1480-1500

Station	Main Studio	Freq	Power	Date
NEW	Edmonton, AB	1480	10 kW/DA-1	12/27/79
CHRD	Drummondville, QU	1480	10 kW/DA-2	6/24/76
CHRD	Drummondville, QU	1480	50/35 kW/DA-2	7/10/79
CKAN	Newmarket, ON	1480	10 kW/DA-N	9/23/77
KAPE	San Antonio, TX	1480	0.5 kW/DA-D	7/1/77
KAUS	Austin, MN	1480	1 kW/DA-2	4/29/70
KHEA	Mission, KS	1480	1 kW/DA-D	5/29/58
KHEA	Mission, KS	1480	0.5/1 kW/DA-2	6/14/61
KMEZ	Dallas, TX	1480	1/5 kW/DA-2	4/9/75
KEHG	Fosston, MN	1480	2.5/5 kW/DA-N	10/26/79
KGCX	Sidney, MT	1480	5 kW/DA-1	7/11/49
KLEO	Wichita, KS	1480	1/5 kW/DA-2	6/29/70
KLMS	Lincoln, NE	1480	1 kW/DA-2	6/14/61
KLMS	Lincoln, NE	1480	1/2.5 kW/DA-D	10/26/79
KLMS	Lincoln, NE	1480	0.5/1 kW/DA-N	10/1/52
KOOD	Lakewood, WA	1480	1 kW/DA-D	3/23/59
KPIA	Ironton, MO	1480	5 kW/DA-D	3/14/74
KPUB	Pueblo, CO	1480	1 kW/DA-D	2/11/58
KVAN	Vancouver, WA	1480	5/1 kW/DA-N	8/24/76
KWEW	Hobbs, NM	1480	1 kW/DA-N	1/21/55
KWEW	Hobbs, NM	1480	1/5 kW/DA-N	8/24/76
KWIZ	Santa Ana, CA	1480	5 kW/DA-2	11/16/79
KWIZ	Santa Ana, CA	1480	1/5 kW/DA-2	1/24/62
KWUN	Concord, CA	1480	0.5 kW/DA-2	11/16/79
KYOS	Merced, CA	1480	5 kW/DA-N	4/1/48
WABB	Mobile, AL	1480	5 kW/DA-N	7/16/75
WAME	Charlotte, NC	1480	5 kW/DA-2	5/27/60

1480-1500

Station	Main Studio	Freq	Power	Date
WCIN	Cincinnati, OH	1480	0.5/5 kW/DA-2	11/27/74
WDAS	Philadelphia, PA	1480	1/5 kW/DA-2	7/26/61
WGSB	Geneva, IL	1480	0.5/1 kW/DA-2	6/14/61
WHBC	Canton, OH	1480	5 kW/DA-N	4/25/46
WHOM	New York, NY	1480	5 kW/DA-2	12/28/67
WIOS	Tawas City-E.Tawas, MI	1480	1/5 kW/DA-2	12/27/68
WISL	Shamokin, PA	1480	1 kW/DA-N	2/10/48
WISM	Madison, WI	1480	5 kW/DA-2	5/8/74
WISM	Madison, WI	1480	1/5 kW/DA-2	7/19/57
WJBM	Jerseyville, IL	1480	0.5 kW/DA-D	4/29/69
WKND	Windsor, CT	1480	0.5 kW/DA-D	7/26/61
WLEE	Richmond, VA	1480	5 kW/DA-2	6/12/74
WRDW	Augusta, GA	1480	5 kW/DA-N	11/42
WRSW	Warsaw, IN	1480	0.5/1 kW/DA-2	5/8/61
WSAR	Fall River, MA	1480	5 kW/DA-1	7/20/77
WSDS	Ypsilanti, MI	1480	0.5 kW/DA-D	8/24/62
WTHI	Terre Haute, IN	1480	1/5 kW/DA-2	1/22/71
WVCF	Windermere, FL	1480	5 kW/DA-D	4/28/65
WYDK	Yadkinville, NC	1480	1 kW/DA-D	12/29/66
NEW	Winchester, VA	1480	0.5 kW/DA-D	6/14/61
NEW	Gravehurst, ON	1490	1/0.25 kW	7/5/83
CBAM	Edmundston, NB	1490	0.10 kW	12/29/52
CFRC	Kingston, ON	1490	0.10 kW	12/18/52
CFWB	Campbell River, BC	1490	1/0.25 kW	9/28/67
CHYM	Kitchener, ON	1490	5/10 kW/DA-2	7/27/65
CKAD	Wilmot Station, NS	1490	1/0.25 kW	1/5/62

1480-1500

Station	Main Studio	Freq	Power	Date
CKBM	Montmagny, QU	1490	0.25/1 kW	10/28/53
CKEN	Kentville, NS	1490	1/0.5 kW/DA-1	8/23/68
WNUS	West Springfield, MA	1490	0.25/1 kW/DA-D	4/22/59
WOHI	Easter Liverpool, OH	1490	0.25/0.5 kW/DA-D	2/2/59
WOLF	Syracuse, NY	1490	0.25/1 kW/DA-D	4/30/63
WVEC	Hampton, VA	1490	0.25 kW	8/16/55
NEW	St. Catherines, ON	1500	1 kW/DA-D	1/28/65
CKAY	Duncan, BC	1500	5/1 kW/DA-2	8/8/72
CKAY	Duncan, BC	1500	10/1 kW/DA-2	3/28/79
NEW	Dallas, GA	1500	1/0.5 kW/DA-D	11/2/79
KANI	Wharton, TX	1500	0.5 kW/DA-1	8/8/59
KOKN	Pawhuska, OK	1500	5 kW/DA-D	11/29/65
KROQ	Burbank, CA	1500	1/10 kW/DA-2	2/28/68
KSTP	St. Paul, MN	1500	50 kW/DA-2	8/27/65
KTXO	Sherman, TX	1500	1 kW/DA-D	6/28/67
KXRX	San Jose, CA	1500	5/10 kW/DA-2	6/28/65
KXRX	San Jose, CA	1500	1/10 kW/DA-2	3/26/58
WAKE	Valparaiso, IN	1500	1 kW/DA-D	8/28/68
WBRI	Indianapolis, IN	1500	10 kW/DA-D	3/28/60
WBRI	Indianapolis, IN	1500	5 kW/DA-D	10/26/62
WDEE	Detroit, MI	1500	5/50 kW/DA-2	8/29/60
WDEE	Detroit, MI	1500	1/10 kW/DA-2	3/30/63
WFIF	Milford, CT	1500	5 kW/DA-D	2/28/69
WGFT	Youngstown, OH	1500	0.5 kW/DA-D	10/29/75
WGFT	Youngstown, OH	1500	0.5/0.25 kW/DA-2	2/28/67
WKAX	Russellville, AL	1500	1 kW/DA-D	7/29/68
WKBX	Winston-Salem, NC	1500	10/1 kW/DA-2	2/22/71

1480-1500

Station	Main Studio	Freq	Power	Date
WKBX	Winston-Salem, NC	1500	1 kW/DA-D	7/26/61
WKER	Pompton Lakes, NJ	1500	1 kW/DA-D	2/22/71
WKER	Pompton Lakes, NJ	1500	0.5 kW/DA-D	3/30/63
WKIZ	Key West, FL	1500	0.25 kW/DA-1	1/30/67
WTOP	Washington, DC	1500	50 kW/DA-2	2/7/57
WVOC	Battle Creek, MI	1500	1 kW/DA-D	1/28/66
WZBN	Zion, IL	1500	0.25 kW/DA-D	5/25/62
NEW	Ellwood City, PA	1500	0.25 kW/DA-D	6/28/67
NEW	Marion-Jonesboro, IN	1500	5/0.5 kW/DA-2	7/12/61
XEMS	Matamoros, Tamaulipas	1500	1 kW/DA-1	8/27/65
XERH	Mexico, DF	1500	20 kW/DA-N	4/15/53

NEW

TABLE 1

ANTENNA DESCRIPTION SHEET

STATION CALL: NEW

STUDIO LOCATION: EDMONTON, ALBERTA

FREQUENCY: 1480 kHz

POWER: 10 kW

CLASS: III

MODE: DA-1

TIME: UNLIMITED

NOTIFICATION LIST NO.: 393.. DATE: ..December 27, 1979

GEOGRAPHICAL LOCATION: Latitude: 53° 23' 40" North
Longitude: 113° 26' 08" West

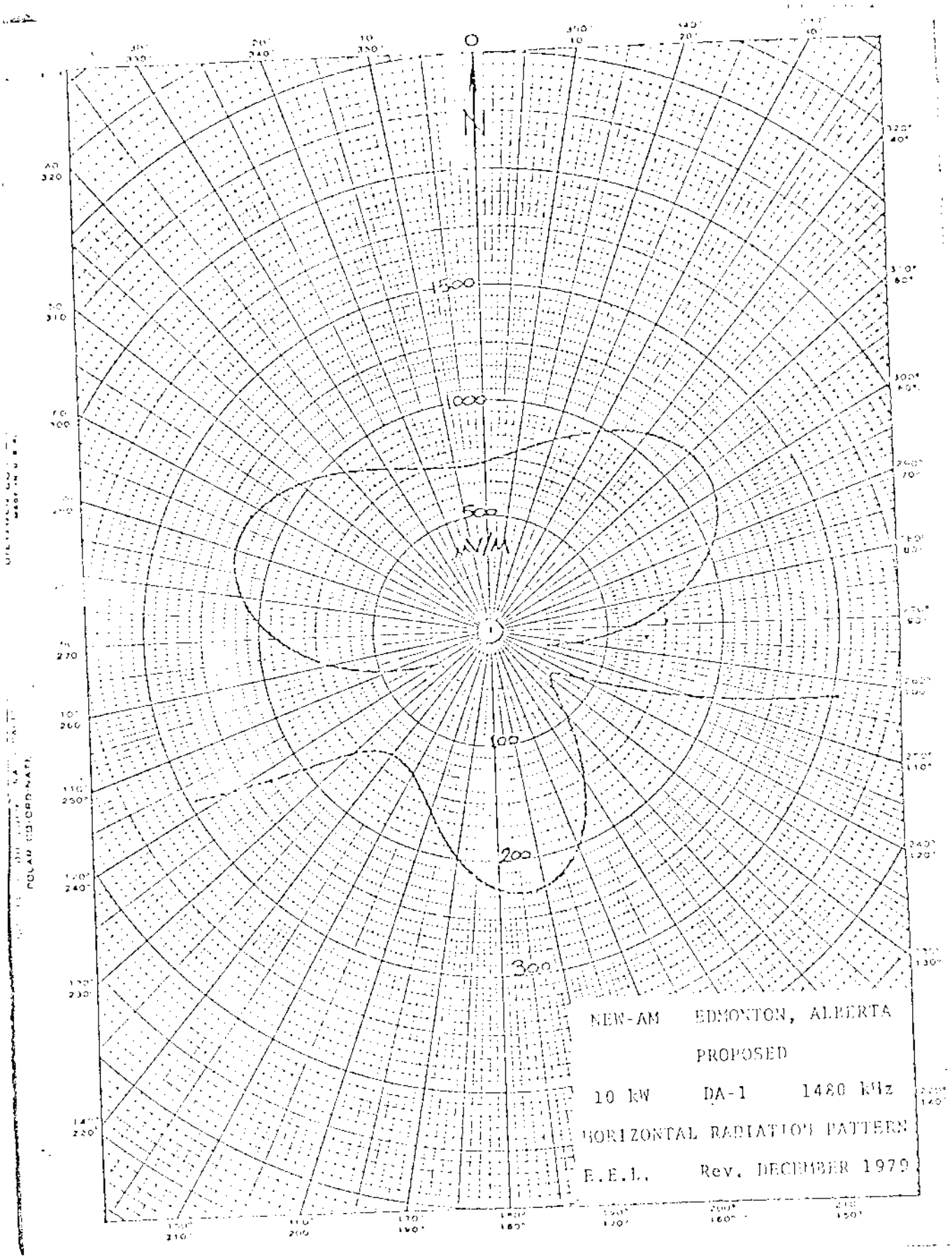
ARRAY CHARACTERISTICS: Three guyed steel towers of uniform cross section; base insulated; series fed; no top loading.

TOWER NUMBER:	1 NORTH	2 CENTRE	3 SOUTH
OVERALL HEIGHT:	185'	385'	185'
HEIGHT ABOVE BASE INSULATOR:	97.5° (180')	205.9° (380')	97.5° (180')
SPACING:	reference	150° (276.9')	301.6° (556.8')
TRUE BEARING:	reference	170°	172.8°
FIELD RATIO:	0.43	1	0.47
PHASE ANGLE	-67°	0°	79°

GROUND SYSTEM: 120 equally spaced radials per tower of #10 AWG soft drawn bare copper buried 6" to 18" deep where possible, of length 266' (0.4λ) excluding those along common chord.

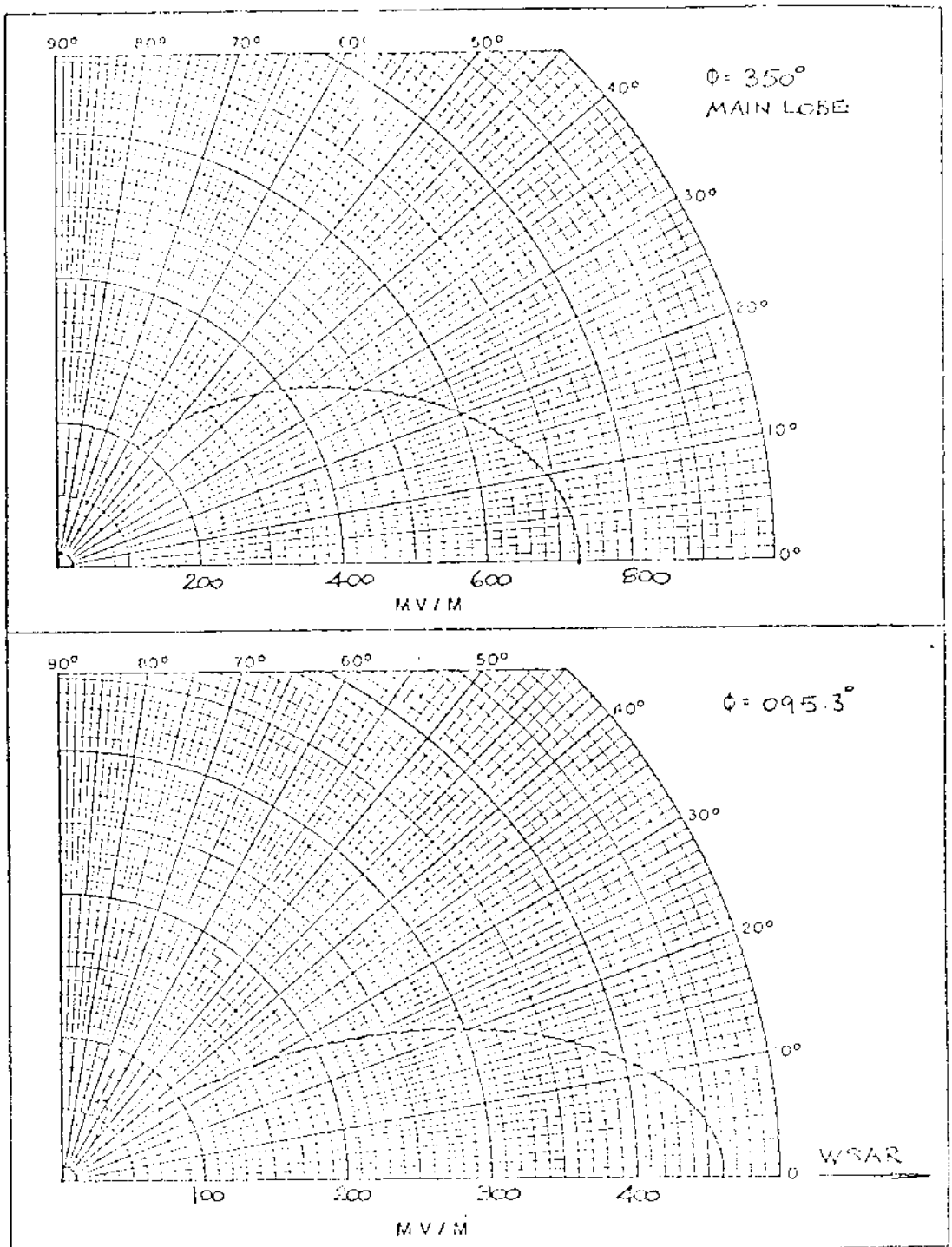
PREDICTED EFFICIENCY: 717.09 mV/m (226.76 mV/m for 1 kW)
(UNATTENUATED FIELD AT ONE MILE)

NEW


N
1500
1000
500
µV/M
100
200
300
NEW-AM EDMONTON, ALBERTA
PROPOSED
10 kW DA-1 1480 kHz
HORIZONTAL RADIATION PATTERN
E.E.L. Rev. DECEMBER 1979

NEW

FIGURE 2-1



VERTICAL RADIATION PATTERNS

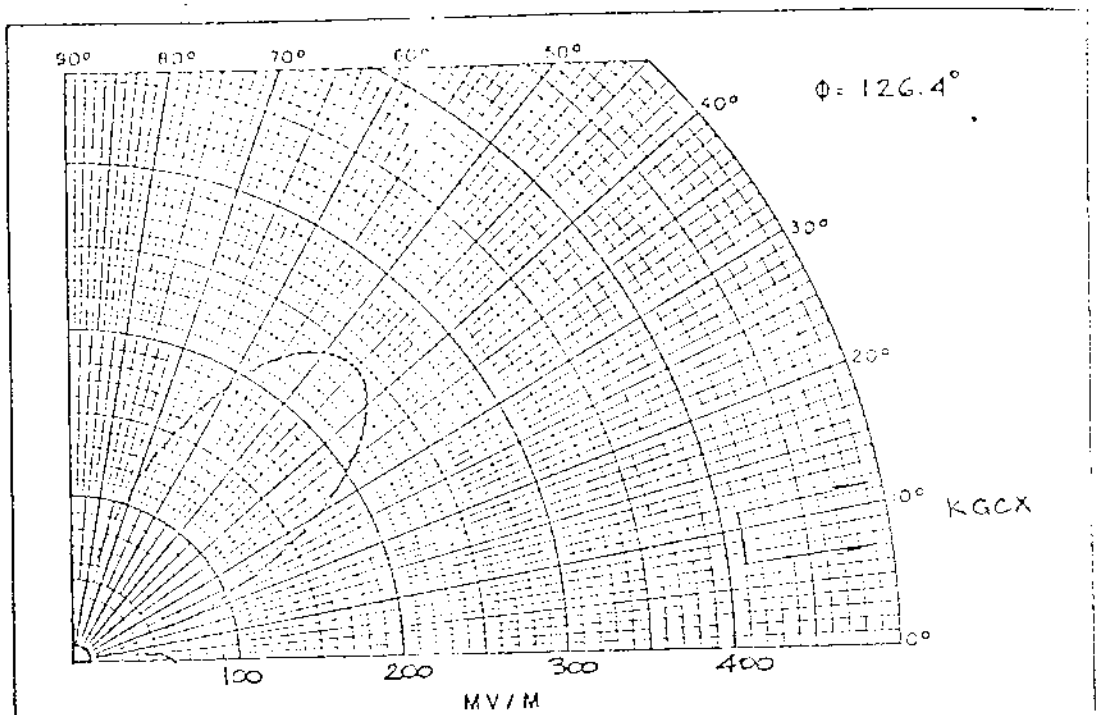
NEW EDMONTON, ALBERTA

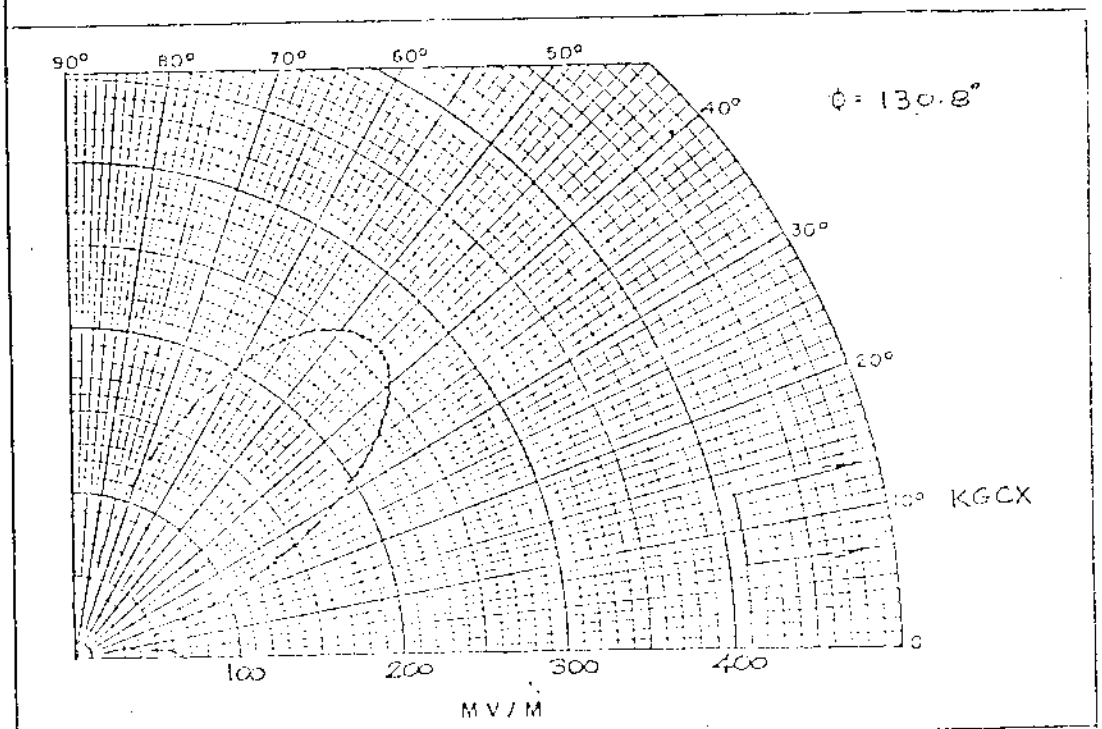
10 kW DA-1 1480 kHz Class III

E.E.L. DEC. 1979

NEW

FIGURE 2-2





VERTICAL RADIATION PATTERNS

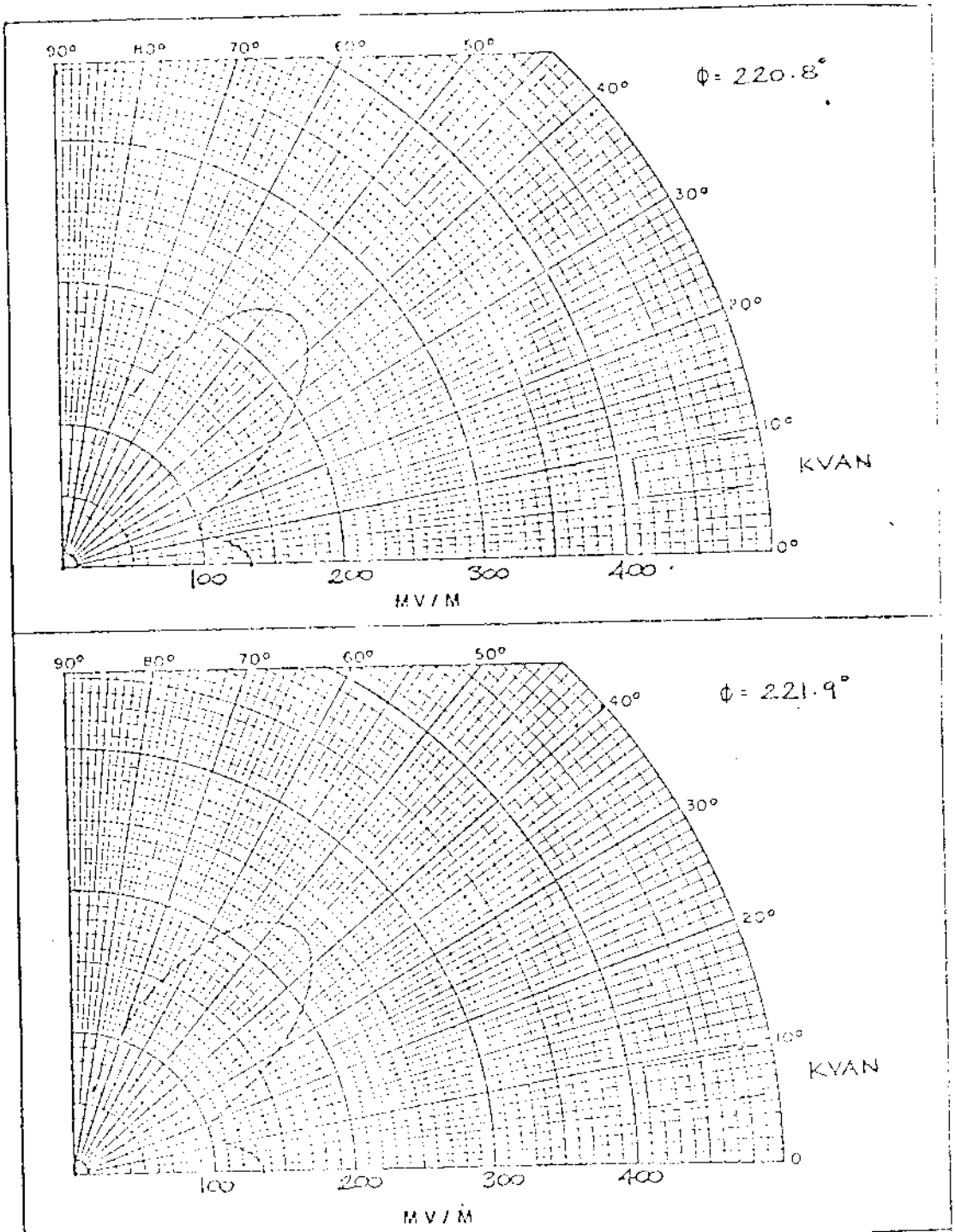
NEW EDMONTON, ALBERTA

10 kW DA-1 1480 kHz Class III

E.E.L. DEC. 1979

NEW

FIGURE 2-3



VERTICAL RADIATION PATTERNS

NEW EDMONTON, ALBERTA

10 kW DA-1 1480 kHz Class III

E.E.L. DEC. 1979

CHRD

SUPPLEMENTAL DIRECTIONAL

ANTENNA DESCRIPTION SHEET

Station: CHRD

Location: Drummondville, Quebec

Frequency: 1480 kHz

Power: 10 kw, Class: III

Notification List No: 357

Date: June 24, 1976

Geographical Location of the Center of the Antenna System:

North Latitude: 45° 47' 47"

West Longitude: 72° 29' 04"

Mode of Operation - DA-2

Note: Please retain the description sheet and directional antenna radiation patterns notified for station CHRD in Canadian Change List Number 215 dated July 8, 1966 and attached to this supplemental description sheet. This notification is for the purpose of indicating only a correction in the geographical coordinates.

CHKV

Description Sheet
(1-30-67ct)

Station CHRD
Drummondville, Quebec

10kw,DA-2,U,Class III
1480 kc

DESCRIPTION OF ARRAY

STATION: CHRD

FREQUENCY: 1480 KHz

CERTIFICATION LIST NO; 215

STUDIO: DRUMMONDVILLE, QUE.

POWER: 10Kw - DA-2

CLASS: III

Date: July 8, 1966

GEOGRAPHICAL COORDINATES OF ARRAY: North Latitude 45° 47' 08"
West Longitude 72° 29' 12"

CHARACTERISTICS OF ARRAY

Mode of operation: 10Kw, Different patterns day and night

Number of elements: Four (4)

Type of Radiators: Guyed steel towers, uniform cross section base insulated for series feed, no top loading.

ANTENNA		No.1 (c)	No.2(n)	No.3 (s)	No.4 (w)
HEIGHT ABOVE INSULATOR		90°	90°	90°	90° (166')
OVERALL HEIGHT		169'	169'	169'	169'
FIELD RATIO	Day	reference	[illegible]	.5	.5
	Night	reference	.5	.5	0
PHASING	Day	reference		+155°	+69°
	Night	reference	-103°	+103°	
SPACING		reference	90°	90°	90° (166')
ORIENTATION		reference	[illegible]	205°	265°

GROUND SYSTEM: Equiangularly spaced radials of solid no.10 B & S copper wire extanding from the base of each tower to a common chord or to 0.4 wavelength

PREDICTED EFFECTIVE FIELD

600 MV/M at 1 mile for 10KW
190 MV/M at 1 mile for 1 Kw

CHRD

Proposed Day
(1-30-67ct)

Station CHRD
Drummondville, Quebec

10kw,DA-2,U,Class III
1480 kc

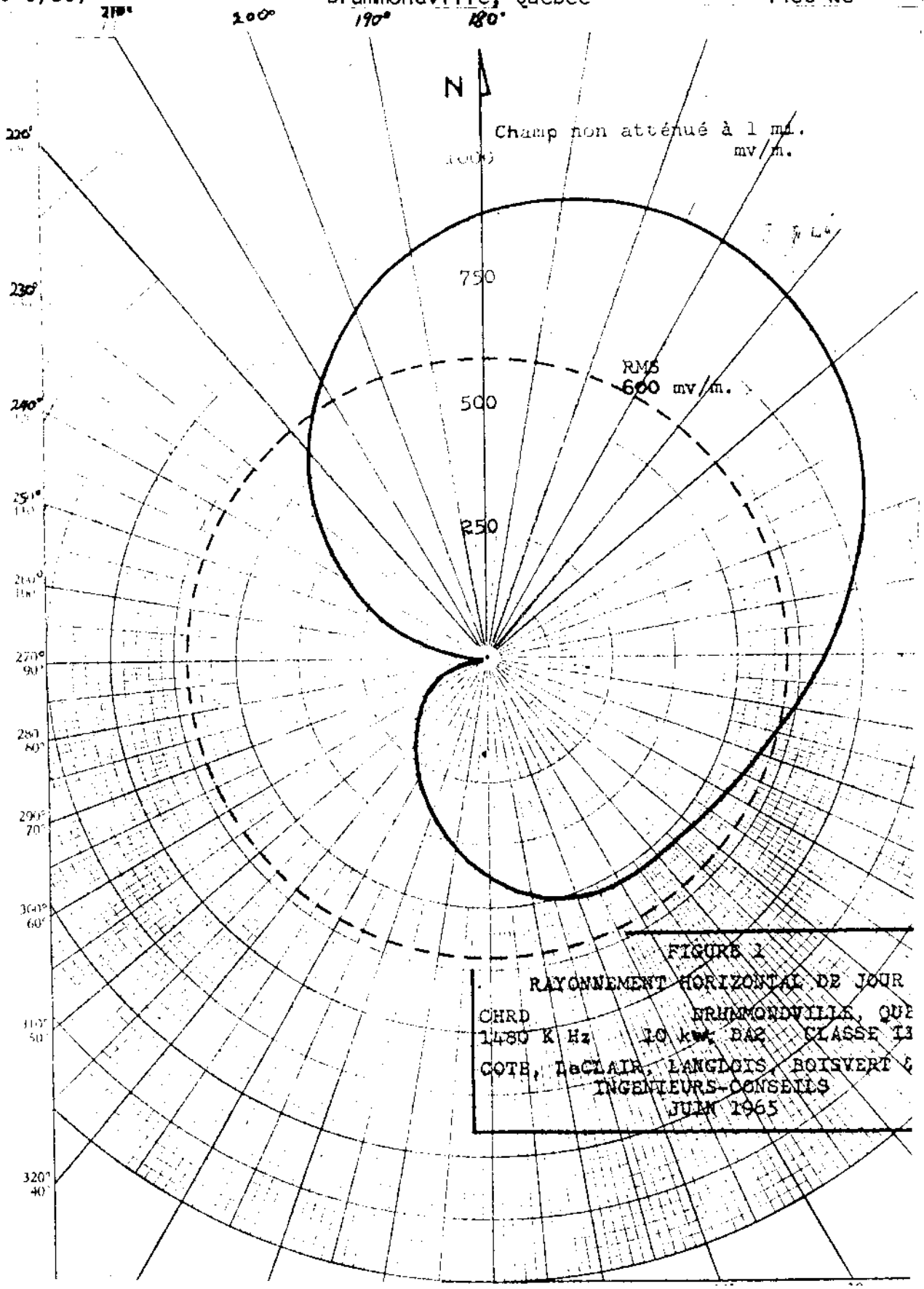


FIGURE 2
RAYONNEMENT HORIZONTAL DE JOUR
CHRD DRUMMONDVILLE, QUE
1480 K Hz 10 kw DA2 CLASSE III
COTE, LaCLAIR, LANGLOIS, BOISVERT &
INGENIEURS-CONSEILS
JUIN 1965

CHRD

Proposed Night
(8-26-66ct)

Station CHRD
Drummondville, Quebec.

10kw,DA-2,U,Class III
1480 kc

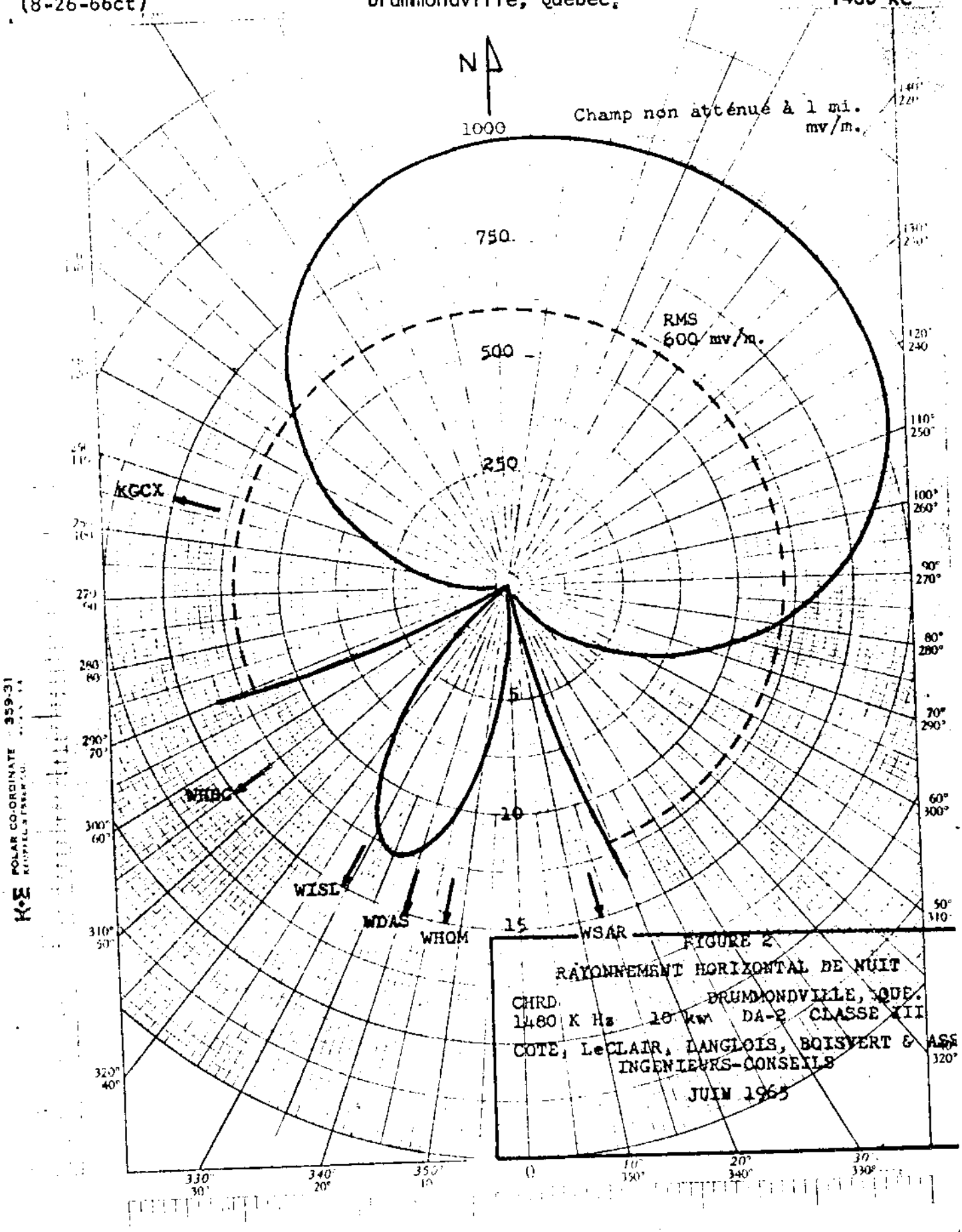


FIGURE 2

RAYONNEMENT HORIZONTAL DE NUIT

CHRD DRUMMONDVILLE, QUE.
1480 K Hz 10 kw DA-2 CLASSE III

COTE, LeCLAIR, DANGLOIS, BOISVERT & ASS
INGENIEURS-CONSEILS

JUIN 1965

CHRD

[illegible]

1. LETTRES D'APPEL: CHRD.

2. EMPLACEMENT: Drummondville, Qué.

3. FREQUENCE: 1430 KHz.

4. PUISSANCE: 50 KW de jour et 35 KW de nuit.

5. CLASSE: III (U).

6. NOTIFICATION NO: 387 DATE: July 10, 1979

7. COORDONNEES: Latitude nord: 45° 47' 47"

Longitude ouest: 72° 29' 04"

8. SYSTEME D'ANTENNE:

a) Fonctionnement: directionnel AD-2.

b) Type: quatre (4) éléments à section uniforme, haubanés et alimentés en série.

c) Mise à la terre: 120 fils #10 par élément, espacés également, d'une longueur max. de 266' (0.4λ) avec courroies d'interconnexion, le tout enfoui à environ 3 pouces sous la surface.

9. DATS D'ANTENNE:

		#1 (C)	#2 (N)	#3 (S)	#4 (O)
Orientation (Az):		Réf.	25°	205°	265°
Hauteur au-dessus de l'isolateur:		166'	166'	166'	166' (90°)
Espacement:		Réf.	166' (90°)	166' (90°)	166' (90°)
Phasage:	Jour:	0.0°	-	+134.0°	+71.0°
	Nuit:	0.0°	-105.0°	+105.0°	-
Rapport d'intensité de champ:	Jour:	1.000	-	0.519	0.410
	Nuit:	1.000	0.501	0.501	-

10. EFFICACITE PREVUE:

a) Jour: 1343.3 mV/m à 1 mille pour 50 KW.
199.0 mV/m à 1 mille pour 1 KW.

b) Nuit: 1124.1 mV/m à 1 mille pour 35 KW.
199.0 mV/m à 1 mille pour 1 KW.
Q= 10 mV/m

YVES R. HAMEL
INGENIEUR-CONSEIL

[illegible]

CHRD

Please retain the radiation patterns notified for CHRD Drumondville, Quebec on Canadian Change List No. 379 dated December 8, 1978. This notification involves only a change to the reduced quadrature factor Q associated with the night-time radiation pattern. The change is consistent with the control system which has been designed for optimum pattern stability.

I - DESCRIPTION DU SYSTEME A ANTENNE DIRECTIONNELLE

1. LETTRES D'APPEL: CHRD.

2. EMPLACEMENT: Drummondville, Qué.

3. FREQUENCE: 1480 KHz.

4. PUISSANCE: 50 KW de jour et 35 KW de nuit.

5. CLASSE: III (U).

6. NOTIFICATION NO: 379 DATE: December 8, 1978

7. COORDONNEES: Latitude nord: 45° 47' 47"

Longitude ouest: 72° 29' 04"

8. SYSTEME D'ANTENNE:

a) Fonctionnement: directionnel AD-2.

b) Type: quatre (4) éléments à section uniforme, haubanés et alimentés en série.

c) Mise à la terre: 120 fils #10 par élément, espacés également, d'une longueur max. de 266' (0.4λ) avec courroies d'interconnexion, le tout enfoui à environ 8 pouces sous la surface.

9. MATS D'ANTENNE:

		#1 (C)	#2 (N)	#3 (S)	#4 (O)
Orientation (Az):		Réf.	25°	205°	265°
Hauteur au-dessus de l'isolateur:		166'	166'	166'	166' (90°)
Espacement:		Réf.	166' (90°)	166' (90°)	166' (90°)
Phasage:	Jour:	0.0°	-	+134.0°	+71.0°
	Nuit:	0.0°	-105.0°	+105.0°	-
Rapport d'intensité de champ:	Jour:	1.000	-	0.510	0.410
	Nuit:	1.000	0.501	0.501	-

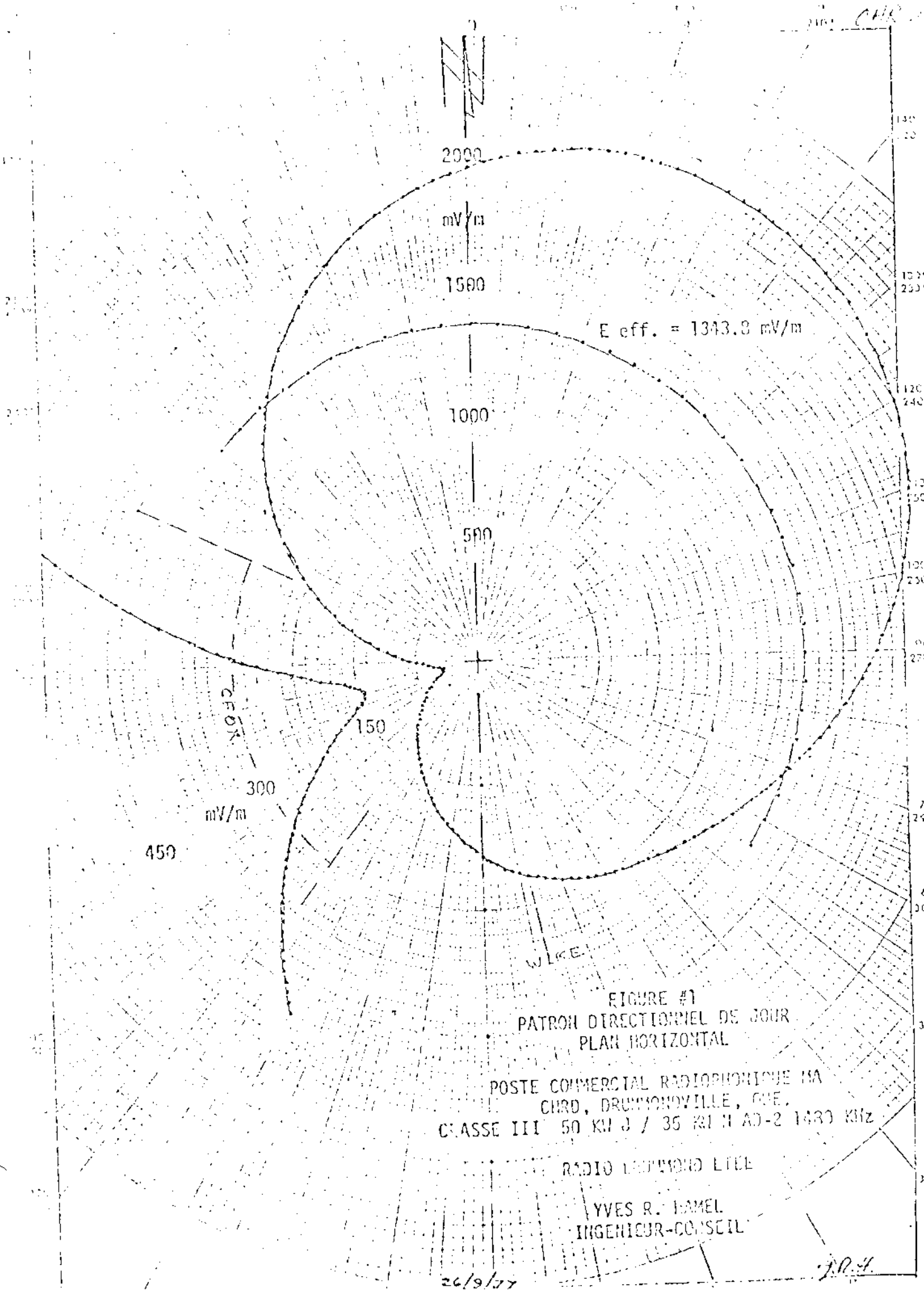
10. EFFICACITE PREVUE:

a) Jour: 1343.3 mV/m à 1 mille pour 50 KW.
190.0 mV/m à 1 mille pour 1 KW.

b) Nuit: 1124.1 mV/m à 1 mille pour 35 KW.
190.0 mV/m à 1 mille pour 1 KW.
Q= 18 mV/m

YVES R. HAMEL
INGENIEUR-CONSEIL

2/10/79


2000
mV/m
1500
E eff. = 1343.8 mV/m
1000
500
150
300
mV/m
450
FIGURE #1
PATRON DIRECTIONNEL DE JOUR
PLAN HORIZONTAL
POSTE COMMERCIAL RADIOPHONIQUE MA
CHRD, DRUMMONDVILLE, QUE.
CLASSE III 50 KW J / 35 KW N AD-2 1430 KHz
RADIO DRUMMOND LTEE
YVES R. DAMEL
INGENIEUR-CONSEIL
26/9/77

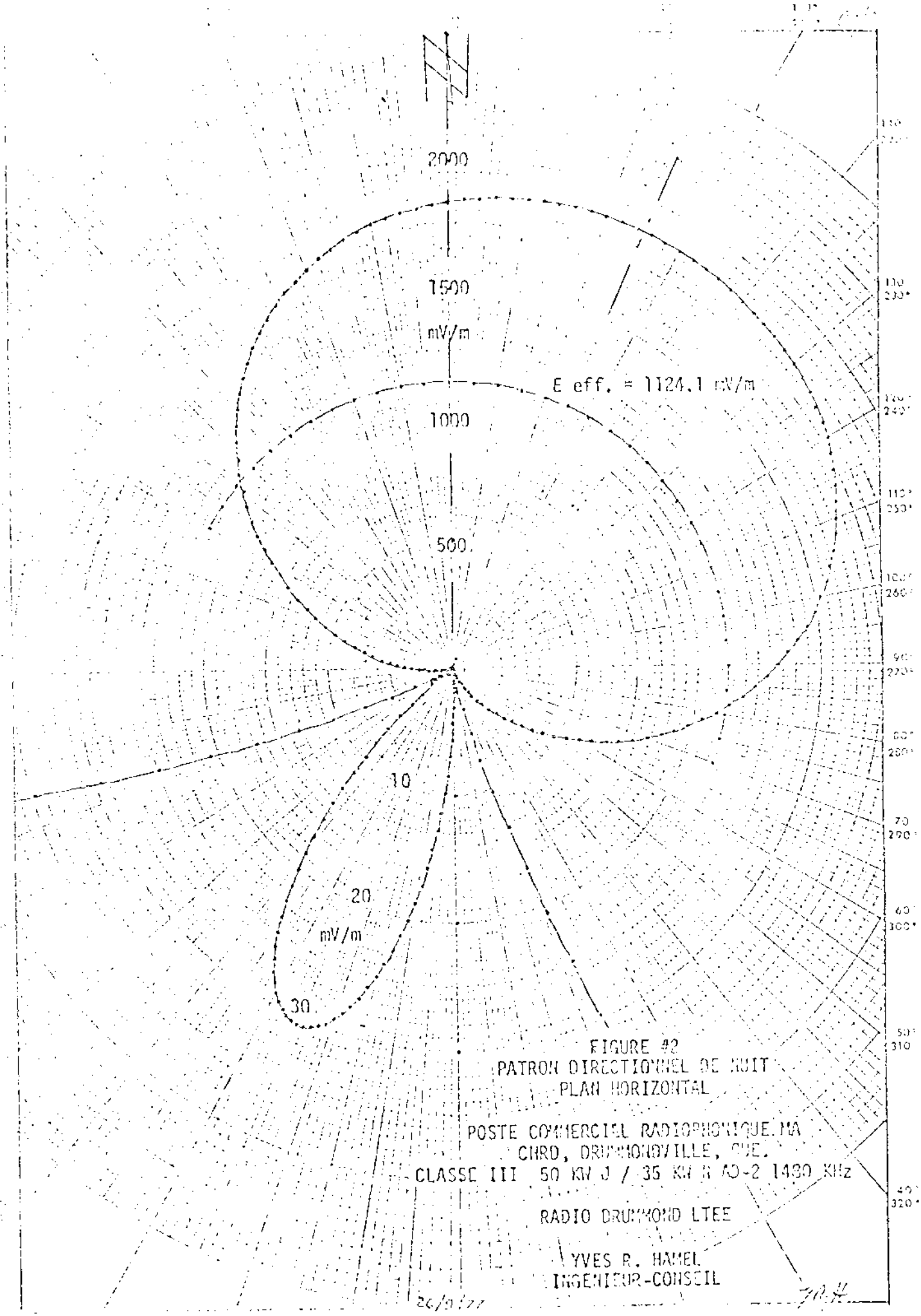


FIGURE #2
PATRON DIRECTIONNEL DE NUIT
PLAN HORIZONTAL

POSTE COMMERCIAL RADIOPHONIQUE MA
CHRD, DRUMMONDVILLE, QUE.
CLASSE III 50 KW J / 35 KW N AD-2 1480 KHz

RADIO DRUMMOND LTEE

YVES R. HAMEL
INGENIEUR-CONSEIL

26/9/77

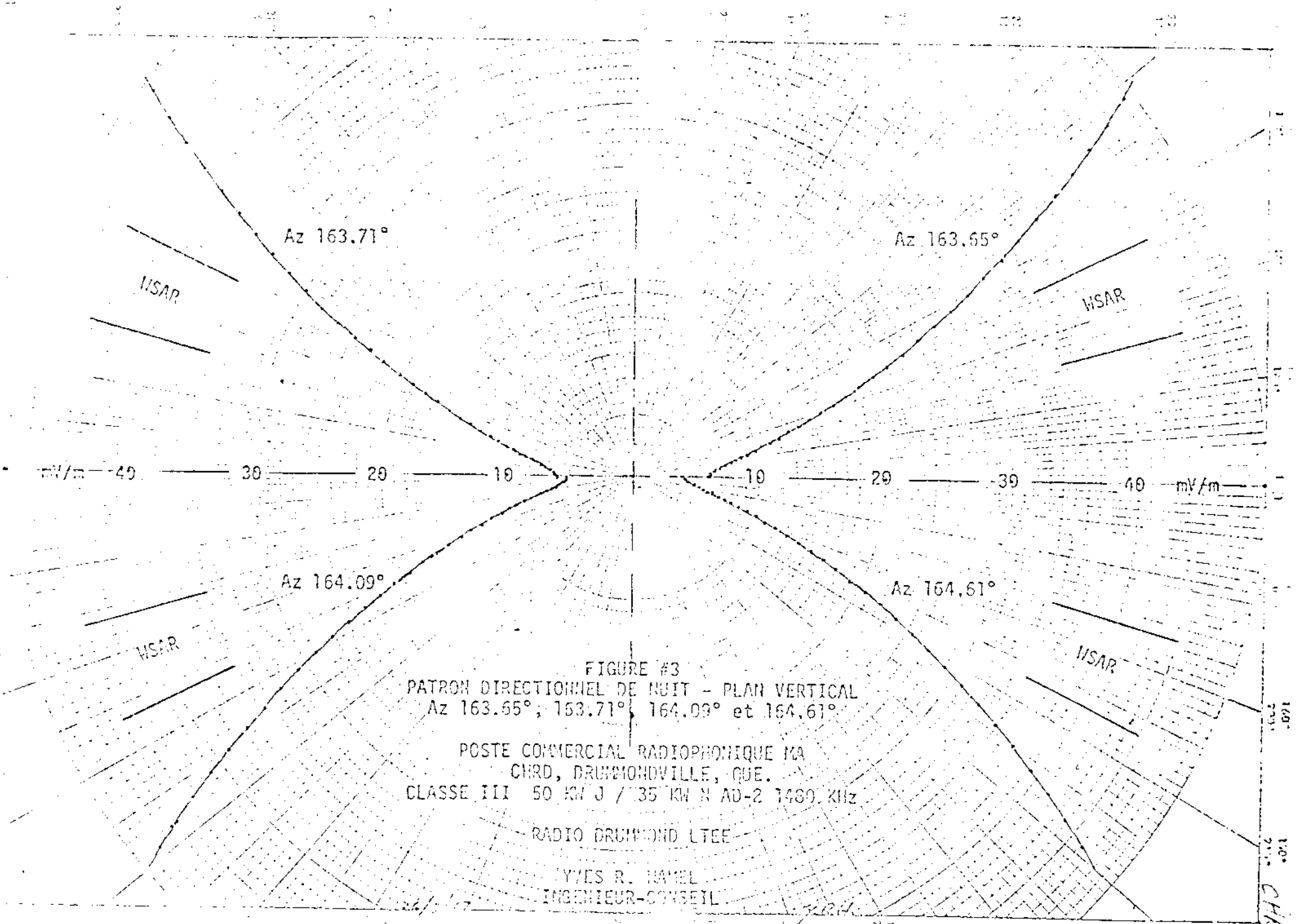


FIGURE #3
PATRON DIRECTIONNEL DE NUIT - PLAN VERTICAL
Az 163.65°, 163.71°, 164.09° et 164.61°

POSTE COMMERCIAL RADIOPHONIQUE MA
CHRD, DRUMMONDVILLE, QUE.
CLASSE III 50 KW J / 35 KW N AD-2 1480 KHz

RADIO DRUMMOND LTEE

YVES R. HAMEL
INGENIEUR-CONSEIL

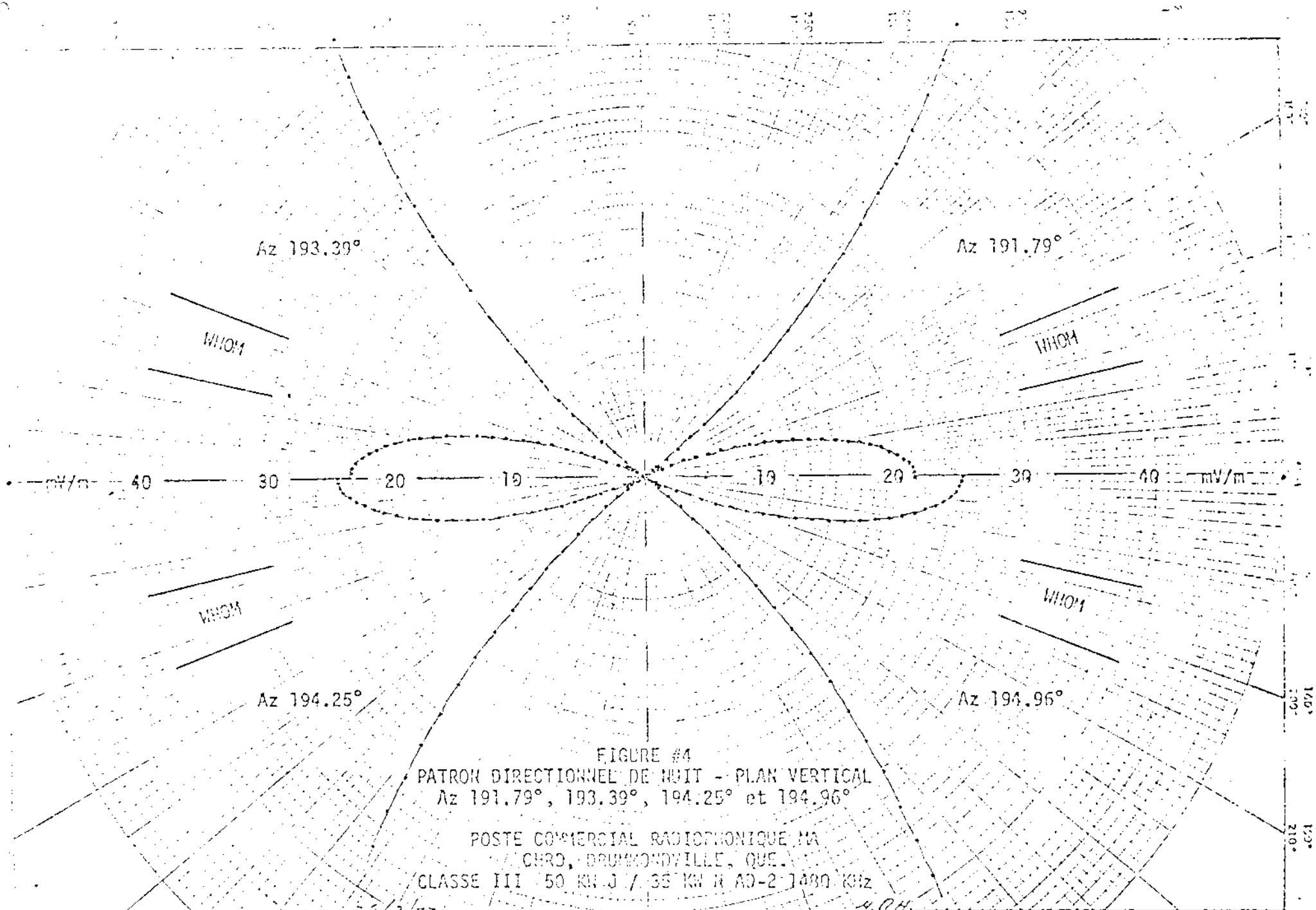


FIGURE #4
PATRON DIRECTIONNEL DE NUIT - PLAN VERTICAL
Az 191.79°, 193.39°, 194.25° et 194.96°

POSTE COMMERCIAL RADIOPHONIQUE MA
CHRD, DRUMMONDVILLE, QUE.
CLASSE III 50 KW J / 35 KW N AD-2 1480 KHz

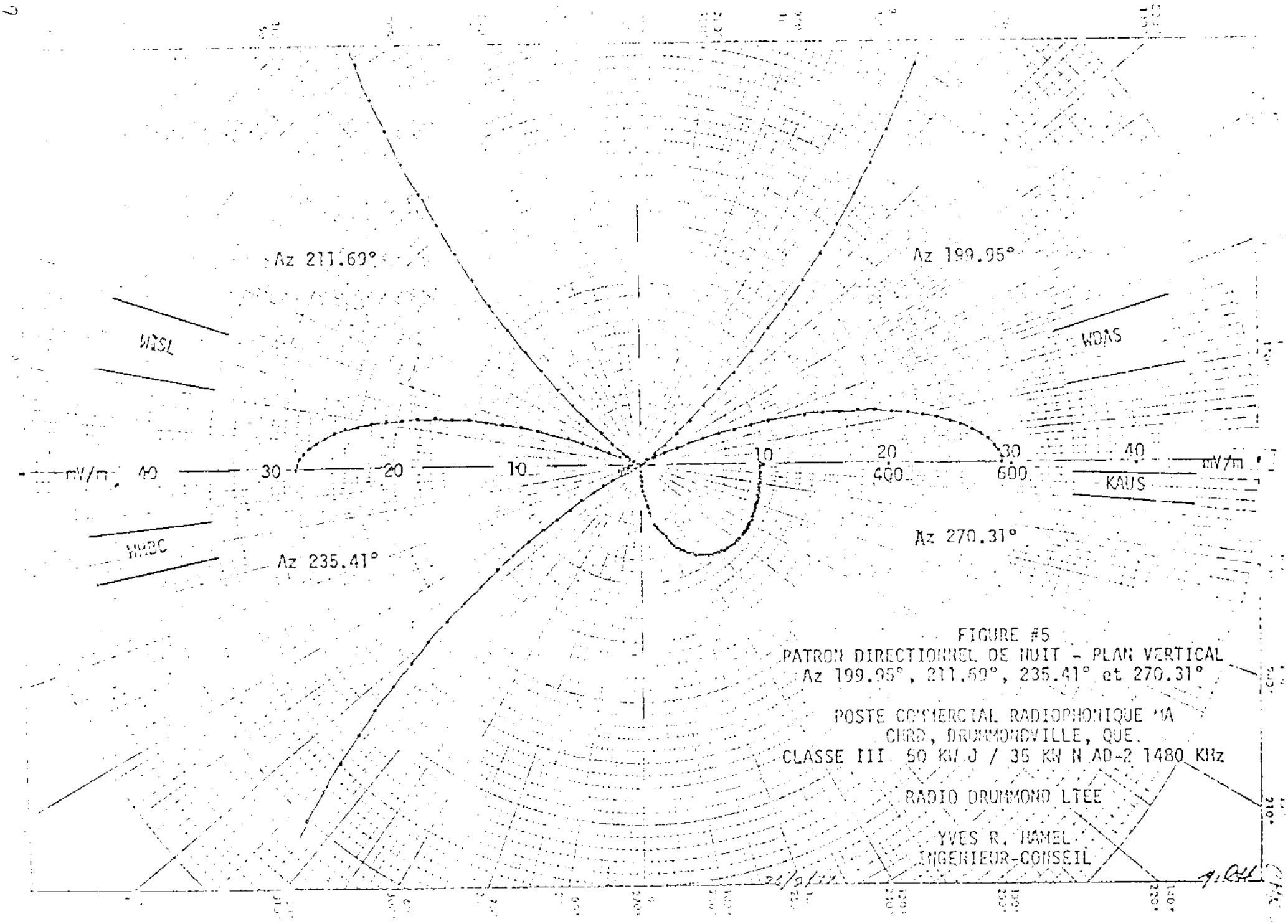


FIGURE #5
PATRON DIRECTIONNEL DE NUIT - PLAN VERTICAL
Az 199.95°, 211.69°, 235.41° et 270.31°

POSTE COMMERCIAL RADIOPHONIQUE MA
CHRD, DRUMMONDVILLE, QUE.
CLASSE III 50 KW D / 35 KW N AD-2 1480 KHz

RADIO DRUMMOND LTEE

YVES R. HAMEL
INGENIEUR-CONSEIL

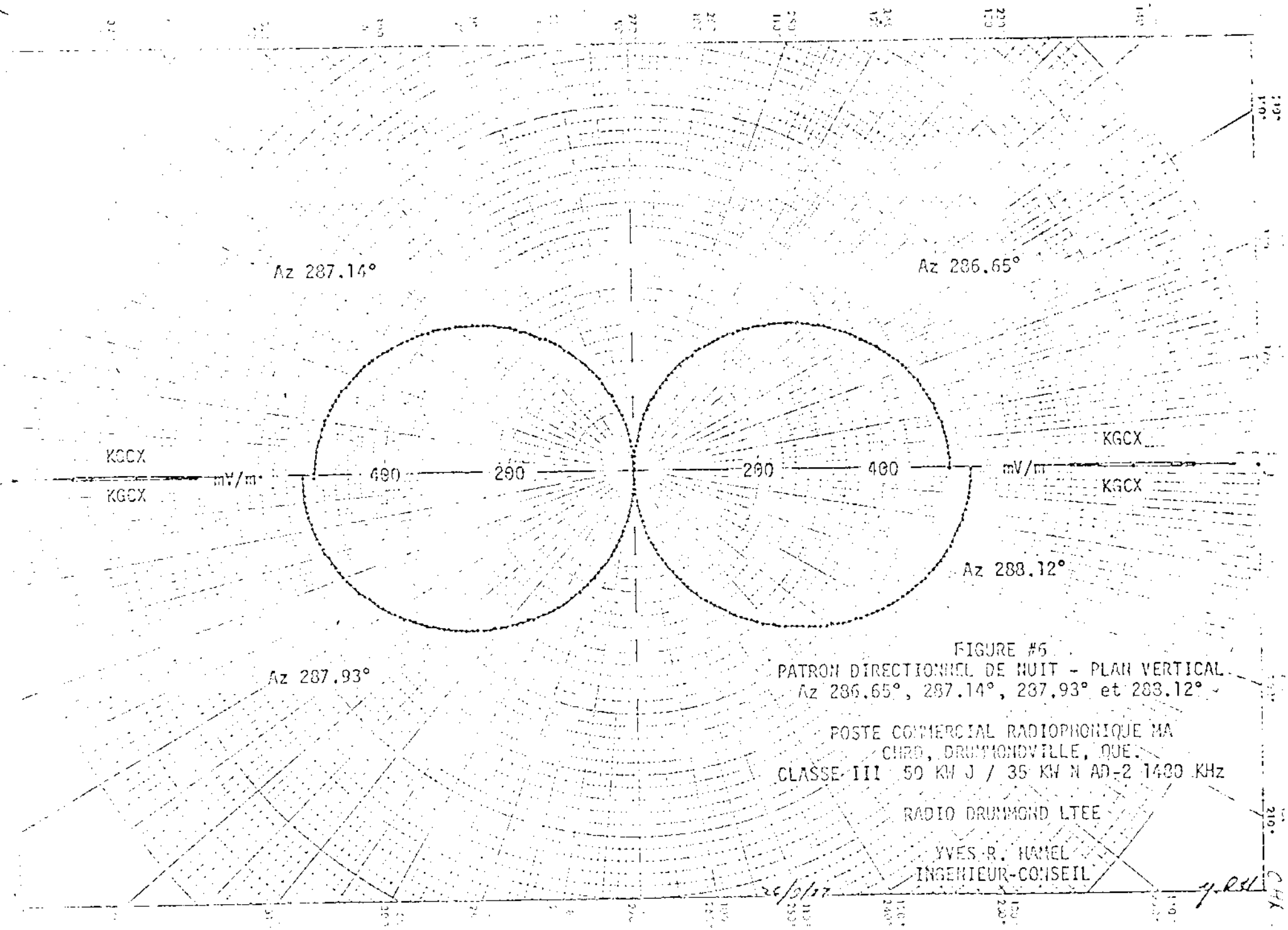


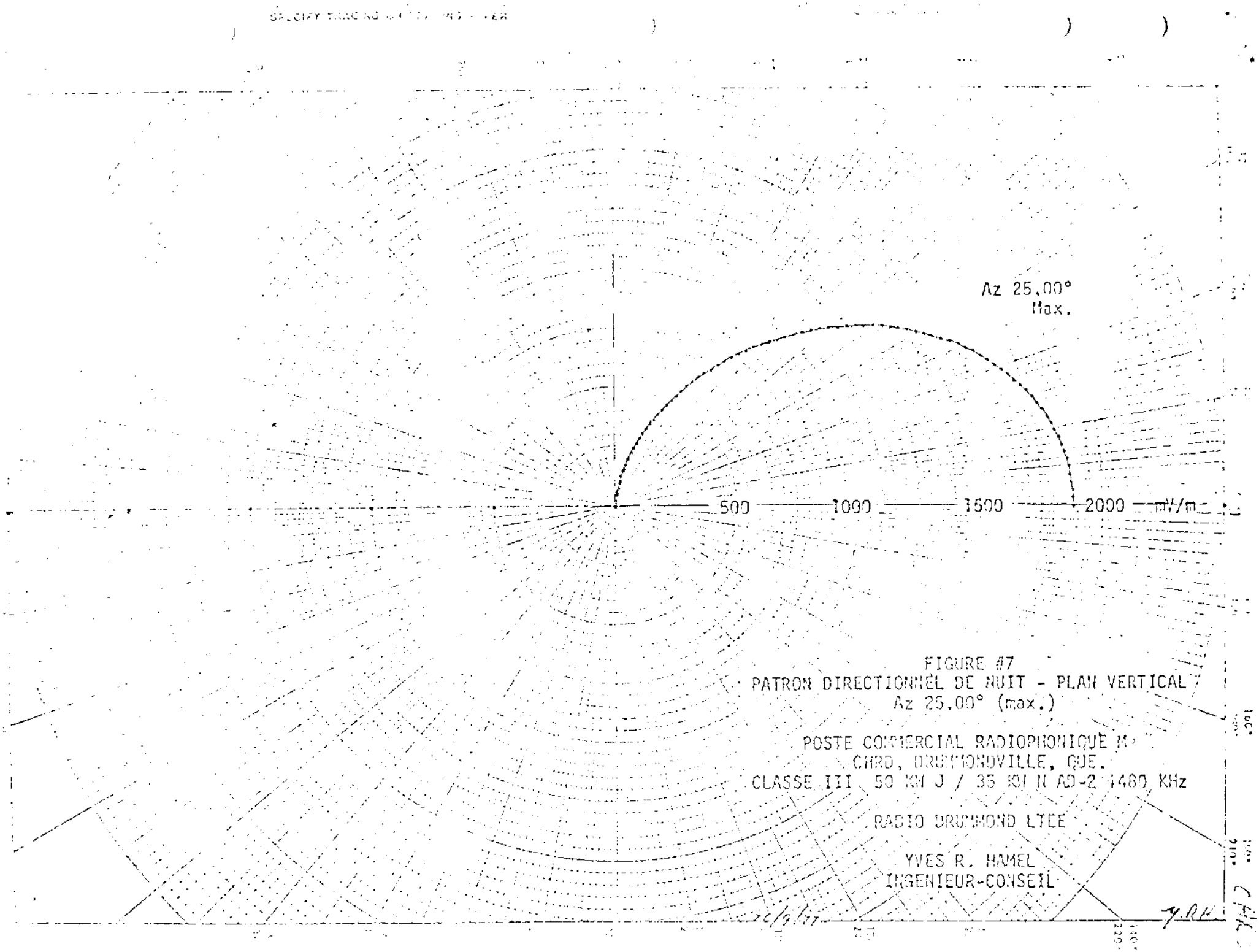
FIGURE #6
PATRON DIRECTIONNEL DE NUIT - PLAN VERTICAL
Az 286.65°, 287.14°, 287.93° et 288.12°

POSTE COMMERCIAL RADIOPHONIQUE MA
CHRO, DRUMMONDVILLE, QUE.
CLASSE III 50 KW J / 35 KW N AD-2 1400 KHz

RADIO DRUMMOND LTEE

YVES R. HAMEL
INGENIEUR-CONSEIL

26/3/77


Az 25.00°
Max.
500
1000
1500
2000 mV/m
FIGURE #7
PATRON DIRECTIONNEL DE NUIT - PLAN VERTICAL
Az 25.00° (max.)
POSTE COMMERCIAL RADIOPHONIQUE
CHRD, DRUMMONDVILLE, QUE.
CLASSE III 50 KW J / 35 KW N AD-2 1480 KHz
RADIO DRUMMOND LTEE
YVES R. HAMEL
INGENIEUR-CONSEIL

CKAN

ANTENNA DESCRIPTION SHEET

DIRECTIONAL DA-2

STATION CALL: CKAN
LOCATION: Newmarket, Ontario.
FREQUENCY: 1480 kc/s
POWER: 10,000 watts
CLASS: III
TIME: Unlimited

NOTIFICATION REFERENCE: 367 DATE: September 23, 1977

GEOGRAPHICAL COORDINATES: Lat 43°57'28", Lon 79°26'44"

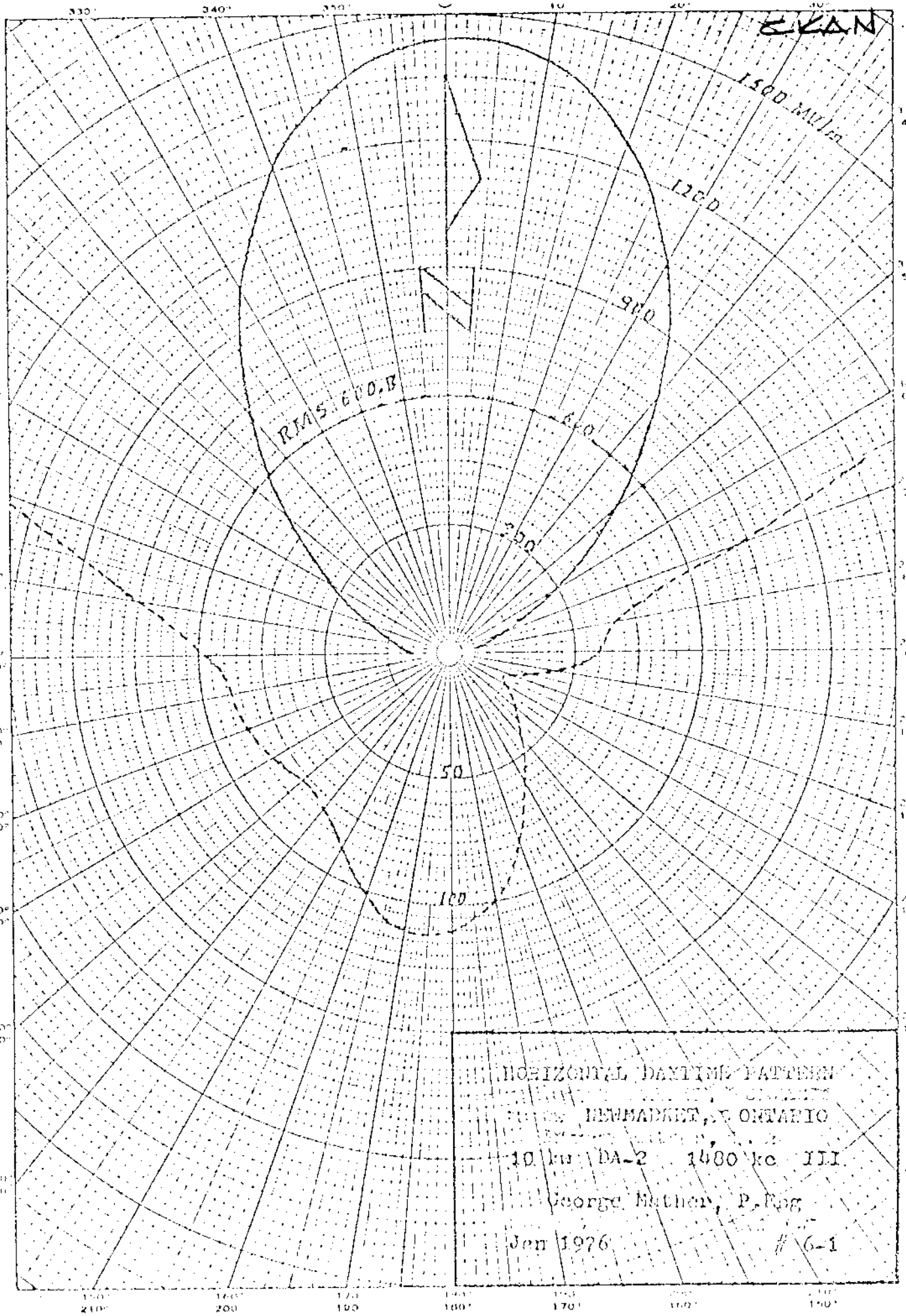
ARRAY CHARACTERISTICS: Six elements, guyed, uniform cross section, base insulated, series feed, no top loading, Height 166.3 feet or 90 degrees

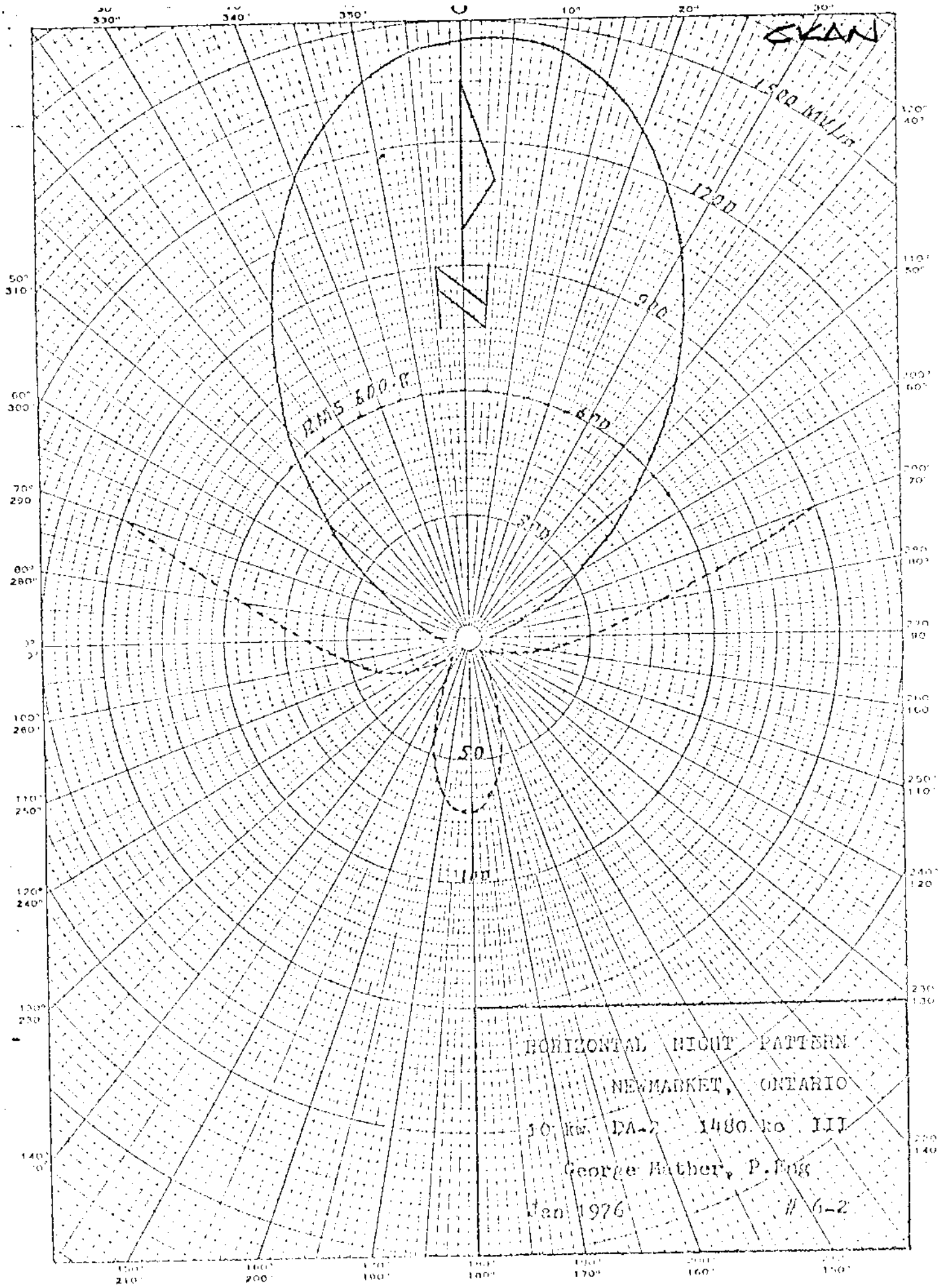
Spacing	1-2, 2-3, 4-5, 5-6,	=	90 degrees or 166.3'
	1-6, 2-5, 3-4,	=	176 degrees or 325.1'
Bearing	1-2-3, 6-5-4,	=	00 degrees
	1-6, 2-5, 3-4,	=	95 degrees

ELEMENT	Day R	Day Ø	Night R	Night Ø
One	1.000	00.0°	0.800.	00.00°
Two	1.178	-101.0	1.310	-113.36
Three	0.360	+158.0	0.540	+132.00
Four	0.306	+168.0	0.675	+137.00
Five	1.001	-91.0	1.638	-108.36
Six	0.850	+10.0	1.000	+05.00

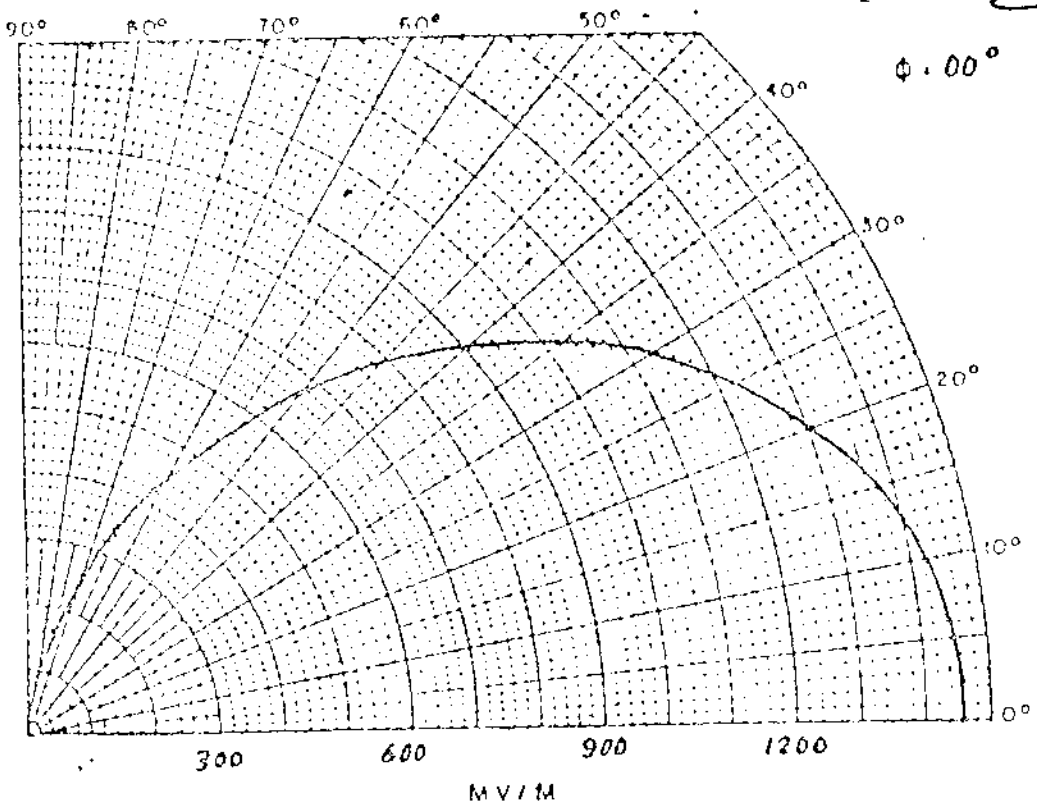
Ground System: 120 radials per tower, #10 AWG bare, soft copper wire, spaced uniformly, depth 8 inches approximately. Radials bonded on lines between towers and bonded to soft copper strap at towers bases. Maximum length 266 feet.

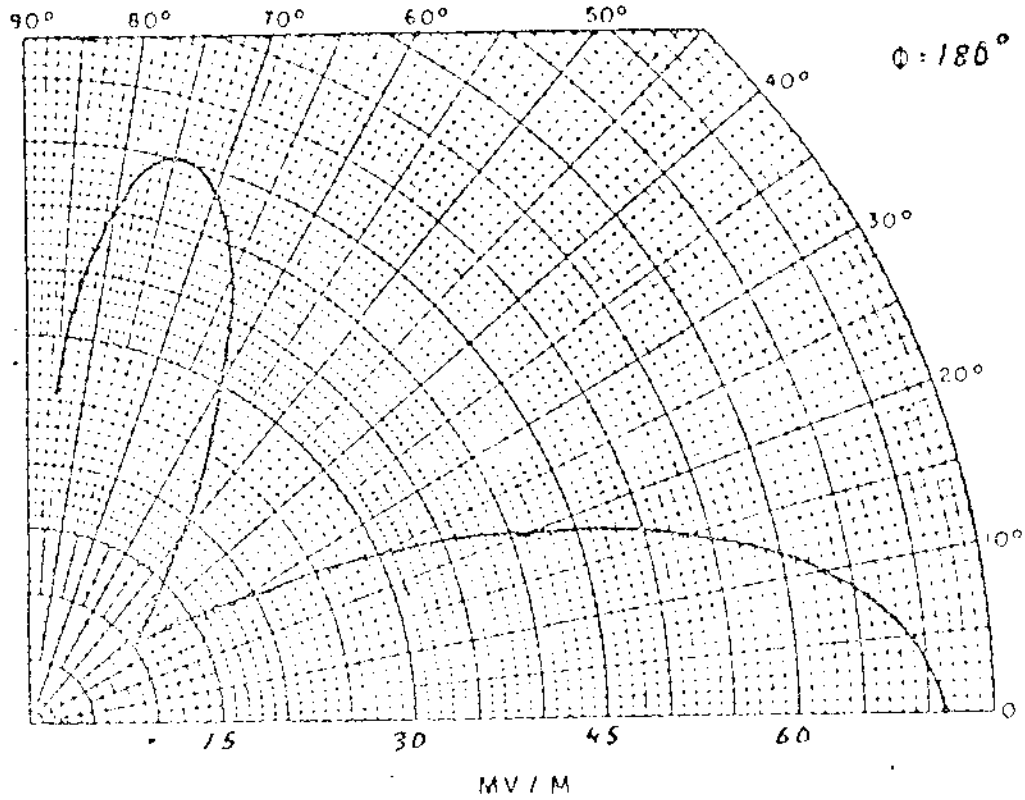
Predicted BMS: 600.8 mv/m at 1 mile for 10 kw
190.0 mv/m at 1 mile for 1 kw


CKAN
1500 mV/m
1200
900
600
RMS 600.B
450
300
150
50
100
HORIZONTAL DAYTIME PATTERN
BEMBADEC, ONTARIO
10 kw DA-2 1480 kc III
George Mather, P.Eng
Jan 1976 # 6-1


CKAN
1500 Mv/m
1200
900
600
RMS 600.0
300
50
100
HORIZONTAL NIGHT PATTERN
NEWMARKET, ONTARIO
10 kw DA-2 1480 kc III
George Hather, P.Eng
Jan 1976
6-2

CKAN





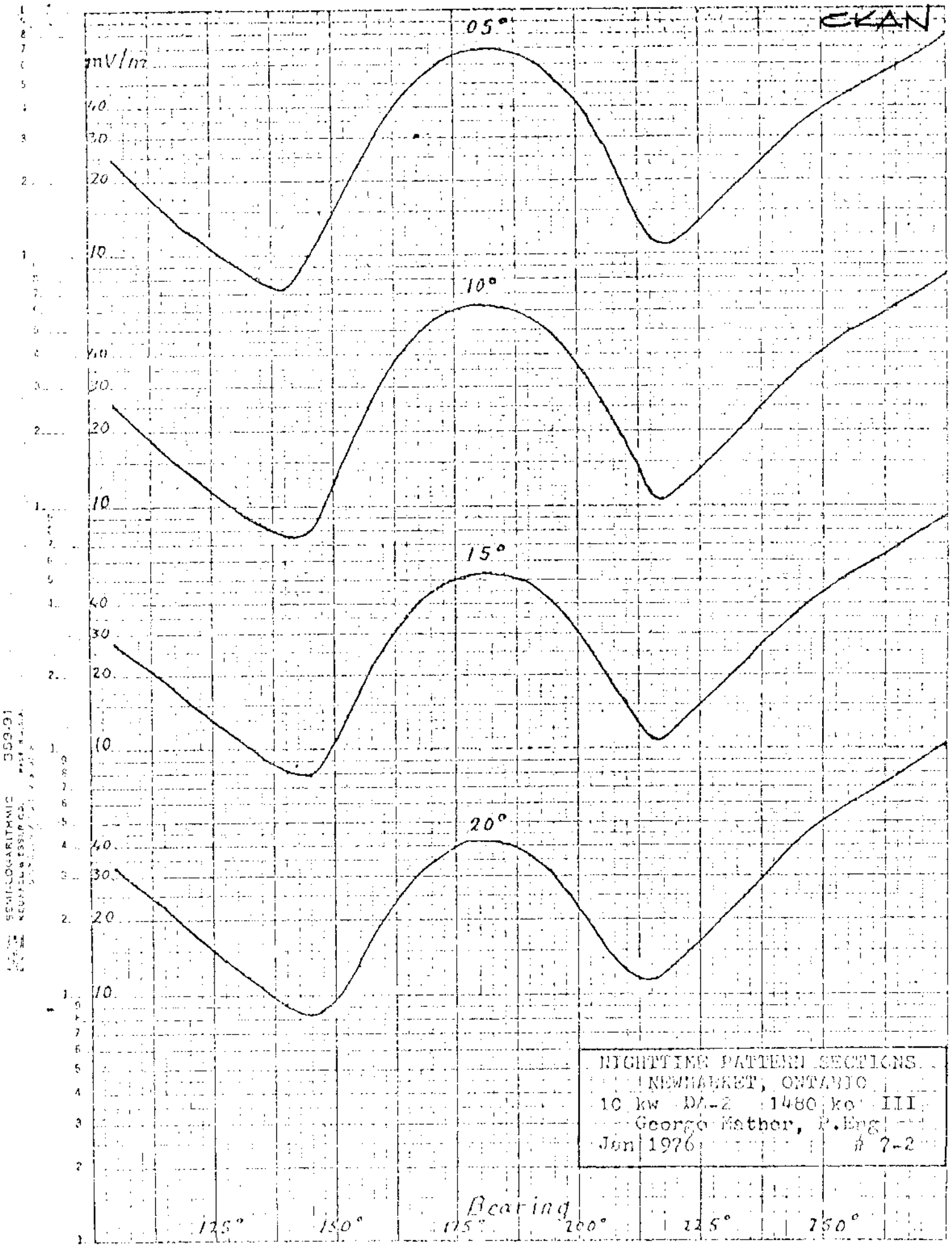
VERTICAL RADIATION PATTERNS

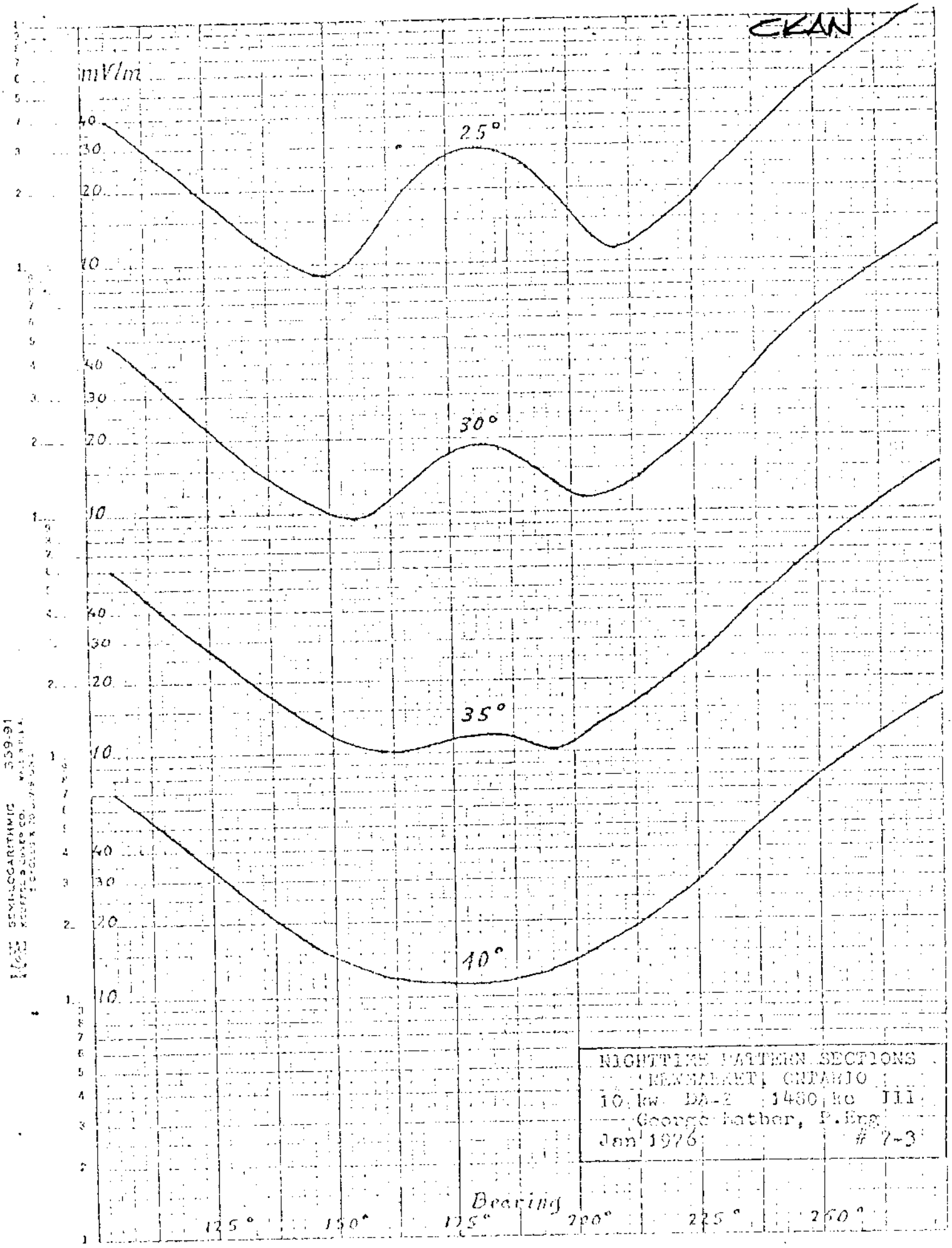
NEWMARKET, ONTARIO
10 kw DA-2 1480 kc III
George Muther, P.Eng.

Jan 1976

7-1

POLAR COORDINATE


CKAN
mV/m
05°
10°
15°
20°
40
30
20
10
Bearing
125°
150°
175°
200°
225°
250°
NIGHTTIME PATTERN SECTIONS
NEWMARKET, ONTARIO
10 kw DA-2 1480 kc III
George Mather, P.Eng
Jan 1976 # 7-2


CKAN
mV/m
25°
30°
35°
40°
40
30
20
10
Bearing
125°
150°
175°
200°
225°
250°
NIGHTTIME PATTERN SECTIONS
BRAMALEA, ONTARIO
10 kw DA-2 1460 kc III
George Rather, P.Eng
Jan 1976
7-3

CKAN

SUPPLEMENTAL DIRECTIONAL

ANTENNA DESCRIPTION SHEET

Station: CKAN

Main Studio: Newmarket, Ontario

Frequency: 1480 kHz

Power: 10 kW Class: III

Notification List No.: 380

Date: December 27, 1978

Geographical Location of the Center of the Antenna System:

North Latitude: 43° 57' 28"
West Longitude: 79° 26' 53"

Mode of Operation: DA-2

Note: Please retain the description sheet and directional antenna radiation patterns notified for station CKAN in Canadian Change List Number 367 dated September 23, 1977 and attach to this supplemental description sheet. This notification is for the purpose of indicating only a correction in the geographical co-ordinates.

SUPPLEMENTAL DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KAPE

Main Studio: San Antonio, Texas

Frequency: 1420 kHz

Power: 0.5 kW

Notification List No. 1739

Date: July 1, 1977

Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM

North Latitude: 29° 24' 43"
West Longitude: 98° 24' 50"

Authorized for Daytime operation (DA-D).

Towers are top loaded by uppermost 40' sections of guy wires to an effective electrical height of 80 degrees.

Note: Please retain the description sheet and directional antenna radiation patterns notified for a new station at San Antonio, Texas in United States Change List Number 822, dated August 3, 1959, and attach to this supplemental Description Sheet. This notification is for the purpose of indicating changes in the geographical coordinates of the center of the antenna system and to add top loading.

San Antonio, Texas

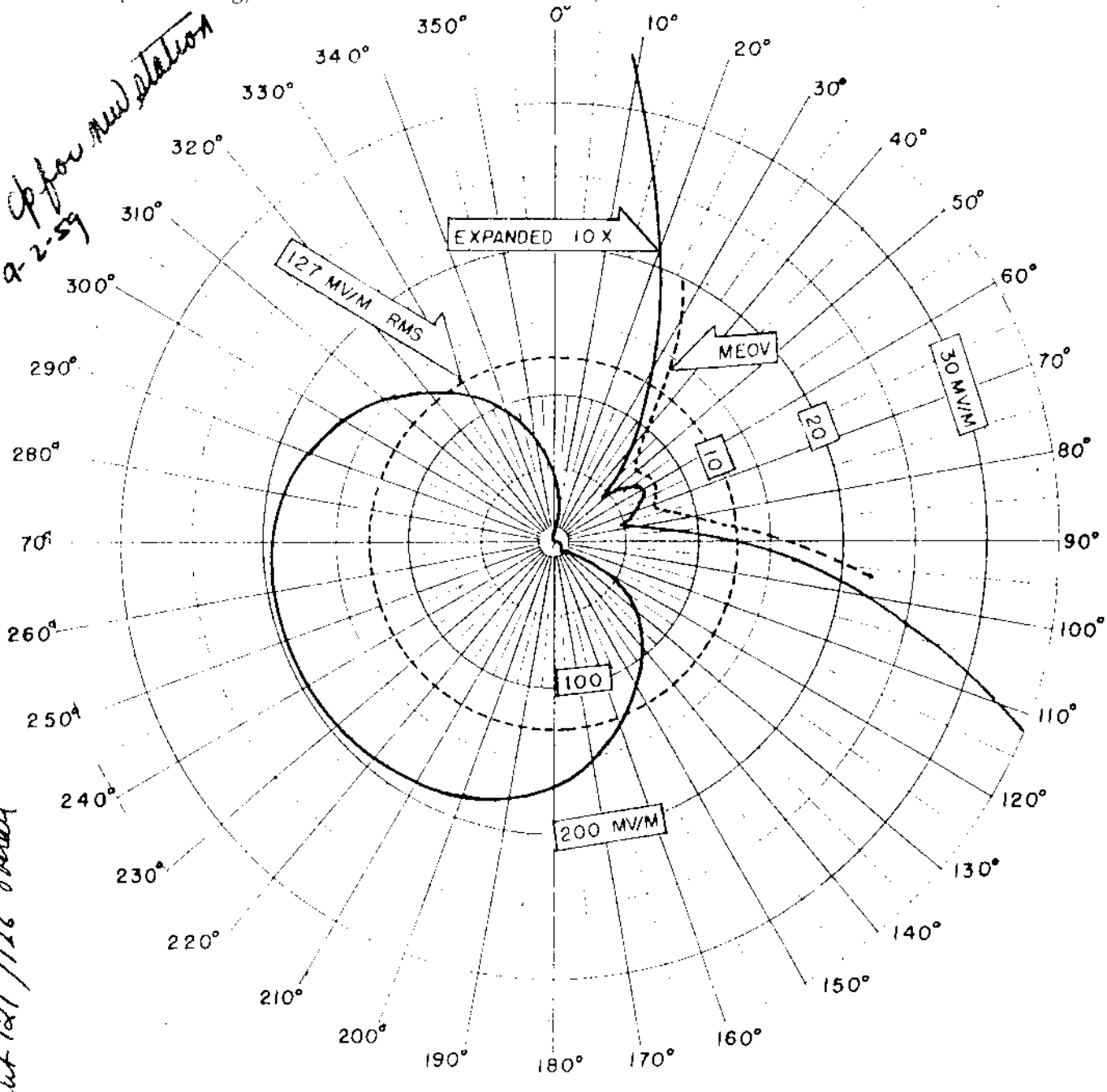
KAPE

PROPOSED DAY
(10-24-58g)

New; Top Broadcasters, Inc.
San Antonio, Texas

500w, DA-D,D
1480 KC

Granted CP for new station 9-2-59

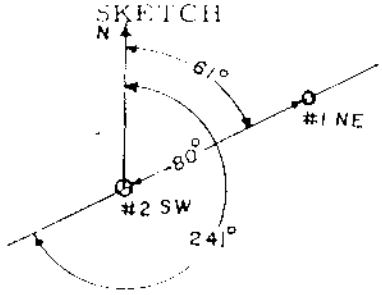


Applied to make changes in antenna system height 121'/126' overall

HORIZONTAL RADIATION PATTERN

NL 29° 04' 42"
WL 98° 24' 51"

ANTENNA PLACEMENT SKETCH



DIRECTIONAL ANTENNA PARAMETERS

STATION New
FREQUENCY 1480 KC
LOCATION San Antonio, Texas
RATED POWER 0.5 KW

Antenna No.	True Bearing	Spacing	Phasing	Field Ratio	Horizontal Field Intensity	Electrical Height
1	61°	80°	0°	1.00	127 MV/M	65°
2	241°	80°	-103°	0.95	120.6 MV/M	65°

KENNETH R HYMAN
RADIO ENGINEER

PATTERN NO 580805.1

EXHIBIT NO 11-B

FCC File No. BP-12,321
Accepted 9-29-58

Top Broadcasters, Incorporated
San Antonio, Texas

1480 KC

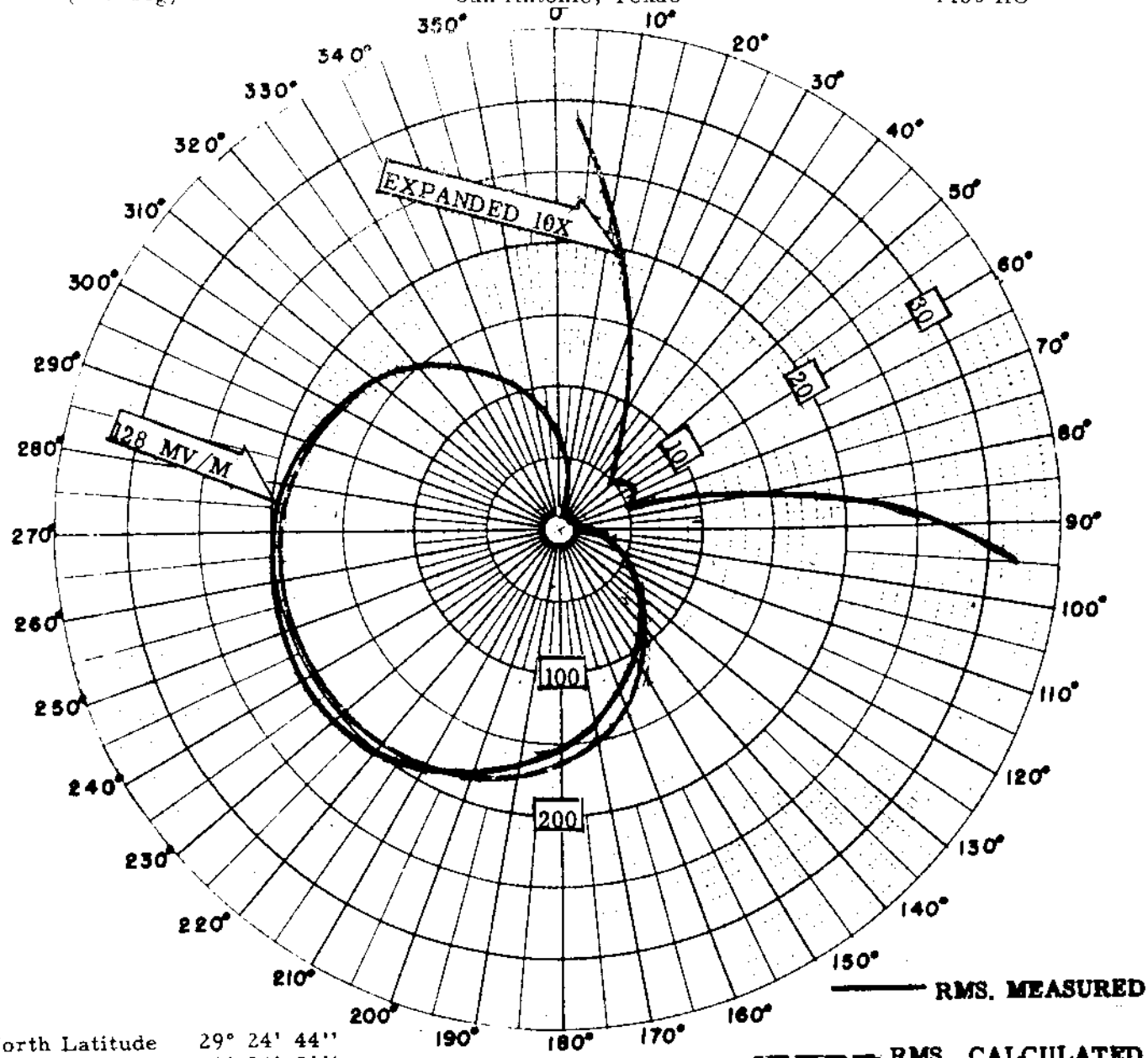
11-4-60 granted for a new station

KAPE

MEASURED DAY
(7-7-60g)

Station KAPE
San Antonio, Texas

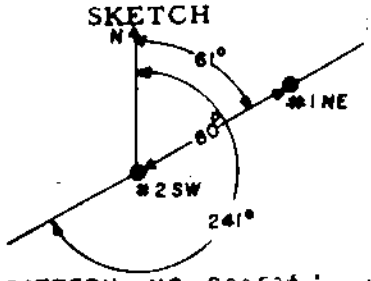
500w, DA-D,D
1480 KC



North Latitude 29° 24' 44''
West Longitude 98° 24' 51''

HORIZONTAL RADIATION PATTERN

ANTENNA PLACEMENT SKETCH



PATTERN NO. 60052E

KENNETH A HYMAN
RADIO ENGINEER
SAN ANTONIO, TEXA

DIRECTIONAL ANTENNA PARAMETERS

STATION New — LOCATION San Antonio, Texas
FREQUENCY 1480 KC — RATED POWER 0.5 KW

Antenna No.	True Bearing	Spacing	Phasing	Field Ratio	Horizontal Field Intensity	Electrical Height
1	61°	80°	0	1.00	126 MV/M	60° Plus 15° Top Loadi
2	241°	80°	~~182°~~	.92		

FCC File No. BL-7955
Accepted 7-1-60

KAPE
San Antonio, Texas

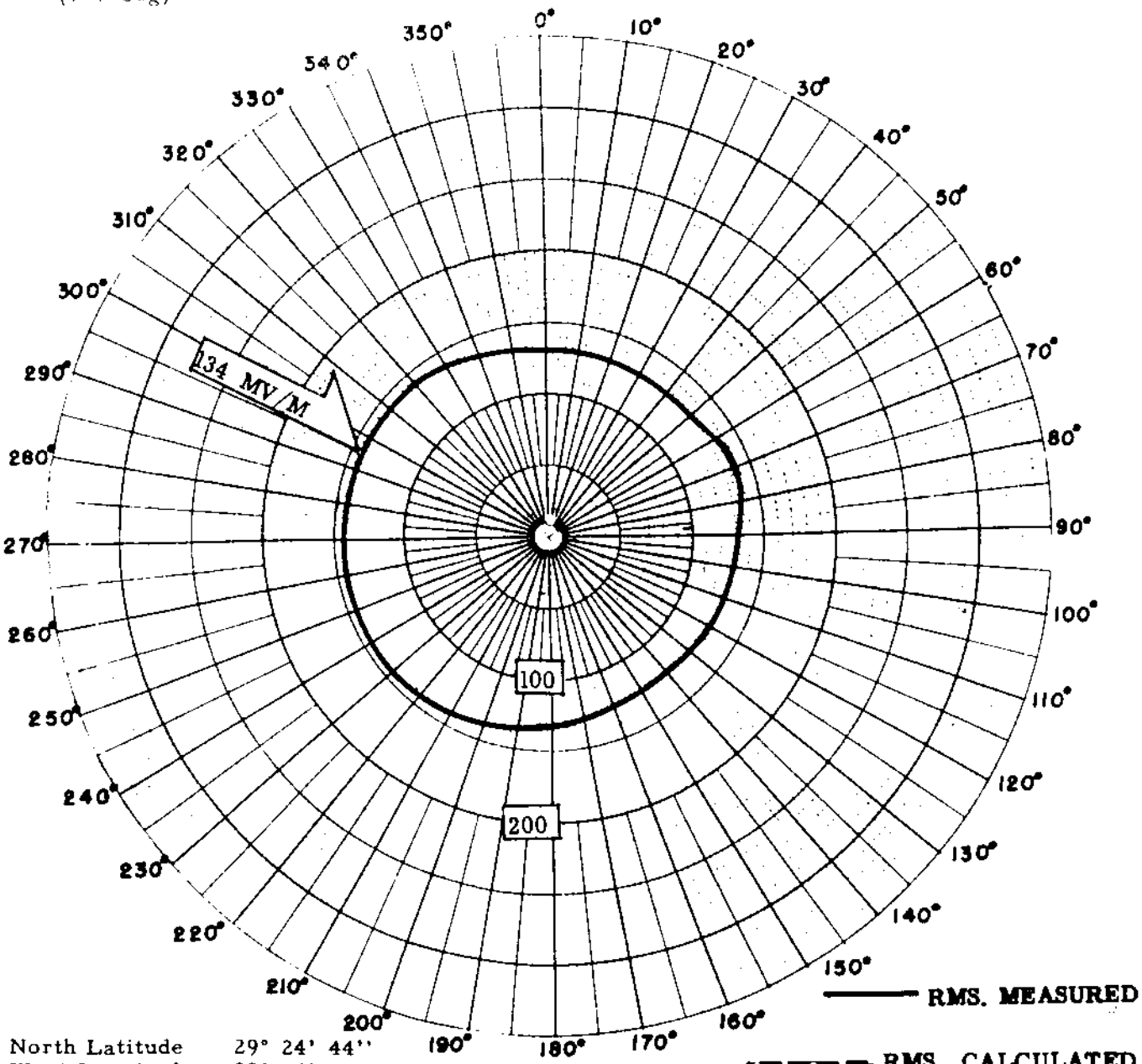
1480 KC

KAPE

MEASURED NON-DA
(7-7-60g)

Station KAPE
San Antonio, Texas

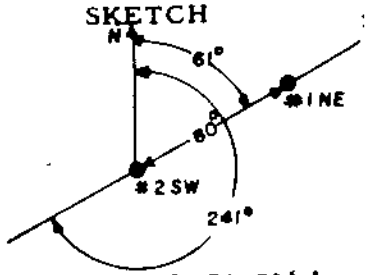
500w, DA-D,D
1480 KC



North Latitude 29° 24' 44''
West Longitude 98° 24' 51''

NON-DIRECTIONAL
HORIZONTAL RADIATION PATTERN

ANTENNA PLACEMENT SKETCH



PATTERN NO. 600526

KENNETH A HYMAN
RADIO ENGINEER
SAN ANTONIO, TEXA

DIRECTIONAL ANTENNA PARAMETERS

STATION New — LOCATION San Antonio, Texas
FREQUENCY 1480 KC — RATED POWER 0.5 KW

Antenna No.	True Bearing	Spacing	Phasing	Field Ratio	Horizontal Field Intensity	Electrical Height
1	61°	90°	0	1.00	126 MV/M	60° Plus 15° Top Loading
2	241°	80°	~~262°~~	.92		

FCC File No. BL-7955
Accepted 7-1-60

KAPE
San Antonio, Texas

1480 KC

PROPOSED DAY Station KAUS NEW, DAY 1480 KC
Austin, Minnesota

PATTERN NO: 470425
SUPERSEDES: 460617
REINSTATES:

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

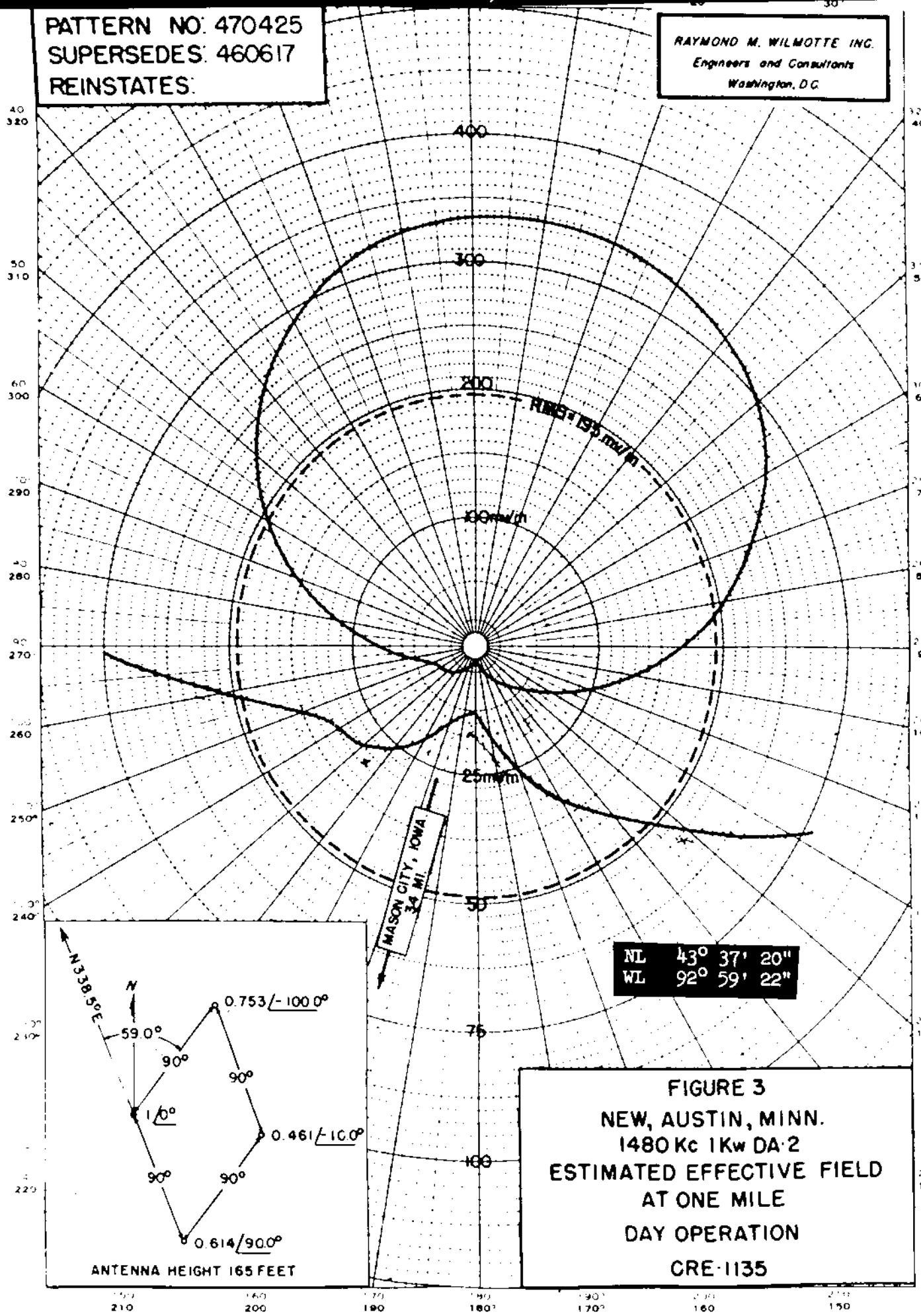
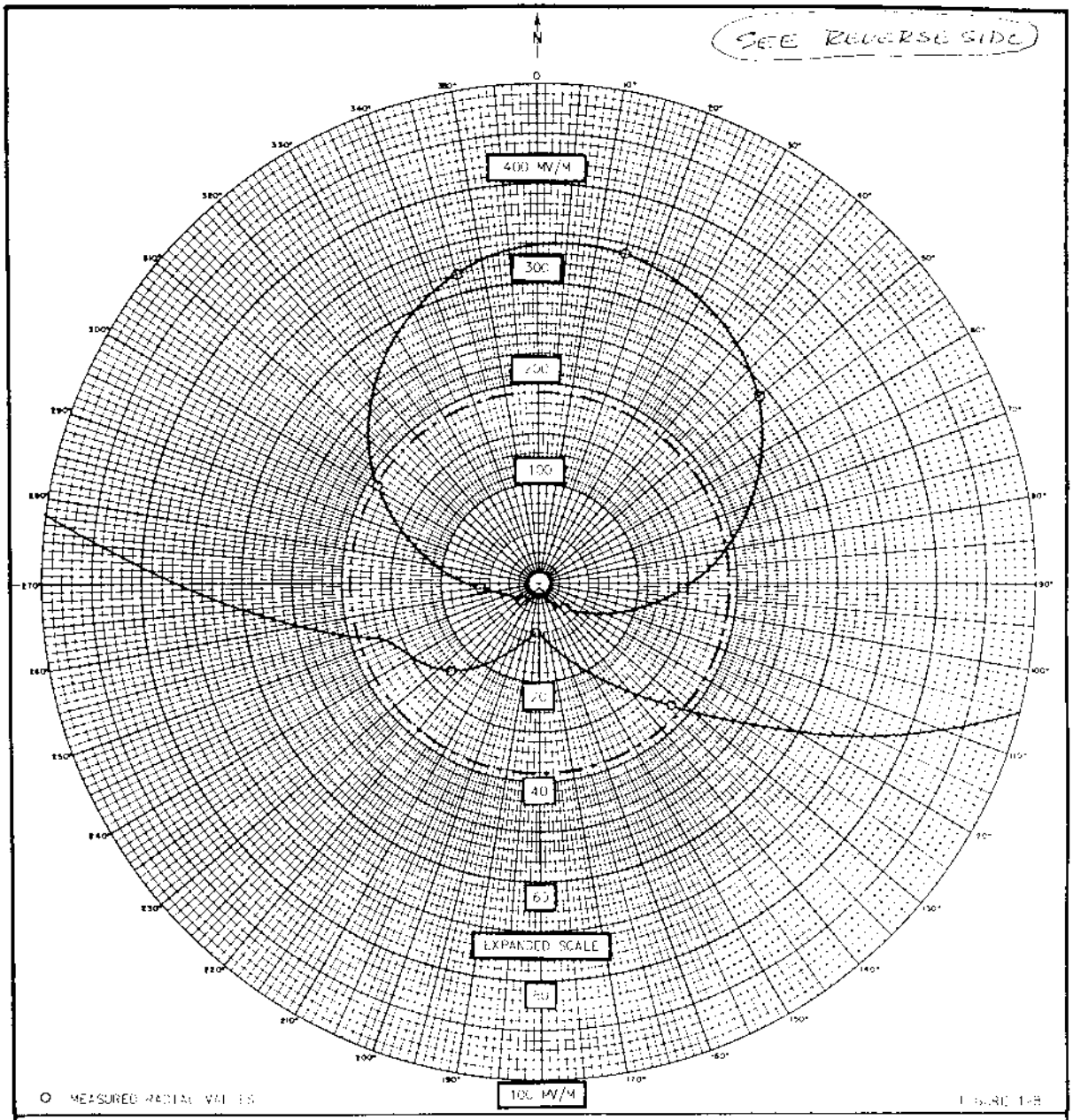


FIGURE 3
NEW, AUSTIN, MINN.
1480 Kc 1Kw DA-2
ESTIMATED EFFECTIVE FIELD
AT ONE MILE
DAY OPERATION
CRE-1135

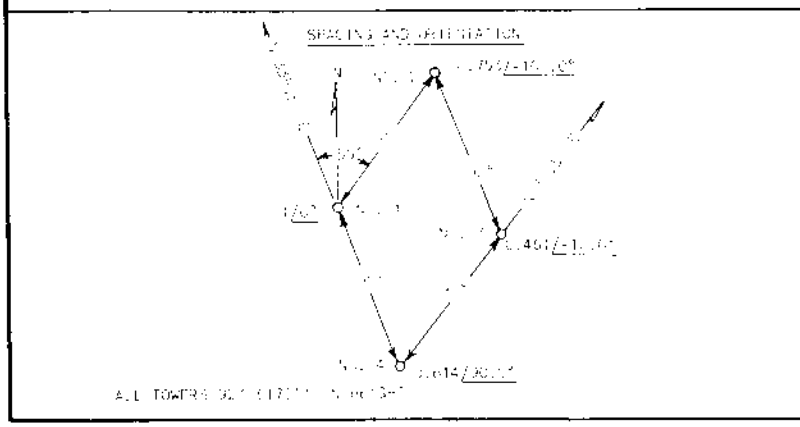
Measured Day
(4-29-70ct)

Station KAUS
Austin, Minnesota

1kw,DA-2,U
1480 kc



HORIZONTAL RADIATION PATTERN



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

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

FCC File No.BL-12568
Accepted 4-2-70

Station KAUS
Austin, Minnesota

1480 kc

PROPOSED NIGHT | Station KAUS Austin, Minnesota | 1kw, DA-2,U | 1480 KC

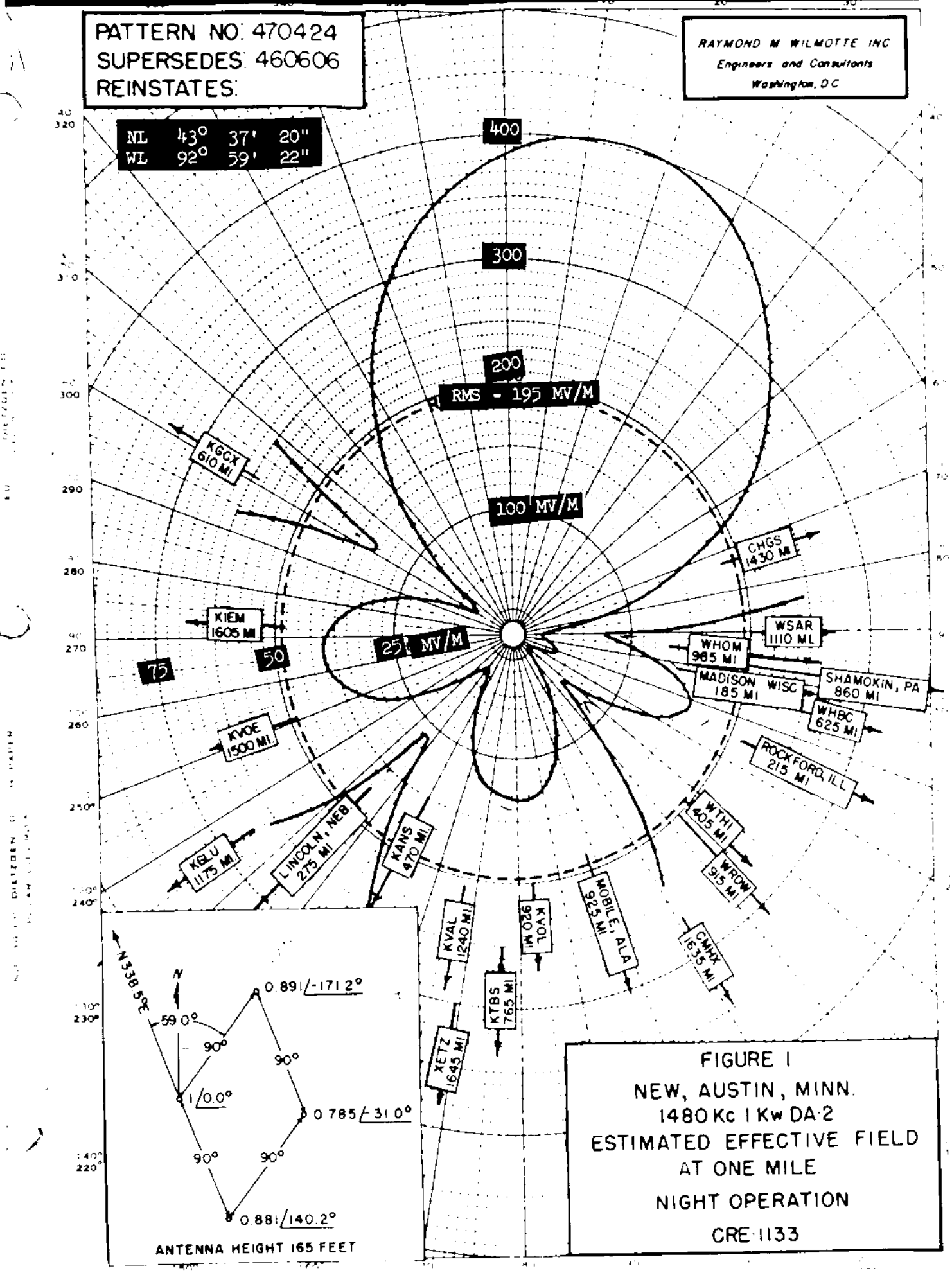


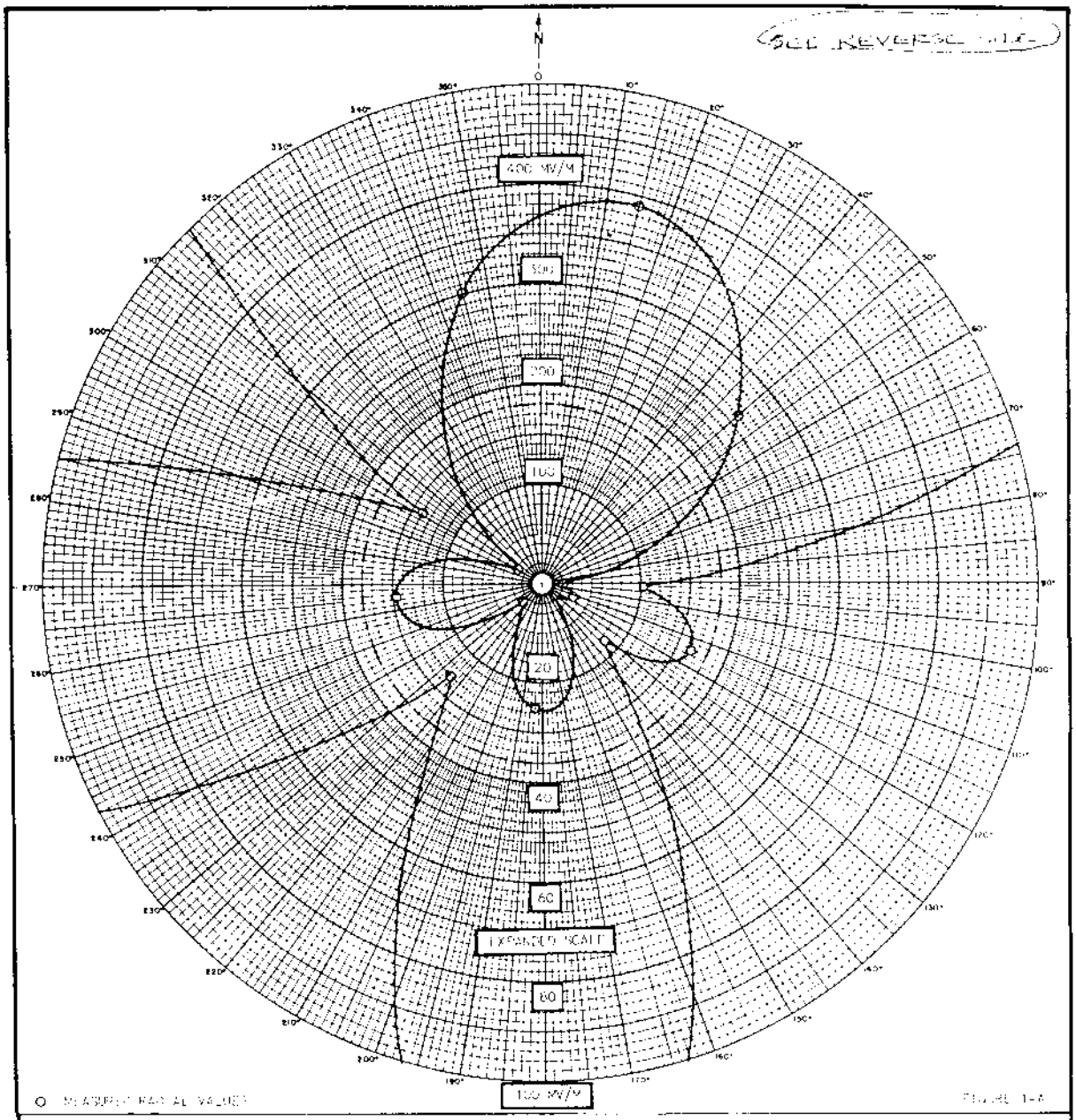
FIGURE 1
NEW, AUSTIN, MINN.
1480 Kc 1 Kw DA-2
ESTIMATED EFFECTIVE FIELD
AT ONE MILE
NIGHT OPERATION
CRE-1133

KAUS

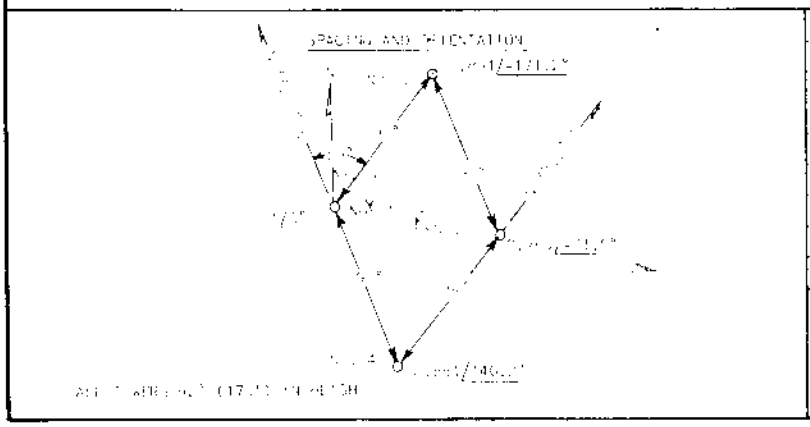
Measured Night
(4-29-70ct)

Station KAUS
Austin, Minnesota

1kw,DA-2,U
1480 kc



HORIZONTAL RADIATION PATTERN



APPLICANT
LOCATION
FREQUENCY
POWER
LATITUDE
LONGITUDE
WHEN USED
RMS FIELD
DATE

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

FCC File No.BL-12568
Accepted 4-2-70

Station KAUS
Austin, Minnesota

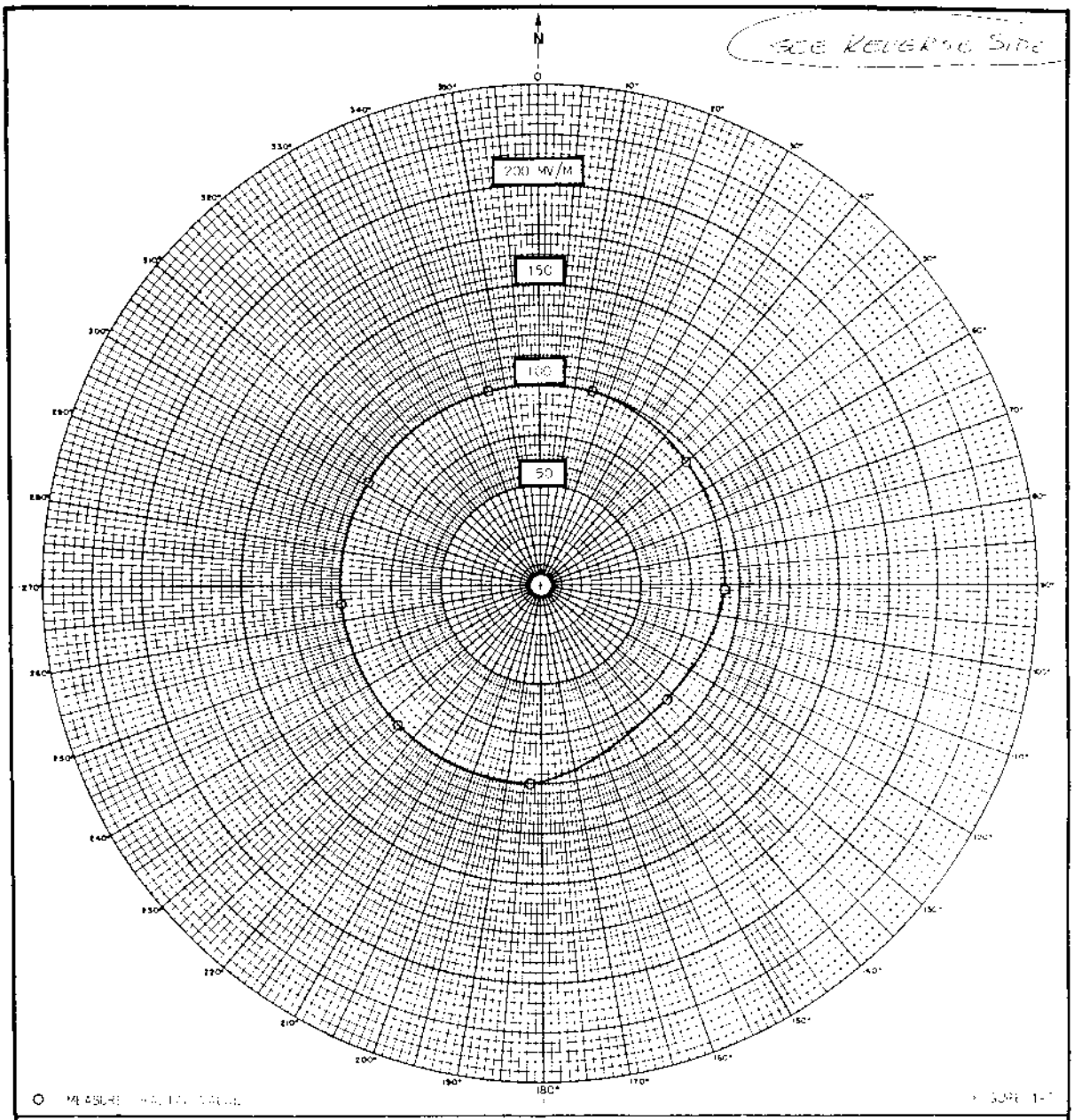
1480 kc

KAUS

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

Station KAUS
Austin, Minnesota

1kw,DA-2,U
1480 kc



HORIZONTAL RADIATION PATTERN

NON - DIRECTIONAL SURVEY

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

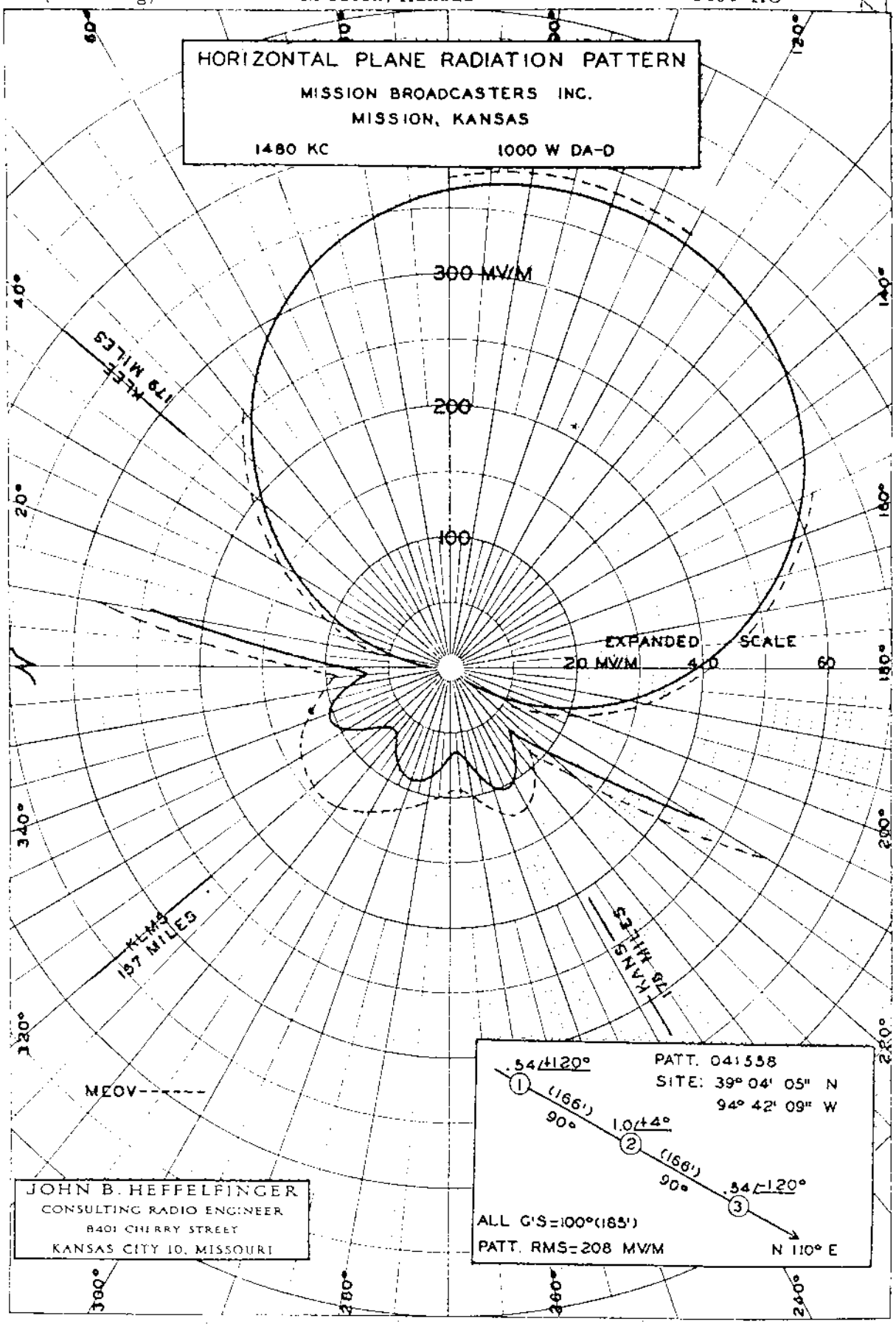
SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No.BL-12568
Accepted 4-2-70

Station KAUS
Austin, Minnesota

1480 kc

PROPOSED DAY (5-29-58g) | Station KBKC Mission, Kansas | 1kw, DA-D,D 1480 KC



Granted CP 12/17/58 for increase in power

Granted L 10-2-59 for increase in power

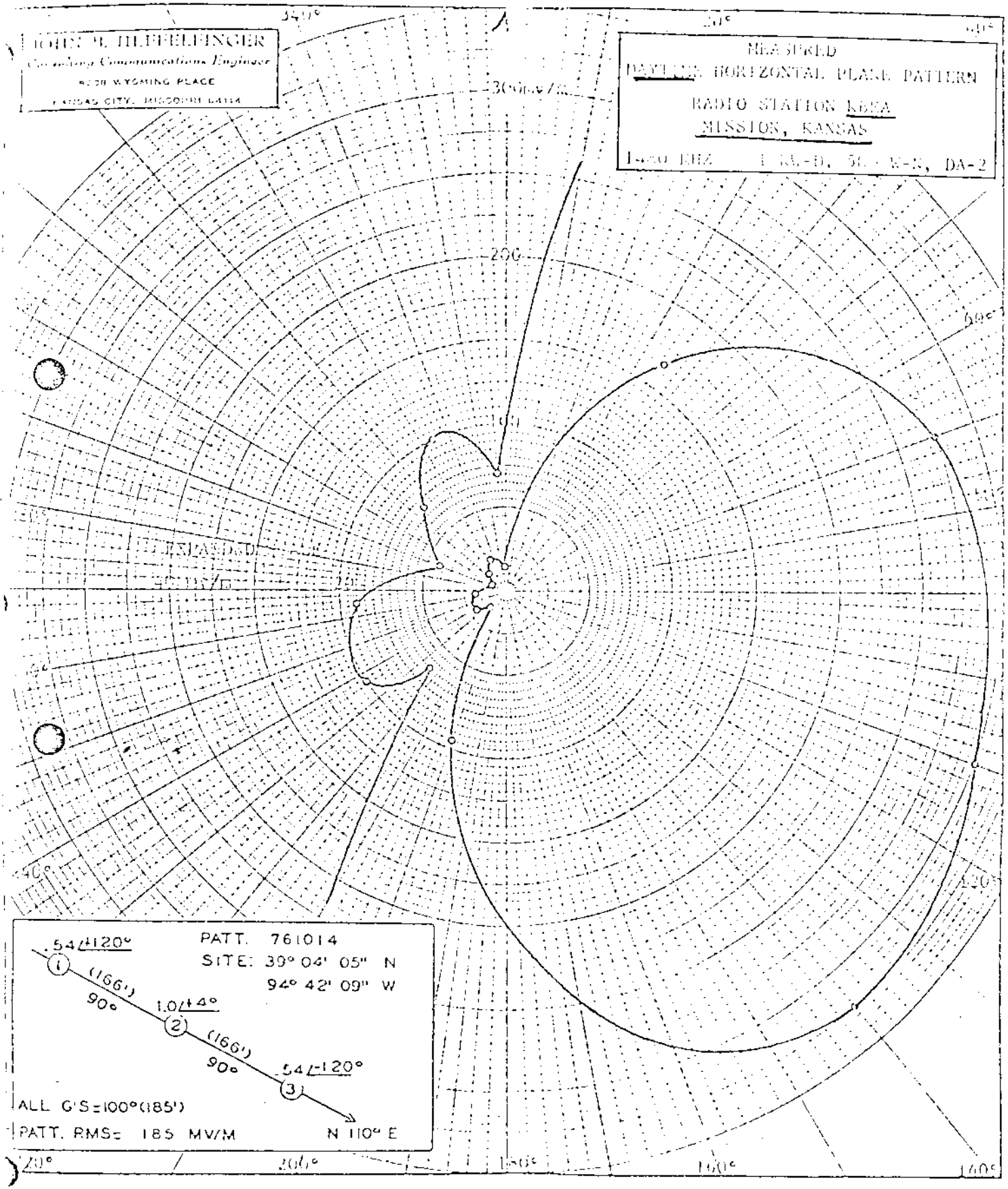
FCC File No. BP-11,984
Accepted 5-20-58

KBKC
Mission, Kansas

1480 KC

KBEA

BZ-9568


JOHN P. HEFFELFINGER
Consulting Communications Engineer
6208 WYOMING PLACE
KANSAS CITY, MISSOURI 64114
MEASURED
DAYTIME HORIZONTAL PLANE PATTERN
RADIO STATION KBEA
MISSION, KANSAS
1450 KHZ
DA-2
340°
20°
40°
300 mv/m
200
100
60°
80°
120°
140°
160°
180°
200°
220°
.54/+120°
(166')
90°
1.0/+4°
(166')
90°
.54/-120°
ALL G'S=100°(185')
PATT. RMS= 185 MV/M
N 110° E
PATT. 761014
SITE: 39° 04' 05" N
94° 42' 09" W

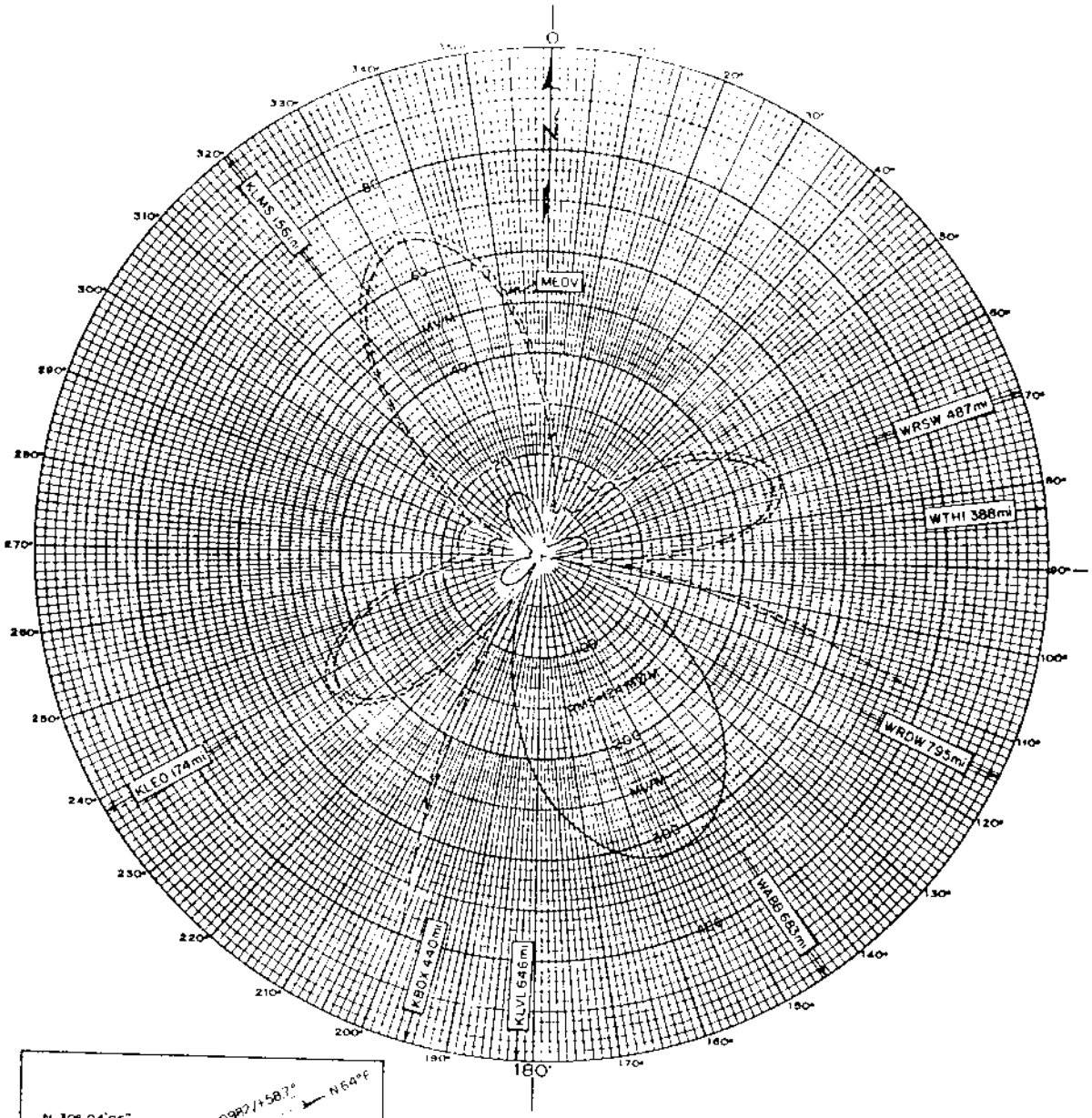
~~KBEA~~
KHEA

PROPOSED NIGHT
(6-14-61g)

Station KBEA
Mission, Kansas

500w, 1kw-LS, DA-2, U
1480 KC

,62
Mod CP to
to DA-2



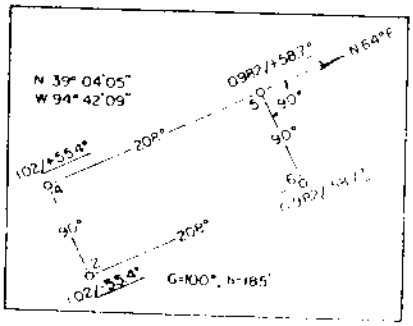


FIGURE 7
CALCULATED NIGHTTIME HORIZONTAL
PLANE PATTERN
RADIO STATION KBKC, INC.
KBEA MISSION, KANSAS
1480KC, U, 5KW, 1KW-LS, U, DA-2
JANUARY 1961

CREUTZ, STEEL & SNOWBERGER
Consulting Engineers
WASHINGTON 5, D. C.

FCC File No. BP-14854
Accepted 6-13-61

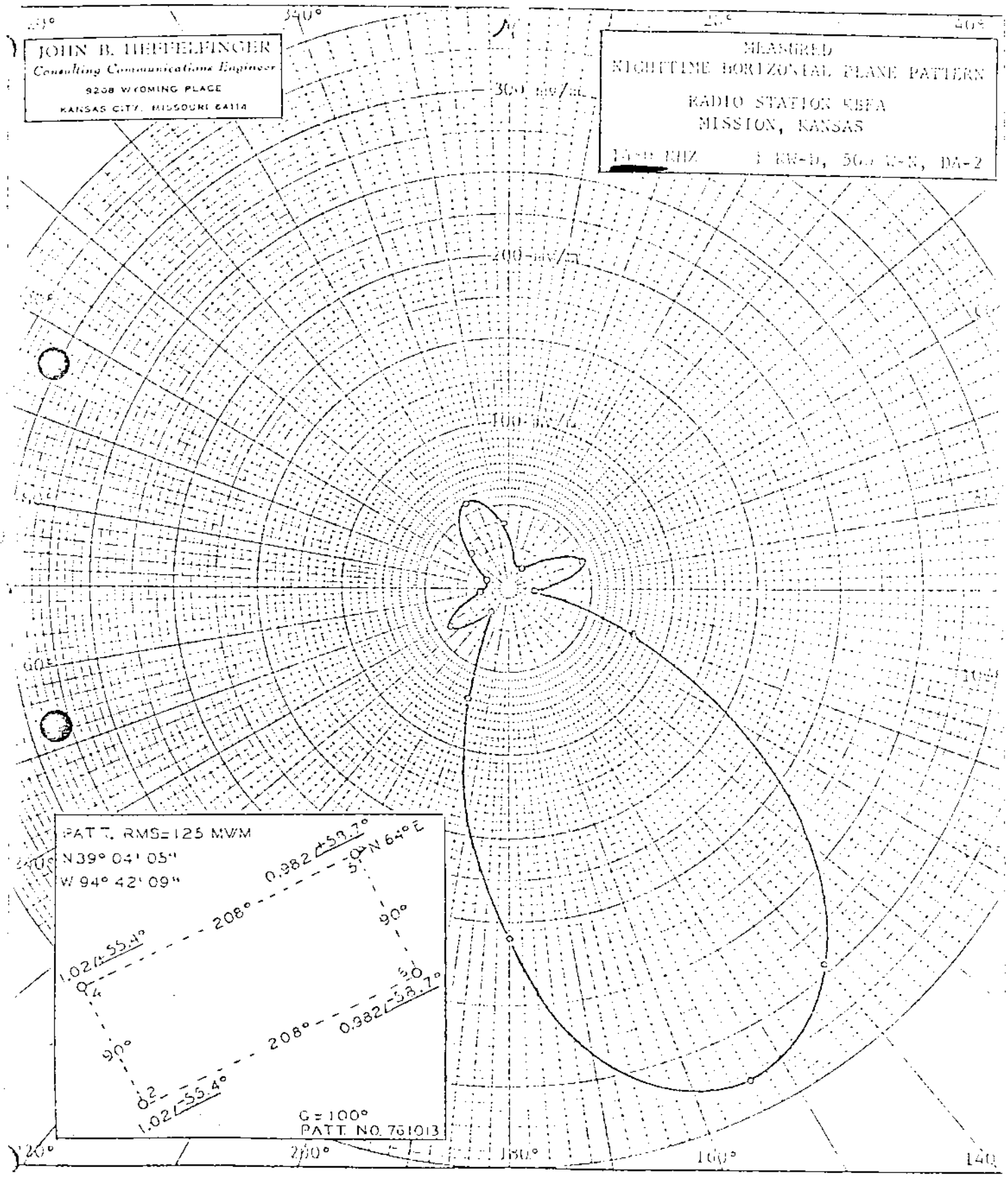
KBEA
Mission, Kansas

1480 KC

KBEA

KH 7-

BZ-9568



~~KBOX~~
KMEZ

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KBOX — Main Studio: Dallas, Texas

Frequency: 1480 kHz — Power: 1 kW Night 5 kW Day

Notification List No. 1627 — Date: April 9, 1975 — Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 32° 52' 15"
West Longitude: 96° 42' 54"

ANTENNA CHARACTERISTICS

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

TOWER:	NW(#1)	N(#2)	SW(#3)	SE(#4)	C(#5)	E(#6)
HEIGHT ABOVE INSULATORS:	120'	120'	120'	120' (65°)	128'	128' (69.3°)
NIGHT PHASING:	0°	+135°	+94°	+209°	---	---
NIGHT FIELD RATIO:	1	1.45	0.642	0.9	---	---
DAY PHASING:	---	---	---	---	-100°	0°
DAY FIELD RATIO	---	---	---	---	0.8	1

SPACING AND ORIENTATION: Nighttime towers #1 through #4 are located at the vertices of a parallelogram the long sides of which are 688.6' (373°) in length on a line bearing 129° true. The short sides are 166' (90°) in length on a line bearing 84° true.

Daytime towers #5 and #6 are spaced 184.6' (100°) on a line bearing 60° true.

GROUND SYSTEM: 120-166' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Daytime	413 mv/m	---	---
Nighttime	184.4 mv/m	224.2 mv/m	193.9 mv/m

(Cont'd.)

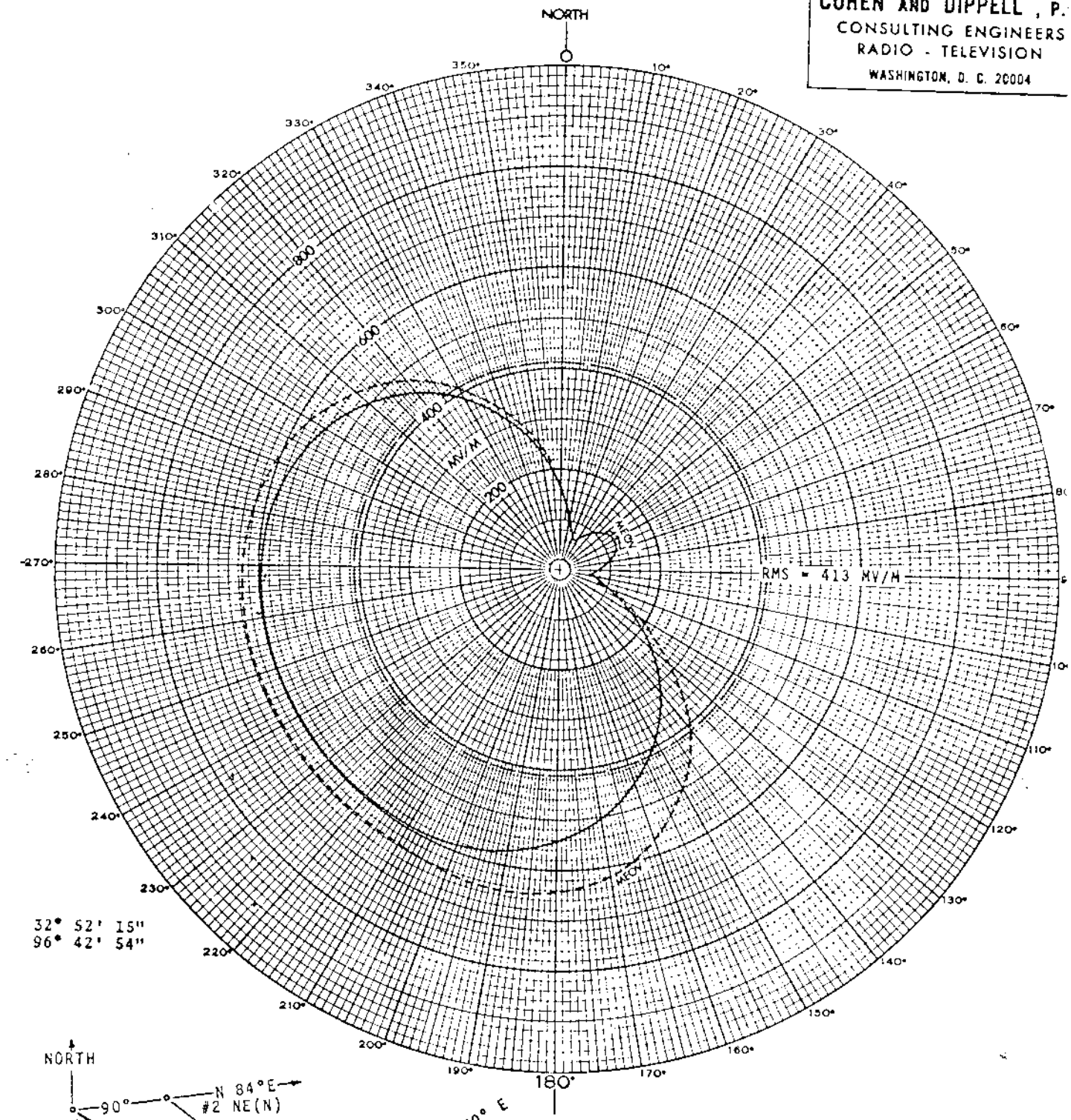
KBOX

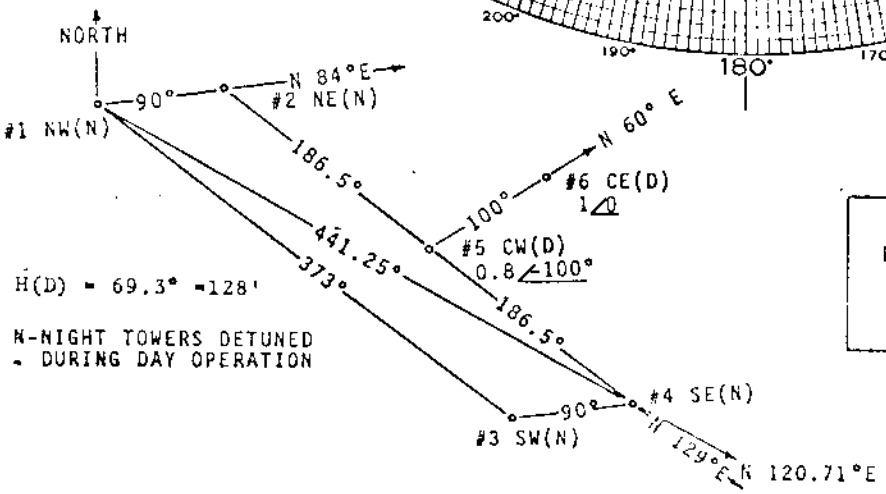
Note: Please retain the Nighttime directional antenna radition patterns notified for Station KBOX in United States Change List Number 1619, dated February 12, 1975, and attach to this Revised Description Sheet and Daytime pattern. This notification concerns only a correction to the orientation from tower #1 to tower #4 from 119.71° true to 120.71° true.

CTR NO 31197A6

~~KBOX~~
KNEZ

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

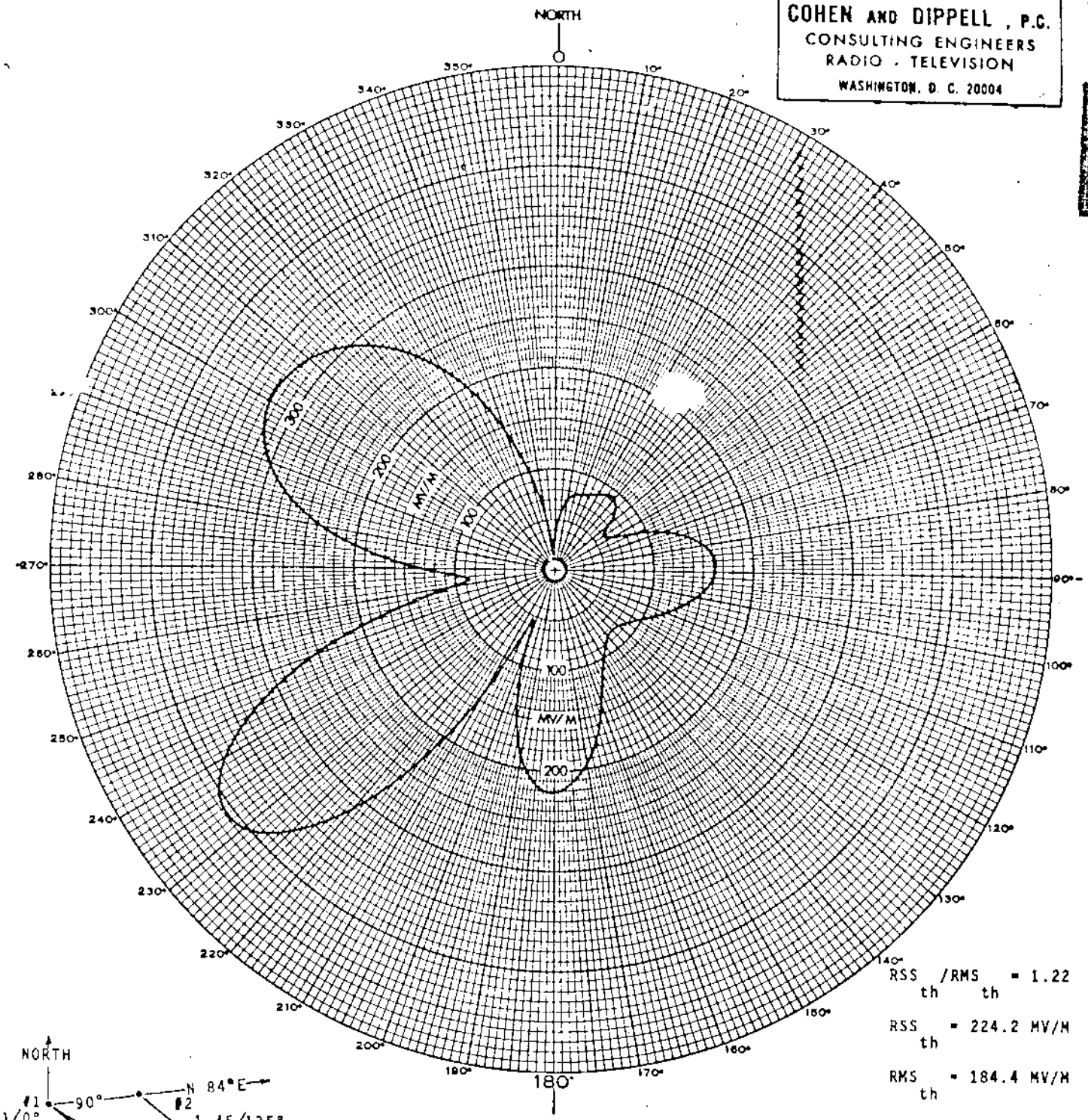


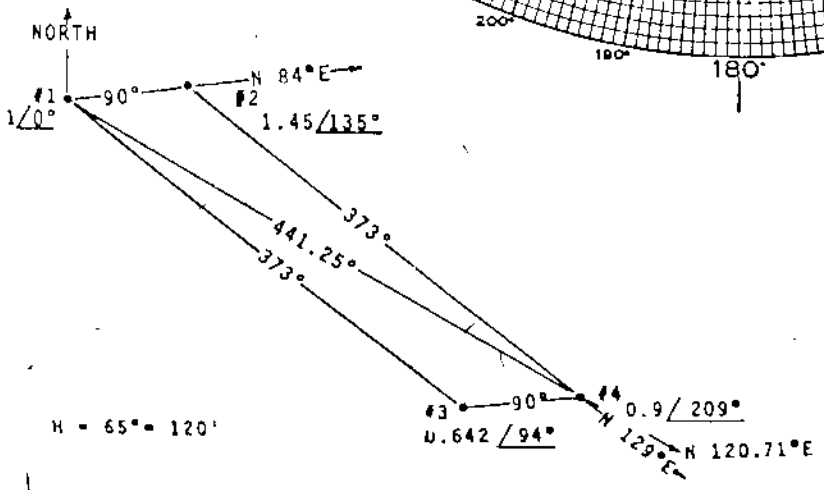


HORIZONTAL PLANE RADIATION PATTERN
FOR THE PROPOSED DAYTIME OPERATION OF
KBOX, DALLAS, TEXAS
1480 KHz - 1/5 KW - DA-2 U
APRIL 1975

~~KBOX~~
KMEZ

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





RSS th /RMS th = 1.22

RSS th = 224.2 MV/M

RMS th = 184.4 MV/M

RMS std = 193.9 MV/M

2 OHM LOSS USED

STANDARD RADIATION PATTERN
HORIZONTAL PLANE
FOR THE PROPOSED NIGHTTIME OPERATION
KBOX, DALLAS, TEXAS
1480 KHz 1/5 KW DA-2 U
AUGUST 1974

KEHG

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station : KEHG Main Studio: Fosston, Minnesota

Frequency : 1480 KHz Power : 2.5 kW Night 5 kW Day

Notification: 1782 Date : October 26, 1979 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 47 ° 33 ' 44 "
West Longitude: 95 ° 43 ' 30 "

ANTENNA CHARACTERISTICS

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

TOWER	N(#1)	C(#2)	S(#3)			
HEIGHT ABOVE INSULATORS	160(86.7°)	197'(106.7°)	160'(86.7°)			
NIGHT PHASING	0°	130°	-99°			
NIGHT FIELD RATIO:	1.0	1.84	0.9			

SPACING AND ORIENTATION: Adjacent towers in a row are spaced 156.9 (85°) on a line bearing 203° true.

GROUND SYSTEM: 120 - 164' equally spaced copper radials plus plus 120 - 50' interspaced radials about each tower. Radials are shortened and bonded to transverse strap along intersections between towers.

KEH G

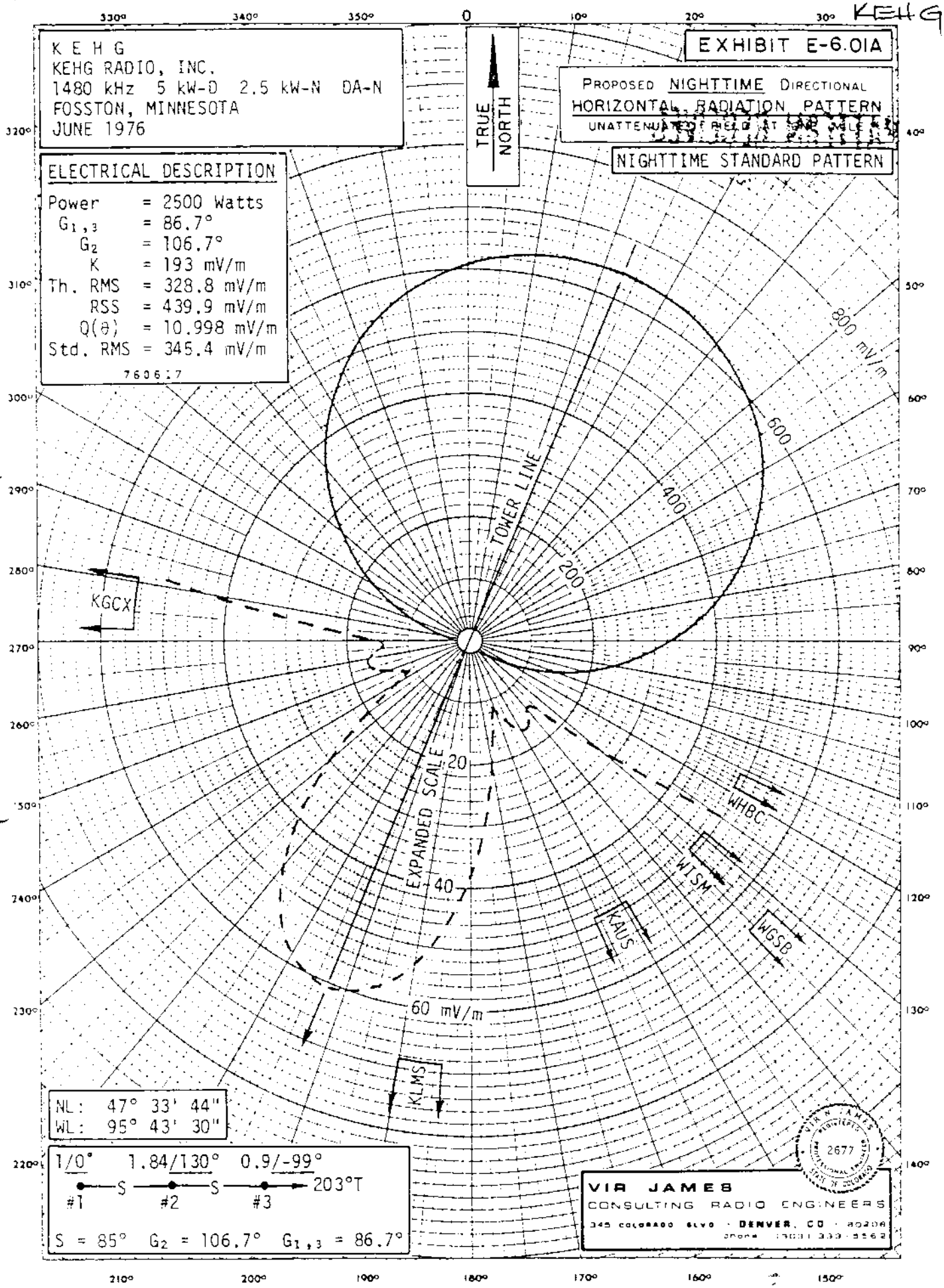
PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	440.5 mV/m	mV/m	mV/m
Night	328.8 mV/m	439.9 mV/m	345.4 mV/m

Note:

Standard Pattern

KEHG



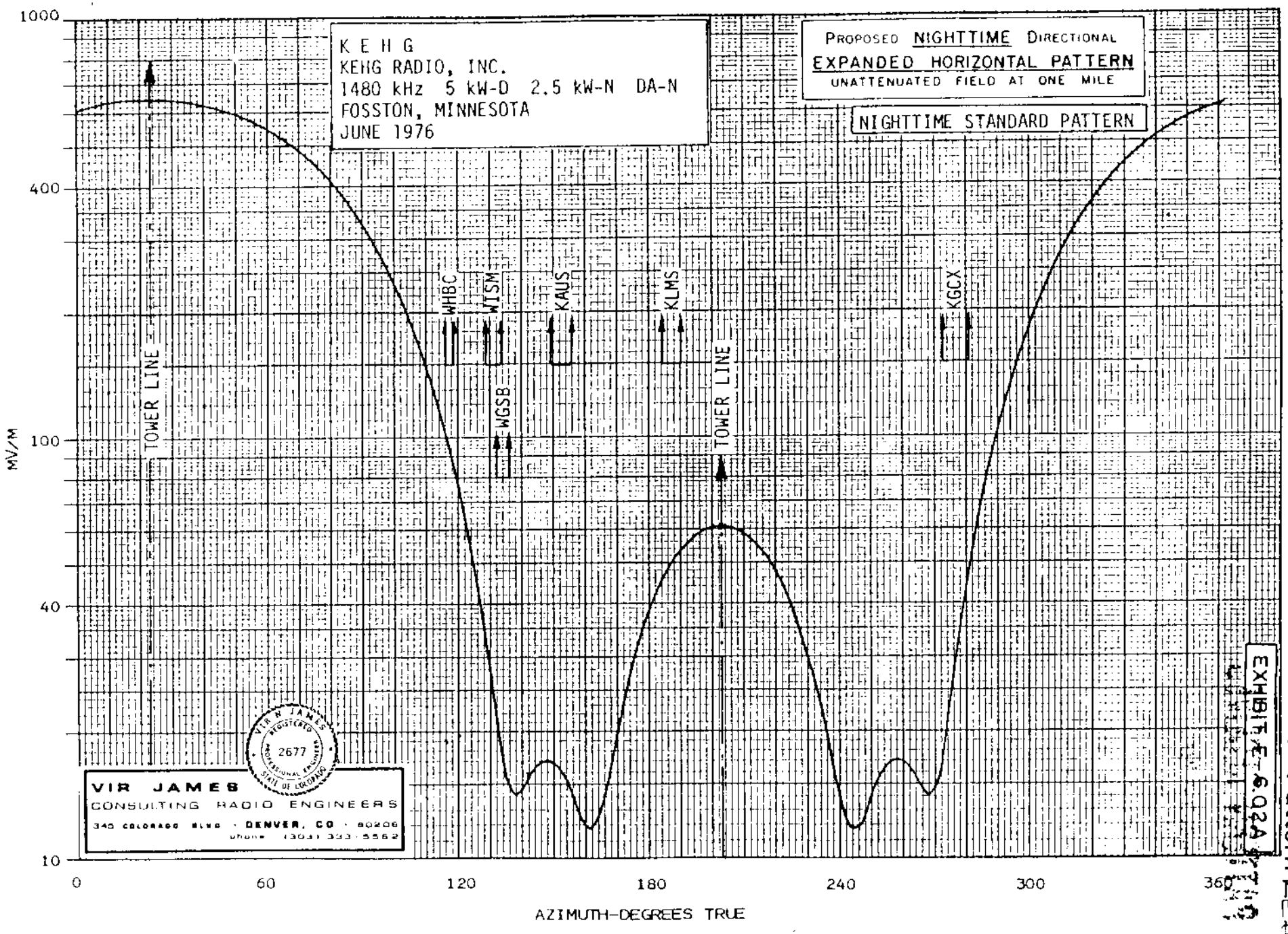
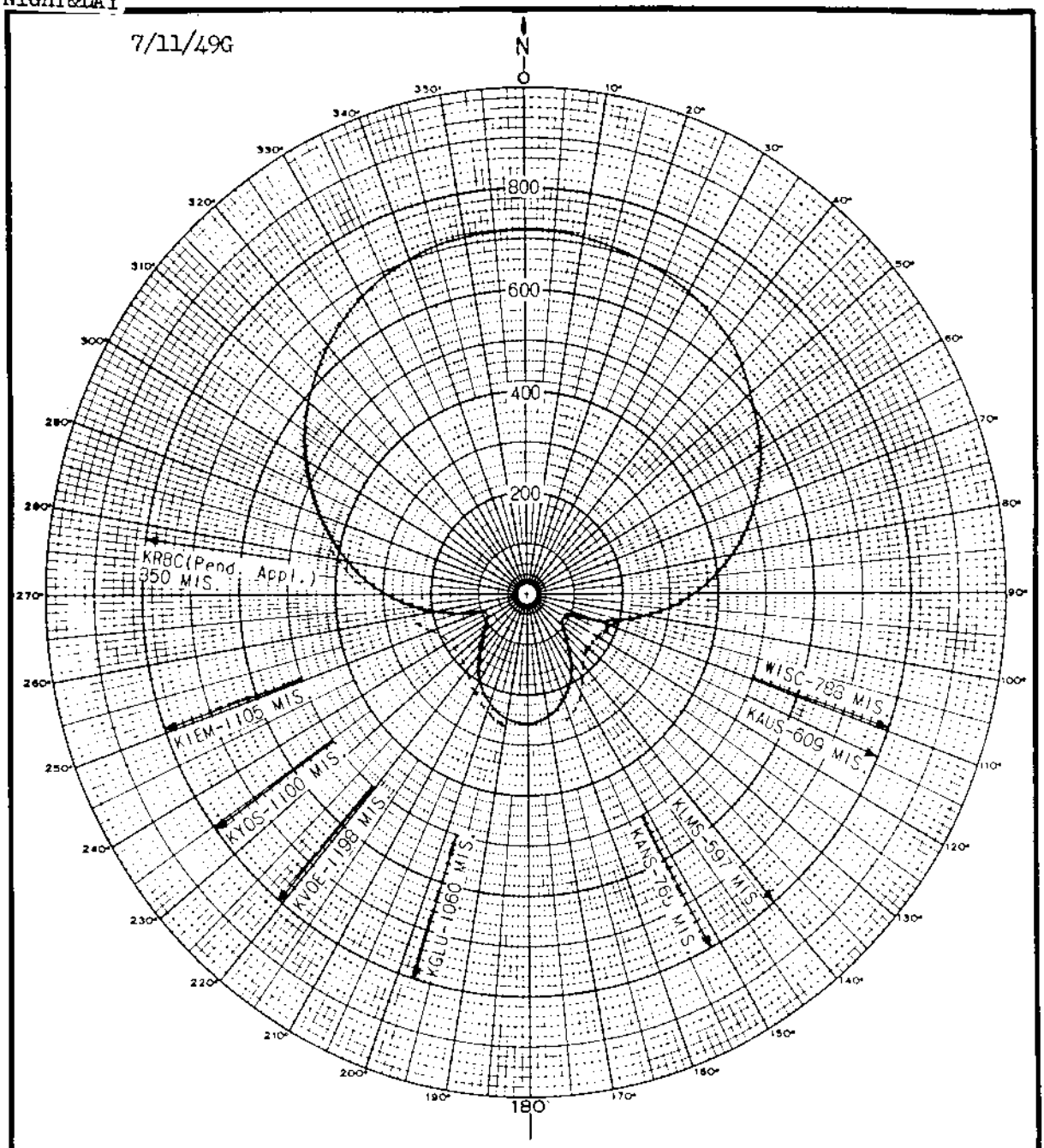


EXHIBIT E-6.02A

KGCX

PROPOSED NIGHT&DAY — KGCX, SIDNEY, MONT. — 5kw, DA-1 — 1480 kc

7/11/49G



RMS = 450 MV/M — CALCULATED ———— MAXIMUM EXPECTED - - - - - - - -

PATTERN NO. 490603

LATITUDE: 47° 46' 26"

LONGITUDE: 104° 6' 54"

ROTHROCK & BAIREY
Consulting Radio Engineers
WASHINGTON, D. C.

S = 80° G = 175' - 95°

S

1 182° TRUE 2

TOWER	FIELD	ψ
1	.8	0°
2	1.0	+135°

FIGURE No. 2A
(Revised)

RADIO STATION KGCX
E. E. KREBSBACH
SIDNEY, MONTANA

Proposed 1480KC - 5KW - DA-1

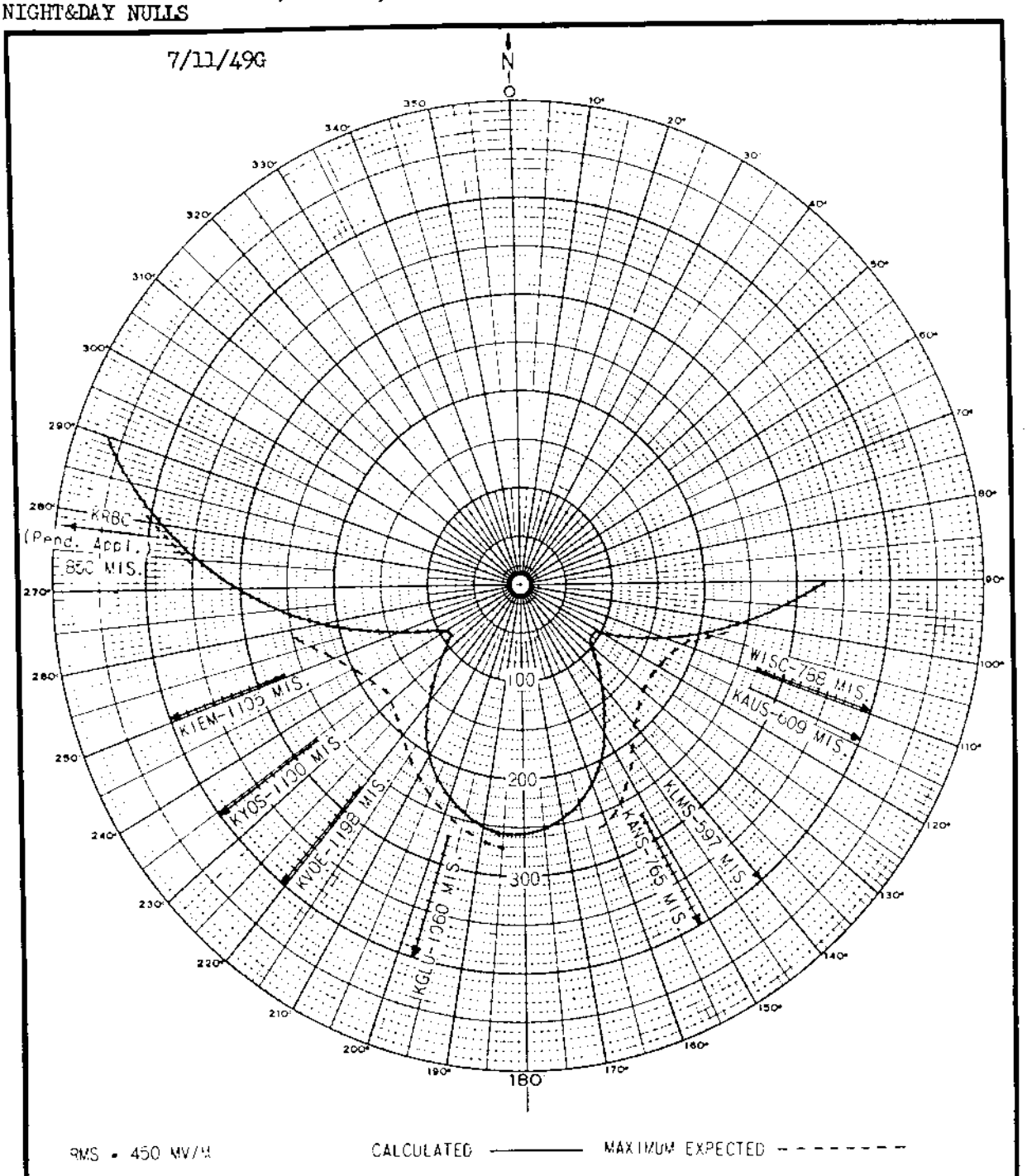
HORIZONTAL PLANE PATTERN

AMENDMENT FILED 7-1-49 BMP-4239

KGCX, Sidney, Mont. 1480 kc.

KGCX

PROPOSED NIGHT&DAY NULLS — KGCX, SIDNEY, MONT. — 5kw, DA-1 — 1480 kc



PATTERN NO. 490603

LATITUDE: 47° 46' 26"

LONGITUDE: 104° 6' 54"

S = 80° G = 175' = 95°

1 162° TRUE 2

TOWER	FIELD	∠
1	.8	0°
2	1.0	+135°

FIGURE No. 2B (Revised)

RADIO STATION KGCX
E. E. KREBSBACH
SIDNEY, MONTANA

Proposed 1480KC - 5KW - DA-1

HORIZONTAL PLANE PATTERN
DETAIL IN MINIMA

ROTHROCK & BAIREY
Consulting Radio Engineers
WASHINGTON, D. C.

AMENDMENT FILED 7-1-49 BMP-4239

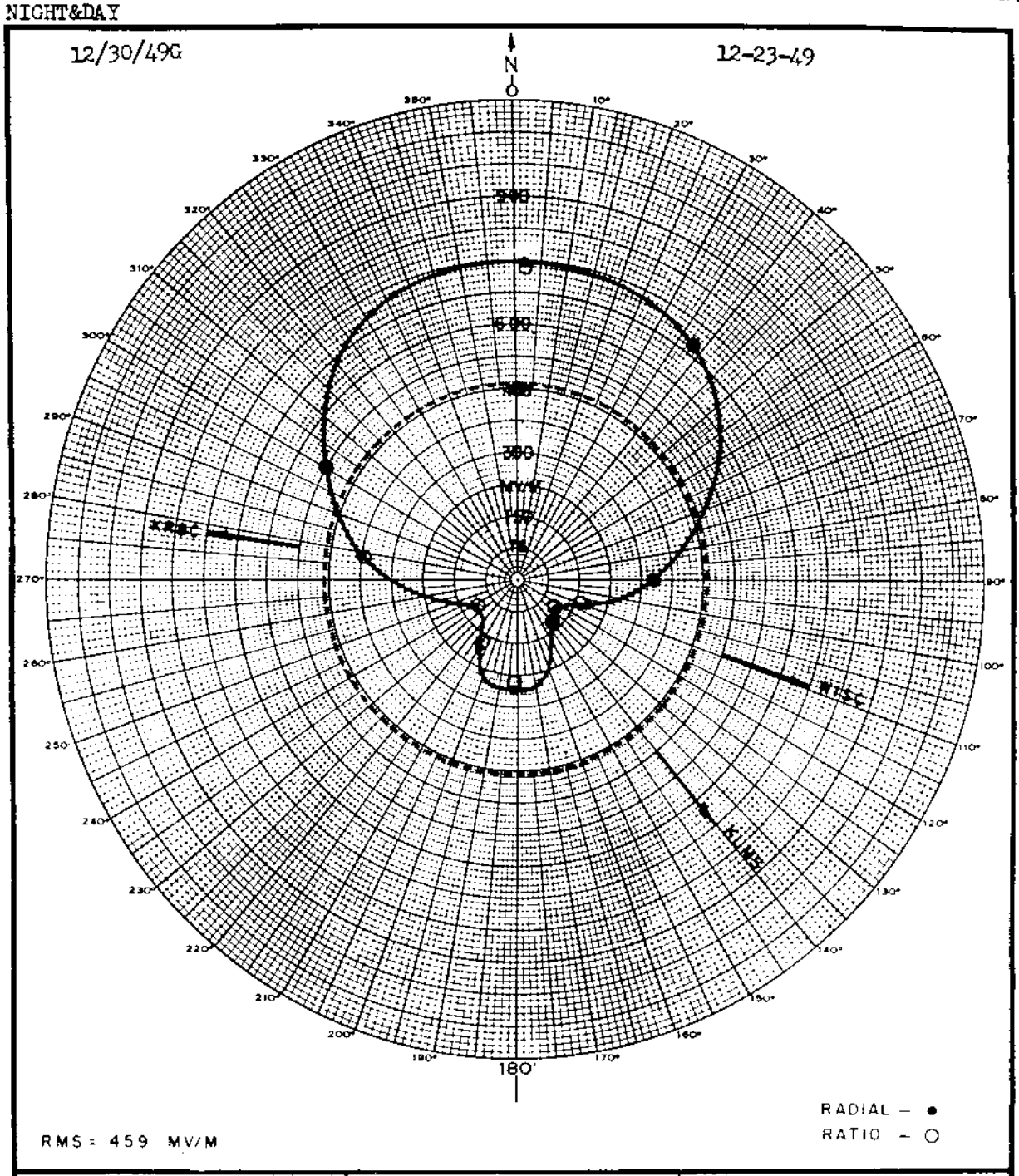
KGCX

MEASURED
NIGHT&DAY

KGCX, SIDNEY, MONT.

