

1090-1100

Station	Main Studio	Freq	Power	Date
CHEC	Lethbridge, AB	1090	10 kW	11/8/82
CHEC	Lethbridge, AB	1090	5 kW/DA-2	2/2/59
NEW	Burlington, ON	1090	0.5 kW	9/28/67
CHRS	St-Jean, QU	1090	10 kW/ND-D	2/26/63
CKKW	Kitchener, ON	1090	10 kW/DA-2	9/72
KAAT	Denver, CO	1090	50 kW/DA-D	2/1/75
KAAY	Little Rock, AR	1090	50 kW/DA-N	6/6/51
KBOZ	Bozeman, MT	1090	5 kW/DA-N	2/12/75
KEXS	Excelsior Springs, MO	1090	0.25 kW/DA-D	10/28/68
KING	Seattle, WA	1090	50 kW/DA-2	9/25/70
KKYN	Plainview, TX	1090	0.5/5 kW/DA-2	11/16/79
KKYN	Plainview, TX	1090	0.5/2.5 kW/DA-2	5/31/78
KLDR	Aurora, CO	1090	1/50 kW/DA-N	10/19/79
KRZY	Albuquerque, NM	1090	1/50 kW/DA-2	10/19/79
KVDB	Sioux Center, IA	1090	0.5 kW/DA-D	6/29/70
WBAL	Baltimore, MD	1090	50 kW/DA-N	4/14/71
WCMG	Jacksonville, FL	1090	50/10 kW/DA-2	4/28/65
WFWR	Fort Wayne, IN	1090	1 kW/DA-D	8/28/68
WIID	Livonia, MI	1090	0.5/0.25 kW/DA-2	8/30/78
WKFI	Wilmington, OH	1090	1 kW/DA-D	5/28/63
WQIK	Jacksonville, FL	1090	10 kW/DA-D	4/30/75
WSLG	Gonzales, LA	1090	10 kW/DA-D	10/19/79
WSLG	Gonzales, LA	1090	0.5 kW/DA-D	2/6/74
NEW	Denver, CO	1090	10 kW/DA-D	1/28/70
NEW	Lubbock, TX	1090	50 kW/DA-D	1/28/70
NEW	Sylacauga, AL	1090	10 kW/DA-D	5/25/67
NEW	Denver, CO	1090	50 kW/DA-D	8/26/70

1090-1100

Station	Main Studio	Freq	Power	Date
NEW	Denver, CO	1090	50 kW/DA-D	8/26/70
NEW	Fajardo, PR	1090	10 kW/DA-D	12/27/68
NEW	Amarillo, TX	1090	10/50 kW/DA-2	5/28/68
NEW	Frederiksted, VI	1090	0.5 kW/DA-D	8/22/69
XEOD	Veracruz, MX	1090	1 kW/DA-N	6/20/58
XERB	Rosarito, MX	1090	50 kW/DA-N	8/23/63
KFAX	San Francisco, CA	1100	50 kW/DA-2	6/9/77
KFAX	San Francisco, CA	1100	1/50 kW/DA-D	4/10/61
KFAX	San Francisco, CA	1100	50 kW/DA-1	3/29/78
KREX	Grand Junction, Co	1100	10/50 kW/DA-2	1/22/71
WHLI	Hemstead, NY	1100	10 kW/DA-D	11/9/56
WLBB	Carrollton, GA	1100	10 kW/DA-D	3/30/66
WWWE	Cleveland, OH	1100	50 kW/DA-1	4/9/58

1	2	2	0	1		
---	---	---	---	---	--	--

PART 1 GENERAL INFORMATION

821108

Assigned frequency (kHz)		02	1 0 9 0
Transmitting station	Name of the station	03	L E T H B R I D G E A B
	Call sign	04	C H E C
	Additional identification	05	
	Station class	06	B
	Operational Status	07	P
Country		08	CAN
Geographical coordinates of the transmitting station		09	1 1 2 W 4 5 5 6 4 9 N 3 1 3 3

11 a) New assignment ☐ b) Modification of characteristic of an assignment recorded in the plan ☒ c) Cancellation of an assignment ☐

12 Modification under Section 4.2.14 Yes ☐ No ☒

13 Date of bringing into service or cessation of operation

Year Month Day

STATION PARAMETERS	DAYTIME OPERATION	NIGHT-TIME OPERATION
Station power (kW)	(21) 1.0	(31)
r.m.s. value of radiation for station power (mV/m at 1 km)	(25) 9.654	(35)
Antenna type	(26) A	(36)
Simple vertical antenna electrical height (degrees)	(27) 9.0	(37)

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

DESCRIPTION SHEET
(2-2-59g)

New Station 5kw, DA-2,U, Class II
Lethbridge, Alberta, Canada 1090 KC

ANTENNA DESCRIPTION SHEET

DIRECTIONAL DA-2

STATION CALL:
 MAIN STUDIO: Lethbridge, Alberta.
 FREQUENCY: 1090 kc/s
 POWER: 5000 watts
 CLASS: II
 TIME: Unlimited

NOTIFICATION REFERENCE: 124,.....Dated: August 29, 1958

GEOGRAPHICAL LOCATION: N.Lat. 49° 31' 33.5"
 W.Lon. 112° 45' 56.1"

ANTENNA CHARACTERISTICS: Three elements, guyed, uniform cross section, base insulated, series feed. No top loading.

ELEMENT	SOUTH	CENTRE	NORTH
Height	226' 90°	226' 90°	226' 90°
Spacing	ref.	188.5' 75°	377.0' 150°
Bearing	ref.	340°	340°
Night ratio	1.0	1.92	1.0
phasing	130°	0°	-130°
Day ratio		0.8	1.0
phasing		0°	-75°
Ground System	120 radials per tower, #10 AWG bare soft copper wire, uniformly spaced, depth approximately 8 inches. Radials bonded to soft copper strap at tower bases. Maximum radial length 362 feet.		
Predicted R.M.S.	190 mv/m at 1 mile for 1 kw 424 mv/m at 1 mile for 5 kw		

GM 9/7/58

5

Lethbridge, Alberta, Can.

0112

124
PROPOSED DAY
(2-2-59g)

New Station
Lethbridge, Alberta, Canada

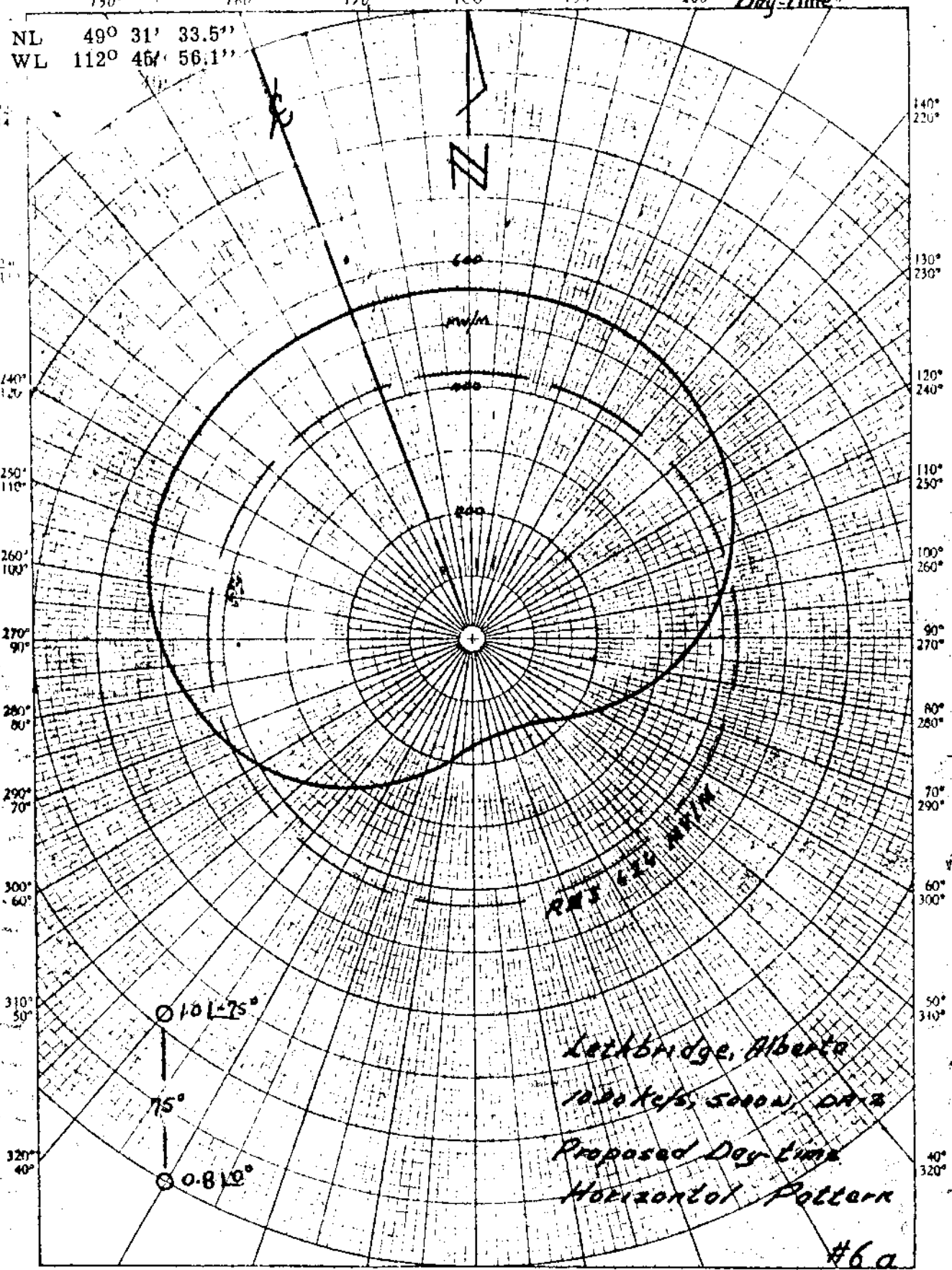
5kw, DA-2, U, Class II

1090 KC

NL 49° 31' 33.5"
WL 112° 46' 56.1"

Day-time

K-E POLAR CO-ORDINATE
STRUPPEL & EYER CO.



18/6/58

812A

Lethbridge, Alberta, Can.

CHRC

PROPOSED NIGHT
(2-2-59g)

New Station
Lethbridge, Alberta, Canada

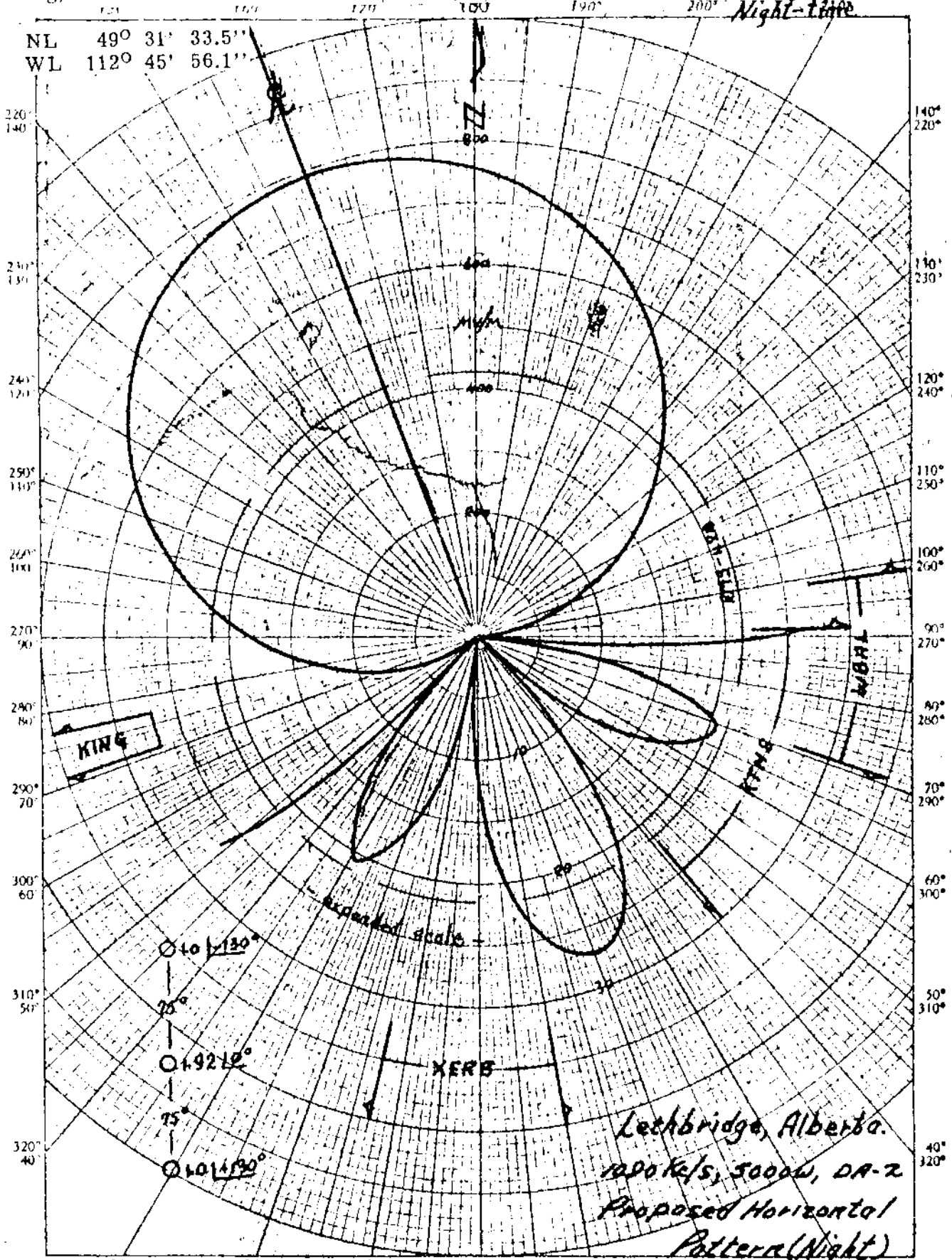
5kw, DA-2, U, Class II

1090 KC

Night-time

NL 49° 31' 33.5"
WL 112° 45' 56.1"

K-E POLAR CO-ORDINATE
MUTUAL & BROWN CO.



18/6/58 130° 340° 350° 0° 10° 20° 30° 310° #6b

DESCRIPTIVE SHEET - OMNIDIRECTIONAL ANTENNA

Station Call: NEW

Main Studio: Burlington, Ontario

Frequency: 1090 Kc/s.

Power: 500 watts.

Class: 11

Time: Day Only

Notification Reference: #230 Date: August 15, 1967

Geographical Location:

North Latitude: N43° 22' 53"

West Longitude: 479° 46' 27.0"

Antenna Characteristics:

Height: 150' (60°)

Expected Efficiency: 124 Mv/m. (175 Mv/m for 1 KW)

Ground System: 144° (312') long radials, numbering
120, spaced every 3° of #10 AWG
soft copper wire and buried approx. 8".

Type of Element: One element, base insulated, guyed,
series fed with no top loading.

#176
Description Sheet
(2-26-63ct)

Station CHRS
St. Jean, Quebec

CHRS
10kw, D, Class II
1090 kc

DIRECTIONAL ANTENNA DESCRIPTION SHEET

STATION: CHRS MAIN STUDIO: St-Jean, Que.

FREQUENCY: 1090 KC POWER: 10KW CLASS: II

DATE: December 21, 1962

NOTIFICATION LIST NO: 175

GEOGRAPHICAL LOCATION
OF THE ANTENNA SYSTEM:

North Latitude: 45° 19' 17"

West Longitude: 73° 18' 36"

ANTENNA CHARACTERISTICS

Mode of Operation: 10KW ND-D (omnidirectional daytime only)

Number of elements: One

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

HEIGHT
ABOVE INSULATORS 150' (60°)

OVERALL HEIGHT 155'

GROUND SYSTEM 120 equiangularly spaced radials extend
from the base of each tower to a distance
of at least 360 feet (0.4 wavelength) when
ever possible. The ground wires consist
of solid copper wire No. 10 & B buried to
a depth of approximately 3 inches.

PREDICTED EFFECTIVE FIELD:

570 MV/M at 1 mile for 10KW

130 MV/M at 1 mile for 1 KW

ANTENNA DESCRIPTION SHEET

STATION CALL: CKKW
MAIN STUDIO: KITCHENER, ONTARIO
FREQUENCY: 1090 kHz
POWER: 10 kW
CLASS: II
MODE: DA-2
TIME: UNLIMITED

NOTIFICATION LIST NO.: .303.

DATE: December 19, 1972

GEOGRAPHICAL LOCATION: Latitude: 43° 17' 20" North
Longitude: 80° 24' 16" West

ARRAY CHARACTERISTICS: Nine guyed steel towers of uniform cross section; base insulated, series fed; no top loading; base insulator 8' above ground.

GROUND SYSTEM: 120 equally spaced radial wires per tower of #10 AWG bare copper buried 6" - 12" below grade; of average length 362' (0.4λ) excluding those along common chords; plus an elevated counterpoise 40' in diameter at each tower.

PREDICTED EFFECTIVE FIELD:
(UNATTENUATED AT ONE MILE) 242 mV/m per kilowatt
or
765 mV/m for 10 kW day and night

CKKW

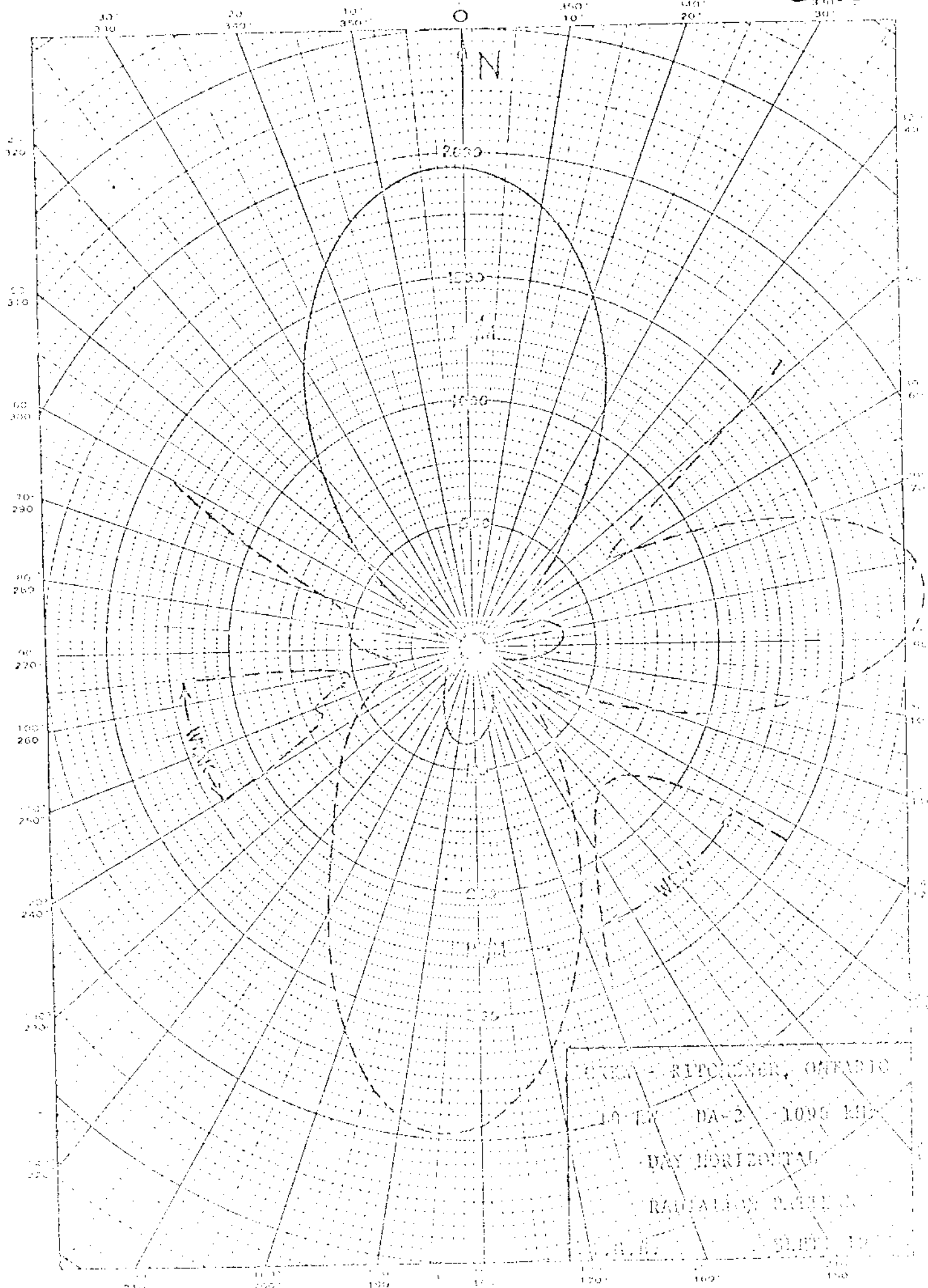
TABLE 1-2

TOWER	HEIGHT		ORIENTATION DEGREES TRUE	SPACING		FIELD RATIO		PHASE ANGLE°
	FEET	DEGREES		DEGREES	FEET	NIGHT	DAY	
#1 NW	527.318	210.376	292.425	213.498	535.1	1.0408		-134.464
#2 NC	529.264	211.152	001.979	075.071	188.1	1.9689		-134.750
#3 NE	529.527	211.257	071.883	213.301	534.6	1.0035		-134.526
#4 CW	520.278	207.567	272.014	200.445	502.4	1.8514		000.089
#5 C	521.807	208.177	0°ref.	0°ref.	0	3.6280		0°
#6 CE	520.937	207.830	092.021	200.377	502.2	1.8486		000.094
#7 SW	529.063	211.072	251.515	213.688	535.6	1.0071		134.578
#8 SC	528.732	210.940	181.983	075.291	188.7	1.9591		135.028
#9 SE	527.035	210.283	212.399	213.264	534.5	1.0145		134.439
#1 NW	527.318	210.376	292.425	213.498	535.1	1.00		0
#2 NC	529.264	211.152	001.979	075.071	188.1	0.85		15
#3 CW	520.278	207.567	272.014	200.445	502.4	0.75		120
#5 C	521.807	208.177	0°ref.	0°ref.	0	0.64		135

CKKW

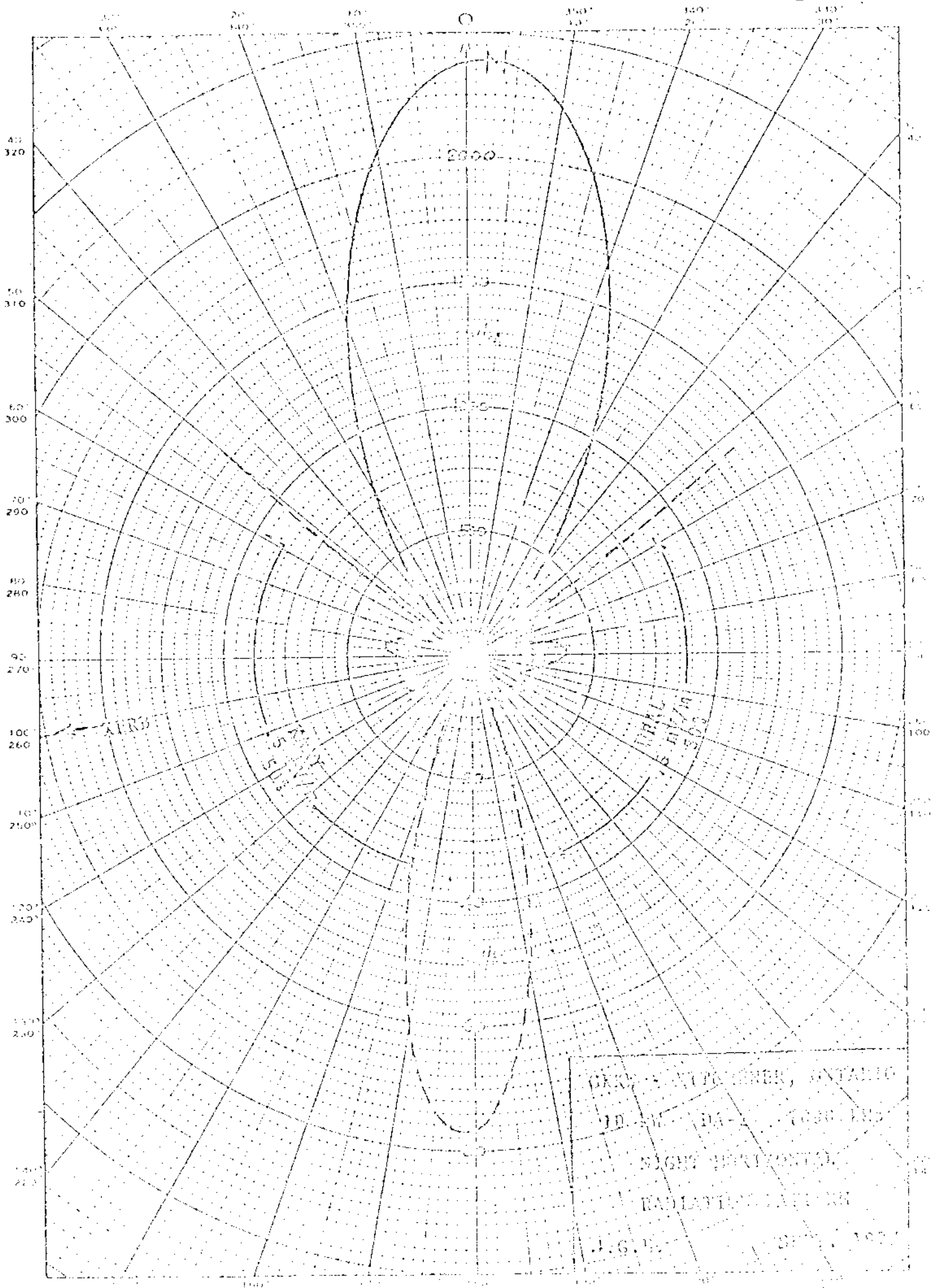
EUGENE DIETZEN CO.
MADE IN U.S.A.

NO. 343-B DIETZEN GRAPH PAPER
POLAR COORDINATE



GREEN - RITCHIE, ONTARIO
10 LB DA-2 1000 MI
DAY HORIZONTAL
RADIATION PAPER
A. H. S. 10

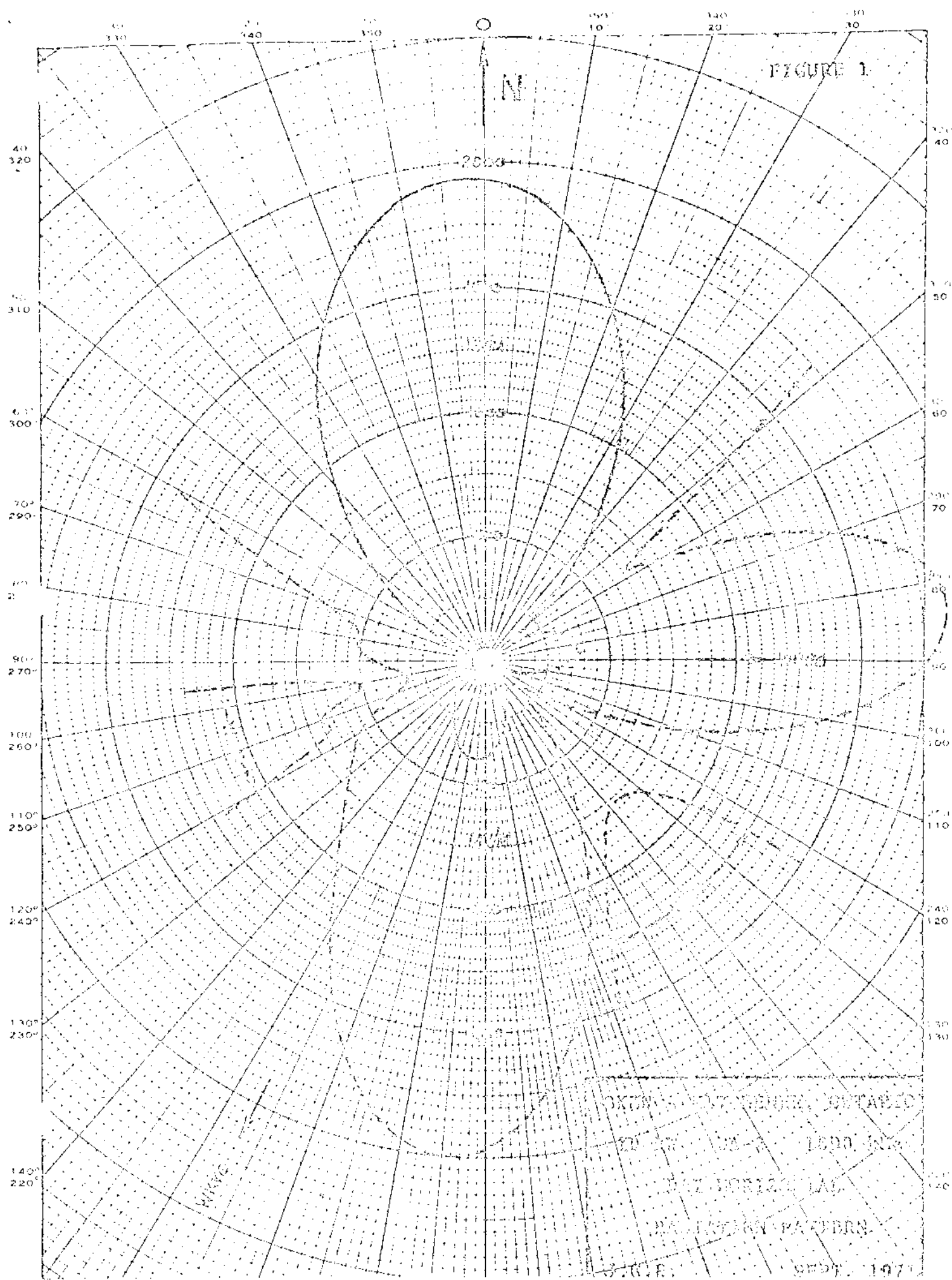
NO. TWO-3 DIEZSEV GRADY PAGES
POLAR CO-ORDINATE



GROSS & WITTMER, BENTON
 10-30-64 1A-2 1030-112
 NIGHT VERTICAL
 RADIATION LATE IN
 11-6-64 1030-112

ANTENNA DESCRIPTION SHEET

STATION CALL: CKKW
 MAIN STUDIO: KITCHENER, ONTARIO
 FREQUENCY: 1090 kHz
 POWER: 10 kW
 CLASS: II
 MODE: DA-2
 TIME: UNLIMITED
 NOTIFICATION LIST NO.: DATE: April 21, 1972
 GEOGRAPHICAL LOCATION: Latitude: 43° 17' 20" North
 Longitude: 80° 24' 16" West
 ARRAY CHARACTERISTICS: Nine guyed steel towers of uniform cross section; base insulated, series fed; no top loading; base insulator 8' above ground.
 GROUND SYSTEM: 120 equally spaced radial wires per tower of #10 AWG bare copper buried 6" - 12" below grade; of average length 362' (0.4λ) excluding those along common chords; plus an elevated counterpoise 40' in diameter at each tower.
 PREDICTED EFFECTIVE FIELD:
 (UNATTENUATED AT ONE MILE)
 264 mV/m per kilowatt
 or
 772 mV/m for 10 kW day and night



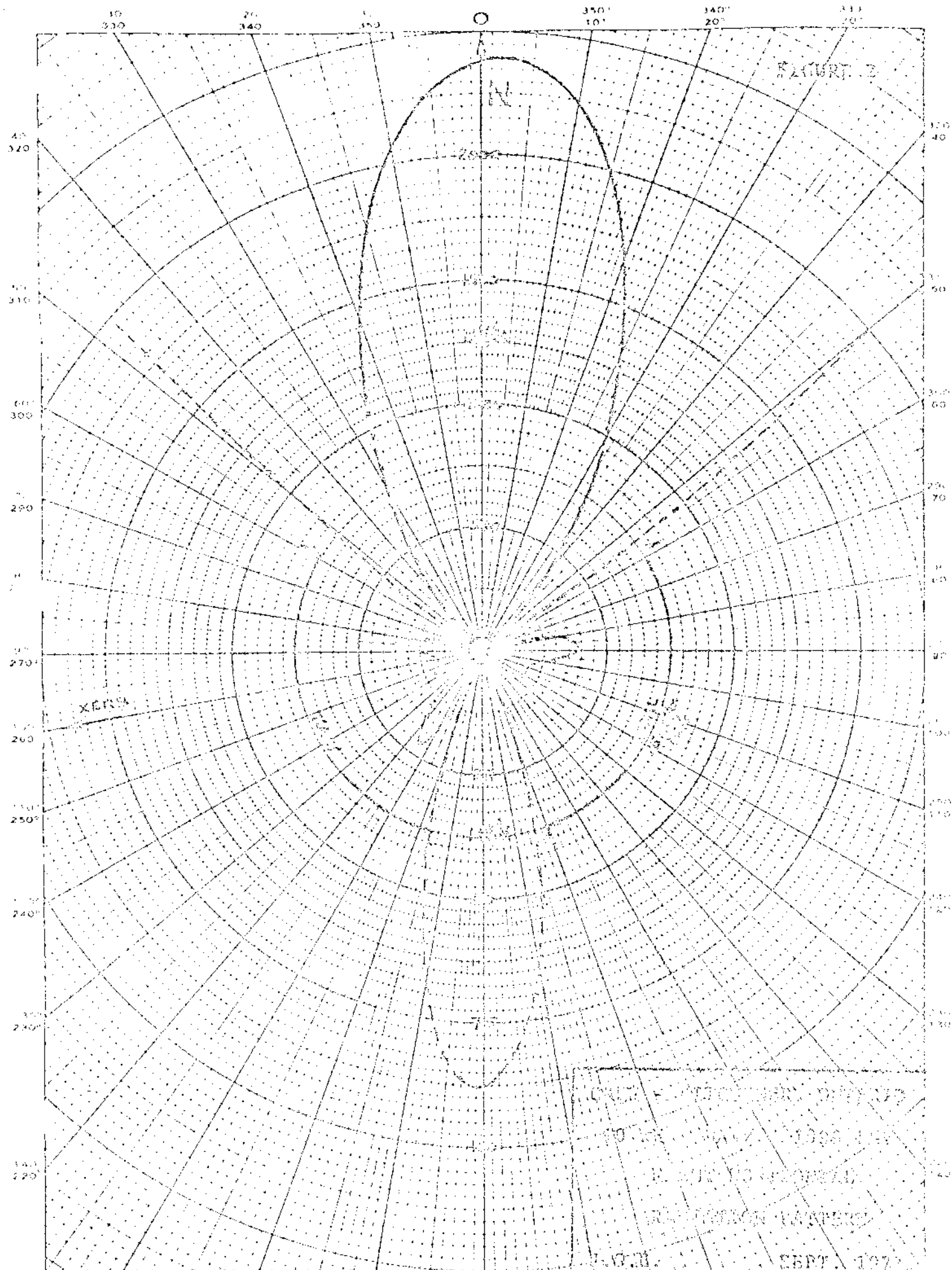
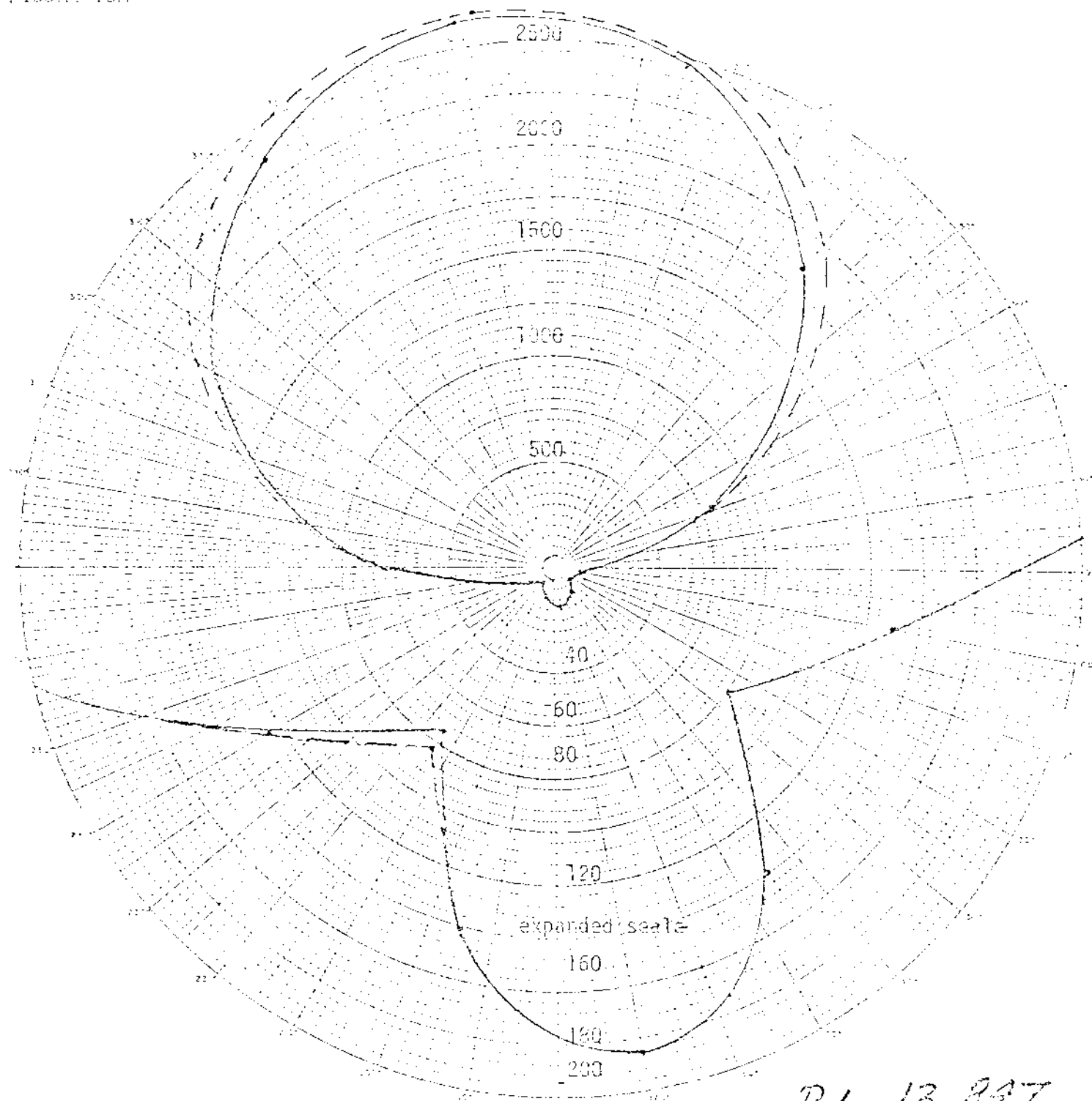


FIGURE 15A

KΔΔT



FMS = 1367

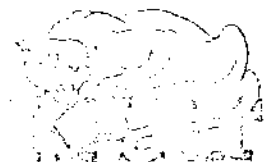
BL-13, 847

Measured Field ——— N350°E
Theoretical Field - - - - True

Latitude: 33° 24' 19"
Longitude: 104° 52' 59"

$\phi = 90^\circ$, $G = 63.77^\circ$ (with T.L.)

4	0.3403 / 138.7°
3	1.0042 / -101.0°
2	1.0 / 0°
1	0.3455 / 93.1°



ANTENNA PARAMETERS

DAYTIME DIRECTIVITY FACTOR
RADIO COLORADO COLLEGE
DENVER, COLORADO

1090 MHz 200W 500M 11.1

KAAY

PROPOSED

KTHS, LITTLE ROCK, ARK.

