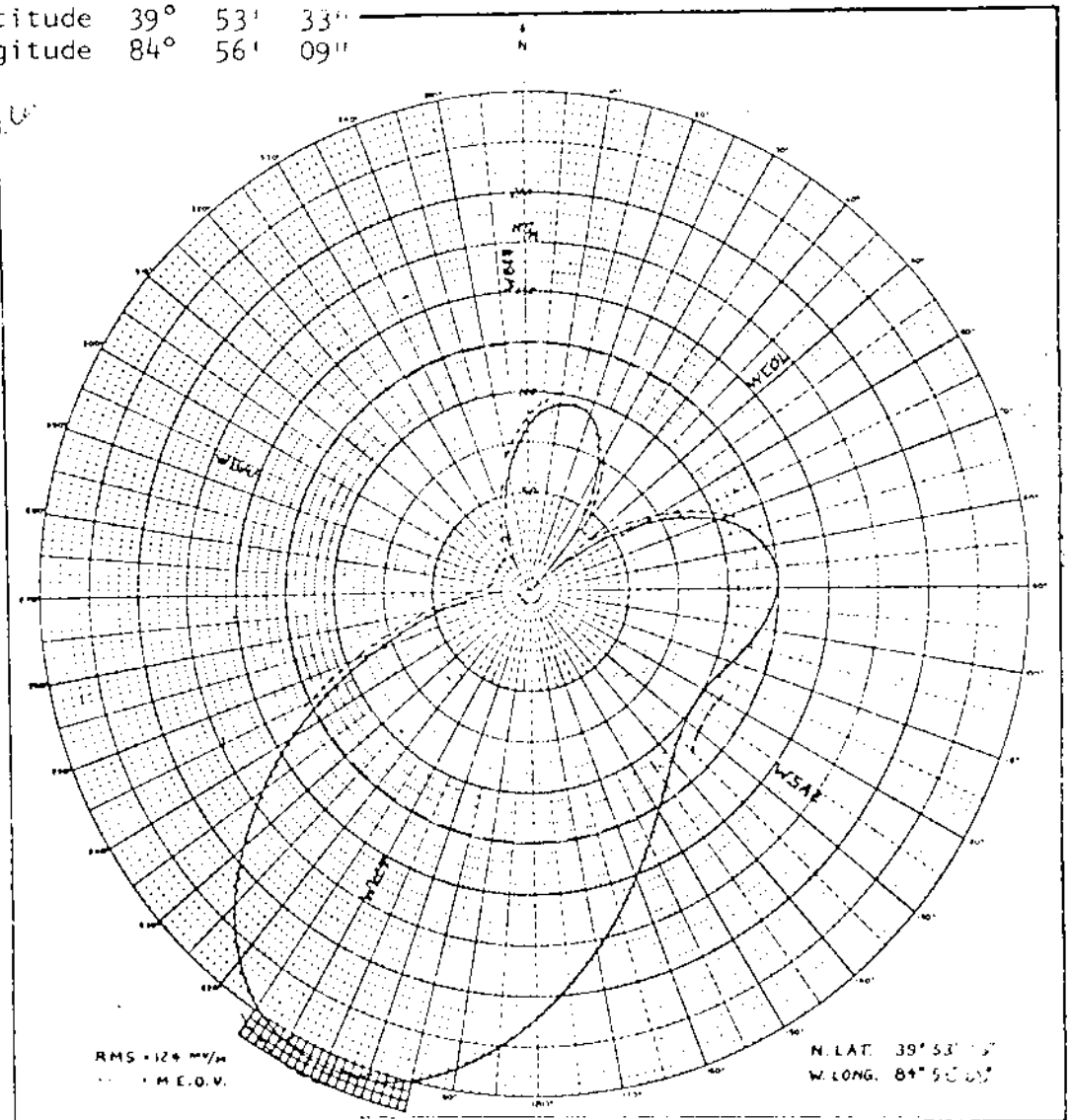
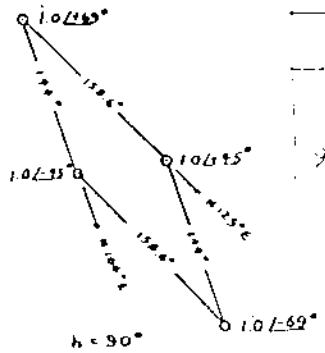


EXHIBIT VI

HORIZONTAL RADIATION PATTERN

RICHMOND BROADCASTING COMPANY

930 KC 500W. DA-DAY, CENTERVILLE IND.



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

PATTERN NO
SUPERSEDES
APP

JUNE 1963

FCC File No.BMP-10945
Accepted 7-1-63

Station WHON
Centerville, Indiana

930 kc

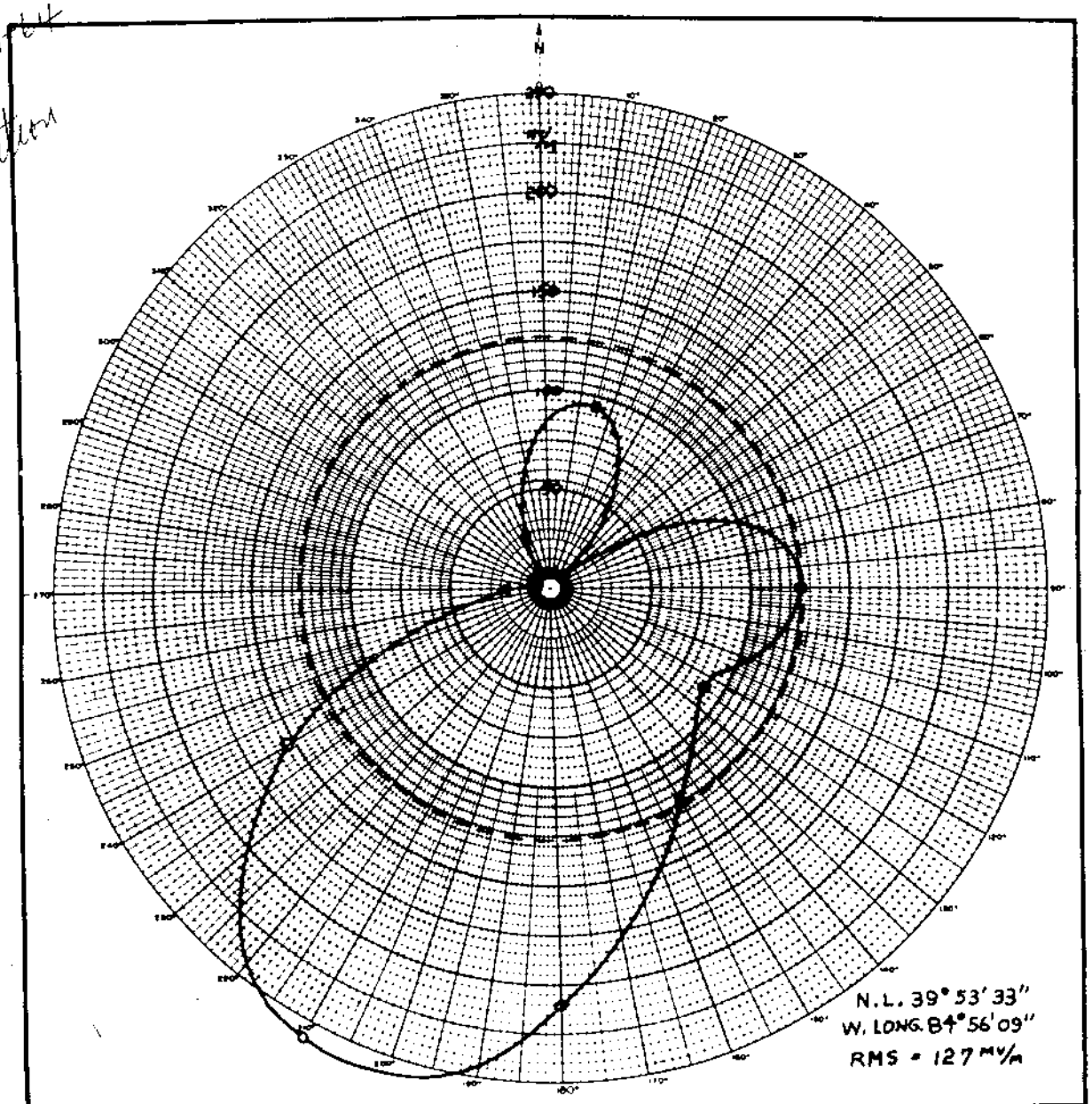
WHON

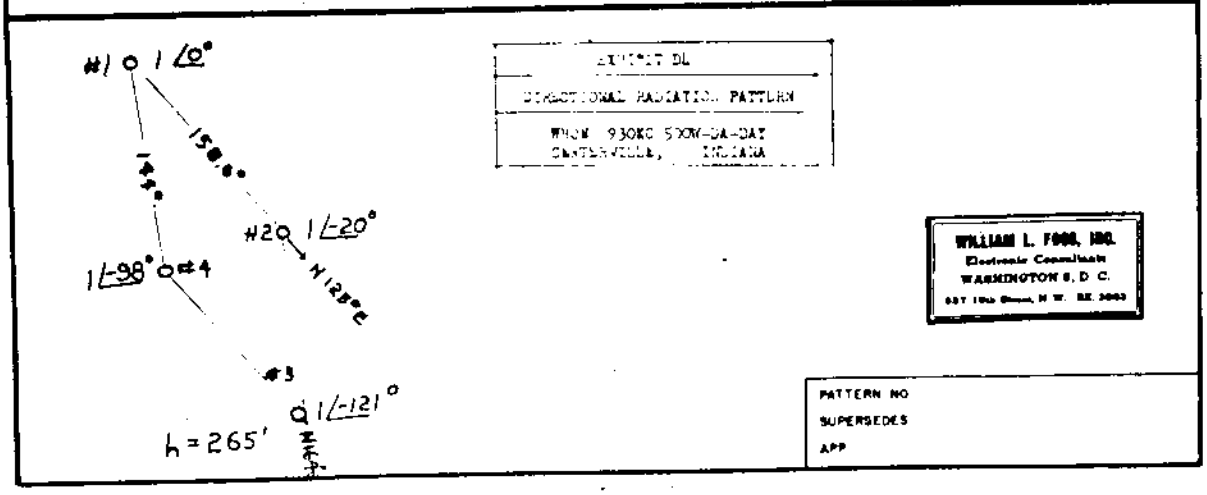
Measured Day
(4-24-64ct)

Station WHON
Centerville, Indiana

500w,DA-D,D
930 kc

= 200 - 8-19-64
granted L
for new station





FCC File No. BL-10504
Accepted 4-10-64

Station WHON
Centerville, Indiana

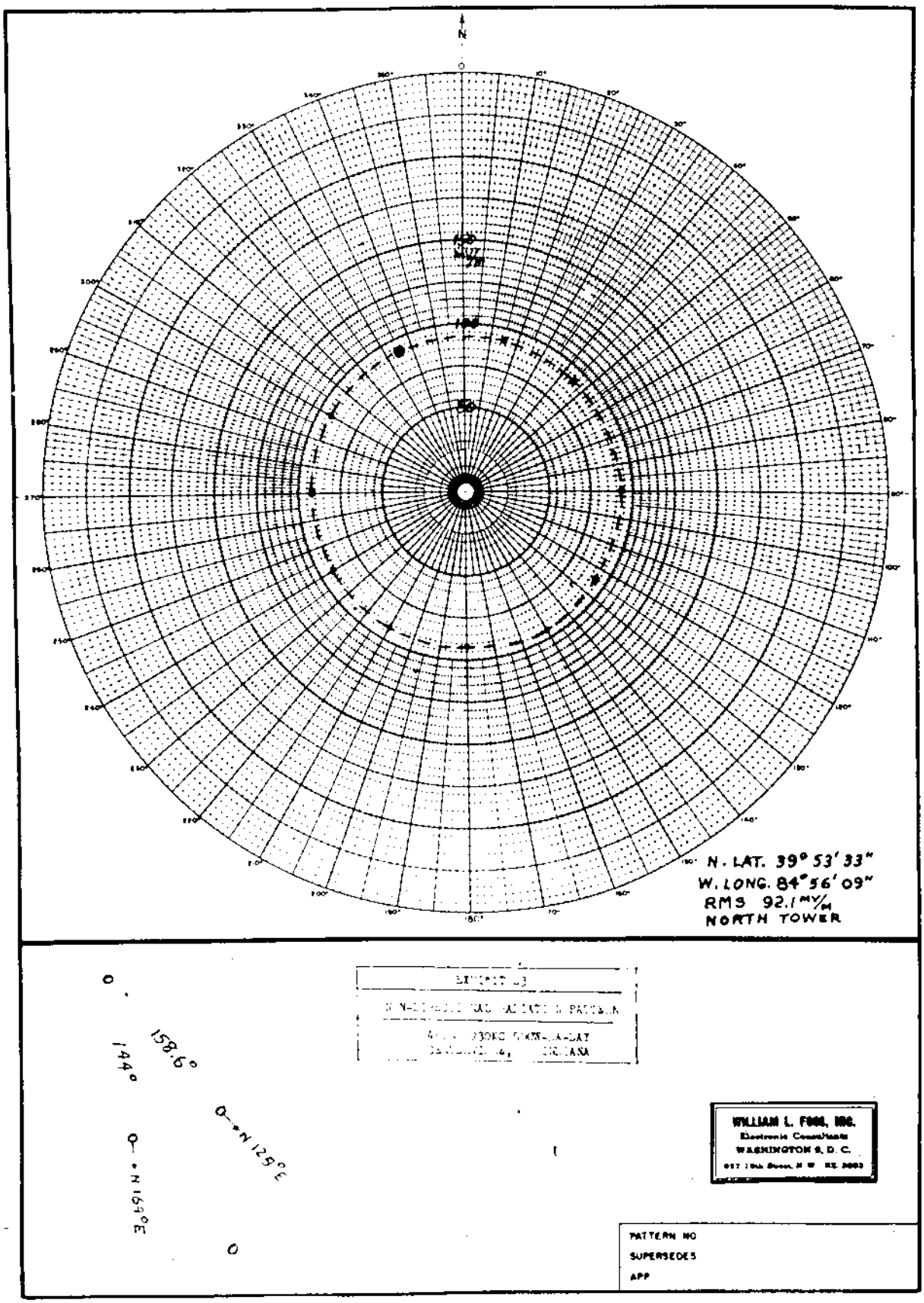
930 kc

WHON

Measured Non-DA
(4-24-64ct)

Station WHON
Centerville, Indiana

500w,DA-D,D
930 kc

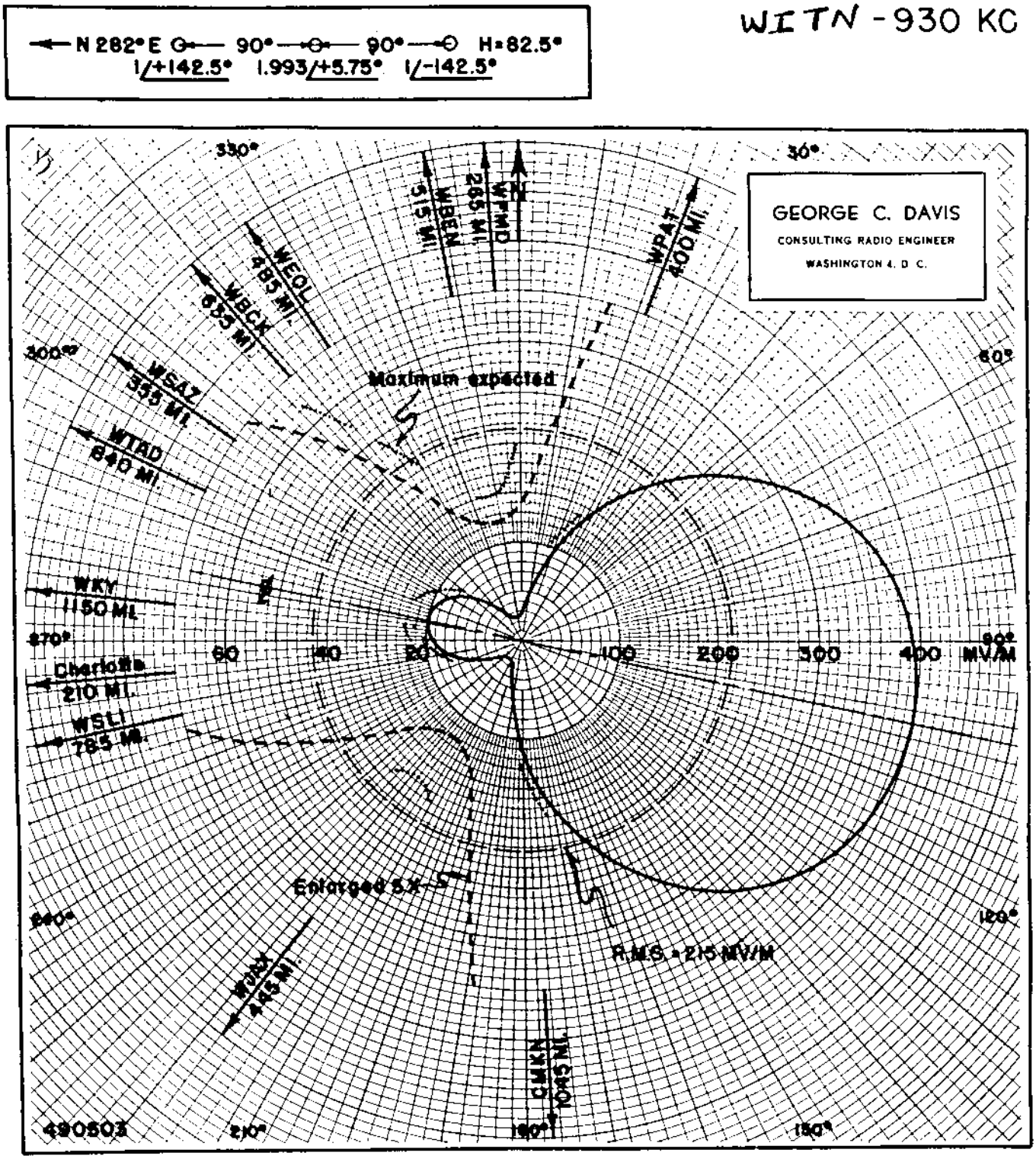


FCC File No. BL-10504
Accepted 4-10-64

Station WHON
Centerville, Indiana

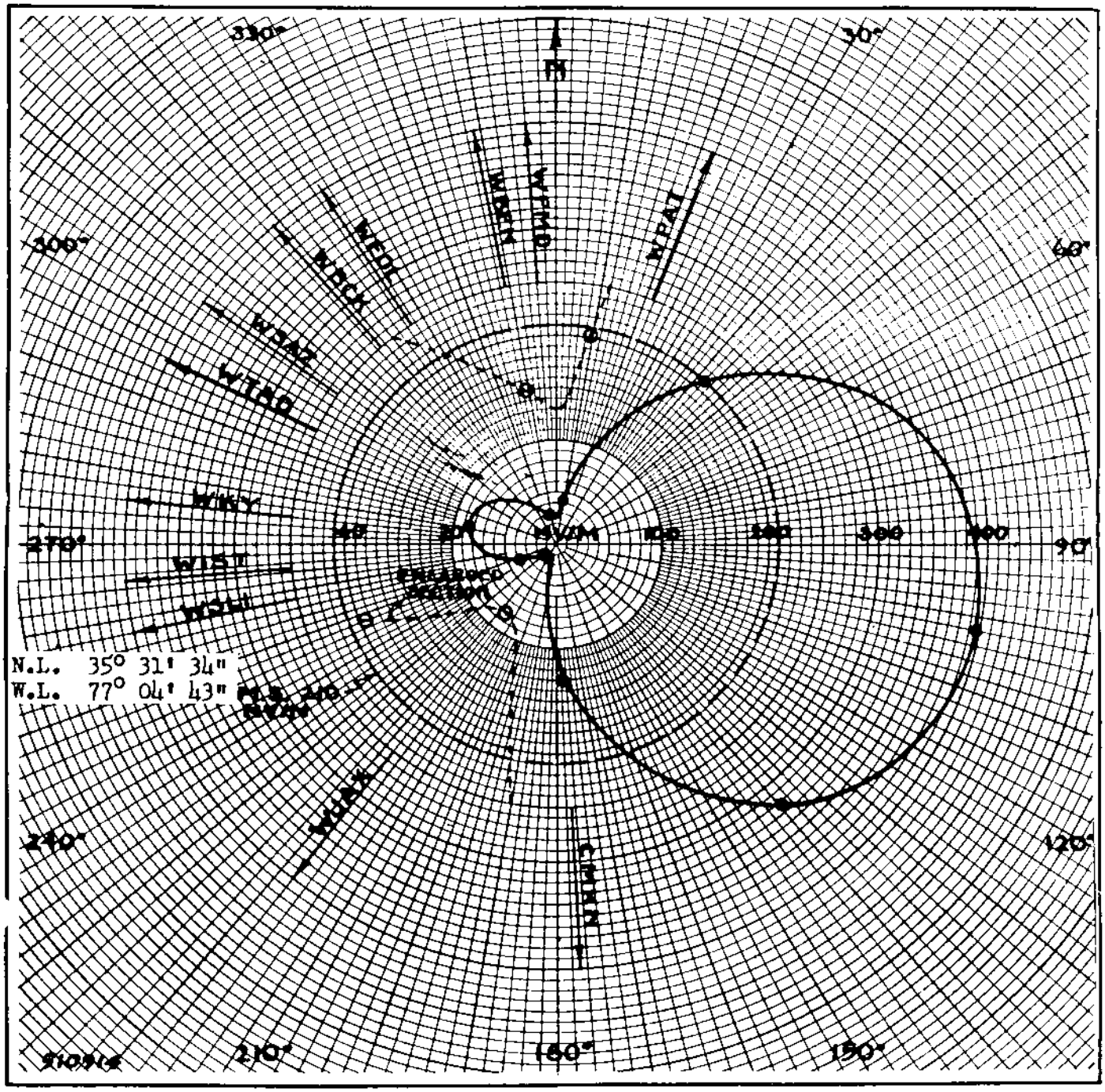
930 kc

WITN - 930 KC



GRAPH OF HORIZONTAL PLANE PATTERN
FOR PROPOSED DIRECTIVE NIGHTTIME OPERATION
OF STATION WRRF, WASHINGTON, NORTH CAROLINA
UNATTENUATED FIELD AT ONE MILE
930 KC - 1 KW: 5 KW-LS - DA(N)
MAY 1949

WITN



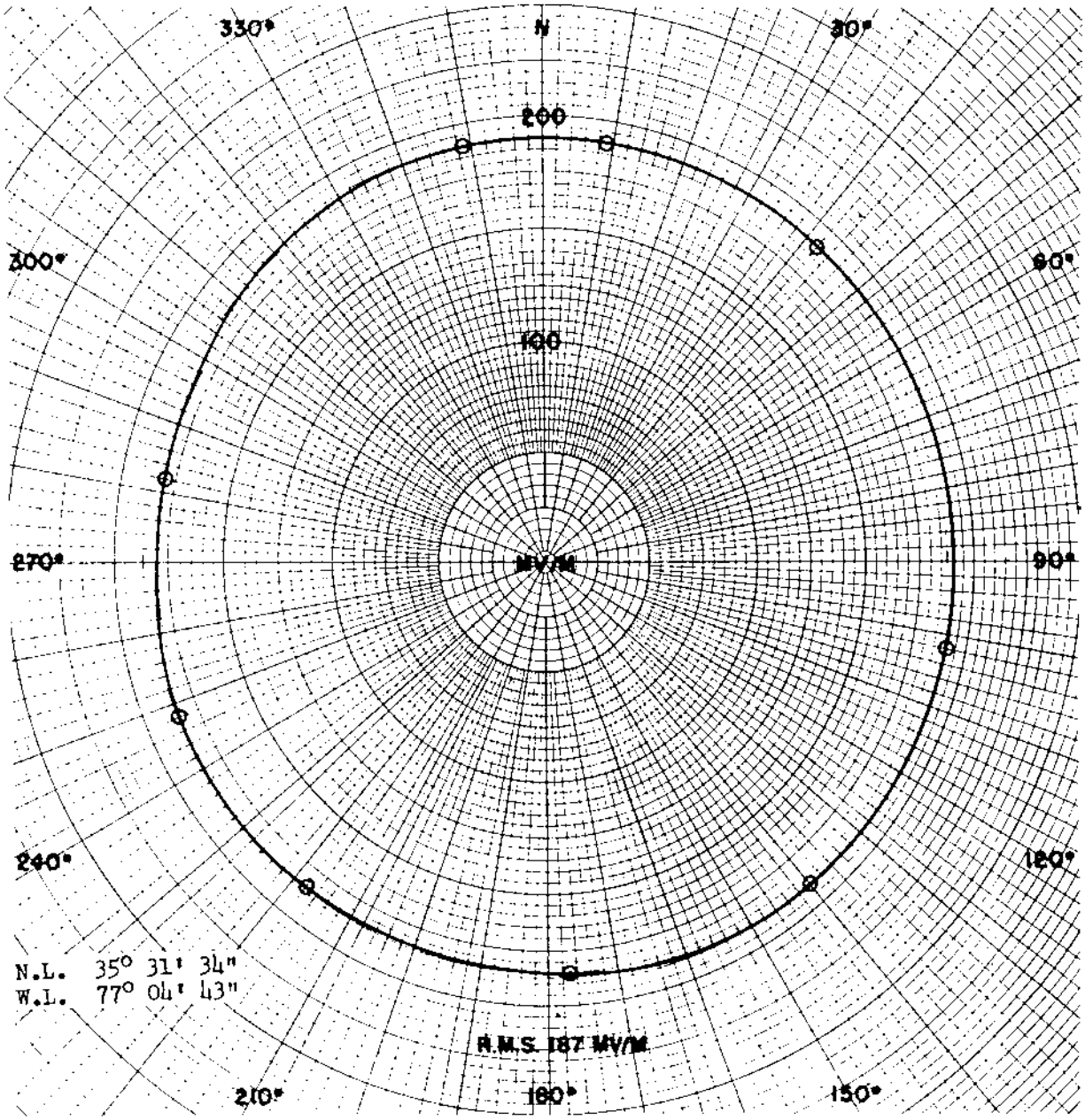
GEORGE C. DAVIS
CONSULTING RADIO ENGINEER
WASHINGTON 4, D. C.

MEASURED NIGHTTIME
HORIZONTAL PLANE PATTERN
UNATTENUATED FIELD AT ONE MILE
WRRF, WASHINGTON, N. C.
930 KC, 1 KW, DA-N
SEPTEMBER, 1951

WITN

MEASURED WRRF, WASHINGTON, N. C. 1 KW, 5 KW-LS, U, DA-N 930 KC
DAY (NON-DA) 10/24/51G

GEORGE C. DAVIS
CONSULTING RADIO ENGINEER
WASHINGTON 4, D. C.



418 MV/M / 5 KW

MEASURED NON-DIRECTIVE
FIELD INTENSITY
WRRF - WASHINGTON, N.C.
930 KC - 5 KW DAY
OCTOBER, 1951

APPL RECD 10/15/51 BL-4545 Amended WRRF, WASHINGTON, N. C. 930 KC

WIZR

Johnstown N.Y.

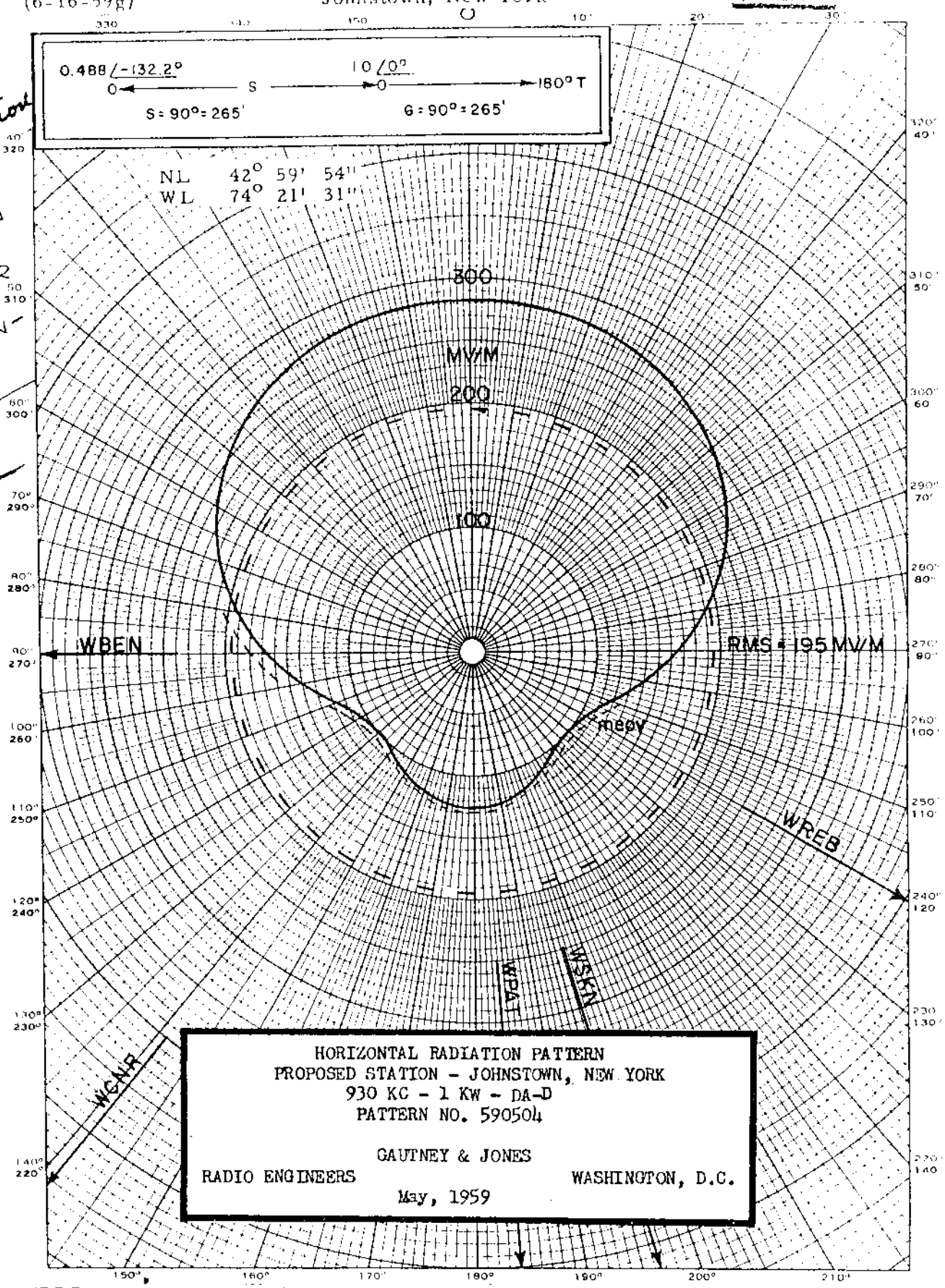
PROPOSED DAY
(6-16-59g)

New; Martin Karig
Johnstown, New York

1kw, DA-D, D
930 KC

4-20-61
granted cp.
for new station
BP-17915
APPLICATION
ACCEPTED
1-17-68 FOR
CP FROM
DA-D TO NON-
DIRECTIONAL
ANTENNA

OVER



FCC File No. BP-11926
Accepted 5-18-59 (Amended)

Martin Karig
Johnstown, New York

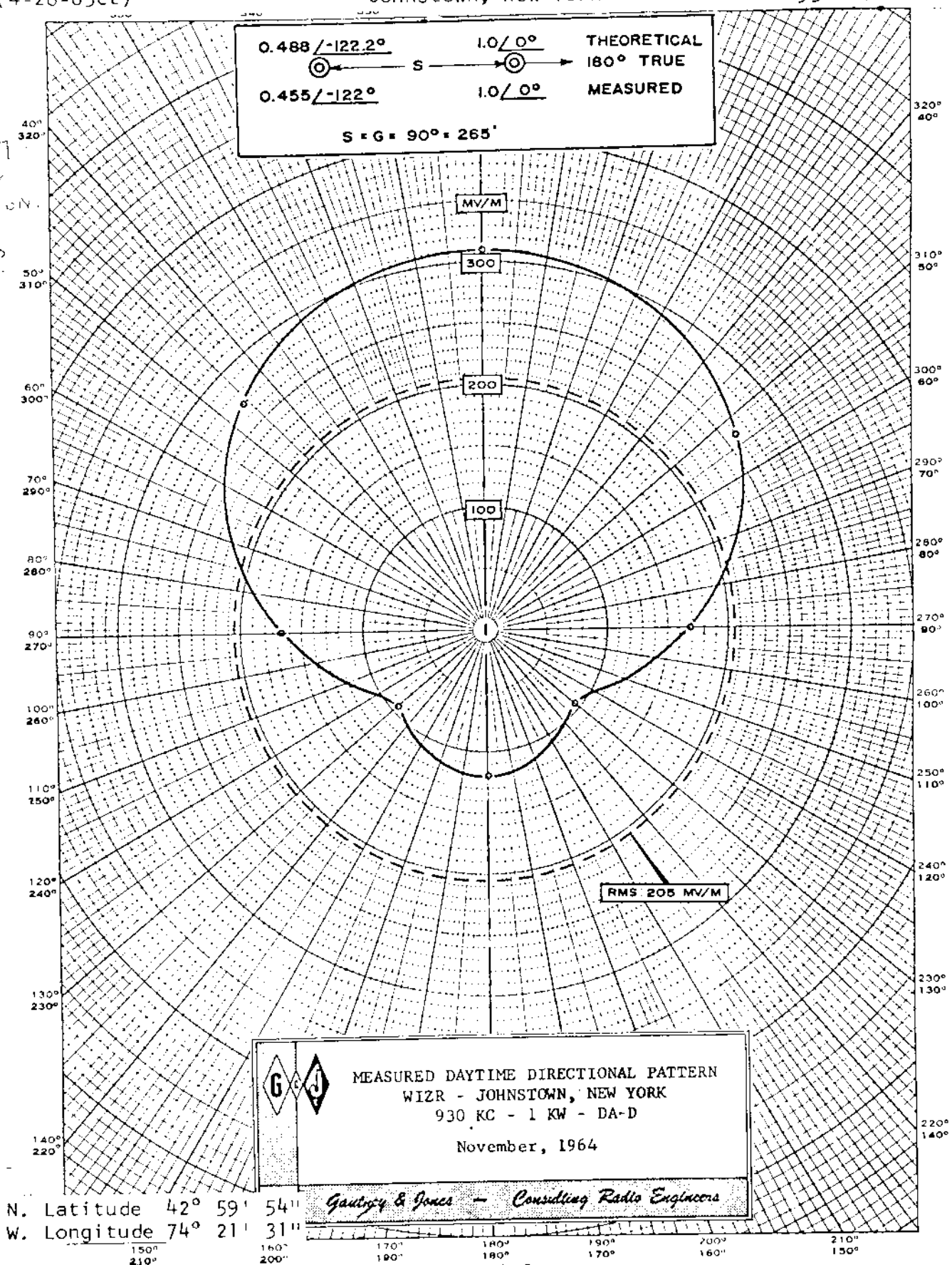
930 KC

WIZR

Measured Day
(4-28-65ct)

Station WIZR
Johnstown, New York

1kw,DA-D,D
930 kc



N. Latitude 42° 59' 54"
W. Longitude 74° 21' 31"

FCC File No. BL-10839
Accepted 3-29-65

Station WIZR
Johnstown, New York

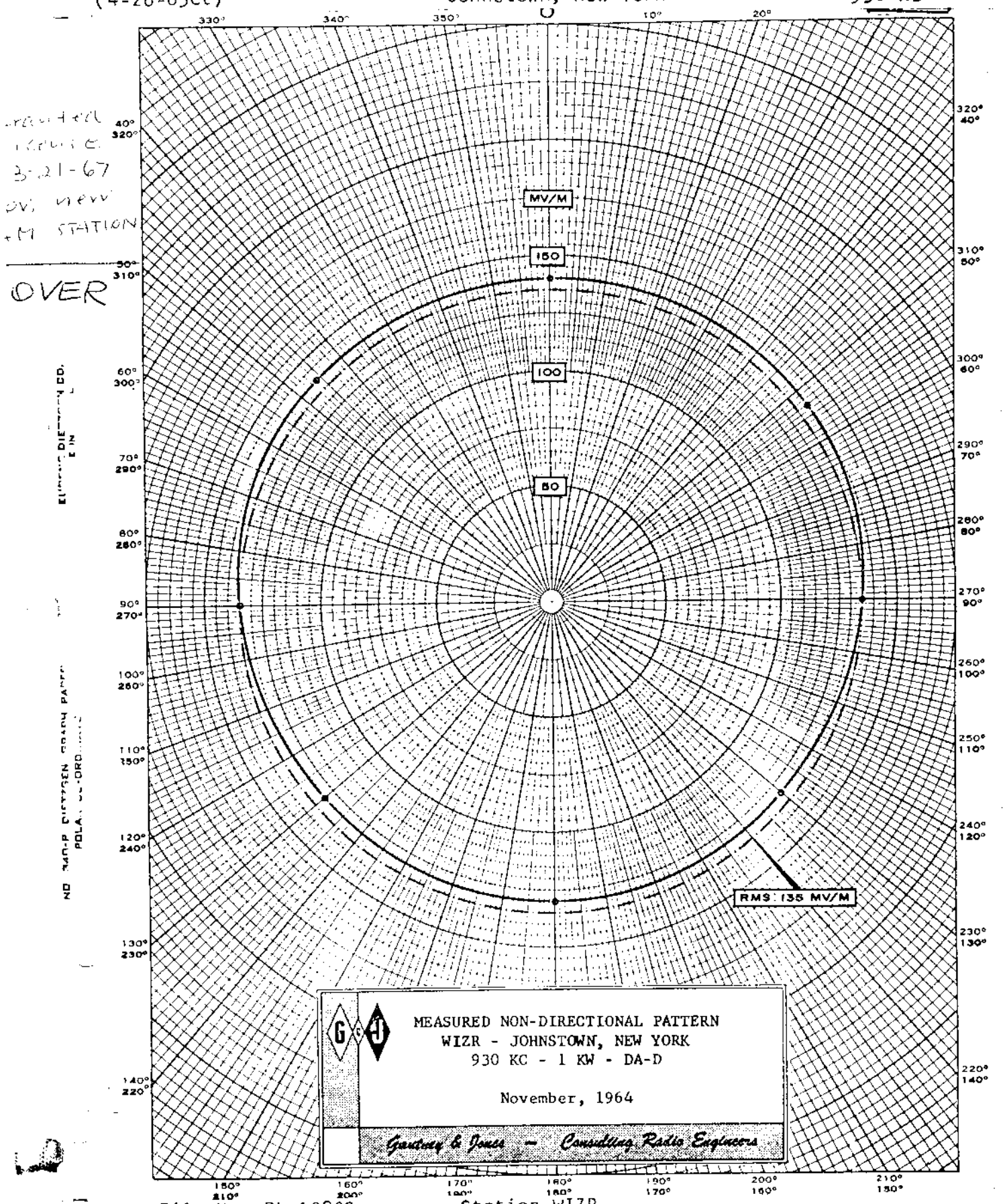
930 kc

WIZR

Measured Non-DA
(4-28-65ct)

Station WIZR
Johnstown, New York

1kw,DA-D,D
930 kc



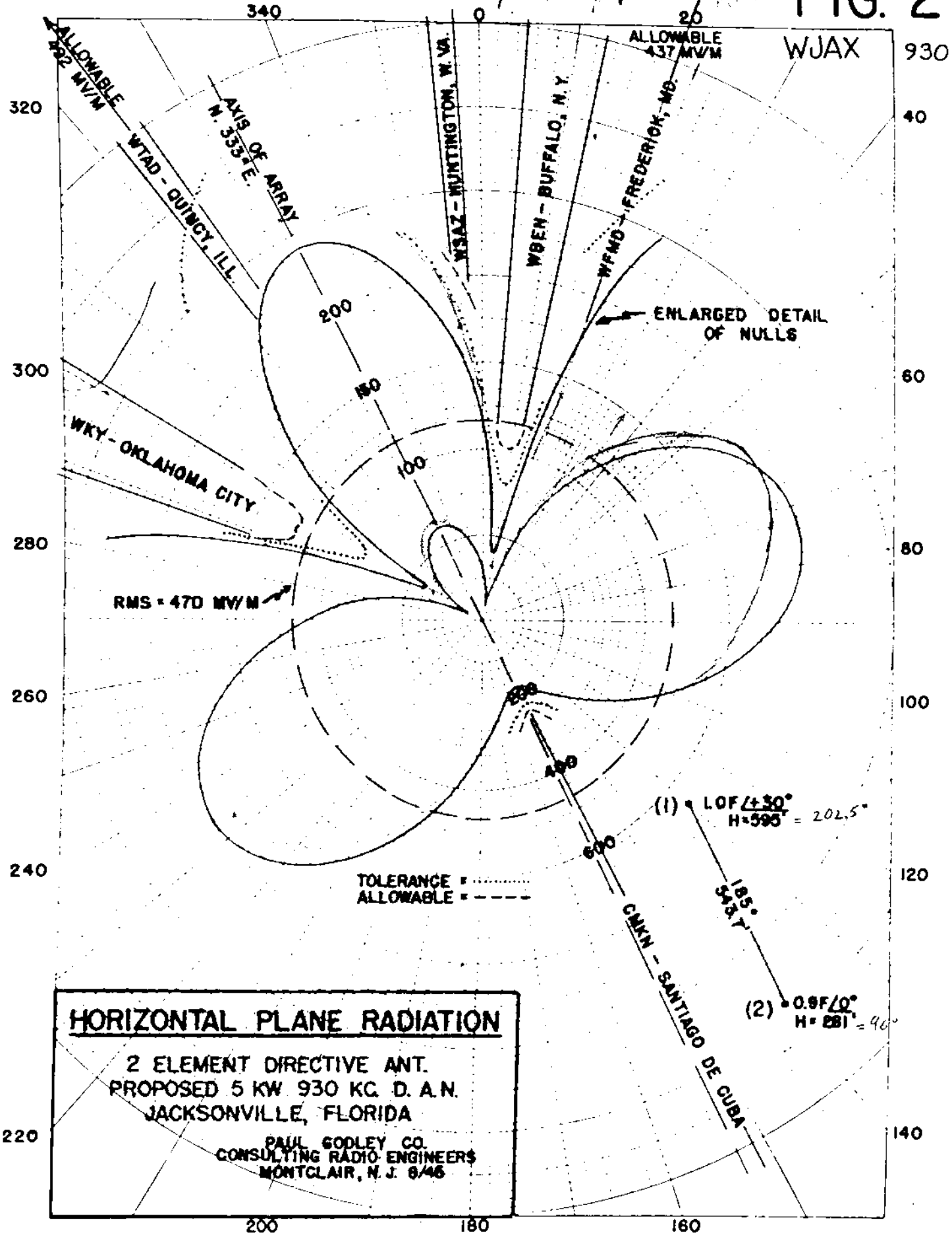
FCC File No. BL-10839
Accepted 3-29-65

Station WIZR
Johnstown, New York

930 kc

P-4271

FIG. 2



HORIZONTAL PLANE RADIATION

2 ELEMENT DIRECTIVE ANT.
PROPOSED 5 KW 930 KC. D. A. N.
JACKSONVILLE, FLORIDA

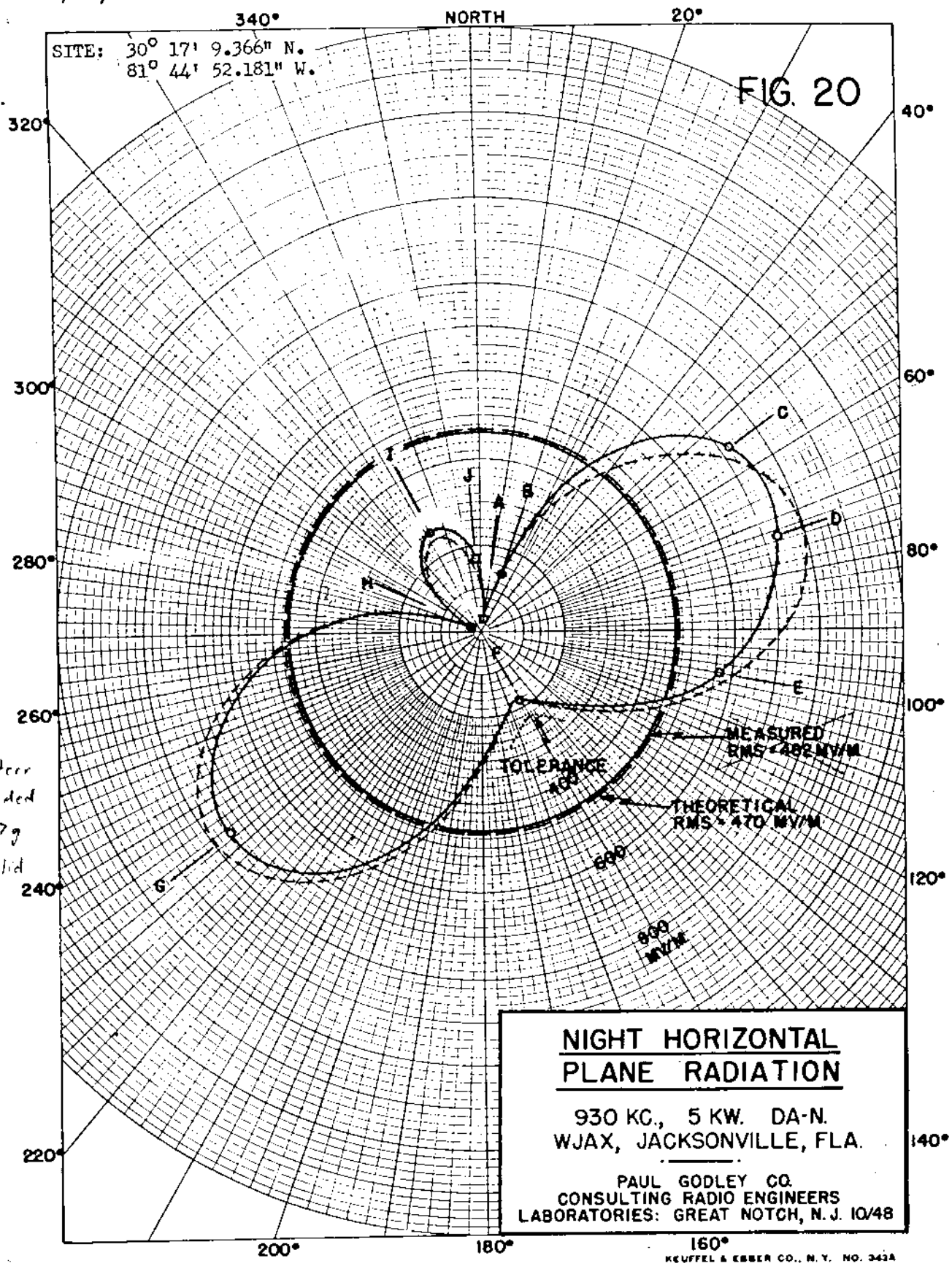
PAUL GODLEY CO.
CONSULTING RADIO ENGINEERS
MONTCLAIR, N. J. 8/46

$E = 412 \left[\left(f_{WJAX}(V) \right)^2 + \left[.9 \left(f_{96}(V) \right)^2 \right] + 1.8 \left(f_{WJAX}(V) \right) \left(f_{96}(V) \right) \cos(185 \cos\theta + 30) \right]^{\frac{1}{2}}$

WJAX

Prop
~~MEASURED~~
NIGHT 12/31/48 G

WJAX, JACKSONVILLE, FLA. 5kw, DAN 930 kc

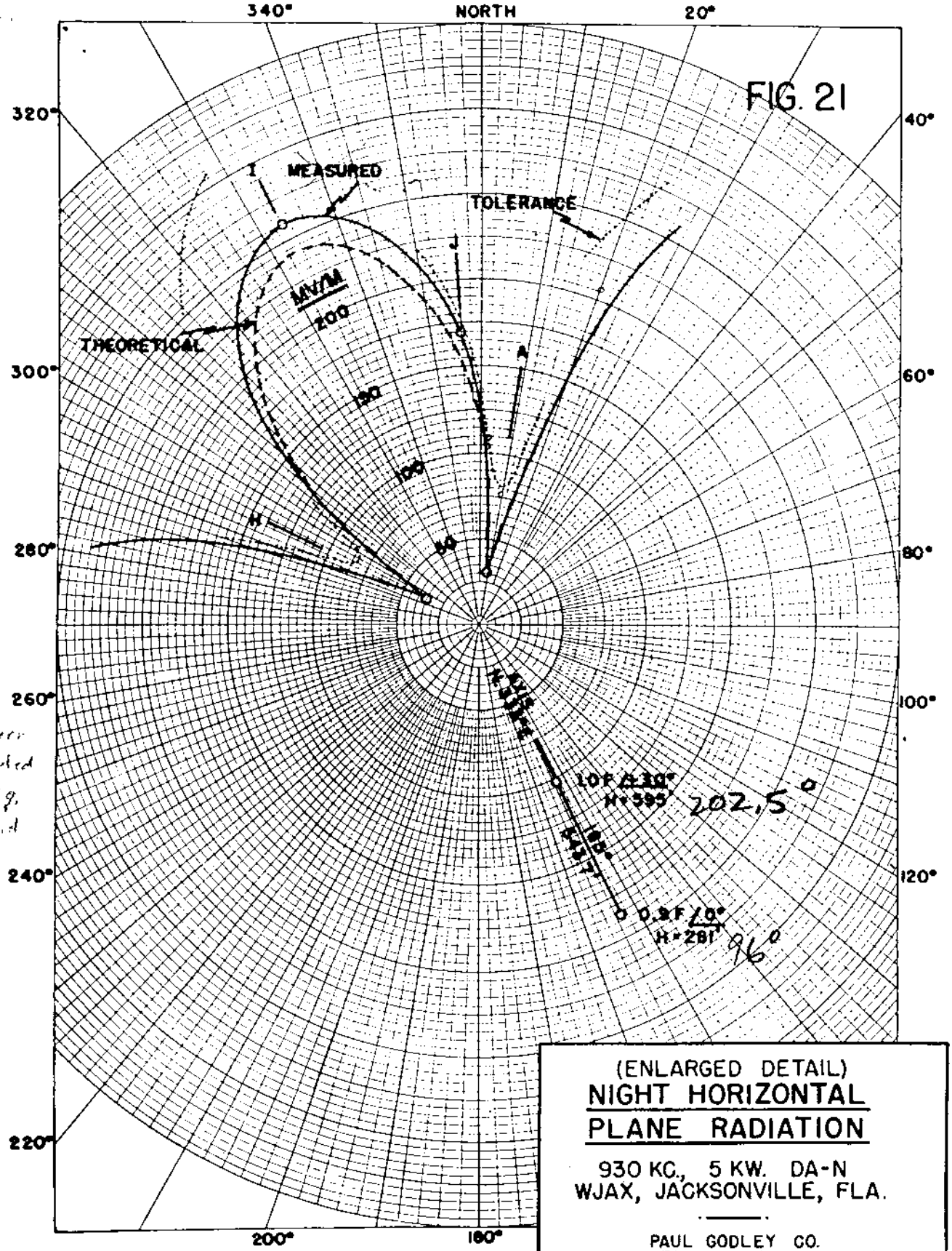


Meas. pattern is superseded by 5/13/57 Prop. is valid

WJAX

Prop
~~MEASURED~~
NIGHT
NULLS

WJAX, JACKSONVILLE, FLA. 12/31/48 5kw, DAN 930 kc



Meas. pattern is superseded by 5/13/59. Prop. is valid

(ENLARGED DETAIL)
NIGHT HORIZONTAL PLANE RADIATION

930 KC., 5 KW. DA-N
WJAX, JACKSONVILLE, FLA.

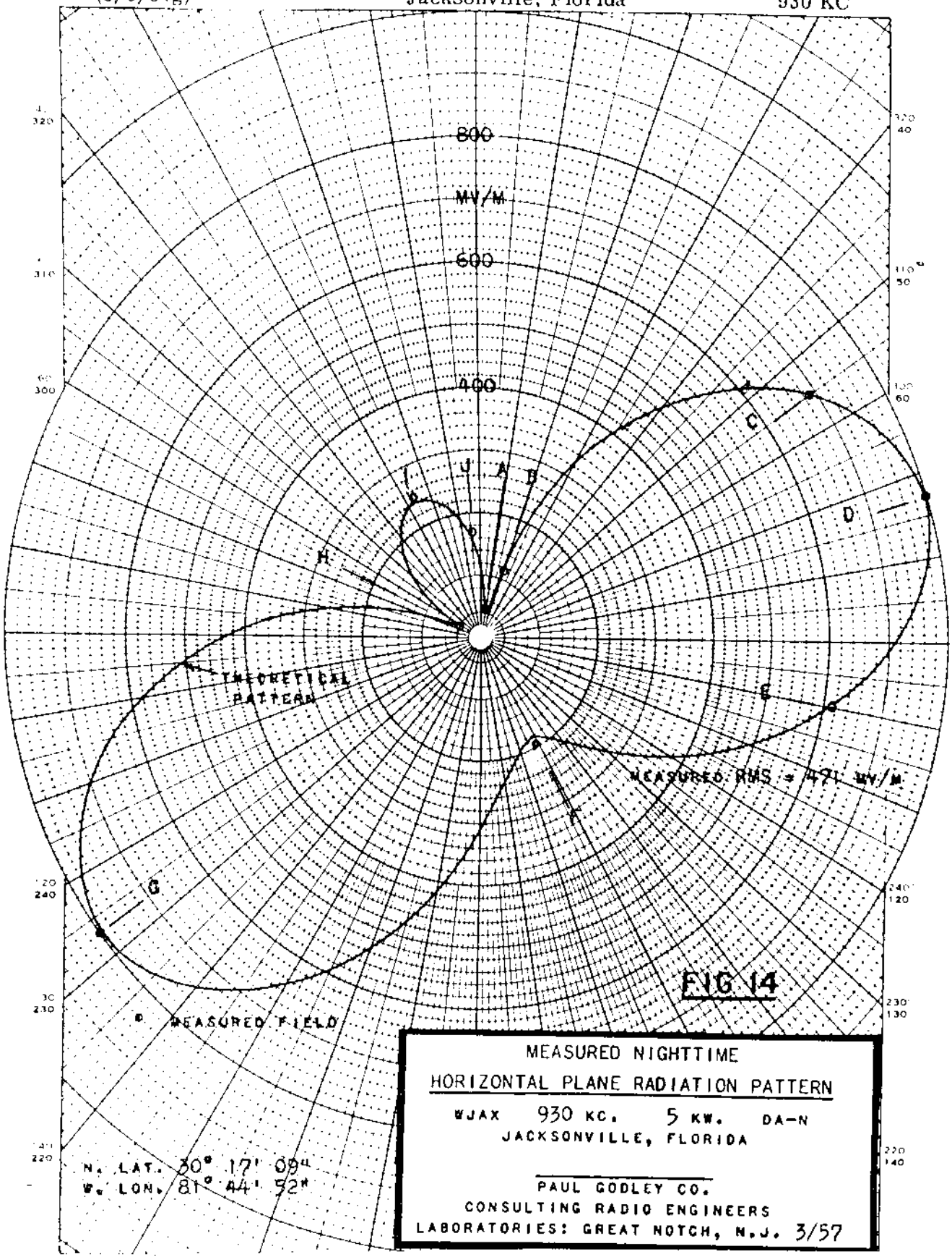
PAUL GODLEY CO.
CONSULTING RADIO ENGINEERS
LABORATORIES: GREAT NOTCH, N. J. 10/48

WJAX

MEASURED NIGHT
(5/3/57g)

Station WJAX
Jacksonville, Florida

5kw, DA-N,U
930 KC



FCC File No. BL-6608
Accepted 4/29/57

WJAX
Jacksonville, Florida

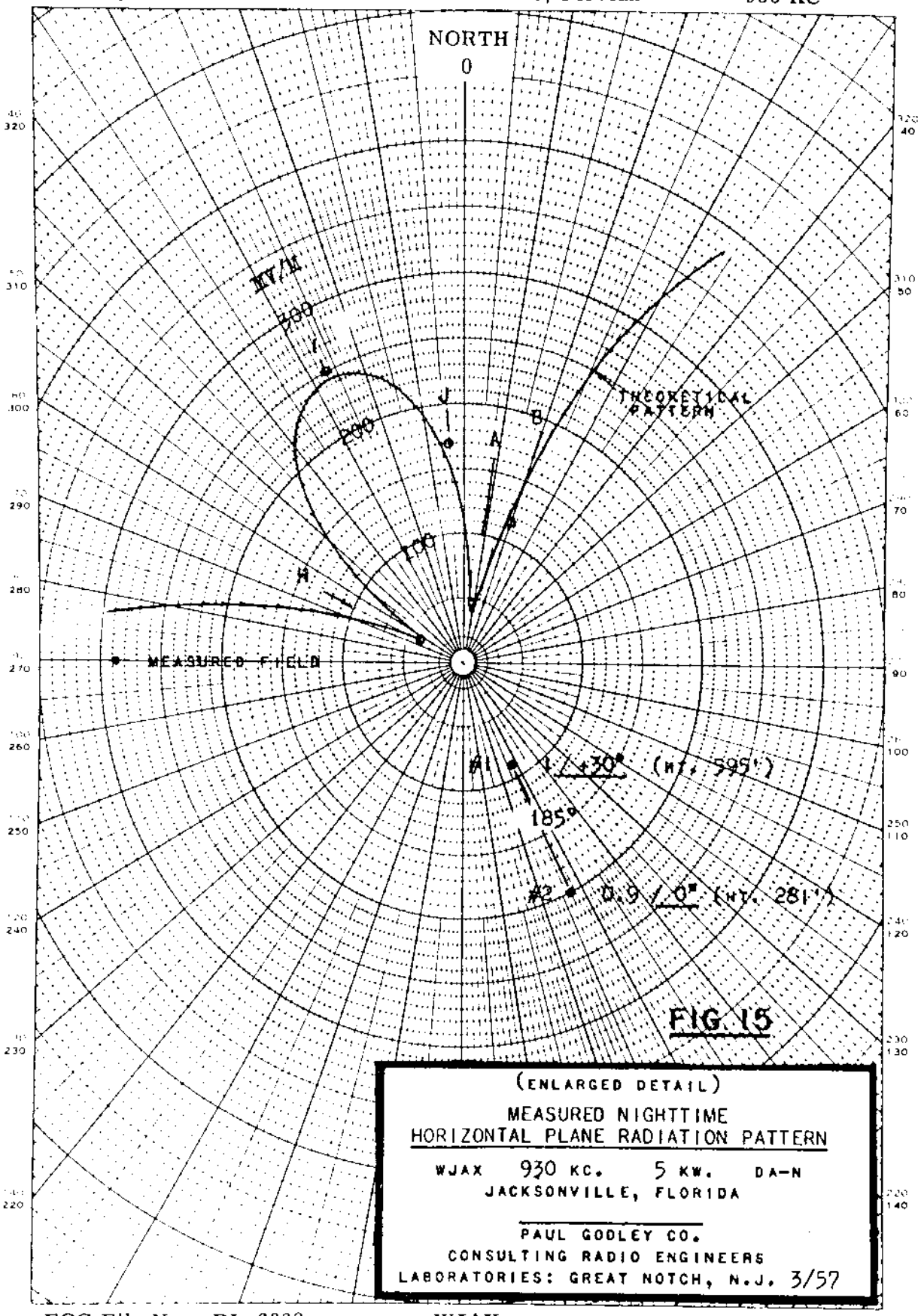
930 KC

WJAX

MEASURED NIGHT NULLS
(5/3/57g)

Station WJAX
Jacksonville, Florida

5kw, DA-N,U
930 KC

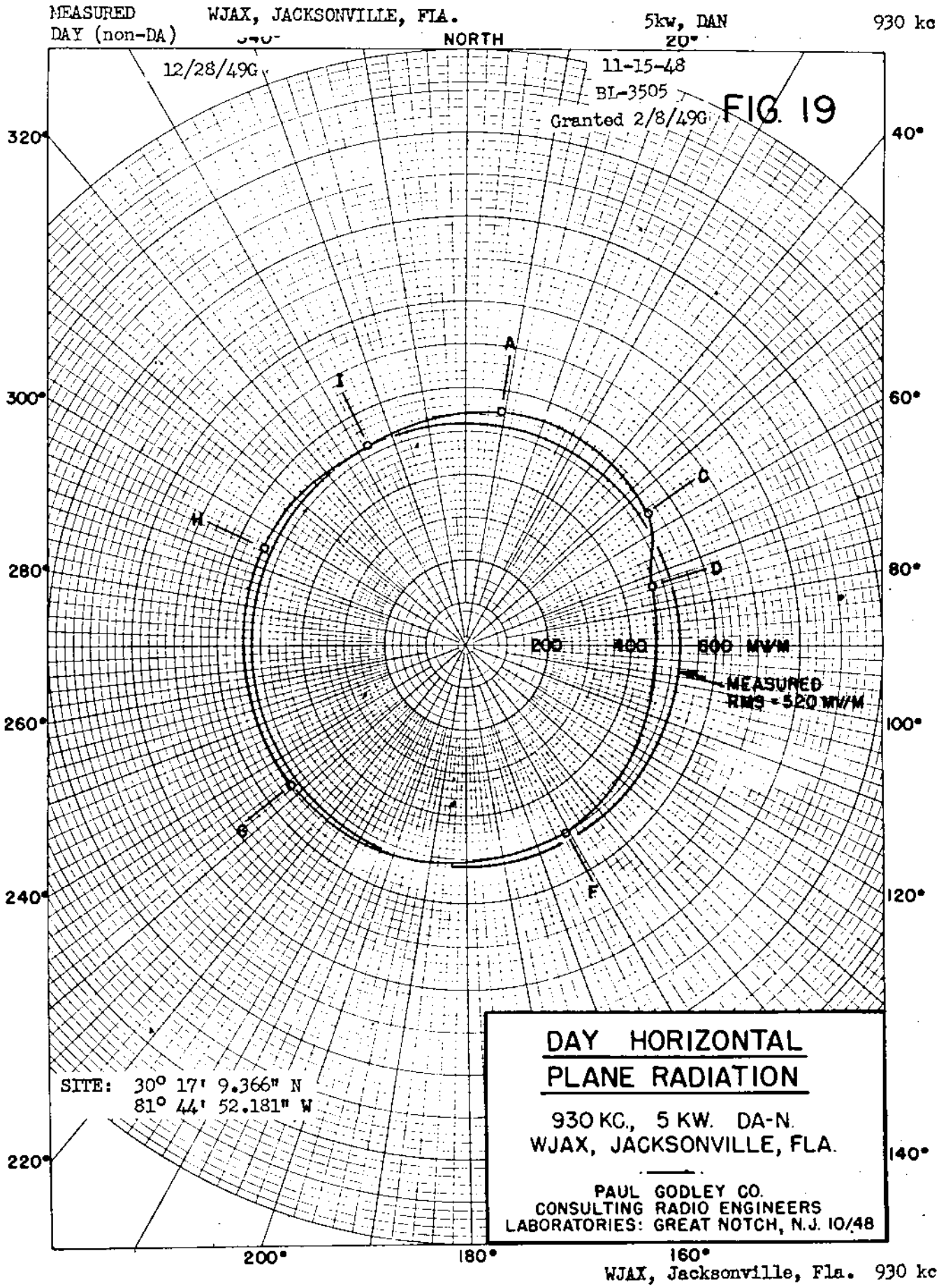


FCC File No. BL-6608
Accepted 4/29/57

WJAX
Jacksonville, Florida

930 KC

WJAX



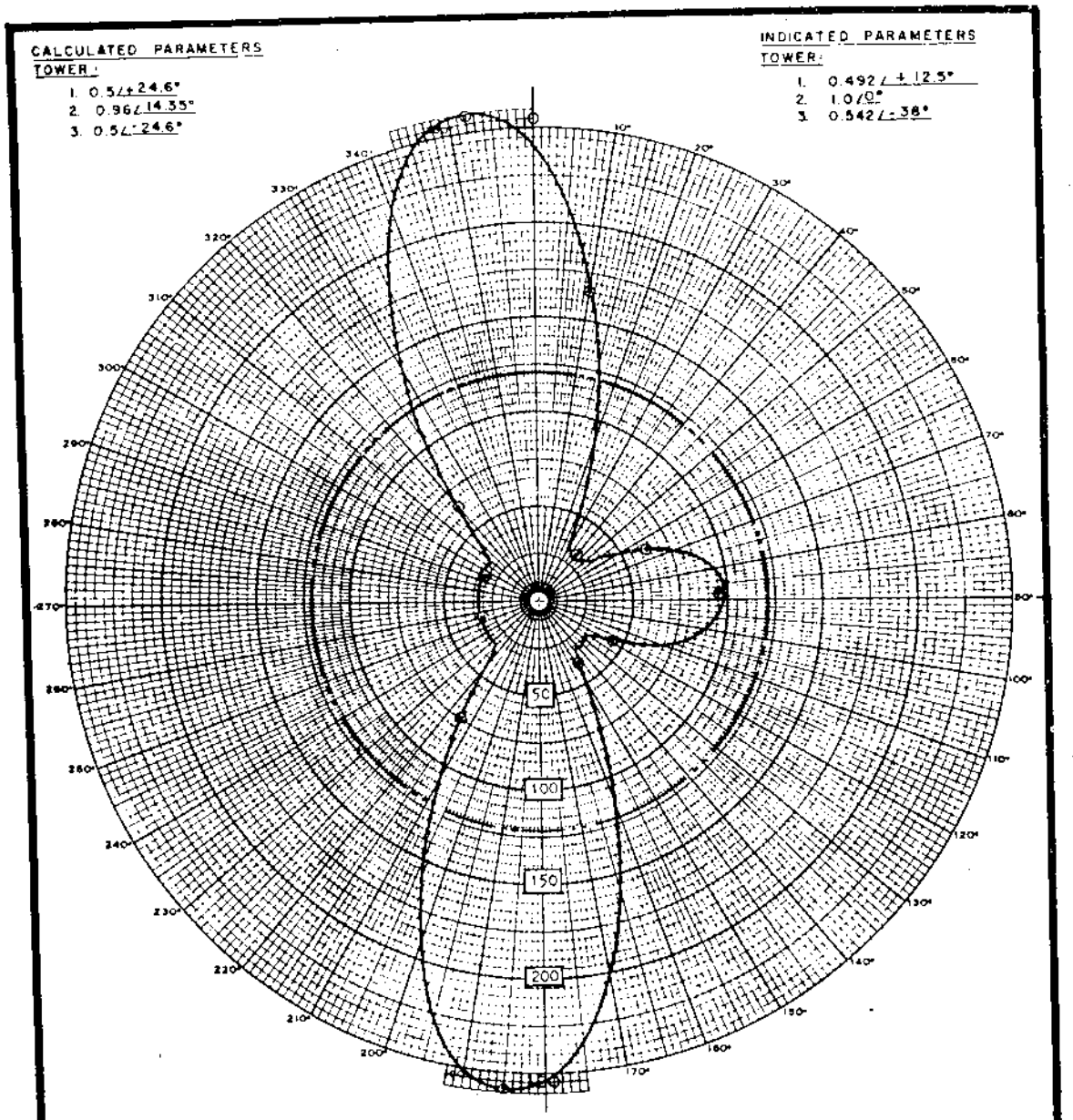
WJAX, Jacksonville, Fla. 930 kc

WKCT

Measured Night
(12-29-65ct)

Station WKCT
Bowling Green, Kentucky

500w,1kw-LS,DA-N,U
930 kc



LATITUDE: 37° 01' 53" LONGITUDE: 86° 26' 18"	ANTENNA PARAMETERS S—S—S N-88°-E #3 #2 #1 S = 232° G = 90°	FIGURE 15 MEASURED NIGHTTIME DIRECTIONAL PATTERN RADIO STATION WKCT BOWLING GREEN, KENTUCKY 930 KC 0.5 1KW-LS,DA-N,U
JOHN H. MULLANEY AND ASSOCIATES A DIVISION OF MULTRONICS INC.		

FCC File No.8L-11168
Accepted 12-22-65

Station WKCT
Bowling Green, Kentucky

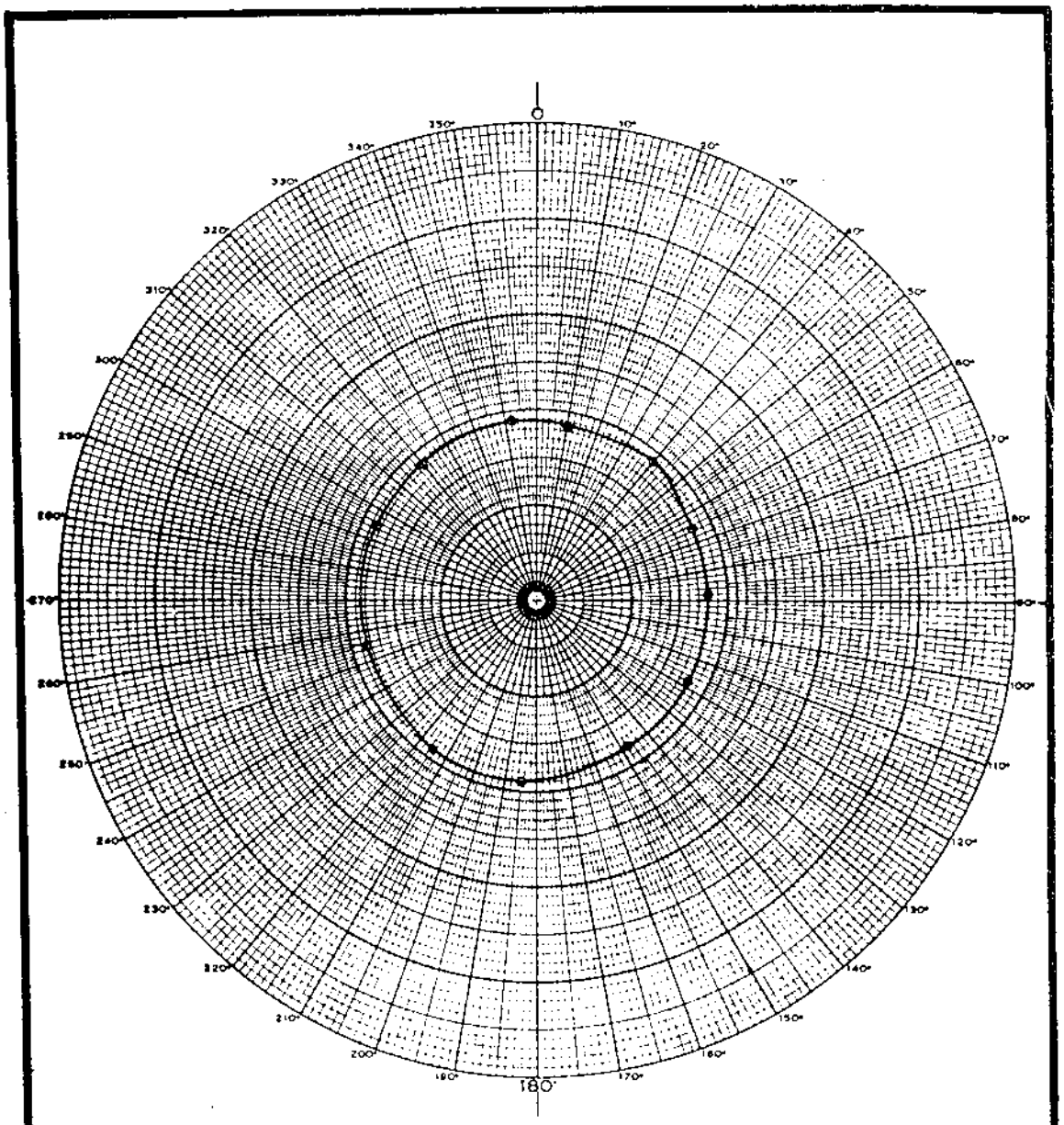
930 kc

WKCT

Measured Non-DA
(12-29-65ct)

Station WKCT
Bowling Green, Kentucky

500w,1kw-LS,DA-N,U
930 kc



E_{RMS} = 185 MV/M

LATITUDE: 37° 01' 53"
LONGITUDE: 86° 26' 18"

JOHN H. MULLANEY AND ASSOCIATES
A DIVISION OF MULTRONICS INC

ANTENNA PARAMETERS

TOWER #2

FIGURE 14

MEASURED DAYTIME NONDIRECTIONAL PATTERN

RADIO STATION WKCT
BOWLING GREEN, KENTUCKY

930 KC 0.5/1 KW-LS,DA-N,U.

FCC File No.BL-11168
Accepted 12-22-65

Station WKCT
Bowling Green, Kentucky

930 kc

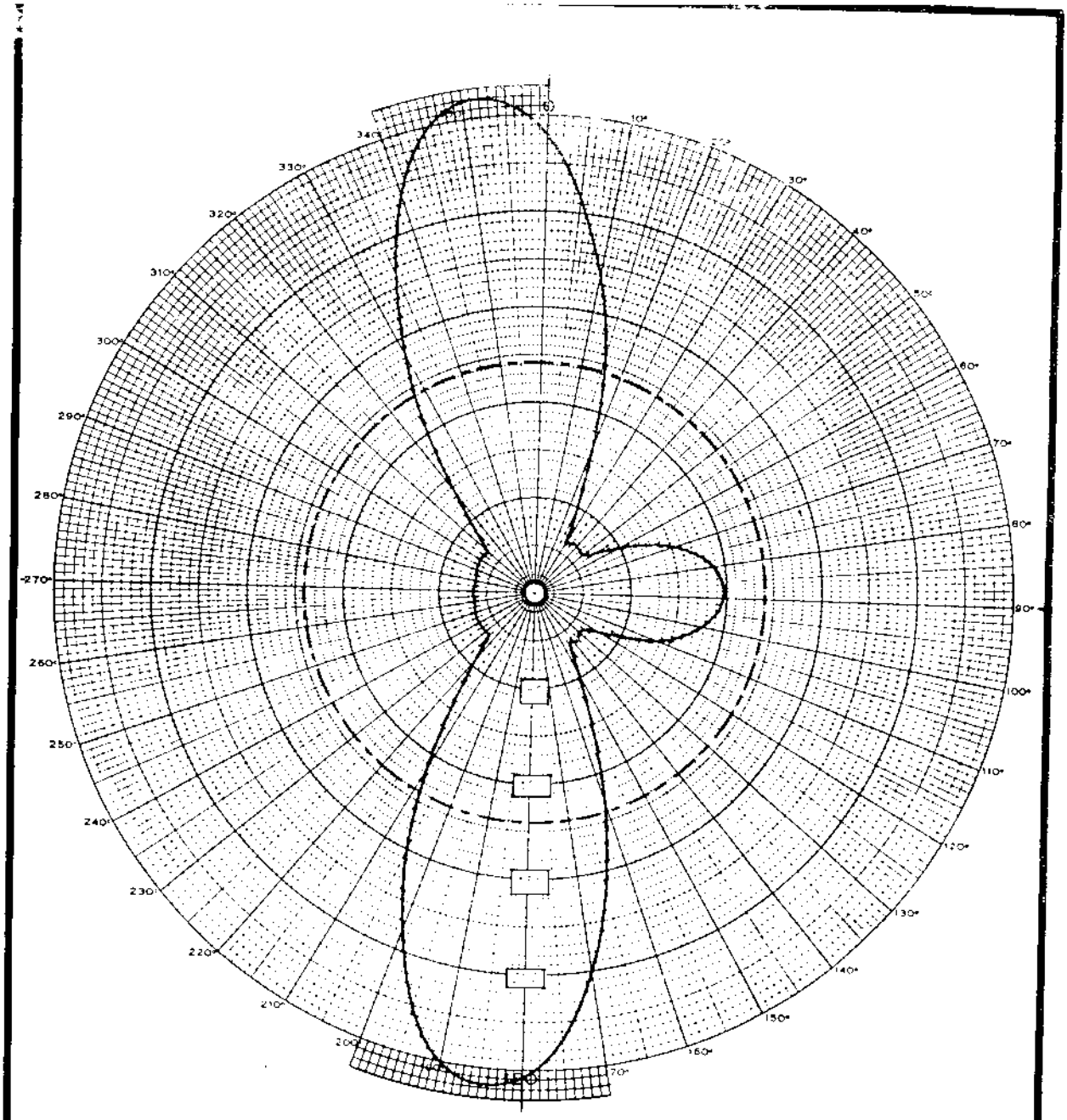
WKCT

Proposed Night
(6-28-65ct)

Station WKCT
Bowling Green, Kentucky

500w,1kw-LS,DA-N,U
930 kc

6-17-65
AG DA-N



E_{RMS} = 1203 MV/M (BY ADJUSTMENT)

——— CALCULATED
— · — R.M.S.

LATITUDE: 37° 01' 53"
LONGITUDE: 86° 26' 18"

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

ANTENNA PARAMETERS

0.5/-24.6° 0.96/14.35° 0.5/24.6°
S S N-88°-E
#3 #2 #1

S = 232°
G = 90°

FIGURE 4

PROPOSED NIGHTTIME
DIRECTIONAL PATTERN

RADIO STATION WKCT
BOWLING GREEN, KENTUCKY

930KC 0.5 1KW-LS, DA-N,U

FCC File No. BP-16568
Accepted 6-4-65

Station WKCT
Bowling Green, Kentucky

930 kc

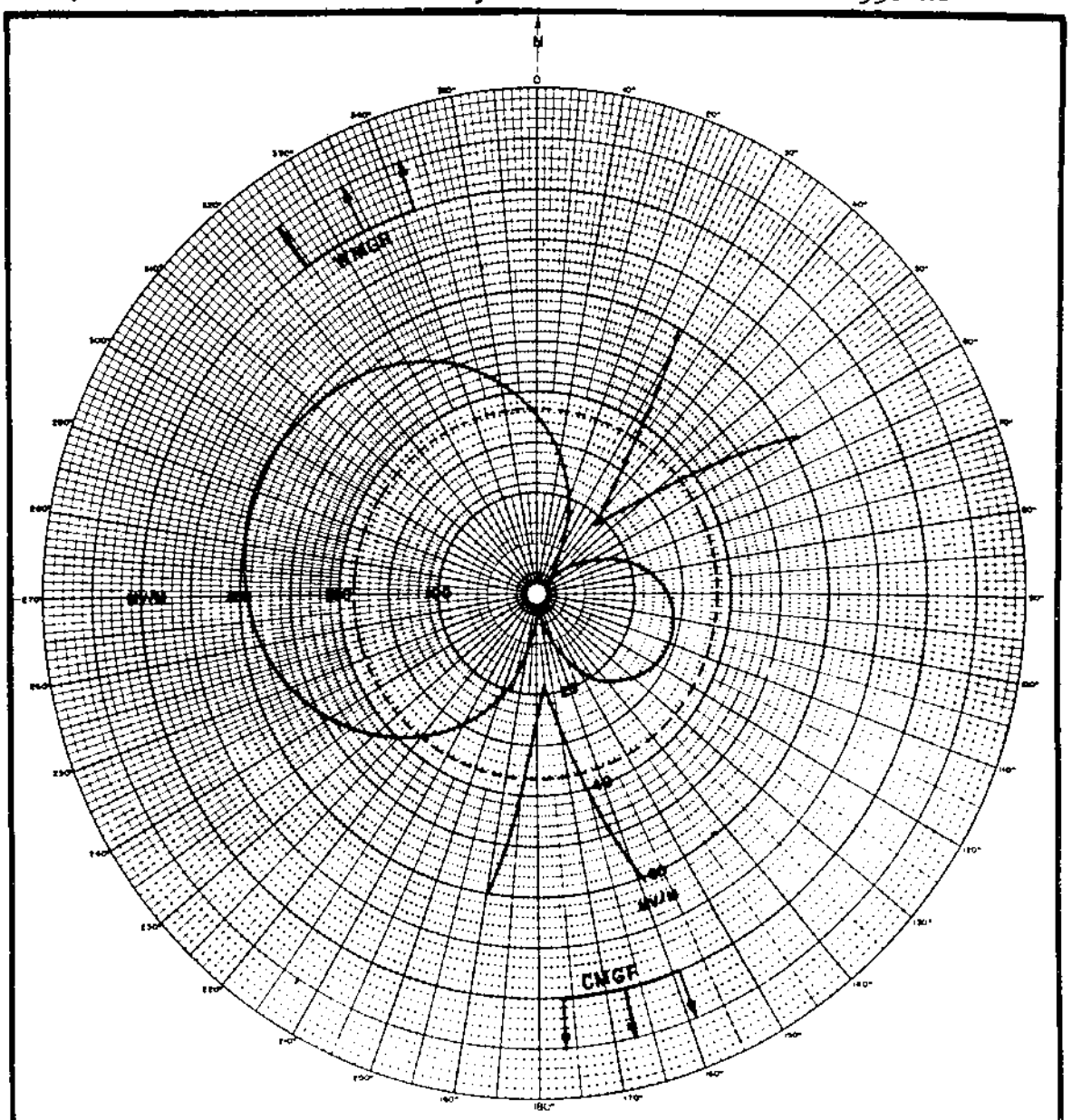
WKXY

Proposed Day
(5-25-62ct)

Station WKXY
Sarasota, Florida

500w,1kw-LS,DA-2,U
930 kc

5/13/64 granted CP change DA-D
BP-16542
1-29-65 CP TO REPLACE EXPIRED PERMIT BP-15474



E_{RMS} = 184.5 MV/M

LATITUDE 27° 20' 36.3"
LONGITUDE 82° 31' 09.6"

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

ANTENNA PARAMETERS

1/0° #1
74°
#2
0.91/150°
N-109°-E
G = 71.5°

FIGURE I
PROPOSED DAYTIME HORIZONTAL POLAR PATTERN
RADIO STATION WKXY
SARASOTA, FLORIDA
930 KC 0.5N/1D, DA-2

FCC File No.BP-15474
Accepted 5-16-62

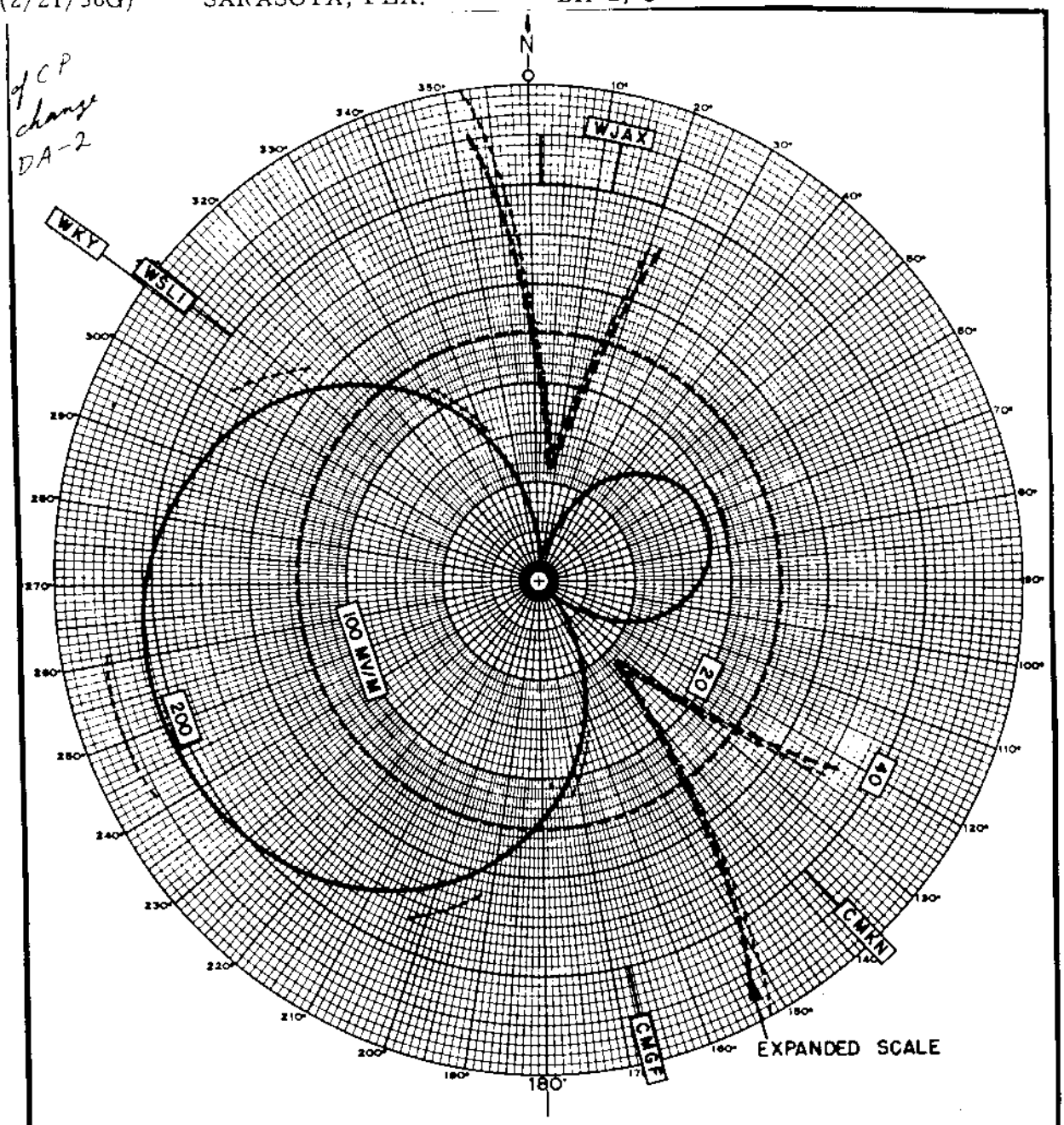
Station WKXY
Sarasota, Florida

930 kc

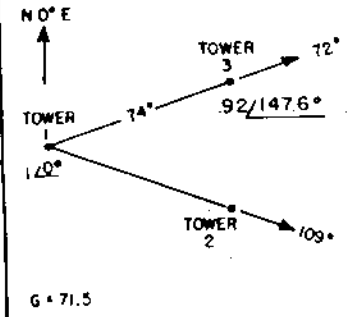
WKXY

PROPOSED NIGHT (2/21/56G) | STATION WKXY SARASOTA, FLA. | 0.5, 1 KW-LS DA-2, U | 930 KC

Granted Mod. of CP (12/18/57) to change from DA-D to DA-2



LATITUDE: 27° 20' 36.6"
LONGITUDE: 82° 31' 09.6"



JOHN H. MULLANEY
Consulting Radio Engineer
Washington, D. C.

FIGURE 4-A
HORIZONTAL PATTERN
NIGHTTIME
RADIO STATION WKXY
SARASOTA, FLA.

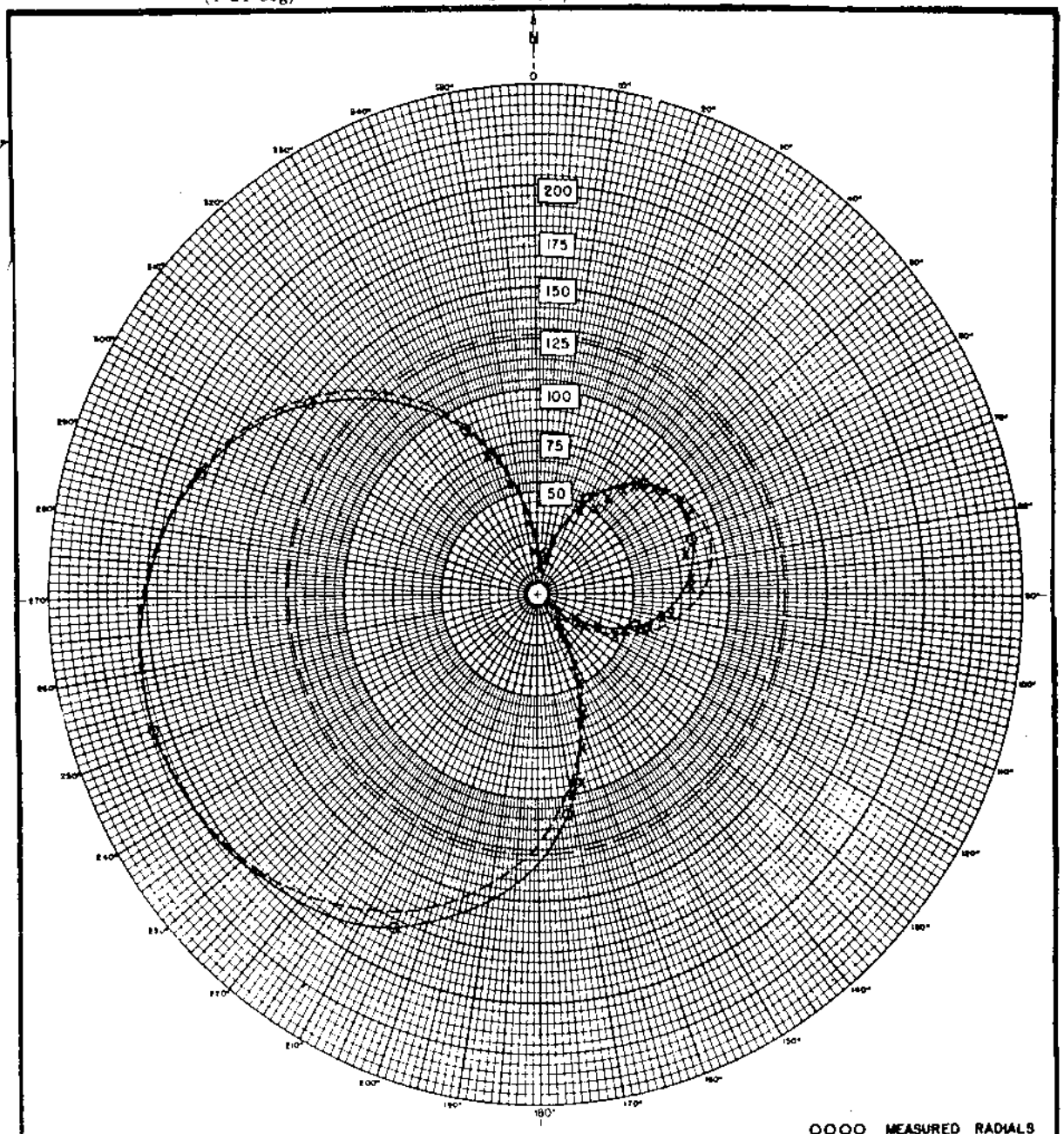
930 KC PRESENT (CP) 1KW-DA-D
930 KC PROPOSED .5-1.KW-LS,DA-2

FCC File No. BMP-7046 Accepted 12-13-55 WKXY, Sarasota, Fla. 930 KC

WKXY

MEASURED NIGHT (4-24-58g) | Station WKXY Sarasota, Florida | 500w,1kw-LS, DA-2,U 930 KC

Granted (7/2/58) license for change from DA-D to DA-2



OOOO MEASURED RADIALS
XXXX CROSS RADIAL
—— MEASURED PATTERN
– – – CALCULATED PATTERN

E_{RMS} = 127.5 MV/M

LATITUDE: 27° 20' 36.3"
LONGITUDE: 82° 31' 09.6"

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

ANTENNA PARAMETERS

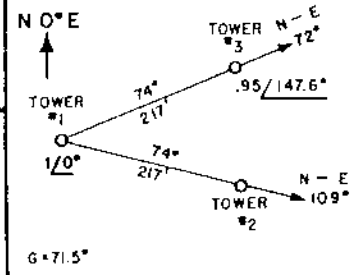


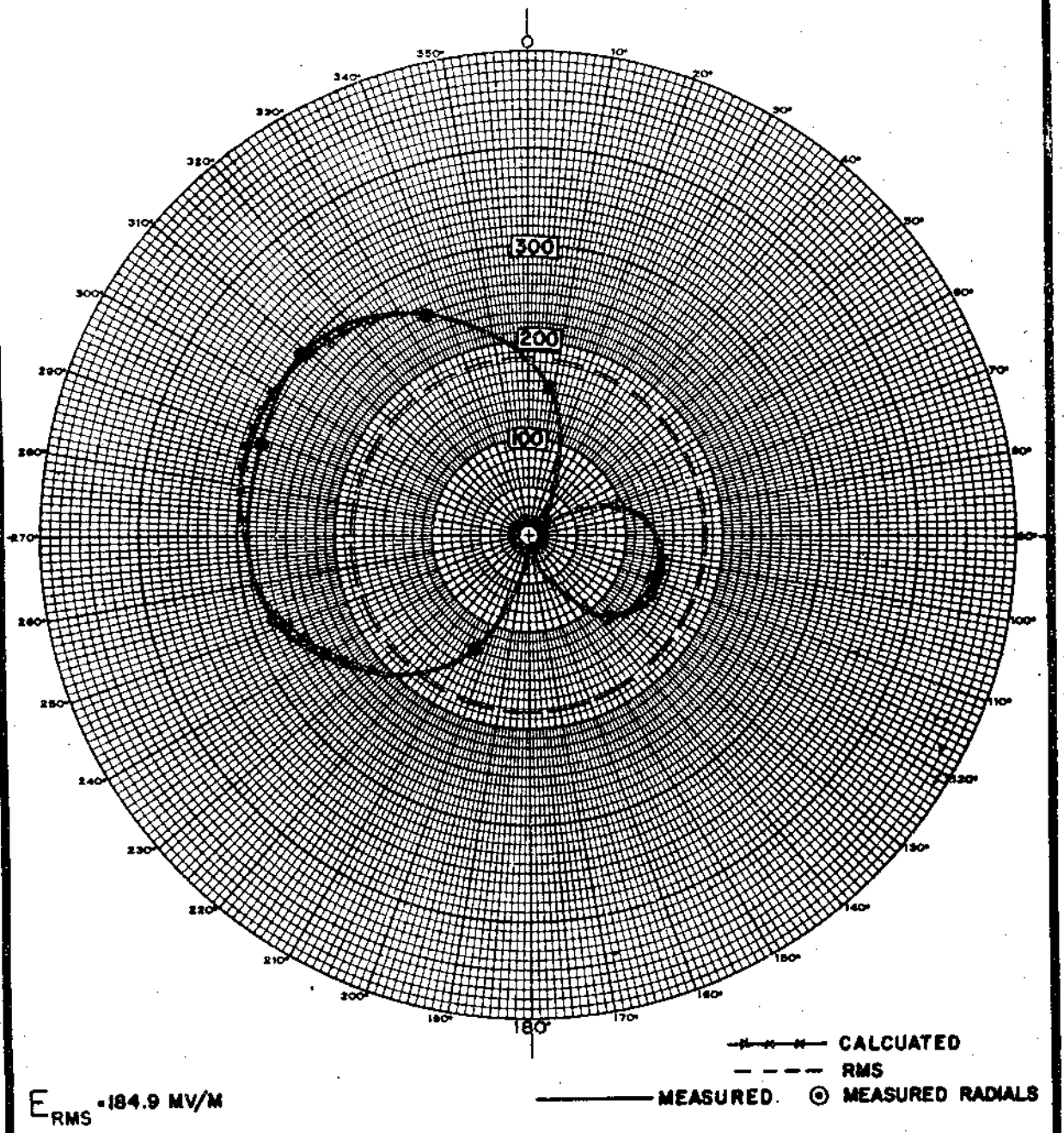
FIGURE 19

MEASURED NIGHTTIME HORIZONTAL POLAR PATTERN RADIO STATION WKXY SARASOTA, FLORIDA

930 KC 0.5 KW-1KW LS, DA-2

FCC File No. BL-7074 Accepted 4-11-58 | WKXY Sarasota, Florida | 930 KC

WKXY



LATITUDE: 27° 20' 36.3"
LONGITUDE: 82° 31' 09.6"

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

ANTENNA PARAMETERS

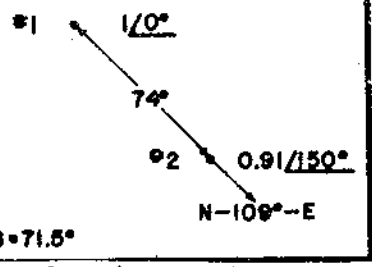


FIGURE 17

DAYTIME DIRECTIONAL HORIZONTAL PATTERN

RADIO STATION WKXY
SARASOTA, FLORIDA

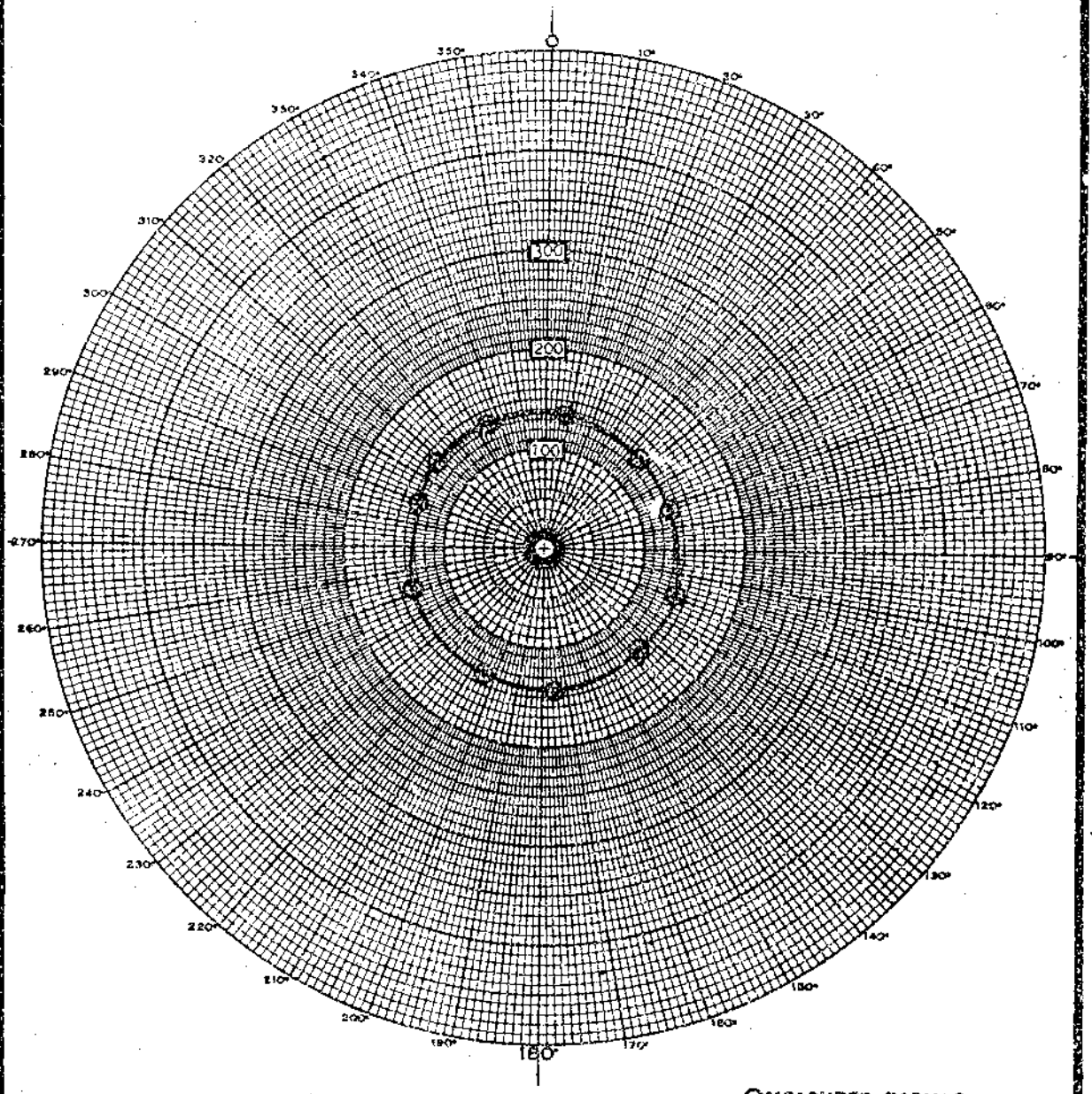
930 KC 0.5 KW,1KW-LS,DA-2,U

Measured Non-DA
(5-27-65ct)

Station WKXY
Sarasota, Florida

500w,1kw-LS,DA-2,U
930 kc

IC
-19-65
HE DA



LATITUDE: 27° 20' 35.3"
LONGITUDE: 82° 31' 08.6"

