1600

Station	Main Studio	Freq	Power	Date
NEW	Calgary, AB	1600	50 kW/DA-N	6/12/81
NEW	Corwall, ON	1600	2.5 kW/DA-1	9/19/79
CFRS	Simcoe, ON	1600	10 kW/DA-2	3/2/73
CJRN	Niagara Falls, ON	1600	25 kW/DA-2	10/13/67
CJRN	Niagara Falls, ON	1600	50 kW/DA-2	12/14/65
CJRN	Niagara Falls, ON	1600	10 kW/DA-2	10/23/59
CKOT	Tillsonburg, ON	1600	10 kW/DA-2	10/2/72
NEW	Pittsburgh, KY	1600	0.5 kW/DA-D	11/16/79
KASH	Eugene, OR	1600	1 kW	
KATZ	St. Louis, MO	1600	5 kW/DA-N	1/7/76
KATZ	St. Louis, MO	1600	1 kW/DA-N	7/11/56
KBOR	Brownsville, TX	1600	1 kW/DA-1	7/10/80
KCRG	Cedar Rapids, IA	1600	5 kW/DA-N	9/29/64
KGST	Fresno, CA	1600	5 kW/DA-N	11/2/79
KLAK	Lakewood, CO	1600	5 kW/DA-N	8/26/66
KLGA	Algona, IA	1600	5 kW/DA-D	9/25/70
KNCY	Nebraska City, NE	1600	0.5 kW/DA-D	6/26/74
KOGT	Orange, TX	1600	1/5 kW/DA-2	11/2/79
KOGT	Orange, TX	1600	1 kW/DA-N	4/24/58
KUBA	Yuba City, CA	1600	1/5 kW/DA-N	11/2/79
KWOW	Pomona, CA	1600	5 kW/DA-N	8/22/80
KYAL	McKinney, TX	1600	5 kW/DA-D	6/28/67
KXEW	South Tucson, AZ	1600	1 kW/DA-N	11/2/79
KXVI	McKinney-Plano, TX	1600	1/5 kW/DA-2	11/16/79
WAAM	Ann Arbor, MI	1600	5 kW/DA-2	7/29/70
WAAM	Ann Arbor, MI	1600	1/5 kW/DA-2	8/27/65
WAAM	Ann Arbor, MI	1600	1 kW/DA-1	9/47

1600

Station	Main Studio	Freq	Power	Date
WAPX	Montgomery, AL	1600	1 kW/DA-N	11/19/46
WAQI	Ashtabula, OH	1600	1 kW/DA-D	2/26/60
WARU	Peru, IN	1600	1 kW/ND	5/15/56
WCGO	Chicago Heights, IL	1600	1 kW/DA-D	1/8/59
WCWC	Ripon, WI	1600	5 kW/DA-2	8/2/56
WEUP	Huntsville, AL	1600	0.5/5 kW/DA-N	11/5/75
WLUZ	Byamon, PR	1600	5 kW/DA-2	11/2/79
WFRC	Reidsville, NC	1600	1 kW/DA-N	1/31/47
WGIV	Charlotte, NC	1600	2.5 kW/DA-2	8/22/80
WGIV	Charlotte, NC	1600	0.5/1 kW/DA-N	3/23/59
WHOL	Allentown, PA	1600	0.5 kW/DA-D	6/20/56
WHVL	Hendersonville, NC	1600	1 kW/DA-D	9/25/70
WINX	Rockville, MD	1600	0.5/1 kW/DA-2	3/22/55
WIXY	East Longmeadow, MA	1600	2.5/5 kW/DA-2	11/16/77
WKEN	Dover, DE	1600	1/0.5 kW/DA-N	2/28/69
WKEN	Dover, DE	1600	1/5 kW/DA-2	11/16/76
WLUZ	Bayamon, PR	1600	1 kW/DA-2	10/28/66
WOKB	Winter Garden, FL	1600	5 kW/DA-2	7/15/76
WOKB	Winter Garden, FL	1600	5 kW/DA-D	4/28/65
WPDC	Elizabethtown, PA	1600	0.5 kW/DA-D	6/20/58
WPOM	Riviera Beach, FL	1600	1 kW/DA-1	8/21/74
WPOM	Riviera Beach, FL	1600	1 kW/DA-N	8/22/61
WQCK	Warner Robins, GA	1600	0.5/2.5 kW/DA-N	8/30/78
WQCK	Warner Robins, GA	1600	0.5/1 kW/DA-N	3/29/78
WRBN	Warner Robins, GA	1600	0.5/1 kW/DA-N	9/11/74
WTTF	Tiffin, OH	1600	1 kW/DA-D	6/14/61
WTTF	Tiffin, OH	1600	0.5 kW/DA-D	2/26/63

1600

Station	Main Studio	Freq	Power	Date
WTRU	Muskegon, MI	1600	5 kW/DA-N	11/24/50
WUNR	Brookline, MA	1600	5 kW/DA-1	2/9/49
WWRL	New York, NY	1600	5 kW/DA-2	4/10/74
WWRL	New York, NY	1600	5 kW/DA-1	9/4/59
WXVI	Montgomery, AL	1600	1/5 kW/DA-2	11/2/79
NEW	Oak Harbor, OH	1600	1 kW/DA-D	1/8/59
XEGM	Toluca, MX	1600	2 kW/DA-D	6/8/78

NEW-CALGARY
1600KHz

TABLE 1-1

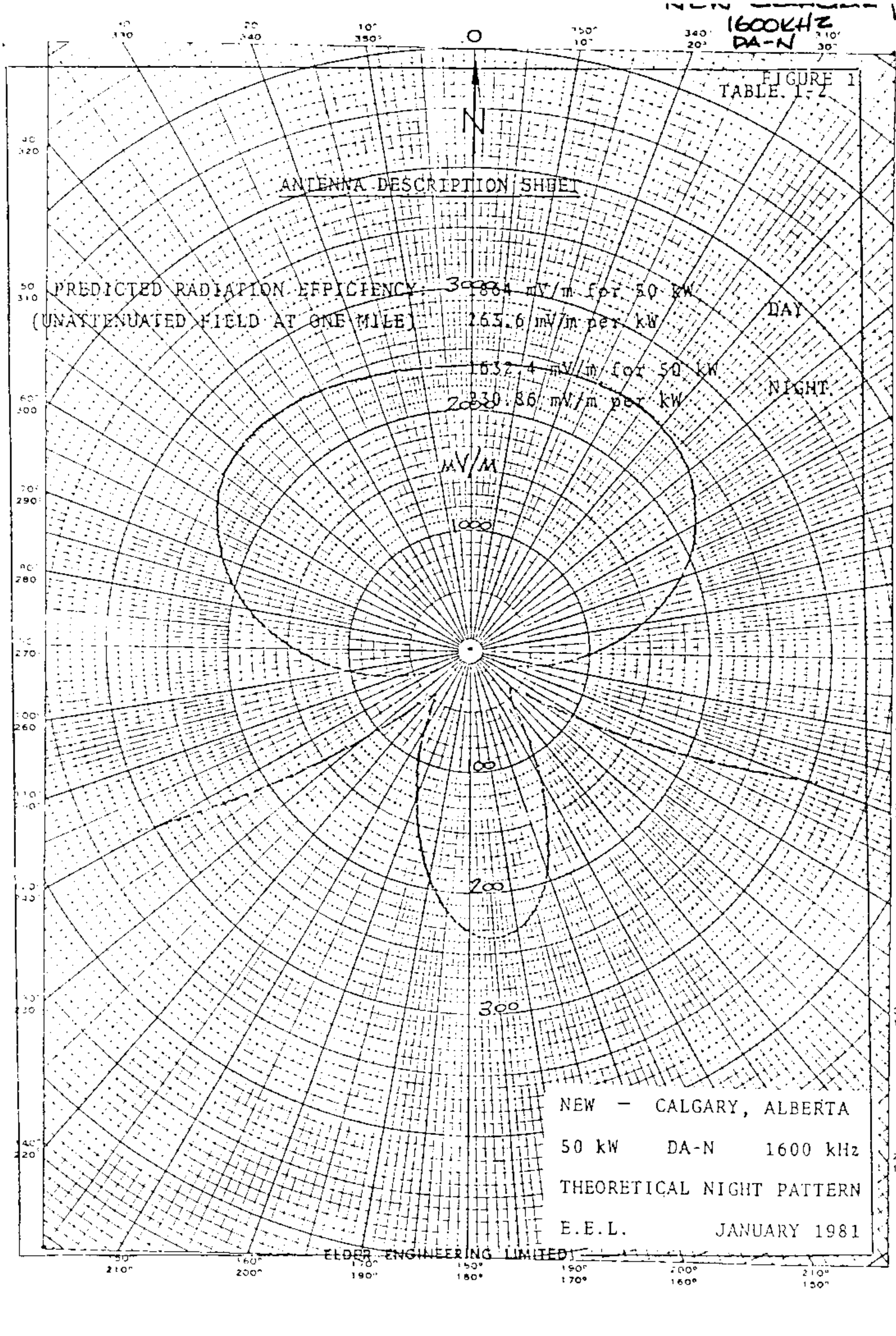
ANTENNA DESCRIPTION SHEET

STATION CALL:	NEW		
STUDIO LOCATION:	CALGARY, ALBERTA		
FREQUENCY:	1600 kHz		
POWER:	50 kW		
MODE:	DA-N		
TIME:	UNLIMITED		
NOTIFICATION LIST NO.:	405...... DATE June 12, 1981...		
GEOGRAPHICAL LOCATION:	Latitude: 50° 56' 15" North Longitude: 113° 51' 30" West		
ARRAY CHARACGERISTICS:	Three guyed steel towers of uniform cross section; base insulated, series fed; no top loading; centre tower daytime non-directional.		
TOWER NUMBER:	1 (N)	2 (C)	3 (S)
OVERALL HEIGHT:	175'	365'	175'
HEIGHT ABOVE BASE INSULATOR:	99.56° (170')	210.82° (360')	99.56° (170')
SPACING:	120° (204.9')	reference	120° (204.9')
TRUE BEARING:	355°	reference	175°
FIELD RATIO:	0.483	1.00	0.483
PHASE ANGLE:	-92.5°	0°	92.5°
GROUND SYSTEM:	120 equally spaced radials per tower of #10 AWG soft drawn bare copper, buried 6" to 18" below grade; where possible of length 369' (0.6λ) for the centre tower, 246' (0.4λ) for the end towers excluding the common chords		

NEW CALGARY
1600KHz

ANTENNA DESCRIPTION SHEET

PREDICTED RADIATION EFFICIENCY: (UNATTENUATED FIELD AT ONE MILE)	1864 mV/m for 50 kW 263.6 mV/m per kW	DAY
	1632.4 mV/m for 50 kW 230.86 mV/m per kW	NIGHT


NEW CALGARY
1600KHZ
DA-N
FIGURE 1
TABLE 1-2
N
ANTENNA DESCRIPTION SHEET
PREDICTED RADIATION EFFICIENCY: 1864 mV/m for 50 kW
(UNATTENUATED FIELD AT ONE MILE) 265.6 mV/m per kW
DAY
1632.4 mV/m for 50 kW
230.86 mV/m per kW
NIGHT
3000
2000
mV/m
1000
100
200
300
NEW - CALGARY, ALBERTA
50 kW DA-N 1600 kHz
THEORETICAL NIGHT PATTERN
E.E.L. JANUARY 1981
ELDER ENGINEERING LIMITED
DIETZGEN CORPORATION
MADE IN U.S.A.
DIETZGEN GRAPH PAPER
POLAR CO-ORDINATE

NEW

Saperstein & Associates Ltd.

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

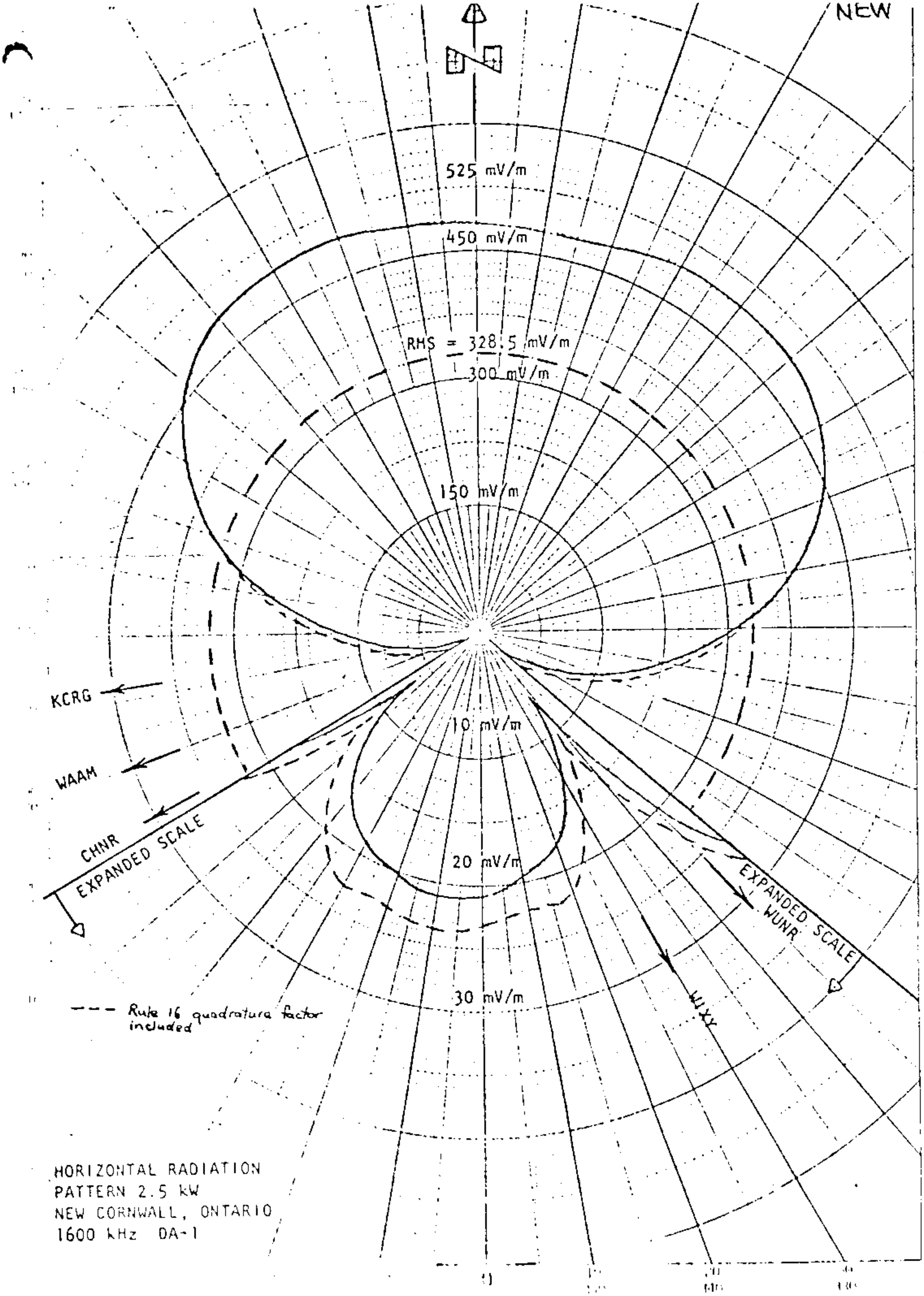
STATION: New	MAIN STUDIO: Corwall, Ontario
FREQUENCY: 1600 kHz	POWER: 2.5 kW Class: III
NOTIFICATION LIST NO.: 389	DATE: September 19, 1979
GEOGRAPHICAL LOCATION:	Latitude: 45° 00' 16"N Longitude: 74° 45' 00"W

ANTENNA CHARACTERISTICS:

Mode of Operation	DA-1
Number of Elements:	Three (3)
Type of Elements:	Uniform cross-section, guyed, Vertical steel towers, base insulated for series excitation.

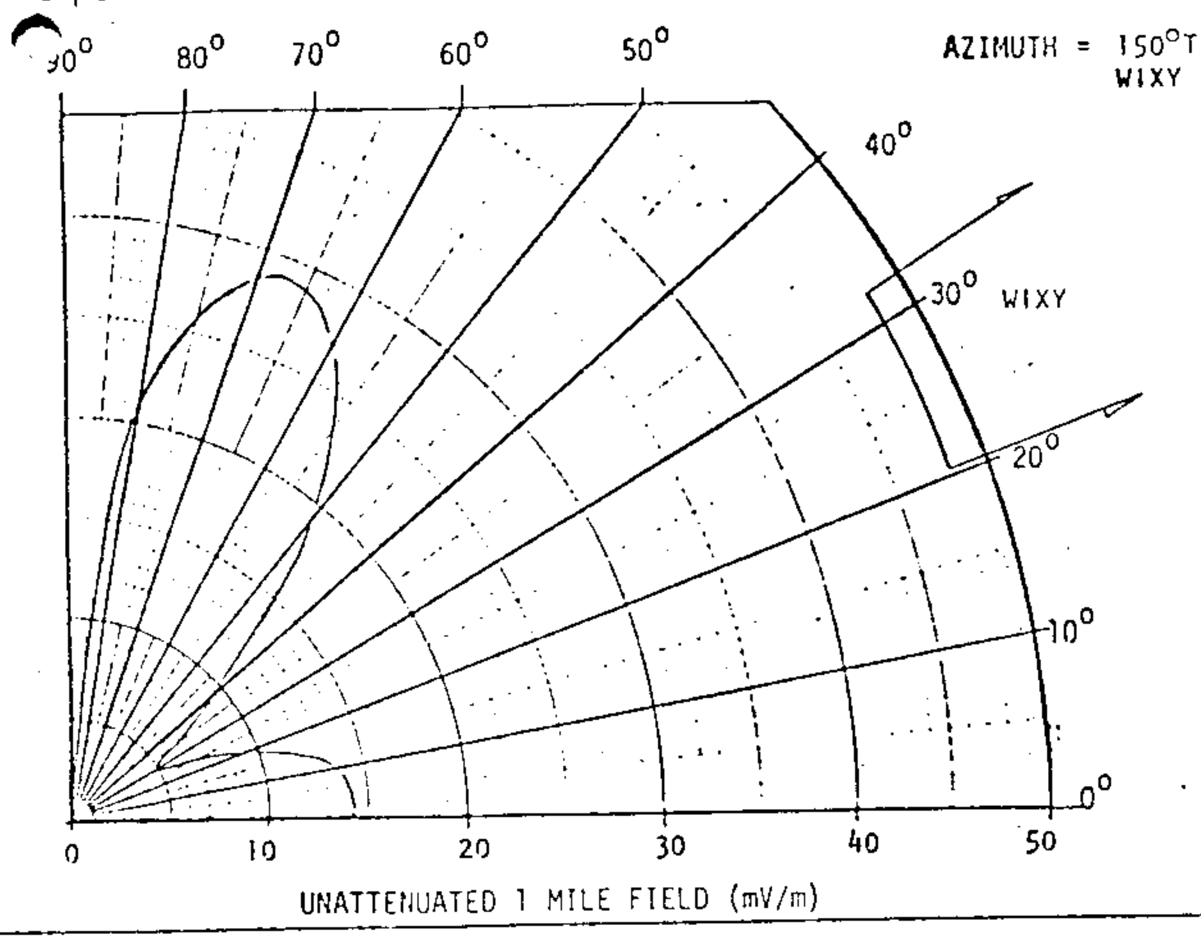
TOWER:	#1 (N)	#2 (C)	#3 (S)
HEIGHT ABOVE INSULATOR:	194.8' (114°)	194.8' (114°)	194.8' (114°)
OVERALL HEIGHT:	200'	200'	200'
SPACING: Relative to Reference Tower #1 (N)	0	(107.5°)	(215.0°)
PHASING:	0	+92.0°	+177.5°
FIELD RATIO:	1.0	1.743	0.810
ORIENTATION:	Ref.	187.8°T	187.8°T

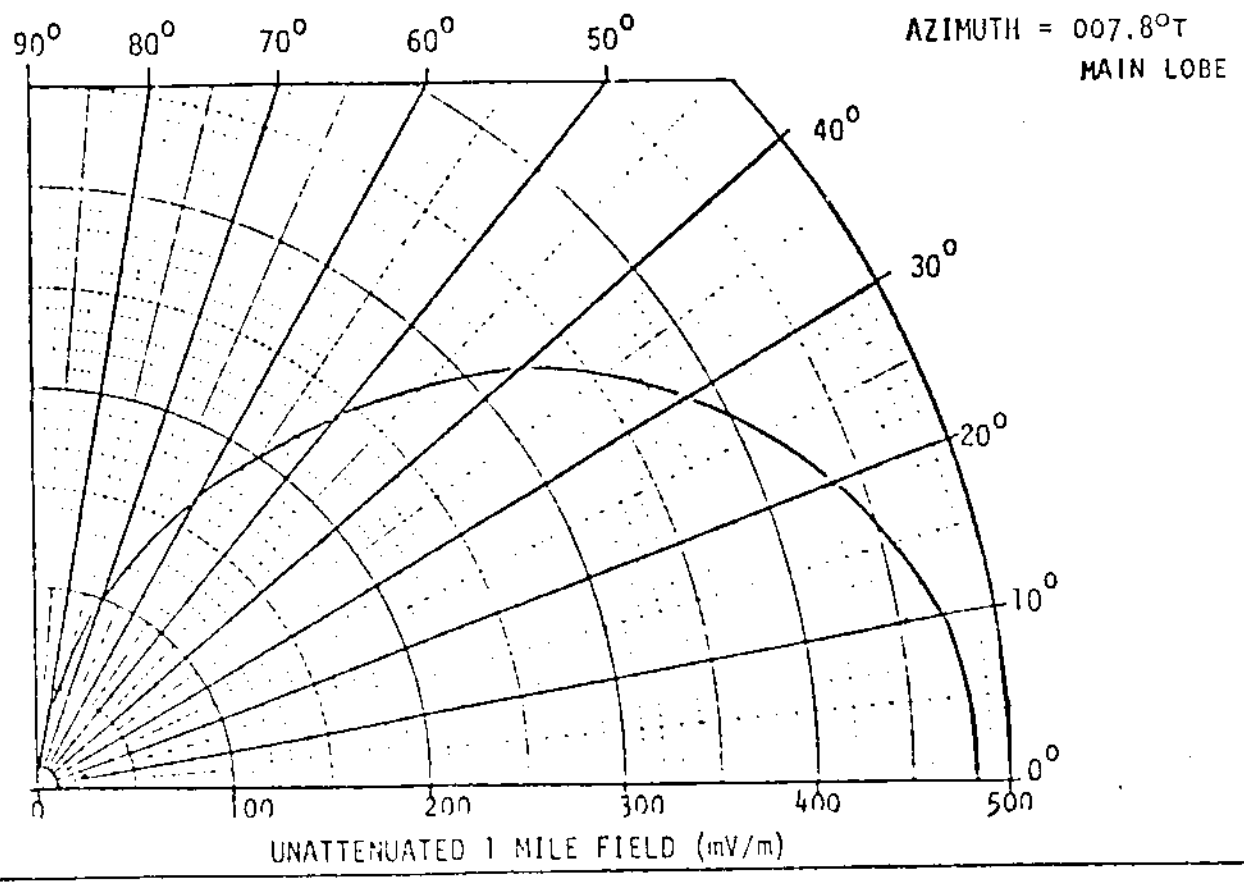
GROUND SYSTEM:	120 equally spaced 2 46' (0.42) radials of #10 copper wire from the base of each tower. Radials are shortened and bonded by transverse bonding straps on bisectors.
PREDICATED EFFECTIVE FIELD:	207.7 mV/m at 1 mile for 1.0 kW 328.5 mV/m at 1 mile for 2.5 kW



HORIZONTAL RADIATION
PATTERN 2.5 kW
NEW CORNWALL, ONTARIO
1600 kHz DA-1

NEW

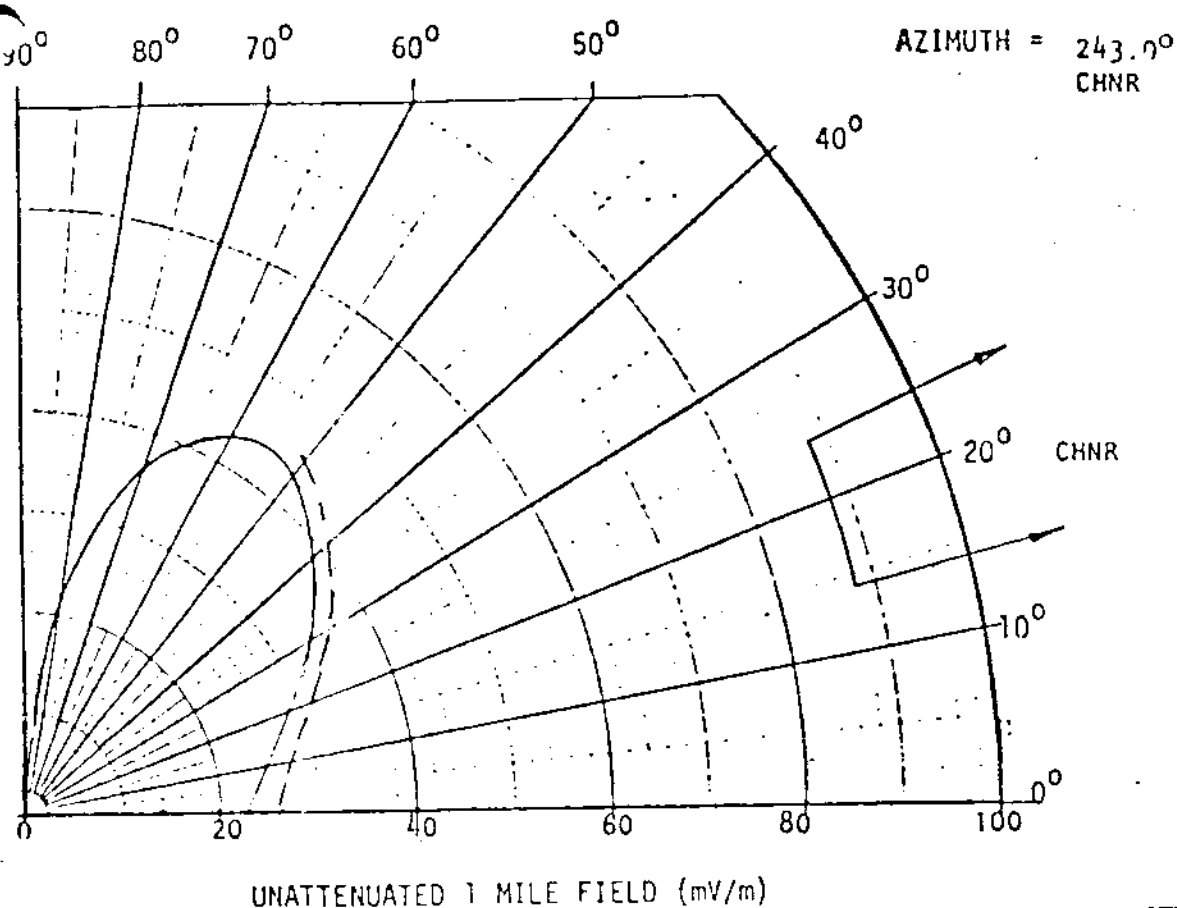


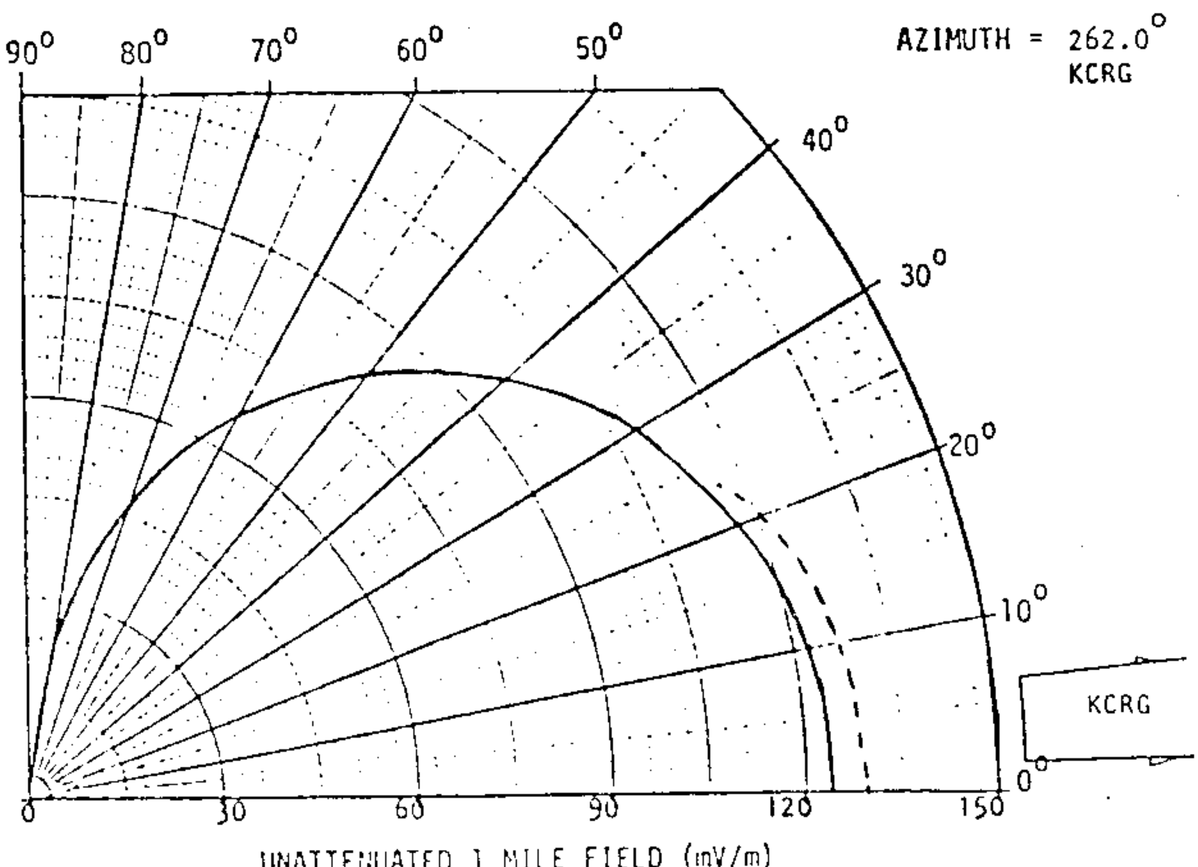


VERTICAL RADIATION PATTERNS
NEW 1600 kHz DA-1 CLASS III CORNWALL, ONTARIO

Saperstein & Associates Ltd.

NEW





VERTICAL RADIATION PATTERNS 2.5 kW
NEW 1600 kHz DA-1 CLASS III CORNWALL, ONTARIO

Consulting Telecommunication & Broadcast Engineers

CFRS

ANTENNA DESCRIPTION SHEET

STATION CALL:	CFRS
MAIN STUDIO:	SIMCOE, ONTARIO
FREQUENCY:	1600 kHz
POWER:	10 kW
CLASS:	III
MODE:	DA-2
TIME:	UNLIMITED

NOTIFICATION LIST NO. : ..306..... DATE: March 2, 1973

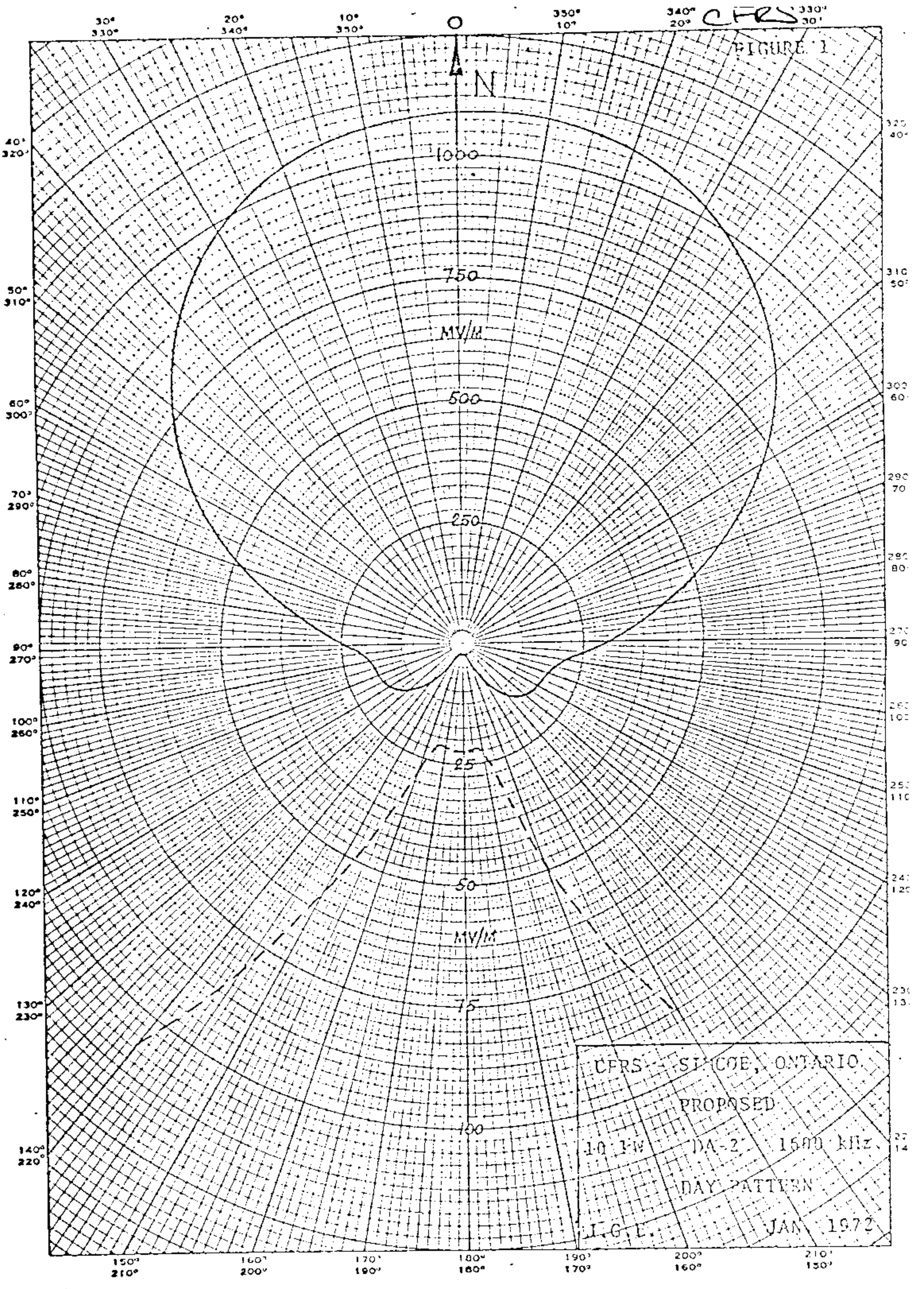
GEOGRAPHICAL LOCATION: Latitude 42° 45' 06" North
Longitude 80° 16' 03" West

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

		1	2	3	4
TOWER NUMBER:		North	NC	SC	South
HEIGHT ABOVE INSULATOR:		150'	150'	150'	150'(88°)
OVERALL HEIGHT ABOVE GRADE:		155'	155'	155'	155'
DAY	FIELD RATIO:	1.00	1.256	0.57	-
DAY	PHASE:	0°	118.3°	256°	-
NIGHT	FIELD RATIO:	1.00	2.25	2.027	0.745
NIGHT	PHASE:	0°	140.85°	277.7°	57°
SPACING:		Ref.	153.8' 90°	307.6' 180°	461.4' 270°
ORIENTATION:		Ref.	183°	183°	183°

GROUND SYSTEM: 120 equally spaced radial wires per tower of #10 AWG bare copper buried approximately 12" below grade; of average length 250'(0.4λ), excluding those along common chords.

PREDICTED EFFECTIVE FIELD: (UNATTENUATED AT ONE MILE) 600 mV/m or 190 mV/m per kW day
580 mV/m or 184 mV/m per kW night.


CFRS
FIGURE 1
N
1000
750
MV/M
500
250
25
50
MV/M
75
100
CFRS - SIMCOE, ONTARIO
PROPOSED
10 KW DA-2 1500 kHz
DAY PATTERN
J.G.L. JAN 1972
POLAR CO-ORDINATE
MADE IN U.S.A.

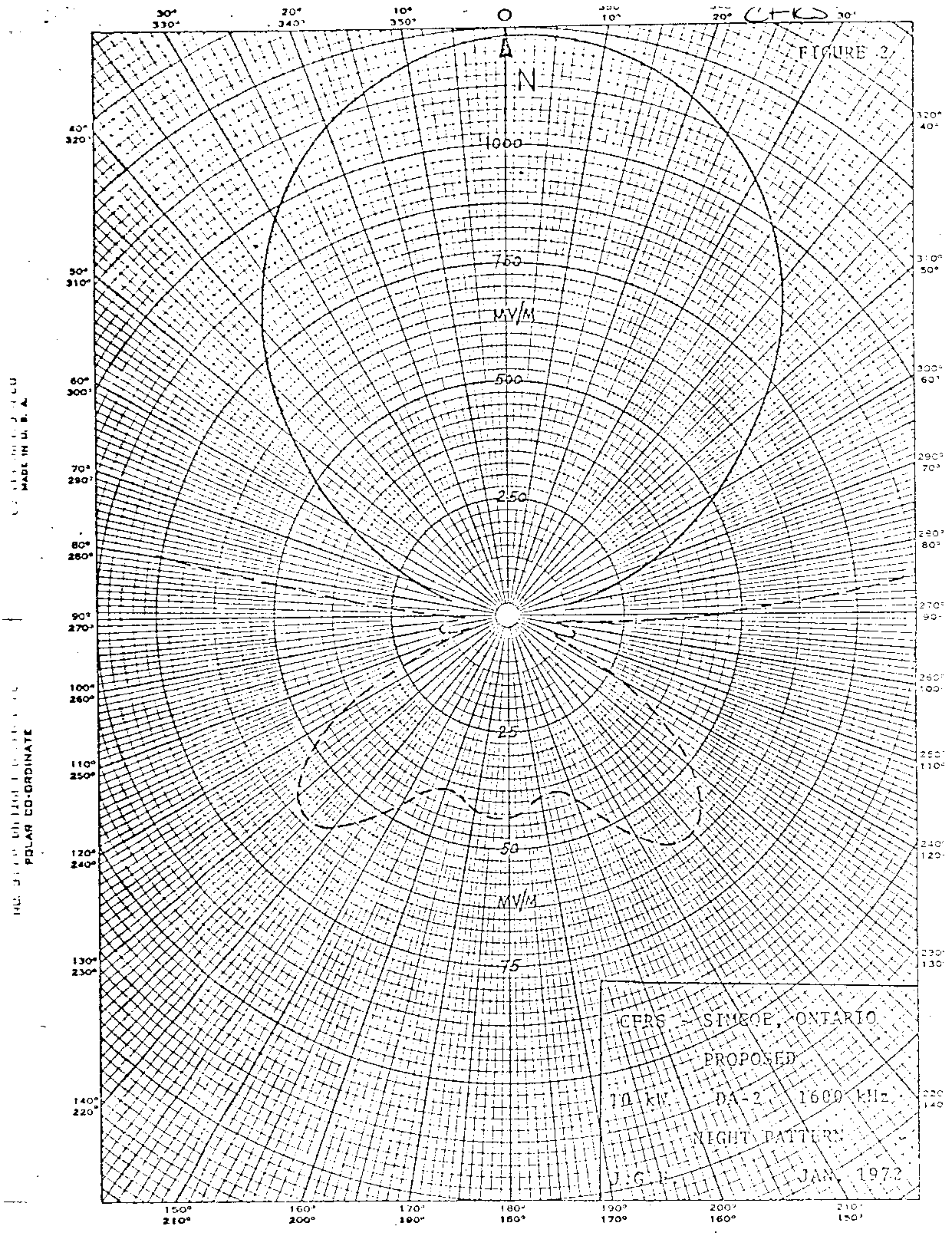


FIGURE 2
N
1000
750
MV/M
500
250
25
50
MV/M
75
CFRS – SIMCOE, ONTARIO
PROPOSED
10 kW DA-2 1600 kHz
NIGHT PATTERN
J.G. JAN. 1972
POLAR CO-ORDINATE
MADE IN U.S.A.

CJRN

Description Sheet
(10-28-67ct)

Station CJRN
Niagara Falls, Ontario

25kw, DA-2, U, Class III
1600 kc

DESCRIPTION SHEET

Directional Antenna System

Station: CJRN

Main Studio: Niagara Falls, Ontario

Frequency: 1600 kc/s

Power: 25 kw

Time: Unlimited

Class: III

Notification List No. 233

Date: October 13, 1967.

Geographic Location - 42° 52' 09" N. Lat.
79° 06' 14" W. Long.

ANTENNA SYSTEM: Mode of Operation: DA-2

HEIGHT: The array consists of 8 towers 295' (173° electrical) high with overall height of 299' for each tower. Towers fitted for series feed.

TOWER PARAMETERS:

			Day		Night	
Tower	Bearing	Spacing	Ratio	Phase	Ratio	Phase
1	Ref.	Ref.	1.0	0.0	1.258	14.091
2	336.000	110.000	1.160	-92.62	1.997	-103.073
3	336.000	220.000	0.166	-196.20	1.783	109.021
4	336.000	330.000	0.227	-123.00	0.966	-4.384
5	256.000	190.000	0.700	-10.00	0.962	-0.585
6	283.387	235.496	0.813	-102.62	1.542	-103.728
7	299.517	314.670	0.266	-226.00	1.446	108.530
8	308.737	408.380			0.991	-8.783

GROUND SYSTEM: The ground system shall consist of 120 - 0.4λ conductors about each base shortened as necessary between towers.

PREDICTED EFFICIENCY: Day & Night - 1100 mv/m unattenuated at 1 mile (220 mv/m for 1 kw)

#206

CJRN

Description Sheet
(1-28-66ct)

Station CJRN
Niagara Falls, Ontario

50kw,DA-2,U,Class III
1600 kc

2.5 DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CJRN

Main Studio: Niagara Falls, Ont.

Frequency: 1600 Kc/s

Power: 50 KW, DA-2 Class III

Notification List No. 206

Date: December 14, 1965.

GEOGRAPHICAL LOCATION
OF THE ANTENNA SYSTEM

North Latitude: 42° 54' 10"
West Longitude: 79° 07' 05"

ANTENNA CHARACTERISTICS:

Mode of Operation: DA-2
Number of Elements: 7
Type of Elements: guyed, base insulated, series fed, uniform cross section.

TOWER:		South 1	2	3	4	5	6	North 7
HEIGHT ABOVE INSULATORS:		153.5(90°)						
OVERALL HEIGHT:		158'						
SPACING:		170.5' (100°)						
PHASING:	Day	0	250.7	-	110.	0.9	-	-
	Night	0	230.	103.	260.	47.	284.	160.
FIELD RATIO:	Day	1.	0.9	-	1.	0.9	-	-
	Night	1.	2.55	2.55	.35	2.55	2.55	1.

ORIENTATION: Towers on a line bearing 5° east of 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. Effective radial length. .4λ (250').

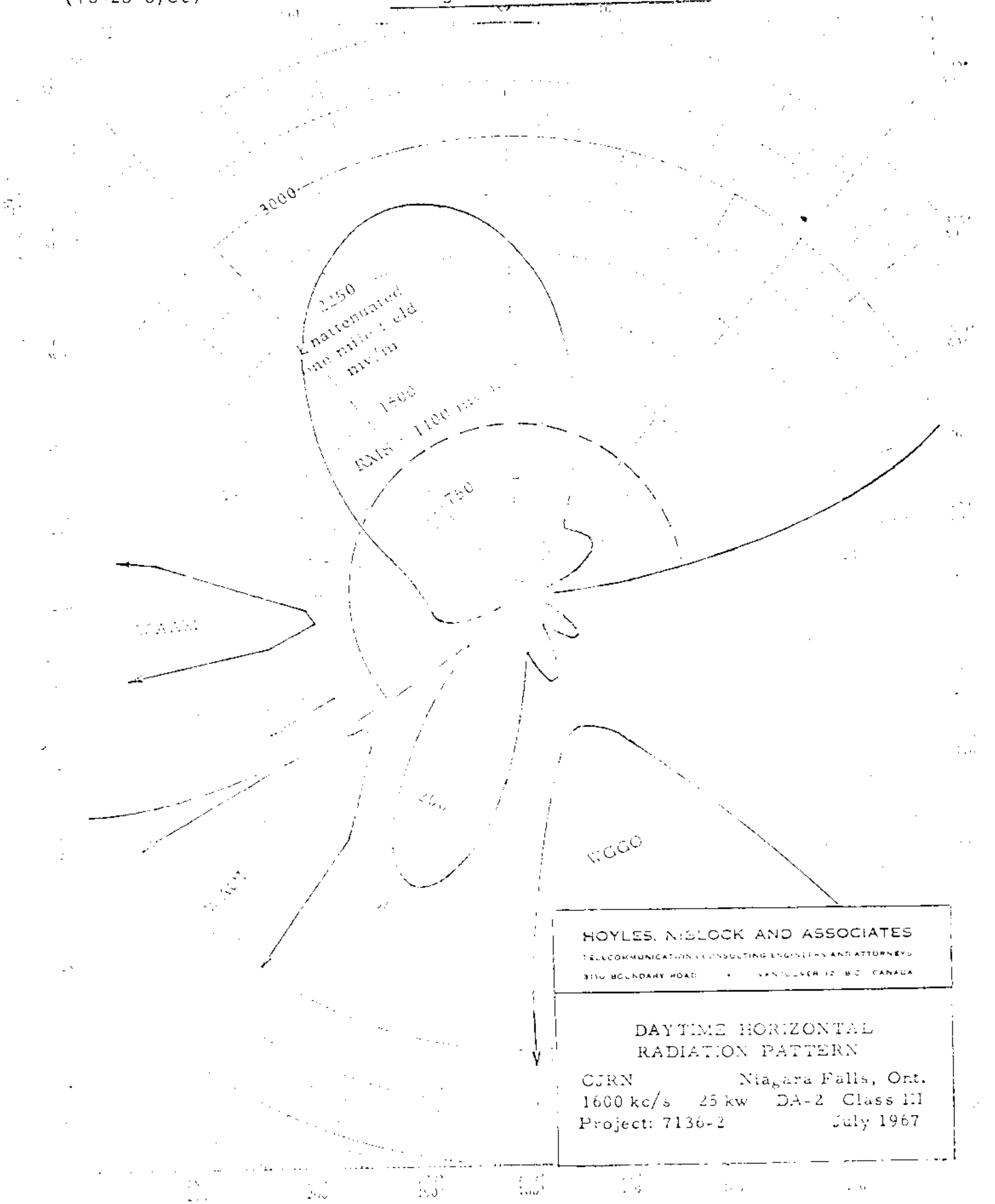
Predicted Effective Field 1308 mv/m (185 mv/m for 1Kw). Day
1270 mv/m (180 mv/m for 1 Kw). Night

CJRN

Proposed Day
(10-28-67ct)

Station CJRN
Niagara Falls, Ontario

25kw,DA-2,U,Class III
1600 kc

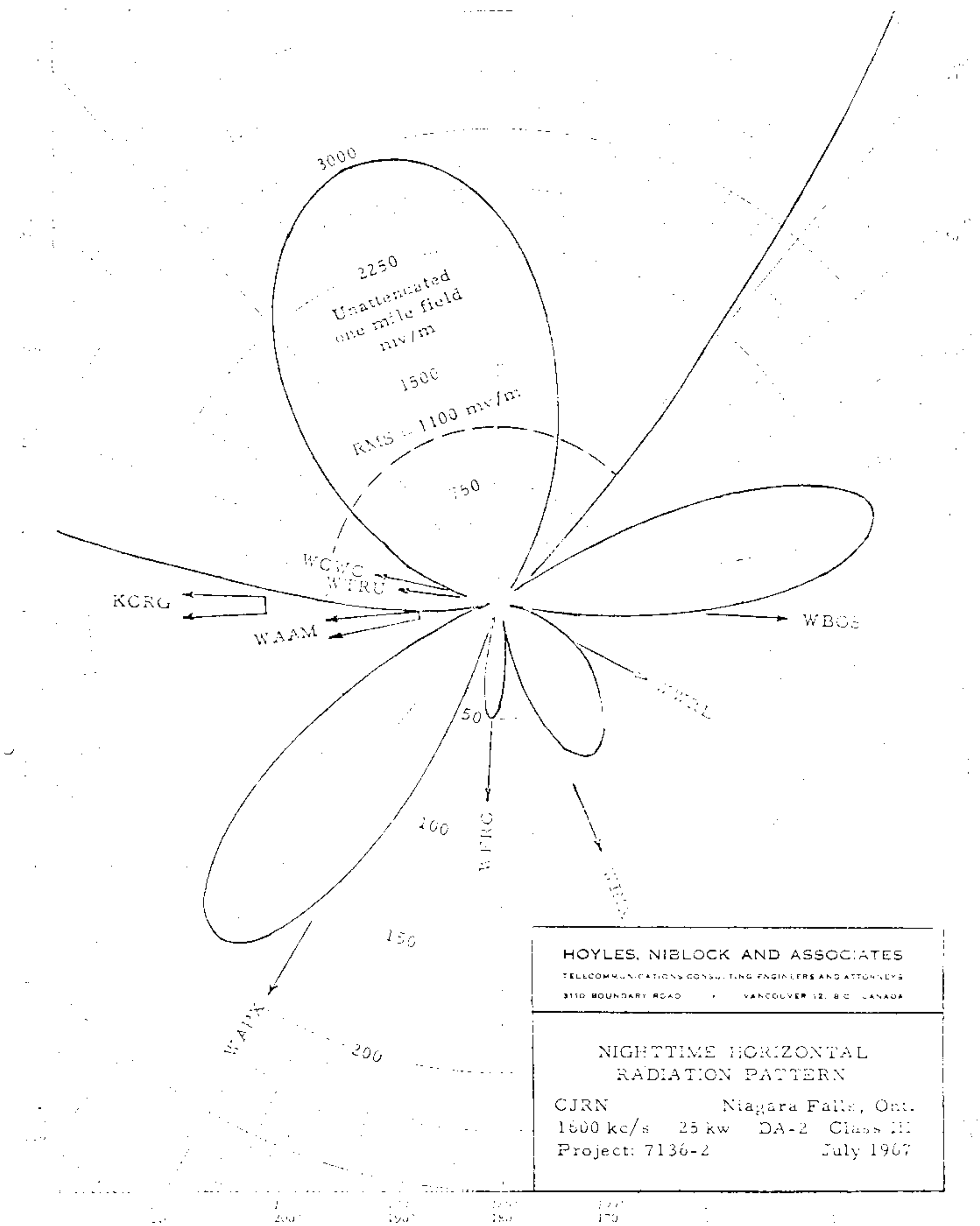


CJRN

Proposed Night (10-28-67ct)

Station CJRN
Niagara Falls, Ontario

25kw,DA-2,U,Class III
1600 kc



HOYLES, NIBLOCK AND ASSOCIATES

TELECOMMUNICATIONS CONSULTING ENGINEERS AND ATTORNEYS

3110 BOUNDARY ROAD • VANCOUVER 12, B.C. CANADA

NIGHTTIME HORIZONTAL RADIATION PATTERN

CJRN Niagara Falls, Ont.

1600 kc/s 25 kw DA-2 Class III

Project: 7136-2 July 1967

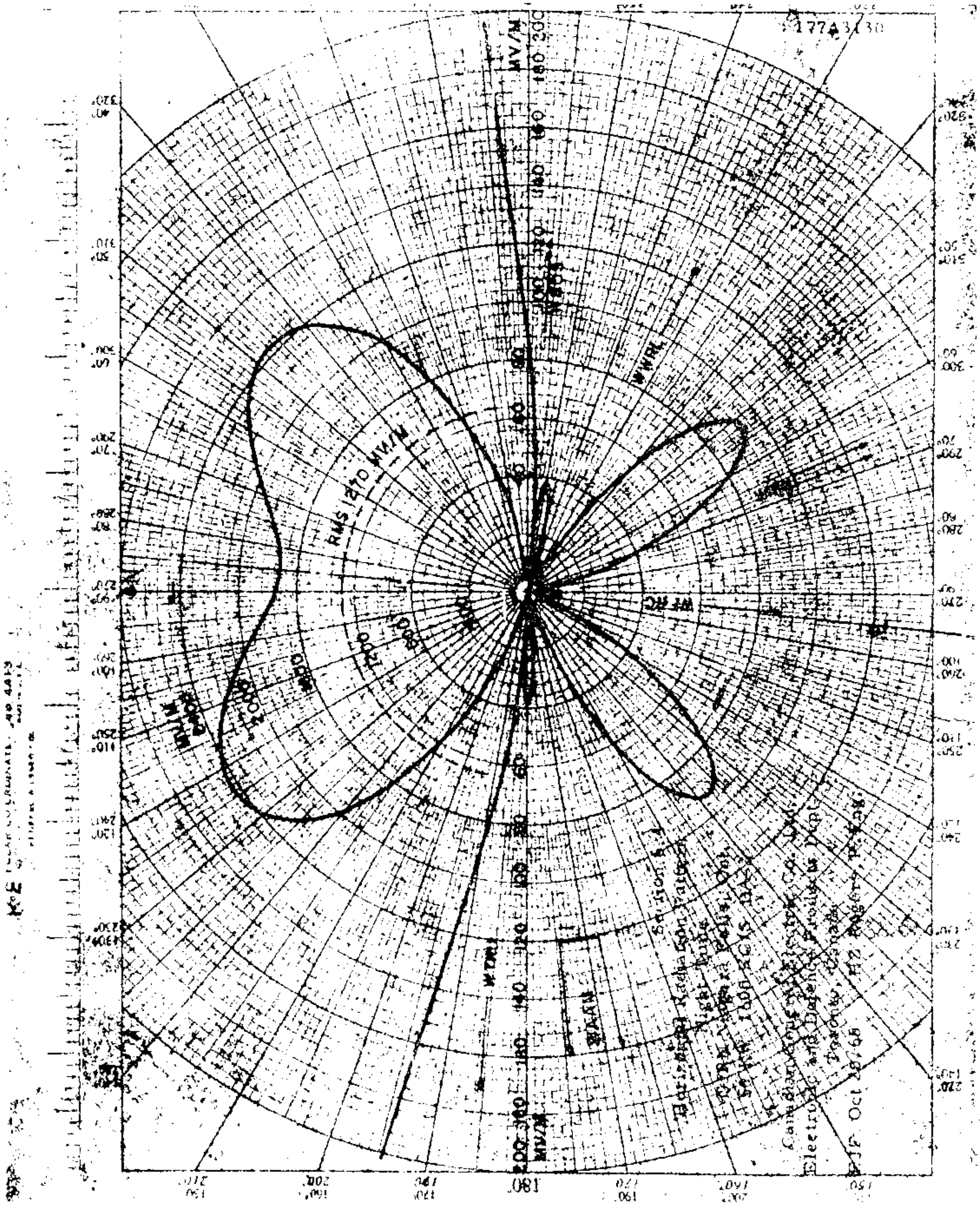
#206

CJRN

Proposed Night
(1-28-66ct)

Station CJRN
Niagara Falls, Ontario

50kw,DA-2,U,Class III
1600 kc



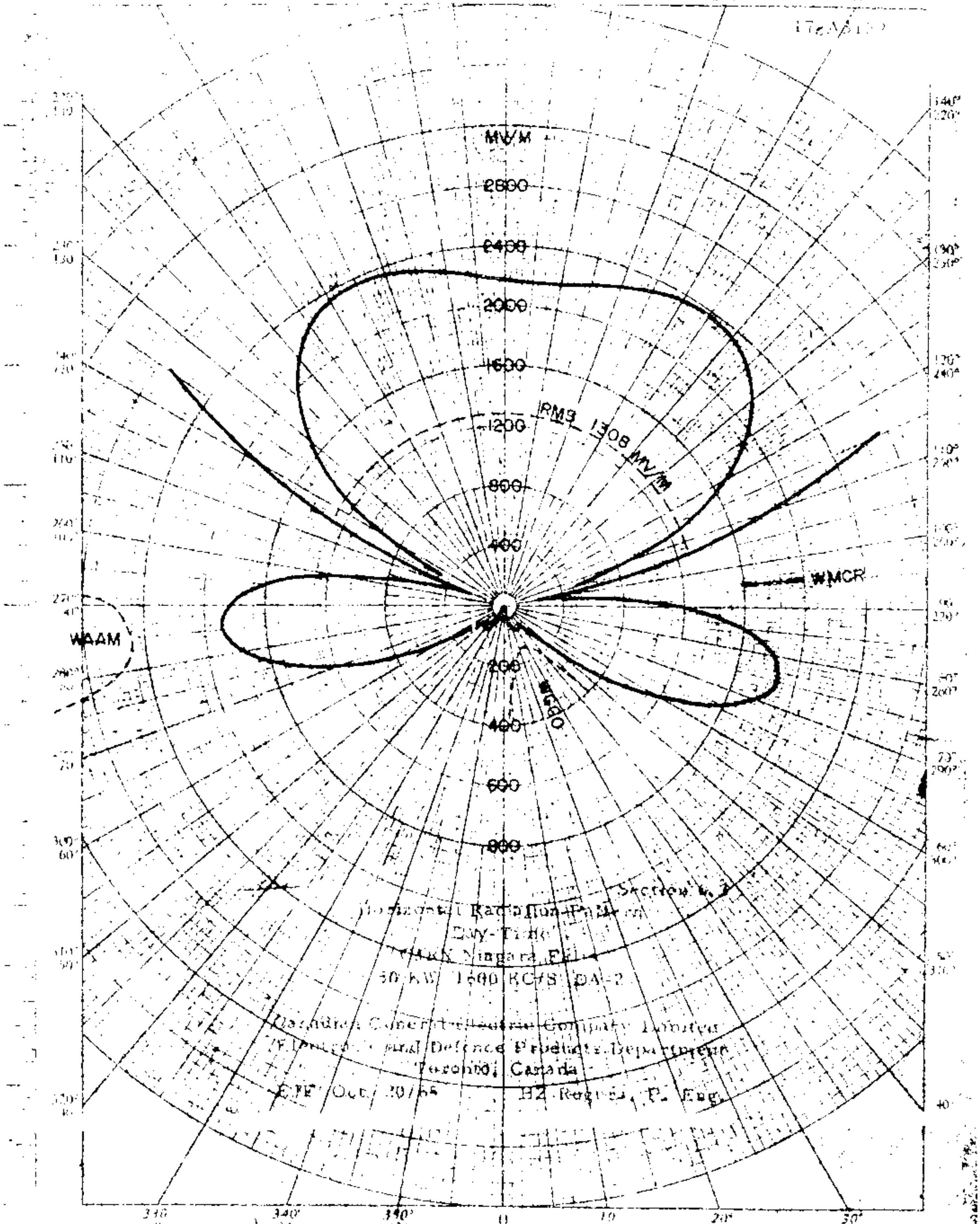
206

CJRN

Proposed Day
(1-28-66ct)

Station CJRN
Niagara Falls, Ontario

50kw,DA-2,U,Class III
1600 kc



CJRN

#140

DESCRIPTION SHEET (9-13-60g) Station CHVC 10kw, DA-2,U, Class III
Niagara Falls, Ontario, Canada 1600 KC

REVISED

Directional Antenna Description Sheet

Station : CHVC Main Studio : Niagara Falls, Ontario

Frequency : 1600 kc Power : 10 kw Class : III

Notification List No. : 140 * Date : October 23, ~~1960~~ 1959.

Geographical Location of Antenna System : North Latitude : 42° 57' 51"
West Longitude : 79° 06' 36"

Antenna Characteristics : Mode of Operation : DA-2
Number of Elements : 4
Type of Element : guyed, uniform cross section, no top loading

	#1 Tower (south)	#2 Tower	#3 Tower	#4 Tower (north)
Height above Insulator	145' (85°)	145'	145'	145'
Overall Height	150'	150'	150'	150'
Spacing	154' (90°)	154'	154'	
Night Phasing	+222.75°	+74.25°	-74.25°	-222.75°
Night Field Ratio	1.0	2.15	2.15	1.0
Day Phasing	0°	-120°	-	-
Day Field Ratio	1.0	0.7	-	-

Orientation : Elements on a line bearing N 12° E.

Ground System : Around each tower base, 120 radials, spaced 3°, each 285' long, plus 120 interspaced radials, each 30' long.

Predicted Effective Field : Night : 555 mv/m at 1 mile (175.5 per kw)
Day : 600 " " 1 " (190 " ").

NOTE: This data supersedes that previously notified for this assignment.

#140

CJRN

PROPOSED DAY
(9-13-60g)

Station CHVC 10kw, DA-2,U, Class III
Niagara Falls, Ontario, Canada 1600 KC

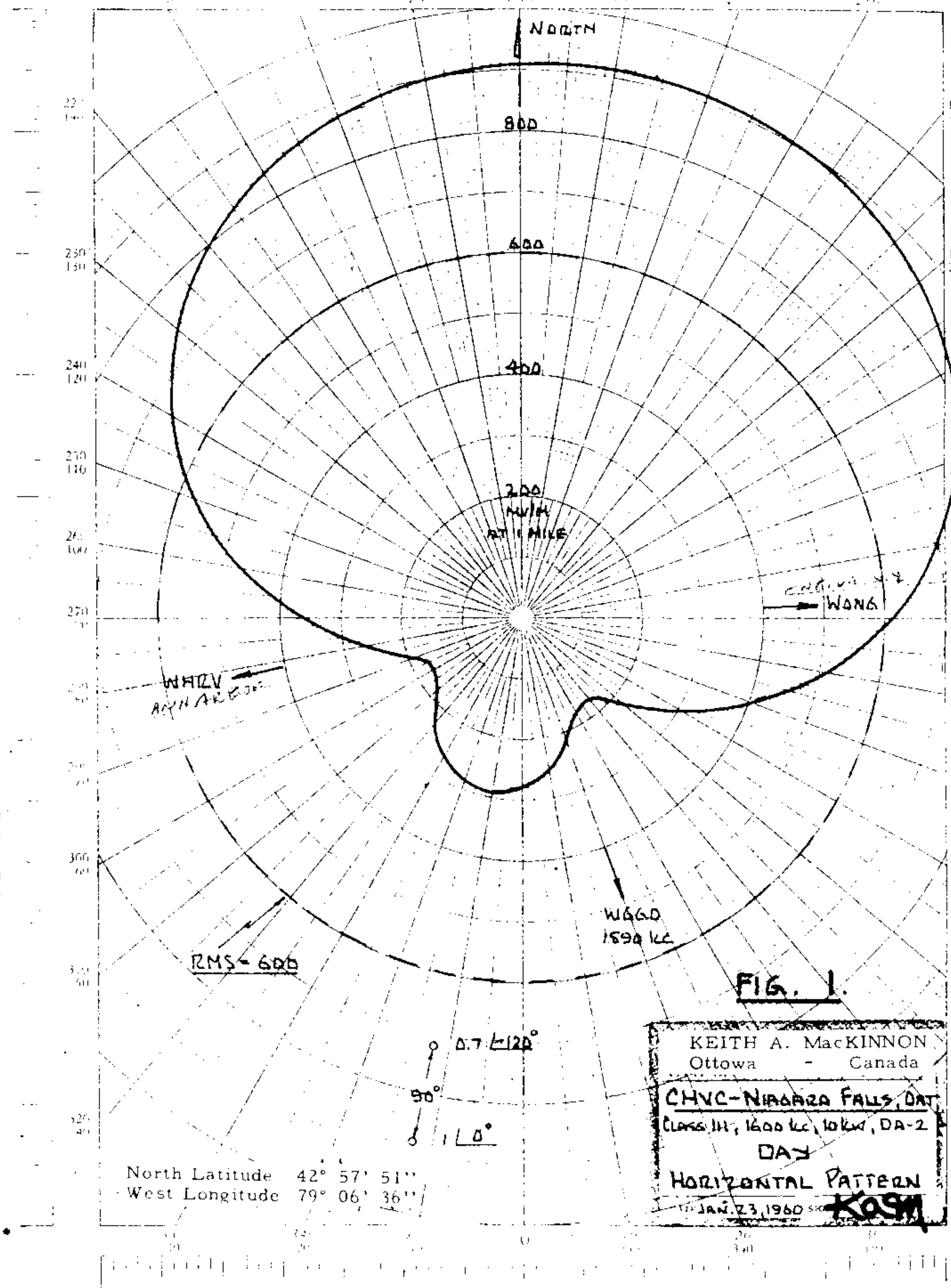


FIG. 1.

North Latitude 42° 57' 51"
West Longitude 79° 06' 36"

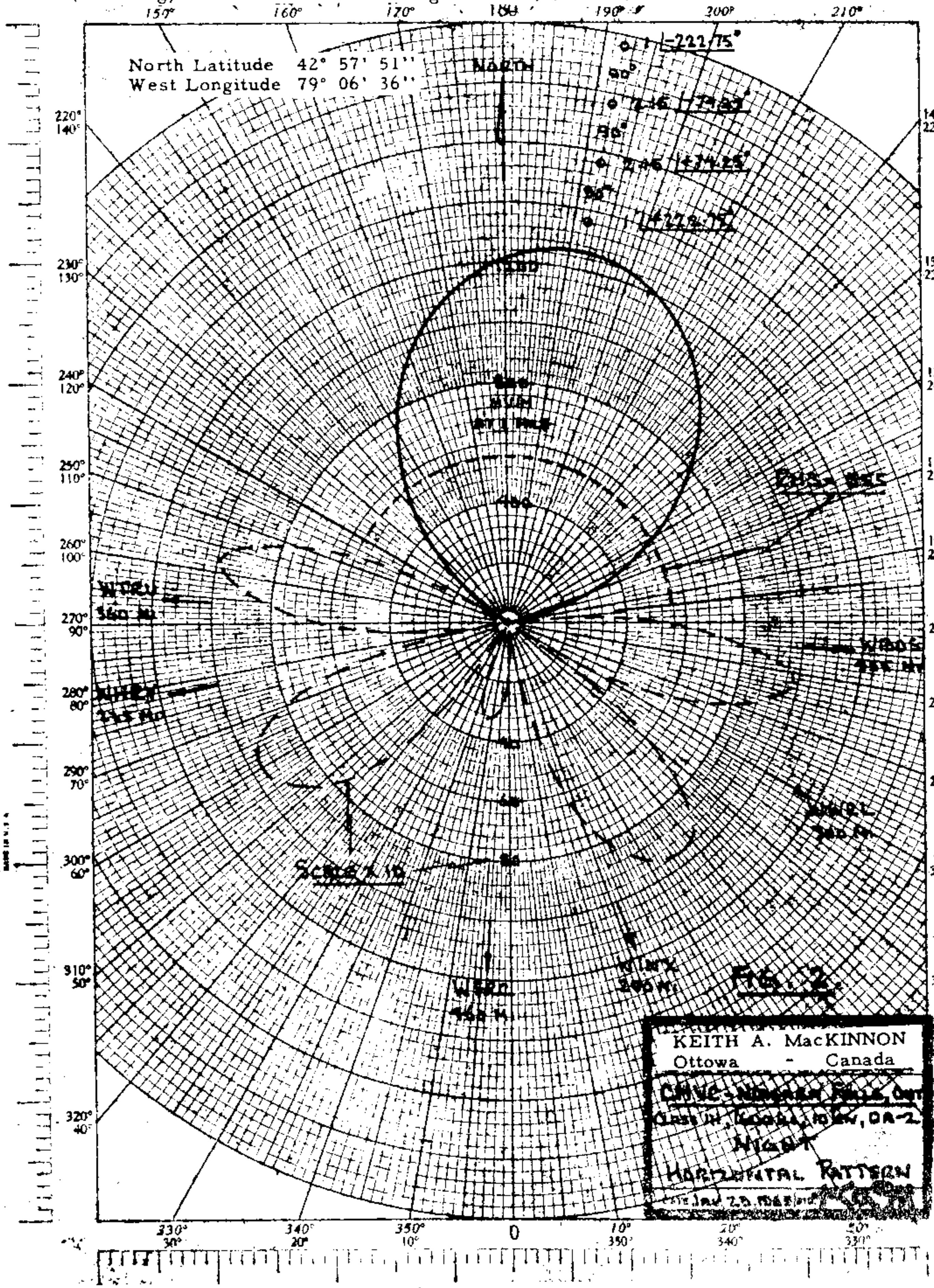
KEITH A. MacKINNON
Ottowa - Canada

CHVC-NIAGARA FALLS, ONT.
CLASS III, 1600 KC, 10KW, DA-2
DAY
HORIZONTAL PATTERN
JAN. 23, 1960
KOSM

CJRN

PROPOSED NIGHT
(9-13-60g)

Station CHVC 10kw, DA-2, U, Class III
Niagara Falls, Ontario, Canada 1600 KC



CKOT

DESCRIPTION OF ARRAY

STATION: CKOT

MAIN STUDIO: Tillsonburg, Ont.

FREQUENCY: 1600 Khz

POWER: 10,000 Watts

TIME: Unlimited

CLASS: 111

NOTIFICATION LIST: 297

DATE: October 2, 1972.

GEOGRAPHICAL LOCATION: 42° - 44' - 08" North
80° - 39' - 25" West

ANTENNA SYSTEM: DA/2

NUMBER OF ELEMENTS: 5 Uniform cross-section, steel radiators, series fed.

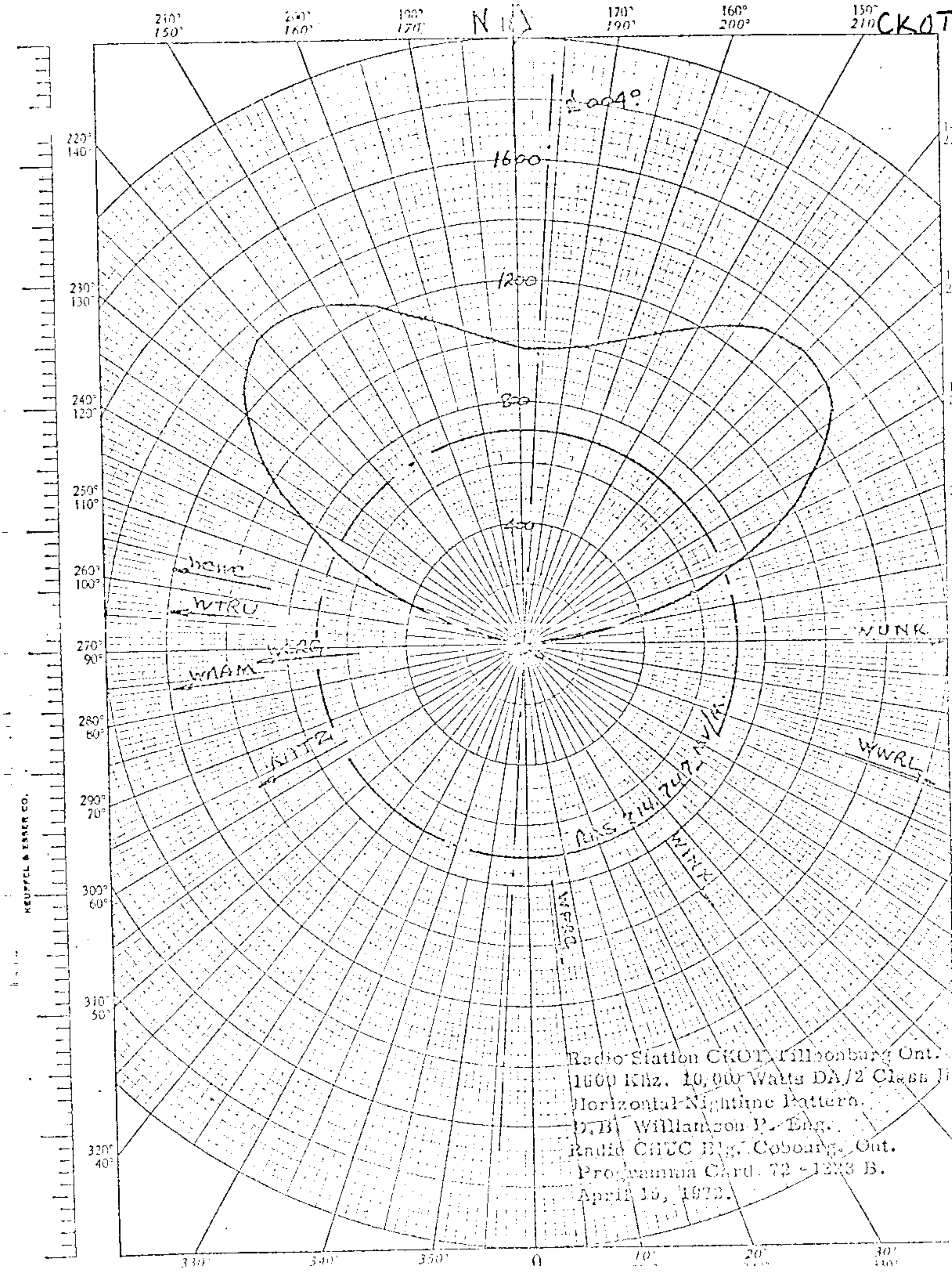
TOWERS:		(1) S	(2)SC	(3) C	(4)NC	(5)N
HEIGHT OVER INSULATORS:		195'(175°)	195'(175°)	195'(175°)	195(175°)	195'(175°)
OVERALL HEIGHT:		200'	200'	200'	200'	200'
ORIENTATION:		Ref.	004°	004°	004°	004°
SPACING:		0	150°	300°	450°	600°
		0	255.5'	511'	766.5'	1022'
PHASING:	day	0	+267.873°	+165.781°	+59.356°	-48.801°
	night	0	+248.421°	+136.486°	+24.551°	-87.028°
RATIOS:	day	1.0000	2.02749	2.17381	1.35605	0.50873
	night	1.0000	2.16954	2.92338	2.16954	1.00000

(All antennae electrically loaded by folded umbrella top hats to 175°)

GROUND SYSTEM: Around each tower base, 120 radials, spaced 3° each 285' long, plus 120 interspaced radials, each 30' long.

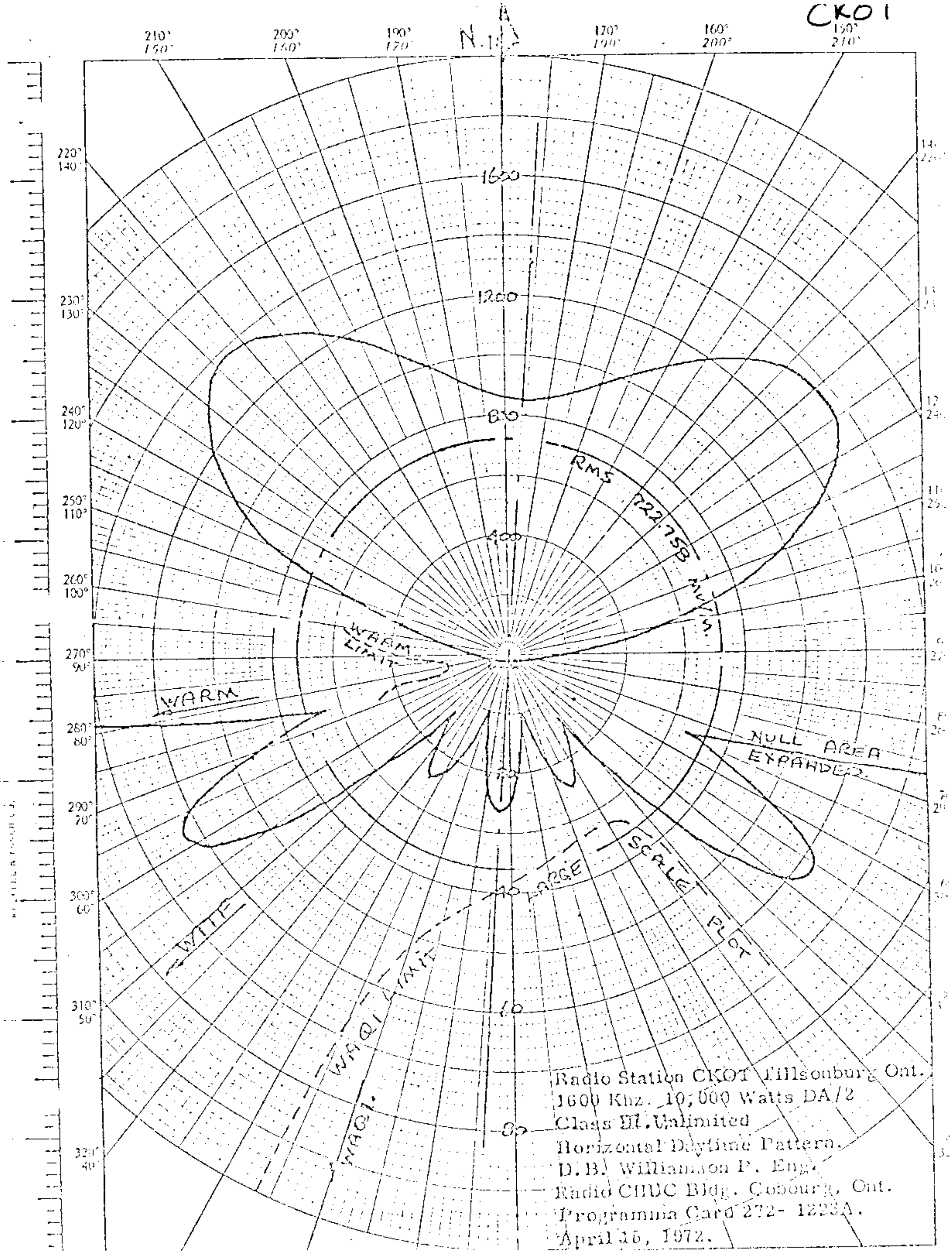
PREDICTED EFFECTIVE FIELD: (day and night) Day — mv/m @ 1 mile for 10 Kw.
722.758 mv/m or 228.556 mv/m @ 1 mile for 1 Kw.
Night — mv/m @ 1 mile for 10 Kw.
714.747 mv/m or 226.023 mv/m @ 1 mile for 1 Kw.

CONSULTANT: D. B. Williamson P. Eng.
Consulting Engineer
Radio CHUC Building
Cobourg, Ont.



CKOT
N
2004°
1600
1200
800
400
WTRU
WAAM
WNTZ
WUNK
WWRL
WINX
WFBD
Radio Station CKOT Tillsonburg Ont.
1600 Khz. 10,000 Watts DA/2 Class II
Horizontal Nighttime Pattern.
D.B. Williamson P. Eng.
Radio CHUC Bldg. Cobourg. Ont.
Programma Card. 72 - 1223 B.
April 15, 1972.
KEUFFEL & ESSER CO.

CKO1


N.
1600
1200
800
400
RMS 222.758 MV/M.
WARM LIMIT
WARM
NULL AREA EXPANDED
SCALE TOO LARGE TO PLOT
WITF
WAQI LIMIT
WAQI
10
Radio Station CKOT Tillsonburg Ont.
1600 Khz. 10,000 Watts DA/2
Class III Unlimited
Horizontal Daytime Pattern.
D. B. Williamson P. Eng.
Radio CHUC Bldg. Cobourg, Ont.
Programma Card 272- 1223A.
April 15, 1972.

NEW
1600KHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: (NEW)

Main Studio: Pittsburgh, Kentucky

Frequency: 1600 kHz

Power: .5kw Day

Notification List No. 1785

Date: November 16,1979 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 37° 10' 16"
West Longitude: 84° 06' 39"

ANTENNA CHARACTERISTICS

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

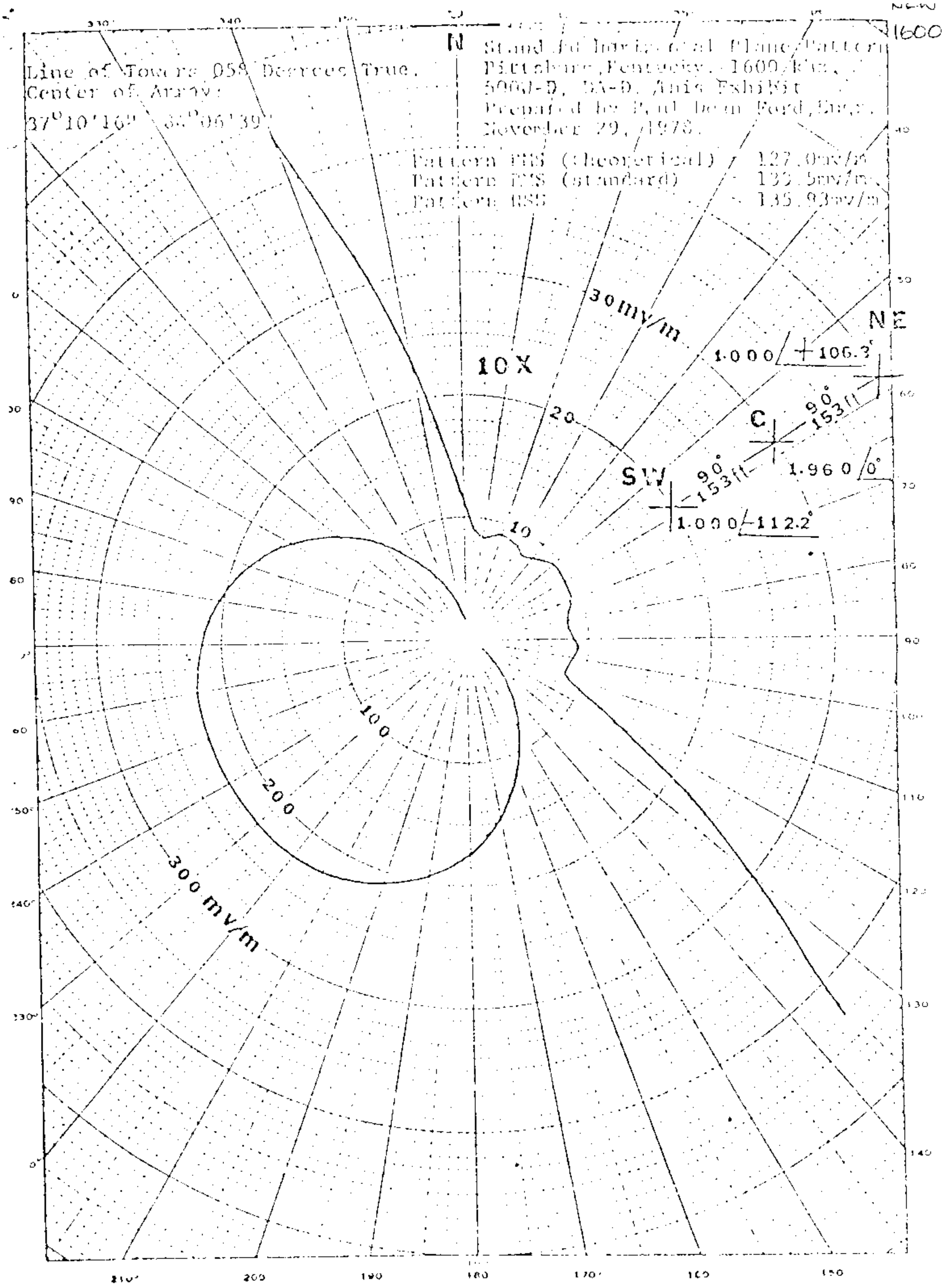
TOWER:	SW	C	NE
HEIGHT ABOVE INSULATORS	153'	153'	153' (89.6)
DAY PHASING:	-112.2°	0°	106.3°
DAY FIELD RATIO:	1.00	1.96	1.00

SPACING AND ORIENTATION: Adjacent towers in a row are spaced 153'(90°) on a line bearing 58° true.

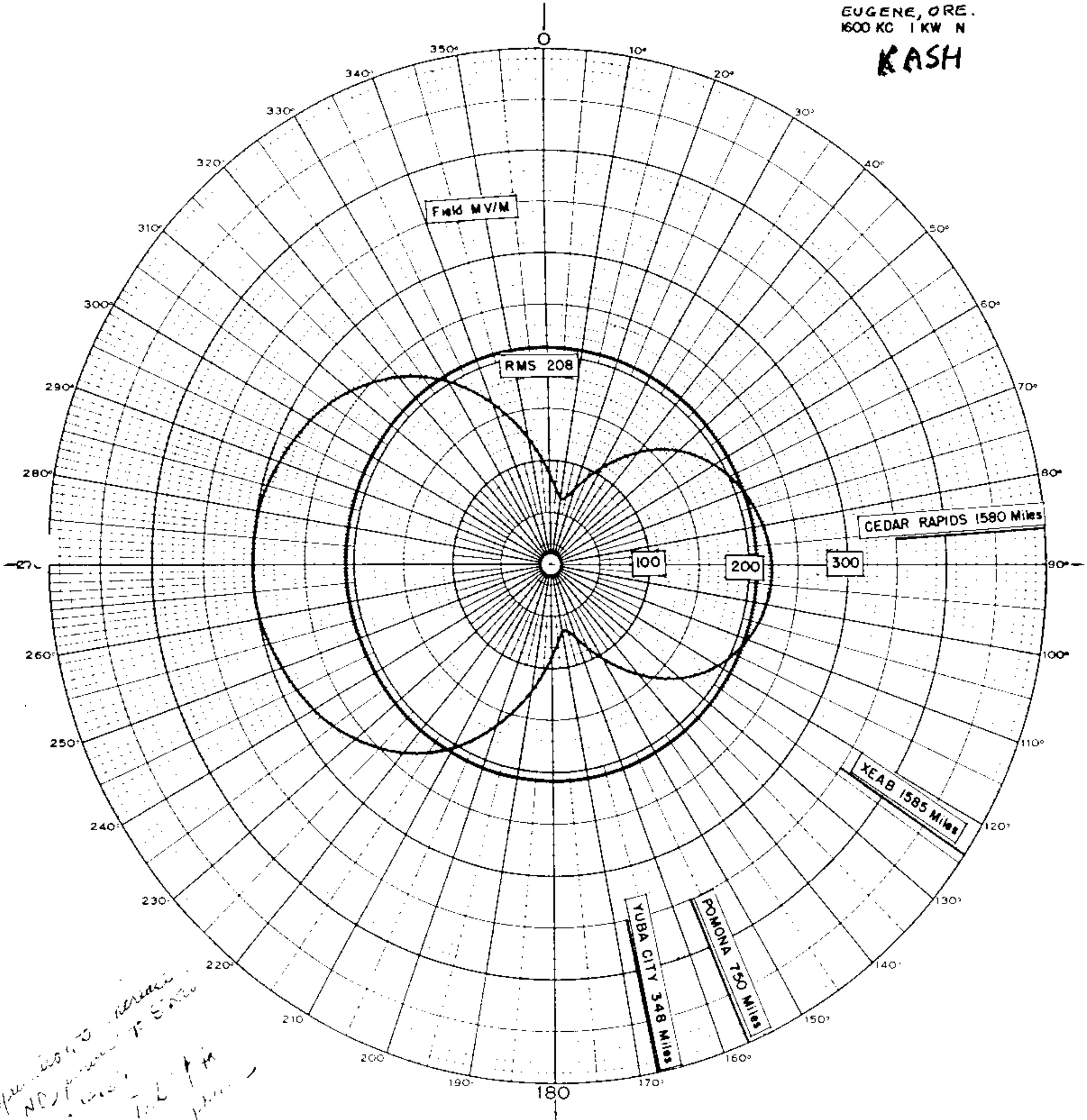
GROUND SYSTEM: 120 - 153' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	127.0 mv/m	135.93 mv/m	133.5 mv/m


NEW 1600
N
Line of Towers 058 Degrees True.
Center of Array:
37°10'16"
1600
5000-D, DA-D
November 29, 1978.
Pattern RMS (theoretical)
127.0mv/m
Pattern RMS (standard)
Pattern RSS
135.93mv/m
30mv/m
10X
20
10
100
200
300 mv/m
NE
1.000 /106.3°
90°
153 ft
C
1.960 /0°
SW
1.000 /112.2°
90
180
170
160
150
190
200
210
110
120
130
140

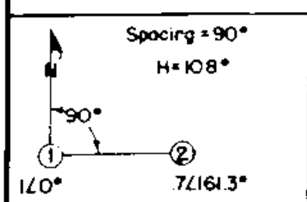
EUGENE, ORE.
1600 KC 1 KW N
KASH



RADIO AIR WAYS INC.
EUGENE, OREGON

Figure 1
Series 4610210

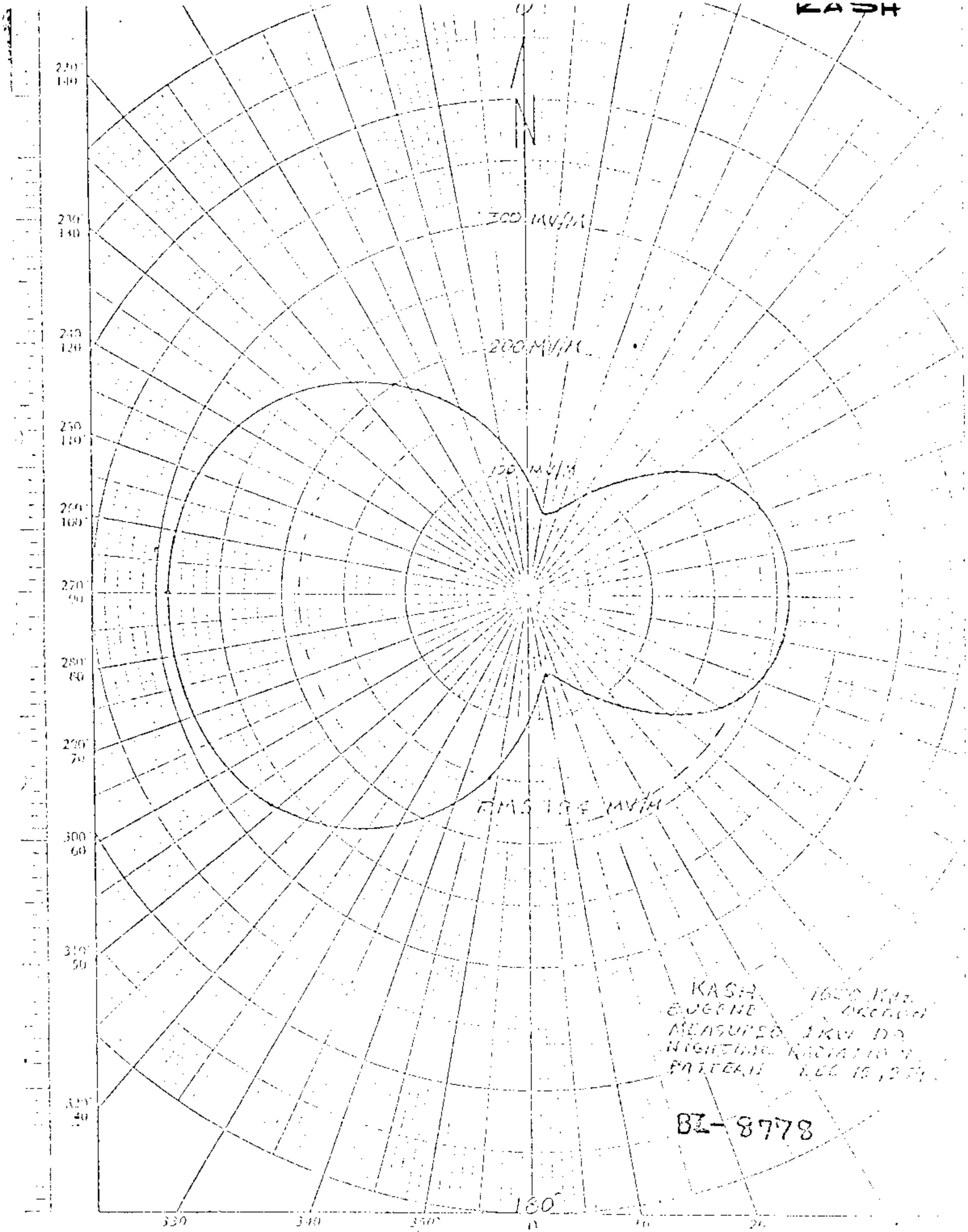
1600 KC
1000 WATTS
NIGHT



PROPOSED
DIRECTIONAL ANTENNA PATTERN

FRANK H. McINTOSH
Consulting Radio Engineer
Washington, D.C.

KASH



N
300 MV/M
200 MV/M
100 MV/M
RMS 198 MV/M
180°
KASH 1600 KHz.
EUGENE OREGON
MEASURED 1KW DA
NIGHTTIME RADIATION
PATTERN DEC 15,
BZ-8778

KATZ

SUPPLEMENTAL DIRECTIONAL ANTENNA
DESCRIPTION SHEET

Station: KATZ

Main Studio: St. Louis, Missouri.

Frequency: 1600 kHz

Power: 5 kW

Notification List No. 1666

Date: January 7, 1976 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 38° 39' 19"

West Longitude: 90° 07' 53"

Authorized for Nighttime operation (DA-N).

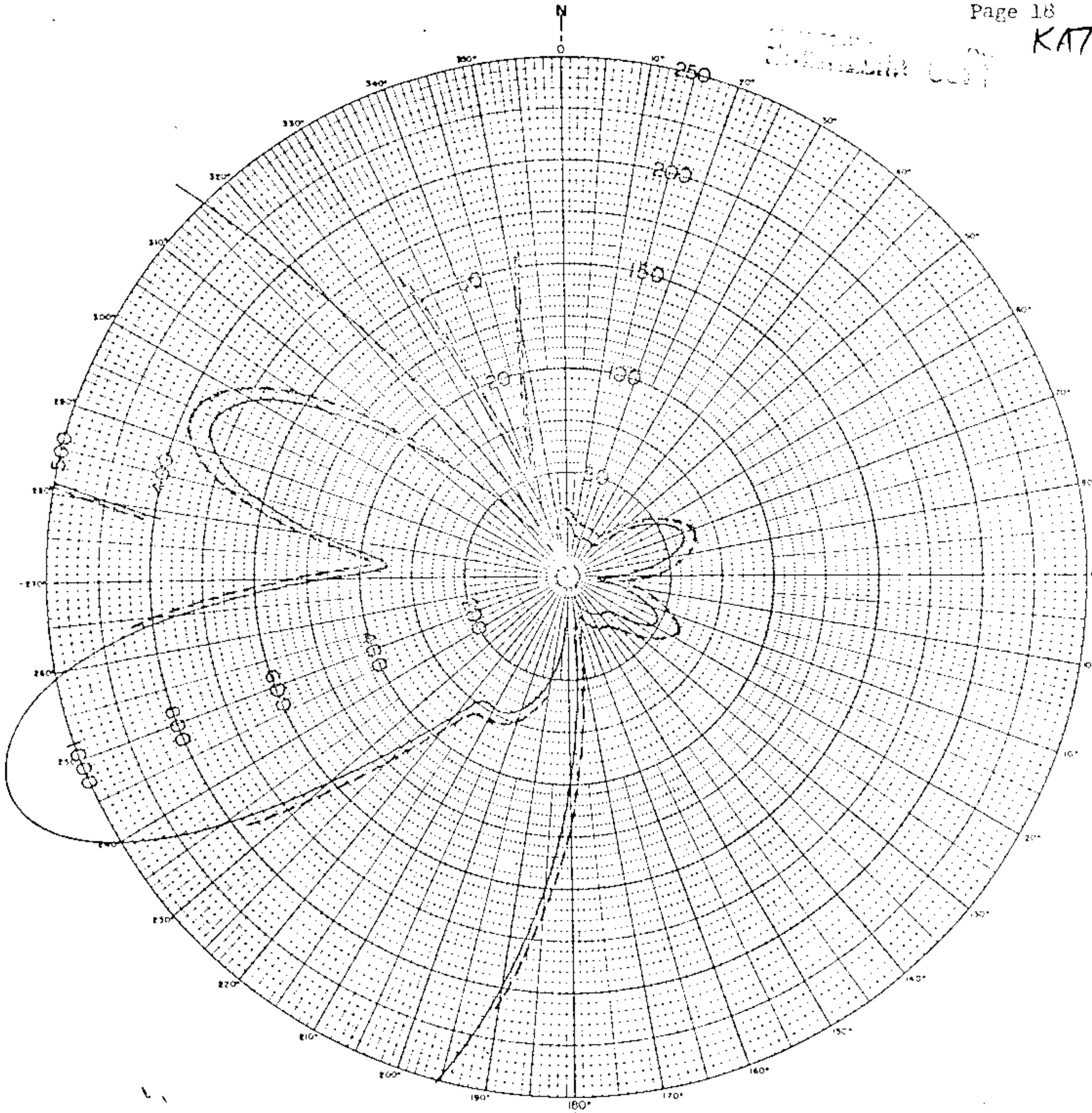
Predicted effective Day Field: (omnidirectional) 425 mv/m at rated power.

Predicted effective Night Field: 400 mv/m at rated power.

Note: Please retain the description sheet and horizontal directional antenna radiation patterns notified for station KATZ in United States Change List Number 1556, dated November 28, 1973, and attach to this supplemental Description Sheet. This notification is for the purpose of indicating only a change to add meovs of radiation in the vertical angle directional antenna radiation patterns.

CTR NO 31240A5

KATZ



HORIZONTAL RADIATION PATTERN 5° Level

APPLICANT KATZ
LOCATION St. Louis, Missour
FREQUENCY 1600 KC/S
POWER 5000 Watts
LATITUDE 38 DEG 39 MIN
LONGITUDE 90 DEG 07 MIN
WHEN USED Nighttime
RMS FIELD 400 MV/M
DATE July

RAL
CONSUL
ST.