50 KW, U, DA-N

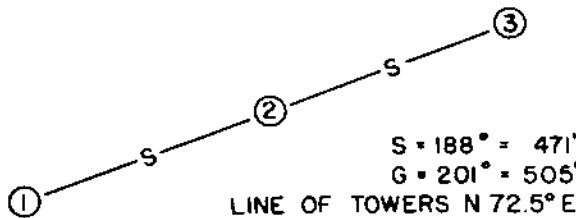
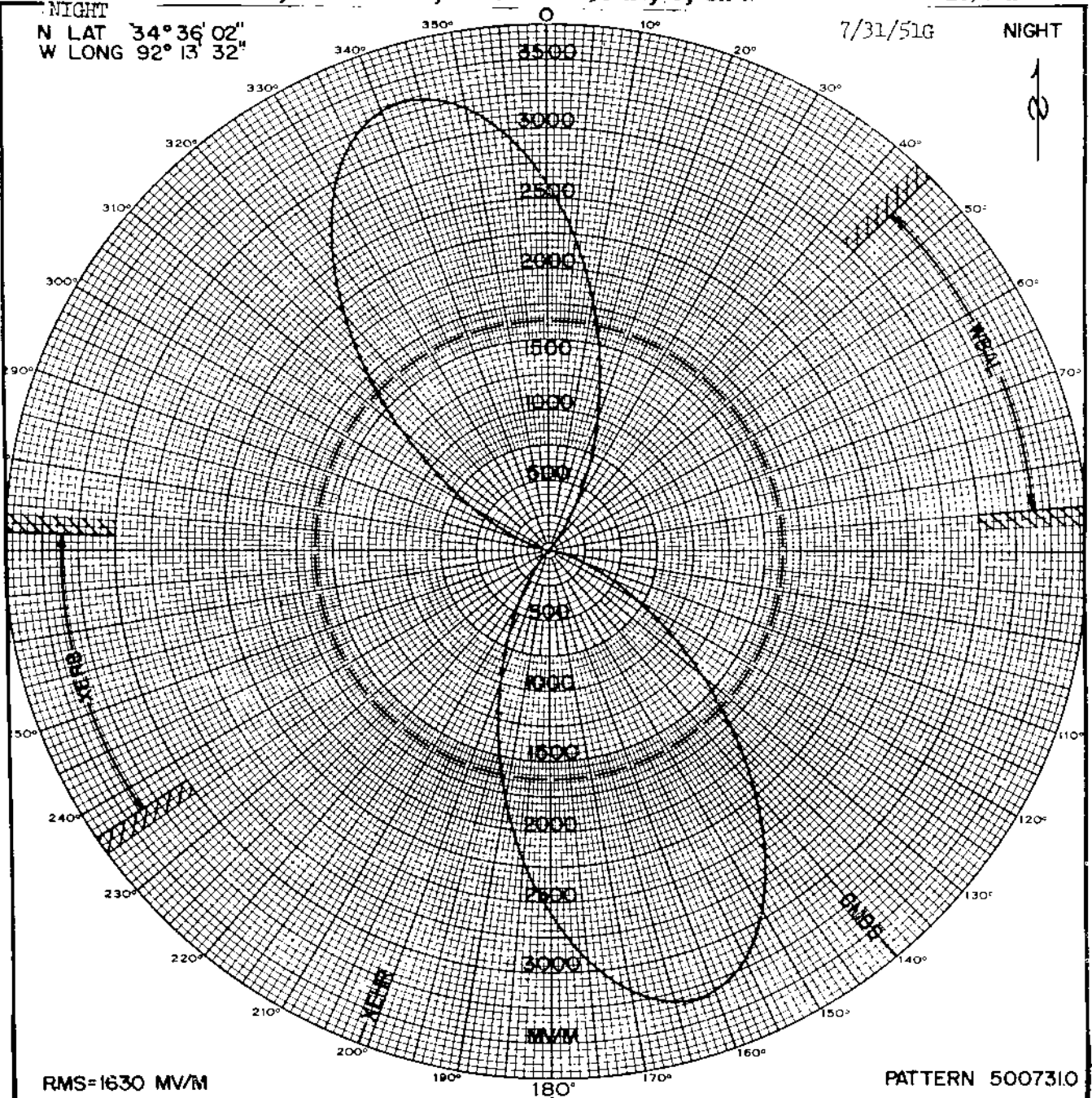
1090 KC

NIGHT

N LAT 34° 36' 02"
W LONG 92° 13' 32"

7/31/51G

NIGHT

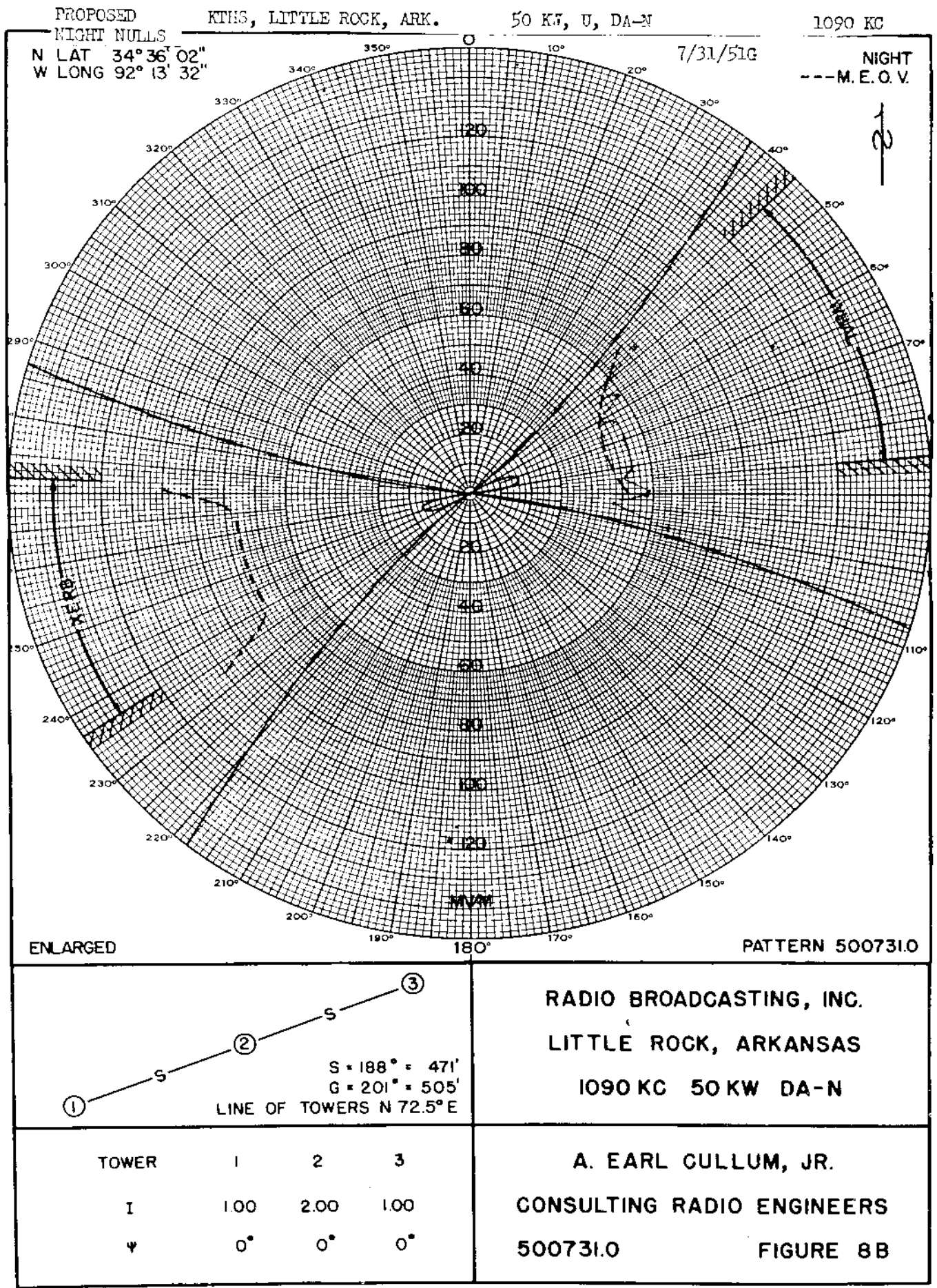


RADIO BROADCASTING, INC.
LITTLE ROCK, ARKANSAS
1090 KC 50 KW DA-N

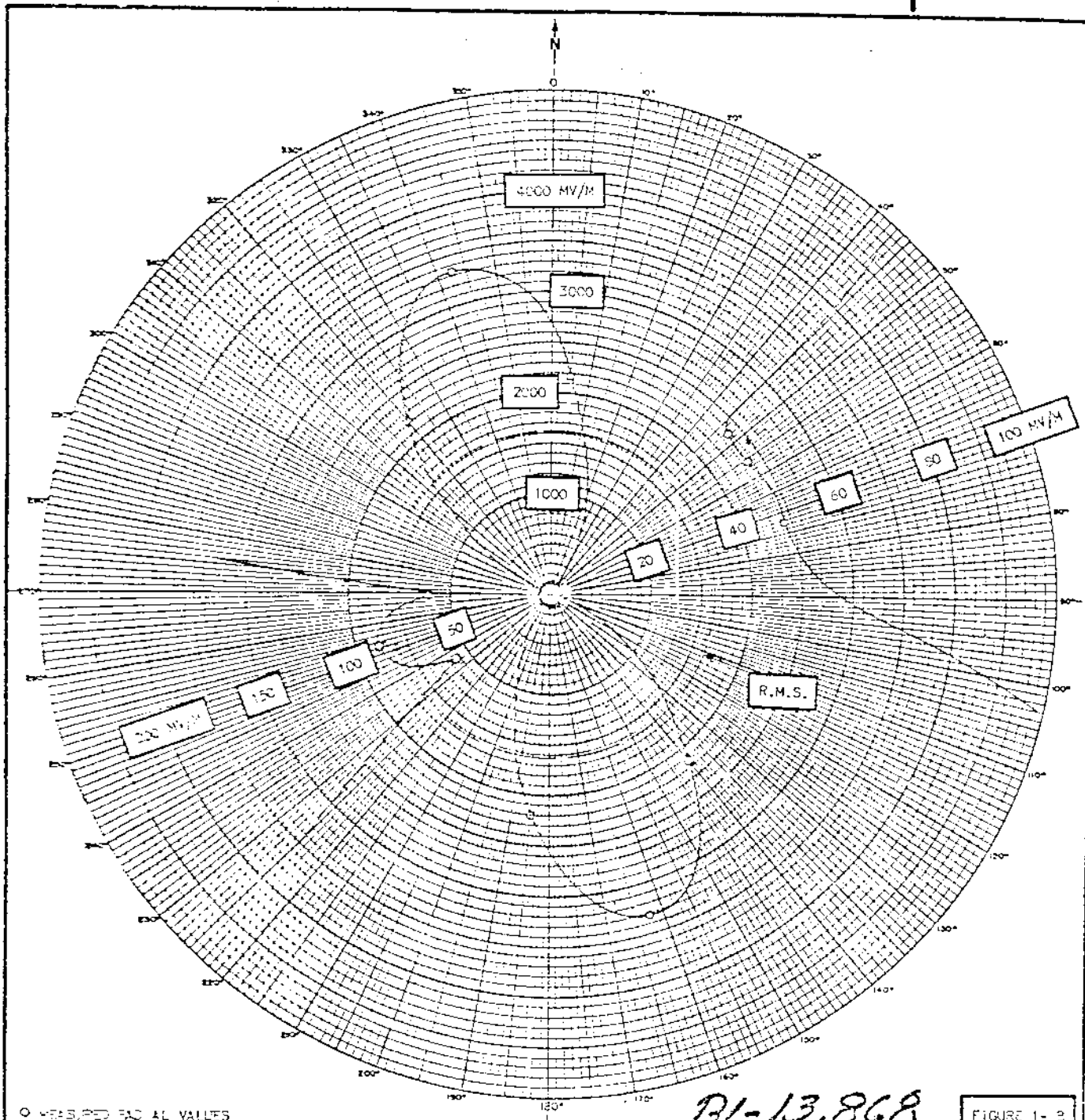
TOWER	1	2	3
I	1.00	2.00	1.00
ψ	0°	0°	0°

A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEERS
500731.0 FIGURE 8A

KAAY 3



KAAY

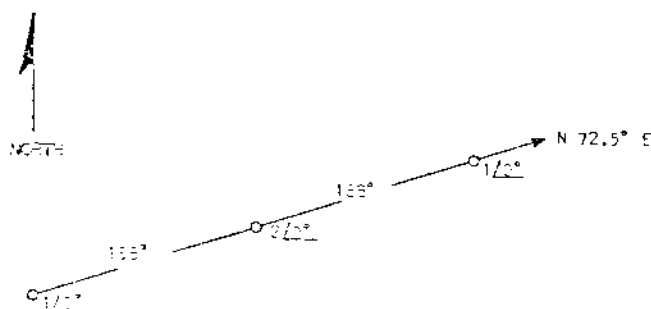


BL-13,868

FIGURE 1-2

HORIZONTAL RADIATION PATTERN

THEORETICAL PARAMETERS



5 + 1000' (ALL TIMES)

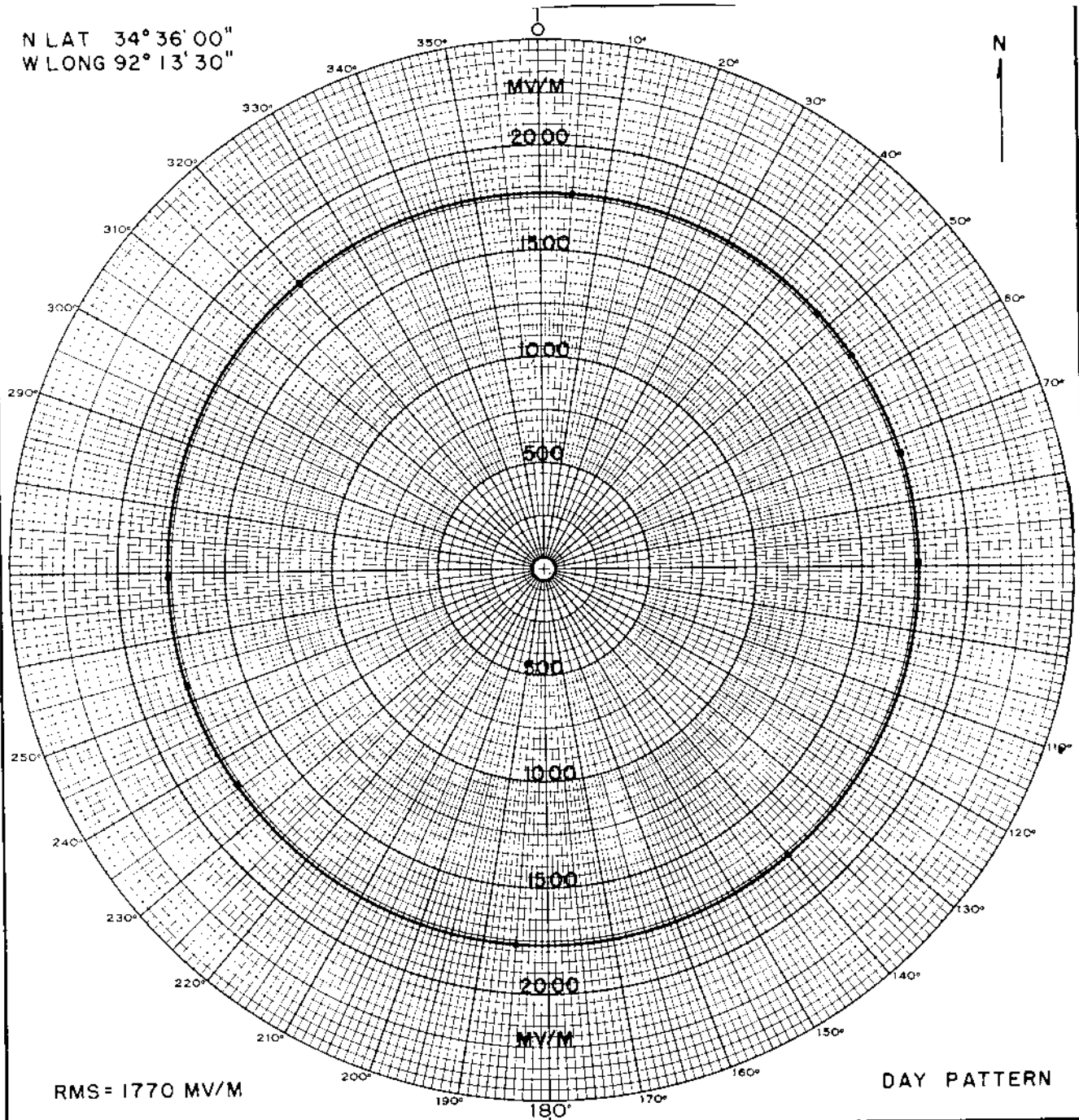
APPLICANT :	KAAY
LOCATION :	LITTLE ROCK, ARKANSAS
FREQUENCY :	1000 KC/S
POWER :	50 KW
LATITUDE :	34 DEG 36 MIN 00 SEC
LONGITUDE :	92 DEG 13 MIN 30 SEC
WHEN USED :	NIGHTTIME
R.M.S. FIELD :	1500 MV/M
DATE :	NOVEMBER 1974

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

MEASURED KTHS, Little Rock, Ark. 50KW, DA-N
DAY (7/13/54G)

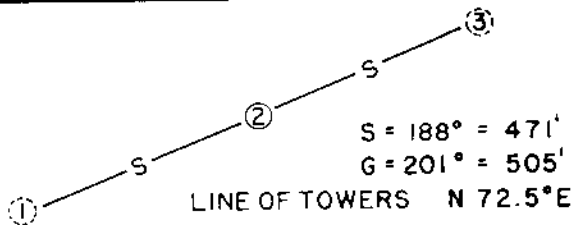
KAAY
1090 KC

N LAT $34^{\circ}36'00''$
W LONG $92^{\circ}13'30''$



RMS = 1770 MV/M

DAY PATTERN



PATTERN BASED ON
MEASUREMENTS

RADIO STATION KTHS
1090 KC 50KW DA-N
540330 FIGURE 4A

A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEERS
DALLAS TEXAS

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: (New) Main Studio: Bozeman, Montana
 Frequency: 1090 kHz Power: 5 kW
 Notification List No. 1619 Date: February 12, 1975 Class: II

GEOGRAPHICAL LOCATION OF THE
CENTER OF THE ANTENNA SYSTEM:

North Latitude: 45° 36' 58"
 West Longitude: 111° 05' 16"

ANTENNA CHARACTERISTICS

Authorized for Nighttime operation. (DA-N)

Number of elements: 5

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

TOWER:	NW(#1)	NC(#2)	C(#3)	SC(#4)	SE(#5)	
HEIGHT ABOVE INSULATORS:	240'	240'	240'	240'	240'	(95.7°)
PHASING:	0°	+43.7°	+86.5°	+127.5°	+166°	
FIELD RATIO:	1.0	3.193	4.253	2.818	0.8	

SPACING AND

ORIENTATION: Adjacent elements are spaced 481.6' (192°) on a line bearing 136° true.

GROUND SYSTEM: 120-225' equally spaced co. radials plus 120-50' interspaced radials about each tower. Radials are extended and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL		STANDARD
	<u>RMS</u>	<u>RSS</u>	<u>RMS</u>
Daytime	429 mv/m	---	---
Nighttime	397.48 mv/m	502.19 mv/m	417.60 mv/m

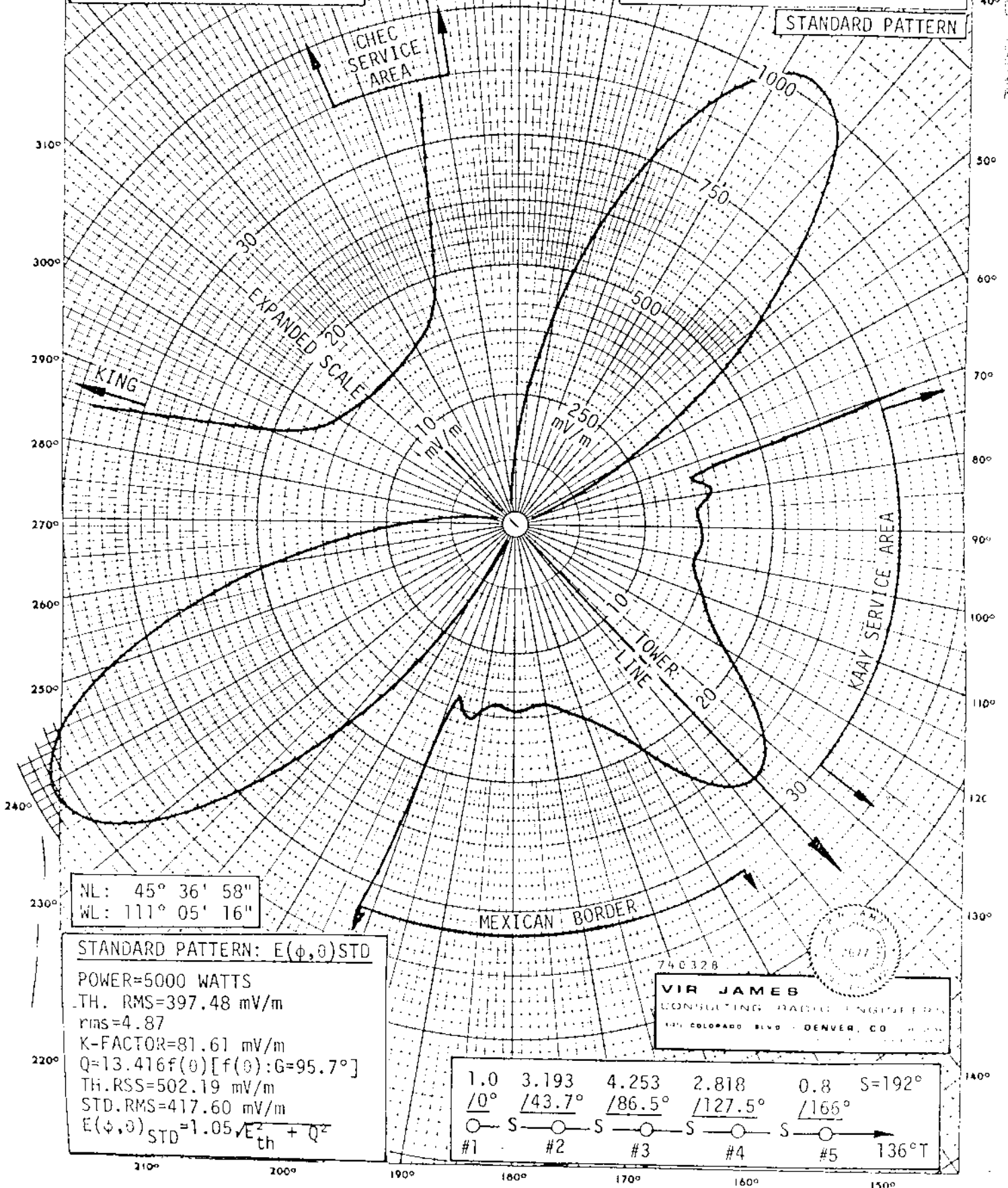
CTR NO 30270A3

EXHIBIT E-6.01A

PROPOSED AM STATION
NORTHERN SUN CORPORATION
390 KHZ 5 kW DA-N
BOZEMAN, MONTANA
FEBRUARY 1974

PROPOSED NIGHTTIME DIRECTIONAL
HORIZONTAL RADIATION PATTERN
UNATTENUATED FIELD AT ONE MILE

STANDARD PATTERN



NL: 45° 36' 58"
WL: 111° 05' 16"

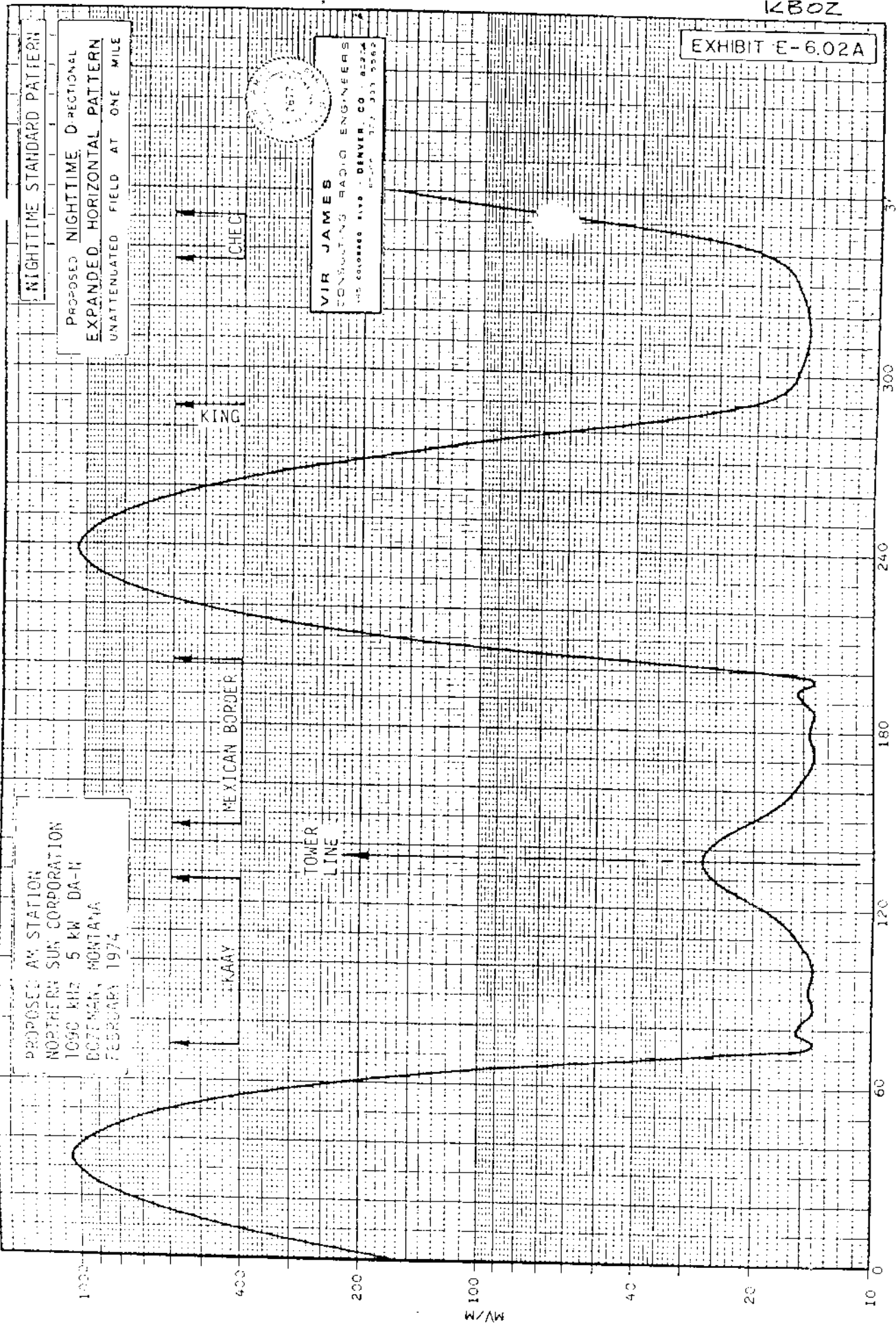
STANDARD PATTERN: $E(\phi, \theta)_{STD}$

POWER=5000 WATTS
TH. RMS=397.48 mV/m
rms=4.87
K-FACTOR=81.61 mV/m
 $Q=13.416f(\theta)[f(\theta):G=95.7^\circ]$
TH. RSS=502.19 mV/m
STD. RMS=417.60 mV/m
 $E(\phi, \theta)_{STD}=1.05\sqrt{E_{th}^2 + Q^2}$