5kw, DA-1

1480 kc



PATTERN NO. 491206 DP
LATITUDE: 47° 46' 26"
LONGITUDE: 104° 06' 54"

TOWER	CURRENT	PHASE
1	5.7	0°
2	8.1	+139°

EXHIBIT NO 18

RADIO STATION KGCX
SIDNEY, MONTANA
1480 KC – 5 KW- DA-1

MEASURED DIRECTIONAL PATTERN

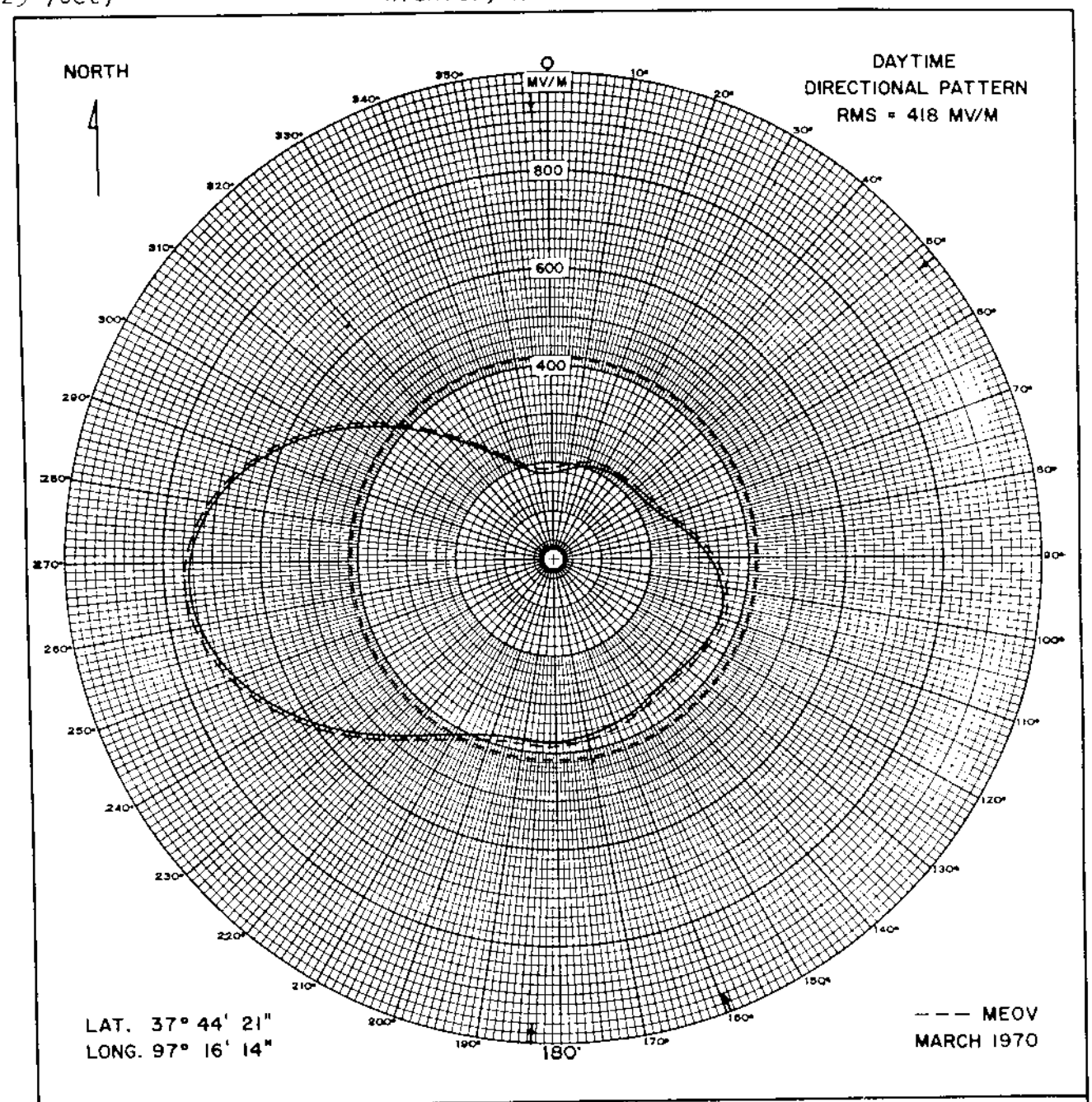
GEORGE B. BAIREY
CONSULTING RADIO ENGINEER
WASHINGTON, D. C

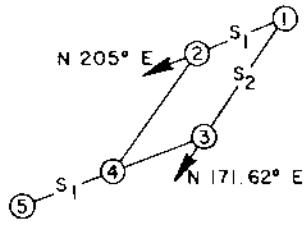
SEE REVERSE SIDE

Proposed Day
(6-29-70ct)

Station KLEO
Wichita, Kansas

KLEO
1kw,5kw-LS,DA-2,U
1480 kc





THEORETICAL PARAMETERS

TOWER	FIELD	PHASE
1	1.000	0.00°
2	0.600	-100.00°
3	0.400	50.00°
4	0.240	- 50.00°
5	–	–

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

RADIO STATION KLEO
1480 KC 1 KW 5 KW-LS DA-2
660420.2A FIGURE 4B

FCC File No.BMP-13000
Accepted 6-1-70

Station KLEO
Wichita, Kansas

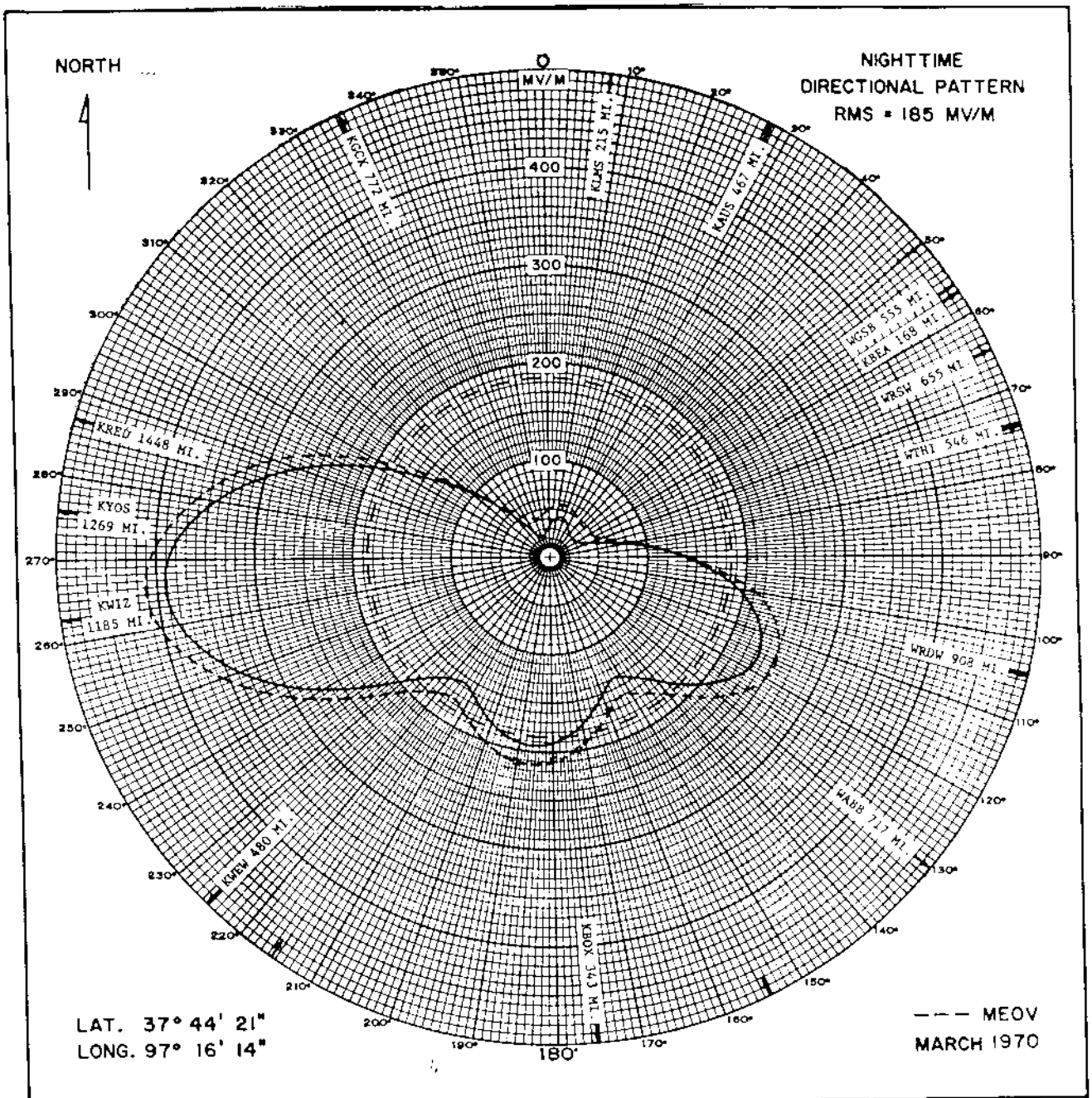
1480 kc

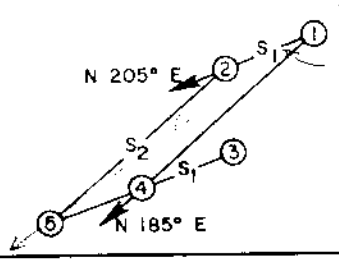
SEE
REVERSE
SIDE

Proposed Night
(6-29-70ct)

Station KLEO
Wichita, Kansas

KLEO
1kw,5kw-LS,DA-2,U
1480 kc





S_1 = 166.0' = 90°
S_2 = 394.8' = 214°
G = 166.0' = 90°

THEORETICAL PARAMETERS

TOWER	FIELD	PHASE
1	1.000	0.00°
2	0.800	-111.00°
3	–	–
4	0.500	- 4.00°
5	0.400	-115.00°

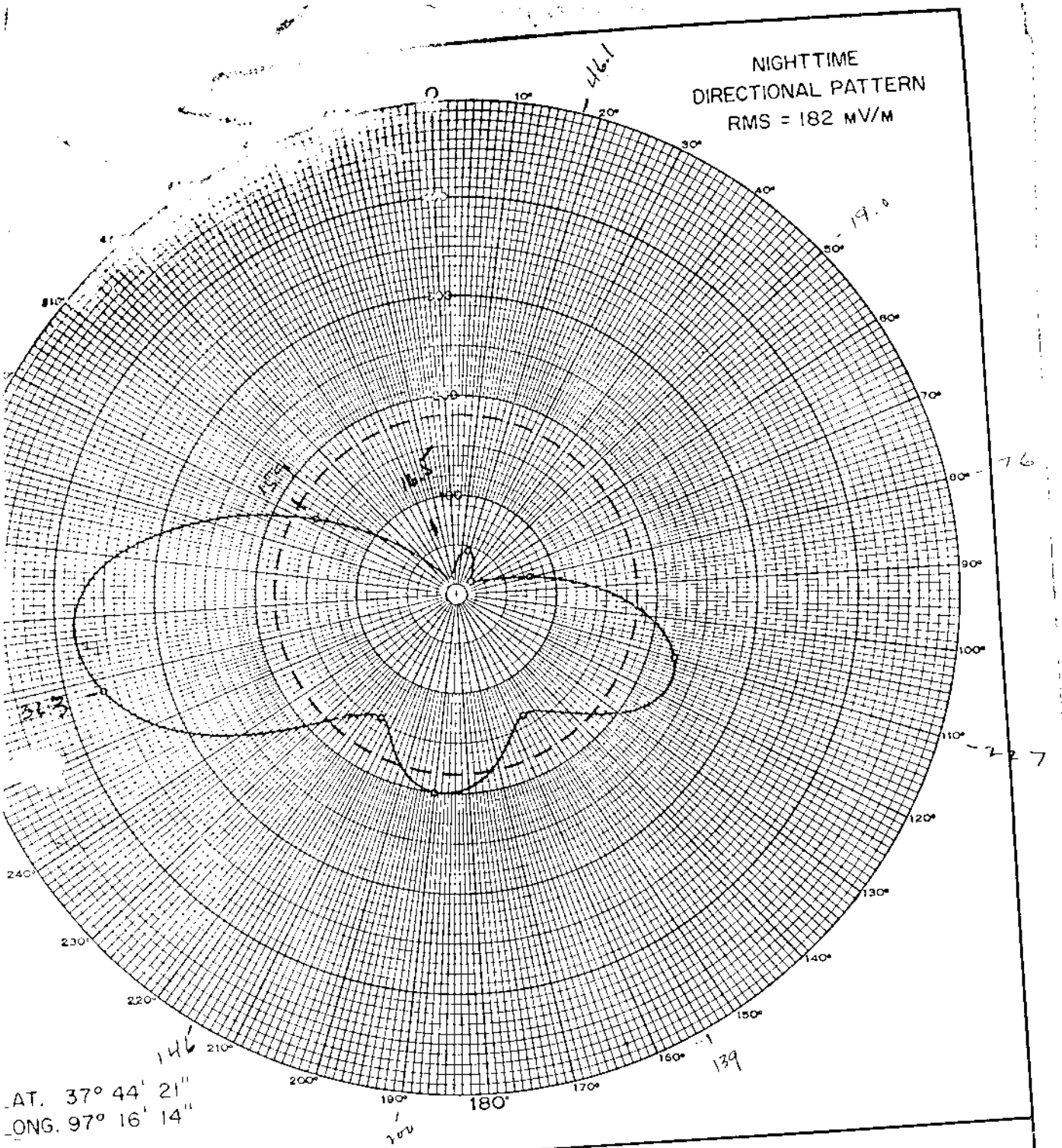
PREPARED BY
THE FIRM OF A. EARL CULLUM, JR.
CONSULTING ENGINEERS

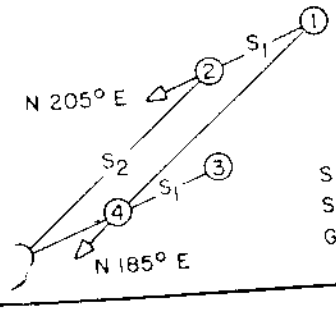
RADIO STATION KLEO
1480 KC 1 KW 5 KW-LS DA-2
660420.3A FIGURE 4B

FCC File No.BMP-13000
Accepted 6-1-70

Station KLEO
Wichita, Kansas

1480 kc





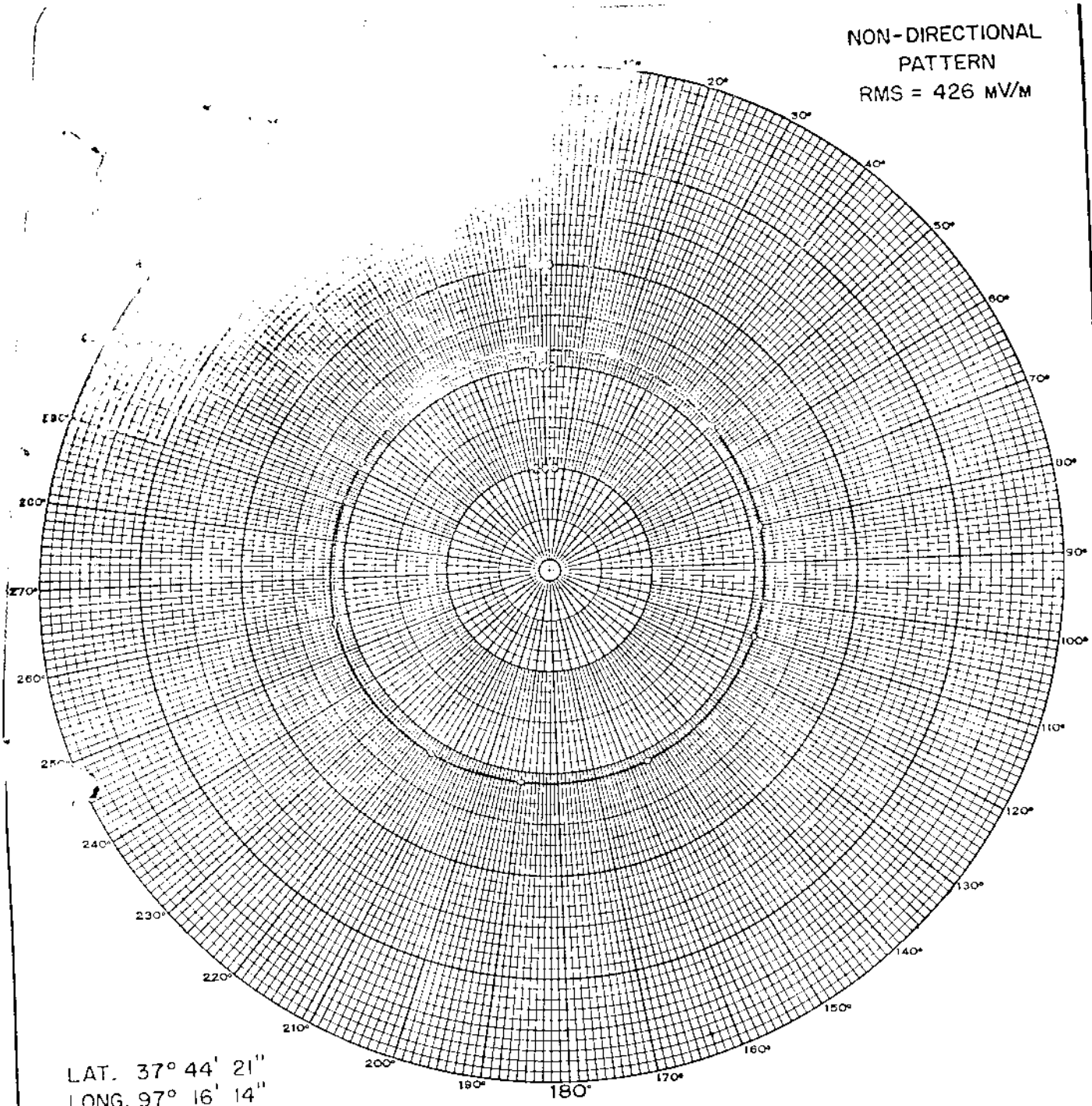
S_1 = 166.0' = 90°
S_2 = 394.8' = 214°
G = 166.0' = 90°

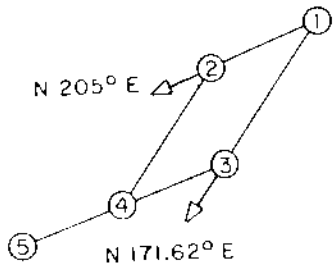
ANTENNA PARAMETERS

TOWER	THEORETICAL FIELD	THEORETICAL PHASE	INDICATED FIELD	INDICATED PHASE
1	1.000	0.00°	1.299	114.00°
2	0.800	−111.00°	1.000	0.00°
3	—	—	—	—
4	0.500	− 4.00°	0.696	112.00°
5	0.400	−115.00°	0.537	− 2.00°

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

RADIO STATION KLEO
1480 kHz 1 kW 5 kW-LS DA-2
701220
FIGURE 2C

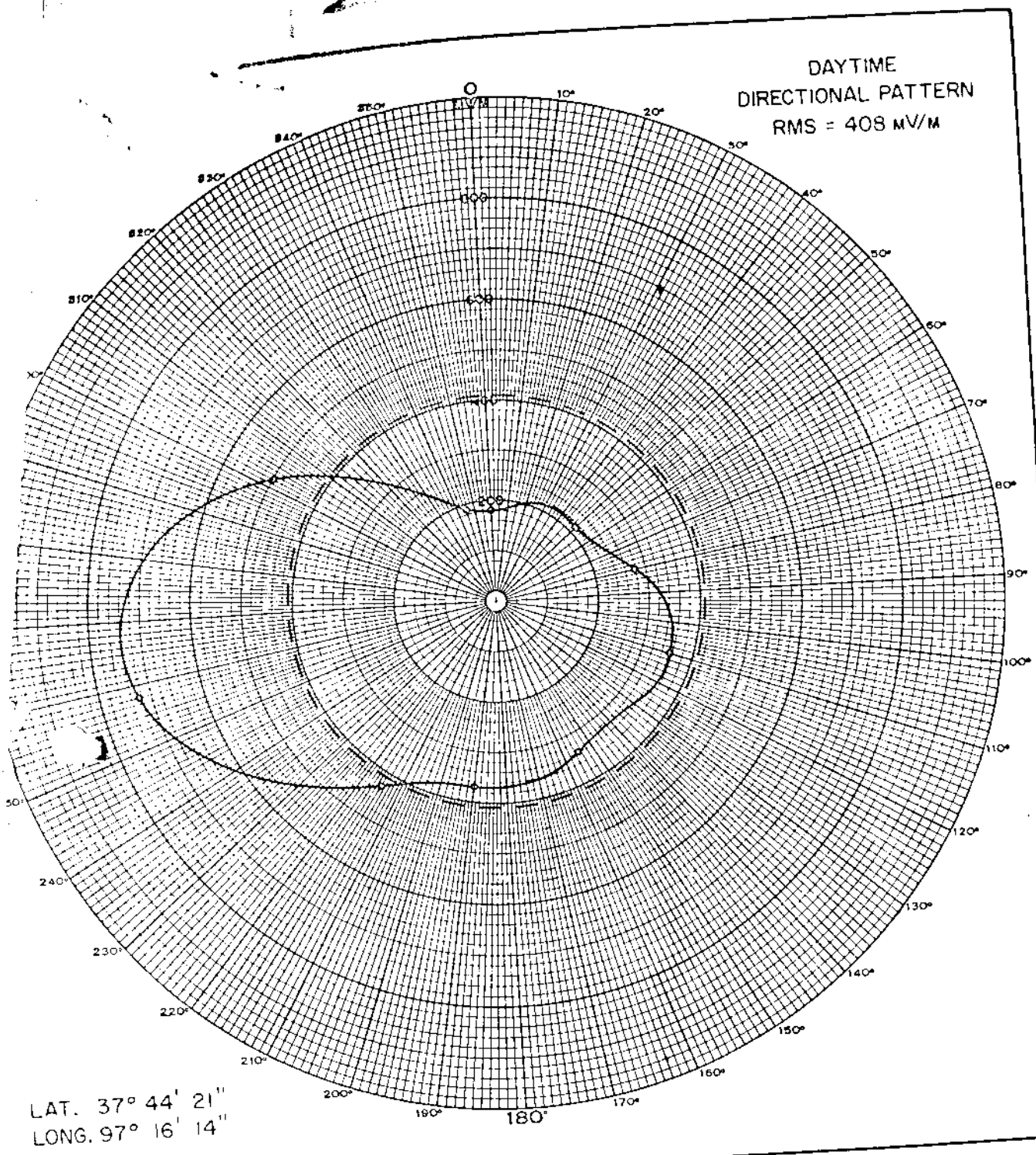


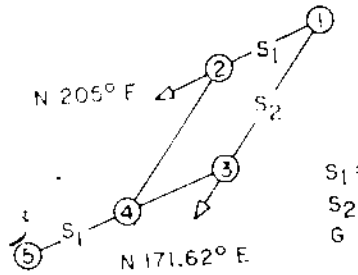


TOWER	TEST OPERATION
1	DETUNED
2	DETUNED
3	SERIES FED
4	DETUNED
5	DETUNED

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

RADIO STATION KLEO
1480 kHz 1 kW 5 kW-LS DA-2
701220 FIGURE 2A





S_1 = 166.0' = 90°
S_2 = 245.5' = 133°
G = 166.0' = 90°

ANTENNA PARAMETERS

TOWER	THEORETICAL FIELD	THEORETICAL PHASE	INDICATED FIELD	INDICATED PHASE
1	1.000	0.00°	1.000	0.00°
2	0.600	-100.00°	0.537	-103.00°
3	0.400	50.00°	0.394	50.00°
4	0.240	-50.00°	0.254	-48.00°
5	—	—	—	—

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

RADIO STATION KLEO
1480 kHz 1 kW 5 kW-LS DA-2
701220
FIGURE 2B

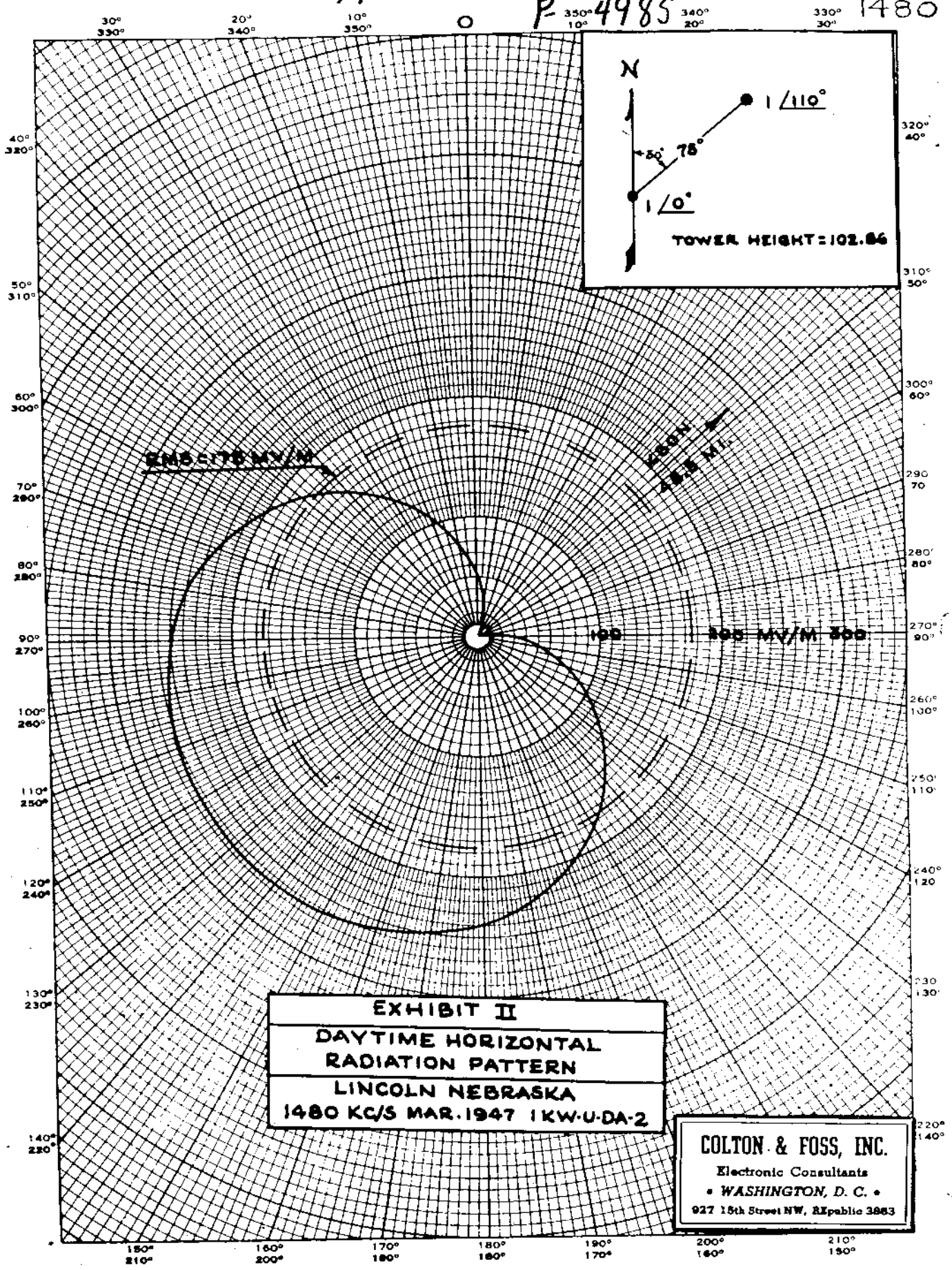
KLMS

LINCOLN, NEB

9/7/48-GO

P-4985

1480



KLMS

PROPOSED DAY NULLS (6-14-61g)

Station KLMS
Lincoln, Nebraska

1kw, DA-2,U
1480 KC

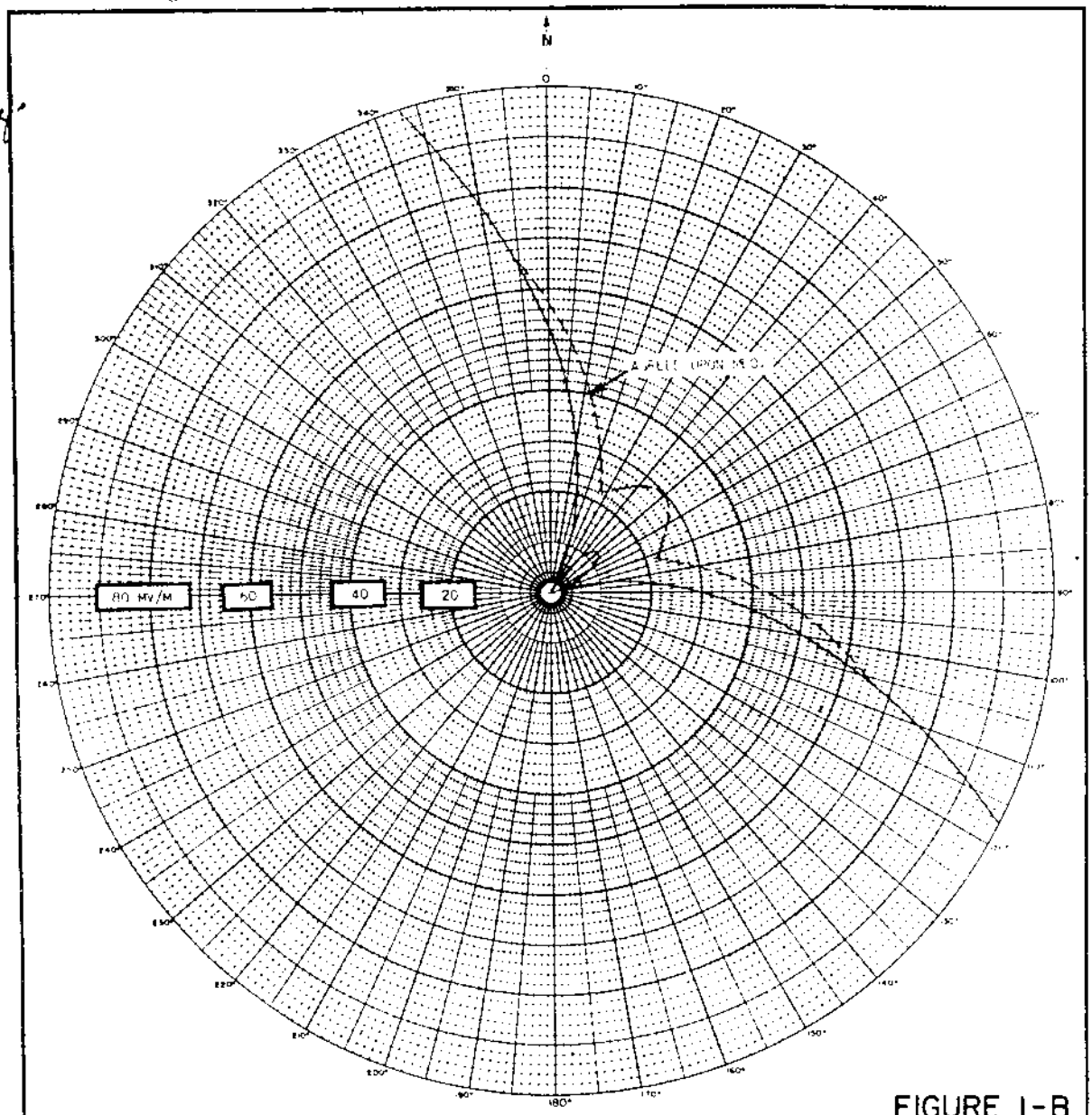


FIGURE 1-B

EXPANDED VIEW OF
KLMS HORIZONTAL PATTERN
WITH
AGREED UPON MEOV

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

FCC File No. BP-14772
Accepted 5-8-61

KLMS
Lincoln, Nebraska

1480 KC

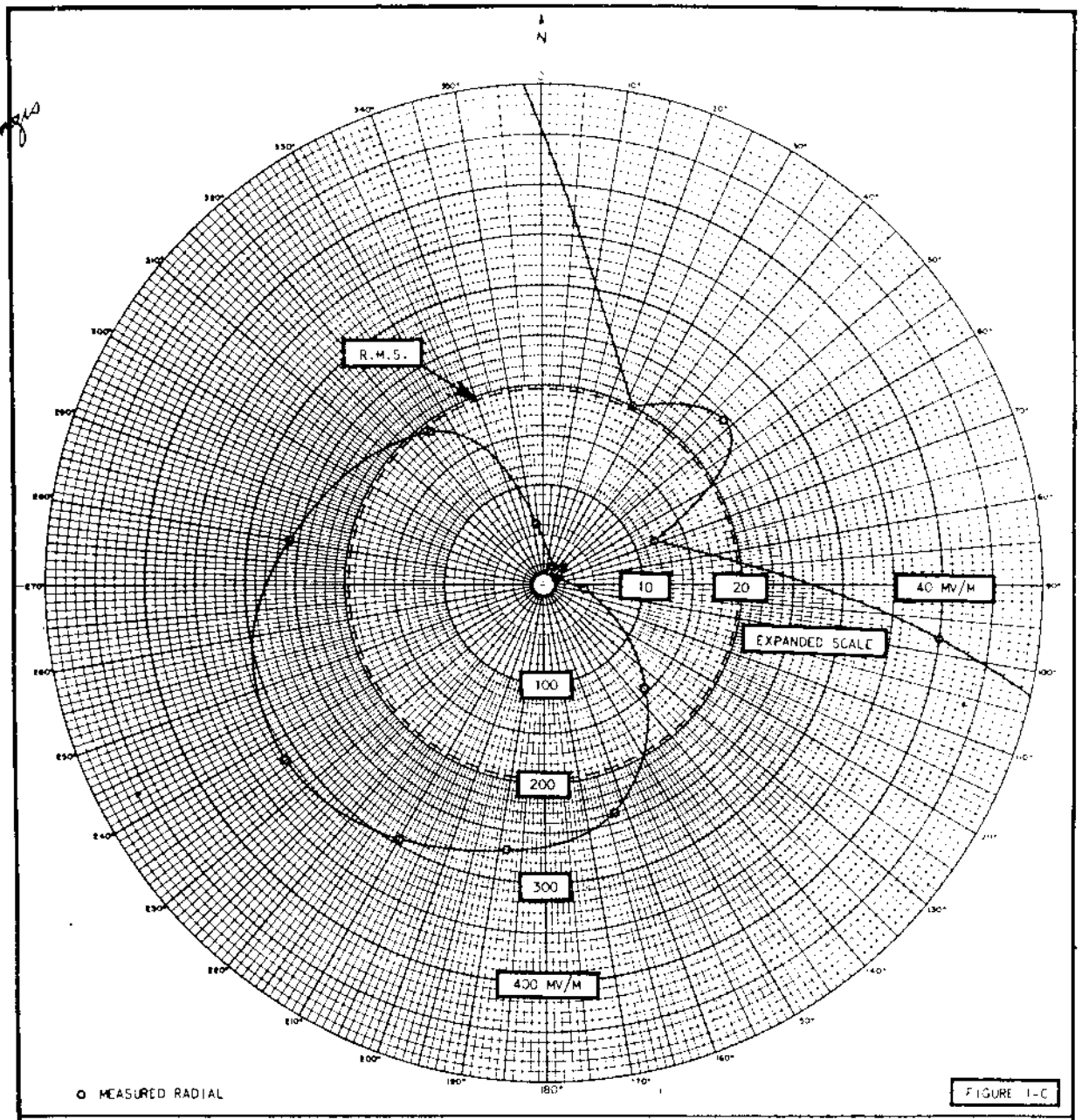
KLMS

Measured Day
(12-19-61ct)

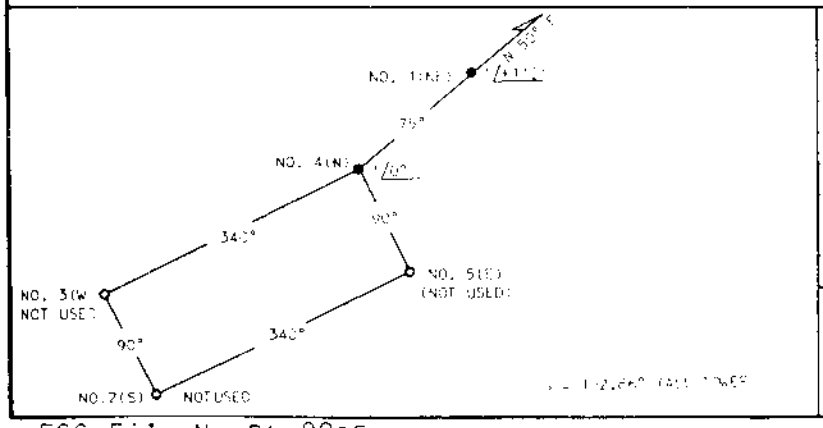
Station KLMS
Lincoln, Nebraska

1kw,DA-2,U
1480 kc

1-24-62 painted over using changes in daytime directional pattern



HORIZONTAL RADIATION PATTERN



APPLICANT
LOCATION
FREQUENCY
POWER
LATITUDE
LONGITUDE
WHEN USED
RMS FIELD
DATE

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

FCC File No.BL-8835
Accepted 11-29-61

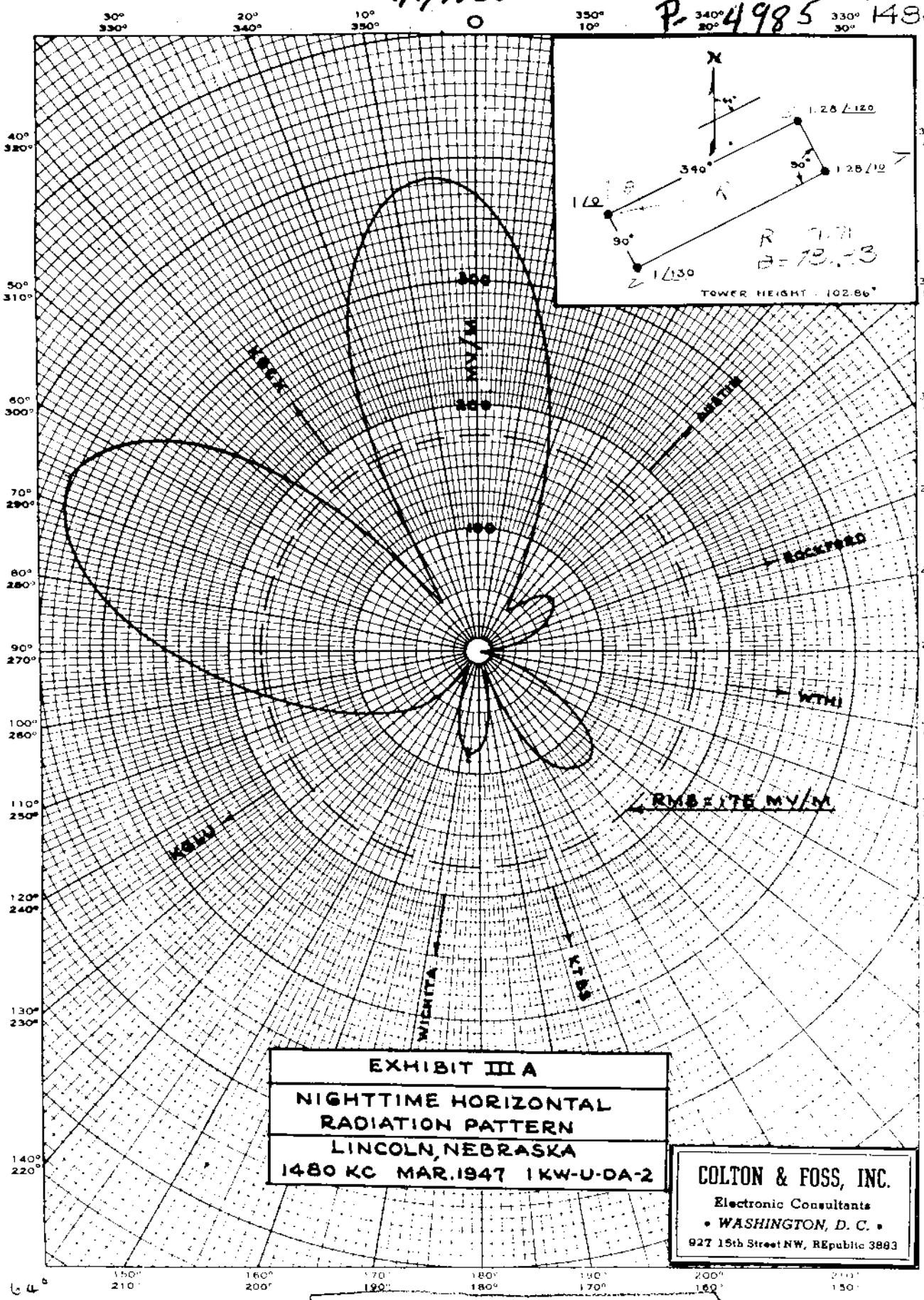
Station KLMS
Lincoln, Nebraska

1480 kc

KLMS
LINCOLN, NEBR.

9/7/48 GO

P- 4985 1480



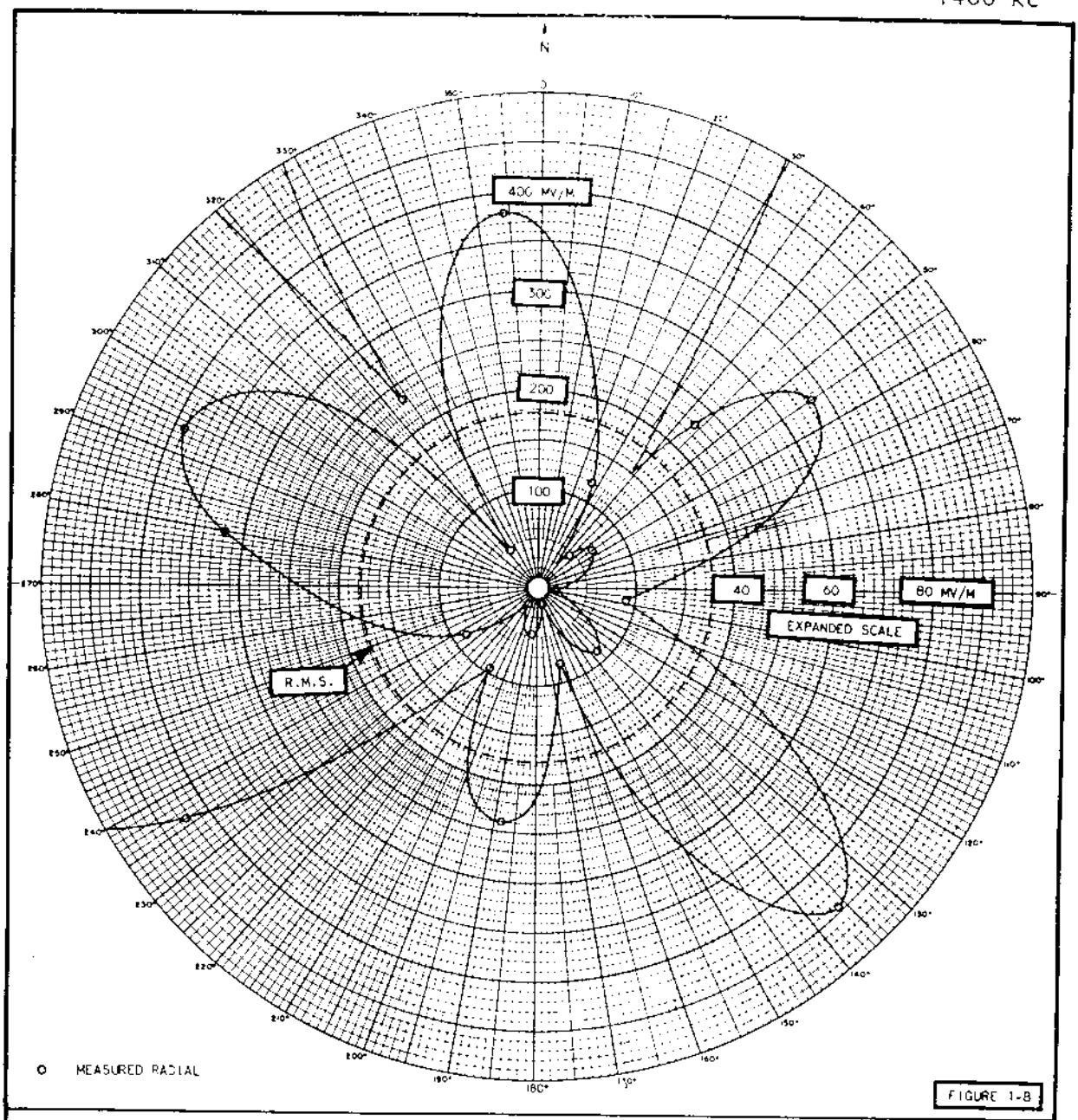
A=0 at 64°
Rotation clockwise $E = 206.5\ f(v)\sqrt{[1.031 + \cos(340 \cos A \cos v - 120)] \times [1 + \cos(90 \sin A \cos v + 130)]}$

KLMS

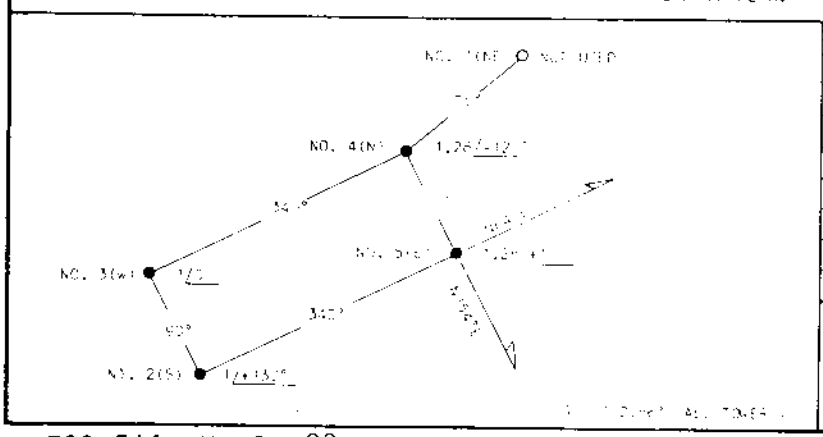
Measured Night
(12-19-61ct)

Station KLMS
Lincoln, Nebraska

1kw, DA-2, U
1480 kc



HORIZONTAL RADIATION PATTERN



APPLICANT	LINCOLN BROADCASTING CORP.
LOCATION	LINCOLN, NEBRASKA
FREQUENCY	1480 KC/S
POWER	1 KW-U DA-2
LATITUDE	40 DEG 48 MIN 27 SEC
LONGITUDE	96 DEG 36 MIN 27 SEC
WHEN USED	NIGHT ME
R.M.S. FIELD	179.2 MV/M
DATE	SEPTEMBER 1961

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

FCC File No.BL-8835
Accepted 11-29-61

Station KLMS
Lincoln, Nebraska

1480 kc

KLMS

Measured Non-DA
(12-19-61ct)

Station KLMS
Lincoln, Nebraska

1kw,DA-2,U
1480 kc

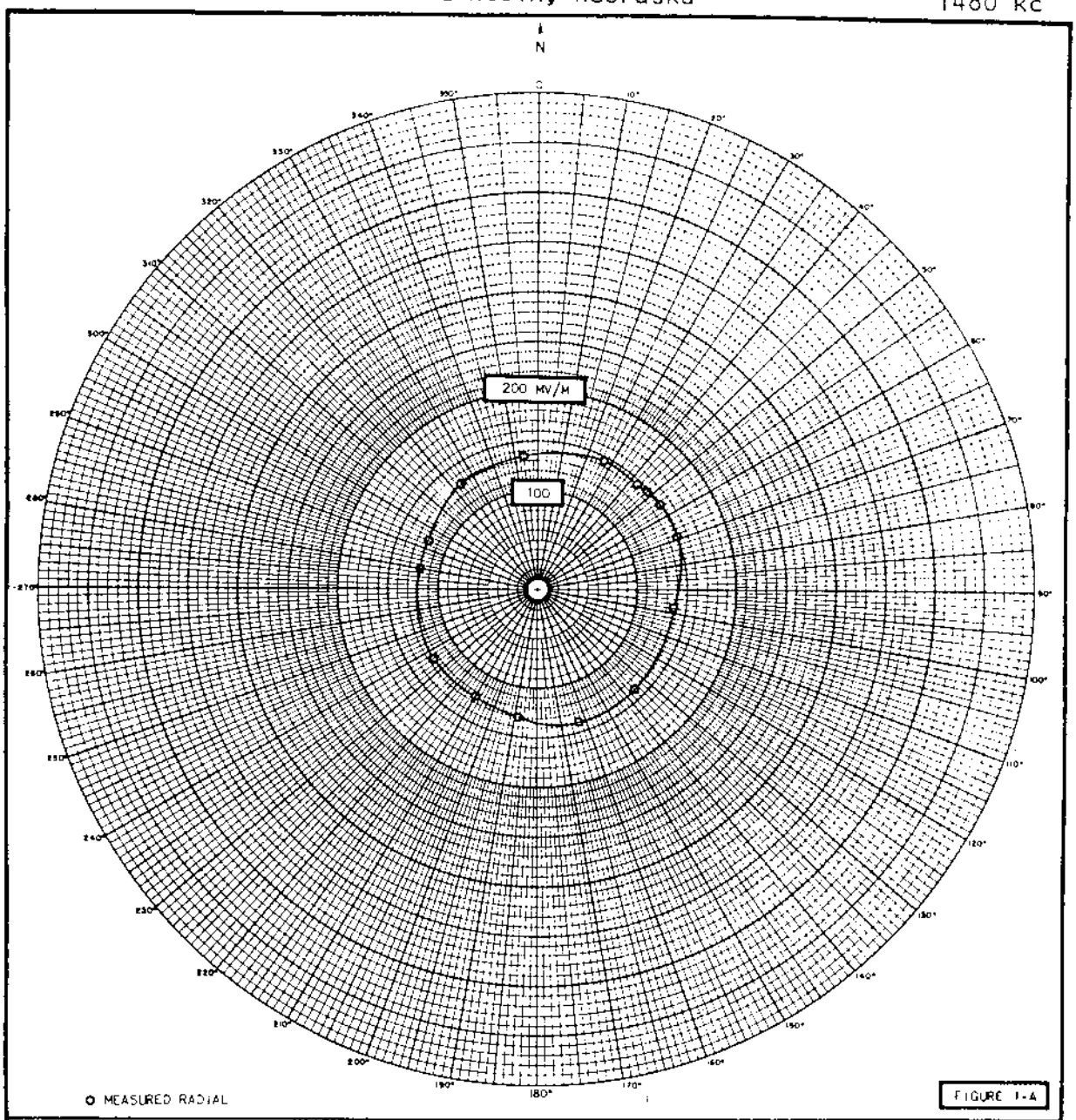


FIGURE 1-A

HORIZONTAL RADIATION PATTERN

NON-DIRECTIONAL SURVEY

APPLICANT	LINCOLN BROADCASTING CORP.
LOCATION	LINCOLN, NEBRASKA
FREQUENCY	1480 KC/S
POWER	500 WATTS
LATITUDE	40 DEG 48 MIN 21 SEC
LONGITUDE	96 DEG 36 MIN 27 SEC
WHEN USED	NON-DIRECTIONAL SURVEY ONLY
RMS FIELD	134.1 MV/M
DATE	SEPTEMBER 1961

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

FCC File No.BL-8835
Accepted 11-29-61

Station KLMS
Lincoln, Nebraska

1480 kc

KLMS

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station : KLMS Main Studio: Lincoln, Nebraska

Frequency : 1480 KHz Power : 1 kW Night 2.5 kW Day

Notification: 1782 Date : October 26, 1979 Class: III

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

DAYTIME				NIGHTTIME			
North Latitude:	40°	47'	47"	North Latitude:	40°	48'	27"
West Longitude:	96°	34'	56"	West Longitude:	96°	36'	27"

DAYTIME ANTENNA CHARACTERISTICS

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

TOWER :	E(#1)	EC(#2)	WC(#3)	W(#4)		
HEIGHT ABOVE INSULATORS :	190'	190'	190'	190'(105°)		
DAY PHASING :	0°	214°	68.5°	283.5°		
DAY FIELD RATIO:	1	2.49	2.48	1.035		

SPACING AND ORIENTATION: Adjacent towers in a row are spaced 166.14' (90°) on a line bearing 280° true.

GROUND SYSTEM: 120 - 166' 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 308.2 mv/m	334.84 mv/m	324.36 mv/m
Night 175 mv/m		

NIGHTTIME ANTENNA CHARACTERISTICS

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

TOWER :	SW(#1)	NW (#2)	NE(#3)	SE(#4)		
HEIGHT ABOVE INSULATORS :	190'	190'	190'	190'		
NIGHT PHASING :	+130°	0°	-120°	10°		
NIGHT FIELD RATIO:	1.00	1.00	1.28	1.28		

SPACING AND ORIENTATION: The towers are located at the vertices of a rectangle the long sides of which are 628.8' (340°) in length on a line bearing 64° true. The short sides are 166.3' (154°) true.

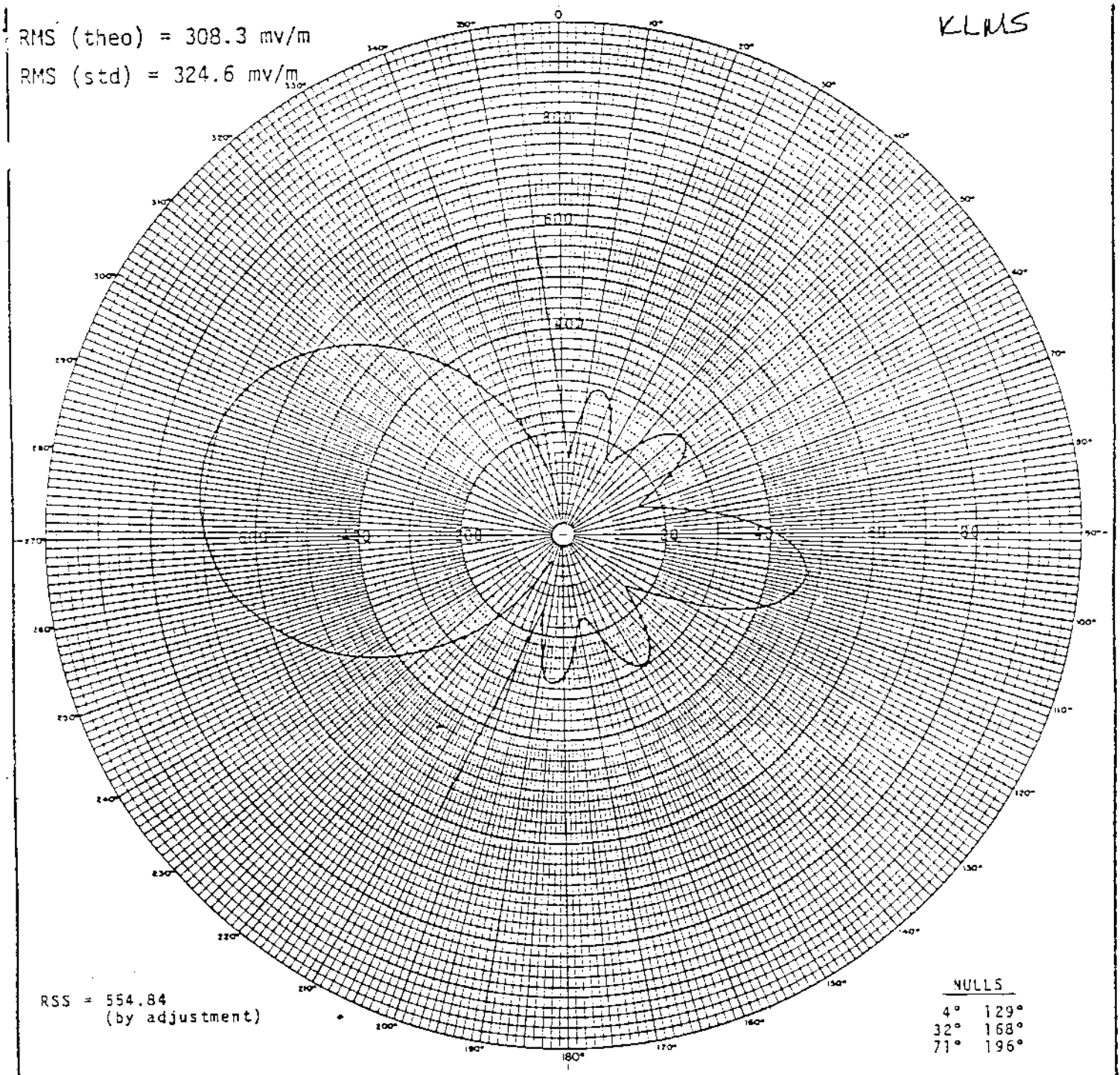
GROUND SYSTEM: 120 - 190' equally spaced copper radials about each tower Radials are shortened and bonded to transverse straps along intersections between towers.

Note: Please retain the nighttime directional antenna radiation pattern notified for Station KLMS in United States Change List Number 248 dated October 16, 1947 and attach to this Revised Description Sheet and Daytime pattern. This notification concerns only a change in the Daytime operation of the station with nighttime operation continued as previously notified.

RMS (theo) = 308.3 mv/m

RMS (std) = 324.6 mv/m

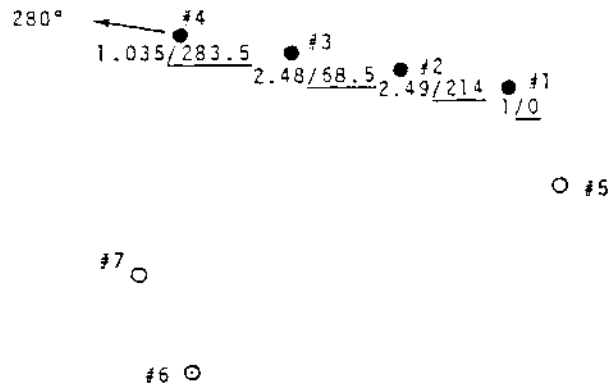
KLMS



RSS = 554.84
(by adjustment)

NULLS	
4°	129°
32°	168°
71°	196°

STANDARD HORIZONTAL RADIATION PATTERN



All G's = 103°

Spacing = 90° Between Adjacent Elements For Day Array

APPLICANT	RADIO STATION KLMS
LOCATION	LINCOLN, NEBRASKA
FREQUENCY	1480 KC/S
POWER	2500 WATTS
LATITUDE	40 DEG. 48 MIN. 27 SEC.
LONGITUDE	96 DEG. 36 MIN. 27 SEC.
WHEN USED	Daytime
R.M.S. FIELD	
DATE	June, 1976

RALPH E. EVANS ASSOCIATES

Consulting Radio Engineers

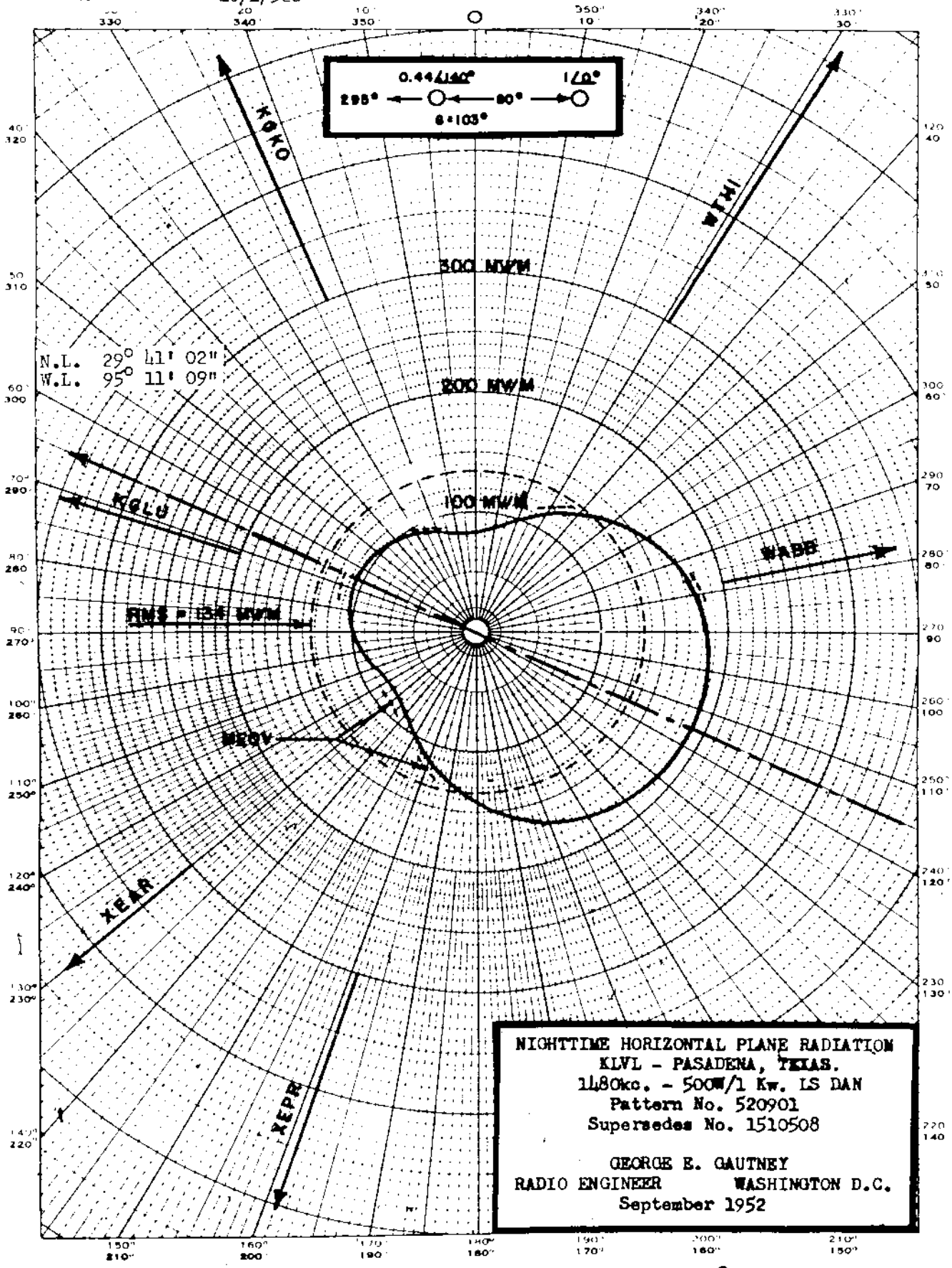
3500 North Sherman Boulevard

Milwaukee, Wisconsin 53216

Telephone: 442-4210 (Area Code 414)

KLVL

PROPOSED NIGHT | KLVL, PASADENA, TEXAS 10/1/52G | 500W, 1 KW-LS, U, DA-N | 1480 KC

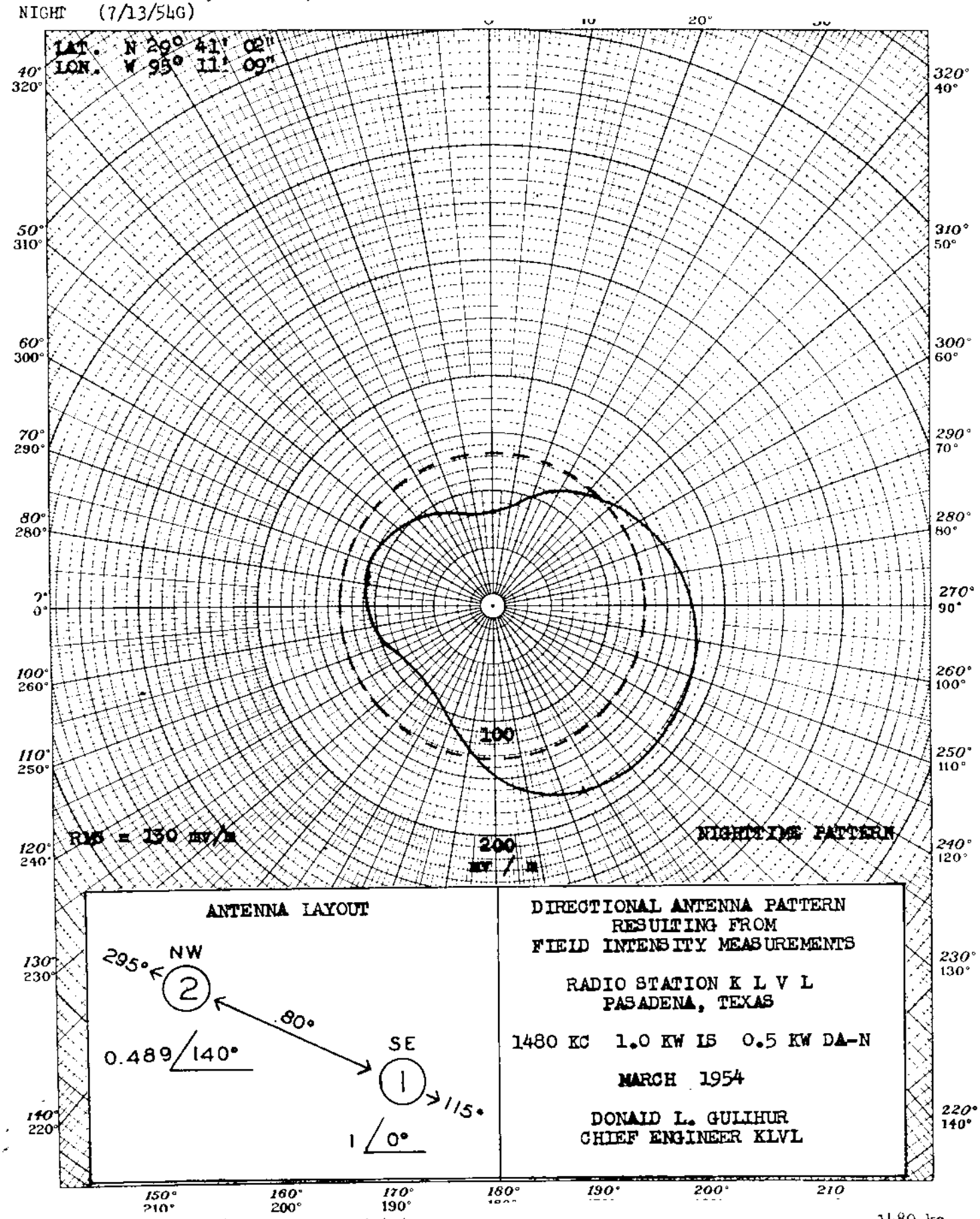


AMED RECD FCC 9/12/52 ACC 9/24/52 BP-8250 Amd.

KLVL, PASADENA, TEXAS 1480 KC

KLVL

MEASURED KLVL, Pasadena, Texas 500W, 1KW-LS, U, DA-N 1480 kc
NIGHT (7/13/54G)



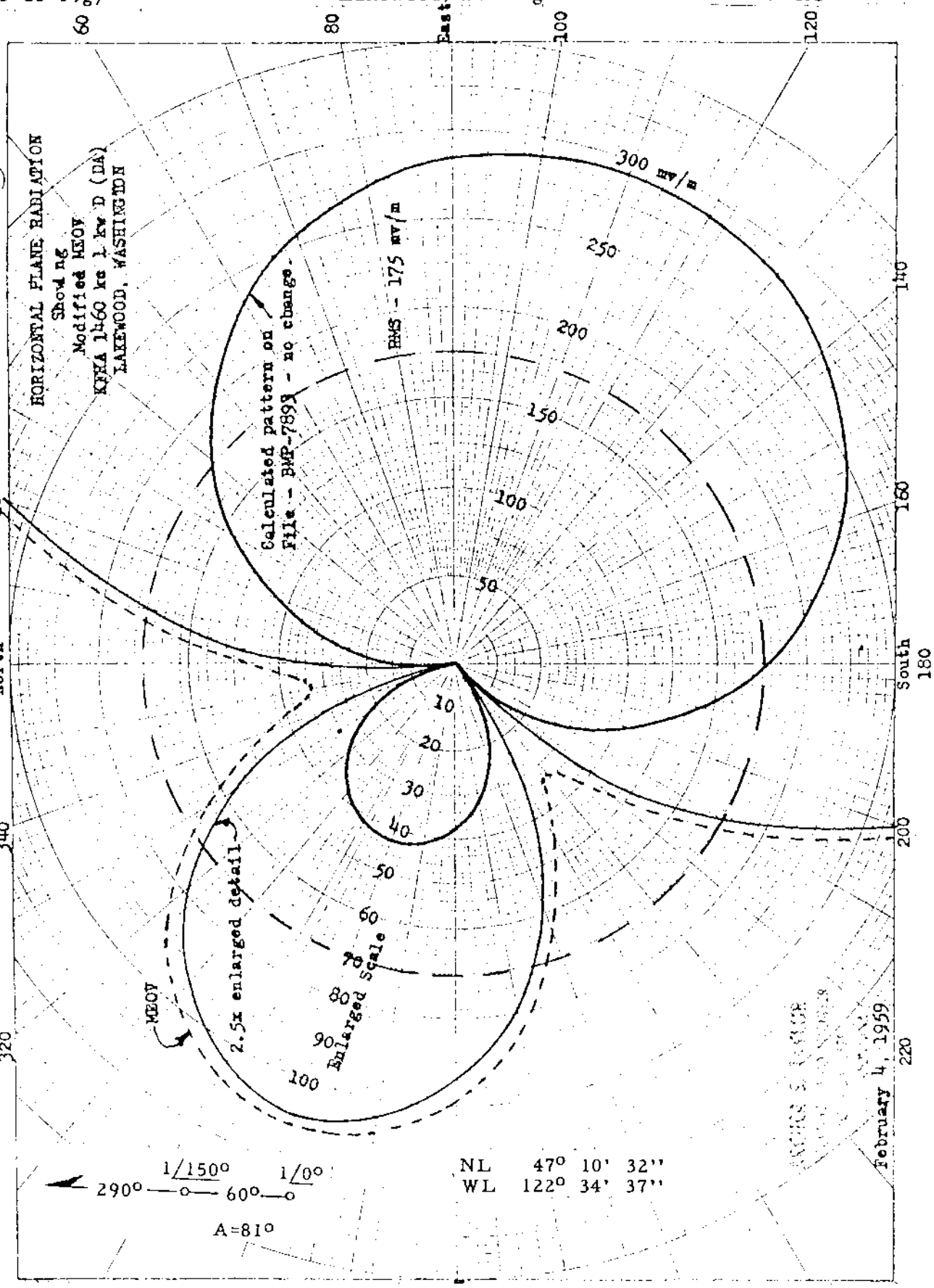
FCC File No. BL-5251 Accepted 4/7/54 KLVL, Pasadena, Texas 1480 kc

KOOD

PROPOSED DAY
(3-23-59g)

Station KFHA
Lakewood, Washington

1kw, DA-D,D
1480 KC



FCC File No. BMP-8403
Accepted 2-10-59

KFHA
Lakewood, Washington

1480 KC

granted license 7-16-59

KOOD

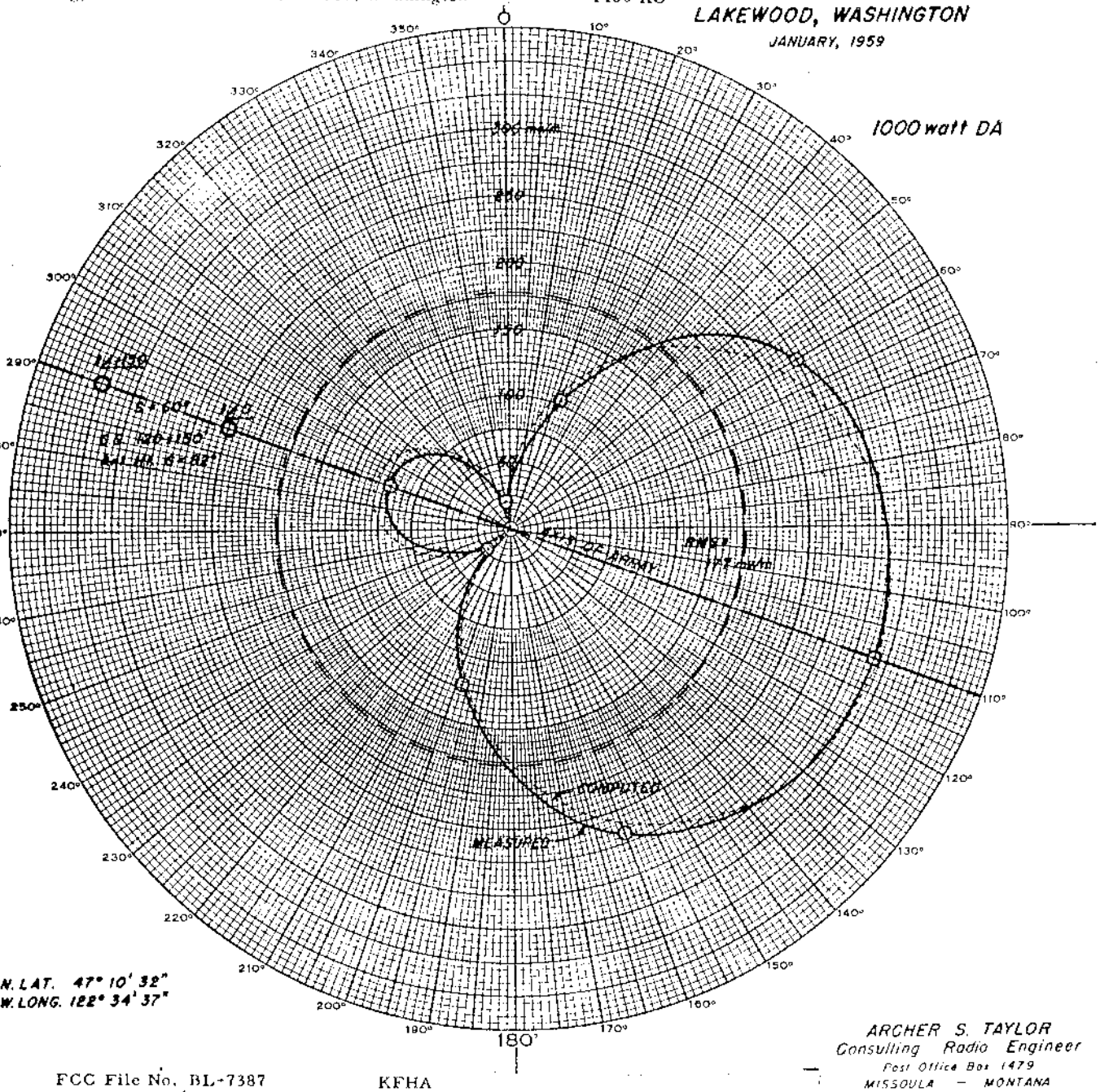
MEASURED DAY
(4-22-59g)

Station KFHA
Lakewood, Washington

1kw, DA-D,D
1480 KC

MEASURED H.P. RADIATION
KFHA (CP) 1480 kc 1kw D (DA)
LAKEWOOD, WASHINGTON
JANUARY, 1959

1000 watt DA



N. LAT. 47° 10' 32"
W. LONG. 122° 34' 37"

ARCHER S. TAYLOR
Consulting Radio Engineer
Post Office Box 1479
MISSOULA — MONTANA

FCC File No. BL-7387
Accepted 3-26-59

KFHA
Lakewood, Washington

1480 KC

NO. 15 H
POLAR CO-ORDINATE

granted license 7-16-59.

KOOD

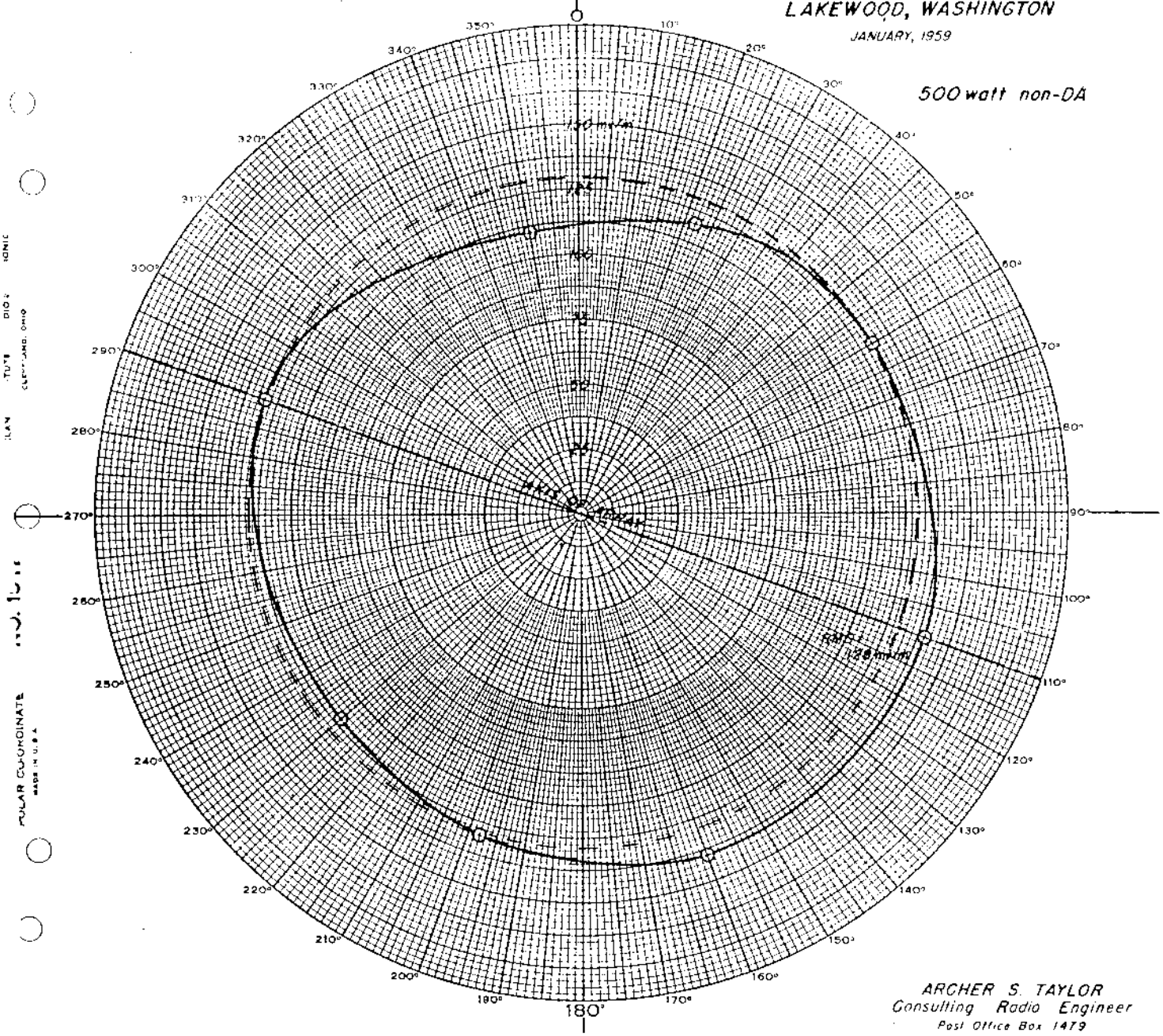
MEASURED D NON-DA
(4-22-59)

Station KFHA
Lakewood, Washington

1kw, DA-D,D
1480 KC

MEASURED H.P. RADIATION
KFHA (CP) 1480 kc 1 kw D(DA)
LAKEWOOD, WASHINGTON
JANUARY, 1959

500 watt non-DA



ARCHER S. TAYLOR
Consulting Radio Engineer
Post Office Box 1479
MISSOULA — MONTANA

FCC File No. BL-7387
Accepted 3-26-59

KFHA
Lakewood, Washington

1480 KC

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station	: KOOD	Main Studio:	Lakewood, Washington
Frequency	: 1480 kHz	Power	: 1kw
Notification List No.:	1751	Date	: September 28, 1977 Class:

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:	North Latitude:	47°	09'	56"
	West Longitude:	122°	34'	32"

Authorized for daytime operation (DA-D)

PREDICTED EFFECTIVE FIELD: 175 mv/m at rated power.

Note: Please retain the description sheet and directional antenna radiation pattern notified for Station KYBA (now KOOD) in United States Change List Number 774, dated September 3, 1958 and attach to this supplemental Description Sheet. This notification is for the purpose of indicating only a change or correction in the geographical coordinates of the center of the antenna system and to supply additional information concerning the predicted effective field of the omnidirectional antenna employed daytime.

KPIA

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KPIA

Main Studio: Ironton, Missouri

Frequency: 1480 kHz

Power: 5 kW

Notification List No. 1571

Date: March 14, 1974

Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 37° 37' 18"
West Longitude: 90° 38' 46"

ANTENNA CHARACTERISTICS

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

TOWER:	SW(#1)	NE(#2)	
HEIGHT ABOVE INSULATORS:	162.9'	162.9'	(88.2°)
PHASING:	0°	+130°	
FIELD RATIO:	1.0	0.64	

SPACING AND ORIENTATION: Elements are spaced 162.9' (88.2°) on a line bearing 54° true.

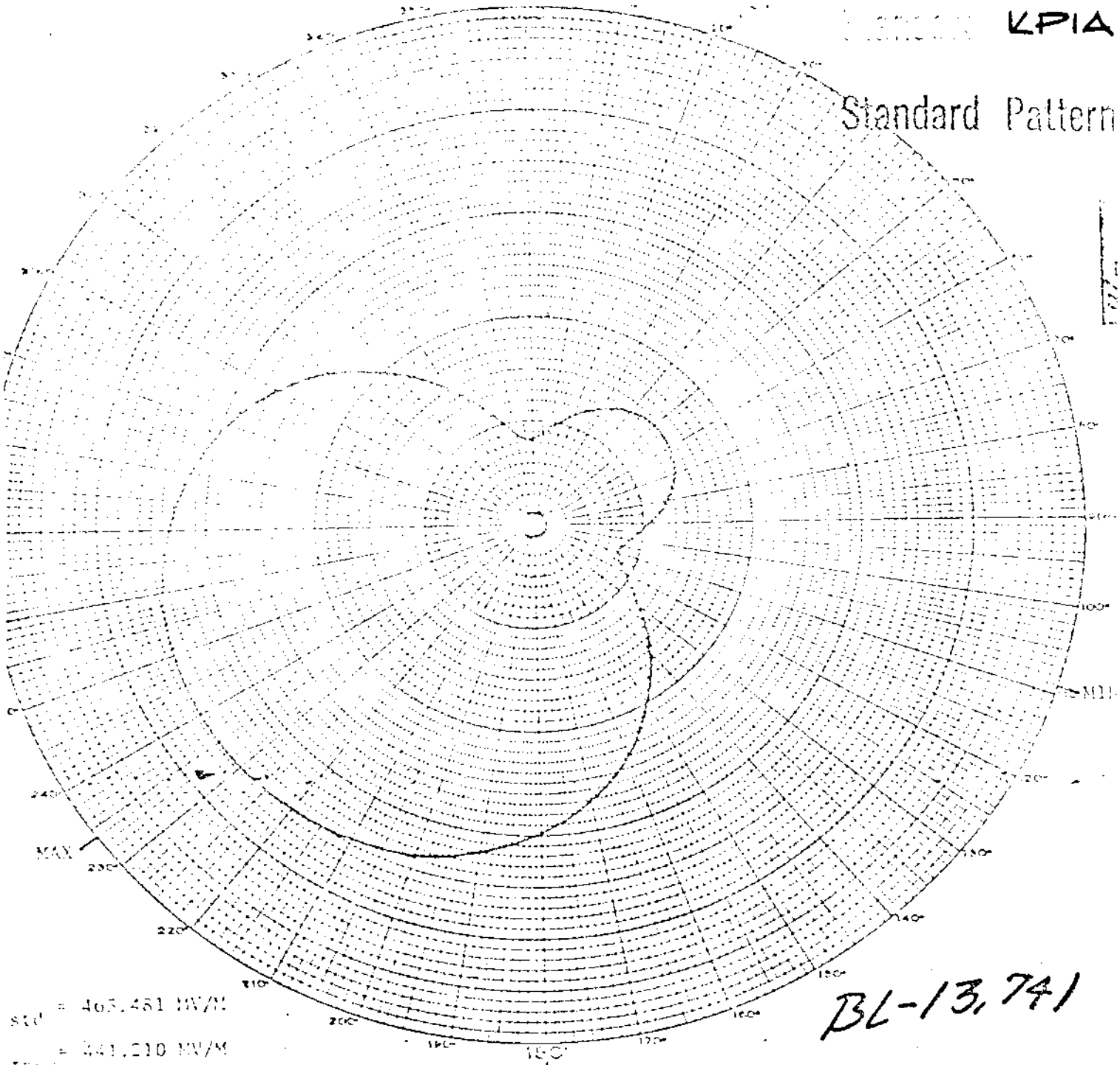
GROUND SYSTEM: 120-162.9' equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
441.210 mv/m	522.101 mv/m	463.481 mv/m

KPIA

Standard Pattern



BL-13,741

E_{810} = 465.481 MV/M

E_{710} = 441.210 MV/M

E_{610} = 522.101 MV/M

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 5	STATION DATA
S = 58.2° G = 58.2° S+G = 162.0° +2° 54° 0.64/130° S +10° 180°	TOWER / ELECTRICAL HEIGHT / SPACING / BEARING / FIELD RATIO 1 2 3 4 5 6	PROPOSED DAYTIME DIRECTIONAL RADIATION PATTERN ************ JULY - 1973 E^2 = 0	CALL KPIA FREQ 1480 kHz POWER 5.0 kW TYPE DA-D TIME DAYTIME LAT. N 3[illegible] LONG. W [illegible] E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.

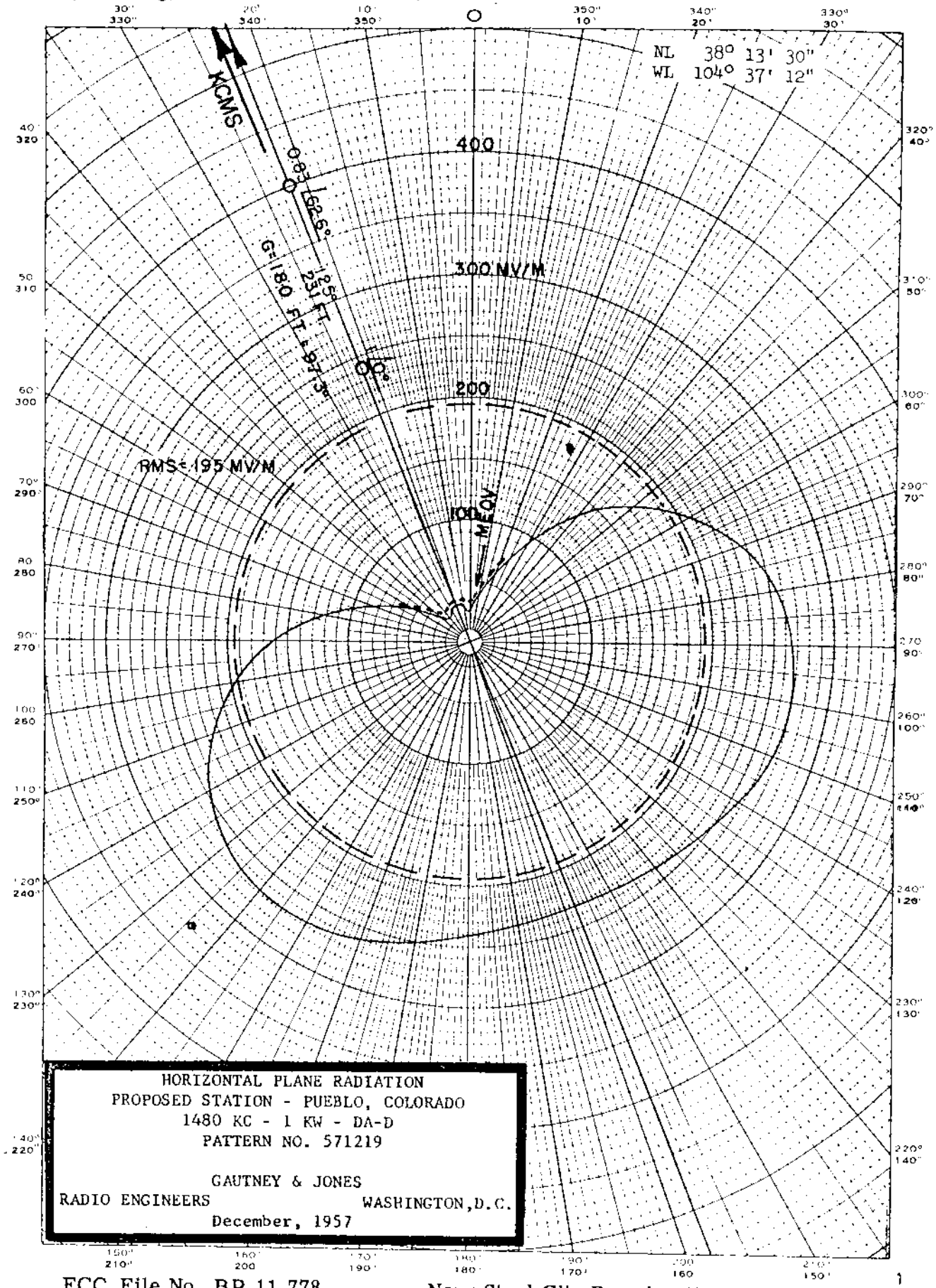
Pueblo, Colo.

KPUB

PROPOSED DAY (2-11-58g)

New; Steel City B/Cstng. Co.,Inc. Pueblo, Colorado

1kw, DA-D,D 1480 KC



FCC File No. BP-11,778
Accepted 1-24-58

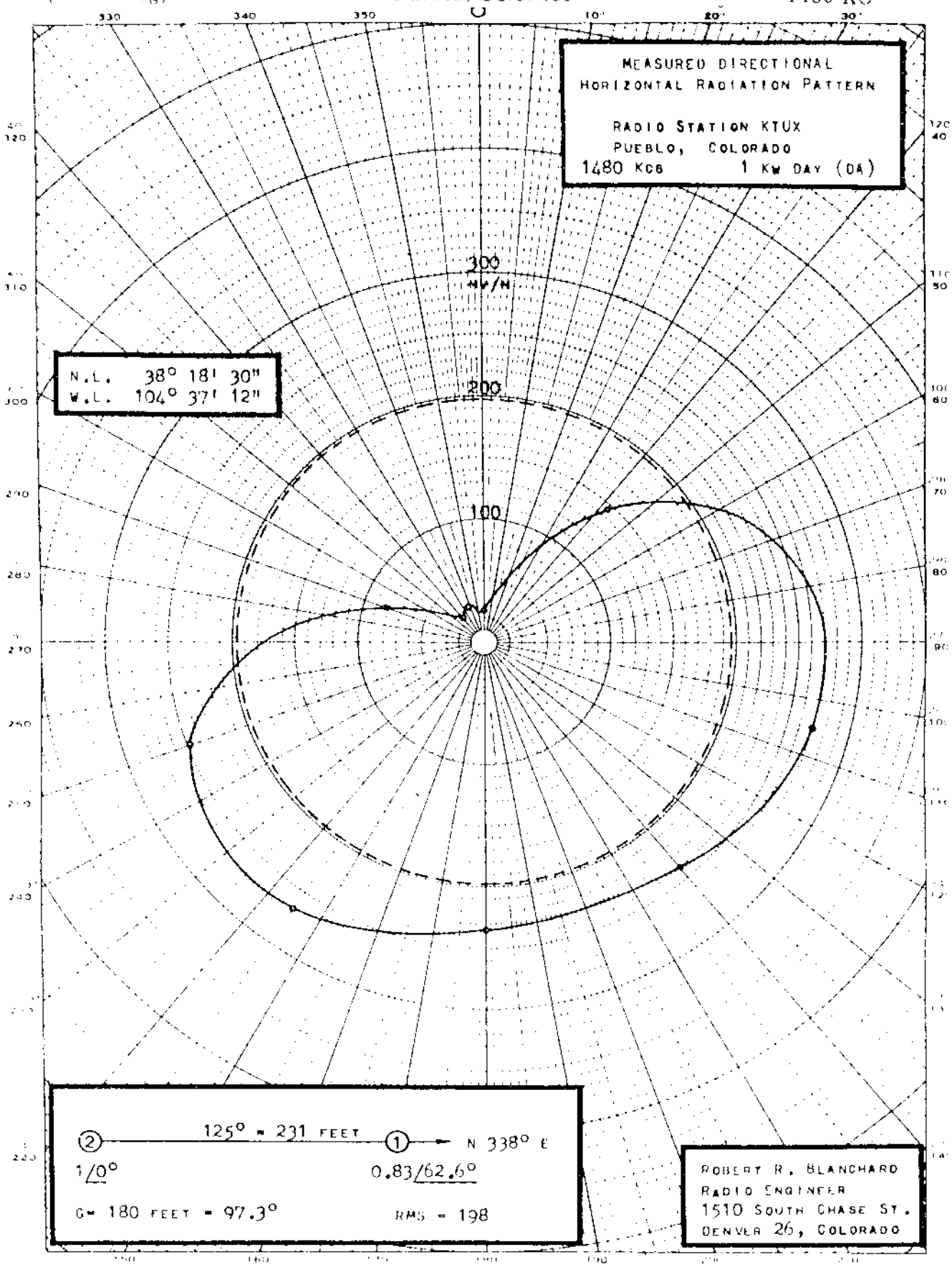
New; Steel City Broadcasting Co., Inc.
Pueblo, Colorado 1480 KC

KPUB

MEASURED DAY
(12-21-59g)

Station KTUX
Pueblo, Colorado

1kw, DA-D,D
1480 KC



Granted 4-14-60

FCC File No. BL-7660
Accepted 11-10-59

KTUX
Pueblo, Colorado

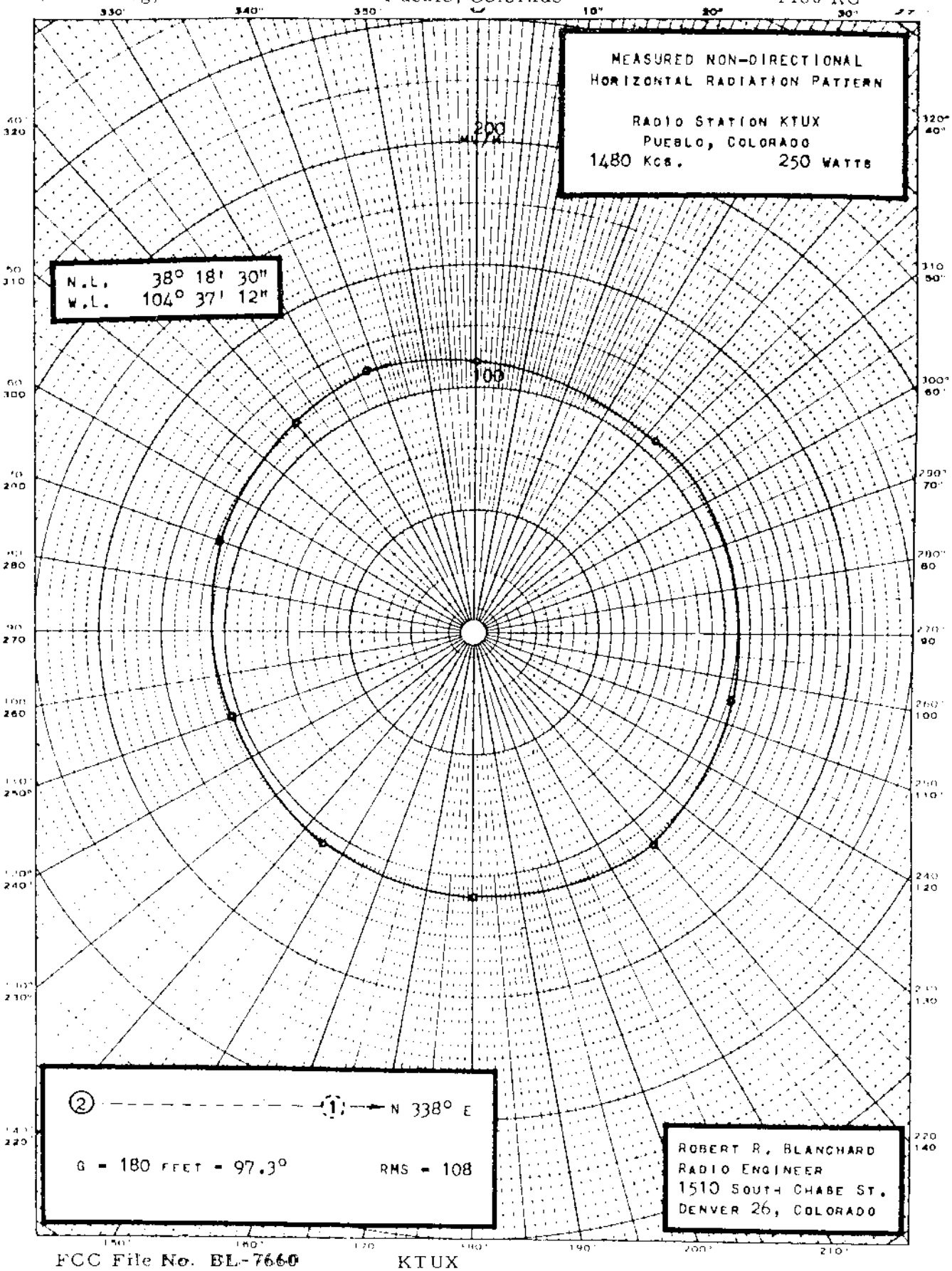
1480 KC

KPUB

MEASURED NON-DA
(12-21-59g)

Station KTUX
Pueblo, Colorado

1kw, DA-D,D
1480 KC



Granted 4-14-60

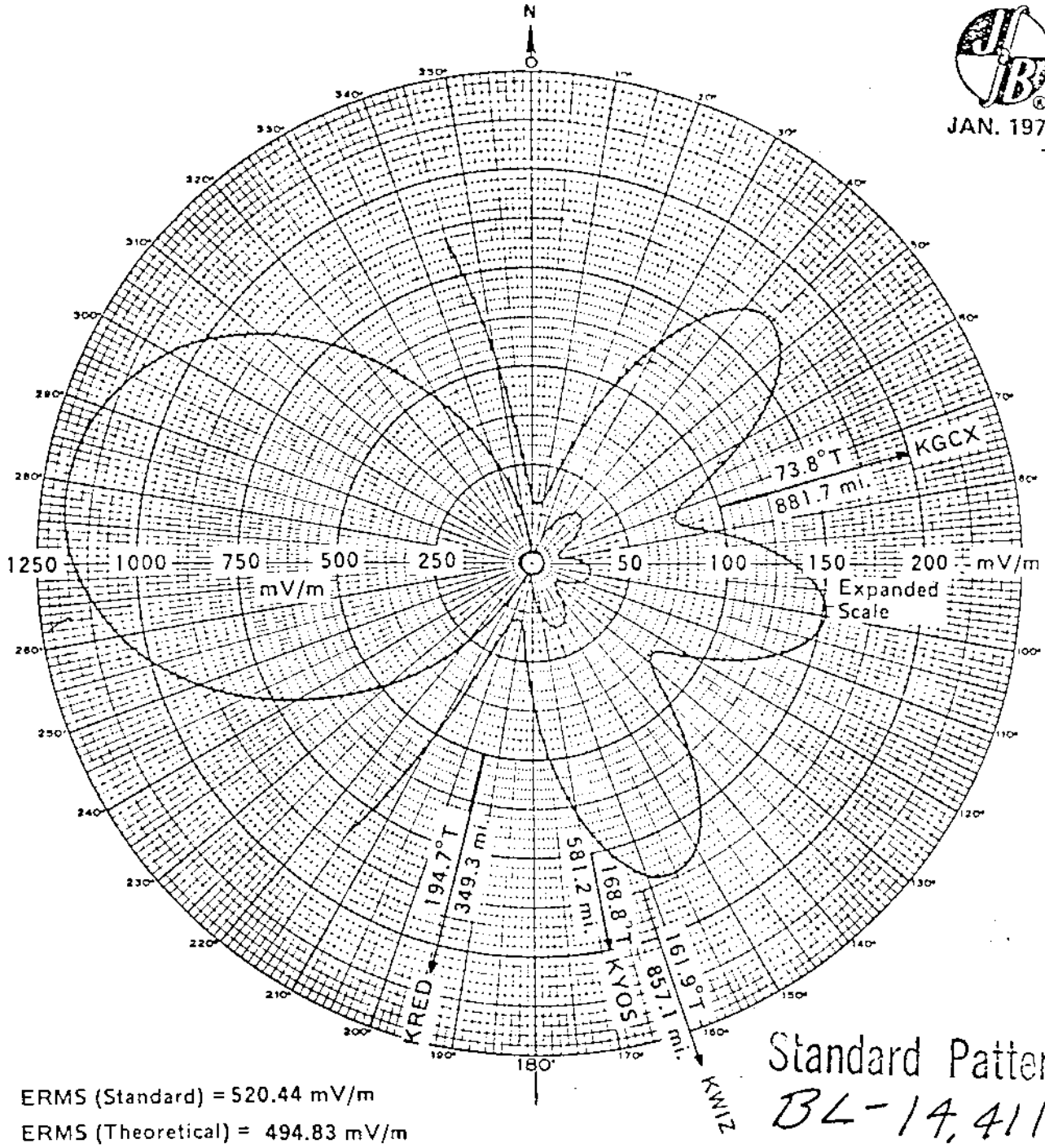
FCC File No. BL-7660
Accepted 11-10-59

KTUX
Pueblo, Colorado

1480 KC

KVAN

JAN. 1976



Standard Pattern
BL-14,411

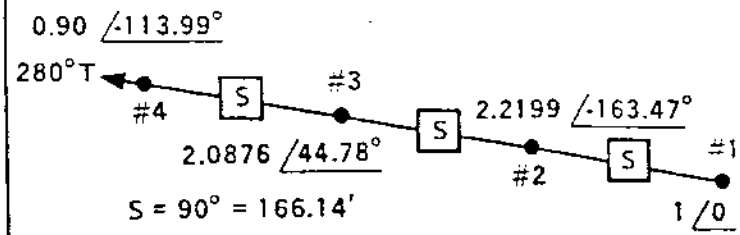
ERMS (Standard) = 520.44 mV/m

ERMS (Theoretical) = 494.83 mV/m

ERSS (Theoretical) = 1142.03 mV/m

N. Lat: 45° 38' 46.5"

W. Long: 122° 30' 46.5"



S = 90° = 166.14'

G_1 & G_2 = 110° = 203.1'

G_3 = 109.4° = 202.0'

G_4 = 107.8° = 199.0'

FIG. 4A-R (2)
PROPOSED NIGHTTIME
STANDARD HORIZONTAL
PLANE PATTERN

KVAN 5/1 (LS), DA-N 1480 kHz

THE NEW BROADCASTING CORPORATION
VANCOUVER, WASHINGTON

KVAN

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KVAN

Main Studio: Vancouver, Washington

Frequency: 1480 kHz

Power: 5 kW Night 1 kW Day

Notification List No. 1699

Date: August 24, 1976 Class: III

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

	Daytime			Nighttime		
North Latitude:	45°	36	06"	45°	38'	46"
West Longitude:	122°	43'	06"	122°	30'	46"

Authorized for Night operation (DA-N).

NIGHTTIME ANTENNA CHARACTERISTICS

Number of elements: 4
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	W(#4)	WC(#3)	EC(#2)	E(#1)
HEIGHT ABOVE INSULATORS:	199.0'(107.8°)	202.0'(109.4°)	203.1'	203.1'(110°)
NIGHT PHASING:	-113.99°	+44.78°	-163.47°	0
NIGHT FIELD RATIO:	0.90	2.0876	2.2199	1

SPACING AND ORIENTATION: The towers are located in a row with adjacent towers spaced 166.26' (90°) on a line bearing 280° true.

GROUND SYSTEM: 120-166' 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.

DAYTIME ANTENNA CHARACTERISTICS

Number of elements: 1

HEIGHT ABOVE INSULATORS: 200'

(Cont'd)

KVAN

GROUND SYSTEM: 120-150' to 200' equally spaced copper radials about the tower.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

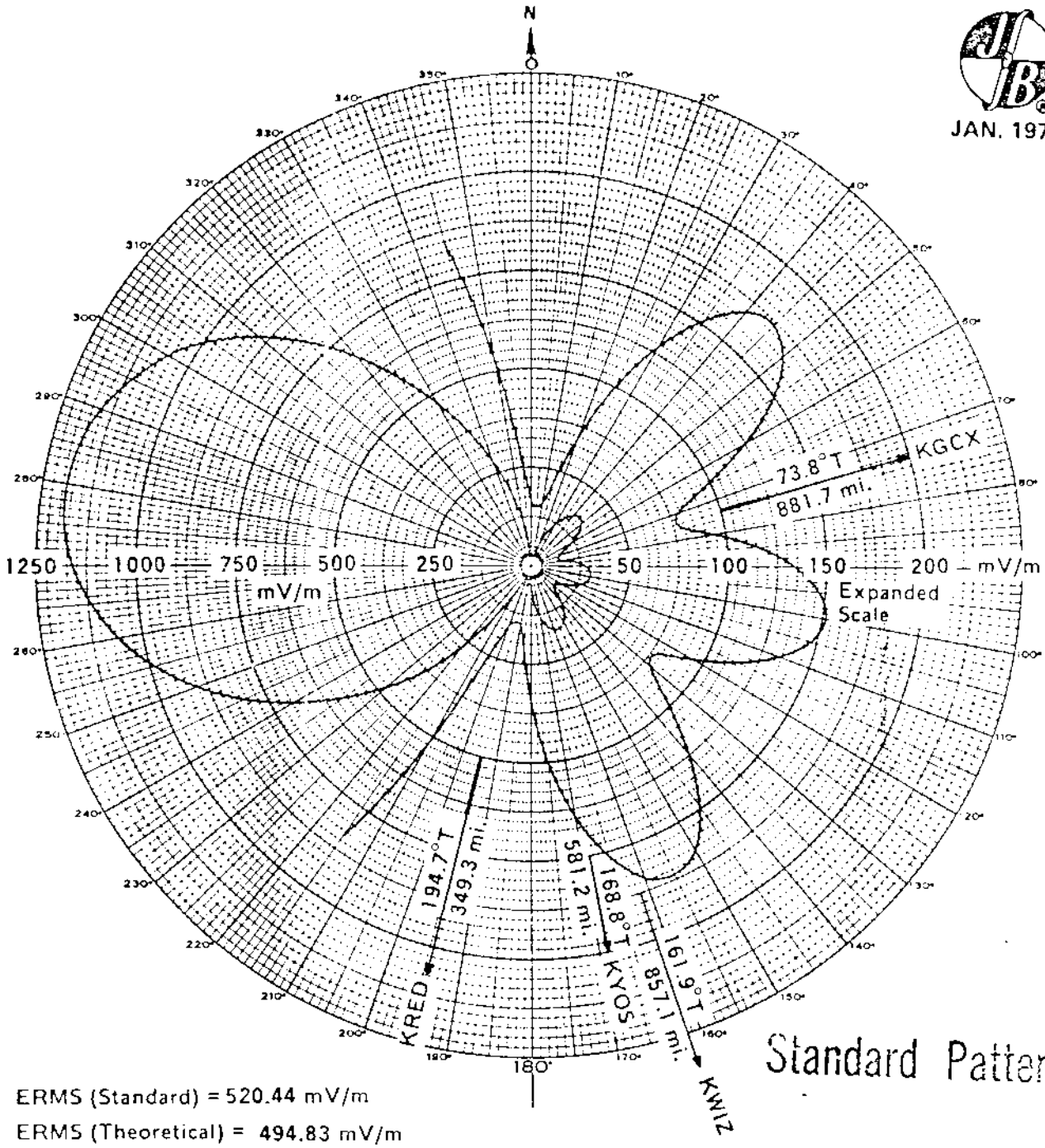
	THEORETICAL		STANDARD
	RMS	RSS	RMS
Day	197 mv/m	- mv/m	- mv/m
Night	494.83 mv/m	1142.03 mv/m	520.44 mv/m

Note: This notification concerns a change to add new nighttime operation with Daytime operation continued as previously notified.

CTR NO 31181A3

KVAN

JAN. 1976



Standard Pattern

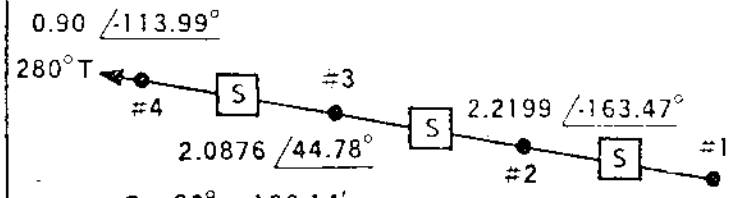
ERMS (Standard) = 520.44 mV/m

ERMS (Theoretical) = 494.83 mV/m

ERSS (Theoretical) = 1142.03 mV/m

N. Lat: 45° 38′ 46.5″

W. Long: 122° 30′ 46.5″



S = 90° = 166.14′

G_1 & G_2 = 110° = 203.1′

G_3 = 109.4° = 202.0′

G_4 = 107.8° = 199.0′

FIG. 4A-R (2)

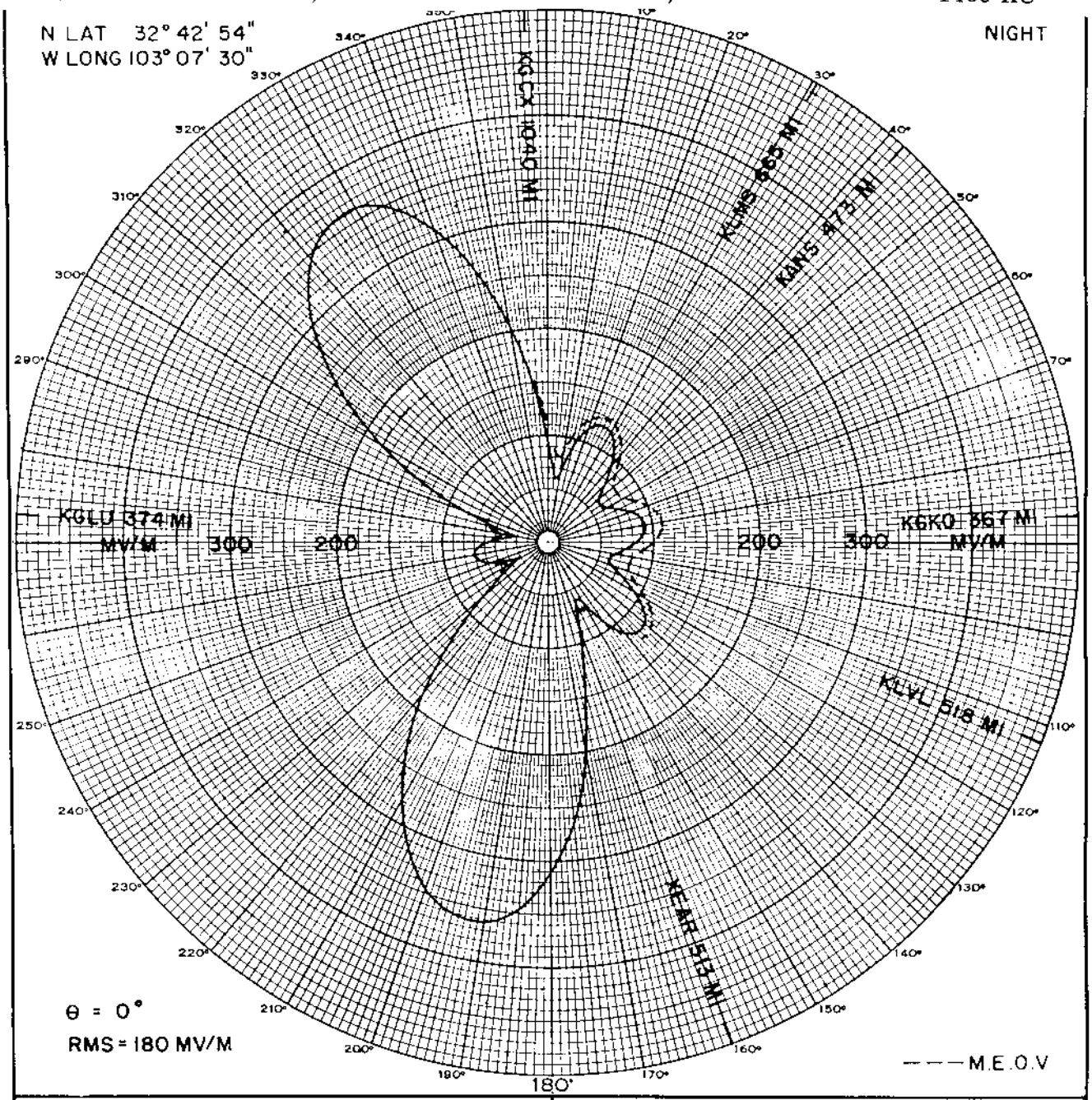
PROPOSED NIGHTTIME STANDARD HORIZONTAL PLANE PATTERN

KVAN 5/1 (LS), DA-N 1480 kHz

THE NEW BROADCASTING CORPORATION
VANCOUVER, WASHINGTON

KWEW

PROPOSED NIGHT (1-21-55G) | KWEW HOBBS, NEW MEXICO | 1 KW DA-N, U | 1480 KC



G_1 = 200' = 108°
$G_{2,3,4}$ = 166' = 90°

(1) — S — (2) — S — (3) — S — (4) → N 80° E

S = 203' = 110°

RADIO STATION KWEW
HOBBS, NEW MEXICO
1480 KC 1 KW DA-N

TOWER	1	2	3	4
FIELD	1.00	.498	.631	.686
PHASE	0.0°	137.1°	25.6°	153.6°

A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEERS
541015.1 FIGURE 7A

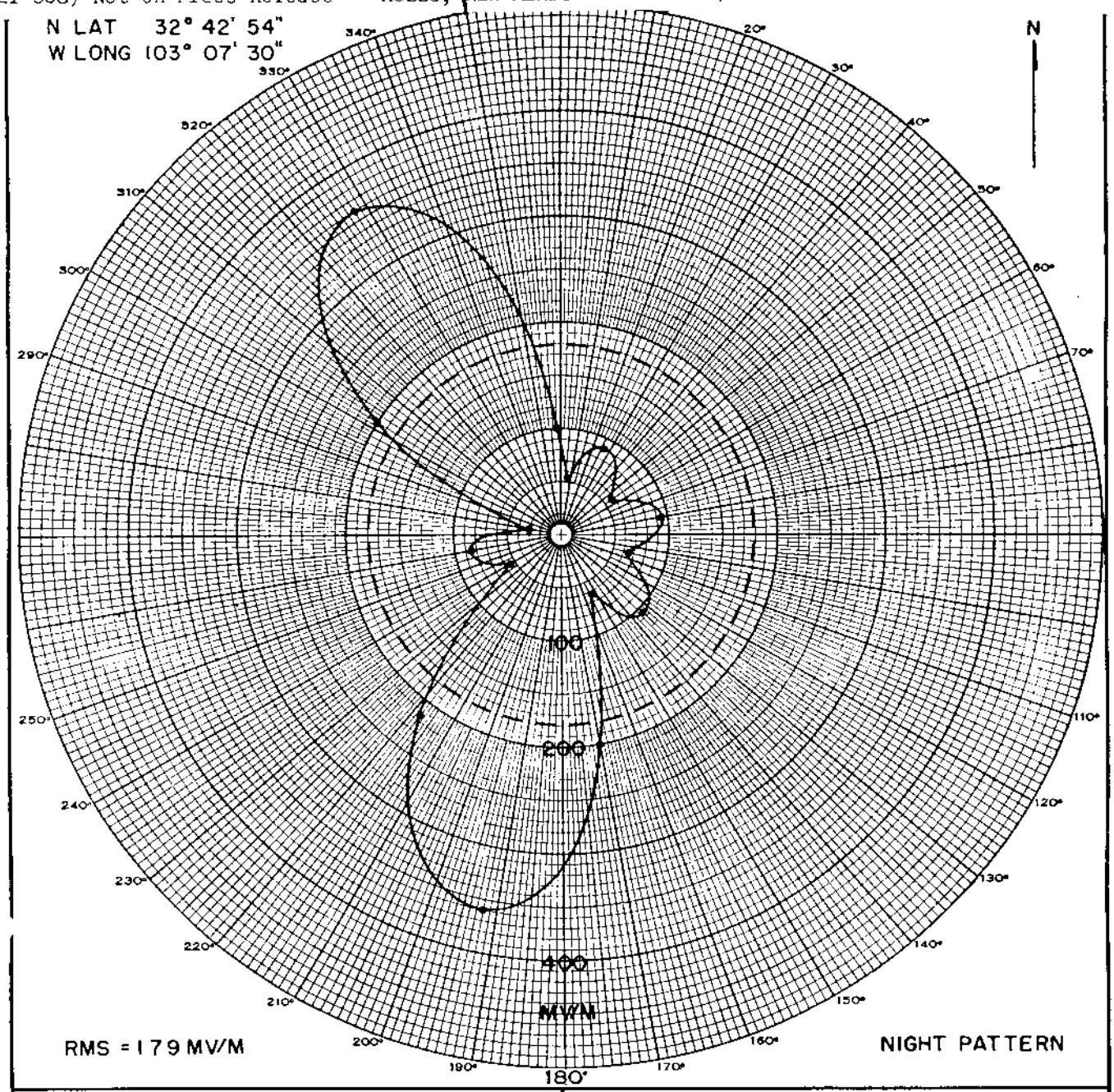
File No. BP-9614 Accepted 1-5-55 KWEW, HOBBS, N.M. 1480 KC

granted L - 11-6-54 for increase in ND Power to 5 kw

~~KWEW~~
KWEW
1460 KC

MEASURED NIGHT(CORRECTED) STATION KWEW 1 KW
(2-21-56G) Not on Press Release HOBBS, NEW MEXICO DA-N, U

N LAT 32° 42' 54"
W LONG 103° 07' 30"



RMS = 179 MV/M

NIGHT PATTERN

Granted 10-6-59 for increase in power to 5 KW

(1) —S— (2) —S— (3) —S— (4) N 80° E

S = 203 FEET = 110 DEGREES

TOWER	(1)	(2)	(3)	(4)
TOWER HEIGHT	108°	90°	90°	90°
THEORETICAL PHASING	0.0°	137.1°	256°	153.6°
PHASE MONITOR READING	0°	123°	27°	154°
THEORETICAL FIELD RATIO	1.000	0.498	0.631	0.686
LOOP CURRENT RATIO	1.000	0.667	0.804	0.914

RADIO STATION KWEW

HOBBS, NEW MEXICO

1480 KC 1 KW DA-N

A. EARL CULLUM, JR.

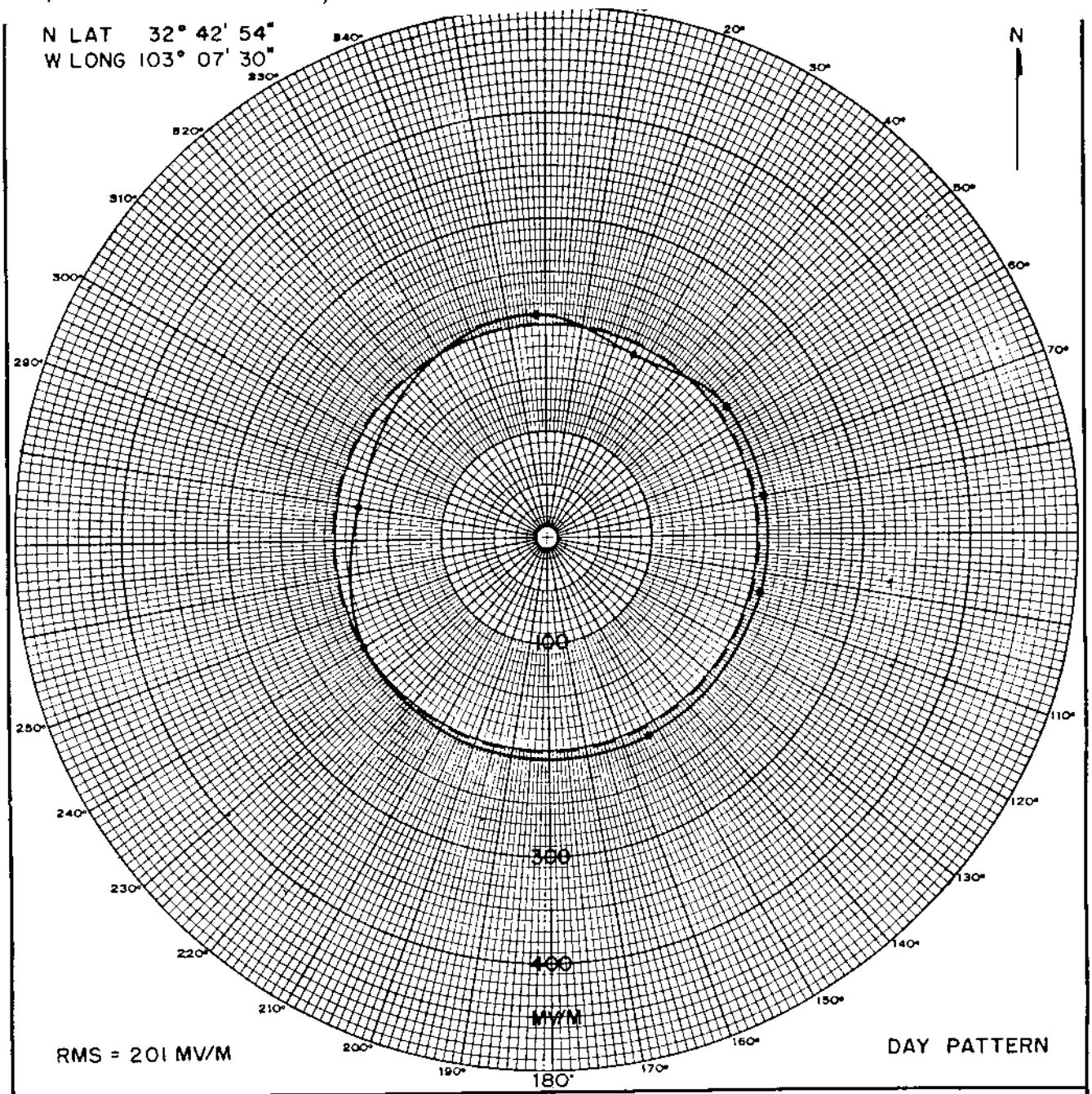
CONSULTING RADIO ENGINEERS

551202.1 FIGURE 4A

~~KWEW~~ KWEW

MEASURED NON-DIRECTIONAL STATION KWEW 1KW
(2-21-56G) HOBBS, NEW MEXICO DA-N, U 1480 KC

granted for increase in N power to 5 kw 11-6-57



(1)—S—(2)—S—(3)—S—(4) N 80° E				
S = 203 FEET = 110 DEGREES				
TOWER	(1)	(2)	(3)	(4)
TOWER HEIGHT	108°	90°	90°	90°

RADIO STATION KWEW
HOBBS, NEW MEXICO
1480 KC 1 KW DA-N

NUMBER 1 TOWER USED FOR
NONDIRECTIONAL OPERATION
NUMBER 2, 3, AND 4 TOWERS DETUNED

A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEERS
551202 FIGURE 4A

FILE NO. BL-6041 ACCEPTED 2-2-56 FCC KWEW, Hobbs, New Mexico 1480 kc

KWEW

SUPPLEMENTAL DIRECTIONAL ANTENNA
DESCRIPTION SHEET

Station: KWEW

Main Studio: Hobbs, New Mexico

Frequency: 1480 kHz

Power: 1kW Night 5 kW Day

Notification List No. 1699

Date: August 24, 1976 Class: III

GEOGRAPHICAL LOCATION OF THE
CENTER OF THE ANTENNA SYSTEM: North Latitude: 32° 42' 57"
West Longitude: 103° 07' 28"

Authorized for Nighttime operation (DA-N).

Predicted effective Day Field: (omnidirectional) 449 mV/m at rated power.

Note: Please retain the directional antenna radiation patterns notified for station KWEW in United States Change List Number 603, dated March 30, 1955, and retain the description sheet notified for KWEW in change List No. 802 dated March 20, 1959, and attached to this supplemental Description Sheet. This notification is for the purpose of indicating only a correction in the geographical coordinates of the center of the antenna system.

CTR NO 31192A4

KWIZ
1480KHz

NOTE: Please retain the Daytime directional antenna radiation pattern notified for Station KWIZ in United States Change List Number 751 dated March 21, 1962 and attach to this Revised Description Sheet and Nighttime pattern. This notification concerns only a change in the Nighttime operation of the station with Daytime operation continued as previously notified.

KWIZ
1480 KHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KWIZ

Main Studio: Santa Ana, California

Frequency: 1480 kHz

Power: 5kw Night 5kw Day

Notification List No. 1785

Date: November 16, 1979 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 33° 45' 06"
West Longitude: 117° 54' 36"

ANTENNA CHARACTERISTICS

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

TOWER:	#1(SW)	#2(NW)	#3(SE)	#4(NE)	#5(SC)
HEIGHT ABOVE INSULATORS:	175	175	175	175	175 (94.75°)
NIGHT PHASING:	0°	+110°	+155°	+265°	---
NIGHT FIELD RATIO:	1.0	1.40	1.70	2.40	---
DAY PHASING:	0°	---	---	---	-150°
DAY FIELD RATIO:	1.0	---	---	---	0.67

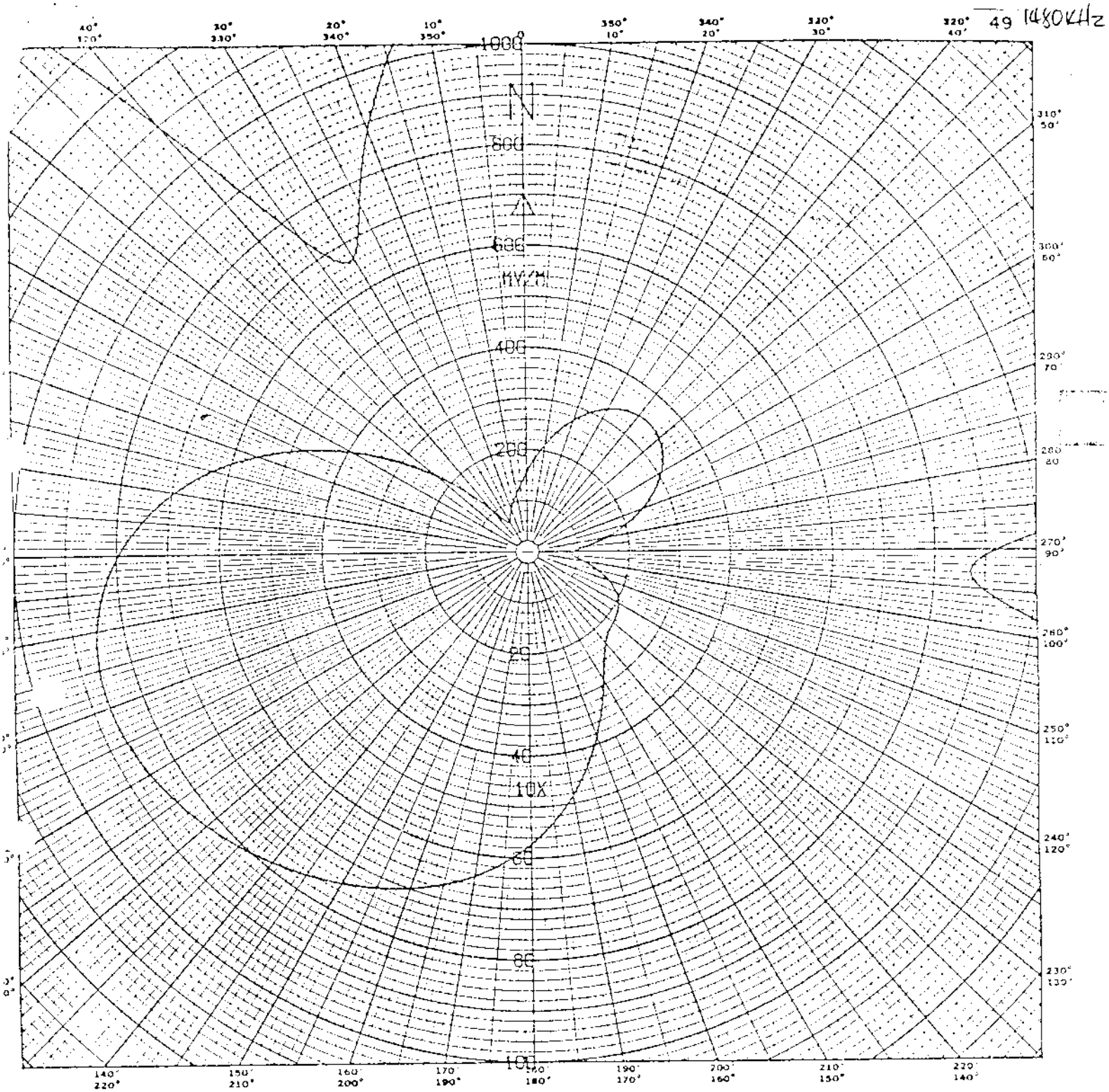
SPACING AND ORIENTATION: With tower #1 as reference, tower #2(NW) is spaced 276.9' (150°) on a line bearing 30.75° true, tower #3(SE) is spaced 166.1'(90°) on a line bearing 65.1° true, tower #4(NE) is spaced 424.6' (230°) on a line bearing 43.19° true, and tower #5(SC) is spaced 112.7' (61°) on a line bearing 65.1° true.

GROUND SYSTEM: 120 - 200' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers. Centers of system are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	428 mv/m		
Night	456.89 mv/m	508.55 mv/m	479.95 mv/m

KWIZ
49 1480KHz

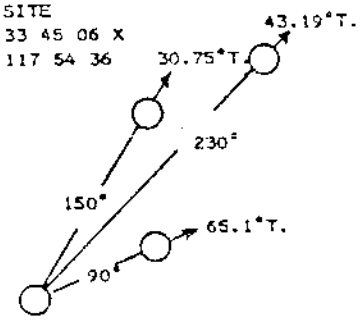


HATFIELD & DAWSON
CONSULTING ELECTRICAL ENGINEERS
3525 STONE WAY N.
SEATTLE, WASHINGTON 98103

RADIO STATION KWIZ
SANTA ANA, CA.

9/78 FIGURE 2

SITE
33 45 06 X
117 54 36



PROPOSED NIGHTIME DIRECTIONAL ANTENNA

5 KW HORIZONTAL PLANE STANDARD PATTERN

RMS THEO = 456.8988 MV/M STD = 479.9506 MV/M
RSS = 508.5527 MV/M K = 149.2519

#	F	Ø	S	Ø
1	1.0	0°	0°	0°
2	1.40	110°	150°	30.75°
3	1.70	155°	90°	65.1°
4	2.40	265°	230°	43.19°

G OF ALL ELEMENTS = 175' (94.75°)

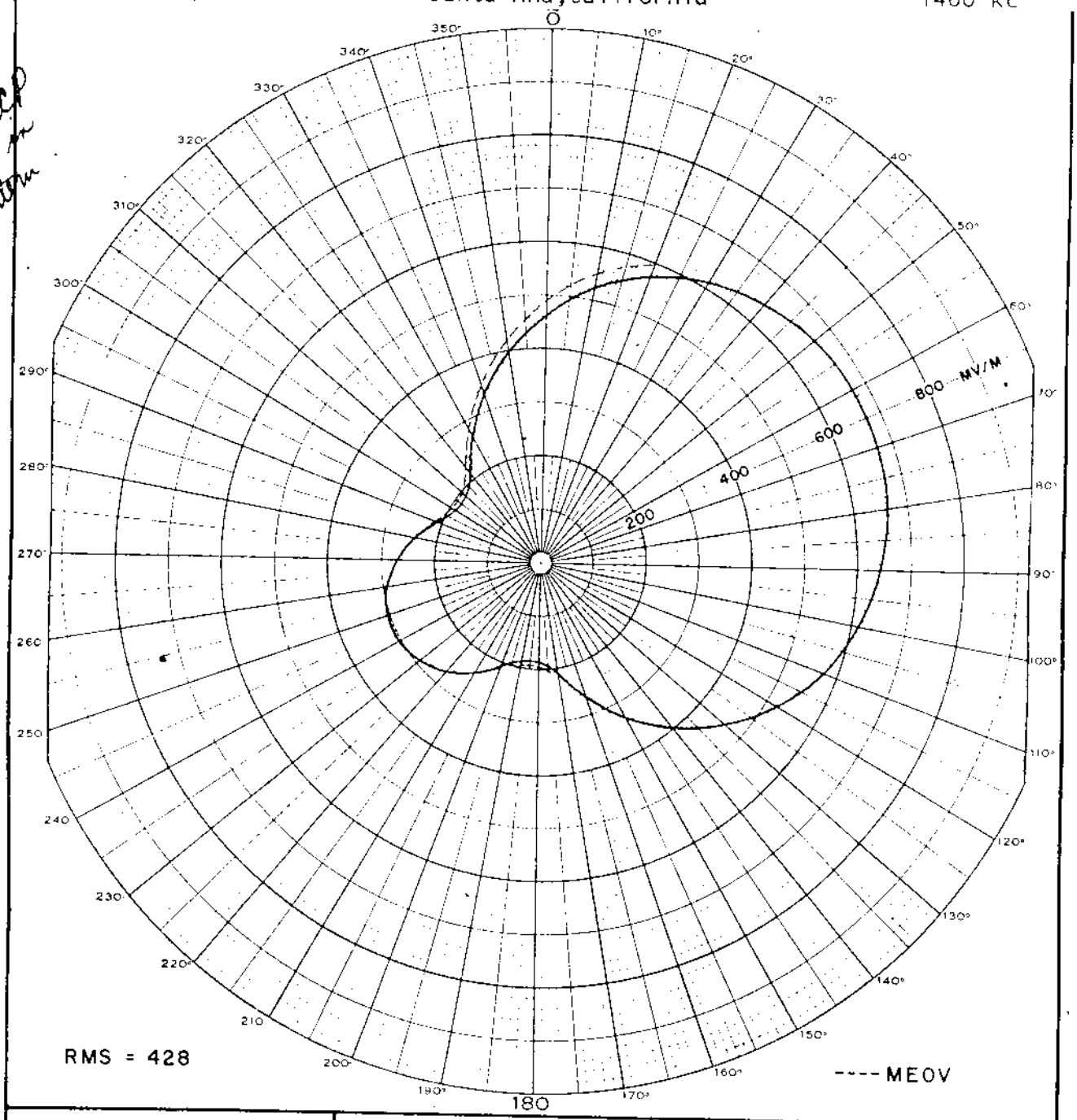
KWIZ

Proposed Day
(1-24-62ct)

Station KWIZ
Santa Ana, California

1kw, 5kw-LS, DA-2, U
1480 kc

3-9-62 granted MCP
changes in
day DA pattern



LAT.	33°	45'	6.4"
LONG.	117°	54'	36"

RON OAKLEY
Consulting Radio Engineer

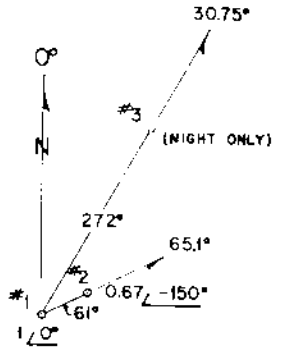


FIGURE 3a

PROPOSED DAYTIME
HORIZONTAL PATTERN

RADIO STATION KWIZ
SANTA ANA, CALIF

1480 KC — 1/5 KW — U — DA-2

(AMENDED NOV. 1961)

FCC File No. BMP-10021
Accepted 1-5-62

Station KWIZ
Santa Ana, California

1480 kc

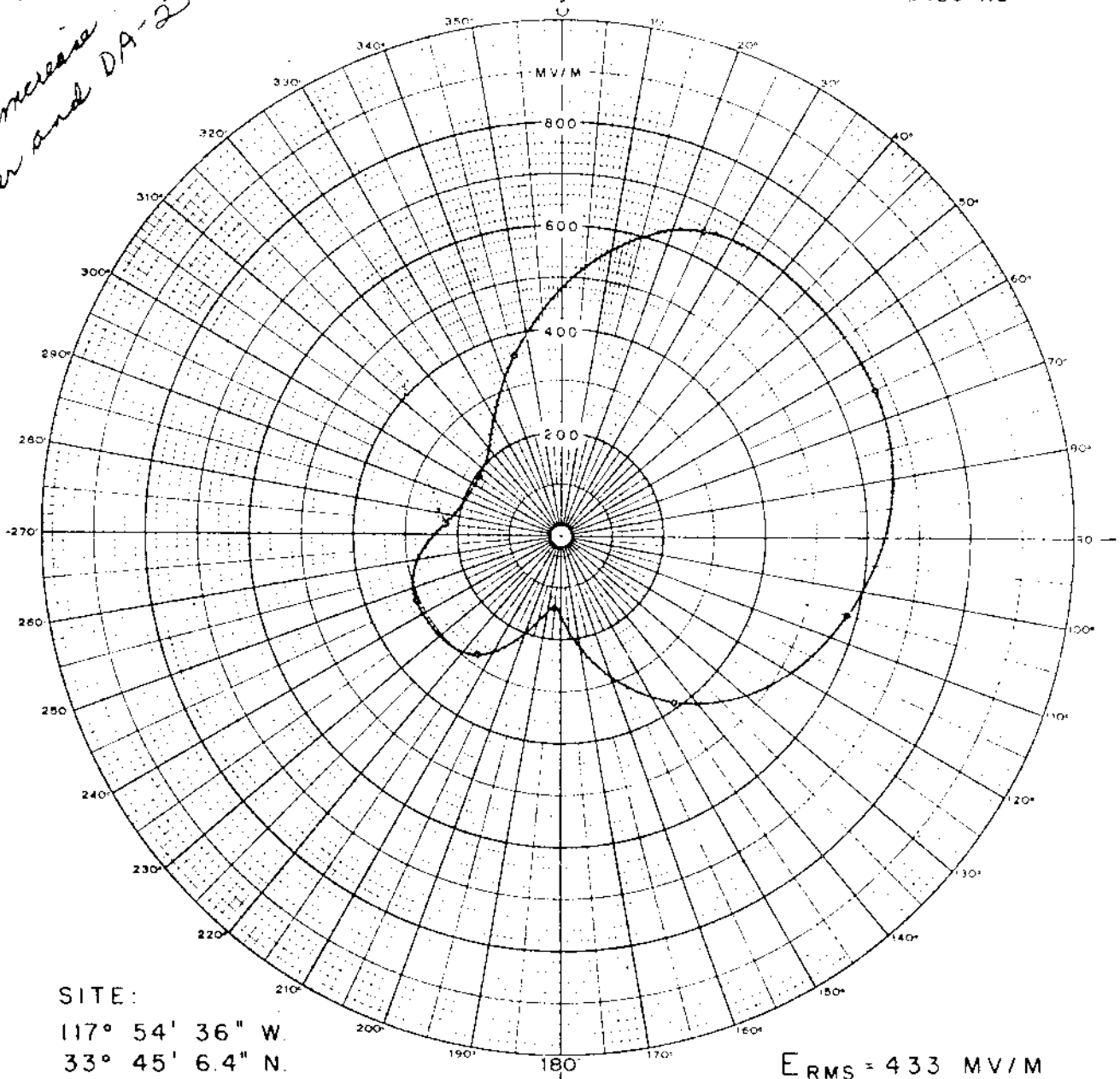
KWIZ

Measured Day
(6-22-62ct)

Station KWIZ
Santa Ana, California

1kw,5kw-LS,DA-2,U
1480 kc

6-13-62
granted L for increase
in day power and DA-2



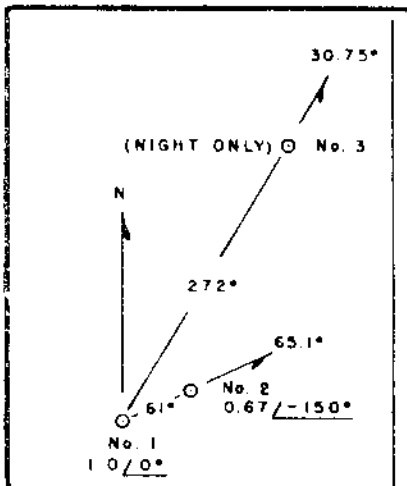


FIGURE 5

MEASURED DAYTIME
DIRECTIONAL FIELD INTENSITY AT ONE MILE
KWIZ, SANTA ANA, CALIFORNIA
1480 KC - 1 KW, 5 KW LS - U - DA-2
JANUARY, 1962

RON OAKLEY
Consulting Radio Engineer

FCC File No.BL-9337
Accepted 6-15-62

Station KWIZ
Santa Ana, California

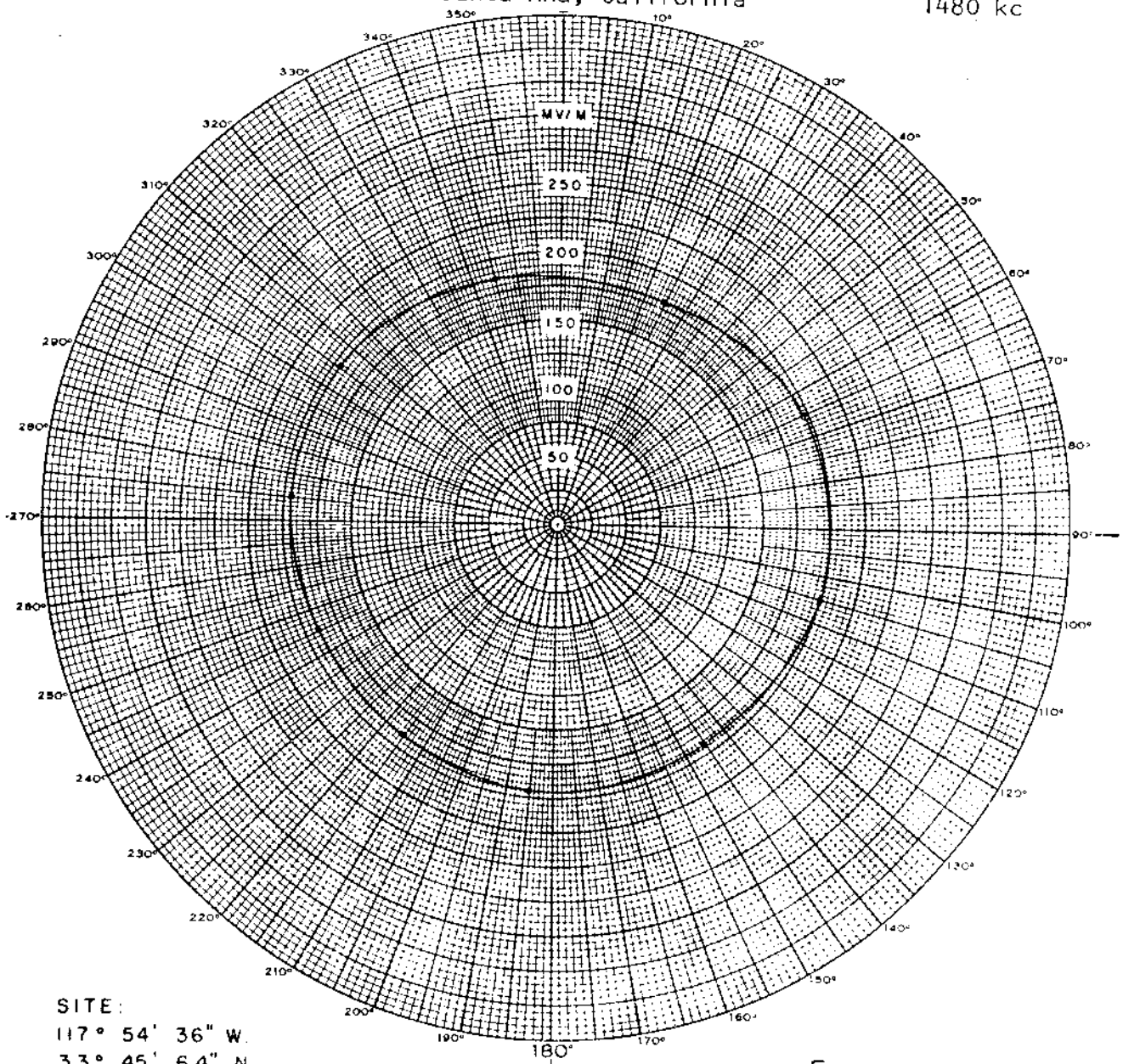
1480 kc

KWIZ

Measured Non-DA
(6-22-62ct)

Station KWIZ
Santa Ana, California

1kw,5kw-LS,DA-2,U
1480 kc



SITE:
117° 54' 36" W.
33° 45' 6.4" N.

E_{RMS} = 192 MV/M

FIGURE 4

NON-DIRECTIONAL FIELD INTENSITY AT ONE MILE

KWIZ, SANTA ANA, CAL

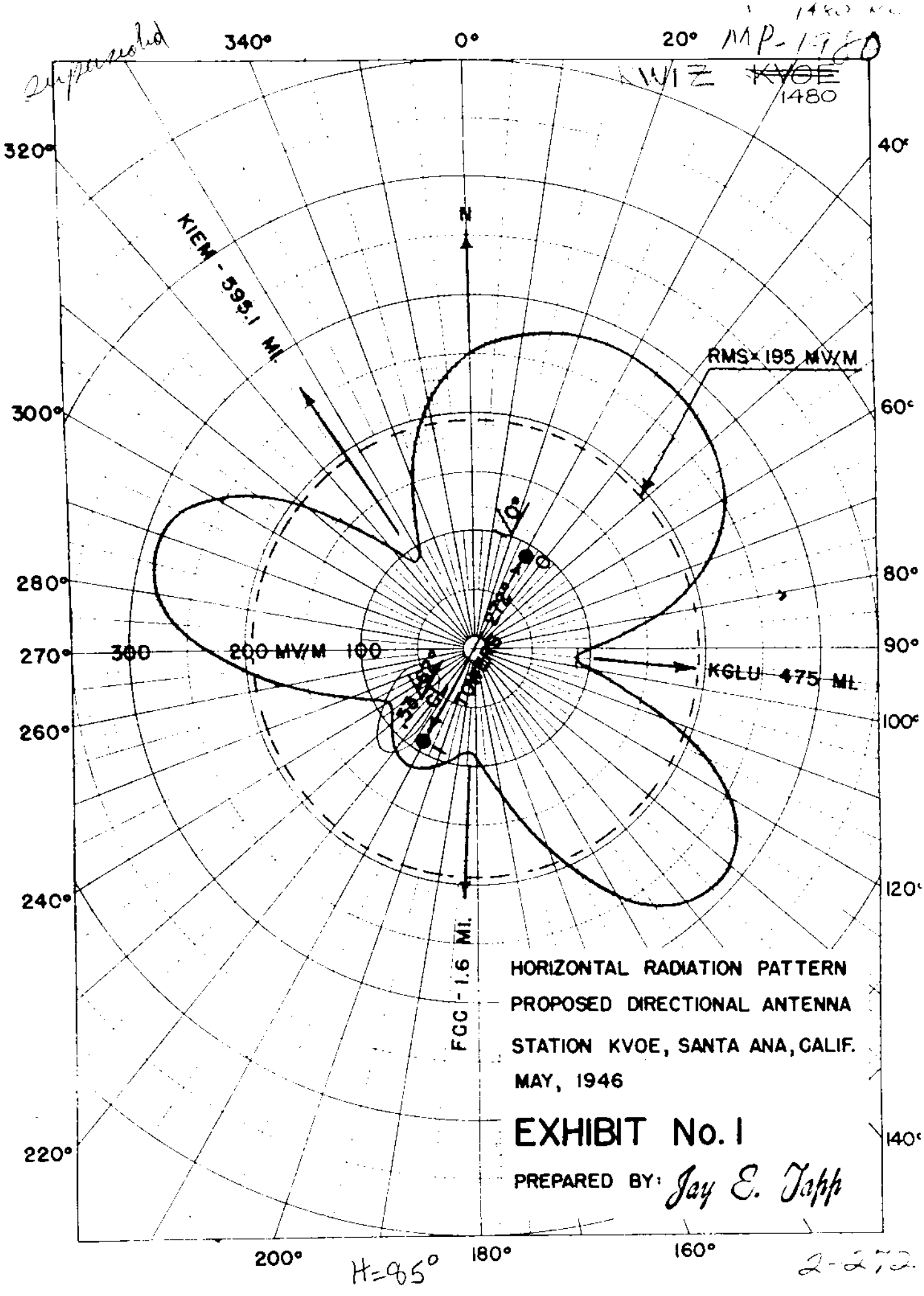
JANUARY, 1962

RON OAKLEY
Consulting Radio Engineer

FCC File No.BL-9337
Accepted 6-15-62

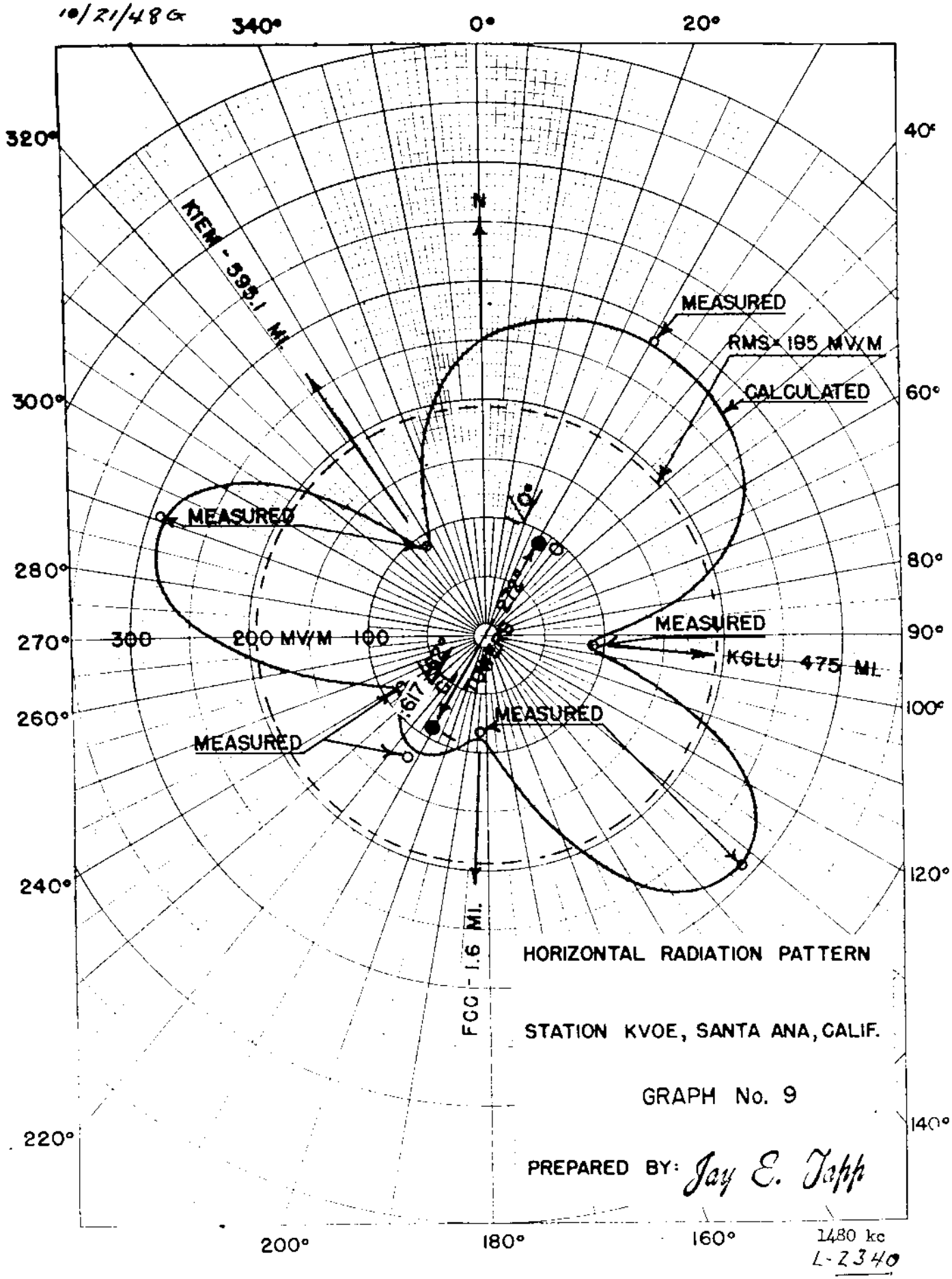
Station KWIZ
Santa Ana, California

1480 kc


340°
0°
20°
320°
40°
300°
60°
280°
80°
270°
90°
260°
100°
240°
120°
220°
140°
200°
180°
160°
N
KIEM - 595.1 MI.
RMS × 195 MV/M
300
200 MV/M
100
KGLU 475 MI.
FCC - 1.6 MI.
HORIZONTAL RADIATION PATTERN
PROPOSED DIRECTIONAL ANTENNA
STATION KVOE, SANTA ANA, CALIF.
MAY, 1946
EXHIBIT No. 1
PREPARED BY: Jay E. Tapp

KWIZ KWIZ
1480

10/21/48 G



L-2340

1-7-60 [illegible] of [illegible] DA [illegible] daytime [illegible]

.617 cos 67°

KWUN
1480kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KWUN

Main Studio: Concord, California

Frequency: 1480 kHz

Power: 0.5kw Night 0.5kw Day

Notification list No. 1785

Date: November 16, 1979 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 37° 57' 45"
West Longitude: 121° 56' 43"

ANTENNA CHARACTERISTICS

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

TOWERS:	NE(#4)	NC(#2)	C(#1)	SC(#3)	SW(#5)
HEIGHT ABOVE INSULATORS:	203'	203'	203'	203'	203' (110°)
DAY AND NIGHT PHASING:	-99°	+132°	0°	-132°	+99°
DAY AND NIGHT FIELD RATIO:	0.190	0.685	1.0	0.685	0.190

SPACING AND ORIENTATION: Adjacent towers in a row are spaced 184' (100°) on a line bearing 60° true.

GROUND SYSTEM: 120 - 90' to 165' equally spaced copper radials plus 240 - 50' interspaced 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	129.5 mv/m		
Night	152.80 mv/m		160.6 mv/m

Azimuth Maximum Augmentation	Augmented Radiation E_2	Span of Augmentation From - To
341°	23.4 $\frac{mv}{m}$	319° 161°

KWUN
1480 kHz
DA-N

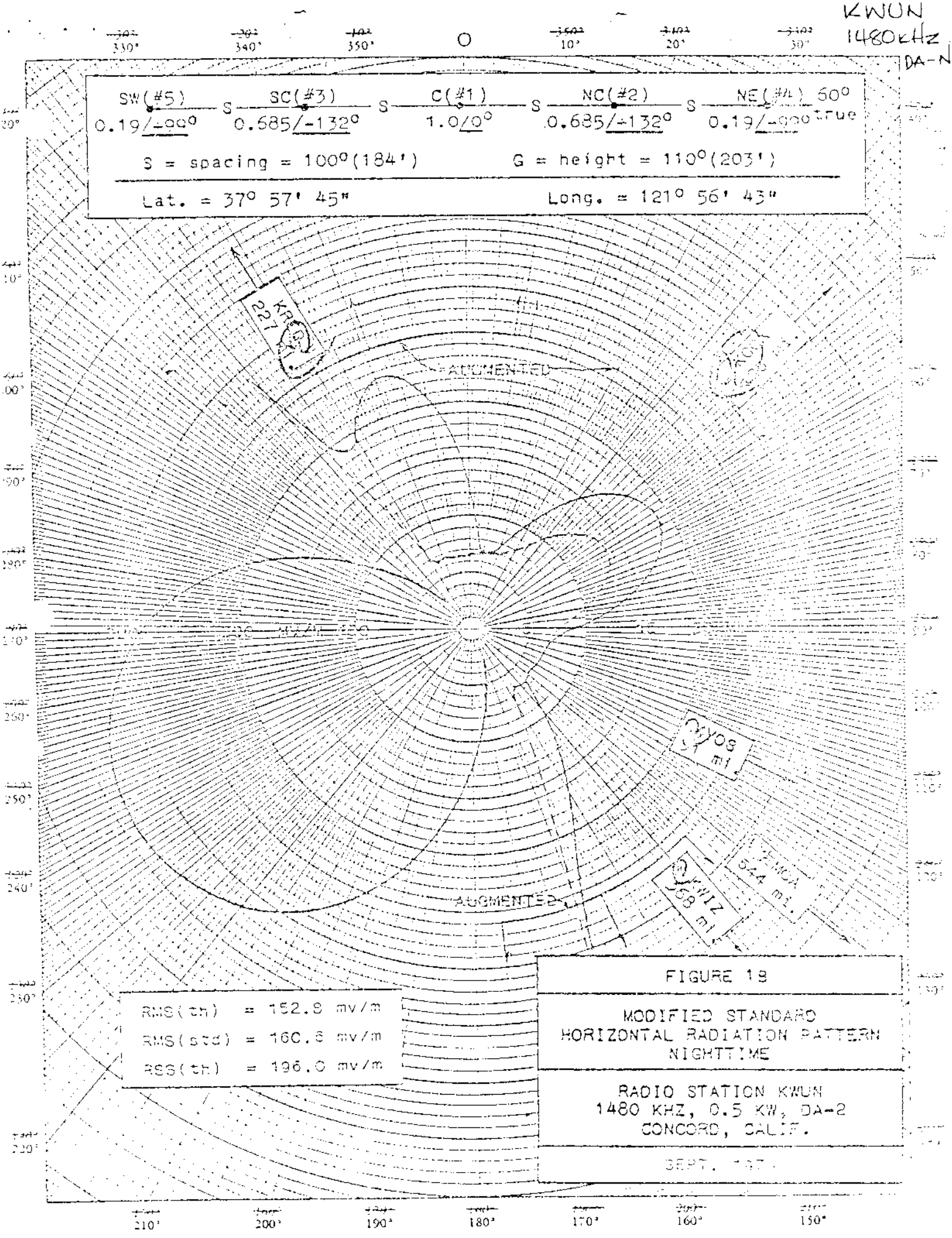


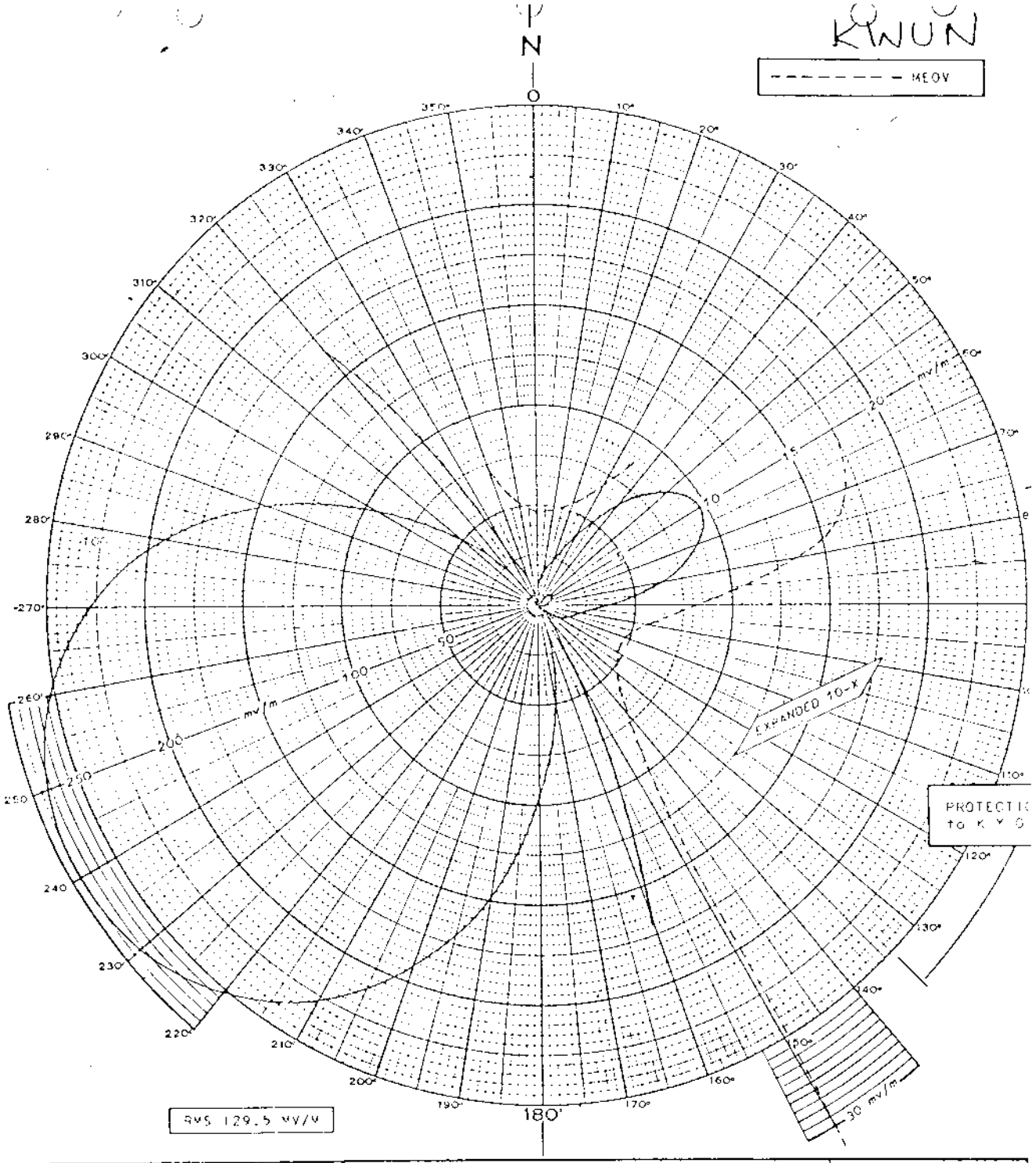
FIGURE 18

MODIFIED STANDARD
HORIZONTAL RADIATION PATTERN
NIGHTTIME

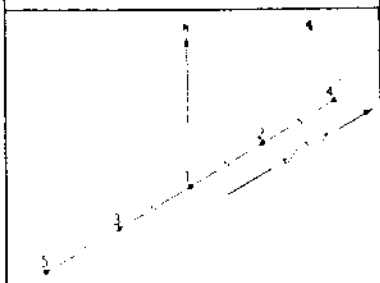
RADIO STATION KWUN
1480 KHZ, 0.5 KW, DA-2
CONCORD, CALIF.

SEPT. 1977

KWUN



TOWER PLACEMENT SKETCH



PATTERN PARAMETERS

TOWER	ELECTRICAL HEIGHT	TRUE TOWER ORIENTATION	SPACING	PHASING	HORIZONTAL FIELD	FIELD RATIO	ELEV. ANGLE	ELEVATION RMS FIELD
No.	θ°	φ°	S°	ψ°	E	F	α°	E_α
1	110	0	0	0		1.0	0	
2	110	60	100	132		.685	5	
3	110	240	100	-132		.685	10	
4	110	60	200	-99		.19	15	
5	110	240	200	99		.19	20	
6							25	
7							30	
8							35	
9							40	
10							45	
	DAYTIME OPERATION ☒		NIGHTTIME OPERATION ☐				E_α	mv/m
							F_α	

STATION DATA

CALL KWUN
FREQUENCY 1480 kc
POWER 0.5 kw
TIME OF OPERATION DAYTIME
TYPE OF OPERATION DA-D
DAYTIME TOWERS 5
NIGHTTIME TOWERS
NO. RADIALS PER TOWER
LENGTH OF RADIALS ' "
GROUND SCREEN DIMENSION
LAT. 37° 57' 45.5"
LONG. 121° 55' 43.7"
SUPERGAIN
PATTERN No.

GEORGE LYNCH, CONSULTING ENGINEER
MODESTO, CALIFORNIA

AMENDED MEOV PROTECTIONS
(Supersedes Pattern of April, 1971)

RADIO STATION KWUN CONCORD, CALIFORNIA

May, 1971

FIGURE 1

FCC File Number BP-19027
July 7, 1971 K & E

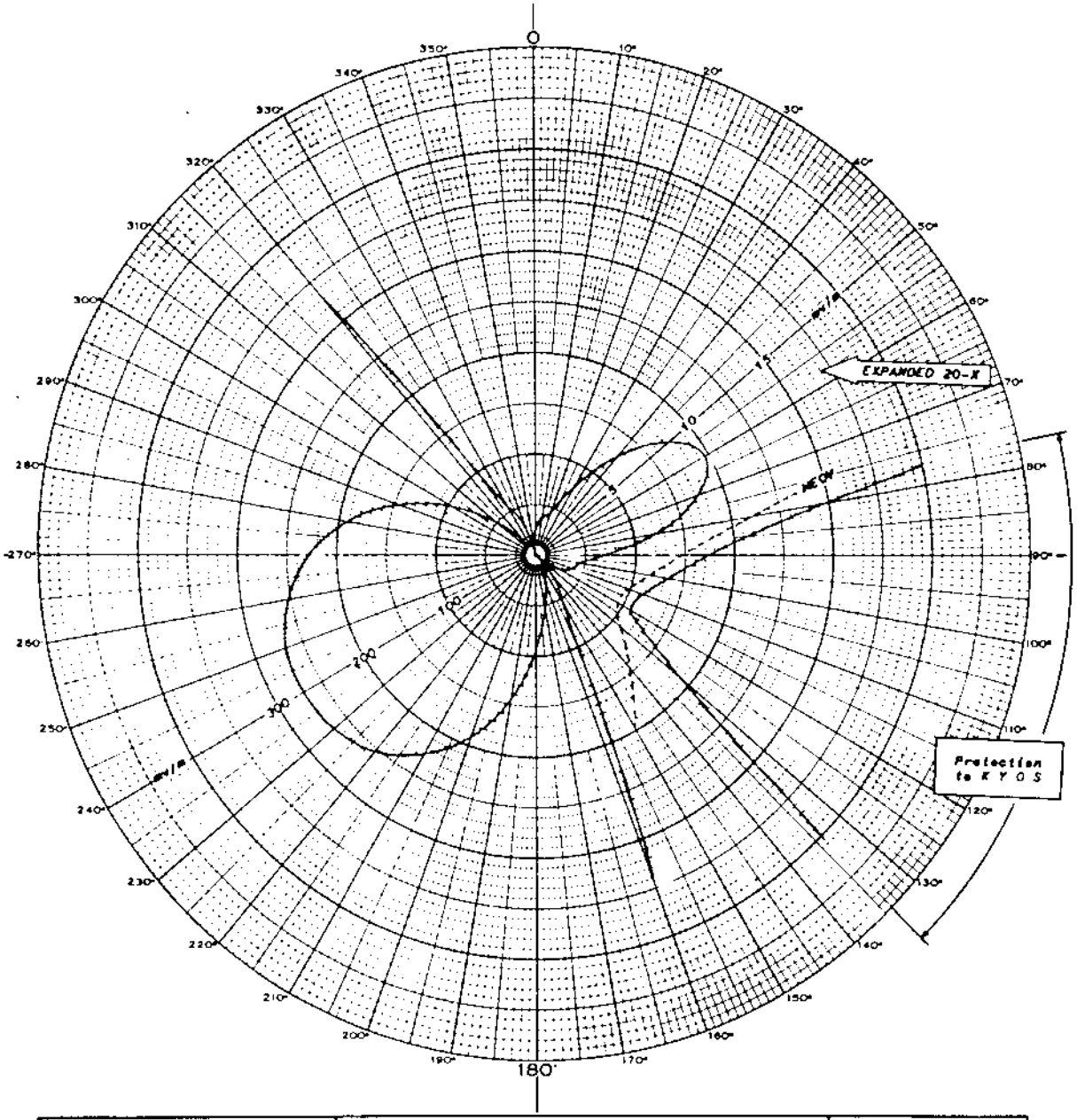
KWUN

PROPOSED DAY
(9-20-61ct)

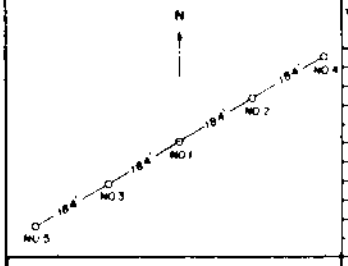
Station KWUN
Concord, California

500w,DA-D,D
1480 kc

10-13-61 granted MCP to make changes in DA system
3-15-61 - granted CP for new station



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA	
	TOWER No.	ELECTRICAL HEIGHT °	TRUE TOWER ORIENTATION °	SPACING °	PHASING °	HORIZONTAL FIELD mv/m	FIELD RATIO	ELEV. ANGLE °	ELEVATION RMS FIELD mv/m	CALL	KWUN
										FREQUENCY	1680 kc
										POWER	0.5 kw
	1	110	0	0	0		1.0	0	129.5	TIME OF OPERATION	DAYTIME
	2	110	60	100	132		.685	10		TYPE OF OPERATION	DA-D
	3	110	240	100	-132		.685	20		DAYTIME TOWERS	5
	4	110	60	200	-99		.19	30		NIGHTTIME TOWERS	-
	5	110	240	200	99		.19	40		No. RADIALS PER TOWER	120
	6							50		LENGTH OF RADIALS	90° approx.
	7							60		GROUND SCREEN DIMENSION	
	8							70		LAT	37° 57' 45.5"
	9							80		LONG	121° 56' 43.7"
	10							E_0 =	mv/m	SUPERSEDES	
	DAYTIME OPERATION ☐			NIGHTTIME OPERATION ☐				P_0 =	kw	PATTERN No.	080761



CECIL LYNCH, CONSULTING ENGINEER
MODESTO, CALIFORNIA

SERVICE BROADCASTING COMPANY
RADIO STATION KWUN
CONCORD, CALIFORNIA

FIGURE NO. 1

FCC File No.BMP-9714
Accepted 8-30-61

Station KWUN
Concord, California

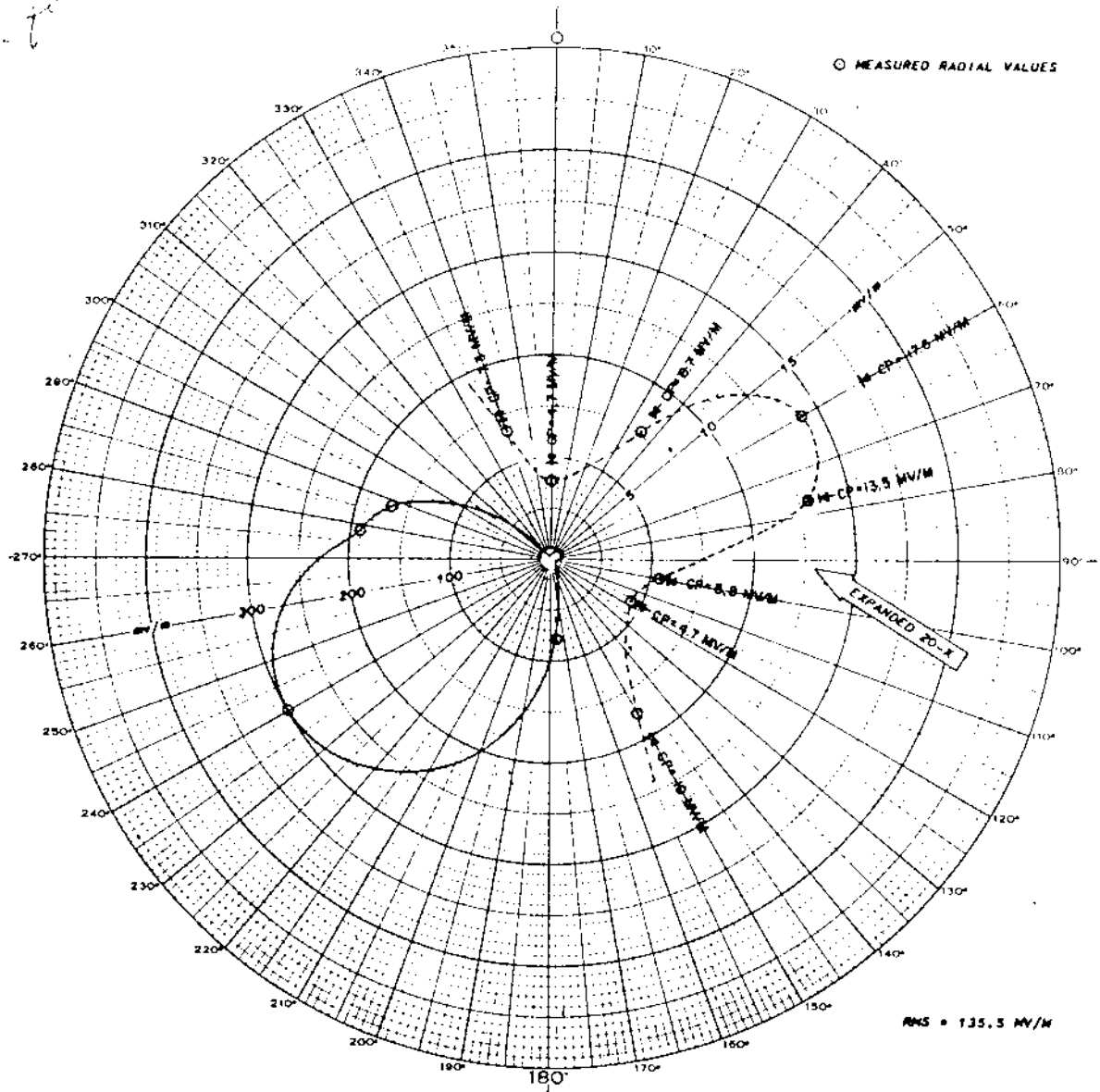
1480 kc

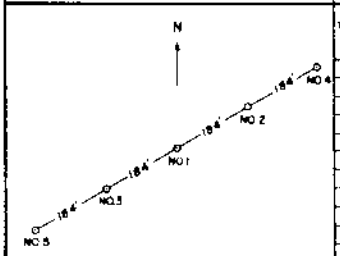
KWUN

Measured Day
(3-30-62ct)

Station KWUN
Concord, California

500w,DA-D,D
1480 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA	
	TOWER No	ELECTRICAL HEIGHT θ°	TRUE TOWER ORIENTATION β°	SPACING S'	PHASING Convention ψ°	FIELD RATIO Convention F	OPERATING PARAMETERS	PHASING Measured ψ°	FIELD RATIO Measured F	CALL	KWUN
	1	110	0	0	0	1.0		0	1.0	FREQUENCY	1480 kc
	2	110	60	100	+132	.685		+131.	.786	POWER	0.5 kw
	3	110	240	100	-132	.685		-149.8	.501	TIME OF OPERATION	DAY
	4	110	60	200	- 99	.19		- 80.5	.276	TYPE OF OPERATION	DA-D
	5	110	240	200	+ 99	.19		+ 62.	.133	DAYTIME TOWERS	5
	6									NIGHTTIME TOWERS	-
	7									No RADIALS PER TOWER	120
	8									LENGTH OF RADIALS	90' approx.
	9									GROUND SCREEN DIMENSION	
	10									LAT	37° 57' 45.5"
	DAYTIME OPERATION ☒			NIGHTTIME OPERATION ☐						LONG	121° 56' 43.7"
										SUPERSEDES	
										PATTERN No.	

DECAL LYNCH, CONSULTING ENGINEER
MODESTO, CALIFORNIA

SERVICE BROADCASTING COMPANY
RADIO STATION KWUN
CONCORD, CALIFORNIA

FIGURE NO. 6-A

FCC File No.BL-8934
Accepted 3-6-62

Station KWUN
Concord, California

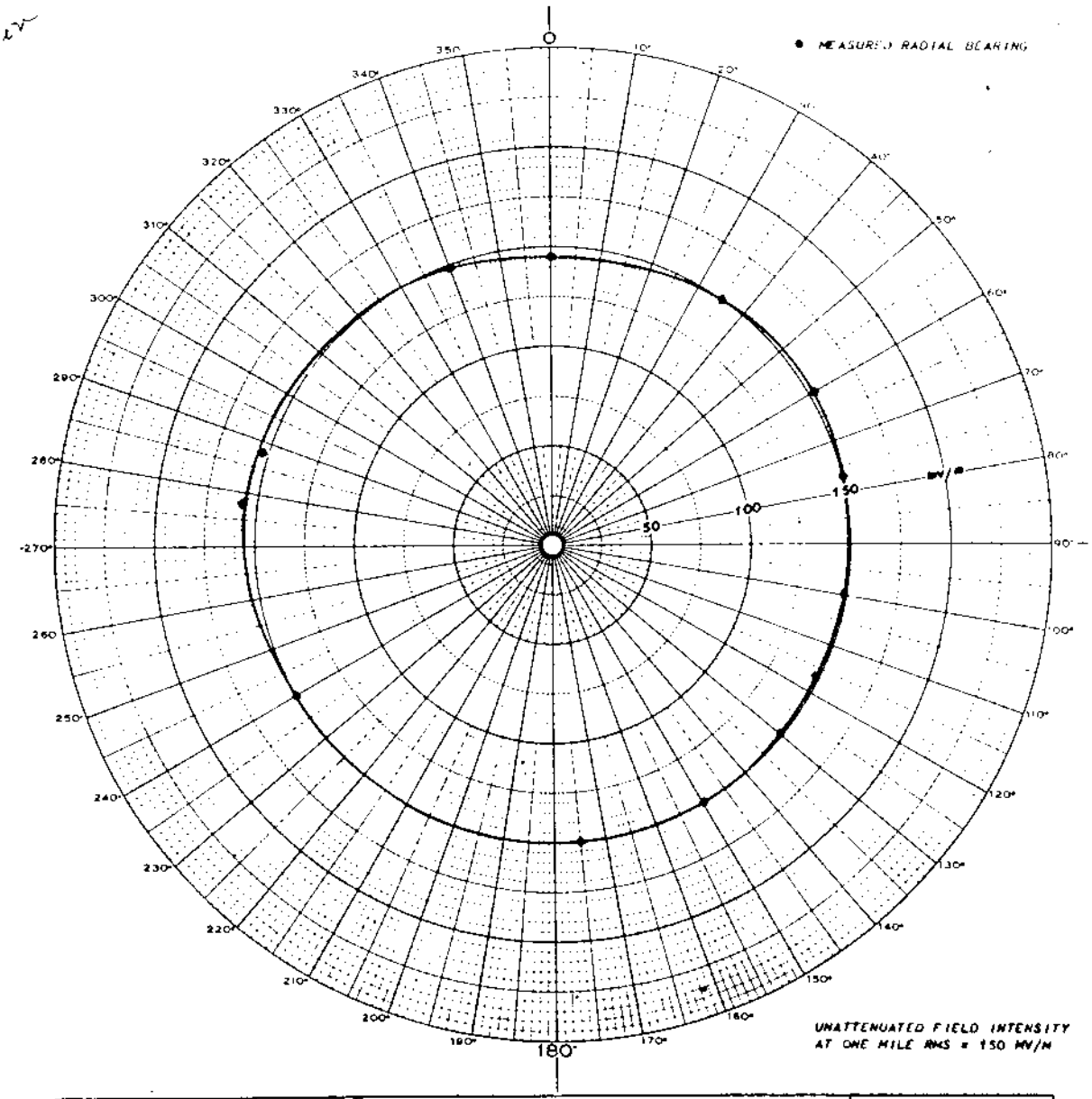
1480 kc

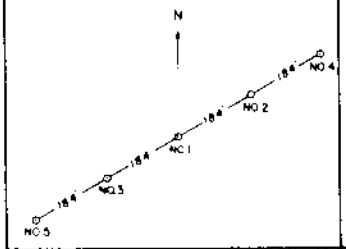
KWUN

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

Station KWUN
Concord, California

500w,DA-D,D
1480 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	STATION DATA
	NON-DIRECTIONAL OPERATION ANTENNA PROOF OF PERFORMANCE TOWER NO 1 USED AS RADIATING ELEMENT NOVEMBER, 1961	CALL KWUN FREQUENCY 1480 kc POWER 0.5 kw TIME OF OPERATION Day TYPE OF OPERATION DA-D DAYTIME TOWERS 5 NIGHTTIME TOWERS - No. RADIALS PER TOWER 120 LENGTH OF RADIALS 90' 165 ft GROUND SCREEN DIMENSIONS 100' Dia. LAT 37° 57' 45.5" LONG 121° 56' 43.7" SUPERSEDES PATTERN No
CECIL LYNCH, CONSULTING ENGINEER MODESTO, CALIFORNIA	SERVICE BROADCASTING COMPANY RADIO STATION KWUN CONCORD, CALIFORNIA	FIGURE NO 9

FCC File No.BL-8934
Accepted 3-6-62

Station KWUN
Concord, California

1480 kc

KWUN

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station : KWUN

Main Studio: Concord, California

Frequency : 1480 KHz

Power : 0.5KW Night 0.5KW Day

Notification List No.: 1779

Date : Sept. 27, 1978

Class: III

GEORGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 37° 57' 46"

West Longitude: ~~121°~~ 56' 44"

ANTENNA CHARACTERISTICS

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

Number of elements: 5

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

TOWER :	SW(#5)	SC(#3)	C(#1)	NC(#2)	NE(#4)
HEIGHT ABOVE INSULATORS :	203'	203'	203'	203'	203'(110°)
Day and Night PHASING:	+99	+132°	0°	+132°	-99°
Day and Night FIELD RATIO	0.190	0.685	1.0	0.685	0.190

SPACING AND ORIENTATION: Adjacent towers in a row are spaced 184'(100°) on a line bearing 60° true.

GROUND SYSTEM: 120 - 90' to 165' equally spaced copper radials plus a counter poise consisting of 240 - 50' elevated radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

KWUN

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL		STANDARD
	RMS	RSS	RMS
DAY	129.5 mV/m	_____ mv/m	_____ mv/m
NIGHT	153.25mv/m	196.24 mv/m	161.04 mv/m

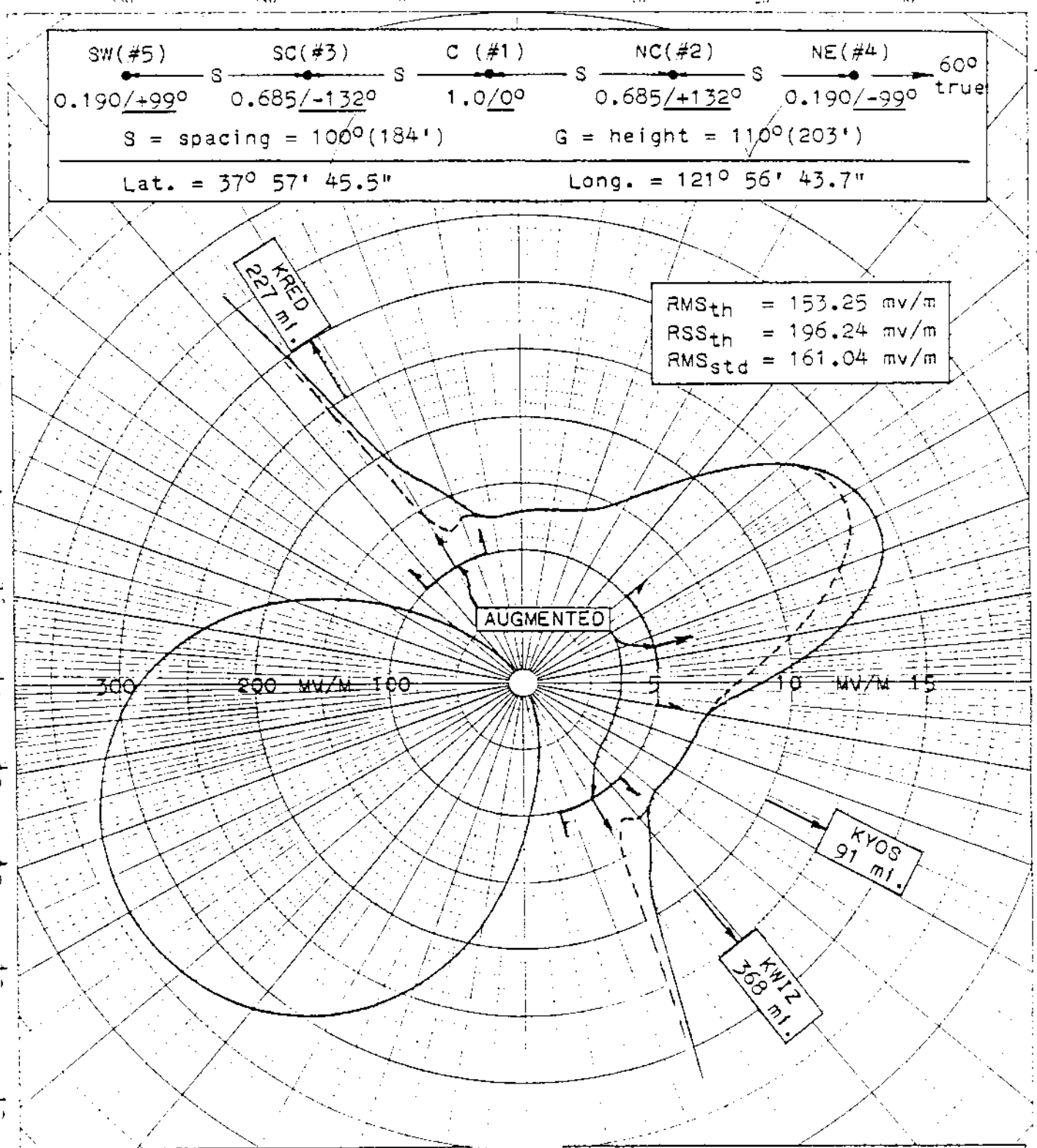
NOTE: Please retain the Daytime directional antenna radiation pattern notified for Station KWUN in United States Change List Number 1430 dated June 24, 1971 and attach to this Revised Description Sheet and Nighttime patterns. This notification concerns only the addition of operation of the station with Daytime operation continued as previously notified.

CTR NO

KWUN

Modified Standard Pattern

KWUN RADIO Exhibit E, April 1976, Page 8



1480 KHZ - 0.5 KW - DA - U

STANDARD HORIZONTAL PLANE PATTERN

PROPOSED NIGHTTIME

KWUN RADIO
CONCORD, CALIF.

April 26, 1976

BOND AND OAKLEY
Consulting Radio Engineers

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: K Y O S

Main Studio: Merced, California

Frequency: 1480 kcs.

Power: 5 kw

Notification List No. 270

Date: April 1, 1948 Class: III-A

GEOGRAPHICAL LOCATION OF ANTENNA:

North Latitude: 37° 22' 30"

West Longitude: 120° 27' 37"

ANTENNA CHARACTERISTICS:

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

TOWER:	North east	Center	South west
HEIGHT ABOVE INSULATORS:	220'	220'	220' (119.3°)
SPACING:	147.7' or	80°	between adjacent towers
PHASING:	152.8°	0°	-152.8°
FIELD RATIO:	1.0	1.7	1.0

GROUND SYSTEM: 120 - 233' to 266' equally spaced radials plus a 30' square ground screen about each tower base. Radials shortened and bonded by transverse bonding straps along intersections between towers.

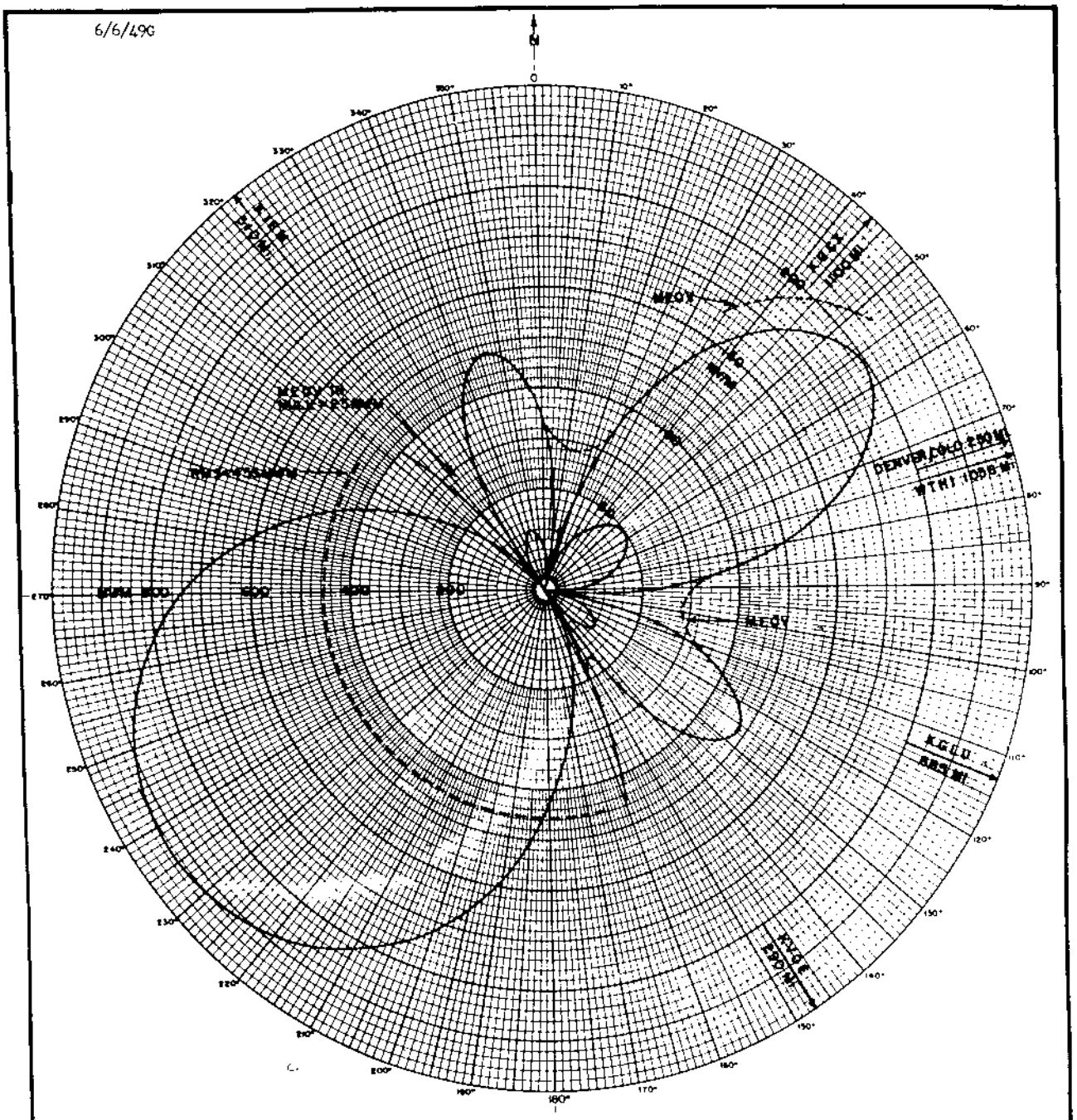
ORIENTATION: Elements on a line bearing 56° true.

Predicted effective Night Field: 455 mv/m (at rated power).

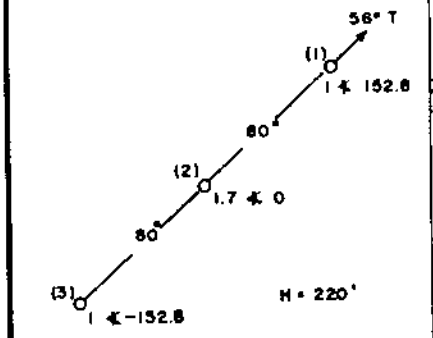
KYOS

PROPOSED NIGHT KYOS, MERCED, CAL. 6-2-49 5kw, DAN 1480 kc

6/6/49G



REVISION
SUPERSEDES PATTERN NO.470923



LATITUDE 37° 22' 30"
LONGITUDE 120° 27' 37"

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG
1	—	—	152.8	1.0	200	119.3
2	236	80	0	1.7	200	119.3
3	236	160	-152.8	1.0	200	119.3

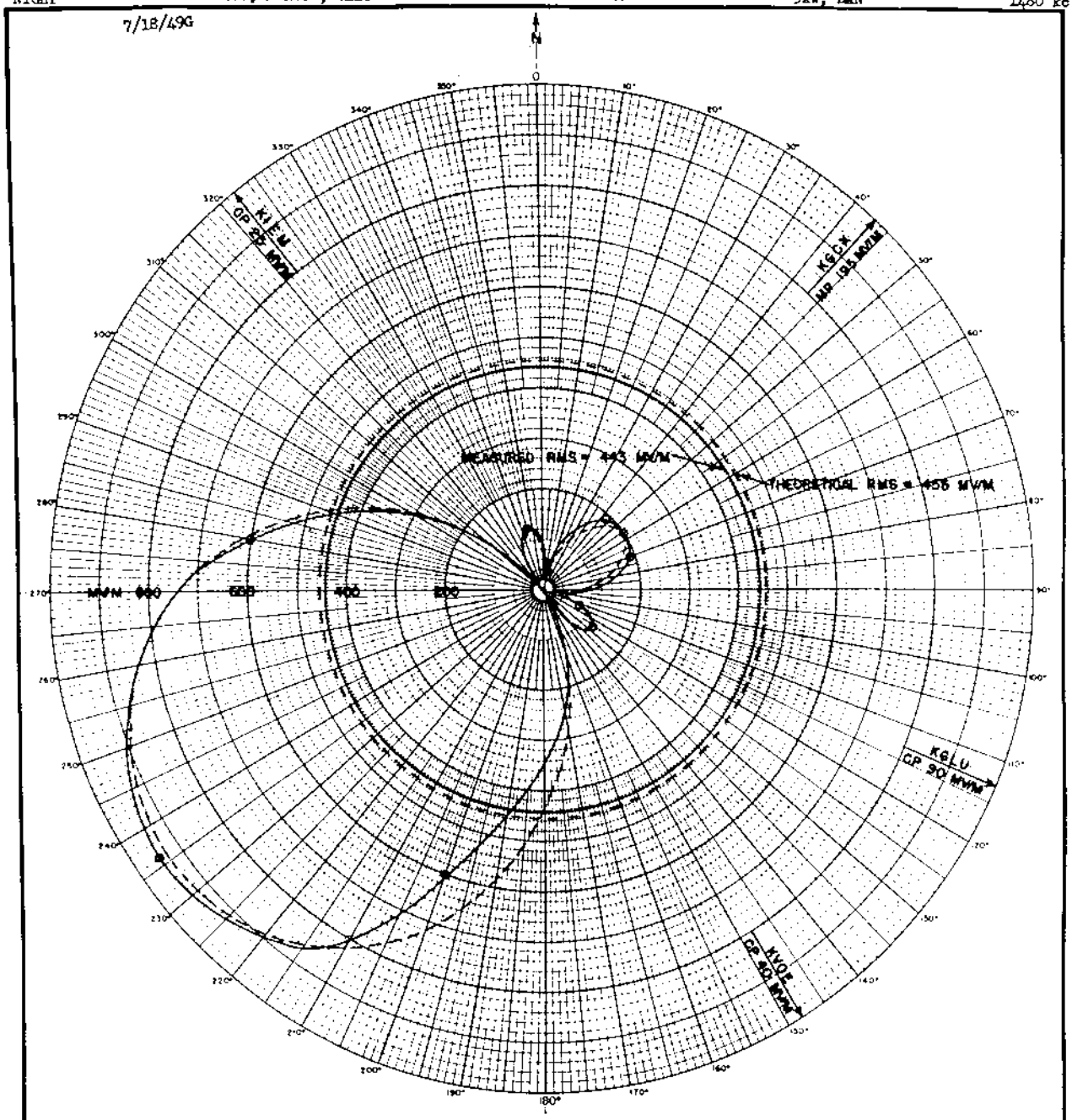
NIGHTTIME
CALCULATED HORIZONTAL
PLANE PATTERN
PROPOSED KYDS
MERCED, CALIFORNIA
1480KC 5KW. U,DA-N

KEAR AND KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D.C.

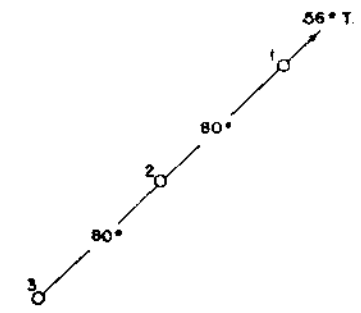
490623

KYOS, Merced, Cal. 1480 kc

7/18/49G



O MEASURED POINTS
----- THEORETICAL PATTERN
——— MEASURED PATTERN



LATITUDE 37° 22' 30"
LONGITUDE 120° 27' 37"

ANTENNA NUMBER	AZIMUTH DEG.	SPACING DEG.	PHASING DEG.	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG.
1	—	—	152.8	1.0	200	119.3
2	236	80	0	1.7	200	119.3
3	236	160	-152.8	1.0	200	119.3

MEASURED NIGHTTIME
HORIZONTAL PLANE PATTERN
KYOS
MERCED, CALIFORNIA
1480KC. 5KW U, DA-N

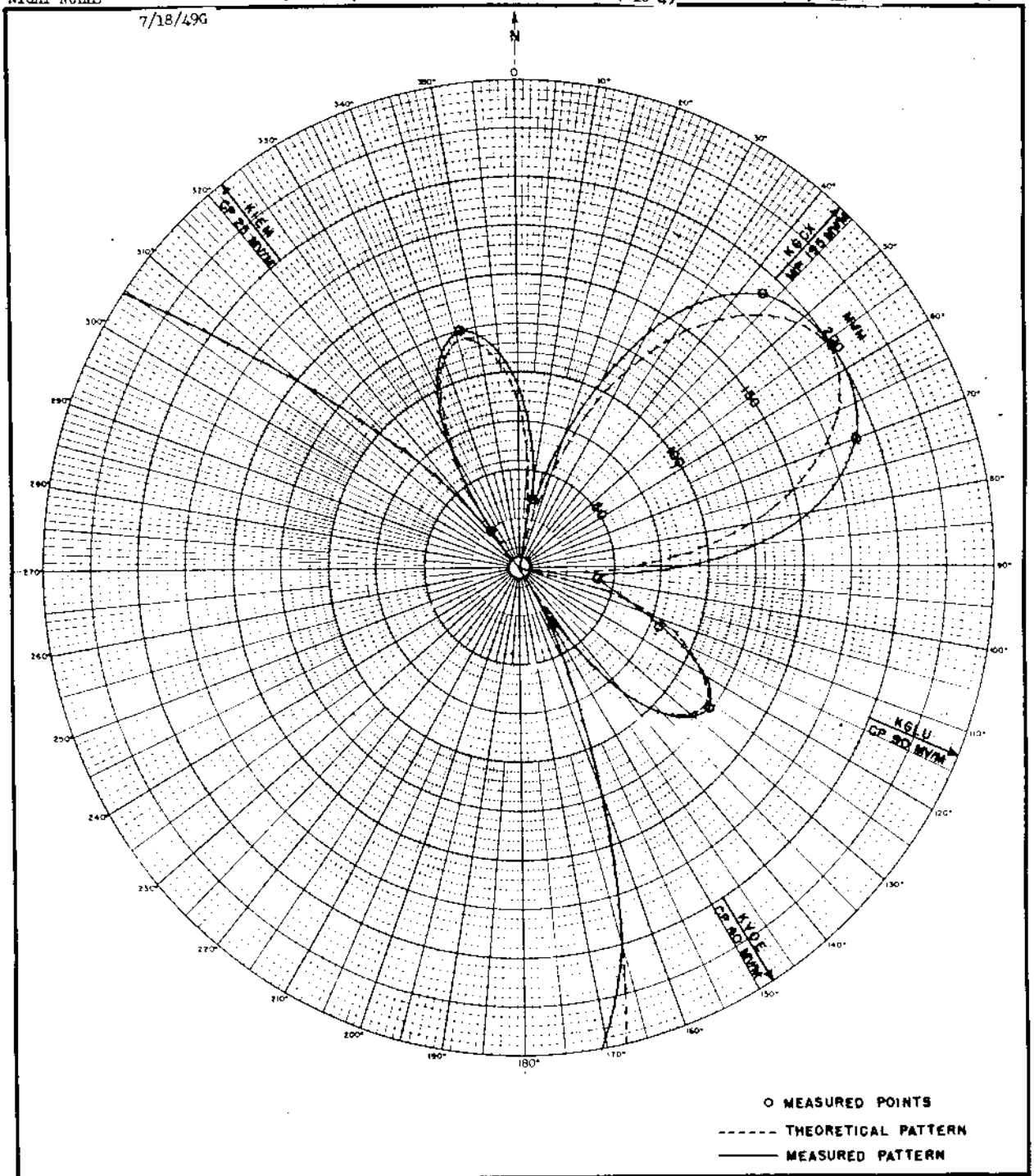
KEAR AND KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D.C

490519

KYOS

MEASURED NIGHT NULLS | KYOS, MERCED, CAL. | 7-10-49 | 5kw, DAN | 1480 kc

7/18/49G



LATITUDE
LONGITUDE

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

EXPANDED SCALE
MEASURED NIGHTTIME
HORIZONTAL PLANE PATTERN
KYOS
MERCED, CALIFORNIA
1480 KC. 5KW U, DA-N

KEAR AND KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D C

490819

KYOS

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station : KYOS Main Studio: Merced, California

Frequency : 1480 KHz Power : 5 kW Night 5 kW Day

Notification: 1782 Date : October 26, 1979 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 37 ° 22 ' 30 "
West Longitude: 120 ° 27 ' 37 "

ANTENNA CHARACTERISTICS

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

TOWER :	SW(#1)	C(#2)	NE(#3)			
HEIGHT ABOVE INSULATORS	220'	220'	220'(119°)			
NIGHT PHASING:	0°	152.9°	-48.6°			
NIGHT FIELD RATIO:	1.0	1.93	1.29			

SPACING AND ORIENTATION: Adjacent towers in a row are spaced 147.7' (80°) on a line bearing 56° true.