ANTENNA PARAMETERS

G=71.5°

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

FIGURE 15

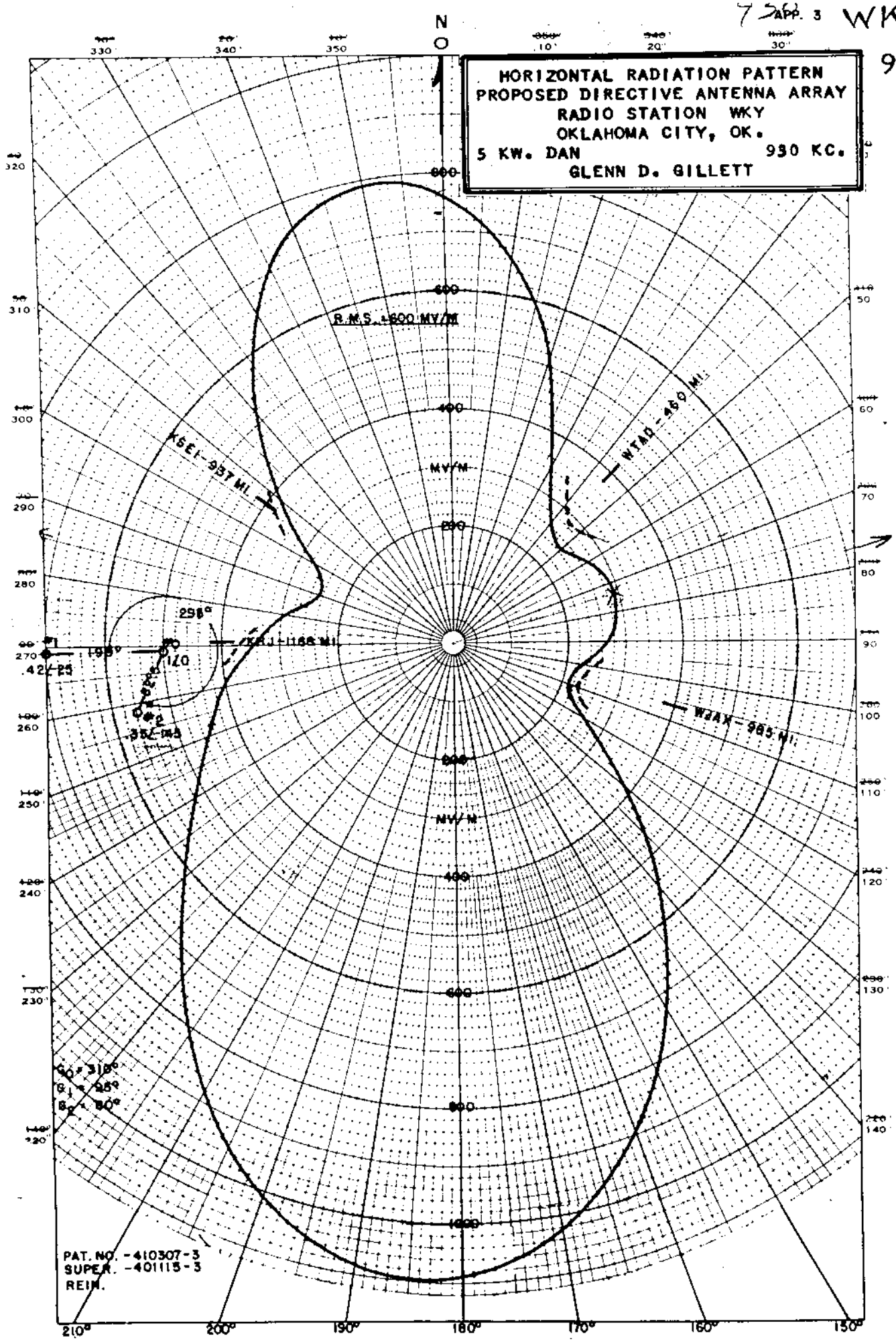
MEASURED NON-DIRECTIONAL HORIZONTAL PATTERN

RADIO STATION WKXY
SARASOTA, FLORIDA

930 KC 0.5 KW, 1 KW-LS, DA-2, U

7 Sept. 3 WKY

930



168.5

410307-3

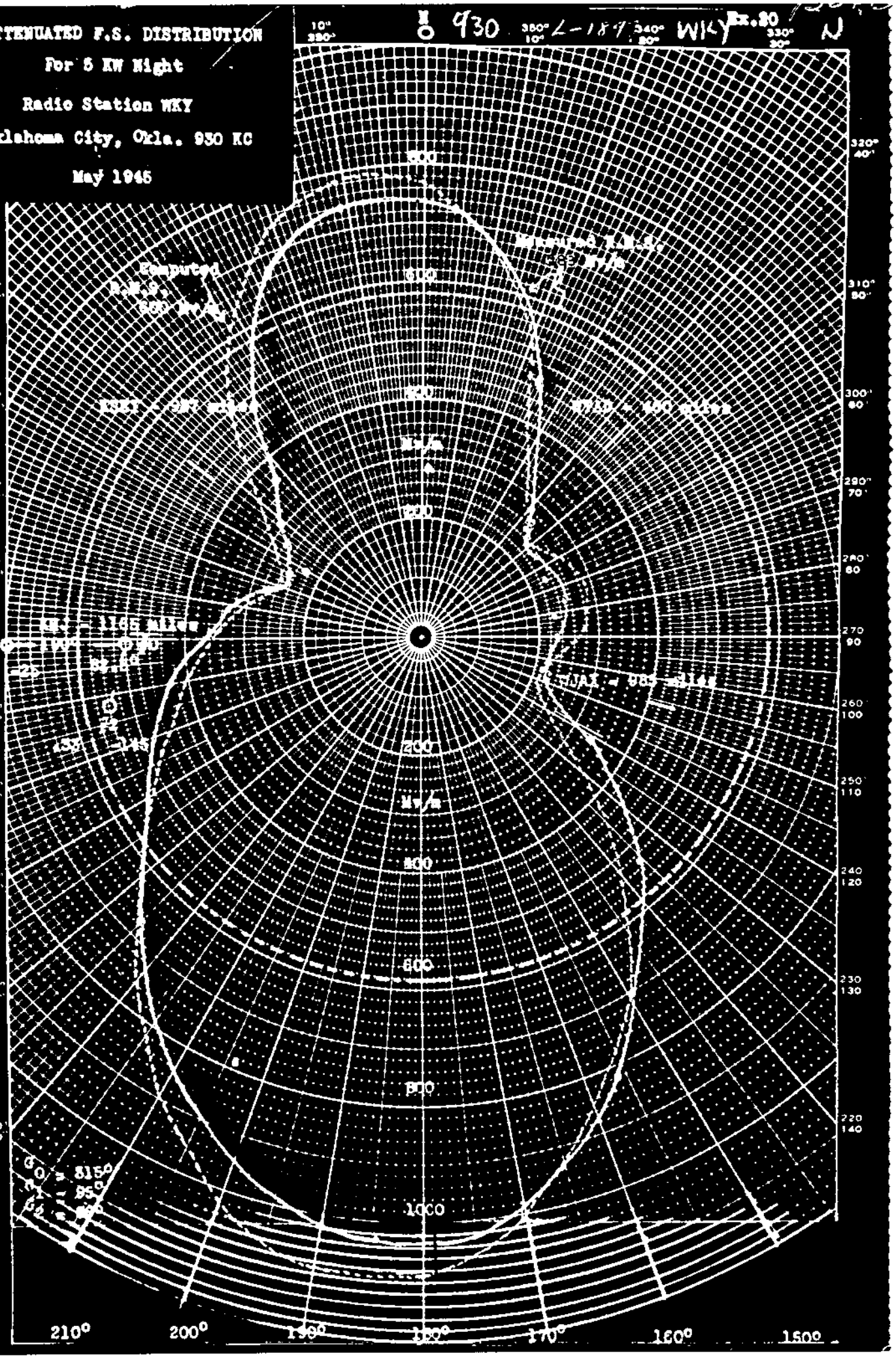
UNATTENUATED F.S. DISTRIBUTION

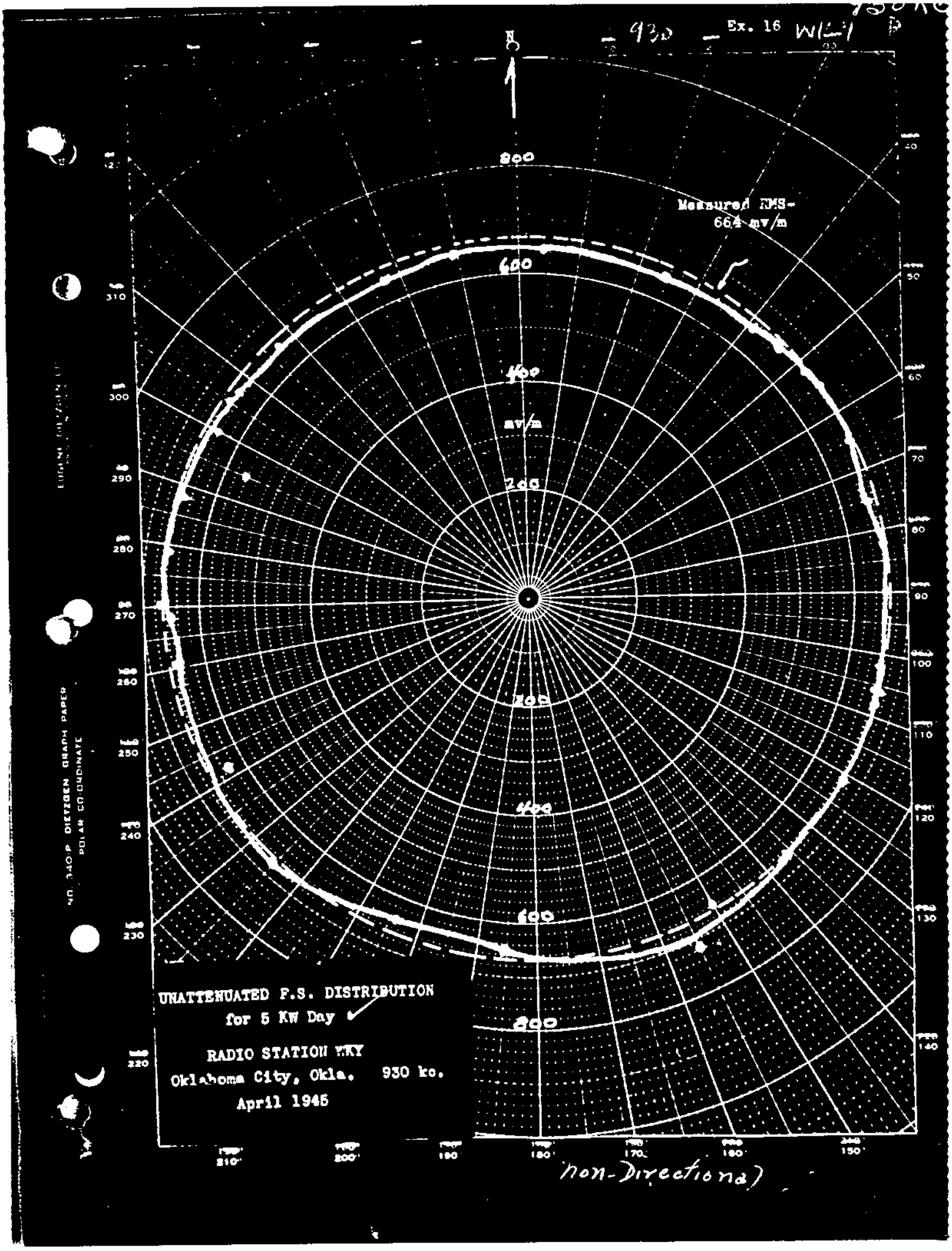
For 5 KW Night

Radio Station WKY

Oklahoma City, Okla. 930 KC

May 1945



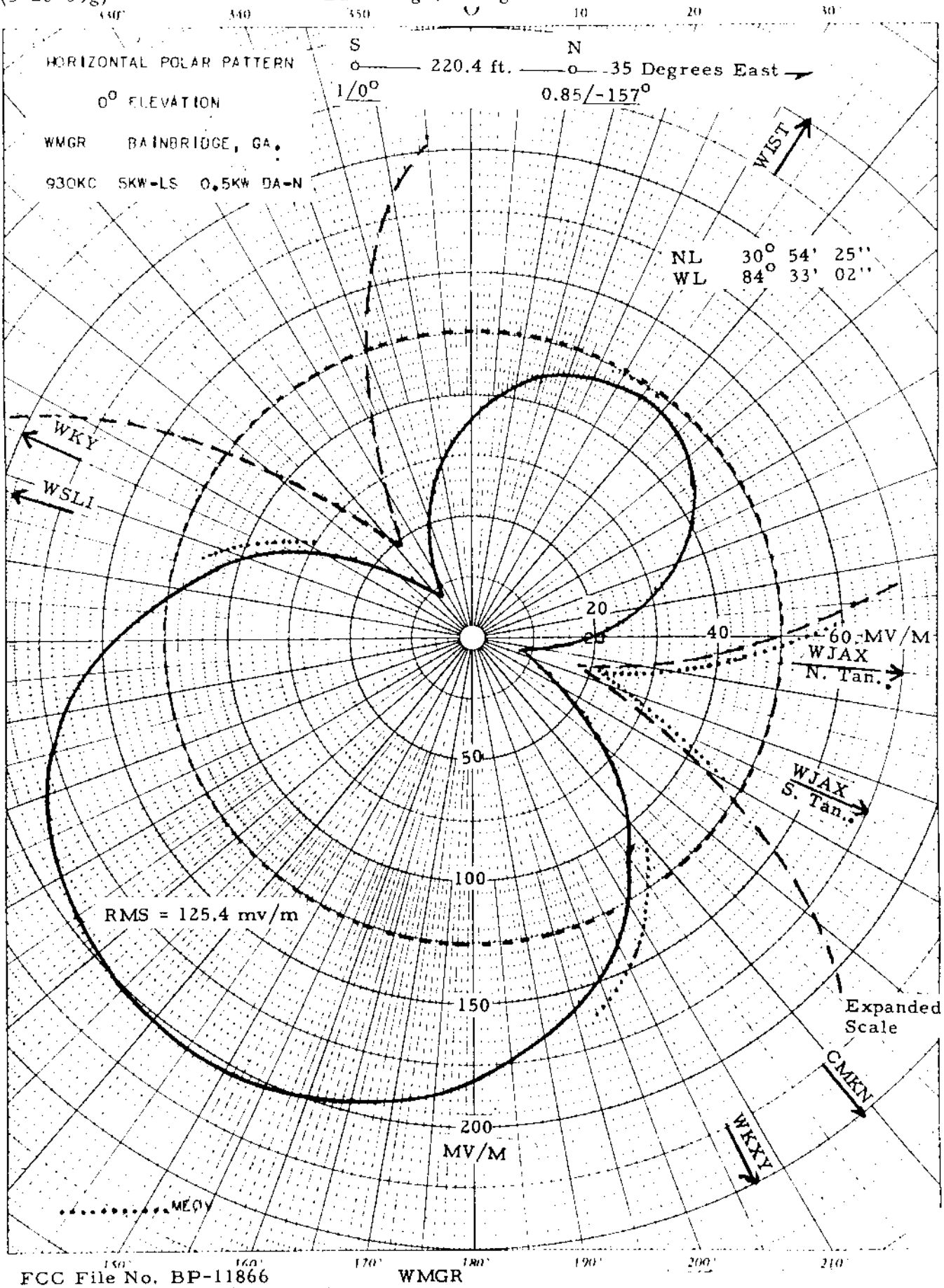

930
Ex. 16
N
800
600
400
mv/m
200
400
600
800
Measured RMS-
664 mv/m
UNATTENUATED F.S. DISTRIBUTION
for 5 KW Day
RADIO STATION WKY
Oklahoma City, Okla. 930 kc.
April 1945
(non-Directional)

WMGR

PROPOSED NIGHT
(5-28-59g)

Station WMGR
Bainbridge, Georgia

500w, 5kw-LS, DA-N,U
930 KC



FCC File No. BP-11866
Accepted 4-24-59 (Amended)

WMGR
Bainbridge, Georgia

930 KC

Granted for submittal DA-N 9-2-59

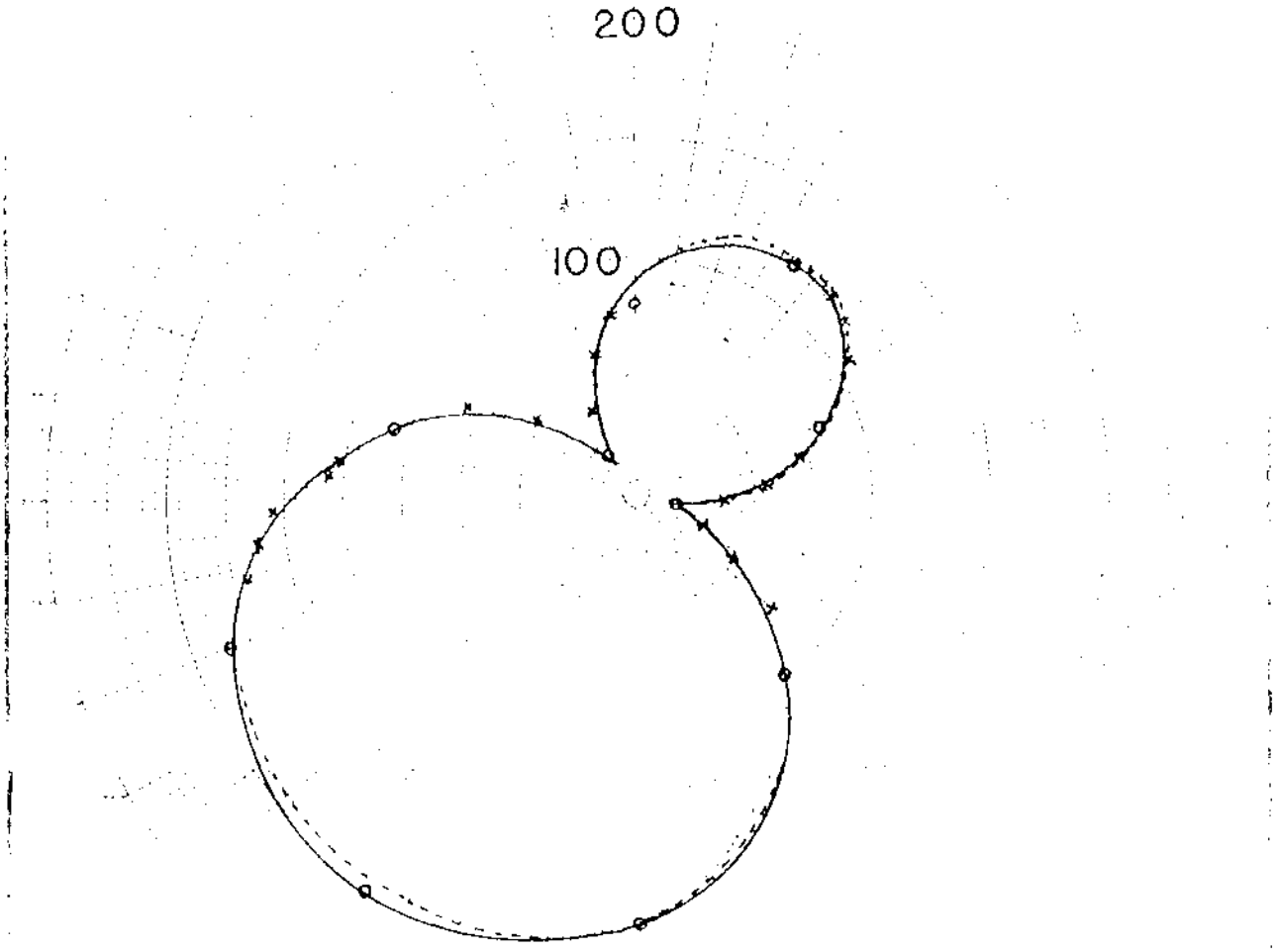
Granted K-DA-N 6-22-60

WMGR

MEASURED NIGHT
(2-26-60g)

Station WMGR
Bainbridge, Georgia

500w, 5kw-LS, DA-N,U
930 KC



COMPUTED- - - -
MEASURED———
RADIALS ooo
CROSS RADIAL XXX

126.3 MV/M

30° 54' 25"
84° 33' 02"

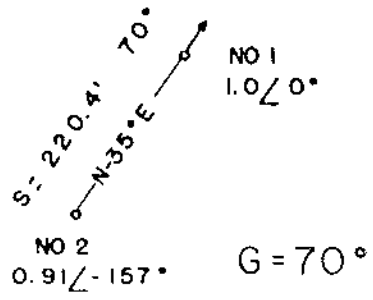


FIGURE 18

HORIZONTAL POLAR PATTERN

WMGR

BAINBRIDGE, GEORGIA

AMBROSE W. KRAMER

.930KC 0.5KW-5KW LS.DAN

FCC File No. BL-7816
Accepted 2-11-60

WMGR
Bainbridge, Georgia

930 KC

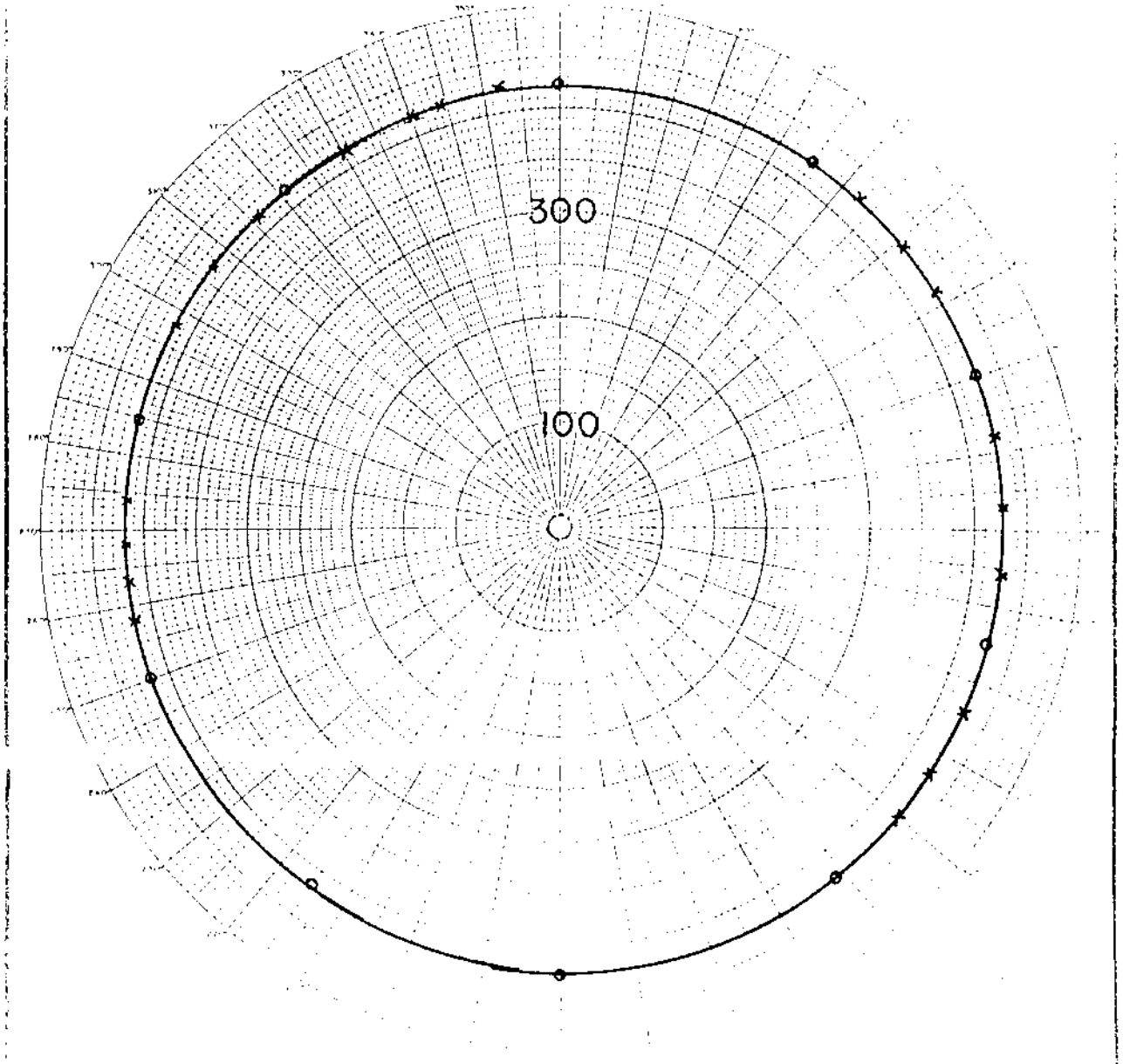
Granted X - DAN - 6-22-60

WMGR

MEASURED NON-DA
(2-26-60g)

Station WMGR
Bainbridge, Georgia

500w, 5kw-LS, DA-N,U
930 KC



MEASURED ooo
RADIALS CROSS x x x

425 MV/M

30° 54' 25"
84° 33' 02"

G = 70°

FIGURE 16

MEASURED NON-DA
HORIZONTAL POLAR PATTERN

WMGR
BAINBRIDGE, GA.

AMBROSE W. KRAMER
CONSULTING RADIO ENGINEER

FCC File No. BL-7816
Accepted 2-11-60

WMGR
Bainbridge, Georgia

930 KC

yes values per DAN 6-22-60

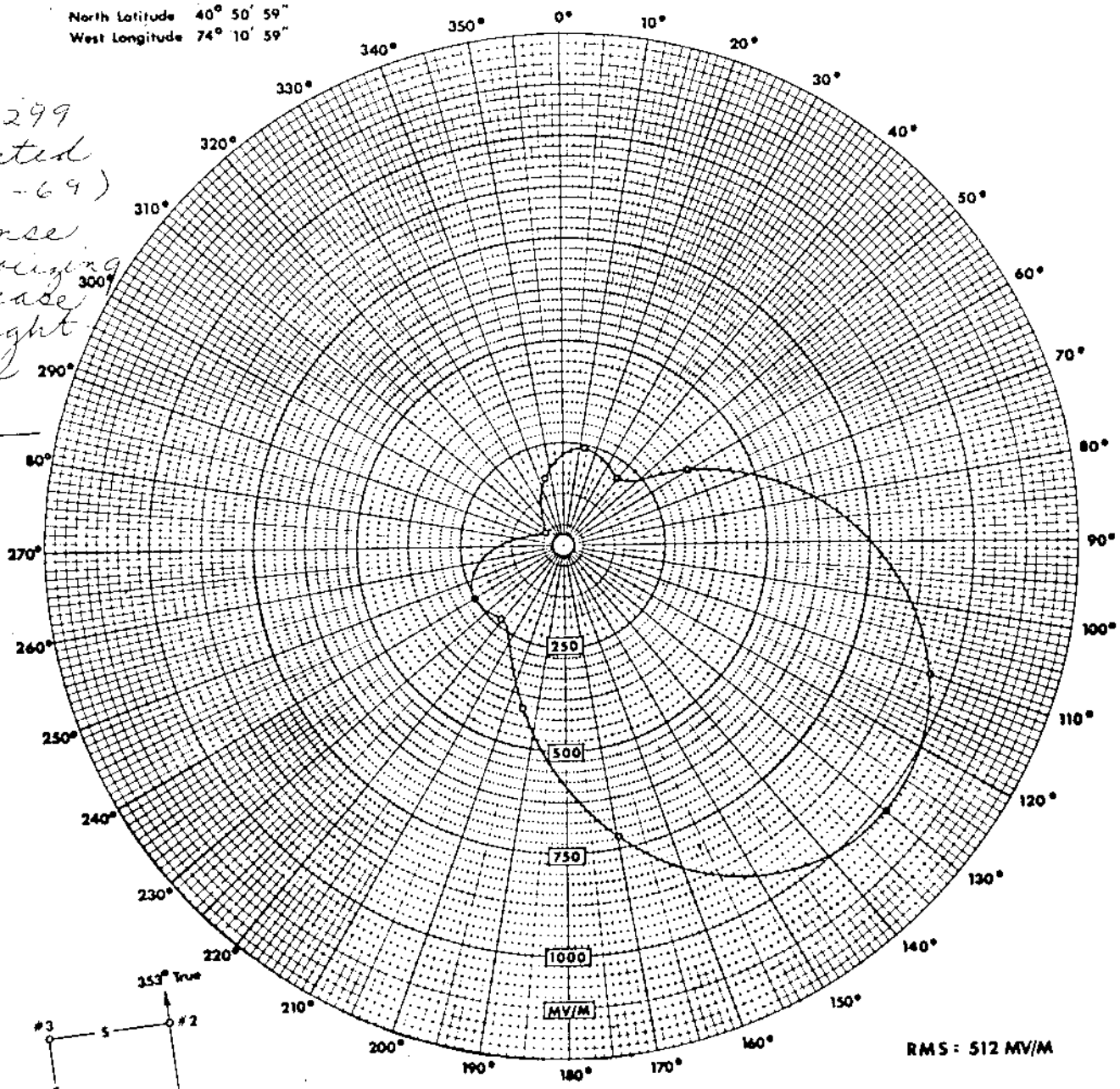
WPAT

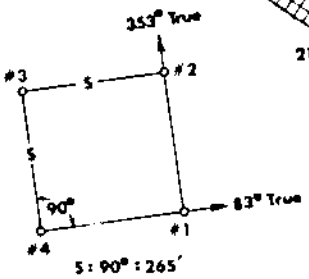
Measured Day
(5-27-66ct)

Station WPAT
Paterson, New Jersey

5kw,DA-2,U
930 kc

BL-11299
Granted
(12-10-69)
license
authorizing
increase
in night
time
MEOV





	Theoretical	Measured
#1	0.44 /126°	0.23/147°
#2	0.67 /-116°	0.53/-108°
#3	1.0 /0°	1.0 /0°
#4	0.67 /-118°	0.67/-126°

MEASURED DAYTIME DIRECTIONAL PATTERN
WPAT — Paterson, New Jersey
930 Kc 5 Kw DA-2

April 1966

GAUTHEY & JOHNS
CONSULTING RADIO ENGINEERS

FCC File No. BL-11299
Accepted 5-24-66

Station WPAT
Paterson, New Jersey

930 kc

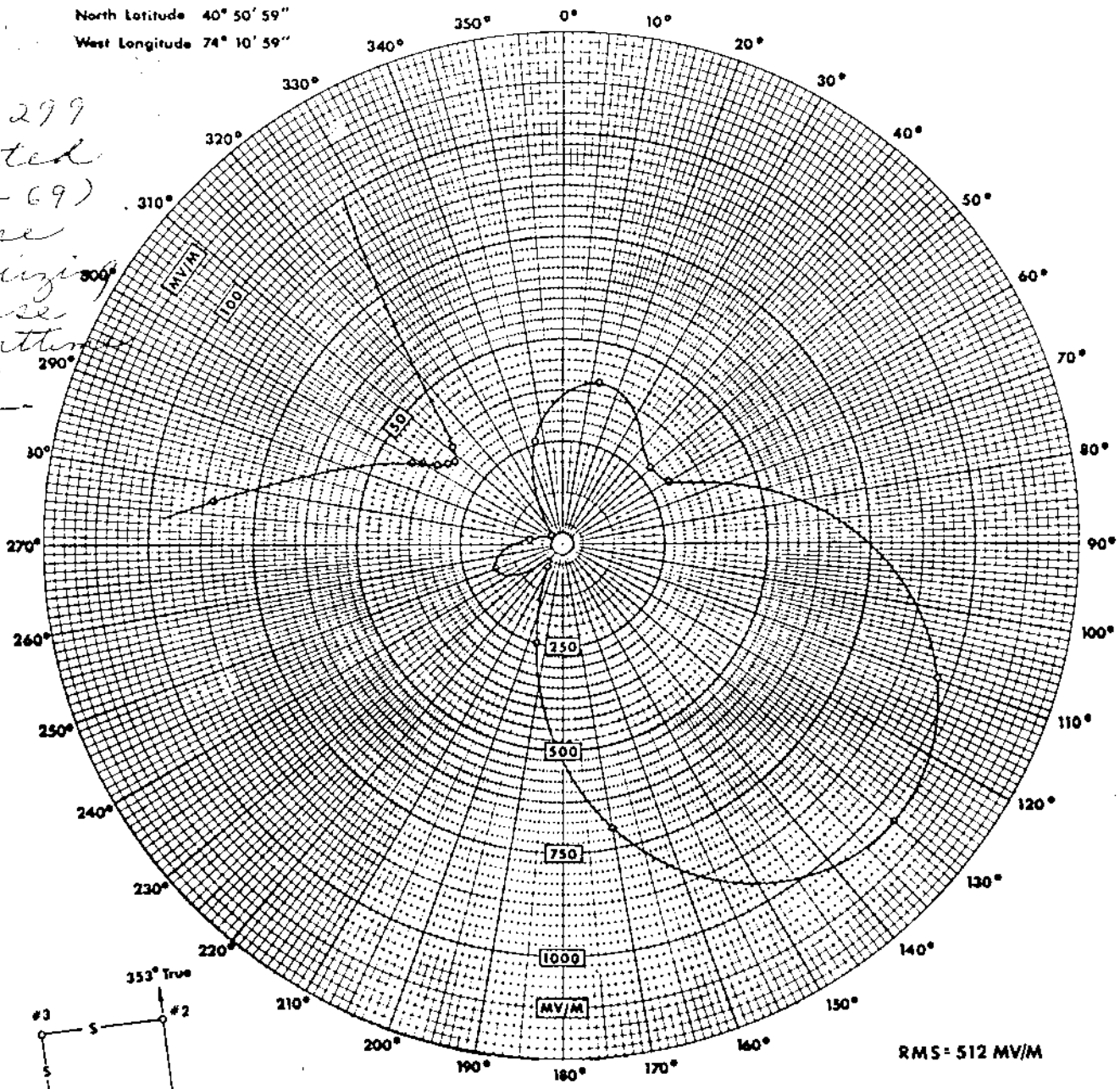
WPAT

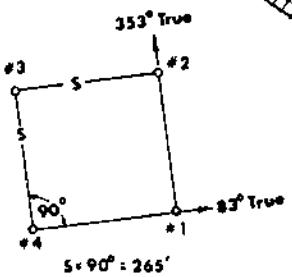
Measured Night
(5-27-66ct)

Station WPAT
Paterson, New Jersey

5kw,DA-2,U
930 kc

BL-11299
Granted
(12-10-69)
license
authorizing
increase
in nighttime
MEOV





S = 90° = 265'
G = 118° Top Loading

	Theoretical	Measured
# 1	0.67/114°	0.665/77°
# 2	1.0 /-116°	0.83/-119°
# 3	1.0 /0°	1.0 /0°
# 4	0.67/-130°	0.71/-156°

MEASURED NIGHTTIME DIRECTIONAL PATTERN
WPAT — Paterson, New Jersey
930 Kc 5Kw DA-2

April 1966

Gautney & Jones
Consulting Radio Engineers

FCC File No. BL-11299
Accepted 5-24-66

Station WPAT
Paterson, New Jersey

930 kc

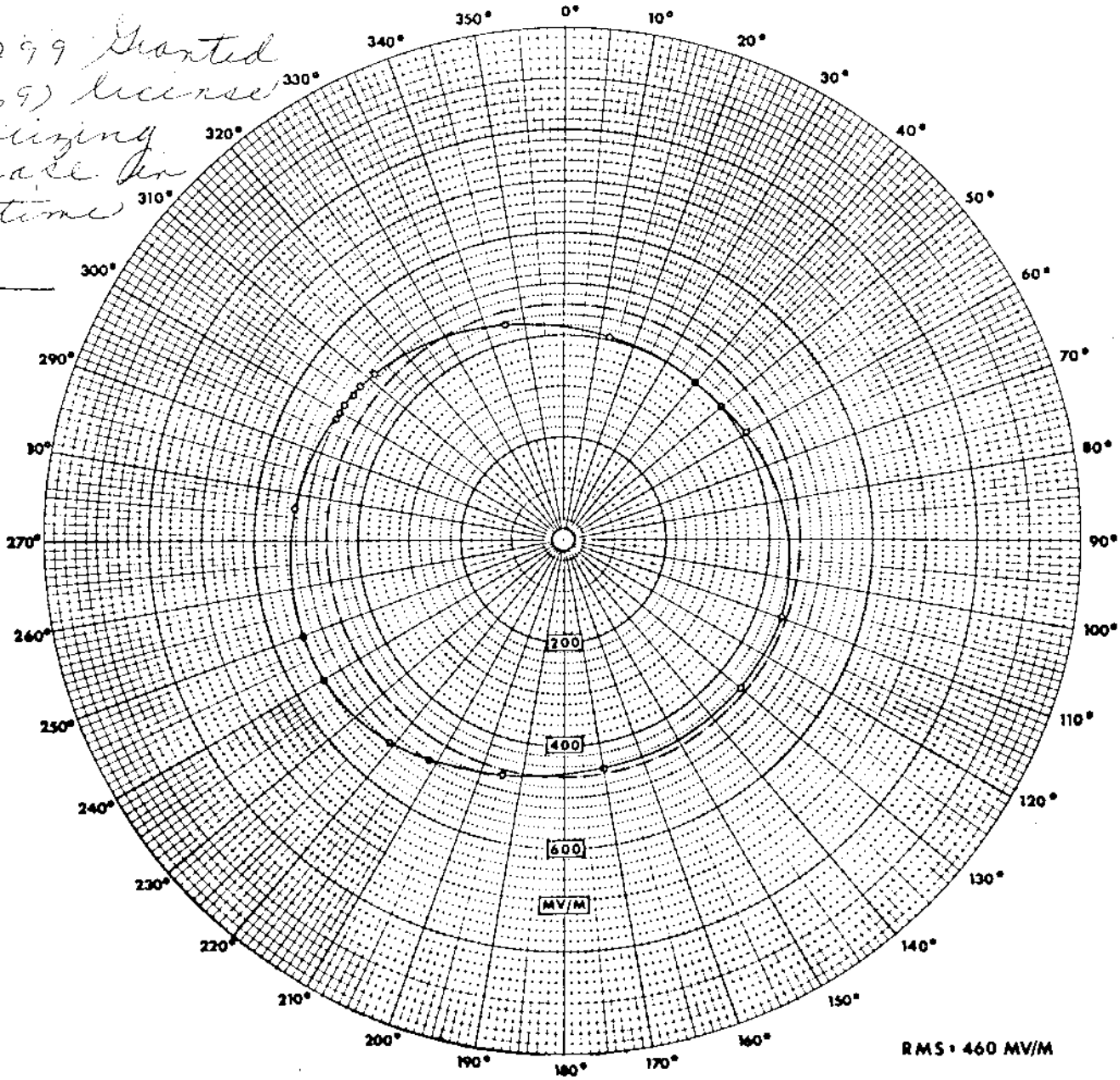
WPAT

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

Station WPAT
Paterson, New Jersey

5kw,DA-2,U
930 kc

BL-11299 Granted (12-10-69) license authorizing increase for nighttime MEOV



MEASURED NON-DIRECTIONAL PATTERN
WPAT — Paterson, New Jersey
930 Kc 5 Kw DA-2

April 1966

Gautney & Jones
Consulting Radio Engineers

FCC File No. BL-11299
Accepted 5-24-66

Station WPAT
Paterson, New Jersey

930 kc

WPAT

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WPAT | Main Studio: Paterson, New Jersey

Frequency: 930 kHz | Power: 5 KW

Notification List No. 1579 | Date: May 8, 1974 | Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM: North Latitude: 40° 50' 59"
West Longitude: 74° 10' 59"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-2)
Number of elements: 4
Type of elements: Series-excited, self-supporting, tapered, vertical steel towers, top loaded by a 50 foot diameter capacity top hat to an equivalent electrical height of 146.5 degrees (*).

TOWER:	NW(#3)	SW(#4)	SE(#1)	NE(#2)
HEIGHT ABOVE INSULATORS:	365'	365'	365'	365' (*)
NIGHT PHASING:	0°	-130°	+114°	-116°
NIGHT FIELD RATIO:	1.5	1.0	1.0	1.5
DAY PHASING:	+234°	+116°	0°	+118°
DAY FIELD RATIO:	2.25	1.5	1.0	1.5

SPACING AND ORIENTATION: The towers are located at the vertices of a parallelogram the long sides of which are 264.84' (90.155°) in length on a line bearing 83.713° true. The short sides are 261.60' (89.052°) in length on a line bearing 352.929° true.

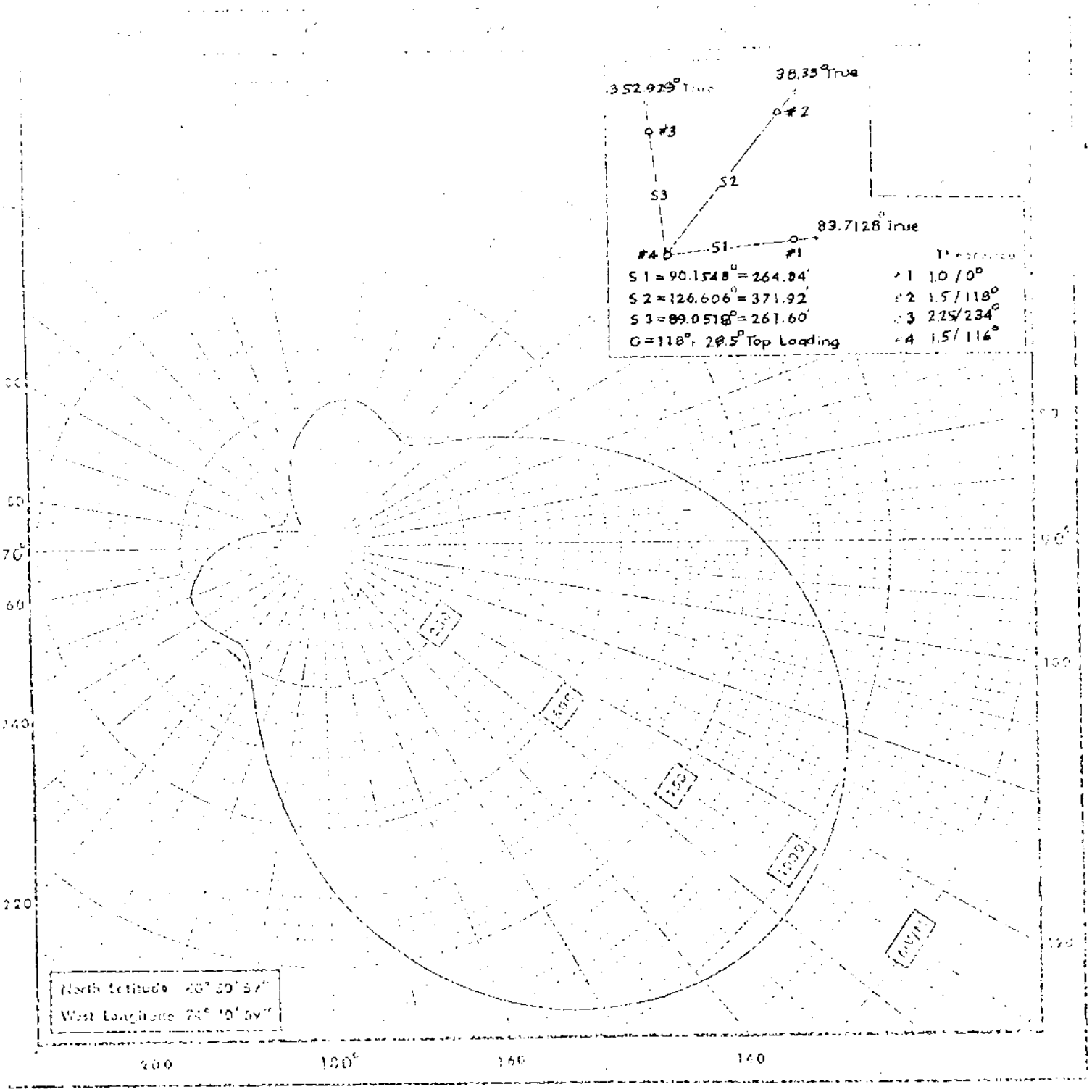
GROUND SYSTEM: 120-365' equally spaced copper radials plus a 40' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of systems are bonded together.

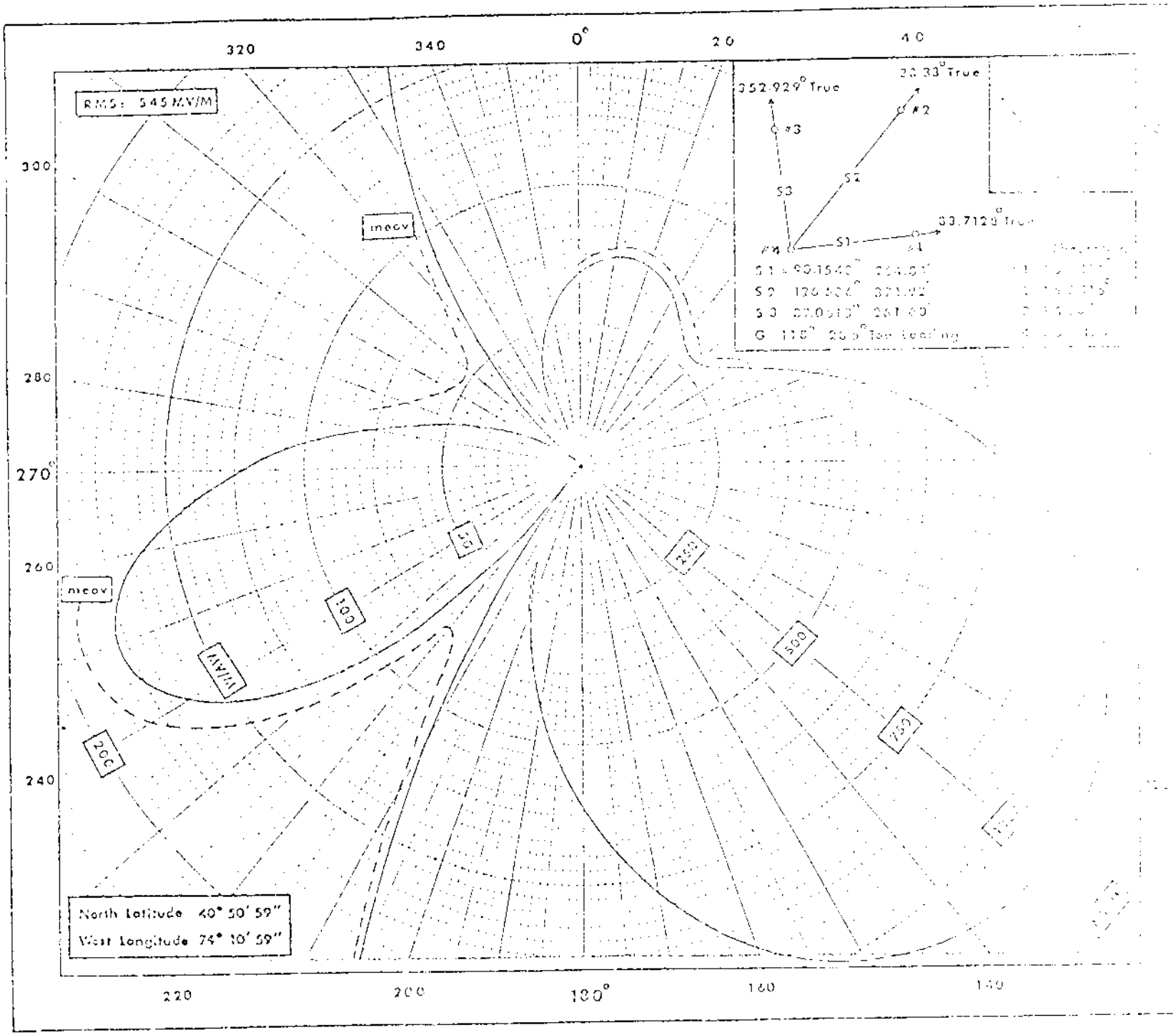
Predicted effective Night Field: 545 mv/m at rated power.

Predicted effective Day Field: 532 mv/m at rated power.

CTR NO 30003A3

WPAT


38.35° True
#2
#3
S3
S2
83.7128° True
#4
S1
#1
S 1 = 90.1548° = 264.84'
S 2 = 126.606° = 371.92'
S 3 = 89.0518° = 261.60'
G = 118°, 28.5° Top Loading
#1 1.0 / 0°
#2 1.5 / 118°
#3 2.25/234°
#4 1.5/ 116°
North Latitude 40° 30' 57"
West Longitude 75° 10' 54"
200
100°
160
140
70°
60
240
220
100

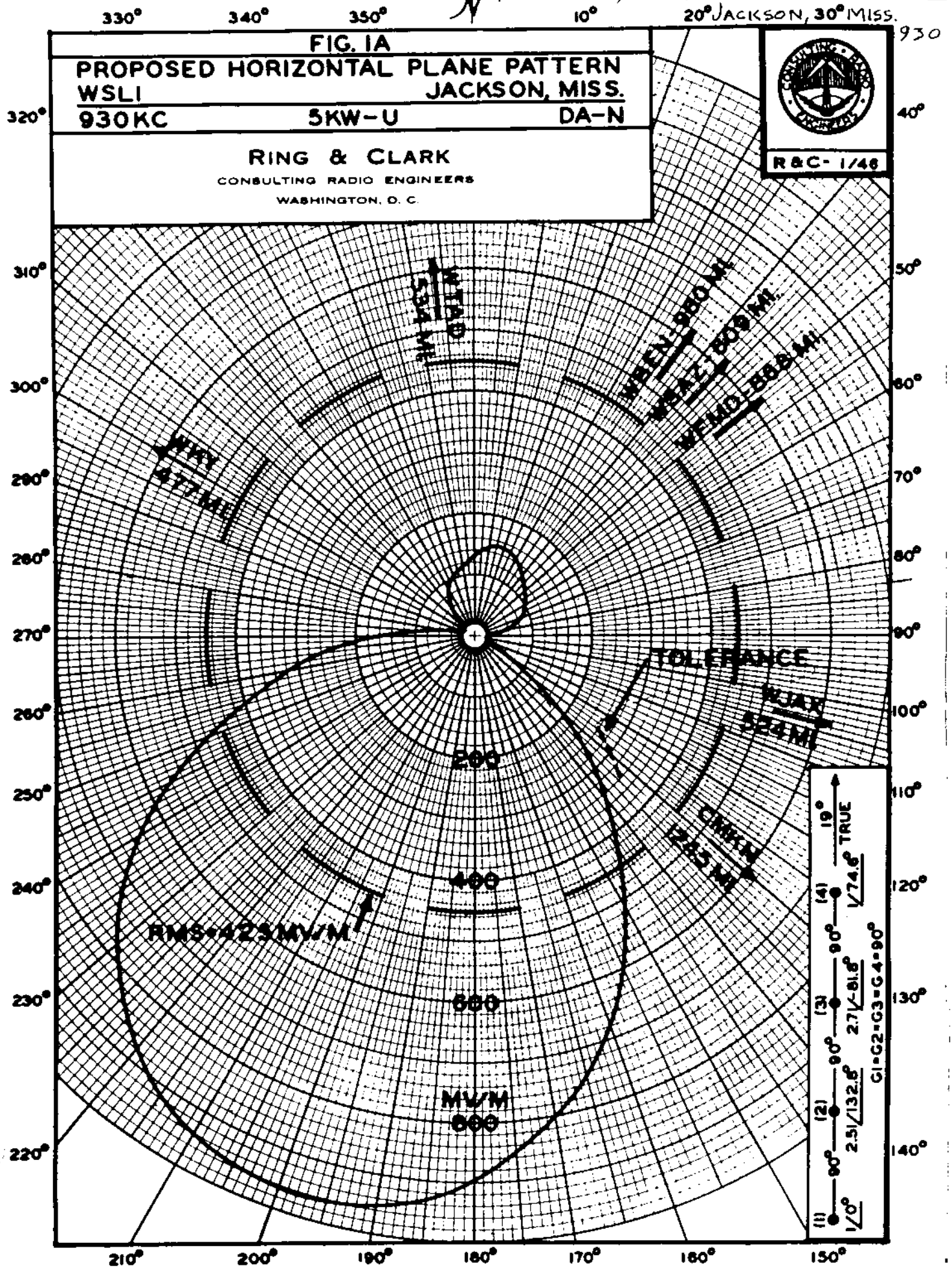

RMS: 545 MV/M
320
340
0°
20
40
300
280
270°
260
240
220
200
180°
160
140
352.929° True
20.33° True
33.7129° True
S1
S2
S3
G #1
G #2
G #3
G #4
mcov
mcov
25
100
250
500
750
1000
200
North Latitude 40° 50' 59"
West Longitude 74° 10' 59"

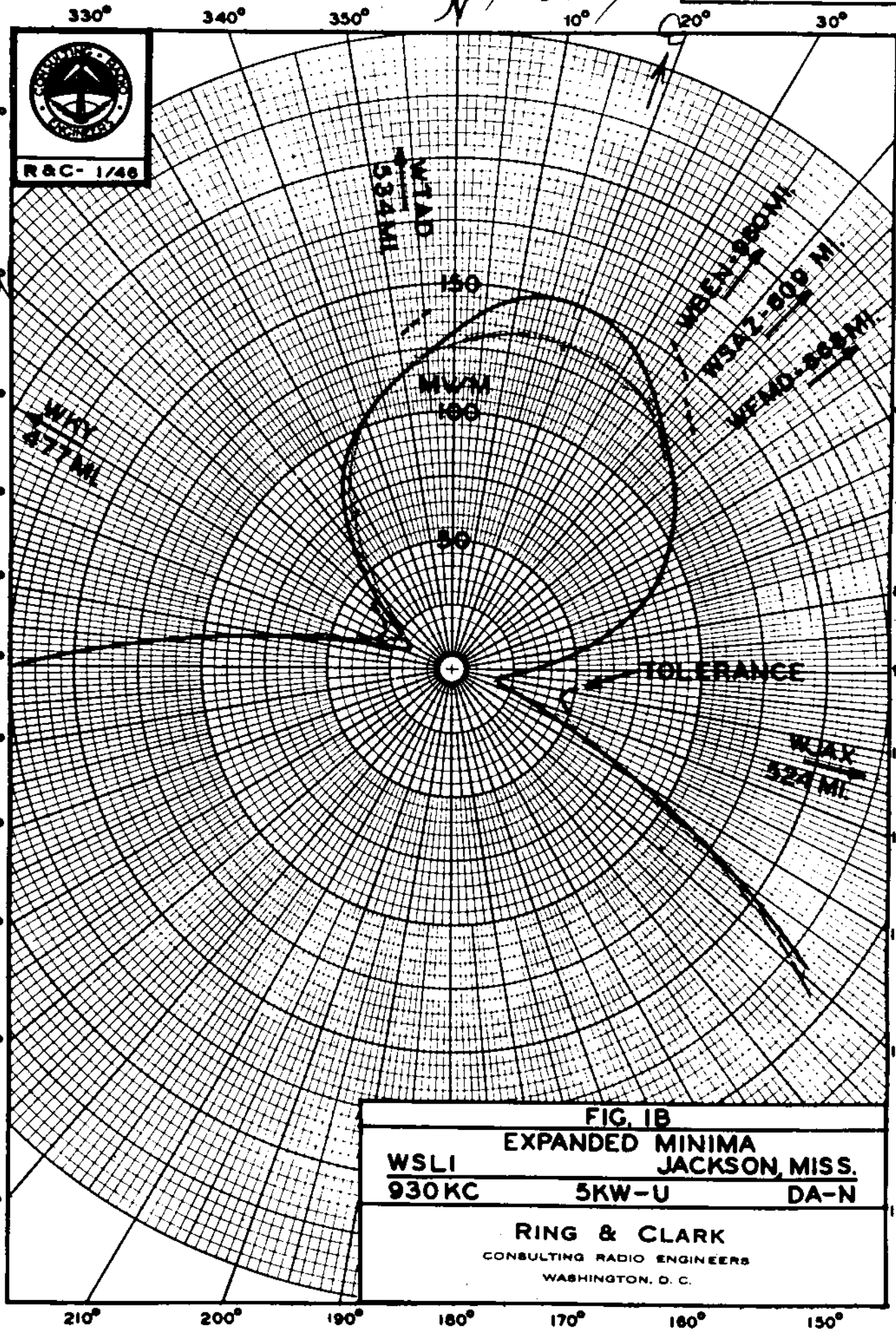
P-3977

WSLI-930KC

20° JACKSON, 30° MISS.

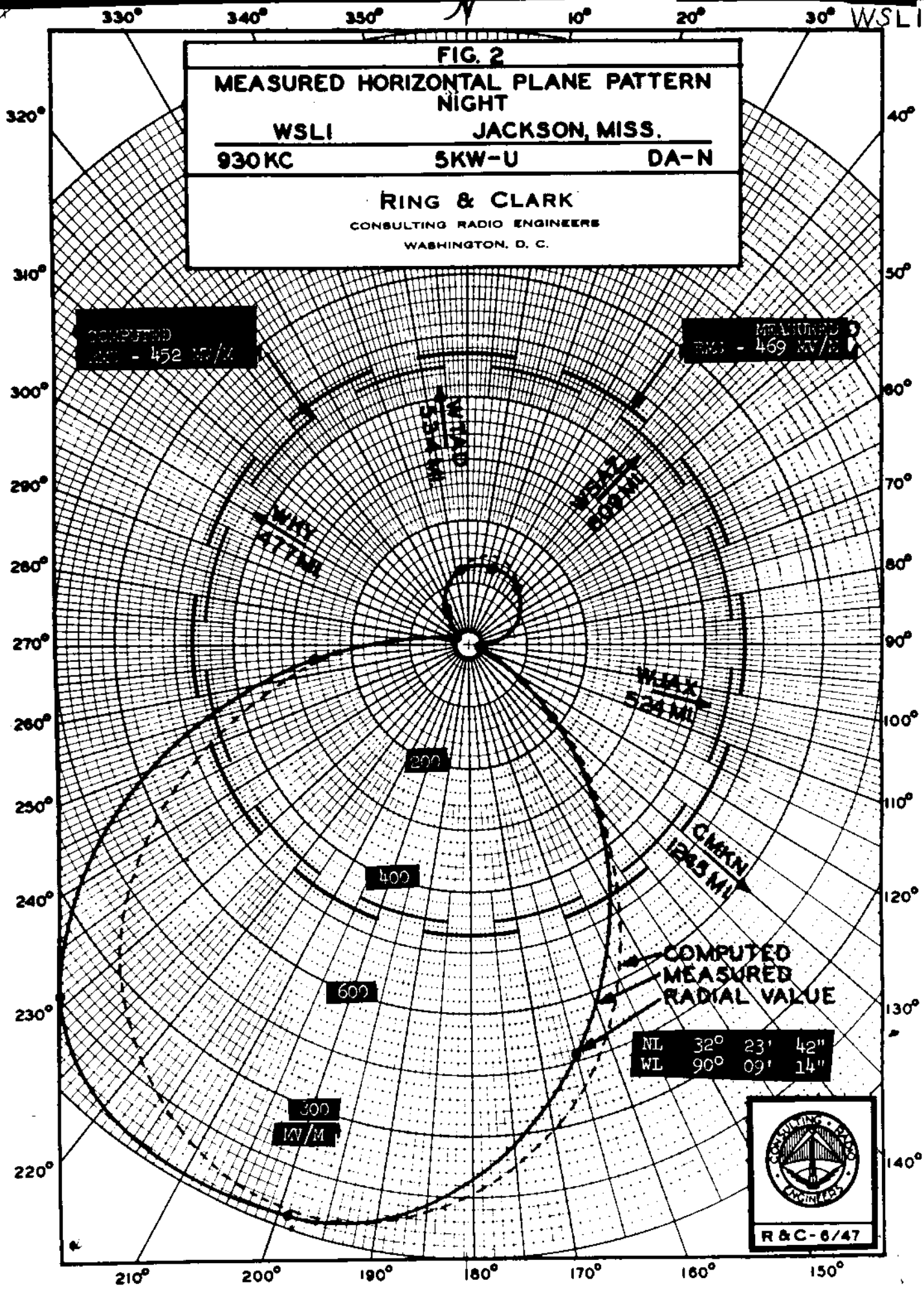
930




R&C- 1/46
330°
340°
350°
10°
20°
30°
320°
40°
310°
50°
300°
60°
290°
70°
280°
80°
270°
90°
260°
100°
250°
110°
240°
120°
230°
130°
220°
140°
210°
200°
190°
180°
170°
160°
150°
WLAD
534 MI.
150
MUM
100
50
WBEN-980 MI.
WSAZ-909 MI.
WFMD-868 MI.
WHY
477 MI.
TOLERANCE
WJAX
524 MI.
FIG. 1B
EXPANDED MINIMA
WSLI
JACKSON, MISS.
930 KC
5KW-U
DA-N
RING & CLARK
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

[redacted]

WSLI



MEASURED NON-DA Station WSLI 5kw, DA-N,U
Jackson, Mississippi 930 KC

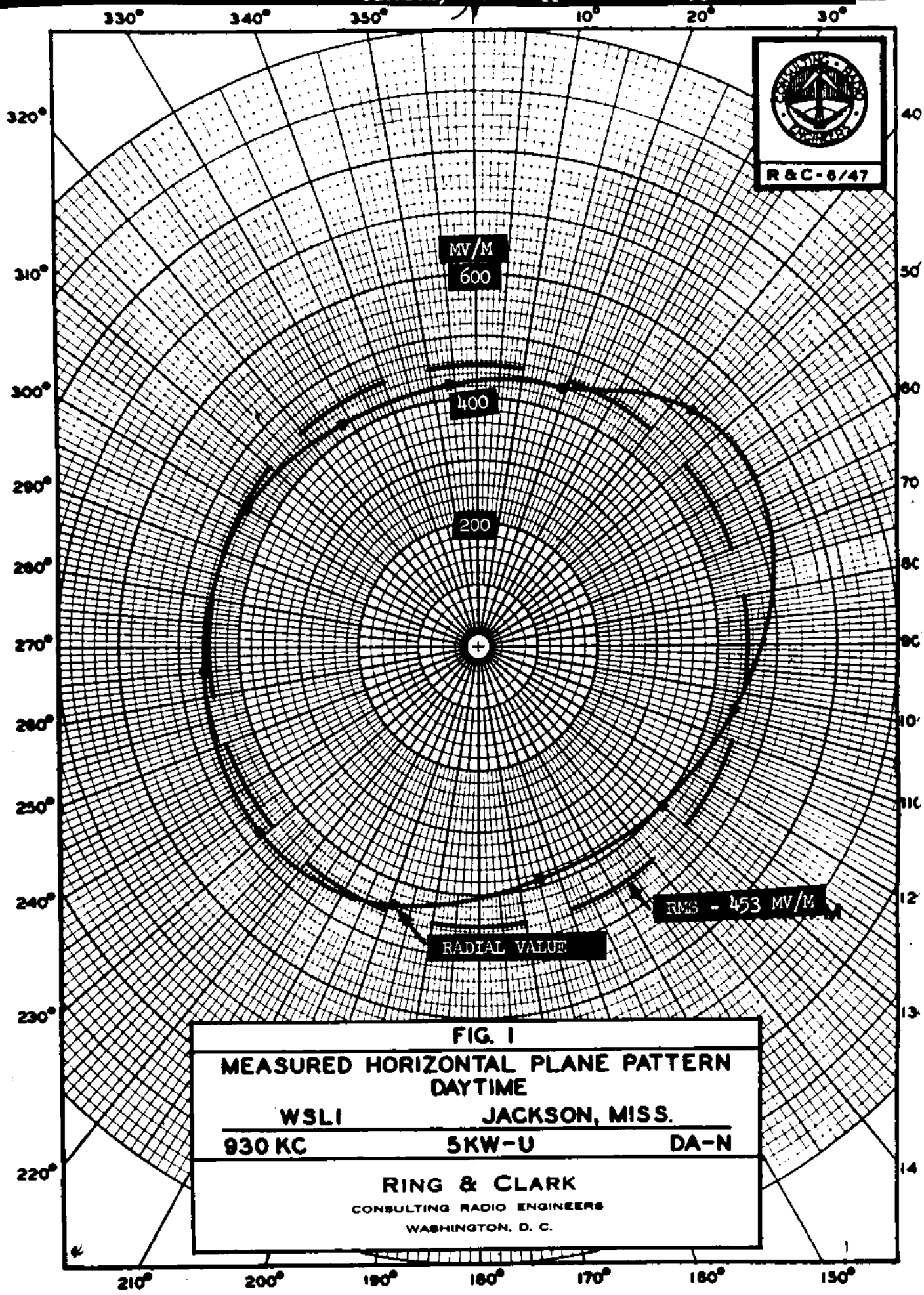


FIG. 1

MEASURED HORIZONTAL PLANE PATTERN
DAYTIME

WSLI JACKSON, MISS.

930 KC 5KW-U DA-N

RING & CLARK
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

CHARLOTTE

PROPOSED NIGHT NULLS

NEW, CHARLOTTE, N. C. (Surety Bg. Co.)

1kw, 5kw-LS, DAN

930 kc

7/13/49G

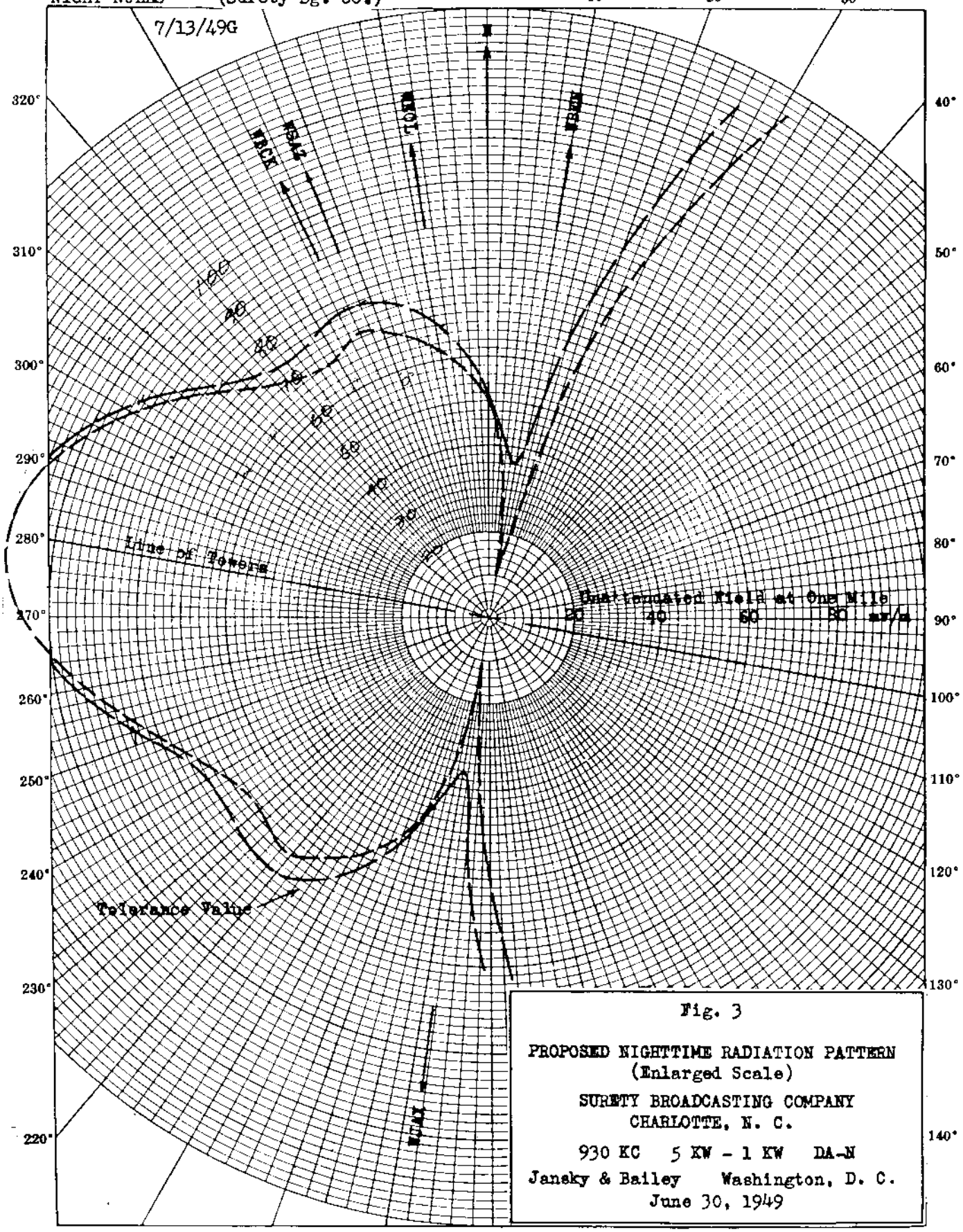


Fig. 3

PROPOSED NIGHTTIME RADIATION PATTERN
(Enlarged Scale)

SURETY BROADCASTING COMPANY
CHARLOTTE, N. C.

930 KC 5 KW - 1 KW DA-N

Jansky & Bailey Washington, D. C.
June 30, 1949

AMENDMENT RECD 7-6-49 BP-6088

New, Charlotte, N. C. 930 kc.

n WSOC CHARLOTTE

PROPOSED NIGHT — NEW, CHARLOTTE, N. C. (Surety Bg. Co.) — 1kw, 5kw-LS, DAN — 930 kc

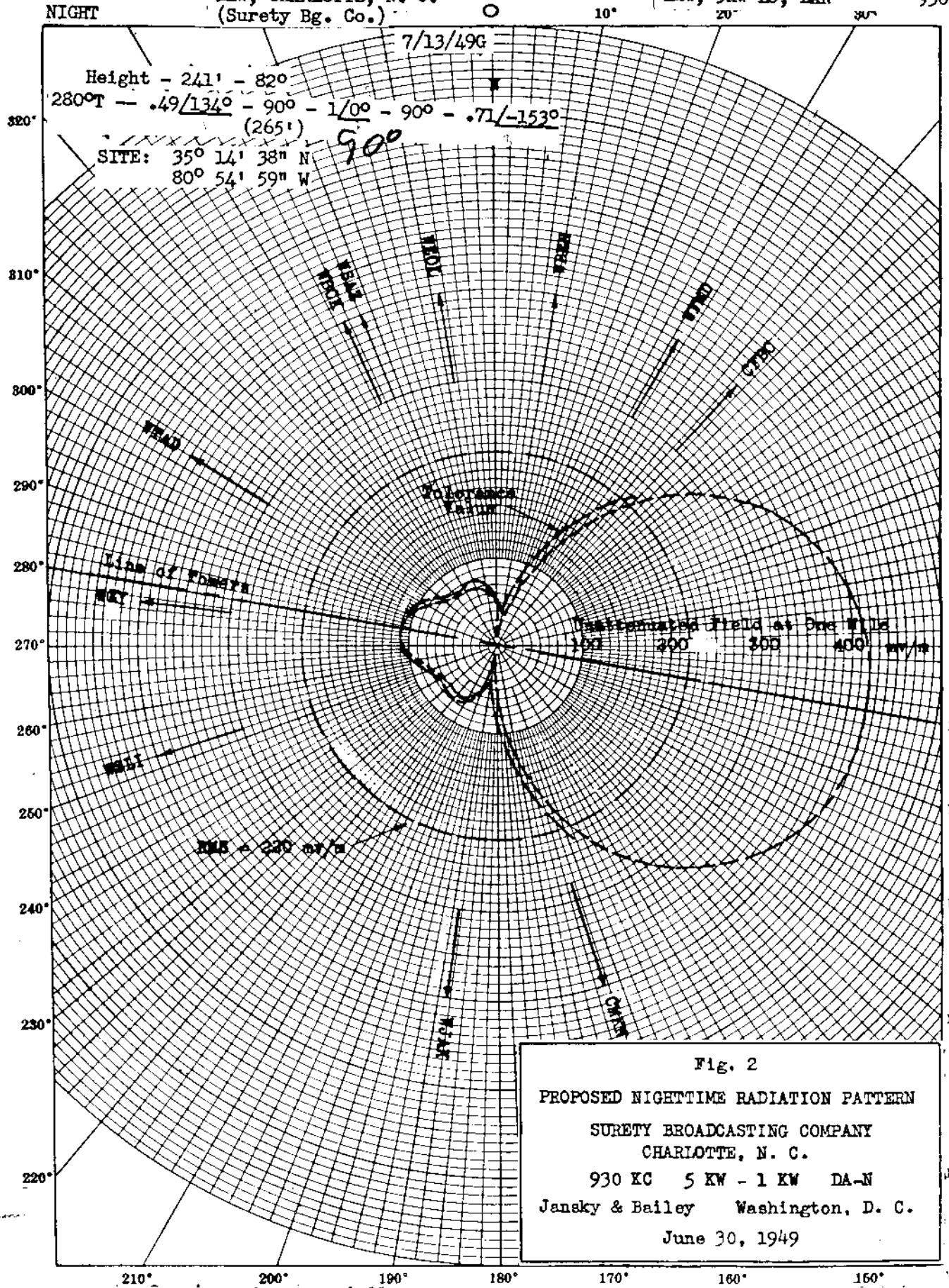


Fig. 2

PROPOSED NIGHTTIME RADIATION PATTERN

SURETY BROADCASTING COMPANY
CHARLOTTE, N. C.

930 KC 5 KW - 1 KW DA-N

Jansky & Bailey Washington, D. C.

June 30, 1949

AMENDMENT RECD 7-6-49 BP-6088

New, Charlotte, N. C. 930 kc

WSOC

MEASURED ~~WIST~~, CHARLOTTE, N. C. 1 KW, 5KW-LS, U, DA-N 930 KC
NIGHT 1/21/52G

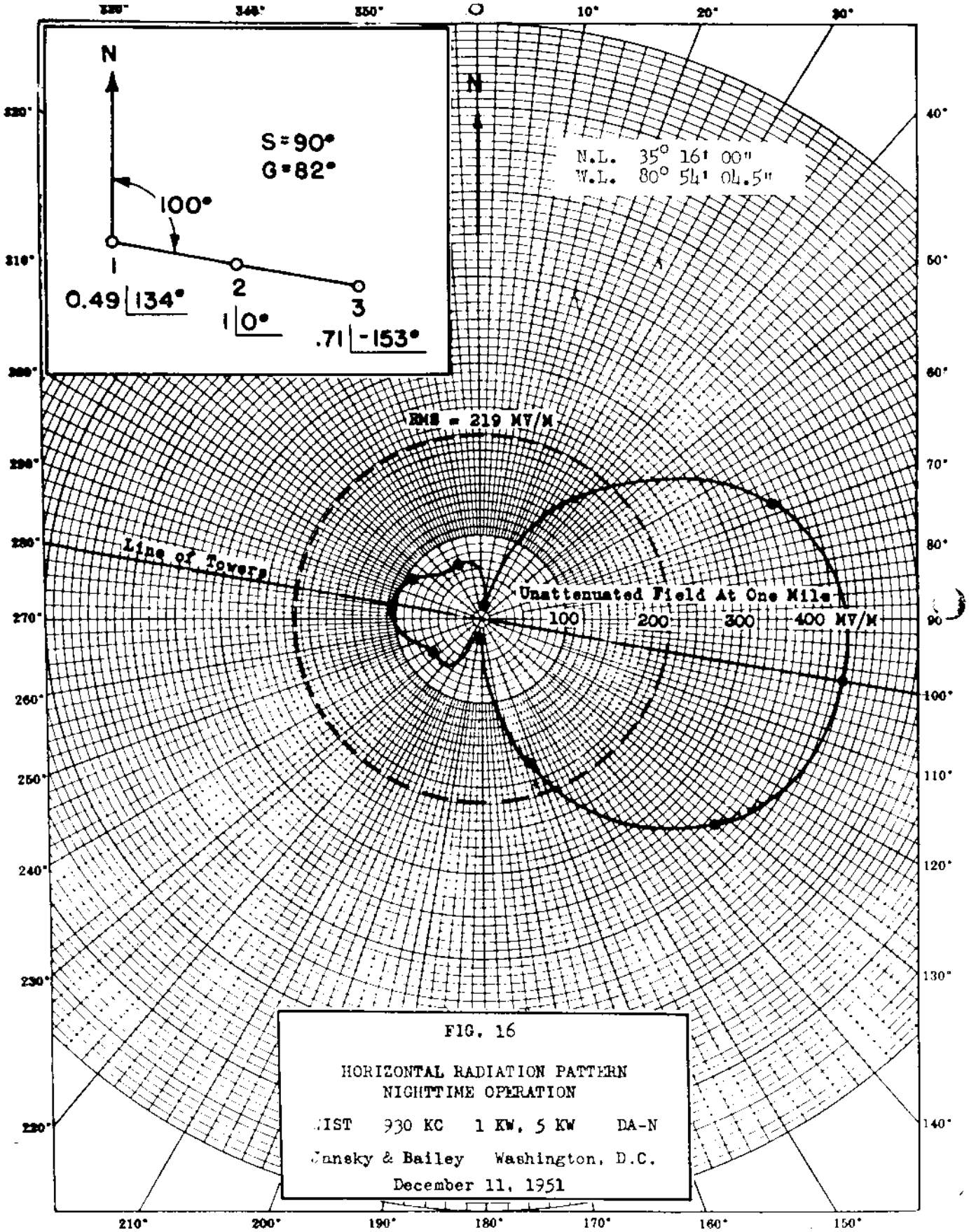


FIG. 16

HORIZONTAL RADIATION PATTERN
NIGHTTIME OPERATION

WIST 930 KC 1 KW, 5 KW DA-N

Jansky & Bailey Washington, D.C.

December 11, 1951

APPL RECD 12/17/51 ACC 1/14/52 BL-4641 WIST, CHARLOTTE, N. C. 930 KC

WSOC

MEASURED NIGHT NULLS — WIST, CHARLOTTE, N. C. 1/21/52G — 1 KW, 5KW-LS, U, DA-N — 930 KC

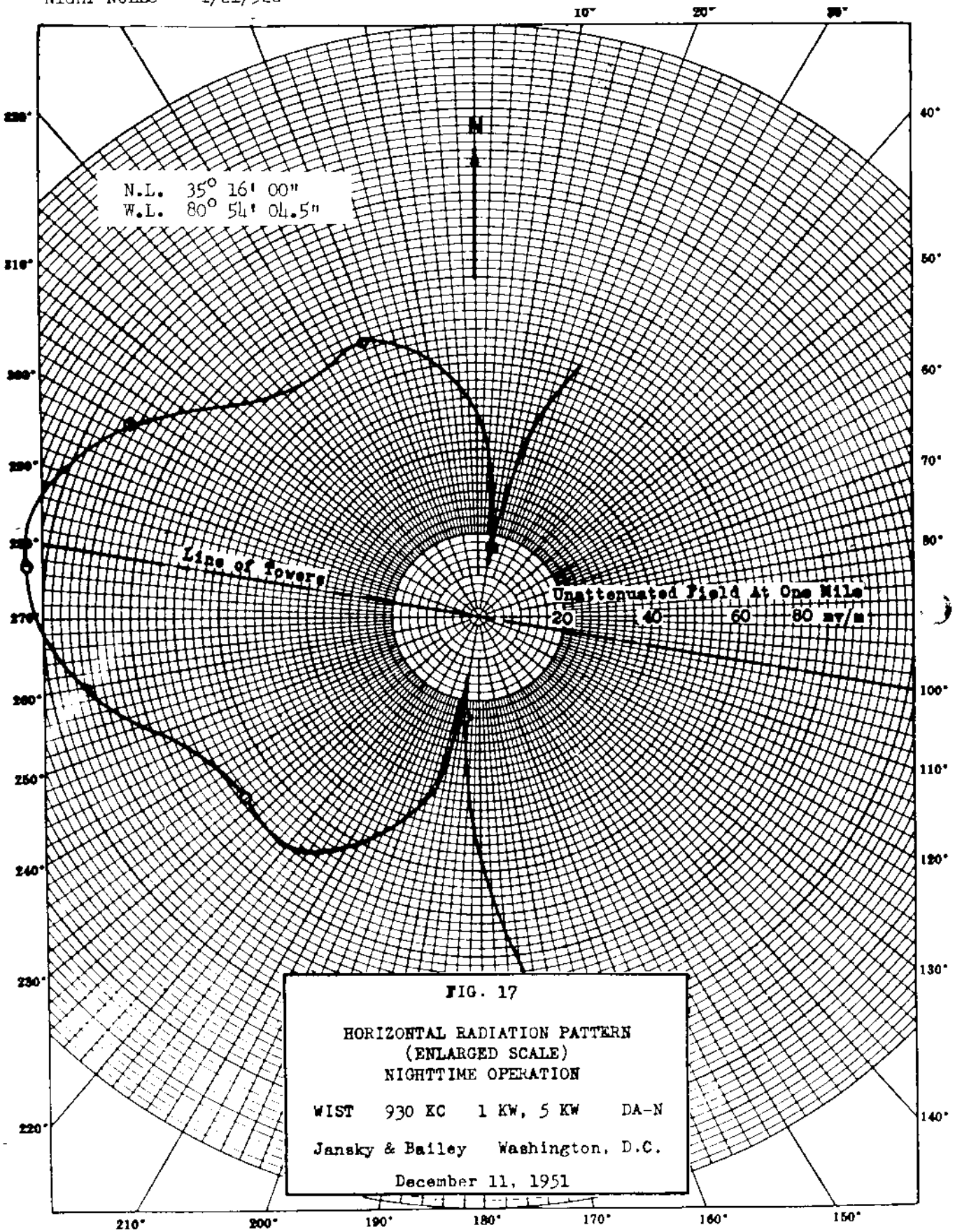


FIG. 17

HORIZONTAL RADIATION PATTERN
(ENLARGED SCALE)
NIGHTTIME OPERATION

WIST 930 KC 1 KW, 5 KW DA-N

Jansky & Bailey Washington, D.C.

December 11, 1951

APPL RECD 12/17/51 ACC 1/14/52 BL-4641 — WIST, CHARLOTTE, N. C. — 930 KC

WSOC

MEASURED WIST, CHARLOTTE, N. C. 1 KW, 5KW-LS, U, DA-N 930 KC
NON-DA (Day) 1/21/52G 930 KC

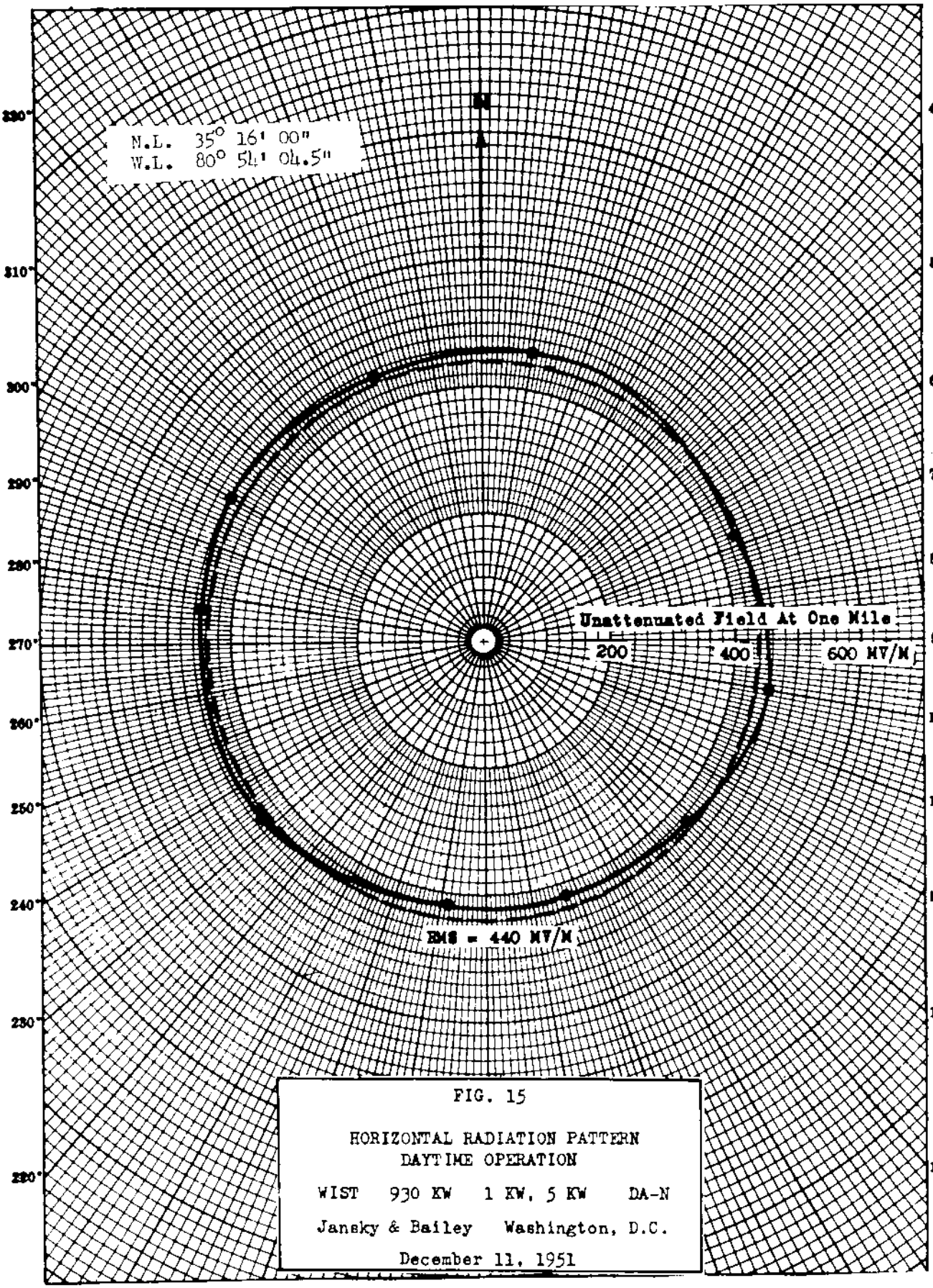


FIG. 15

HORIZONTAL RADIATION PATTERN
DAYTIME OPERATION

WIST 930 KW 1 KW, 5 KW DA-N

Jansky & Bailey Washington, D.C.

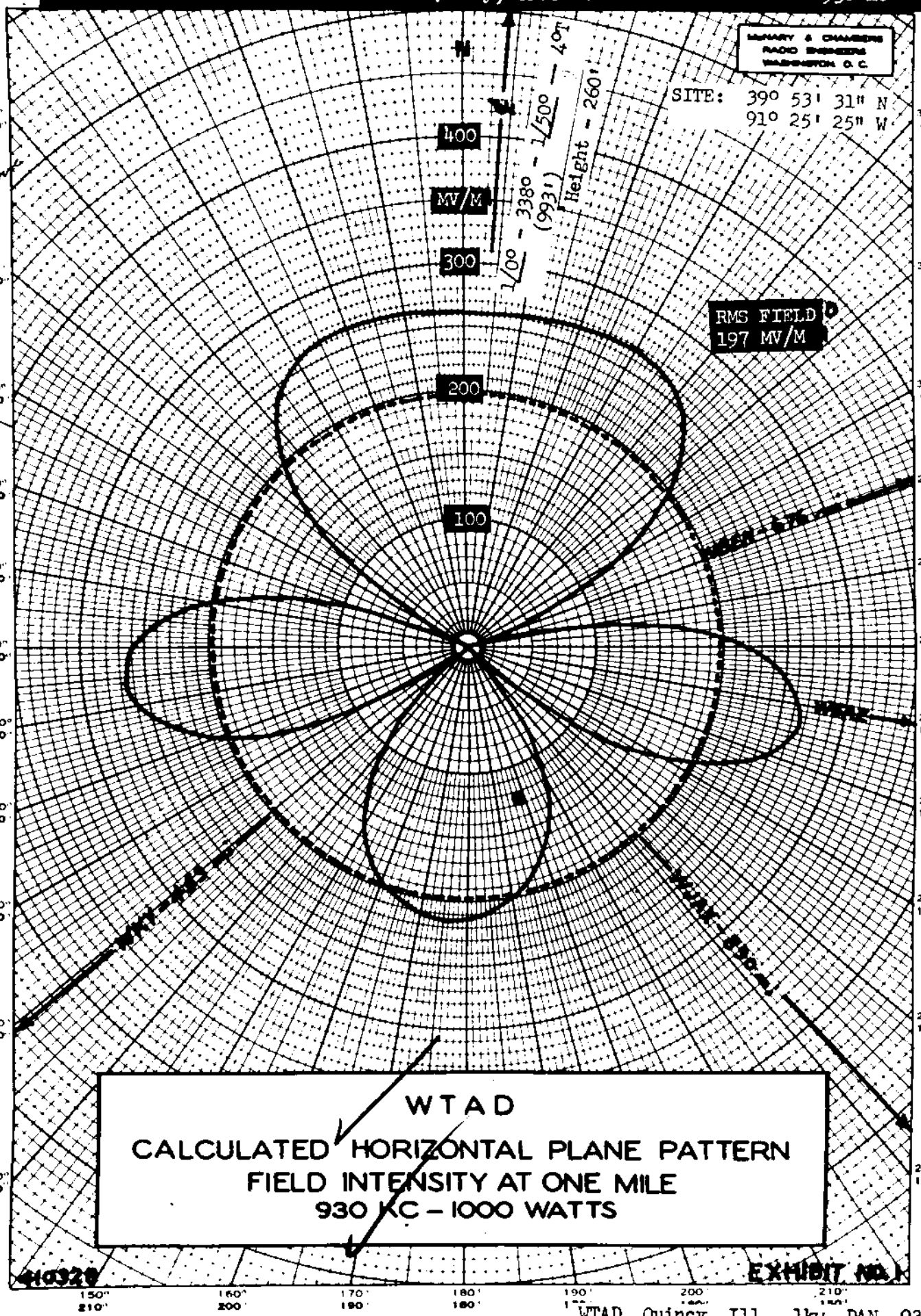
December 11, 1951

APPL RECD 12/17/51 ACC 1/14/52 BL-4641 WIST, CHARLOTTE, N. C. 930 KC

WTAD

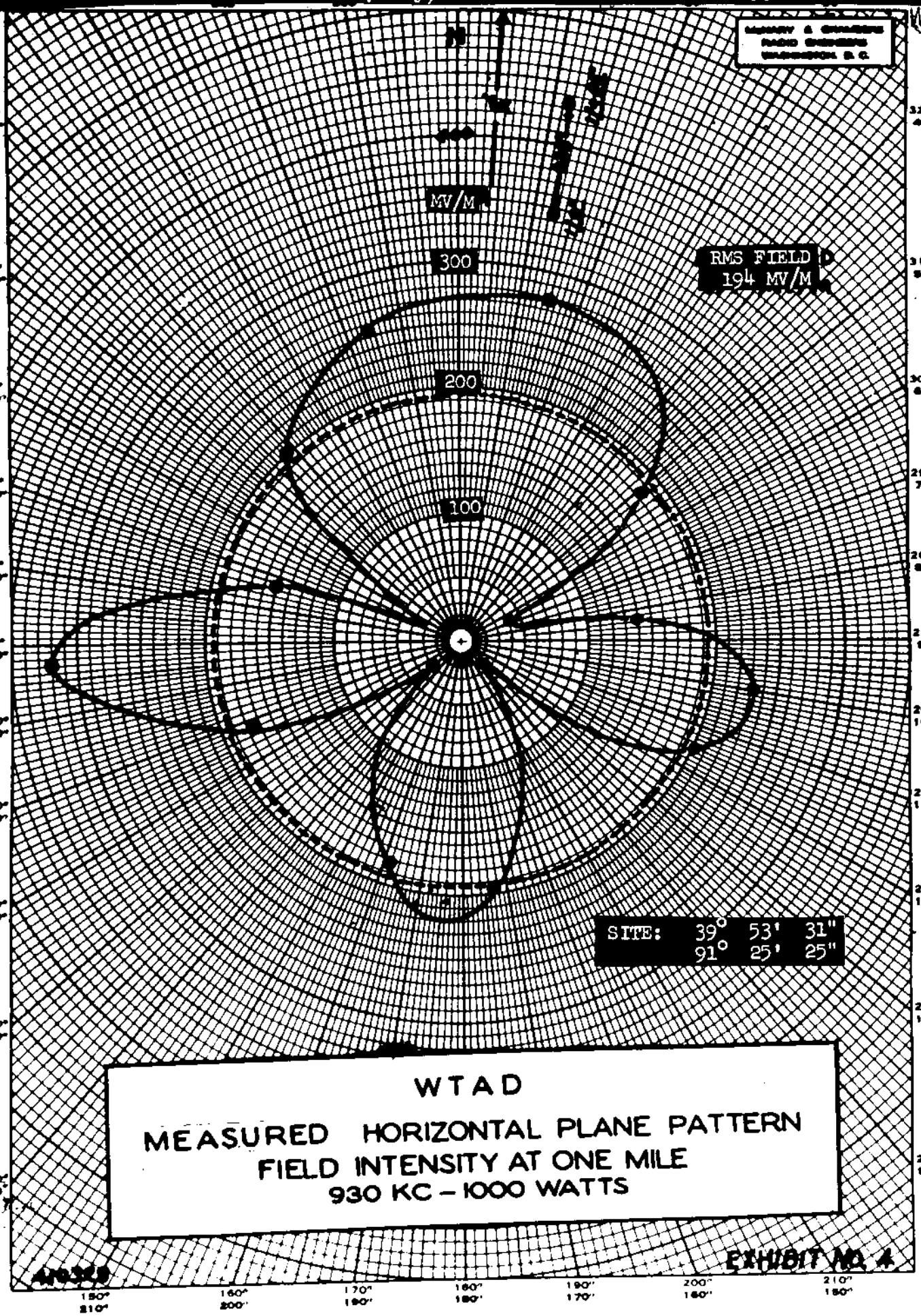
PROPOSED NIGHT Station WTAD 1kw,5kw-LS, DA-N,U
Quincy, Illinois 930 KC

ranted Mod
f license
1/19/58 To move
main studio
ocation To
llington
Township



WTAD
CALCULATED HORIZONTAL PLANE PATTERN
FIELD INTENSITY AT ONE MILE
930 KC – 1000 WATTS

WTAD, Quincy, Ill. 1kw, DAN, 930 kc


MEASURED NIGHT
Station WTAD
Quincy, Illinois
930 KC
MV/M
300
200
100
RMS FIELD
194 MV/M
SITE: 39° 53' 31"
91° 25' 25"
WTAD
MEASURED HORIZONTAL PLANE PATTERN
FIELD INTENSITY AT ONE MILE
930 KC – 1000 WATTS
EXHIBIT NO. 4

Hathaway & Chambers
7014 MONSEY BUILDING

PAGE & DAVIS

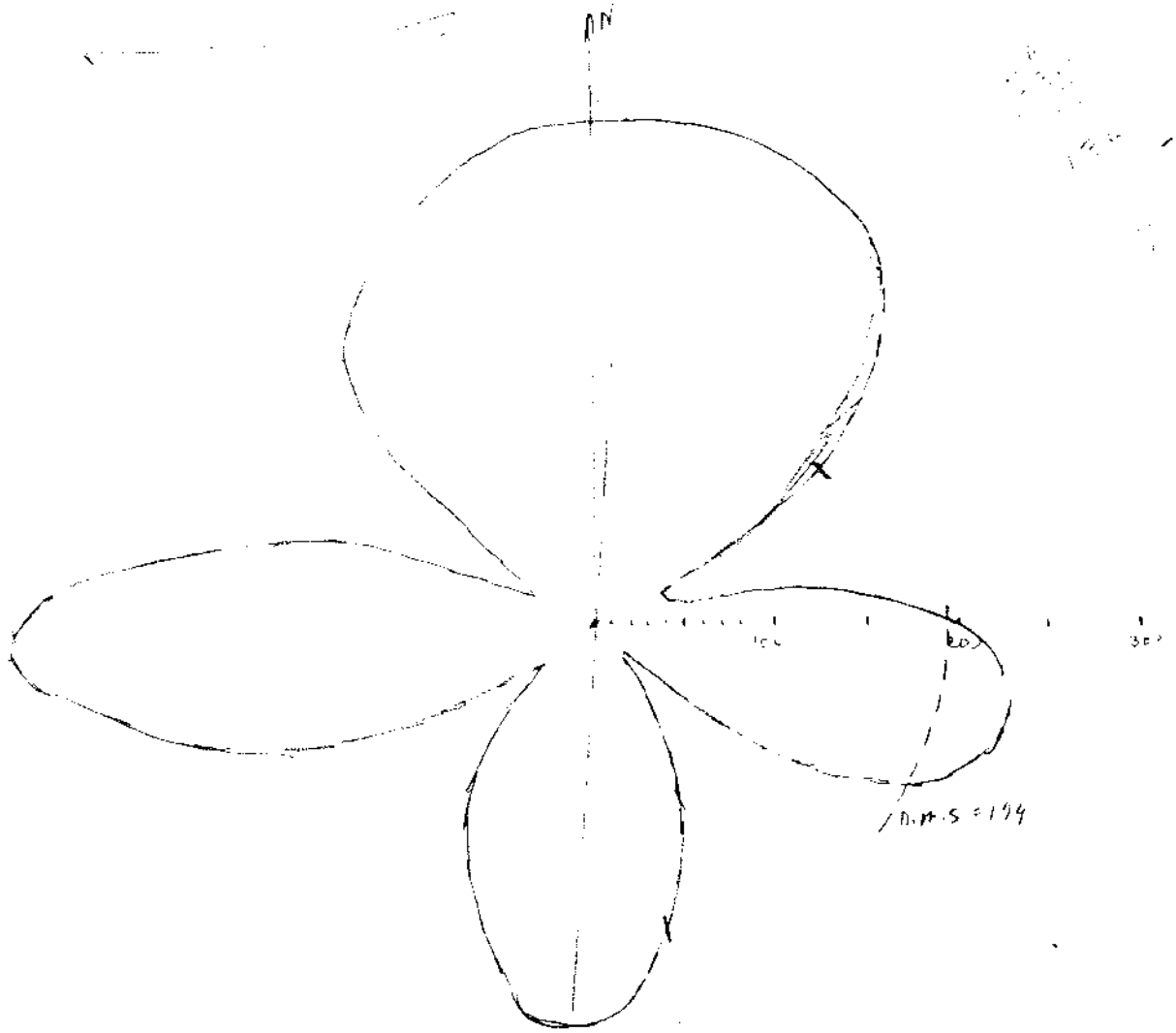
WTAD

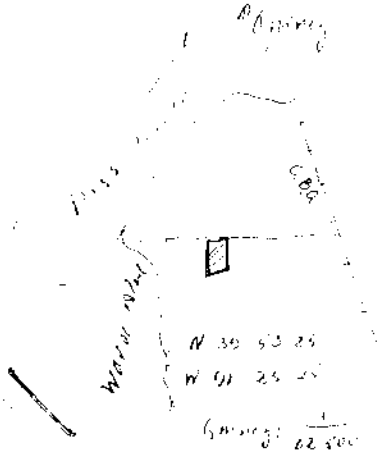
930AC

Bearing on 930AC 258°
L.T. N 40° E
phasing 30° on leading
H= 260' 1:1 Height of antenna

Fields on 930EW pt. 1
WDEN 40.5
WSAZ 52.1
WJIX 25.8
WKY 10.6

Mean field this
194 mv/m





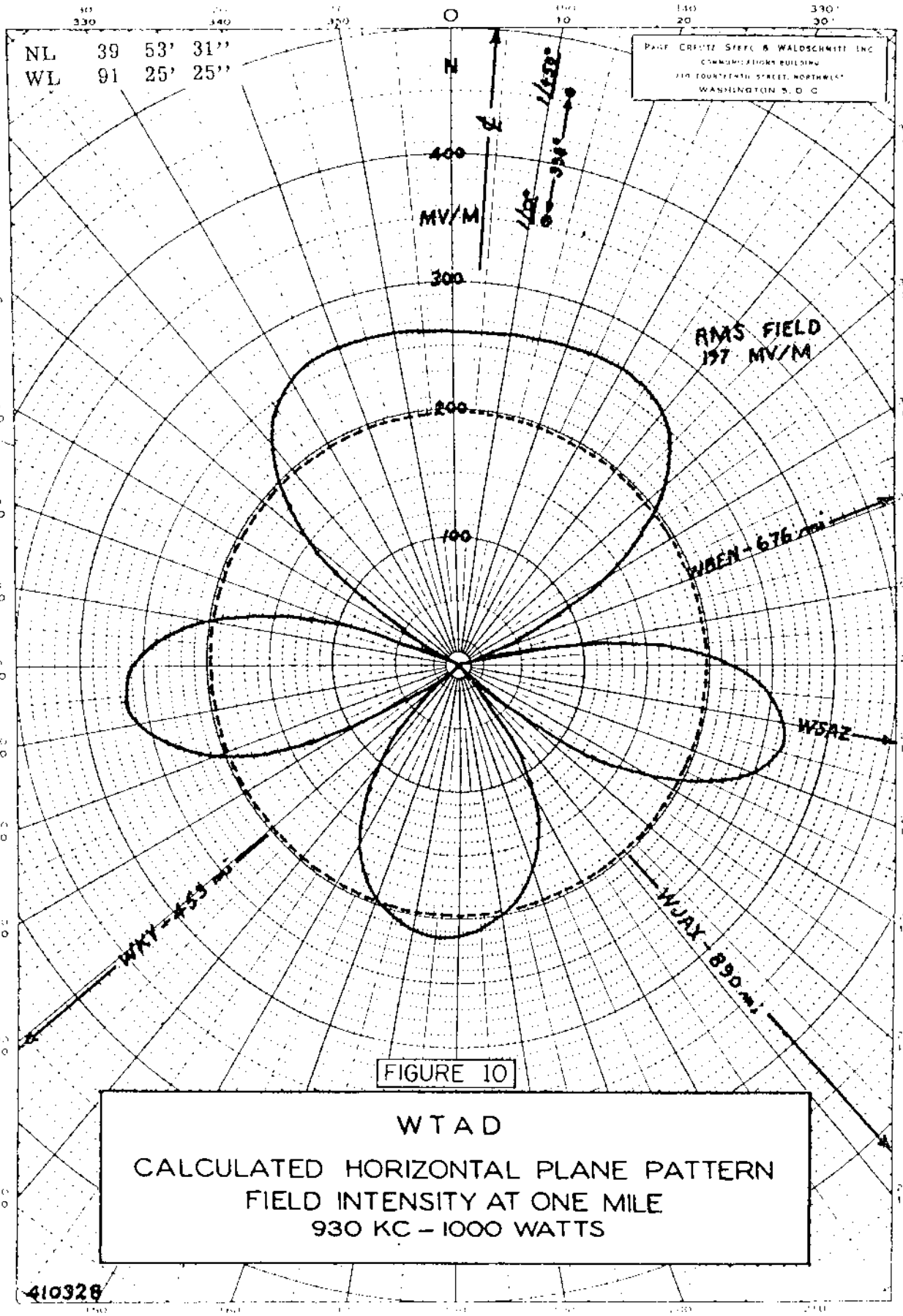
retained for added info

WVTAD

PROPOSED NIGHT
(8-18-58g)

Station WTAD
Quincy, Illinois

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



granted mod of license 11/19/58 to move main studio location to Ellington township

FIGURE 10

WTAD

CALCULATED HORIZONTAL PLANE PATTERN
FIELD INTENSITY AT ONE MILE
930 KC – 1000 WATTS

FCC File No. BZ-4020
Accepted 8-11-58

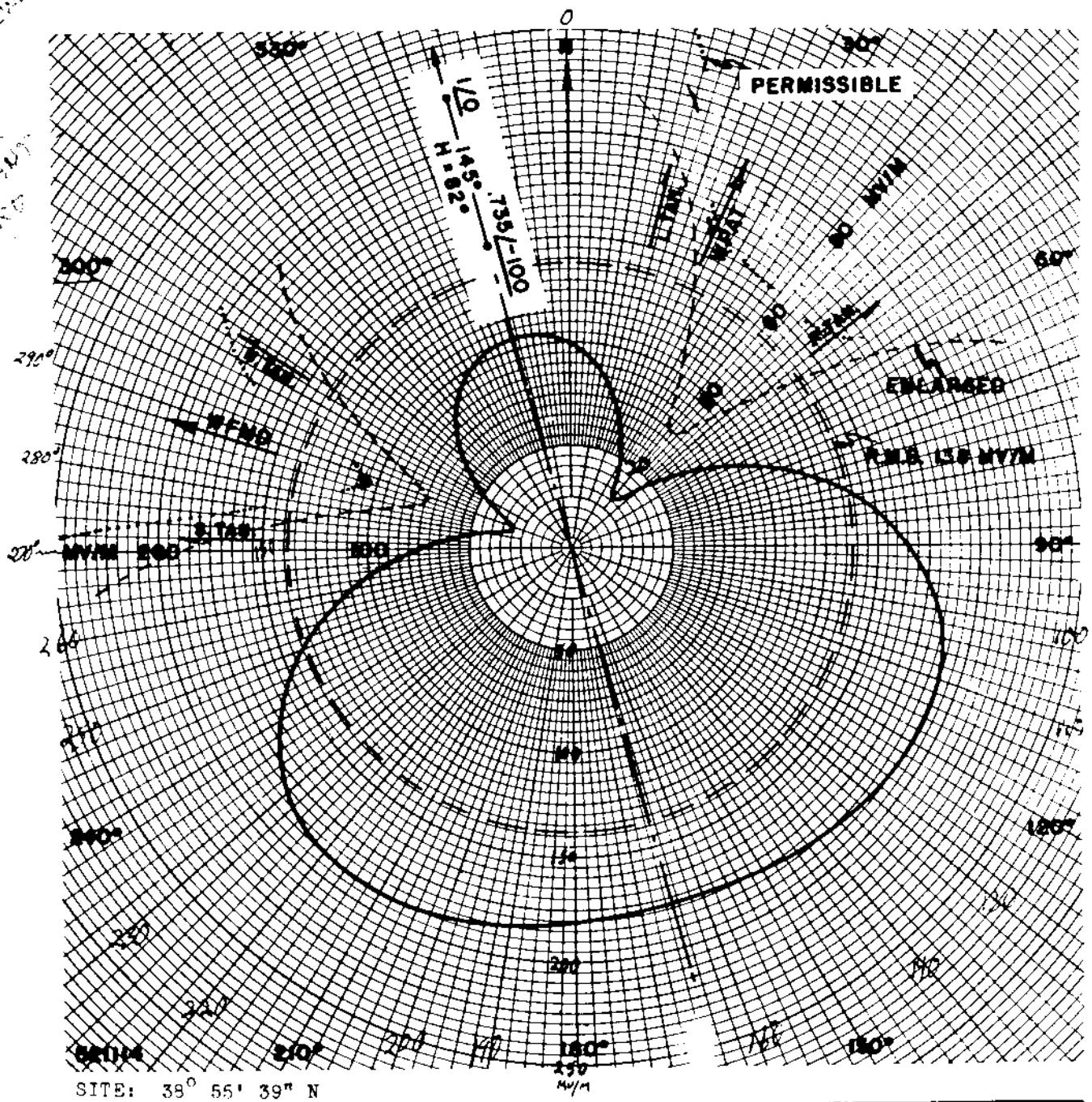
WTAD
Quincy, Illinois

930 KC

WTHDI

PROPOSED WKSB, MILFORD, DELAWARE 500w, D, DA-D 930 kc
DAY (3/4/53G)

DENIED RENEWAL OF LIC 6-20-66
NEW APPLICANT SEE MILFORD



SITE: 38° 55' 39" N
75° 29' 15" W

GEORGE C. DAVIS
CONSULTING RADIO ENGINEER
WASHINGTON 4, D. C.