740328

VIR JAMES
CONSULTING RADIO ENGINEER
1411 COLORADO BLVD - DENVER, CO

1.0	3.193	4.253	2.818	0.8	S=192°
/0°	/43.7°	/86.5°	/127.5°	/165°	
○	○	○	○	○	→
#1	#2	#3	#4	#5	136°T



PROPOSED AM STATION
 NORTHERN SUN CORPORATION
 1090 KHZ 5 KW DA-M
 BOZEMAN, MONTANA
 FEBRUARY 1974

NIGHTTIME STANDARD PATTERN
 PROPOSED NIGHTTIME DIRECTIONAL
 EXPANDED HORIZONTAL PATTERN
 UNATTENUATED FIELD AT ONE MILE

KAAV

KING

CHEC

MEXICAN BORDER

TOWER
 LINE

VIR JAMES
 CONSULTING RADIO ENGINEERS
 145 COLLEGE BLVD DENVER, CO 80202
 PHONE 333 333 3363



EXHIBIT E-6.02A

KBOZ

Standard Pattern

AZIMUTH - DEGREES TRUE

1KBOZ

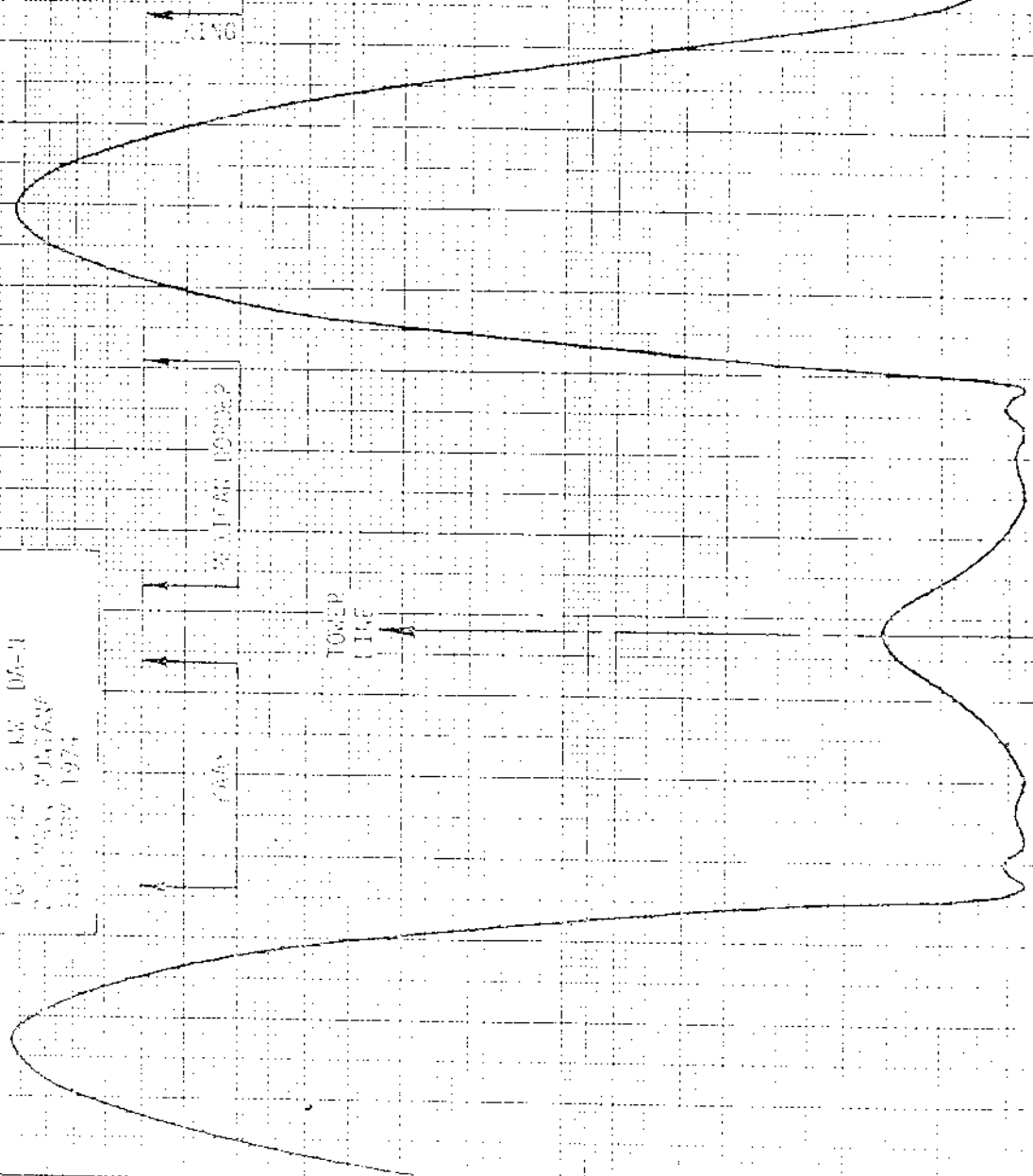
UPPER STANDARD PATTERN

VERTICAL AXIS 05°
CONICAL ROTATION PATTERN
DIRECTION 100° 200° 300°

EXHIBIT F-6 028

VIR JAMES
FBI - NEW YORK
DINER CC

PROJECT AM STATION
STATION 3000
1000-42 3 10 05-1
2000-42 2 10 05-1
2000-42 2 10 05-1
2000-42 2 10 05-1

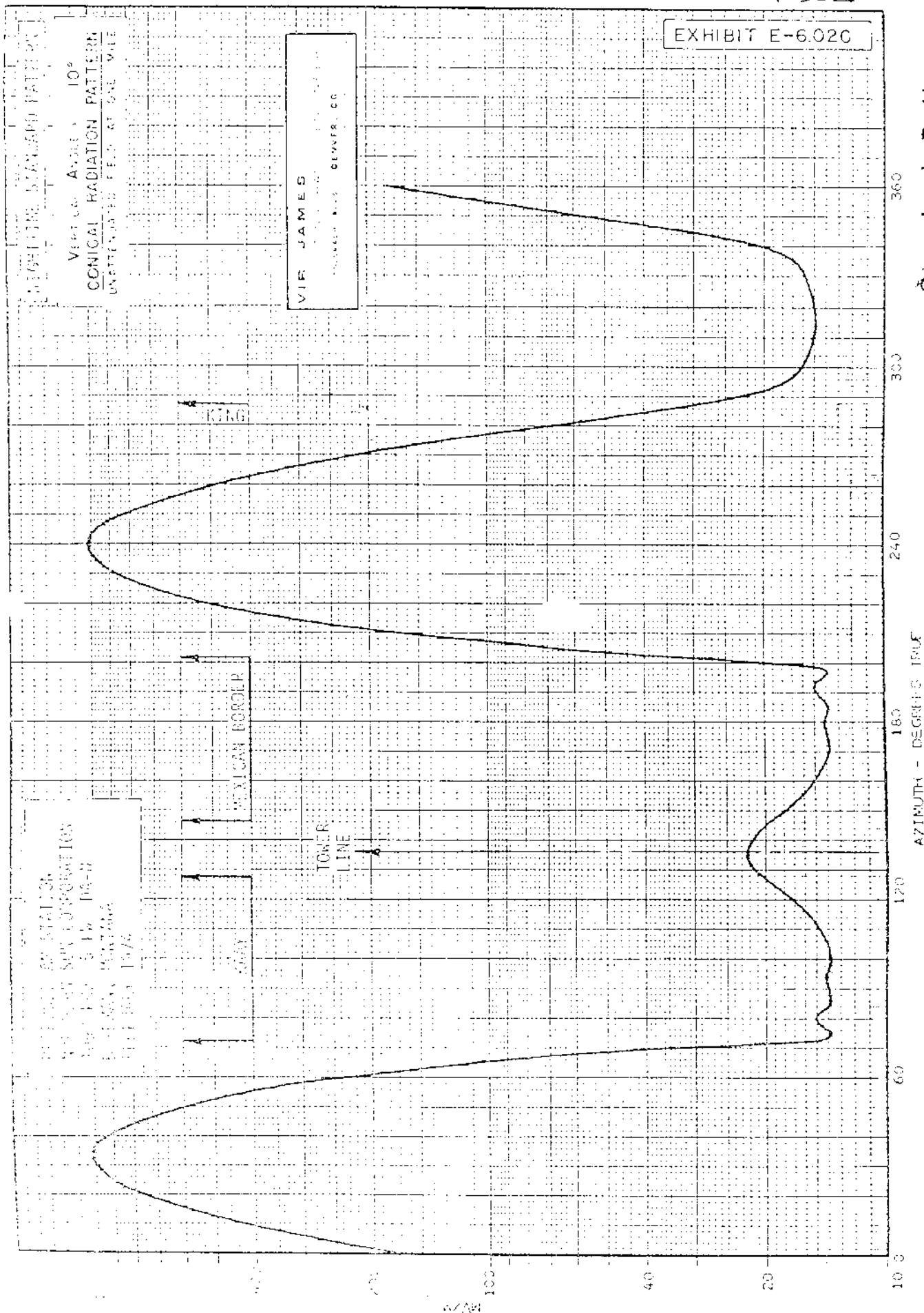


Standard Pattern

A/1000 000000

1230Z

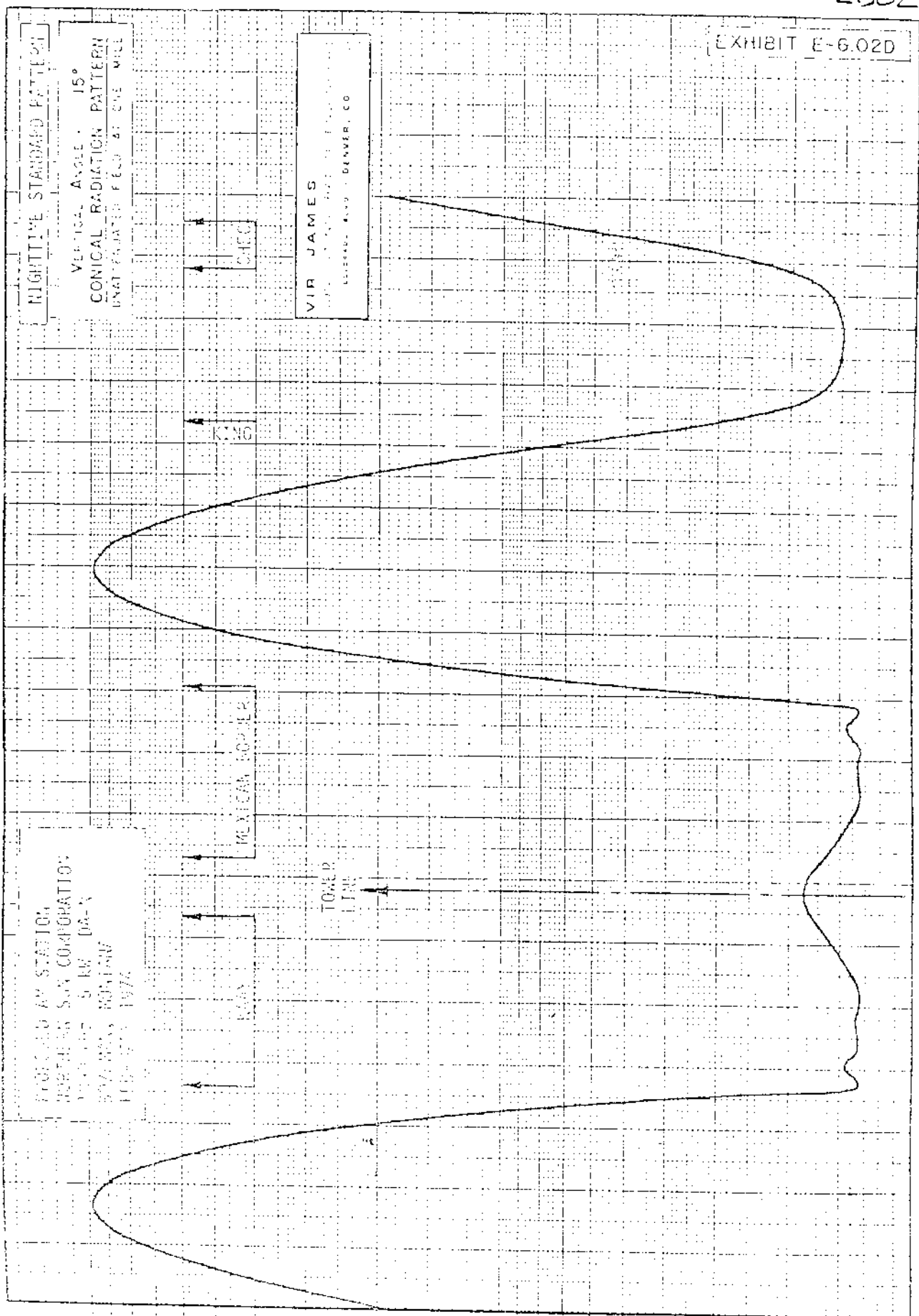
EXHIBIT E-6.02C



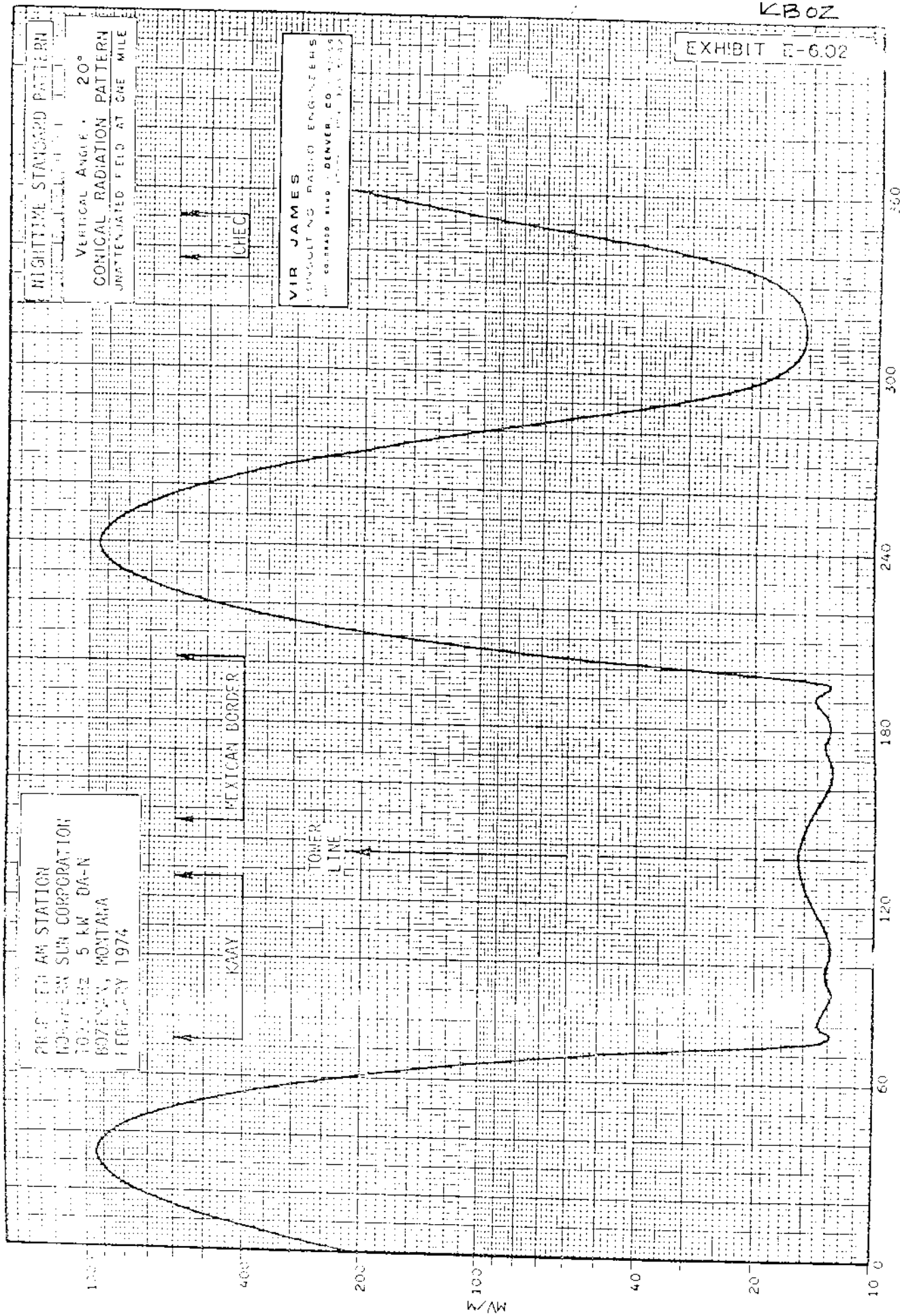
Standard Pattern

KBOZ

EXHIBIT E-6.02D



Standard Pattern



2810 AM STATION
KOWAN SUN CORPORATION
102.1 MHz 5 KW DA-N
BOZEMAN, MONTANA
FEBRUARY 1974

NIGHTTIME STANDARD PATTERN

VERTICAL ANGLE - 20°
CONICAL RADIATION PATTERN
UNATTENUATED FIELD AT ONE MILE

KAAY

MEXICAN BORDER

TOWER
LINE

VIR JAMES
CONSULTING RADIO ENGINEERS
100 CO. STREET, DENVER, CO. 80202

EXHIBIT E-602

KB0Z

PROPOSED AM STATION
NORTHERN SUN CORPORATION
1060 1-2 5 KW DA-N
BOZEMAN, MONTANA
FEBRUARY 1974

NIGHTTIME STANDARD PATTERN

VERTICAL ANGLE 25°
CONICAL RADIATION PATTERN
UNATTENUATED FIELD AT ONE MILE

ONE FC

TOXER
LINE

EXHIBIT E-602F

VIR JAMES
FEDERAL BUREAU OF INVESTIGATION
DENVER CO

K30Z

AZIMUTH DEGREES TRUE

300 360

Standard Pattern

RIGHT TIME STANDARD PATTERN

VERTICAL ANGLE 30°
CONICAL RADIATION PATTERN
UNATTENUATED FIELD AT ONE MILE

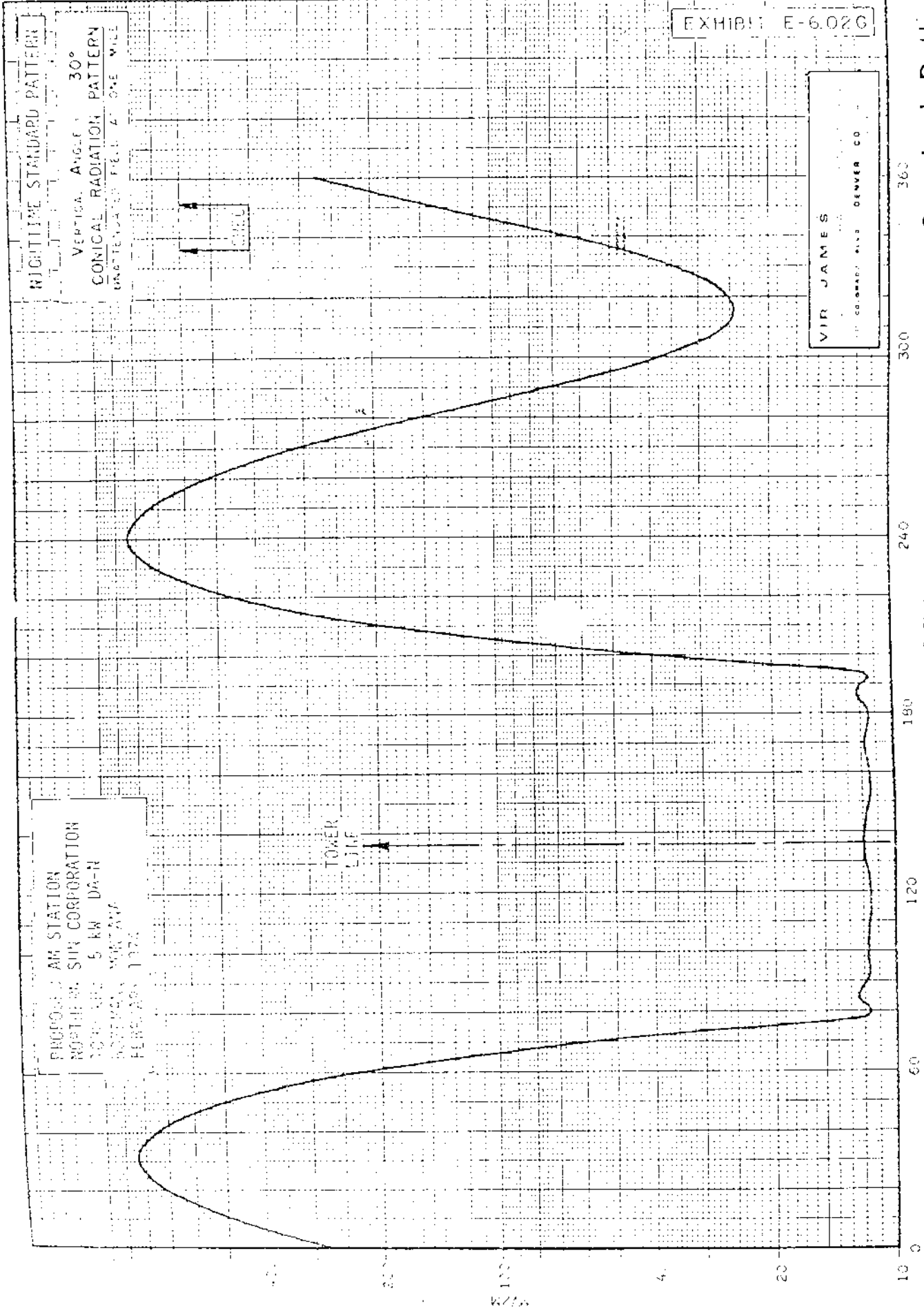
EXHIBIT E-6.02G

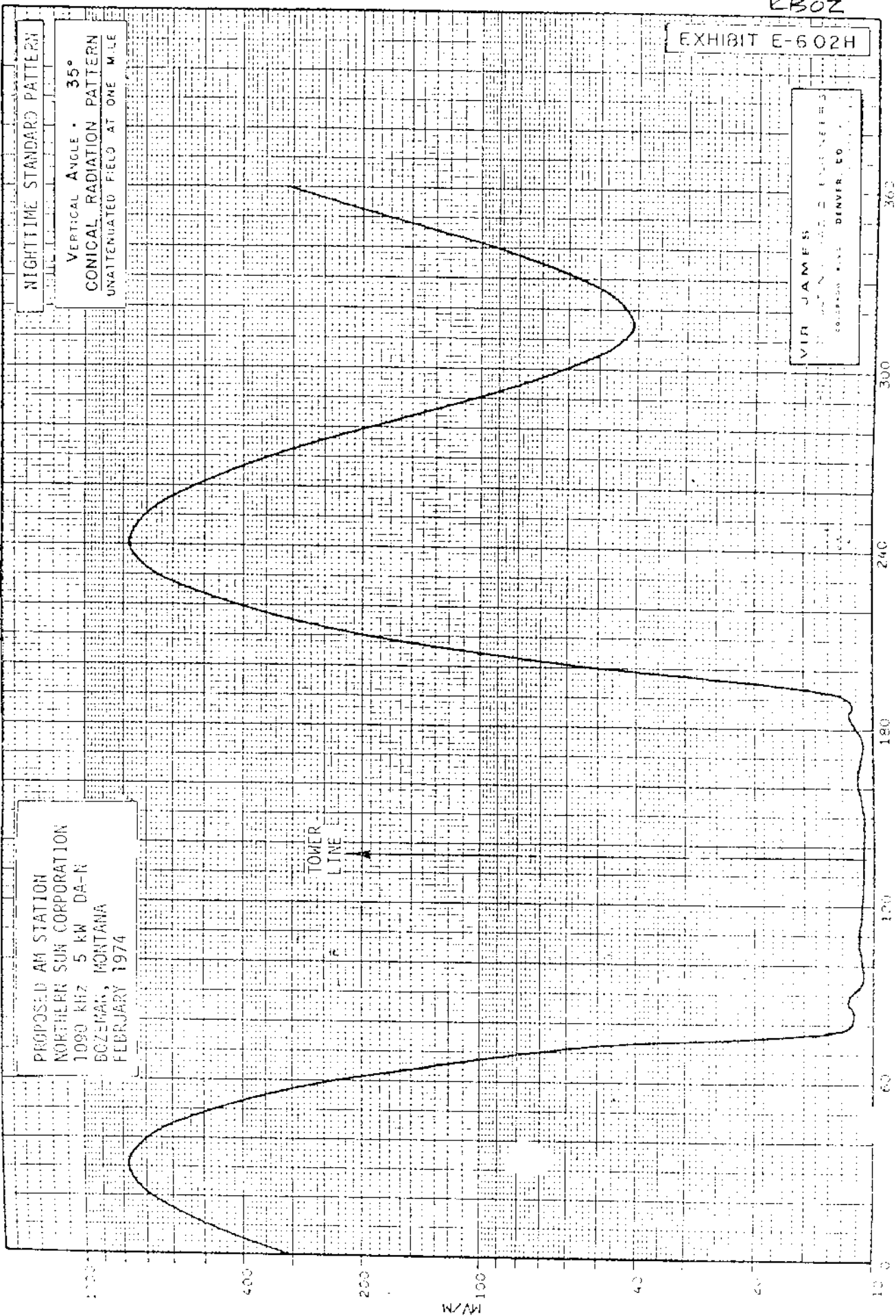
VIR JAMES
COMMUNICATIONS AND DENVER CO

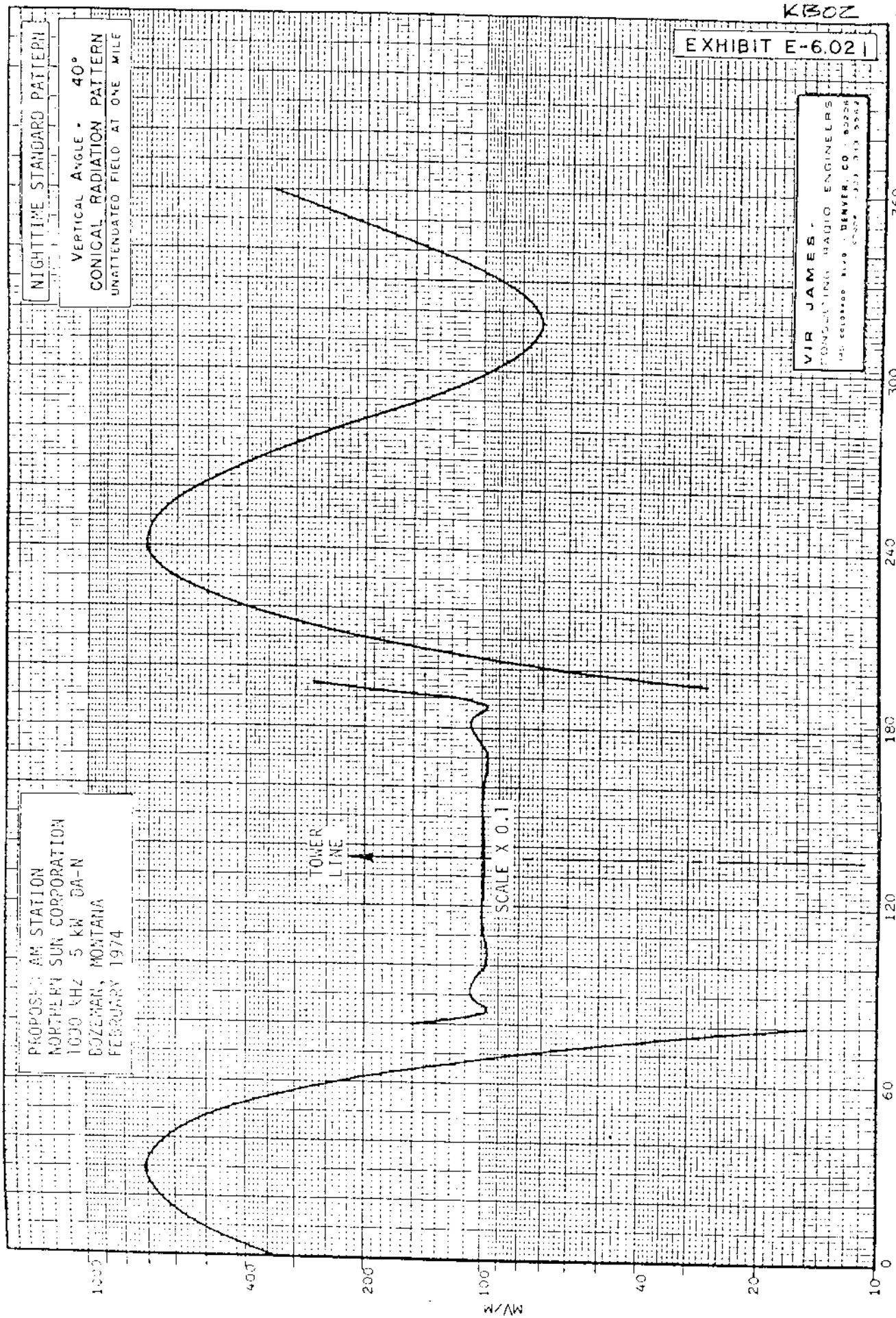
PROPOSED AM STATION
NORTHERN SUIR CORPORATION
1000 W. 5th DA-N
BOZEMAN MONTANA
FEBRUARY 1974

TOWER
LINE

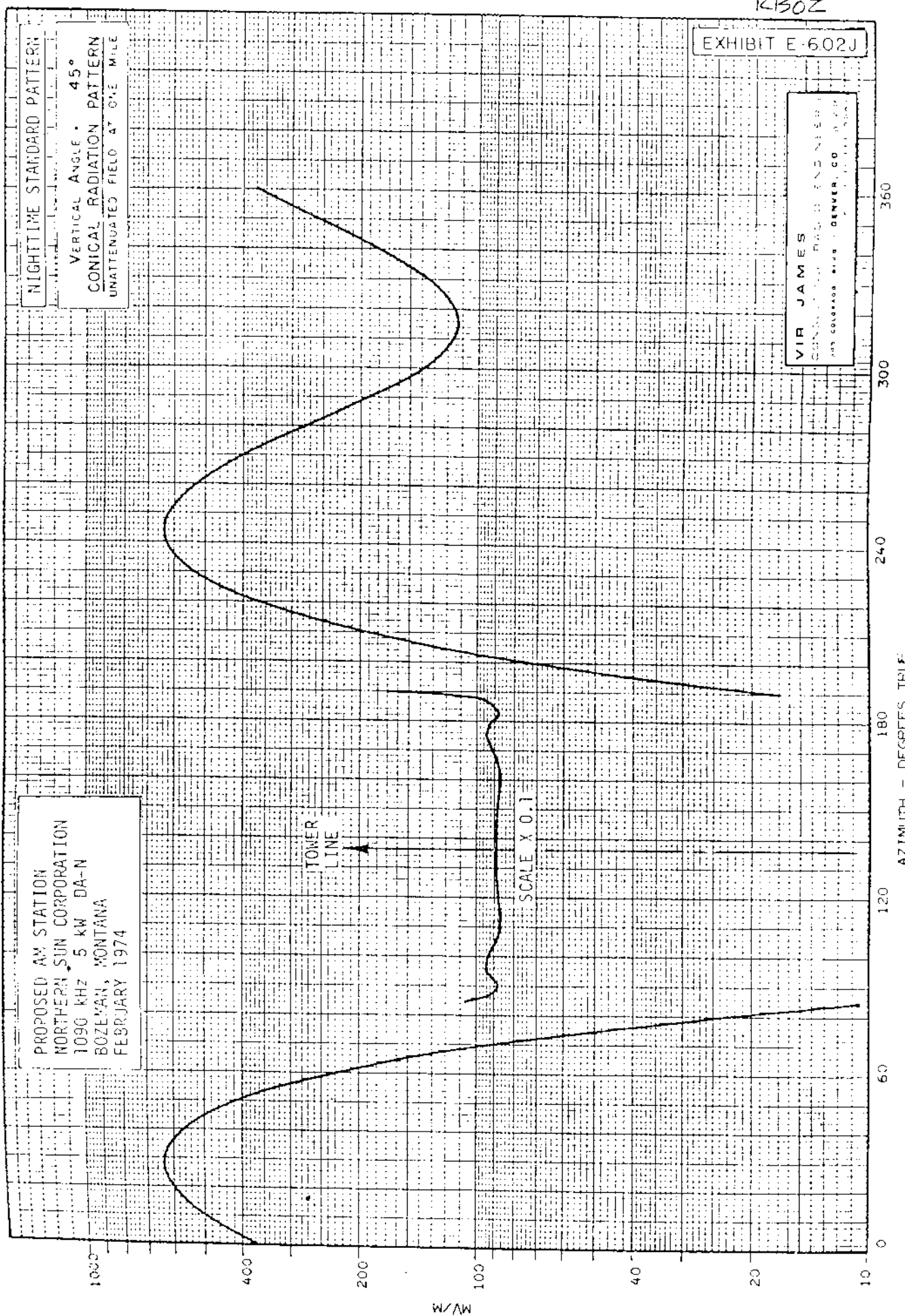
Standard Pattern







Standard Pattern



NIGHTTIME STANDARD PATTERN

VERTICAL ANGLE - 50°
CONICAL RADIATION PATTERN
UNATTENUATED FIELD AT ONE MILE

EXHIBIT E-6.02K

VIR JAMES
JAN 1960 - FEB 1961
RECEIVED NOV 28 1960

PROPOSED AM STATION
NORTHERN SUN CORPORATION
1090 KHZ 5 KW DA-N
BOZEMAN, MONTANA
FEBRUARY 1974

LINE
TOWER

SCALE X 0.1

AZIMUHI, DEGEF, TOME

300

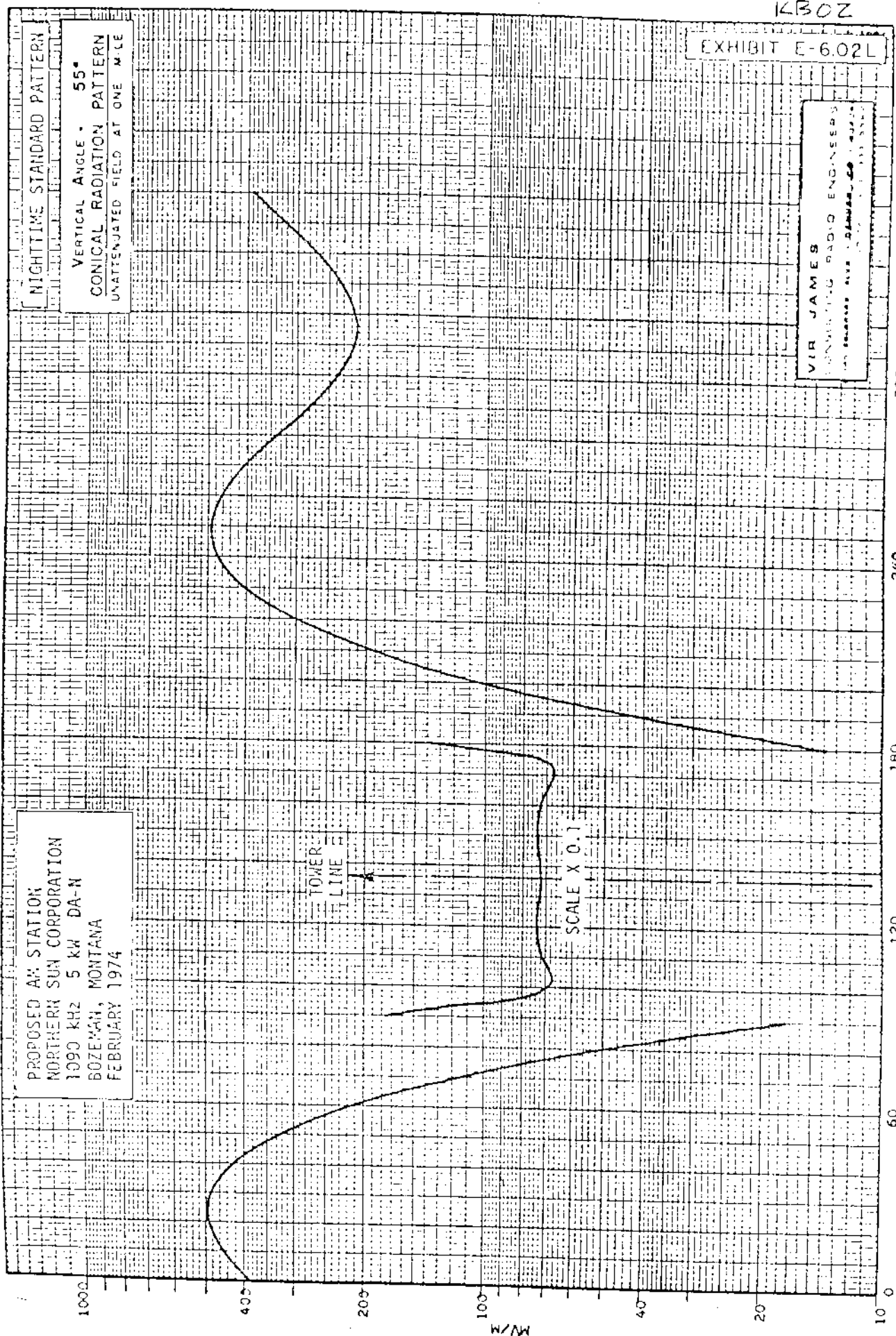
240

021

120

69

نظم / لحن



PROPOSED AM STATION
NORTHERN SUN CORPORATION
1090 KHZ 5 KW DA-N
BOZEMAN, MONTANA
FEBRUARY 1974

NIGHTTIME STANDARD PATTERN
VERTICAL ANGLE - 55°
CONICAL RADIATION PATTERN
UNATTENUATED FIELD AT ONE MILE

EXHIBIT E-6.02L

VIR JAMES
COMMUNICATIONS RADIO ENGINEERS
1000 UNIVERSITY AVENUE
BOZEMAN, MONTANA 59717

AZIMUTH - DEGREES TRUE

Standard Pattern

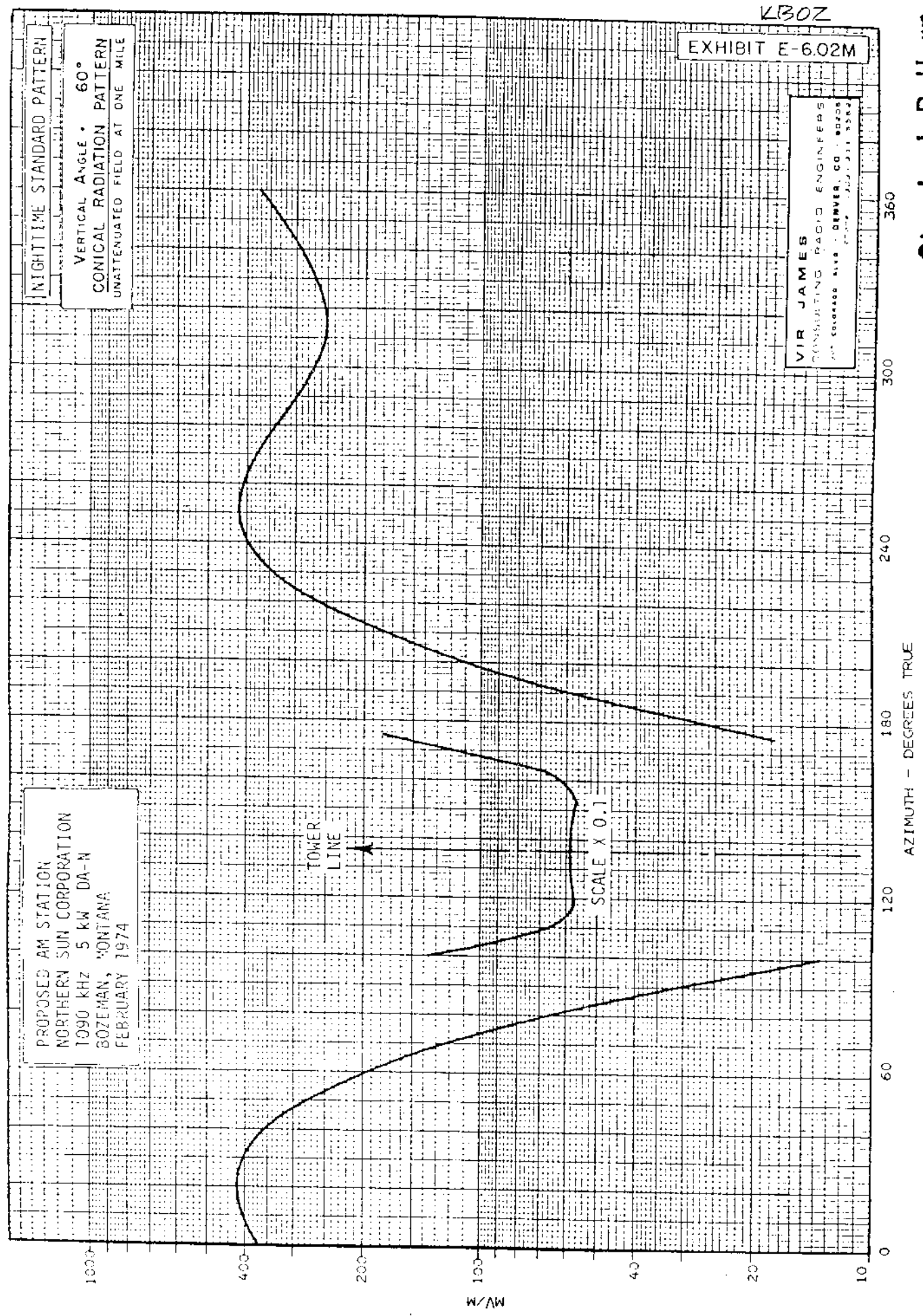
1430Z

NIGHTTIME STANDARD PATTERN
 VERTICAL ANGLE • 60°
 CONICAL RADIATION PATTERN
 UNATTENUATED FIELD AT ONE MILE

PROPOSED AM STATION
 NORTHERN SUN CORPORATION
 1090 KHZ 5 KW DA-N
 BOZEMAN, MONTANA
 FEBRUARY 1974

EXHIBIT E-6.02M

VIR JAMES
 CONSULTING RADIO ENGINEERS
 1400 COLORADO BLVD • DENVER, CO 80202
 PHONE 333-3311 • 3334



Standard Pattern

2073

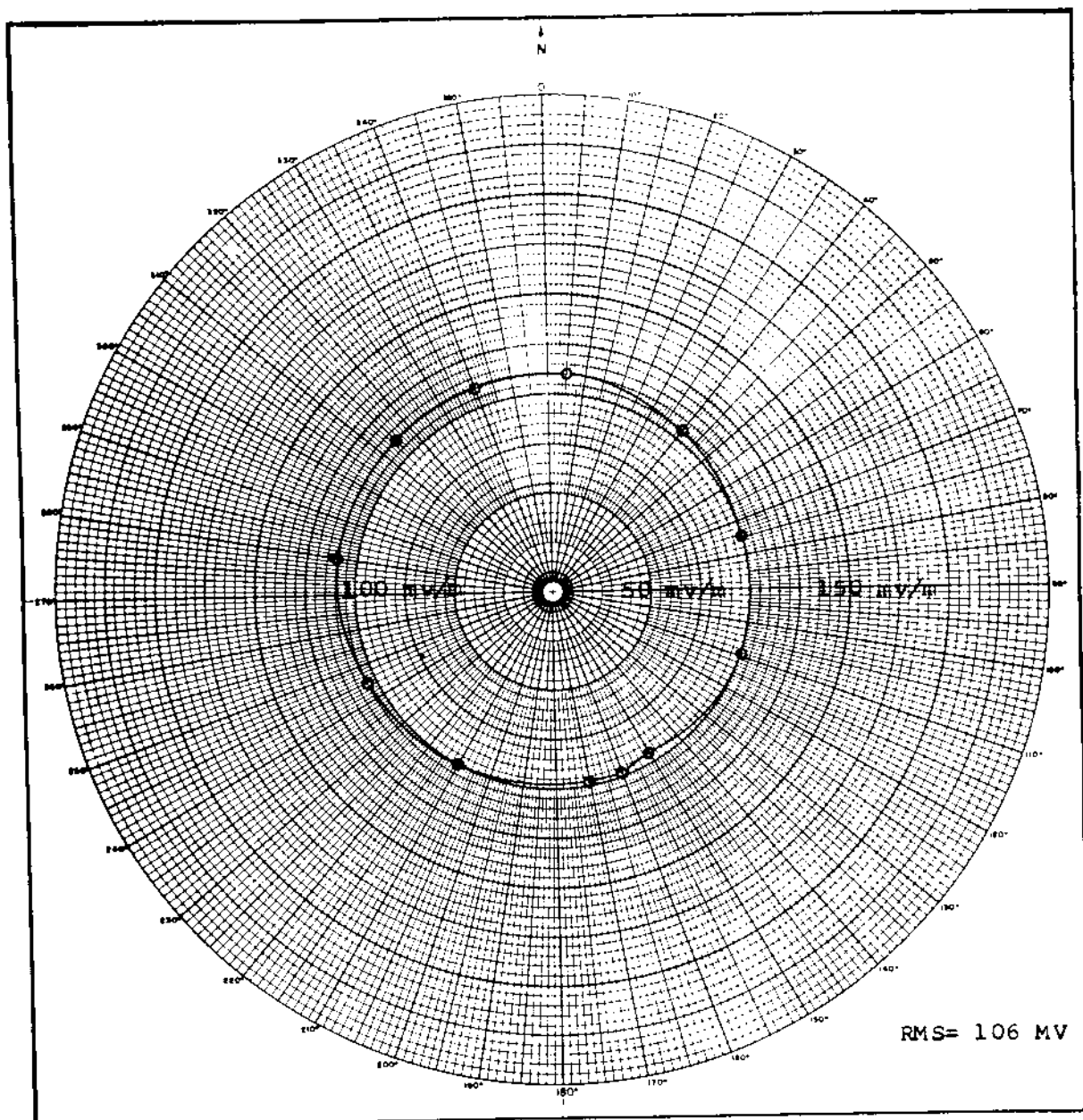
KEXS

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

Station KEXS
Excelsior Springs, Missouri

250w, DA-D, D
1090 kc

10-29-68
Granted
license



HORIZONTAL RADIATION PATTERN

NON-DIRECTIONAL

APPLICANT	KEXS
LOCATION	Excelsior Spgs.
FREQUENCY	1090 kc
POWER	0.25 KW
LATITUDE	39 DEG 20 MIN 26 SEC
LONGITUDE	94 DEG 14 MIN 26 SEC
WHEN USED	Daytime
RMS FIELD	106 mv/m
DATE	July 1968

ROBERT L. MIERS
CONSULTING RADIO ENGINEER
ROLLA, MISSOURI 65401

FCC File No. BL-12108
Accepted 10-2-68

Station KEXS
Excelsior Springs, Missouri

1090 kc

KEXD

Proposed Day
(6-28-66ct)

New; Excelsior Springs Bcstg. Co.
Excelsior Springs, Missouri

250w, DA-D, D
1090 kc

1-12-67
-RATED
CP
OR NEW
STATION

North Latitude
39° 20' 26"
West Longitude
94° 14' 26"

A=220' (88°)

RMS = 90 MW/M

HORIZONTAL RADIATION PATTERN FOR THE
PROPOSED NEW STANDARD BROADCAST STATION
AT EXCELSIOR SPRINGS, MISSOURI OPERATING
ON 1090 KCS WITH 250 WATTS, DA-DAYTIME
650809
RALPH J. BITZER, CONSULTING RADIO ENGINEER

FCC File No. BP-16912
Accepted 6-15-66

New; Excelsior Springs Bcstg. Co.
Excelsior Springs, Missouri

1090 kc

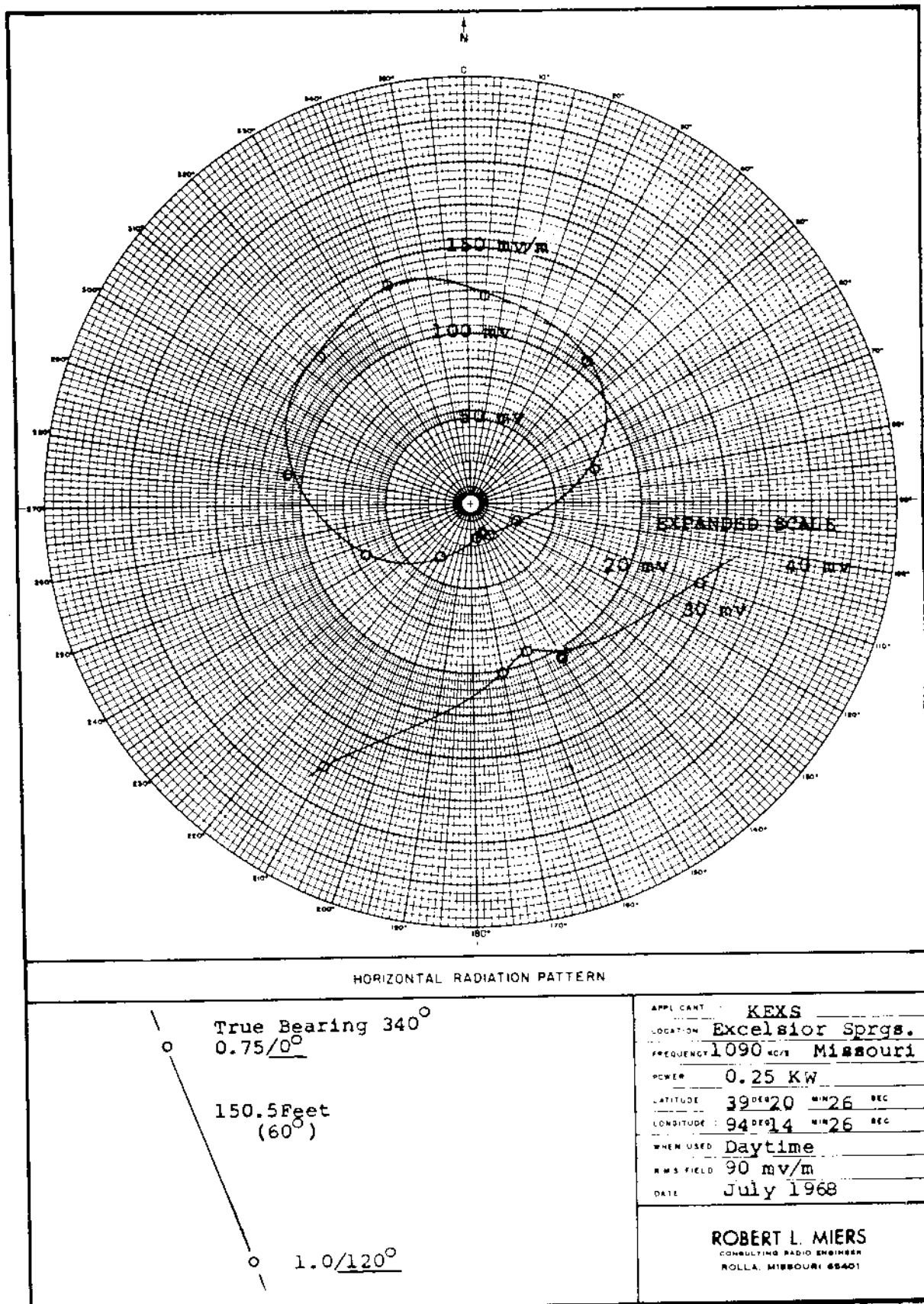
KEXS

Measured Day
(10-28-68ct)

Station KEXS
Excelsior Springs, Missouri

250w, DA-D, D
1090 kc

10-29-68
Granted
license



FCC File No. BL-12108
Accepted 10-2-68

Station KEXS
Excelsior Springs, Missouri

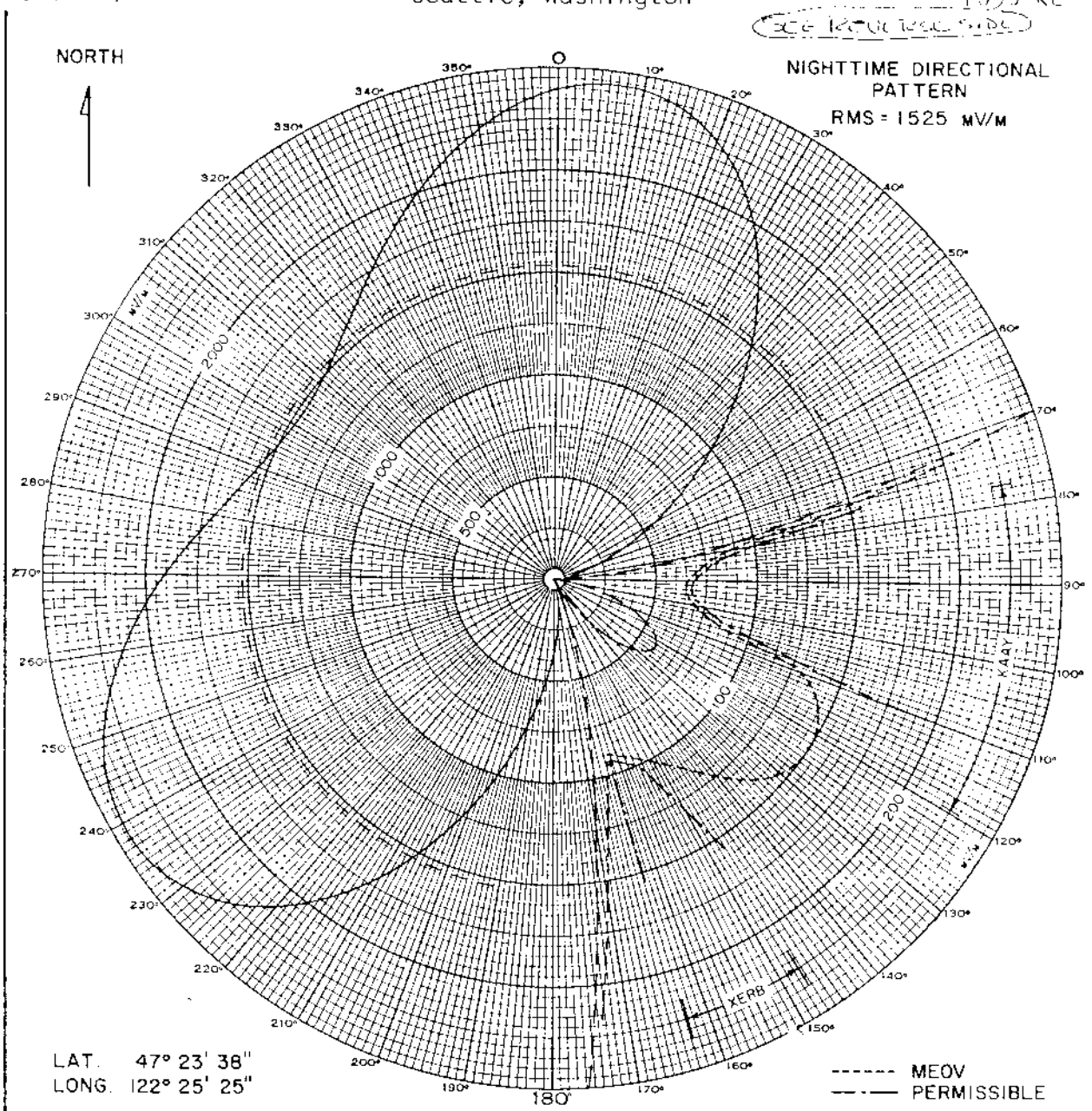
1090 kc

Proposed Night
(9-25-70ct)

Station KING
Seattle, Washington

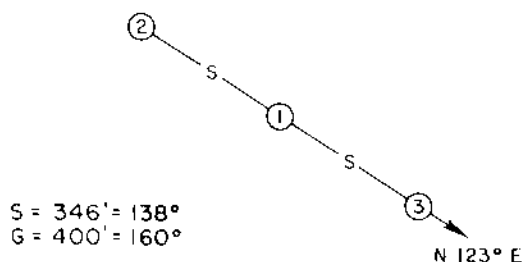
KING
50kw, DA-2, U
1090 kc

SEE INSTRUCTIONS



LAT. 47° 23' 38"
LONG. 122° 25' 25"

----- MEOV
----- PERMISSIBLE



THEORETICAL ANTENNA PARAMETERS

TOWER	FIELD	PHASE
1	2.00	0°
2	1.00	-60°
3	1.00	60

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

RADIO STATION KING
1090 kHz 50 kW DA-2
690930.A FIGURE 2B

FCC File No. BMP-13090
Accepted 9-21-70

Station KING
Seattle, Washington

1090 kc

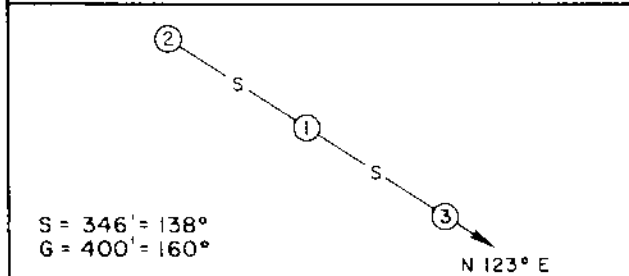
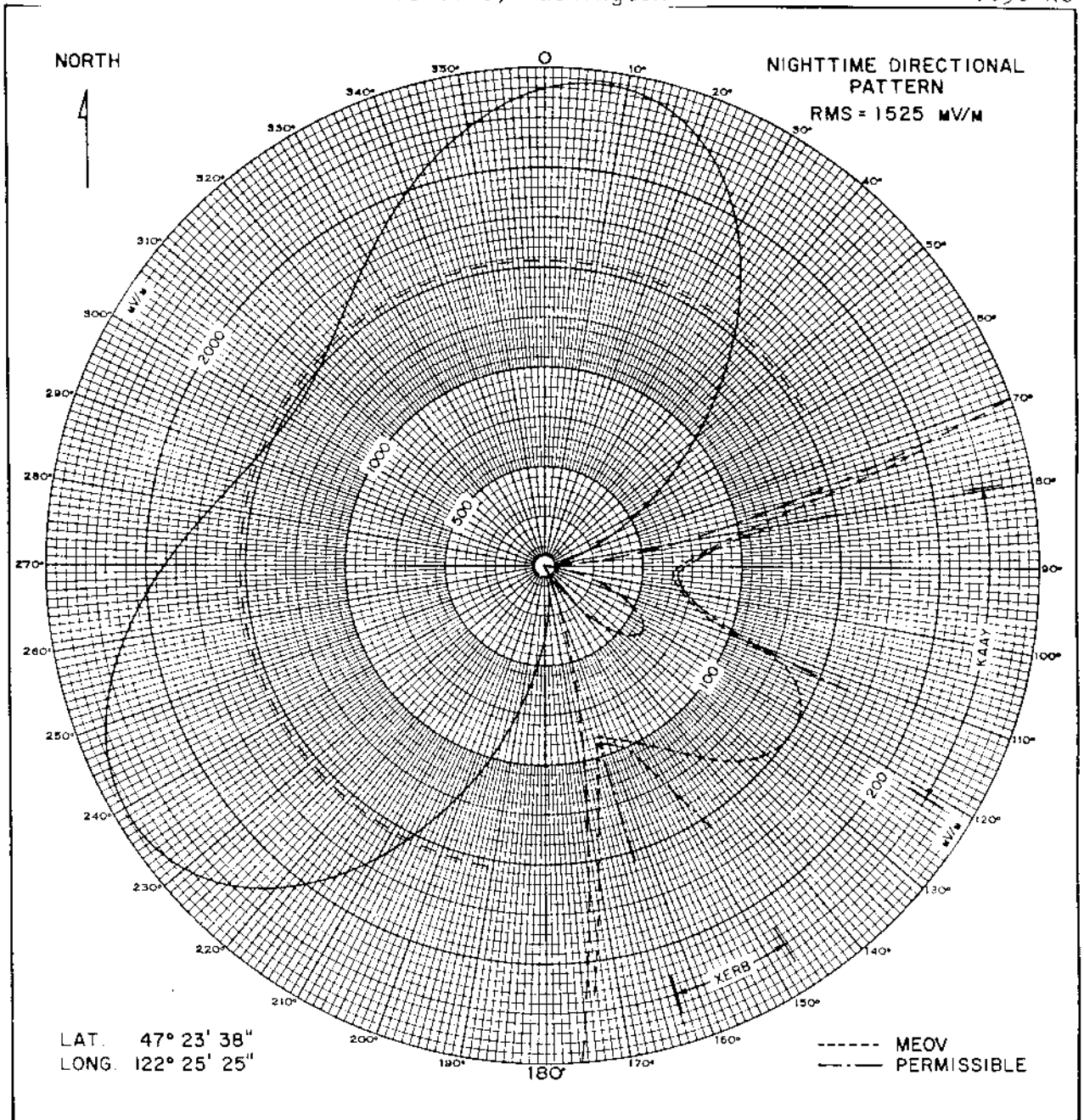
SEE
REVERSE
SIDE

KING

Proposed Night
(6-29-70ct)

Station KING
Seattle, Washington

50kw, DA-2, U
1090 kc



THEORETICAL ANTENNA PARAMETERS

TOWER	FIELD	PHASE
1	2.00	0°
2	1.00	-60°
3	1.00	60

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

RADIO STATION KING
1090 kHz 50 kW DA-2
690930 FIGURE 2B

FCC File No. BP-18796
Accepted 6-17-70

Station KING
Seattle, Washington

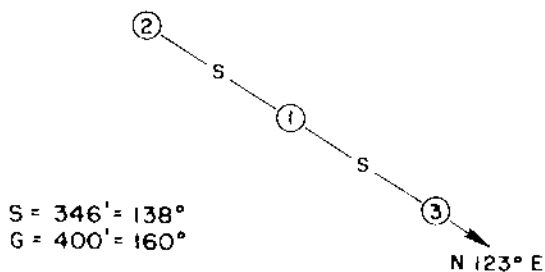
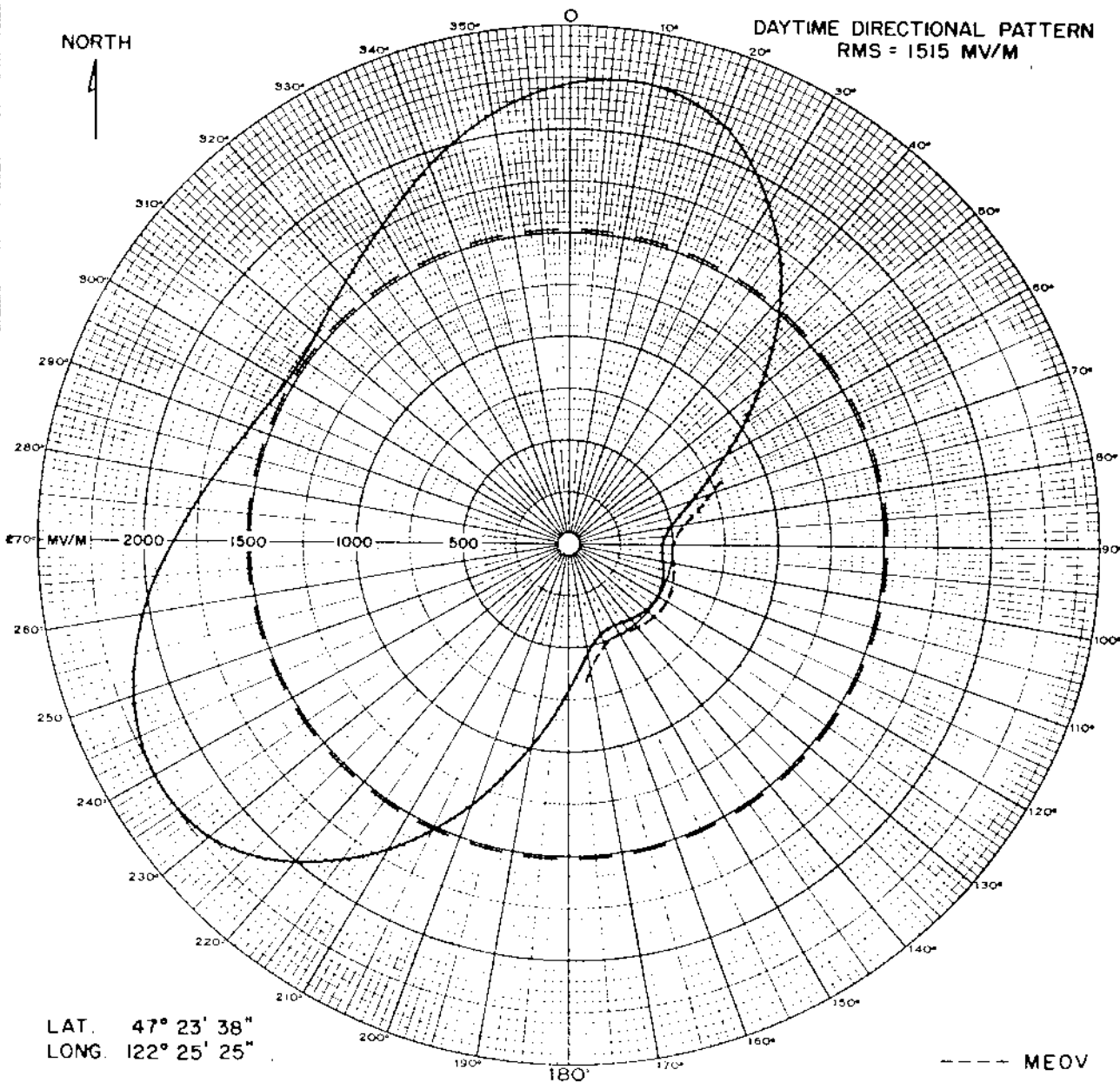
1090 kc

KING

Proposed Day
(10-26-64ct)