GROUND SYSTEM: 120 - 232' to 266' equally spaced copper radials plus a 30'x30 square ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers. Centers of system are bonded together.

KYOS

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	451.7 mV/m	_____ mV/m	_____ mV/m
Night	455 mV/m	310.6 mV/m	_____ mV/m

Note:

KYOS

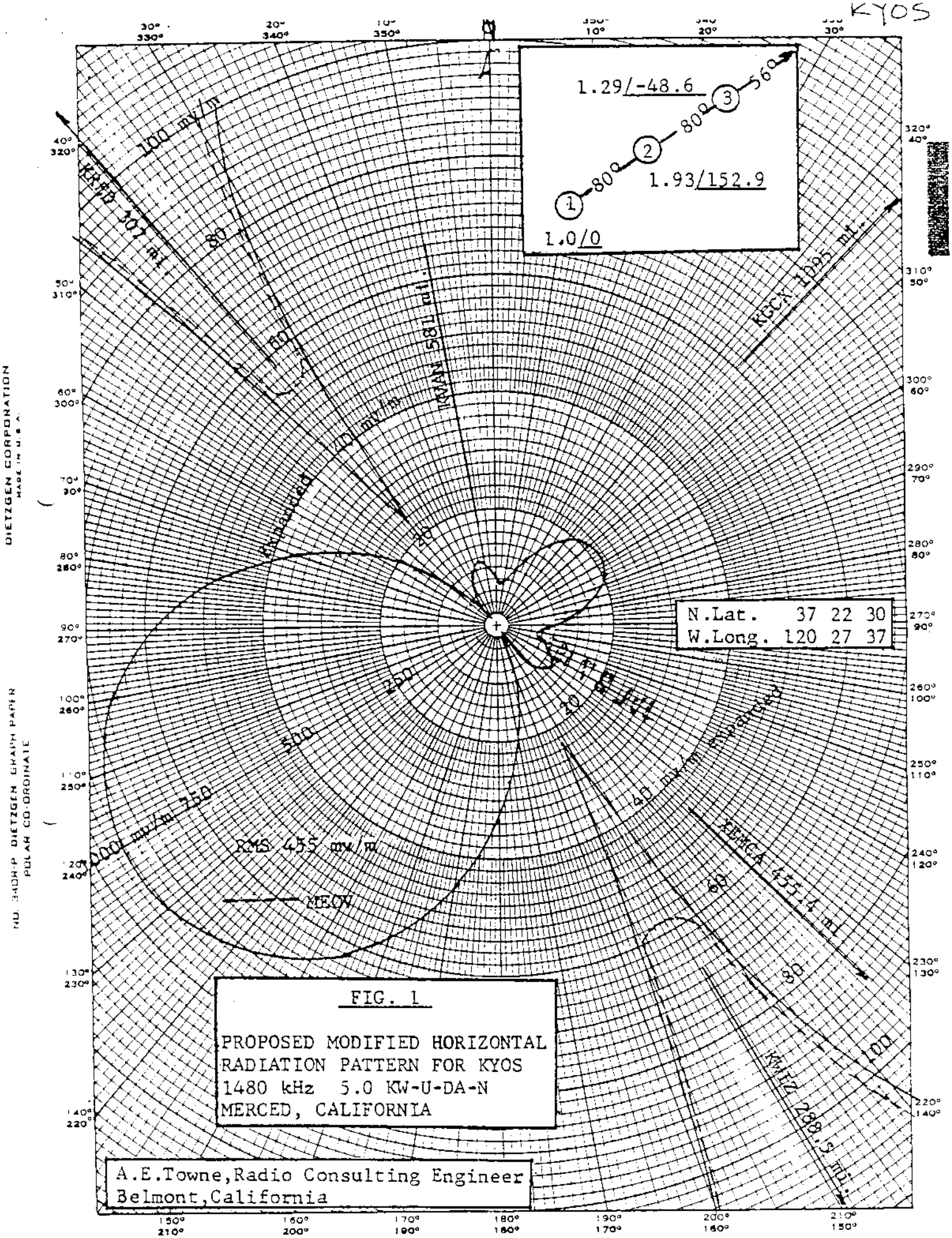


FIG. 1

PROPOSED MODIFIED HORIZONTAL RADIATION PATTERN FOR KYOS 1480 kHz 5.0 KW-U-DA-N MERCED, CALIFORNIA

A.E.Towne, Radio Consulting Engineer
Belmont, California

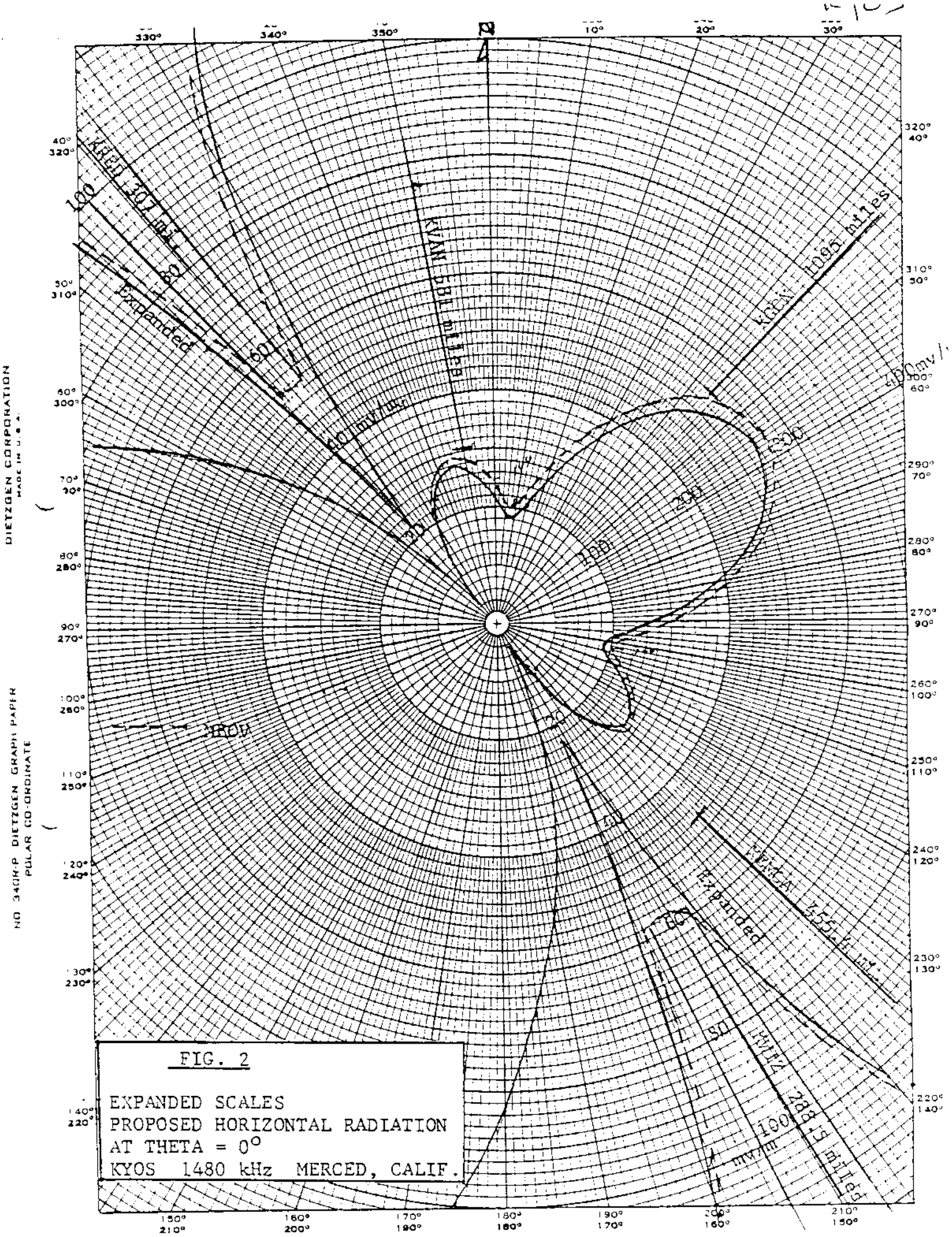


FIG. 2

EXPANDED SCALES
PROPOSED HORIZONTAL RADIATION
AT THETA = 0°
KYOS 1480 kHz MERCED, CALIF.

KYOS

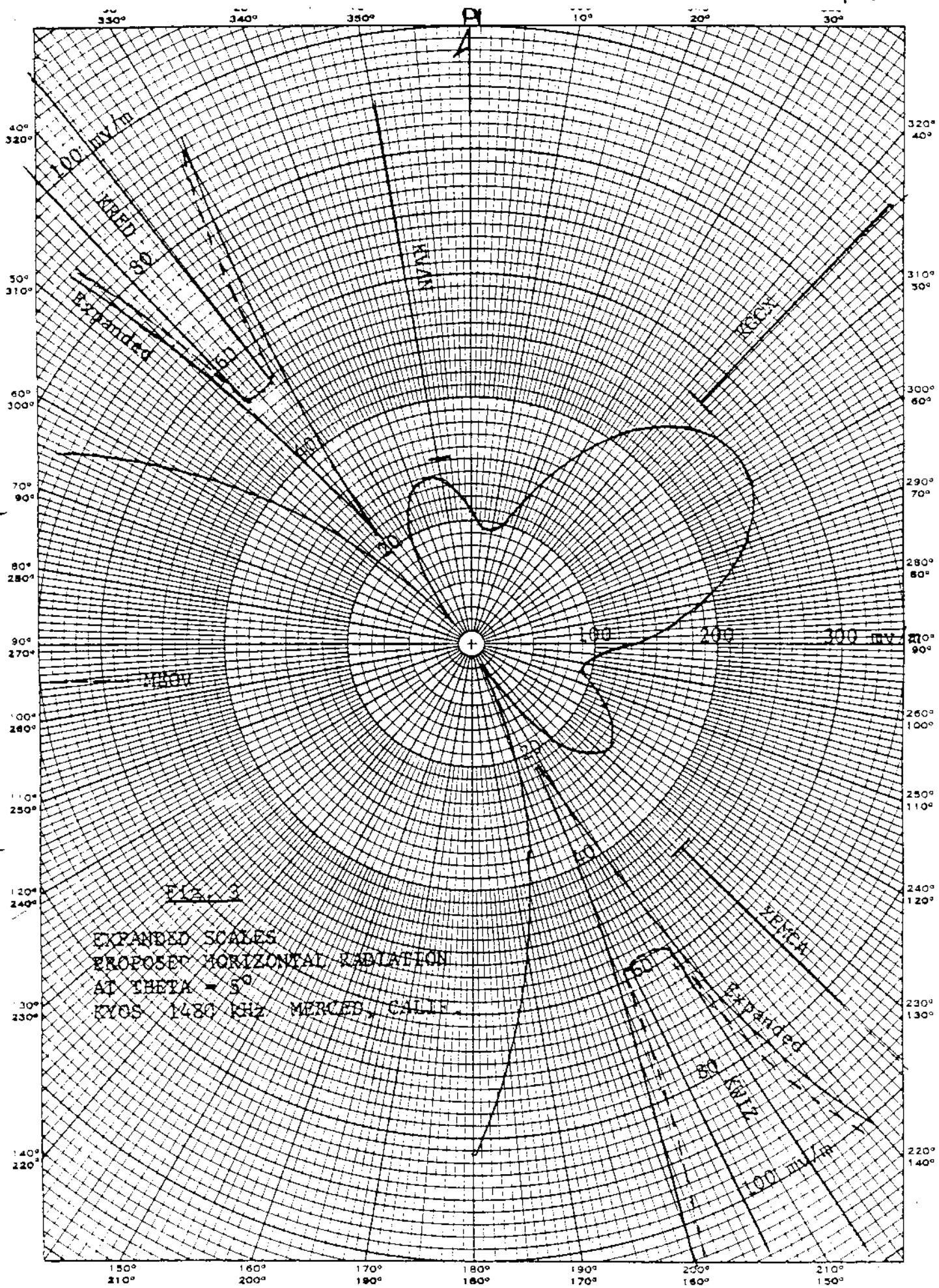


FIG. 3

EXPANDED SCALES
PROPOSED HORIZONTAL RADIATION
AT THETA = 5°
KYOS 1480 KHz MERCED, CALIF.

KYOS

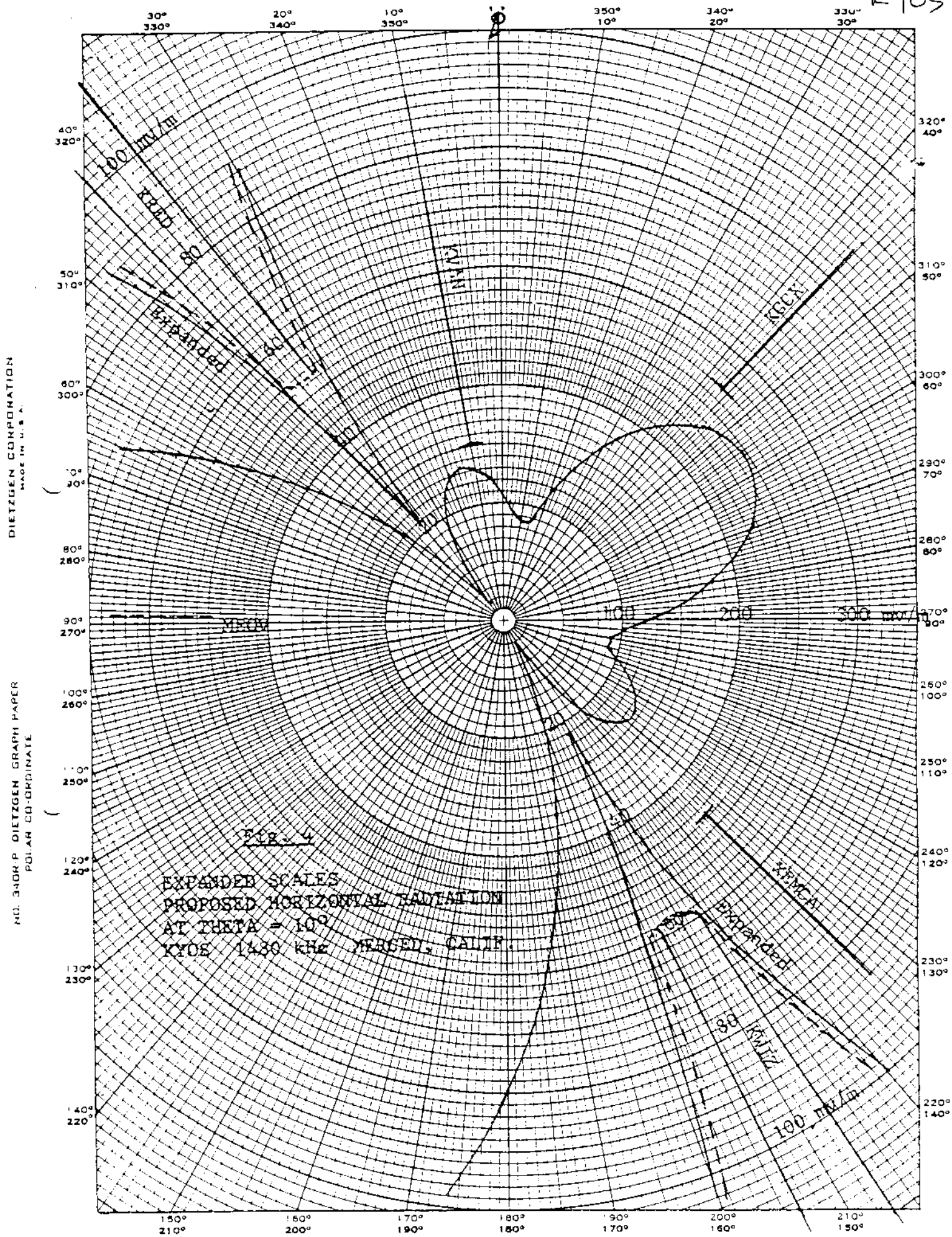


FIG. 4

EXPANDED SCALES
PROPOSED HORIZONTAL RADIATION
AT THETA = 10°
KYOS 1430 kHz MERCED, CALIF.

KYOS

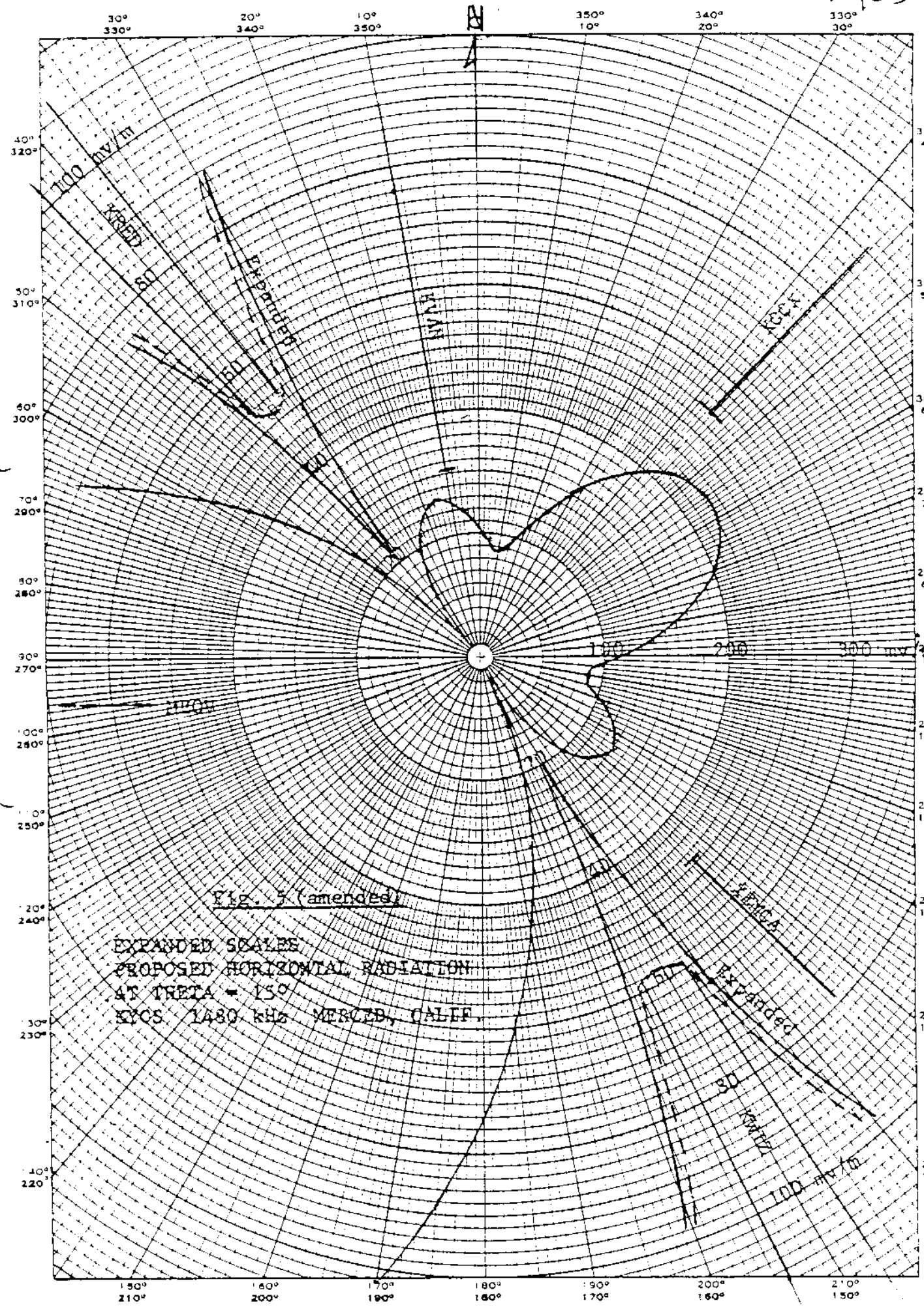


Fig. 5 (amended)

EXPANDED SCALES
PROPOSED HORIZONTAL RADIATION
AT THETA = 150°
KYOS 1480 kHz MERCED, CALIF.

KYOS

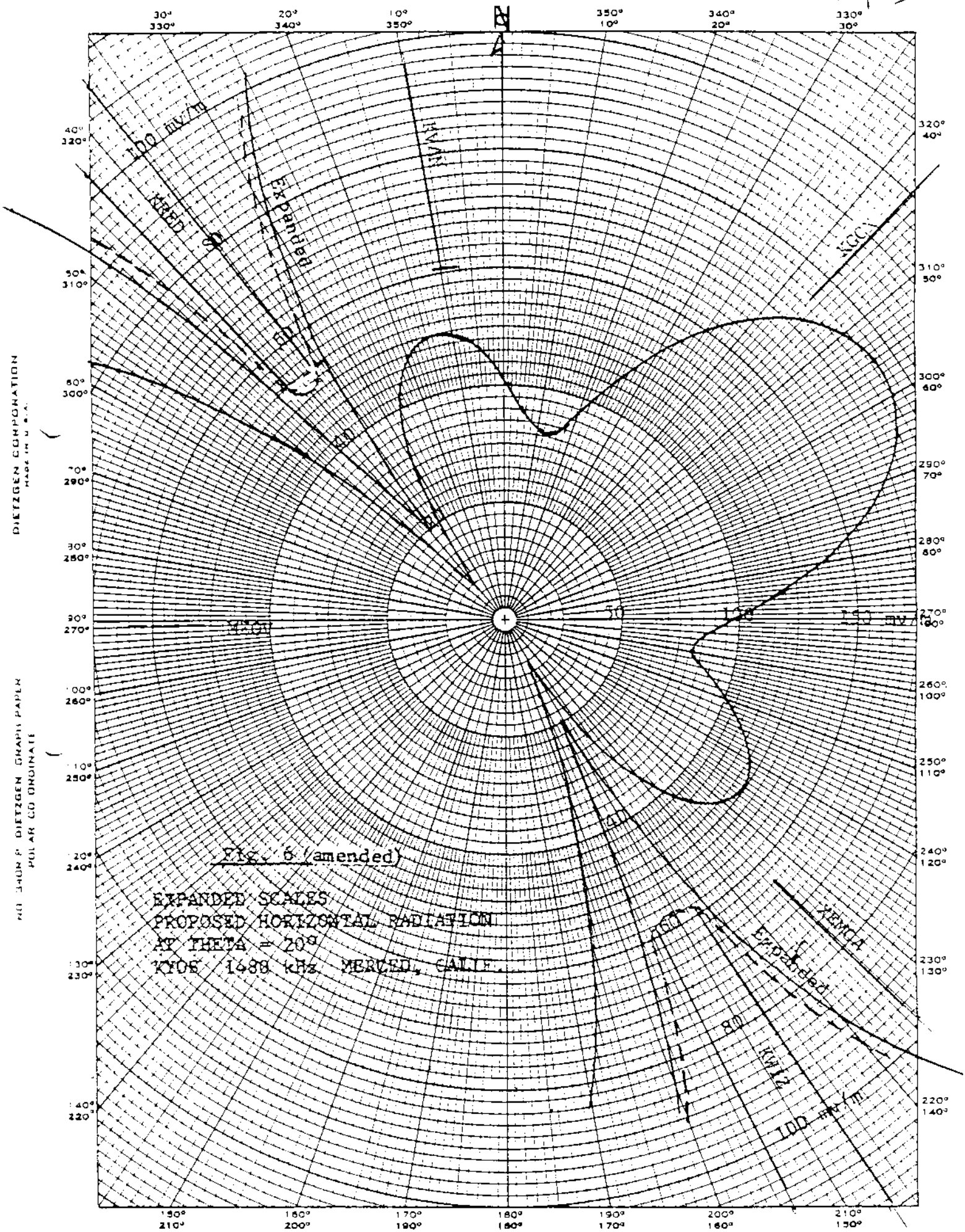
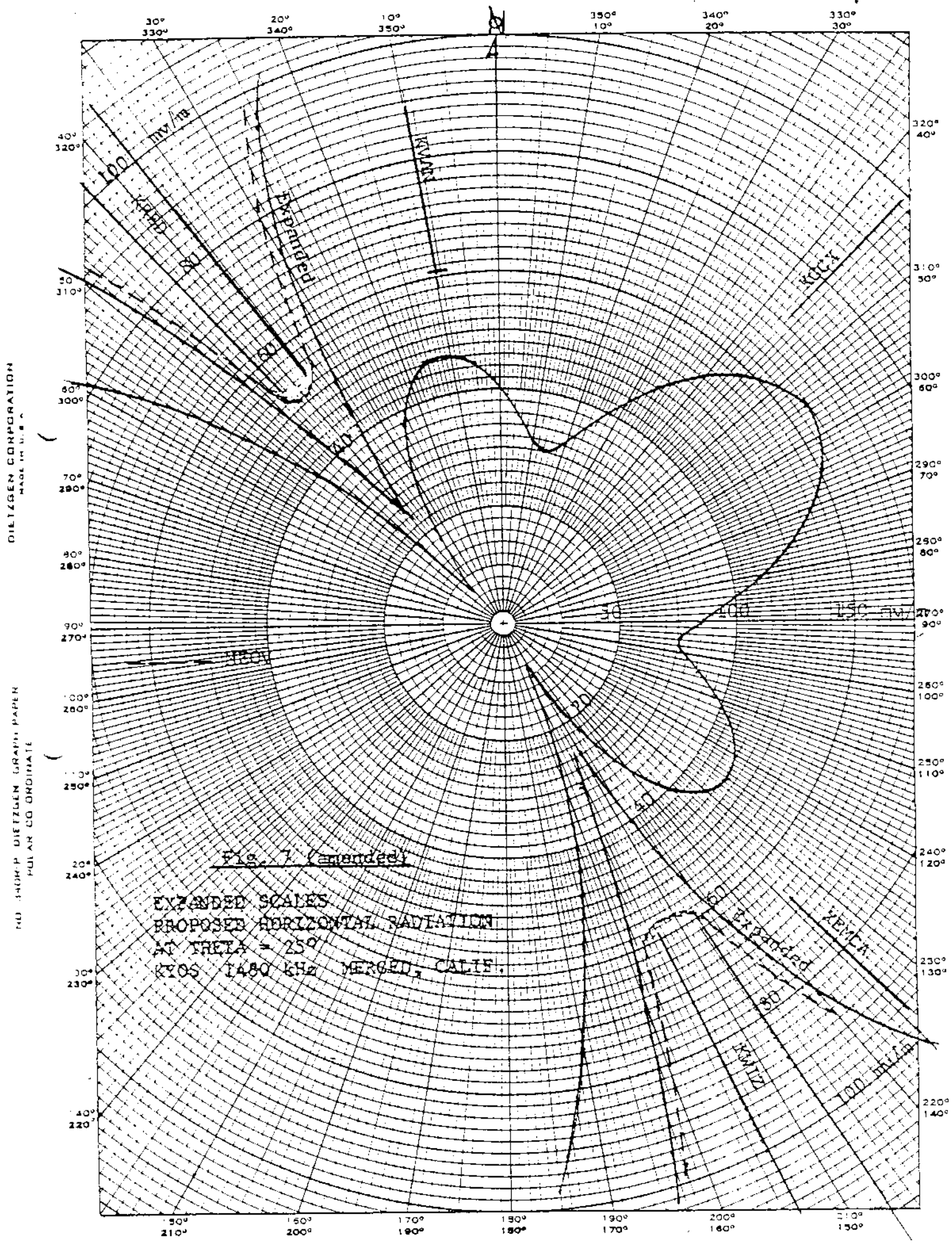


Fig. 6 (amended)

EXPANDED SCALES
PROPOSED HORIZONTAL RADIATION
AT THETA = 20°
KYOS 1488 kHz MERCED, CALIF.

KYOS


Expanded
KWIZ
KGCX
KPRO
KEMA
KWIZ
Expanded
100 mv/m
80
60
40
20
30
40
50 mv/m
KEON
Fig. 7 (amended)
EXPANDED SCALES
PROPOSED HORIZONTAL RADIATION
AT THETA = 25°
KYOS 1480 kHz MERCED, CALIF.

KYOS

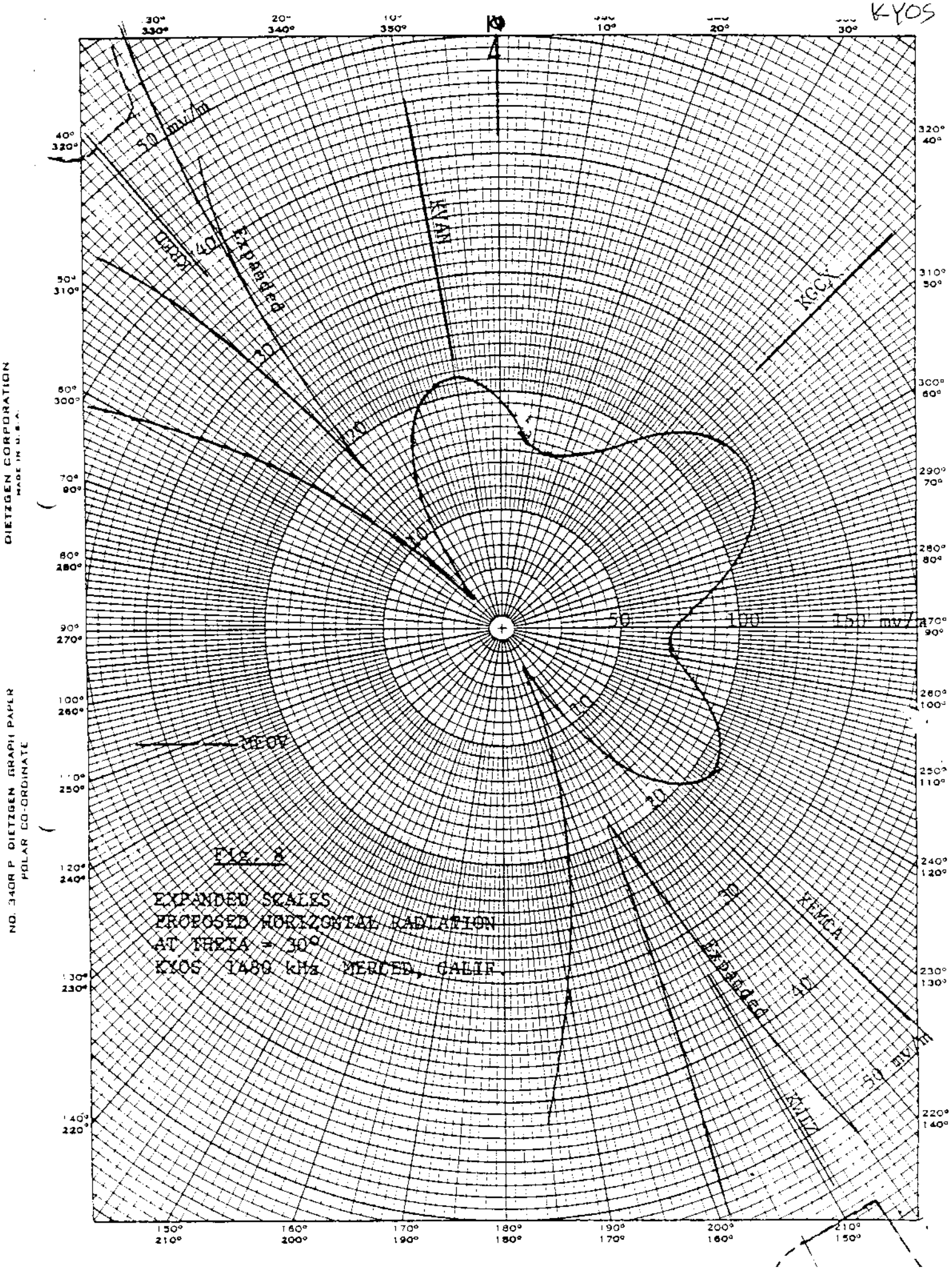


FIG. 8

EXPANDED SCALES
PROPOSED HORIZONTAL RADIATION
AT THETA = 30°
KYOS 1480 kHz MERCED, CALIF.

KYOS

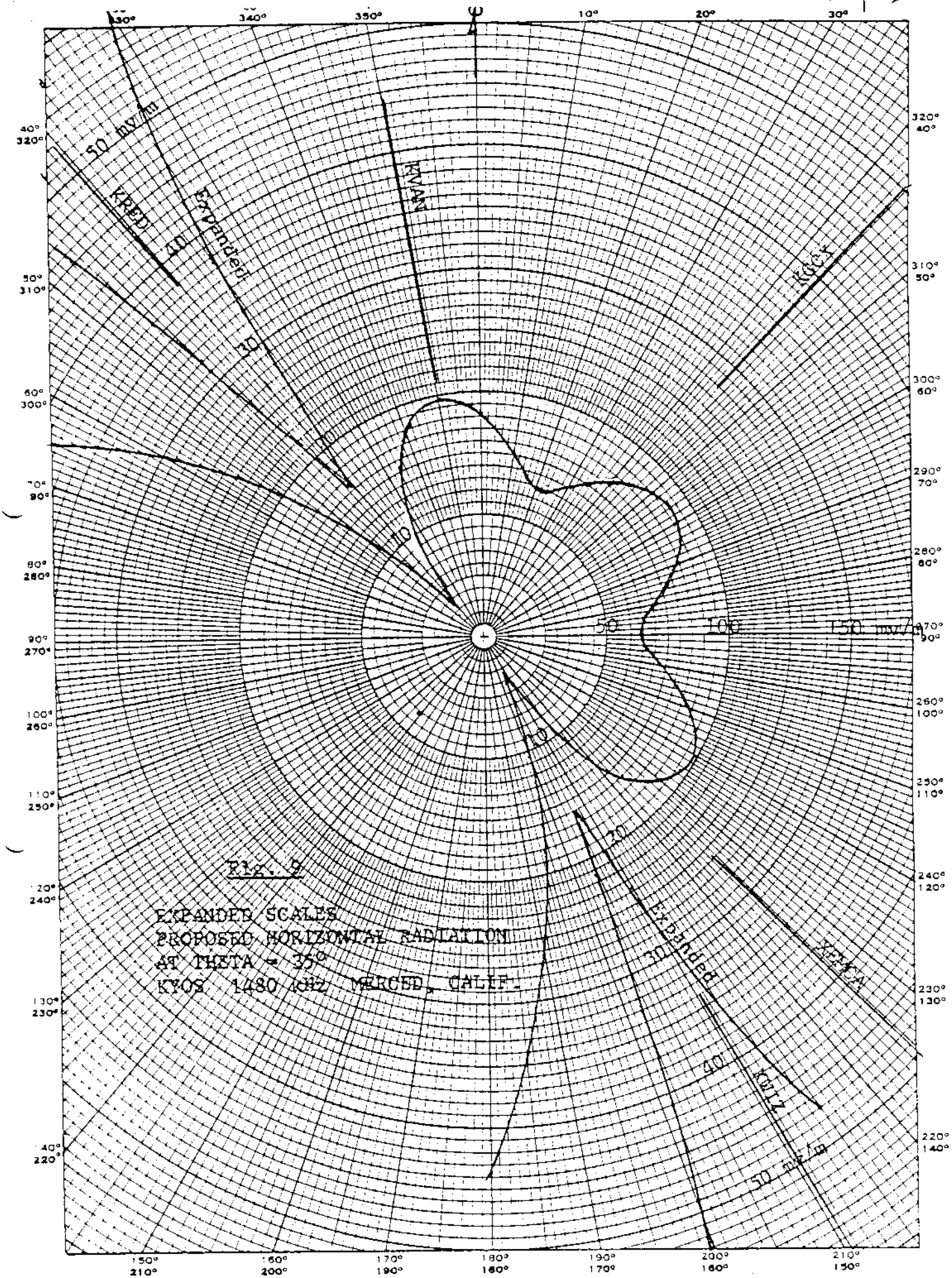


Fig. 9

EXPANDED SCALES
PROPOSED HORIZONTAL RADIATION
AT THETA = 35°
KYOS 1480 KHZ MERCED, CALIF.

KYOS

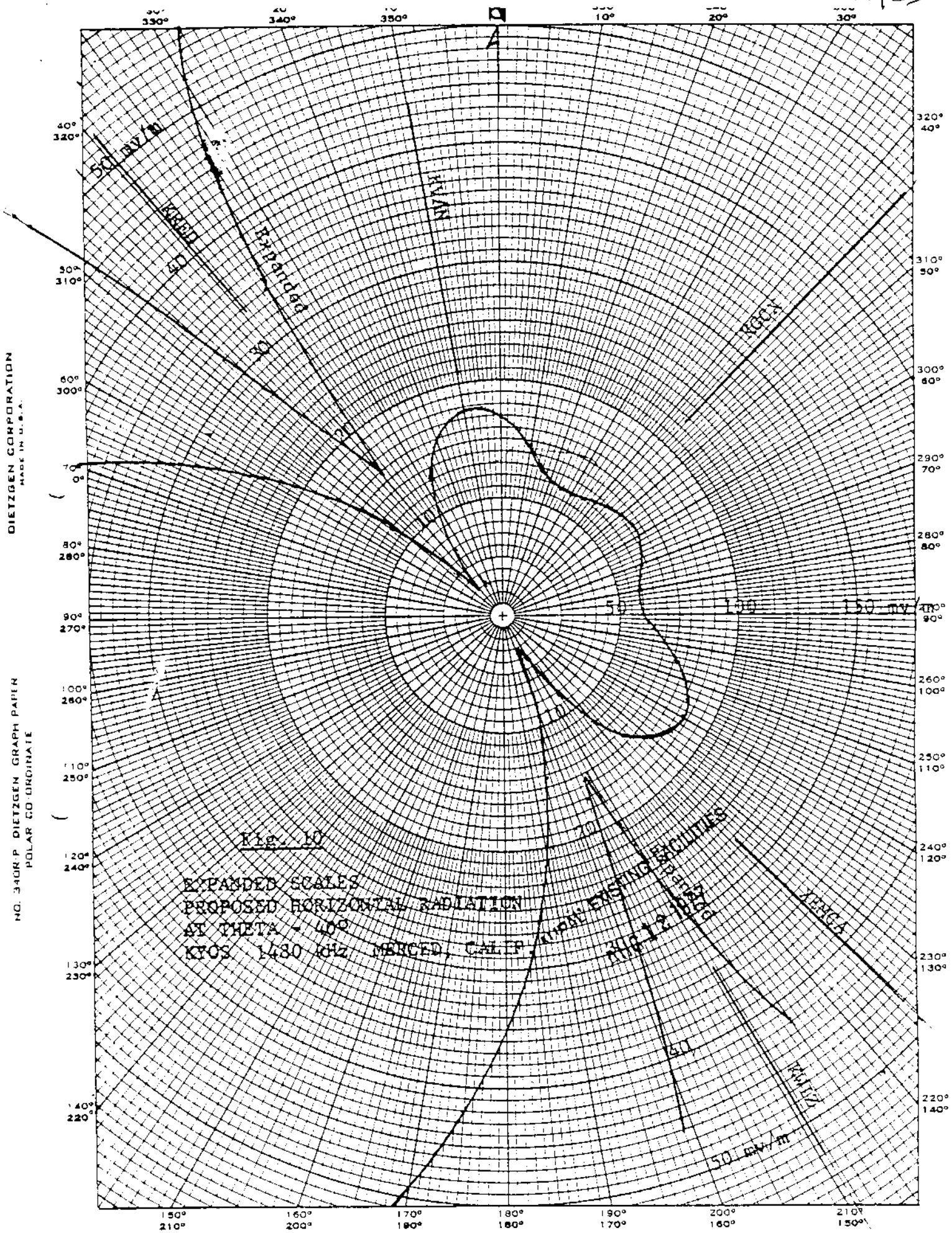


Fig. 10

EXPANDED SCALES
PROPOSED HORIZONTAL RADIATION
AT THETA = 40°
KYOS 1480 kHz MERCED, CALIF.

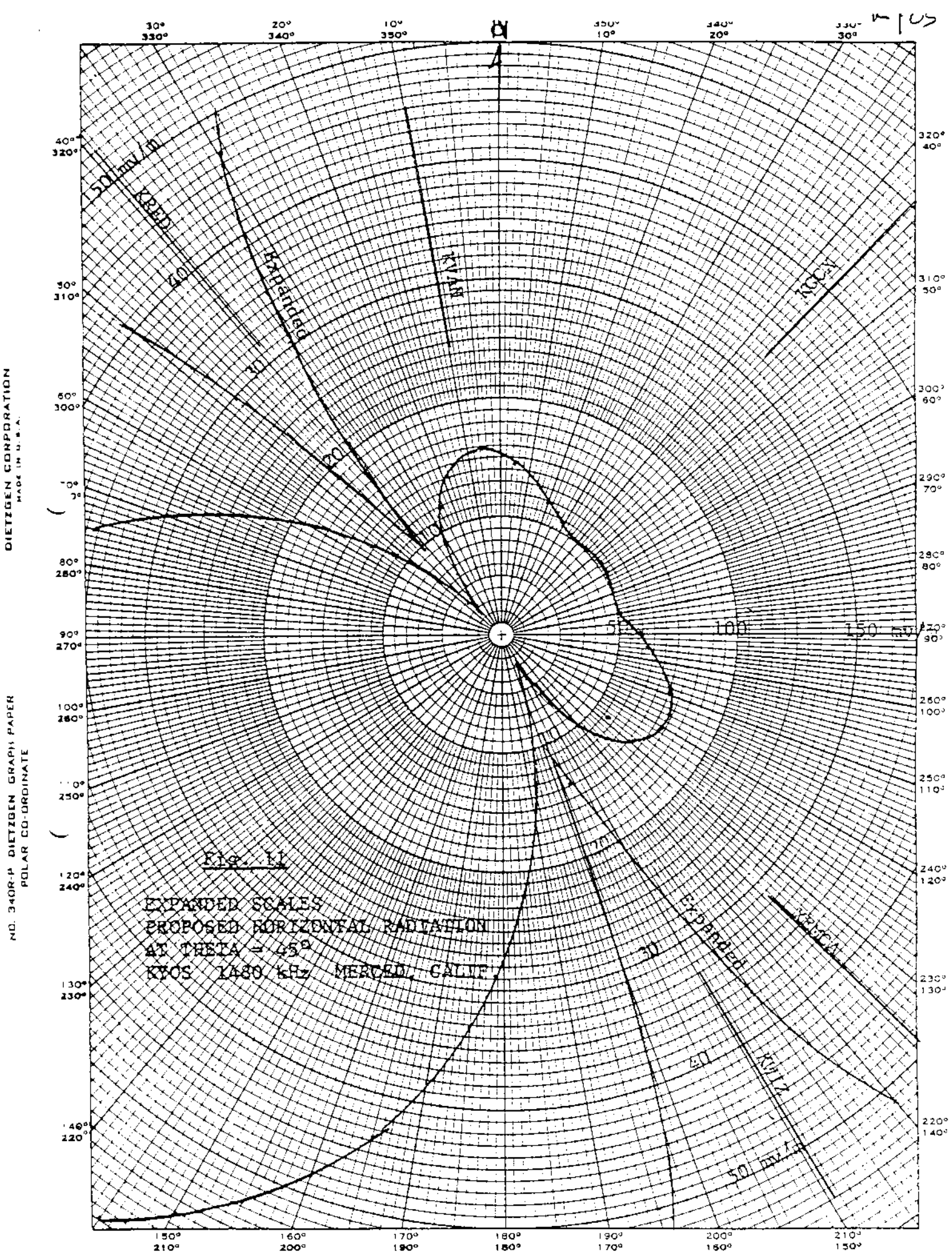


Fig. 11

EXPANDED SCALES
PROPOSED HORIZONTAL RADIATION
AT THETA = 45°
KYOS 1480 kHz MERCED, CALIF.

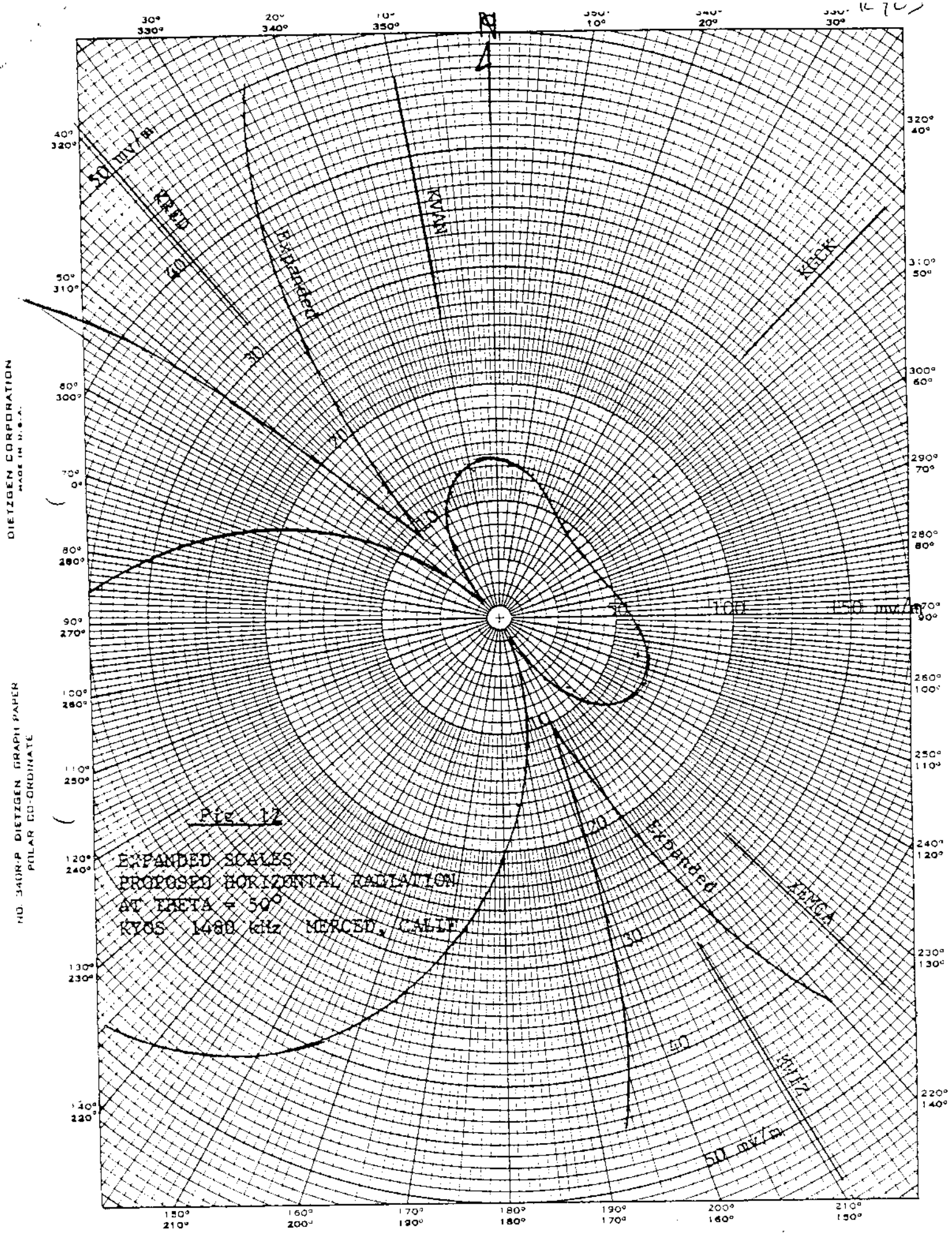


Fig. 12

EXPANDED SCALES
PROPOSED HORIZONTAL RADIATION
AT THETA = 50°
KYOS 1480 kHz MERCED, CALIF.

1605

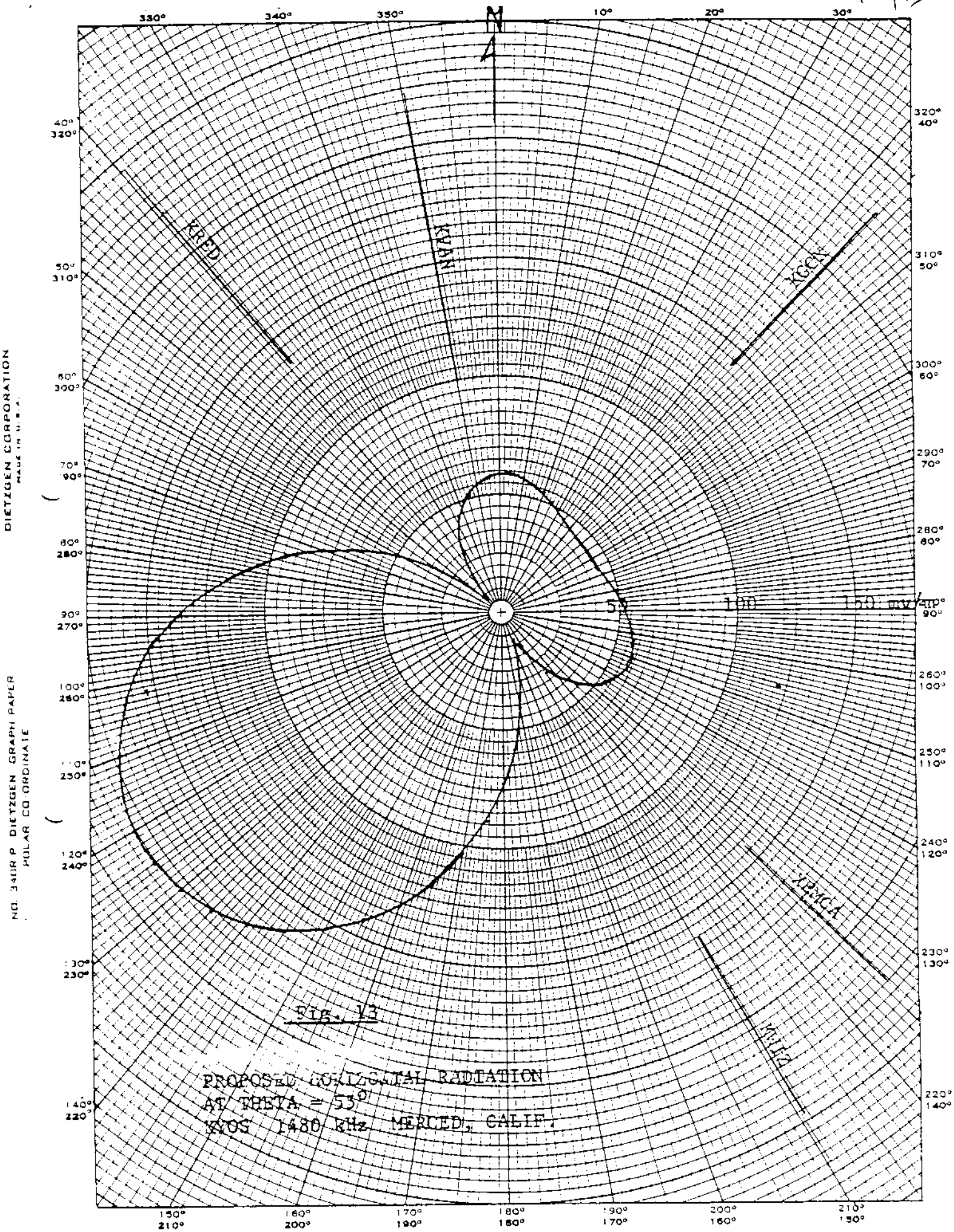


FIG. 13

PROPOSED HORIZONTAL RADIATION
AT THETA = 53°
KYOS 1480 kHz MERCED, CALIF.

KYOS

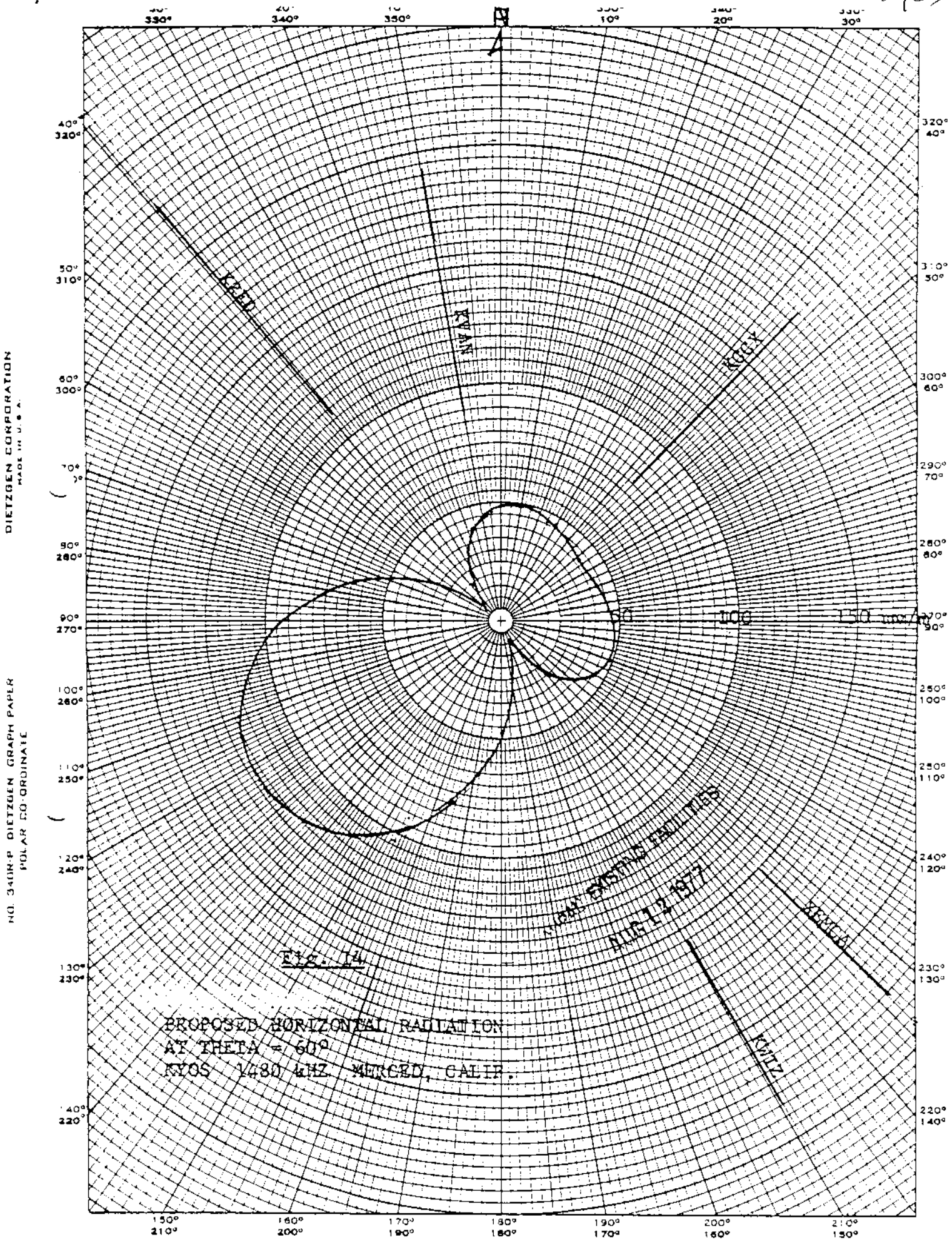


FIG. 14

PROPOSED HORIZONTAL RADIATION
AT THETA = 60°
KYOS 1480 kHZ MERCED, CALIF.

WABB

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WABB Main Studio: Mobile, Alabama

Frequency: 1480 kHz Power: 5 kW

Notification List No. 1641 Date: July 16, 1975 Class: III

GEOGRAPHICAL LOCATION OF THE CENTERS OF THE ANTENNA SYSTEMS:

Daytime		Nighttime	
North Latitude:	30° 43' 11"	North Latitude:	30° 46' 26"
West Longitude:	88° 04' 16"	West Longitude:	88° 07' 08"

NIGHTTIME ANTENNA CHARACTERISTICS

Authorized for Nighttime operation. (DA-N)
Number of elements: 4
Type of elements: Series-excited, tower #3 uniform cross-section, guyed, towers #1, #2 and #4 Self-supporting, tapered, vertical steel towers.

TOWER:	NW(#4)	NC(#3)	SC(#2)	S(#1)
HEIGHT ABOVE INSULATORS:	360'	360'(195°)	200'	200' (108°)
PHASING:	0°	-142°	+64°	-85°
FIELD RATIO:	1.0	2.06	1.74	0.65

SPACING AND ORIENTATION: From reference tower #4; tower #3 is spaced 167' (90.5°) on a line bearing 146° true, tower #2 is spaced 332' (180°) on a line bearing 140° true, and tower #1 is spaced 498' (270°) on a line bearing 140° true.

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

Predicted effective Night Field: 477 mv/m at rated power.

DAYTIME ANTENNA CHARACTERISTICS

Authorized for Daytime operation (NDD).
Type of element: Series-excited, uniform cross-section, guyed, vertical steel tower.
Height above insulator: 240'
Ground System: 120-222' (ave) equally spaced copper radials.
Predicted effective Day Field: (omnidirectional) 462 mv/m at rated power.

Note: Please retain the Nighttime directional antenna radiation pattern notified for Station WABB in United States Change List Number 1225 dat July 19, 1967, and attach to this Revised Description Sheet. This notification concerns only a change in the Daytime operation of the station with Nighttime operation continued as previously notified.

CTR NO 30329A0

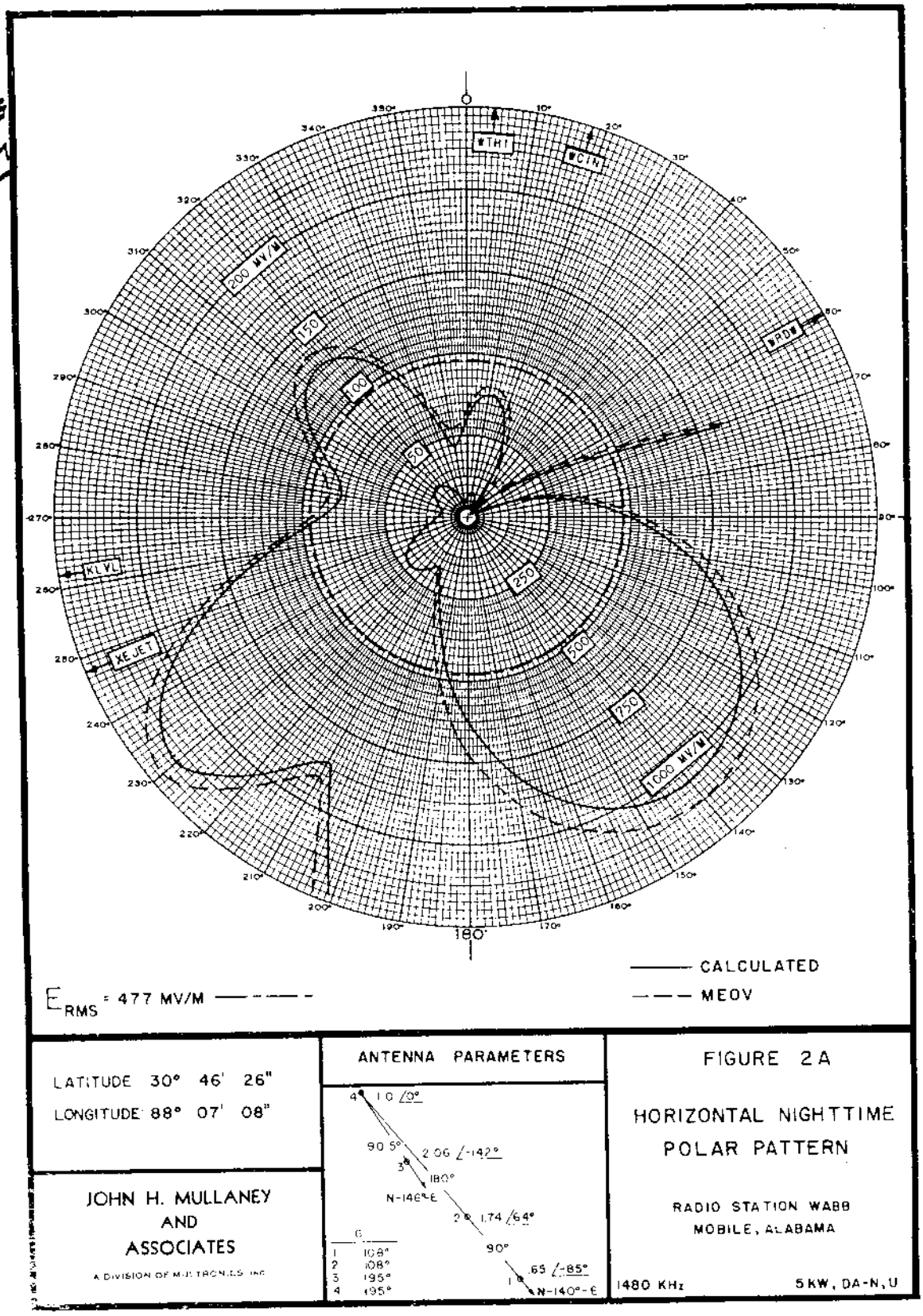
WABE

Proposed Night
(6-28-67ct)

Station WABB
Mobile, Alabama

5kw, DA-N, U
1480 kc

7-13-67
GRANTED
P
02 CHANGES
DA SYSTEM



FCC File No. BP-17760
Accepted 6-9-67

Station WABB
Mobile, Alabama

1480 kc

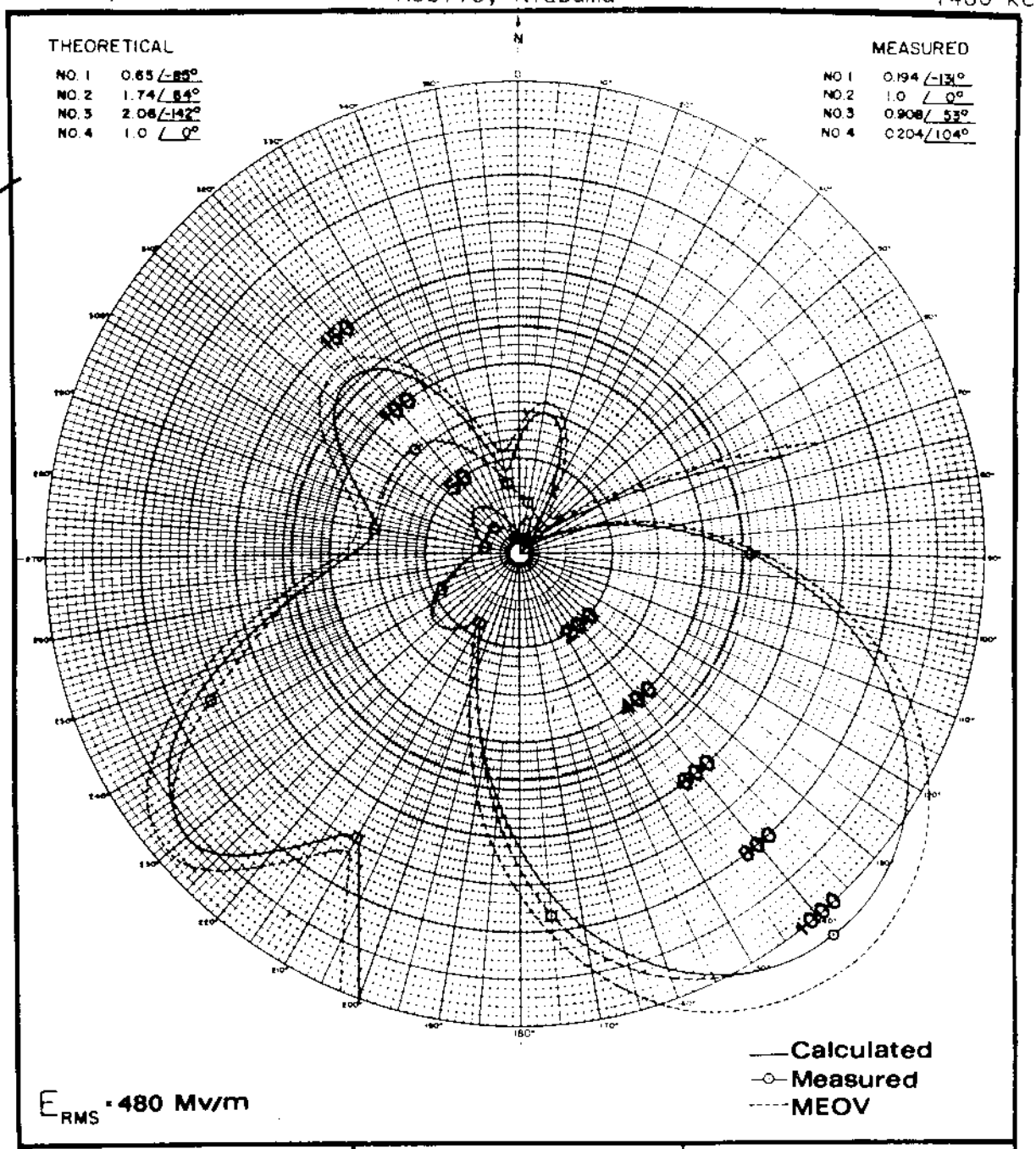
WABB

Measured Night
(6-28-68ct)

Station WABB
Mobile, Alabama

5kw, DA-N, U
1480 kc

7-17-68
GRANTED
LICENSE.



LATITUDE: 30° 46' 26"
LONGITUDE: 88° 07' 08"

ANTENNA PARAMETERS

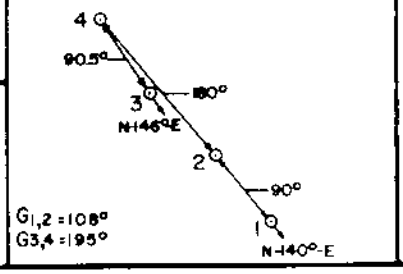


FIGURE 23

MEASURED NIGHTTIME DIRECTIONAL PATTERN

Radio Station **WABB**
Mobile, Alabama

1480 KHz 5 KW, DA-N, U

L. J. N. du Treil & Associates, Inc.
CONSULTING RADIO ENGINEERS
201 Nelson Drive
NEW ORLEANS, LA. 70123

FCC File No. BL-11985
Accepted 6-14-68

Station WABB
Mobile, Alabama

1480 kc

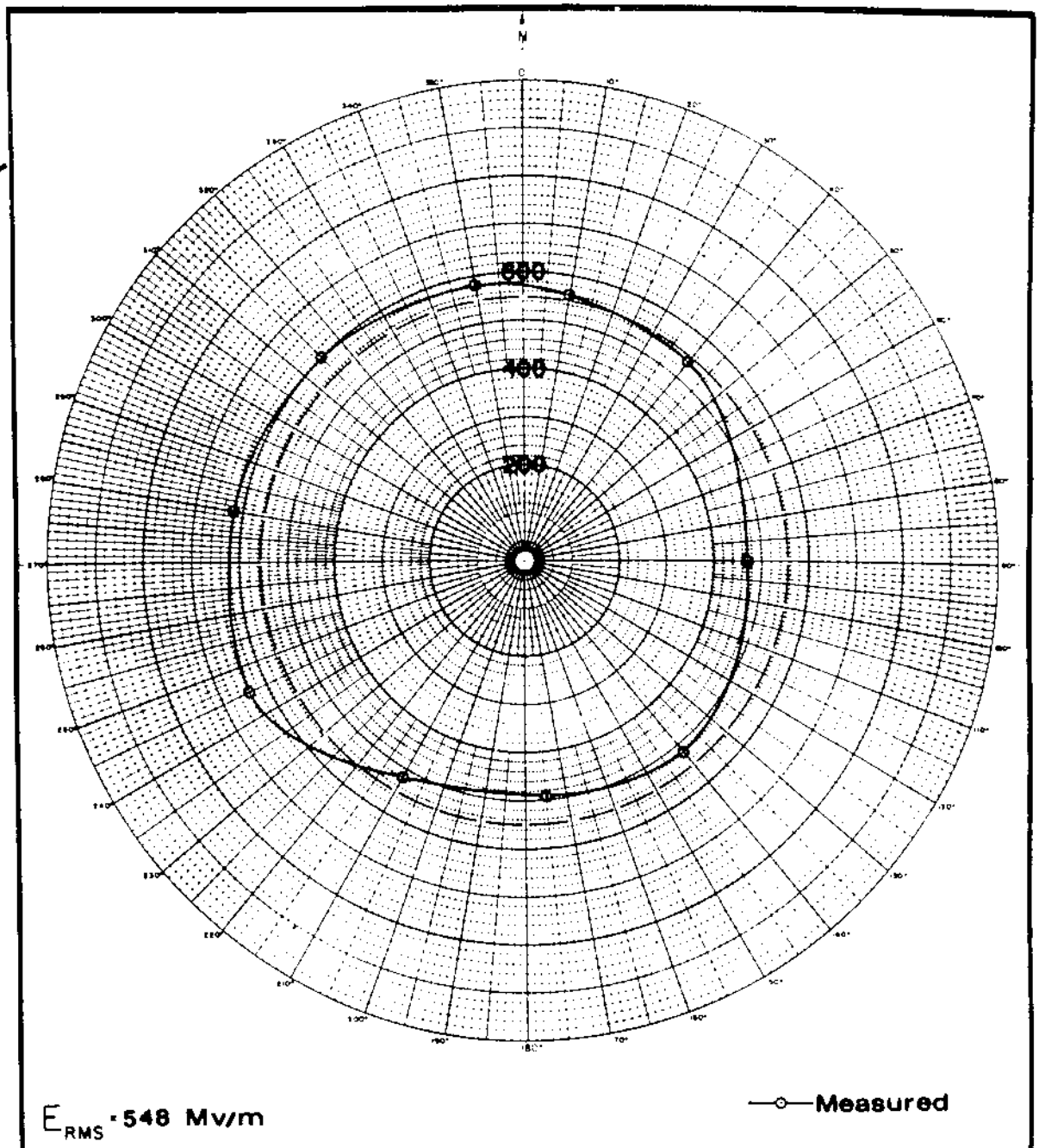
WABB

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

Station WABB
Mobile, Alabama

5kw,DA-N,U
1480 kc

7-17-68
GRANTED
LICENSE.



LATITUDE 30° 46' 26" LONGITUDE 88° 07' 08"	ANTENNA PARAMETERS	FIGURE 22
	TOWER NO. 3 5 KW	MEASURED NON-DIRECTIONAL PATTERN Radio Station **WABB** Mobile, Alabama
L. J. N. du Treil & Associates, Inc. CONSULTING RADIO ENGINEERS 201 Nelson Drive NEW ORLEANS, LA. 70123	G 3 = 195° / 360'	1480 KHz 5 KW, DA-N, U

FCC File No.BL-11985
Accepted 6-14-68

Station WABB
Mobile, Alabama

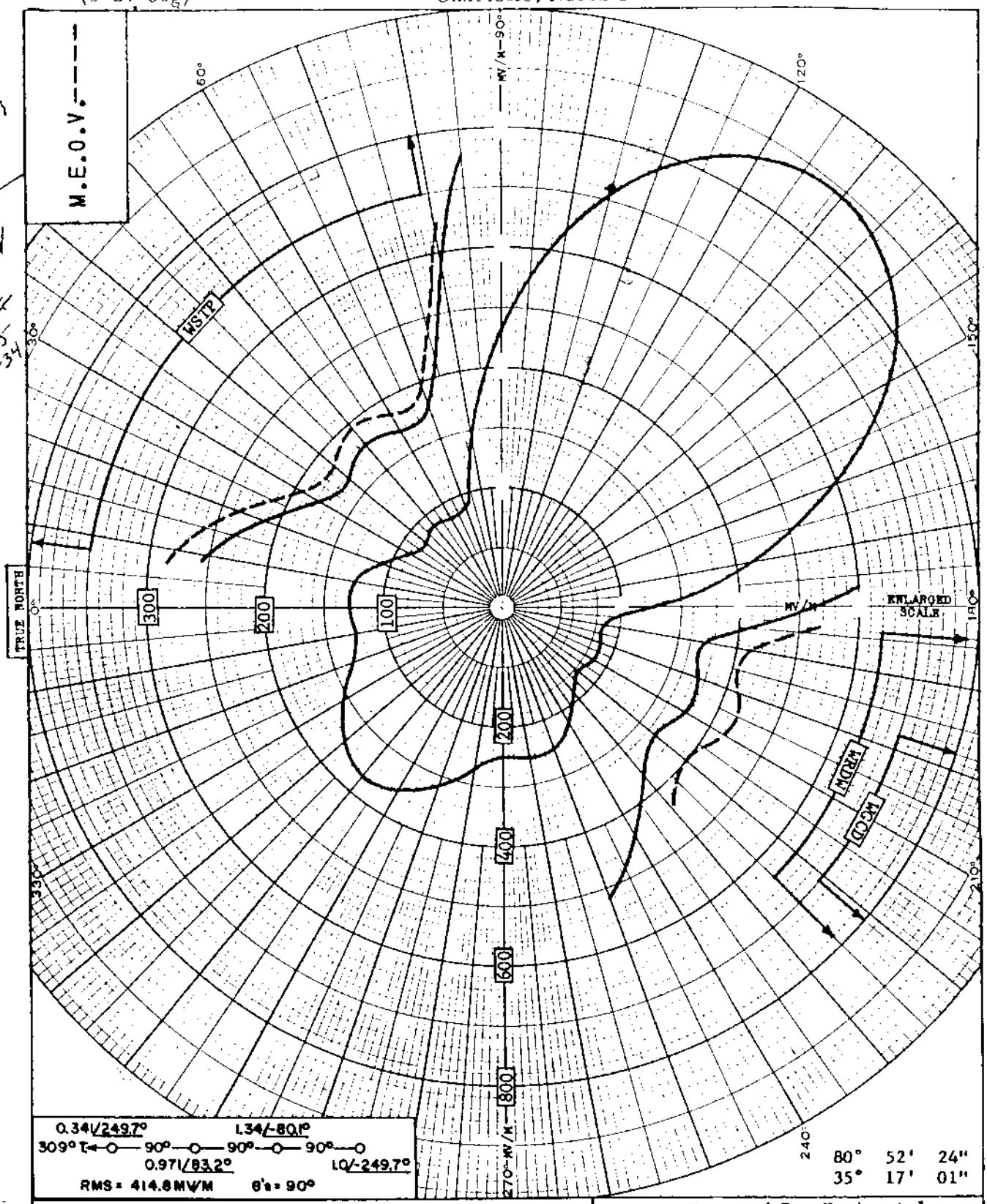
1480 kc

WAME

PROPOSED DAY
(5-27-60g)

Station WWOK
Charlotte, North Carolina

5kw, DA-2,U
1480 KC



COMMERCIAL RADIO EQUIPMENT CO. RADIO ENGINEERING CONSULTANTS WASHINGTON, D. C.	PATTERN: Proposed Day Horizontal
	FOR: WWOK, Charlotte, N. C.
	POWER: 5 KW FREQ: 1480 KC
	DATE: March 28, 1960

FCC File No. BP-14127
Accepted 5-20-60

WWOK
Charlotte, North Carolina

1480 KC

WAME

Measured Day
(10-30-63ct)

Station WWOK
Charlotte, North Carolina

5kw,DA-2,U
1480 kc

1

5/12/64 permitted to change power & ant. sys. location, increase power, & install DA-2

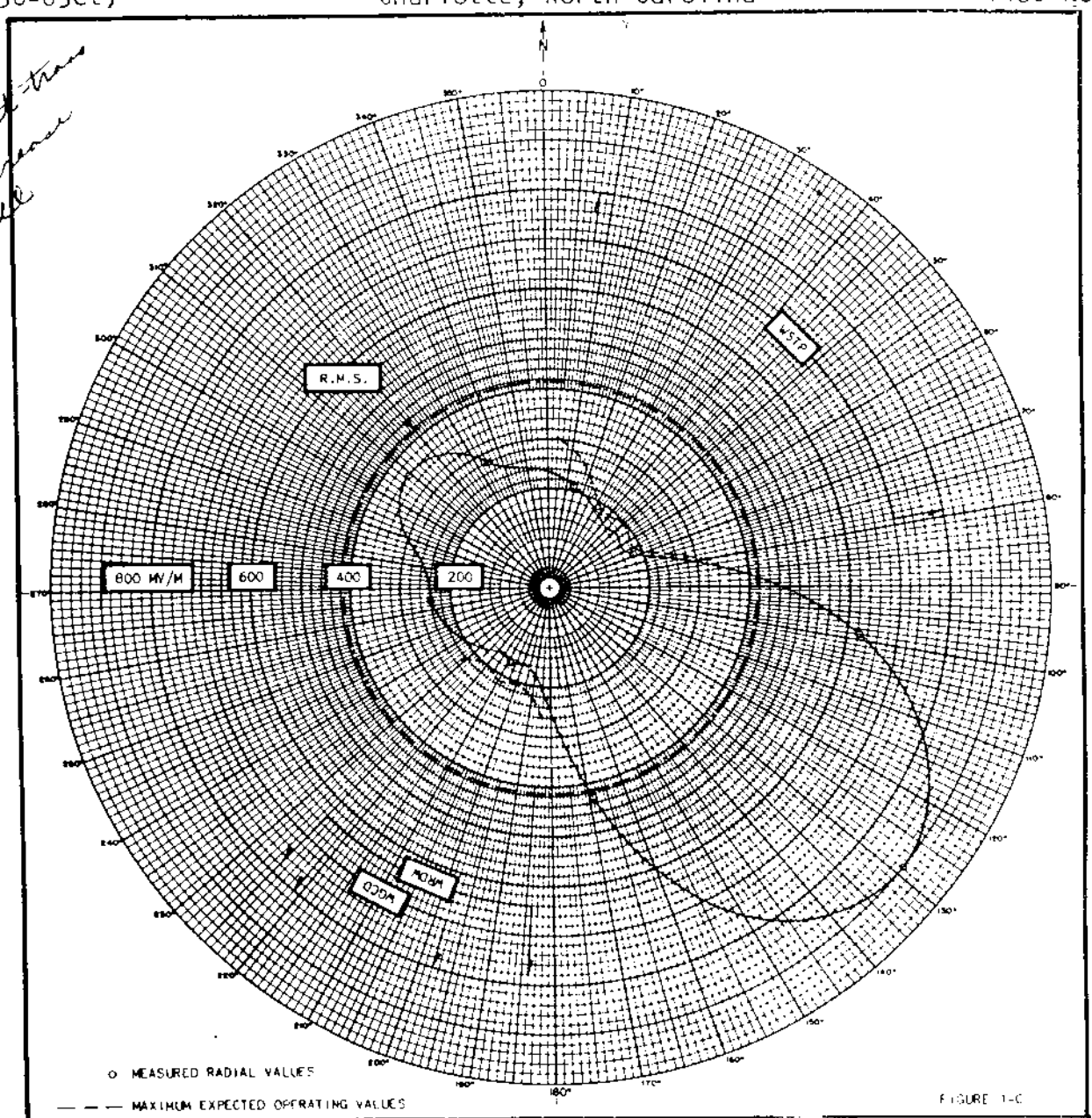
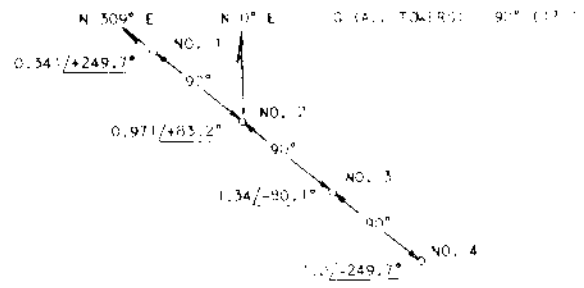


FIGURE 1-C

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION



APPLICANT	RADIO CHARLOTTE, INC. (WWOK)
LOCATION	CHARLOTTE, N. C.
FREQUENCY	1480 KC/S
POWER	5 KW-U (DA-2)
LATITUDE	35 DEG 17 MIN 15 SEC
LONGITUDE	80 DEG 52 MIN 34 SEC
WHEN USED	DAYTIME
R.M.S. FIELD	414 MV/M
DATE	AUGUST 1963

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

FCC File No.BL-10300
Accepted 10-7-63

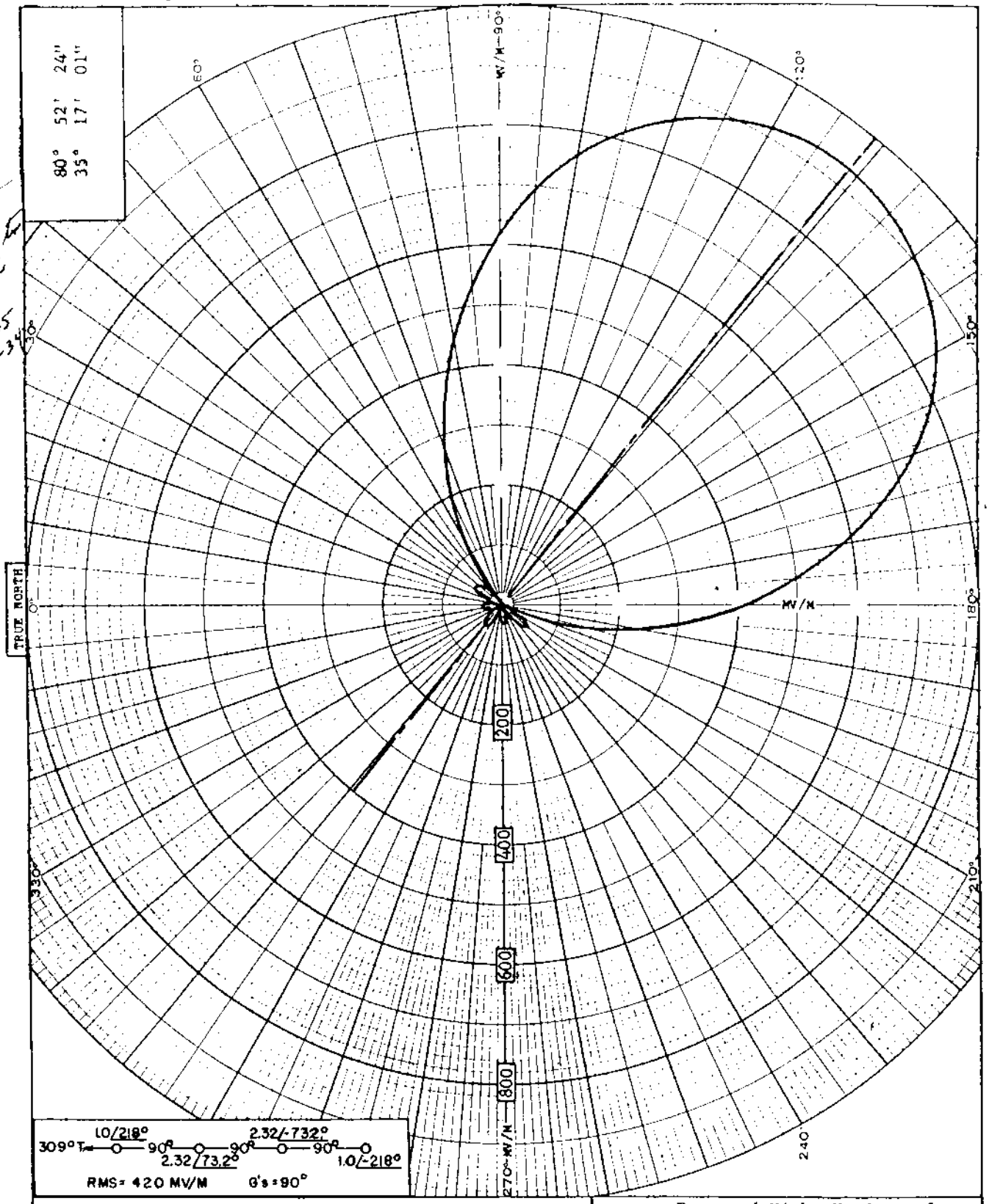
Station WWOK
Charlotte, North Carolina

1480 kc

WAME

PROPOSED NIGHT
(5-27-60g)

Station WWOK 5kw, DA-2,U
Charlotte, North Carolina 1480 KC



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

PATTERN: Proposed Night Horizontal
FOR: WWOK, Charlotte, N. C.
POWER: 5 KW FREQ: 1480 KC
DATE: March 28, 1960

FCC File No. BP-14127
Accepted 5-20-60

WWOK
Charlotte, North Carolina 1480 KC

WAME

Measured Night
(10-30-63ct)

Station WWOK
Charlotte, North Carolina

5kw,DA-2,U
1480 kc

5/13/64 granted cp to change hours & return location, increase power, & install DA-2

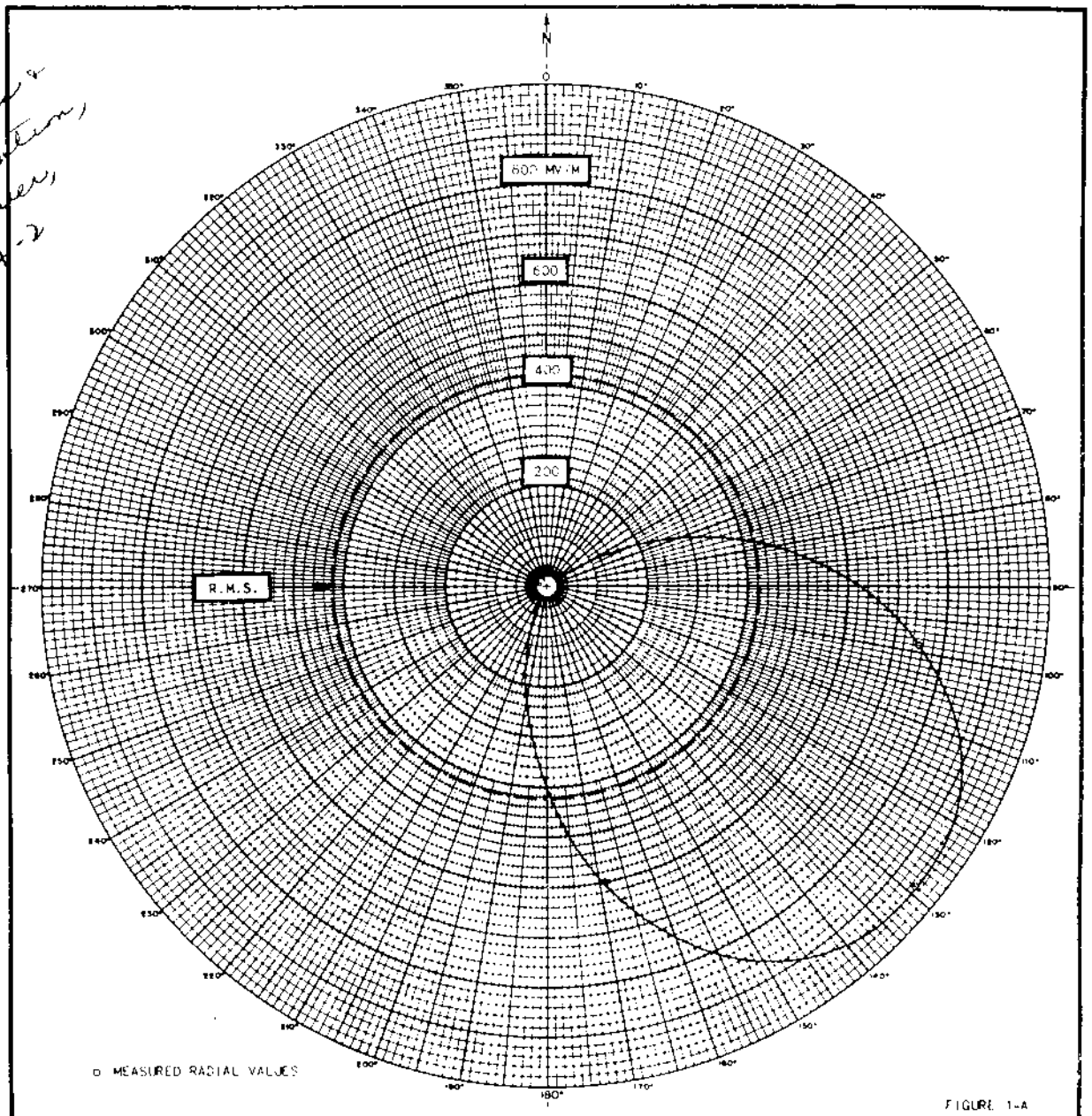
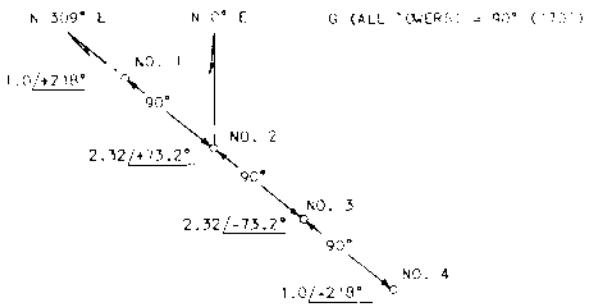


FIGURE 1-A

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION



APPLICANT	RADIO CHARLOTTE, INC. (WWOK)
LOCATION	CHARLOTTE, N. C.
FREQUENCY	1480 KC/S
POWER	5 KW-U (DA-2)
LATITUDE	35 DEG 17 MIN. 05 SEC.
LONGITUDE	80 DEG 52 MIN. 34 SEC.
WHEN USED	NIGHTTIME
R.M.S. FIELD	427 MV/M
DATE	AUGUST 1963

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

FCC File No.BL-10300
Accepted 10-7-63

Station WWOK
Charlotte, North Carolina

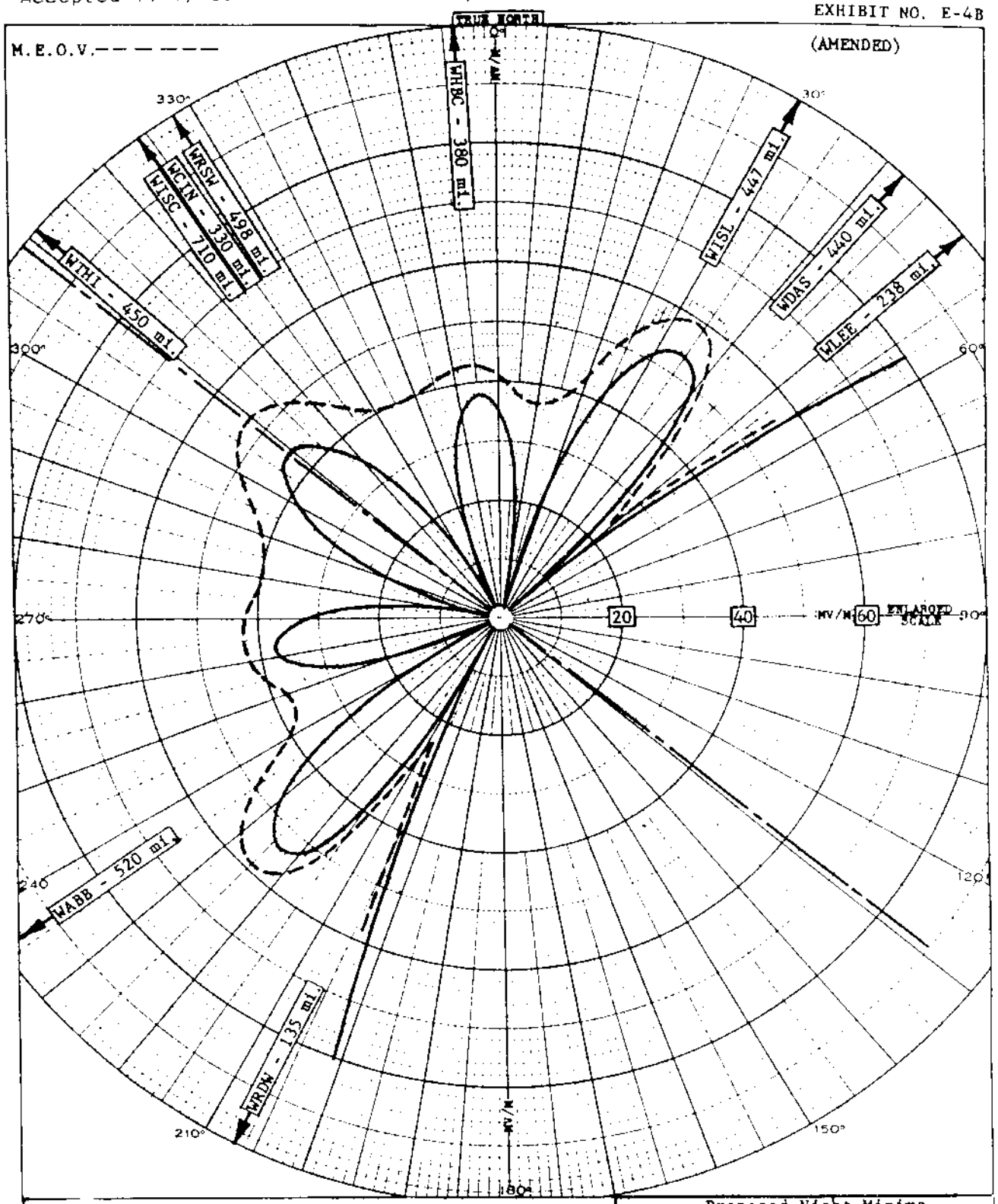
1480 kc

WAME

PROPOSED NIGHT NULLS
Accepted 11-17-60

Station WWOK
Charlotte, North Carolina

1480 KC
EXHIBIT NO. E-4B
(AMENDED)



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

PATTERN: Proposed Night Minima
FOR: WWOK, Charlotte, N. C.
POWER: 5 KW FREQ: 1480 KC
DATE: October 28, 1960

FCC File No. BP-14127 WWOK
Accepted 11-17-60 (Amended) Charlotte, North Carolina 1480 KC

WAME

Measured Night Nulls
(10-30-63ct)

Station WWOK
Charlotte, North Carolina

5kw,DA-2,U
1480 kc

5/12/64 granted pt. hours and ant. trans. locations increase power and install DA-2

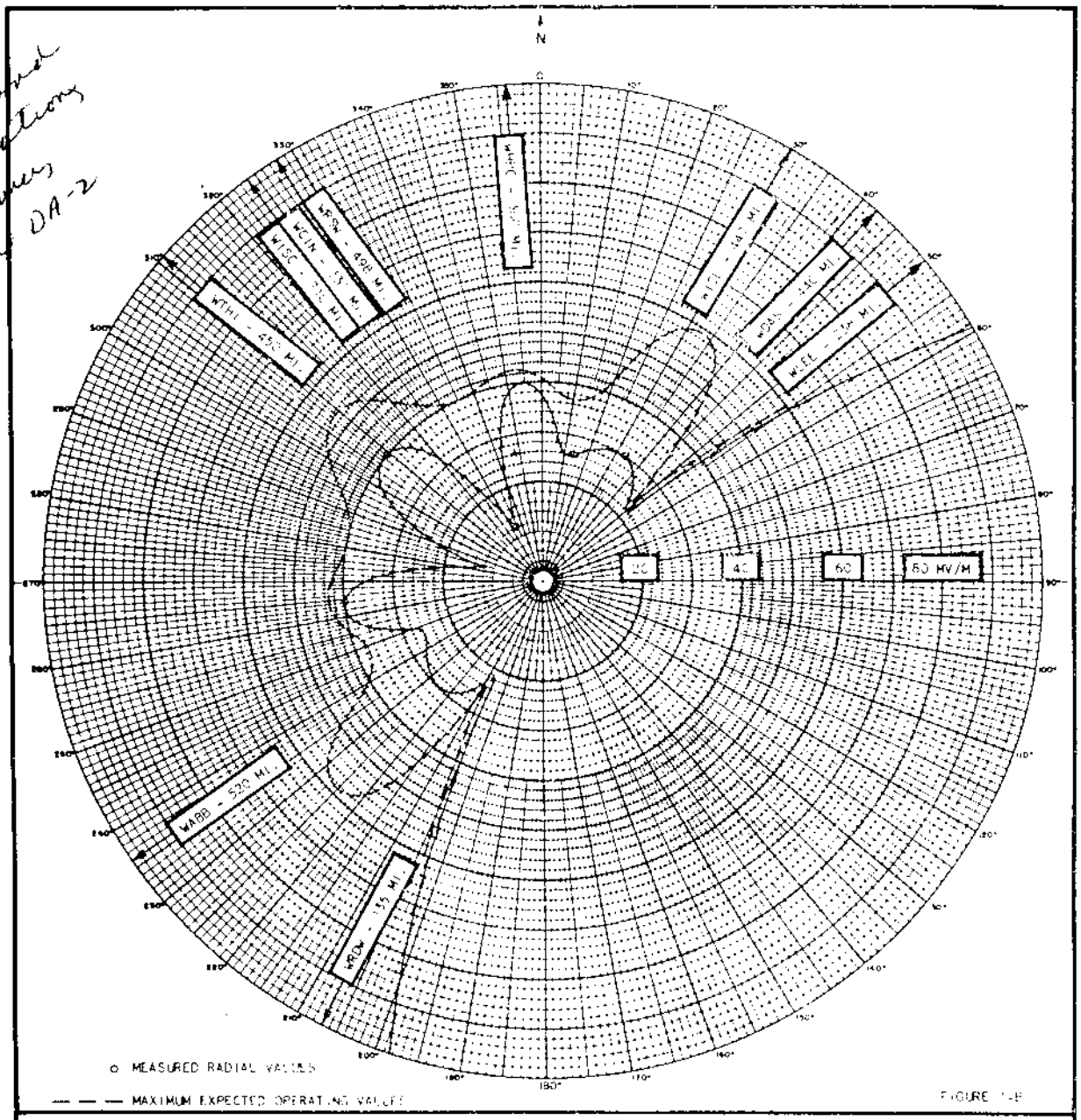


FIGURE 1-F

HORIZONTAL RADIATION PATTERN

EXPANDED VIEW

APPLICANT: Radio Charlotte, Inc. (WWOK)
LOCATION: Charlotte, N. C.
FREQUENCY: 1480 KC/S
POWER: 5 kw U (DA-2)
LATITUDE: 35 DEG 17 MIN 31 SEC
LONGITUDE: 80 DEG 52 MIN 24 SEC
WHEN USED: N. Guthrie
RMS FIELD: 420 MV/M
DATE: August 1963

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

FCC File No.BL-10300
Accepted 10-7-63

Station WWOK
Charlotte, North Carolina

1480 kc

WAME

Measured Non-DA
(10-30-63ct)

Station WWOK
Charlotte, North Carolina

5kw,DA-2,U
1480 kc 2

5/12/64 granted cp to change hours of ant. trans location, increase power & install DA-2

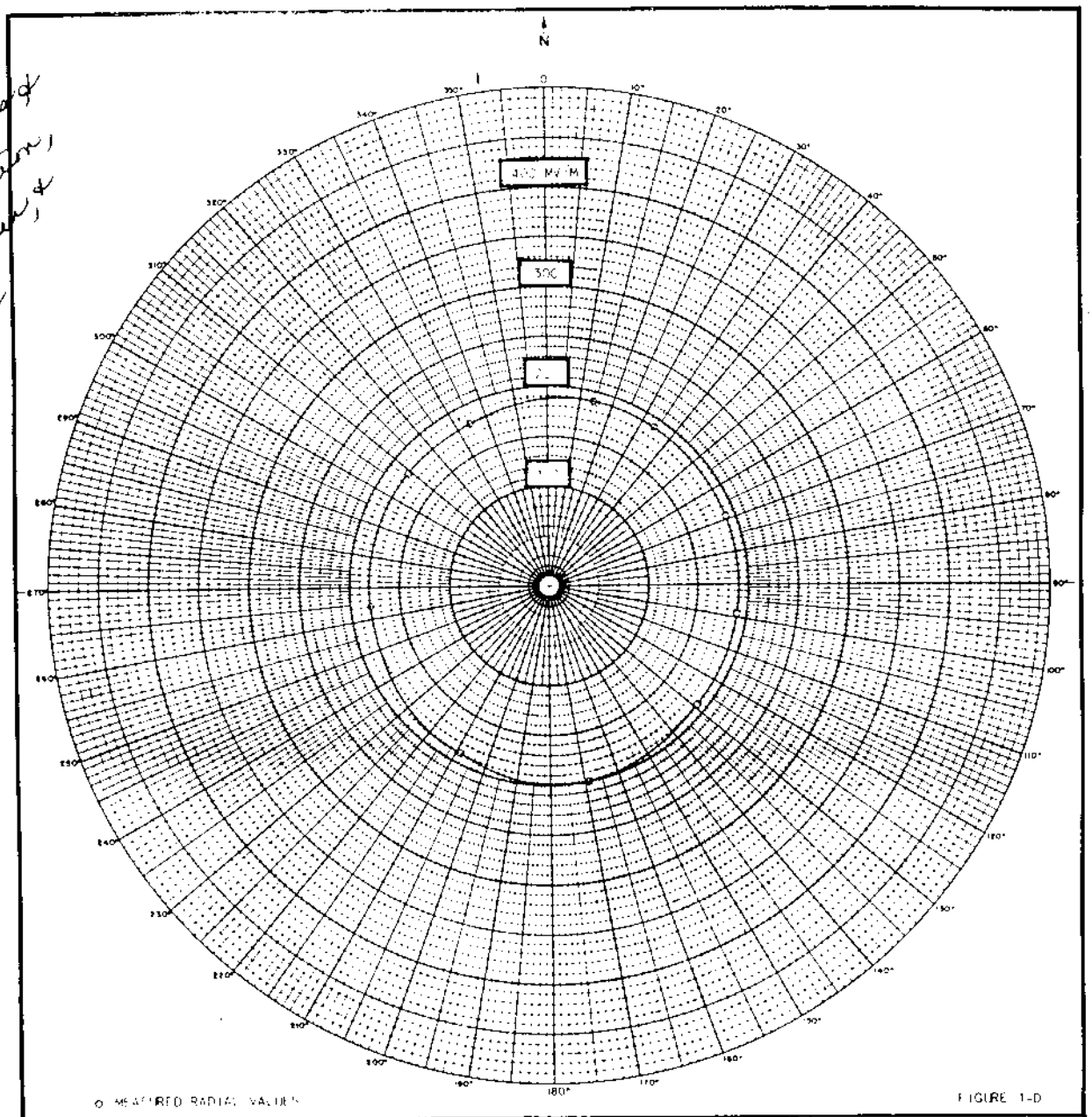


FIGURE 1-D

HORIZONTAL RADIATION PATTERN

NON-DIRECTIONAL SURVEY

APPLICANT	RADIO CHARLOTTE, INC. (WWOK)
LOCATION	CHARLOTTE, N. C.
FREQUENCY	1480 KC/S
POWER	1 KW
LATITUDE	35 DEG 11 MIN 17 SEC
LONGITUDE	80 DEG 52 MIN 24 SEC
WHEN USED	NON-DIRECTIONAL SURVEY
R.M.S. FIELD	180 MV/M
DATE	AUGUST 1963

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

FCC File No.BL-10300
Accepted 10-7-63

Station WOOK
Charlotte, North Carolina

1480 kc

CO
F

WCIN

DIRECTIONAL ANTENNA DESCRIPTION SHEET

MAY 29 1975

WASHINGTON, D.C.

tation: WCIN — Main Studio: Cincinnati, Ohio

Frequency: 1480 kHz — Power: 0.5 kW Night 5 kW Day

Notification List No. 1608 — Date: November 27, 1974 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:
North Latitude: 39° 09' 19"
West Longitude: 84° 30' 03"

ANTENNA CHARACTERISTICS

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

TOWER:	W(#5)	SW(#4)	SC(#3)	NC(#2)	NE(#1)
HEIGHT ABOVE INSULATORS:	150' (81.2°)	419.4'	419.4'	419.4'	419.4' (227.2°)
NIGHT PHASING:	-	-126.53°	+40.23°	-159.2°	0°
NIGHT FIELD RATIO:	-	0.25	0.876	1.24	1
DAY PHASING:	+30°	0°	-116°	-	-
DAY FIELD RATIO:	0.645	1	0.161	-	-

SPACING AND ORIENTATION: Adjacent elements #4 thru #1 are spaced 166.1' (90°) on a line bearing 51.5° true.

Tower #5 is spaced 240' (130°) on a line bearing 339° true from tower #4.

GROUND SYSTEM: 120-166' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

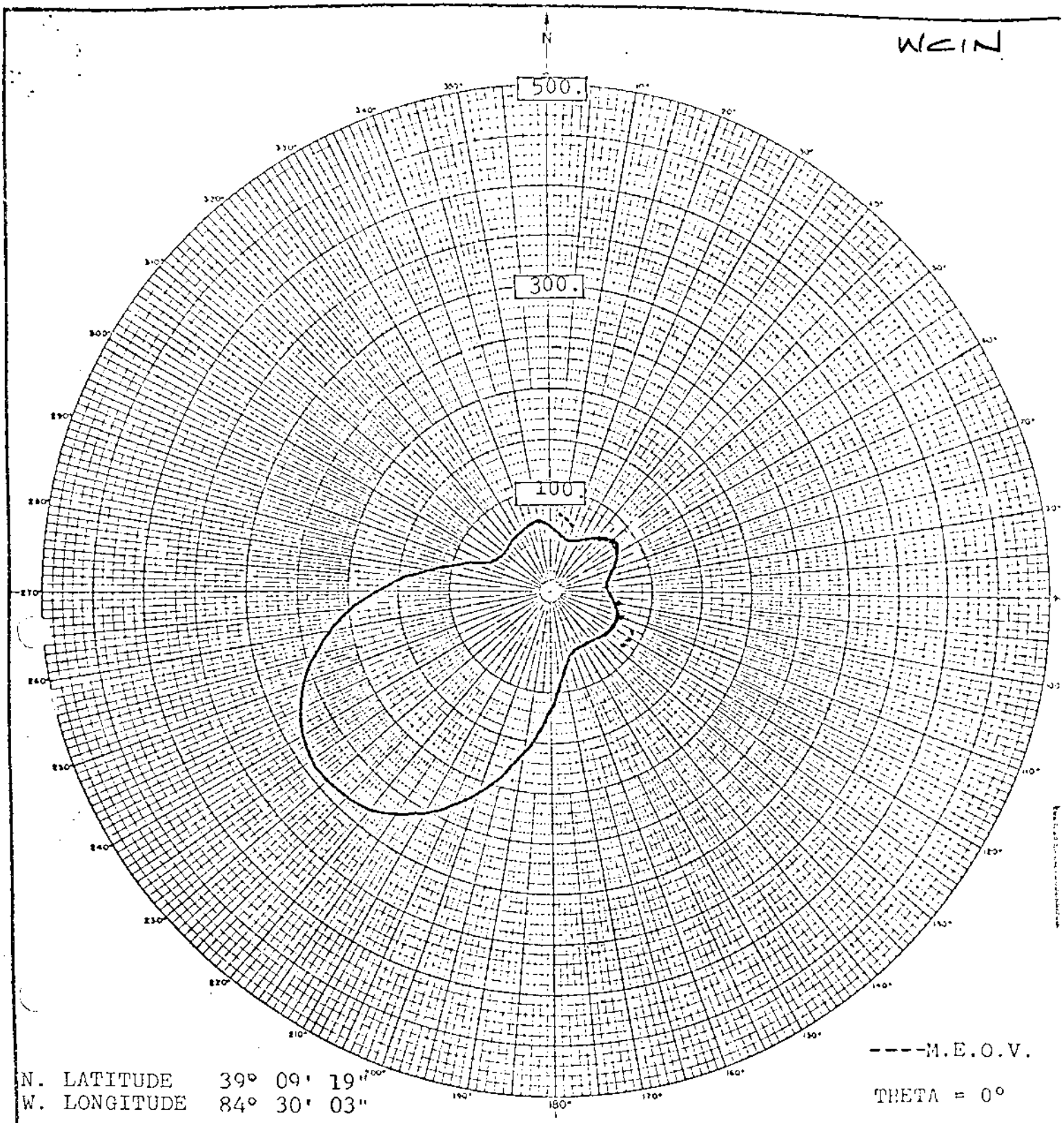
Predicted effective Night Field: 136 mv/m at rated power.

Predicted effective Day Field: 408 mv/m at rated power.

Note: This notification concerns changes to add meovs of radiation to the directional antenna patterns and corrections to heights of antennas.

AR NO 31194A5

WCIN



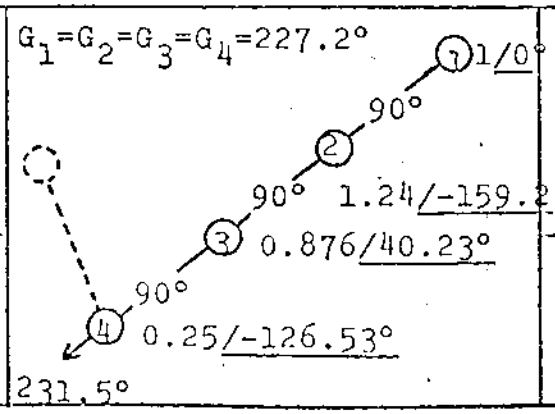
N. LATITUDE 39° 09' 19"
W. LONGITUDE 84° 30' 03"

E_{RSS} = 317.378

E_{RMS} = 136.000

RSS/RMS = 2.334

$G_1=G_2=G_3=G_4=227.2°$



RADIO STATION WCIN
CINCINNATI, OHIO
PROPOSED NIGHT PATTERN
1480 KHz. 0.5 KW DA-N

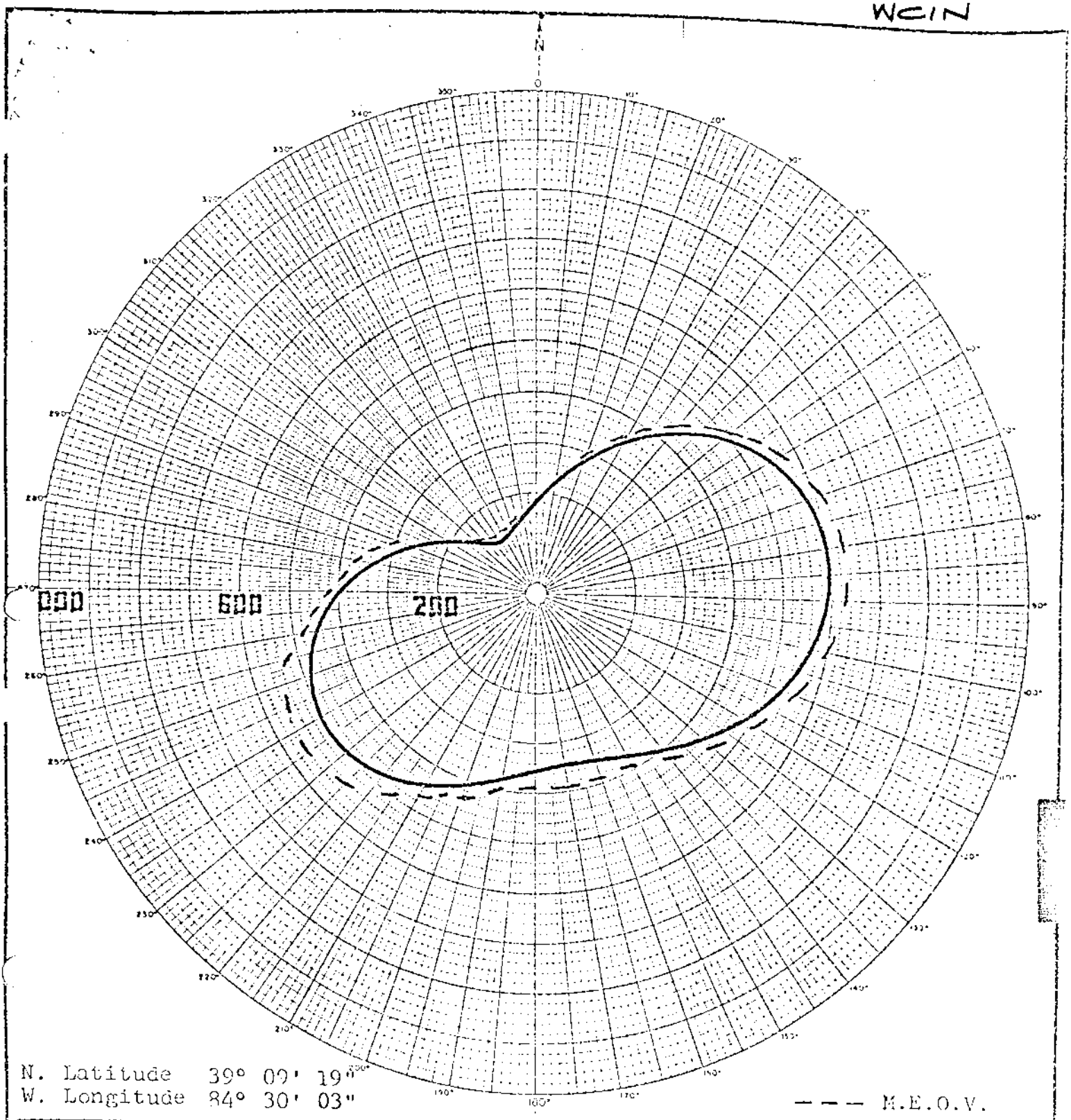
JOHN H. MULLANEY

CONSULTING
RADIO ENGINEER

FIGURE 6 A

AMENDED

WCIN



E_{RSS} = 406.829

E_{RMS} = 408.000

RSS/RMS = 0.997

$G_3=G_4=227.2°$ $G_5=81.2°$

339°T .645/30°

51.5°T .161/-116°

130°

90°

1/ 0°

RADIO STATION WCIN
CINCINNATI, OHIO
PROPOSED DAY PATTERN
1480 KHz 5-0.5 KW DA-2

JOHN H. MULLANEY

CONSULTING
RADIO ENGINEER

FIGURE 3

AMENDED 10/31/74

JOHN H. MULLANEY AND ASSOCIATES

Form 69 Report 69 ix

TABLE XIII

INVERSE FIELDS BASED ON RADIAL MEASUREMENT DATA

RADIO STATION WCIN
CINCINNATI, OHIO

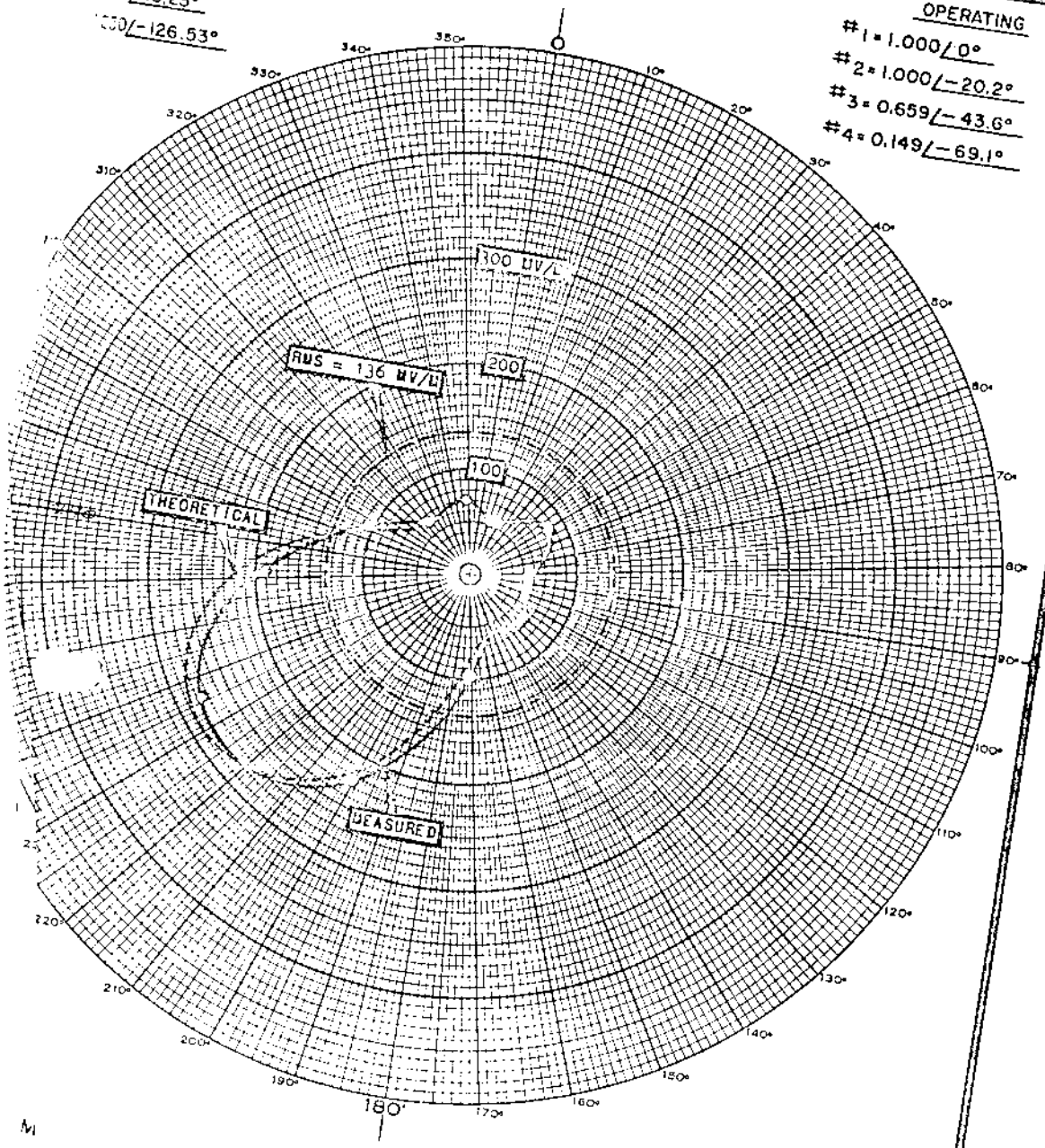
1480 KHz - 0.5 KW / 5 KW - D - DA-2

RADIAL	BEARING (DEGREES)	MEASURED FIELD - MV/M NON-DA	DA-D	DA-N
A	14	200	275	52
B	51.5	220	480	83
C	89	275	580	55
D	122	300	520	65
E	169	250	340	98
F	200	275	390	225
G	236	265	530	275
H	262	260	470	190
I	288	210	260	105
J	314	255	---	63
K	325	260	125	--
L	348	240	160	70

From 69 report

ETICAL
00/0°
240/-159.2°
70/40.23°
250/-126.53°

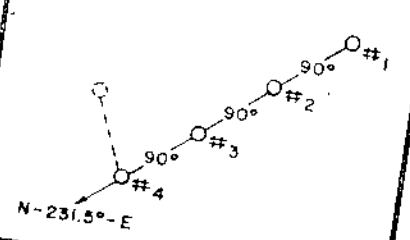
OPERATING
#1 = 1.000/0°
#2 = 1.000/-20.2°
#3 = 0.659/-43.6°
#4 = 0.149/-69.1°



9' 19"
03"

ANTENNA PARAMETERS

θ1, 2, 3 & 4 = 227.2°



⊙ RADIAL VALUES

FIGURE 16

NIGHTTIME DIRECTIONAL HORIZONTAL POLAR PATTERN

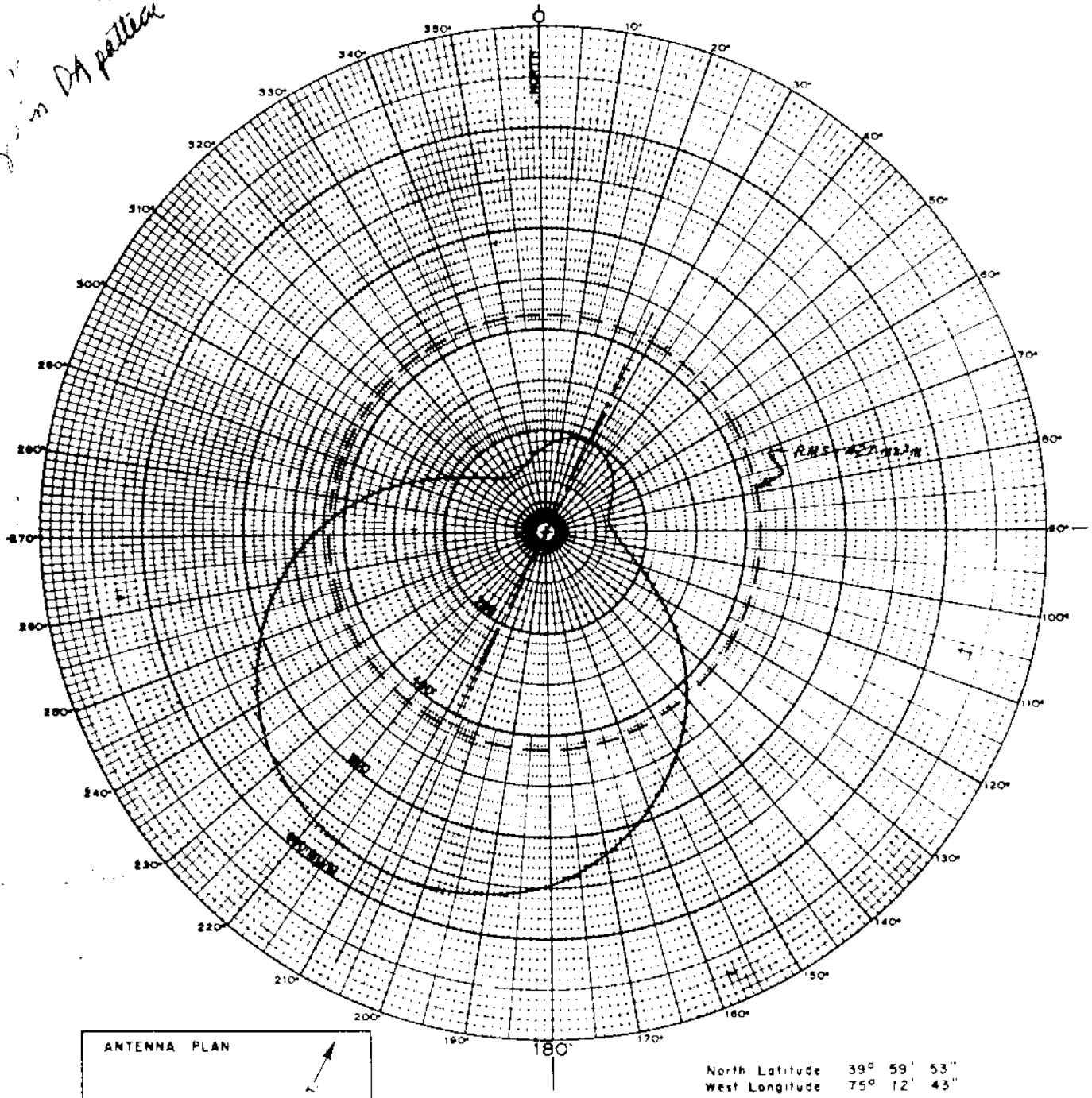
RADIO STATION WCIN
CINCINNATI, OHIO

1480 KHz

PROPOSED DAY
(7-26-61ct)

Station WDAS 1kw,5kw-LS,DA-2 U
Philadelphia, Pennsylvania 1480 KC

9/6/61 granted of w/ change in DA pattern



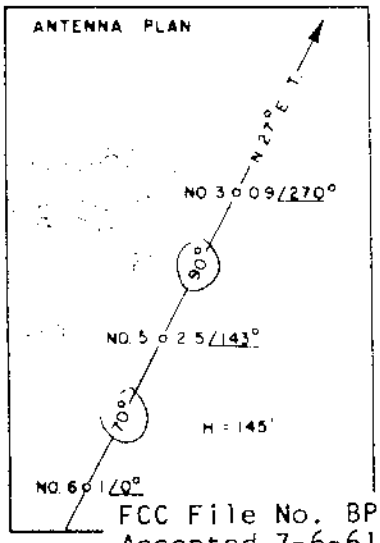


FIGURE 1
HORIZONTAL RADIATION PATTERN
(PROPOSED DAYTIME OPERATION)
MAX M. LEON, INC.
WDAS 1 KW, 5 KW-LS, DA-2 1480 KC
PHILADELPHIA, PENNSYLVANIA
Prepared by
Lohnes and Culver *Washington 4, D.C.*

FCC File No. BP-14897
Accepted 7-6-61

WDAS
Philadelphia, Pennsylvania 1480 KC

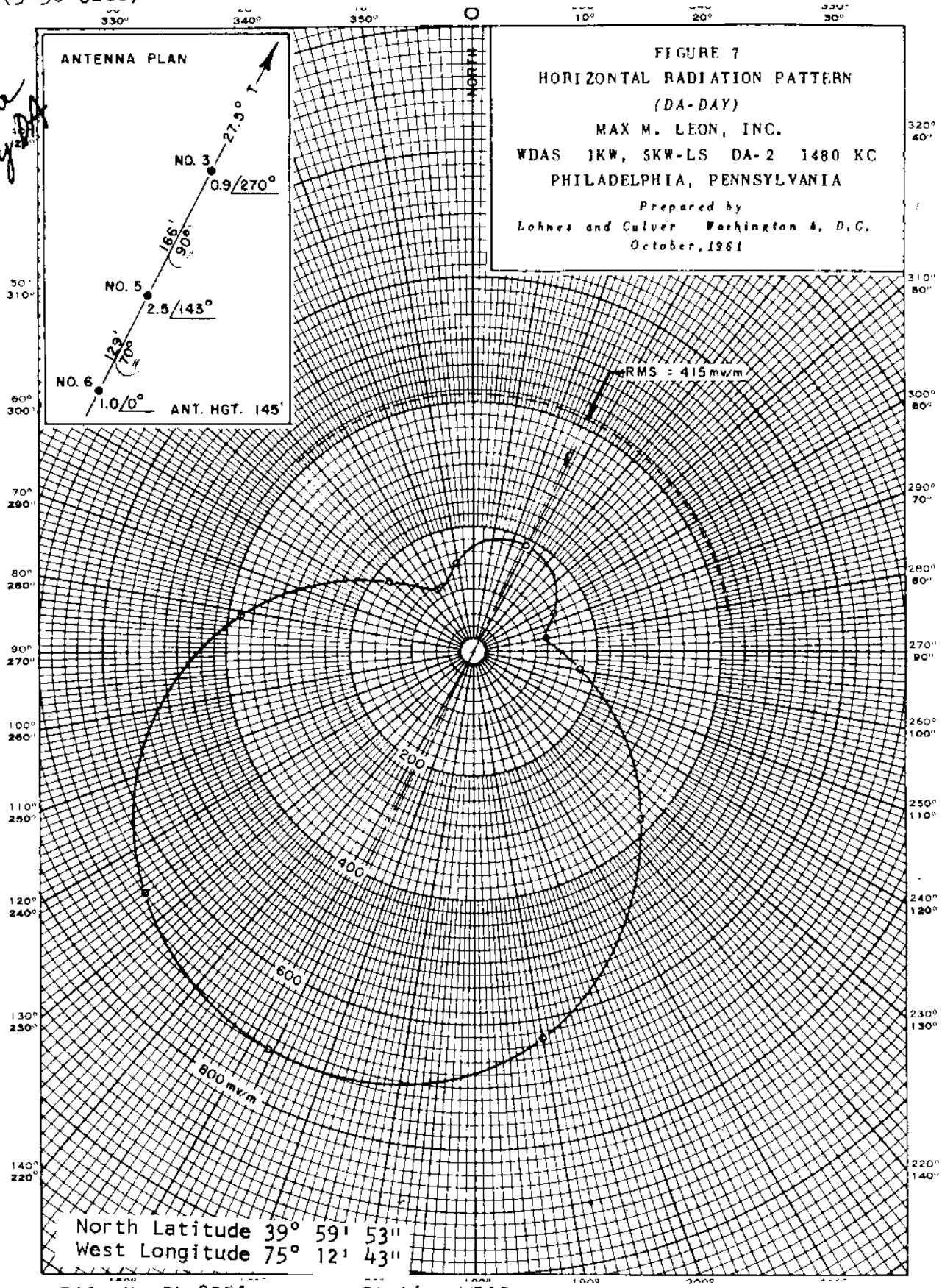
WDAS

Measured Day
(3-30-62ct)

Station WDAS
Philadelphia, Pennsylvania

1kw,5kw-LS,DA-2,U
1480 kc

3-22-63 printed I for changes in day DA pattern.



FCC File No.BL-8951
Accepted 3-13-62

Station WDAS
Philadelphia, Pennsylvania

1480 kc

WDAS

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

Station WDAS
Philadelphia, Pennsylvania

1kw,5kw-LS,DA-2,U
1480 kc

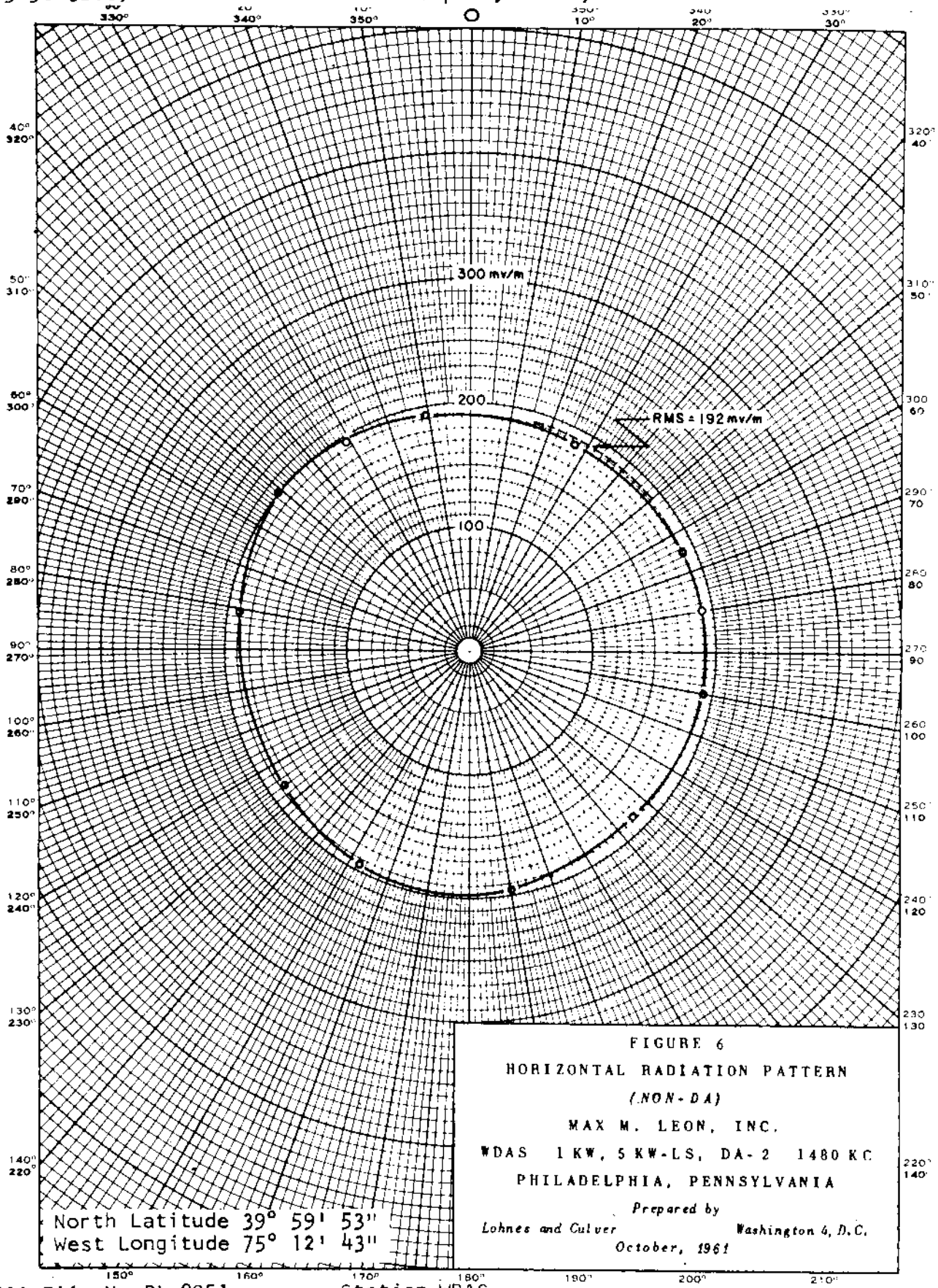


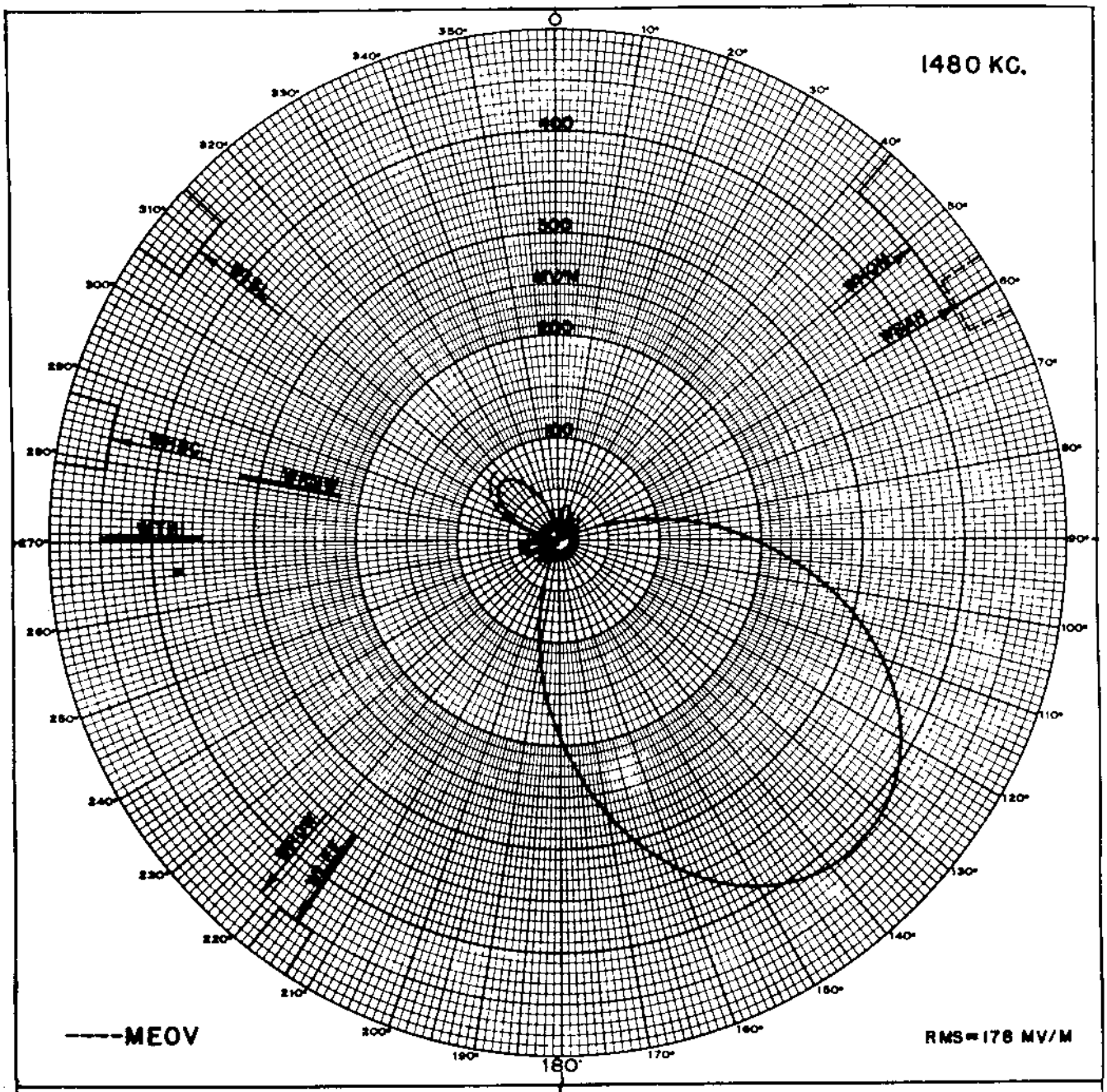
FIGURE 6
HORIZONTAL RADIATION PATTERN
(NON-DA)
MAX M. LEON, INC.
WDAS 1 KW, 5 KW-LS, DA-2 1480 KC
PHILADELPHIA, PENNSYLVANIA
Prepared by
Lohnes and Culver *Washington 4, D.C.*
October, 1961

FCC File No.BL-8951
Accepted 3-13-62

Station WDAS
Philadelphia, Pennsylvania

1480 kc

WDAS



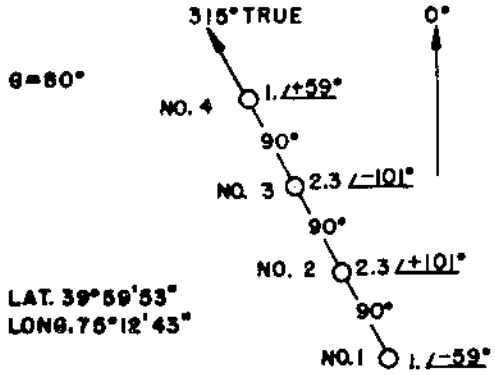


FIGURE 1-A
PROPOSED NIGHTTIME
HORIZONTAL PLANE RADIATION PATTERN
MAX M. LEON, INC.

WDAS PHILADELPHIA, PENNSYLVANIA

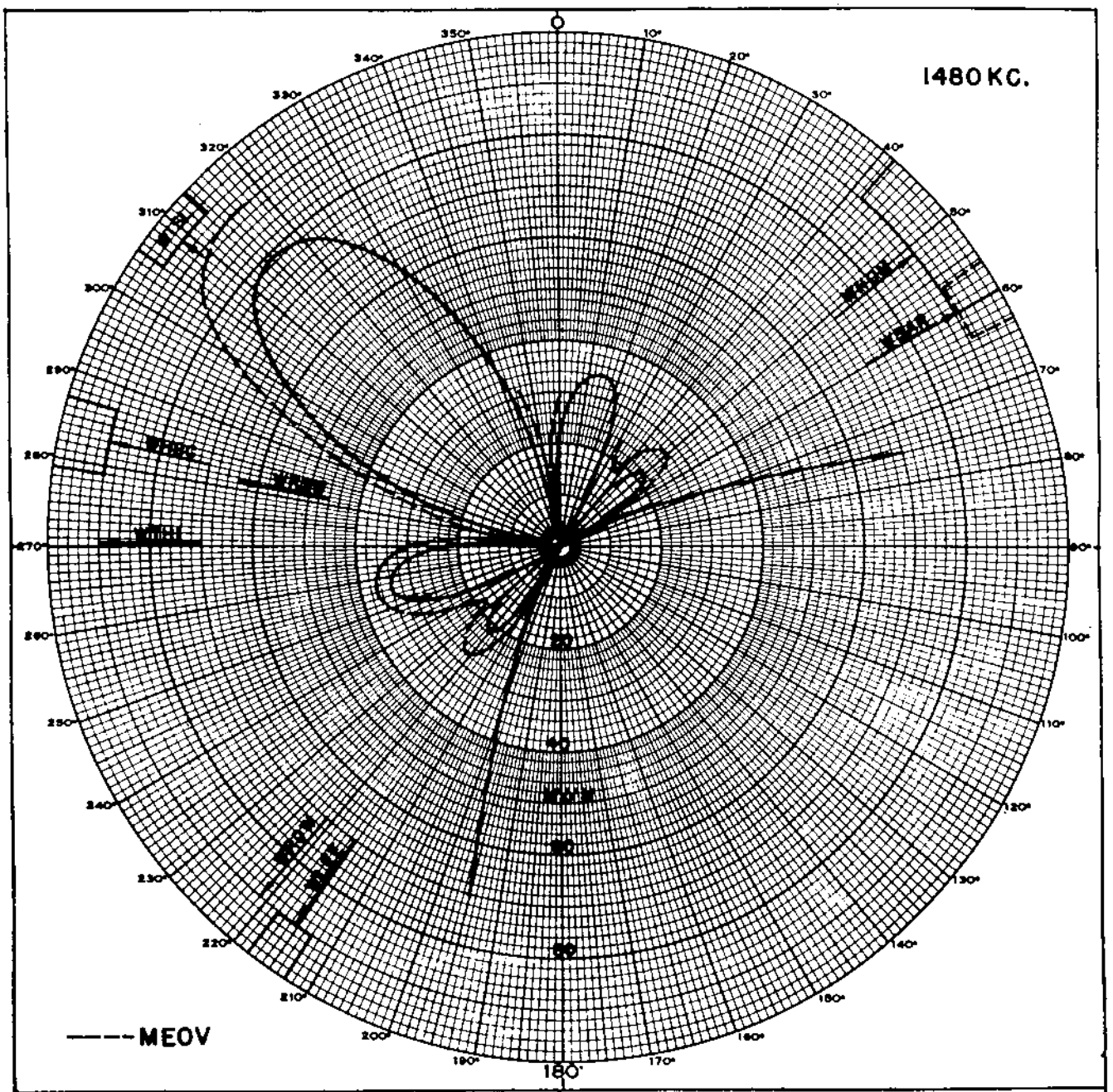
1480 kc 1. kw U DA-2

E. C. PAGE
CONSULTING RADIO ENGR'S.
WASHINGTON, D.C.

VRE-JC 14 MAY 1952

WDAS

PROPOSED NIGHT NULLS | WDAS, PHILADELPHIA, PA. 7/2/52G | 1 KW, U, DA-2 | 1480 KC



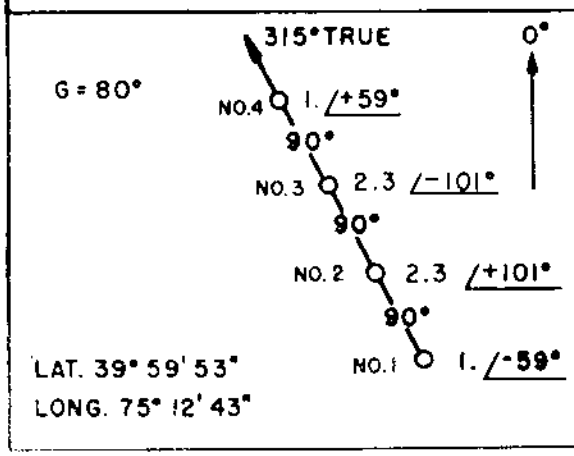


FIGURE 1-B
EXPANDED MINIMA OF NIGHTTIME
HORIZONTAL PLANE RADIATION PATTERN
MAX M. LEON, INC.
WDAS PHILADELPHIA, PENNSYLVANIA
1480 kc 1. kw U DA-2
E.C. PAGE
CONSULTING RADIO ENGR'S.
WASHINGTON, D.C.
VRE-JC 14 MAY, 1952

APPL RECD 6/3/52 ACC 6/16/52 BP-8508 WDAS, PHILADELPHIA, PA. 1480 KC

WDAS

Measured Night
10/6/55G

STATION WDAS
PHILADELPHIA, PA.

1 KW
DA-2, U

1480 KC

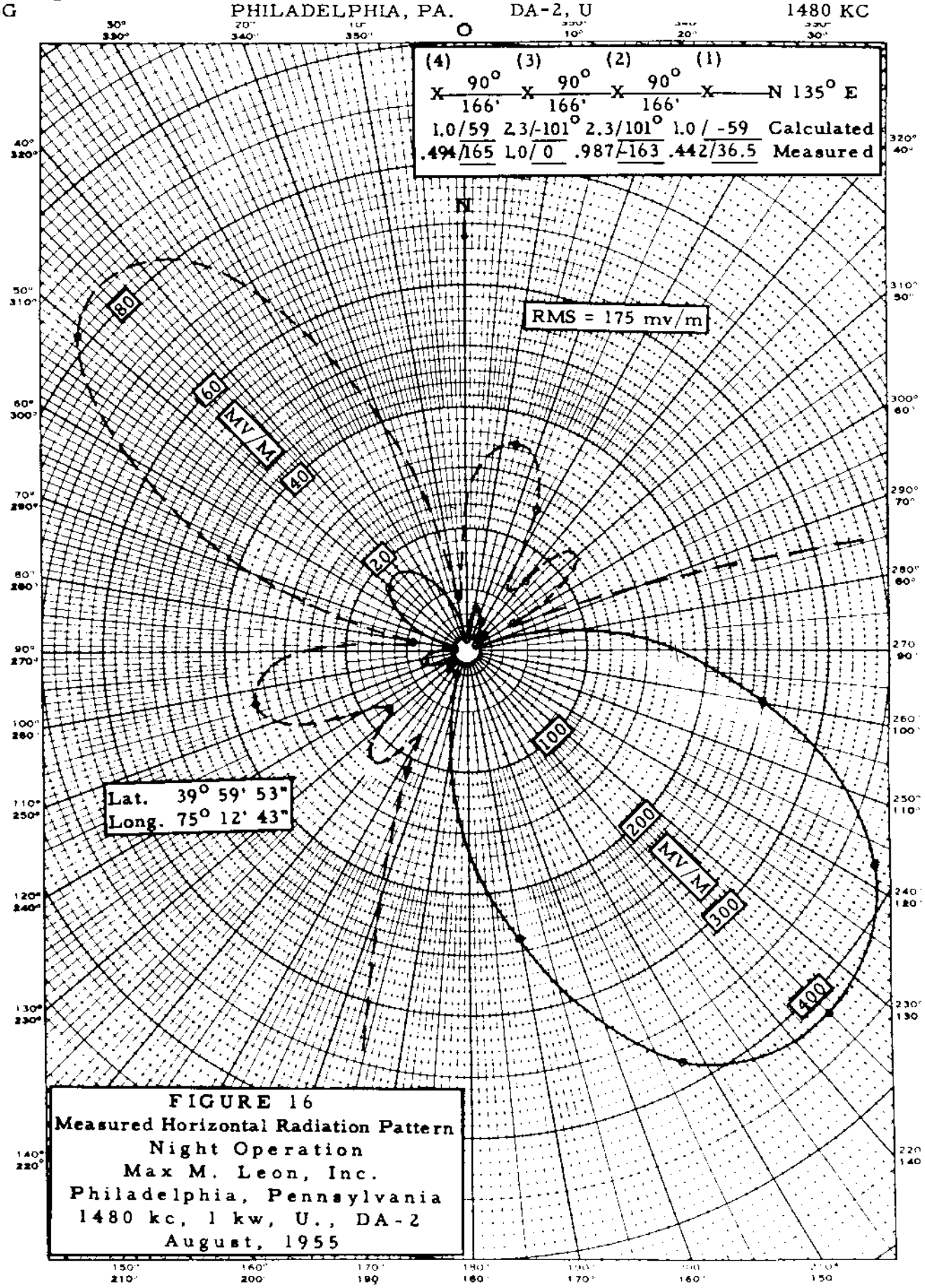


FIGURE 16
Measured Horizontal Radiation Pattern
Night Operation
Max M. Leon, Inc.
Philadelphia, Pennsylvania
1480 kc, 1 kw, U., DA-2
August, 1955

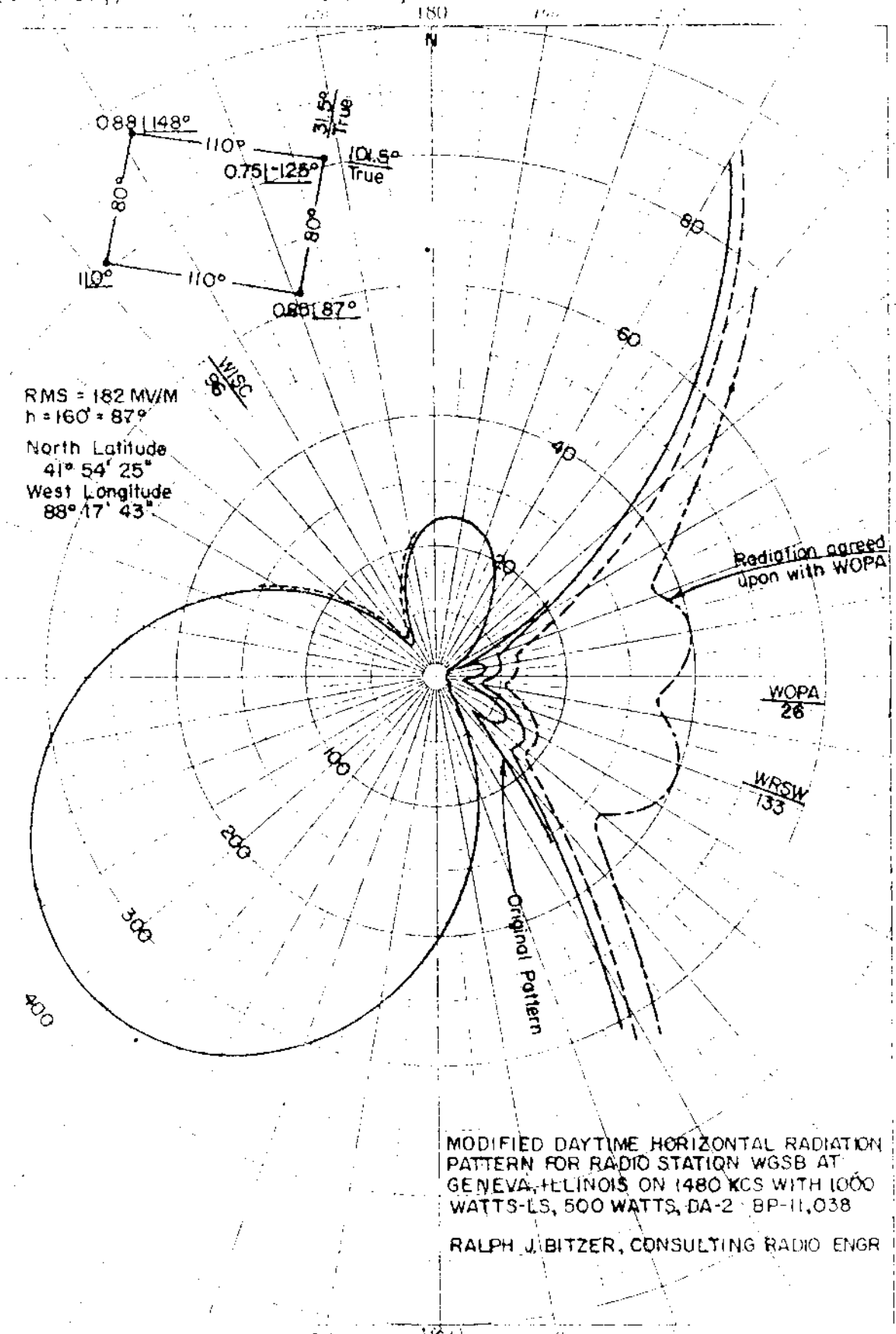
File No. BL-5837 Accepted 9/1/55 WDAS, PHILADELPHIA, PA. 1480 KC

WGSB

PROPOSED DAY
(6-14-61q)

Station WGSB
Geneva, Illinois

500w, 1kw-LS, DA-2,U
1480 KC



FCC File No. BMP-9413
Accepted 5-11-61 (Amended)

WGSB
Geneva, Illinois

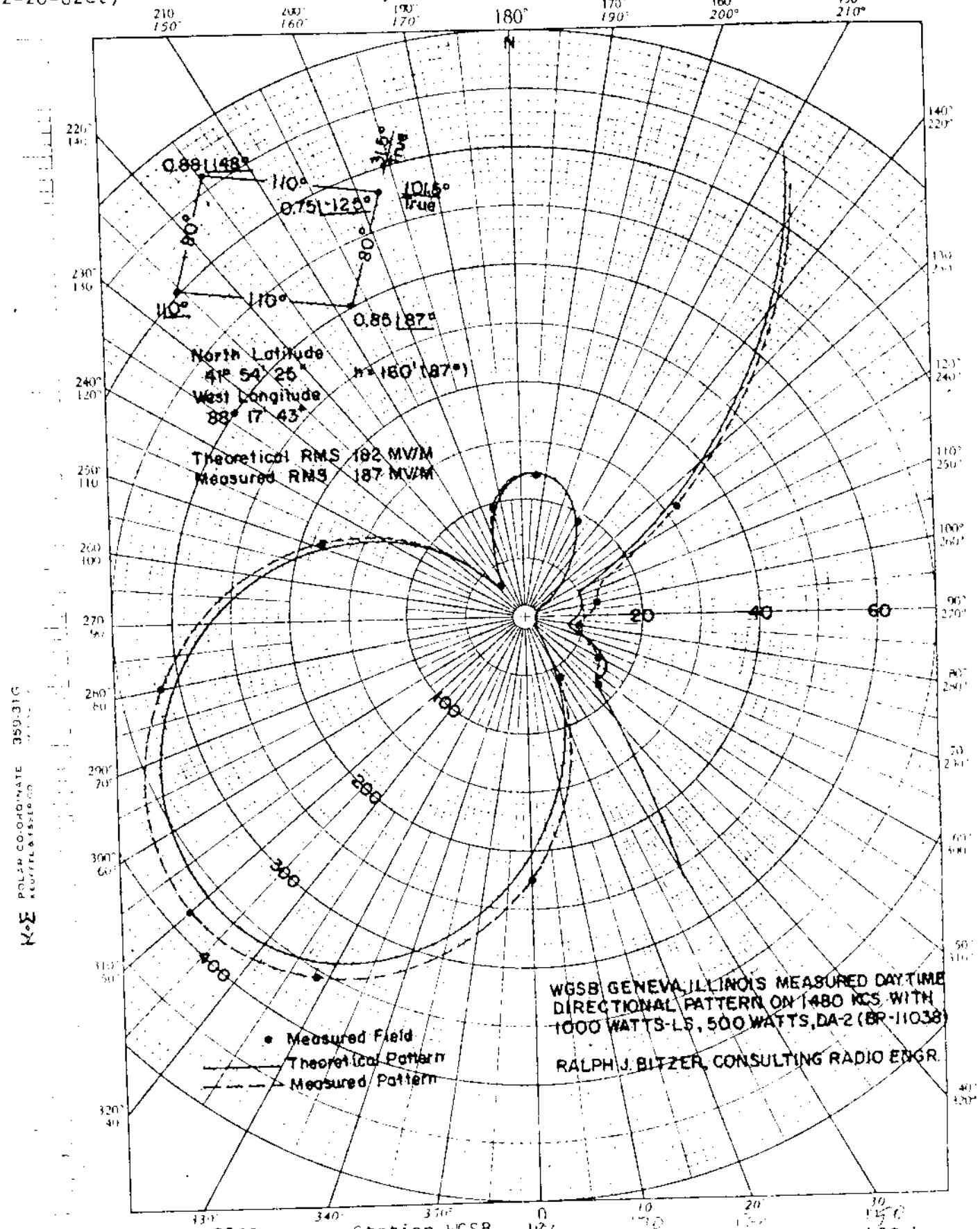
1480 KC

WGSB

Measured Day
(2-28-62ct)

Station WGSB
Geneva, Illinois

500w, 1kw-LS, DA-2, U
1480 kc



FCC File No. BL-8860
Accepted 1-23-62

Station WGSB
Geneva, Illinois

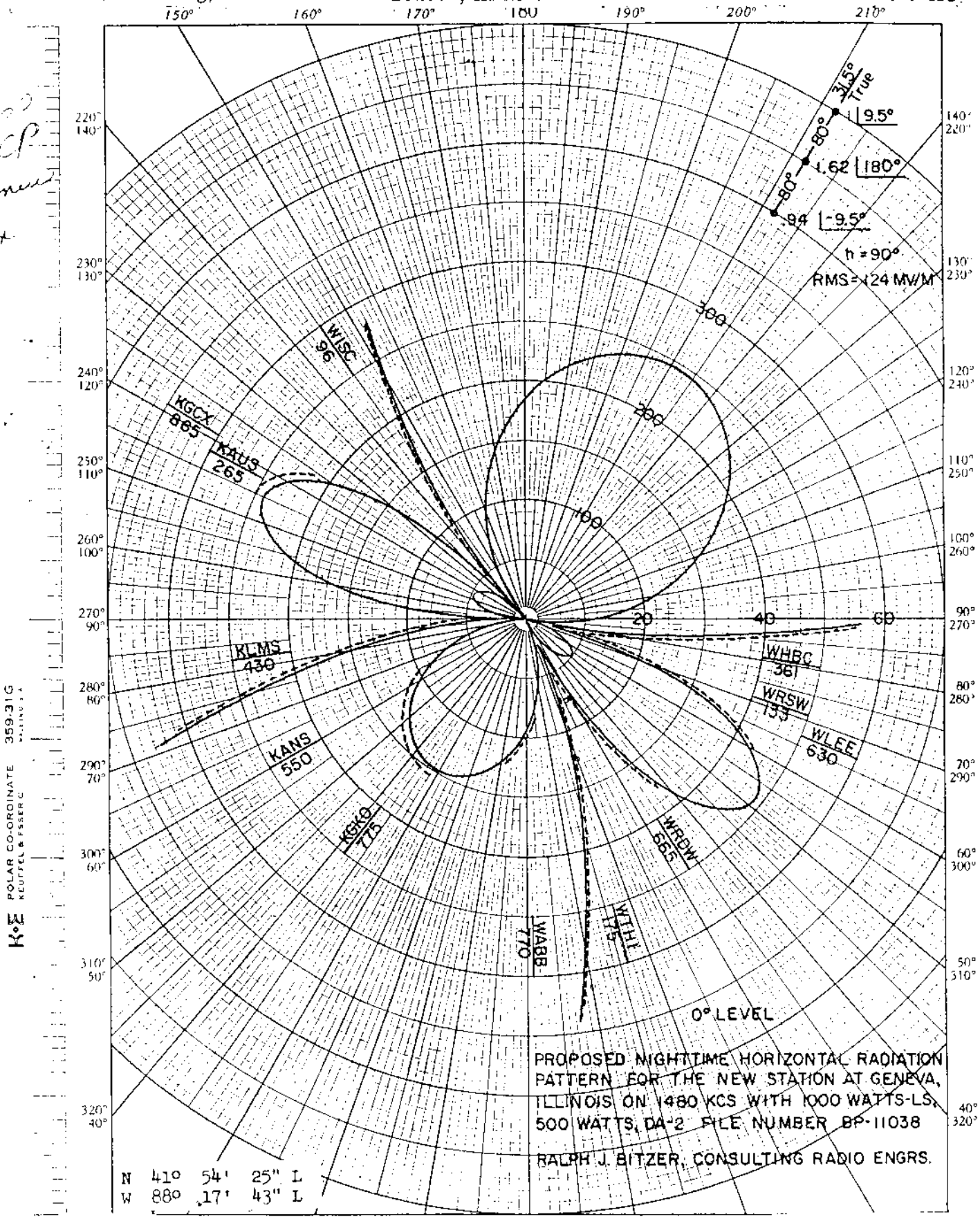
1480 kc

Geneva, Ill. WGSB

PROPOSED NIGHT (11-29-57g)

New; Fox Valley Bcstng. Co. Geneva, Illinois

500w,1kw-LS, DA-2,U 1480 KC



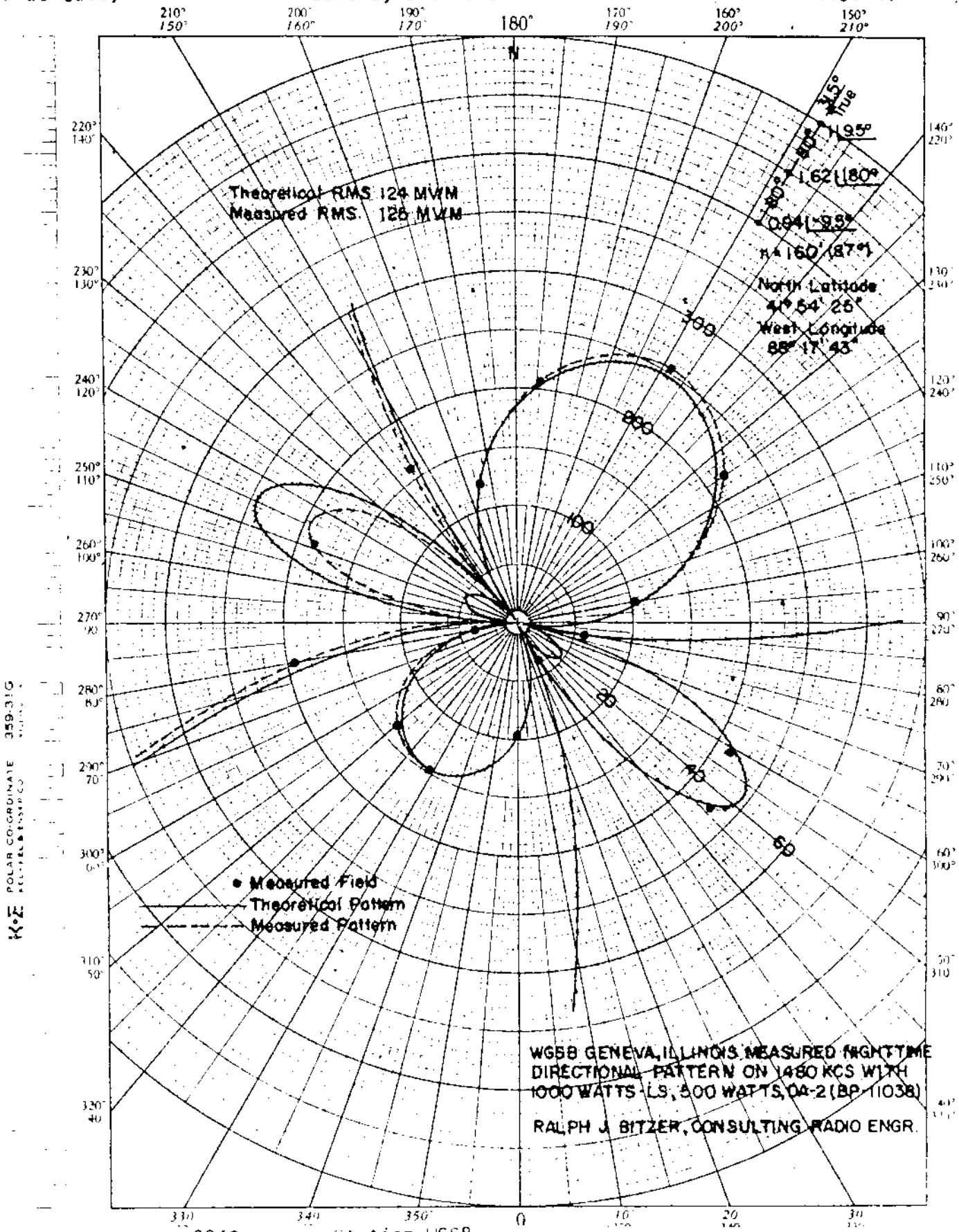
FCC File No. BP-11,038 Fox Valley Bcstng. Co.
Accepted 11-26-57 (Amended) Geneva, Illinois 1480 KC

WGSB

Measured Night
(2-28-62ct)

Station WGSB
Geneva, Illinois

500w,1kw-LS,DA-2,U
1480 kc



FCC File No.BL-8860
Accepted 1-23-62

Station WGSB
Geneva, Illinois

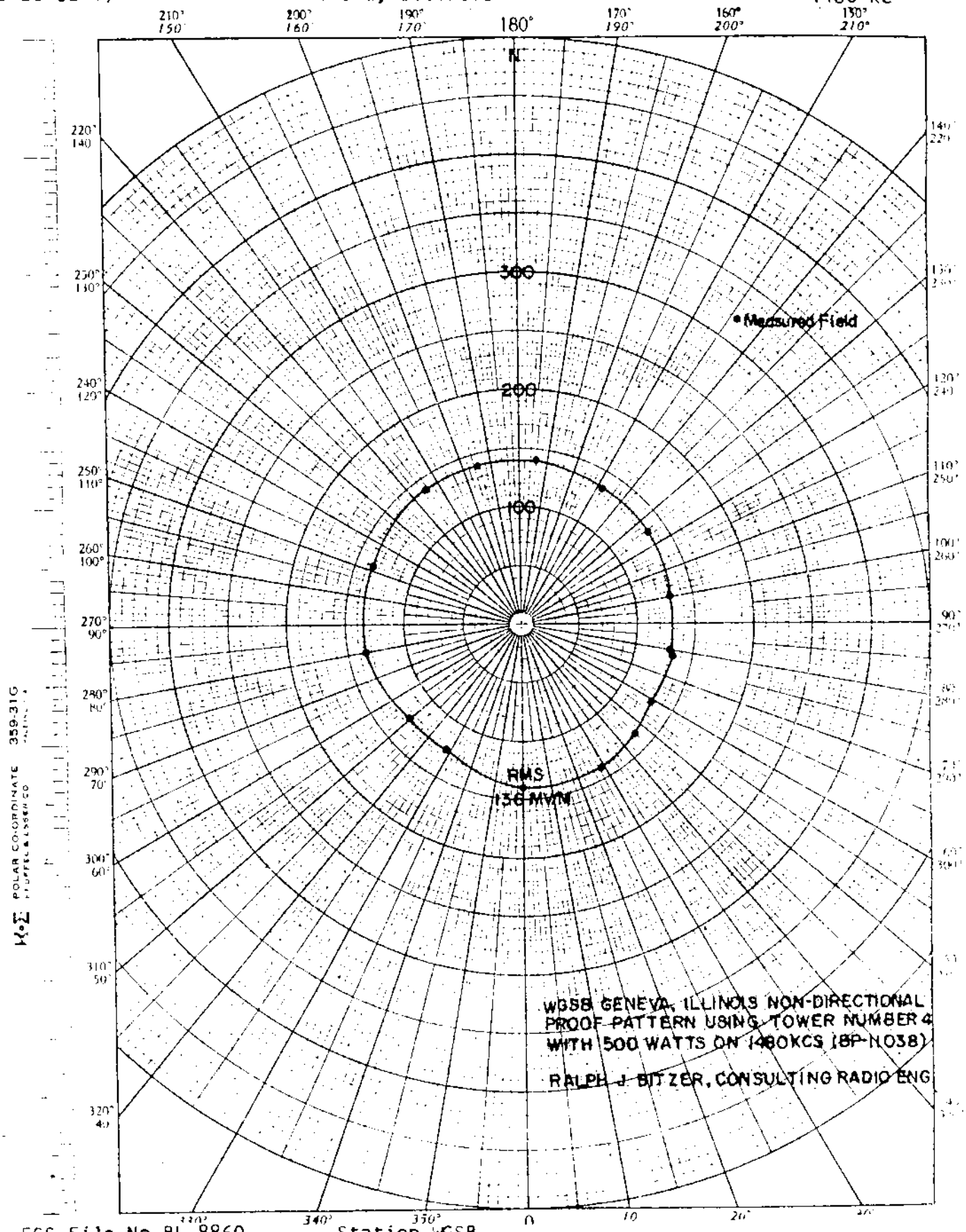
1480 kc

WGSB

Measured Non-DA
(2-28-62ct)

Station WGSB
Geneva, Illinois

500w,1kw-LS,DA-2,U
1480 kc



FCC File No.BL-8860
Accepted 1-23-62

Station WGSB
Geneva, Illinois

1480 kc

7136

WHBC-1480KC

WHBC

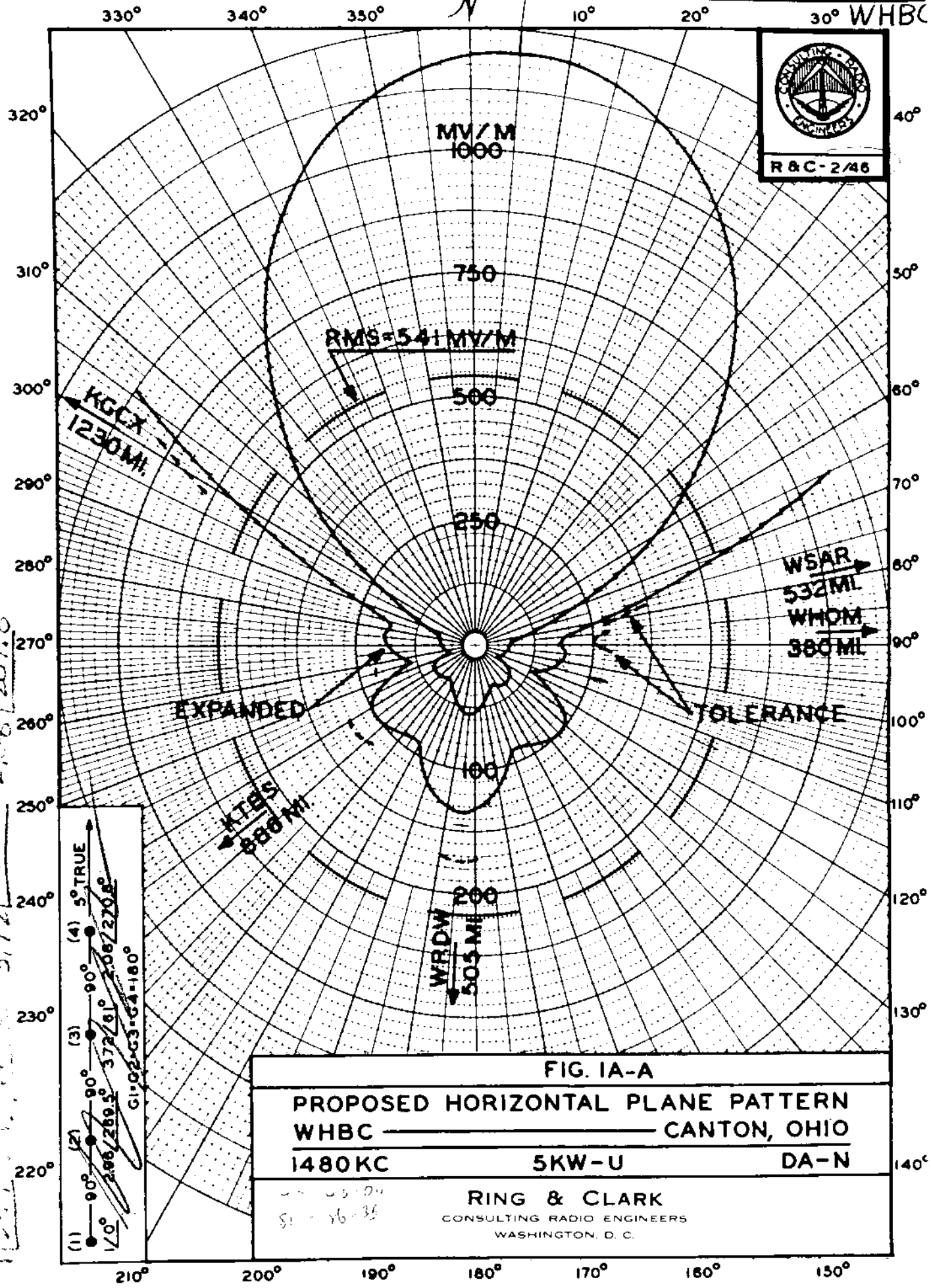


FIG. 1A-A

PROPOSED HORIZONTAL PLANE PATTERN

WHBC — CANTON, OHIO

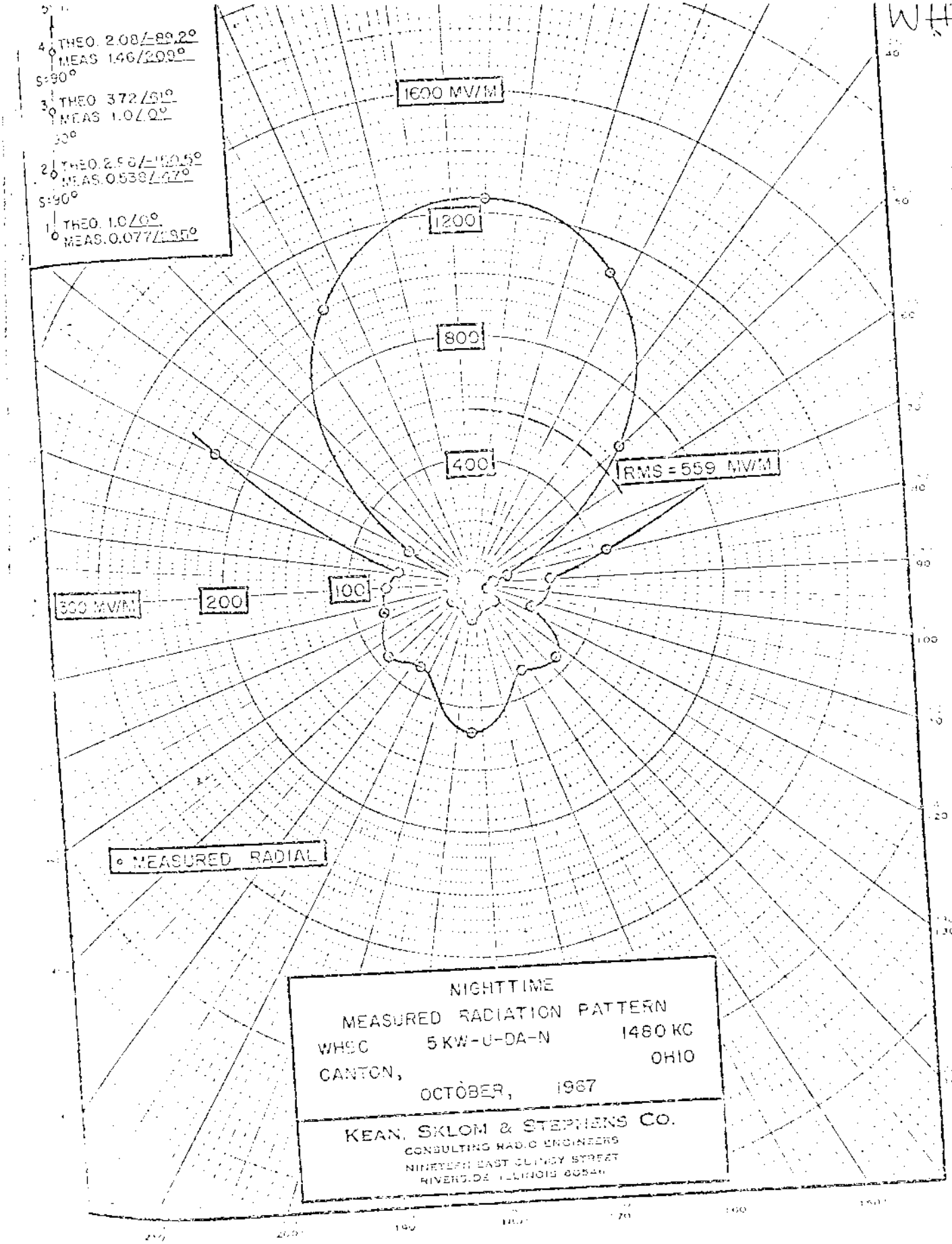
1480KC 5KW-U DA-N

RING & CLARK

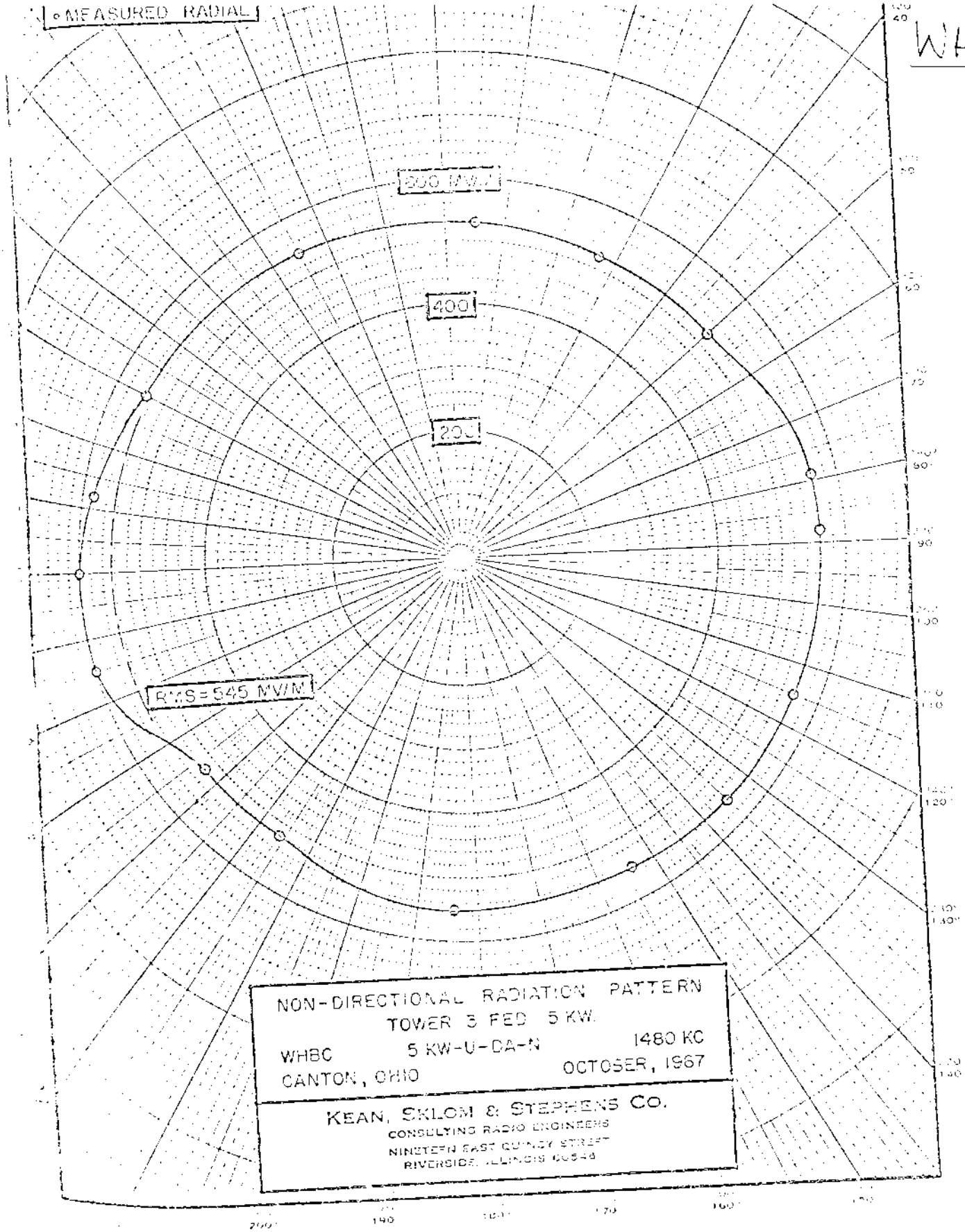
CONSULTING RADIO ENGINEERS

WASHINGTON, D. C.

WHSC


4 THEO. 2.08/-89.2°
MEAS 1.46/209°
S=90°
3 THEO 3.72/61°
MEAS 1.0/0°
S=90°
2 THEO. 2.58/-150.5°
MEAS. 0.538/47°
S=90°
1 THEO. 1.0/0°
MEAS. 0.077/-95°
1600 MV/M
1200
800
400
RMS = 559 MV/M
300 MV/M
200
100
• MEASURED RADIAL
NIGHTTIME
MEASURED RADIATION PATTERN
WHSC 5 KW-U-DA-N 1480 KC
CANTON, OHIO
OCTOBER, 1967
KEAN, SKLOM & STEPHENS CO.
CONSULTING RADIO ENGINEERS
NINETEEN EAST CLINGY STREET
RIVERSIDE ILLINOIS 60546

WHBC


MEASURED RADIAL
600 MV/M
400
200
RMS = 545 MV/M
NON-DIRECTIONAL RADIATION PATTERN
TOWER 3 FED 5 KW.
WHBC 5 KW-U-DA-N 1480 KC
CANTON, OHIO OCTOBER, 1967
KEAN, SKLOM & STEPHENS CO.
CONSULTING RADIO ENGINEERS
NINETEEN EAST QUINCY STREET
RIVERSIDE, ILLINOIS 60546

WHBC

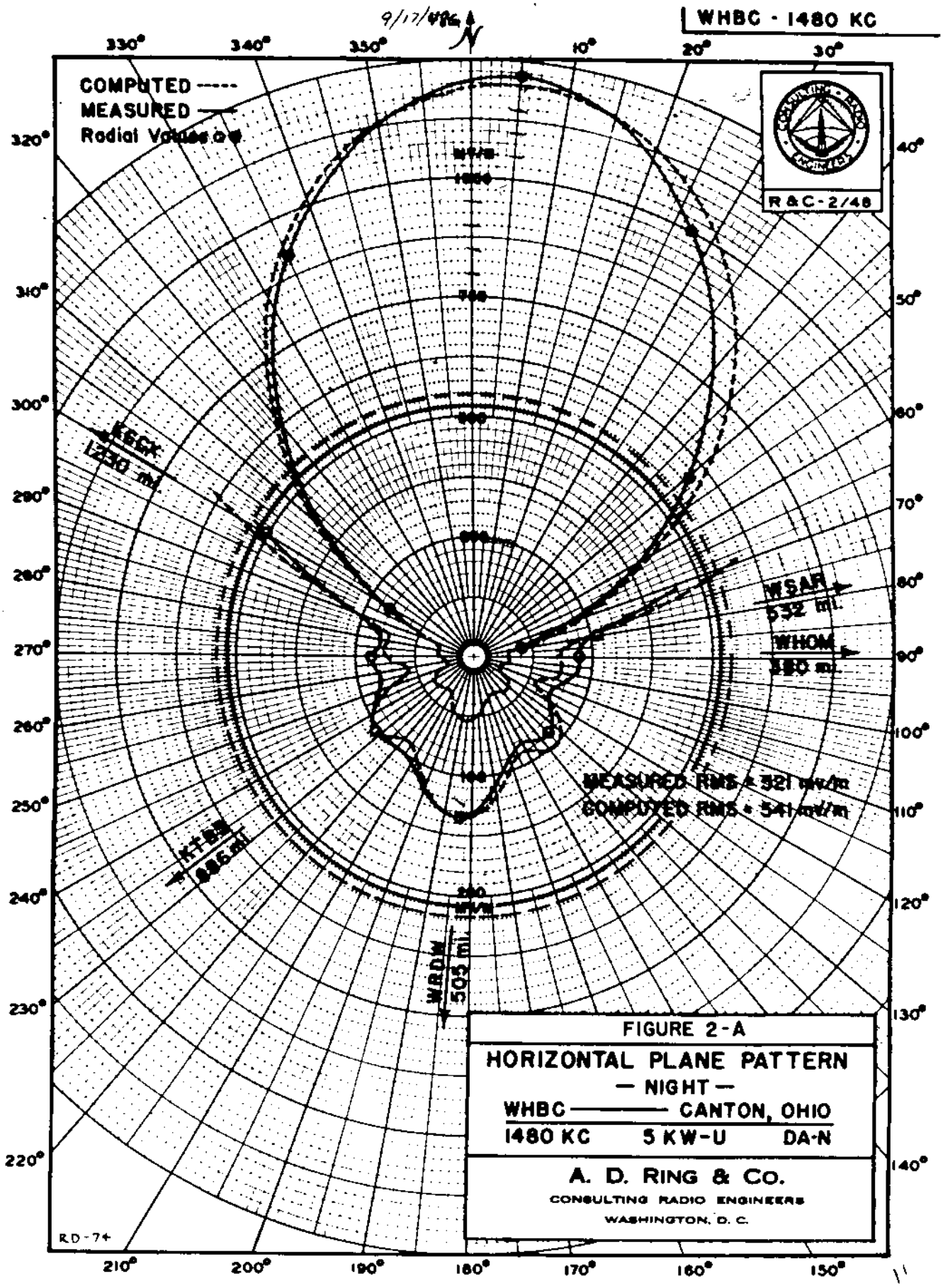


FIGURE 2-A

HORIZONTAL PLANE PATTERN

— NIGHT —

WHBC ——— CANTON, OHIO

1480 KC 5 KW-U DA-N

A. D. RING & CO.

CONSULTING RADIO ENGINEERS

WASHINGTON, D. C.