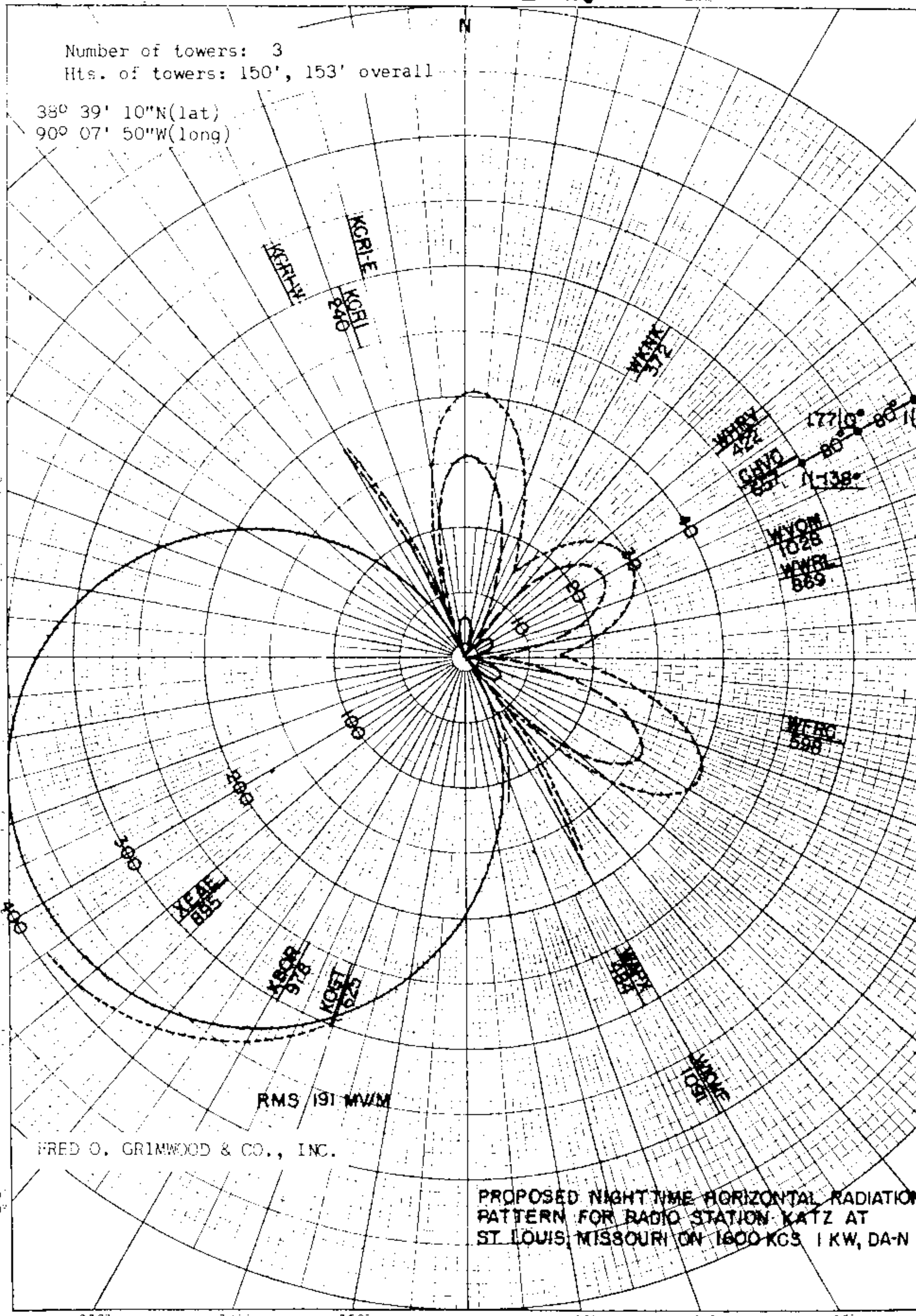
KATZ

PROPOSED NIGHT
(6/21/55G)

STATION KATZ
ST. LOUIS, MISSOURI

1KW
DA-N, U

1600 KC



FILE NO. BP-9887

ACCEPTED FCC 6/1/55

KATZ, St. Louis, Missouri 1600 KC

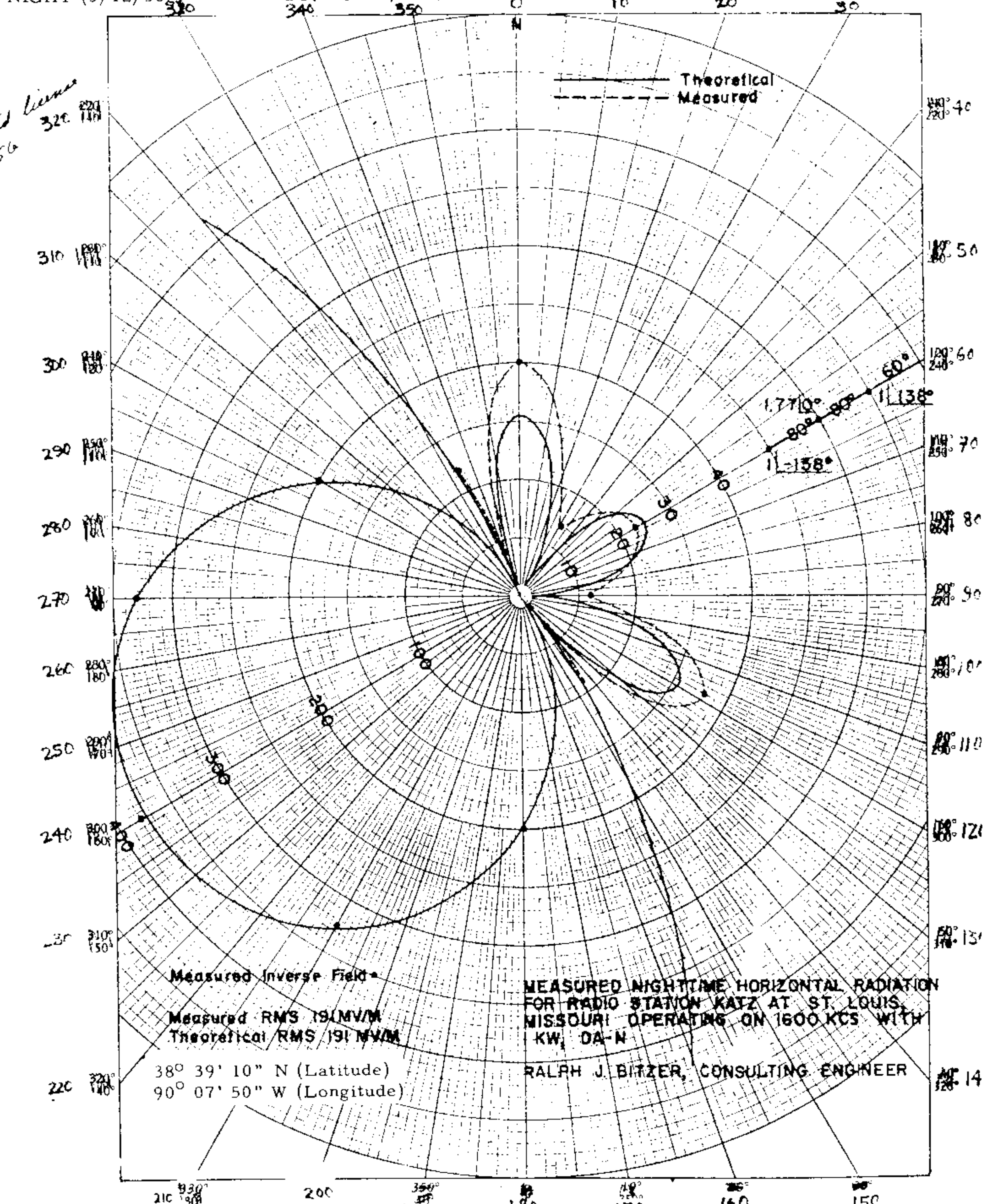
KATZ

MEASURED
NIGHT (3/12/56g)

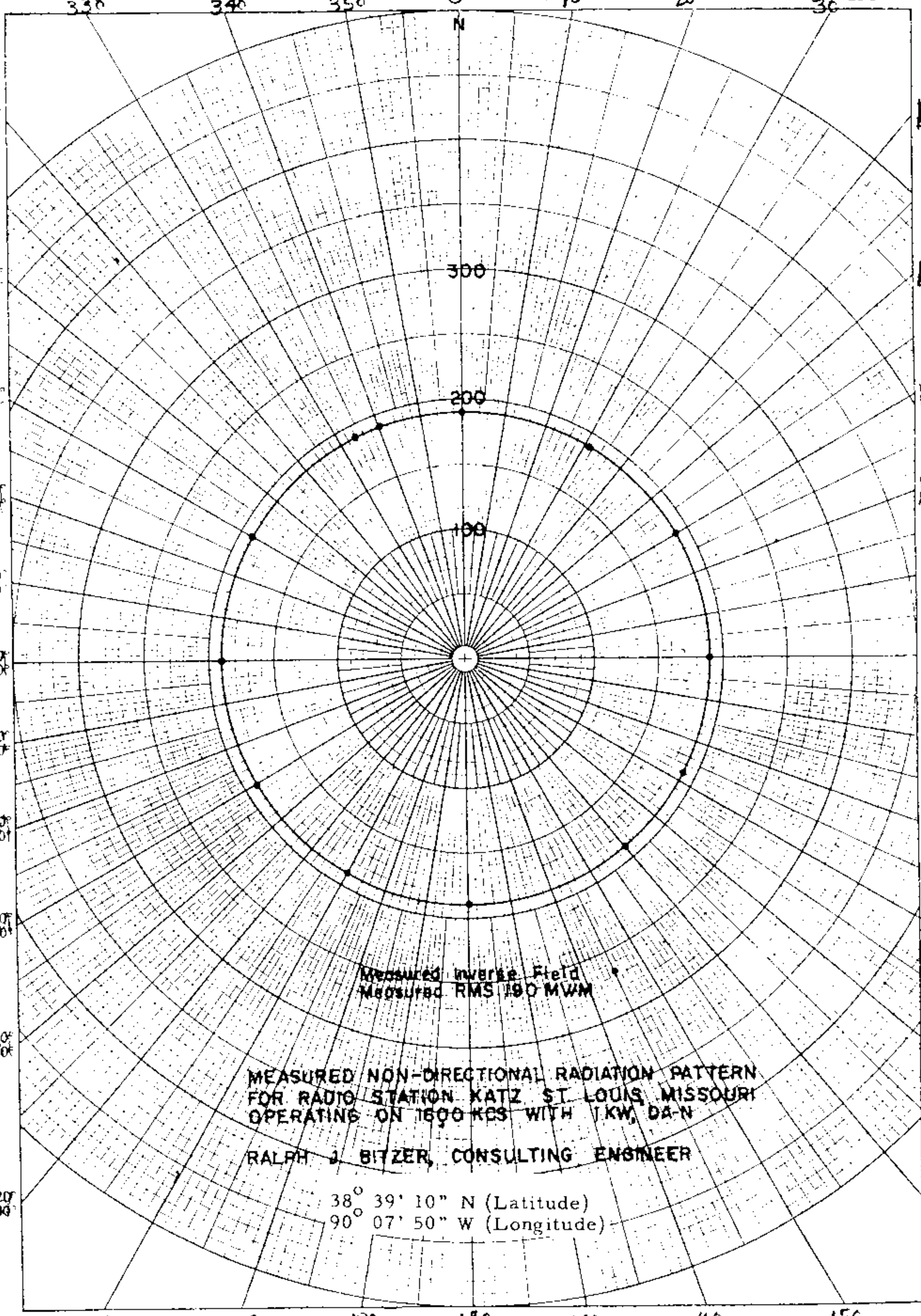
STATION KATZ
ST. LOUIS, MO.

1 KW
DA-N,U

1600 KC



MEASURED NON-DA (3/12/56g)
STATION KATZ ST. LOUIS, MO.
1 KW DA-N,U
1600 KC



FCC File No. BL-6067 Accepted 2-14-56 KATZ, St. Louis, Mo. 1600 KC granted ~~license~~ C.P. 2/24/57 to change to 5 KW

KATZ

PROPOSED
NIGHT (7-11-56g)

STATION KATZ
ST. LOUIS, MO.

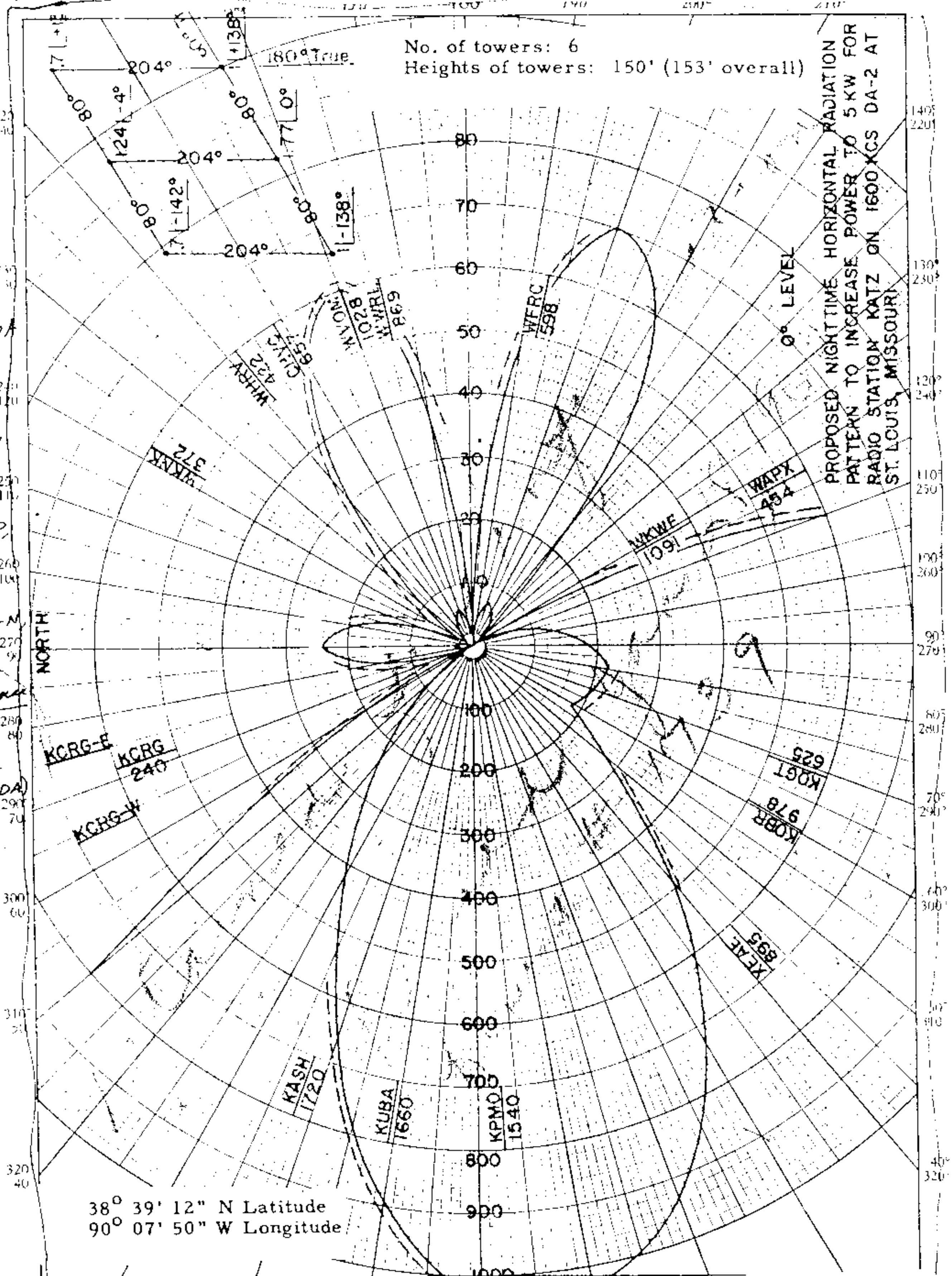
5 KW
DA-NU

1600 KC

Granted Mod of CP 8/1/57 to change from DA-2 to DA-N

Granted CP 10/16/57 to increase Non DA Day to 5 KW from presently licensed 1 KW, DA-N, U. & extending for 6 mo. the outstanding CP, as modified, for operating with 5 KW, DA-N, U.

granted license 12/26/57 for increase in day (Non DA) power to 5 KW



FCC File No. BP-10,652 Accepted 7-3-56 KATZ, St. Louis, Mo. 1600 KC

KBOR
1600 kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KBOR	Main Studio: Brownsville, Texas
Frequency: 1600 kHz	Power: 1kw Night 1kw Day
Notification List No. 1787	Date: July 10, 1980 Class: III
GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:	North Latitude: 25° 56' 57" West Longitude: 97° 33' 15"

ANTENNA CHARACTERISTICS

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

TOWER:	SW(#1)	NE(#2)
HEIGHT ABOVE INSULATORS:	190'	190° (111.3°)
PHASING:	0°	0°
FIELD RATIO:	1.0	0.66

SPACING AND ORIENTATION: Towers in a row are spaced 273.3' (160°) on a line bearing 20° true.

GROUND SYSTEM: 120 - 190' equally spaced copper radials plus a 48' square ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

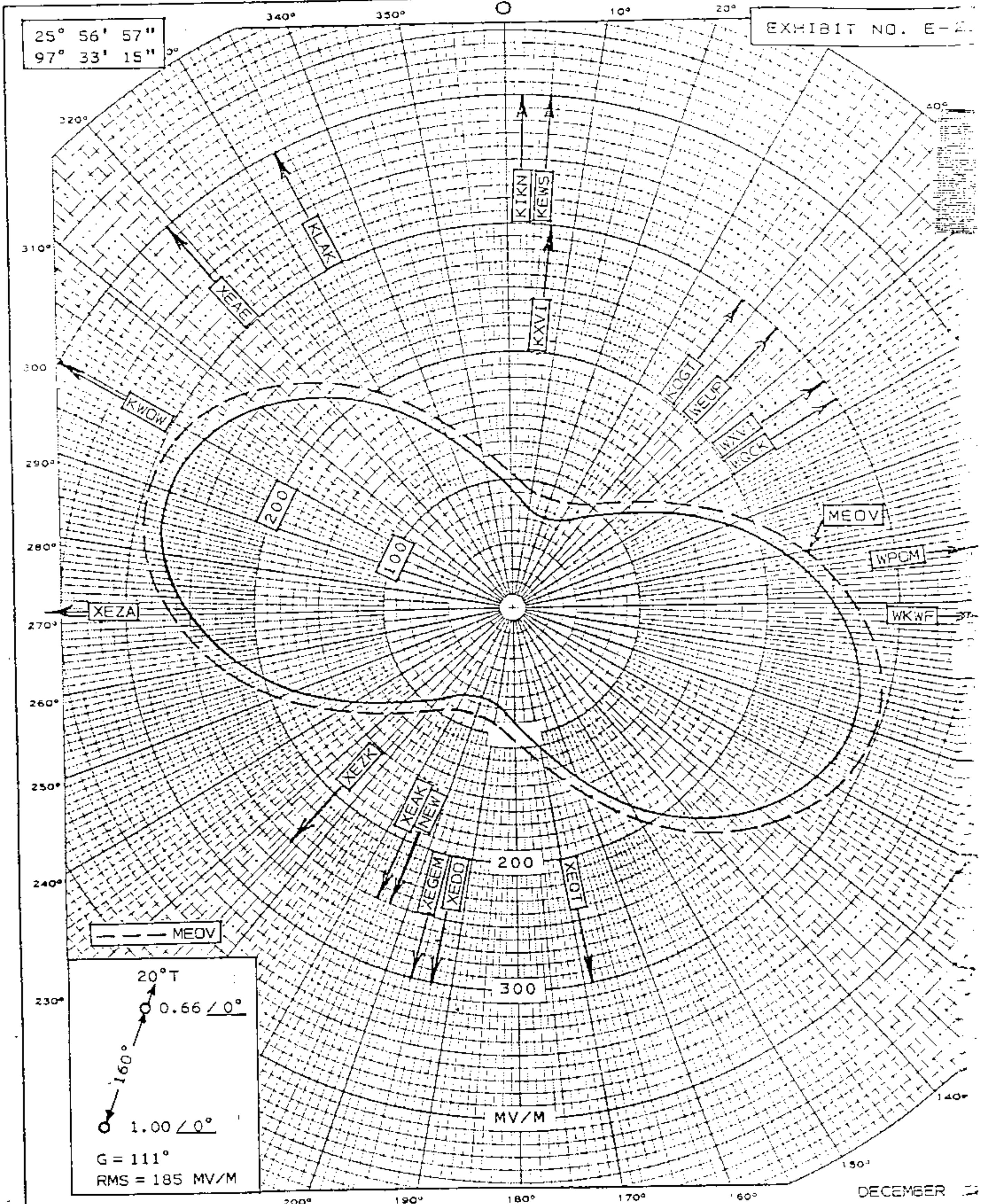
PREDICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL
<u>RMS</u>

185 mv/m

THEORETICAL 1600KHZ.

EXHIBIT NO. E-2



DECEMBER

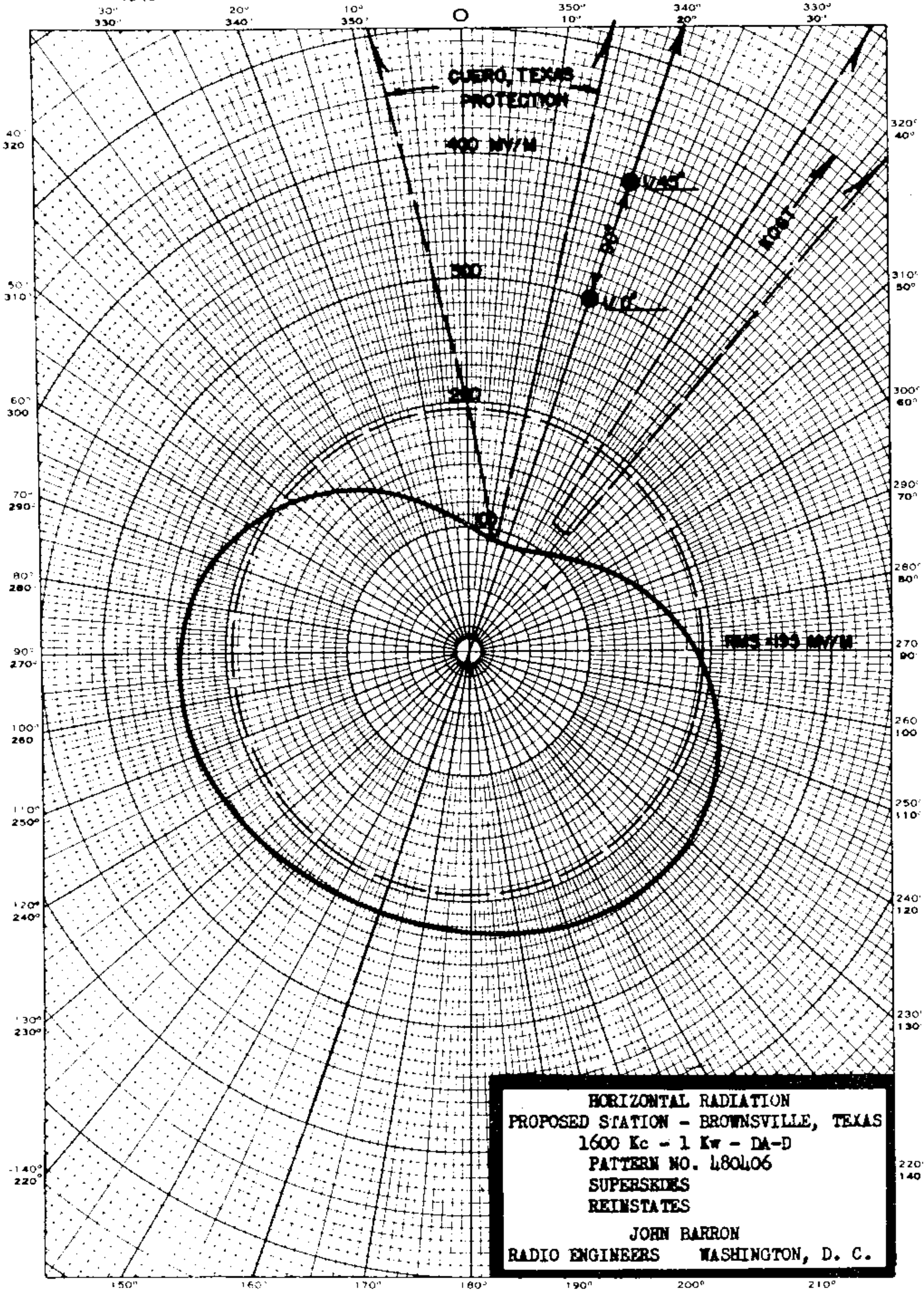
EDWARD F. LORENTZ & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

PROPOSED DAYTIME AND NIGHTTIME
HORIZONTAL DIRECTIONAL ANTENNA PATTERN

KBOR, BROWNSVILLE, TEXAS
1600 KHZ, 1 KW-U, DA-1

KBOR
BROWNSVILLE, TEX
1600

MAY 20 1948 G

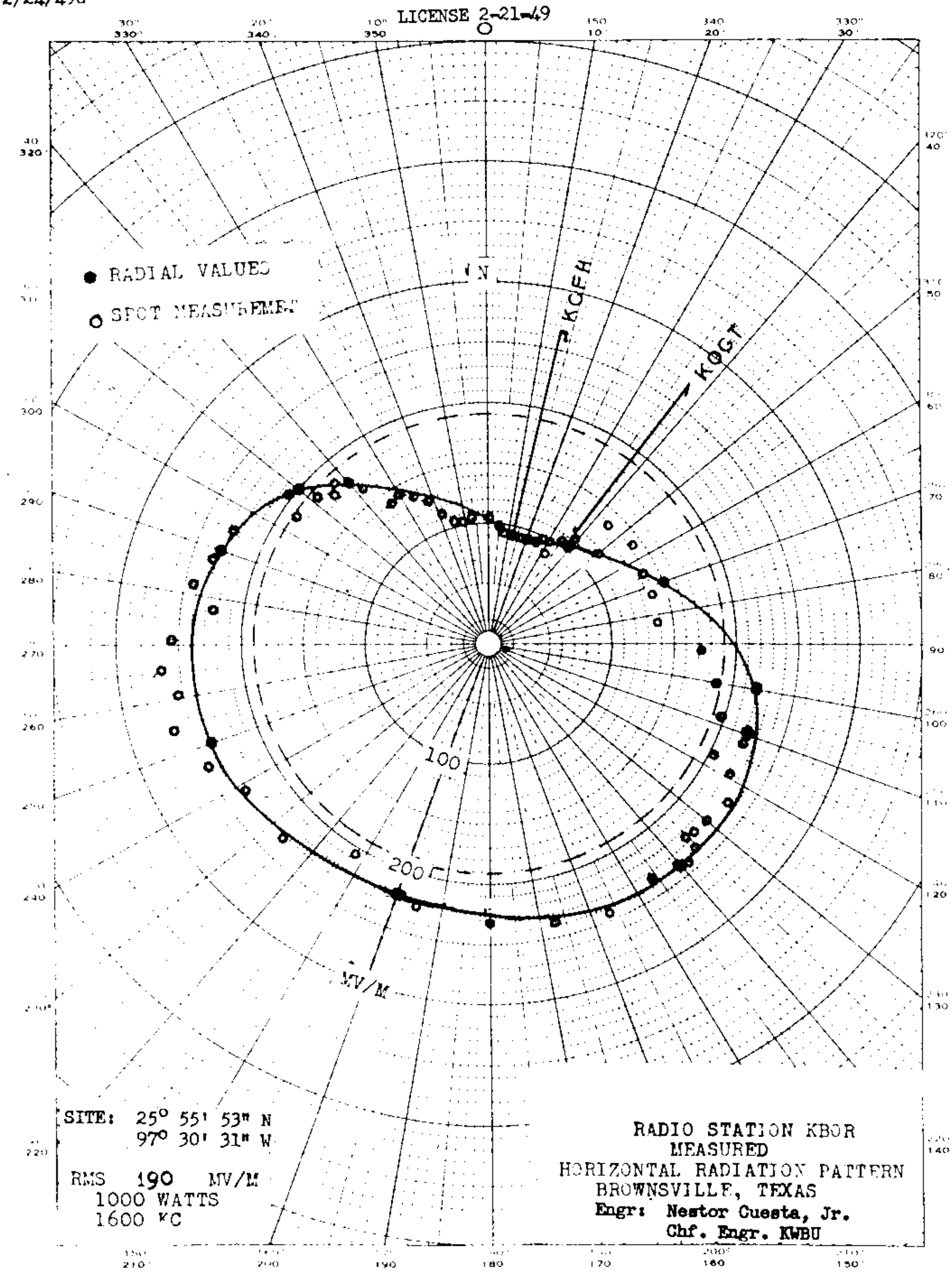


HORIZONTAL RADIATION
PROPOSED STATION - BROWNSVILLE, TEXAS
1600 Kc - 1 Kw - DA-D
PATTERN NO. 480406
SUPERSEDES
REINSTATES
JOHN BARRON
RADIO ENGINEERS WASHINGTON, D. C.

Amendment rec'd 4-30-48 P-6379

KBOR

MEASURED KBOR, BROWNSVILLE, TEX. 1kw,D,DA 1600 kc
DAY 2/24/49G

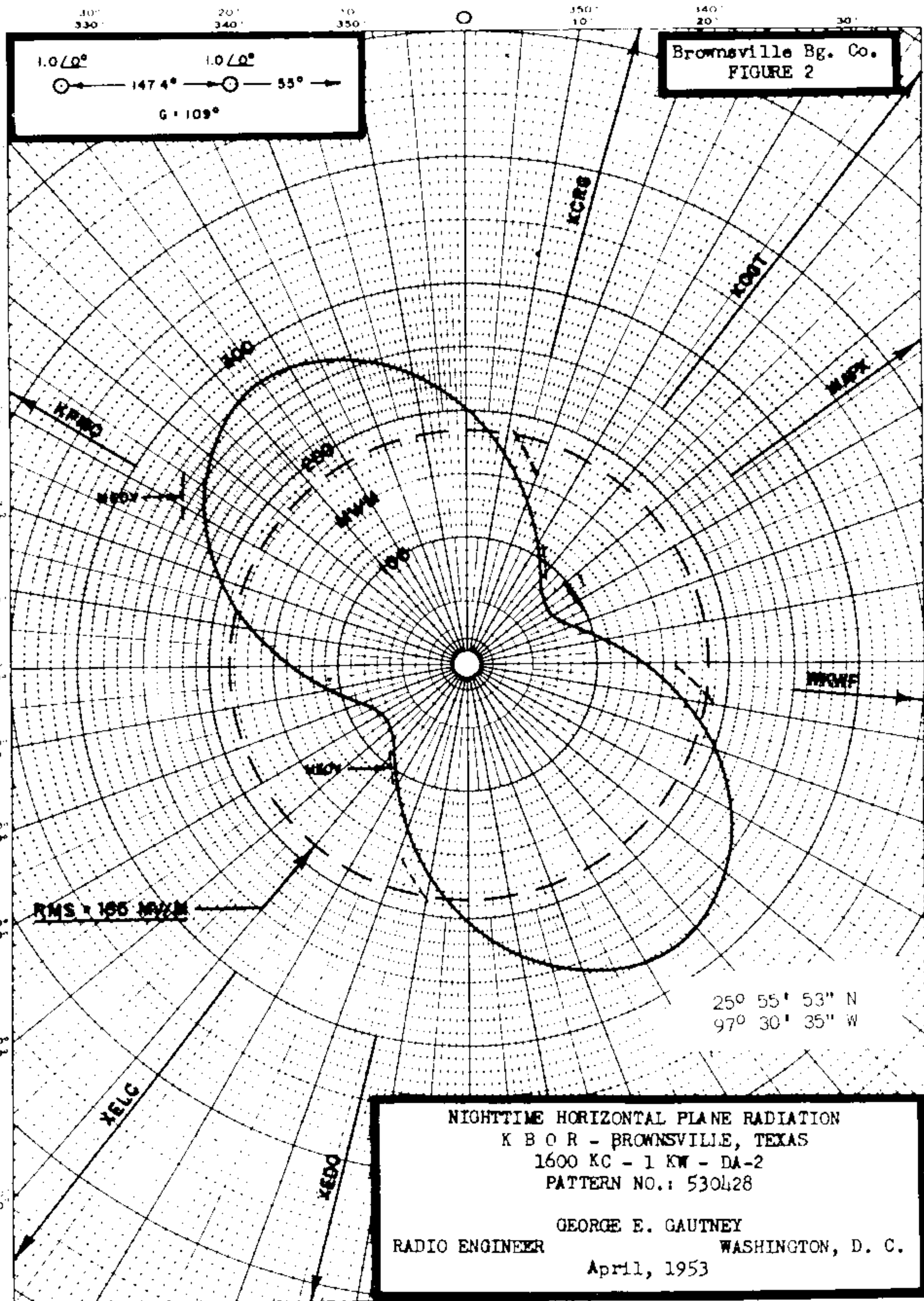


SITE: 25° 55' 53" N
97° 30' 31" W

RMS 190 MV/M
1000 WATTS
1600 KC

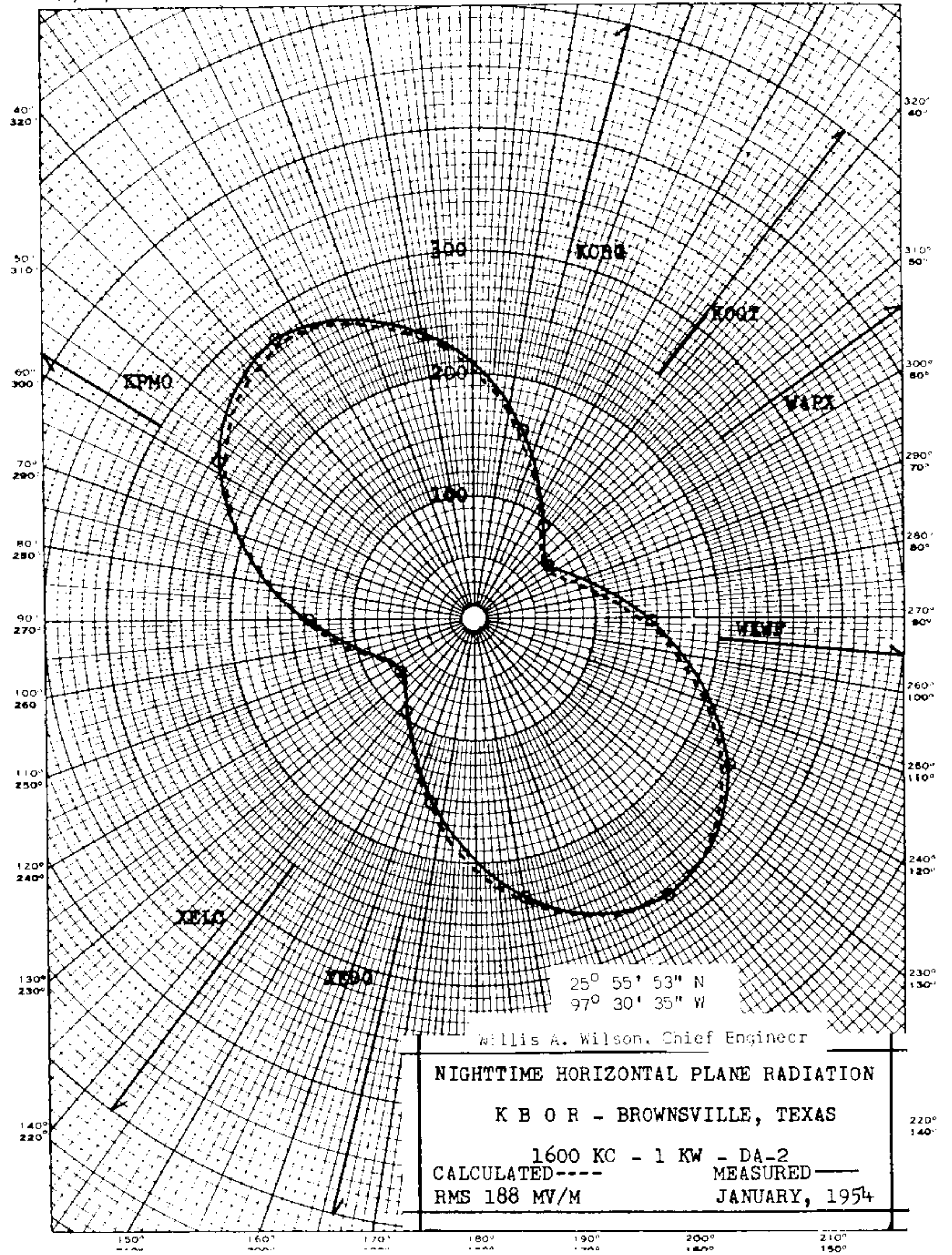
RADIO STATION KBOR
MEASURED
HORIZONTAL RADIATION PATTERN
BROWNSVILLE, TEXAS
Engr: Nestor Cuesta, Jr.
Chf. Engr. KWBU

PROPOSED NIGHT (6/25/53G) KBOR, BROWNVILLE, TEXAS 1kw, DA-2 1600 kc



KBOR

MEASURED KBOR, BRownville, Texas lkw, U, DA-2 1600 kc
NIGHT (2/16/54G)

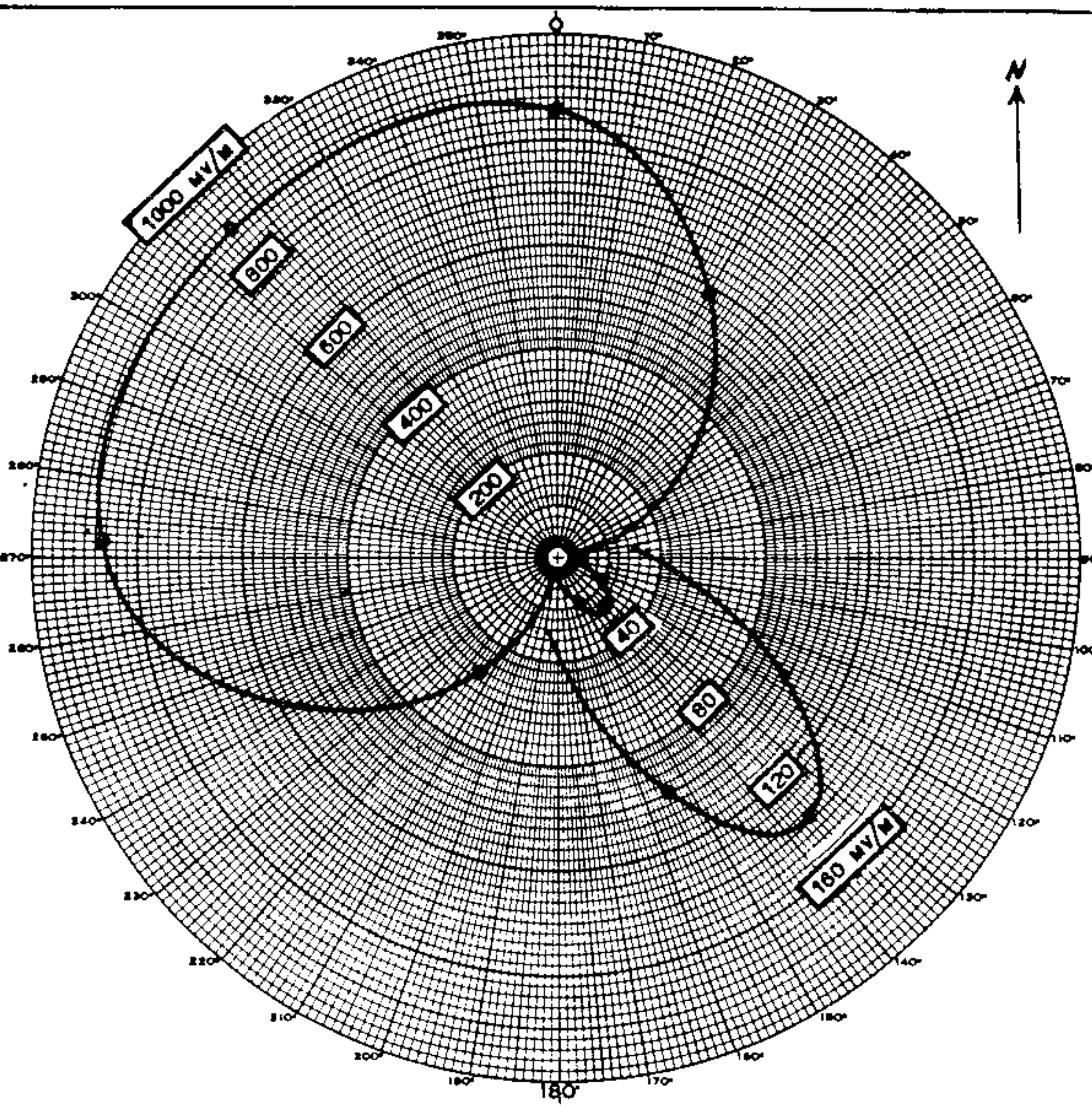


FCC File No. BL-5219 Accepted 2/9/54 KBOR, Brownville, Texas 1600 k

Measured Night
(9-29-64)

Station KCRG
Cedar Rapids, Iowa

5kw,DA-N,U
1600 kc

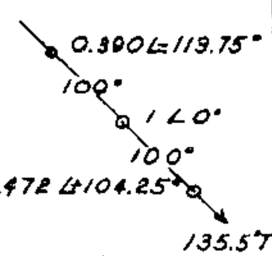


SITE COORDINATES

41° 56' 21" N
91° 32' 04" W

EXHIBIT B-1

MEASURED NIGHTIME DIRECTIONAL HORIZONTAL RADIATION PATTERN



CEDAR RAPIDS TELEVISION COMPANY
CEDAR RAPIDS, IOWA

KCRG

ENGINEERING DEPARTMENT

RADIO STATION

KCRG

1600 KC

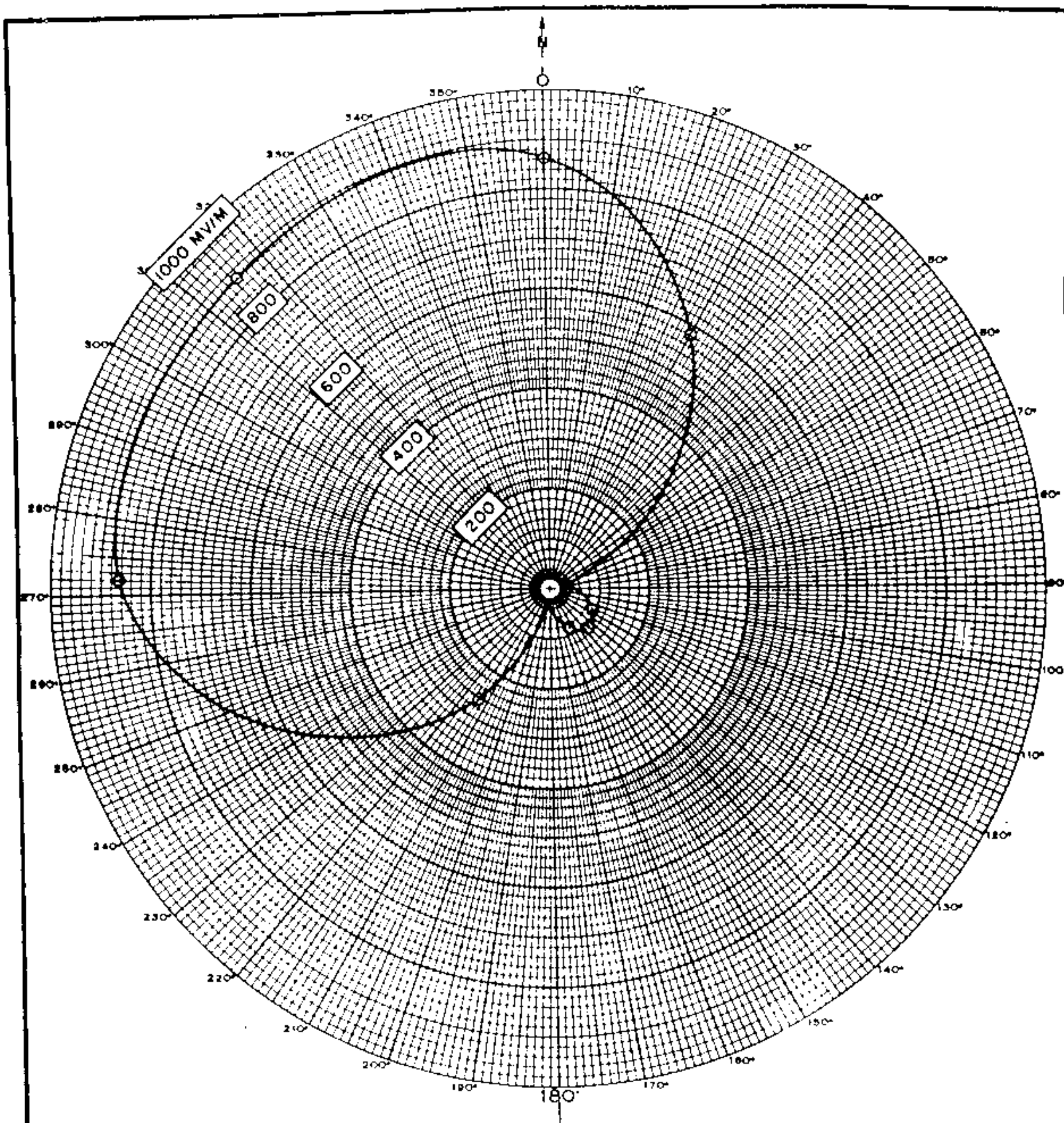
5 KW DA-N

KCRG

Measured Night
(11-29-63ct)

Station KCRG
Cedar Rapids, Iowa

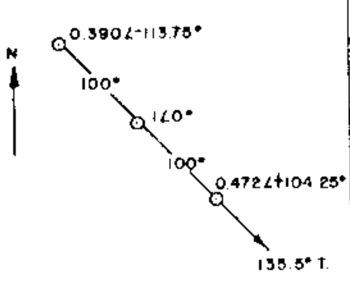
5kw,DA-N,U
1600 kc



E_{RMS} = 555 MV/M

⊙ - MEASURED VALUES

EXHIBIT B-1



LATITUDE 41° 58' 21" North
LONGITUDE 91° 32' 04" West

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

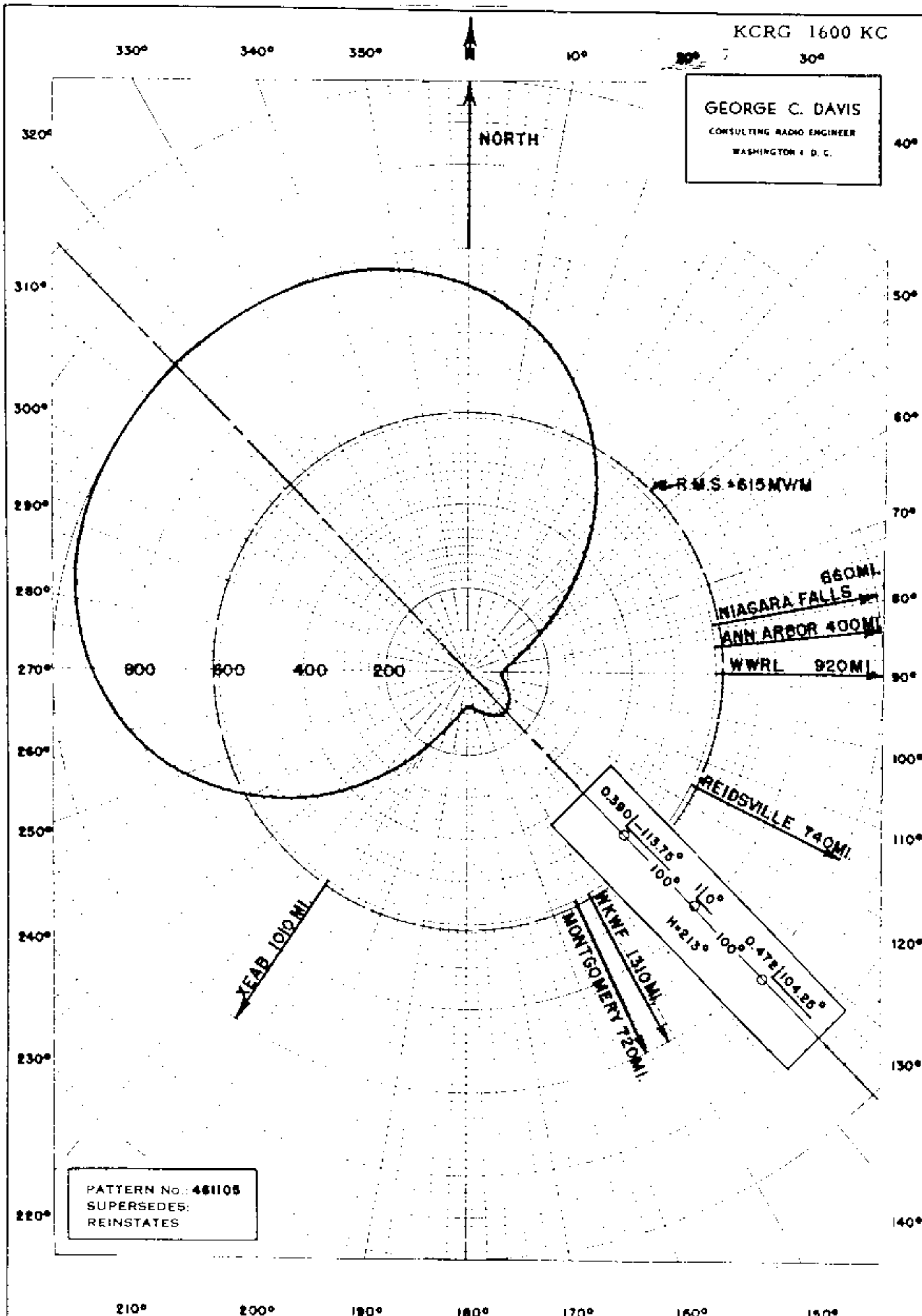
MEASURED
HORIZONTAL PLANE
PATTERN
FOR
KCRG
CEDAR RAPIDS, IOWA
1600 KC, 5 KW, DA-N
630904

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON D. C.

FCC File No. BZ-5071
Accepted 11-5-63

Station KCRG
Cedar Rapids, Iowa

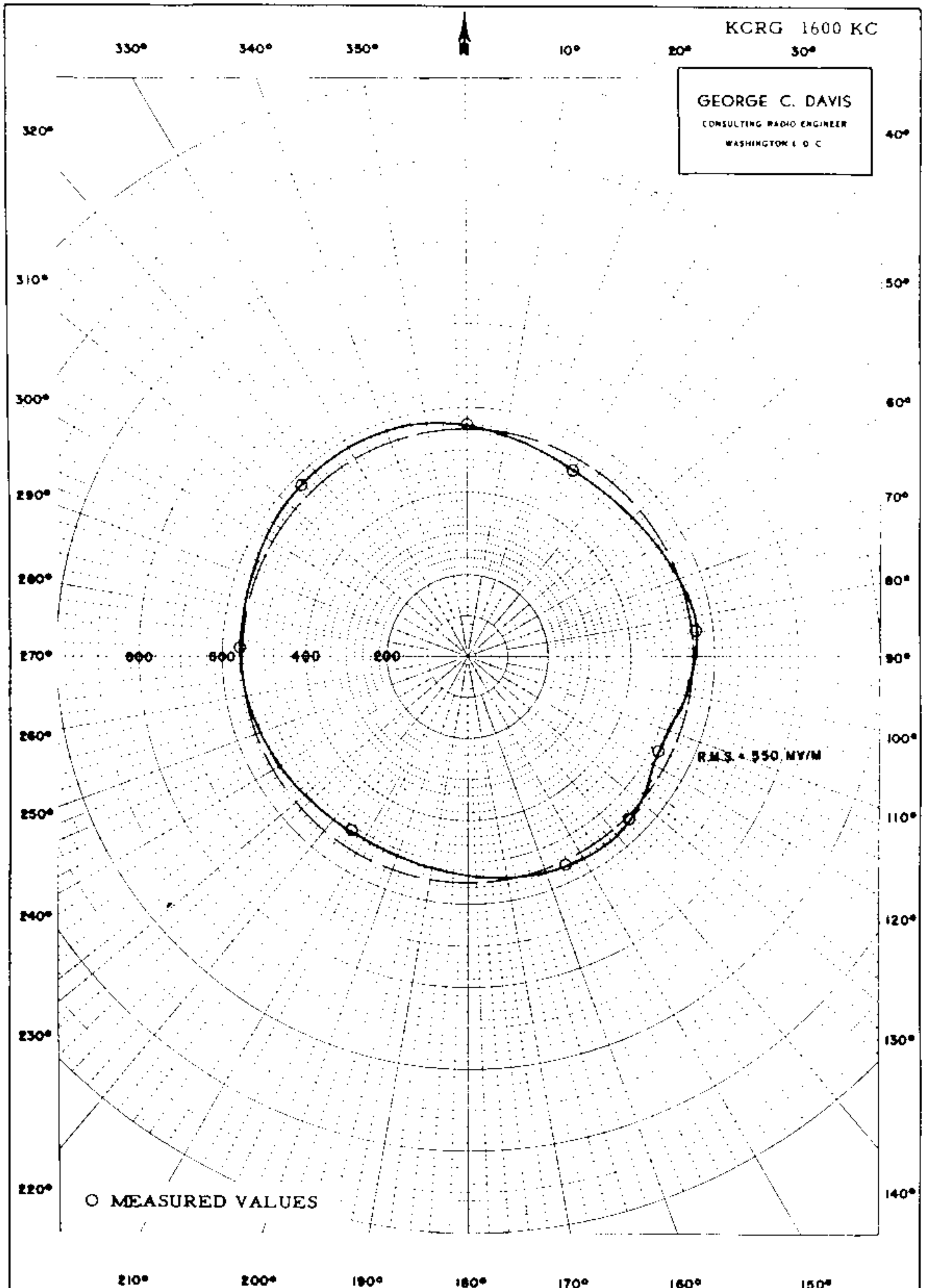
1600 kc



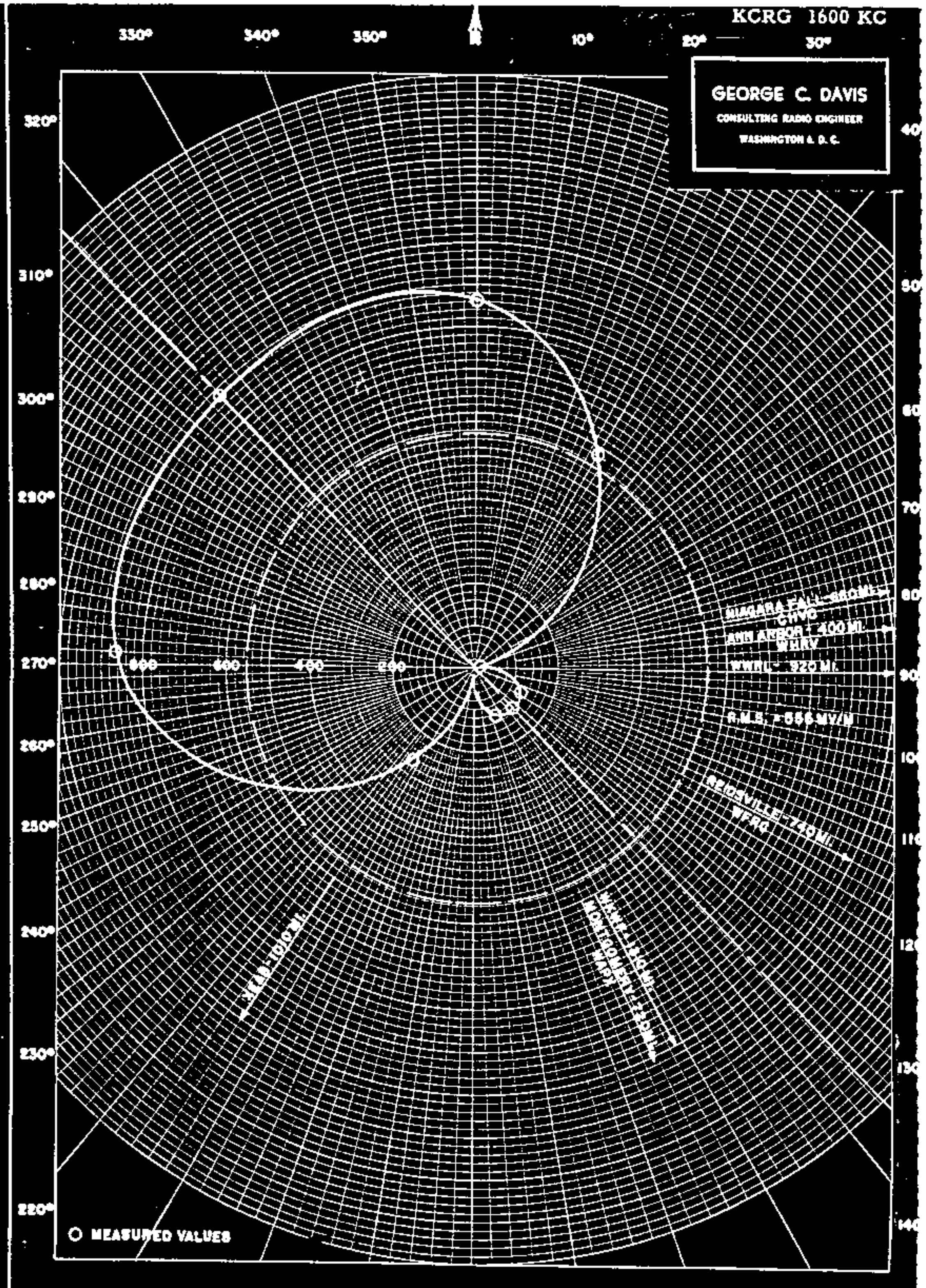
COMPUTED PATTERN
FOR KCRG, CEDAR RAPIDS, IOWA
1600 KC - 5 KW - DA-N
NOVEMBER 1946

OVER

KCRG



POLAR GRAPH OF
NON-DIRECTIVE FIELD INTENSITY
FOR KCRG, CEDAR RAPIDS, IOWA
1600 KC - 5 KW - DA-N
DECEMBER 1947



POLAR GRAPH OF
MEASURED FIELD INTENSITY
FOR NIGHTTIME OPERATION
FOR KCRG, CEDAR RAPIDS, IOWA
DECEMBER 1947

KGST
1600kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KGST

Main Studio: Fresno, California

Frequency: 1600 kHz

Power: 5kw Night 5kw Day

Notification List No. 1783

Date: November 2, 1979 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 36° 42' 36"
West Longitude: 119° 50' 06"

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:	SW	SC	NC	NE
HEIGHT ABOVE INSULATORS:	195'	195'	195'	195' (114.2°)
NIGHT PHASING:	0°	186°	12°	198°
NIGHT FIELD RATIO:	1.0	2.63	2.45	1.05

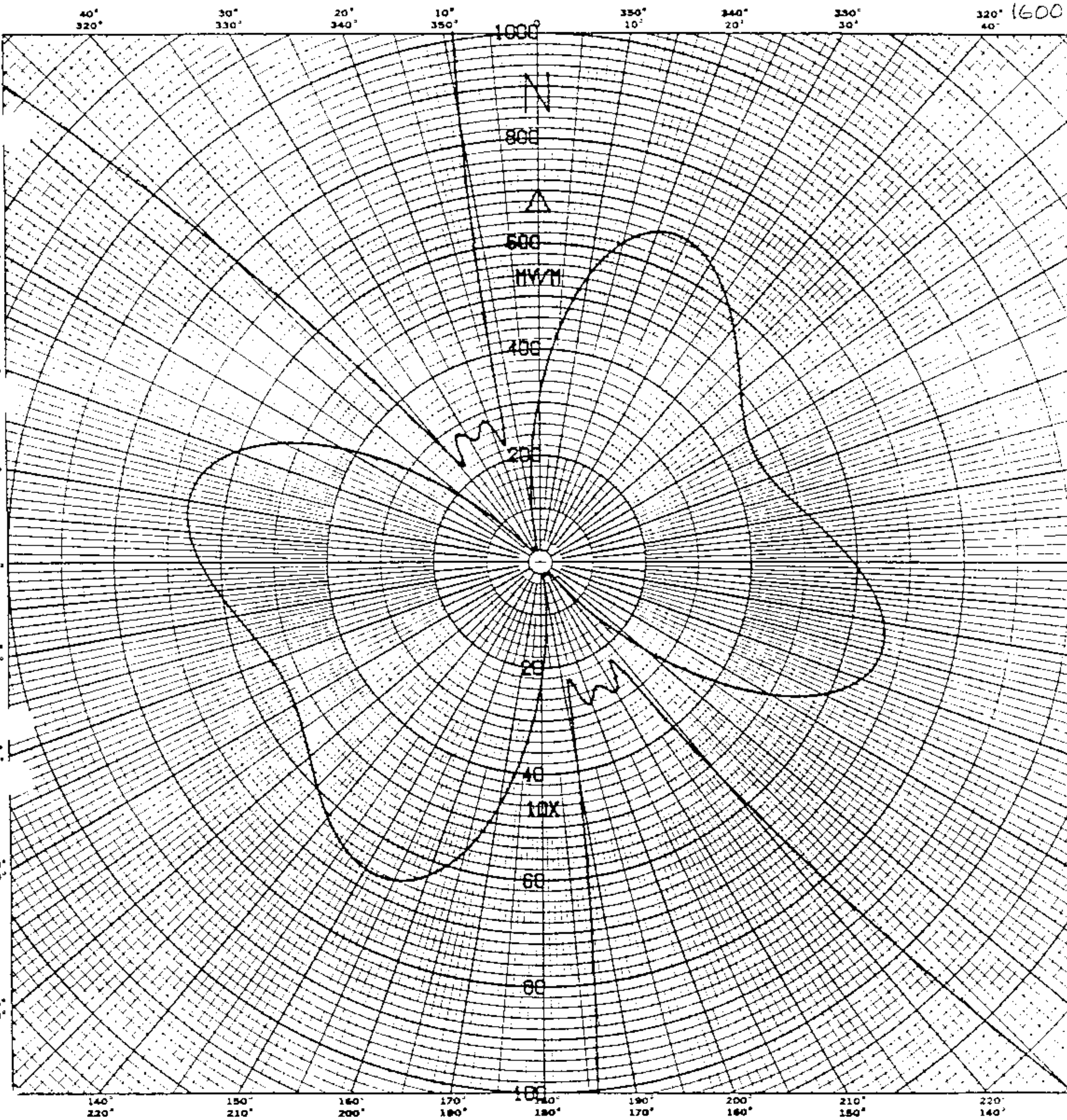
SPACING AND ORIENTATION: Four towers in a row are spaced 389.5' (228.1°) on a line bearing 64° true.

GROUND SYSTEM: 120-130' to 200' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

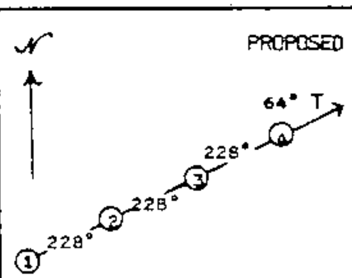
	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	440.5 mv/m		
Night	456.6 mv/m	345.35 mv/m	477.6 mv/m

KGDI
1600 kHz



HATFIELD & DAWSON
CONSULTING ELECTRICAL ENGINEERS
3525 STONE WAY N.
SEATTLE, WASHINGTON 98103

RADIO STATION KGST
FRESNO, CA USA
11/78 FIGURE E



SITE: 36° 42' 36'' NL X
119° 50' 06'' WL

PROPOSED NIGHTIME DIRECTIONAL ANTENNA 1600 KHZ
5.0 KW DA-N HORIZONTAL PLANE STANDARD PATTERN
RMSTHEO 454.6163 MV/M RMSSTD 477.5549 MV/M
RSS 345.3485 MV/M K 89.1036 MV/M

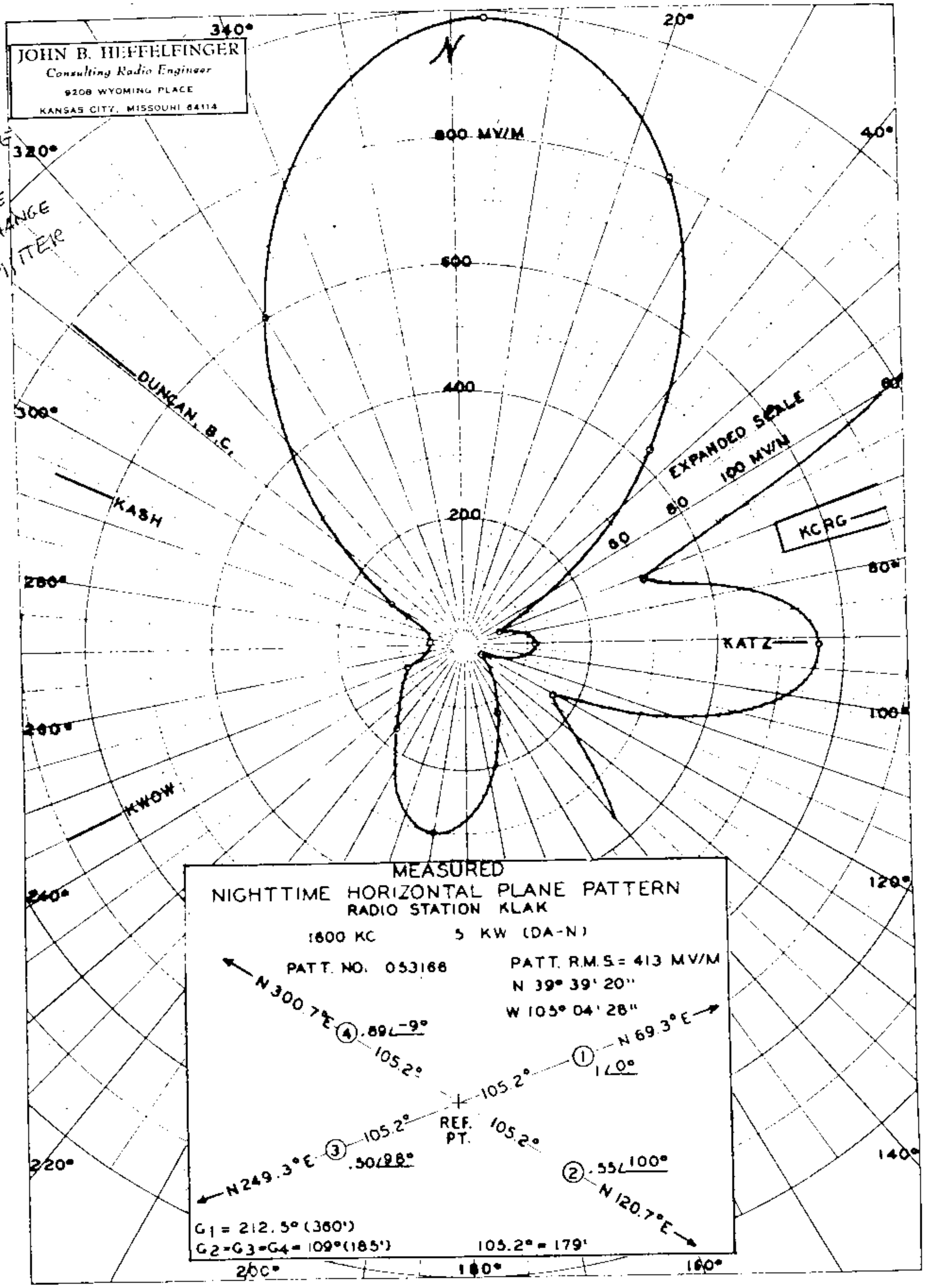
#	F	Ψ	S	θ	G
1	1.00	0	0	0	114.15°
2	2.63	186	228	64°	114.15°
3	2.45	12	456	64°	114.15°
4	1.05	198	684	64°	114.15°

KLAK

Measured Night
(8-26-66ct)

Station KLAK
Lakewood, Colorado

5kw,DA-N,U
1600 kc



BP 16544
FP 6-11-65
12-15-66
GRANTED LICENSE
COV. INCREASE
IN NIGHTTIME
POWER AND CHANGE
IN ANT. TRANSMITTER
LOCATION.

FCC File No.BL-11396
Accepted 8-23-66

Station KLAK
Lakewood, Colorado

1600 kc

KLAK

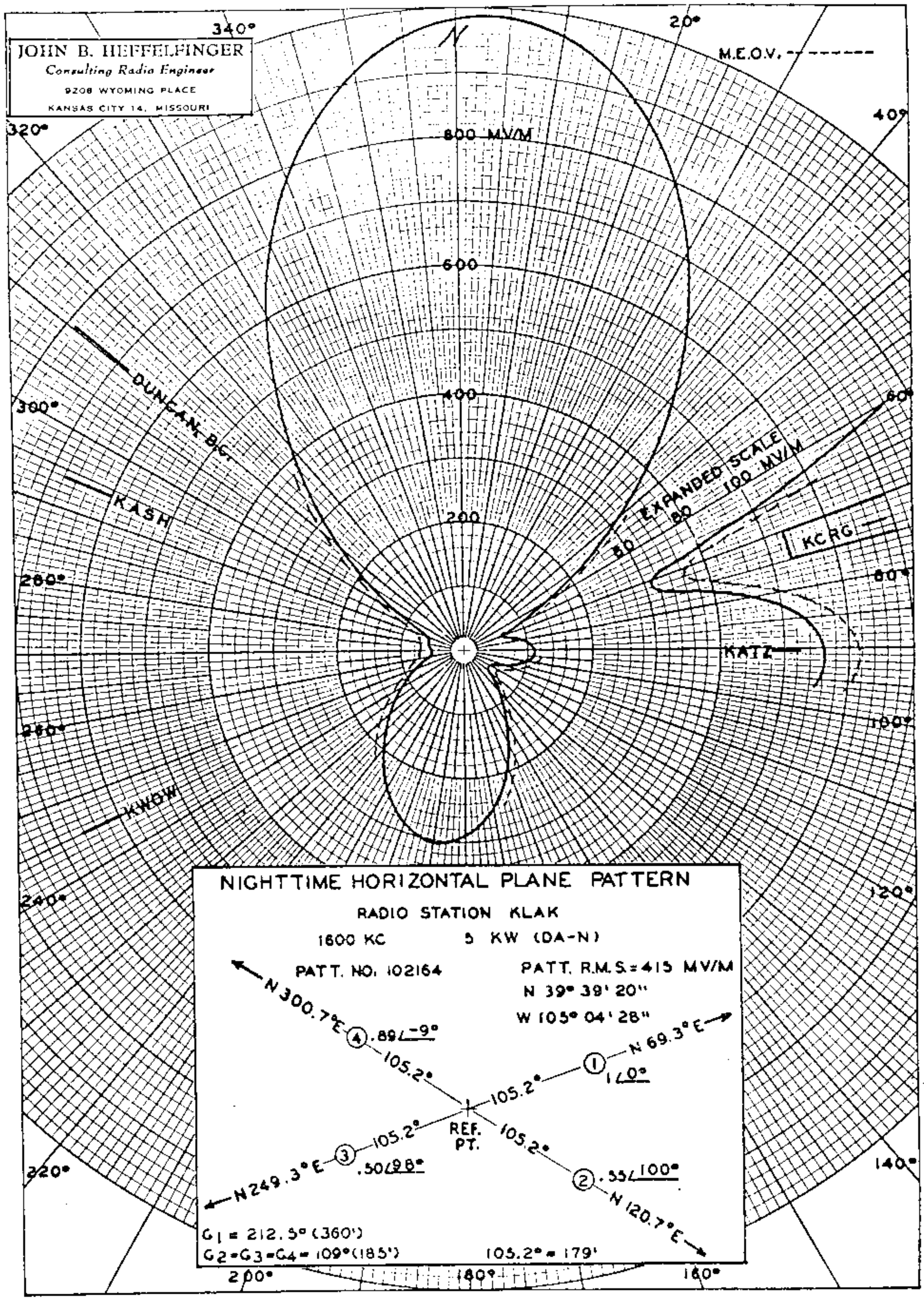
Proposed Night
(3-26-65ct)

Station KLAK
Lakewood, Colorado

5kw,DA-N,U
1600 kc

CP 6-11-65

BL 11396



FCC File No. BP-16544
Accepted 3-23-65

Station KLAK
Lakewood, Colorado

1600 kc

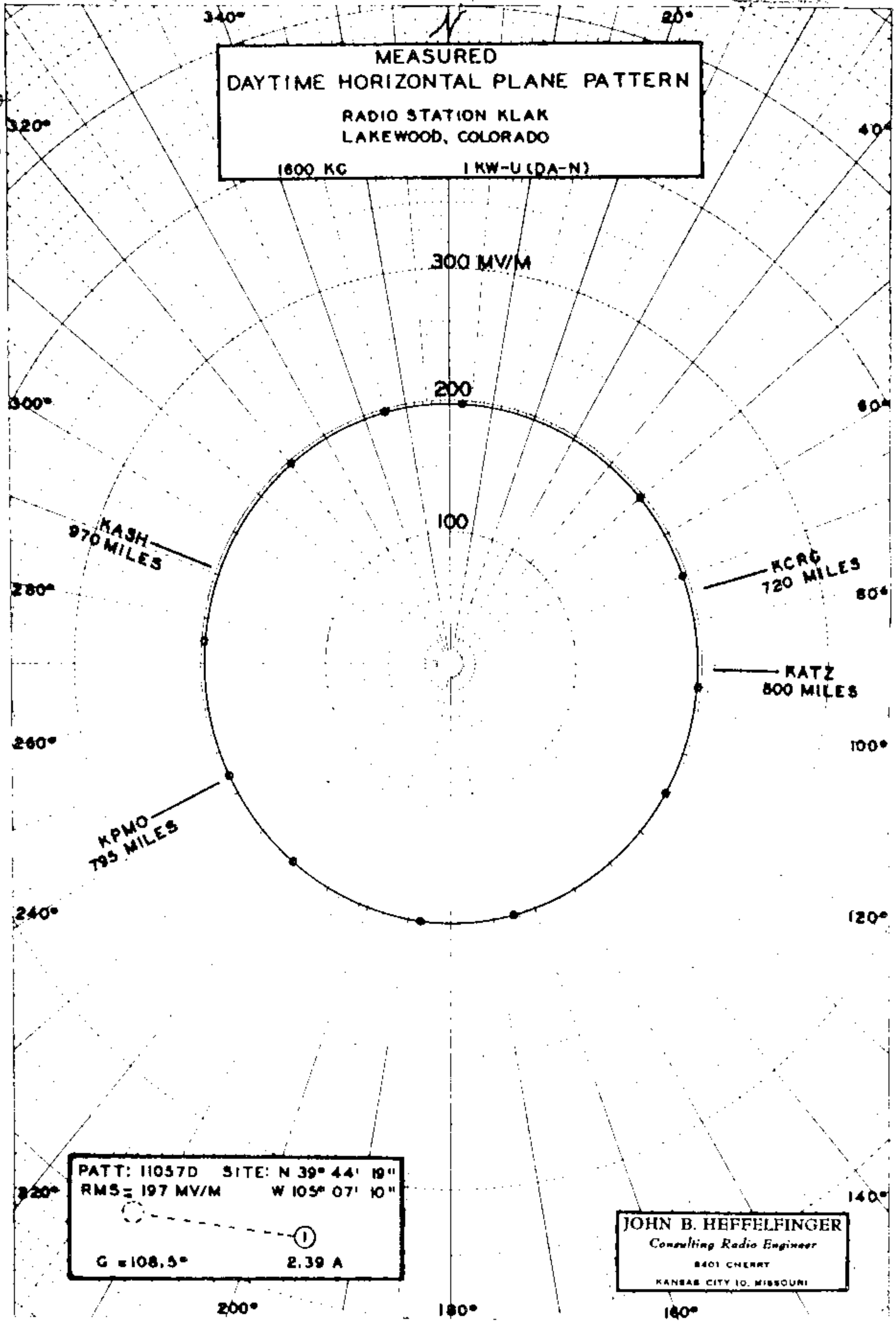
Granted license 3/28/57

KLAK

MEASURED NON-DIRECTIONAL (2/1157g)

Station KLAK
Lakewood, Colorado

1KW,DA-N,U
1600 KC



Granted CP to increase daytime power to 5KW 7-27-60

FCC File No. BL-6507
Accepted 1/31/57

KLAK
Lakewood, Colorado

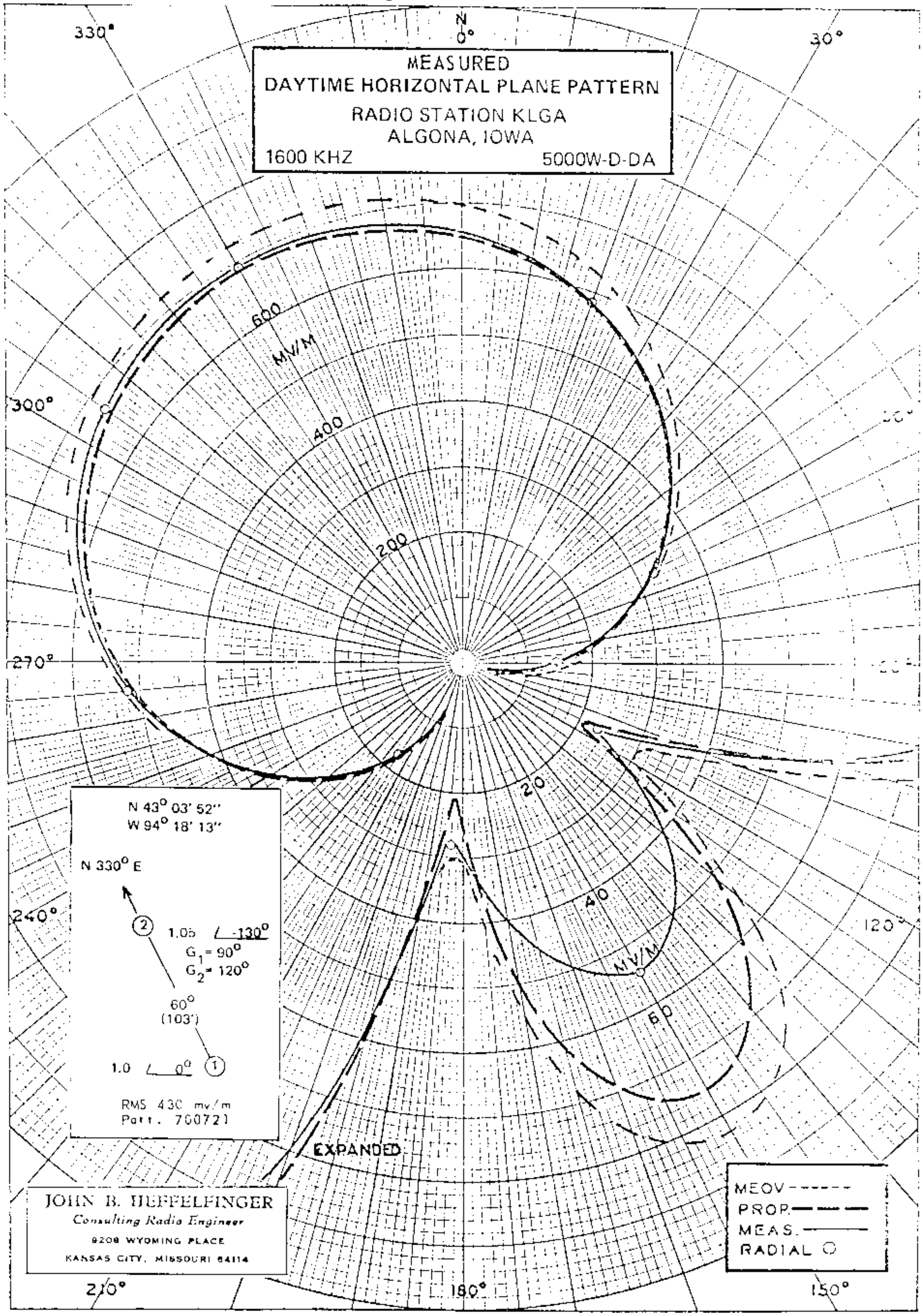
1KW,DA-N,U
1600KC

KLGA

Measured Day (9-25-70ct)

Station KLGA
Algona, Iowa

5kw, DA-D, D
1600 kc



FCC File No. BL-12722
Accepted 8-31-70

Station KLGA
Algona, Iowa

1600 kc

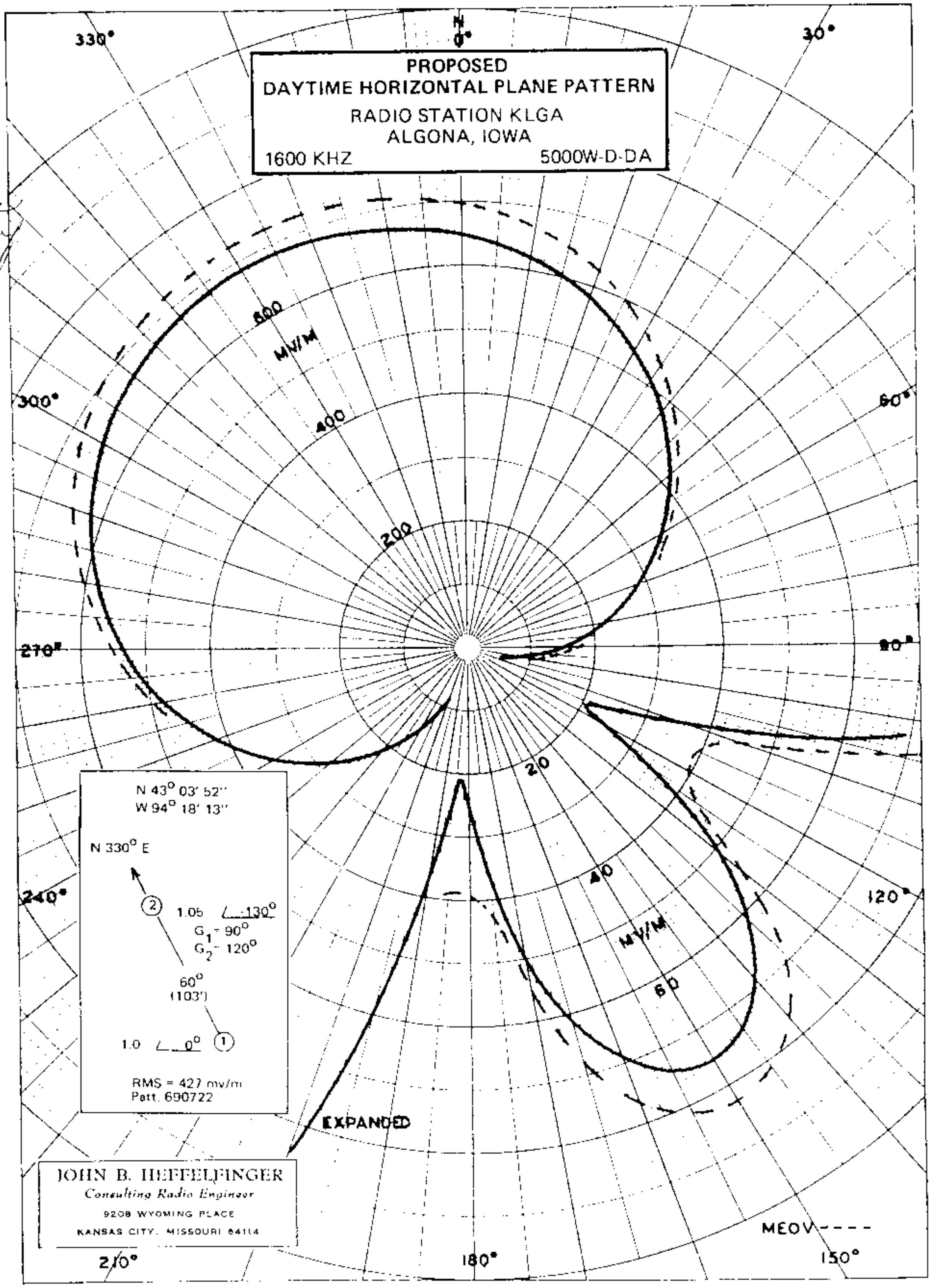
KLGA

Proposed Day
(10-28-69ct)

Station KLGA
Algona, Iowa

5kw,DA-D,D
1600 kc

BP-18652
Granted
12-9-69)
P to
increase
height of
NW#2
tower



FCC File No.BP-18652
Accepted 10-14-69

Station KLGA
Algona, Iowa

1600 kc

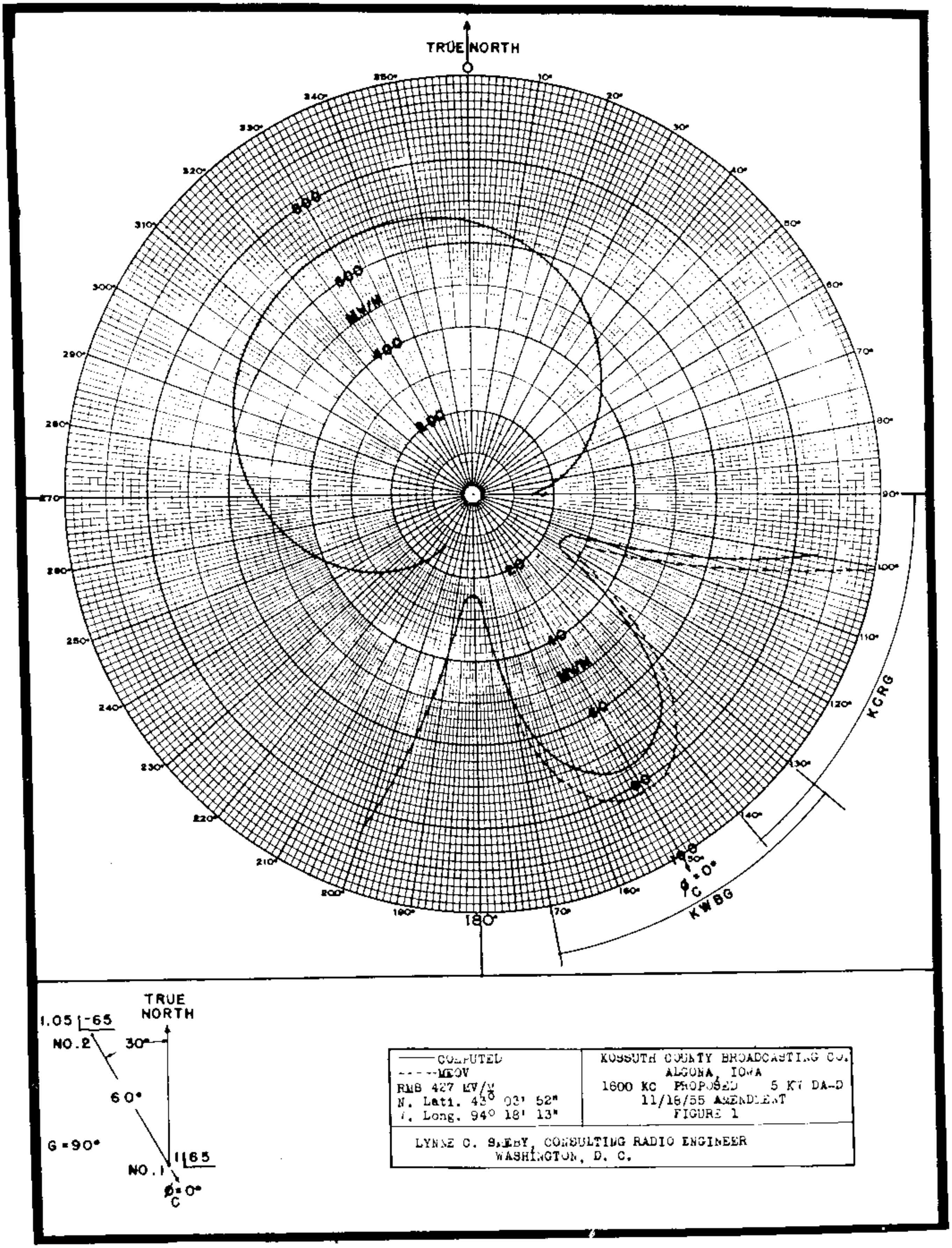
KLGA

PROPOSED
DAY 1/12/56G

Kossuth Co. B/C Co.,
Inc., Algona, Iowa

5 KW
DA-D, Day

1600 KC



FCC File No. BP-9645 Accepted 12/16/55

Kossuth Co. B/C Co.,
Inc., Algona, Iowa

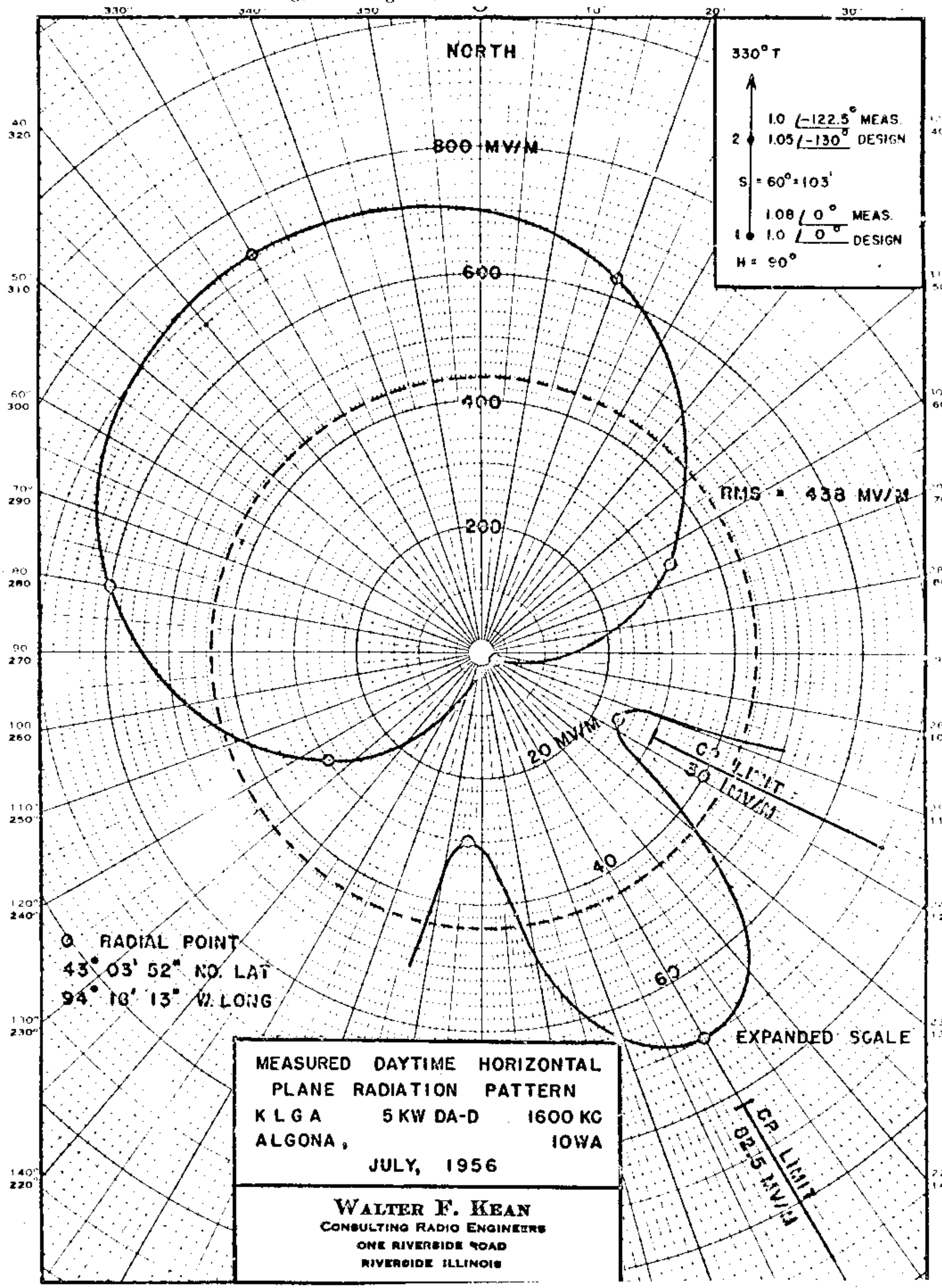
1600 KC

KLGA

MEASURED
DAY (9-14-56g)

STATION K L G A 5 KW, DA-D, D
Algona, Iowa

1600 KC



FCC File
BL-6284

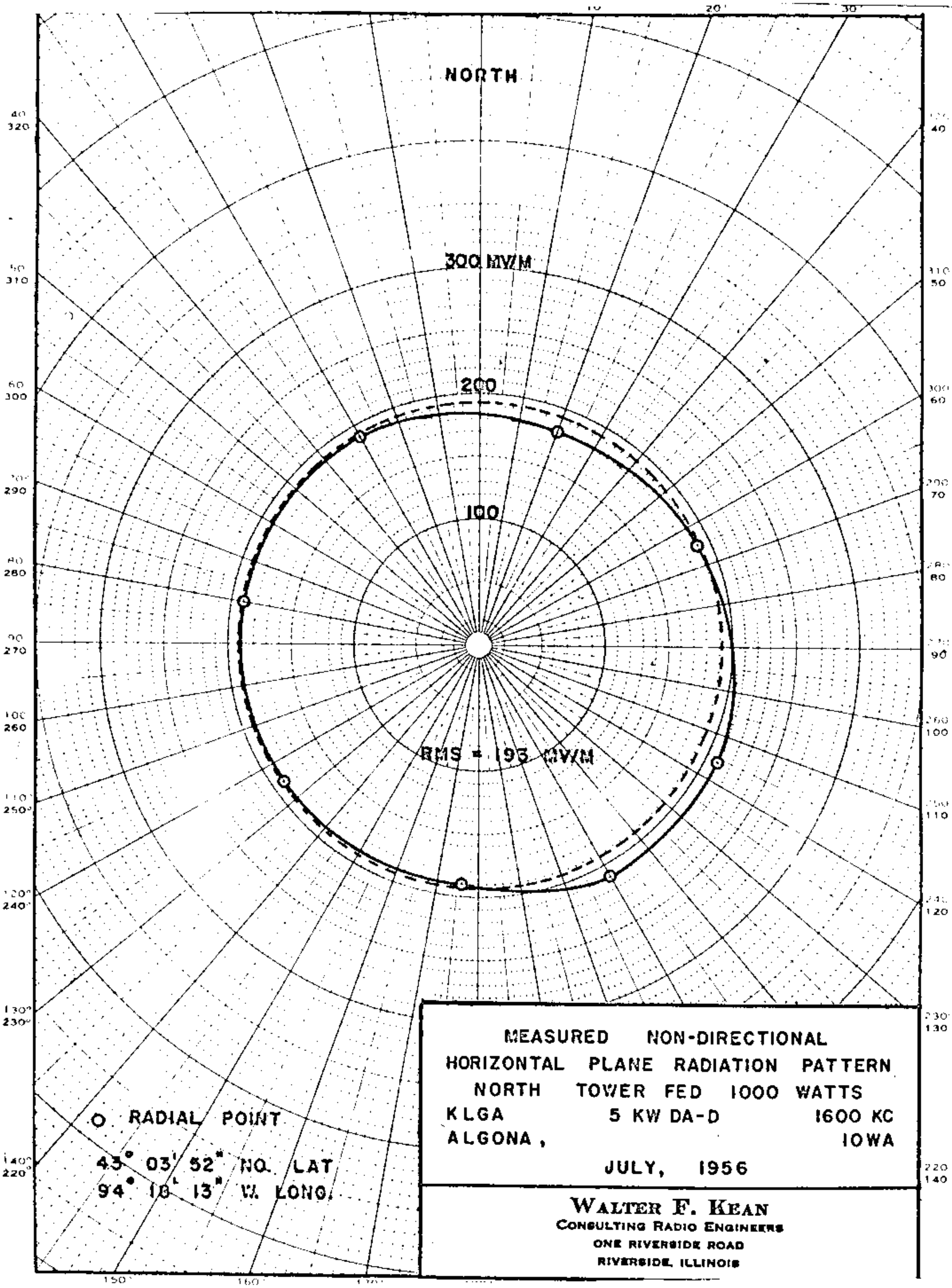
Accepted 9-4-56

Station KLGA
Algona, Iowa

1600 KC

KLGA

MEASURED NON-DA(9-14-56g) STATION K L G A Algona, Iowa 5 KW, DA-D, D 1600 KC



FCC File BL-6284 Accepted 9-4-56 Station KLGA Algona, Iowa 1600 KC

KNCY 1

CORRECTED DIRECTIONAL
ANTENNA DESCRIPTION SHEET

Station: KNCY

Main Studio: Nebraska City, Nebraska

Frequency: 1600 kHz

Power: 0.5 kW

Notification List No. 1586

Date: June 26, 1974 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM: North Latitude: 40° 40' 27"
West Longitude: 95° 53' 08"

Authorized for Daytime operation (DA-D).

Predicted effective Field: 124 mv/m at rated power.

Note: Please retain the description sheet and directional antenna radiation patterns notified for a new station at Nebraska City, Nebraska, in United States Change List Number 790, dated December 23, 1958, 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.