Station KING
Seattle, Washington

50kw, DA-2, U
1090 kc



DAYTIME THEORETICAL ANTENNA PARAMETERS

TOWER	FIELD	PHASE
1	3.00	0°
2	1.00	-60°
3	1.00	+60°

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

RADIO STATION KING
1090 KC 50 KW DA-2
640520.2
FIGURE 6

FCC File No. BP-16301
Accepted 9-25-64

Station KING
Seattle, Washington

1090 kc

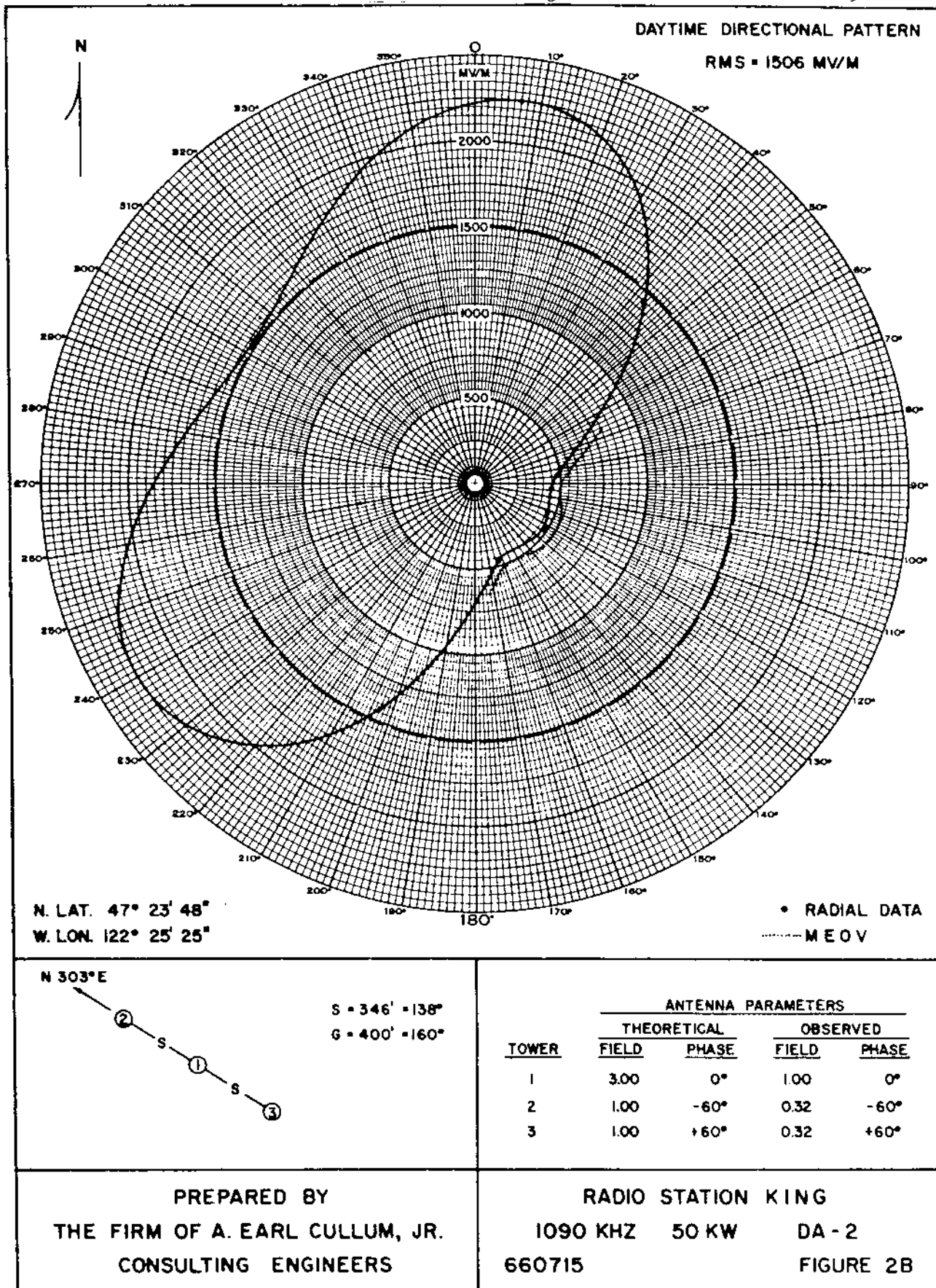
P-16301
-8-65 CP
HG. DA-1 to DA-2
BRC-3232
4/26/68 G. GRANT
REVIEW CONTROL

KING

Measured Day
(9-28-66ct)

Station KING
Seattle, Washington

50kw, DA-2, U
1090 kc



FCC File No. BL-11401
Accepted 9-14-66

Station KING
Seattle, Washington

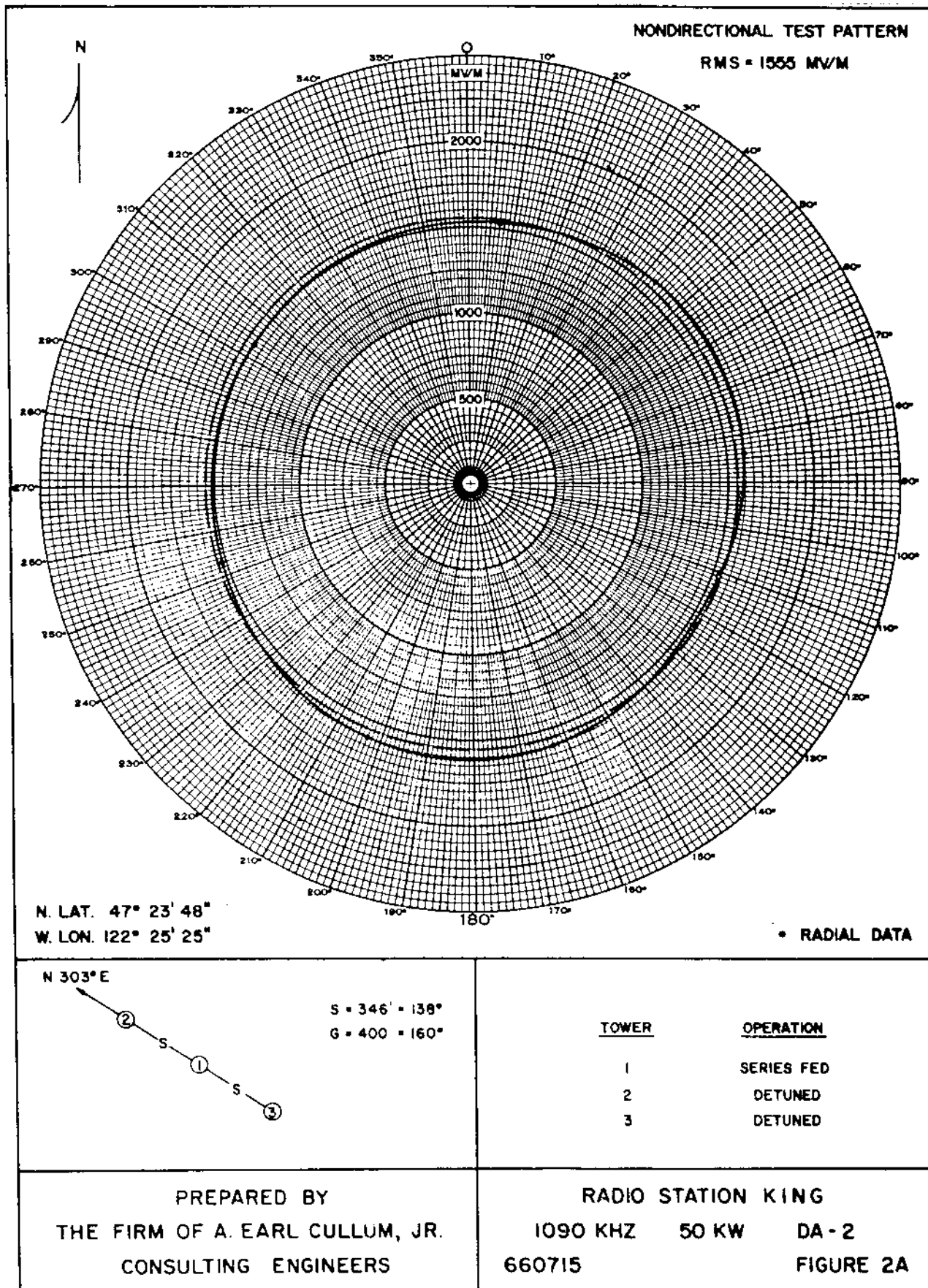
1090 kc

KING

Measured Non-DA
(9-28-66ct)

Station KING
Seattle, Washington

50kw, DA-2, U
1090 kc



FCC File No. BL-11401
Accepted 9-14-66

Station KING
Seattle, Washington

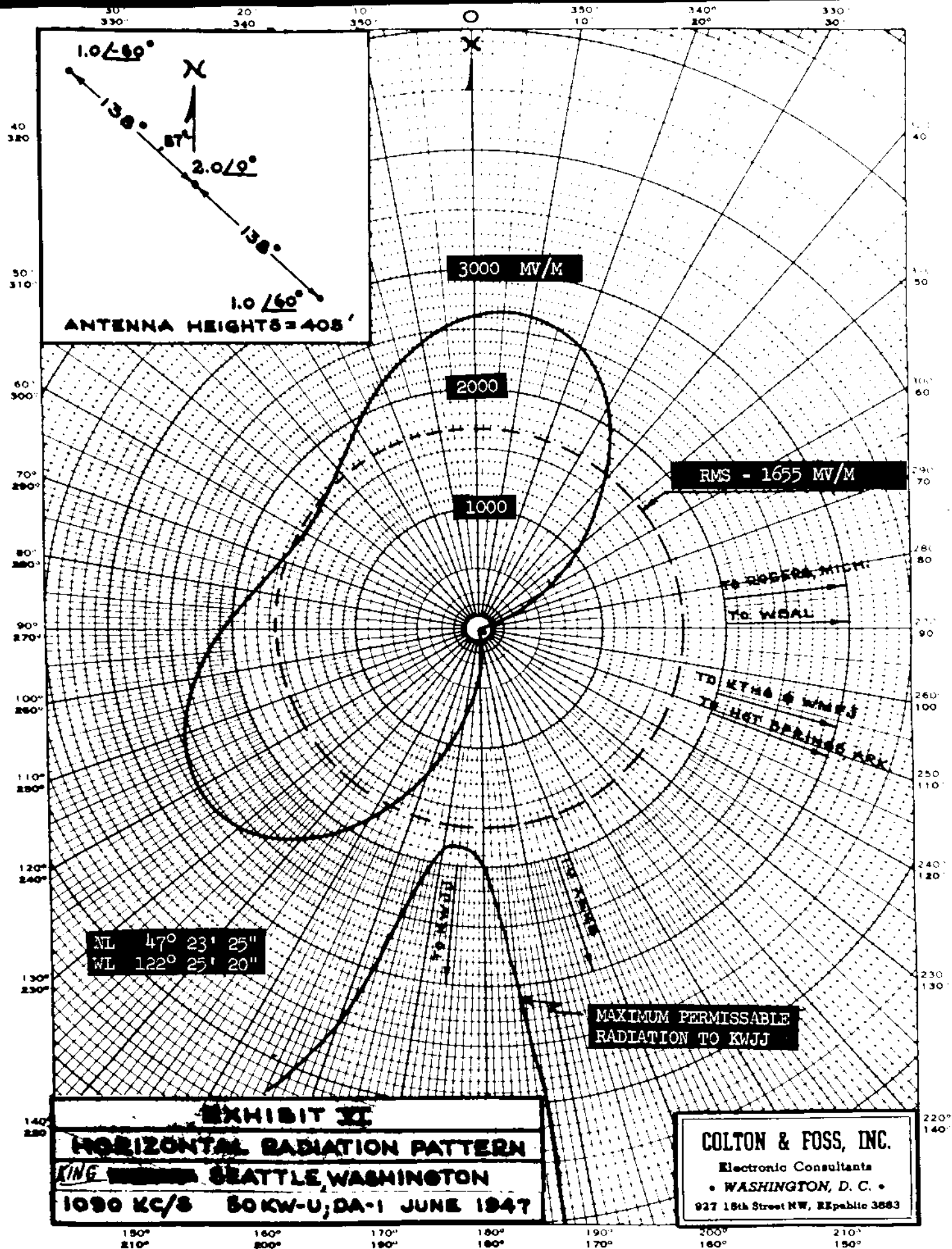
1090 kc

PROPOSED DAY & NIGHT

Station KING
Seattle, Washington

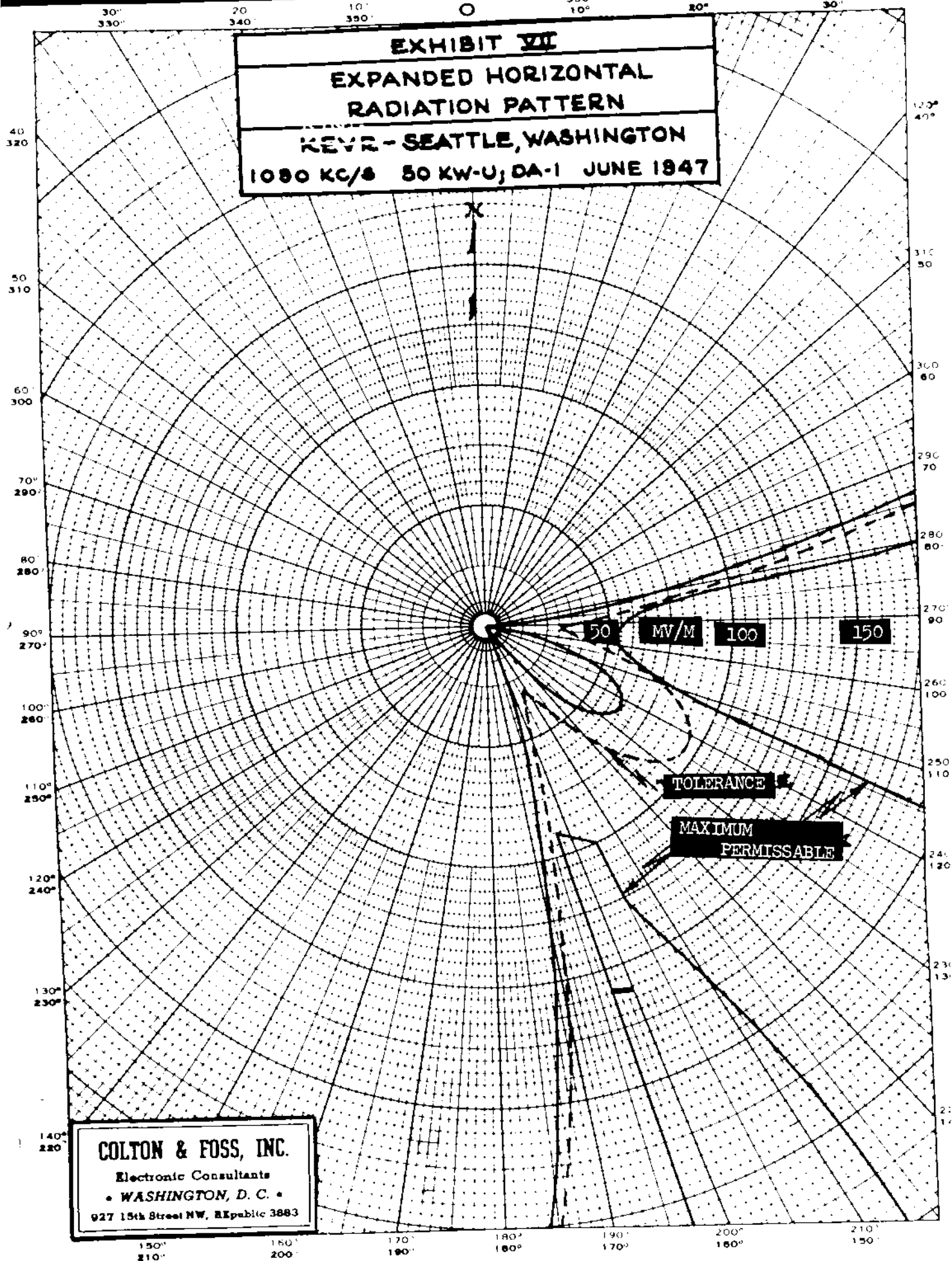
50kw, DA-1, U
1090 KC

KING



EUGENE DIEZSEN CO
WASHINGTON, D.C.

NO 340 P DIEZSEN GRAPH PAPER
POLAR CO-ORDINATE



KING

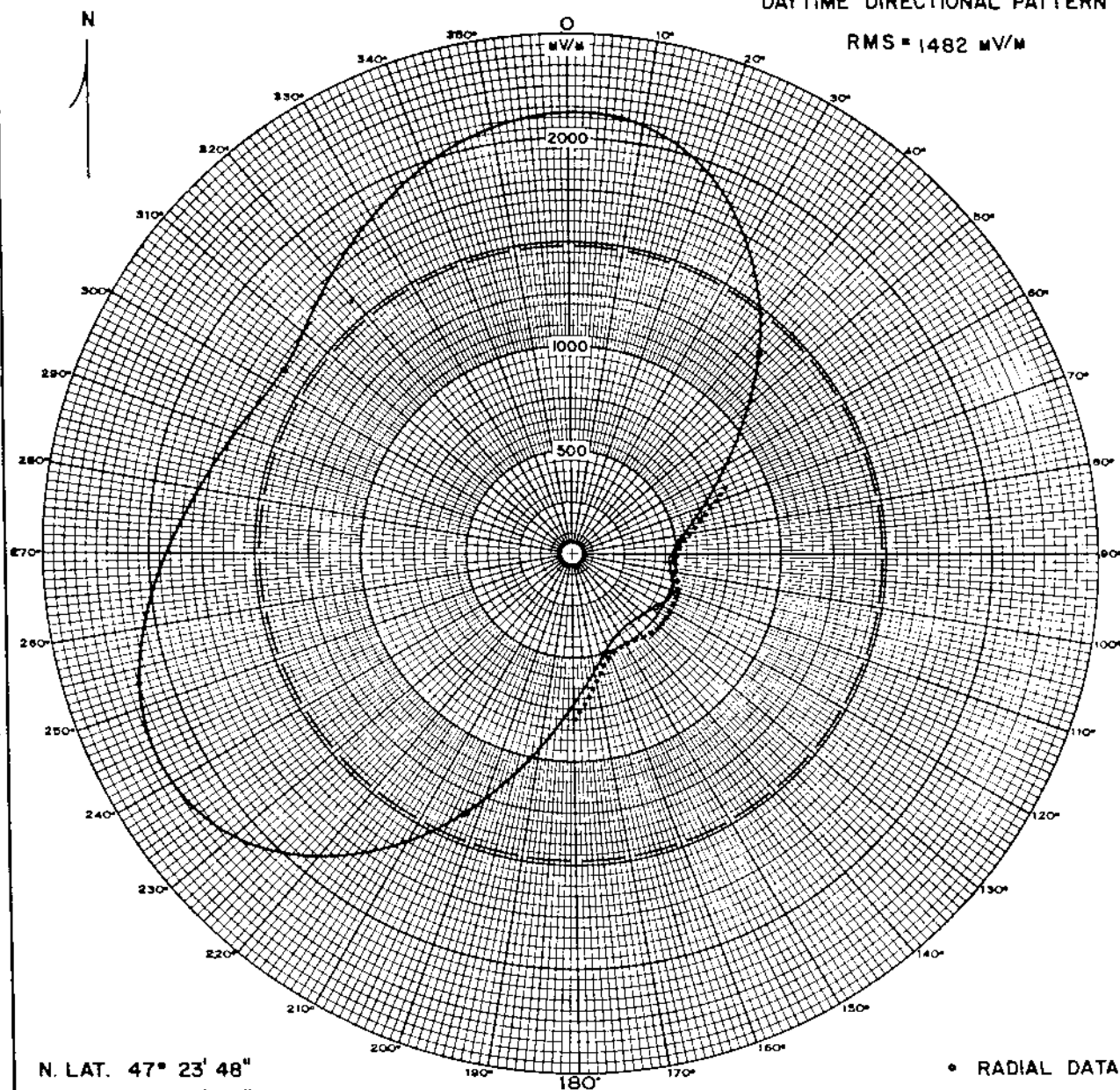
Measured Day
(4-29-68ct)

Station KING
Seattle, Washington

50kw, DA-2, U
1090 kc

DAYTIME DIRECTIONAL PATTERN

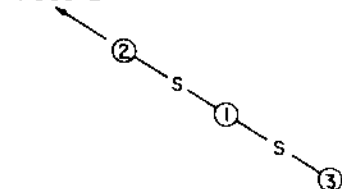
RMS = 1482 mV/m



N. LAT. 47° 23' 48"
W. LON. 122° 25' 25"

• RADIAL DATA
..... MEO V

N 303°E



S = 346' = 138°
G = 400' = 160°

ANTENNA PARAMETERS

TOWER	THEORETICAL		OBSERVED	
	FIELD	PHASE	FIELD	PHASE
1	3.00	0°	1.00	0°
2	1.00	-60°	0.32	-60°
3	1.00	+60°	0.32	+60°

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

RADIO STATION KING
1090 kHz 50 kW DA-2
680205

FIGURE 3B

FCC File No. BRC-3232
Accepted 4-4-68

Station KING
Seattle, Washington

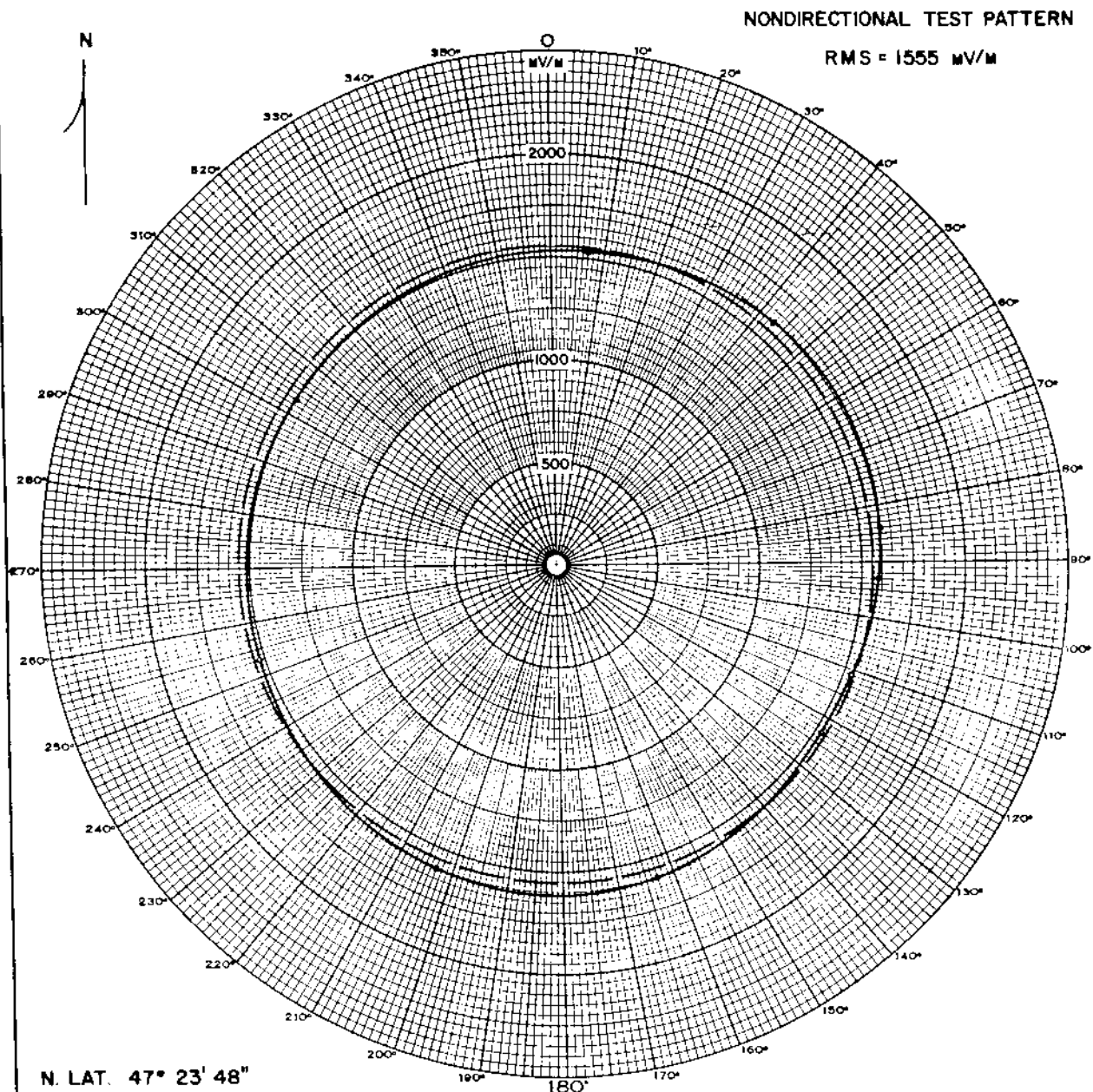
1090 kc

KING

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

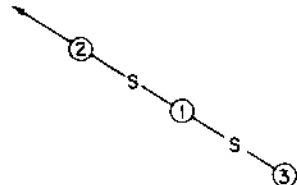
Station KING
Seattle, Washington

50kw, DA-2, U
1090 kc



• RADIAL DATA

N 303° E



S = 346' = 138°

G = 400' = 160°

TOWER

OPERATION

1

SERIES FED

2

DETUNED

3

DETUNED

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

RADIO STATION KING
1090 kHz 50 kW DA-2
680205 FIGURE 3A

FCC File No. BRC-3232
Accepted 4-4-68

Station KING
Seattle, Washington

1090 kc

MEASURED
NIGHT & DAY

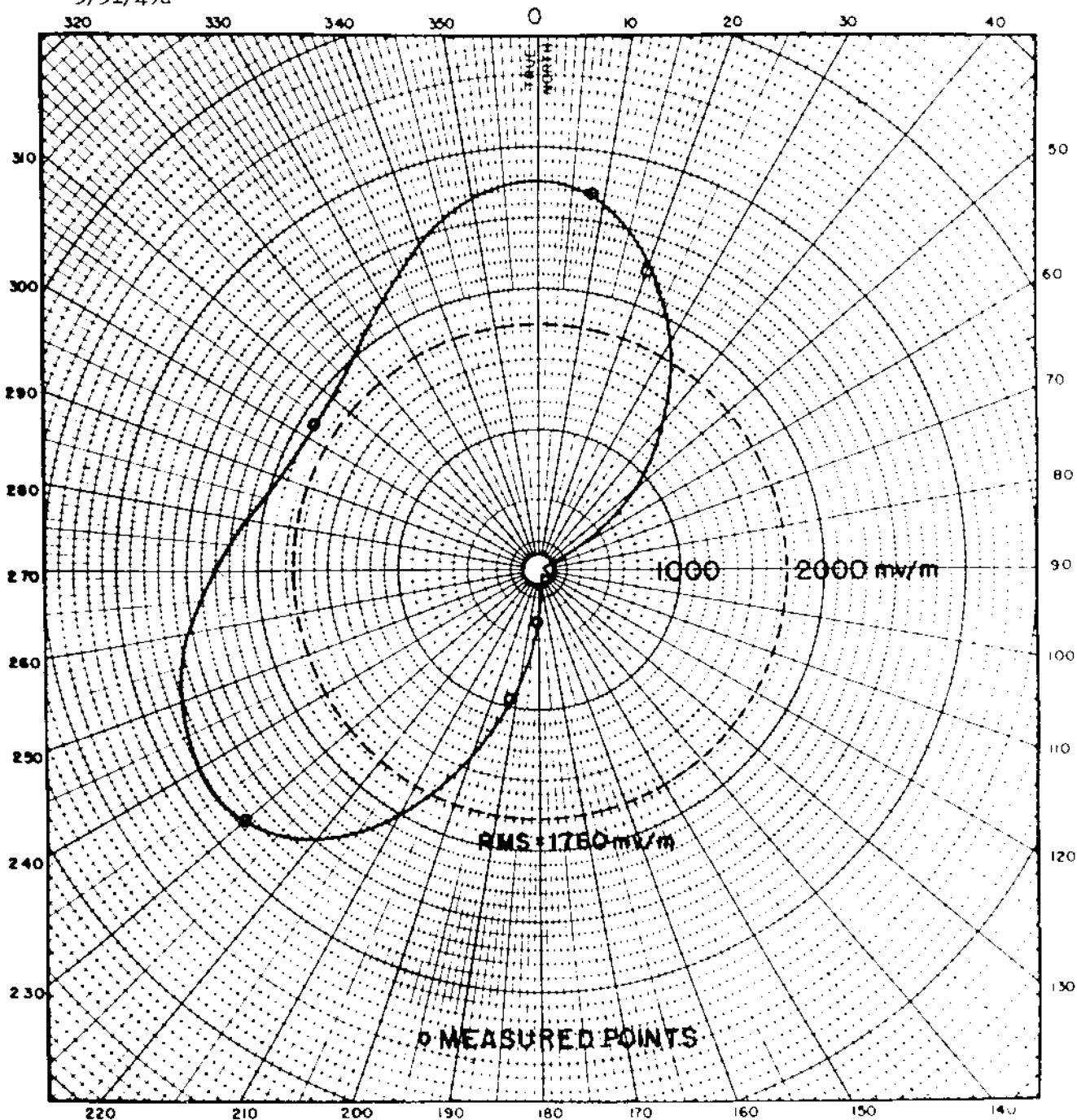
KING, SEATTLE, WASH.

50kw, DA1
License 3-24-49

KING

1090 kc.

3/31/49G



SITE: 47° 23' 25" N
122° 25' 20" W

HORIZONTAL RADIATION PATTERN
MEASURED
SEATTLE WASHINGTON

KING
1090KC
50KW
DA-1



CONSULTING RADIO ENGINEERS

FIGURE 3
490317

KING, Seattle, Wash. 1090 kc

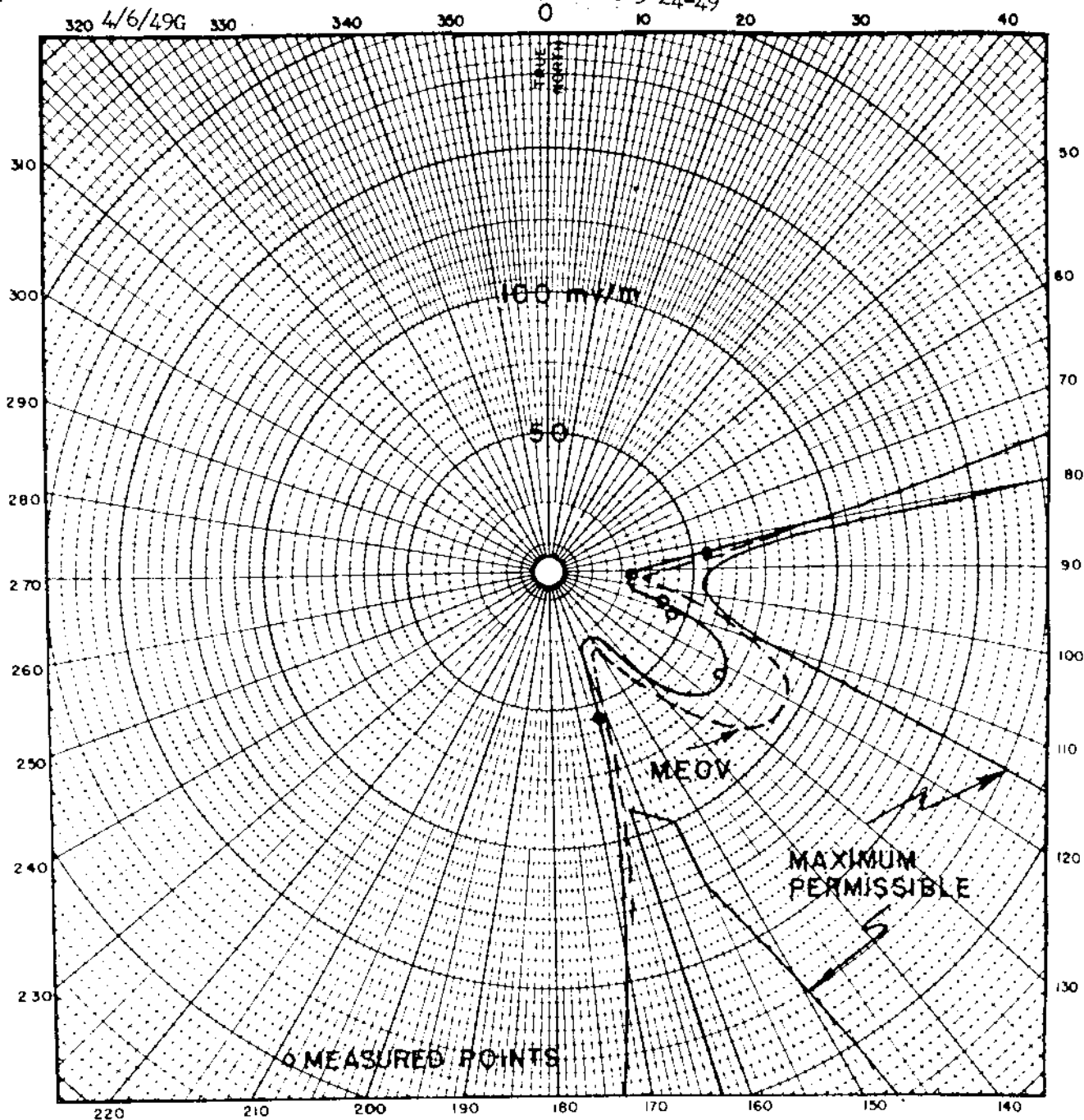
KING

MEASURED
NIGHT & DAY,
NULLS

KING, SEATTLE, WASH.

50kw, DA1 1090 kc

License 3-24-49



SITE: 47 23' 25" N 122 25' 20" W	HORIZONTAL RADIATION PATTERN EXPANDED NULL DETAIL MEASURED SEATTLE WASHINGTON	KING 1090 KC 50 KW DA - 1
	 CONSULTING RADIO ENGINEERS	FIGURE 3A 490317

KING, Seattle, Wash. 1090 kc

KKYN
1090 kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KKYN Main Studio: Plainview, Texas
Frequency: 1090 kHz Power: 0.5kw Night 5kw Day
Notification List No. 1785 Date: November 16, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 34° 05' 32"
West Longitude: 101° 38' 26"

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.

TOWERS:	SW(#1)	SC(#2)	NC(#3)	NE(#4)
HEIGHT ABOVE INSULATORS:	225'	225'	225'	225' (90°)
NIGHT PHASING:	0°	+48.72°	+98.28°	+147°
NIGHT FIELD RATIO:	1	2.3375	2.3375	1
DAY PHASING:	0°	+15	+223°	---
DAY FIELD RATIO::	1.0	0.7	0.4	---
SPACING AND ORIENTATION:	Towers in a row are spaced 471.44' (188°) on a line bearing 60.5° true.			

GROUND SYSTEM: 120 - 250' equally spaced copper radials plus a 20' 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		STANDARD
	RMS	RSS	RMS
Day	397.3 mv/m	466.3 mv/m	417.2 mv/m
Night 1/	124.07 mv/m	153.44 mv/m	130.3 mv/m

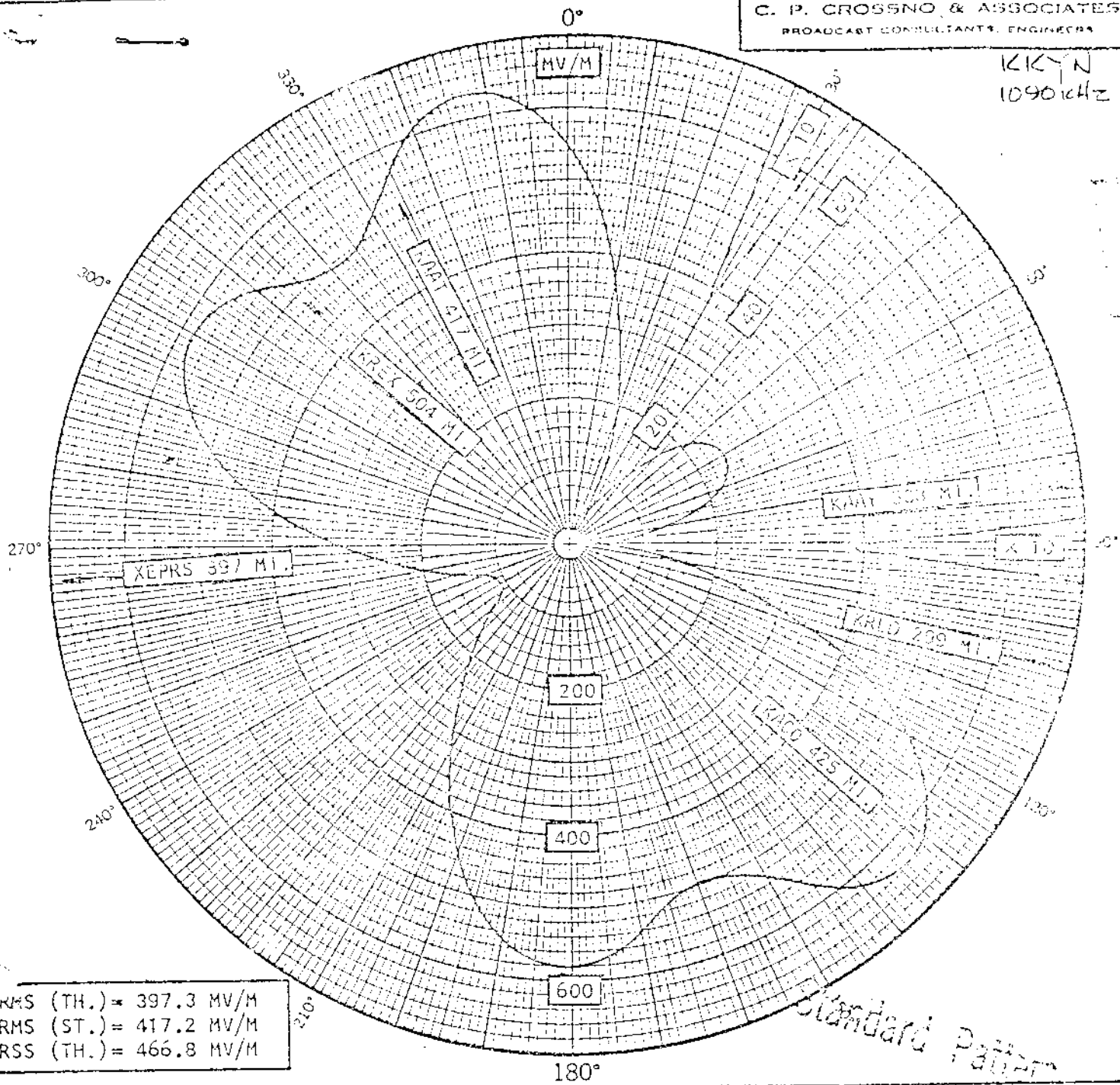
1/ By adjustment of input power.

KKYN
1090kHz

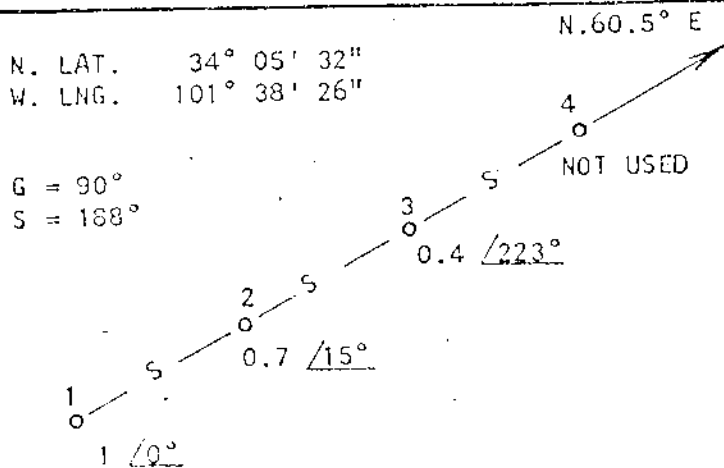
- 2 -

Note: Please retain the Nighttime directional antenna radiation pattern notified for Station KKYN in United States Change List Number 1775, dated May 31, 1978 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.

KKYN
1090 kHz



RMS (TH.) = 397.3 MV/M
RMS (ST.) = 417.2 MV/M
RSS (TH.) = 466.8 MV/M



N. LAT. 34° 05' 32"
W. LNG. 101° 38' 26"

G = 90°
S = 168°

STANDARD RADIATION PATTERN
(DAY)

RADIO STATION K K Y N
PLAINVIEW, TEXAS

1090 KHz.

0.5 KW, 5 KW-LS, DA-2

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KKYN

Main Studio: Plainview, Texas

Frequency: 1090 kHz

Power: 0.5kw Night 2.5kw Day

Notification List No. 1775

Date: May 31, 1978 Class: II

GEOGRAPHICAL LOCATION OF THE
CENTER OF THE ANTENNA SYSTEM:

North Latitude: 34° 05' 32"

West Longitude: 101° 38' 26"

ANTENNA CHARACTERISTICS

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

Number of Elements: 4

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

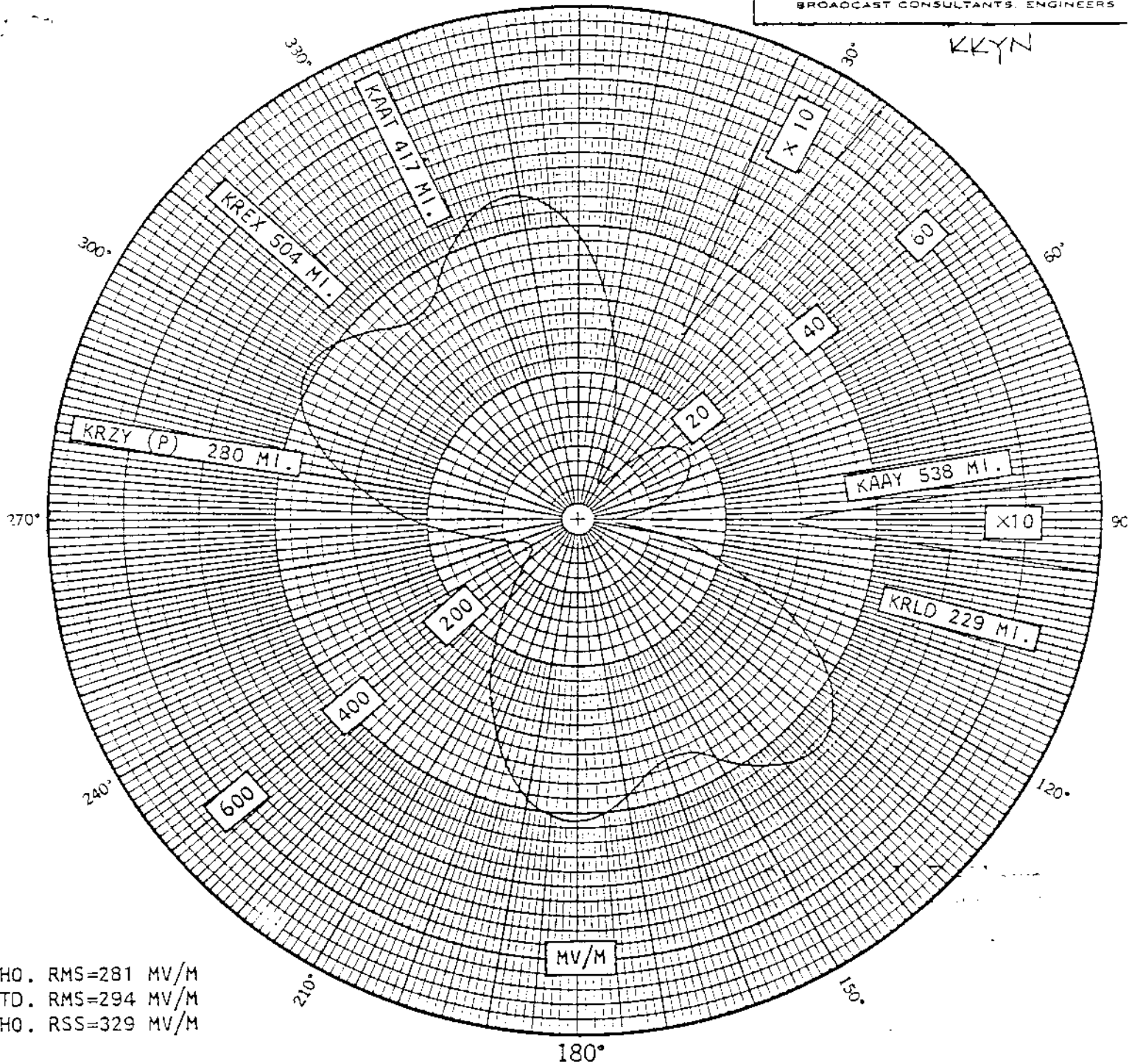
TOWER:	SW (#1)	SC (#2)	NC (#3)	NE (#4)
HEIGHT ABOVE INSULATORS:	225'	225'	225'	225' (90°)
NIGHT PHASING:	0°	+48.72°	+98.28°	147°
NIGHT FIELD RATIO:	1	2.3375	2.3375	1
DAY PHASING:	0°	+15°	+223°	
DAY FIELD RATIO:	1.0	0.7	0.4	
SPACING AND ORIENTATION:	Four in line towers spaced 471.44' (188°) apart on a line bearing 60.5° true.			
GROUND SYSTEM:	120 - 250" 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. Centers of system are bonded together.			