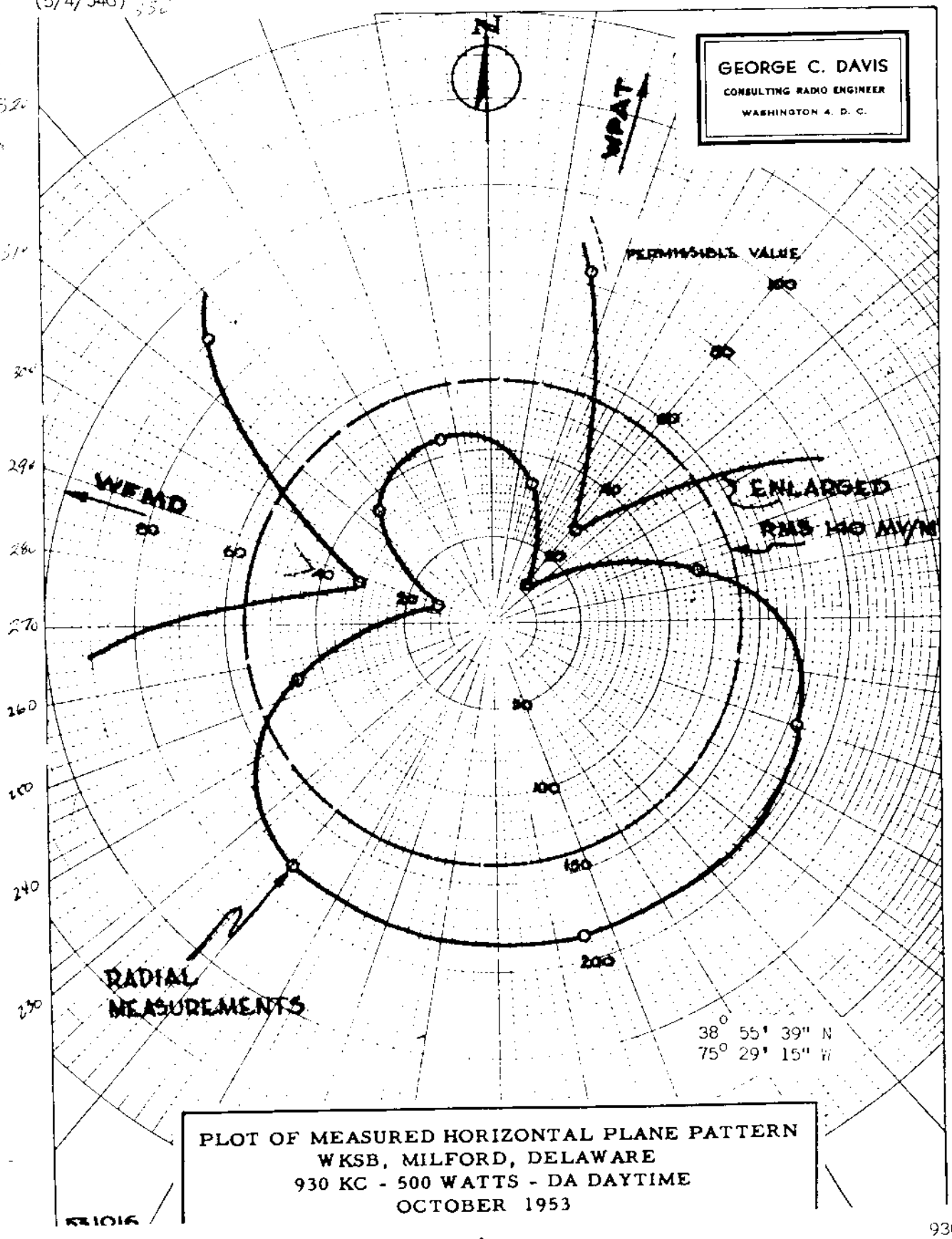
PROPOSED DAYTIME
HORIZONTAL PLANE PATTERN FOR
KENT-SUSSEX BROADCASTING CO.
MILFORD, DELAWARE
930 KC-500 WATTS-DA-DAYTIME
NOVEMBER, 1952

FCC File No. BMP-6087 Date Accepted ? WKSB, Milford, Delaware 930 kc

WTH D

MEASURED WKSB, Milford, Delaware 500W, D, DA-D 930 kc
DAY (5/4/54G)

DENIED RENEWAL OF LIC 6-20-66



PLOT OF MEASURED HORIZONTAL PLANE PATTERN
WKSB, MILFORD, DELAWARE
930 KC - 500 WATTS - DA DAYTIME
OCTOBER 1953

930 kc

FCC Fil No. BL-5151 WKSB, Milford, Delaware

WTHD

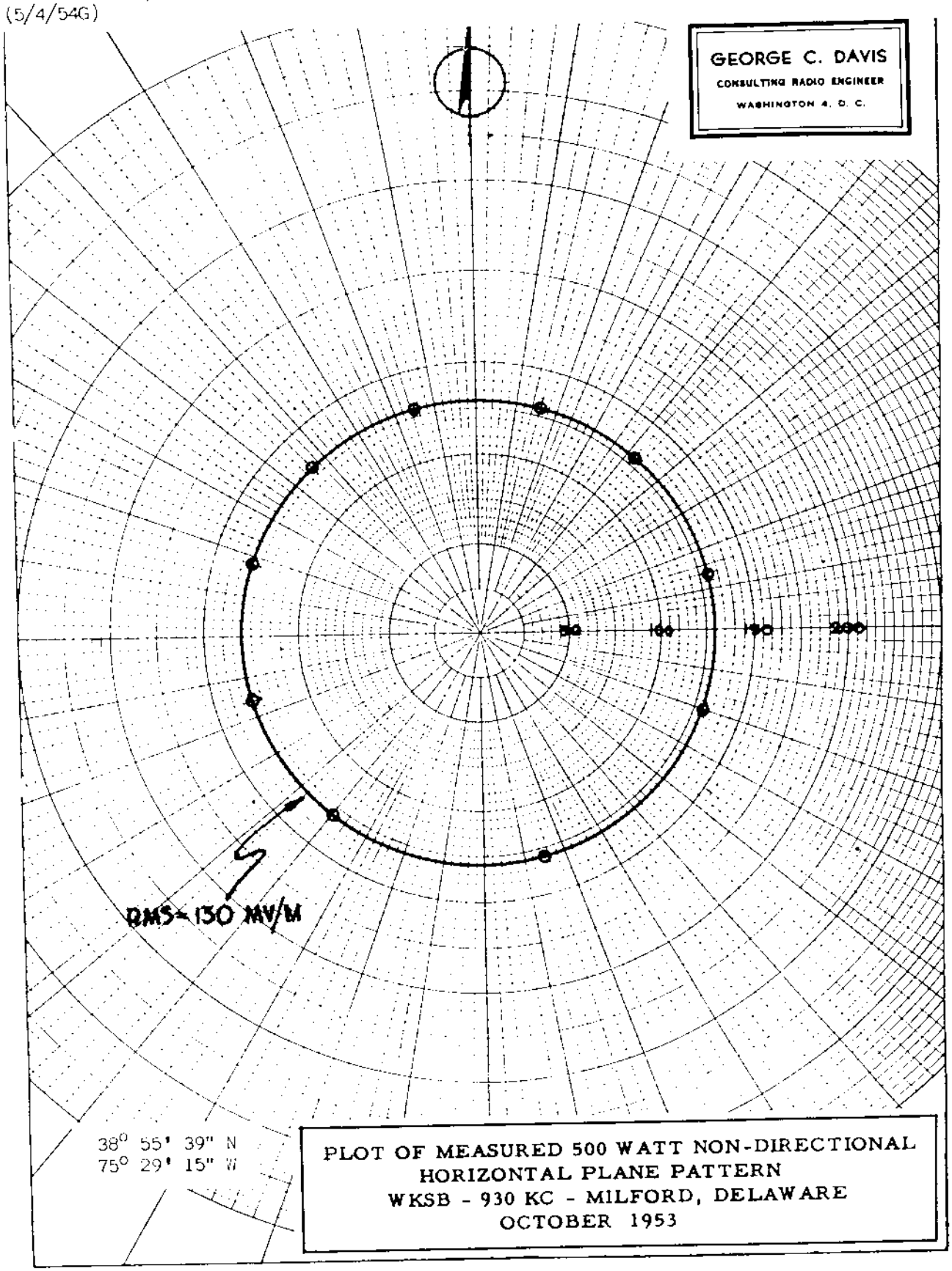
MEASURED
N-DA (5/4/54G)

WKSB, Milford, Delaware

500W, D, DA-d

930 kc

DENIED RENEWAL OF LIC 6-30-66



PLOT OF MEASURED 500 WATT NON-DIRECTIONAL
HORIZONTAL PLANE PATTERN
WKSB - 930 KC - MILFORD, DELAWARE
OCTOBER 1953

FCC File No. BL-5151

WKSB, Milford, Delaware

930 kc

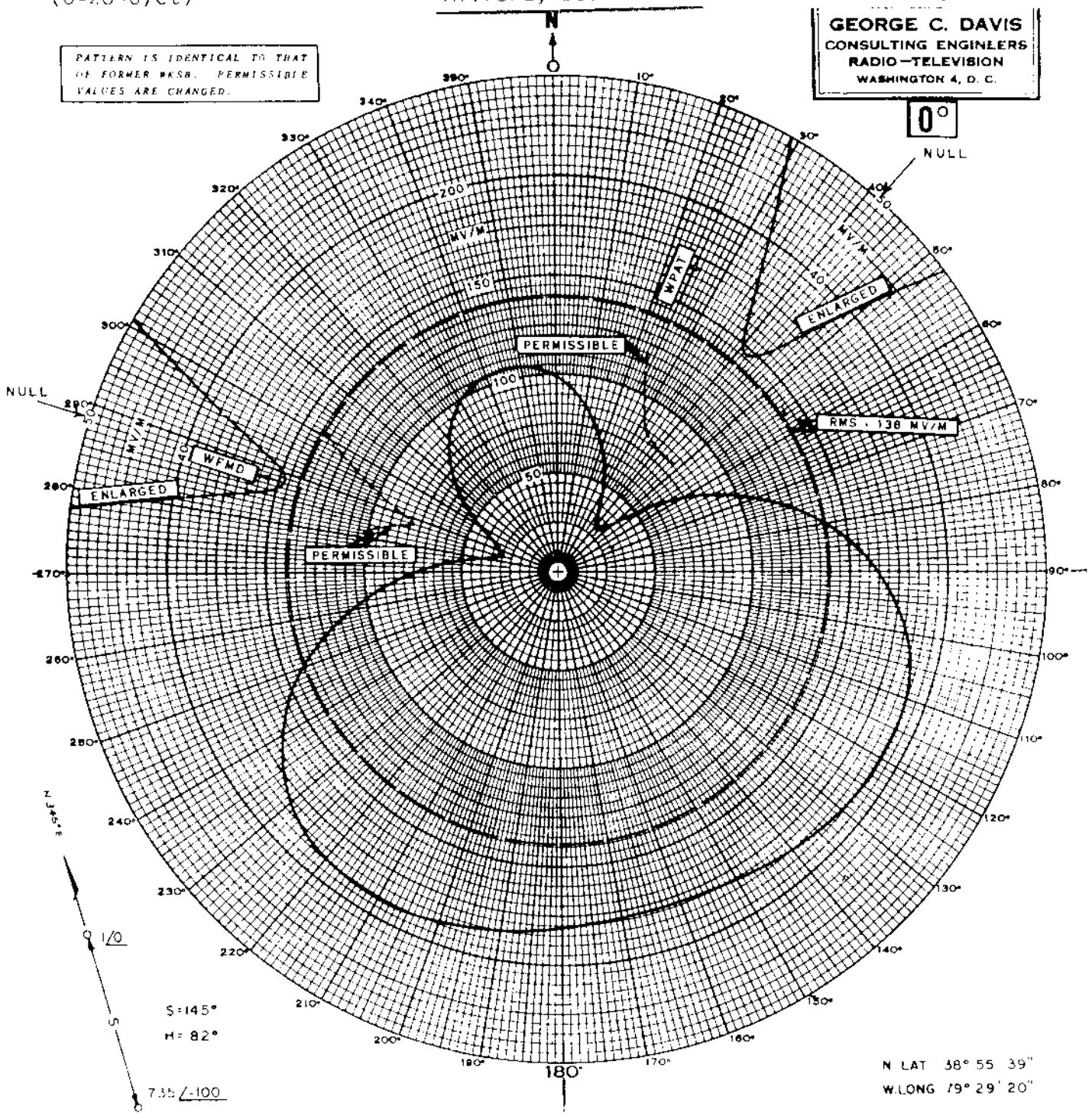
WTHD

Proposed Day
(6-28-67ct)

New; Broadcasters, Inc.
Milford, Delaware

500w,DA-D,D
930 kc

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



DAYTIME HORIZONTAL PLANE RADIATION PATTERN
~~MILFORD BROADCASTING CORPORATION~~
MILFORD, DELAWARE
930 KC 0.5 KW DA-D
JULY 1966

FCC File No.BP-17448
Accepted 6-1-67 Amended

New; Broadcasters, Inc.
Milford, Delaware

930 kc

WIHD ~~NEW~~

Proposed Day
(12-29-66ct)

New; Broadcasters, Inc.
Milford, Delaware

500w,DA-D,D
930 kc

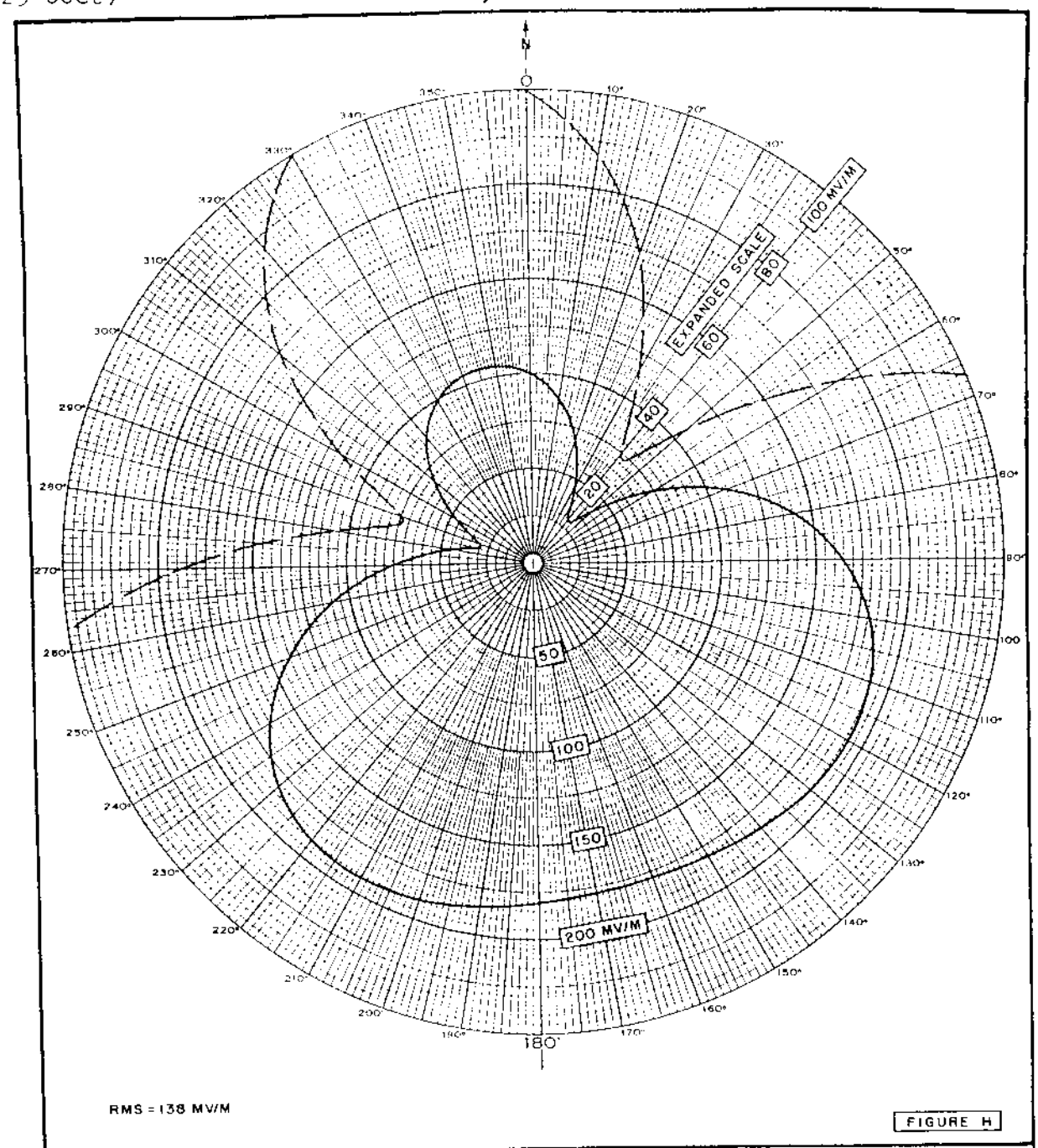
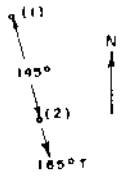


FIGURE H



LATITUDE 38° 55' 19" North
LONGITUDE 75° 28' 19" West

ANTENNA NUMBER	AZIMUTH DEG.	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG.
1	–	–	0	1.0	–	82°
2	165	145	-100	0.735	–	82°

HORIZONTAL PLANE
RADIATION PATTERN
FOR
PROPOSED STATION
MILFORD, DELAWARE
930 KC 500W DA,D

660802

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D. C.

FCC File No.BP-17448
Accepted 12-19-66

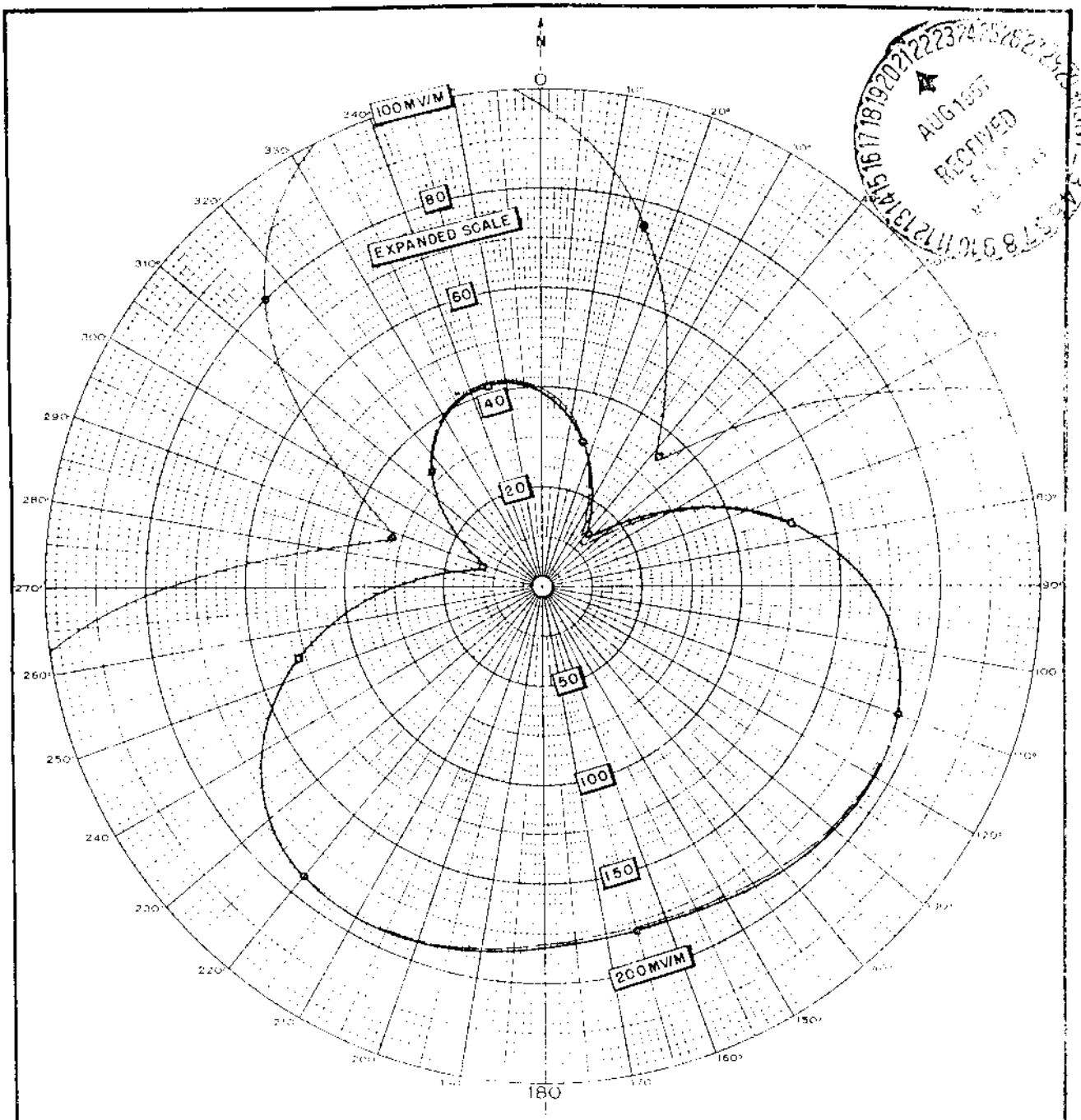
New; Broadcasters, Inc.
Milford, Delaware

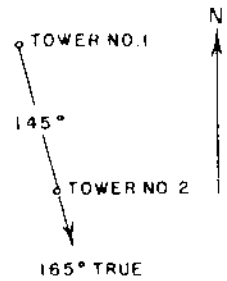
930 kc

Measured Day
(12-28-67ct)

Station WTHD
Milford, Delaware

500w,DA-D,D
930 kc





LATITUDE 38° 55' 39" NORTH
LONGITUDE 75° 29' 20" WEST

ANTENNA NUMBER	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	HEIGHT DEG
1	–	–	0	1.0	–	82°
2	165	145	-100	0.35	–	82°

MEASURED & THEORETICAL
HORIZONTAL PLANE PATTERN
FOR
PROPOSED
WTHD
MILFORD, DELAWARE
930 KC 500 WATTS DAD
670818

KEAR & KENNEDY

FCC File No.BL-11845
Accepted 12-14-67

Station WTHD
Milford, Delaware

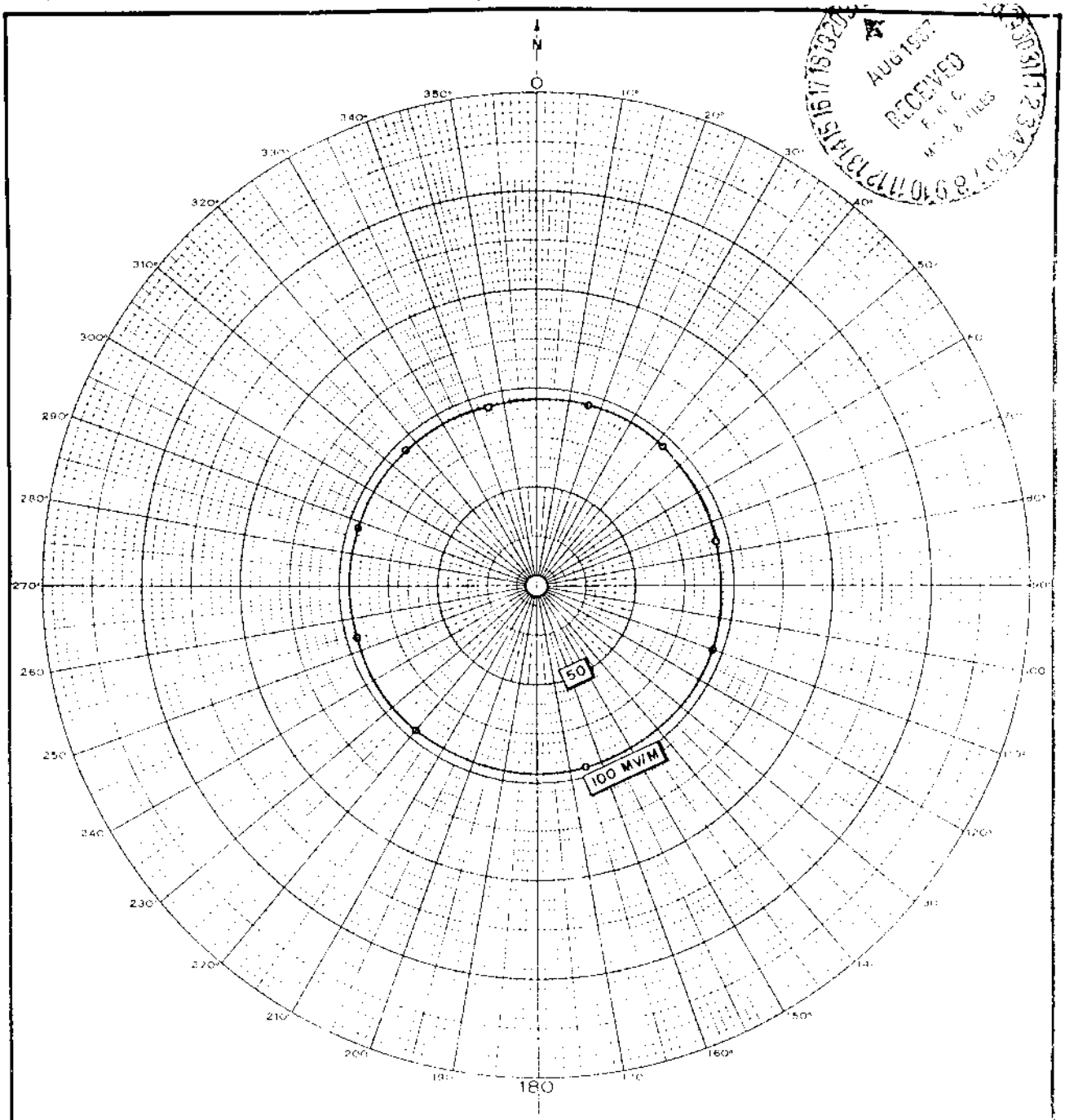
930 kc

WTHD

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

Station WTHD
Milford, Delaware

500w,DA-D,D
930 kc



RMS = 95 MV/M

EXHIBIT E

38° 55' 39" NORTH
75° 29' 20" WEST

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG

MEASURED NON-DIRECTIONAL PATTERN
FOR
PROPOSED
WTHD
MILFORD, DELAWARE
930 KC 500 WATTS DA-D
670818

READ & KENNEDY

FCC File No.BL-11845
Accepted 12-14-67

Station WTHD
Milford, Delaware

930 kc

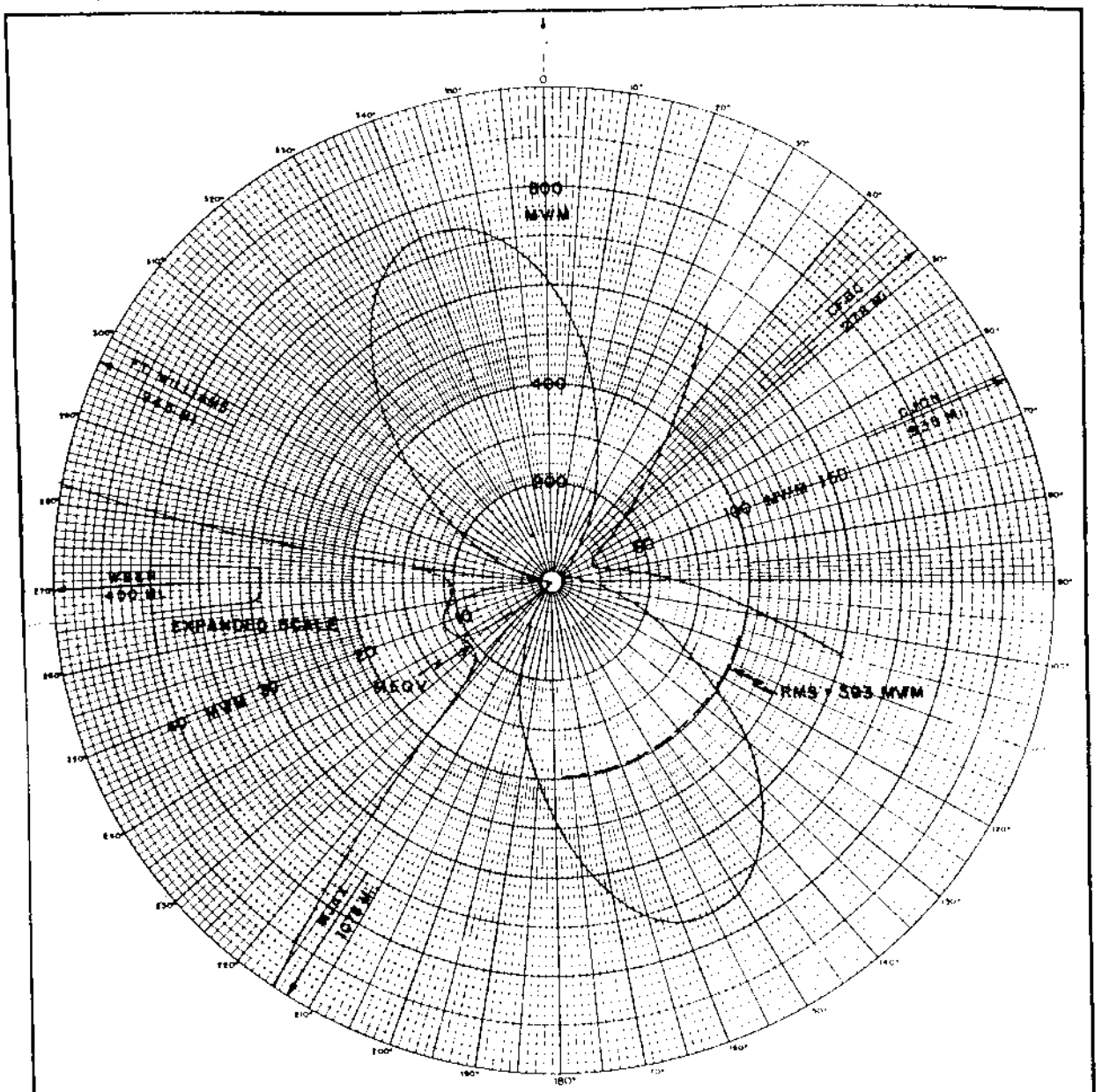
WWNH

PROPOSED NIGHT
(6-16-59g)

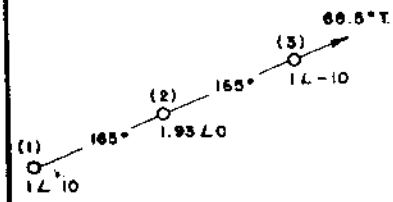
Station WWNH
Rochester, New Hampshire

5kw, DA-N, U
930 KC

1/16/63 granted CP for DAN



PATTERN NO. 1
θ = 0°



LATITUDE 43° 17' 19"
LONGITUDE 70° 57' 02"

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 kW	HEIGHT DEG
1	SEE DIAGRAM	SEE DIAGRAM	10	1.0	192.5	96
2			0	1.93	192.5	96
3			-10	1.0	192.5	96

NIGHTTIME
HORIZONTAL PLANE PATTERN
PROPOSED WWNH
ROCHESTER, N. H.
930 KC. 5 KW. DA-N.
590218.

KEAR AND KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D.C.

FCC File No. BP-13,053
Accepted 6-2-59

WWNH
Rochester, New Hampshire

930 KC

WWNH

Measured Night
(4-24-64ct)

Station WWNH
Rochester, New Hampshire

5kw,DA-N,U
930 kc

6-15-67
GRANTED
LICENSE
FOR DA-N.

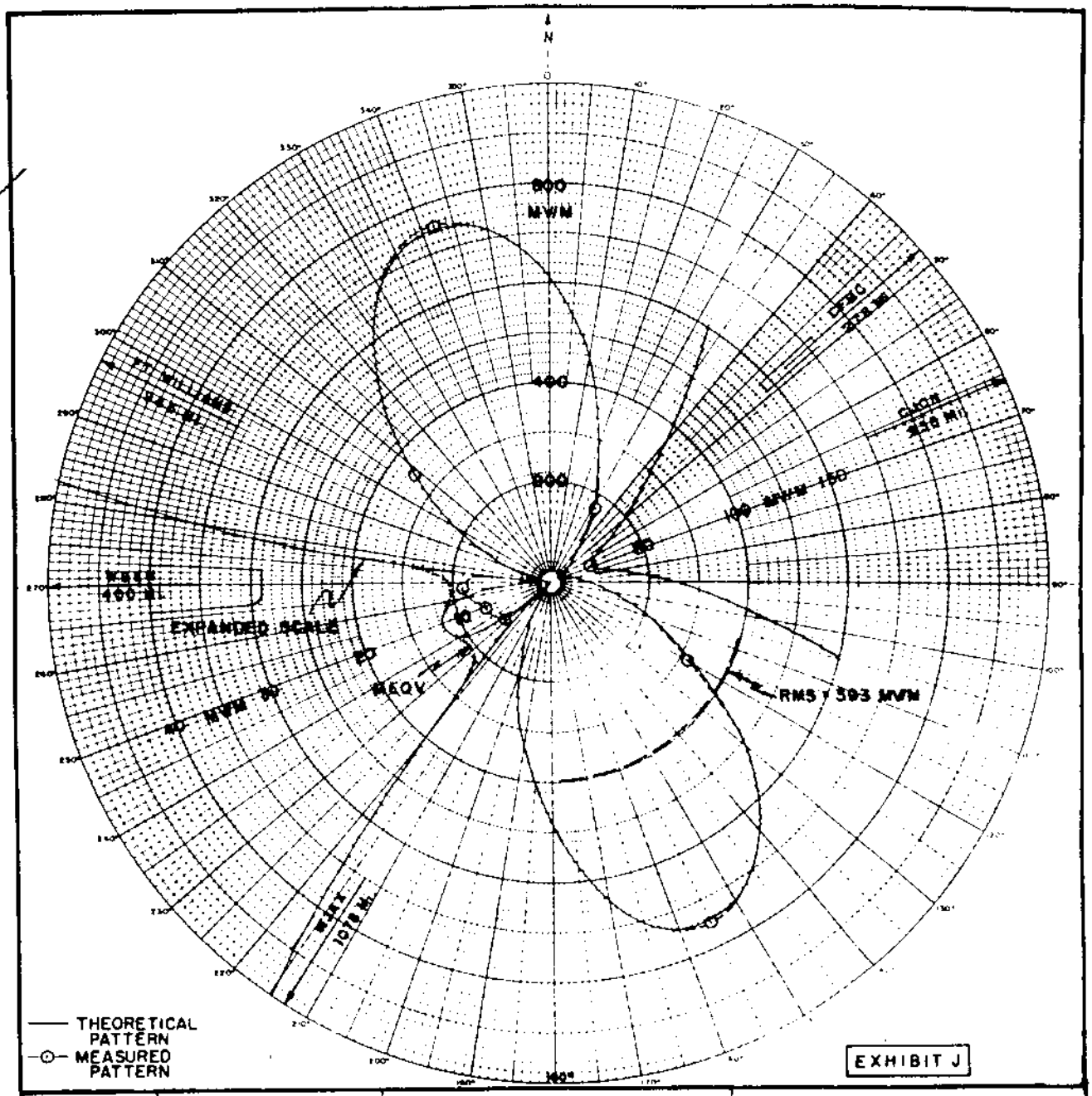
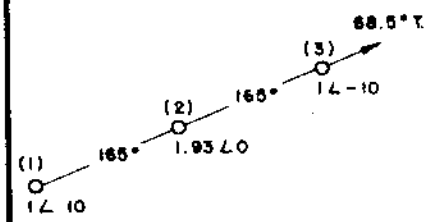


EXHIBIT J



LATITUDE 43° 17' 13" N.
LONGITUDE 70° 56' 55" W

ANTENNA NUMBER	AZIMUTH DEG.	SPACING DEG.	PHASING DEG.	F.E.K. RATIO	M.V.M. FOR 1 KW.	HEIGHT DEG.
1	SEE DIAGRAM	SEE DIAGRAM	10	1.0	192.5	96
2			0	1.93	192.5	96
3			-10	1.0	192.5	96

NIGHTTIME
HORIZONTAL PLANE PATTERN
WWNH
ROCHESTER, N.H.
930 KC. 5 KW. DA-N.
640224

KEAR AND KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D.C.

FCC File No. BL-10523
Accepted 4-15-64

Station WWNH
Rochester, New Hampshire

930 kc

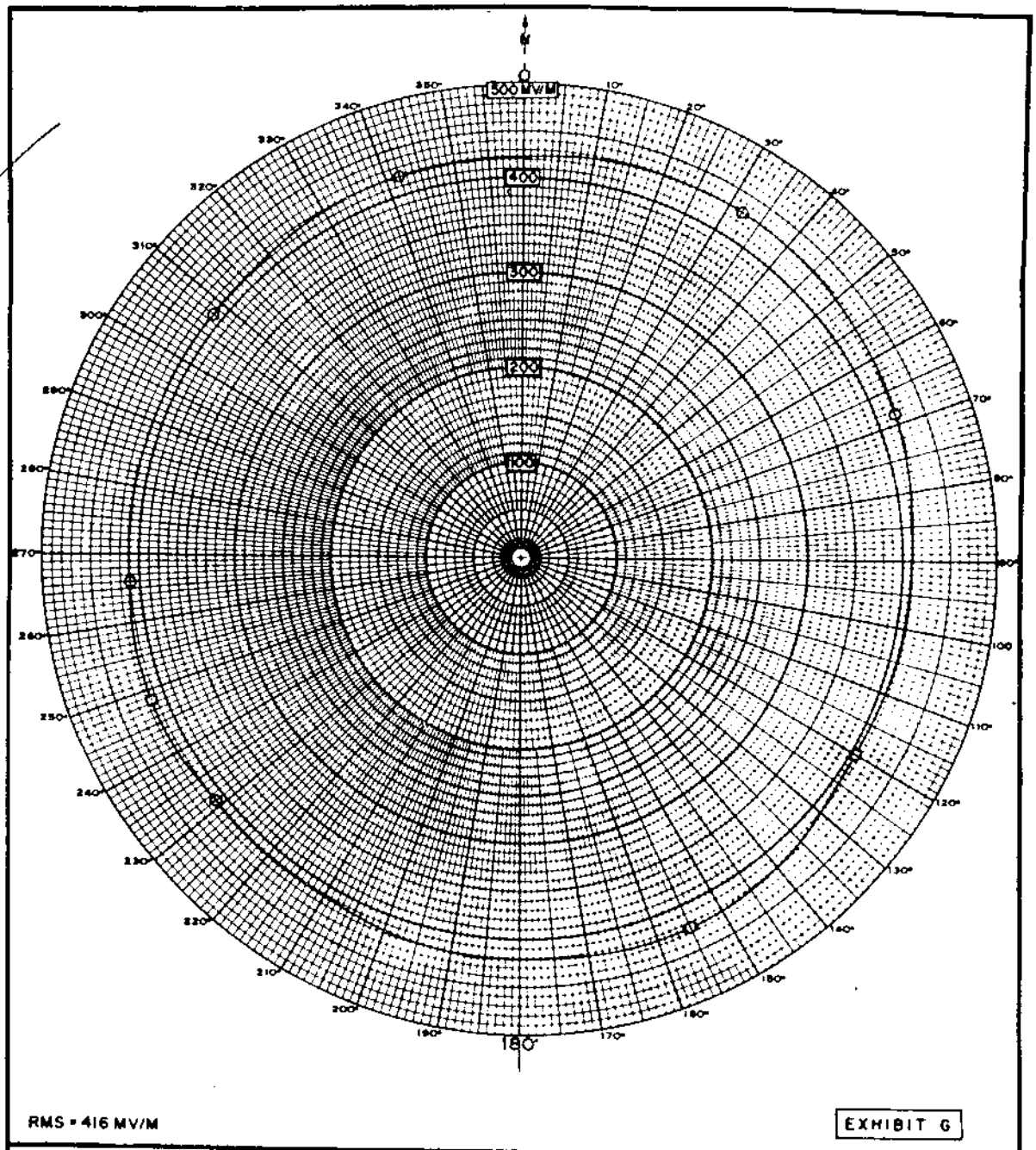
WWNH

Measured Non-DA
(4-24-64ct)

Station WWNH
Rochester, New Hampshire

5kw,DA-N,U
930 kc

6-15-67
GRANTED
LICENSE
FOR DA-N.



LATITUDE 43° 17' 13" N.
LONGITUDE 70° 56' 55" W.

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG

DAYTIME MEASURED
HORIZONTAL PLANE PATTERN

WWNH

ROCHESTER, NEW HAMPSHIRE

930 KC 5 KW. DA-N.

640224

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON D. C.

FCC File No. BL-10523
Accepted 4-15-64

Station WWNH
Rochester, New Hampshire

930 kc

DIRECTIONAL ANTENNA - DESCRIPTION SHEET

NEW

STATION: New

MAIN STUDIO: Richmond, B.C.

FREQUENCY: 940 KHz

POWER: 2.5 KW, Class II

NOTIFICATION LIST NO: 381

DATE: January 8, 1979

GEOGRAPHICAL LOCATION:

Latitude: 49° 08' 42" NORTH
Longitude: 123° 03' 09" WEST

ANTENNA CHARACTERISTICS:

Mode of Operation: DA-1, Unlimited

Number of Elements: 4 (Four)

Type of Elements: Uniform cross-section, guyed, vertical steel towers, base insulated for series feed, no top loading.

TOWER:	#1	#2	#3	#4
HEIGHT ABOVE INSULATOR:	276' (95°)	276' (95°)	276' (95°)	276' (95°)
VERALL HEIGHT:	285'	285'	285'	285'
SPACING:	ref.	90°	180°	270°
PHASING:	ref.	+108.76°	-142.17°	-33.41°
FIELD RATIO:	1.0	2.8794	2.8794	1.0
ORIENTATION:	ref.	127	127	127

GROUND SYSTEM: 120 equiangularly spaced radials extend from the base of each tower to a distance of 0.4 wavelengths (418 feet) with the exception of those joined along the common chords. Ground wires are #10, soft drawn copper wire, buried approximately 8 inches in the ground.

PREDICTED EFFECTIVE FIELD: 325 mV/m at 1 mile for 2.5 KW.

IMAGINEERING LIMITED

REDUCED Q: $0.02\ f(\epsilon)\ E_{rss} = 6.87 mV/m$

NEU

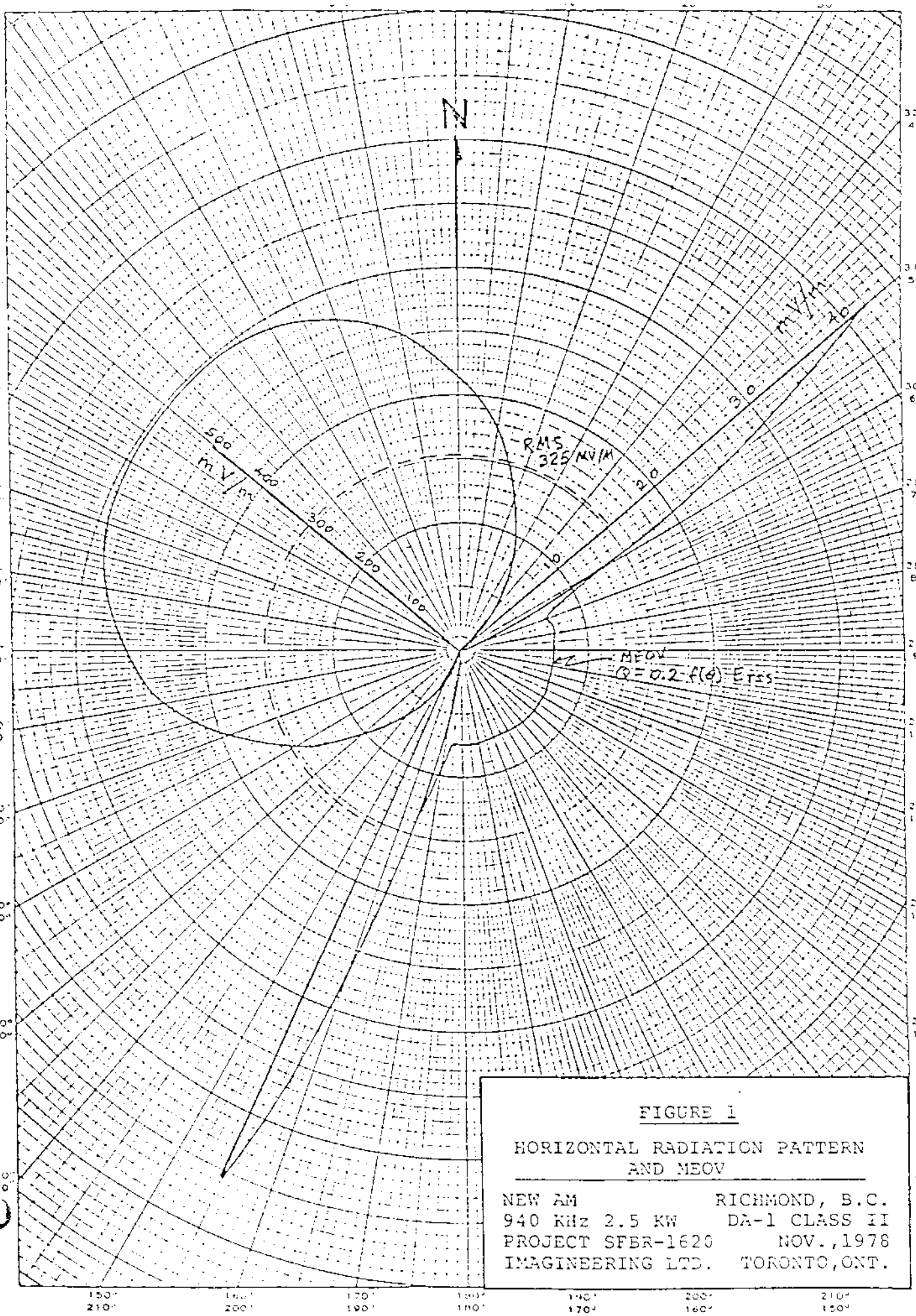


FIGURE 1

HORIZONTAL RADIATION PATTERN AND MEOV

NEW AM	RICHMOND, B.C.
940 KHz 2.5 KW	DA-1 CLASS II
PROJECT SFBR-1620	NOV.,1978
IMAGINEERING LTD.	TORONTO,ONT.

NEW

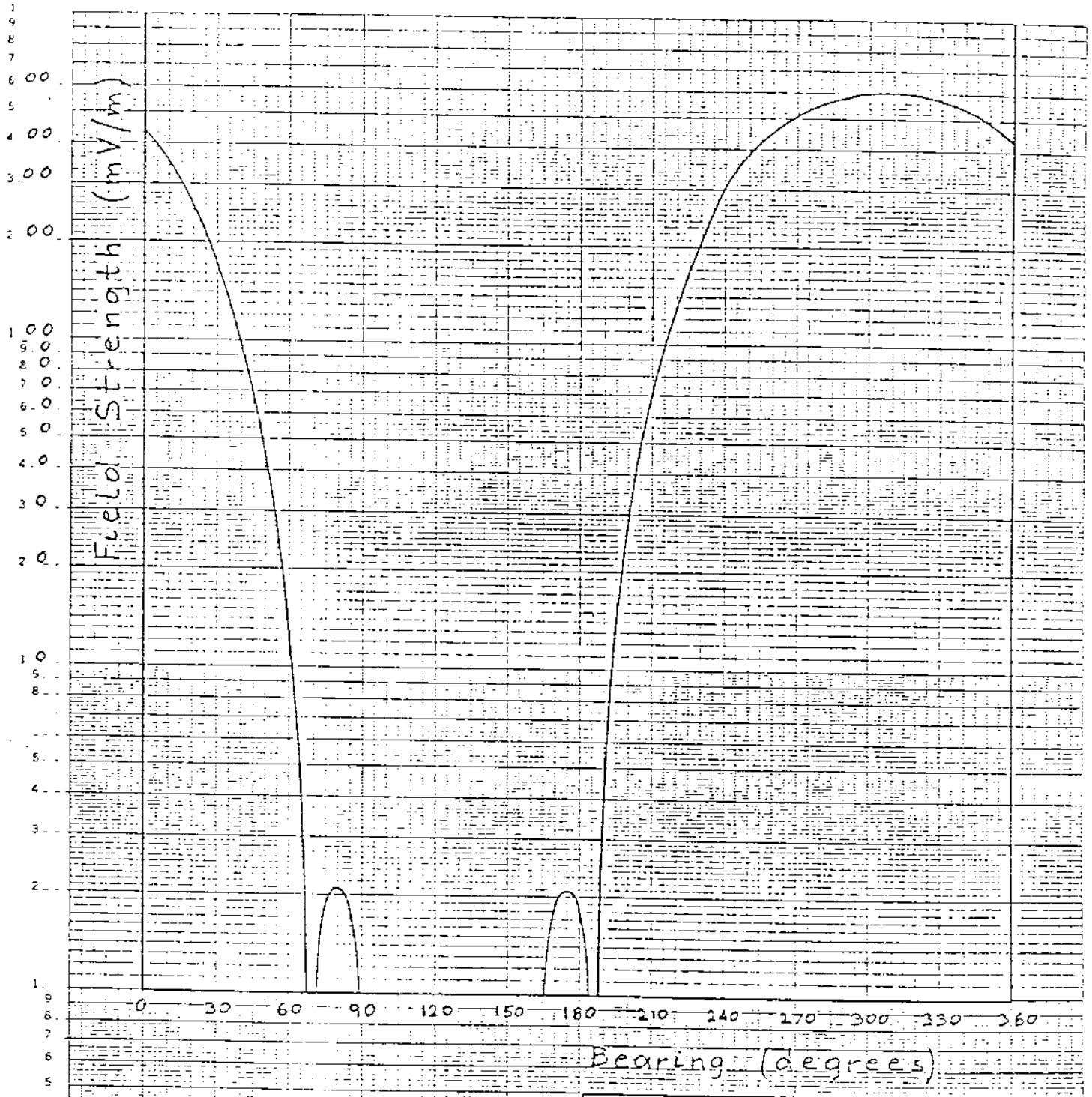


FIGURE 2

RADIATION PATTERN, ELEVATION 0°

NEW AM RICHMOND, B.C.
940 KHz 2.5 KW DA-1 CLASS II
PROJECT SFBR-1620 NOV., 1978
IMAGINEERING LTD. TORONTO, ONT.

CBM

DIRECTIONAL ANTENNA DESCRIPTION SHEET

STATION	: CBM	MAIN STUDIO:	Montreal, Que.
POWER	: 50 kw	FREQUENCY :	940 KHz, Class I-B
NOTIFICATION LIST NOS:	372	DATE :	April 7, 1978
GEOGRAPHICAL LOCATION:	North Latitude:	$45^{\circ}25'42''$	
	West Longitude:	$73^{\circ}26'58''$	

ANTENNA CHARACTERISTICS

MODE OF OPERATION	: DA-1
NUMBER OF ELEMENTS	: Two (2)
TYPE OF ELEMENTS	: No. 1 - Uniform cross-section, guyed steel tower, base insulated for series feed No. 2 - Uniform cross-section, guyed steel tower, base insulated for series feed, no top-loading

TOWERS	: No. 1	No. 2
Height above insulators of radiating elements:	357' (123°)	580' (199.5°)
Overall height of radiating elements :	367'	585'
Field ratios :	0.12	1.0
Phasing :	-90°	0°
Spacing :	111.3° (323.5')	0°
Orientation :	23°	Ref.

CBM

Antenna characteristics

GROUND SYSTEM : 120 equally spaced radials of 1" wide copper strap, buried approximately 8" deep, 600 ft. long except those bonded along the common cord between the towers and those limited by property size; plus a solid 40' x 40' sheet at the base of each tower.

PREDICTED EFFECTIVE FIELD: 1830 mV/m at 1 mile for 50 kW
258.8 mV/m at 1 mile for 1 kW

July 9, 1974
Rev. 1
Rev. 2 (16.12.74)
Rev. 3 (22.06.76)
Rev. 4 (13.03.78)

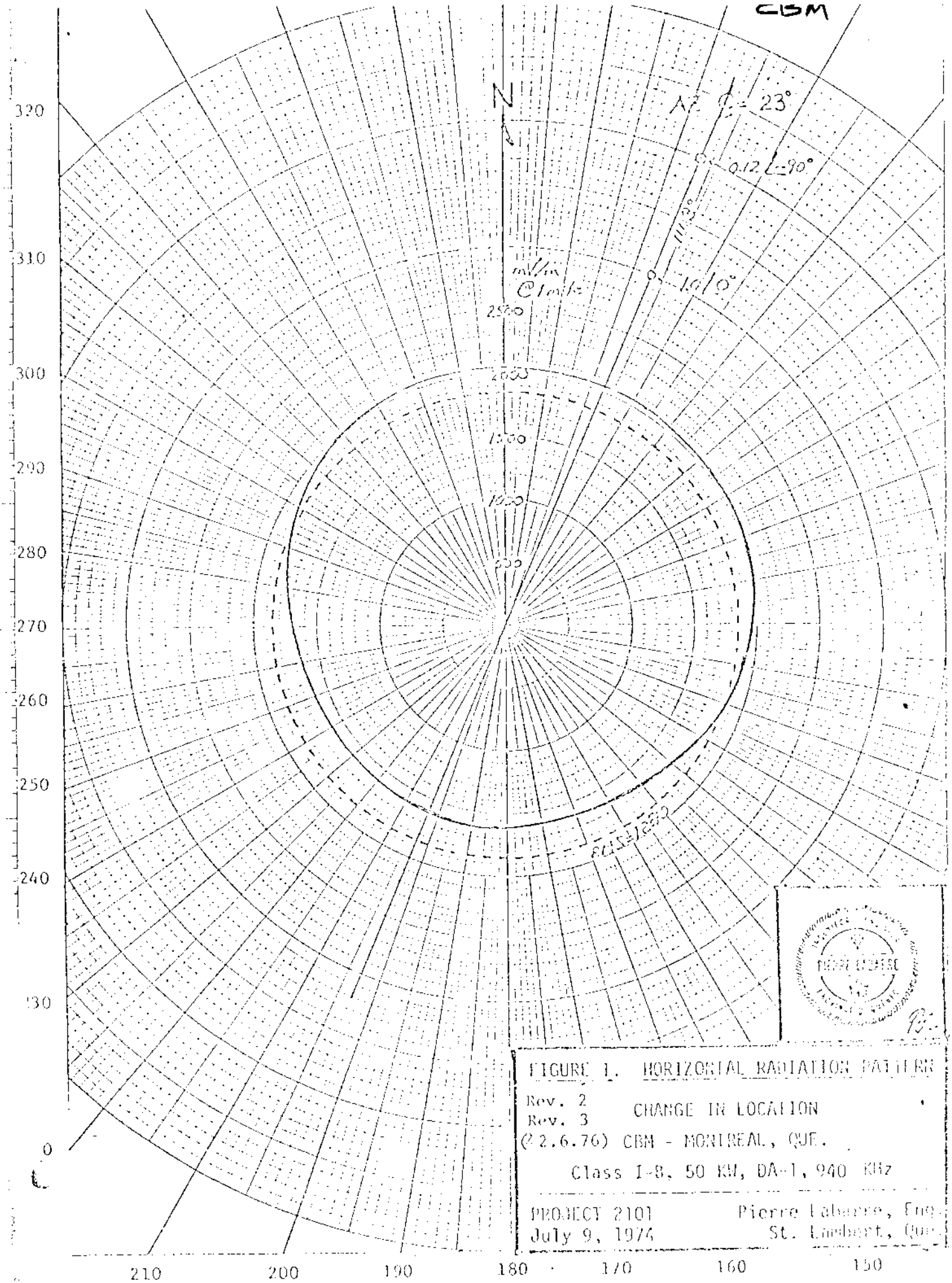
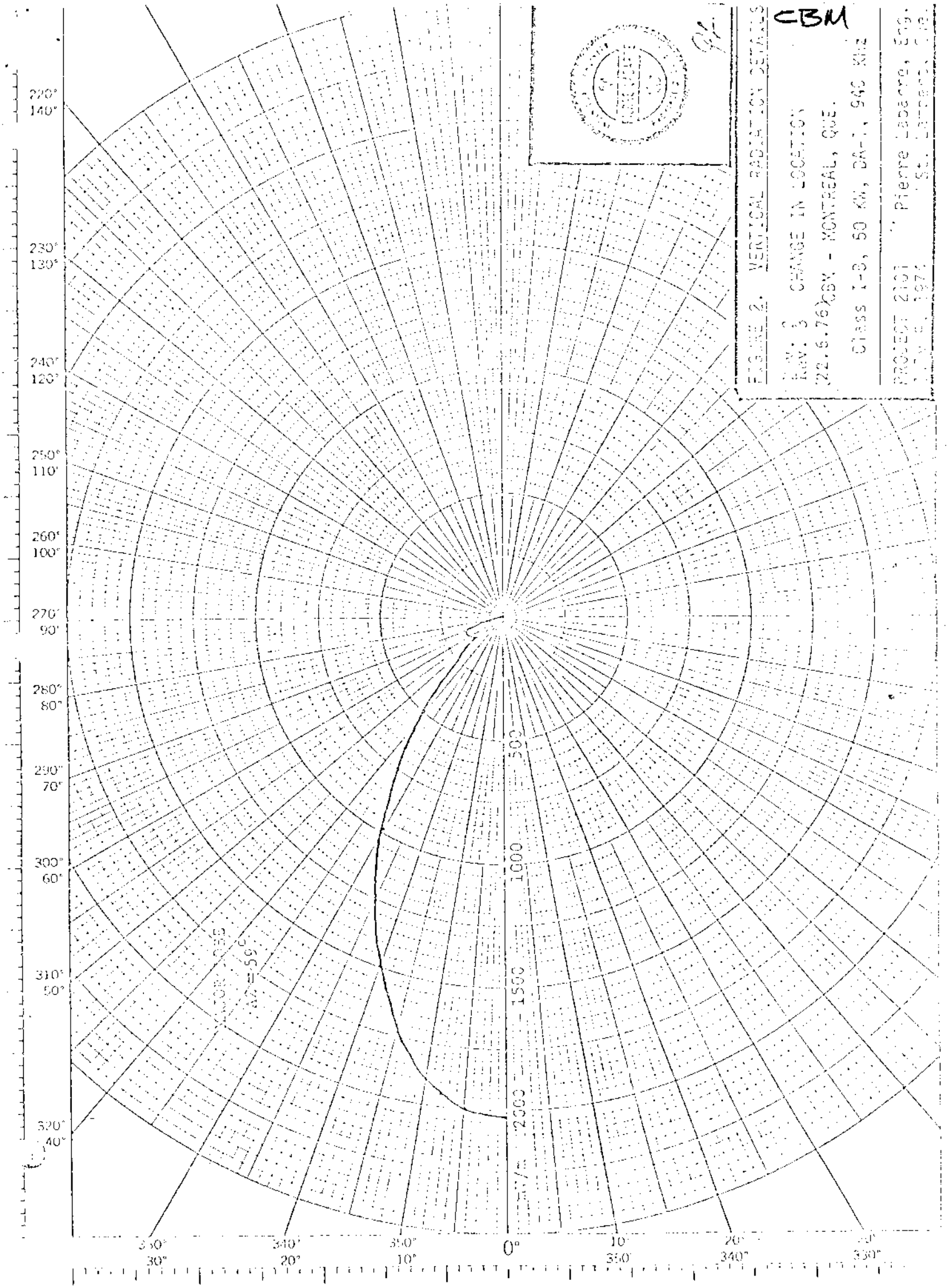


FIGURE 1. HORIZONTAL RADIATION PATTERN

Rev. 2
Rev. 3 CHANGE IN LOCATION
(2.6.76) CBM - MONTREAL, QUE.

Class I-B, 50 KW, DA-1, 940 KHz

PROJECT 2101 Pierre Laberge, Eng.
July 9, 1974 St. Lambert, Que.


CBM
FIGURE 2. VERTICAL RADIATION DETAILS
REV. 3 CHANGE IN LOCATION
(22.6.76) CBY - MONTREAL, QUE.
Class I-B, 50 KW, DA-1, 940 KHZ
PROJECT 2101
Pierre Laberge, Eng.
220°
140°
230°
130°
240°
120°
250°
110°
260°
100°
270°
90°
280°
80°
290°
70°
300°
60°
310°
50°
320°
40°
500
1000
1500
2000
350°
30°
340°
20°
330°
10°
0°
10°
350°
20°
340°
30°
330°

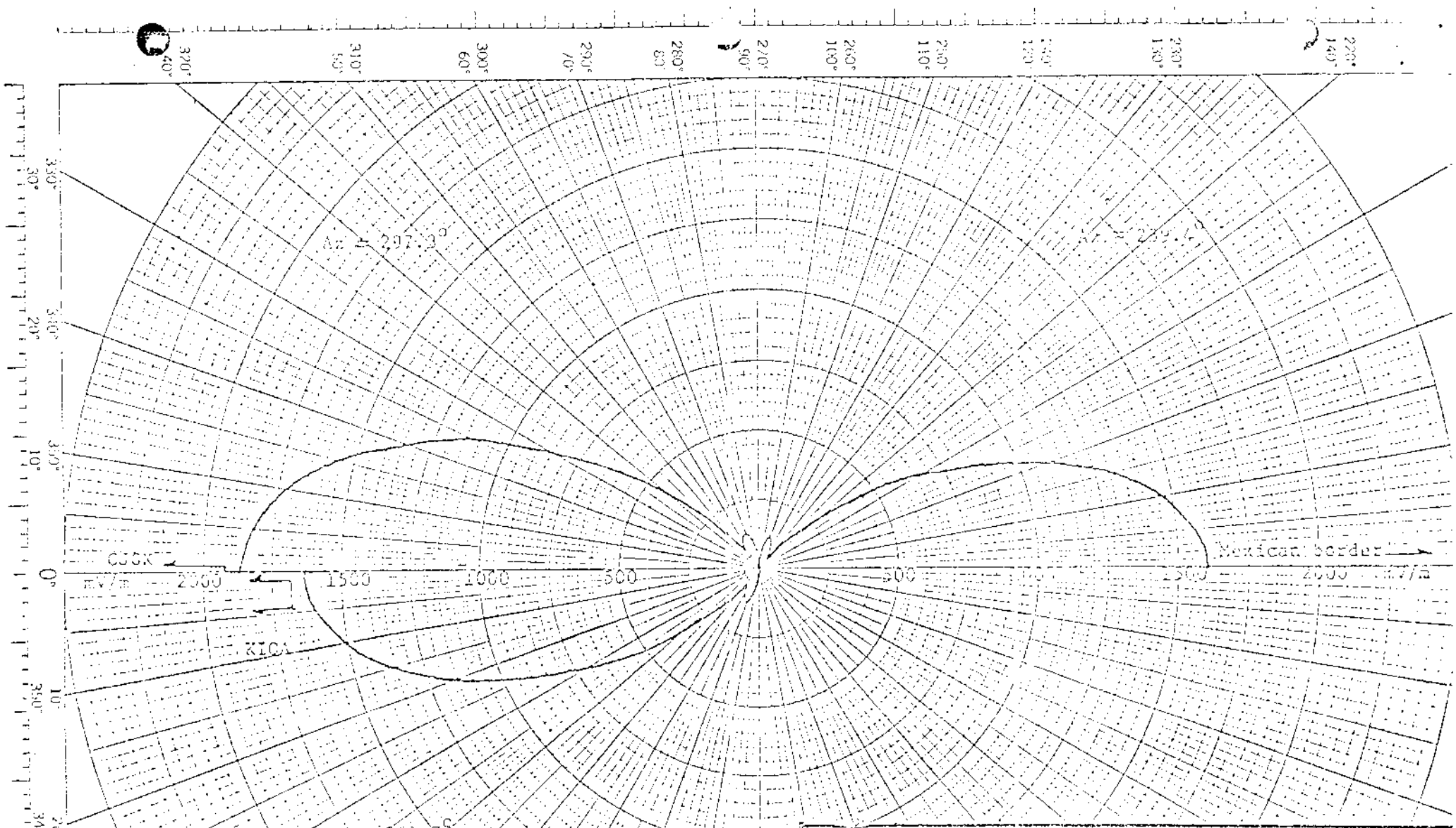


FIGURE 3. VERTICAL RADIATION DETAILS

Rev. 2 CHANGE IN LOCATION
Rev. 3
(22.6.76) CBM - MONTREAL, QUE.

Class I-B, 50 kW, DA-1, 940 KHz

PROJECT 2101 Pierre Labarre, Eng.
July 9, 1974 St. Lambert, Que.

CBM

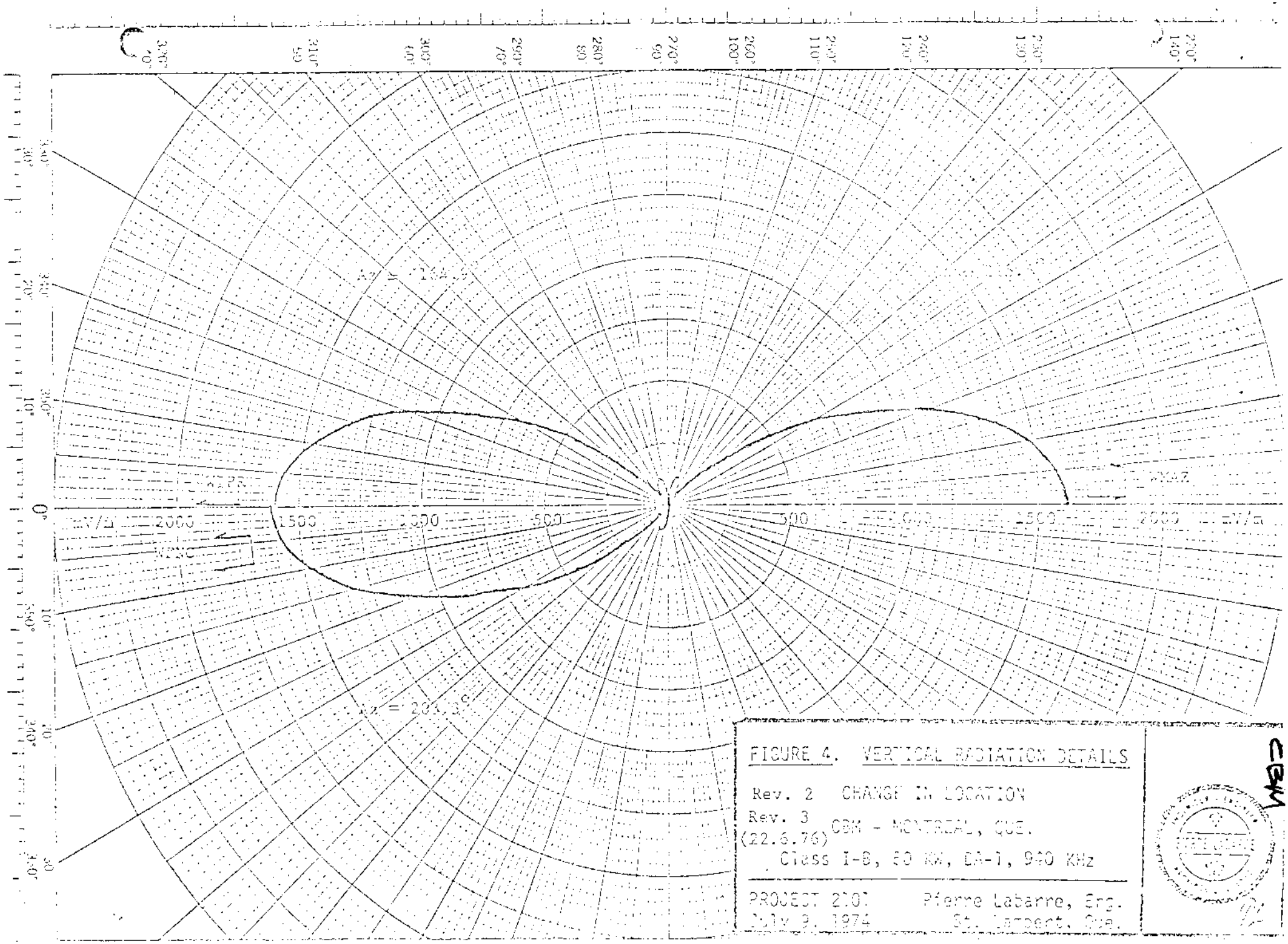


FIGURE 4. VERTICAL RADIATION DETAILS

Rev. 2 CHANGE IN LOCATION
Rev. 3 (22.6.76) CBM - MONTREAL, QUE.
Class I-B, 50 KW, DA-1, 940 KHz

PROJECT 2101 Pierre Labarre, Eng.
July 9, 1974 St. Lambert, Que.

CBM

CJGX

Description Sheet
(8-28-67ct)

Station CJGX
Yorkton, Saskatchewan

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

2.5 DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station:	CJGX	Main Studio:	Yorkton, Sask.
Frequency:	940 Kc/s	Power:	10 KW, DA-N Class: II
Notification List No:	190	Date:	October 2, 1964

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

North Latitude: 51° 12' 23"

West Longitude: 102° 20' 08"

ANTENNA CHARACTERISTICS

Mode of Operation: DA-N
Number of Elements: 4
Type of Elements: guyed, base insulated, series fed, uniform cross section.

TOWER:	No. 1 North	No. 2 West	No. 3 South	No. 4 East
HEIGHT ABOVE INSULATORS:	262' (90°)	262'	262'	262'
OVERALL HEIGHT:	267'	267'	267'	267'
SPACING 1-2, 4-3	262' (90°)			
SPACING 1-4, 2-3	320'(110°)			
PHASING : Night	0°	-164.35	-70.35	-266.
FIELD RATIO: Night	1.	.85	.722	.85

ORIENTATION: Towers placed in parallelogram form.
Towers 1 and 2 on a line bearing 168° with True North
Towers 4 and 3 on a line bearing 168° with True North
Towers 1 and 4 on a line bearing 153° with True North
Towers 2 and 3 on a line bearing 153° with True North

GROUND SYSTEM: 120 radials No. 10 AWG copper wire per tower. Radials from each tower bonded to No. 4 AWG bus at right angles midway between towers and extending to property limits. Effective radial length .4λ

Predicted Effective Field Night 600 mv/m (190 mv/m for 1 Kw).

Note: Please retain previous notification for CJGX day operation, using No. 2 tower for omnidirectional operation.

#196

CJGX

Description Sheet (3-26-65ct) | Station CJGX Yorkton, Sask. | 10kw,DA-N,U,Class II 940 kc

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CJGX

Main Studio: Yorkton, Sask.

Frequency: 940 Kc/s

Power: 10 KW, DA-N Class: II

Notification List No: 196

Date: March 1, 1965.

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

North Latitude: 51° 12' 23"

West Longitude: 102° 20' 08"

ANTENNA CHARACTERISTICS

Mode of Operation: DA-N
Number of Elements: 4
Type of Elements: guyed, base insulated, series fed, uniform cross section.

TOWER:	No. 1 North	No. 2 West	No. 3 South	No. 4 East
HEIGHT ABOVE INSULATORS:	262' (90°)	262'	262'	262'
OVERALL HEIGHT:	267'	267'	267'	267'
SPACING 1-2, 4-3	349'(120°)			
SPACING 1-4, 2-3	262'(90°)			
PHASING: Night	268.5°	0.	90.36	358.86
FIELD RATIO: Night	.8	1.	.83	.664

ORIENTATION: Towers placed in parallelogram form.
Towers 1 and 2 on a line bearing 47.5° with True North
Towers 4 and 3 on a line bearing 47.5° with True North
Towers 1 and 4 on a line bearing 090° with True North
Towers 2 and 3 on a line bearing 090° with True North

GROUND SYSTEM: 120 radials No. 10 AWG copper wire per tower. Radials from each tower bonded to No. 4 AWG bus at right angles midway between towers and extending to property limits. Effective radial length 4 wavelength.

Predicted Effective Field Night 600 mv/m (190 mv/m for 1 Kw).

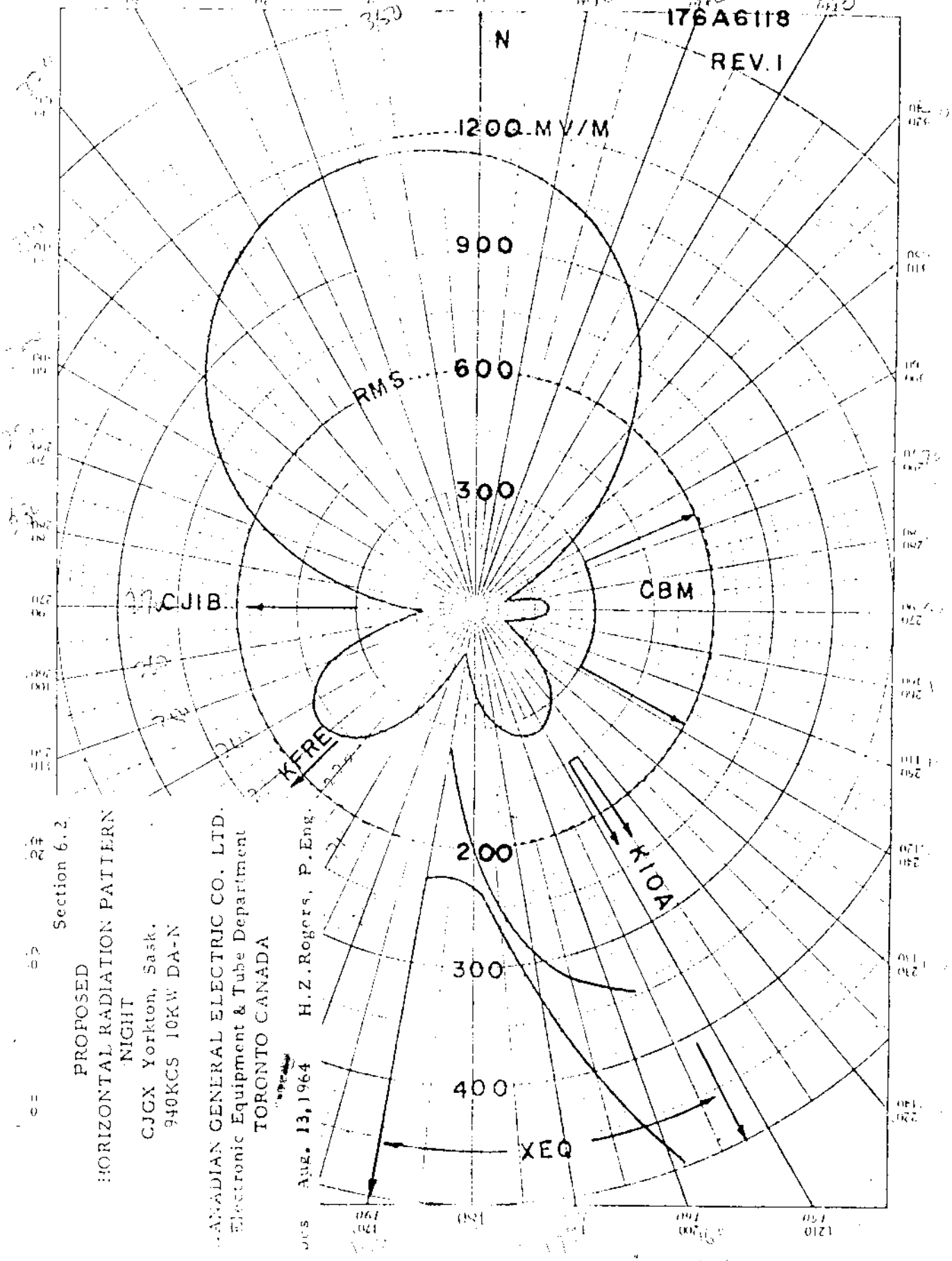
Note: Please retain previous notification for CJGX day operation, using No. 1 tower for omnidirectional operation.

CJGX

Proposed Night
(8-28-67ct)

Station CJGX
Yorkton, Saskatchewan

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



Section 6.2

PROPOSED
HORIZONTAL RADIATION PATTERN
NIGHT
CJGX Yorkton, Sask.
940KCS 10KW DA-N

CANADIAN GENERAL ELECTRIC CO. LTD.
Electronic Equipment & Tube Department
TORONTO CANADA

Aug. 13, 1964

H.Z.Rogers, P.Eng.

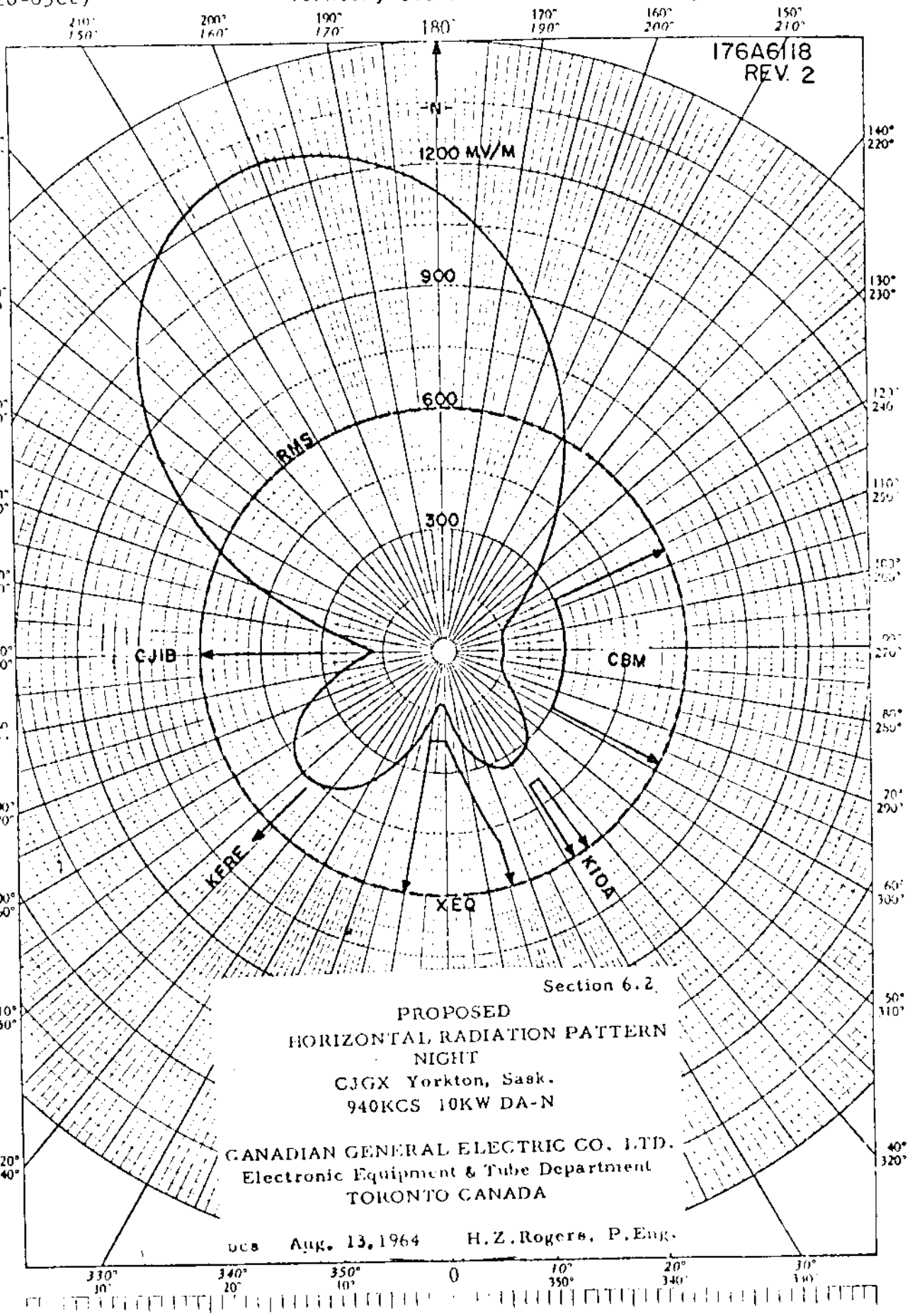
#196

CJGX

Proposed Night
(3-26-65ct)

Station CJGX
Yorkton, Sask.

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



VERNON, BRITISH COLUMBIA CJIB

Directional Antenna Description Sheet

Station Call : CJIB Main Studio : Vernon, B. C.

Frequency : 940 kc Power : 10 kw Class : II

Notification List No. : 284 Date : November 22, 1971.

Geographical Location
of Antenna System : N. Lat. 50° 19' 26" W. Lng. 119° 14' 42"

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

	No. 1 Tower (south-east)	No. 2 Tower (north-west)
Height above insulator	260' (90°)	260'
Overall Height	265'	265'
Spacing	183' (63°)	
Phasing	0°	141° lag
Field Ratio	1.0	0.78

Orientation: Line through towers bears N 49° W

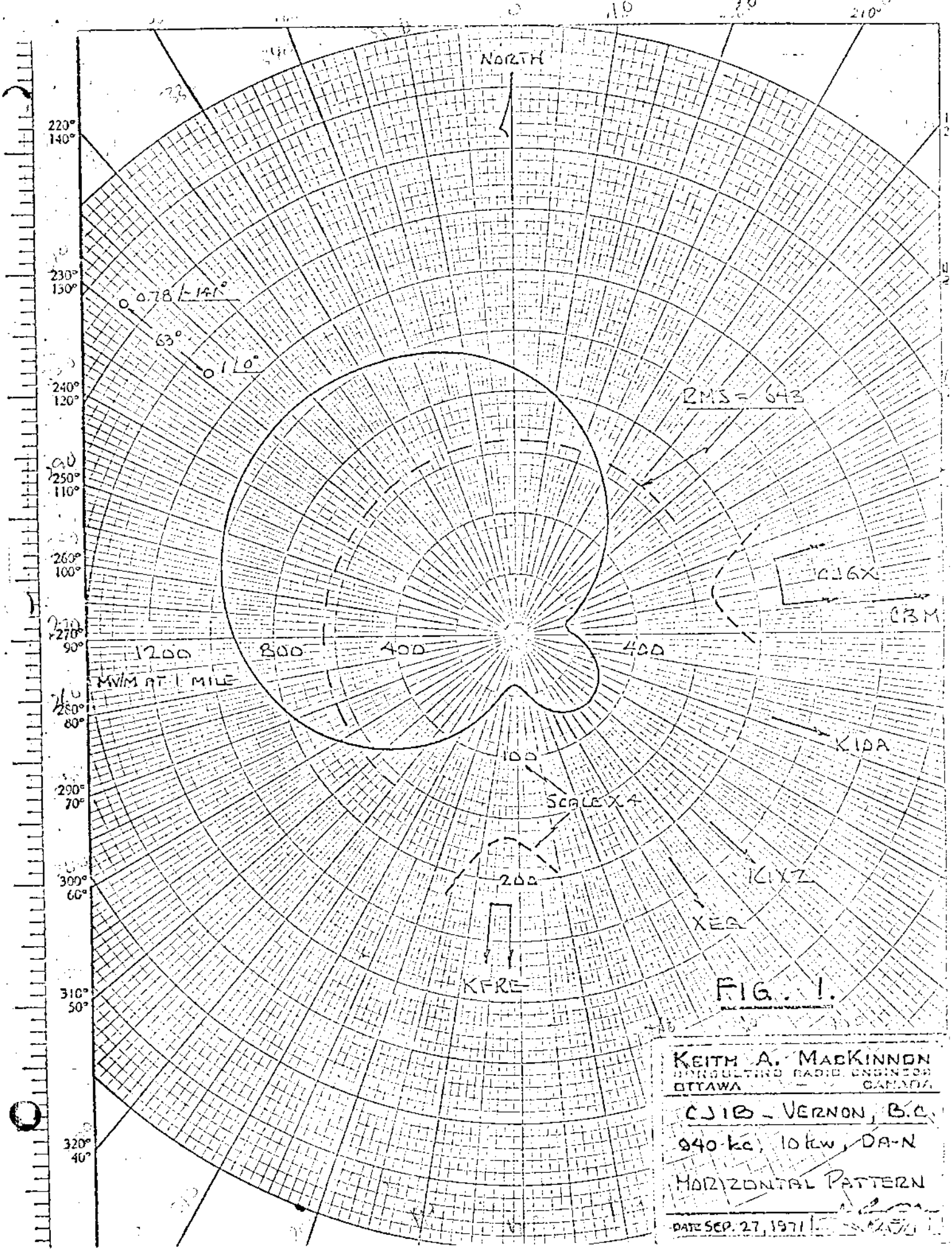
Ground System: Around each tower base 120 radials 425' long except those terminating on right bisector.

Predicted
Effective Field: 643 mv/m at 1 mile (203 per kw)

oooooooooooooo

VERNON, BRITISH COLUMBIA

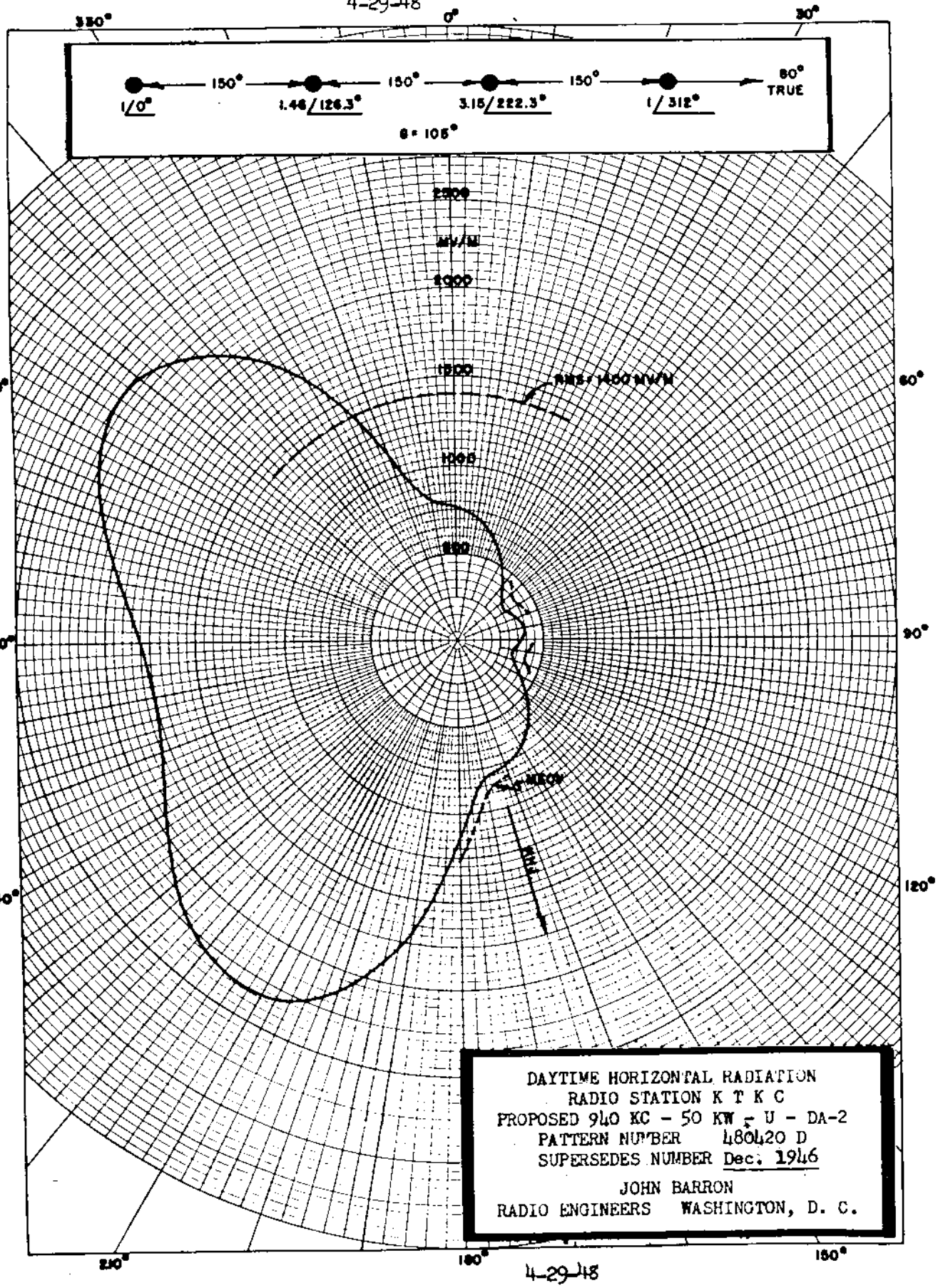
CJIB



KFRE ~~KTKC~~ 940

APR 30 1948 G

4-29-48



DAYTIME HORIZONTAL RADIATION
RADIO STATION K T K C
PROPOSED 940 KC - 50 KW - U - DA-2
PATTERN NUMBER 480420 D
SUPERSEDES NUMBER Dec. 1946

JOHN BARRON
RADIO ENGINEERS WASHINGTON, D. C.

4-29-48

KFRE

MEASURED KFRE, FRESNO, CAL. 50kw, DA2 940 kc

DAY 3/7/49G License 8-28-49

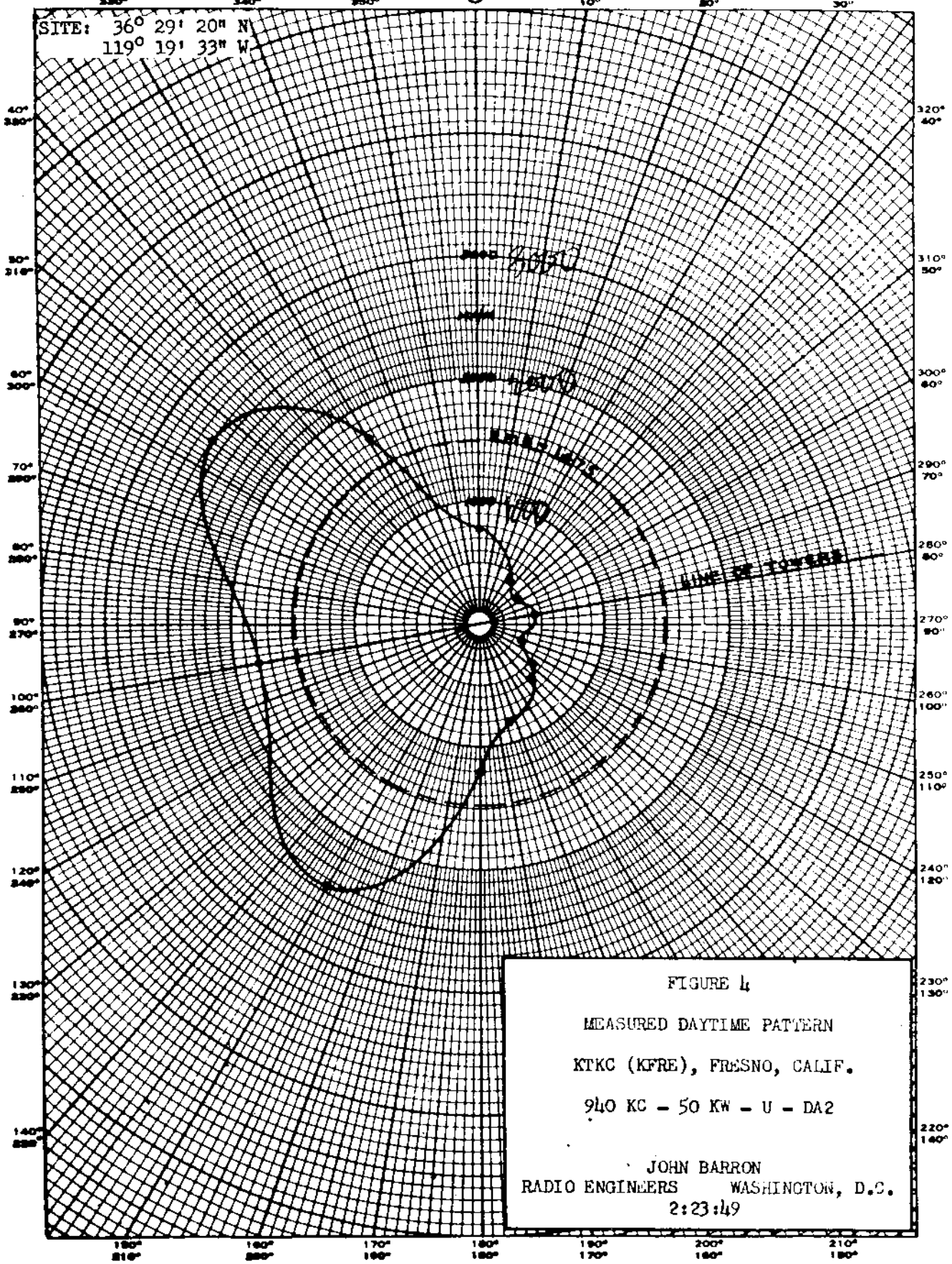


FIGURE 4

MEASURED DAYTIME PATTERN

KTKC (KFRE), FRESNO, CALIF.

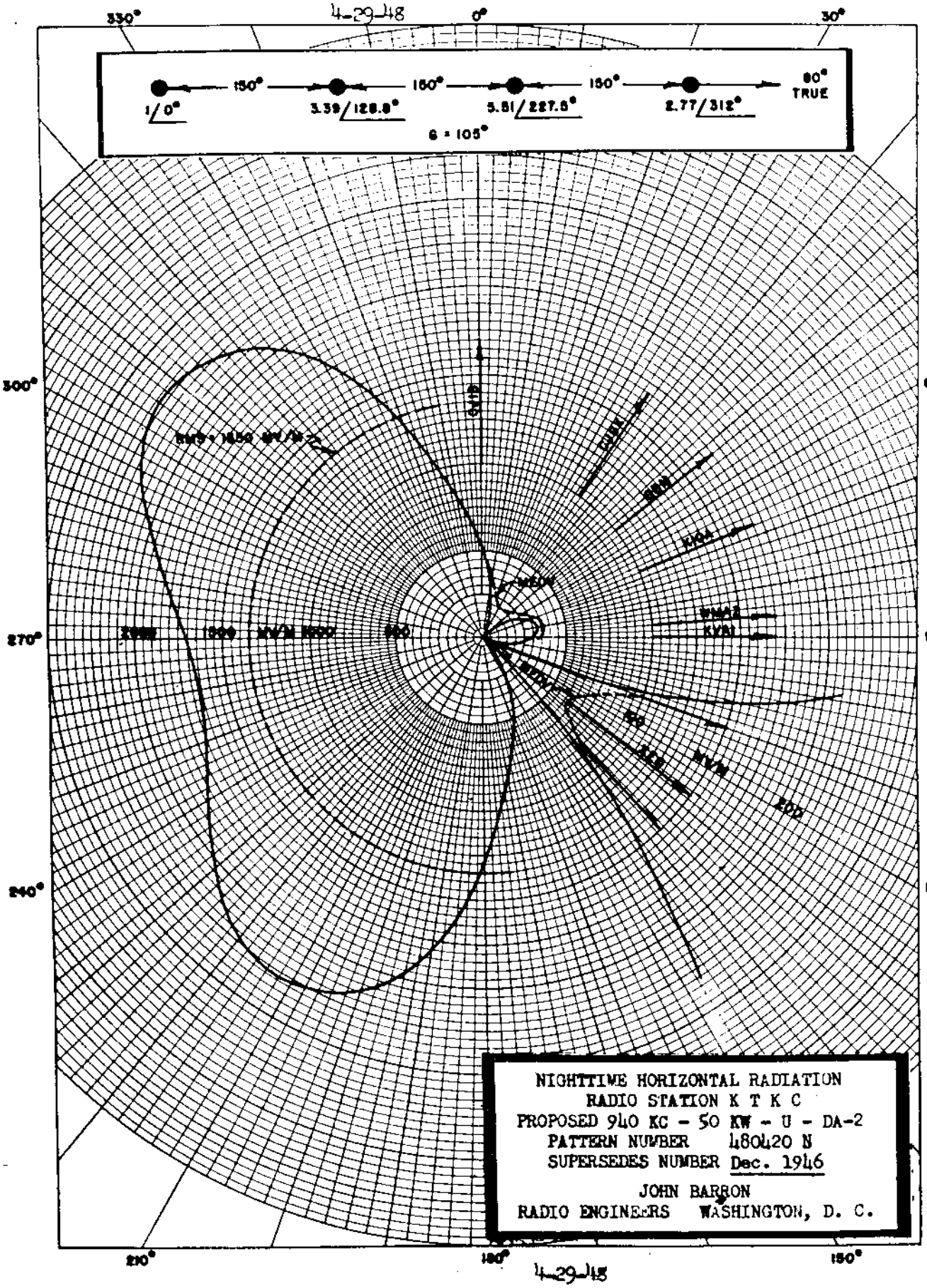
940 KC – 50 KW – U – DA2

JOHN BARRON
RADIO ENGINEERS WASHINGTON, D.C.
2:23:49

~~KTKC~~
KFRE 940

APR 30 1948 G

4-29-48



4-29-48

KFRE

MEASURED KFRE, FRESNO, CAL. 50kw,DA2 940 kc

NIGHT 3/7/49G

License 2-28-49

SITE: 36° 29' 20" N
119° 19' 33" W

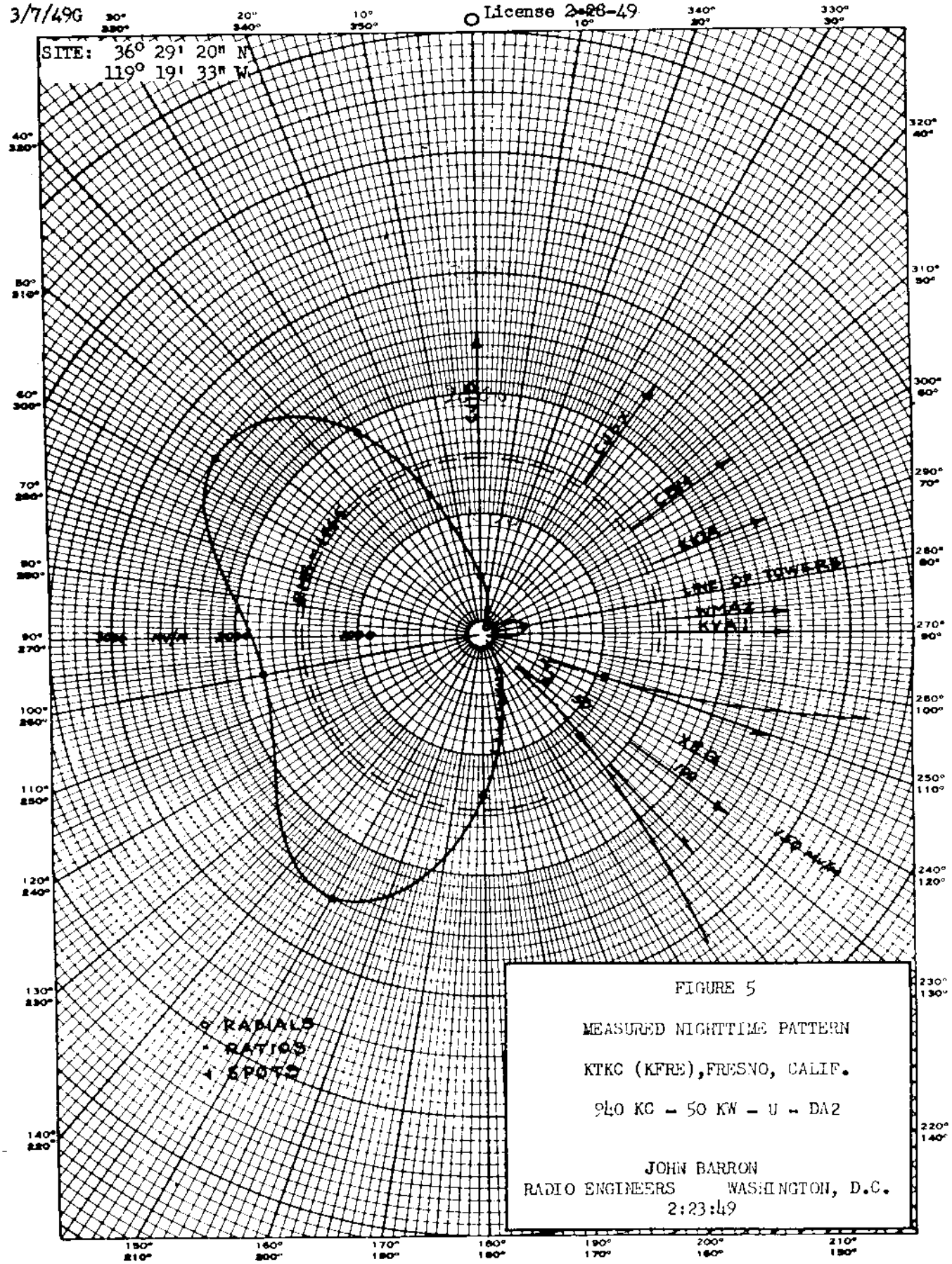


FIGURE 5

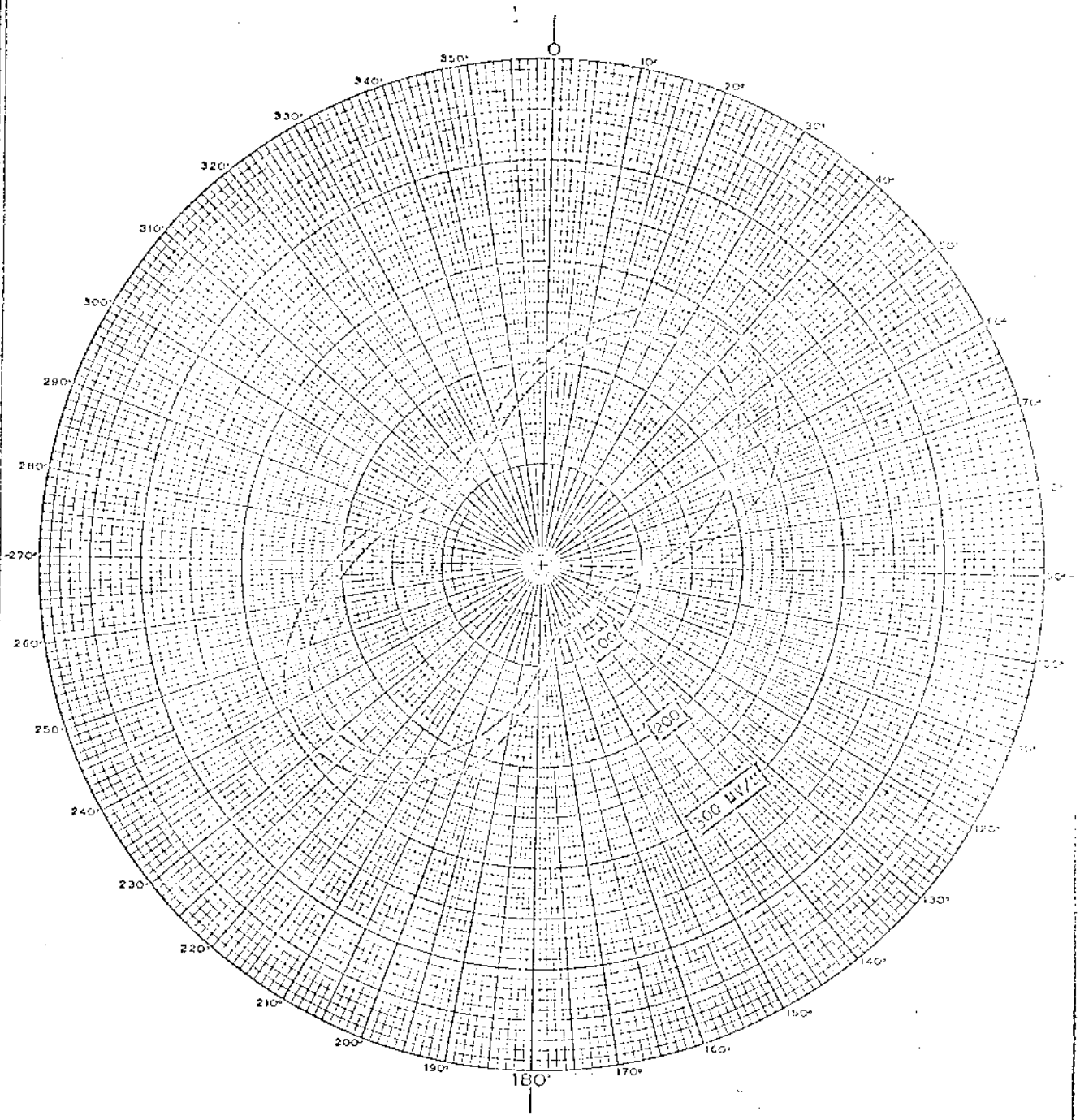
MEASURED NIGHTTIME PATTERN

KTKC (KFRE),FRESNO, CALIF.