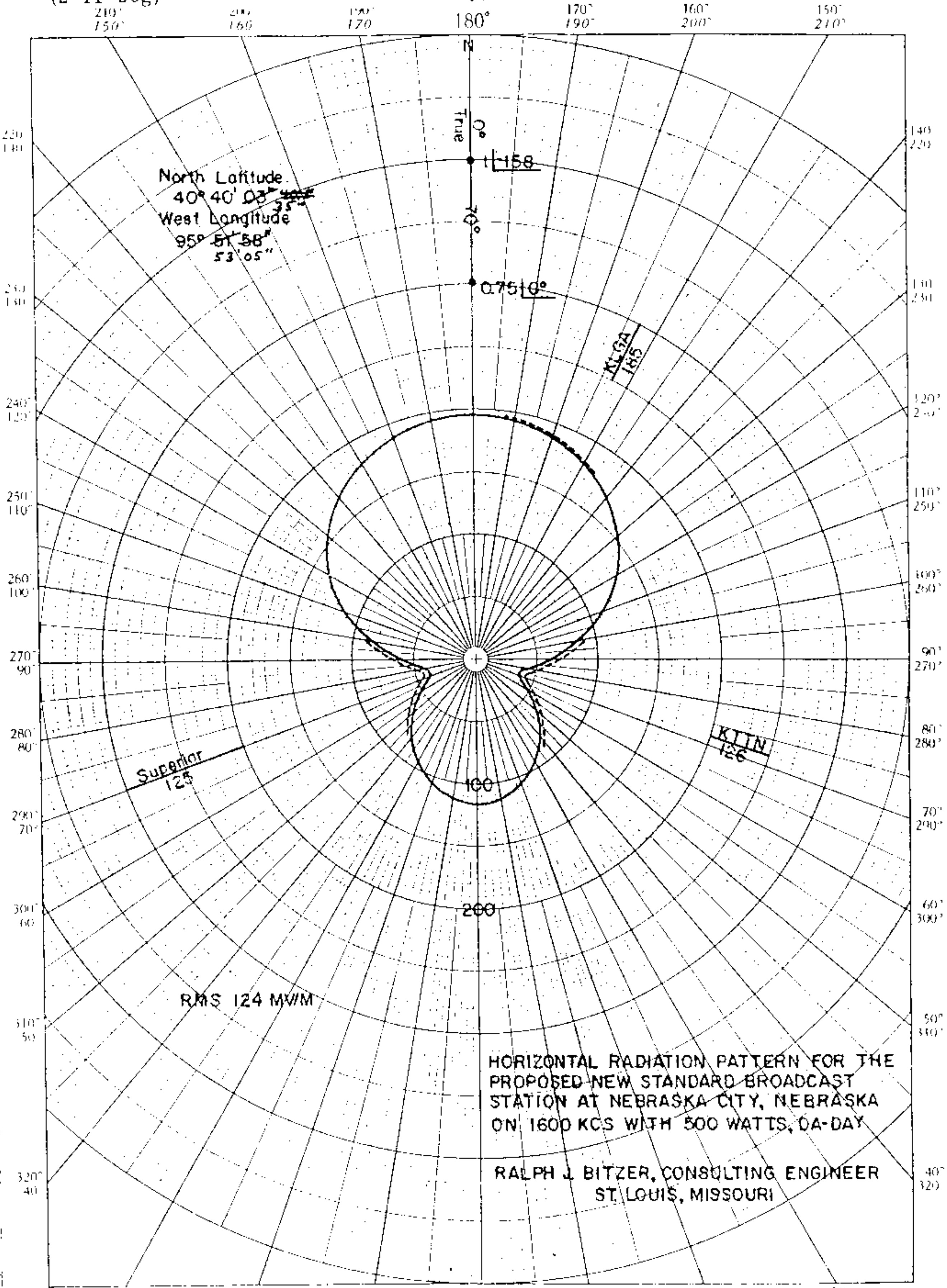
Nebraska City, Neb. KNCY

PROPOSED DAY
(2-11-58g)

New; Otoe Broadcasting Co.
Nebraska City, Nebraska

500w, DA-D,D
1600 KC

Granted CP 2/23/58 for new station



FCC File No. BP-11,792
Accepted 2-3-58

Otoe Broadcasting Company
Nebraska City, Nebraska 1600 KC

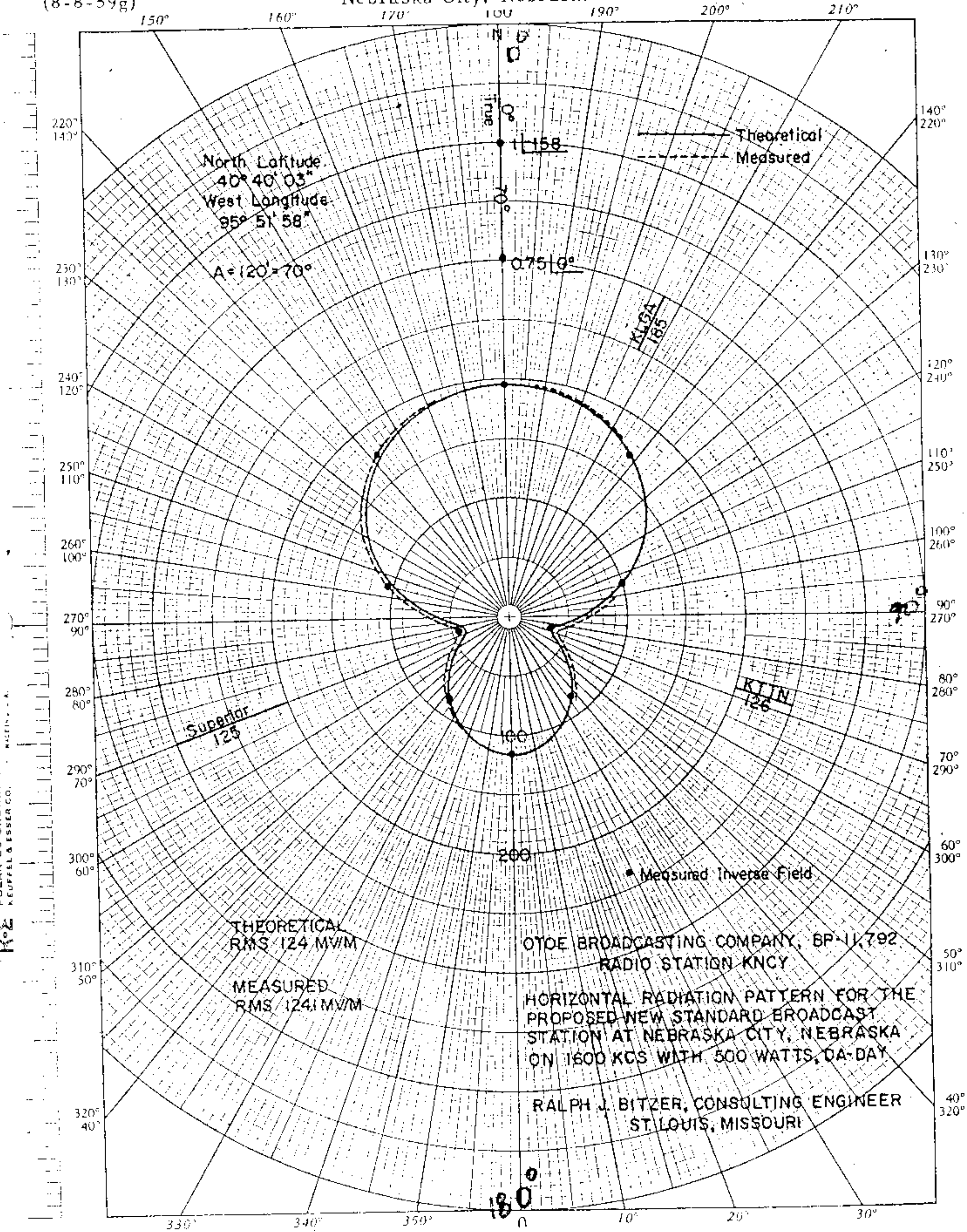
KNCY

MEASURED DAY
(8-8-59g)

Station KNCY
Nebraska City, Nebraska

500w, DA-D, D
1600 KC

granted 1-5-60



FCC File No. BL-7539
Accepted 7-27-59

KNCY
Nebraska City, Nebraska

1600 KC

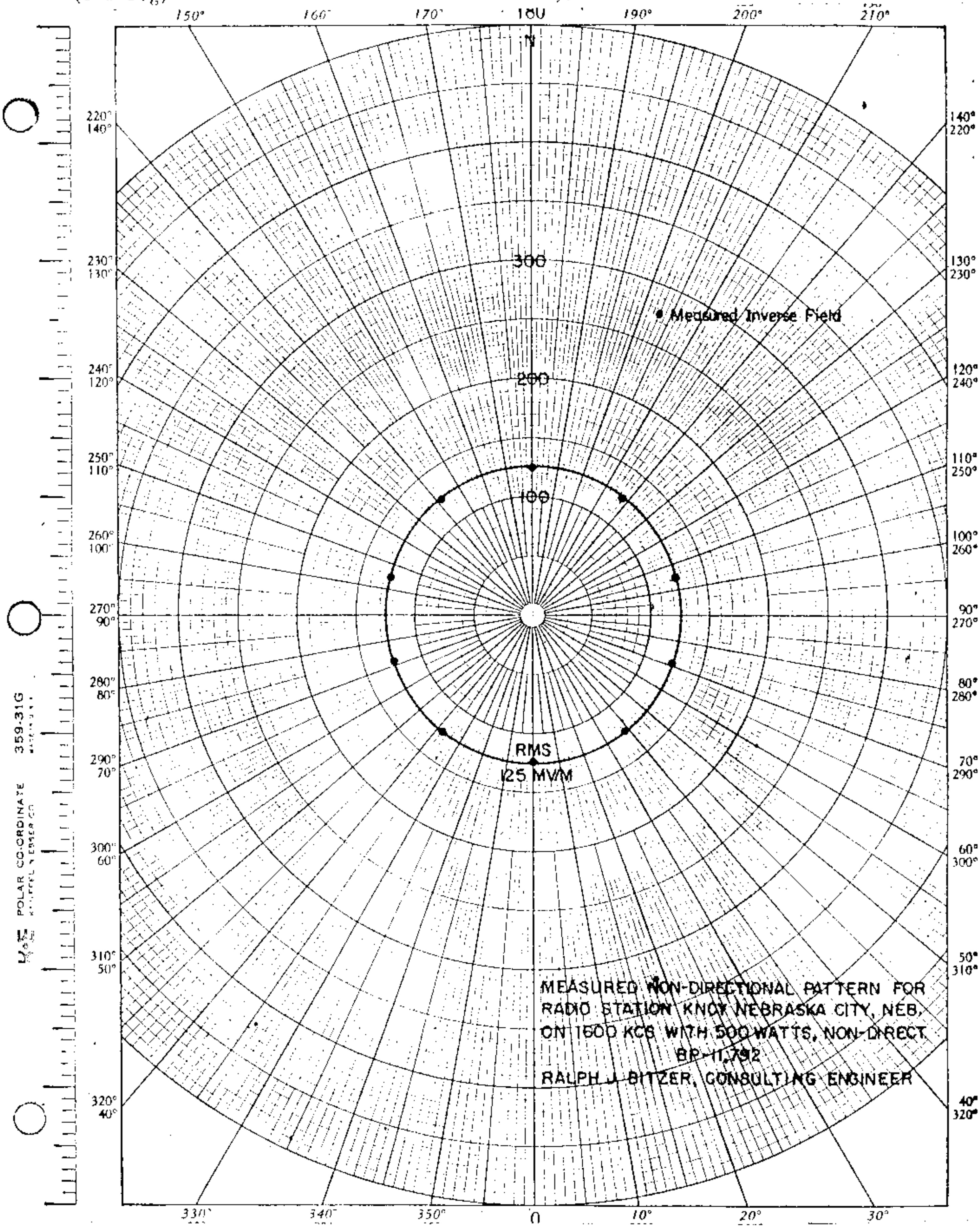
KNCY

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

KNCY
Nebraska City, Nebraska

500w, DA-D, D
1600 KC

granted L- 5-3-60



FCC File No. BL-7539
Accepted 7-27-59

KNCY
Nebraska City, Nebraska

1600 KC

KOGT
1600 kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KOGT | Main Studio: Orange, Texas

Frequency: 1600 kHz | Power: 1kw Night 5kw Day

Notification List No. 1783 | Date: November 2, 1979 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM: North Latitude: 30° 08' 25" West Longitude: 93° 45' 11"

ANTENNA CHARACTERISTICS

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

TOWER:	S(#1)	C(#2)	N(#3)
HEIGHT ABOVE INSULATORS:	195'	195'	195' (114°)
NIGHT PHASING:	0°	138.7°	266.1°
NIGHT FIELD RATIO:	1.0	.91	.33
DAY PHASING:	0°	233.7°	106.9°
DAY FIELD RATIO:	1.0	4.82	6.30

SPACING AND ORIENTATION: Adjacent towers in a row are spaced 145'(85°) on a line bearing 355° true.

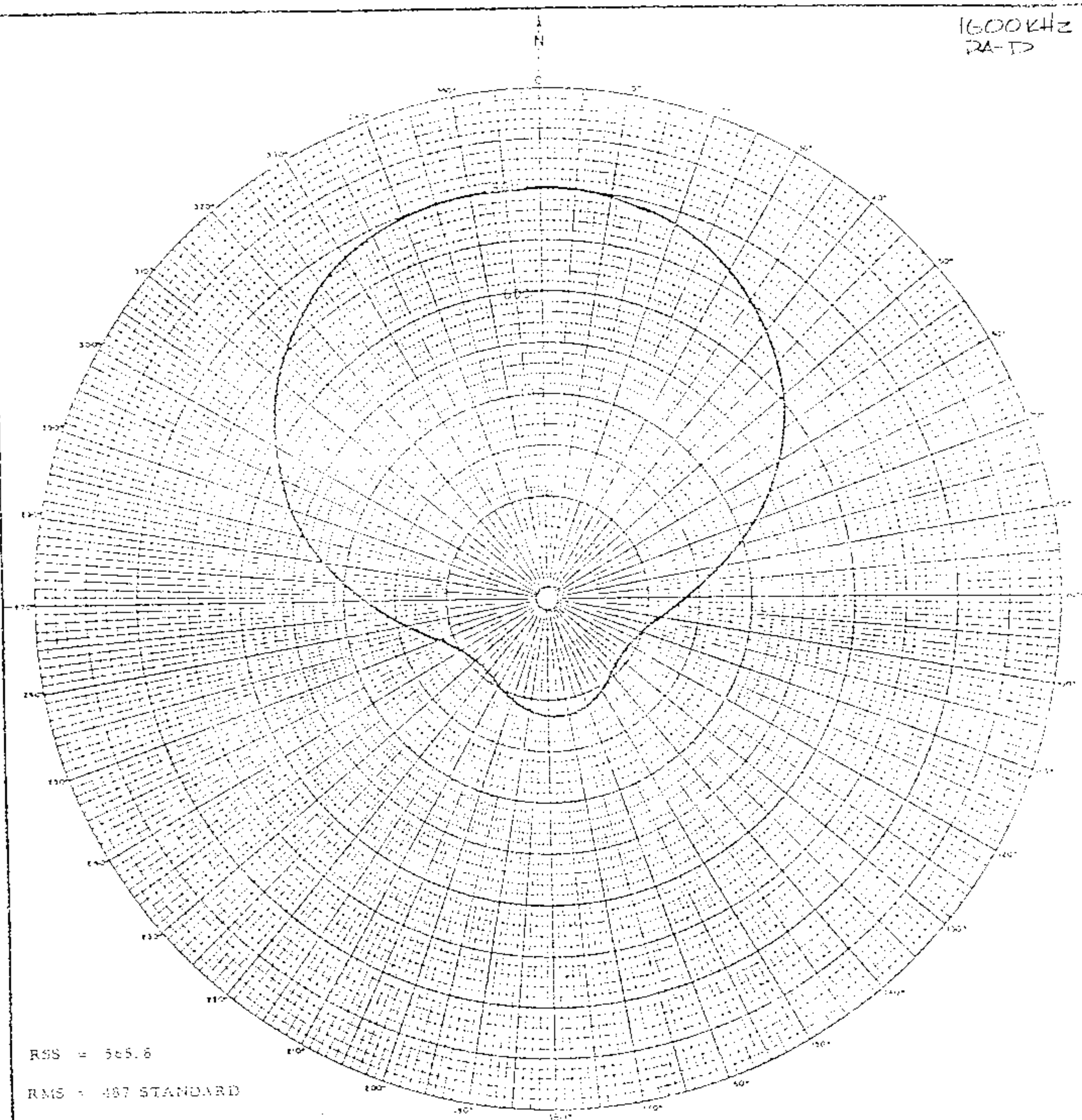
GROUND SYSTEM: 180-200' equally spaced copper radials plus a 40'X 40' square ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	463.6 mv/m	565.8 mv/m	487 mv/m
Night	211.6 mv/m	228.0 mv/m	222.3 mv/m

KOGT

1600 KHz
DA-D

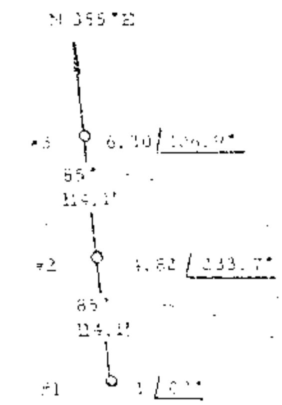


RSS = 565.6

RMS = 487 STANDARD

HORIZONTAL RADIATION PATTERN

FIGURE 1



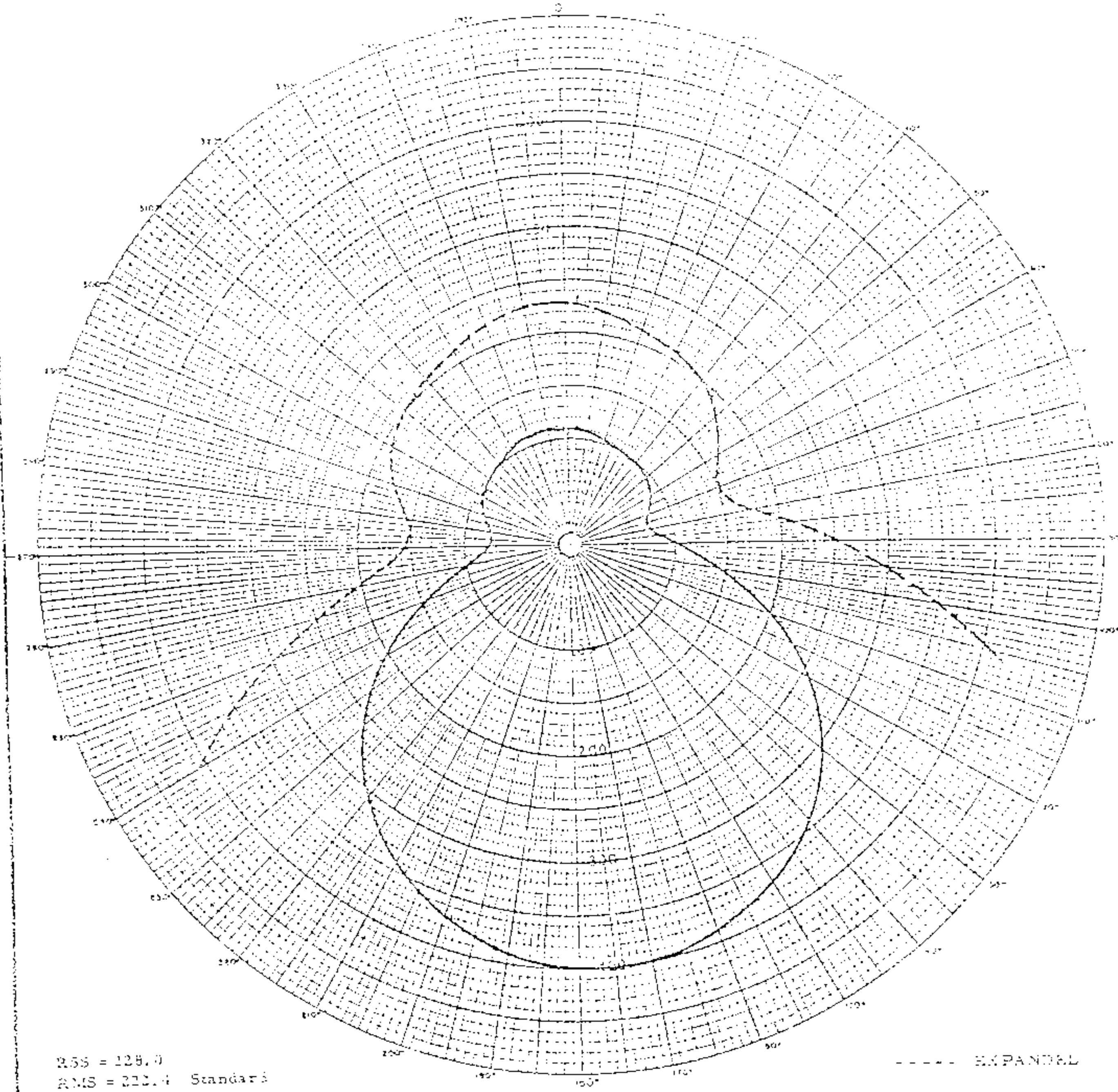
G = 84°

APPLICANT :	Radio Station KOGT
LOCATION :	Orange, Texas
FREQUENCY :	1600 KC/S
POWER :	5 KW
LATITUDE :	30 DEG 08 MIN 25 SEC
LONGITUDE :	93 DEG 45 MIN 11 SEC
WHEN USED :	Daytime
RMS FIELD :	463.6 Theoretical
DATE	June 1976

ROBERT L. PURCELL

WASHINGTON, D.C.

KOGT
1600 kHz
DA-N

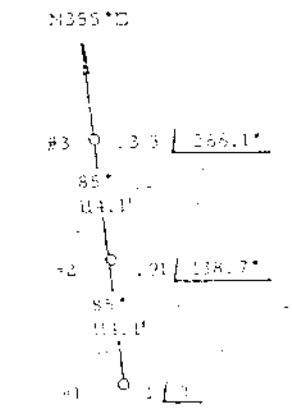


RSS = 128.0
RMS = 222.4 Standard

----- EXPANDED

HORIZONTAL RADIATION PATTERN

FIGURE 3A



APPLICANT	Radio Station KOGT
LOCATION	Orange, Texas
FREQUENCY	1600 KC/S
POWER	1.0 KW
LATITUDE	30 DEG 08 MIN 33 SEC
LONGITUDE	93 DEG 45 MIN SEC
WHEN USED	Nighttime
RMS FIELD	211.9 Theoretical
DATE	June, 197

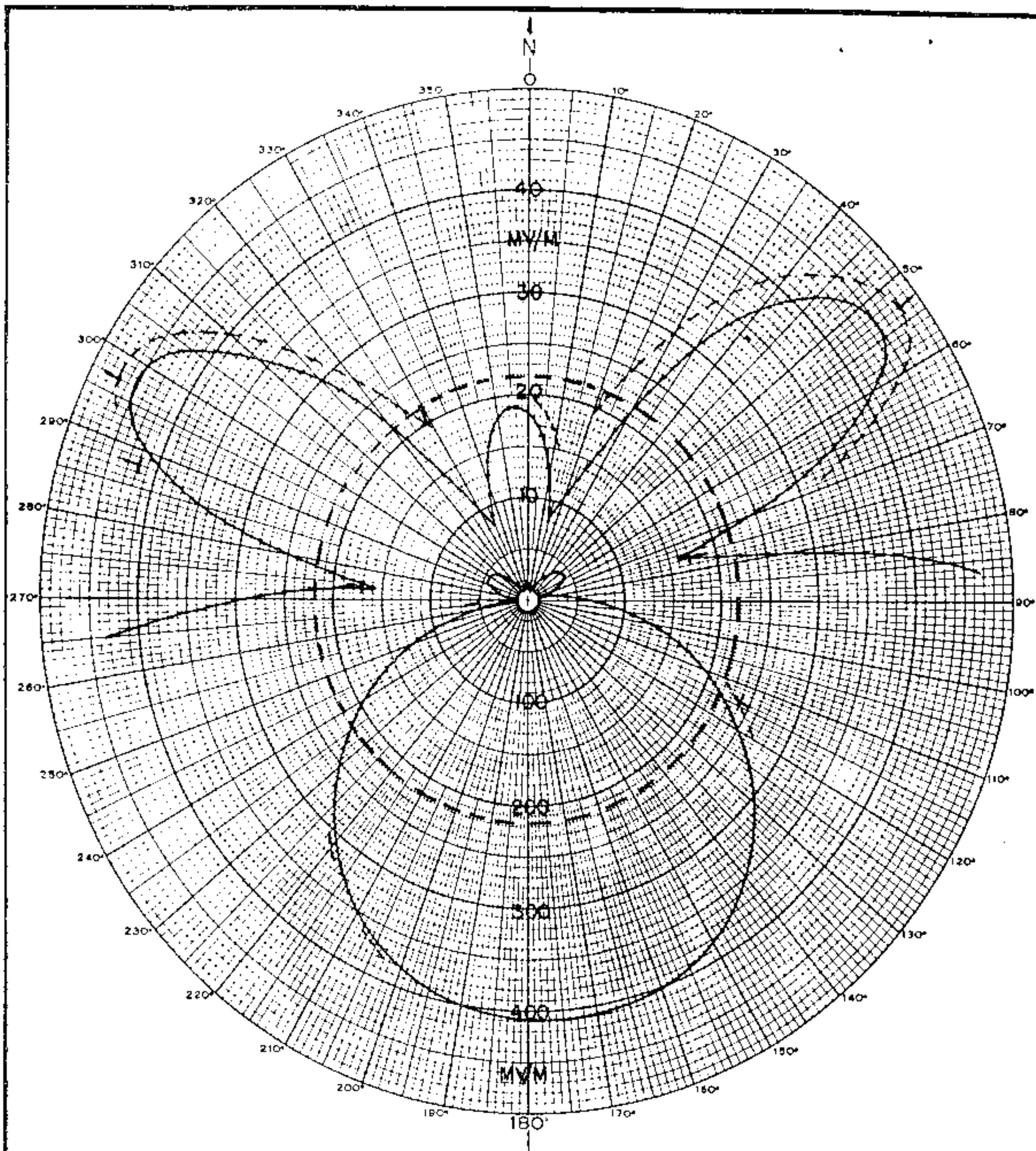
ROBERT L. PURCELL
WASHINGTON, D.C.

KOGT

PROPOSED NIGHT
(4-24-58g)

Station KOGT
Orange, Texas

1kw, DA-N,U
1600 KC



RMS = 218 MV/M   MEOV ----   MONITORING POINT TOLERANCE VALUES - ⊥

PATTERN NO. 520809ML
LATITUDE: 30° 08' 25"
LONGITUDE: 93° 45' 11"

HAROLD B. ROTHROCK
CONSULTING RADIO ENGINEER
CITIZENS NATIONAL BANK BUILDING
BEDFORD, INDIANA

TOWER	FIELD	PHASE
N	0.855	134
C	1.55	0
S	1.00	-134

G = 114°

S = 85°   C.L. AT 355°

EXHIBIT NO. 5

RADIO STATION KOGT
ORANGE —— TEXAS

1600 KC – 1 KW – DA-N

FCC File No. BL-5034

KOGT
Orange, Texas

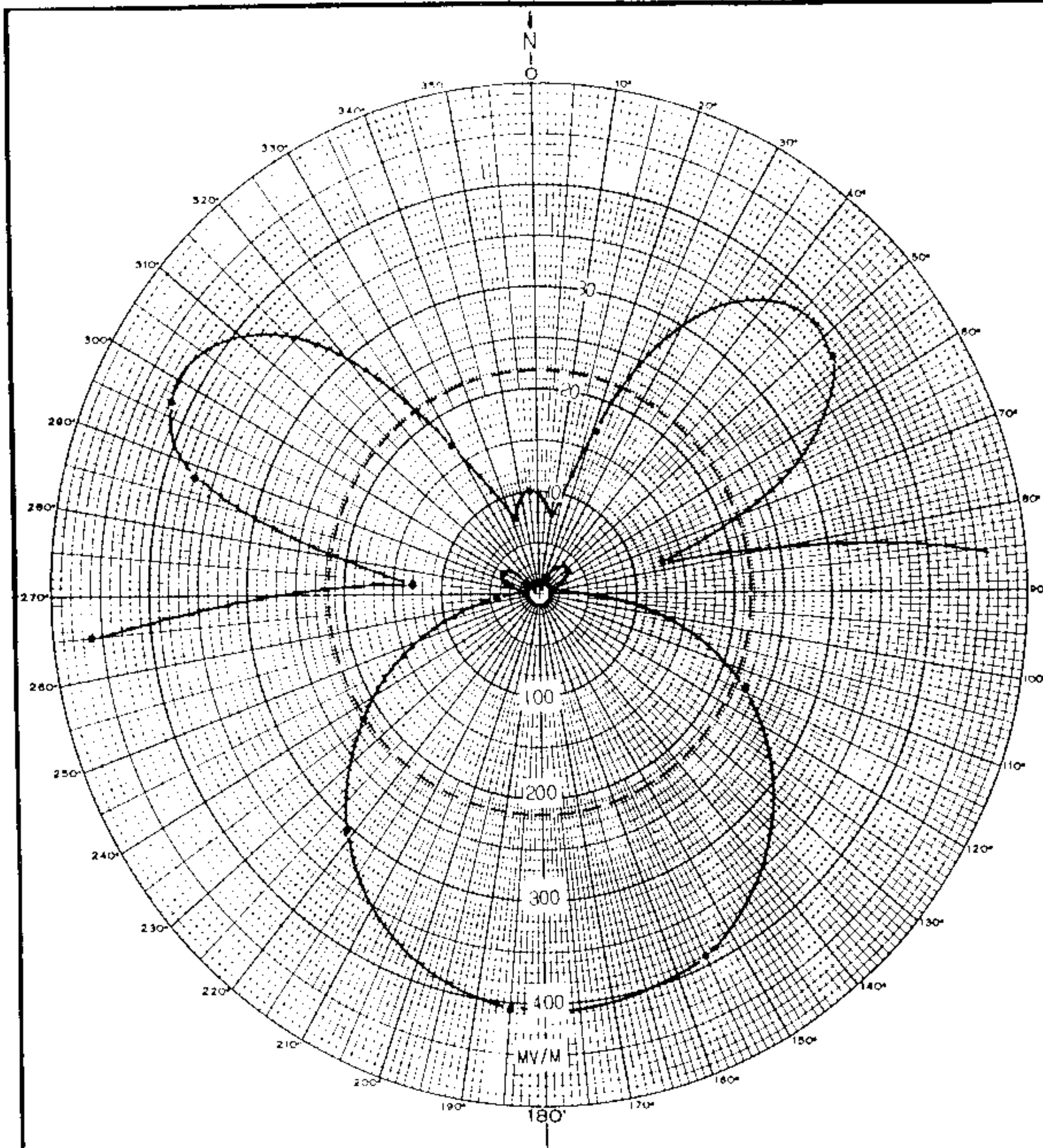
1600 KC

KOGT

MEASURED NIGHT (4-24-58g)

Station KOGT
Orange, Texas

1kw, DA- N,U
1600 KC



RMS = 218 MV/M

PATTERN NO. [illegible]
LATITUDE: 30° 08' 25"
LONGITUDE: 93° 45' 11"

HAROLD B ROTHROCK
CONSULTING RADIO ENGINEER
CITIZENS NATIONAL BANK BUILDING
BEDFORD INDIANA

Exhibit No. 10

RADIO STATION KOGT
SABINE AREA BROADCASTING CORP.
ORANGE, TEXAS

1600kc - 1kw, U - DA-N

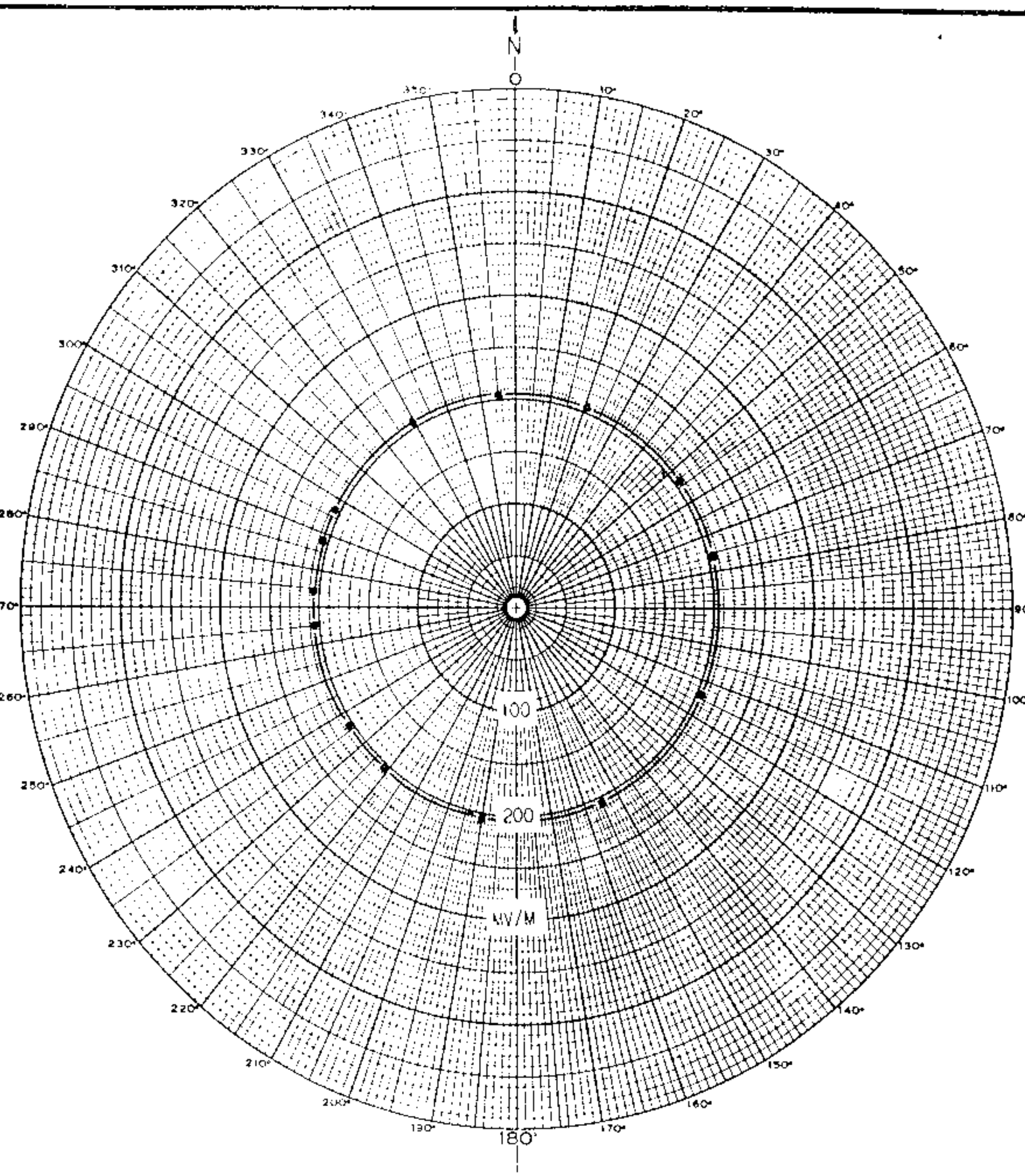
MEASURED DIRECTIONAL PATTERN
NIGHTTIME

KOGT

MEASURED NON-DA
(4-24-58g)

Station KOGT
Orange, Texas

1kw, DA-N,U
1600 KC



RMS = 205 MV/M

PATTERN NO. 520800NDP
LATITUDE: 30° 06' 25"
LONGITUDE: 93° 45' 11"

HAROLD B. ROTHROCK
CONSULTING RADIO ENGINEER
CITIZENS NATIONAL BANK BUILDING
BEDFORD, INDIANA

Exhibit No. 9

RADIO STATION KOGT
SABINE AREA BROADCASTING CORP.
ORANGE, TEXAS

1600kc - 1kw. U - DA-N

MEASURED NON-DIRECTIONAL PATTERN

FCC File No. BL-5034

KOGT
Orange, Texas

1600 KC

KUBA
[illegible]

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Call Sign: KUBA

Main Studio: Yuba City,

Frequency: 1600 kHz

Power: 1kW Night 5kW Day

Notification List No. [illegible]

Date: November 2, 1979

Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 39° 06' 00"

West Longitude: 121° 39' 18"

ANTENNA CHARACTERISTICS

Authorized for nighttime operation. (DA-N)

Number of elements: 2

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

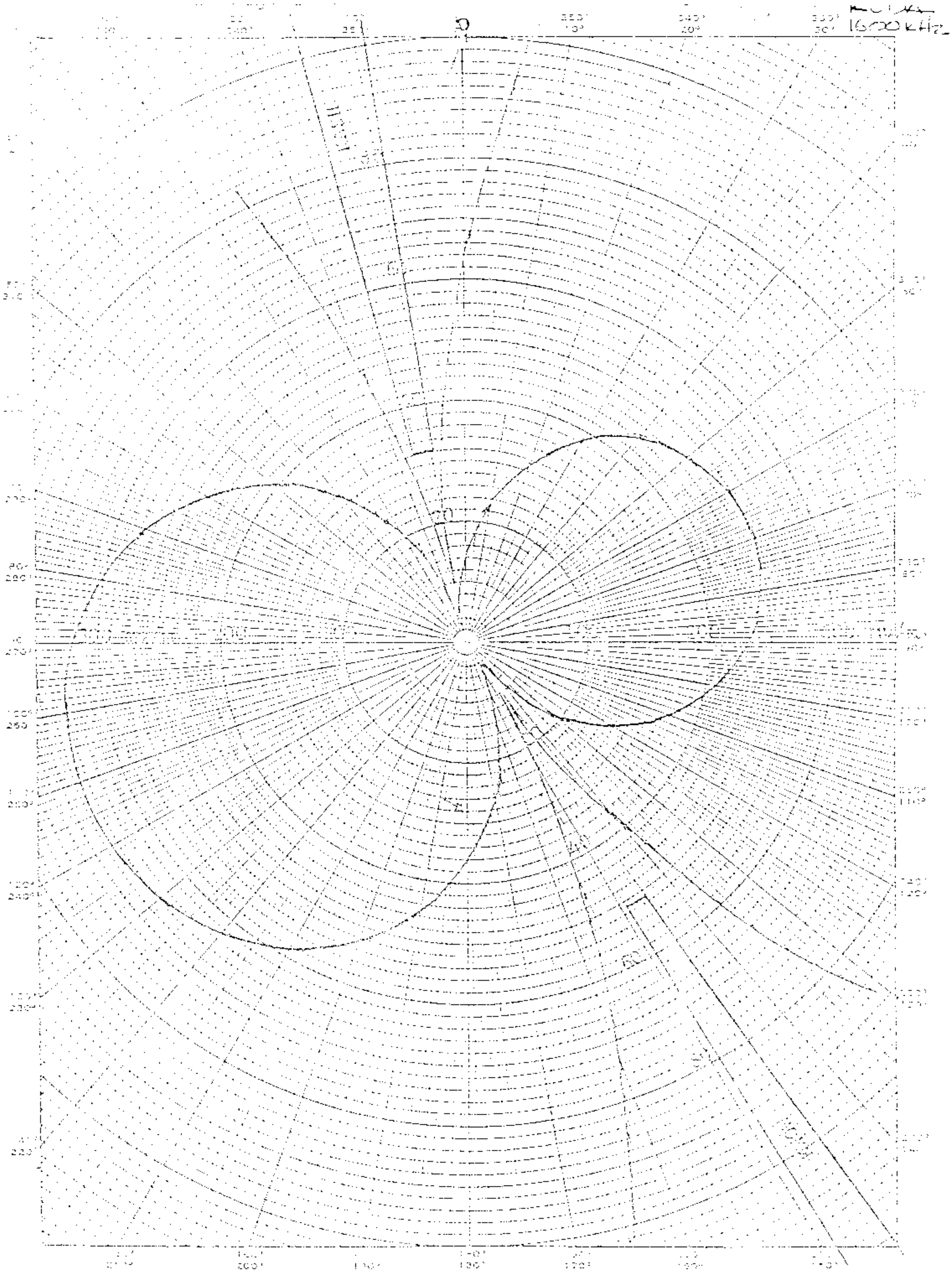
TOWER:	NE(#1)	SW(#2)
HEIGHT ABOVE INSULATORS:	185'	185' (108.3°)
NIGHT PHASING:	0	-103.6°
NIGHT FIELD RATIO:	1.0	1.0

SPACING AND ORIENTATION: Adjacent towers in a row are spaced 153.7' (90°) on a line bearing 67.5° true.

GROUND SYSTEM: 120 - 185' equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers. Centers of system not bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

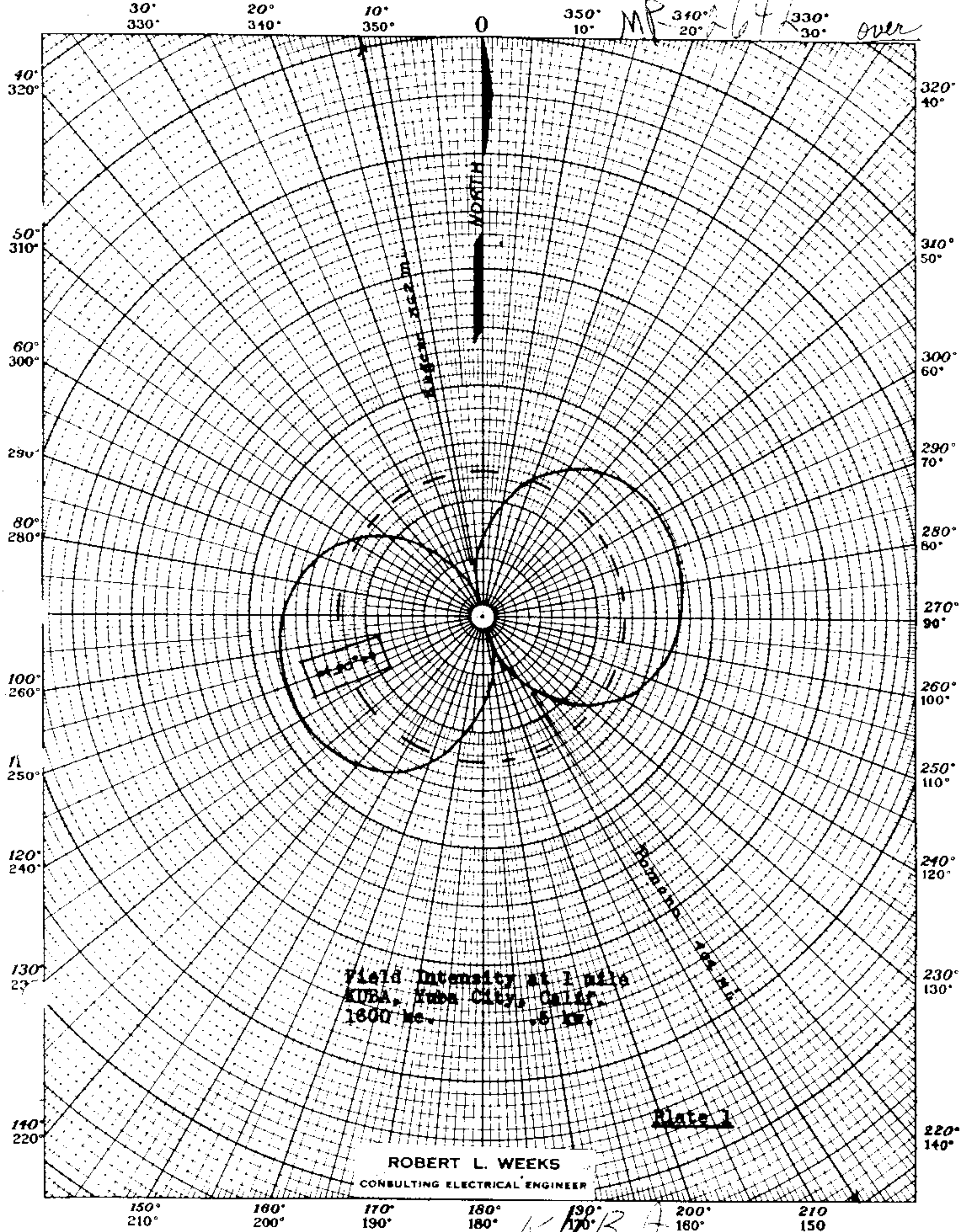
	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	442.7 mv/m		
Night	211.42 mv/m	[illegible] mv/m	222.12 mv/m


16000 kHz

KUBA

1600 Kc

MP-2642 over



KUBA

KUBA

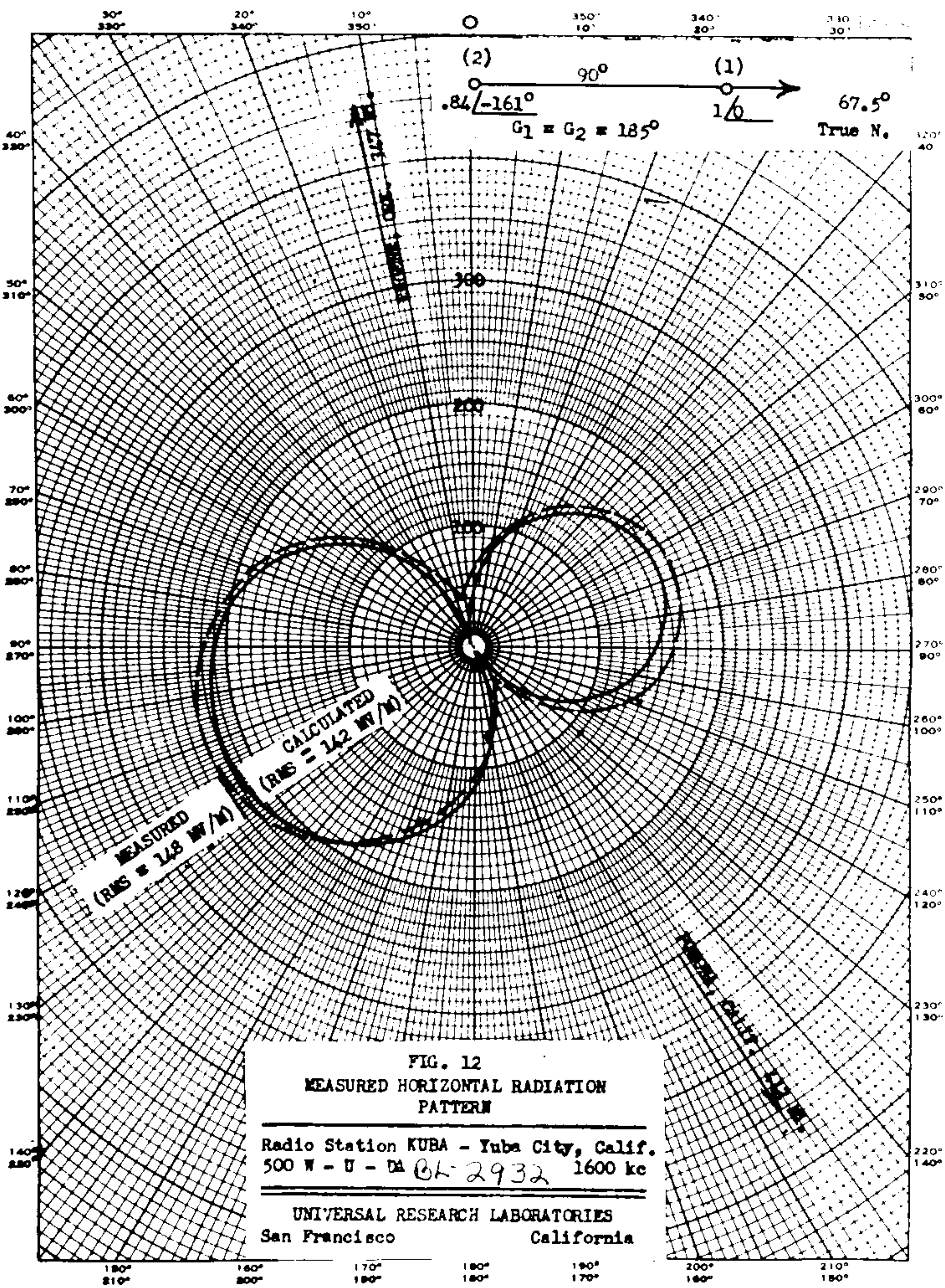


FIG. 12
MEASURED HORIZONTAL RADIATION
PATTERN

Radio Station KUBA - Yuba City, Calif.
500 W - U - DA BL-2932 1600 kc

UNIVERSAL RESEARCH LABORATORIES
San Francisco California

KWOW
1600kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KWOW

Main Studio: Pomona, California

Frequency: 1600 kHz

Power: 5kw Night 5kw Day

Notification List No. 1788

Date: August 22, 1080 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 34° 01' 48"
West Longitude: 117° 43' 35"

ANTENNA CHARACTERISTICS

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

TOWER:	N(#1)	S(#2)
HEIGHT ABOVE INSULATORS:	250'	160'
NIGHT PHASING:	0°	-131°
NIGHT FIELD RATIO:	1.0	0.765

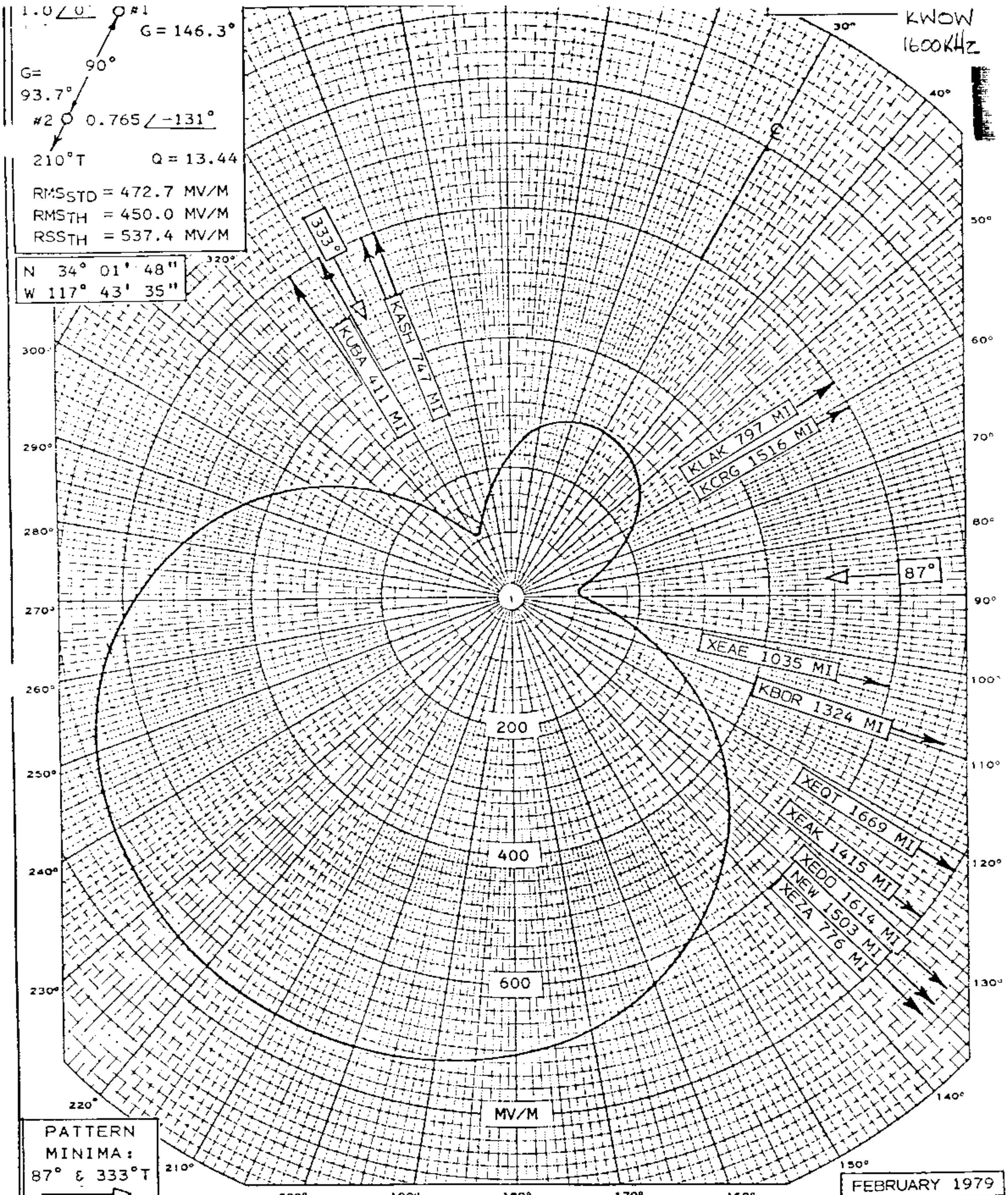
SPACING AND ORIENTATION: Towers in a row are spaced 153.8' (90°) on a line bearing 210° true.

GROUND SYSTEM: 120 - 155' to equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL		STANDARD
	RMS	RSS	RMS
Night	450.0 mv/m	537.4 mv/m	472.7 mv/m

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



EDWARD F. LORENTZ & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

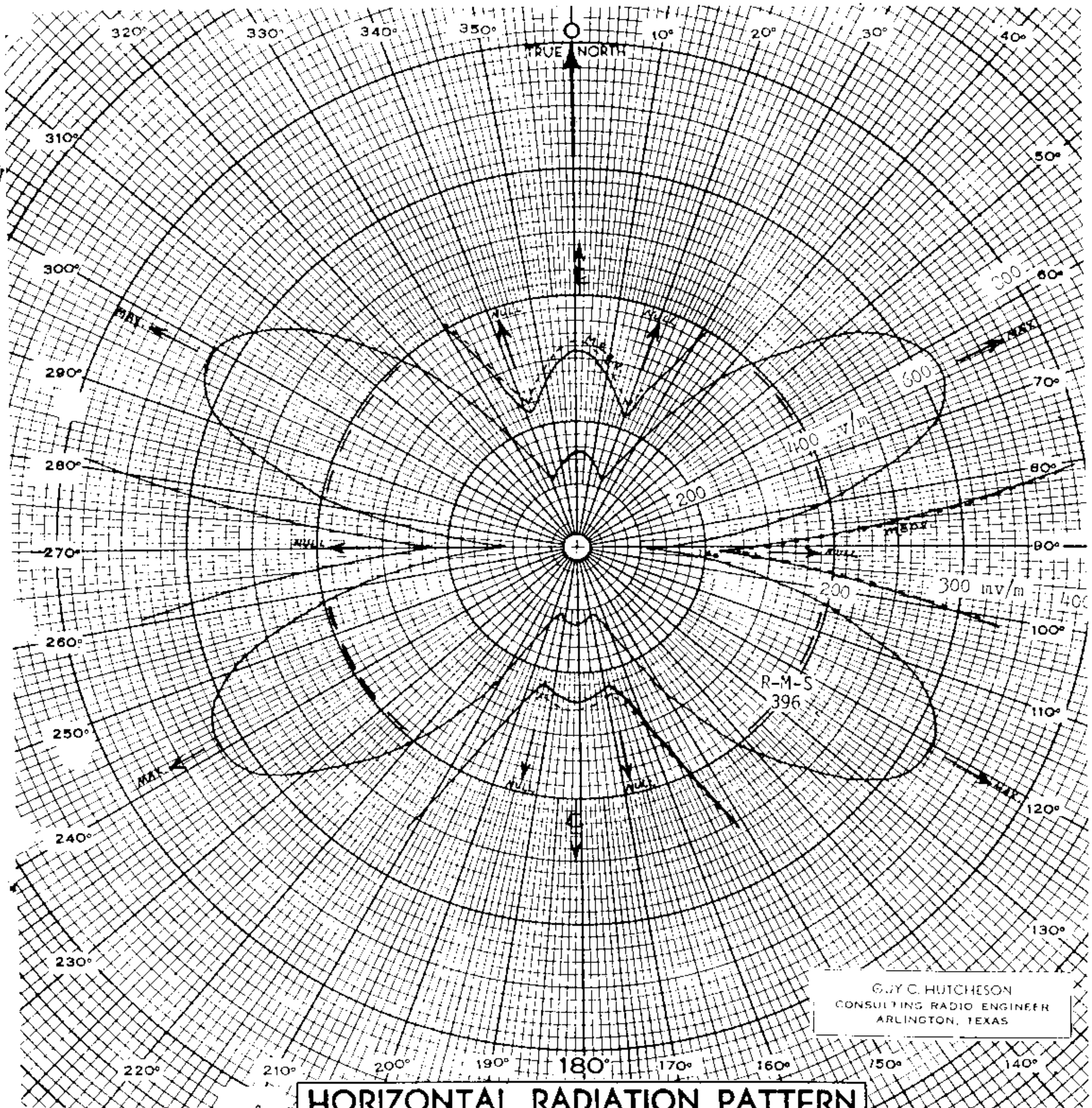
PROPOSED NIGHTTIME HORIZONTAL
STANDARD PATTERN
KWOW, POMONA, CALIFORNIA
1600 KHZ 5 KW - U DA - N
Standard Pattern

KYAL

Proposed Day
(6-28-67ct)

Station KYAL
McKinney, Texas

5kw,DA-D,D
1600 kc



HORIZONTAL RADIATION PATTERN

1°
#1 NORTH
1/0°
375°
640FT.
#2 SOUTH
0.7/-186°
181°

KYAL	McKINNEY, TEXAS	33° 06' 18" & 96° 46' 53"
Station		Location
1600 kc	5 kw DA-D	CALCULATED DAYTIME PATTERN
Frequency	Power	

G's = 162 FT. = 95°

FIG. 1-A

FCC File No.BP-17644
Accepted 6-8-67 Amended

Station KYAL
McKinney, Texas

1600 kc

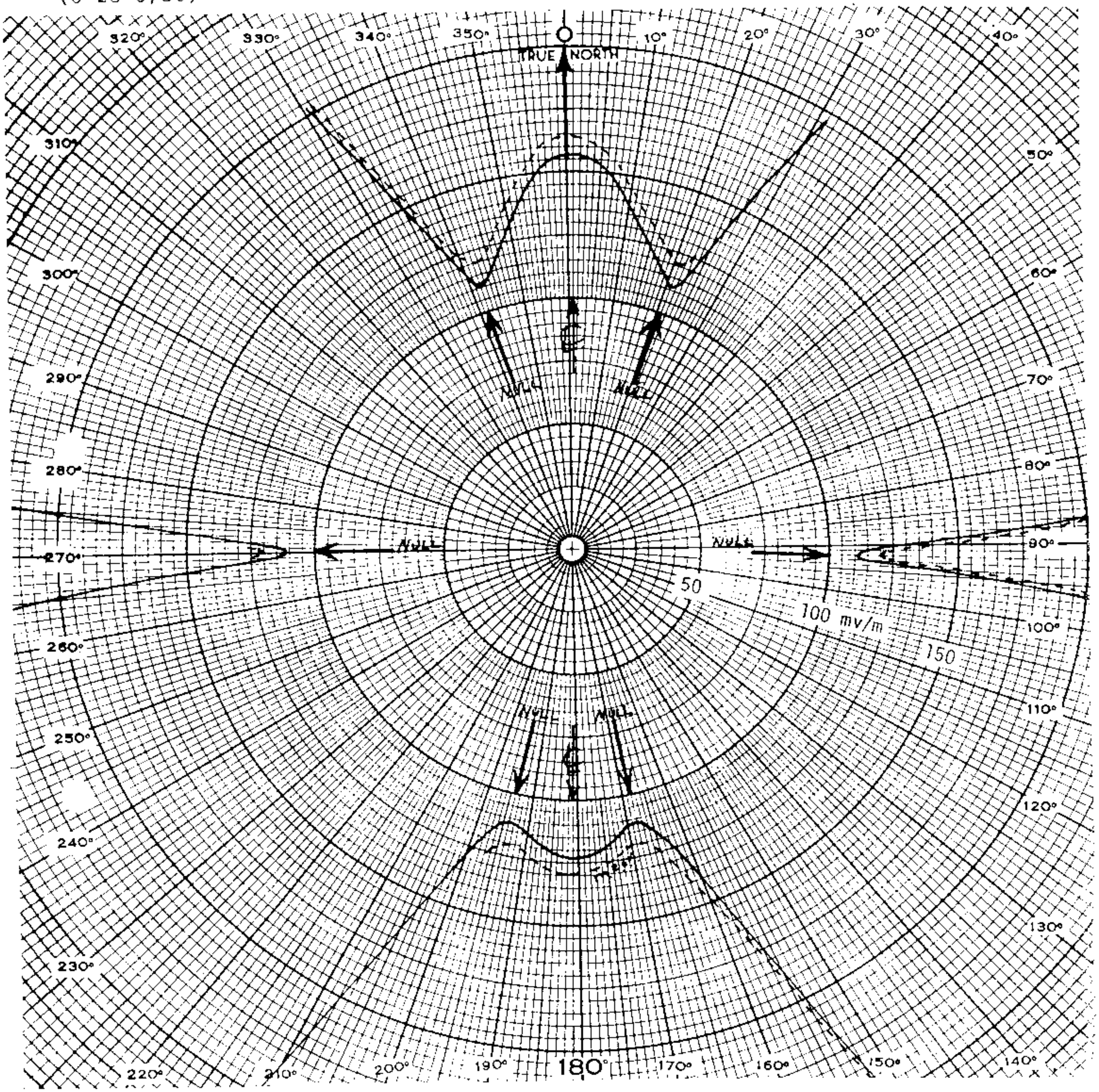
OVER

KYAL

Proposed Day Nulls
(6-28-67ct)

Station KYAL
McKinney, Texas

5kw,DA-D,D
1600 kc



EXPANDED SCALE FOR NULLS

KYAL, McKINNEY, TEXAS

1600 kc 5 kw DA-D

GUY C. HUTCHESON
CONSULTING RADIO ENGINEER
ARLINGTON, TEXAS

FIG. 1-B

FCC File No.BP-17644
Accepted 6-8-67 Amended

Station KYAL
McKinney, Texas

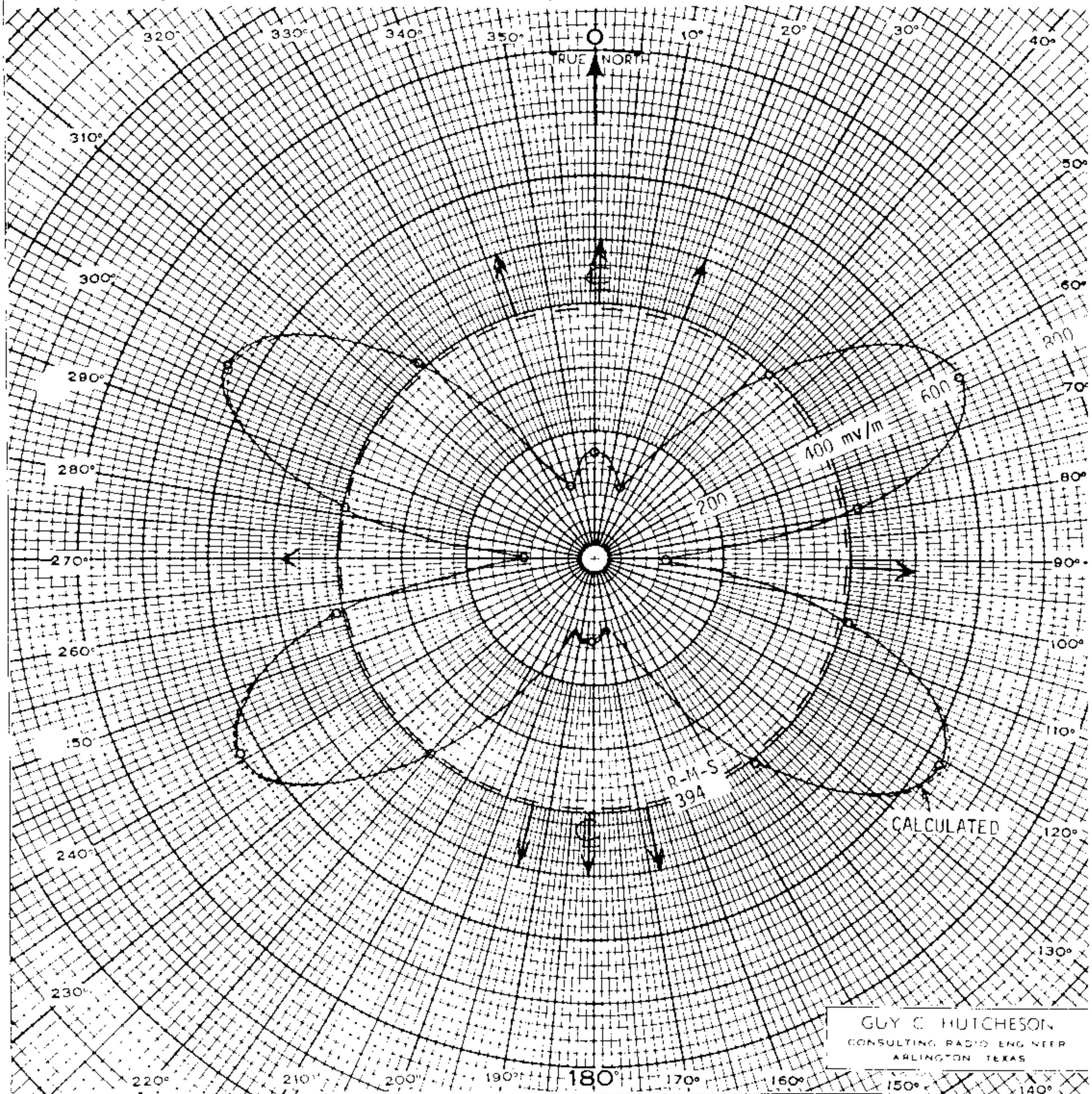
1600 kc

KYAL

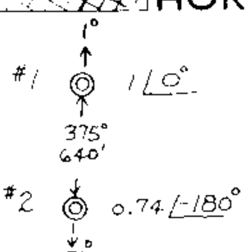
Measured Day
(2-28-69ct)

Station KYAL
McKinney, Texas

5kw,DA-D,D
1600 kc



HORIZONTAL RADIATION PATTERN



KYAL	McKINNEY, TEXAS	33° 06' 18" & 96° 46' 53"
Station		Location
1600 kc	5 kw DA-D	MEASURED DAYTIME PATTERN
Frequency	Power	

162 ft. = 95° Each
Height of Antennas

FIG. 10

FCC File No. BL-12254
Accepted 1-31-69

Station KYAL
McKinney, Texas

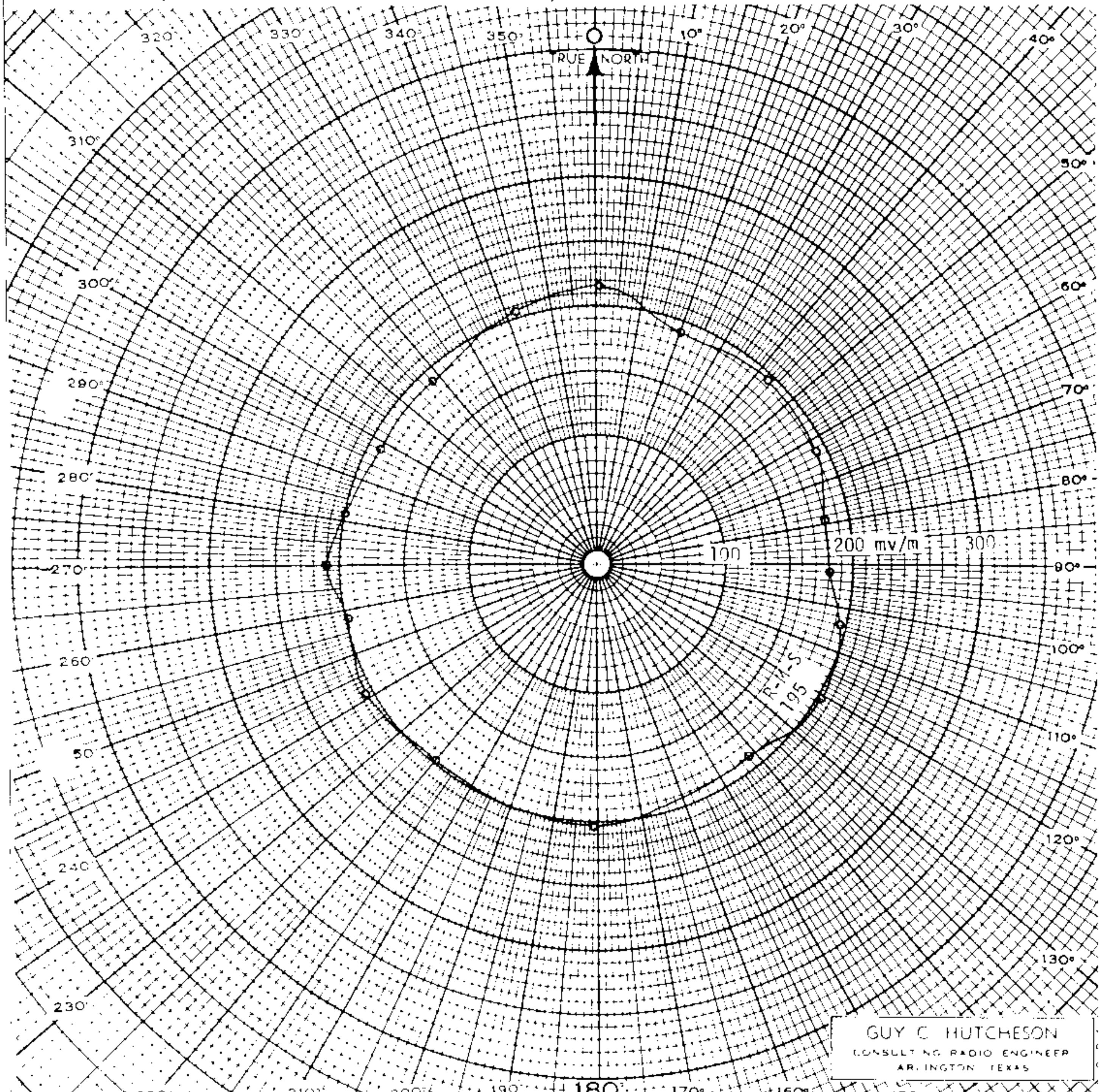
1600 kc

KYAL

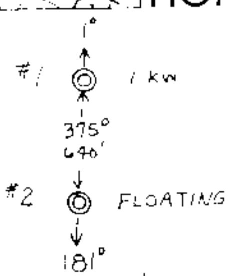
Measured Non-DA
(2-28-69ct)

Station KYAL
McKinney, Texas

5kw,DA-D,D
1600 kc



HORIZONTAL RADIATION PATTERN



KYAL	McKINNEY, TEXAS	33° 06' 18" & 96° 46' 53"
Station		Location
1600 kc	1 kw NON-DA	MEASURED NON-DIRECTIONAL PATTERN
Frequency	Power	
162 FT. = 95°		
Height of Antennas		

FIG. 3

FCC File No.BL-12254
Accepted 1-31-69

Station KYAL
McKinney, Texas

1600 kc

KXEW
1600kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KXEW

Main Studio: South Tucson, Arizona

Frequency: 1600 kHz

Power: 1kw Night 1kw Day

Notification List No. 1783

Date: November 2, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 32° 11' 46"
West Longitude: 110° 59' 02"

ANTENNA CHARACTERISTICS

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

TOWER:	NW(#1)	SE(#2)
HEIGHT ABOVE INSULATORS:	157'	140' (82°)
NIGHT PHASING:	0°	-55°
NIGHT FIELD RATIO:	1.0	0.75

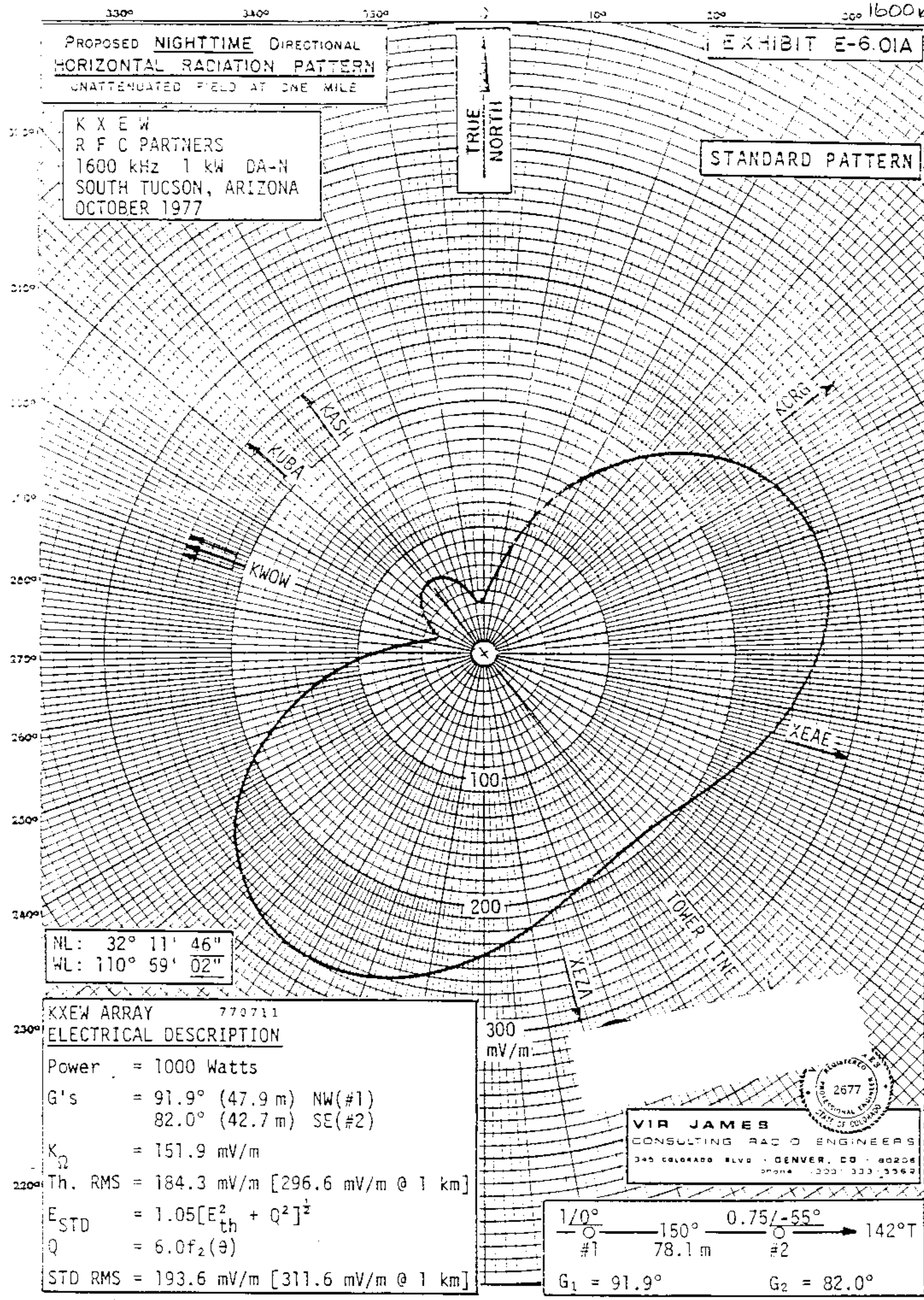
SPACING AND ORIENTATION: Adjacent towers in a row are spaced 256.2' (150°) on a line bearing 142° true.

GROUND SYSTEM: 120 - 151' equally spaced copper radials pluc 120 - 50' interspaced radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

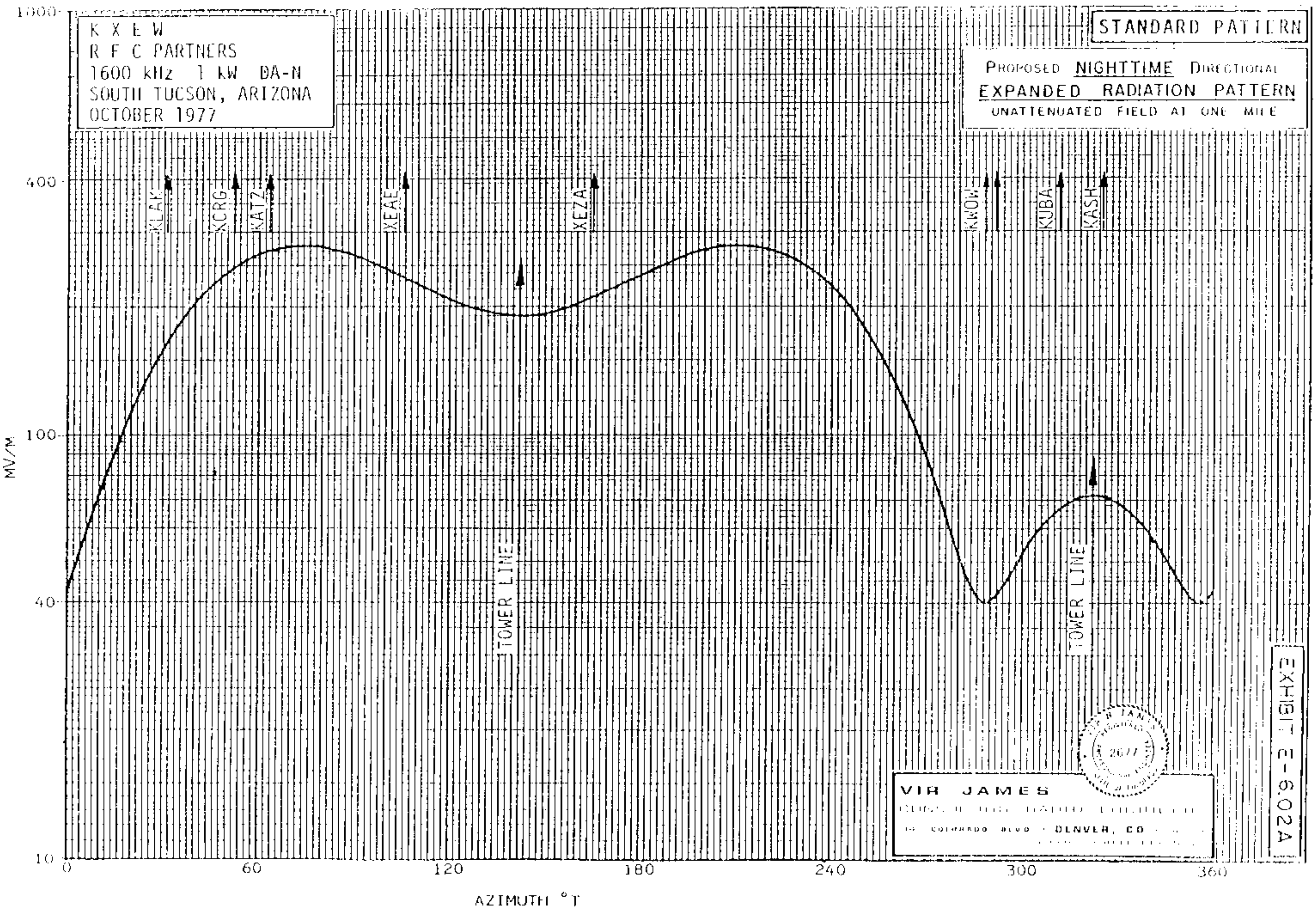
PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	191 mv/m		
Night	184.3 mv/m	189.88 mv/m	193.6 mv/m

KXEW
1600 kHz



KXEW
1600kHz



KXVI
1600kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KXVI

Main Studio: McKinney-Plano, Texas

Frequency: 1600 kHz

Power: 1kw Night 5kw Day

Notification List No. 1785

Date: November 16, 1979 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 33° 03' 50"
West Longitude: 96° 35' 02"

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:	#1 (NW)	#2 (C)	#3 (SC)	#4 (SW)	#5 (W)	#6 (NE)	#7 (E)
HEIGHT ABOVE INSULATORS:	247' (144.6°)	247'	247'	247'	247'	247'	247'
NIGHT PHASING:	-14°	---	---	---	-104°	-90°	0°
NIGHT FIELD RATIO:	0.7	---	---	---	0.49	0.7	1.0
DAY PHASING:	0°	95°	95°	0°	---	---	---
DAY FIELD RATIO:	1.0	0.7	0.35	0.5	---	---	---

SPACING AND ORIENTATION:

DAY: The towers are located at the vertices of a parallelogram the long sides of which are 328.10' (192°) in length on a line bearing 160° true. The short sides are 153.8' (90°) in length on a line bearing 110° true.

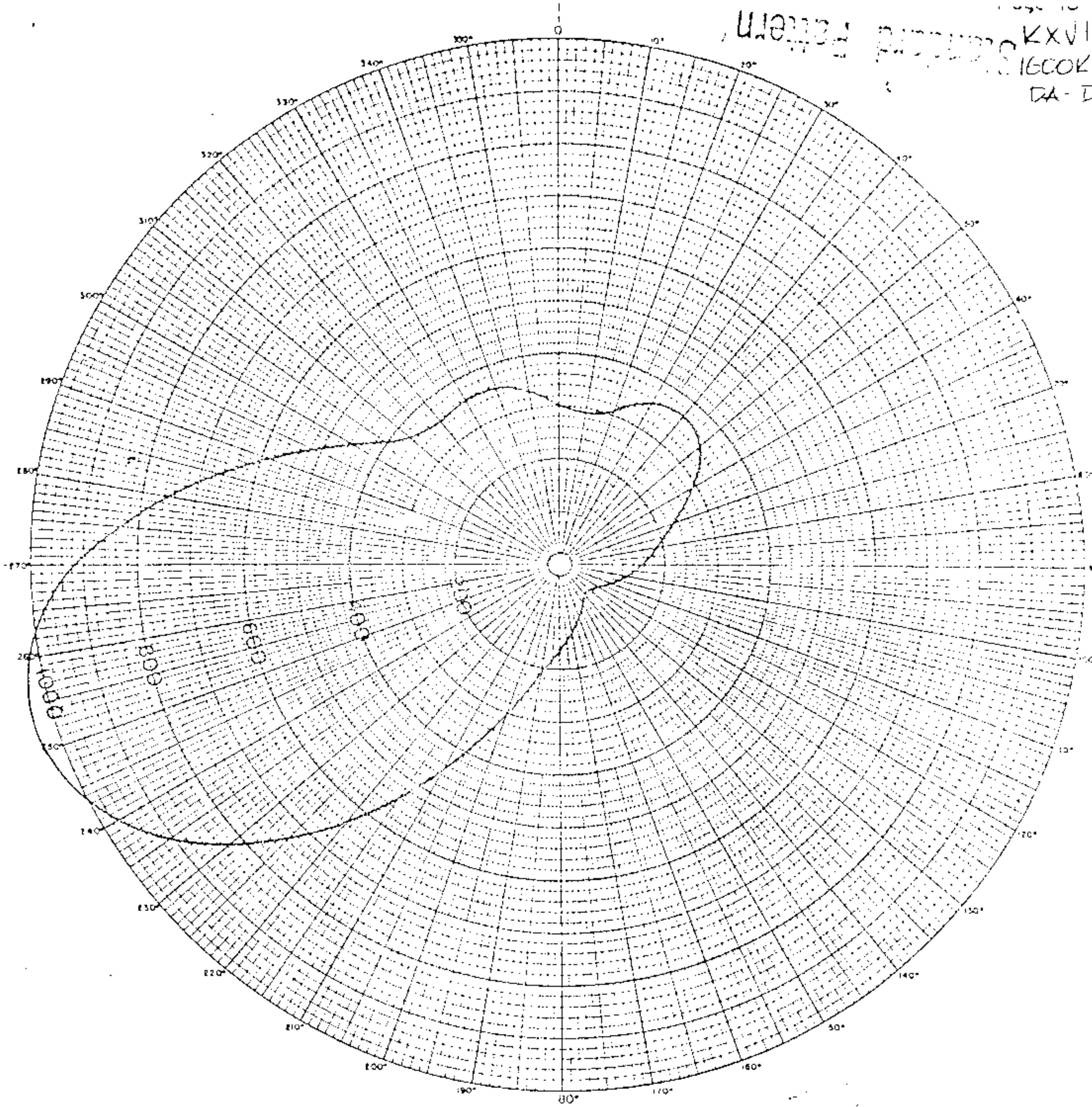
NIGHT: On a line bearing 260° true, tower #5(W) is 158.8'(90°) from tower #1(NW) of the Daytime array (tower #1NW is common to both patterns) from tower #1(NW), tower #6, tower #7(E) is 153.8' (90°) on a line bearing 80° true.

GROUND SYSTEM: 120 - 150' equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	450 mv/m	540.9 mv/m	472.7 mv/m
Night	198.4 mv/m	223.8 mv/m	208.4 mv/m

KXVI
1600KHz
DA-D

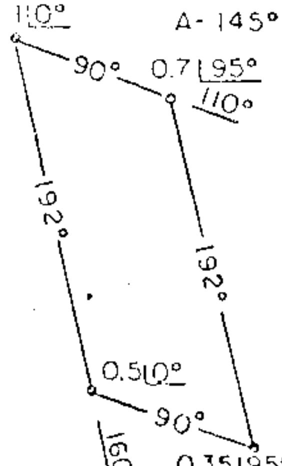


HORIZONTAL RADIATION PATTERN

Standard Pattern

Theoretical RMS - 450.0 MV/M
Standard Pattern RMS - 472.5 MV/M
RSS - 540.9 MV/M

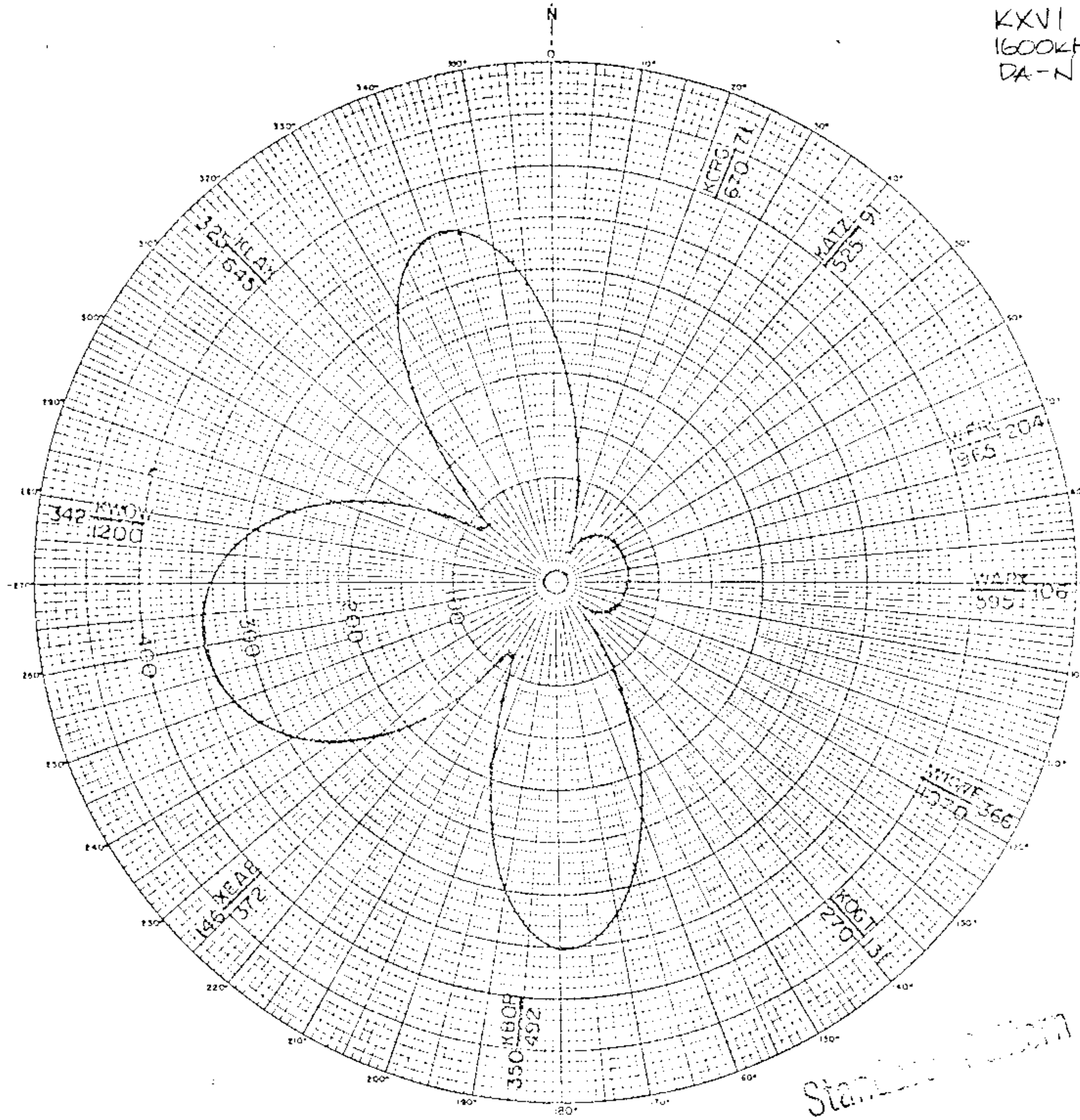
A-247'/250'



APPLICANT	KXVI
LOCATION	McKinney-Plano, Texas
FREQUENCY	1600 KC/S
POWER	5 KW-LS, 1 KW, DA-2
LATITUDE	[illegible] DEG [illegible] MIN [illegible] SEC
LONGITUDE	96 DEG [illegible] MIN [illegible] SEC
WHEN USED	Daytime
RMS FIELD	472.5 MV/M
DATE	May [illegible], 1975

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

KXVI
1600KHZ
DA-N



Standard Pattern

HORIZONTAL RADIATION PATTERN — 0° Standard Pattern

Theoretical RMS - 198.4 MV/M
Standard Pattern RMS - 208.2 MV/M
RSS - 223.8 MV/M

0.49 ⌊-104° — 90° — 0.7 ⌊-14° — 200° — 0.7 ⌊-90° — 90° — 1 ⌊0° — 80° True

A-145°

A-247'/250'

APPLICANT	KXVI
LOCATION	McKinney, Texas
FREQUENCY	1600 KC/S
POWER	5KW-LS, 1KW, DA-2
LATITUDE	33 DEG 03 MIN 50 SEC
LONGITUDE	96 DEG 35 MIN 02 SEC
WHEN USED	Nighttime
R.M.S. FIELD	208.2 MV/M
DATE	May 25th, 1976

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

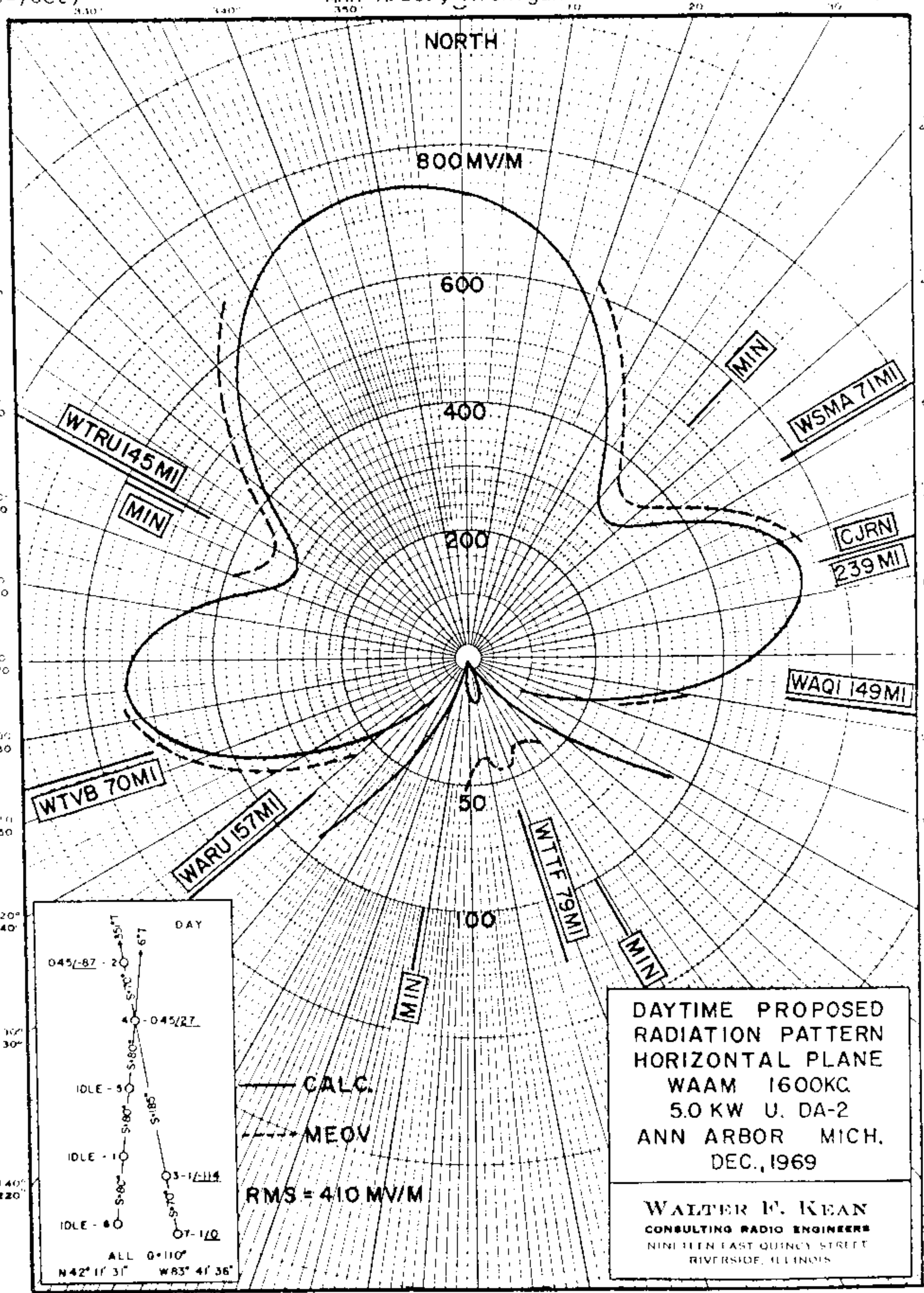
SEE REVERSE

WAAM

Proposed Day
(7-29-70ct)

Station WAAM
Ann Arbor, Michigan

5kw, DA-2, U
1600 kc



FCC File No. BP-18631
Accepted 7-13-70

Station WAAM
Ann Arbor, Michigan

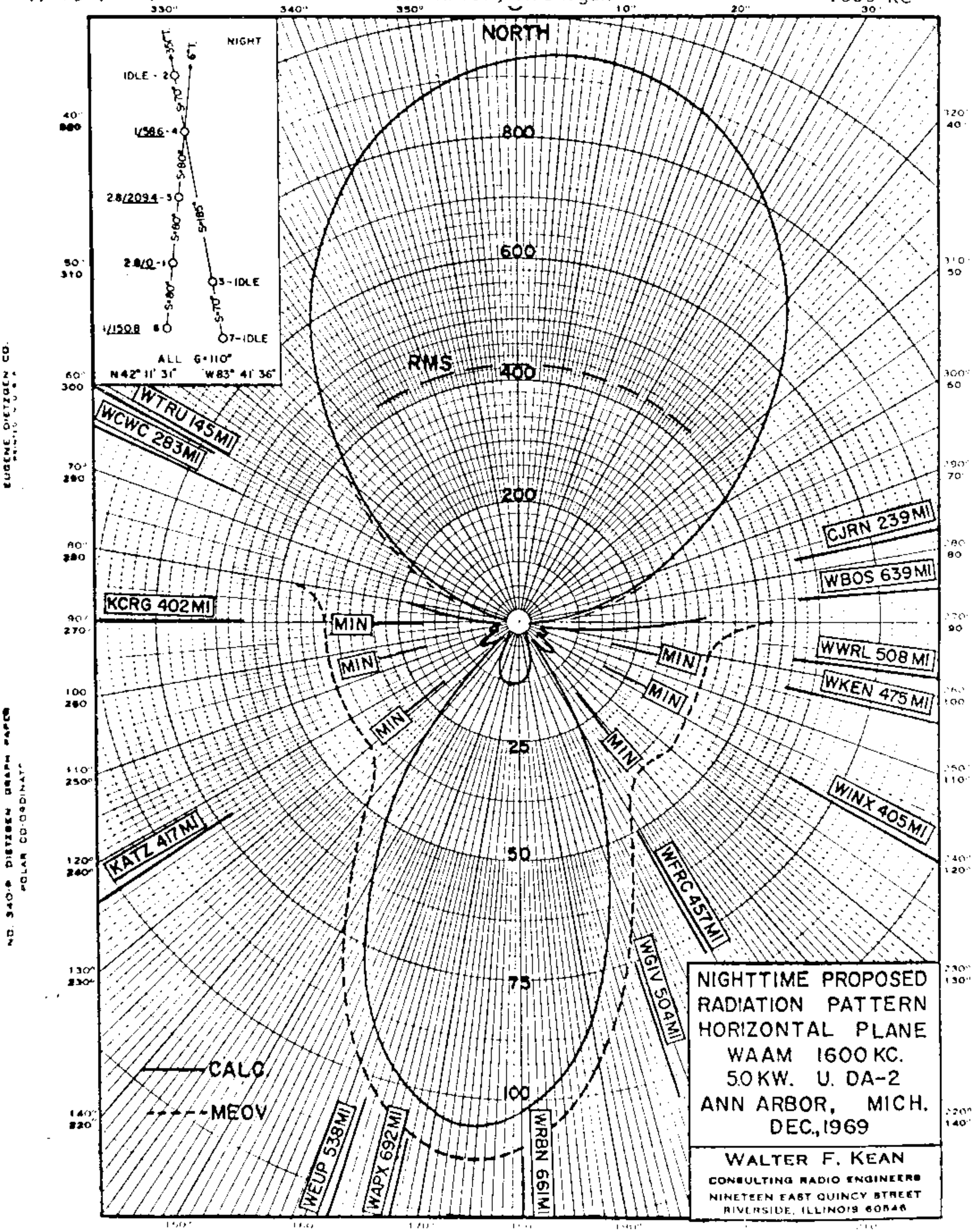
1600 kc

SEE REVERSE WAAM

Proposed Night
(7-29-70ct)

Station WAAM
Ann Arbor, Michigan

5kw,DA-2,U
1600 kc



FCC File No. BP-18631
Accepted 7-13-70

Station WAAM
Ann Arbor, Michigan

1600 kc

WAAM

Proposed Day
(8-27-65ct)

Station WAAM
Ann Arbor, Michigan

1kw,5kw-LS,DA-2,U
1600 kc

MCP 8-26-65
CHG DA
ADD TOWER

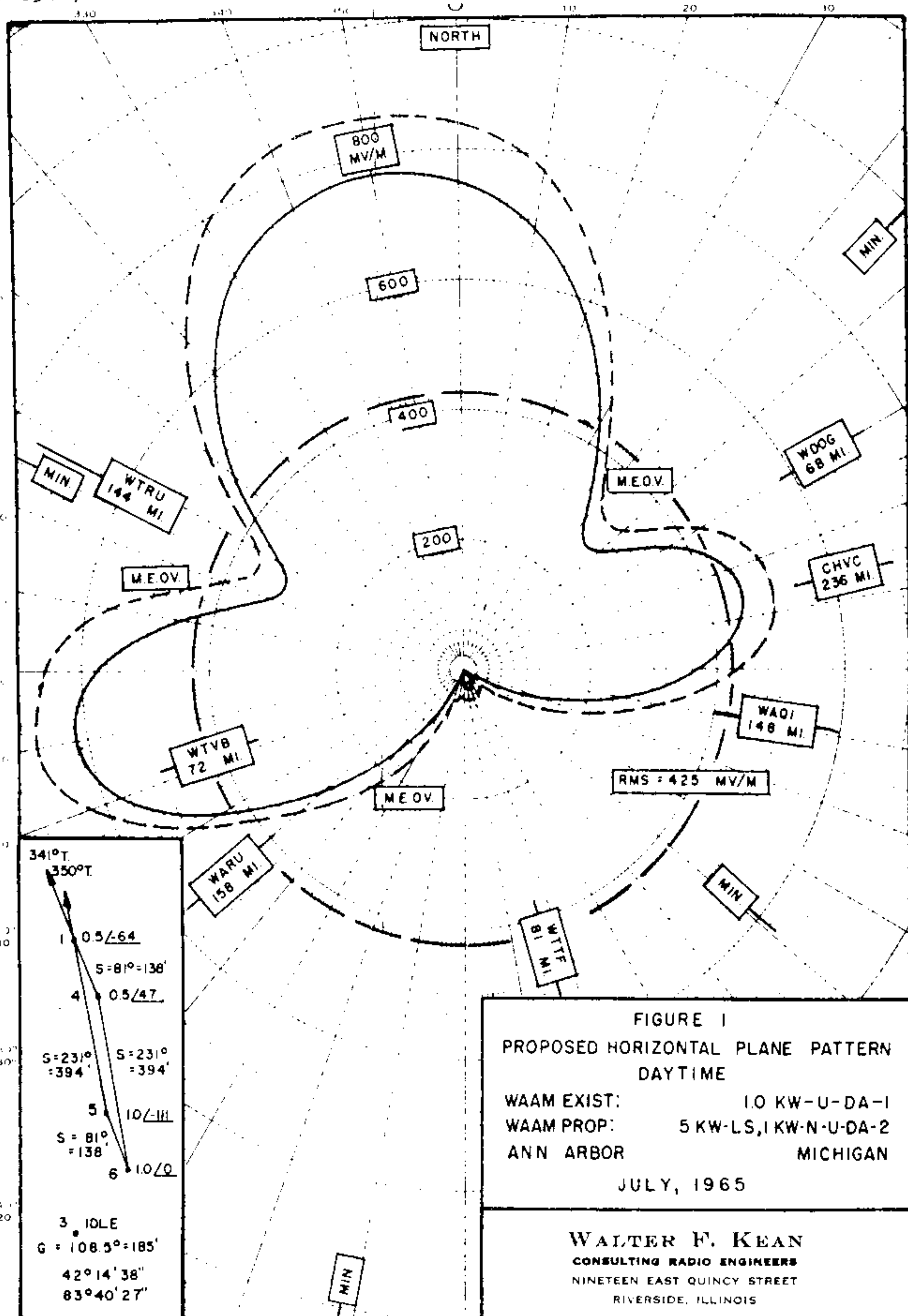


FIGURE 1
PROPOSED HORIZONTAL PLANE PATTERN
DAYTIME

WAAM EXIST: 1.0 KW-U-DA-1
WAAM PROP: 5 KW-LS, 1 KW-N-U-DA-2
ANN ARBOR MICHIGAN

JULY, 1965

WALTER F. KEAN
CONSULTING RADIO ENGINEERS
NINETEEN EAST QUINCY STREET
RIVERSIDE, ILLINOIS

FCC File No.BMP-11571
Accepted 8-12-65

Station WAAM
Ann Arbor, Michigan

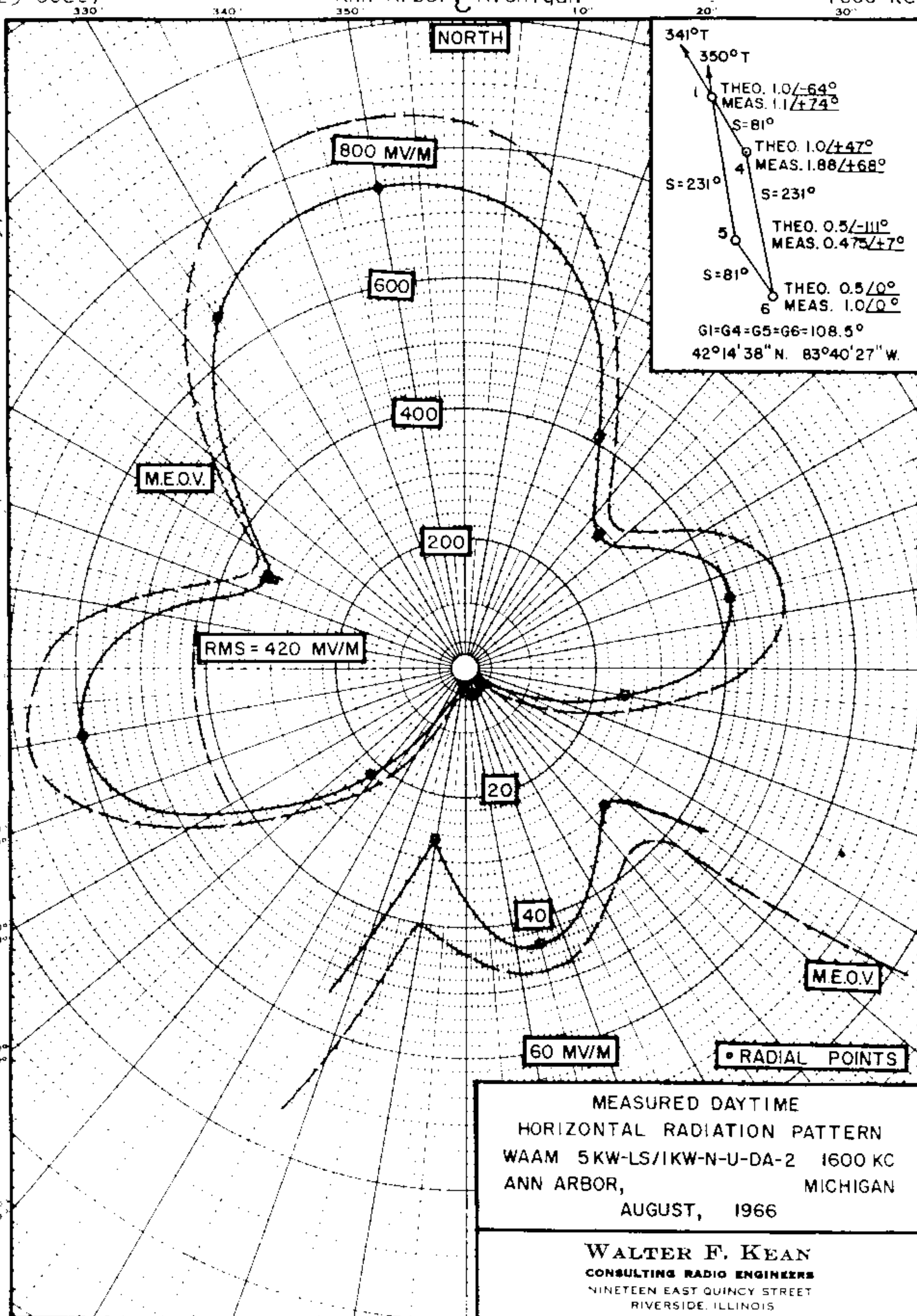
1600 kc

WAAM

Measured Day
(12-29-66ct)