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	RSS	STANDARD RMS
Day 1/	281.0 mv/m	329 mv/m	295.2 mv/m
Night 1/	124.07 mv/m	153.44 mv/m	130.3 mv/m

1/ By adjustment of input power.

KKYN

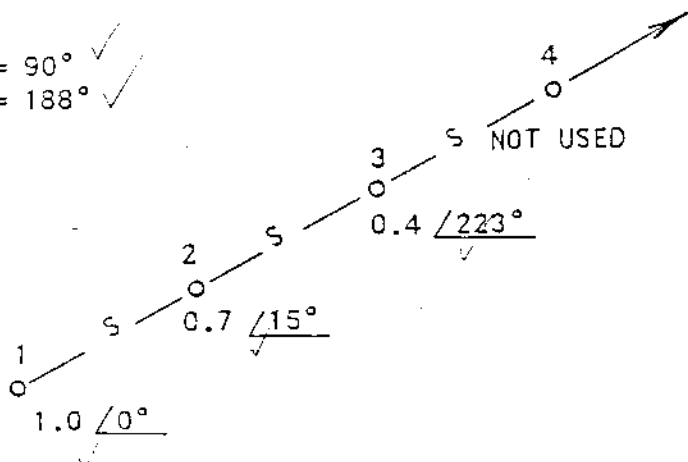


THO. RMS=281 MV/M
 STD. RMS=294 MV/M
 THO. RSS=329 MV/M

N. LAT. $34^{\circ} 05' 32''$ ✓
 W. LNG. $101^{\circ} 38' 26''$ ✓

N. 60.8° E.

G = 90° ✓
 S = 188° ✓



STANDARD RADIATION PATTERN

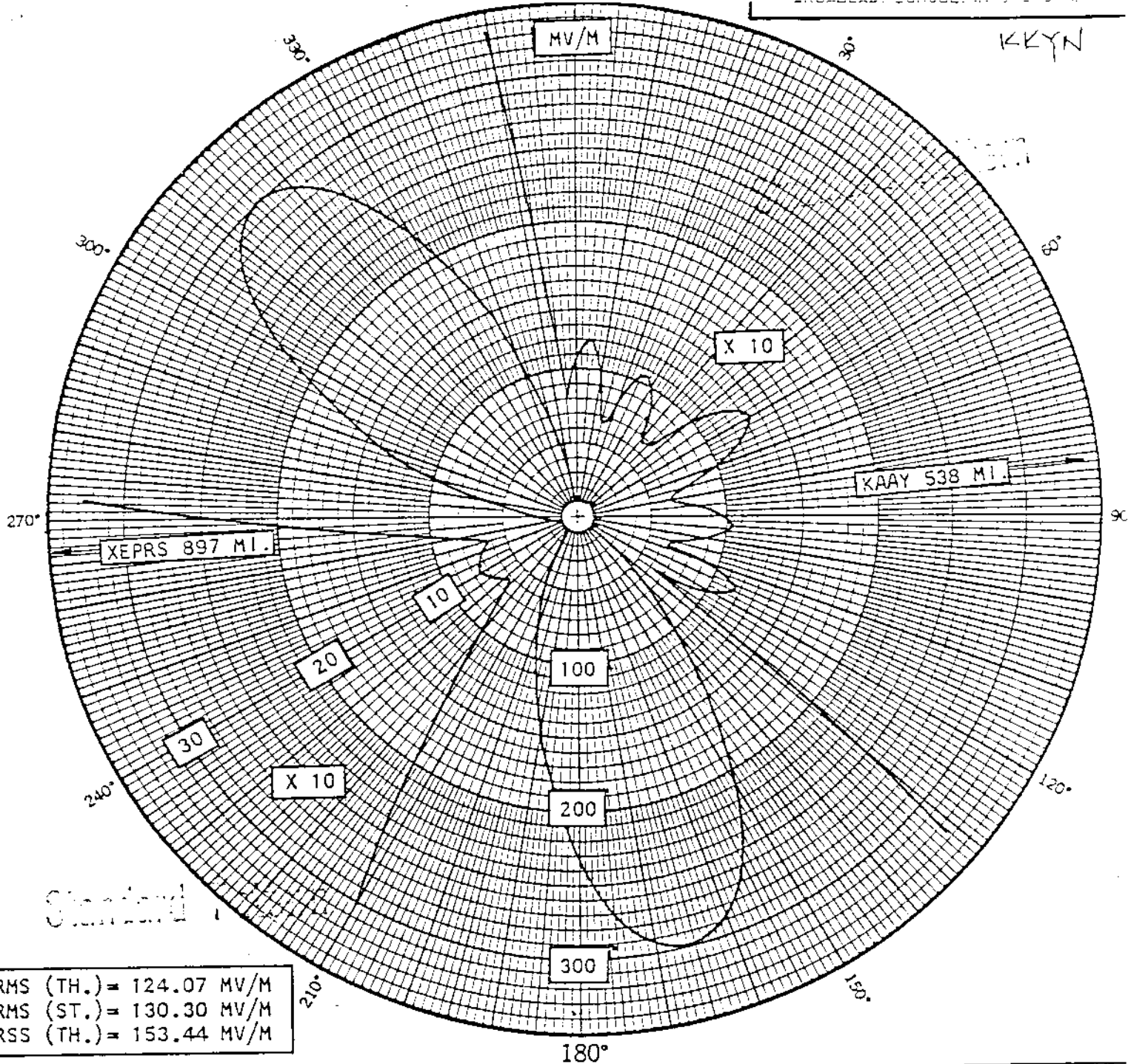
(DAY)

RADIO STATION K K Y N

PLAINVIEW, TEXAS

1090 KHz.

0.5 KW, 2.5 KW-LS, DA-2

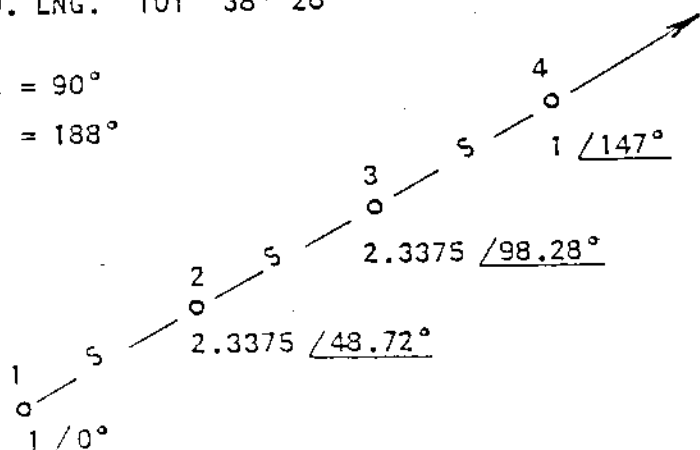


N. LAT. $34^{\circ} 05' 32''$
 W. LNG. $101^{\circ} 38' 26''$

N. 60.5° E

G = 90°

S = 188°



STANDARD RADIATION PATTERN
 (NIGHT)

RADIO STATION K K Y N
 PLAINVIEW, TEXAS

1090 KHz.

0.5 KW, 5 KW-LS, DA

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KLDR Main Studio: Aurora, Colorado
 Frequency: 1090 kHz Power: 1kw Night 50kw Day-LS
 Notification List No. 1781 Date: October 19, 1979 Class: III

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

NIGHTTIME: North Latitude: 39° 39' 53"
 West Longitude: 104° 39' 24"
 DAYTIME: North Latitude: 39° 28' 56"
 West Longitude: 105° 02' 31"

NIGHTTIME ANTENNA CHARACTERISTICS

Authorized for Nighttime operation. (DA-N)
 Number of elements: 9
 Type of elements: Series excited, uniform cross-section,
 guyed, vertical steel towers.

TOWER:	#1	#2	#3	#4	#5	#6	#7	#8	#9
HEIGHT ABOVE INSULATORS	376'	376'	376'	376'	376'	376'	376'	376'	376' (150°)
NIGHT PHASING:	0°	99°	198°	1.8°	100.8°	199.8°	3.5°	102.5°	201.5°
NIGHT FIELD RATIO:	1.0	1.98	1.0	1.96	3.88	1.96	1.0	1.98	1.0

SPACING AND
 ORIENTATION: Night Operations: With reference tower #1; tower #2 and #3
 are are spaced 100° apart on a line bearing 105°
 true; Tower #4 and #7 are spaced 208° apart
 on a line bearing 195° true; Tower #5 and
 #9 are spaced 230.7° apart on a line bearing
 169.33° true; Tower #8 is spaced 427.85°
 on a line bearing 181.48° true; Tower #6 is
 spaced 288.55° on a line bearing 151.123° true.

GROUND SYSTEM: 120 - 226' equally spaced copper radials plus 120 - 50' interspaced
 radials about each tower. Radials are shortened and bonded to a
 transverse strap along intersections between towers.

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, top loaded
by upper 36' Section of guy wires to an
effective electrical height of 83.8° (*).

TOWER	NW(#4)	NC(#3)	SC(#2)	SE(#1)
HEIGHT ABOVE INSULATORS:	185'	185'	185'	185' (*)
DAY PHASING:	41.66°	163.12°	271.3°	0°
DAY FIELD RATIO:	0.949	2.42	2.24	1

SPACING AND
ORIENTATION:

Adjacent elements are spaced 225' (90°) on a line
bearing 350° true.

GROUND SYSTEM: 120 - 226' equally spaced copper radials plus 120 - 50'
interspaced radials about each tower. Radials are shortened
and bonded to transverse straps along intersections between
towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

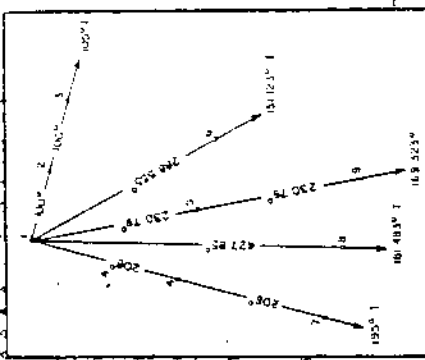
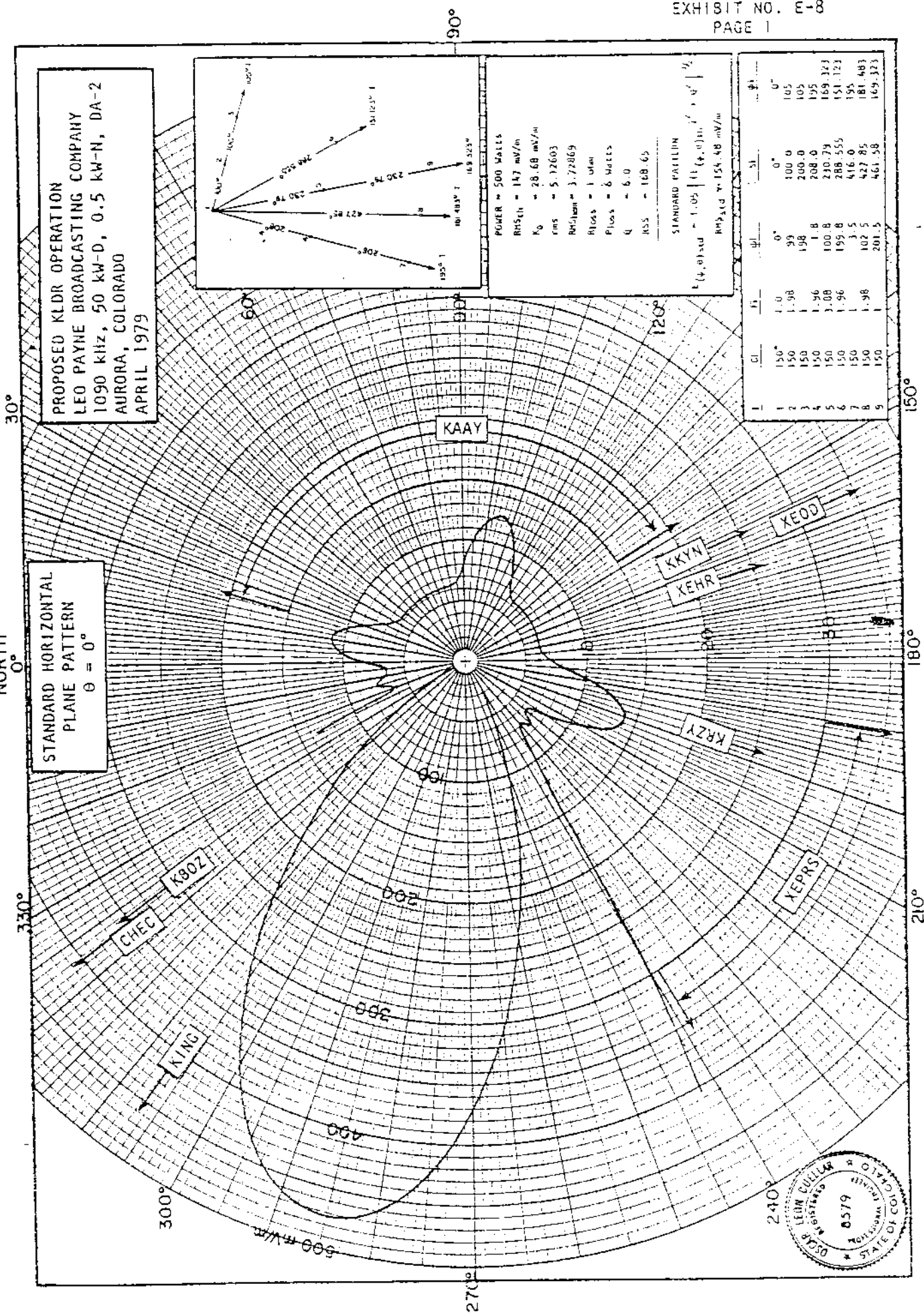
	THEORETICAL		STANDARD
	RMS	RSS	RMS
Day	1437.58 mv/m	1485.94 mv/m	1509.46 mv/m

Note: Please retain the Daytime directional antenna radiation pattern notified
for Station KAAT in United States Change List Number 1546 dated September
19, 1973 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.

TRUE
NORTH
0°

STANDARD HORIZONTAL
PLANE PATTERN
 $\theta = 0^\circ$

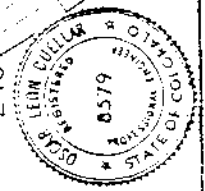
PROPOSED KLDL OPERATION
LEO PAYNE BROADCASTING COMPANY
1090 kHz, 50 kW-D, 0.5 kW-N, DA-2
AURORA, COLORADO
APRIL 1979

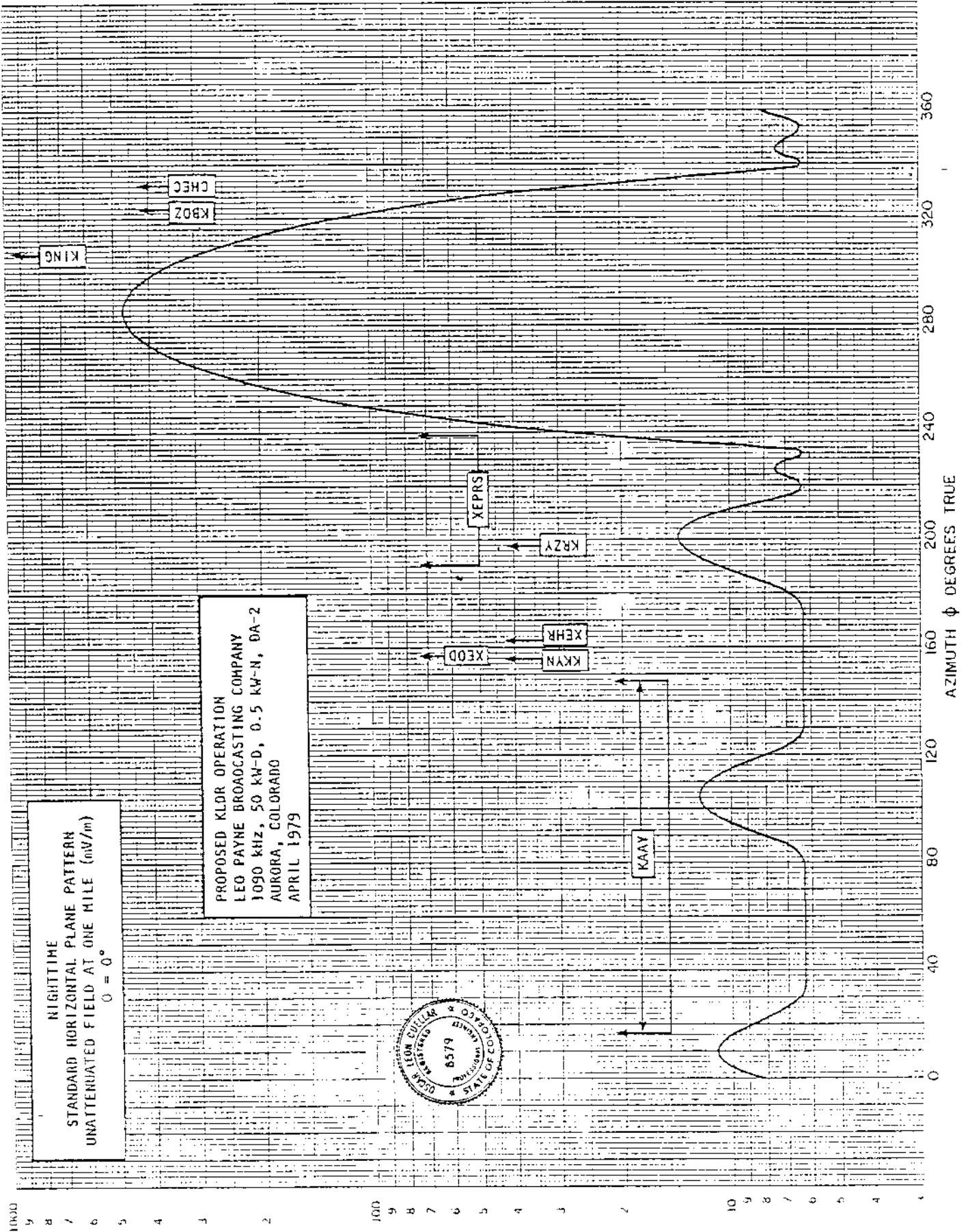


POWER = 500 Watts
RMS = 14.7 mV/m
 $E_0 = 28.68 \text{ mV/m}$
rms = 5.12603
Reflection = 3.72869
Rloss = 1.04m
Ploss = 6 Watts
 $Q = 6.0$
RSS = 168.65

STANDARD PATTERN
 $E(4, \theta)_{std} = 1.05 \left| E_0 \right| \left(\frac{1}{2} (1 + \cos^2 \theta) \right)^{1/2}$
RMS = 154.48 mV/m

f	GL	FI	SI	PI
1	150	1.0	99	100.0
2	150	1.98	198	200.0
3	150	1.96	1.8	208.0
4	150	3.08	100.8	230.79
5	150	1.96	199.8	288.555
6	150	1.96	3.5	416.0
7	150	1.98	102.5	427.85
8	150	201.5	461.58	169.323
9	150			





KRZY

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station : KRZY Main Studio: Abuquerque, New Mexico
 Frequency : 1090 KHz Power : 1 kW Night 50 kW Day -LS
 Notification : 1781 Date : Oct. 19, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 35 02 40.8
 West Longitude: 106 28 22.8

ANTENNA CHARACTERISTICS

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

Number of elements: 6

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

TOWER	C(#1)	E(#2)	W(#3)	MC(#4)	ME(#5)	MW(#6)
HEIGHT ABOVE INSULATORS	<u>226'</u>	<u>226'</u>	<u>226'</u>	<u>226'</u>	<u>226'</u>	<u>226' (90°)</u>
NIGHT PHASING	<u>0°</u>	<u>1.2°</u>	<u>-104.8°</u>	<u>-104.4°</u>	<u>-105.8°</u>	<u>01.8</u>
NIGHT FIELD RATIO:	<u>1.0</u>	<u>0.518</u>	<u>0.497</u>	<u>0.987</u>	<u>0.504</u>	<u>0.524</u>
DAY PHASING	<u>0°</u>	<u>49°</u>	<u>-49°</u>	<u>---</u>	<u>---</u>	<u>---</u>
DAY FIELD RATIO	<u>1.0</u>	<u>0.535</u>	<u>0.494</u>	<u>---</u>	<u>---</u>	<u>---</u>

SPACING AND ORIENTATION

: Daytime: Three towers in line equally spaced 150°
 on a line bearing 97.5° True.

Nighttime: With Tower #1 (SC) as reference tower #2
 (SW) is spaced 499.3' (199.2°) apart at an azimuth of
 219.3° T, tower #3 (NW) is spaced 537.7' (214.5°) at
 an azimuth of 240.9° T, tower #4 (NC) is spaced 200'
 (79.8°) apart at an azimuth of 309° T, tower #5 (NE)
 is spaced 535.4' (213.6°) apart at an azimuth of 17°T,
 tower #6 (SE) is spaced 498.1' (198.7°) at an azimuth
 of 29.8° T.

GROUND SYSTEM : 120 - 226 equally spaced copper radials plus 120 - 40'
 interspaced radials about each tower. Radials are
 shortened and bonded to a transverse straps along
 intersections between towers.

KRZY

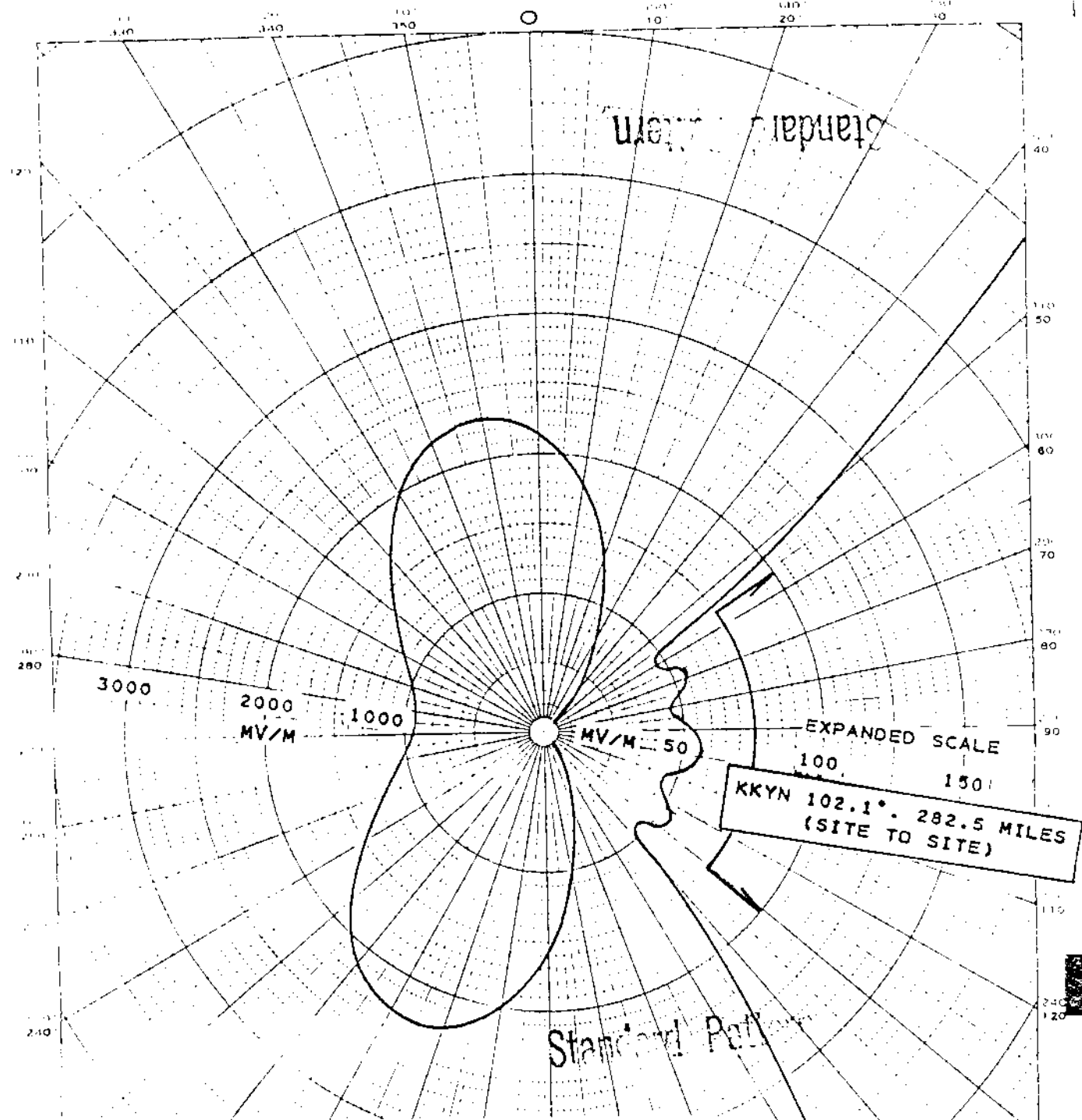
2.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL		STANDARD
	<u>RMS</u>	<u>RSS</u>	<u>RMS</u>
Day	1272 mv/m	1332 mv/m	1336 mv/m
Night	<u>180.07</u> mv/m	<u>239.61</u> mv.m	<u>198.17</u> mv/m

Note:

KRZY



$G = 90^\circ \xrightarrow{0.494 / -49^\circ} \text{---} \xrightarrow{170^\circ} \text{---} \xrightarrow{0.535 / 49^\circ} \text{---} \xrightarrow{97.5^\circ \text{ TRUE}}$			
STANDARD HORIZONTAL PLANE PATTERN			
POWER	50 KW. DA-D	CO-ORDINATES:	
RMS (THEO.)	1272 MV/M	NL	35° 02' 40.8"
RMS (STD.)	1336 MV/M	WL	106° 28' 22.8"
RSS	1332 MV/M		
BURROUGH'S BROADCASTING CO. - KRZY. ALBUQUERQUE			
NEW MEXICO 10-10-78			

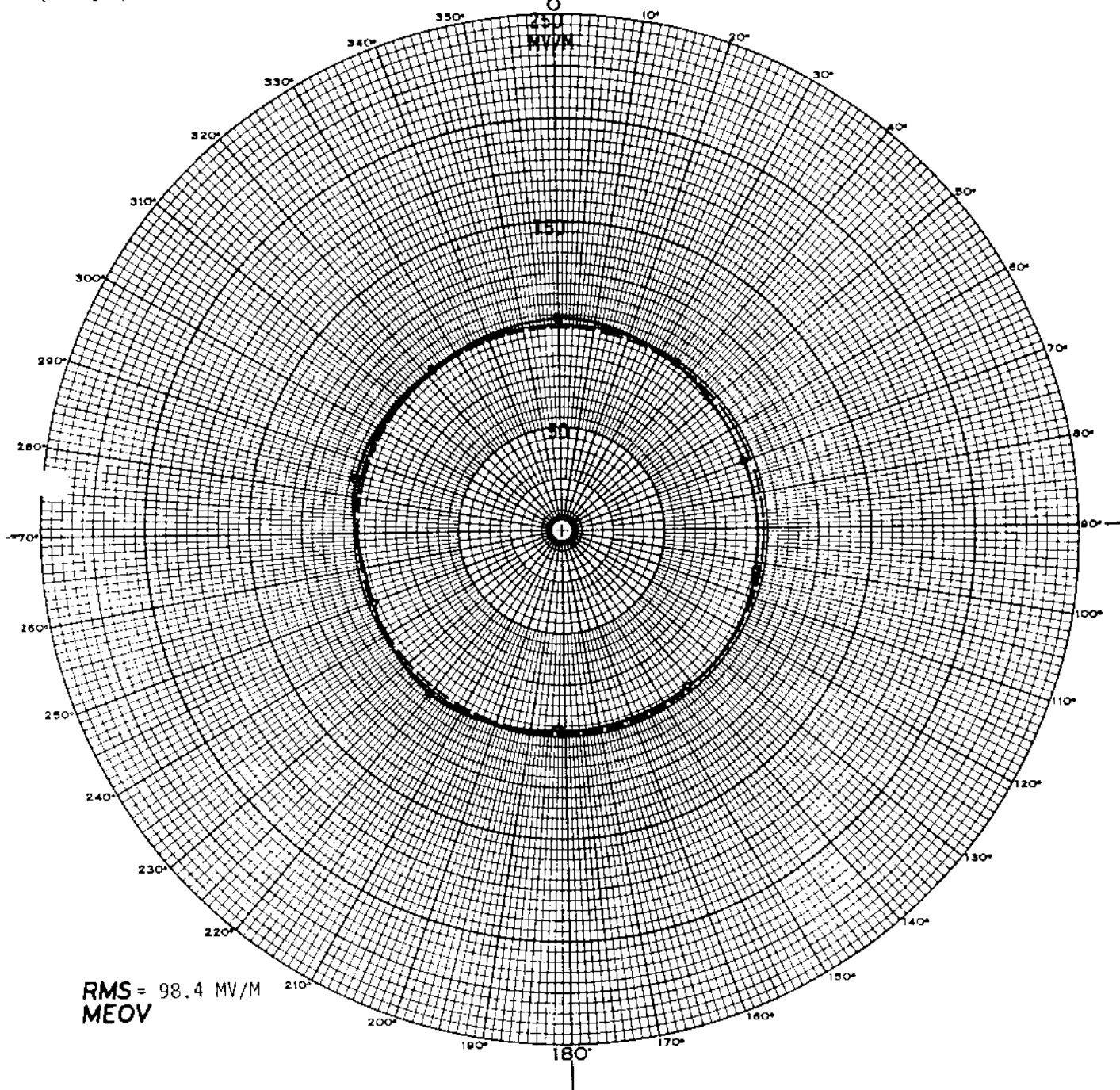
EXHIBIT E-88

Measured Non-DA
(6-29-70ct)

Station KVDB
Sioux Center, Iowa

SCE
REVERSE
SIDE

KVDB
500w, DA-D, D
1090 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 5	STATION DATA
G's = 79.8° No. 1 ○ NU 70° No. 2 ○ NDA 142° T.	TOWER	ELECTRICAL	SPACING	PHASING	FIELD	MEASURED NON-DIRECTIONAL ***** SIoux CENTER, IOWA OCTOBER - 1969 θ° - 0°	CALL KVDB FREQ 1090 KHz. POWER 0.25 Kw TYPE TIME LAT. 43-03-22 LONG 96-10-17 E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.
	No	H ^{ft}	S ^{ft}	V ^{ft}	F		
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
DAYTIME OPERATION ☒					NIGHTTIME OPERATION ☐		

FCC File No. BL-12629
Accepted 6-8-70

Station KVDB
Sioux Center, Iowa

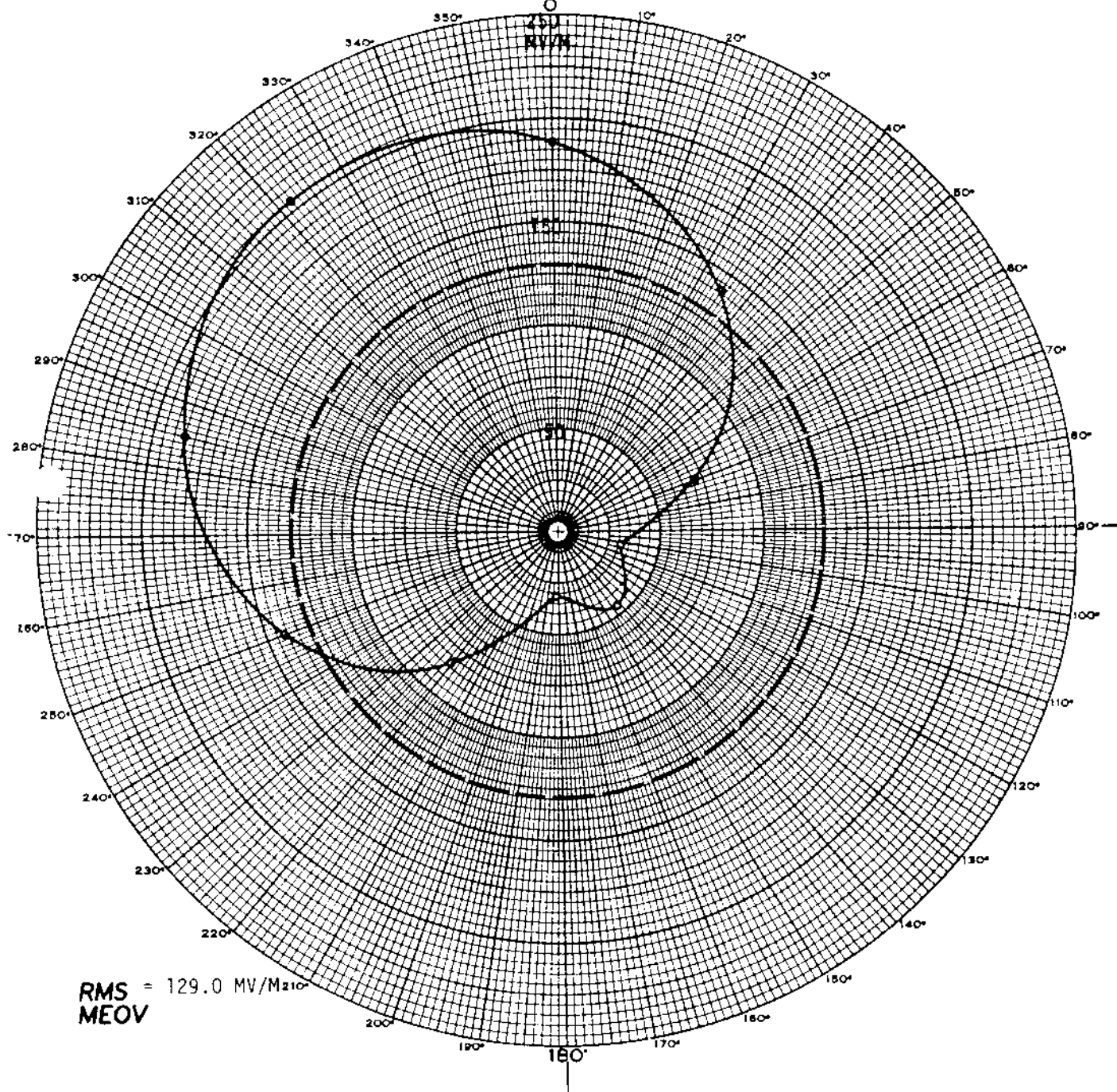
1090 kc

Measured Day
(6-29-70oct)

Station KVDB
Sioux Center, Iowa

SEE
REVERSE
SIDE

KVDB
500w, DA-D, D
1090 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 6	STATION DATA
G's = 79.8° No. 1 1.0/ 0° 70° No. 2 0.85/+113° (Measured) 142° T.	TOWER	ELECTRICAL HEIGHT	SPACING	PHASING	FIELD RATIO	MEASURED DIRECTIONAL PATTERN ***** SIoux CENTER, IOWA OCTOBER - 1969 θ° = 0°	CALL KVDB FREQ 1090 KHz. POWER 0.5 Kw TYPE DA-D TIME DAYTIME LAT. 43-03-22 LONG. 96-10-17 E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.
	No.	h'	s'	φ'	F		
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
10							
DAYTIME OPERATION ☐					NIGHTTIME OPERATION ☐		

FCC File No. BL-12629
Accepted 6-8-70

Station KVDB
Sioux Center, Iowa

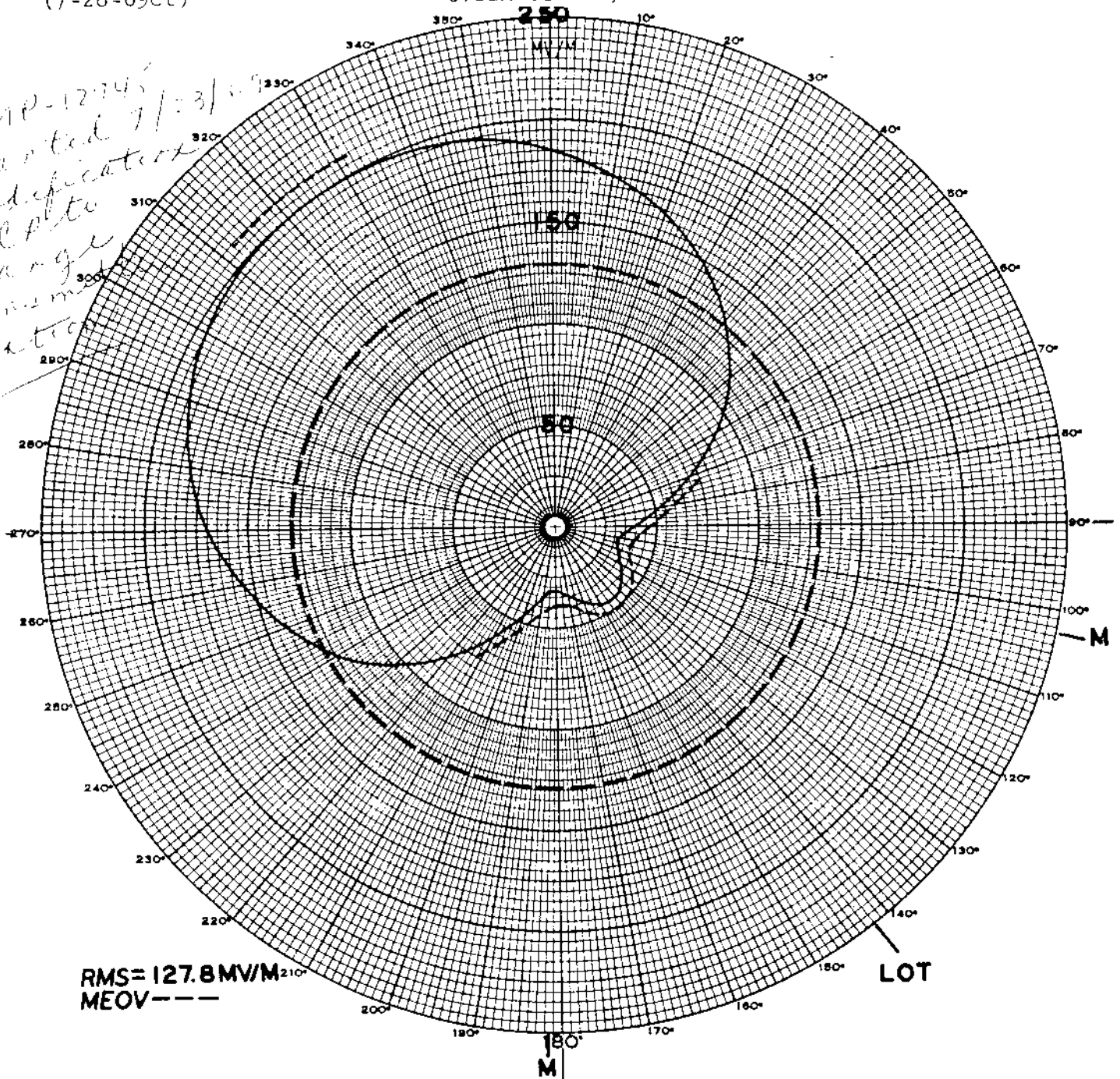
1090 kc

Proposed Day
(7-28-69ct)

Station KVDB
Sioux Center, Iowa

KVDB
500w, DA-D, D
1090 kc

*BMP-12745
Granted 7/23/69
modification
in Cpl to
change
transmission
location*



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 4	STATION DATA
G's = 79.8° No. 1 1.0/0° 70° No. 2 0.75/126° 142° T.	TOWER	ELECTRICAL	SPACING	PHASING	FIELD	PROPOSED PATTERN DIRECTIONAL DAYTIME ONLY SIOUX CENTER, IOWA	CALL NEW FREQ 1090 KHz POWER 0.5 Kw TYPE DA-D TIME DAYTIME LAT. NL 43-03-22 LONG WL 96-10-17 E.H.MUNN, JR. RADIO ENGINEER COLDWATER, MICH.
	No.	HEIGHT	g's	deg	ratio		
	1	79.8	-	0°	1.0		
	2	79.8	70°	126°	0.75		
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
DAYTIME OPERATION ☒					NIGHTTIME OPERATION ☐	θ° = 0°	

FCC File No. BMP-12745
Accepted 6-27-69

Station KVDB
Sioux Center, Iowa

1090 kc

August 10, 1971 K & E

SUPPLEMENTAL
DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WBAL

Main Studio: Baltimore, Maryland

Frequency: 1090 kHz

Power: 50kw

Notification List No. 1420

Date: April 14, 1971 Class: 1-B

GEOGRAPHICAL LOCATION OF THE
CENTER OF THE ANTENNA SYSTEM:

North Latitude: 39° 22' 33"

West Longitude: 76° 46' 21"

Predicted effective Day Field: (omnidirectional) 1795 mv/m at rated power.

Note: Please retain the original directional antenna radiation pattern notified in 1941 for station WBAL and attach to this supplemental Description Sheet. This notification is for the purpose of indicating only a correction in the geographical coordinates of the center of the antenna system.