WHBC

Rec'd 10-7-47

9/17/48 G O

WHBC 1480 KC

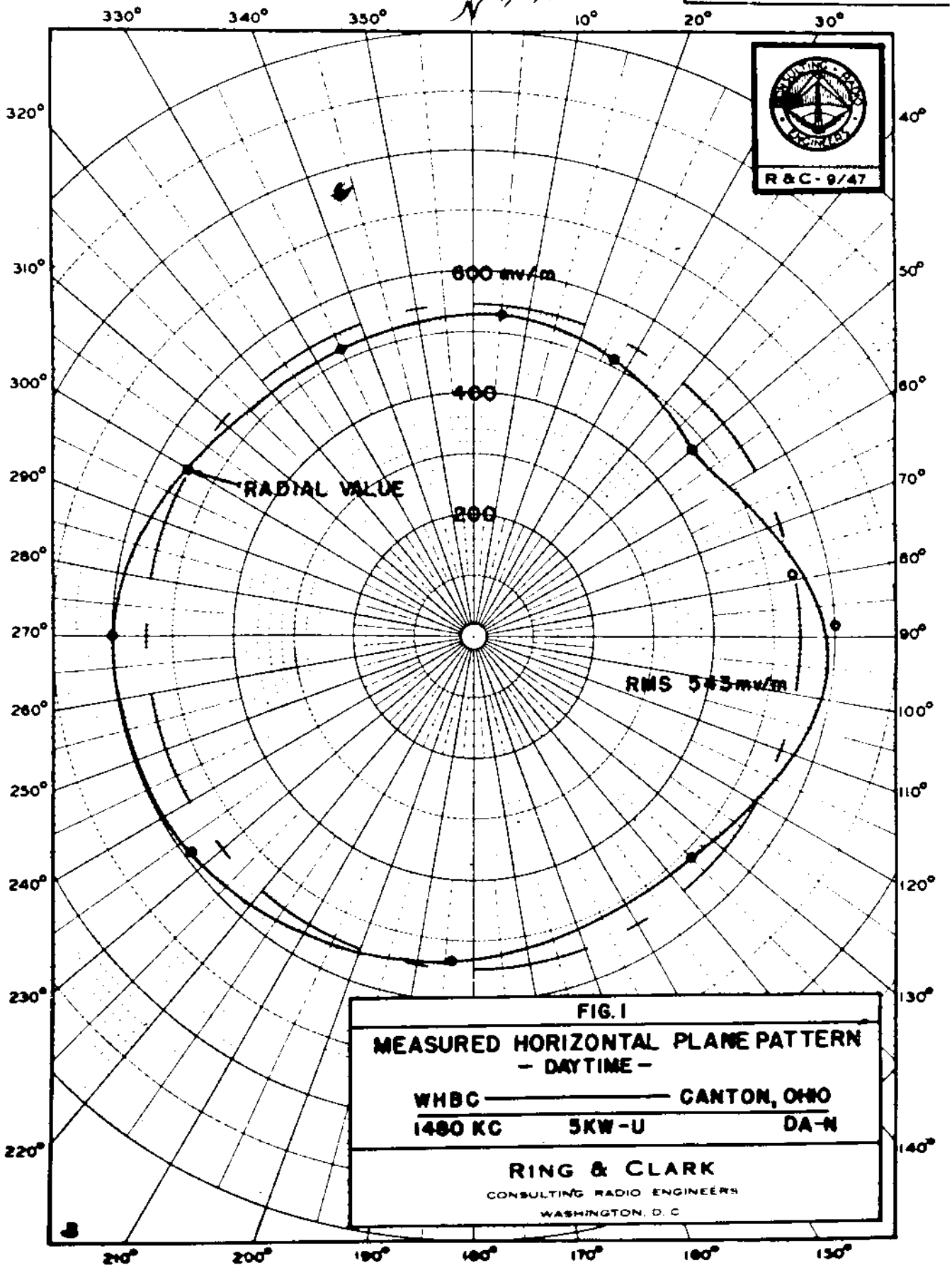


FIG. I

MEASURED HORIZONTAL PLANE PATTERN
— DAYTIME —

WHBC — CANTON, OHIO

1480 KC 5KW-U DA-N

RING & CLARK
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C

WHOM

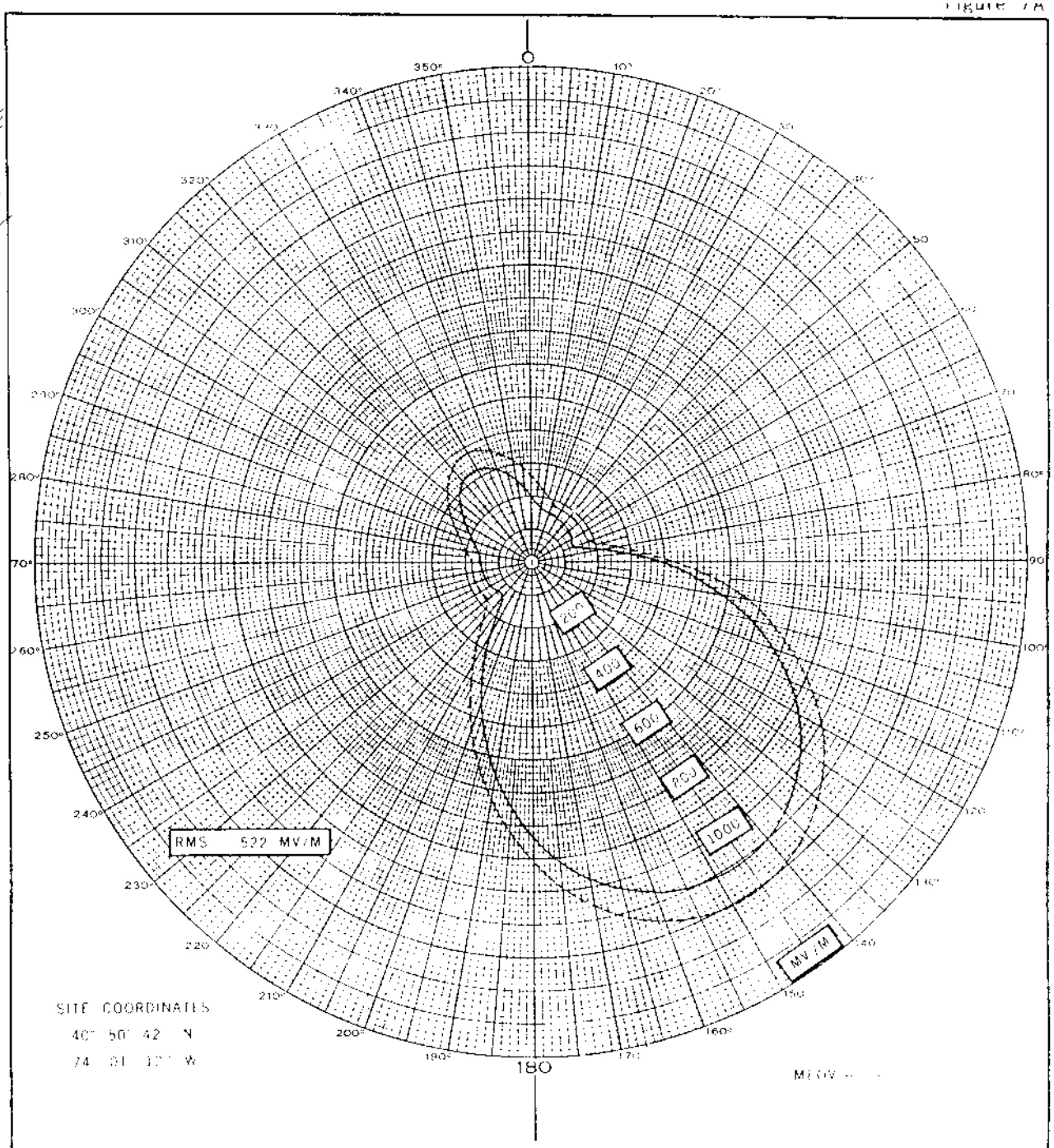
Proposed Day
(12-28-67ct)

Station WHOM
New York, New York

5kw,DA-2,U
1480 kc

Figure 7A

12-6-67
GRANTED
CP TO CHANGE
ANTENNA LOC.
IN DA, SYSTEM



PROPOSED DAYTIME HORIZONTAL PLANE RADIATION PATTERN

	PROGRESS BROADCASTING CORPORATION NEW YORK, NEW YORK Jules Cohen & Associates Consulting Electronic Engineers	RADIO STATION WHOM 1480 KHZ 5KW DA-2 CALCULATION No. 670909A0

FCC File No.BP-17937
Accepted 12-12-67

Station WHOM
New York, New York

1480 kc

WHOM

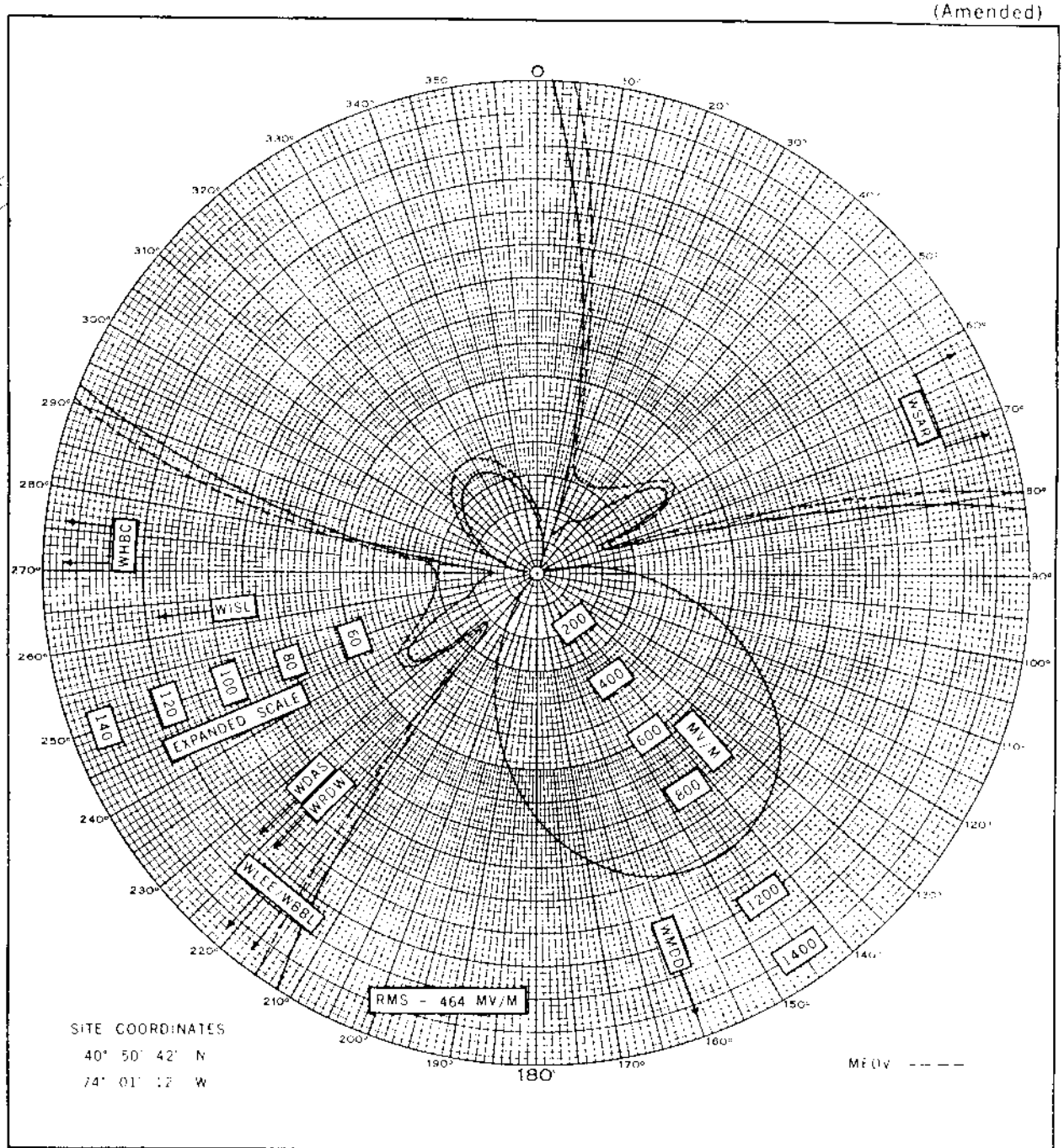
Proposed Night
(12-28-67ct)

Station WHOM
New York, New York

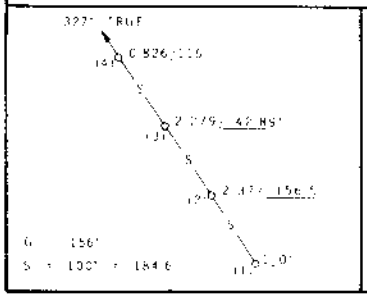
5kw, DA-2, U
1480 kc

Figure 10A
Sheet 1 of 14
(Amended)

12-6-67
GRANTED
CP
CHANGES
IN DA SYSTEM



PROPOSED NIGHTTIME HORIZONTAL PLANE RADIATION PATTERN



PROGRESS BROADCASTING CORPORATION
NEW YORK, NEW YORK

Jules Cohen & Associates
Consulting Electronics Engineers

RADIO STATION WHOM
1480 KHZ
5 KW U DA 2
PATTERN No 670909AN

FCC File No. BP-17937
Accepted 12-12-67

Station WHOM
New York, New York

1480 kc

WHOM

12-6-67
GRANTED CP
CHANGES IN DA SYSTEM.

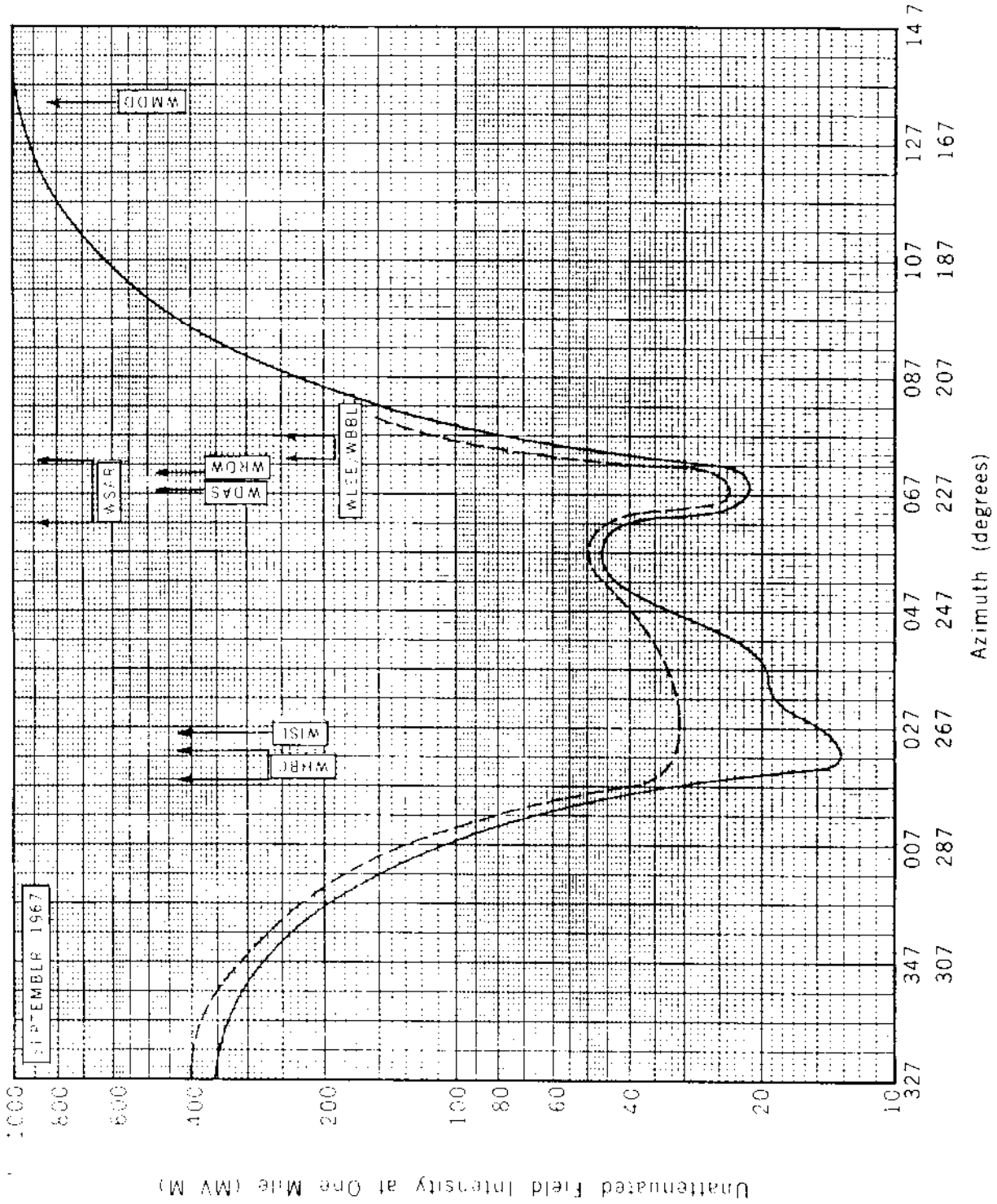
Figure 10A

Sheet 2 of 14

Proposed Night Nulls
(12-28-67cL)

Station WHOM
New York, New York

5kw, DA-2, U
1480 kc



PROPOSED NIGHTTIME RADIATION PATTERN AT VERTICAL ANGLE OF 0 DEGREES

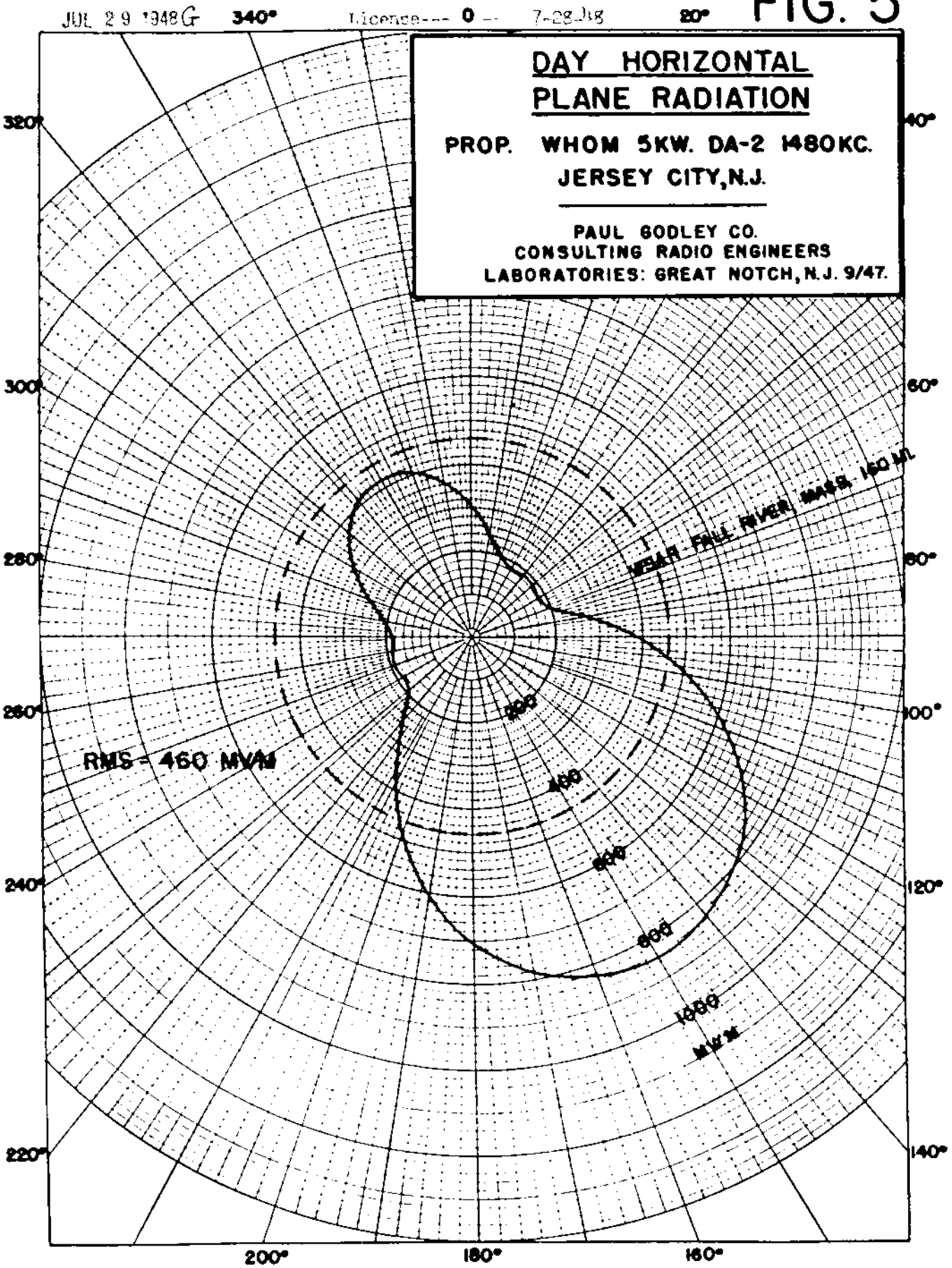
FCC File No.BP-17937
Accepted 12-12-67

Station WHOM
New York, New York

1480 kc

New York, N.Y. WHOM 1480

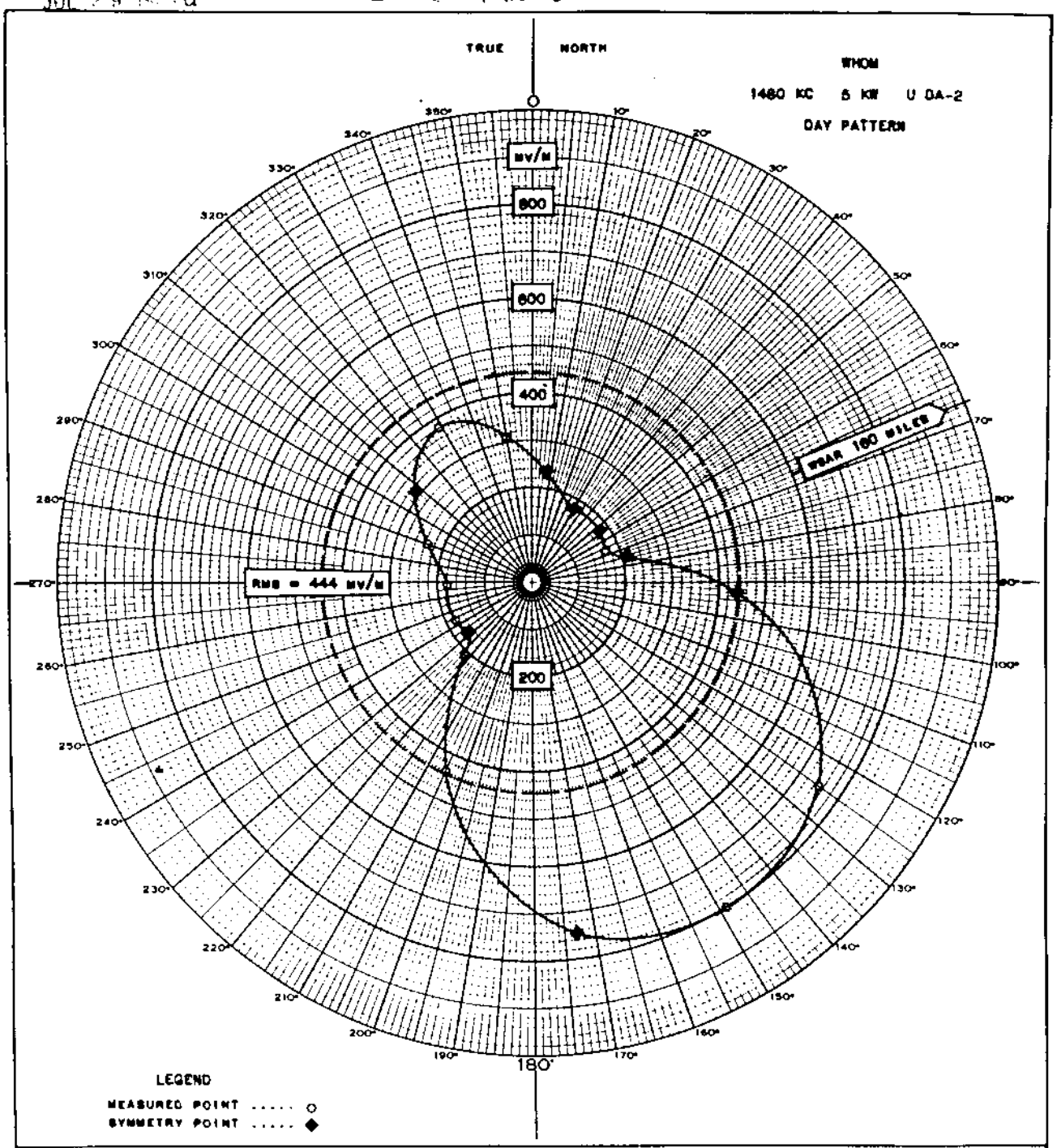
FIG. 5



WHOM
1480

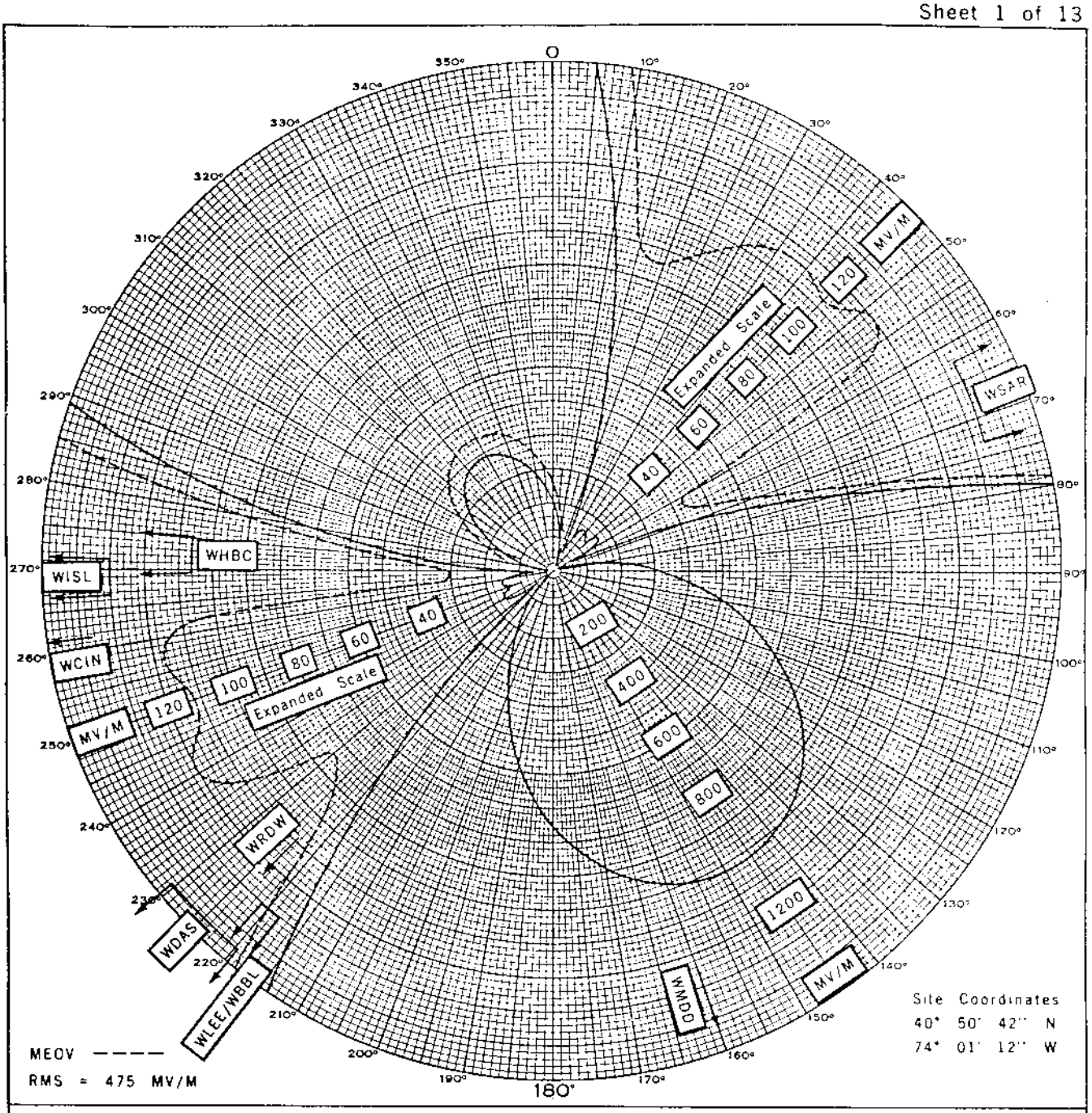
JUL 29 1980 G

License 7-22-48

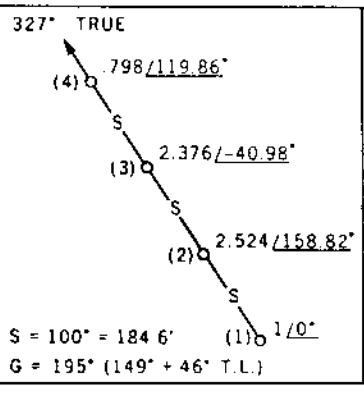


MEASURED HORIZONTAL PLANE RADIATION PATTERN FOR DAYTIME OPERATION

329° TRUE ④ ○ 80° 166° 0 ∠0° ③ ● 80° 166° 0.52 ∠160° ② ● 80° 166° 1.0 ∠17° ① ● 0.52 ∠-180°	ATLANTIC BROADCASTING COMPANY WELDON & CARR CONSULTING RADIO ENGINEERS WASHINGTON DC	WHOM 1480 KC 5 KW U DA-2 480727 E SUPERSEDES 480714 M



PROPOSED NIGHTTIME HORIZONTAL PLANE RADIATION PATTERN



PROGRESS BROADCASTING CORPORATION

NEW YORK, NEW YORK

RADIO STATION WHOM

1480 KHZ

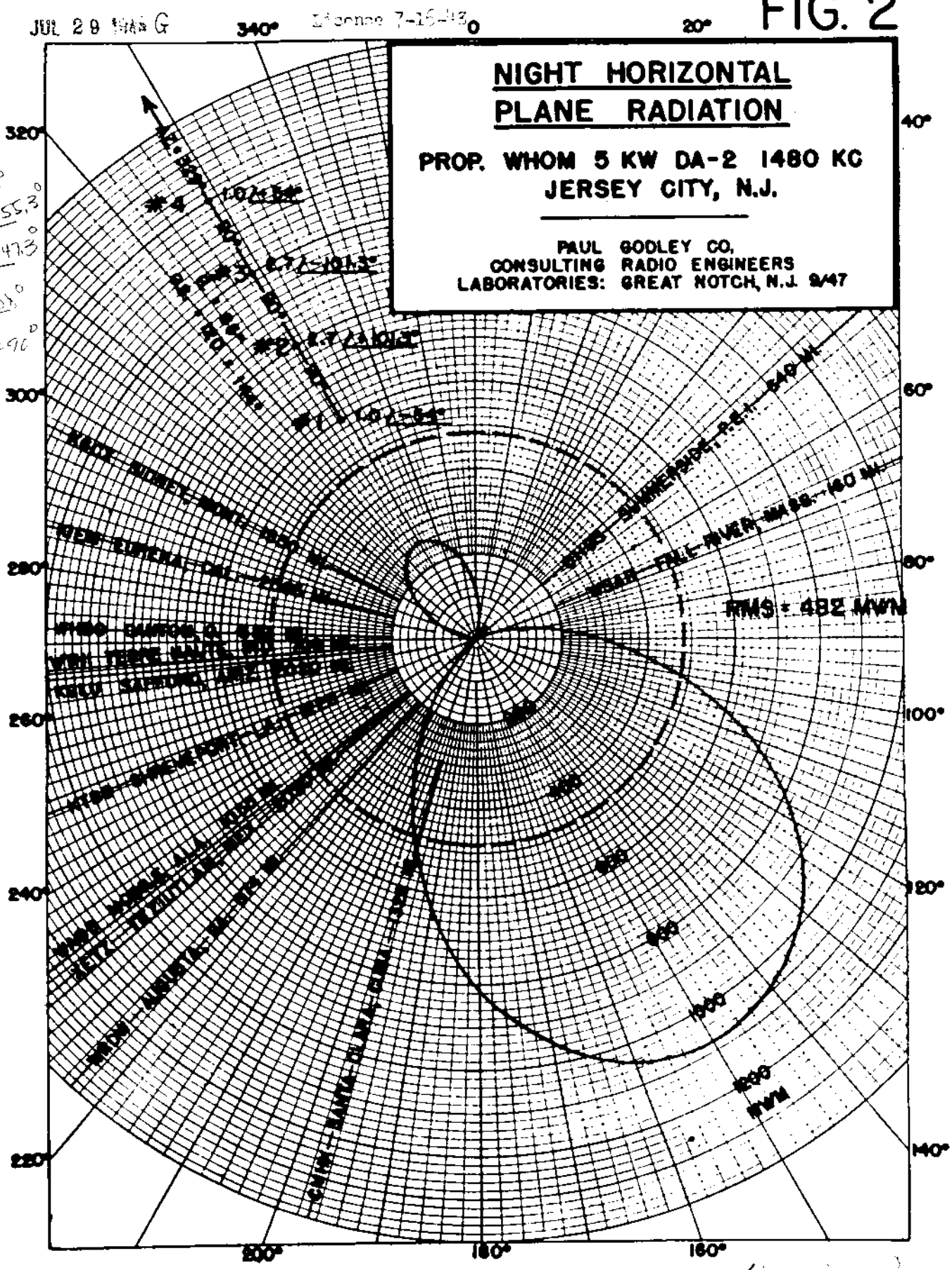
5 KW U DA-2

Jules Cohen & Associates
Consulting Electronics Engineers

JULY 1973

WHOM
1480

FIG. 2

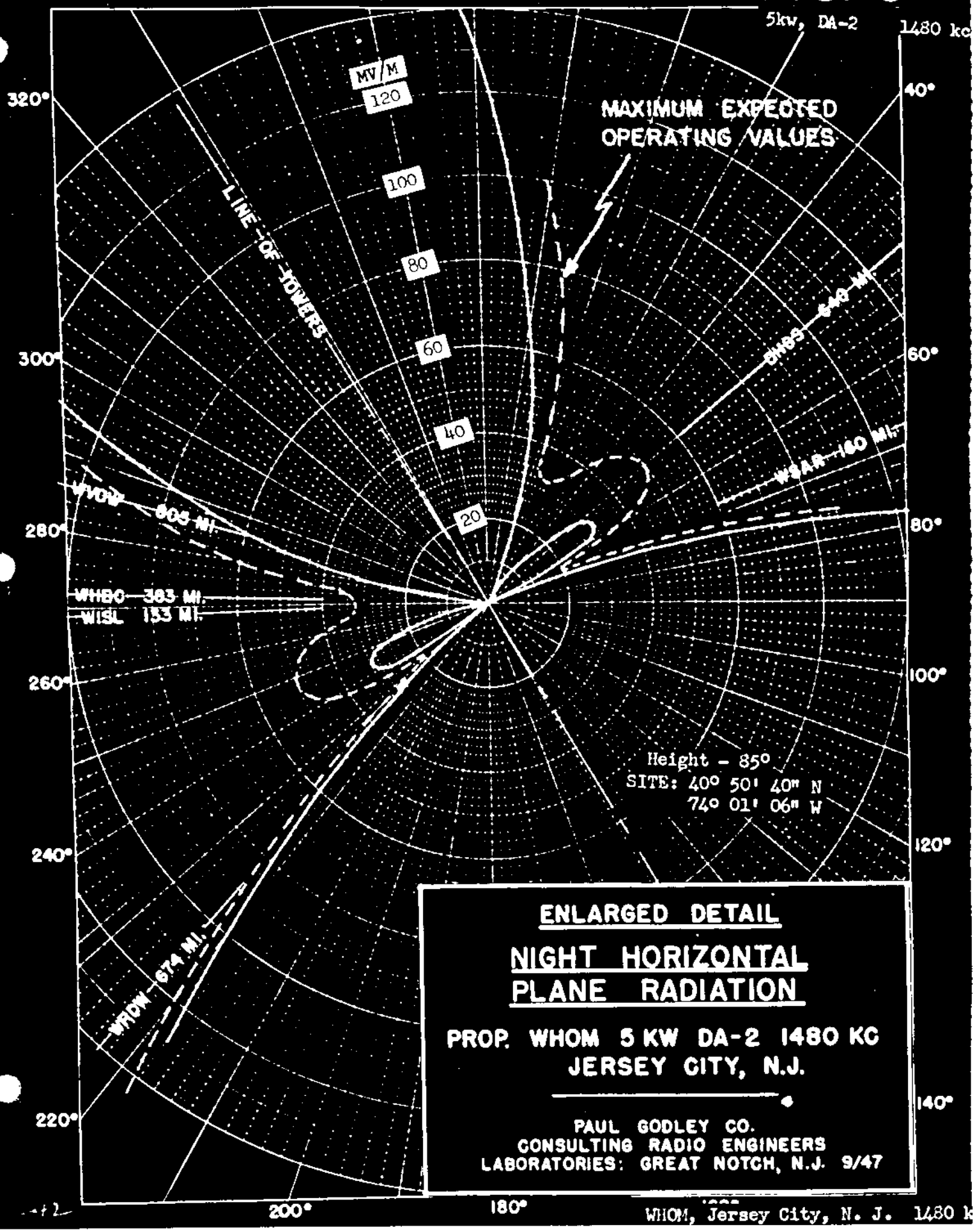


PROPOSED NIGHT NULLS

Station WHOM
New York, New York

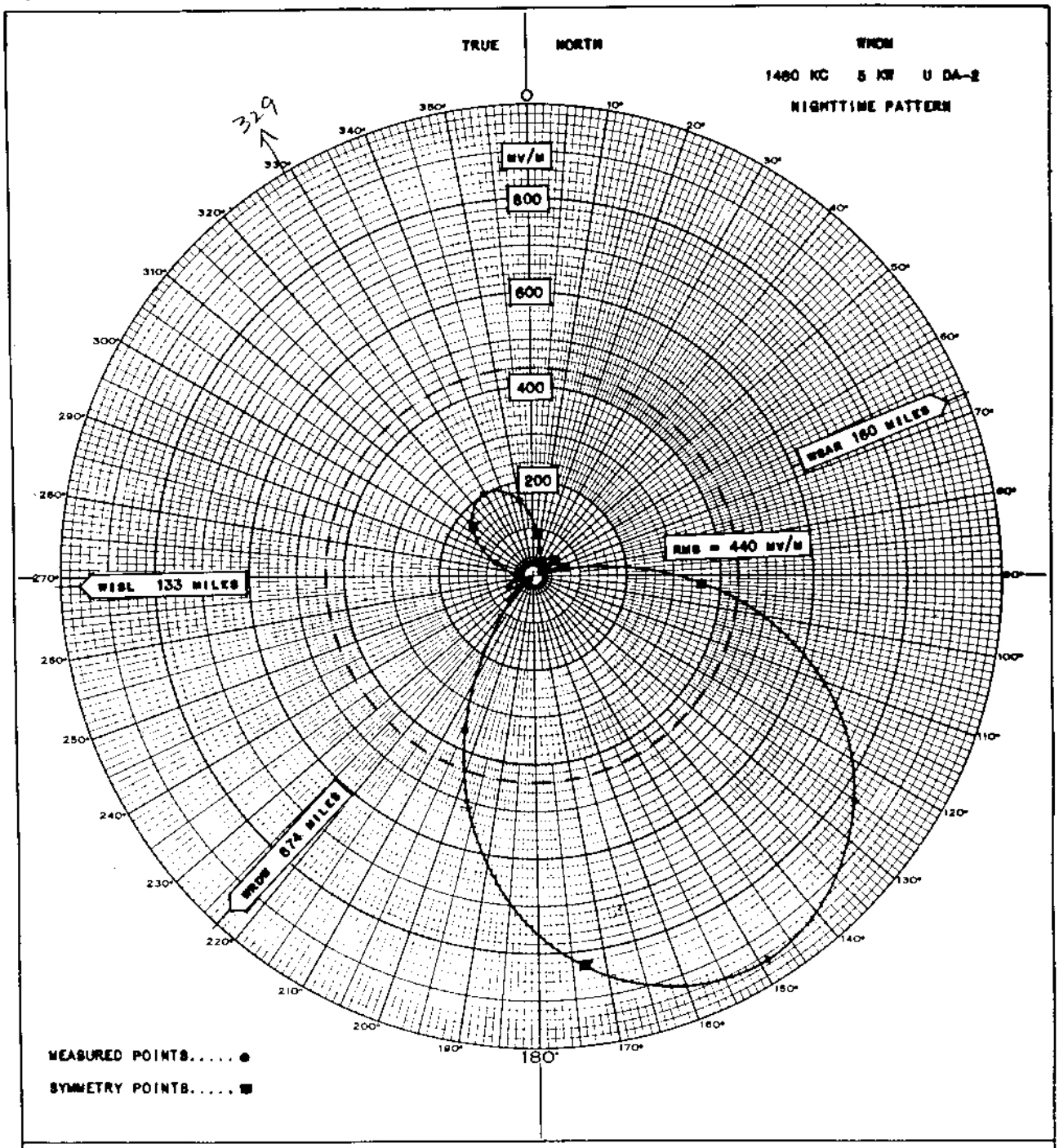
5kw, DA-2,U
1480 KC

FIG. 3



WHOM
1480

License 7-16-48



MEASURED HORIZONTAL PLANE RADIATION PATTERN FOR NIGHTTIME OPERATION

329° TRUE (4) ● 90° 166' 1.0 /64° (3) ● 90° 166' 2.7 /-101.5° (2) ● 90° 166' 2.7 /101.3° (1) ● 1.0 /-54°	ATLANTIC BROADCASTING COMPANY WELDON & CARR CONSULTING RADIO ENGINEERS WASHINGTON DC	WHOM 1480 KC 5 KW U DA-2 480714 K

WHO1

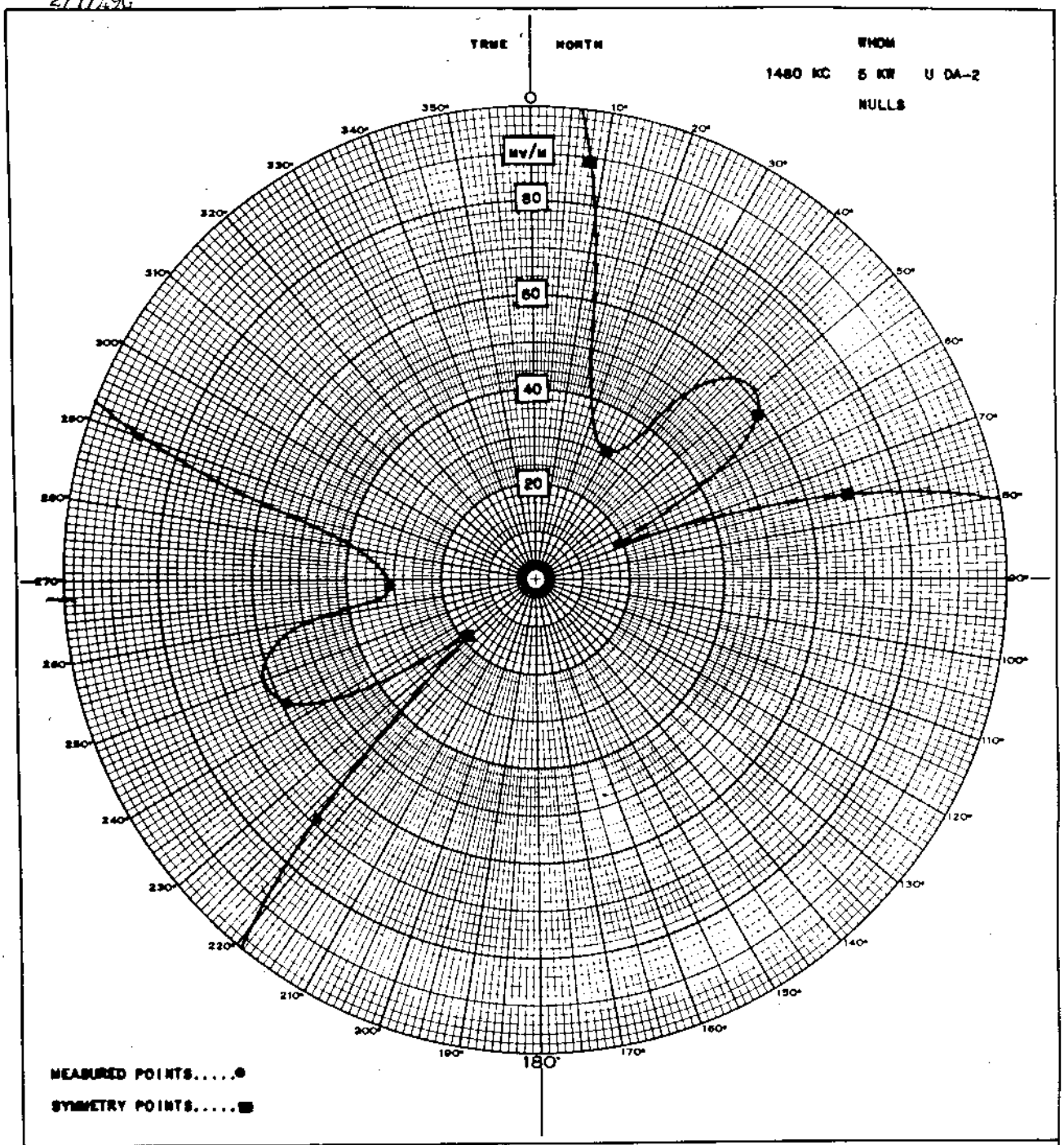
MEASURED NIGHT NULLS

WHOM, JERSEY CITY, N.J. 2/7/49G

License 7/16/48

5kw,DA2

1480 kc



MEASURED HORIZONTAL PLANE RADIATION PATTERN FOR NIGHTTIME OPERATION

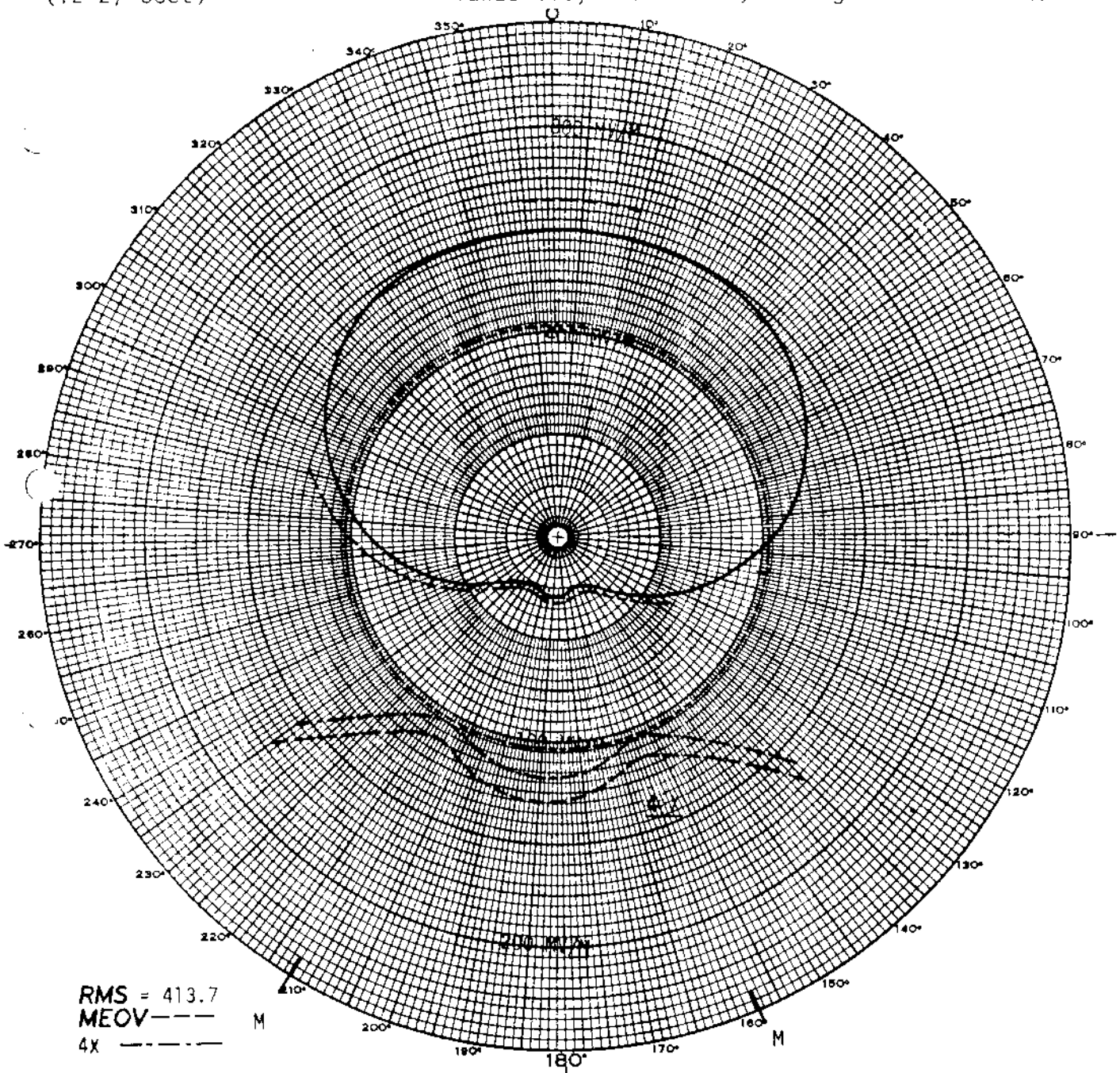
SITE: 40° 42' 10" N 74° 02' 15" W DETAIL IN NULLS 40°-50-40 74°-01-06	ATLANTIC BROADCASTING COMPANY WELDON & CARR CONSULTING RADIO ENGINEERS WASHINGTON DC	WHOM 1480 KC 5 KW U DA-2 480714 L

WIOS

Proposed Day
(12-27-68ct)

Station WIOS
Tawas City-East Tawas, Michigan

1kw,5kw-LS,DA-2,U
1480 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE A-3	STATION DATA
G_1=162.6° G_2=G_3=81.3° No. 1 1/0° 90° No. 2 0.70/+100° 90° No. 3 Not Used 185° T.	TOWER No. / ELECTRICAL HEIGHT θ° / SPACING δ° / PHASING ψ° / FIELD RATIO f 1 2 3 4 5 6 7 8 9 10 DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐	PROPOSED 5 KW DAYTIME PATTERN ********** WIOS θ° = 0°	CALL WIOS FREQ 1480 kc/s POWER 5 kw TYPE DA-2 TIME DAYTIME LAT. 44° 15' 48" LONG. 83° 32' 42" E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BP-18311
Accepted 12-12-68

Station WIOS
Tawas City-East Tawas, Michigan

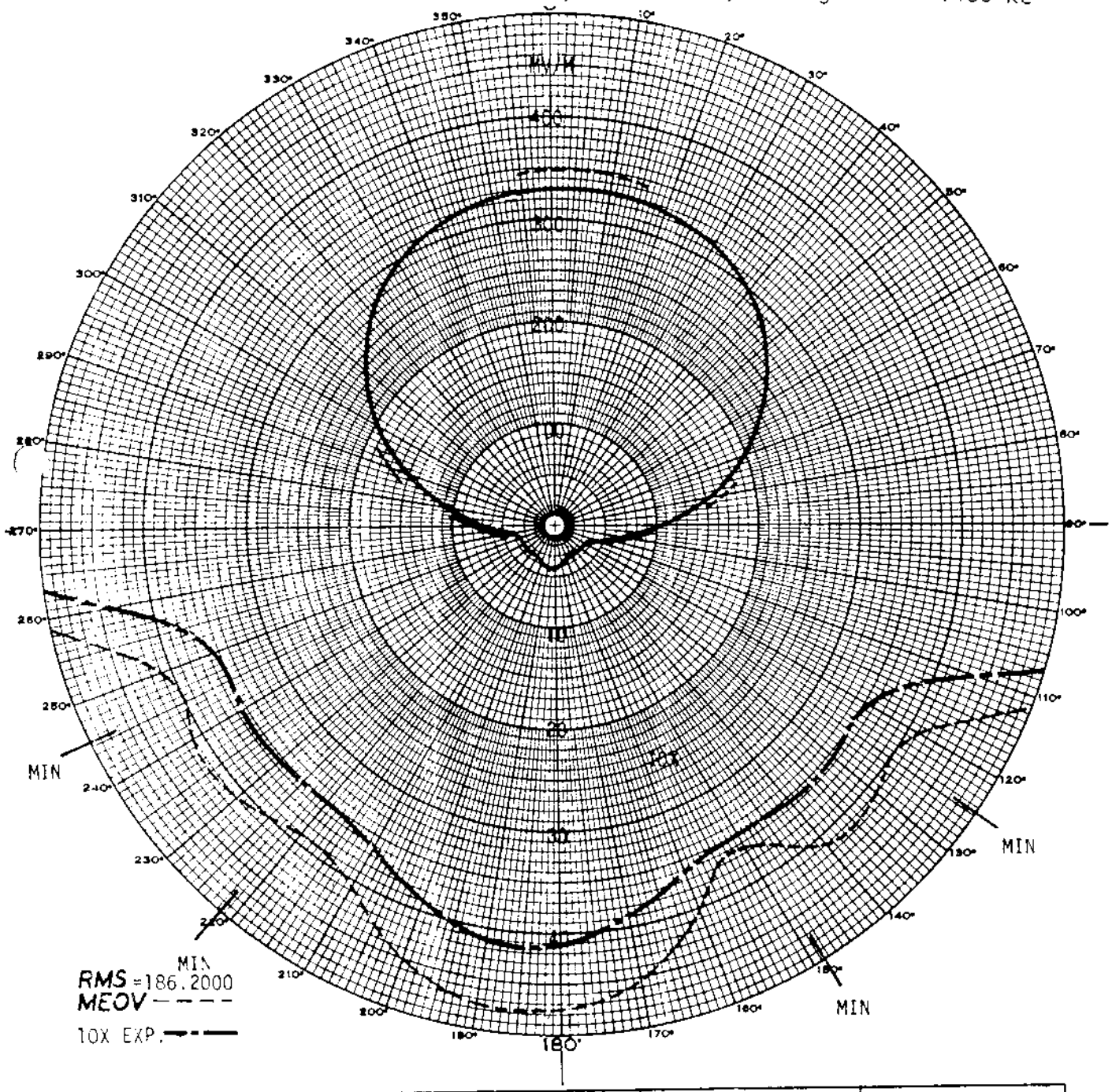
1480 kc

WIOS

Proposed Night
(12-27-68ct)

Station WIOS
Tawas City-East Tawas, Michigan

1kw,5kw-LS,DA-2,U
1480 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE B-7	STATION DATA
G_1 = 162.6° G_2 = G_3 = 81.3° No. 1 O 1/0° 90° No. 2 O 1.177/+122° 90° No. 3 O 0.436/-116° 185° T.	TOWER No. / ELECTRICAL HEIGHT θ° / SPACING δ° / PHASING ψ° / FIELD RATIO F 1 2 3 4 5 6 7 8 9 10 DAYTIME OPERATION ☐ NIGHTTIME OPERATION ☒	PROPOSED NIGHTTIME DIRECTIONAL ANTENNA RADIATION PATTERN ***** WIOS ***** 11/67 GND LEVEL θ° =0	CALL WIOS FREQ 1480 KHz POWER 1.0 KW TYPE DA-2 TIME NIGHT LAT. N 44-15-48 LONG. W 83-32-42 E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BP-18311
Accepted 12-12-68

Station WIOS
Tawas City-East Tawas, Michigan

1480 kc

Tawas City - East Tawas, Mich. WIOS

Superior Hdcg Co.

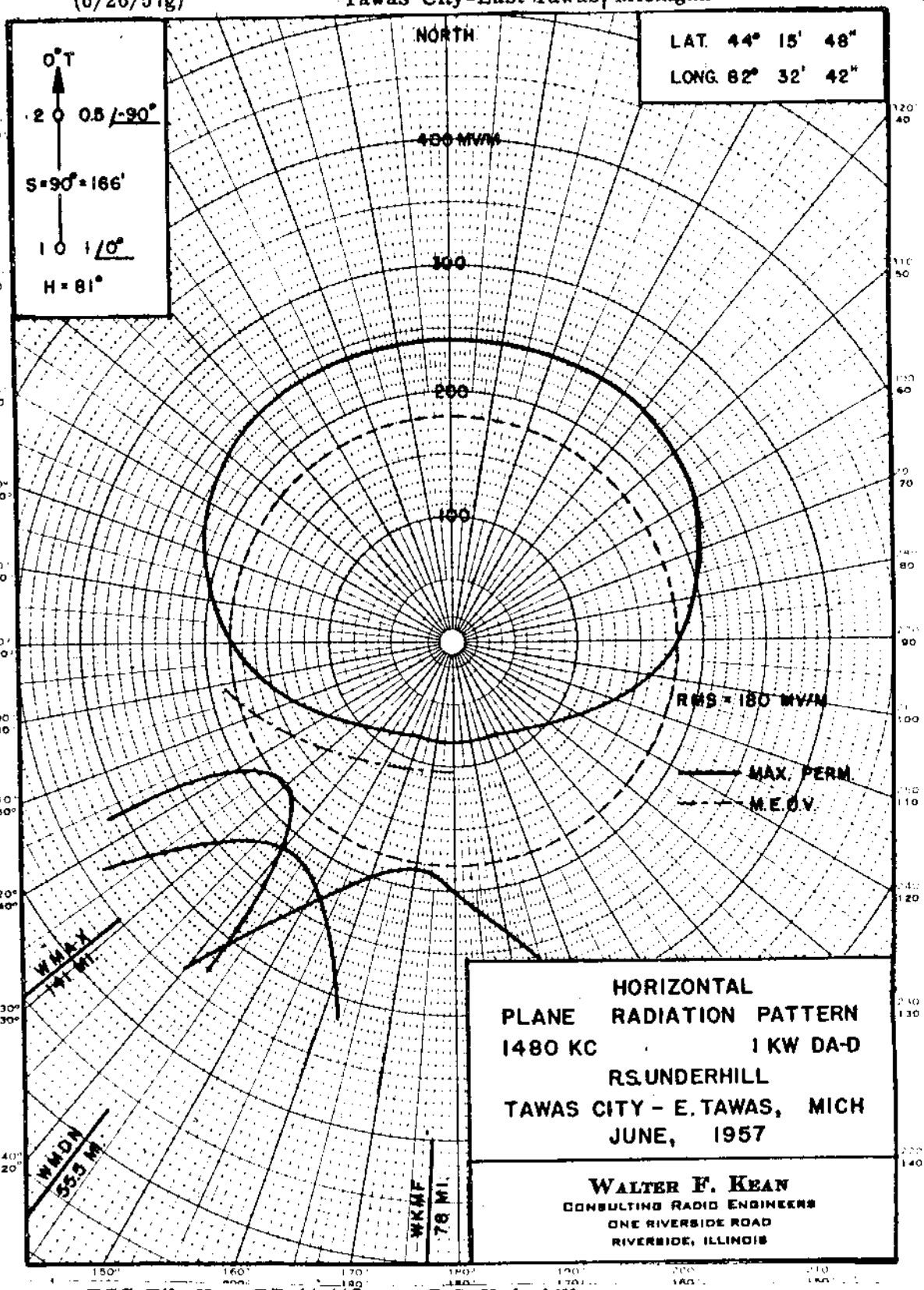
PROPOSED DAY
(6/26/57g)

New, ~~R.S. Underhill~~
Tawas City-East Tawas, Michigan

1kw, DA-D,D
1480 KC

Granted CP 9/5/57 for new station

granted new CP for new station 3-15-62



FCC File No. BP-11,115
Accepted 6/14/57

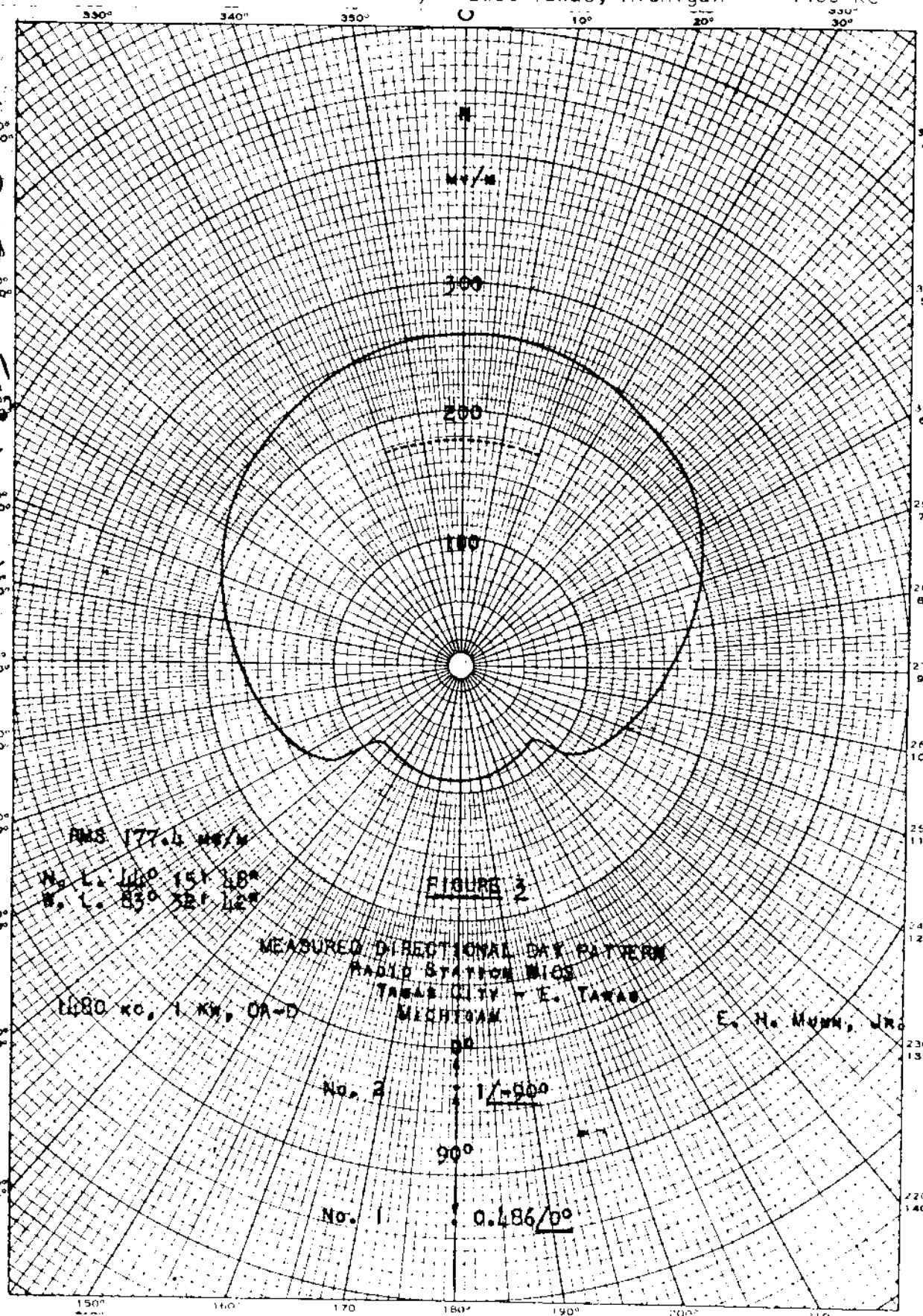
R.S. Underhill
Tawas City- East Tawas, Michigan 1480 KC

WIOS

Measured Day
(1-24-62ct)

Station WIOS
Tawas City - East Tawas, Michigan

1kw,DA-D,D
1480 kc



FCC File No.
Accepted

Station WIOS
Tawas City - East Tawas, Michigan

1480 kc

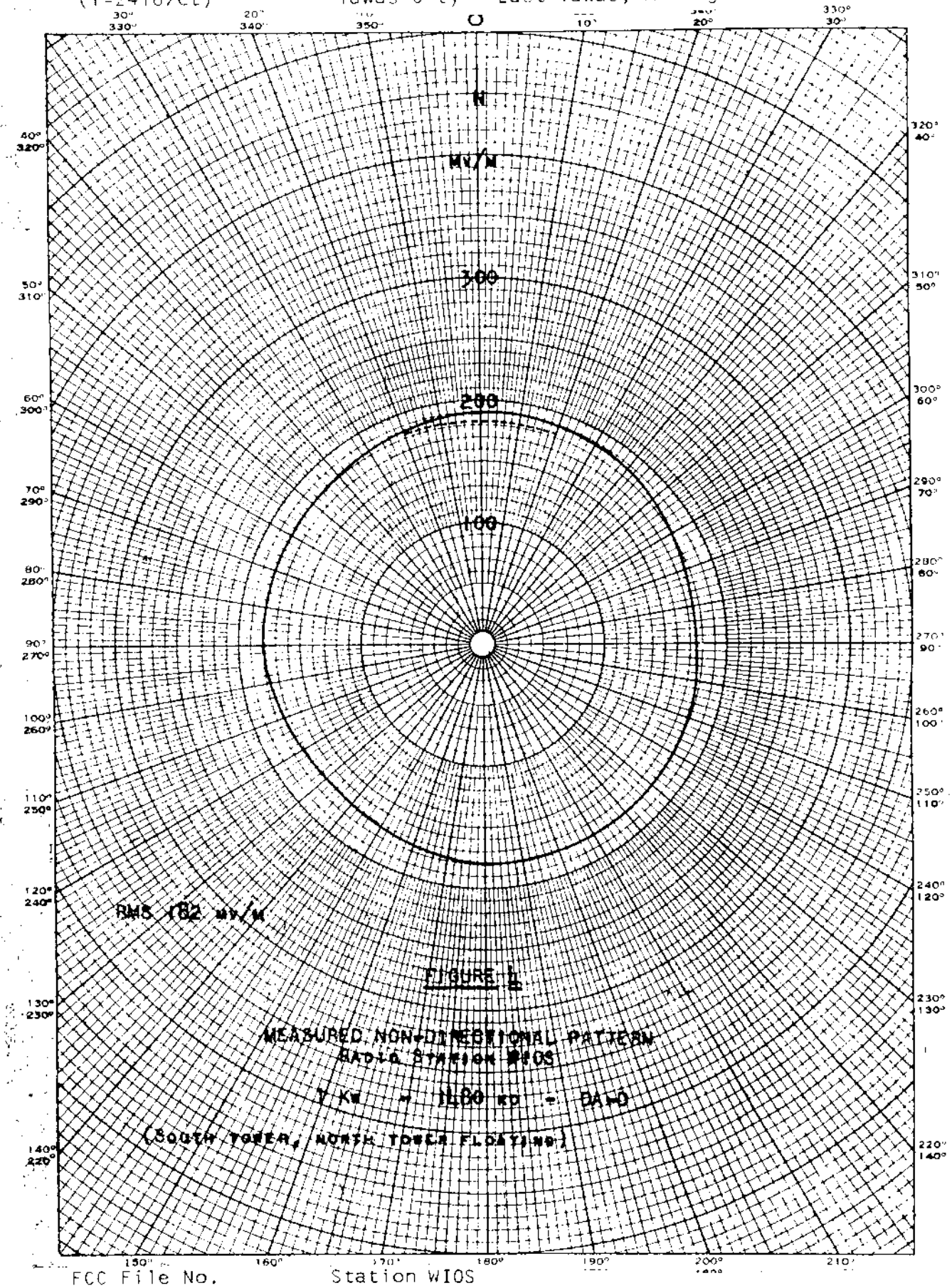
1

WIOS

Measured Non-DA
(1-24162ct)

Station WIOS
Tawas City - East Tawas, Michigan

1kw,DA-D,D
1480 kc

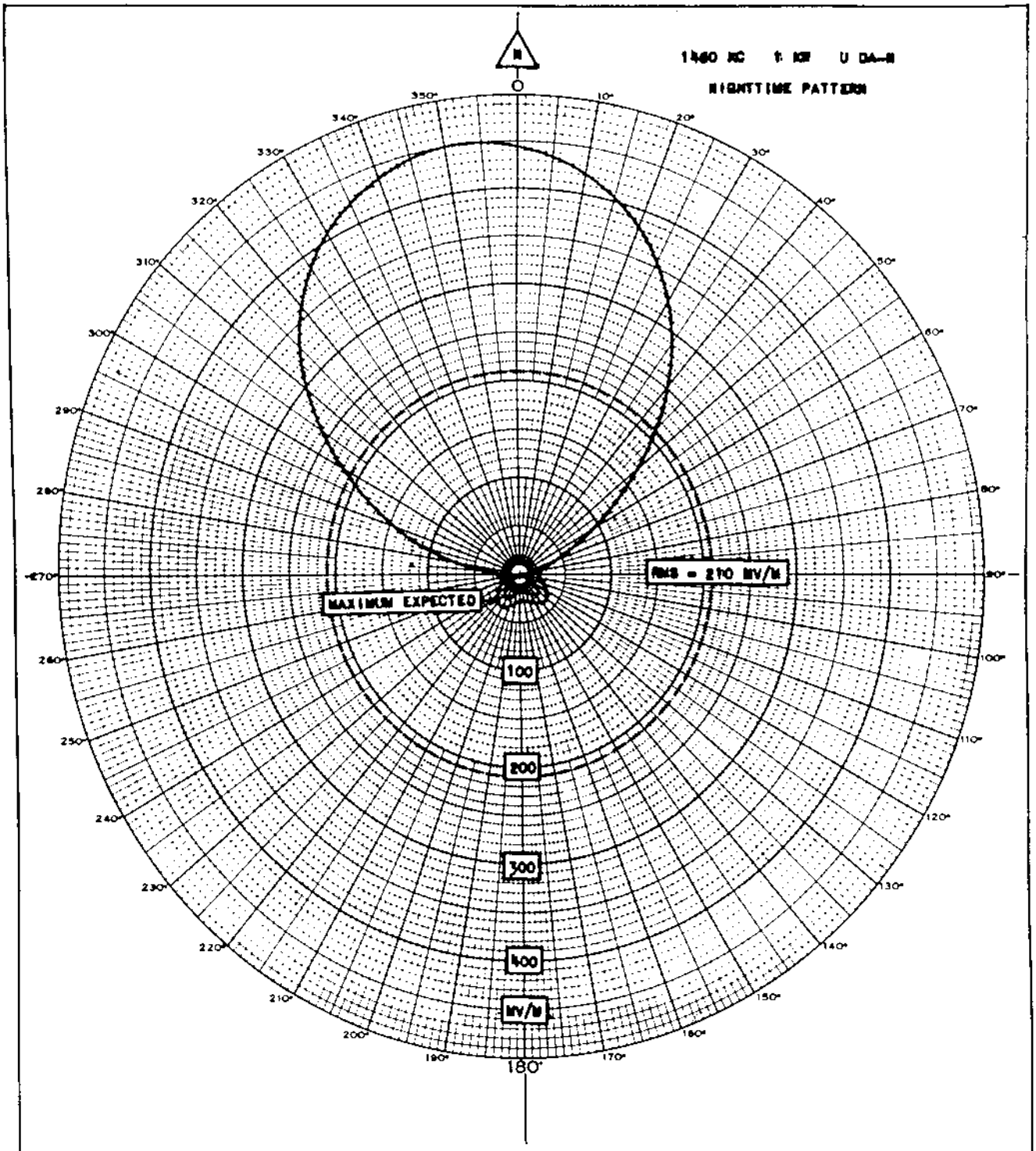


FCC File No.
Accepted

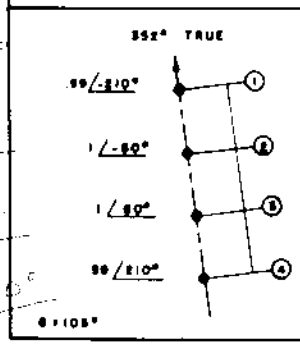
Station WIOS
Tawas City - East Tawas, Michigan

1480 kc

WISL
1480



CALCULATED HORIZONTAL PLANE RADIATION PATTERN FOR NIGHTTIME OPERATION

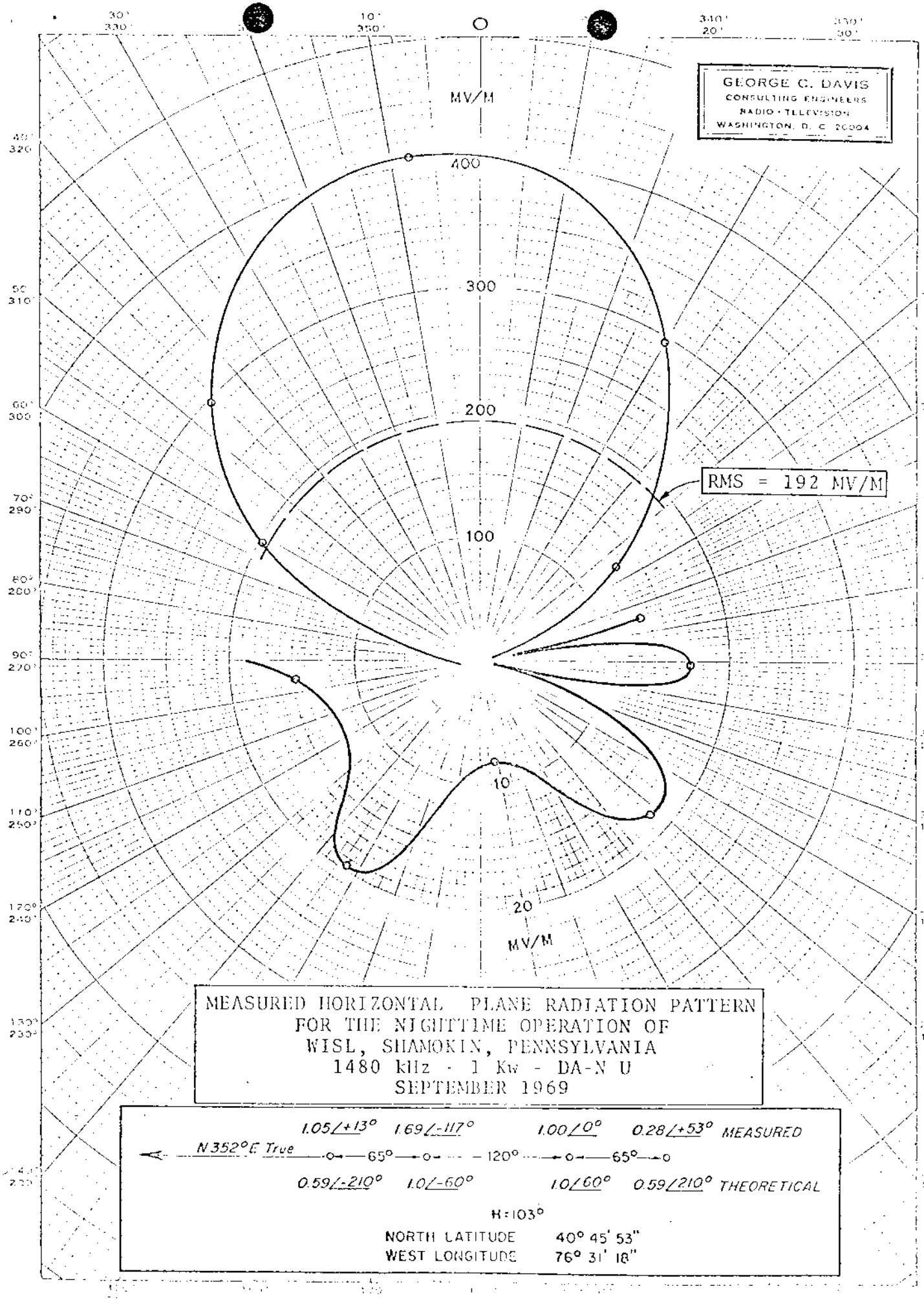


RADIO ANTHRACITE INCORPORATED
SHAMOKIN PENNSYLVANIA

WELDON & CARR
CONSULTING RADIO ENGINEERS
WASHINGTON DC

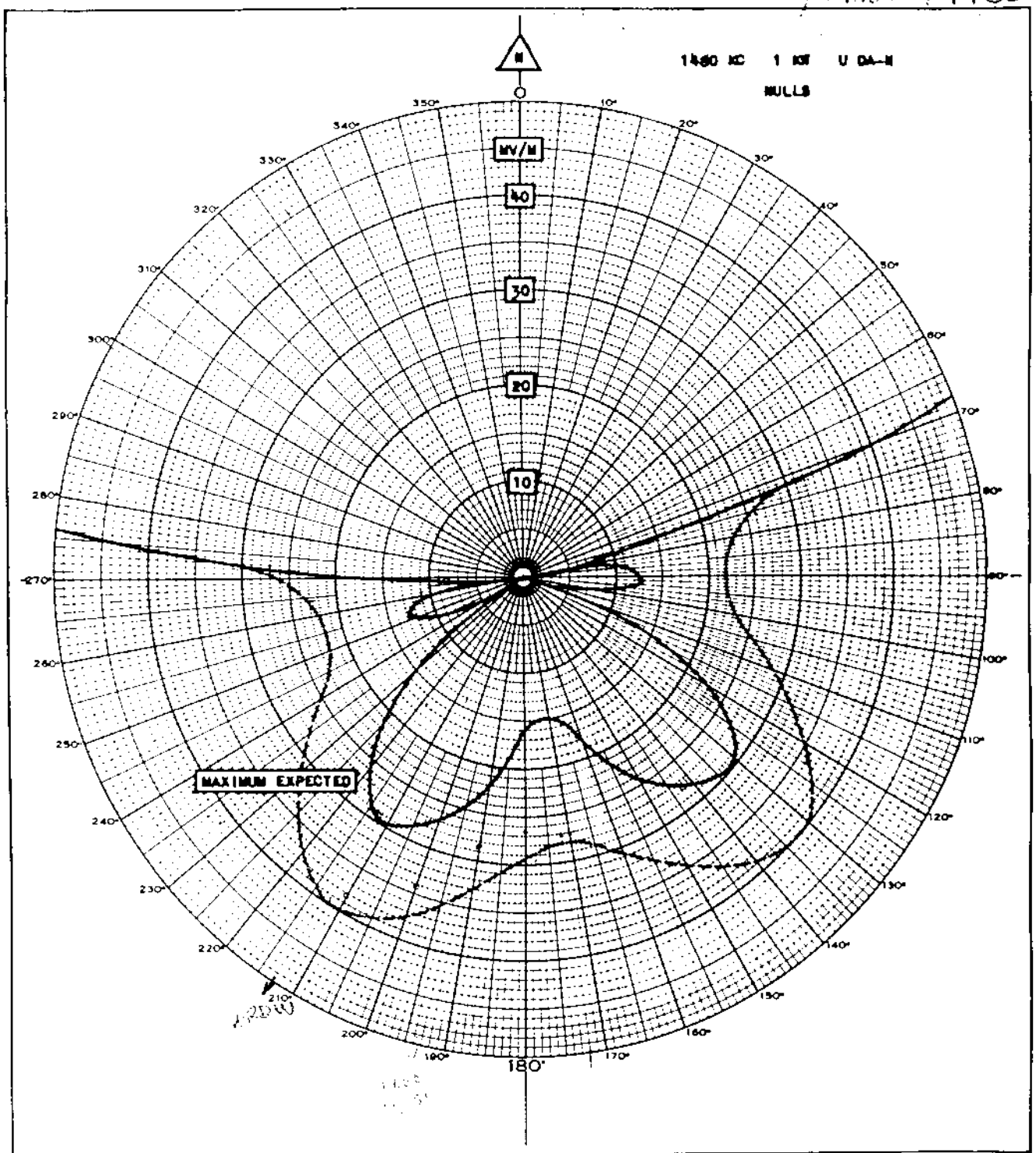
WISL
SHAMOKIN PENNSYLVANIA

1480 KC 1 KW U DA-N
470613A


GEORGE C. DAVIS
CONSULTING ENGINEERS
RADIO • TELEVISION
WASHINGTON, D. C. 20004
MV/M
400
300
200
100
10
20
MV/M
RMS = 192 MV/M
MEASURED HORIZONTAL PLANE RADIATION PATTERN
FOR THE NIGHTTIME OPERATION OF
WISL, SHAMOKIN, PENNSYLVANIA
1480 kHz - 1 Kw - DA-N U
SEPTEMBER 1969
1.05/+13° 1.69/-117° 1.00/0° 0.28/+53° MEASURED
N 352°E True
65° 120° 65°
0.59/-210° 1.0/-60° 1.0/60° 0.59/210° THEORETICAL
H=103°
NORTH LATITUDE 40° 45' 53"
WEST LONGITUDE 76° 31' 18"

WISL

FIGURE 2 1480



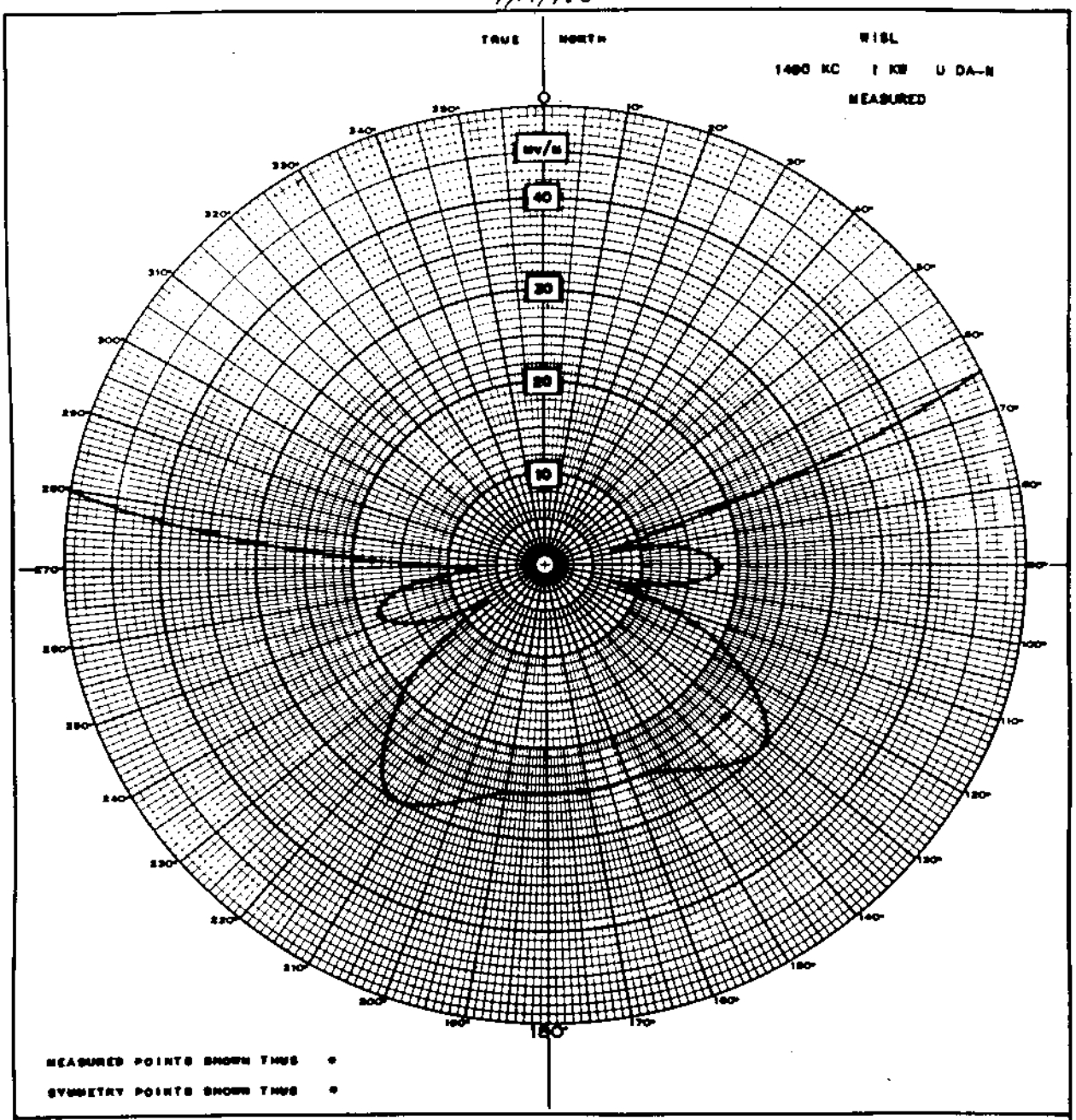
CALCULATED HORIZONTAL PLANE RADIATION PATTERN FOR NIGHTTIME OPERATION

DETAILS IN NULLS	RADIO ANTHRACITE INCORPORATED SHAMOKIN PENNSYLVANIA	WISL SHAMOKIN PENNSYLVANIA
	WELDON & CARR CONSULTING RADIO ENGINEERS WASHINGTON DC	1480 KC 1 KW U DA-N 4706138

WISL
1480

Rec'd 1-22-48

9/17/48G



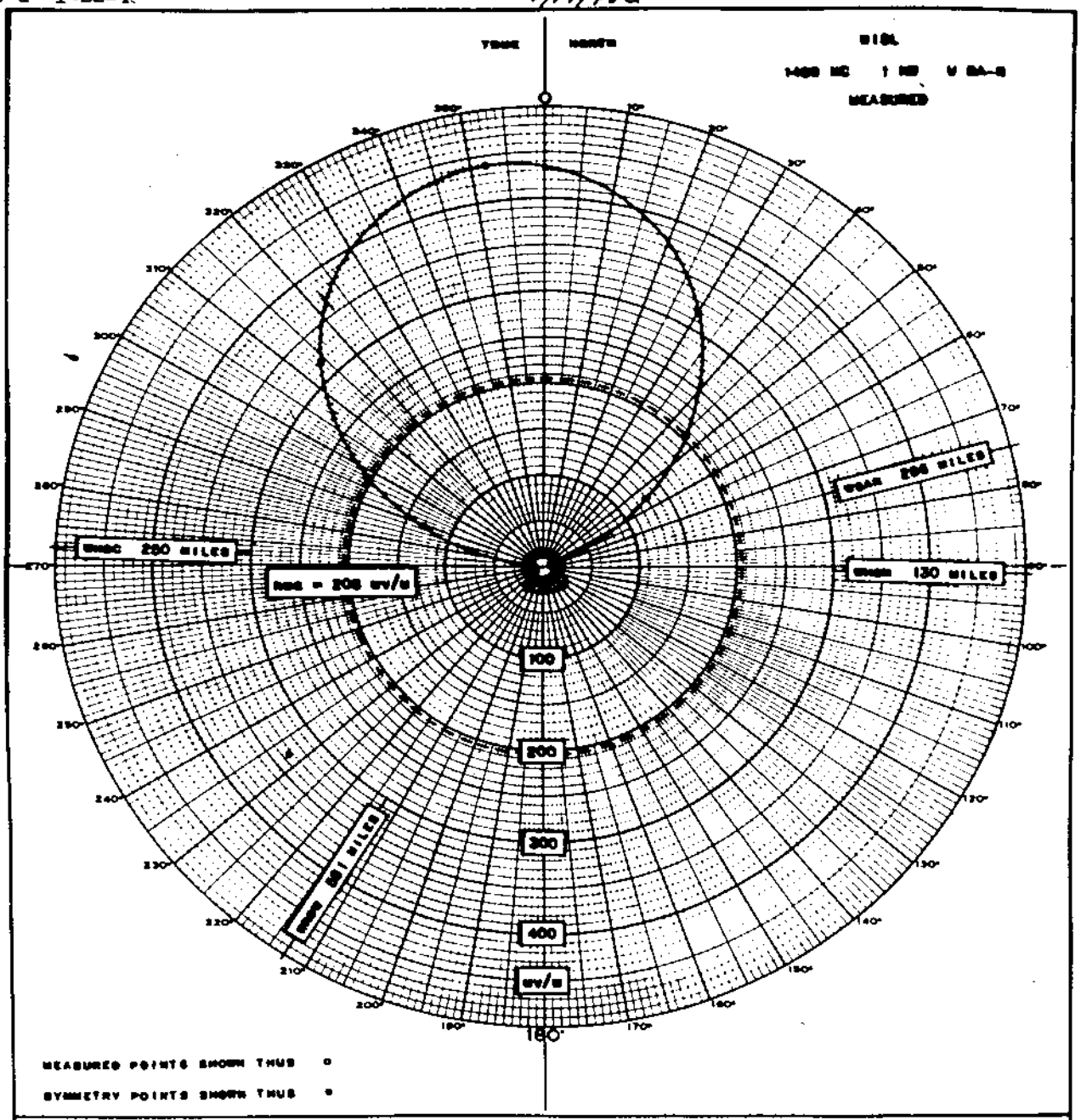
MEASURED HORIZONTAL PLANE RADIATION PATTERN

DETAIL IN NULLS	RADIO ANTHRACITE INCORPORATED SHAMOKIN PENNSYLVANIA	WISL SHAMOKIN PENNSYLVANIA
	WELDON & CARR CONSULTING RADIO ENGINEERS WASHINGTON DC	1480 KC 1 KW U DA-N 480119 A

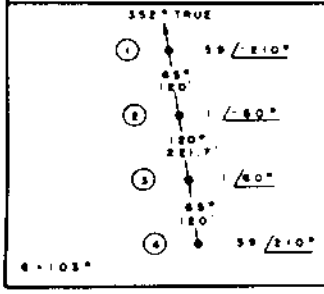
WISL
1480

Rec'd 1-22-4

9/17/48G



MEASURED HORIZONTAL PLANE RADIATION PATTERN



RADIO ANTHRACITE INCORPORATED
SHAMOKIN PENNSYLVANIA

WELDON & CARR
CONSULTING RADIO ENGINEERS
WASHINGTON DC

WISL
SHAMOKIN PENNSYLVANIA

1480 KC 1 KW U DA-N
480119 B

WISM

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WISM — Main Studio: Madison, Wisconsin

Frequency: 1480 kHz — Power: 5 kW

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

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:
North Latitude: 43° 01' 30"
West Longitude: 89° 23' 48"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-2)
Number of elements: 5
Type of elements: Towers #1, #2, #3 and #4 are series-excited, uniform cross-section, guyed, vertical steel towers. Tower #5 is tapered, self-supporting. Tower #2 is electrically sectionalized with detuning skirts to an effective electrical height of 108.3° (*)

TOWER:	SW(#1)	SC(#2)	NC(#3)	NE(#4)	E(#5)
HEIGHT ABOVE INSULATORS:	200'	480'(*)	200'	200'	200' (108.3°)
NIGHT PHASING:	0°	-141.68°	+74.86°	-70°	---
NIGHT FIELD RATIO:	1.0	2.324	2.181	0.81	---
DAY PHASING:	---	---	---	0°	+120°
DAY FIELD RATIO:	---	---	---	0.415	0.315

SPACING AND ORIENTATION: Nighttime adjacent elements #1, #2, #3 and #4 are spaced 185' (100°) on a line bearing 17° true. Daytime elements #4 and #5 are spaced 111' (60°) on a line bearing 140° true.

GROUND SYSTEM: 120-250' equally spaced copper radials plus a 32' square ground screen about towers #4 and #5. 120-185' equally spaced copper radials plus a 24' square ground screen about towers #1, #2 and #3. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of systems are bonded together.

Predicted effective Night Field: 450 mv/m at rated power by adjustment of input power.

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

(Cont'd.)

WISM

Note: Please retain the Daytime directional antenna radiation pattern notified for Station WISM in United States Change List Number 1438, dated August 18, 1971, and attach to this Revised Description Sheet and Nighttime patterns. This notification concerns only a change in MEOV's of radiation in the Nighttime operation of the station with Daytime operation continued as previously notified.

CTR NO 30471A3

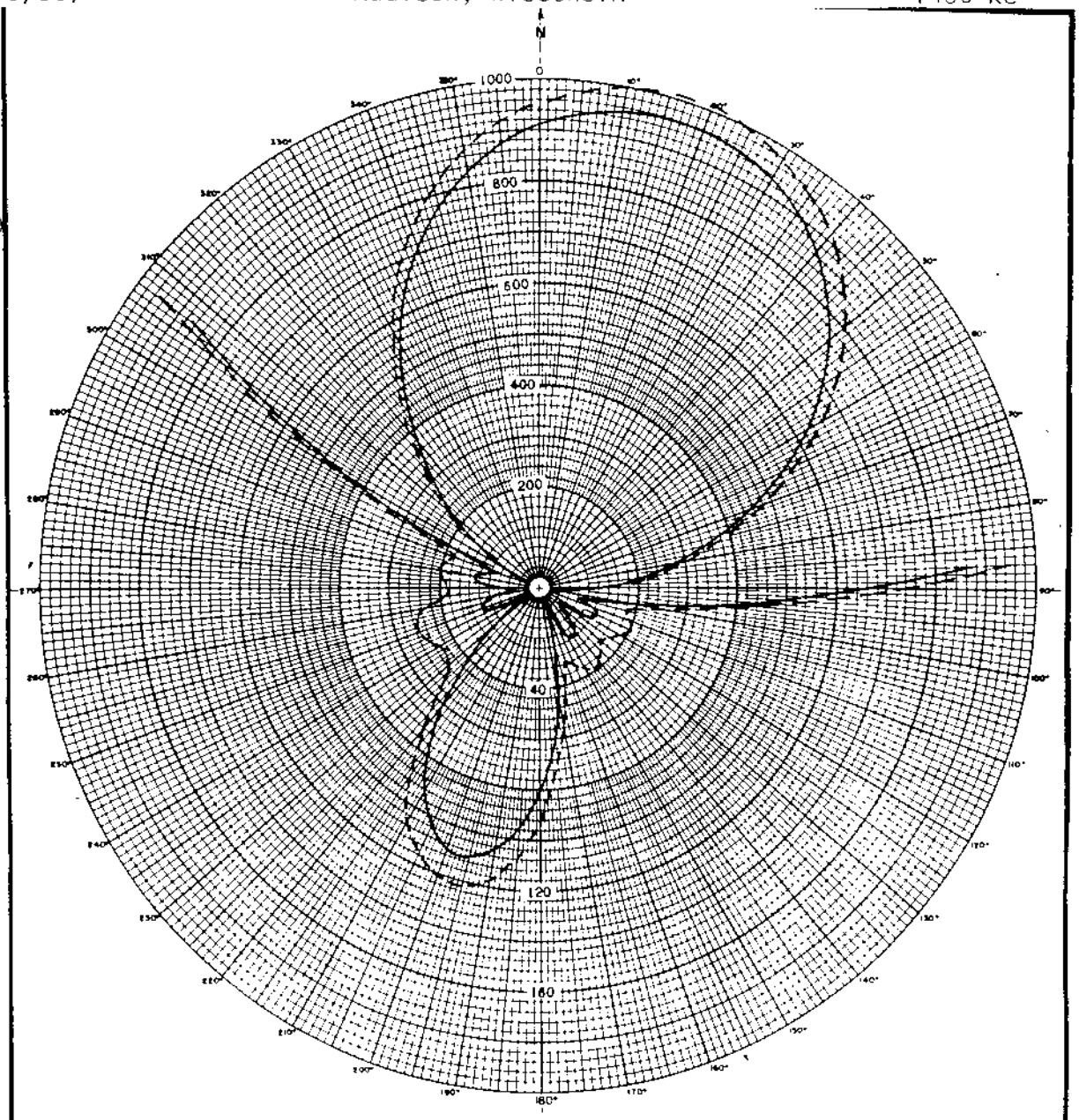
WISM

Proposed Night
(11-28-67ct)

Station WISM
Madison, Wisconsin

5kw,DA-2,U
1480 kc

1-29-67
GRANTED
MODIF. OF CP
CHANGES IN
NIGHTTIME DA
PATTERN (HEOV)



E_{RMS} = 450 MV/M (BY ADJUSTMENT)

LOCATION OF MINIMA - 104°T, 129°T, 158°T
236°T, 265°T, 290°T

LATITUDE 43° 01' 30"

LONGITUDE 89° 23' 48"

CHARLES E. BRENNAN
CONSULTING RADIO ENGINEERS
MILWAUKEE, WISCONSIN

ANTENNA PARAMETERS

ALL G's = 108°

SPACING BETWEEN ADJOINING TOWERS IS 100°.

17°T

4 ● 0.81/-70°

3 ● 2.181/+74.86°

2 ● 2.324/-141.68°

1 ● 1.0/0°

670930

FIGURE 2

PROPOSED NIGHTTIME
DIRECTIONAL ANTENNA PATTERN

RADIO STATION WISM
MADISON, WISCONSIN

1480 KC

5000 DA-2 U

FCC File No.BMP-12206
Accepted 11-8-67

Station WISM
Madison, Wisconsin

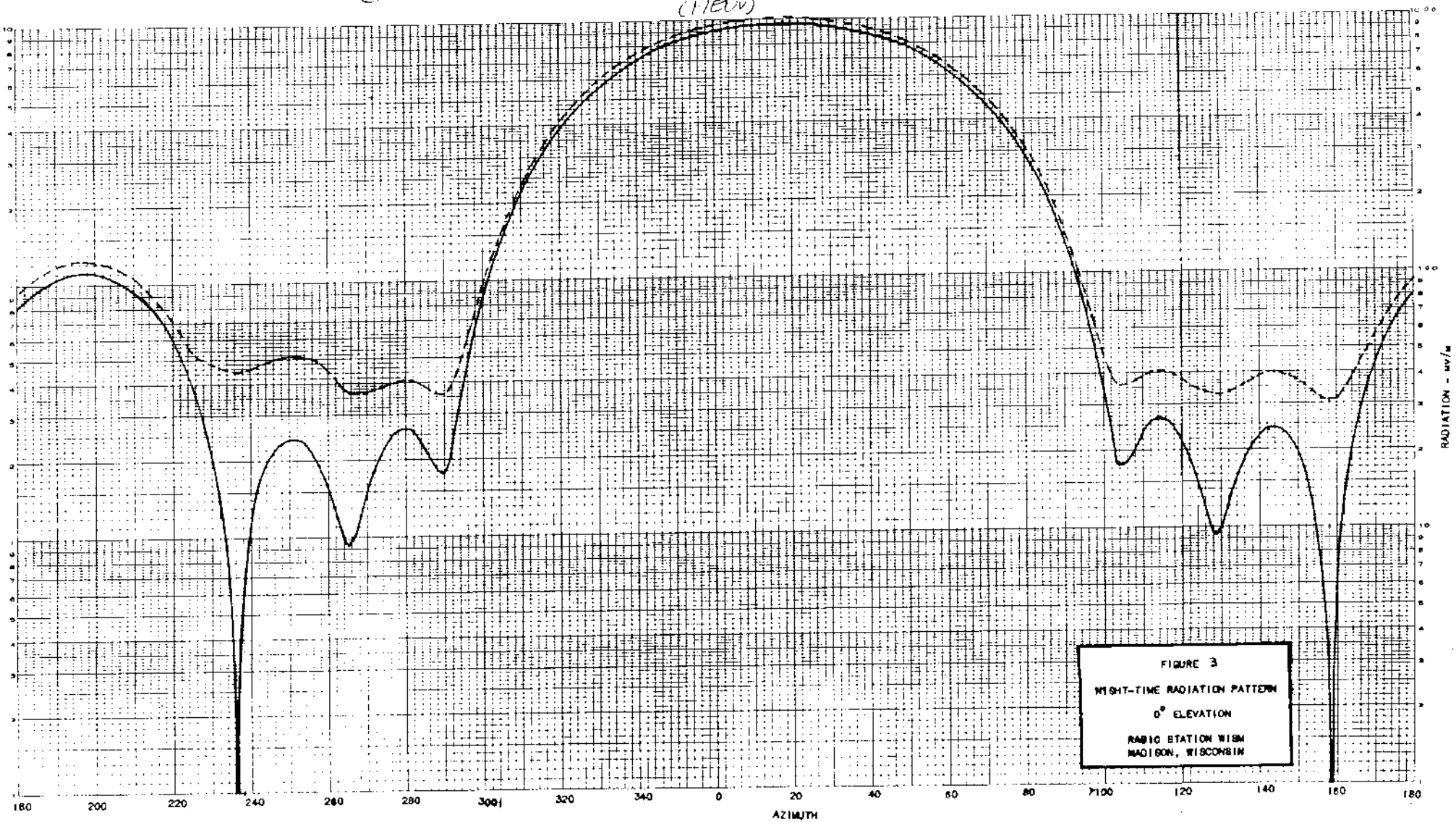
1480 kc

Proposed Night Nulls
(11-28-67ct)

Stati WISM
Madiso , Wisconsin

5kw, DA-2, U
1480 kc

11-29-67
GRANTED MODIF. OF CP
CHANGES IN NIGHTT DA PATTERN
(MEDV)



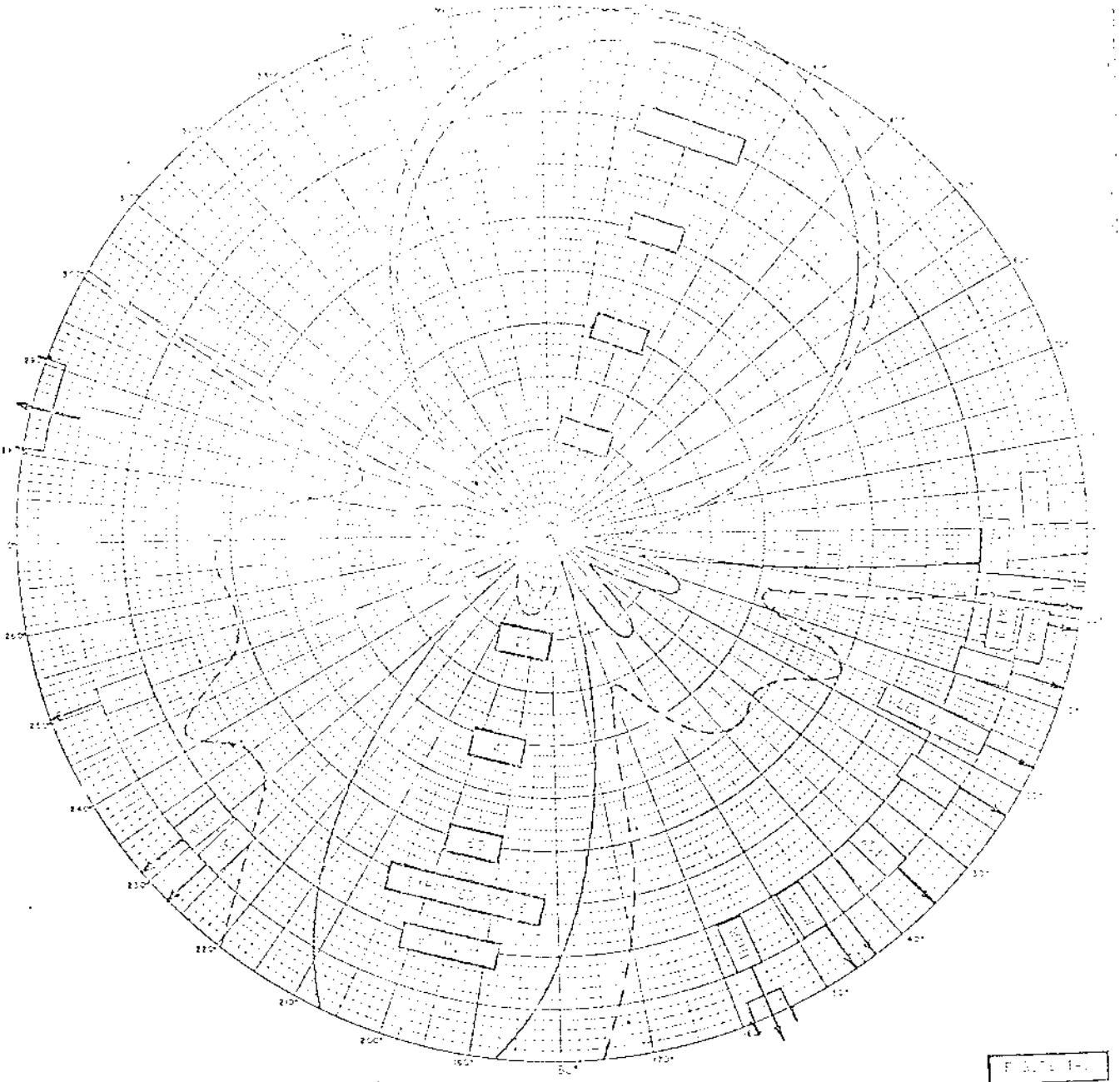
FCC File No. BMP-12206
Accepted 11-8-67

Station WISM
Madison, Wisconsin

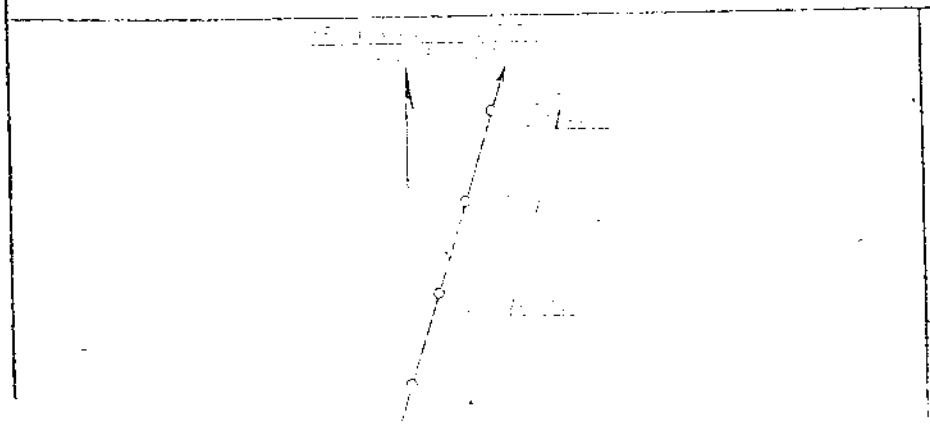
1480 kc

WISH

KIISM



HORIZONTAL RADIATION PATTERN



APPLICANT

LOCATION

FREQUENCY

POWER

LATITUDE DEG MIN SEC

LONGITUDE DEG MIN SEC

DATE

JAN, 1974

GILLIGAN, MOFFET & [illegible]

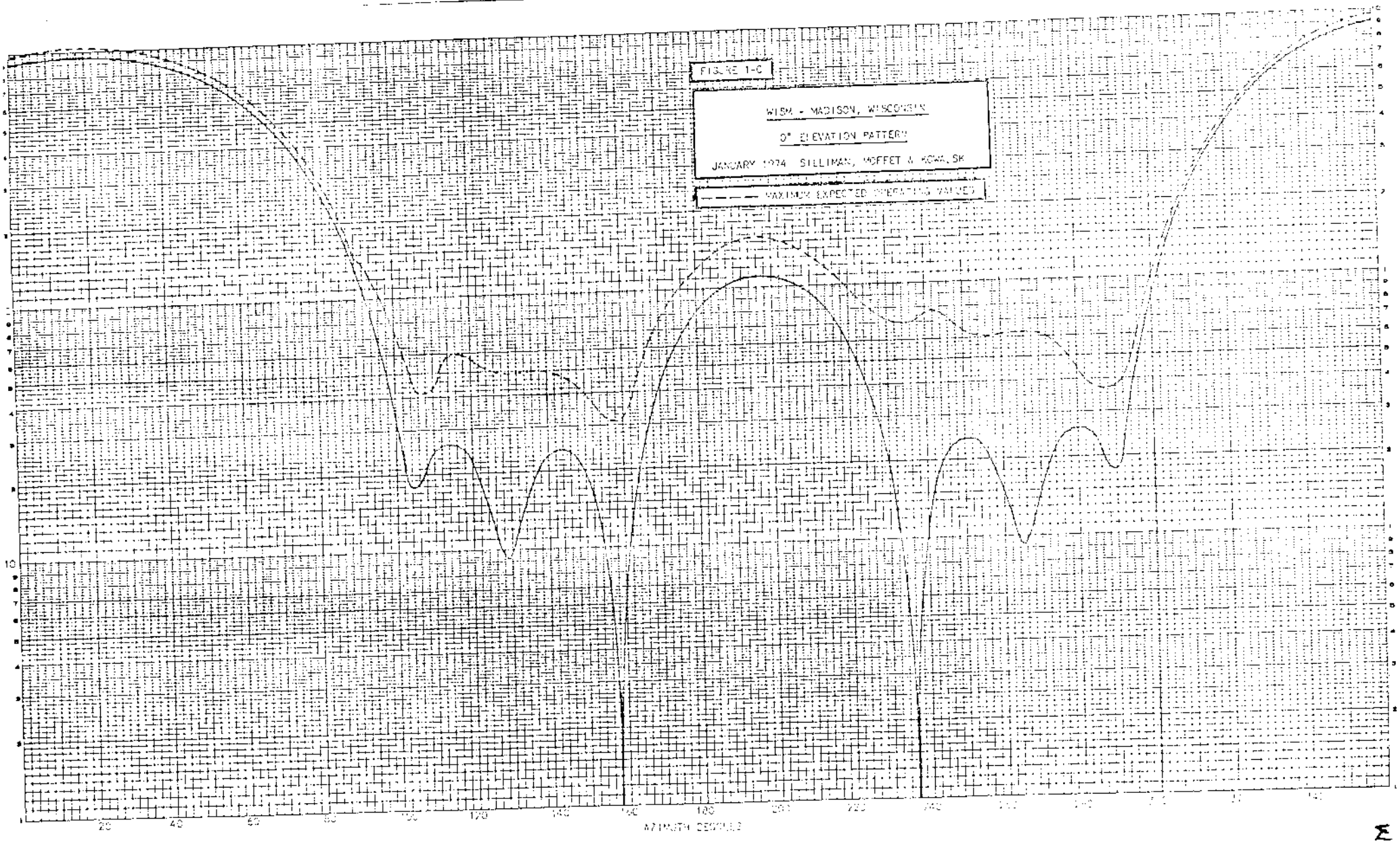


FIGURE 1-C
WISM - MADISON, WISCONSIN
0° ELEVATION PATTERN
JANUARY 1974 SILLIMAN, MOFFET & KOWALSKI
MAXIMUM EXPECTED OPERATING VALUES
AZIMUTH DEGREES

WISM

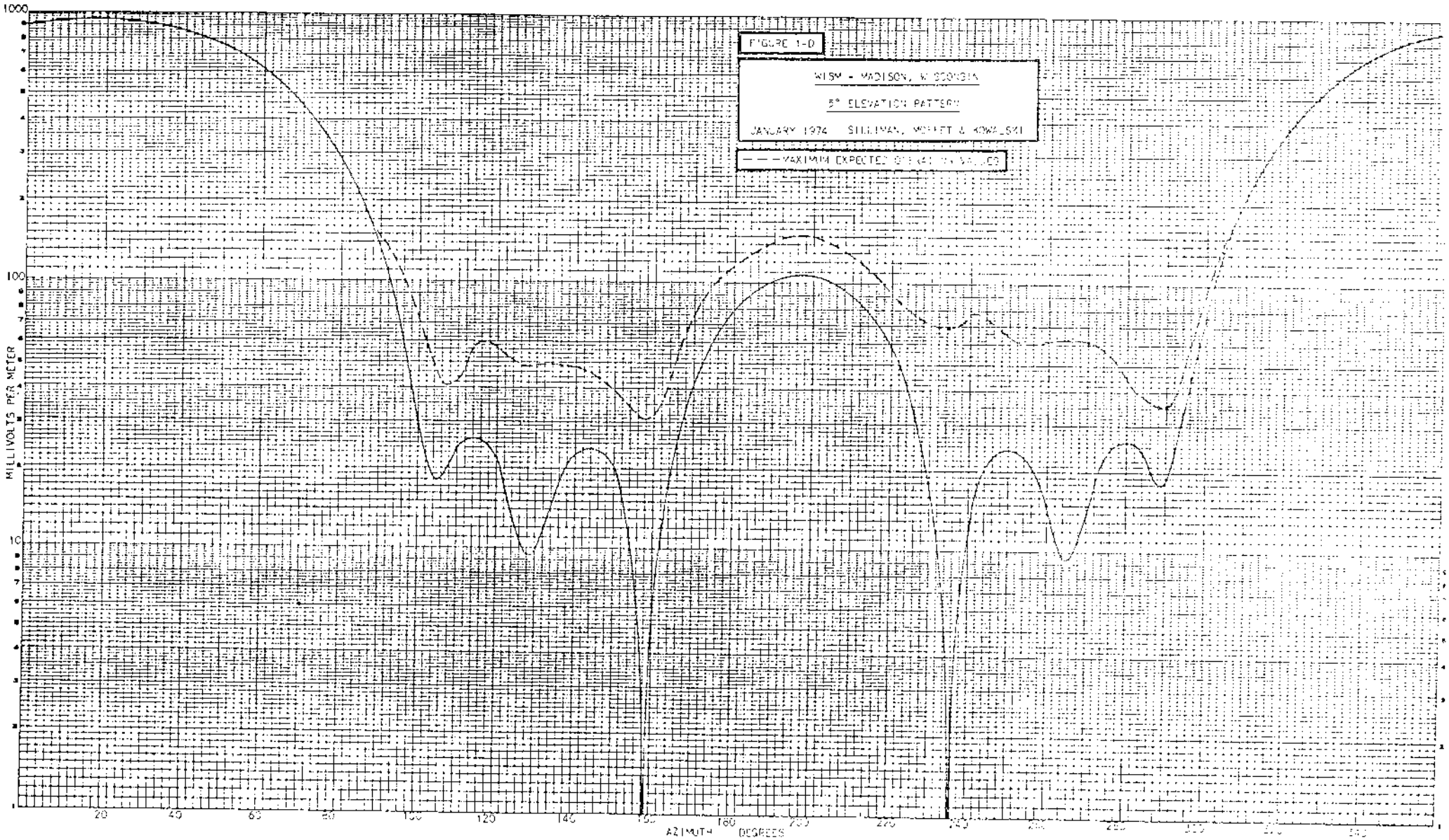


FIGURE 1-D
WISM - MADISON, WISCONSIN
5° ELEVATION PATTERN
JANUARY 1974 STILLMAN, WOLFET & KOWALSKI
MAXIMUM EXPECTED OPERATING VALUES
MILLIVOLTS PER METER
1000
100
10
1
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
AZIMUTH DEGREES

WISM

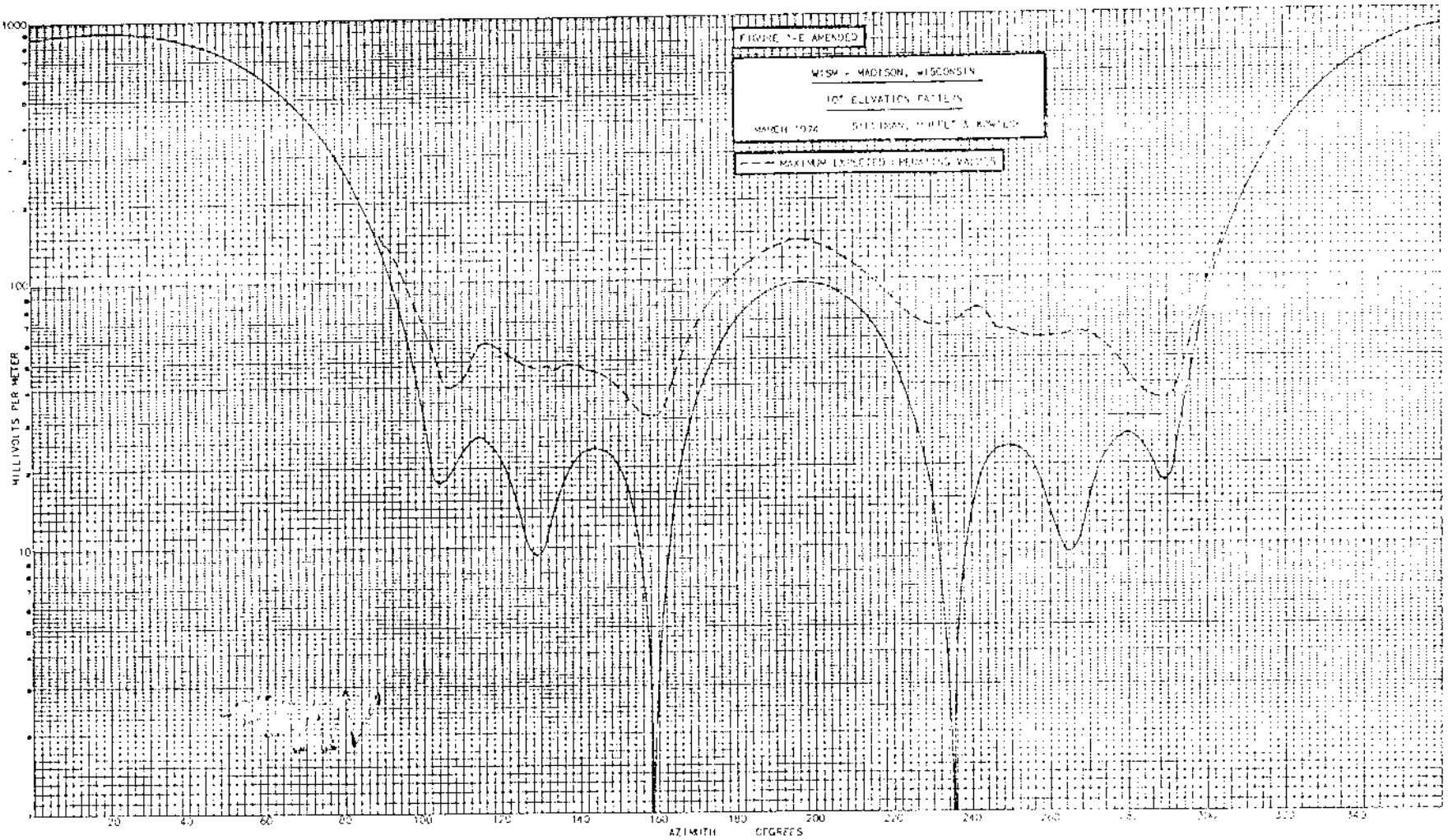


FIGURE 1-E AMENDED
WISM - MADISON, WISCONSIN
10° ELEVATION PATTERN
MARCH 1974
MAXIMUM EXPECTED OPERATING VALUES
MILLIVOLTS PER METER
1000
100
10
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
AZIMUTH DEGREES

WISM

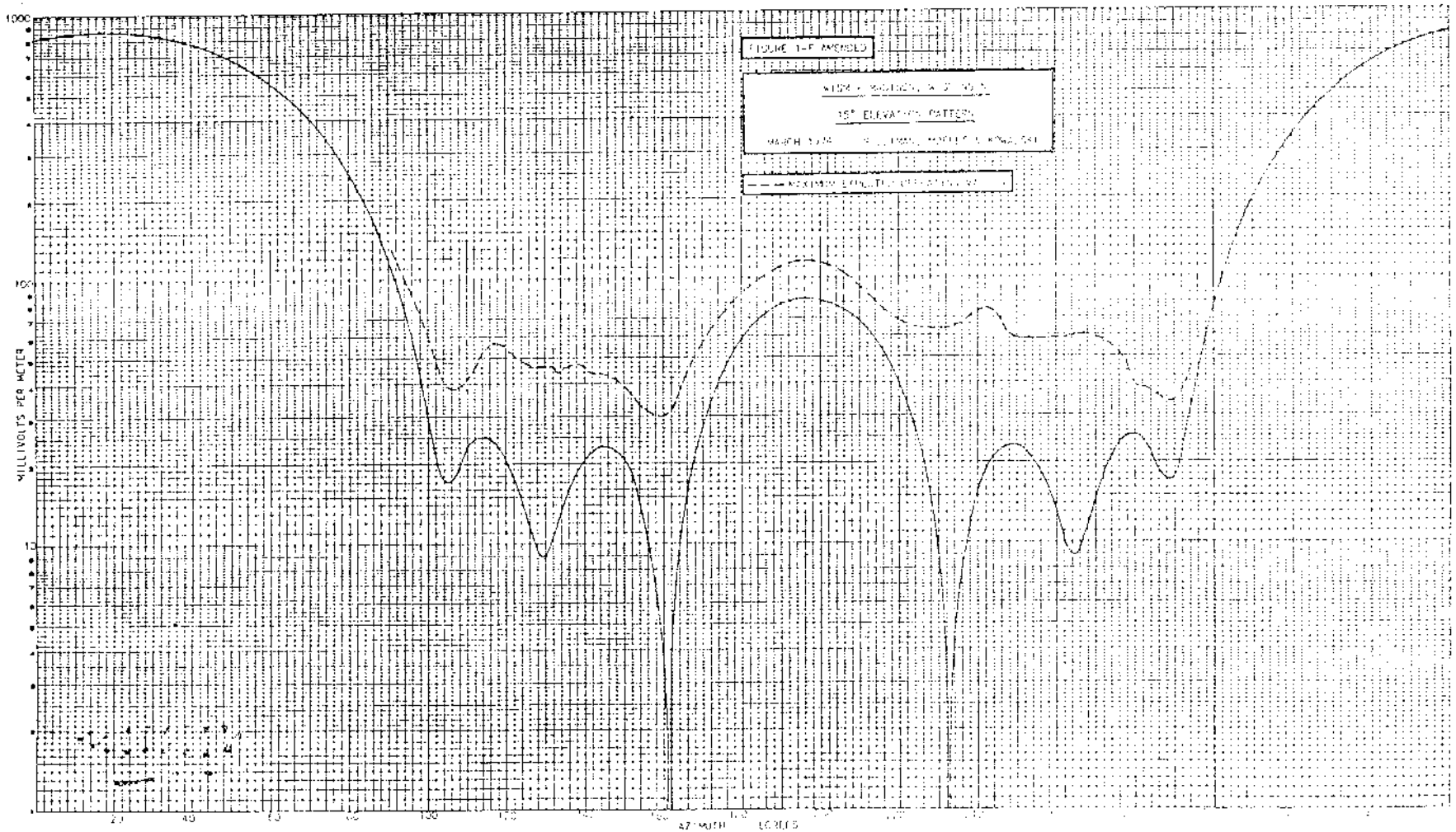


FIGURE 1-F MODELS
15° ELEVATION PATTERN
MILLIVOLTS PER METER
1000
100
10
1
AZIMUTH DEGREES

WISM

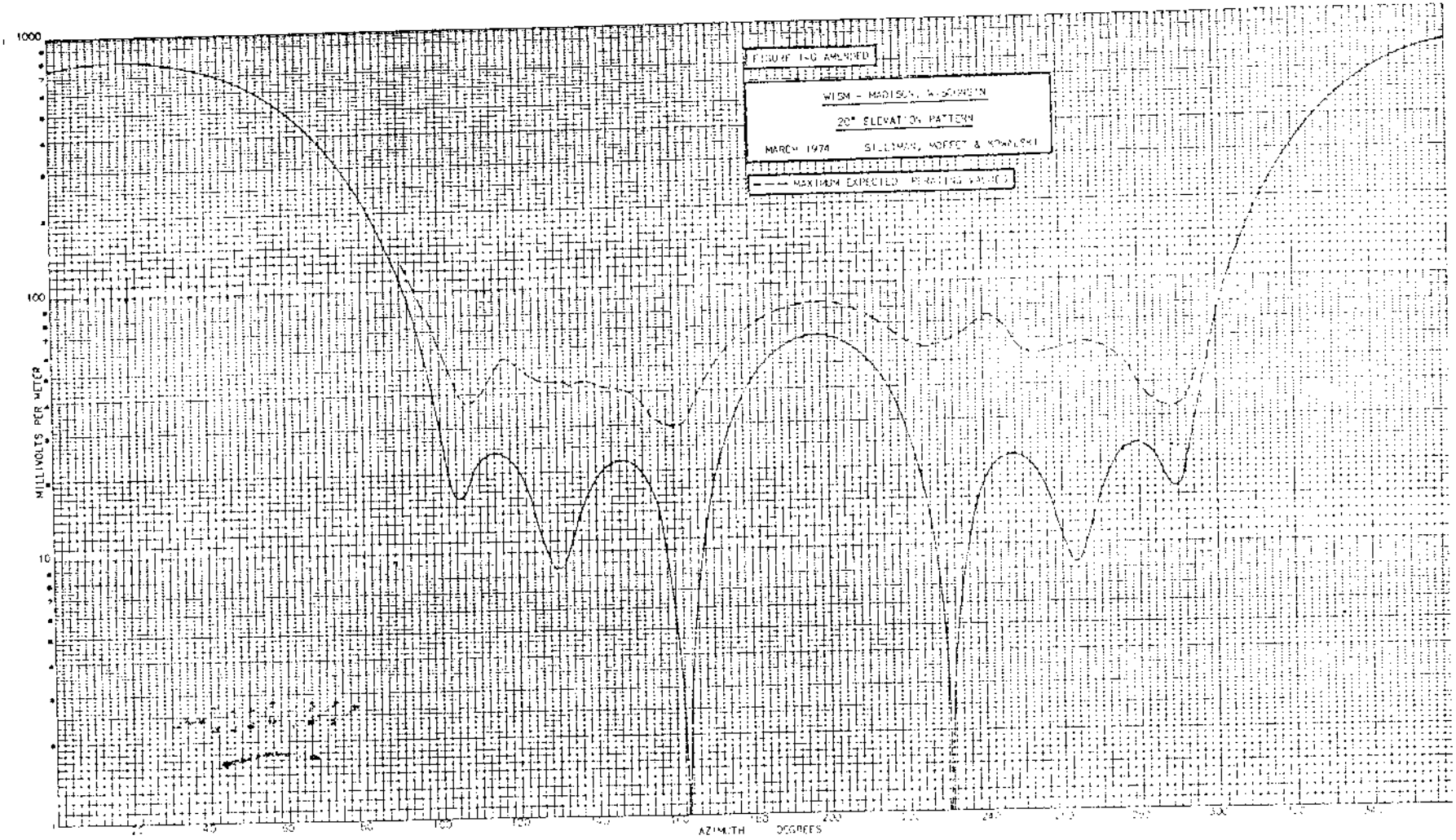


FIGURE 1-G AMENDED
WISM - MADISON, WISCONSIN
20° ELEVATION PATTERN
MARCH 1974 STILLMAN, MOFFET & KOWALSKI
MAXIMUM EXPECTED OPERATING VALUE
MILLIVOLTS PER METER
1000
100
10
AZIMUTH DEGREES

WISM

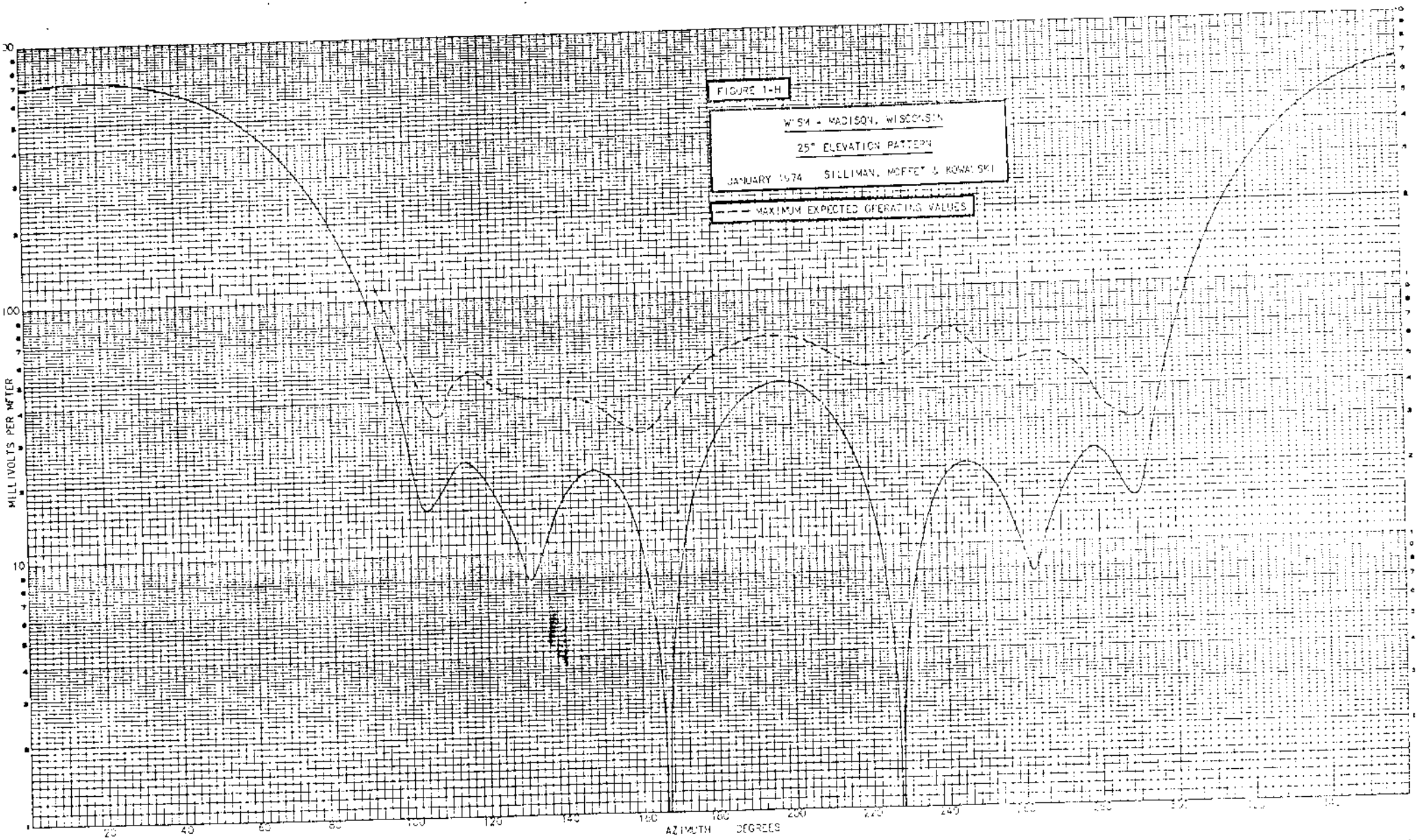


FIGURE 1-H
WISM - MADISON, WISCONSIN
25° ELEVATION PATTERN
JANUARY 1974 STILLMAN, MOFFET & KOWALSKI
MAXIMUM EXPECTED OPERATING VALUES
MILLIVOLTS PER METER
AZIMUTH DEGREES
20
40
60
80
100
120
140
160
180
200
220
240
1
10
100

WISM

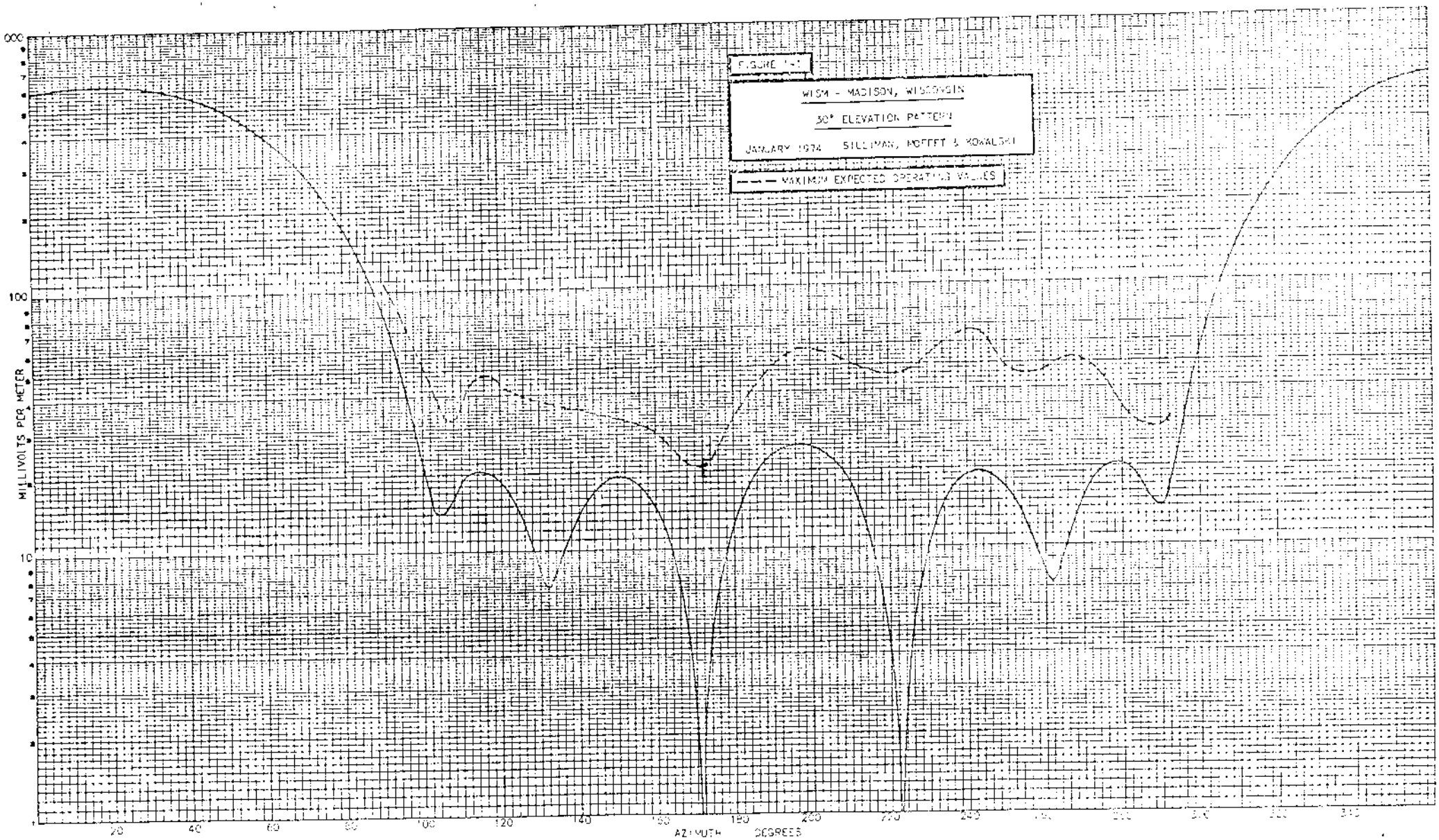


FIGURE 1-2
WISM - MADISON, WISCONSIN
30° ELEVATION PATTERN
JANUARY 1974 SILLIMAN, MOFFET & KOWALSKI
MAXIMUM EXPECTED OPERATING VALUES
MILLIVOLTS PER METER
1000
100
10
1
20
40
60
80
100
120
140
160
180
200
220
240
AZIMUTH DEGREES

WISM

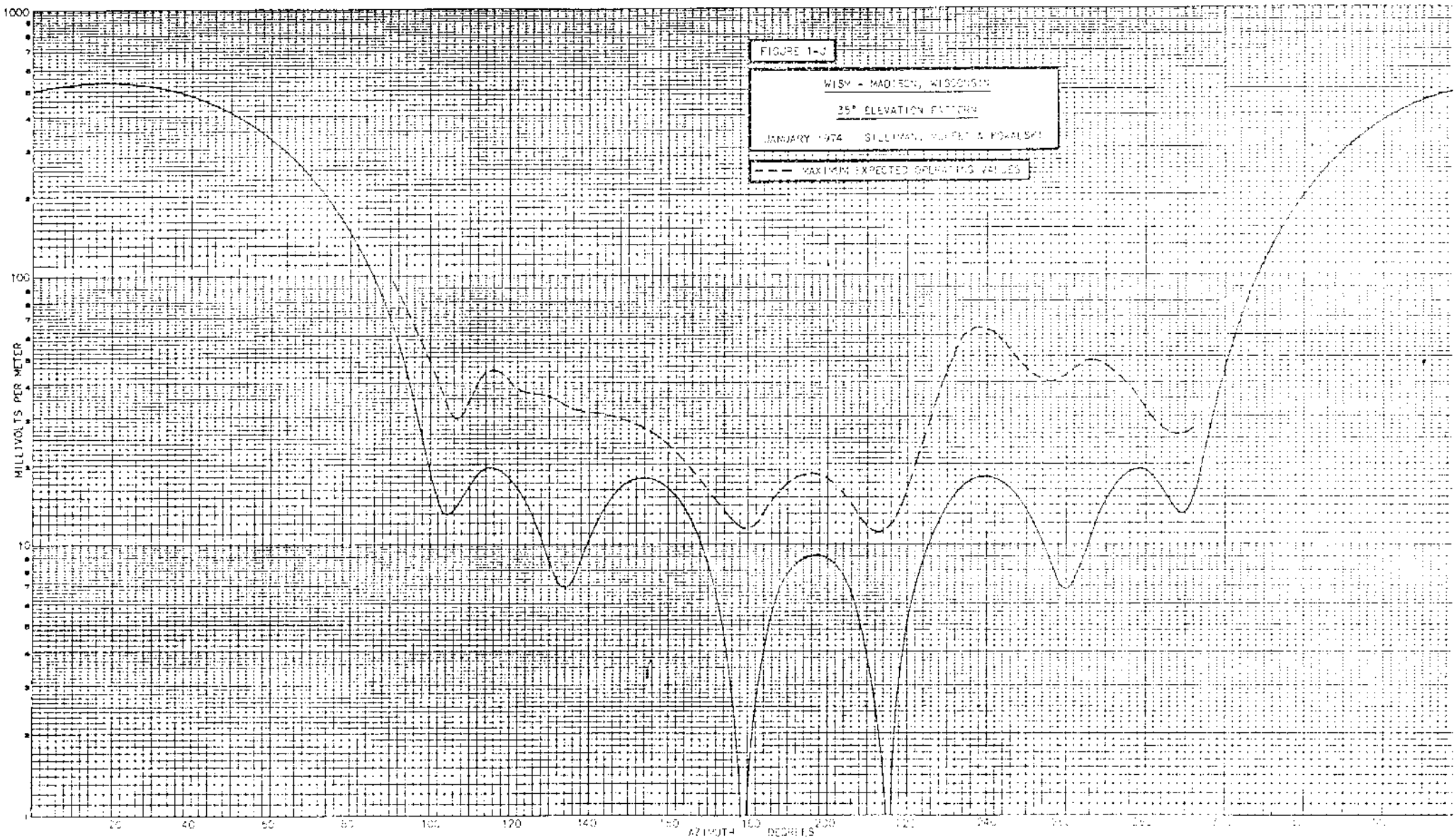


FIGURE 1-J
WISM - MADISON, WISCONSIN
25° ELEVATION PATTERN
JANUARY 1974 SILLIMAN, SUPPER & KOWALSKI
MAXIMUM EXPECTED OPERATING VALUES
MILLIVOLTS PER METER
1000
100
10
1
20
40
60
80
100
120
140
160
180
200
220
240
AZIMUTH DEGREES

WISM

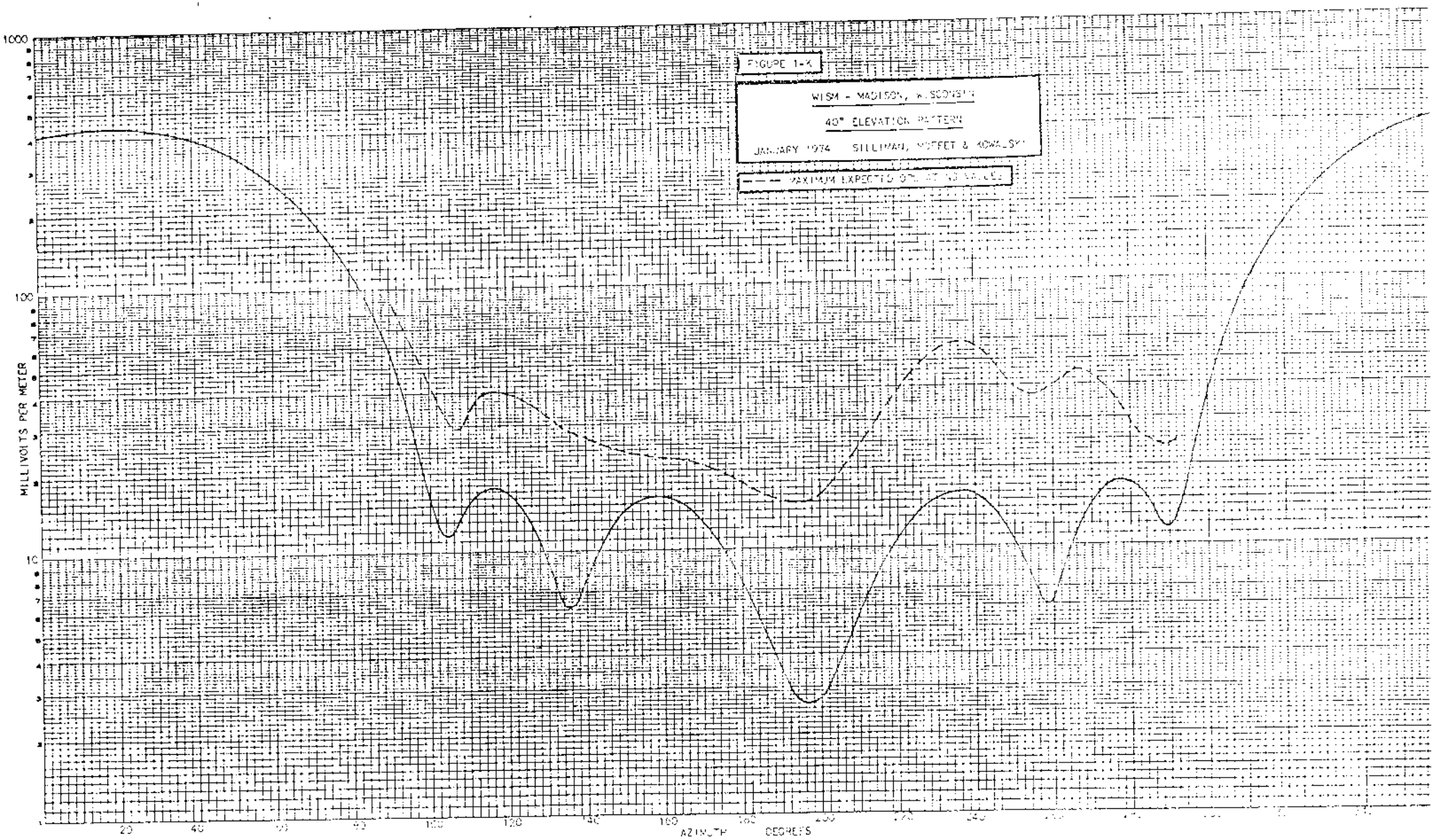


FIGURE 1-A
WISM - MADISON, WISCONSIN
40° ELEVATION PATTERN
JANUARY 1974 SULLIVAN, MOFFET & KOWALSKI
MAXIMUM EXPECTED
1000
100
10
MILLIVOLTS PER METER
20
40
120
140
160
AZIMUTH DEGREES

WISM

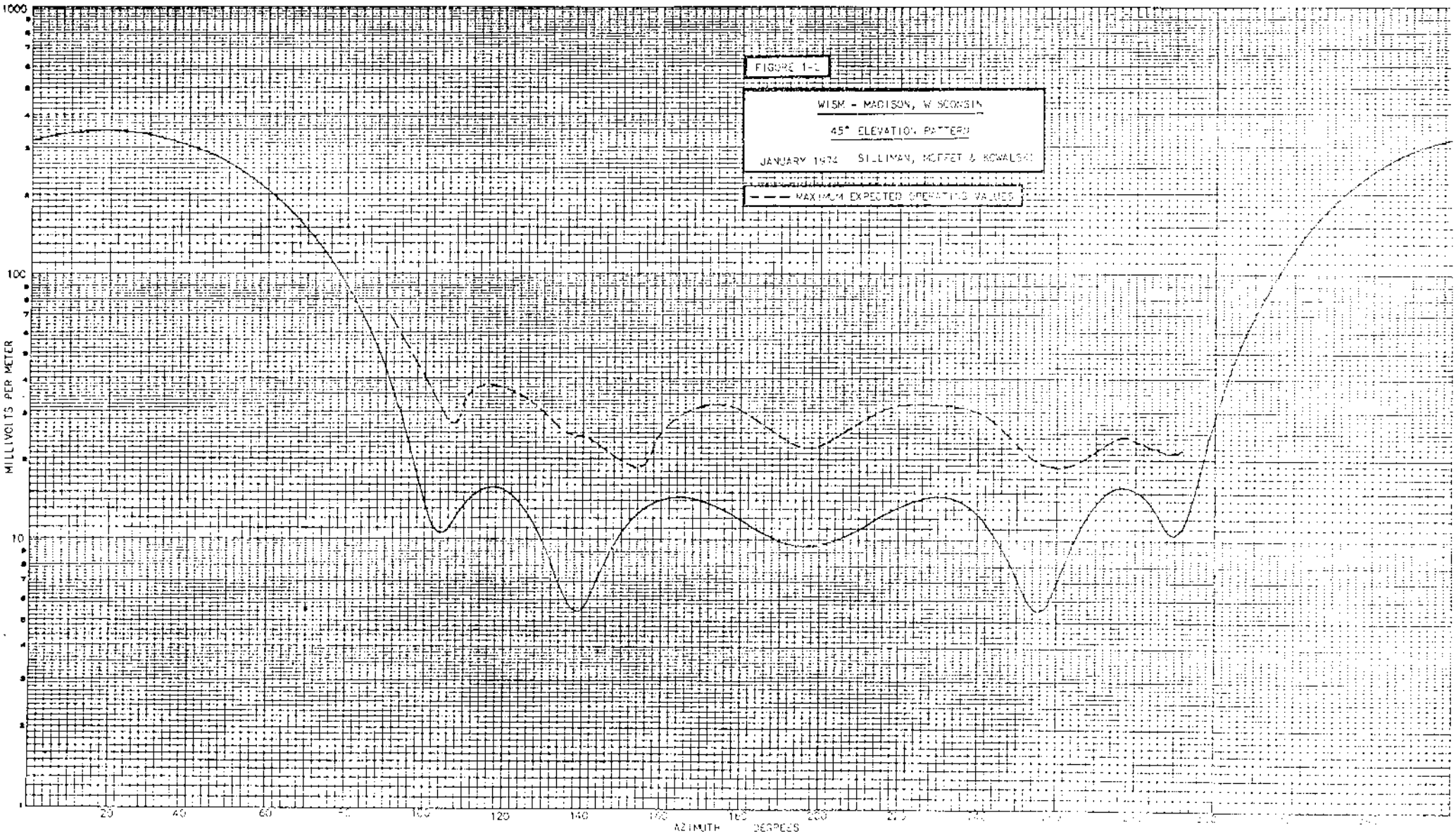


FIGURE 1-2
WISM - MADISON, WISCONSIN
45° ELEVATION PATTERN
JANUARY 1974 SILLIMAN, MOFFET & KOWALSKI
MAXIMUM EXPECTED OPERATING VALUES
MILLIVOLTS PER METER
1000
100
10
1
20
40
60
120
140
AZIMUTH DEGREES

WISM

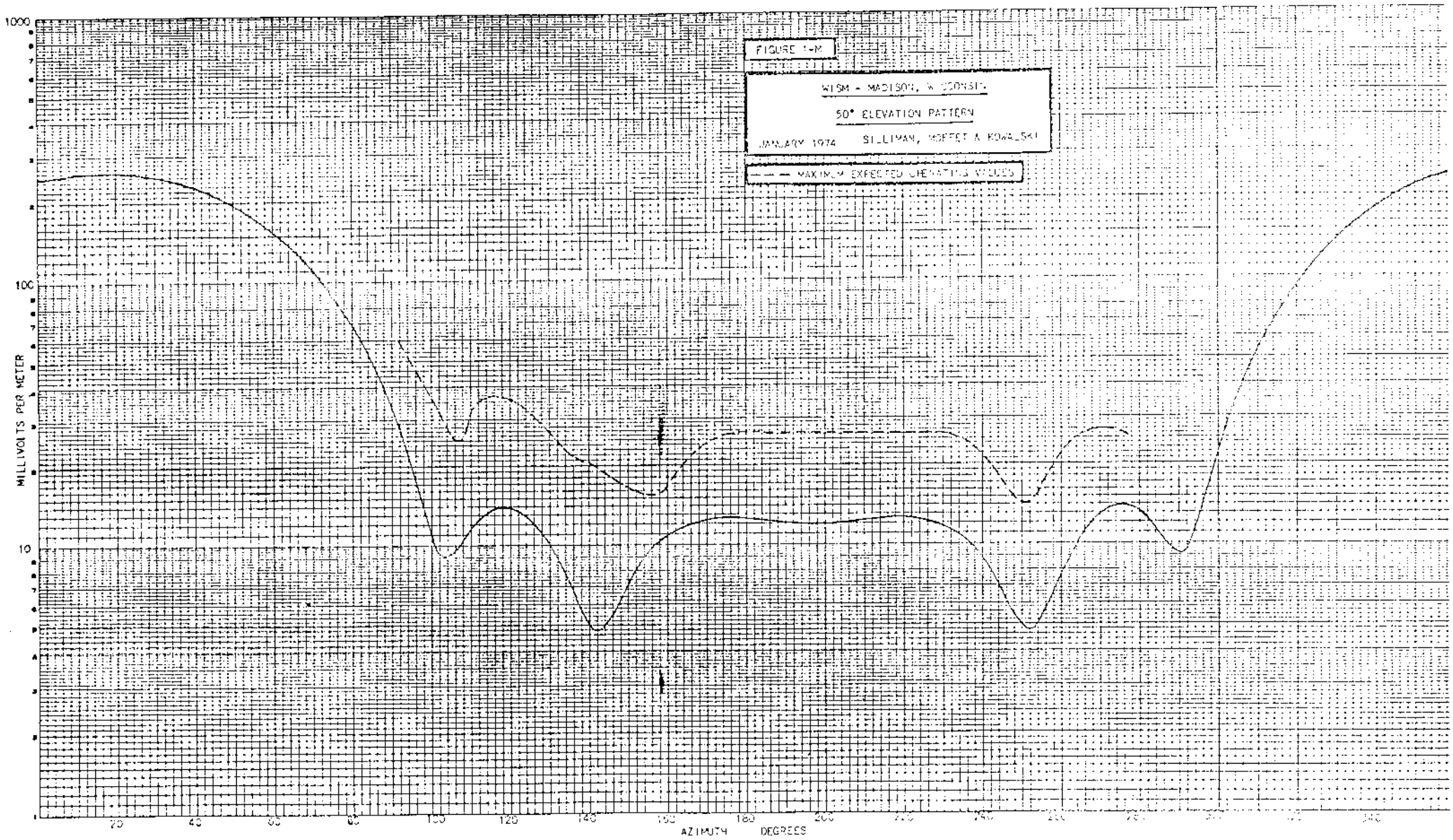


FIGURE 1-M
WISM - MADISON, WISCONSIN
50° ELEVATION PATTERN
JANUARY 1974
SILLIMAN, MOFFET & KOWALSKI
MAXIMUM EXPECTED OPERATING VALUES
MILLIVOLTS PER METER
1000
100
10
1
20
40
60
80
100
120
140
160
180
200
AZIMUTH DEGREES

WISM

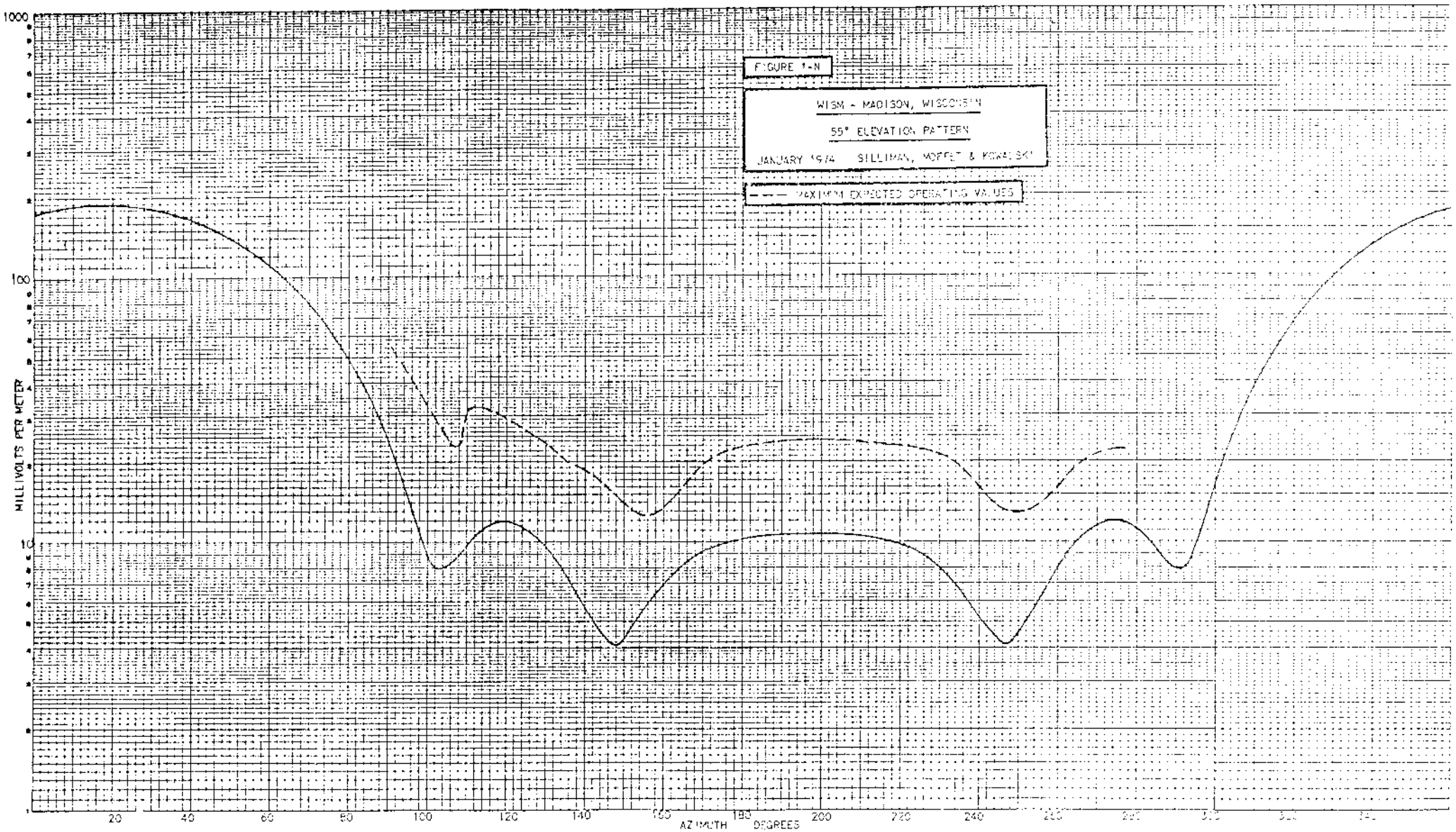


FIGURE 1-N
WISM - MADISON, WISCONSIN
55° ELEVATION PATTERN
JANUARY 1974 SILLIMAN, MOFFET & KOWALSKI
MAXIMUM EXPECTED OPERATING VALUES
MILLIVOLTS PER METER
1000
100
10
1
20
40
60
80
100
120
140
160
180
200
220
240
AZIMUTH DEGREES

WISM

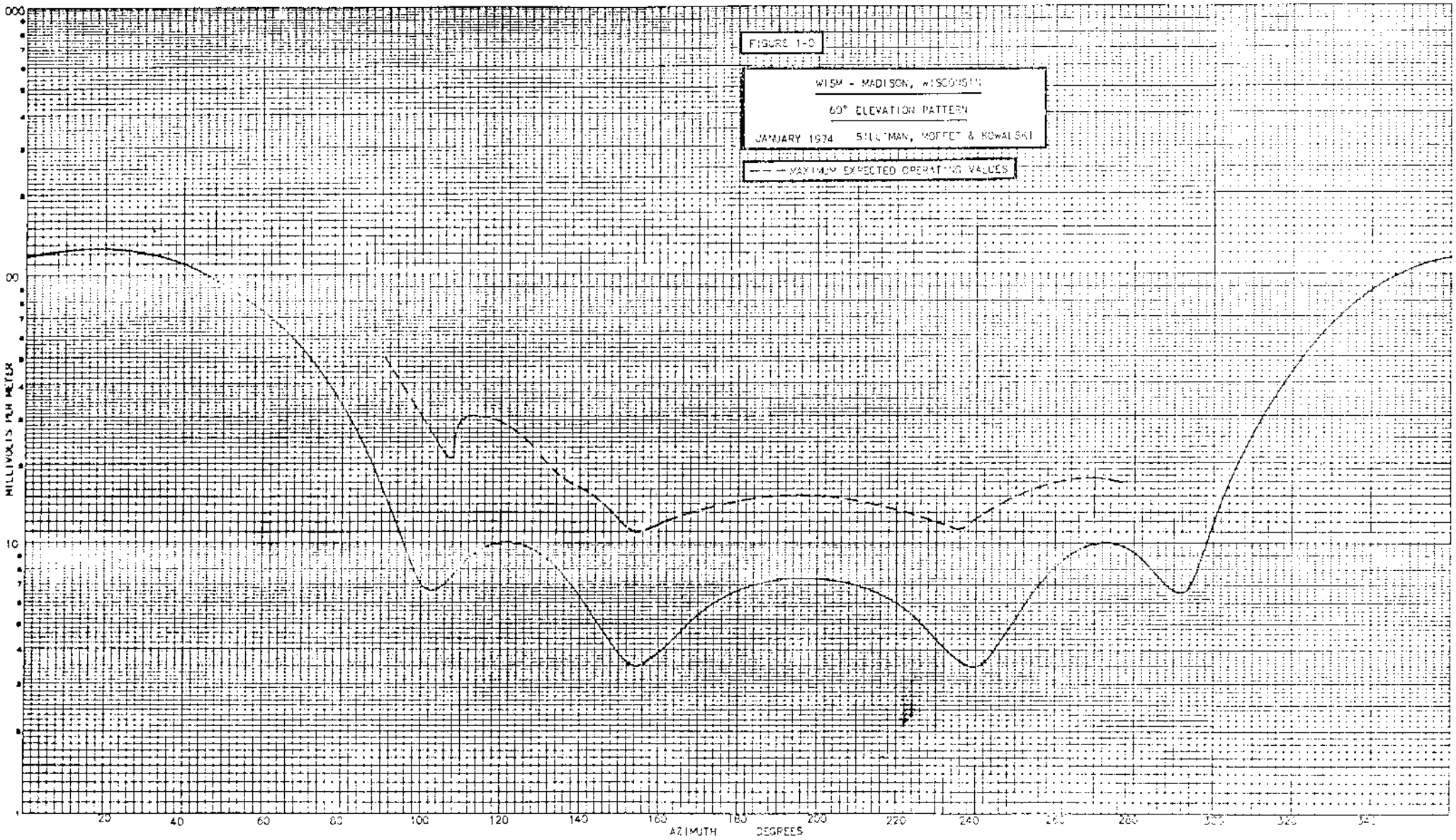
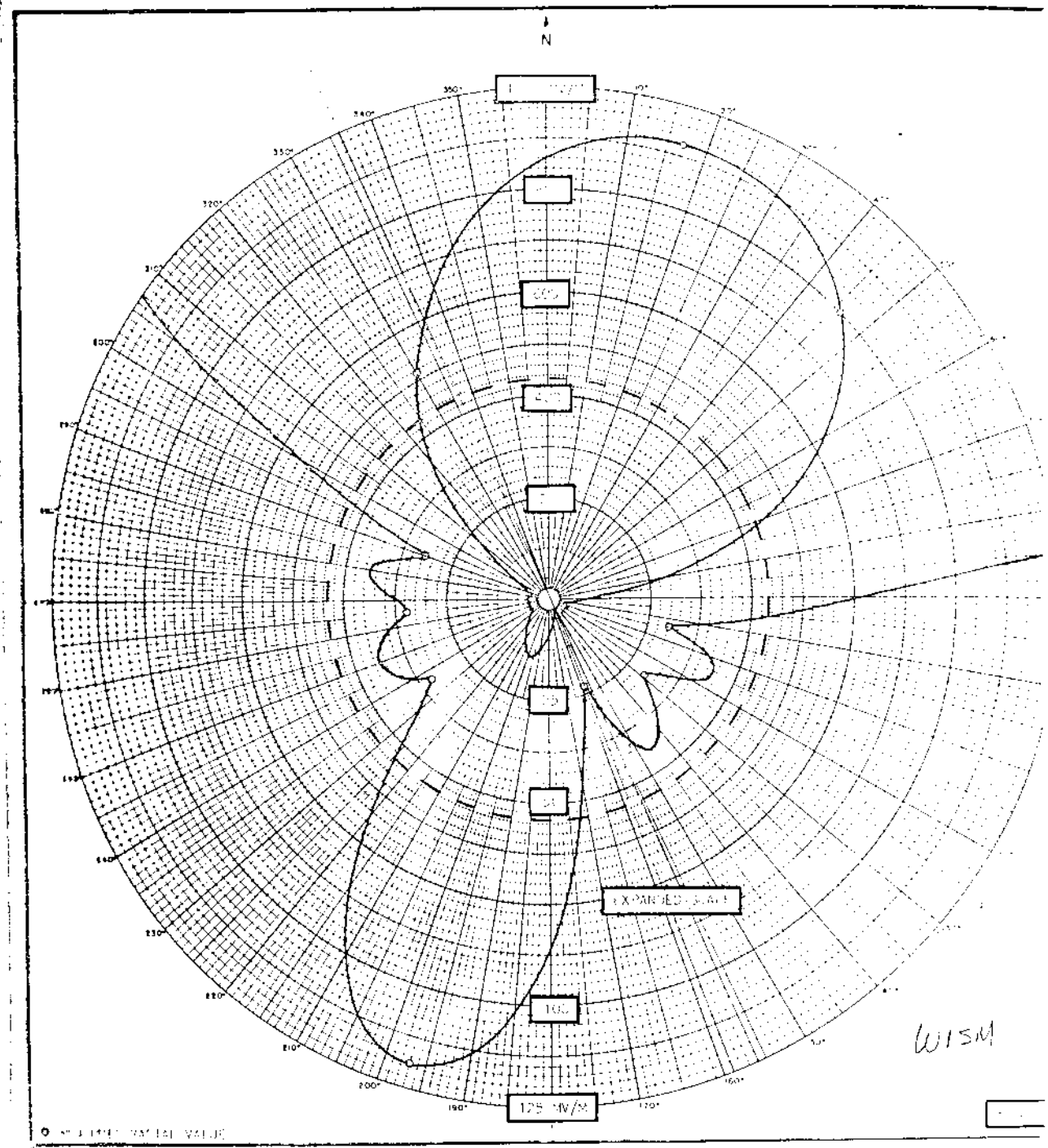
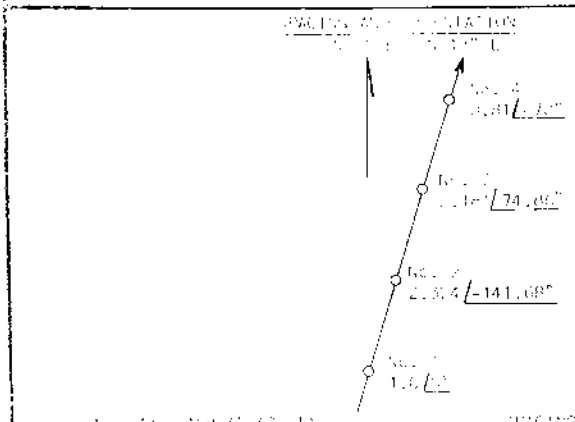


FIGURE 1-3
WISM - MADISON, WISCONSIN
69° ELEVATION PATTERN
JANUARY 1974 SILLMAN, MOFFET & KOWALSKI
MAXIMUM EXPECTED OPERATING VALUES
MILLIVOLTS PER METER
1000
100
10
1
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
AZIMUTH DEGREES

WISM



HORIZONTAL RADIATION PATTERN



APPLICANT

LOCATION

FREQUENCY

POWER

LATITUDE DEG MIN SEC

LONGITUDE DEG MIN SEC

WHEN USED

R.M.S. FIELD

DATE

SILLIMAN, MOFFET & KOWAL

CONSULTING RADIO ENGINEERS

WASHINGTON, D.C.

WISM

PROPOSED DAY
(7/19/57g)

Station WISC
Madison, Wisconsin

1kw,5kw-LS, DA-2,U
1480 KC

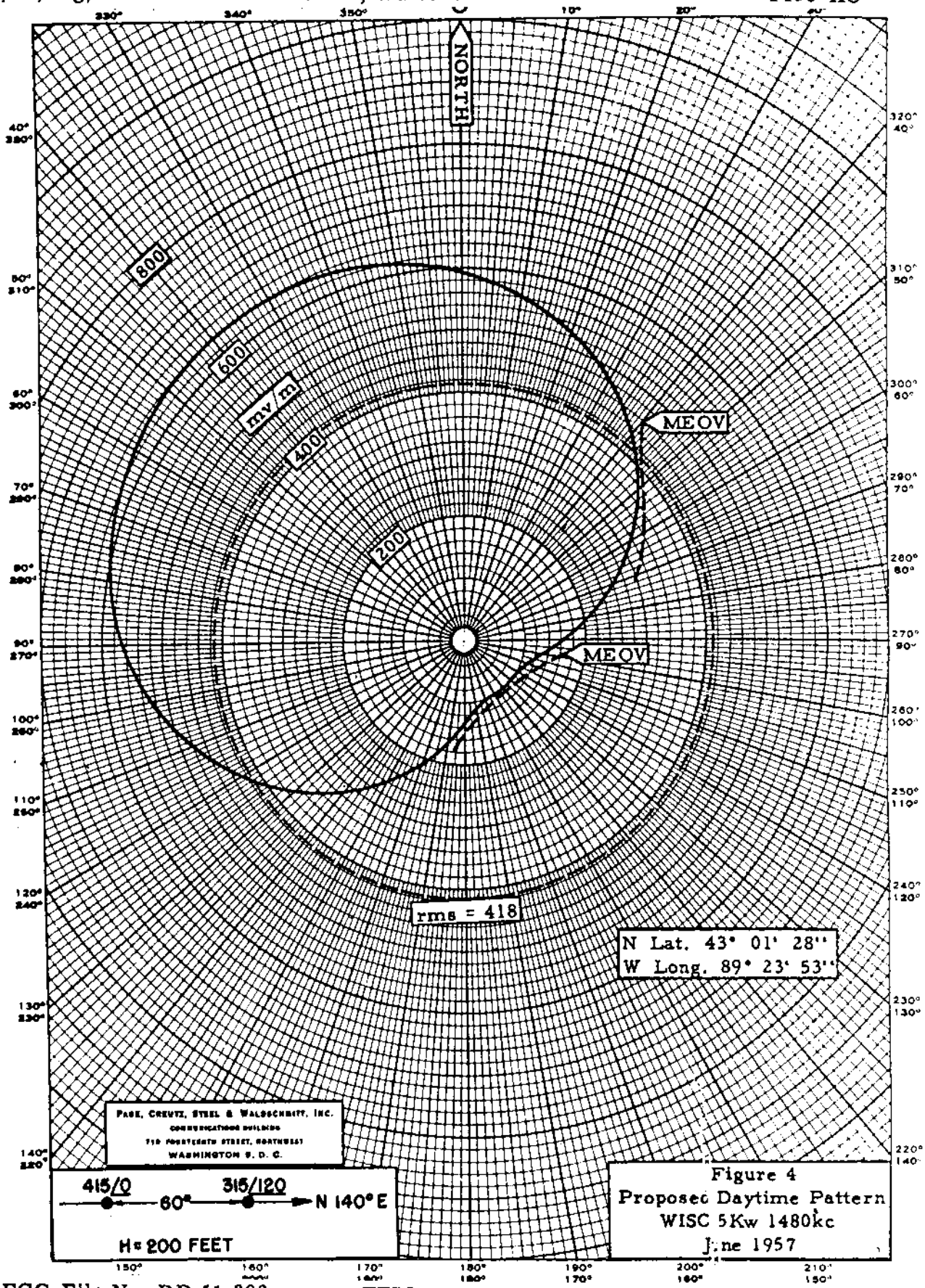


Figure 4
Proposed Daytime Pattern
WISC 5Kw 1480kc
June 1957

FCC File No. BP-11,396
Accepted 7/16/57

WISC
Madison, Wisconsin

1480 KC

WISM

MEASURED DAY
(12-21-59g)

Station WISM
Madison, Wisconsin

1/5KW
~~500w, 1KW~~-LS, DA-2, U
1480 KC

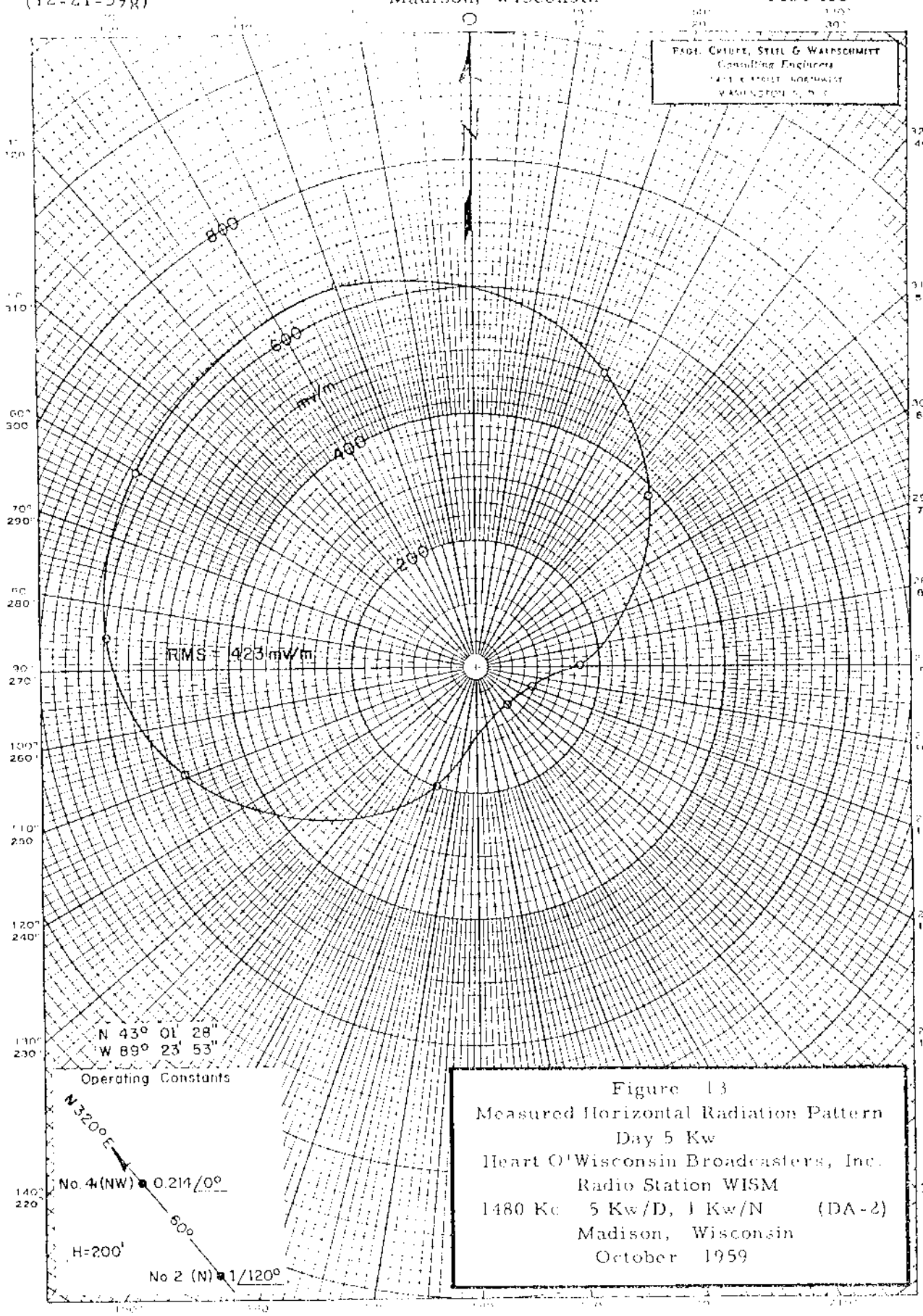


Figure 13
Measured Horizontal Radiation Pattern
Day 5 Kw
Heart O'Wisconsin Broadcasters, Inc.
Radio Station WISM
1480 Kc 5 Kw/D, 1 Kw/N (DA-2)
Madison, Wisconsin
October 1959

FCC File No. BL-7723
Accepted 11-24-59

WISM
Madison, Wisconsin

1480 KC

WISM

MEASURED NON-DA
(12-21-59g)

Station WISM
Madison, Wisconsin

~~500w, 1kw~~ 1/5 kw-LS, DA-2, U
1480 KC

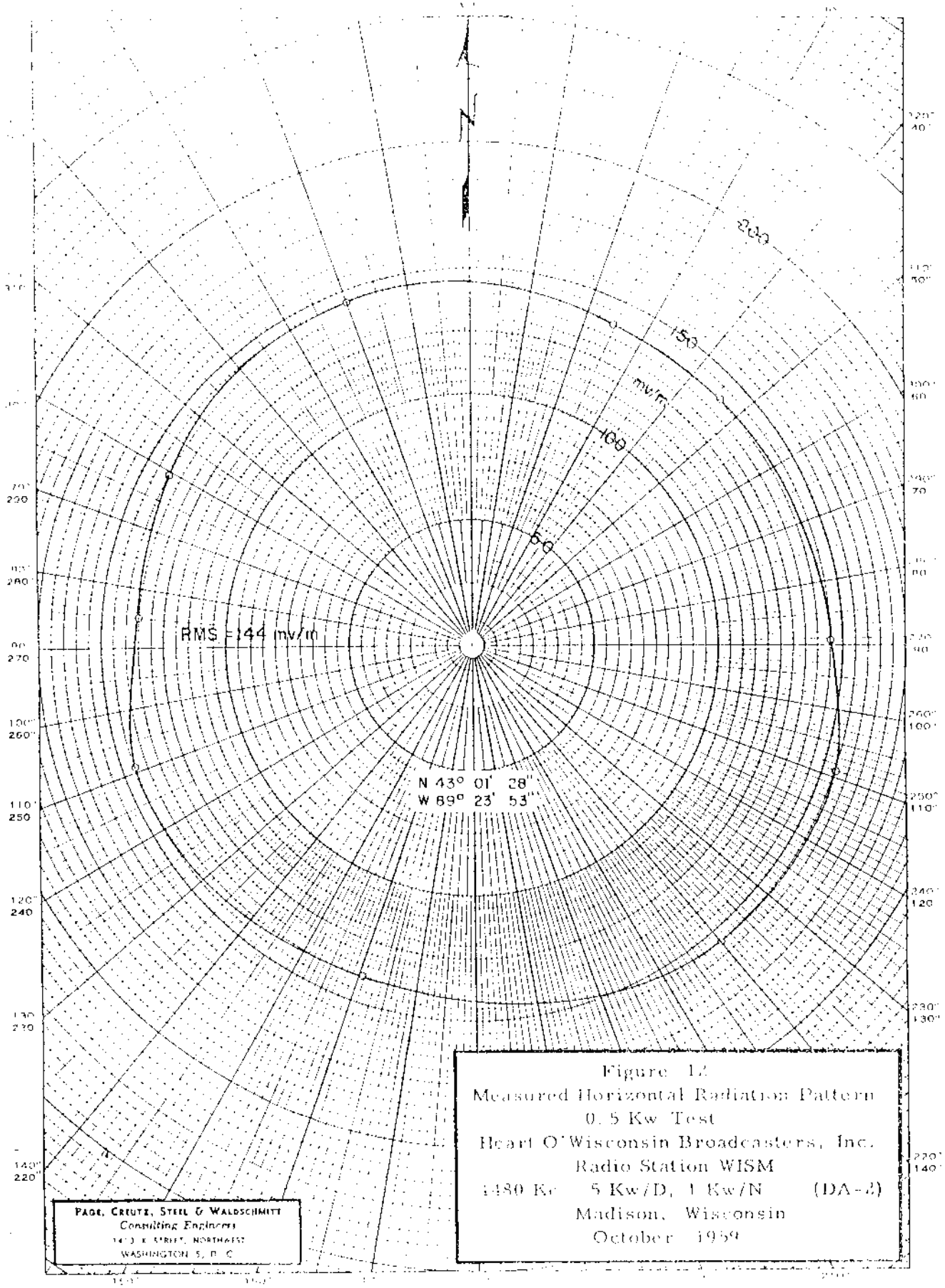


Figure 12
Measured Horizontal Radiation Pattern
0.5 Kw Test
Heart O'Wisconsin Broadcasters, Inc.
Radio Station WISM
1480 Kc 5 Kw/D, 1 Kw/N (DA-2)
Madison, Wisconsin
October 1959

FCC File No. BL-7723
Accepted 11-24-59

WISM
Madison, Wisconsin

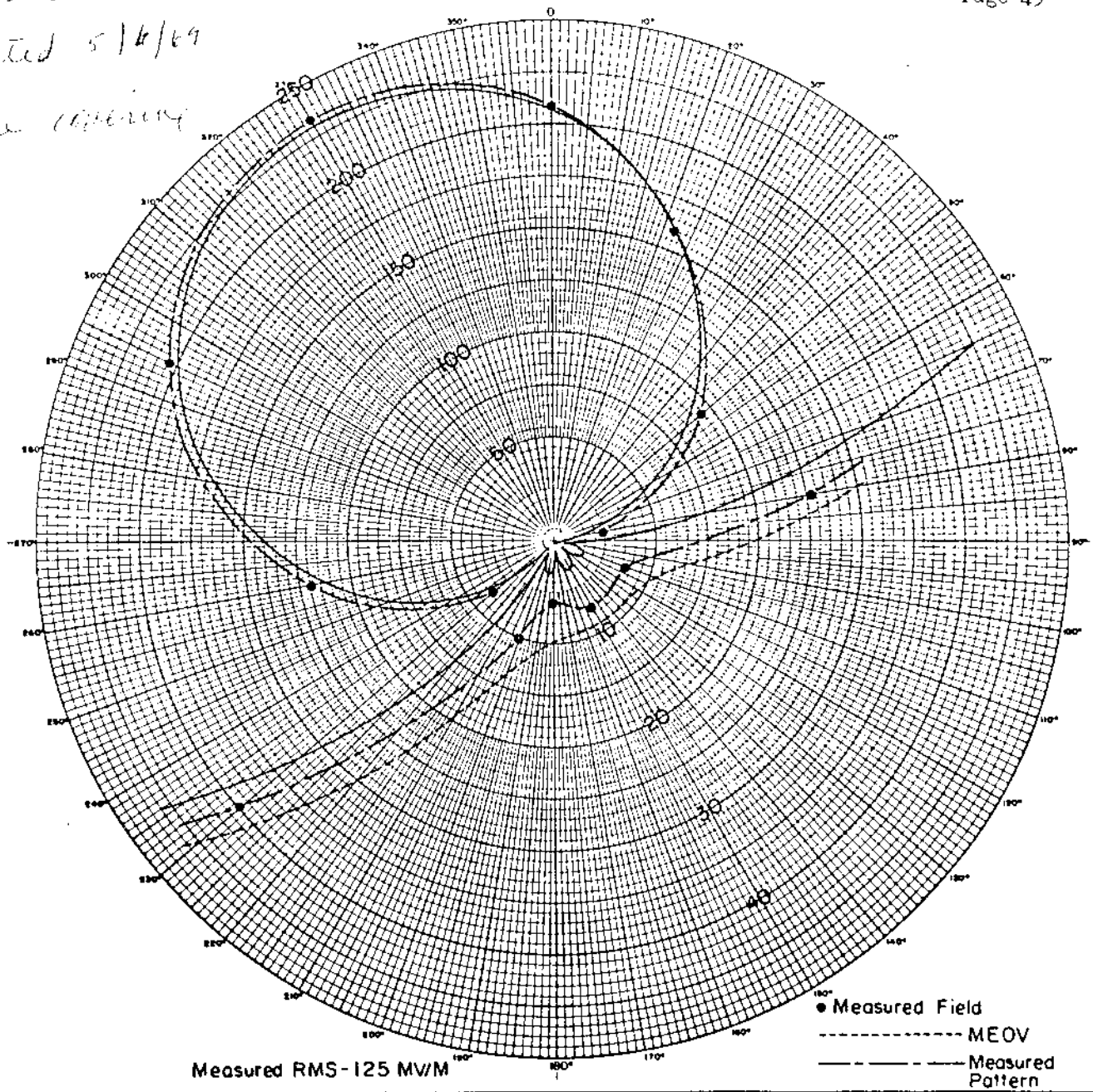
1480 KC

WJBM
500w, DA-D, D
1480 kc
Page 42

Measured Day
(4-29-69ct)

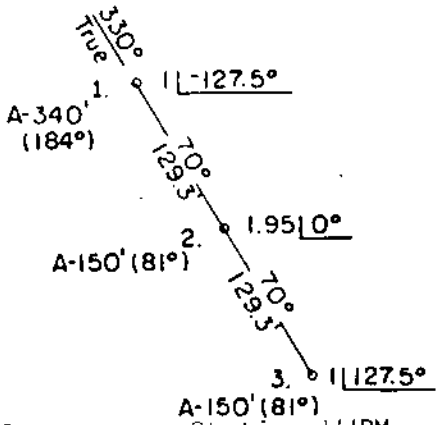
Station WJBM
Jerseyville, Illinois

Granted 5/6/69
Licensed operating
hours



Measured RMS-125 MV/M

HORIZONTAL RADIATION PATTERN WJBM - 0°



APPLICANT	Tri-County Broadcasting Co.
LOCATION	Jerseyville, Illinois
FREQUENCY	1480 KC/S
POWER	500 Watts
LATITUDE	39 DEG. 06 MIN. 46 SEC.
LONGITUDE	90 DEG. 18 MIN. 43 SEC.
WHEN USED	Daytime
R.M.S. FIELD	124 MV/M (Theoretical)
DATE	January 31, 1967

Proof 2/26/69
RALPH J. BITZER
CONSULTING RADIO ENGINEERS
ST. LOUIS, MISSOURI

FCC File No. BL-12313
Accepted 4-3-69

Station WJBM
Jerseyville, Illinois

1480 kc

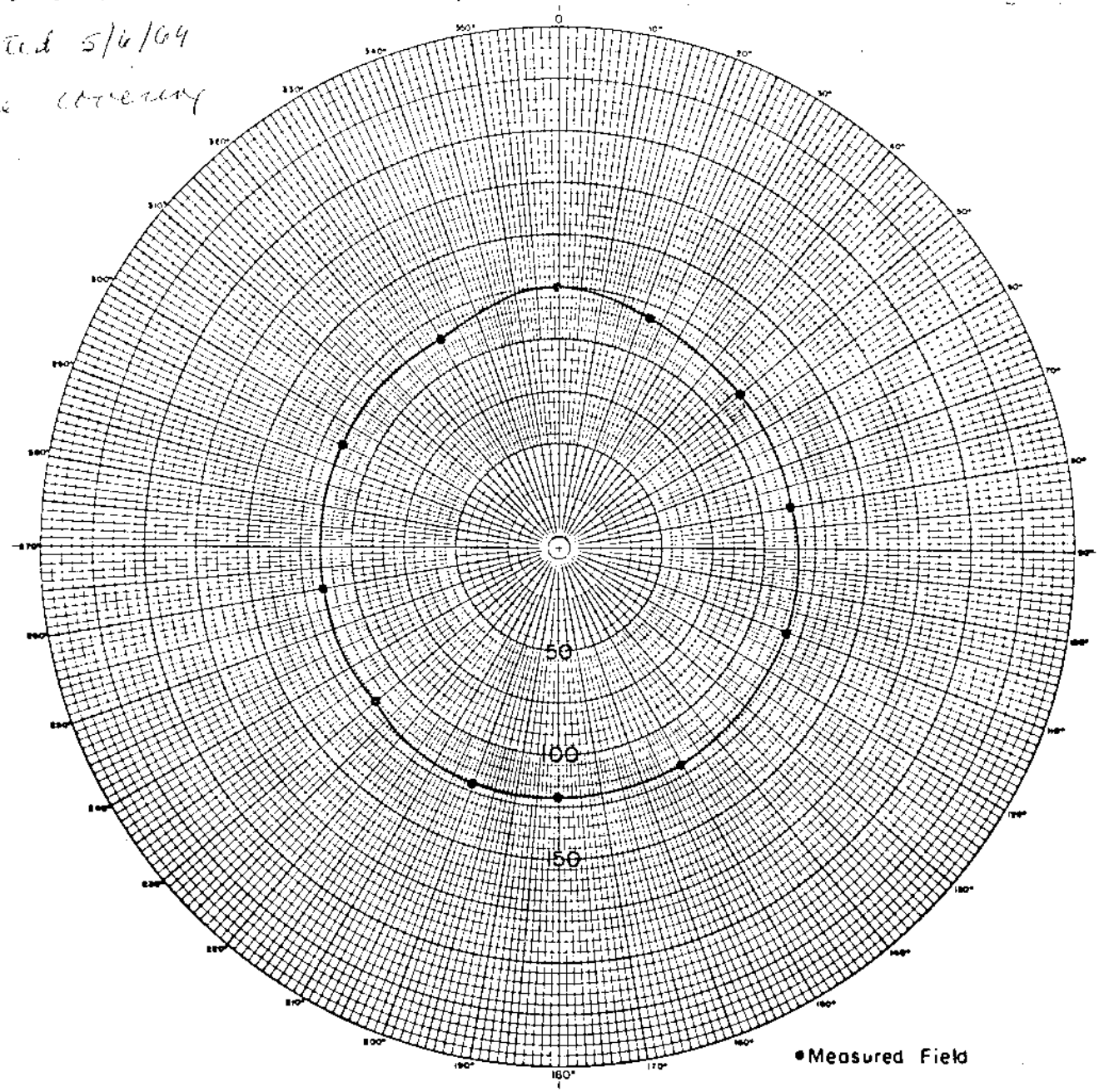
WJBM

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

Station WJBM
Jerseyville, Illinois

500w, DA-D, D
1480 kc

Printed 5/6/69
license currency
changes



HORIZONTAL RADIATION PATTERN

APPLICANT	Tri-County B/Cing Co.
LOCATION	WJBM Jerseyville, Ill.
FREQUENCY	1480 KC/S
POWER	250 Watts, Non-D
LATITUDE	39 DEG. 06 MIN. 46 SEC.
LONGITUDE	90 DEG. 18 MIN. 43 SEC.
WHEN USED	Non-D Proof
R.M.S. FIELD	117 MV/M
DATE	

RALPH J. BITZER
CONSULTING RADIO ENGINEERS

FCC File No. BL-12313
Accepted 4-3-69

Station WJBM
Jerseyville, Illinois

1480 kc

WJBM

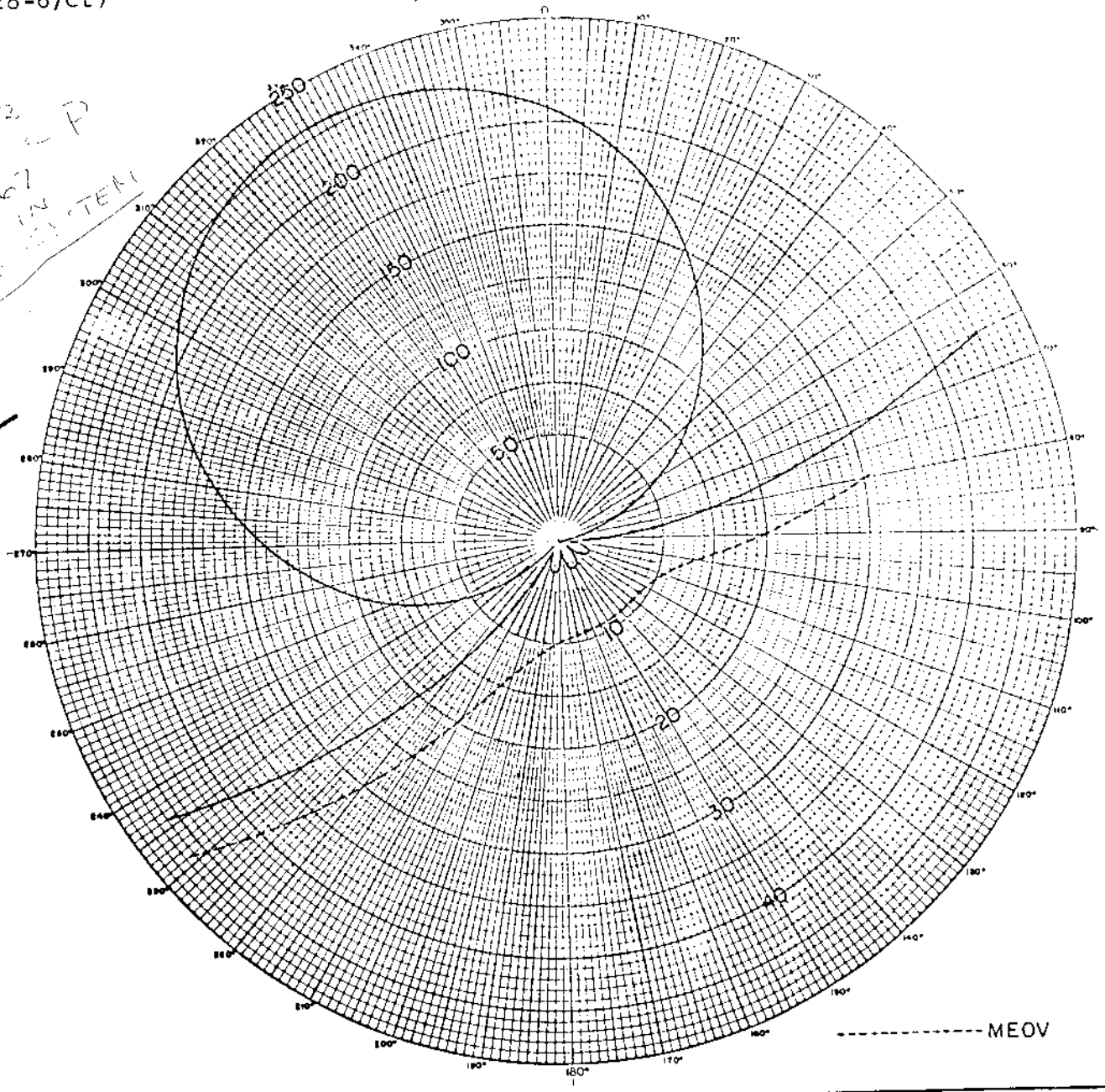
500w, DA-D, D
1480 kc

Proposed Day
(2-28-67ct)

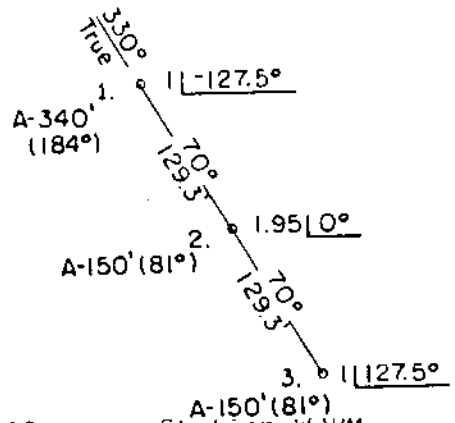
Station WJBM
Jerseyville, Illinois

BP-17622
GRANTED - P
5-5-67
CHANGE IN
ANTENNA SYSTEM

OVER



HORIZONTAL RADIATION PATTERN WJBM - 0°



APPLICANT	Tri-County Broadcasting Co.
LOCATION	Jerseyville, Illinois
FREQUENCY	1480 KC/S
POWER	500 Watts
LATITUDE	39 DEG 06 MIN 46 SEC
LONGITUDE	90 DEG 18 MIN 43 SEC
WHEN USED	Daytime
R.M.S. FIELD	124 MV/M
DATE	January 31, 1967

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

FCC File No. BP-17622
Accepted 2-21-67

Station WJBM
Jerseyville, Illinois

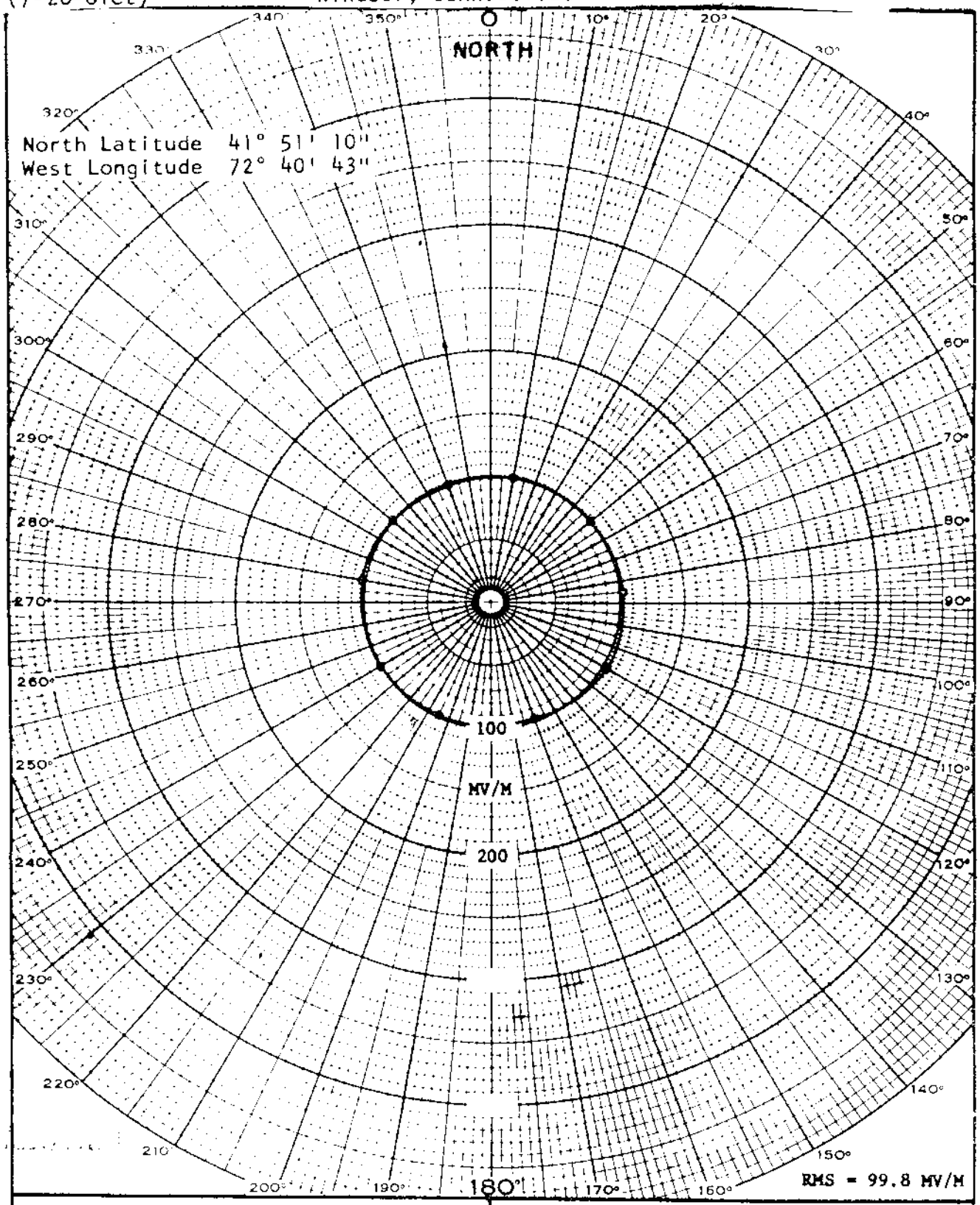
1480 kc

WKND

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

Station WSOR 500w, DA-D,D
Windsor, Connecticut 1480 KC

E-13



COMMERCIAL RADIO EQUIPMENT CO.
Radio Engineering Consultants
WASHINGTON D C

MEASURED NON-DIRECTIONAL RADIATION
WSOR, NO. 1 TOWER, 1480 KC, 250 W
WINDSOR, CONNECTICUT
APRIL 1961

FCC File No. BL-8458
Accepted 7-14-61

WSOR
Windsor, Connecticut 1480 KC

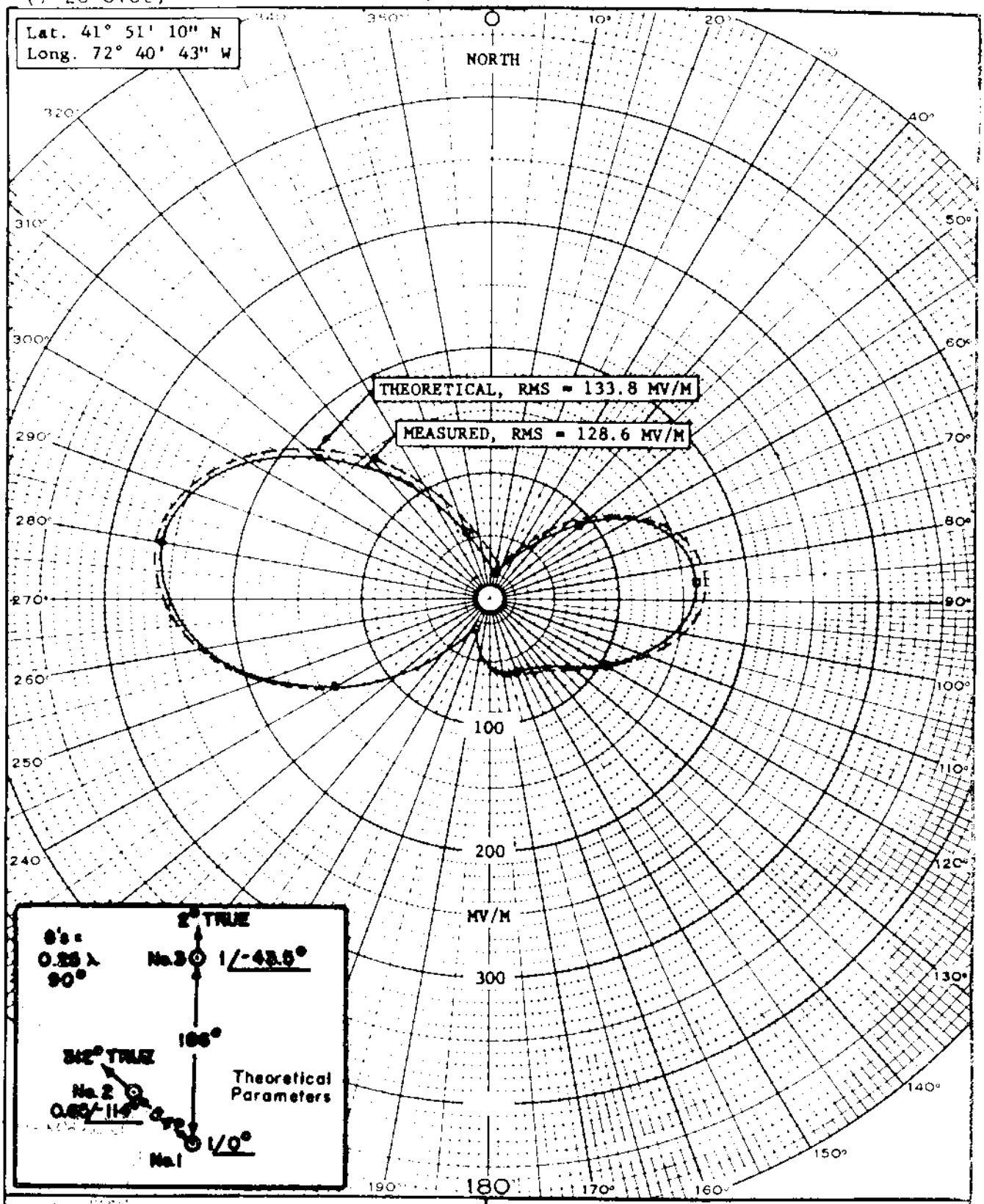
WKND

MEASURED DAY
(7-26-61ct)

Station WSOR
Windsor, Connecticut

500w, DA-D,D
1480 KC

E-14



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

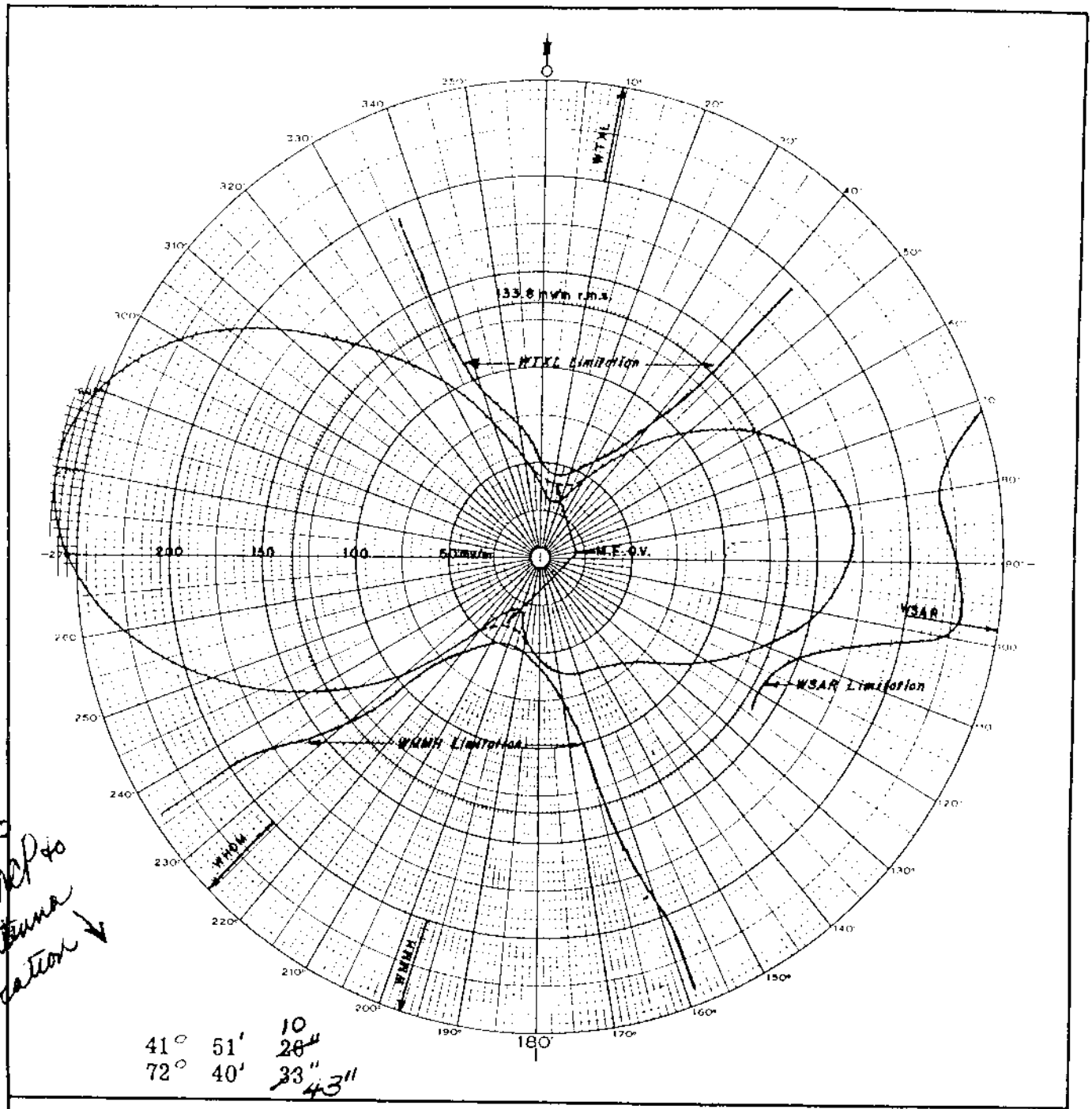
MEASURED DAYTIME PATTERN
WSOR, WINDSOR, CONNECTICUT
1480 KC, 500 W-D, DA
APRIL 1961

FCC File No. BL-8458
Accepted 7-14-61

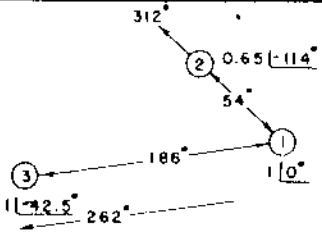
WSOR
Windsor, Connecticut 1480 KC

Windsor, Conn. WKND

PROPOSED DAY (7/15/57g) | New, The Tobacco Valley B/Cng Co. Windsor, Connecticut | 500w, DA-D,D 1480 KC



ESTIMATED EFFECTIVE FIELD AT ONE MILE IN THE HORIZONTAL PLANE



G=0.25 λ

THE TOBACCO VALLEY BROADCASTING COMPANY
WINDSOR, CONNECTICUT

1480 kc | DA - D | 500 watts

570515 | Figure 1

EXHIBIT E-1

FREDERIC D. SCHOTTLAND
Consulting Radio Engineer
WEST ORANGE, N. J.