Station WAAM
Ann Arbor, Michigan

1kw,5kw-LS,DA-2,U
1600 kc



MEASURED DAYTIME
HORIZONTAL RADIATION PATTERN
WAAM 5KW-LS/1KW-N-U-DA-2 1600 KC
ANN ARBOR, MICHIGAN
AUGUST, 1966

WALTER F. KEAN
CONSULTING RADIO ENGINEERS
NINETEEN EAST QUINCY STREET
RIVERSIDE, ILLINOIS

FCC File No.BL-11474
Accepted 12-9-66

Station WAAM
Ann Arbor, Michigan

1600 kc

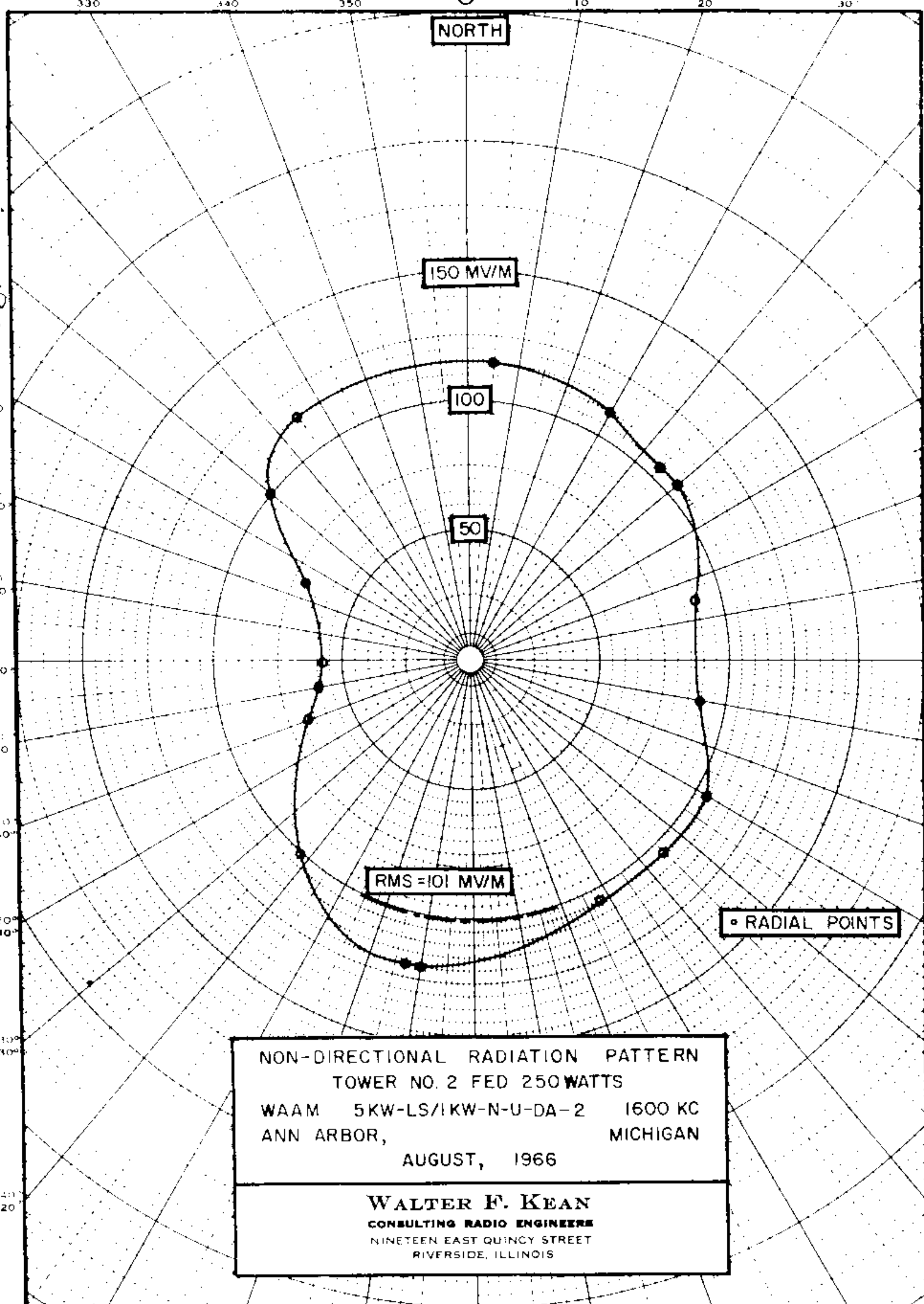
WAAM

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

Station WAAM
Ann Arbor, Michigan

1kw,5kw-LS,DA-2,U
1600 kc

BL-114-74
1-12-67
GRANTED
-KENSE INC.
IN DAYT.
POWER AND
CH. TO DA-2



FCC File No.BL-11474
Accepted 12-9-66

Station WAAM
Ann Arbor, Michigan

1600 kc

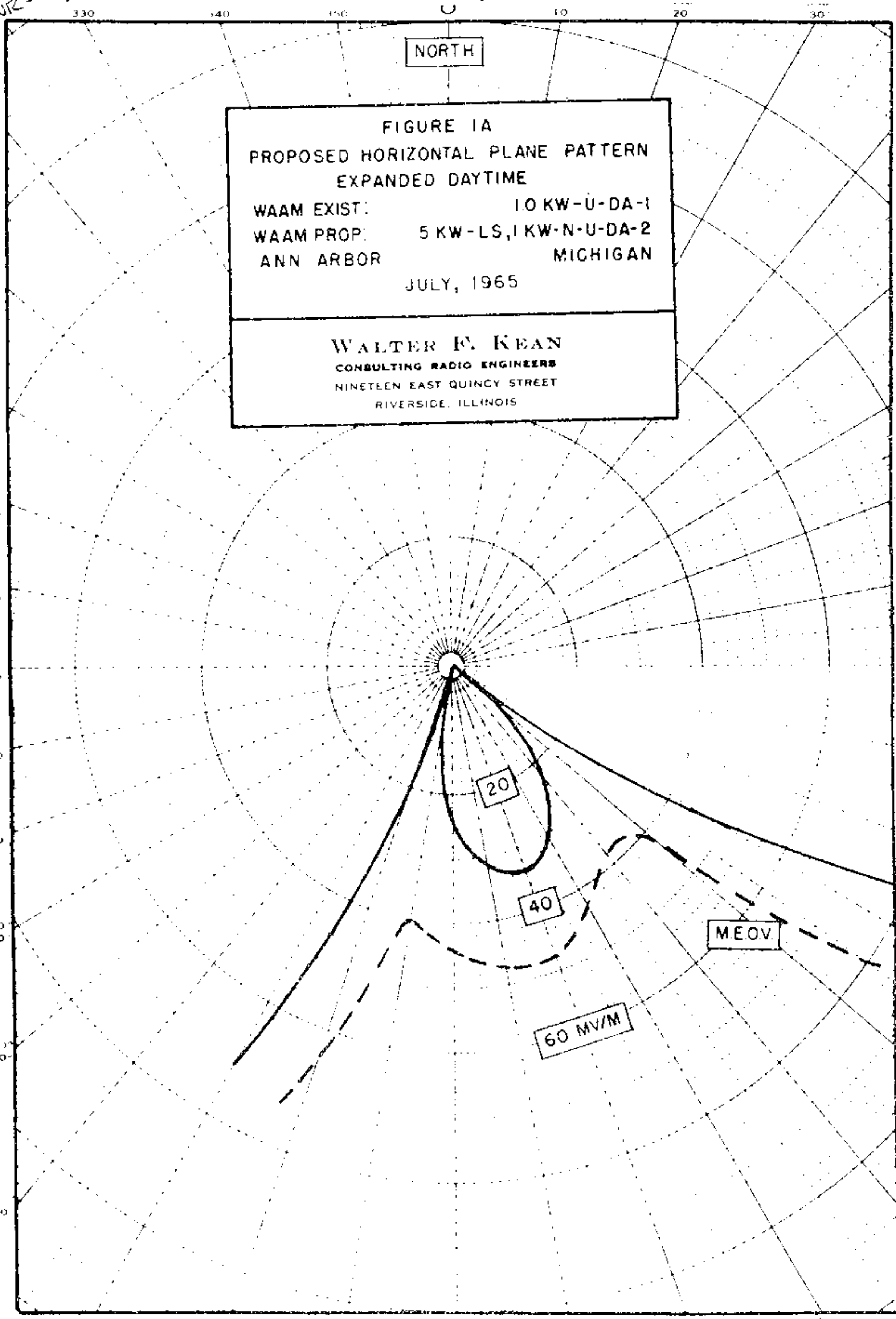
WAAM

Proposed Day Nulls
(8-27-65ct)

Station WAAM
Ann Arbor, Michigan

1kw,5kw-LS,DA-2,U
1600 kc

MCP CHG DA, ADP-TWR
8-26-65



FCC File No.BMP-11571
Accepted 8-12-65

Station WAAM
Ann Arbor, Michigan

1600 kc

W AAM
1600

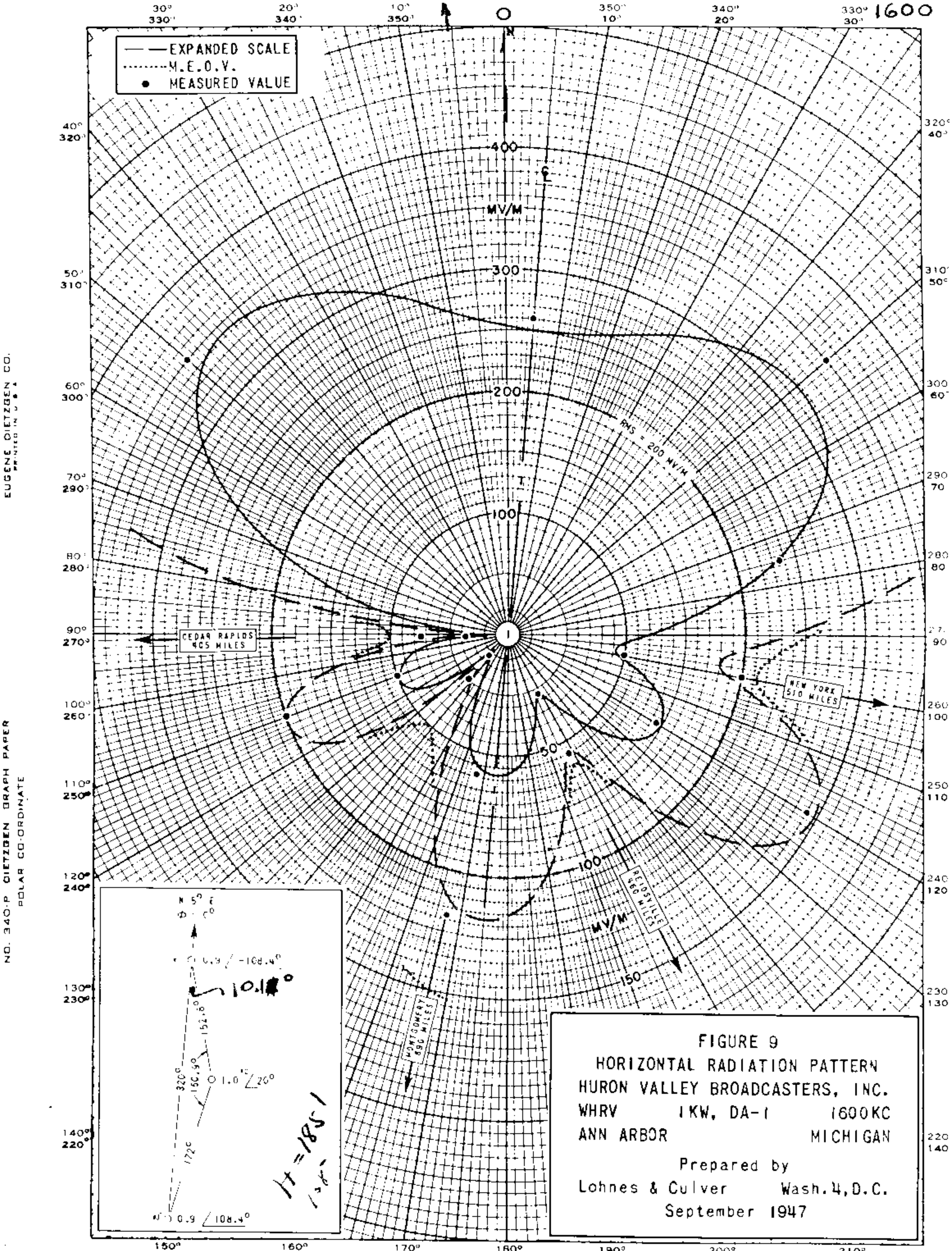
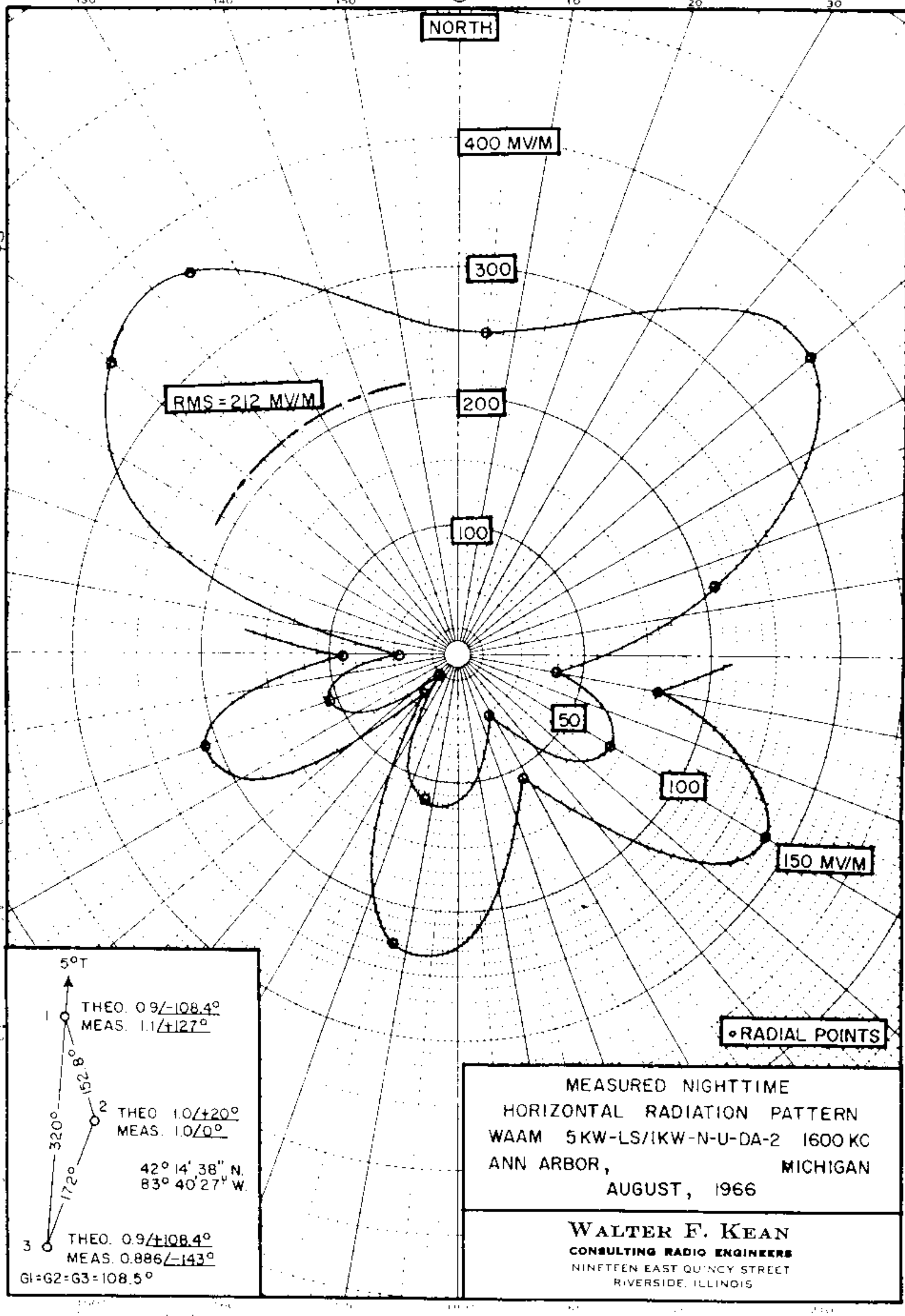


FIGURE 9
HORIZONTAL RADIATION PATTERN
HURON VALLEY BROADCASTERS, INC.
WHRV 1KW, DA-1 1600KC
ANN ARBOR MICHIGAN
Prepared by
Lohnes & Culver Wash. 4, D.C.
September 1947

WAAM

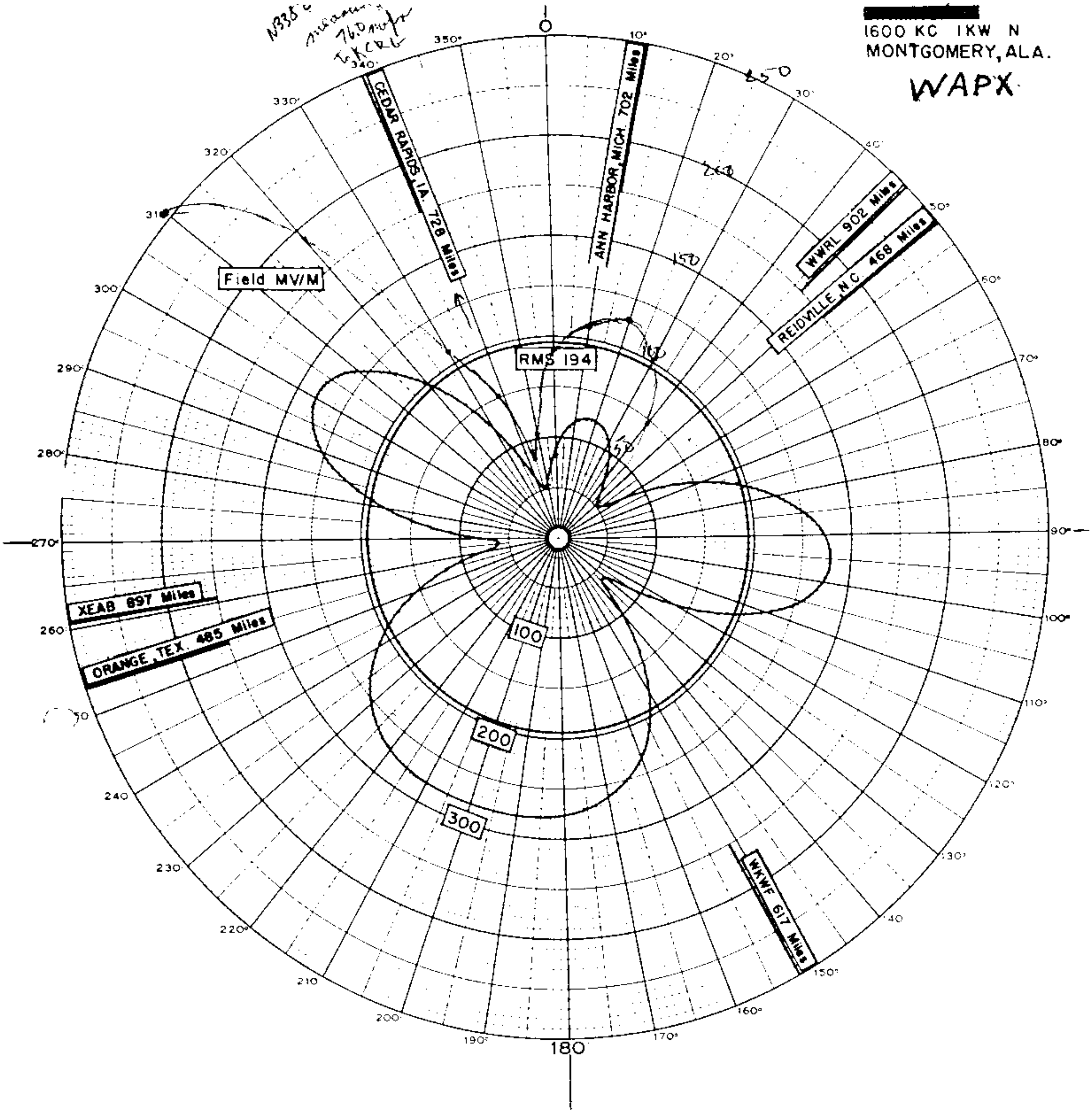
Measured Night (12-29-66ct) | Station WAAM Ann Arbor, Michigan | 1kw, 5kw-LS, DA-2, U 1600 kc

BL-11474
1-12-67
GRANTED
LICENSE
INCR. IN
DAYT. POWER
AND CHANGE
TO DA-2



FCC File No. BL-11474 | Station WAAM | 1600 kc
Accepted 12-9-66 | Ann Arbor, Michigan |

[redacted]
1600 KC 1KW N
MONTGOMERY, ALA.
WAPX

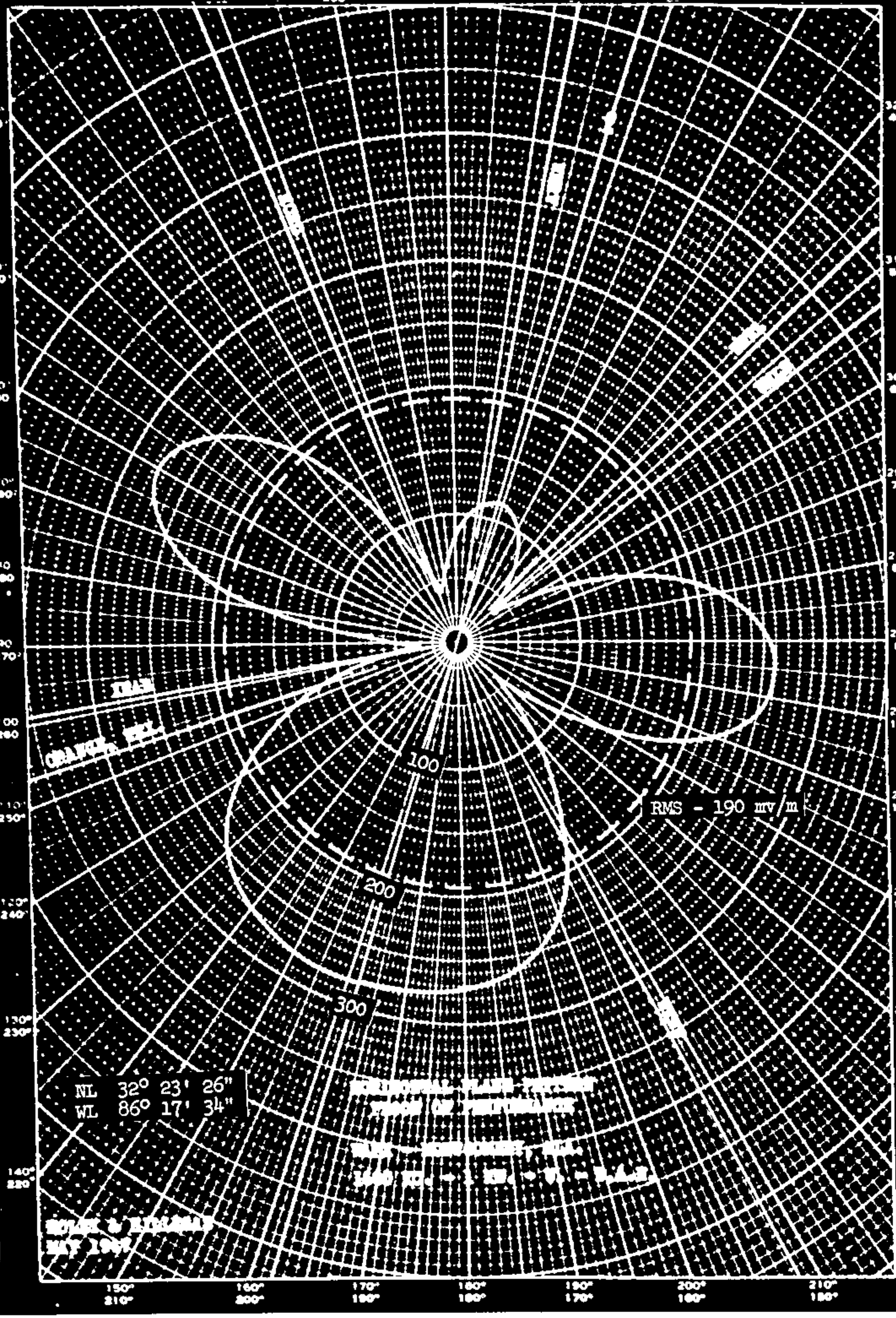


UNITED BROADCASTING CO. MONTGOMERY, ALABAMA	Figure 1 Series 46100IP 1600 KC 1000 WATTS NIGHT
N .76-63° 18° 120° SPACING 291° H = 88° — PROPOSED DIRECTIONAL ANTENNA PATTERN	FRANK H McINTOSH *Consulting Radio Engineer* Washington, D.C.

MEASURED NIGHT

Station WAPX
Montgomery, Alabama

1kw, DA-N,U
1600 KC



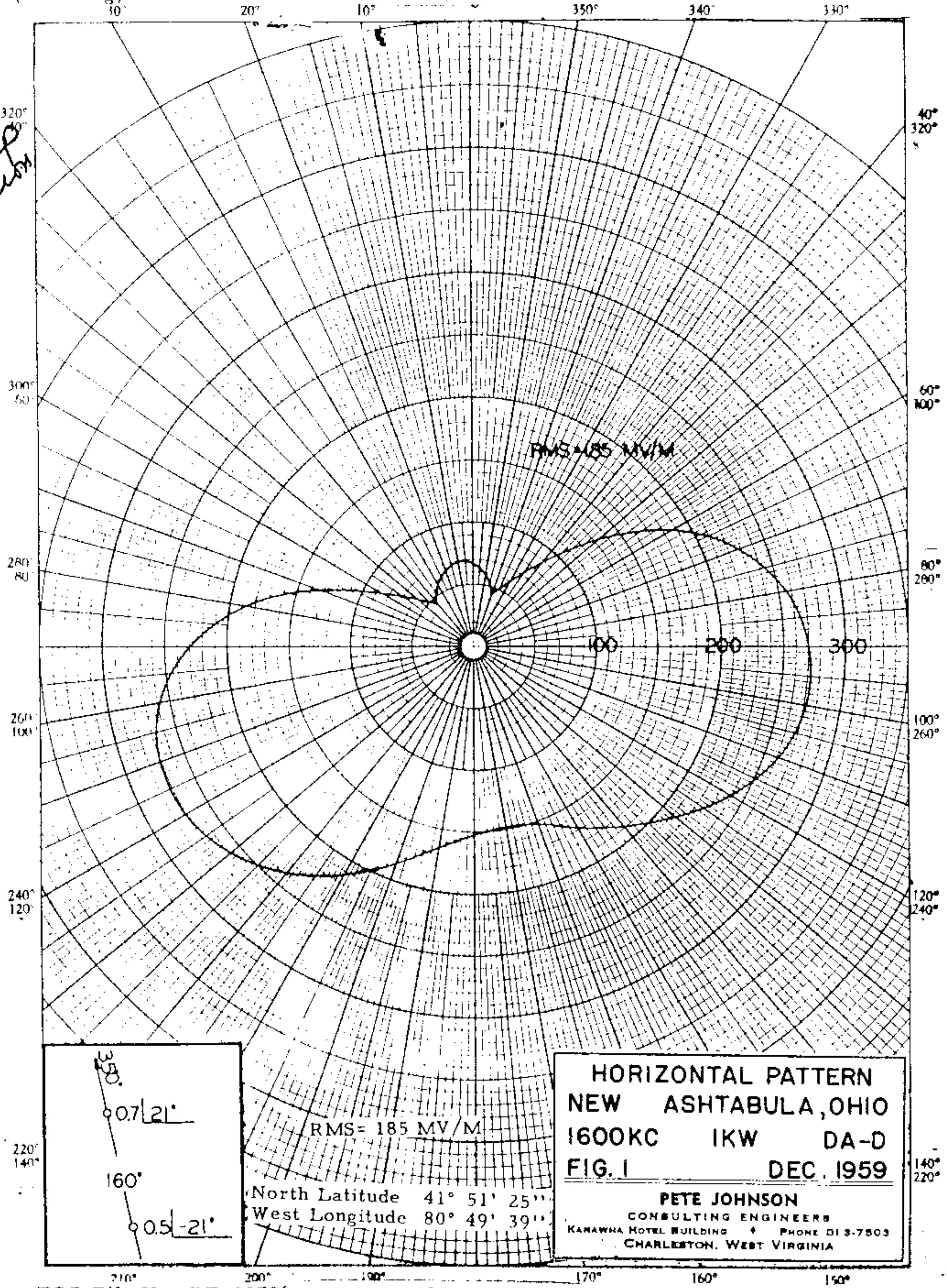
WAQI

PROPOSED DAY
(2-26-60g)

New; Quests, Inc.
Ashtabula, Ohio

1kw, DA-D,D
1600 KC

1-26-62 granted CP to new station



FCC File No. BP-13786
Accepted 1-25-60

Quests, Incorporated
Ashtabula, Ohio

1600 KC

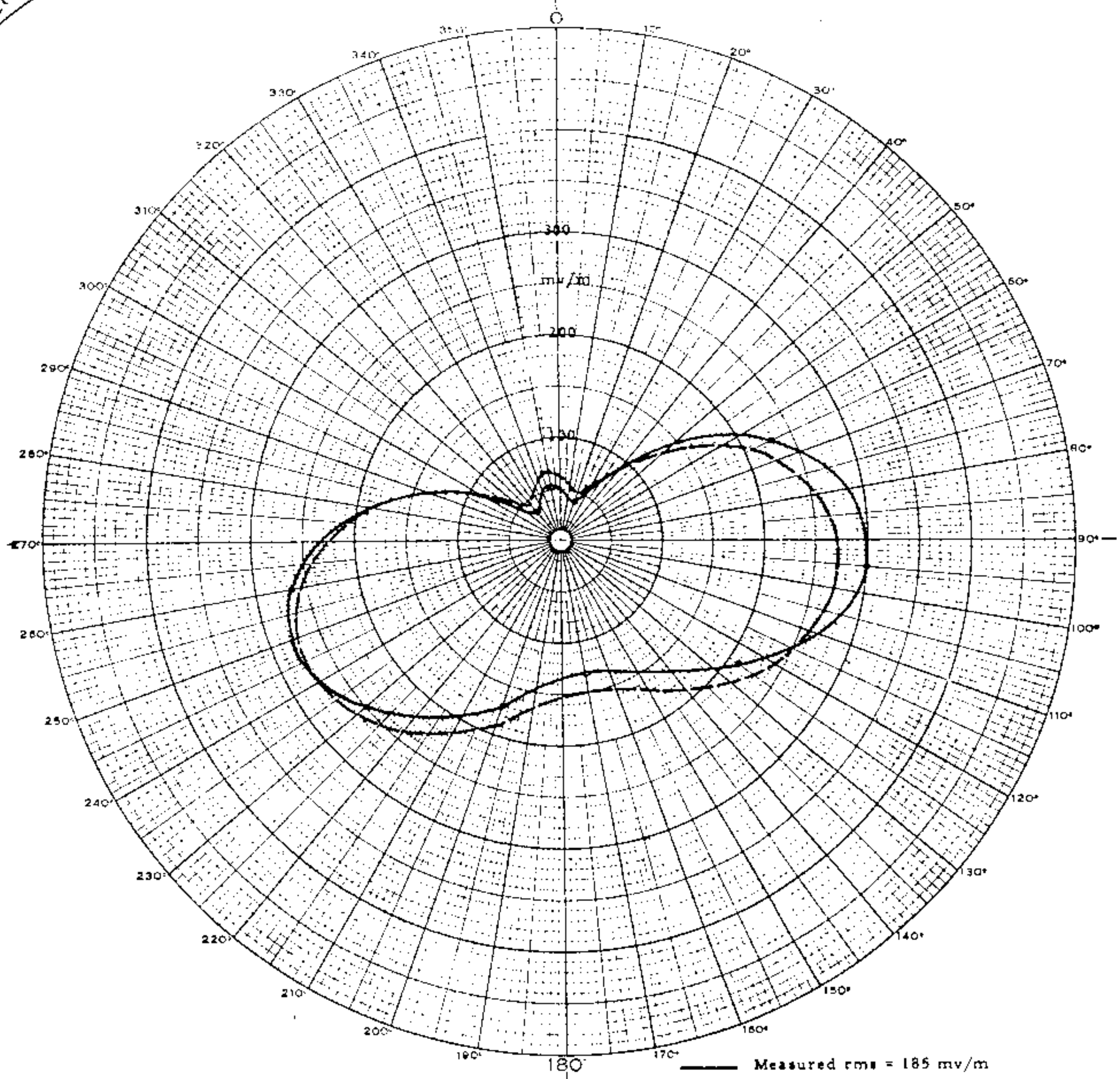
WAQI

L-10501
-15-65 LIC

Measured Day
(4-24-64ct)

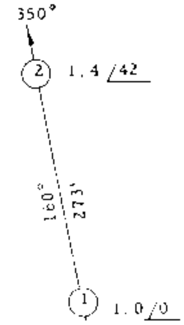
Station WAQI
Ashtabula, Ohio

1kw, DA-D, D
1600 kc



—— Measured rms = 185 mv/m
---- Computed rms = 185 mv/m

TOWER PLACEMENT SKETCH



PATTERN PARAMETERS

TOWER No	ELECTRICAL HEIGHT $G°$	TRUE TOWER ORIENTATION $\phi°$	SPACING $S°$	PHASING $\psi°$	HORIZONTAL FIELD E	FIELD RATIO F	ELEV. ANGLE $\theta°$	ELEVATION RMS FIELD E_θ
1	88	0	0	0		1.0	0	185
2	88	350	160	42		1.4	10	
3							20	
4							30	
5							40	
6							50	
7							60	
8							70	
9							80	
10								

%

STATION DATA

CALL	WAQI
FREQUENCY	1600 kc
POWER	1 kw
TIME OF OPERATION	DA-D
TYPE OF OPERATION	Class III
DAYTIME TOWERS	2
NIGHTTIME TOWERS	--
NO. RADIALS PER TOWER	120
LENGTH OF RADIALS	91 ° 155 '
GROUND SCREEN DIMENSION	24' x 24'
LAT.	41 ° 51 ' 20 "
LONG.	80 ° 49 ' 52 "
OPERATES	--
PATTERN NO.	640114

CARL E. SMITH
Consulting Radio Engineers

FIG. 7.11
WAQI
Ashtabula, Ohio
HORIZONTAL PATTERN

FCC File No. BL-10501
Accepted 4-7-64

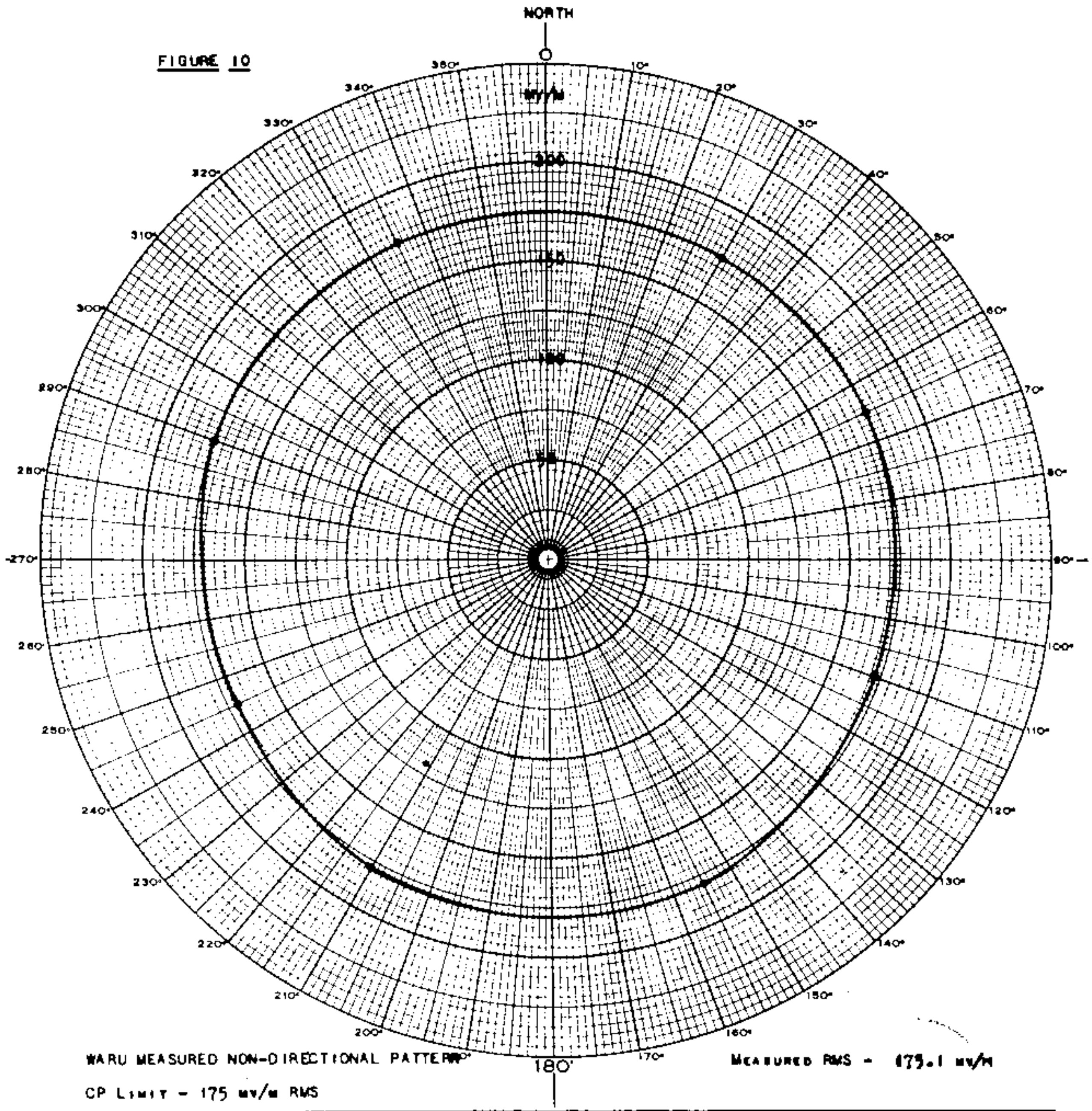
Station WAQI
Ashtabula, Ohio

1600 kc

WARU

MEASURED (Non-DA) DAY (5/15/56g) | STATION WARU PERU, INDIANA | 1 KW Non-DA, D | 1600 KC

FIGURE 10



WARU MEASURED NON-DIRECTIONAL PATTERN

MEASURED RMS - 175.1 MV/M

CP LIMIT - 175 MV/M RMS

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	STATION DATA
No. of towers: 1 Height of towers: 150' (153' overall) 40° 45' 53" N (Latitude) 86° 02' 26" W (Longitude)	TOWER No. 1–10; ELECTRICAL HEIGHT $G°$; TRUE TOWER ORIENTATION $\phi°$; SPACING $S°$; PHASING $\psi°$; HORIZONTAL FIELD MV/M E; FIELD RATIO F; ELEV. ANGLE $\theta°$ 0, 10, 20, 30, 40, 50, 60, 70, 80; ELEVATION RMS FIELD MV/M E_θ; E_1 = MV/M; P_1 = KW; DAYTIME OPERATION ☐; NIGHTTIME OPERATION ☐	CALL WARU FREQUENCY 1600 KC POWER 1 KW TIME OF OPERATION D TYPE OF OPERATION DAYTIME TOWERS 1 NIGHTTIME TOWERS – No. RADIALS PER TOWER LENGTH OF RADIALS FT GROUND SCREEN DIMENSION LAT. LONG. SUPERSEDES PATTERN No.

E. Harold Munn, Jr.
RADIO ENGINEER
Coldwater, Michigan

FCC File No. BL-6137 Accepted 5-8-56 WARU, Peru, Indiana 1600 KC

Chicago Heights, Ill.

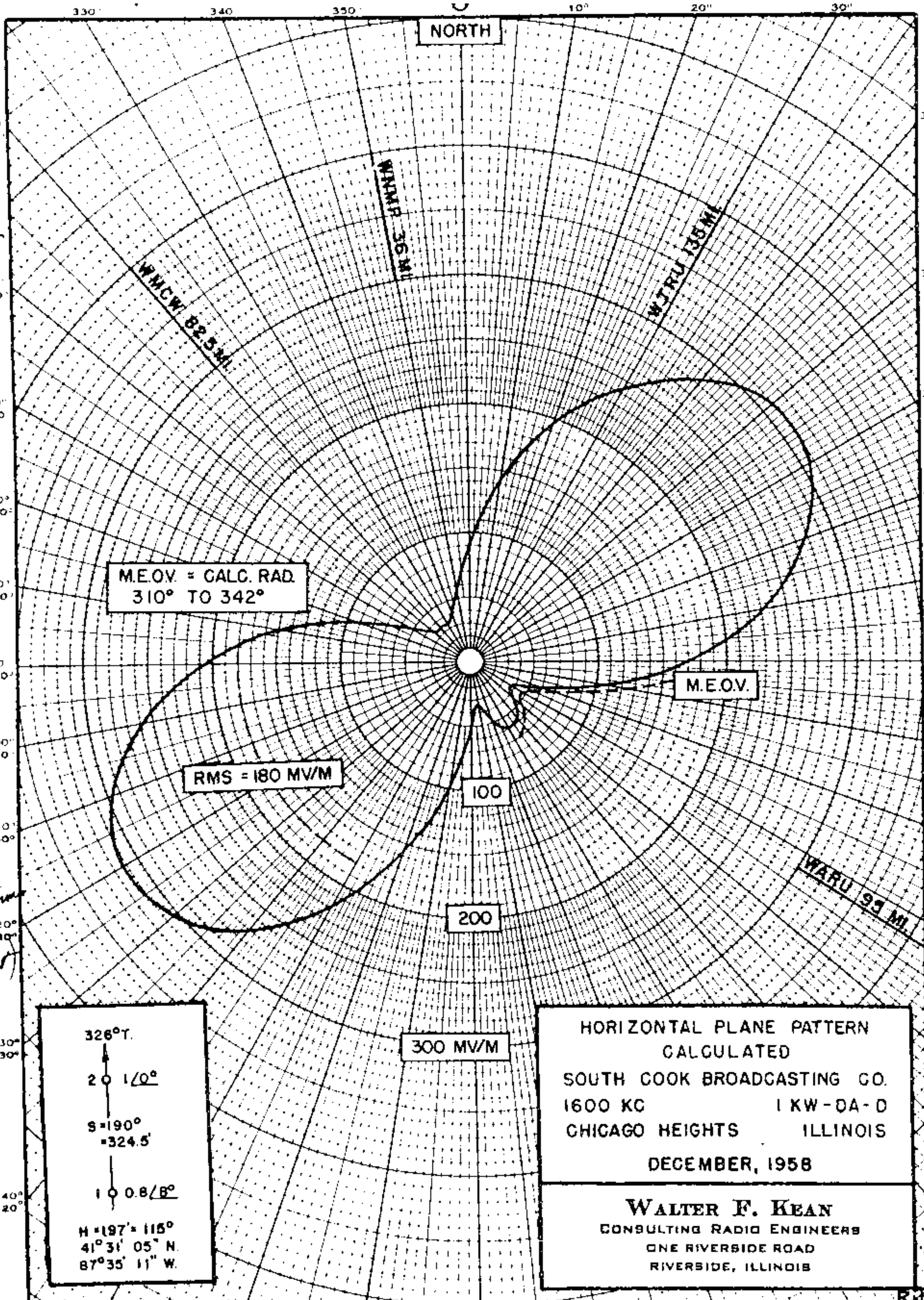
WCGO

PROPOSED DAY (1-8-59g)

New; South Cook Bcstng., Inc.
Chicago Heights, Illinois

1kw, DA-D, D
1600 KC

Granted CP 2/25/59 for a new station



Amended to decrease antenna height to 144.5'/150' (ft) overall

FCC File No. BP-11787
Accepted 12-29-58 Amended

South Cook Broadcasting, Incorporated
Chicago Heights, Illinois 1600 KC

FIGURE 1

Chicago Heights, Ill.

WCGE

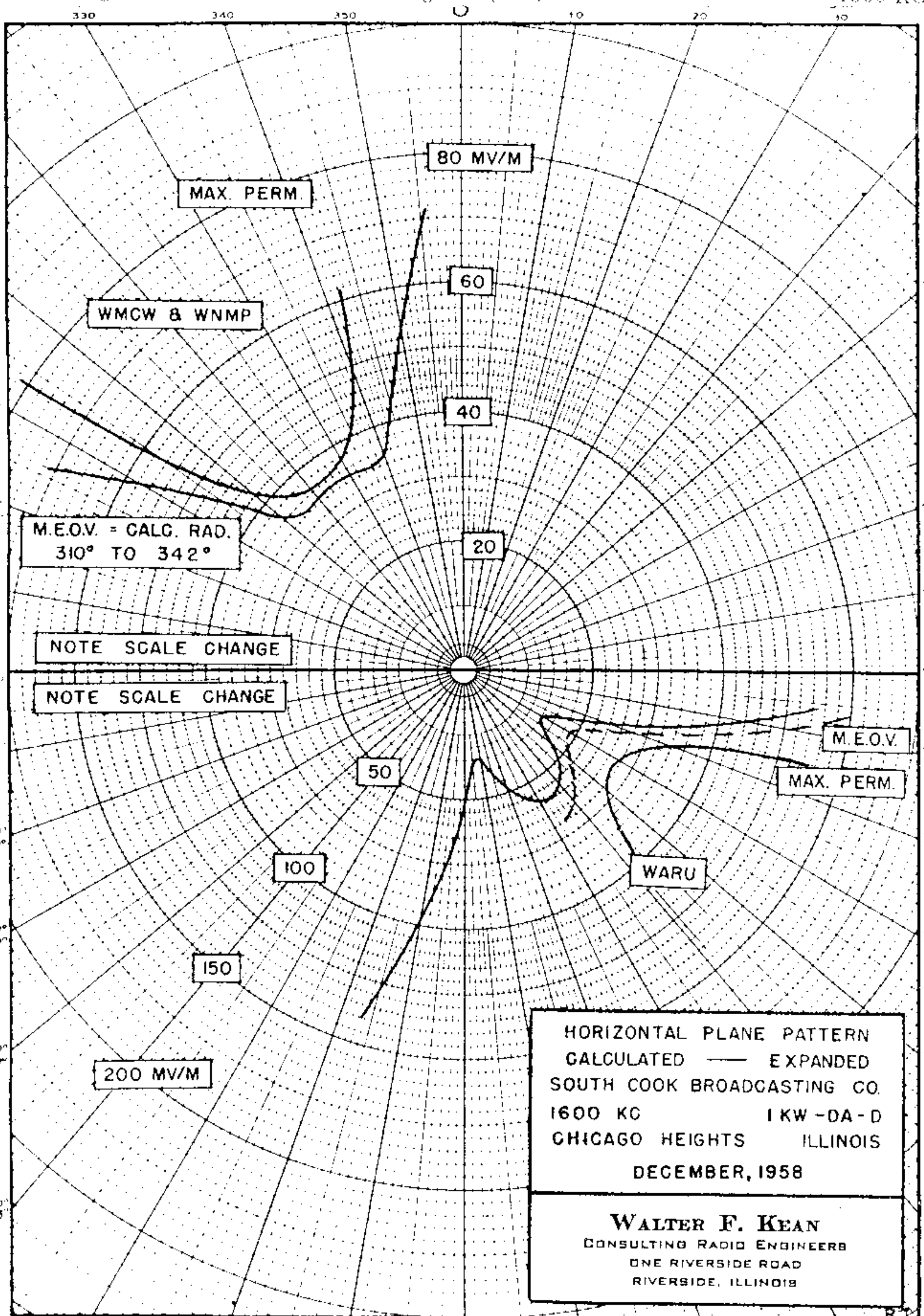
granted for a new station 5-31-60

PROPOSED DAY NULLS
(1-8-59g)

New; South Cook Bcstng., Inc.
Chicago Heights, Illinois

1kw, DA-D, D
1600 KC

Granted CP (2/25/59) for a new station



FCC File No. BP-11787
Accepted 12-29-58 Amended

South Cook Broadcasting, Incorporated
Chicago Heights, Illinois 1600 KC

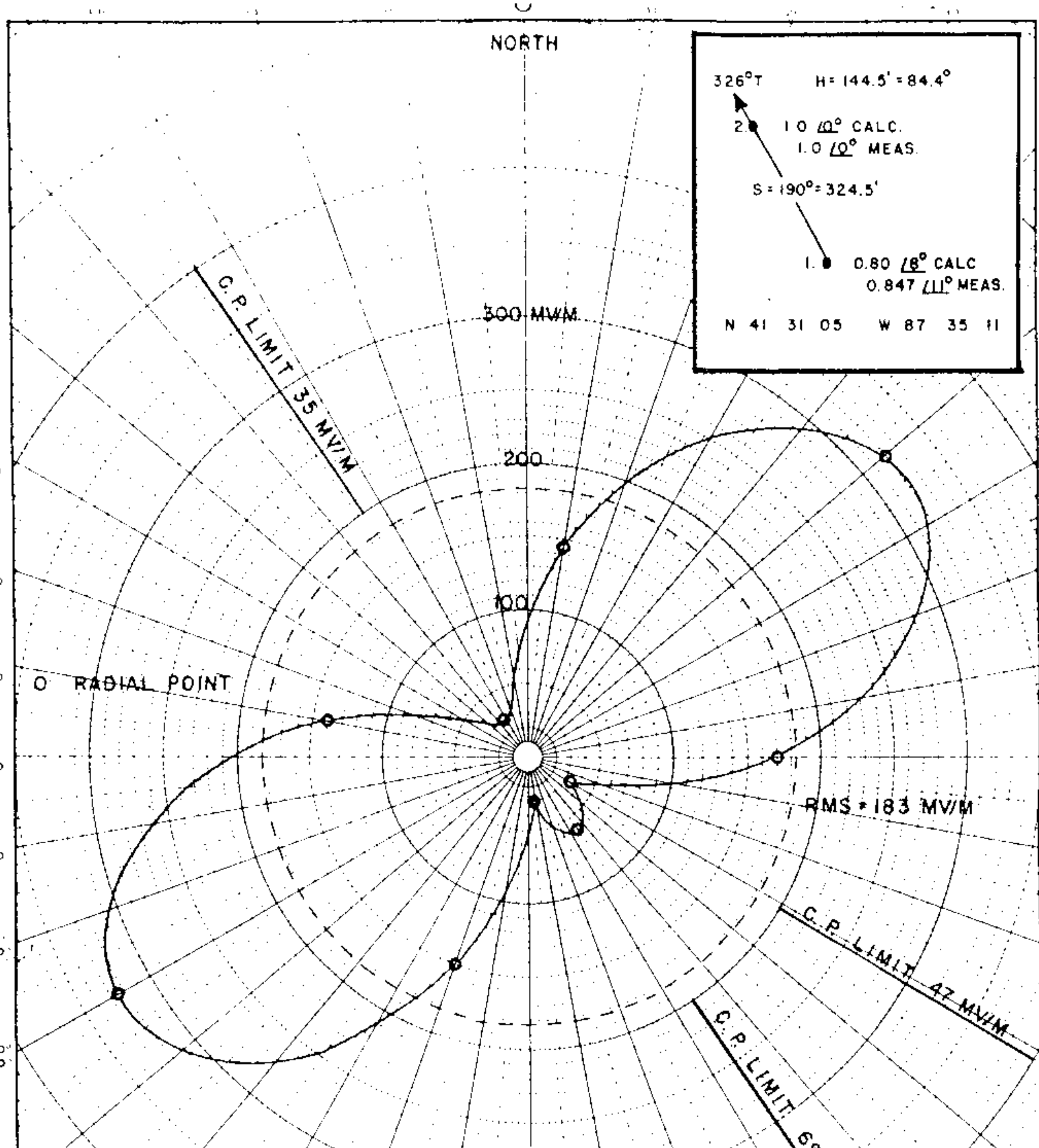
FIGURE 1A

WCGc

MEASURED DAY
(11-16-59g)

Station WCGO
Chicago Heights, Illinois

1kw, DA-D,D
1600 KC



MEASURED DAYTIME HORIZONTAL PLANE RADIATION PATTERN
WCGO 1 KW DA-D 1600 KC
CHICAGO HEIGHTS, ILLINOIS
AUGUST, 1959

WALTER F. KEAN
CONSULTING RADIO ENGINEERS
NINETEEN EAST QUINCY STREET
RIVERSIDE, ILLINOIS

FCC File No. BL-7622
Accepted 10-7-59

WCGO
Chicago Heights, Illinois

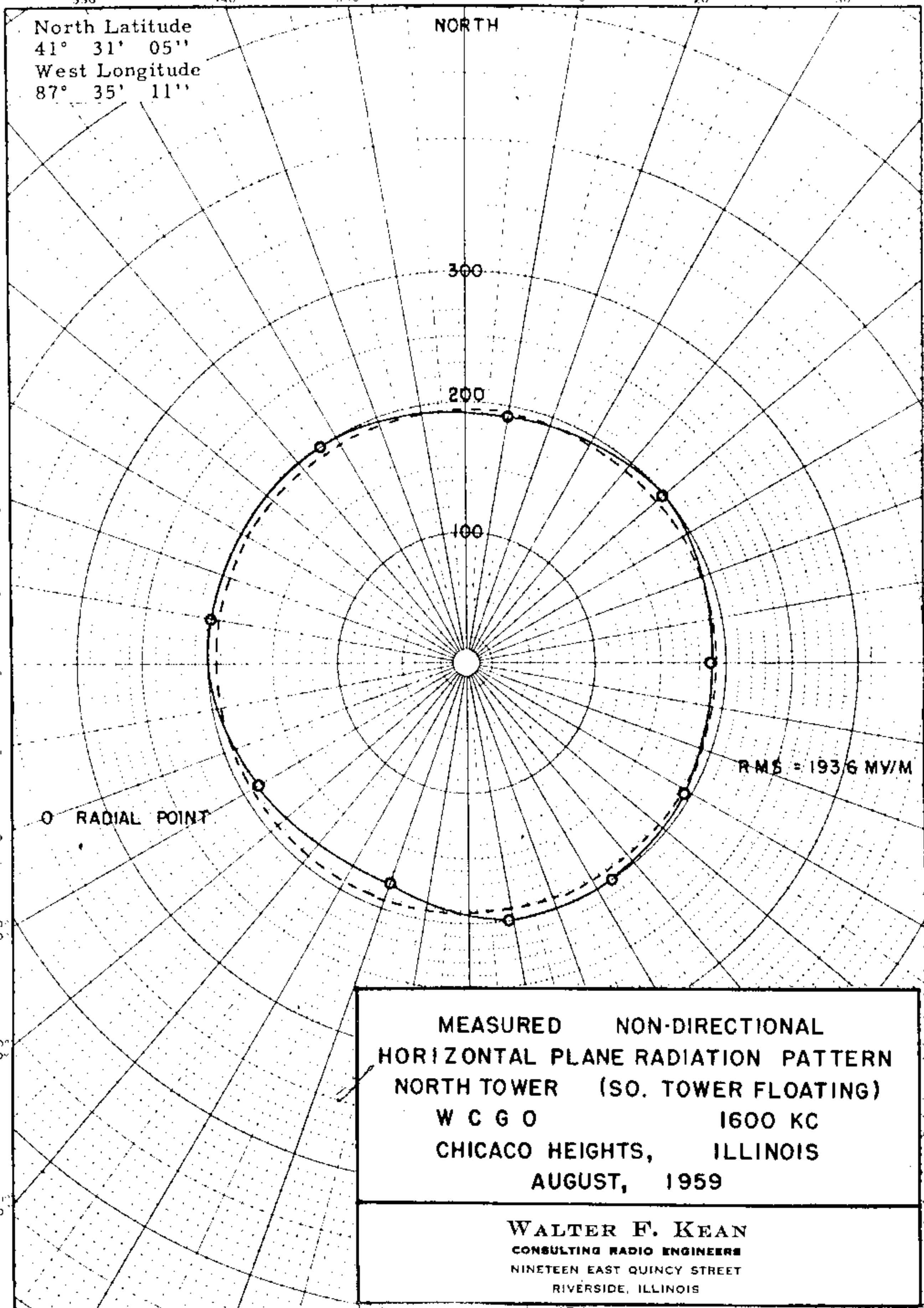
1600 KC

WCGO

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

Station WCGO
Chicago Heights, Illinois

1kw, DA-D,D
1600 KC



FCC File No. BL-7622
Accepted 10-7-59

WCGO
Chicago Heights, Illinois

1600 KC

RIPON, WISC
WCWC

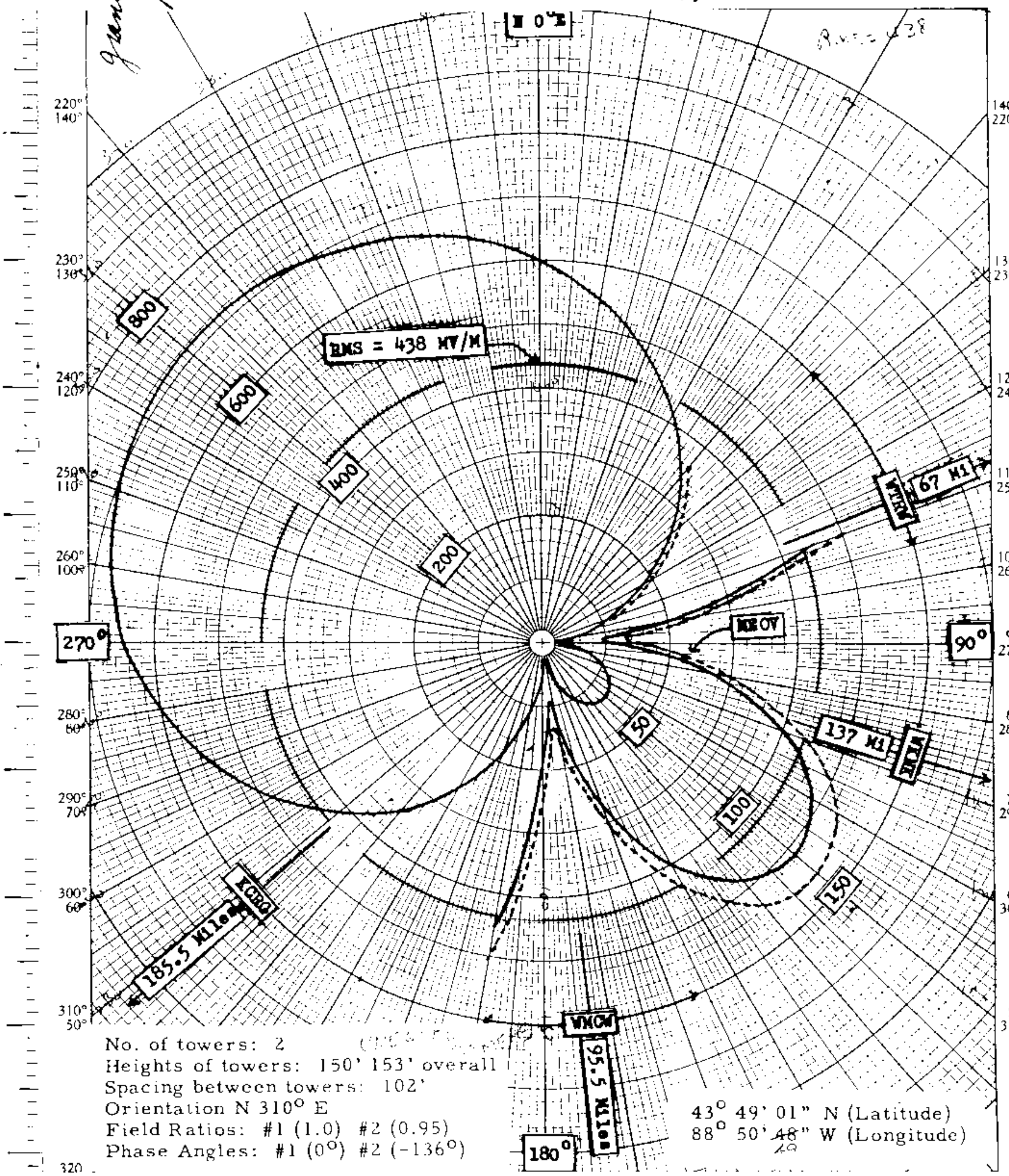
PROPOSED
DAY (8-2-56)

granted 2-? 12/5/56

CENTRAL WISCONSIN CO., INC.
RIPON, WISCONSIN

5 KW
DA-2, U

1600 KC



No. of towers: 2
Heights of towers: 150' 153' overall
Spacing between towers: 102'
Orientation N 310° E
Field Ratios: #1 (1.0) #2 (0.95)
Phase Angles: #1 (0°) #2 (-136°)

43° 49' 01" N (Latitude)
88° 50' ~~48~~ 49" W (Longitude)

560615

1600 KC

PROPOSED HORIZONTAL RADIATION PATTERN
CENTRAL WISCONSIN CO., INC
RIPON, WISCONSIN

FIGURE 7

5000 W - DA-D

CHARLES E. BRENNAN & ASSOCIATES
RADIO ENGINEERS

FCC File No. BP-10,687 Accepted 7-27-56 Central Wisconsin Co., Inc. Ripon, Wisc. 1600 KC

WCWC

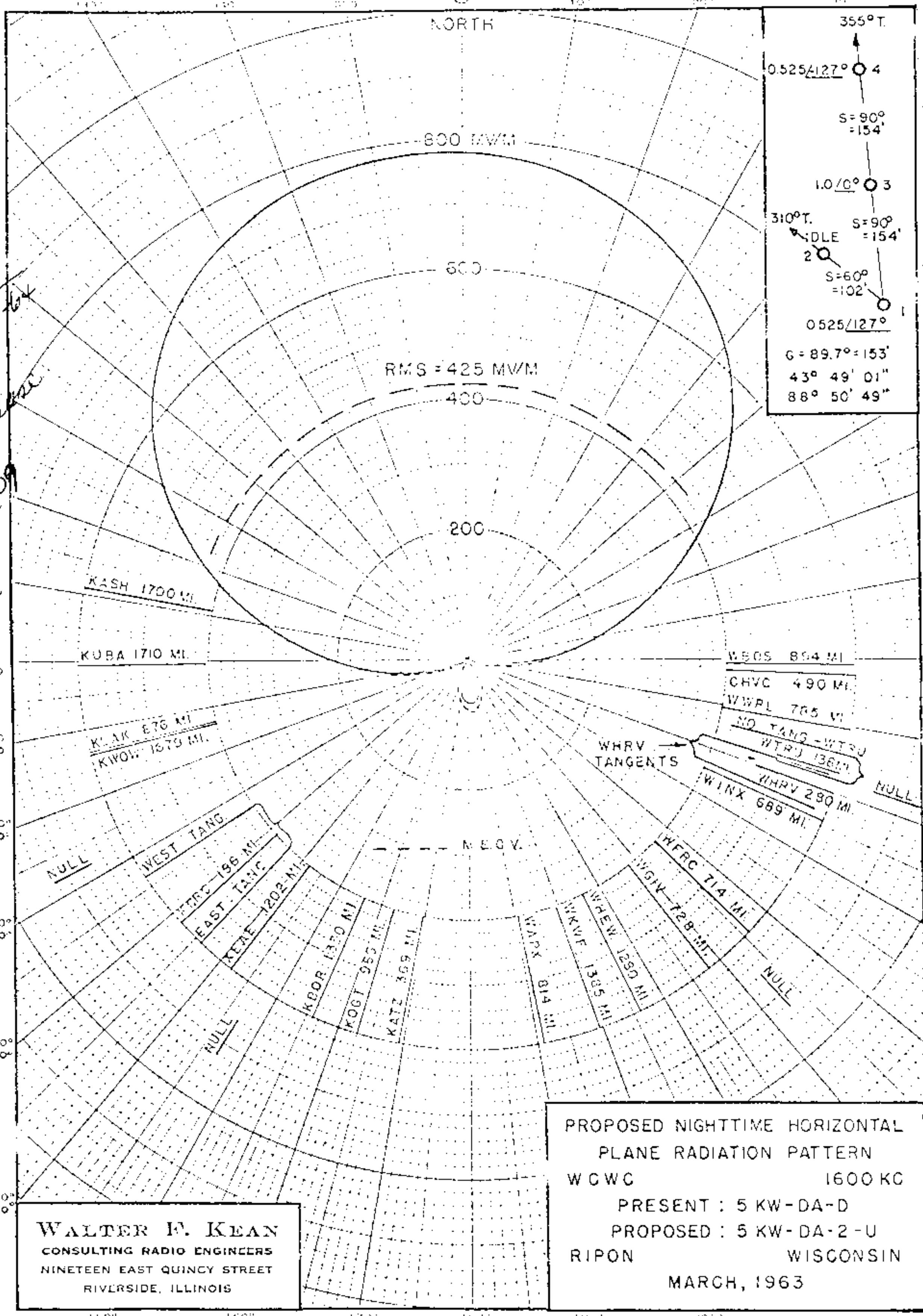
Proposed Night
(7-24-63ct)

Station WCWC
Ripon, Wisconsin

5kw,DA-2,U
1600 kc

3-11-64 mod CP change com 5kw ND DTE to DA-2, U

201-9-24-64 MP-1336 MCP to increase #2 to 206/209



NO. 340-P DIETZGEN GRAPH PAPER POLAR COORDINATE

FCC File No.BP-15953
Accepted 7-15-63

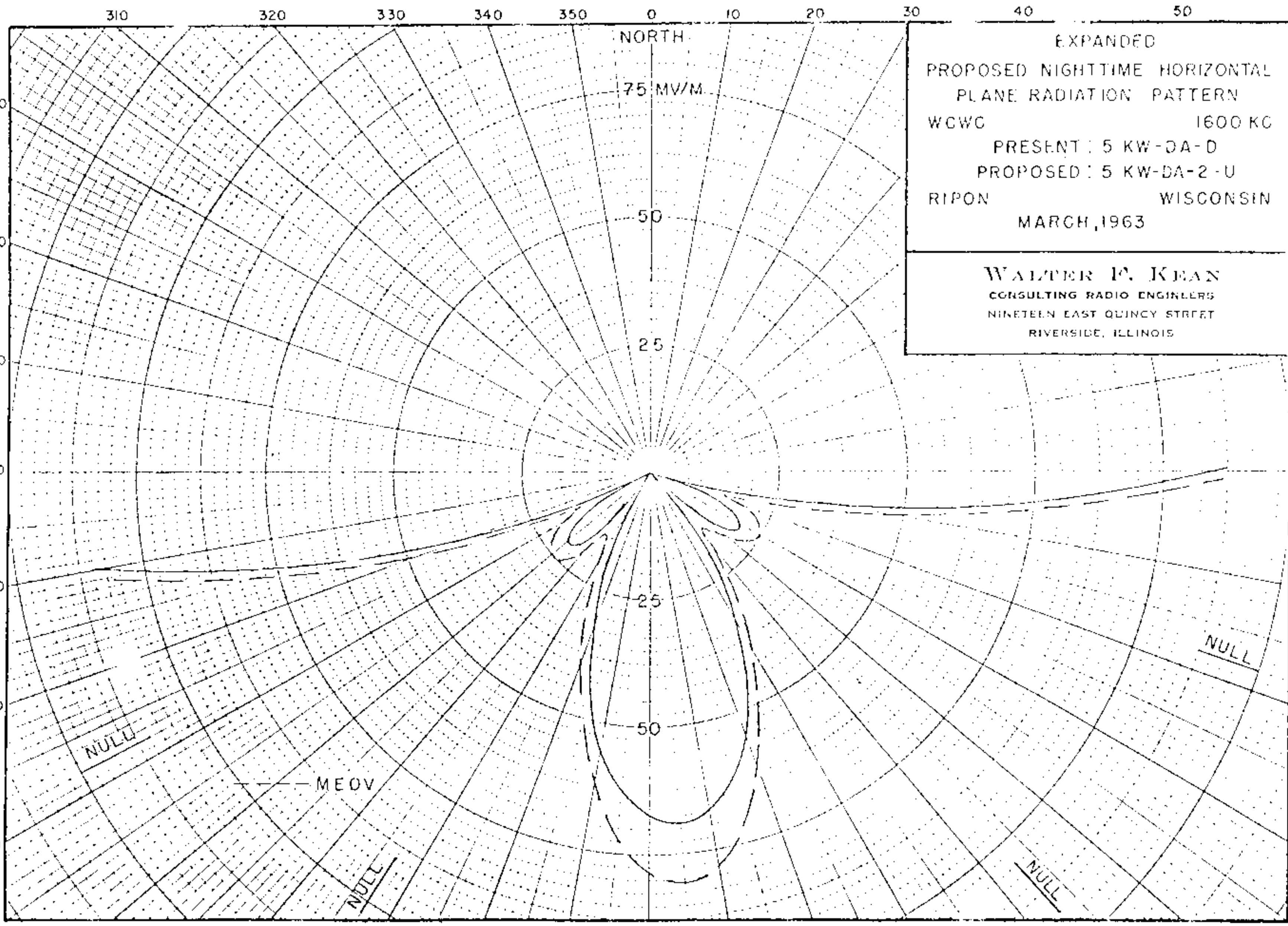
Station WCWC
Ripon, Wisconsin

1600 kc

Proposed Night Nulls
(7-24-63ct)

Station WCWC
Ripon, Wisconsin

5kw,DA-2,U
1600 kc



FCC File No.BP-15953
Accepted 7-15-63

Station WCWC
Ripon, Wisconsin

1600 kc

Figure 1A

WCWC

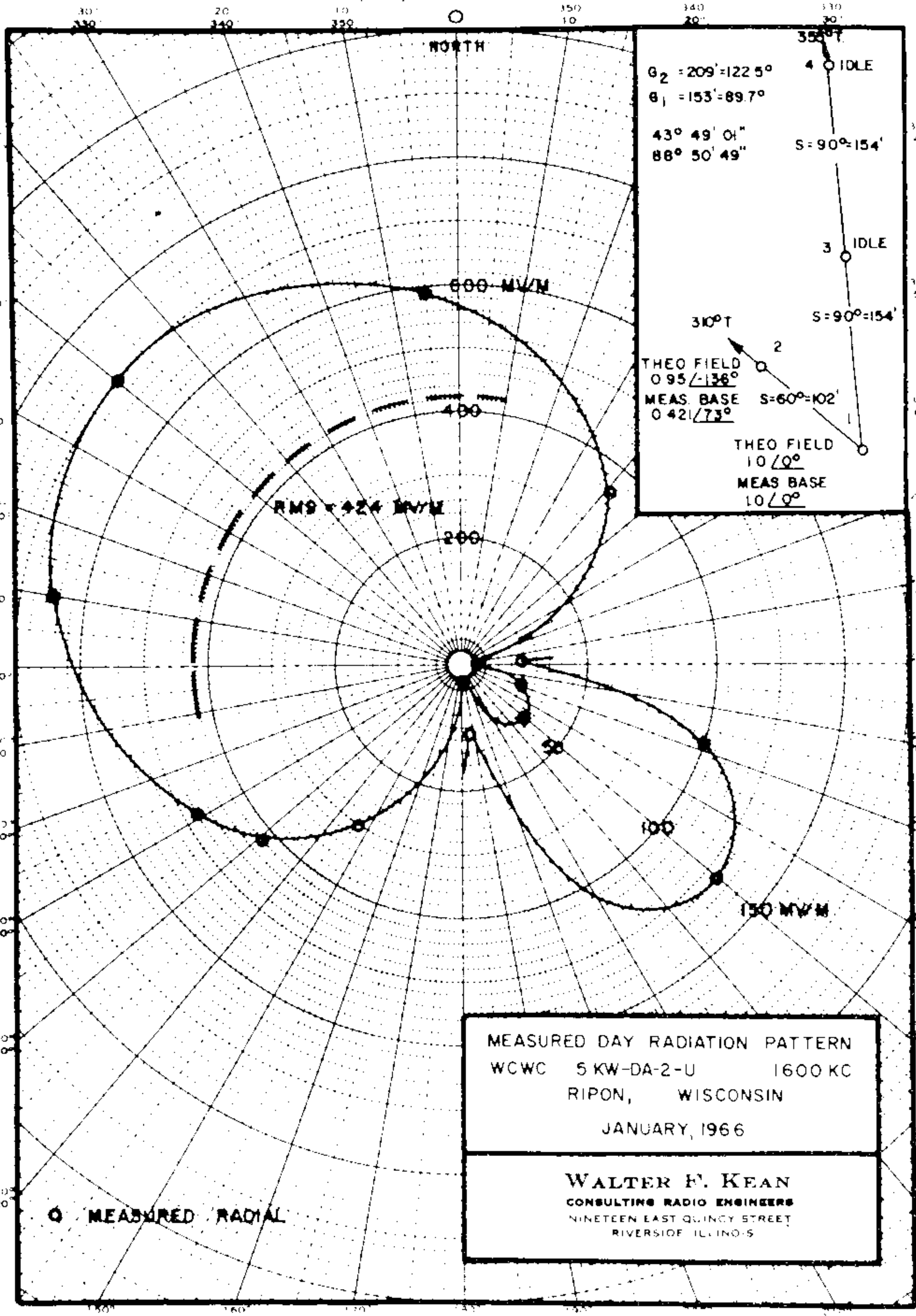
WCWC

Measured Day (6-28-66ct)

Station WCWC
Ripon, Wisconsin

5kw, DA-2, U
1600 kc

3L10897
DA-Z
LIC 8-11-66



FCC File No. BZ-5993
Accepted 6-10-66

Station WCWC
Ripon, Wisconsin

1600 kc

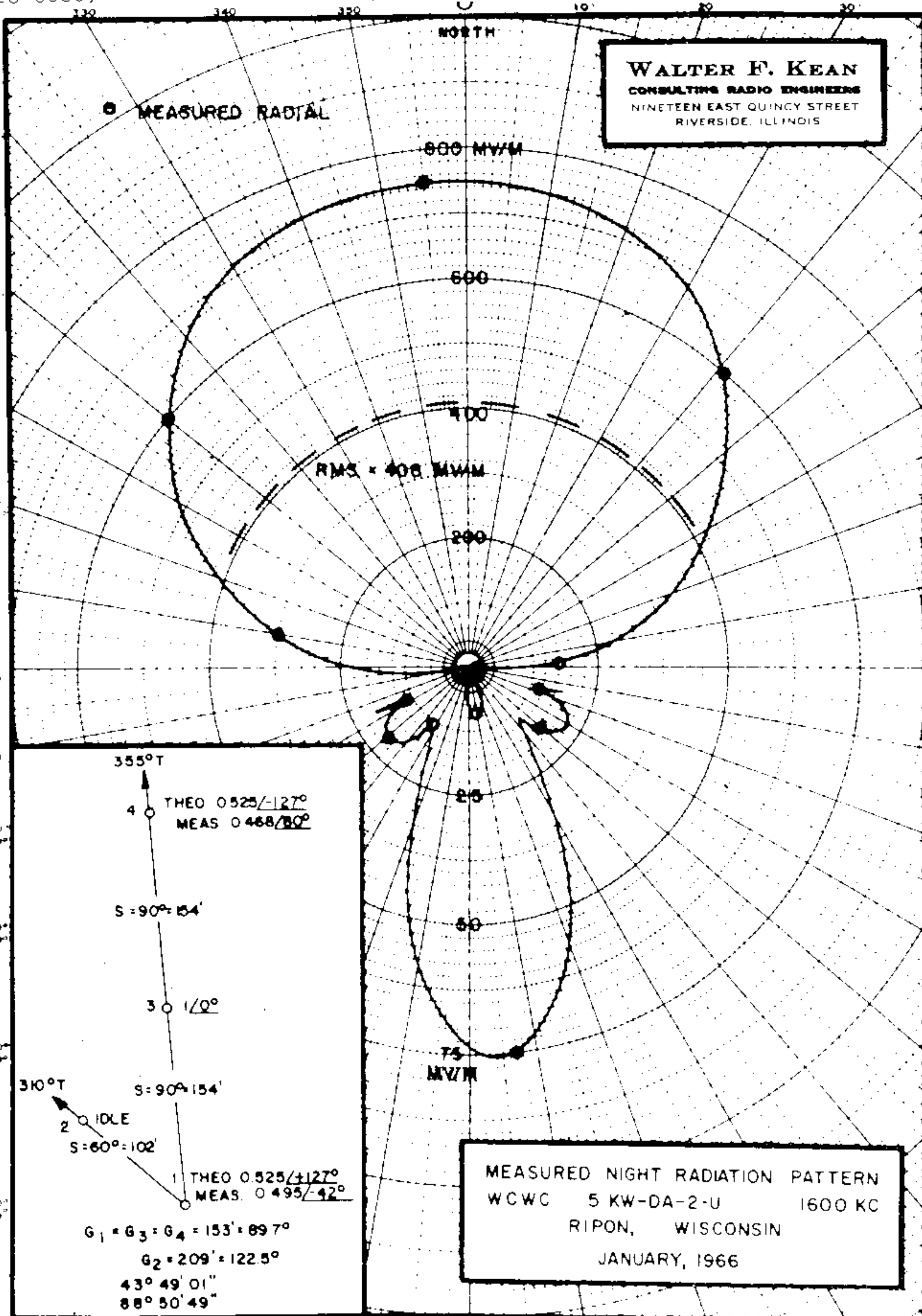
WCWC

Measured Night
(6-28-66ct)

Station WCWC
Ripon, Wisconsin

5kw,DA-2,U
1600 kc

BL 10897
DA-2
LIC 8-11-66



FCC File No.BZ-5993
Accepted 6-10-66

Station WCWC
Ripon, Wisconsin

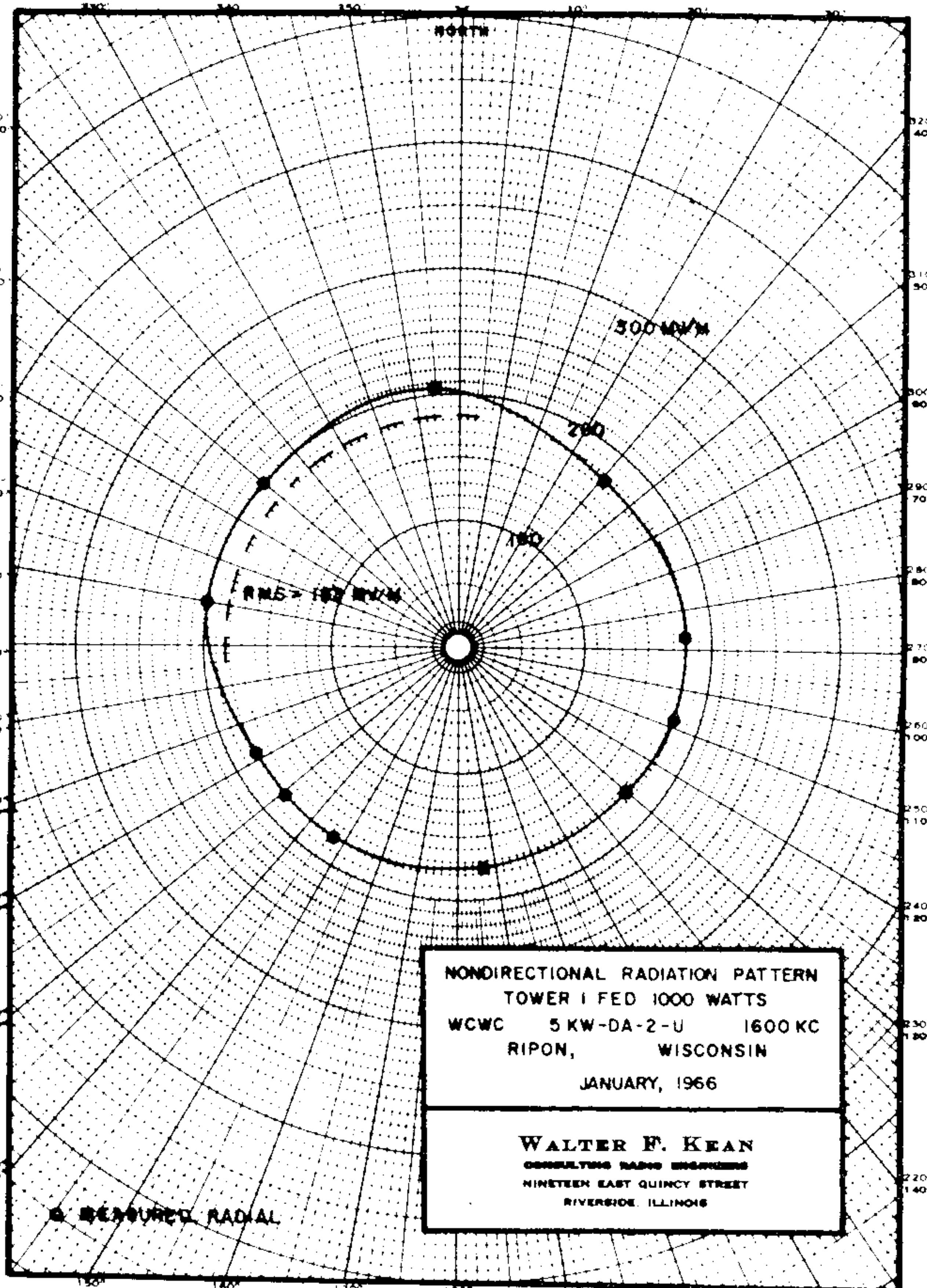
1600 kc

WCWC

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

Station WCWC
Ripon, Wisconsin

5kw,DA-2,U
1600 kc



FCC File No.BZ-6993
Accepted 6-10-66

Station WCWC
Ripon,Wisconsin

1600 kc

WEUP

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WEUP

Main Studio: Huntsville, Alabama

Frequency: 1600 kHz

Power: 0.5 kW Night 5 kW Day

Notification List No. 1657

Date: November 5, 1975 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 34° 45' 26"
West Longitude: 86° 38' 32"

ANTENNA CHARACTERISTICS

Authorized for Nighttime operation. (DA-N)
Number of elements: 7
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers. Tower #7 is top loaded by upper sections of guy wires to an effective electrical height of 220 degrees (*)

TOWER:	NW(#4)	WC(#5)	SW(#6)	NE(#1)	EC(#2)	SE(#3)	N(#7)
HEIGHT ABOVE INSULATORS:	Towers #1 through #6 are 180' (105.4°)						255' (*)
PHASING:	+180.000°	+45.563	-63.70	0°	+225.563°	-243.700°	-
FIELD RATIO:	1.1110	1.1393	0.6001	1	1.0257	0.5398	-
DAY PHASING:	-	-	-	-	-	-	0°
DAY FIELD RATIO:	-	-	-	-	-	-	1

SPACING AND ORIENTATION: Nighttime, towers are located in two rows with three towers per row. Adjacent towers in a row are spaced 196' (115°) on a line bearing 352.5° true. End towers in both rows forming the short side of a parallelogram are spaced 222' (130°) on a line bearing 82.5° true.

GROUND SYSTEM: 120-105' to 154' equally spaced copper radials about tower #1 through #6 plus 120-200' radials about tower #7. Radials are shortened and bonded to transverse straps along intersections between towers.

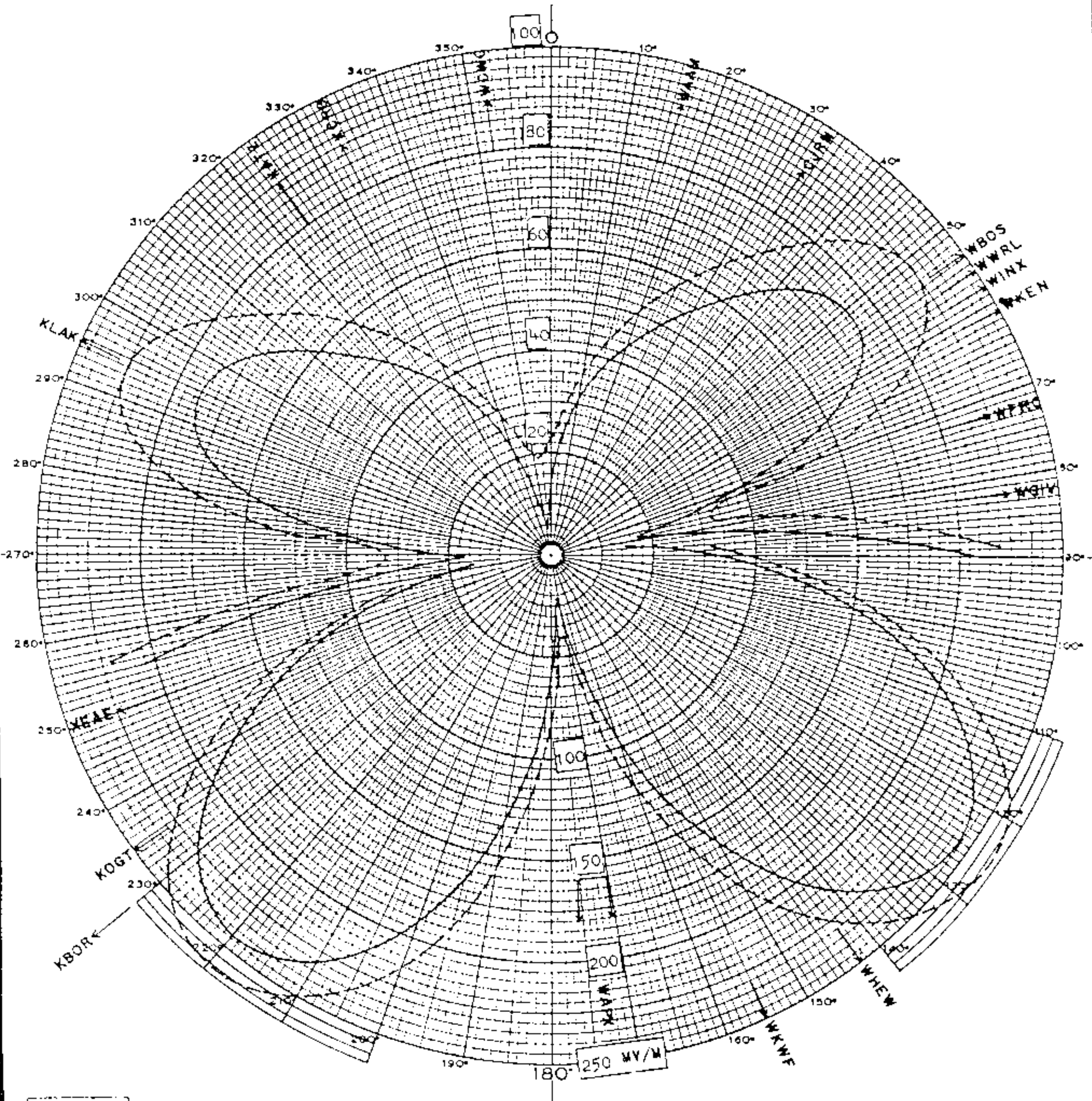
Predicted effective Night Field: 128 mv/m at rated power by adjustment of input pow-

Predicted effective Day Field: (omnidirectional Tower #7) 593 mv/m at rated power.

Note: This notification concerns a change to add new nighttime operation with no change in the daytime operation as previously notified.

CTR NO 30480A3

WEUP



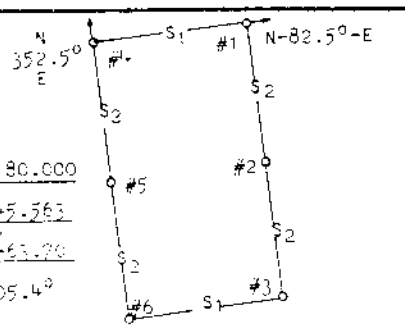
WEOV

E_{RMS} = 128 MV/M

LATITUDE 34°-45'-26"

LONGITUDE 86°-38'-32"

ANTENNA PARAMETERS



#1 = 1.0000/0.000 #4 = 1.1110/180.000

#2 - 1.0257/225.563 #5 = 1.1393/45.563

#3 - 0.5398/-243.000 #6 = 0.6001/-63.70

S_1 - 130°; S_2 - 115°; ALL Gt's - 105.4°

FIGURE 2A

PROPOSED NIGHTTIME
HORIZONTAL RADIATION PATTERN

RADIO STATION WEUP
HUNTSVILLE, ALABAMA

1600 KHz

0.5/5KW DA-2 U

WEUP

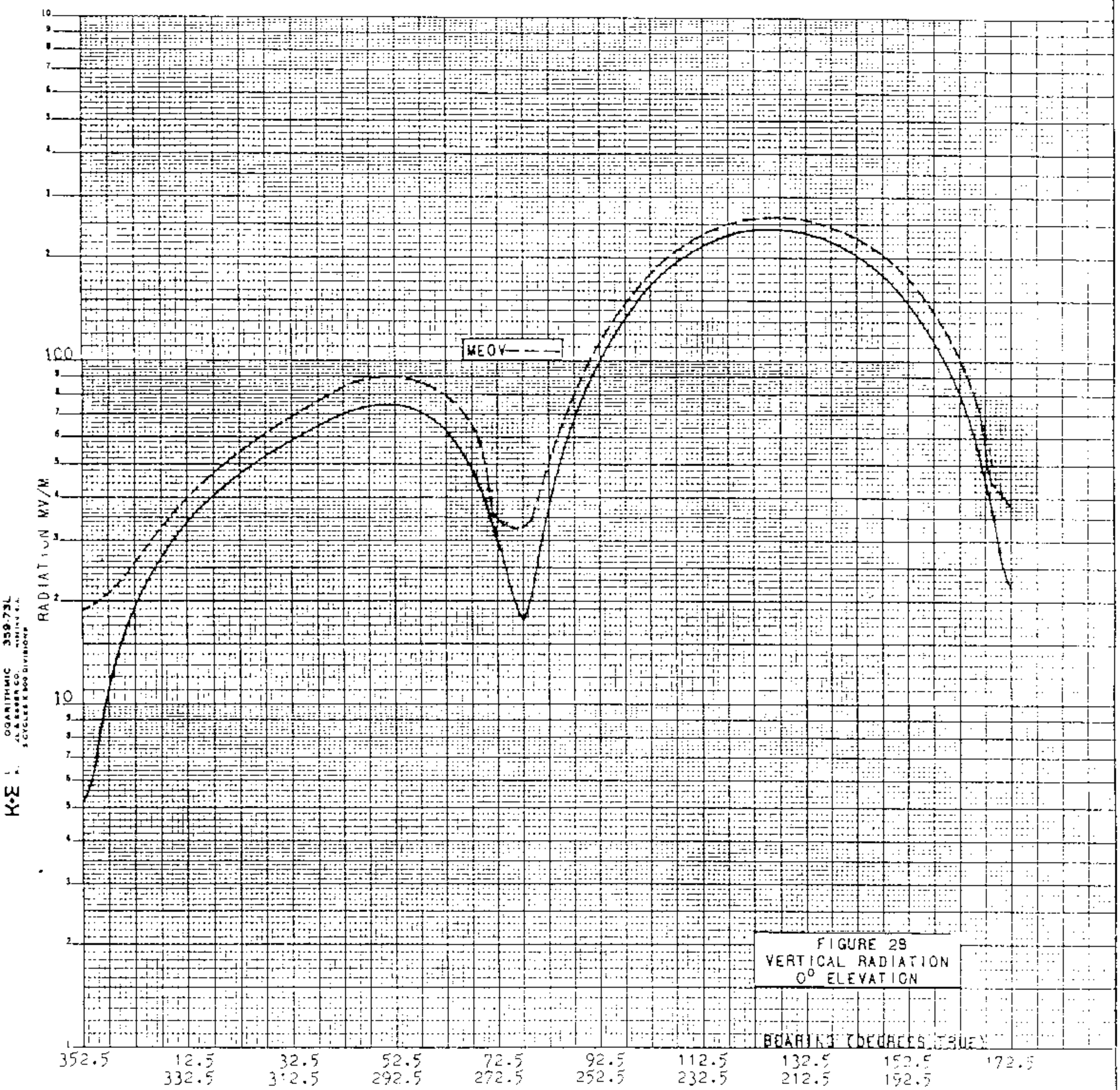


FIGURE 29
VERTICAL RADIATION
0° ELEVATION

WLUZ
1600kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WLUZ

Main Studio: Bayamon, Puerto Rico

Frequency: 1600 kHz

Power: 5kw Night 5kw Day

Notification List No. 1783

Date: November 2, 1979 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 18° 21' 38"
West Longitude: 66° 09' 30"

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:	W(#1)	E(#2)
HEIGHT ABOVE INSULATORS:	150.3'	150.3' (88.0°)
NIGHT PHASING:	0°	-145°
NIGHT FIELD RATIO:	1.0	0.89
DAY PHASING:	0°	-125°
DAY FIELD RATIO:	1.0	0.80

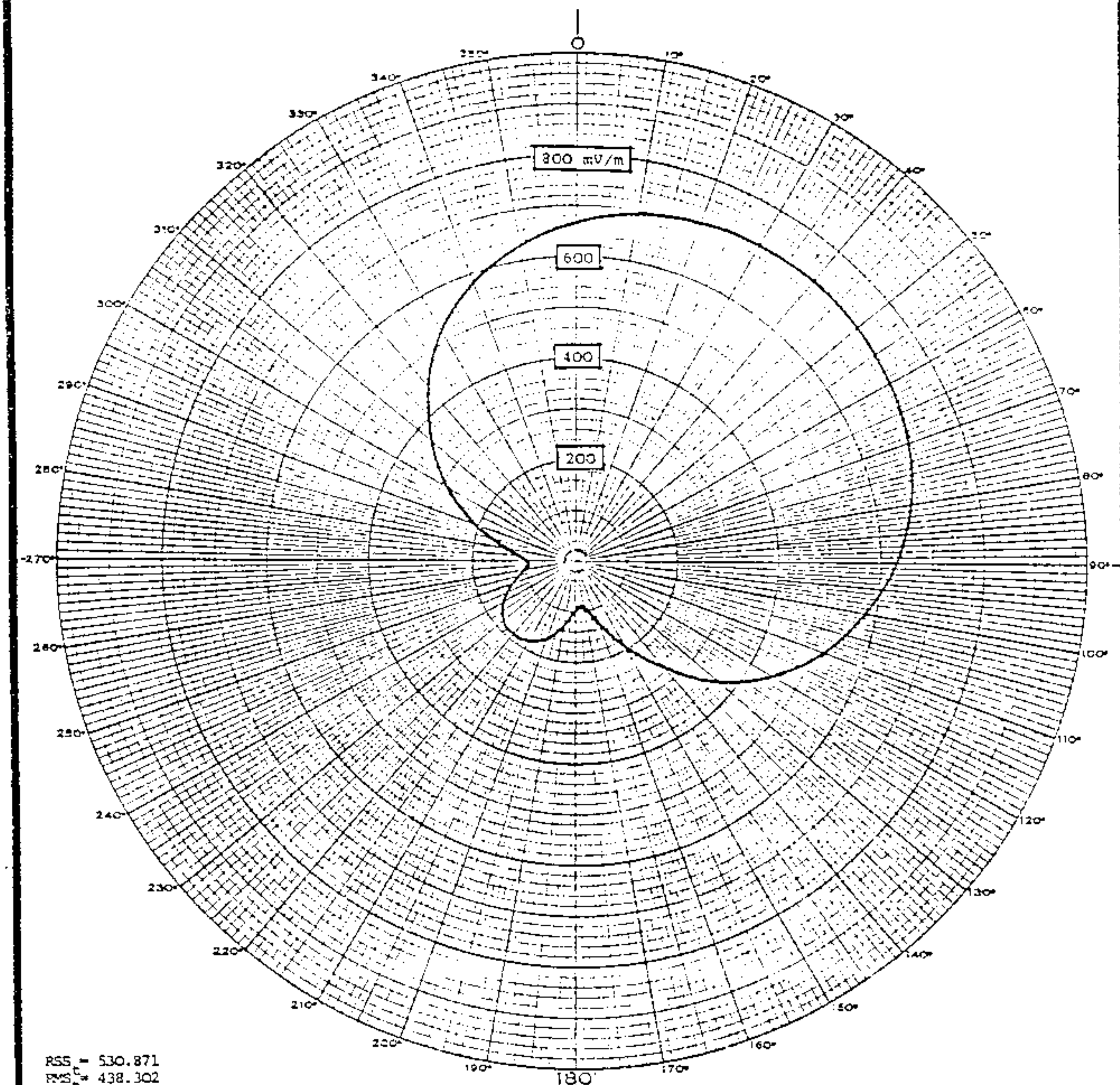
SPACING AND ORIENTATION: Adjacent towers in a row are spaced 136.6' (80°) on a line bearing 70° true.