CTR NO 30861A4

PROPOSED NIGHT NULLS

Station WBAL
Baltimore, Maryland

50kw, DA-N,U
1090 KC

k

WBAL

EXHIBIT - IV - a
1090 KC

W. H. & C. Co.
Radio Engineers
Baltimore, Md.

150

MV/M

100

50

TOWERS

KTHS - 980 MILES

50

100

MV/M

150

CALCULATED HORIZONTAL PLANE PATTERN
SHOWING DETAILS OF MINIMUM
WBAL - BALTIMORE, MD.
1090 KC — 50 KW
APRIL 1940

WBAL, Baltimore, Md. 1090 kc

NO 340-P DIETZEN GRAPH TABLE
F. & CO. ORDIN

EXHIBIT - IV

MINNERY & CHAMBERS
RADIO ENGINEERS
WASHINGTON D C

R.M.S. FIELD
1600 MV/M

5 $\angle$ 100° 9.85 $\angle$ 0° 5 $\angle$ 100°

TOWERS

KTHS - 950 MILES

1000 MV/M

2000

3000

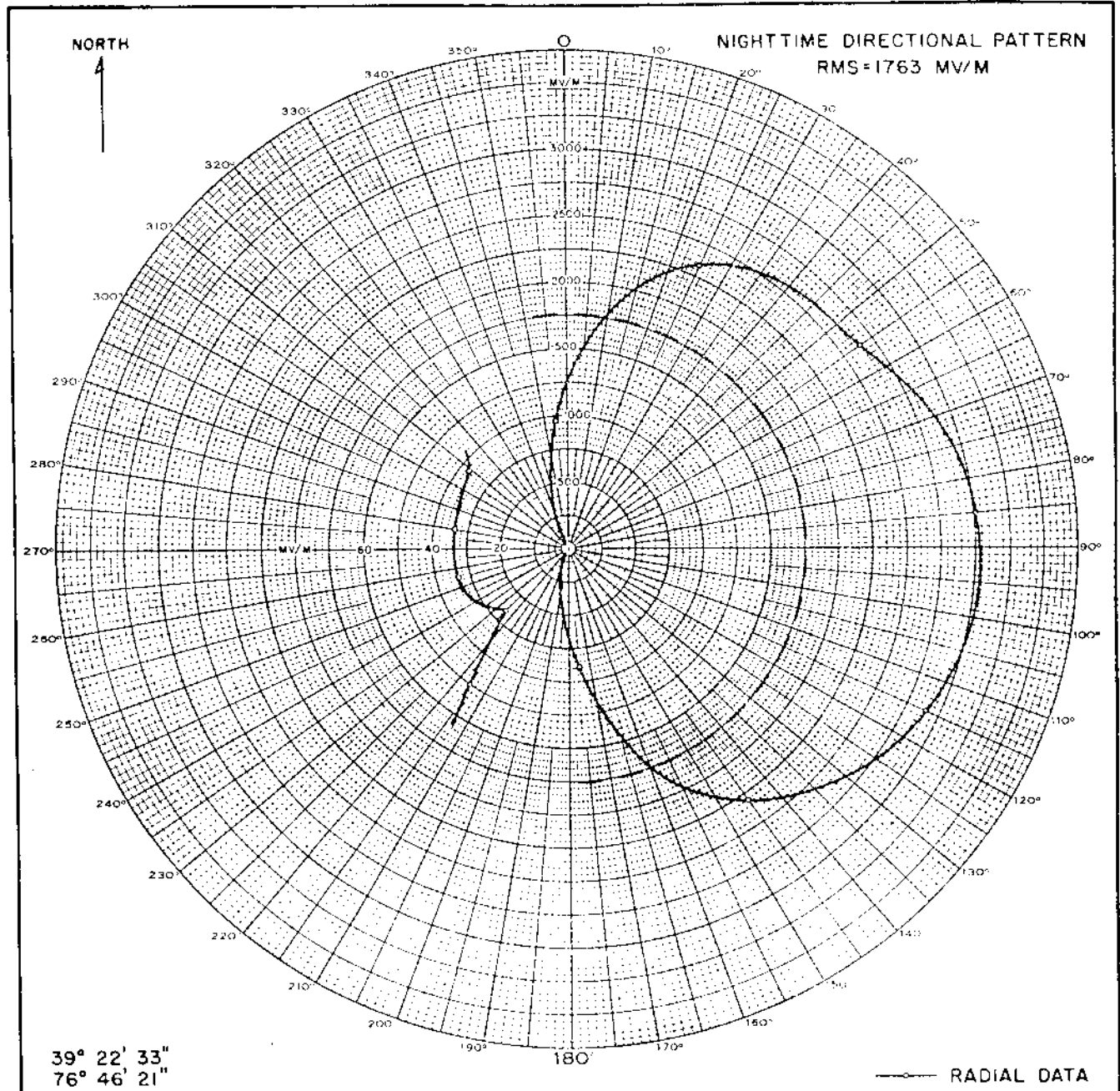
CALCULATED HORIZONTAL PLANE PATTERN
PROPOSED DIRECTIONAL ANTENNA
WBAL - BALTIMORE, MD.
1090 KC — 50 KW
APRIL 1940 $H = 495'$

WBAL

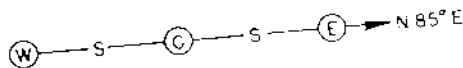
Measured Night
(4-28-65ct)

Station WBAL
Baltimore, Maryland

50kw, DA-N, U
1090 kc



39° 22' 33"
76° 46' 21"



S = 233' = 93°
G = 500' = 200°

ANTENNA PARAMETERS

TOWER	THEORETICAL		INDICATED	
	FIELD	PHASE	FIELD	PHASE
W	.508	100°	.489	121°
C	1.00	0°	1.00	0°
E	.508	-100°	.641	-115°

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

RADIO STATION WBAL
BALTIMORE, MARYLAND
630520
FIGURE 2B

FCC File No. BL-10161
Accepted

Station WBAL
Baltimore, Maryland

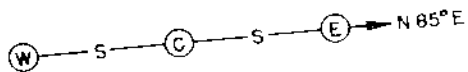
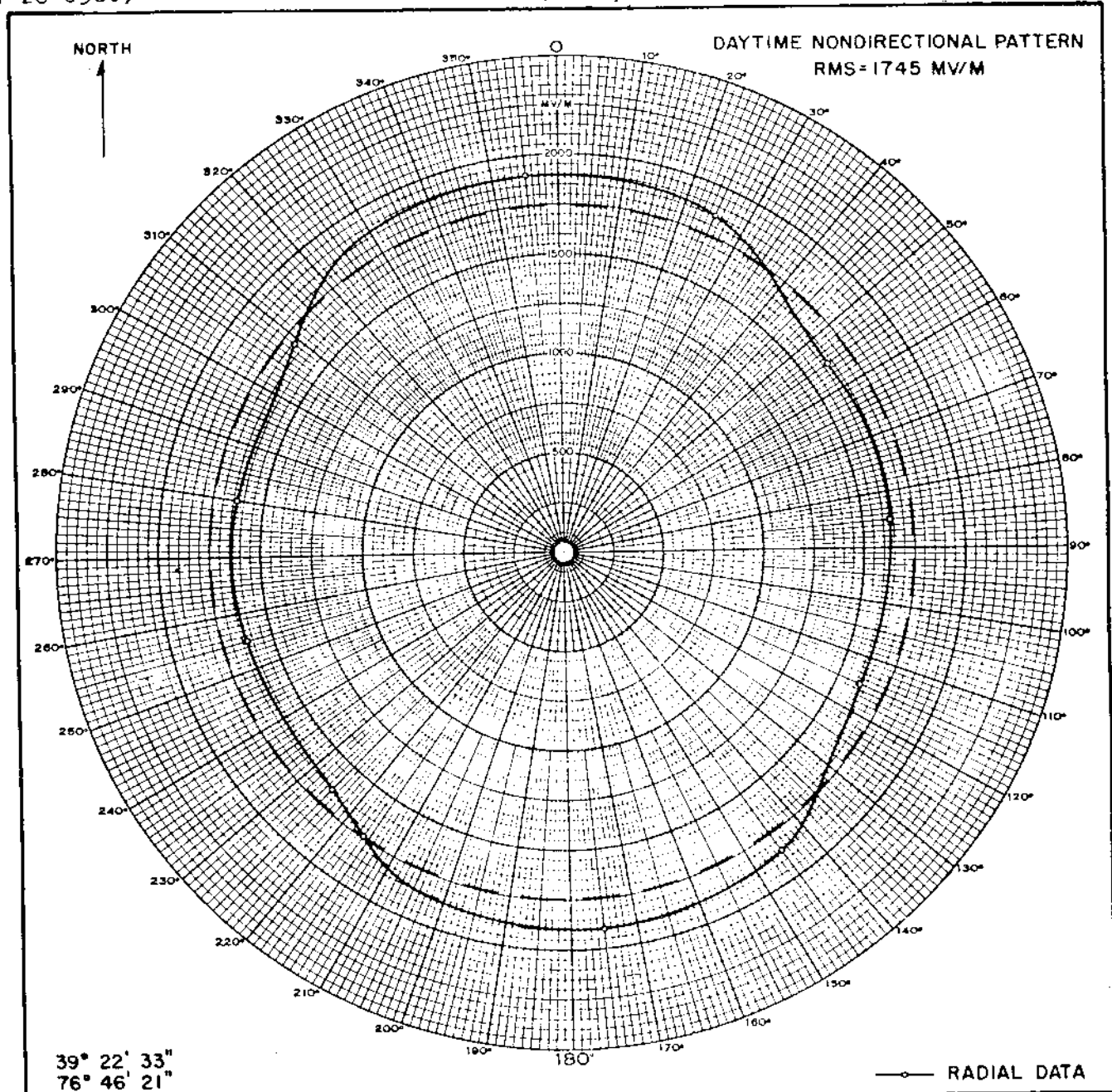
1090 kc

WBAL

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

Station WBAL
Baltimore, Maryland

50kw, DA-N, U
1090 kc



S = 233' = 93°
G = 500' = 200°

TOWER	OPERATION
W	GROUNDED
C	SERIES FED
E	GROUNDED

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

RADIO STATION WBAL
BALTIMORE, MARYLAND
630520 FIGURE 2A

FCC File No. BL-10161
Accepted

Station WBAL
Baltimore, Maryland

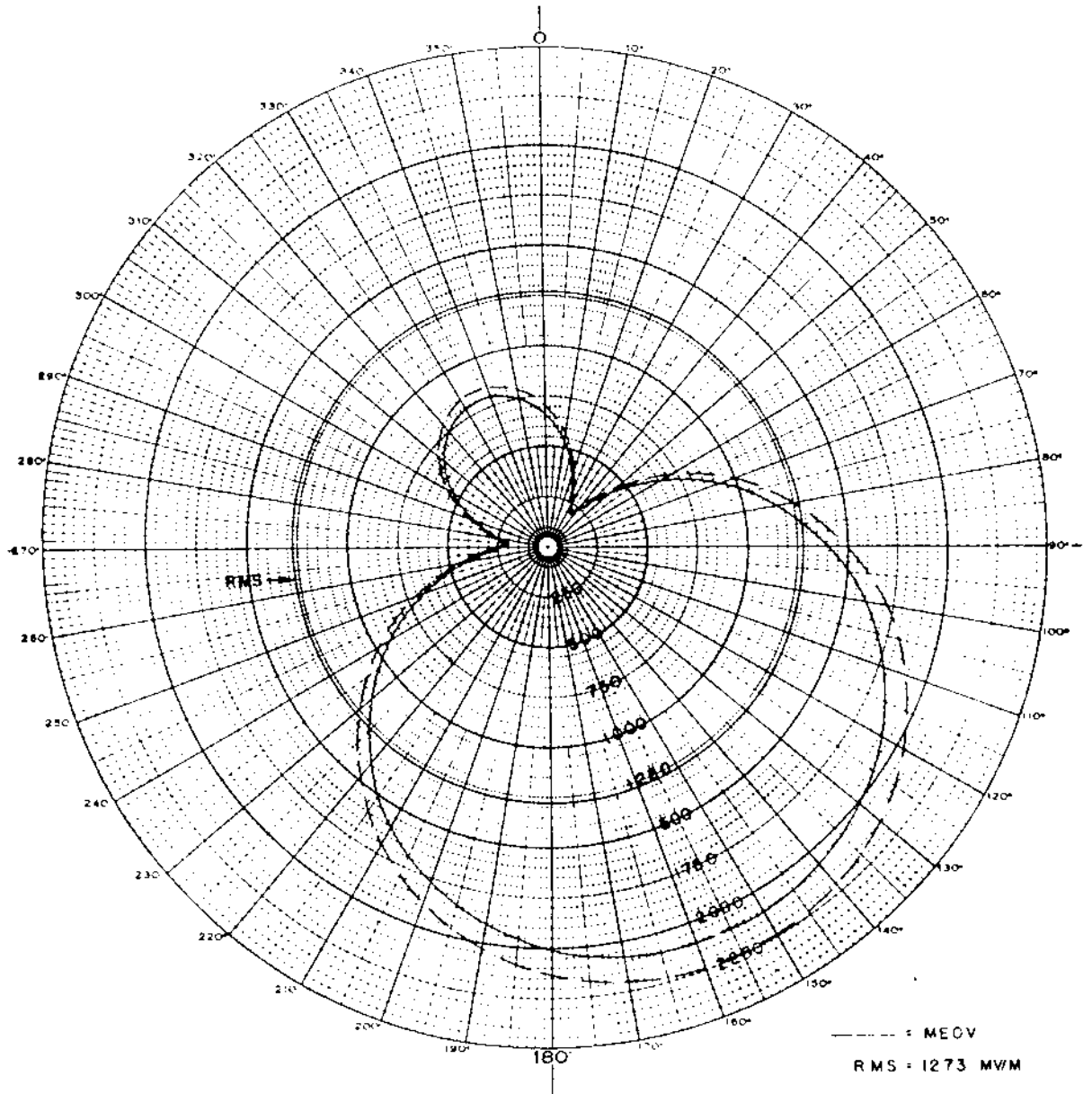
1090 kc

Proposed Day
(4-28-65ct)

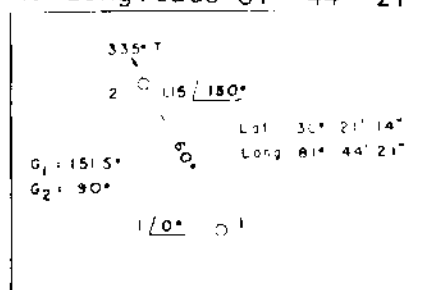
Station WQIK
Jacksonville, Florida

WCMG
50
1090 kc

*WAPPL 3-17-66
CHG PWR.*



N. Latitude 30° 21' 14"
W. Longitude 81° 44' 21"



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

FIGURE 2
CALCULATED SWR HORIZONTAL PATTERN
FOR DAYTIME USE
ROWLAND BROADCASTING COMPANY, INC.
WQIK JACKSONVILLE FLORIDA
1090KC 50KW, 10KW - CH D
OCTOBER 1964

FCC File No. BP-16644
Accepted 3-10-65

Station WQIK
Jacksonville, Florida

1090 kc

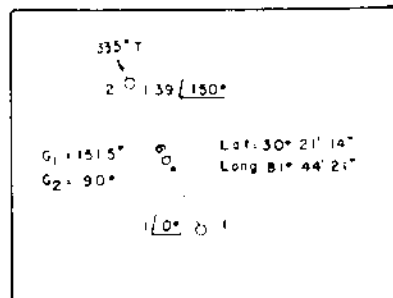
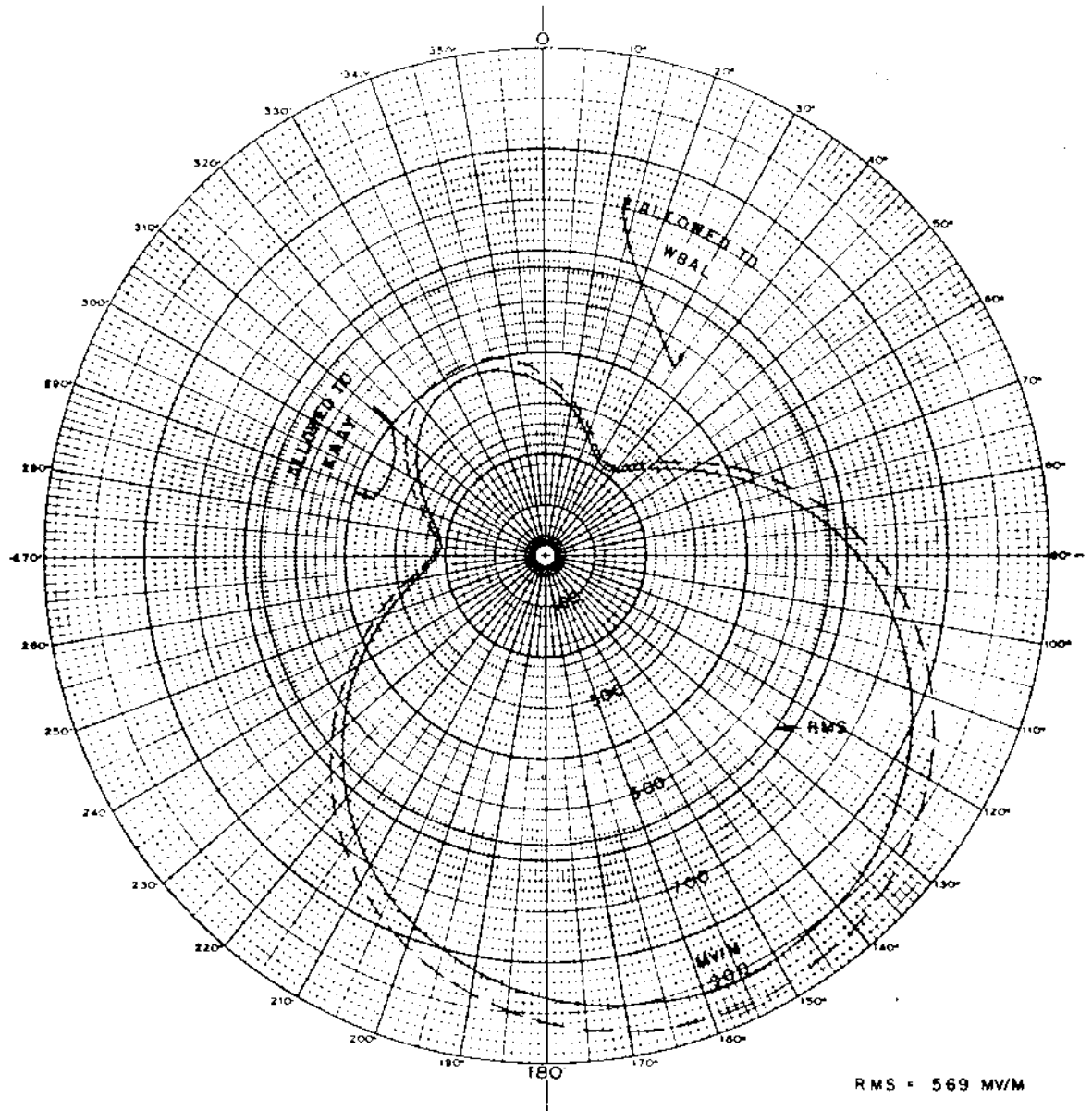
WCMG

Proposed Day (CH)
(4-28-65ct)

Station WQIK
Jacksonville, Florida

50kw, (10kw-CH), DA-2, D
1090 kc

3-APPL 3-17-66
CHef, PWR



WILLIS C. BEECHER
CONSULTING ENGINEER
WASHINGTON D. C.

FIGURE 7
CALCULATED 10KW HORIZONTAL PATTERN
FOR CRITICAL HOURS USE
ROWLAND BROADCASTING COMPANY, INC.
WQIK JACKSONVILLE FLORIDA
1090KC 50KW, 10KW - CH D
OCTOBER 1964

FCC File No. BP-16644
Accepted 3-10-65

Station WQIK
Jacksonville, Florida

1090 kc

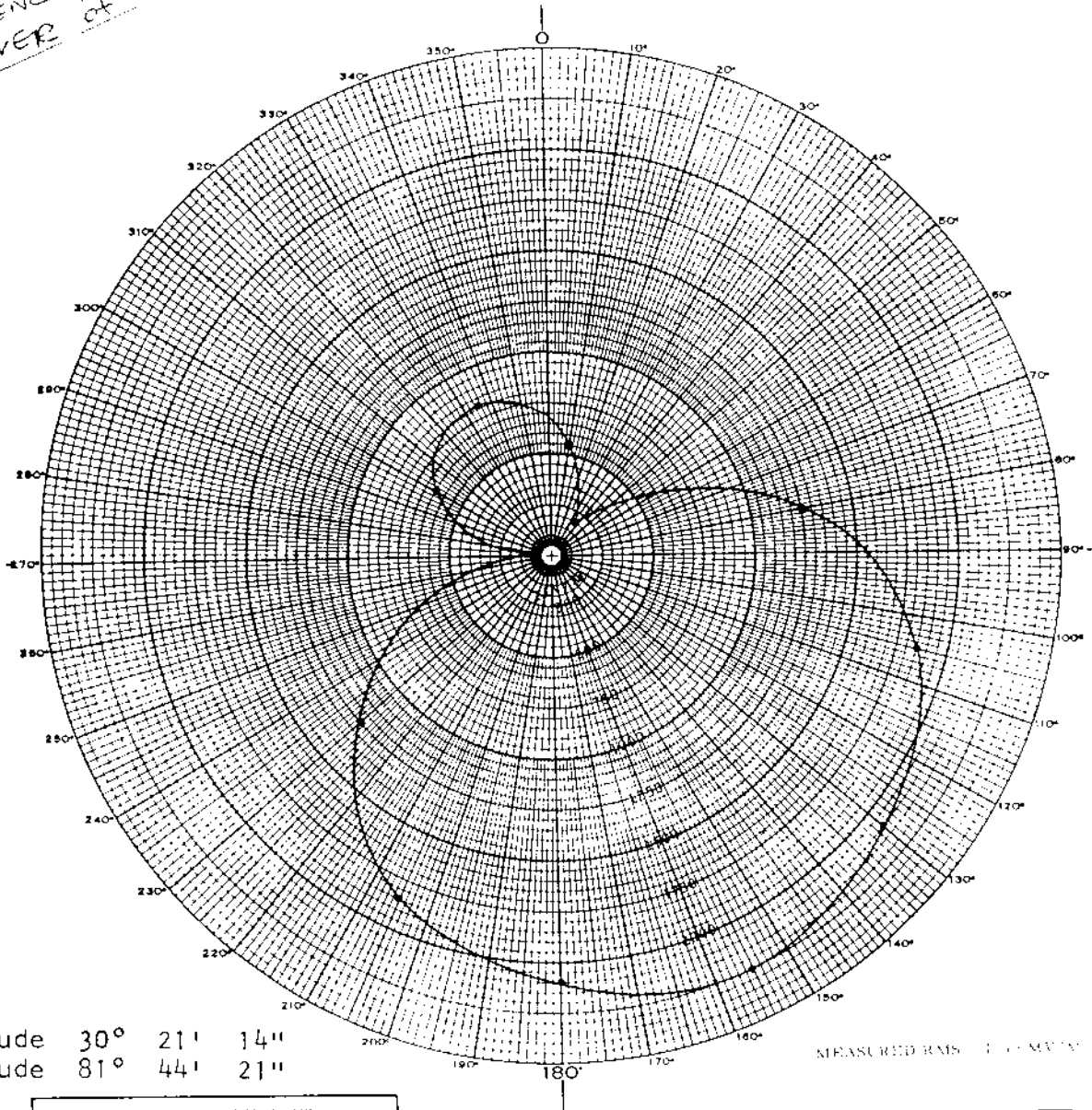
WCMG

Measured Day
(10-28-67ct)

Station WQIK
Jacksonville, Florida

50kw, 10kw-CH, DA-2, D
1090 kc

11-30-67
GRANTED LICENSE
CON. CHANGE IN
FREQUENCY INCREASE
IN POWER of DA-2.



North Latitude 30° 21' 14"
West Longitude 81° 44' 21"

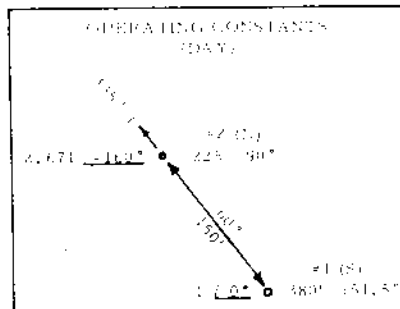


FIGURE XI-A
MEASURED 50KW HORIZONTAL PATTERN
FOR DAYTIME USE
ROWLAND BROADCASTING COMPANY, INC.
RADIO STATION WQIK
JACKSONVILLE, FLORIDA
1090KC 50KW, 10KW-CH DA-2
JULY 1967

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

FCC File No. BL-11751
Accepted 10-4-67

Station WQIK
Jacksonville, Florida

1090 kc

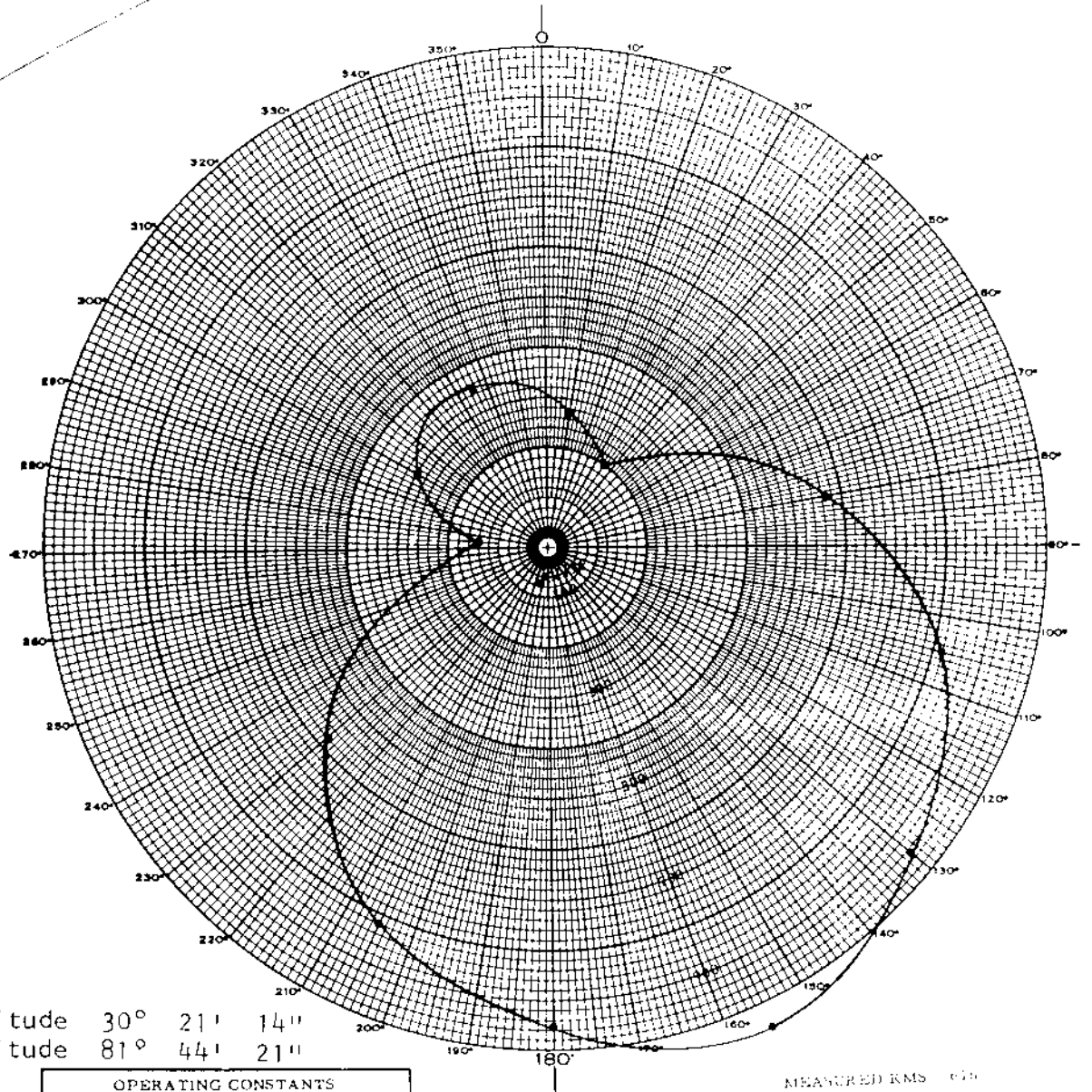
WCMG

Measured Day (CH)
(10-29-67ct)

Station WQIK
Jacksonville, Florida

50kw, 10kw-CH, DA-2, D
1090 kc

11-30-67
GRANTED LICENSE
INCREASE IN POWER
INSTALLATION OF DA-2



North Latitude 30° 21' 14"
West Longitude 81° 44' 21"

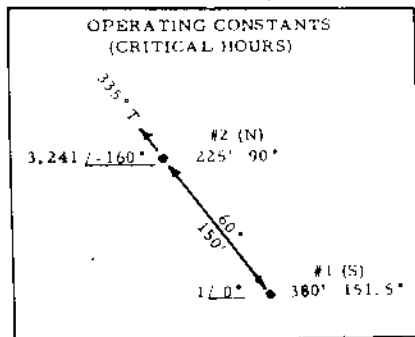


FIGURE X-A
MEASURED 10KW HORIZONTAL PATTERN
FOR CRITICAL HOURS USE
ROWLAND BROADCASTING COMPANY, INC.
RADIO STATION WQIK
JACKSONVILLE, FLORIDA
1090KC 50KW, 10KW-CH DA-2
JULY 1967

WILLIS C. BLECHER
CONSULTING ENGINEER
WASHINGTON D C

FCC File No. BL-11751
Accepted 10-4-67

Station WQIK
Jacksonville, Florida

1090 kc

WCMG

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

Station WQIK
Jacksonville, Florida

50kw, 10kw-CH, DA-2, D
1090 kc

11-30-67
GRANTED LICENSE
INCR. IN POWER
INSTALL. OF DA-2

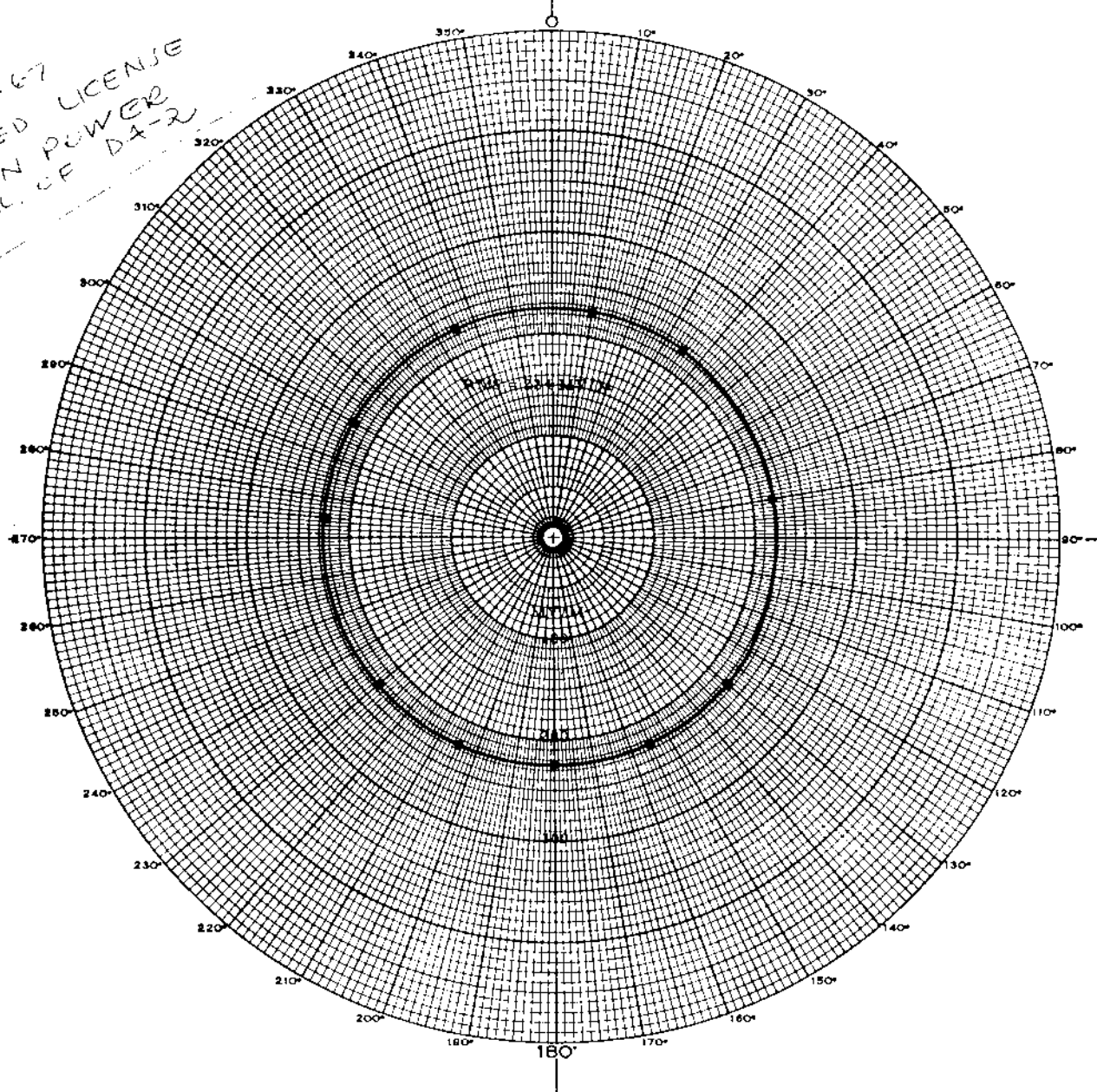


FIGURE IX
MEASURED 1KW NON-DIRECTIONAL PATTERN
ROWLAND BROADCASTING COMPANY, INC.
RADIO STATION WQIK
JACKSONVILLE, FLORIDA
1090KC 50KW, 10KW-CH DA-2
JULY 1967

WILLIS C REECHER
CONSULTING ENGINEER
WASHINGTON, D C

FCC File No. BL-11751
Accepted 10-4-67

Station WQIK
Jacksonville, Florida

1090 kc

WCMG

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

Station WQIK
Jacksonville, Florida

50kw, 10kw-CH, DA-2, D
1090 kc

11-30-67
GRANTED LICENSE
INCR. IN POWER
INSTALL. OF DA-2

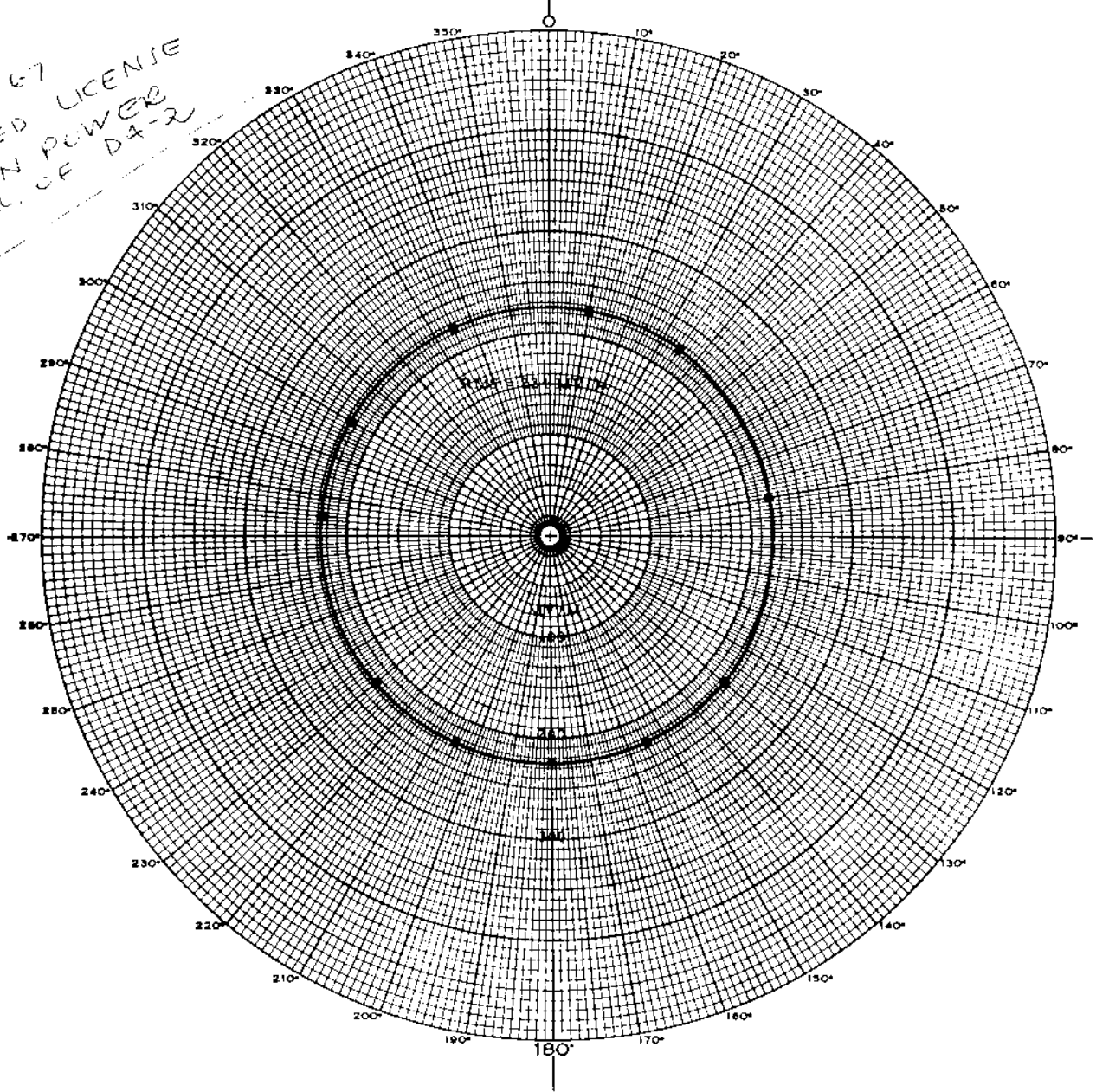


FIGURE IX
MEASURED 1KW NON-DIRECTIONAL PATTERN
ROWLAND BROADCASTING COMPANY, INC.
RADIO STATION WQIK
JACKSONVILLE, FLORIDA
1090KC 50KW, 10KW-CH DA-2
JULY 1967

WILLIS C BEECHER
CONSULTING ENGINEER
WASHINGTON, D. C.

FCC File No. BL-11751
Accepted 10-4-67

Station WQIK
Jacksonville, Florida

1090 kc

WFWR

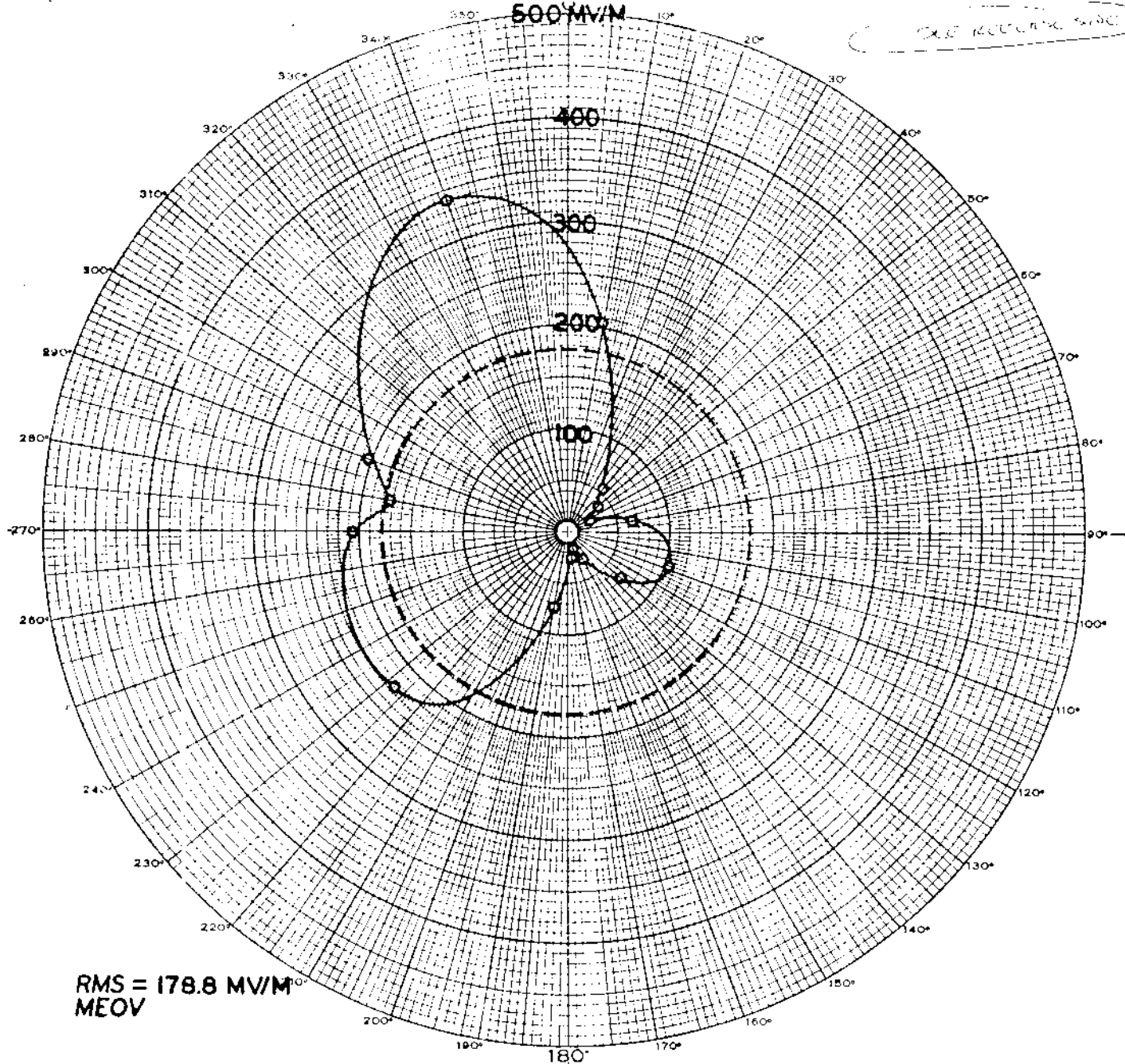
Measured Day
(8-28-68ct)

Station WFWR
Ft. Wayne, Indiana

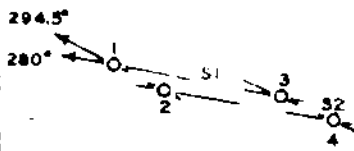
1kw, DA-D, D
1090 kc

500 MV/M

SEE MEASUREMENT



RMS = 178.8 MV/M
MEOV

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 5	STATION DATA
$\alpha_1 = 141^\circ$ $\alpha_{2,3,4} = 90^\circ$ $\beta_1 = 195.5^\circ$ $\beta_2 = 65^\circ$ 	TOWER No.	ELECTRICAL HEIGHT h	SPACING d	PHASING ϕ	FIELD RATIO F	MEASURED DAYTIME DIRECTIONAL	CALL WFWR FREQ 1090 kHz POWER 1 kw TYPE DA-D TIME DAYTIME LAT. 41-04-58 LONG. 85-06-22
	1			0.0°	1.000	WFWR - FT. WAYNE INDIANA MAY - 1968 $\theta^\circ = 0^\circ$	E.H. MUNN, JR. RADIO ENGINEER COLDWATER, MICH.
	2			+141.0°	4.514		
	3			+41.5°	2.481		
	4			-155.0°	2.219		
	5						
	6						
	7						
	8						
	9						
	10						
DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐							

FCC File No. BL-12056
Accepted 8-16-68

Station WFWR
Ft. Wayne, Indiana

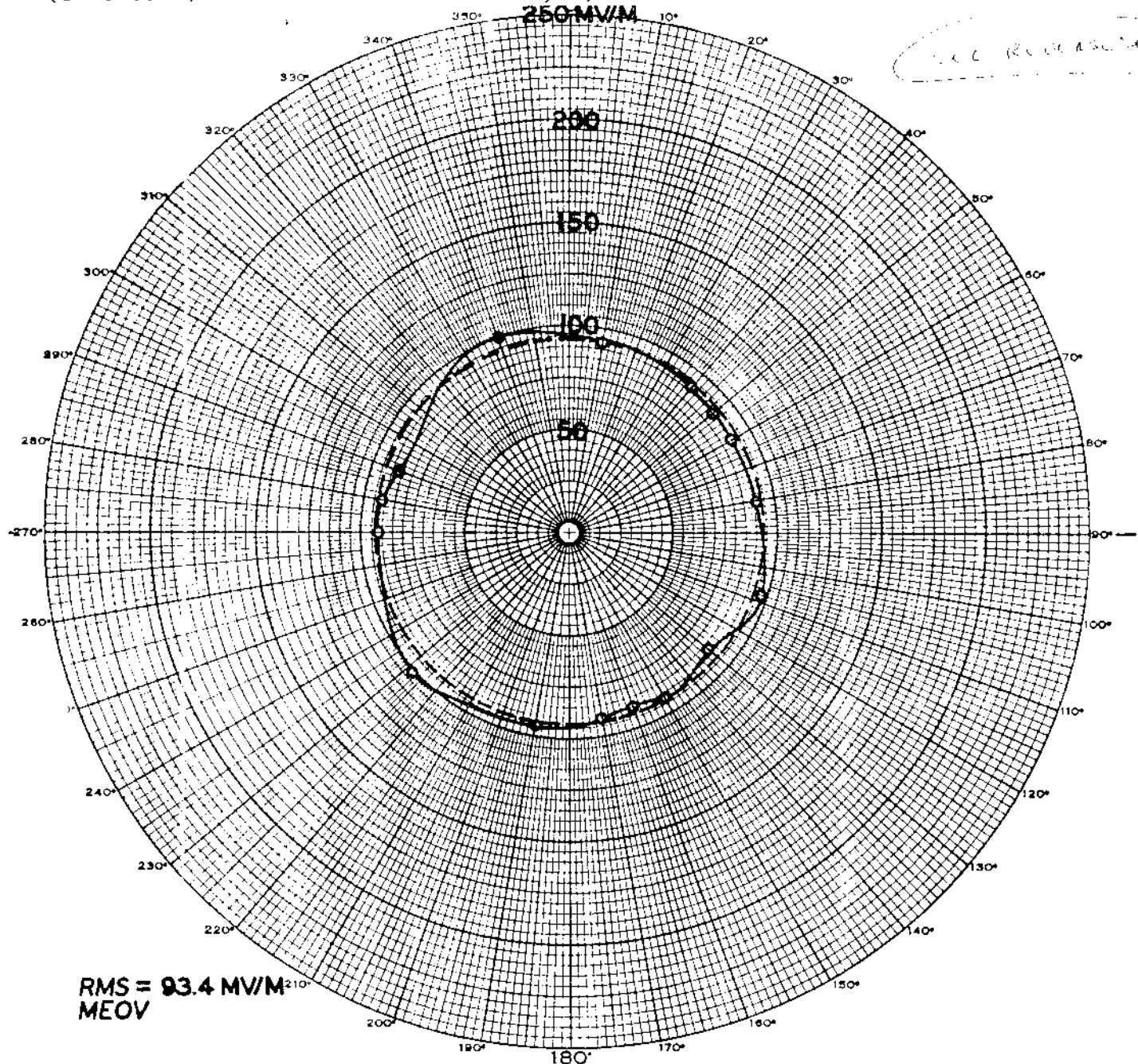
1090 kc

WFWK

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

Station WFWR
Ft. Wayne, Indiana

1kw, DA-D, D
1090 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 6	STATION DATA																																																							
G1=141° G2,3,4=90° S1=195.5° S2=65°	<table border="1"> <thead> <tr> <th>TOWER No.</th> <th>ELECTRICAL HEIGHT</th> <th>SPACING</th> <th>PHASING</th> <th>FIELD RATIO</th> </tr> </thead> <tbody> <tr><td>1</td><td></td><td></td><td></td><td></td></tr> <tr><td>2</td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td></td><td></td><td></td></tr> <tr><td>7</td><td></td><td></td><td></td><td></td></tr> <tr><td>8</td><td></td><td></td><td></td><td></td></tr> <tr><td>9</td><td></td><td></td><td></td><td></td></tr> <tr><td>10</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	TOWER No.	ELECTRICAL HEIGHT	SPACING	PHASING	FIELD RATIO	1					2					3					4					5					6					7					8					9					10					MEASURED DAYTIME NON-DIRECTIONAL TEST USING #3 TOWER OF ARRAY APRIL-MAY 1968	CALL WFWR FREQ 1090 kHz POWER 0.25 Kw TYPE NDA TEST TIME DAYTIME LAT. N 41-04-58 LONG. W 85-04-02 E.H. MUNN, JR. RADIO ENGINEER COLDWATER, MICH.
TOWER No.	ELECTRICAL HEIGHT	SPACING	PHASING	FIELD RATIO																																																						
1																																																										
2																																																										
3																																																										
4																																																										
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FCC File No. BL-12056
Accepted 8-16-68

Station WFWR
Ft. Wayne, Indiana

1090 kc

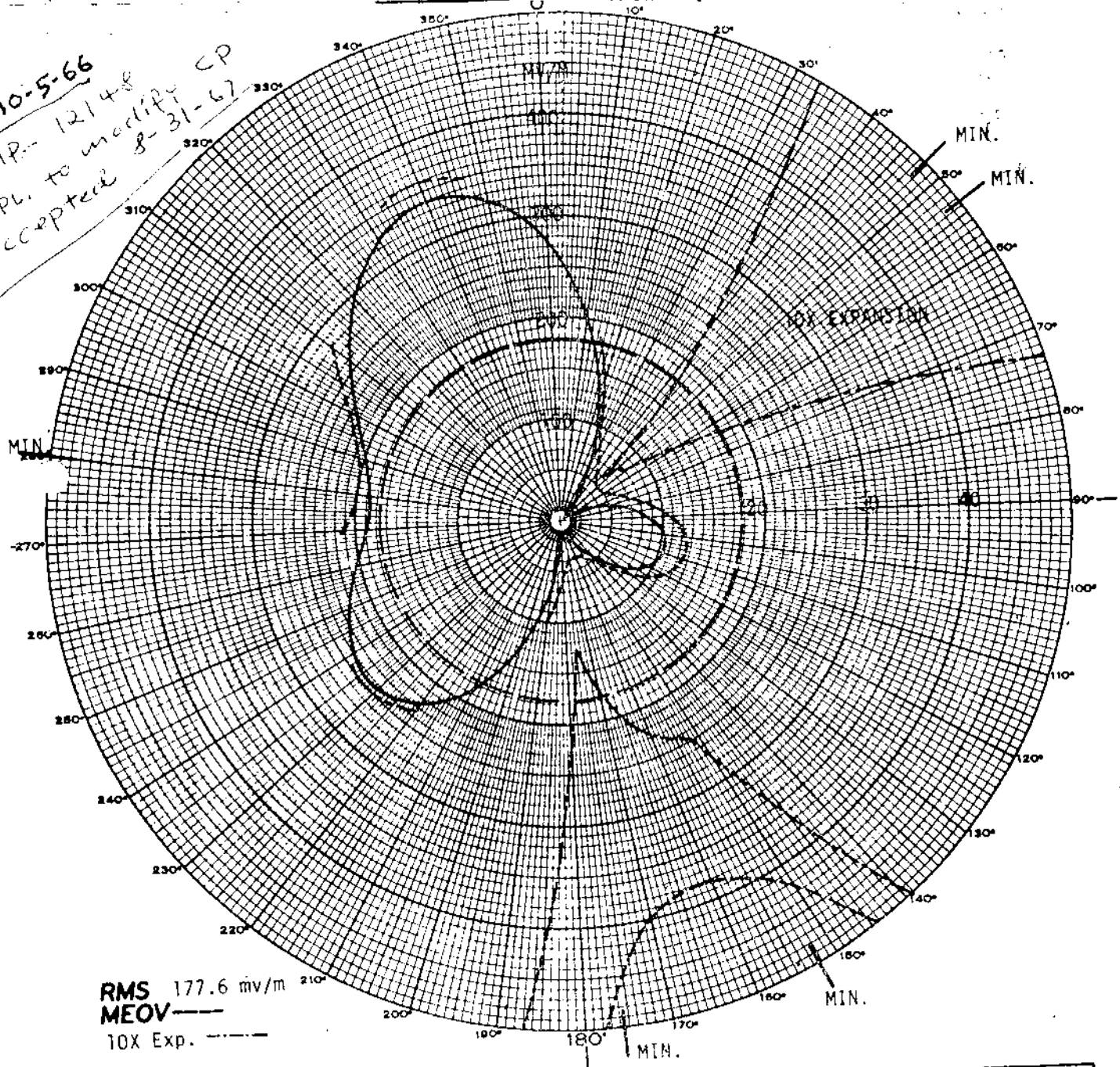
V F W K

Proposed Day
(1-28-66ct)

New; Fort Wayne Bcst. Co.
Fort Wayne, Indiana

1kw, DA-D, D
1090 kc

CP 10-5-66
BMP- 12148
APPL. to modify CP
accepted 8-31-67



RMS 177.6 mv/m
MEOV
10X Exp.