940 KC – 50 KW – U – DA2

JOHN BARRON
RADIO ENGINEERS WASHINGTON, D.C.
2:23:49

KHOS



E_{RMS} = 177 MV/M

KHOS

LATITUDE: 32° 12' 04" LONGITUDE: 111° 01' 02" DATE: NOV. 24, 1970	ANTENNA PARAMETERS	FIGURE 22
JOHN H. MULLANEY AND ASSOCIATES	#1 O 1/0° S #2 O 0.61/26° N-135°-E S=163.24°=474.7' G=89.41°=260'	AUTHORIZED DAYTIME PATTERN WITH PROPOSED MEOV RADIO STATION KHOS TUCSON, ARIZONA
		940 KHz 0.25/1 KW-LS, DA-2, U

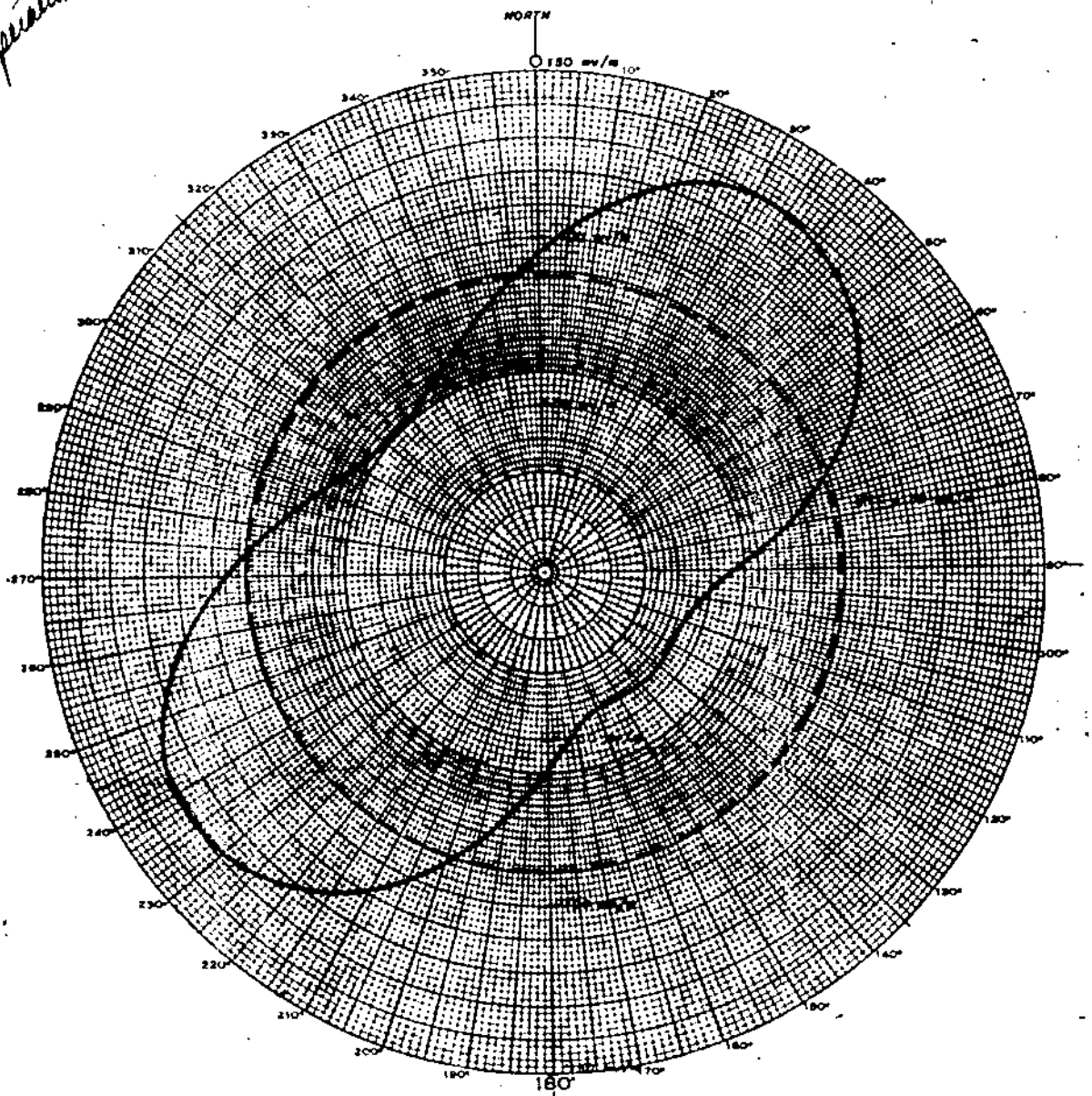
KHOS

2-9-62
granted MCP to
change to DA-2 operation

Proposed Day
(2-28-62ct)

Station KOBY
Tucson, Arizona

250w,DA-2,U
940 kc



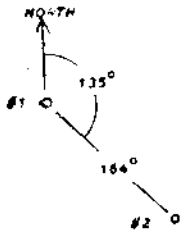
TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA
	TOWER No.	ELECTRICAL HEIGHT	TOWER ORIENTATION	SPACING	PHASING	HORIZONTAL FIELD	FIELD RATIO	ELEV. ANGLE	ELEVATION RMS FIELD	CALL KOBY
		°	°	°	°	ε	ρ	°	ε₀	FREQUENCY 940 kc
	1	90	0	0	0	86	1.0	0	88	POWER 0.25 kw
	2	90	135	164	26	43	0.3	10		TIME OF OPERATION UNLIMITED
	3							20		TYPE OF OPERATION DA-2
	4							30		DAYTIME TOWERS 2
	5							40		NIGHTTIME TOWERS 2
	6							50		No. RADIALS PER TOWER 240
	7							60		LENGTH OF RADIALS 90 & 250 ft
	8							70		GROUND SCREEN DIMENSION —
	9							80		LAT. 32° 12' 04"
	10									LONG. 111° 01' 02"
								E_{av}	mv/m	SUPERSEDES
								R_{av}	kw	PATTERN No.

EXHIBIT V-1C (DAYTIME)
RADIO STATION KOBY
TUCSON, ARIZONA

12-15-61

FCC File No.BMP-10061
Accepted 1-22-62

Station KOBY
Tucson, Arizona

940 kc

KHOS

FCC File Number BMP-13219
August 10, 1971 K & E

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KHOS

Main Studio: Tucson, Arizona

Frequency: 940 kHz

Power: 0.25kw Night 1kw Day

Notification List No. 1422

Date: April 28, 1971

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 32° 12' 04"
West Longitude: 111° 01' 02"

ANTENNA CHARACTERISTICS

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

TOWER:	NW(#1)	SE(#2)
HEIGHT ABOVE INSULATORS:	260'	260' (89.41°)
NIGHT PHASING:	0°	+26°
NIGHT FIELD RATIO:	1	1
DAY PHASING:	0°	+26°
DAY FIELD RATIO:	1	0.61

SPACING AND ORIENTATION: Elements are spaced 474.7' (163.24°) on a line bearing 135° true.

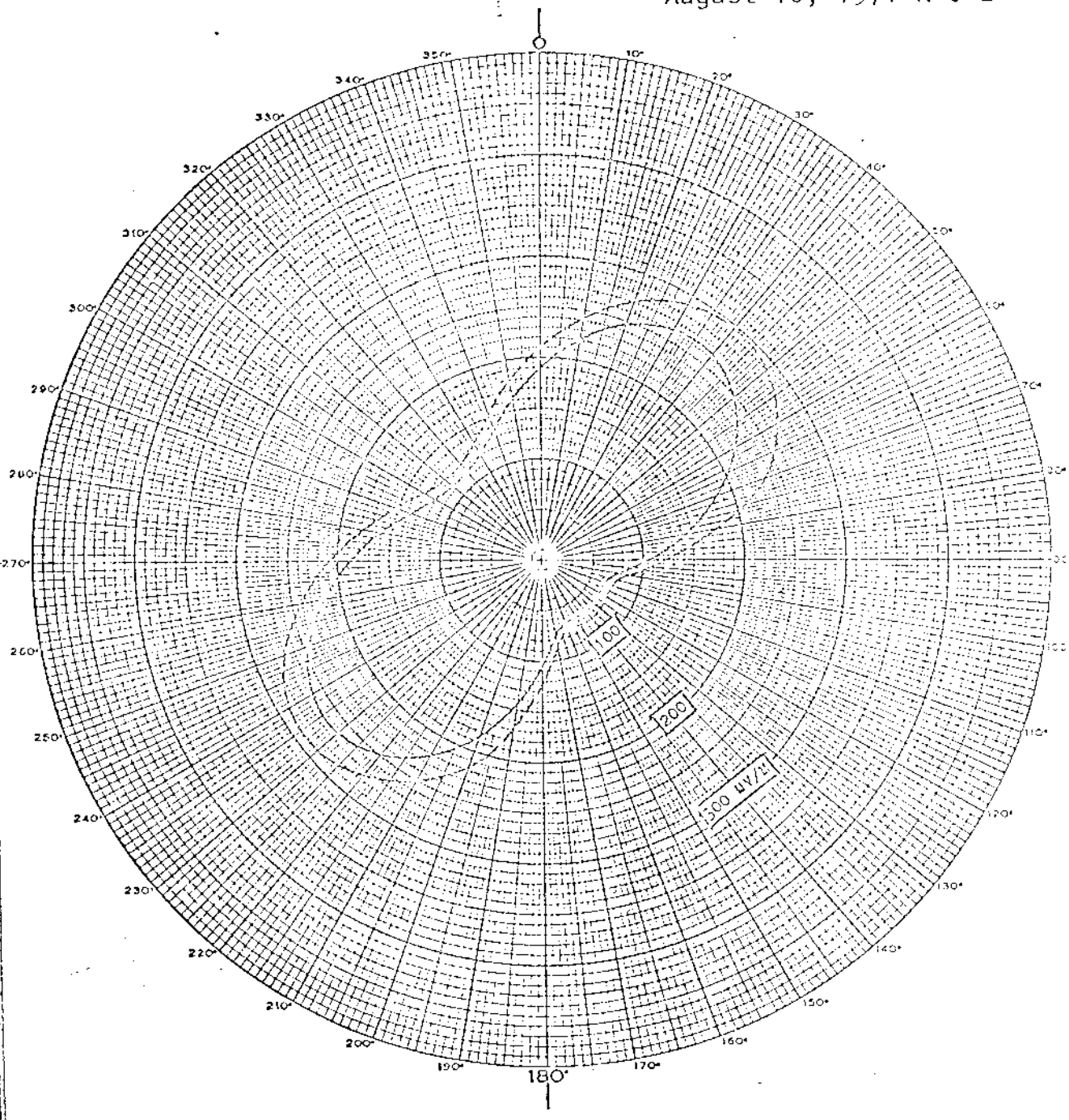
GROUND SYSTEM: 120 - 250' equally spaced copper radials plus 120 - 50' interspaced radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

Predicted effective Night Field: 88 mv/m at rated power.

Predicted effective Day Field: 177 mv/m at rated power.

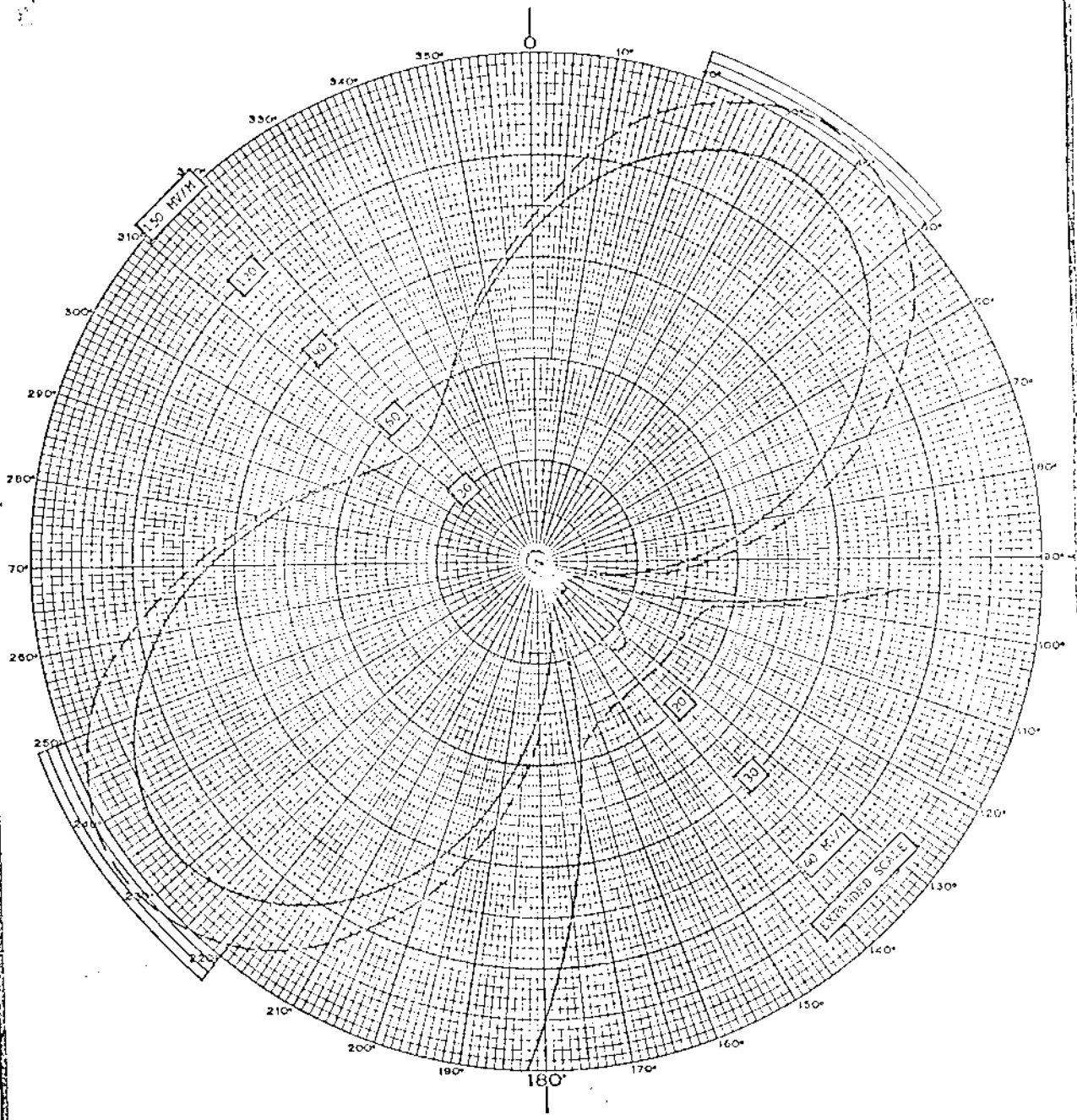
CTR NO 30541A4

FCC File Number BMP-13219
August 10, 1971 K & E



E_{RMS} = 177 MV/M

LATITUDE: 32° 12' 04" LONGITUDE: 111° 01' 02" DATE: NOV. 24, 1970	ANTENNA PARAMETERS	FIGURE 22 DAYTIME PATTERN
JOHN H. MULLANEY AND ASSOCIATES	#1 1/0° S #2 0.61/26° N-135°-E S=163.24°=474.7' G=89.41°=260'	RADIO STATION KHOS TUCSON, ARIZONA 940 KHz 0.25/1 KW-LS, DA-2.



E_{RMS} = 88 MV/M

– – – – – – = MEOV

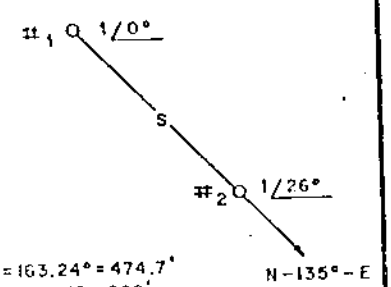
LATITUDE: 32° 12' 04"

LONGITUDE: 111° 01' 02"

DATE: SEPTEMBER 11, 1970

JOHN H. MULLANEY
AND
ASSOCIATES

ANTENNA PARAMETERS



S = 163.24° = 474.7'
0 = 89.41° = 260'

FIGURE 7

NIGHTTIME PATTERN

RADIO STATION KHOS
TUCSON, ARIZONA

940 KHz 0.25/1 KW-LS, DA-2, U

TUCSON ARIZONA

KHOS

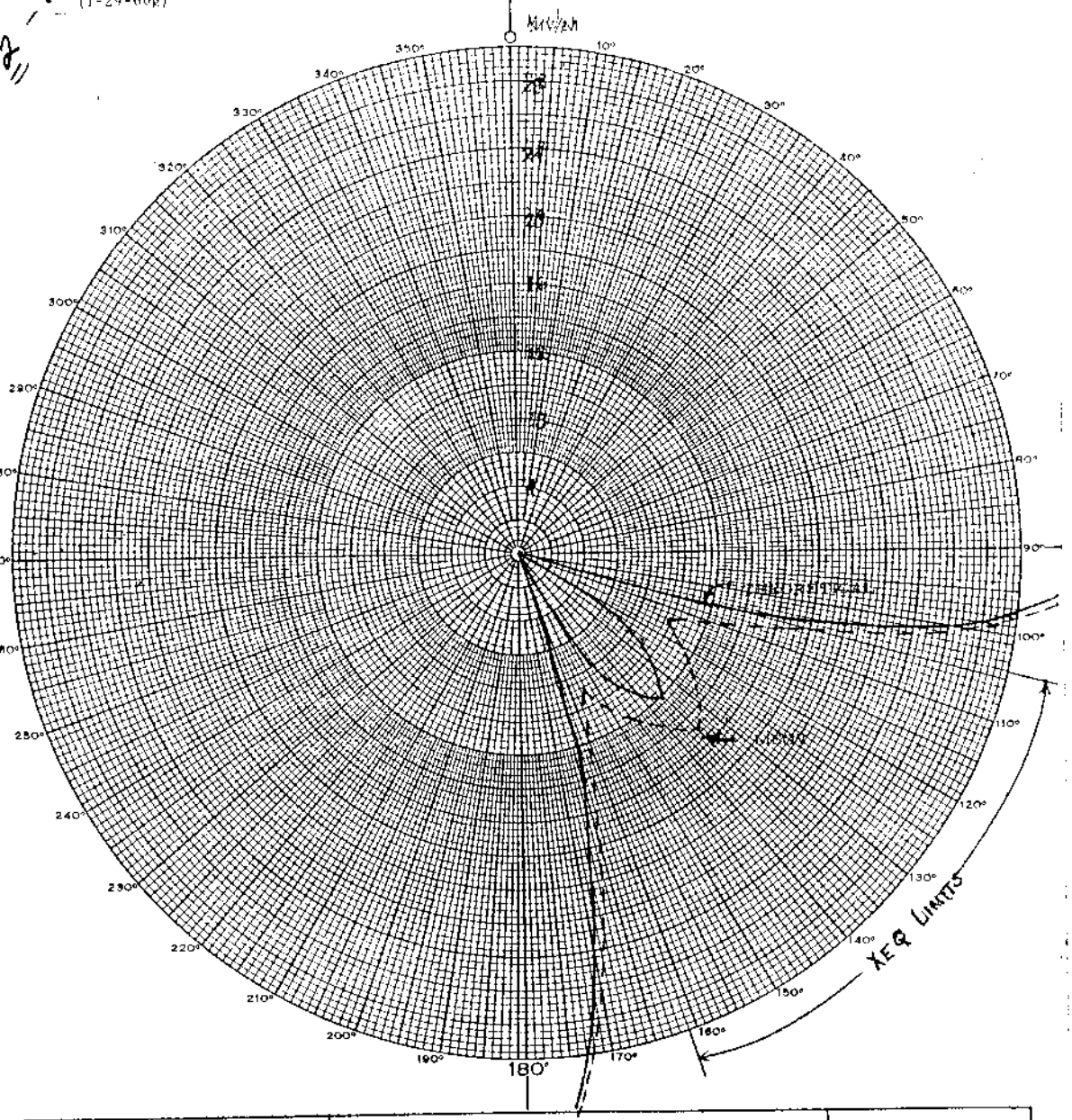
granted CP for new station 5-4-60
granted MCP for DA-2 - 2-9-62

POLAROID PRINTS NO. 15 LP

C. EVERAND INSTITUTE OF RADIO ELECTRONICS CLEVELAND OHIO

PROPOSED DAY & NIGHT NULLS
(1-29-60p)

New: Grabet, Inc. Radio Enterprises 250w, DA-1,U
Tuscon, Arizona 940 KC



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA	
	TOWER No.	ELECTRICAL HEIGHT °	TRUE TOWER ORIENTATION °	SPACING °	PHASING °	HORIZONTAL FIELD mv/m	FIELD RATIO	ELEV. ANGLE °	ELEVATION RMS FIELD mv/m	CALL	
	1	90	0	0	0	69	1.0	0	88	FREQUENCY	940 kc
	2	90	135	164	26	69	1.0	10		POWER	8.25 kw
	3							20		TIME OF OPERATION	UNL
	4							30		TYPE OF OPERATION	Clear
	5							40		DAYTIME TOWERS	8
	6							50		NIGHTTIME TOWERS	2
	7							60		No. RADIALS PER TOWER	40
	8							70		LENGTH OF RADIALS	50' 250'
	9							80		GROUND SCREEN DIMENSION	—
	10							Ea°	mv/m	LAT. 32 12 07	
								Ea°	kw	LONG. 110 59 44	
		DAYTIME OPERATION ☒		NIGHTTIME OPERATION ☒						SUPERSEDES	
										PATTERN No.	

N
135°
164°
#2

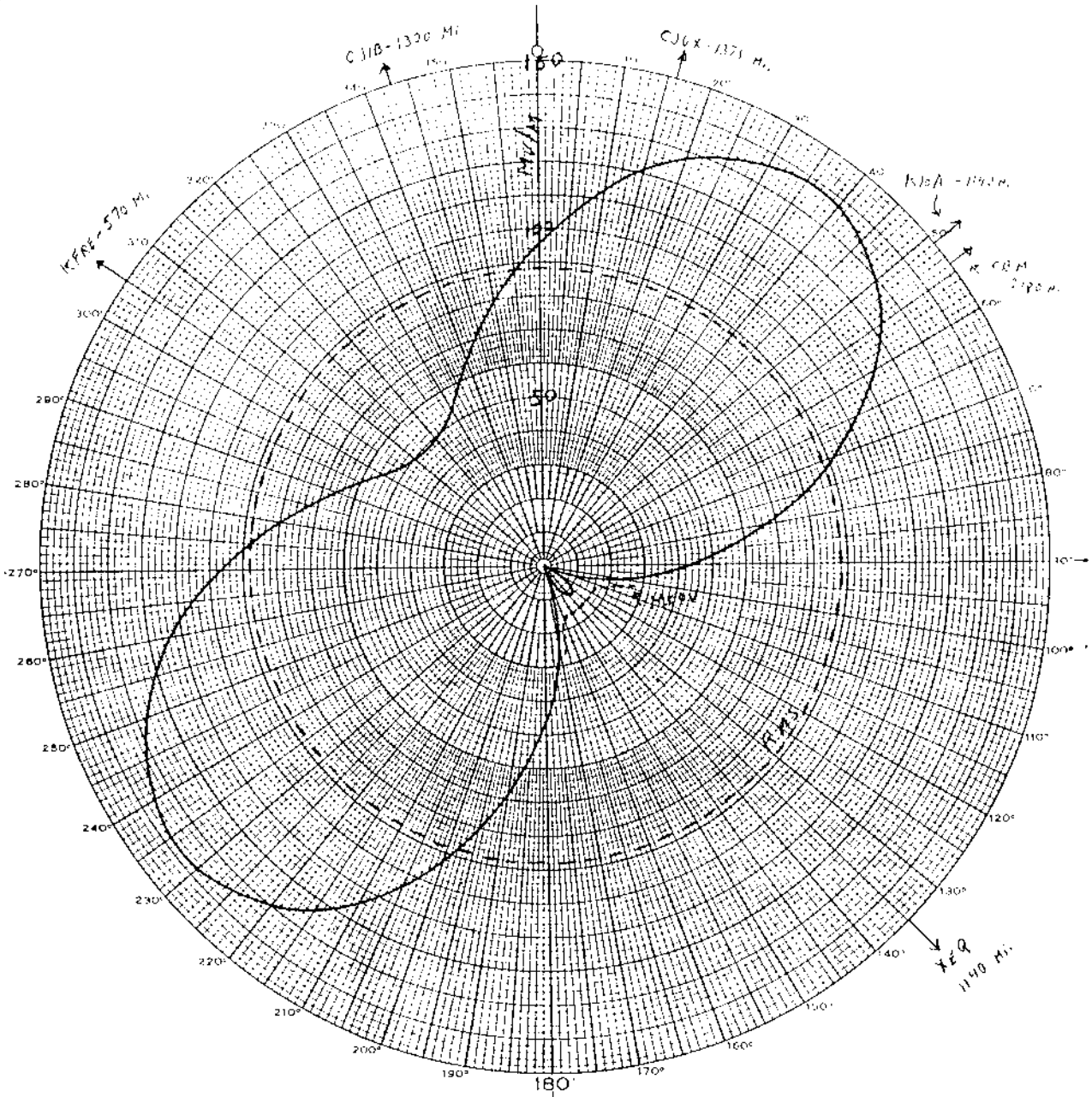
EXHIBIT 1 (AMENDED 12-31-59) 12-9-59
EXPANDED HORIZONTAL RADIATION PATTERN
GRABET, INC. d/b/a RADIO ENTERPRISES 940 KC (DA) TUSCON, ARIZONA
THOMAS B. FRIEDMAN, CONSULTING RADIO ENGINEER

granted CP for new Station 5-4-60

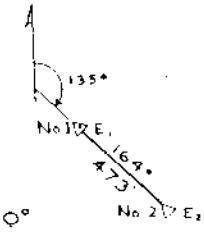
TUCSON, ARIZONA

PROPOSED DAY & NIGHT (11-16-59g) | New: Grabet, Inc. Tucson, Arizona | 250w, DA-1,U 940 KC

KHOS



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	STATION DATA



E_1 /0°

E_2 /164 cos θ cos φ + 26°

Tower No.	Electrical Height (Degrees)	Tower Orientation (Degrees)	Spacing (Degrees)	Phasing (Degrees)	Horizontal Field Ratio	Field Ratio	Elevation Angle (Degrees)	Elevation Pattern Field (Mv/m)
1	90	0	0	0	.69	1.00	0	88
2	90	135	164	26	.69	1.00	10	
3							20	
4							30	
5							40	
6							50	
7							60	
8							70	
9							80	
10							90	
			X		X			

STATION DATA

Call: —
Frequency: 940 Kc
Power: 0.25 Kw
Time of Operation: UNLIMITED
Type of Operation: CLASS II
Number of Towers: 2
Number of Guyed Towers: 2
No. Radials per Tower: 240
Length of Radials: 50 - 250'
Geographic Coordinates: 32 12 07 / 110 59 44
Other: —
Construction No.: —

GRABET, INC.
RADIO ENTERPRISES
NEW 940 KC 250 - U(DA)
TUCSON, ARIZONA

EXHIBIT V-IC(AMEND)

PROPOSED HORIZONTAL RADIATION PATTERN

THOMAS B. FRIEDMAN
Pacific Palisades, Calif.
September 8, 1959

FCC Form No. 301 - 1
Accepted 10-14-59 (Amended)

Grabet, Incorporated
Tucson, Arizona

940 KC

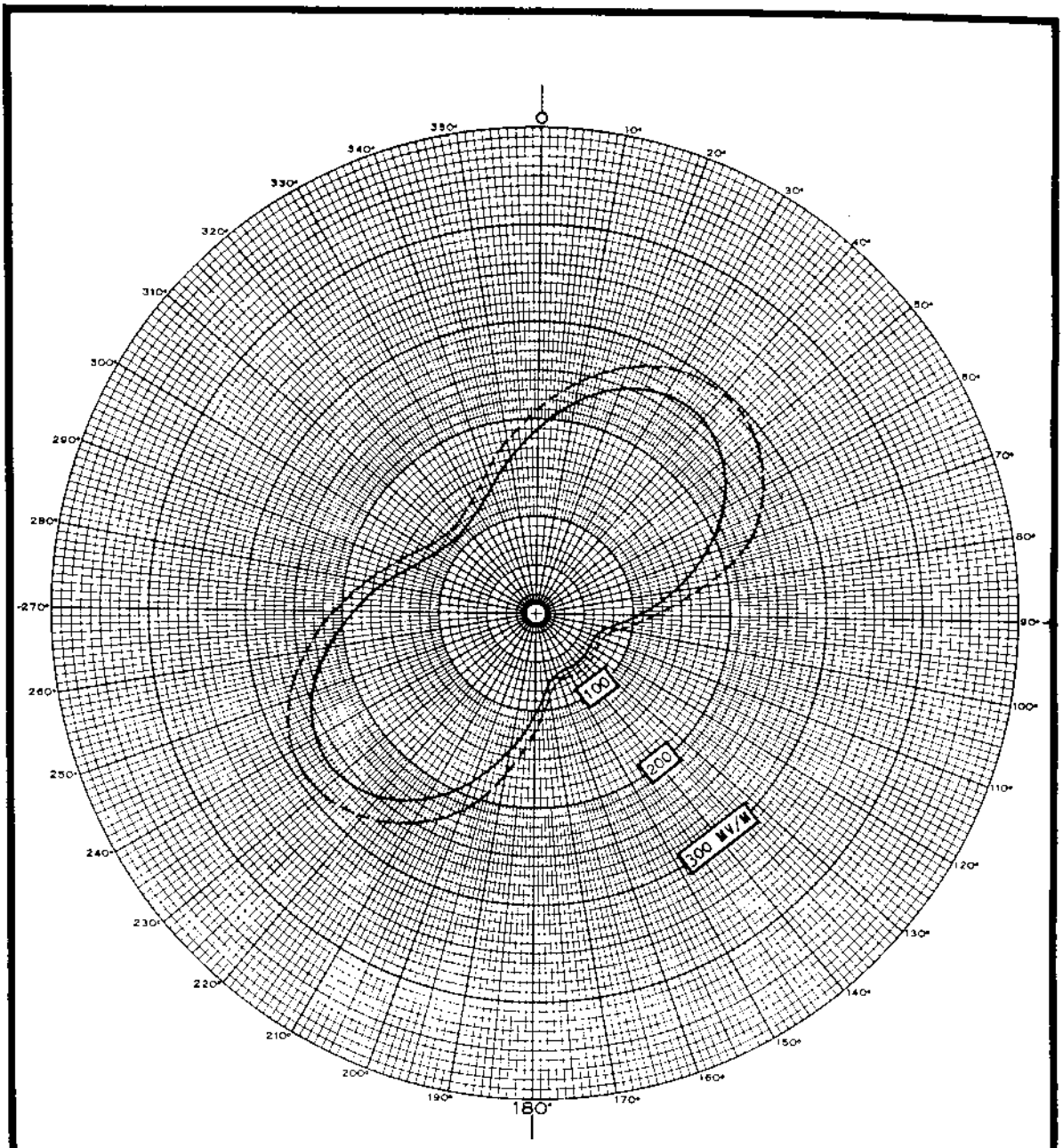
BMP - 12954
GR (4-3-70) mod. of CP to add MEOV to authorized DIR. ANTENNA PATTERN

KHOS

Proposed Day
(4-29-70ct)

Station KHOS
Tucson, Arizona

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

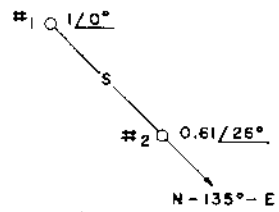


E_{RMS} = 177 MV/M

LATITUDE: 32° 12' 04"
LONGITUDE: 111° 01' 02"

JOHN H. MULLANEY
AND
ASSOCIATES

ANTENNA PARAMETERS



S = 164° = 461.7'
G = 90° = 261.8'

FIGURE 1

AUTHORIZED DAYTIME PATTERN
WITH
PROPOSED MEOV

RADIO STATION KHOS
TUCSON, ARIZONA

940 KHz 0.25/1 KW-LS, DA-2, U

FCC File No. BMP-12954
Accepted 3-27-70

Station KHOS
Tucson, Arizona

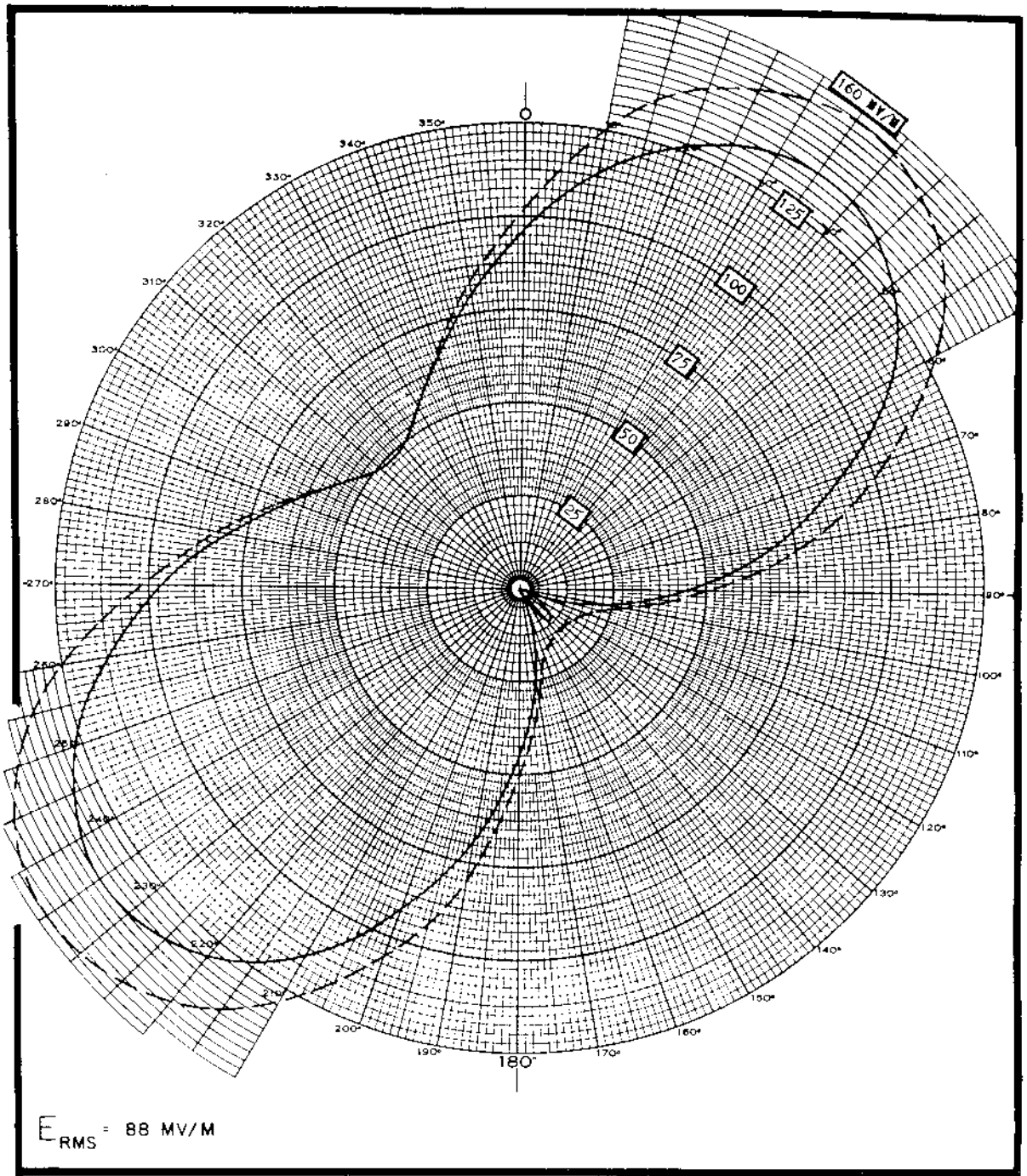
940 kc

GR (4-3-70) Mod. of CP to add MEOV to authorized directional antenna pattern

Proposed Night
(4-29-70ct)

Station KHOS
Tucson, Arizona

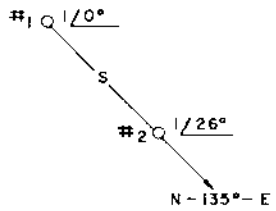
KHOS
250w, 1kw-LS, DA-2, U
940 kc



LATITUDE: 32° 12' 04"
LONGITUDE: 111° 01' 02"

JOHN H. MULLANEY
AND
ASSOCIATES

ANTENNA PARAMETERS



S = 164° = 481.7'
G = 90° = 261.8'

FIGURE 3

PRESENT NIGHTTIME PATTERN
WITH
PROPOSED MEOV

RADIO STATION KHOS
TUCSON, ARIZONA

940 KHz 0.25/1 KW-LS, DA-2, U

FCC File No. BMP-12954
Accepted 3-27-70

Station KHOS
Tucson, Arizona

940 kc

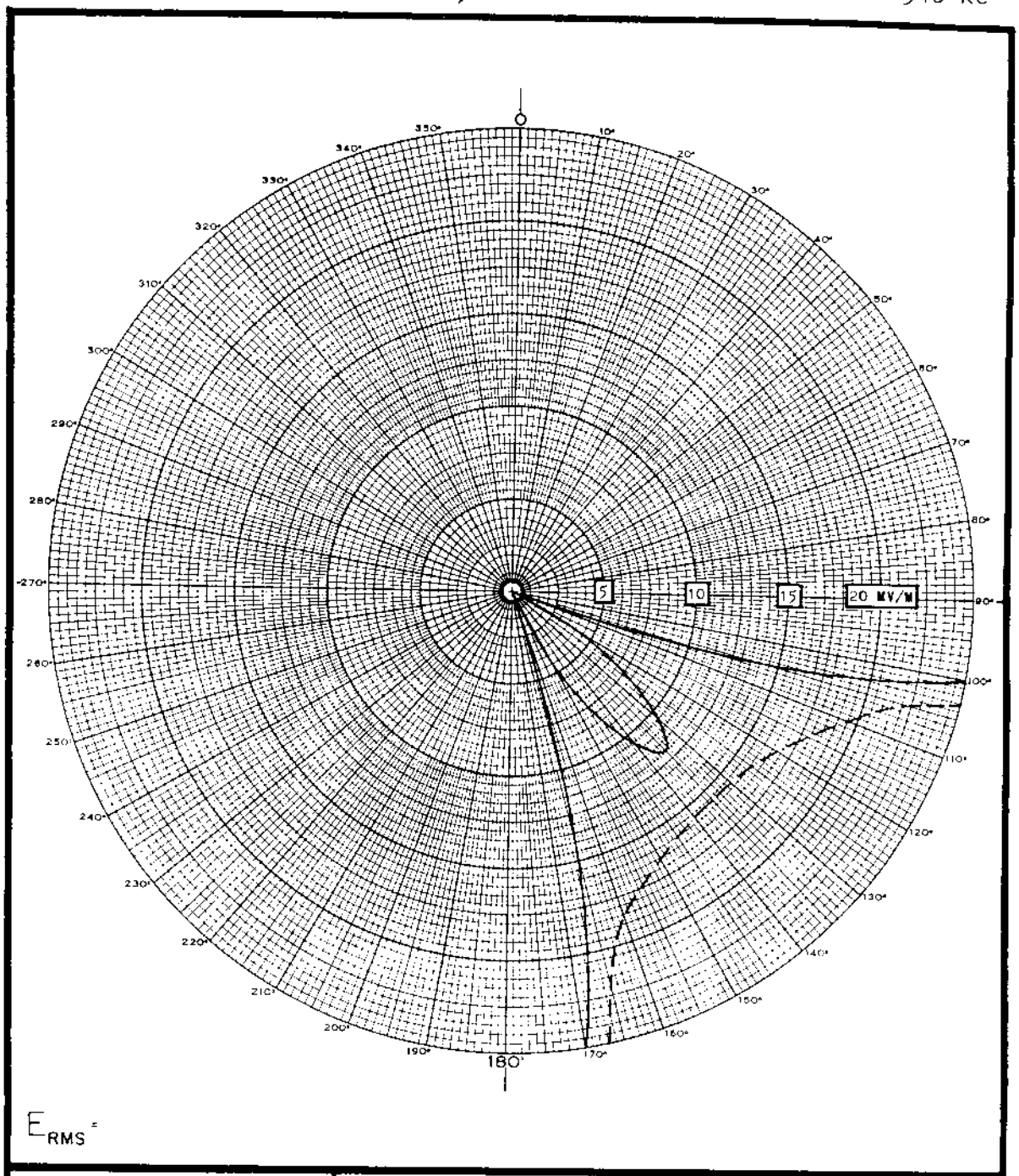
BMP — 1-1-1
CIR. (4-3-70) Mod. of CP to add MEOV to Authorized directional Antenna Patterns

KHOS

Proposed Night Nulls
(4-29-70ct)

Station KHOS
Tucson, Arizona

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



LATITUDE: LONGITUDE	ANTENNA PARAMETERS	FIGURE 3A EXPANDED VIEW OF FIGURE 3
JOHN H. MULLANEY AND ASSOCIATES		RADIO STATION KHOS TUCSON, ARIZONA 940 KHz 0.25/1 KW-LS, DA-2, U

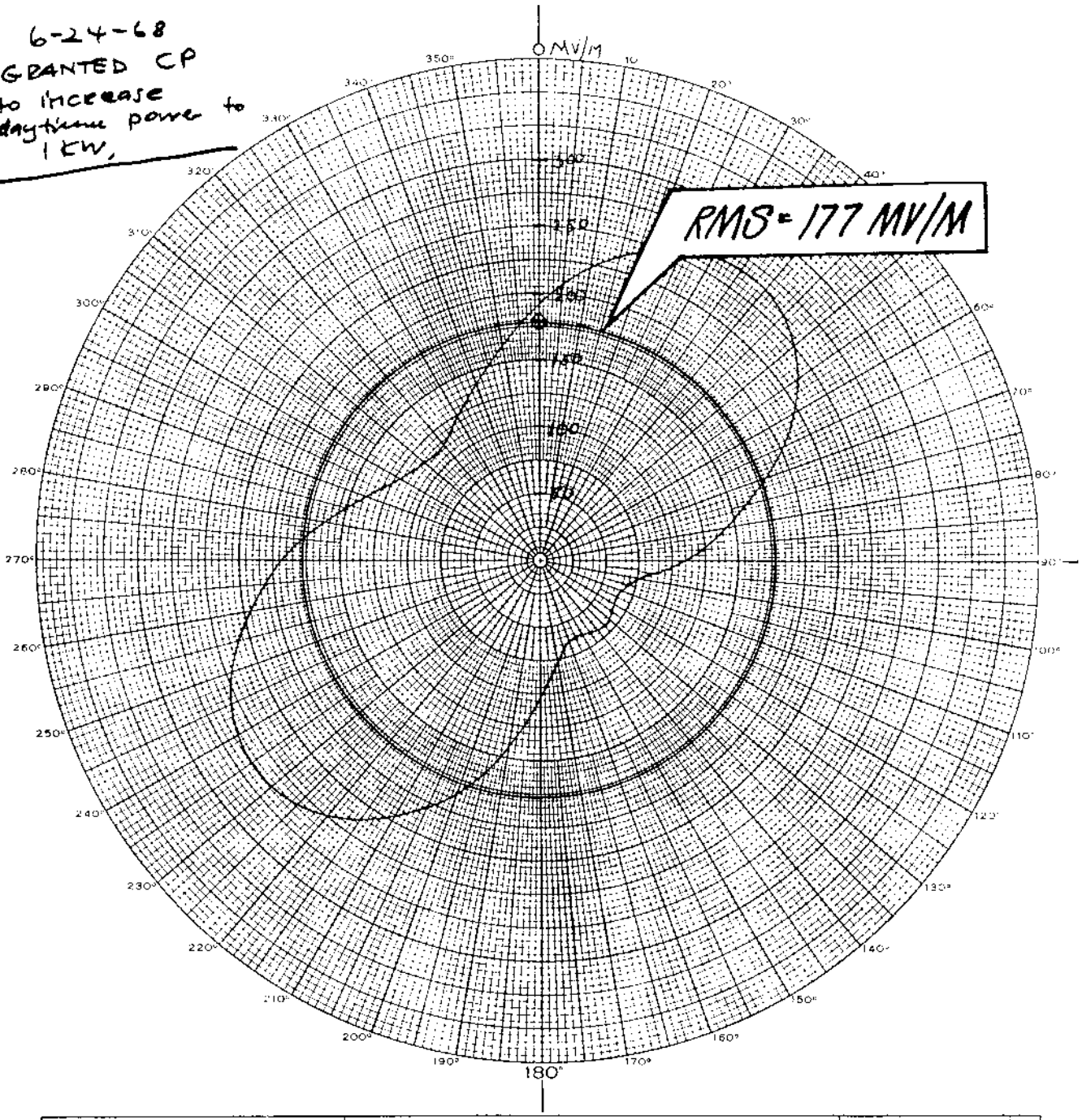
FCC File No. BMP-12954
Accepted 3-27-70

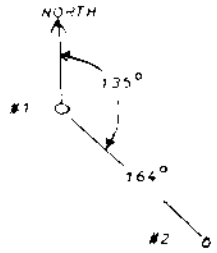
Station KHOS
Tucson, Arizona

940 kc

K HOS

6-24-68
GRANTED CP
to increase
daytime power to
1 KW,



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA
	TOWER No.	ELECTRICAL HEIGHT °	TRUE TOWER ORIENTATION θ°	SPACING d°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV ANGLE θ°	ELEVATION RMS FIELD mv/m E_θ	CALL KHOS
	1	90	0	0	0	165	1.0	0	177	FREQUENCY 940
	2	90	135	164	26	100	0.61	0		POWER 1.0
	3							20		TIME OF OPERATION UNLIMITED
	4							30		TYPE OF OPERATION DA-2
	5							40		DAYTIME TOWERS 2
	6							50		NIGHTTIME TOWERS 2
	7							60		No. RADIALS PER TOWER 260
	8							70		LENGTH OF RADIALS 50 & 250 ft
	9							80		GROUND SCREEN DIMENSION —
	10							90		LAT. 32 12 04
										LONG. 111 01 02
										SUPERGAIN
										PATTERN No.

NORTH
135°
#1
164°
#2

FIG. 3

ANTENNA RADIATION PATTERN
PROPOSED POWER INCREASE TO 1 KW
RADIO STATION KHOS
TUCSON, ARIZONA

THOMAS B. FRIEDMAN
CONSULTING RADIO ENGINEER

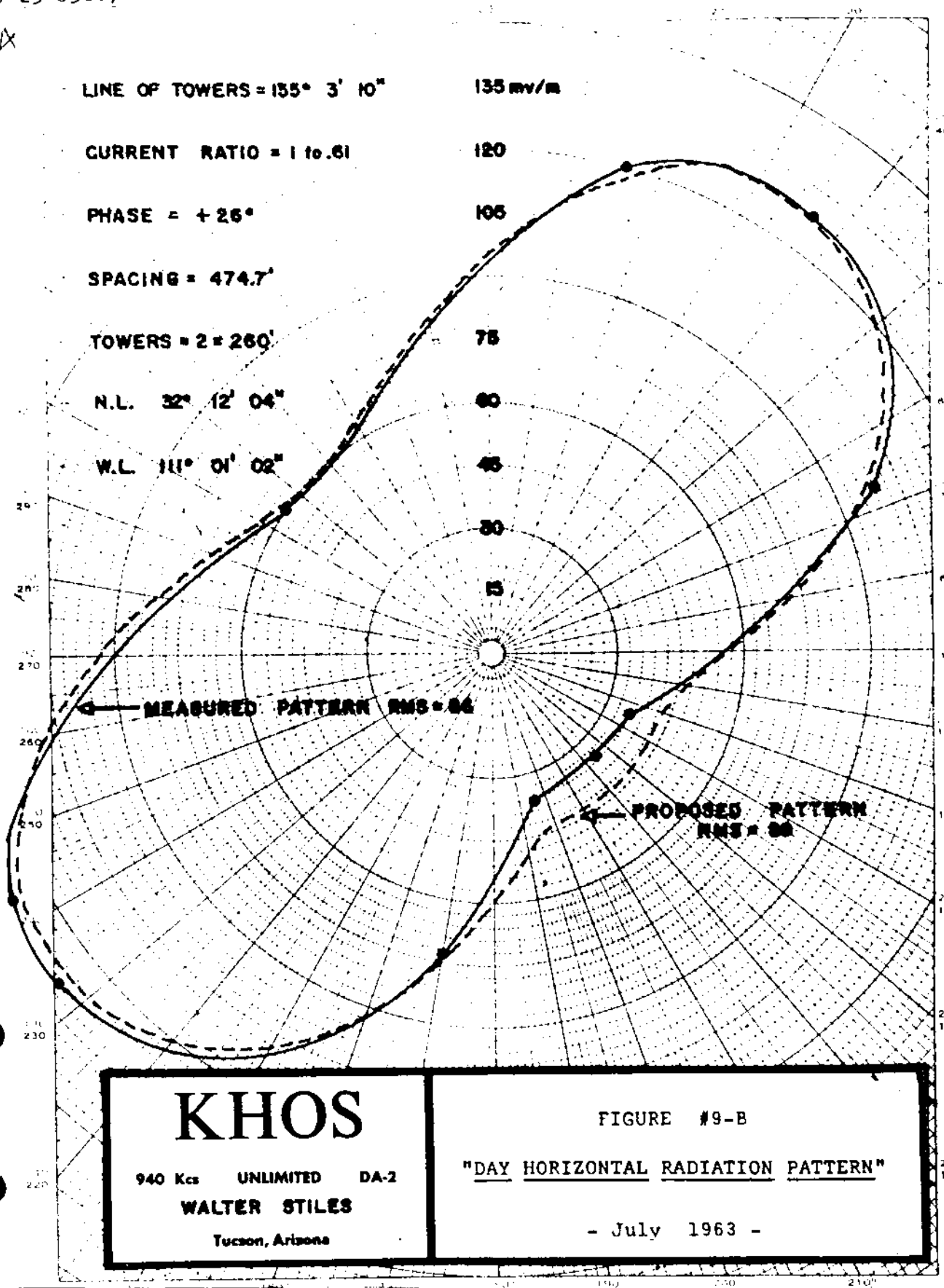
KHOS

Measured Day
(9-25-63ct)

Station KHOS
Tucson, Arizona

250w,DA-2,U
940 kc

-1C 6-12-64



KHOS

940 Kcs UNLIMITED DA-2

WALTER STILES

Tucson, Arizona

FIGURE #9-B

"DAY HORIZONTAL RADIATION PATTERN"

- July 1963 -

FCC File No.BL-10231
Accepted 8-28-63

Station KHOS
Tucson, Arizona

940 kc

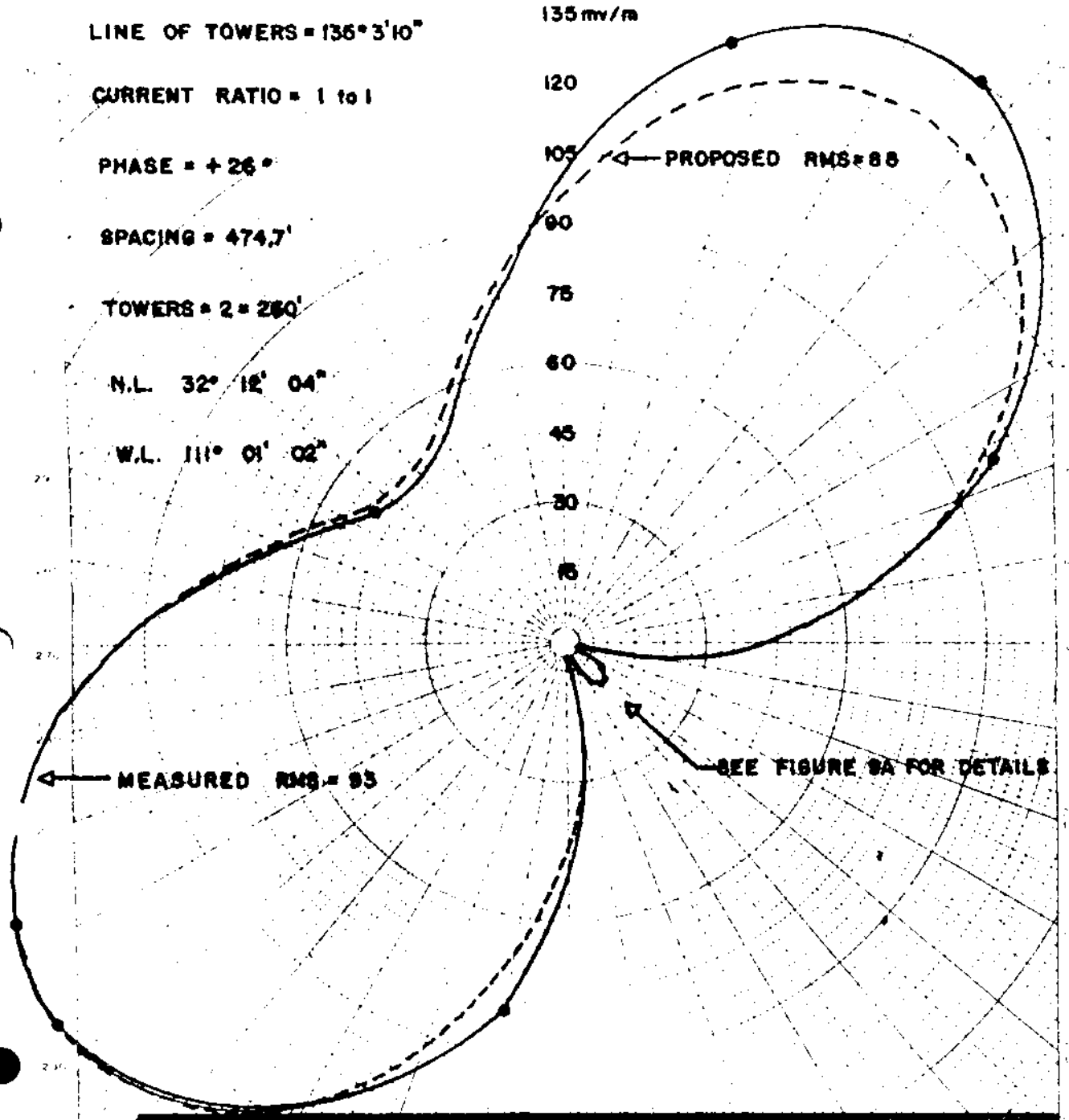
KHOS

Measured Night
(9-25-63ct)

Station KHOS
Tucson, Arizona

250w,DA-2,U
940 kc

16 6-12-64



KHOS

940 Kcs UNLIMITED DA-2

WALTER STILES

Tucson, Arizona

FIGURE #9

"NIGHT HORIZONTAL RADIATION PATTERN"

- July 1963 -

FCC File No.BL-10231
Accepted 8-28-63

Station KHOS
Tucson, Arizona

940 kc

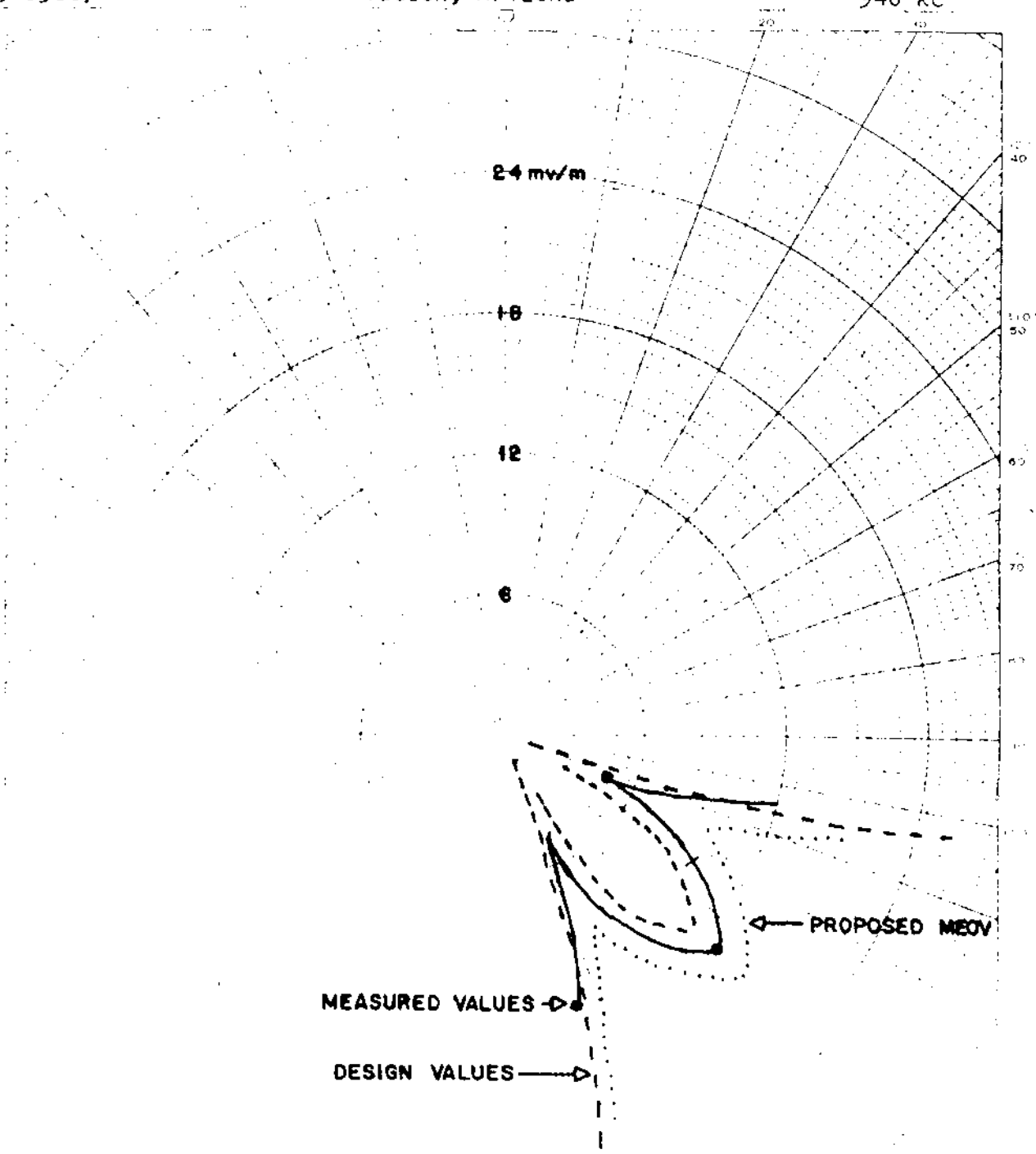
KHOS

Measured Night Nulls
(9-25-63ct)

Station KHOS
Tucson, Arizona

250w,DA-2,U
940 kc

LIC 6-12-64



KHOS 940 Kcs UNLIMITED DA-2 WALTER STILES Tucson, Arizona	FIGURE #9-A "NIGHT PATTERN - NULL AREA" - July 1963 -

FCC File No.BL-10231
Accepted 8-28-63

Station KHOS
Tucson, Arizona

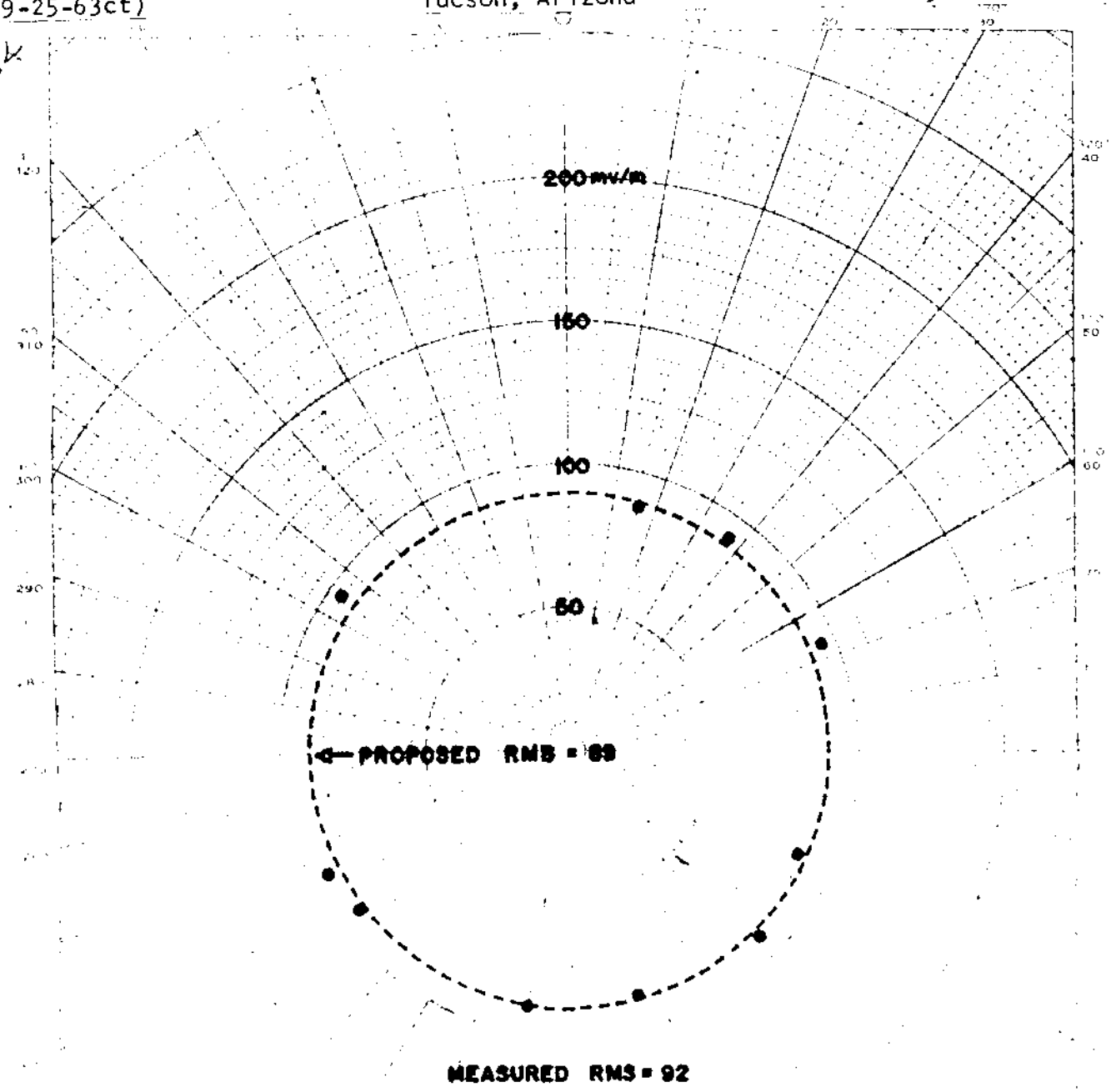
940 kc

KHOS

Measured Non-DA
(9-25-63ct)

Station KHOS
Tucson, Arizona

250w,DA-2,U
940 kc



KHOS	FIGURE #9-C
940 Kcs UNLIMITED DA-2 WALTER STILES Tucson, Arizona	"NON-DIRECTIONAL RADIATION PATTERN" - July 1963 -

FCC File No.BL-10231
Accepted 8-28-63

Station KHOS
Tucson, Arizona

940 kc

KIOA

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KIOA

Main Studio: Des Moines, Iowa

Frequency: 940 kHz

Power: 5 kW Night 10 kW Day

Notification List No. 1655

Date: October 22, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 41° 28' 35"
West Longitude: 93° 22' 26"

ANTENNA CHARACTERISTICS

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

TOWER:	#6(NW)	#4(CW)	#2(SW)	#5(NE)	#3(CE)	#1(
HEIGHT ABOVE INSULATORS:	All towers 262' (90°)					
NIGHT PHASING:	0°	0°	0°	+92.6°	+92.6°	+9.
NIGHT FIELD RATIO:	1.0	2.0	1.0	1.0	2.0	
DAY PHASING:	-	0°	-	-	+135°	
DAY FIELD RATIO:	-	1.0	-	-	1.25	

SPACING AND ORIENTATION: The towers are located in two rows with three towers per row. Adjacent towers in a row are spaced 599' (206°) on a line bearing 17° true. End towers of each row forming the short side of the parallelogram are spaced 262' (90°) on a line bearing 79° true.

GROUND SYSTEM: 120-419' equally spaced buried copper radials plus 120-50' interspaced radials forming a counterpoise about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers. Centers of systems are bonded together.

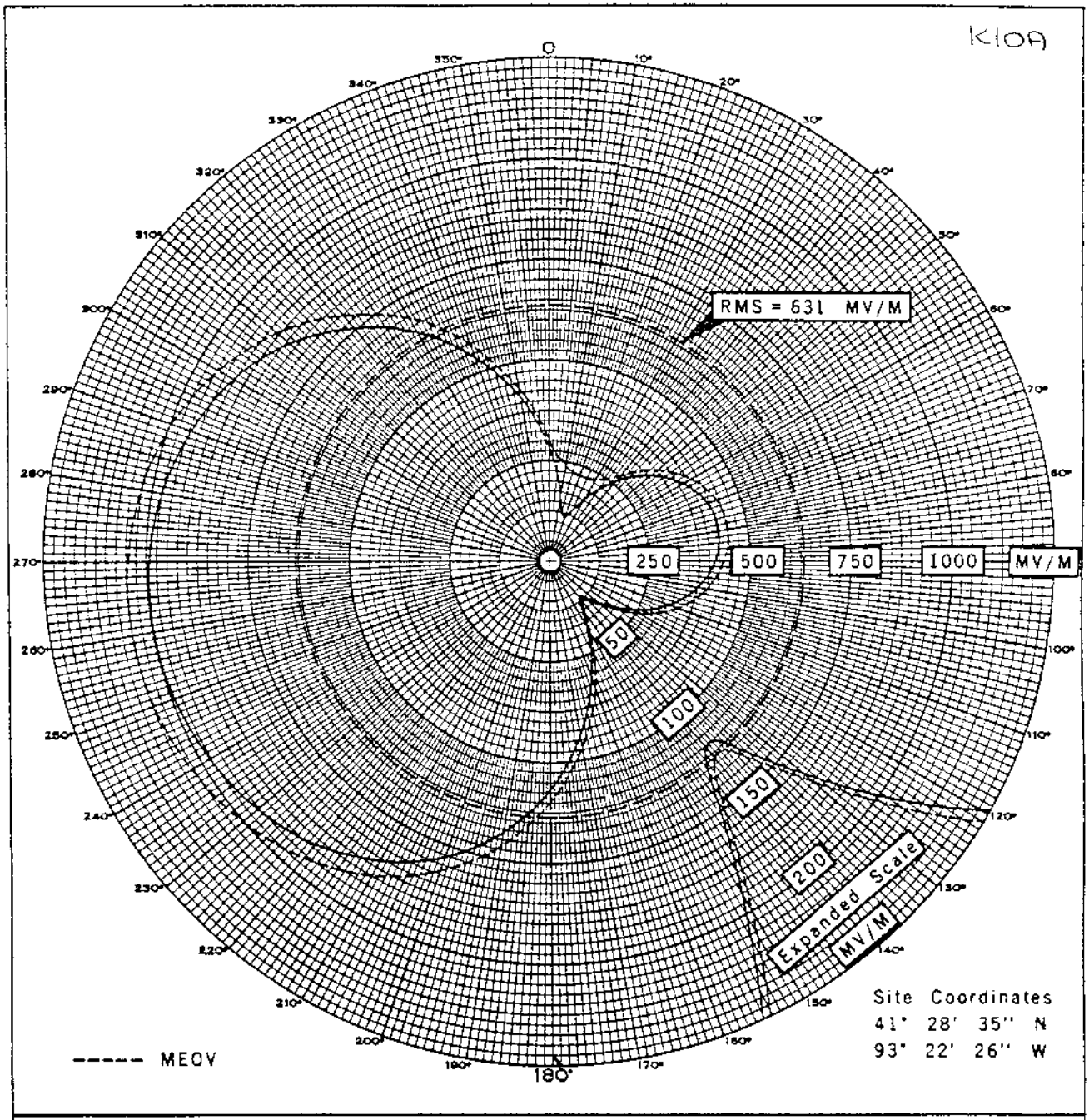
Predicted effective Night Field: 395 mv/m at rated power.

Predicted effective Day Field: 631 mv/m at rated power.

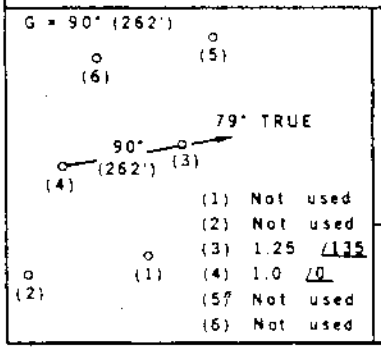
Note: This notification concerns only minor changes in the Daytime and Nighttime directional antenna radiation patterns.

CTR NO 30784A4

Figure 2A



DAYTIME HORIZONTAL PLANE RADIATION PATTERN

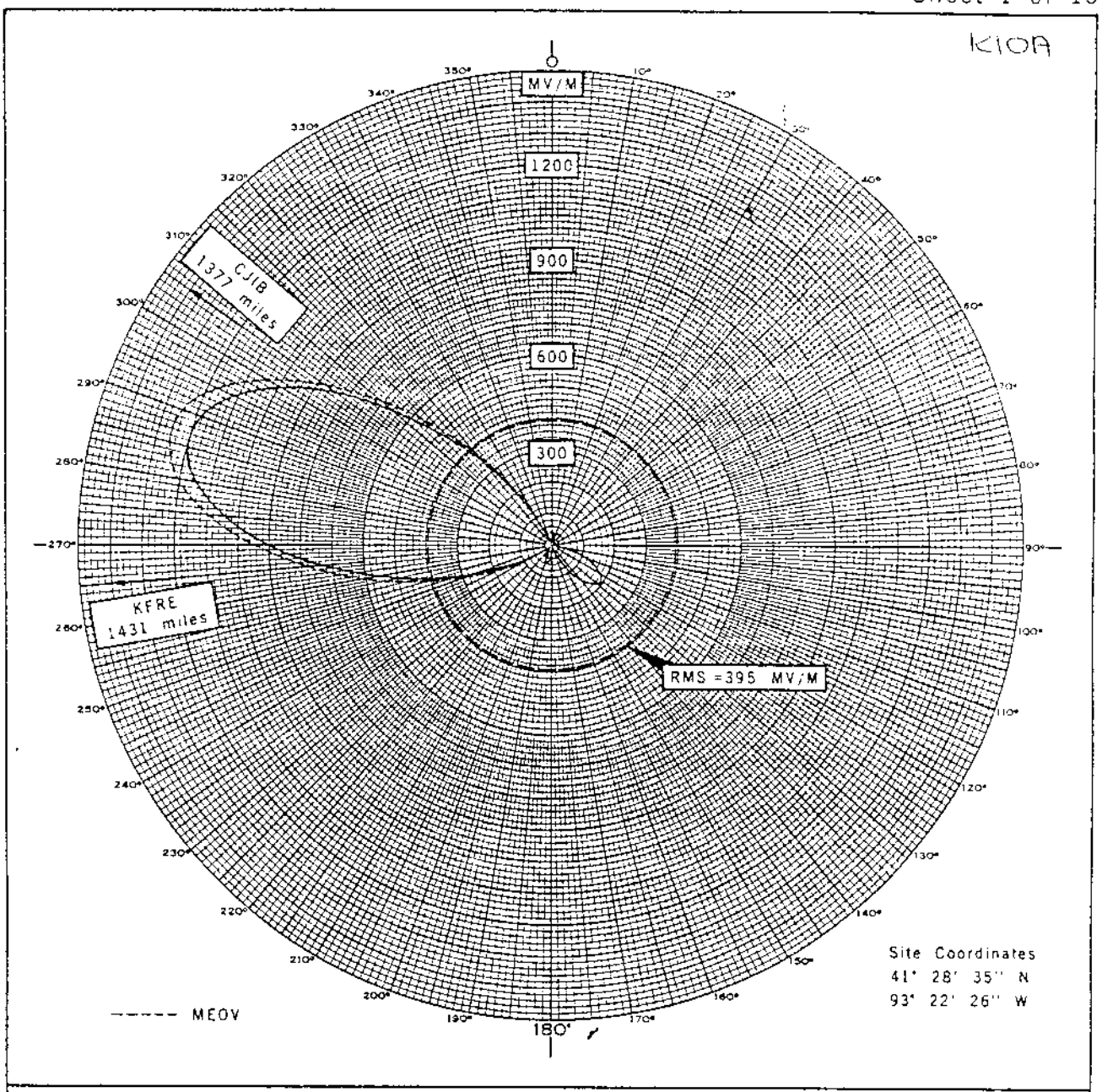


MID AMERICA BROADCASTING, INC.
RADIO STATION KIOA
DES MOINES, IOWA

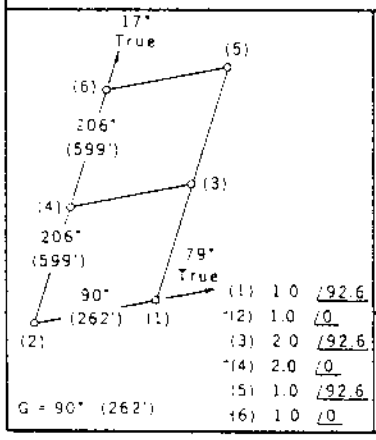
Jules Cohen & Associates
Consulting Electronics Engineers

940 KHZ
5 KW, 10 KW-LS
U DA-2

DECEMBER 1974



NIGHTTIME HORIZONTAL PLANE RADIATION PATTERN



MID AMERICA BROADCASTING, INC.

RADIO STATION KIOA

DES MOINES, IOWA

940 KHZ

5 KW, 10 KW-LS

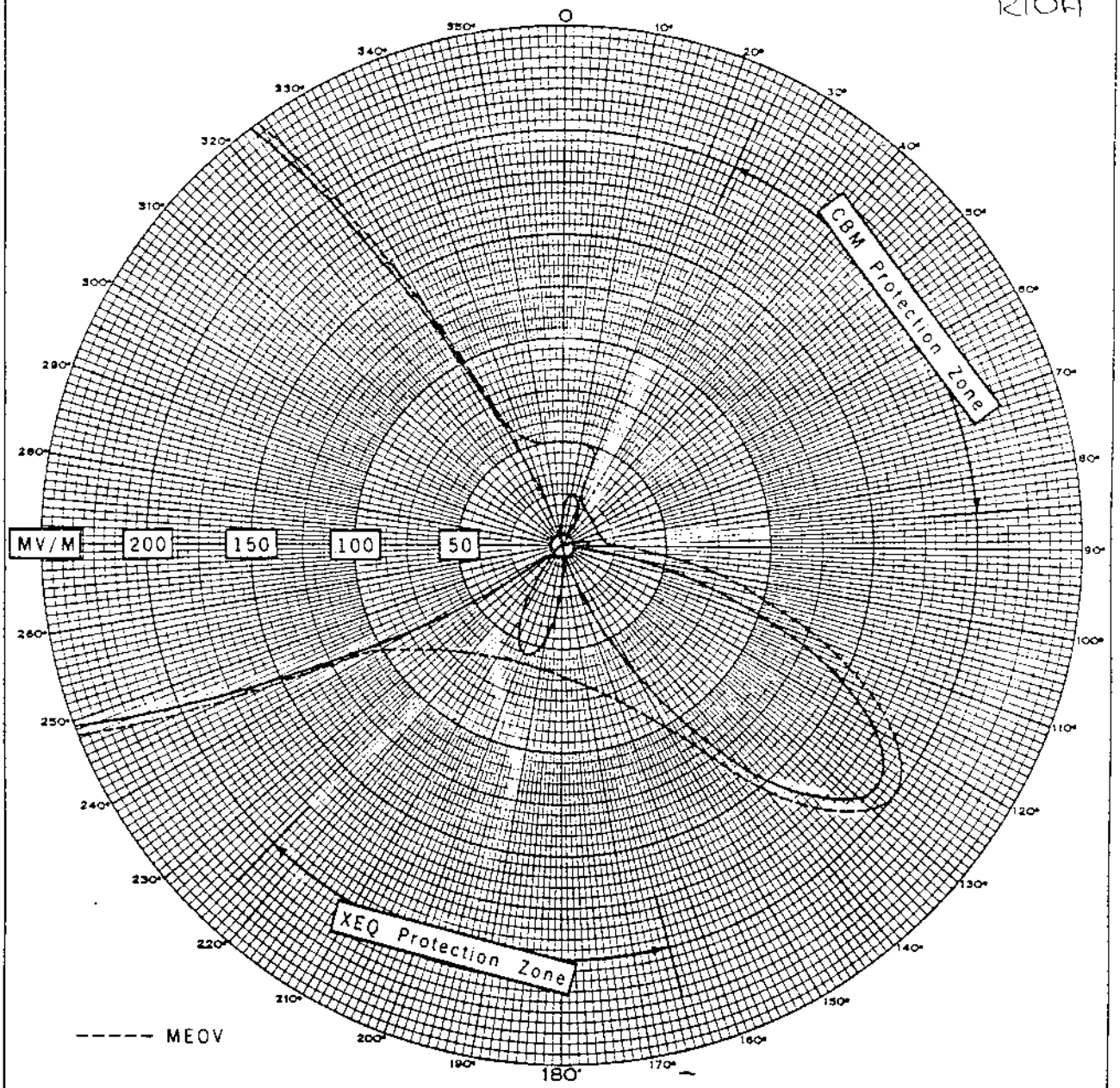
U DA-2

Jules Cohen & Associates

Consulting Electronics Engineers

AUGUST 1974

KIOA

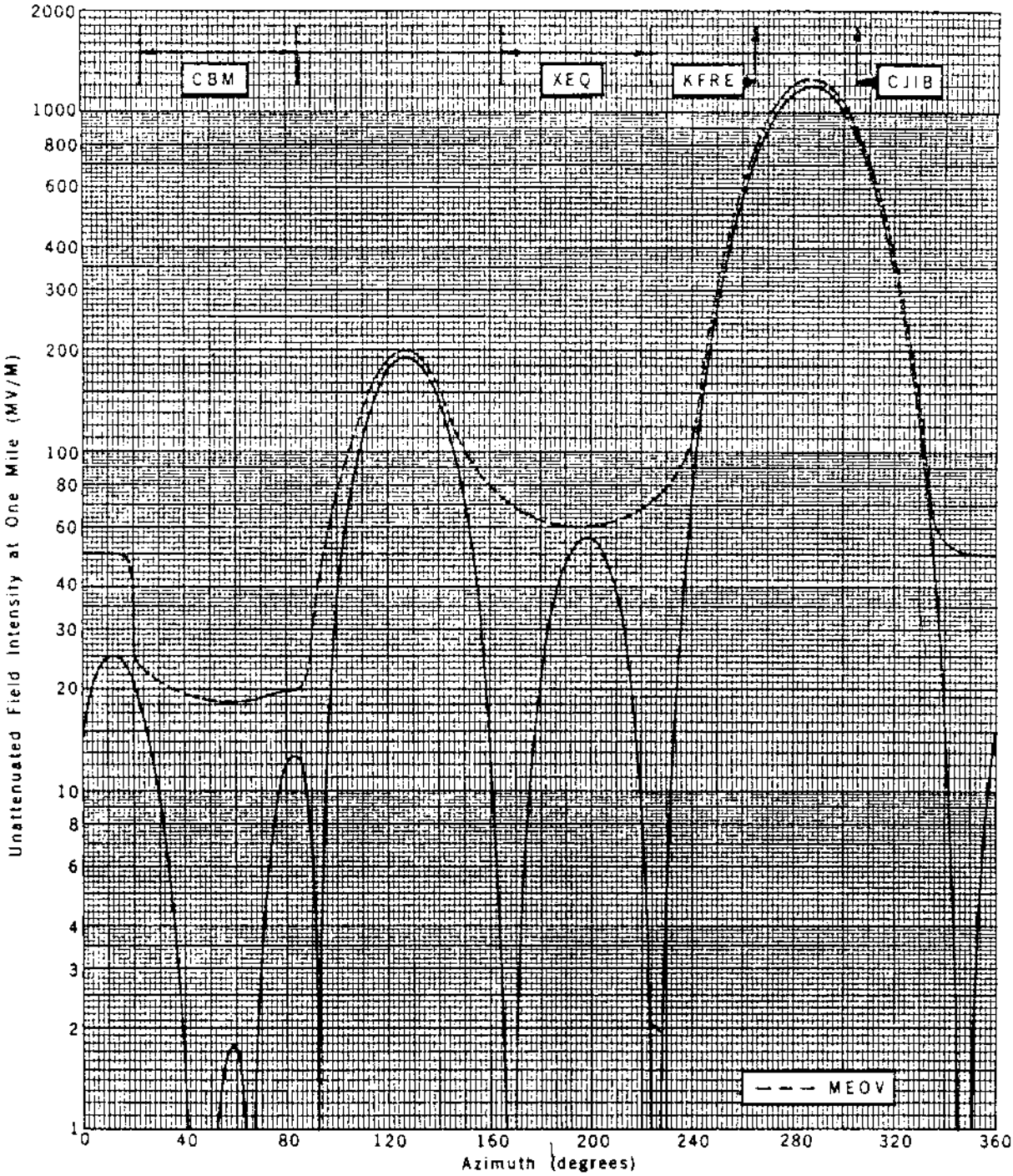


NIGHTTIME HORIZONTAL PLANE RADIATION PATTERN

NULL DETAIL	MID AMERICA BROADCASTING, INC. RADIO STATION KIOA DES MOINES, IOWA	940 KHZ 5 KW, 10 KW-LS U DA-2
	Jules Cohen & Associates Consulting Electronics Engineers	AUGUST 1974

AUGUST 1974

KIOA



PROPOSED NIGHTTIME RADIATION PATTERN
AT VERTICAL ANGLE OF 0 DEGREES

MID AMERICA BROADCASTING, INC.

STATION KIOA DES MOINES, IOWA

940 KHZ 5 KW, 10 KW-LS U DA-2

Jules Cohen & Associates Consulting Electronics Engineers

KIOA

Measured Day
(2-28-70ct)

Station KIOA
Des Moines, Iowa

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

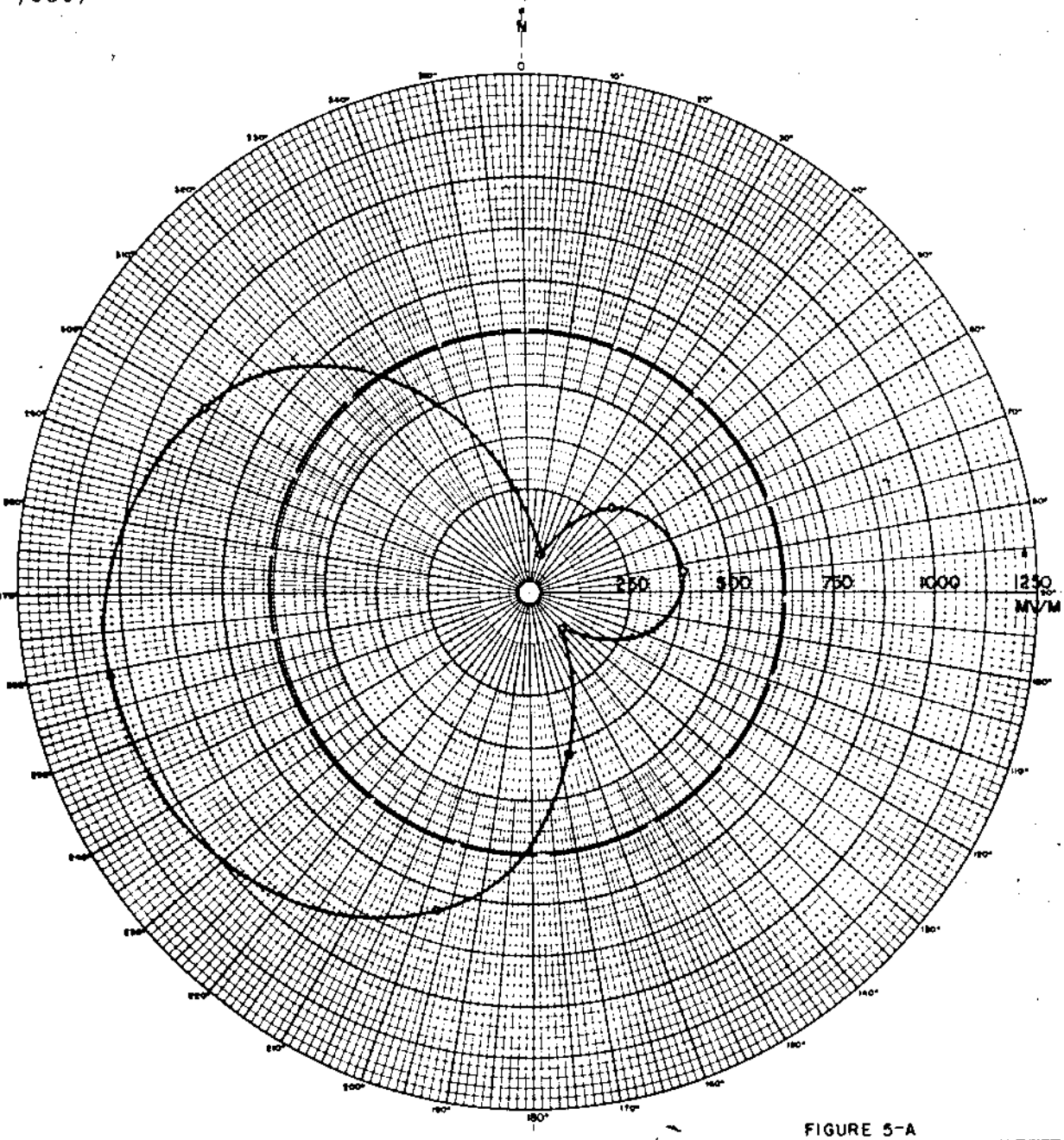
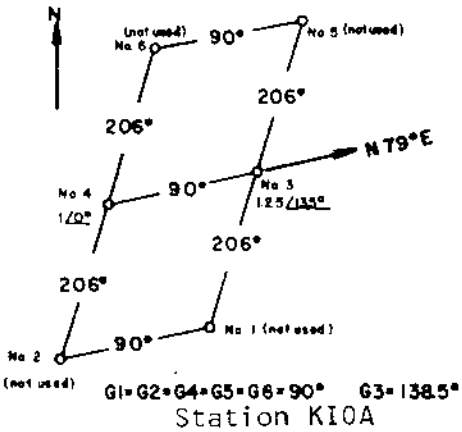


FIGURE 5-A

HORIZONTAL RADIATION PATTERN



APPLICANT	KIOA
LOCATION	DES MOINES, IOWA
FREQUENCY	940 KC/S
POWER	10 KW DA-D
LATITUDE	41 DEG 28 MIN 35 SEC
LONGITUDE	93 DEG 22 MIN 26 SEC
WHEN USED	DAYTIME
R.M.S. FIELD	635 MV/M
DATE	MAY 1969

RAYMOND E. ROHRER & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

FCC File No.BZ-7378
Accepted 1-30-70

Station KIOA
Des Moines, Iowa

940 kc
940 kc

Measured Day Nulls
(2-28-70ct)

Station KIOA
Des Moines, Iowa

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

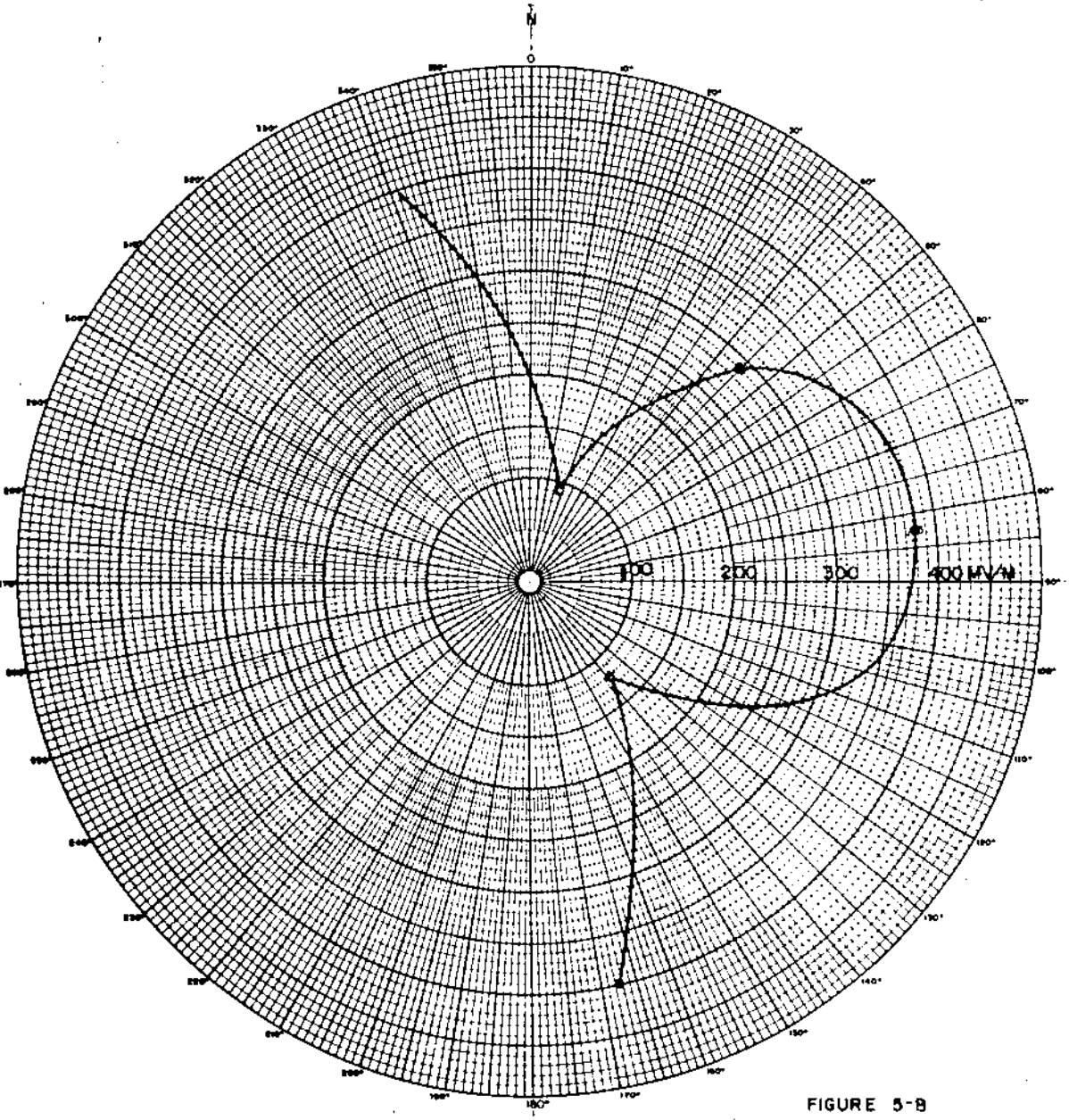


FIGURE 5-8

EXPANDED DAY

RAYMOND E. ROHRER & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON D. C.

FCC File No.BZ-7378
Accepted 1-30-70

Station KIOA
Des Moines, Iowa

940 kc

KIOA

Measured Night
(2-28-70ct)

Station KIOA
Des Moines, Iowa

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

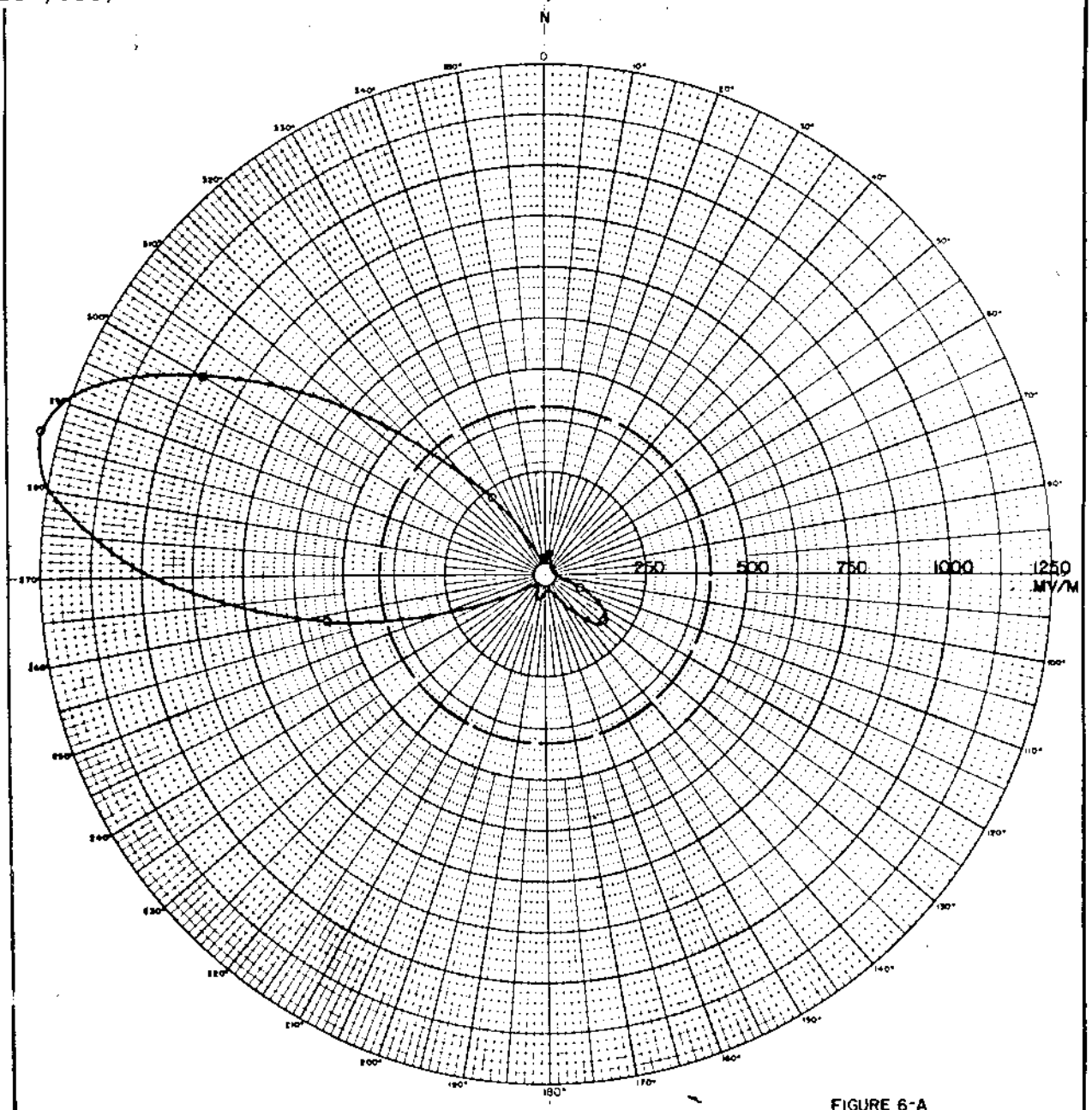
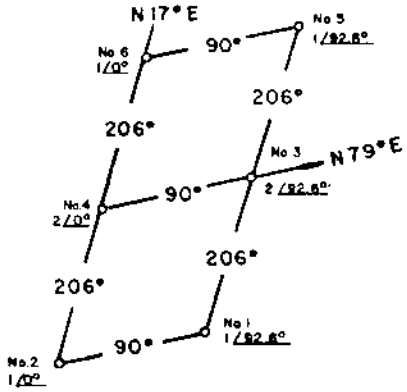


FIGURE 6-A

HORIZONTAL RADIATION PATTERN



APPLICANT	KIOA
LOCATION	DES MOINES, IOWA
FREQUENCY	940 KC/S
POWER	5 KW DA-N
LATITUDE	41 DEG 28 MIN 35 SEC
LONGITUDE	93 DEG 22 MIN 26 SEC
WHEN USED	NIGHTTIME
R.M.S. FIELD	412 MV/M
DATE	MAY 1969

RAYMOND E. ROHRER & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

FCC File No.BZ-7378
Accepted 1-30-70

Station KIOA
Des Moines, Iowa

940 kc

Measured Night Nulls
(2-28-70ct)

Station KIOA
Des Moines, Iowa

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

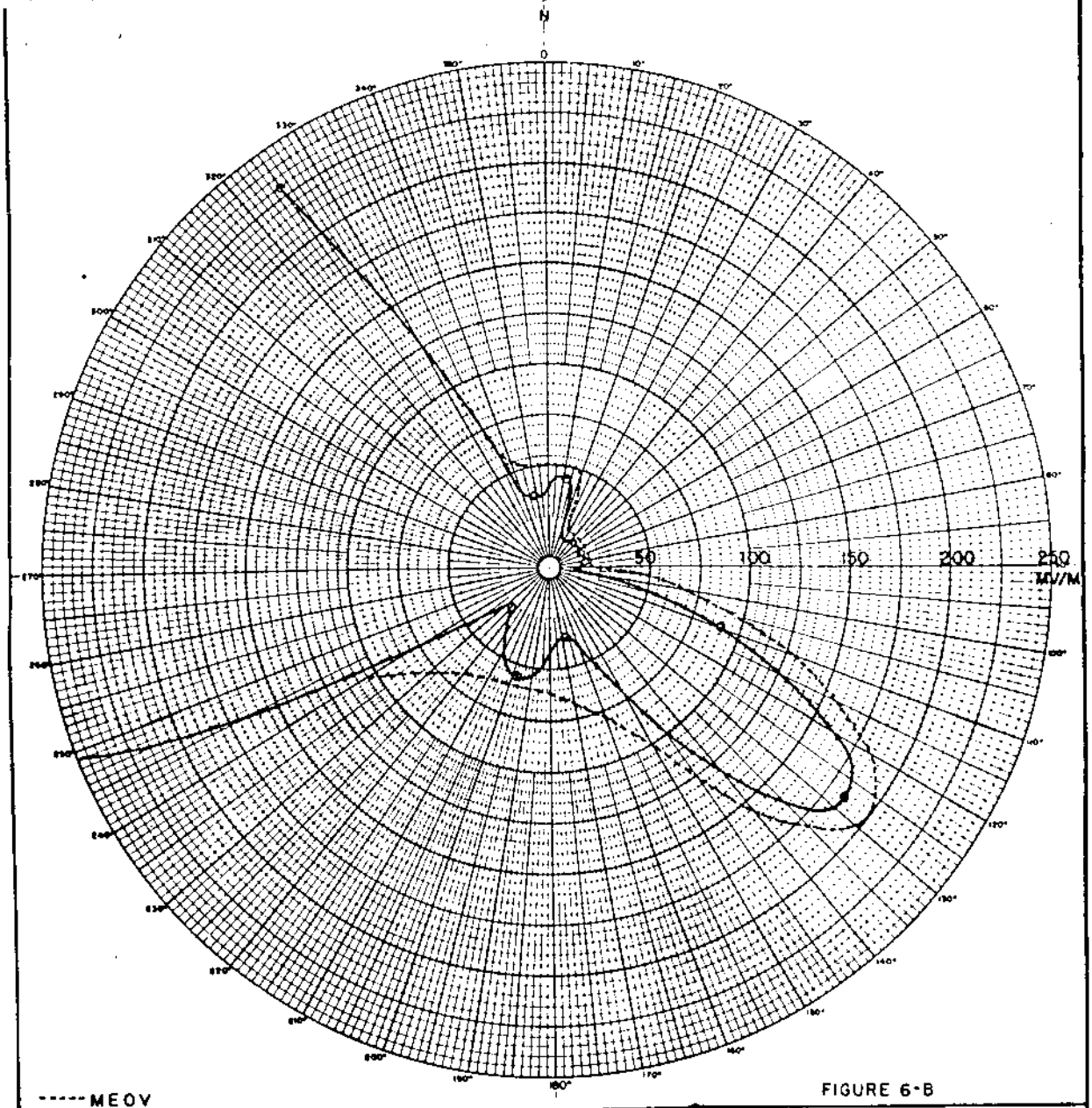


FIGURE 6-B

EXPANDED NIGHT

RAYMOND E. ROHRER & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C

FCC File No.BZ-7378
Accepted 1-30-70

Station KIOA
Des Moines, Iowa

940 kc

KIOA

Measured Non-DA
(2-28-70ct)

Station KIOA
Des Moines, Iowa

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

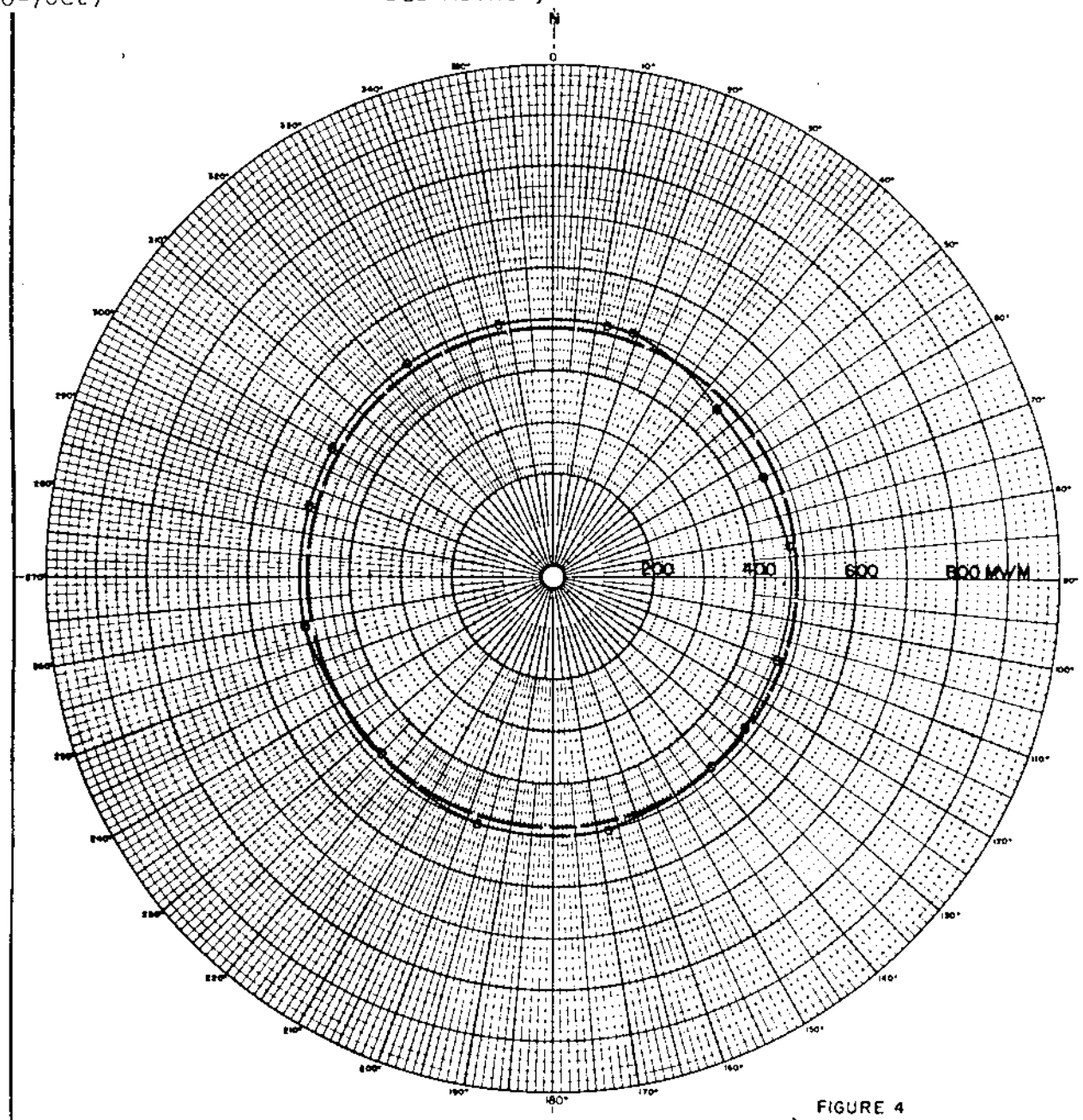


FIGURE 4

HORIZONTAL RADIATION PATTERN

TOWER No.3 WAS USED FOR THE NON-DIRECTIONAL SURVEY THE REMAINING TOWERS WERE DETUNED

APPLICANT	KIOA
LOCATION	DES MOINES, IOWA
FREQUENCY	940 KC/S
POWER	5 KW DA-D
LATITUDE	41 DEG 28 MIN 35 SEC
LONGITUDE	93 DEG 22 MIN 26 SEC
WHEN USED	NON-DIRECTIONAL SURVEY
RMS FIELD	484 MV/M
DATE	MAY 1969

RAYMOND E. ROHRER & ASSOCIATES
CONSULTING RADIO ENGINEERS

FCC File No.BZ-7378
Accepted 1-30-70

Station KIOA
Des Moines, Iowa

940 kc

KIXZ

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KIXZ

Main Studio: Amarillo, Texas

Frequency: 940 kHz

Power: 1 kW Night 5 kW Day

Notification List No. 1637

Date: June 18, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 35° 09' 17"
West Longitude: 101° 45' 28"

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:	W	S	N	E
HEIGHT ABOVE INSULATORS:	240'	240'	240'	240' (82.5°)
NIGHT PHASING:	-90°	0.0°	-90°	0.0°
NIGHT FIELD RATIO:	1.000	1.025	1.025	1.000
DAY PHASING:	-70°	0°	-	-
DAY FIELD RATIO:	1.0	1.0	-	-

SPACING AND ORIENTATION: The towers are located at the vertices of a parallelogram the long sides of which are 524' (180°) in length on a line bearing 52.5° true. The short sides are 262' (90°) in length on a line bearing 172.5°).