GROUND SYSTEM: 120-70' to 155' equally spaced copper radials plus 120-50' interspaced radials about each tower.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	438.3 mv/m	530.87 mv/m	460.2 mv/m
Night	447.1 mv/m	640.6 mv/m	469.5 mv/m

WLUZ
1600KHz
DA - D



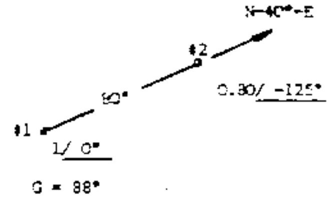
RSS$_t$ = 530.871
RMS$_t$ = 438.302
RMS STANDARD = 460.217

February, 1977

LATITUDE: 18° 21' 38"
LONGITUDE 66° 09' 32"

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

ANTENNA PARAMETERS



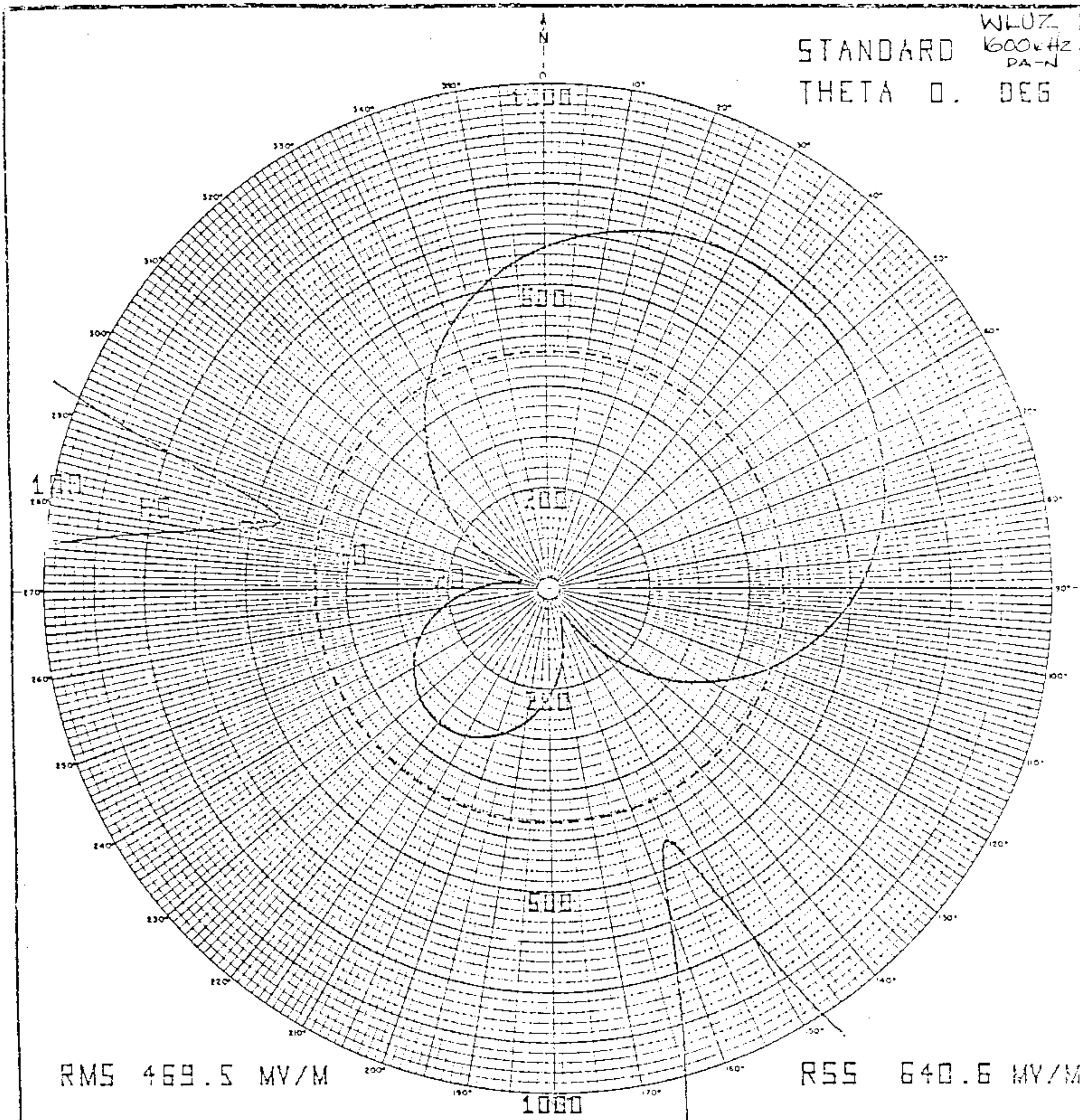
F I G U R E 4

PLOT OF DAYTIME
DIRECTIONAL PATTERN

RADIO STATION WLUZ
BAYAMON, PUERTO RICO

1600 KHz

5 KW-DA-2.0



LAT: 18° 21' 38"	TOWER #	HEIGHT DEGREES	FIELD RATIO	SPACING DEGREES	BEARING DEGREES	PHASING DEGREES
LONG: 66° 09' 32"	1	88.00	1.000	0.000	0.000	0.000
	2	88.00	0.890	80.000	40.000	-145.000

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

PLOT OF NIGHTTIME
DIRECTIONAL PATTERN

FEBRUARY, 1978

FIGURE 7
RADIO STATION WLUZ
BAYAMON, PUERTO RICO
1600 KHz 5 kw, DA-2, U

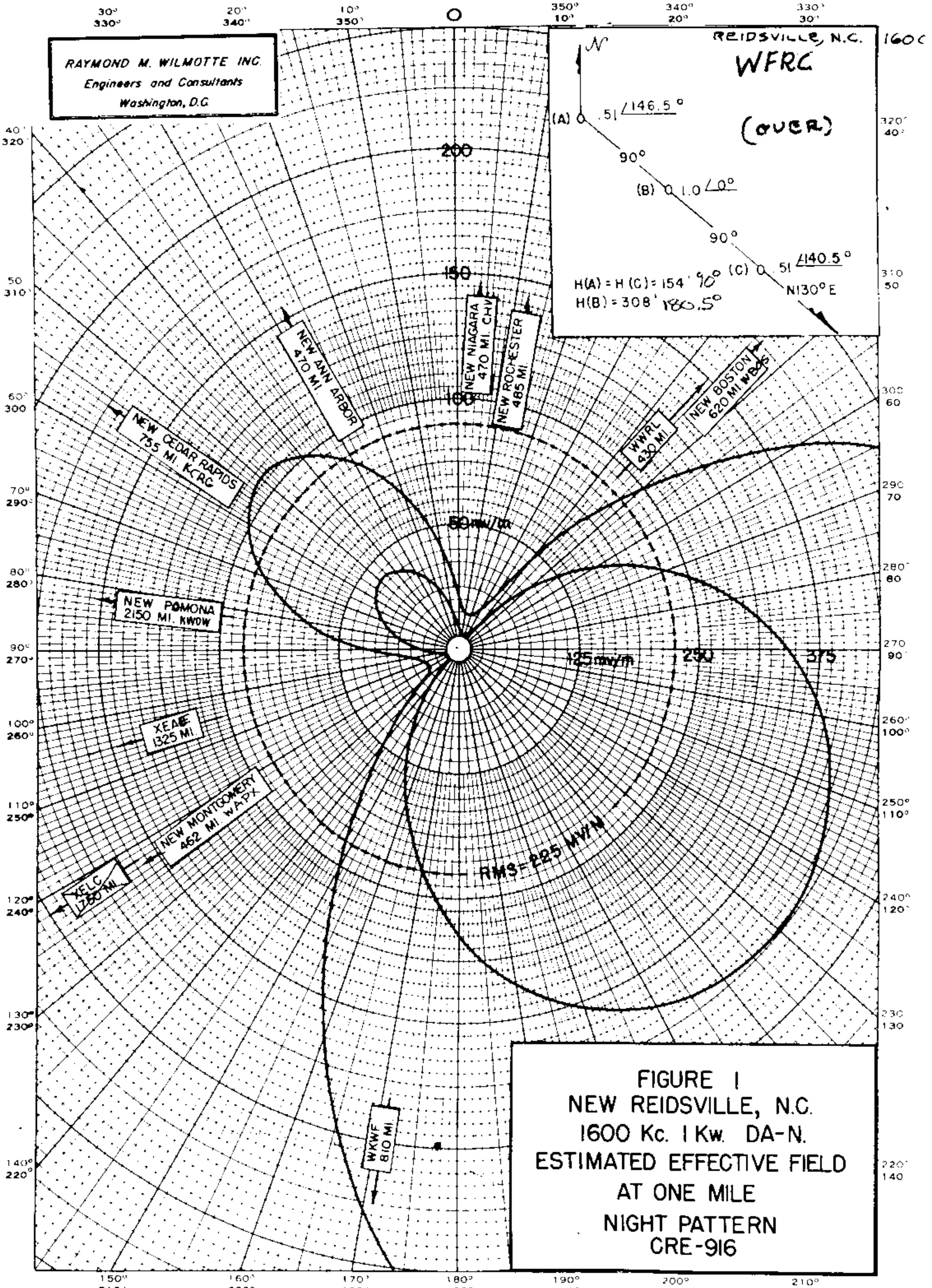
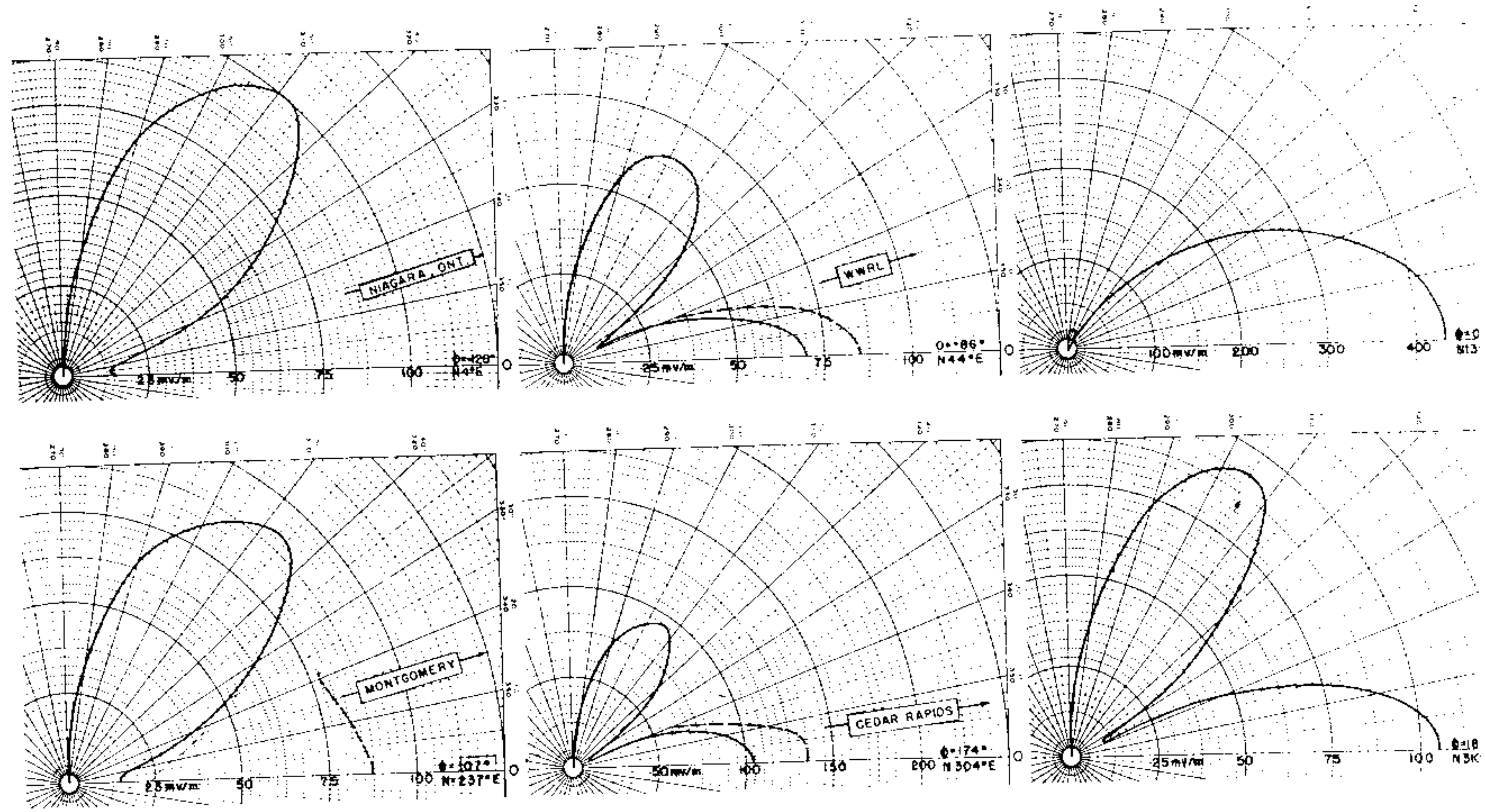


FIGURE 1
NEW REIDSVILLE, N.C.
1600 Kc. 1 Kw. DA-N.
ESTIMATED EFFECTIVE FIELD
AT ONE MILE
NIGHT PATTERN
CRE-916

EUGENE DIETZGEN CO.

NO. 340-P DIETZGEN GRAPH PAPER
POLAR CO-ORDINATE


NIAGARA, ONT.
25 mv/m
50
75
100
WWRL
0=86°
N44°E
25 mv/m
50
75
100
100 mv/m
200
300
400
MONTGOMERY
φ=107°
N=237°E
25 mv/m
50
75
100
CEDAR RAPIDS
φ=174°
N 304°E
50 mv/m
100
150
200
25 mv/m
50
75
100

REIDSVILLE
1600
WF[illegible]

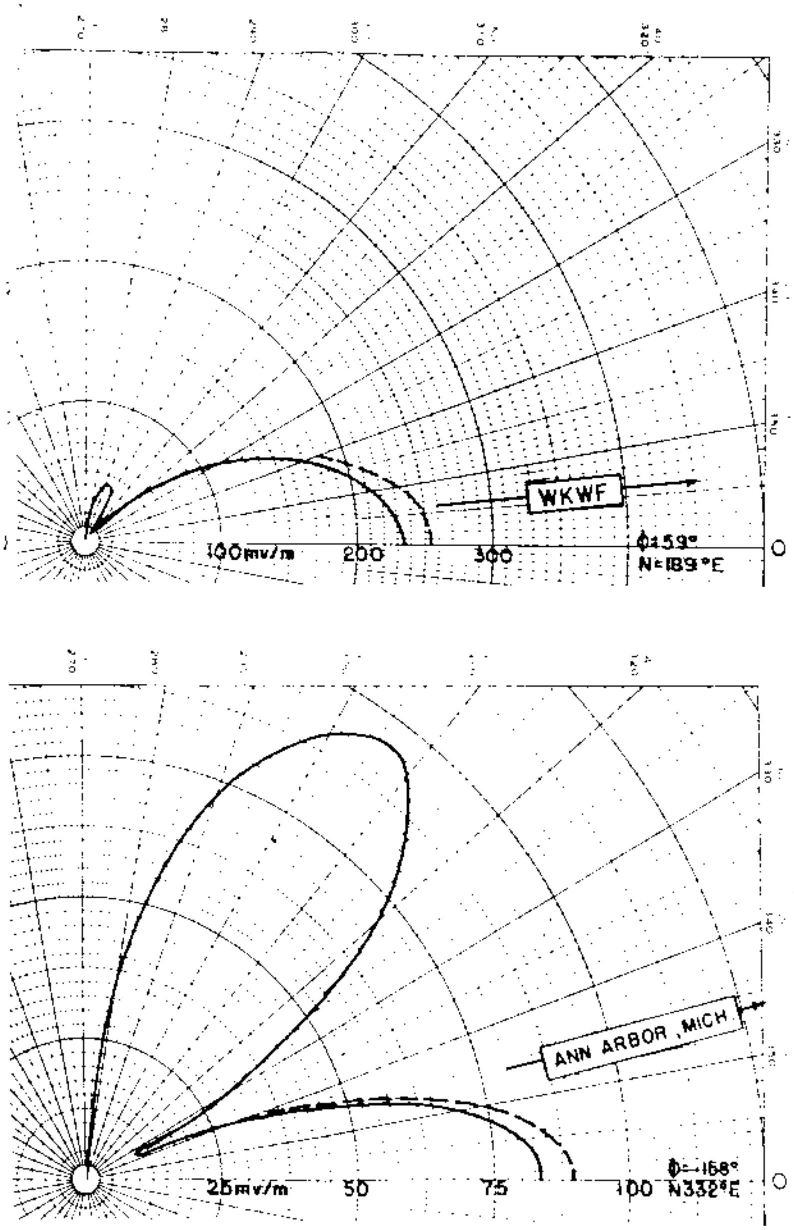


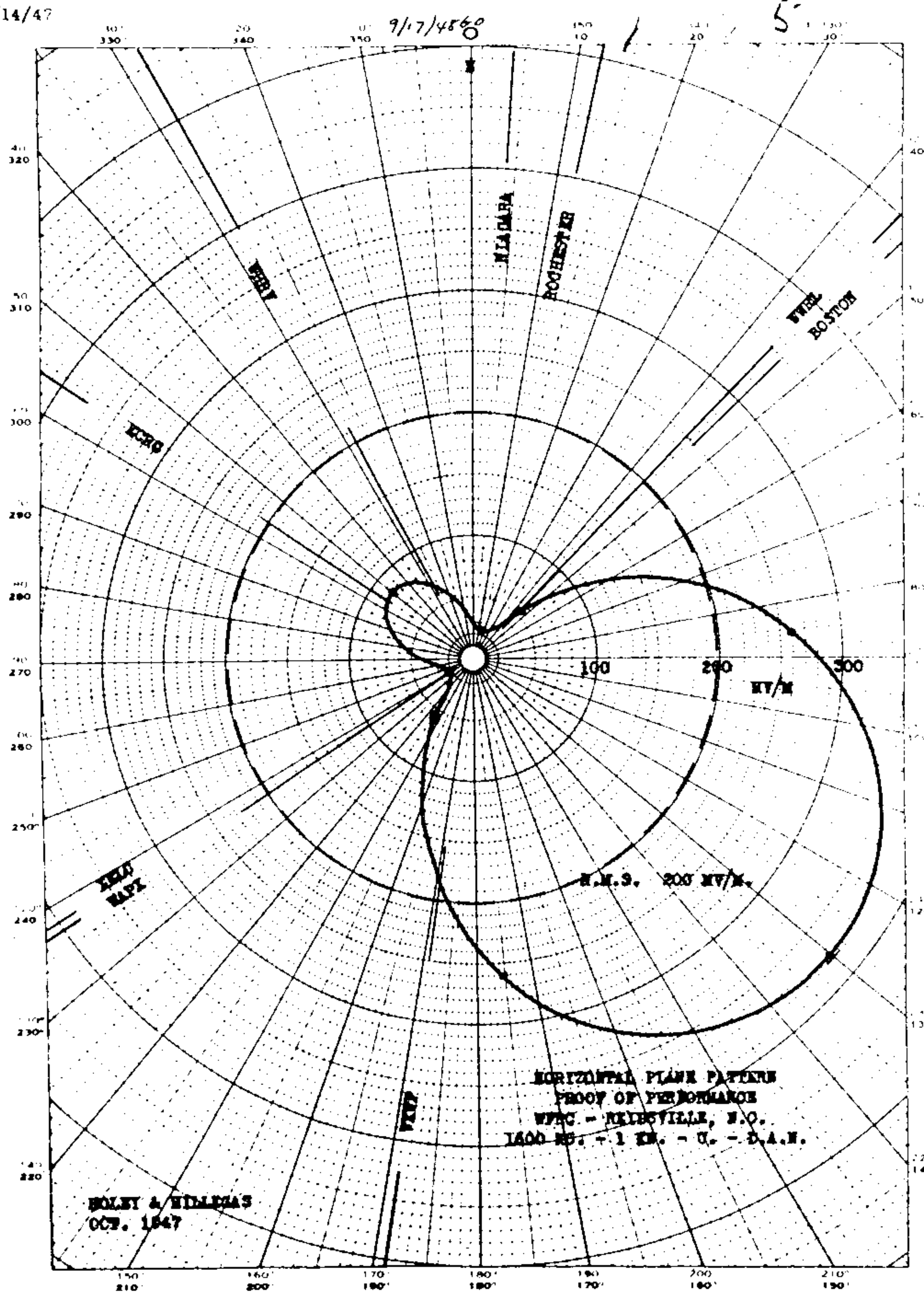
FIGURE 2
NEW, REIDSVILLE, N.C.
1600 Kc 1 Kw DA-N
ESTIMATED EFFECTIVE FIELD AT ONE MILE
IN SELECTED VERTICAL PLANES
NIGHT TIME OPERATION
CRE-918

RAYMOND M. WILMOTTE INC.
Engineers and Consultants
Washington, D.C.

WFRC
1600

Rec'd 10/14/47

9/17/48



WFRC

MEASURED NIGHT
(10-25-61ct)

Station WFRC
Reidsville, North Carolina

1kw,DA-N,N
1600 kc

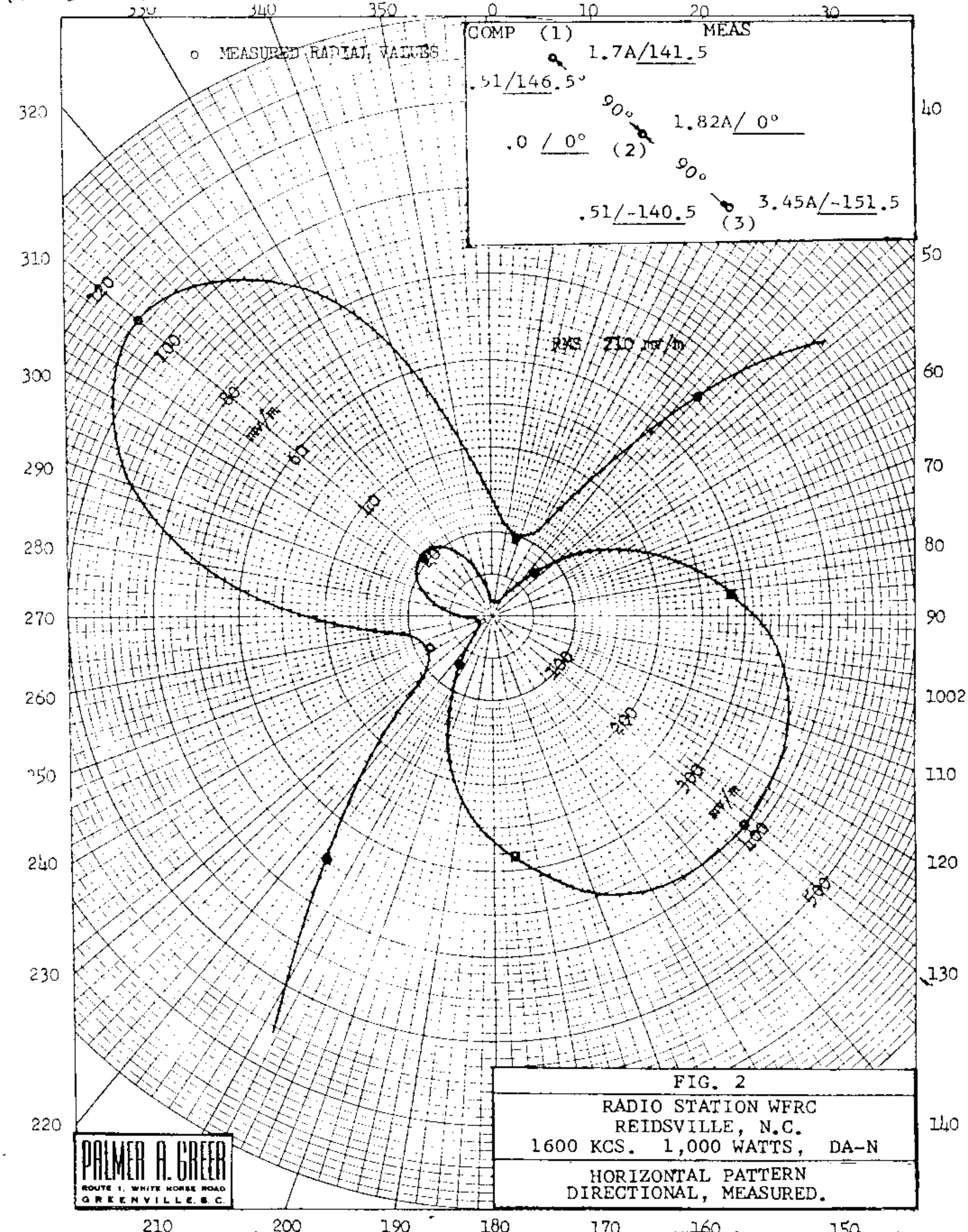


FIG. 2

RADIO STATION WFRC
REIDSVILLE, N.C.
1600 KCS. 1,000 WATTS, DA-N

HORIZONTAL PATTERN
DIRECTIONAL, MEASURED.

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

FCC File No. BZ-4517
Accepted 9-18-61

Station WFRC
Reidsville, North Carolina

1600 kc

WFE

MEASURED NON-DA
(10-25-61ct)

Station WFRC
Reidsville, North Carolina

1kw,DA-N,N
1600 kc

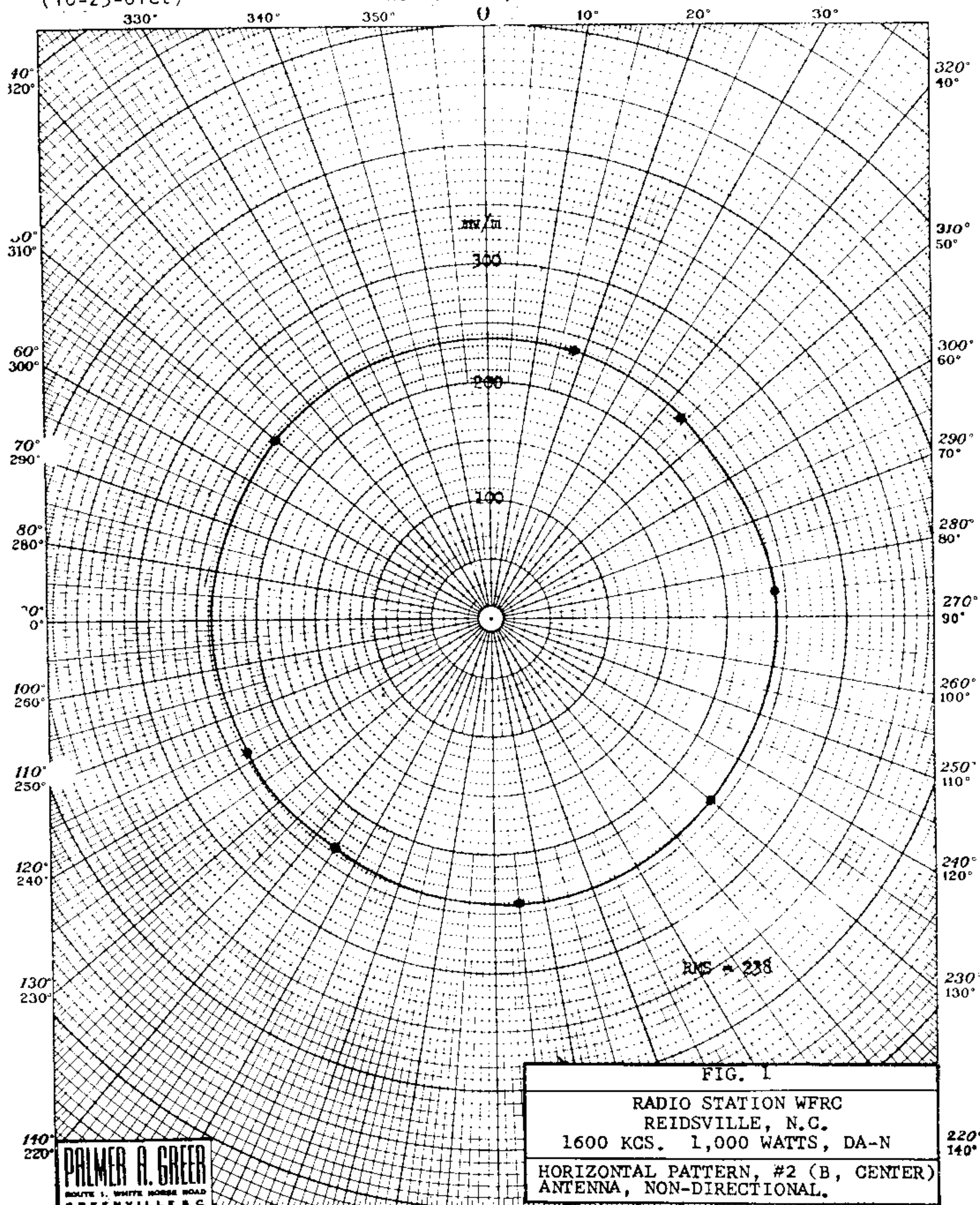


FIG. I

RADIO STATION WFRC
REIDSVILLE, N.C.
1600 KCS. 1,000 WATTS, DA-N

HORIZONTAL PATTERN, #2 (B, CENTER) ANTENNA, NON-DIRECTIONAL.

PALMER A. GREER
ROUTE 1, WHITE HORSE ROAD
GREENVILLE, S.C.

FCC File No. BZ-4517
Accepted 9-18-61

Station WFRC
Reidsville, North Carolina

1600 kc

WGIV
1600kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WGIV

Main Studio: Charlotte, North Carolina

Frequency: 1600 kHz

Power: 2.5kw Night 2.5kw Day

Notification list No. 1788

Date: August 22, 1980 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 35° 14' 57"
West Longitude: 80° 51' 41"

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:	#1 (NW)	#2 (WC)	#3 (EC)	#4 (SE)
HEIGHT ABOVE INSULATORS:	150'	150'	150'	150' (87.8)
NIGHT PHASING:	0°	-162.7°	+40.4°	-122.1°
NIGHT FIELD RATIO:	1.0	1.90	1.62	0.62
DAY PHASING:	0°	-161.4°	+34.9	-168.3°
DAY FIELD RATIO:	1.0	0.8417	0.4935	0.1761

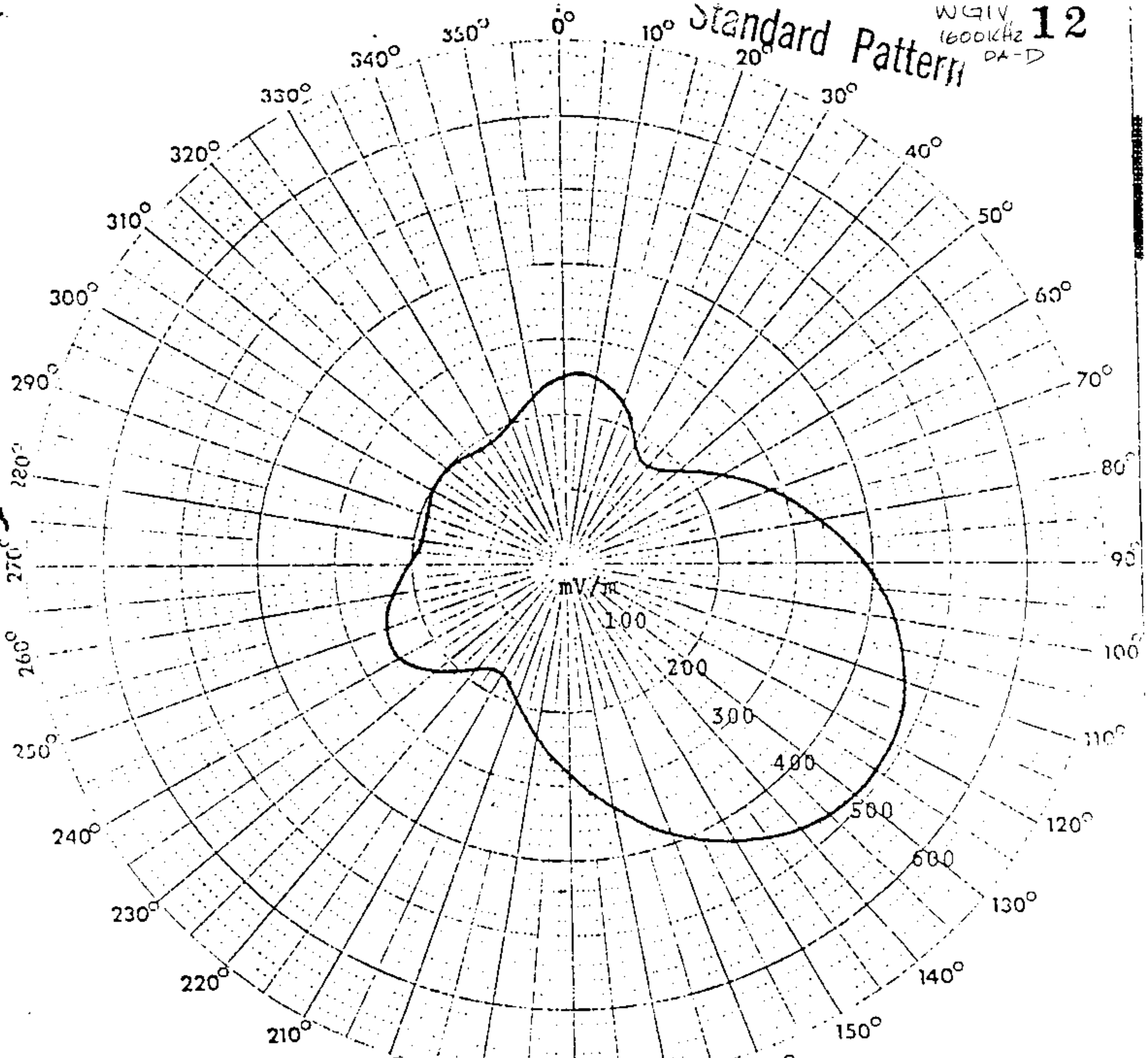
SPACING AND ORIENTATION: Towers in a row are spaced 90° on a line bearing 125° true.

GROUND SYSTEM: 120 - 154' equally spaced copper radials plus a 32' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	276.70 mv/m	533.31 mv/m	290.9 mv/m
Night	207.22 mv/m	520.05 mv/m	218.0 mv/m

WGIV 1600kHz DA-D **12**



Proposed RMS by adjustment

FEB 2 0 1980

STANDARD HORIZONTAL PLANE PATTERN

N. Lat. 35° 14' 57"
W. Lng. 80° 51' 41"
1600 kHz. 2.5 kW: D

	mV/m
Theo RMS	276.70
Theo RSS	533.31
FCC 'Q'	13.333
L	378.71
Std. RMS	290.9

#1 1/0°
#2 0.8417/-161.4
#3 0.4935/34.9
#4 0.1761/-168.3
125°

G=87.8°
S=90° 153.7'

EXHIBIT E-1 FIGURE 5

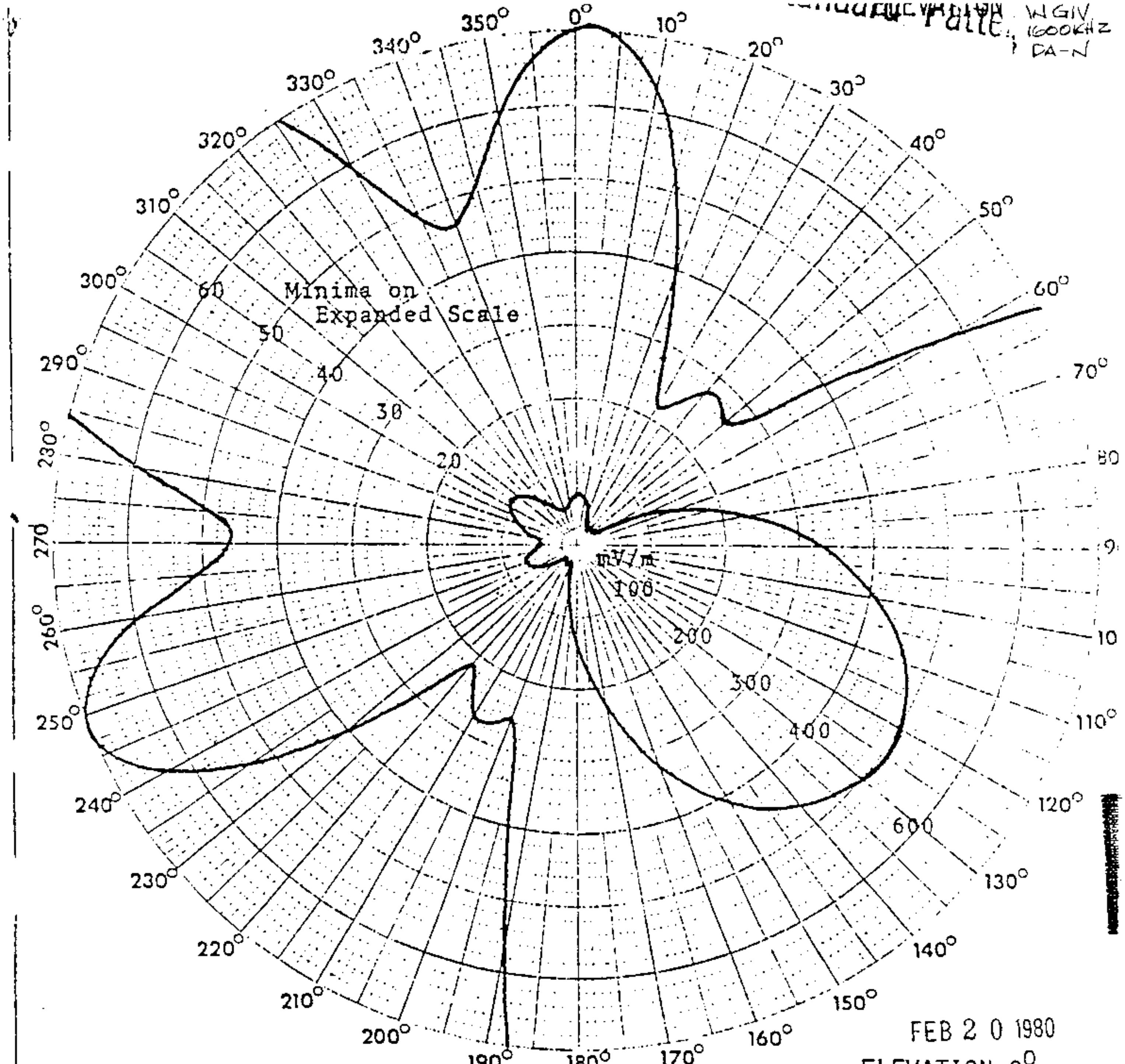
NEW GIV, INC.

WGIV - CHARLOTTE, N. C.

PROPOSED DAYTIME PATTERN

B. SCOTT BAXTER
AND ASSOCIATES
P. O. BOX 413
BRENTWOOD, TENN. 37027

WGIV 1600KHZ DA-N



FEB 2 0 1980

ELEVATION 0°

STANDARD HORIZONTAL PLANE PATTERN		
N. Lat. 35° 14' 57" W. Lng. 80° 51' 41" 1600 kHz. 1 kW: N		#1 1/0°
	mV/m	#2 1.90/-162.7°
Theo. RMS	207.22	#3 1.62/40.4°
Theo. RSS	520.05	#4 0.62/-122.1°
FCC 'Q'	13.001	125°
L	188.41	G=87.8°
Std. RMS	218.0	S=90° 153.7'

EXHIBIT E-1 FIGURE 6

NEW GIV, INC.

WGIV - CHARLOTTE, N. C.

PROPOSED NIGHTTIME PATTERN

B. SCOTT BAXTER
AND ASSOCIATES
P. O. BOX 415
BRENTWOOD, TENN. 37027

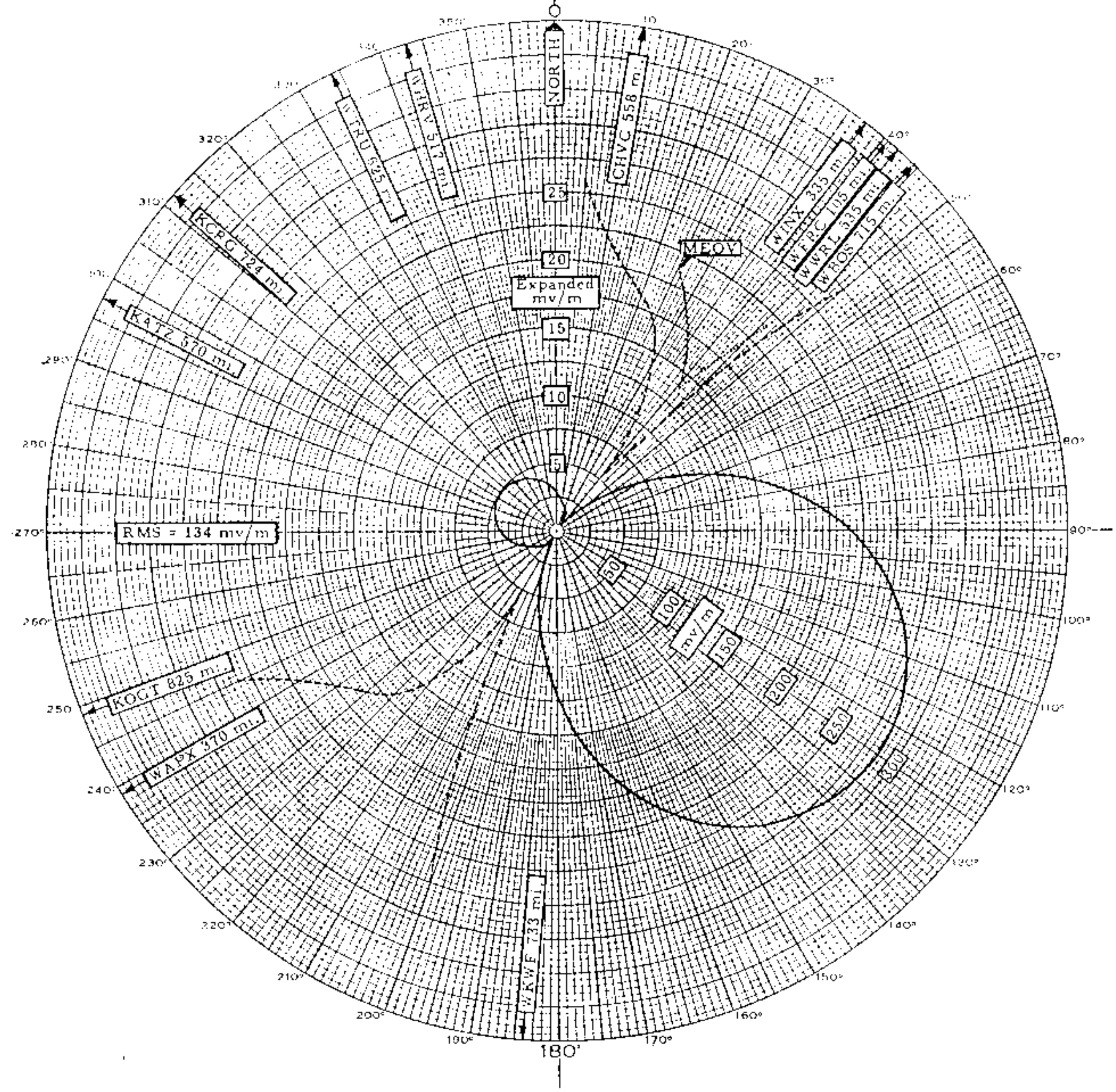
WGIV

granted CP/fr DH-N 2-3-60

PROPOSED NIGHT
(3-23-59g)

Station WGIV
Charlotte, North Carolina

500w, 1kw-LS, DA-N,U
1600 KC



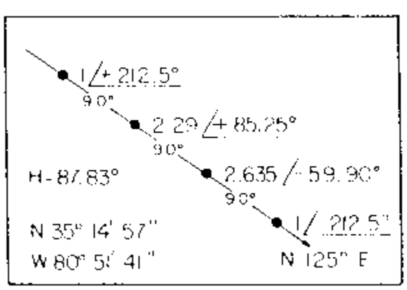


FIGURE 5
PROPOSED NIGHTTIME
HORIZONTAL RADIATION PATTERN
WGIV CHARLOTTE, NORTH CAROLINA
1600 KC 1 KW-LS 500 WATT DA-N U
FEBRUARY 1959

PAGE, CREUTZ, STEEL & WALDSCHMITT
Consulting Engineers
K STREET NORTHWEST
WASHINGTON 6, D. C.

FCC File No. BP-11898
Accepted 3-5-59 (Amended)

Station WGIV
Charlotte, North Carolina

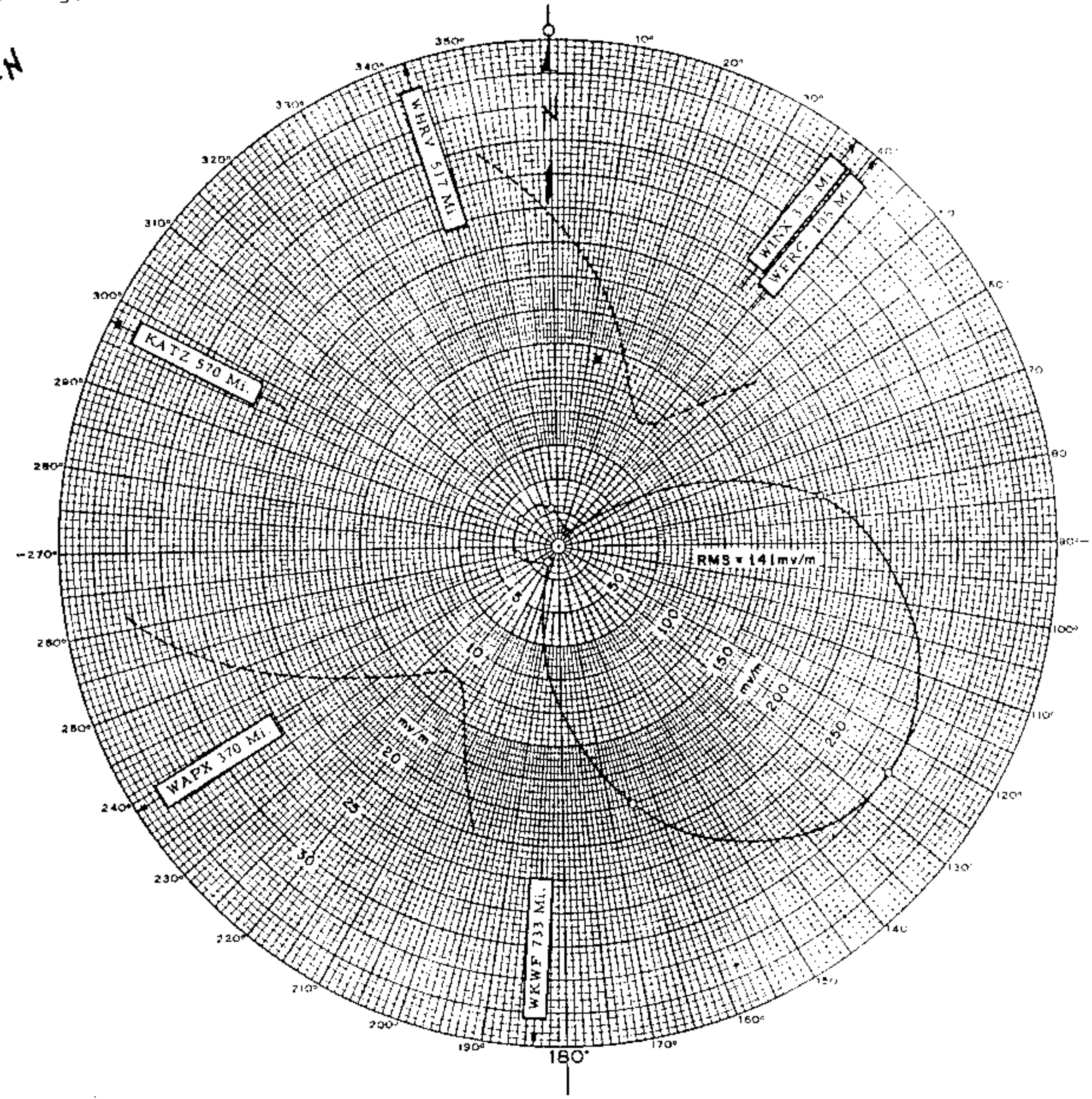
1600 KC

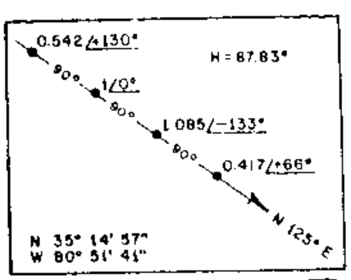
WGIV

MEASURED NIGHT
(12-15-60g)

Station WGIV 500w, 1kw-LS, DA-N U
Charlotte, North Carolina 1600 KC

10-26-62
granted L for usage in lieu of op; Xmtr site; and DA-N





PAGE, CREUTZ, STEEL & WALDSCHMITT
Consulting Engineers
1472 K STREET, NORTHWEST
WASHINGTON 5, D. C.

FIGURE 5

POLAR PLOT OF THE MEASURED
NIGHT HORIZONTAL RADIATION PATTERN
WGIV, CHARLOTTE, NORTH CAROLINA
1600 KC 1 KW ND-D 0.5 KW DA-N
SEPTEMBER 1960

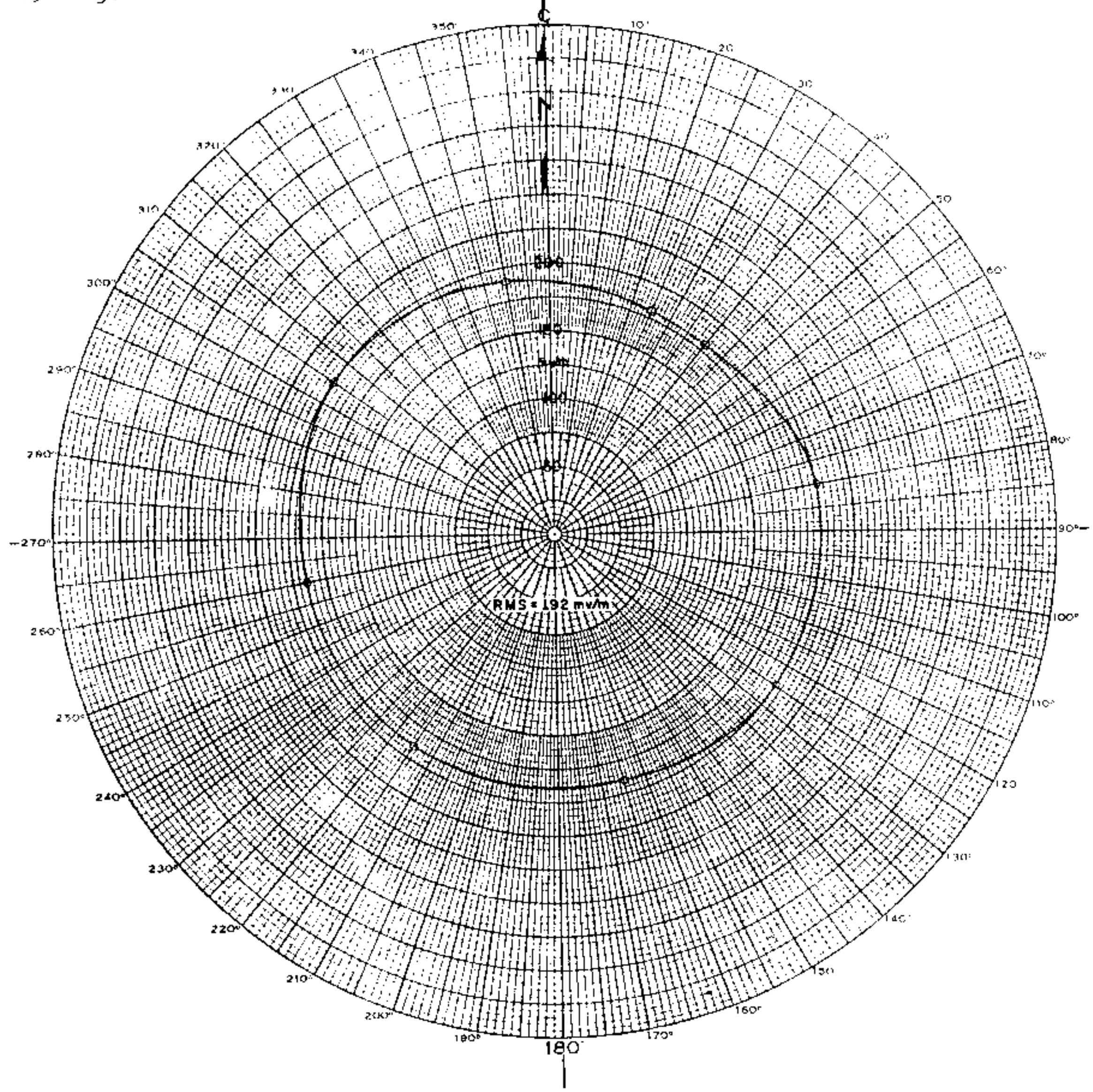
FCC File No. BL-8153
Accepted 11-17-60

WGIV
Charlotte, North Carolina 1600 KC

WGIV

MEASURED NON-DA
(12-15-60g)

Station WGIV 500w, 1kw-LS, DA-N,U
Charlotte, North Carolina 1600 KC



PAGE, CREUTZ, STEEL & WALDSCHMITT
Consulting Engineers
WASHINGTON, D. C.

FIGURE 4

POLAR PLOT OF THE MEASURED

DAYTIME HORIZONTAL RADIATION PATTERN

WGIV, CHARLOTTE, NORTH CAROLINA

1600 KC 1 KW ND-D 0.5 KW DA-N

SEPTEMBER 1960

FCC File No. BI-8153
Accepted 11-17-60

WGIV
Charlotte, North Carolina 1600 KC

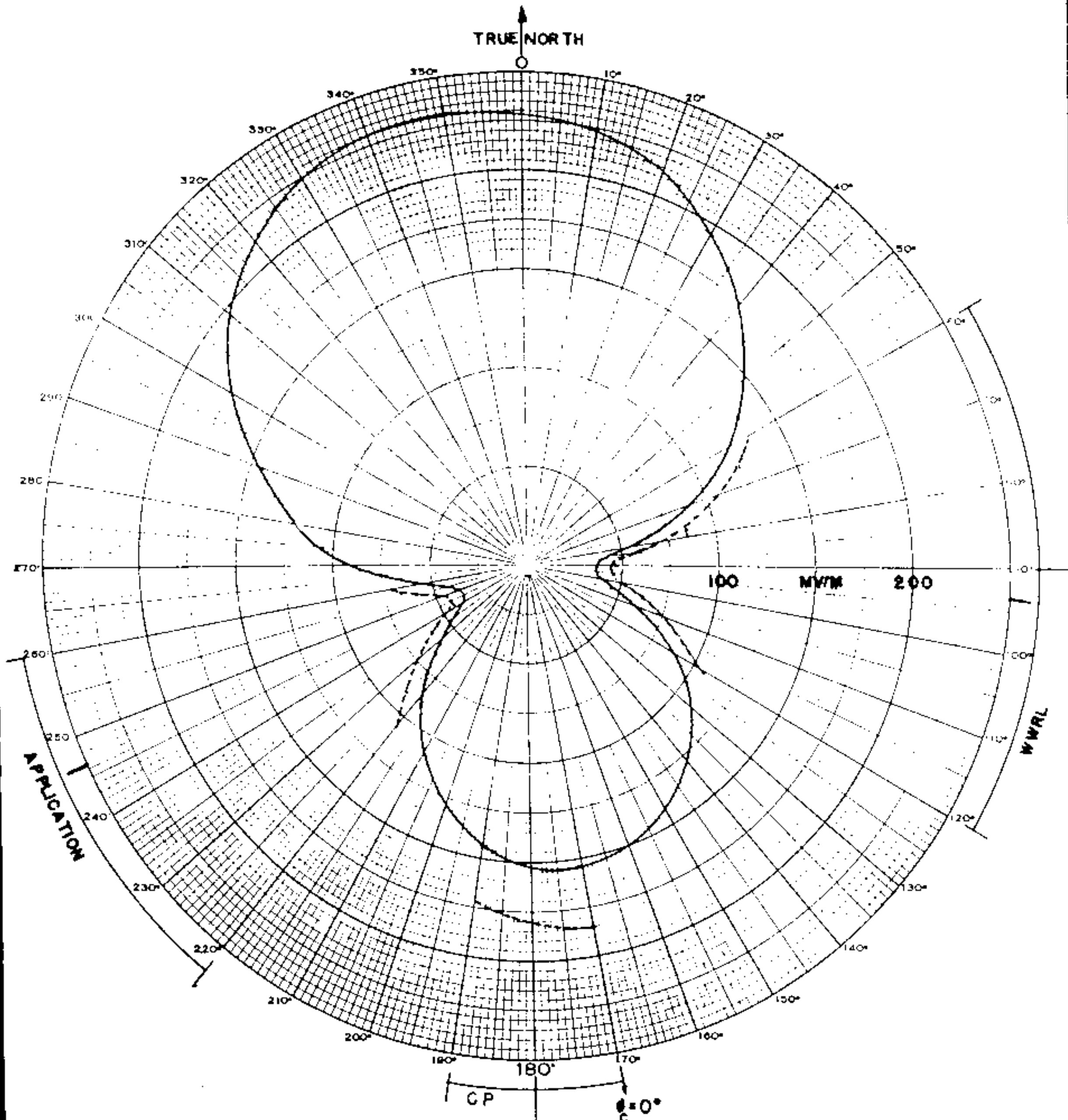
WHOL

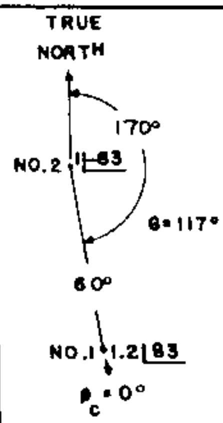
PROPOSED
DAY (6-20-56g)

STATION WHOL
ALLENTOWN, PA.

500 W
DA-D, D

1600 KC





——— COMPUTED - - - - - MEOV RMS 149 MV/M N. LATI. 40° 35' 33" W. LONG. 75° 28' 42"	WHOL ALLENTOWN BROADCASTING CORP. ALLENTOWN, PENNSYLVANIA 1600 KC PROPOSED 0.5 KW DA-D APRIL 1[illegible], 1956
LYNNE C. SMEBY, CONSULTING RADIO ENGINEER WASHINGTON 14, D. C. FIGURE 1	

FCC File No. BP-10,551 Accepted 5-9-56 WHOL, Allentown, Pa. 1600 KC

WHOL

MEASURED DAY
(10/30/57g)

Station WHOL
Allentown, Pennsylvania

500w, DA-D,D

1600 KC

Granted license 11/21/57 for change in fac. & DA system

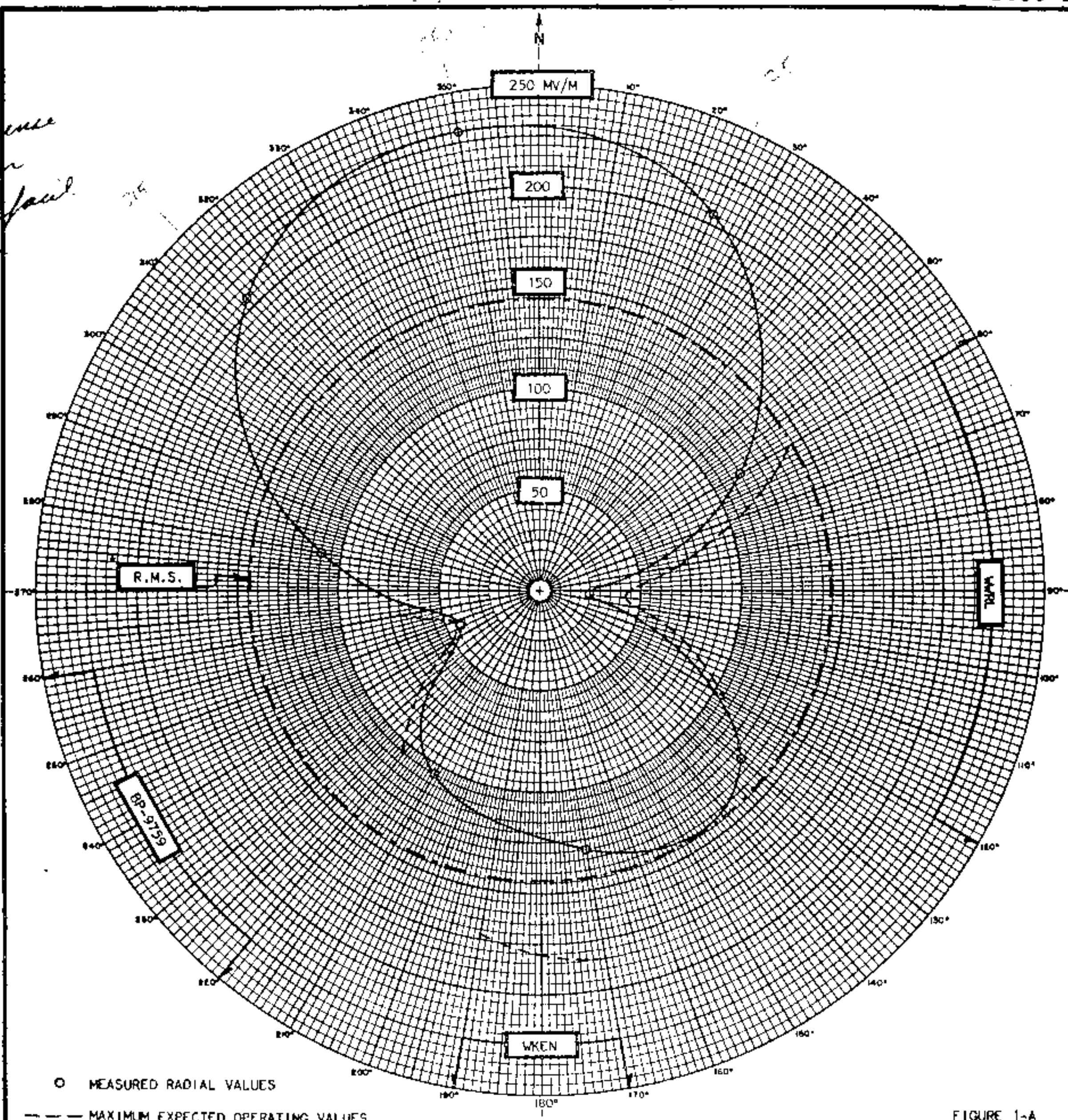


FIGURE 1-A

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION

N 350° E

NO. 2 1/-83°

60°

NO. 1 1.2/83°

G = 117°

APPLICANT	: ALLENTOWN BCSTG CORP. (WHOL)
LOCATION	: ALLENTOWN, PENNSYLVANIA
FREQUENCY	: 1600 KC/S
POWER	: 500 WATTS
LATITUDE	: 40 DEG 35 MIN 33 SEC.
LONGITUDE	: 75 DEG. 28 MIN. 42 SEC.
WHEN USED	: ~~NIGHTTIME~~ DAYTIME
R.M.S FIELD	: 144 MV/M (MEASURED)
DATE	: JUNE 1957

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

FCC File No. BL-6785
Accepted 10/16/57

WHOL
Allentown, Pennsylvania

1600 KC

WHOL

MEASURED NON-DA (10/30/57g)

Station WHOL Allentown, Pennsylvania

500w, DA-D,D 1600 KC

Granted license 11/21/57 for change in facil. + DA system

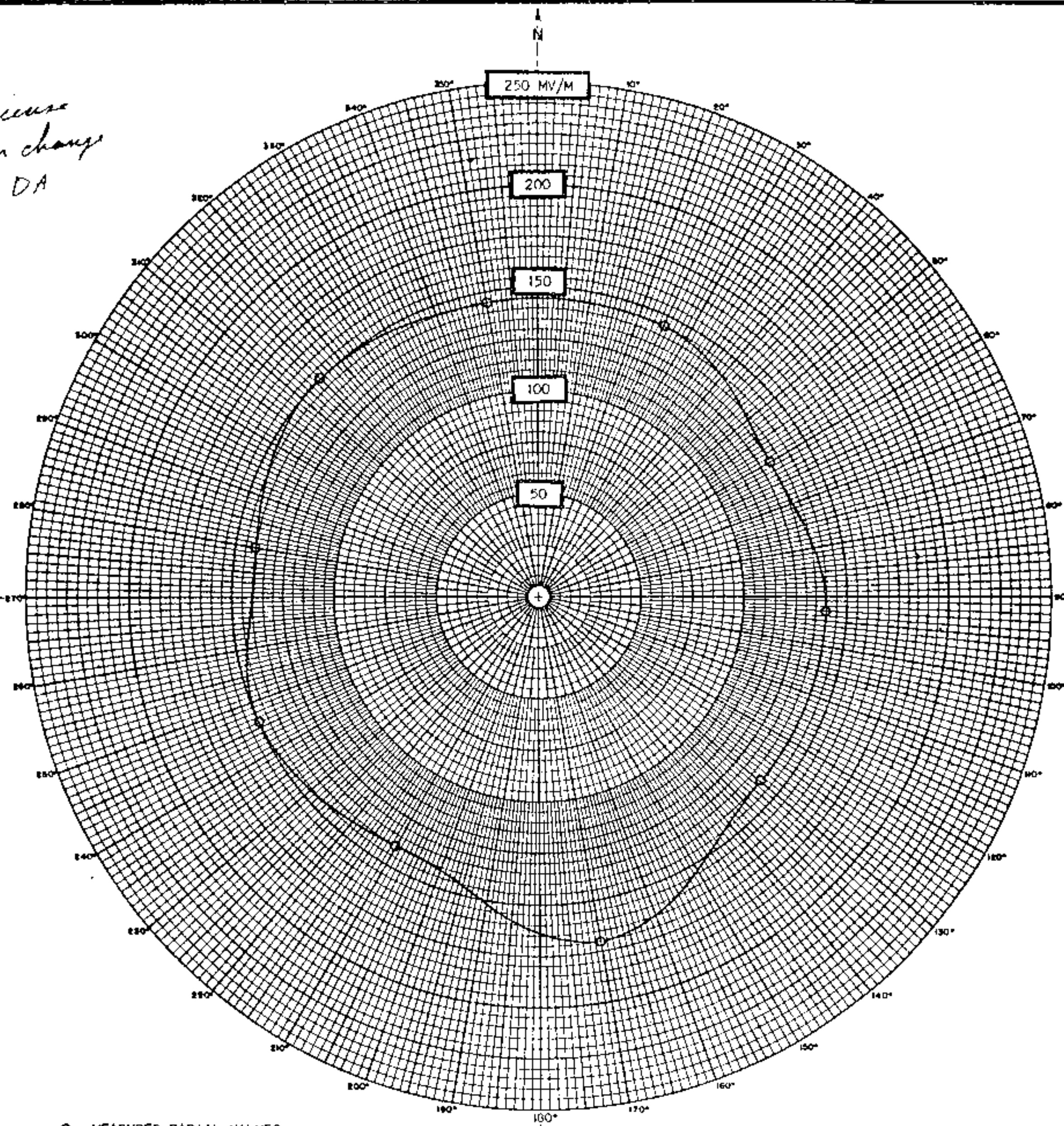


FIGURE 1-8

HORIZONTAL RADIATION PATTERN

NON-DIRECTIONAL SURVEY

APPLICANT	: ALLENTOWN BCSTG CORP. (WHOL)
LOCATION	: ALLENTOWN, PENNSYLVANIA
FREQUENCY	: 1600 KC/S
POWER	: 500 WATTS
LATITUDE	: 40 DEG 35 MIN. 33 SEC.
LONGITUDE	: 75 DEG. 28 MIN. 42 SEC.
WHEN USED	: NON-DIRECTIONAL SURVEY
R.M.S. FIELD	: 145 MV/M
DATE	: JUNE 1957

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

FCC File No. BL-6785
Accepted 10/16/57

WHOL
Allentown, Pennsylvania

1600 KC

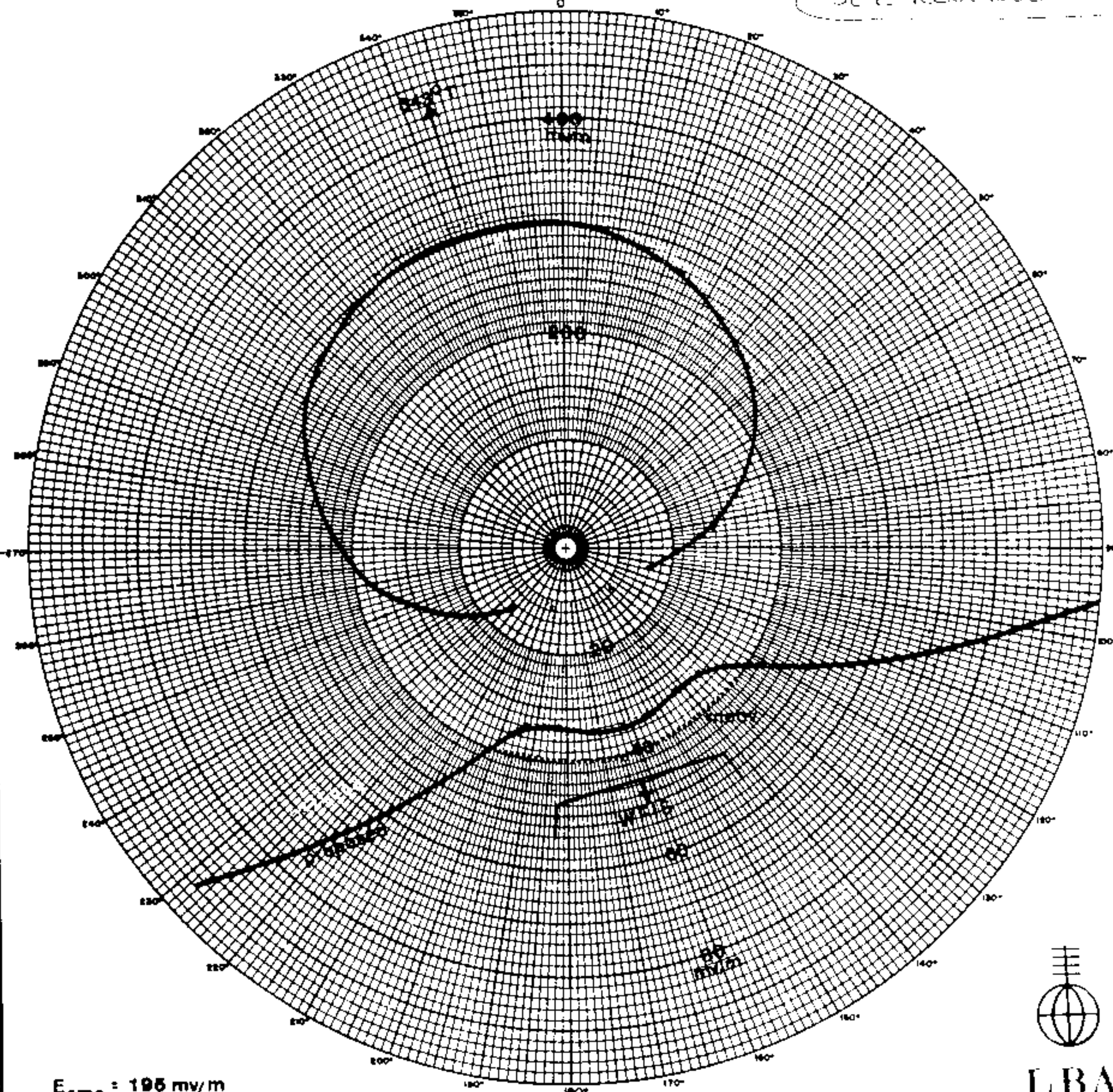
WHVL
1kw,DA-D,D
1600 kc

Proposed Day
(9-25-70ct)

Station WHVL
Hendersonville, North Carolina

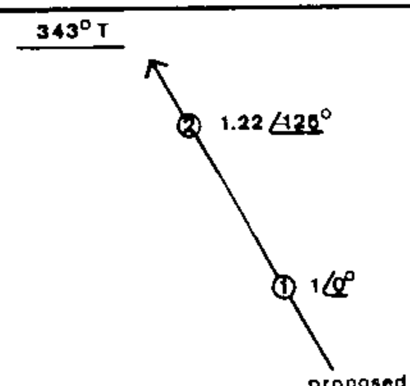
North Latitude 35° 18' 33"
West Longitude 82° 27' 36"

LAWRENCE BEHR ASSOCIATES, INC.



E_{rms} = 196 mv/m

LBA



S=60°
G=90°

1010169

WHVL PATTERN

(PROPOSED WHVL PATTERN)

JANUARY 1969

FIGURE 3A

FCC File No.BP-18837
Accepted 9-2-70

Station WHVL
Hendersonville, North Carolina 1600 kc

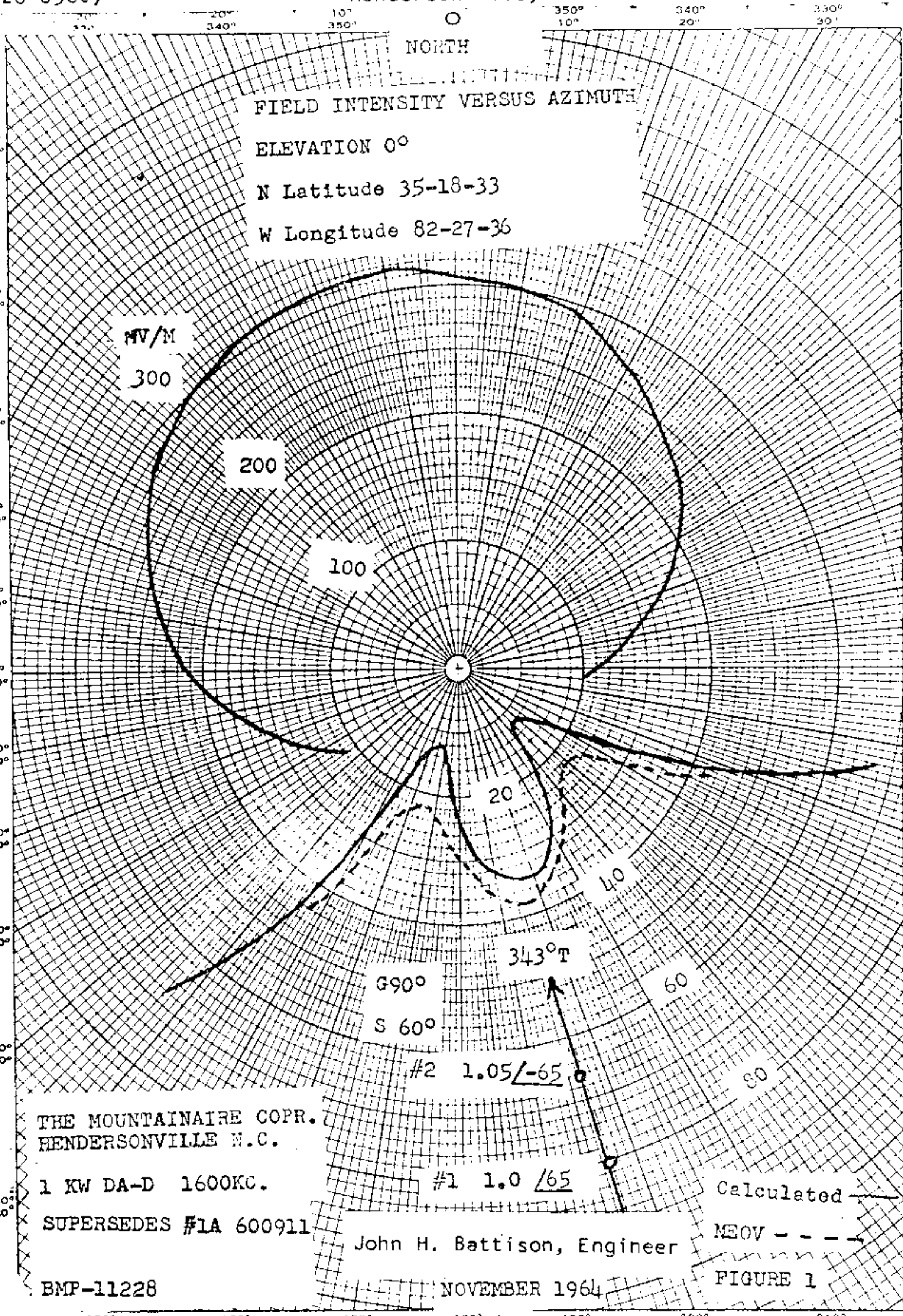
WHVL

Proposed Day
(1-28-65ct)

Station WHVL
Hendersonville, North Carolina

1kw,DA-D,D
1600 kc

BMP-11414
GRANTED
12-24-64
CHG DA



EUGENE DIETZGEN CO. MADE IN U.S.A.

NO. 340R-P DIETZGEN GRAPH PAPER POLAR CO-ORDINATE

FCC File No. BMP-11414
Accepted 12-28-64

Station WHVL
Hendersonville, North Carolina

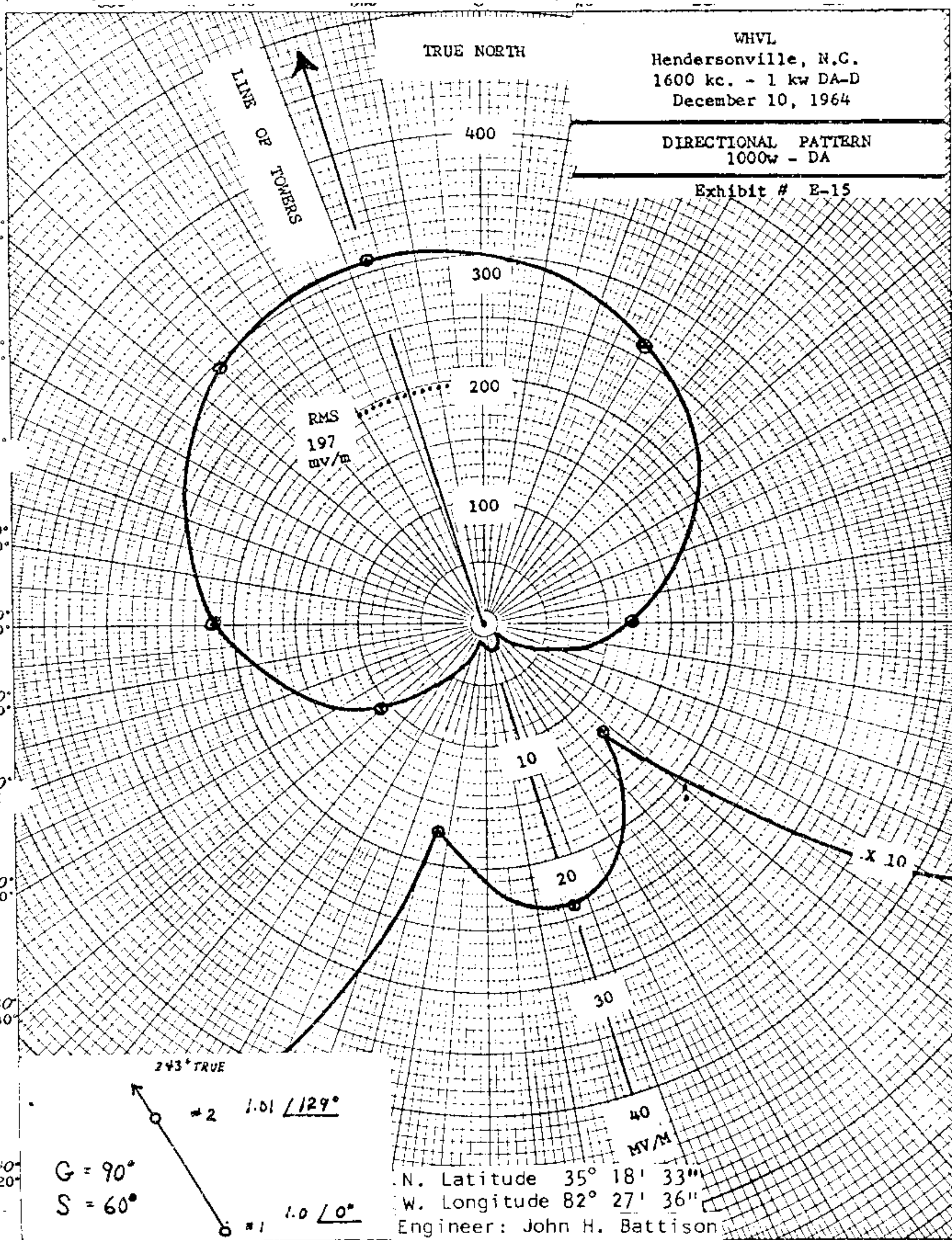
1600 kc

WHVL

Measured Day (4-28-65ct)

Station WHVL
Hendersonville, North Carolina

1kw,DA-D,D
1600 kc



FCC File No. BL-10845
Accepted 3-30-65

Station WHVL
Hendersonville, North Carolina 1600 kc

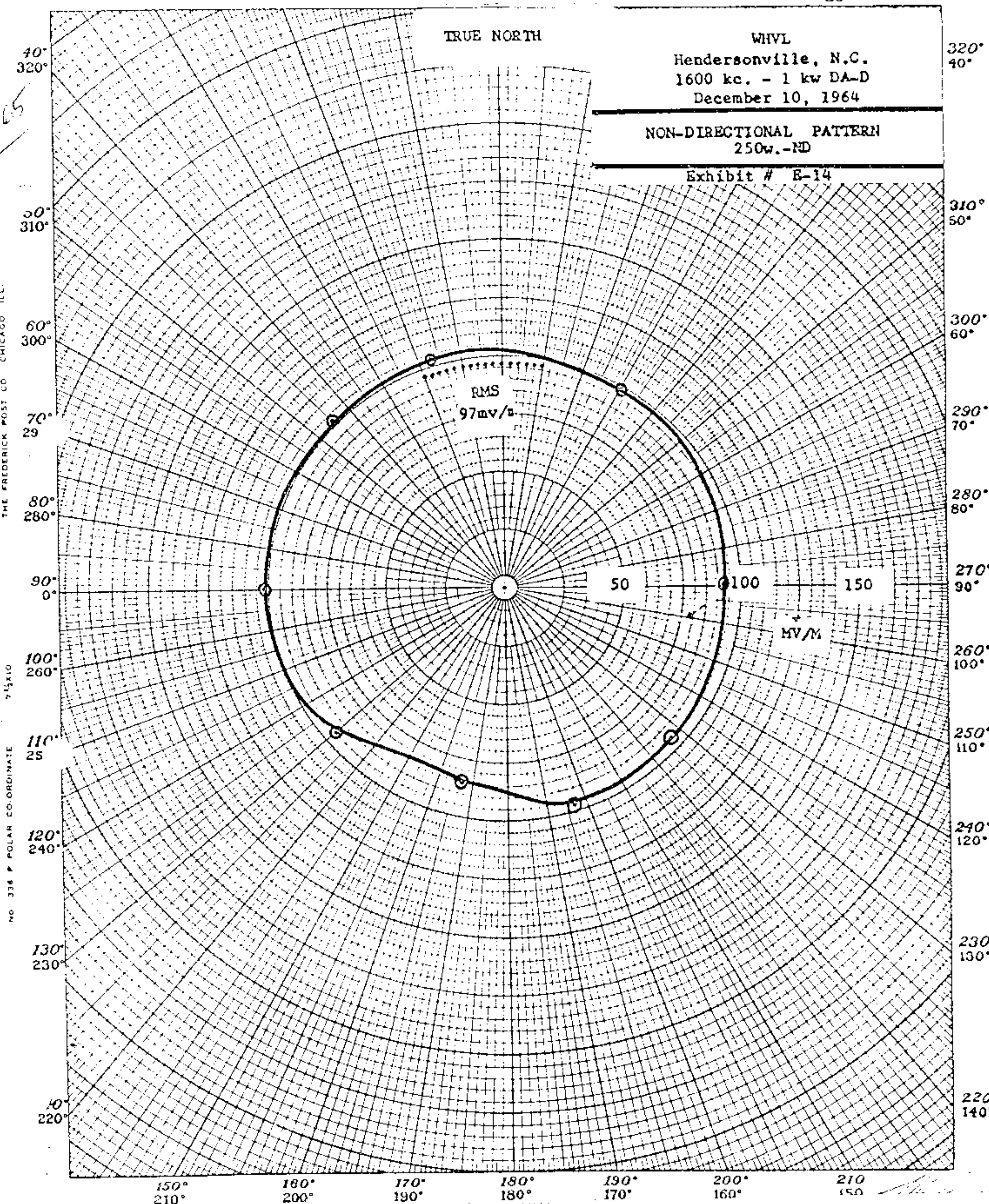
WHVL

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

Station WHVL
Hendersonville, North Carolina

1kw, DA-D, D
1600 kc

-IC
5-19-65

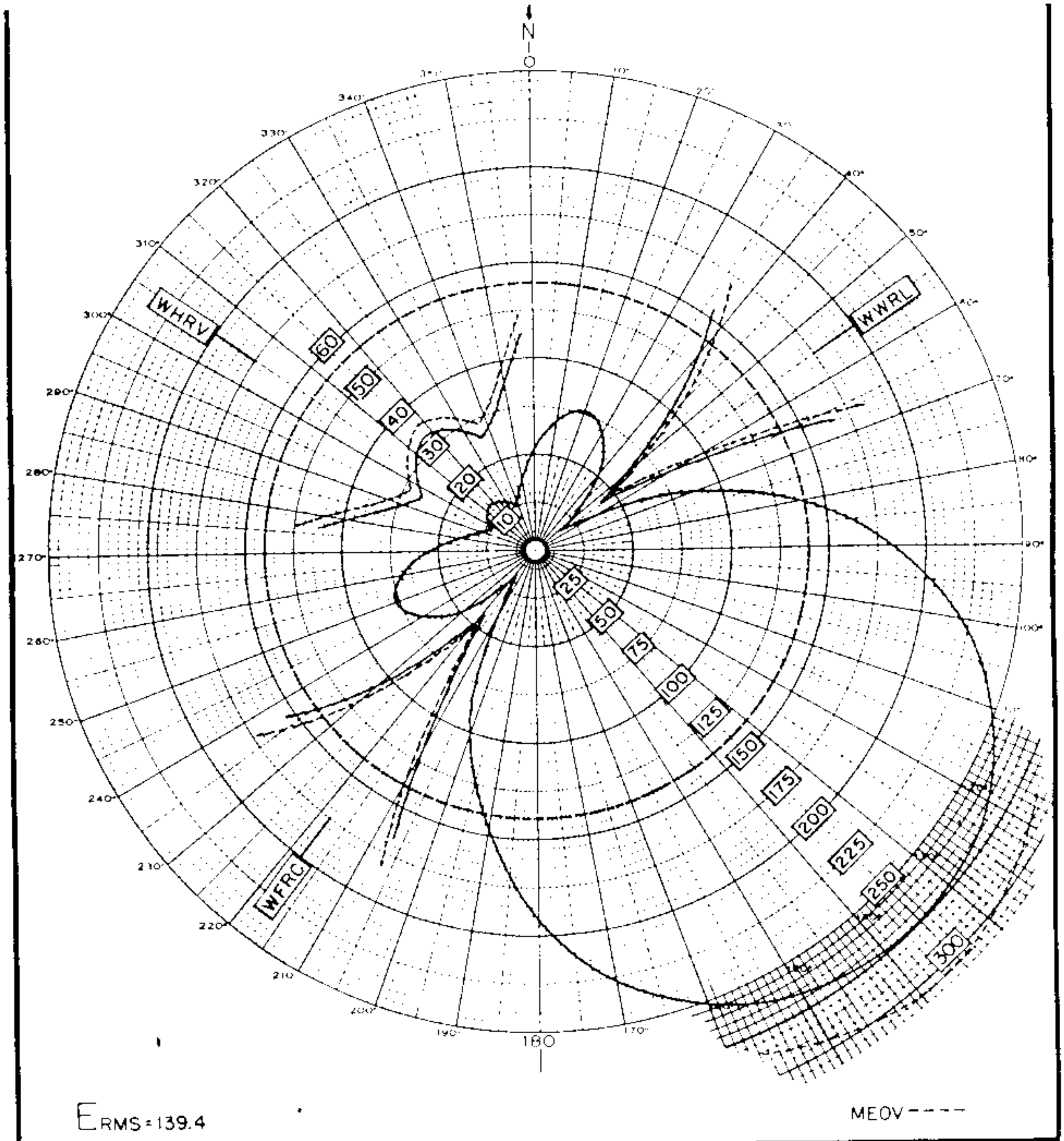


FCC File No. BL-10845
Accepted 3-30-65

Station WHVL
Hendersonville, North Carolina 1600 kc

WINX

PROPOSED NIGHT (3/22/55G) | STATION WINX, ROCKVILLE, MARYLAND | 500W, 1KW-LS DA-2, U | 1600 KC



$E_{RMS} = 139.4$

LATITUDE 39° 05' 51"
LONGITUDE 77° 09' 07"

JOHN H. MULLANEY

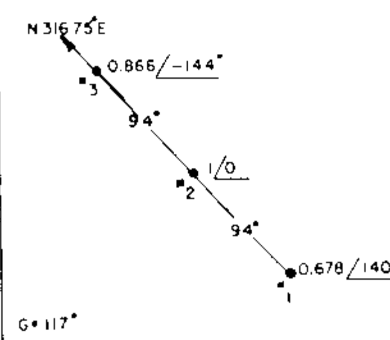


FIGURE 5

NIGHTTIME HORIZONTAL POLAR PATTERN

RADIO STATION WINX

ROCKVILLE, MARYLAND

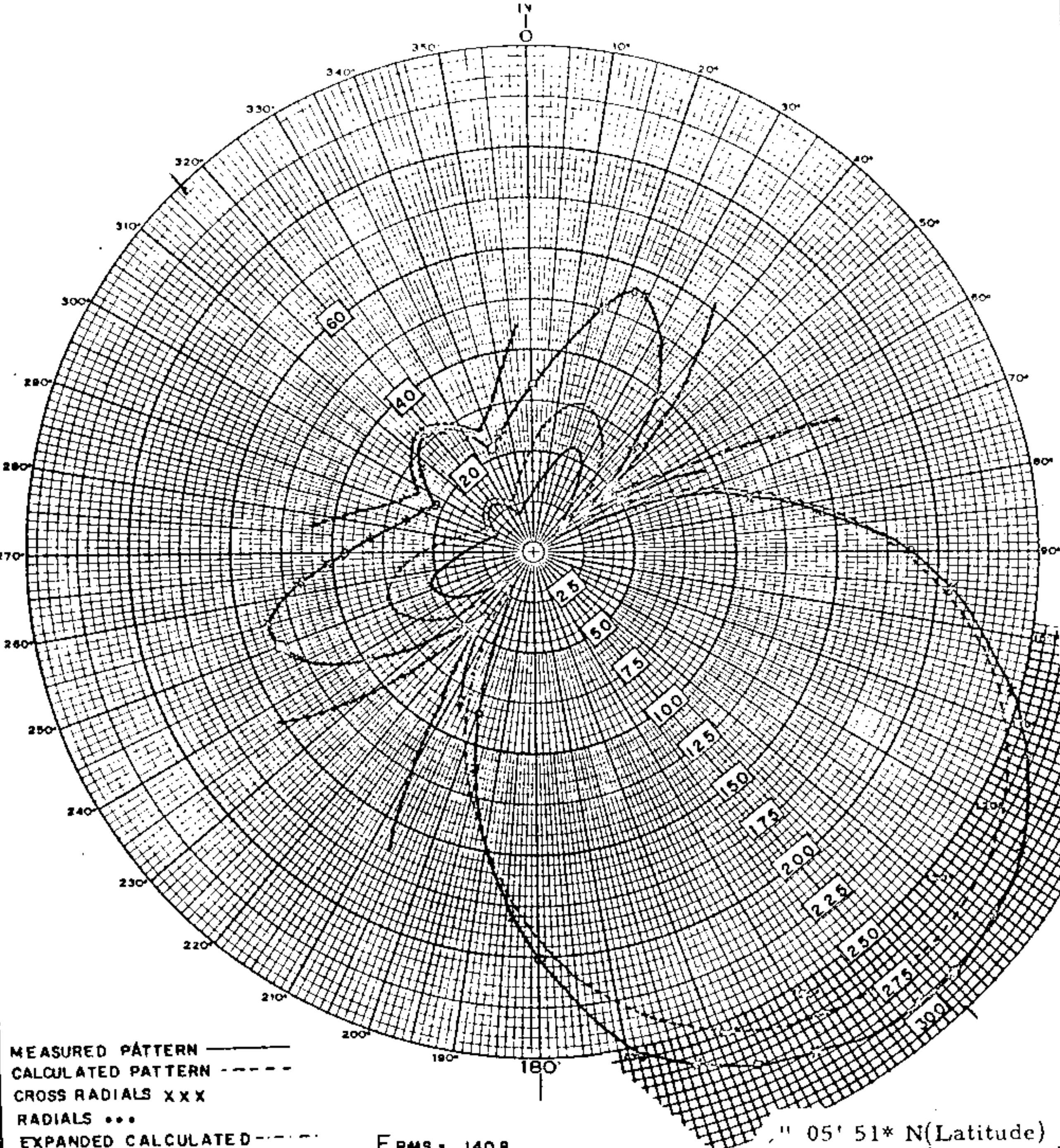
1600 KC 0.5-1KW LS, DA-2

granted expense 12/11/57 to employ DA for nighttime only

WINX

MEASURED NIGHT (9-14-56g) STATION W I N X 500W, 1KW, DA-N, U 1600 KC

A. A. Snowberger(Technical Dir.)
Rockville, Maryland



MEASURED PATTERN ————
CALCULATED PATTERN - - - - -
CROSS RADIALS x x x
RADIALS • • •
EXPANDED CALCULATED - · - · -

E_{RMS} = 140.8

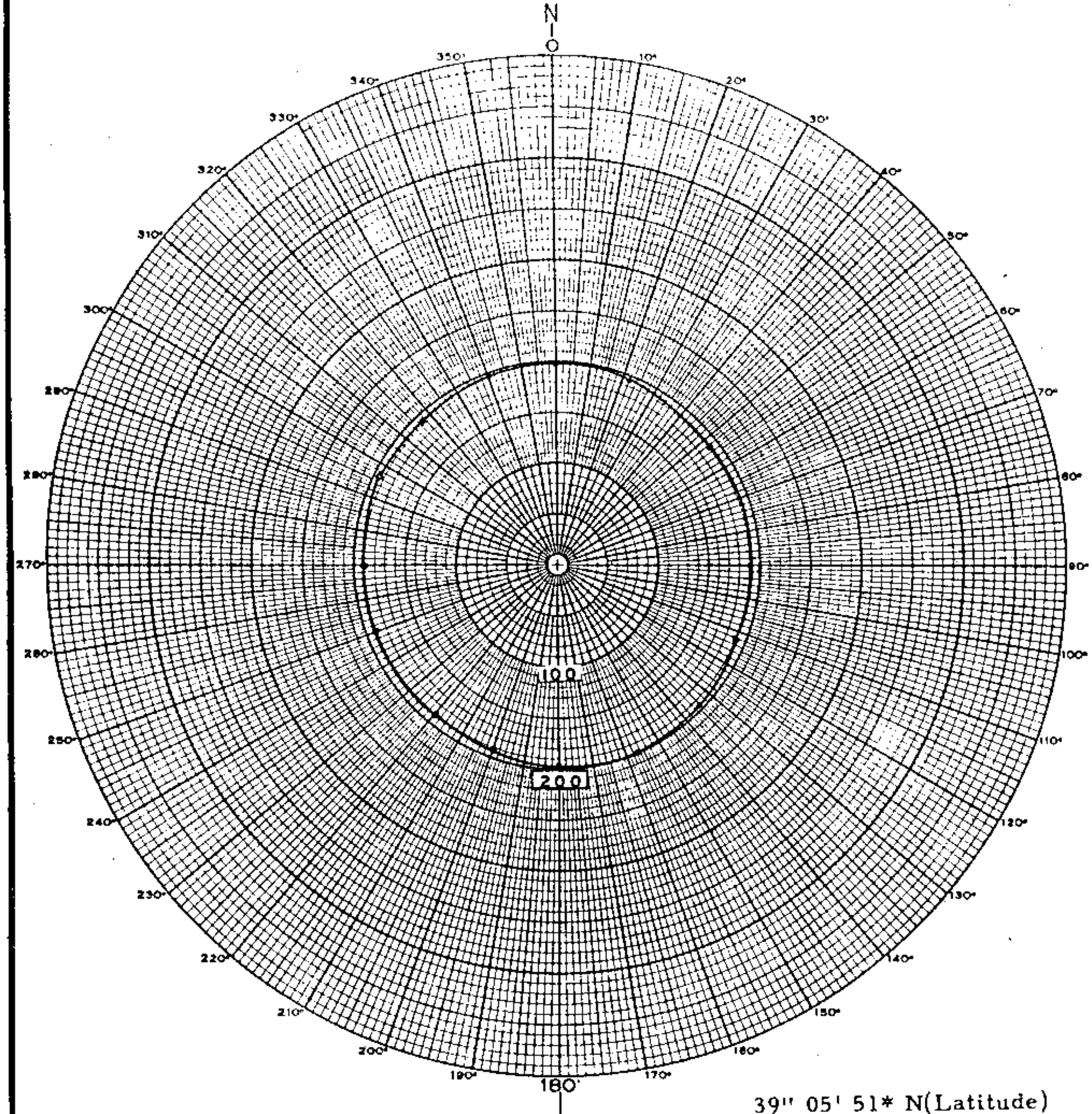
" 05' 51* N(Latitude)
77" 09' 07* W(Longitude)

PATTERN NO. LATITUDE: 39° 05' 51" LONGITUDE: 77° 09' 07"	N 316.75°E #2 N.E. .886 /144 94° #1 C 1/0 94° #3 S.E. .678 /-140	FIGURE 38 MEASURED NIGHTTIME DIRECTIONAL HORIZONTAL PATTERN RADIO STATION WINX ROCKVILLE, MARYLAND
U. B. C., ENG. DEPT.		