FCC File No. ~~BP-11,339~~ The Tobacco Valley B/Cng Co.
Accepted 7/10/57 BMP 4087 Windsor, Connecticut 1480 KC

WLEE
WBBL

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Stations: WLEE and WBBL Main Studio: Richmond, Virginia
(Both stations share time and use the same transmitter and antenna facilities)
Frequency: 1480 kHz Power: 5 kW

Notification List No. 1584 Date: June 12, 1974 Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:
North Latitude: 37° 35' 50"
West Longitude: 77° 30' 39"

ANTENNA CHARACTERISTICS

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

TOWER:	NW(#1)	NC(#2)	SC(#3)	SE(#4)	
HEIGHT ABOVE INSULATORS:	300'	300'	300'	300'	(162.5°)
NIGHT PHASING:	-88.5°	+137.8°	0°	-137.8°	
NIGHT FIELD RATIO:	1.05	2.47	2.47	1	
DAY PHASING:	-	+163°	-17°	-163°	
DAY FIELD RATIO:	-	1.00	2.00	1.00	

SPACING AND ORIENTATION: Adjacent elements #2, #3 and #4 are spaced 166' (90°) on a line bearing 314° true. Tower #1 is spaced 338' (183°) on a line bearing 316° true from tower #3.

GROUND SYSTEM: 120-166' equally spaced copper radials plus a 20' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

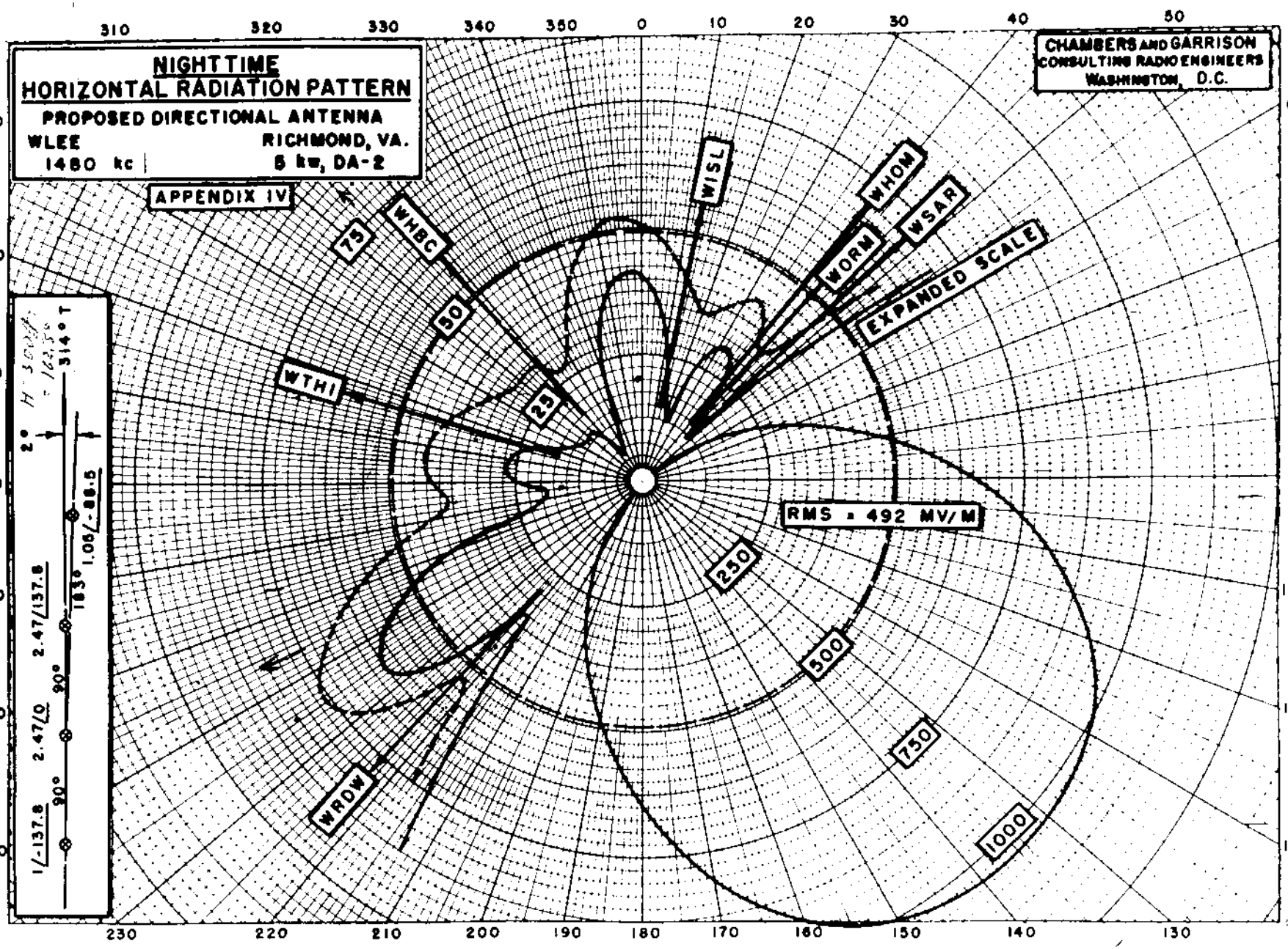
Predicted effective Day and Night Fields: 492 mv/m at rated power.

Note: Please retain the Daytime directional antenna radiation pattern notified for station WLEE labelled "APPENDIX VI (AMENDED)" in United States Change List Number 351 and attach to this Revised Description Sheet and Nighttime patterns. This notification concerns only a change to add M.E.O.V.'s of radiation to the Nighttime directional antenna radiation pattern and to correct the nighttime field ratios of tower #1 and #4 with Daytime operation continued as previously notified.

WBBL CTR NO 31199A4
WLEE CTR NO 30535A3

A = 0 at 314 Rotation c.c.

E = 173.5 F(V) [1 ∠-137.8 − 90 cos A cos V + 2.47 ∠0 cos V + 2.47 ∠137.8 + 90 cos A cos V + 1.05 ∠-88.5 + 183 cos(A+2) cos V



AUG 5 1948

37-35-50
77-30-39

WLEE
1480
WBEL

NIP-8237 WLEE Amendment Rec'd 7-30-48

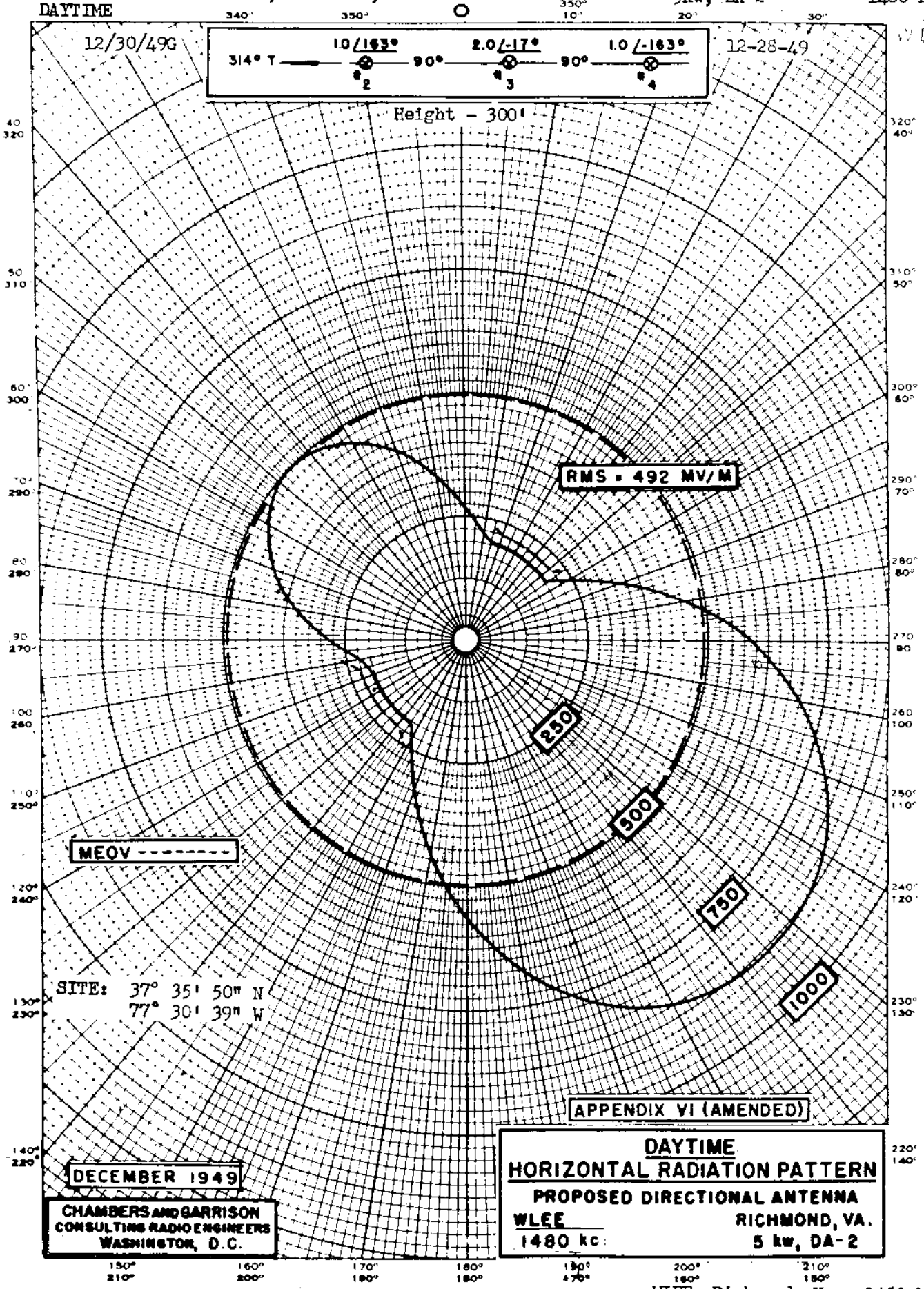
WLEE

PROPOSED DAYTIME

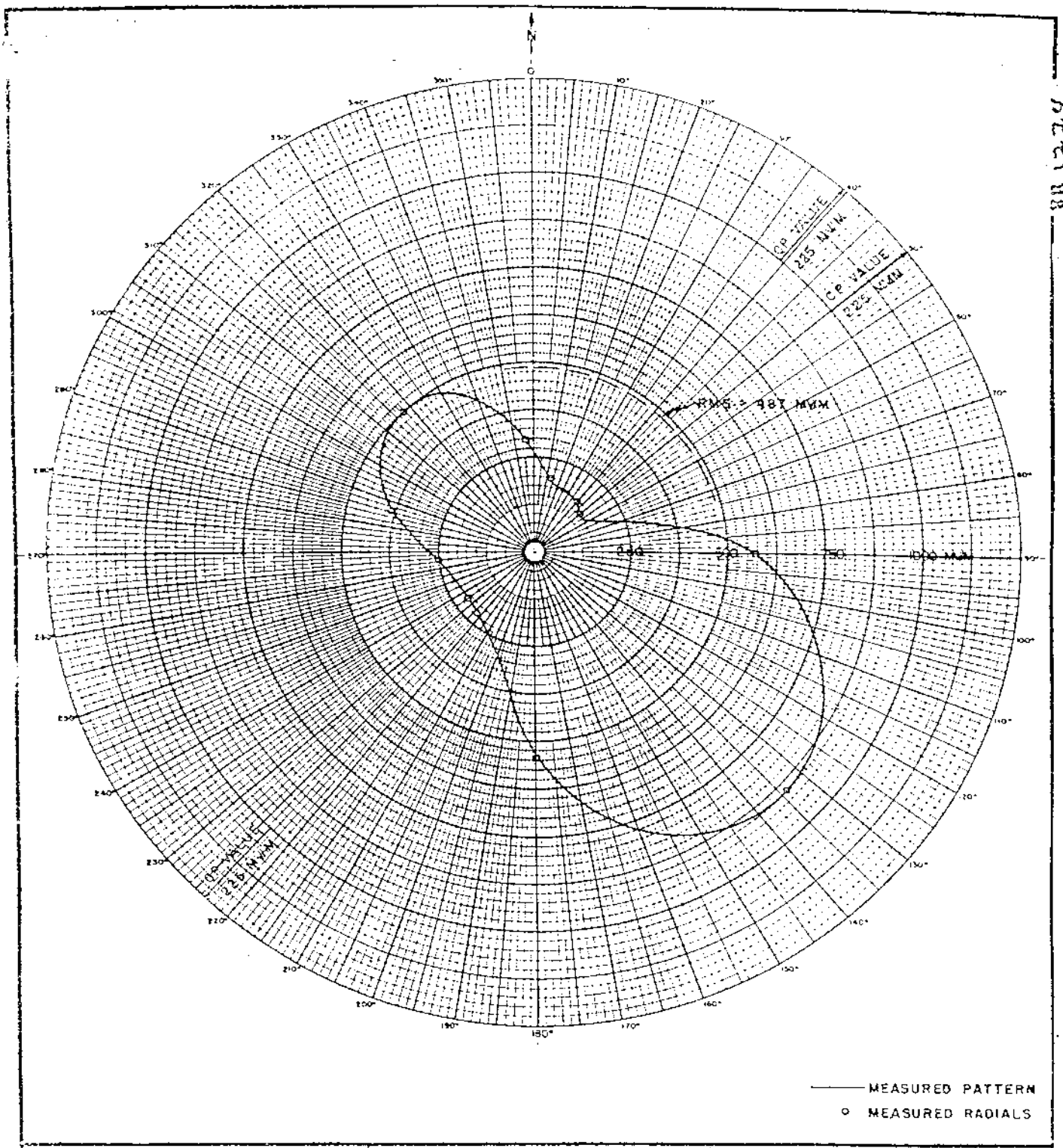
WLEE, RICHMOND, VA.

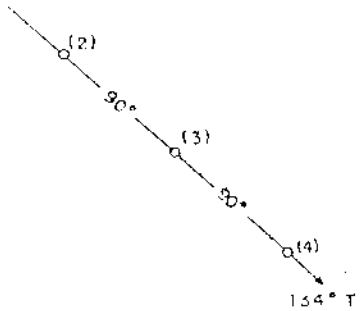
5kw, DA-2

1480 kc



WLEE, Richmond, Va. 1480 kc





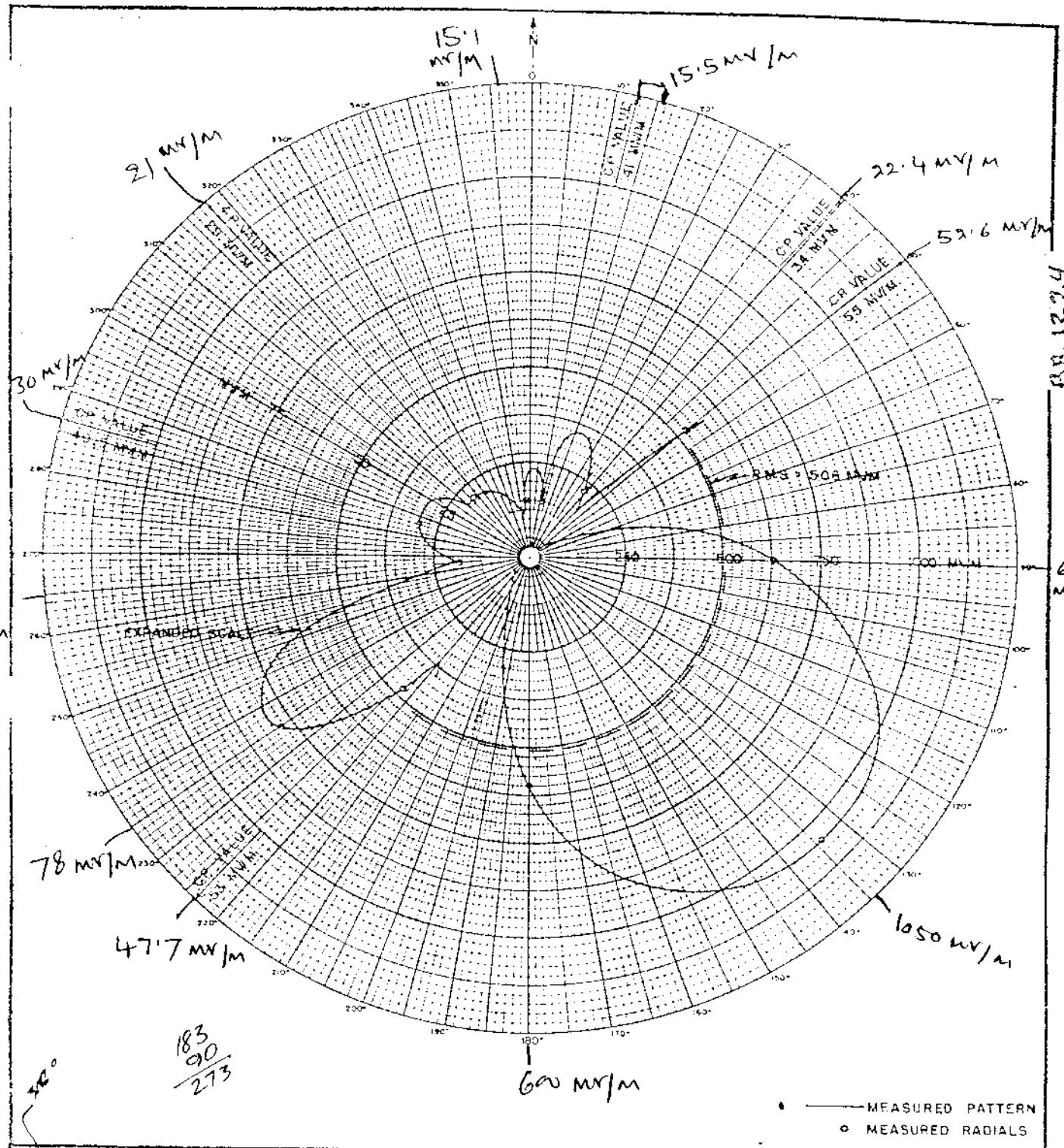
LATITUDE 37° 35' 50"
LONGITUDE 77° 30' 39"

ANTENNA NUMBER	AZIMUTH DEG.	SPACING DEG	PHASING DEG	FIELD RATIO	MVM FOR 1 KW	HEIGHT DEG.
1	SEE DIAGRAM	SEE DIAGRAM	—	—		--
2			163°	1.0		163°
3			—17°	2.0		163°
4			—163°	1.0		163°

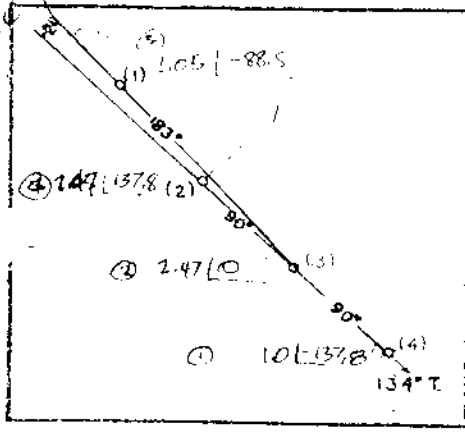
MEASURED DAYTIME
HORIZONTAL PLANE PATTERN
WLEE
RICHMOND, VIRGINIA
1480 KC. 5 KW. U, DA-2
540611

KEAR AND KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D.C.

BR1224 9/27/54



183
90
273



LATITUDE 37° 35' 50"
LONGITUDE 77° 30' 39"

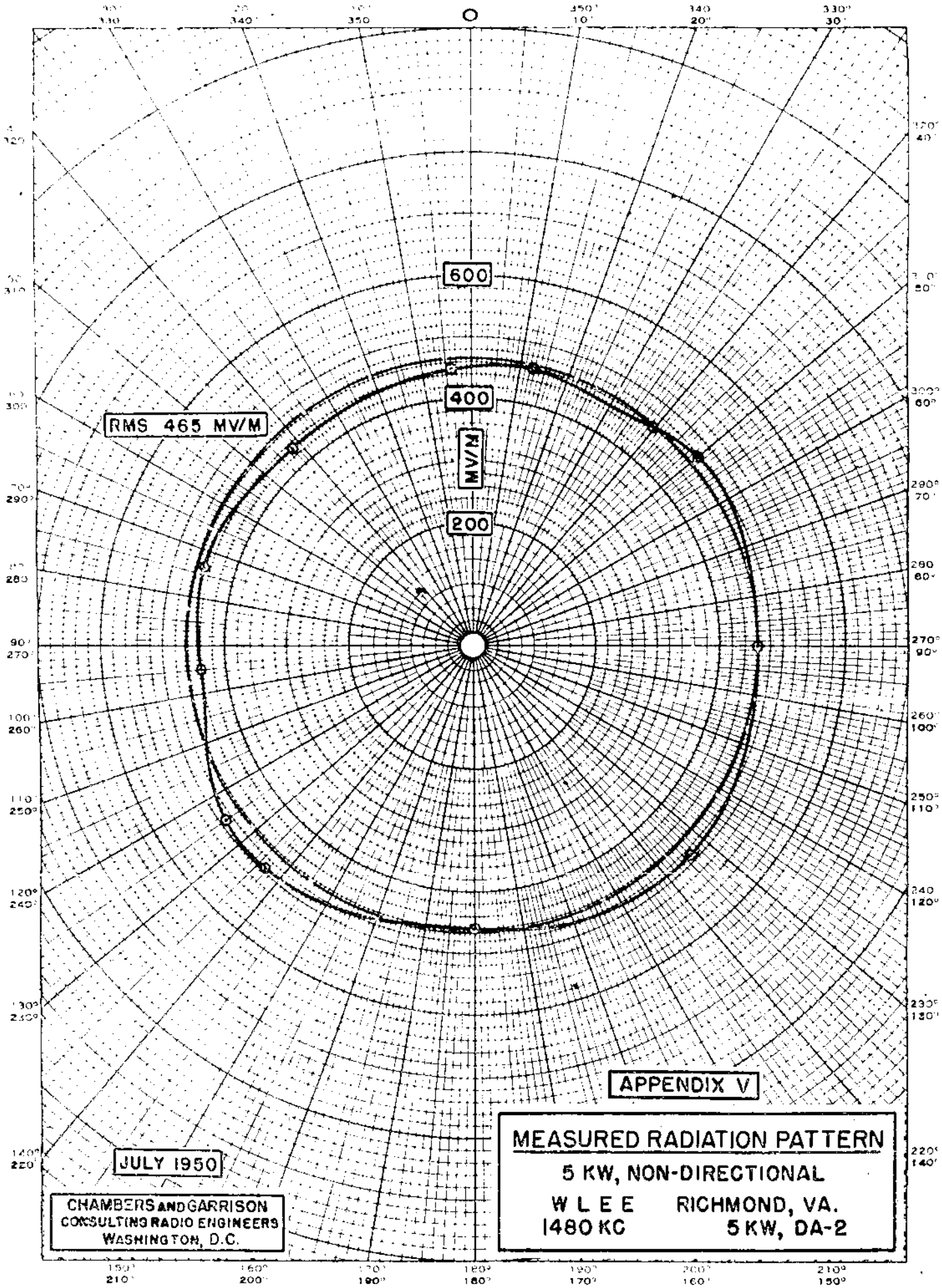
ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG
1	SEE	SEE	-88.5	1.05		163°
2			137.8	2.47		163°
3	DIAGRAM	DIAGRAM	0	2.47		163°
4			-137.8	1		163°

MEASURED NIGHTTIME
HORIZONTAL PLANE PATTERN
WLEE
RICHMOND, VIRGINIA
1480 KC. 5 KW. U, DA-2
540611

KEAR AND KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D.C.

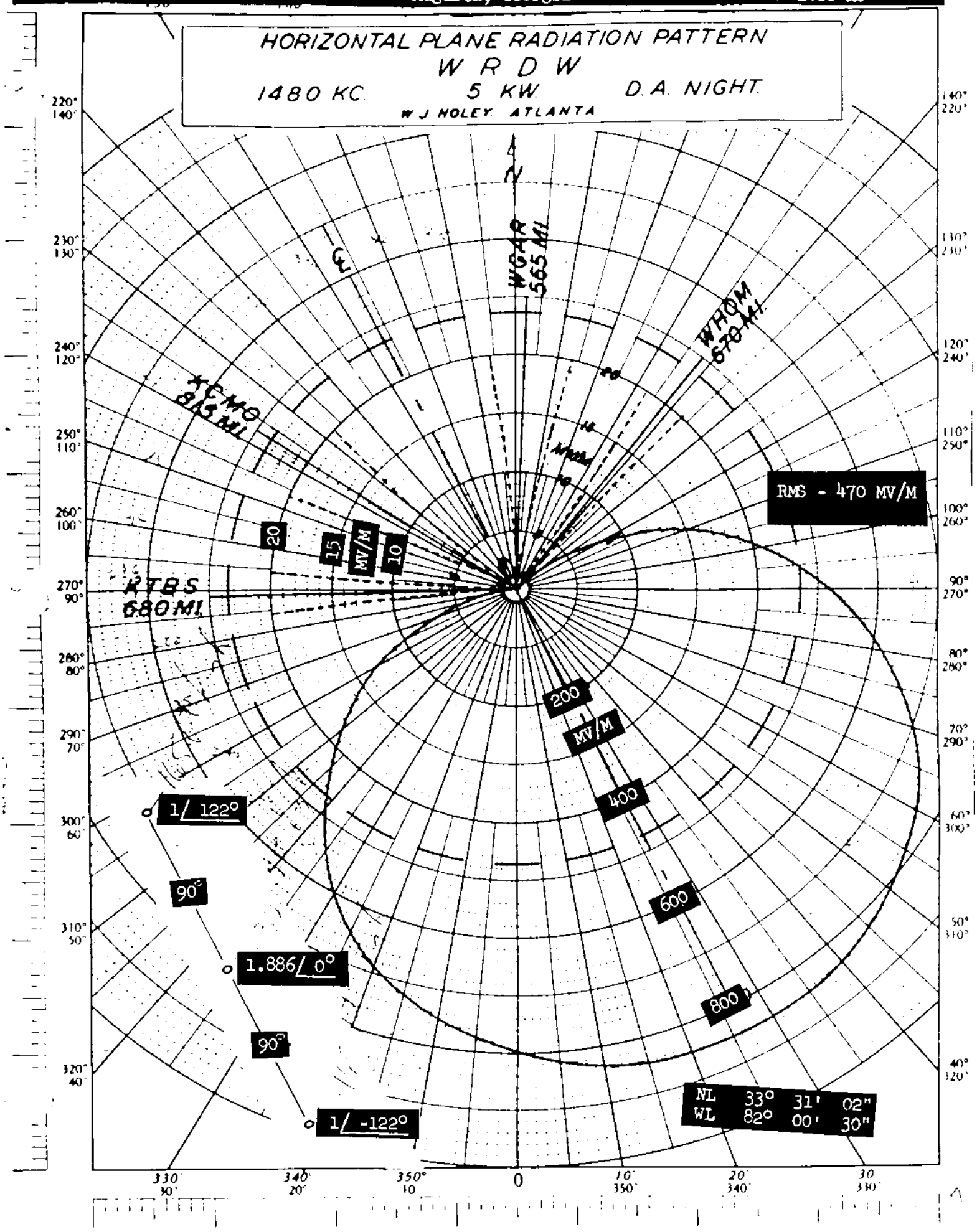
BR 12211 9/22/54

WLEE

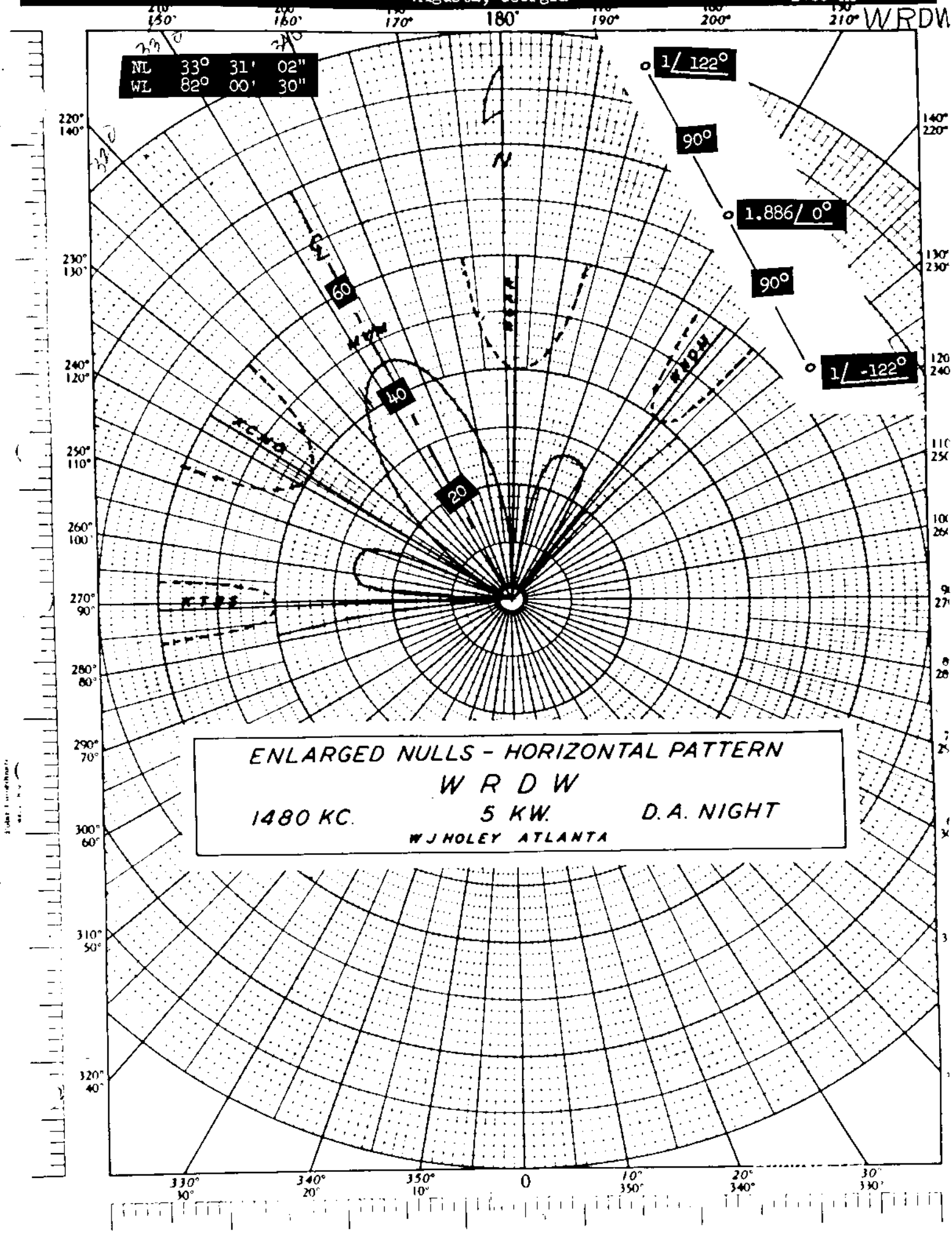

600
400
200
MV/M
RMS 465 MV/M
APPENDIX V
MEASURED RADIATION PATTERN
5 KW, NON-DIRECTIONAL
W L E E RICHMOND, VA.
1480 KC 5 KW, DA-2
JULY 1950
CHAMBERS AND GARRISON
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

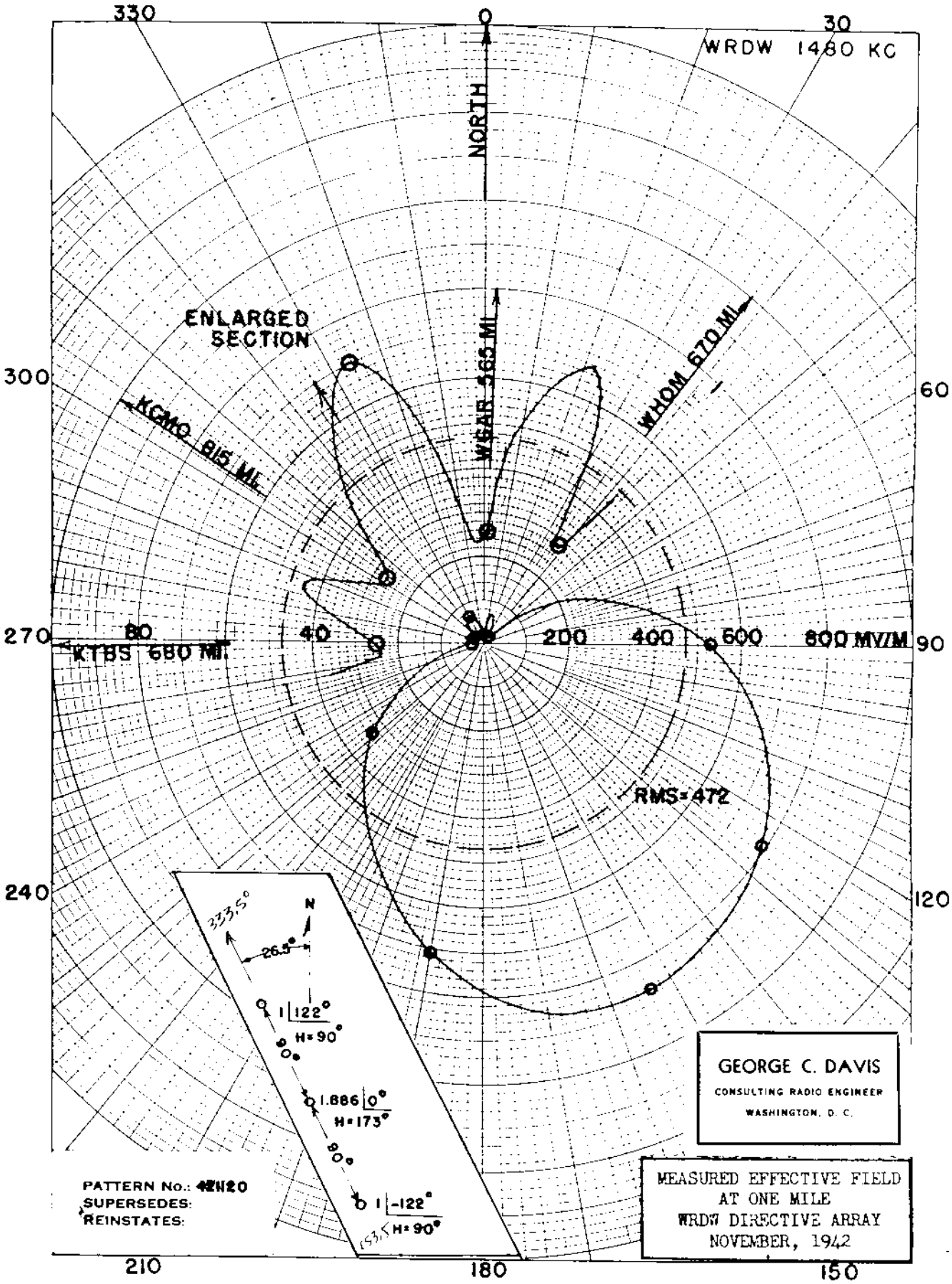
WRDW

PROPOSED NIGHT | Station WRDW Augusta, Georgia | 5kw, DA-N,U | 1480 KC



PROPOSED NIGHT NULLS Station WRDW 5kw, DA-N,U
Augusta, Georgia 1480 KC




WRDW 1480 KC
NORTH
ENLARGED SECTION
WGAR 365 MI.
WHOM 670 MI.
KCMO 815 MI.
KTBS 680 MI.
RMS=472
200
400
600
800 MV/M
40
80
330
30
300
60
270
90
240
120
210
180
150
N
333.5°
26.5°
1 122°
H=90°
80°
1.886 0°
H=173°
80°
1 -122°
H=90°
153.5°
GEORGE C. DAVIS
CONSULTING RADIO ENGINEER
WASHINGTON, D. C.
PATTERN No.: 42N20
SUPERSEDES:
REINSTATES:
MEASURED EFFECTIVE FIELD
AT ONE MILE
WRDW DIRECTIVE ARRAY
NOVEMBER, 1942

WRSW

PROPOSED DAY
(5-8-61g)

Station WRSW
Warsaw, Indiana

500w, 1kw-LS, DA-2,U
1480 KC

6-20-62 granted license day power from 500w to 1kw and change in DA.

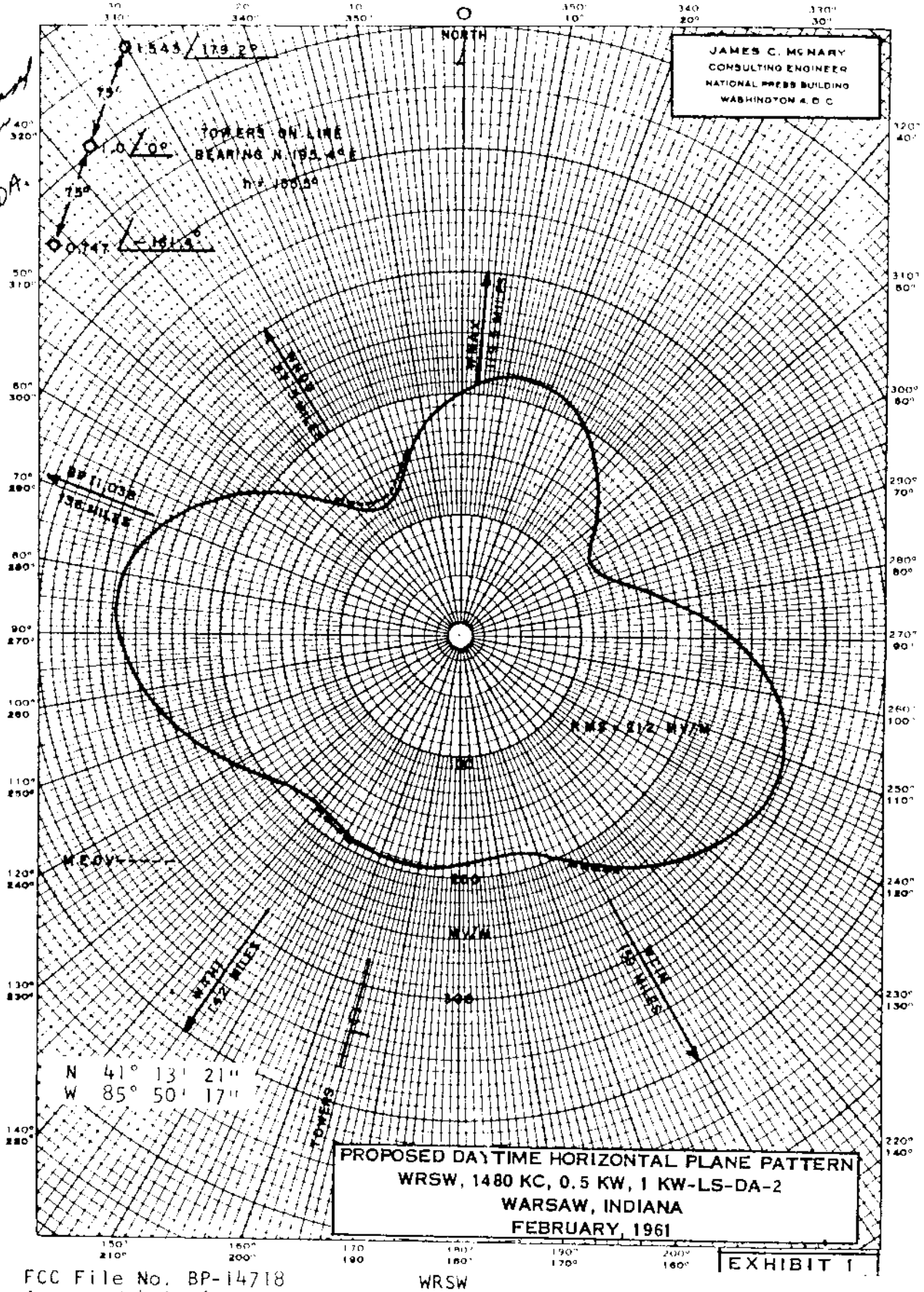


EXHIBIT 1

FCC File No. BP-14718
Accepted 4-13-61

WRSW
Warsaw, Indiana

1480 KC

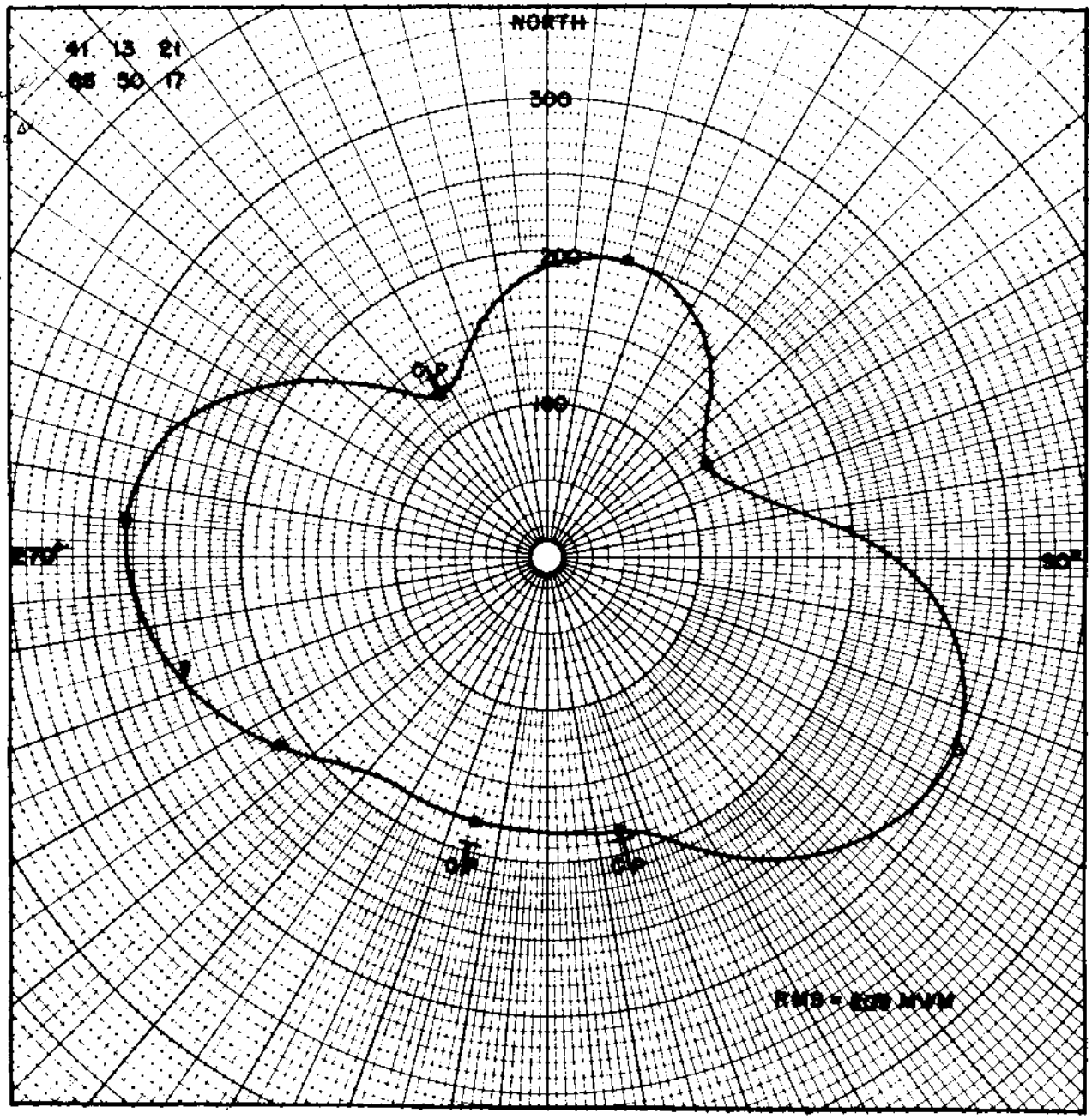
WRSW

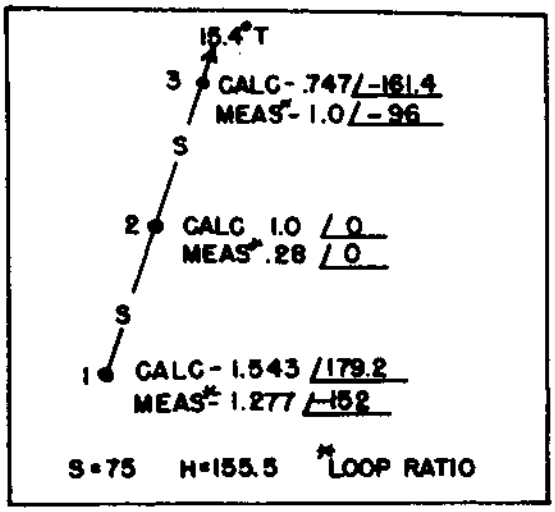
Measured Day
(4-30-63ct)

Station WRSW
Warsaw, Indiana

500w,1kw-LS,DA-2,U
1480 kc

4-29-63 granted license covering increase in day power and change in DA pattern





W R S W
MEASURED DAY PATTERN
1480KC 1KW
WARSAW, INDIANA
DEC. 1962

ROBERT A. JONES
CONSULTING ENGINEERS
LA GRANGE, ILLINOIS

FCC File No.BL-9839
Accepted 3-26-63

Station WRSW
Warsaw, Indiana

1480 kc

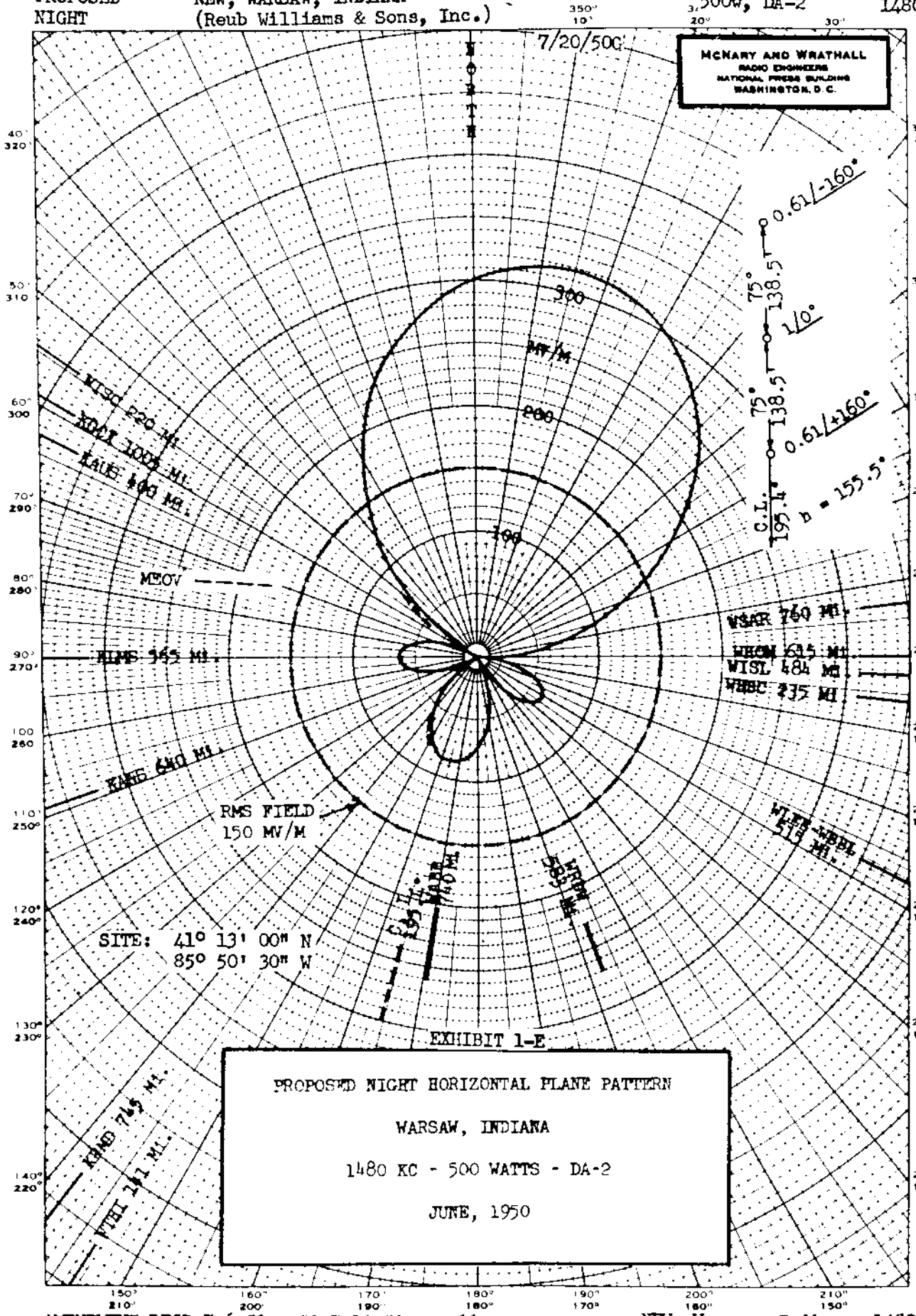
WRSW

PROPOSED NIGHT

NEW, WARSAW, INDIANA
(Reub Williams & Sons, Inc.)

500w, DA-2

WARSAW, IND.
1480 kc



AMENDMENT RECD 7-6-50 ACC 7-14-50 BP-6670

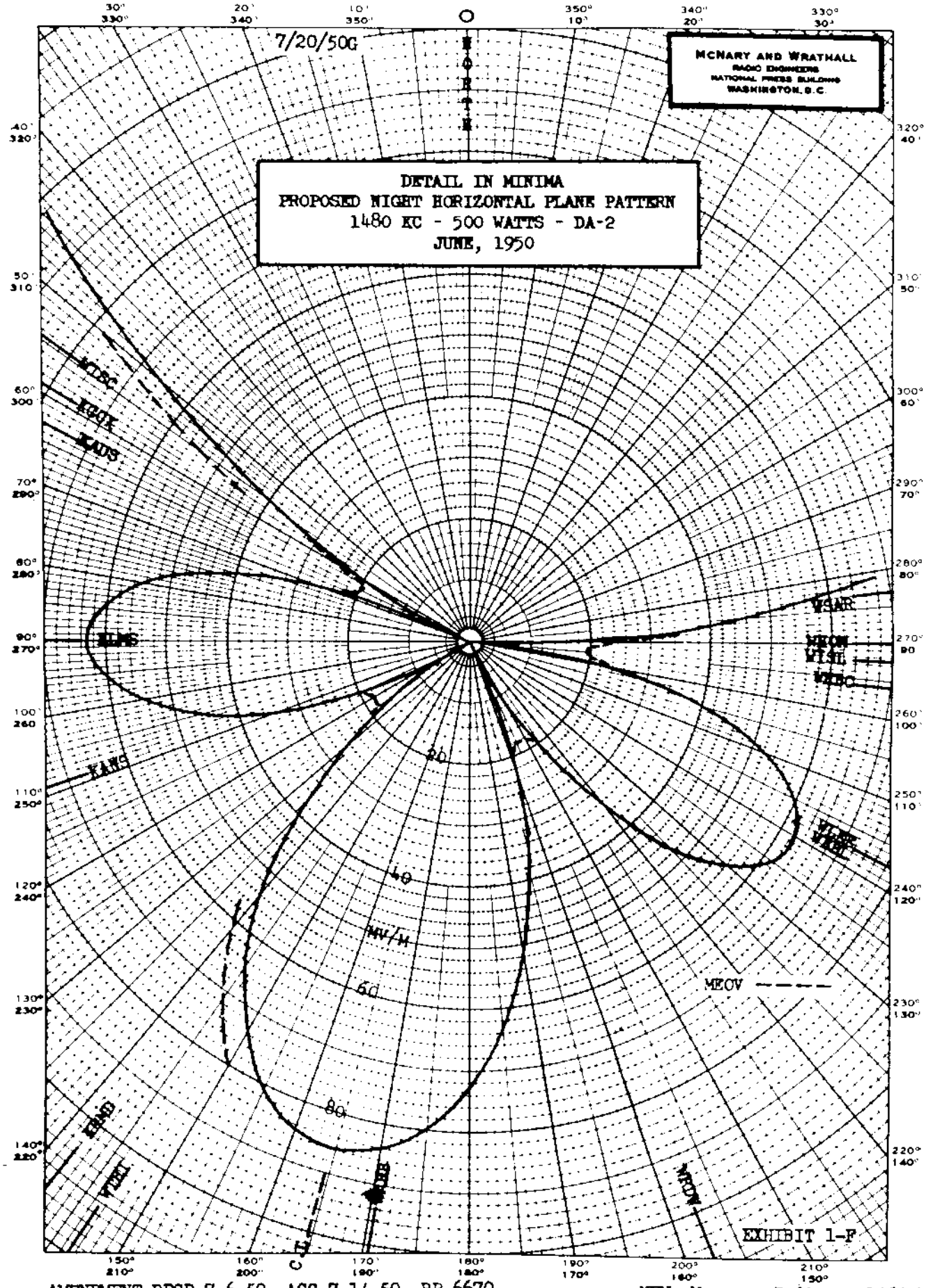
NEW, Warsaw, Indiana 1480 kc

PROPOSED NIGHT NULLS

NEW, WARSAW, INDIANA
(Reub Williams & Sons, Inc.)

500w, DA-2 1480 kc

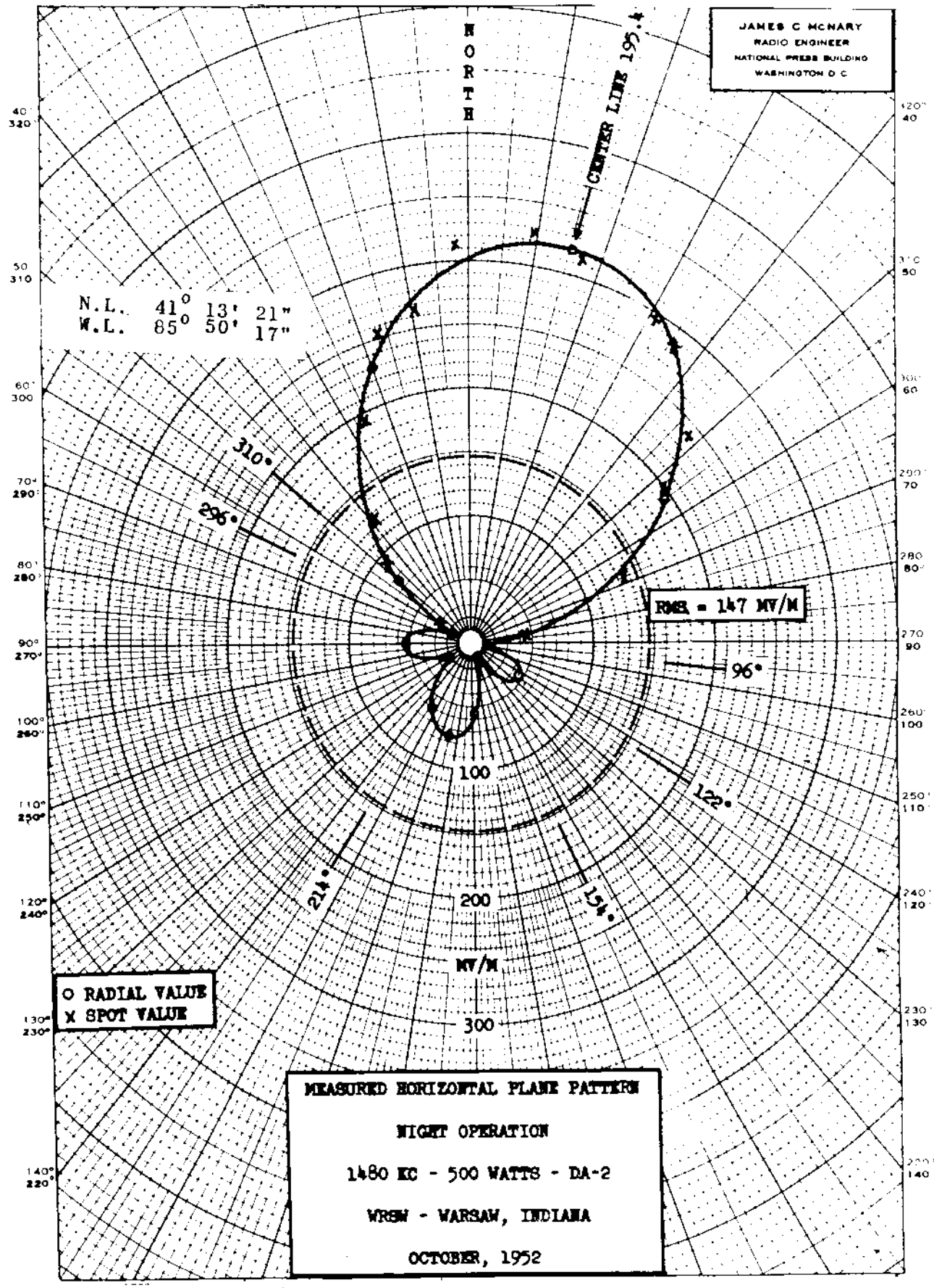
WRSW
WARSAW, IND.



AMENDMENT RECD 7-6-50 ACC 7-14-50 BP-6670

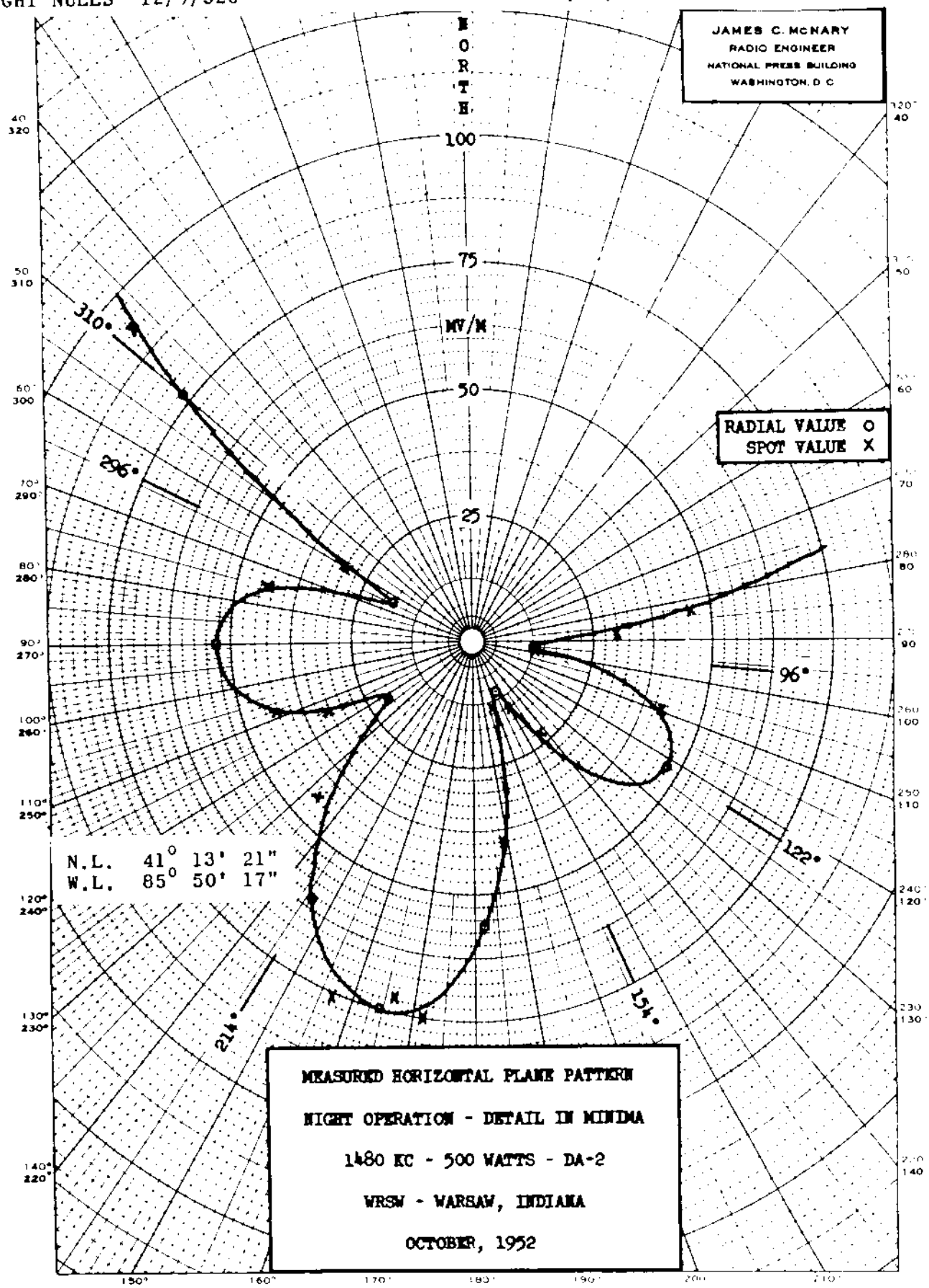
NEW, Warsaw, Indiana 1480 kc

MEASURED WRSW, WARSAW, IND. 500W, U, DA-2 1480 KC
NIGHT 12/9/52G



RECD FCC 10/24/52 ACC 11/24/52 BL--4827 WRSW, WARSAW, IND. 1480 KC

MEASURED NIGHT NULLS — WRSW, WARSAW, IND. 12/9/52G — 500W, U, DA-2 — 1480 KC



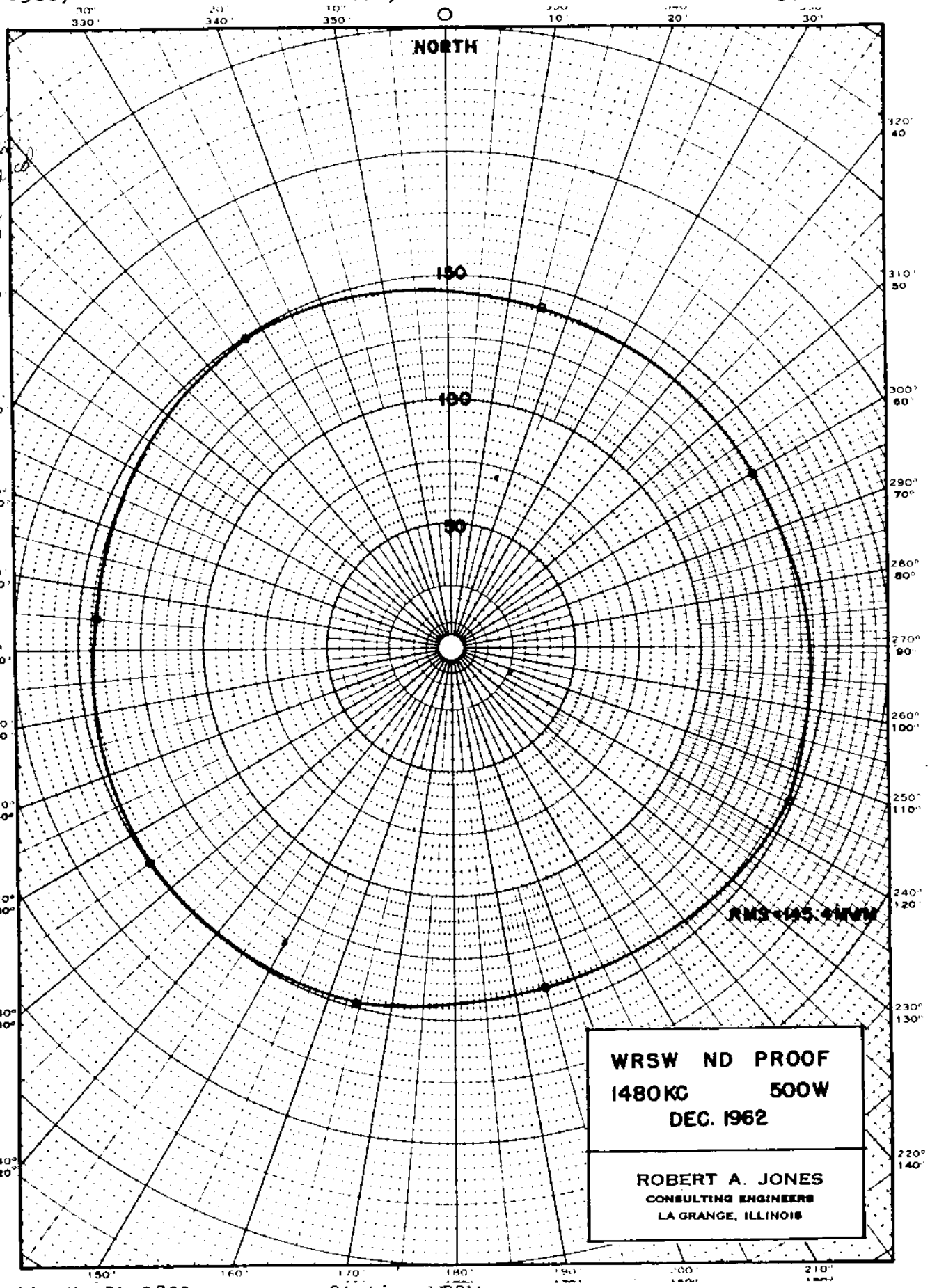
RECD FCC 10/24/52 ACC 11/24/52 BL-4827 — WRSW, WARSAW, IND. — 1480 KC

WRSW

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

Station WRSW
Warsaw, Indiana

500w, 1kw-LS, DA-2, U
1480 kc



-29-63
initial licensing increased
day power and
use in day
pattern

FCC File No. BL-9839
Accepted 3-26-63

Station WRSW
Warsaw, Indiana

1480 kc

WSAR

TECHNICAL ANTENNA DESCRIPTION SHEET

Station: WSAR — Main Studio: Fall River, Massachusetts

Frequency: 1490 kHz — Power: 5 kW

Notification Sheet No. 1742 — Date: July 20, 1977 — Class: [illegible]

GEOGRAPHICAL CO-ORDINATES OF CENTER OF THE ARRAY USA SYSTEM:
North Latitude: 41° 43' 26"
West Longitude: 71° 11' 21"

ANTENNA CHARACTERISTICS

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

TOWER:	SP(#2)	NE(#1)
HEIGHT ABOVE INSULATORS:	397'	397' (215°)
PHASING:	471.3°	0°
FIELD RATIO:	1	1

SPACING AND ORIENTATION: Towers are spaced 221.5' (120°) on a line bearing 247° true

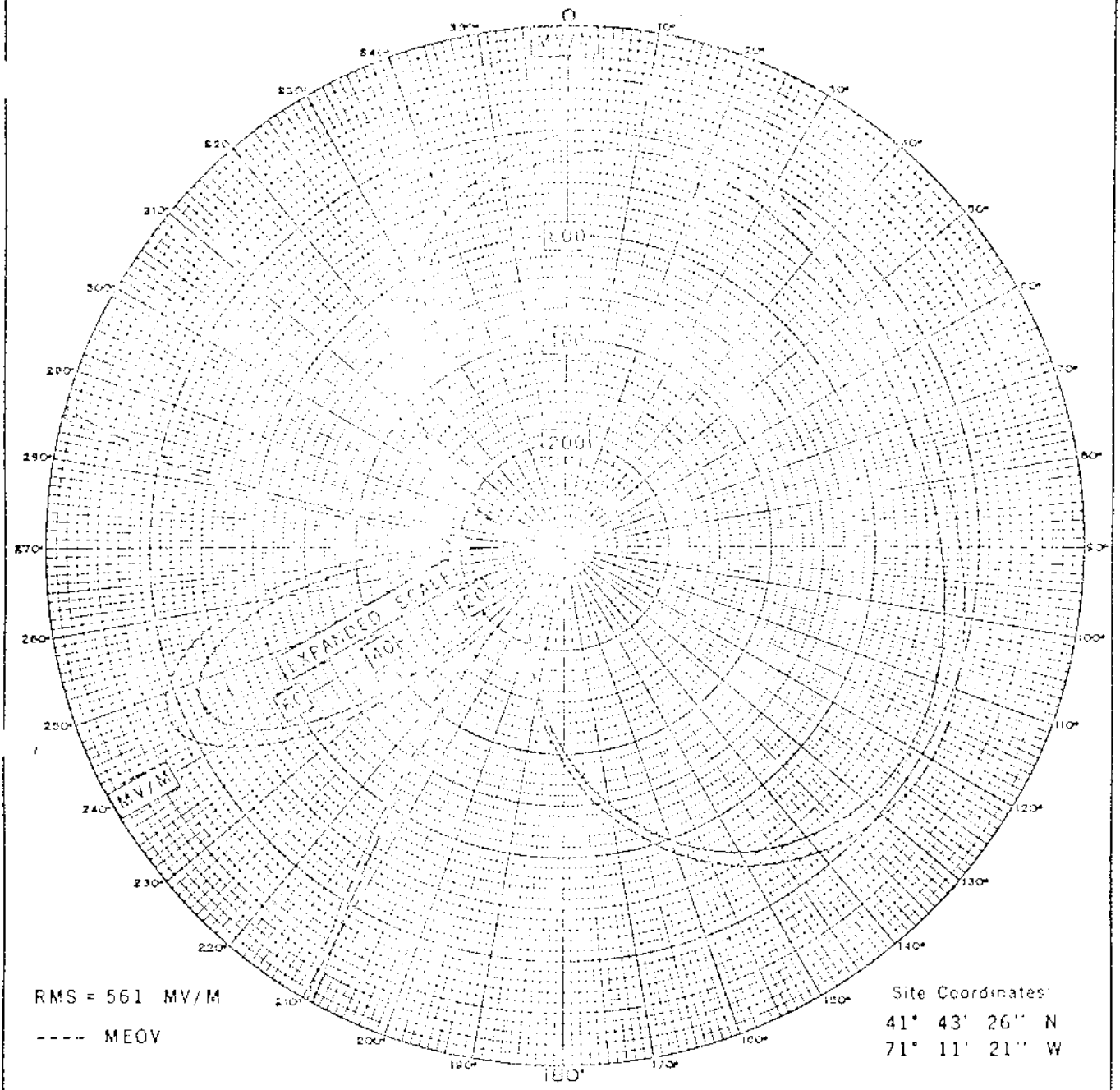
GROUND SYSTEM: 120-265' equally spaced copper radials plus a 48' square ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between tw

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

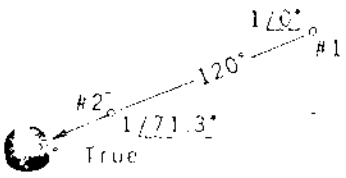
THEORETICAL		STANDARD
RMS	RSS	RMS
561 mv/m	- mv/m	- mv/m

Note: This notification concerns changes in the daytime and nighttime directional antenna systems and radiation patterns.

WSAR



PROPOSED HORIZONTAL PLANE RADIATION PATTERN

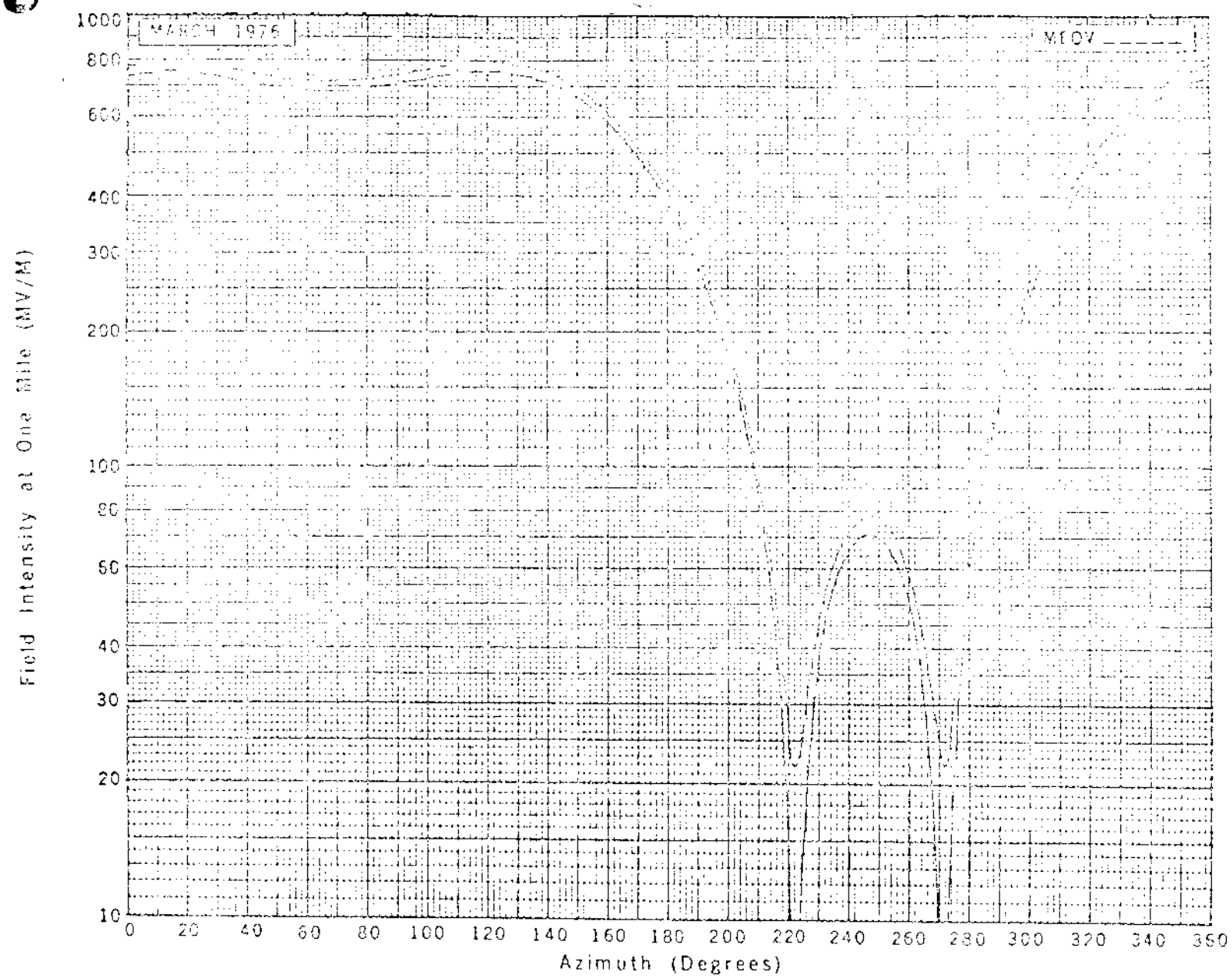


G = 215°

QUALITY RADIO CORPORATION
FALL RIVER, MASSACHUSETTS

Jules Cohen & Associates
Consulting Electronics Engineers

STATION WSAR
1480 KHZ
5 KW U DA-1
MARCH 1976

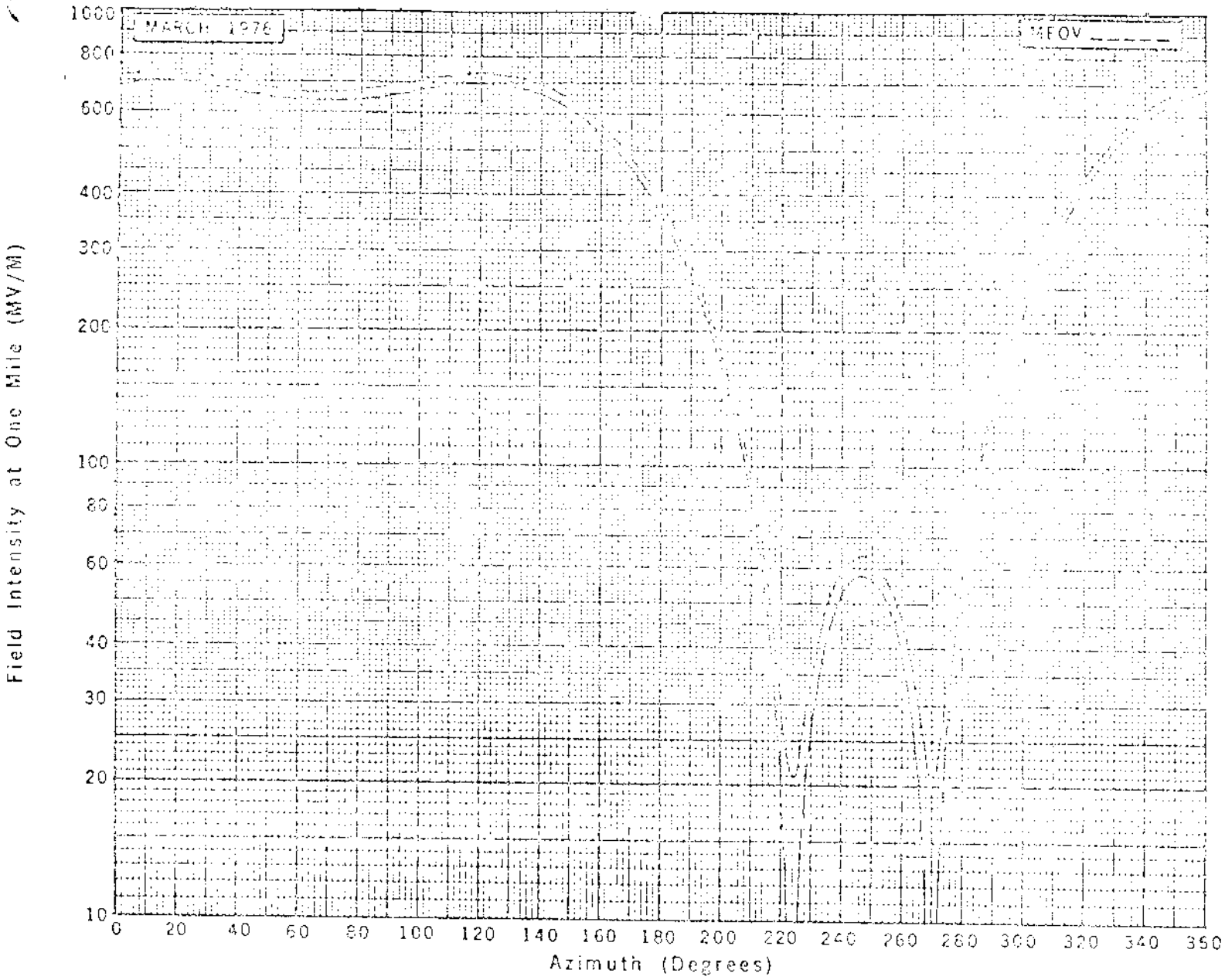


PROPOSED RADIATION PATTERN AT VERTICAL ANGLE OF 5 DEGREES

QUALITY RADIO CORPORATION STATION WSAR FALL RIVER, MASSACHUSETTS

1480 KHZ 5 KW U DA-1

WSAR Sheet 2 of 13

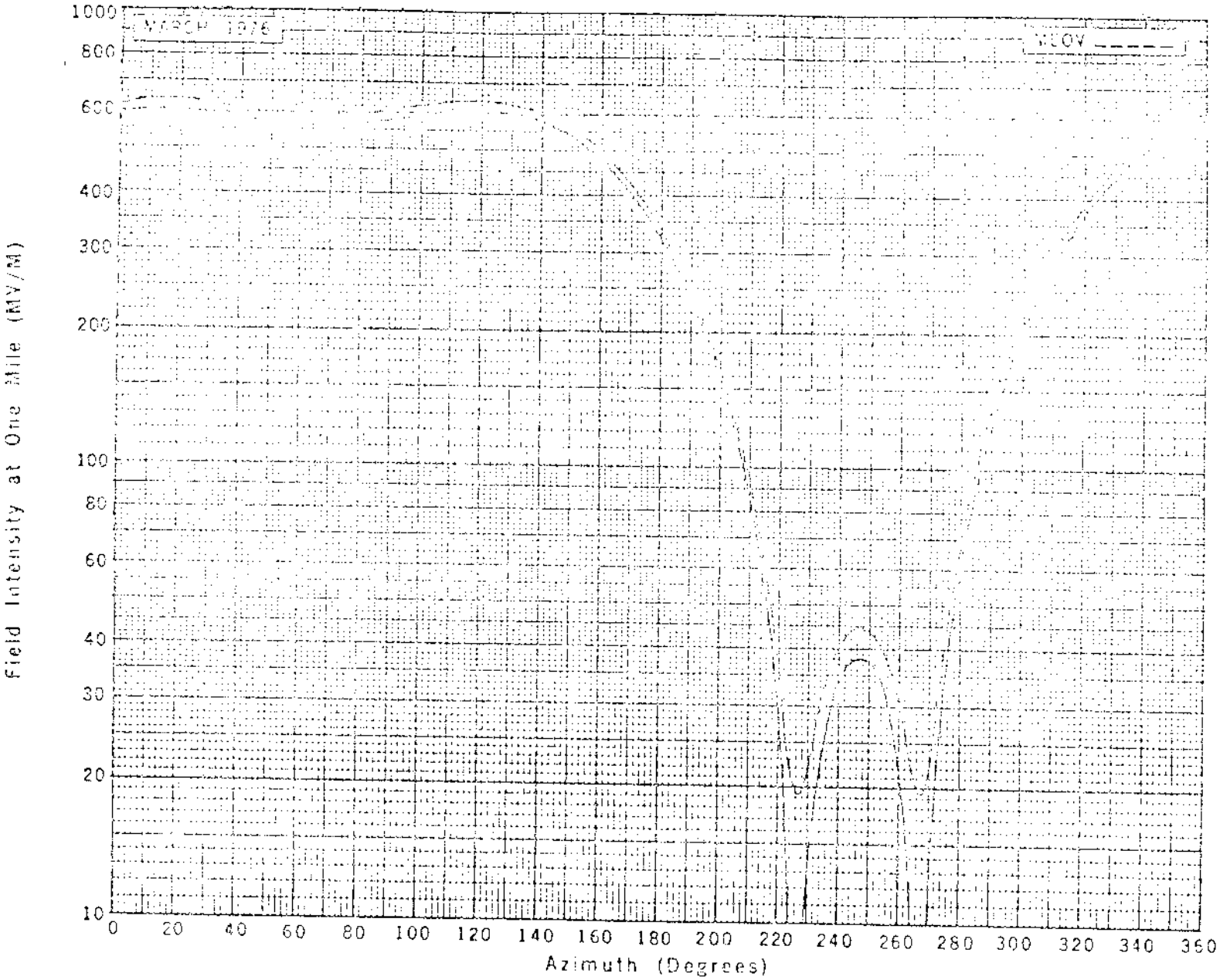


PROPOSED RADIATION PATTERN AT VERTICAL ANGLE OF 10 DEGREES

QUALITY RADIO CORPORATION STATION WSAR FALL RIVER, MASSACHUSETTS

1480 KHZ 5 KW U DA-1

WSAR Sheet 3 of 13

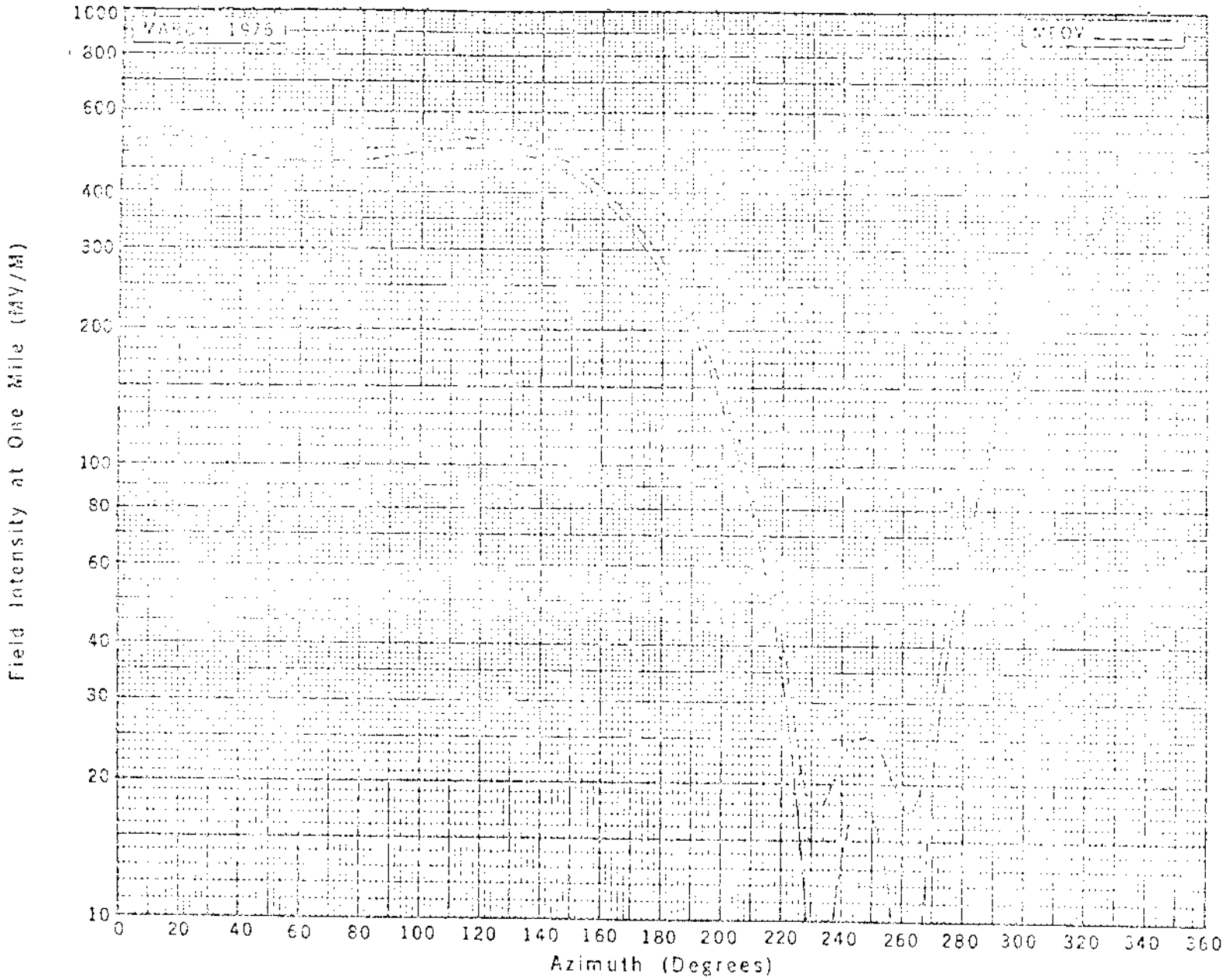


PROPOSED RADIATION PATTERN AT VERTICAL ANGLE OF 15 DEGREES

QUALITY RADIO CORPORATION STATION WSAR FALL RIVER, MASSACHUSETTS

1480 KHZ 5 KW U DA-1

WSAR Sheet 4 of 13

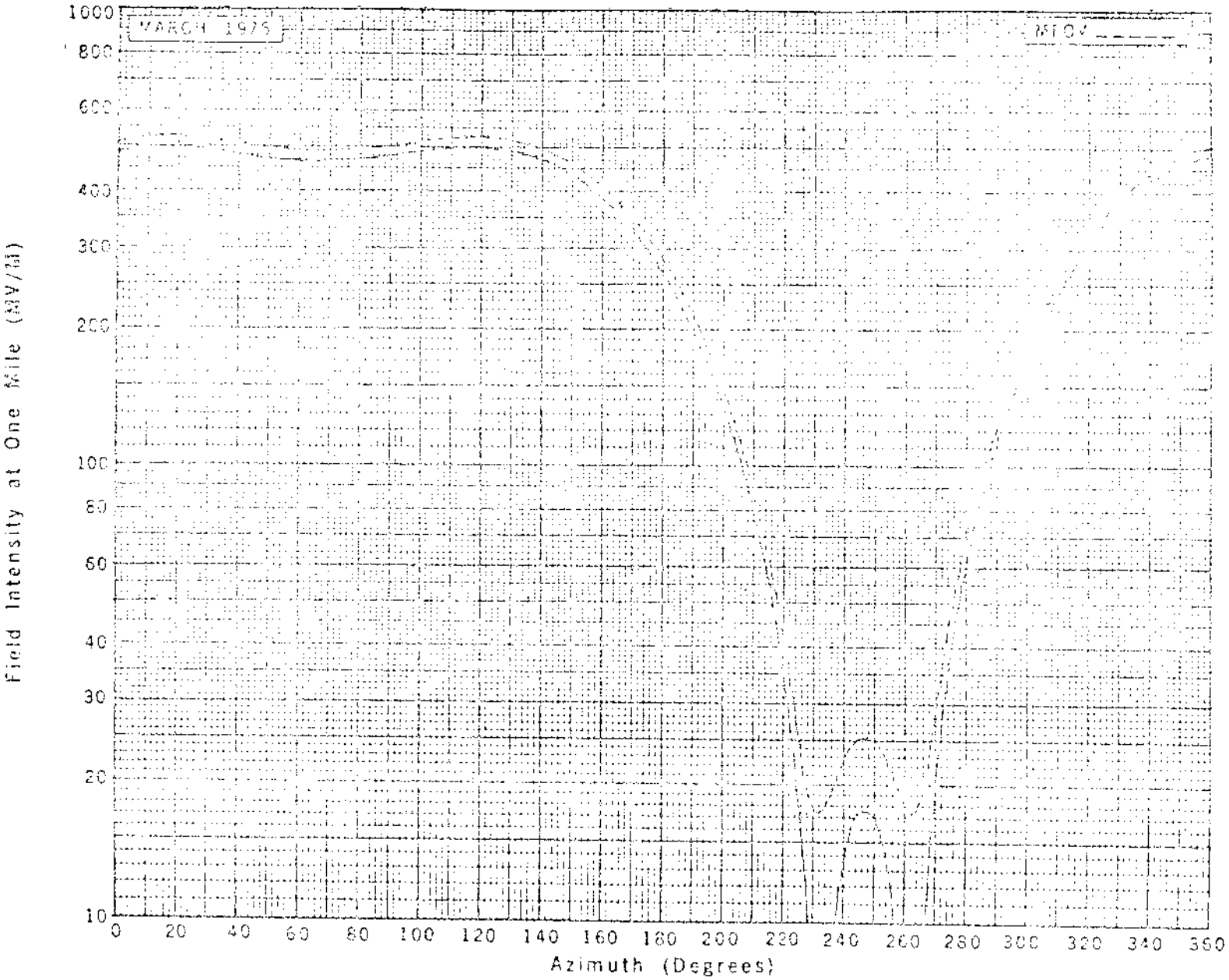


PROPOSED RADIATION PATTERN AT VERTICAL ANGLE OF 20 DEGREES

QUALITY RADIO CORPORATION STATION WSAR FALL RIVER, MASSACHUSETTS

1480 KHZ 5 KW U DA-1

WSAR Figure 6 Sheet 5 of 13

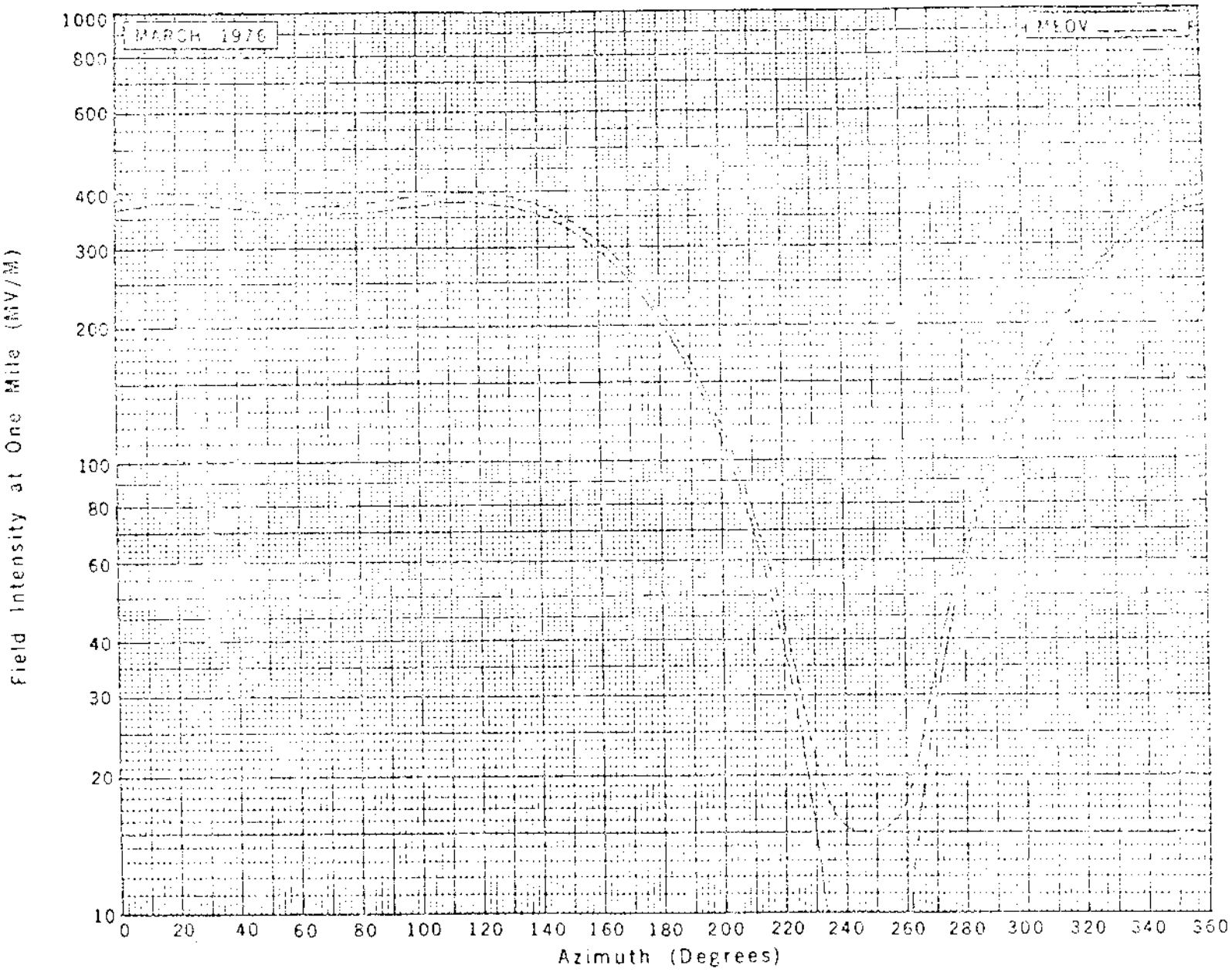


PROPOSED RADIATION PATTERN AT VERTICAL ANGLE OF 20 DEGREES

QUALITY RADIO CORPORATION STATION WSAR FALL RIVER, MASSACHUSETTS

1480 KHZ 5 KW U DA-1

WSAR Figure 6 Sheet 5 of 13

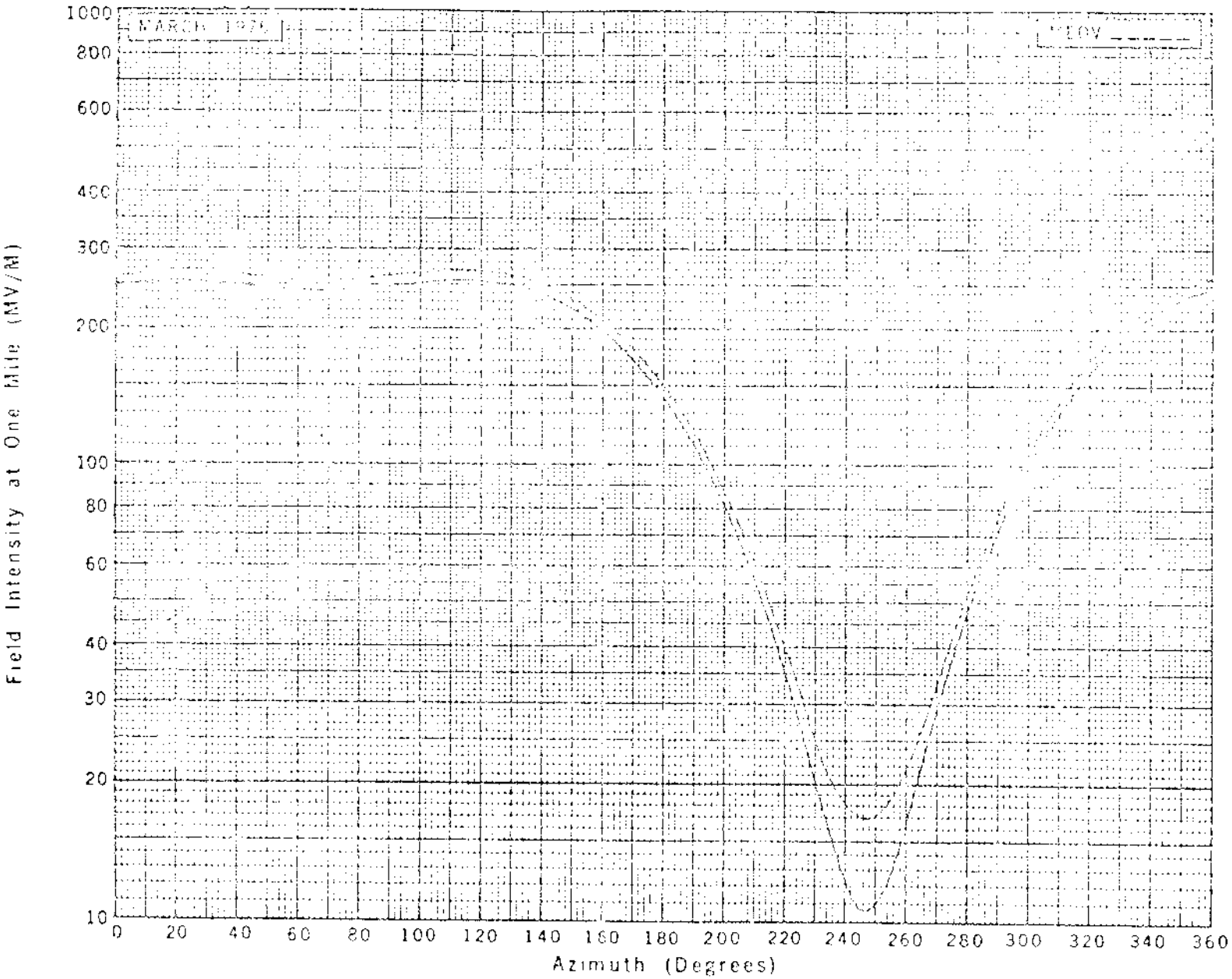


PROPOSED RADIATION PATTERN AT VERTICAL ANGLE OF 25 DEGREES

QUALITY RADIO CORPORATION STATION WSAR FALL RIVER, MASSACHUSETTS

1480 KHZ 5 KW U DA-1

WSAR Sheet 6 of 13

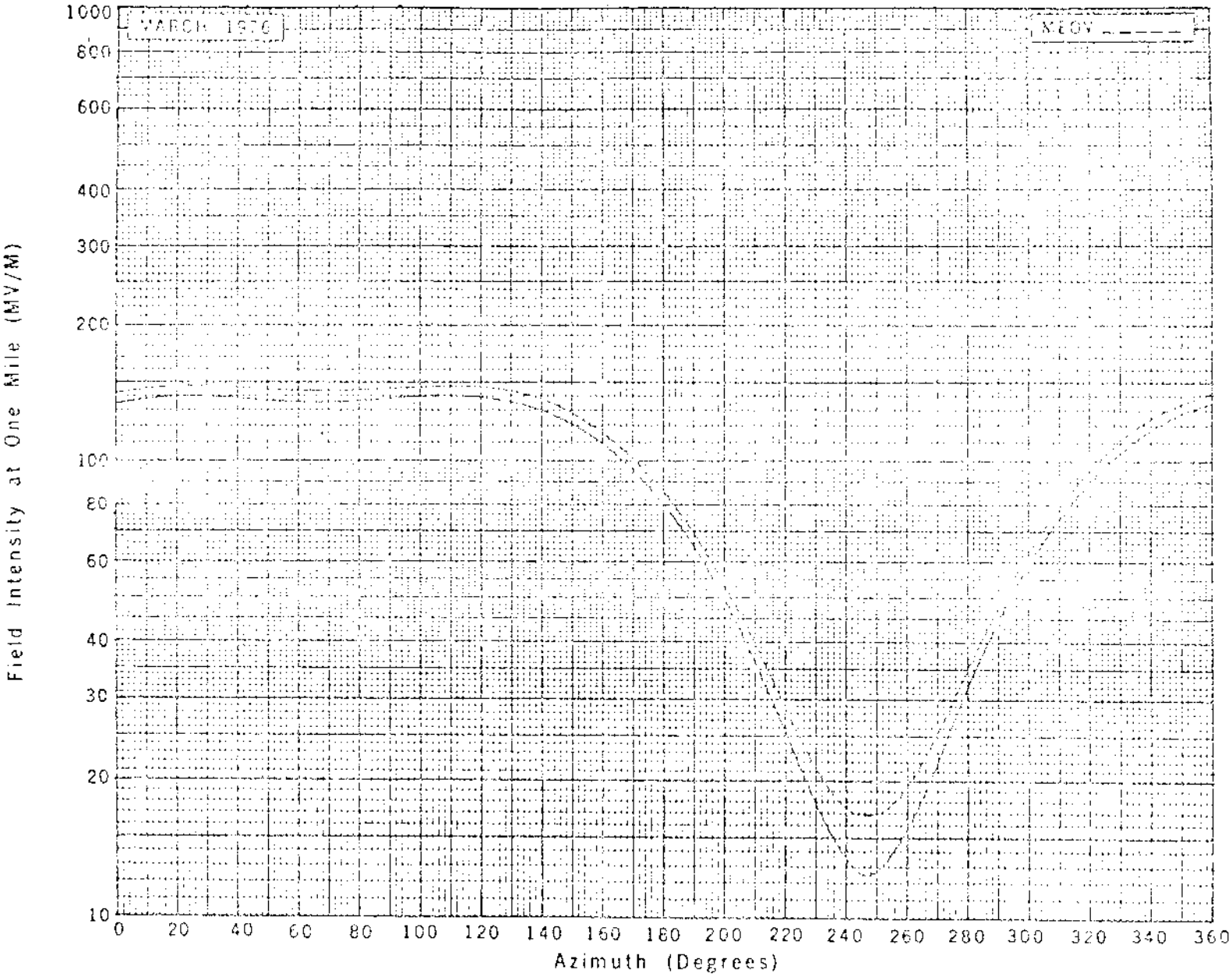


PROPOSED RADIATION PATTERN AT VERTICAL ANGLE OF 30 DEGREES

QUALITY RADIO CORPORATION STATION WSAR FALL RIVER, MASSACHUSETTS

1480 KHZ 5 KW U DA 1

WSAR Figure 6
Sheet 7 of 13



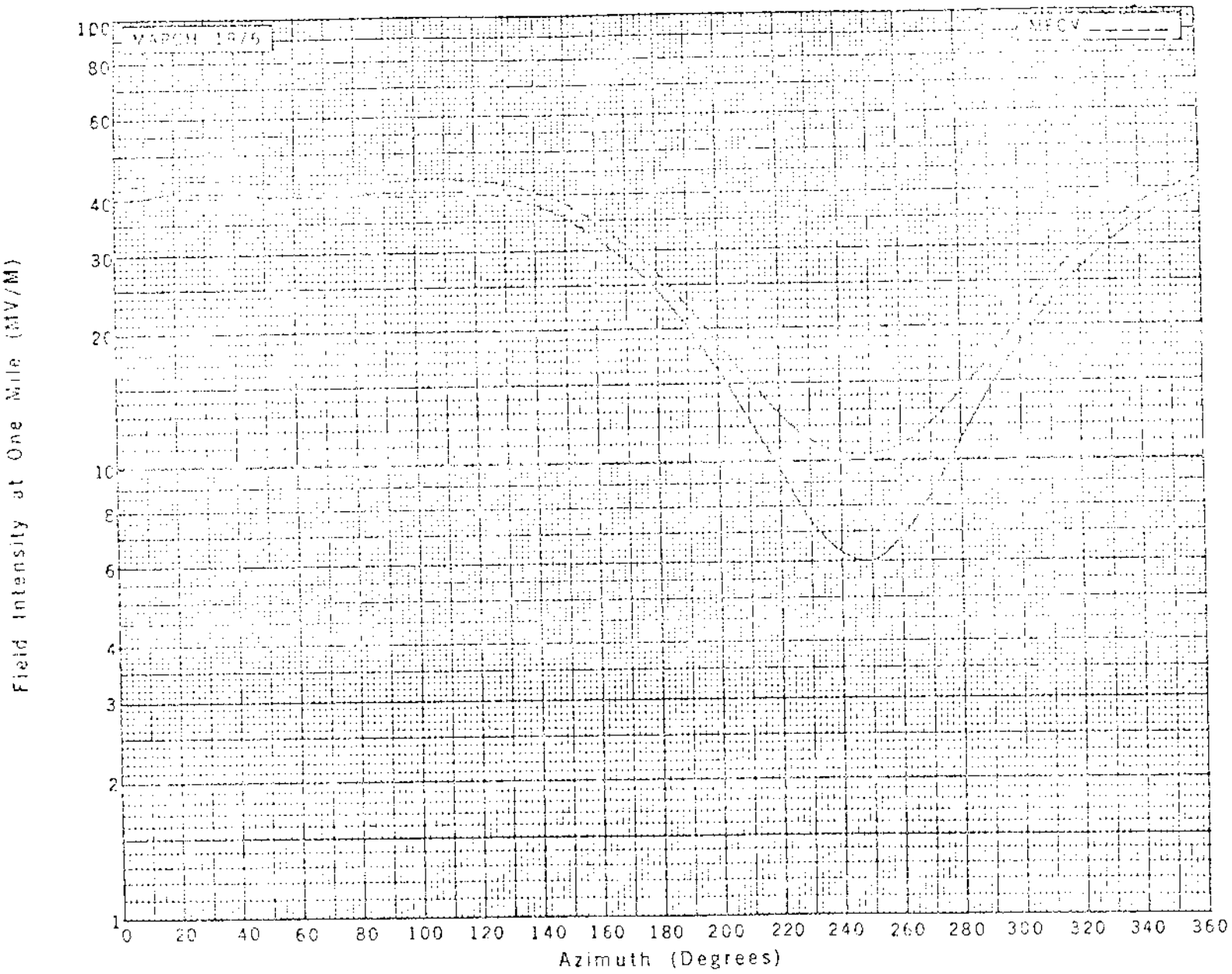
PROPOSED RADIATION PATTERN AT VERTICAL ANGLE OF 35 DEGREES

QUALITY RADIO CORPORATION STATION WSAR FALL RIVER, MASSACHUSETTS

1480 KHZ 5 KW U DA-1

WSAR

Figure 6
Sheet 8 of 13



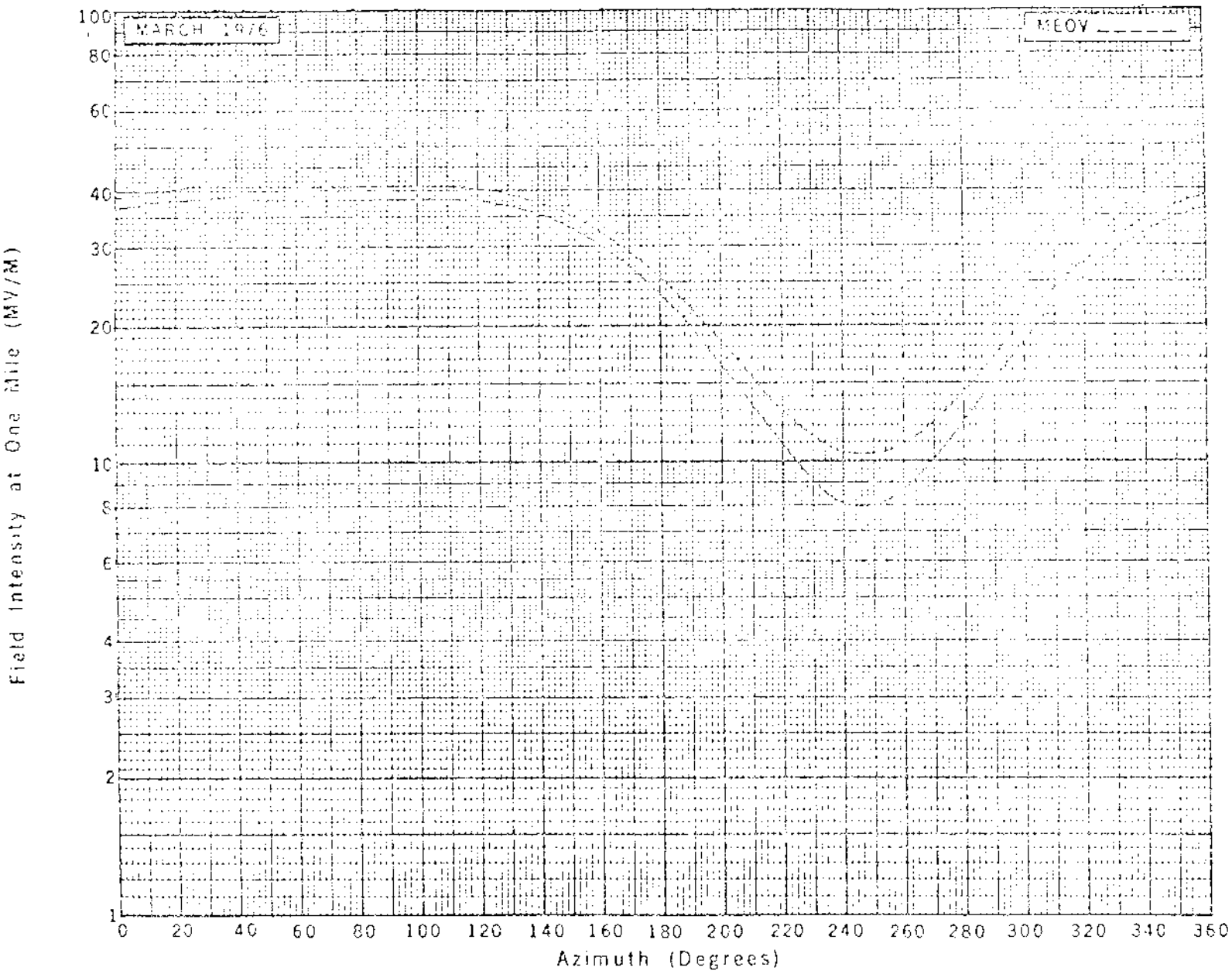
PROPOSED RADIATION PATTERN AT VERTICAL ANGLE OF 40 DEGREES

QUALITY RADIO CORPORATION STATION WSAR FALL RIVER, MASSACHUSETS

1480 KHZ 5 KW U DA-1

WSAR

Figure 6
Sheet 9 of 13

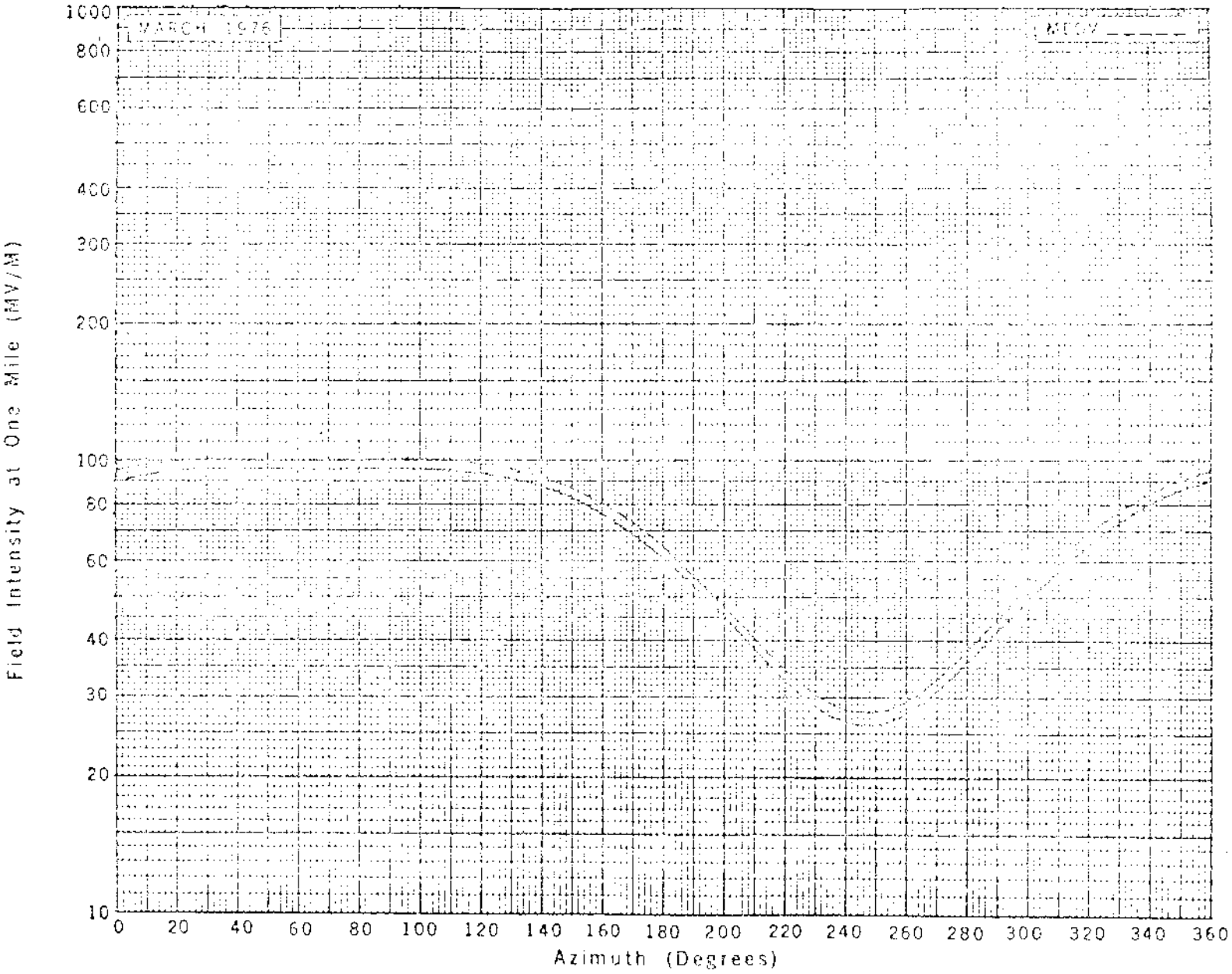


PROPOSED RADIATION PATTERN AT VERTICAL ANGLE OF 45 DEGREES

QUALITY RADIO CORPORATION STATION WSAR FALL RIVER, MASSACHUSETTS

1480 KHZ 5 KW U DA-1

WSAR Figure 6
Sheet 10 of 13

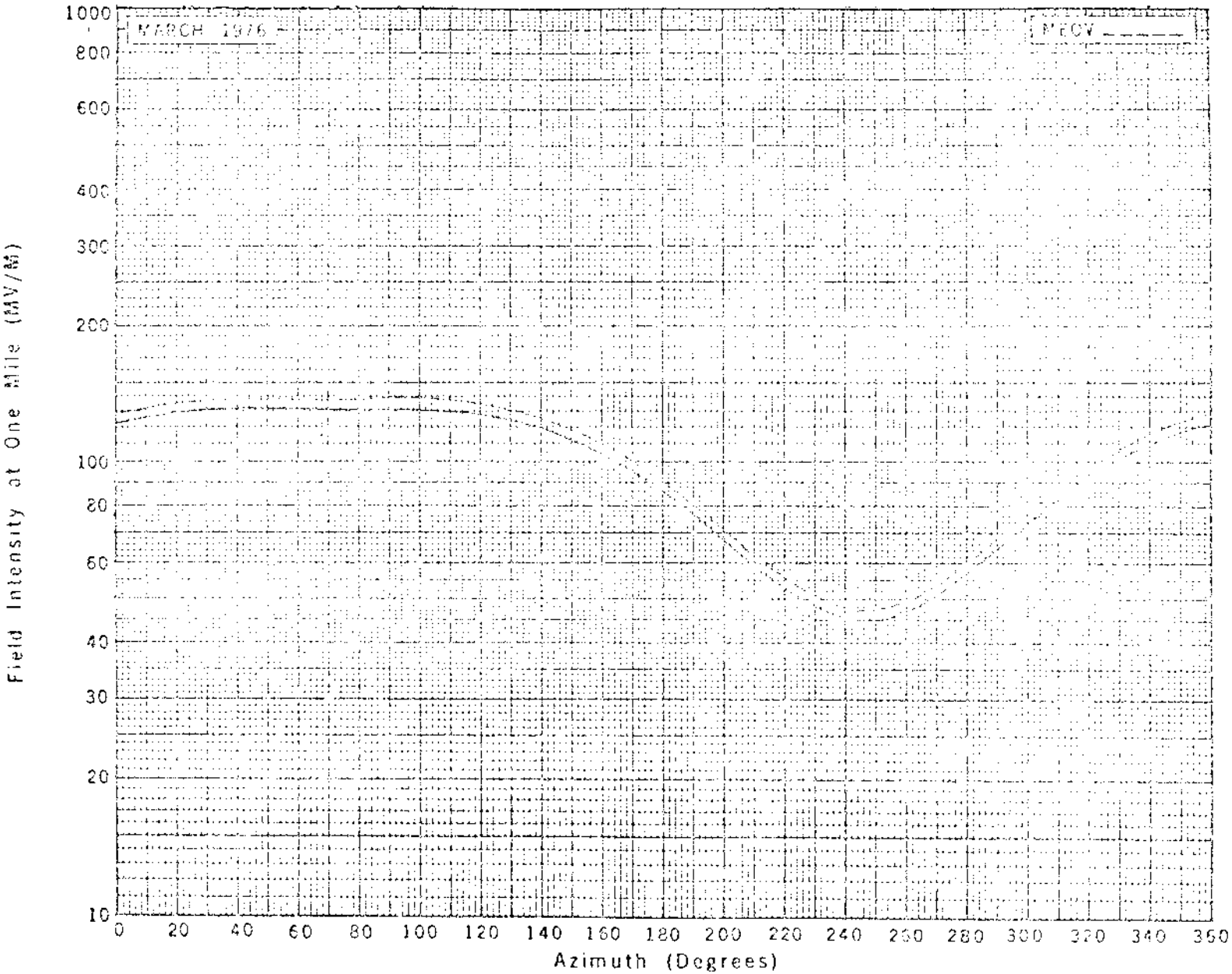


PROPOSED RADIATION PATTERN AT VERTICAL ANGLE OF 50 DEGREES

QUALITY RADIO CORPORATION STATION WSAR FALL RIVER, MASSACHUSETTS

1480 KHZ 5 KW U DA-1

WSAR Figure 6
Sheet 11 of 13

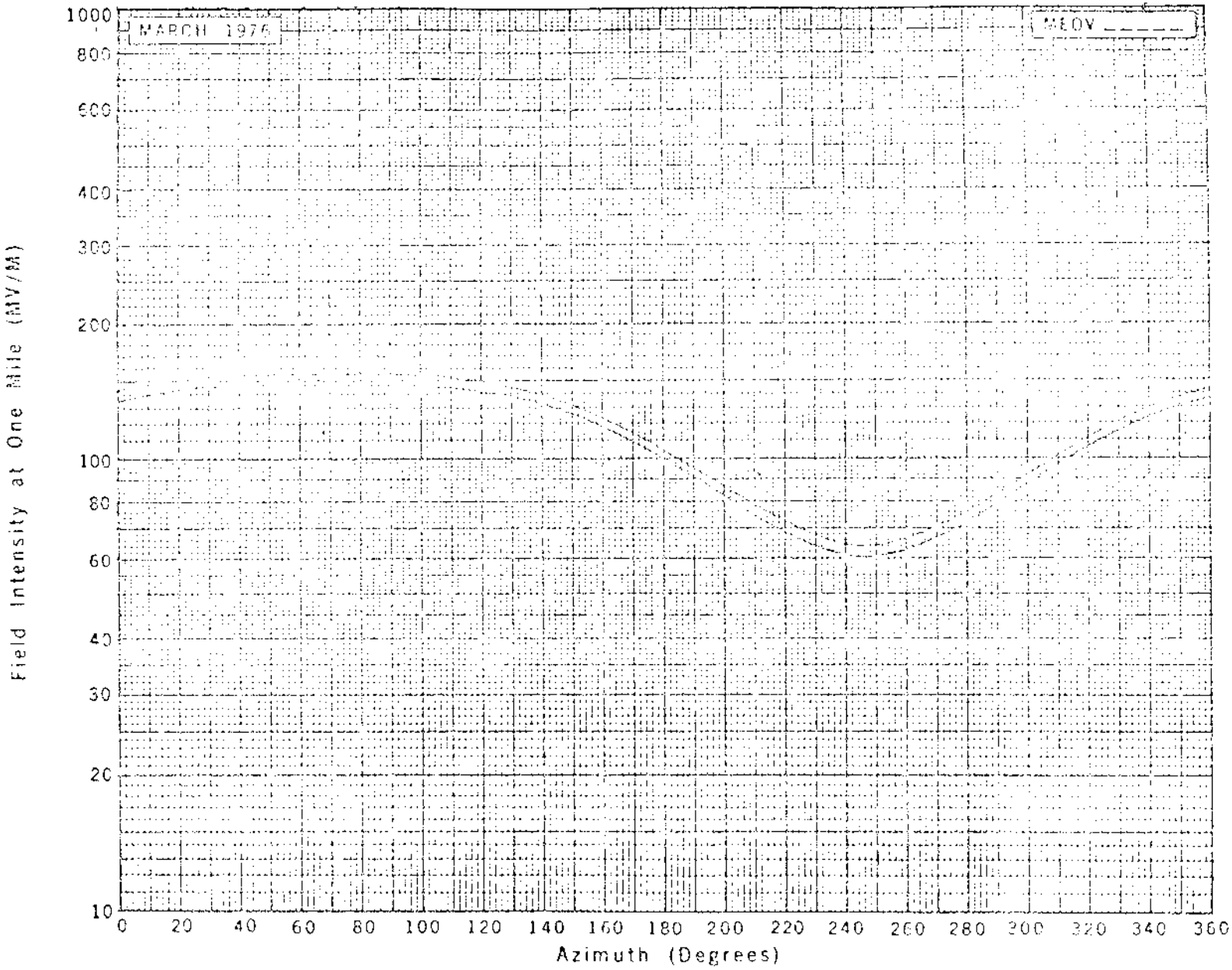


PROPOSED RADIATION PATTERN AT VERTICAL ANGLE OF 55 DEGREES

QUALITY RADIO CORPORATION STATION WSAR FALL RIVER, MASSACHUSETTS

1480 KHZ 5 KW U DA-1

WSAR Figure 6
Sheet 12 of 1



PROPOSED RADIATION PATTERN AT VERTICAL ANGLE OF 60 DEGREES

QUALITY RADIO CORPORATION STATION WSAR FALL RIVER, MASSACHUSETTS

1480 KHZ 5 KW U DA-1

WSAR Figure 6
Sheet 13 of 13

WSAR

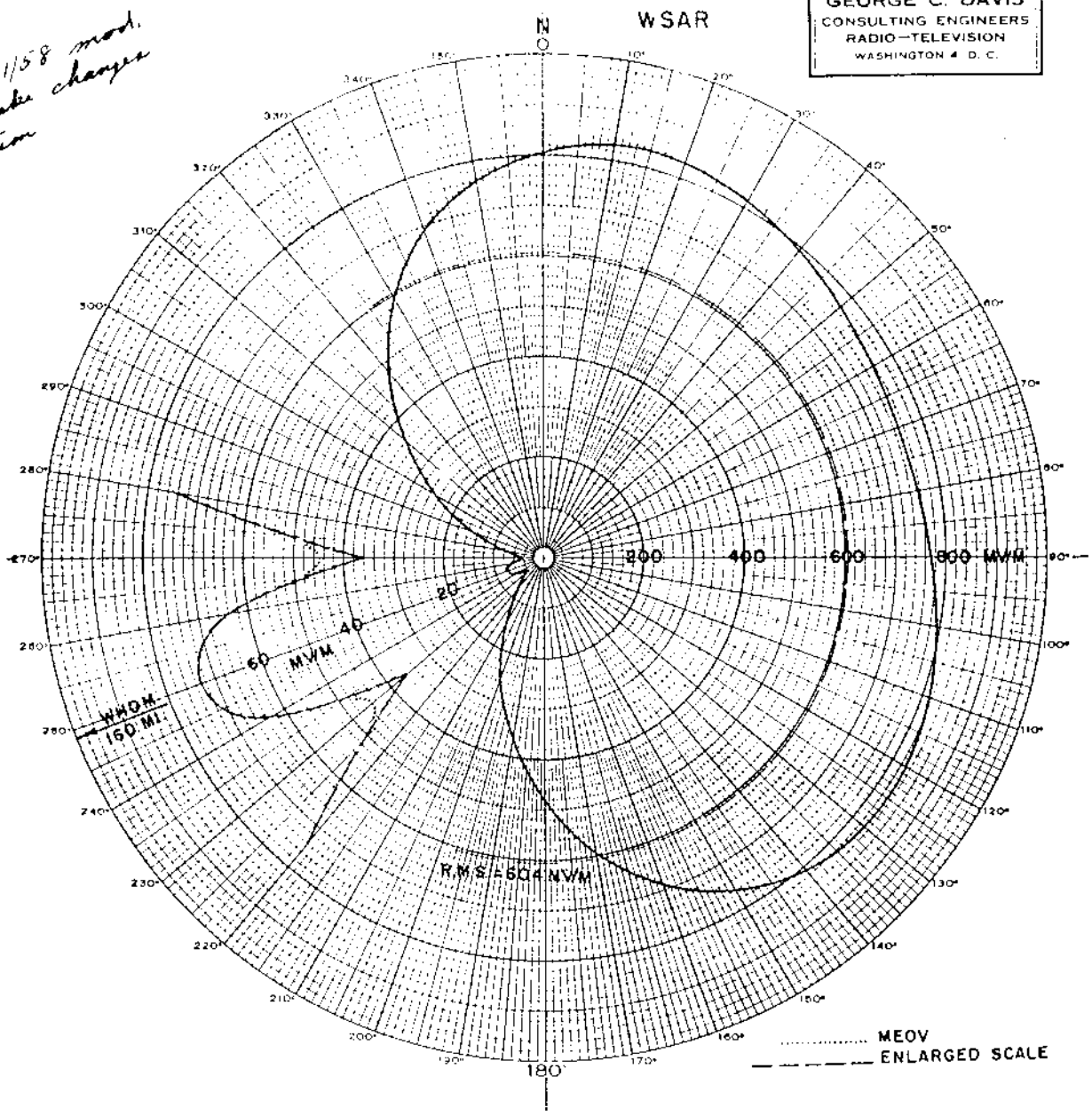
PROPOSED DAY
(4-24-58g)

Station WSAR 5kw, DA-2,U
Fall River, Massachusetts

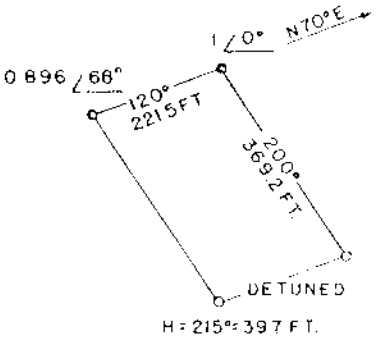
1480 KC

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

Granted 7/31/58 mod. of C.P. to make changes in DA system



NL 41° 43' 23''
WL 71° 11' 19''



HORIZONTAL PLANE PATTERN FOR
PROPOSED DAYTIME OPERATION
WSAR, FALL RIVER, MASSACHUSETTS
1480 KC - 5 KW - DA-2
MARCH 1958

FCC File No. BMP-8105
Accepted 4-11-58

WSAR
Fall River, Massachusetts

1480 KC

WSAR

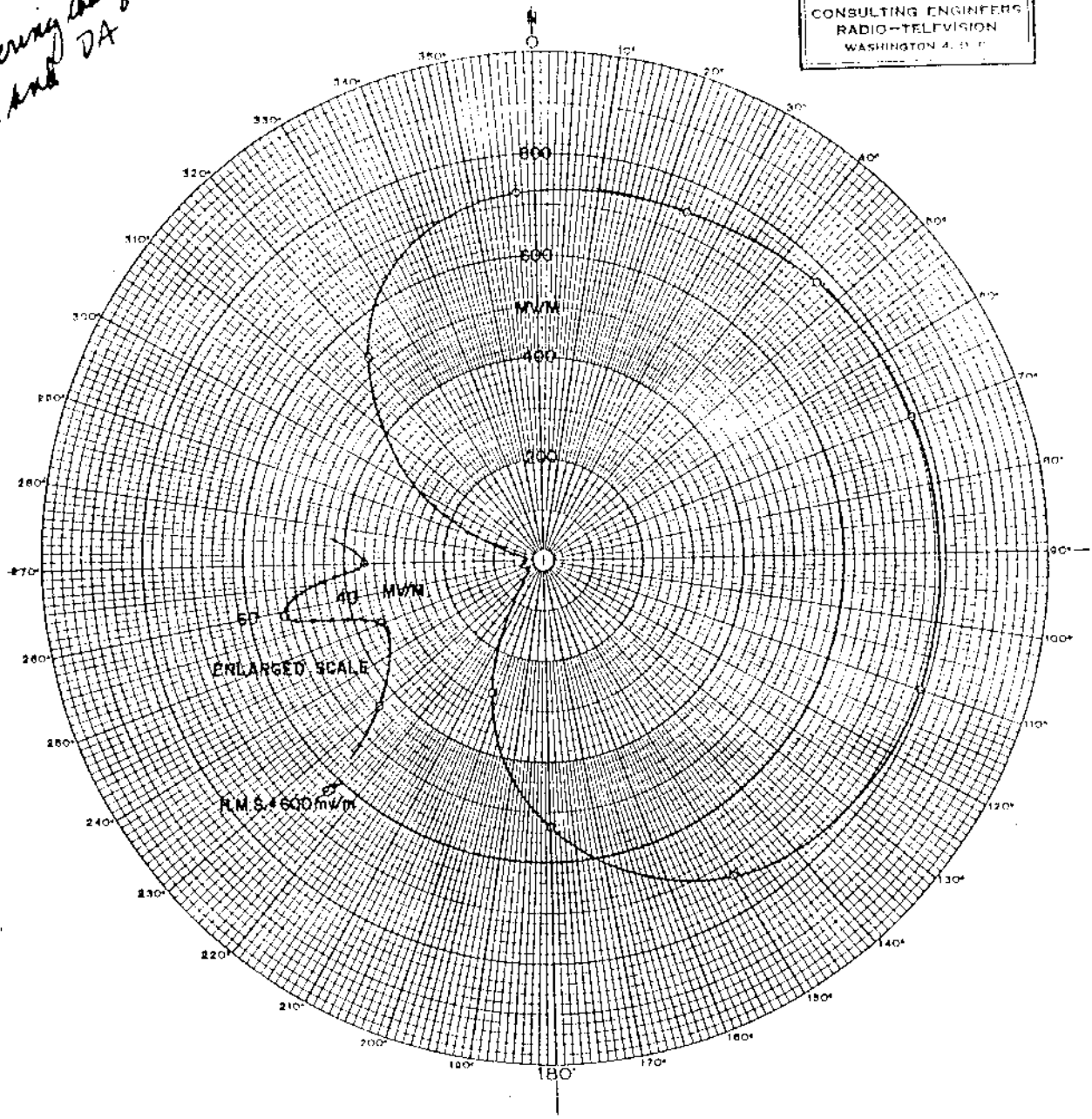
MEASURED DAY
(2-26-60g)

11-23-62 granted, covering changes in transmitter site and DA

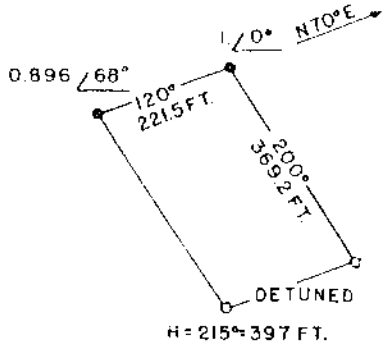
Station WSAR
Fall River, Massachusetts

5kw, DA-2,U
1480 KC

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



North Latitude 41° 43' 23"
West Longitude 71° 11' 19"



MEASURED
HORIZONTAL PLANE PATTERN
FOR DAYTIME OPERATION
WSAR, FALL RIVER, MASSACHUSETTS
1480 KC 5 KW DA-2
JANUARY 1960

FCC File No. BL-7835
Accepted 2-18-60

WSAR
Fall River, Massachusetts 1480 KC

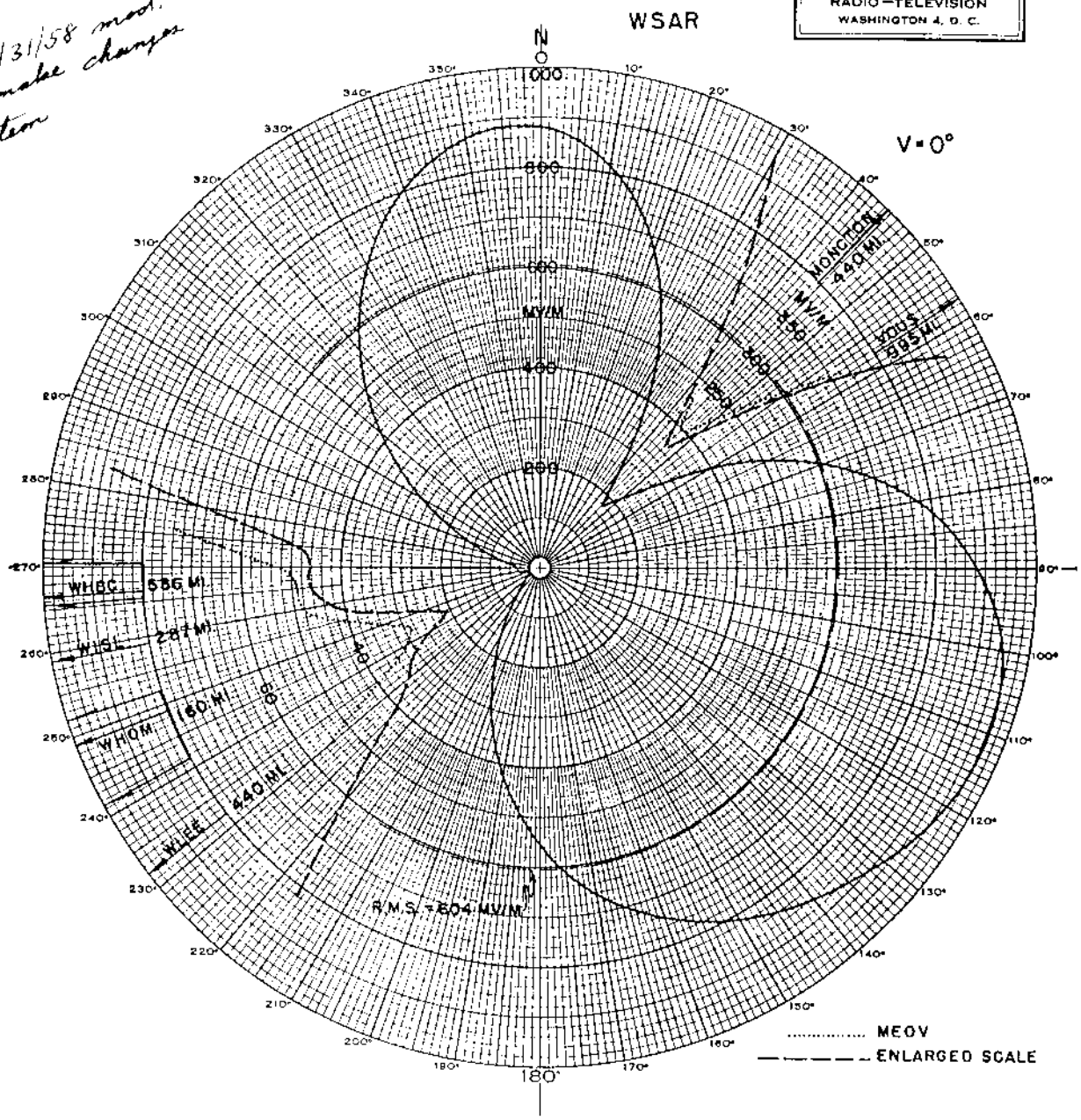
WSAR

PROPOSED NIGHT
(4-24-58g)

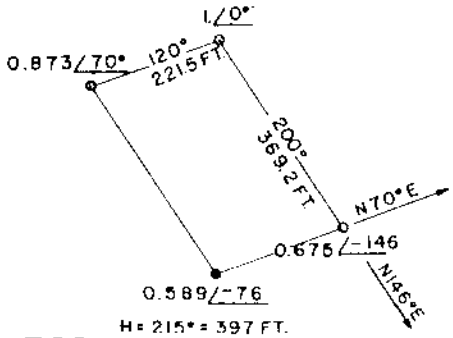
Station WSAR 5kw, DA-2,U
Fall River, Massachusetts 1480 KC

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

Granted 7/31/58 mod. of CP to make changes in DA system



NL 41° 43' 23''
WL 71° 11' 19''



HORIZONTAL PLANE PATTERN FOR
PROPOSED NIGHTTIME OPERATION
WSAR, FALL RIVER, MASSACHUSETTS
1480 KC - 5 KW - DA-2
MARCH 1958

FCC File No. BMP-8105
Accepted 4-11-58

WSAR
Fall River, Massachusetts 1480 KC

WSAR

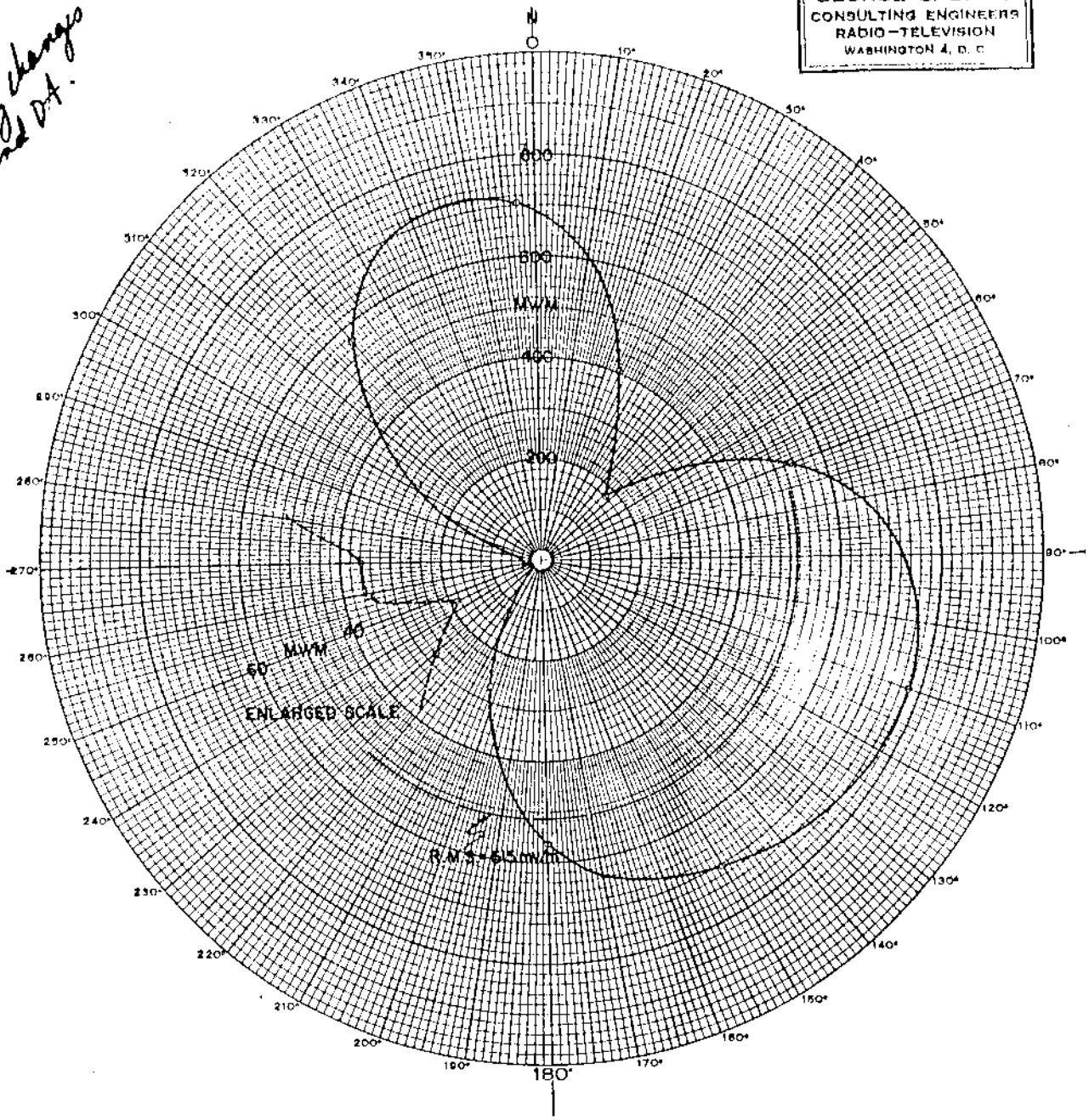
MEASURED NIGHT
(2-26-60g)

Station WSAR
Fall River, Massachusetts

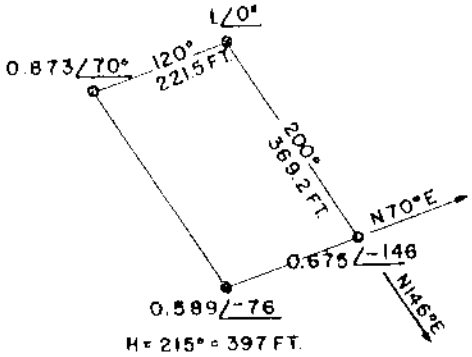
5kw, DA-2,U
1480 KC

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

11-23-62
granted L covering change in ∇ x mtr site and DA.



North Latitude 41° 43' 23''
West Longitude 71° 11' 19''



MEASURED
HORIZONTAL PLANE PATTERN
FOR NIGHTTIME OPERATION
WSAR, FALL RIVER, MASSACHUSETTS
1480 KC 5 KW DA-2
JANUARY 1960

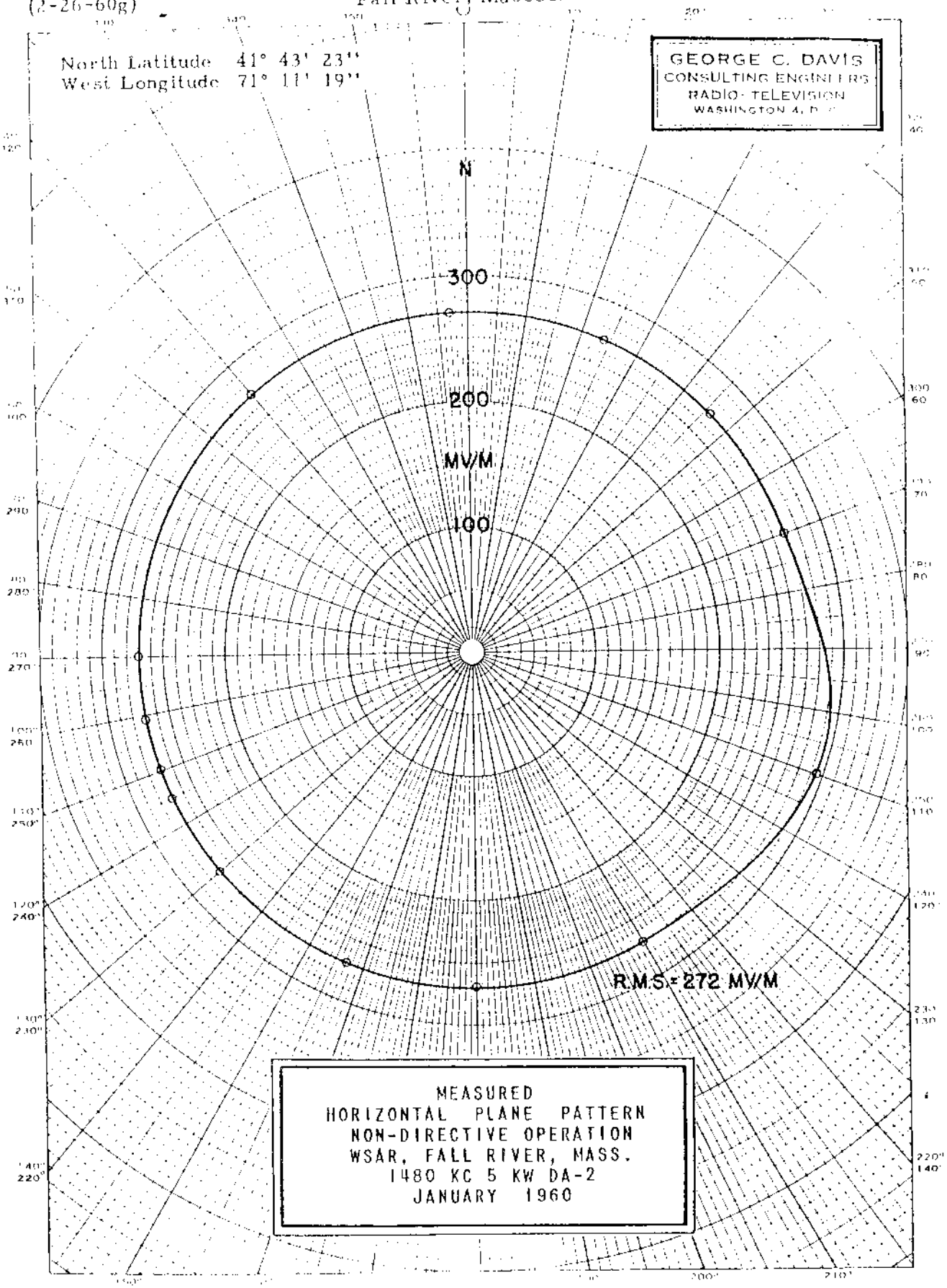
FCC File No. BL-7835
Accepted 2-18-60

WSAR
Fall River, Massachusetts 1480 KC

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

Station WSAR
Fall River, Massachusetts

5kw, DA-2,U
1480 KC



FCC File No. BL-7835
Accepted 2-18-60

WSAR
Fall River, Massachusetts

1480 KC

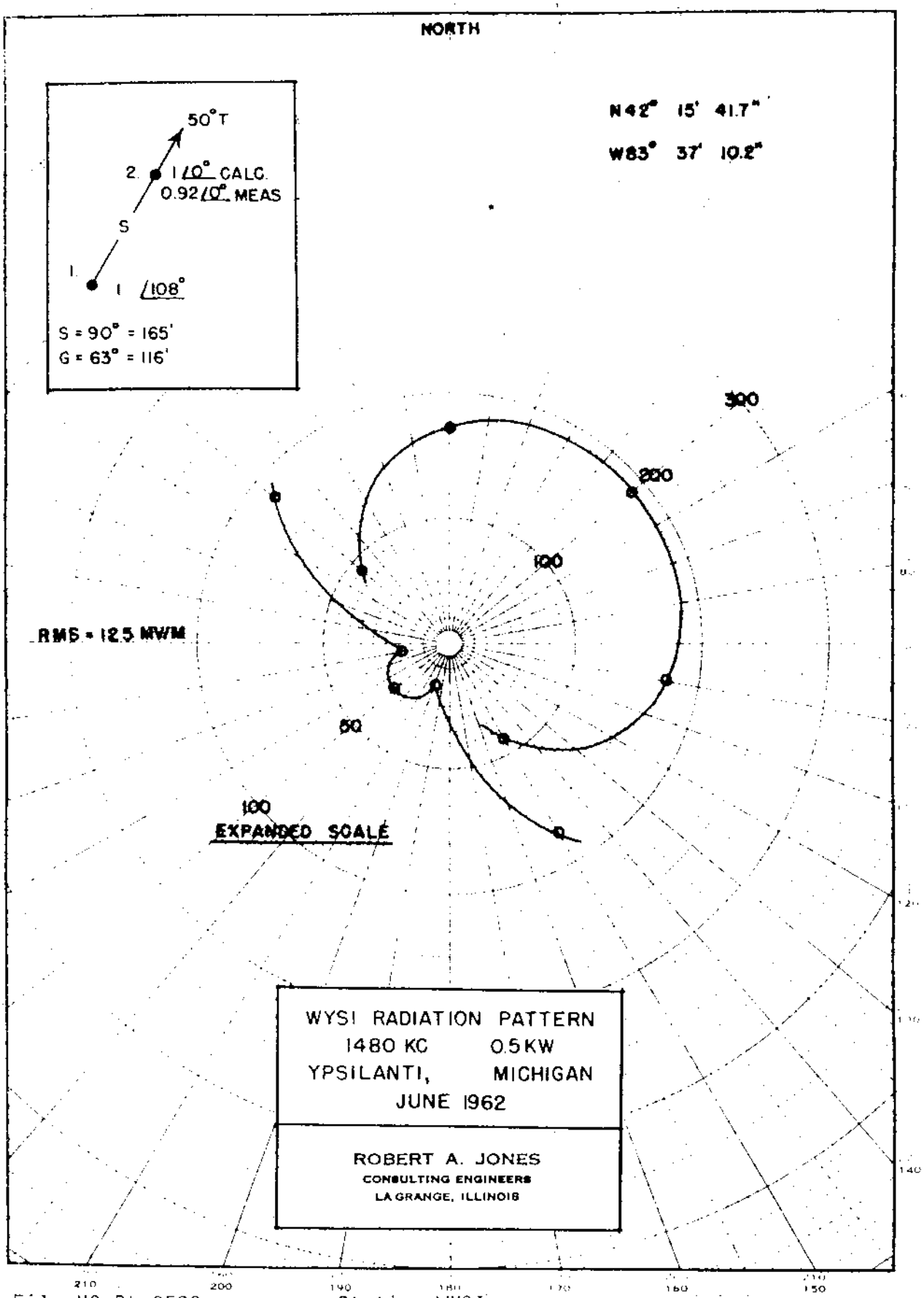
WSDS

Measured Day
(8-24-62ct)

Station WYSI
Ypsilanti, Michigan

500w,DA-D,D
1480 kc

3-4-64
[illegible]



FCC File NO.BL-9500
Accepted 8-8-62

Station WYSI
Ypsilanti, Michigan

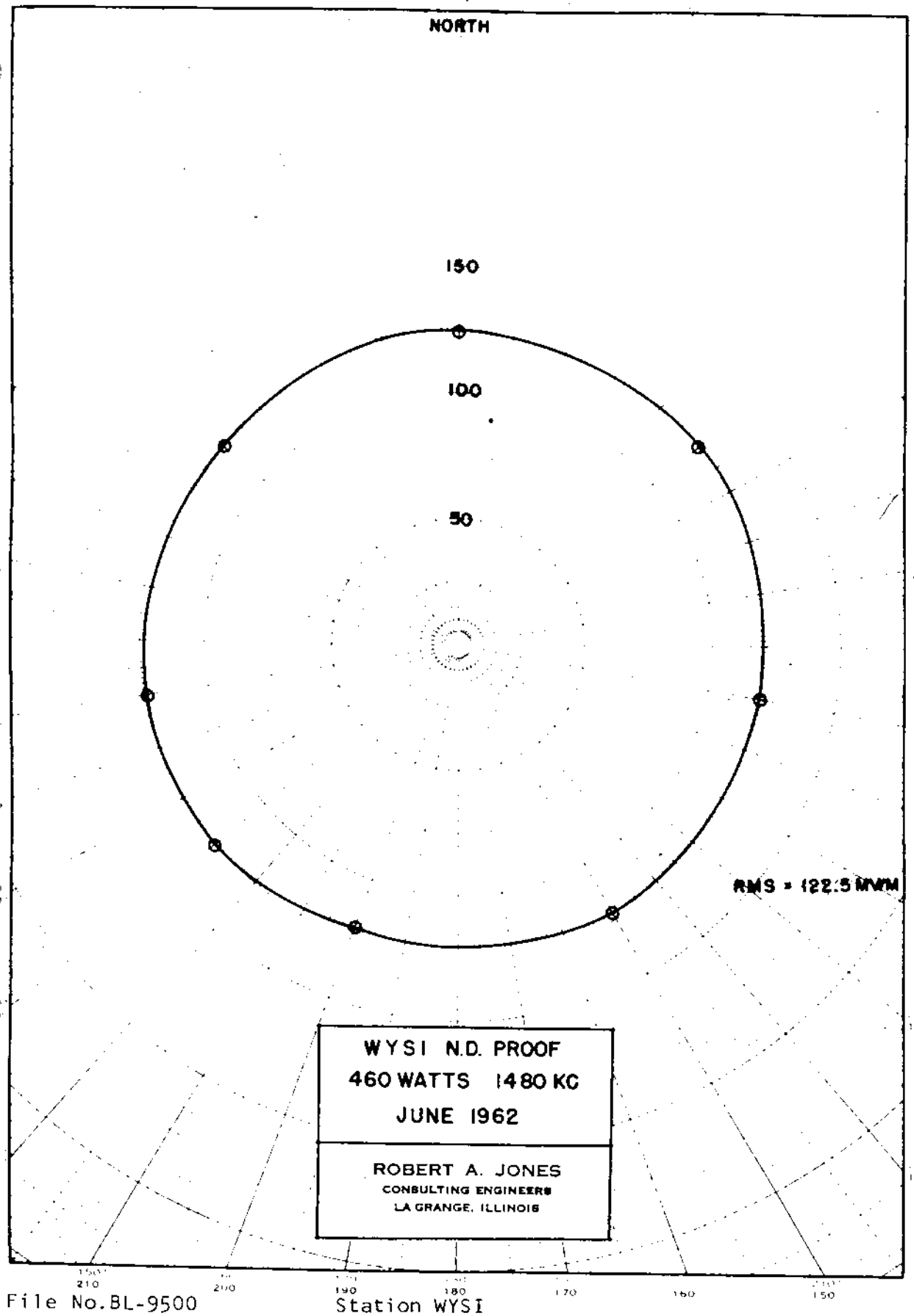
1480 kc

WSOS

Measured Non-DA
(8-24-62ct)

Station WYSI
Ypsilanti, Michigan

500w,DA-D,D
1480 kc



FCC File No.BL-9500
Accepted 8-8-62

Station WYSI
Ypsilanti, Michigan

1480 kc

YPSILANTI, MICH.

WSDS

PROPOSED DAY
(8-8-59g)

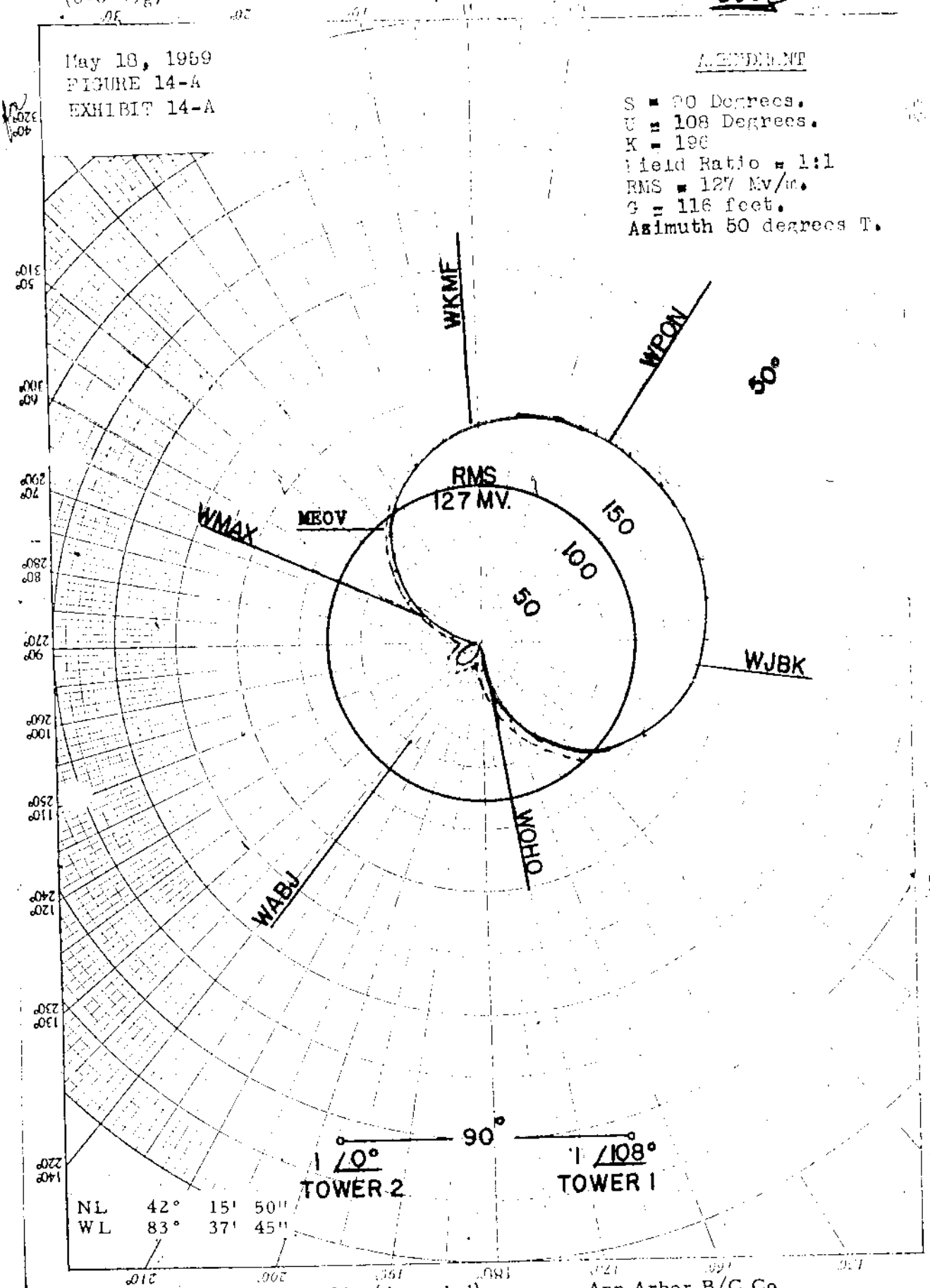
New: Ann Arbor B/C Co. 500w. D.
Ypsilanti, Michigan 1480 KC

over

May 18, 1959
FIGURE 14-A
EXHIBIT 14-A

AMENDMENT

S = 90 Degrees.
U = 108 Degrees.
K = 196
Field Ratio = 1:1
RMS = 127 Mv/m.
G = 116 feet.
Azimuth 50 degrees T.



FCC File No. BP-13221 (Amended)
Accepted 7-13-59 (formerly BP-12447)

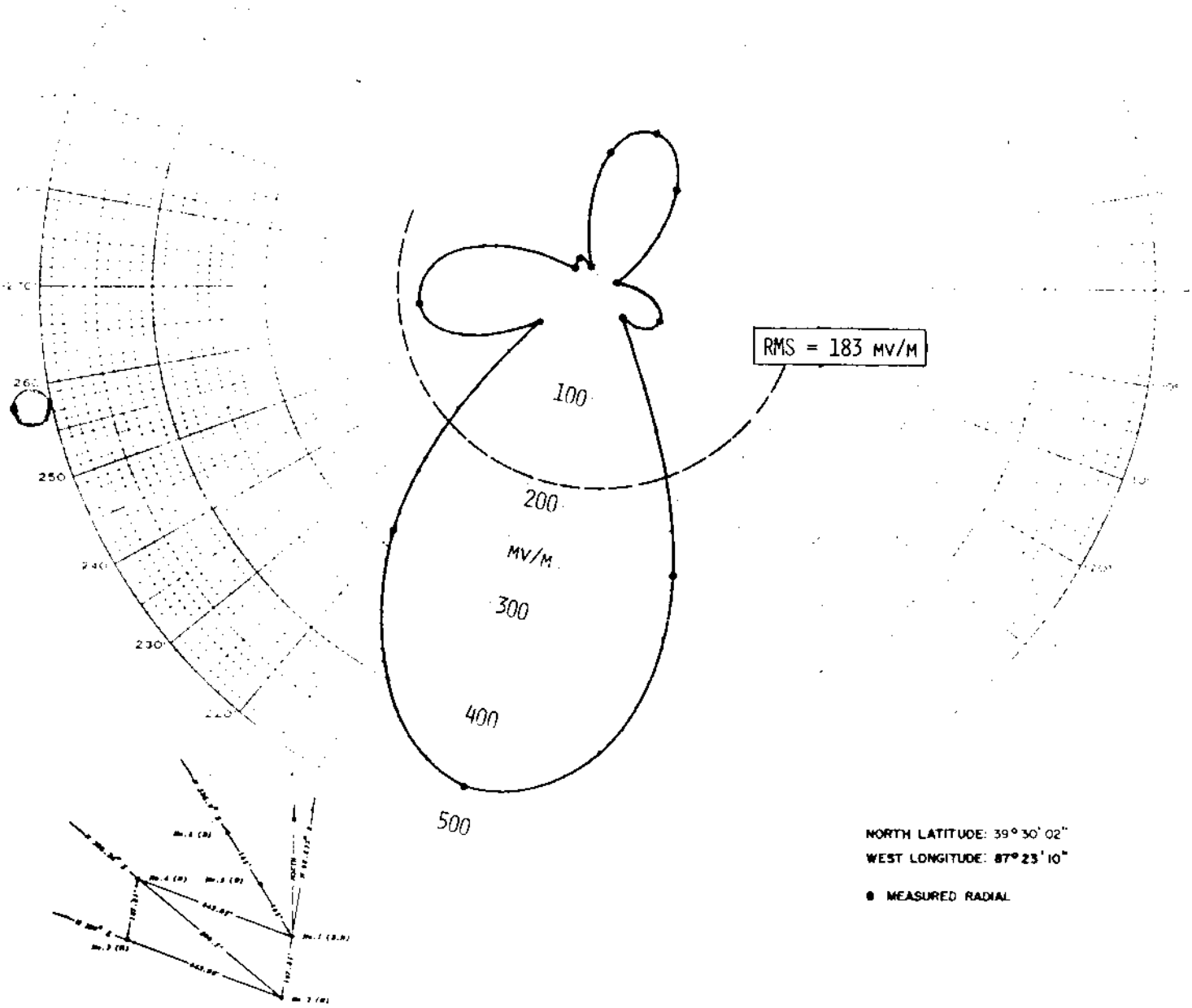
Ann Arbor B/C Co.
Ypsilanti, Michigan 1480 KC

Engineer John H Marsh

WTHI

NORTH

COHEN & DIPPELL
CONSULTING ENGINEERS
RADIO - TELEVISION
WASHINGTON, D C 20004



NORTH LATITUDE: 39° 30' 02"
WEST LONGITUDE: 87° 23' 10"

● MEASURED RADIAL

NIGHT PARAMETERS

TOWER NO. 1	1.0/0°
TOWER NO. 2	1.08/-105°
TOWER NO. 3	0.924/-7°
TOWER NO. 4	1.17/+82°

MEASURED HORIZONTAL PLANE RADIATION PATTERN
FOR THE NIGHTTIME OPERATION OF
WTHI, TERRE HAUTE, INDIANA
1480 kHz 1/5 KW DA-2 U
NOVEMBER 1970

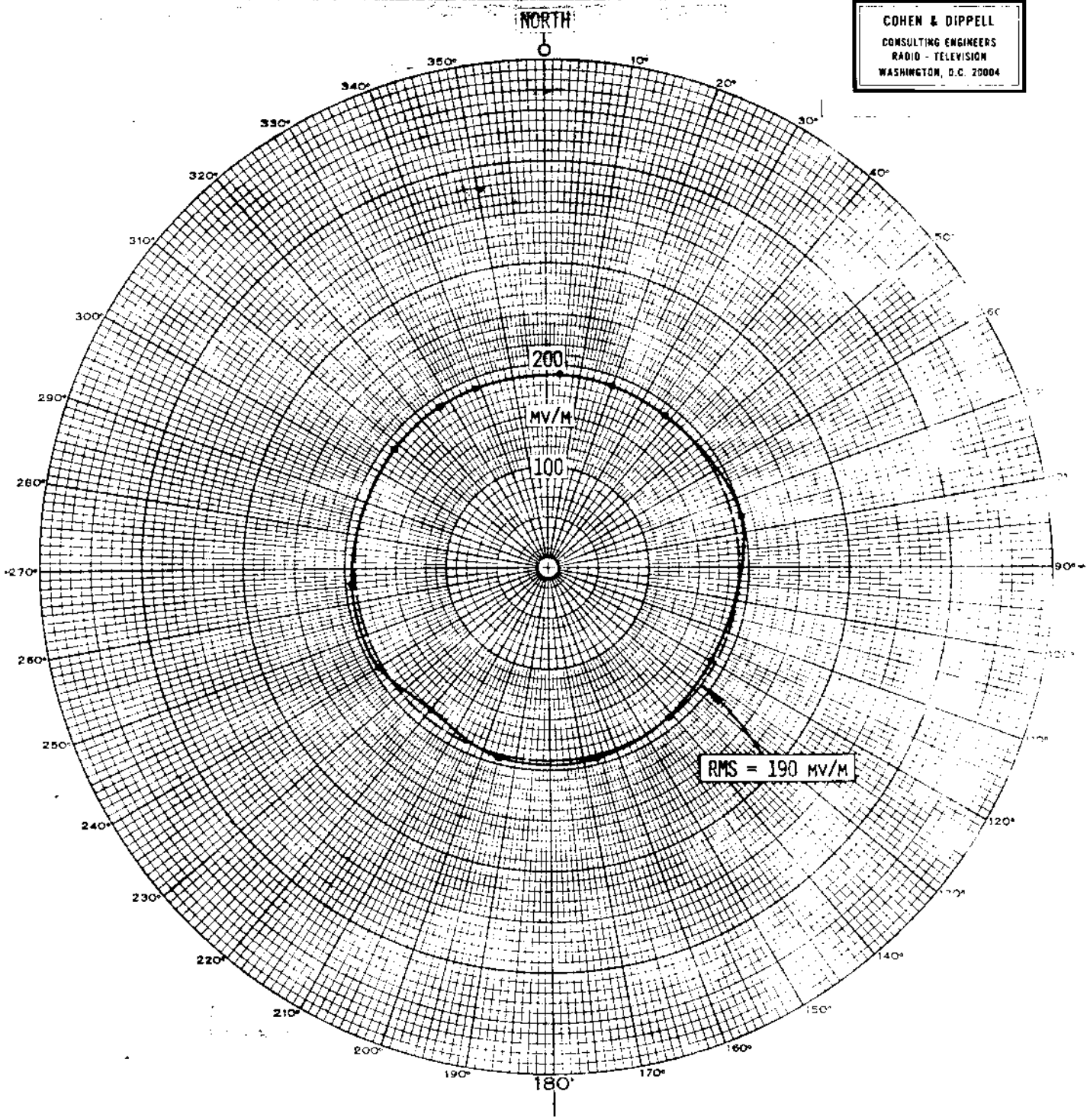
WTHI

Measured Non-DA
(1-22-71ct)

Station WTHI
Terre Haute, Indiana

1kw,5kw-LS,DA-2,U
1480 kc

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



MEASURED NON-DIRECTIONAL UNATTENUATED
FIELD INTENSITY AT ONE MILE FOR
WTHI, TERRE HAUTE, INDIANA
1480 kHz 1/5 KW DA-2 U
NOVEMBER 1970

FCC File No.BL-12840
Accepted 1-20-71

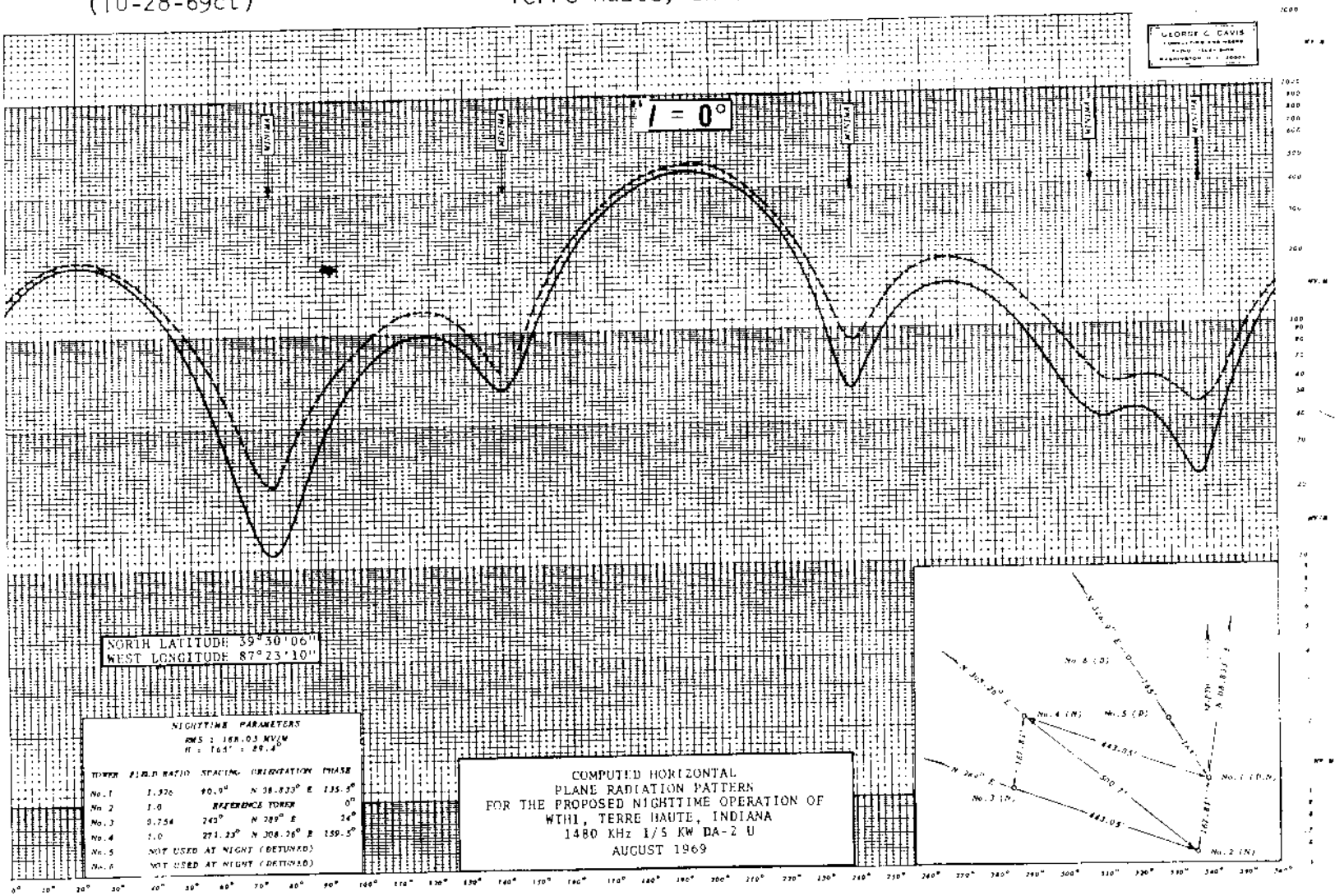
Station WTHI
Terre Haute, Indiana

1480 kc

Proposed Night Nulls
(10-28-69ct)

Station WTHI
Terre Haute, Indiana

1kw,5kw-LS,DA-2,U
1480 kc



FCC File No.BMP-12801
Accepted 10-14-69

Station WTHI
Terre Haute, Indiana

1480 kc

WTHI

WTHI

Proposed Night
(10-28-69ct)

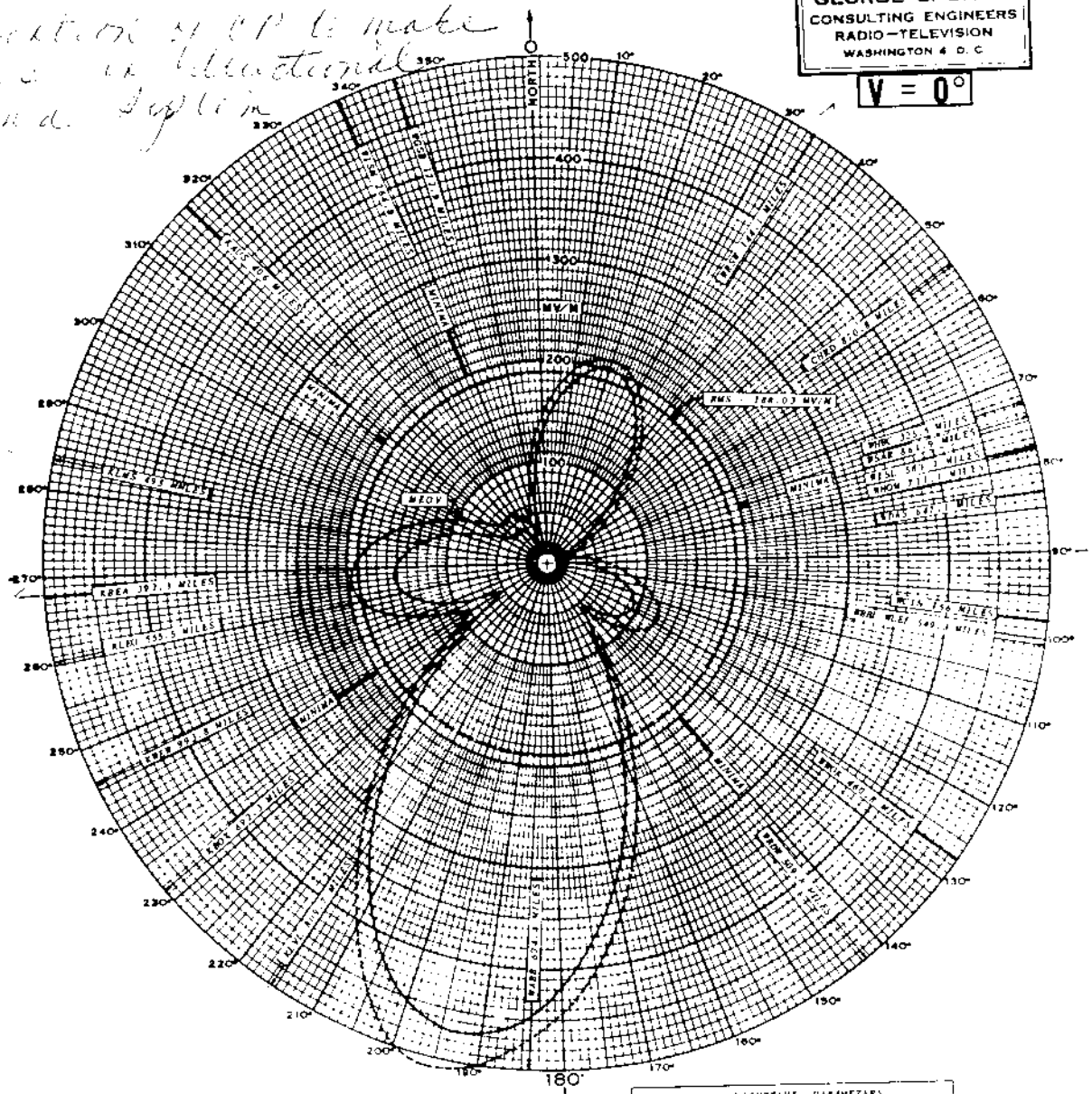
Station WTHI
Terre Haute, Indiana

1kw,5kw-LS,DA-2,U
1480 kc

BMP-12801 Granted (11-6-69)
Modification of CP to make
changes in directional
antenna. Daytime

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

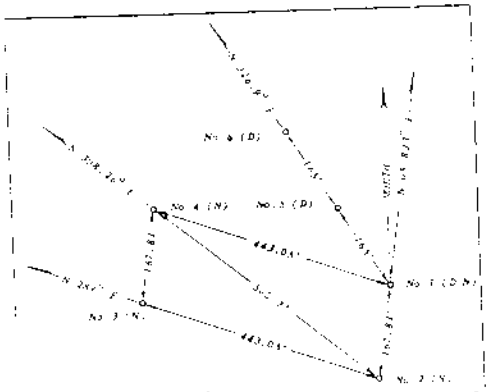
V = 0°



NORTH LATITUDE 39°30'06"
WEST LONGITUDE 87°23'10"

NIGHTTIME PARAMETERS

TOWER	RIB-E RATIO	SPACING	ORIENTATION	PHASE
No. 1	1.326	[illegible]	[illegible]	[illegible]
No. 2	1.0	REFERENCE TOWER		0°
No. 3	0.734	140°	[illegible]	[illegible]
No. 4	1.0	[illegible]	[illegible]	[illegible]
No. 5	NOT USED AT NIGHT - DETUNED			
No. 6	NOT USED AT NIGHT - DETUNED			



COMPUTED HORIZONTAL
PLANE RADIATION PATTERN
FOR THE PROPOSED NIGHTTIME OPERATION OF
WTHI, TERRE HAUTE, INDIANA
1480 KHz 1/5 KW DA-2 U
AUGUST 1969

FCC File No.BMP-12801
Accepted 10-14-69

Station WTHI
Terre Haute, Indiana

1480 kc

WTHI

Proposed Day
(10-28-69ct)

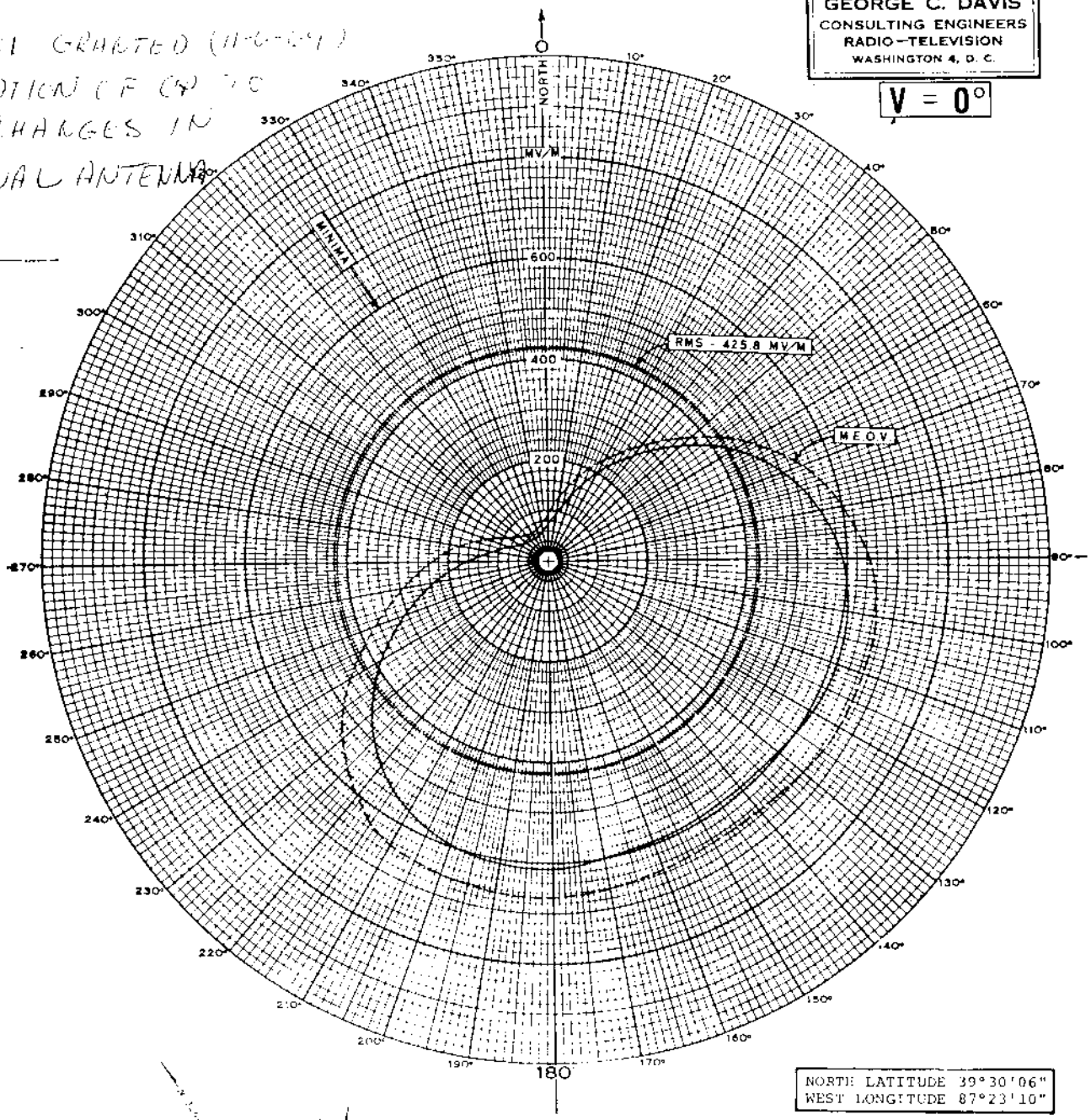
Station WTHI
Terre Haute, Indiana

1kw,5kw-LS,DA-2,U
1480 kc

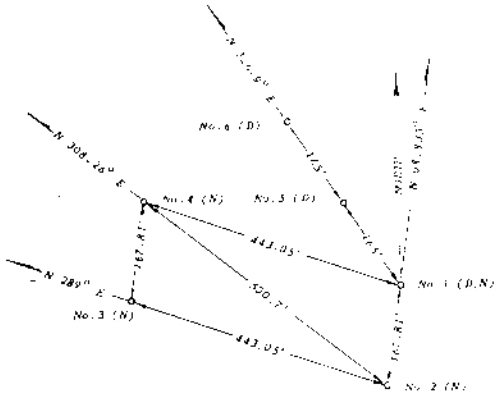
MP-12801 GRANTED (11-6-69)
MODIFICATION OF CP TO
MAKE CHANGES IN
DIRECTIONAL ANTENNA
SYSTEM

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

V = 0°



NORTH LATITUDE 39°30'06"
WEST LONGITUDE 87°23'10"



COMPUTED HORIZONTAL
PLANE RADIATION PATTERN
FOR THE PROPOSED DAYTIME OPERATION OF
WTHI, TERRE HAUTE, INDIANA
1480 KHz 1/5 KW DA-2 U
APRIL 1969

DAYTIME PARAMETERS
RMS 425.8 MV/M
H - 165' - 99.4°

	FIELD RATIO	PHASE
NO. 1	1.0	0°
NO. 2	NOT USED DURING DAY	
NO. 3	NOT USED DURING DAY	
NO. 4	NOT USED DURING DAY	
NO. 5	3.602	69.2°
NO. 6	2.132	138°

FCC File No.BMP-12801
Accepted 10-14-69

Station WTHI
Terre Haute, Indiana

1480 kc

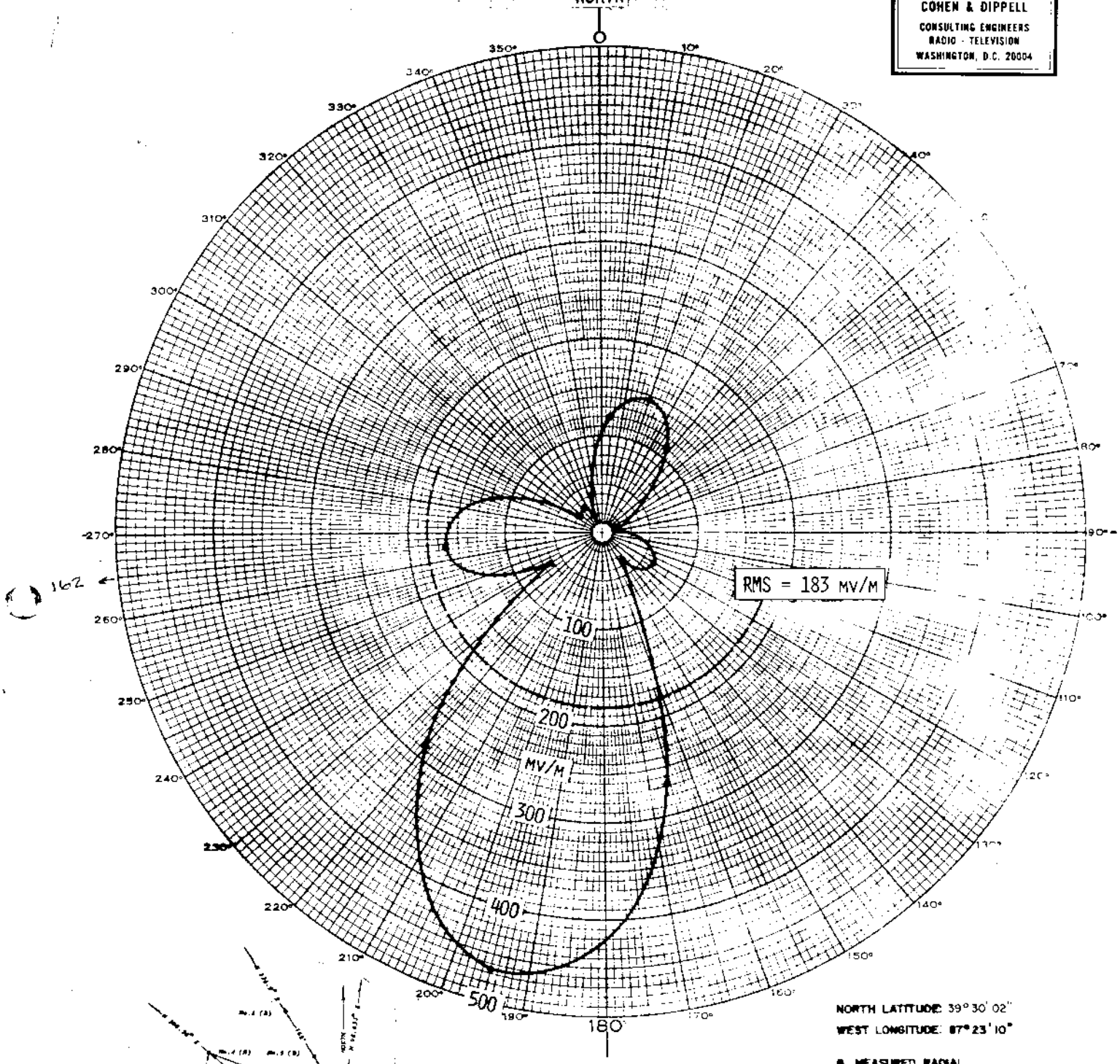
WTHI

Measured Night
(1-22-71ct)

Station WTHI
Terre Haute, Indiana

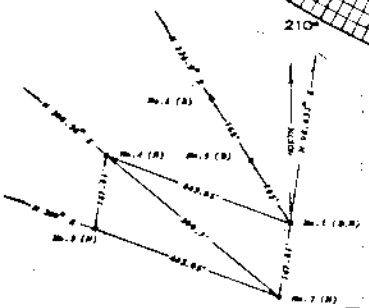
1kw,5kw-LS,DA-2,U
1480 kc

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



NORTH LATITUDE 39° 30' 02"
WEST LONGITUDE 87° 23' 10"

● MEASURED RADIAL



NIGHT PARAMETERS
TOWER NO. 1 1.0/0°
TOWER NO. 2 1.08/-105°
TOWER NO. 3 0.924/-7°
TOWER NO. 4 1.17/+62°

MEASURED HORIZONTAL PLANE RADIATION PATTERN
FOR THE NIGHTTIME OPERATION OF
WTHI, TERRE HAUTE, INDIANA
1480 kHz 1/5 KW DA-2 U
NOVEMBER 1970

FCC File No.BL-12840
Accepted 1-20-71

Station WTHI
Terre Haute, Indiana

1480 kc

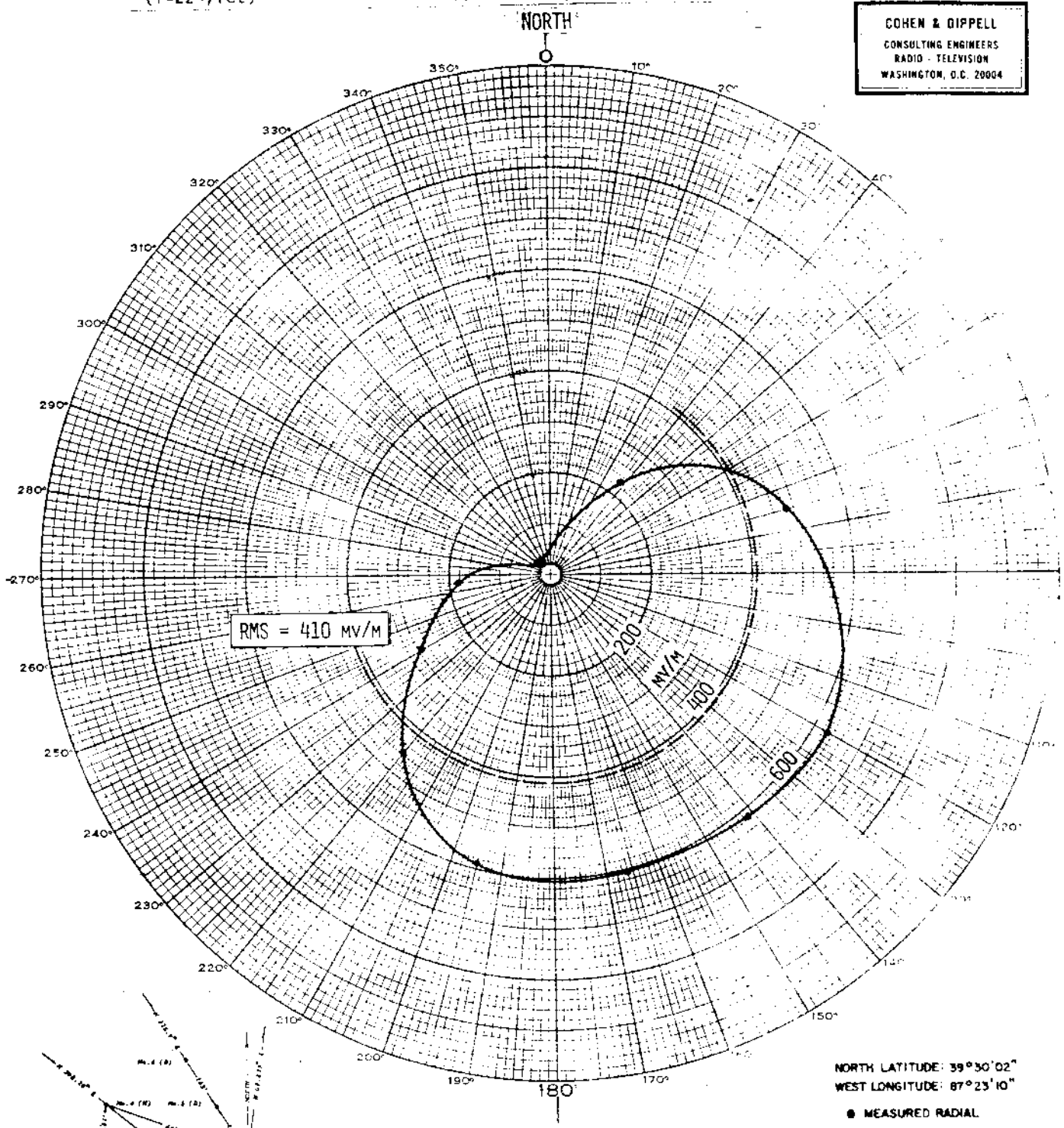
WTHI

Measured Day
(1-22-71ct)

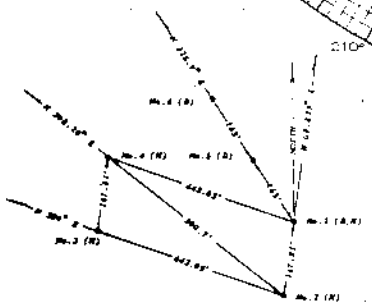
Station WTHI
Terre Haute, Indiana

1kw,5kw-LS,DA-2,U
1480 kc

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



NORTH LATITUDE: 39°30'02"
WEST LONGITUDE: 87°23'10"
● MEASURED RADIAL



DAY PARAMETERS

TOWER NO. 1 .072/-163°

TOWER NO. 5 1.0/0°

TOWER NO. 6 0.883/+28°

MEASURED HORIZONTAL PLANE RADIATION PATTERN
FOR THE DAYTIME OPERATION OF
WTHI, TERRE HAUTE, INDIANA
1480 kHz 1/5 KW DA-2 U
NOVEMBER 1970

FCC File No.BL-12840
Accepted 1-20-71

Station WTHI
Terre Haute, Indiana

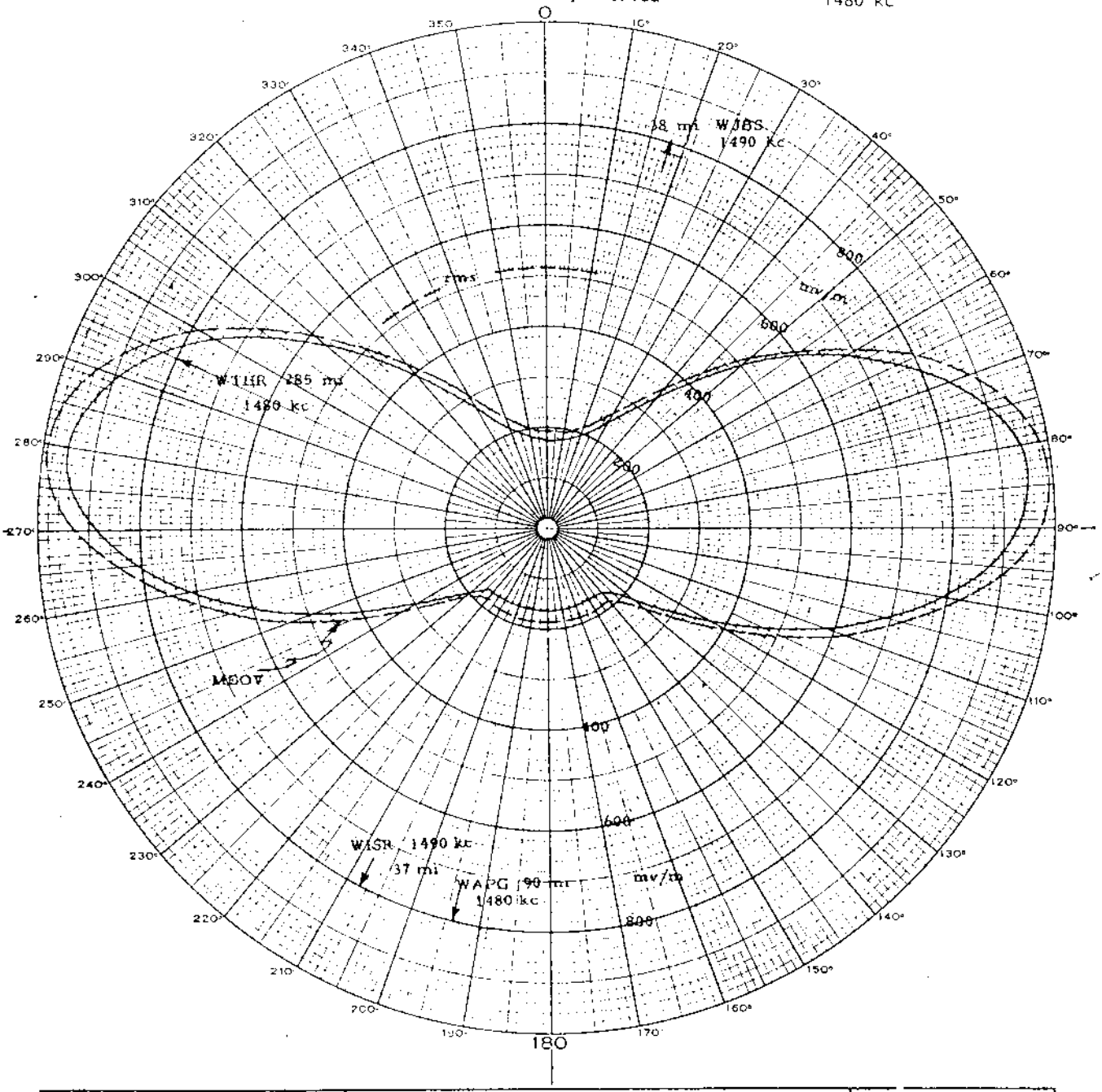
1480 kc

WVCF

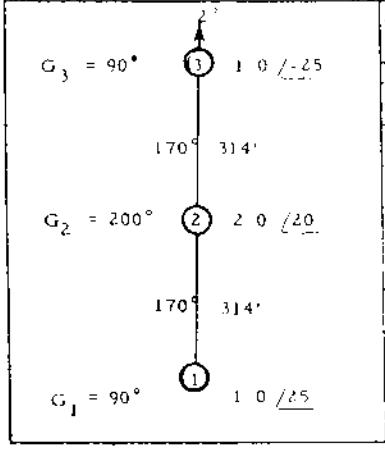
Proposed Day
(4-28-65cL)

Station WXIV
Windermere, Florida

5kw,DA-D,D
1480 kc



TOWER PLACEMENT SKETCH



PATTERN PARAMETERS

TOWER No.	ELECTRICAL HEIGHT θ°	TRUE TOWER ORIENTATION φ°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO f	ELEV ANGLE θ°	ELEVATION RMS FIELD mv/m E_θ
1	90	182	170	25	242	1.0	0	515
2	200	0	0	20	484	2.0	10	
3	90	2	170	-25	242	1.0	20	
4							30	
5							40	
6							50	
7							60	
8							70	
9							80	
							90	
							G_θ	
							f_θ	

STATION DATA

CALL	WXIV
FREQUENCY	1480 kc
POWER	5 kw
TIME OF OPERATION	DA-D
TYPE OF OPERATION	Class III
DAYTIME TOWERS	3
NIGHTTIME TOWERS	
No. RADIALS PER TOWER	120
LENGTH OF RADIALS	90' 166'
GROUND SYSTEM DIMENSIONS	24'x24'
LAT	28° 29' 51"
LONG	81° 28' 52"
TIME PERIODS	
PATTERN No.	640924

CARL E. SMITH
Consulting Radio Engineers

FIG. 3
HORIZONTAL PATTERN
American Home Stations, Inc.
Windermere, Florida

FCC File No. BP-16643
Accepted 4-7-65

Station WXIV
Windermere, Florida

1480 kc

Proposed Day
(12-29-66ct)

A. D. RING & ASSOCIATES - 10/60 - M

New; Yadk[illegible] Broadcasting Co., Inc.
Yadkinville, North Carolina

1kw,DA-D,D
1480 kc

over

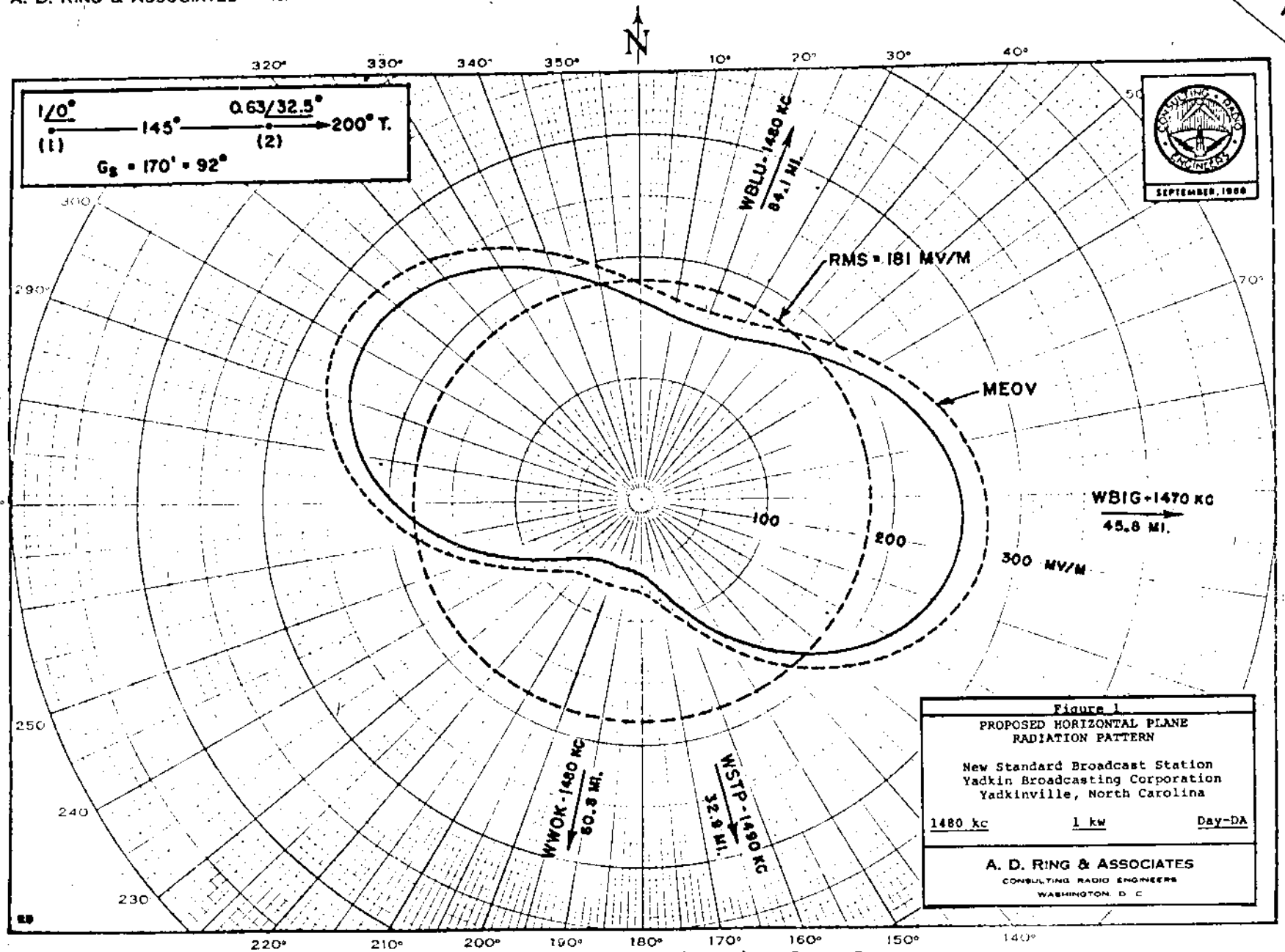


Figure 1
PROPOSED HORIZONTAL PLANE
RADIATION PATTERN

New Standard Broadcast Station
Yadkin Broadcasting Corporation
Yadkinville, North Carolina

1480 kc | 1 kw | Day-DA

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

FCC File No.BP-17452
Accepted 12-8-66

New; Yadkin Broadcasting Co., Inc.
Yadkinville, North Carolina

1480 kc

WYDK

A. D. RING &

Measured Day
(8-28-68ct)

Station WYDK
Yadkinville, North Carolina

1kw, DA-D, D
1480 kc

BL-12069 Granted (2-24-69)
license covering
station

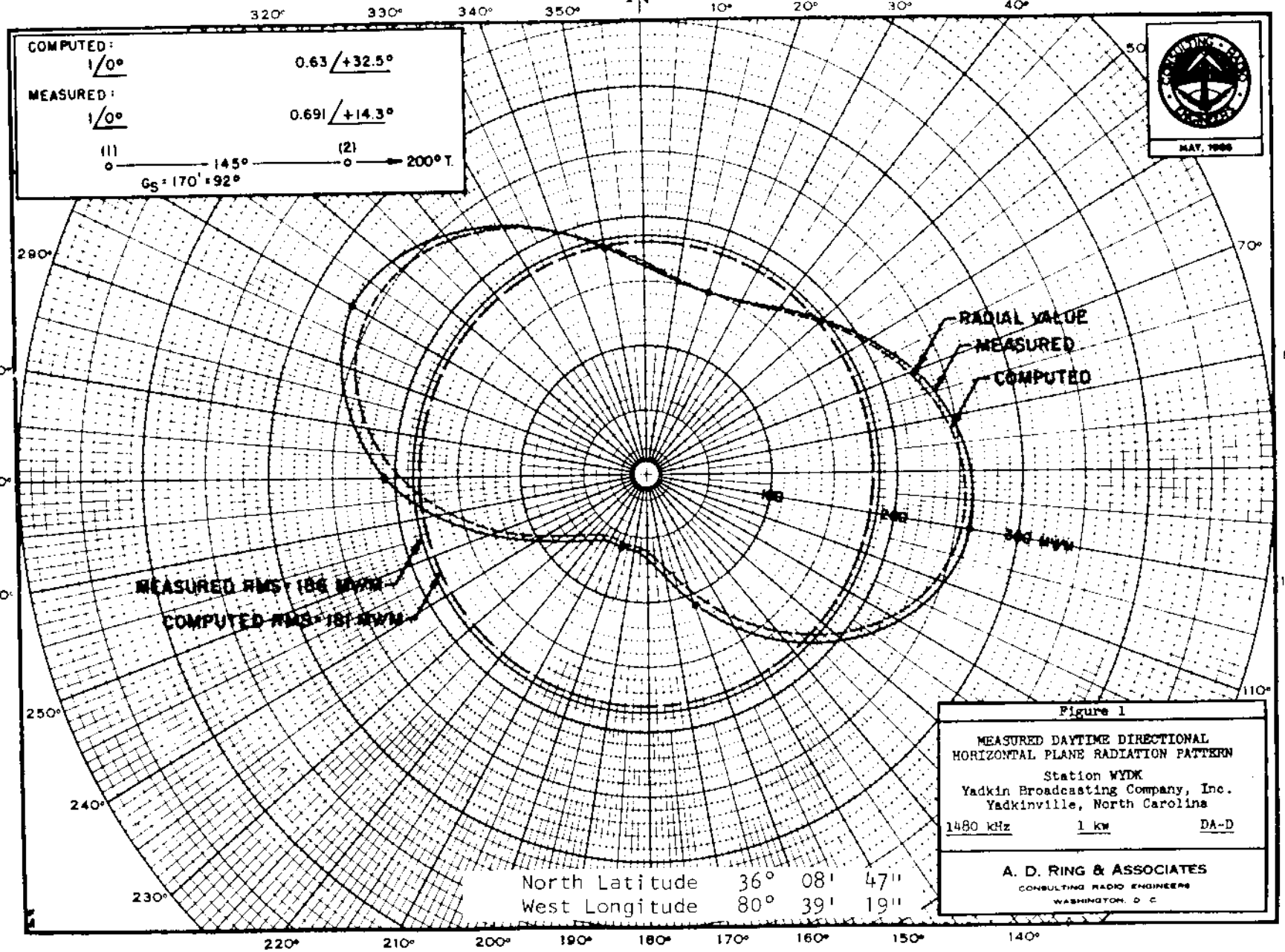


Figure 1

MEASURED DAYTIME DIRECTIONAL
HORIZONTAL PLANE RADIATION PATTERN

Station WYDK
Yadkin Broadcasting Company, Inc.
Yadkinville, North Carolina

1480 kHz 1 kw DA-D

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

WYDK 1480 KHz

WYDK

FCC File No. BL-12069
Accepted 8-21-68

Station WYDK
Yadkinville, North Carolina

1480 kc

BL-12069 Granted (2-24-69)
license covering new station.