GROUND SYSTEM: 120-365' equally spaced copper radials plus a 48' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

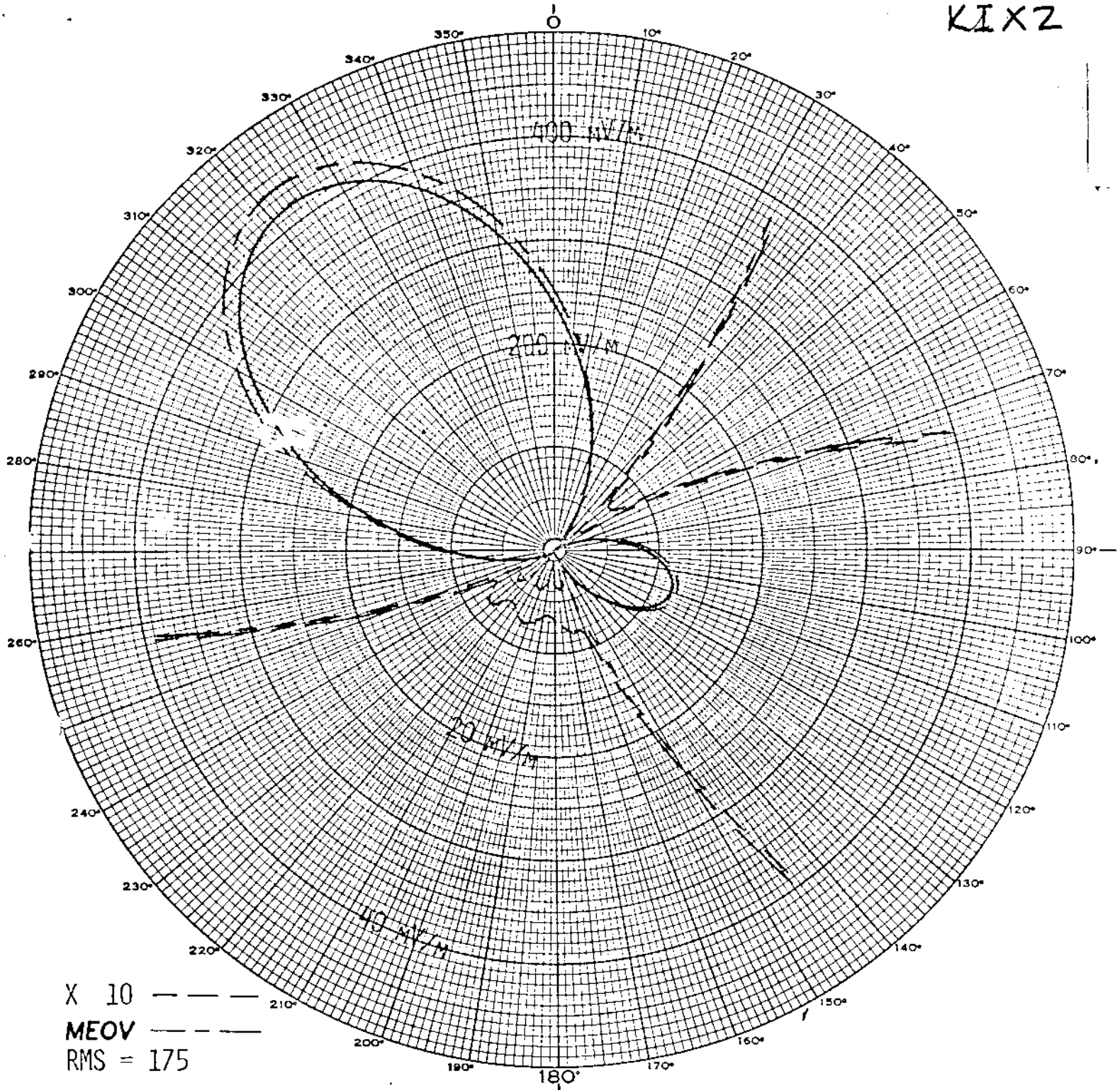
Predicted effective Night Field: 175 mv/m at rated power.

Predicted effective Day Field: 418 mv/m at rated power.

Note: Please retain the Daytime directional antenna radiation pattern notified for Station KLYN (now KIXZ) in United States Change List Number 728 dated October 23, 1957 and attach to this Revised Descripti Sheet and Nighttime patterns. This notification concerns only a change to add meova of radiation in the Nighttime pattern of the station with Daytime operation continued as previously notified.

CTR NO 30787A4

KIXZ



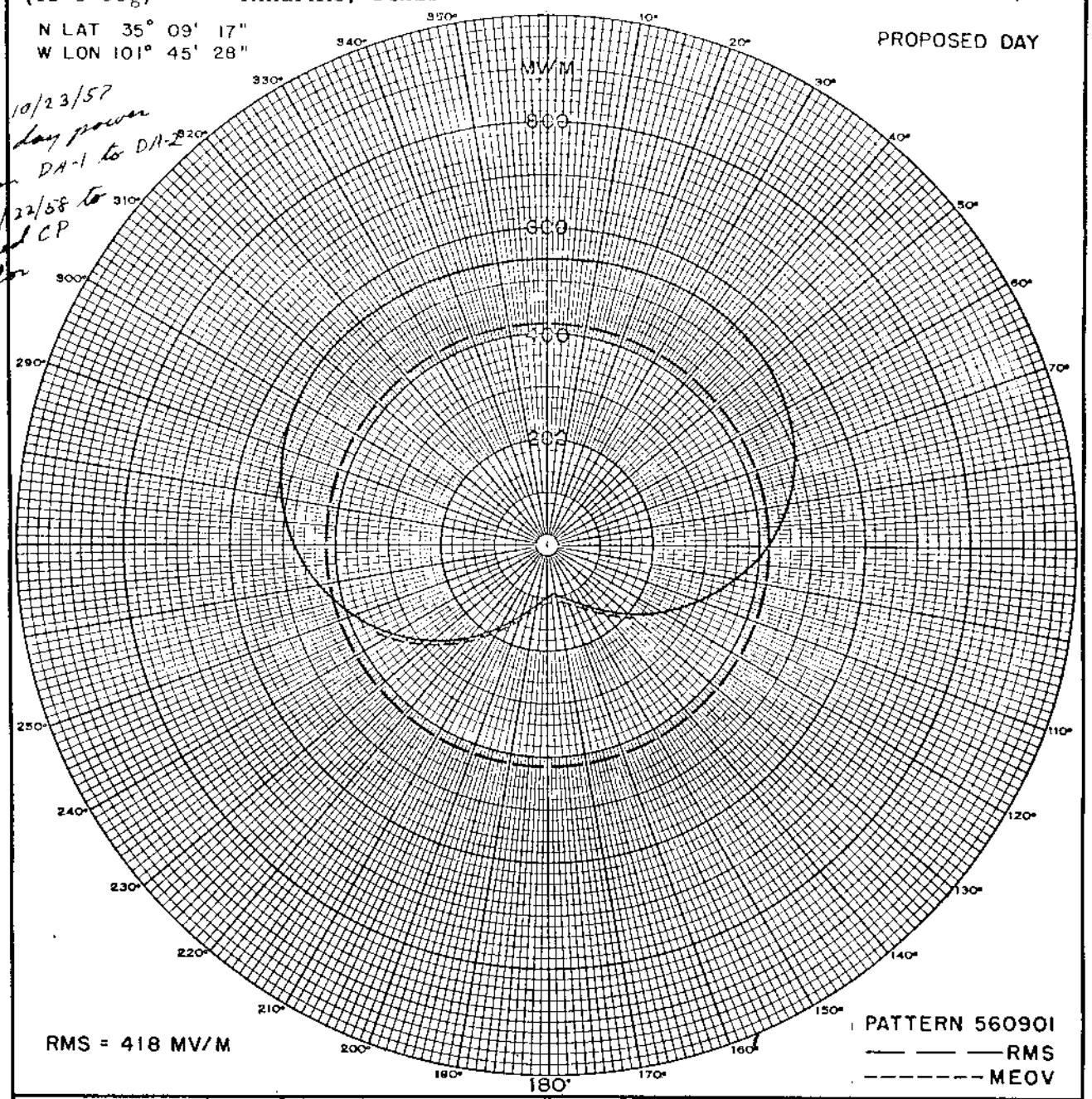
TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 2	STATION DATA
G=82.5° #4 90° 52.5°T. 352.5° T. 180° #2 #3 180° 90° #1	TOWER No.	ELECTRICAL HEIGHT G°	SPACING S°	PHASING V°	FIELD RATIO F	PROPOSED MEO VALUES KIXZ AMARILLO, TEXAS	CALL KIXZ FREQ 940 kHz POWER 1.0 kW TYPE DA-2 TIME NIGHT LAT. 35°09'17" LONG. 101°45'28"
	1			0.0°	1.025		
	2			0.0°	1.000		
	3			-90°	1.000		
	4			-90°	1.025		
	5						
	6					θ° = 0	
	DAYTIME OPERATION ☐		NIGHTTIME OPERATION ☒				E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.

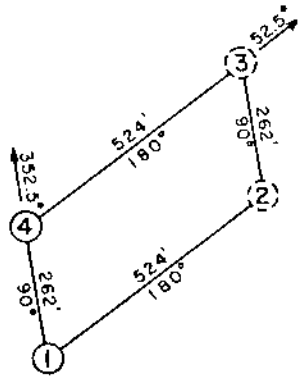
KIXZ

PROPOSED DAY Station K L Y N 5 KW-D, 1KW-N, DA-2, U 940 KC
(12-3-56g) Amarillo, Texas

N LAT 35° 09' 17"
W LON 101° 45' 28"

Granted CP 10/23/57 to increase day power & change from DA-1 to DA-2
Granted CP 7/22/58 to replace expired CP (BP-10,890) for increase in day power





TOWER	FIELD	PHASE
1	1.0	0°
2	0.0	–
3	0.0	–
4	1.0	-70°

RADIO STATION KLYN
AMARILLO, TEXAS
940 KC 1KW 5KW-LS DA-2

A. EARL CULLUM, JR.
CONSULTING ENGINEERS

560901.2 FIGURE 7A

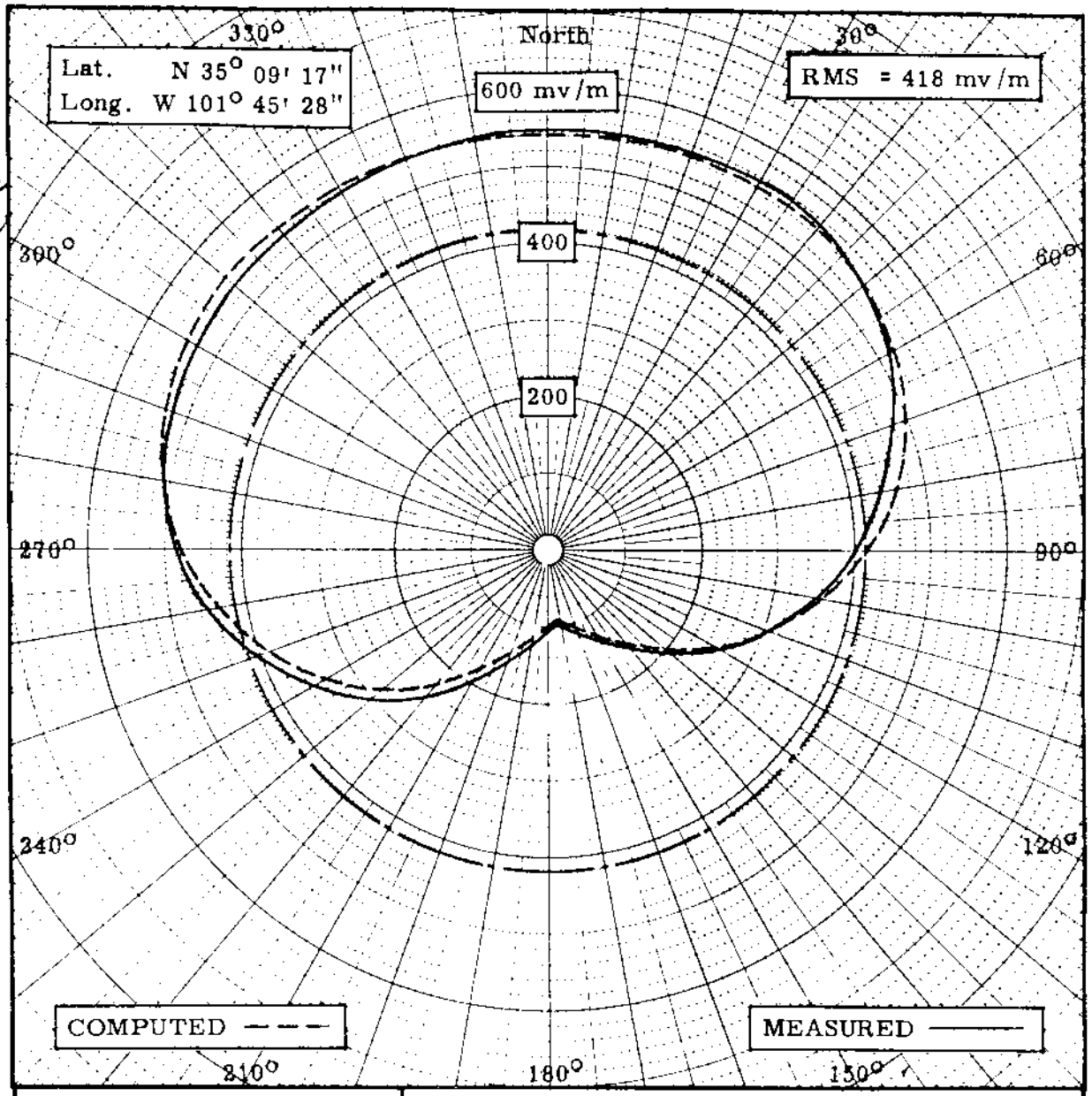
FCC File No.
BP-~~10,890~~ 12,086 Accepted 11-20-56 Station KLYN, Amarillo, Texas 940 KC

KIXZ

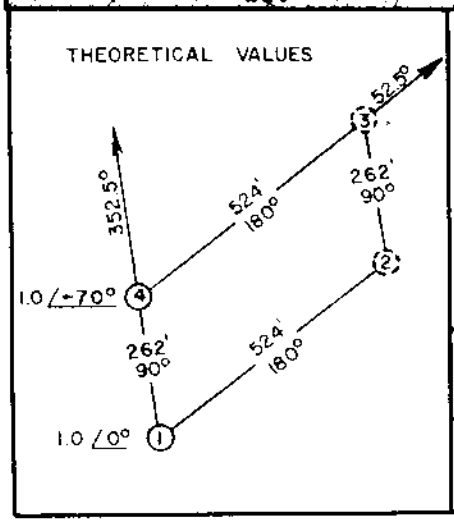
MEASURED DAY
(4-22-60g)

Station KIXZ
Amarillo, Texas

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



granted for increase in power and DA-2 operation 8-8-60



RADIO STATION KIXZ
AMARILLO, TEXAS

MEASURED DAYTIME DIRECTIONAL
HORIZONTAL PLANE RADIATION PATTERN
940 KC 1 KW 5 KW-LS DA-2

010660-2

FIGURE 2

Merl Saxon
Consulting Radio Engineer
Lufkin, Texas

FCC File No. BL-7866
Accepted 3-29-60

KIXZ
Amarillo, Texas

940 KC

KIXZ

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KIXZ

Main Studio: Amarillo, Texas

Frequency: 940 kHz

Power: 1 kW Night 5 kW Day

Notification List No. 1637

Date: June 18, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 35° 09' 17"
West Longitude: 101° 45' 28"

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:	W	S	N	E
HEIGHT ABOVE INSULATORS:	240'	240'	240'	240' (82.5°)
NIGHT PHASING:	-90°	0.0°	-90°	0.0°
NIGHT FIELD RATIO:	1.000	1.025	1.025	1.000
DAY PHASING:	-70°	0°	-	-
DAY FIELD RATIO:	1.0	1.0	-	-

SPACING AND ORIENTATION: The towers are located at the vertices of a parallelogram the long sides of which are 524' (180°) in length on a line bearing 52.5° true. The short sides are 262' (90°) in length on a line bearing 172.5°)

GROUND SYSTEM: 120-365' equally spaced copper radials plus a 48' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

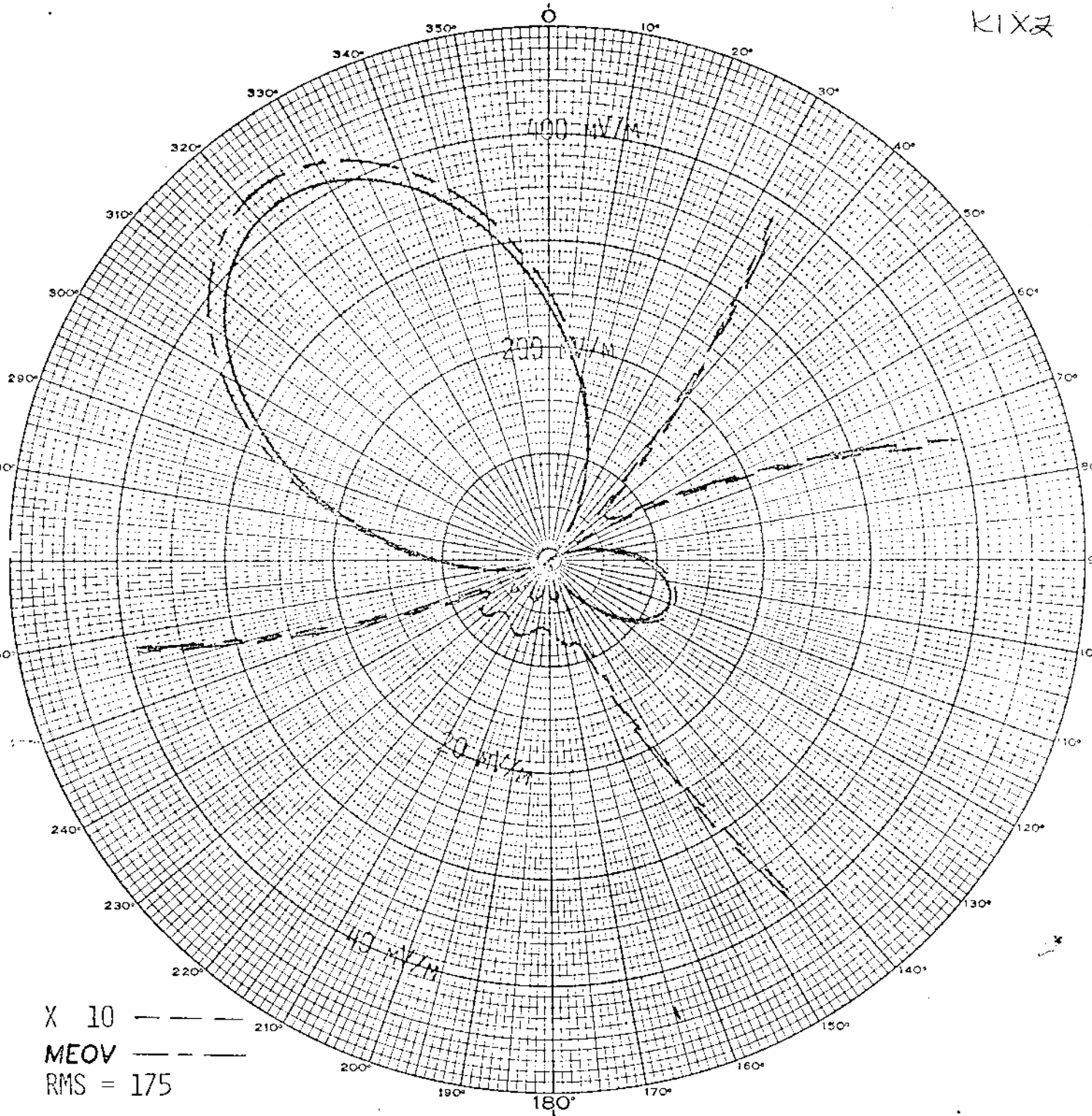
Predicted effective Night Field: 175 mv/m at rated power.

Predicted effective Day Field: 418 mv/m at rated power.

Note: Please retain the Daytime directional antenna radiation pattern notified for Station KLYN (now KIXZ) in United States Change List Number 728 dated October 23, 1957 and attach to this Revised Descript. Sheet and Nighttime patterns. This notification concerns only a change to add moves of radiation in the Nighttime pattern of the station with Daytime operation continued as previously notified.

CTR NO 30787A4

KIXZ



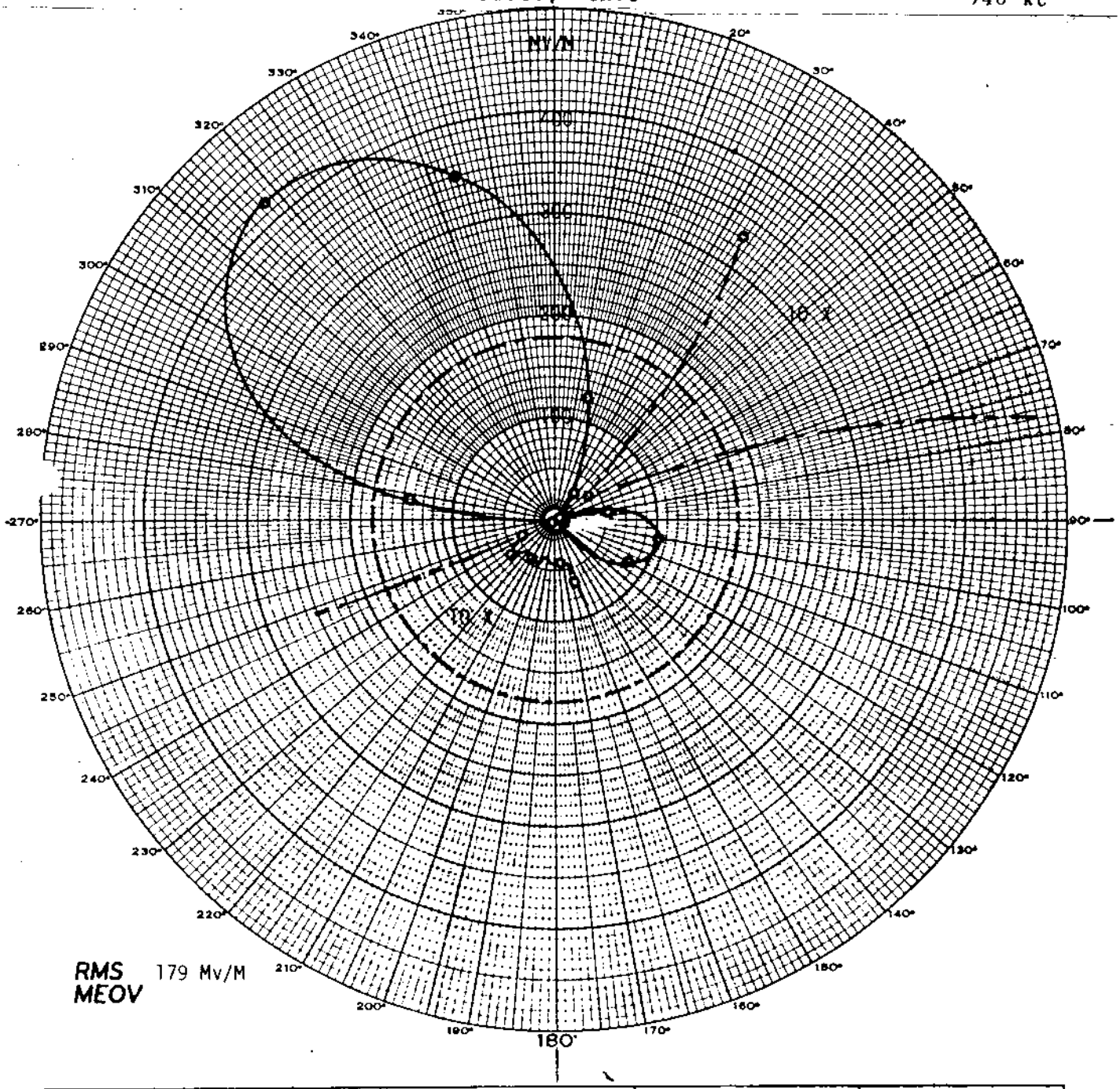
TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 2	STATION DATA
G=82.5° #4; 90°52.5°T.; 352.5° T. 180°; #2; #3; 90°; 180°; #1	TOWER No	ELECTRICAL HEIGHT G°	SPACING S°	PHASING ψ°	FIELD RATIO F	PROPOSED MEO VALUES KIXZ AMARILLO, TEXAS	CALL KIXZ FREQ 940 kHz POWER 1.0 kW TYPE DA-2 TIME NIGHT LAT. 35°09'17" LONG. 101°45'28"
	1			0.0°	1.025		
	2			0.0°	1.000		
	3			-90°	1.000		
	4			-90°	1.025		
	5						
	6						
	DAYTIME OPERATION ☐		NIGHTTIME OPERATION ☑			θ° = 0	E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.

KIXZ

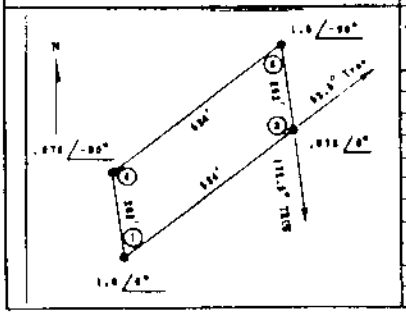
Measured Night
(3-30-66CT)

Station KIXZ
Amarillo, Texas

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



RMS MEOV 179 Mv/M

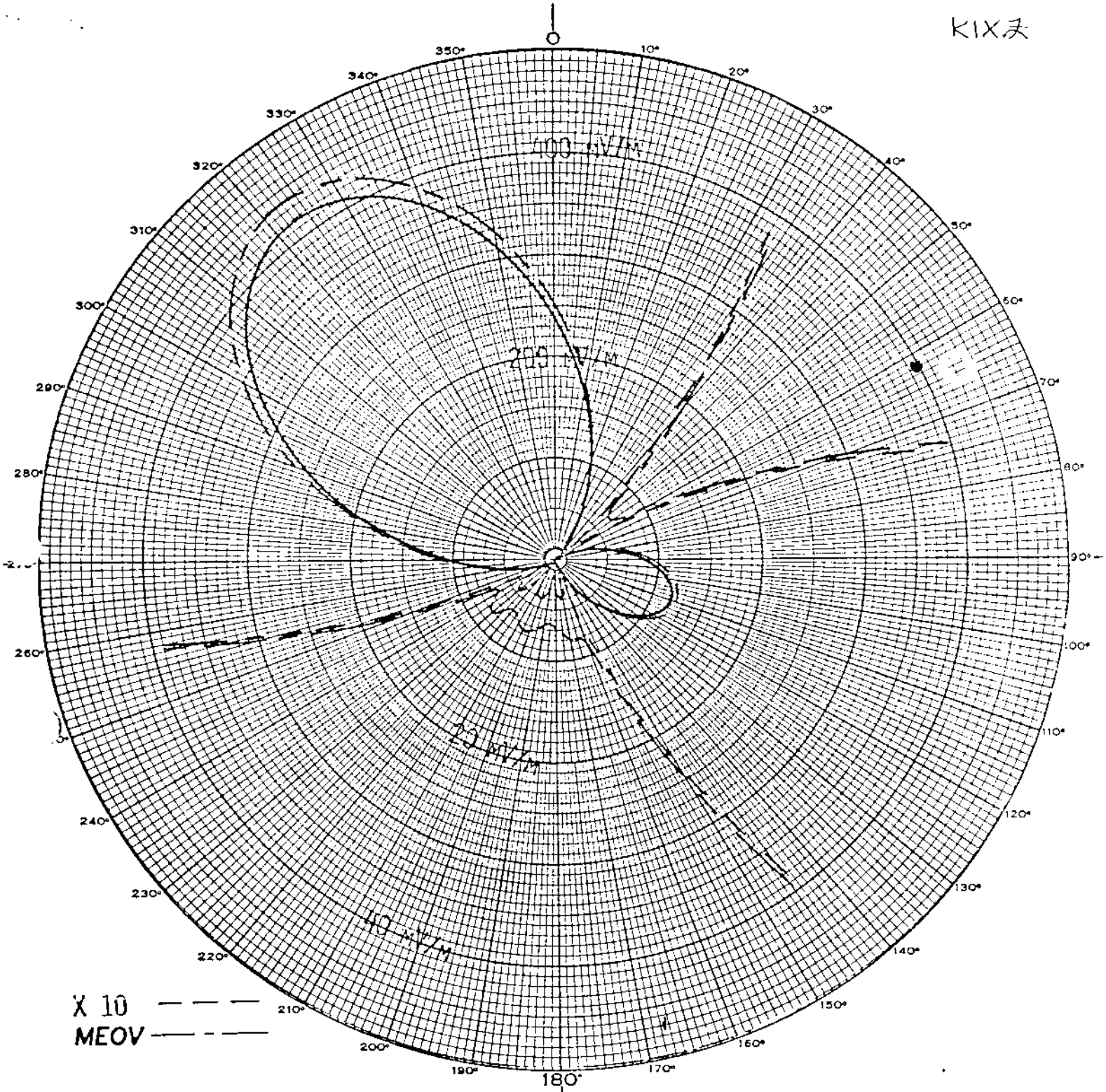
TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 2	STATION DATA
	TOWER No.	ELECTRICAL HEIGHT G°	SPACING S°	PHASING ψ°	FIELD RATIO f	MEASURED NIGHT DIRECTIONAL PATTERN 1966 PROOF-OF-PERFORMANCE	CALL KIXZ FREQ 940 Kc/S POWER 1 Kw N TYPE DA-2 TIME Night LAT. N35°09'15" LONG W101°45'45"
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	DAYTIME OPERATION ☐			NIGHTTIME OPERATION ☐		θ°	E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BRC-2853
Accepted 3-25-66

Station KIXZ
Amarillo, Texas

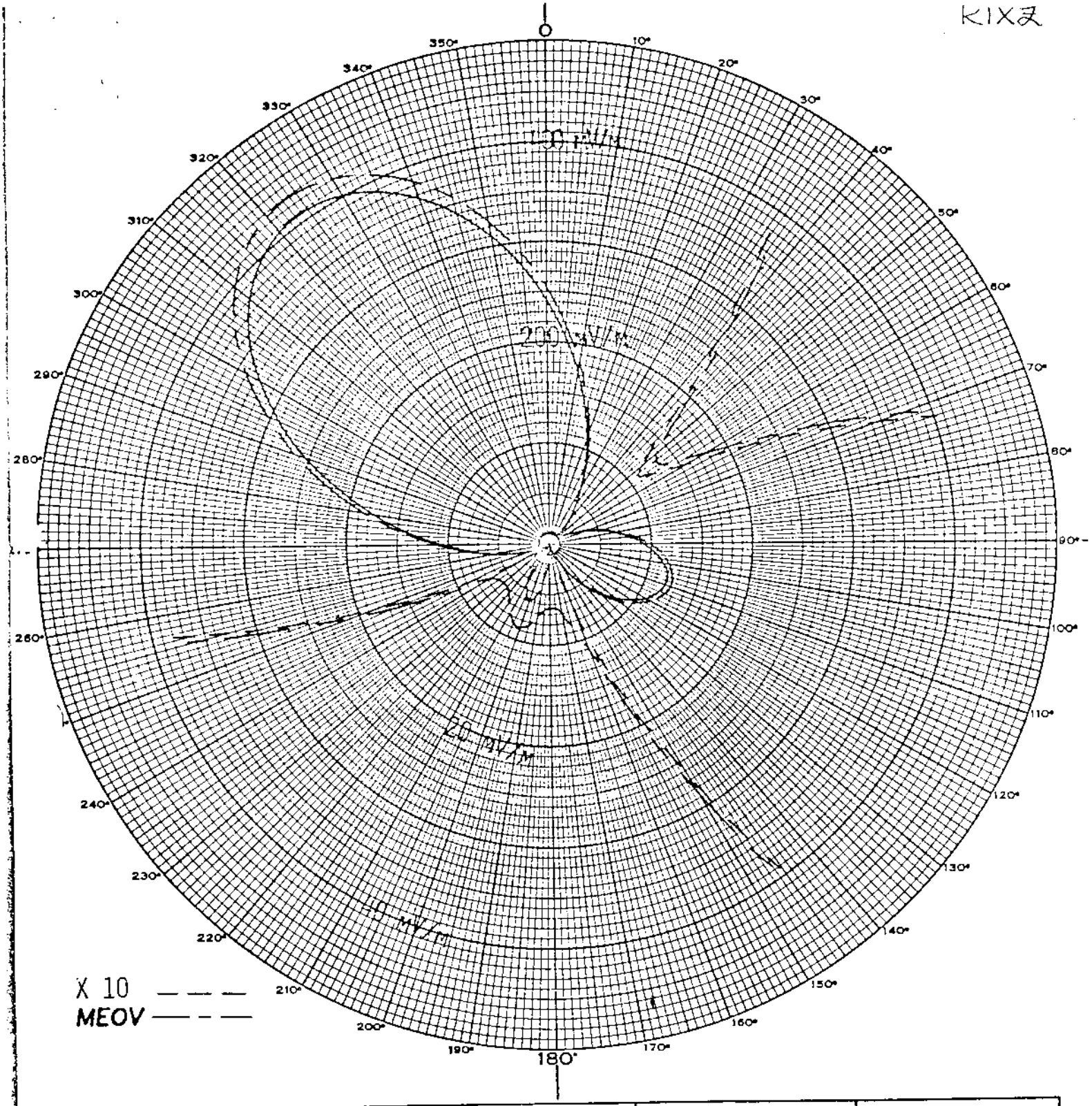
940 kc

KIXZ



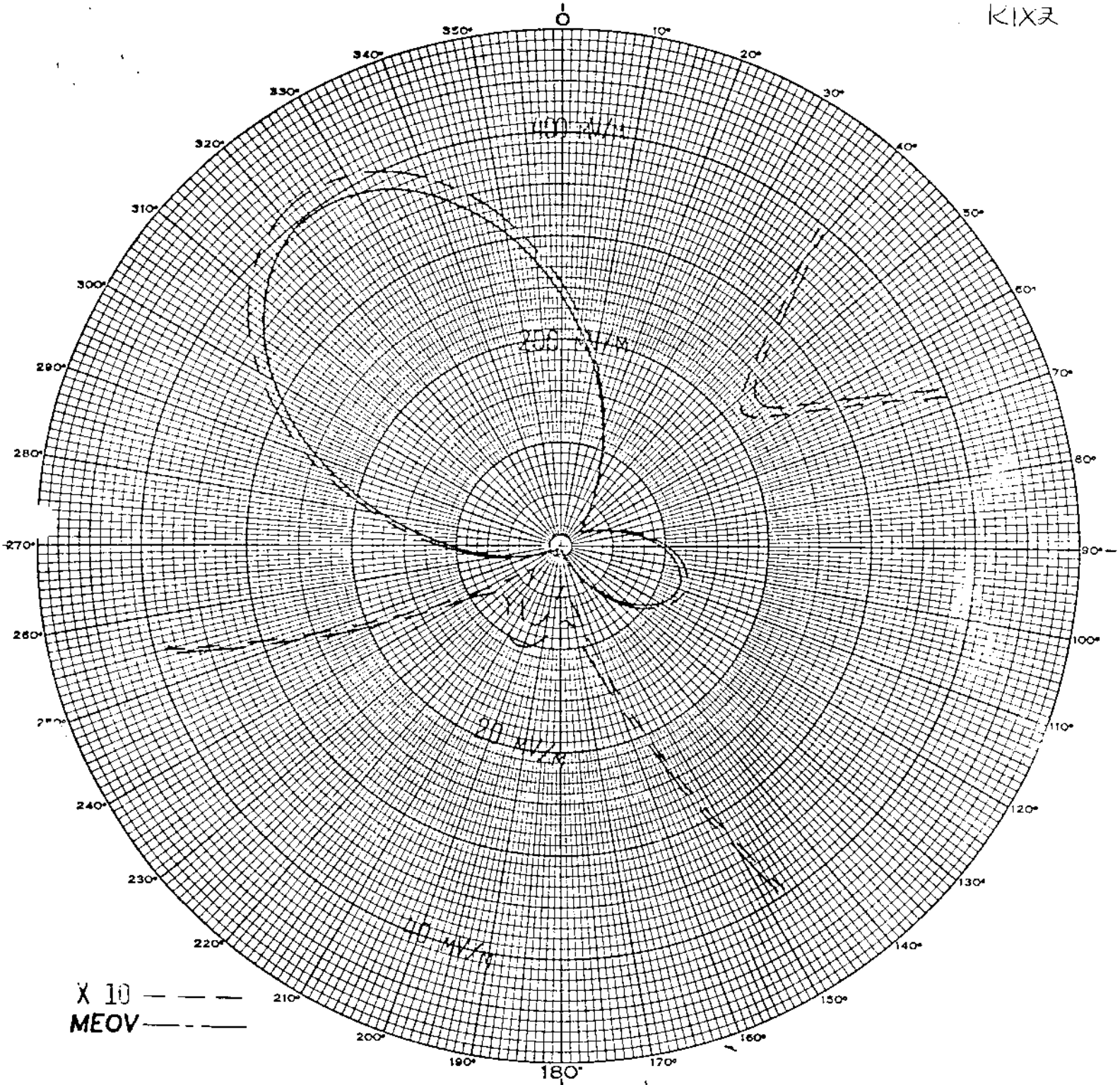
TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 2A	STATION DATA
	TOWER No.	ELECTRICAL HEIGHT G°	SPACING S°	PHASING M°	FIELD RATIO F	PROPOSED MEO VALUES KIXZ 940 kHz	CALL FREQ POWER TYPE TIME LAT. LONG.
	1						
	2						
	3						
	4						
	5						
	6					$\theta^\circ = 5$	E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.
	DAYTIME OPERATION ☐			NIGHTTIME OPERATION ☒			

KIXZ



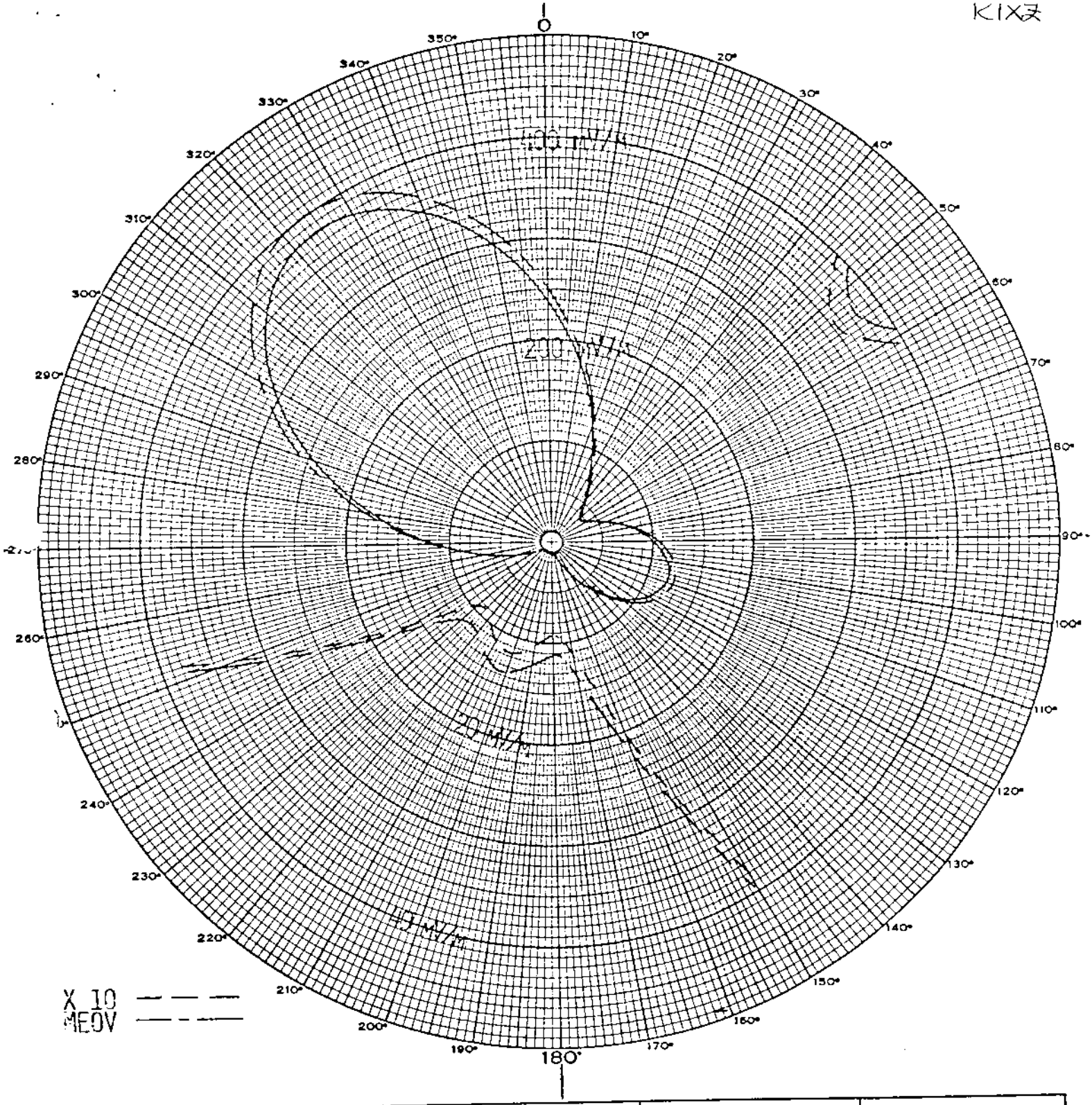
TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 2B	STATION DATA
	TOWER No.	ELECTRICAL HEIGHT G°	SPACING S°	PHASING ψ°	FIELD RATIO F_1	PROPOSED MEO VALUES KIXZ	CALL FREQ POWER TYPE TIME LAT. LONG.
	1						
	2						
	3						
	4						
	5						
	6						
	DAYTIME OPERATION ☐		NIGHTTIME OPERATION ☒			θ° = 10	E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.

KIXZ



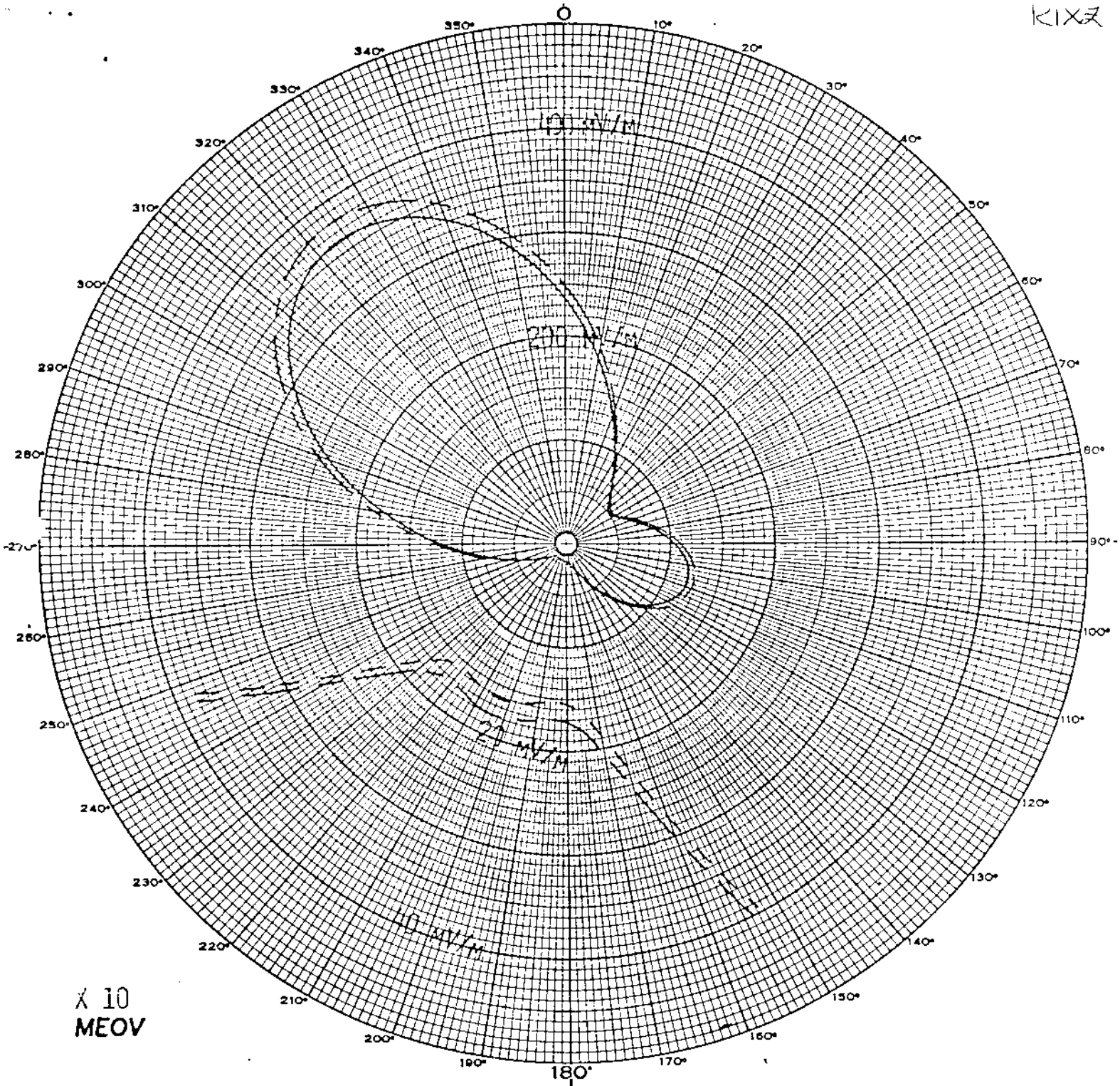
TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 2C	STATION DATA
	TOWER No.	ELECTRICAL HEIGHT σ°	SPACING S°	PHASING φ°	FIELD RATIO F	PROPOSED MEO VALUES KIXZ	CALL FREQ POWER TYPE TIME LAT. LONG.
	1						
	2						
	3						
	4						
	5						E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.
	6					θ° 15	
	DAYTIME OPERATION ☐			NIGHTTIME OPERATION ☒			

KIXZ



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 2D	STATION DATA
	TOWER No.	ELECTRICAL HEIGHT G°	SPACING S°	PHASING ψ°	FIELD RATIO F	PROPOSED MEO VALUES KIXZ	CALL FREQ POWER TYPE TIME LAT. LONG.
	1						
	2						
	3						
	4						
	5						
	6						
	DAYTIME OPERATION ☐		NIGHTTIME OPERATION ☒			θ=20	E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.

KIXZ

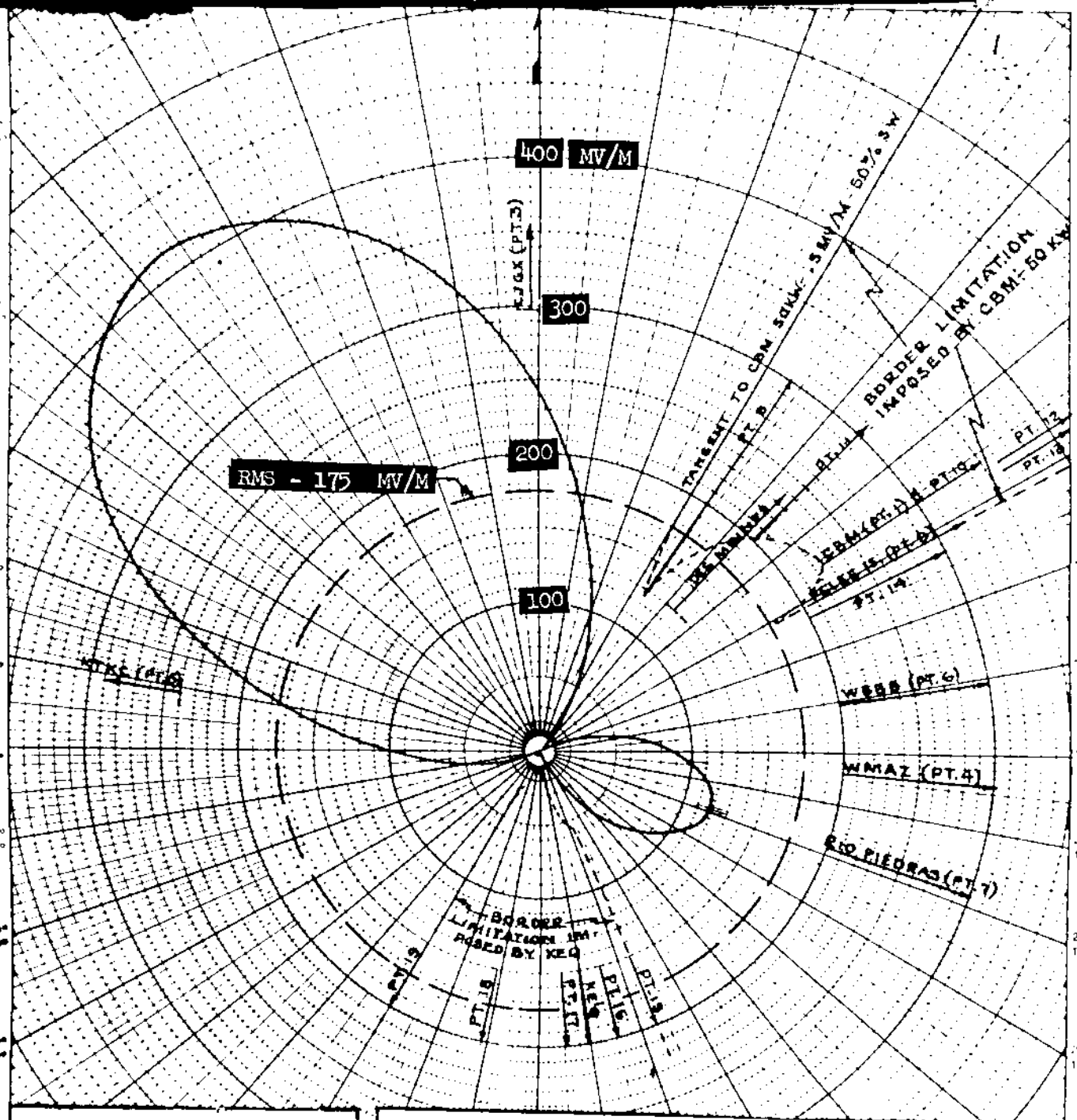


X 10
MEOV

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 2E	STATION DATA
	TOWER No.	ELECTRICAL HEIGHT G°	SPACING S°	PHASING ψ°	FIELD RATIO F	PROPOSED MEO VALUES KIXZ	CALL FREQ POWER TYPE TIME LAT. LONG.
	1						
	2						
	3						
	4						
	5						
	6						
	DAYTIME OPERATION ☐		NIGHTTIME OPERATION ☐			θ° 25	E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.

PROPOSED DAY & NIGHT Station KLYN 1kw, DA-1,U
Amarillo, Texas 940 KC

940KC



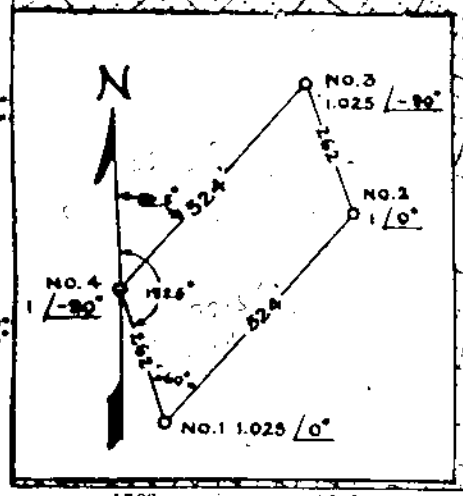


FIGURE VII

CALCULATED HORIZONTAL RADIATION PATTERN

(UNATTENUATED FIELD STRENGTH AT ONE MILE)

PROPOSED STATION — AMARILLO, TEXAS
940 KC/S JUNE 1946 1KW-U-.DA

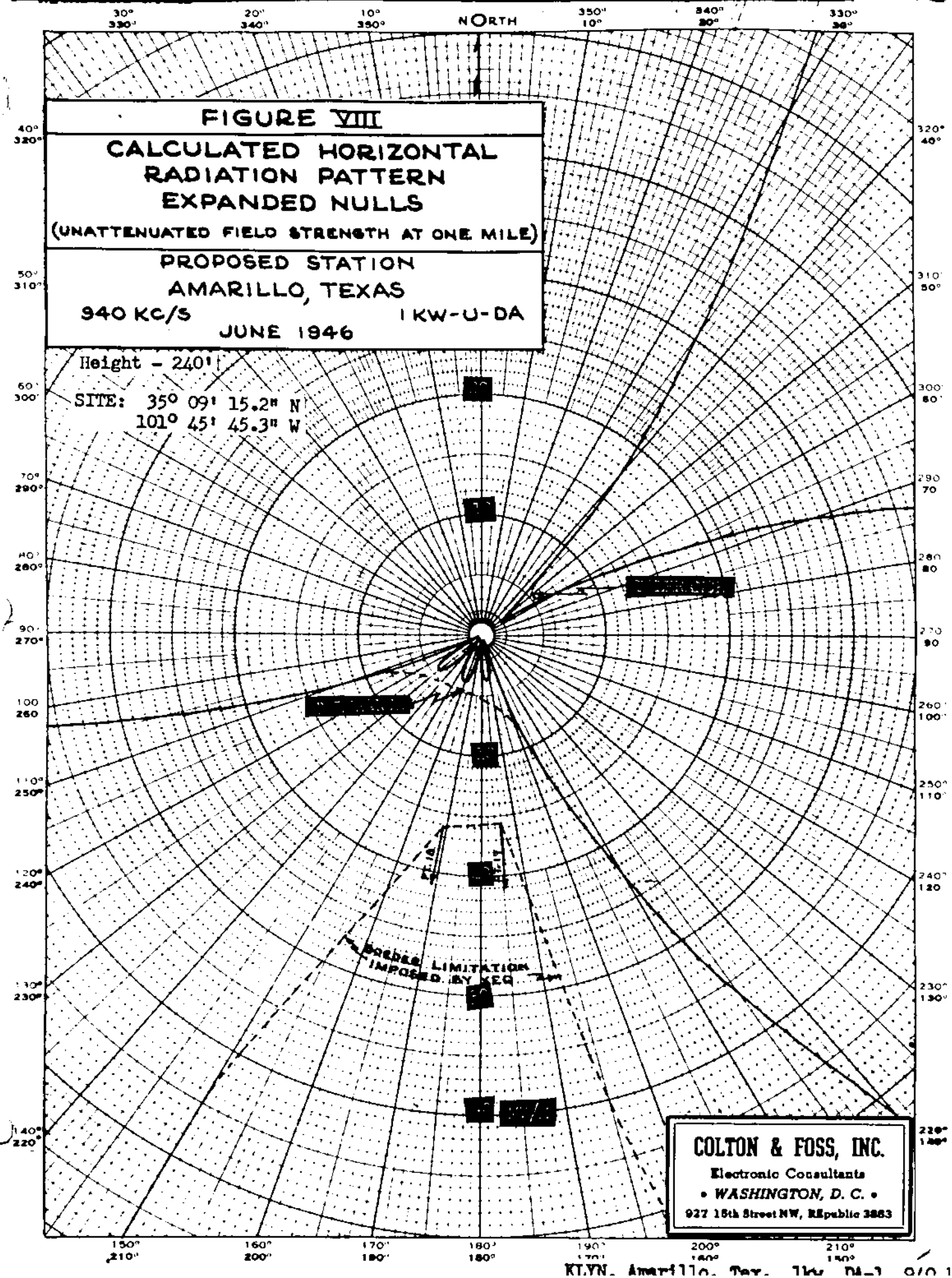
NL 33° 09' 19"
NL 101° 45' 45"

COLTON & FOSS, INC.
Electronic Consultants
• WASHINGTON, D. C. •
927 15th Street NW, REpublic 3883

24

[redacted] Station KIYN 1kw, DA-1,U
[redacted] Amarillo, Texas 940 KC

KIAZ
940 KC



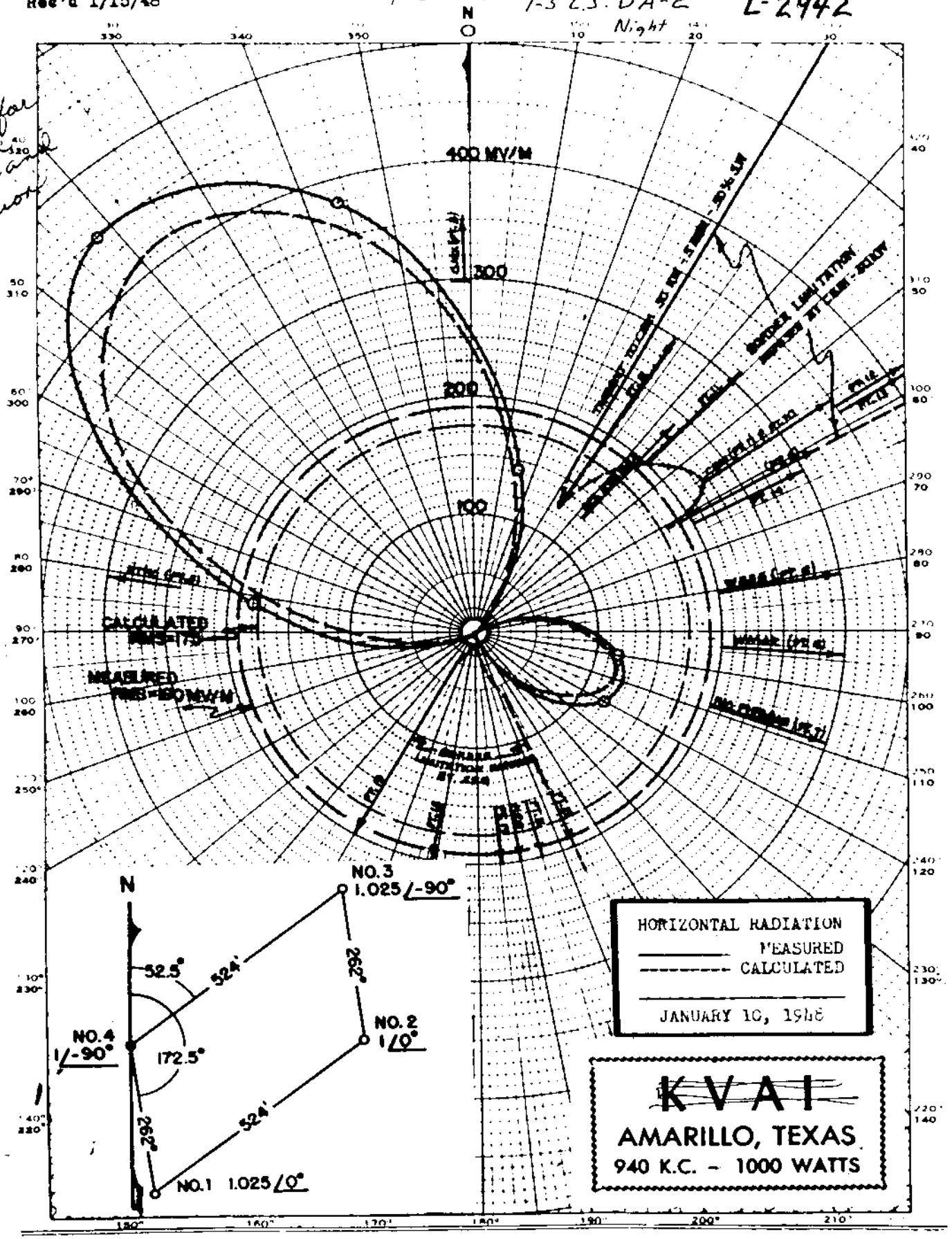
KIYN, Amarillo, Tex. 1kw DA-1 940 1

940kc KIXZ

Rec'd 1/15/48

9-2-48 G 1-5 L.S. DA-2 Night L-2942

Granted for increase in day power and DA-2 operation 8-8-60



STILES & WARING — CONSULTING RADIO ENGINEERS — BOSTON AND WASHINGTON

940KC KIXZ

1-5 C.S. DA-2

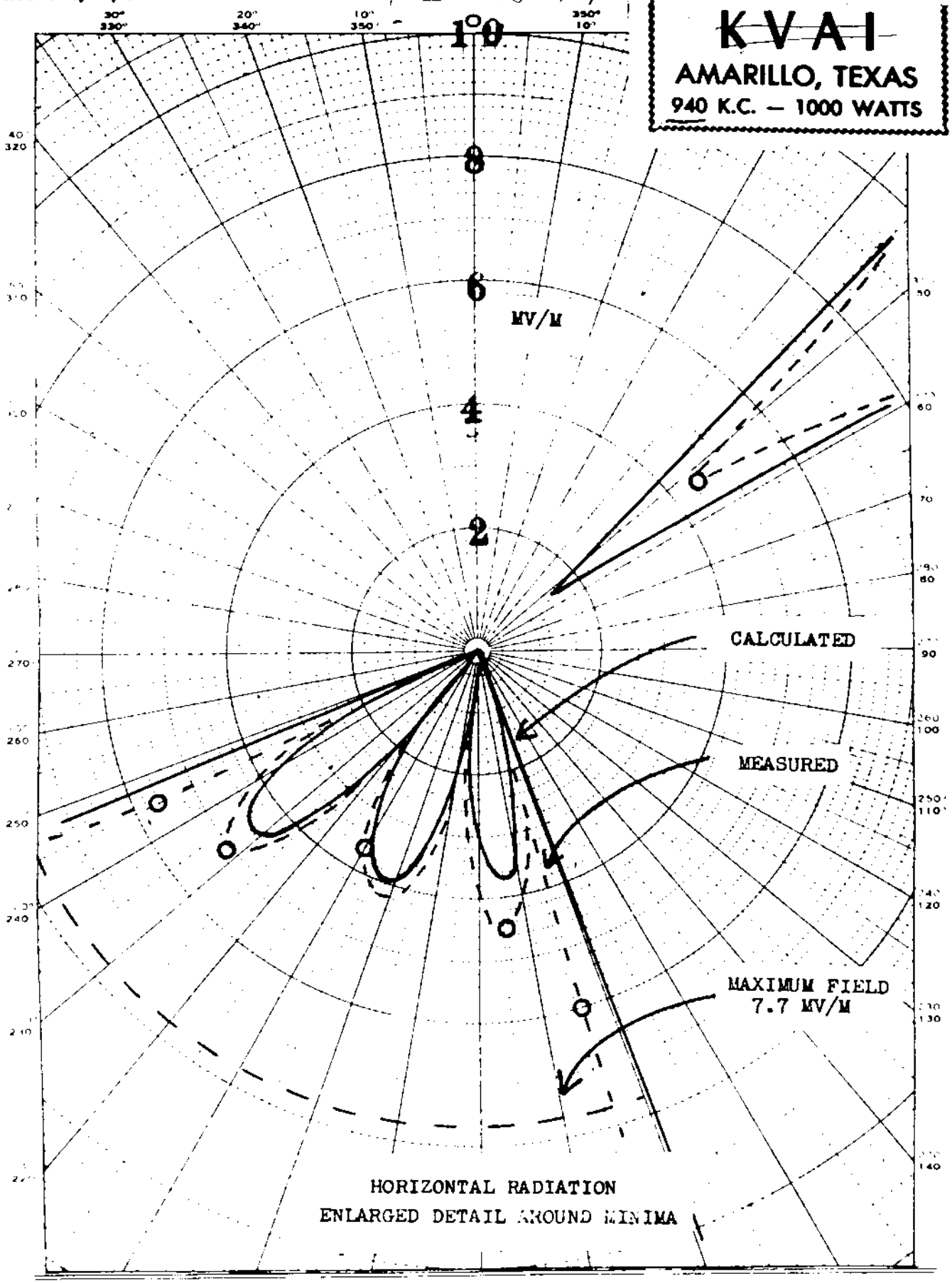
9-2 - 48 G Night

Rec'd 1/15/48

KVAI

AMARILLO, TEXAS

940 K.C. — 1000 WATTS



STILES & WARING — CONSULTING RADIO ENGINEERS — BOSTON AND WASHINGTON

KTON

3-29-61 granted CP for new station.

6-5-61 granted CP change to main location

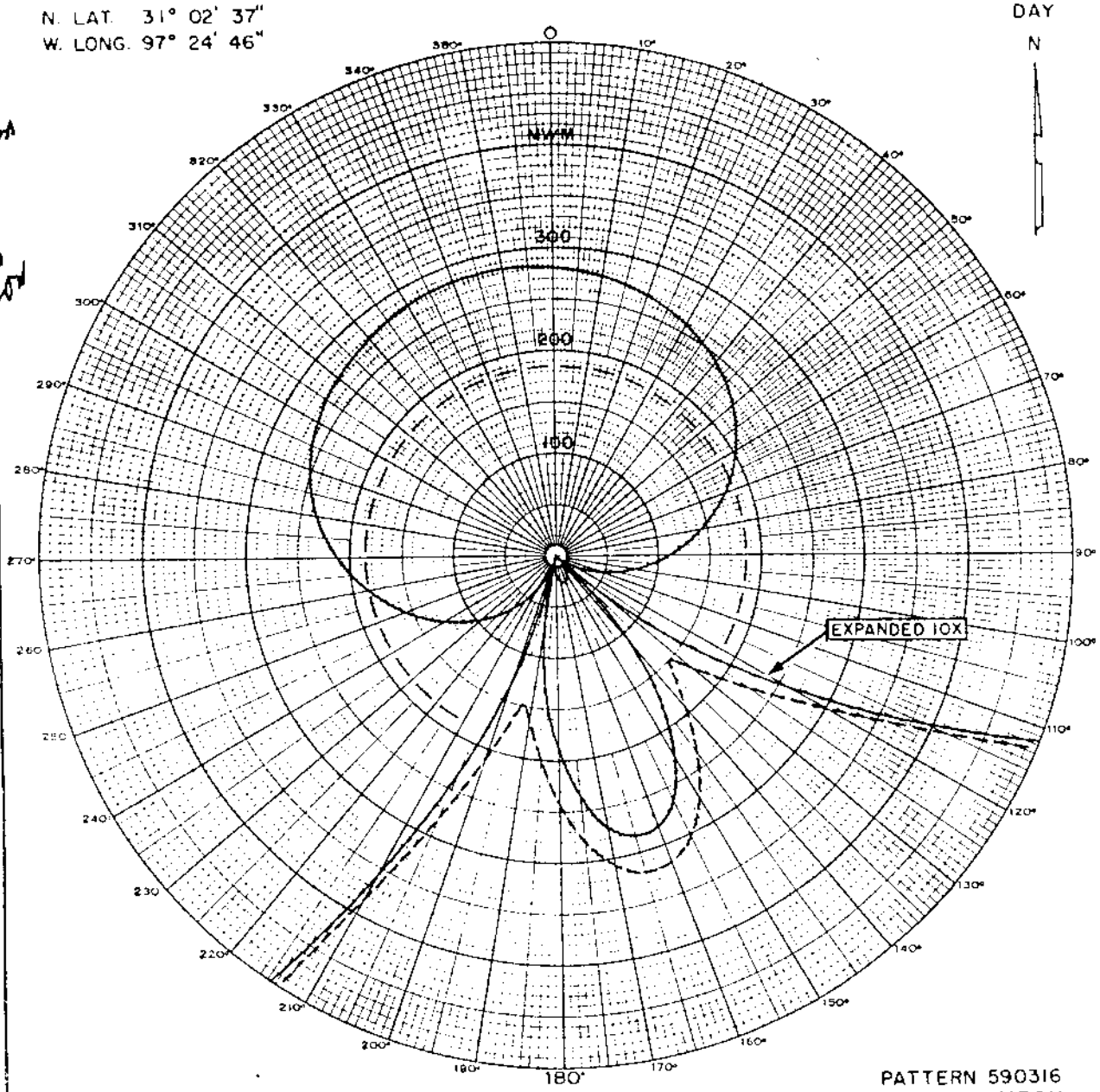
-3-62 granted L for new station

PROPOSED DAY
(6-14-61g)

Station KTON
Belton, Texas

1kw, DA-D,D
940 KC

N. LAT. 31° 02' 37"
W. LONG. 97° 24' 46"



RMS = 185 MV/M

PATTERN 590316
------ MEOV

N 17° W
1
S
2
S = 233' = 80.0°
G = 220' = 75.5°

TOWER	FIELD	PHASE
1	1.0	0°
2	1.0	111°

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

BELTON BROADCASTERS, INC.
940 KC 1 KW DA-D
610422 FIGURE 6A

FCC File No. BMP-9488
Accepted 5-22-61

KTON
Belton, Texas 940 KC

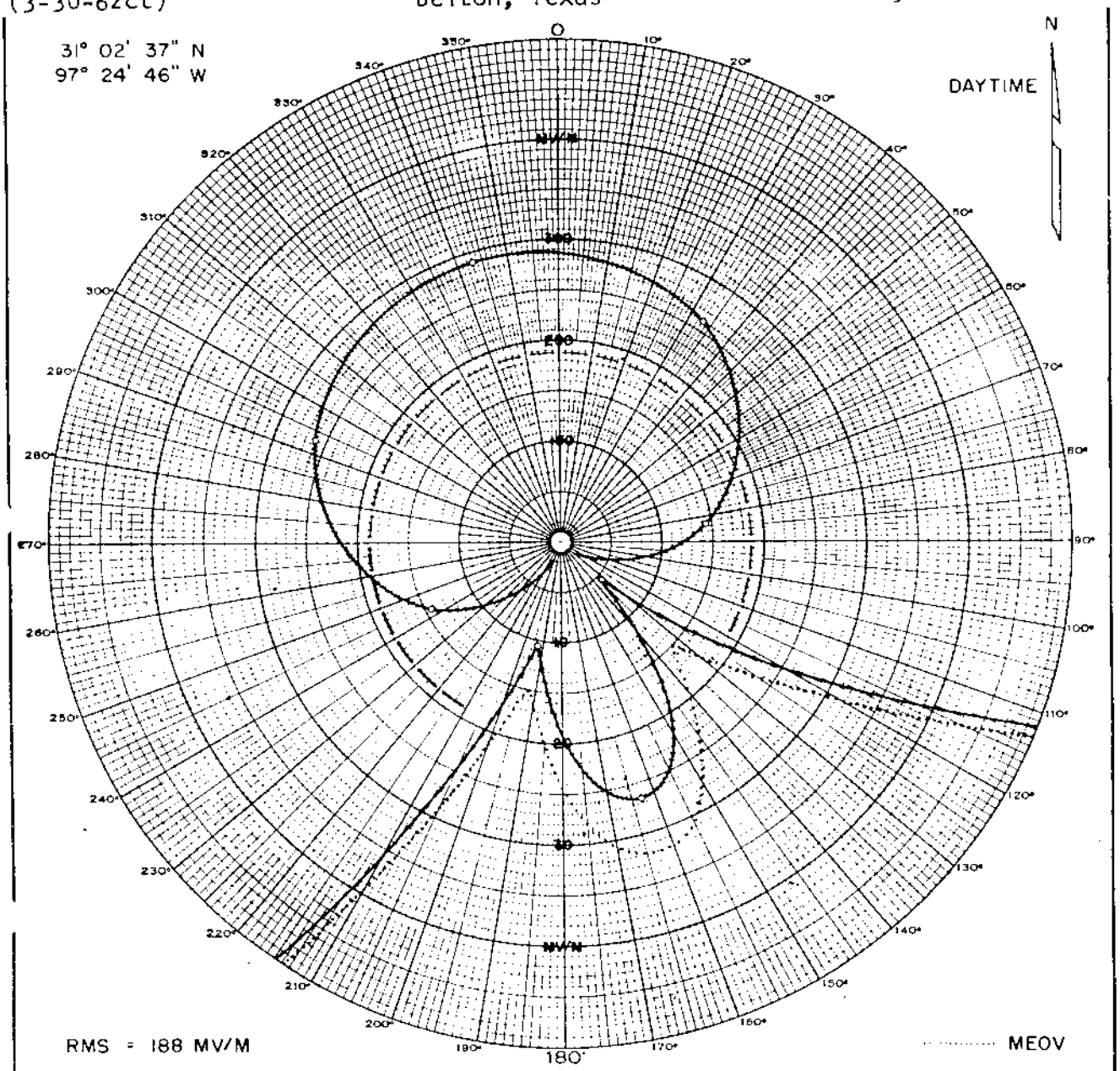
KTON

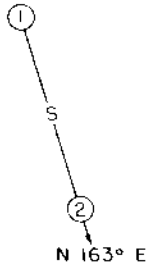
Measured Day
(3-30-62ct)

Station KTON
Belton, Texas

1kw, DA-D, D
940 kc

31° 02' 37" N
97° 24' 46" W





$G_1 = G_2 = 75.5°$
$S = 80° = 233'$

DAYTIME ANTENNA PARAMETERS

	THEORETICAL		MEASURED	
TOWER	1	2	1	2
BASE RATIO	1.00	1.00	1.00	.983
LOOP RATIO	1.00	1.00	1.00	1.00
LOOP PHASE	0°	+111°	0°	+106°

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

RADIO STATION KTON
940 KC 1 KW DA-D
611030 FIGURE 4B

FCC File No. BL-8924
Accepted 3-6-62

Station KTON
Belton, Texas

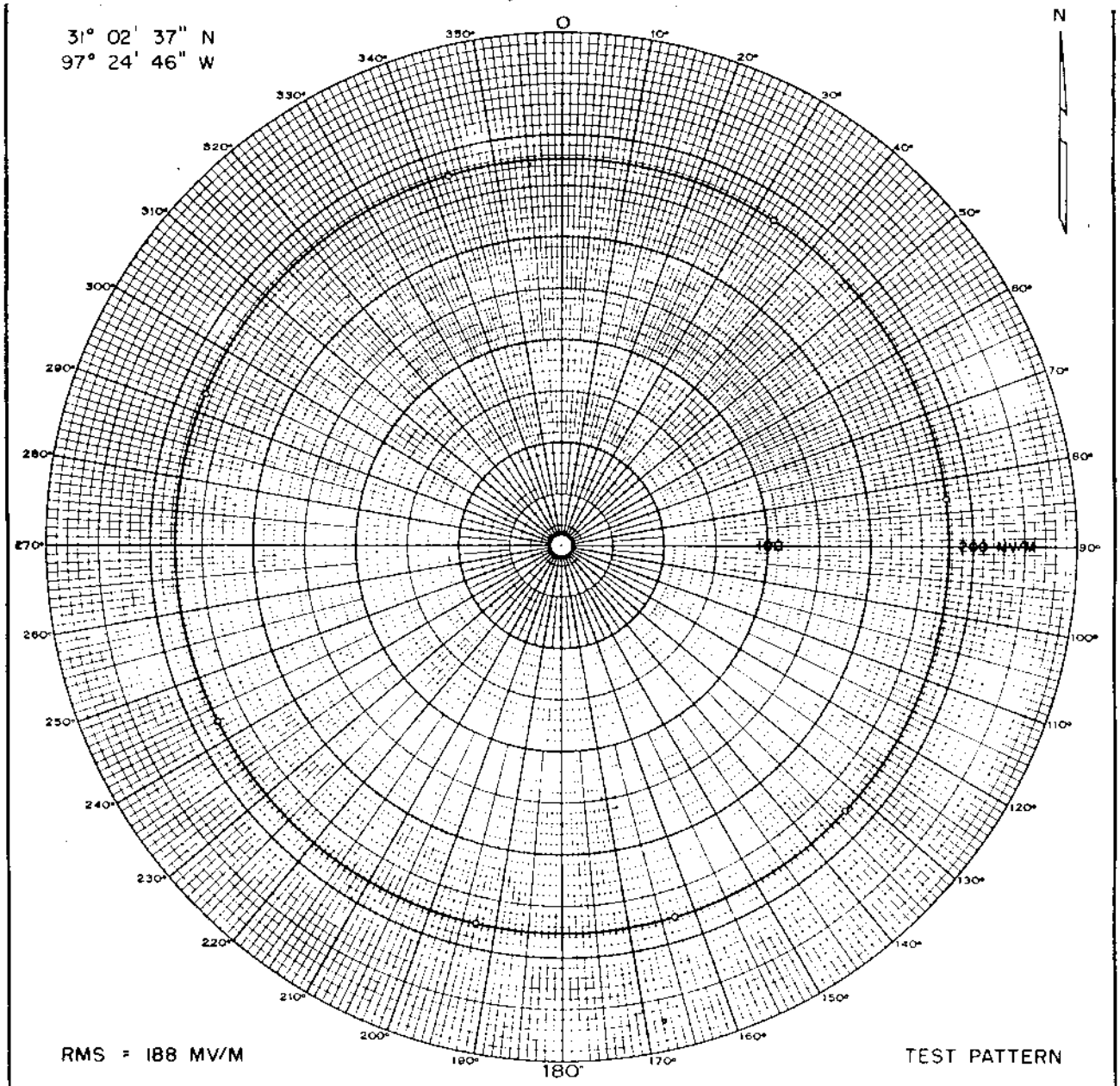
940 kc

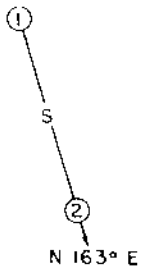
KTON

Measured Non-DA
(3-30-62ct)

Station KTON
Belton, Texas

1kw,DA-D,D
940 kc





$G_1 = G_2 = 75.5°$
$S = 80° = 233'$

1.0 KW NON-DIRECTIONAL TEST

TOWER	1	2
OPERATION	SERIES FED	DETUNED

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

RADIO STATION KTON
940 KC 1 KW DA-D
611030 FIGURE 4A

FCC File No.BL-8924
Accepted 3-6-62

Station KTON
Belton, Texas

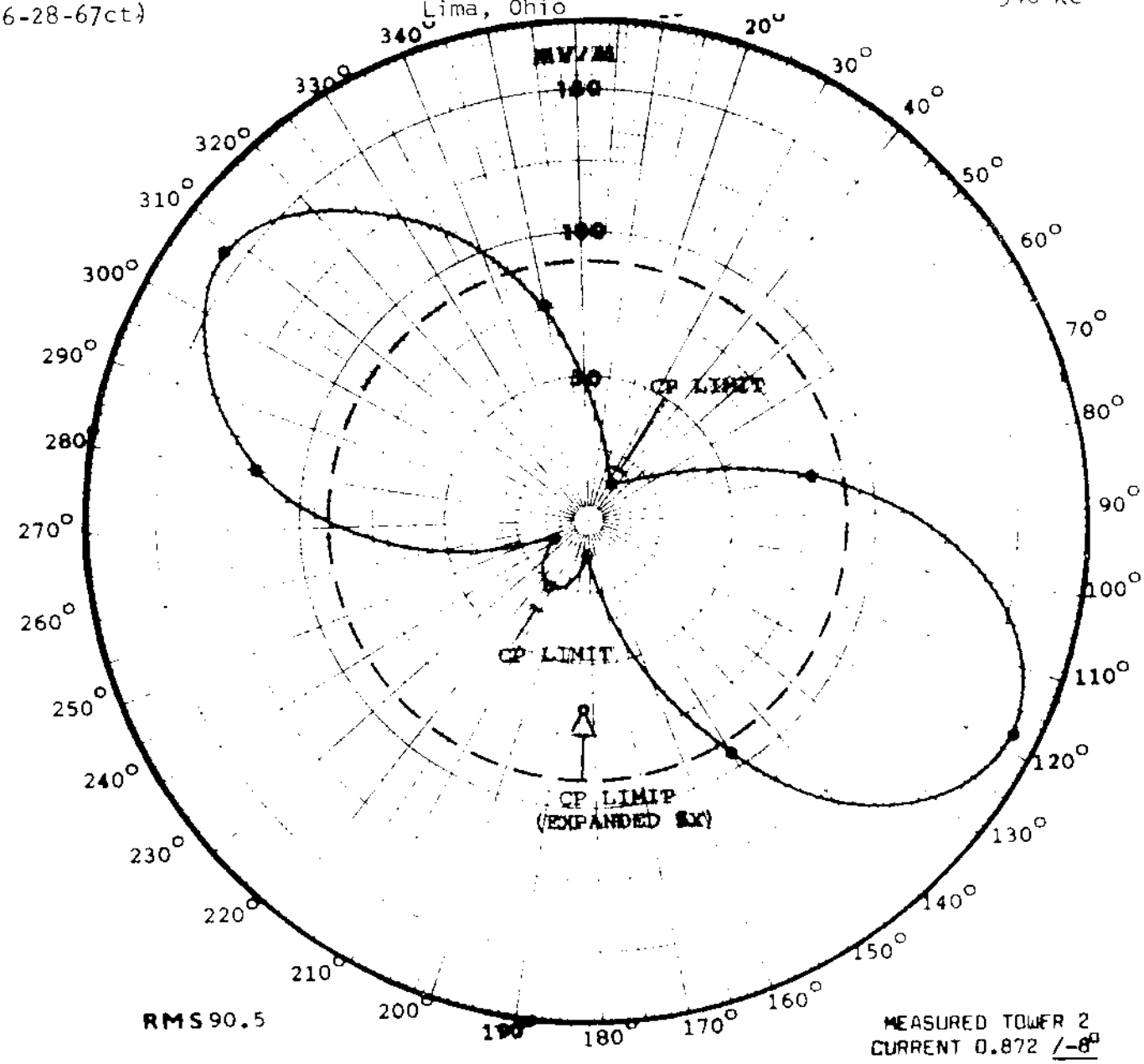
940 kc

WCIT

Measured Day
(6-28-67ct)

Station WCIT
Lima, Ohio

250w,DA-D,D
940 kc



ARRAY DATA	FIGURE 2	STATION DATA
G'S = 82.4° 33°T NO.2 ° 0.9 /-19° S=186° NO.1 ° 1/ 0°	MEASURED DAYTIME RADIATION PATTERN ********** 1967 SKELETON PROOF OF PERFORMANCE ********** FEBRUARY 1967	CALL WCIT LIMA OHIO FREQ 940 KHz POWER 250 WATTS TYPE DA-D HOURS DAYTIME LAT. N-40-43-19 LONG. W-84-05-04 RAY S. ALLEN CHIEF ENGINEER RADIO STATION WCIT

FCC File No.BZ-6424
Accepted 6-5-67

Station WCIT
Lima, Ohio

940 kc

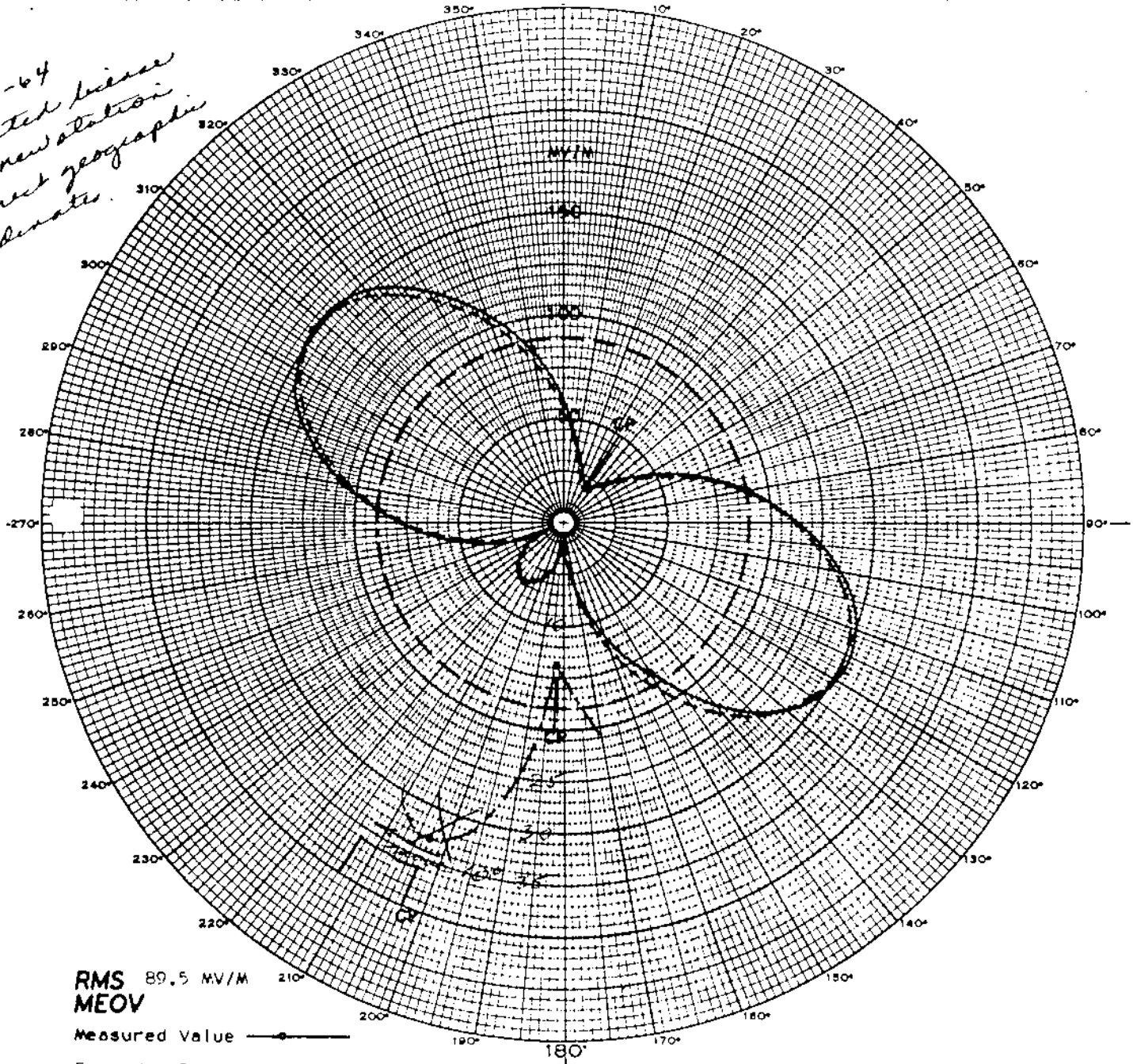
WCIT

Measured Day
(9-25-63ct)

Station WCIT
Lima, Ohio

250w,DA-D,D
940 kc

1-22-64
rotated lines
on new station
correct geographic
coordinates.



RMS 89.5 MV/M
MEOV

Measured Value ——●——

Expanded 5 x — — —

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 3	STATION DATA
33° T. G°s= No. 2 0.9/-19° 82.4° 186° 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 ☐	MEASURED DAYTIME DIRECTIONAL PATTERN – RADIO STATION WCIT Lima, Ohio July - 1963 θ° 0	CALL WCIT FREQ 940 kc/s POWER 0.25 Kw TYPE DA-D TIME DAYTIME LAT. N-40-43-21 LONG. W-84-05-04 E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BL-10253
Accepted9-3-63

Station WCIT
Lima, Ohio

940 kc

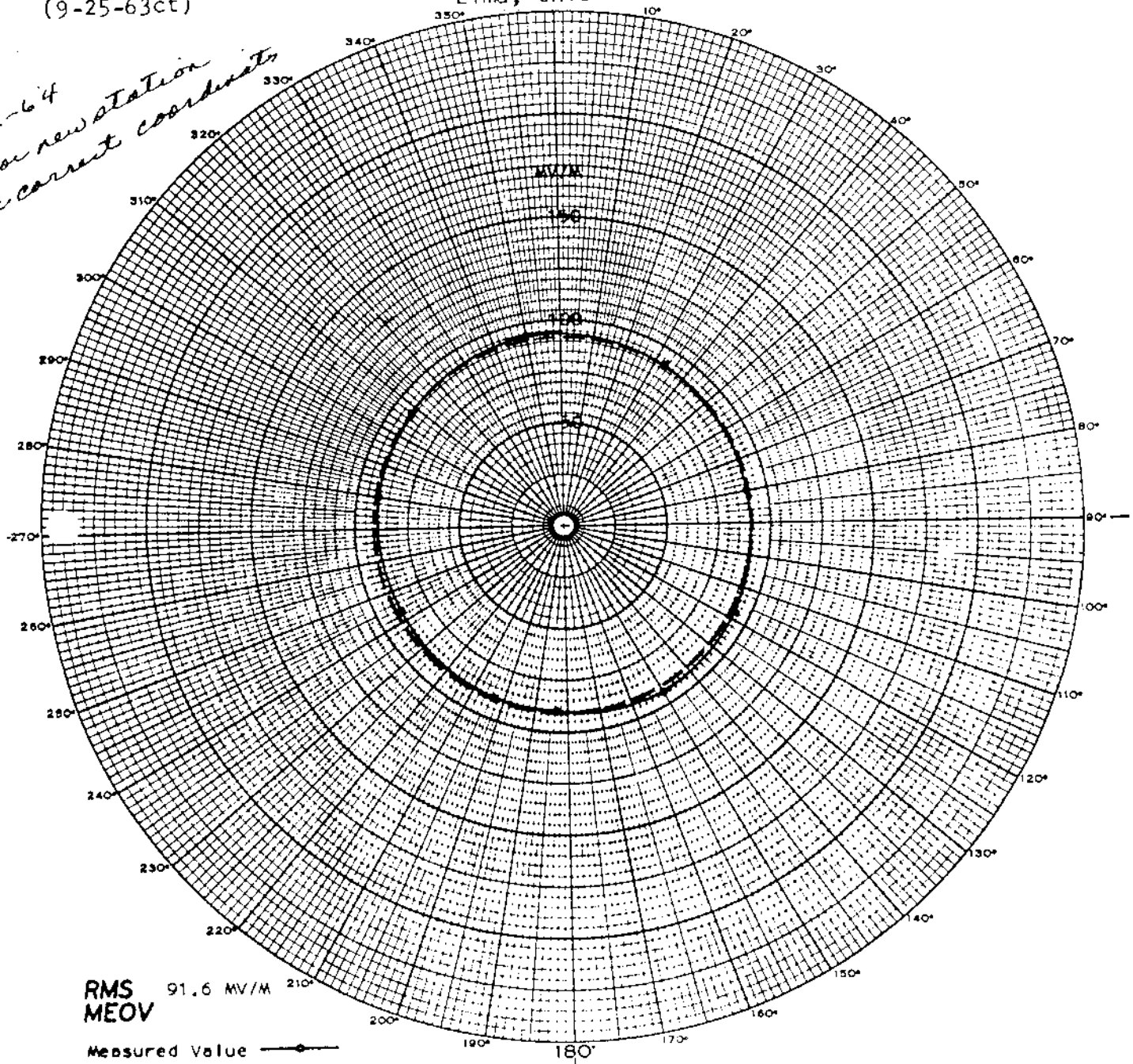
WCIT

Measured Non-DA
(9-25-63ct)

Station WCIT
Lima, Ohio

250w,DA-D,D
940 kc

-22-64
G for new station
and correct coordinates



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 2	STATION DATA
33° T. No. 2 (not used) G=82.4° S=186° S No. 1	TOWER No. / ELECTRICAL HEIGHT G° / SPACING S° / PHASING ψ° / FIELD RATIO F 1 2 3 4 5 6 7 8 9 10 DAYTIME OPERATION ☐ NIGHTTIME OPERATION ☐	MEASURED PATTERN SOUTH TOWER – NORTH TOWER OPEN CIRCUITED JULY - 1963 θ°	CALL WCIT FREQ 940 kc/s POWER 0.25 Kw TYPE NON-DA TIME PROOF LAT. LONG. E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BL-10253
Accepted 9-3-63

Station WCIT
Lima, Ohio

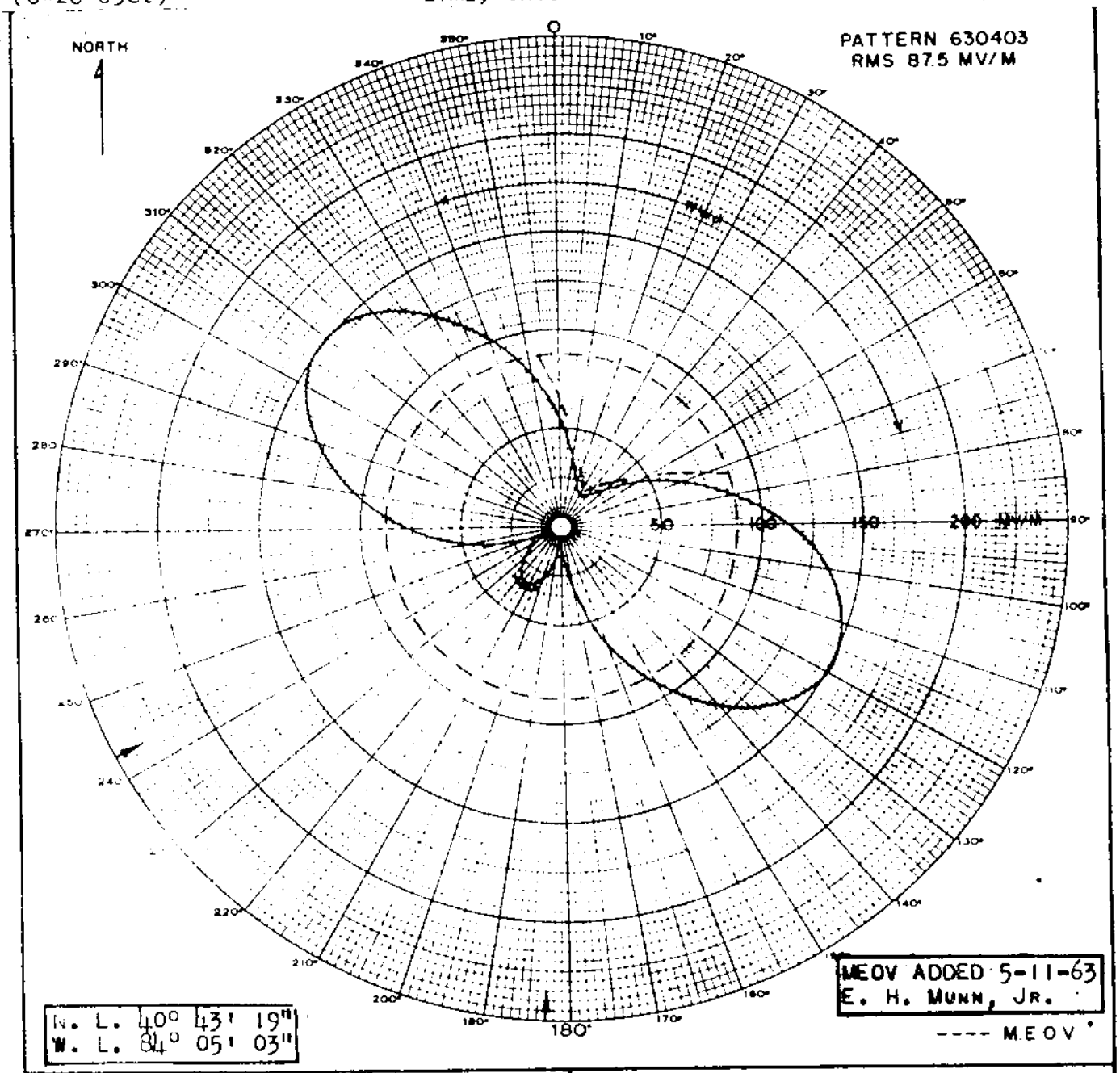
940 kc

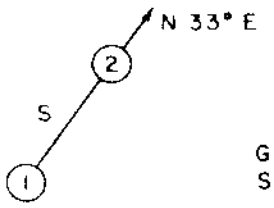
WCIT

Proposed Day
(6-28-63ct)

Station WCIT
Lima, Ohio

250w,DA-D,D
940 kc





G = 240' = 82.4°
S = 541' = 186°

TOWER	FIELD	PHASE
1	1.0	0°
2	0.9	19°

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

CITIZENS BROADCASTING COMPANY
940 KC 0.25 KW DA-D
630403 FIGURE 6A

FCC File No.BMP-10911
Accepted 5-31-63

Station WCIT
Lima, Ohio

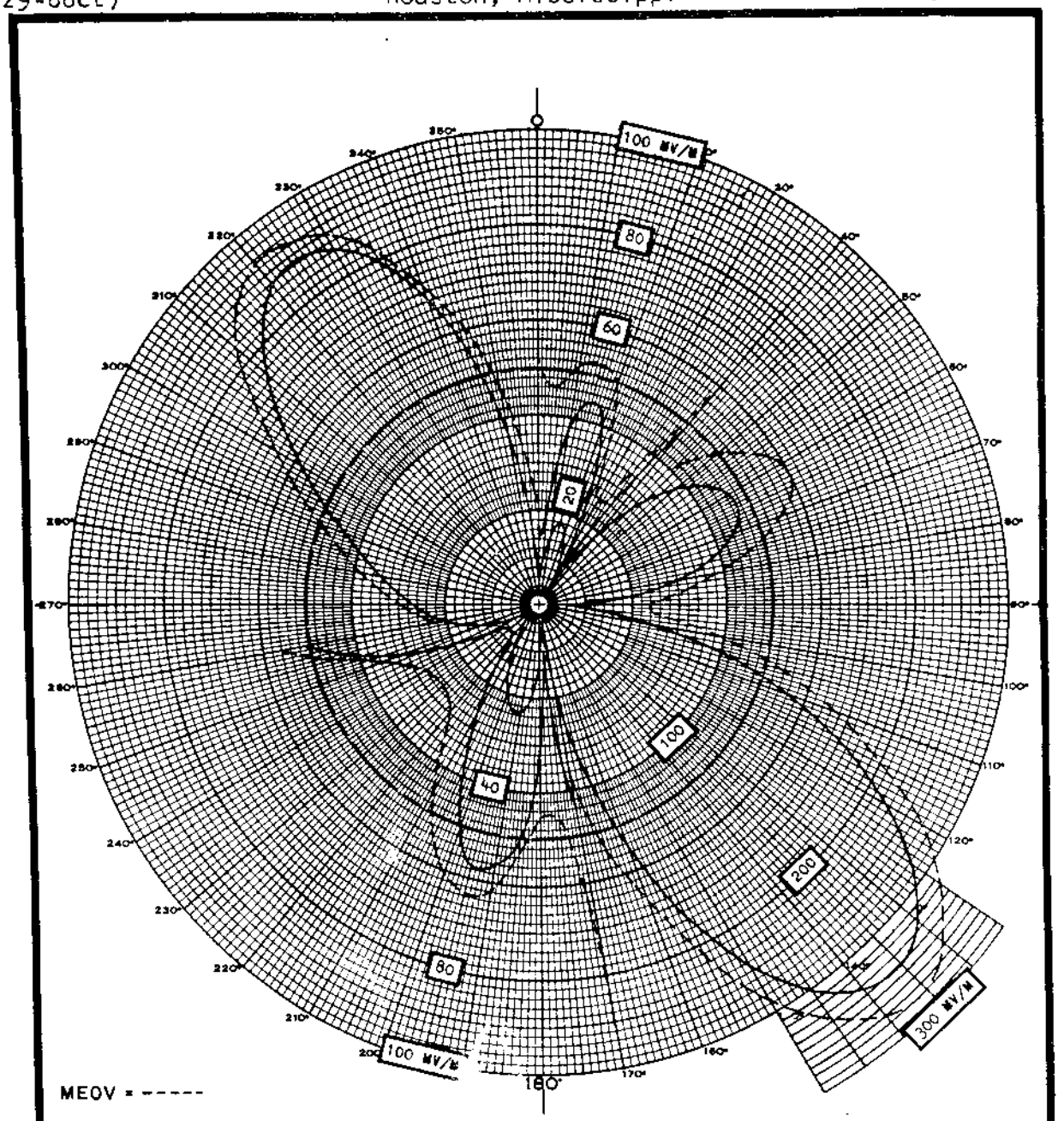
940 kc

WCPC

Proposed Night
(11-29-68ct)

Station WCPC
Houston, Mississippi

500w,50kw-LS,DA-2,U
940 kc



MEOV = -----

E_{RMS} = 124 MV/M (BY ADJUSTMENT)

#1 = 0.9/106.5 #3 = 1.0/0
#4 0.855/75.5 #5 = 0.95/-31

LATITUDE: 33°-56'-00"

LONGITUDE: 89°-00'-33"

JOHN H. MULLANEY
AND
ASSOCIATES

ANTENNA PARAMETERS

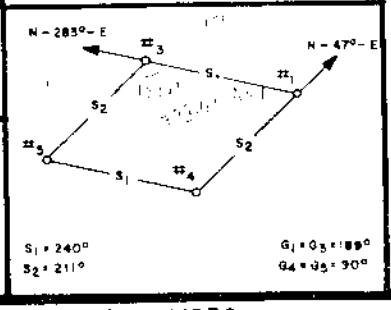


FIGURE 3

PROPOSED NIGHTTIME
HORIZONTAL RADIATION PATTERN

RADIO STATION WCPC
HOUSTON, MISSISSIPPI

940 KHz 0.5/50kw DA-2U

FCC File No.BP-18298
Accepted 10-31-68

Station WCPC
Houston, Mississippi

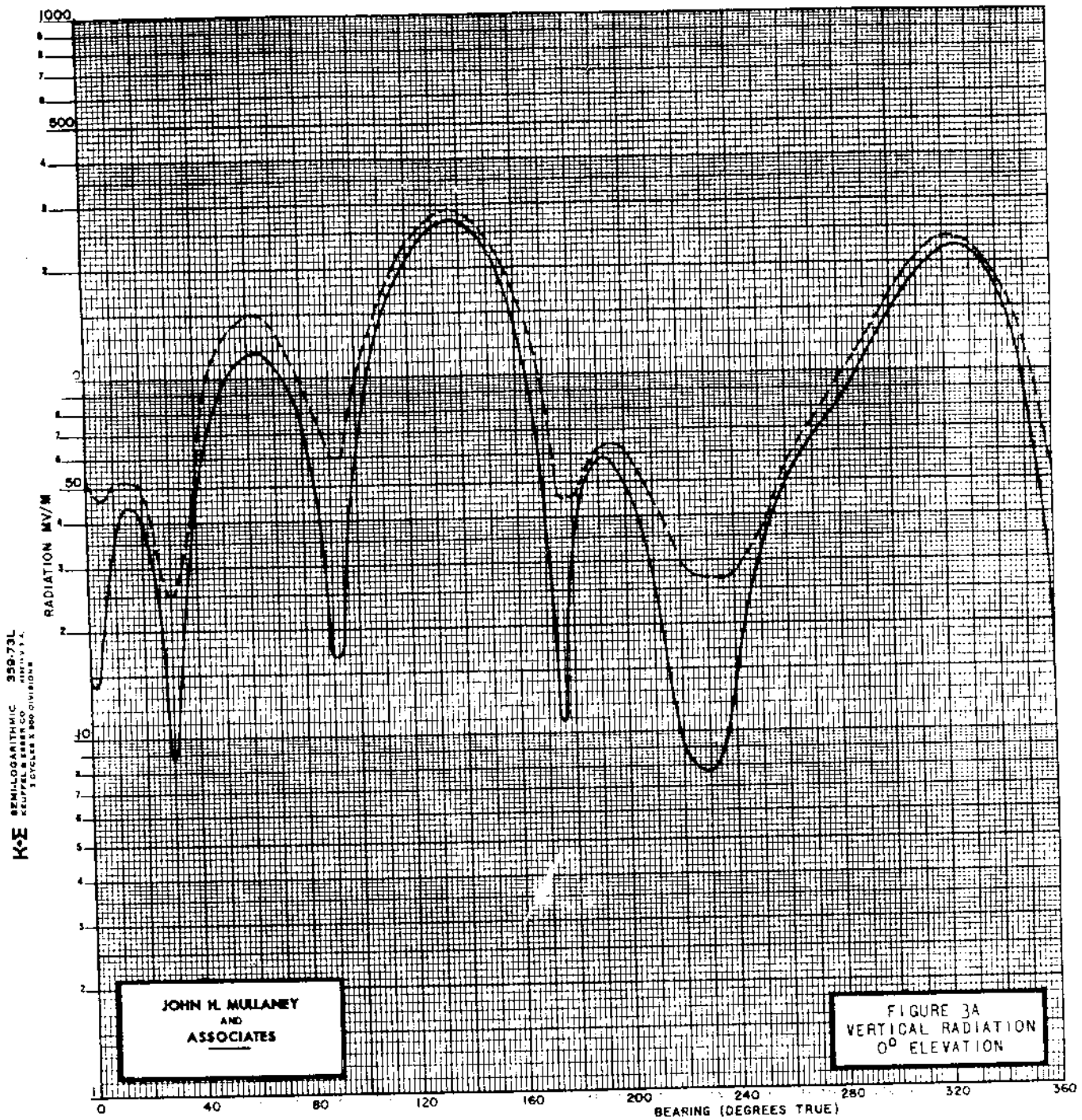
940 kc

WCPC

Proposed Night Nulls
(11-29-68ct)

Station WCPC
Houston, Mississippi

500w,50kw-LS,DA-2,U
940 kc



FCC File No.BP-18298
Accepted 10-31-68

Station WCPC
Houston, Mississippi

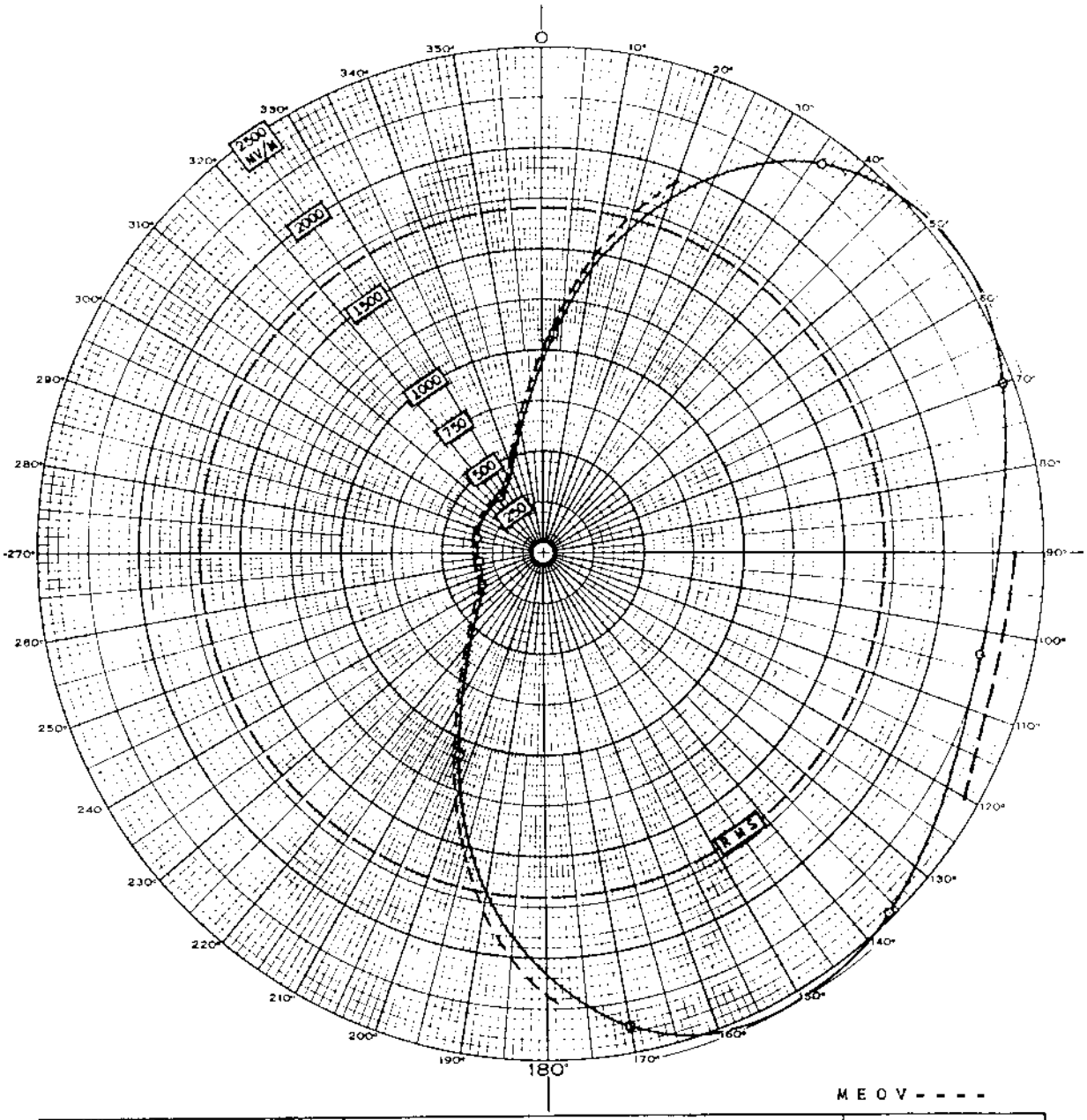
940 kc

WCPC

Measured Day
(3-29-67ct)

Station WCPC
Houston, Mississippi

50kw,DA-D,D
940 kc



M E O V - - - -

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA	
	TOWER No	ELECTRICAL HEIGHT G°	TRUE TOWER ORIENTATION θ°	SPACING S°	PHASING V°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV ANGLE θ°	ELEVATION RMS FIELD mv/m E_θ	CALL	W C P C
N283°E #3 — 130° — #2 — 110° — #1	1	189°	000°	000°	-73°		.523	0		FREQUENCY	940 kc
	2	189°	283°	110°	000°		1.00	10		POWER	50 kw
	3	189°	283°	240°	+87°		.428	20		TIME OF OPERATION	DAY
	4							30		TYPE OF OPERATION	DA
	5							40		DAYTIME TOWERS	1-2-3
	6							50		NIGHTTIME TOWERS	XXX
	7							60		NO RADIALS PER TOWER	120
	8							70		LENGTH OF RADIALS	160-550 ft
	9							80		GROUND SCREEN DIMENSION	48' x 48'
	10							RMS	1703 mv/m	LAT	N 33° 56' 00"
	DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐							P =	50 kw	LONG	W 89° 00' 33"
										SUPERSEDES	640213A
										PATTERN No	660711A

CLAUDE M GRAY
CONSULTING RADIO ENGINEER
BIRMINGHAM ALA

MEASURED HORIZONTAL RADIATION PATTERN

W C P C HOUSTON, MISSISSIPPI

50 KW-DA-D 940 KC

FCC File No.BL-11590
Accepted 3-17-67

Station WCPC
Houston, Mississippi

940 kc

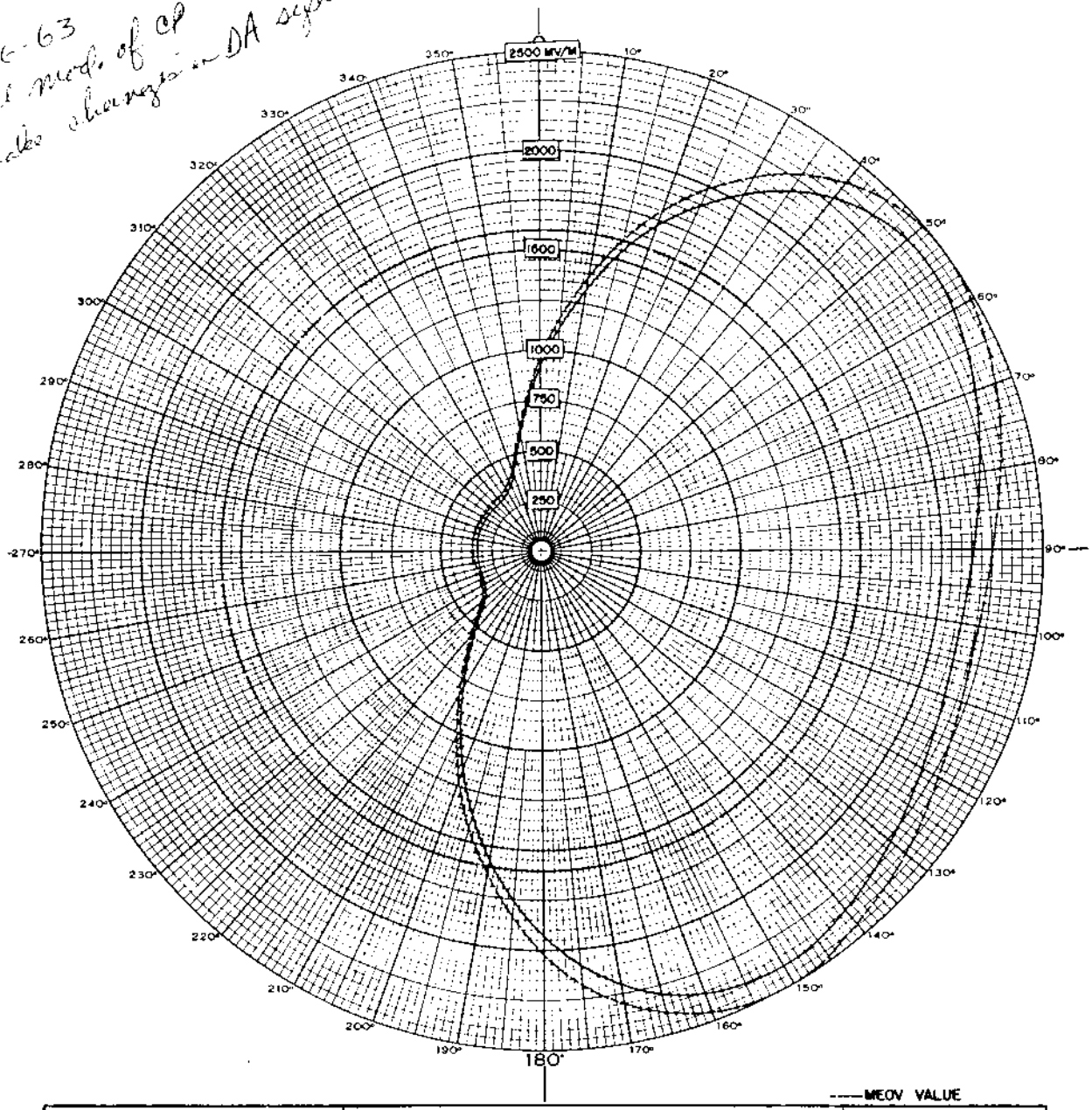
WCPC

Proposed Day
(5-28-63ct)

Station WCPC
Houston, Mississippi

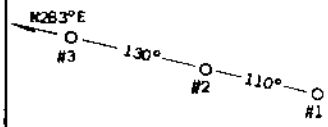
50kw,DA-D,D
940 kc

5-16-63
granted mod. of CP
to make changes in DA system



----MEOV VALUE

TOWER PLACEMENT SKETCH



PATTERN PARAMETERS

TOWER No	ELECTRICAL HEIGHT θ°	TRUE TOWER ORIENTATION φ°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV ANGLE θ°	ELEVATION RMS FIELD mv/m E_θ
1	189°	000°	000°	-73°		.523	0	
2	189°	283°	110°	000°		1.00	10	
3	189°	283°	240°	+87°		.428	20	
4							30	
5							40	
6							50	
7							60	
8							70	
9							80	
10							RMS 1600 mv/m	

DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐ P_k = 50 kw

STATION DATA

CALL	W C P C
FREQUENCY	940 kc
POWER	50 kw
TIME OF OPERATION	DAY
TYPE OF OPERATION	DA
DAYTIME TOWERS	3
NIGHTTIME TOWERS	xxx
No. RADIALS PER TOWER	120
LENGTH OF RADIALS	160-550 ft.
GROUND SCREW DIMENSION	24'x24'
LAT	N 33° 56' 00"
LONG	W 89° 00' 33"
SUPERSEDES	601215
PATTERN No	630201

CLAUDE M. GRAY
CONSULTING RADIO ENGINEER
BIRMINGHAM, ALA

EXHIBIT
1-B-5

PROPOSED HORIZONTAL RADIATION PATTERN

PROPOSED 50 KW, DA-D 940 KC

STATION WCPC HOUSTON, MISSISSIPPI

FCC File No.BMP-10887
Accepted 5-3-63

Station WCPC
Houston, Mississippi

940 kc

WCPC

Measured Day
(3-30-64ct)

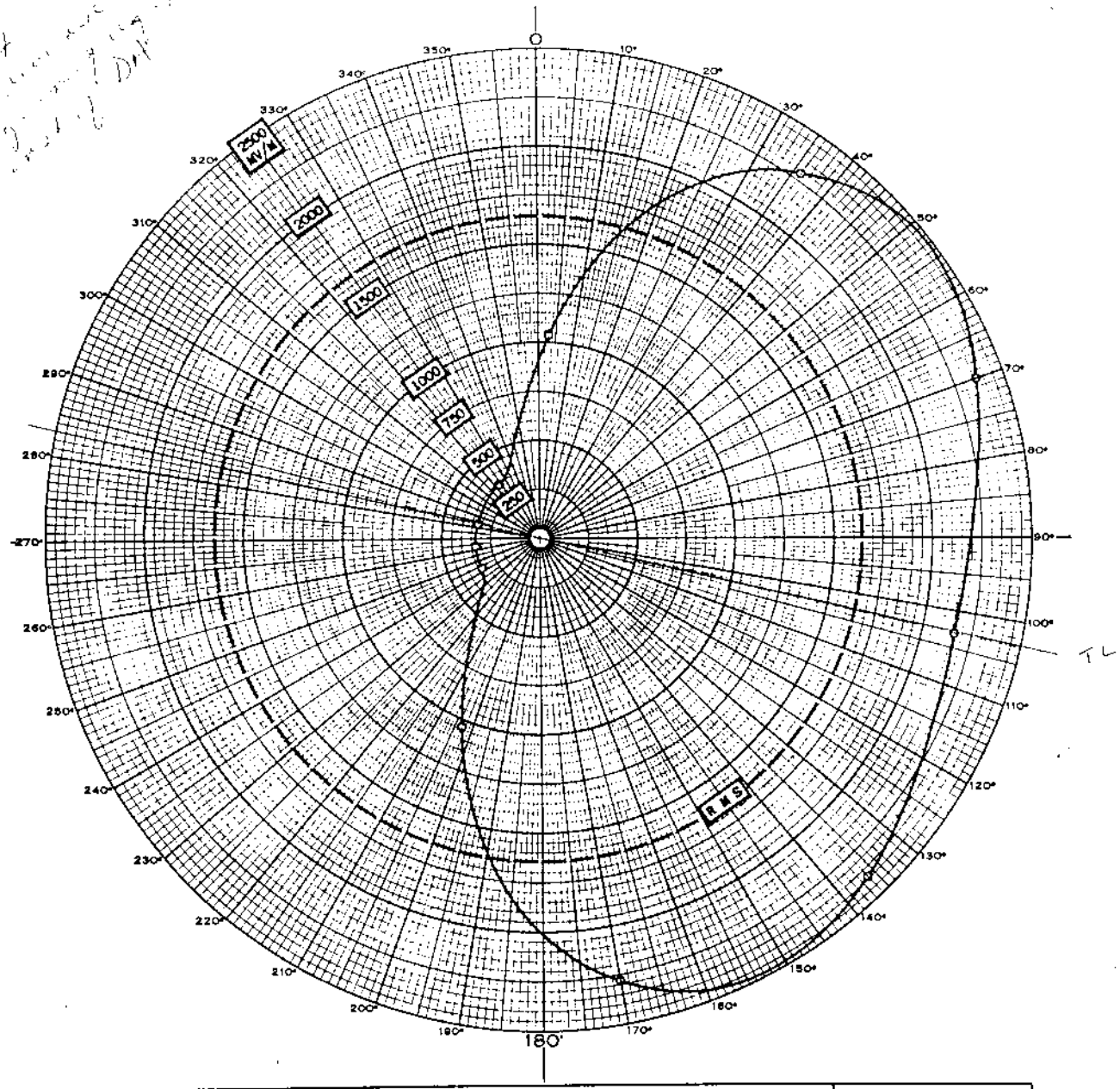
Station WCPC
Houston, Mississippi

50kw,DA-D,D
940kc

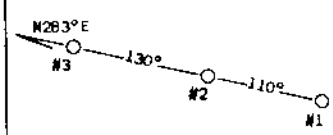
POLAR CO-ORDINATE
MADE IN U.S.A.