FCC File BL-6251 Accepted 9-4-56 Station WINX 1600 KC
A. A. Snowberger, (Technical Dir.)
Rockville, Maryland

WINX

MEASURED STATION W I N X 500W, 1KW, DA-N, U 1600 KC
NON-DA(9-14-56g) A. A. Snowberger(Technical Dir.)
Rockville, Maryland



39° 05' 51" N(Latitude)
77° 09' 07" W(Longitude)

ERMS = 193.4

LATITUDE: N 39° 05' 51" LONGITUDE: W 77° 09' 07"	G = 117°	FIGURE 36 MEASURED NON-DA DAYTIME HORIZONTAL PATTERN RADIO STATION WINX ROCKVILLE, MD. 1600 KC 1. KW.LS - 0.5KW-DA.N

FCC File
BL-6251

Accepted 9-4-56

Station WINX
A. A. Snowberger, (Technical Dir.)
Rockville, Maryland

1600 K

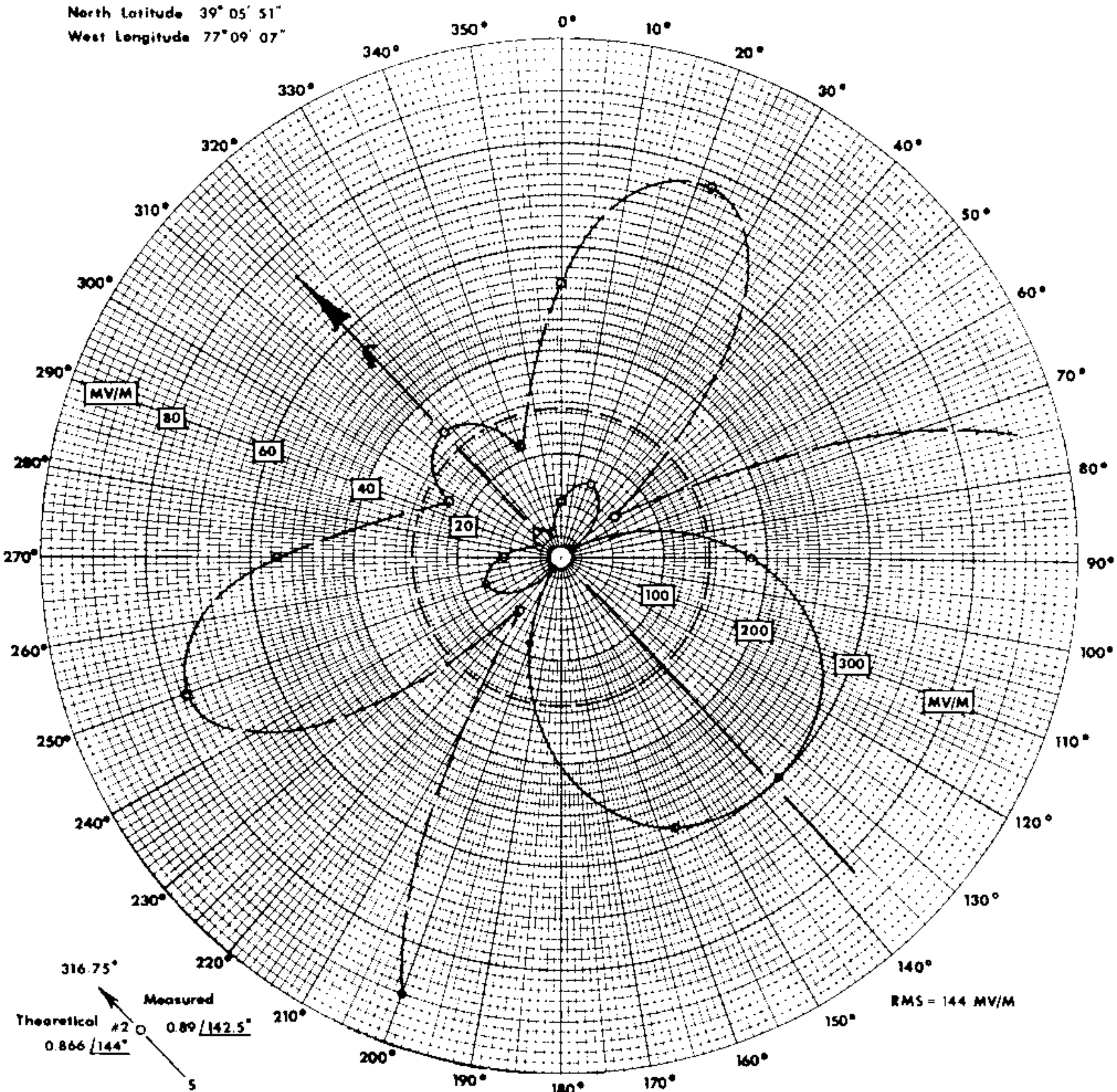
WINX

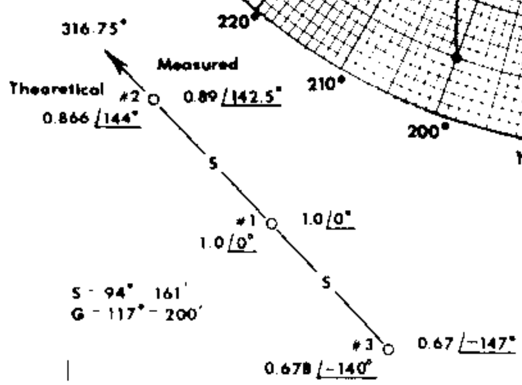
Measured Night
(10-28-68ct)

Station WINX
Rockville, Maryland

500w,1kw-LS,DA-N,U
1600 kc

PAGE 2





Measured Nighttime Directional Pattern
WINX – Rockville, Maryland
1600 KHz 0.5 Kw/1Kw-LS DA-N

March 1968

GAUTNEY & JONES
CONSULTING RADIO ENGINEERS

FCC File No.BZ-6953
Accepted 10-3-68

Station WINX
Rockville, Maryland

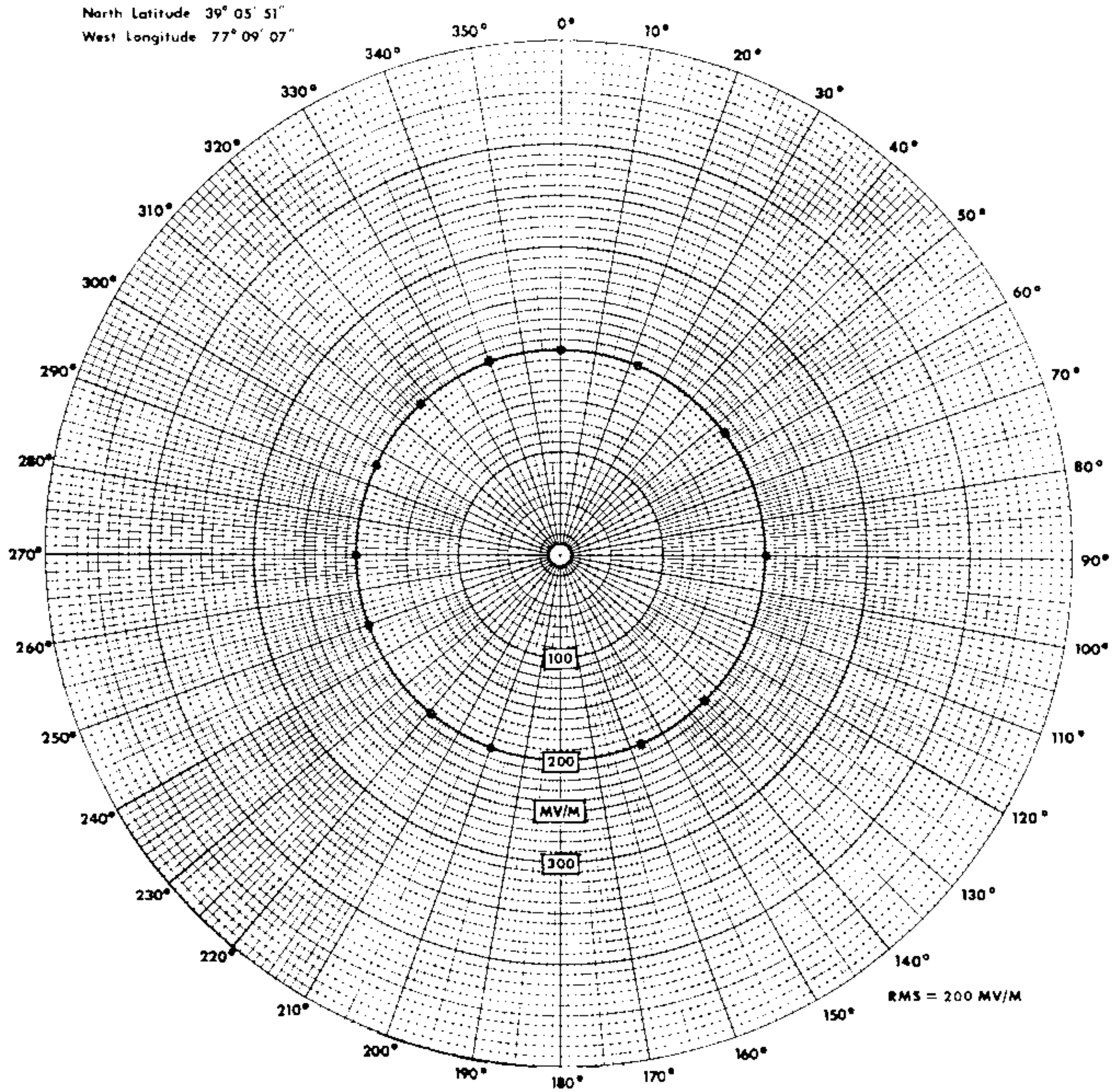
1600 kc

WINX

Measured Non-DA
(10-28-68ct)

Station WINX
Rockville, Maryland

500w,1kw-LS,DA-N,U
1600 kc
PAGE 1



Measured Non-directional Pattern
WINX Rockville, Maryland
1600 KHz 0.5 Kw/1Kw-LS DA-N

March 1968

Gautney & Jones
Consulting Radio Engineers

FCC File No.BZ-6953
Accepted 10-3-68

Station WINX
Rockville, Maryland

1600 kc

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WIXY | Main Studio: East Longmeadow, Massachusetts

Frequency: 1600 kHz | Power: 2.5kw Night 5kw Day

Notification List No. 1757 | Date: November 16, 1977 | Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 42° 04' 30"
West Longitude: 72° 31' 40"

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(#4)	S(#3)	N(#1)	E(#2)
HEIGHT ABOVE INSULATORS:	188'	188'	188'	188' (110°)
NIGHT PHASING:	+83°	+243°	0°	+160°
NIGHT FIELD RATIO:	1.18	1.227	1.00	1.04
DAY PHASING:	---	---	0°	+120°
DAY FIELD RATIO:	---	---	1.00	0.40

SPACING AND ORIENTATION: From reference tower #1: tower #2 is spaced 153.7' (90°) on a line bearing 146° true; tower #3 is spaced 256.1' (150°) on a line bearing 199.13° true; and tower #4 is spaced 204.9' (120°) on a line bearing 236° true.

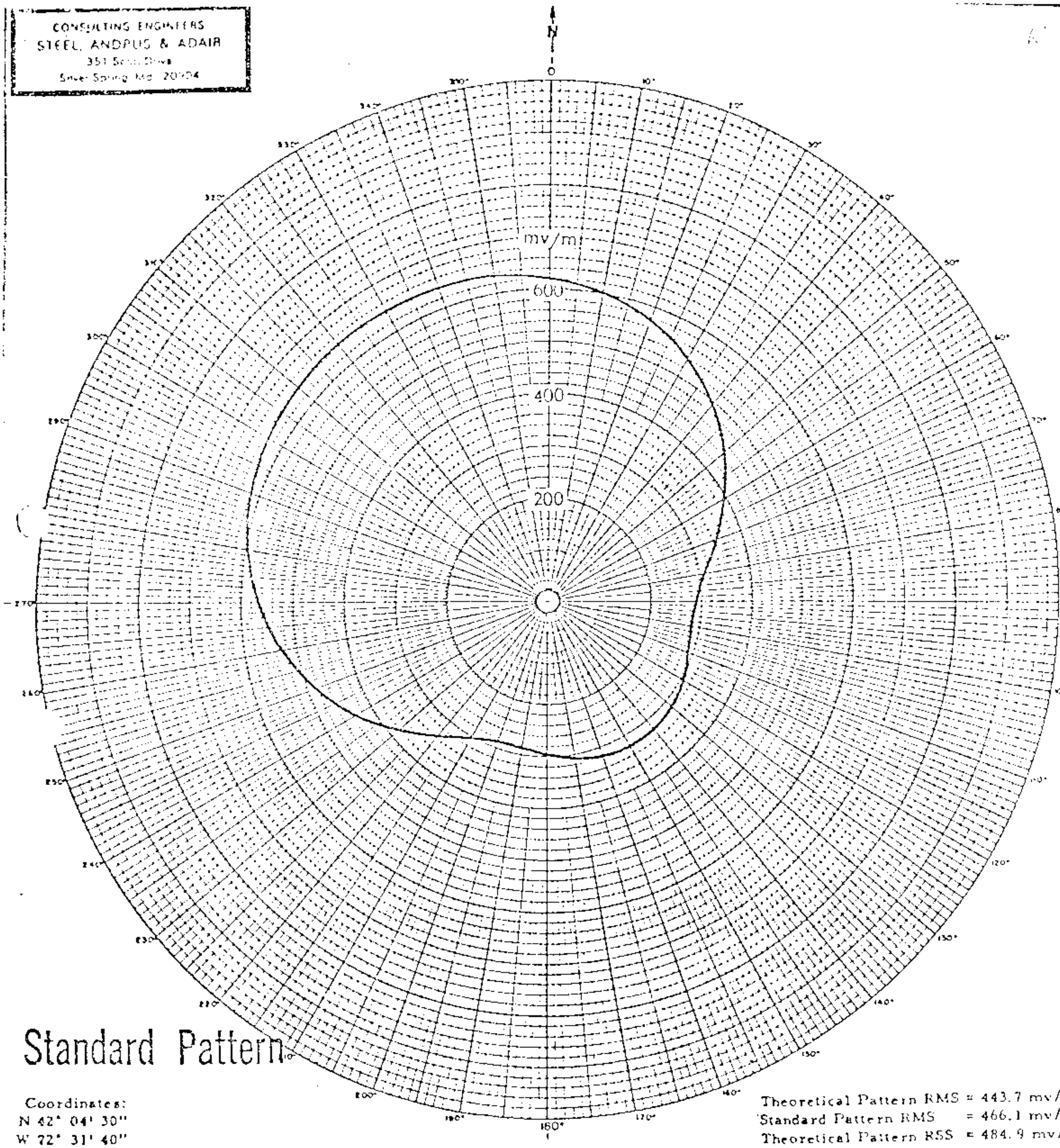
GROUND SYSTEM: 120-153.7' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of system are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	443.7 mv/m	484.9 mv/m	466.1 mv/m
Night	333.5 mv/m	434.5 mv/m	350.3 mv/m

This notification concerns a new nighttime operation and changes in the daytime operation from an omnidirectional antenna system.

CONSULTING ENGINEERS
STEEL, ANDRUS & ADAIR
351 Scott Drive
Silver Spring, Md. 20904



Coordinates:
N 42° 04' 30"
W 72° 31' 40"

Theoretical Pattern RMS = 443.7 mv/m
Standard Pattern RMS = 466.1 mv/m
Theoretical Pattern RSS = 484.9 mv/m

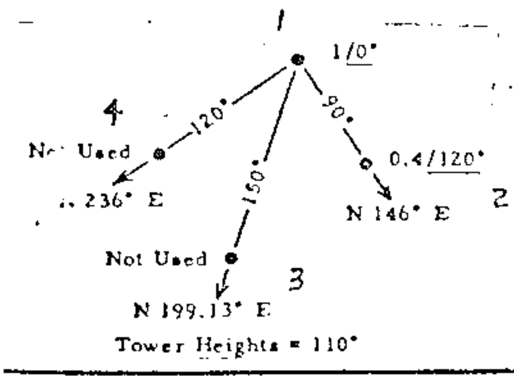
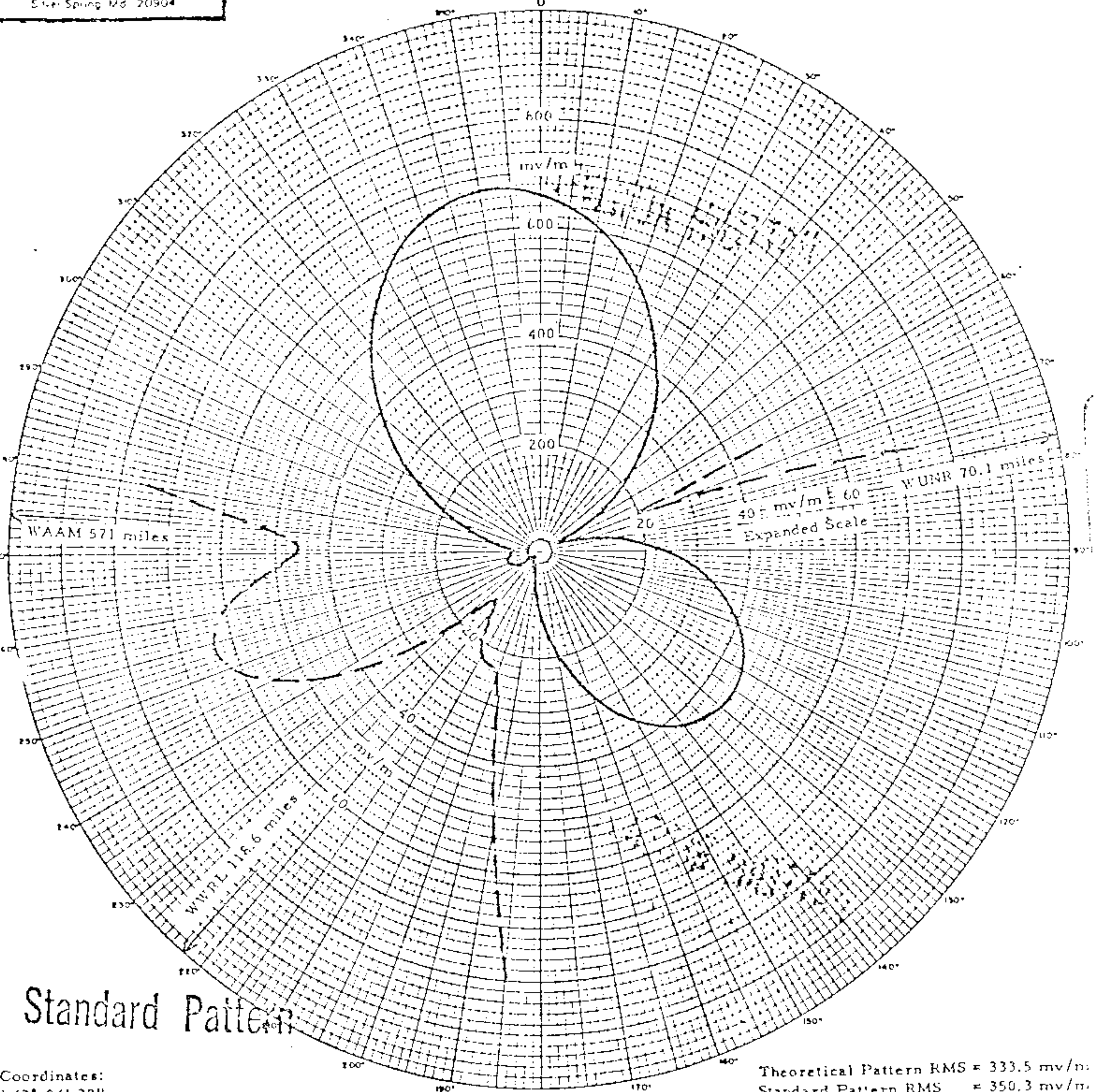


Figure 3
Proposed Daytime Horizontal
Standard Radiation Pattern
WTYM East Longmeadow, Massachusetts
1600 KHz 2.5/5Kw-LS DA-2 U
November 1976

CONSULTING ENGINEERS
STEEL ANDRUS & ADAIR
351 Scott Drive
Silver Spring, Md. 20904



Coordinates:
N 42° 04' 30"
W 72° 31' 40"

Theoretical Pattern RMS = 333.5 mv/m
Standard Pattern RMS = 350.3 mv/m
Theoretical Pattern RSS = 434.5 mv/m

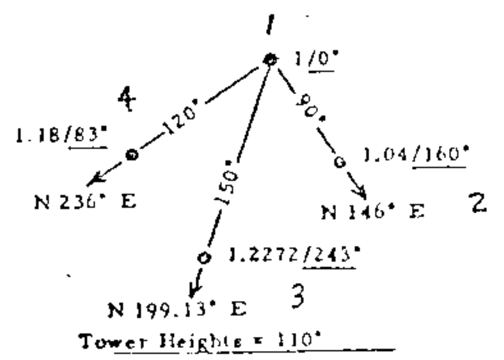


Figure 7
Proposed Nighttime Horizontal
Standard Radiation Pattern
WTYM East Longmeadow, Massachusetts
1600 KHz 2.5/5 KW-LS DA-2 U
November 1976

WKEN

Proposed Night
(2-28-69ct)

Station WKEN
Dover, Delaware

1kw,500w-LS,DA-N,U
1600 kc

BMP-12649
Granted
2-19-69)
modification
of CP to
make change
in directional
antenna
system

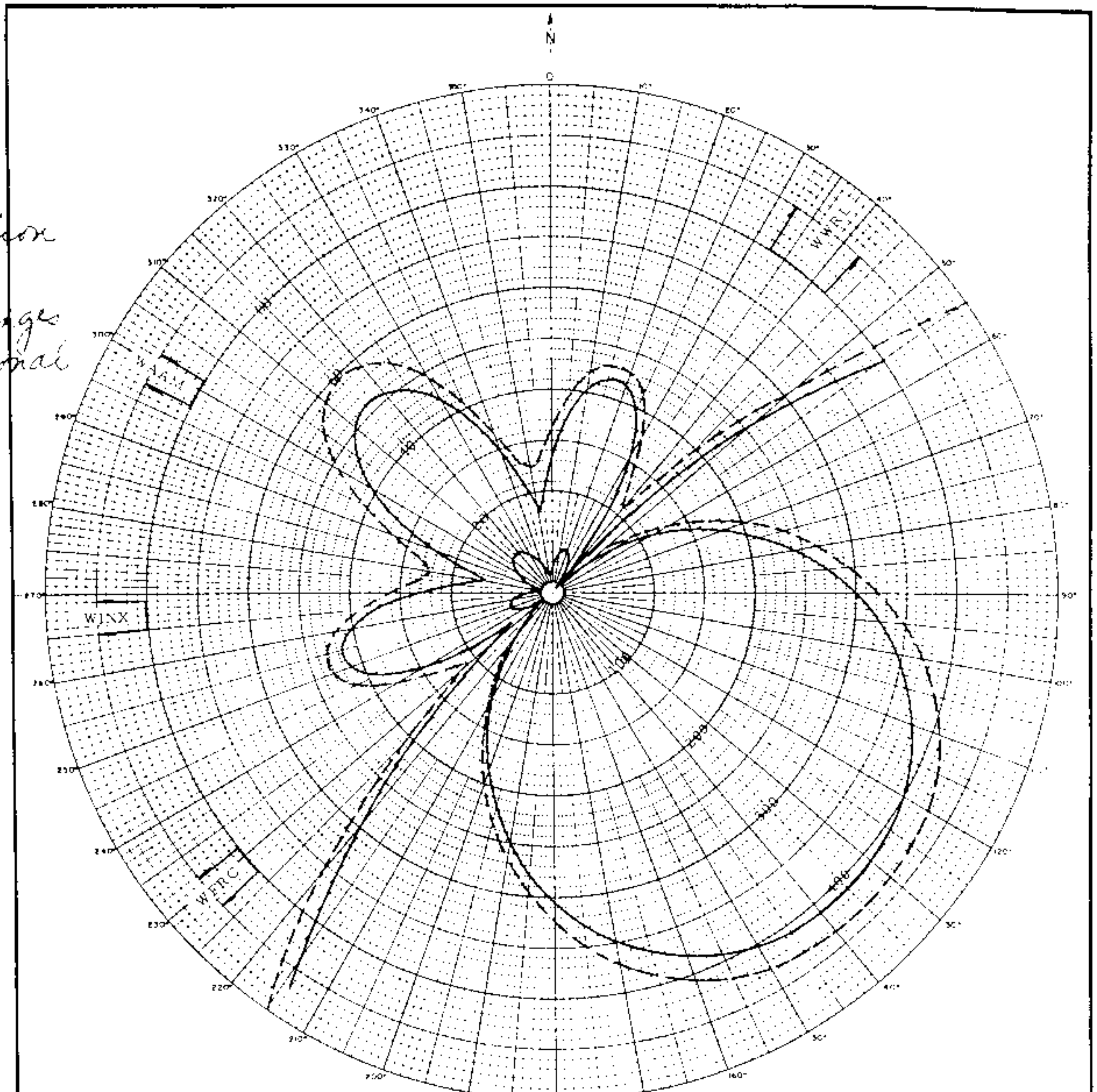
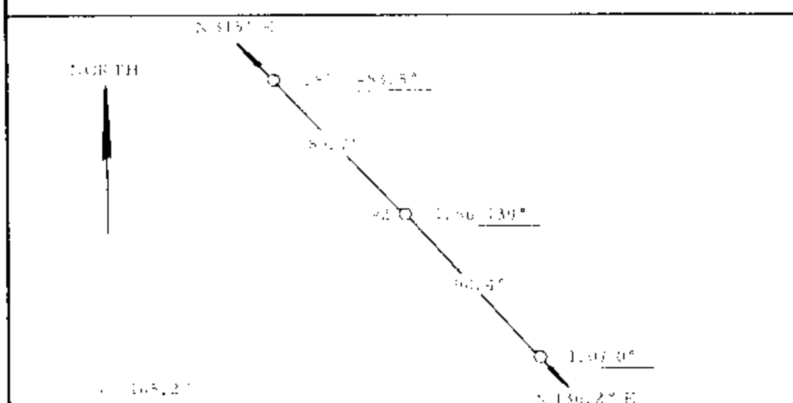


FIGURE 1-A

HORIZONTAL RADIATION PATTERN



APPLICANT	Radio Station WKEN
LOCATION	Dover, Delaware
FREQUENCY	[illegible]
POWER	[illegible]
LATITUDE	[illegible] DEG [illegible] MIN 11 SEC
LONGITUDE	75 DEG [illegible] MIN [illegible] SEC
WHEN USED	Night-time
RMS FIELD	212 [illegible]
DATE	December 1, [illegible]

ROBERT L. PURCELL

WASHINGTON D.C

FCC File No.BMP-12649
Accepted 2-14-69

Station WKEN
Dover, Delaware

1600 kc

WKEN

Measured Night
(4-29-69ct)

Station WKEN
Dover, Delaware

1kw,500w-LS,DA-N,U
1600 kc

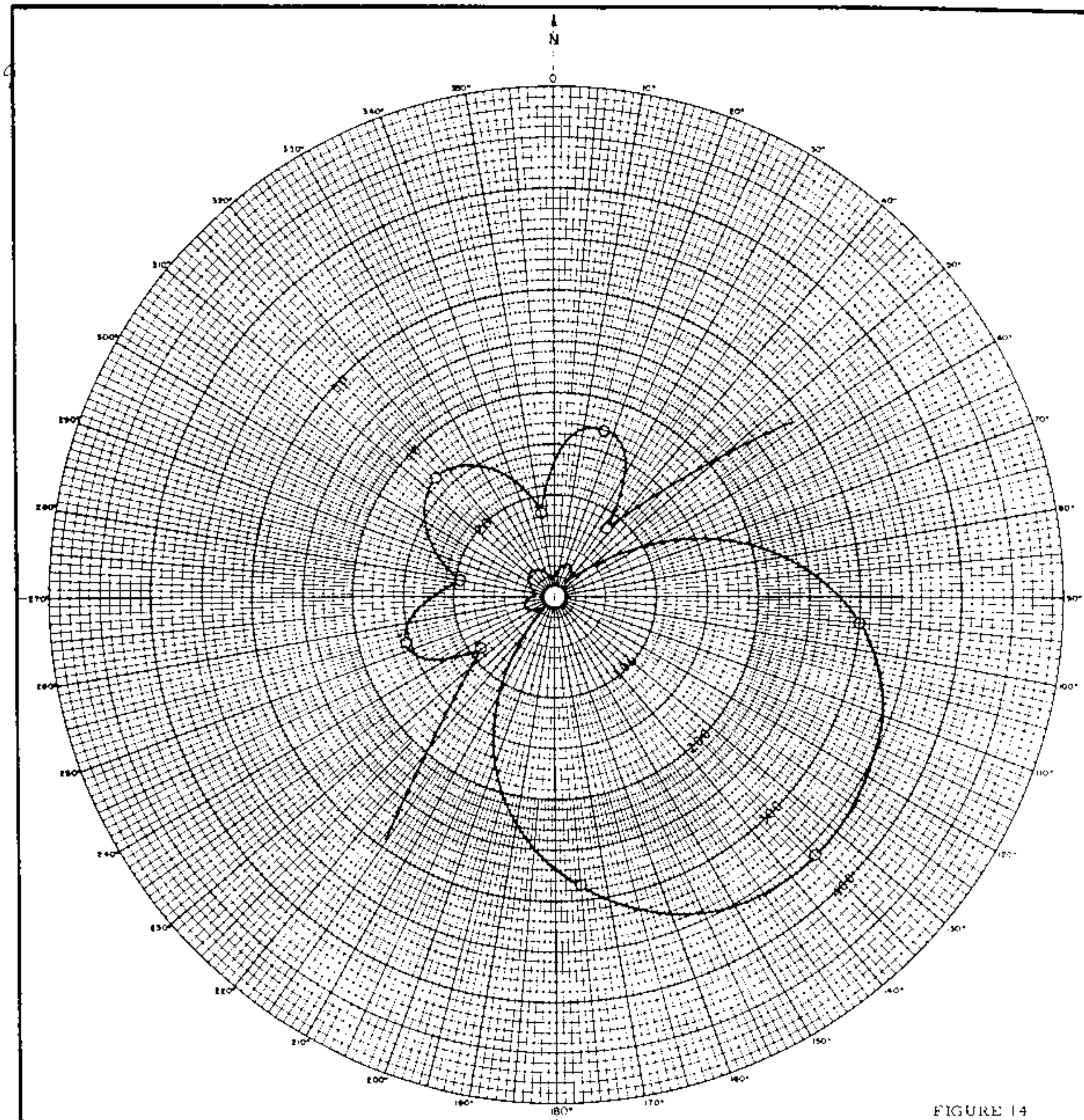
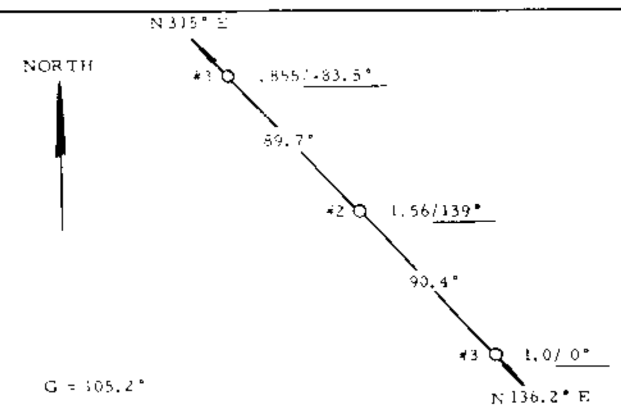


FIGURE 14

HORIZONTAL RADIATION PATTERN



APPLICANT	Radio Station WKEN
LOCATION	Dover, Delaware
FREQUENCY	1600 KC/S
POWER	1.0Kw
LATITUDE	39 DEG 10 MIN 11 SEC
LONGITUDE	75 DEG 33 MIN 13 SEC
WHEN USED	Night-time
RMS FIELD:	188.5 mv/m
DATE	February 1969

ROBERT L. PURCELL

WASHINGTON, D. C.

FCC File No.BL-12311
Accepted 4-3-69

Station WKEN
Dover, Delaware

1600 kc

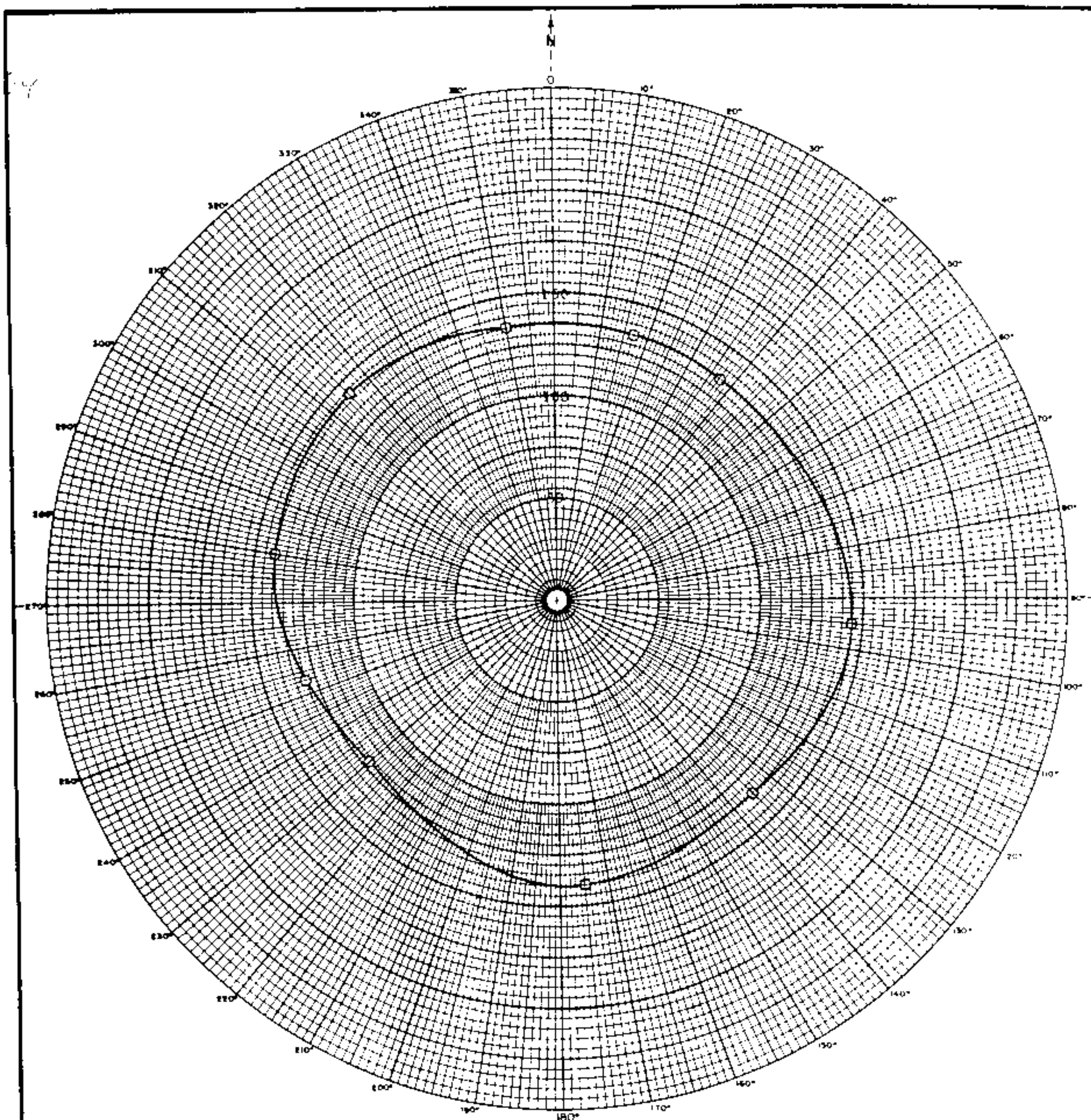
WKEN

Measured Non-DA
(4-29-69ct)

Station WKEN
Dover, Delaware

1kw,500w-LS,DA-N,U
1600 kc

punted 5/12/74
Cleanup
drawing
changed



RMS 136.5 MV/M

FIGURE 13

NON-DIRECTIONAL FIELD SURVEY

ROBERT L. PURCELL
WASHINGTON D.C.

FCC File No.BL-12311
Accepted 4-3-69

Station WKEN
Dover, Delaware

1600 kc

WKEN

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WKEN — Main Studio: Dover, Delaware

Frequency: 1600 kHz — Power: 1 kW Night 5 kW Day

Notification List No. 1709 — Date: November 16, 1976 — Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM: North Latitude: 39 ° 10 ' 11 "
West Longitude: 75 ° 33 ' 13 "

ANTENNA CHARACTERISTICS

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

TOWER:	NW(#3)	C(#2)	SE(#1)	
HEIGHT ABOVE INSULATORS:	180'	180'	180'	(105.2°)
NIGHT PHASING:	-83.5°	+139°	0°	
NIGHT FIELD RATIO:	0.855	1.56	1.0	
DAY PHASING:	+287°	+140°	0°	
DAY FIELD RATIO:	0.512	1.12	1.0	

SPACING AND ORIENTATION: From tower #2, tower #1, is spaced 154.4' (90.4°) on a line bearing 136.2° true and tower #3 is spaced 153.2' (89.7°) on a line bearing 315° true.

GROUND SYSTEM: 120-160' equally spaced copper radials plus 120-50' inter-spaced radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

(Cont'd)

WKEN

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

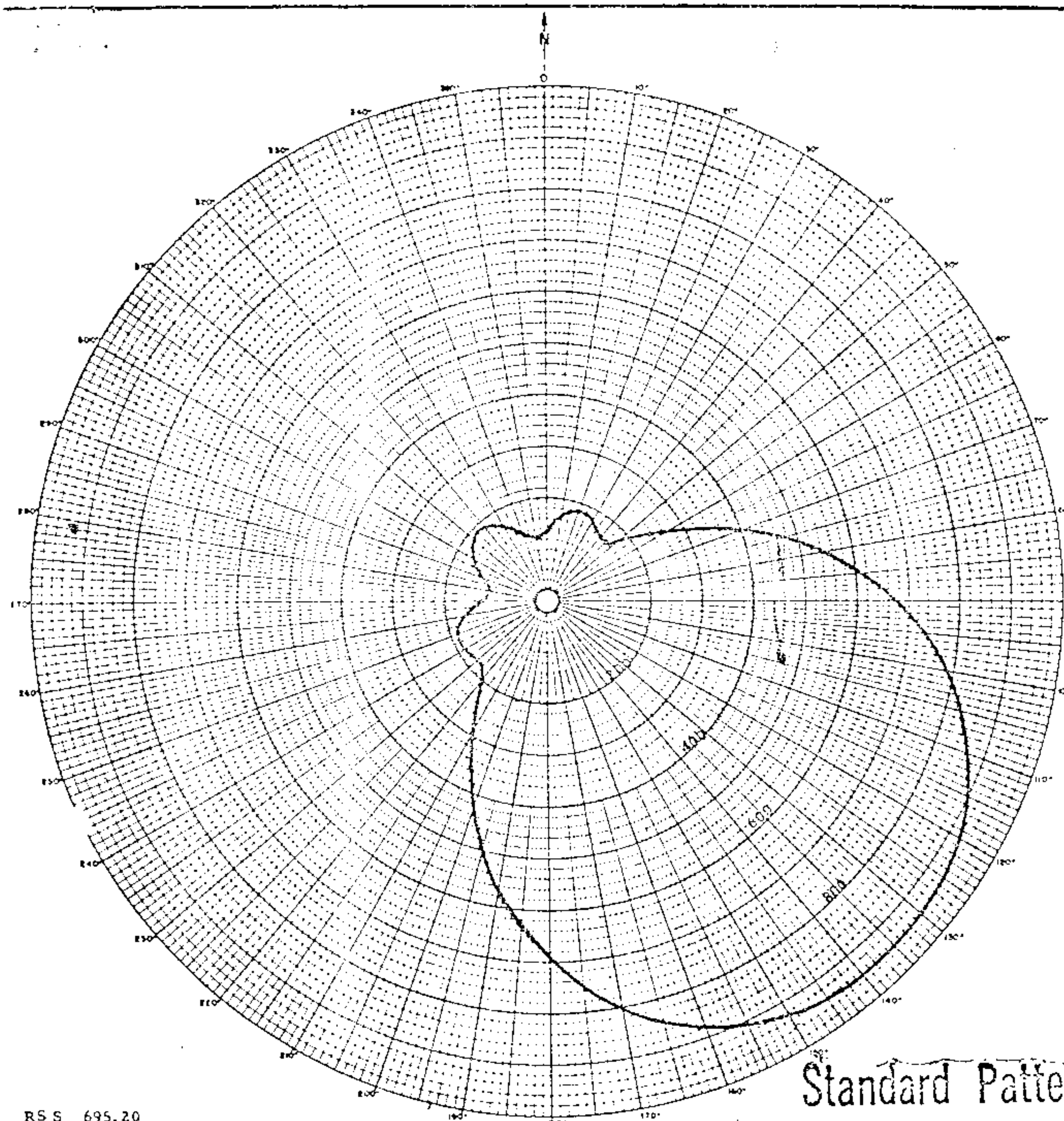
	THEORETICAL				STANDARD	
	RMS		RSS		RMS	
Day	472.55	mv/m	695.20	mv/m	496.51	mv/m
Night	212	mv/m	-	mv/m	-	mv/m

Note: Please retain the Nighttime directional antenna radiation pattern notified for Station WKEN in United States Change List Number 1308 dated February 19, 1969 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: 30291A3
30291A4

WKEN

PRO[illegible] STD DA DAY



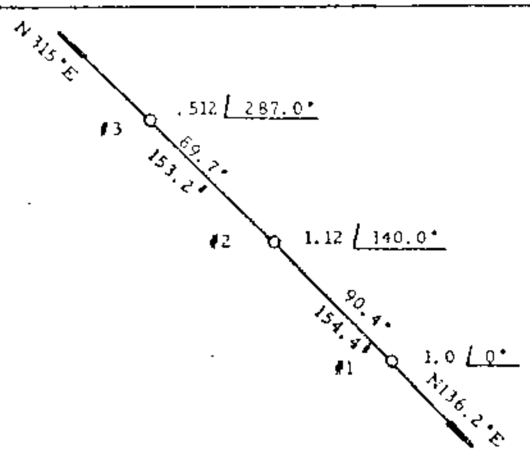
Standard Pattern

RSS 695.20

RMS 496.51 (Standard)

FIGURE 1

HORIZONTAL RADIATION PATTERN



G = 105.2°

APPLICANT	Radio Station WKEN
LOCATION	Dover, Delaware
FREQUENCY	1600 KHz
POWER	5 KW
LATITUDE	39 DEG 10 MIN 11 SEC
LONGITUDE	75 DEG 33 MIN. 13 SEC
WHEN USED	Daytime
RMS FIELD	472.55 Theoretical
DATE	May 1975

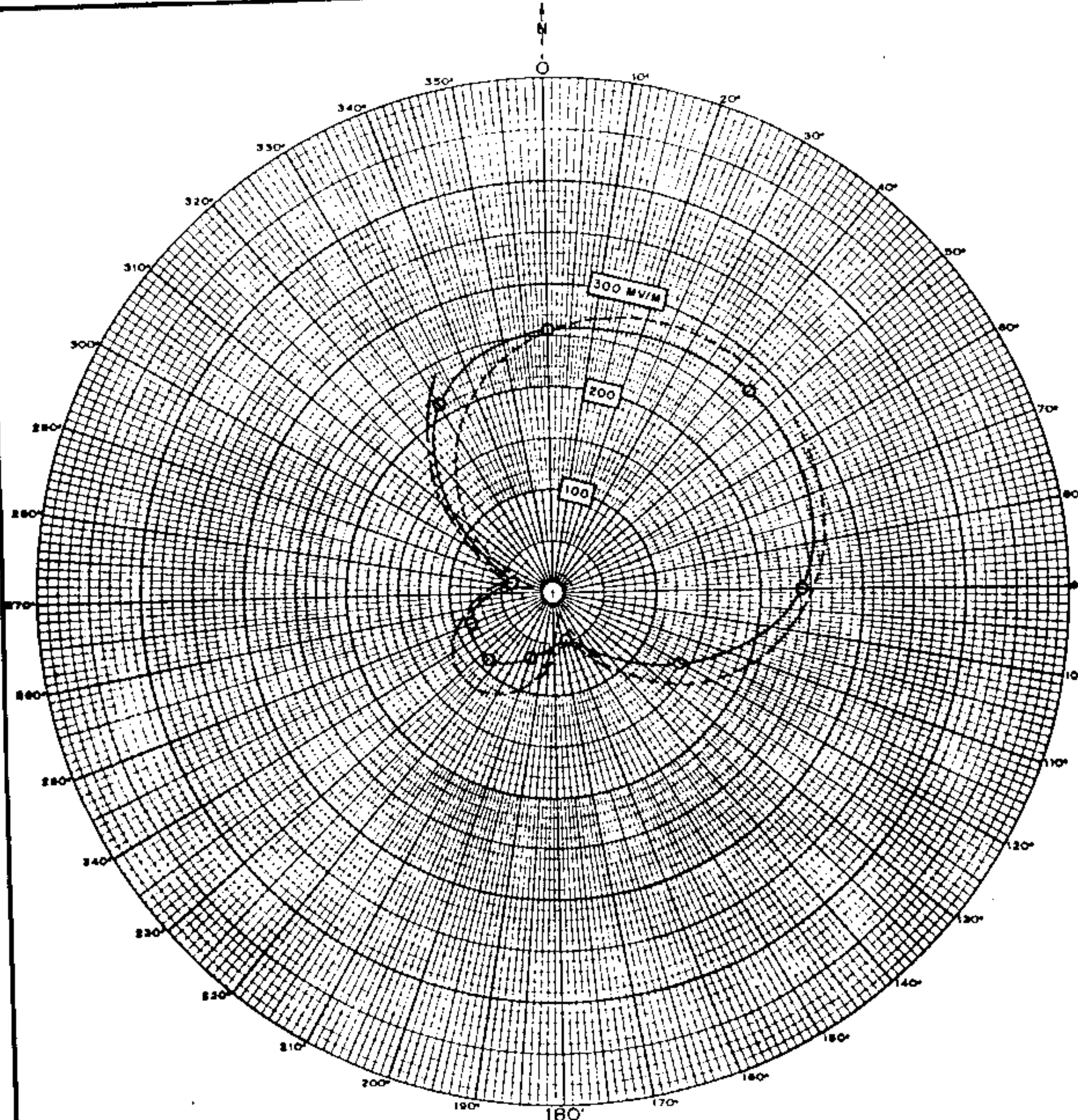
ROBERT L. PURCELL

WASHINGTON, D.C.

WLUZ

Measured Day & Night (10-28-66ct)	Station WLUZ Bayamon, Puerto Rico	1kw,DA-1,U 1600 kc

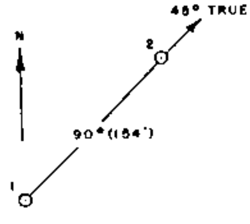
BL-11405
2-6-67
LICENSE
A NEW AM
BROADCAST
STATION.



RMS (THEORETICAL): 180 MV/M
RMS (MEASURED): 175 MV/M

—○—○— MEASURED PATTERN
- - - - - - THEORETICAL PATTERN
— - — - — M.E.O.V.

EXHIBIT I



LATITUDE 18° 21' 38" NORTH
LONGITUDE 66° 09' 30" WEST

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG
1	–	–	0	1.0	–	88
2	45	90	-135	0.89	–	88

MEASURED
DIRECTIONAL PATTERN
FOR
WLUZ
BAYAMON, PUERTO RICO
1600 KC 1 KW U, DA-1
660705

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D. C.

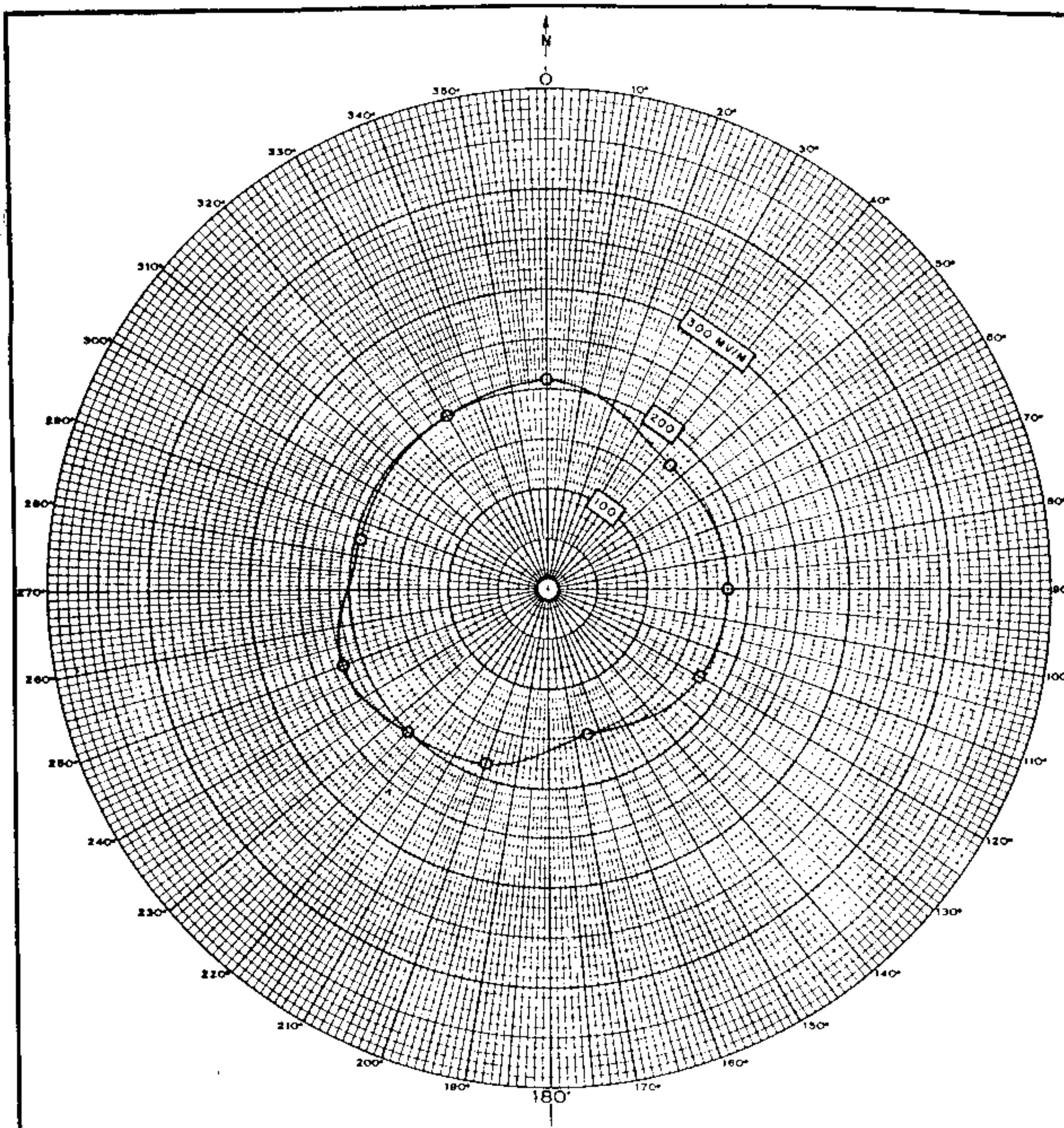
WLUZ

Measured Non-DA
(10-28-66ct)

Station WLUZ
Bayamon, Puerto Rico

1kw,DA-1,U
1600 kc

GRANTED
LICENSE
COVERING A
NEW AM
BROADCAST STATION



RMS: 189 MV/M

EXHIBIT G

LATITUDE 18° 21' 38" NORTH
LONGITUDE 66° 09' 30" WEST

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

MEASURED
NON-DIRECTIONAL PATTERN
FOR
WLUZ
BAYAMON, PUERTO RICO
1600 KC 1 KW U, DA-1
660706

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D. C.

FCC File No.BL-11405
Accepted 10-18-66

Station WLUZ
Bayamon, Puerto Rico

1600 kc

~~WBPR~~ WLUZ

Proposed Day & Night (12-30-63ct)	New; Alfredo Beauchamp Diaz Bayamon, Puerto Rico	1kw,DA-1,U 1600 kc

5/21/64 granted cp on new station

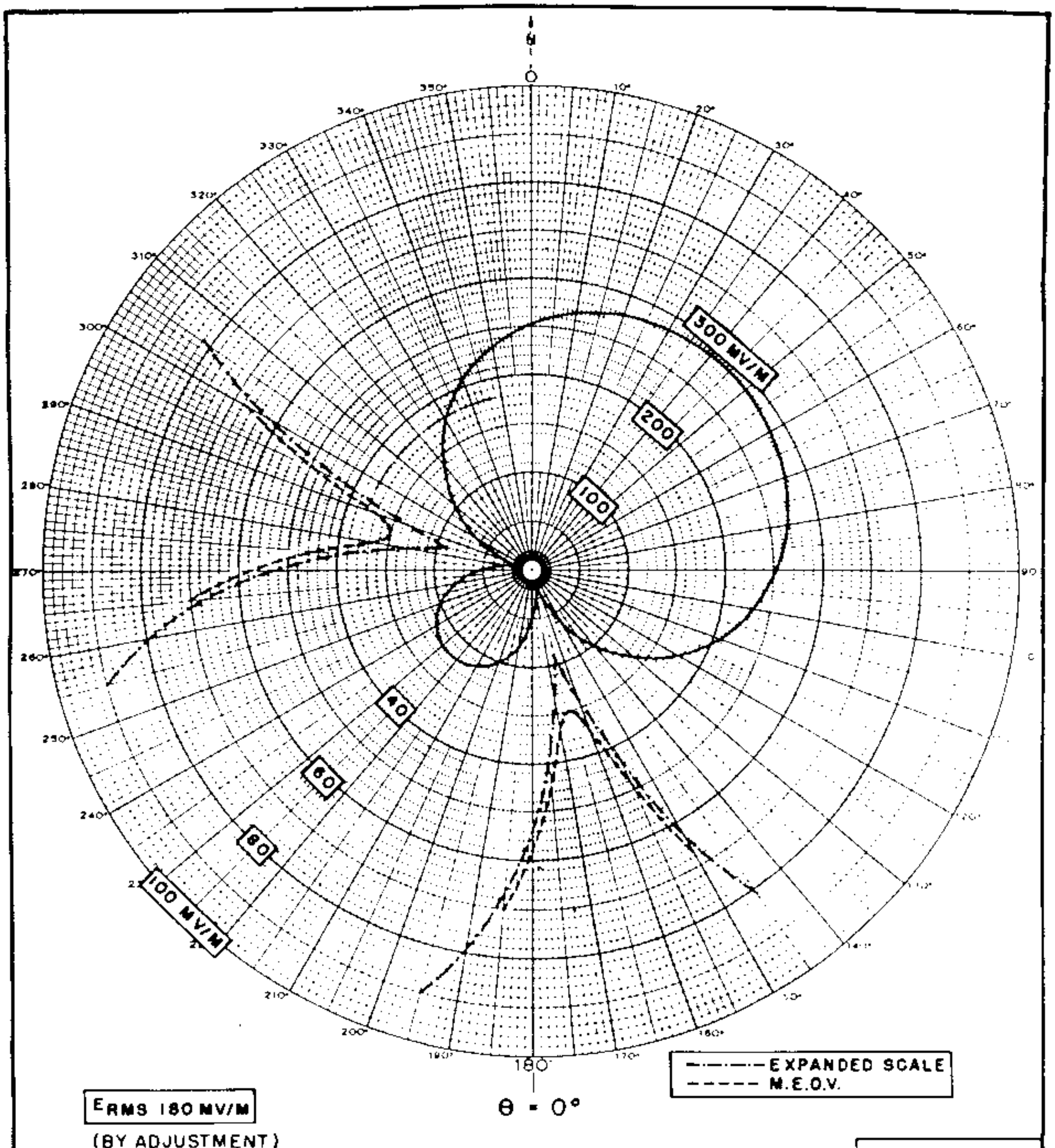
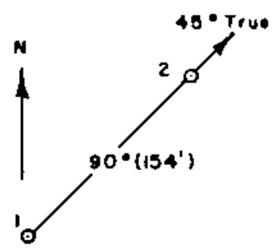


EXHIBIT 5



LATITUDE 18° 21' 38" North
LONGITUDE 66° 09' ~~32"~~ 30 West

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG
1	—	—	0	1.0	—	88
2	45°	90	-135	0.89	—	88

HORIZONTAL PLANE PATTERN FOR PROPOSED
BAYAMON, PUERTO RICO
1600 KC 1 KW, DA-1, U
631023

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D. C.

FCC File No.BP-15329 Accepted 12-13-63 Amended	New; Alfredo Beauchamp Diaz Bayamon, Puerto Rico	1600 kc

WOKB

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WOKB — Main Studio: Winter Garden, Florida

Frequency: 1600 kHz — Power: 5 kW

Notification List No. 1693 — Date: July 15, 1976 — Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:
North Latitude: 28° 34' 06"
West Longitude: 81° 31' 09"

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:	#1(SE)	#2(C)	#3(NW)	#4(N)
HEIGHT ABOVE INSULATORS:	285'	285'	285'	285' (166.8°)
NIGHT PHASING:	0°	0°	0°	-
NIGHT FIELD RATIO:	1.0	1.394	0.518	-
DAY PHASING:	-	0°	-	0°
DAY FIELD RATIO:	-	1.0	-	0.38

SPACING AND ORIENTATION: Daytime, towers #2 and #4 are spaced 307.6' (180°) on a line bearing 5° true.

Nighttime, towers #1, #2, and #3 are spaced 345.2' (202°) on a line bearing 339° true.

GROUND SYSTEM: 120-200' equally spaced copper radials plus a 24' square groun 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	488.23 mv/m	546.56 mv/m	512 mv/m
Night	481.25 mv/m	625.8 mv/m	505 mv/m

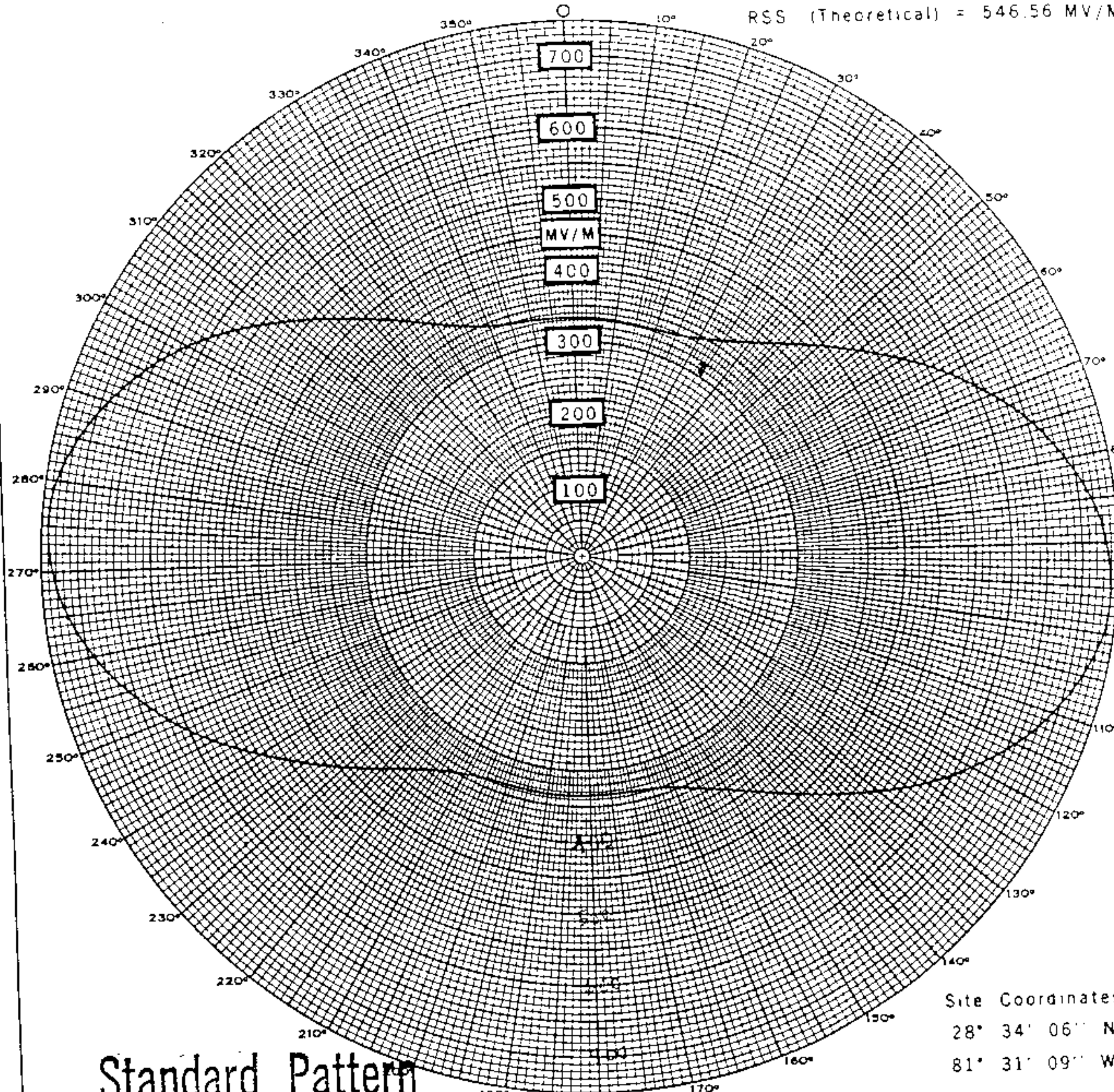
CTR No 30547A3

WOKB

Figure 7

SEPTEMBER 1975

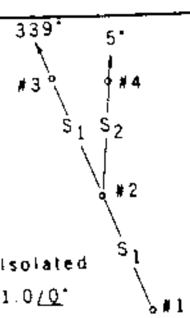
RMS (Theoretical) = 488.23 MV/M
RMS (Standard) = 512 MV/M
RSS (Theoretical) = 546.56 MV/M



Standard Pattern

Site Coordinates
28° 34' 06'' N
81° 31' 09'' W

PROPOSED DAYTIME HORIZONTAL PLANE STANDARD RADIATION PATTERN



S_2 = 180°
S_1 = 202°

#1 Isolated
#2 1.0/0°
#3 Isolated
#4 0.38/0°

G (All) = 166.8°

EVERBACH BROADCASTING
COMPANY, INC.
WINTER GARDEN, FLORIDA

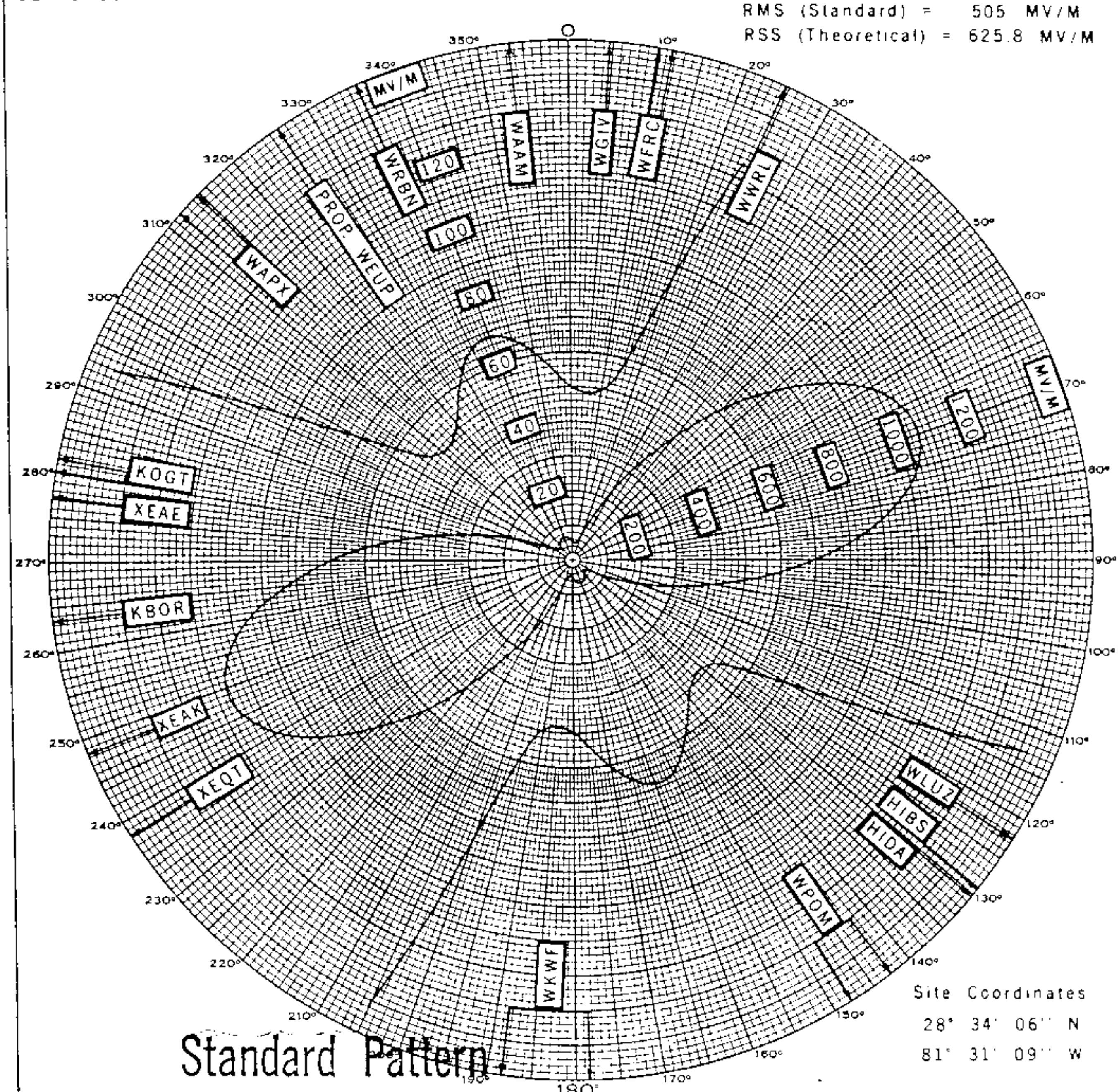
Jules Cohen & Associates
Consulting Electronics Engineers

RADIO STATION WOKB
1600 KHZ

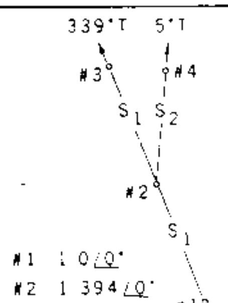
5 KW U DA-2

Pattern No. 750829

WOKB



PROPOSED NIGHTTIME HORIZONTAL PLANE
STANDARD RADIATION PATTERN



S_1=202°
S_2=180°

#1 1.0/0°
#2 1.394/0°
#3 0.518/0°
#4 Isolated

G (All)=166.8°

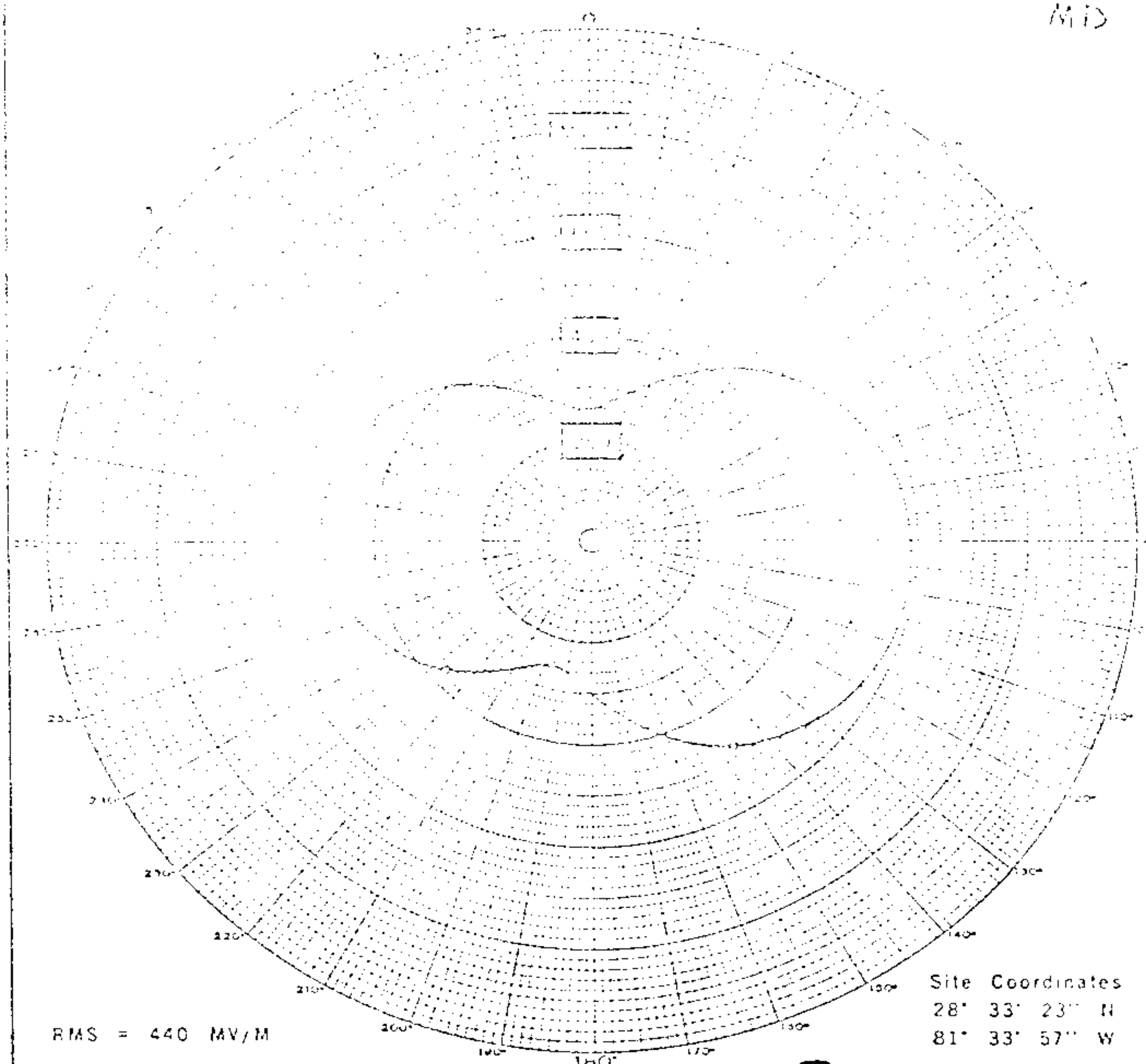
EVERBACH BROADCASTING COMPANY, INC.
WINTER GARDEN, FLORIDA

Jules Cohen & Associates
Consulting Electronics Engineers

RADIO STATION WOKB
1600 KHZ
5 KW U DA-2
Pattern No. 750828

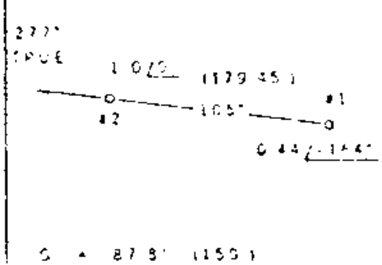
WOKB

MD



BL-13,736

MEASURED DIRECTIONAL HORIZONTAL PLANE RADIATION PATTERN



EVERBACH
BROADCASTING COMPANY, INC.
WINTER GARDEN, FLORIDA

Jules Cohen & Associates
Consulting Electronics Engineers

STATION WOKB

1600 KHZ

5 KW D DA

JUNE 1974

WOKB

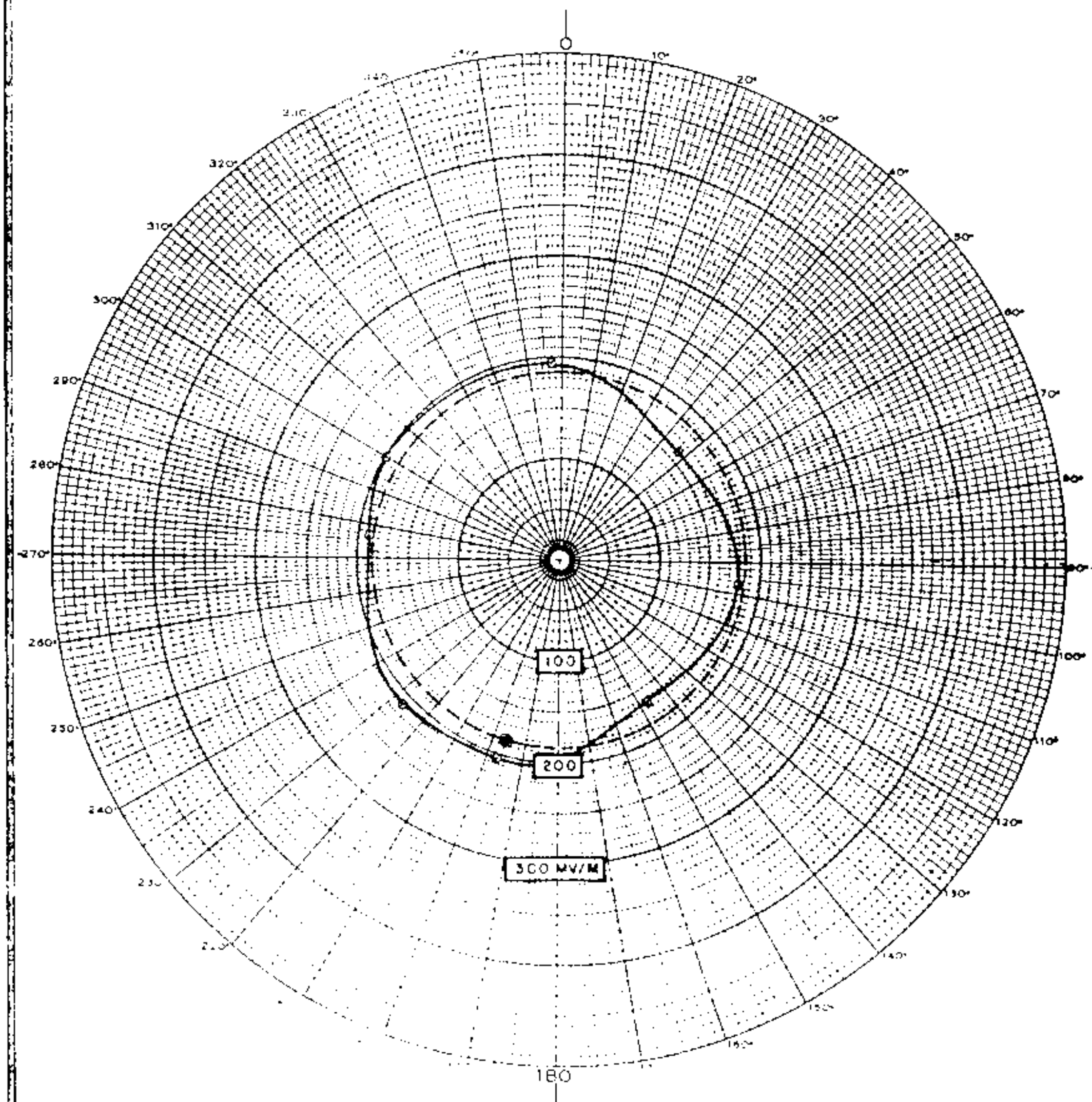
, 10421
, 8-13-65

BL 11305
LIC 8-2-66

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

Station WOKB
Winter Garden, Florida

5kw,DA-D,D
1600 kc



E_{RMS} = 185 MV/M - - - - -

LATITUDE 28° 33' 23" LONGITUDE 81° 33' 57"	ANTENNA PARAMETERS	FIGURE 18 MEASURED NONDIRECTIONAL PATTERN
JOHN H. MULLANEY AND ASSOCIATES A DIVISION OF MULTRONICS, INC.	TOWER #1	RADIO STATION WOKB WINTER GARDEN, FLORIDA 1600 KC 5 KW, DA-D,D

WOKB

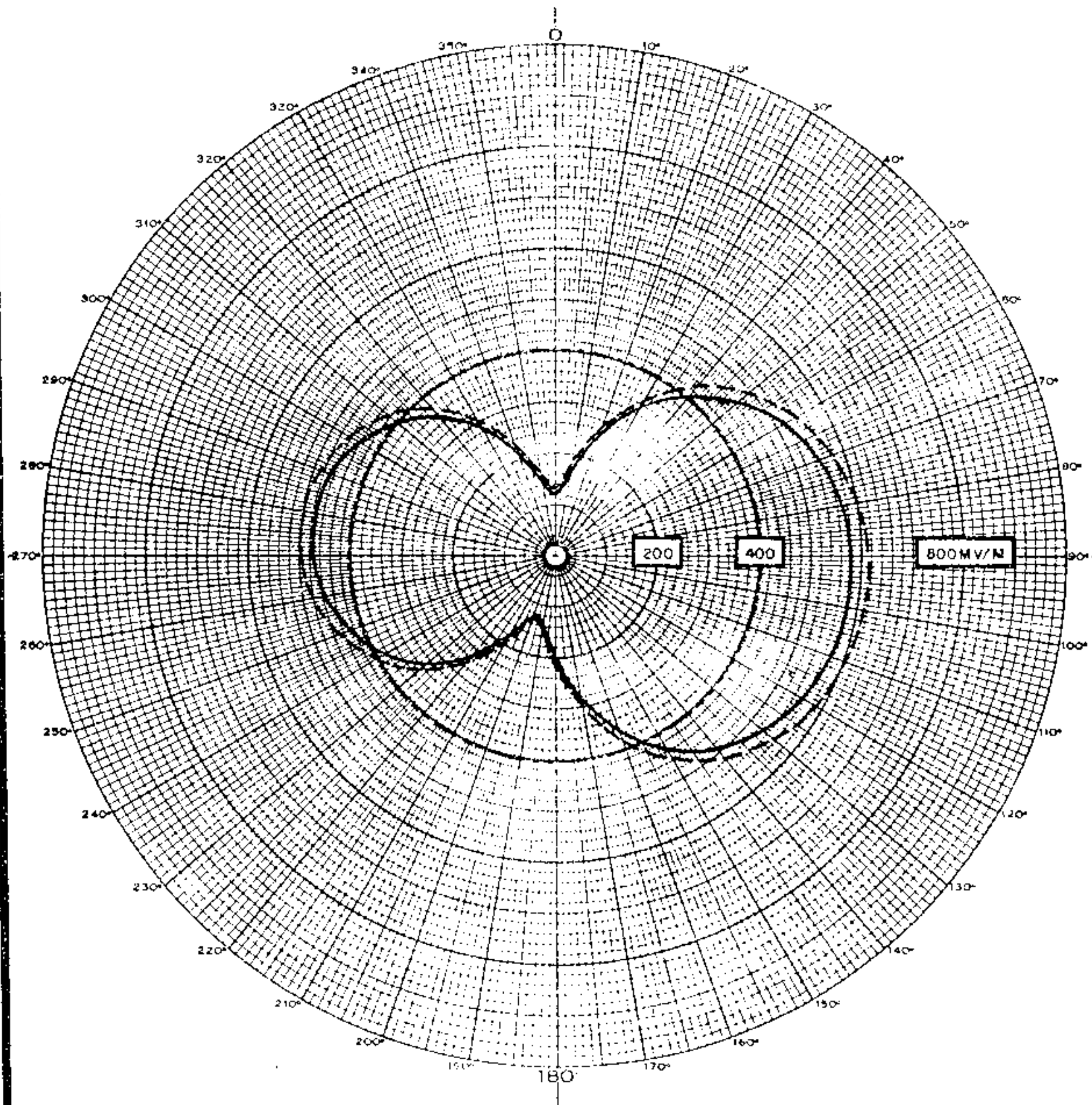
Proposed Day
(4-28-65ct)

Station WOKB
Winter Garden, Florida

5kw,DA-D,D
1600 kc

GR 8-13-65
INCR. PWR
DA-D

BL 11305
LIC 8-2-66



E_{RMS} = 402 MV/M

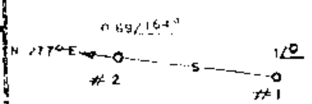
——— CALCULATED
- - - - M.E.O.V.

LATITUDE: 28° 33' 23"
LONGITUDE: 81° 33' 57"

JOHN H. MULLANEY
AND
ASSOCIATES

A DIVISION OF ...

ANTENNA PARAMETERS



S = 105° = 179.45'
G = 87.8° = 150

FIGURE 5

PROPOSED HORIZONTAL
POLAR PATTERN

RADIO STATION WOKB
WINTER GARDEN, FLORIDA

1600 KC

5 KW, DA - D

FCC File No. BP-16421
Accepted 3-30-65

Station WOKB
Winter Garden, Florida

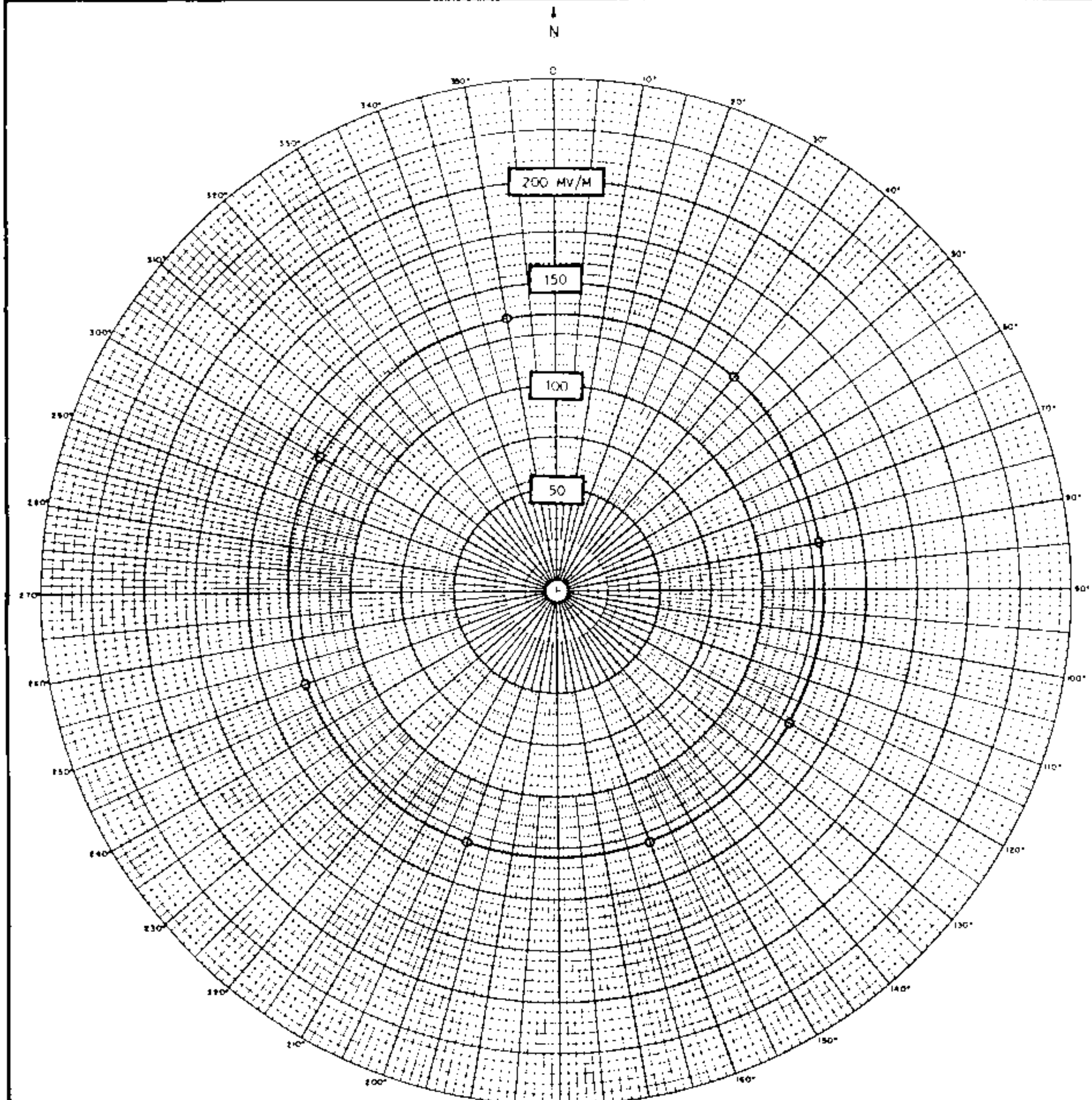
1600 kc

WPDC

MEASURED NON-DA
(6-20-58g)

Station WEZN 500w, DA-D,D
Elizabethtown, Pennsylvania 1600 KC

Granted license
10/31/58



O MEASURED RADIAL VALUES

FIGURE I - 8

HORIZONTAL RADIATION PATTERN

NON - DIRECTIONAL SURVEY

APPLICANT	COLONIAL BROADCASTING CO.
LOCATION	ELIZABETHTOWN, PENNSYLVANIA
FREQUENCY	1600 KC/S
POWER	500 WATTS
LATITUDE	40 DEG 10 MIN 15 SEC
LONGITUDE	76 DEG 35 MIN 50 SEC
WHEN USED	NON-DIRECTIONAL SURVEY
RMS FIELD	131 MV/M
DATE	APRIL 1958

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

FCC File No. BL-7116
Accepted 5-26-58

WEZN
Elizabethtown, Pennsylvania 1600 KC

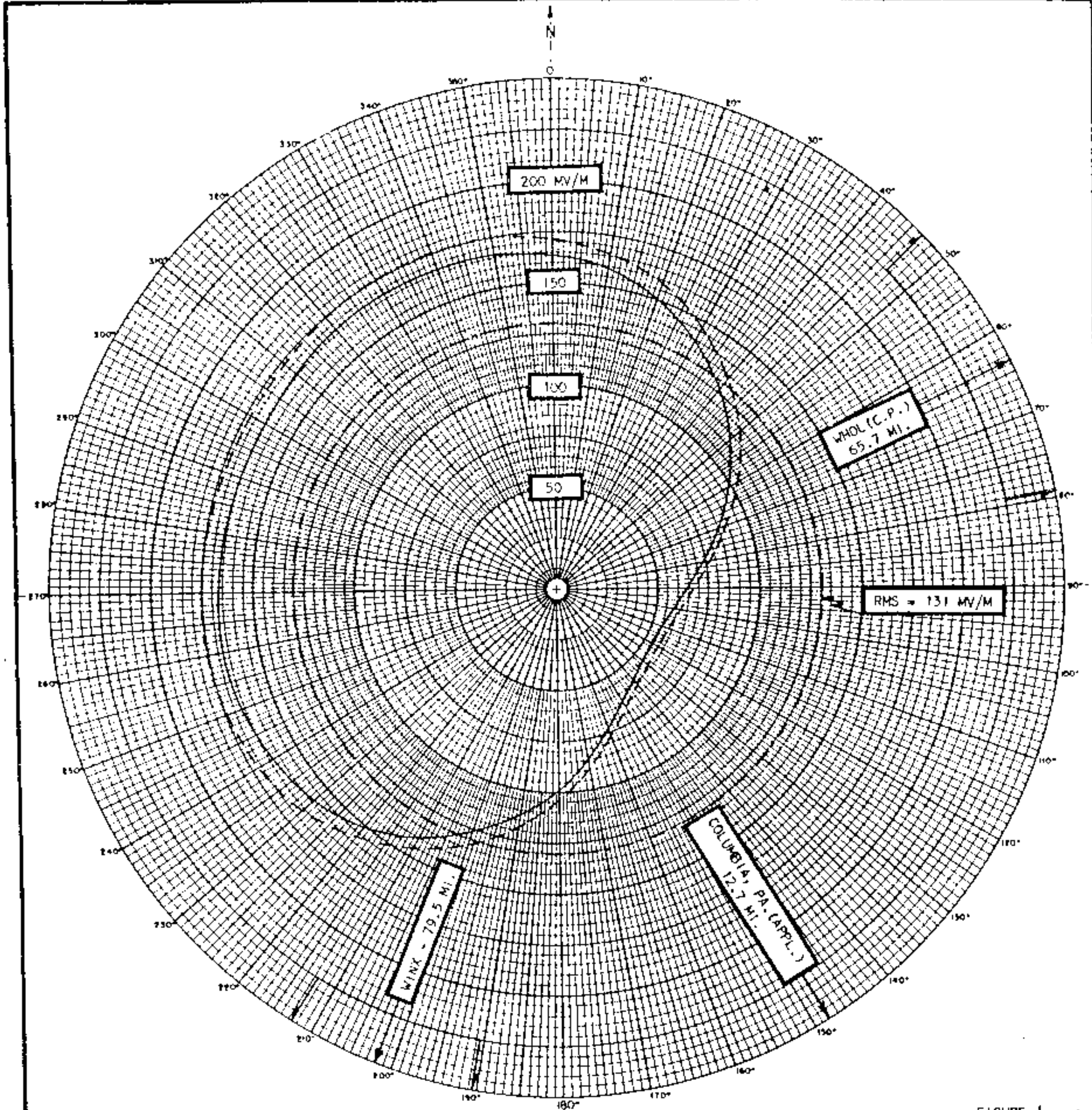
Colonial 1 WPDC

PROPOSED DAY
(6/17/57g)

New, Colonial B/Cng Co.
Elizabethtown, Pennsylvania 1600 KC

Elizabethtown, Pa

Granted CP 8/1/57 for new AM station

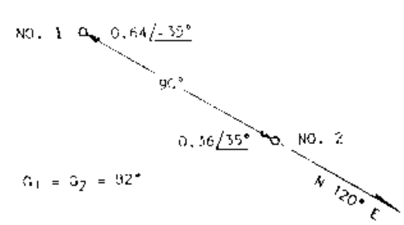


— — — MAXIMUM EXPECTED OPERATING VALUES

FIGURE 1

HORIZONTAL RADIATION PATTERN

ORIENTATION AND SPACING OF ANTENNA SYSTEM



$G_1 = G_2 = 92°$

APPLICANT	COLONIAL BROADCASTING CO.
LOCATION	ELIZABETHTOWN, PENNSYLVANIA
FREQUENCY	1600 KC/S
POWER	0.5 KW-D (DA)
LATITUDE	40 DEG 10 MIN 15 SEC.
LONGITUDE	76 DEG. 35 MIN 50 SEC
WHEN USED	DAYTIME
R.M.S. FIELD	131 MV/M (CALCULATED)
DATE	MAY 1957

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

FCC File No. BP-9759
Accepted 6/12/57 (Docket # 11540)

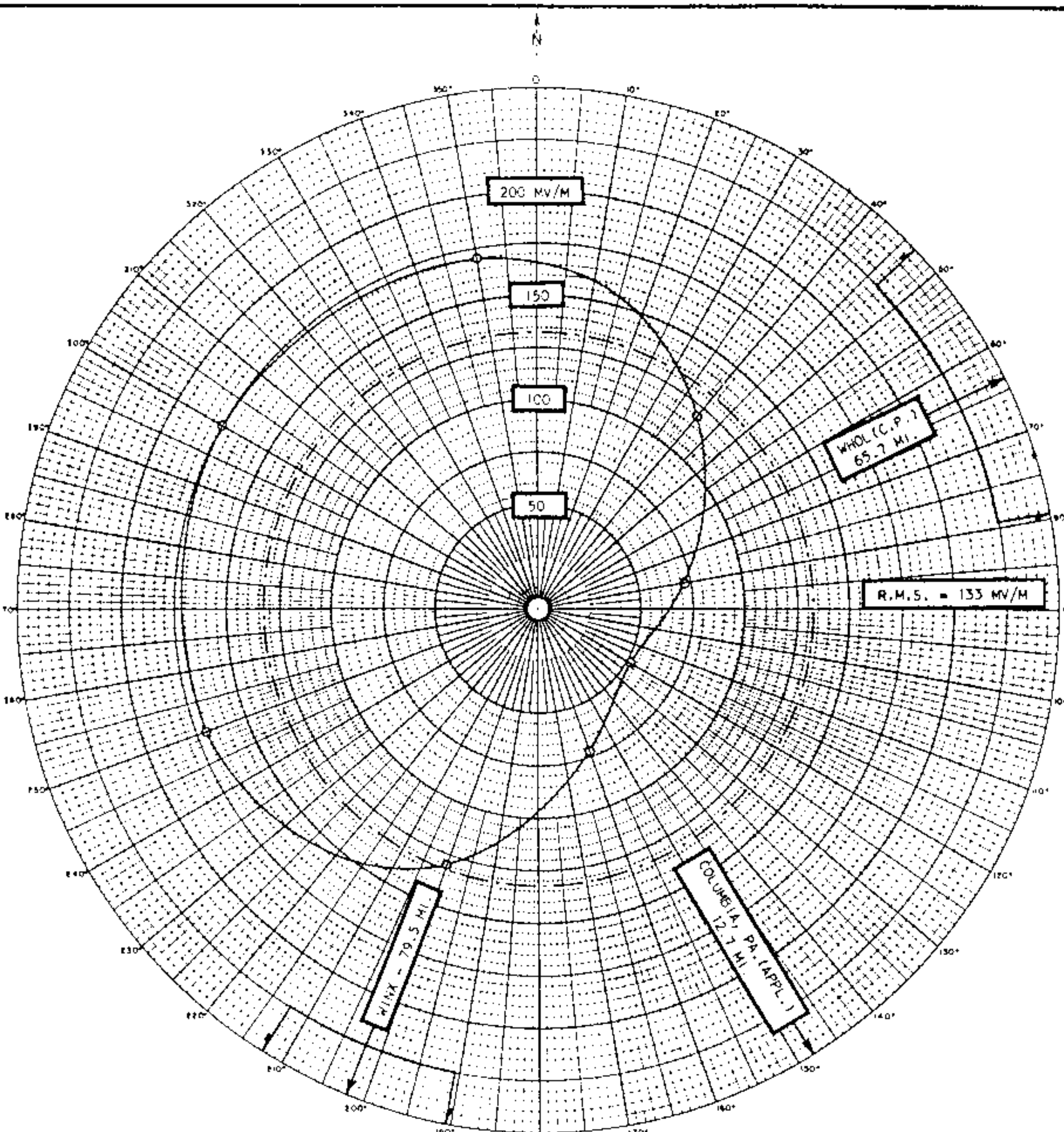
Colonial B/Cing Co.
Elizabethtown, Pennsylvania 1600 KC

WPDC

MEASURED DAY
(6-20-58g)

Station WEZN 500w, DA-D,D
Elizabethtown, Pennsylvania 1600 KC

Granted license
10/31/58

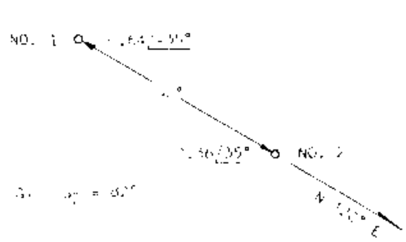


O MEASURED RADIAL VALUES

FIGURE 1 - A

HORIZONTAL RADIATION PATTERN

ORIENTATION AND SPACING
OF ANTENNA SYSTEM



APPLICANT	COLONIAL BROADCASTING CO.
LOCATION	ELIZABETHTOWN, PENNSYLVANIA
FREQUENCY	1600 KC/S
POWER	500 WATTS
LATITUDE	40 DEG 10 MIN 15 SEC
LONGITUDE	76 DEG 35 MIN 50 SEC
WHEN USED	DAYTIME ONLY
R.M.S. FIELD	133 MV/M (MEASURED)
DATE	APRIL 1958

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

FCC File No. BL-7116
Accepted 5-26-58

WEZN
Elizabethtown, Pennsylvania 1600 KC

WPOM

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WPOM — Main Studio: Riviera Beach, Florida

Frequency: 1600 MHz — Power: 1 kW

Notification List No. 1594 — Date: August 21, 1974 — Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:
North Latitude: 26° 45' 43"
West Longitude: 80° 06' 20"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-1) STANDA PATTE
Number of elements: 4
Type of elements: Series-excited, uniform cross-section, guy vertical steel towers.

TOWER:	N(#4)	NC(#3)	SC(#2)	S(#1)
HEIGHT ABOVE INSULATORS:	362'	362'	362'	362' (212°)
PHASING:	+117.11°	-38.01°	+152.24°	0°
FIELD RATIO:	1.9197	3.6618	2.95	1.0

SPACING AND ORIENTATION: From reference tower #1: Tower #2 is spaced 173.833' ([illegible]) on a line bearing 348.60° true, Tower #3 is spaced 282.435' (165.4°) on a line bearing 348.36° true, Tower #4 is spac 404.528' (236.9°) on a line bearing 343.68° true.