WYDK

Measured Non-DA
(8-28-68ct)

Station WYDK
Yadkinville, North Carolina

1kw, DA-D, D
1480 kc

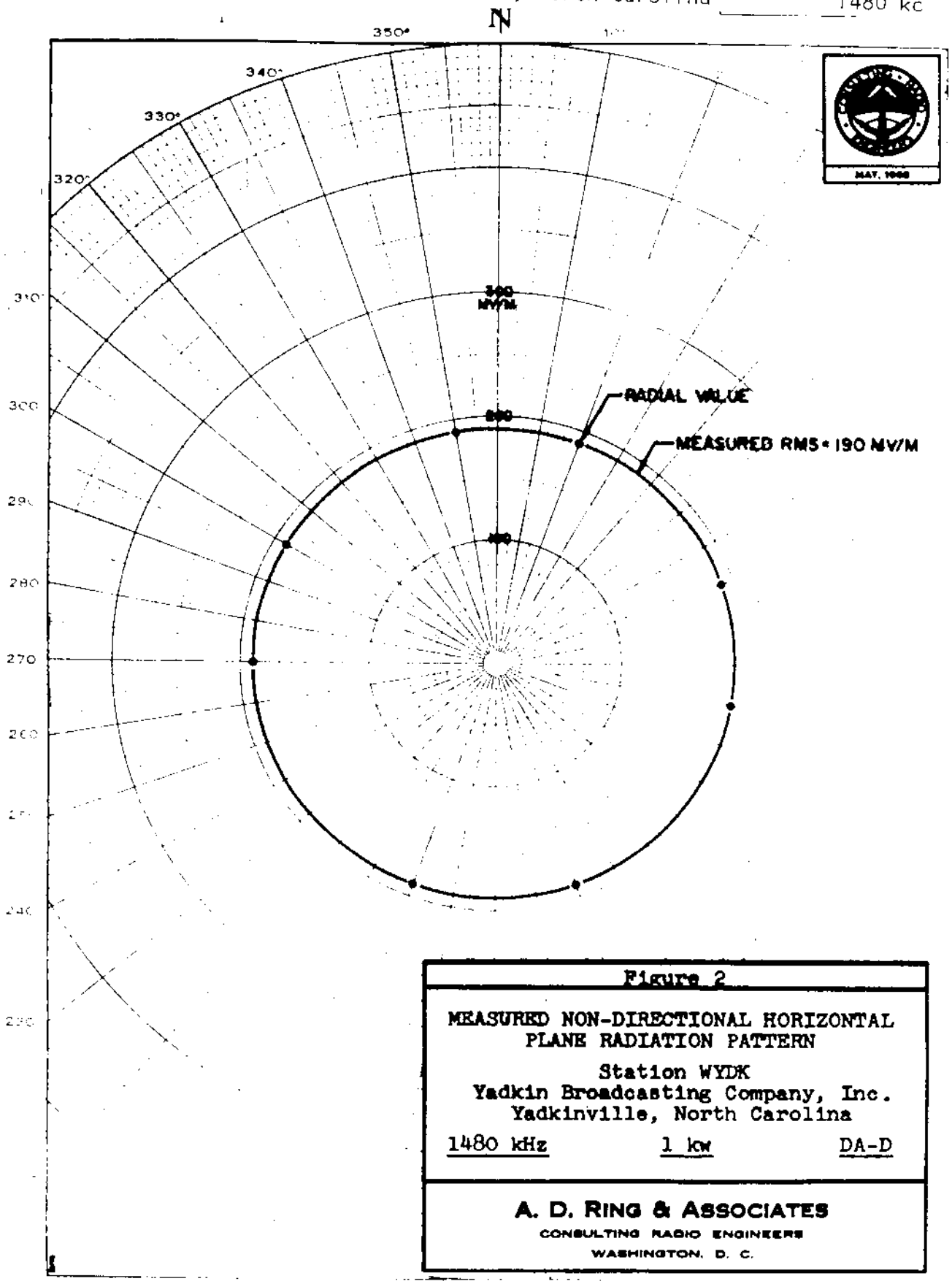


Figure 2

MEASURED NON-DIRECTIONAL HORIZONTAL PLANE RADIATION PATTERN

Station WYDK
Yadkin Broadcasting Company, Inc.
Yadkinville, North Carolina

1480 kHz **1 kw** **DA-D**

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

A. D. RING & ASSOCIATES · 4/64 · M

FCC File No.BL-12069
Accepted 8-21-68

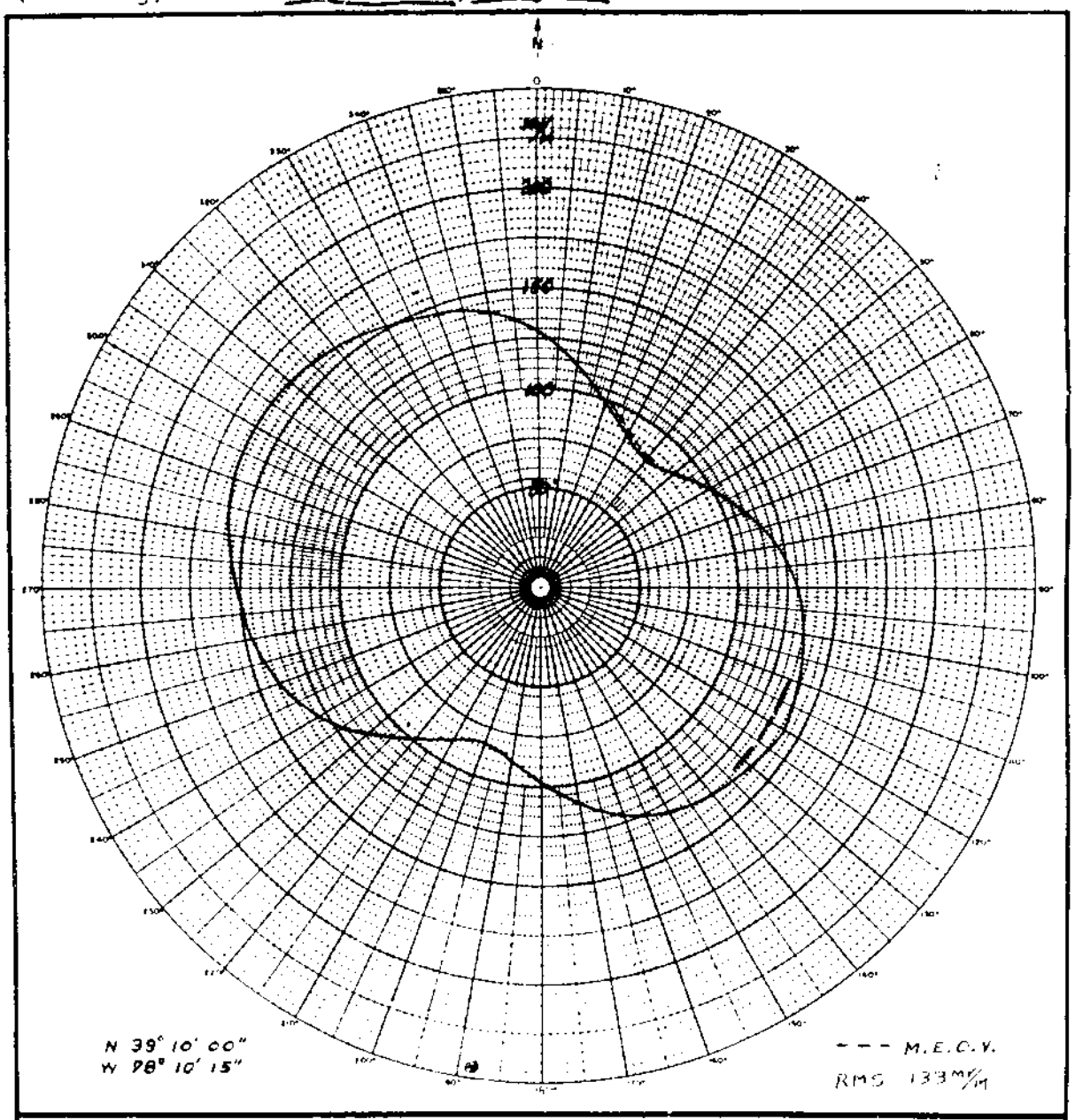
Station WYDK
Yadkinville, North Carolina

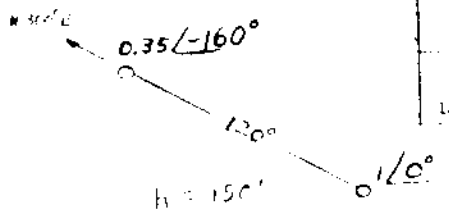
1480 kc

PROPOSED DAY
(6-14-61g)

New; Frederick County Bcstrs.
Winchester, Virginia

500w, DA-D,D
1480 KC





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

PATTERN NO
SUPERSEDES
APP

FCC File No. BP-12531
Accepted 5-19-61 (Amended)

Frederick County Broadcasters
Winchester, Virginia 1480 KC

IFRB Serial No. NEW 1490

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT

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

PART I GENERAL INFORMATION

(01) Administration: CANADA Sheet No. 420 Date 830705

Assigned frequency (kHz)		(02)	1490
Transmitting station	Name of the station	(03)	GRAVENHURST ON
	Call sign	(04)	
	Additional Identification	(05)	
	Station class	(06)	C
	Operational Status	(07)	P
Country		(08)	CAN
Geographical coordinates of the transmitting station		(09)	79W24 33 44N55 23

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

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

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

STATION PARAMETERS		DAYTIME OPERATION		NIGHT-TIME OPERATION
Station power (kW)	(21)	1.	(31)	.25
r.m.s. value of radiation for station power (mV/m at 1 km)	(25)	321.8	(35)	160.9
Antenna type	(26)	A	(36)	A
Simple vertical antenna electrical height (degrees)	(27)	114.5	(37)	114.5

(44) Remarks

COORDINATION UNDER ARTICLE 4:

COUNTRY	USA							
IN PROGRESS	X							
ACCEPTANCE OBTAINED								

IFRB Serial No. NEU 1490

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT

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

PART I GENERAL INFORMATION

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

Assigned frequency (kHz)		(02)	1490
Transmitting station	Name of the station	(03)	GRAVENHURST ON
	Call sign	(04)	
	Additional Identification	(05)	
	Station class	(06)	C
	Operational Status	(07)	?
Country		(08)	CAN
Geographical coordinates of the transmitting station		(09)	79W24'33"/44N55'23"

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

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

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

STATION PARAMETERS	DAYTIME OPERATION		NIGHT-TIME OPERATION	
Station power (kW)	(21)	1	(31)	.25
r.m.s. value of radiation for station power (mV/m at 1km)	(25)	321.8	(35)	160.9
Antenna type	(26)	A	(36)	A
Simple vertical antenna electrical height (degrees)	(27)	114.5	(37)	114.5

(44) Remarks

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

29-52

CBAM
1490

AIR SERVICES
TELECOMMUNICATIONS DIVISION
(5-10-116)

CANADA

DEPARTMENT OF TRANSPORT

DESCRIPTIVE SHEET - OMNIDIRECTIONAL ANTENNA

Station Call: CBAM

Main Studio: Edmundston, New Brunswick

Frequency: 1490 Kc/s.

Power: 0.10 Kw.

Class: IV

Time: U

Notification Reference: NARBA Annex 3

Geographical Location:

North Latitude: 47° 22' -

West Longitude: 68° 20' -

(Exact location to be determined)

Antenna Characteristics:

Height: 105 ft. 60 degrees

Expected Efficiency: 90 mv/m at 1 mi. for 0.25 Kw.

or: 180 mv/m at 1 mi. for 1 Kw.

Ground System:

120 radials each 200 feet long

Type of Element:

Vertical tower radiator. Base insulated for series feed.

December 29, 1952

DEC 18-52

CFRC
1490

AIR SERVICES
TELECOMMUNICATIONS DIVISION
(5-10-107)

CANADA

DEPARTMENT OF TRANSPORT

DESCRIPTIVE SHEET - OMNIDIRECTIONAL ANTENNA

Station Call: CFRC

Main Studio: Kingston, Ontario

Frequency: 1490 Kc/s.

Power: 0.10 Kw.

Class: IV

Time: U

Notification Reference: NARBA Annex 3

Geographical Location:

North Latitude: 44° 13' 37"

West Longitude: 76° 29' 43"

Antenna Characteristics:

(see below)

Height: ---------- ft. ---------- degrees

Expected Efficiency: 56 mv/m at 1 mi. for 0.1 Kw.

or: 177 mv/m at 1 mi. for 1 Kw.

Ground System:

Counterpoise of parallel wires 130' long.

Type of Element:

T-Antenna: single wire, flat-top, 130 feet long, 110' above ground.

December 18, 1952

CFWB

Description Sheet
(10-28-67ct)

Station CFWB
Campbell River, B. C.

250w,1kw-LS,U,Class IV
1490 kc

DESCRIPTIVE SHEET - OMNIDIRECTIONAL ANTENNA

STATION CALL: CFWB	MAIN STUDIO: CAMPBELL RIVER, B.C.
POWER: 1 KW D/0.25 KW Night	FREQUENCY: 1490 KC/S CLASS: IV
NOTIFICATION LIST NO.: 232	DATE: September 28, 1967
GEOGRAPHICAL LOCATION:	NORTH LATITUDE: 50° 01' 01" WEST LONGITUDE: 125° 15' 42"
MODE OF OPERATION:	ND (Non-directional 125° 15' 42")
ANTENNA HEIGHT ABOVE INSULATORS:	110' (60°)
GROUND SYSTEM:	120 radials are equally spaced, the north and south radials are greater than 0.33 wavelengths long (220'), all east and west radials are longer than 0.4 wavelengths (264') to provide an equivalent 0.4 wavelength ground radial system.
TYPE OF ELEMENT:	Square tower, uniform cross-section base insulated for series feed.
PREDICTED EFFECTIVE FIELD:	DAY 180 mv/m for 1 Kw

#176

CFWB

Description Sheet
(3-30-63ct)

New Station
Campbell River, B.C.

250w,U,Class IV
1490 kc

DESCRIPTION OF APPLY

STATION: New

MAIN STUDIO: Campbell River, B.C.

POWER: 250 Watts

FREQUENCY: 1490 Kc/s

CLASS: IV

TIME: U Operation

MODIFICATION REFERENCE: 176

DATE: February 26, 1963

LOCATION:

North Latitude 50° 01' 01"

West Longitude 125° 15' 42"

ANTENNA:

Mode of Operation:
ND (Non-directional) one element uniform cross section, guyed steel tower, base insulated for series feed.

HEIGHT ABOVE INSULATORS:

110' (60°)

GROUND SYSTEM:

120 equally spaced radials, the north and south radials are greater than .33 wavelength long (220'), all east & west radials are longer than .4 wavelength (264') to provide an equivalent 0.4 wavelength ground radial system.

PROJECTED EFFECTIVE FIELD:

90 MV/M at 1 mile for 250 watts

or

180 MV/M at 1 mile for 1 Kw.

#199

CHYM

ANTENNA DESCRIPTION SHEET

DIRECTIONAL DA-2

STATION CALL	C H Y M
MAIN STUDIO	Kitchener, Ontario
FREQUENCY	1490 kc/s
POWER	Day 10 kw - 5 kw Night
CLASS	IV
TIME	Unlimited
NOTIFICATION REFERENCE	199..... DATE: May 10, 1965
GEOGRAPHICAL LOCATION	Lat 43°23'06", Lon 80°30'00"
ARRAY CHARACTERISTICS	Four elements, guyed, uniform cross section, base insulated, series feed. Height 165 feet or 90 degrees. No top loading.

ELEMENT	ONE	TWO	THREE	FOUR
BEARING	REF	00°	00°	00°
SPACING	REF	80° 146.8'	160° 293.6'	240° 440.4'
Day ratio	1000	1501	1147	246
Day phase	00°	-118.2°	117.6°	-30°
Night ratio	1000	1911	1632	567
Night phase	00°	-157.8°	44.3°	-113°

Ground System: 120 radials per tower, #10 AWG bare, soft copper wire, spaced uniformly, depth 8 inches approximately. Radials bonded on a line between towers and bonded to soft copper strap at tower base. Maximum radial length 264 feet.

Day R M S: 600 mv/m at 1 mile for 10 kw
190 mv/m at 1 mile for 1 kw

Night RMS: 393 mv/m at 1 mile for 5 kw
176 mv/m at 1 mile for 1 kw

Mar 1965

5

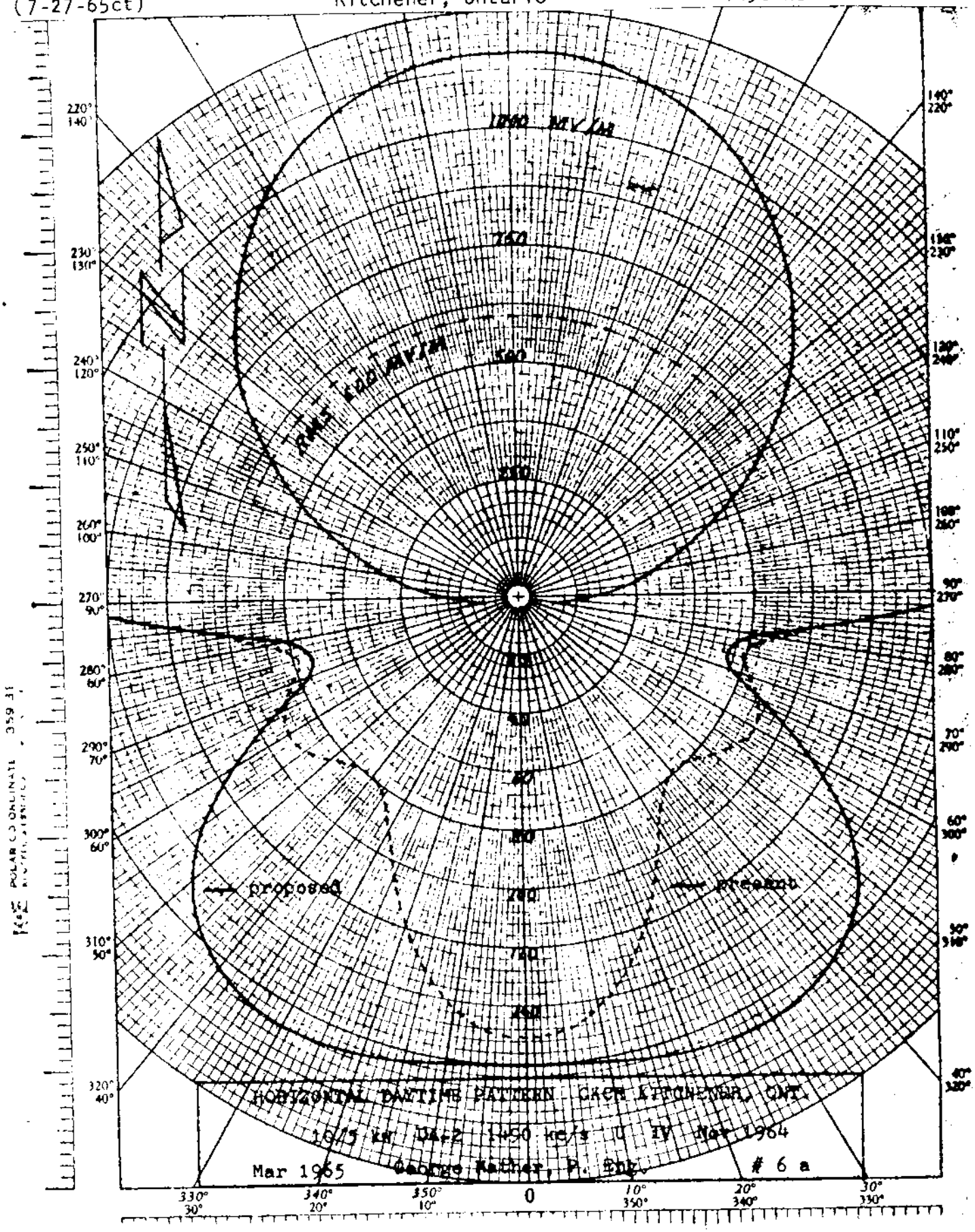
#199

CHYM

Proposed Day
(7-27-65ct)

Station CHYM
Kitchener, Ontario

5kw,10kw-LS,DA-2,U, Class IV
1490 kc



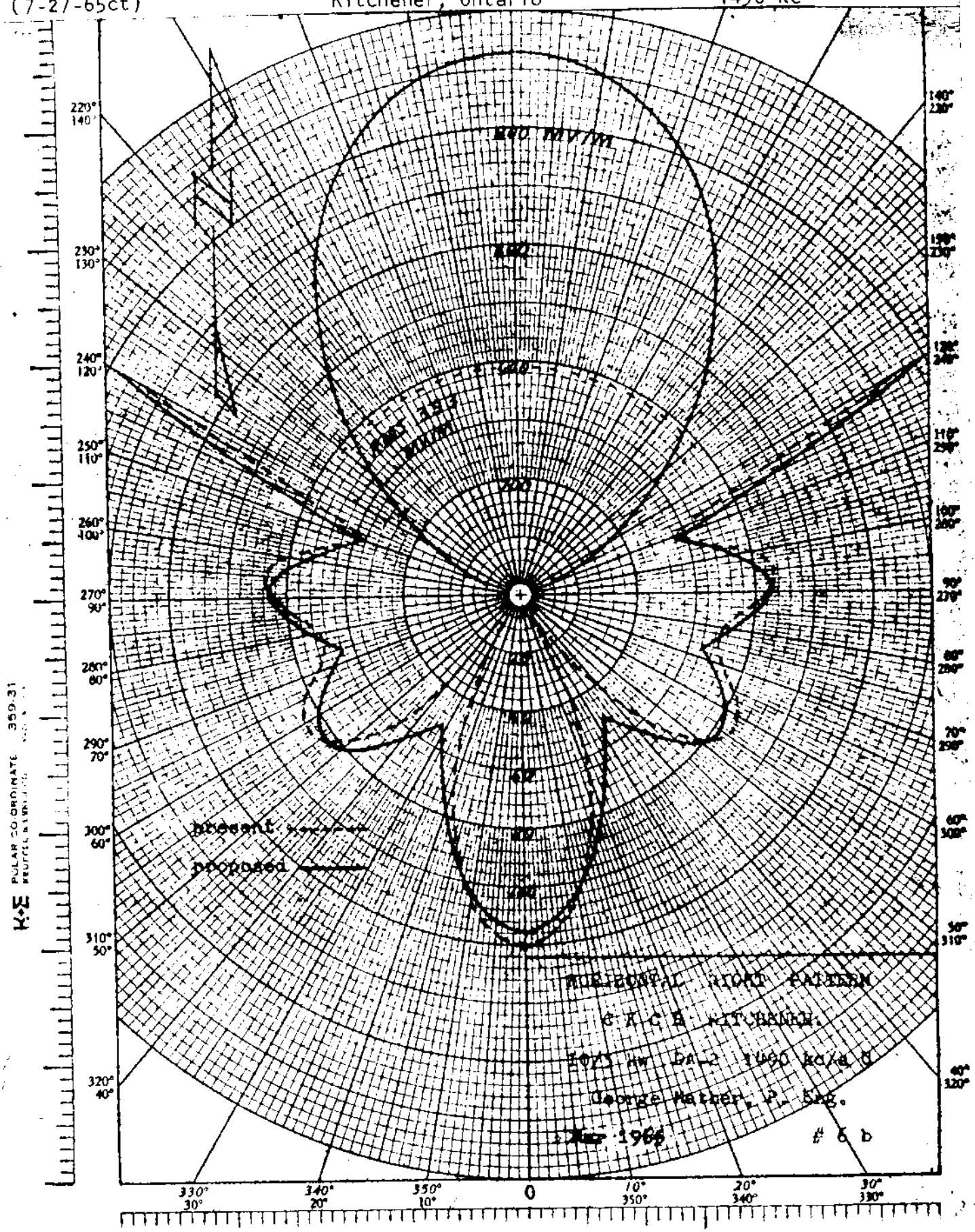
#199

CHYM

Proposed Night
(7-27-65ct)

Station CHYM
Kitchener, Ontario

5kw,10kw-LS,DA-2,U, Class IV
1490 kc



150

HYM

DESCRIPTION SHEET
(8-22-61ct)

Station CKCR
Kitchener, Ontario, Canada

5kw, 10kw-LS, DA-2, U,
1490 KC

REVISED

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CKCR

Main Studio: Kitchener, Ont.

Frequency: 1490 kc.

Power: 10 kw Day/ 5 kw Night.

Notification List No. 300

Date: August 31, 1960

Location: North Lat. 43° 23' 06"
West Long. 80° 30' 00"

Antenna: Mode of Operation DA-2

4 guyed elements, uniform cross-section
base insulated, series fed.

Tower	#1 (South)	#2	#3	#4 (North)
Height above Insulators:	165'	165'	165'	165'
Overall height:	169'	169'	169'	169'
Spacing:	146 2/3'	80°	80°	
Phasing day:	+139°	-6.0°	-139°	not used
Phasing night:	0°	-157.1°	+42.9°	-119.0°
Field ratio day:	1.0	1.89	1.0	
Field Ratio night	1.0	2.0	1.80	0.64

Ground System

120 radials per tower #10 AWG, bare soft-drawn copper wire, uniformly spaced, depth [illegible]" approximately, 264' long (.4 λ), except for shortened radials between towers (bonded at intersections).

Guaranteed Effective Field

[illegible] 393 mv/m (170 [illegible] w at one mile)

[illegible] 601 mv/m (190 [illegible] w at one mile)

Orientation of Towers

Towers are on a line bearing [illegible]° of True North.

NOTE: This supersedes the data previously supplied for this assignment.

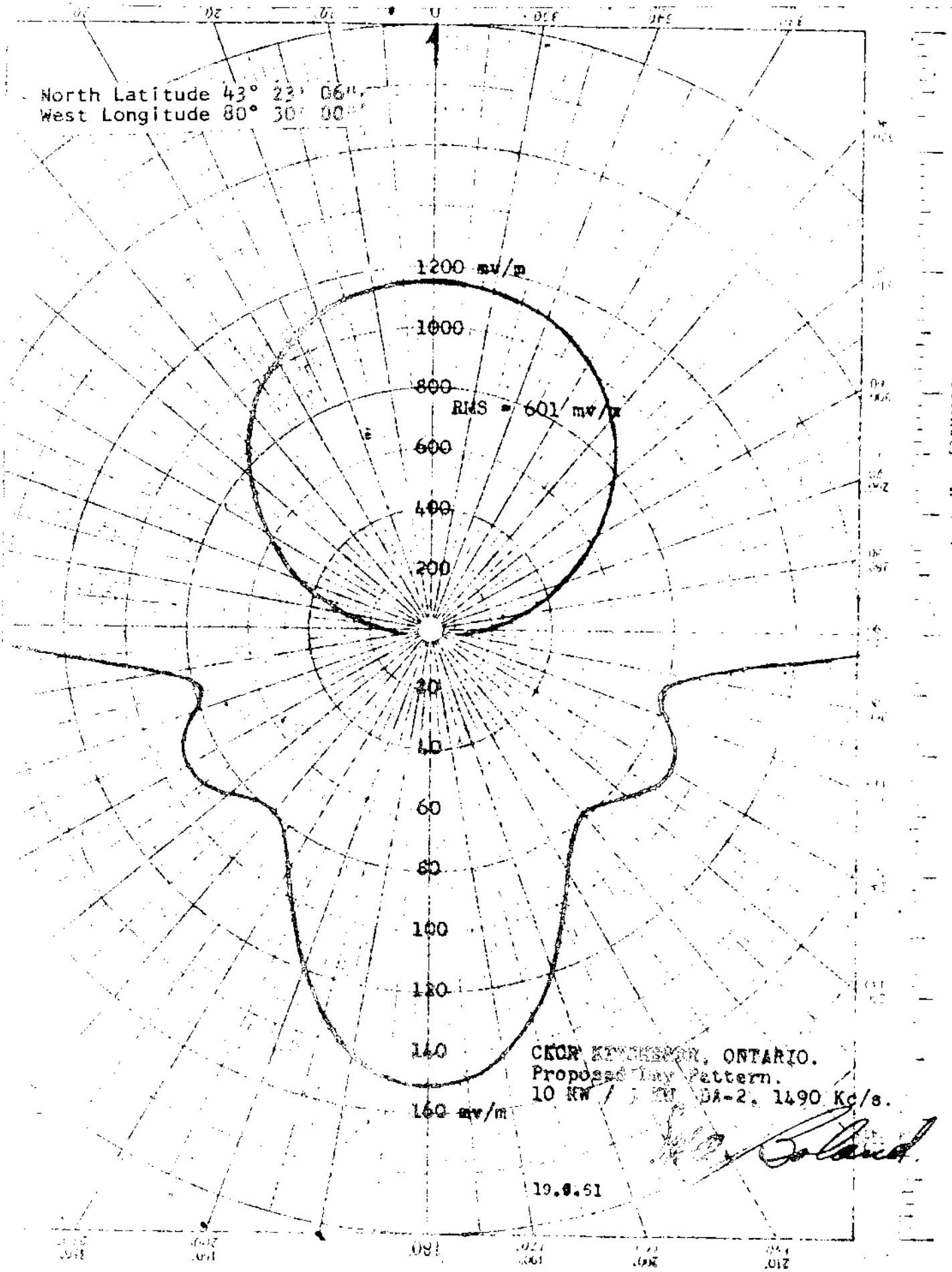
19.9.61

#150

PROPOSED DAY
(8-22-61ct)

Station CKCR
Kitchener, Ontario, Canada

5kw, 10kw-LS, DA-2, U
1490 KC

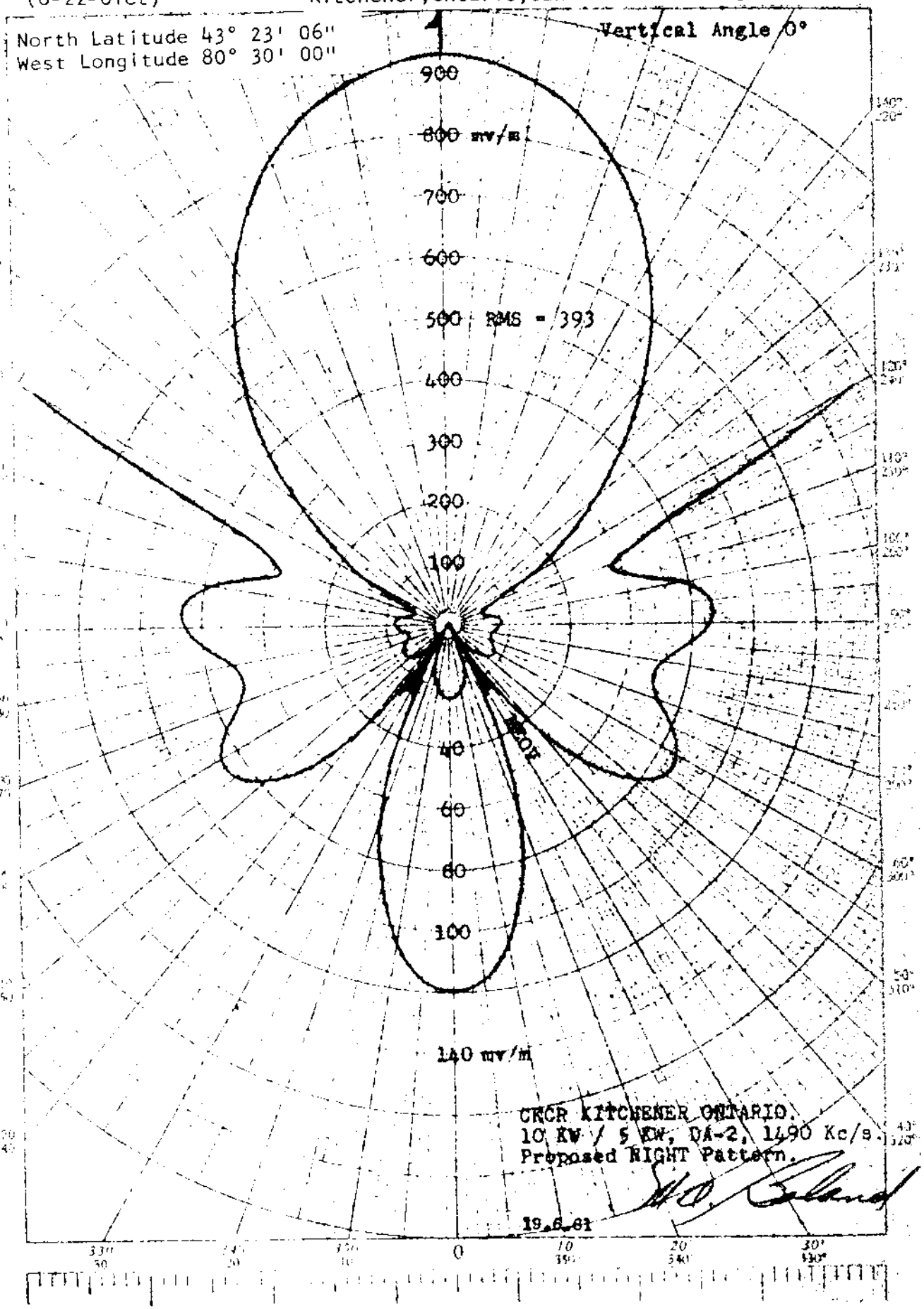


#150

PROPOSED NIGHT
(8-22-61ct)

Station CKCR
Kitchener, Ontario, Canada

5kw, 10kw-LS, DA-2, U
1490 KC



#166

Description Sheet
(2-28-62ct)

New Station
Wilmot Station, Nova Scotia

250w,1kw,U,Class IV
1490 kc

DESCRIPTION SHEET - OMNIDIRECTIONAL ANTENNA

STATION CALL: NEW

MAIN STUDIO: Wilmot Station, N.S.

FREQUENCY: 1490 Kc/s

POWER: 1 Kw day/250 w night

CLASS: IV

TIME: U

Notification List No.: 166 Date: January 5, 1962

GEOGRAPHICAL LOCATION OF THE ANTENNA:

North Latitude: 44° 58' 36"

West Longitude: 65° 0[illegible]' 32"

ANTENNA CHARACTERISTICS:

Height: 110' (60°)

Type of Element: Square uniform cross section, guyed, insulated from ground, series fed, no top loading.

Ground System: 120 radials of No. 10 B & S bare copper wire, equally spaced around the tower, extending 265' (approx. 0.4 of a wave-length) and buried at a depth of approx. 8 inches.

Expected Efficiency: 181 mv/m at 1 mile per Kw. radiated

90.5 mv/m at 1 mile for 250 w. radiated

#79 [illegible]

CKBM
1490

AIR SERVICES
TELECOMMUNICATIONS DIVISION

5-10-283

CANADA

REFER TO FILE NUMBER

DEPARTMENT OF TRANSPORT

DESCRIPTIVE SHEET - OMNIDIRECTIONAL ANTENNA

Station Call: ~~NEW~~ CKBM

Main Studio: Montmagny, Quebec

Frequency: 1490 KC.

Power: 250 W.

Class: IV

Time:

Notification Reference: #79 Dated: October 28, 1953

Geographical Location:

North Latitude: 47° 00' 09"

West Longitude: 70° 31' 01"

Antenna Characteristics:

Height: 110 Ft. 60 degrees

Expected Efficiency: mv/m at 1 mi. for KW
or: 180 mv/m at 1 mi. for 1 KW

Ground System:

120 radials, spaced 3°, each 165' long.

Type of Elements:

One, uniform cross-section vertical radiator, guyed, series fed, no top loading.

CKBM

Description Sheet
(9-26-68ct)

Station CKBM
Montmagny, Quebec

250w,1kw-LS,U,Class IV
1490 kc

Page 1

C O R R E C T E D

ANTENNA DESCRIPTION SHEET

STATION CALL: CKBM

MAIN STUDIO: MONTMAGNY, QUEBEC

FREQUENCY: 1490 kHz

POWER: .25N/1D kW

CLASS: IV

MODE: ND-U

TIME: UNLIMITED

NOTIFICATION LIST NO.: .167..... DATE: January 19, 1962

GEOGRAPHICAL LOCATION: Latitude: 46° 59' 55" North
Longitude: 70° 31' 01" West

ANTENNA CHARACTERISTICS -

PHYSICAL HEIGHT: 230'(125.5°)

TYPE OF ELEMENT: Steel tower of uniform square cross section; guyed, base insulated and series fed. Loaded by an umbrella consisting of the top 30' of the upper guy wires, a horizontal skirt and intermediate radial wires to provide an electrical height of approximately 163°.

GROUND SYSTEM: 120 equally spaced radials of #10 AWG bare copper wire, extending 165' (0.25λ) and buried 6"-8".

PREDICTED EFFICIENCY: 112.5 mV/m at 1 mile for .25 kW night
225 mV/m at 1 mile for 1 kW day

Note:

This concerns a reduction in tower height only.

CKEN

Description Sheet
(9-26-68ct)

Station CKEN 500w,1kw-LS,DA-1,U,Class IV
Kentville, Nova Scotia 1490 kc

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

Station : CKEN Main Studio : Kentville, N.S.

Frequency : 1490 KHz Power : 1-D/0.5-N Class: IV

Notification List No.: 244 Date: AUGUST 23, 1968

GEOGRAPHICAL LOCATION : 45° 06' 40" N. Lat.
OF THE ANTENNA SYSTEM 64° 29' 35" W. Long.

ANTENNA CHARACTERISTICS :

Mode of Operation : DA-1, full time

No. of Elements : 2 (Two)

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

Tower No.	:	1 (SE)	2 (NW)
Height above insulator	:	121.5' (66.3°)	121.5'
Spacing	:	121.5' (66.3°)	
Field Ratio	:	1	1.45
Phasing	:	0°	+ 147°

Orientation : 337° East of True North.

Ground System : 120 equiangularly spaced radials per tower, No. 10 AWG soft-drawn copper wire, buried 8" approx., covering an area equivalent to a 0.4 wavelength radial system.

PREDICTED EFFECTIVE FIELD :

175 mV/m at one mile for 1 Kw radiated
124 mV/m at one mile for 0.5 Kw radiated.

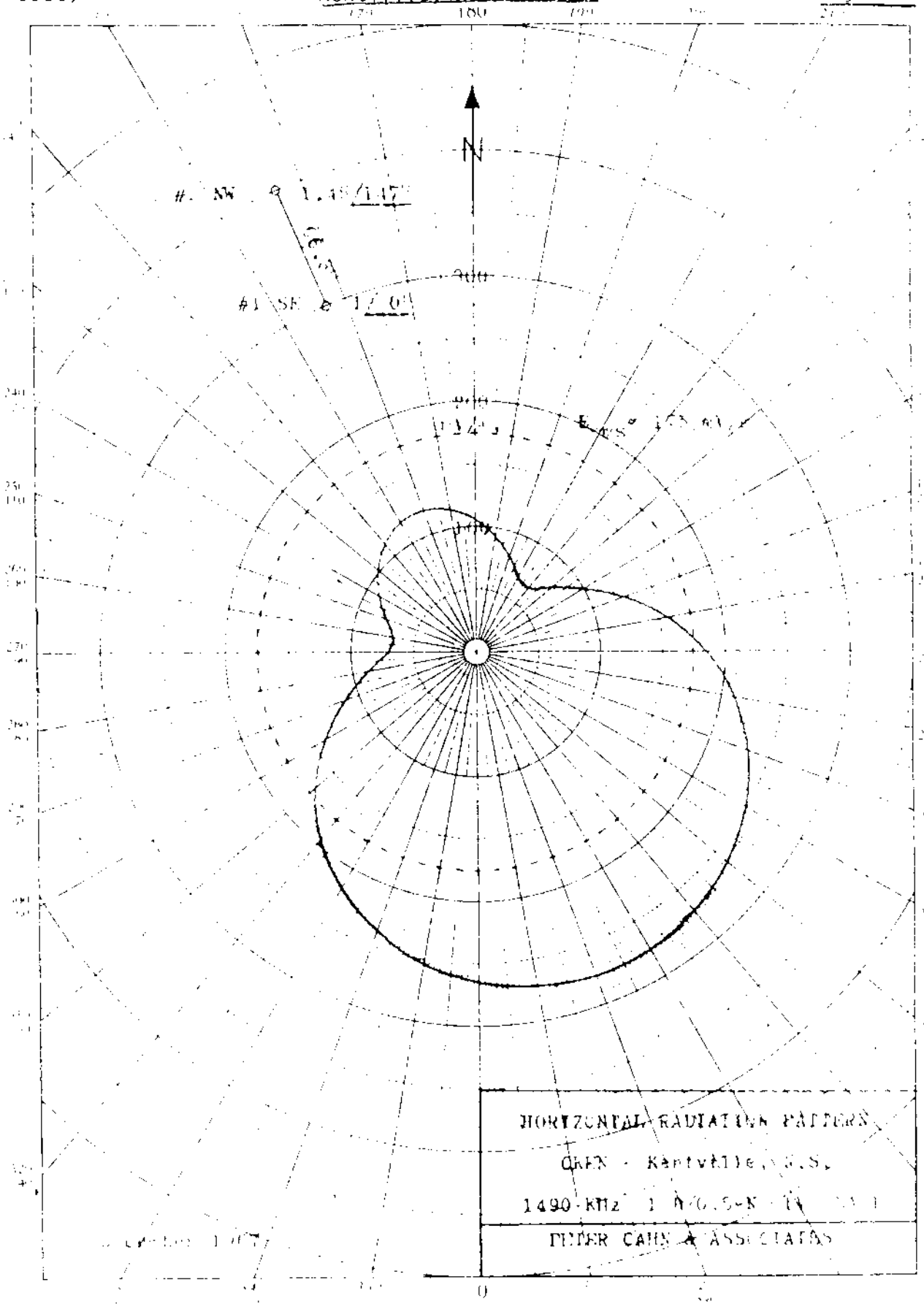
PETER CAHN & ASSOCIATES

CKEN

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

Station CKEN
Kentville, Nova Scotia

500w,1kw-LS,DA-1,U,Class IV
1490 kc

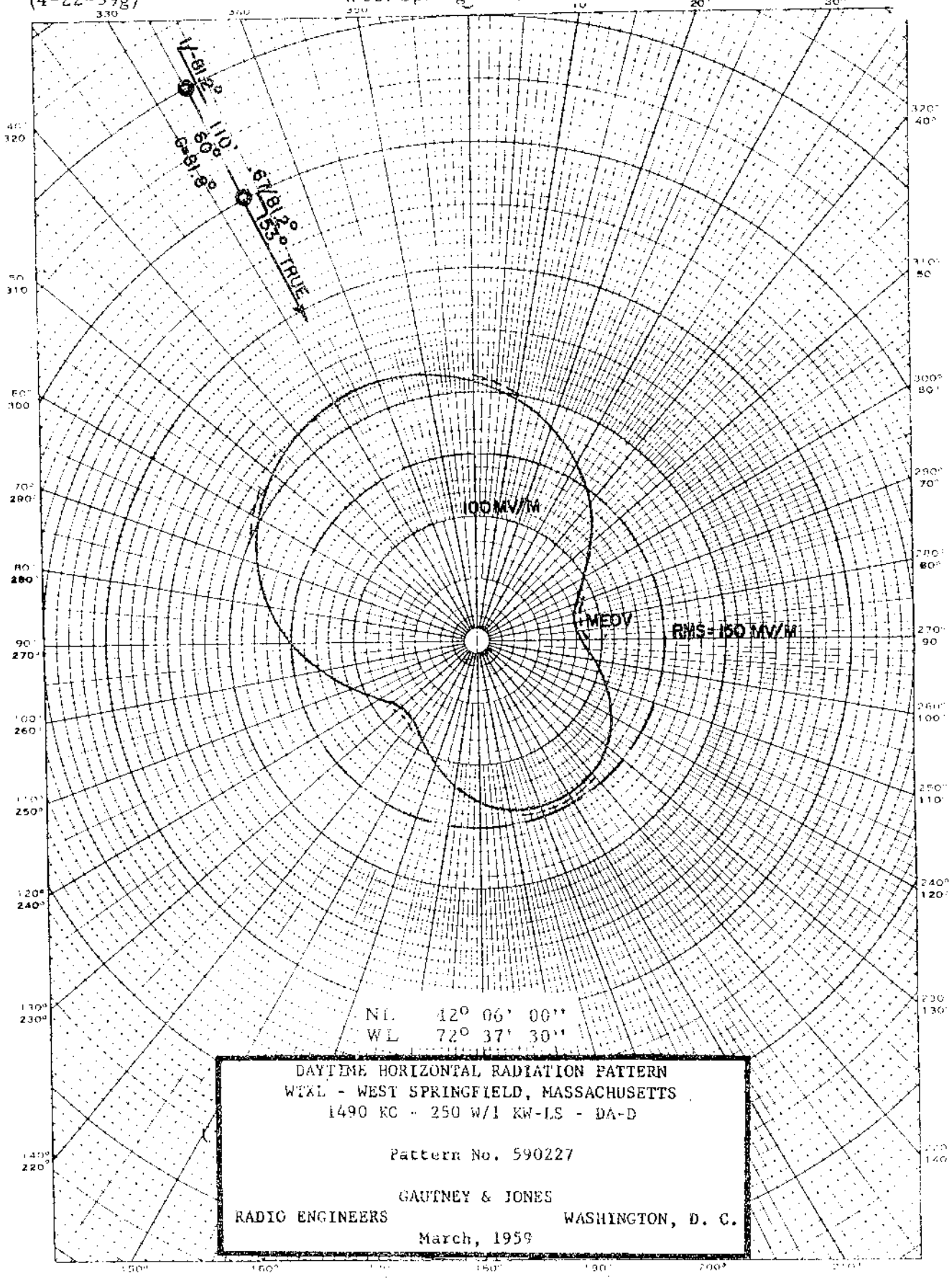


WNUS

PROPOSED DAY
(4-22-59g)

Station WTXL
West Springfield, Massachusetts

250w, 1kw-LS, DA-D,D
1490 KC



FCC File No. BP-12632
Accepted 3-20-59 (Amended)

WTXL
West Springfield, Massachusetts 1490 KC

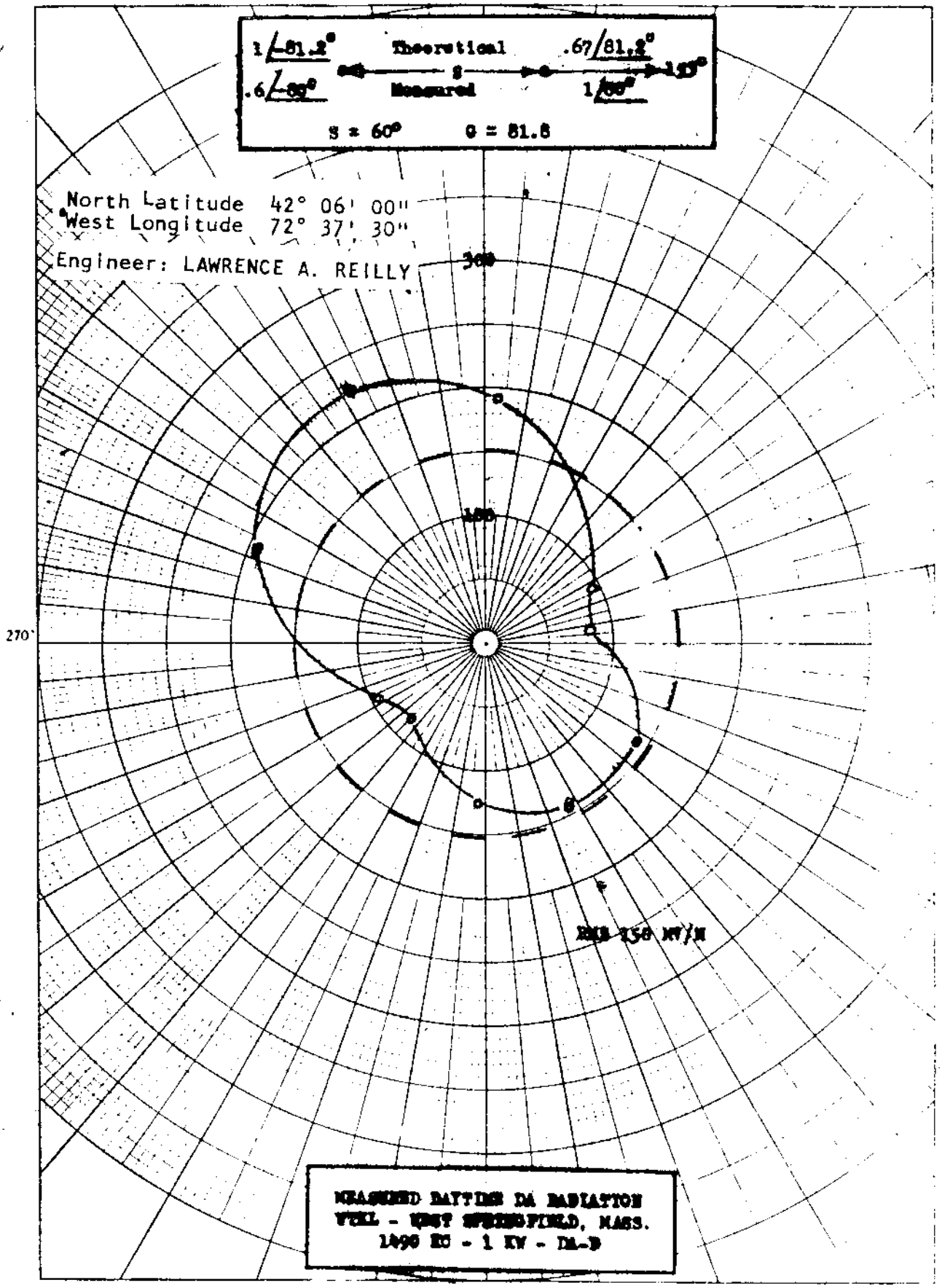
Granted 4 w. increase in power to 1 KW and installed DA-D
5-11-60

WNUS

MEASURED DAY
(7-26-61ct)

Station WTXL 1kw, DA-D,D
West Springfield, Massachusetts 1490 KC

1-20-61 granted for A-D



FCC File No. BL-8342
Accepted 6-16-61

WTXL
West Springfield, Massachusetts 1490 KC

WNUS

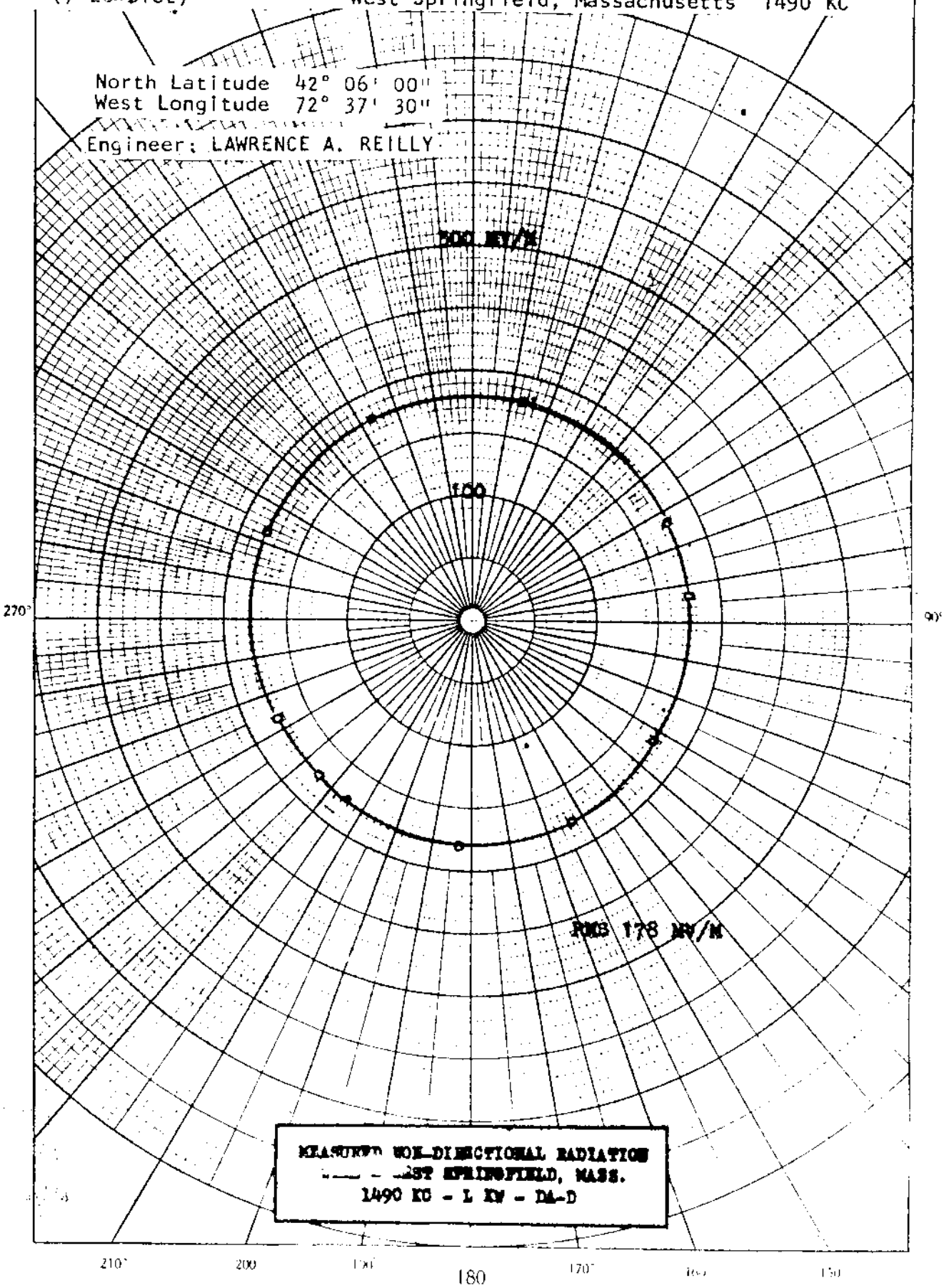
MEASURED NON-DA
(7-26-61ct)

Station WTXL
West Springfield, Massachusetts

1kw, DA-D,D
1490 KC

North Latitude 42° 06' 00"
West Longitude 72° 37' 30"

Engineer: LAWRENCE A. REILLY



FCC File No. BL-8342
Accepted 6-16-61

WTXL
West Springfield, Massachusetts 1490 KC

WOHI

PROPOSED DAY
(2-2-59g)

Station WOHI
East Liverpool, Ohio

250w, 500w-LS, DA-D,U
1490 KC

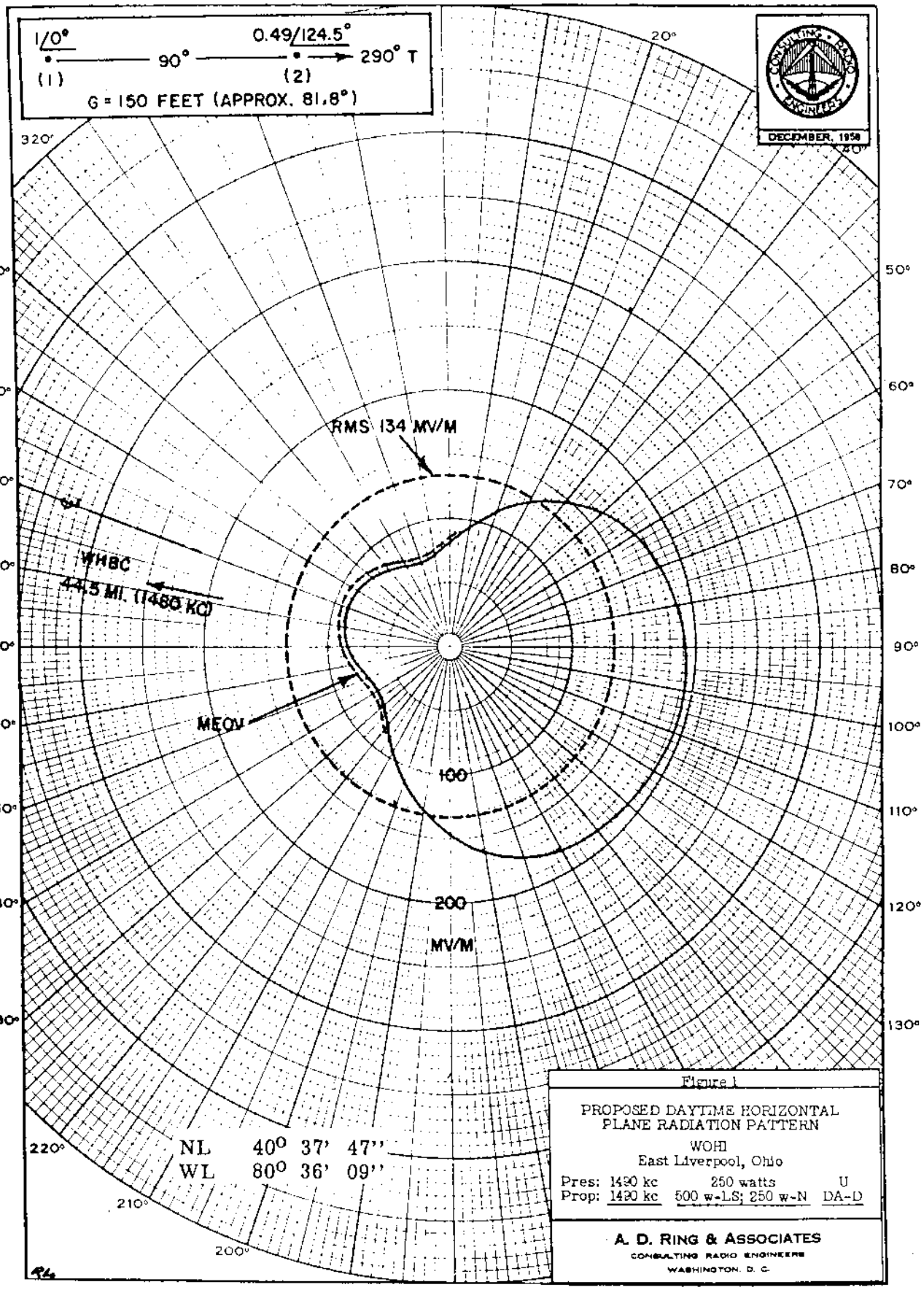


Figure 1

PROPOSED DAYTIME HORIZONTAL PLANE RADIATION PATTERN

WOHI
East Liverpool, Ohio

Pres:	1490 kc	250 watts	U
Prop:	1490 kc	500 w-LS; 250 w-N	DA-D

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

A. D. RING & ASSOCIATES - 1/54 - M

FCC File No. BP-12678
Accepted 1-13-59

WOHI
East Liverpool, Ohio

1490 KC

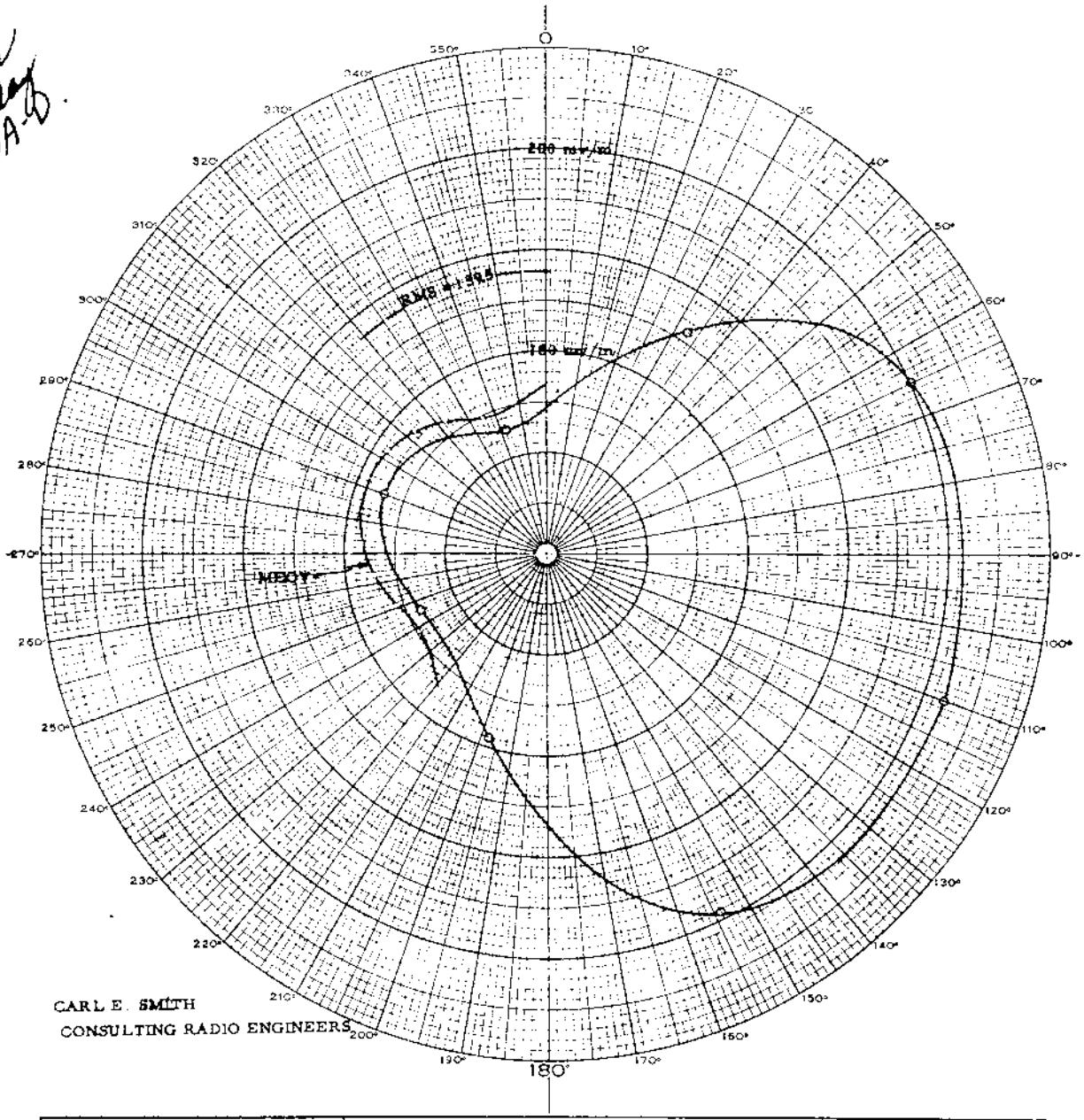
WOHI

Measured Day
(9-27-62ct)

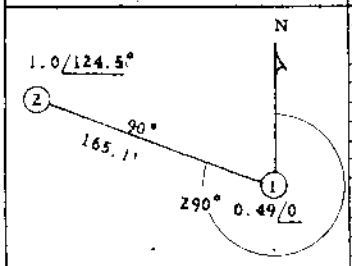
Station WOHI
East Liverpool, Ohio

250w,500w-LS,DA-D,U
1490 kc

12/28/62 granted L for decrease in day power and DA-D.



CARL E. SMITH
CONSULTING RADIO ENGINEERS

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA
	TOWER No.	ELECTRICAL HEIGHT	TRUE TOWER ORIENTATION	SPACING	PHASING	HORIZONTAL FIELD	FIELD RATIO	ELEV. ANGLE	ELEVATION RMS FIELD	CALL WOHI
		G°	θ°	S°	V°	E	F	θ°	E_θ	FREQUENCY 1490 kc
	1	81.8	0	0	0	66	.49	0	139.5	POWER 250 w N/500w D**
	2	81.8	290°	90°	124.5°	135	1.0	10		TIME OF OPERATION U DA-D
	3							20		TYPE OF OPERATION Class IV
	4							30		DAYTIME TOWERS 2
	5							40		NIGHTTIME TOWERS 1
	6							50		No RADIALS PER TOWER 120
	7							60		LENGTH OF RADIALS 190' 200'
	8							70		GROUND SCREEN DIMENSION 24' x 24'
	9							80		LAT. 40° 37' 47"
	10									LONG 80° 36' 09"
								E_θ	mv/m	SUPERSEDES
								P_k	kw	PATTERN No 62.06.11

DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐

CONSTRANDER CORP.
EAST LIVERPOOL, OHIO

FIG. 6.10

MEASURED HORIZONTAL PATTERN

FCC File No.BL-9531
Accepted 8-29-62

Station WOHI
East Liverpool, Ohio

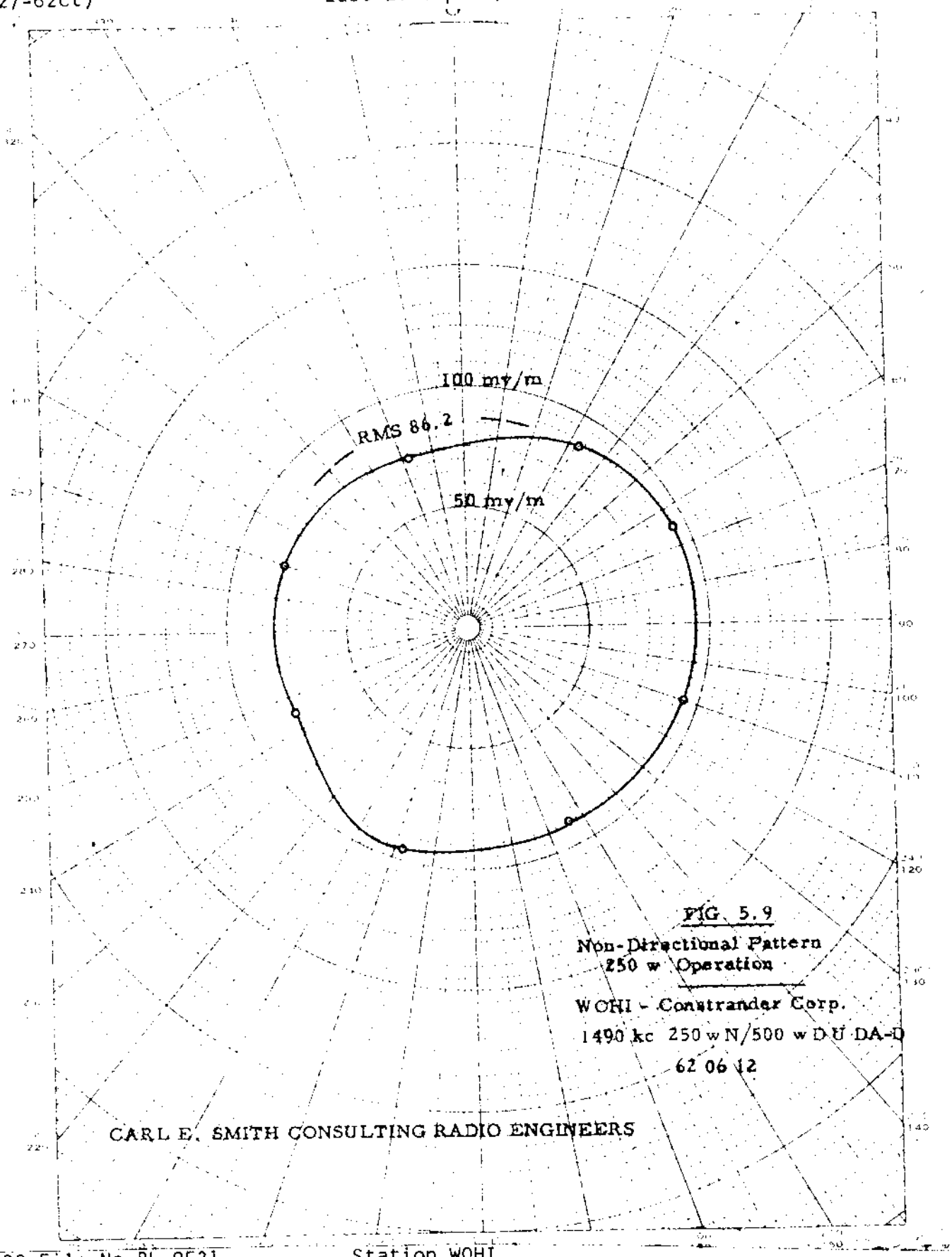
1490 kc

WOHI

Measured Non-DA
(9-27-62ct)

Station WOHI
East Liverpool, Ohio

250w,500w-LS,DA-D,U
1490 kc



FCC File No. BL-9531
Accepted 8-29-62

Station WOHI
East Liverpool, Ohio

1490 kc

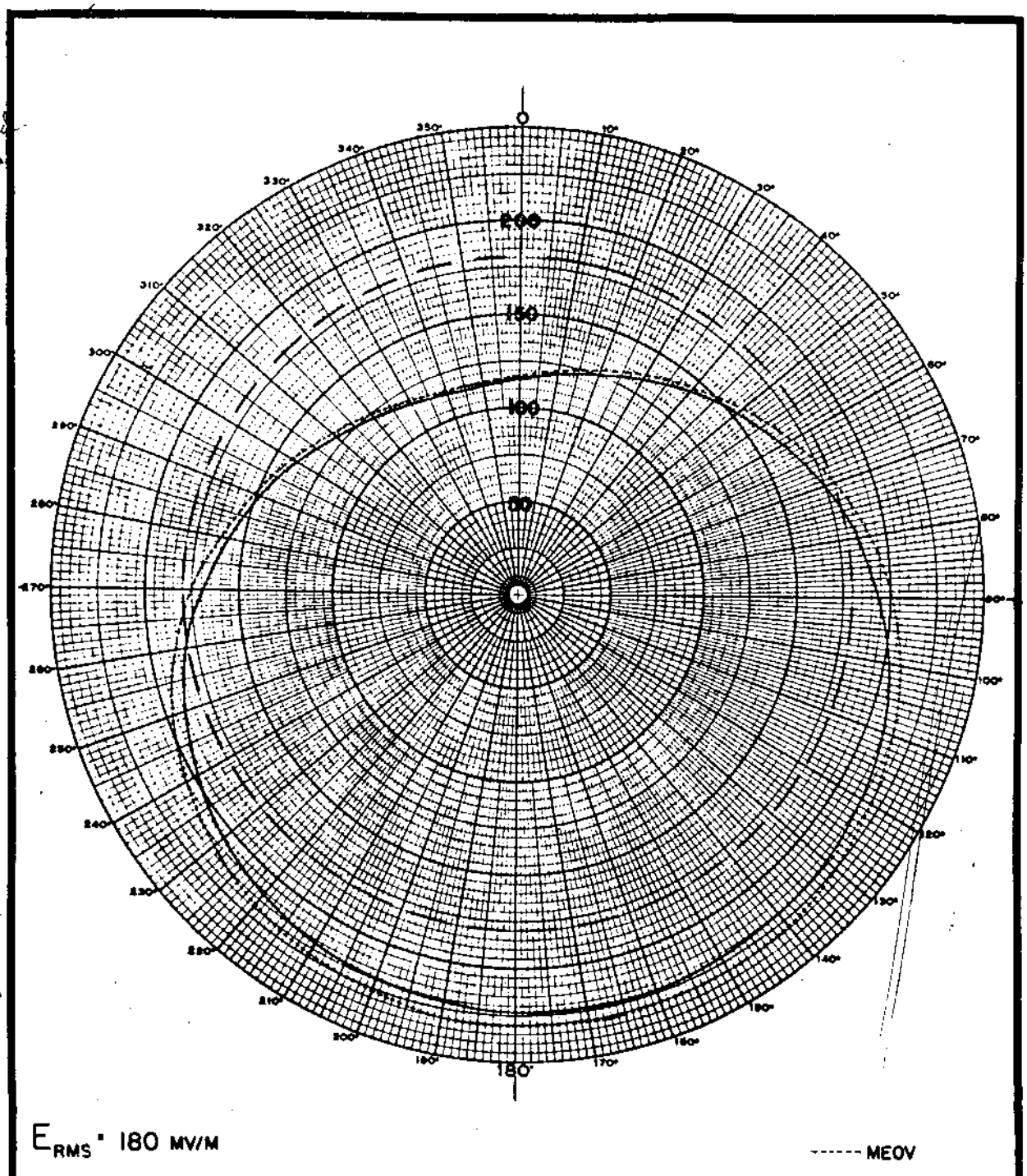
WOLF

Proposed Day
(4-30-63ct)

Station WOLF
Syracuse, New York

250w,1kw-LS,DA-D,U
1490 kc

8-9-63
Directed not
to CP to make
change in
DA system.



LATITUDE: 43° 03' 30"
LONGITUDE: 76° 10' 01"

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

ANTENNA PARAMETERS

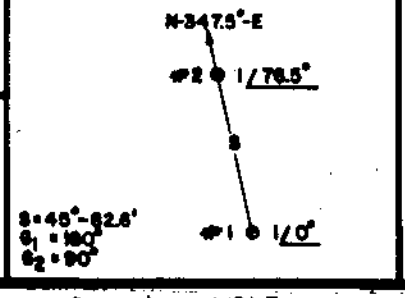


FIGURE 3

AMENDED DAYTIME DIRECTIONAL
HORIZONTAL POLAR PATTERN

RADIO STATION
WOLF
SYRACUSE, NEW YORK

1490 KC 0.25/1 KW-LS, DA-D, U

FCC File No.BMP-10833
Accepted 3-26-63

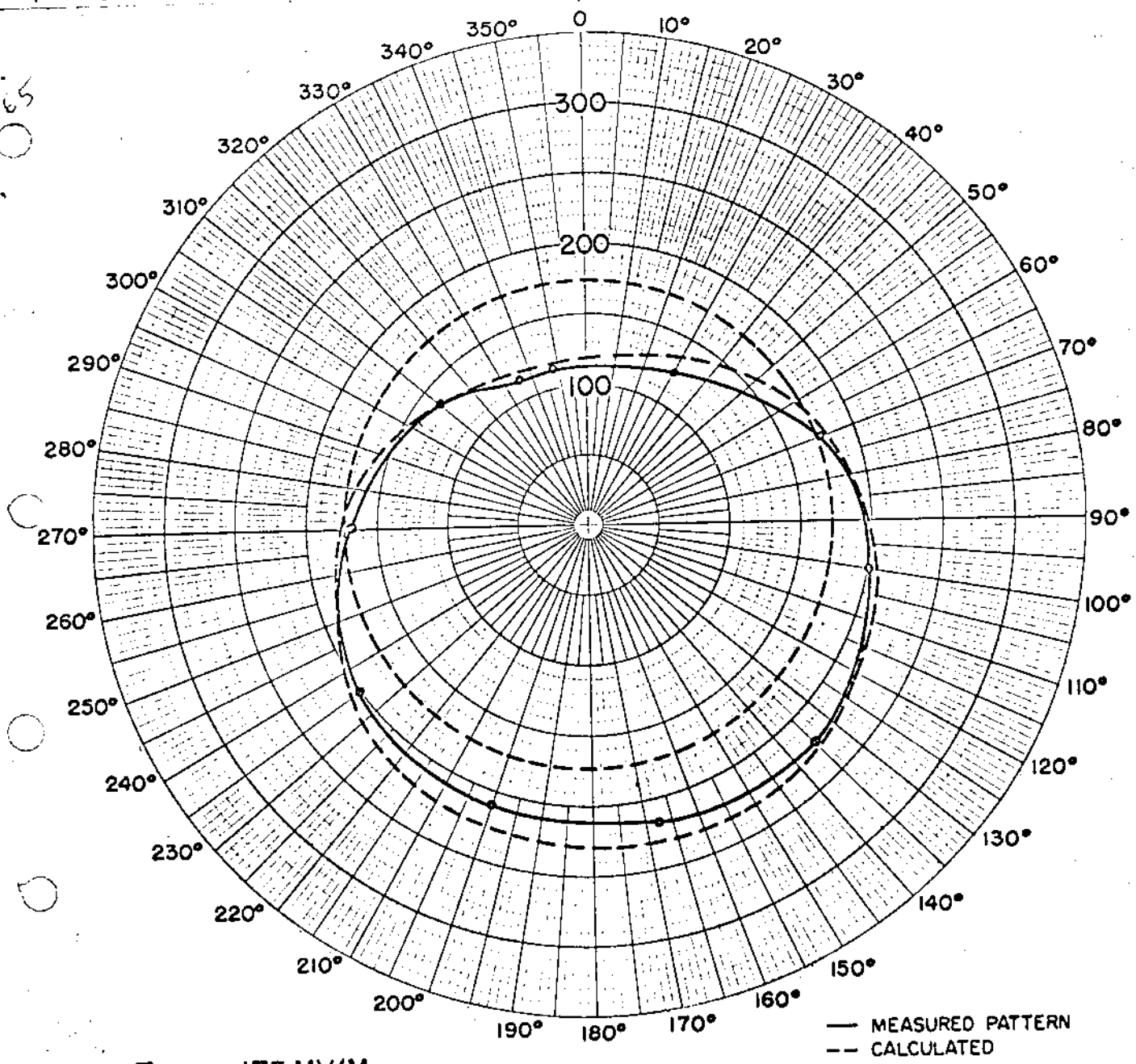
Station WOLF
Syracuse, New York

1490 kc

Measured Day
(11-29-65ct)

Station WOLF
Syracuse, New York

WOLF
250w,1kw-LS,DA-D,U
1490 kc



E_{RMS} = 173 MV/M

LATITUDE: 43° 03' 30" LONGITUDE: 76° 10' 01"	ANTENNA PARAMETERS N 347.5° E #2 ∘ 1∠76.5° S S = 45°-82.6' G_1 = 180° G_2 = 90° #1 ∘ 1∠0°	FIGURE 18 MEASURED DAYTIME HORIZONTAL POLAR PATTERN
VY BROADCASTING CO., INC. ENGINEERING DEPARTMENT ITHACA, N.Y.		RADIO STATION WOLF SYRACUSE, NEW YORK 1490 KC 0.25/1 KW-LS,DA-D,U

FCC File No. BL-11020
Accepted 8-31-65

Station WOLF
Syracuse, New York

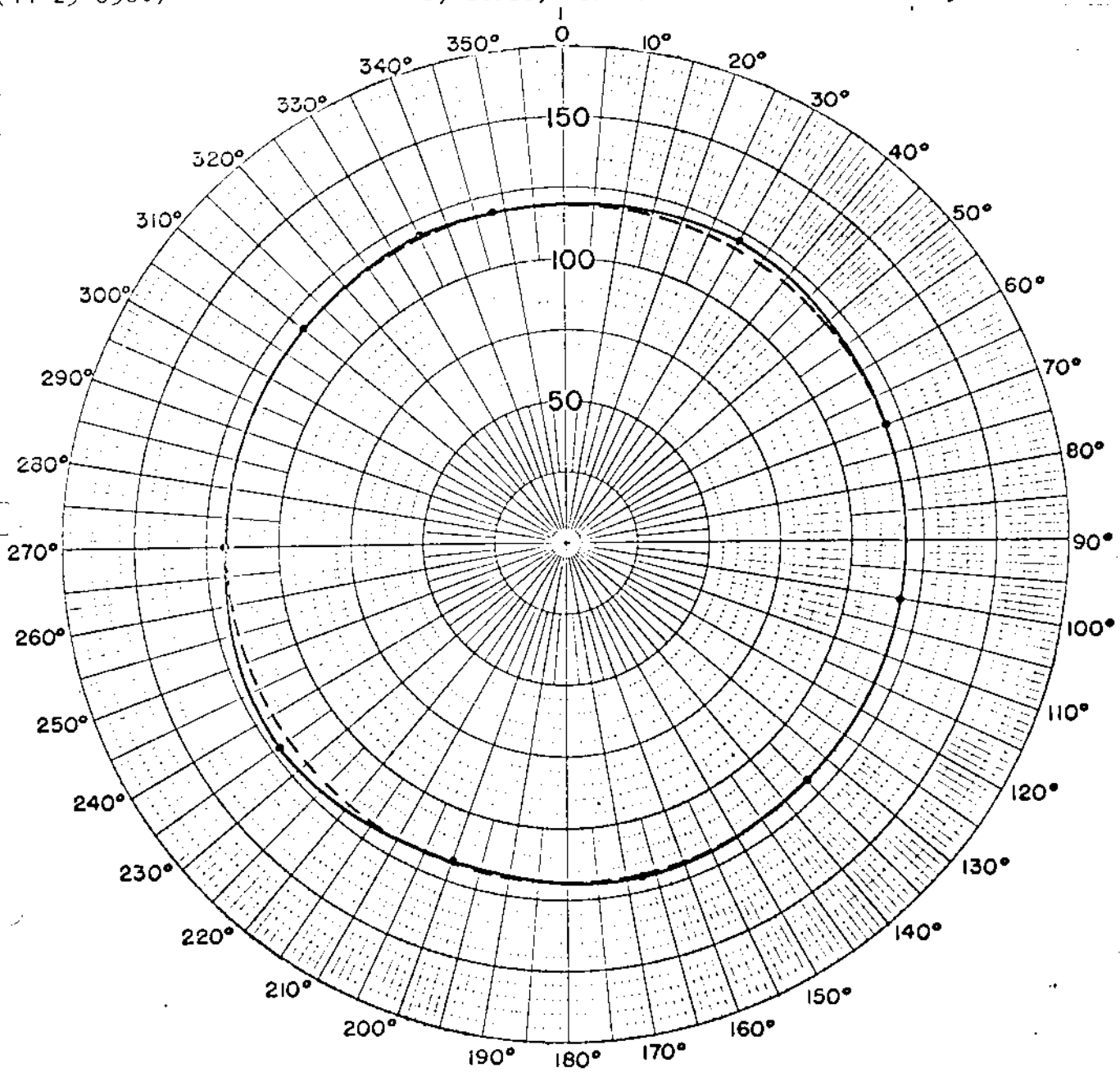
1490 kc

WOLF

Measured Non-DA
(11-29-65ct)

Station WOLF
Syracuse, New York

250w,1kw-LS,DA-D,U
1490 kc



E_{RMS} = 119 MV/M

LATITUDE: 43° 03' 30" LONGITUDE: 76° 10' 01"	ANTENNA PARAMETERS	FIGURE 16 MEASURED NON-DA HORIZONTAL POLAR PATTERN
VY BROADCASTING CO., INC. ENGINEERING DEPARTMENT ITHACA, N.Y.		RADIO STATION WOLF SYRACUSE, NEW YORK 1490KC 0.25/1 KW-LS,DA-D,U

FCC File No. BL-11020
Accepted 8-31-65

Station WOLF
Syracuse, New York

1490 kc

1490 KC

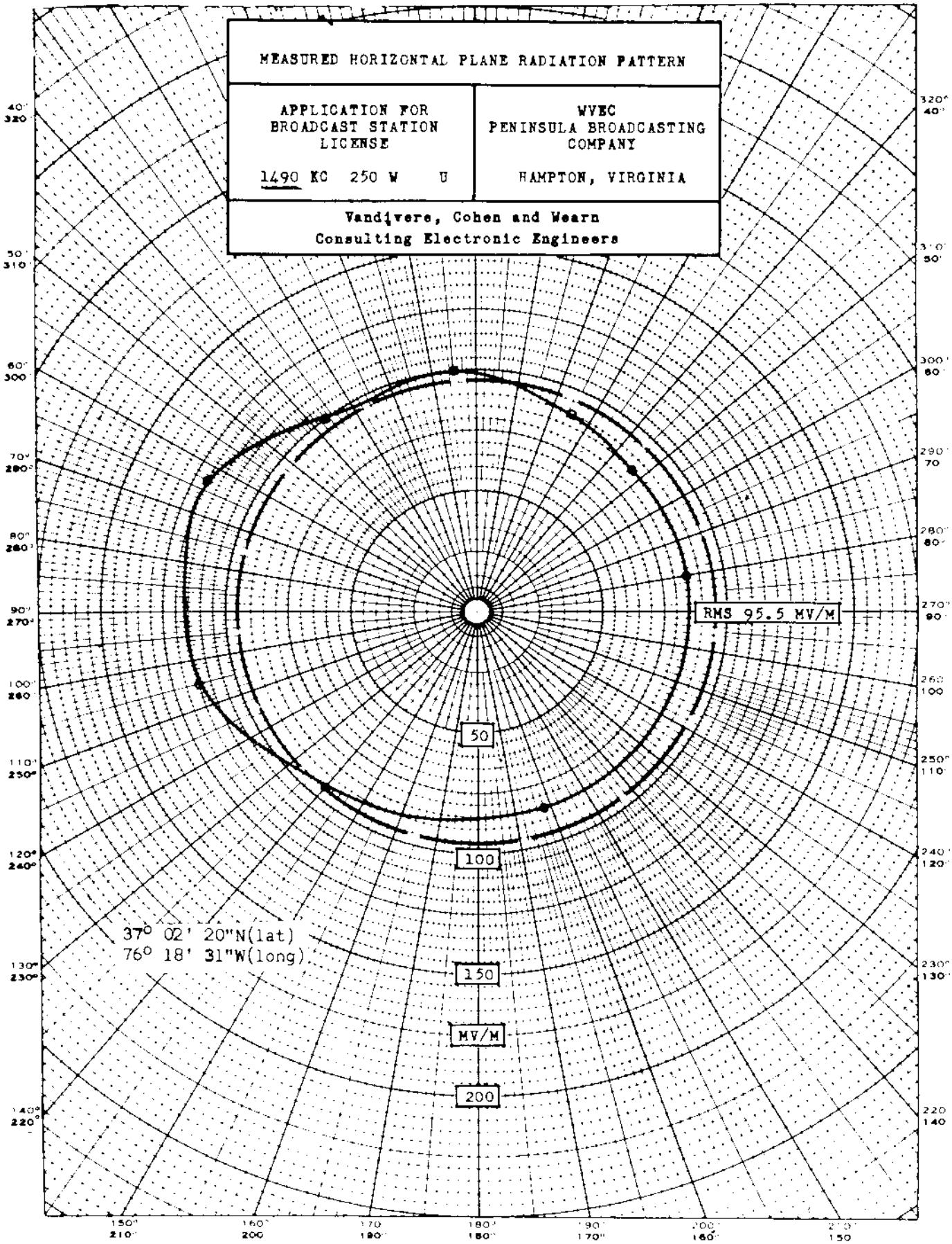
WVEC

MEASURED NON-DIRECTIONAL
(8/16/55G)

STATION WVEC
HAMPTON, VIRGINIA

250W
NON-DA, U

1490 KC 1490



FILE NO. BL-5785 ACCEPTED 7/28/55 FCC

WVEC, Hampton, Virginia 1490 KC

DIRECTIONAL ANTENNA DESCRIPTION SHEET -

STATION	: New	MAIN STUDIO	: St. Catharines, Ontario.
FREQUENCY	: 1500 KC/S	POWER	: 1 KW, Class: II
NOTIFICATION LIST NO.	189	DATE	: July 20, 1964

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM : North Latitude 43° 12' 49"

: West Longitude 79° 11' 05"

ANTENNA CHARACTERISTICS

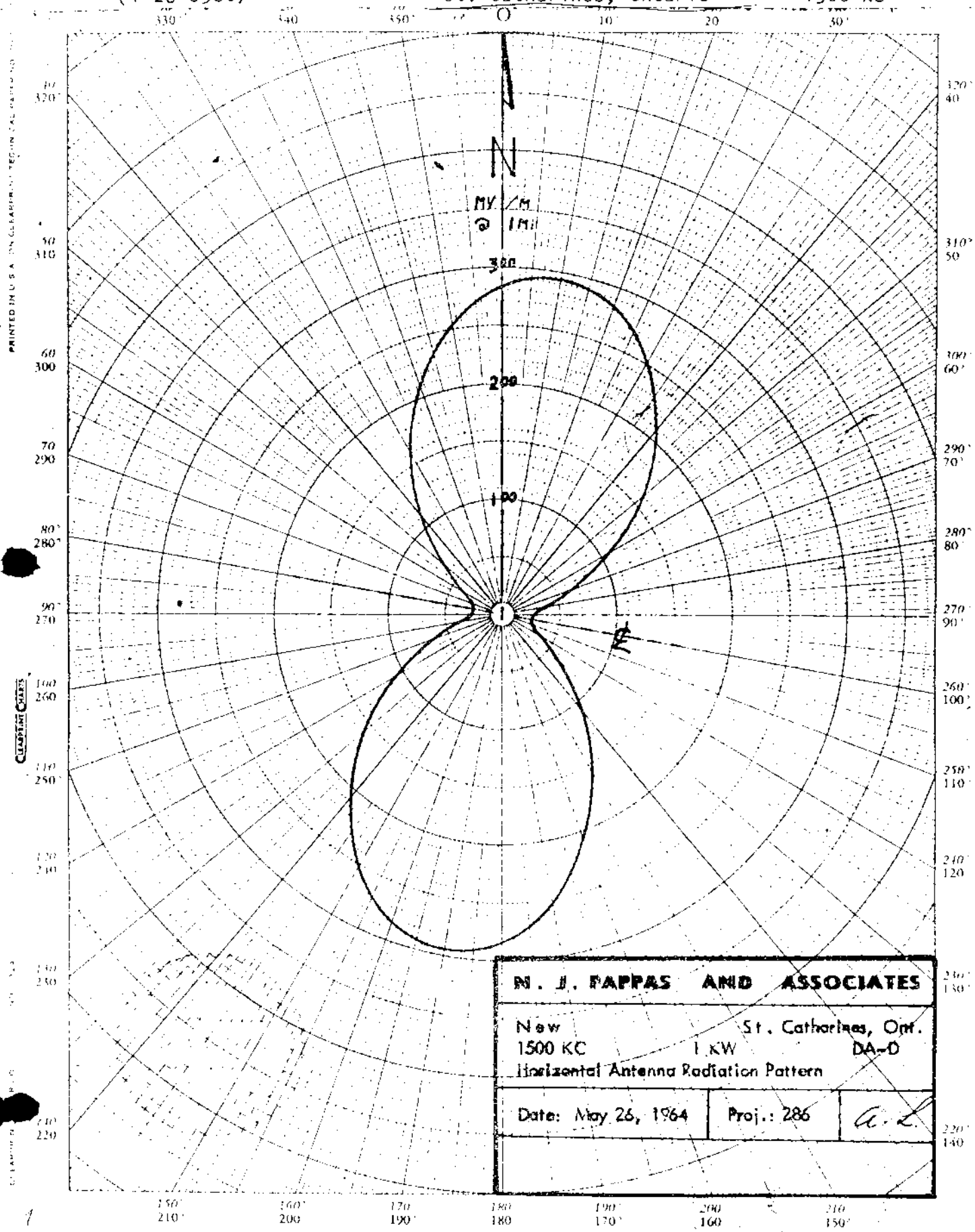
MODE OF OPERATION	:	DA-D (Directional, daytime only)	
NUMBER OF ELEMENTS	:	Two (2)	
TYPE OF ELEMENTS	:	Uniform cross-section guyed steel towers, base insulated for series feed, no top loading	
TOWER	:	1 (W)	2 (E)
HEIGHT ABOVE INSULATORS	:	110' (60.3°)	110' (60.3°)
OVERALL HEIGHT	:	115'	115'
SPACING	:	328' (180°) between towers	
PHASING	:	0°	0°
FIELD RADIO	:	1.0	1.2
ORIENTATION	:	Tower on line bearing 100° East of True North	
GROUND SYSTEM	:	120 equally spaced radials of B and S No. 10 soft drawn bare copper wire per tower extending to distances between .36 and .5 wavelengths except where bonded on the common chord and buried approximately 8 inches.	
PREDICTED EFFECTIVE FIELD	:	175 MV/M at 1 mile for 1 KW.	

#189

Proposed Day
(1-28-65ct)

New Station
St. Catharines, Ontario

1kw,DA-D,D,Class II
1500 kc



CKAY

PROJECT #11401

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

STATION: CKAY MAIN STUDIO: DUNCAN, B.C.

FREQUENCY: 1500 kHz POWER: 5 kW Day, 1 kW Night

NOTIFICATION LIST: 295 DATE: August 8, 1972

GEOGRAPHICAL LOCATION: Latitude 48° 44' 21" North
Longitude 123° 41' 58" West

ANTENNA CHARACTERISTICS:

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

TOWER	#1 (East)	#2 (West)
Height above base insulator:	130' (71.3°)	130' (71.3°)
Overall Height:	134'	134'
Day Ratio:	1.0	0.73
Day Phasing:	0°	-84°
Night Ratio:	1.0	0.85
Night Phasing:	0°	-63°

GROUND SYSTEM: 120 equally spaced radials per tower of No. 10 AWG bare soft copper wire, buried approximately 8 inches. No. 4 AWG copper wire joins the radials along the common chord. The effective length of the ground system is 0.4 wavelength.

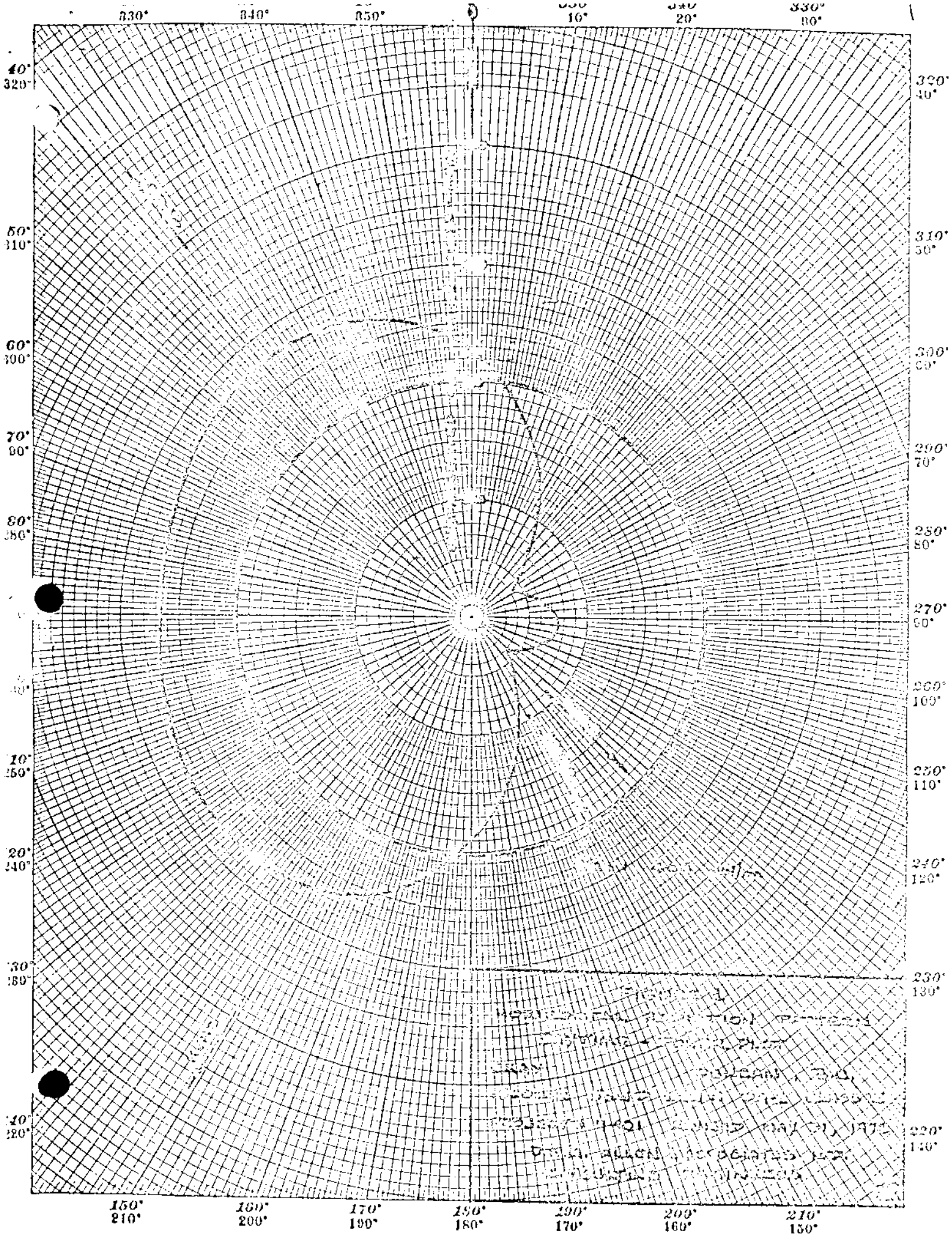
SPACING AND ORIENTATION: Tower No. 2 is spaced 218' (120°) along a line bearing 275° True from Tower #1.

PREDICTED EFFECTIVE FIELDS:

Daytime 404 mV/m at 1 mile for 5 kW
181 mV/m at 1 mile for 1 kW

Nighttime 183 mV/m at 1 mile for 1 kW

REVISED MAY 31, 1972


330°
340°
350°
0
10°
20°
30°
40°
320°
50°
310°
60°
300°
70°
290°
80°
280°
270°
260°
250°
240°
230°
220°
150°
160°
170°
180°
190°
200°
210°

#184

CKAY

Description Sheet (6-29-64ct) | New Station Duncan, B.C. | 1kw,DA-1,U,Class II 1500 kc

2.4 - DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: NEW

Main Studio: Duncan, B.C.

Frequency: 1500 kc/s

Power: 1 KW **Class:** II

Notification List No: 184

Date: February 10, 1964

GEOGRAPHICAL LOCATION OF THE ANTENNA SYSTEM:

North Latitude: 48° 44' 19"

West Longitude: 123° 41' 54"

ANTENNA CHARACTERISTICS:

Mode of Operation: DA-1
Number of Elements: 2
Type of Elements: Guyed, uniform cross section, base insulated, series fed, No top loading.

	No. 1 East		No. 2 West
TOWER:			
HEIGHT ABOVE INSULATORS:	130'		130' (71.3°)
OVERALL HEIGHT:	134'		134'
SPACING:		218' (120°)	
PHASING:	0°		-63°
FIELD RATIO:	1.0		0.85

ORIENTATION: Towers on a line bearing 95° east of North

GROUND SYSTEM: 120 radials per tower of No. 10 AWG soft drawn copper wire. Radials running between towers bonded to No. 4 AWG stranded copper wire positioned at right angles to tower line. Effective length of ground system 0.4.

Predicted Effective Field RMS 183 mv/m (183mv/m for 1Kw)

Revised February 1962

184

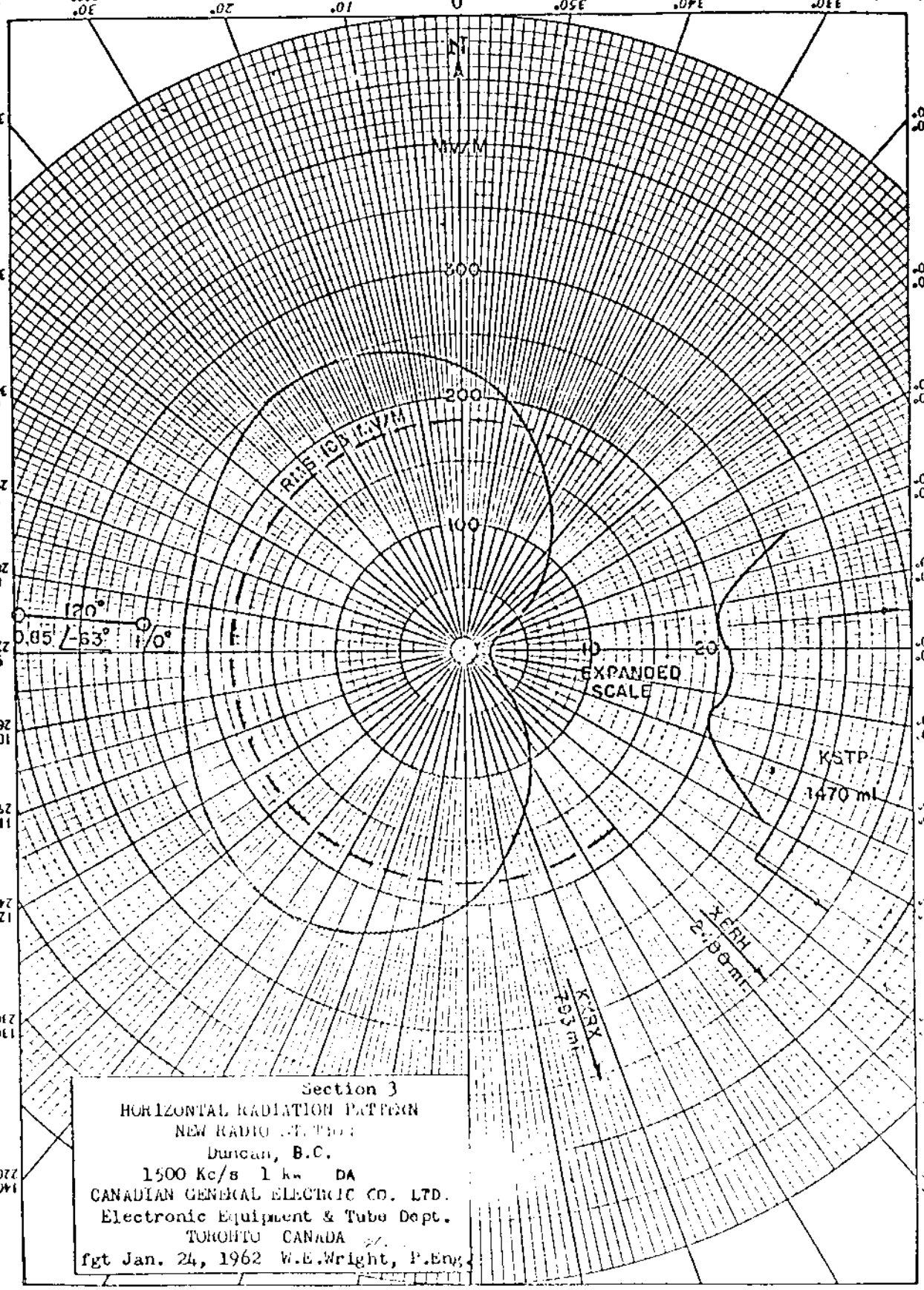
CKAY

Proposed Day & Night
(6-29-64ct)

New Station
Duncan, B.C.

1kw,DA-1,U,Class II
1500 kc

152A1773



Section 3
HORIZONTAL RADIATION PATTERN
NEW RADIO STATION
Duncan, B.C.
1500 Kc/s 1 kw DA
CANADIAN GENERAL ELECTRIC CO. LTD.
Electronic Equipment & Tube Dept.
TORONTO CANADA
fgt Jan. 24, 1962 W.E.Wright, P.Eng.

CKAY

PROJECT #11406

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

STATION: CKAY MAIN STUDIO: DUNCAN, B.C.

FREQUENCY: 1500 kHz POWER: 10 kW Day, 1 kW Night

NOTIFICATION LIST: 383 DATE: March 28, 1979

GEOGRAPHICAL LOCATION: Latitude 48° 44' 21" North
Longitude 123° 41' 58" West

ANTENNA CHARACTERISTICS:

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

TOWER	#1 (East)	#2 (West)
Height above base insulator:	130' (71.3°)	130' (71.3°)
Overall Height:	134'	134'
Day Ratio:	1.0	.31
Day Phasing:	0°	-81.7°
Night Ratio:	1.0	0.85
Night Phasing:	0°	-63°

GROUND SYSTEM: 120 equally spaced radials per tower of No. 10 AWG bare soft copper wire, buried approximately 8 inches. No. 4 AWG copper wire joins the radials along the common chord. The effective length of the ground system is 0.4 wavelength.

SPACING AND ORIENTATION: Tower No. 2 is spaced 218' (120°) along a line bearing 275° True from Tower #1.

PREDICTED EFFECTIVE FIELDS:

Daytime 560 mV/m at 1 mile for 10 kW
177 mV/m at 1 mile for 1 kW

Nighttime 183 mV/m at 1 mile for 1 kW

This notification concerns only a change in the day-time power and radiation pattern. Please retain the night-time radiation patterns, which were notified in Change List 184 dated February 10, 1964.

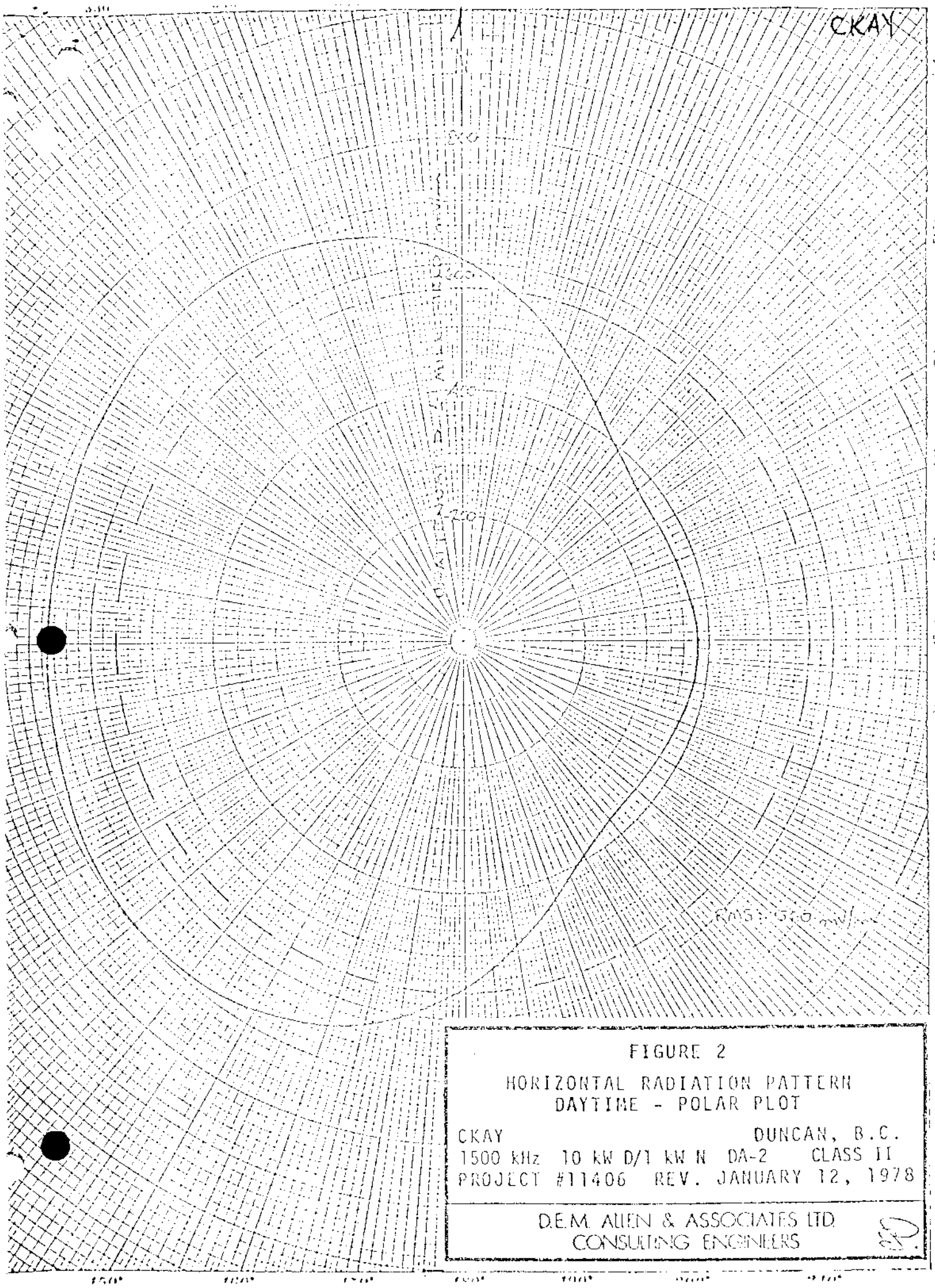


FIGURE 2

HORIZONTAL RADIATION PATTERN
DAYTIME - POLAR PLOT

CKAY DUNCAN, B.C.
1500 kHz 10 kW D/1 kW N DA-2 CLASS II
PROJECT #11406 REV. JANUARY 12, 1978

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

NEW
1500 kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: (NEW)

Main Studio: Dallas, Georgia

Frequency: 1500 kHz

Power: 1kw Day

Notification List No. 1783

Date: November 2, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 33 56' 42"
West Longitude: 84° 49 41"

ANTENNA CHARACTERISTICS

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

TOWER:	SE(#1)	NW(#2)
HEIGHT ABOVE INSULATORS:	170' (93.3°)	170' (93.3°)
DAY PHASING:	0°	45°
DAY FIELD RATIO:	1.00	0.75

SPACING AND ORIENTATION: The towers are spaced 295.27' (162.1°) on a line bearing 346.0° true.

GROUND SYSTEM: 120-164' 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:

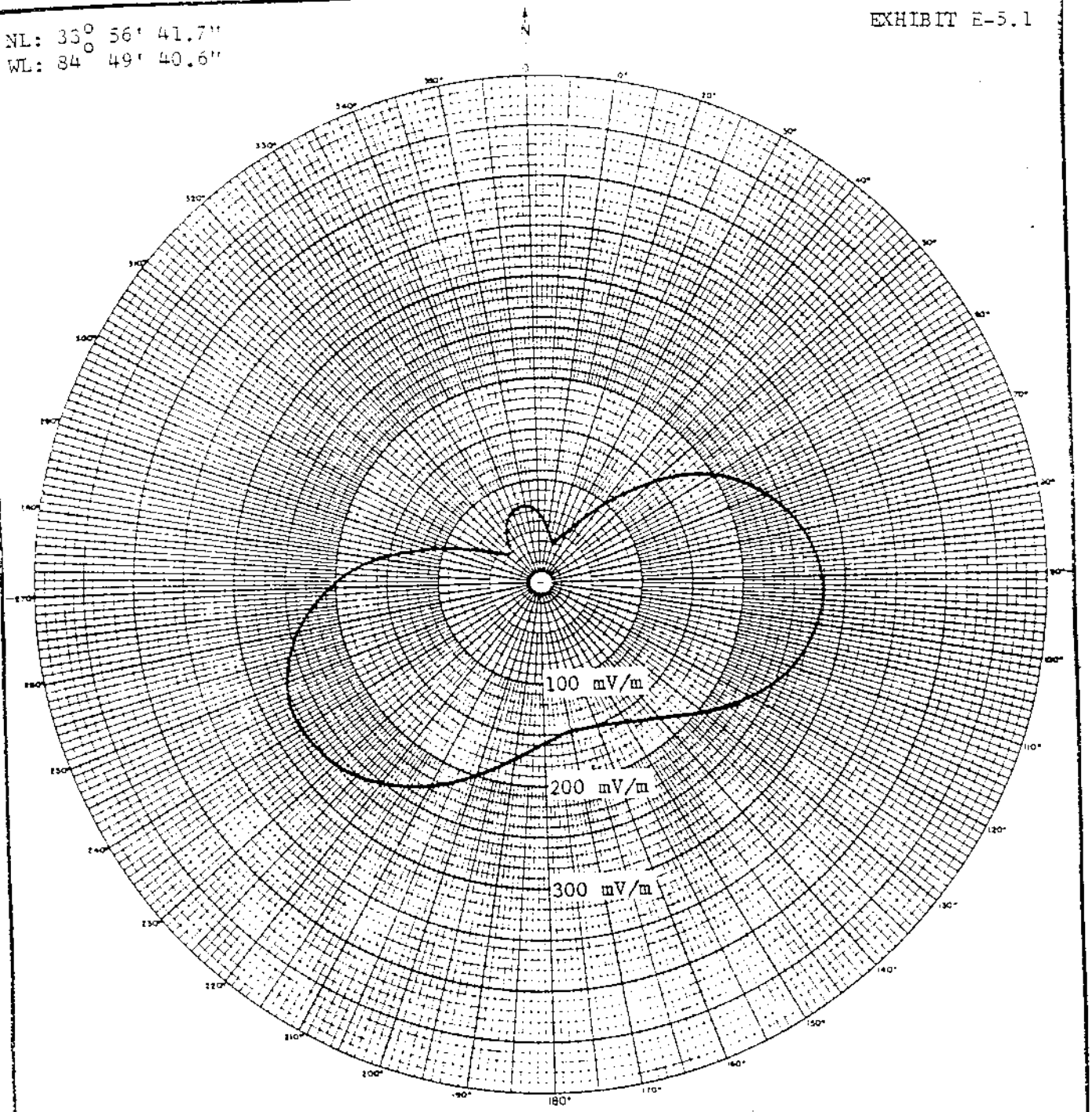
	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS	Q Factor 6 f(e) mv/m
Day 1/	175.00 mv/m	187.96 mv/m	183.86 mv/m	

1/ By adjustment of input power.

NEW 1500 KHZ
DA-D

EXHIBIT E-5.1

NL: 33° 56' 41.7"
WL: 84° 49' 40.6"



STANDARD HORIZONTAL RADIATION PATTERN

PROPOSED AM STATION
PAULDING PRODUCTIONS, INC.
1500 KHZ - 1 KW DA-D
DALLAS, GEORGIA
MARCH 1977

0.75/ 45°
346° ← ⊕ — 162° — 295.27 FEET — ⊕ — 1 / 0°

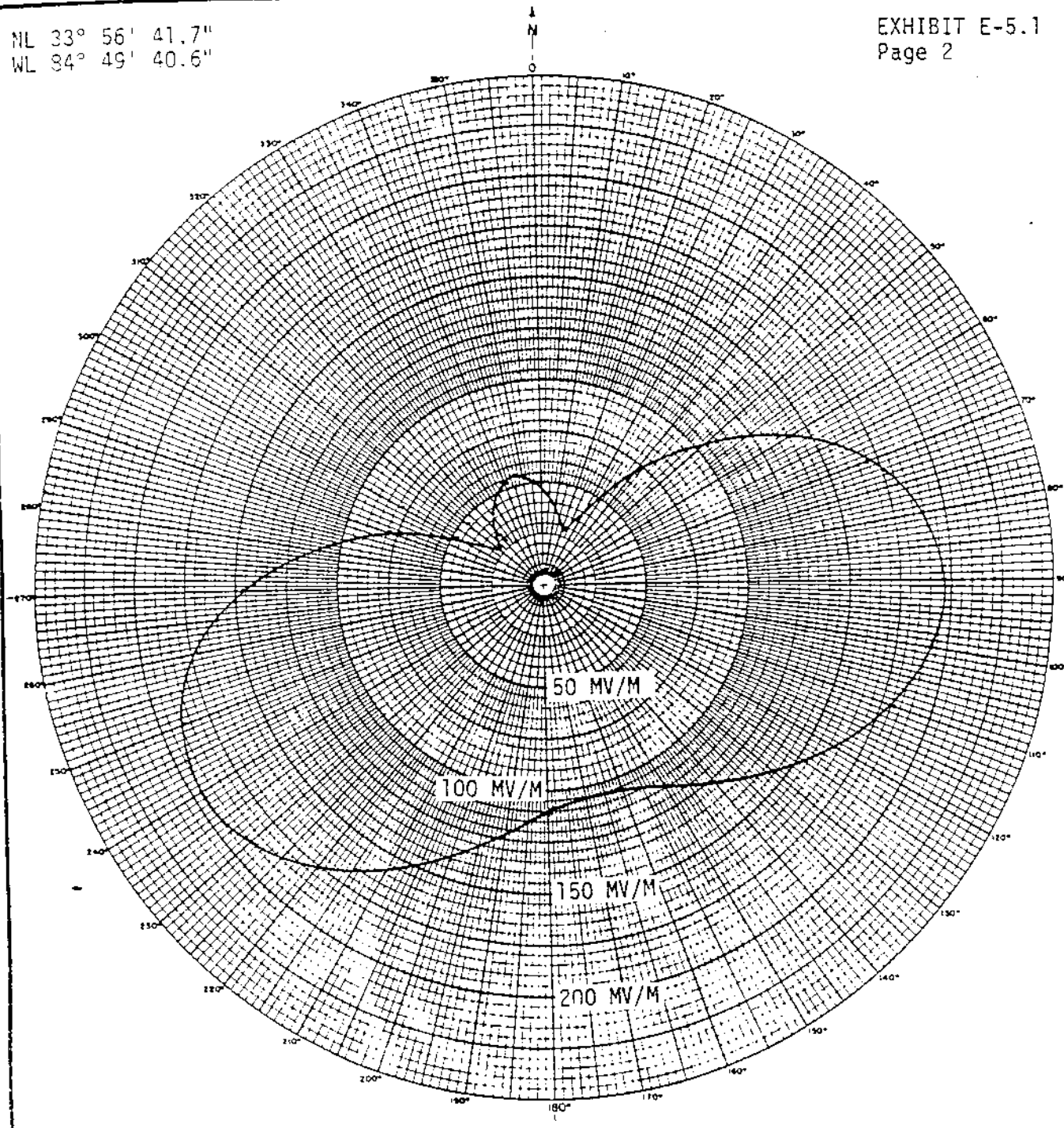
K FACTOR	150.368 mV/m
THEO. RMS	175 mV/m adj.
THEO. RSS	187.961 mV/m
STD. RMS	183.858 mV/m
Q FACTOR	6
ELECT. HEIGHT	96° - 170 FEET

ROBERT L. MIERS
CONSULTING RADIO ENGINEER
P. O. BOX 12 ROLLA MISSOURI 65401 PHONE 314 364-3146

NEW 1500KHZ
DA-CH

NL 33° 56' 41.7"
WL 84° 49' 40.6"

EXHIBIT E-5.1
Page 2



STANDARD HORIZONTAL RADIATION PATTERN

PROPOSED AM STATION
PAULDING PRODUCTIONS, INC.
1500 KHZ - 1 KW DA-D, 0.5 KW CH
DALLAS, GEORGIA
FEBRUARY 1978

CRITICAL HOURS PATTERN

0.75/ 45° 1.0 / 0°
346° ←——+——162°—295.27 feet——+——

K FACTOR	106.323 mV/m
THEO. RMS	123.74 mV/m
THEO. RSS	132.904 mV/m
STD. RMS	130.007 mV/m
Q FACTOR	6
ELECT. HEIGHT	96° - 170 FEET

ROBERT L. MIERS
CONSULTING RADIO ENGINEER
P. O. BOX 12 ROLLA, MISSOURI 65401 PHONE 314 364-3146

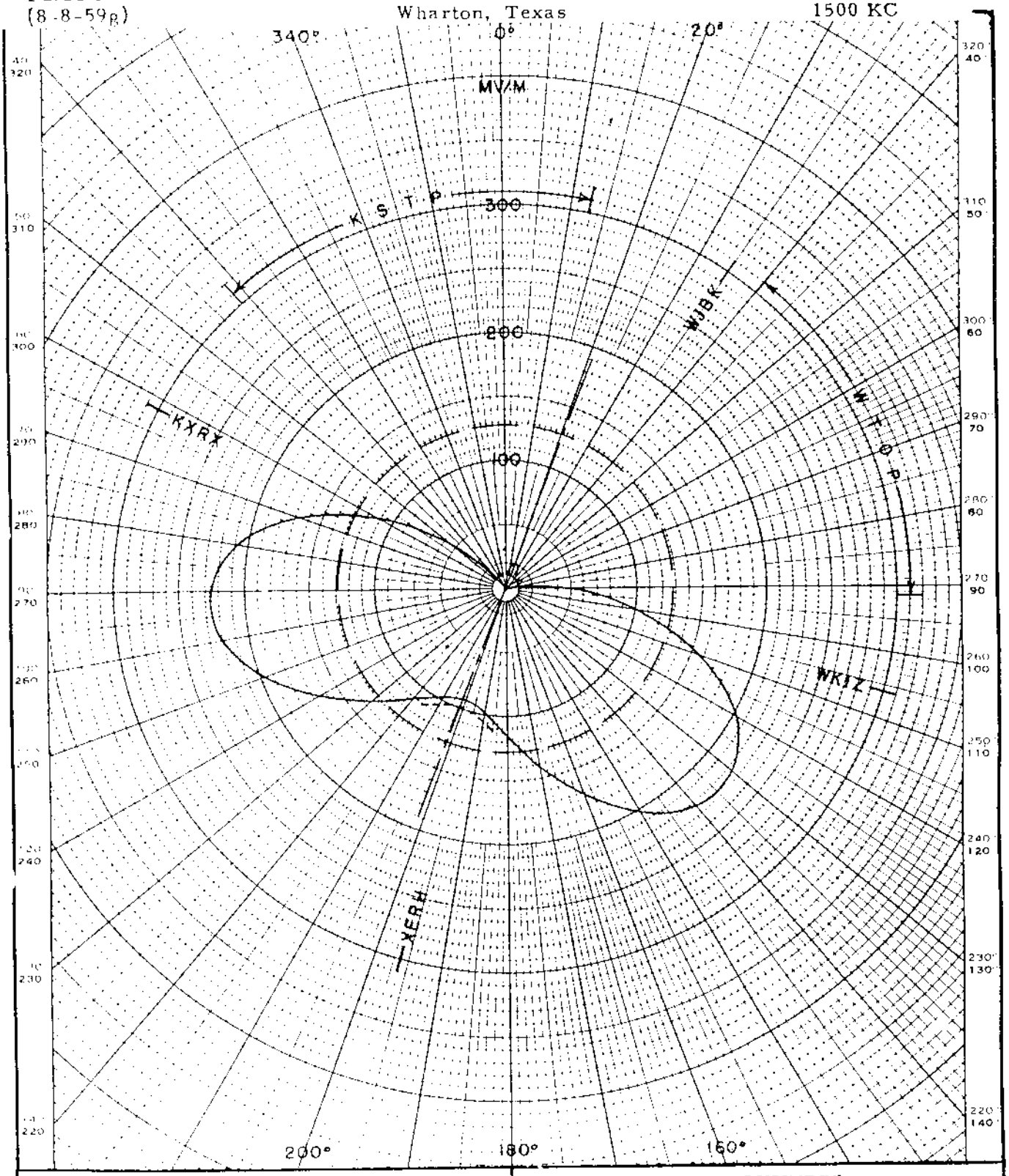
WHARTON, TEXAS KANI

PROPOSED DAY & NIGHT (8-8-59g)

New; V. M. Preston
Wharton, Texas

500w, DA-1, U
1500 KC

2-8-61 granted cp for a new station



S=160° = 291.6' G'S = 98.7° = 180'

0.559/-63.5° 1/0° 0.559/63.5°
③ ← S → ② ← S → ① — 21°T →

NL 29° 19' 22"
WL 96° 03' 32"

RMS = 128 MV/M -----MEOV

FCC File No. BP-13223
Accepted 7-13-59

V. M. Preston
Wharton, Texas

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

V. M. PRESTON
WHARTON, TEXAS
1500 KC, 500W, DA-1, U

590310

FIGURE 4A

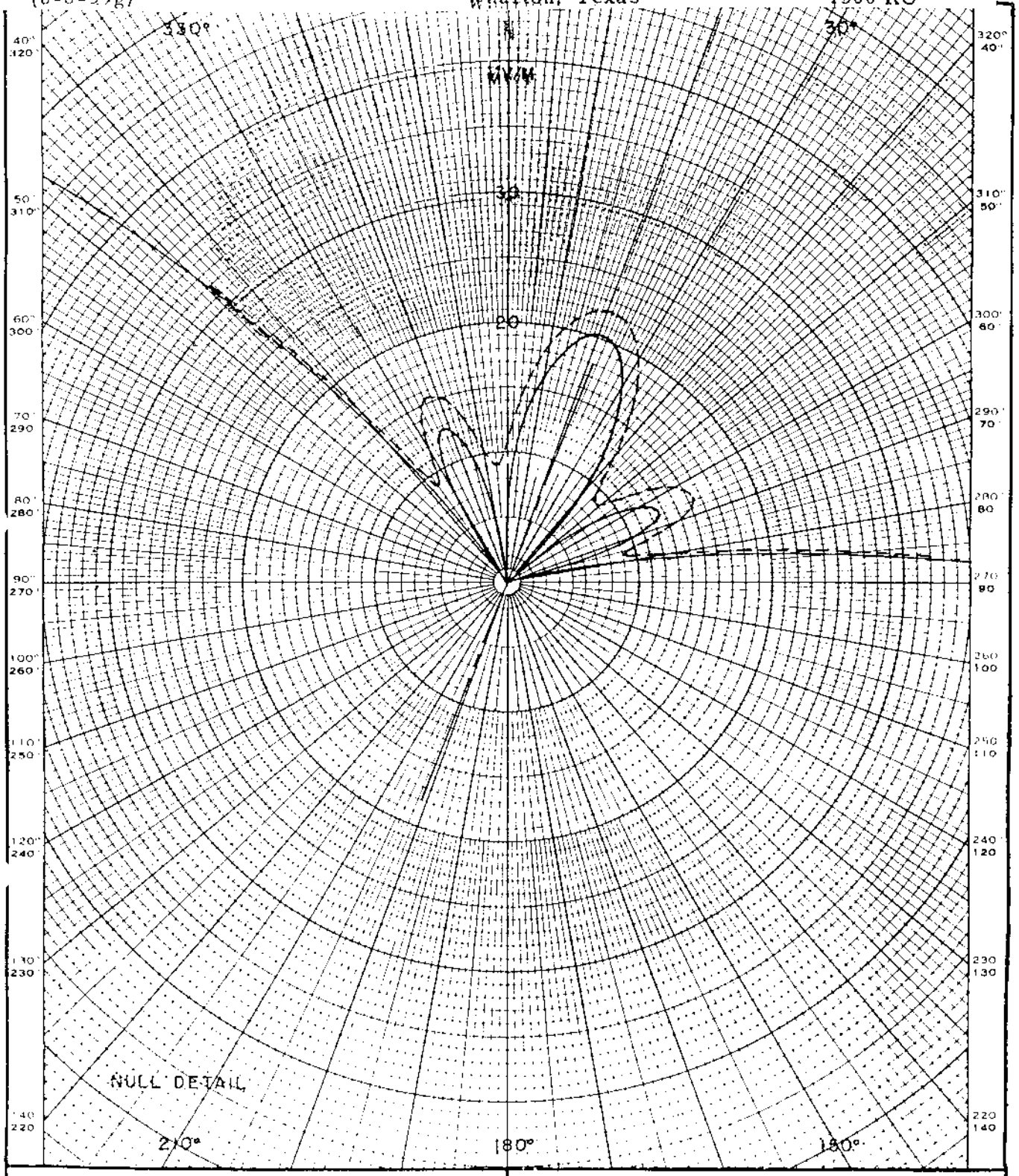
1500 KC

WHARTON, TEXAS KANI

PROPOSED DAY & NIGHT NULLS (8-8-59g)

New; V. M. Preston
Wharton, Texas

500w, DA-1, U
1500 KC



S = 160° = 291.6' G'S = 98.7° = 180'

0.559/-63.5° 1/0° 0.559/63.5°

③ ← S → ② ← S → ① — 21° T →

NL 29° 19' 22"
WL 96° 03' 32"

RMS = 128 MV/M -----MEOV

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

V. M. PRESTON
WHARTON, TEXAS
1500 KC, 500W, DA-1, U

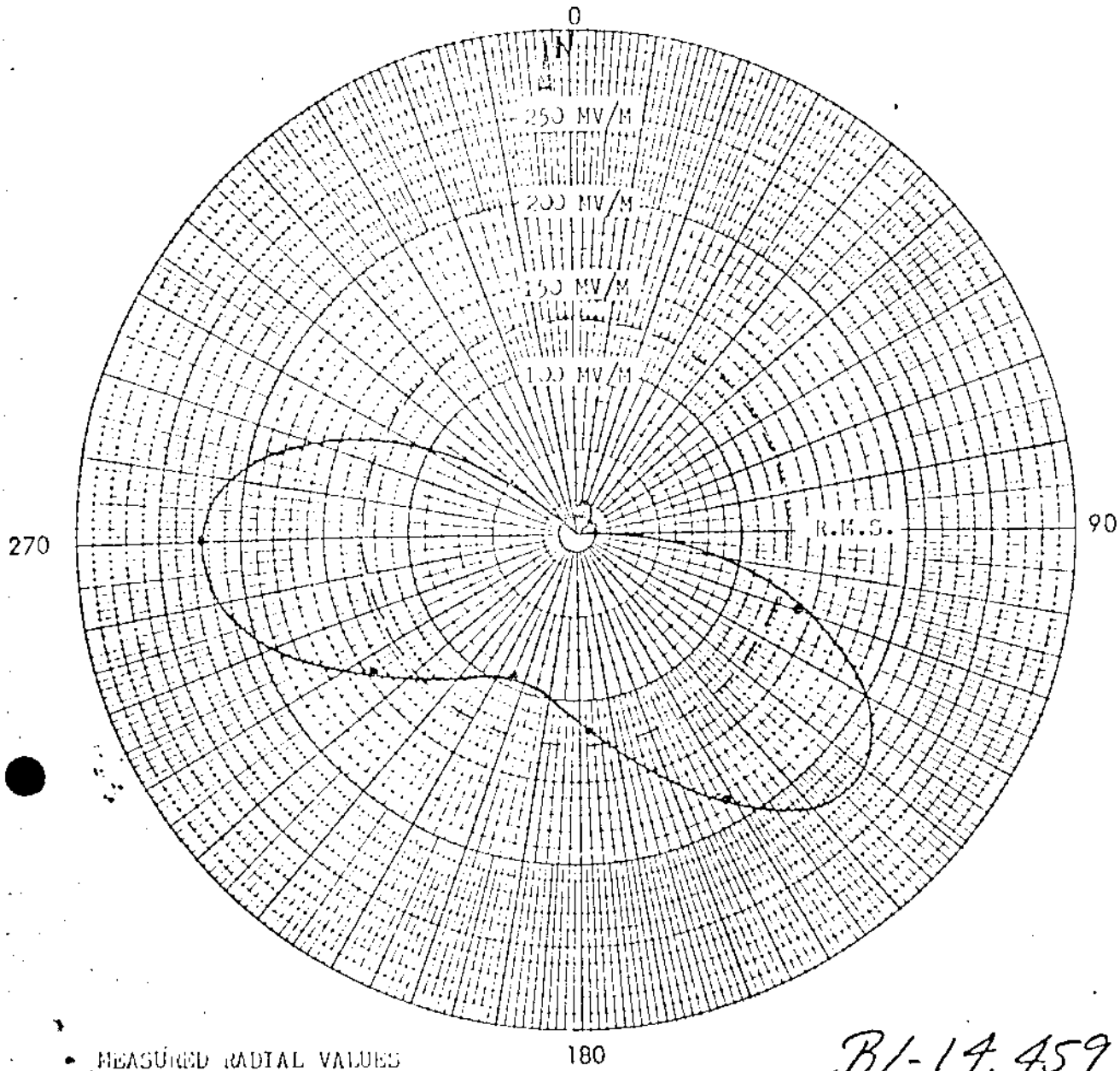
590310 FIGURE 4B

FCC File No. BP-13223
Accepted 7-13-59

V. M. Preston
Wharton, Texas

1500 KC

KANI



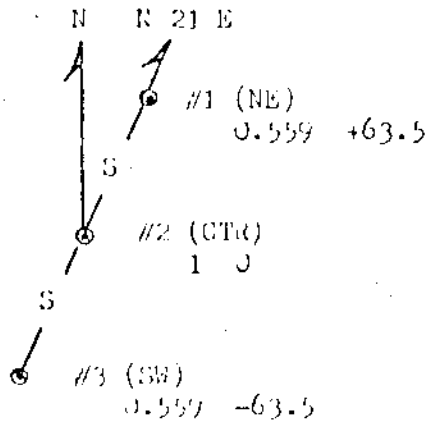
BL-14,459

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION:

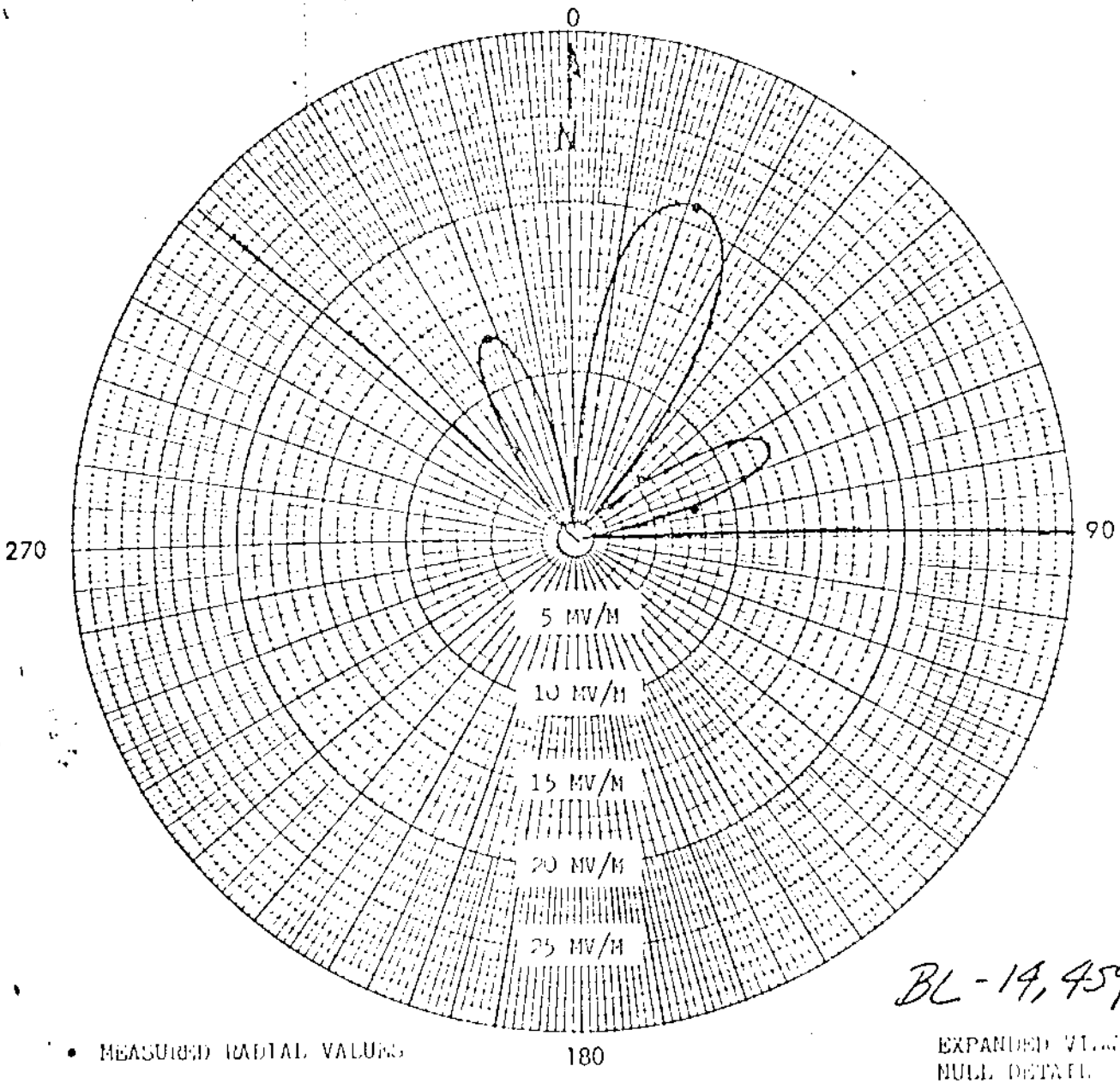
G'S = 98.7°
= 180'

S = 160°
= 291.6'



STATION:	K A N I
LOCATION:	WHARTON, TEXAS
FREQUENCY:	1500 KHz
POWER:	0.5 KW-U DA-1
LATITUDE:	29 d 19 m 22 s
LONGITUDE:	96 d 03 m 32 s
WHEN USED:	DAY AND NIGHT
R.M.S. FIELD:	128.6 MV/M
DATE:	JANUARY, 1978

KANI

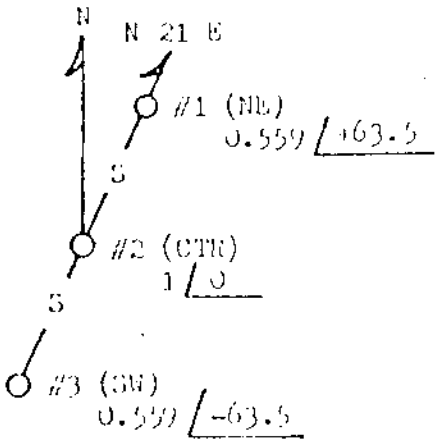


HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION:

G'S = 98.7°
= 180'

S = 160°
= 291.6'



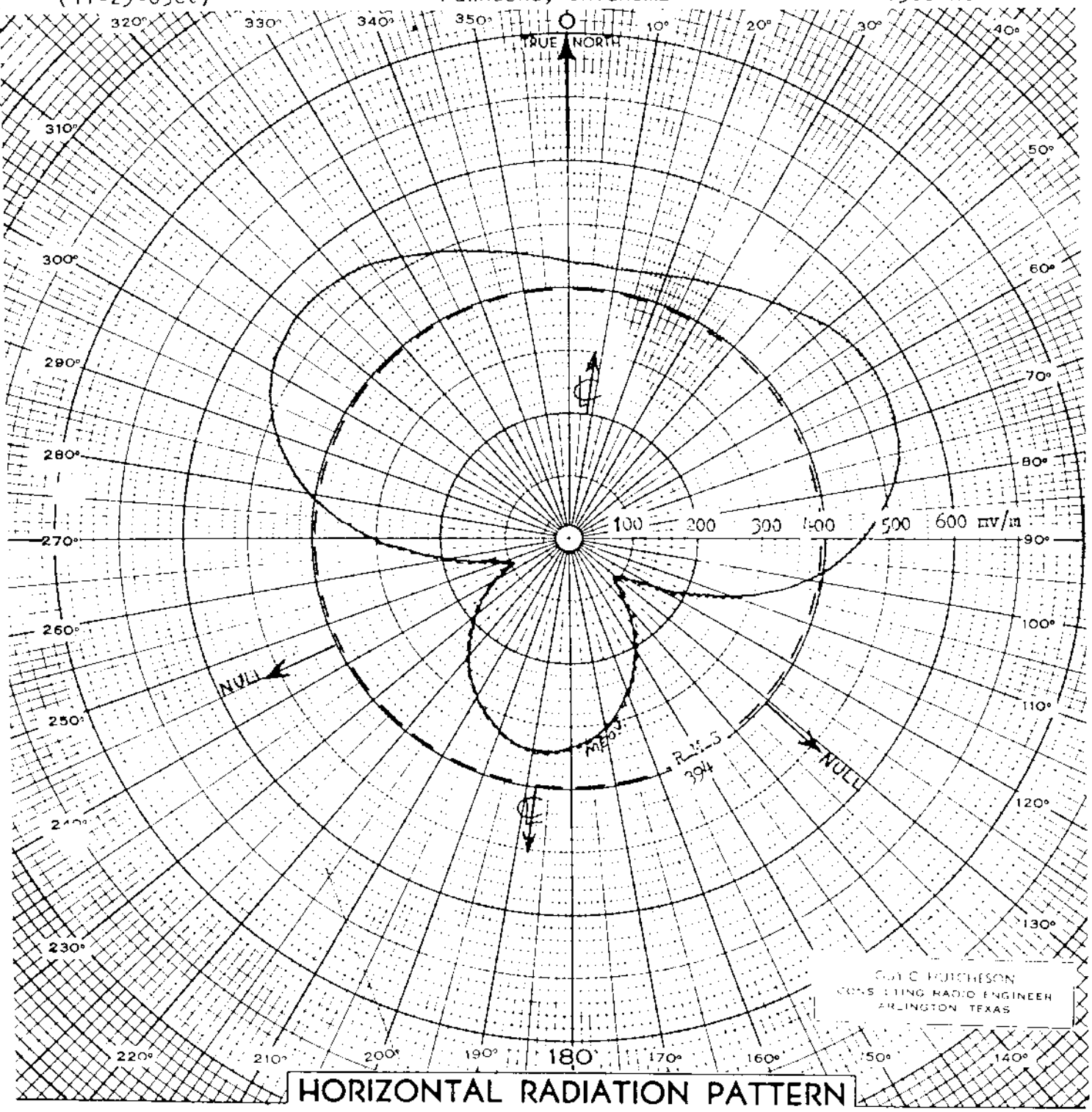
STATION:	K A N I
LOCATION:	WHARTON, TEXAS
FREQUENCY:	1500 KHz
POWER:	0.5 KW-U DA-1
LATITUDE:	29 d 19 m 22 s
LONGITUDE:	96 d 03 m 32 s
WHEN USED:	DAY AND NIGHT
R.M.S. FIELD:	128.6 MV/M
DATE:	JANUARY, 1978

KOKN

Proposed Day
(11-29-65ct)

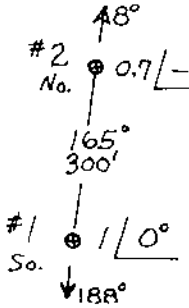
Station KOSG
Pawhuska, Oklahoma

5kw,DA-D,D
1500 kc



HORIZONTAL RADIATION PATTERN

ANTENNA LAYOUT



KOSG	PAWHUSKA, OKLAHOMA
Station	Location
1500 kc	5 kw
Frequency	Power
	36° 40' 00", 96° 21' 48"

PROPOSED DAYTIME

G's = 120'

Fig. 1

FCC File No. BP-16736
Accepted 11-18-65

Station KOSG
Pawhuska, Oklahoma

1500 kc

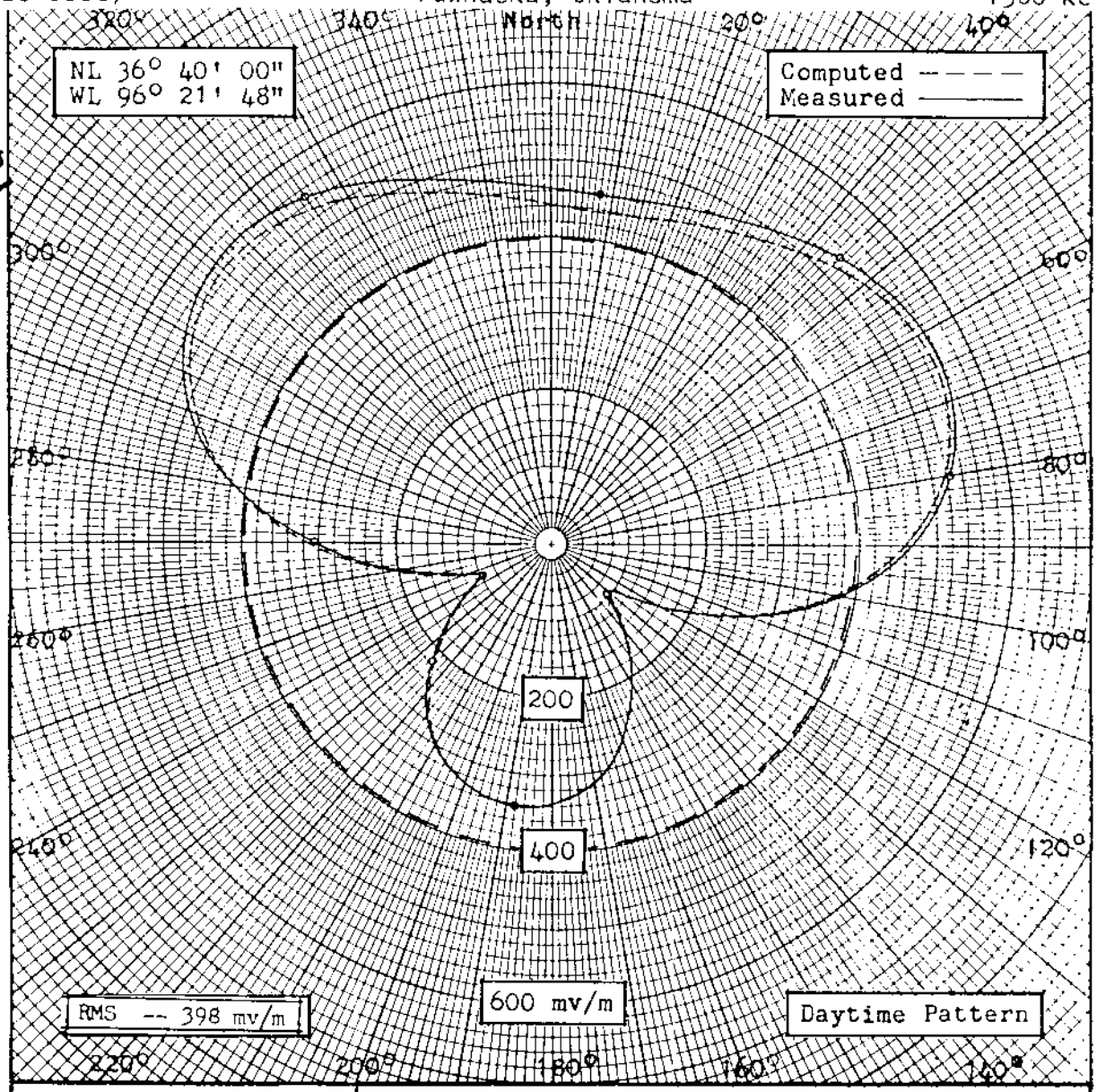
KOKN

Measured Day
(5-28-68ct)

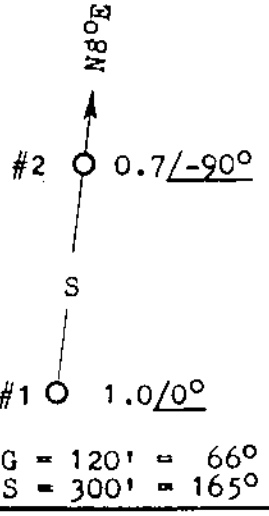
Station KOSG
Pawhuska, Oklahoma

5kw,DA-D,D
1500 kc

6-3-68
GRANTED
LICENSE
COV. CHANGES



Theoretical Values



RADIO STATION KOSG
PAWHUSKA, OKLAHOMA

MEASURED DIRECTIONAL
HORIZONTAL PLANE RADIATION PATTERN
1500 KHZ 5000 WATTS

021568-3

FIGURE 3

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

FCC File No. BL-11960
Accepted 5-8-68

Station KOSG
Pawhuska, Oklahoma

1500 kc

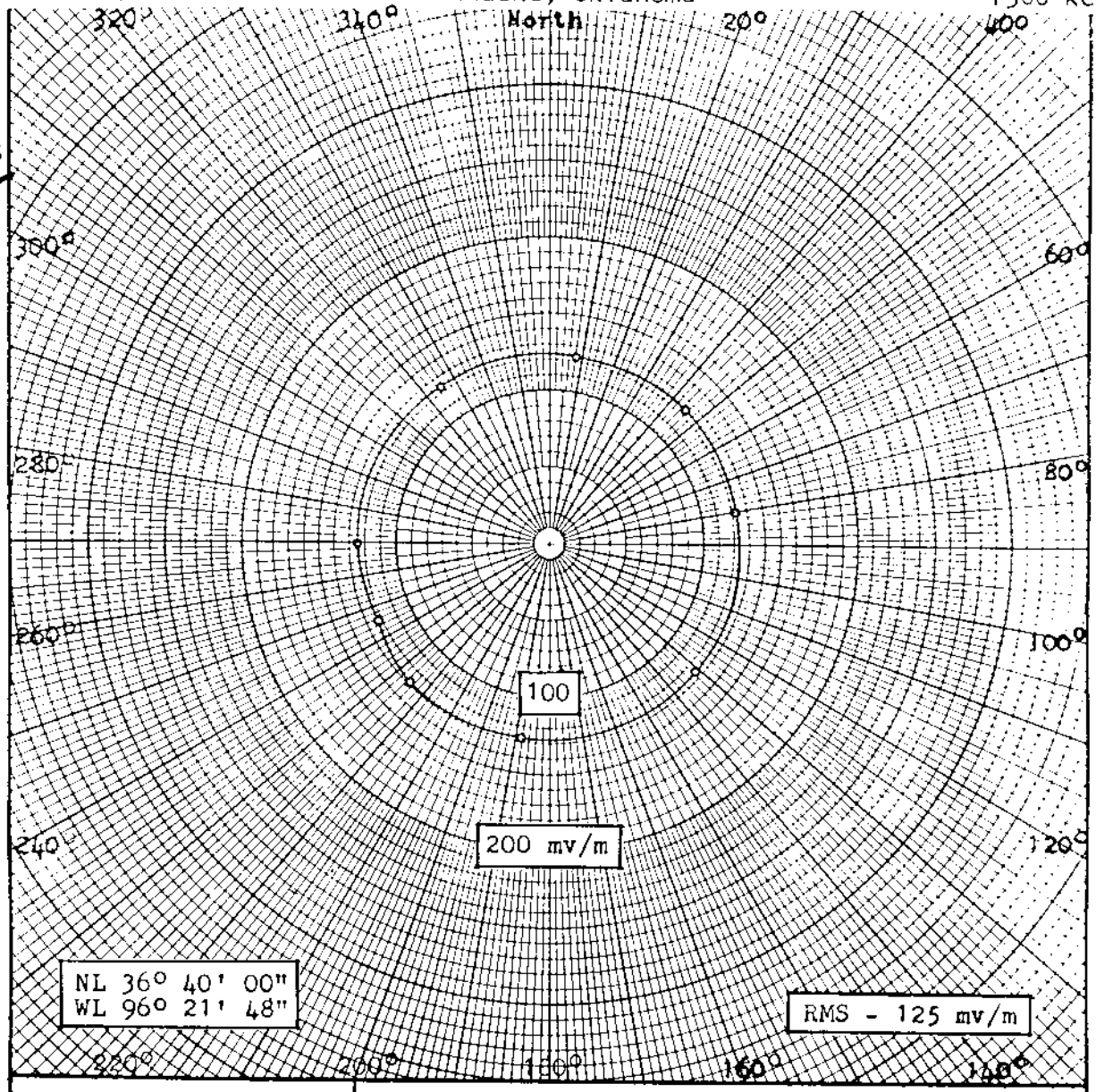
KOKN

Measured Non-DA
(5-28-68ct)

Station KOSG
Pawhuska, Oklahoma

5kw,DA-D,D
1500 kc

6-3-68
GRANTED
LICENSE
COV. CHANGES



N8°E

#2 ○ Isolated

S

#1 ○ 500 Watts

G = 120' = 66°
S = 300' = 165°

RADIO STATION KOSG
PAWHUSKA, OKLAHOMA

MEASURED NON-DIRECTIONAL
HORIZONTAL PLANE RADIATION PATTERN
1500 KHZ 500 WATTS

021568-2

FIGURE 2

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

FCC File No. BL-11960
Accepted 5-8-68

Station KOSG
Pawhuska, Oklahoma

1500 kc

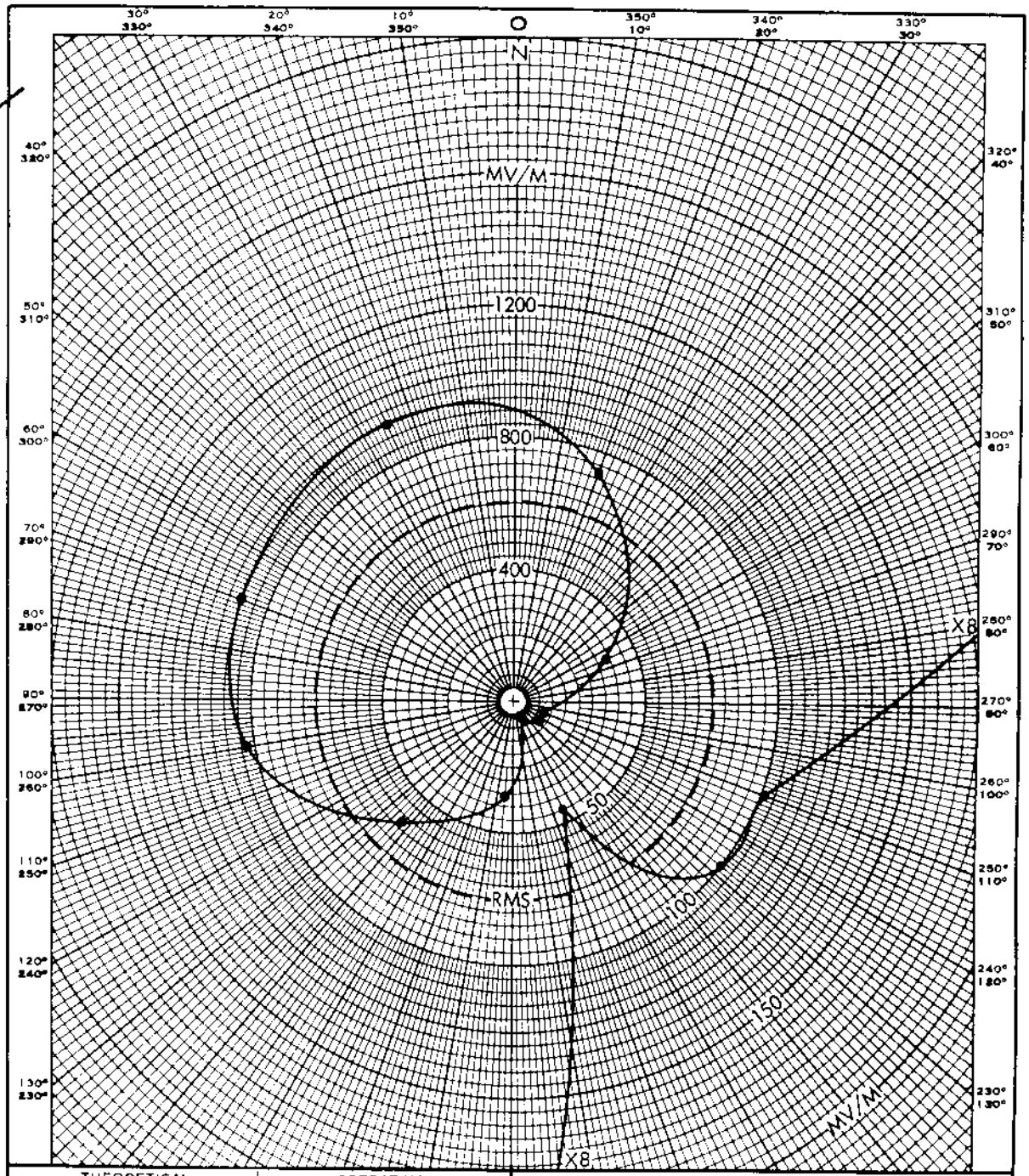
KROQ ~~KBBQ~~

Measured Day
(2-28-68ct)

Station KBBQ
Burbank, California

1kw,10kw-LS,DA-2,U
1500 kc

2-9-68
GRANTED
LICENSE



THEORETICAL

N42.5°E
0.920/-57.6° S6
S2 0.246/-34.9°
S3 S5
1.000/57.6°
N120°E
0.246/115.1°

OPERATING

N42.5°E
0.905/-89.0°
0.250/-133.0°
1/0°
N120°E
0.250/-81.0°

N. LAT. 34° 11' 47" S2=S3=45.0°=82.0 FT RMS=604 MV/M
W. LONG 118° 15' 30" S5=S6=35.5°=68.5 FT G=90°=164'

HAMMETT & EDISON
CONSULTING RADIO ENGINEERS
SAN FRANCISCO

RADIO STATION KBBQ
1500 KHZ 1 KW 10 KW-LS DA-2
BURBANK, CALIFORNIA

MEASURED
HORIZONTAL RADIATION
DAYTIME

UNATTENUATED FIELD INTENSITY
AT ONE MILE
1967 MEASUREMENTS

631015.1

FIGURE 13B

FCC File No.BL-10954
Accepted 1-30-68

Station KBBQ
Burbank, California

1500 kc

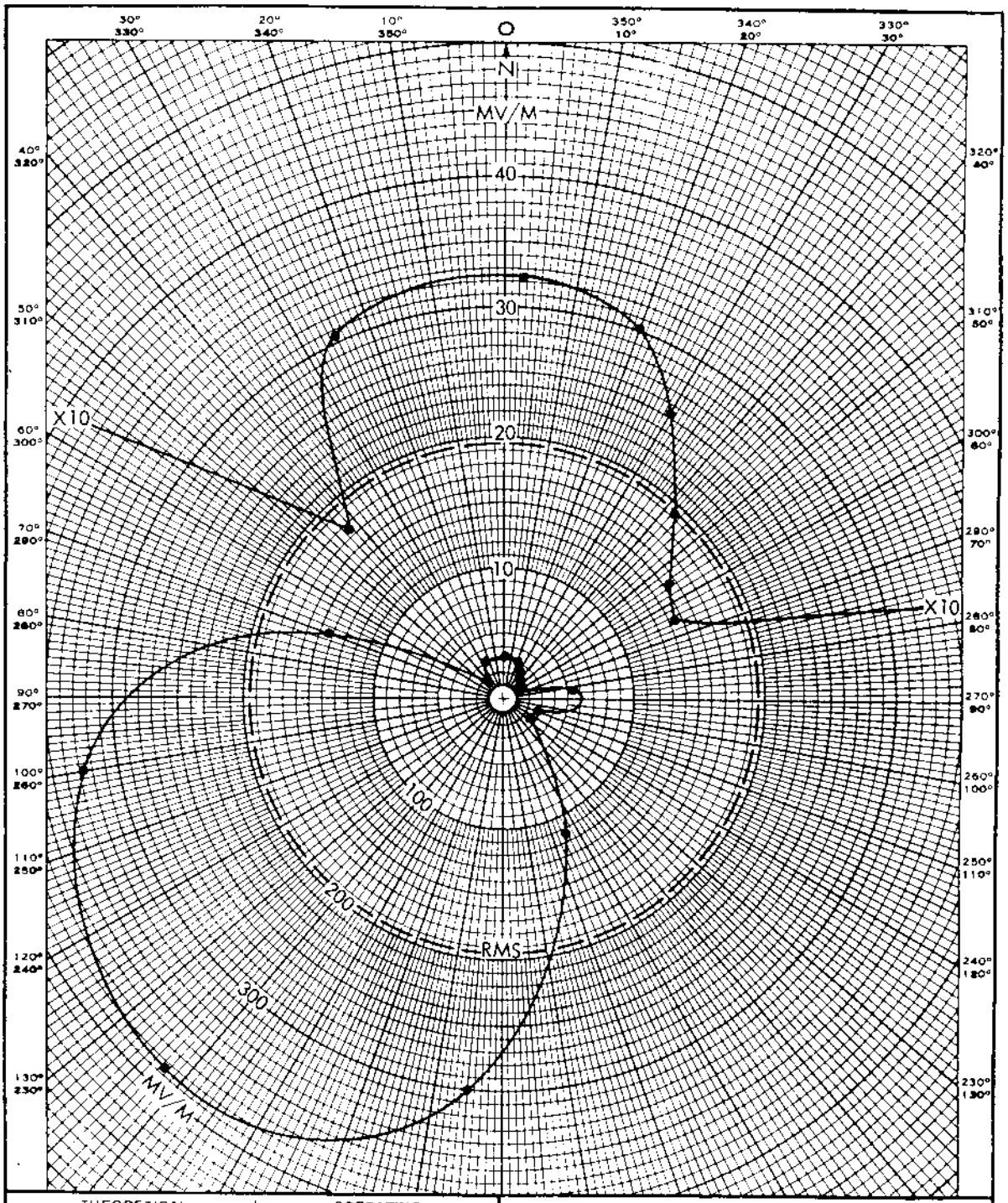
KNUQ KBBQ

Measured Night
(2-28-68ct)

Station KBBQ
Burbank, California

1kw,10kw-LS,DA-2,U
1500 kc

2-9-68
GRANTED
LICENSE



THEORETICAL	OPERATING
N42.5°E: 1 1.0000 /2.00°	N42.5°E: 1 0.384 /107.5°
2 2.3982 /-117.17°	2 0.791 /122.0°
3 2.3982 /117.17°	3 1.000 /0.0°
4 1.0000 /2.00°	4 0.302 /110.5°

N. LAT. 34° 11' 47"
W. LONG. 118° 15' 30"

RMS=195 MV/M

S=90°=164'
G=90°=164'

HAMMETT & EDISON
CONSULTING RADIO ENGINEERS
SAN FRANCISCO

RADIO STATION KBBQ
1500 KHZ, 1 KW, 10 KW-LS, DA-2
BURBANK, CALIFORNIA

MEASURED
HORIZONTAL RADIATION
NIGHTTIME

UNATTENUATED FIELD INTENSITY
AT ONE MILE
1967 MEASUREMENTS

6310151

FIGURE 13C

FCC File No.BL-10954
Accepted 1-30-68

Station KBBQ
Burbank, California

1500 kc

KBBQ

KBBQ

Measured Night Nulls
(2-28-68ct)

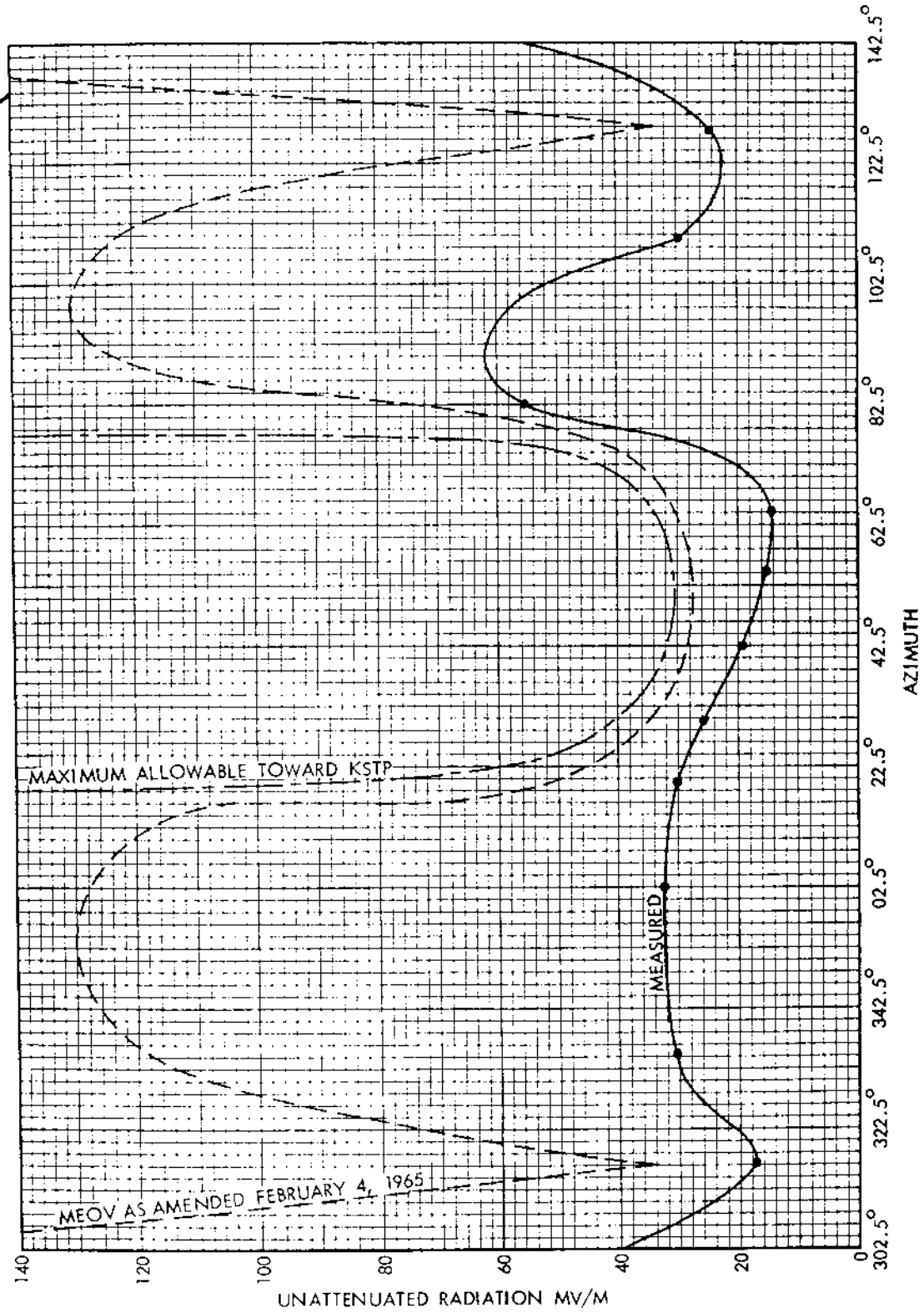
Station KBBQ
Burbank, California

1kw,10kw-LS,DA-2,U
1500 kc

2-9-68
GRANTED
LICENSE

RADIO STATION KBBQ

MEASURED HORIZONTAL RADIATION, NIGHTTIME



631015.1
FCC File No.BL-10954
Accepted 1-30-68

Hammett & Edison
Consulting Radio Engineers
Station KBBQ
Burbank, California

FIGURE 13D

1500 kc

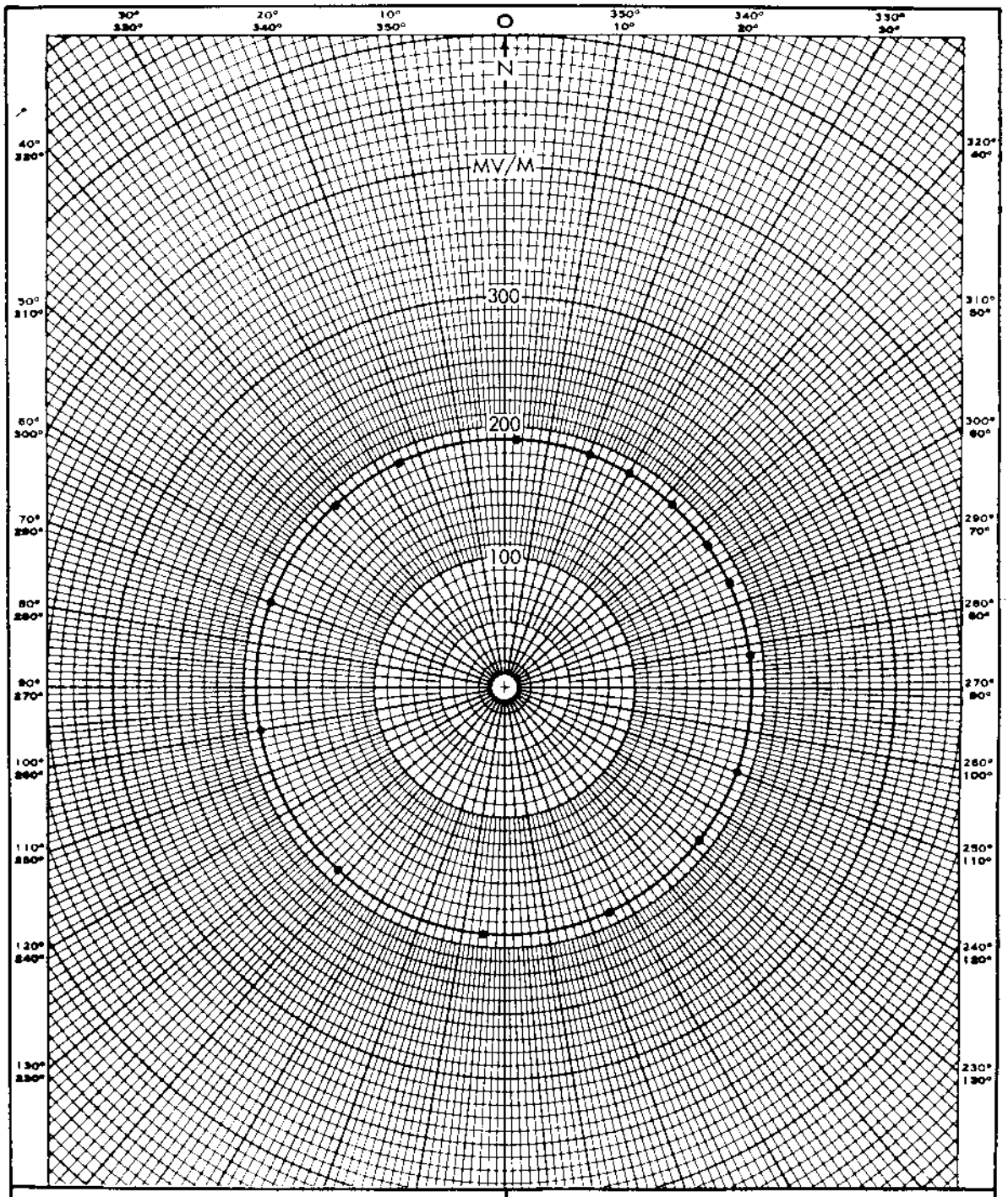
KROQ KBBQ

Measured Non-DA
(2-28-68ct)

Station KBBQ
Burbank, California

1kw,10kw-LS,DA-2,U
1500 kc

2-9-68
GRANTED
LICENSE



N. LAT. 34° 11' 47"
W. LONG. 118° 15' 30"
G=90°=164'
RMS=190 MV/M
1 KW INTO TOWER 6

HAMMETT & EDISON
CONSULTING RADIO ENGINEERS
SAN FRANCISCO

RADIO STATION KBBQ
1500 KHZ 1 KW, 10 KW-LS DA-2
BURBANK, CALIFORNIA

MEASURED
HORIZONTAL RADIATION
NON-DIRECTIONAL
UNATTENUATED FIELD INTENSITY
AT ONE MILE
1967 MEASUREMENTS

631015.1

FIGURE 13A

FCC File No.BL-10954
Accepted 1-30-68

Station KBBQ
Burbank, California

1500 kc

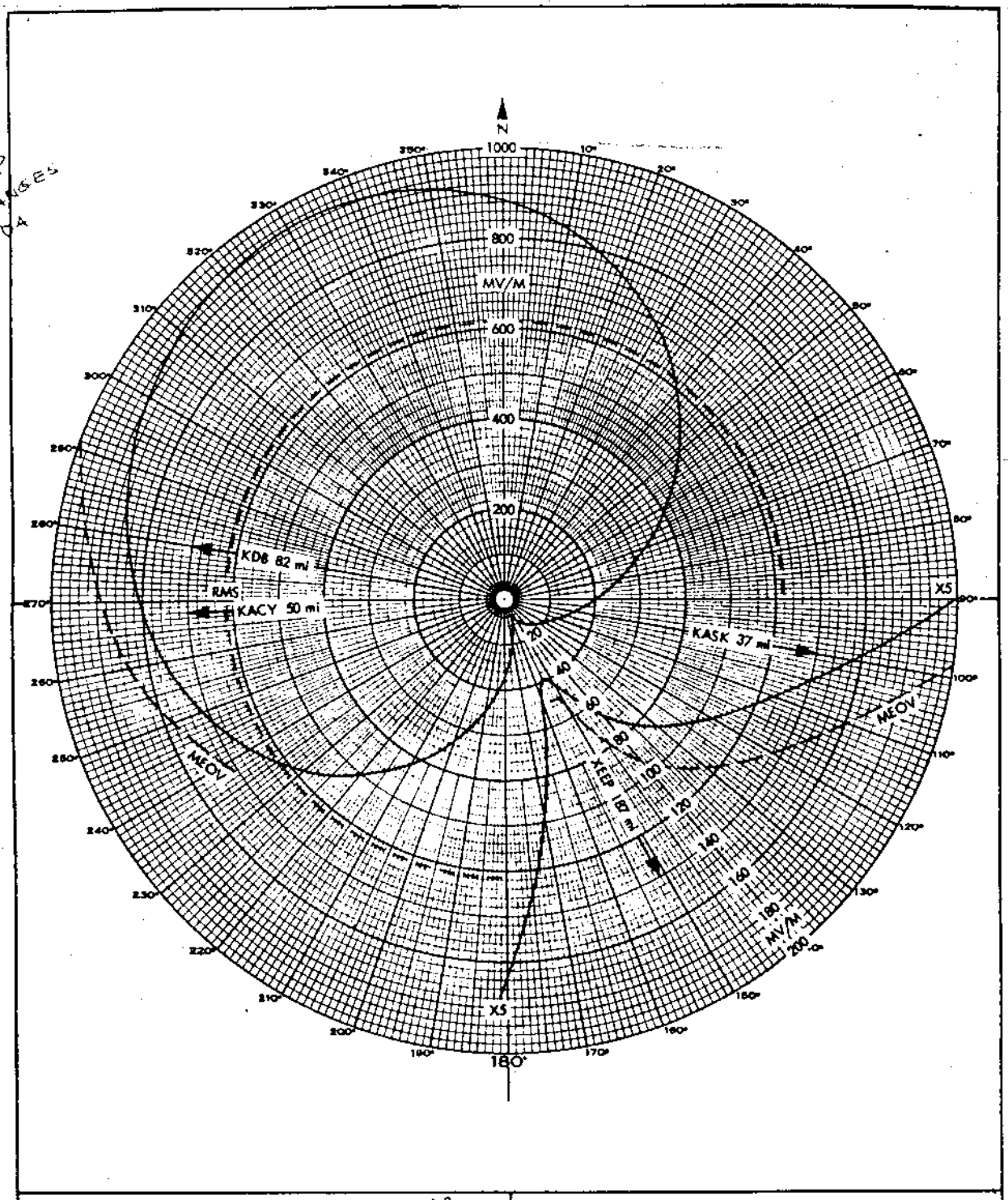
KROQ ~~KBBQ~~ ~~KBLA~~

Proposed Day
(8-26-66ct)

Station KBLA
Burbank, California

1kw,10kw-LS,DA-2,U
1500 kc

2-7-66
GRANTED CP
TO MAKE CHANGES
IN DAYTIME DA
SYSTEM.