NO. 10 HP

CLEVELAND INSTITUTE OF RADIO ELECTRONICS
CLEVELAND, OHIO



TOWER PLACEMENT SKETCH



PATTERN PARAMETERS

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	189°	000°	000°	-73°		.523	0	
2	189°	283°	110°	000°		1.00	10	
3	189°	283°	240°	+87°		.428	20	
4							30	
5							40	
6							50	
7							60	
8							70	
9							80	
10							RMS 1643 mv/m	
							P_r = 50 kw	

DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐

STATION DATA

CALL	W C P C
FREQUENCY	940 kc
POWER	50 kw
TIME OF OPERATION	DAY
TYPE OF OPERATION	DA
DAYTIME TOWERS	1-2-3
NIGHTTIME TOWERS	XXX
No RADIALS PER TOWER	120
LENGTH OF RADIALS	160-550 ft
GROUND SCREEN DIMENSION	24'x24'
LAT	N 33° 56' 00"
LONG	W 89° 00' 33"
SUPERSEDES	631218A
PATTERN No	640213A

CLAUDE M. GRAY
CONSULTING RADIO ENGINEER
BIRMINGHAM, ALA

MEASURED HORIZONTAL RADIATION PATTERN

W C P C HOUSTON, MISSISSIPPI

50 KW-DA-D 940 KC

FCC File No. BL-10442
Accepted 3-11-64

Station WCPC
Houston, Mississippi

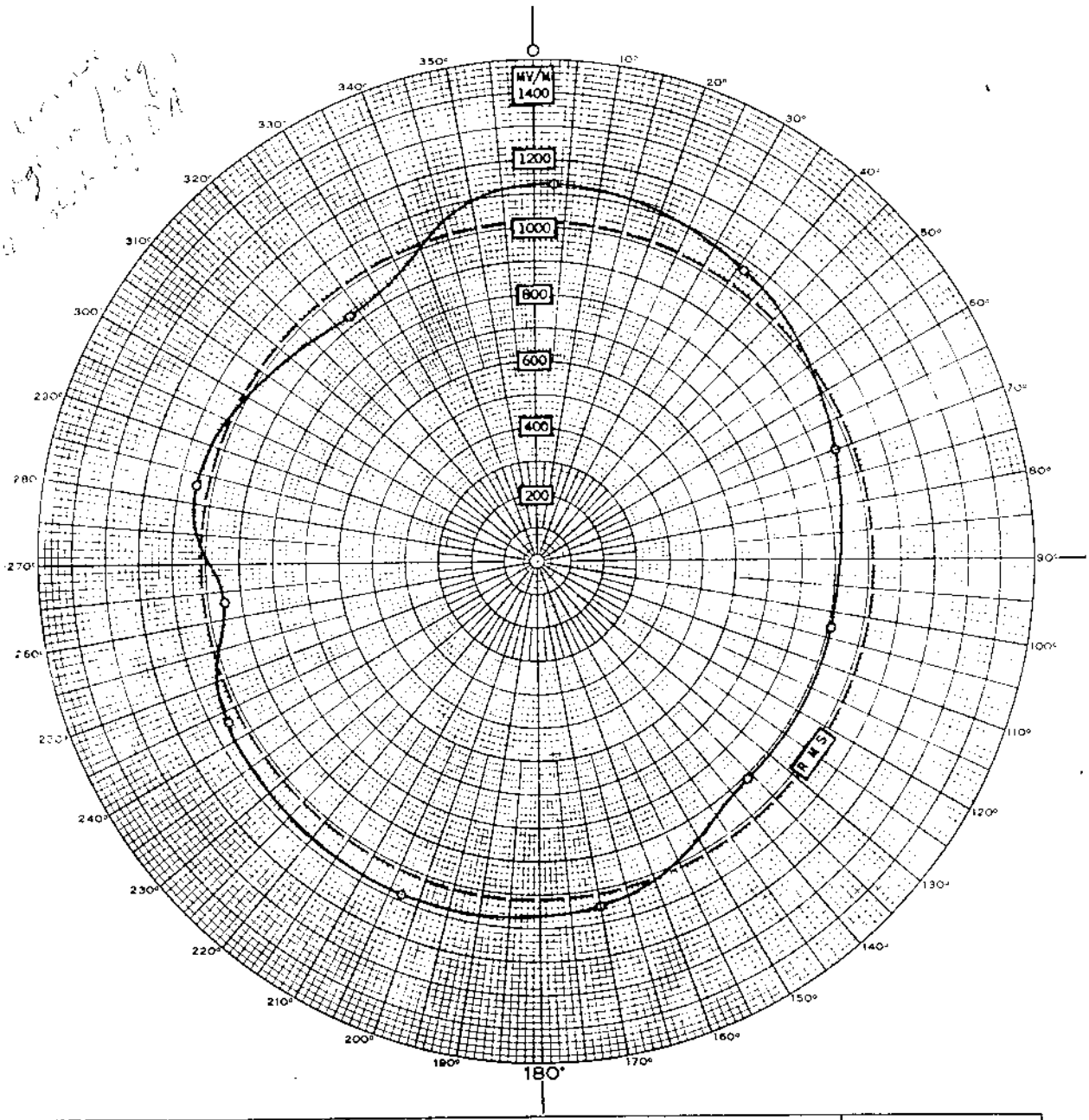
940kc

WCPC

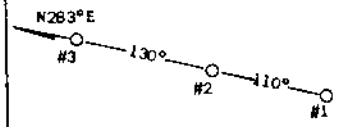
Measured Non-DA
(3-30-64ct)

Station WCPC
Houston, Mississippi

50kw,DA-D,D
940kc



TOWER PLACEMENT SKETCH



PATTERN PARAMETERS

TOWER No	ELECTRICAL HEIGHT G°	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	189°					0.00	0	
2	189°	000°	000°	000°		1.00	10	
3	189°					0.00	20	
4							30	
5							40	
6							50	
7							60	
8							70	
9							80	
10							RMS 1015 mv/m	
							P_k = 17.8 kw	

DAYTIME OPERATION ☒ Proof NIGHTTIME OPERATION ☐

STATION DATA

CALL	W C P C
FREQUENCY	940 kc
POWER	17.8 kw
TIME OF OPERATION	Day-Proof
TYPE OF OPERATION	N D
DAYTIME TOWERS	#2 (Proof)
NIGHTTIME TOWERS	X X
No. RADIALS PER TOWER	120
LENGTH OF RADIALS	160-550 ft
GROUND SCREEN DIMENSION	24'x24'
LAT	N 33° 56' 00"
LONG	W 89° 00' 33"
SUPERSEDES	
PATTERN No	631217A

CLAUDE M. GRAY
CONSULTING RADIO ENGINEER
BIRMINGHAM, ALA

MEASURED HORIZONTAL RADIATION PATTERN

W C P C HOUSTON, MISSISSIPPI

50 KW-DA-D 940 KC

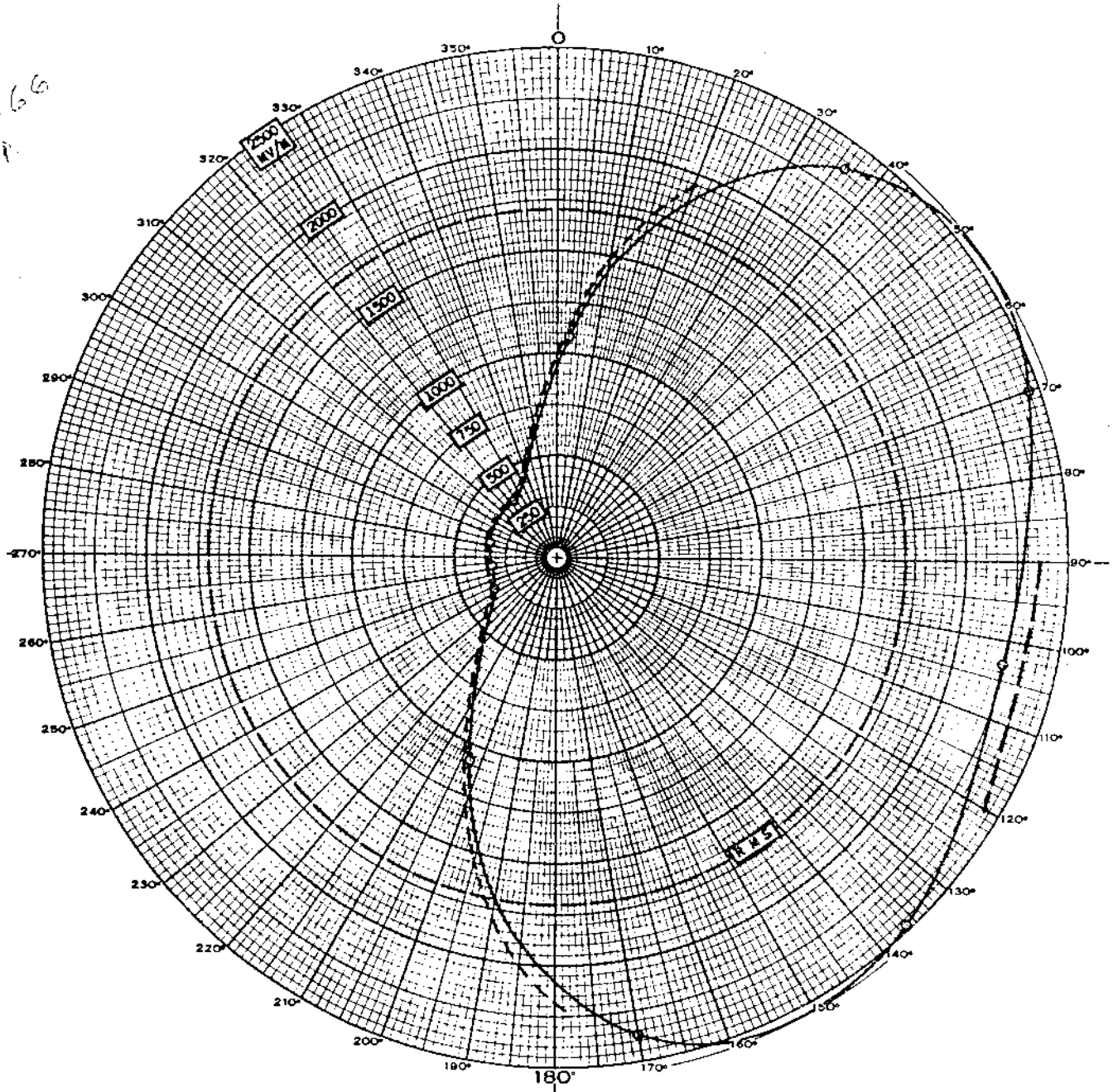
FCC File No. BL-10442
Accepted 3-11-64

Station WCPC
Houston, Mississippi

940kc

(4-28-66ct) Houston, Mississippi 940 kc WCPC

NO. 10 HP CLEVELAND, OHIO



MEOV - - - -

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA	
	TOWER No.	ELECTRICAL HEIGHT θ°	TRUE TOWER ORIENTATION φ°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV. ANGLE δ°	ELEVATION RMS FIELD mv/m E_δ	CALL	W C P C
	1	189°	000°	000°	-73°		.523	0		FREQUENCY	940 kc
	2	189°	283°	110°	000°		1.00	10		POWER	50 kw
	3	189°	283°	240°	+87°		.426	20		TIME OF OPERATION	DAY
	4							30		TYPE OF OPERATION	DA
	5							40		DAYTIME TOWERS	1-2-3
	6							50		NIGHTTIME TOWERS	XXX
	7							60		No. RADIALS PER TOWER	120
	8							70		LENGTH OF RADIALS	160-550 ft
	9							80		GROUND SCREEN DIMENSION	48' x 48'
	10							RMS	1703 mv/m	LAT.	N 33° 56' 00"
								P_k	50 kw	LONG	W 89° 00' 33"
										SUPERSEDES	640213A
										PATTERN No.	660131A

N283°E #3 — 130° — #2 — 110° — #1

DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐

CLAUDE M. GRAY
CONSULTING RADIO ENGINEER
BIRMINGHAM, ALA.

MEASURED HORIZONTAL RADIATION PATTERN

W C P C HOUSTON, MISSISSIPPI

50 KW-DA-D 940 KC

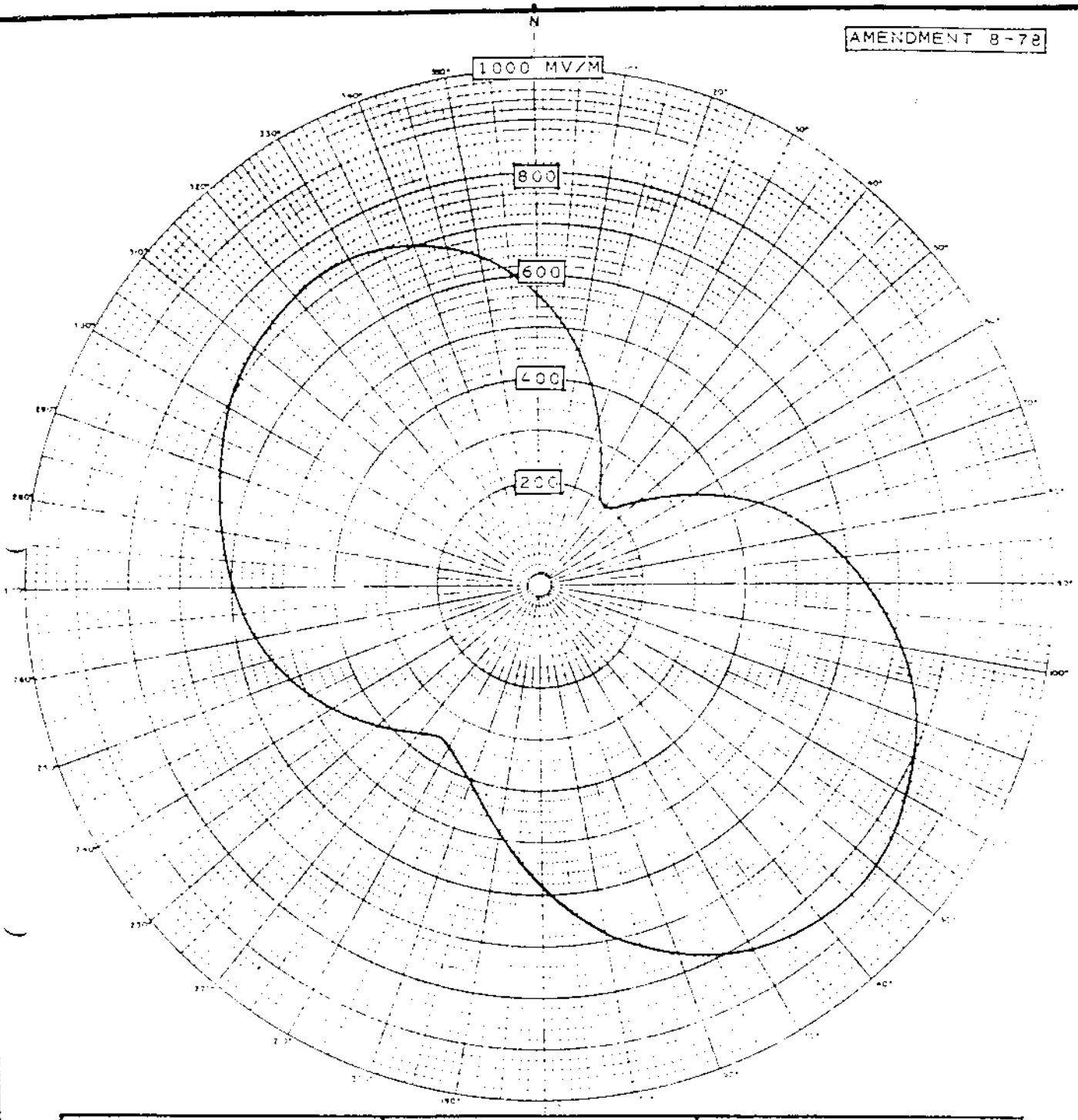
FCC File No. BP-17173
Accepted 4-20-66

Station WCPC
Houston, Mississippi

940 kc

WE00

AMENDMENT 8-78

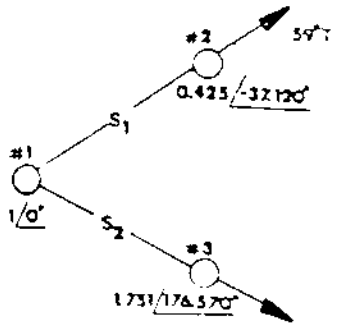


LBA

LAWRENCE BERRY ASSOCIATES, INC.

GREENVILLE, N.C. 27834

ANTENNA PARAMETERS



$S_1 = 120°$ $G_1 = 169°$ 118°T

$S_2 = 112°$ $G_2 = G_3 = 65.4°$

RSS_{ch}/RMS_{ch}	=	1.153
RSS_{ch}	=	656.616
RSS_{ecd}	=	689.447
RMS_{ch}	=	570.758
RMS_{ecd}	=	599.296
$R_L(3)$	=	1.5 OHMS

FIGURE 11

PROPOSED STANDARD DAYTIME HORIZONTAL PATTERN

RADIO TIDEWATER, INC.
RADIO STATION WE00
SMITHFIELD, VIRGINIA

940 KHZ, 10KW, DA-D

1-76

WEOO

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station : WEOO

Main Studio: Smithfield, Virginia

Frequency : 940 kHz

Power: 10 kW Day

Notification List No. 1779

Date: September 27, 1978

Class: II

GEORGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude:	36°	57'	16"
West Longitude:	76°	37'	48"

ANTENNA CHARACTERISTICS

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

TOWER :	WC(#1)	S(#3)	N(#2)
HEIGHT ABOVE INSULATORS :	490' (168.59°)	190'	190' (65.37°)
PHASING:	0°	+176.57°	-37.12°
FIELD RATIO:	1	1.751	0.425

SPACING AND ORIENTATION: With the WC(#1) tower as reference the S(#3) tower is located 326' (112.2°) on a line bearing 118° true, the N(#2) tower is located 349' (120.2°) on a line bearing 59° true.

GROUND SYSTEM: 120-63' to 300' equally spaced copper radials a 24' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
1/	570.76 mV/m	656.62 mV/m	599.30 mV/m

1/ By adjustment of input power.

WEOO

SUPPLEMENTAL DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WEOO

Main Studio: Smithfield, Virginia

Frequency: 940 kHz

Power: 1 kW

Notification List No. 1598

Date: September 19, 1974 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM: North Latitude: 36° 57' 16"

West Longitude: 76° 37' 48"

Authorized for Daytime operation (DA-D).

TOWER:	SW(#1)	NE(#2)
HEIGHT ABOVE INSULATORS:	490' (168.55°)	190' (Top loaded to equivalent electrical height of 75°)

Predicted effective Day Field: 191 mv/m at rated power.

Note: Please retain the description sheet and directional antenna radiation pattern notified for station WAYM in United States Change List Number 1527, dated May 3, 1973, and attach to this supplemental Description Sheet. This notification is for the purpose of indicating only a change in the height of tower #2 from 120.00° to 75° and a reduction in Predicted Effective Day Field from 204.26 mv/m.

WEOO

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WEOO

Main Studio: Smithfield, Virginia

Frequency: 940 kHz

Power: 1 kW

Notification List No. 1656

Date: October 29, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 36° 57' 16"
West Longitude: 76° 37' 48"

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 #2 is top loaded to an equivalent electrical height of 75°. (*)

TOWER:	SW(#1)	NE(#2)
HEIGHT ABOVE INSULATORS:	490' (169°)	190' (*)
PHASING:	0°	+66°
FIELD RATIO:	1	1.57

SPACING AND ORIENTATION: Elements are spaced 348.78' (120°) on a line bearing 239° true.

GROUND SYSTEM: 120-130' to 300' equally spaced copper radials plus 120-75' interspaced radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

Predicted effective Field: 191 mv/m at rated power.

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

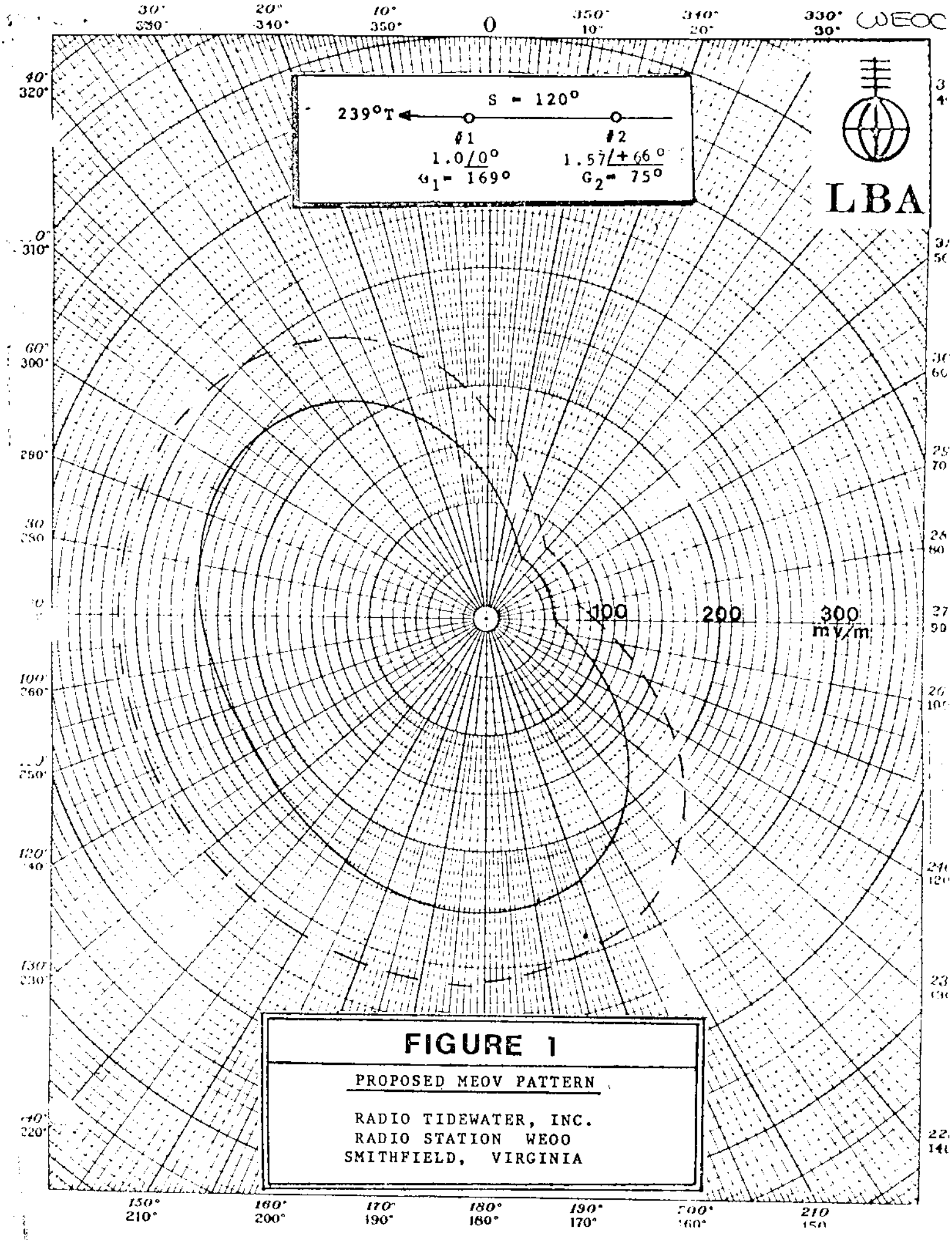


FIGURE 1

PROPOSED MEOV PATTERN

RADIO TIDEWATER, INC.
RADIO STATION WEOO
SMITHFIELD, VIRGINIA

WESA

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station : WESA

Main Studio : Charleroi, Pensylvania

Frequency : 940 kHz

Power: 1 kW Day

Notification List No. 1776

Date : June 28, 1978

Class: II

GEORGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude:	40°	07'	24"
West Longitude:	79°	53'	45"

ANTENNA CHARACTERISTICS

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

TOWER:	S(#1)	N(#2)
HEIGHT ABOVE INSULATORS:	300' (103.2°)	380' (130.7)
PHASING:	0°	+123°
FIELD RATIO:	1	1.69

SPACING AND ORIENTATION: Towers row are spaced 232.5' (80°) on a line bearing 314° true.

GROUND SYSTEM: 120-275' about the S(#1) tower, 120-380' about the N(#2) equally spaced copper radials plus a 32' square ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers. Centers of system are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
207.8 mV/m	243.5 mV/m	2/8.3 mV/m

This notification concerns a daytime power increase using a directional antenna system.

A. D. RING & ASSOCIATES - 5/67 - 500

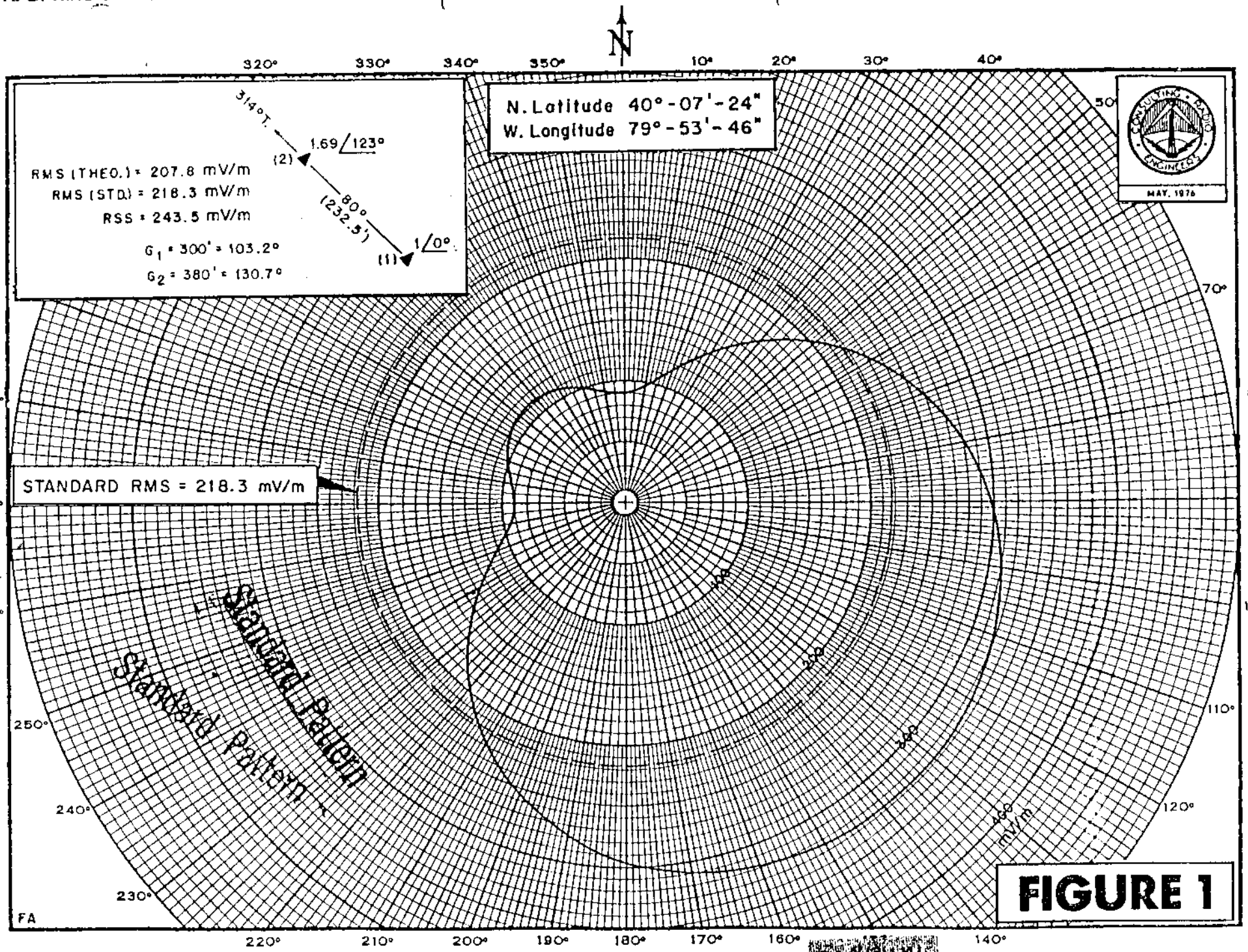


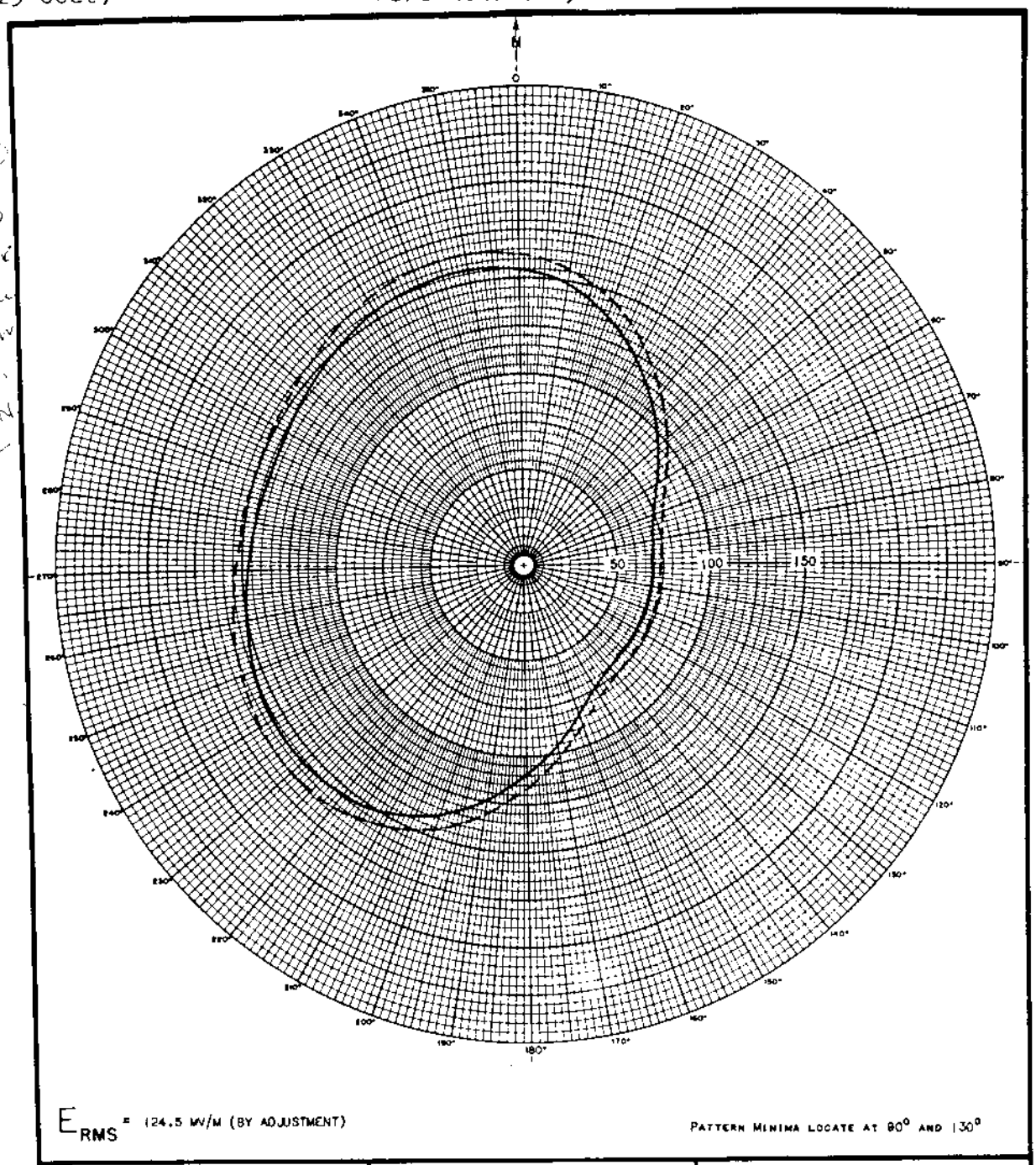
FIGURE 1

WESA - 940 kHz

Proposed Day
(11-29-66ct)

Station WFAW
Fort Atkinson, Wisconsin

500w,DA-D,D
940 kc



E_{RMS} = 124.5 MV/M (BY ADJUSTMENT)

PATTERN MINIMA LOCATE AT 80° AND 130°

LATITUDE: 42° 53' 52"

LONGITUDE: 88° 50' 54"

CHARLES E. BRENNAN
CONSULTING RADIO ENGINEERS
MILWAUKEE, WISCONSIN

ANTENNA PARAMETERS

1
1.0/0° S = 120°

2
0.39/+65° → 110°

G_1 = 89°

G_2 = 41°

660425 FIGURE 4

BLACKHAWK BROADCASTING COMPANY

RADIO STATION WFAW

FORT ATKINSON, WISCONSIN

940 KC 500 DA-D

FCC File No.BP-17250
Accepted 11-8-66

Station WFAW
Fort Atkinson, Wisconsin

940 kc

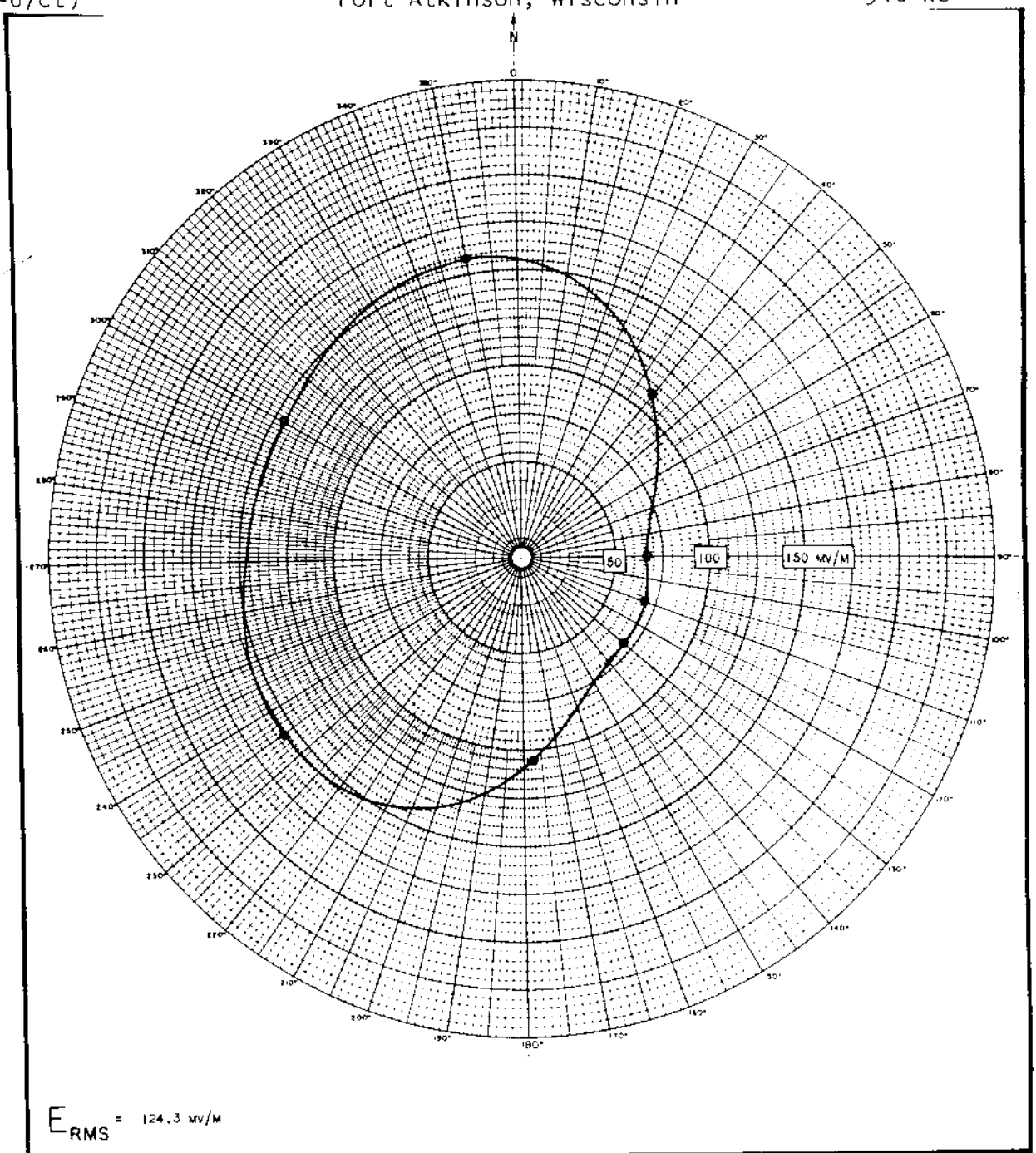
WFAW

Measured Day
(10-28-67ct)

Station WFAW
Fort Atkinson, Wisconsin

500w, DA-D, D
940 kc

11-8-67
GRANTED
LICENSE
CHANGE IN
DA PATTERN



E_{RMS} = 124.3 MV/M

LATITUDE 42° 53' 48"

LONGITUDE 88° 50' 53"

CHARLES E. BRENNAN
CONSULTING RADIO ENGINEERS
MILWAUKEE, WISCONSIN

ANTENNA PARAMETERS

$G_1 = 89°$; $G_2 = 41°$

1
1.0/0° S = 120° 2
0.39/+65° → 110°

670816 FIGURE 2

MEASURED DAYTIME DIRECTIONAL RADIATION

RADIO STATION WFAW
FORT ATKINSON, WISCONSIN

940 kc. 500 DA-D

FCC file No.BL-11771
Accepted 10-17-67

Station WFAW
Fort Atkinson, Wisconsin

940 kc

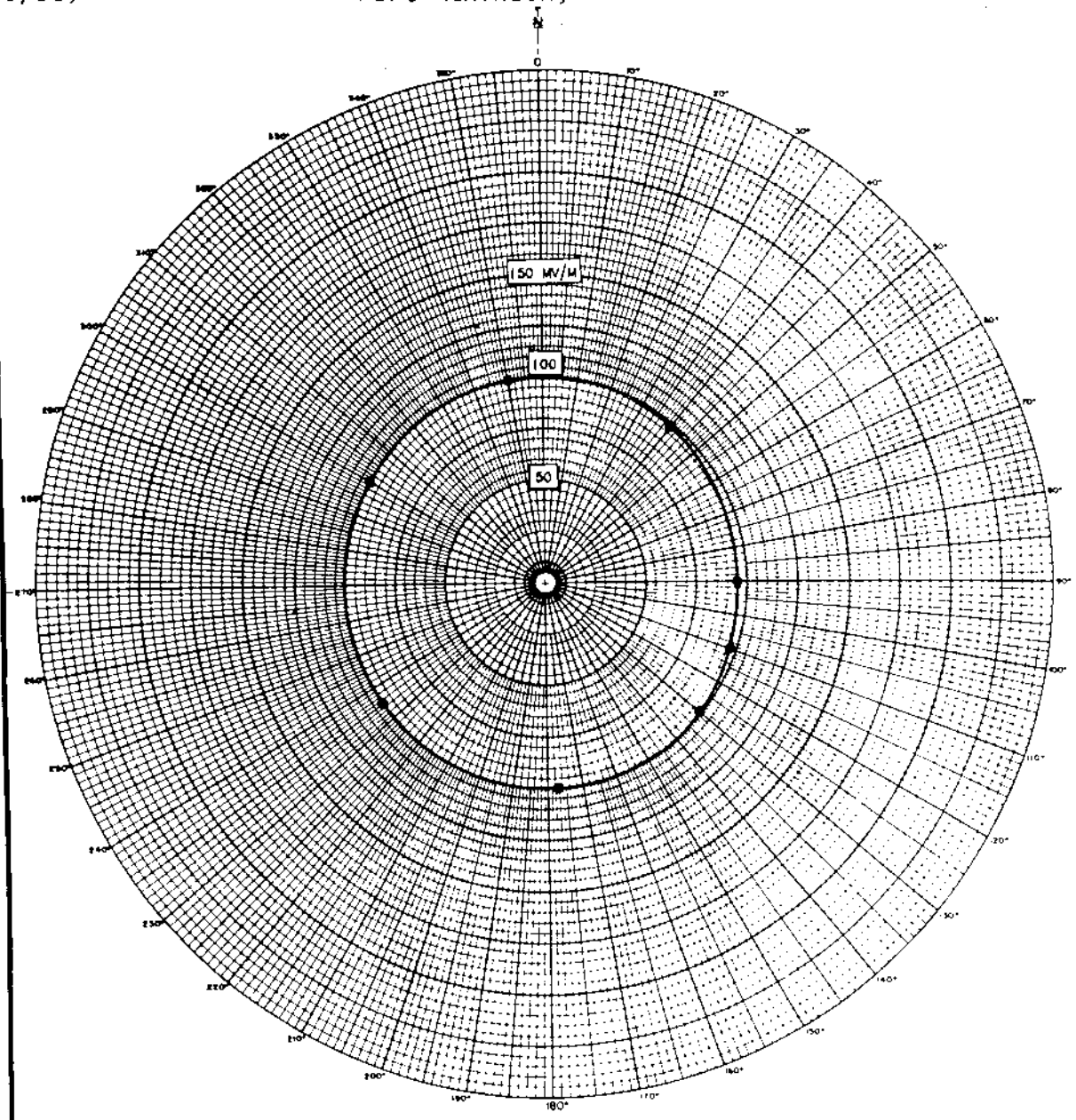
WFAW

Measured Non-DA
(10-28-67ct)

Station WFAW
Fort Atkinson, Wisconsin

500w,DA-D,D
940 kc

11-8-67
GRANTED
LICENSE
CHANGE
DA
DATTERN



E_{RMS} = 98.5 MV/M

LATITUDE:

LONGITUDE:

CHARLES E. BRENNAN
CONSULTING RADIO ENGINEERS
MILWAUKEE, WISCONSIN

ANTENNA PARAMETERS

G_1 = 89°; G_2 = 41°

MEASURED WITH 265 WATTS INPUT TO G_1

1 ○

2 ○

670816 FIGURE 3

MEASURED NON-DIRECTIONAL RADIATION

RADIO STATION WFAW

FORT ATKINSON, WISCONSIN

940 KC 500 DA-D

FCC File No.BL-11771
Accepted 10-17-67

Station WFAW
Fort Atkinson, Wisconsin

940 kc

WFNC

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WFNC

Main Studio: Fayetteville, North Carolina

Frequency: 940 kHz

Power: 1 kW Night 50 kW Day

Notification List No. 1652

Date: October 1, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 35° 04' 46"
West Longitude: 78° 55' 58"

ANTENNA CHARACTERISTICS

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

TOWER:	NW(#4)	SW(#1)	NE(#3)	SE(#2)
HEIGHT ABOVE INSULATORS:	260'	260'	472'(162.8°)	260'(89.5°)
PHASING:	+108°	0°	-12°	-120°
FIELD RATIO:	0.85	1.0	0.595	0.7

SPACING AND ORIENTATION: The towers are located at the vertices of a parallelogram the long sides of which are 374'(128.6°) in length on a line bearing 105° true. The short sides are 232.6'(80°) in length on a line bearing 5° true.

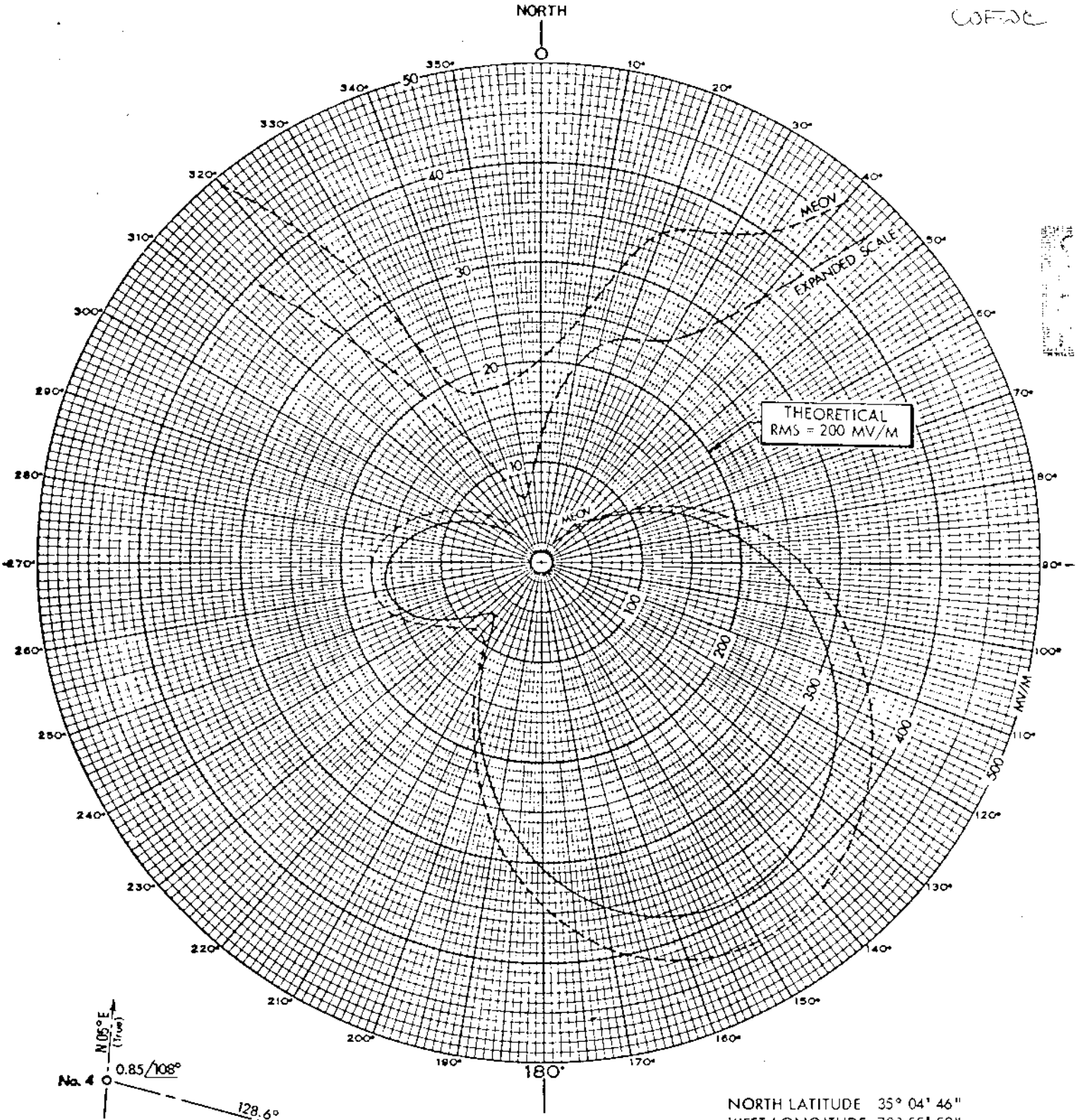
GROUND SYSTEM: 120-282' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

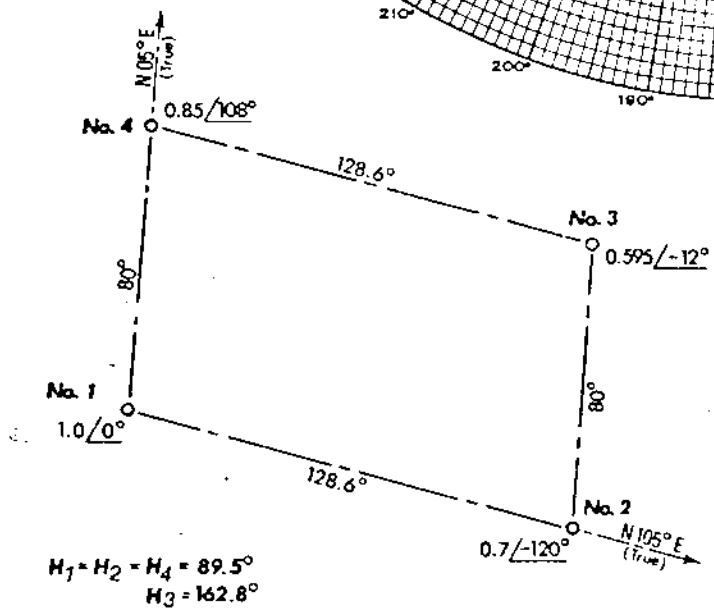
Predicted effective Night Field: 200 mv/m at rated power.

Predicted effective Day Field: (omnidirectional tower #1) 1345 mv/m at rated power.

Note: This notification concerns an increase in height of tower #3 and minor changes in directional antenna radiation, with Daytime operation continued as previously notified.

CTR NO 30786A5





NORTH LATITUDE 35° 04' 46"
WEST LONGITUDE 78° 55' 58"

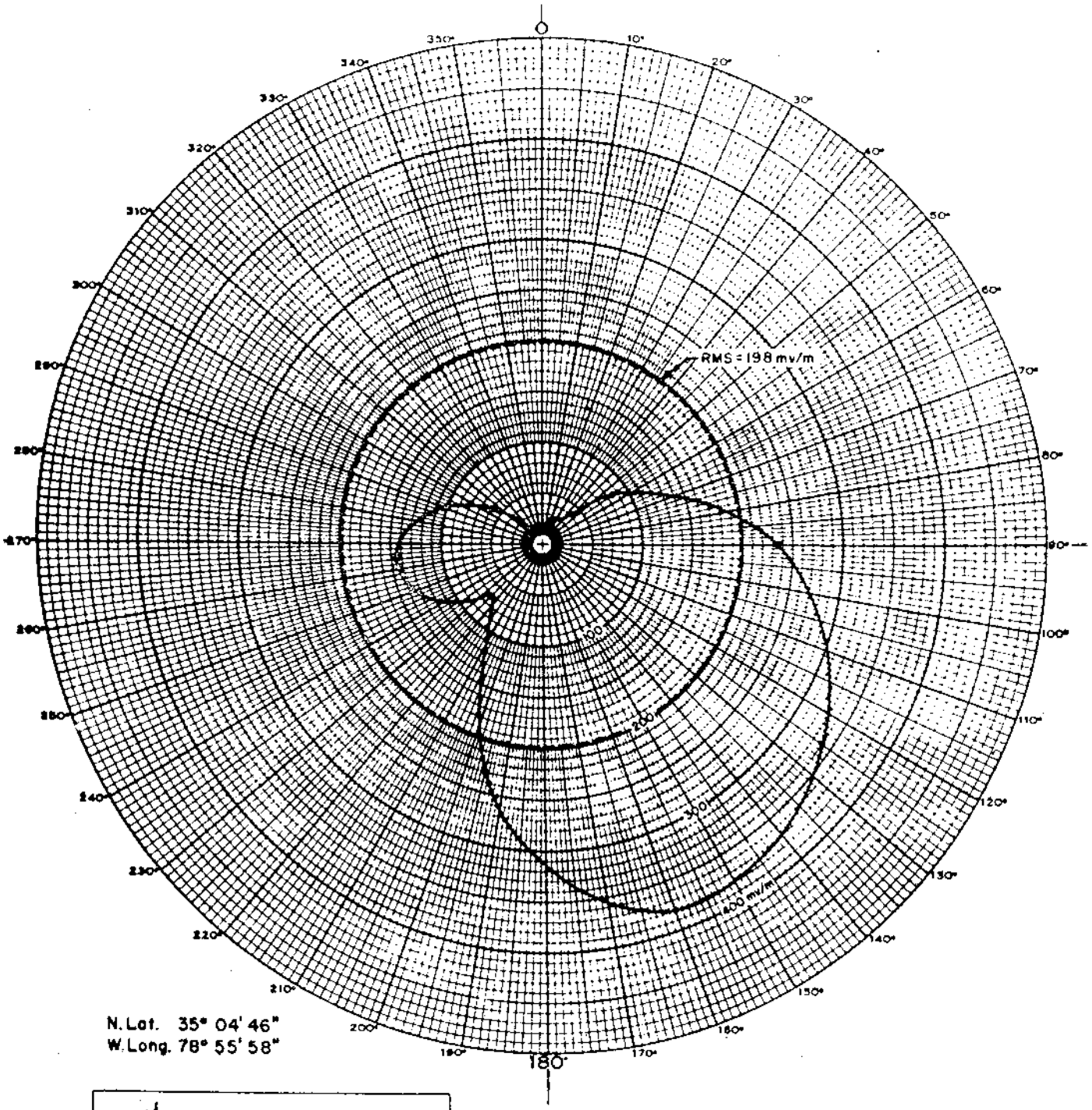
FIGURE 1
NIGHTTIME HORIZONTAL PLANE
RADIATION PATTERN
CAPE FEAR BROADCASTING COMPANY
WFNC 1KW, 50KW-LS, DA-N 940 KHz
FAYETTEVILLE, NORTH CAROLINA

Prepared by
Lohnes and Culver Washington, D. C.
April 1975

WFNC

MEASURED NIGHT
(7-26-61ct)

Station WFNC 1kw,10kw-LS,DA-N,U
Fayetteville, North Carolina 940 KC



N. Lat. 35° 04' 46"
W. Long. 78° 55' 58"

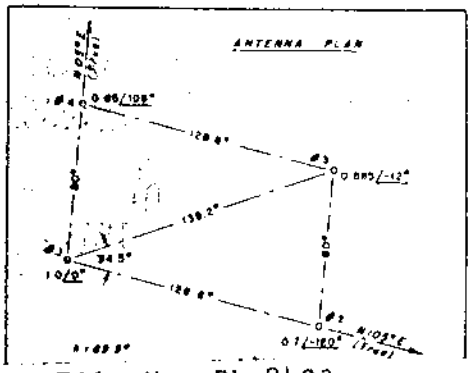


FIGURE 8
HORIZONTAL RADIATION PATTERN
(NIGHTTIME OPERATION)
CAPE FEAR BROADCASTING COMPANY
WFNC 1 KW, 10 KW-LS, DA-N 940 KC
FAYETTEVILLE, NORTH CAROLINA
Prepared by
Lohnes and Culver *Washington 4, D.C.*

FCC File No. BL-8403
Accepted 6-28-61

WFNC
Fayetteville, North Carolina 940 KC

WFNC

Proposed Day
(8-26-66ct)

Station WFNC
Fayetteville, North Carolina

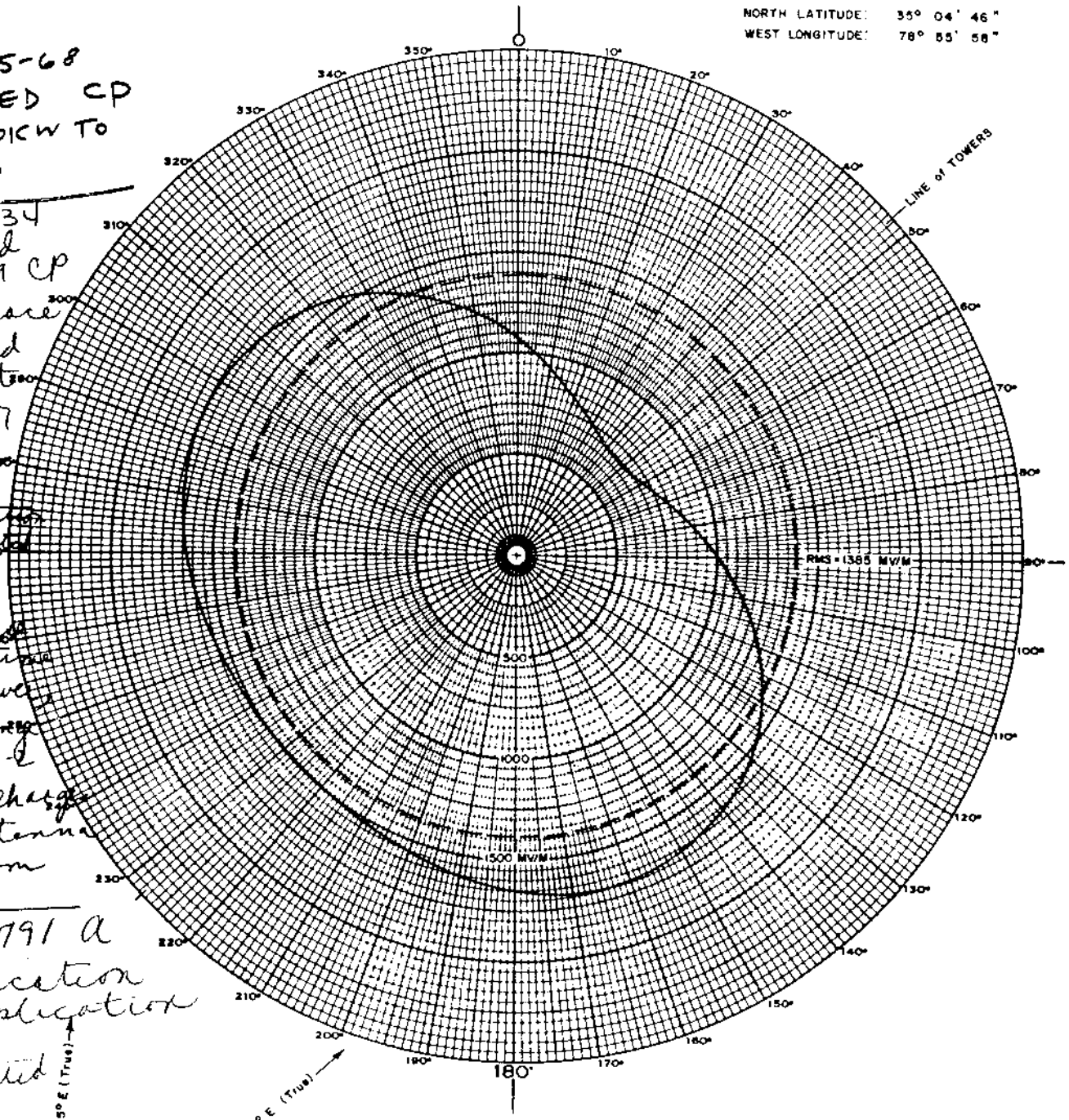
PA- 1kw,50kw-LS,DA-2,U
940 kc

4-25-68
GRANTED CP
FROM 10KW TO
50 KW.

BP-18434
Granted
1-31-69 CP
to replace
expired
permit
BP-17017

BP-18434
an application
was accepted
1-31-69
by the
to increase
daytime
power,
change
to DA-2
make changes
in antenna
system

BMP-12791 a
modification
to application
was
accepted
9/12/69
by FCC
to change
from
DA-2
to
DA-N



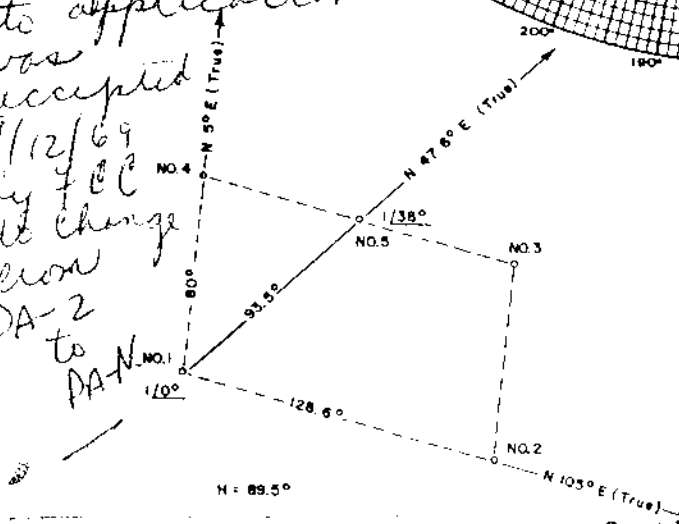


FIGURE 3
DAYTIME RADIATION PATTERN
WFNC 1 KW, 50 KW-LS, DA-2 940 KC
FAYETTEVILLE, NORTH CAROLINA

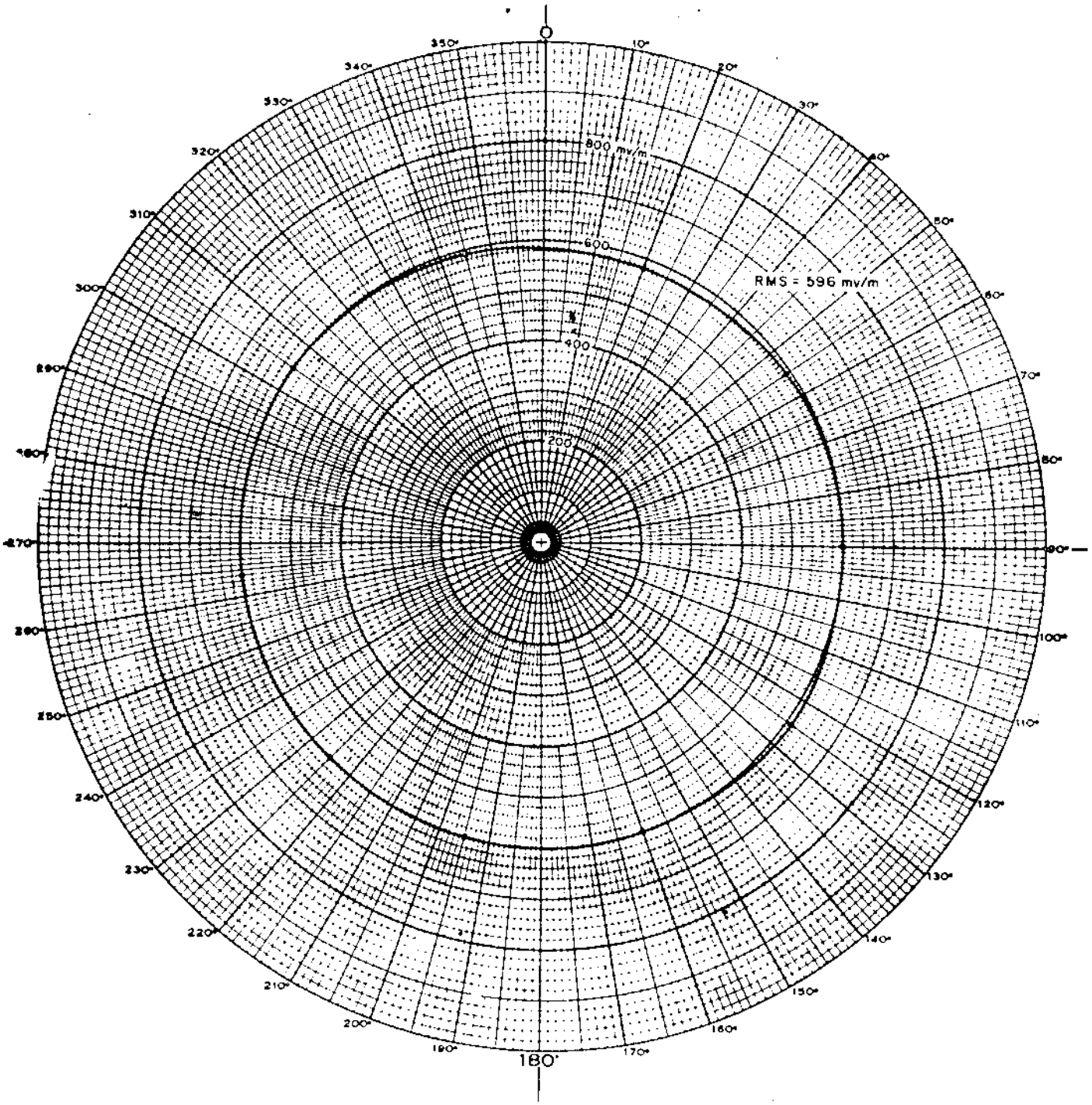
Prepared by
Lohnes and Culver Washington, D. C.
August, 1965

FCC File No. BP-17017
Accepted 8-12-66

Station WFNC
Fayetteville, North Carolina 940 kc

MEASURED NON-DA
(7-26-61ct)

Station WFNC 1kw, 10kw-LS, DA-N, U*
Fayetteville, North Carolina 940 KC



N. Lat. 35° 04' 46"
W. Long. 78° 55' 58"

FIGURE 7
HORIZONTAL RADIATION PATTERN
(DAYTIME OPERATION)
CAPE FEAR BROADCASTING COMPANY
WFNC 1 KW, 10 KW-LS, DA-N 940 KC
FAYETTEVILLE, NORTH CAROLINA
Prepared by
Lohnes and Culver *Washington 4, D.C.*

FCC File No. BL-8405
Accepted 6-28-61

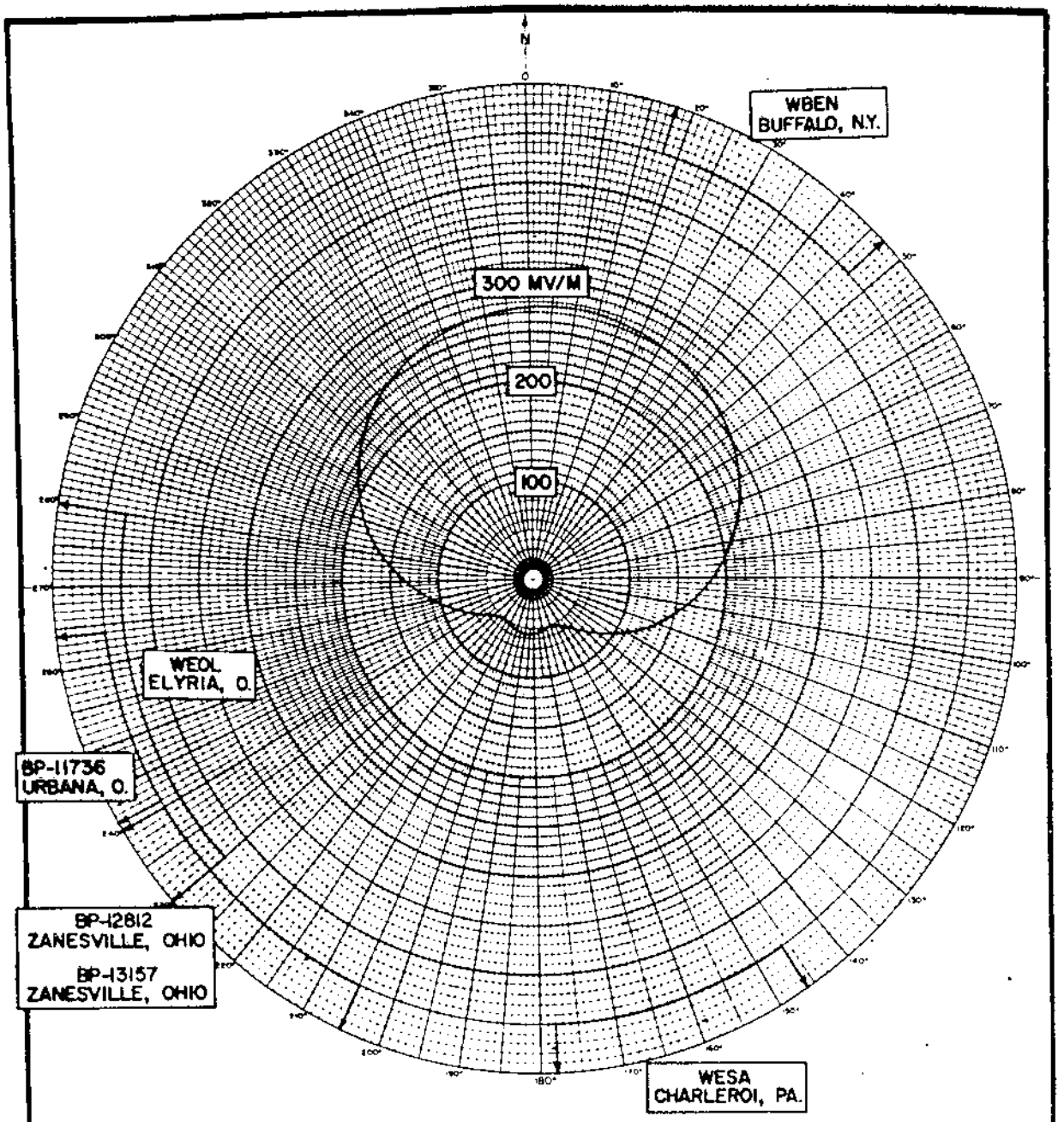
WFNC
Fayetteville, North Carolina 940 KC

WGRP

PROPOSED DAY
(7-26-61ct)

Station WGRP 1kw, DA-D,D *
Greenville, Pennsylvania 940 KC

granted OPD
orig DA pattern
9-8-61



E_{RMS} = 182 MV/M (BY ADJUSTMENT)

LATITUDE N 41° 23' 10.4"

LONGITUDE W 80° 24' 34.8"

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

ANTENNA PARAMETERS

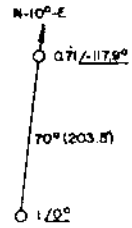


FIGURE 4

PROPOSED
DAYTIME DIRECTIONAL
HORIZONTAL
POLAR PATTERN

RADIO STATION WGRP
GREENVILLE, PENN.

940 KC 1 KW, DA-D

FCC File No. BP-14929
Accepted 7-20-61

WGRP
Greenville, Pennsylvania 940 KC

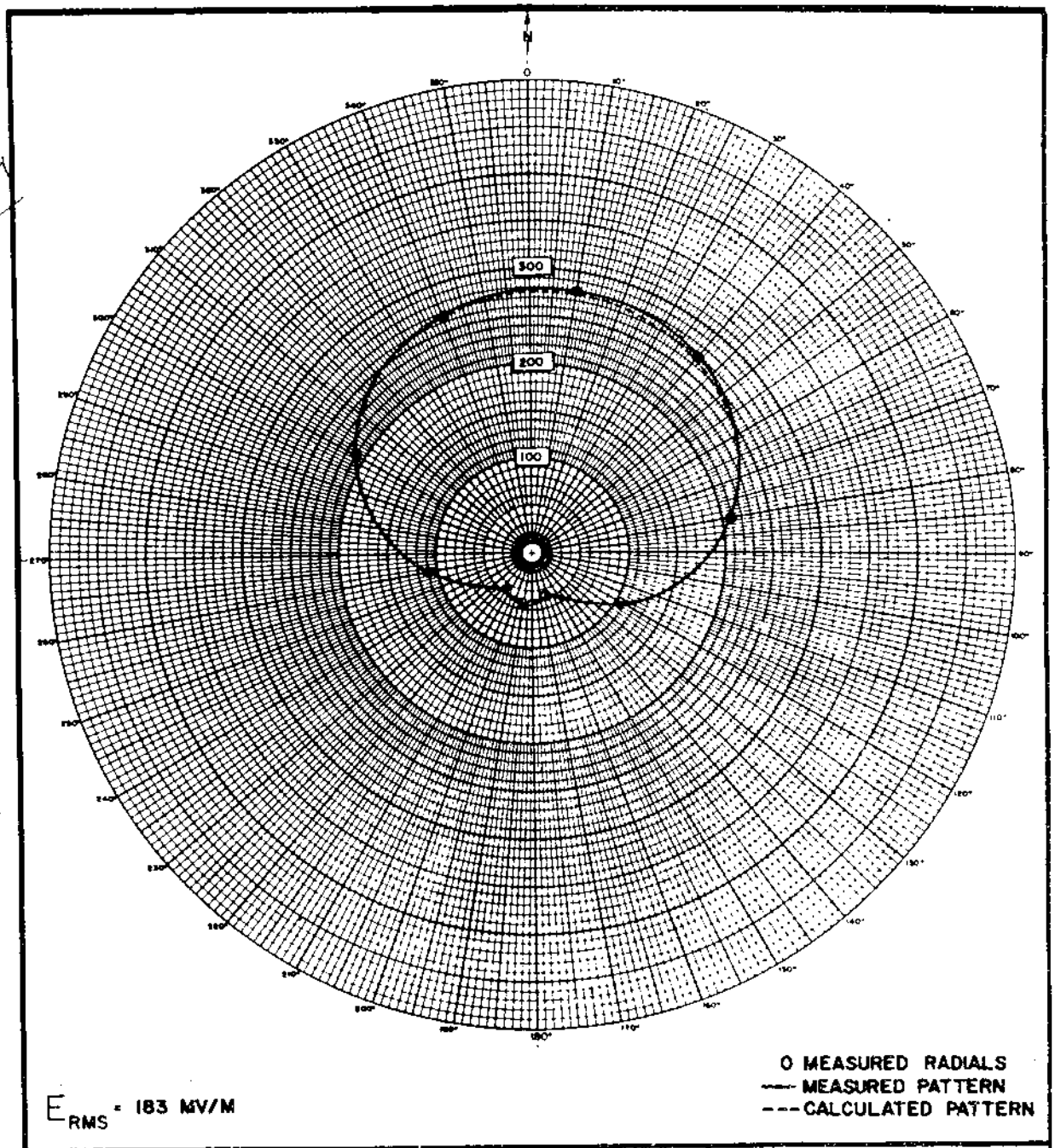
WGRP

Measured Day
(3-30-62ct)

Station WGRP
Greenville, Pennsylvania

1kw,DA-D,D
940 kc

4-5-62
GRANTED
LICENSE
CHANGES
IN DA SYSTEM



LATITUDE: 41° 23' 10.4"
LONGITUDE: 80° 24' 34.8"

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

ANTENNA PARAMETERS

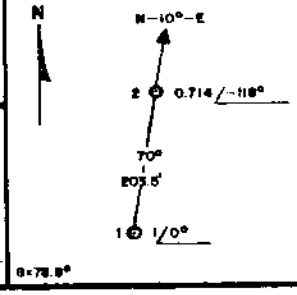


FIGURE 15

MEASURED DAYTIME
HORIZONTAL POLAR PATTERN

RADIO STATION WGRP
GREENVILLE, PENN.

940 KC 1 KW,DA-D

FCC File No.BL-8921
Accepted 3-6-62

Station WGRP
Greenville, Pennsylvania

940 kc

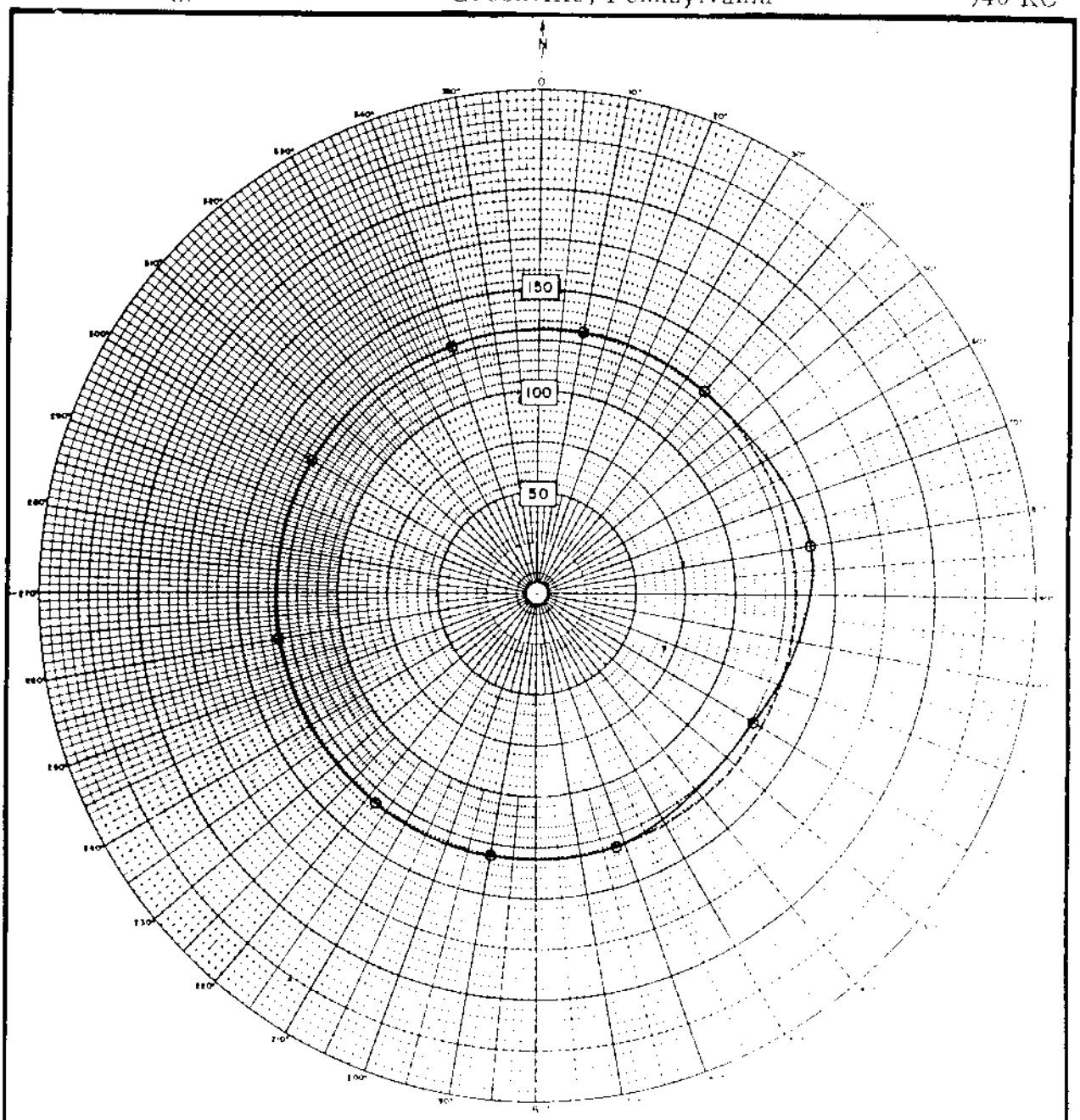
WGRP

MEASURED NON-DA
(11-16-59g)

Station WGRP
Greenville, Pennsylvania

1kw, DA-D,D
940 KC

Granted license 8-1-60



E_{RMS} = 131.2 MV/M

LATITUDE	41°	23'	10.4"
LONGITUDE	80°	24'	34.8"

ANTENNA PARAMETERS

G = 78.8°

FIGURE 17

MEASURED NON-DA
HORIZONTAL POLAR PATTERN

RADIO STATION WGRP
GREENVILLE, PENNSYLVANIA

940 KC 1 KW DA-D

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

FCC File No. BL-7623
Accepted 10-7-59

WGRP
Greenville, Pennsylvania

940 KC

WINZ

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WINZ

Main Studio: Miami, Florida

Frequency: 940 kHz

Power: 10 kW Night 50 kW Day

Notification List No. 1585

Date: June 19, 1974

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 25° 57' 36"
West Longitude: 80° 16' 13"

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.

TOWER:	W(#4)	SW(#5)	S(#6)	C(#7)	N(#3)	NE(#2)	E(#1)
HEIGHT ABOVE INSULATORS:	300'	300'	300'	300'	300'	300'	300'(103
NIGHT PHASING:	+94°	-33°	-160°	-	+127	0°	-127°
NIGHT FIELD RATIO:	0.38	0.76	0.38	-	0.5	1.0	0.5
DAY PHASING:	+165°	-	-	0°	-	-	-128°
DAY FIELD RATIO:	0.39	-	-	1	-	-	0.48

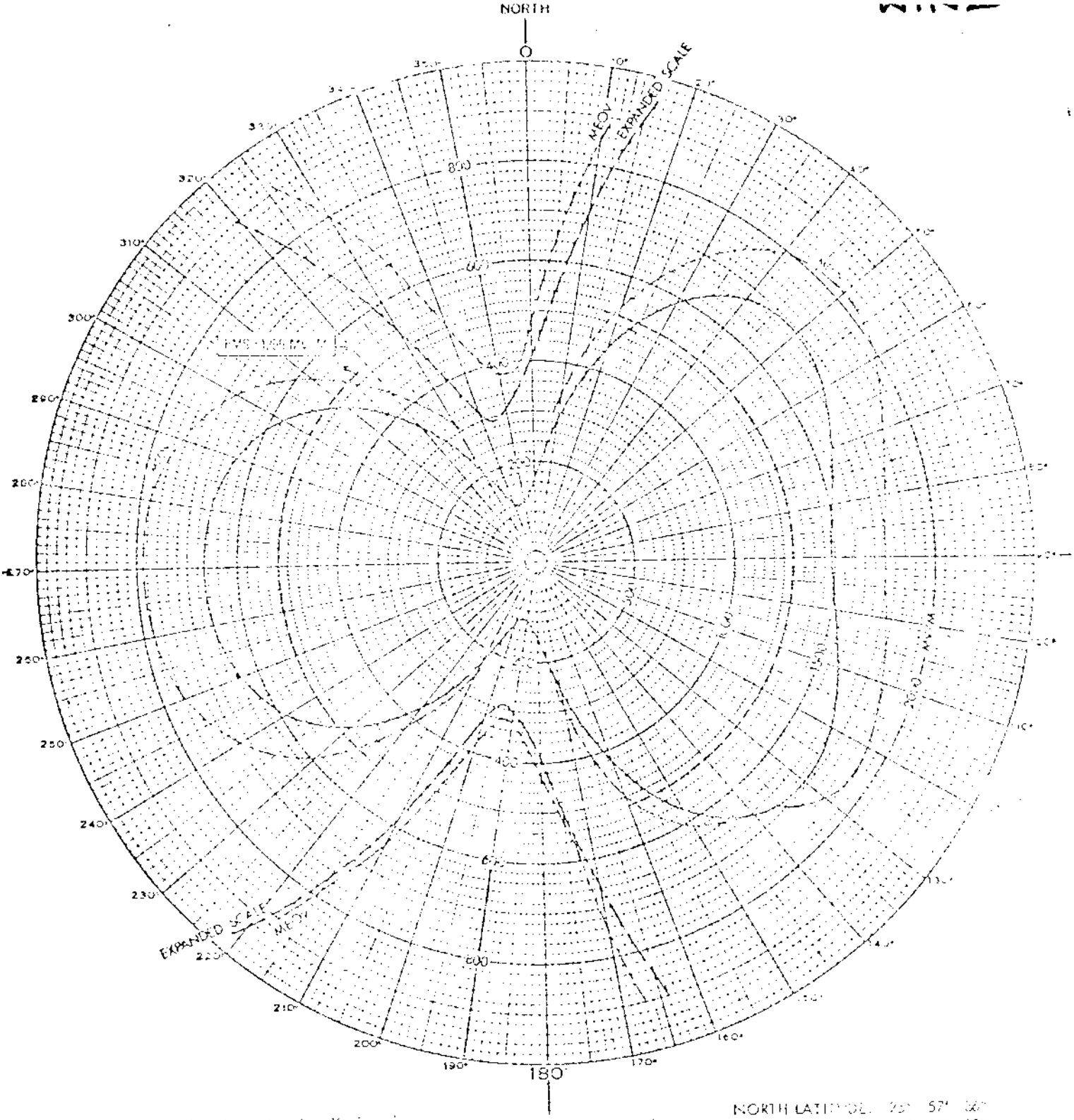
SPACING AND ORIENTATION: Towers 1-2-3 and 4-5-6 form two rows with three towers per row. Adjacent elements in a row are spaced 276.3'(95°) on a line bearing 112° true. End towers in each row forming the other sides of the parallelogram are spaced 639.9'(220°) on a line bearing 70° true. Tower #7 is spaced 556.9'(191.46°) equally between towers #1 and #4 on a line bearing 89.39° true.

GROUND SYSTEM: 120-260' equally spaced copper radials plus a square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of systems are bonded together.

Predicted effective Night Field: 656 mv/m at rated power.

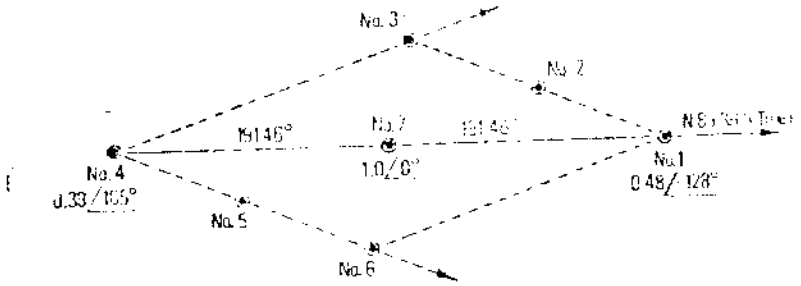
Predicted effective Day Field: 1295 mv/m at rated power by adjustment of input power.

CTR NO 30782A4



Theoretical RMS restricted to 1265 mv/m

NORTH LATITUDE: 25° 57' 36"
WEST LONGITUDE: 80° 16' 13"



ANTENNA HEIGHT =

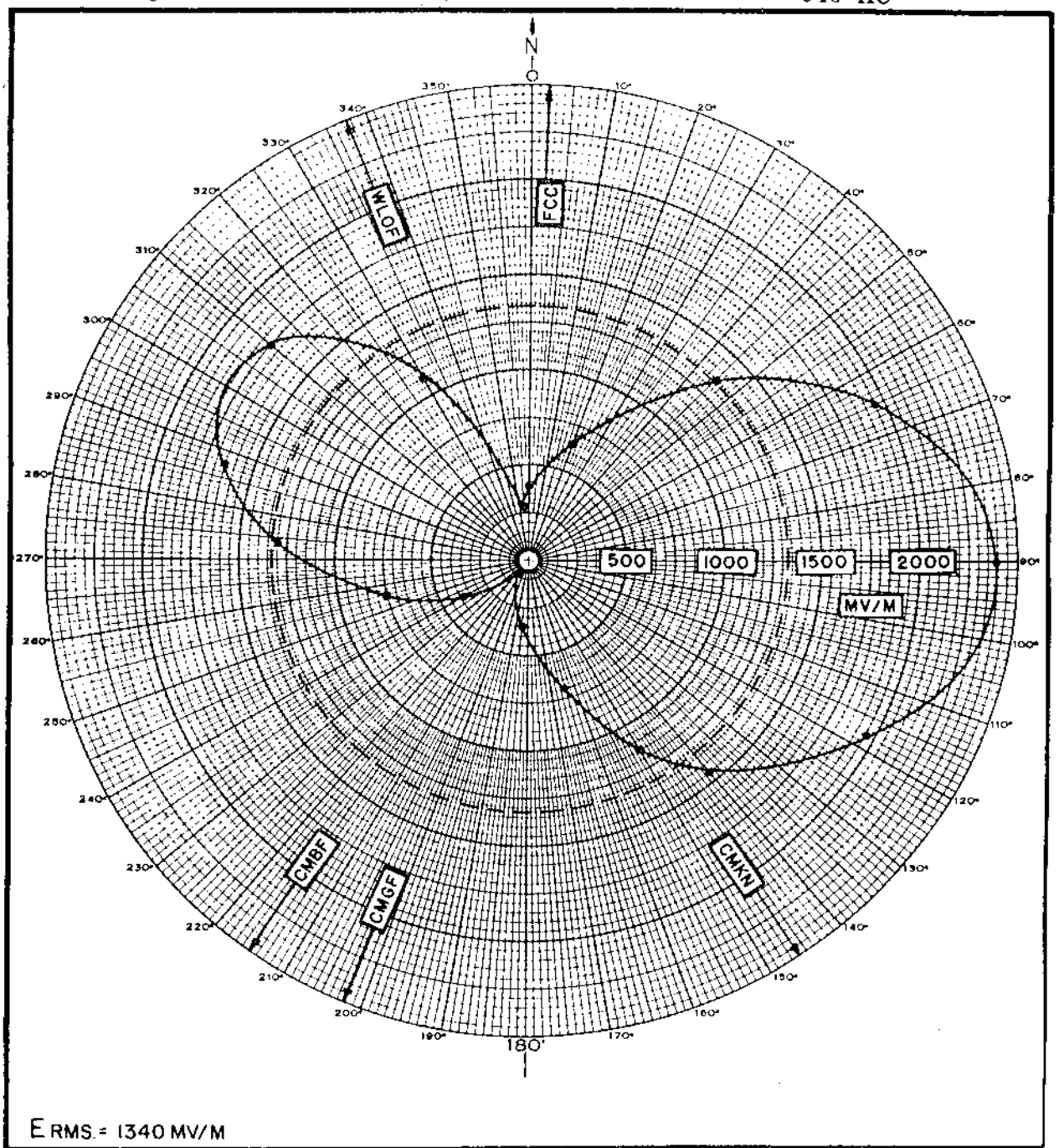
Towers No 2, No 3, No [illegible] 6
not used in Day[illegible]

FIGURE 4
PROPOSED DAYTIME HORIZONTAL PLANE
RADIATION PATTERN
WINZ 10KW, 50 KW-LS, DA-2 940 Kc
WINZ, INC.
MIAMI, FLORIDA

Prepared by
Lohnes and Culver Washington, D.
March, 1974

WWINZ

MEASURED DAY (4-9-58g) | Station WINZ Miami, Florida | 10kw,50kw-LS, DA-2,U 940 KC



E RMS.= 1340 MV/M

PATTERN NO. 580302D
LATITUDE: 25° 57' 36"
LONGITUDE: 80° 16' 20"

HAROLD B. ROTHROCK
Consulting Radio Engineer
WASHINGTON, D. C.

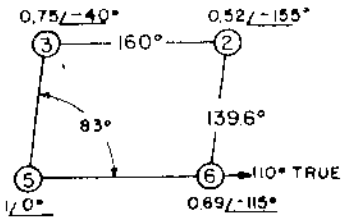
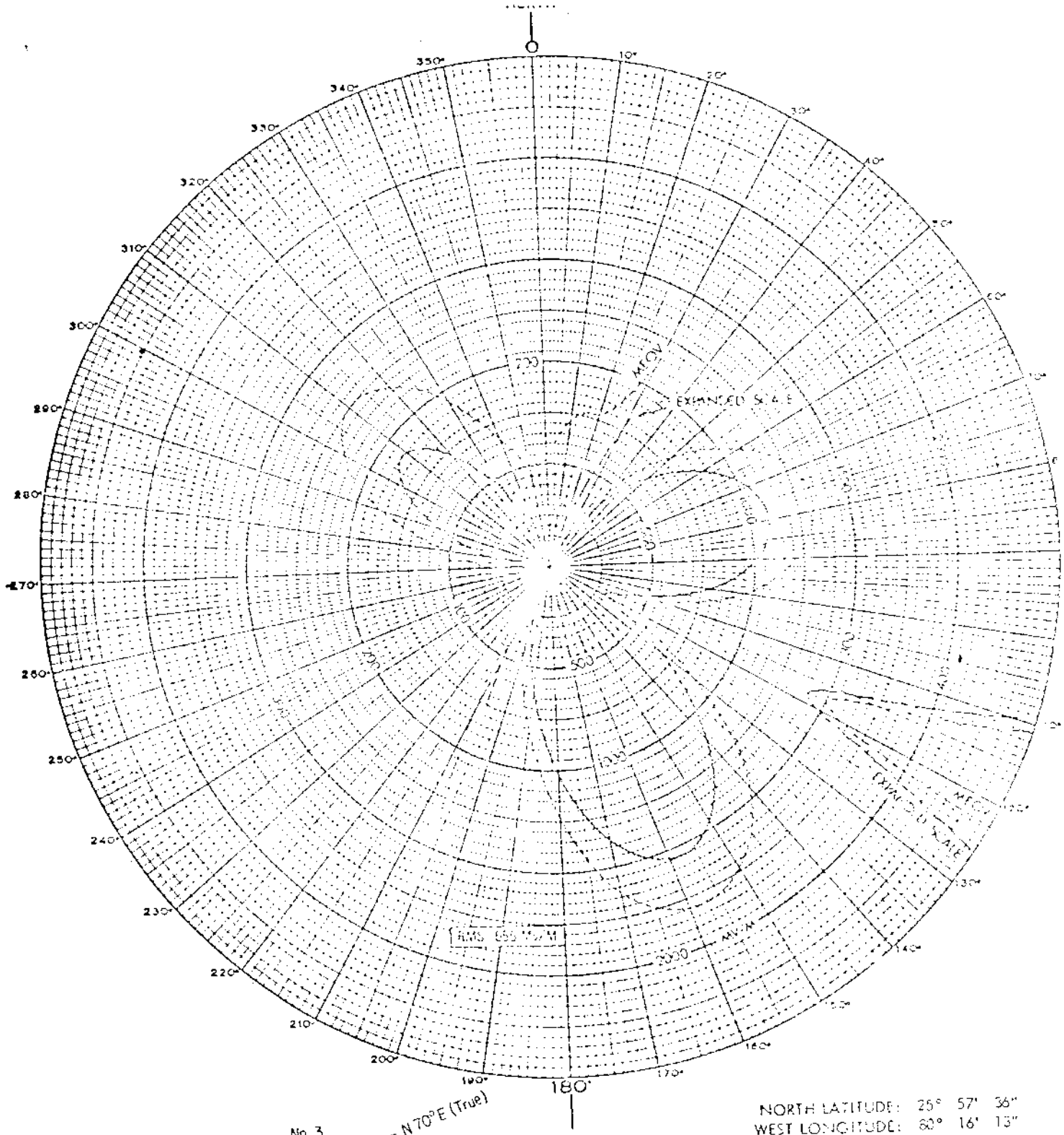


FIGURE 22
RADIO STATION WINZ
MIAMI, FLA.
MEASURED DAYTIME PATTERN

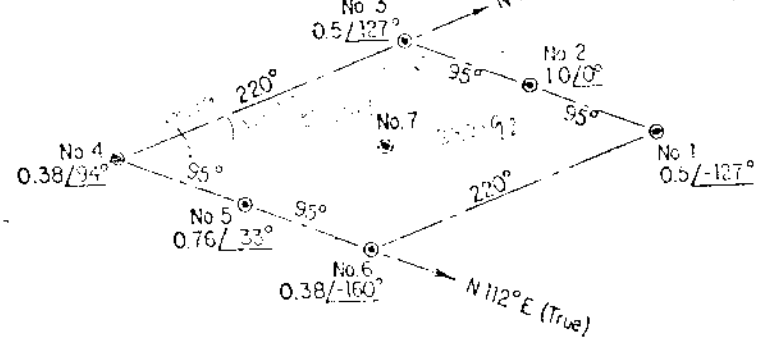
940 KC 10 KW - 50 KW LS DA-2

WINZ MIAMI, FLORIDA 940 KC

This pattern was filed with a license renewal application.