GROUND SYSTEM: 120-153' equally spaced copper radials plus 120-50' inter-spaced radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of systems are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
244.77 mv/m	1116.79 mv/m	258.67 mv/m

CTR NO 3123844

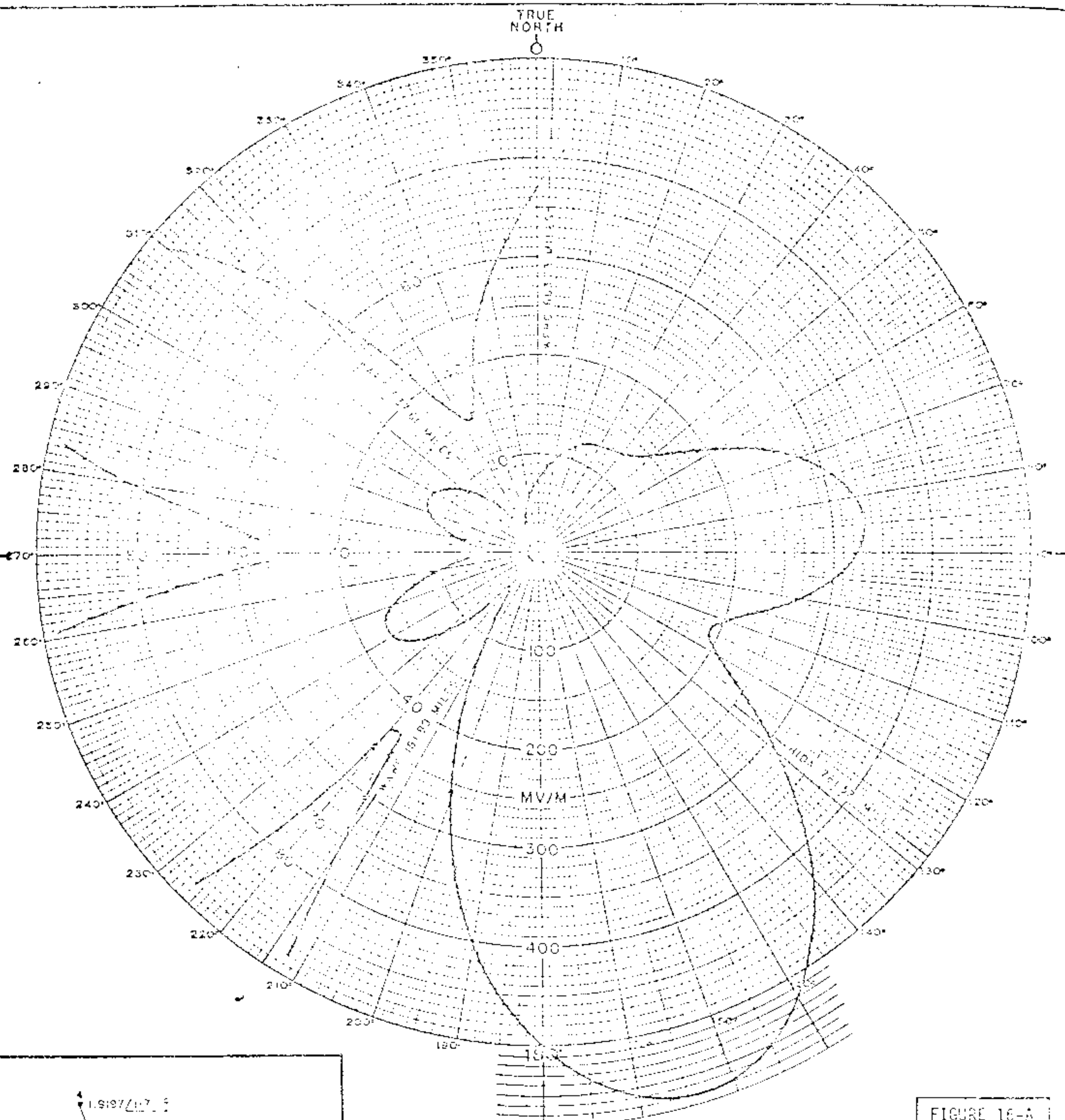
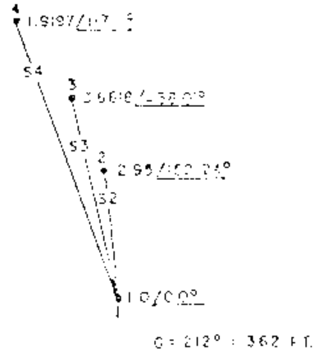


FIGURE 16-A



TOWER	TRUE AZIMUTH	SPACING
2	348.61°	[illegible]
3	348.36°	10?.4°
4	343.61°	236.9°

STANDARD HORIZONTAL PLANE PATTERN

RMS STANDARD	258.6715 MV/M
RMS THEORETICAL	244.7666 MV/M
RSS THEORETICAL	1116.7864 MV/M
N. LATITUDE	26° 45' 43"
W. LONGITUDE	80° 06' 20"
DATE	6-5-74
SUPERSEDES	12-15-73

RADIO STATION WPOM
RIVIERA BEACH, FLORIDA
PROPOSED
1600 KHZ - 1 KW - DA-1

RUSSELL P. MAY
Consulting Radio Engineer
Melbourne, Florida

WPOM

MEASURED NON-DA (8-22-61ct) | WHEW Riviera Beach, Florida | 1kw, 1600 KC

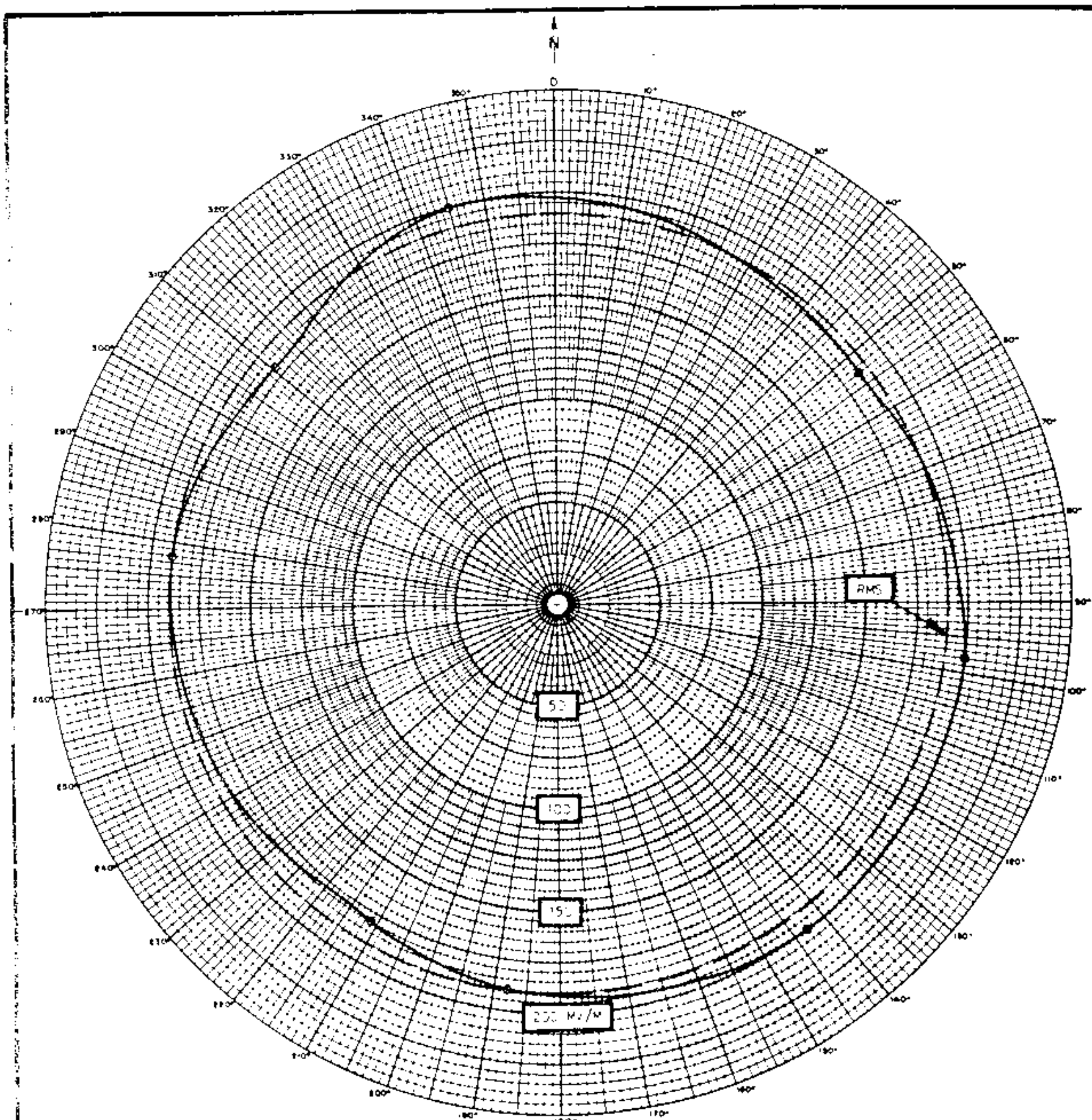


FIGURE 1

HORIZONTAL RADIATION PATTERN

NON-DIRECTIONAL SURVEY

APPLICANT	WHEW
LOCATION	RIVIERA BEACH, FLORIDA
FREQUENCY	1600 KC/S
POWER	1 KW-U(DA-N)
LATITUDE	26 DEG 45 MIN 43 SEC
LONGITUDE	80 DEG 06 MIN 19 SEC.
WHEN USED	DAYTIME
RMS FIELD	190.7 MV/M
DATE	APRIL 1961

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

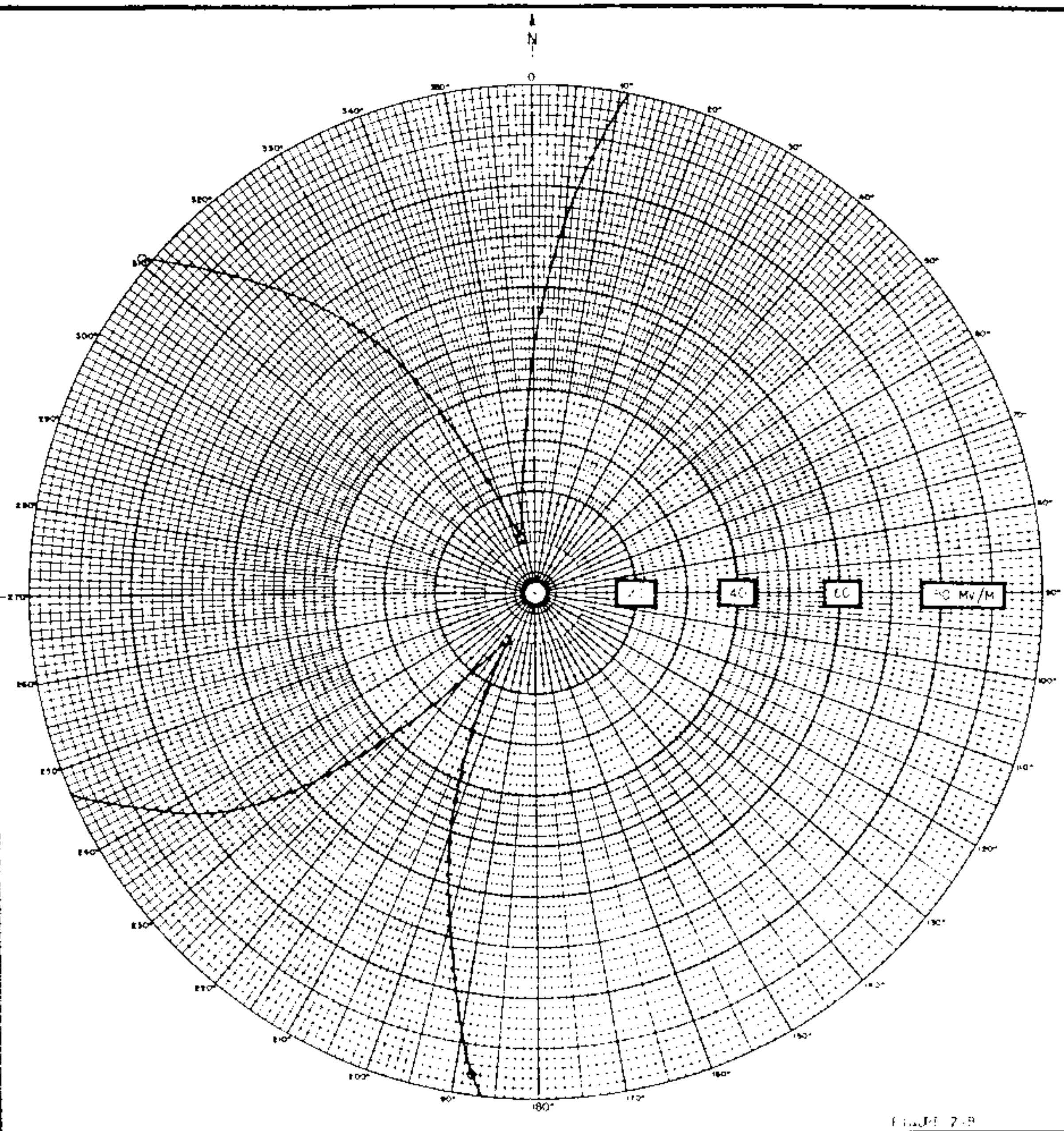
FCC File No. BL-8597 | WHEW |
Accepted 8-16-61 | Riviera Beach, Florida | 1600 KC

WPOM

MEASURED NIGHT NULLS (8-22-61ct)

WHEW
Riviera Beach, Florida

1600 KC



EXPANDED VIEW

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

WPOM

MEASURED NIGHT (8-22-61ct) | WHEW Riviera Beach, Florida | 1kw, DA-N,U 1600 KC

3-1-62 granted L for DA-N

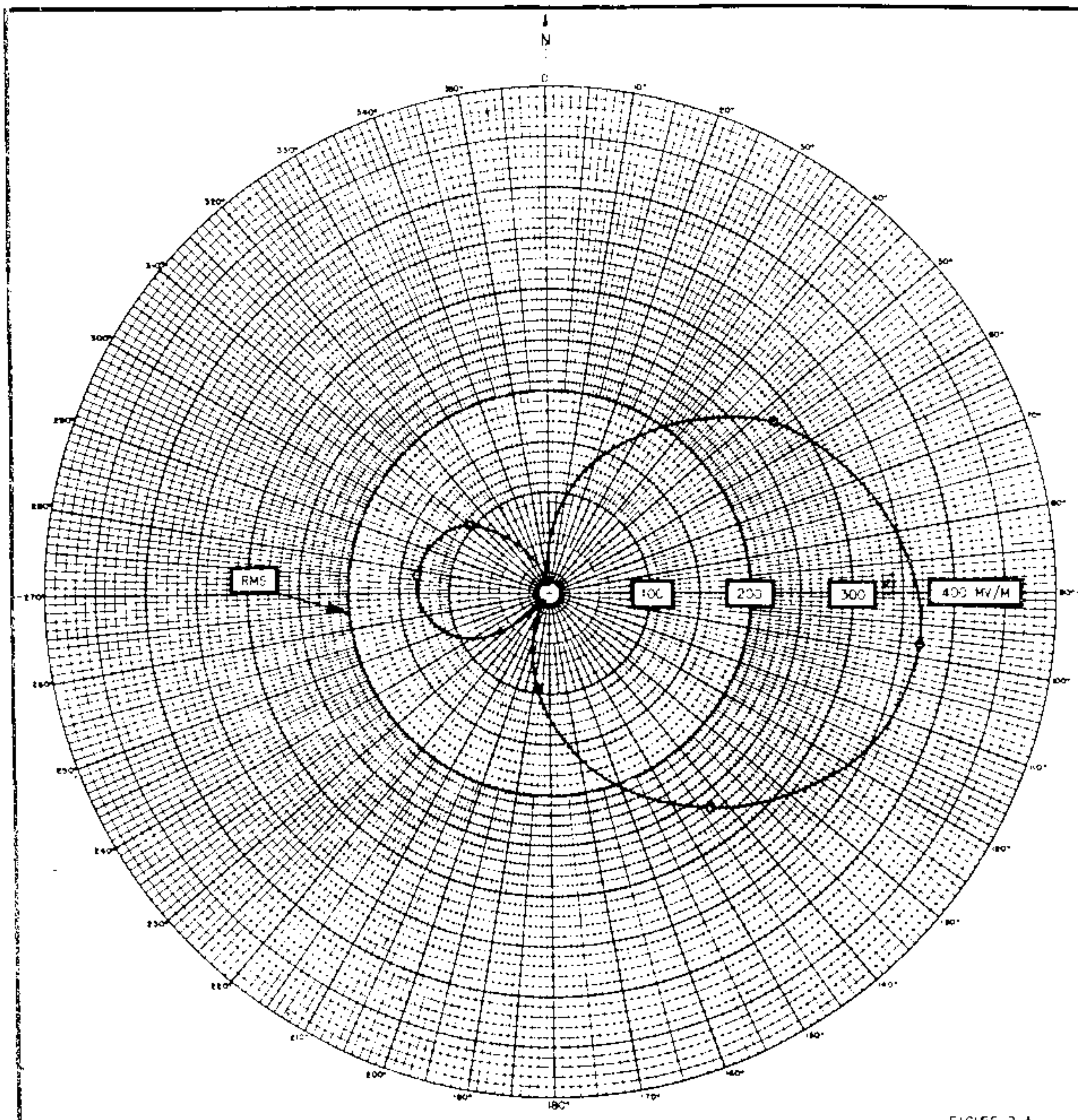
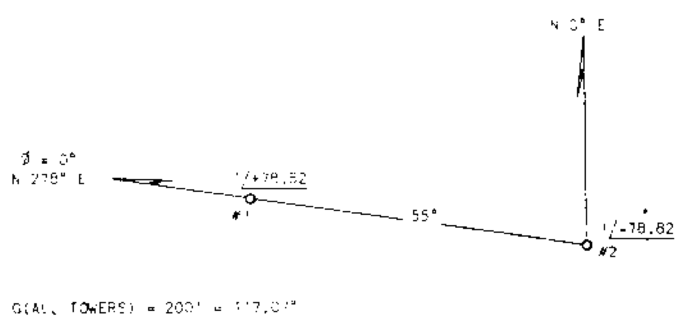


FIGURE 2-A

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION



APPLICANT	WHEW
LOCATION	RIVIERA BEACH, FLORIDA
FREQUENCY	1600 KC/S
POWER	1 KW-U(DA-N)
LATITUDE	26 DEG 45 MIN 43 SEC
LONGITUDE	80 DEG 06 MIN 19 SEC
WHEN USED	NIGHTTIME
RMS FIELD	201.7 MV/M
DATE	APRIL 1961

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

FCC File No. BL-8597 Accepted 8-16-61 | WHEW Riviera Beach, Florida | 1600 KC

WPOM

PROPOSED NIGHT NULLS
(11-17-58g)

Station WHEW
Riviera Beach, Florida

1kw, DA-N, U
1600 KC

Granted MCP + install DA-N
3-9-60

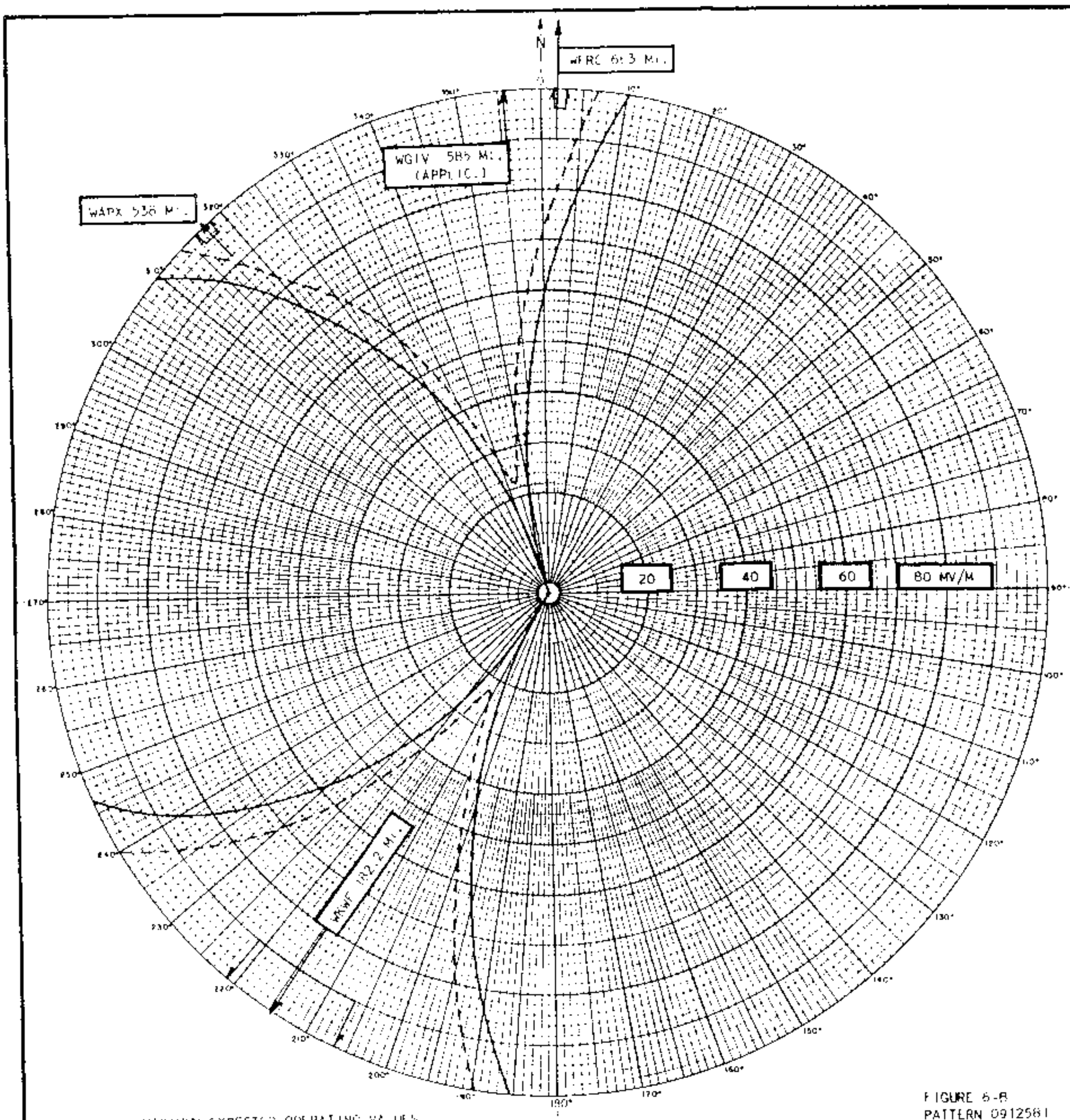


FIGURE 6-B
PATTERN 0912581

HORIZONTAL RADIATION PATTERN

WHEW - RIVIERA BEACH, FLORIDA

EXPANDED VIEW

APPLICANT	ROBERT HECKSHER (WHEW)
LOCATION	RIVIERA BEACH, FLORIDA
FREQUENCY	1600 KC/S
POWER	1 KW-U-DA-N
LATITUDE	26 DEG 45 MIN 43 SEC
LONGITUDE	80 DEG 06 MIN 19 SEC
WHEN USED	NIGHTTIME
R.M.S. FIELD	175 MV/M (CALCULATED)
DATE	SEPTEMBER 1958

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

FCC File No. BMP-8303
Accepted 11-12-58

WHEW
Riviera Beach, Florida

1600 KC

✓ WPOM

~~W~~

granted MCP to Install DA-N
3-9-60

3-1-62
granted L
for DA-N

PROPOSED NIGHT
(11-17-58g)

Station WHEW
Riviera Beach, Florida

1kw, DA-N, U
1600 KC

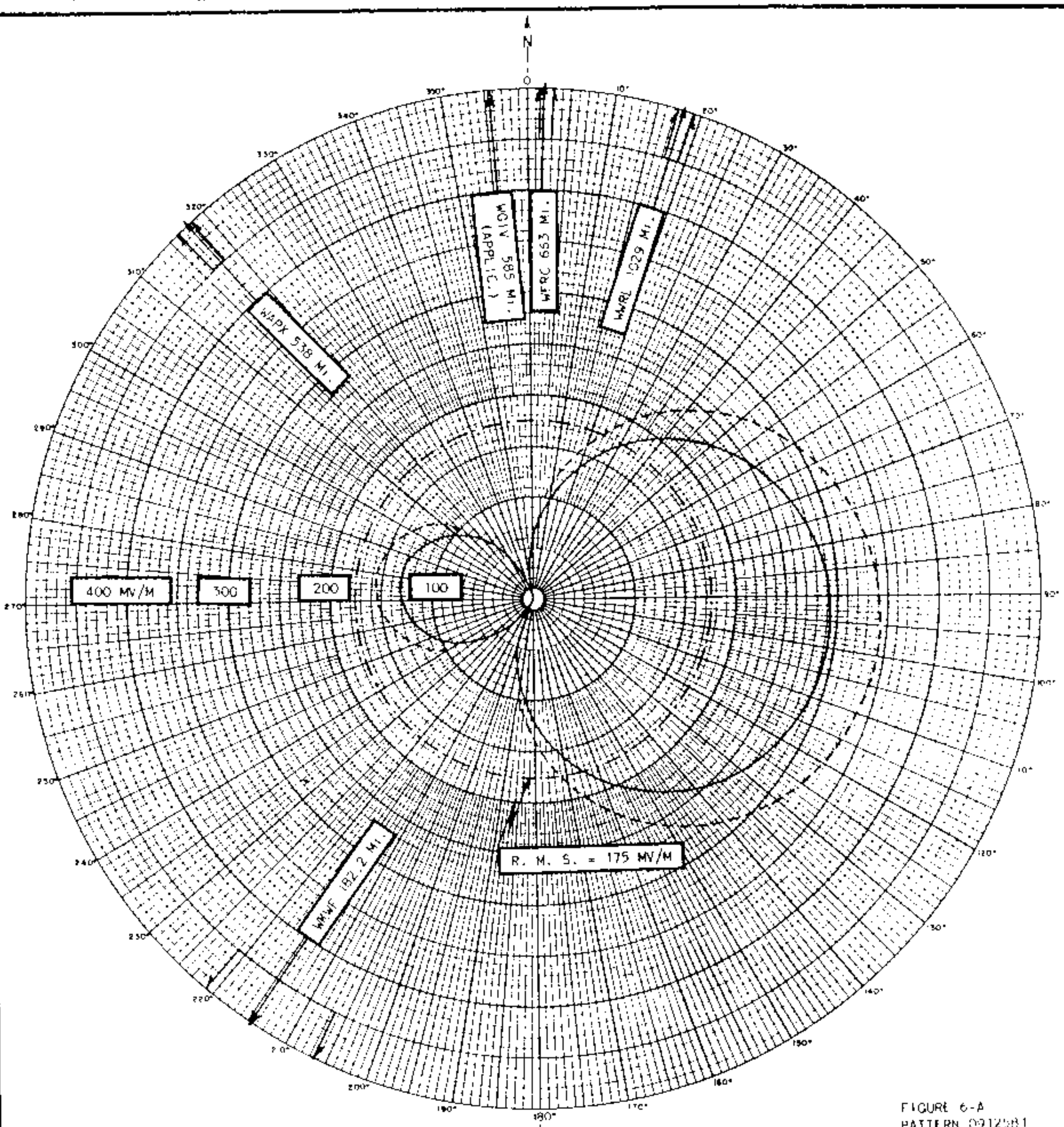
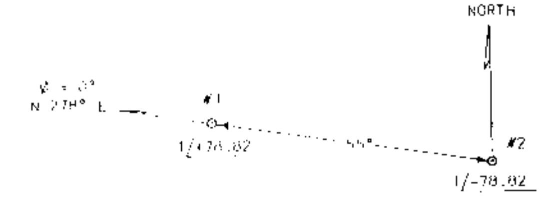


FIGURE 6-A
PATTERN 0912581

– – – – MAXIMUM EXPECTED OPERATING VALUES

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION



APPLICANT	ROBERT HECKSHER (WHEW)
LOCATION	RIVIERA BEACH, FLORIDA
FREQUENCY	1600 KC/S
POWER	1 KW-U-DA-N
LATITUDE	26 DEG 45 MIN 43 SEC
LONGITUDE	80 DEG 06 MIN 19 SEC
WHEN USED	NIGHTTIME
RMS FIELD	175 MV/M (CALCULATED)
DATE	SEPTEMBER 1958

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

FCC File No. BMP-8303
Accepted 11-12-58

WHEW
Riviera Beach, Florida

1600 KC

WQCK

SUPPLEMENTAL AND CORRECTED
DIRECTIONAL ANTENNA DESCRIPTION SHEET
Issued: ________________ 19 __

Station: WQCK | Main Studio: Warner Robins, Georgia

Frequency: 1600 KHz | Power: 0.5 Kw Night 2.5 Kw Day

Notification: 1778 | Date: August 30, 1978 | Class: III

GEOGRAPHICAL LOCATION OF THE CENTERS OF DAYTIME AND NIGHT-TIME ANTENNA SYSTEMS:

NIGHTTIME:	North Latitude:	32°	38'	03"
	West Longitude:	83°	40'	18"
DAYTIME:	North Latitude:	32°	38'	19"
	West Longitude:	83°	38'	33"

Authorized for Nighttime operation. (DA-N)

Predicted effective Day Field: (omnidirectional) 298.8 mv/m at rated power.

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* Note: Please retain the description sheet and directional antenna radiation patterns notified for station WRBN (now WQCK) in United States Change List Number 1475, dated May 3, 1972 and attach to this supplemental Description Sheet. This notification is for the purpose of indicating only an increase in the daytime power and to supply the new predicted effective field of the omnidirectional antenna employed daytime with nighttime operation continued as previously notified.

WQCK

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WQCK

Frequency: 1600 kHz

Notification List No. 1773

Main Studio: Warner Robins, Georgia

Power: 0.5kw Night 1kw Day

Date: March 29, 1978 Class: III

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

Daytime		Nighttime	
North Latitude:	32° 38' 19"	North Latitude:	32° 38' 03"
West Longitude:	83° 38' 33"	West Longitude:	83° 40' 18"

Authorized for Nighttime operation (DA-N) .

Predicted effective Day Field: (omnidirectional) 189 mv/m at rated power.

Note: Please retain the description sheet and directional antenna radiation patterns notified for station WREN (now WQCK) in United States Change List Number 1475, dated May 3, 1972 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 daytime antenna system.

WRBN

SUPPLEMENTAL AND CORRECTED
DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WRBN

Main Studio: Warner Robins, Georgia

Frequency: 1600 kHz

Power: 0.5 kW Night 1 kW Day

Notification List No. 1597

Date: September 11, 1974 Class: III

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

	Daytime				Nighttime		
North Latitude	32°	$38'$	$16''$	North Latitude	32°	$38'$	$03''$
West Longitude	83°	$38'$	$30''$	West Longitude	83°	$40'$	$18''$

Authorized for Nighttime operation (DA-N).

Predicted effective Day Field: (omnidirectional) 189 mv/m at rated power.

Note: Please retain the description sheet and directional antenna radiation patterns notified for station WRBN in United States Change List Number 1475, dated May 3, 1972, and attach to this supplemental Description Sheet. This notification is for the purpose of indicating only a change in the geographical coordinates of the center of the Nighttime antenna system.

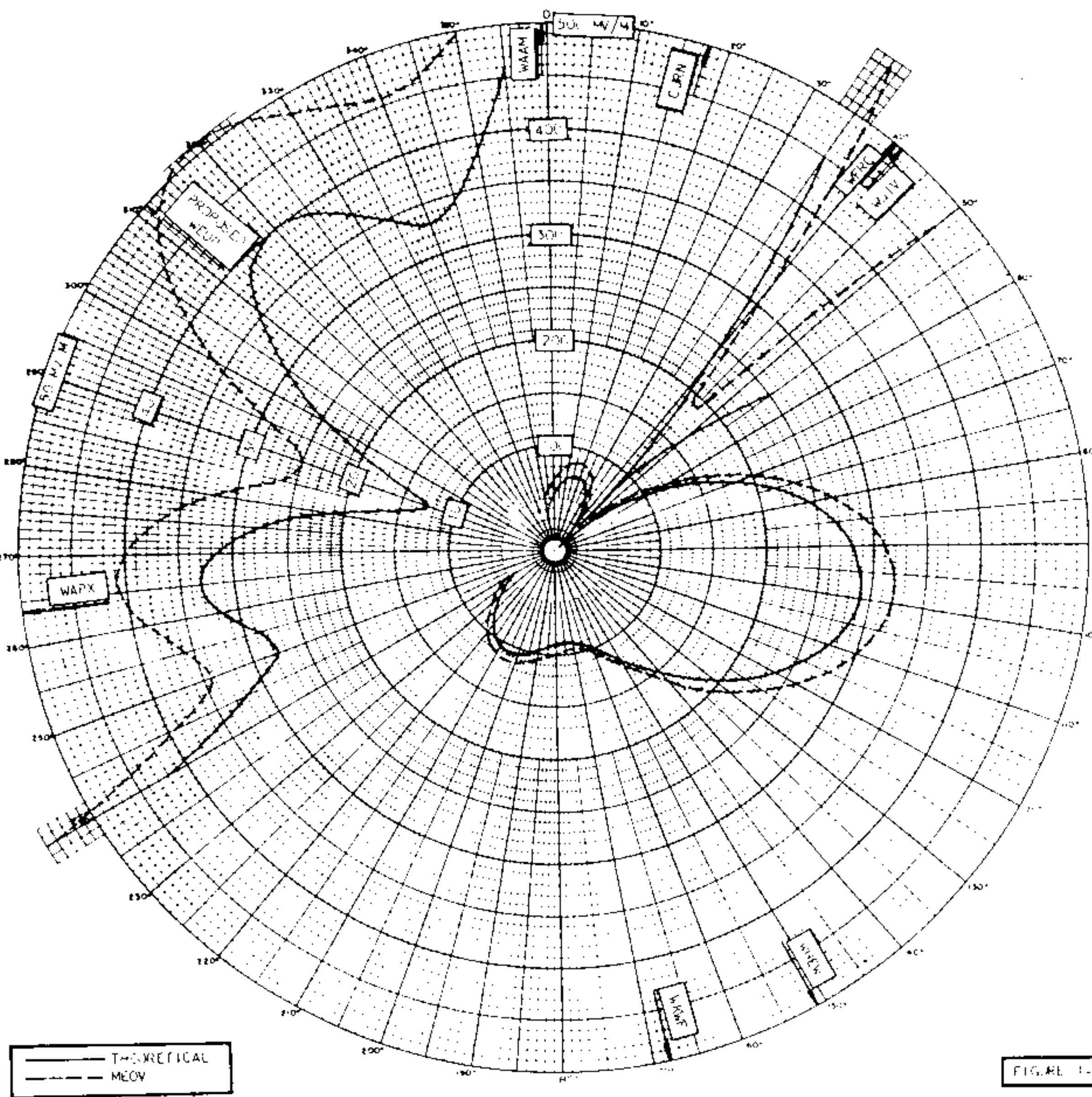
CTR NO 31310A4

WRBN

Proposed Night
(4-29-69ct)

Station WRBN
Warner Robins, Georgia

500w,1kw-LS,DA-N,U
1600 kc



HORIZONTAL RADIATION PATTERN

APPLICANT	
LOCATION	WARNER ROBINS, GEORGIA
FREQUENCY	KC/S
POWER	
LATITUDE	DEG MIN SEC
LONGITUDE	DEG 38 MIN SEC
WHEN USED	
RMS FIELD	
DATE	

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

FCC File No.BP-18409
Accepted 4-23-69

Station WRBN
Warner Robins, Georgia

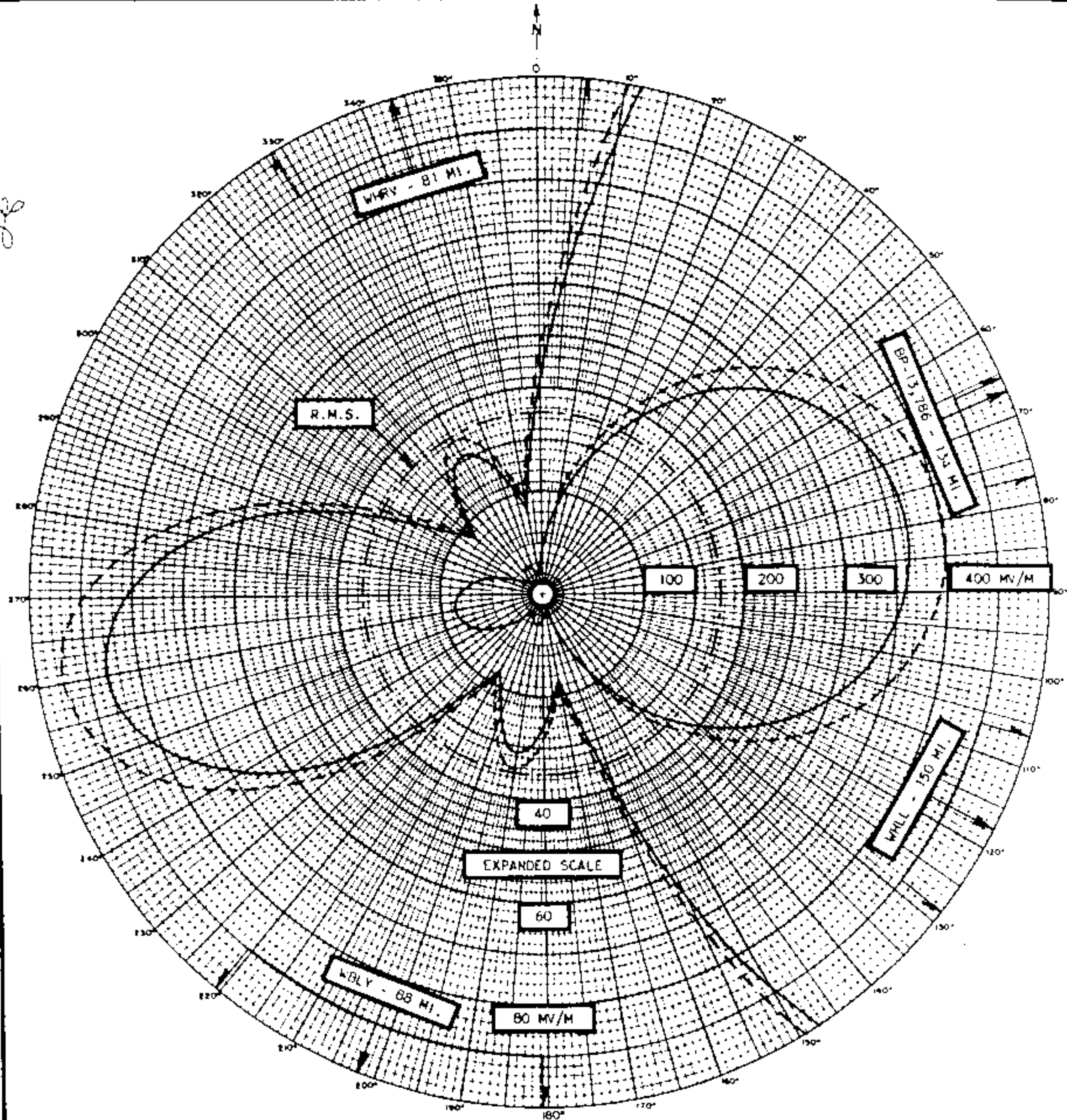
1600 kc

#202
10-2-64
BL 10610
granted for
DA-D change

PROPOSED DAY
(6-14-61g)

Station WTTF
Tiffin, Ohio

1kw, DA-D,D
1600 KC

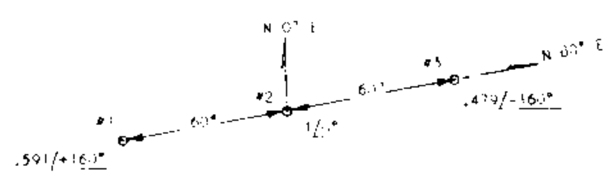


— — — MAXIMUM EXPECTED OPERATING VALUES

FIGURE 1

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION



G (ALL TOWERS) = 85° (145°)

APPLICANT	WTTF, INC.
LOCATION	TIFFIN, OHIO (WTTF)
FREQUENCY	1600 KC/S
POWER	1 KW-D-DA
LATITUDE	41 DEG 07 MIN 32 SEC
LONGITUDE	83 DEG 13 MIN 45 SEC
WHEN USED	DAYTIME
RMS FIELD	176 MV/M
DATE	APRIL 1961

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

FCC File No. BP-14822
Accepted 6-5-61

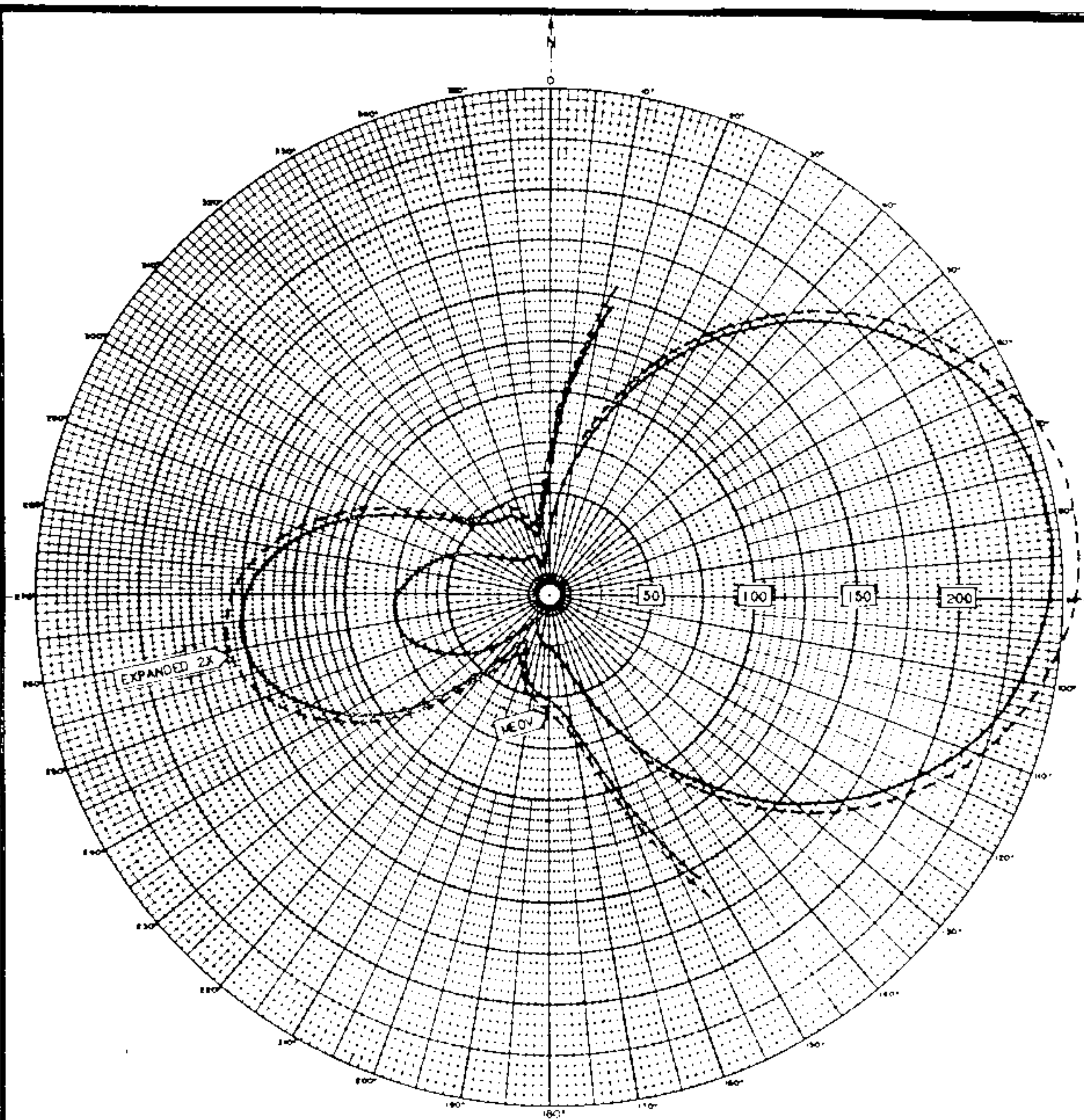
WTTF
Tiffin, Ohio

1600 KC

WTTF

Proposed Day (2-26-63ct)	Station WTTF Tiffin, Ohio	500w, DA-D, D 1600 kc

3-27-63
granted CP to
make changes in
DA system



E_{RMS} = 125 MV/M (BY POWER ADJUSTMENT)

LATITUDE: 41° 07' 32"
LONGITUDE: 83° 13' 55"

CHARLES E. BRENNAN
CONSULTING RADIO ENGINEERS
MILWAUKEE, WISCONSIN

ANTENNA PARAMETERS

G'h = 85°
Spacings: Space Ref. Point to #1 & 3 = 80°
Space Ref. Point to #2 = 20.14°

267.97° 1.0/-7°
0.555/-154°
#3 → 82°T
#1 #2 Space Ref. Point
0.555/+154°

630117 FIGURE 7

PROPOSED AMENDMENT
TO
DIRECTIONAL ANTENNA PATTERN
RADIO STATION WTTF
TIFFIN, OHIO

1600 KC 500 DA-D

FCC File No. BP-15835 Accepted 2-1-63	Station WTTF Tiffin, Ohio	1600 kc

Tiffin, Ohio

WTTF

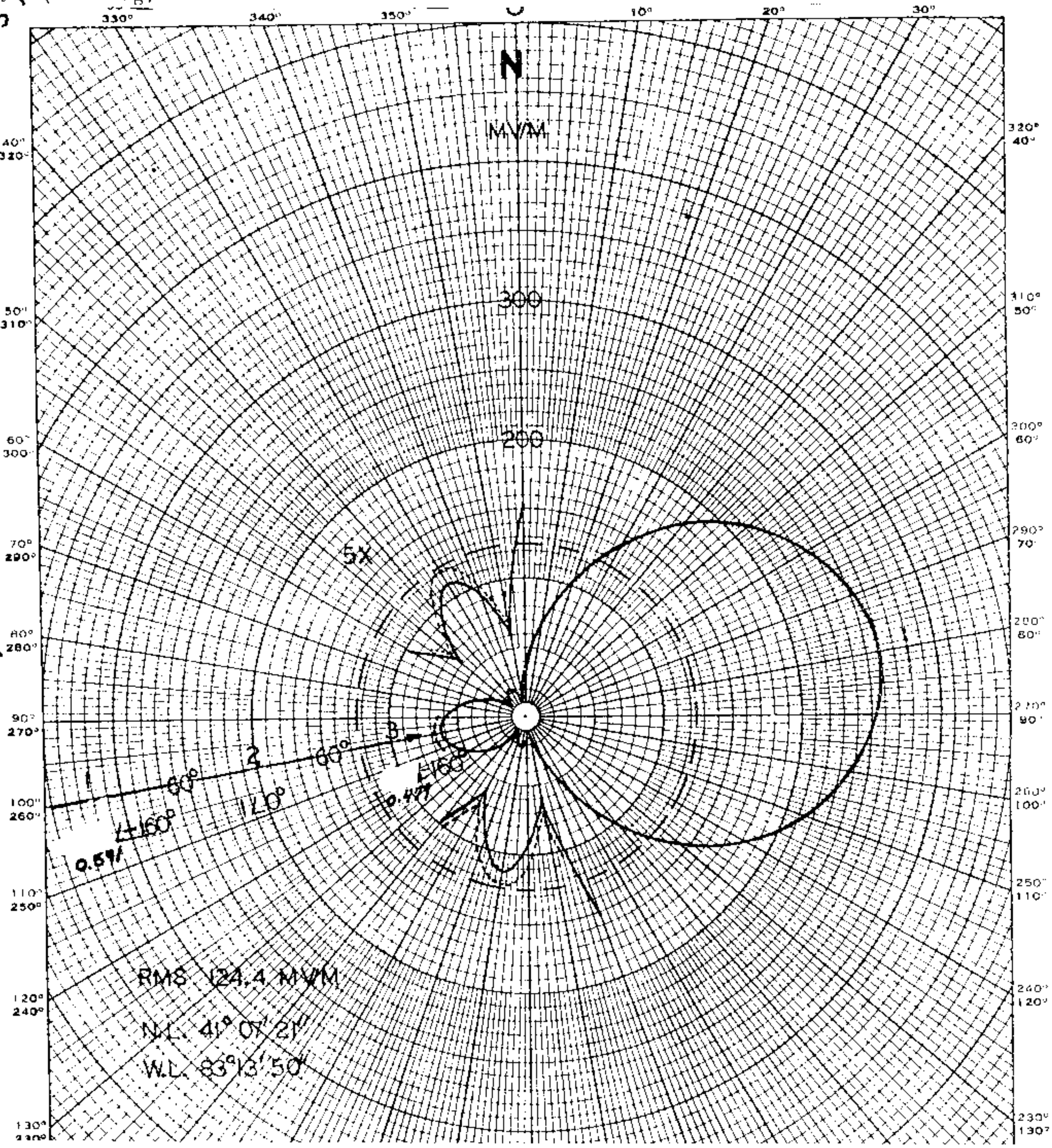
7-22-59

Granted CP for a new station
granted MCP to change DA pattern 12-22-59

PROPOSED DAY
(1-8-59g)

Malrite Bcstng. Co.
Tiffin, Ohio

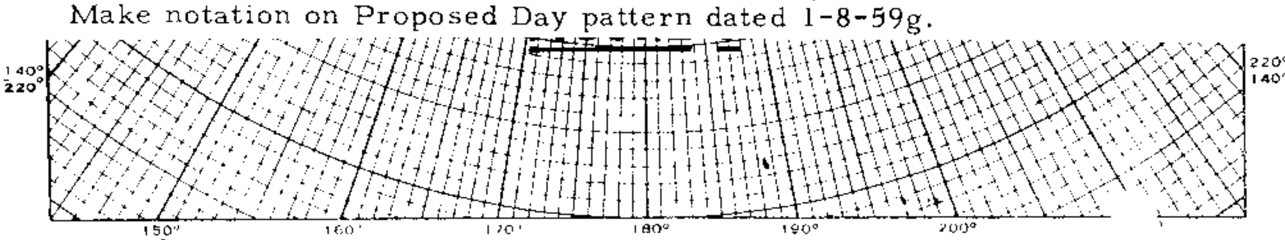
500w, DA-D, D
1600 KC



1600 KC WTTF - Tiffin, Ohio; BMP-8826. An application to modify CP was accepted by the FCC. Proposed modification is:

Limit of 171° True be increased to 15.4 mv/m.

Make notation on Proposed Day pattern dated 1-8-59g.



FCC File No. BP-11448
Accepted 12-29-58 Amended

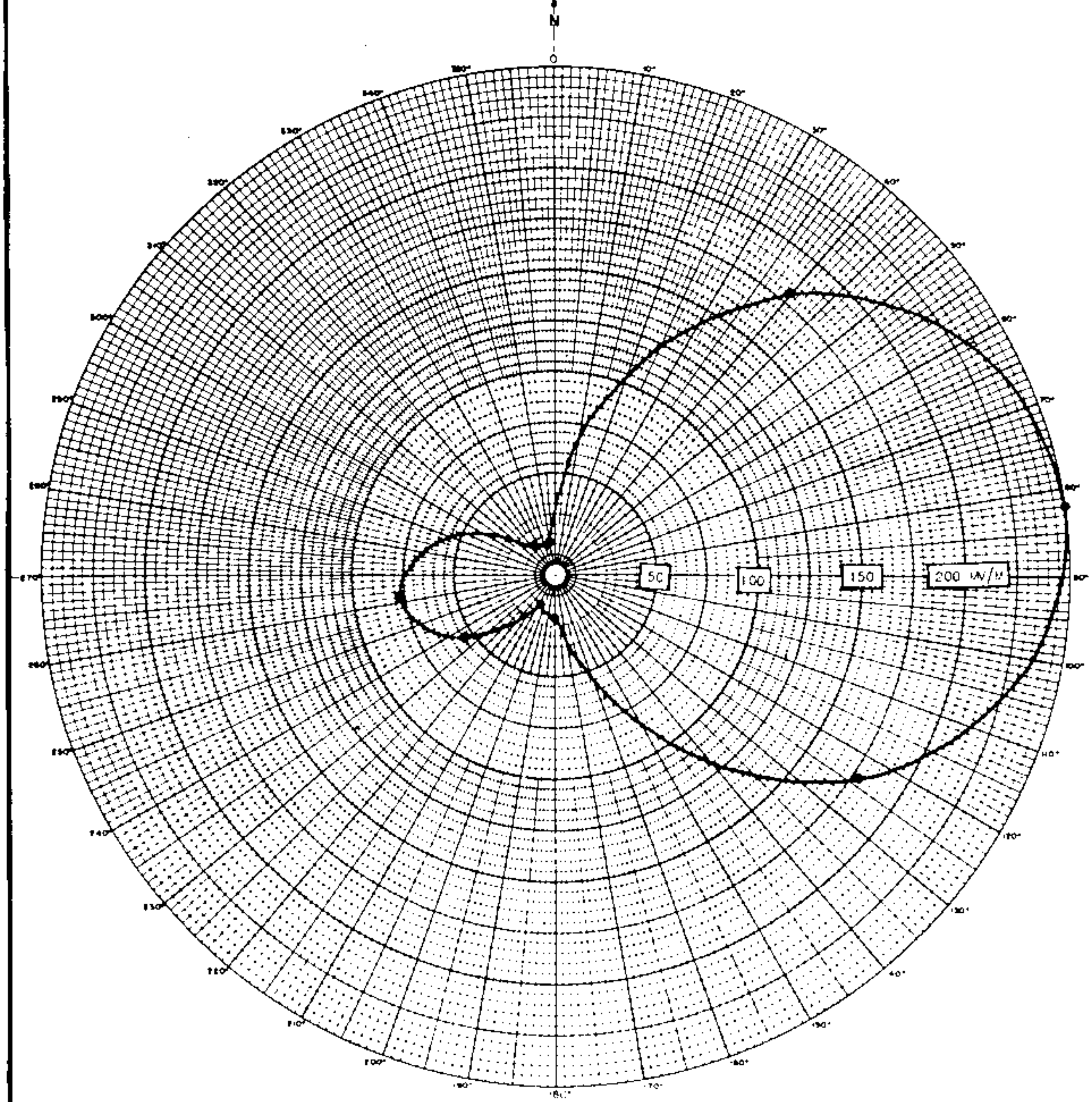
Malrite Broadcasting Company
Tiffin, Ohio 1600 KC

WTTF

Measured Day (6-29-64ct)

Station WTTF
Tiffin, Ohio

500w,DA-D,D
1600 kc



E_{RMS} = 128 MV/M

LATITUDE: 41° 07' 32"

LONGITUDE: 83° 13' 55"

CHARLES E. BRENNAN
CONSULTING RADIO ENGINEERS
MILWAUKEE, WISCONSIN

ANTENNA PARAMETERS

G's = 85°

Spacings: Space Ref. Pt. to 1 & 3 = 80°

Space Ref. Pt. to 2 = 20.14°

← 267.97° 1.0/-7° #2

#3 → 82° 0.555/-154°

#1 0.555/+154°

Space Reference Pt.

640420 FIGURE 3

MEASURED DIRECTIONAL RADIATION

RADIO STATION WTTF

TIFFIN, OHIO

1600 KC 500 DA-D

FCC File No.BL-10610
Accepted 6-8-64

Station WTTF
Tiffin, Ohio

1600 kc

WTTF

granted 5-16-60

MEASURED DAY (1-29-60g) Station WTTF Tiffin, Ohio 500w, DA-D,D 1600 KC

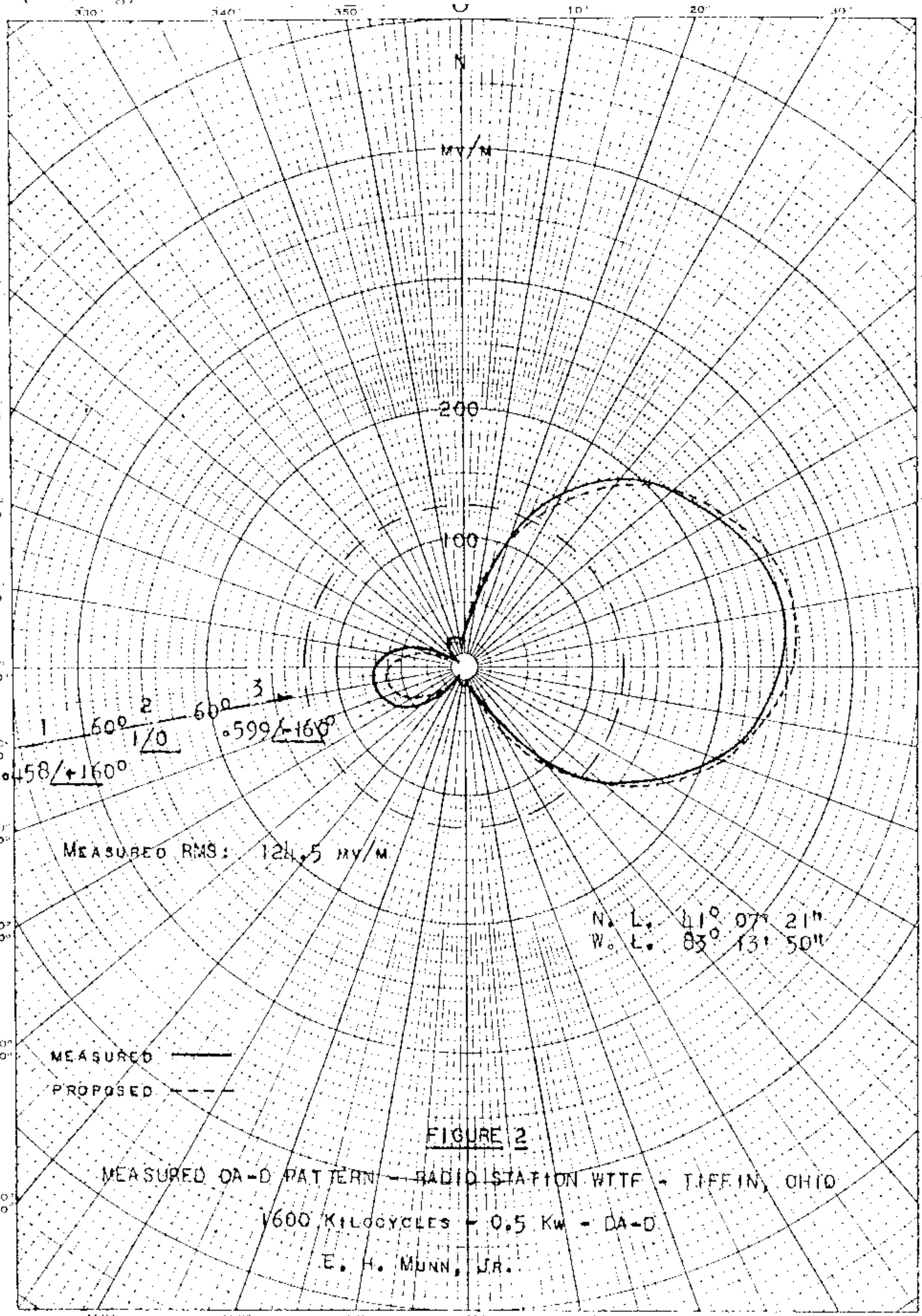


FIGURE 2

MEASURED DA-D PATTERN - RADIO STATION WTTF - TIFFIN, OHIO

1600 KILOCYCLES - 0.5 KW - DA-D

E. H. MUNN, JR.

60

FCC File No. BL-7772
Accepted 1-8-60

WTTF
Tiffin, Ohio

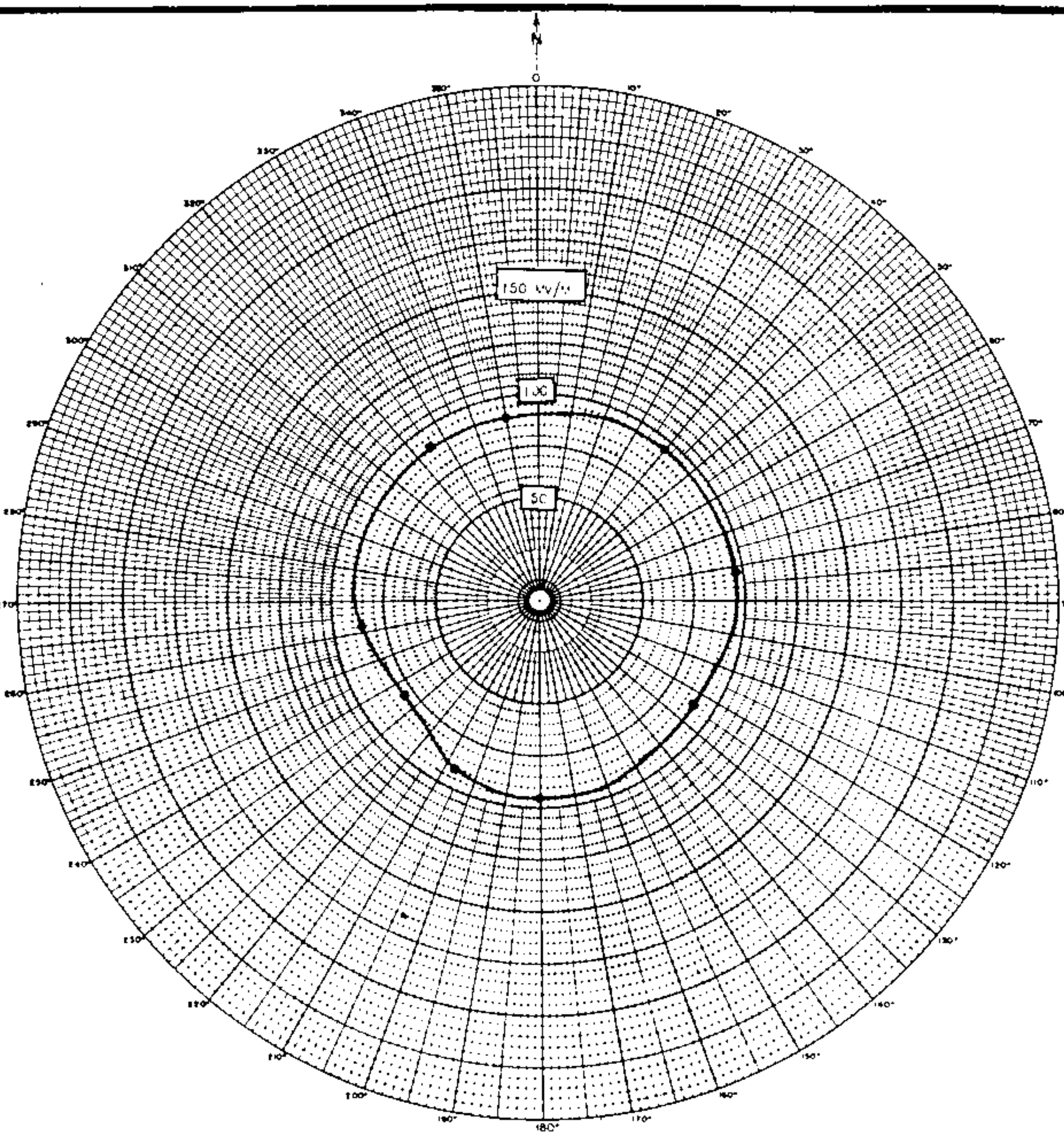
1600 KC

WTTF

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

Station WTTF
Tiffin, Ohio

500w,DA-D,D
1600 kc



E_{RMS} = 91 MV/M

LATITUDE: 41° 07' 32"
LONGITUDE: 83° 13' 55"

CHARLES E. BRENNAN
CONSULTING RADIO ENGINEERS
MILWAUKEE, WISCONSIN

ANTENNA PARAMETERS

MEASURED WITH 250 WATTS TO TOWER 2
G = 85°

1 2 3

640420 FIGURE 2

MEASURED NON-DIRECTIONAL RADIATION
RADIO STATION WTTF
TIFFIN, OHIO

1600 KC 500 DA-D

FCC File No.BL-10610
Accepted 6-8-64

Station WTTF
Tiffin, Ohio

1600 kc

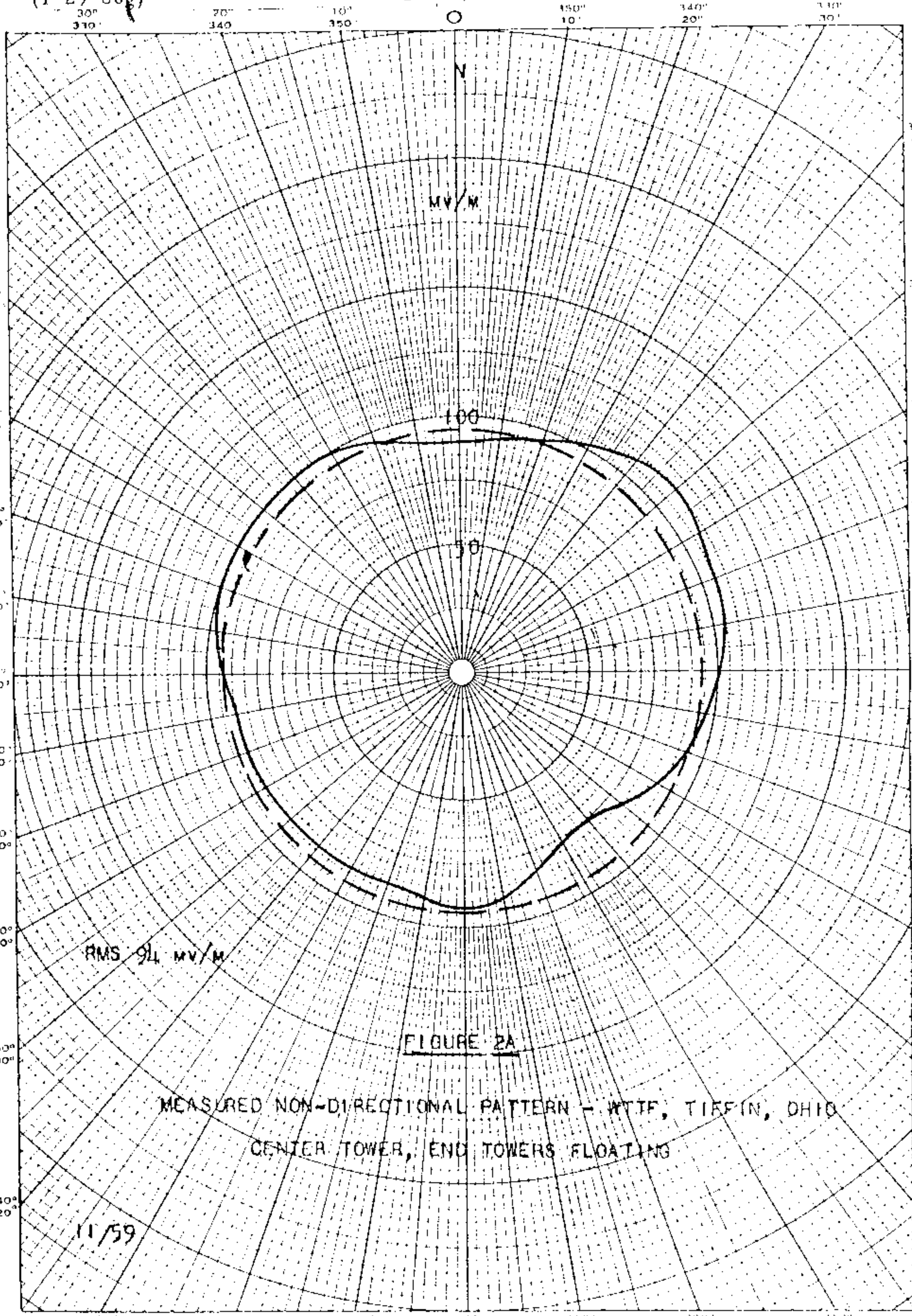
WTTF

MEASURED NON-DA
(1-29-60g)

Station WTTF
Tiffin, Ohio

500w, DA-D,D
1600 KC

granted 2-16-60



61

FCC File No. BL-7772
Accepted 1-8-60

WTTF
Tiffin, Ohio

1600 KC

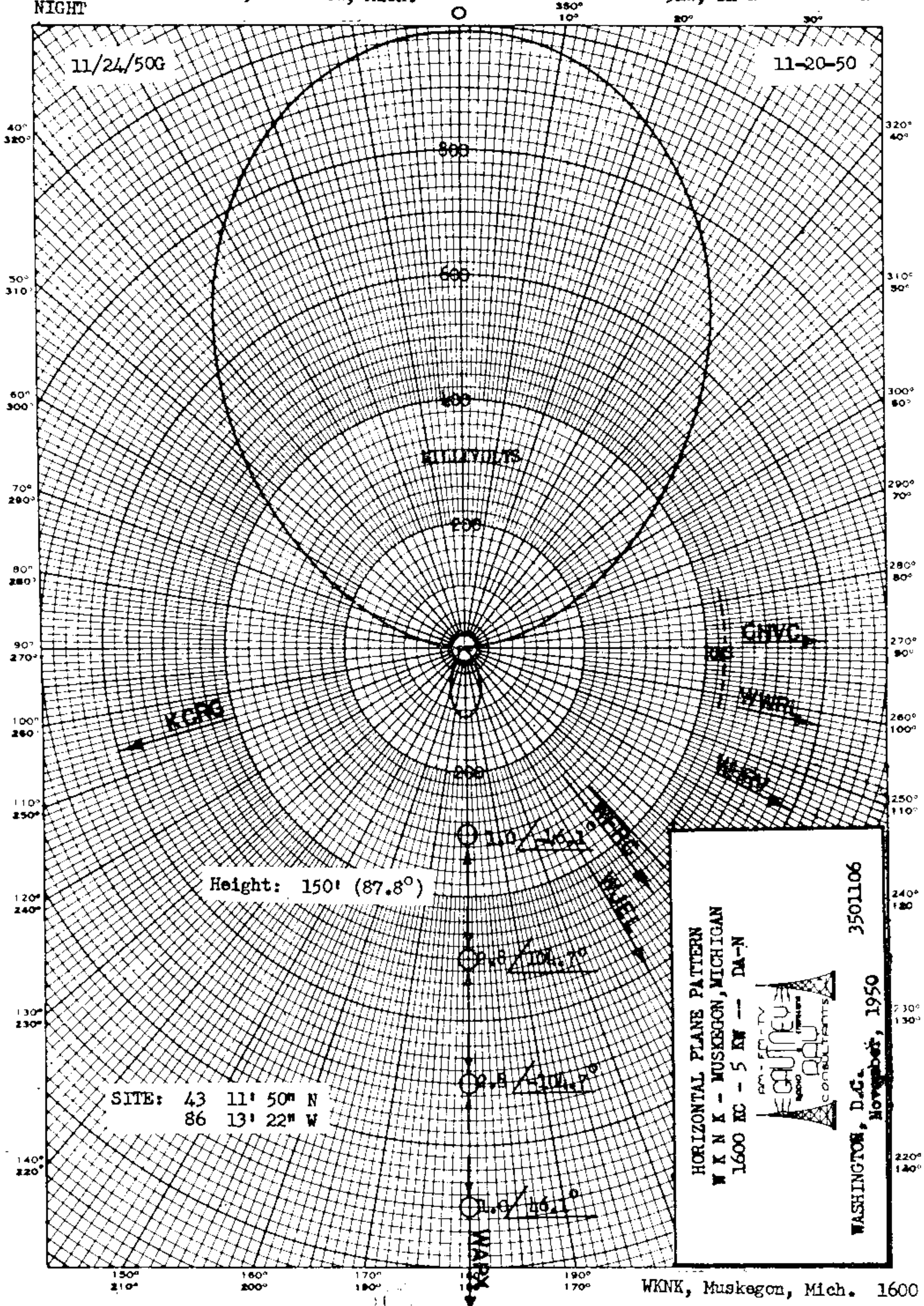
WTRU

PROPOSED
NIGHT

WKNK, MUSKEGON, MICH.

5kw, DA-N

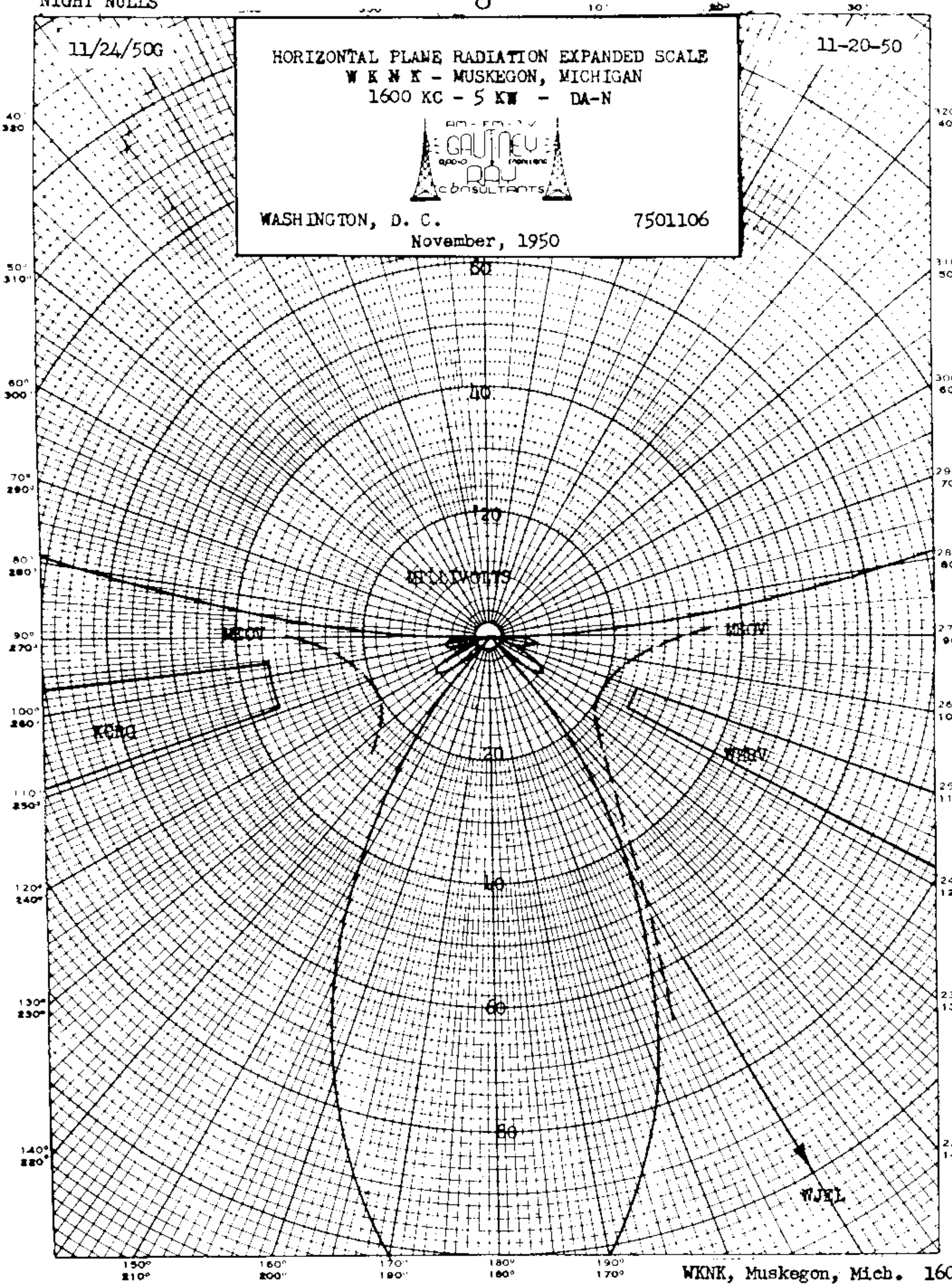
1600 kc



WKNK, Muskegon, Mich. 1600 kc

WTRU ~~WKNK~~

PROPOSED NIGHT NULLS WKNK, MUSKEGON, MICH. 5kw, DA-N 1600 kc

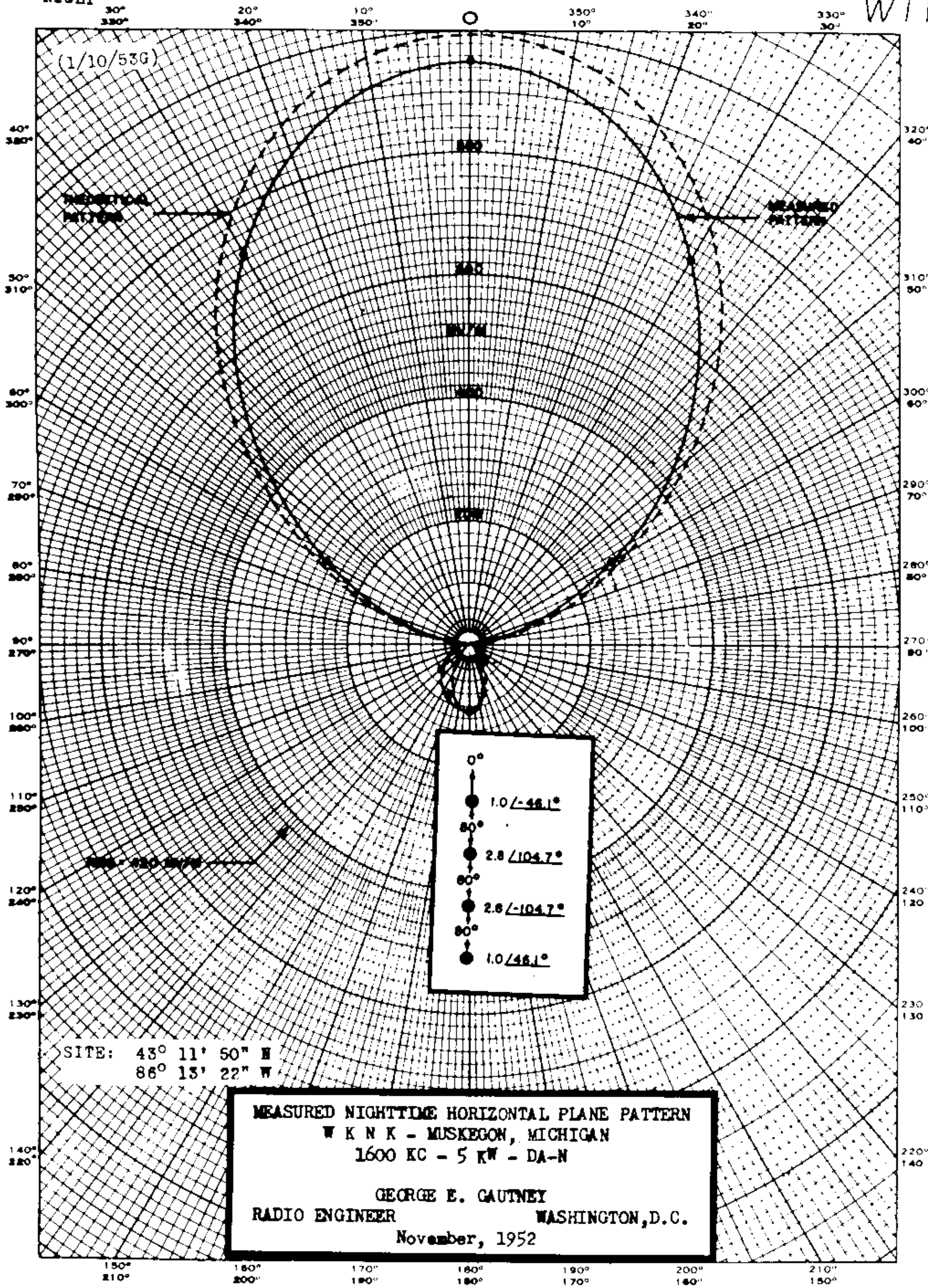


WKNK, Muskegon, Mich. 1600 kc

MEASURED NIGHT

WKNK, MUSKEGON, MICH. 5kw, U, DA-N

~~WKNK~~
1600 kc
WTRU

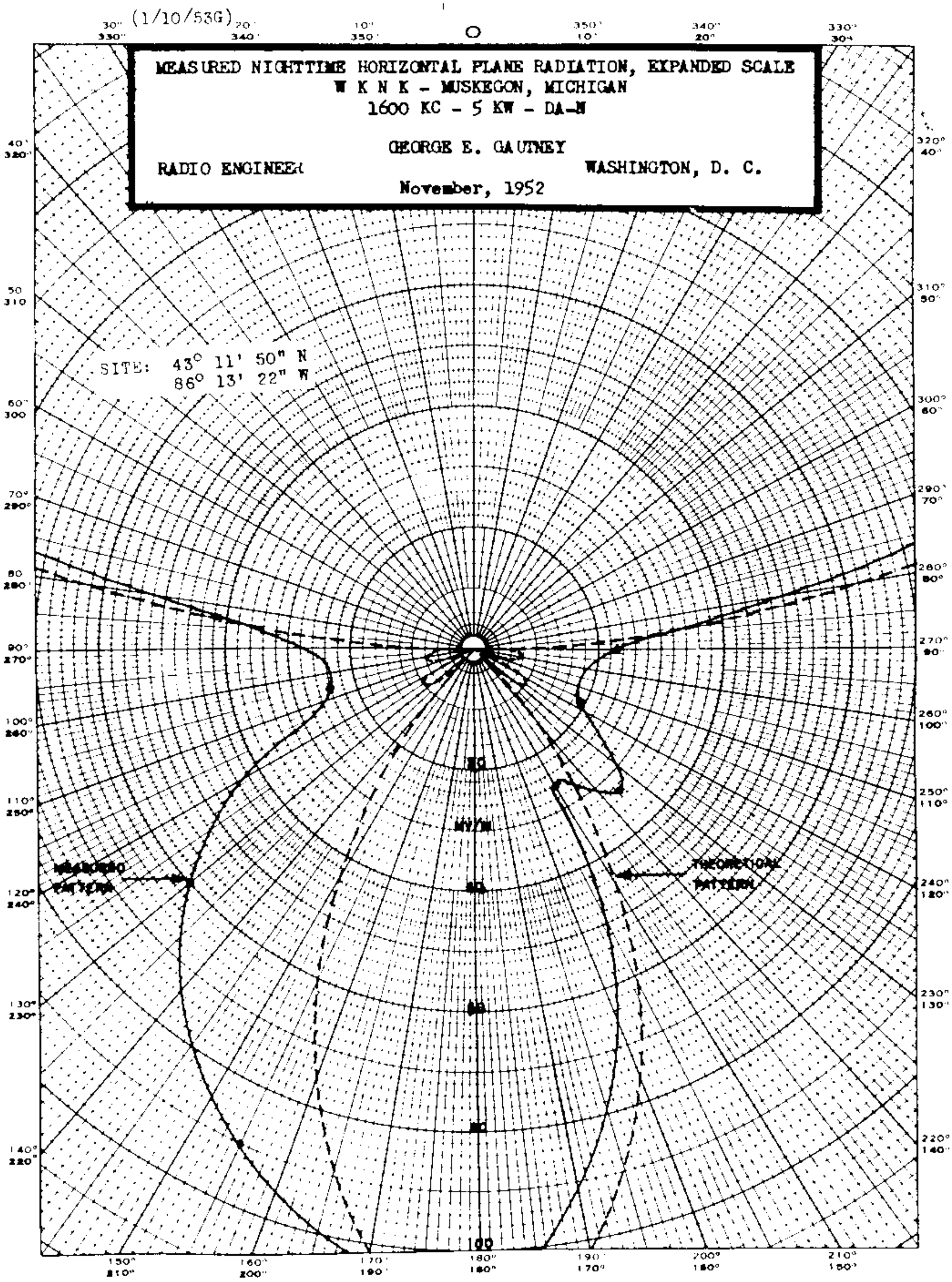


FCC FILE NO. BL-4854 12-4-52 WKNK, Muskegon, Mich. 1600 kc

W/TRU ~~WKNK~~

MEASURED
NIGHT NULLS
(1/10/53G)

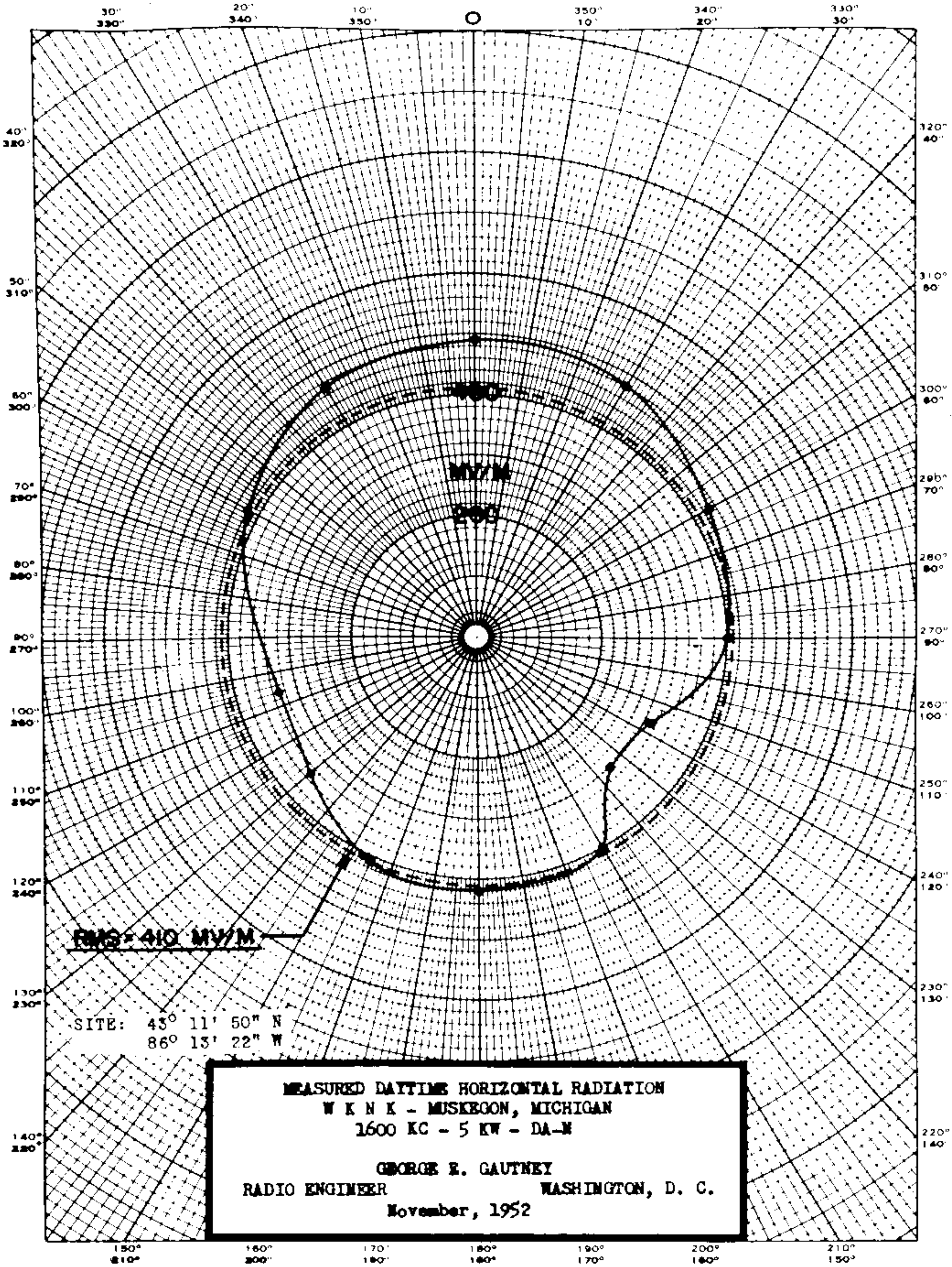
WKNK, MUSKEGON, MICH. 5kw, U, DA-N 1600 kc



FCC FILE NO. BL-4854 12-4-52 WKNK, Muskegon, Mich. 1600 kc

~~WKNK~~

MEASURED DAY (1/10/53G) WKNK, MUSKEGON, MICH. 5kw, U, DA-N 1600 kc WTR



FCC FILE NO. BL-4854 12-4-52 WKNK, Muskegon, Mich. 1600 kc

WUNR

MEASURED NIGHT&DAY NULLS   WVOM, BROOKLINE, MASS.   8-5-48   5kw, DA1   1600kc

2/9/49G

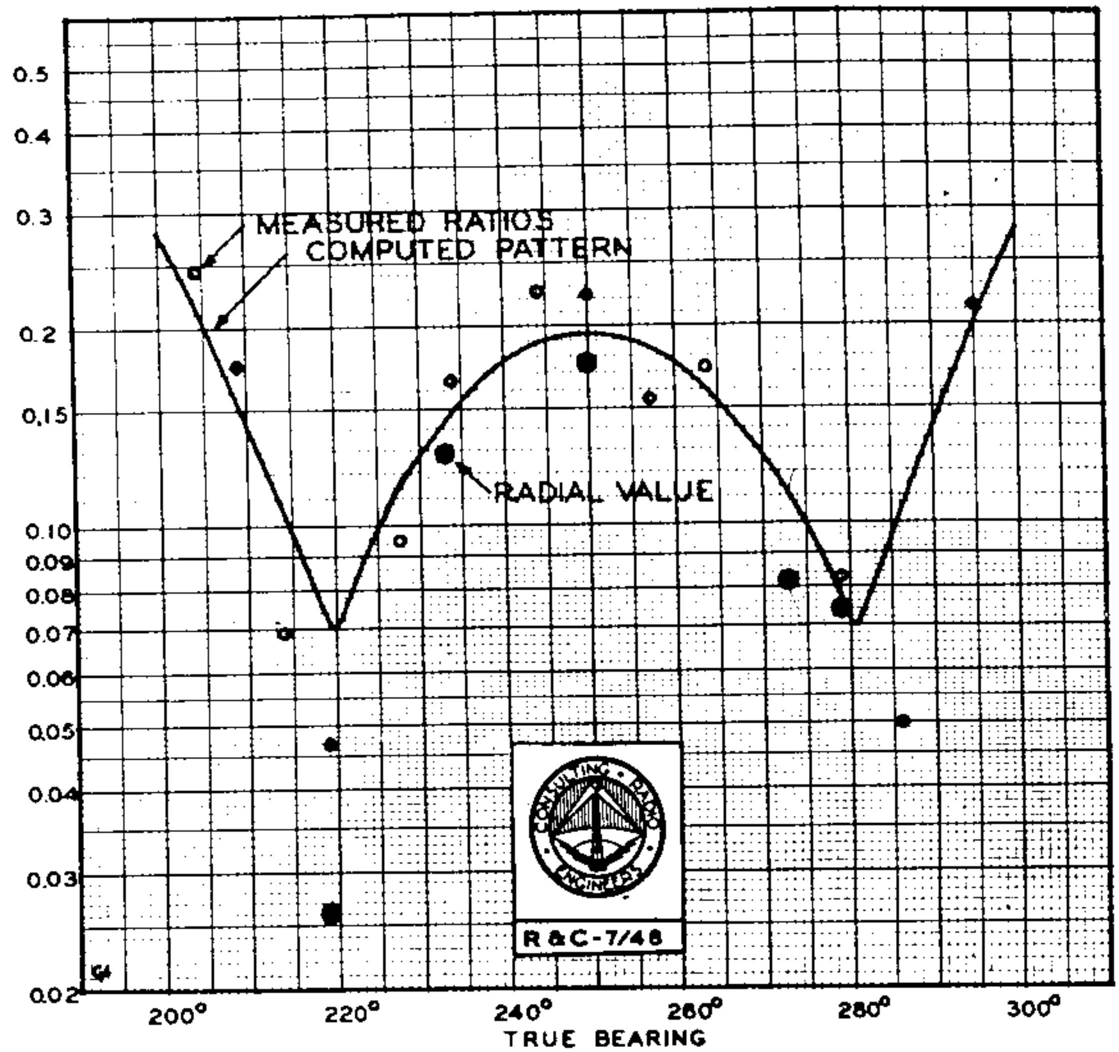


Figure 2-A

CROSS MINIMA RATIO MEASUREMENTS

WVOM

BOSTON BROADCASTING CORPORATION

Brookline, Massachusetts

1600 kc	5 kw - U	-	DA-1

A. D. RING & CO.

CONSULTING RADIO ENGINEERS

WASHINGTON D. C.

WUNR

MEASURED NIGHT&DAY 2/9/49G   WVOM, BROOKLINE, MASS.   8-5-48   5kw,DA1   ~~WVOM~~-1600KC

WUNR 2-1

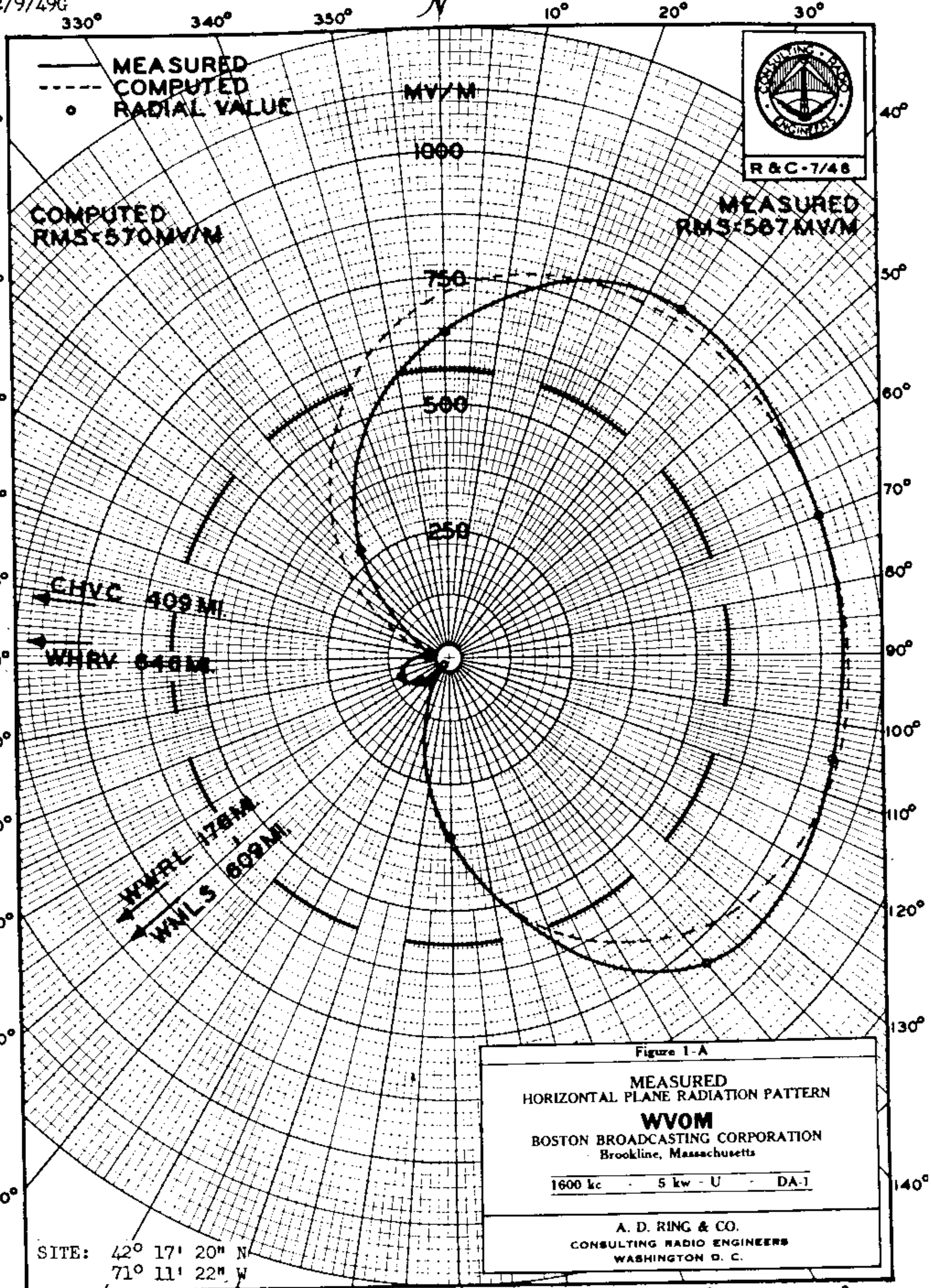


Figure 1-A

MEASURED
HORIZONTAL PLANE RADIATION PATTERN
WVOM
BOSTON BROADCASTING CORPORATION
Brookline, Massachusetts

1600 kc - 5 kw - U - DA-1

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

SITE: 42° 17' 20" N
71° 11' 22" W

MP-5004 NEW-1600KC
WUNR

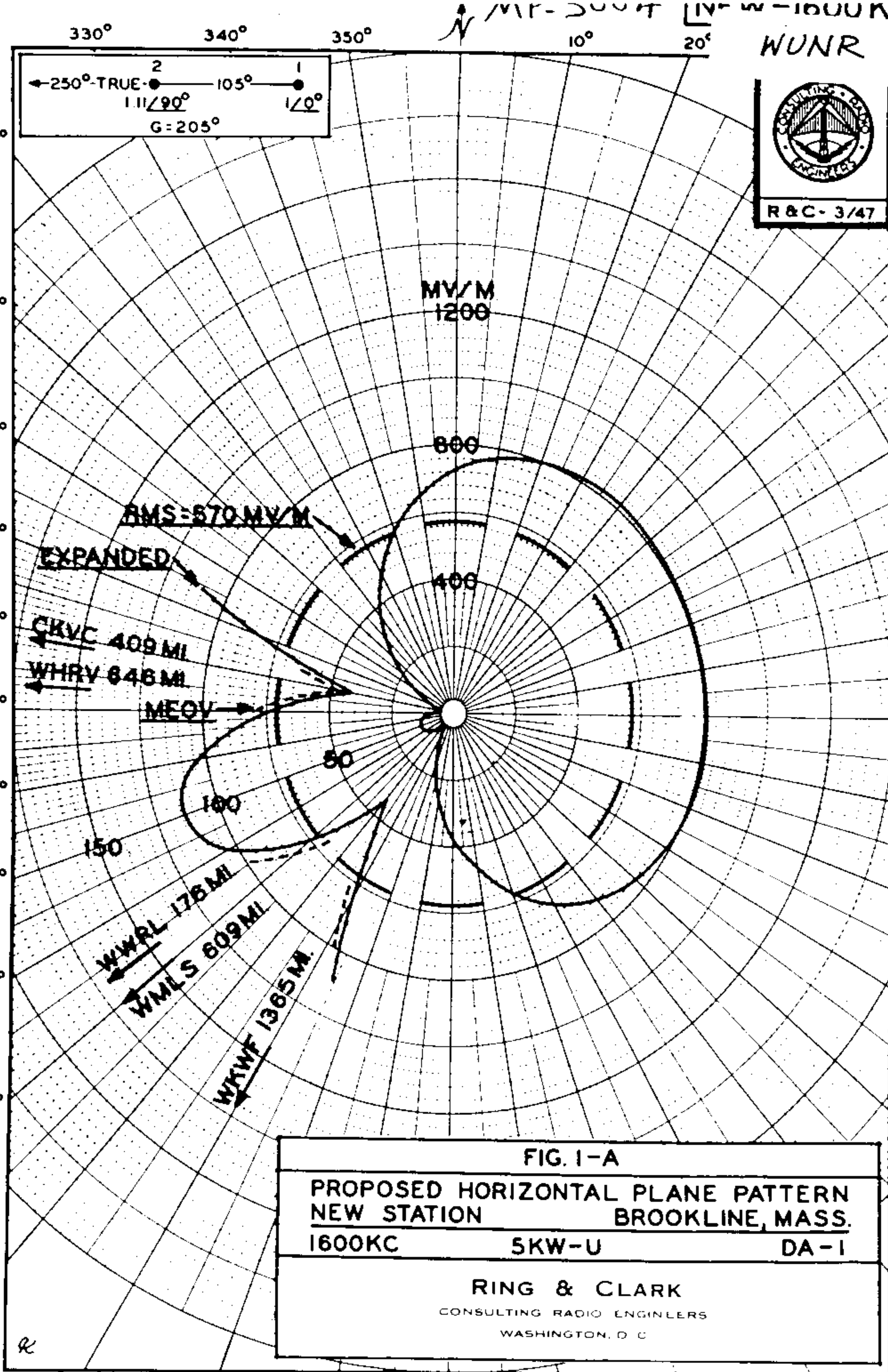


FIG. 1-A

PROPOSED HORIZONTAL PLANE PATTERN
NEW STATION BROOKLINE, MASS.
1600KC 5KW-U DA-1

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

WWRL

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WWRL | Main Studio: New York, New York
Frequency: 1600 KHz | Power: 5 KW
Notification List No. 1575 | Date: April 10, 1974 | Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:
North Latitude: 40° 47' 44"
West Longitude: 74° 03' 18"

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, top loaded by upper sections of guy wires to an effective height of 215°. (*)

TOWER:	NE(#1)	SE(#2)	SW(#3)	NW(#4)	
HEIGHT ABOVE INSULATORS:	308'	308'	308'	308'	(*)
NIGHT PHASING:	0°	-4.0°	+92.0°	+96.0°	
NIGHT FIELD RATIO:	0.97	0.9215	0.95	1.0	
DAY PHASING:	0°	-9.0°	+91°	+125°	
DAY FIELD RATIO:	1.0	0.65	0.62	0.85	

SPACING AND ORIENTATION: The towers are located at the vertices of a parallelogram the long sides of which are 321.2' (188°) in length on a line bearing 35° true. The short sides are 153.8' (90°) in length on a line bearing 297° true.

GROUND SYSTEM: 120-246' equally spaced copper radials plus 240-50' interspaced radials forming a counterpoise about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

Predicted effective Night Field: 570 mv/m at rated power.

Predicted effective Day Field: 583.5 mv/m at rated power.

Note: Please retain the directional antenna radiation pattern notified for Station WWRL in United States Change List Number 865 dated June 8, 1960 and attach to this Revised Description Sheet and pattern. This notification concerns only a change in MEOVs of radiation in the Daytime pattern with Nighttime operation continued as previously notified.