TOWER PLACEMENT SKETCH		PATTERN PARAMETERS					FIGURE 3	STATION DATA
G's = 90° S₂ = 65° S₁ = 195.5°		TOWER	ELECTRICAL HEIGHT	SPACING	PHASING	FIELD RATIO	PROPOSED DAYTIME RADIATION PATTERN Fort Wayne B/C Co. NOVEMBER 1965 θ°	CALL NEW FREQ 1090 Kc/S POWER 1 Kw TYPE DA-D TIME DAYTIME LAT. N41-04-58.2 LONG. W85-04-21.5 E.H. MUNN, JR. RADIO ENGINEER COLDWATER, MICH.
1	2	3	4	5	6			
7	8	9	10	11	12			
13	14	15	16	17	18			
19	20	21	22	23	24			
25	26	27	28	29	30			
31	32	33	34	35	36			
37	38	39	40	41	42			
43	44	45	46	47	48			
49	50	51	52	53	54			
FCC File No. BP-14797 Accepted 1-5-66 Amended		New; Fort Wayne Bcst. Co. Fort Wayne, Indiana					1090 Kc	

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: W11D

Main Studio: Livonia, Michigan

Frequency: 1090 kHz

Power: 0.5kw Night 0.25kw Day

Notification List No: 1778

Date: August 30, 1973 Class: II

GEOGRAPHICAL LOCATION OF THE
CENTER OF THE ANTENNA SYSTEM:

North Latitude: 42° 19' 46"

West Longitude: 83° 21' 43"

ANTENNA CHARACTERISTICS

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

Number of elements: 10

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

TOWER:	#1(SWC)	#2(NWC)	#3(SEC)	#4(NEC)	#5(SW)	#6(NW)	#7(N) cont'd
HEIGHT ABOVE INSULATORS:	204'	204'	204'	204' (81.4°)	278.7'	278.7'	278.7'
NIGHT PHASING:	---	---	---	---	0	-125°	-119.4
NIGHT FIELD RATIO:	---	---	---	---	1.0	1.0	1.379
DAY PHASING:	0°	-126	16°	-110			
DAY FIELD RATIO:	1.0	1.0	0.6	0.6			

Continued-

TOWER:	#8(NE)	#9(SE)	#10(S)
HEIGHT ABOVE INSULATORS:	278.7'	278.7'	278.7' (111.2°)
NIGHT PHASING:	-114°	11°	5.48°
NIGHT FIELD RATIO:	1.0	1.0	1.874

SPACING AND
ORIENTATION:

NIGHTTIME:

The towers are located at the vertices and sides of a parallelogram the long sides of which are 476.3' (192.5°) in length on a line bearing 96.8° true. The short sides are 1504' (60°) in length on a line bearing 6.3° true.

DAYTIME:

The towers are located at the vertices of a parallelogram the long sides of which are 640' (253°) in length on a line bearing 101° true. The short sides are 113' (45°) in length on a line bearing 21° true.

GROUND SYSTEM: 120 - 122' to 415' equally spaced copper radials plus
120 - 100' interspaced radials and a 24' square ground
screen about each tower. Radials are shortened and
bonded to transverse straps along intersections between
towers. Centers of system are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

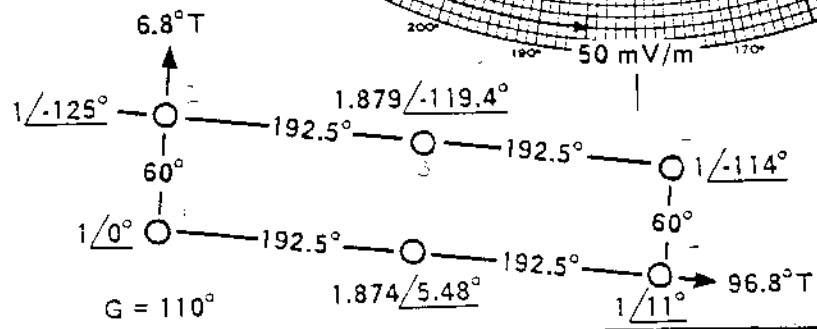
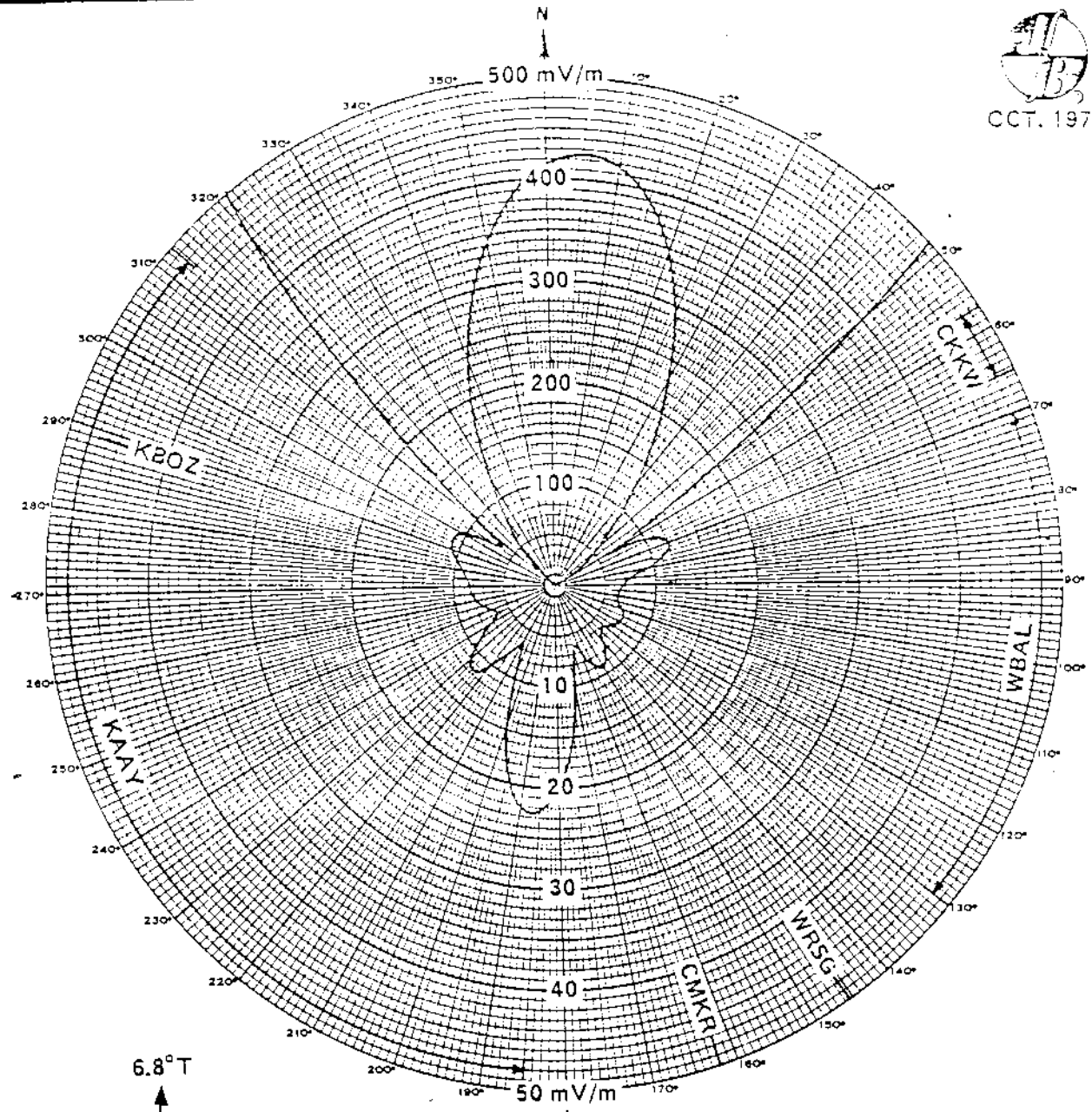
	<u>RMS</u>	THEORETICAL <u>RSS</u>	STANDARD <u>RMS</u>
Day	90 mv/m		
Night	134.72 mv/m	205.43 mv/m	141.20 mv/m

Note: Please retain the Daytime directional antenna radiation pattern notified for Station WERB in United States Change List Number 1034 dated October 30, 1963 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.

WIID



CCT. 1973



Theoretical RMS = 134.72 mV/m
 Augmented RMS = 141.20 mV/m
 RSS = 205.43 mV/m

Latitude: 42° 19' 46"
 Longitude: 83° 21' 43"

FIG. 4A-R
 PROPOSED NIGHTTIME
 STANDARD RADIATION PATTERN
 (Horizontal Plane)
 WIID 500 watts DA-N 1090 kHz
 GRACE/WOLPIN BROADCASTING CO.
 GARDEN CITY, MICHIGAN

Standard Pattern

Garden City

W11D

Proposed Day
(9-27-62ct)

New: Livonia Broadcasting Co.
Garden City, Michigan

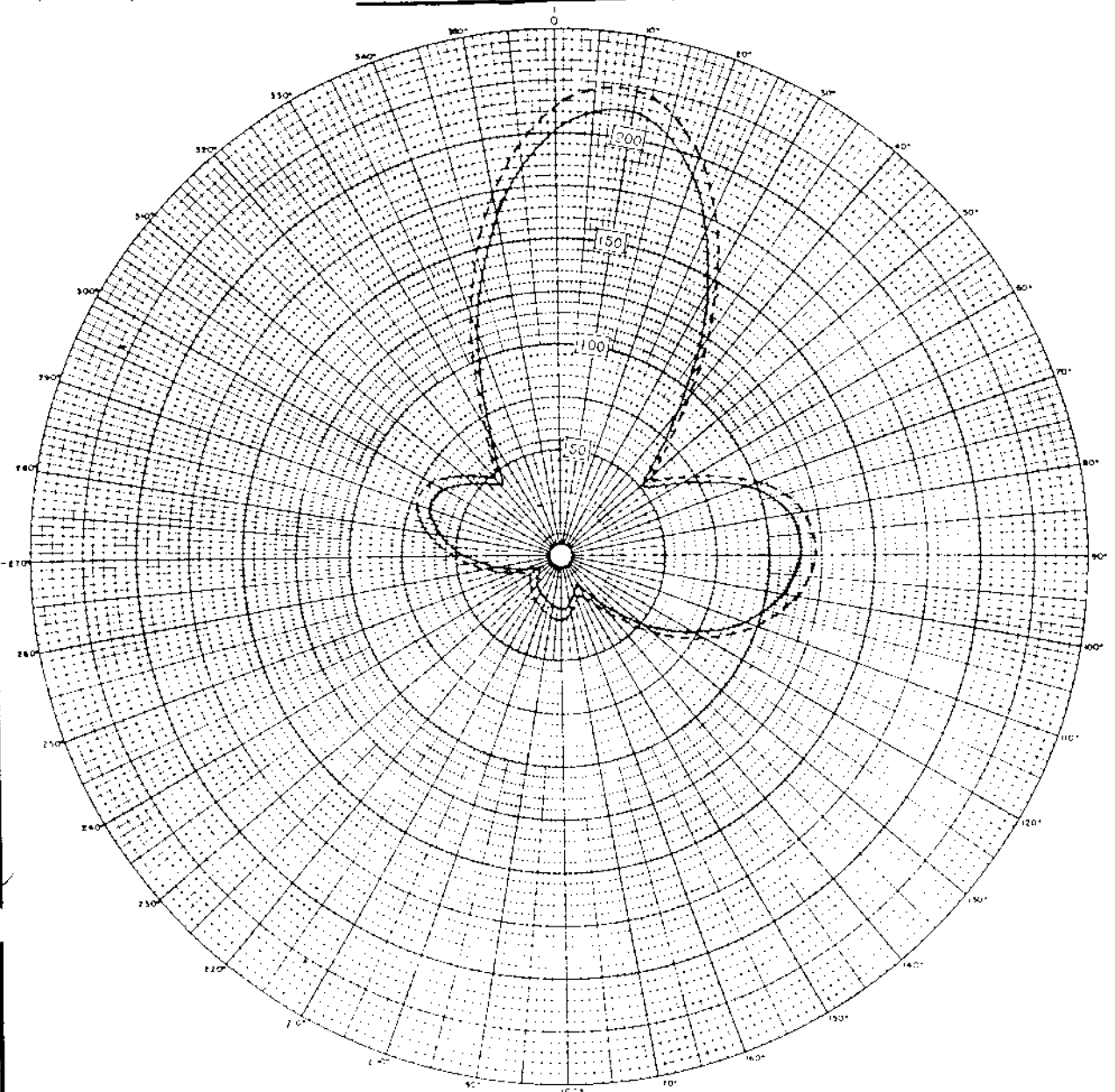
250w, DA-D, D
1090 kc

10-18-62
change name

4-16-63
granted CP
or new AM
Station

11-23-63
mailed
mod of
CP to
Navy
international
in flight.

11-17-63
application to
change to
24/200 was
accepted



$E_{RMS} = 90 \text{ mV/m (BY ADJUSTMENT)}$

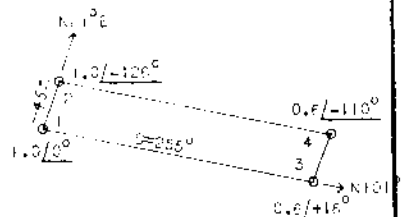
SUPERSEDES CODE 620608

LATITUDE: 42° 18' 30"

LONGITUDE: 83° 01' 45"

ANTENNA PARAMETERS

ALL Z's = 77.2° + T.L. SEE MEAS. PAT.



CHARLES E. BRENNAN
CONSULTING RADIO ENGINEER
MILWAUKEE, WISCONSIN

620906

FIGURE 7-A

LIVONIA BROADCASTING COMPANY
GARDEN CITY, MICHIGAN

1090 KC

250 DA-D

FCC File No. BP-12314

Accepted 9-20-62 Amended

New: Livonia Broadcasting Co.
Garden City, Michigan

1090 kc

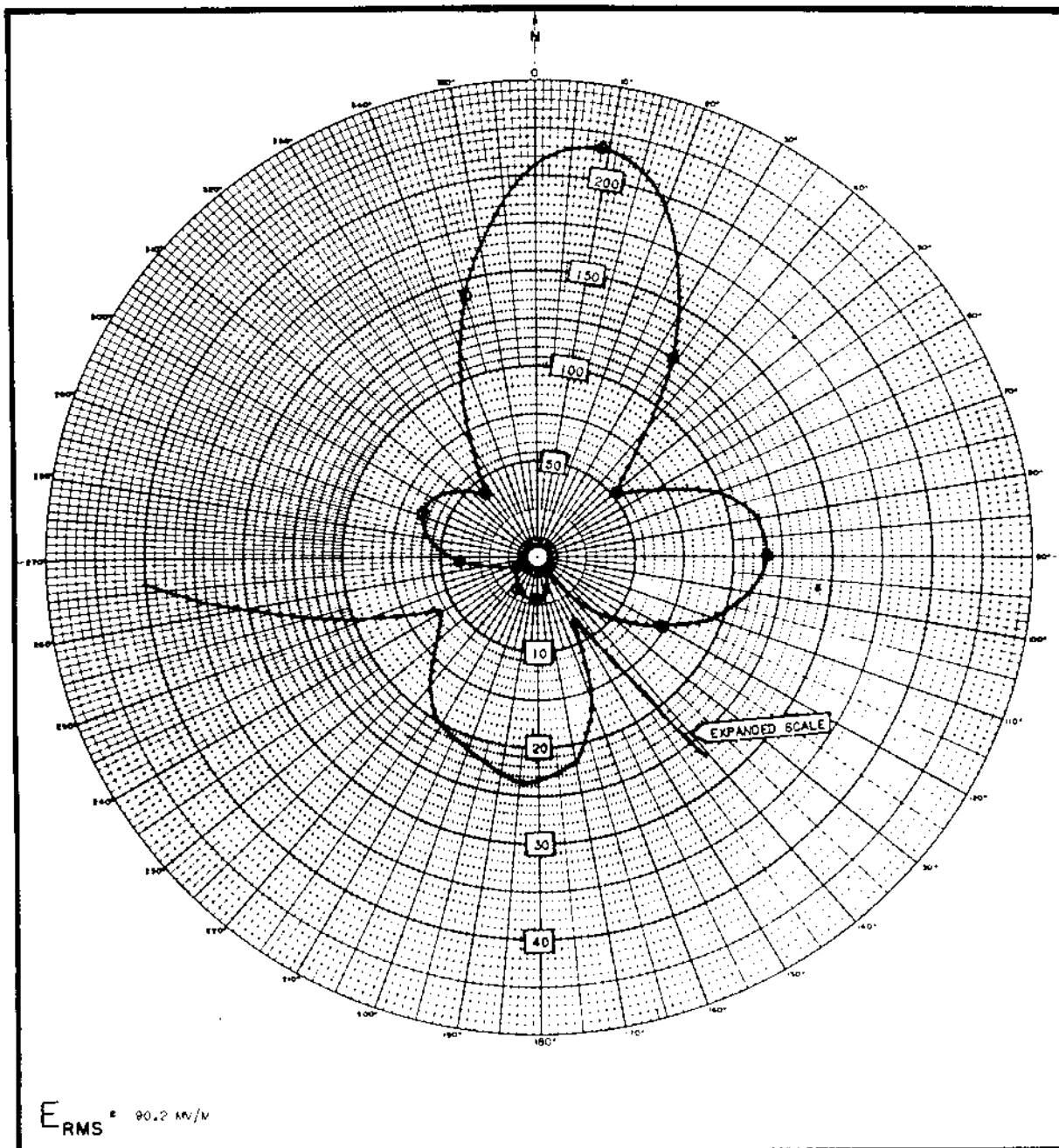
W11D

Measured Day
(1-29-64ct)

Station WERB
Garden City, Michigan

250w, DA-D, D
1090 kc

BL-10353
LIC 10-30-64

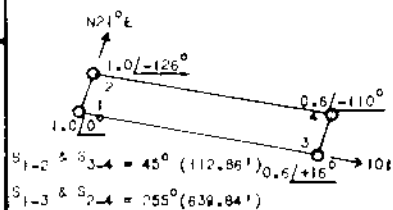


LATITUDE: 42° 19' 46"
LONGITUDE: 83° 21' 43"

CHARLES E. BRENNAN
CONSULTING RADIO ENGINEERS
MILWAUKEE, WISCONSIN

ANTENNA PARAMETERS

ALL $\beta = 81.2^\circ$



631003 FIGURE 3
MEASURED DIRECTIONAL PATTERN
RADIO STATION WERB
GARDEN CITY, MICHIGAN
1090 Kc. 250 DA-D

FCC File No. BL-10353
Accepted 1-15-64

Station WERB
Garden City, Michigan

1090 kc

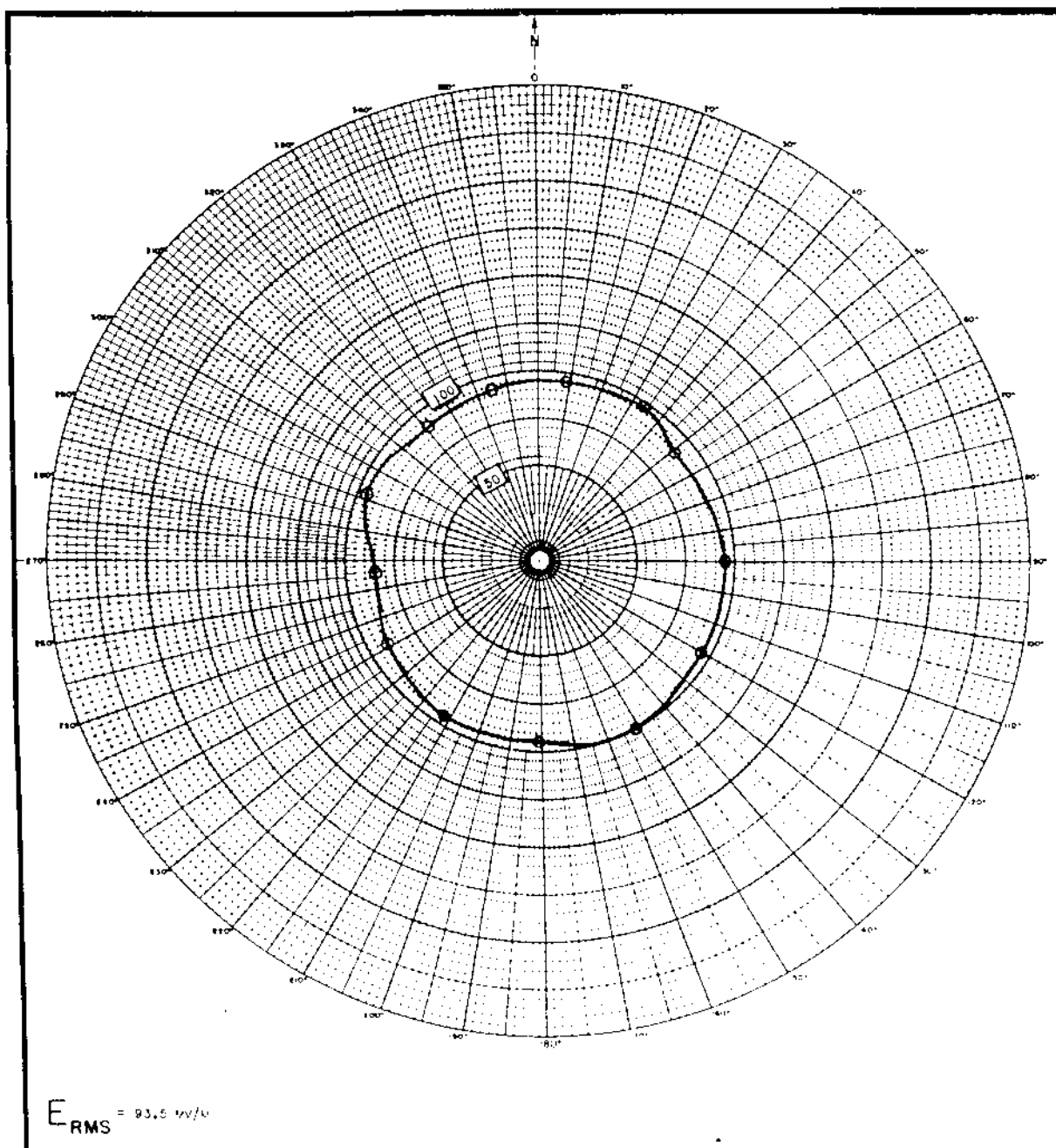
WIID

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

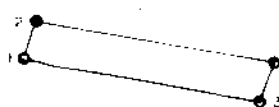
Station WERB
Garden City, Michigan

250w, DA-D, D
1090 kc

BL-10353
LIC 10-30-64



$E_{RMS} = 93.5 \text{ mV/m}$

LATITUDE 42° 19' 40" LONGITUDE 83° 21' 45"	ANTENNA PARAMETERS $\lambda = 81.20$ TOWER 2 USED FOR NON-DIRECTIONAL MEASUREMENTS 	431003 FIGURE 2 MEASURED NON-DIRECTIONAL PATTERN RADIO STATION WERB GARDEN CITY, MICHIGAN 1090 KC. 250 DA-D
CHARLES E. BRENNAN CONSULTING RADIO ENGINEERS MILWAUKEE, WISCONSIN		

FCC File No. BL-10353
Accepted 1-15-64

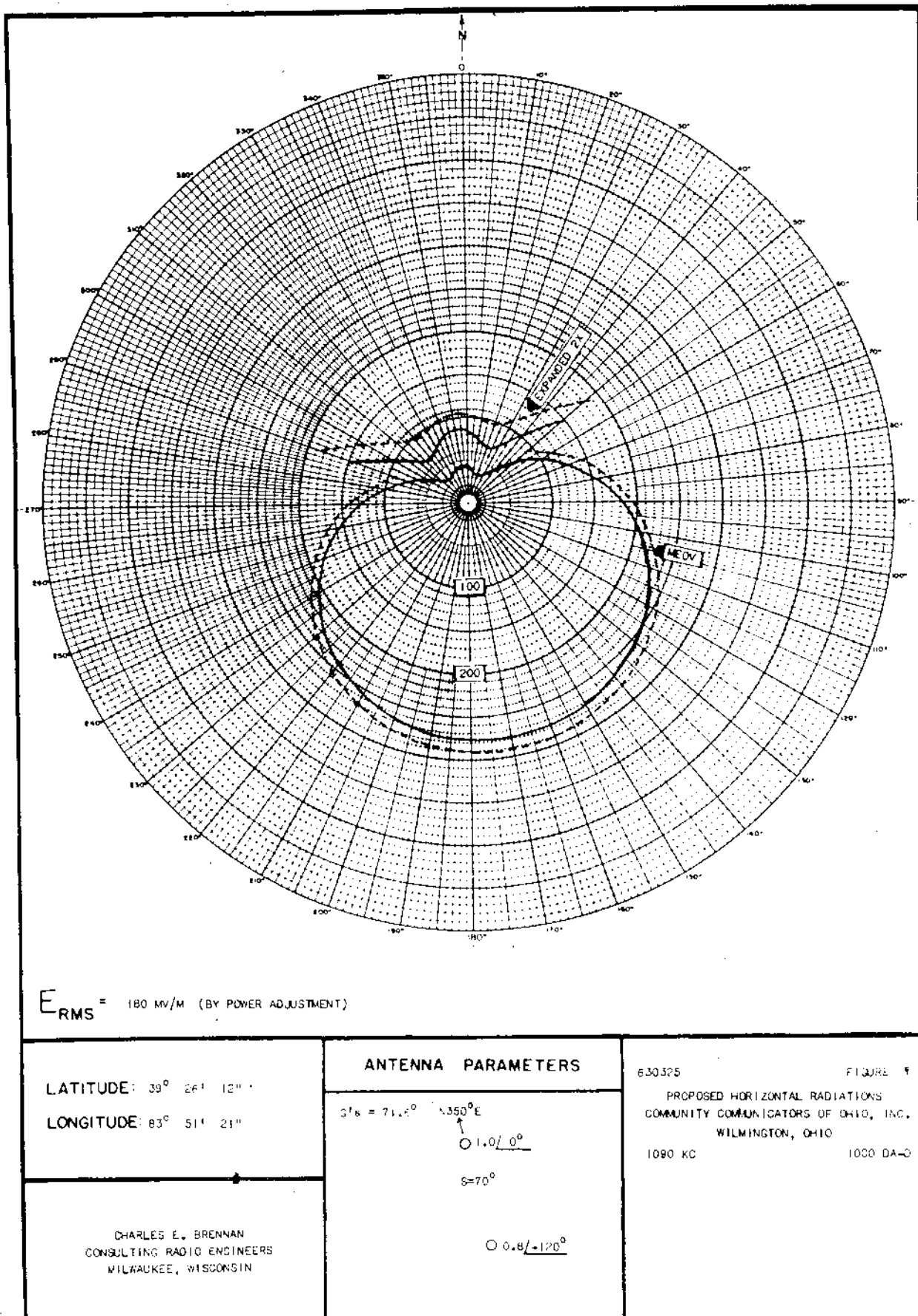
Station WERB
Garden City, Michigan

1090 kc

Proposed Day
(5-28-63ct)

New; Community Communicators of Ohio, Inc.
Wilmington, Ohio

1kw, DA-D, D
1090 kc

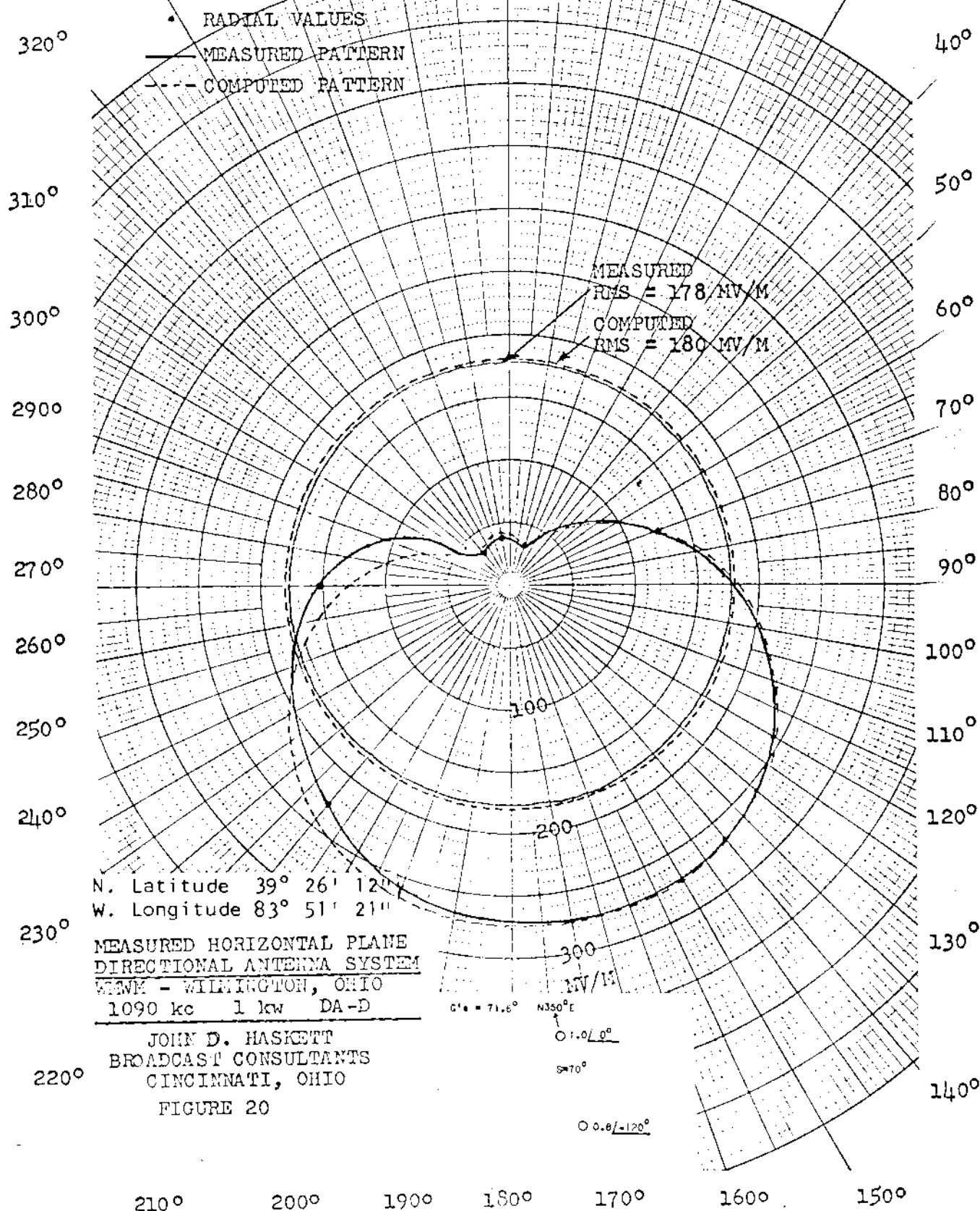


WKFI

Measured Day
(4-28-65ct)

Station WMWM
Wilmington, Ohio

1kw, DA-D, D
1090 kc



FCC File No. BL-10838
Accepted 3-30-65

Station WMWM
Wilmington, Ohio

1090 kc

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WQIK

Main Studio: Jacksonville, Florida

Frequency: 1090 kHz

Power: 10 kW

Notification List No. 1630

Date: April 30, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE
CENTER OF THE ANTENNA SYSTEM:

North Latitude: 30° 21' 14"

West Longitude: 81° 44' 21"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)

Number of elements: 2

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

TOWER:	SE(#1)	NW(#2)
HEIGHT ABOVE INSULATORS:	380' (151.5°)	225' (90°)
PHASING:	0°	+150°
FIELD RATIO:	1	1.39

SPACING AND

ORIENTATION: Elements are spaced 150' (60°) on a line bearing 335° true.

GROUND SYSTEM: 120-225' to 380' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

Predicted effective Field: 569 mv/m at rated power.

Note: This notification concerns a reduction in power from 50 kW
to 10 kW.

WQIK

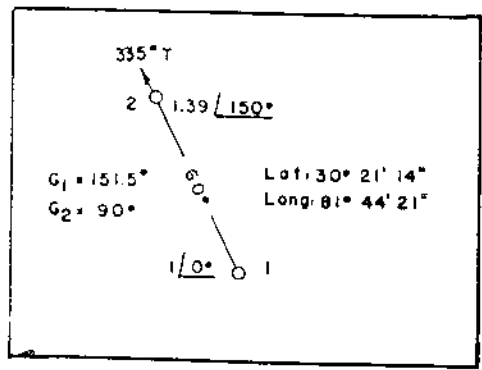
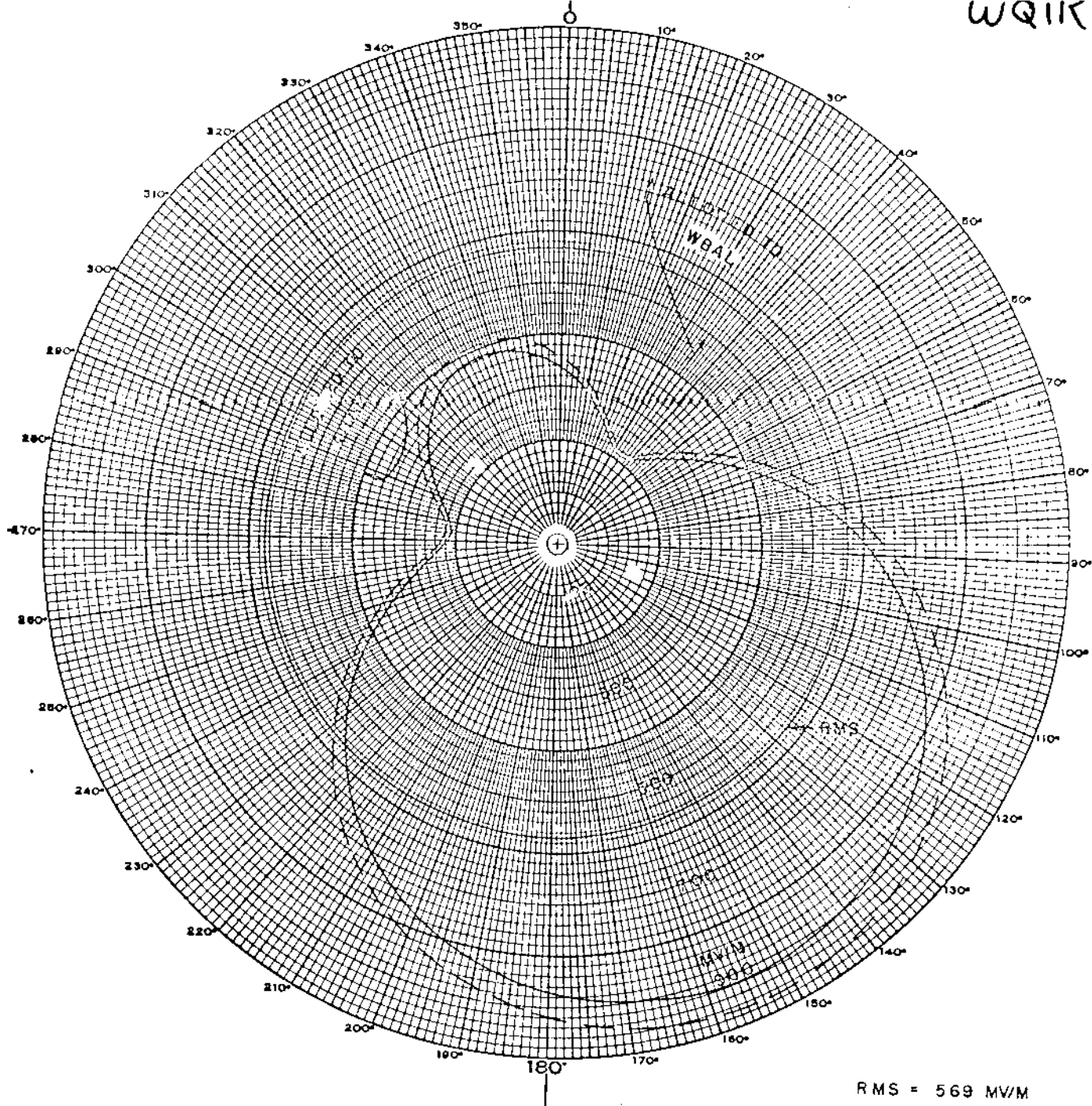


FIGURE X-B

CALCULATED 10KW HORIZONTAL PATTERN

ROWLAND BROADCASTING COMPANY, INC.

RADIO STATION WQIK

JACKSONVILLE, FLORIDA

1090KC 10KW

JULY 1967

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

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station : WSLG Main Studio: Gonzales, Louisiana
 Frequency : 1090 Power : Night 10 kW Day
 Notification : 1781 Date : Oct. 19, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE
 CENTER OF THE ANTENNA SYSTEM:

North Latitude: 30 15 14
 West Longitude: 90 56 38

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)

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

TOWER : N((#1) S(#2)
 HEIGHT ABOVE INSULATORS : 493 493 (197.7°)
 DAY PHASING : 83° 0°
 DAY FIELD RATIO : 1.18 1.0
 SPACING AND ORIENTATION : Towers in a row are spaced 250.7' (100°)
on a line bearing 350° true.
 GROUND SYSTEM : 120 - 190' to 260' equally spaced copper radials plus
a 24' square ground about each tower. Radials are
shortened and bonded to a transverse strap along inter-
sections between towers.