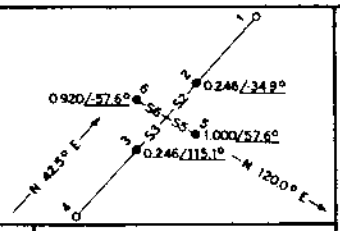


N. LAT. 34° 11' 47"
W. LONG 118° 15' 30"

S2 = S3 = 45.0° = 82.0 FT
S5 = S6 = 37.5° = 68.5 FT

G = 90° = 164 FT

RMS = 615 MV/M



HAMMETT & EDISON
CONSULTING RADIO ENGINEERS
SAN FRANCISCO

RADIO STATION KBLA
1500 KC. 1 KW. 10 KW-LS. DA-2
BURBANK, CALIFORNIA

650816

PROPOSED HORIZONTAL RADIATION DAYTIME

UNATTENUATED FIELD INTENSITY
AT ONE MILE

FIGURE 6

FCC File No.BP-17022
Accepted 8-5-66

Station KBLA
Burbank, California

1500 kc

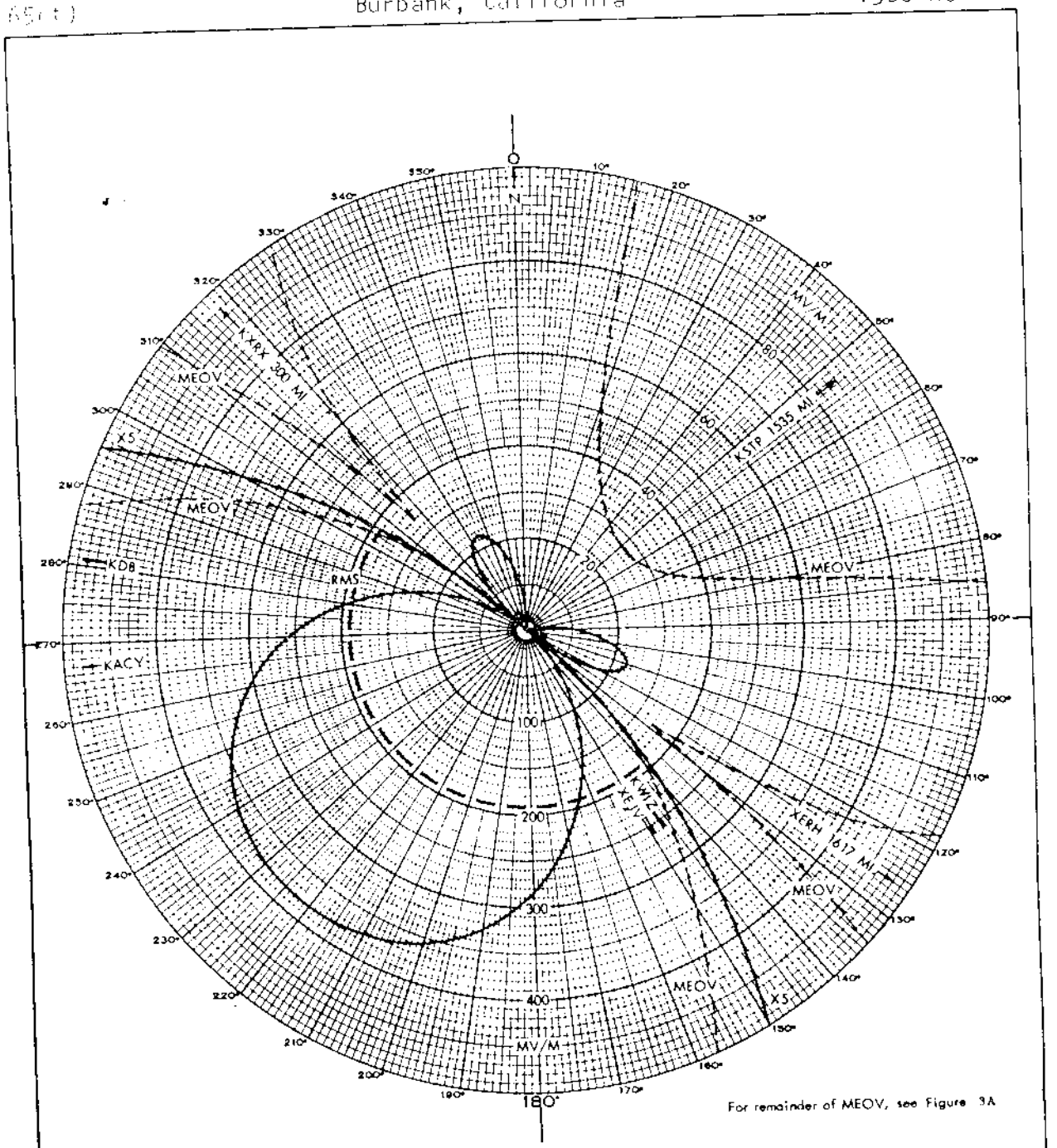
KBBQ ~~KBLA~~

Proposed Night
(2-24-65rt)

Station KBLA
Burbank, California

1kw,10kw-LS,DA-2,U
1500 kc

BMP-11425
CP 2-11-65



N LAT 34° 11' 47"
W LONG 118° 15' 30"

S = G = 90° = 164'
RMS = 192 MV/M

N42.5°E
1 • 1.0000/2.00°
2 • 2.3982/-117.17°
3 • 2.3982/117.17°
4 • 1.0000/-2.00°

PROPOSED HORIZONTAL RADIATION NIGHTTIME

UNATTENUATED FIELD INTENSITY AT ONE MILE

HAMMETT & EDISON
CONSULTING RADIO ENGINEERS
SAN FRANCISCO

RADIO STATION KBLA
1500 KC. 1 KW. 10 KW-LS. DA-2
BURBANK. CALIFORNIA

641212.1

Figure 3

FCC File No. BMP-11425
Accepted 2-11-65 Amended

Station KBLA
Burbank, California

1500 kc

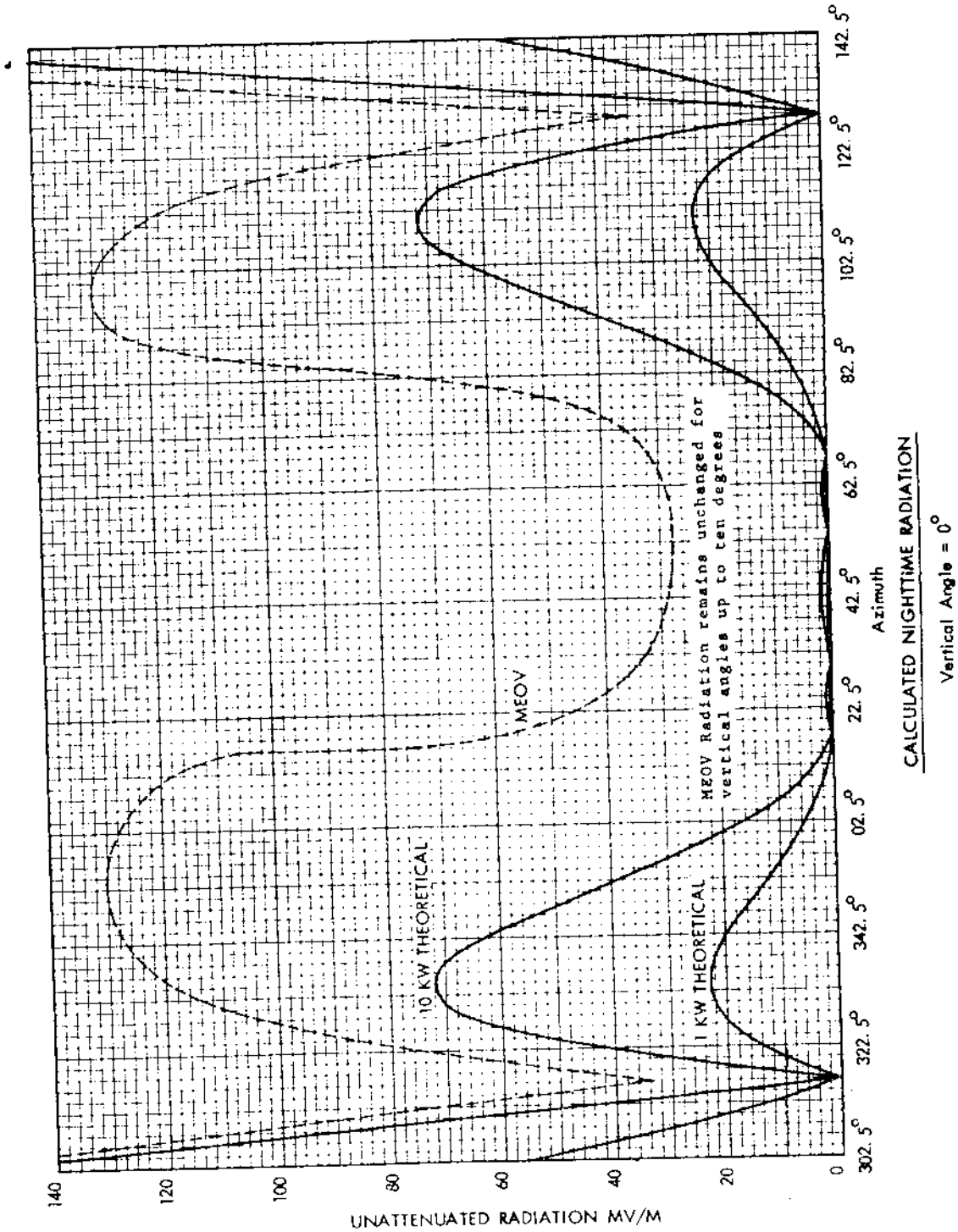
KROQ ~~KBBQ KBLA~~

Proposed Night Nulls
(2-24-65ct)

Station KBLA
Burbank, California

1kw,10kw-LS,DA-2,U
1500 kc

RADIO STATION KBLA



Hammett & Edison
Consulting Radio Engineers

641212.1

Figure 3A

FCC File No. BMP-11425
Accepted 2-11-65 Amended

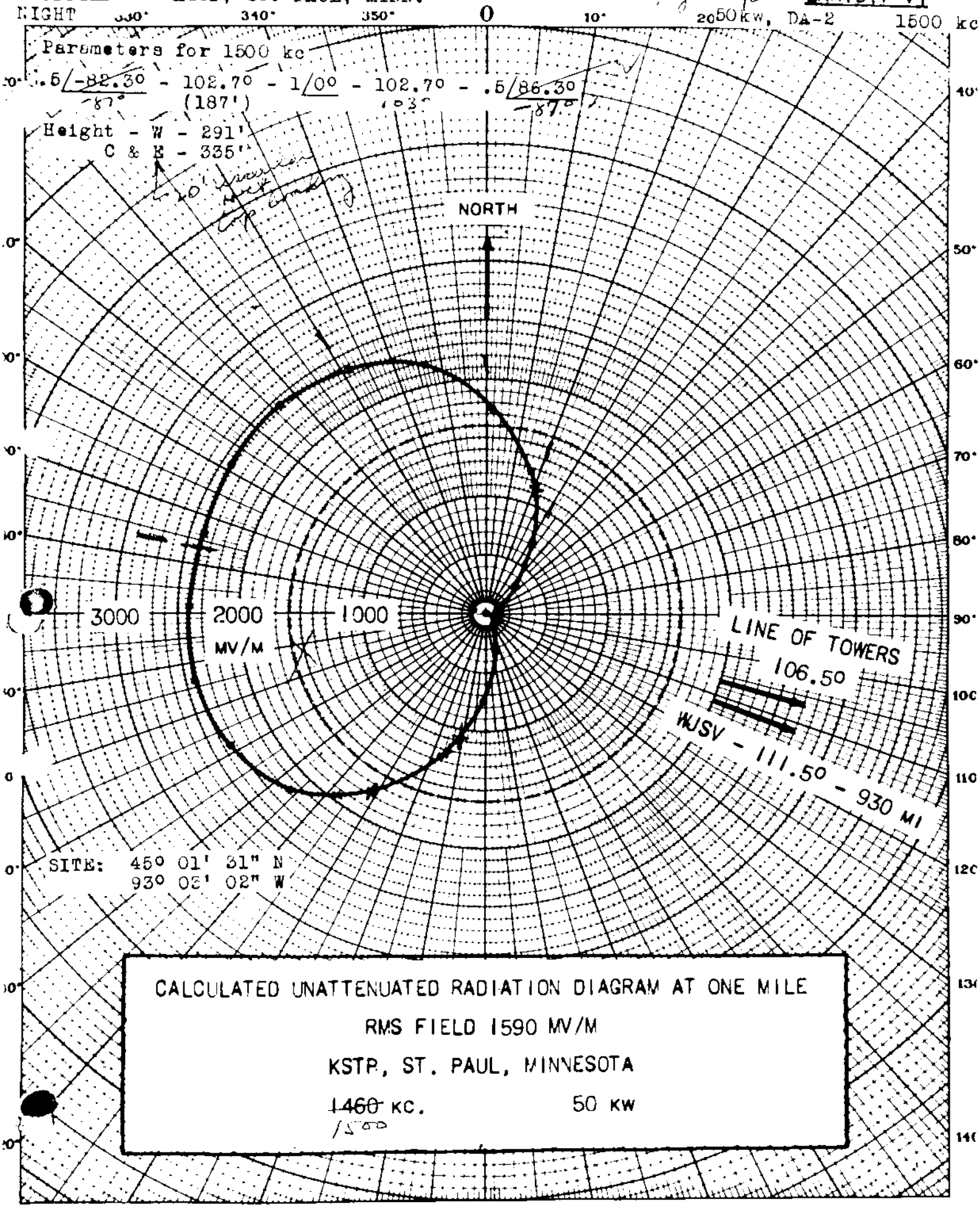
Station KBLA
Burbank, California

1500 kc

PROPOSED NIGHT KSTP, ST. PAUL, MINN. 50 kw, DA-2 1500 kc

KSTP

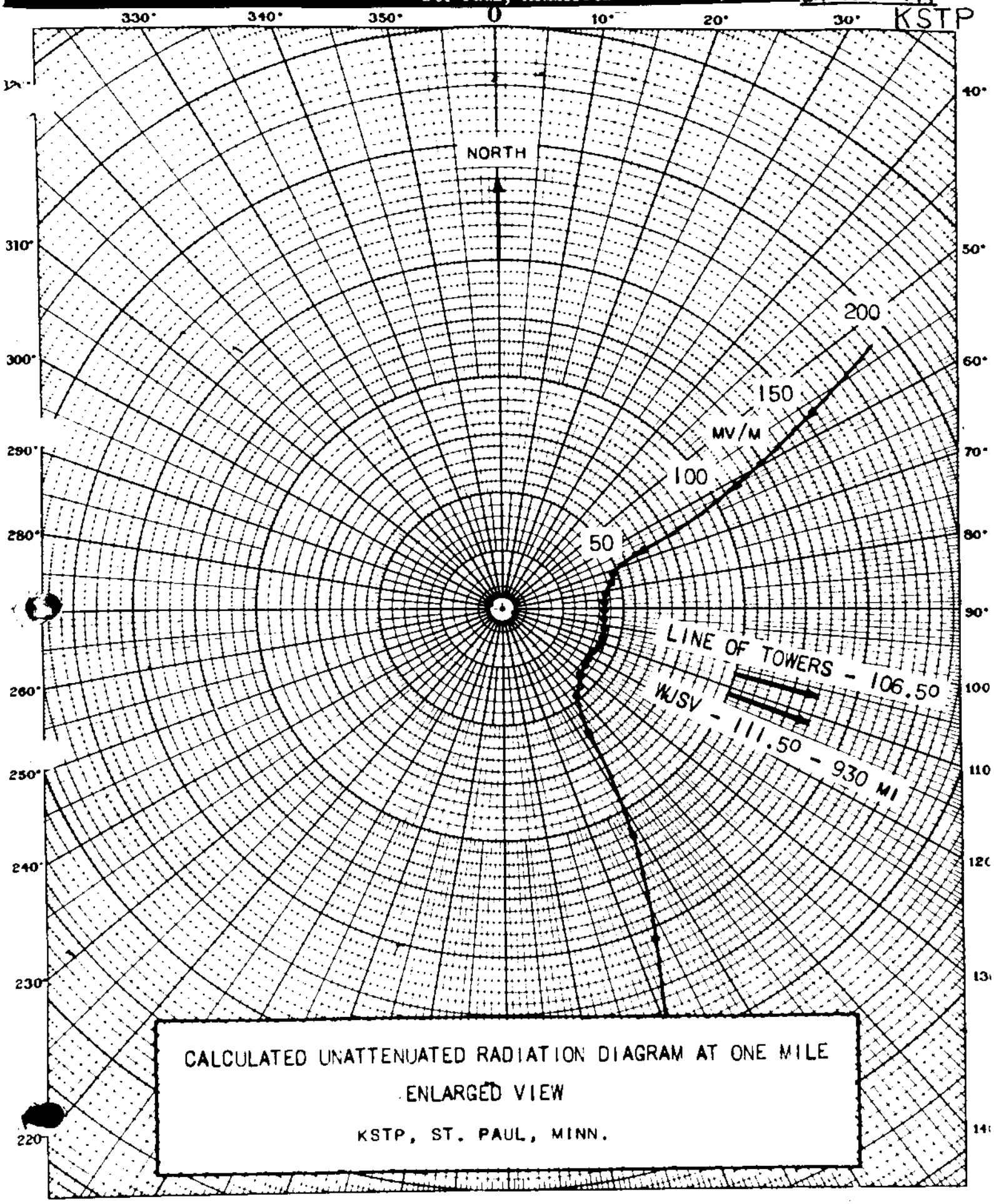
EXHIBIT VI



PROPOSED NIGHT NULLS Station KSTP St. Paul, Minnesota 50kw, DA-2,U 1500 KC

EXHIBIT VII

KSTP



KSTP, St. Paul, Minn. 1500 k

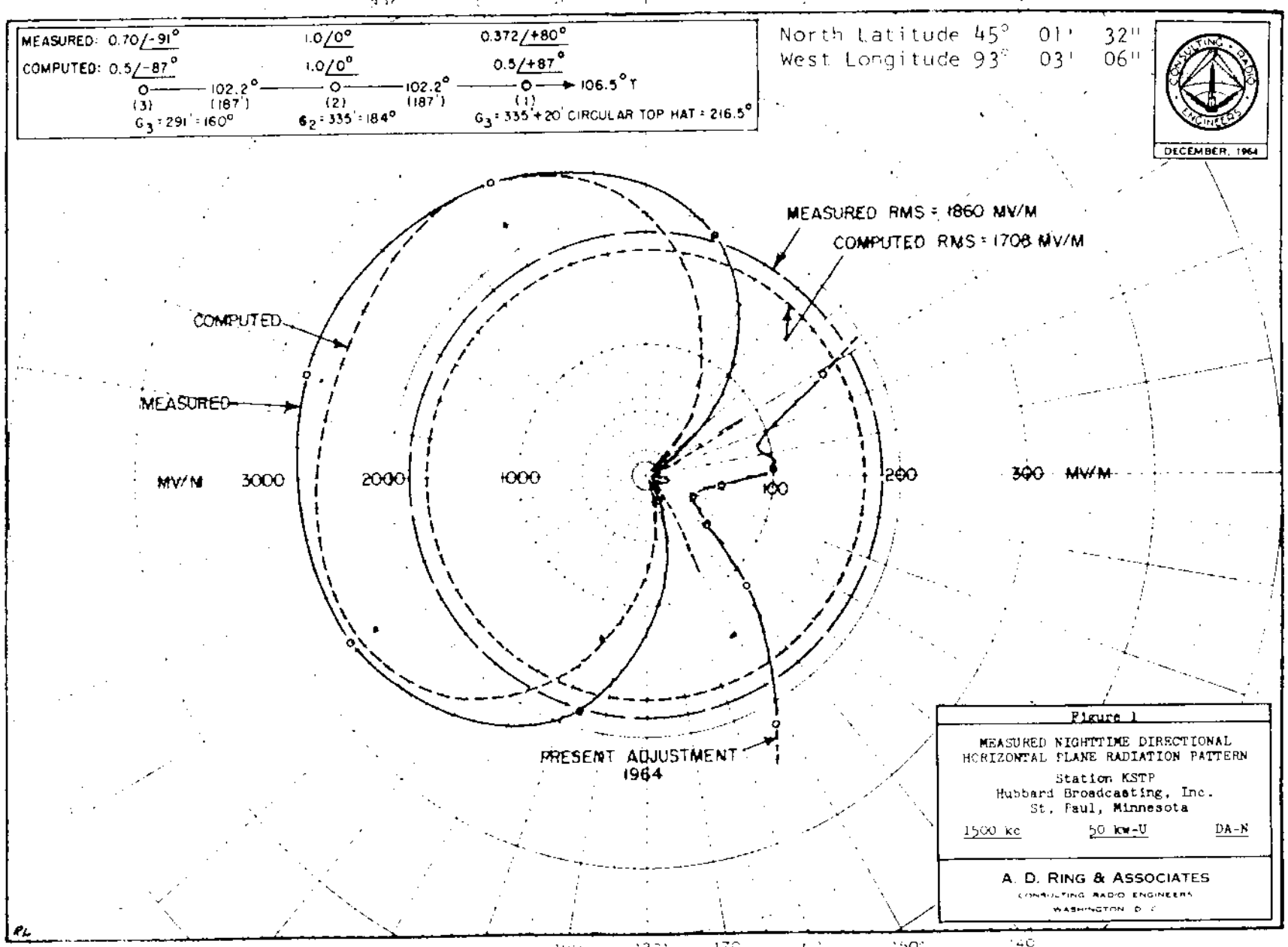
A. D. Ri

Measured Night
(8-27-65ct)

Station KSTP
St. Paul, Minnesota

50kw,DA-N,U
1500 kc

LIC 11-2-65



FCC File No.BZ-5648
Accepted 8-20-65

Station KSTP
St. Paul, Minnesota

1500 kc

KSTP

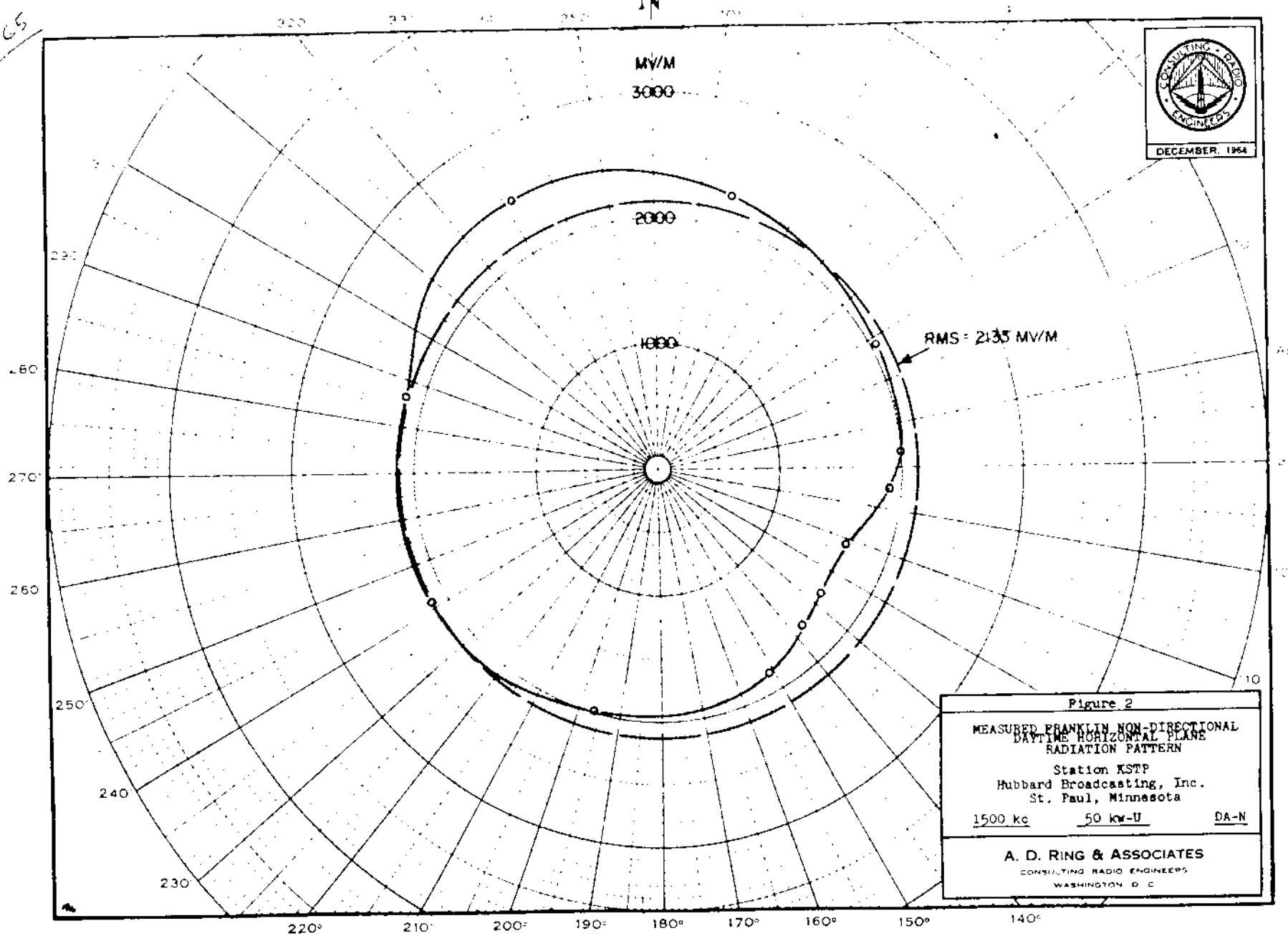
A. D. RING &

Measured Non-DA
(8-27-65ct)

Station KSTP
St. Paul, Minnesota

50kw, DA-N, U
1500 kc

LIC. 11-2-65



FCC File No.BZ-5648
Accepted 8-20-65

Station KSTP
St. Paul, Minnesota

1500 kc

KSTP

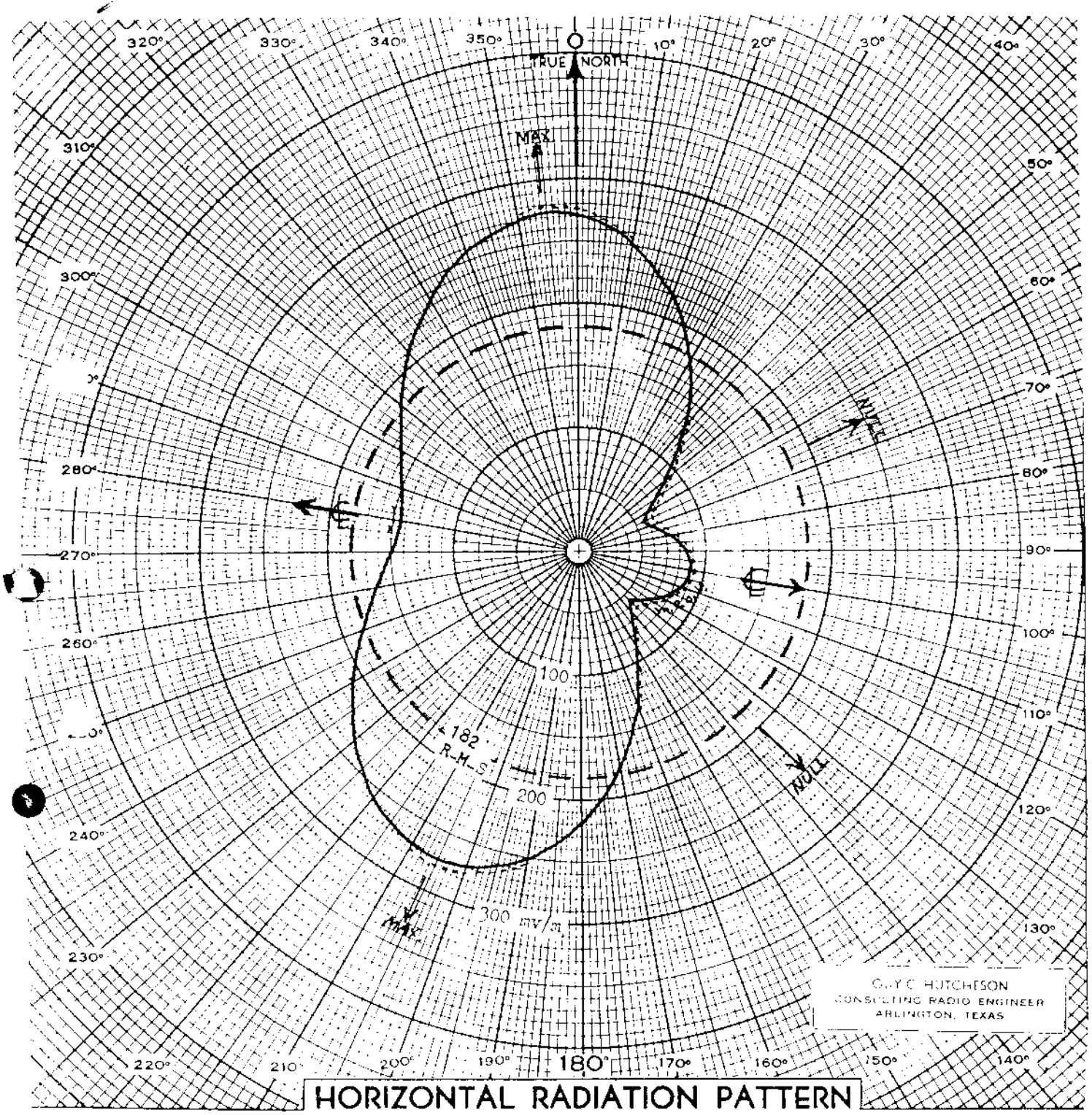
KTXO

Proposed Day
(6-28-67ct)

Station KTXO
Sherman, Texas

1kw,DA-D,D
1500 kc

OVER



HORIZONTAL RADIATION PATTERN

#2 WEST ANTENNA LAYOUT
0.65 /-45°
#1 EAST
1 / 0°
280° 165° 300 FT. 100°

KTXO — Station
SHERMAN, TEXAS — Location
33° 41' 30", 96° 33' 22"
1500 kc — Frequency
1 KW DA-D — Power
PROPOSED CALCULATED DAYTIME PATTERN

G'_R = 145 FT. = 79.6°

Fig. 1

FCC File No.BP-17679
Accepted 6-9-67

Station KTXO
Sherman, Texas

1500 kc

KXRX

Proposed Night
(6-28-65ct)

Station KXRX
San Jose, California

5kw,10kw-LS,DA-2,U
1500 kc

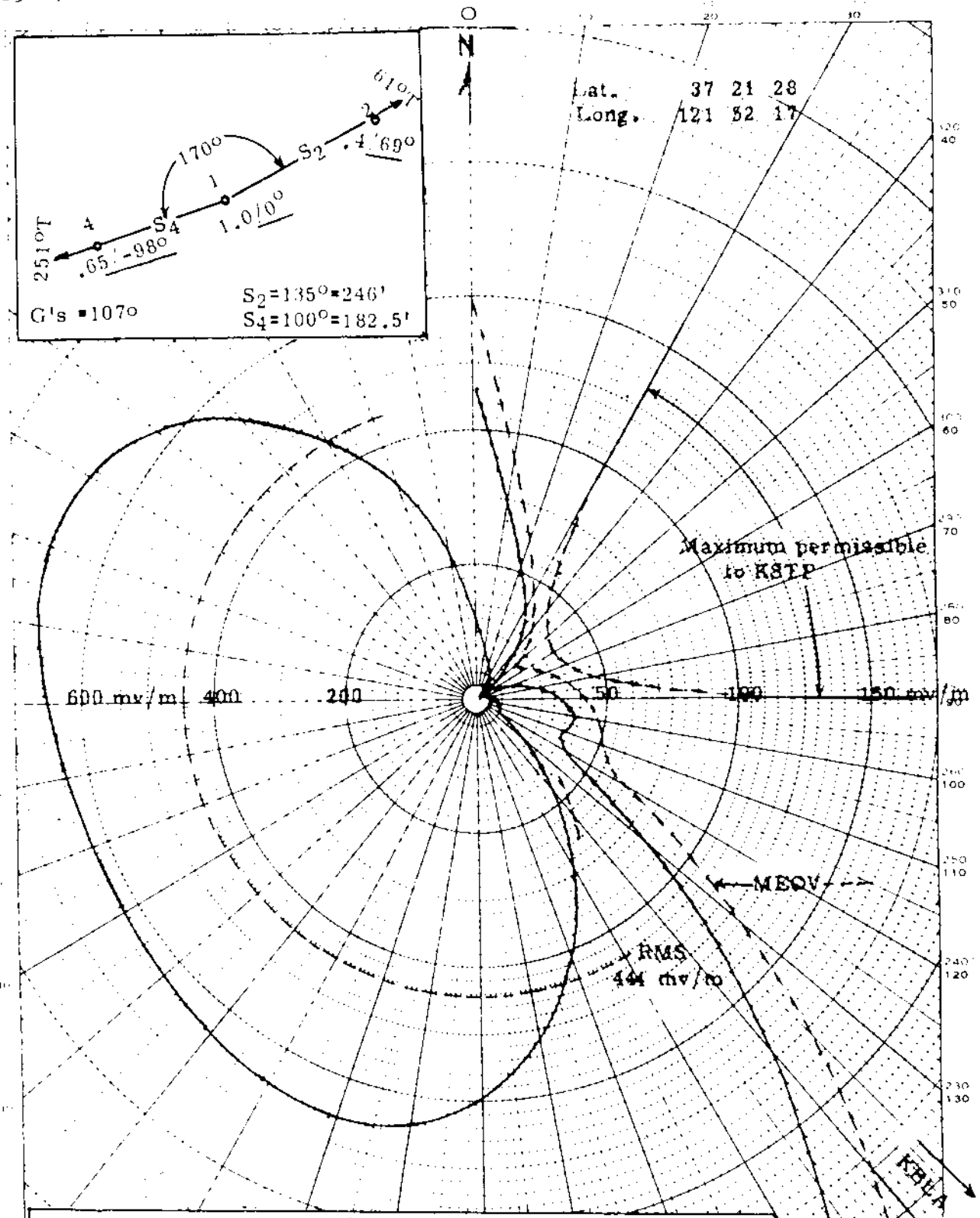


FIG. 5

PROPOSED NIGHTTIME HORIZONTAL RADIATION
KXRX 1500 KC 5.0 KW San Jose, California

A.E.Towne Associates Inc., Radio Engineering Consultants, San Francisco, Calif.

FCC File No. BP-16616
Accepted 6-18-65

Station KXRX
San Jose, California

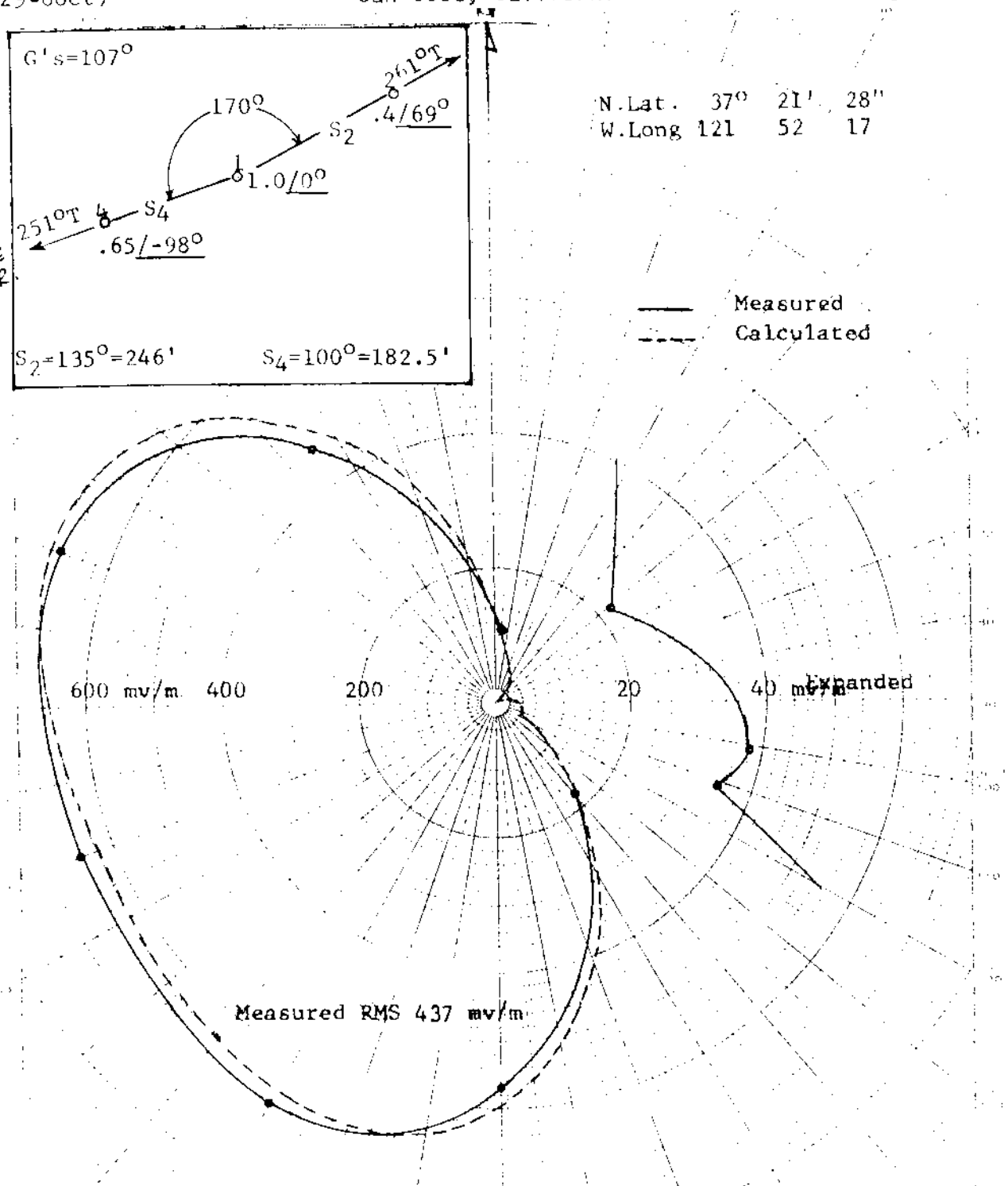
1500 kc

KXRX

Measured Night
(12-29-66ct)

Station KXRX
San Jose, California

5kw,10kw-LS,DA-2,U
1500 kc



12-15-66
GRANTED LICENSE COVERING INCREASE IN POWER

FIG. 2

MEASURED NIGHTTIME HORIZONTAL RADIATION

KXRX 1500 KC 5.0 KW DA-2

A.E.Towne Assoc.Inc., Radio Eng. Consultants, San Carlos,Calif.

FCC File No.BL-11443
Accepted 12-5-66

Station KXRX
San Jose, California

1500 kc

KXRX

1 Day
ct)

Station KXRX
San Jose, California

5kw,10kw-LS,DA-2,U
1500 kc

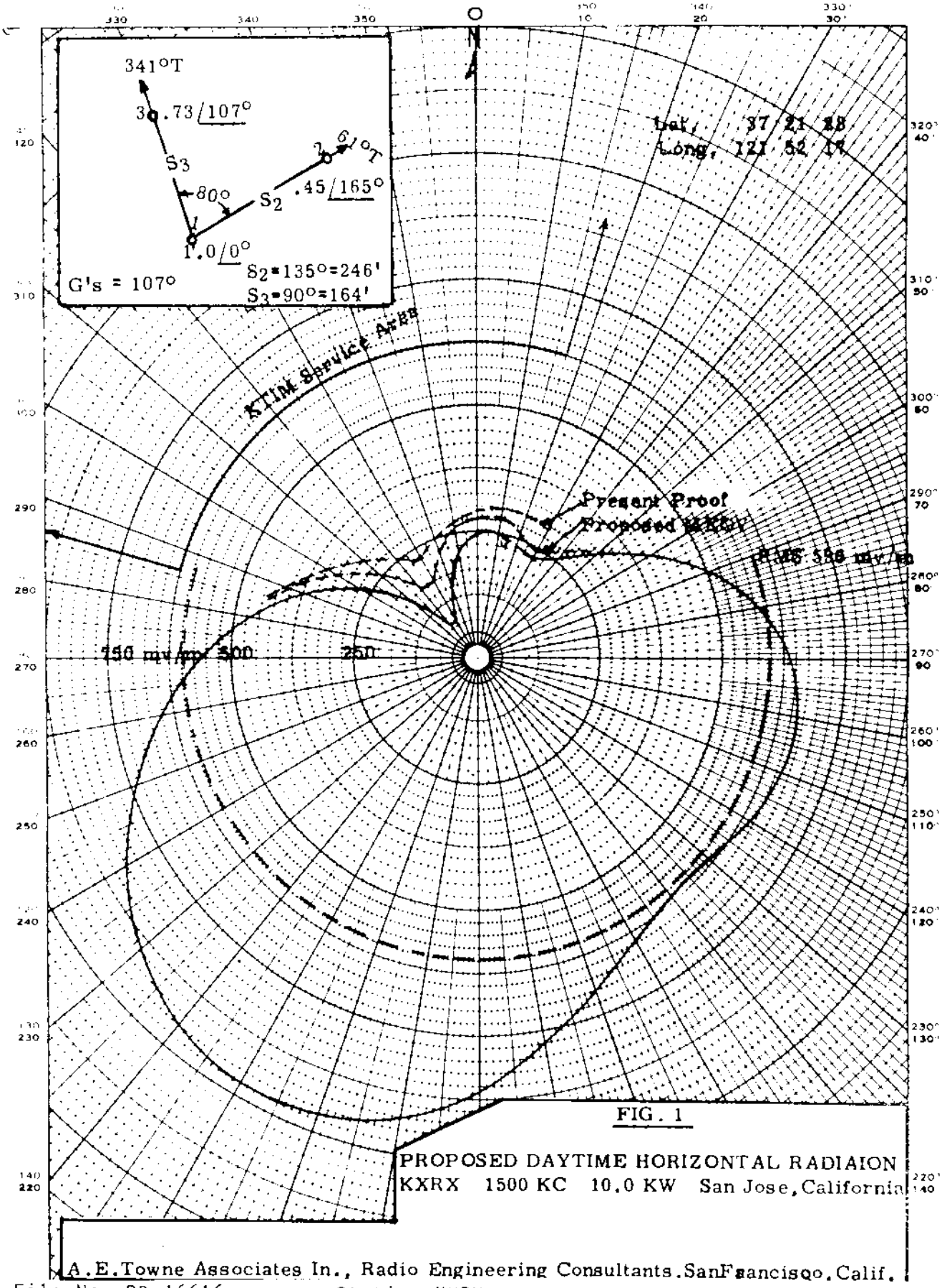


FIG. 1

PROPOSED DAYTIME HORIZONTAL RADIAION
KXRX 1500 KC 10.0 KW San Jose, California

A.E.Towne Associates In., Radio Engineering Consultants.SanFsancisqo.Calif.

FCC File No. BP-16616
Accepted 6-18-65

Station KXRX
San Jose, California

1500 kc

KXRX

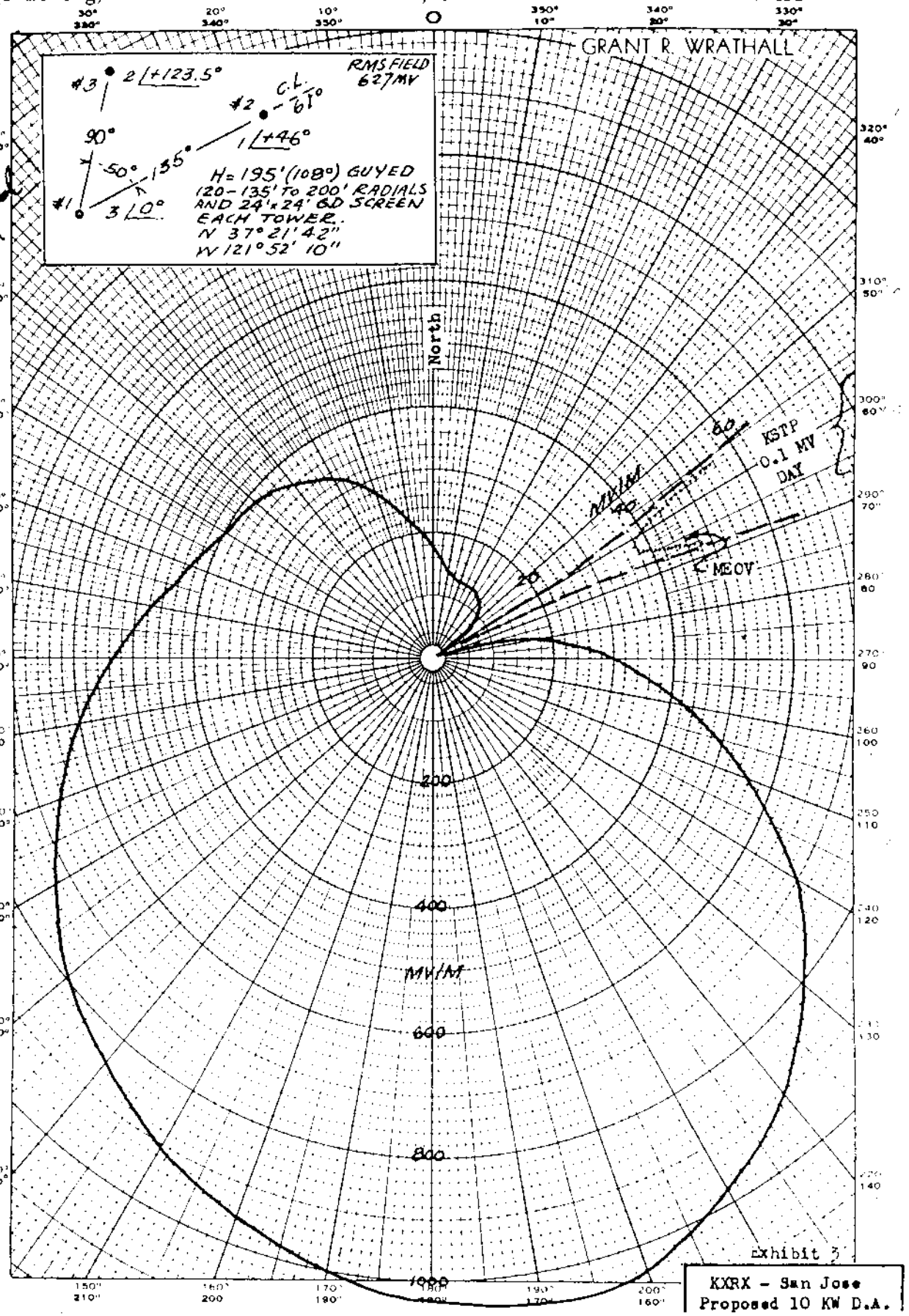
PROPOSED DAY
(3-26-58g)

Station KXRX
San Jose, California

1kw,10kw-LS, DA-2,U
1500 KC

12-7-60 granted CP for DA-2

3-8-62 granted CP for increase in day power and changes in day DA system.



FCC File No. BP-10,483
Accepted 3-21-58 (Amended)

KXRX
San Jose, California

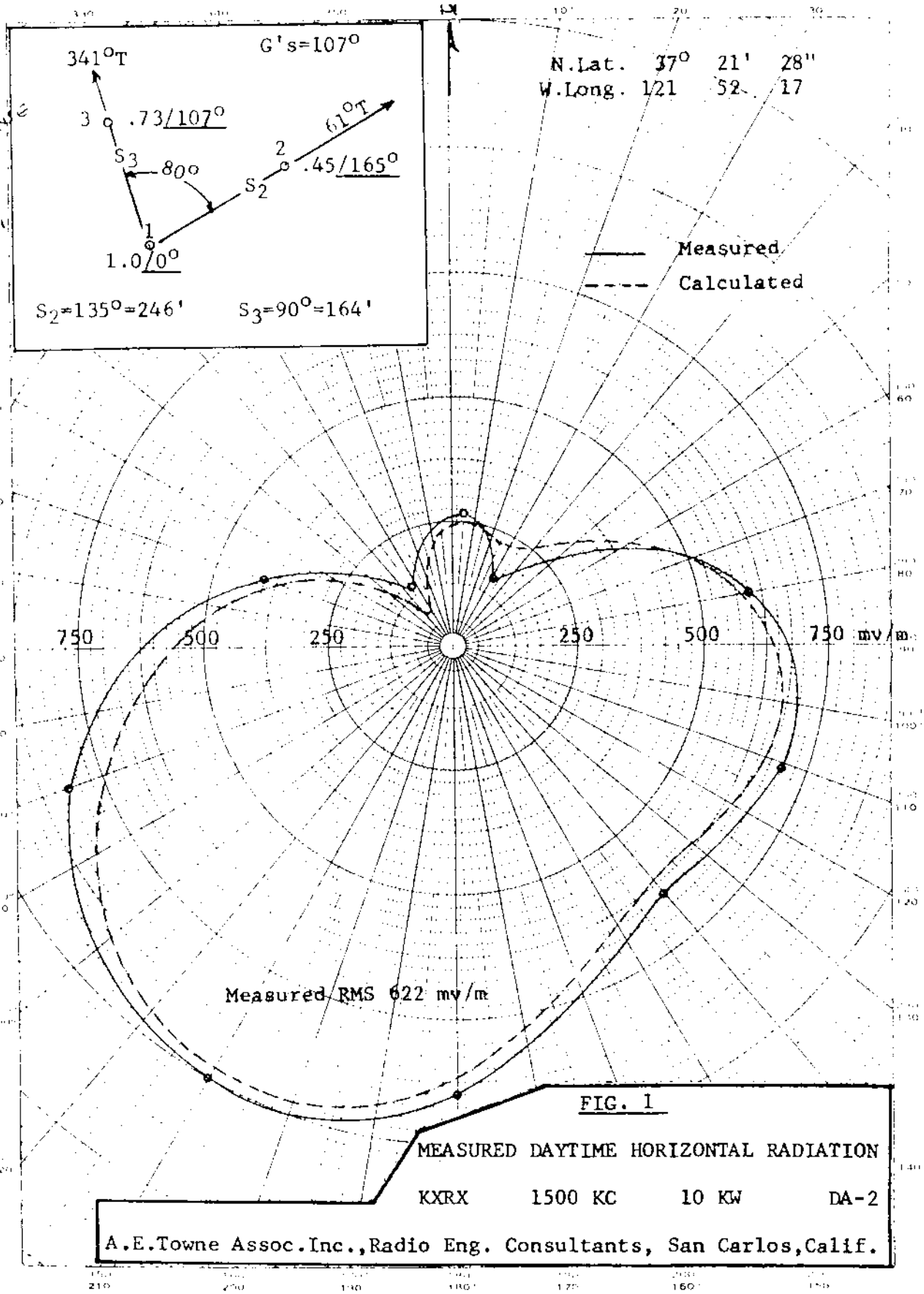
1500 KC

KXRX

Measured Day
(12-29-66ct)

Station KXRX
San Jose, California

5kw,10kw-LS,DA-2,U
1500 kc



12-15-66
GRANTED LICENSE
COVERING
INCREASE
IN POWER

FIG. 1

MEASURED DAYTIME HORIZONTAL RADIATION

KXRX 1500 KC 10 KW DA-2

A.E.Towne Assoc.Inc.,Radio Eng. Consultants, San Carlos,Calif.

FCC File No.BL-11443
Accepted 12-5-66

Station KXRX
San Jose, California

1500 kc

KXRX

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

Station KXRX
San Jose, California

5kw,10kw-LS,DA-2,U
1500 kc

12-15-66
GRANTED LICENSE
COVERING
INCREASE
IN POWER

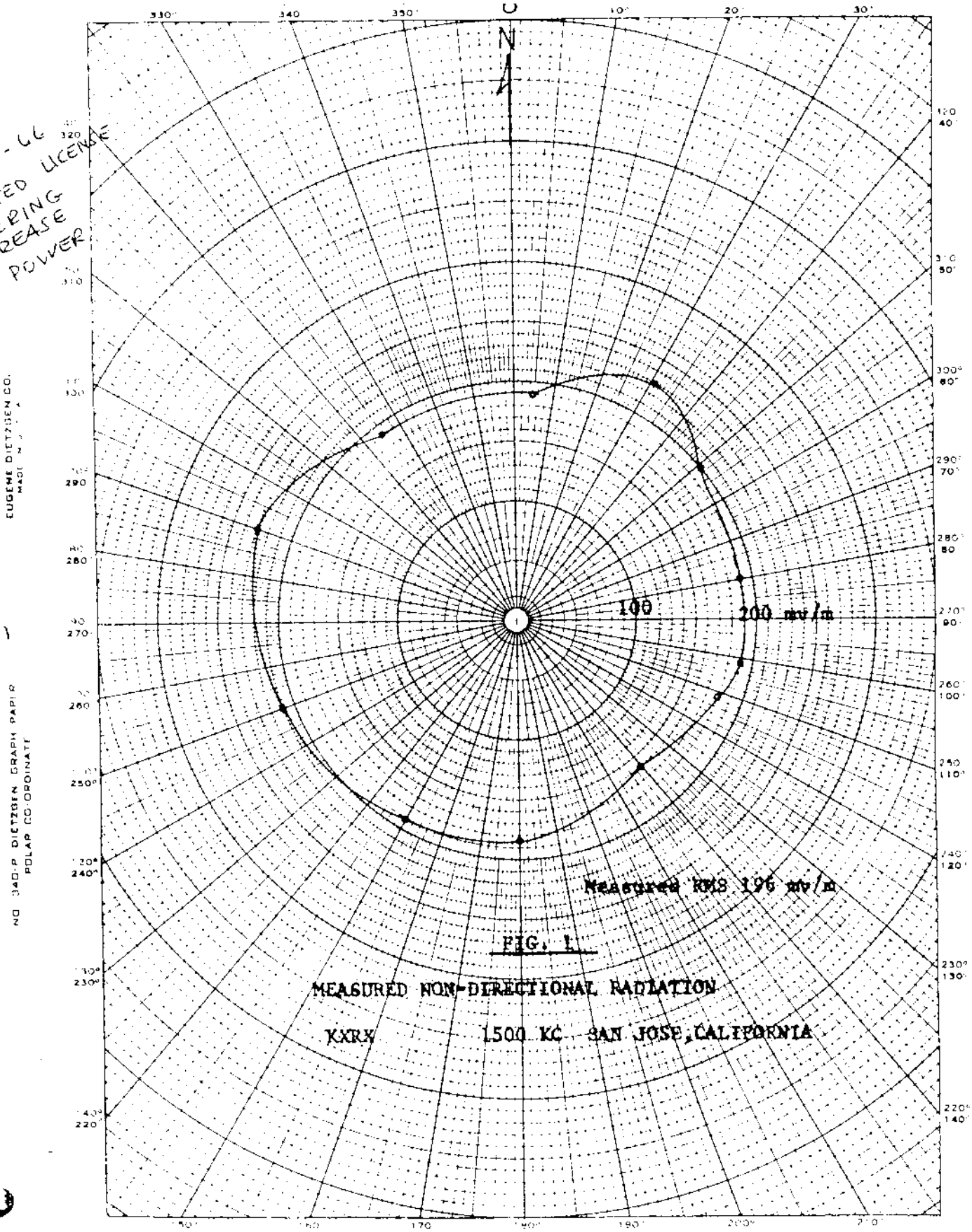


FIG. 1

MEASURED NON-DIRECTIONAL RADIATION

KXRX 1500 KC SAN JOSE, CALIFORNIA

FCC File No.BL-11443
Accepted 12-5-66

Station KXRX
San Jose, California

1500 kc

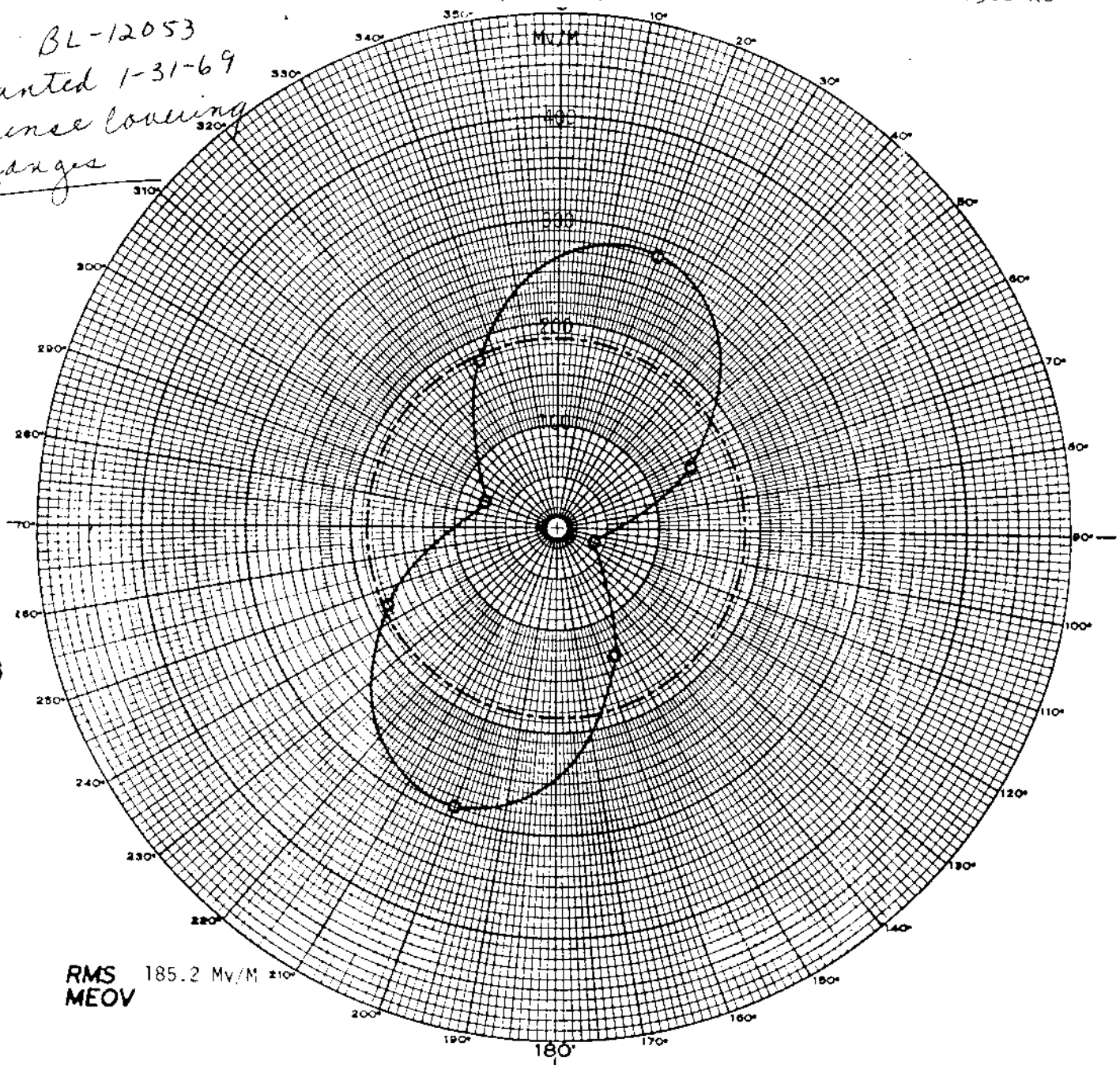
WAKE

Measured Day
(8-28-68ct)

BL-12053
Granted 1-31-69
License covering
changes

Station WAKE
Valparaiso, Indiana

1kw, DA-D, D
1500 kc



RMS 185.2 Mv/M ±10%
MEOV

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 2A	STATION DATA
G's = 106.5° S = 160° #1 3.79/0° S #2 1/1° 110° T	TOWER No. / ELECTRICAL HEIGHT θ° / SPACING S° / PHASING ψ° / FIELD RATIO F 1 2 3 4 5 6 7 8 9 10 DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐	MEASURED DAYTIME DIRECTIONAL PATTERN * * * * * * * JUNE 1968 PROOF θ° 0°	CALL WAKE FREQ 1500 kHz POWER 1 Kw TYPE DA TIME DAYTIME LAT. 41-26-36 LONG. 87-02-54 E.H. MUNN, JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No. BL-12053
Accepted 8-16-68

Station WAKE
Valparaiso, Indiana

1500 kc

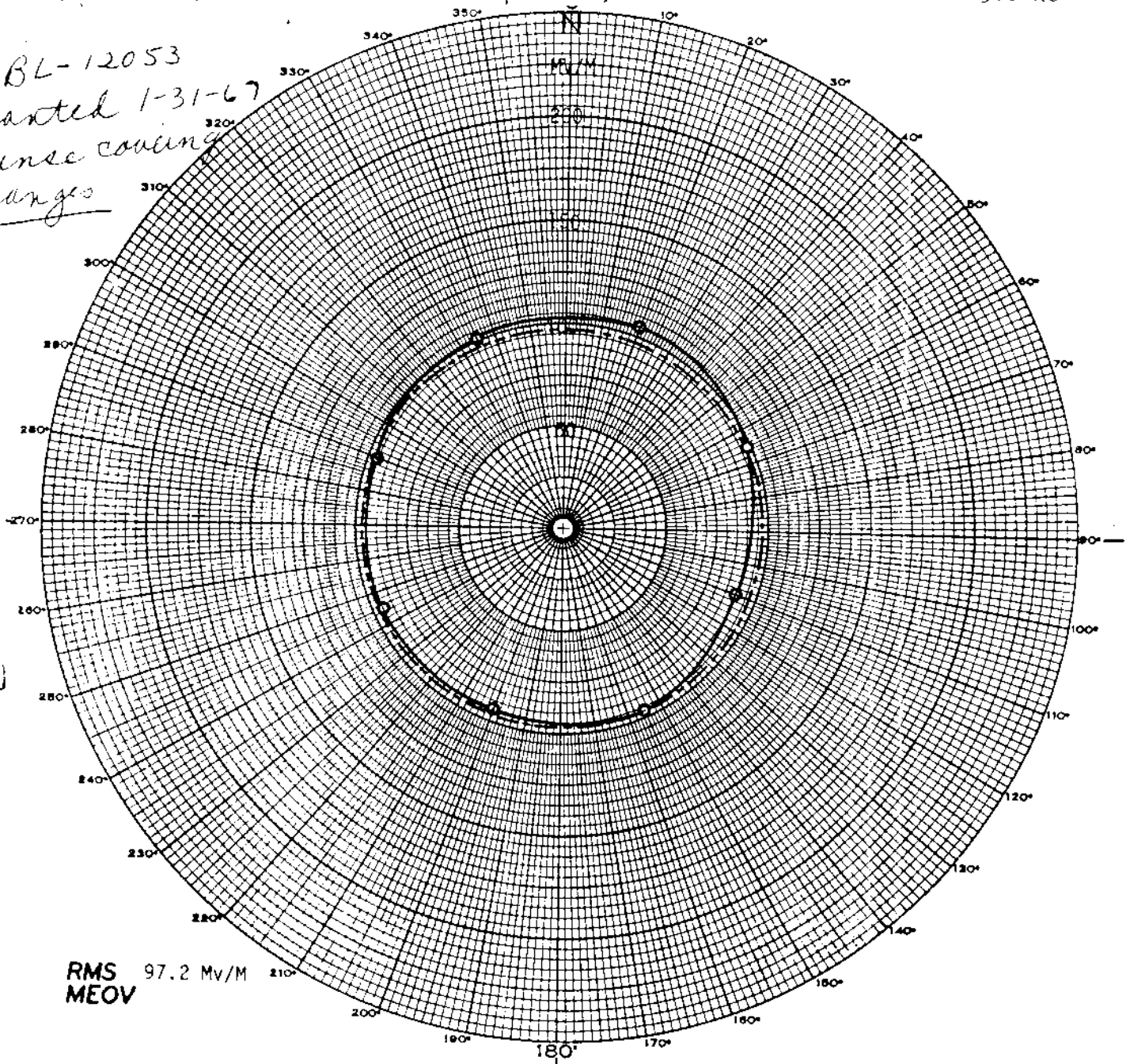
WAKE

Measured Non-DA
(8-28-68ct)

Station WAKE
Valparaiso, Indiana

1kw, DA-D, D
1500 kc

BL-12053
Granted 1-31-69
license covering
changes



RMS 97.2 Mv/M
MEOV

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 2	STATION DATA
G's = 106.5° S = 160° No. 1 S No. 2 (NC) 110° T	TOWER No. / ELECTRICAL HEIGHT θ° / SPACING δ° / PHASING ψ° / FIELD RATIO r 1 2 3 4 5 6 7 8 9 10 DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐	MEASURED NON-DA RADIATION PATTERN USING WEST TOWER * * * * * * JUNE 1968 PROOF θ° 0°	CALL WAKE FREQ 1500 kHz POWER 0.25 Kw TYPE NDA TEST TIME DAYTIME LAT. 41-26-36 LONG. 87-02-54 E.H. MUNN, JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No. BL-12053
Accepted 8-16-68

Station WAKE
Valparaiso, Indiana

1500 kc

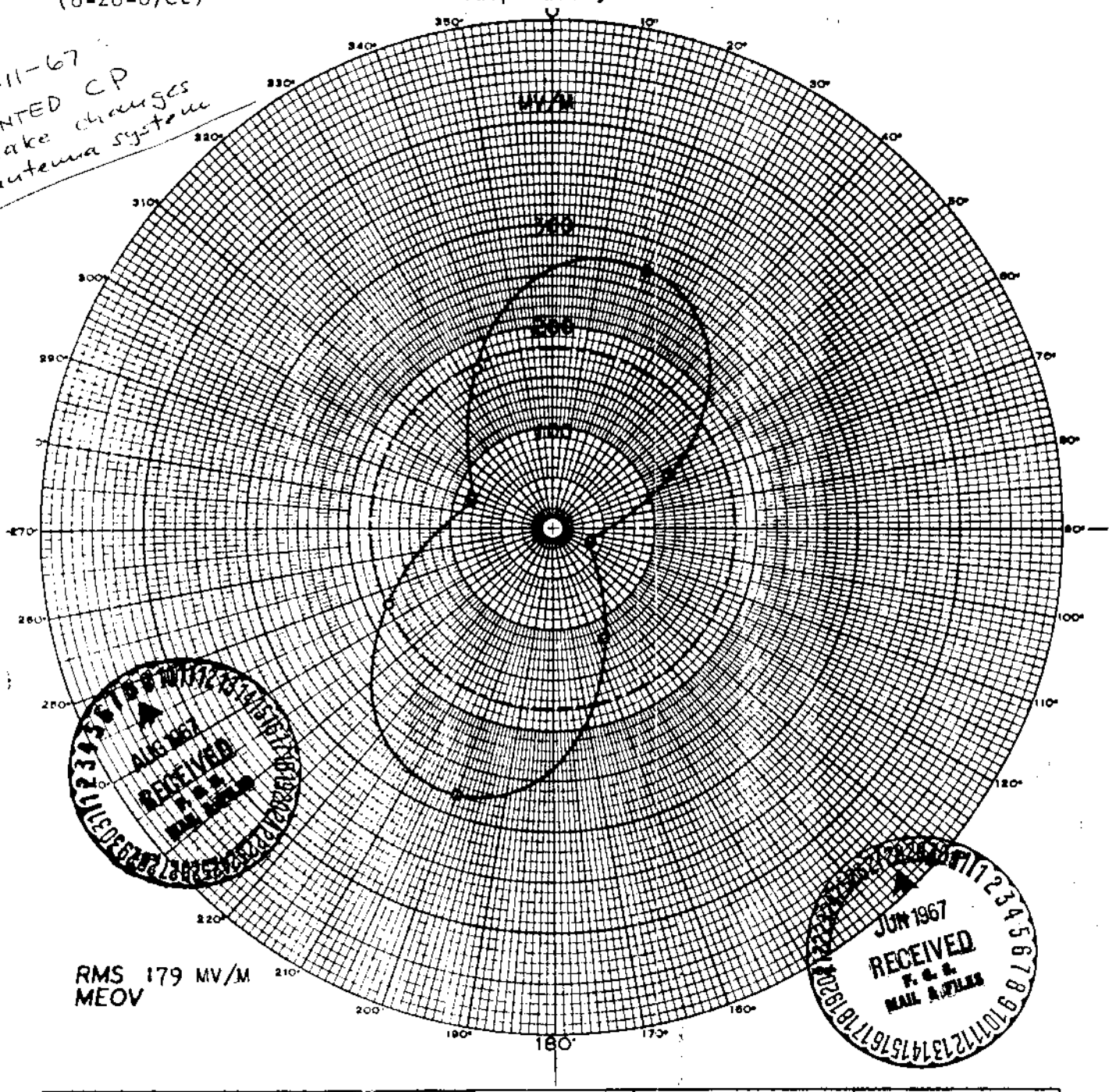
WAKE

MEASURED
~~Proposed~~ Day
(8-28-67ct)

Station WAKE
Valparaiso, Indiana

1kw,DA-D,D
1500 kc

8-11-67
GRANTED CP
to make changes
in antenna system



RMS 179 MV/M
MEOV

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 2	STATION DATA
S= 160° G's =106.5° No. 1 0.837/0° S No. 2 1/3°	TOWER No. / ELECTRICAL HEIGHT θ° / SPACING d° / PHASING ψ° / FIELD RATIO r 1 2 3 4 5 6 7 8 9 10 DAYTIME OPERATION ■ NIGHTTIME OPERATION □	MEASURED DAYTIME DIRECTIONAL 1964 TOWER HEIGHT CHANGES 6/67 θ°	CALL WAYK FREQ 1500 kc/s POWER 1 Kw TYPE DA-D TIME DAY LAT. 41-26-36 LONG. 87-02-54 E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BP-17813
Accepted 8-11-67

Station WAKE
Valparaiso, Indiana

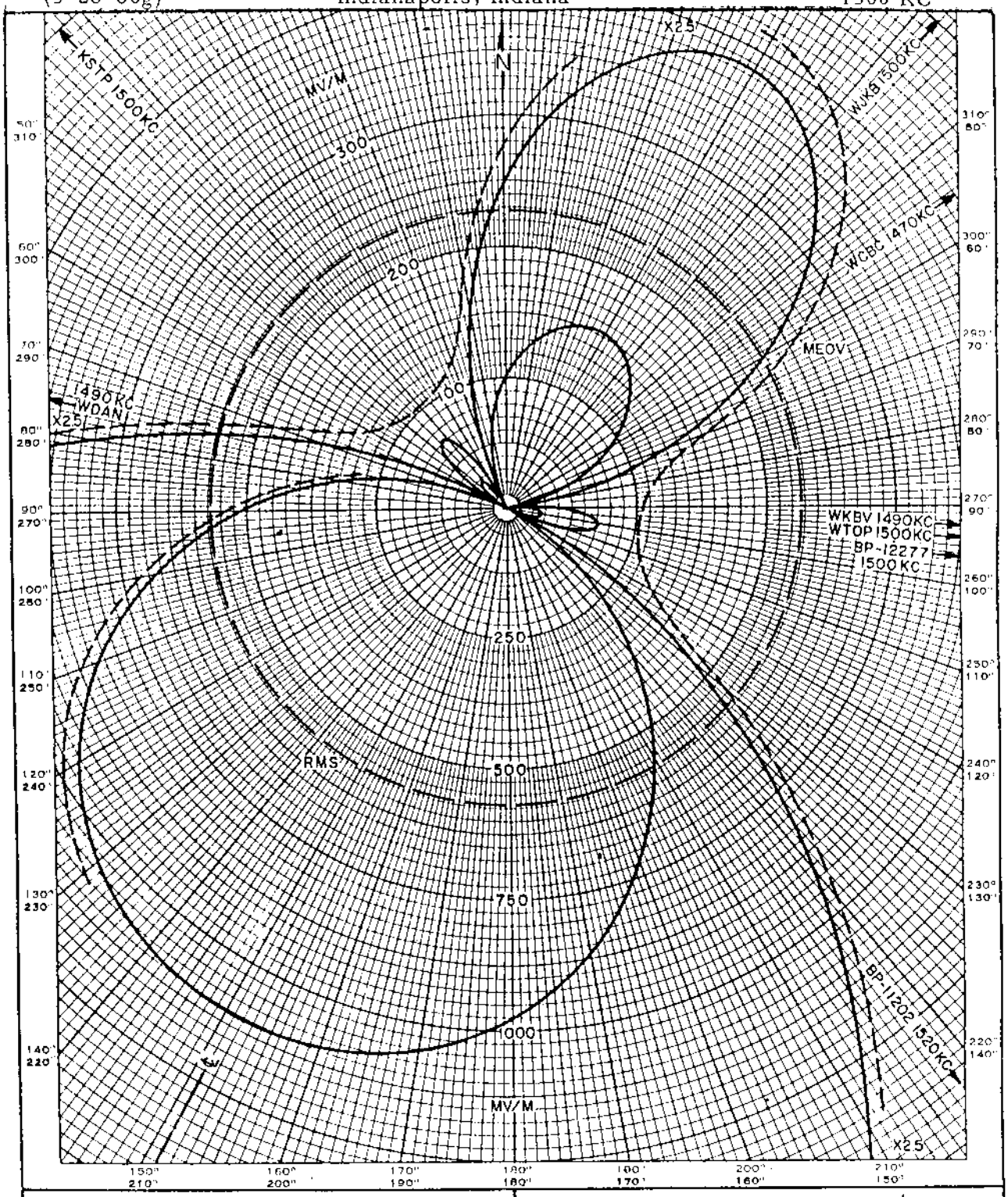
1500 kc

INDIANAPOLIS, IND. WBRI

PROPOSED DAY
(3-28-60g)

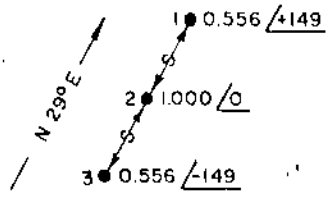
New; Radio One Five Hundred, Inc.
Indianapolis, Indiana

10kw, DA-D,D
1500 KC



N. LAT. 39° 52' 14"
W. LONG. 86° 05' 17"

S = 100° = 182'
G = 90° = 164'
RMS = 570 MV/M



HAMMETT & EDISON
CONSULTING RADIO ENGINEERS
SAN FRANCISCO

NEW RADIO STATION
1500 KC, 10 KW, DA-D
INDIANAPOLIS, INDIANA

HORIZONTAL RADIATION PATTERN
DAYTIME

UNATTENUATED FIELD INTENSITY
AT ONE MILE

591210

FIGURE 5B

FCC File No. BP-13922
Accepted 3-7-60

Radio One Five Hundred, Incorporated
Indianapolis, Indiana

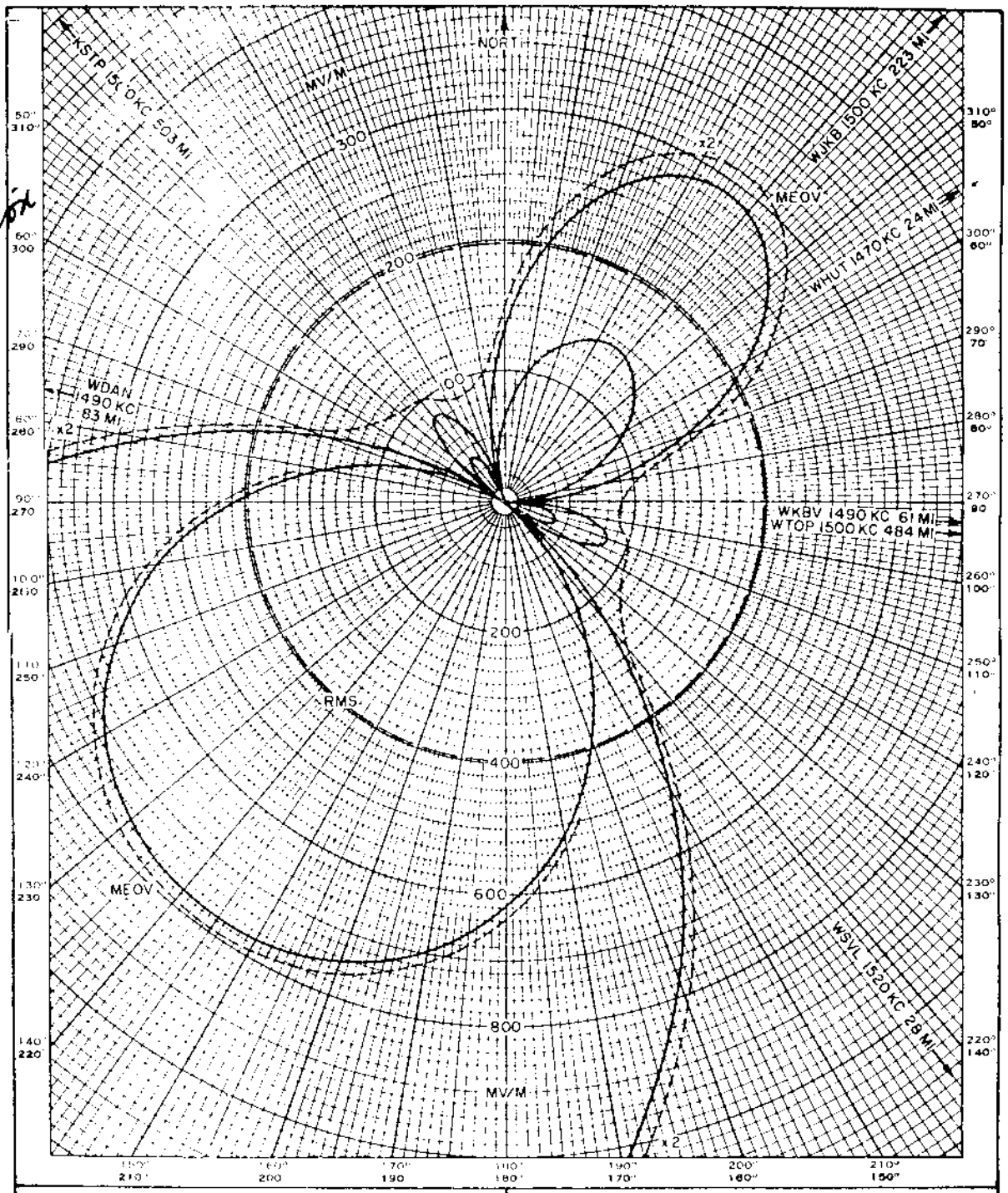
1500 KC

W.BRI

Proposed Day
(10-26-62ct)

New; Radio One Five Hundred, Inc. 5kw,DA-D,D
Indianapolis, Indiana 1500 kc

1/23/63
granted CP
for new station



S=100°=182'

G=90°=164'

RMS=395 MV/M

N LAT 39° 52' 14"
W. LONG. 86° 05' 17"

N36°E

1 0.593 /+152.5

2 1.000/0

3 0.593 /-152.5

HORIZONTAL RADIATION PATTERN
DAYTIME

UNATTENUATED FIELD INTENSITY
AT ONE MILE

HAMMETT & EDISON
CONSULTING RADIO ENGINEERS
SAN FRANCISCO

NEW RADIO STATION
1500 KC, 5 KW, DA-D
INDIANAPOLIS, INDIANA

611222

FIGURE 5B

FCC File No. BP-13922
Accepted 10-15-62 Amended

New; Radio One Five Hundred, Inc.
Indianapolis, Indiana 1500 kc

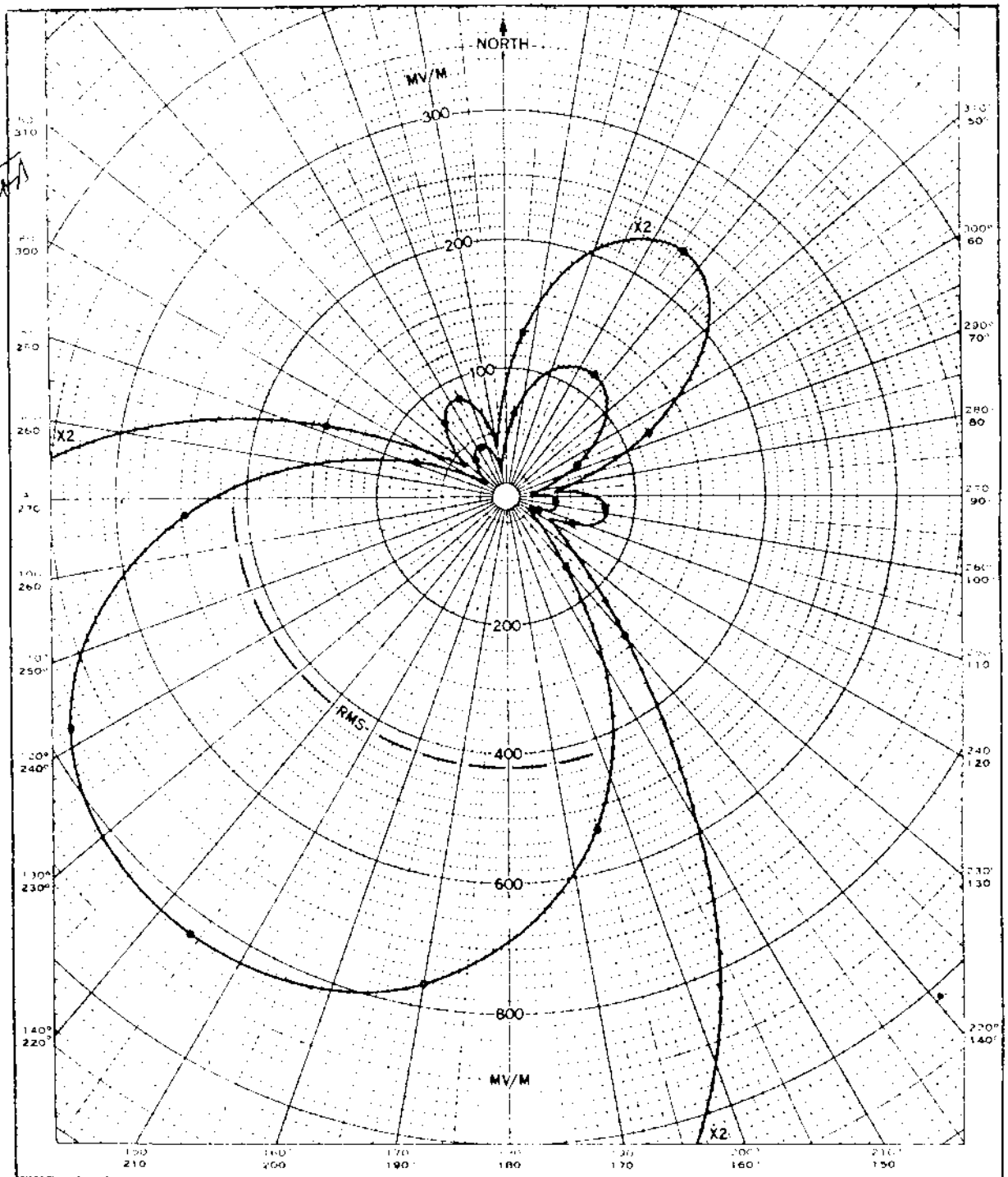
W.BR 1

Measured Day
(5-28-64ct)

Station WNDY
Indianapolis, Indiana

5kw,DA-D,D
1500 kc

#200
8-19-64
granted L.
for new station



THEORETICAL	OPERATING
1 0.593 /+152.5°	1 0.636 /+154.0°
2 1.000 /0°	2 1.000 /0°
3 0.593 /-152.5°	3 0.630 /-144.5°
N36°E, S, S	N36°E, S, S

N. LAT. 39° 52' 14"
W. LONG. 86° 05' 17"

RMS=422 MV/M

S=100°=182'
G=90°=164'

HAMMETT & EDISON
CONSULTING RADIO ENGINEERS
SAN FRANCISCO

RADIO STATION WNDY
1500 KC. 5 KW. DA-D
INDIANAPOLIS, INDIANA

MEASURED
DIRECTIONAL
HORIZONTAL RADIATION PATTERN

UNATTENUATED FIELD INTENSITY AT ONE MILE

631202

FIGURE 10B

FCC File No.BL-10535
Accepted 4-28-64

Station WNDY
Indianapolis, Indiana

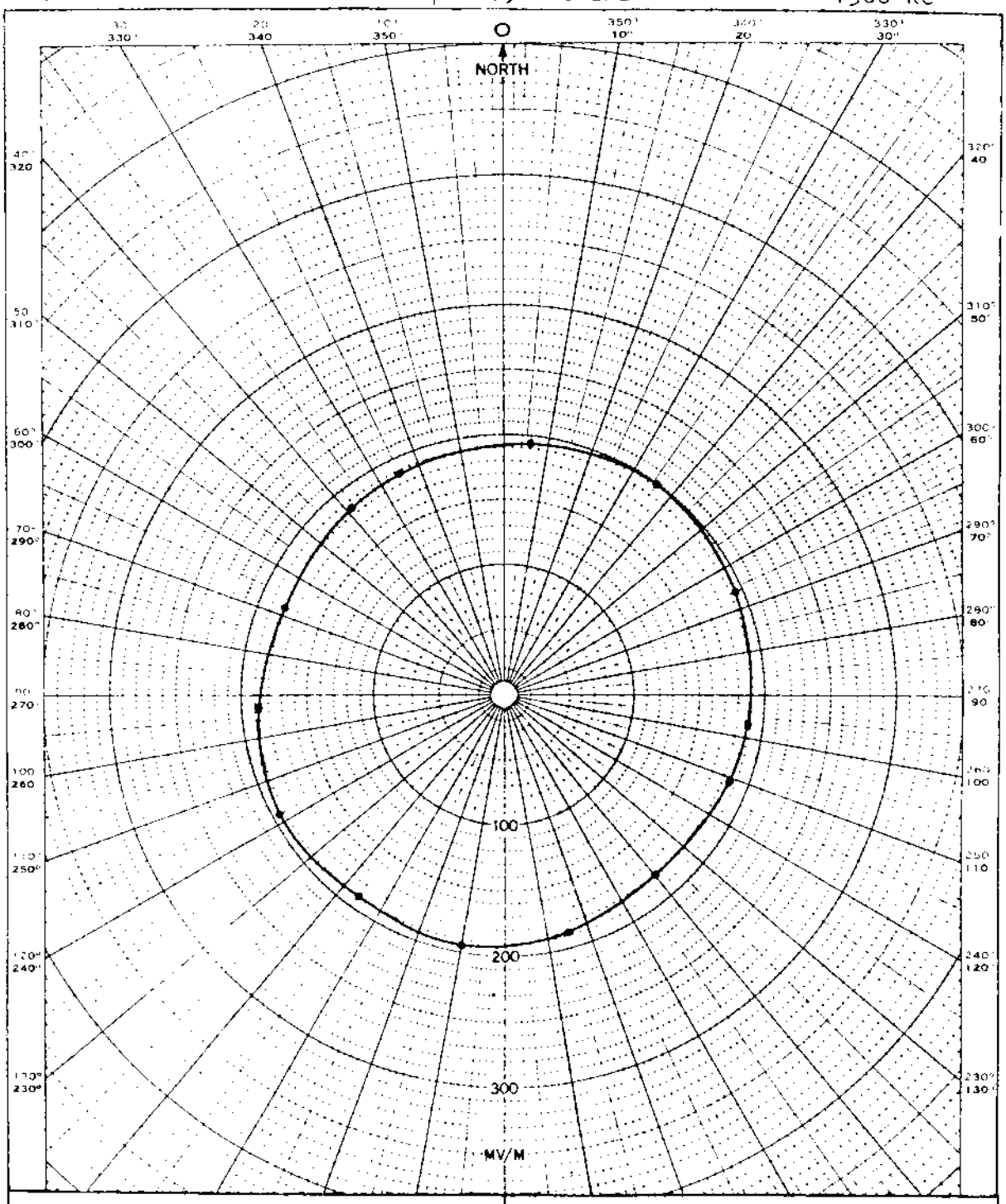
1500 kc

W.BR11

Measured Non-DA
(5-28-64ct)

Station WNDY
Indianapolis, Indiana

5kw,DA-D,D
1500 kc



N LAT 39° 52' 14"
W. LONG 86° 05' 17"

G=90°=164'

RMS=188 MV/M

1 KW INTO TOWER 2 WITH TOWERS 1 & 3 FLOATING

HAMMETT & EDISON
CONSULTING RADIO ENGINEERS
SAN FRANCISCO

RADIO STATION WNDY
1500 KC. 5 KW. DA-D
INDIANAPOLIS. INDIANA

MEASURED

NON-DIRECTIONAL

HORIZONTAL RADIATION PATTERN

UNATTENUATED FIELD INTENSITY AT ONE MILE

631202

FIGURE 10A

FCC File No.BL-10535
Accepted 4-28-64

Station WNDY
Indianapolis, Indiana

1500 kc

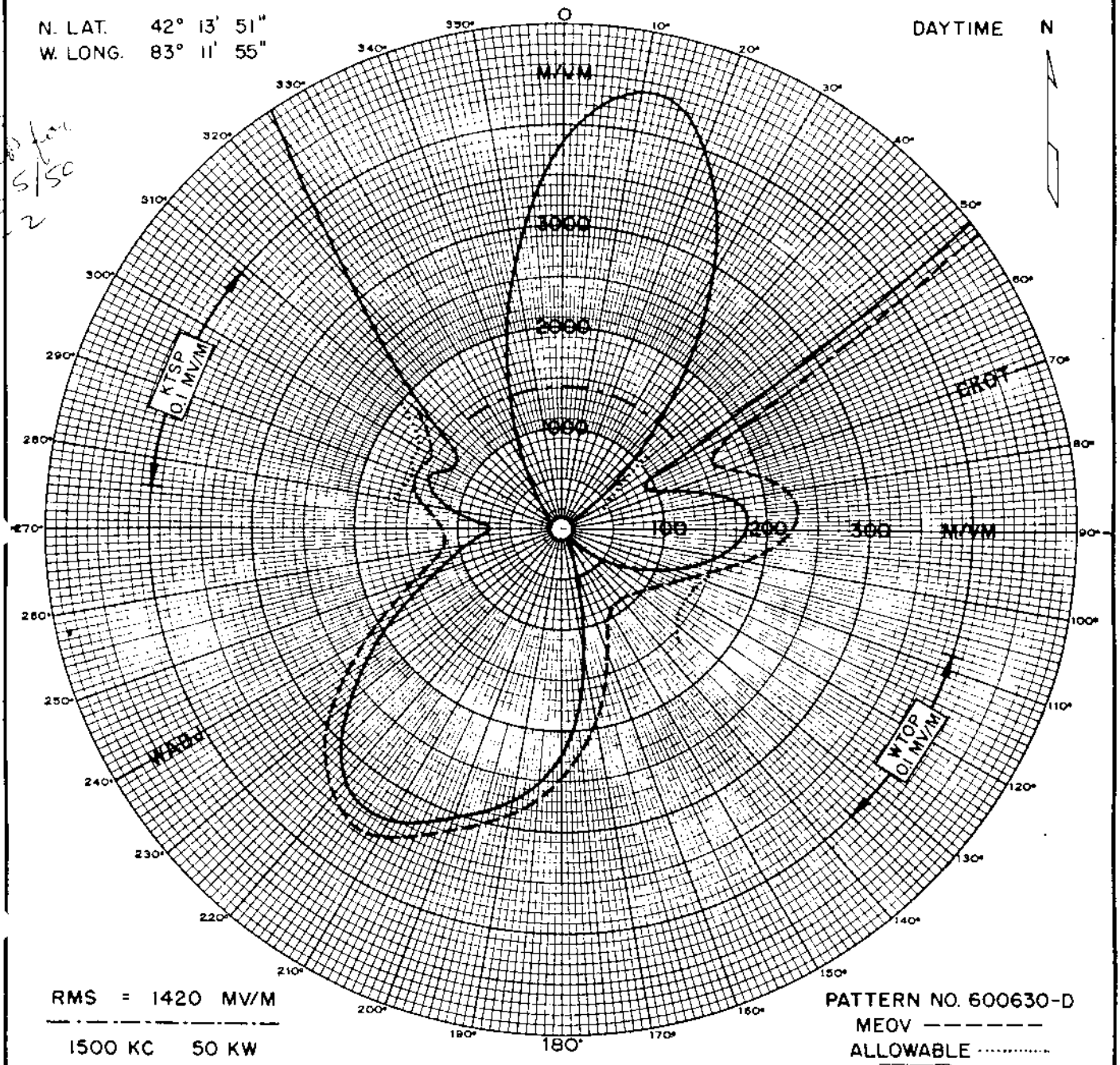
WDEE

PROPOSED DAY
(8-29-60g)

Station WJBK 5kw, 50kw-L.
Detroit, Michigan 1500 KC

N. LAT. 42° 13' 51"
W. LONG. 83° 11' 55"

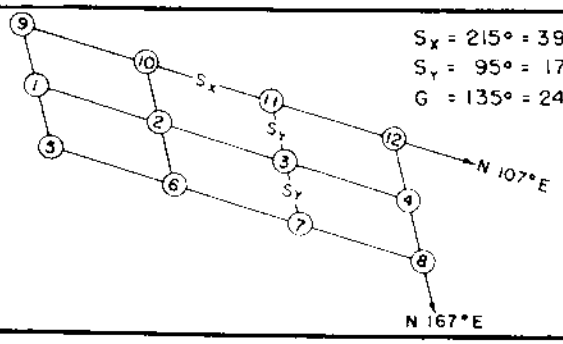
DAYTIME



RMS = 1420 MV/M

1500 KC 50 KW

PATTERN NO. 600630-D
MEOV ------
ALLOWABLE .....



10	11	12
0.375 | -226	0.514 | -207.4	0.176 | -194
2	**3**	**4**
1.185 | -109	1.625 | -90.4	0.555 | -77
6	**7**	**8**
1.000 | +0	1.371 | +18.6	0.468 | +32

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

RADIO STATION WJBK
DETROIT, MICHIGAN
600630.2 FIGURE 6A

FCC File No. BP-14275
Accepted 8-10-60 (was BP-13959)

WJBK
Detroit, Michigan 1500 KC

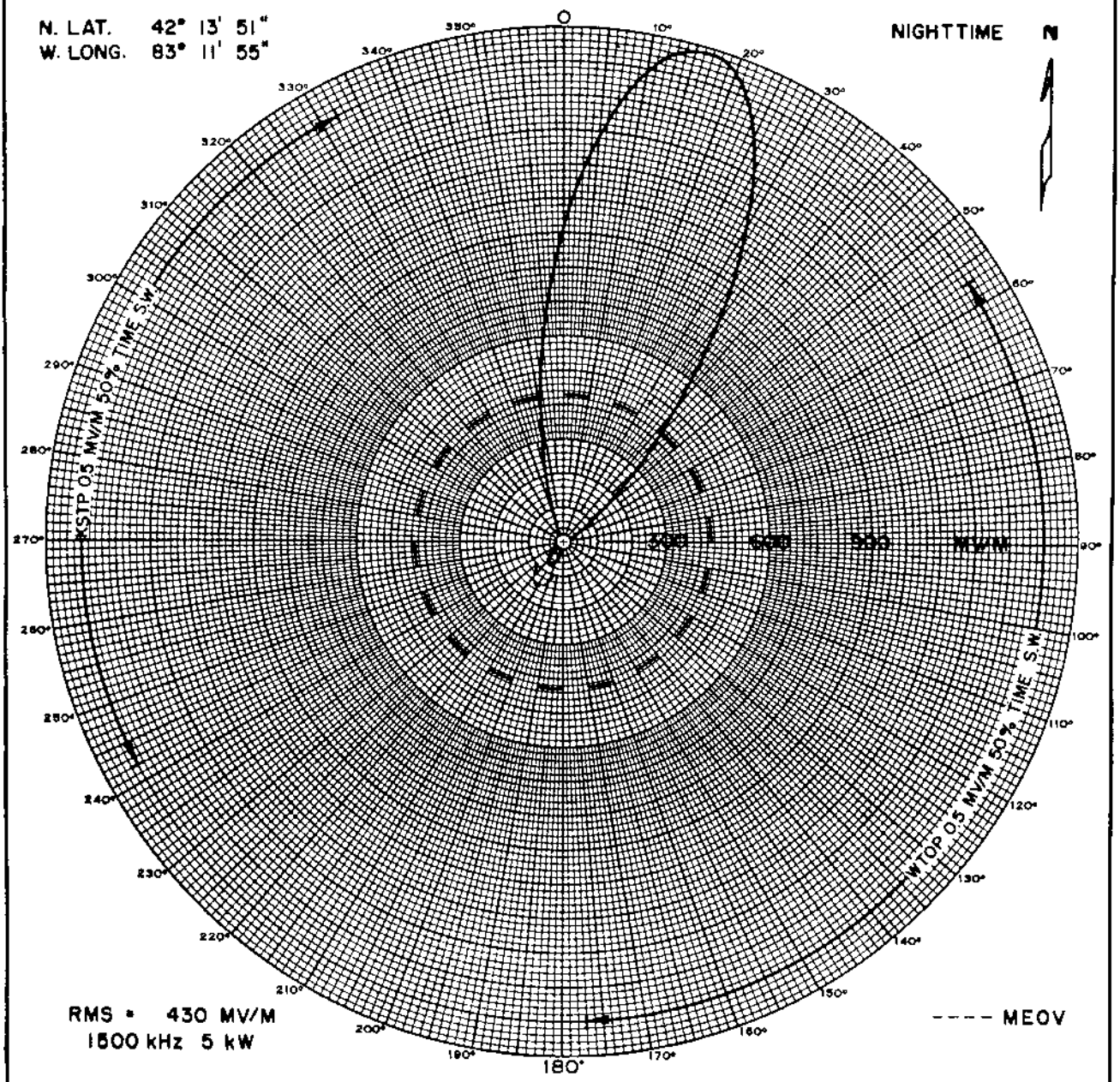
WDEE

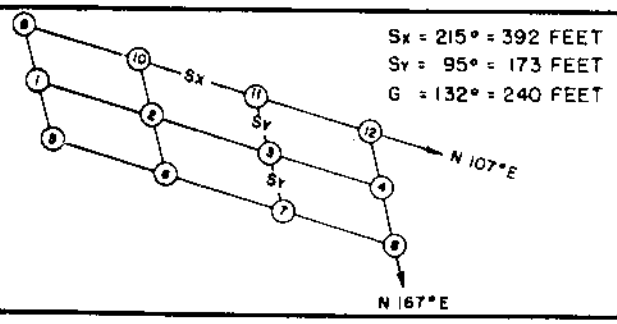
Proposed Night
(1-29-68ct)

Station WJBK
Detroit, Michigan

5kw, 50kw-LS, DA-2, U
1500 kc

OVER





9	10	11	12
1.00 | +0	2.76 | +0	2.76 | +0	1.00 | +0
1	**2**	**3**	**4**
1.47 | +98	4.06 | +98	4.06 | +98	1.47 | +98
5	**6**	**7**	**8**
.50 | +204	1.38 | +204	1.38 | +204	.50 | +204

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

RADIO STATION WJBK
DETROIT, MICHIGAN
671211
FIGURE 1A

FCC File No. BMP-12244
Accepted 1-2-68

Station WJBK
Detroit, Michigan

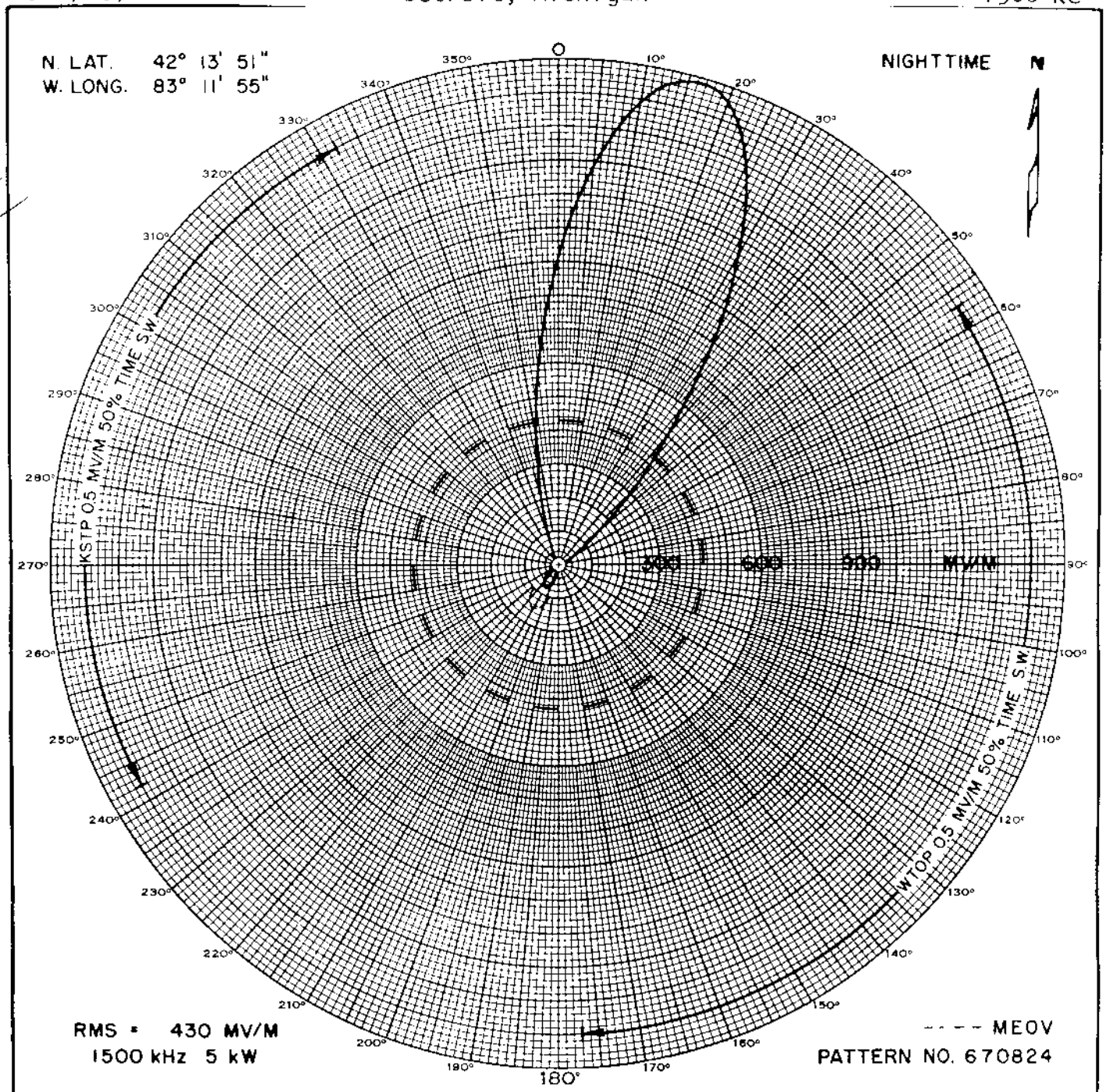
1500 kc

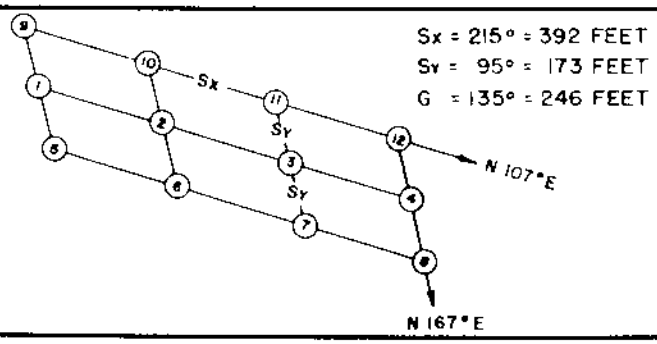
Proposed Night
(9-28-67ct)

Station WJBK
Detroit, Michigan

5kw, WDEE

OVER





9: 1.00 ∠+0	10: 2.76 ∠+0	11: 2.76 ∠+0	12: 1.00 ∠+0
1: 1.47 ∠+98	2: 4.06 ∠+98	3: 4.06 ∠+98	4: 1.47 ∠+98
5: .50 ∠+204	6: 1.38 ∠+204	7: 1.38 ∠+204	8: .50 ∠+204

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CONSULTING ENGINEERS

RADIO STATION WJBK
DETROIT, MICHIGAN
670824 FIGURE 1A

FCC File No. BMP-12166
Accepted 9-19-67

Station WJBK
Detroit, Michigan

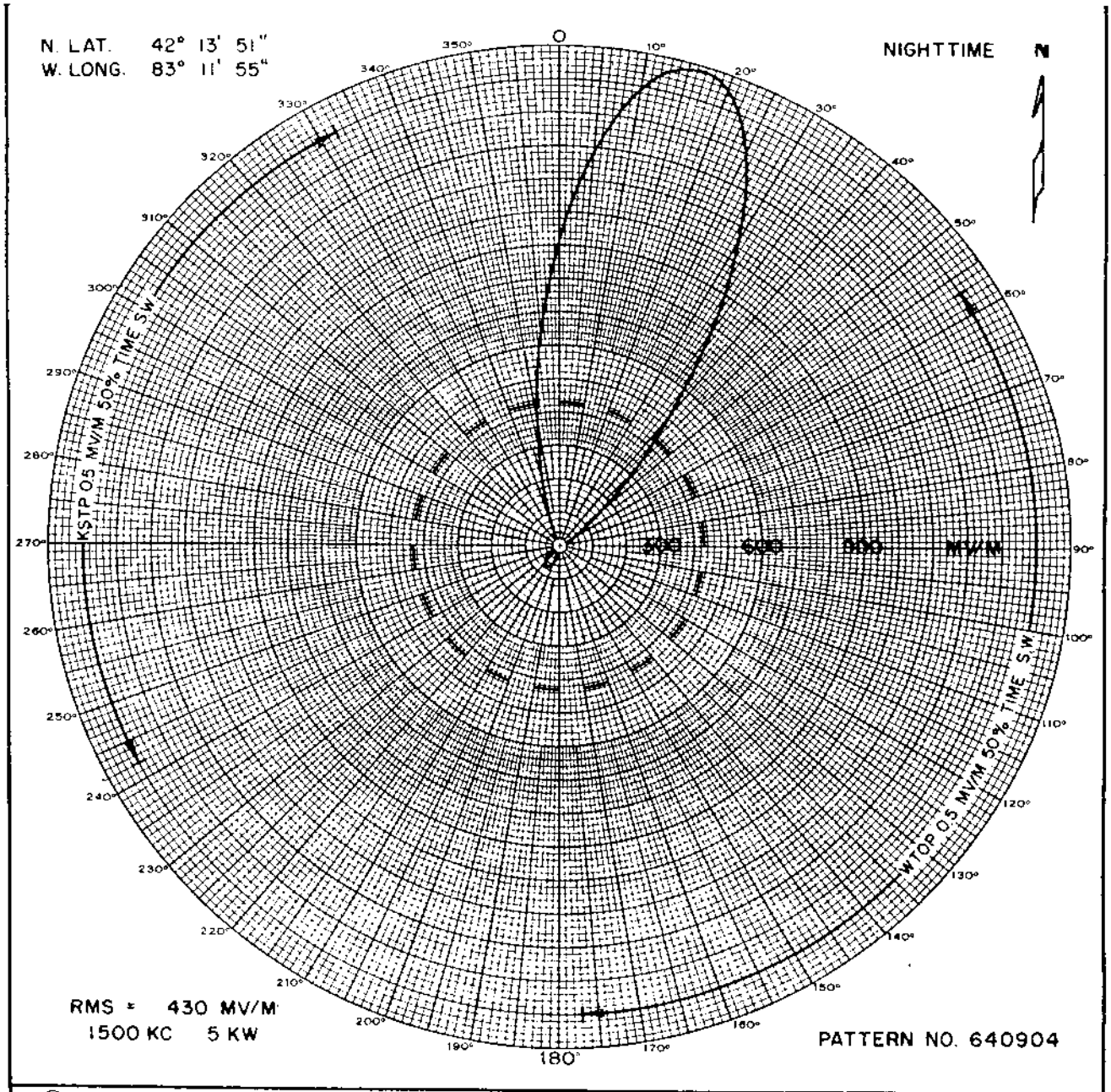
1500 kc

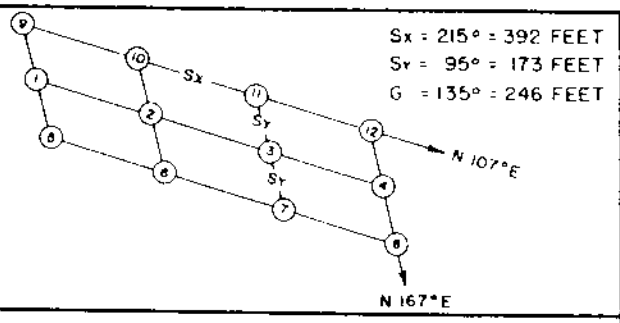
WOEE

Proposed Night
(11-27-64ct)

Station WJBK
Detroit, Michigan

5kw,50kw-LS,DA-2,U
1500 kc





9: 1.00 ∠+0	10: 2.76 ∠+0	11: 2.76 ∠+0	12: 1.00 ∠+0
1: 1.47 ∠+98	2: 4.06 ∠+98	3: 4.06 ∠+98	4: 1.47 ∠+98
5: 50 ∠+204	6: 1.38 ∠+204	7: 1.38 ∠+204	8: 50 ∠+204

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CONSULTING ENGINEERS

RADIO STATION WJBK
DETROIT, MICHIGAN
640904
FIGURE 1

FCC File No. BMP-11354
Accepted 11-9-64

Station WJBK
Detroit, Michigan

1500 kc

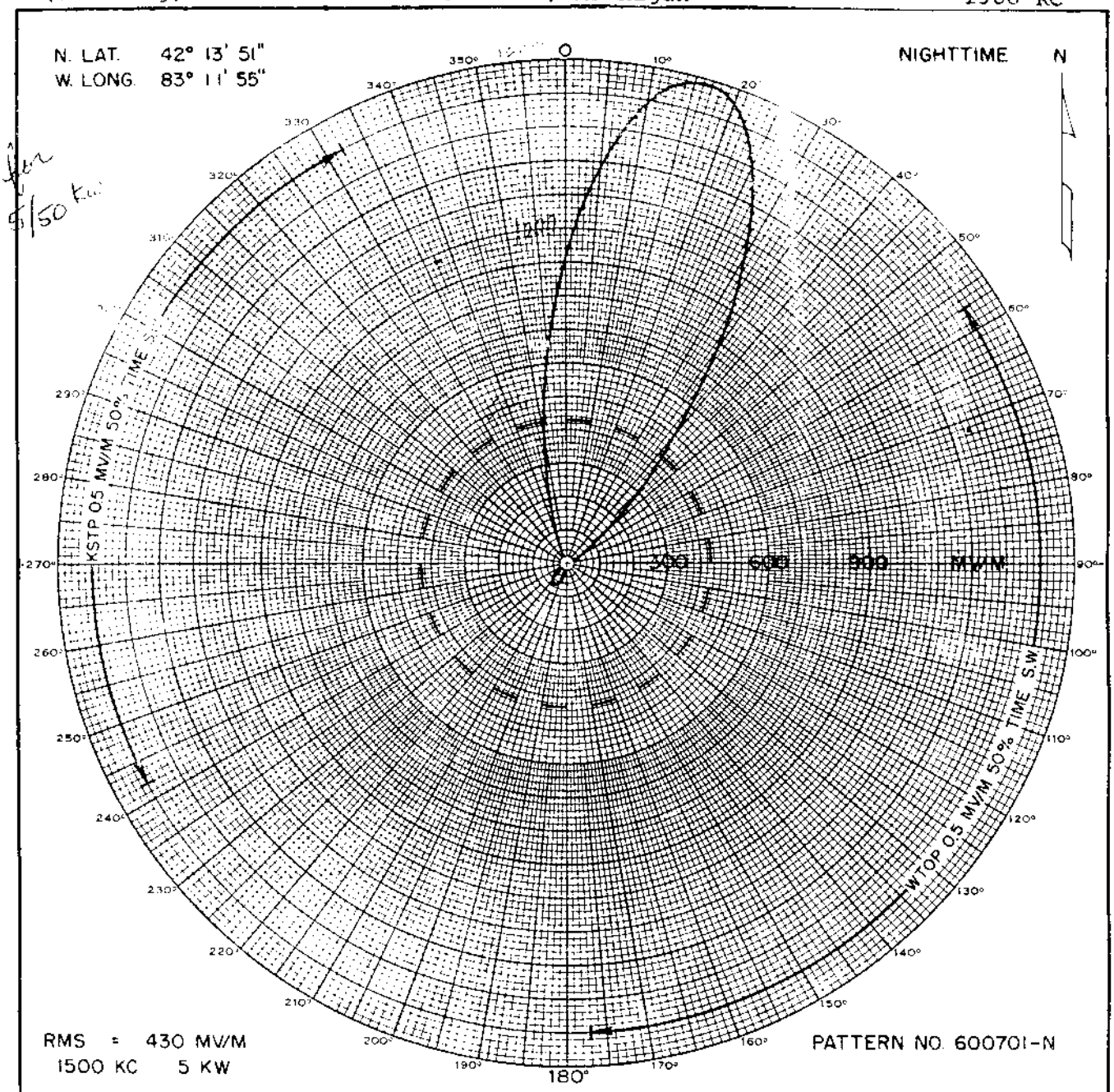
WDEE

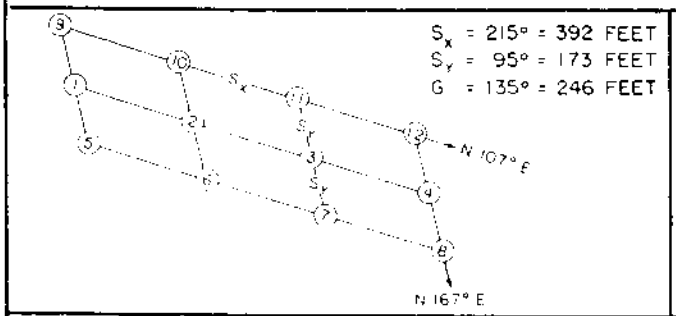
PROPOSED NIGHT
(8-29-60g)

Station WJBK
Detroit, Michigan

5kw, 50kw-LS, DA-2,U
1500 KC

A-24-63 granted CP for change to 5/50 kw DA-2





9: 50 ∠-204	10: 1.38 ∠-204	11: 1.38 ∠-204	12: .50 ∠-204
1: 1.47 ∠-98	2: 4.06 ∠-98	3: 4.06 ∠-98	4: 1.47 ∠-98
5: 1.00 ∠+0	6: 2.76 ∠+0	7: 2.76 ∠+0	8: 1.00 ∠+0

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

RADIO STATION WJBK
DETROIT, MICHIGAN
600701.2 FIGURE 6A

FCC File No. BP-14275
Accepted 8-10-60 (was BP-13959)

WJBK
Detroit, Michigan 1500 KC

Proposed Night Nulls
(1-29-68ct)

Station WJBK
Detroit, Michigan

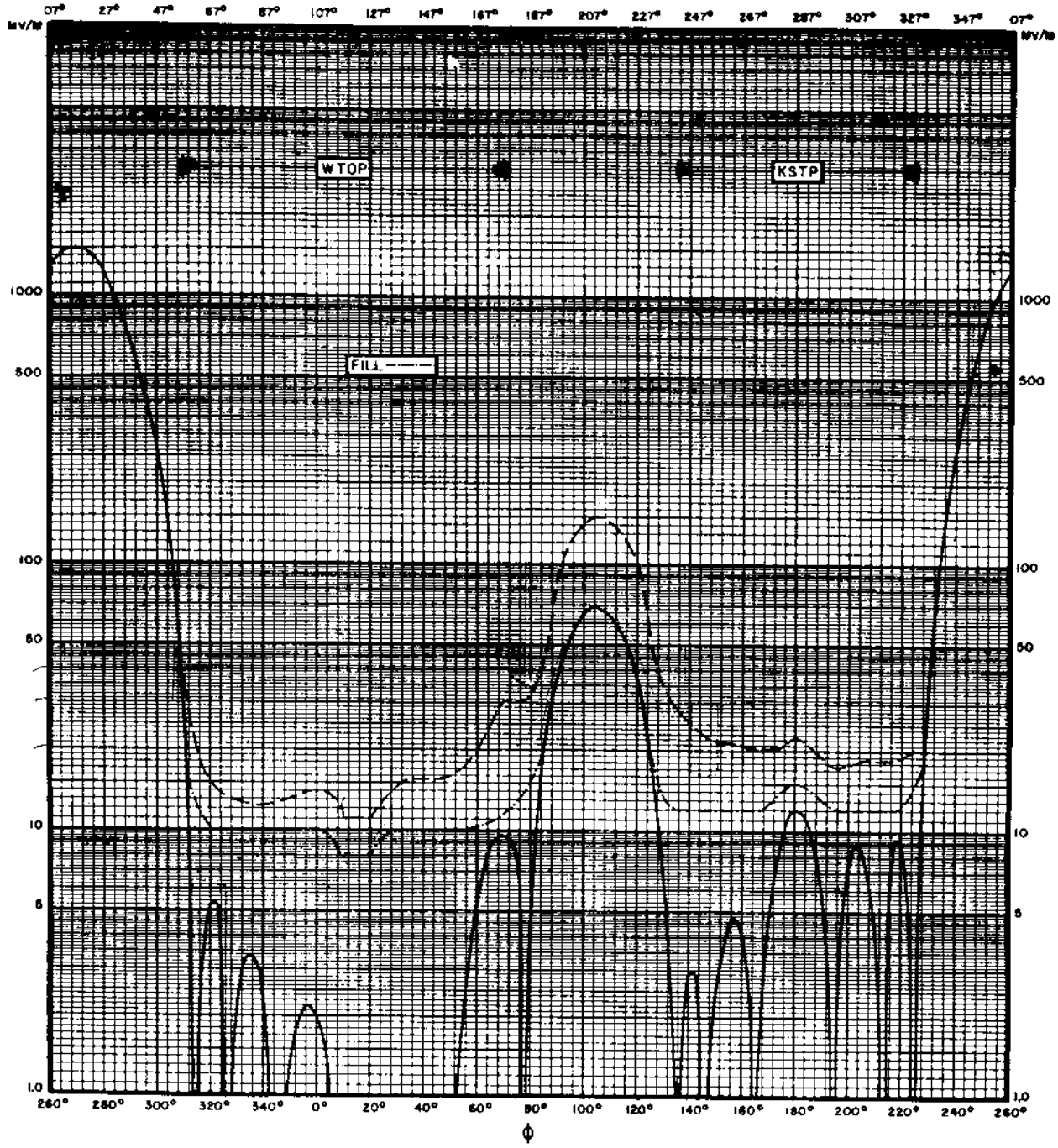
5kw, 5

WDEE

1500 kc

AZIMUTH

OVER



PROPOSED 1500 kHz 5 kW NIGHTTIME
MEOV - - - 0° ELEVATION

PREPARED BY THE FIRM OF A. EARL CULLUM, JR. CONSULTING ENGINEERS	RADIO STATION WJBK DETROIT, MICHIGAN 671211 FIGURE 1B

FCC File No. BMP-12244
Accepted 1-2-68

Station WJBK
Detroit, Michigan

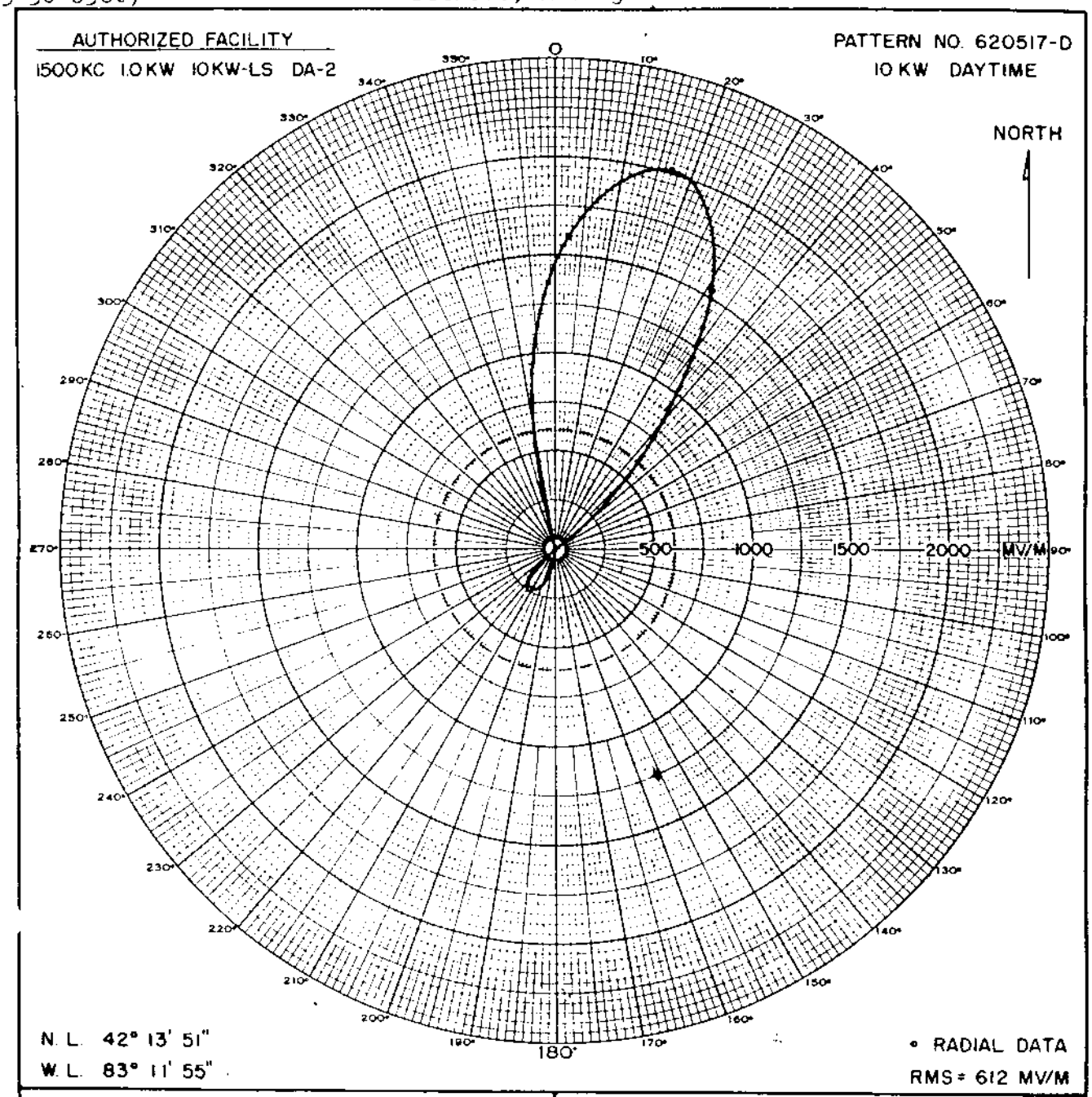
1500 kc

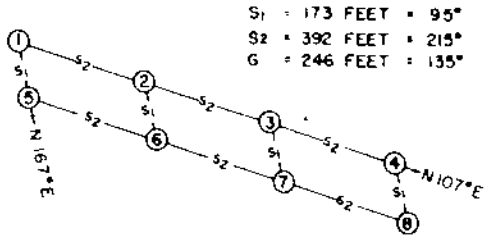
WDEE

Measured Day
(3-30-63ct)

Station WJBK
Detroit, Michigan

1kw,10kw-LS,DA-2,U
1500 kc





THEORETICAL ANTENNA PARAMETERS

TOWER	RELATIVE FIELD	PHASE
1	1.00	0°
2	2.76	0°
3	2.76	0°
4	1.00	0°
5	1.00	90°
6	2.76	90°
7	2.76	90°
8	1.00	90°

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

RADIO STATION WJBK
DETROIT, MICHIGAN
620517
FIGURE 17B

FCC File No. BZ-4853
Accepted 3-20-63

Station WJBK
Detroit, Michigan

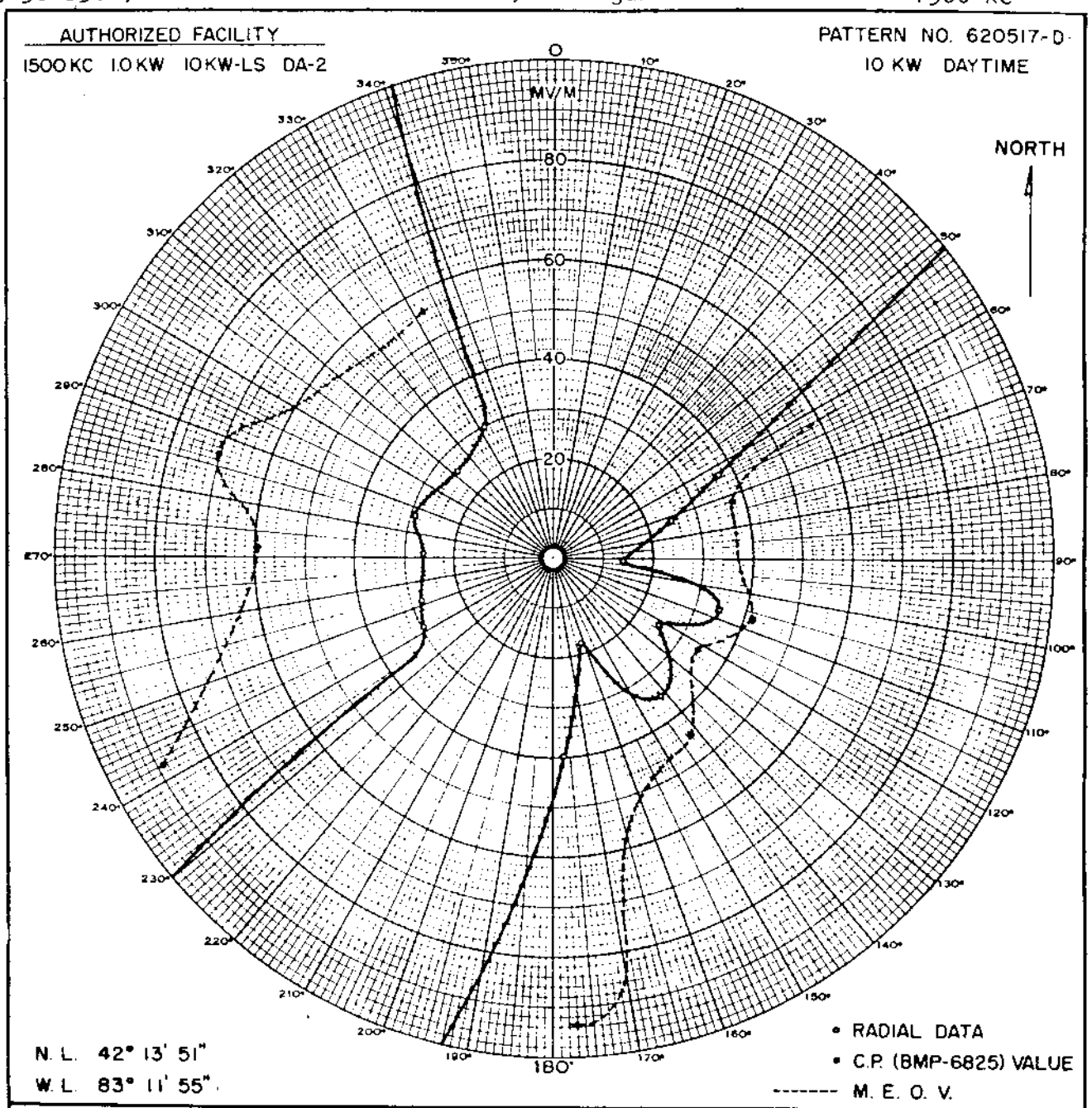
1500 kc

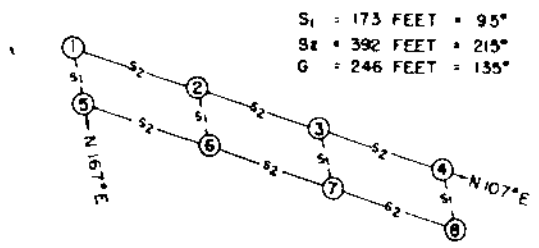
WDEE

Measured Day Nulls
(3-30-63ct)

Station WJBK
Detroit, Michigan

1kw,10kw-LS,DA-2,U
1500 kc





THEORETICAL ANTENNA PARAMETERS

TOWER	RELATIVE FIELD	PHASE
1	1.00	0°
2	2.76	0°
3	2.76	0°
4	1.00	0°
5	1.00	90°
6	2.76	90°
7	2.76	90°
8	1.00	90°

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

RADIO STATION WJBK
DETROIT, MICHIGAN
620517
FIGURE 17C

FCC File No. BZ-4853
Accepted 3-20-63

Station WJBK
Detroit, Michigan

1500 kc

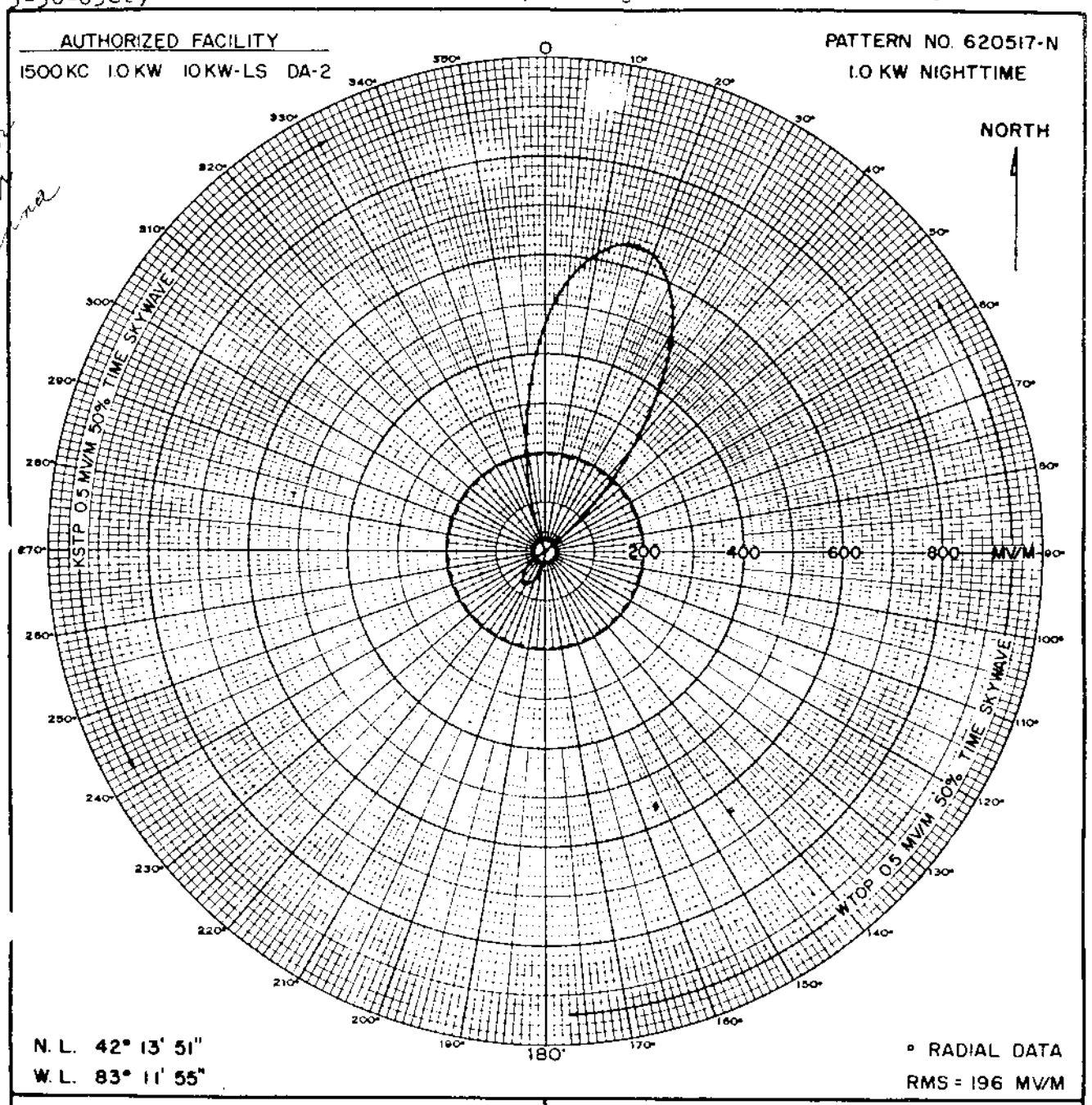
WDEE

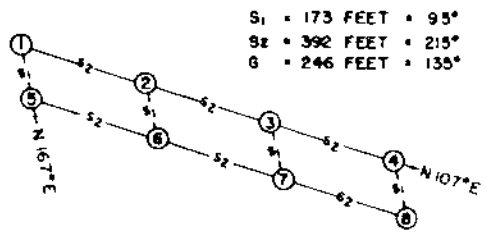
Measured Night
(3-30-63ct)

Station WJBK
Detroit, Michigan

1kw, 10kw-LS, DA-2, U
1500 kc

#303
11-16-64
permitted mod for
change in night
directional antenna
parameters





THEORETICAL ANTENNA PARAMETERS

TOWER	RELATIVE FIELD	PHASE
1	1.00	0°
2	2.76	0°
3	2.76	0°
4	1.00	0°
5	1.00	90°
6	2.76	90°
7	2.76	90°
8	1.00	90°

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

RADIO STATION WJBK
DETROIT, MICHIGAN
620517
FIGURE 17D

FCC File No. BZ-4853
Accepted 3-20-63

Station WJBK
Detroit, Michigan

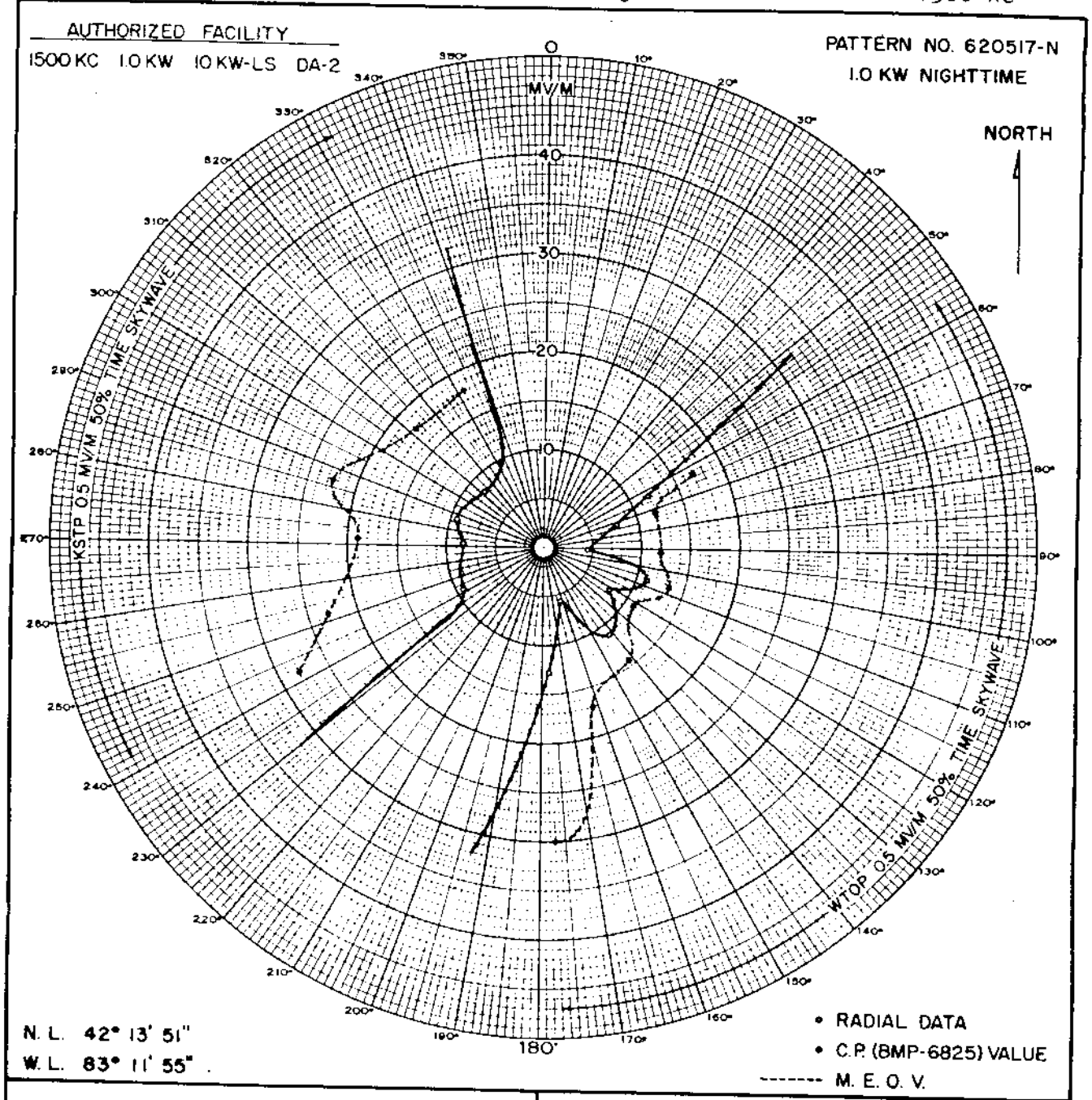
1500 kc

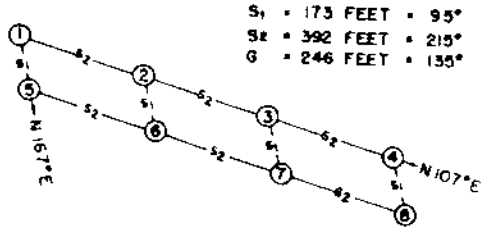
WDEE

Measured Night Nulls
(3-30-63ct)

Station WJBK
Detroit, Michigan

1KW, 10KW-LS, DA-2, U
1500 kc





THEORETICAL ANTENNA PARAMETERS

TOWER	RELATIVE FIELD	PHASE
1	1.00	0°
2	2.76	0°
3	2.76	0°
4	1.00	0°
5	1.00	90°
6	2.76	90°
7	2.76	90°
8	1.00	90°

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

RADIO STATION WJBK
DETROIT, MICHIGAN
620517
FIGURE 17E

FCC File No. BZ-4853
Accepted 3-20-63

Station WJBK
Detroit, Michigan

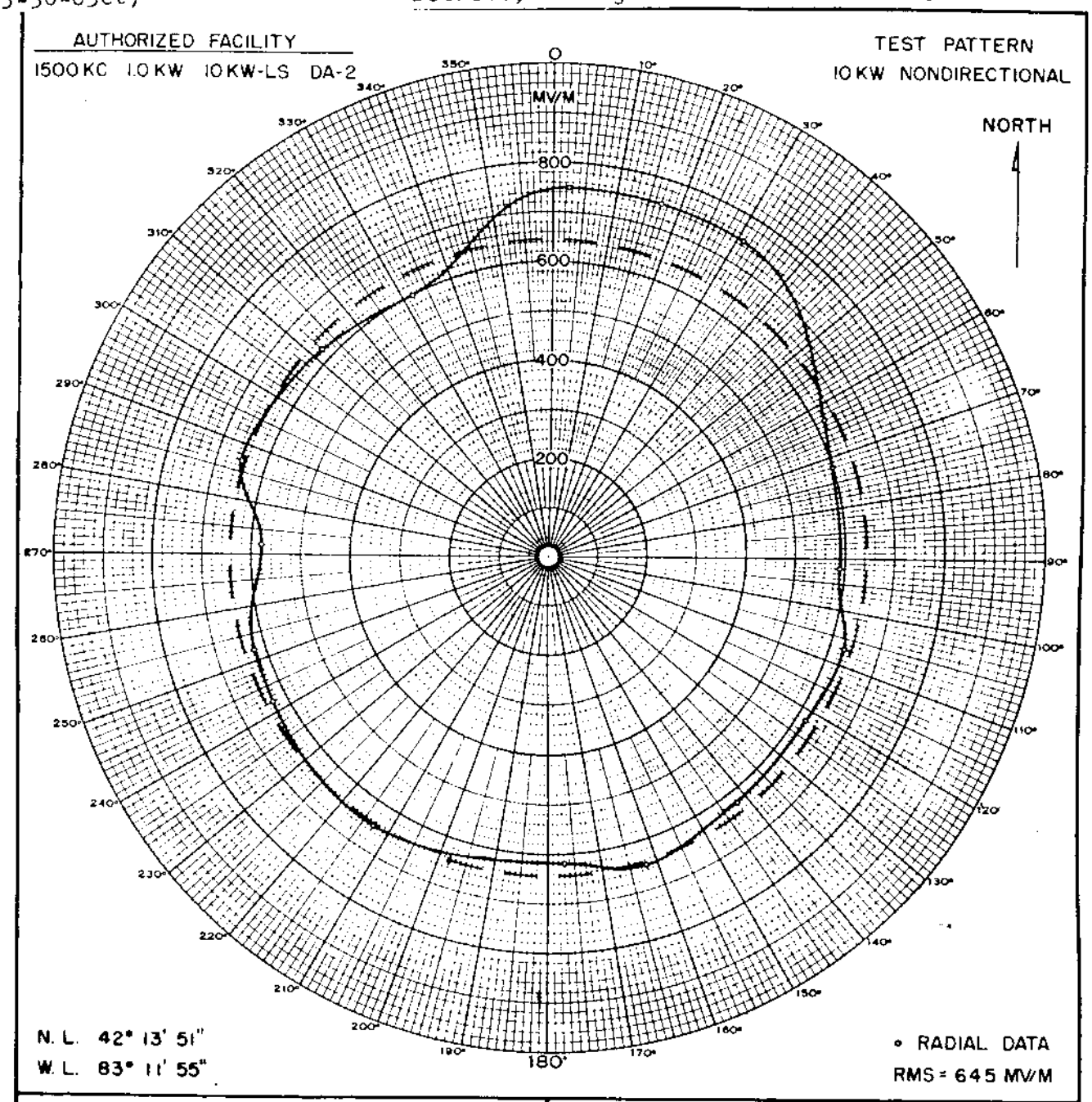
1500 kc

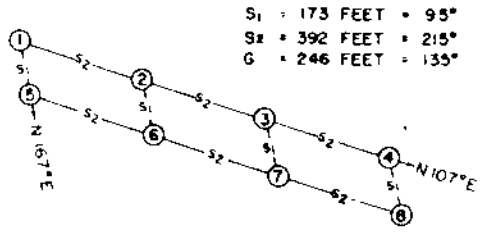
WDEE

Measured Non-DA
(3-30-63ct)

Station WJBK
Detroit, Michigan

1kw,10kw-LS,DA-2,U
1500 kc





TOWER	OPERATION
1	DETUNED
2	DETUNED
3	DETUNED
4	DETUNED
5	DETUNED
6	SERIES-FED
7	DETUNED
8	DETUNED

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

RADIO STATION WJBK
DETROIT, MICHIGAN

620517

FIGURE 17A

FCC File No. BZ-4853
Accepted 3-20-63

Station WJBK
Detroit, Michigan

1500 kc

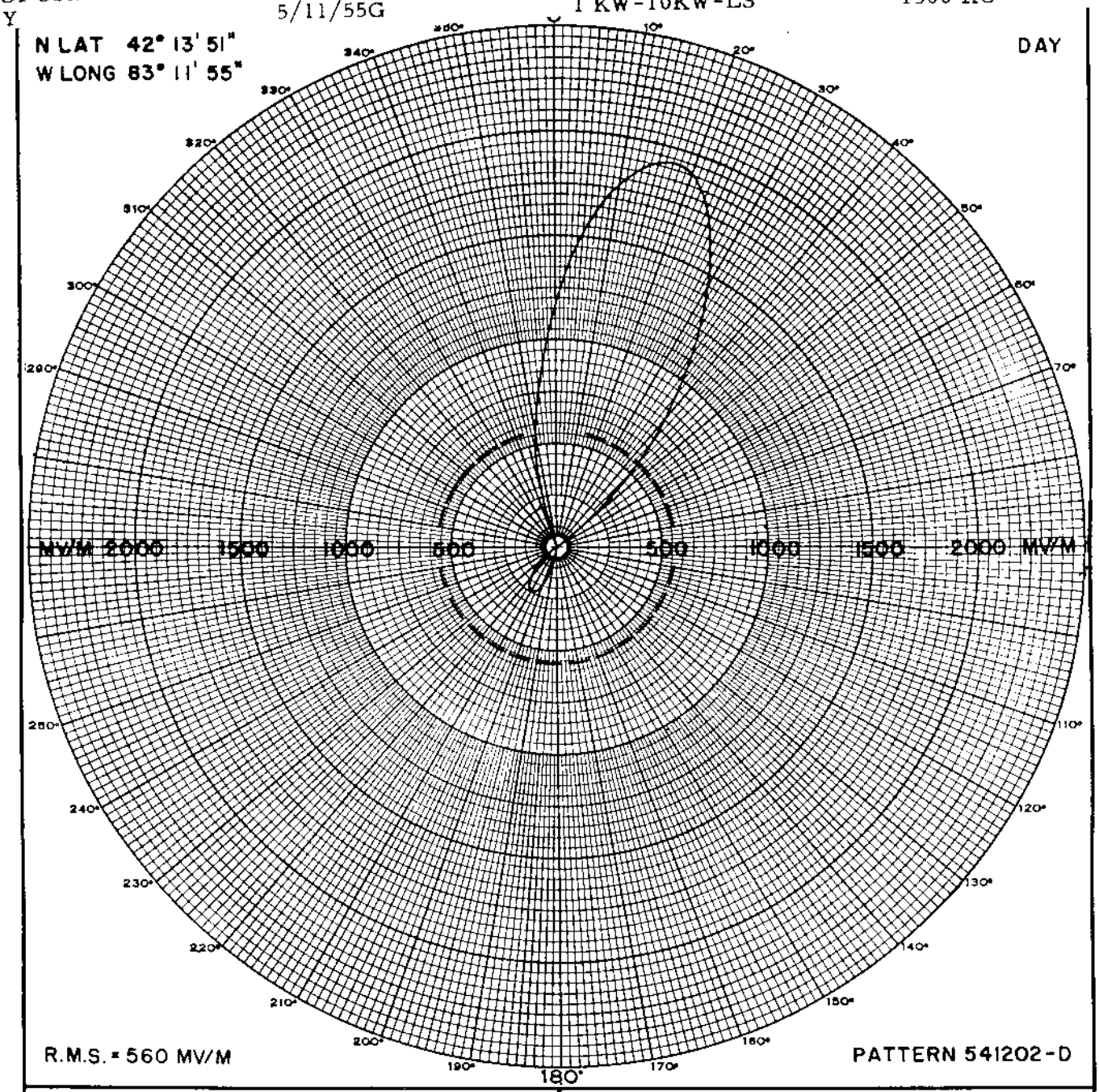
WOEE

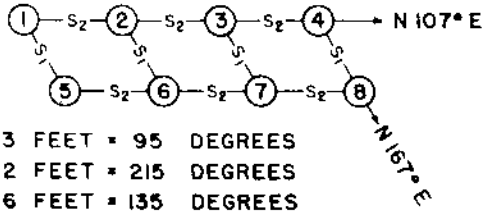
PROPOSED DAY

WJBK, DETROIT, MICH.
5/11/55G

DA-2
1 KW-10KW-LS

1500 KC





S_1 = 173 FEET = 95 DEGREES
S_2 = 392 FEET = 215 DEGREES
G = 246 FEET = 135 DEGREES

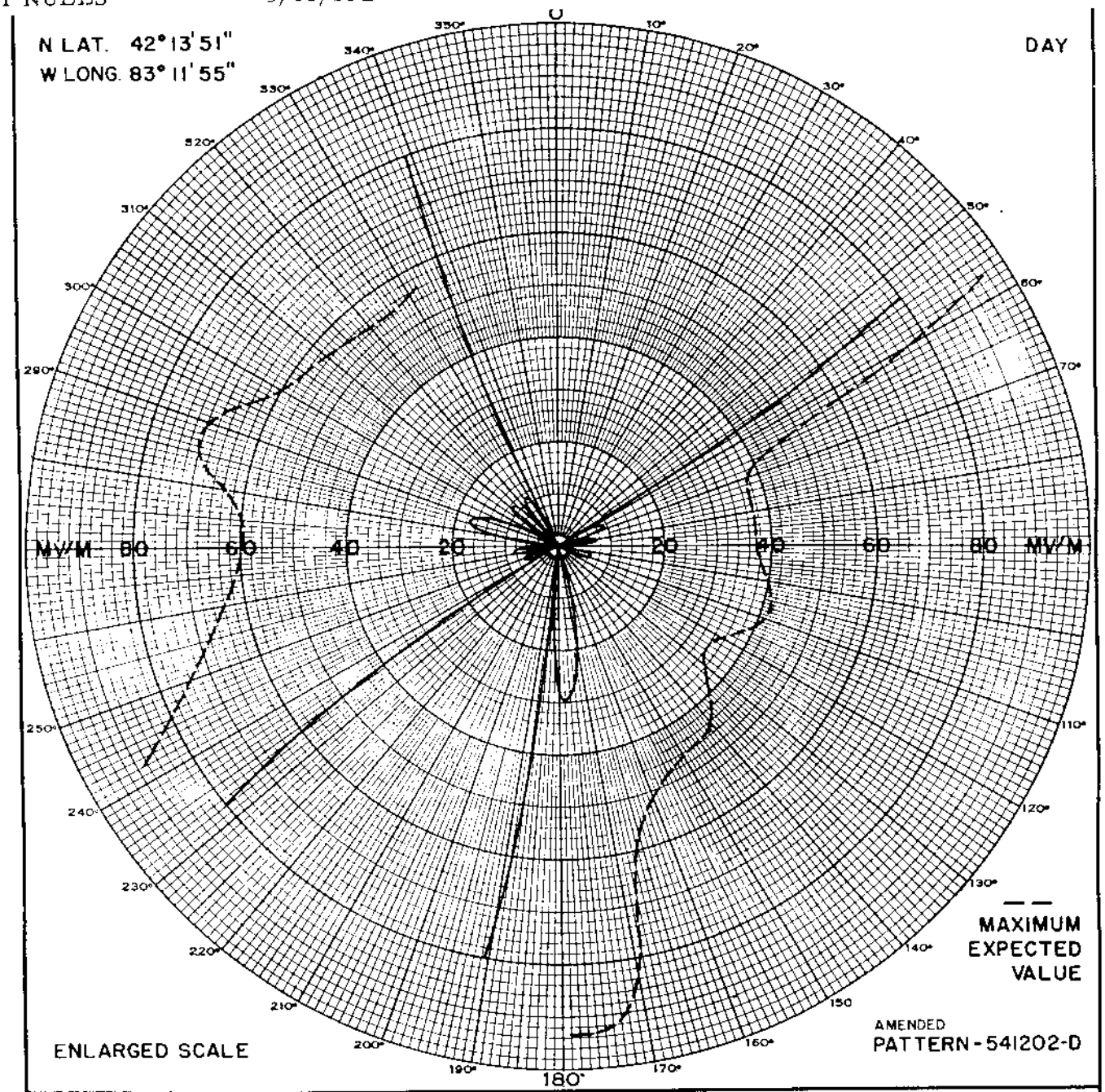
RADIO STATION WJBK
DETROIT, MICHIGAN
1500 KC 1 KW 10 KW-LS DA-2

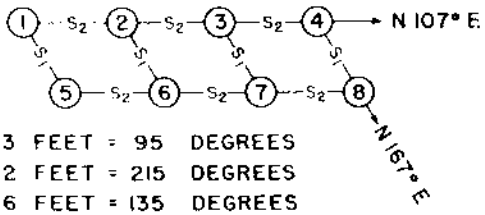
NO.	1	2	3	4	5	6	7	8
I	1.0	2.76	2.76	1.0	1.0	2.76	2.76	1.0
Ψ	0°	0°	0°	0°	90°	90°	90°	90°

A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEERS
541202.1 FIGURE 7A

WDEE

PROPOSED DAY NULLS | WJBK, DETROIT, MICH 5/11/55G | DA-2 1 KW-10KW-LS | 1500 KC





S_1 = 173 FEET = 95 DEGREES
S_2 = 392 FEET = 215 DEGREES
G = 246 FEET = 135 DEGREES

NO.	1	2	3	4	5	6	7	8
I	1.0	2.76	2.76	1.0	1.0	2.76	2.76	1.0
ψ	0°	0°	0°	0°	90°	90°	90°	90°

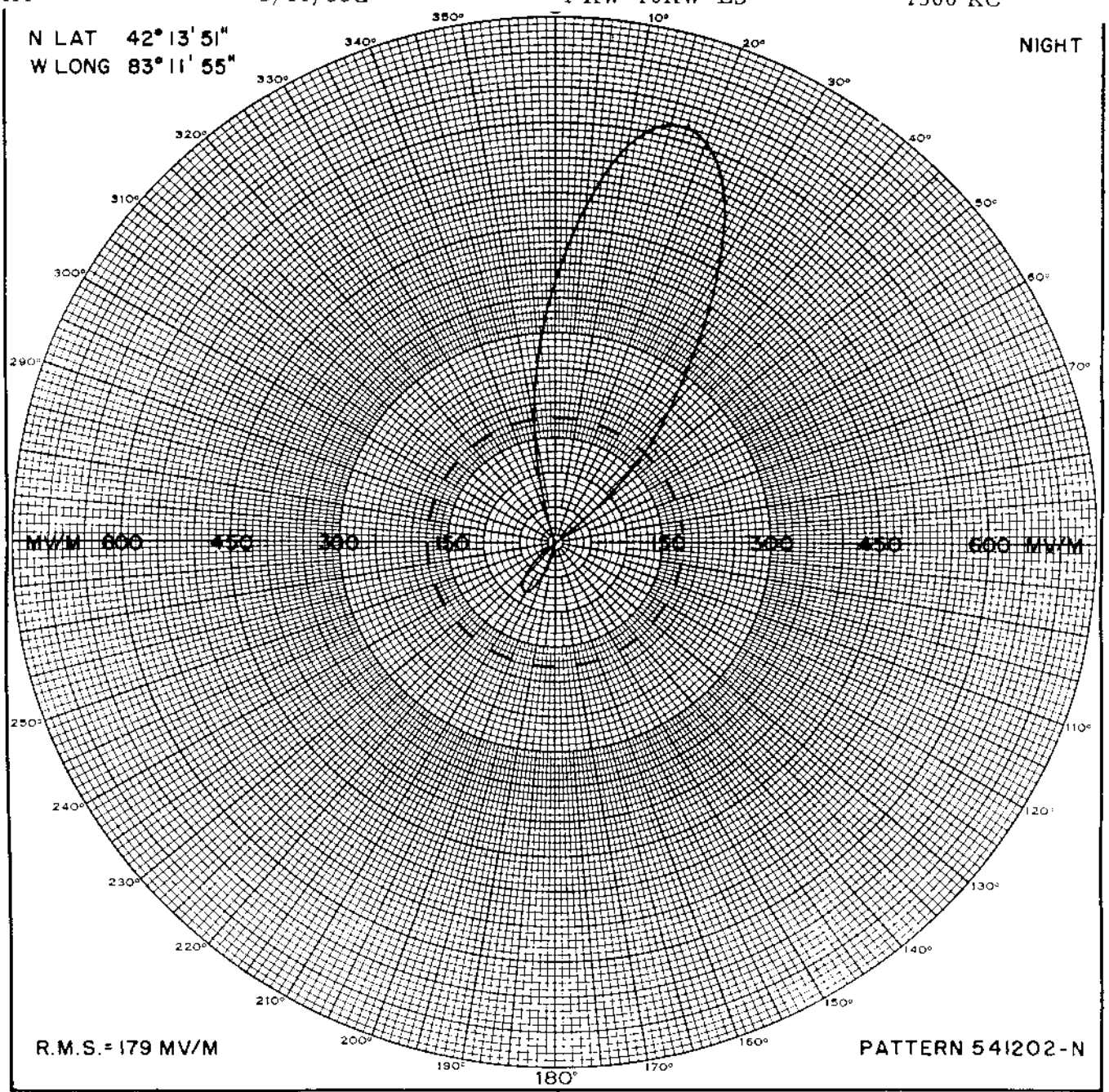
RADIO STATION WJBK
DETROIT, MICHIGAN
1500 KC 1 KW 10 KW-LS DA-2

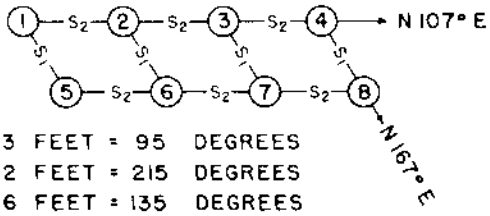
A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEERS
541202 AMENDED FIGURE 7B

FCC File No. BMP-6825 Accepted 4-27-55 WJBK, DETROIT, MICH. 1500 KC

WDEE

PROPOSED NIGHT | WJBK, DETROIT, MICH. 5/11/55G | DA-2 1 KW-10KW-LS | 1500 KC





S_1 = 173 FEET = 95 DEGREES
S_2 = 392 FEET = 215 DEGREES
G = 246 FEET = 135 DEGREES

RADIO STATION WJBK
DETROIT, MICHIGAN
1500 KC 1 KW 10 KW-LS DA-2

NO.	1	2	3	4	5	6	7	8
I	1.0	2.76	2.76	1.0	1.0	2.76	2.76	1.0
Ψ	0°	0°	0°	0°	90°	90°	90°	90°

A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEERS
541202.1 FIGURE 8A

Proposed Night Nulls
(9-28-67ct)

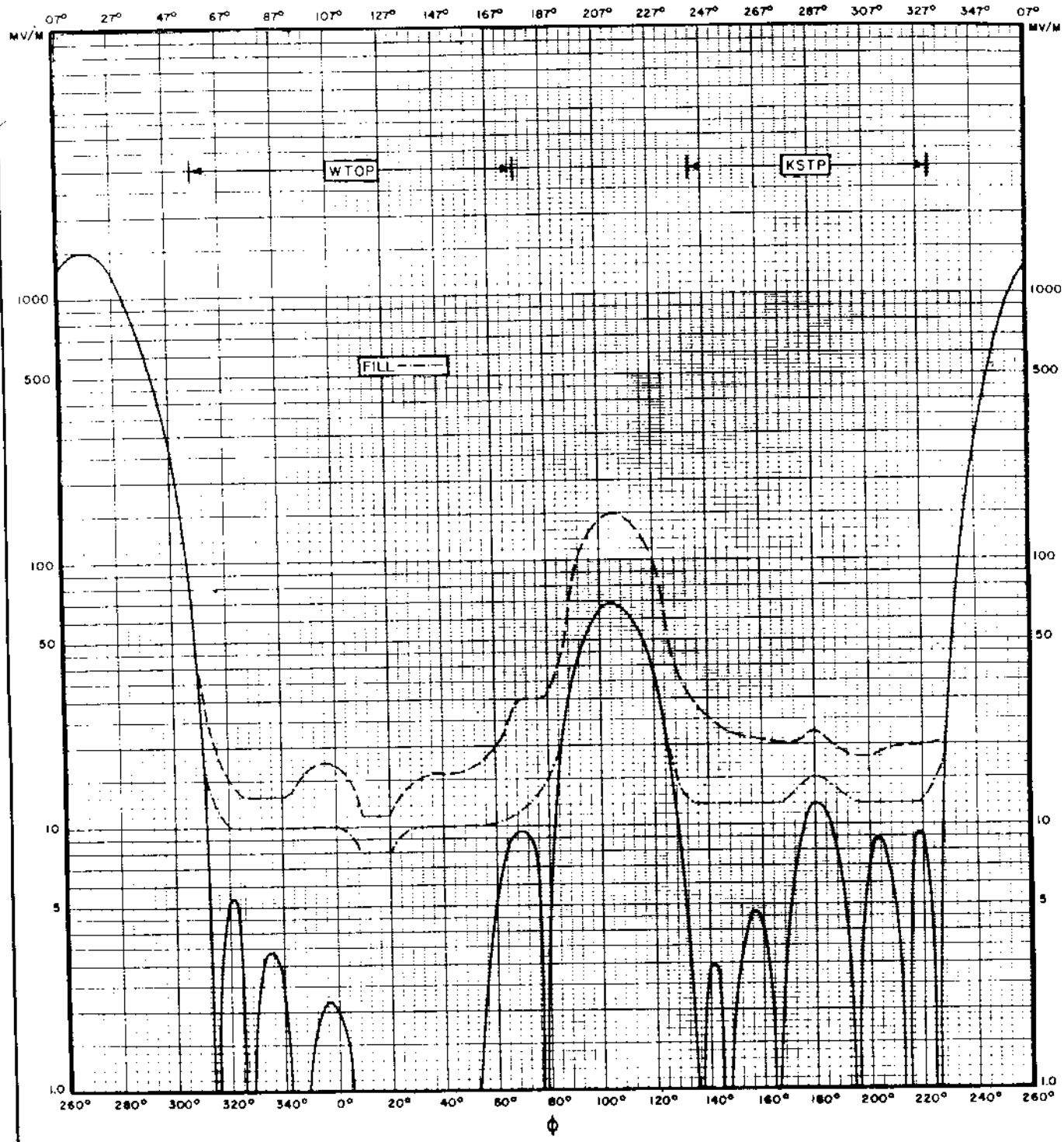
Station WJBK
Detroit, Michigan

5k

WDEE

1500 kc

AZIMUTH



PROPOSED 1500 kHz 5 kW NIGHTTIME

MEOV - - - 0° ELEVATION

PREPARED BY THE FIRM OF A. EARL CULLUM, JR. CONSULTING ENGINEERS	RADIO STATION WJBK DETROIT, MICHIGAN 670824 FIGURE 1B

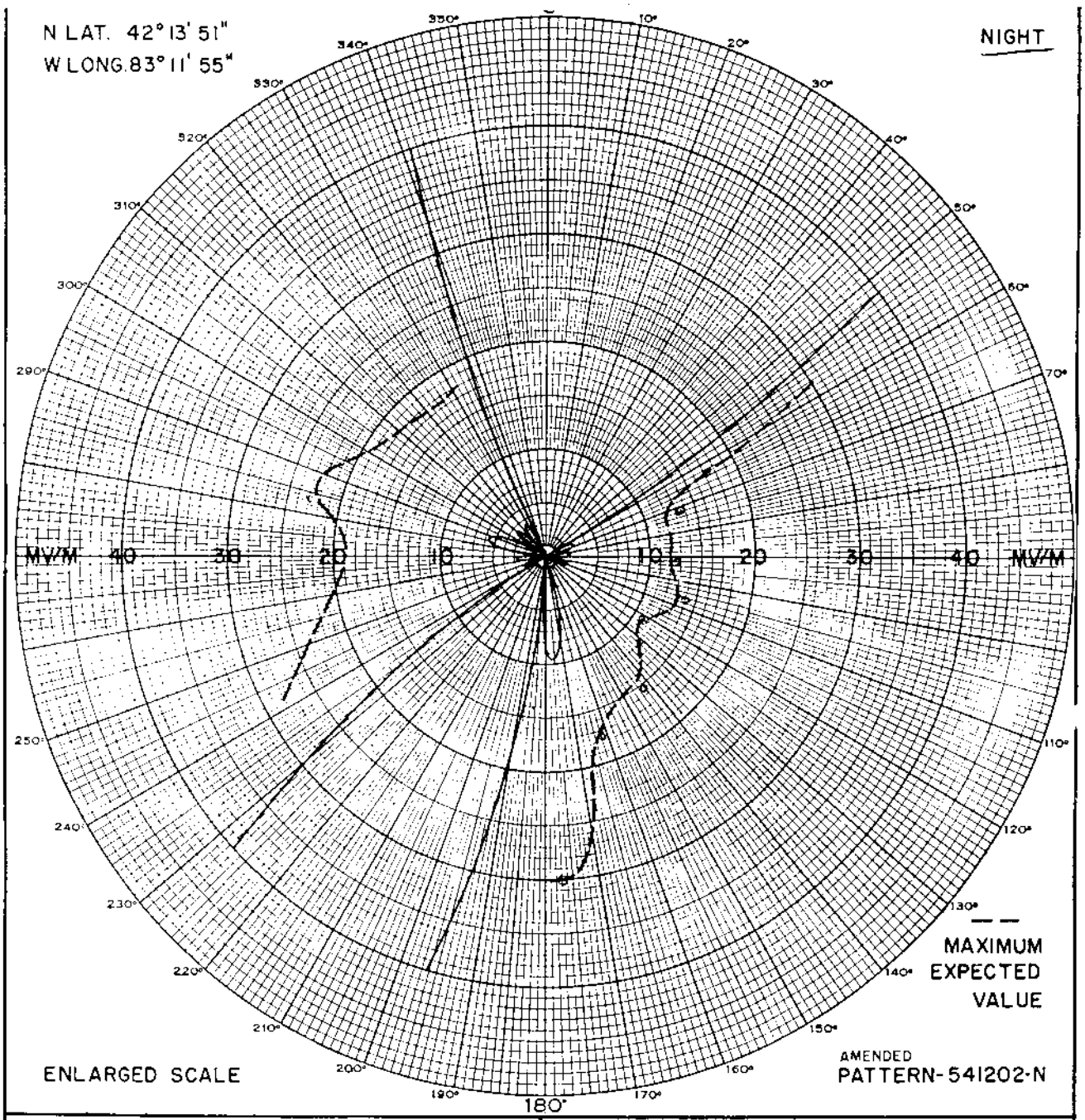
FCC File No. BMP-12166
Accepted 9-19-67

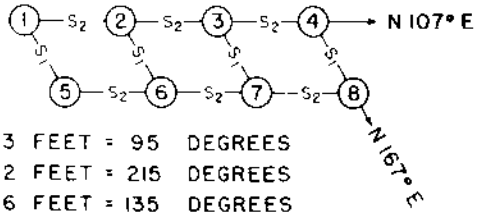
Station WJBK
Detroit, Michigan

1500 kc

WDEE

PROPOSED NIGHT NULLS | WJBK, DETROIT, MICH. 5/11/55G | DA-2 1 KW-10KW-LS | 1500 KC





S_1 = 173 FEET = 95 DEGREES
S_2 = 392 FEET = 215 DEGREES
G = 246 FEET = 135 DEGREES

NO.	1	2	3	4	5	6	7	8
I	1.0	2.76	2.76	1.0	1.0	2.76	2.76	1.0
Ψ	0°	0°	0°	0°	90°	90°	90°	90°

RADIO STATION WJBK
DETROIT, MICHIGAN
1500 KC 1 KW 10 KW-LS DA-2

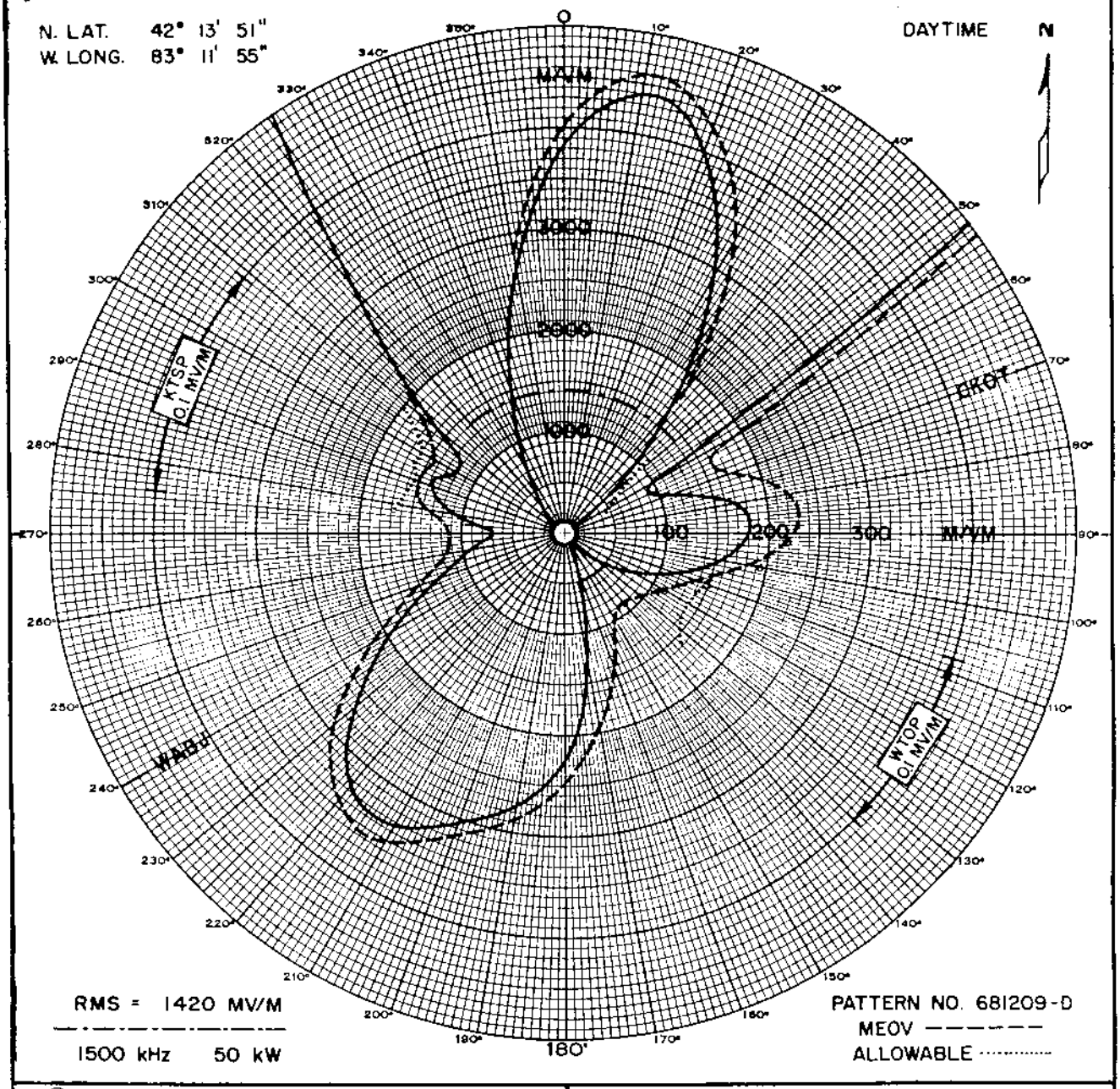
A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEERS
541202 AMENDED FIGURE 8B

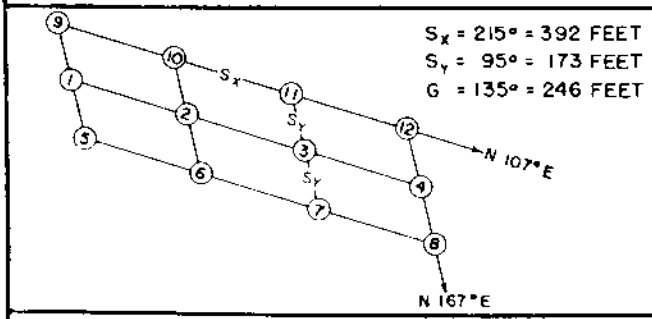
WDEE

Proposed Day
(1-28-69ct)

Station WJBK
Detroit, Michigan

1500 kc





10: 0.375 ∠ -226	11: 0.514 ∠ -207.4	12: 0.176 ∠ -194
2: 1.185 ∠ -109	3: 1.625 ∠ -90.4	4: 0.555 ∠ -77
6: 1.000 ∠ +0	7: 1.371 ∠ +18.6	8: 0.468 ∠ +32

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

RADIO STATION WJBK
DETROIT, MICHIGAN
681209 FIGURE 1

FCC File No. BMP-12621
Accepted 1-22-69

Station WJBK
Detroit, Michigan

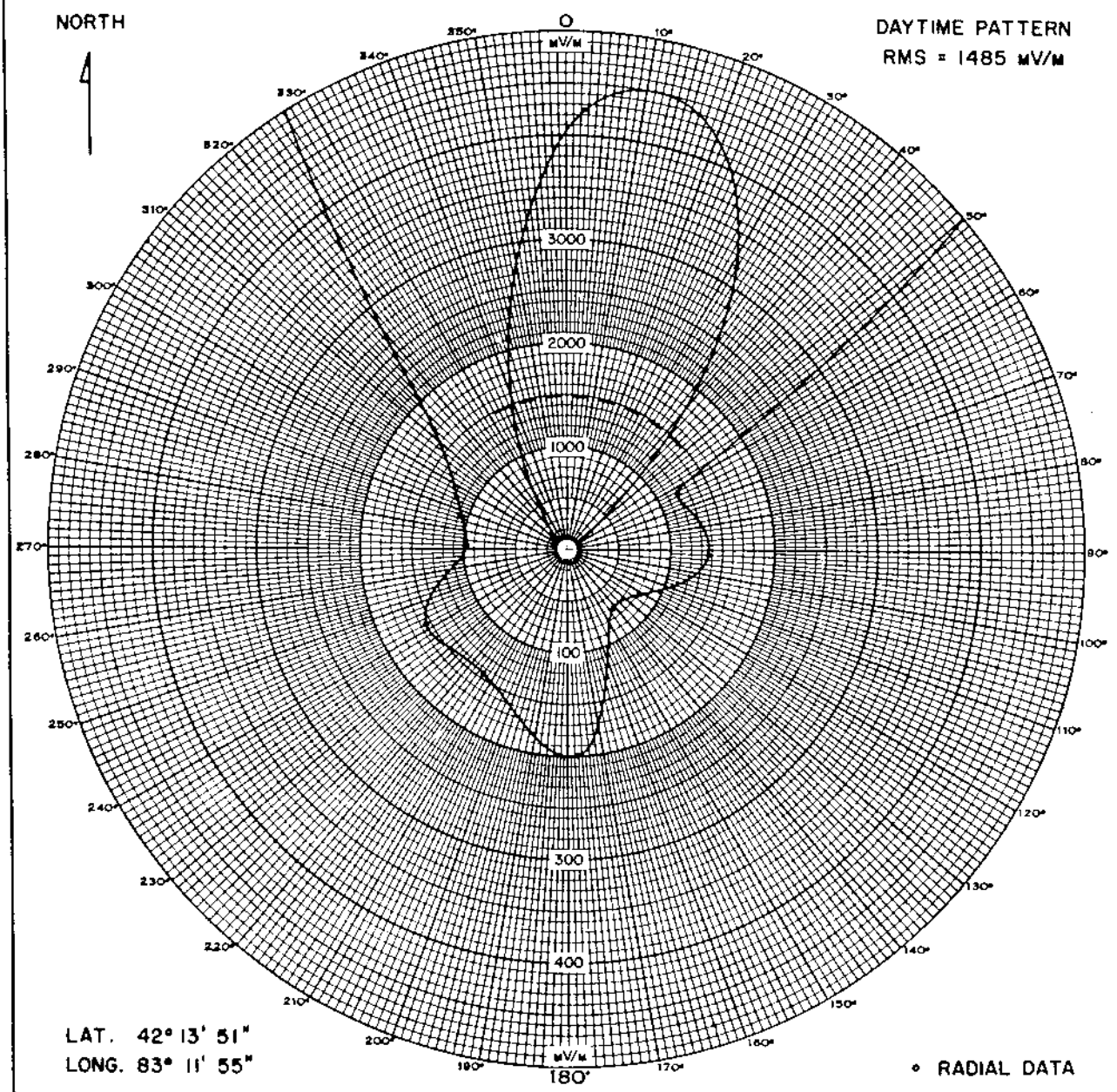
1500 kc

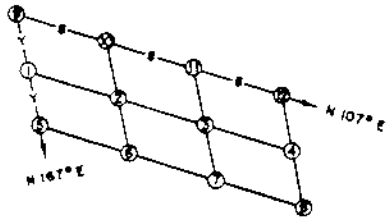
WDEE

Measured Day
(9-26-68ct)

Station WJBK
Detroit, Michigan

5kw,50kw-LS,DA-2,U
1500 kc





TOWER	THEORETICAL RATIO AND PHASE		OBSERVED RATIO AND PHASE	
1	-	-	-	-
2	1.185	-109°	0.724	342.8°
3	1.625	- 90.4	1.000	2.0
4	0.555	- 77	0.412	13.3
5	-	-	-	-
6	1.000	0	0.448	93.2
7	1.371	18.6	0.651	109.3
8	0.468	32	0.224	122.0
9	-	-	-	-
10	0.375	-226	0.275	219.4
11	0.514	-207.4	0.357	244.7
12	0.176	-194	0.124	252.9

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

RADIO STATION WJBK
1500 kHz 5 kW 50 kW-LS DA-2
680520 FIGURE 2B

FCC File No.BL-12094
Accepted 9-19-68

Station WJBK
Detroit, Michigan

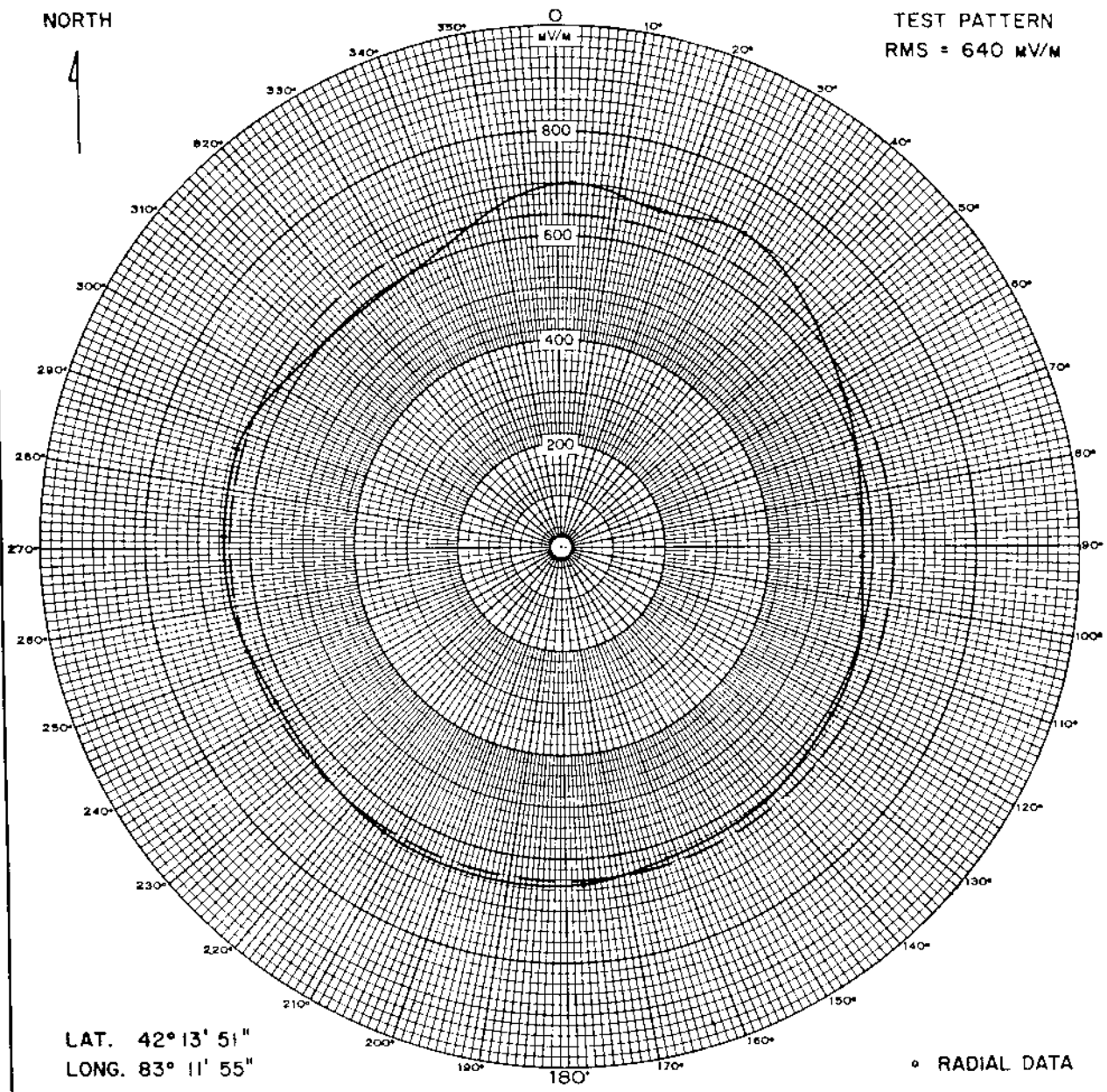
1500 kc

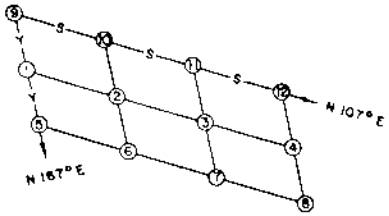
WDEE

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

Station WJBK
Detroit, Michigan

5kw,50kw-LS,DA-2,U
1500 kc





TOWER NO.6 SERIES EXCITED
ALL OTHER TOWERS DETUNED

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

RADIO STATION WJBK
1500 kHz 5 kW 50 kW-LS DA-2
680520 FIGURE 2A

FCC File No.BL-12094
Accepted 9-19-68

Station WJBK
Detroit, Michigan

1500 kc

WFIF

Proposed Day
(2-28-69ct)

Station WFIF
Milford, Connecticut

5kw,DA-D,D
1500 kc

BMP-12647
Granted
2-18-69
Mod. of CP
to make
changes

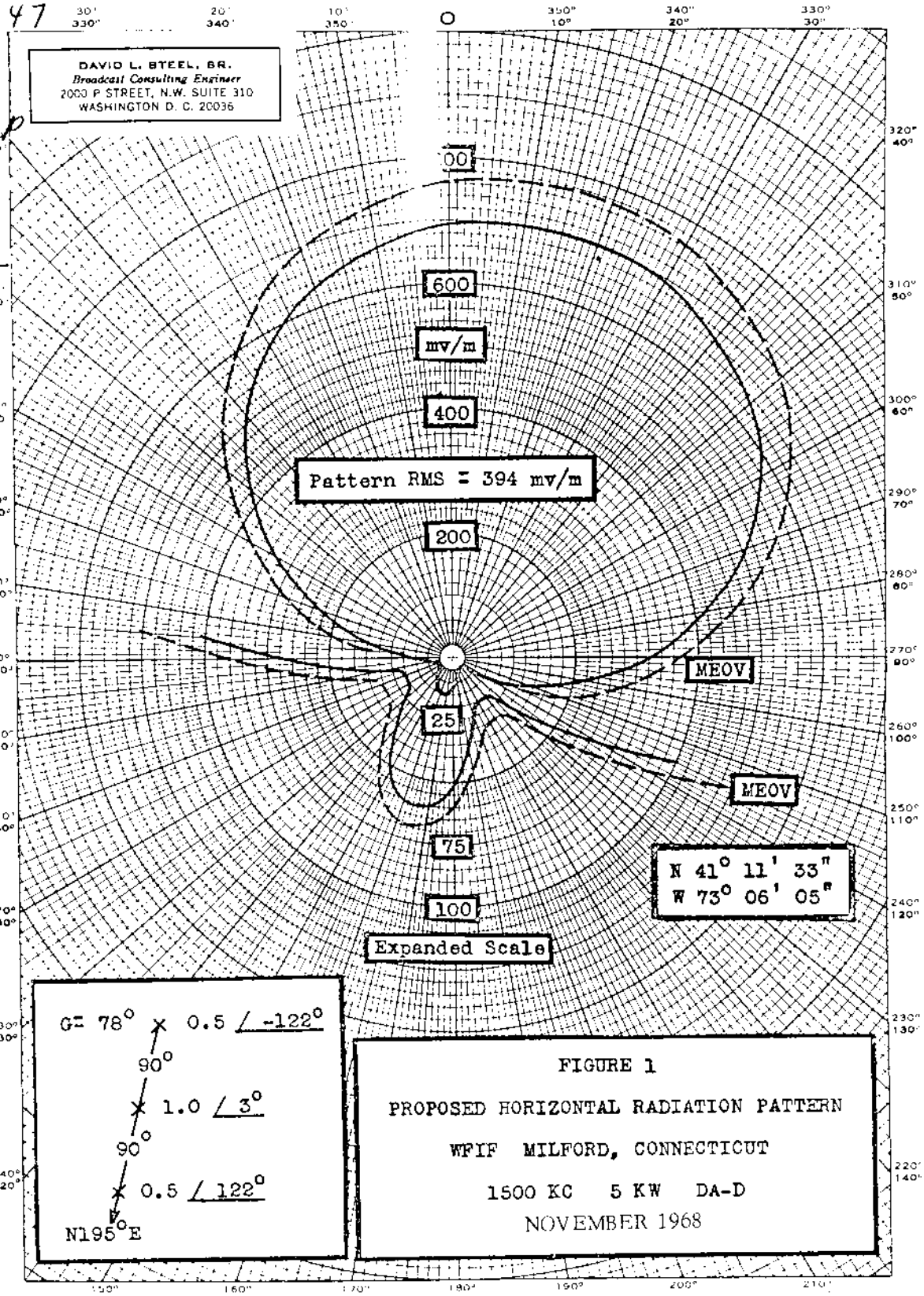


FIGURE 1

PROPOSED HORIZONTAL RADIATION PATTERN

WFIF MILFORD, CONNECTICUT

1500 KC 5 KW DA-D

NOVEMBER 1968

FCC File No.BMP-12647
Accepted 2-14-69

Station WFIF
Milford, Connecticut

1500 kc

WFIF

SEE REVERSE SIDE 6/29/70

Measured Day
(12-29-65ct)

Station WFIF
Milford, Connecticut

5kw,DA-D,D
1500 kc

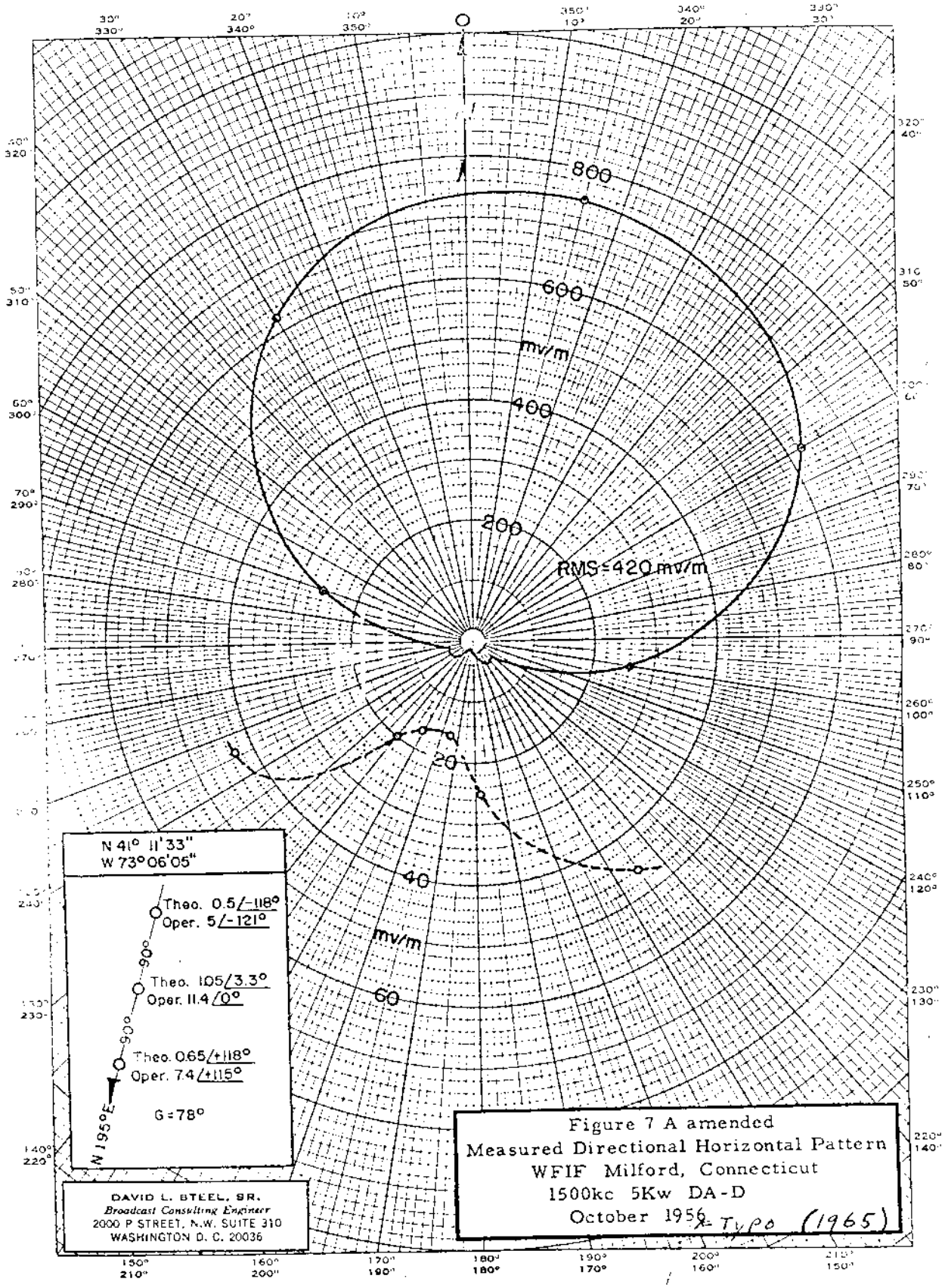


Figure 7 A amended
Measured Directional Horizontal Pattern
WFIF Milford, Connecticut
1500kc 5Kw DA-D
October 1956 Typo (1965)

FCC File No.BL-11166
Accepted 12-16-65

Station WFIF
Milford, Connecticut

1500 kc

WFIF

SEE REVERSE SIDE 6/29/70

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

Station WFIF
Milford, Connecticut

5kw, DA-D, D
1500 kc

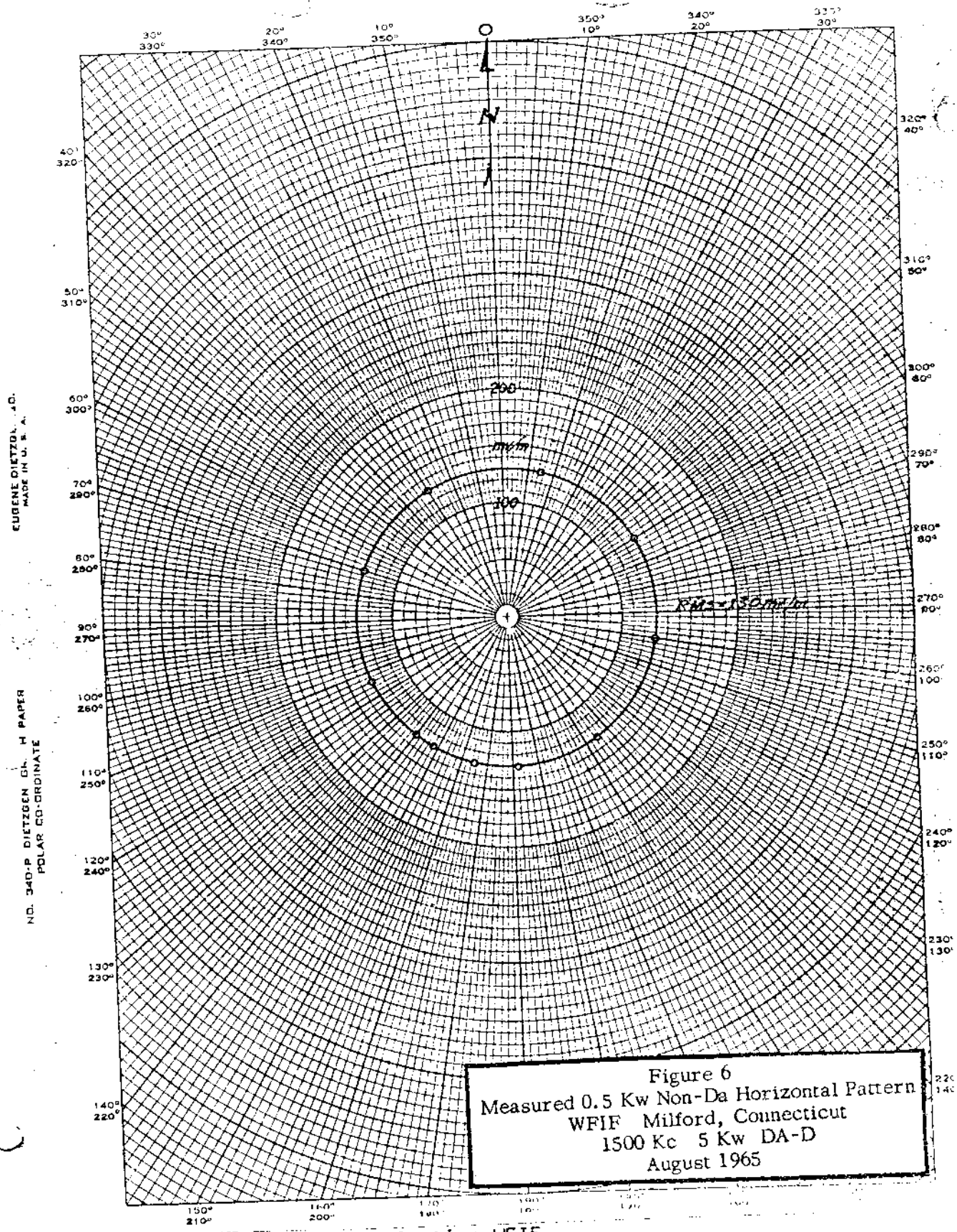


Figure 6
Measured 0.5 Kw Non-Da Horizontal Pattern
WFIF Milford, Connecticut
1500 Kc 5 Kw DA-D
August 1965

FCC File No.BL-11166
Accepted 12-16-65

Station WFIF
Milford, Connecticut

WGFT

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WGFT

Main Studio: Youngstown, Ohio

Frequency: 1500 kHz

Power: 0.5 kW

Notification List No. 1656

Date: October 29, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 41° 06' 25"
West Longitude: 80° 34' 59"

ANTENNA CHARACTERISTICS

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

TOWER:	W(#1)	WC(#2)	EC(#3)	SE(#4)
HEIGHT ABOVE INSULATORS:	168'	168'	168'	168'(90°)
PHASING:	0°	-191.72°	-9.89°	+164.5°
FIELD RATIO:	1.0	2.0977	1.6840	0.625

SPACING AND ORIENTATION: From reference tower #1; tower #2 is spaced 164' (90°) on a line bearing 93° true, tower#3 is spaced 326.2'(179°) on a line bearing 98° true and tower #4 is spaced 492' (264.5°) on a line bearing 106° true.