CTR NO 30623A

WWRL

Proposed Day
(9-25-7Oct)

Station WWRL
New York, New York

5kw,DA-2,U
1600 kc

See reverse side

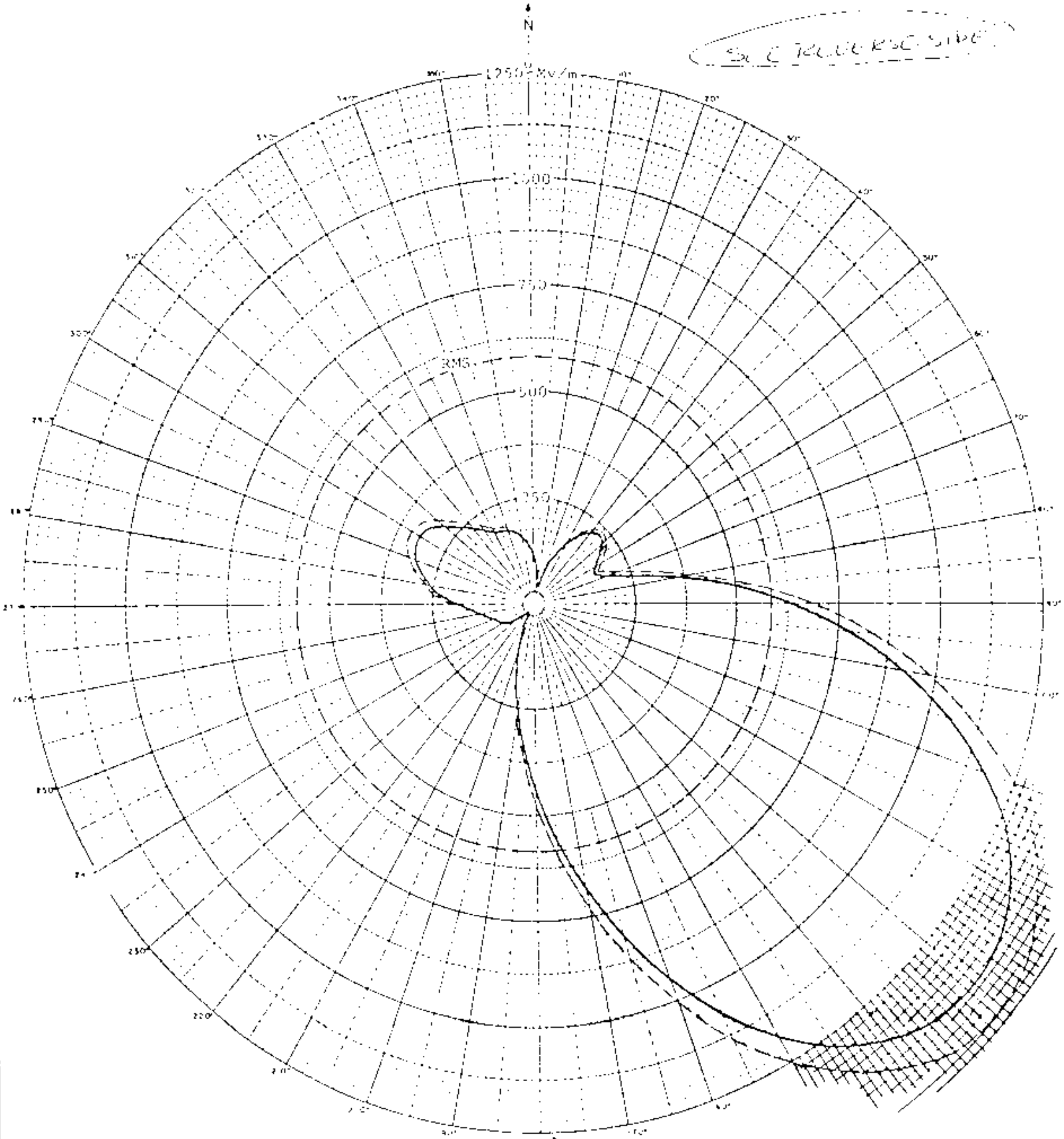
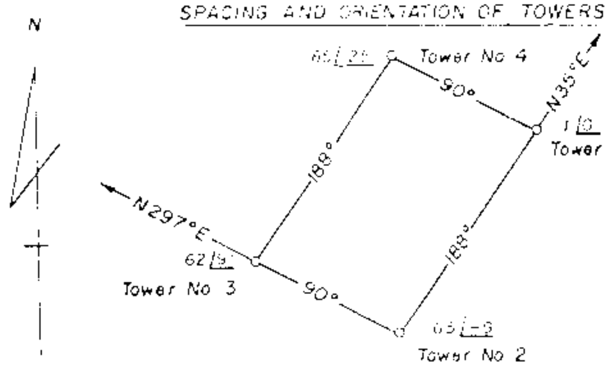


FIGURE 1 — A

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION OF TOWERS



ALL G's = 215° (INCLUDING TOP LOADING)

APPLICANT	WWRL
LOCATION	NEW YORK, NEW YORK
FREQUENCY	1600 KHz
POWER	5 KW
LATITUDE	40 DEG 47 MIN 44 SEC
LONGITUDE	74 DEG 03 MIN 18 SEC
WHEN USED	DAYTIME
RMS FIELD	583.5 MV/M
DATE	NOVEMBER 1969

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

FCC File No.BMP-13065
Accepted 9-17-70

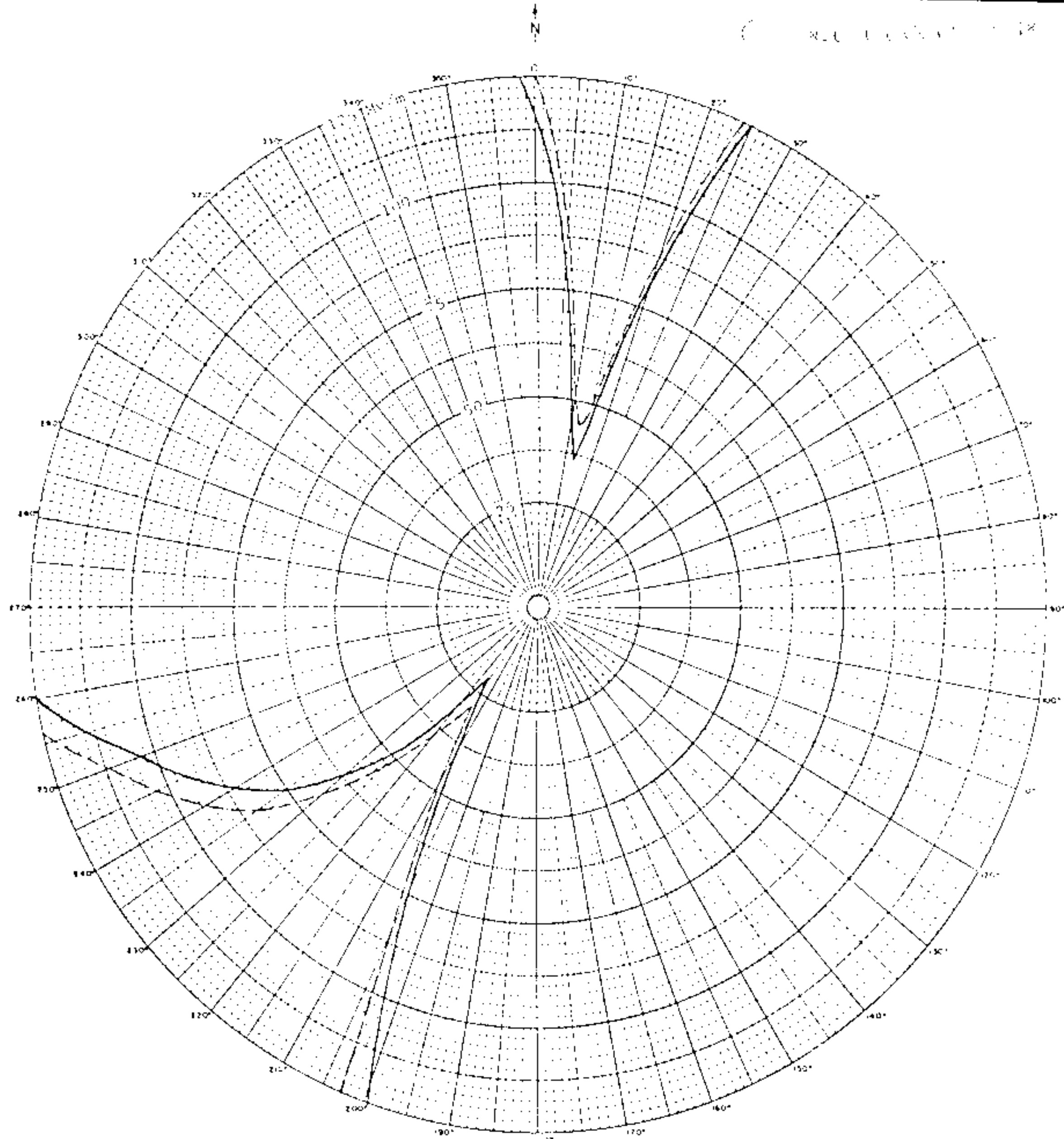
Station WWRL
New York, New York

1600 kc

Proposed Day Nulls
(9-25-70ct)

Station WWRL
New York, New York

WWRL
5kw,DA-2,U
1600 kc



-----MAXIMUM EXPECTED OPERATING VALUES

FIGURE 1 — B

EXPANDED VIEW

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

WWR

Proposed Day
(12-29-66ct)

Station WWRL
New York, New York

5kw,DA-2,U
1600 kc

12-7-66
GRANTED
MODIFICATION
OF CP TO MAKE
CHANGES IN
DAYTIMA DA
PATTERN.

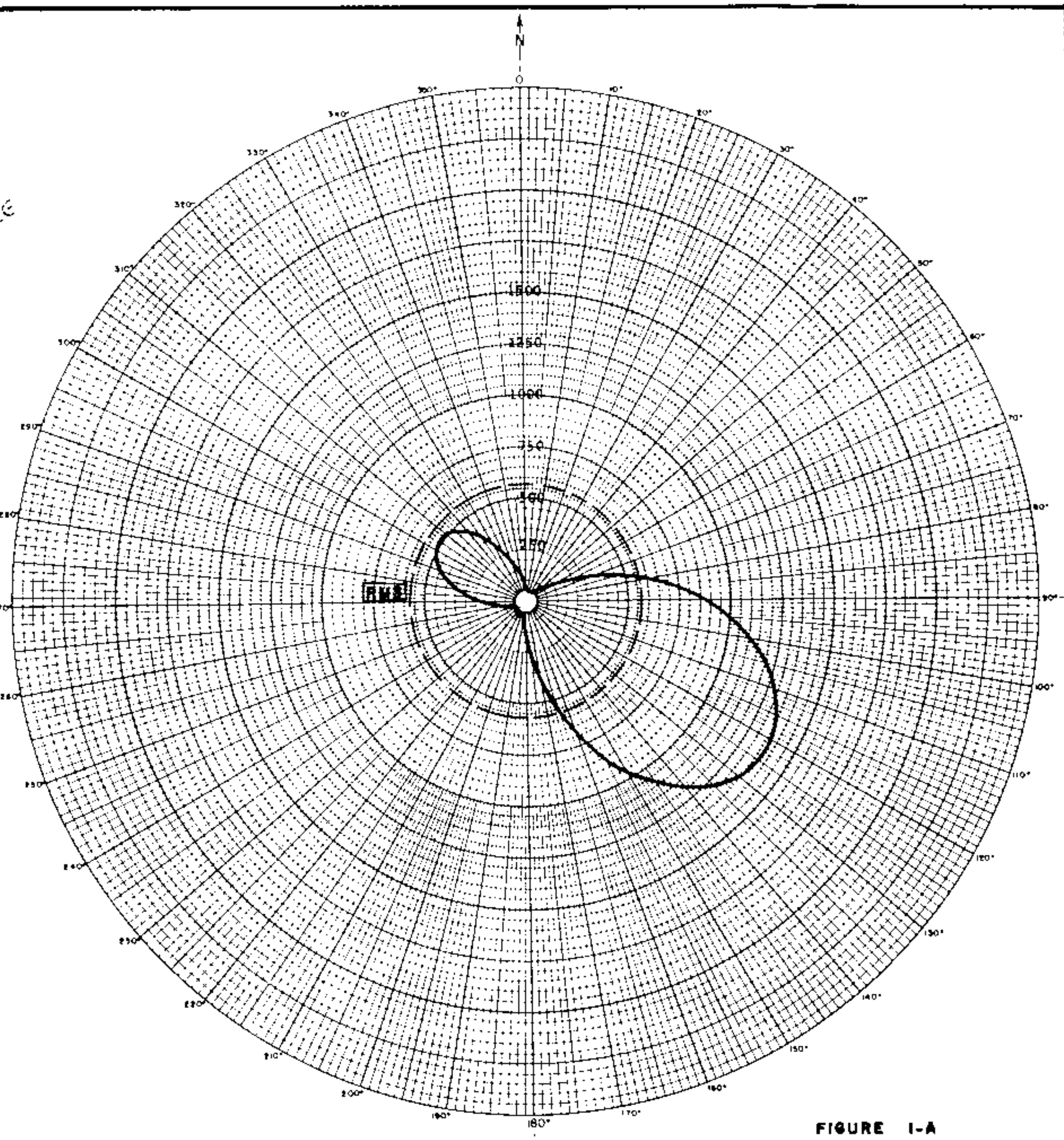
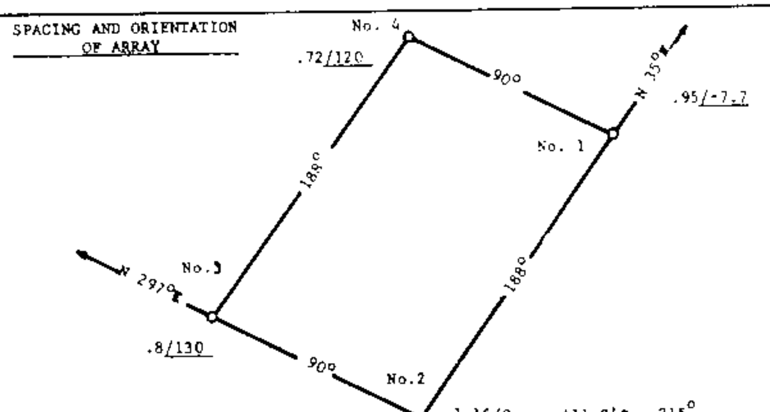


FIGURE I-A

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION OF ARRAY



APPLICANT	WWRL, Inc.
LOCATION	New York, New York
FREQUENCY	1600 KC/S
POWER	5 KW
LATITUDE	40 DEG 47 MIN 44 SEC.
LONGITUDE	74 DEG 03 MIN 18 SEC.
WHEN USED	Daytime
R.M.S. FIELD	570 MV/M
DATE	September 1966

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

FCC File No. BMP-11938
Accepted 12-5-66

Station WWRL
New York, New York

1600 kc

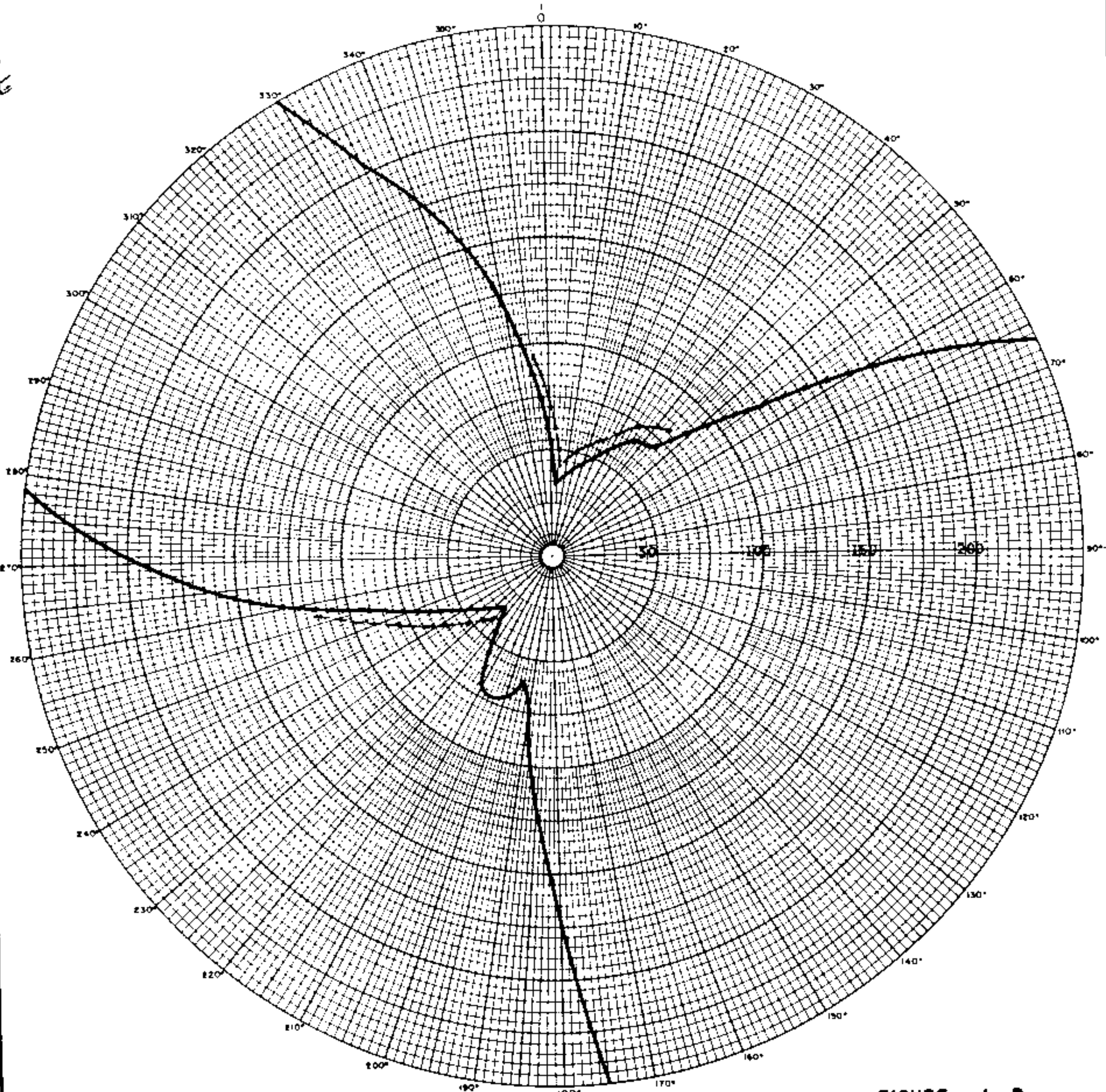
VV VV KL

Proposed Day Nulls
(12-29-66ct)

Station WWRL
New York, New York

5kw, DA-2, U
1600 kc

12-7-66
GRANTED MODIF. OF CP TO MAKE CHANGES IN DAYTIME DA PATTERN.



------ MAXIMUM EXPECTED OPERATING VALUE

FIGURE 1 - B

EXPANDED SCALE

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

FCC File No. BMP-11938
Accepted 12-5-66

Station WWRL
New York, New York

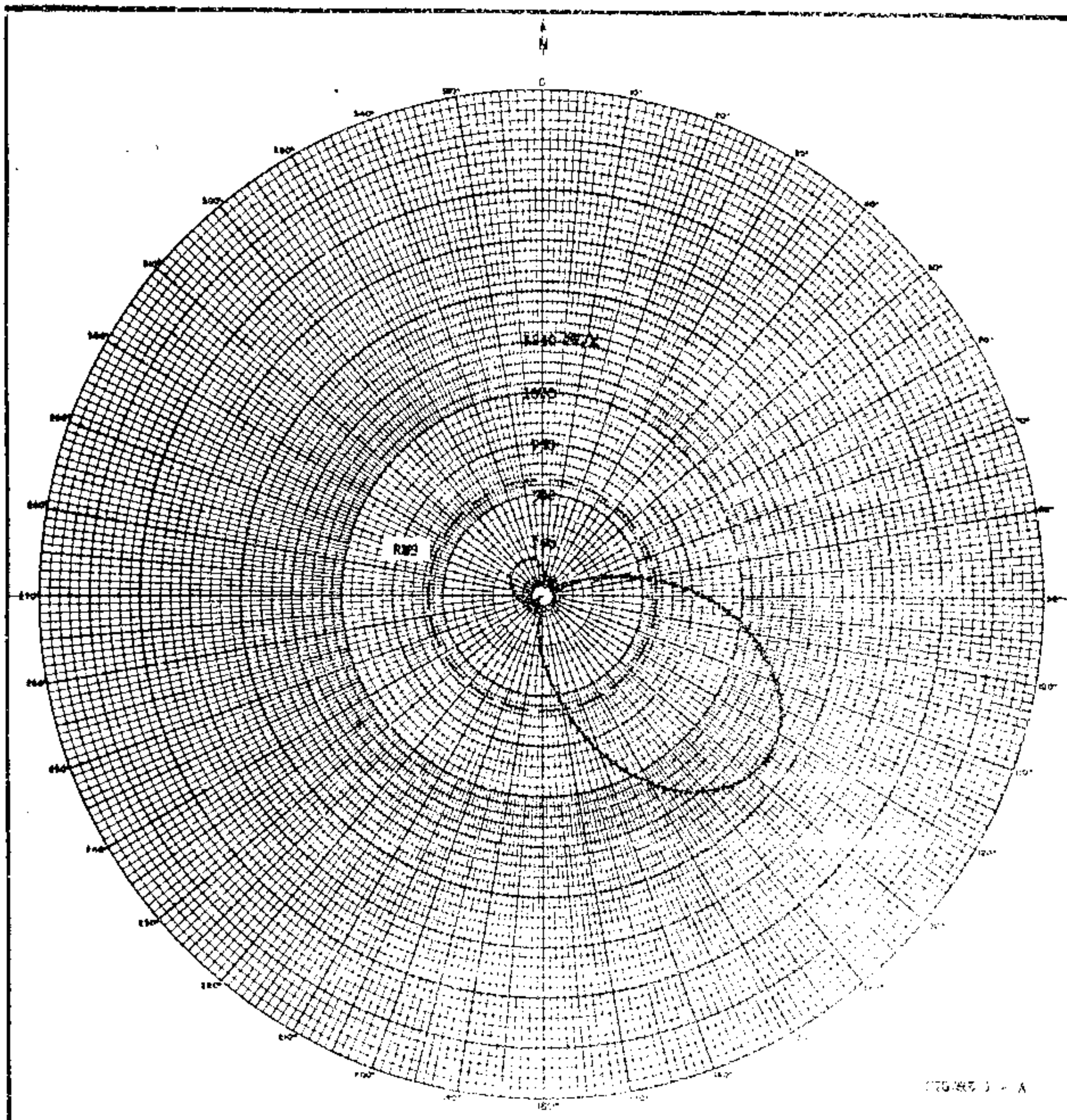
1600 kc

Proposed Day
(5-27-65ct)

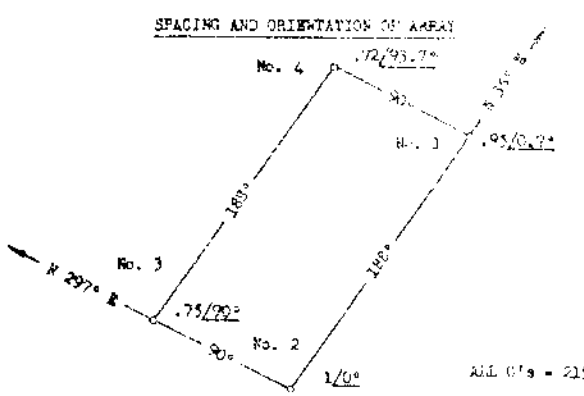
Station WWRL
New York, New York

5kw, DA-2, U
1600 kc

P CHG DAY
DA 10-11-65



HORIZONTAL RADIATION PATTERN



APPLICANT	... INC.
LOCATION	NEW YORK, NEW YORK
FREQUENCY	1600 KCS
POWER	5 KW
LATITUDE	47 MIN 44 SEC
LONGITUDE	03 MIN 18 SEC
WHEN USED	DAYTIME
DATE	OCTOBER 196_

RAYMOND E. ... ASSOCIATES

FCC File No. BP-16547
Accepted 4-27-65

Station WWRL
New York, New York

1600 kc

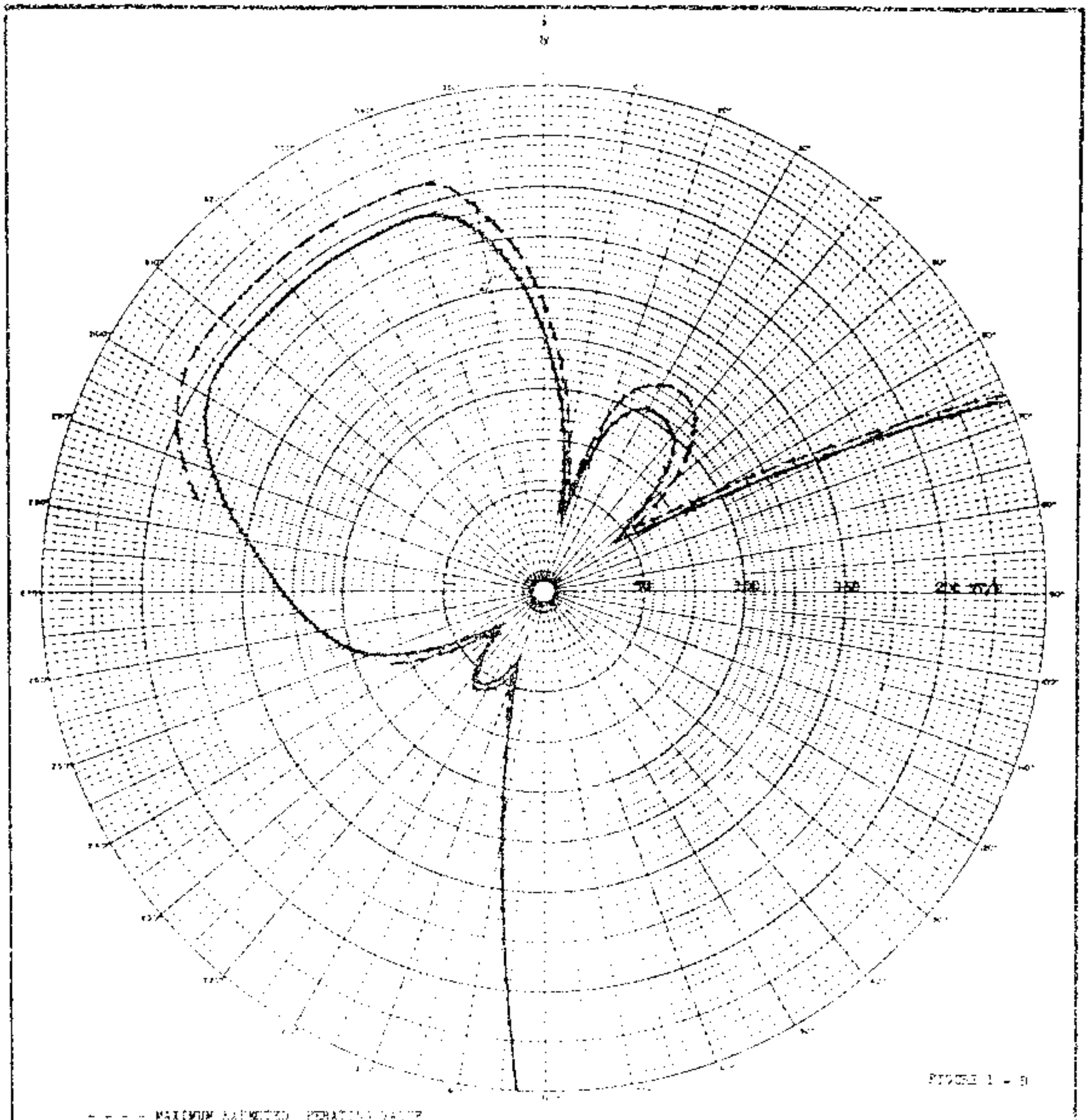
WWRL

Proposed Day Nulls
(5-27-65ct)

Station WWRL
New York, New York

5kw,DA-2,U
1600 kc

CP 10-11-65
CHG DAY DA



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

FCC File No. BP-16547
Accepted 4-27-65

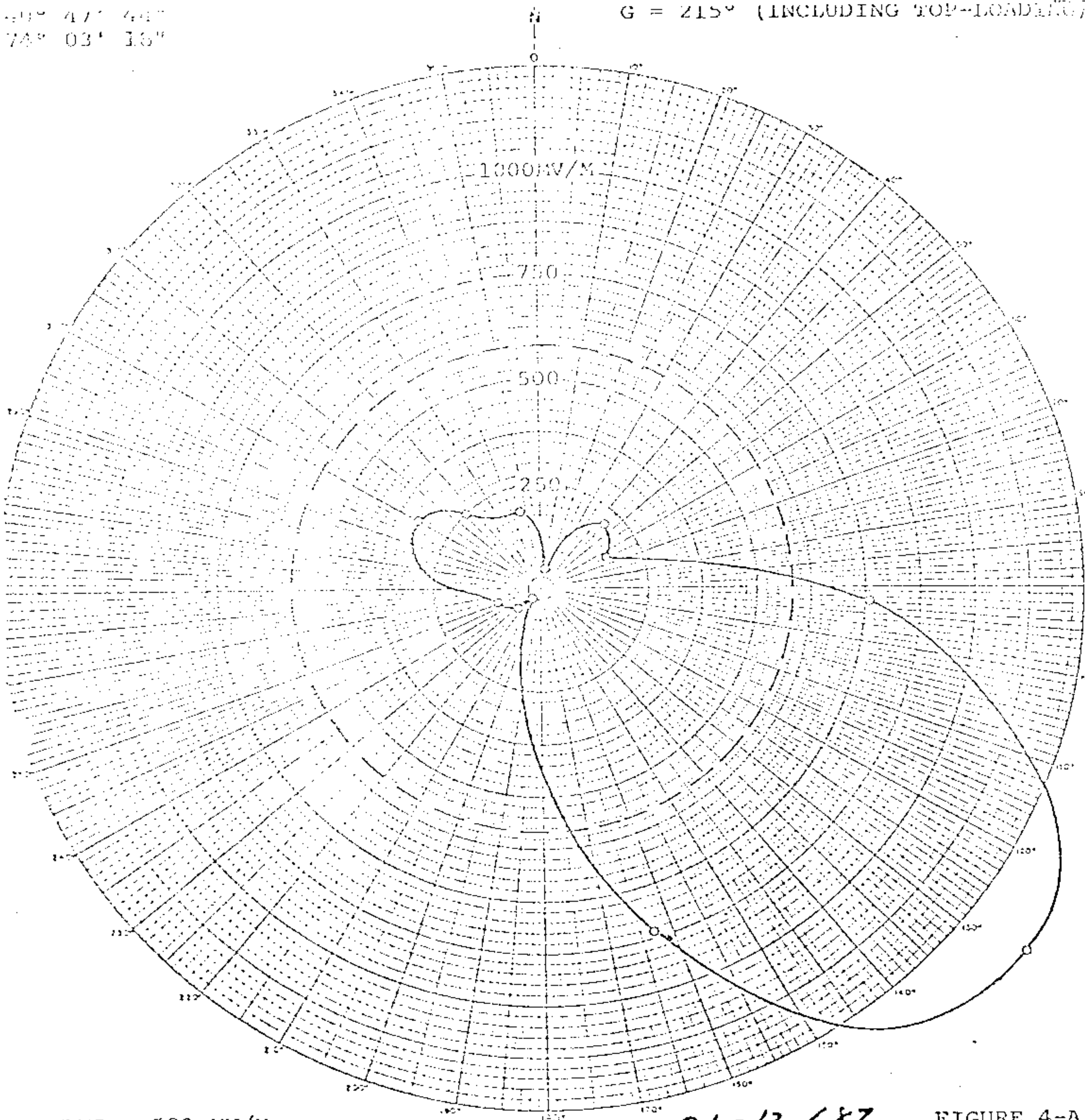
Station WWRL
New York, New York

1600 kc

WWRL.

40° 47' 44"
74° 03' 16"

G = 215° (INCLUDING TOP-LOADING)

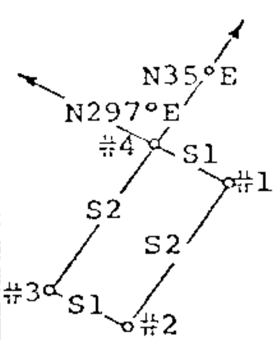


RMS = 582 MV/M

BL-13,687

FIGURE 4-A

TOWER	RATIO	PHASE
1	1.0	0°
2	.65	-9°
3	.62	91°
4	.85	125°



S1 = 90°
S2 = 188°

MEASURED DAYTIME
HORIZONTAL RADIATION PATTERN

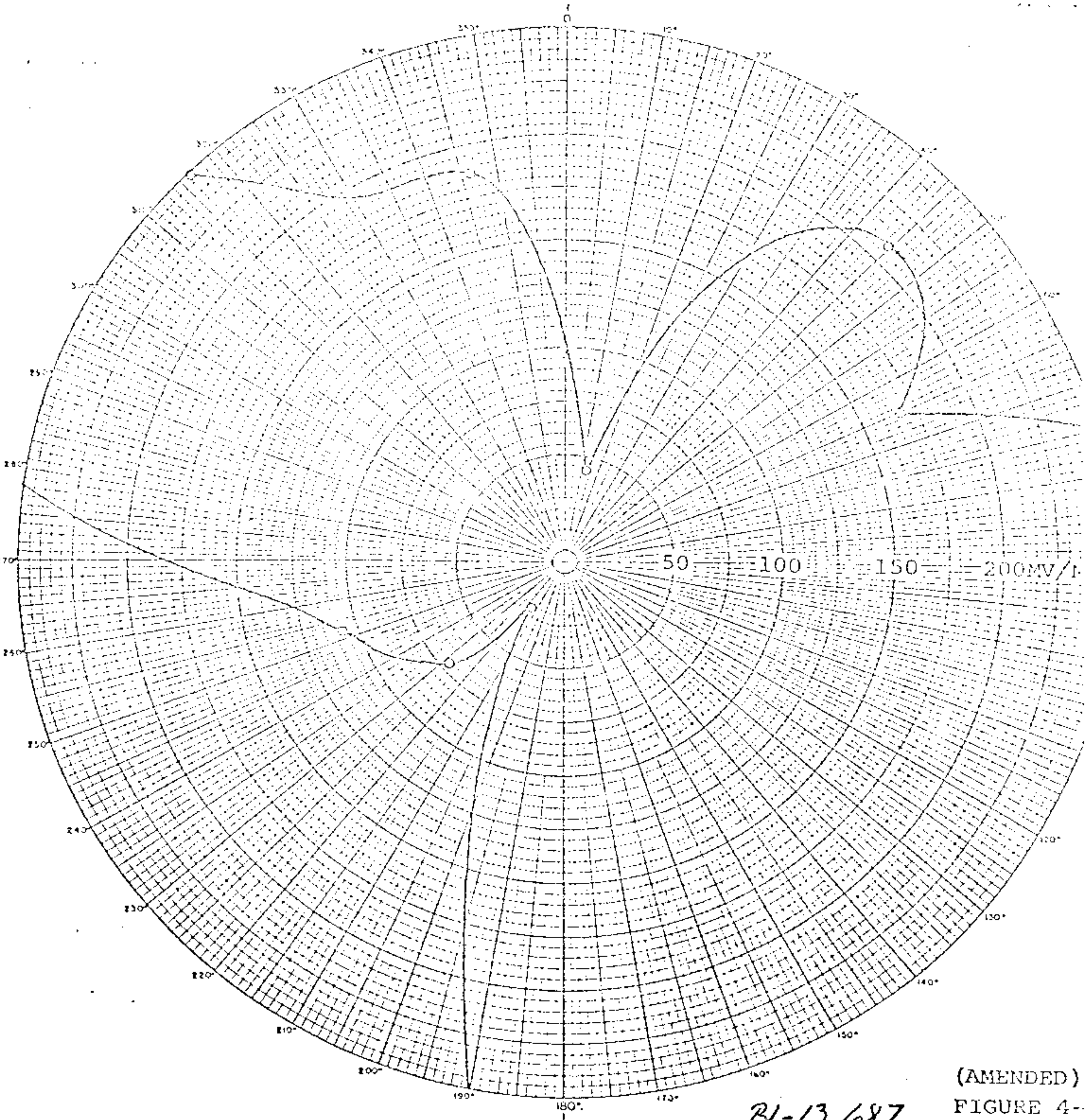
DECEMBER 1973

RAYMOND E. ROHRER

WWRL
NEW YORK, NEW YORK

1600KHZ 5KW DA-2

WWRL



(AMENDED)

FIGURE 4-

BL-13,687

MEASURED DAYTIME HORIZONTAL RADIATION PATTERN
(EXPANDED SECTION)

APRIL 1974 RAYMOND E. ROHRER	WWRL NEW YORK, NEW YORK DA-2 1600KHZ 5KW DA

WWRL

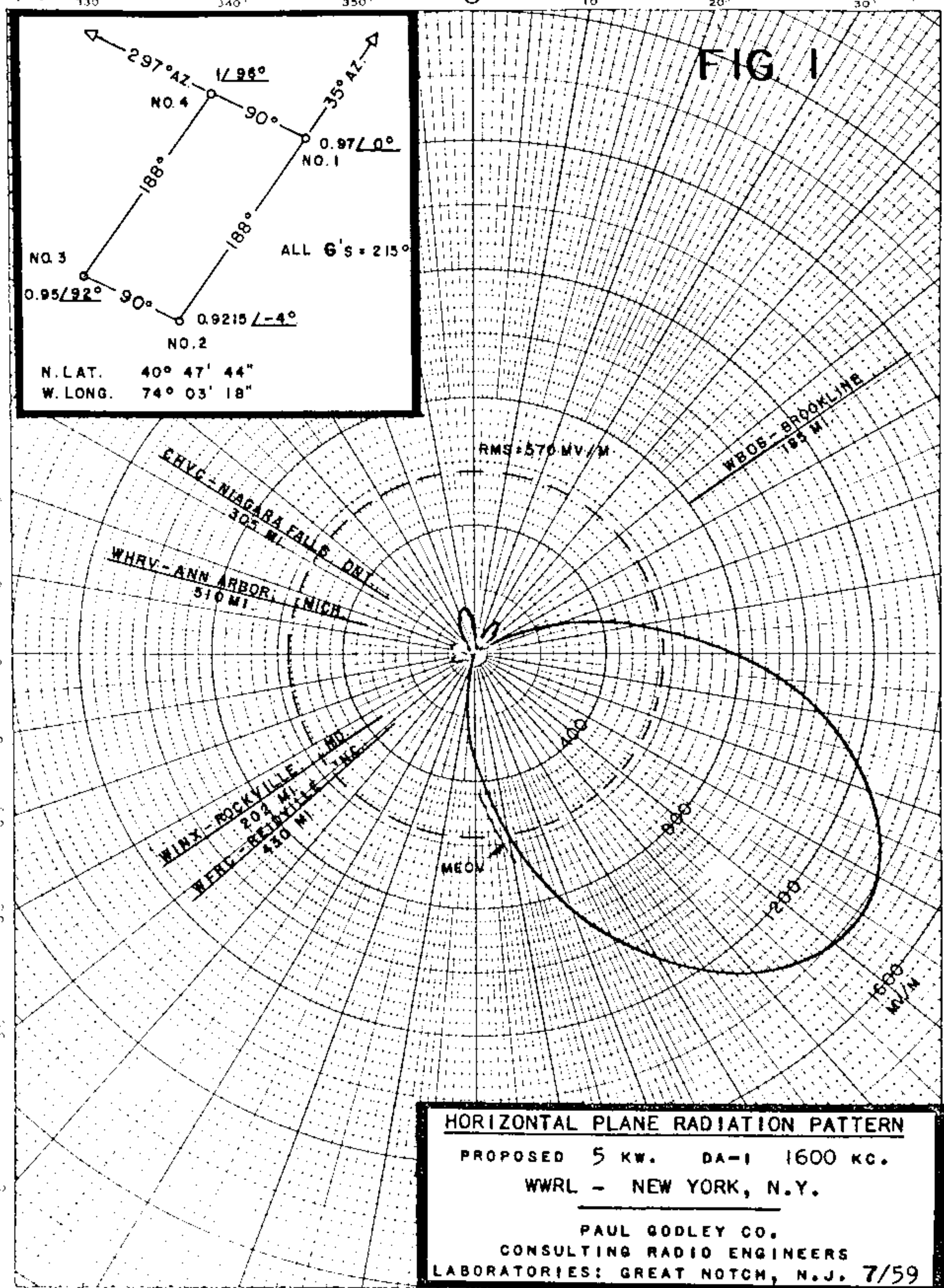
granted CP to change DA system 5-25-60

granted L covering CP 10-5-61

PROPOSED DAY & NIGHT
(9-4-59g)

Station WWRL
New York, New York

5kw, DA-1,U
1600 KC



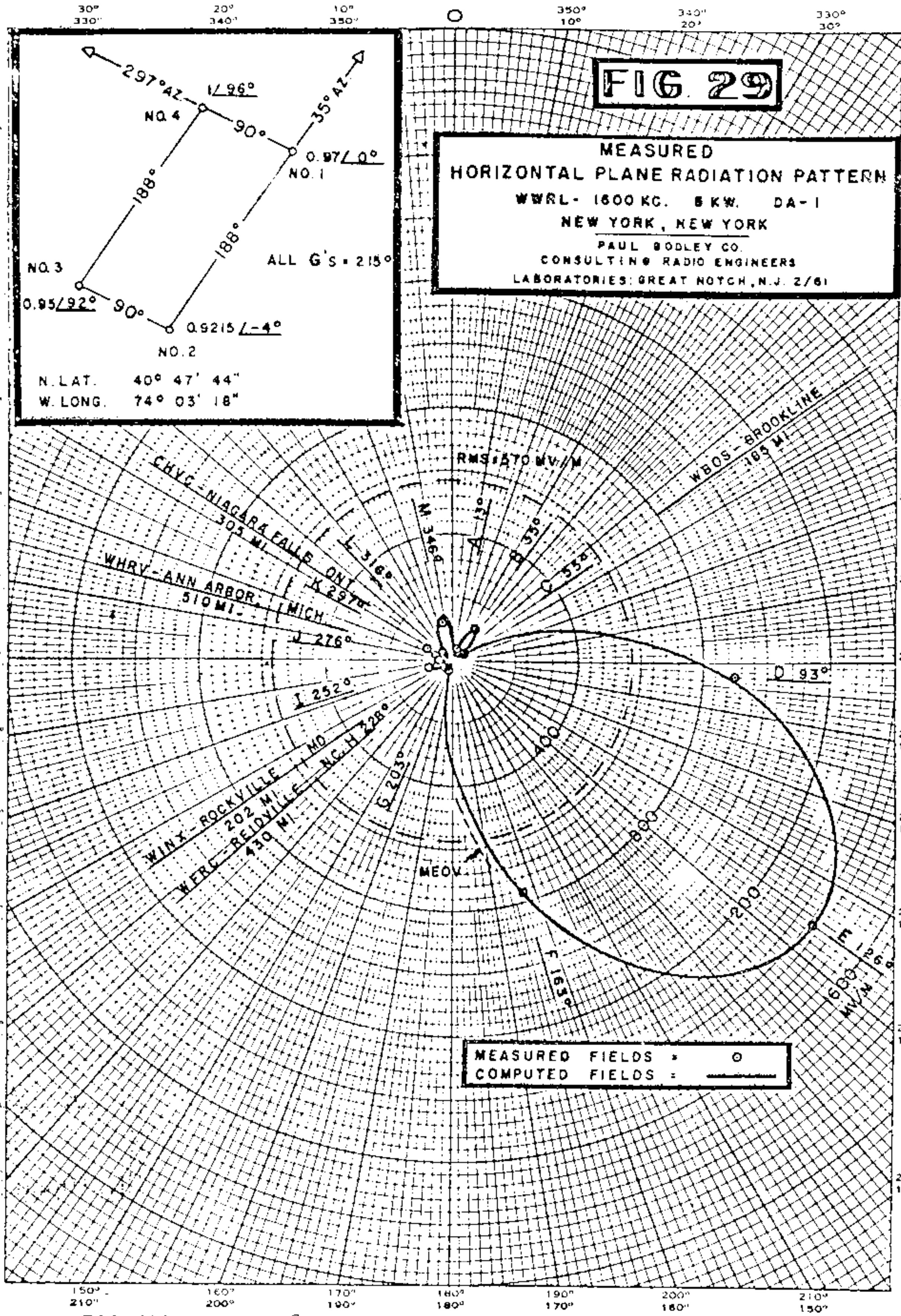
FCC File No. BP-13335
Accepted 8-19-59

WWRL
New York, New York

1600 KC

WWRL

MEASURED DAY & NIGHT (7-26-61ct)
Station WWRL
New York, New York
5kw, DA-1,U
1600 KC



FCC File No. BL-8391
Accepted 6-27-61

WWRL
New York, New York
1600 KC

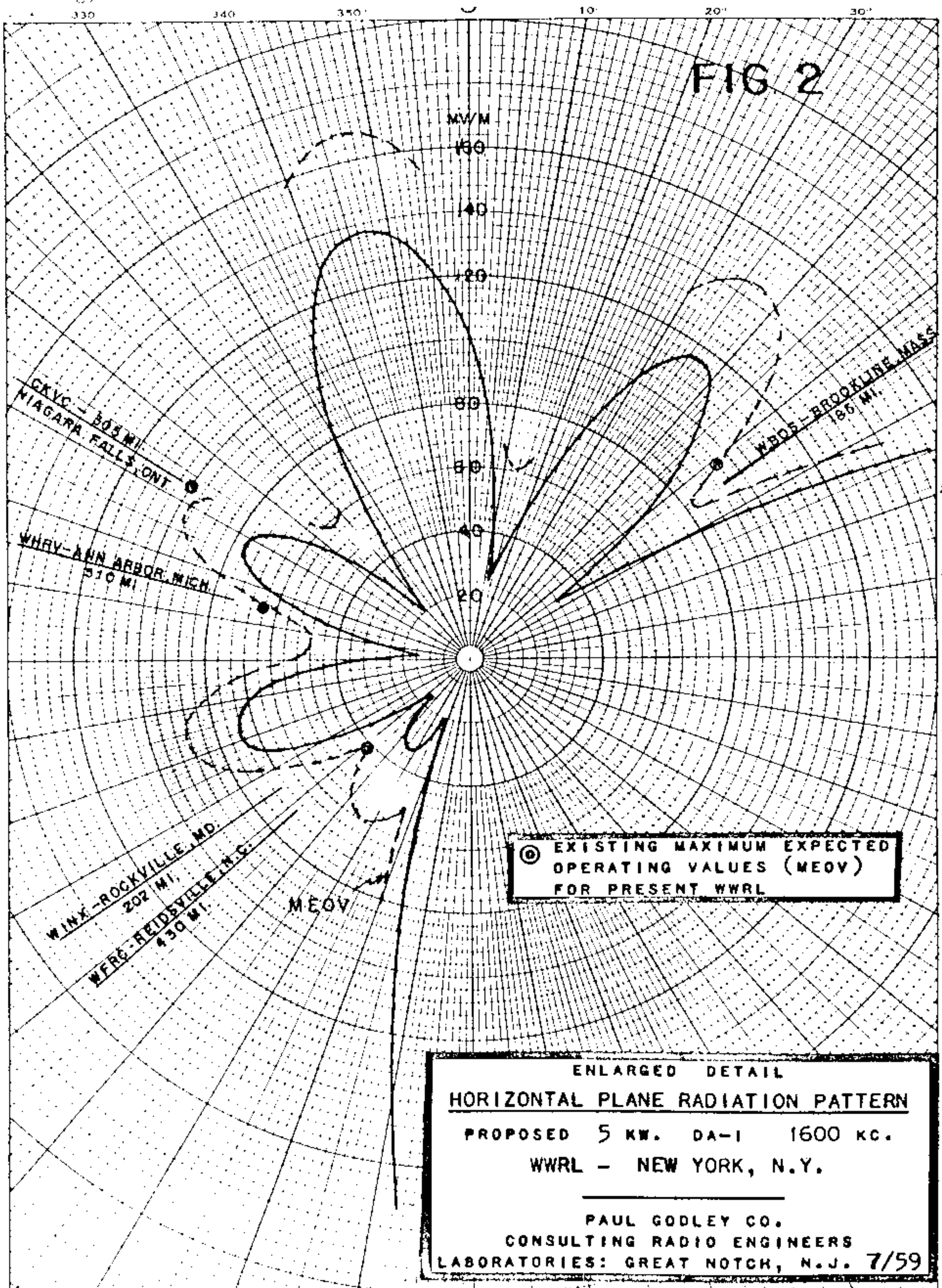
WWRL

PROPOSED DA-1 NULLS
(9-4-59g)

Station WWRL
New York, New York

5kw, DA-1,U
1600 KC

Granted CP to change DA system 5-25-60
granted License covering CP 10-3-61



ENLARGED DETAIL
HORIZONTAL PLANE RADIATION PATTERN
PROPOSED 5 KW. DA-1 1600 KC.
WWRL - NEW YORK, N.Y.

PAUL GODLEY CO.
CONSULTING RADIO ENGINEERS
LABORATORIES: GREAT NOTCH, N.J. 7/59

FCC File No. BP-13335
Accepted 8-19-59

WWRL
New York, New York

1600 KC

WWRL

MEASURED DAY & NIGHT NULLS (7-26-61ct)

Station WWRL 5kw, DA-1,U
New York, New York 1600 KC

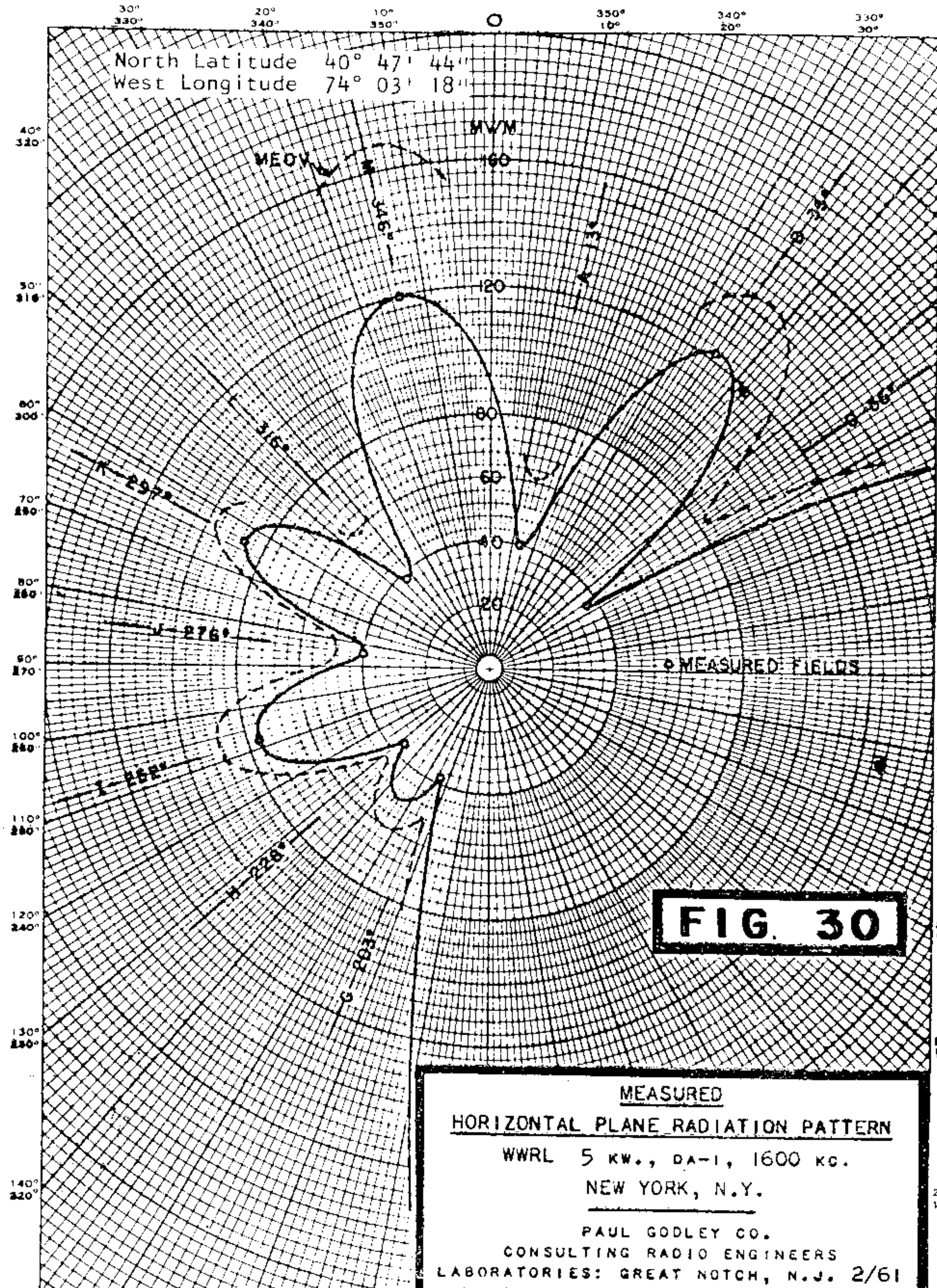


FIG 30

MEASURED
HORIZONTAL PLANE RADIATION PATTERN
WWRL 5 KW., DA-1, 1600 KC.
NEW YORK, N.Y.

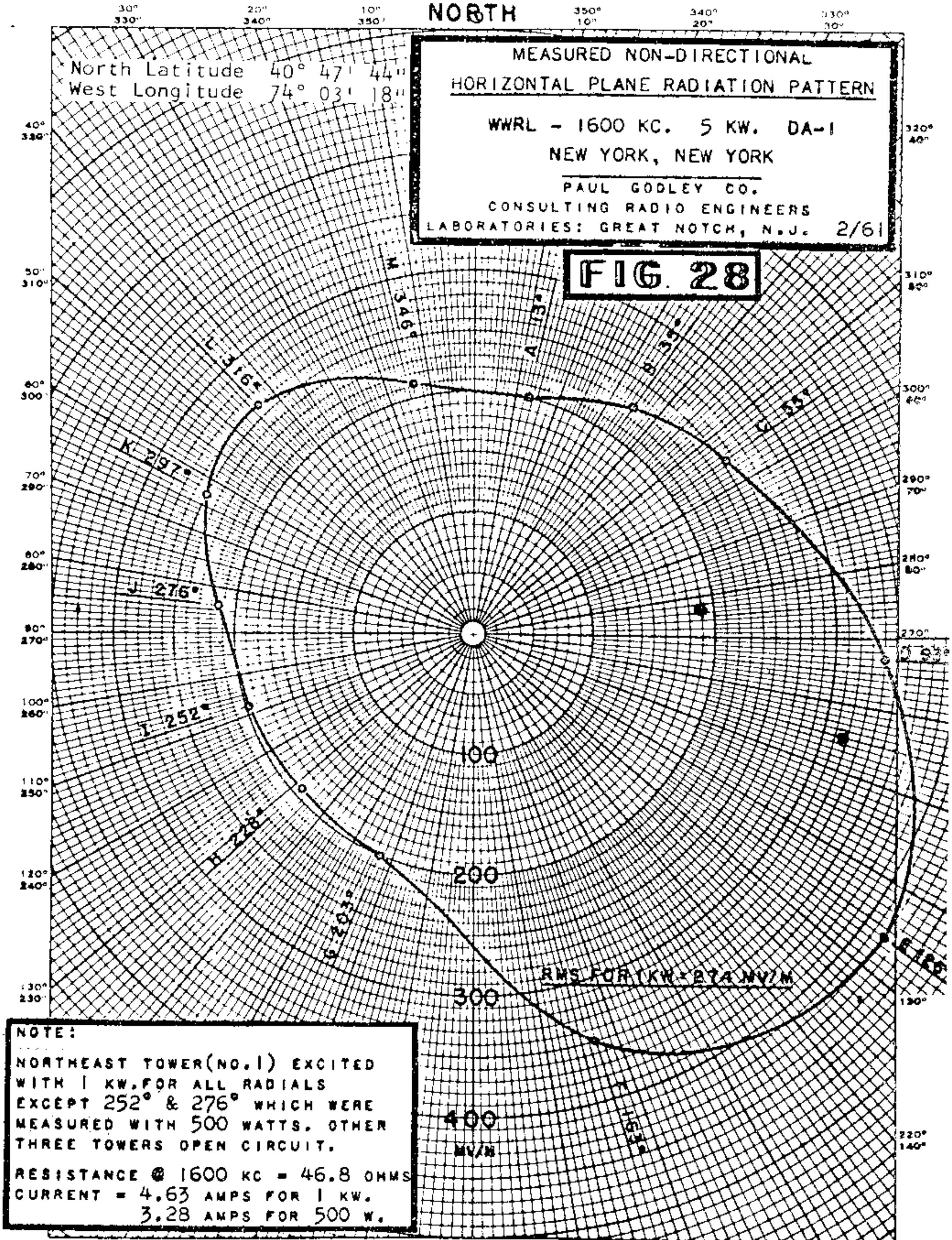
PAUL GODLEY CO.
CONSULTING RADIO ENGINEERS
LABORATORIES: GREAT NOTCH, N.J. 2/61

FCC File No. BL-8391
Accepted 6-27-61

WWRL
New York, New York 1600 KC

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

Station WWRL 5kw, DA-1,U
New York, New York 1600 KC



FCC File No. BL-8391
Accepted 6-27-61

WWRL
New York, New York 1600 KC

WXVI
[illegible] khz

DIRECTIONAL ANTENNA SYSTEM [illegible]

[illegible]

[illegible]

[illegible]

[illegible] Towers: [illegible]

Date: November [illegible], 19[illegible]

[illegible]

[illegible]

North Latitude: 32° [illegible]
West Longitude: 8[illegible]° [illegible]

[illegible]

[illegible]
[illegible]
Type of [illegible], uniform [illegible]
[illegible]

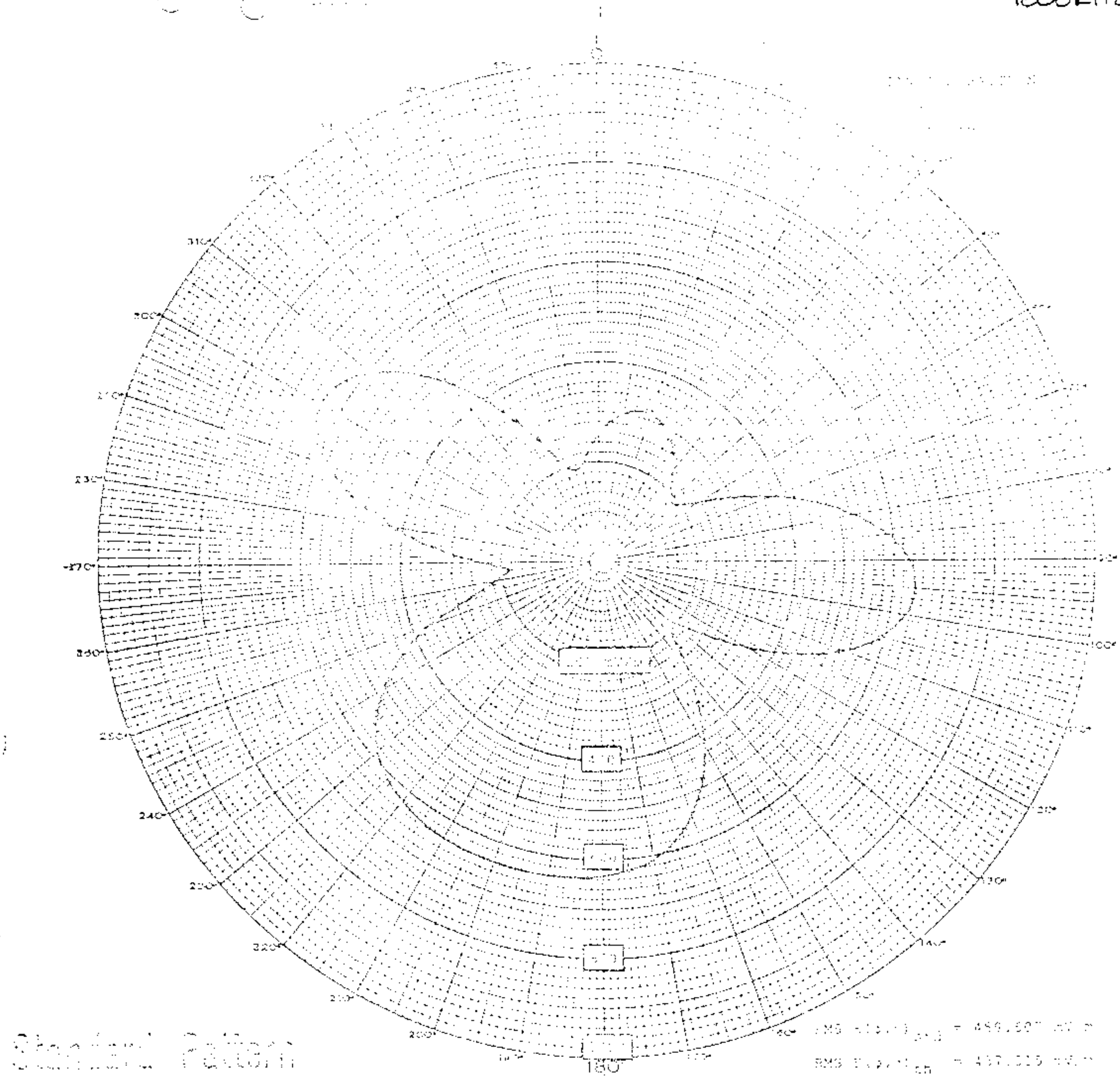
TOWER:	N(#2)	S(#1)
HEIGHT ABOVE INSULATORS:	150'	150' ([illegible])
[illegible]	-[illegible]°	0
[illegible]	0.7	1.0
DAY PHASING:	-63°	0°
DAY [illegible]	0.55	1
SPACING AND ORIENTATION:	Towers in a [illegible] (291°) on a line [illegible] 120 [illegible].	
GROUND SYSTEM:	120 - 200' [illegible] copper radials plus a [illegible] square ground screen about each tower. Radials are [illegible] and buried [illegible] copper strap along [illegible] towers. [illegible] bonded together.	

[illegible]

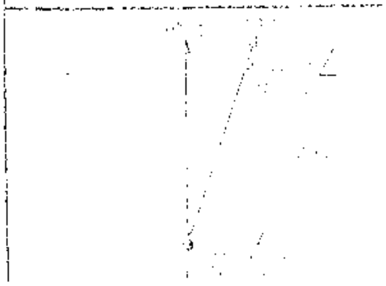
	[illegible]		STANDARD
	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]			

[illegible] Please [illegible] the Nighttime directional antenna radiation pattern notified for Station WXVI in United States Change List Number [illegible] dated [illegible] 17, 19[illegible] 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.

WXVI
1600kHz



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	STATION DATA

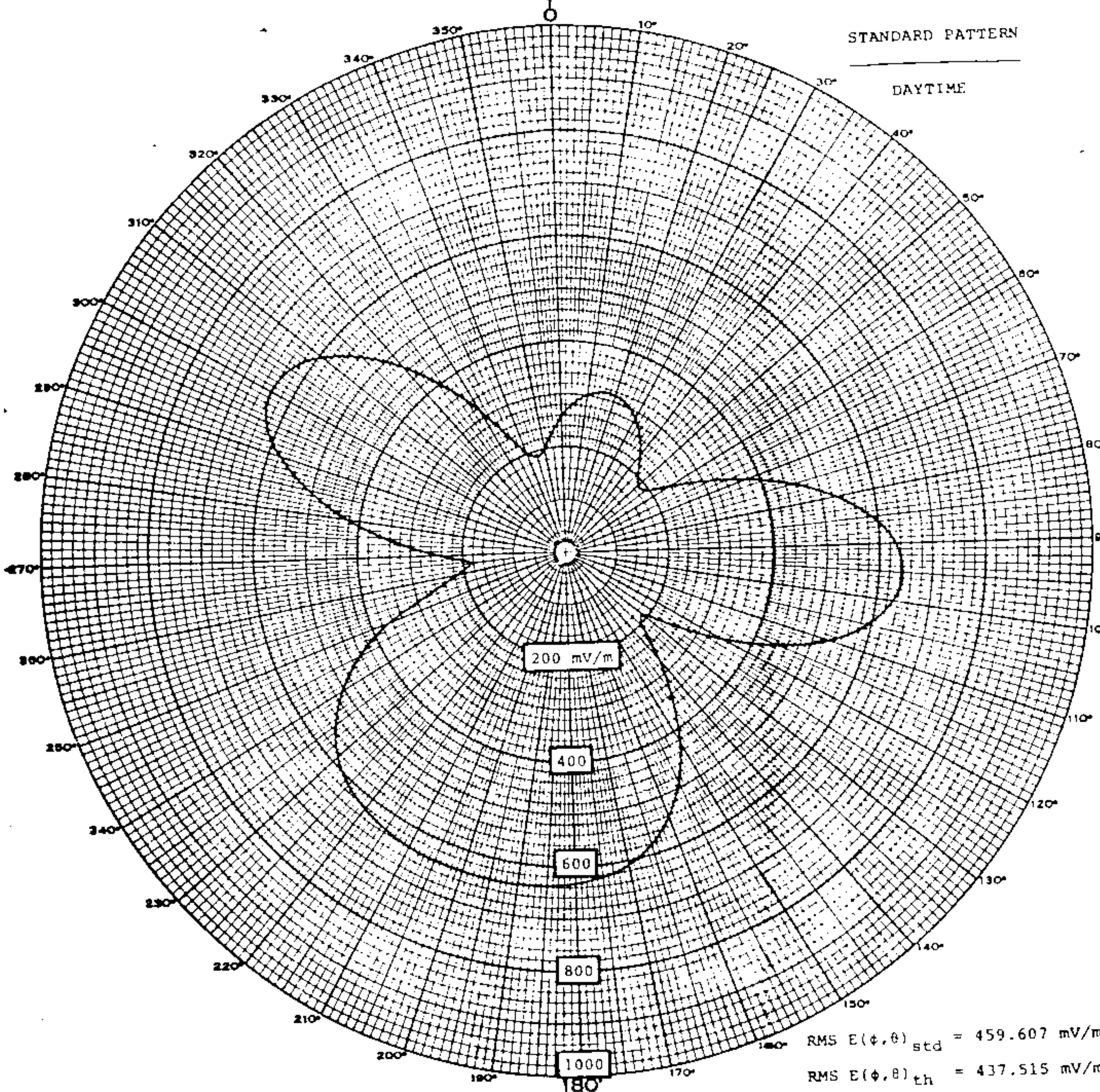


POLAR CO-ORDINATE NO. 10LP CLEVELAND INSTITUTE OF ELECTRONICS CLEVELAND, OHIO MADE IN U.S.A.

WXVI

STANDARD PATTERN

DAYTIME

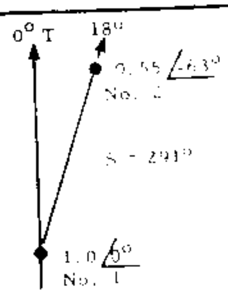


RMS $E(\phi,\theta)_{std}$ = 459.607 mV/m

RMS $E(\phi,\theta)_{th}$ = 437.515 mV/m

RSS = 450.797 mV/m

TOWER PLACEMENT SKETCH



PATTERN PARAMETERS

TOWER No	ELECTRICAL HEIGHT G°	TRUE TOWER ORIENTATION φ°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO M	ELEV. ANGLE θ°	ELEVATION RMS FIELD mv/m E_θ
1	90	0	0	0		1.0	0	
2	90	18	291	-1[illegible]		0.55	10	
3							20	
4							30	
5							40	
6							50	
7							60	
8							70	
9							80	
10							E_r =	mv/m
							P_r =	kw

DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐

STATION DATA

CALL	WXVI
FREQUENCY	1600 kc
POWER	5.0 kw
TIME OF OPERATION	Unlimited
TYPE OF OPERATION	DA-2
DAYTIME TOWERS	No. 1,2
NIGHTTIME TOWERS	No. 1,2
No. RADIALS PER TOWER	120
LENGTH OF RADIALS	117-200 '
GROUND SCREEN DIMENSION	24'x24'
LAT	32 ° 23 ' 40 "
LONG	86 ° 17 ' 21 "
SUPERSEDES	
PATTERN No	761230

Carl E. Smith
CONSULTING RADIO ENGINEERS
8200 SNOWVILLE ROAD
CLEVELAND, OHIO • 44141

761215

FIG. 3.3
DAYTIME STANDARD HORIZONTAL PLANE PATTERN

Radio Station WXVI
Montgomery, Alabama
1600 kHz 1N/5D DA-2 U

Oak Harbor, Ohio

PROPOSED DAY
(1-8-59g)

New; Dale Windnagel
Oak Harbor, Ohio

1kw, DA-D, D
1600 KC

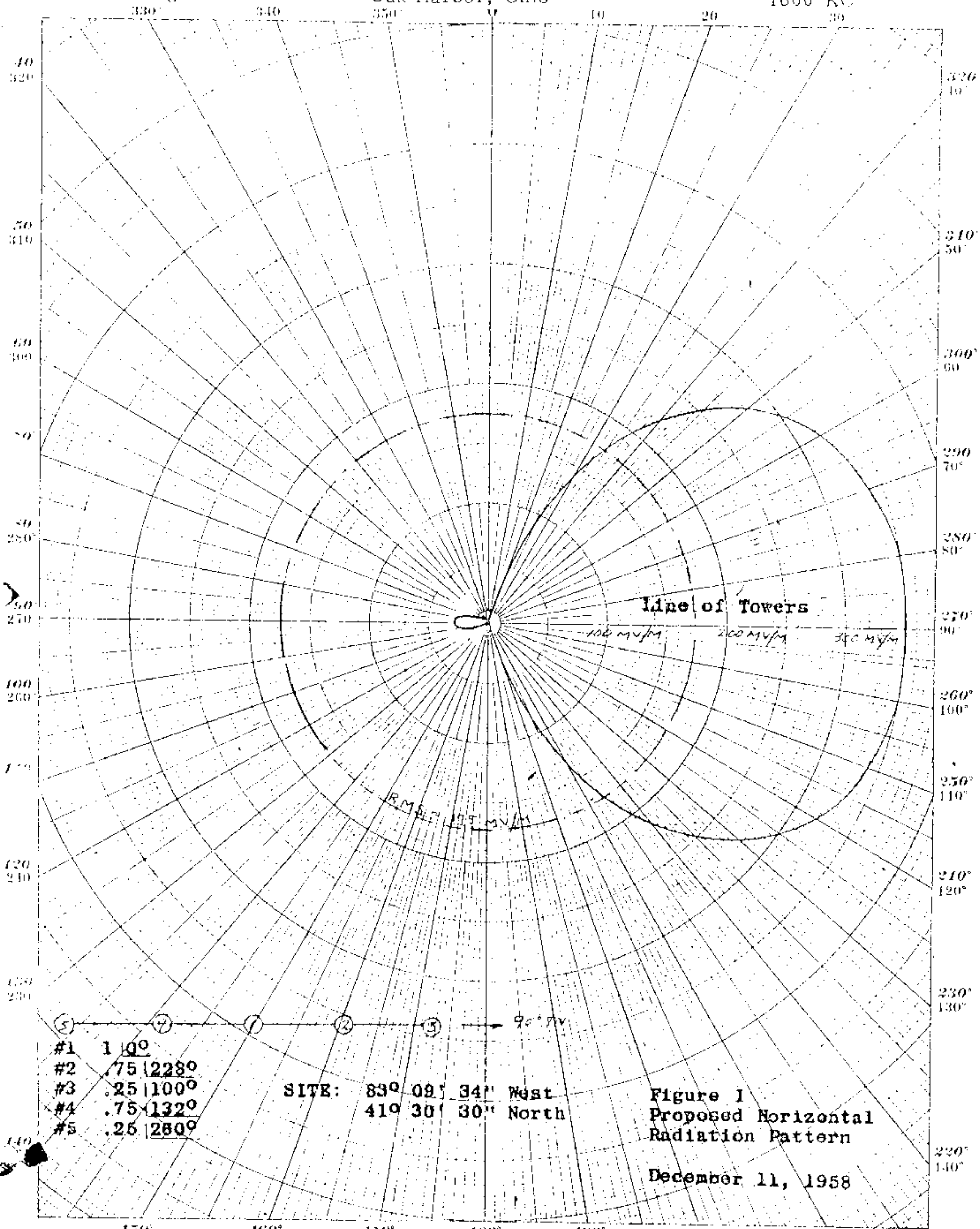


Figure I
Proposed Horizontal
Radiation Pattern

December 11, 1958

FCC File No. BP-11953
Accepted 12-29-58 Amended

Dale Windnagel
Oak Harbor, Ohio

1600 KC

Oak Harbor, Ohio

PROPOSED DAY NULLS
(1-8-59g)

New; Dale Windnagel
Oak Harbor, Ohio

1kw, DA-D, D
1600 KC

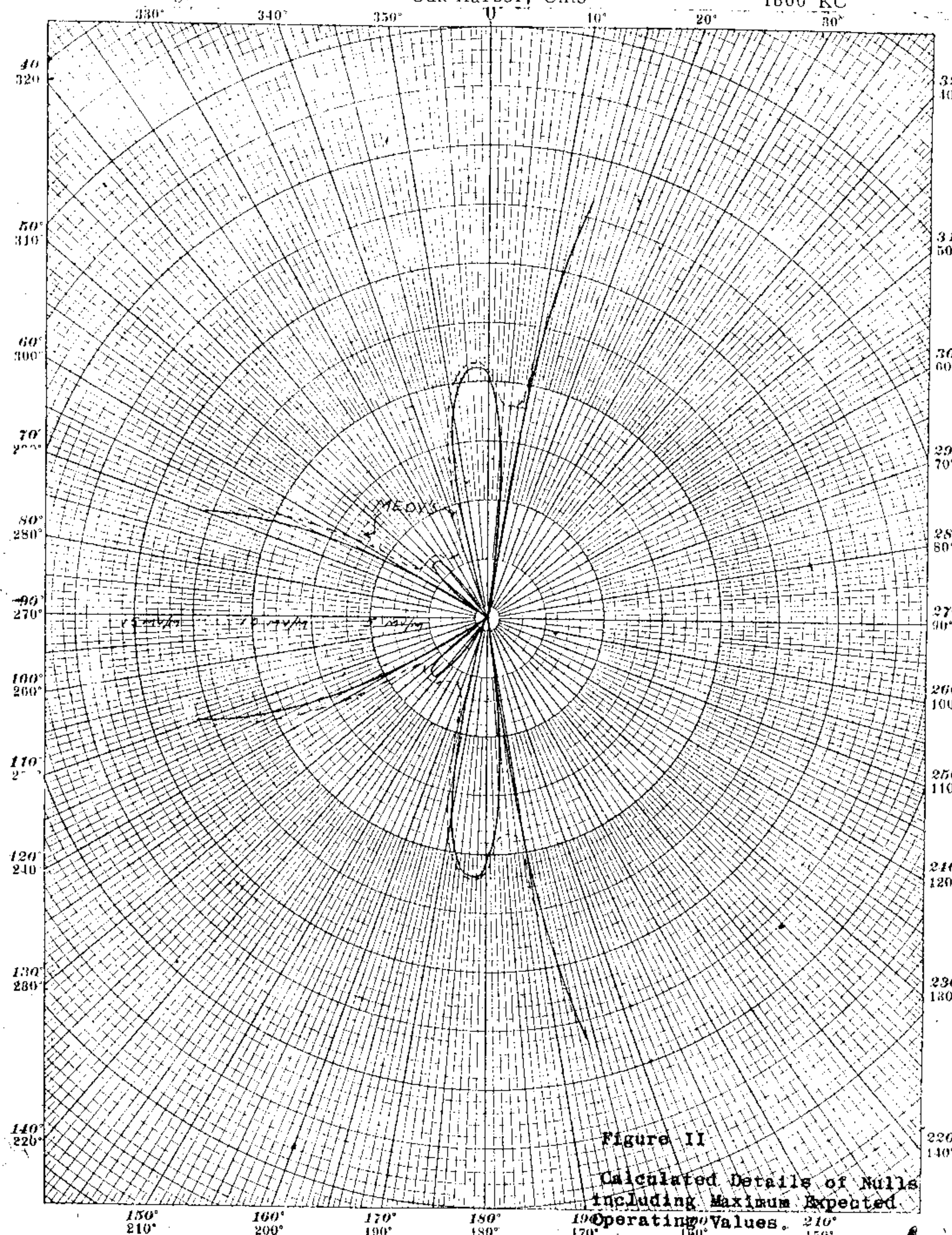


Figure II

Calculated Details of Nulls including Maximum Expected Operating Values.

December 11, 1958

FCC File No. BP-11953
Accepted 12-29-58 Amended

Dale Windnagel
Oak Harbor, Ohio

1600 KC

XEGEM

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: XEGEM Main Studio: Toluca, Mexico

Frequency: 1600 kHz Power: 2 kW

Notification List No. (*) Date: (*) Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM: North Latitude: 19° 14' 45"
West Longitude: 99° 34' 54"

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:	SW(#1)	C(#2)	NE(#3)
HEIGHT ABOVE INSULATORS:	102.5'	102.5'	102.5' (60°)
PHASING:	-108°	0°	+108°
FIELD RATIO:	1	1.955	1

SPACING AND OREINTATION: The towers are located in a row with adjacent towers spaced 153.8' (90°) on a line bearing 72.5° true.

GROUND SYSTEM: 120-153.8' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL
RMS

285.6 mV/m

(*)FCC Note: This supplementary data was transmitted by Mexican letter dated March 11, 1979, in connection with an item notified in Change List No. 277 dated November 30, 1976. Pending clarification, it is assumed that the geographical coordinates specified in this supplementary data supercede the coordinates notified in Change List No. 277.

DESCRIPCION DEL SISTEMA DIRECCIONAL DE RADIACION .. XEGEM
OPERACION DIURNA

ESTACION : XEGEM | UBICACION : TOLUCA, MEX.

FRECUENCIA : 1600 KHz.	POTENCIA : 2 kW.
LISTA DE NOTIFICACIONES :	CLASE : III.
LOCALIZACION GEOGRAFICA DEL SISTEMA RADIADOR.	LONGITUD O : 99° 34' 54" LATITUD N: 19° 14' 45"

CARACTERISTICAS DEL SISTEMA

AUTORIZADO PARA OPERACION :	AD - D .
NUMERO DE ELEMENTOS RADIADORES :	TRES .
TIPO DE ELEMENTOS RADIADORES : TORRES :	TORRES VERTICALES DE ACERO DE SECCION UNIFORME TRIANGULAR SOPORTADAS CON RETENIDAS ALIMENTACION, TIPO SERIE.

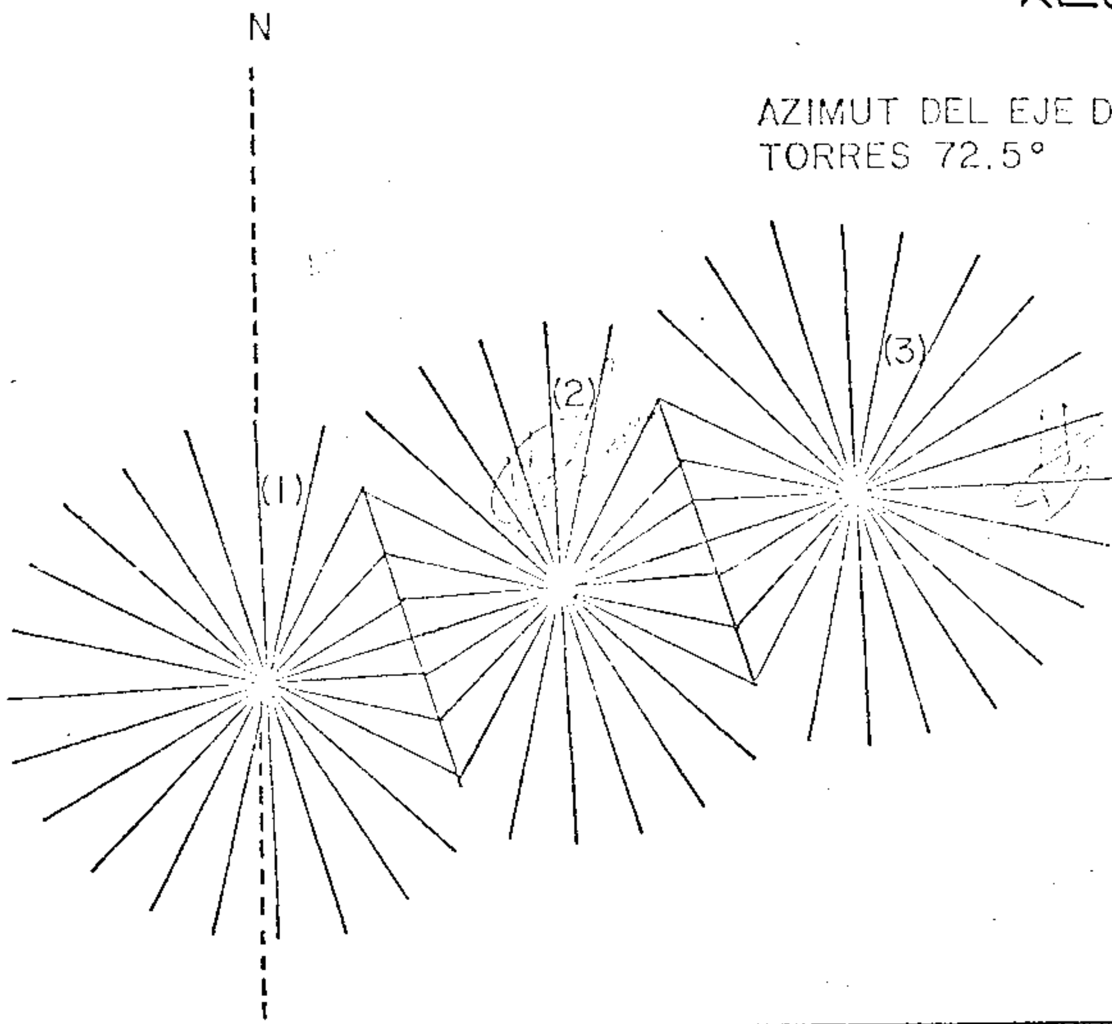
TORRE:	SW(1)	C(2)	NE(3)
ALTURA SOBRE LOS AISLADORES:	60°(31.25m)	60°(31.25m)	60°(31.25m)
MAGNITUDES RELATIVAS DE CORRIENTES:	1	1.955	1
DEFASAMIENTO:	- 108°	0°	108°
SEPARACION ENTRE TORRES:	REFERENCIA	90°(46.875m)	180°(93.75m)
AZIMUT DEL EJE DE LAS TORRES:	REFERENCIA	72.5°	72.5°

RAIZ CUADRATICA MEDIA TEORICA : 285.6 mV/m.

INTENSIDAD DE CAMPO R.C.M NO ATENUADO A 1609 m.POR kW: 189.9 mV/m.

XEGEM

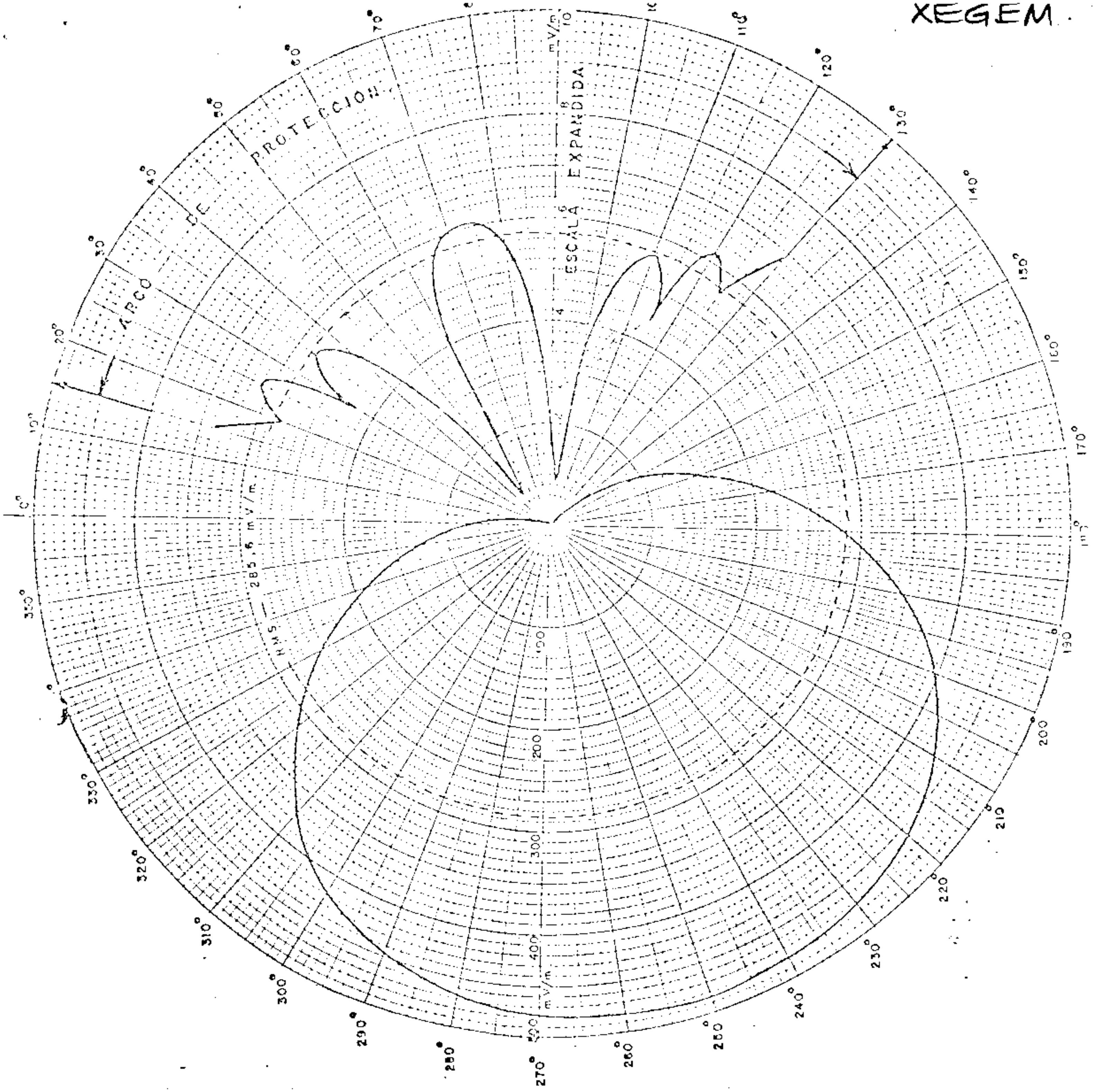
AZIMUT DEL EJE DE LAS TORRES 72.5°



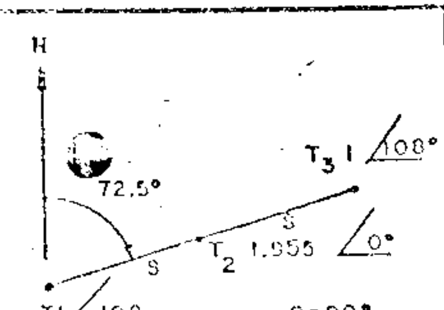
SISTEMA DE TIERRA

120 RADIALES DE ALAMBRE DE COBRE Nº 10 EN CADA TORRE, DE 46,875 M. DE LONG. CADA UNO, UNIDOS AL CENTRO COMO LO INDICA LA FIGURA, POR ALAMBRE DEL MISMO MATERIAL TIPO 00. TODO EL SISTEMA ESTA ENTERRADO 0.30 M., LA SEPARACION ENTRE LOS EJES DE LAS TORRES ES DE 46,875 M.	XEGEM TOLUCA, MEX.	FRECUENCIA Y POTENCIA 1600 kHz. 2 kW. AD-D DISEÑO: PERITO Nº:

XEGEM.



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



XEGEM

TOLUCA, MEX.

FRECUENCIA: 1600 kHz.

DISEÑO:

XEGEM

PATRON DE RADIACION HORIZONTAL TABULADO

OPERACION DIURNA

ESTACION: XEGEM POTENCIA: 2000 watts.

FRECUENCIA: 1600 kHz. UBICACION: TOLUCA, MEX.

$$E = 2E_1 f_1(\theta) \sqrt{F_2 F_3} \sqrt{\left[\frac{1+F_2^2}{2F_2} + \cos(S_2 \cos\theta \cos\phi + \psi_2)\right]\left[\frac{1+F_3^2}{2F_3} + \cos(S_3 \cos\theta \cos\phi + \psi_3)\right]}$$

AZIMUT (grados)	E (mV/m) a 1609 m.	AZIMUT (grados)	E (mV/m) a 1609 m.
0	67.70	180	285.01
5	46.39	185	316.52
10	28.96	190	345.81
15	6.80	195	372.36
20	5.59	200	395.83
25	6.20	205	416.07
30	4.43	210	433.10
35	5.63	215	447.05
40	5.06	220	458.18
45	3.30	225	466.81
50	0.91	230	473.30
55	1.63	235	478.00
60	3.91	240	481.21
65	5.61	245	483.20
70	6.02	250	484.15
75	6.02	255	484.15
80	5.61	260	483.20
85	3.91	265	481.21
90	1.63	270	478.00
95	0.91	275	473.30
100	3.30	280	466.81
105	5.06	285	458.18
110	5.63	290	447.05
115	4.43	295	433.10
120	6.20	300	416.07
125	5.59	305	395.83
130	6.80	310	372.36
135	28.96	315	345.81
140	46.39	320	316.52
145	67.70	325	285.01
150	92.66	330	251.94
155	120.86	335	218.10
160	151.69	340	184.39
165	184.39	345	151.69
170	218.10	350	120.86
175	251.94	355	92.66

DATOS ADICIONALES

Corriente alimentada a cada torre, amp:

(1) 6.244 (2) 12.207 (3) 6.224.

Impedancia en Ohms (Sistema de alimentación)

(1) 16.172 -- j 110.894

(2) 8.933 -- j 131.559

(3) 0.980 -- j 140.104 .

XEGEM

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: XEGEM | Main Studio: Toluca, Mexico

Frequency: 1600 KHz | Power: 2 KW

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

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:
North Latitude: 19° 14' 45"
West Longitude: 99° 34' 54"

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:	SW(#1)	C(#2)	NE(#3)
HEIGHT ABOVE INSULATORS:	102.5'	102.5'	102.5' (60°)
PHASING:	-108°	0°	+108°
FIELD RATIO:	1	1.955	1

SPACING AND OREINTATION: The towers are located in a row with adjacent towers spaced 153.8' (90°) on a line bearing 72.5° true.

GROUND SYSTEM: 120-153.8' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL
RMS

285.6 mv/m

(*)FCC Note: This supplementary data was transmitted by Mexican letter dated March 11, 1978, in connection with an item notified in Change List No. 277 dated November 30, 1976. Pending clarification, it is assumed that the geographical coordinates specified in this supplementary data supercede the coordinates notified in Change List No. 277.

DESCRIPCION DEL SISTEMA DIRECCIONAL DE RADIACION ...

OPERACION DIURNA

ESTACION : XECHM UBICACION : TOLUCA, MEX.

FRECUENCIA : 1600 KHz. POTENCIA : 2 KW.

LISTA DE NOTIFICACIONES : CLASE : III

LOCALIZACION GEOGRAFICA DEL SISTEMA RADIADOR. LONGITUD O : 99° 34' 54" LATITUD N: 19° 14' 45"

CARACTERISTICAS DEL SISTEMA

AUTORIZADO PARA OPERACION : AD - D.

NUMERO DE ELEMENTOS RADIADORES : TRES .

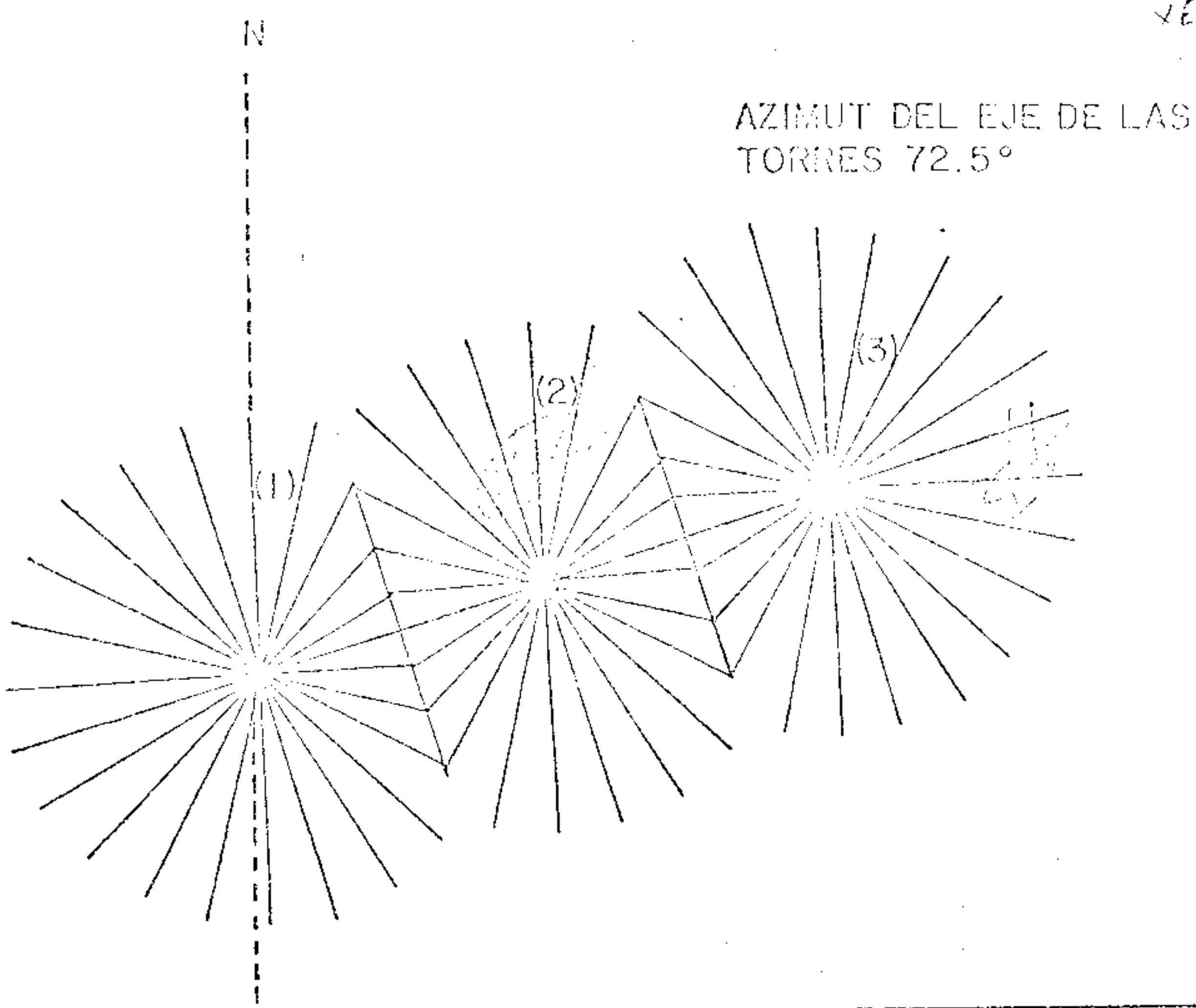
TIPO DE ELEMENTOS RADIADORES : TORRES VERTICALES DE ACERO

TORRES : DE SECCION UNIFORME TRIANGULAR SOPORTADAS CON RETENIDAS ALIMENTACION, TIPO SERIE.

TORRE :	SW(1)	C(2)	NE(3)
ALTURA SOBRE LOS AISLADORES:	60°(31.25m)	60°(31.25m)	60°(31.25m)
MAGNITUDES RELATIVAS DE CORRIENTES:	1	1.955	1
DEFASAMIENTO:	- 108°	0°	108°
SEPARACION ENTRE TORRES:	REFERENCIA	90°(46.875m)	180°(93.75m)
AZIMUT DEL EJE DE LAS TORRES:	REFERENCIA	72.5°	72.5°

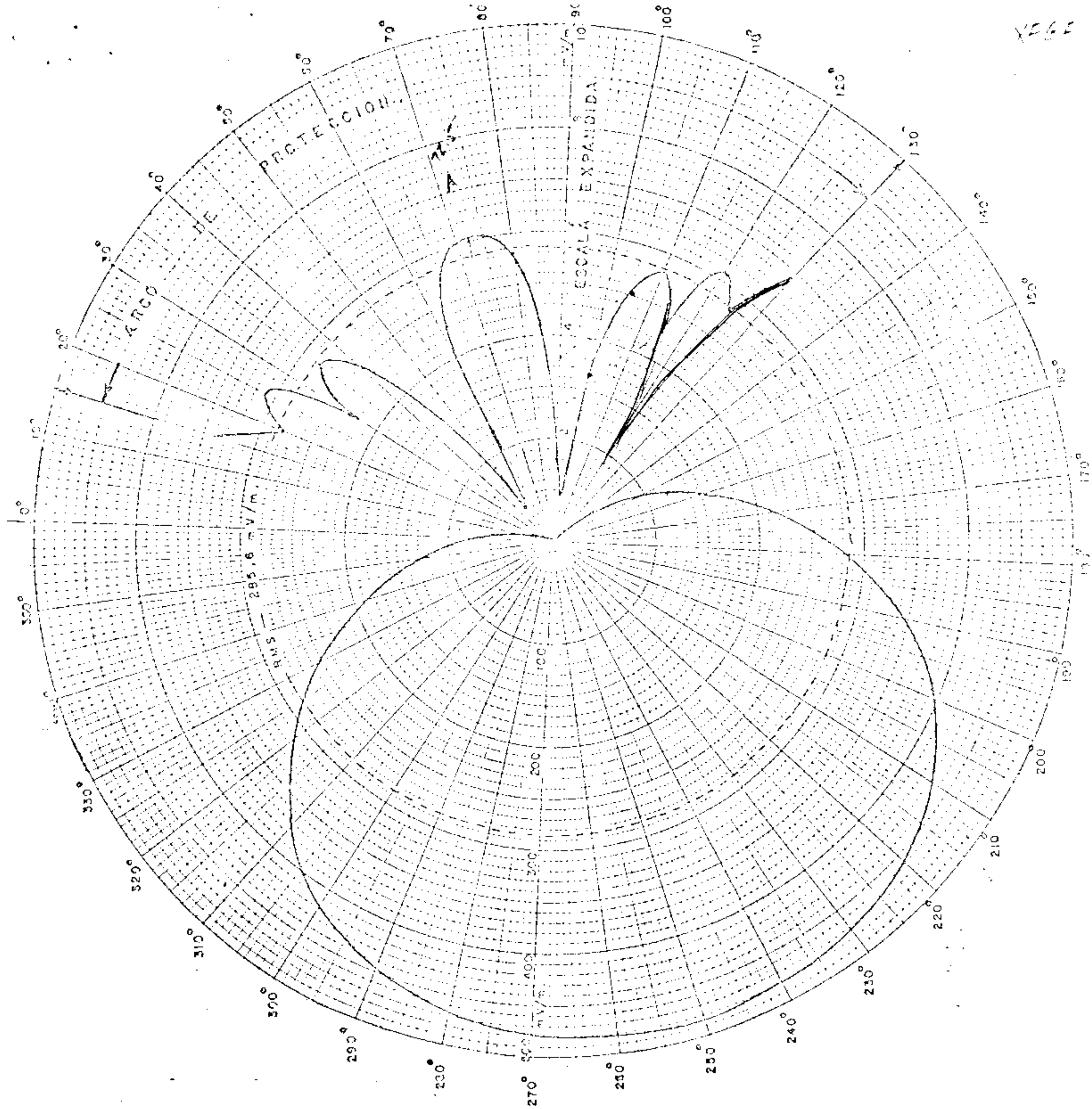
RAIZ CUADRATICA MEDIA TEORICA : 285.6 mV/m.

INTENSIDAD DE CAMPO R.C.M NO ATENUADO A 1609 m.POR KW: 189.9 mV/m.

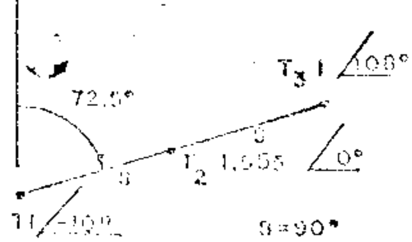


SISTEMA DE TIERRA

120 RADIALES DE ALAMBRE DE COBRE Nº 10 EN CADA TORRE, DE 46,875 M. DE LONG. CADA UNO, UNIDOS AL CENTRO COMO LO INDICA LA FIGURA, POR ALAMBRE DEL MISMO MATERIAL TIPO 00, TODO EL SISTEMA ESTA ENTERRADO 0.30 M., LA SEPARACION ENTRE LOS EJES DE LAS TORRES ES DE 46,875 M.	XEGEM TOLUCA, MEX.	FRECUENCIA Y POTENCIA 1600 kHz. 2 kW. AD-D DISEÑO: PERITO Nº:



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



XEGEM

TOLUCA, MEX.

FRECUENCIA: 1600 kHz.

DISEÑO :

XEGEM

PATRON DE RADIACION HORIZONTAL TABULADO

OPERACION DIURNA

ESTACION: XEGEM POTENCIA: 5000 watts.

FRECUENCIA: 1600 KHz. UBICACION: TOLUCA, MEX.

$$E = 2E_1 f_1(\theta) \sqrt{F_2 F_3 \left[\frac{1+F_2^2}{2F_2} + \cos(S_2 \cos\theta \cos\phi + \psi_2)\right]\left[\frac{1+F_3^2}{2F_3} + \cos(S_3 \cos\theta \cos\phi + \psi_3)\right]}$$

AZIMUT (grados)	E (mV/m) a 1609 m.	AZIMUT (grados)	E (mV/m) a 1609 m.
0	67.70	180	285.01
5	46.39	185	316.52
10	28.96	190	345.61
15	6.80	195	372.36
20	5.59	200	395.83
25	6.20	205	416.07
30	4.43	210	433.10
35	5.63	215	447.05
40	5.06	220	458.18
45	3.30	225	466.81
50	0.91	230	473.30
55	1.63	235	478.00
60	3.91	240	481.21
65	5.61	245	483.20
70	6.62	250	484.15
75	6.02	255	484.15
80	5.61	260	483.20
85	3.91	265	481.21
90	1.63	270	478.00
95	0.91	275	473.30
100	3.30	280	466.81
105	5.06	285	458.18
110	5.63	290	447.05
115	4.43	295	433.10
120	6.20	300	416.07
125	5.59	305	395.83
130	6.80	310	372.36
135	28.96	315	345.61
140	46.39	320	316.52
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(2) 8.533 − j 131.559
(3) 0.980 − j 140.164.