NORTH LATITUDE: 25° 57' 36"
WEST LONGITUDE: 80° 16' 13"



ANTENNA HEIGHT = 103°

Tower No. 7 not used in Nighttime Array

FIGURE 5
PROPOSED NIGHTTIME HORIZONTAL PLA
RADIATION PATTERN
WINZ 10KW, 50 KW-LS, DA-2 940 KH
WINZ, INC.
MIAMI, FLORIDA

Prepared by
Lohnes and Culver Washington,
March, 1974

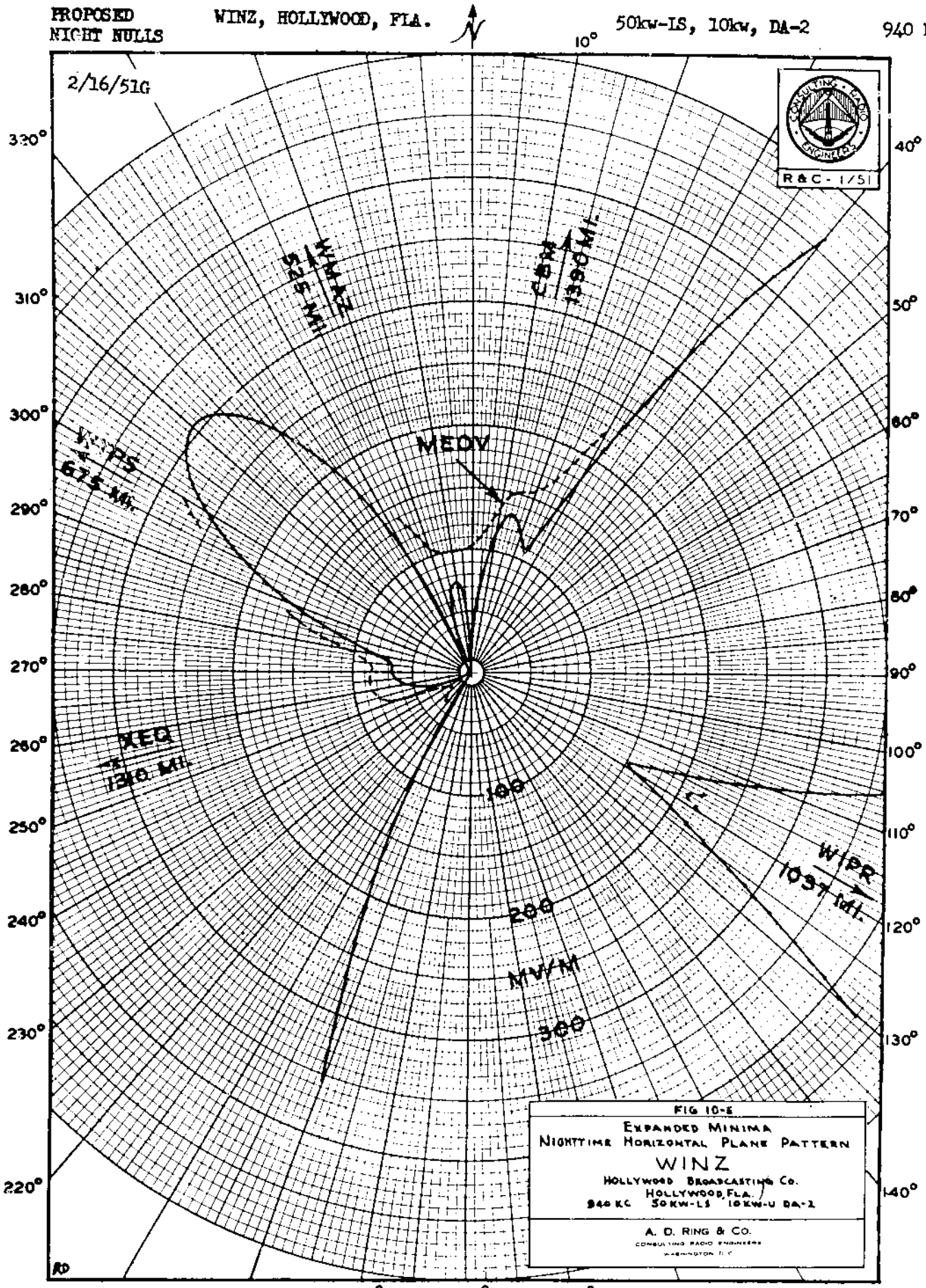
WINZ

PROPOSED NIGHT NULLS

WINZ, HOLLYWOOD, FLA.

50kw-LS, 10kw, DA-2

940 kc



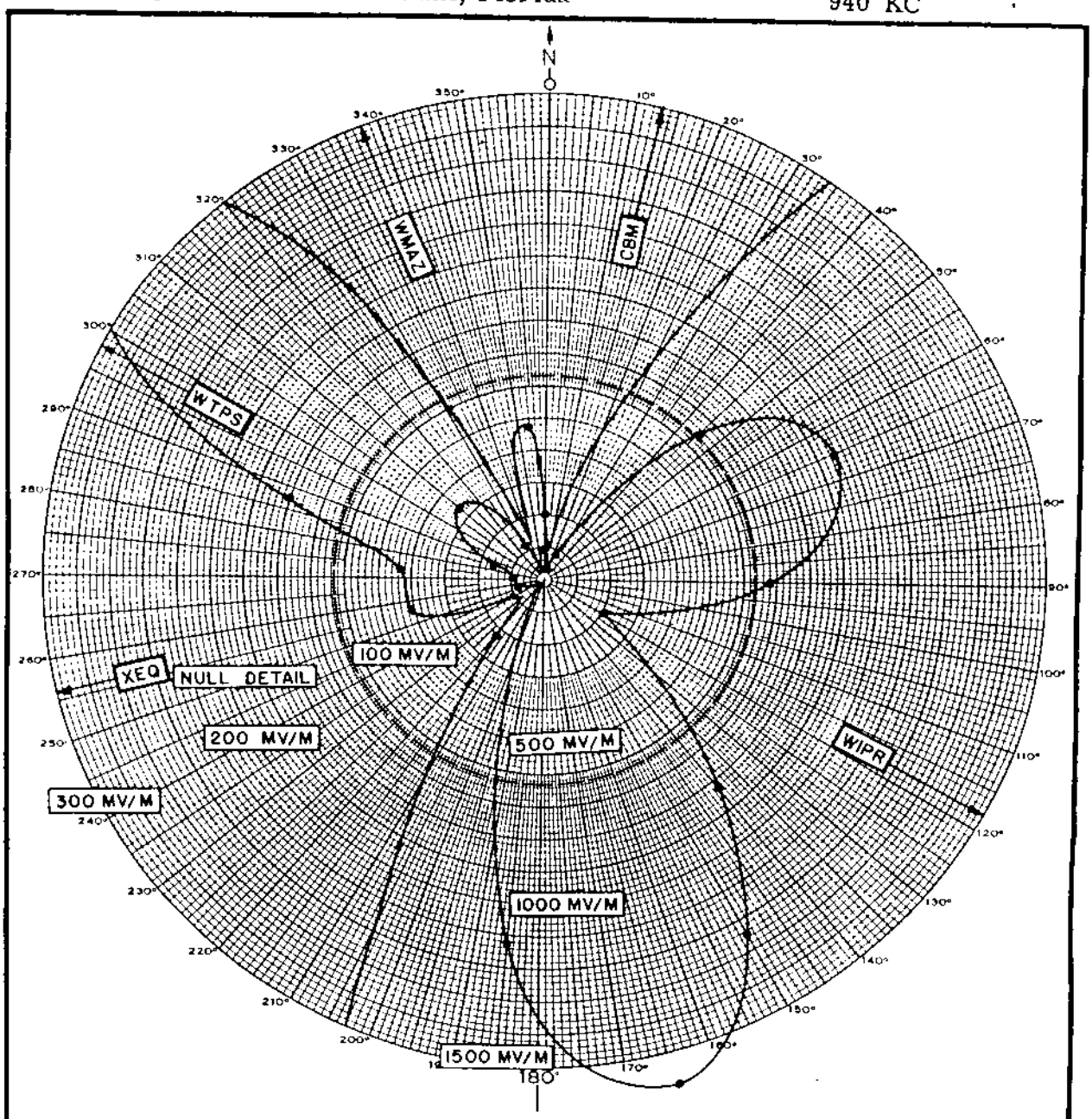
AMENDED 2/9/51 BMP-3205

WINZ, Hollywood, Fla. 940 kc

MEASURED NIGHT
(4-9-58g)

Station WINZ
Miami, Florida

10kw,50kw-LS, DA-2,U
940 KC



PATTERN NO. 580301N
LATITUDE: 25° 57' 36"
LONGITUDE: 80° 16' 20"

HAROLD B. ROTHROCK
Consulting Radio Engineer
WASHINGTON, D. C.

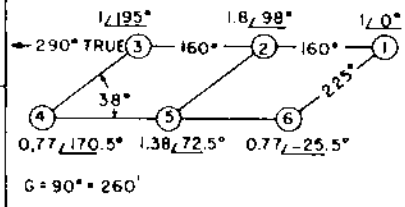


FIGURE 23
RADIO STATION WINZ
MIAMI, FLA.
MEASURED NIGHTTIME PATTERN

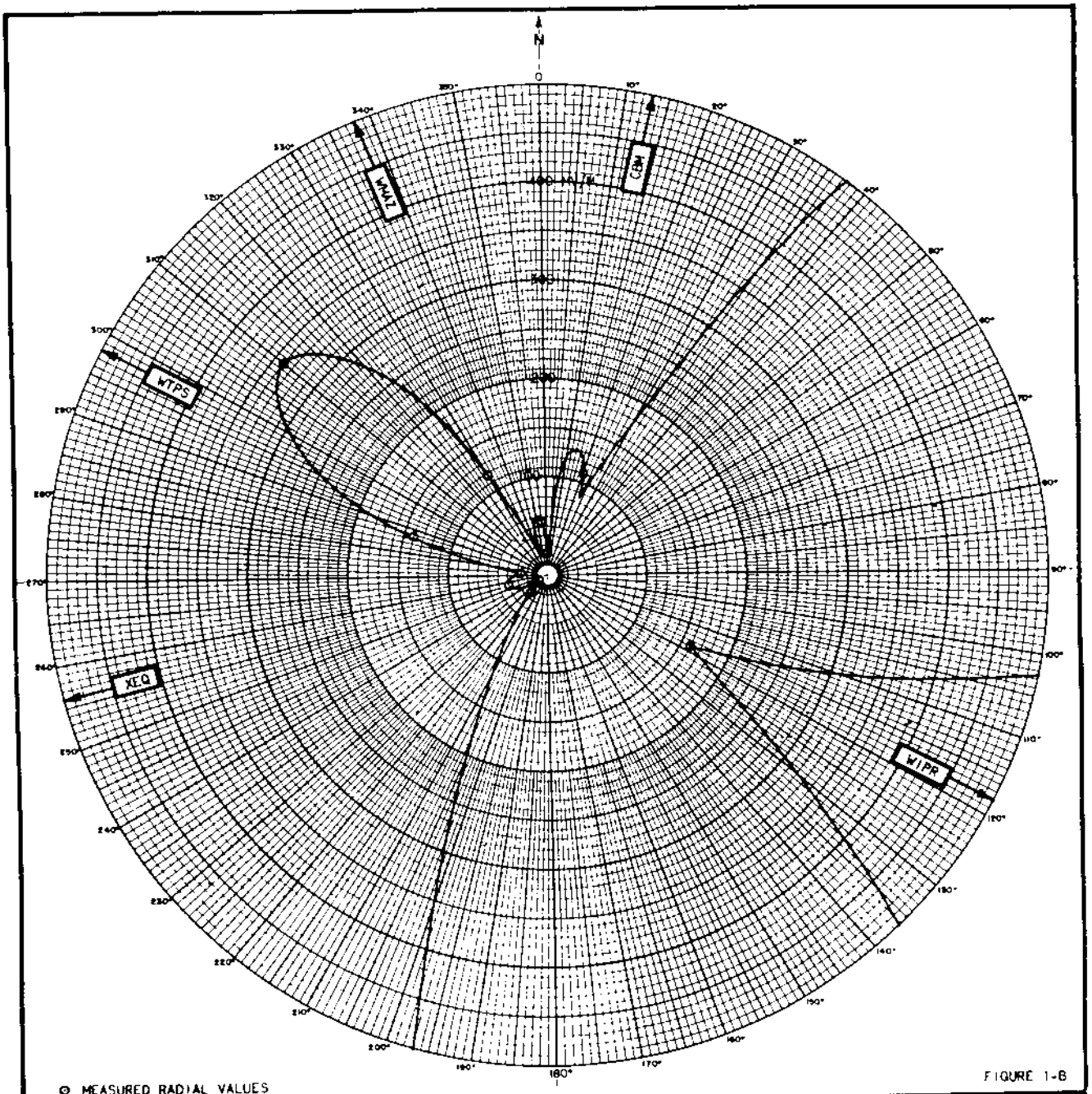
940 KC 10 KW – 50 KW LS DA-2

WINZ Miami, Florida 940 KC

This pattern was filed with a license renewal application.

WINZ

MEASURED NULLS WINZ, HOLLYWOOD, FLA. 10kw N, DA-2 940 kc
NIGHTTIME (9/16/53) G



⊙ MEASURED RADIAL VALUES

FIGURE 1-B

WINZ

HORIZONTAL RADIATION PATTERN

(MEASURED NULLS)

	(E)	(NE)	(N)	(W)	(SW)	(S)
ANTENNA	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6
PHASE DEG.	0°	98°	196°	170.5°	72.5°	-25.5°
HEIGHT DEG.	89.5°	89.5°	89.5°	89.5°	89.5°	89.5°
FIELD RATIO	1.0	1.8	1.0	0.77	1.38	0.77
NON-DA ANT.						

FREQUENCY:	940 KC
ASSIGNMENT:	50 Kw-LS, 10 Kw-N(DA-2)
LONGITUDE:	80 DEG. 16 MIN. 20 SEC.
LATITUDE:	25 DEG. 57 MIN. 36 SEC.
WHEN USED:	NIGHTTIME
R.M.S. FIELD:	633 MV/M (MEASURED)
DATE:	JUNE 1953

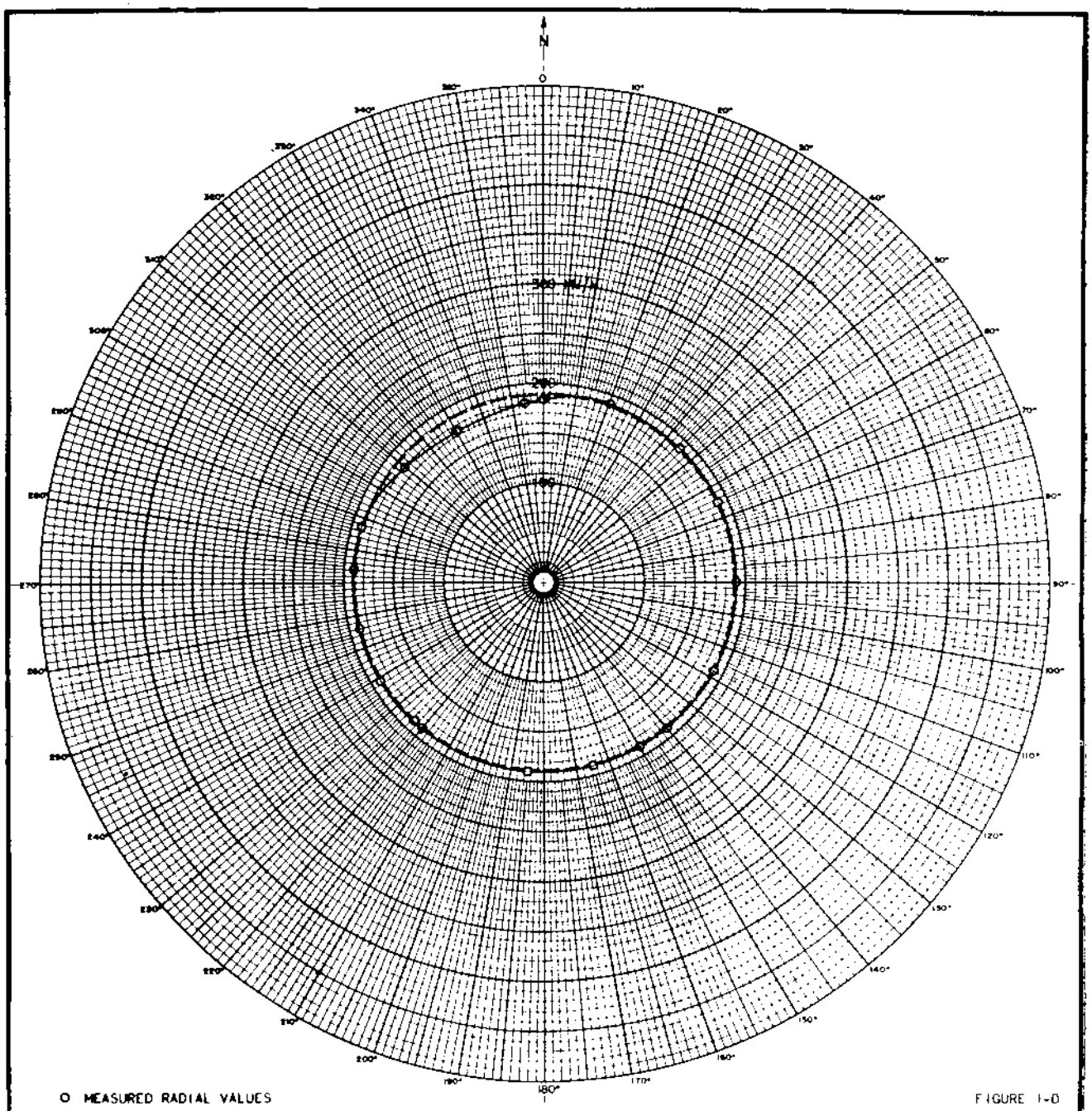
ROBERT M. SILLIMAN
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

940 kc

FCC File No. BL-5082 8-7-53 WINZ, HOLLYWOOD, FLA.

WINZ

MEASURED WINZ, HOLLYWOOD, FLA. 10kw N, DA-2 . 940 kc
NON DIRECTIONAL (9/16/53) G



O MEASURED RADIAL VALUES

FIGURE 1-D

WINZ

HORIZONTAL RADIATION PATTERN

(MEASURED NON-DIRECTIONAL - 1 KW.)

	(E)	(NE)	(N)	(W)	(SW)	(S)
ANTENNA	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6
PHASE DEG.						
HEIGHT DEG.						
FIELD RATIO						
NON-DA ANT.	*					

FREQUENCY	940 KC
ASSIGNMENT:	50 KW-LS, 10 KW-N(DA-2)
LONGITUDE	80 DEG. 16 MIN. 20 SEC.
LATITUDE	25 DEG. 57 MIN. 36 SEC.
WHEN USED:	NON-DIRECTIONAL SURVEY
R.M.S. FIELD.	188 MV/M (MEASURED)
DATE.	JUNE 1953

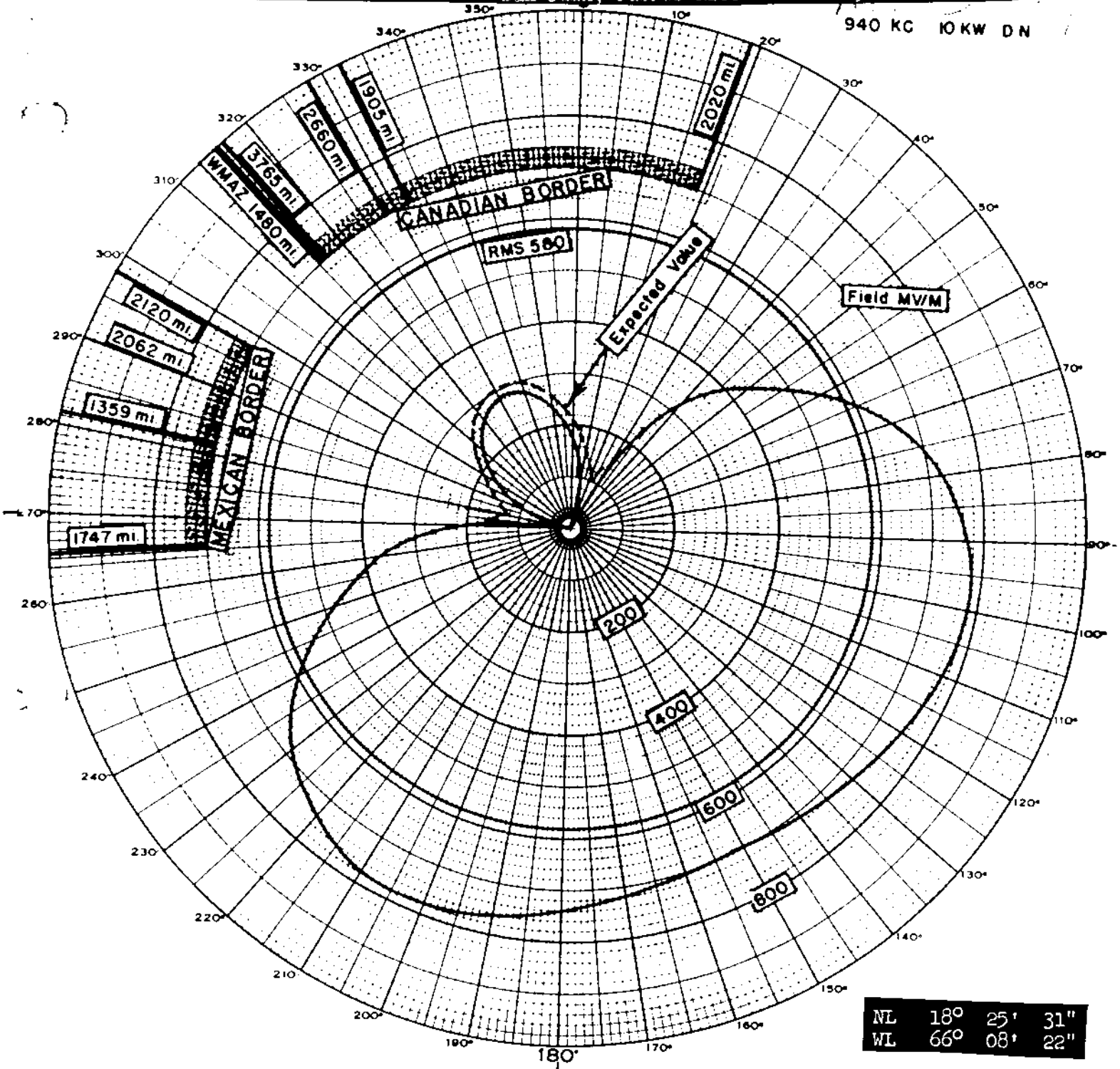
ROBERT M. SILLIMAN
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC FILE NO. BL-5802 8-7-53 WINZ, HOLLYWOOD, FLA. 940 kc

PROPOSED DAY & NIGHT Station WIPR San Juan, Puerto Rico 940 KC

WIPR

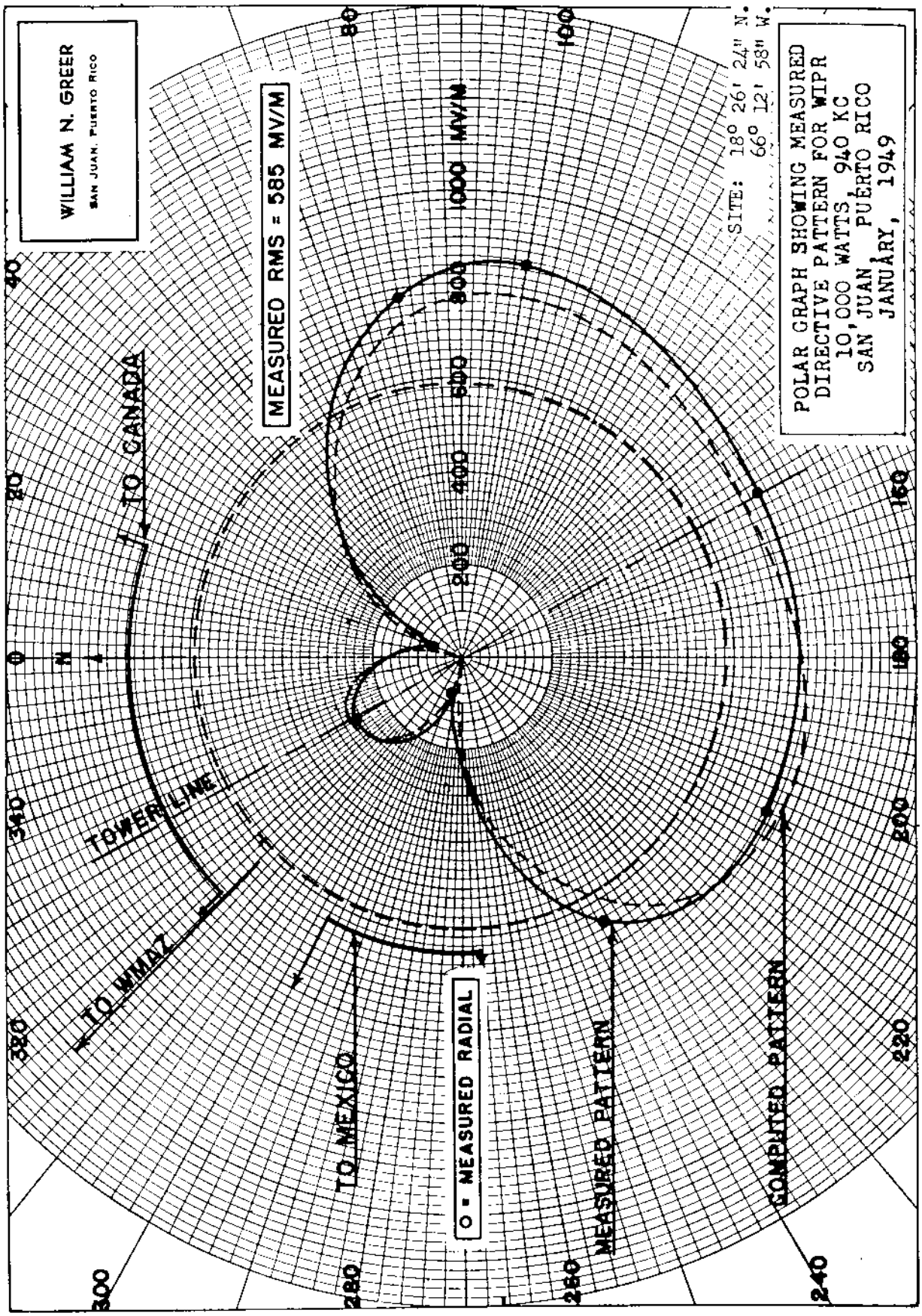
940 KC 10 KW DN



NL	18°	25'	31"
WL	66°	08'	22"

PUERTO RICO COMMUNICATIONS AUTHORITY SAN JUAN, PUERTO RICO		Figure 1 Series 470808C
		940 KC 10000 WATTS DAY NIGHT
332° TRUE 1/85° N SPACING 138° H=91° 1/60°	PROPOSED DIRECTIONAL ANTENNA PATTERN	FRANK H. McINTOSH *Consulting Radio Engineer* Washington, D.C.

MEASURED WIPR, SANTURCE, P. R. License 1-24-49 10kw,DA1 940 kc
NIGHT&DAY 1/25/49



S. Haven, Mich.

WJUK

PROPOSED DAY
(5-28-59g)

New; Radio 940
South Haven, Michigan

1kw, DA-D,D
940 KC

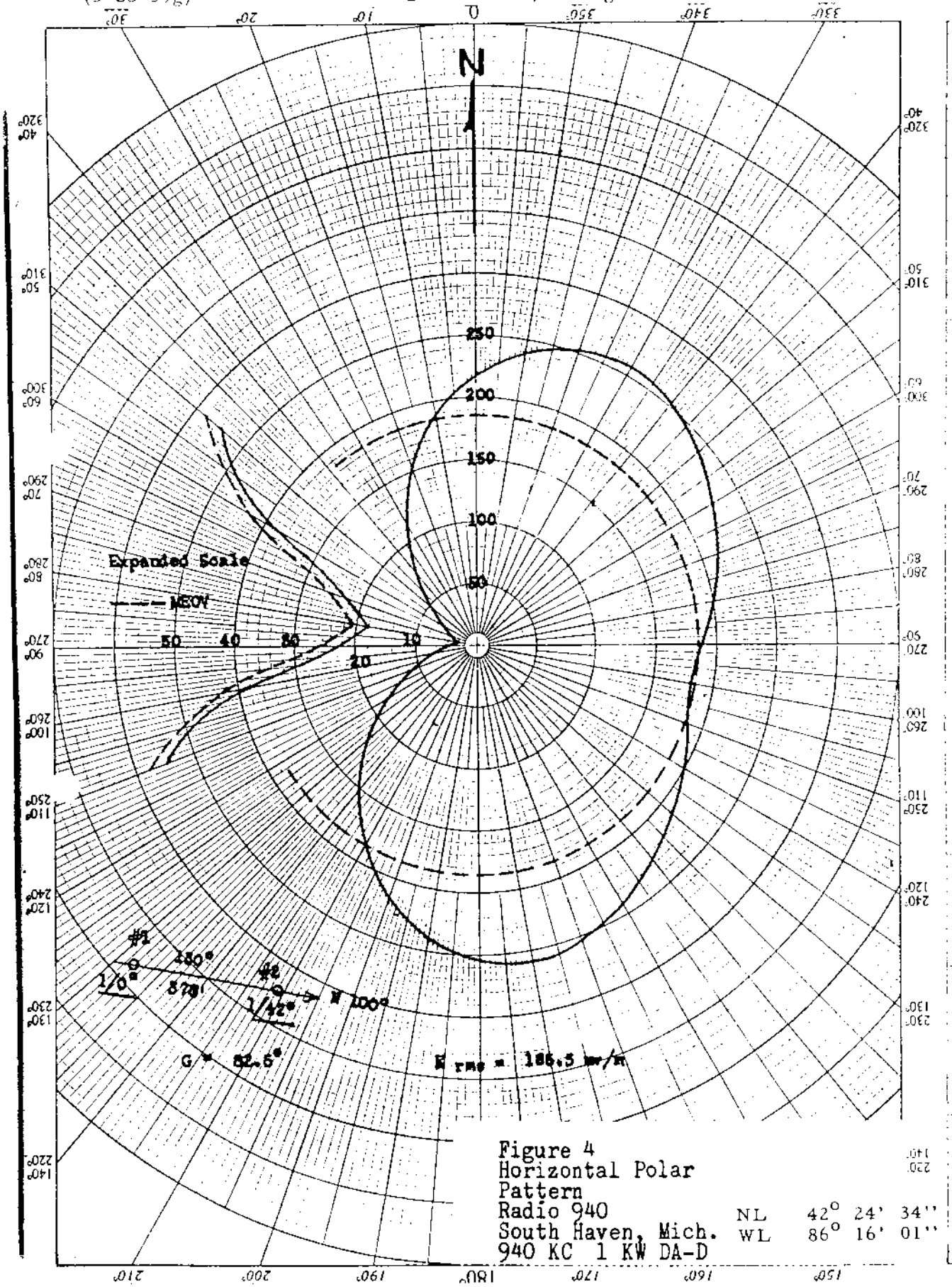


Figure 4
Horizontal Polar
Pattern
Radio 940
South Haven, Mich.
940 KC 1 KW DA-D

NL 42° 24' 34''
WL 86° 16' 01''

FCC File No. BP-12373
Accepted 5-6-59 (Amended)

Radio 940
South Haven, Michigan

940 KC

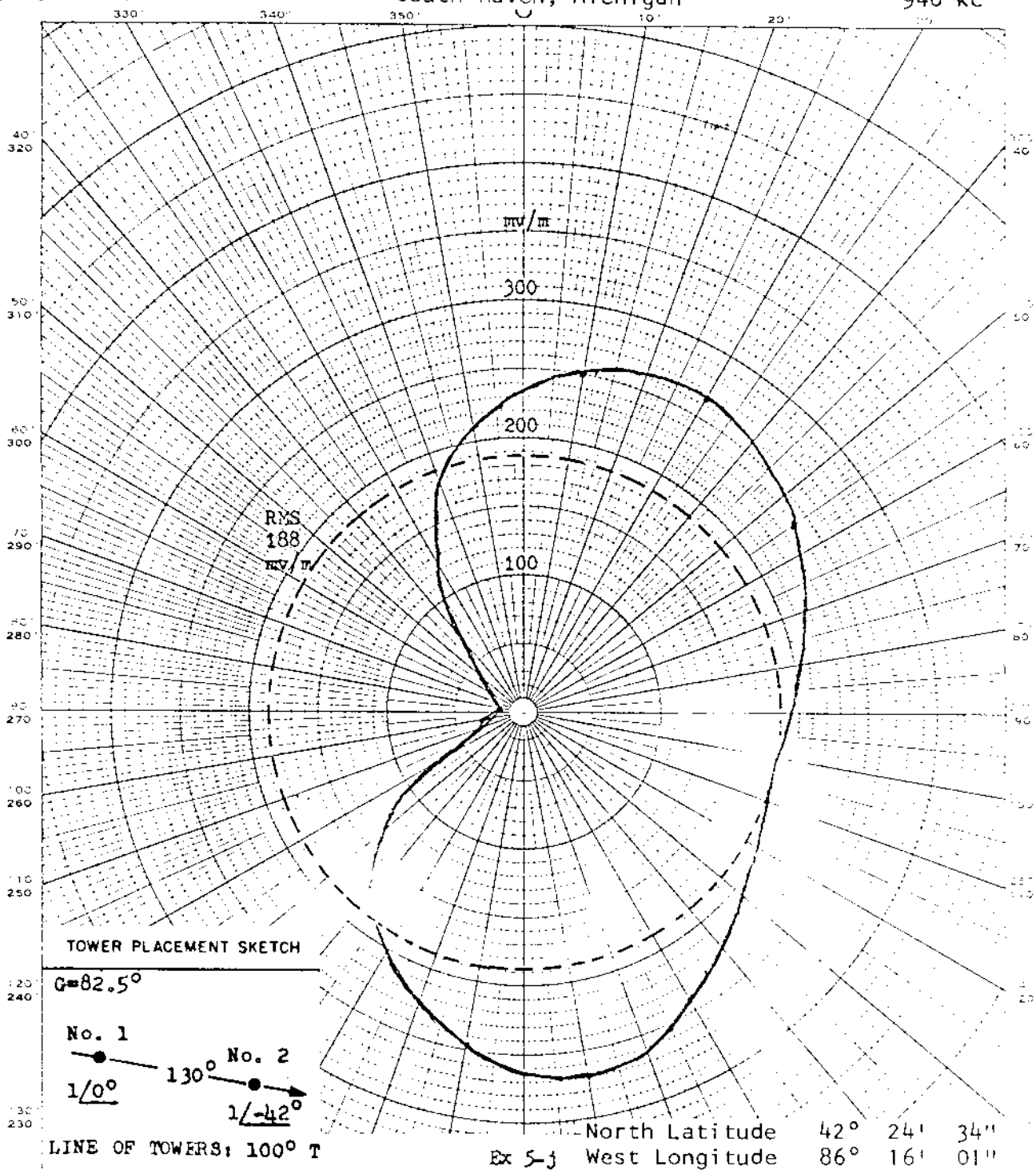
WJOR

Measured Day
(7-29-68ct)

Station WJOR
South Haven, Michigan

1kw,DA-D,D
940 kc

9/11/68
RAISED REMOTE CONTROL



North Latitude 42° 24' 34"
Ex 5-j West Longitude 86° 16' 01"

WJOR South Haven, Michigan. 940 kc 1 kw May 1968

radial	inv. field	radial	inv. field
10° T.	250 mv/m	145° T.	230 mv/m
30° T.	265 mv/m	170° T.	270 mv/m
55° T.	240 mv/m	190° T.	245 mv/m
100° T.	185 mv/m	260° T.	32 mv/m
		280° T.	17 mv/m

Engineer: Victor H. Voss

FCC File No.BRC-3270
Accepted 7-17-68

Station WJOR
South Haven, Michigan

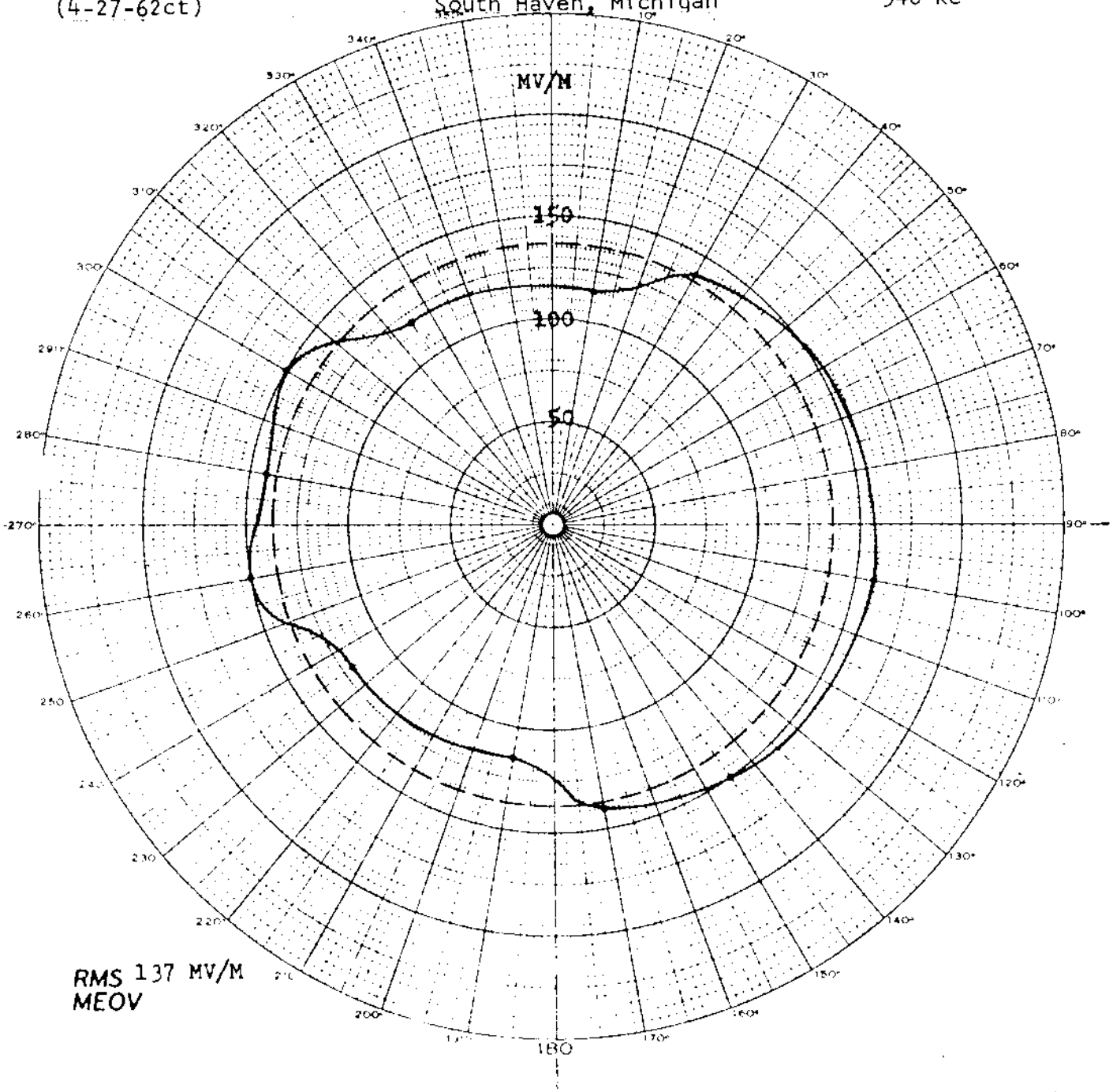
940 kc

WJOR

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

Station WJOR
South Haven, Michigan

1kw,DA-D,D
940 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 3	STATION DATA
G=82.5°		MEASURED ND-D - - WJOR DAYTIME NON-DIRECTIONAL MEASURED FROM EAST TOWER WEST TOWER FLOATED	CALL WJOR FREQ 940 Kc POWER 0.5 Kw TYPE ND TIME LAT. 42°24'34" LONG. 86°16'01"
No. 1 (NOT USED) No. 2 1.0/-		θ° 0°	E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.
LINE OF TOWERS:100° T.			

FCC File No.BL-9051
Accepted 4-2-62

Station WJOR
South Haven, Michigan

940 kc

WKYK

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WKYK — Main Studio: Burnsville, North Carolina

Frequency: 940 kHz — Power: 0.25 kW Night — 1 kW Day

Notification List No. 1739 — Date: July 1, 1977 — Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 35° 55' 03"
West Longitude: 82° 16' 45"

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:	SW(#3)	S(#2)	E(#1)
HEIGHT ABOVE INSULATORS:	206'	206'	206' (70°)
PHASING:	+136.71	-63.24°	0°
FIELD RATIO:	0.781	1.077	1

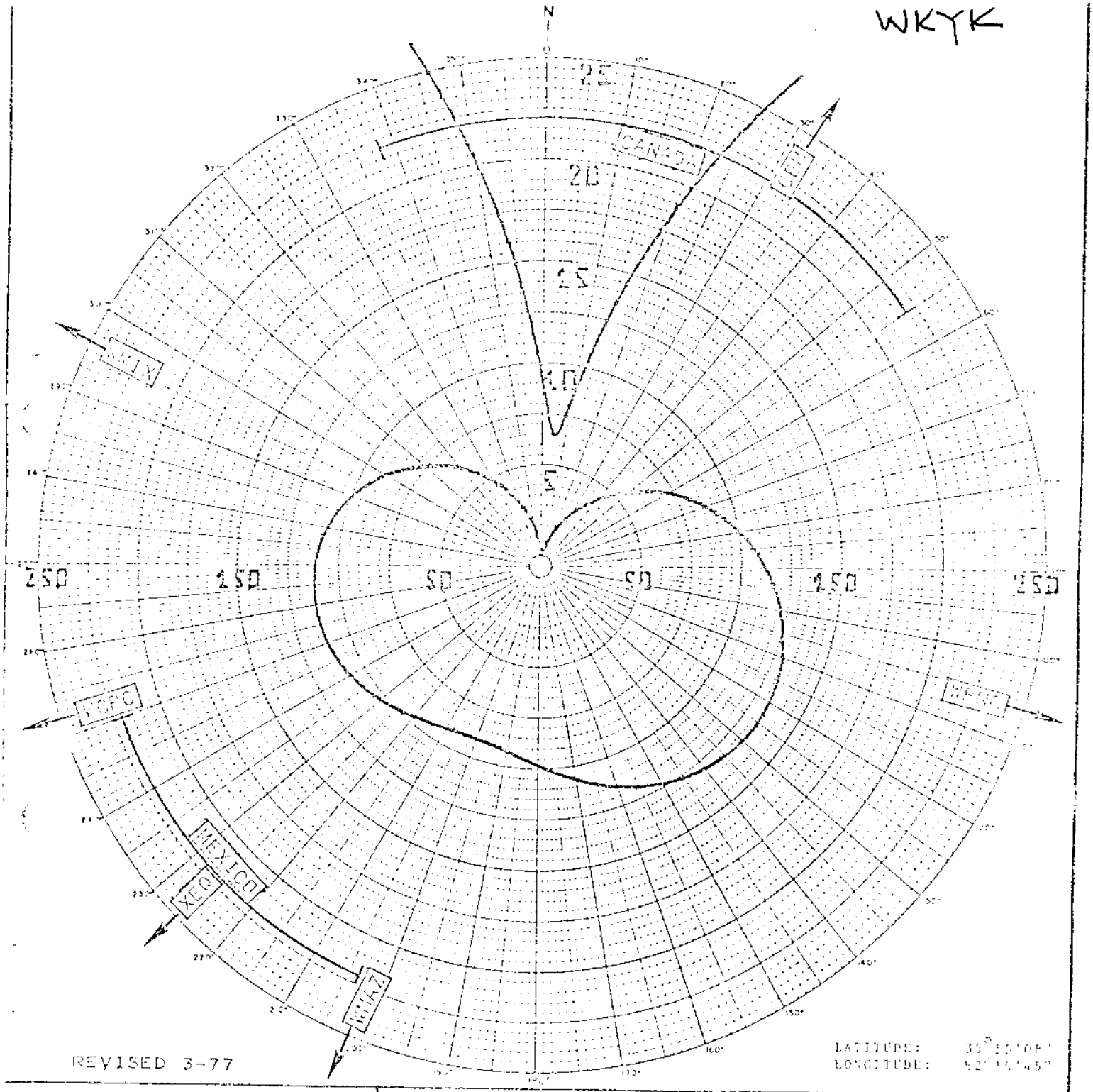
SPACING AND ORIENTATION: From tower #1, tower #2 is located 210.5' (72.41°) on a line bearing 193.4° true and tower #3 is located 231.2'(79.54°) on a line bearing 253.8° true.

GROUND SYSTEM: 120-85' to 295' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL		STANDARD
	RMS	RSS	RMS
Day	123 mv/m	- mv/m	- mv/m
Night	87.86 mv/m	109.32 mv/m	92.25 mv/m

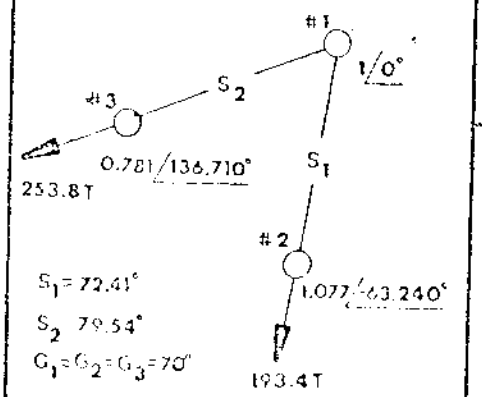
WKYK



LBA

LAWRENCE BERG ASSOCIATES, INC.
GREENVILLE, N.C. 27834

ANTENNA PARAMETERS



RSS_{cb}/RMS_{std}	=	1.944
RSS_{cb}	=	109.316
RSS_{std}	=	114.789
RMS_{cb}	=	57.856
RMS_{std}	=	92.349
$P_{(1,2,3)}$	=	5.25 mlv

FIGURE 15A

PROPOSED STANDARD DIRECTIONAL HORIZONTAL PATTERN

MARY MEDIA, INC.
RADIO STATION WKYK
BURNSVILLE, NORTH CAROLINA

880 KHZ, .25/1.0 DA-1

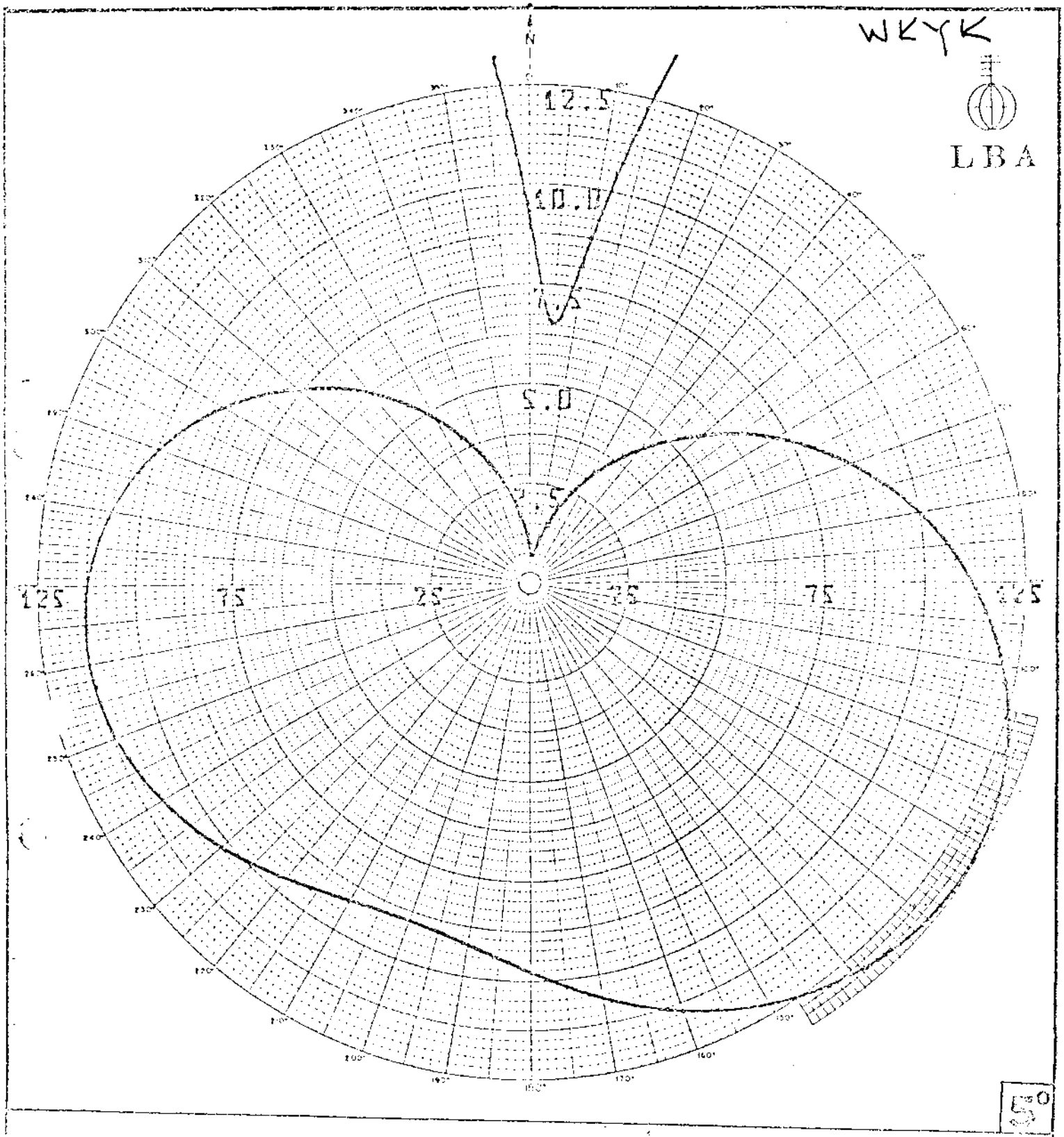


FIGURE 15B

PROPOSED VERTICAL NIGHT PATTERN

RADIO STATION WKYK
BURNSVILLE, NORTH CAROLINA

3-77

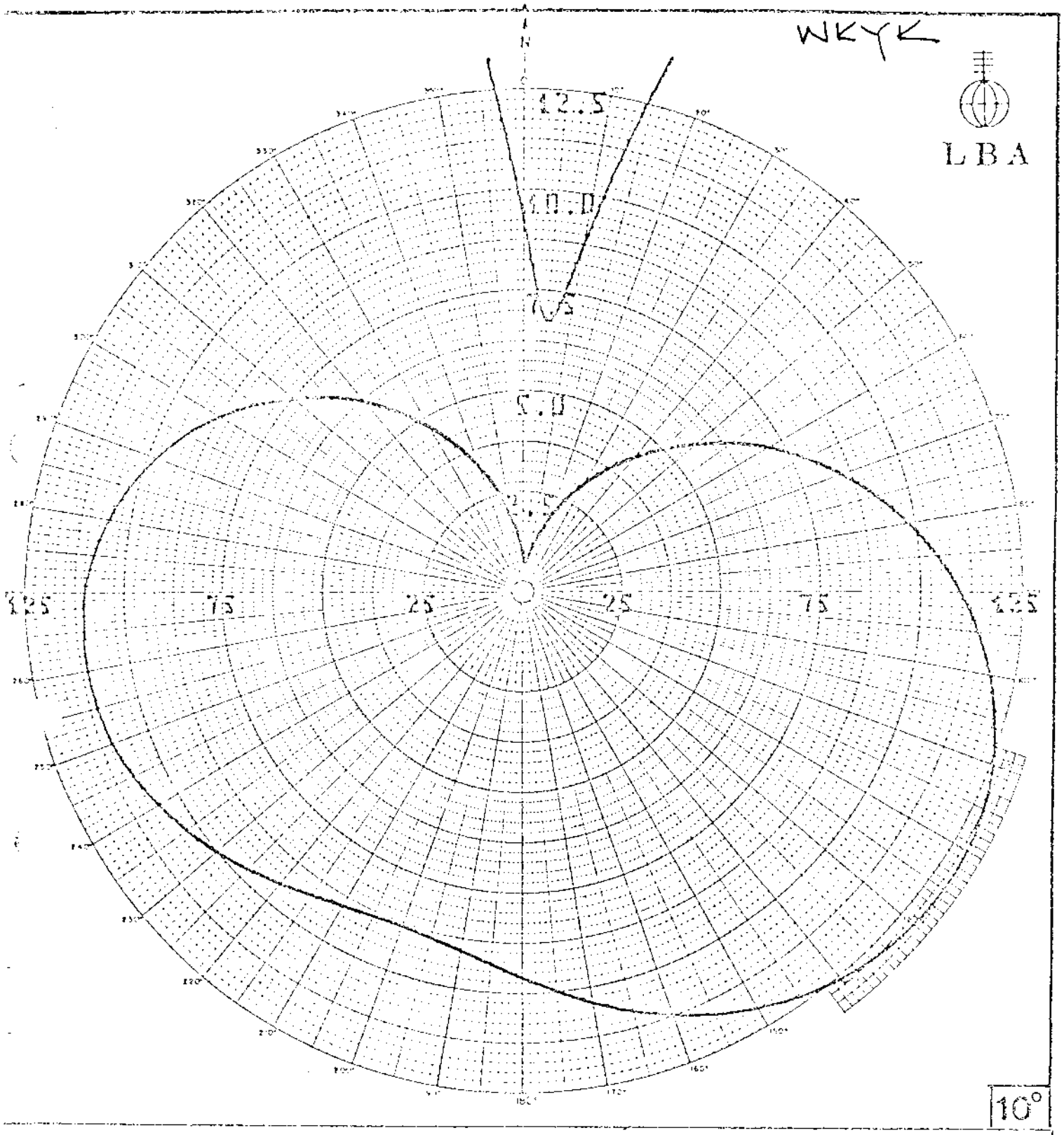


FIGURE 15c

PROPOSED VERTICAL NIGHT PATTERN

RADIO STATION WKYK
BURNSVILLE, NORTH CAROLINA

3-77

WKYK

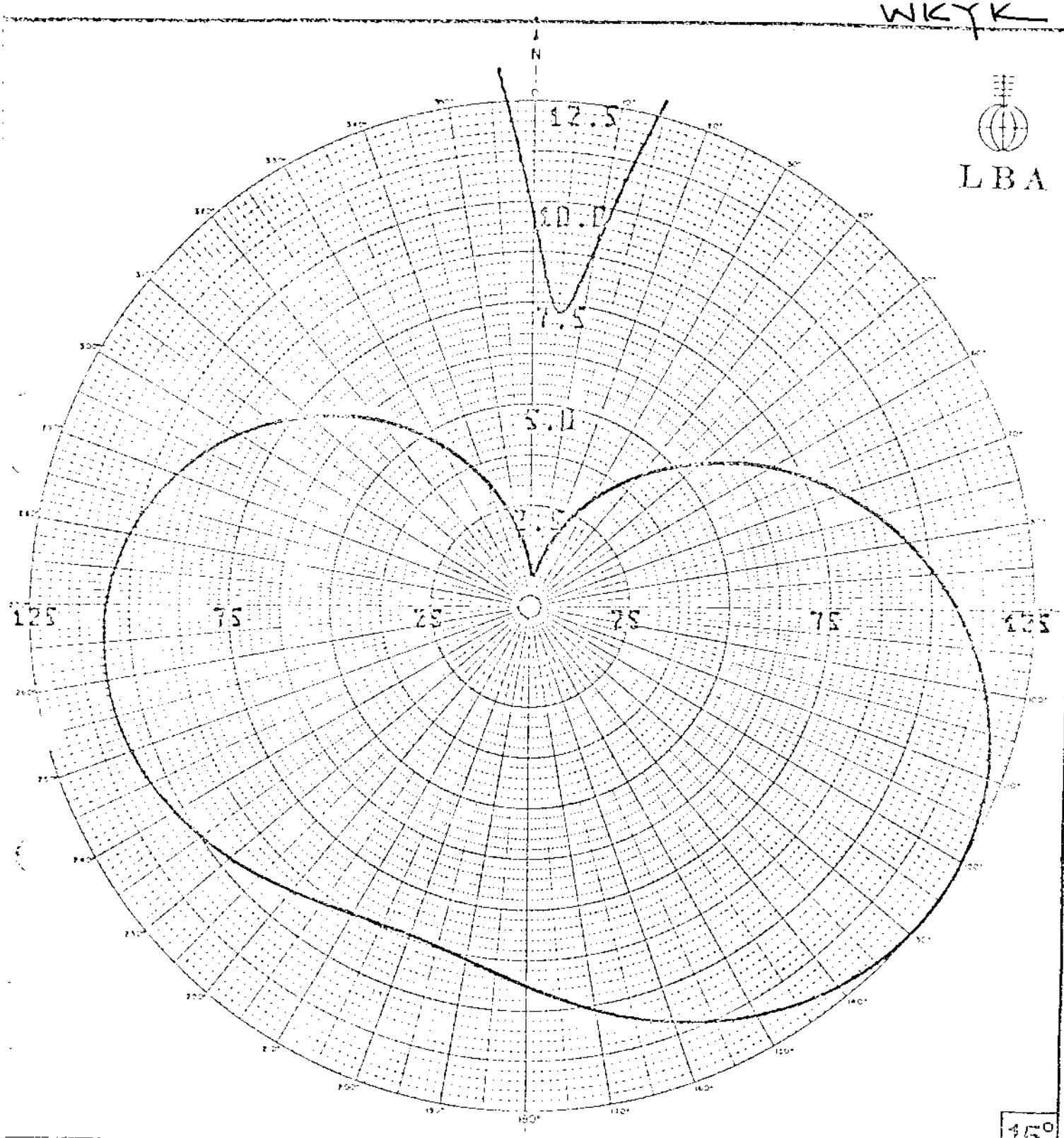


FIGURE 15D

PROPOSED VERTICAL NIGHT PATTERN

RADIO STATION WKYK
BURNSVILLE, NORTH CAROLINA

3-77

WKYK

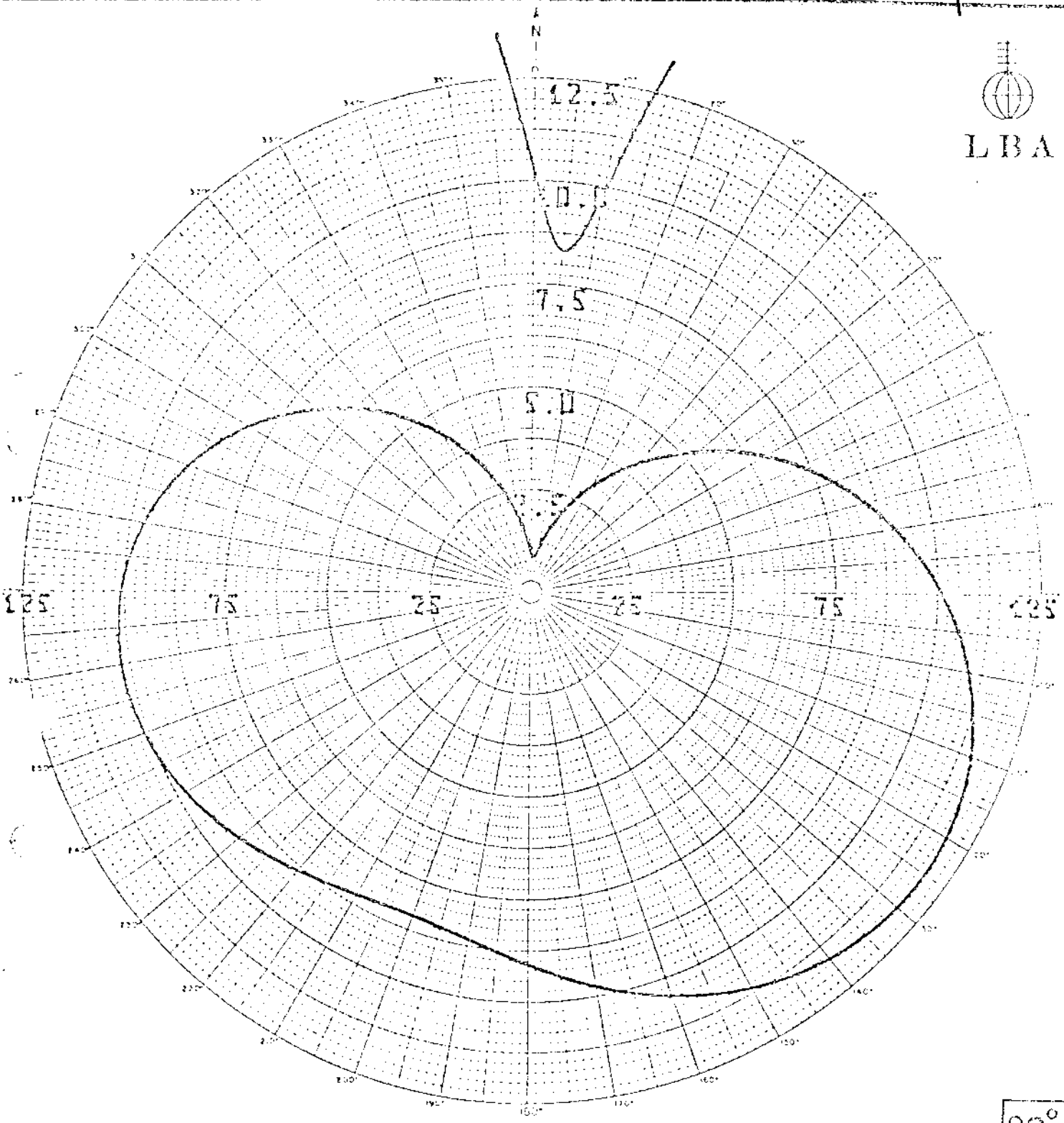


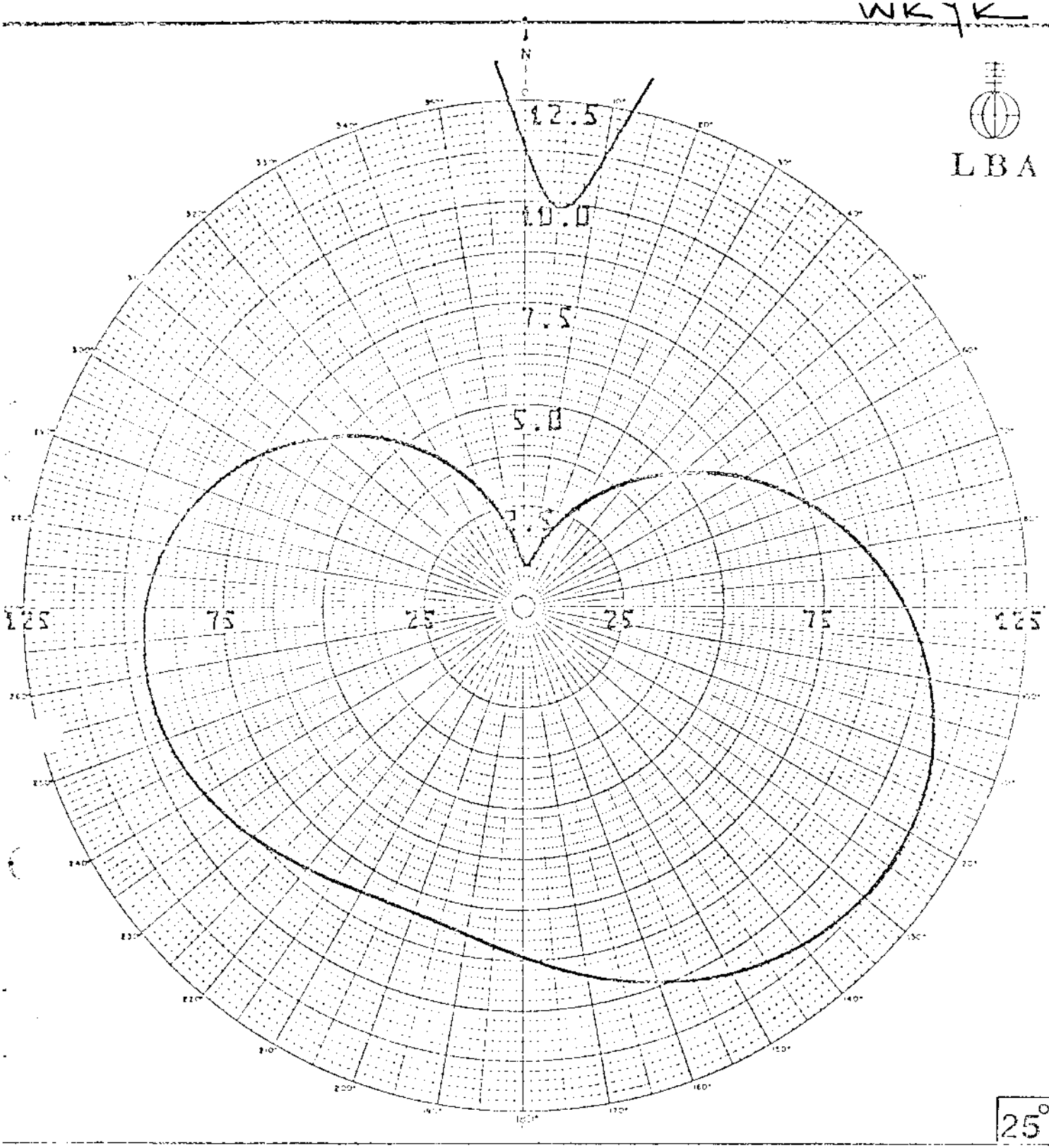
FIGURE 15E

PROPOSED VERTICAL NIGHT PATTERN

RADIO STATION WKYK
BURNSVILLE, NORTH CAROLINA

3-77

WKYK



LBA

FIGURE 15F

PROPOSED VERTICAL NIGHT PATTERN

RADIO STATION WKYK
BURNSVILLE, NORTH CAROLINA

3-77

WKYK

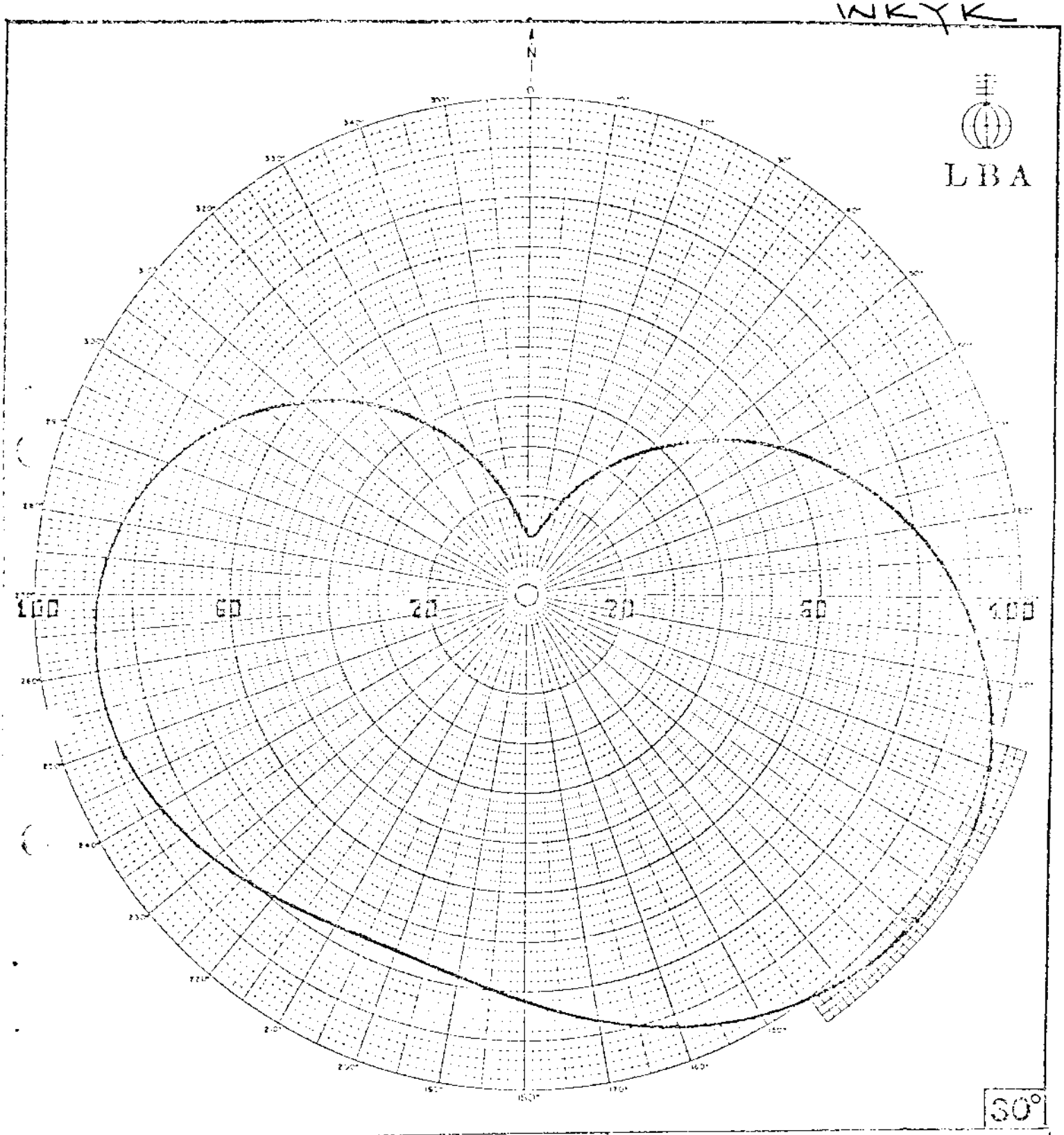


FIGURE 15G

PROPOSED VERTICAL NIGHT PATTERN

RADIO STATION WKYK
BURNSVILLE, NORTH CAROLINA

3-77

WKYK

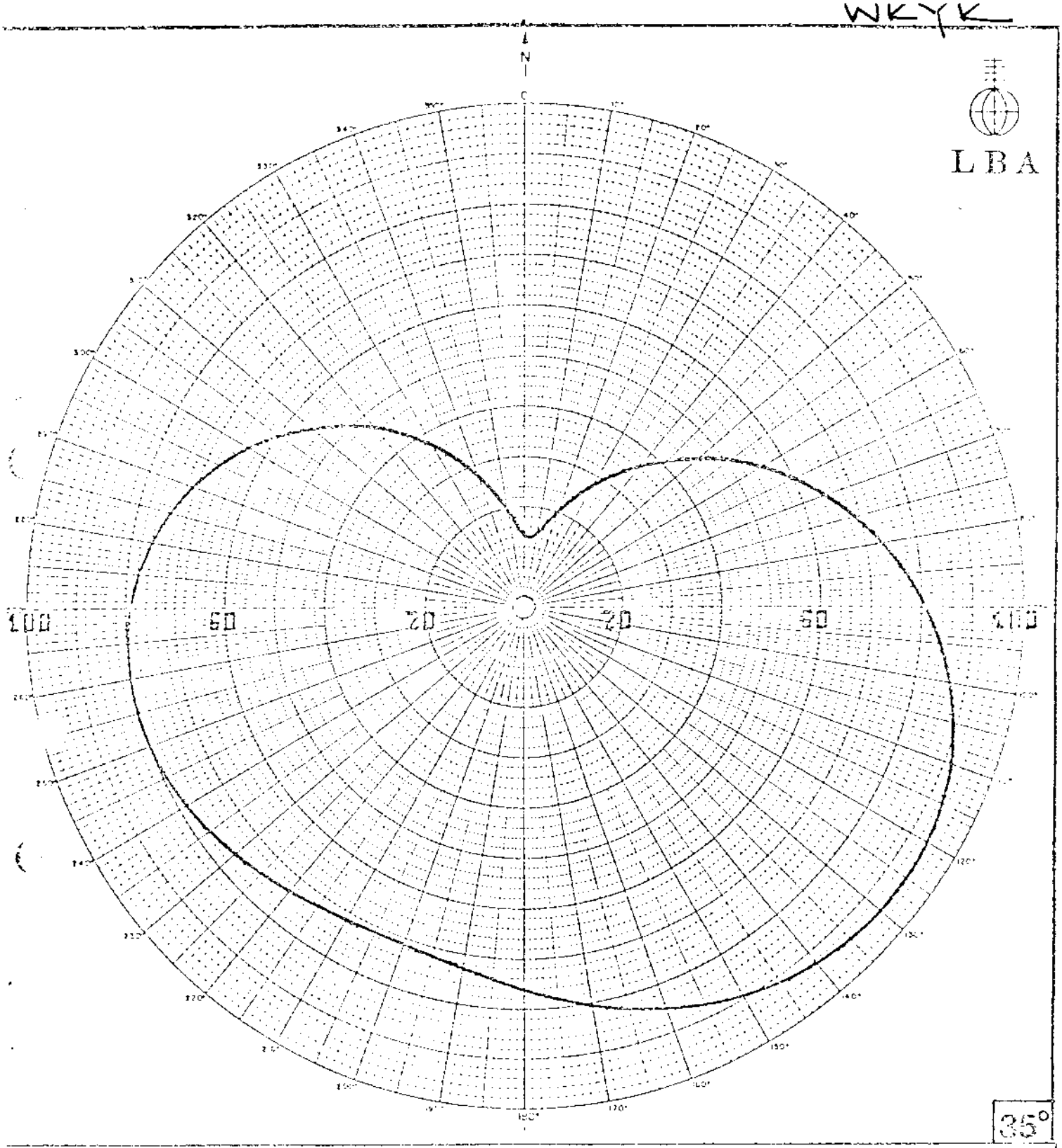


FIGURE 15H

PROPOSED VERTICAL NIGHT PATTERN

RADIO STATION WKYK
BURNSVILLE, NORTH CAROLINA

3-77

WKYK

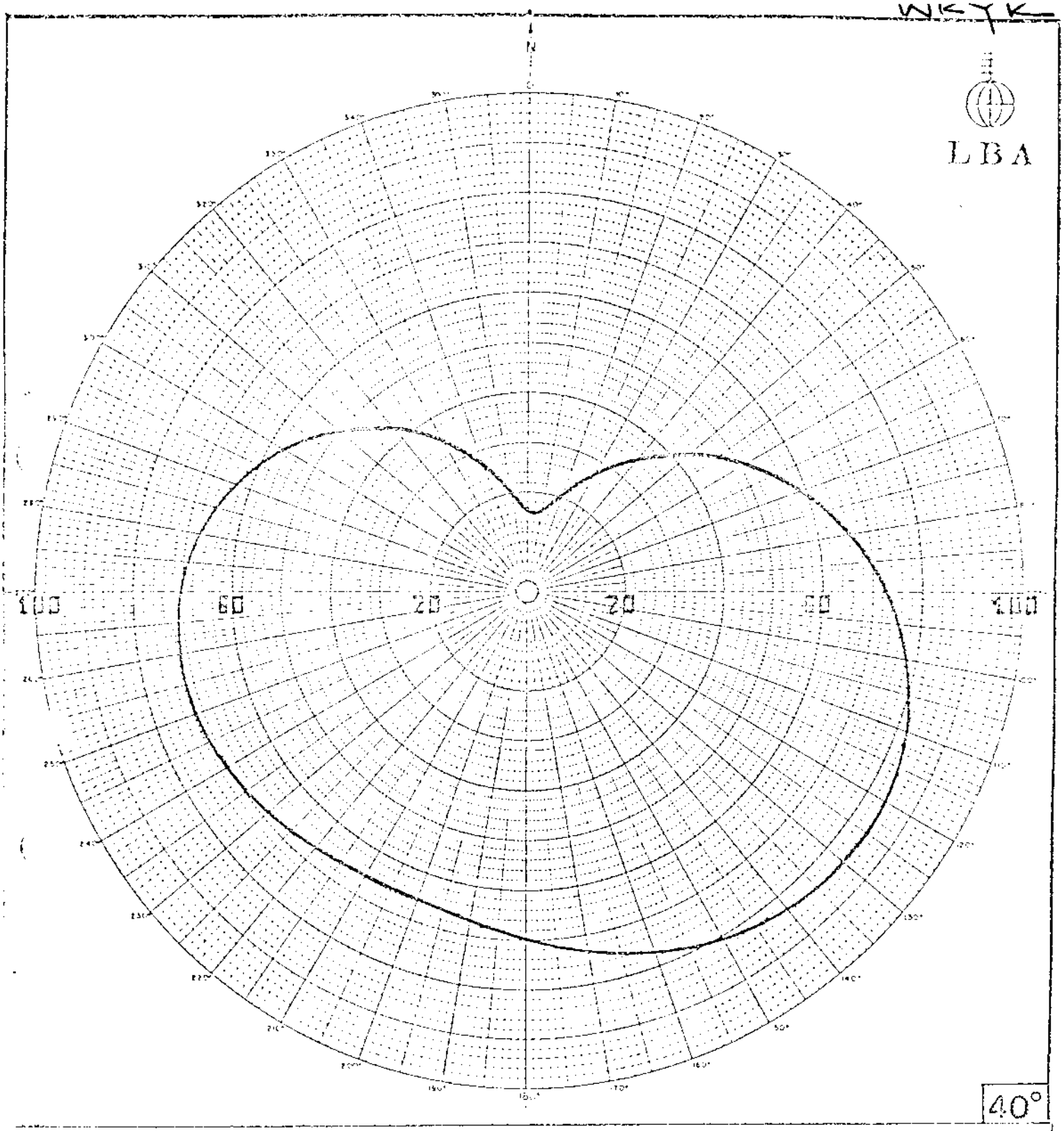


FIGURE 15

PROPOSED VERTICAL NIGHT PATTERN

RADIO STATION WKYK
BURNSVILLE, NORTH CAROLINA

3-77

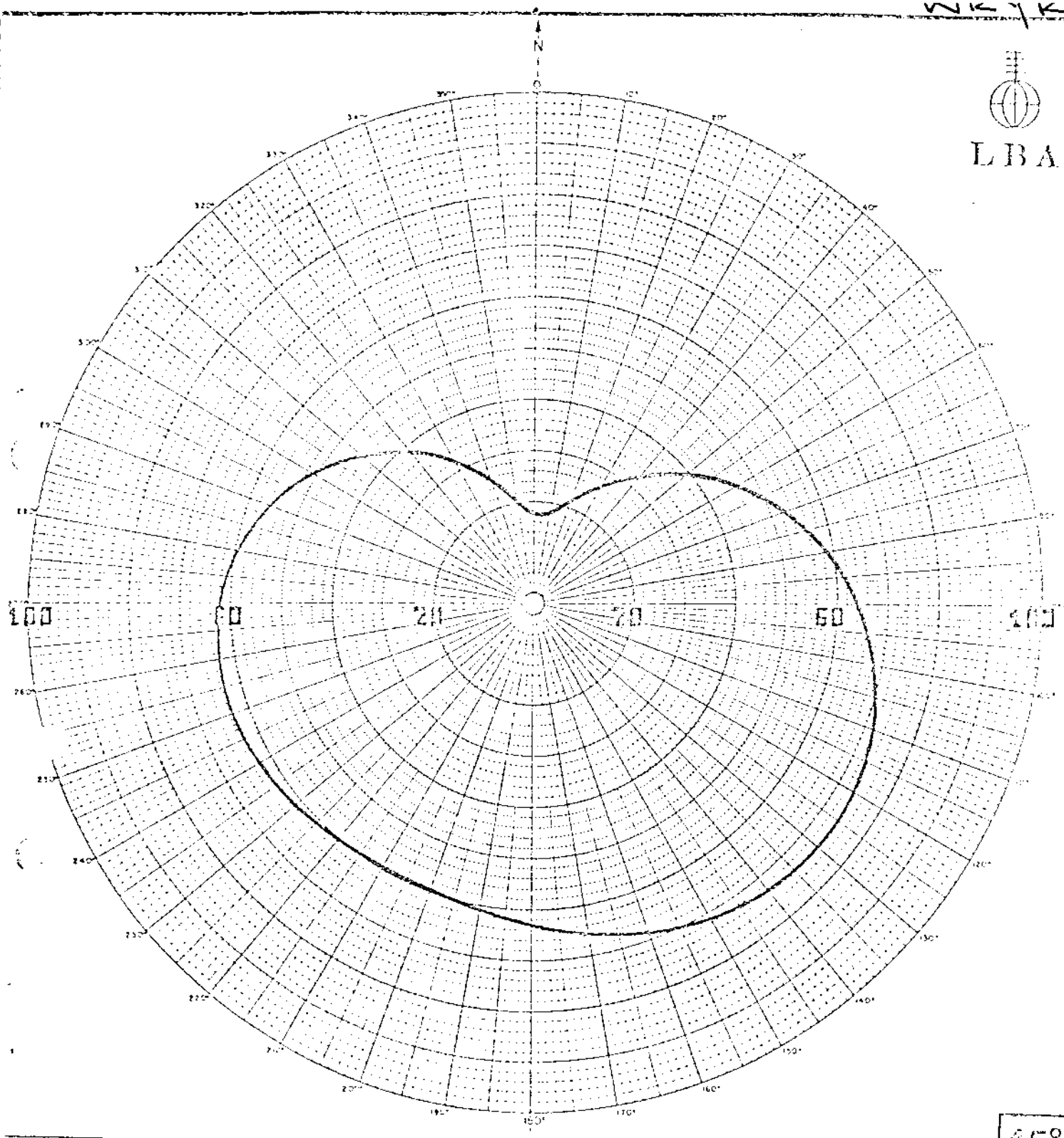


FIGURE 15J

PROPOSED VERTICAL NIGHT PATTERN

RADIO STATION WKYK
BURNSVILLE, NORTH CAROLINA

3-77

WKYK

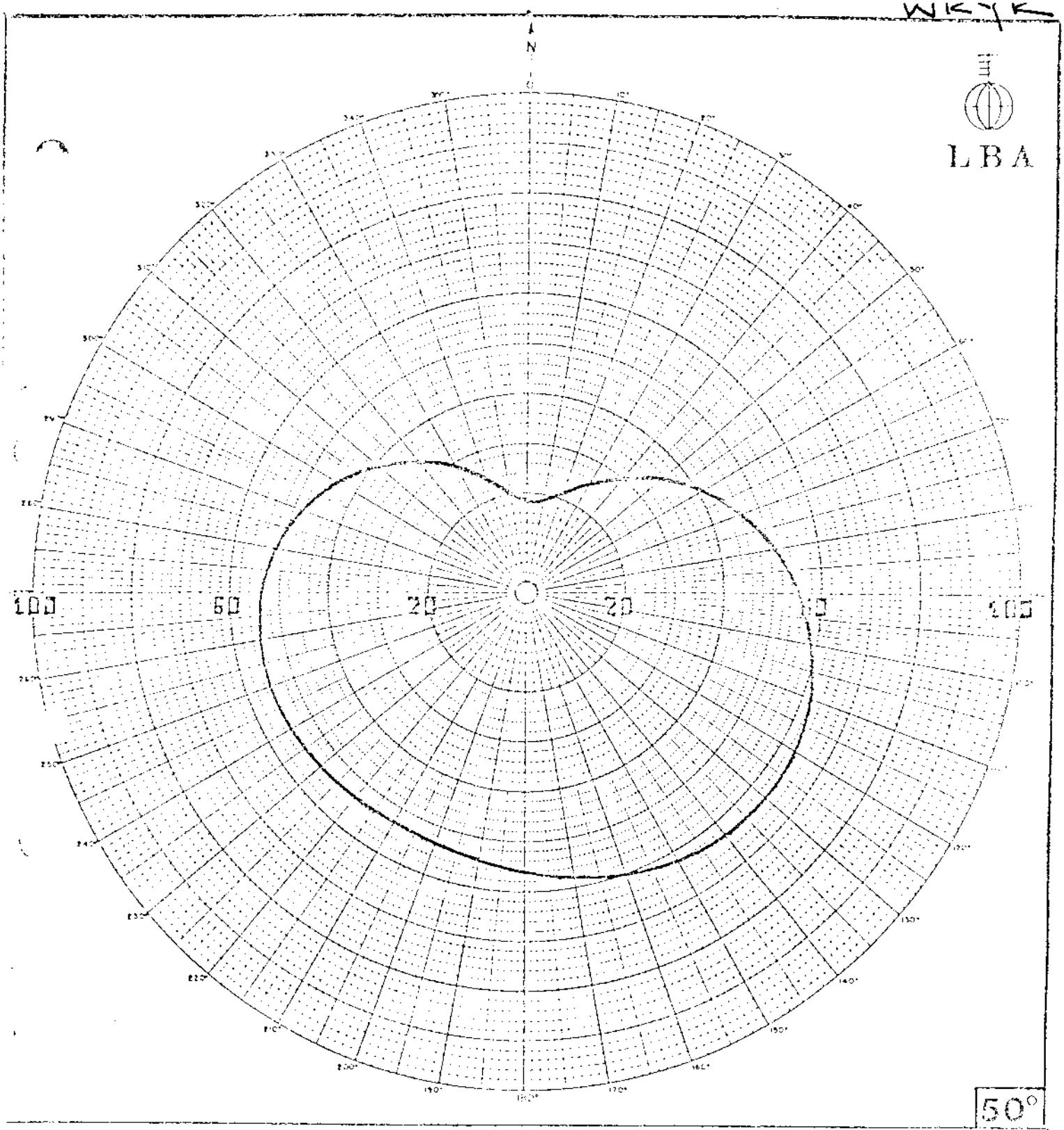


FIGURE 15K

PROPOSED VERTICAL NIGHT PATTERN

RADIO STATION WKYK
BURNSVILLE, NORTH CAROLINA

3-77

WKYK

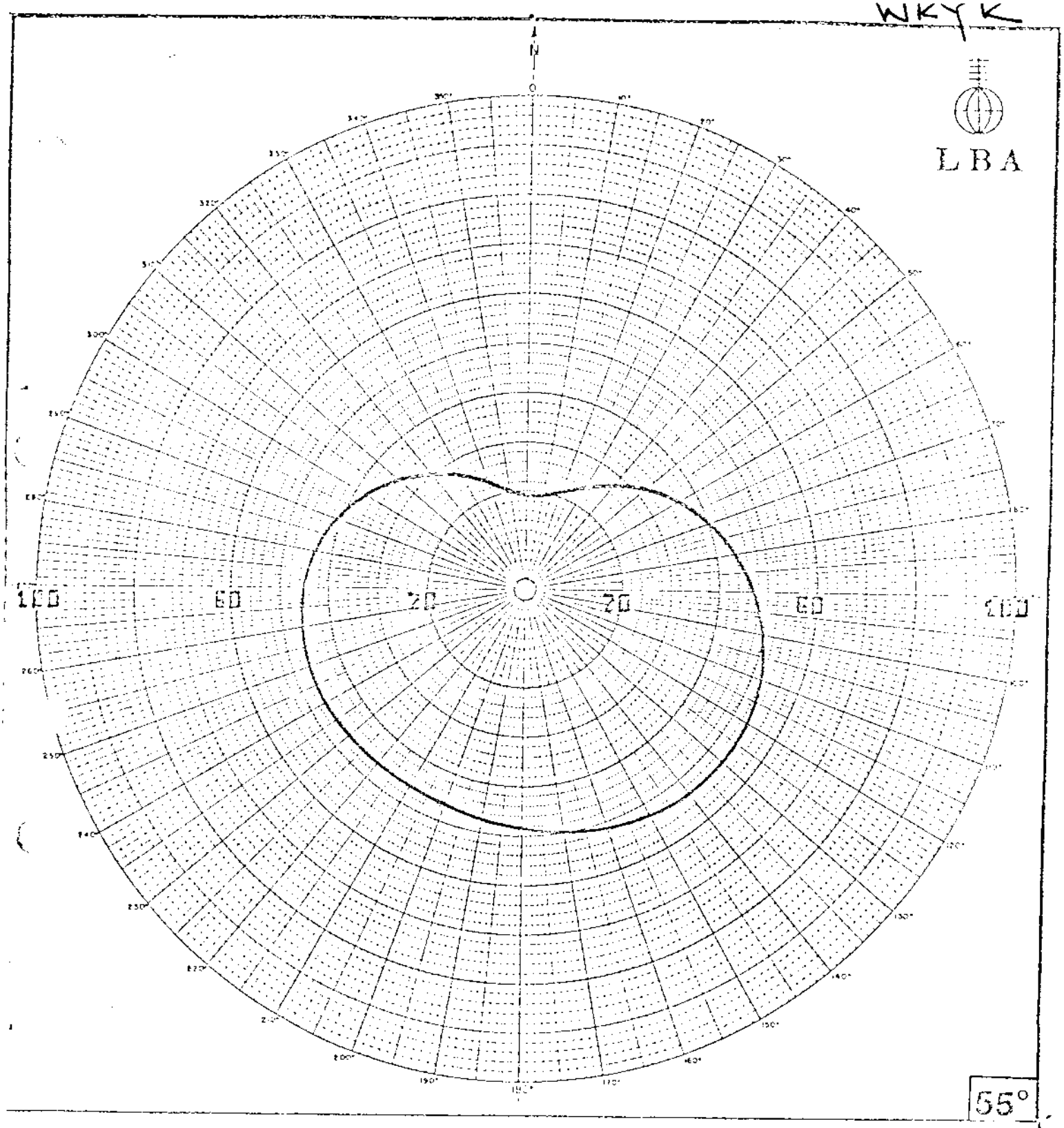


FIGURE 15L

PROPOSED VERTICAL NIGHT PATTERN

RADIO STATION WKYK
BURNSVILLE, NORTH CAROLINA

3-77

WKYK

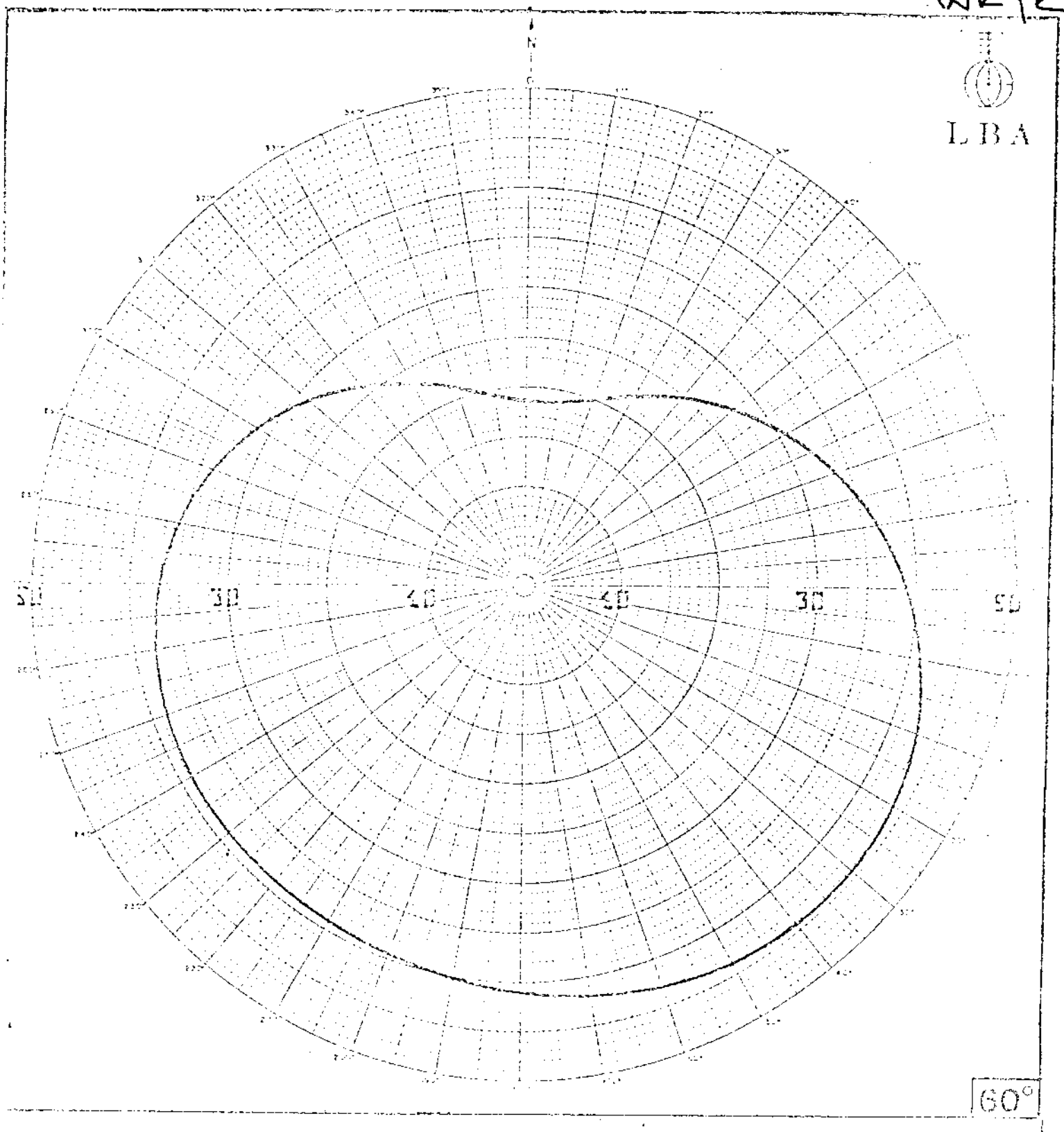


FIGURE 15M

PROPOSED VERTICAL NIGHT PATTERN

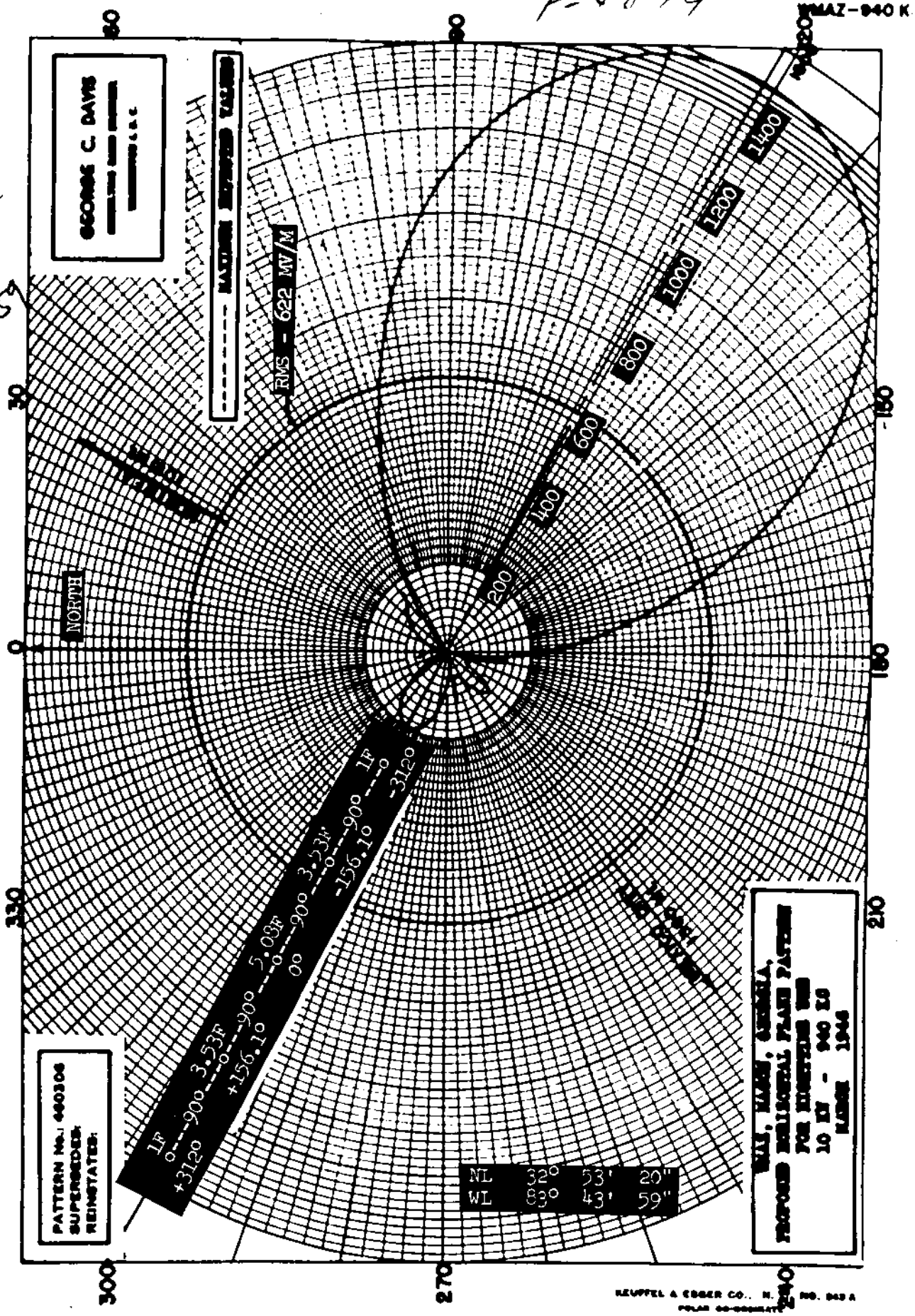
RADIO STATION WKYK
BURNSVILLE, NORTH CAROLINA

3-77

WMAZ

PROPOSED NIGHT Station WMAZ 10kw, DA-2,U
Macon, Georgia 940 KC

P-4819



Granted increase in day power to 5.0KW and from DA-2 to DA-N. (4/23/58)

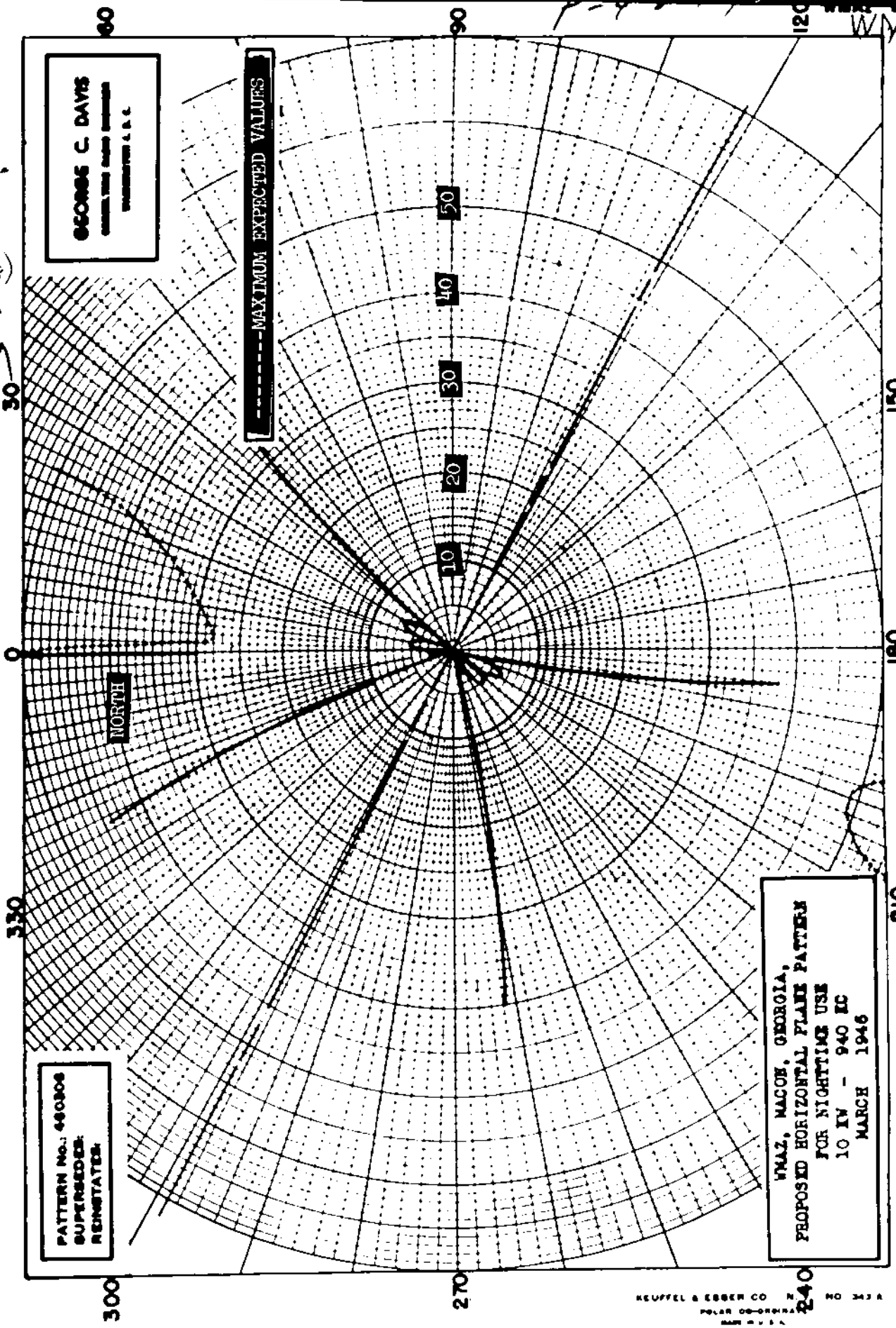
granted license 1-6-59

27

PROPOSED NIGHT NULLS Station WMAZ 10kw, DA-2,U
Macon, Georgia 940 KC

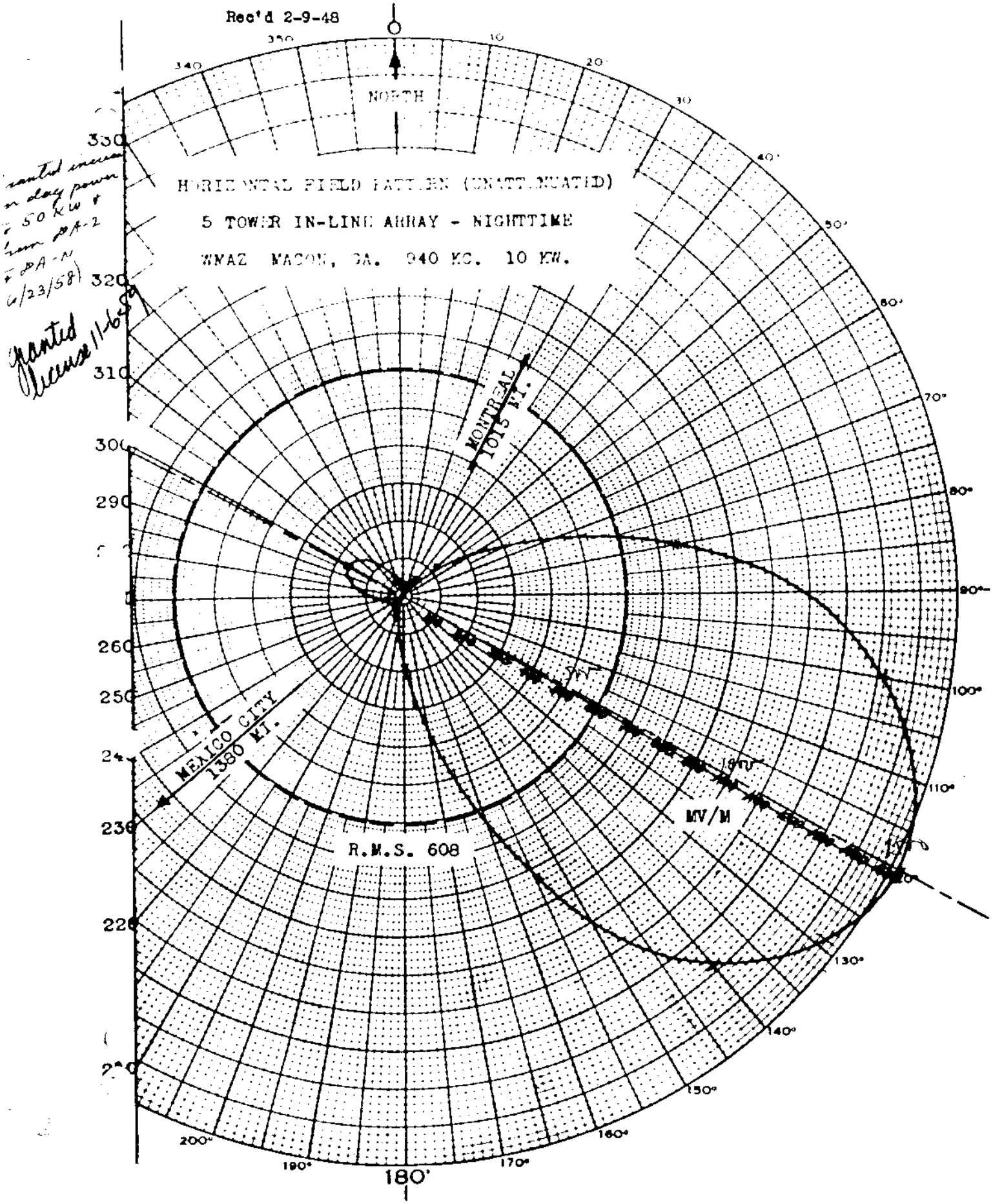
WMA

Granted increase in day power to 50 kw & from DA-2 to DA-N (6/23/58)
Granted license 11-21-57



WMAZ
940

Rec'd 2-9-48



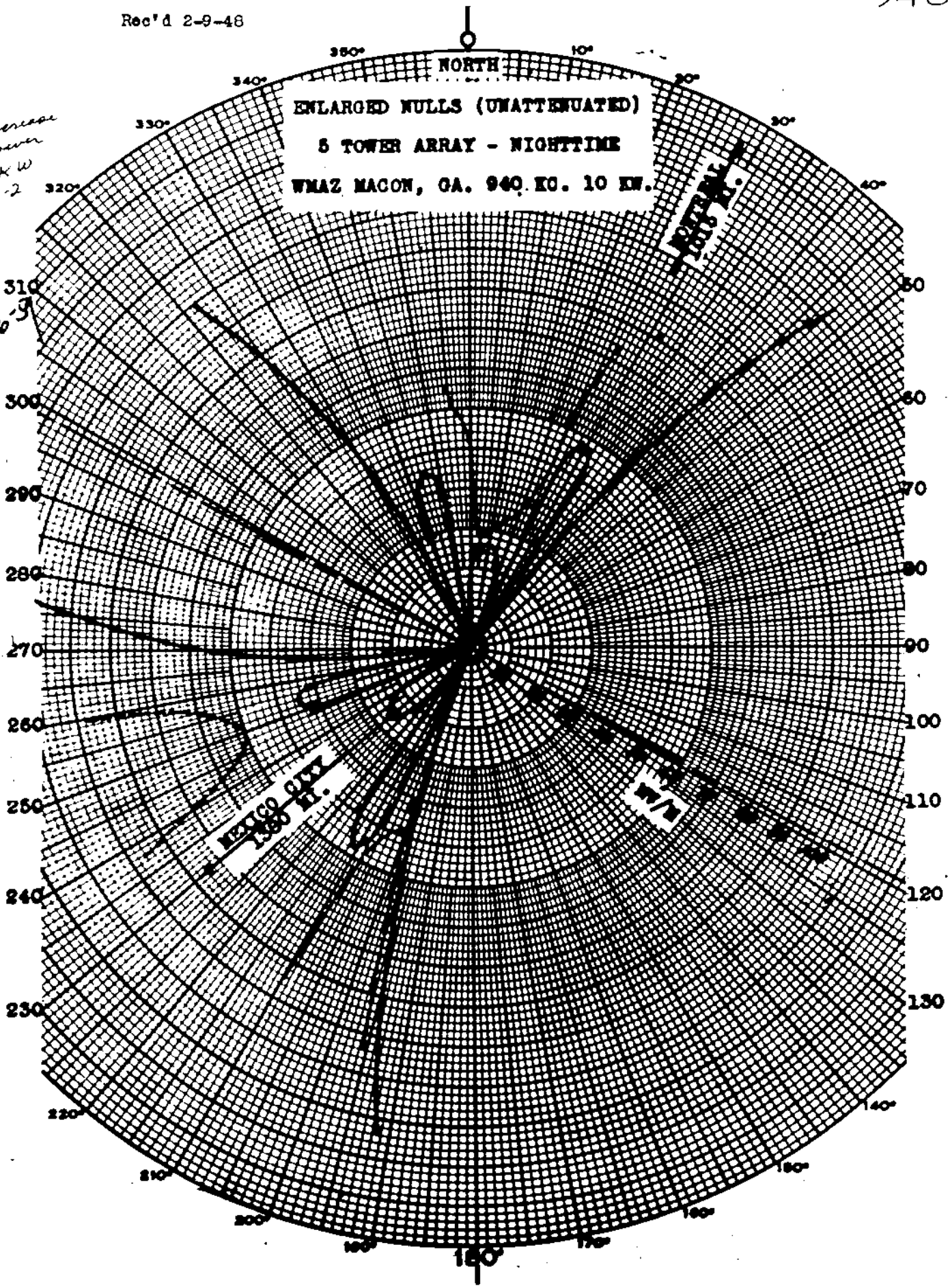
Granted license 11-6-58

WMAZ
940

Rec'd 2-9-48

Granted increase in day power ~~to~~ from 50 KW from DA-2 to DA-N 1/23/58

granted Decmx 11-6-59



WMIX

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WMIX

Main Studio: Mount Vernon, Illinois

Frequency: 940 kHz

Power: 0.5 kW Night 5 kW Day

Notification List No. 1621

Date: February 26, 1975 Class: II

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

Daytime		Nighttime	
North Latitude:	38° 22' 14"	North Latitude:	38° 21' 15"
West Longitude:	88° 55' 24"	West Longitude:	89° 00' 29"

Authorized for Daytime and Nighttime operation (DA-2).