GROUND SYSTEM: 120-102' to 165' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

Predicted effective Field: 128.75 mv/m at rated power.

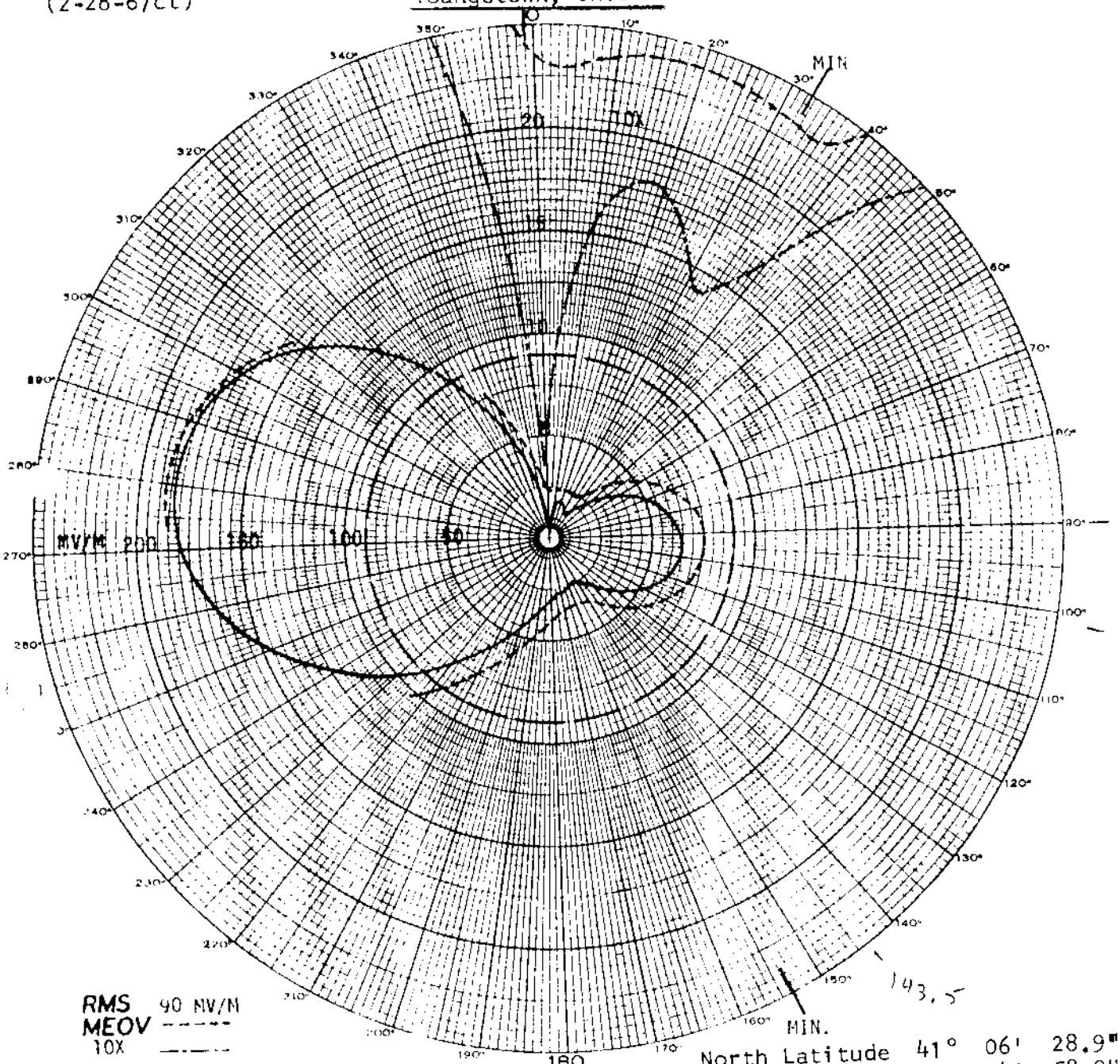
Note: Please retain the Daytime directional antenna radiation pattern notified for a new station at Youngstown, Ohio in United States Change List Number 1531 dated May 31, 1973 and attach to this Revised Description Sheet. This notification concerns only a change in parameters to the complimentary directional antenna parameters which produce the identical radiation pattern.

WGFT

Proposed Day (CH)
(2-28-67ct)

New; Media, Inc.
Youngstown, Ohio

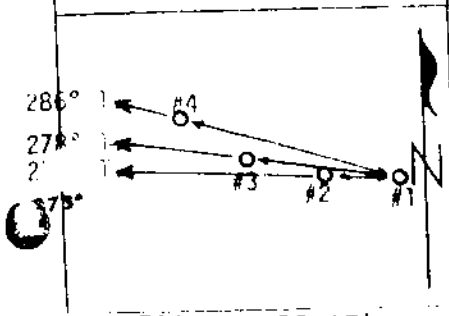
500w,250w-CH,DA-2,D
1500 kc



RMS 90 MV/M
MEOV - - - - -
10X — · — · —

North Latitude 41° 06' 28.9"
West Longitude 80° 34' 58.9"

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 3-B	STATION DATA



TOWER No.	ELECTRICAL HEIGHT °	SPACING '	PHASING °	FIELD RATIO
1	90	ref	0	1.0
2	90	90	211.6792	.06219
3	90	179.47	628	1.3932
4	90	264.5	-100	0.320
5				
6				
7				
8				
9				
10				

DAYTIME PATTERN DESIGN CH NIGHTTIME PATTERN

FIGURE 3-B

Youngstown, Ohio

Proposed Critical Hours DA Pattern

θ°

STATION DATA

CALL New
FREQ 1500 KHz
POWER 0.25 Kw
TYPE DA-2
TIME CH
LAT. 41-06-28.9
LONG. 80-34-58.9

E.H.MUNN,JR.
RADIO ENGINEER
COLDWATER, MICH.

FCC File No.BP-17435
Accepted 2-7-67

New; Media, Inc.
Youngstown, Ohio

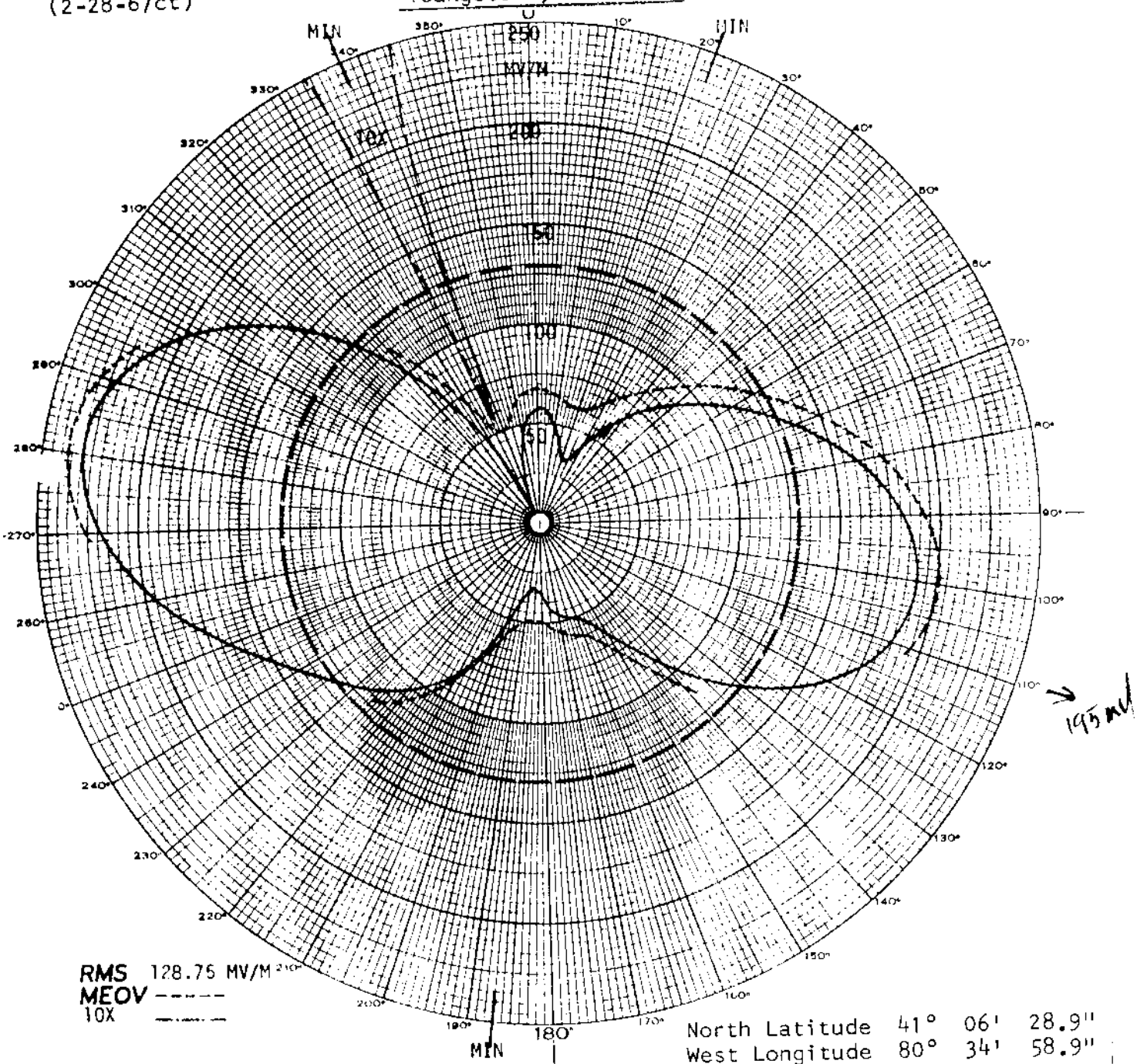
1500 kc

WGFT

Proposed Day
(2-28-67ct)

New; Media, Inc.
Youngstown, Ohio

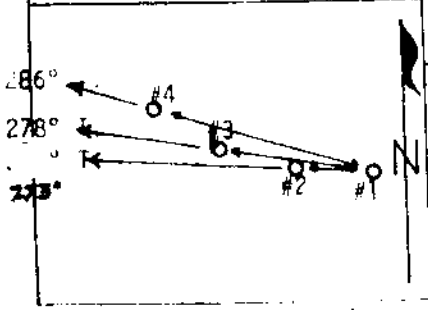
500w,250w-CH,DA-2,D
1500 kc



RMS 128.75 MV/M
MEOV - - - - -
10X ——·——

North Latitude 41° 06' 28.9"
West Longitude 80° 34' 58.9"

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 3-A	STATION DATA



TOWER No.	ELECTRICAL HEIGHT °	SPACING °	PHASING °	FIELD RATIO
1	90	ref	0	1.0
2	90	90	191.71	2.09769
3	90	179	358.06	1.62488
4	90	264.5	164.5	0.625
5				
6				
7				
8				
9				
10				

DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐

Youngstown, Ohio

Proposed Daytime
Directional Antenna
Pattern

θ°

CALL New
FREQ 1500 KHz
POWER 0.5 Kw
TYPE DA-2
TIME Day
LAT. 41-0[illegible]
LONG. 80-34-58

E.H.MUNN,JR.
RADIO ENGINEER
COLDWATER, MICH.

FCC File No.BP-17435
Accepted 2-7-67

New; Media, Inc.
Youngstown, Ohio

1500 kc

WGFT

SUPPLEMENTAL DIRECTIONAL ANTENNA
DESCRIPTION SHEET

Station: WGFT

Main Studio: Youngstown, Ohio

Frequency: 1500 kHz

Power: 0.5 kW

Notification List No. 1704

Date: October 5, 1976 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 41° 06' 26"

West Longitude: 80° 34' 57"

Authorized for Daytime operation (DA-D).

Predicted effective Field: 128.75 mv/m at rated power.

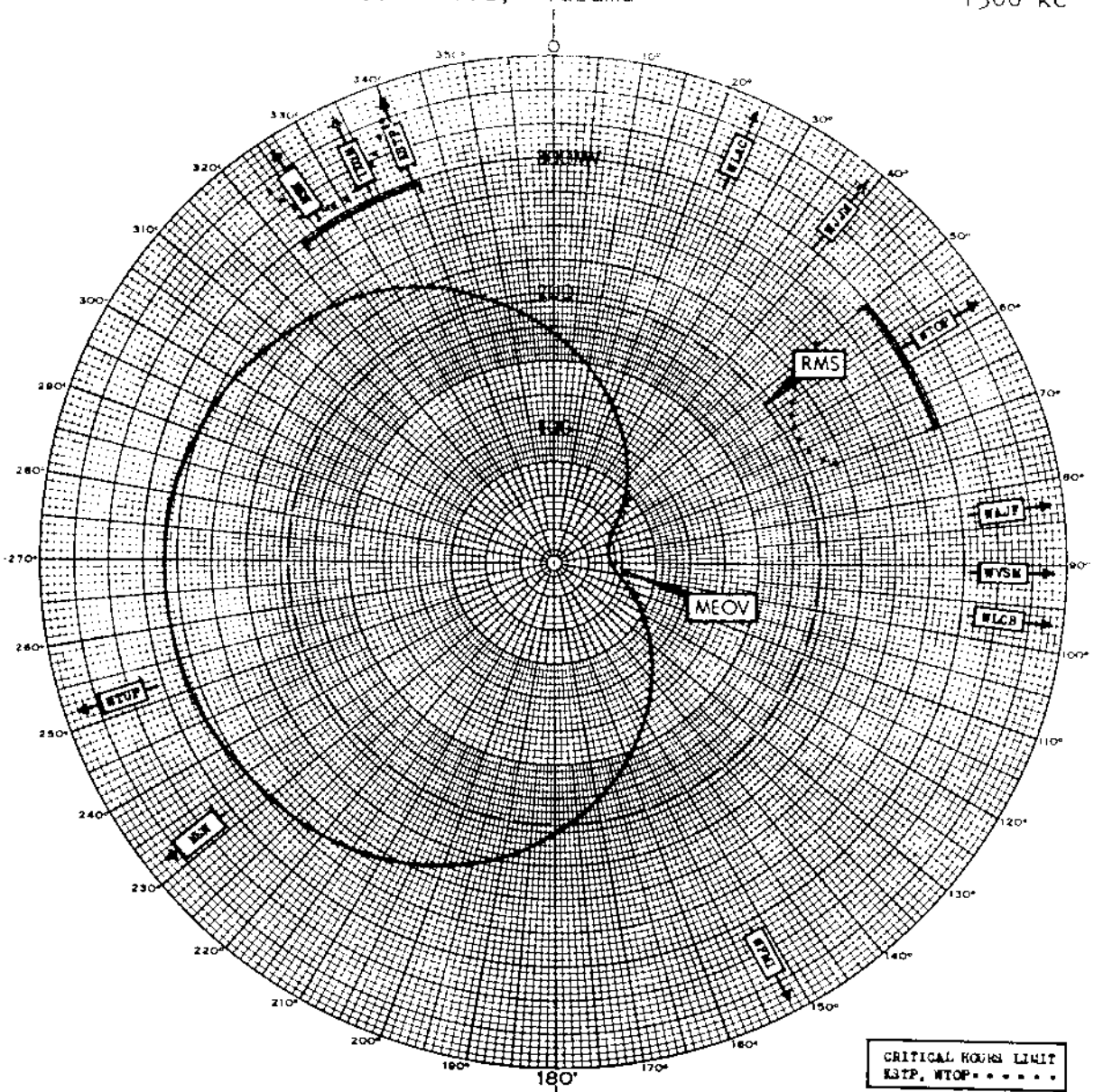
Note: Please retain the daytime directional antenna radiation pattern notified for a new station at Youngstown, Ohio in United States Change List Number 1531, dated May 31, 1973 and the directional antenna description sheet notified in Change List No. 1656 dated October 29, 1975 and attach to this supplemental Description Sheet. This notification is for the purpose of indicating only a correction in the geographical coordinates of the center of the antenna system.

WKAX

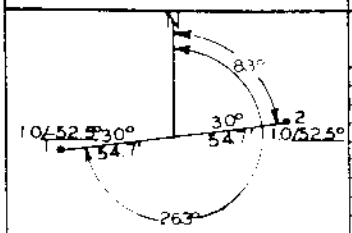
Proposed Day
(7-29-68ct)

New; Franklin Broadcasting Co.
Russellville, Alabama

1kw, DA-D,D
1500 kc



CRITICAL HOURS LIMIT
WTUP, WTOP - - - - - -

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA		
	TOWER No.	ELECTRICAL HEIGHT °	TRUE TOWER ORIENTATION °	SPACING °	PHASING °	HORIZONTAL FIELD mv/m	FIELD RATIO	ELEV ANGLE °	ELEVATION RMS FIELD mv/m	CALL	NEW	
	1	90	263	30	-52.5	153.5	1.0	0	195	FREQUENCY	1500	kc
	2	90	83	30	52.5	153.5	1.0	10		POWER	1.0	kw
	3							20		TIME OF OPERATION	DAY	
	4							30		TYPE OF OPERATION		
	5							40		DAYTIME TOWERS		
	6							50		NIGHTTIME TOWERS		
	7							60		NO. RADIALS PER TOWER		
	8							70		LENGTH OF RADIALS		ft
	9							80		GROUND SCREEN DIMENSION		
	10							90		LAT.	34° 31' 42"	
										LONG.	87° 42' 41"	
	DAYTIME OPERATION ■				NIGHTTIME OPERATION □					SUPERSEDES		
										PATTERN No.		

RADIATION PATTERN
NEW. RUSSELLVILLE, ALABAMA
J. L. STEVENS MEMPHIS TENN.
NOV. 1967

FCC File No.BP-18225
Accepted 7-22-68

New; Franklin Broadcasting Co.
Russellville, Alabama

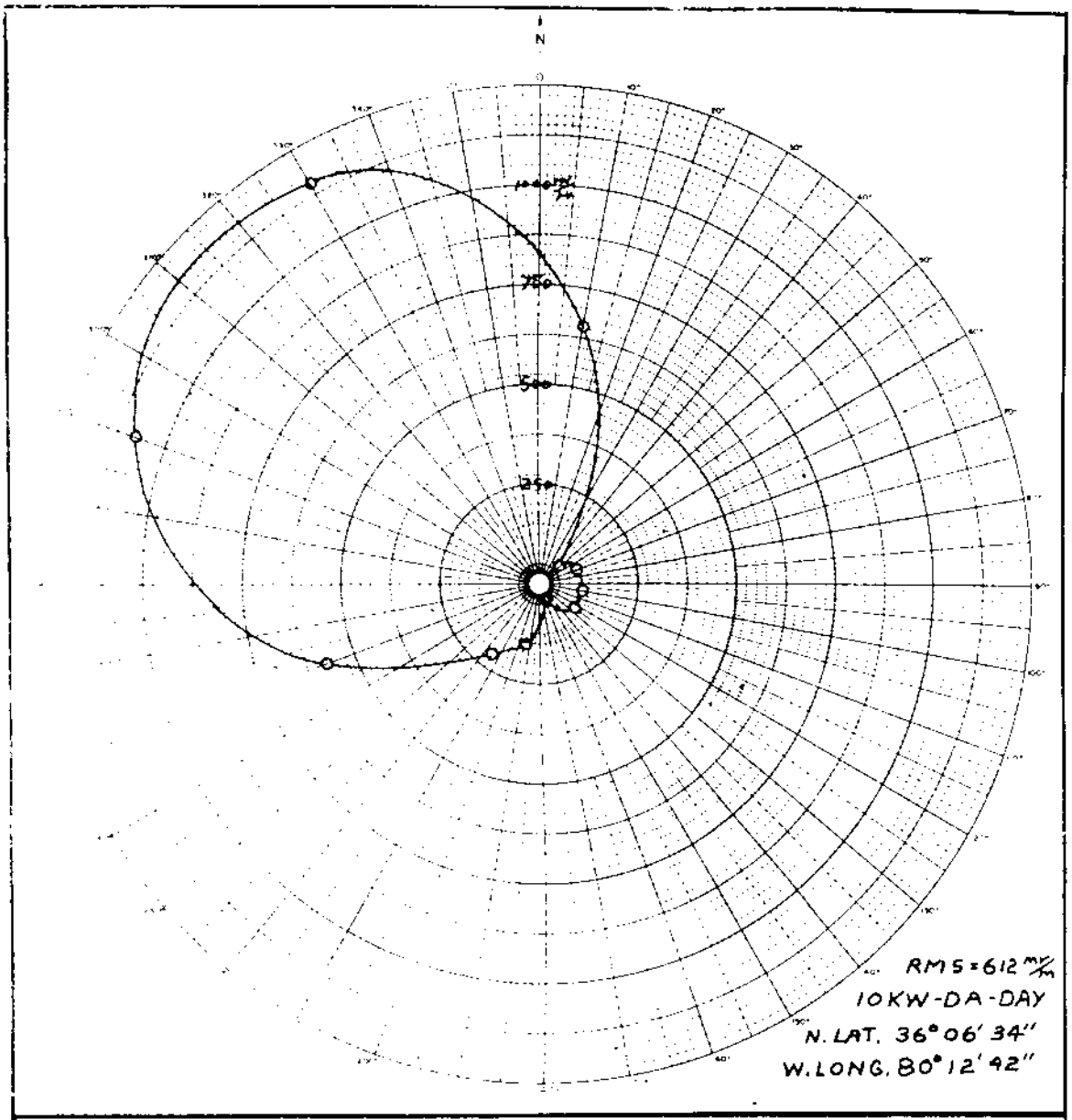
1500 kc

WKBX

Measured Day
(2-22-71ct)

Station WKBX
Winston-Salem, North Carolina

10kw,1kw-CH,DA-2,D
1500 kc



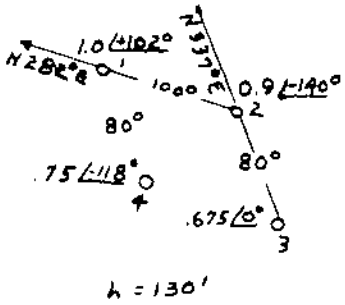


FIGURE LXIVA
MEASURED HORIZONTAL RADIATION PATTERN
RADIO STATION WKBX
1500KC 10KW-D. 1KW-CH. DA-2
WINSTON SALEM, NORTH CAROLINA

WILLIAM L. FOSS, INC.
Electronic Consultants
WASHINGTON 5, D. C.
827 14th Street, N.W. RE 38-1

PATTERN NO
SUPERSEDES
APP

FCC File No.BL-12865
Accepted 2-11-71

Station WKBX
Winston-Salem, North Carolina

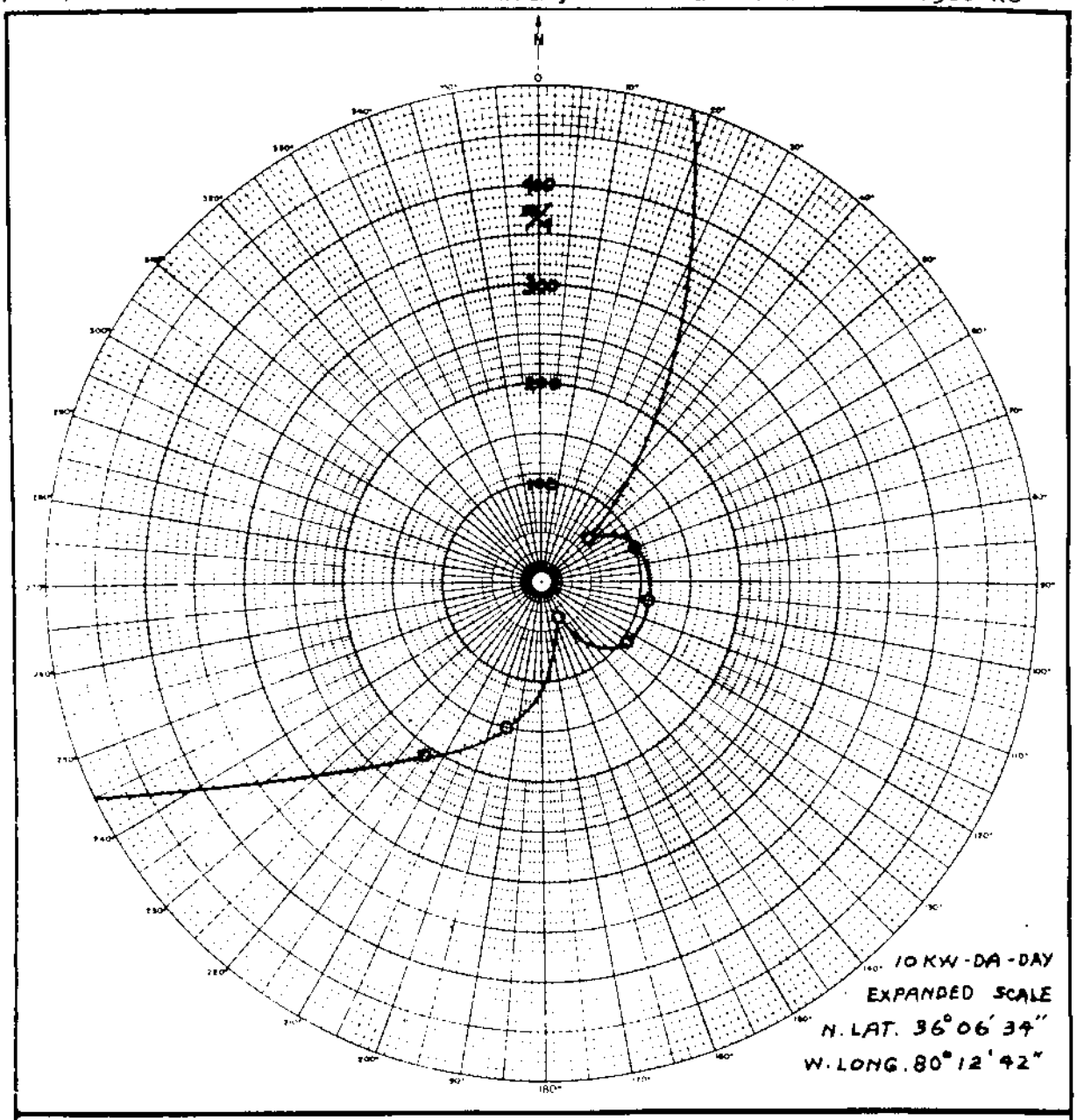
1500 kc

WKBX

Measured Day Nulls
(2-22-71ct)

Station WKBX
Winston-Salem, North Carolina

10kw, 1kw-CH, DA-2, D
1500 kc



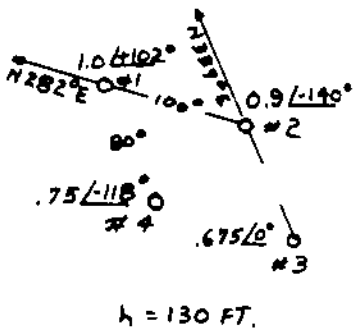


FIGURE LXV
MEASURED HORIZONTAL RADIATION PATTERN
RADIO STATION WKBX
1500 KC 10KW-D, 1KW-CH, DA-2
WINSTON SALEM, NORTH CAROLINA

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

PATTERN NO
SUPERSEDES
APP

FCC File No. BL-12865
Accepted 2-11-71

Station WKBX
Winston-Salem, North Carolina

1500 kc

WKBX

Measured Day (CH)
(2-22-71ct)

Station WKBX
Winston-Salem, North Carolina

10kw,1kw-CH,DA-2,D
1500 kc

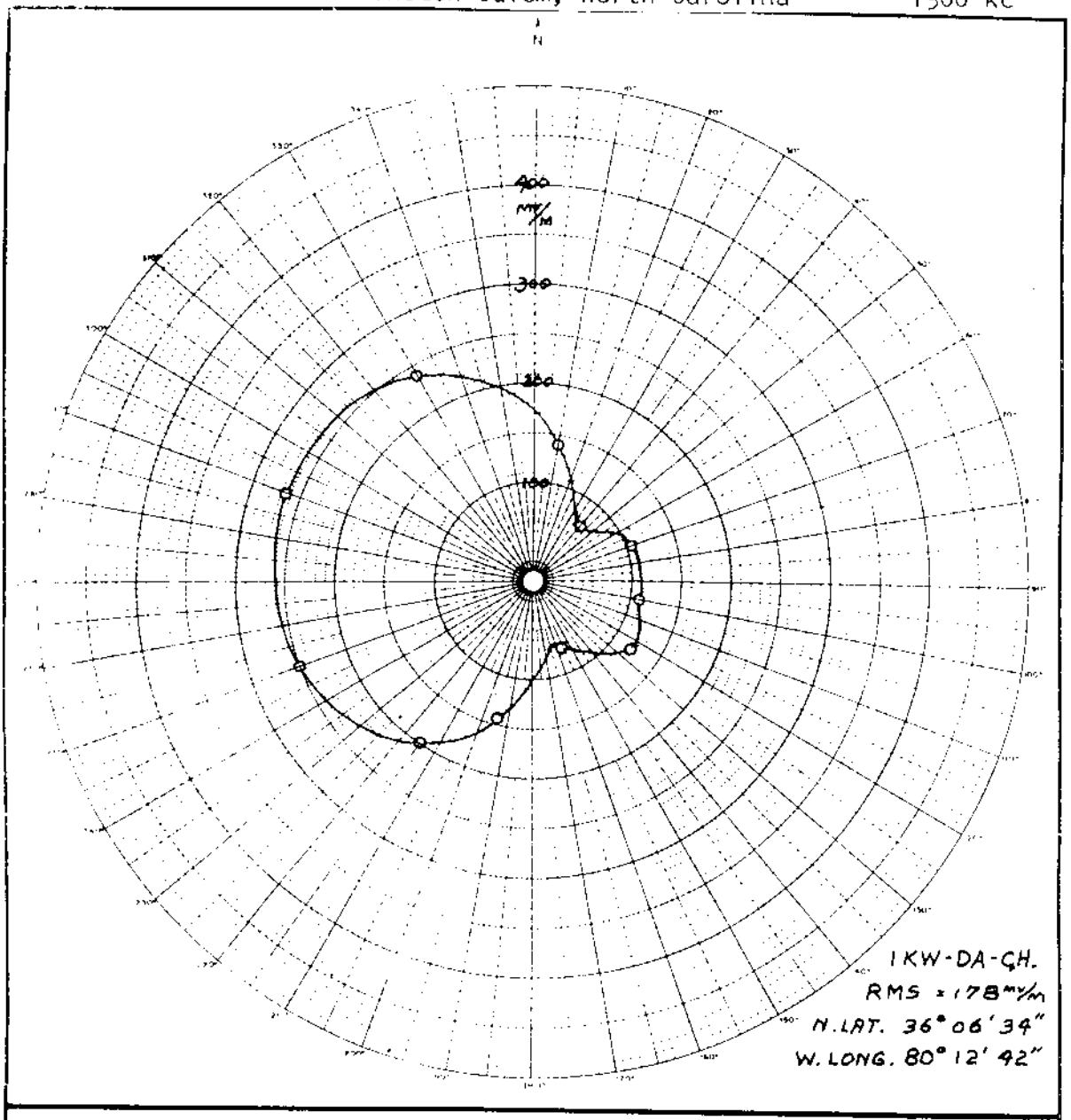
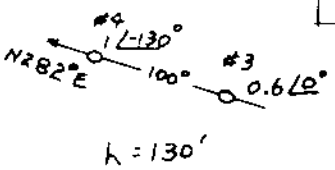


FIGURE LXIII
MEASURED HORIZONTAL RADIATION PATTERN
RADIO STATION WKBX
1500 KC 10KW-D, 1KW-CH, DA-2
WINSTON SALEM, NORTH CAROLIN



WILLIAM L. FOSS, INC.
Electronic Consultants
WASHINGTON 5, D. C.
822 19th Street, N.W. RE 3843

PATTERN NO
SUPERSEDES
APP

FCC File No.BL-12865
Accepted 2-11-71

Station WKBX
Winston-Salem, North Carolina

1500 kc

WKBX

Measured Non-DA
(2-22-71ct)

Station WKBX
Winston-Salem, North Carolina

10kw,1kw-CH,DA-2,D
1500 kc

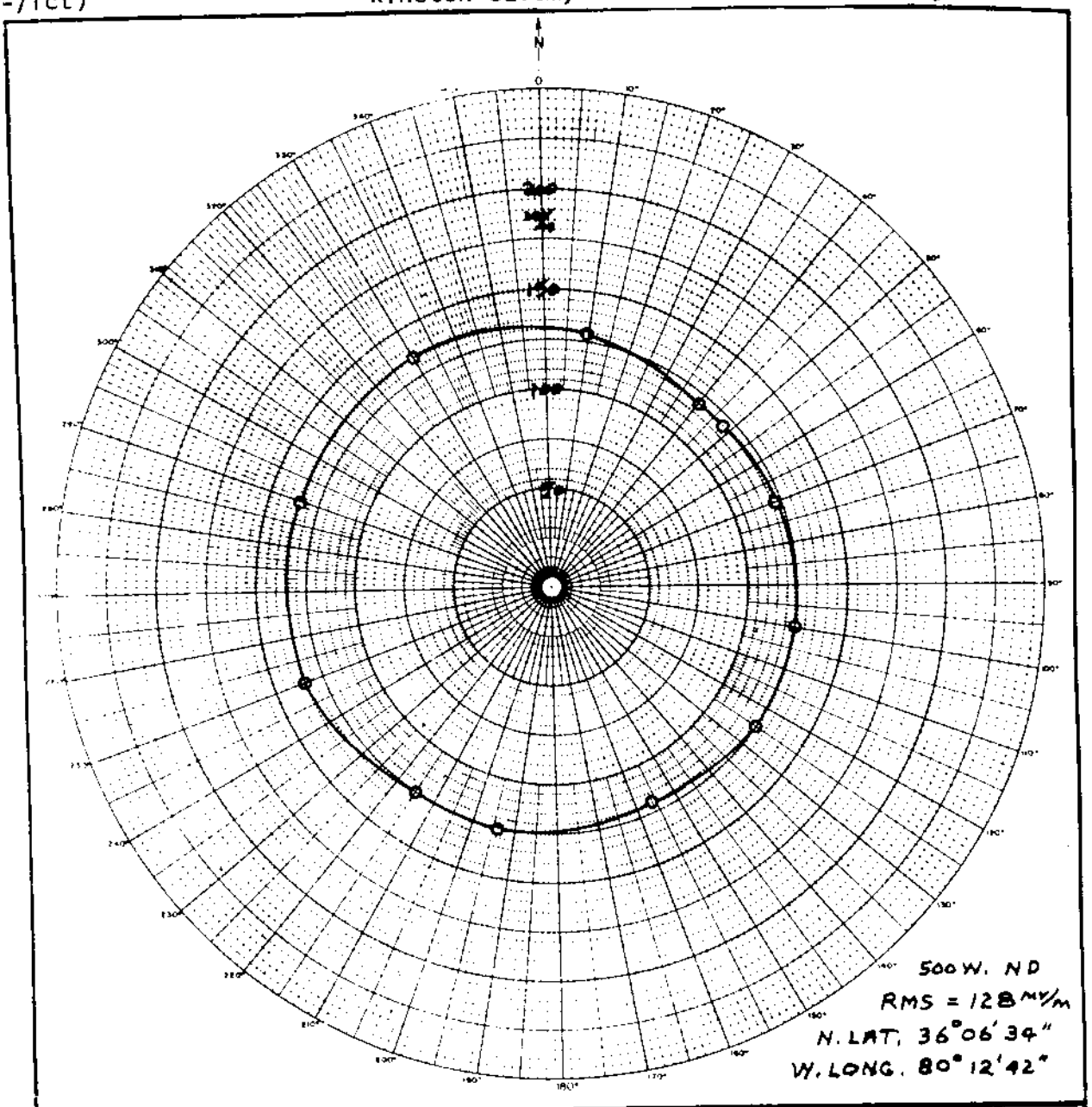


FIGURE LXII
MEASURED HORIZONTAL RADIATION PATTERN
RADIO STATION WKBX
1500 KC 10KW-D, 1KW-CH, DA-2
WINSTON SALEM, NORTH CAROLINA

WILLIAM L. FOSS, INC.
Electronic Consultants
WASHINGTON 9, D. C.
937 19th Street, N.W. RE 3663

PATTERN NO
SUPERSEDES
APP

FCC File No.BL-12865
Accepted 2-11-71

Station WKBX
Winston-Salem, North Carolina

1500 kc

WKBX

Proposed Day Nulls
(12-27-68ct)

Station WKBX
Winston-Salem, North Carolina

10kw,1kw-CH,DA-2,D
1500 kc

BP-18307
Granted
2-10-69
CP to change
from 1kw,
DA-D, to
10kw, 1kw-CH
DA-2, D

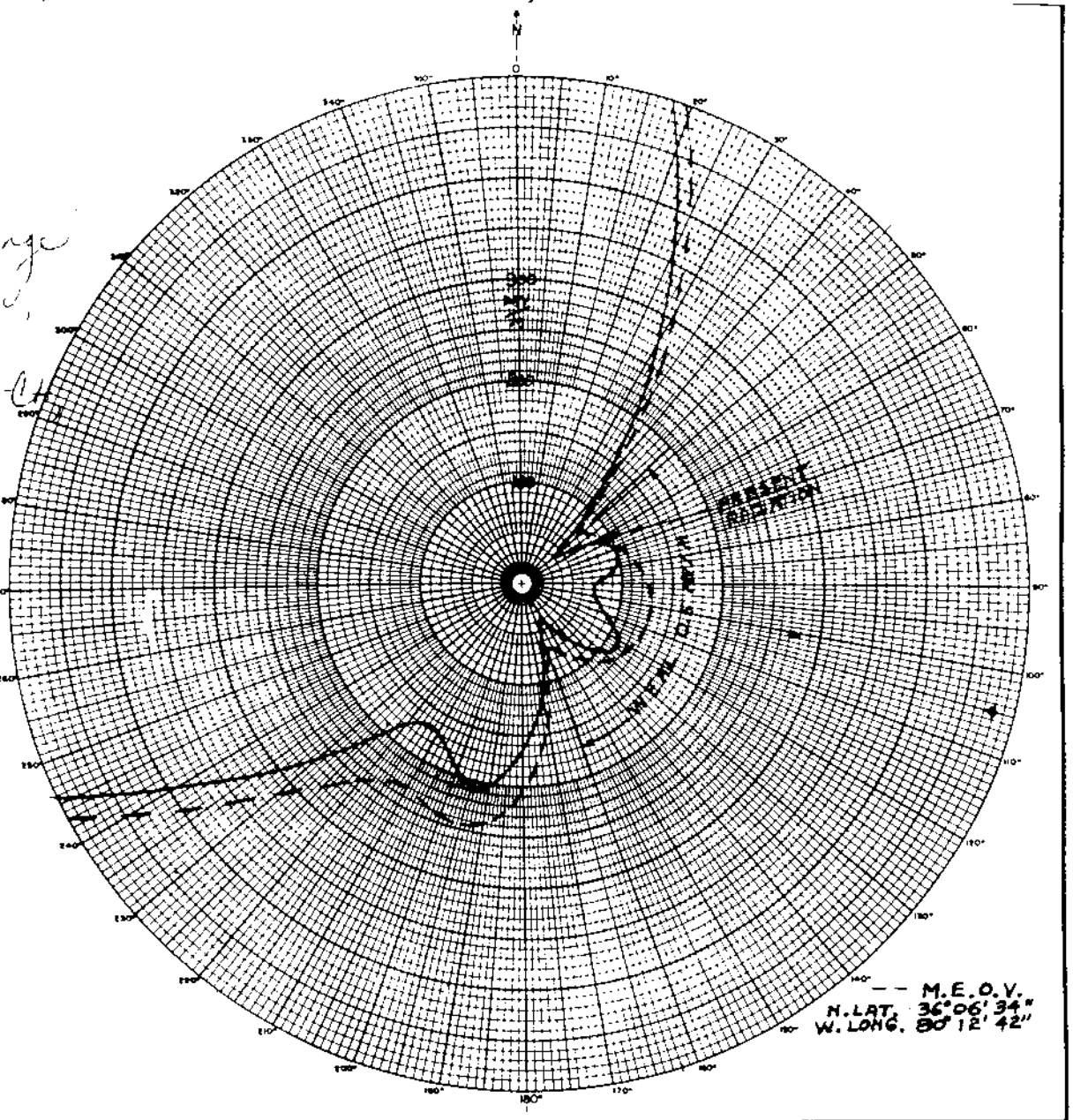
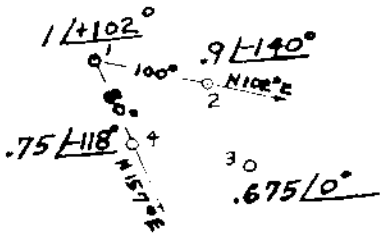


EXHIBIT VIIA

HORIZONTAL RADIATION PATTERN
EXPANDED SCALE
RADIO STATION WKBX
1500KC 10KW-D,1KW-CH DA-2
WINSTON SALEM, N. C.



h = 130 FT.
1+2 EXISTING

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

PATTERN NO
SUPERSEDES
APP.

FCC File No.BP-18307
Accepted 11-27-68

Station WKBX
Winston-Salem, North Carolina

1500 kc

WKBX

Proposed Day
(12-27-68ct)

Station WKBX
Winston-Salem, North Carolina

10kw,1kw-CH,DA-2,D
1500 kc

BP-18307
Granted
1/16/69 CP
to change
from 1kw, DA D,
DLO 10 kw,
1kw-CH,
DA-2, D

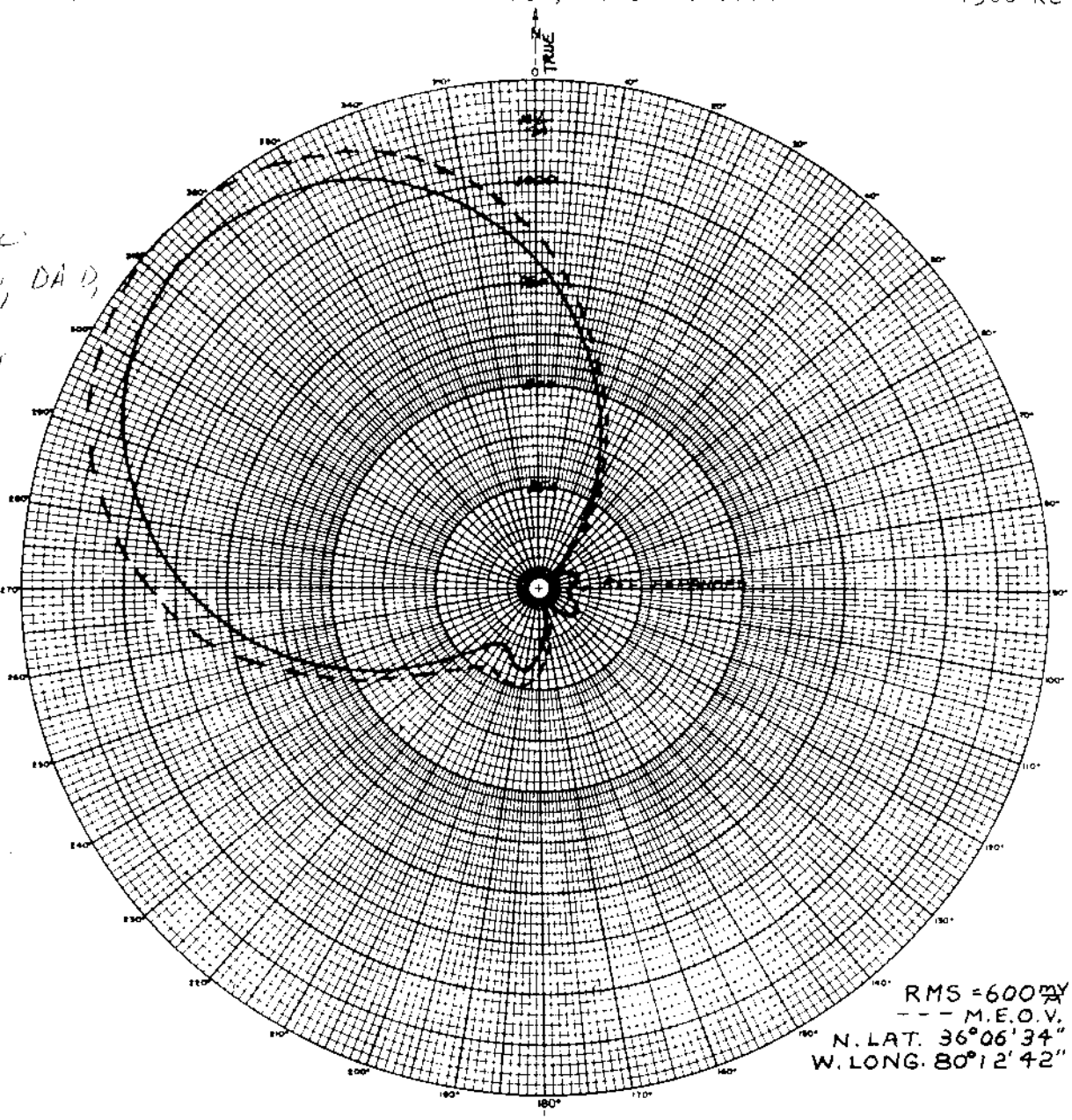
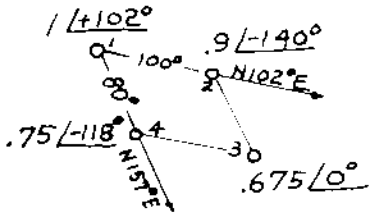


EXHIBIT VII

HORIZONTAL RADIATION PATTERN
RADIO STATION WKBX
1500KC 10KW-D 1KW-CH DA-2
WINSTON SALEM, N. C.



h = 130 FT.
1-2 EXISTING

PATTERN NO
SUPERSEDES
APP

FCC File No.BP-18307
Accepted 11-27-68

Station WKBX
Winston-Salem, North Carolina

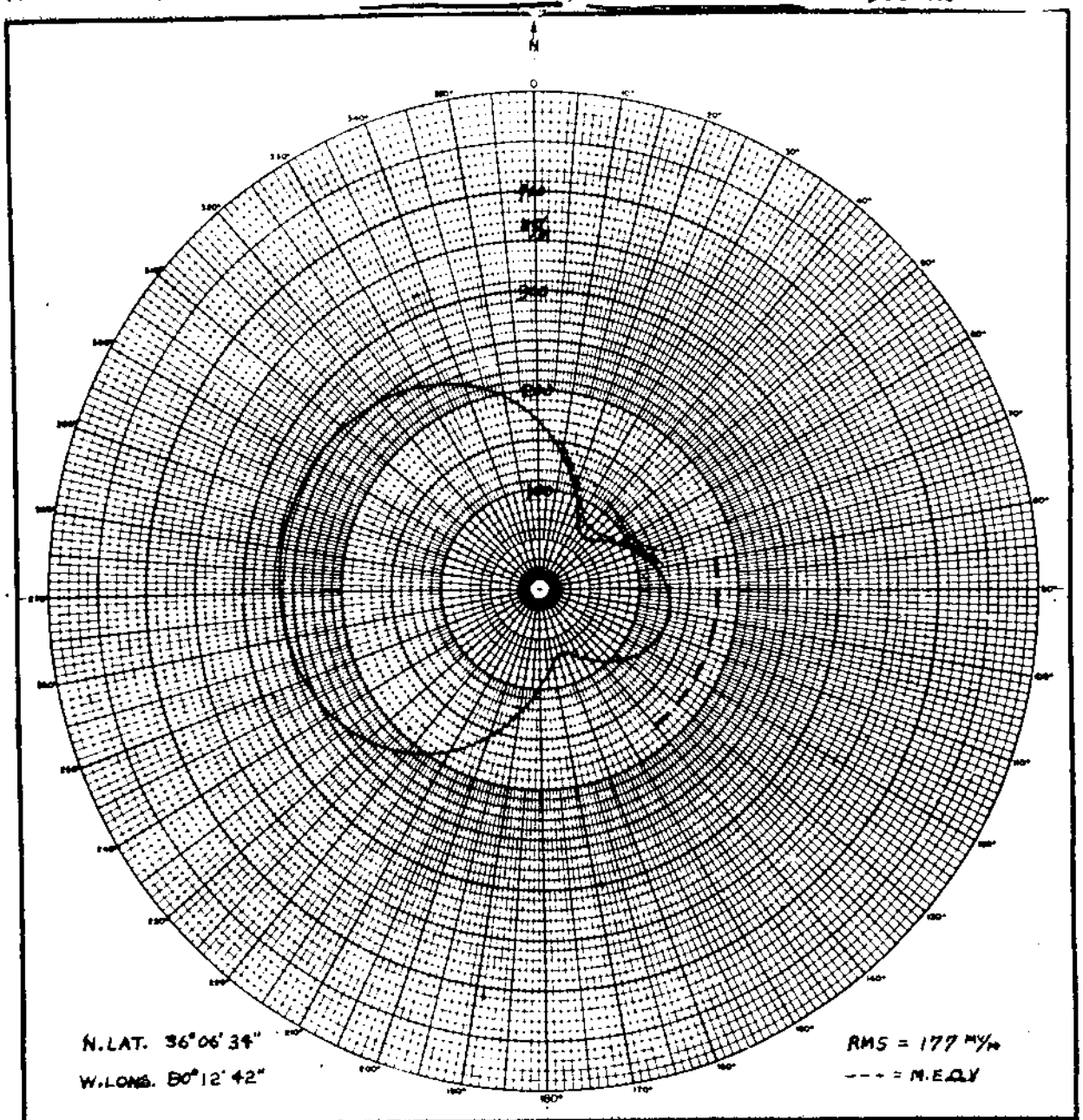
1500 kc

WKBX

PROPOSED DAY
(7-26-61ct)

New; Stuart W. Epperson 1kw, DA-D,D
Winston-Salem, North Carolina 1500 KC

BP ~~17278~~
~~BP 17278~~
~~RA 7616 (ND)~~



1.0 /-130°
100°
0.6/0°
N102°E
h = 130 FT.

EXHIBIT IV
HORIZONTAL RADIATION PATTERN
STUART W. EPPERSON
1500KC 1KW-DA-D WINSTON SALEM, N.C.

WILLIAM L. FOSS, INC.
Electronic Consultants
WASHINGTON 6, D. C.
527 15th Street, N.W. RE. 3-8063

PATTERN NO
SUPERSEDES
APP

FCC File No. BP-14909
Accepted 7-17-61

Stuart W. Epperson
Winston-Salem, North Carolina 1500 KC

WKBX

Measured Day
(3-26-65ct)

Station WKBX
Winston-Salem, North Carolina

1kw,DA-D,D
1500 kc

L.C. 11-3-65
~~DP 17 274~~
~~PA 710 KC DD~~

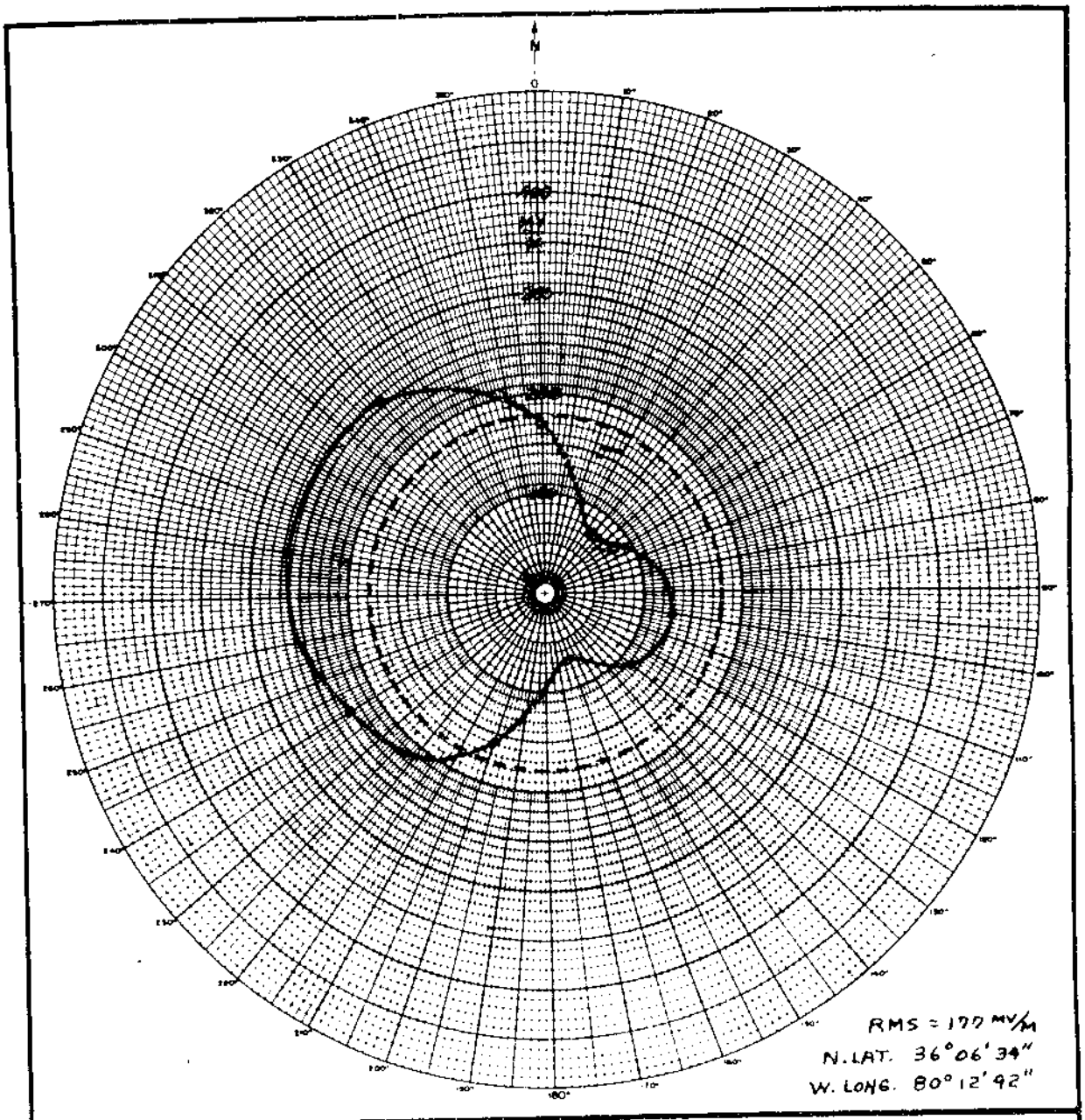
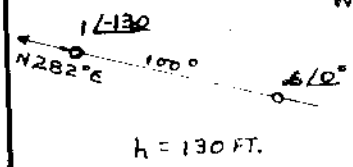


EXHIBIT II
MEASURED DAYTIME
HORIZONTAL RADIATION PATTERN

WKBX 1500 KC 1KW-DA-DAY WINSTON SALEM, N.C.



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

PATTERN NO
SUPERSEDES
APP

FCC File No. BL-10767
Accepted 2-24-65

Station WKBX
Winston-Salem, North Carolina

1500 kc

WKBX

Measured Non-DA
(3-26-65ct)

Station WKBX
Winston-Salem, North Carolina

1kw,DA-D,D
1500 kc

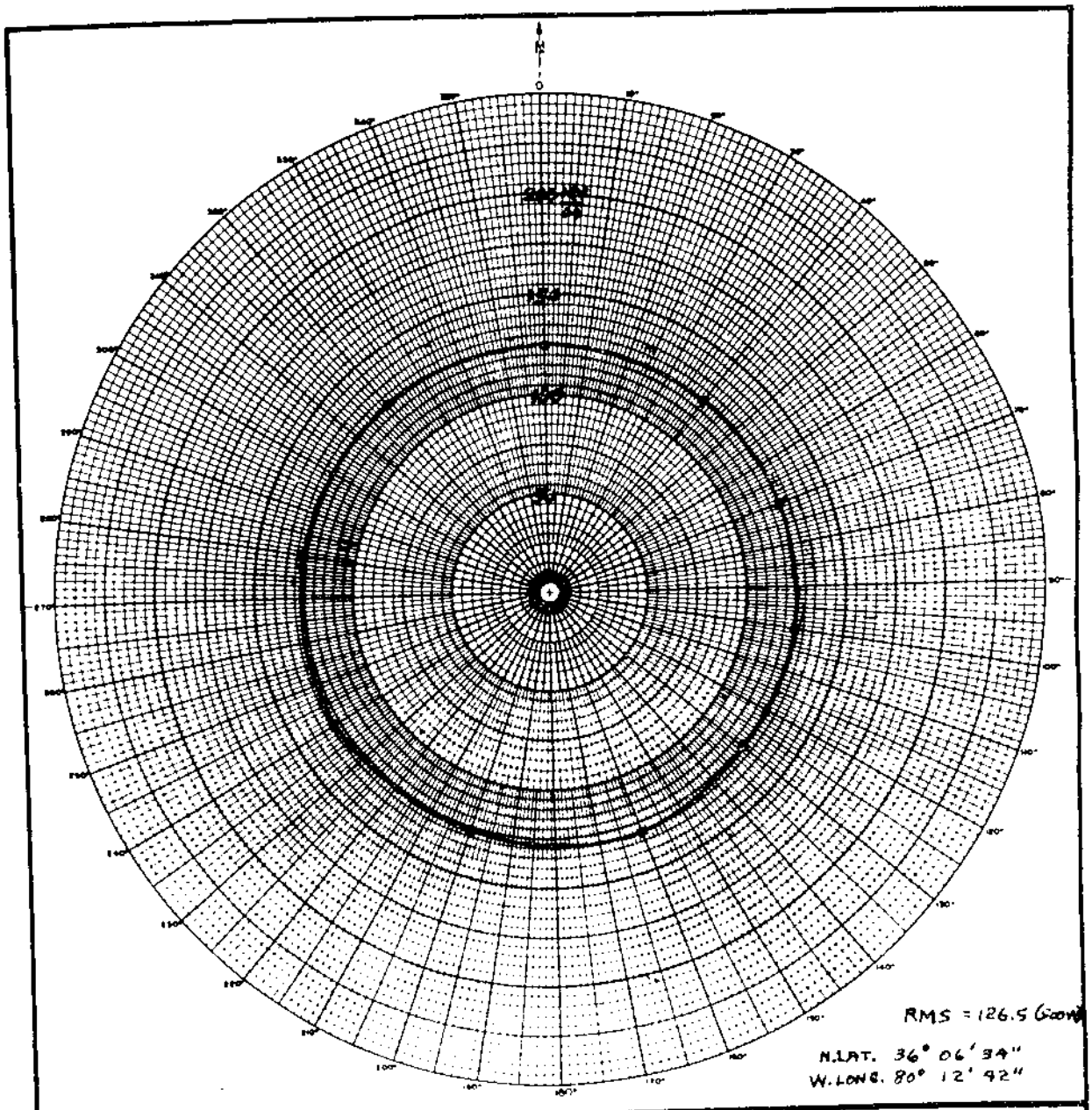


EXHIBIT I

MEASURED HORIZONTAL PLANE PATTERN

NON-DIRECTIONAL W. TOWER

WKBX 1500 KC 1KW-DA-DAY WINSTON SALEM, NC

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

PATTERN NO
SUPERSEDES
APP

FCC File No. BL-10767
Accepted 2-24-65

Station WKBX
Winston-Salem, North Carolina

1500 kc

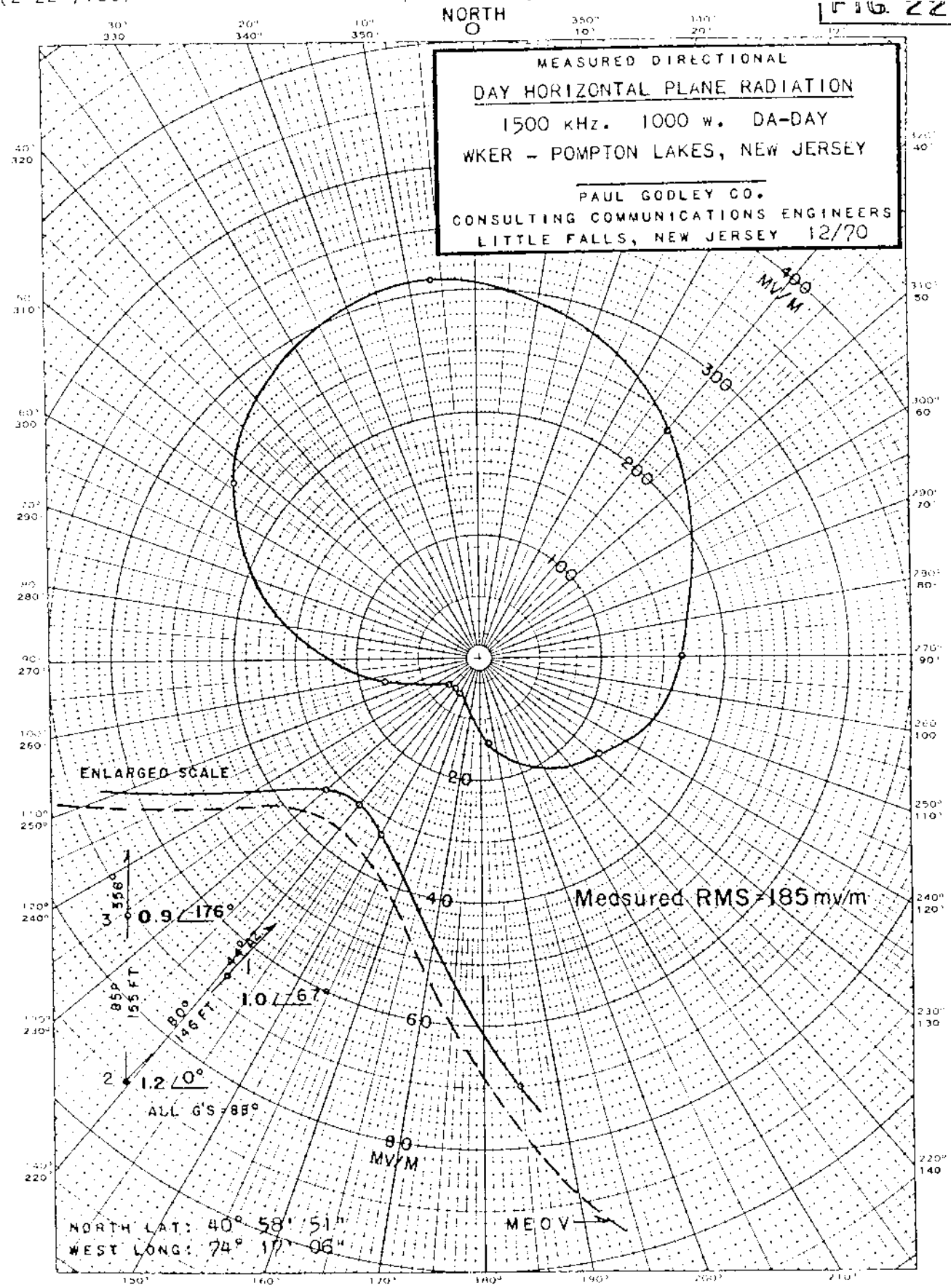
WKER

Measured Day
(2-22-71ct)

Station WKER
Pompton Lakes, New Jersey

1kw, DA-D, D
1500 kc

FIG. 22



FCC File No. BL-12851
Accepted 1-27-71

Station WKER
Pompton Lakes, New Jersey

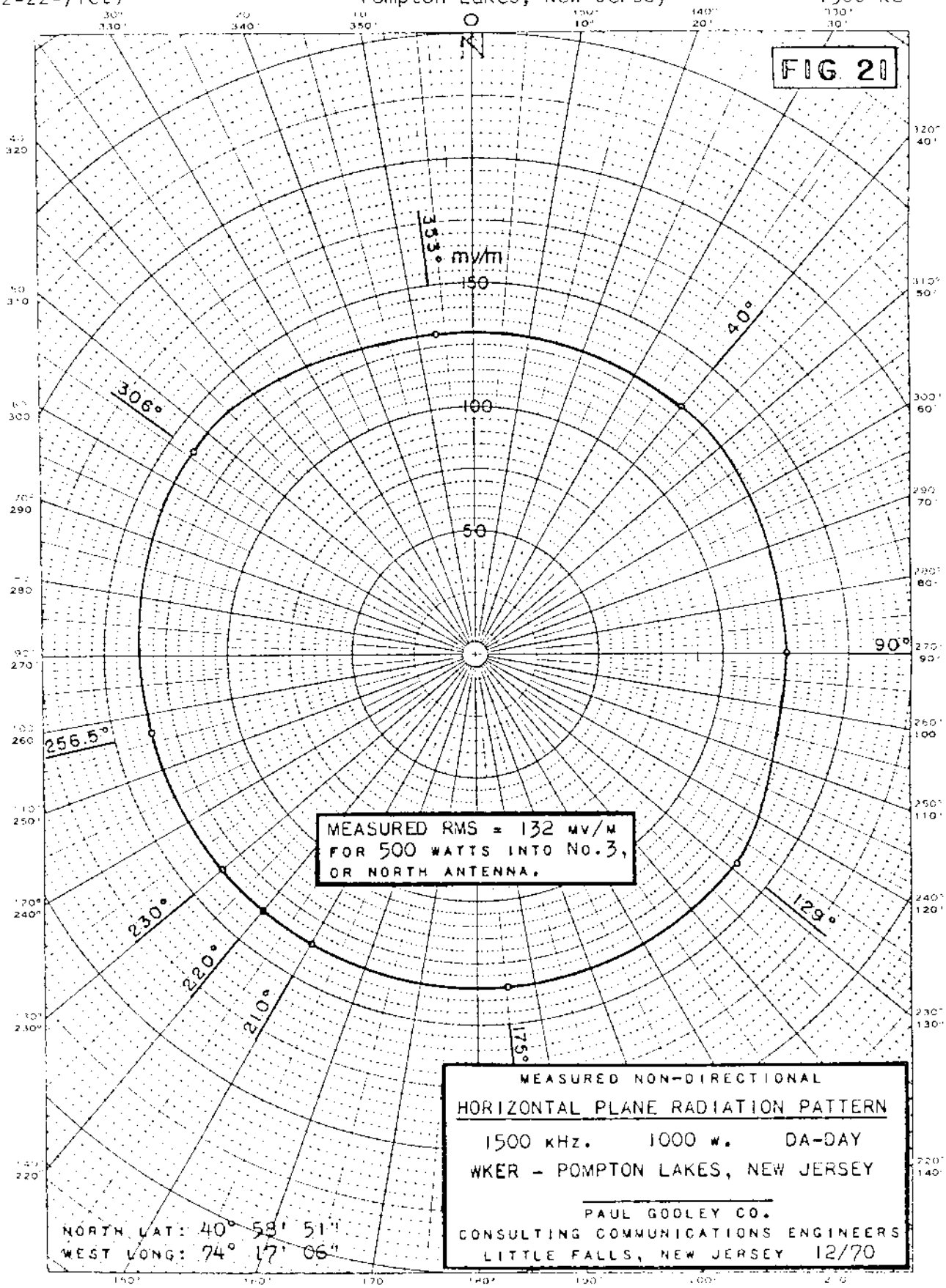
1500 kc

WKER

Measured Non-DA
(2-22-71ct)

Station WKER
Pompton Lakes, New Jersey

1kw, DA-D, D
1500 kc



FCC File No.BL-12851
Accepted 1-27-71

Station WKER
Pompton Lakes, New Jersey

1500 kc

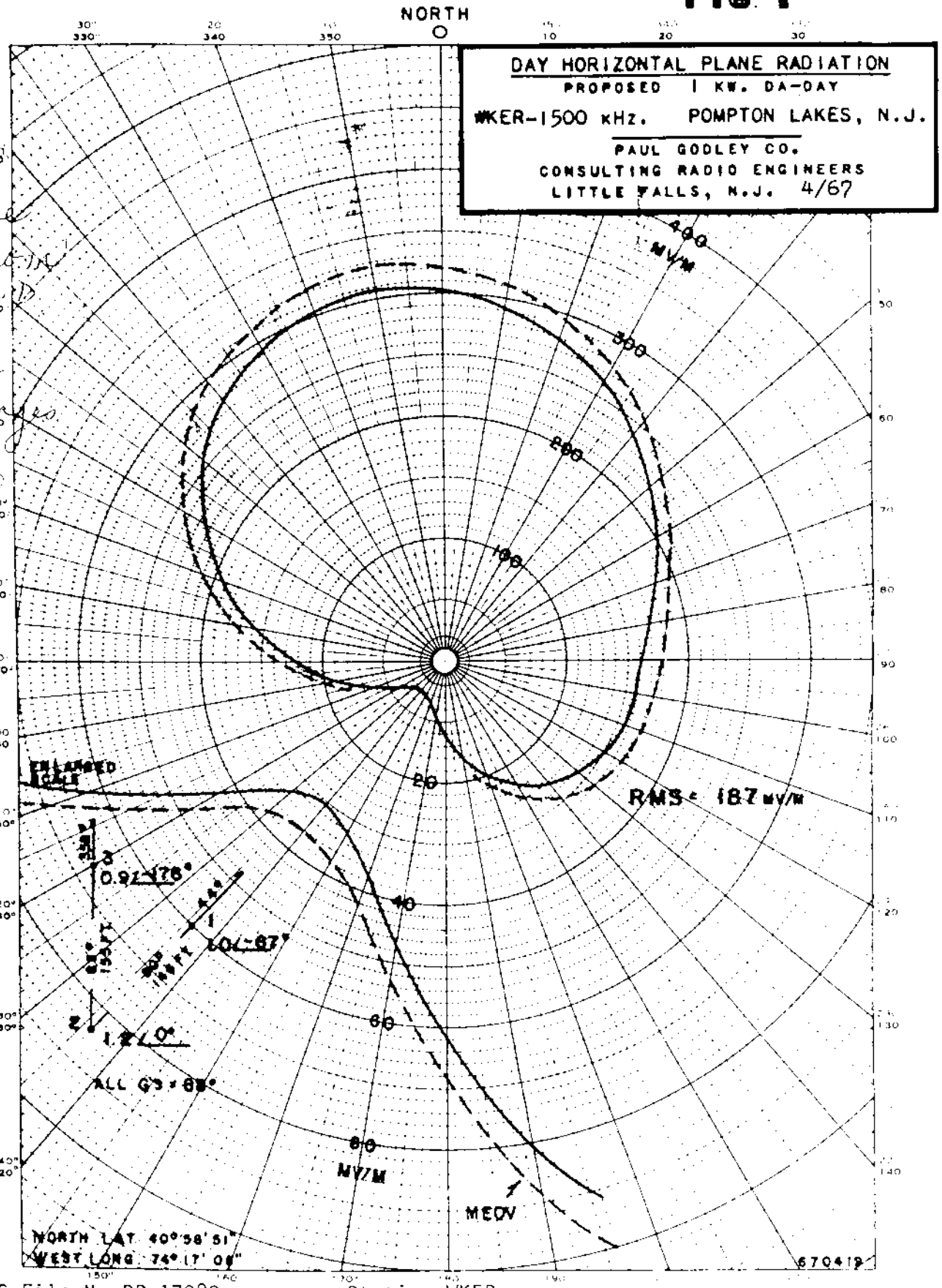
WKER

Proposed Day
(3-28-68ct)

Station WKER
Pompton Lakes, New Jersey

1kw,DA-D,D
1500 kc

BP-17989
Granted
6/9/69 to
increase
power from
500 w, DA-D
D-D, 1 kw
DA-D, D-
make changes
in DA
system



FCC File No.BP-17989
Accepted 3-19-68

Station WKER
Pompton Lakes, New Jersey

1500 kc

WKER

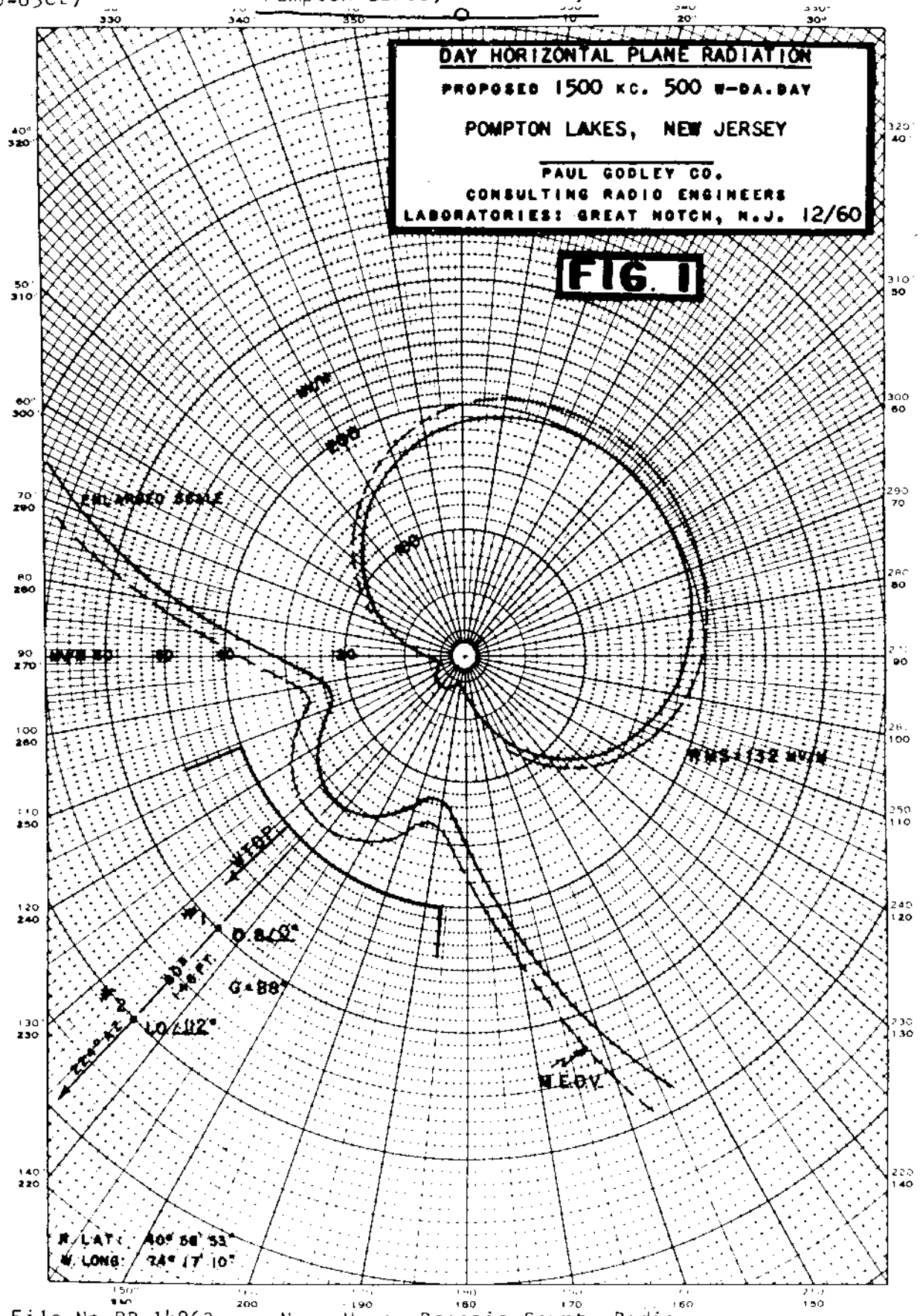
Proposed Day
(3-30-63ct)

New; Upper Passaic County Radio
Pompton Lakes, New Jersey

500w,DA-D,D
1500kc

6-12-63 granted CP for new AM station

4/29/64 granted mod of CP to change ant-trans location



FCC File No.BP-14863
Reinstated 3-20-63

New; Upper Passaic County Radio
Pompton Lakes, New Jersey

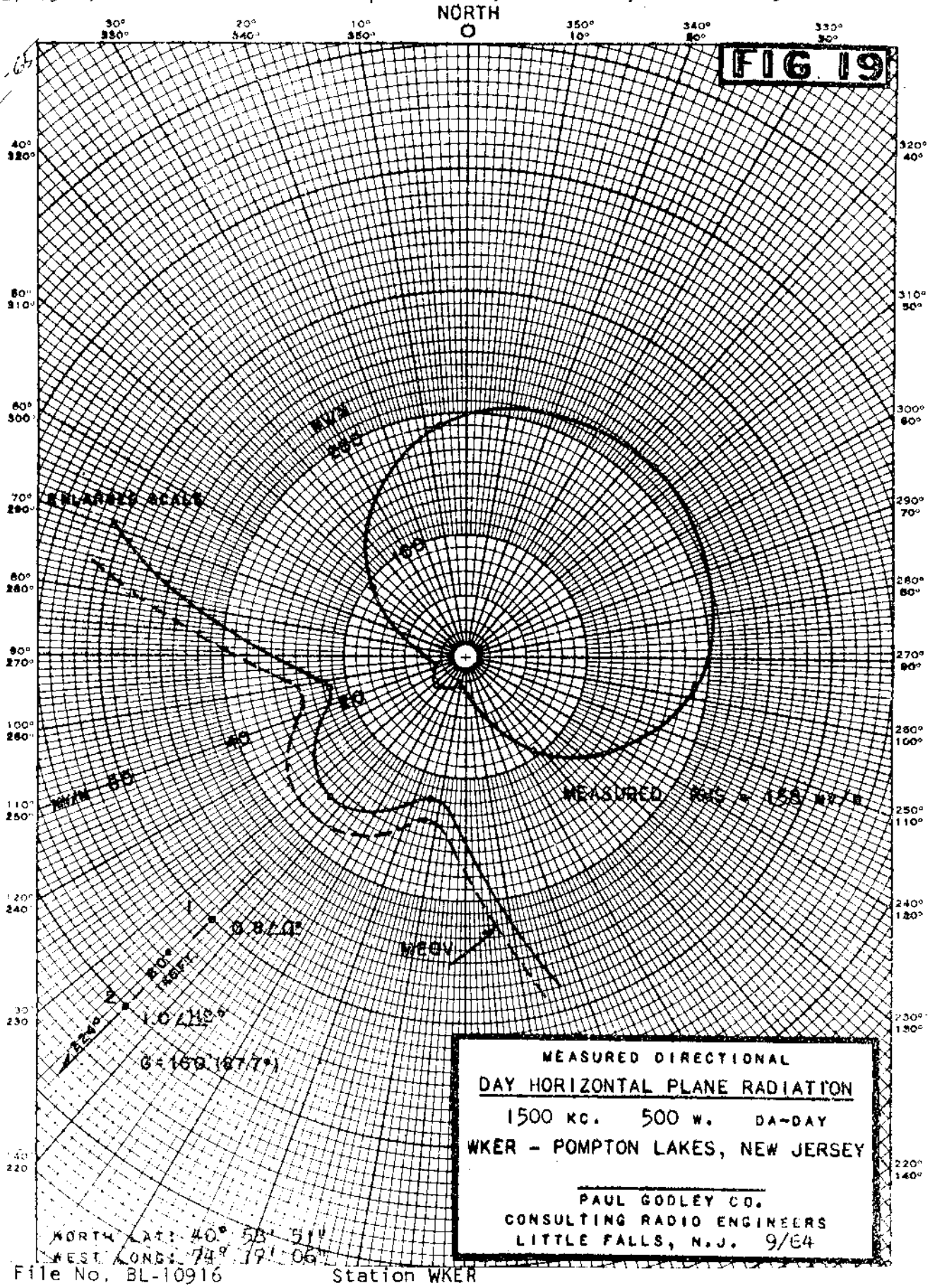
1500 kc

WKER

Measured Day
(5-27-65ct)

Station WKER
Pompton Lakes, New Jersey

500w, DA-D, D
1500 kc



FCC File No. BL-10916
Accepted 5-21-65

Station WKER
Pompton Lakes, New Jersey

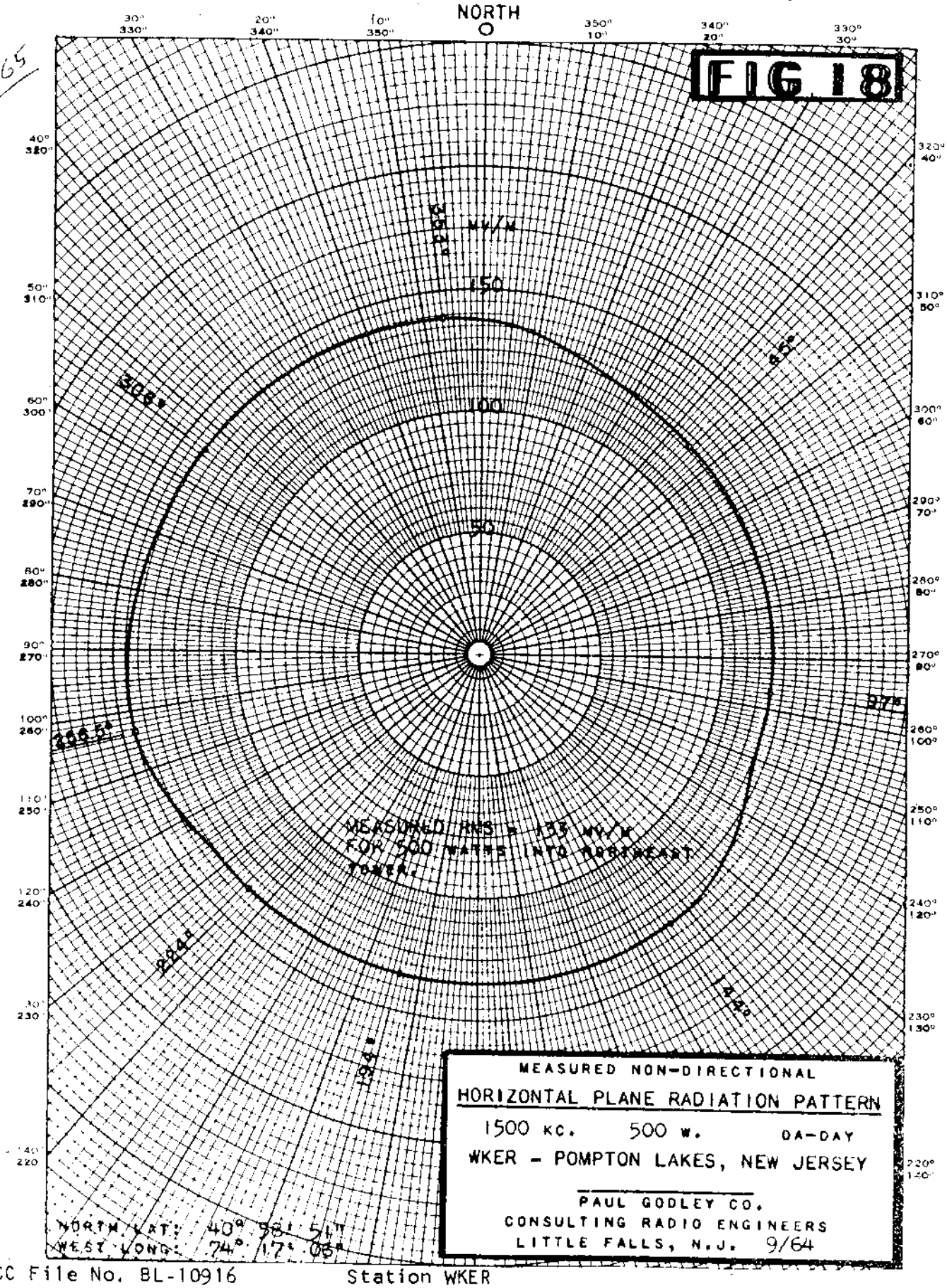
1500 kc

WKER

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

Station WKER
Pompton Lakes, New Jersey

500w,DA-D,D
1500 kc



FCC File No. BL-10916
Accepted 5-21-65

Station WKER
Pompton Lakes, New Jersey

1500 kc

~~WKIZ~~
1500 kHz

WKIZ

SUPPLEMENTAL AND CORRECTED
DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WKIZ

Main Studio: Key West, Florida

Frequency: 1500 kHz

Power: 0.25kw Night 0.25kw Day

Notification List No. 1787

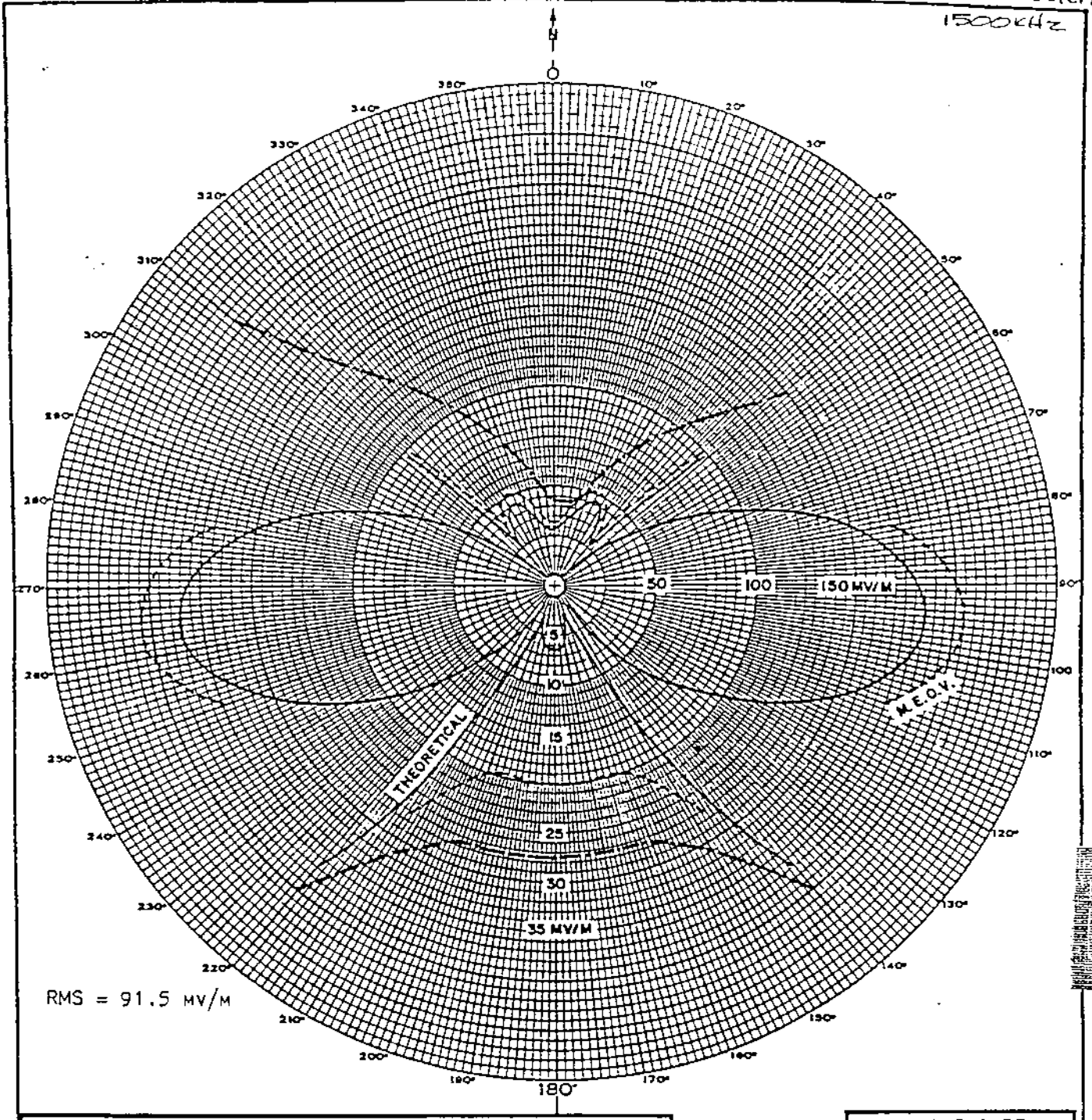
Date July 10, 1980 Class: II

GEOGRAPHICAL LOCATION OF THE
CENTER OF THE ANTENNA SYSTEM:

North Latitude: 24° 34' 01"
West Longitude: 81° 44' 54"

Note: Please retain the description sheet notified for station WKIZ in United States Change List number 1200, dated January 25, 1967 and attach to this supplemental Description Sheet and Directional Antenna patterns. This notification is for the purpose of notifying changes to the directional antenna pattern MEOV's.

~~WKIZ~~ WKIZ
1500 KHz



MEOV

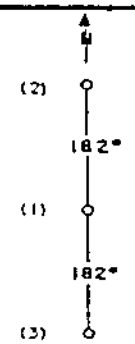
MARCH 1978

THE TOWER NUMBERS AND FIELD RATIOS HAVE BEEN CORRECTED.

SILLIMAN, MOFFET & KOWALSKI, P.C.

AMENDED FIGURE A1

FIGURE 1



LATITUDE 24° 34' 01" NORTH
LONGITUDE 81° 44' 54" WEST

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG
2	—	—	17	0.50		82.3
1	180	182	0	1.0		82.3
3	180	364	-17	0.61		82.3

HORIZONTAL PLANE PATTERN

WKIZ

KEY WEST, FLORIDA

1500 KC 250 W U, DA-1

661213

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D. C.

WKIZ

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

Station WKIZ
Key West, Florida

250w,DA-1,U
1500 kc

BP-17538
GRANTED
1-20-67
CP CHANGES
IN DA PATTERN.

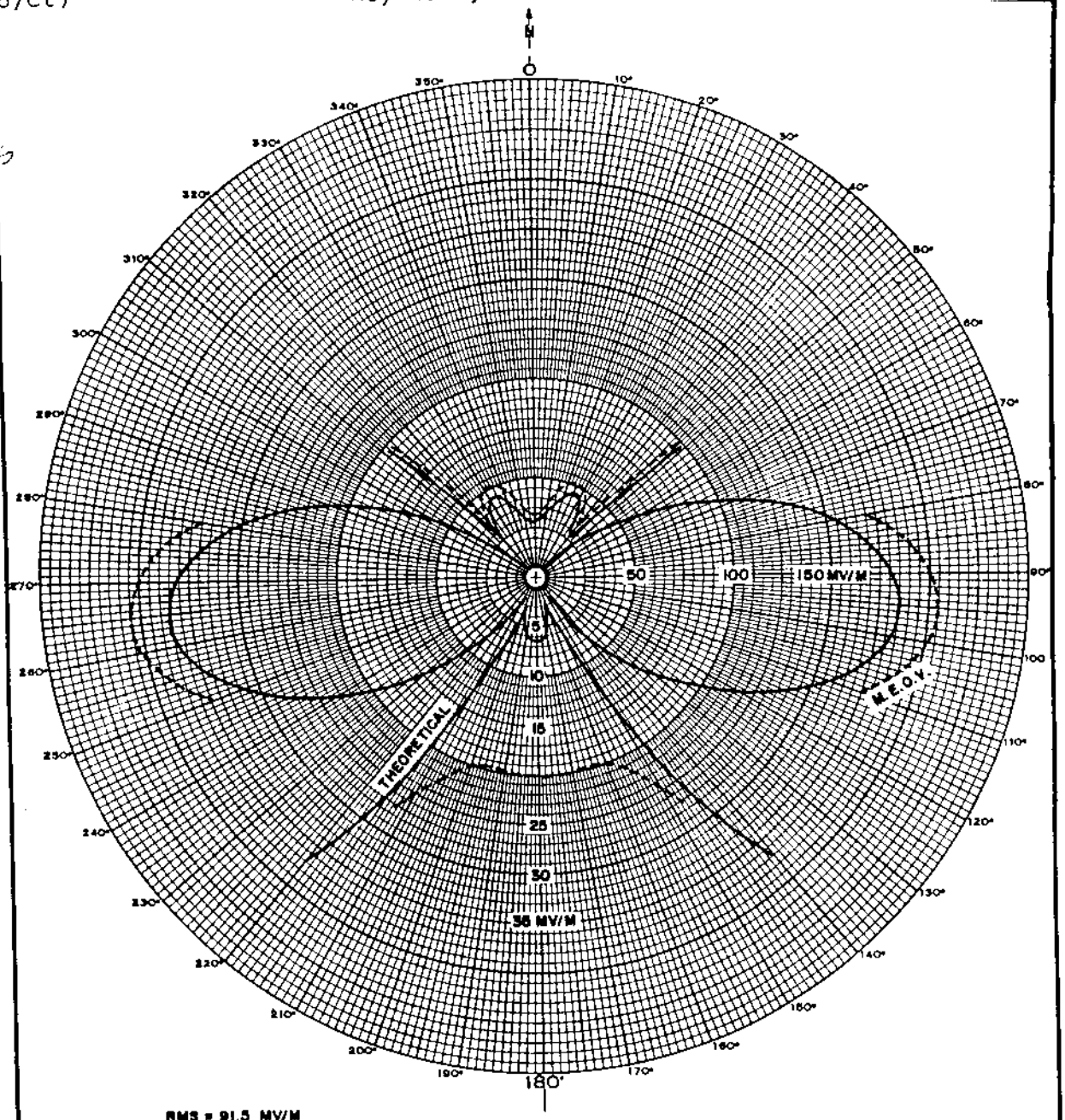
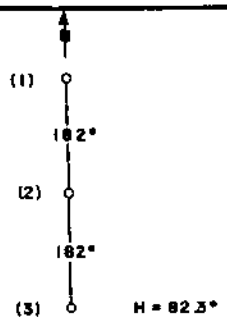


FIGURE 1



LATITUDE 24° 34' 01" NORTH
LONGITUDE 81° 44' 54" WEST

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG
1	—	—	17	0.506		82.3
2	180	182	0	0		82.3
3	180	364	-17	0.625		82.3

HORIZONTAL
PLANE PATTERN
WKIZ
KEY WEST, FLORIDA
1500 KC 250 W U,DA-1
661213

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D C

FCC File No.BP-17538
Accepted 1-11-67

Station WKIZ
Key West, Florida

1500 kc

WKIZ

Measured Day & Night
(6-28-67ct)

Station WKIZ
Key West, Florida

250w,DA-1,U
1500 kc

(1-20-67)
GRANTED
LICENSE

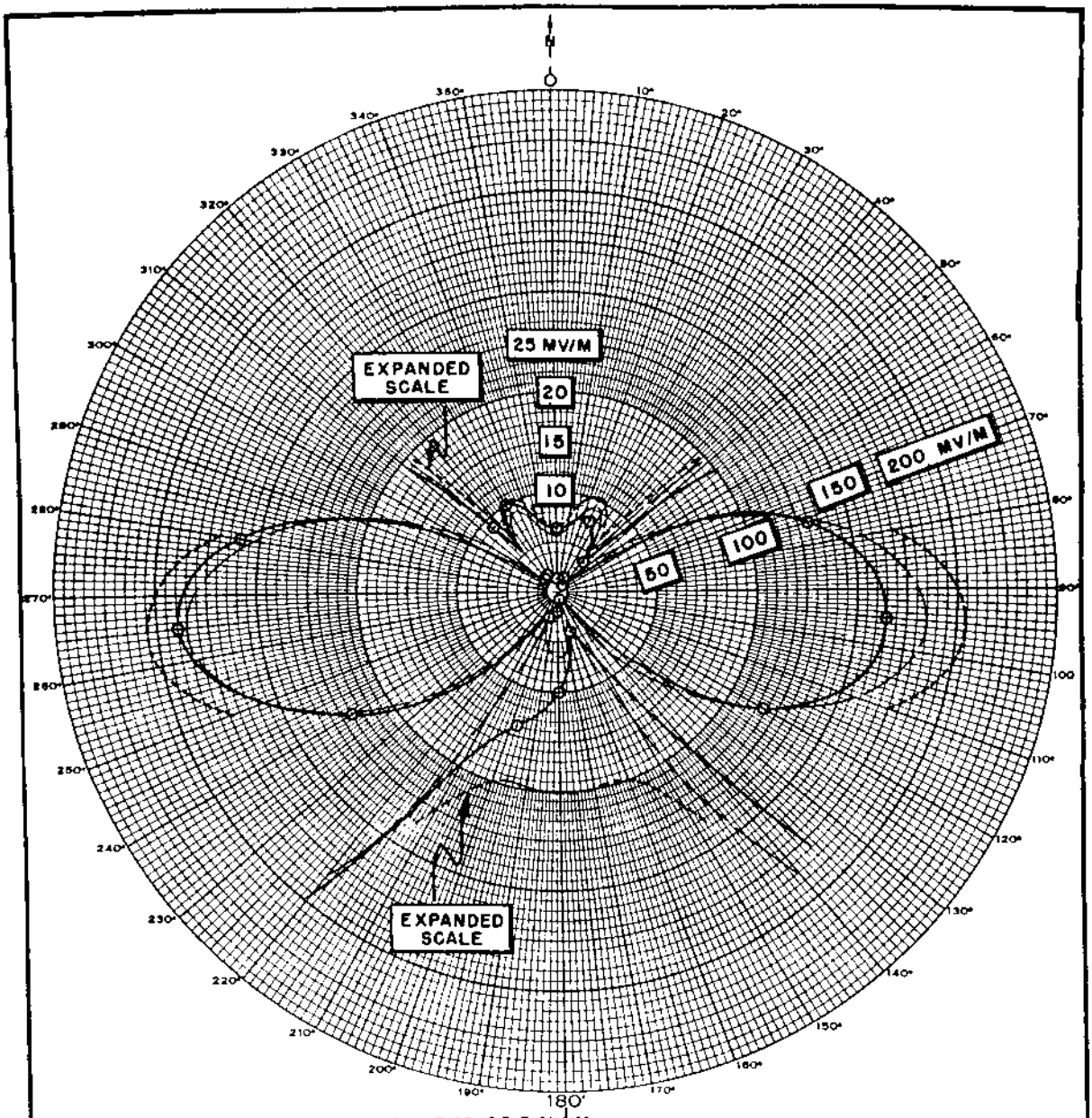


EXHIBIT G

0° TRUE

LATITUDE 24° 34' 02" NORTH
LONGITUDE 81° 44' 53.8" WEST

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG
1	0	–	0	1	–	82.3
2	0	182	17	.564	–	82.3
3	0	182	-17	.615	-	82.3

THEORETICAL AND MEASURED HORIZONTAL PLANE PATTERN FOR
WKIZ
KEY WEST, FLORIDA
1500 KC 250 W U-DA-1
670111

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON D.C.

FCC File No.BL-11659
Accepted 6-19-67

Station WKIZ
Key West, Florida

1500 kc

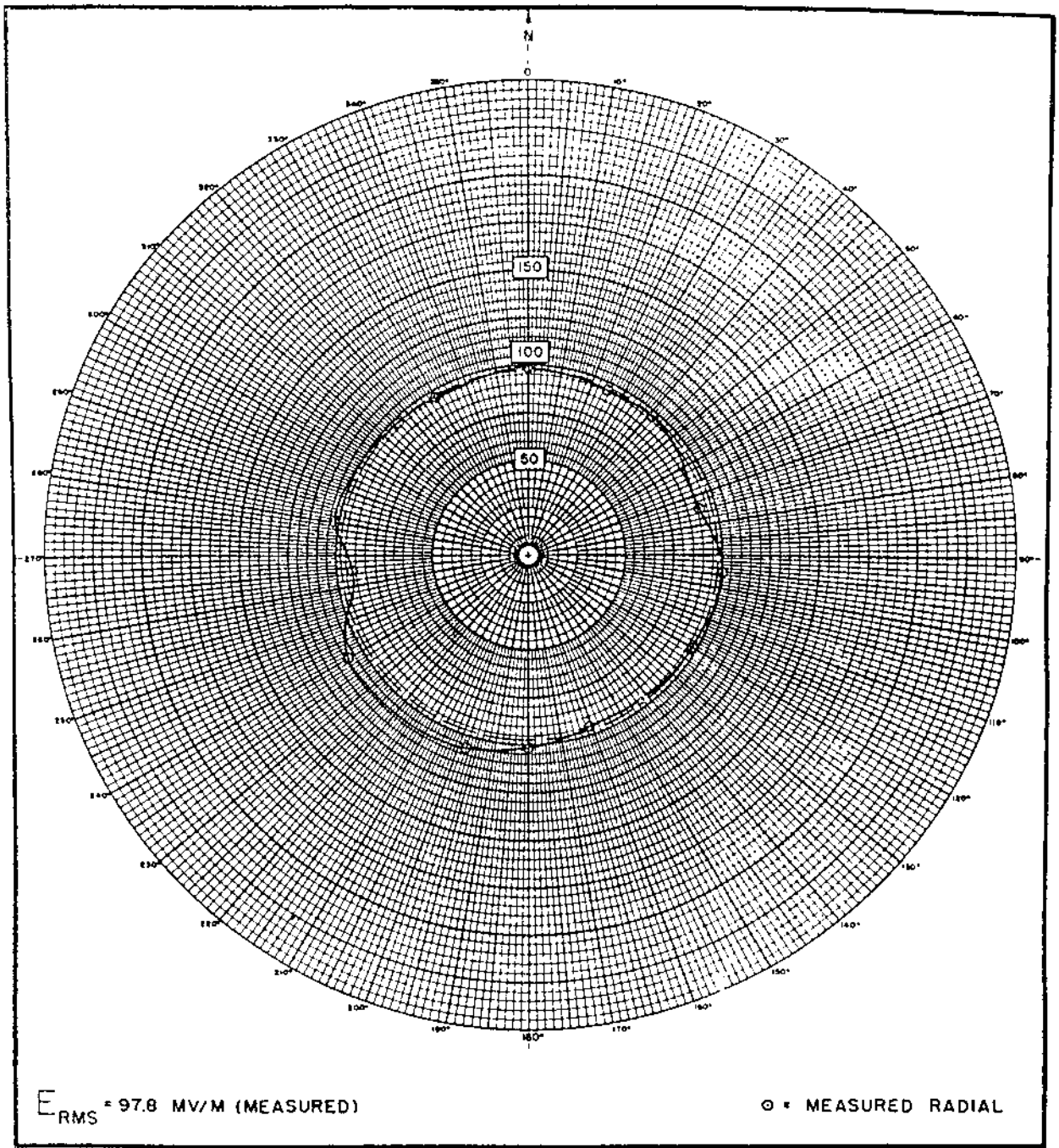
WKIZ

MEASURED NON-DA
(5-28-59g)

Station WKIZ
Key West, Florida

250w, DA-1,U
1500 KC

Granted L - for new Station
10-12-59



E_{RMS} = 97.8 MV/M (MEASURED)

⊙ = MEASURED RADIAL

LATITUDE: 24° 34' 02"

LONGITUDE: 81° 44' 53.8"

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

ANTENNA PARAMETERS

G = 82.3°

FIGURE 19A

HORIZONTAL POLAR PATTERN
(NON-DIRECTIONAL)

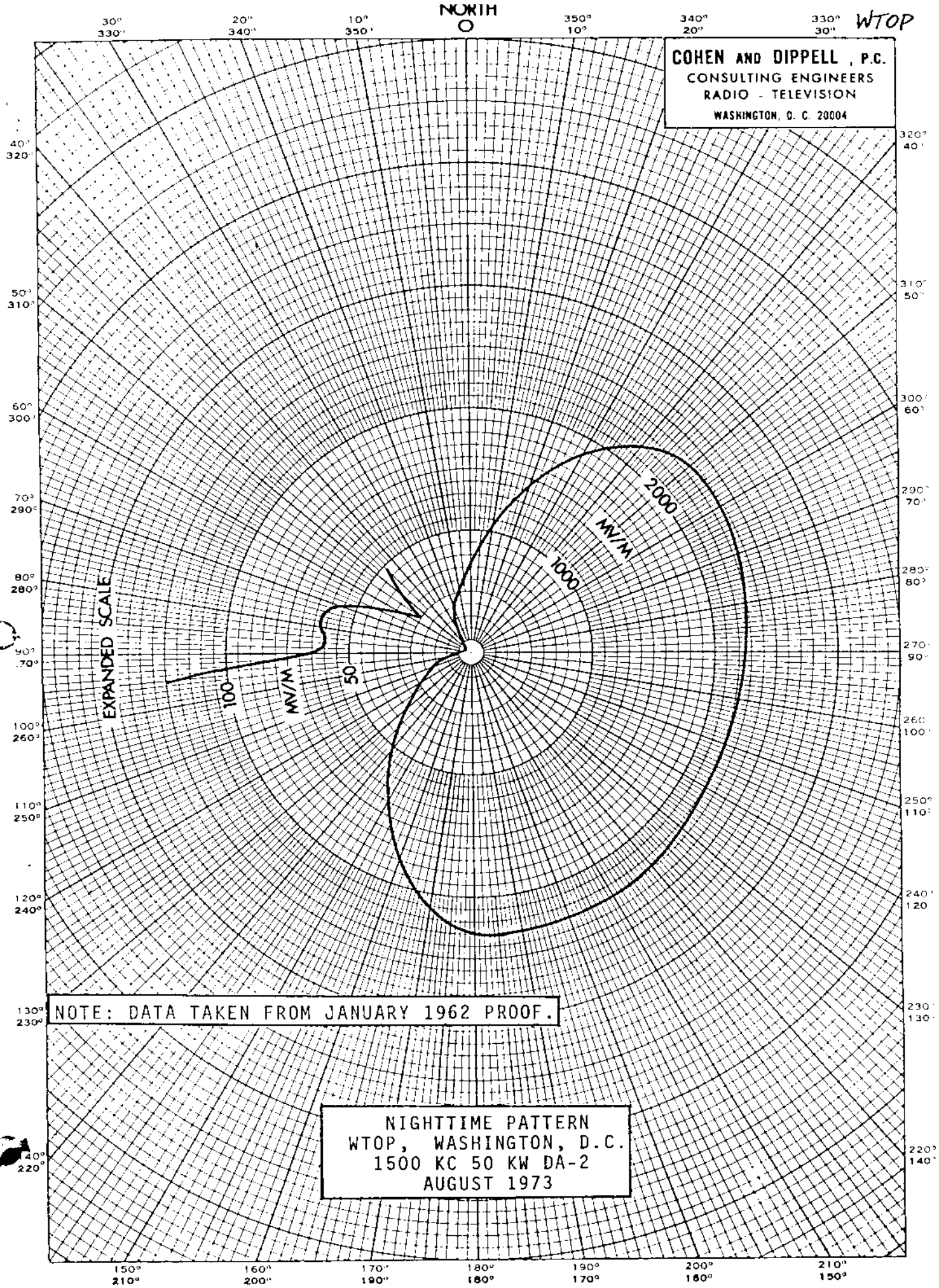
RADIO STATION WKIZ
KEY WEST, FLA.

1500 KC 250W DA-1,U

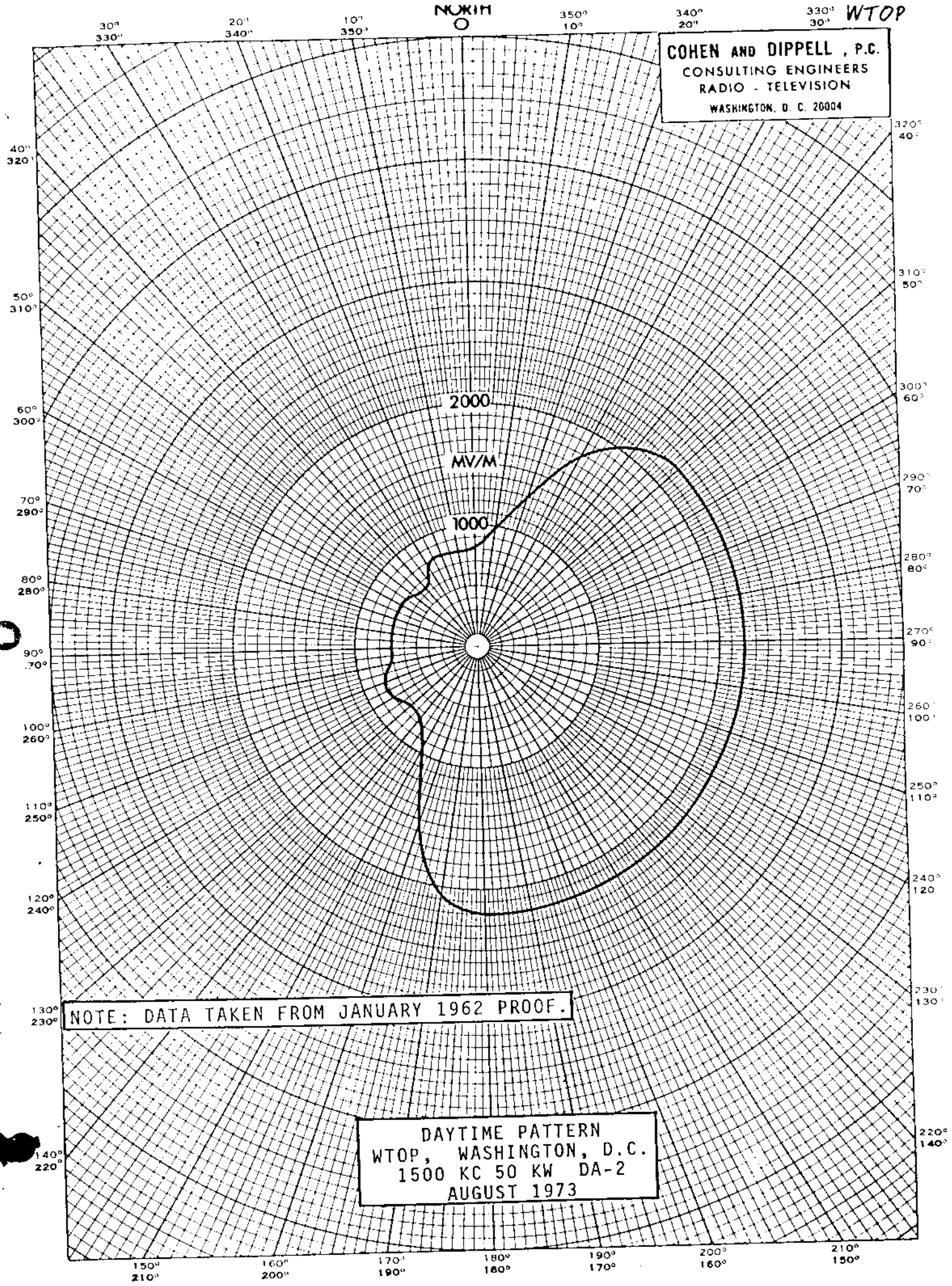
FCC File No. BL-7458
Accepted 5-13-59

WKIZ
Key West, Florida

1500 KC

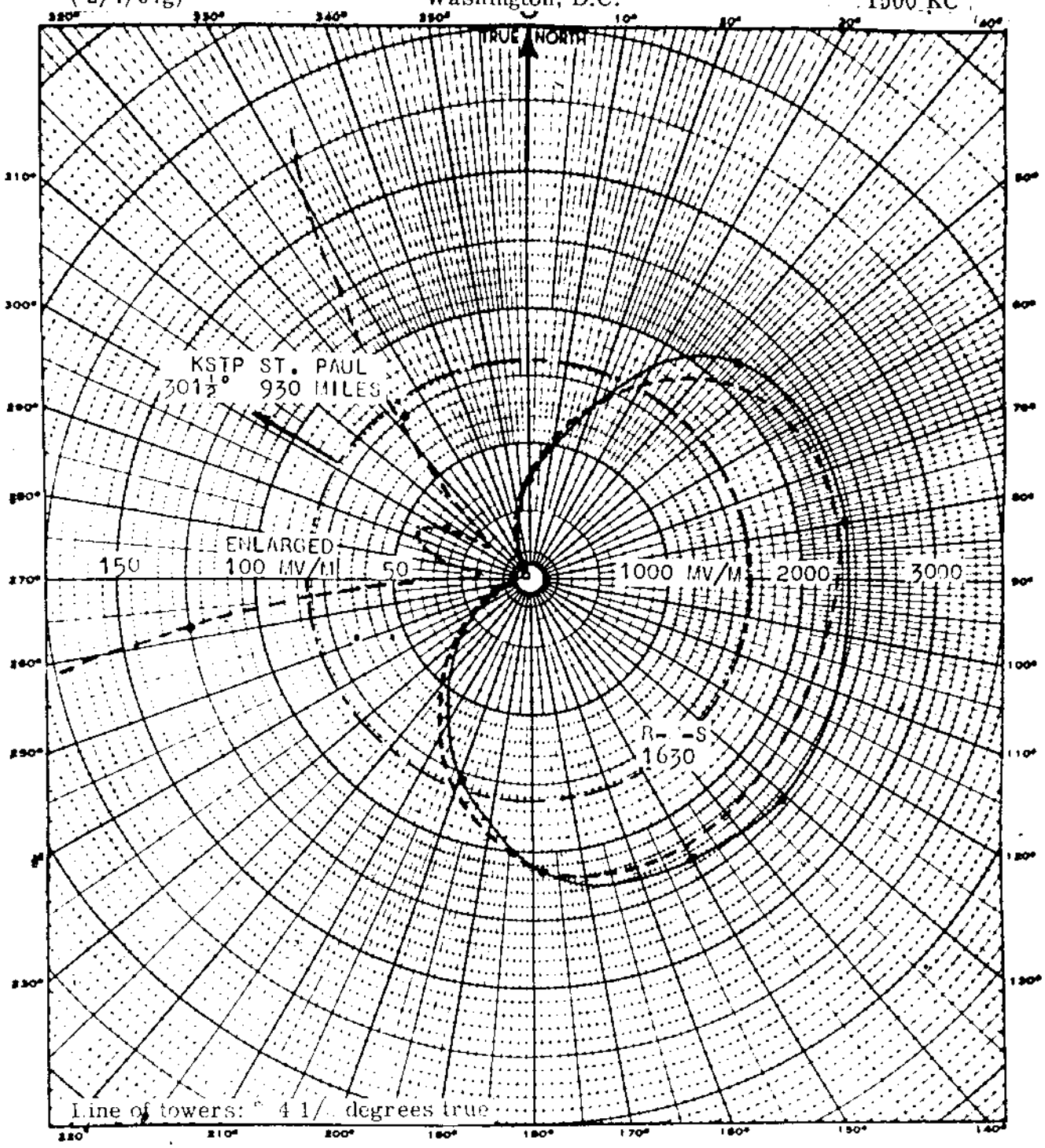

WTOP
NORTH
COHEN AND DIPPELL, P.C.
CONSULTING ENGINEERS
RADIO - TELEVISION
WASHINGTON, D. C. 20004
2000 MV/M
1000
100 MV/M
50
EXPANDED SCALE
NOTE: DATA TAKEN FROM JANUARY 1962 PROOF.
NIGHTTIME PATTERN
WTOP, WASHINGTON, D.C.
1500 KC 50 KW DA-2
AUGUST 1973

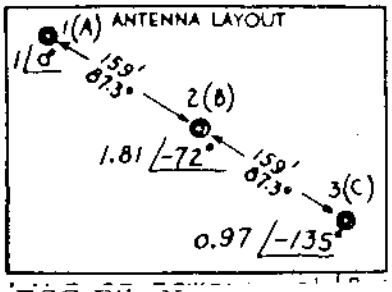
WTOP


NORTH
COHEN AND DIPPELL, P.C.
CONSULTING ENGINEERS
RADIO - TELEVISION
WASHINGTON, D. C. 20004
2000
MV/M
1000
NOTE: DATA TAKEN FROM JANUARY 1962 PROOF.
DAYTIME PATTERN
WTOP, WASHINGTON, D.C.
1500 KC 50 KW DA-2
AUGUST 1973
EUGENE DIETZGEN CO.
MADE IN U. S. A.
NO. 341-P DIETZGEN GRAPH PAPER
POLAR CO-ORDINATE

WTOP

PROPOSED (2/7/57g) | NIGHT | Station WTOP Washington, D.C. | 50KW, DA-2,U | 1500 KC





WTOP-WASHINGTON, D.C.

Station	Power	Location
1500	50 KW	1630 MV/M (230/KW) R-M-S Field

Frequency	Height of Antenna
3	0.515 λ OR 337 FT

No. of Elements: MEASURED ☒ CALCULATED ☐

Eng. Dept. No. 4101.1b.12

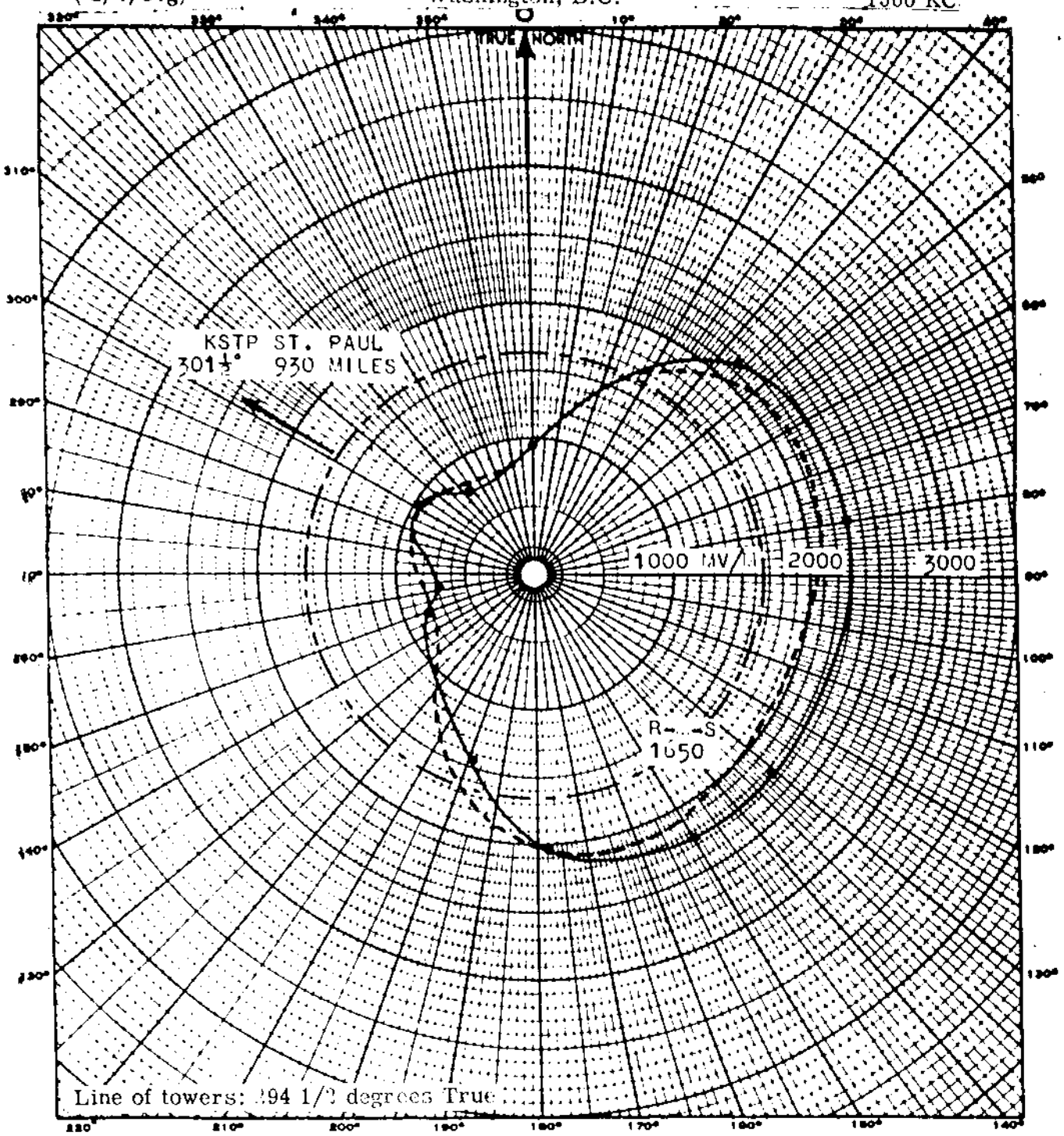
Pattern: NIGHTTIME PATTERN

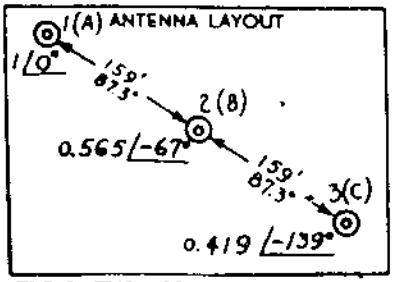
FCC File No. BL-1117

WTOP Washington, D.C. 1500 KC

WTOP

PROPOSED (2/7/57g) DAY Station WTOP 50 KW, DA-2,U
Washington, D.C. 1500 KC





WTOP-WASHINGTON, D.C.

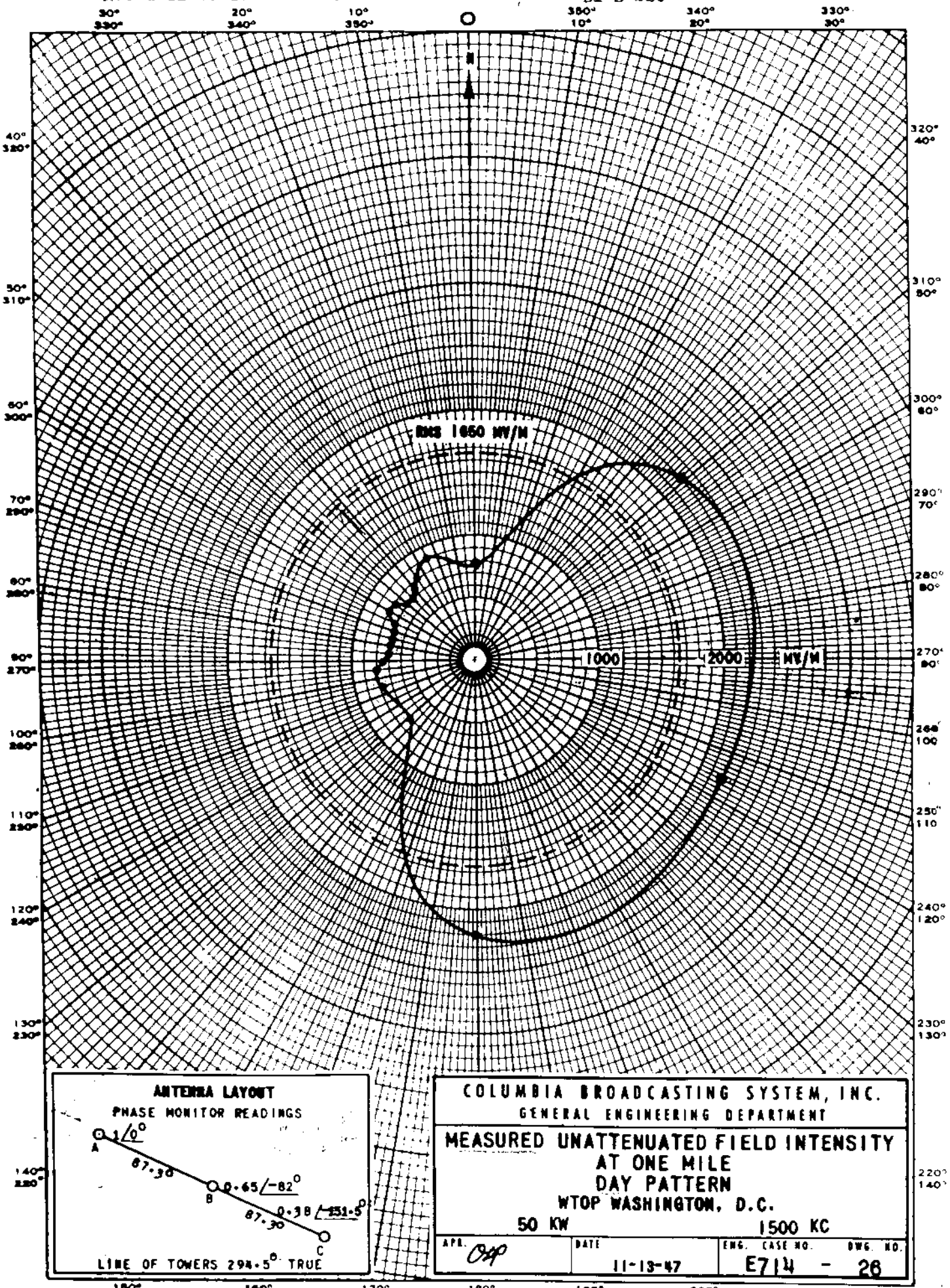
Station		Location
1500	50 KW	1650 MV/M (233/KW)
Frequency	Power	R-M-S Field
3	0.515 λ OR 337 FT	
No. of Elements	Height of Antenna	
MEASURED ☐	CALCULATED ☐	410 1/4.13
Pattern		Eng. Dept. No.
DAYTIME PATTERN		

FCC File No.
BL-1117

WTOP
Washington, D.C.

1500 KC

Rec'd 11-25-47 Bl-S-220 WTOP-1500



WTOP

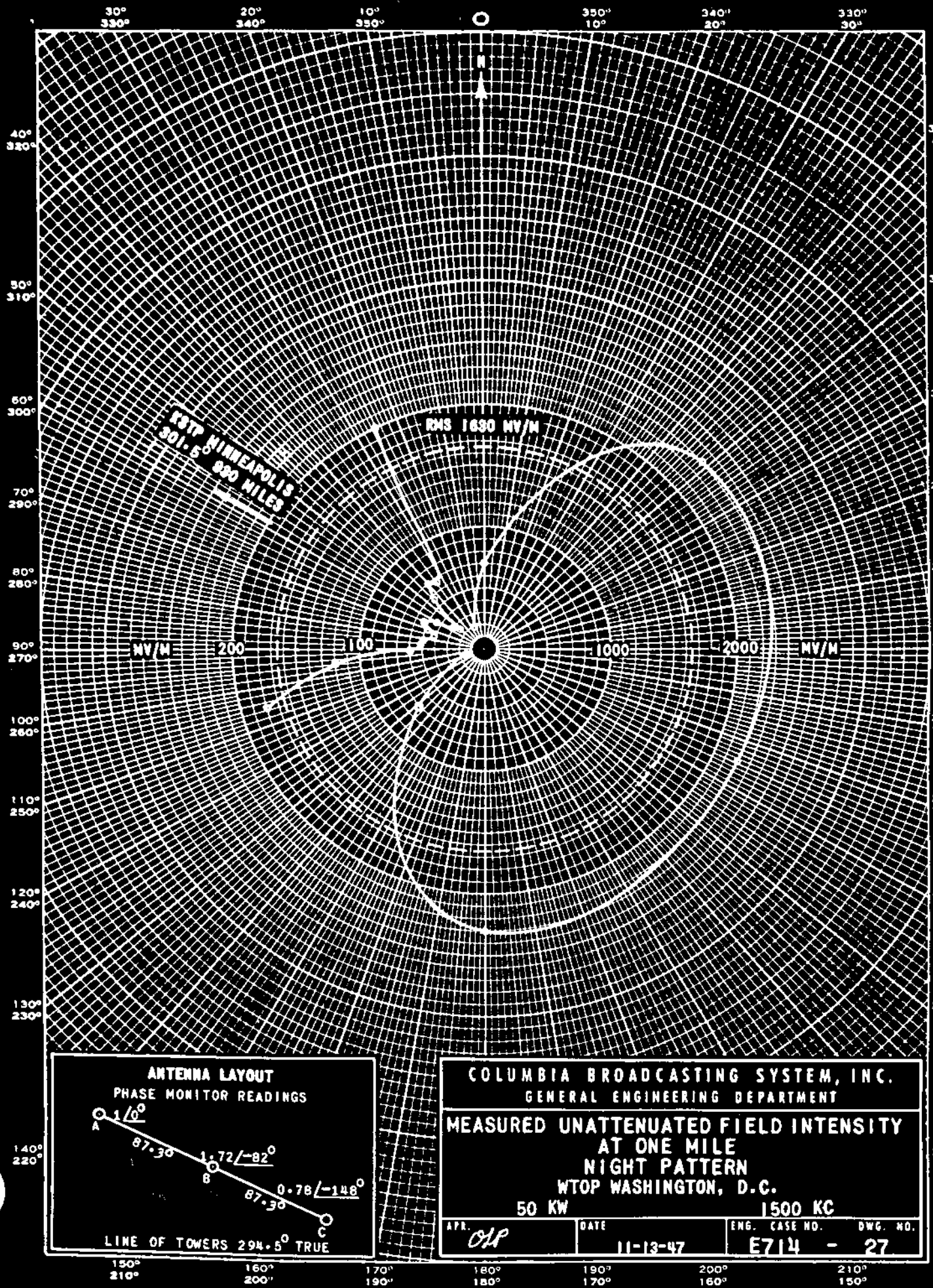

N
RMS 1680 MV/M
WTOP MINNEAPOLIS
301.5°
880 MILES
MV/M
200
100
1000
2000
MV/M
ANTENNA LAYOUT
PHASE MONITOR READINGS
A
1/0°
87.30
1.72/-82°
B
87.30
0.78/-148°
C
LINE OF TOWERS 294.5° TRUE
COLUMBIA BROADCASTING SYSTEM, INC.
GENERAL ENGINEERING DEPARTMENT
MEASURED UNATTENUATED FIELD INTENSITY
AT ONE MILE
NIGHT PATTERN
WTOP WASHINGTON, D.C.
50 KW
1500 KC
APR. OLP
DATE 11-13-47
ENG. CASE NO. E714
DWG. NO. 27

Fig. 24

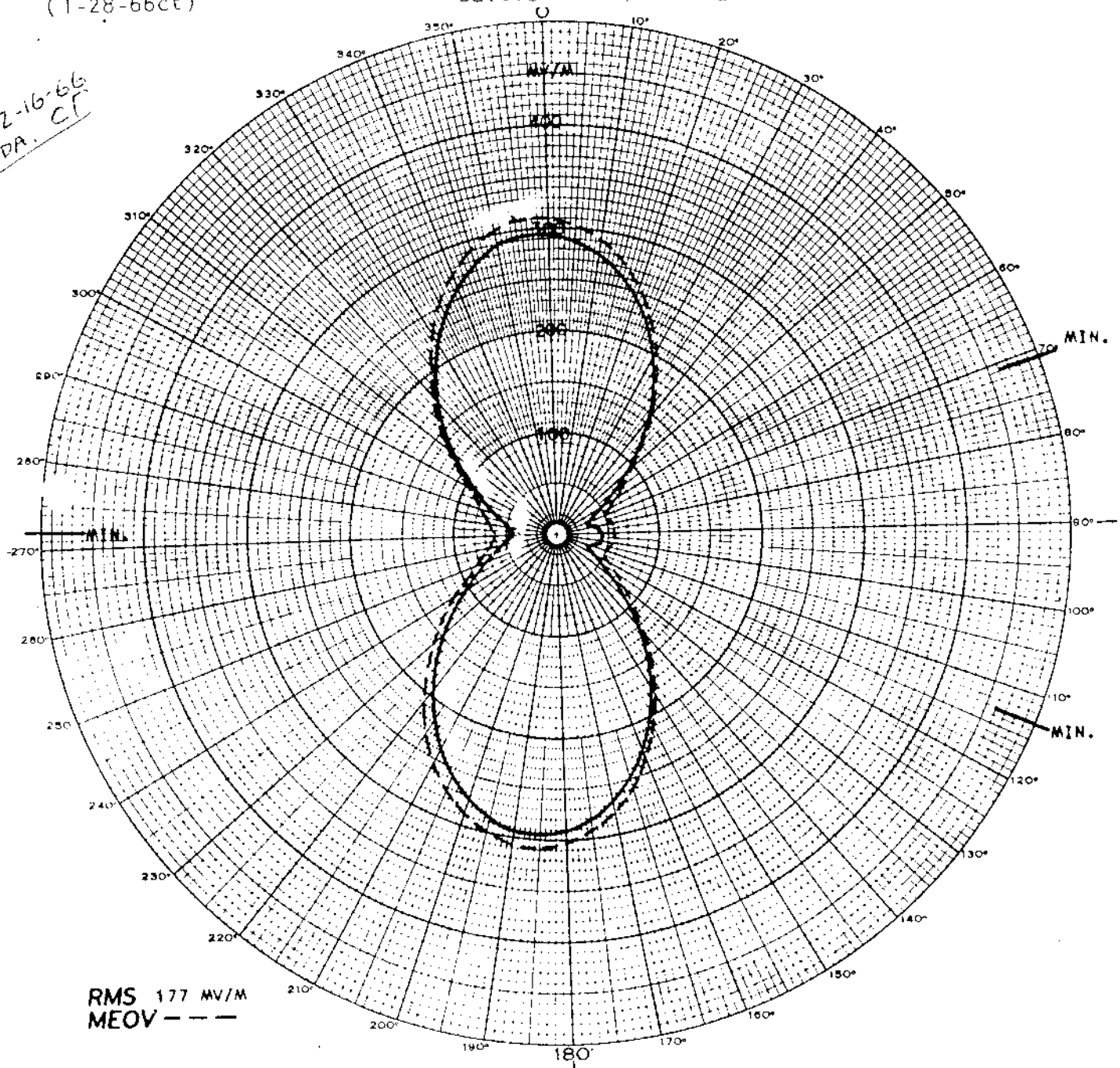
WVOC

Proposed Day
(1-28-66ct)

Station WVOC
Battle Creek, Michigan

1kw,DA-D,D
1500 kc

+PPL. 2-16-66
CHG. DA. CT



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 1B	STATION DATA
S_1=60° S_2=180° N=002°-E	TOWER No. / ELECTRICAL HEIGHT / SPACING / PHASING / FIELD RATIO	PROPOSED DAYTIME DIRECTIONAL PATTERN WVOC - 10/65	CALL WVOC FREQ 1500 Kc/S POWER 1 Kw TYPE DA-D TIME DAYTIME LAT. 42° 17' 30" LONG. 85° 10' 08"
	DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐	θ°	E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BP-16472
Accepted 1-5-66 Amended

Station WVOC
Battle Creek, Michigan

1500 kc

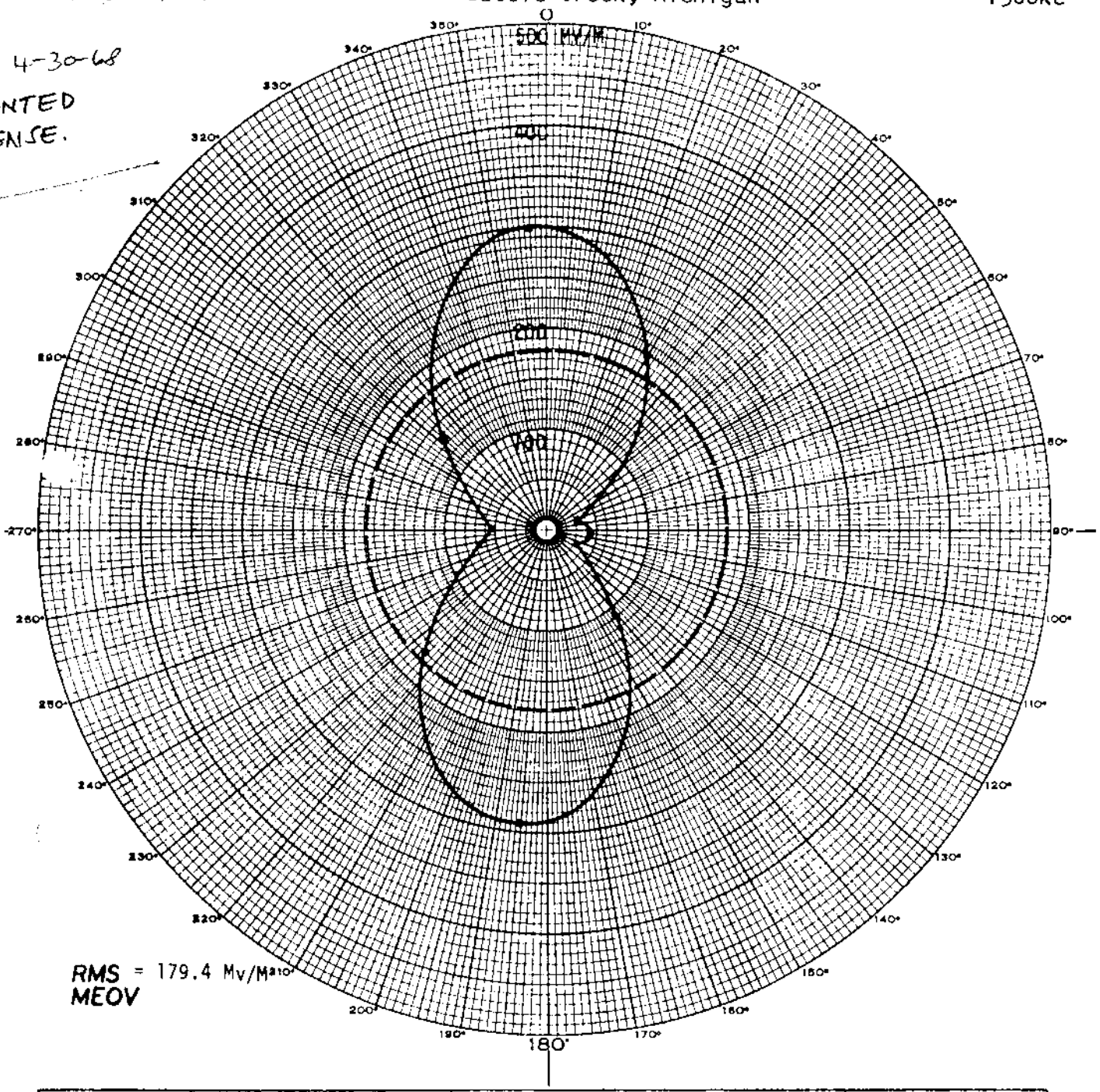
WVOC

Measured Day
(1-30-67ct)

Station WVOC
Battle Creek, Michigan

1kw,DA-D,D
1500kc

4-30-68
GRANTED
LICENSE.



RMS = 179.4 Mv/M
MEOV

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 4	STATION DATA
G=99° S_1=60° S_2=180° N-002°-E NC S_2 NC S_1 S_1 #2 S_2 #1 92° 0.972/-21° 1.0/0°	TOWER No. / ELECTRICAL HEIGHT θ° / SPACING S° / PHASING ψ° / FIELD RATIO F 1 2 3 4 5 6 7 8 9 10 DAYTIME OPERATION ☐ NIGHTTIME OPERATION ☐	WVOC MEASURED DAY DIRECTIONAL PATTERN MAY - 1966 θ° = 0°	CALL WVOC FREQ 1500 Kc/S POWER 1 Kw TYPE DA-D TIME DAYTIME LAT. 42° 17' 30" LONG. 85° 10' 08" E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BL-11492
Accepted 12-29-66

Station WVOC
Battle Creek, Michigan

1500 kc

WVOC

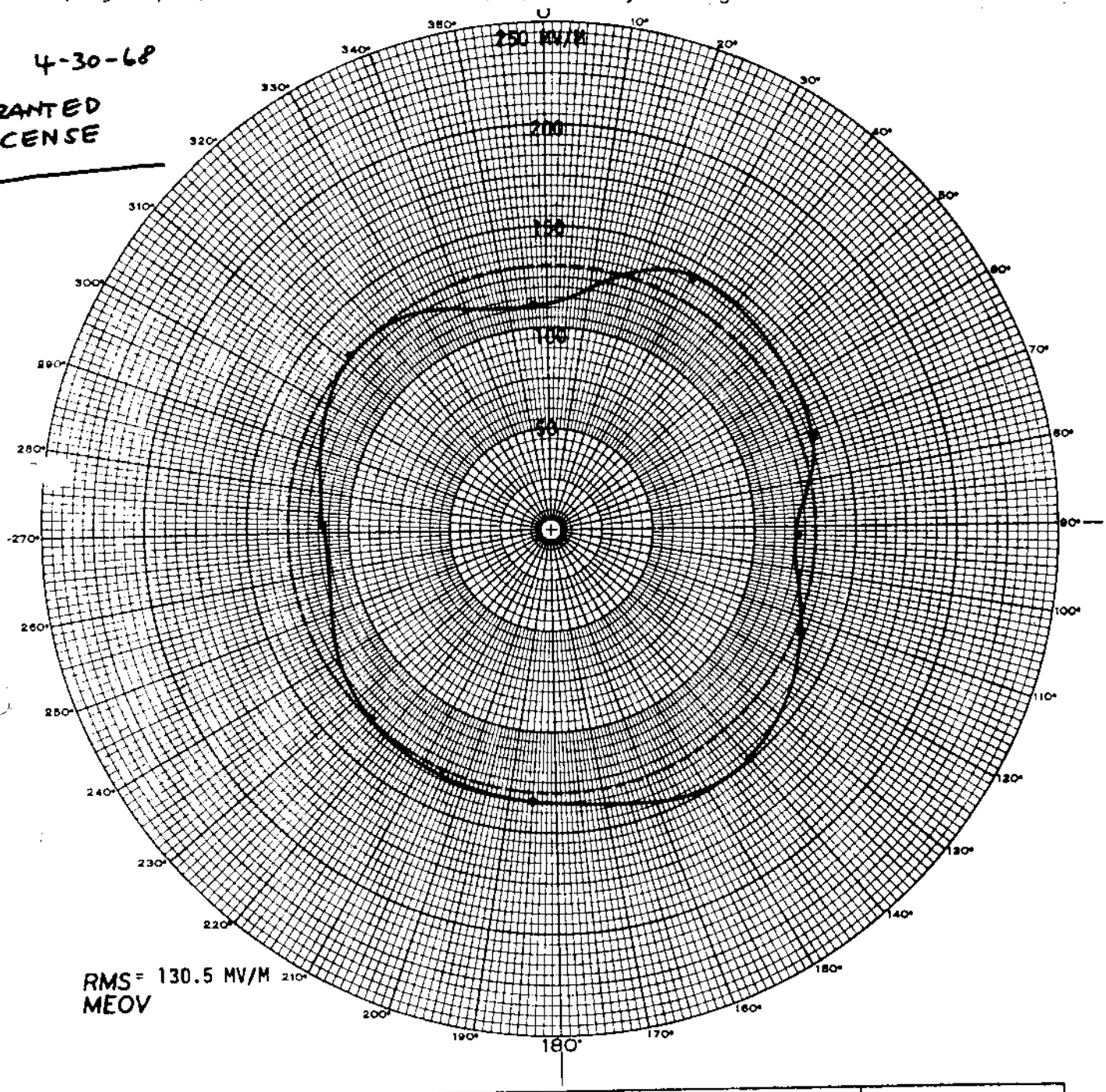
Measured Non-DA
(1-30-67ct)

Station WVOC
Battle Creek, Michigan

1kw,DA-D,D
1500 kc

4-30-68

GRANTED LICENSE



RMS = 130.5 MV/M
MEOV

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 5	STATION DATA
G=99° S_1=60° S_2=180° N-002°-E #2 S_1 S_2 #1 S_1 S_2 ○=not used ●=NDA test	TOWER No. / ELECTRICAL HEIGHT θ° / SPACING S° / PHASING V° / FIELD RATIO F 1 2 3 4 5 6 7 8 9 10 DAYTIME OPERATION ☐ NIGHTTIME OPERATION ☐	WVOC MEASURED NON-DIRECTIONAL PATTERN USING SOUTHWEST TOWER Θ^0 = 0°	CALL WVOC FREQ 1500 KHz. POWER 0.5 kw TYPE DA-D TIME DAYTIME LAT. 42°17'30" LONG. 85°10'08" E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BL-11492
Accepted 12-29-66

Station WVOC
Battle Creek, Michigan

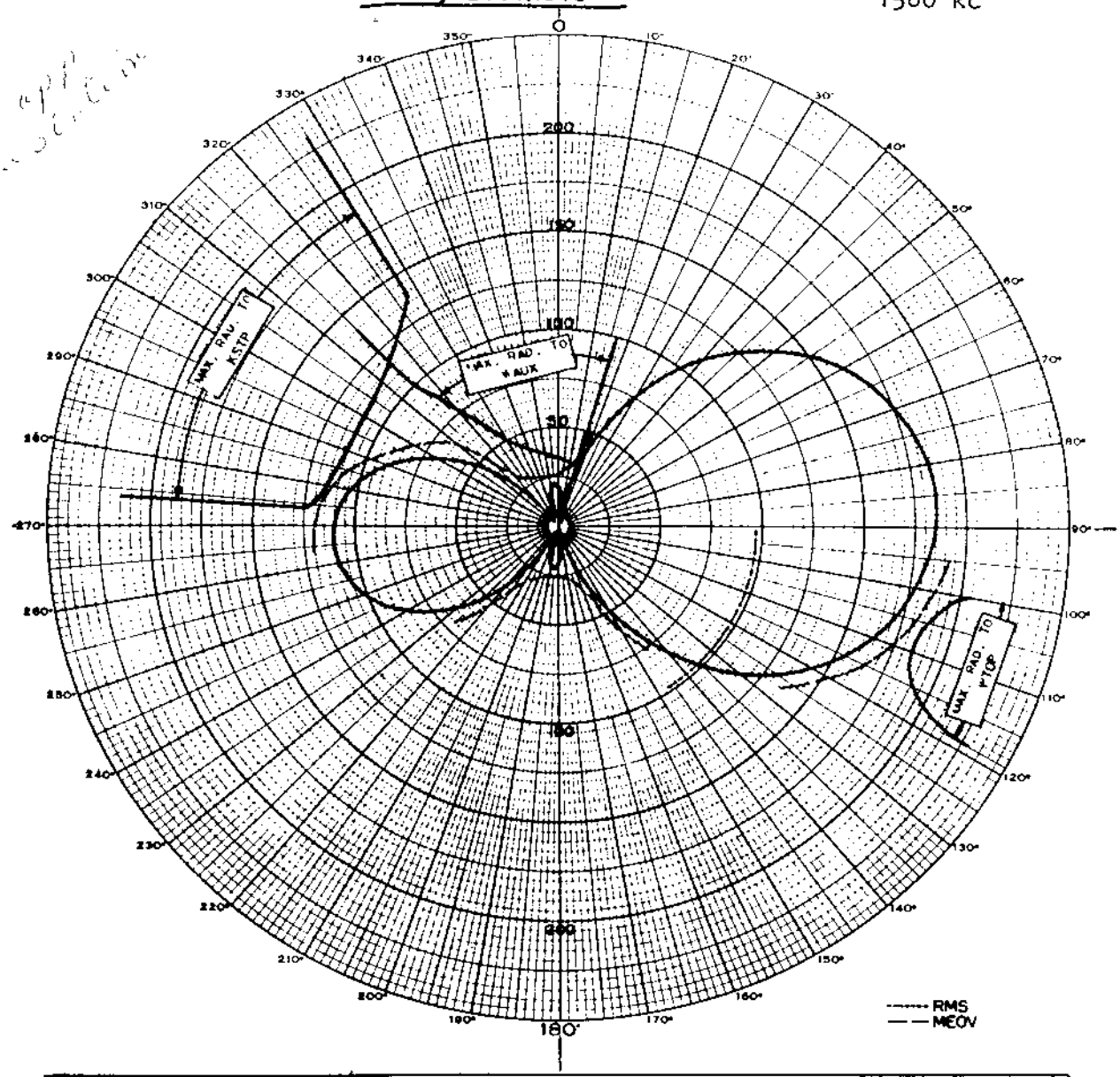
1500 kc

WZBN

Proposed Day
(5-25-62ct)

New; Z-B Broadcasting Co.
Zion, Illinois

250w,DA-D,D
1500 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA
	TOWER No	ELECTRICAL HEIGHT θ°	TRUE TOWER ORIENTATION ψ°	SPACING D°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV ANGLE β°	ELEVATION RMS FIELD mv/m E_β	CALL NEW
	3	75°	N266°E	100°	+165°		0.59	0	97.4	FREQUENCY 1500 kc
	1	75°	--	—	0°	123.5	1.0	10		POWER 0.25 kw
	2	75°	N86°E	100°	-165°		0.59	20		TIME OF OPERATION DAY
	4							30		TYPE OF OPERATION DA-D
	5							40		DAYTIME TOWERS 3
	6							50		NIGHTTIME TOWERS --
	7							60		No RADIALS PER TOWER 120
	8							70		LENGTH OF RADIALS 90 " 164 ft.
	9							80		GROUND SCREEN DIMENSION 24x24
	10									LAT. 42 ° 27 ' 18 "
										LONG. 87 ° 54 ' 01 "
								E_β =	mv/m	SUPERSEDES
	DAYTIME OPERATION ☒			NIGHTTIME OPERATION ☐				P_β =	kw	PATTERN No 620326

Z-B BROADCASTING CO.
ZION, ILLINOIS

FIGURE 1
DATE April 2, 1962

CONSULTING ENGINEERS GEORGE P. ADAIR ENGINEERING COMPANY WASHINGTON, D. C.

FCC File No.BP-15458
Accepted 5-4-62

New; Z-B Broadcasting Co.
Zion, Illinois

1500 kc

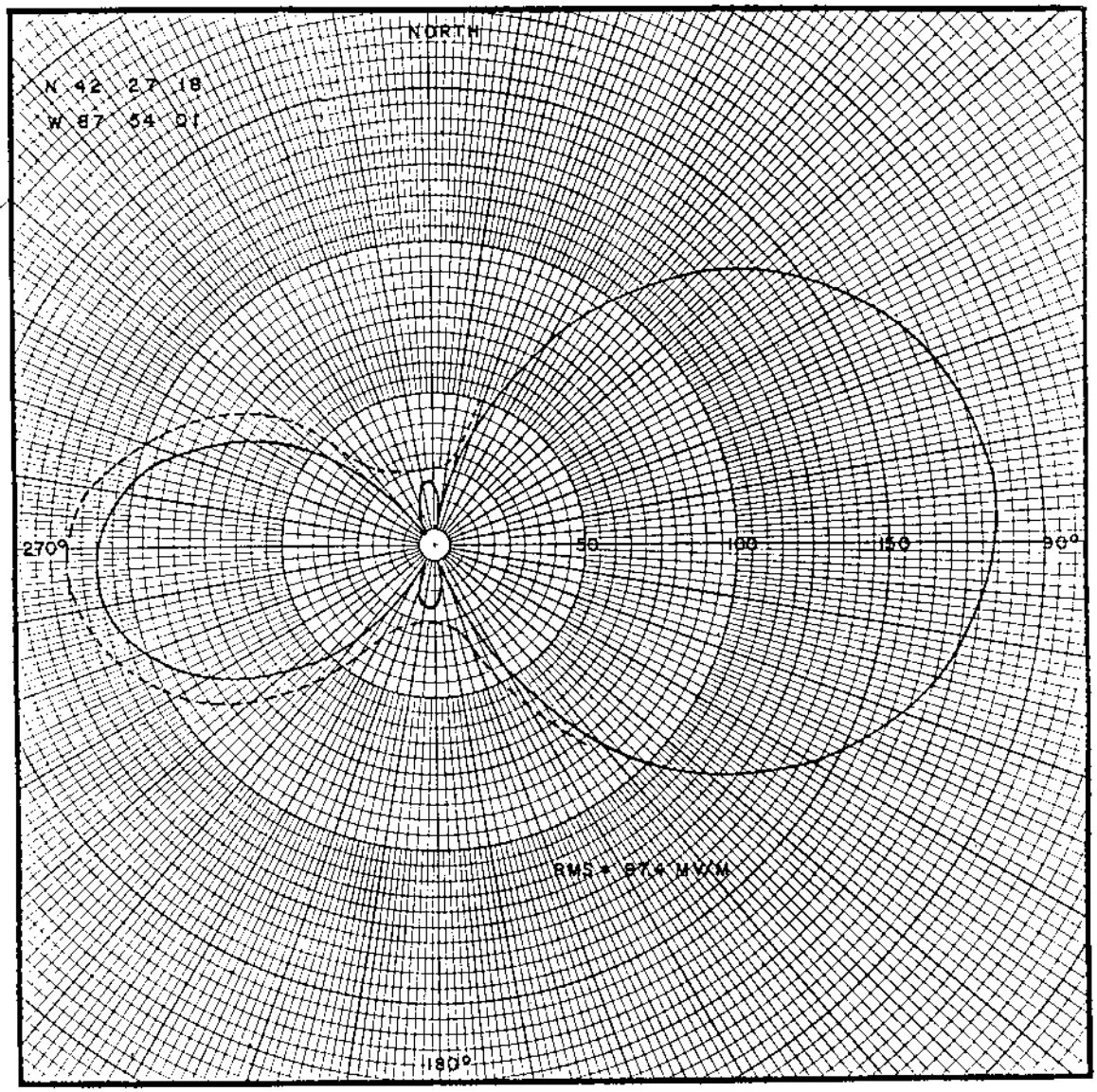
WZBN

Proposed Day
(8-28-67ct)-

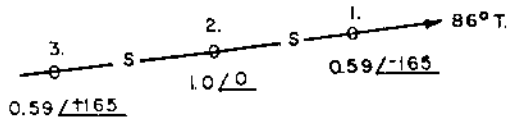
Station WZBN
Zion, Illinois

250w,DA-D,D
1500 kc

9-7-67
GRANTED
MODIF FOR CP
CHANGE IN
ANTENNA
SYSTEM



PATTERN PARAMETERS



S = 100° = 182°

H = 77° = 140 FEET

WZBN
HORIZONTAL RADIATION PATTERN
1500 KHZ 0.25 KW DA-D
ZION, ILLINOIS
JULY, 1967

ROBERT A. JONES
CONSULTING ENGINEERS
LA GRANGE, ILLINOIS

FIGURE 1

FCC File No. BMP-12125
Accepted 8-9-67

Station WZBN
Zion, Illinois

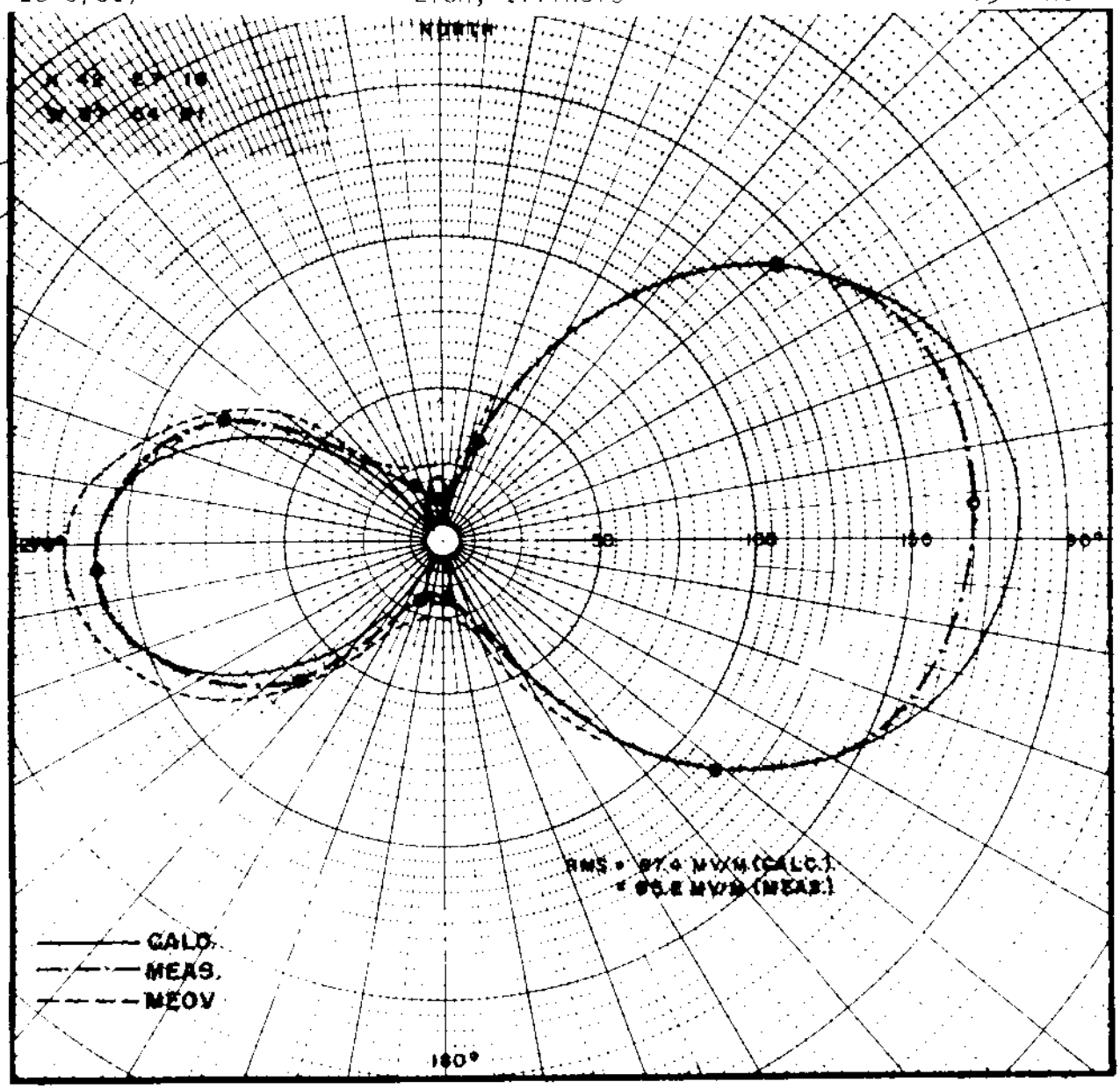
1500 kc

WZBN

Measured Day
(10-28-67ct)

Station WZBN
Zion, Illinois

250w,DA-D,D
1500 kc



OVER

PATTERN PARAMETERS

W. C. E.

86° T

S S

0.59 /-165 CALC.

0.509 /-165 MEAS.

10 /0

10 /0

0.59 /+165

0.448 /167

S = 100° = 182'

H = 77° = 140 FEET

WZBN
HORIZONTAL RADIATION PATTERN
1500 KHZ 0.25 KW DA-D
ZION, ILLINOIS

ROBERT A. JONES
CONSULTING ENGINEERS
LA GRANGE, ILLINOIS

FCC File No.BL-11762
Accepted 10-13-67

Station WZBN
Zion, Illinois

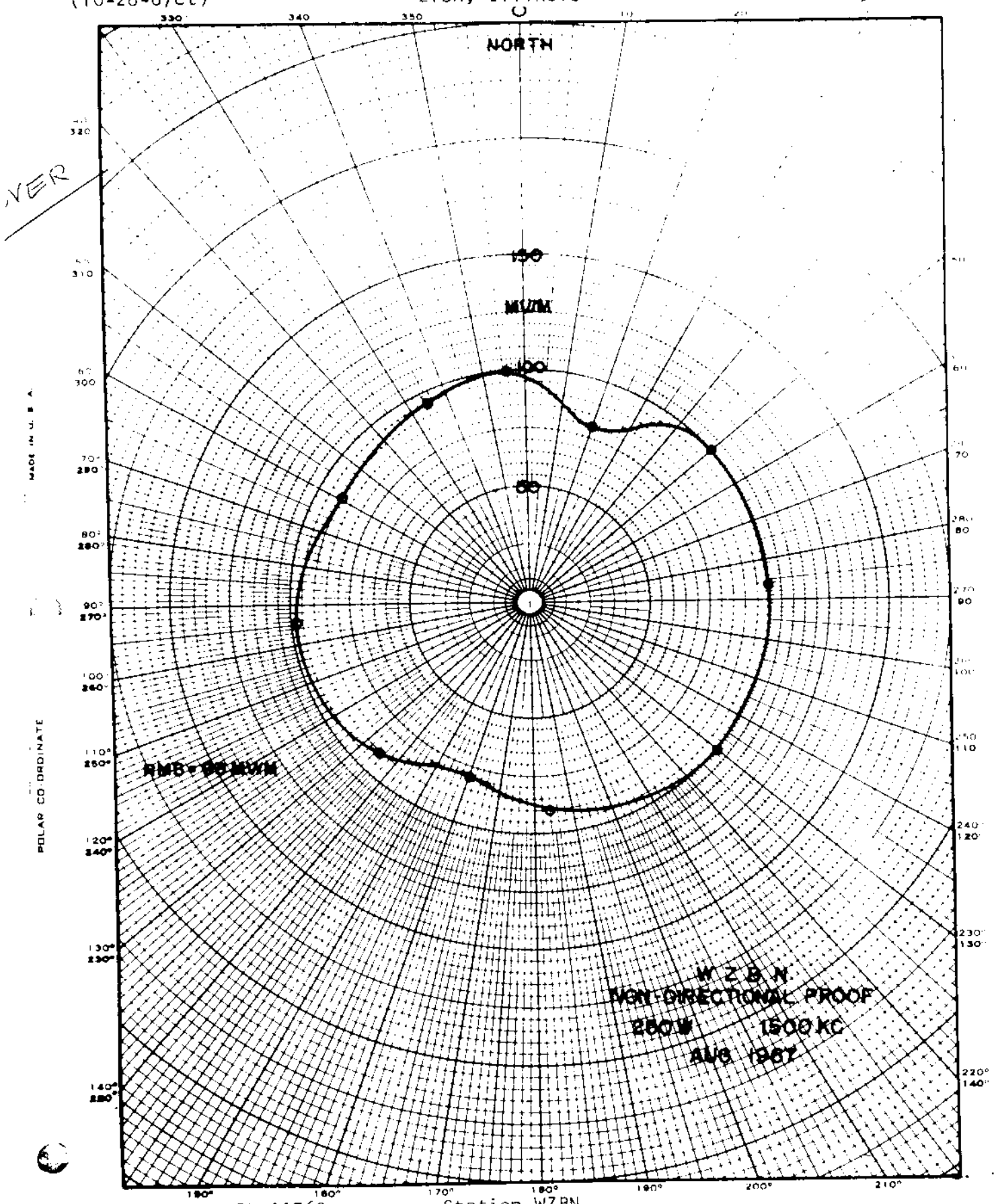
1500 kc

WZBN

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

Station WZBN
Zion, Illinois

250w,DA-D,D
1500 kc



FCC File No.BL-11762
Accepted 10-13-67

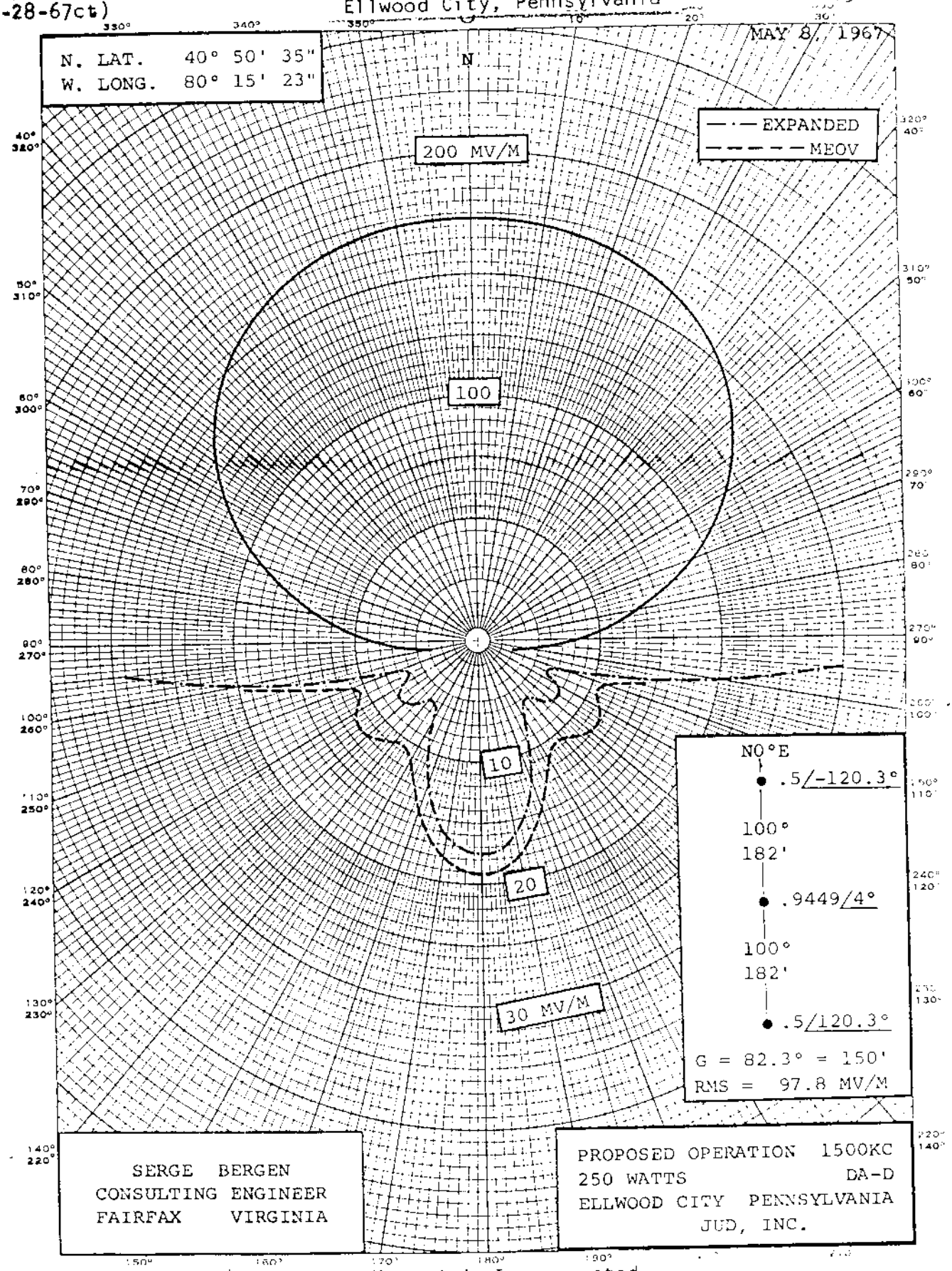
Station WZBN
Zion, Illinois

1500 kc

Proposed Day
(6-28-67ct)

New; Jud, Incorporated
Ellwood City, Pennsylvania

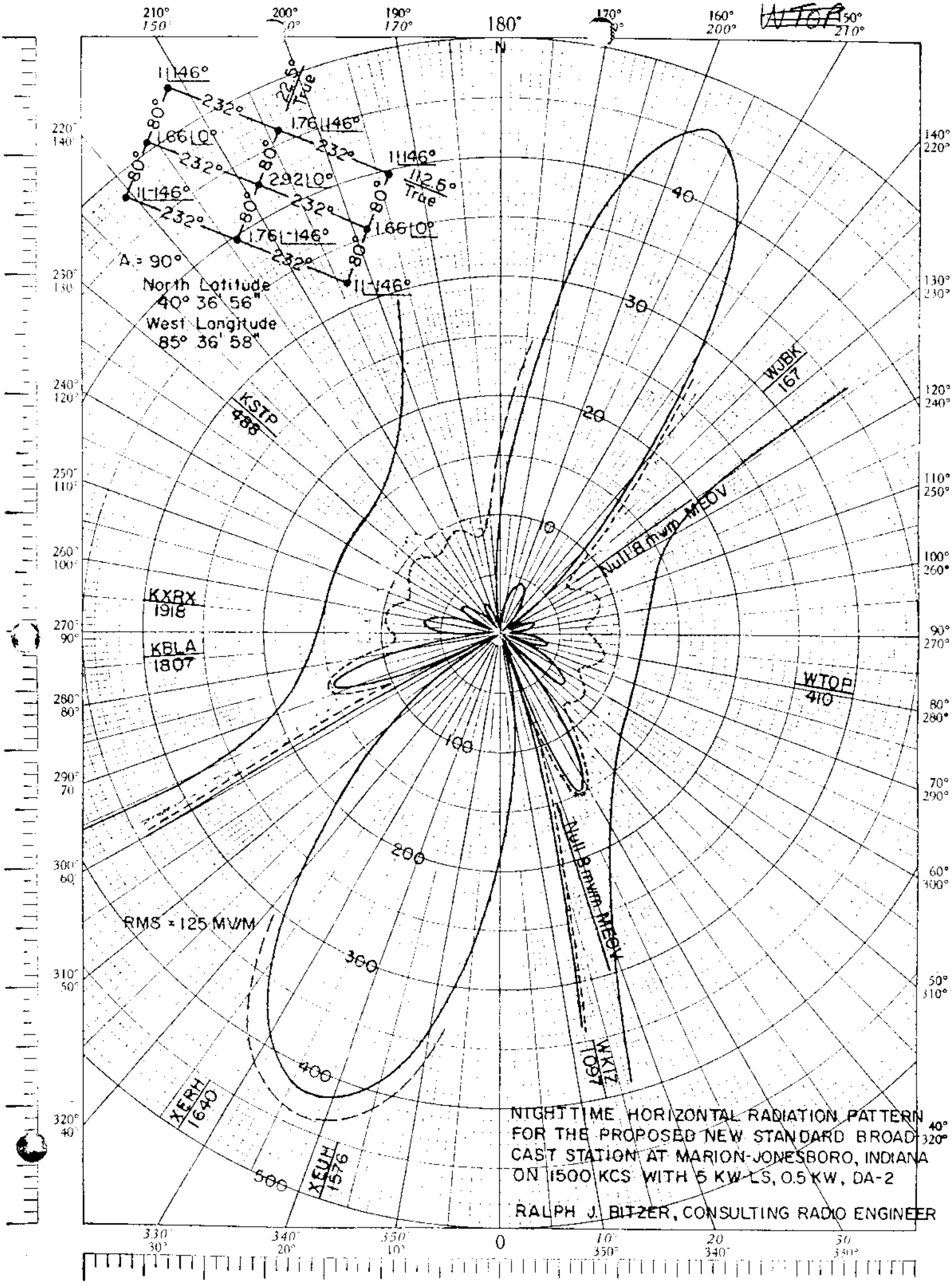
250w,DA-D,D
1500 kc



FCC File No.BP-17749
Accepted 6-14-67

New; Jud, Incorporated
Ellwood City, Pennsylvania

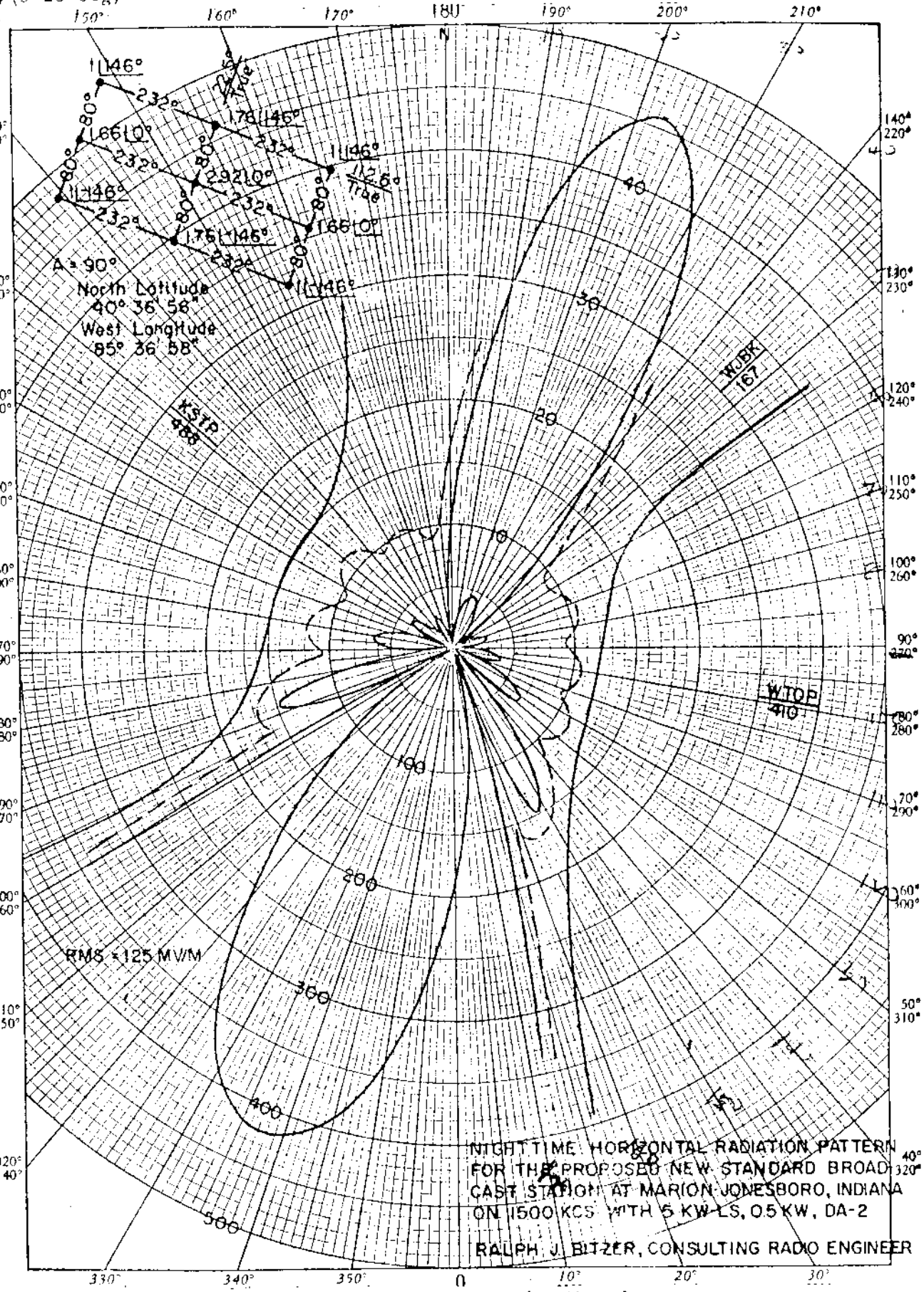
1500 kc


180°
N
0
A = 90°
North Latitude
40° 36' 56"
West Longitude
85° 36' 58"
1.1∠46°
1.76∠46°
1.66∠0°
2.92∠0°
1.1∠46°
112.5°
True
1.76∠-46°
1.66∠0°
1.1∠-46°
232°
80°
22.5°
True
KSTP
488
KXRX
1918
KBLA
1807
WJBK
167
Null 8 mvm MEOV
WTOP
410
Null 8 mvm MEOV
WKIZ
1097
XERH
1640
XEUH
1576
RMS = 125 MV/M
40
30
20
100
200
300
400
500
NIGHTTIME HORIZONTAL RADIATION PATTERN
FOR THE PROPOSED NEW STANDARD BROAD-
CAST STATION AT MARION-JONESBORO, INDIANA
ON 1500 KCS WITH 5 KW-LS, 0.5 KW, DA-2
RALPH J. BITZER, CONSULTING RADIO ENGINEER

PROPOSED NIGHT
(3-28-60g)

New; Geneco B/Cstng, Inc.
Marion-Jonesboro, Indiana

500w,5kw-LS,DA-2,U
1500 KC



FCC File No. BP-13975
Accepted 3-24-60

Geneco Broadcasting, Inc.
Marion - Jonesboro, INDIANA

1500 KC

XEMS

Description Sheet
(8-27-65ct)

Station XEMS
Matamoros, Tamaulipas

1kw,DA-1,U,Class III
1500 kc

DIRECTIONAL ANTENNA DESCRIPTION SHEET
(Issued July 21, 1965)

Station: XEMS

Main Studio: Matamoros, Tamaulipas

Frequency: 1500 kc/s

Power: 1kw

Notification List No. (*)

Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 25° 52' 43"

West Longitude: 97° 31' 09"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-1)
Number of elements: 2
Type of elements: Guyed, vertical steel towers.

TOWER:	#1(SW)	#2(NE)	
HEIGHT ABOVE INSULATORS:	164'	164'	(90°)
PHASING:	0°	+8°	
FIELD RATIO:	1	1	

SPACING AND ORIENTATION: Elements are spaced 328.1' (180°) on a line bearing 25.5° true.

GROUND SYSTEM: 120 - 164' equally spaced copper radials about each tower.

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

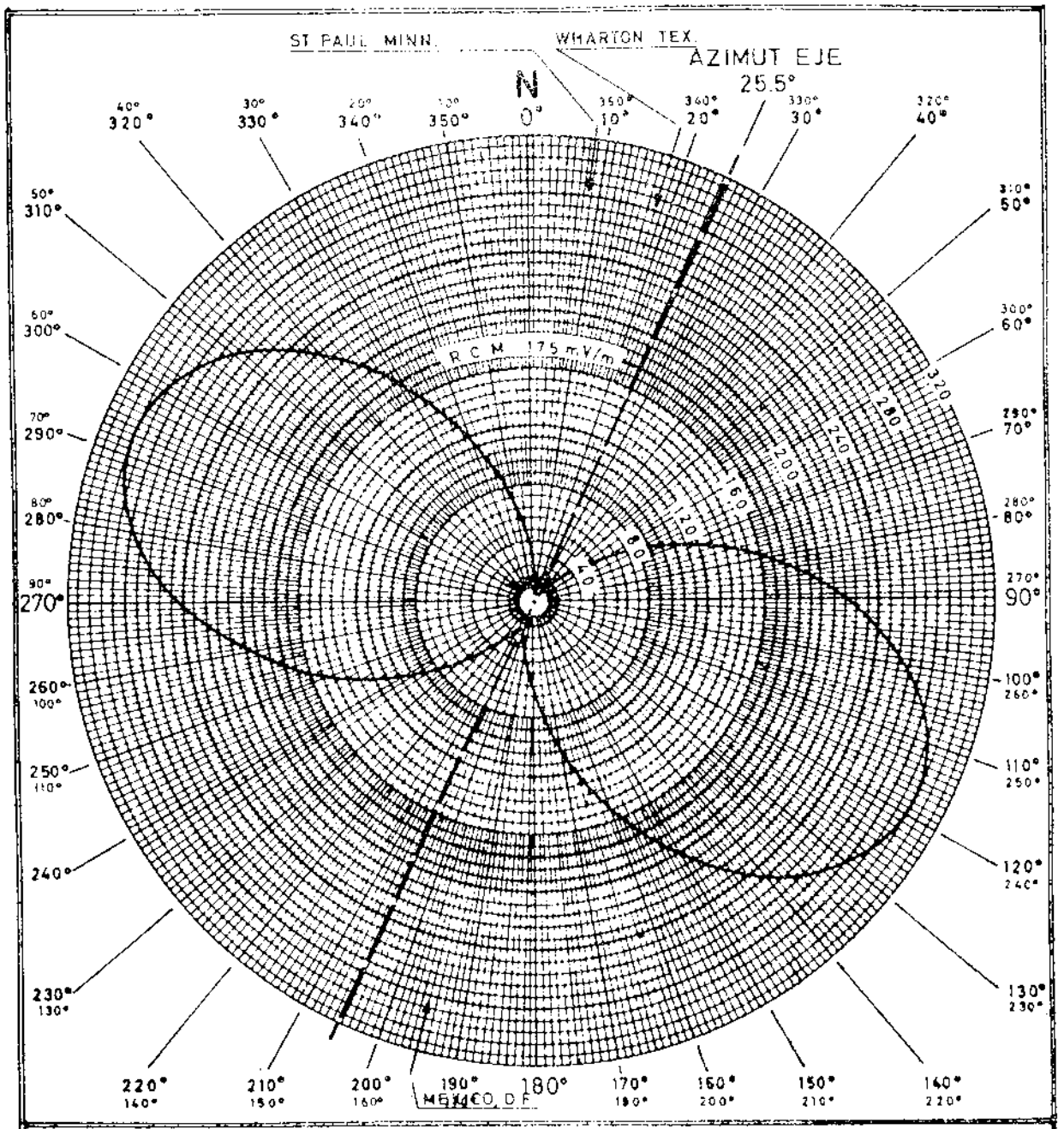
(*) FCC Note: This "supplementary" information corresponds to a change in an existing station assignment concerning which official notification has not been received in the Commission as of July 21, 1965.

XEMS

Proposed Day & Night
(8-27-65ct)

Station XEMS
Matamoros, Tamaulipas

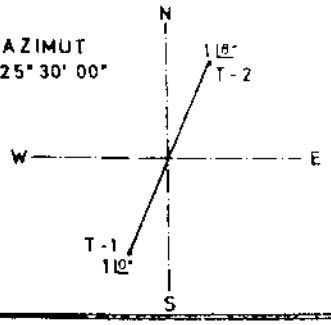
1kw,DA-1,U,Class III
1500 kc



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

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

AZIMUT
25° 30' 00"



RADIODIFUSORA

XEMS

Matamoros, Tamps.

FRECUENCIA
1500 KCS
POTENCIA
1000 W-C.
SISTEMA DIRECCIONAL - MISMO PATRON DIA Y NOCHE

DISEÑO
ING. MANUEL GALLARDO AURO.

DIBUJO
HECTOR ROJAS

XERH

DESCRIPCION DEL SISTEMA DIRECCIONAL DE RADIACION

ESTACION X E R H

ESTUDIOS EN México, D.F.

FRECUENCIA 1500 Kcs.

POTENCIA 20,000 Watts.

CLASE II

LISTA DE CAMBIOS _____

FECHA _____

LOCALIZACION GEOGRAFICA DEL SISTEMA RADIADOR

LONGITUD 99° 07' 59" Oeste
LATITUD 19° 23' 41" Norte

AUTORIZADO PARA OPERACION NOCTURNA DA-N

NUMERO DE ELEMENTOS RADIADORES: DOS

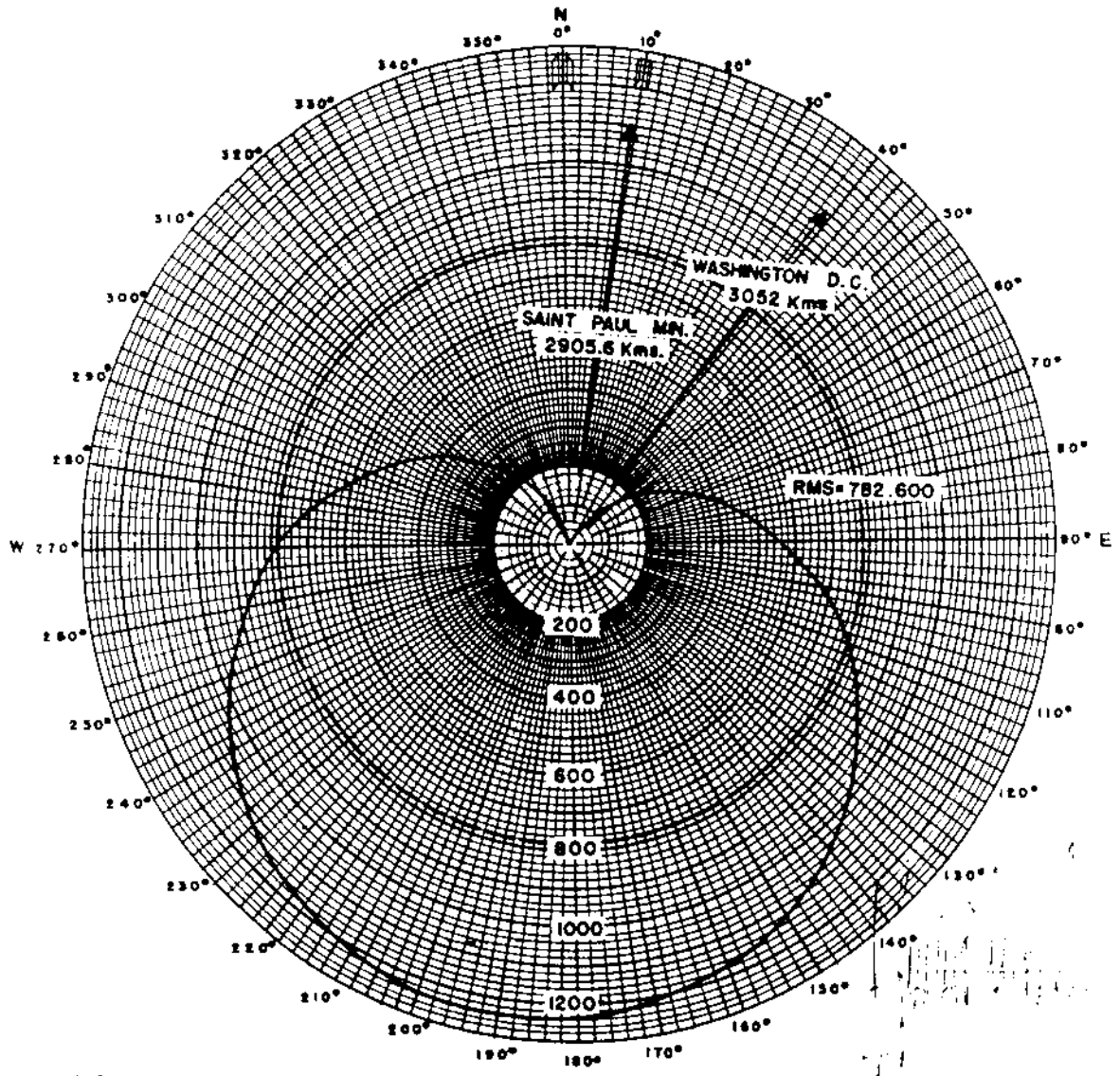
TIPO DE ELEMENTOS RADIADORES: TORRES VERTICALES DE ACERO SOPORTADAS CON RETENIDAS Y ALIMENTADAS EN SERIE

TORRES	Sur	Norte
ALTURA SOBRE LOS AISLADORES	90° = 50 metros	90° = 50 metros
SEPARACION ENTRE TORRES	45° = 25 metros	
DEFASAMIENTO	0°	135°
MAGNITUDES RELATIVAS DE CORRIENTES	1	1
AZIMUT DEL EJE DE LAS TORRES	10° 00' 00"	

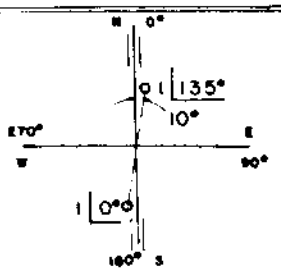
RAIZ CUADRATICA MEDIA TEORICA 782.600 mV/M

EFICIENCIA DEL SISTEMA RADIADOR 175 mV/M/Kw

PROPOSED NIGHT — XERH, MEXICO, D.F. (4/15/53G) — 20,000 W, DA-N — 1500 kc



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



RADIODIFUSORA
XERH
México, D. F.

1500 Kc.
20 000 Watts.

ARTURO AMADOR.
MANUEL CASTELLANOS.
Pasantes Ing. COMUNICACIONES.