DAYTIME ANTENNA CHARACTERISTICS

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

TOWER:	W(#2)	E(#1)
HEIGHT ABOVE INSULATORS:	264' (90°)	509' (174°)
PHASING:	+20°	0°
FIELD RATIO:	0.57	1

SPACING AND ORIENTATION: Elements are spaced 569.77' (196°) on a line bearing 270° true.

GROUND SYSTEM: 120-245' to 450' equally spaced copper radials plus a 40' square ground screen about tower #1, and 120-260' equally spaced copper radials about tower #2.

Predicted effective Day Field: 468 mv/m at rated power.

NIGHTTIME ANTENNA CHARACTERISTICS

MODIFIED STANDARD PATTERN

Number of elements: 3
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	N(#3)	C(#2)	S(#1)
HEIGHT ABOVE INSULATORS:	300'	300'	300' (103.2°)
PHASING:	+37.4°	+23.3°	0°
FIELD RATIO:	1.00	1.89	1.00

SPACING AND ORIENTATION: Adjacent elements are spaced 581.3' (200°) on a line bearing 15° true.

GROUND SYSTEM: 120-262' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are extended and bonded to transverse straps along intersections between towers.

Predicted effective Night Field at rated power:

THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
127.9 mv/m	165.1 mv/m	134.3 mv/m

MODIFIED PATTERN AUGMENTATION

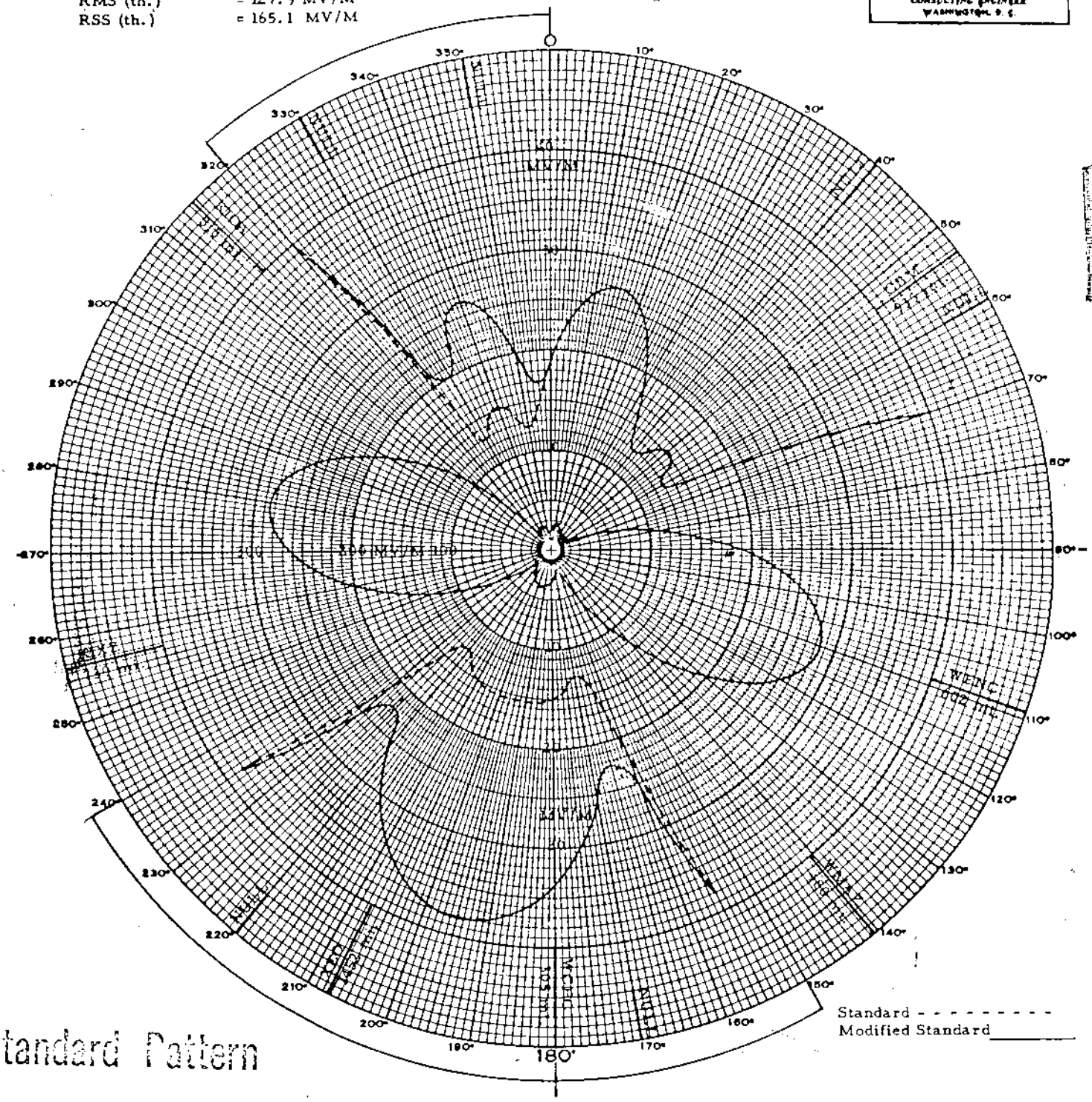
Azimuth of Maximum Augmentation	Augmented Radiation E_2	Span of Augmentation	
		From:	To:
195°	35,000 mv/m	150°	240°
340°	21,744 mv/m	320°	0°

NOTE: Please retain the Daytime directional antenna radiation pattern notified for Station WMIX in United States Change List Number 912, dated June 7, 1961, and attach to this Revised Description Sheet and Nighttime pattern. This notification concerns changes to add new Nighttime operation of the station and corrections to the Daytime transmitter location and antenna height.

WMIX

RMS (mod. std.) = 134.7 MV/M
RMS (std.) = 134.3 MV/M
RMS (th.) = 127.9 MV/M
RSS (th.) = 165.1 MV/M

WILLIS B. MECHLIN
CONSULTING ENGINEER
WASHINGTON, D. C.



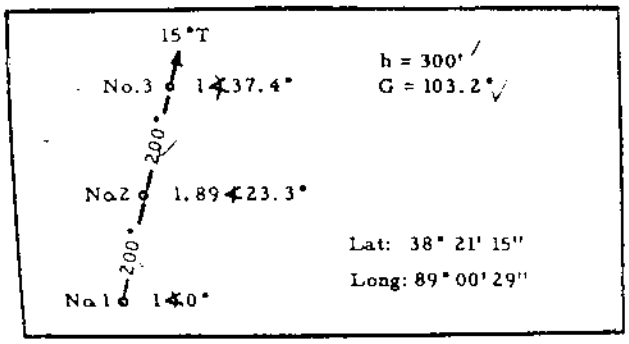


FIGURE 7

CALCULATED NIGHTTIME

MODIFIED STANDARD HORIZONTAL PATTERN

WITHERS BROADCASTING COMPANY OF ILLINOIS

WMIX, MOUNT VERNON, ILLINOIS

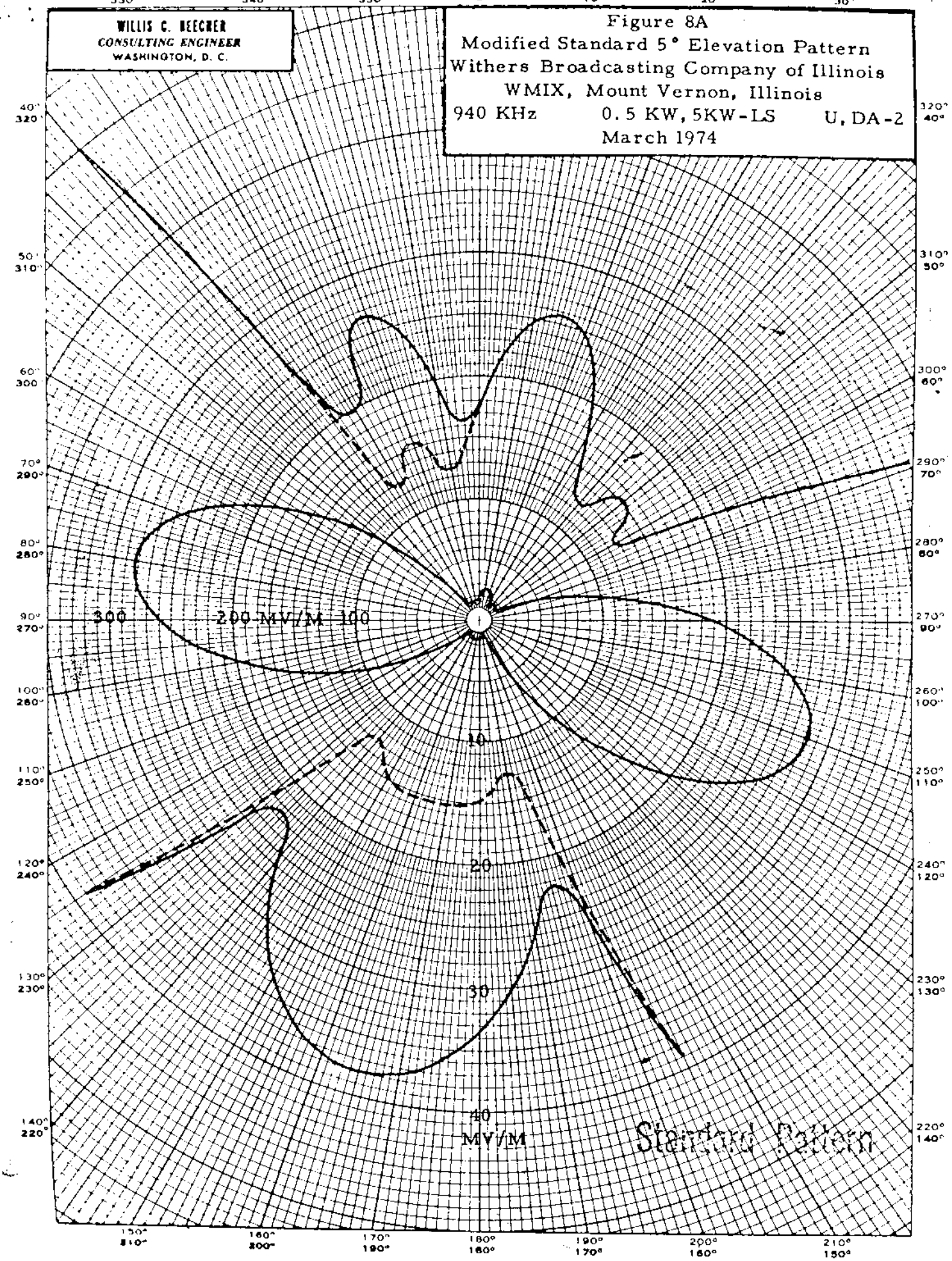
940 KHz 0.5 KW, 5 KW-LS U, DA-2

MARCH 1974

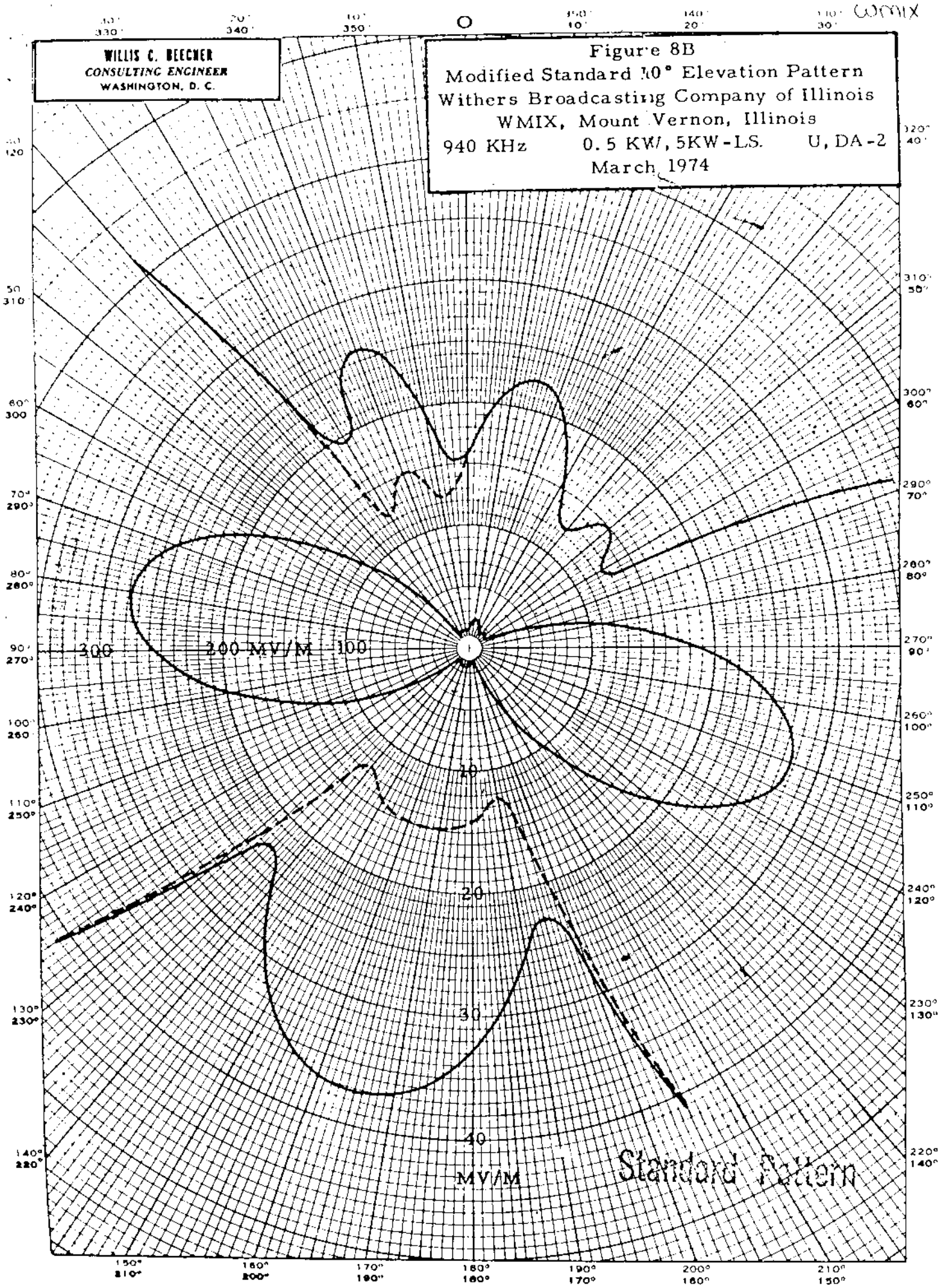
WMIX

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

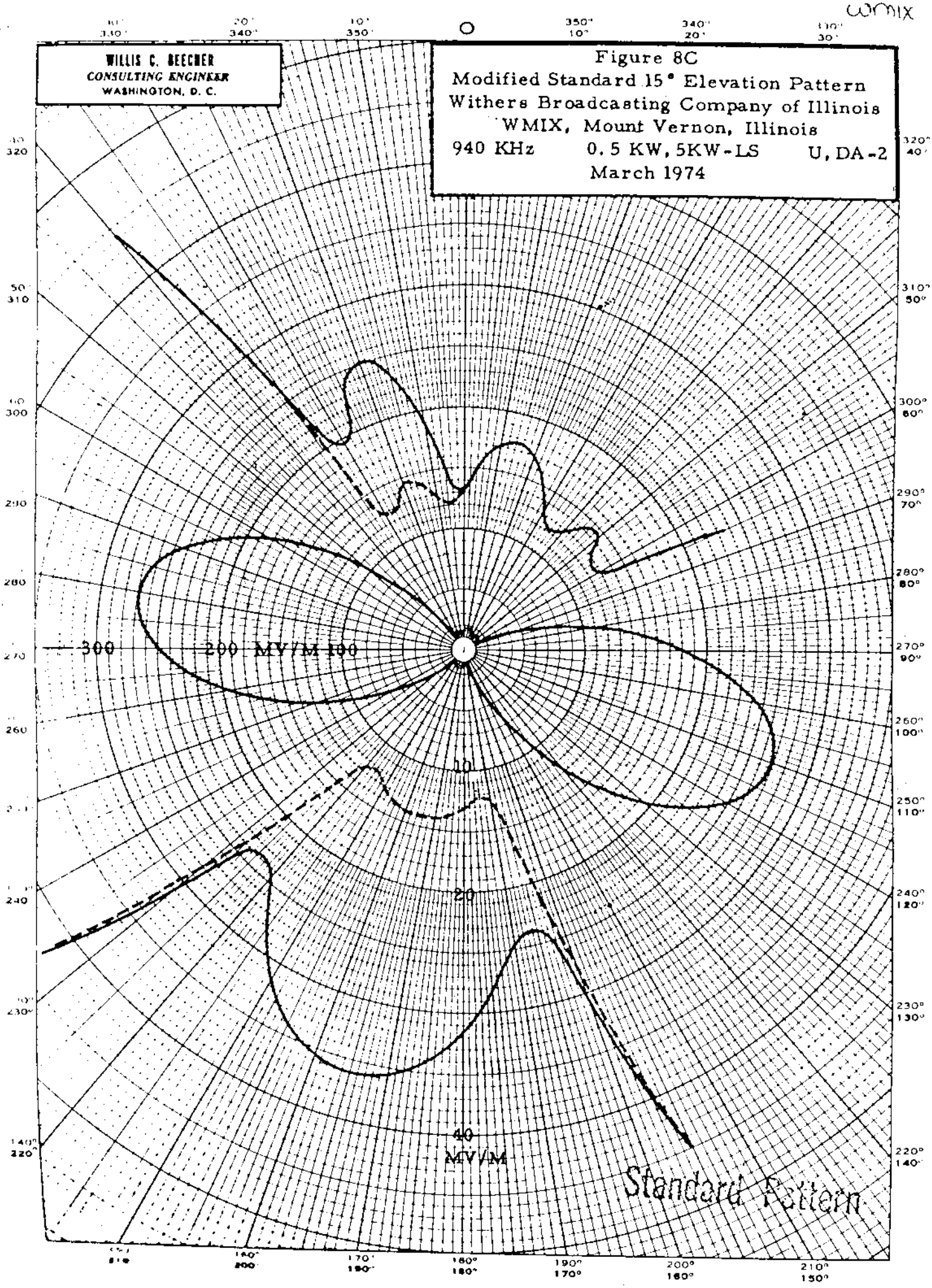
Figure 8A
Modified Standard 5° Elevation Pattern
Withers Broadcasting Company of Illinois
WMIX, Mount Vernon, Illinois
940 KHz 0.5 KW, 5KW-LS U, DA-2
March 1974



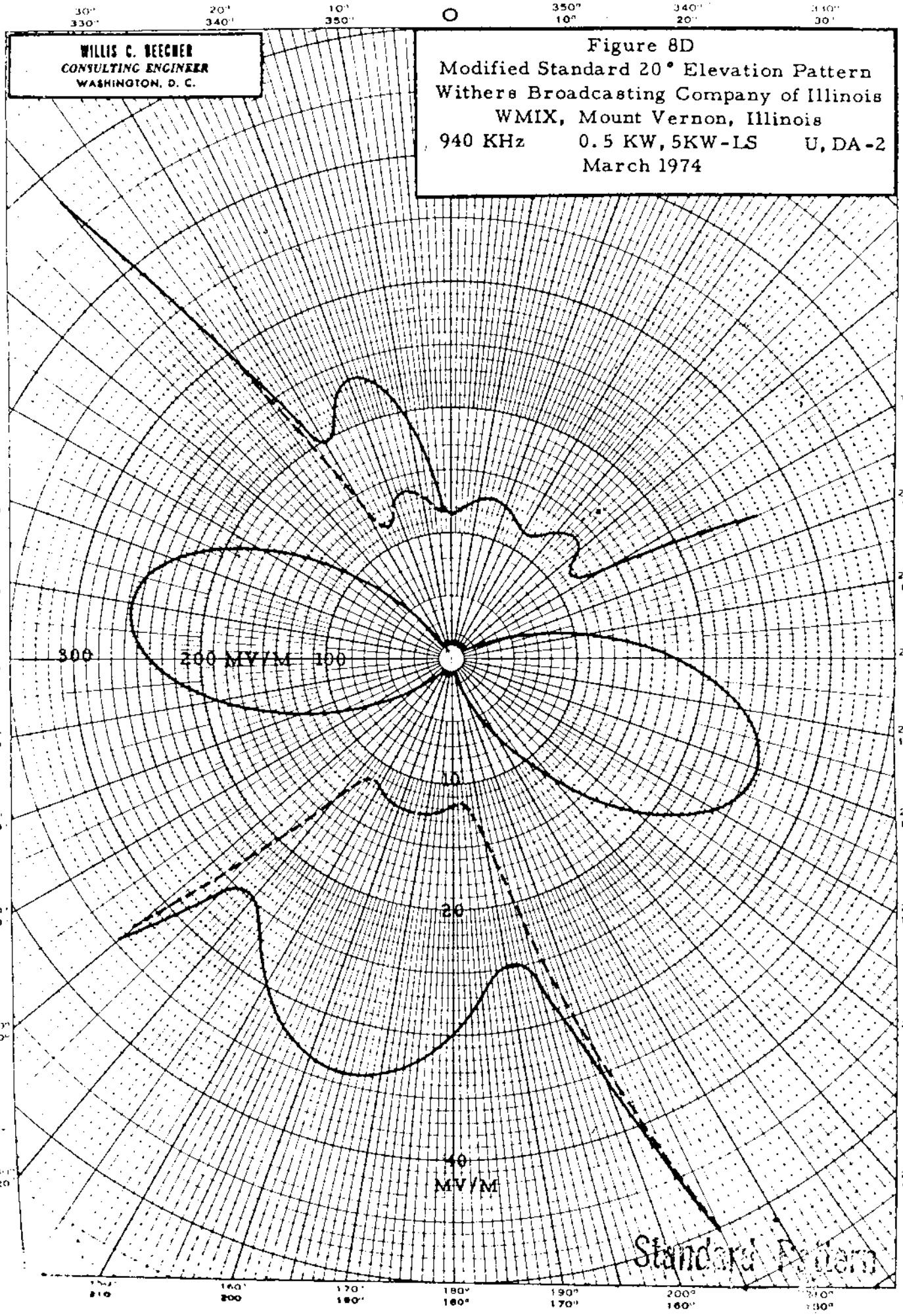
WMIX


WILLIS C. BEECHER
CONSULTING ENGINEER
WASHINGTON, D. C.
Figure 8B
Modified Standard 10° Elevation Pattern
Withers Broadcasting Company of Illinois
WMIX, Mount Vernon, Illinois
940 KHz 0.5 KW, 5KW-LS. U, DA-2
March 1974
300
200 MV/M
100
10
20
30
40
MV/M
Standard Pattern

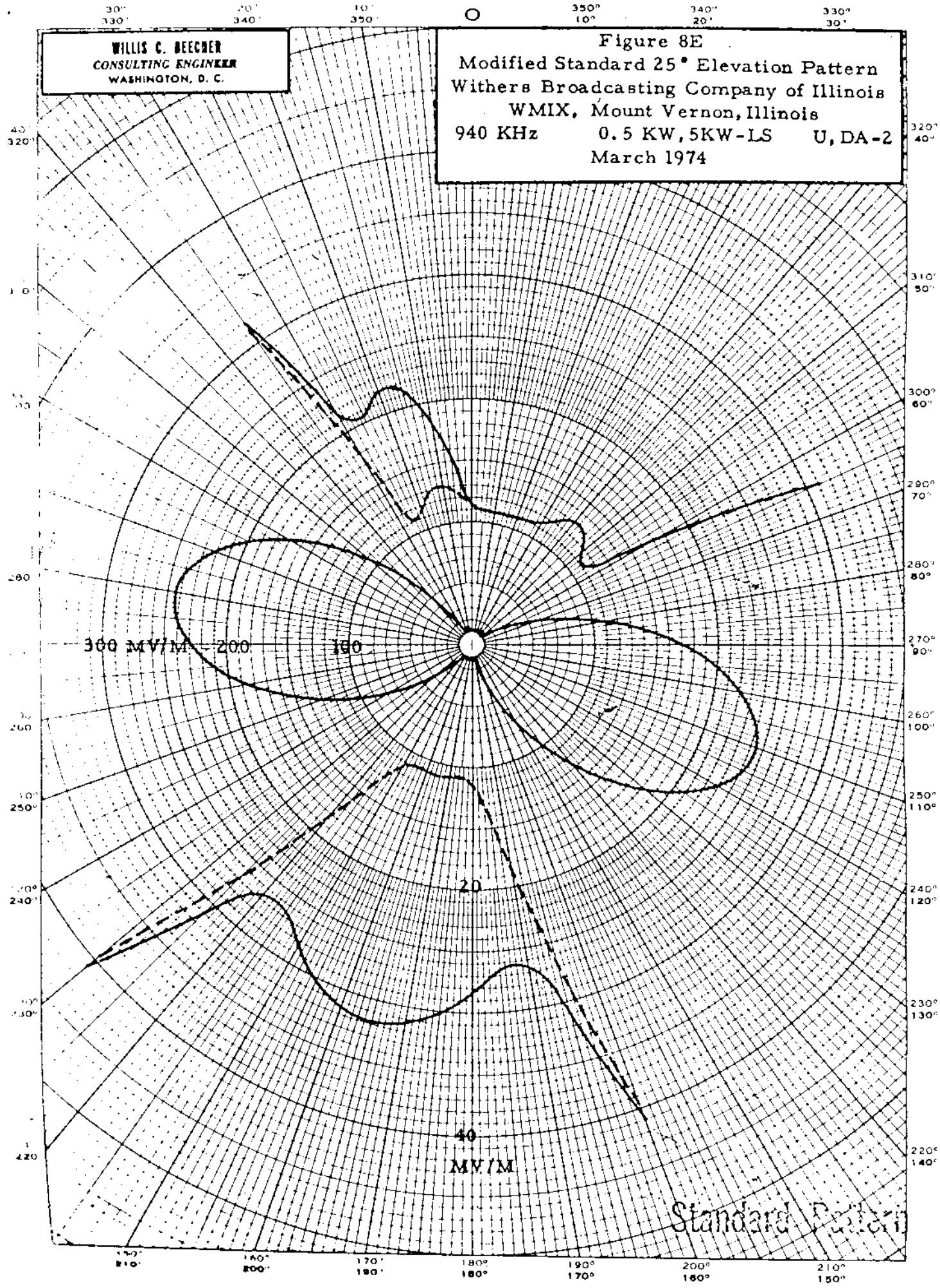
WMIX


WILLIS C. BEECHER
CONSULTING ENGINEER
WASHINGTON, D. C.
Figure 8C
Modified Standard 15° Elevation Pattern
Withers Broadcasting Company of Illinois
WMIX, Mount Vernon, Illinois
940 KHz 0.5 KW, 5KW-LS U, DA-2
March 1974
300
200 MV/M 100
10
20
40
MV/M
Standard Pattern

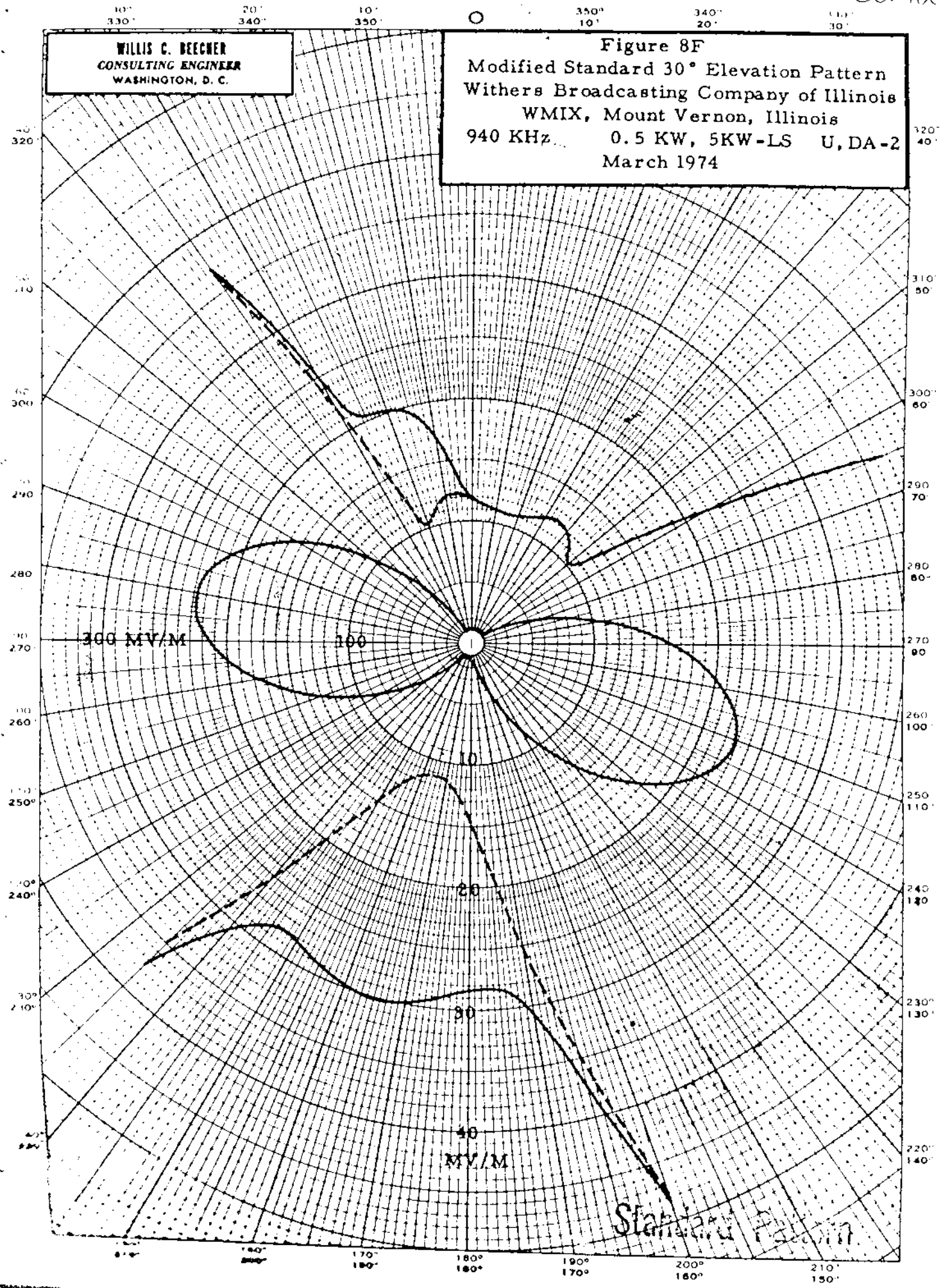
WMIX


WILLIS C. BEECHER
CONSULTING ENGINEER
WASHINGTON, D. C.
Figure 8D
Modified Standard 20° Elevation Pattern
Withers Broadcasting Company of Illinois
WMIX, Mount Vernon, Illinois
940 KHz 0.5 KW, 5KW-LS U, DA-2
March 1974
300
200 MV/M
100
10
20
40
MV/M
Standard Pattern

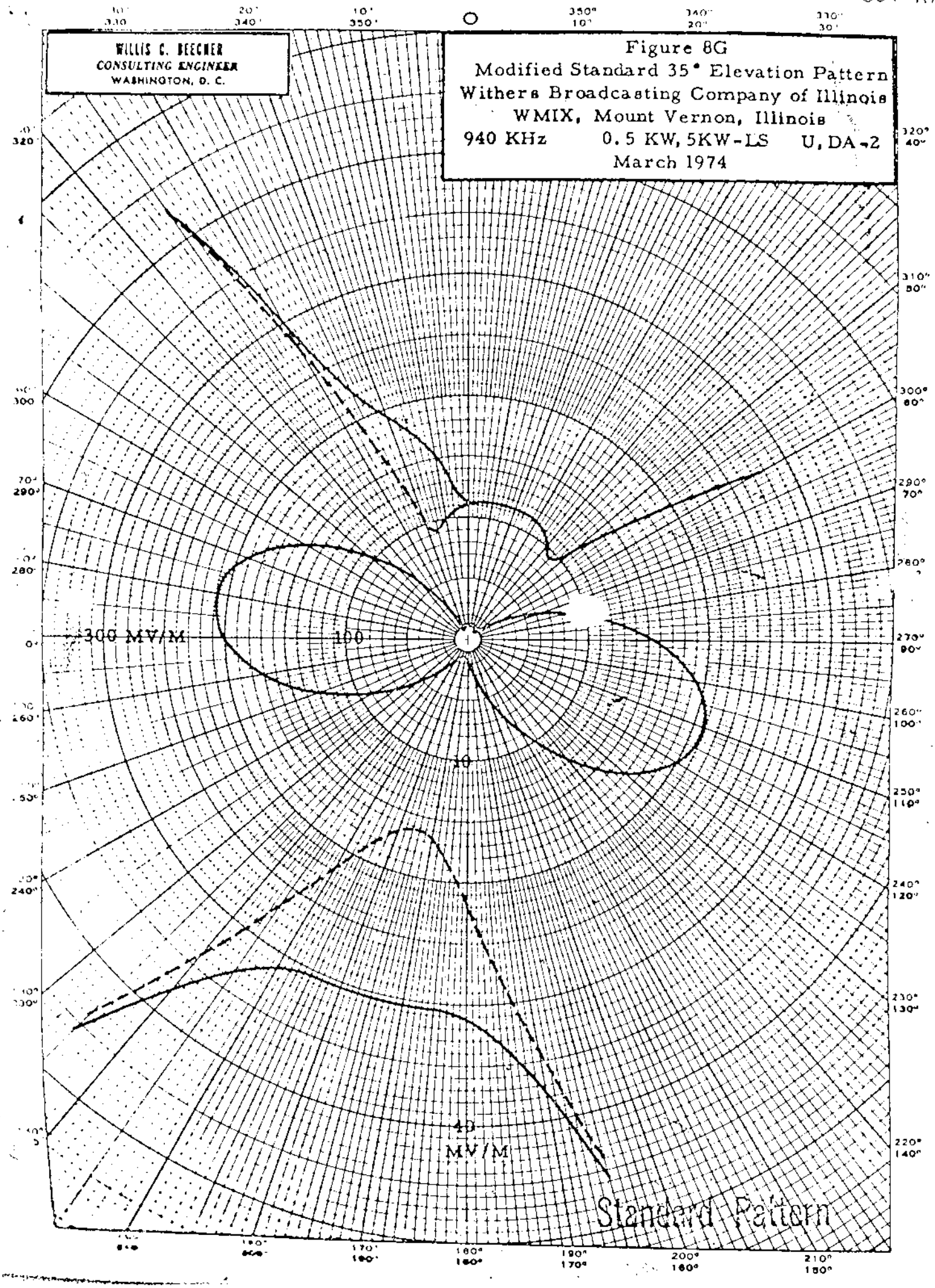
WMIX


WILLIS C. BEECHER
CONSULTING ENGINEER
WASHINGTON, D. C.
Figure 8E
Modified Standard 25° Elevation Pattern
Withers Broadcasting Company of Illinois
WMIX, Mount Vernon, Illinois
940 KHz 0.5 KW, 5KW-LS U, DA-2
March 1974
300 MV/M
200
100
20
40
MV/M
Standard Pattern

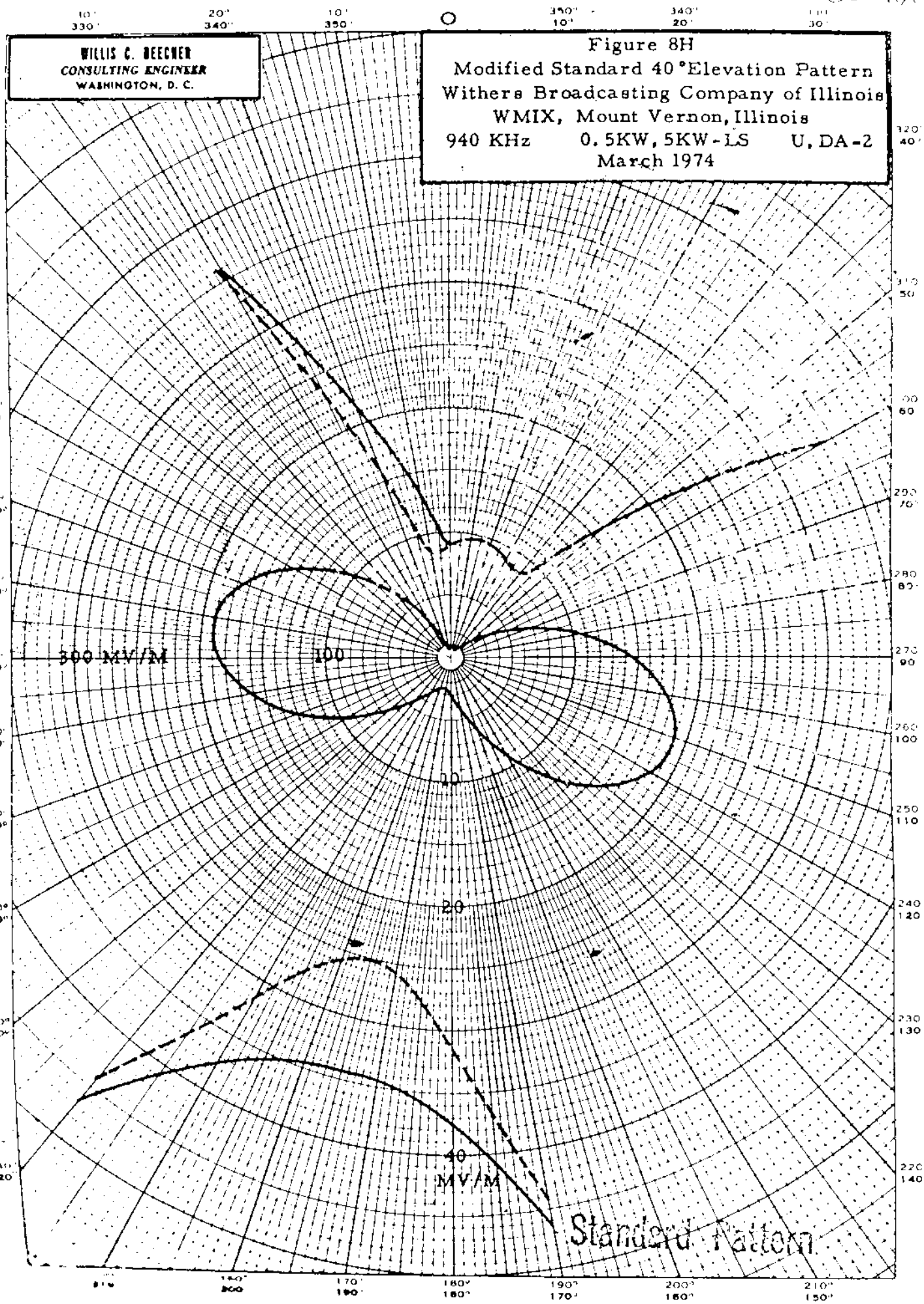
WMIX


WILLIS C. BEECHER
CONSULTING ENGINEER
WASHINGTON, D. C.
Figure 8F
Modified Standard 30° Elevation Pattern
Withers Broadcasting Company of Illinois
WMIX, Mount Vernon, Illinois
940 KHz 0.5 KW, 5KW-LS U, DA-2
March 1974
300 MV/M
100
10
20
30
40
MV/M
Standard Pattern

WMIX


WILLIS C. BEECHER
CONSULTING ENGINEER
WASHINGTON, D. C.
Figure 8G
Modified Standard 35° Elevation Pattern
Withers Broadcasting Company of Illinois
WMIX, Mount Vernon, Illinois
940 KHz 0.5 KW, 5KW-LS U, DA-2
March 1974
300 MV/M
100
10
1.0
MV/M
Standard Pattern

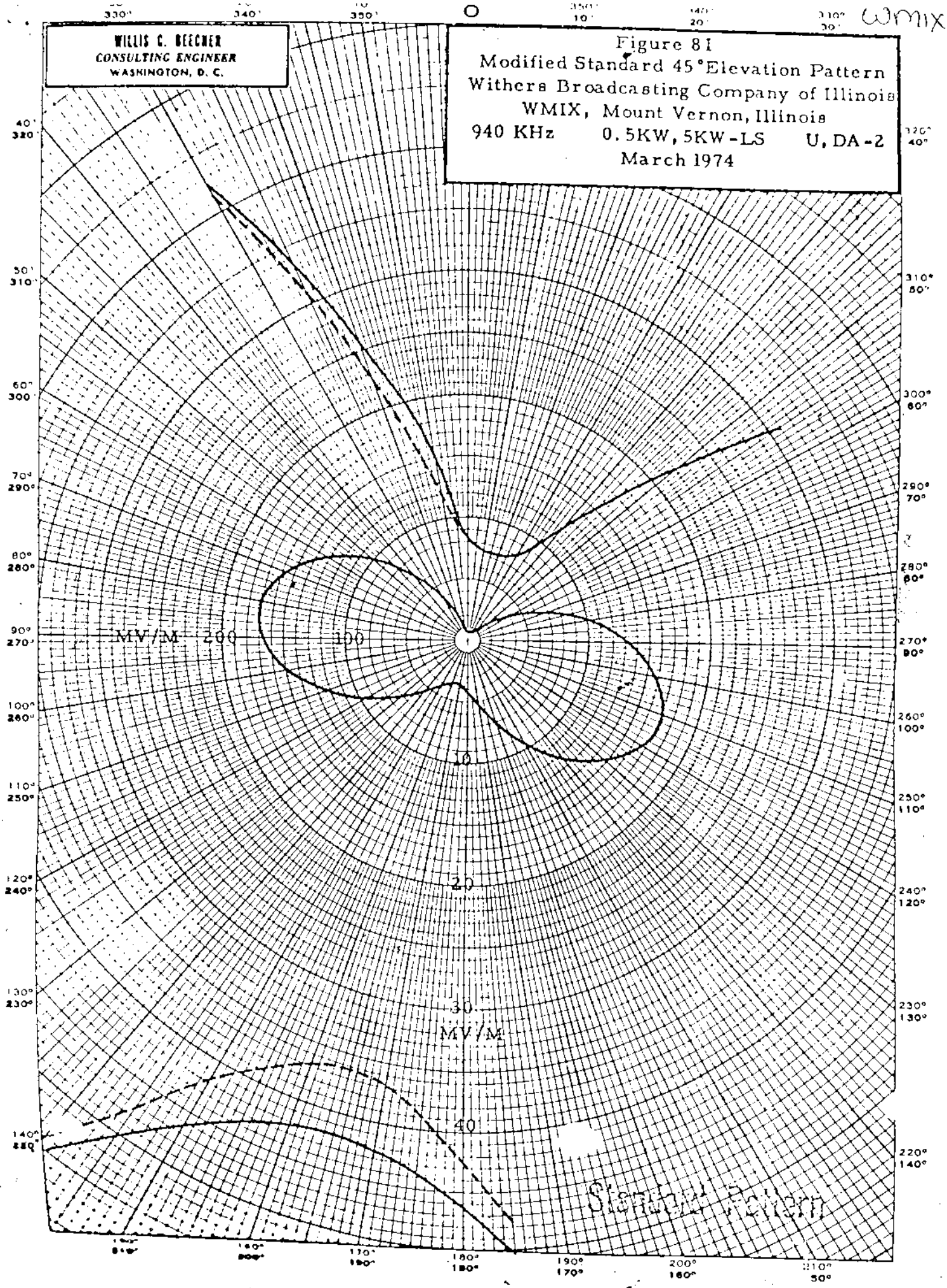
WMIX


WILLIS C. BEECHER
CONSULTING ENGINEER
WASHINGTON, D. C.
Figure 8H
Modified Standard 40°Elevation Pattern
Withers Broadcasting Company of Illinois
WMIX, Mount Vernon, Illinois
940 KHz 0.5KW, 5KW-LS U, DA-2
March 1974
300 MV/M
100
10
20
40
MV/M
Standard Pattern

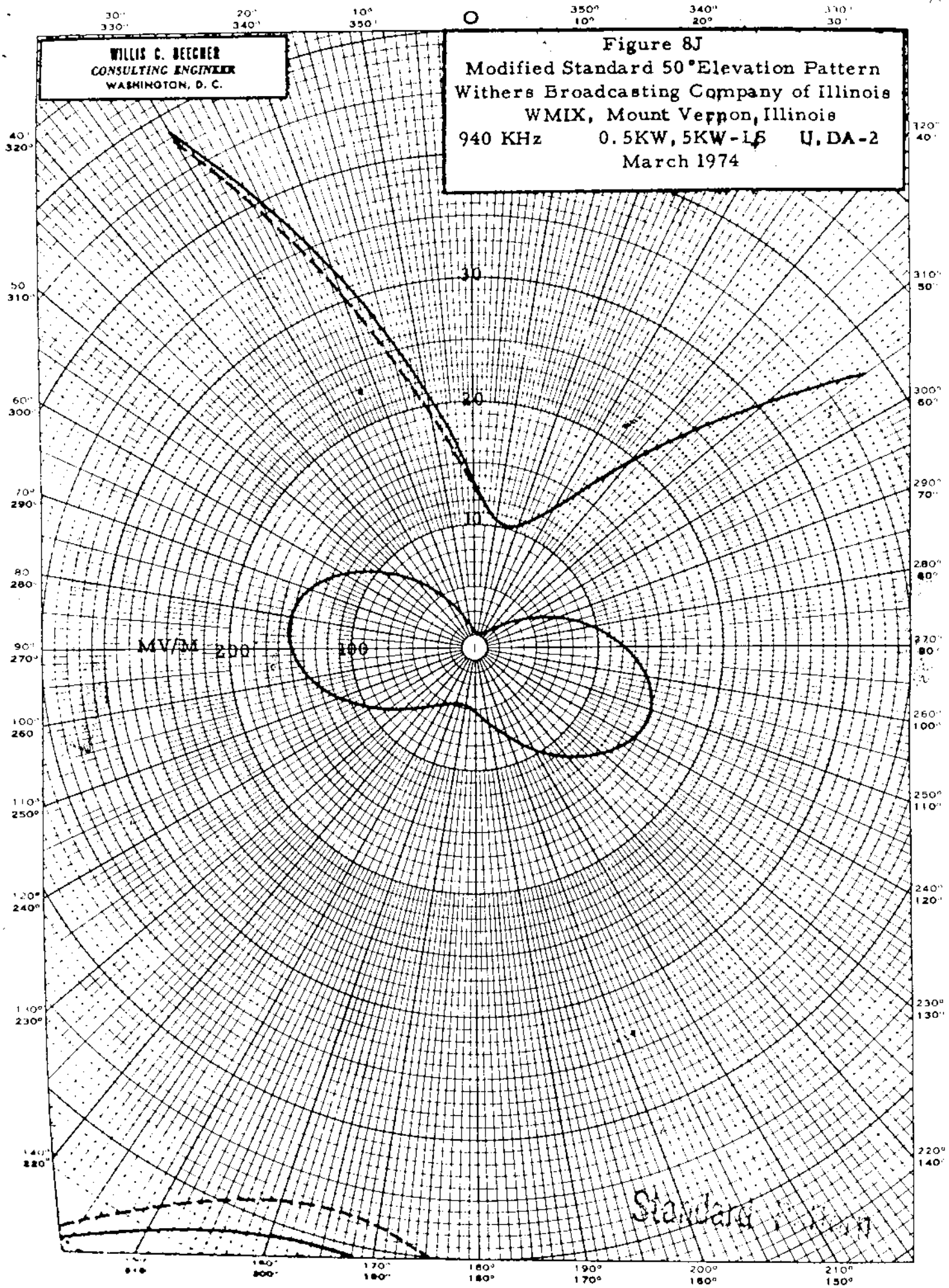
WMIX

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

Figure 8I
Modified Standard 45°Elevation Pattern
Withers Broadcasting Company of Illinois
WMIX, Mount Vernon, Illinois
940 KHz 0.5KW, 5KW-LS U, DA-2
March 1974



WMIX


WILLIS C. BEECHER
CONSULTING ENGINEER
WASHINGTON, D. C.
Figure 8J
Modified Standard 50° Elevation Pattern
Withers Broadcasting Company of Illinois
WMIX, Mount Vernon, Illinois
940 KHz 0.5KW, 5KW-LS U, DA-2
March 1974
MV/M
200
100
30
20
10
Standard Pattern

WMIX

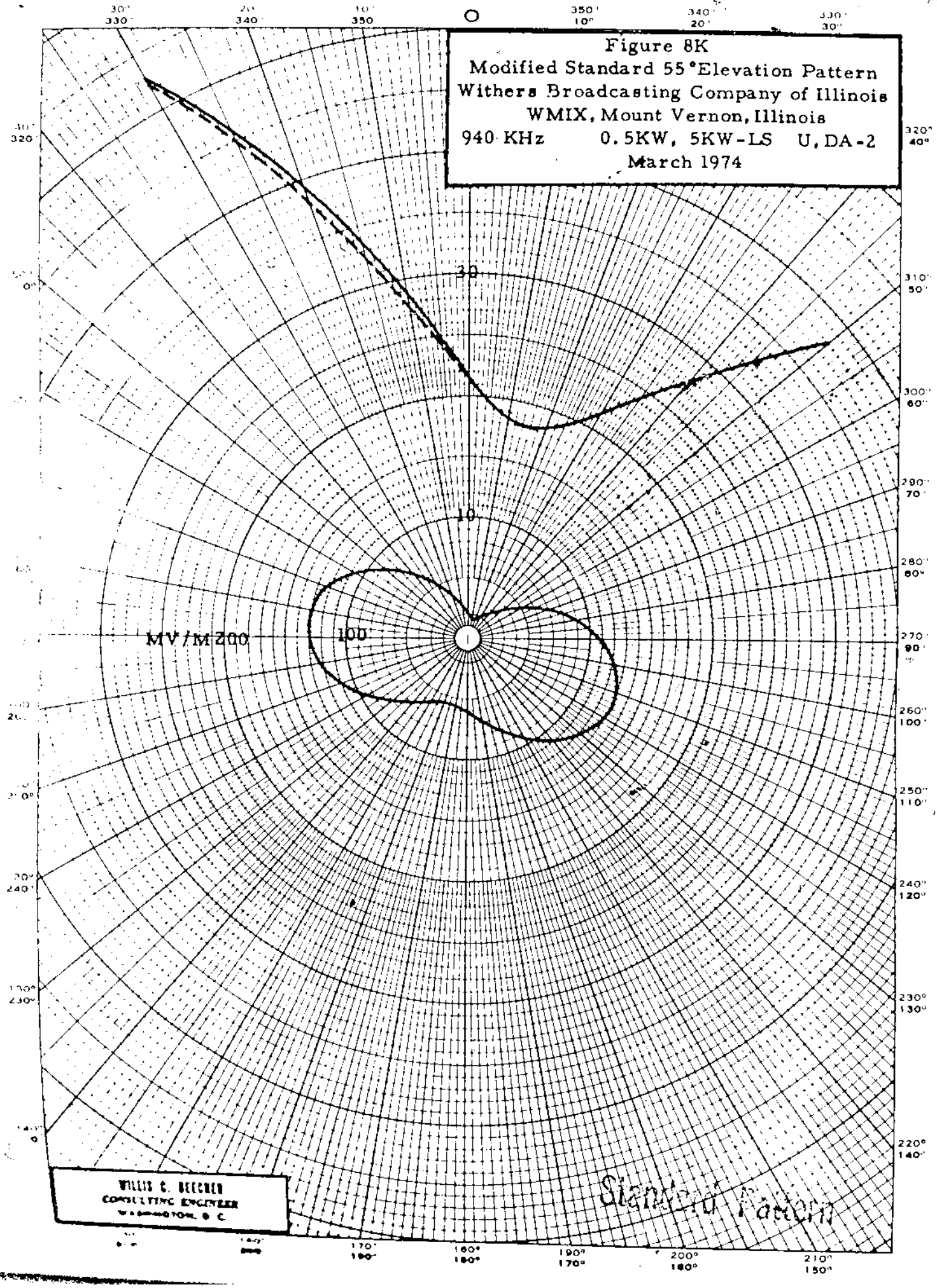


Figure 8K
Modified Standard 55° Elevation Pattern
Withers Broadcasting Company of Illinois
WMIX, Mount Vernon, Illinois
940 KHz 0.5KW, 5KW-LS U, DA-2
March 1974
30
10
MV/M 200
100
WILLIS C. BECCHER
CONSULTING ENGINEER
WASHINGTON, D. C.
Standard Pattern

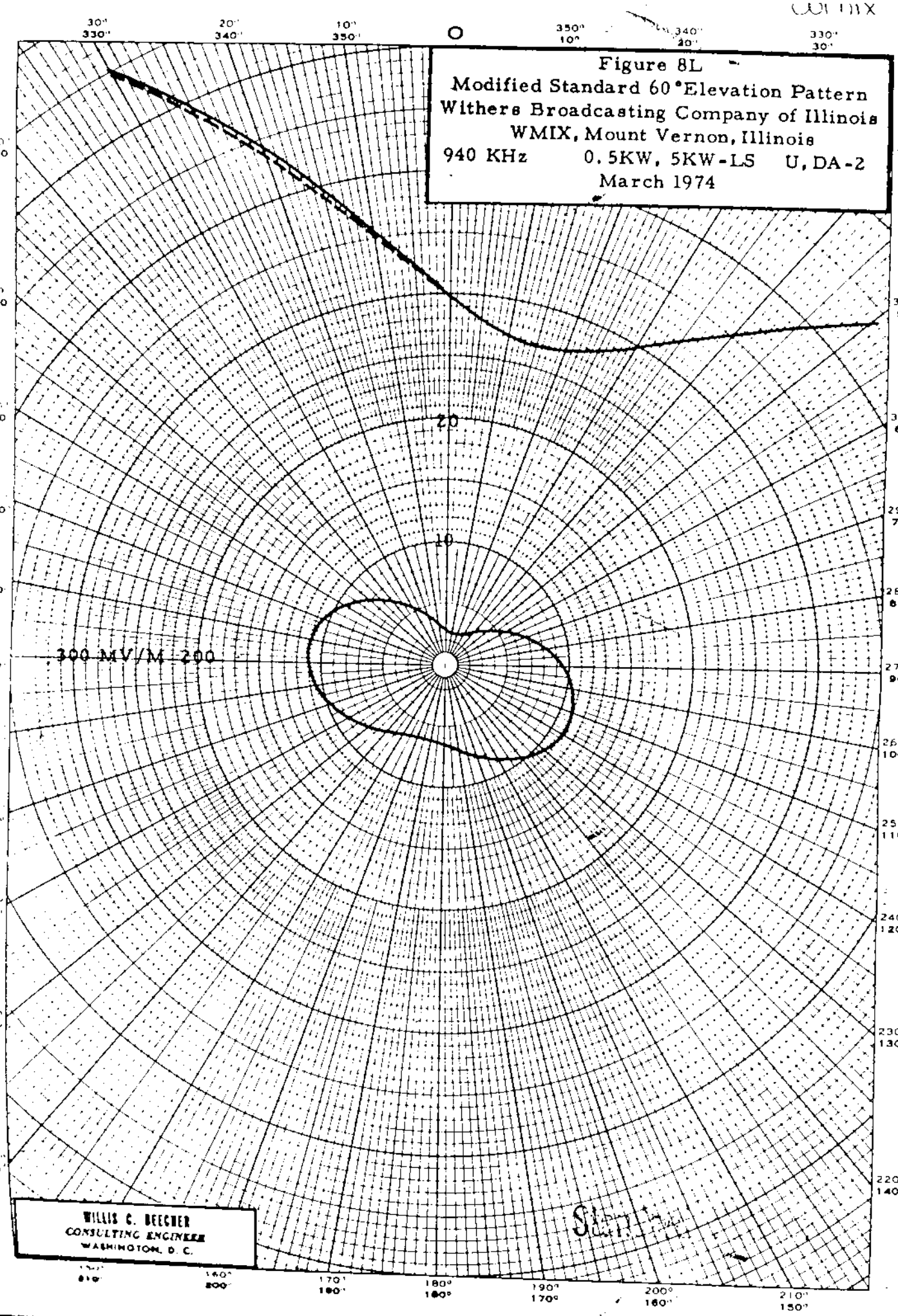


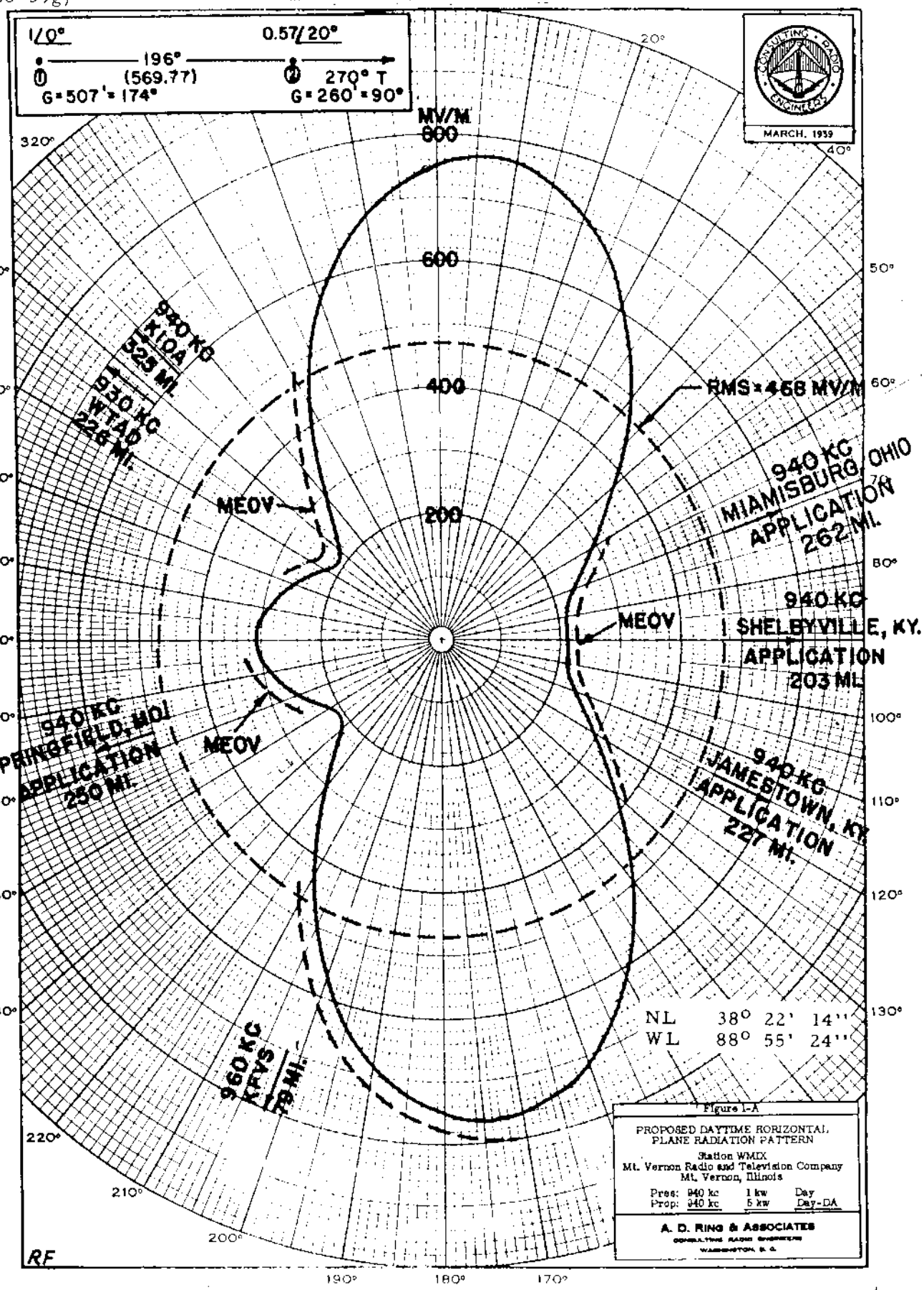
Figure 8L
Modified Standard 60° Elevation Pattern
Withers Broadcasting Company of Illinois
WMIX, Mount Vernon, Illinois
940 KHz 0.5KW, 5KW-LS U, DA-2
March 1974
20
10
300 MV/M 200
WILLIS C. BEECHER
CONSULTING ENGINEER
WASHINGTON, D. C.

WMIX

PROPOSED DAY
(5-28-59g)

Station WMIX
Mt. Vernon, Illinois

5kw, DA-D,D
940 KC



A. D. RING & ASSOCIATES - 1/54 - M

FCC File No. BP-11829
Accepted 4-21-59 (Amended)

WMIX
Mt. Vernon, Illinois

940 KC

WMIX

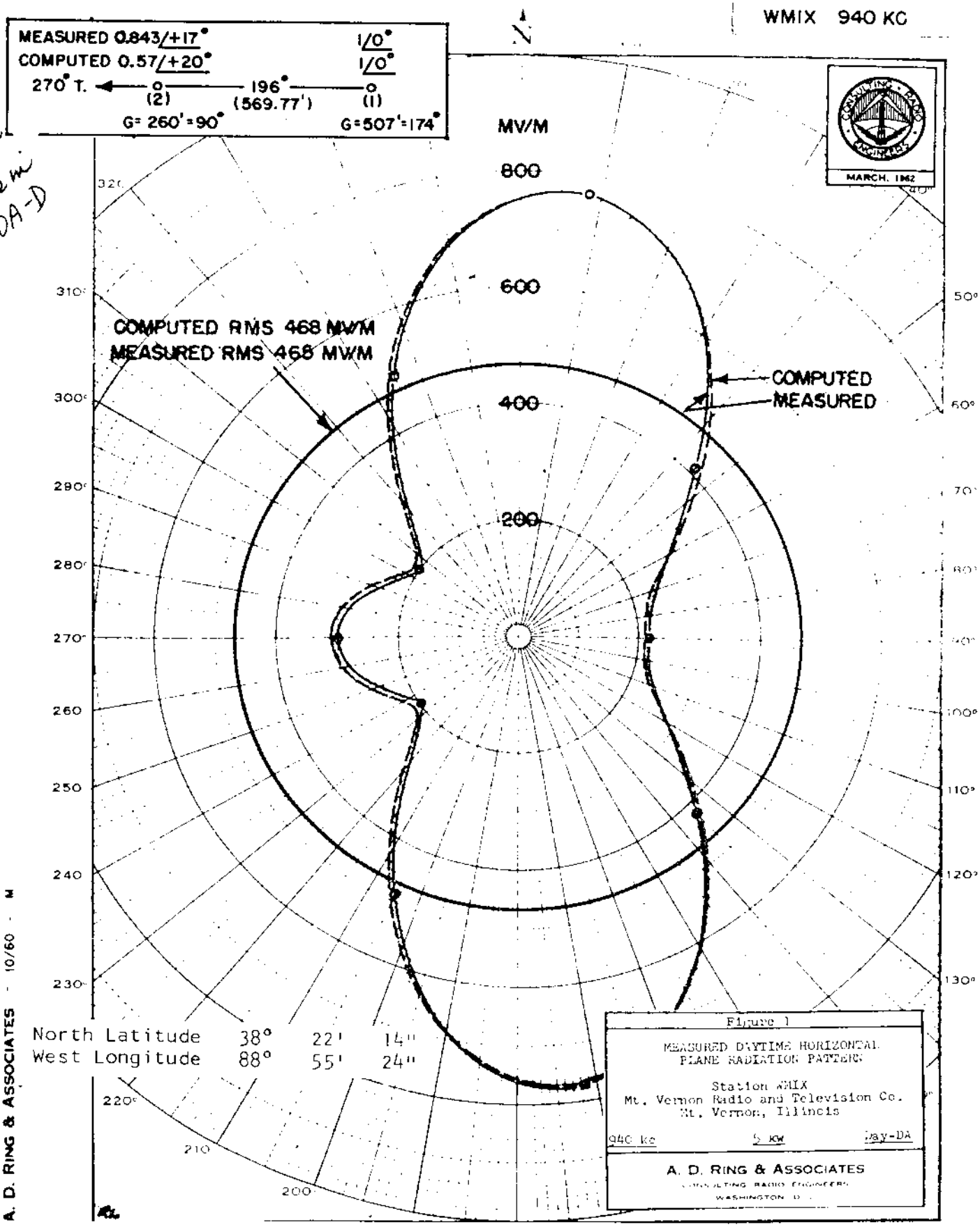
Measured Day
(6-22-62ct)

Station WMIX
Mt. Vernon, Illinois

5kw,DA-D,D
940 kc

WMIX 940 KC

-14-62
granted
for increase in
power + DA-D



FCC File No.BL-9323
Accepted 6-4-62

Station WMIX
Mt. Vernon, Illinois

940 kc

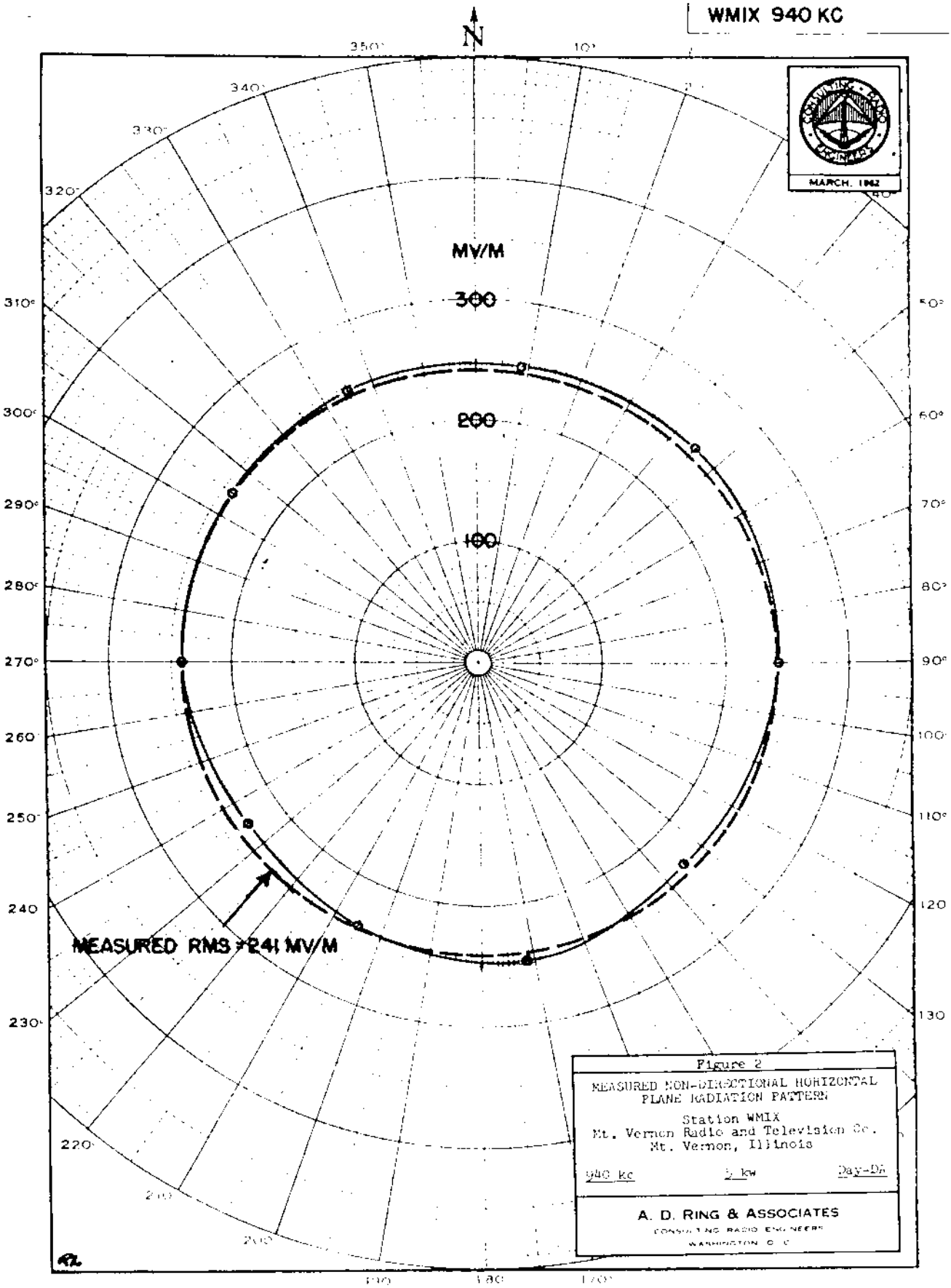
WMIX

Measured Non-DA
(6-22-62ct)

Station WMIX
Mt. Vernon, Illinois

5kw,DA-D,D
940 kc

WMIX 940 KC



A. D. RING & ASSOCIATES - 10/60 - M

FCC File No.BL-9323
Accepted 6-4-62

Station WMIX
Mt. Vernon, Illinois

940 kc

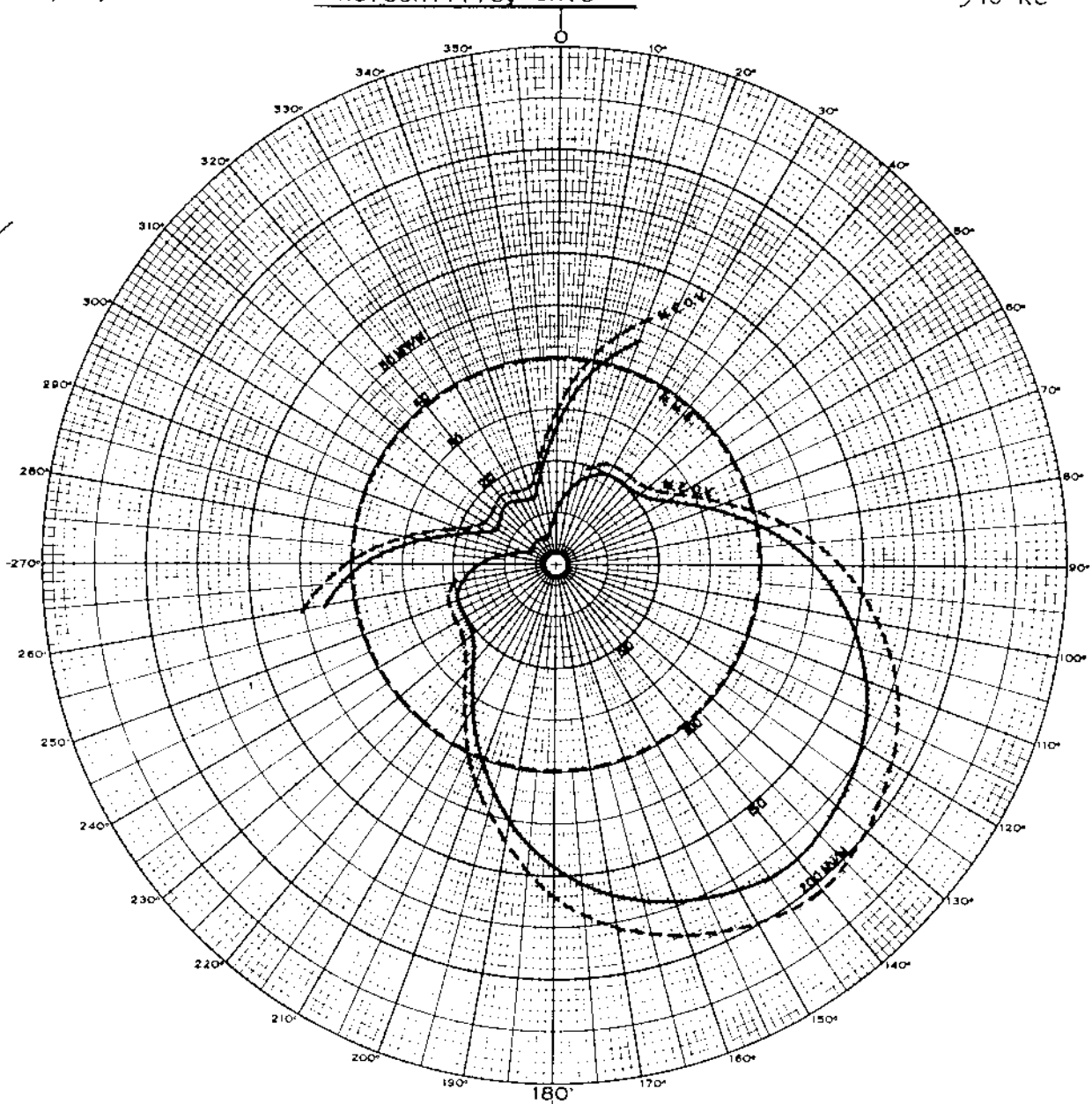
WNAL

Proposed Day
(1-30-67ct)

New; Valley Broadcasting, Inc.
Nelsonville, Ohio

250w,DA-D,D
940 kc

7-5-67
GRANTED
CP FOR
NEW AM ST.



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA	
N320°E NO 3 0.47 /-81° 90° NO. 2 1.016 /+126.1° 90° NO. 1 1.0 /0° N140°E	TOWER No	ELECTRICAL HEIGHT G°	TRUE TOWER ORIENTATION θ°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV ANGLE φ°	ELEVATION RMS FIELD mv/m E_φ	CALL	NEW
	1	90	0	0	0	97.5	1.0	0	98.91	FREQUENCY	940 kc
	2	90	320	90	+126.1		1.016	10		POWER	0.250 kw
	3	90	320	180	-81.0		0.47	20		TIME OF OPERATION	DAY
	4							30		TYPE OF OPERATION	DA-D
	5							40		DAYTIME TOWERS	3
	6							50		NIGHTTIME TOWERS	---
	7							60		NO. RADIALS PER TOWER	120
	8							70		LENGTH OF RADIALS	90° 262 ft
	9							80		GROUND SCREEN DIMENSION	---
	10							f_1		LAT	39° 27' 48"
								f_2		LONG	82° 15' 18"
										SUPERGAIN	---
										PATTERN No	661003

VALLEY BROADCASTING, INC.
NELSONVILLE, OHIO

FIGURE 1
OCTOBER 3, 1966

CONSULTING ENGINEERS GEORGE P. ADAIR ENGINEERING COMPANY WASHINGTON D.C.

FCC File No.BP-17531
Accepted 1-20-67

New; Valley Broadcasting, Inc.
Nelsonville, Ohio

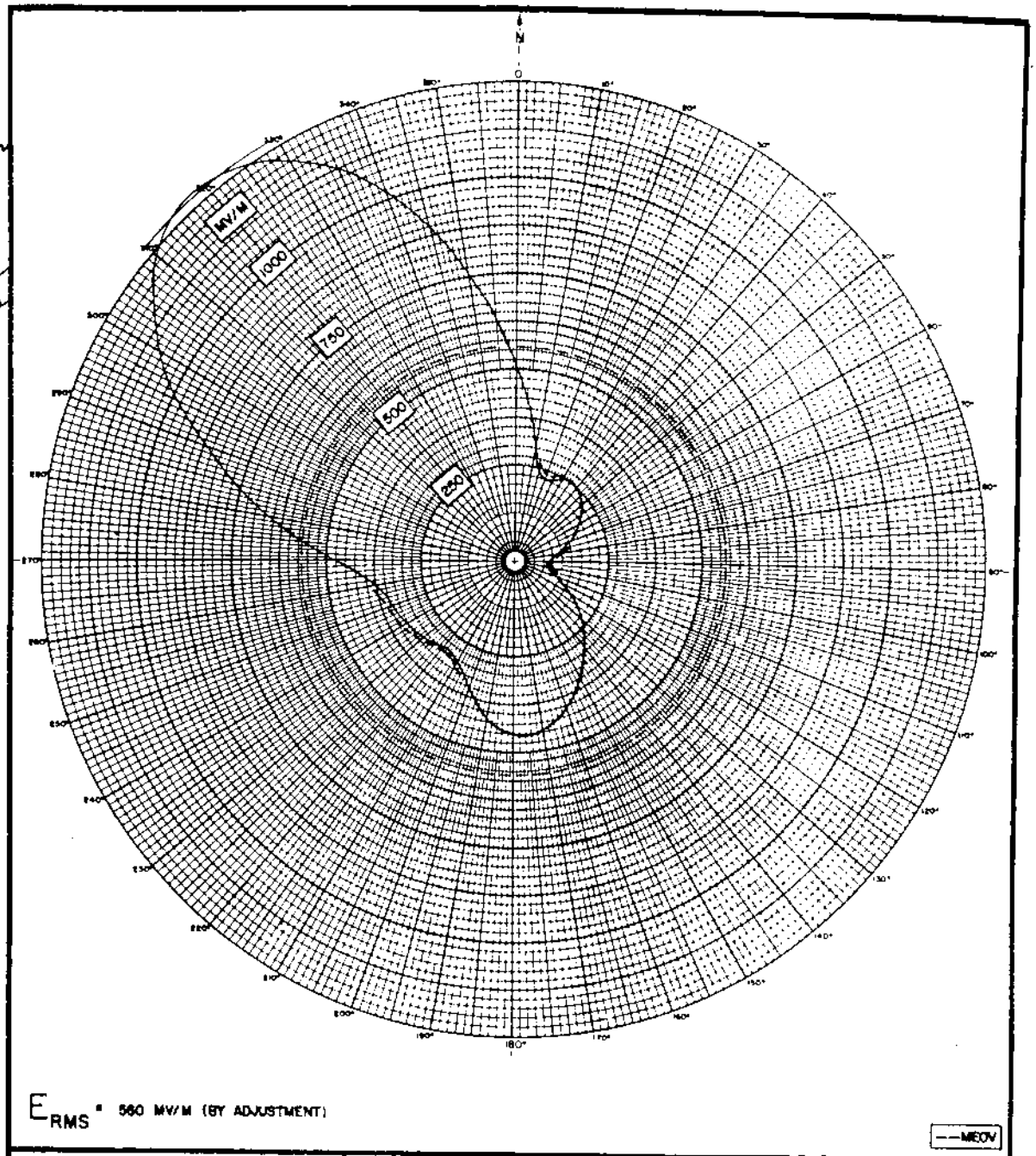
940 kc

WYLD

PROPOSED DAY
(4-10-61g)

Station WYLD 500w, 10kw-LS, DA-2, U
New Orleans, Louisiana 940 KC

b-22-62
granted CP
to increase
nighttime power
from 1 kw
to 5 kw)
change from
DA-N to DA-2



LATITUDE: N 29° 54' 00"
LONGITUDE: W 90° 00' 17"

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

ANTENNA PARAMETERS

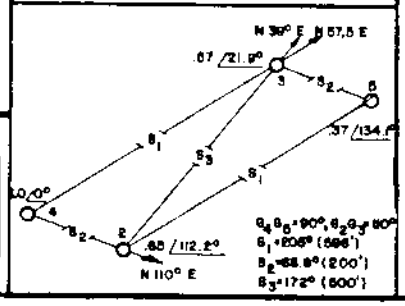


FIGURE 4

PROPOSED DAYTIME DIRECTIONAL PATTERN

RADIO STATION WYLD
NEW ORLEANS, LA.

940KC 0.5/10KW-LS, DA-2, U

FCC File No. BP-14658
Accepted 3-6-61

Station WYLD
New Orleans, Louisiana 940 KC

WYLD

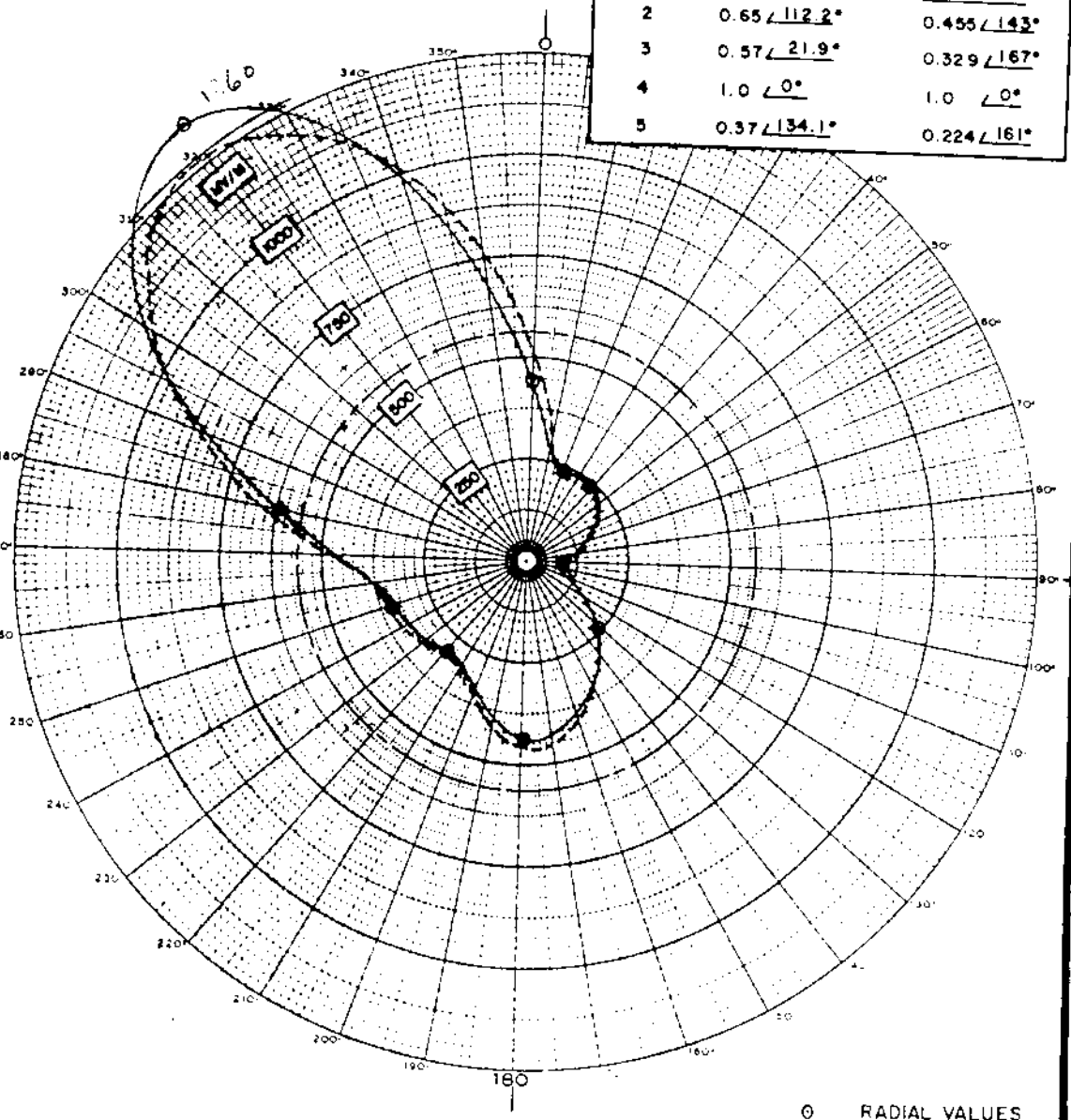
Measured Day
(9-25-63ct)

Station WYLD
New Orleans, Louisiana

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

BL-10 277
1-29-65
LIC. INCR PAT PWR
CHG DA-N TO DA-2

TOWER	THEORETICAL	MEASURED
2	0.65 ∠ 112.2°	0.455 ∠ 143°
3	0.57 ∠ 21.9°	0.329 ∠ 167°
4	1.0 ∠ 0°	1.0 ∠ 0°
5	0.37 ∠ 134.1°	0.224 ∠ 161°



E_{RMS} = 560 MV/M (MEASURED)

⊙ RADIAL VALUES
--- THEORETICAL
—— MEASURED

LATITUDE N 29° 54' 00"
LONGITUDE W 90° 00' 17"

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

ANTENNA PARAMETERS

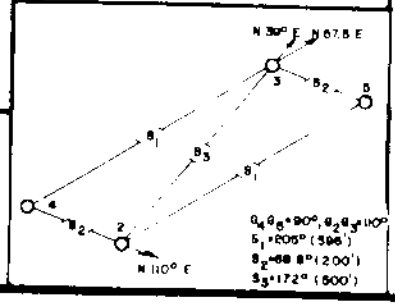


FIGURE 13

MEASURED
DAYTIME DIRECTIONAL
HORIZONTAL PATTERN

RADIO STATION WYLD
NEW ORLEANS, LA

940 KC 0.5/10 KW-LS,DA-2,U

FCC File No.BL-10277
Accepted 9-19-63

Station WYLD
New Orleans, Louisiana

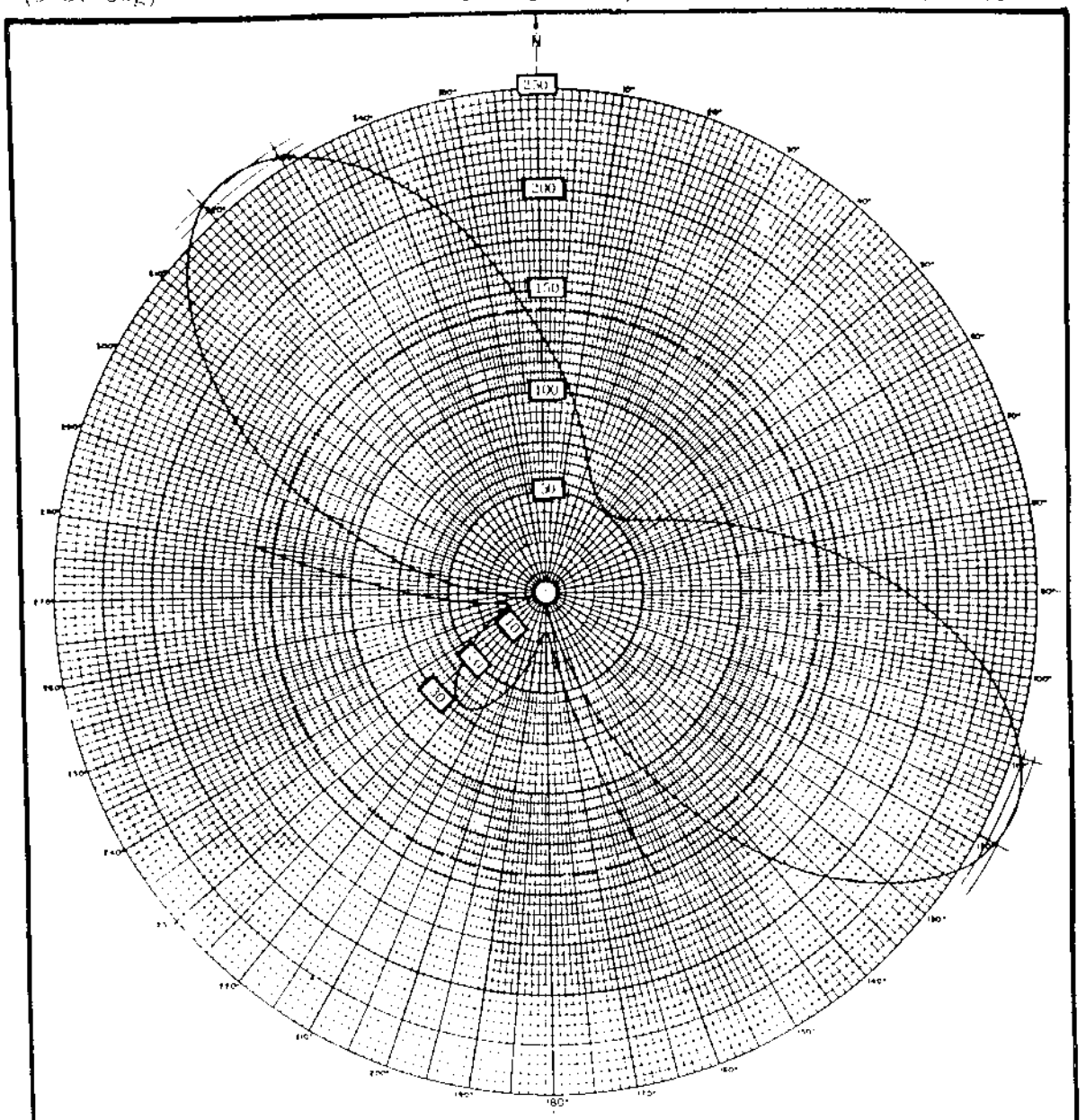
940 kc

WYLD

PROPOSED NIGHT
(5-27-60g)

Station WYLD
New Orleans, Louisiana

500w, 1kw-LS, DA-N,U
940 KC



E_{RMS} = 141.5 MV/M

MEOV-----

Granted 5-25-60

LATITUDE: 29° 54' 00"
LONGITUDE: 90° 00' 17"

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

ANTENNA PARAMETERS

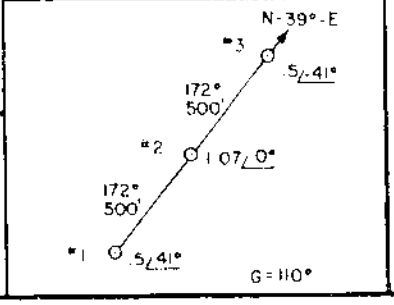


FIGURE 3A

PLOT OF NIGHTTIME HORIZONTAL PATTERN

RADIO STATION WYLD
NEW ORLEANS, LA

940 KC 0.5, 1KW-LS, DA-N,U

FCC File No. BP-13078
Accepted 5-2-60 (Amended)

WYLD
New Orleans, Louisiana

940 KC

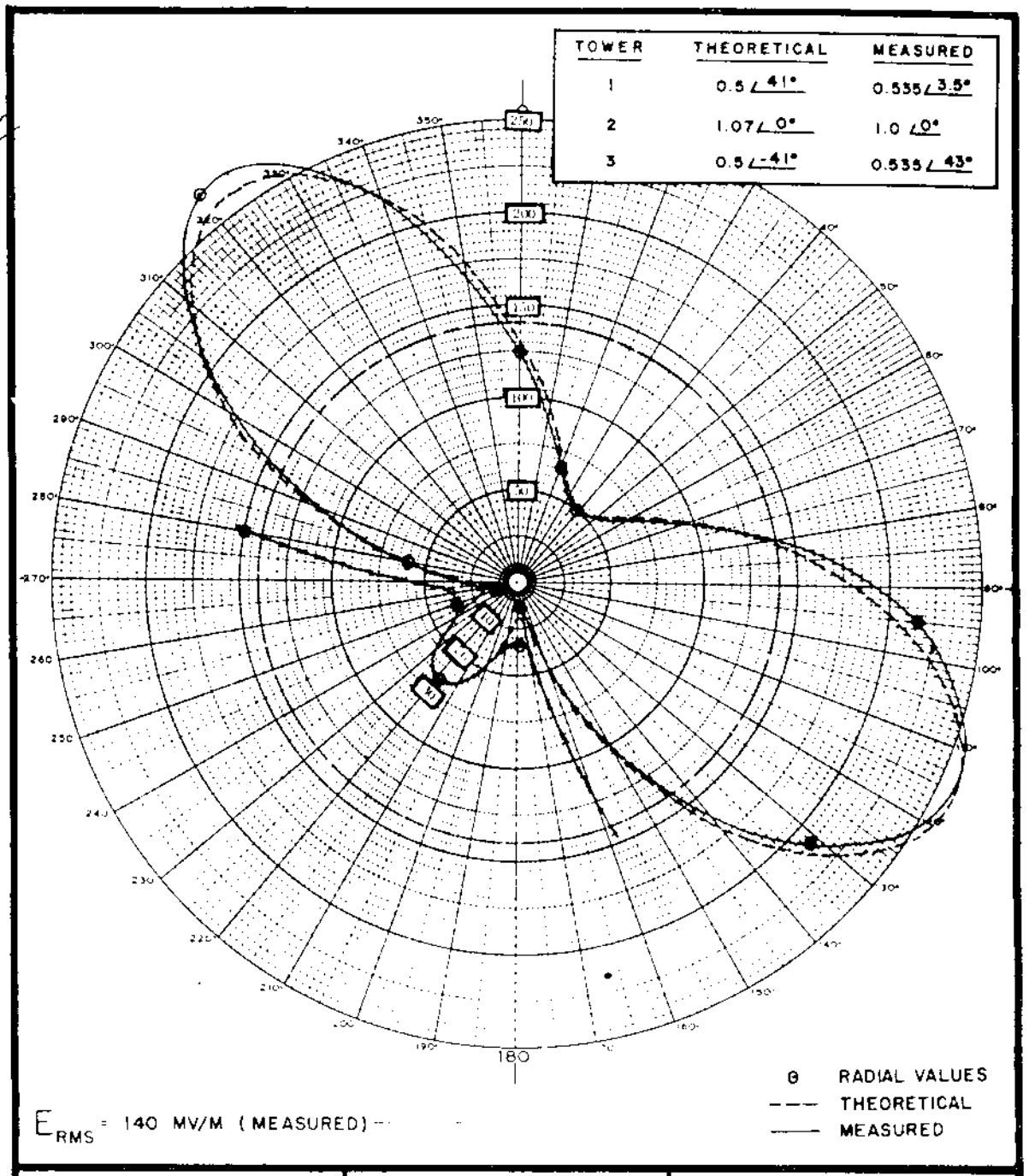
WYLD

Measured Night
(9-25-63ct)

Station WYLD
New Orleans, Louisiana

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

BL-10 277
1-29-65 LIC
INCR. DAY PWR
CHG DA-N TO DA-2



LATITUDE N 29° 54' 00"
LONGITUDE W 90° 00' 17"

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

ANTENNA PARAMETERS

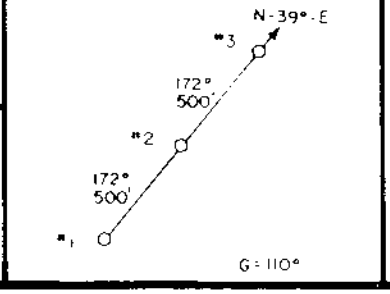


FIGURE 14

MEASURED
NIGHTTIME DIRECTIONAL
HORIZONTAL PATTERN

RADIO STATION WYLD
NEW ORLEANS, LA.

940 KC 0.5/10KW-LS,DA-2,U

FCC File No.BL-10277
Accepted 9-19-63

Station WYLD
New Orleans, Louisiana

940 kc

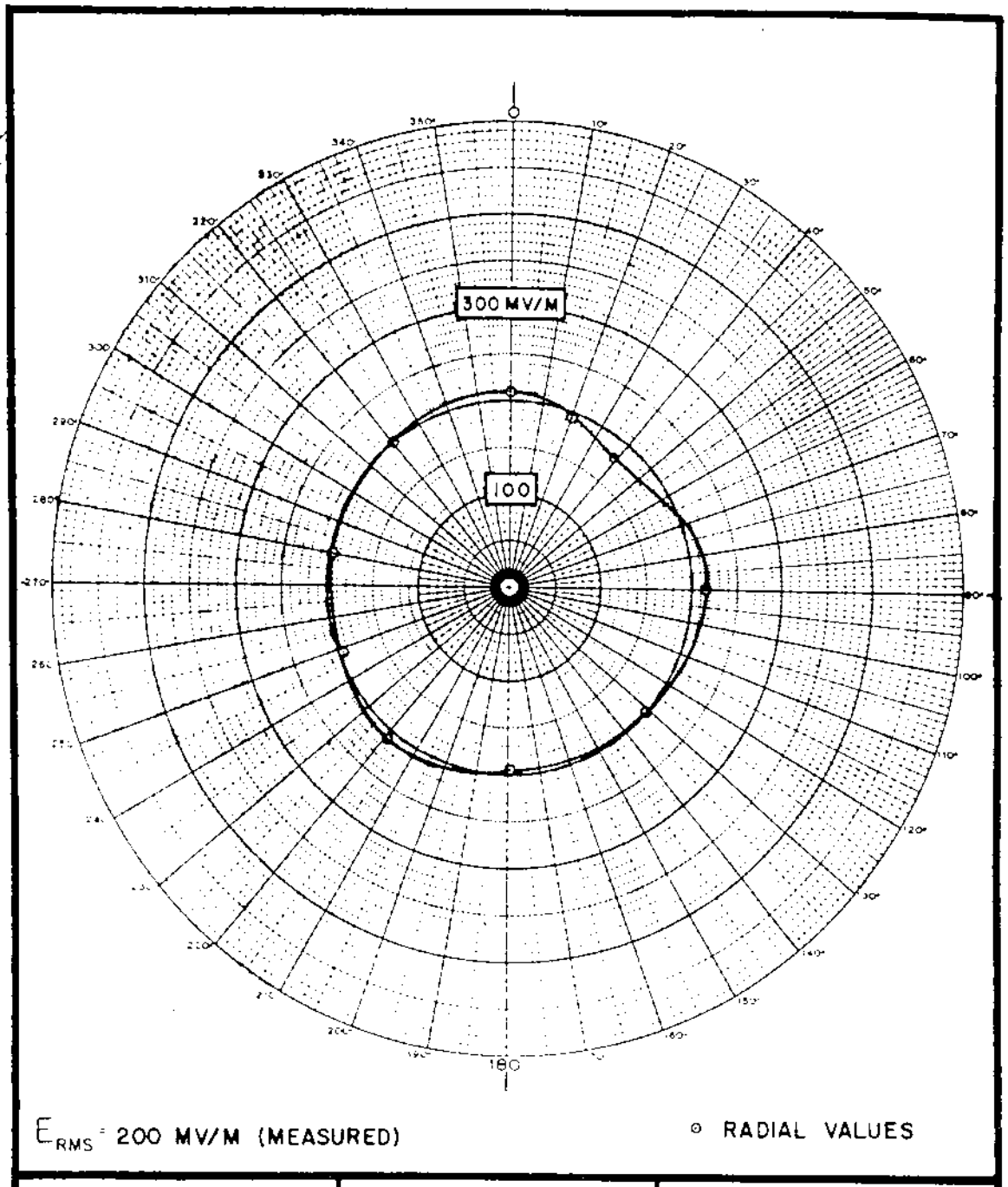
WYLD

Measured Non-DA
(9-25-63ct)

Station WYLD
New Orleans, Louisiana

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

BL-10277
1-29-65 LIC
INCR. DAY PWR
CHG DA-N TO DA-2



LATITUDE N 29° 54' 00" LONGITUDE W 90° 00' 17"	ANTENNA PARAMETERS	FIGURE 12
JOHN H. MULLANEY AND ASSOCIATES A DIVISION OF MULTRONICS, INC	# 2 TOWER G=110° P=1 KW	MEASURED HORIZONTAL NON-DIRECTIONAL PATTERN RADIO STATION WYLD NEW ORLEANS, LA. 940 KC 0.5/10 KW-LS,DA-2,U

FCC File No.BL-10277
Accepted 9-19-63

Station WYLD
New Orleans, Louisiana

940 kc