STANDARD DISK 508 REFERENCE A/2

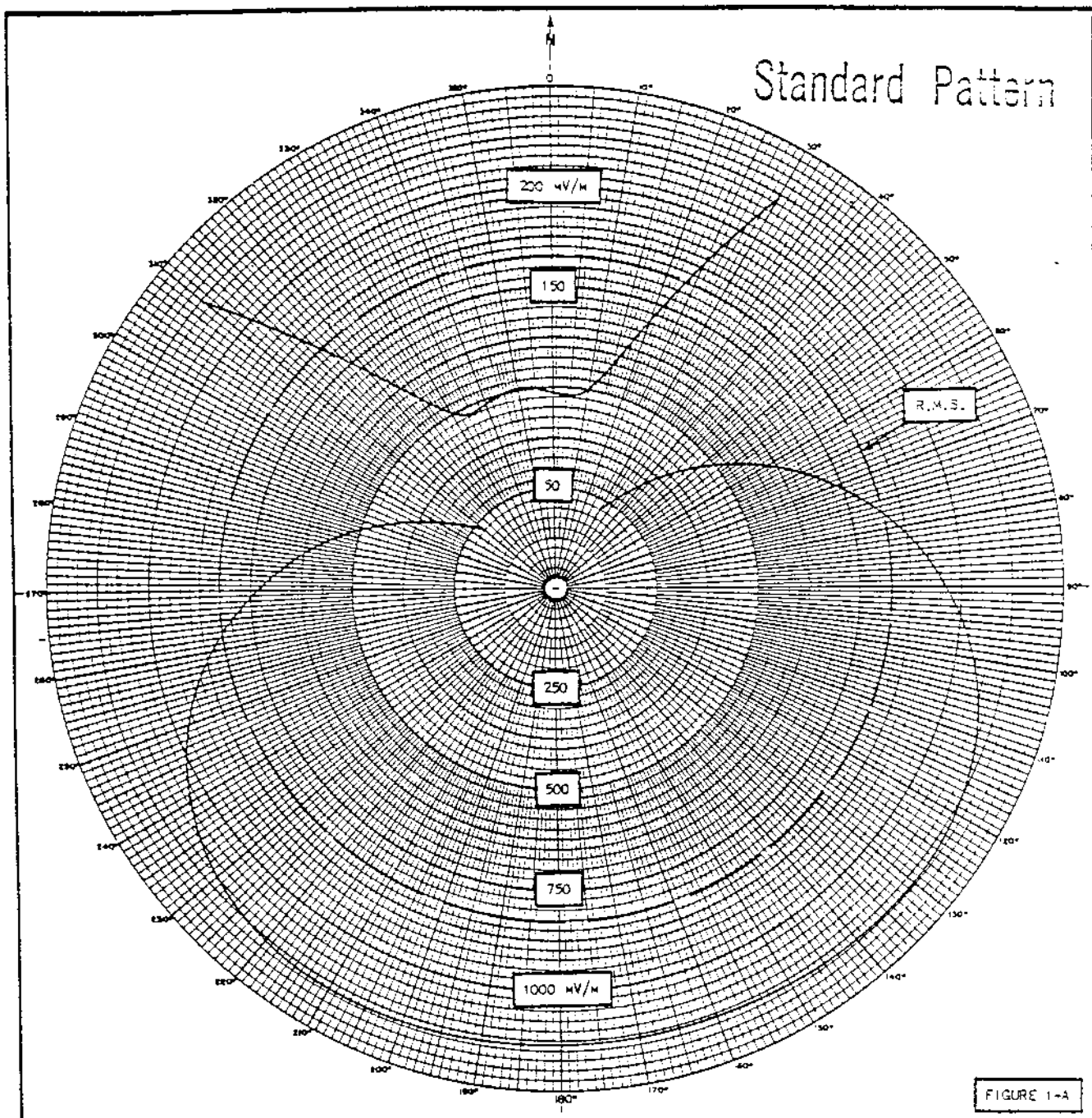
2.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL		STANDARD
	<u>RMS</u>	<u>RSS</u>	<u>RMS</u>
Day	<u>789.9</u> mv/m	<u>772.82</u> mv/m	<u>829.4</u> mv/m

Note:

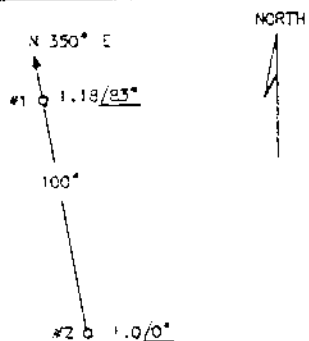
WSLG



STANDARD HORIZONTAL PLANE PATTERN

ERSS : 1,772.82
Q : 19.32

THEORETICAL PARAMETERS



G = 196.7° (BOTH TOWERS)

APPLICANT :	ASCENSION PARISH BCSTNG CO.
LOCATION :	WSLG - GONZALES, LA
FREQUENCY :	1090 KHZ
POWER :	10 KW
LATITUDE :	30 DEG. 15 MIN. 14 SEC.
LONGITUDE :	90 DEG. 56 MIN. 38 SEC.
WHEN USED :	DAYTIME
R.M.S. FIELD :	789.9 mV/m (THEORETICAL)
R.M.S. FIELD :	329.5 mV/m (STANDARD)
DATE :	NOVEMBER 1975

SULLIVAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
711 FOURTEENTH STREET, N. W.
WASHINGTON, D. C. 20008

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Main Studio: Gonzales, Louisiana

Power: 0.5 kW

Class: II

North Latitude: 30° 15' 13"
West Longitude: 90° 56' 34"

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: S(#2) N(#1)

HEIGHT ABOVE
INSULATORS: 493' 493' (196.7°)

PHASING: -80° 0°

FIELD RATIO: 0.76 1.0

SPACING AND

ORIENTATION: Elements are spaced 250.7' (100°) on a line bearing 350° true.

GROUND SYSTEM: 120-190' to 260' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL		STANDARD
<u>RMS</u>	<u>RSS</u>	<u>RMS</u>
176.40 $\mu\text{V/m}$	171.16 $\mu\text{V/m}$	185.33 $\mu\text{V/m}$

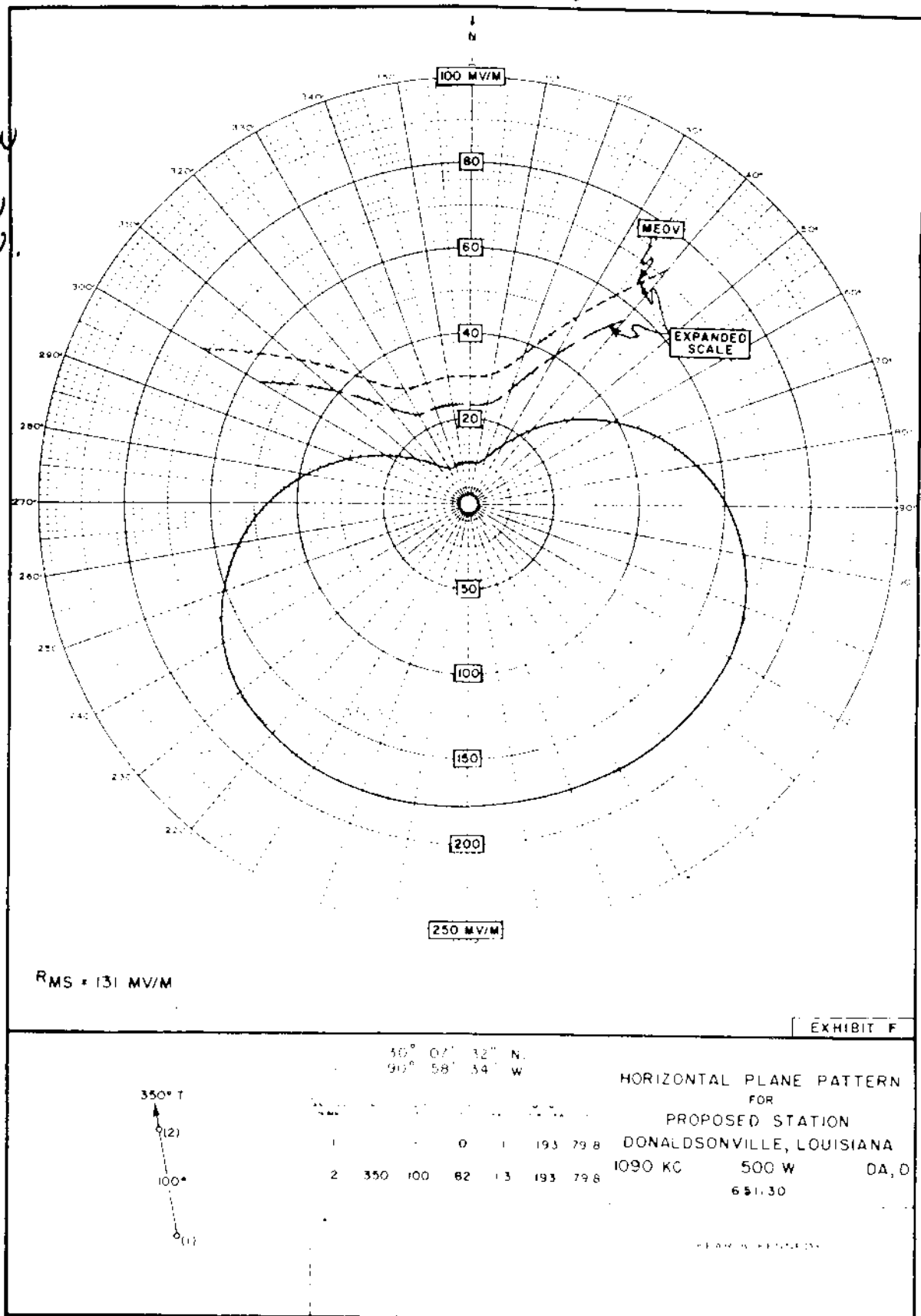
Note: This notification concerns only minor changes in the directional antenna system and radiation pattern.

Proposed Day
(2-28-66ct)

New; Ascension Parish Bcstg. Co.
(Donaldsonville, Louisiana)

500w, DA-D, D
1090 kc

BP-17035
GRANTED
2-15-67
APPLICATION
FOR A CP
FOR A NEW
AM STATION.



FCC File No. BP-17035
Accepted 1-27-66

New; Ascension Parish Bcstg. Co.
Donaldsonville, Louisiana

1090 kc

WSLG

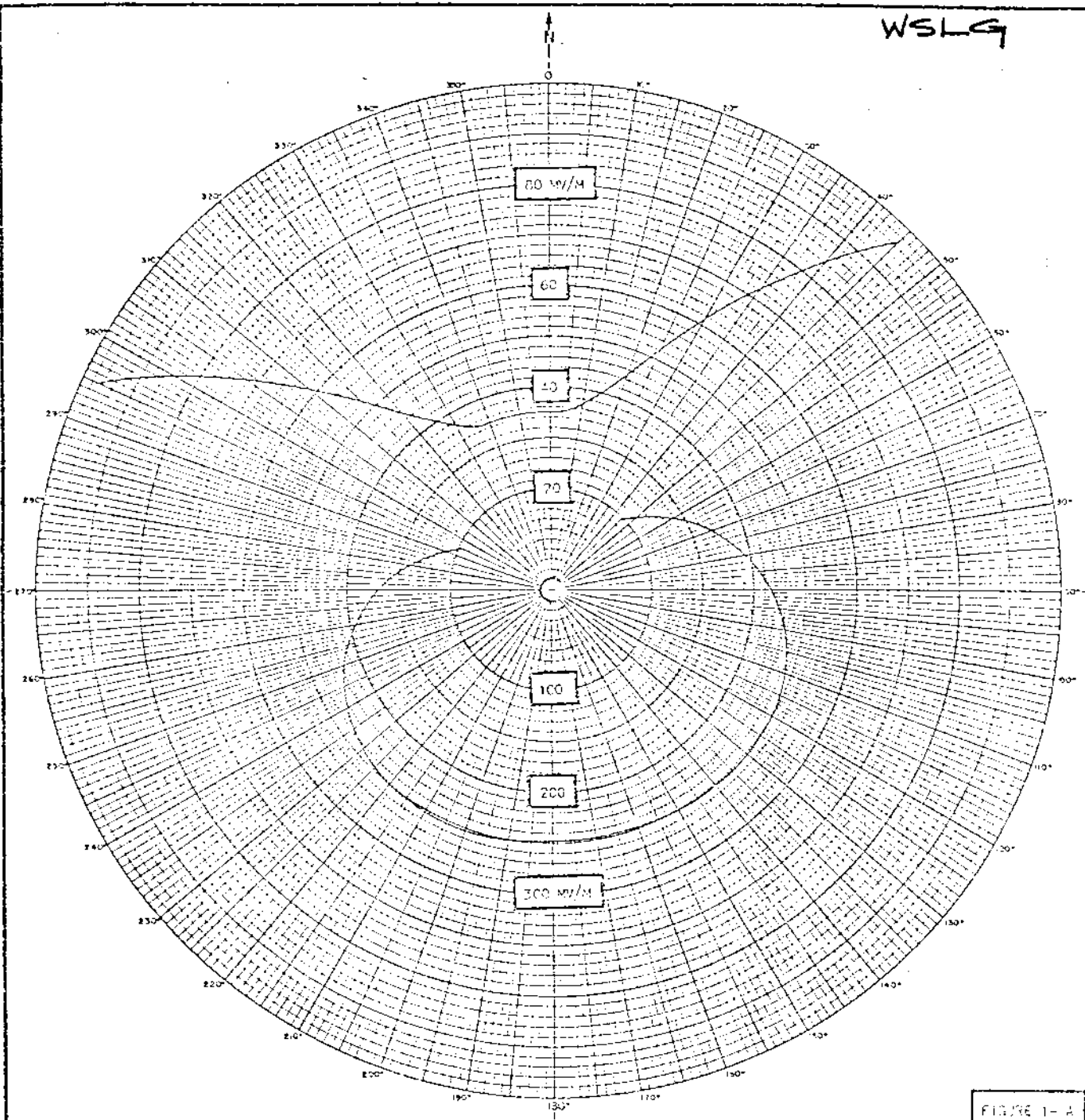
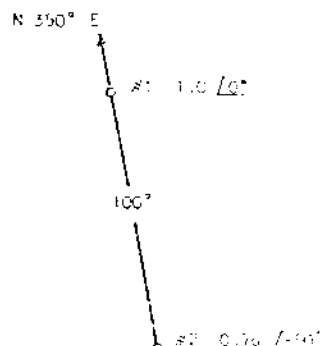


FIGURE 1-A

STANDARD HORIZONTAL PLANE PATTERN

E (S, D) STD = 165.55 MV/M
 F (S, E) TR = 176.40 MV/M
 RSS = 171.16 MV/M
 Q = 6



APPLICANT	ASCENSION PARISH BOATS, CO.
LOCATION	WSLG - GONZALES, LOUISIANA
FREQUENCY	1020 KC/S
POWER	500 WATTS
LATITUDE	30 DEG 15 MIN 13 SEC
LONGITUDE	90 DEG 58 MIN 34 SEC
WHEN USED	DAYTIME
RMS FIELD	165.3 MV/M
DATE	1 OCTOBER 1973

SILLIMAN, MOFFET & KOWALSKI

CONSULTING RADIO ENGINEERS

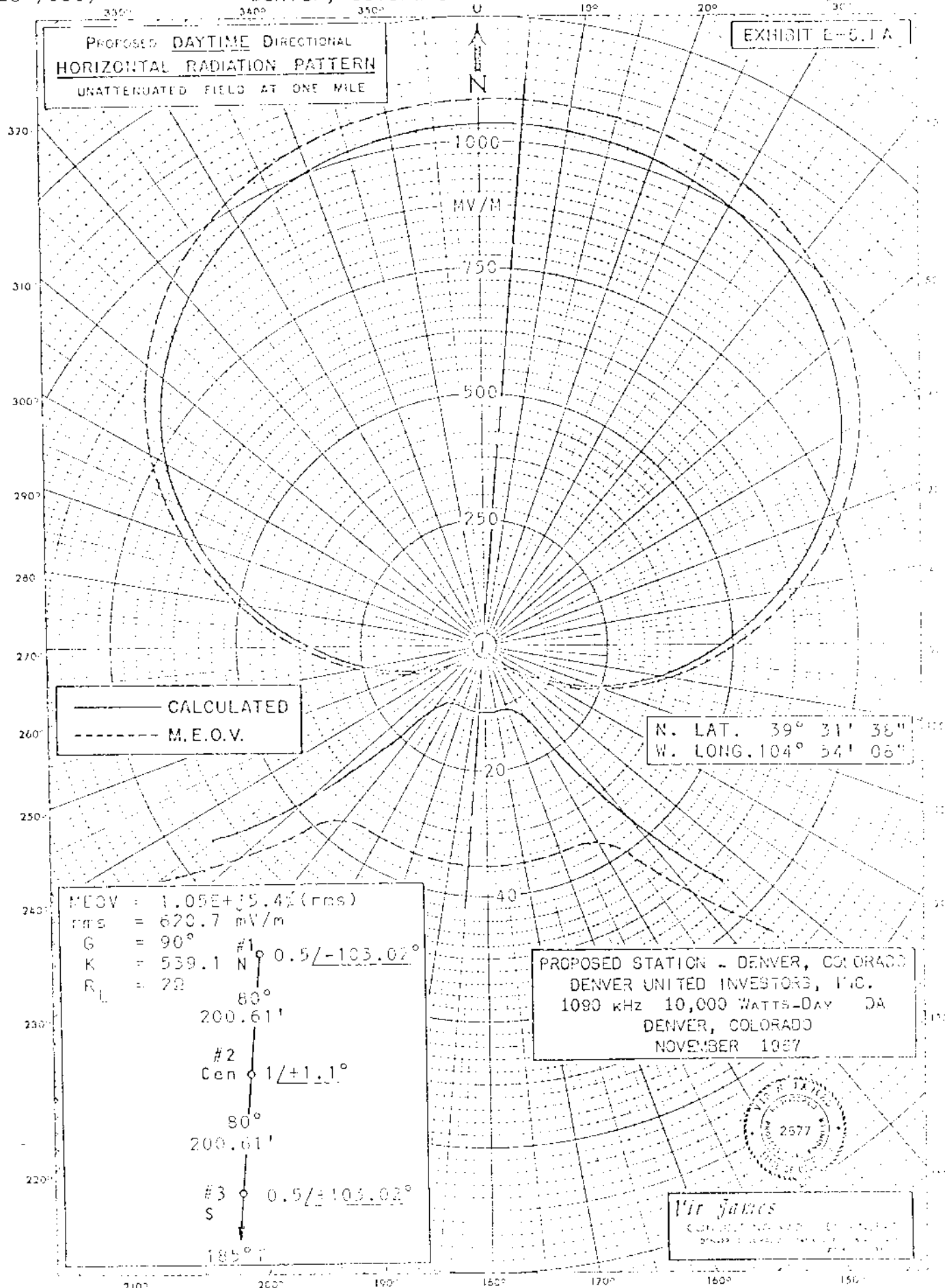
WASHINGTON, D.C.

NEW

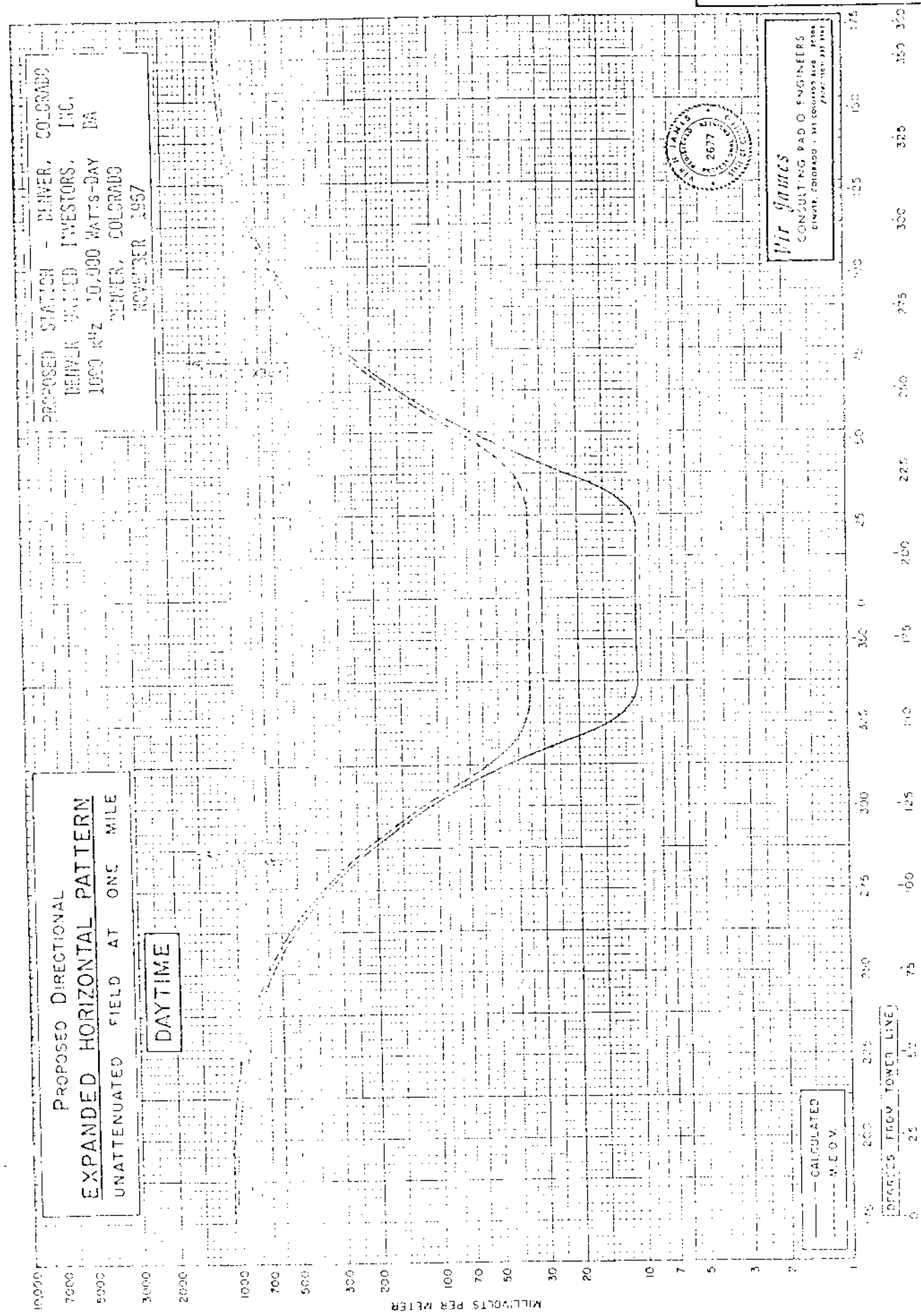
Proposed Day
(1-28-70oct)

New; Denver United Investors Group, Inc.
Denver, Colorado

10kw, DA-D, D
1090 kc



Proposed Day Nulls (1-28-70ct) New; Denver Unit of Investors Group, Inc. 10kw, DA-D, D 1090 kc Denver, Colorado



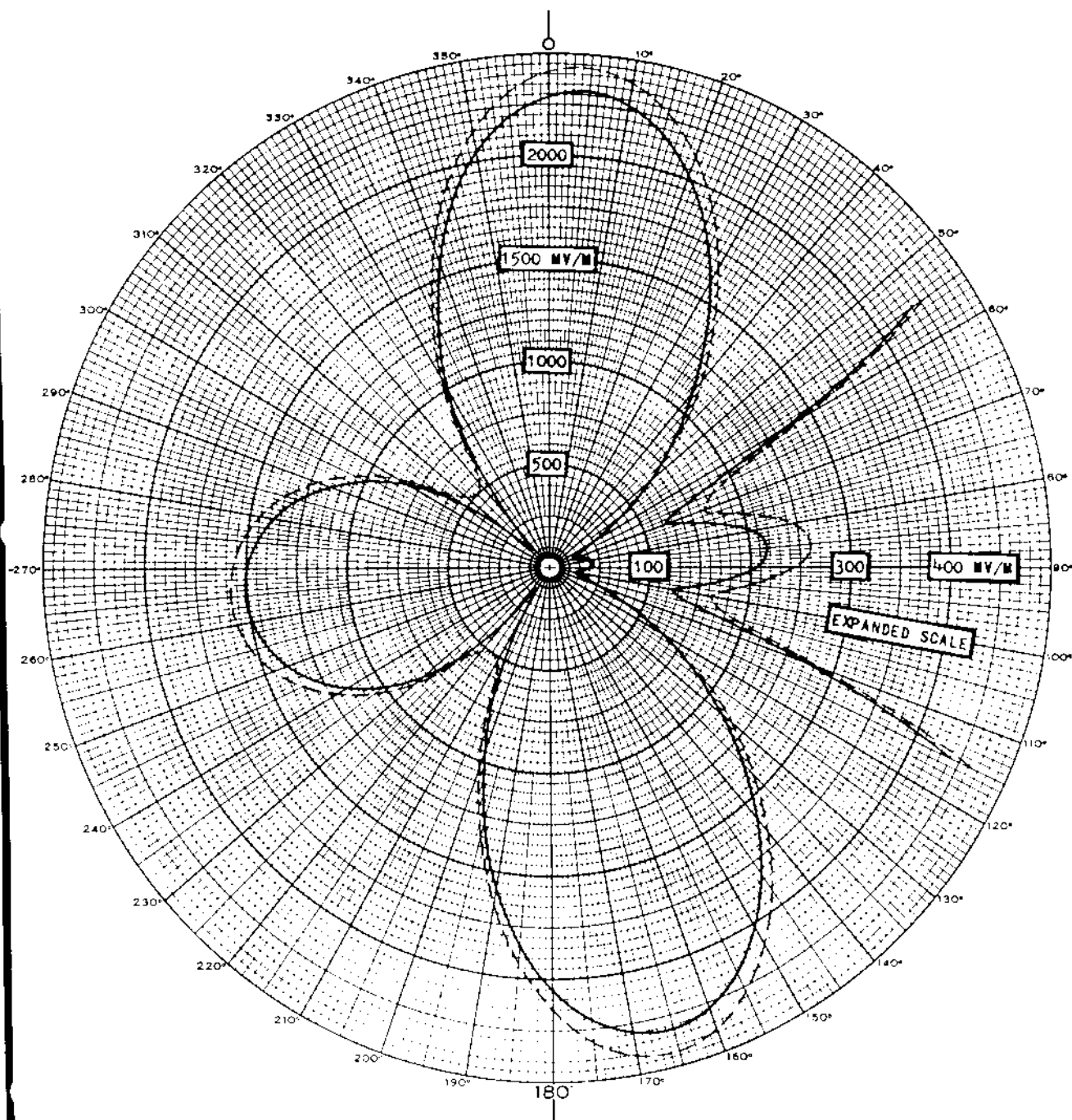
FCC File No. BP-18364 New; Denver United Investors Group, Inc.
Accepted 1-14-70 Denver, Colorado 1090 kc

NEW

Proposed Day
(1-28-70ct)

New; Caprock Radio, Inc.
Lubbock, Texas

50kw, DA-D, D
1090 kc



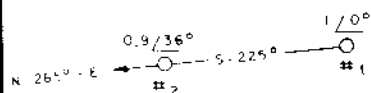
$E_{RMS} = 1350 \text{ MV/M (BY ADJUSTMENT)}$

----- MEOW

LATITUDE: 33° 37' 30"

LONGITUDE 101° 53' 37.5"

ANTENNA PARAMETERS



HORIZONTAL PLANE
PATTERN PROPOSED
STATION: LUBBOCK,
TEXAS 1090 KC
DAYTIME ONLY
50 KILOWATTS

El Paso, Texas
San Antonio, Texas
El Paso, Texas

FCC File No. BP-18482
Accepted 1-15-70

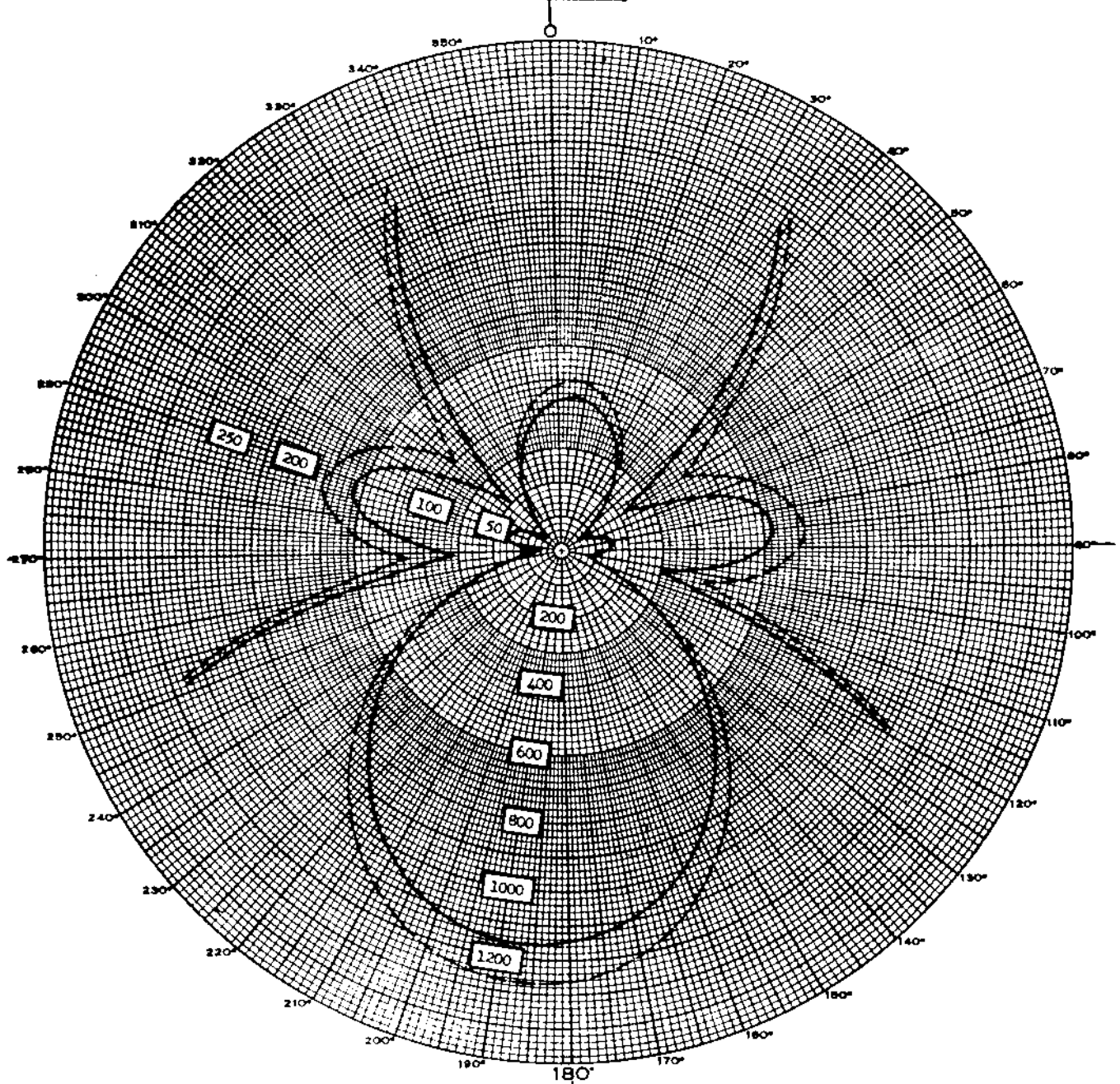
New; Caprock Radio, Inc.
Lubbock, Texas

1090 kc

Proposed Day
(5-25-67ct)

New; Heart of Dixie Broadcasting Co.
Sylacauga, Alabama

10kw, DA-0, D
1090 kc



--- MBOV

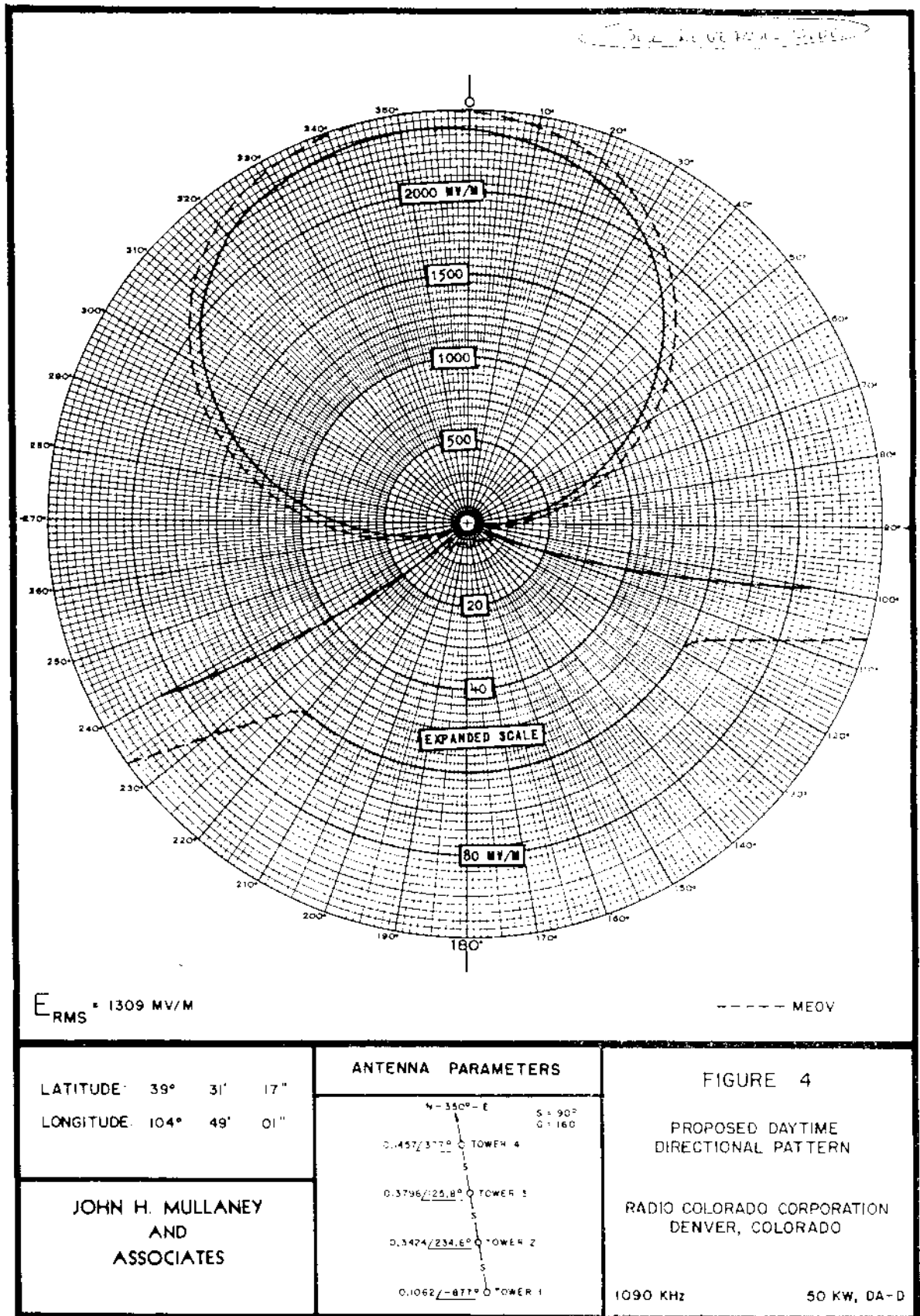
TOWER PLACEMENT SKETCH		PATTERN PARAMETERS								STATION DATA		
	TOWER	ELECTRICAL HEIGHT	TRUE TOWER ORIENTATION	SPACING	PHASING	HORIZONTAL FIELD	FIELD RATIO	ELEV. ANGLE	ELEVATION RMS FIELD	CALL	F	F
	No.	ft	°	ft	°	°		°	μV/m			
	1	90°	000°	000°	-160.65°	0.658	0	568.8	FREQUENCY	1090	kc	
	2	90°	006°	080°	000°	1.00	10		POWER	10.0	kw	
	3	90°	006°	160°	+162.49°	0.503	20		TIME OF OPERATION	Daytime		
	4						30		TYPE OF OPERATION	DA		
	5						40		DAYTIME TOWERS	1-2-3		
	6						50		NIGHTTIME TOWERS	X-X-X		
	7						60		No. RADIALS PER TOWER	120		
	8						70		LENGTH OF RADIALS	100 to 825	ft	
9						80		GROUND SCREEN DIMENSIONS	11' x 48'			
10						90		LAT.	33° 13'	N		
						100		LONG.	86° 11'	W		
										SUPERSEDES		
										P. = 10.0 db		
										PATTERN No. 670210A		

CLAUDE M. GRAY
CONSULTING RADIO ENGINEER
BIRMINGHAM, ALA.

EXHIBIT
1-A-6
00° ELEVATION

PROPOSED HORIZONTAL RADIATION PATTERN
HEART OF DIXIE BROADCASTING COMPANY
SYLACAUGA, ALABAMA

50kw, DA-D, D
1090 kc

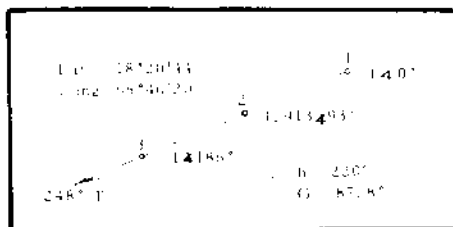
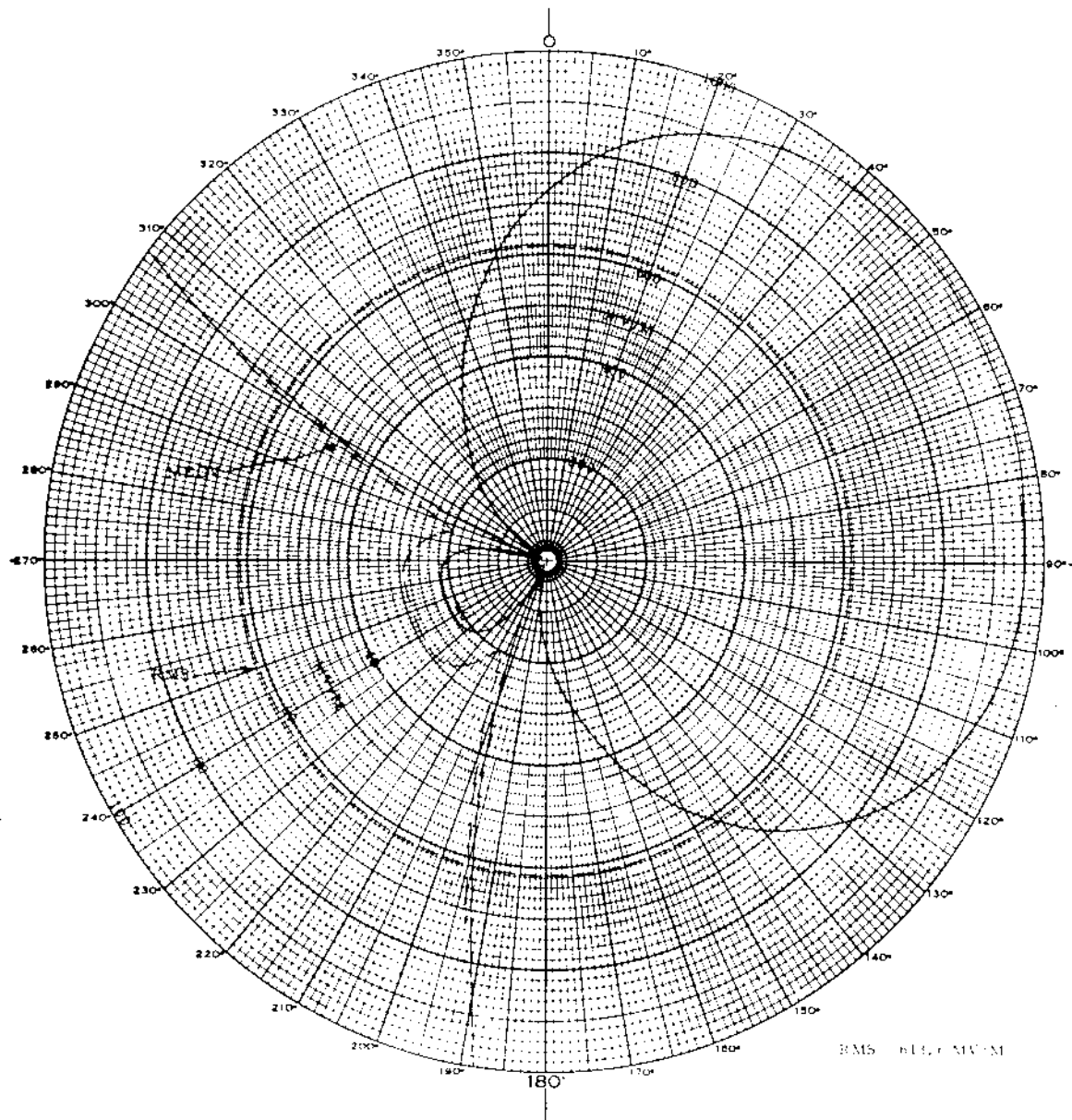


1090 kc

Proposed Day
(12-27-68ct)

New; Fajardo Broadcasting Corp.
Fajardo, Puerto Rico

10kw, DA-D, D
1090 kc



WILLIS C. BECHER
CONSULTING ENGINEER
WAFAPRION, C. C.

Figure 6
Calculated Horizontal Plane Pattern
Proposed Station
Fajardo, Puerto Rico
1090Kc 10Kw D, DA-D
April 1968

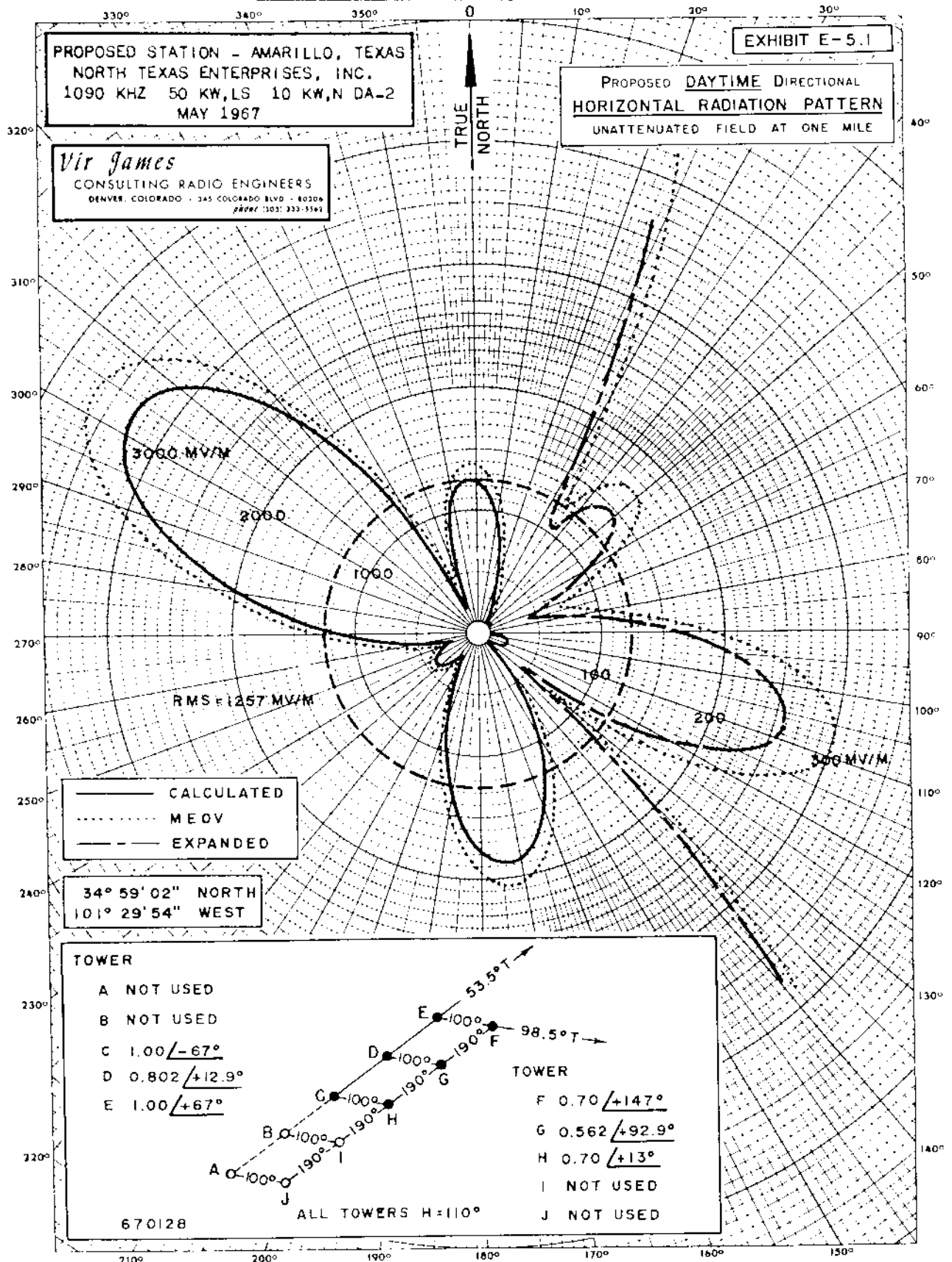
FCC File No. BP-18324
Accepted 11-29-68

New; Fajardo Broadcasting Corp.
Fajardo, Puerto Rico

1090 kc

Proposed Day
(5-28-68ct)

New; North Texas Enterprises, Inc. 10kw, 50kw-LS, DA-2, U
Amarillo, Texas 1090 kc



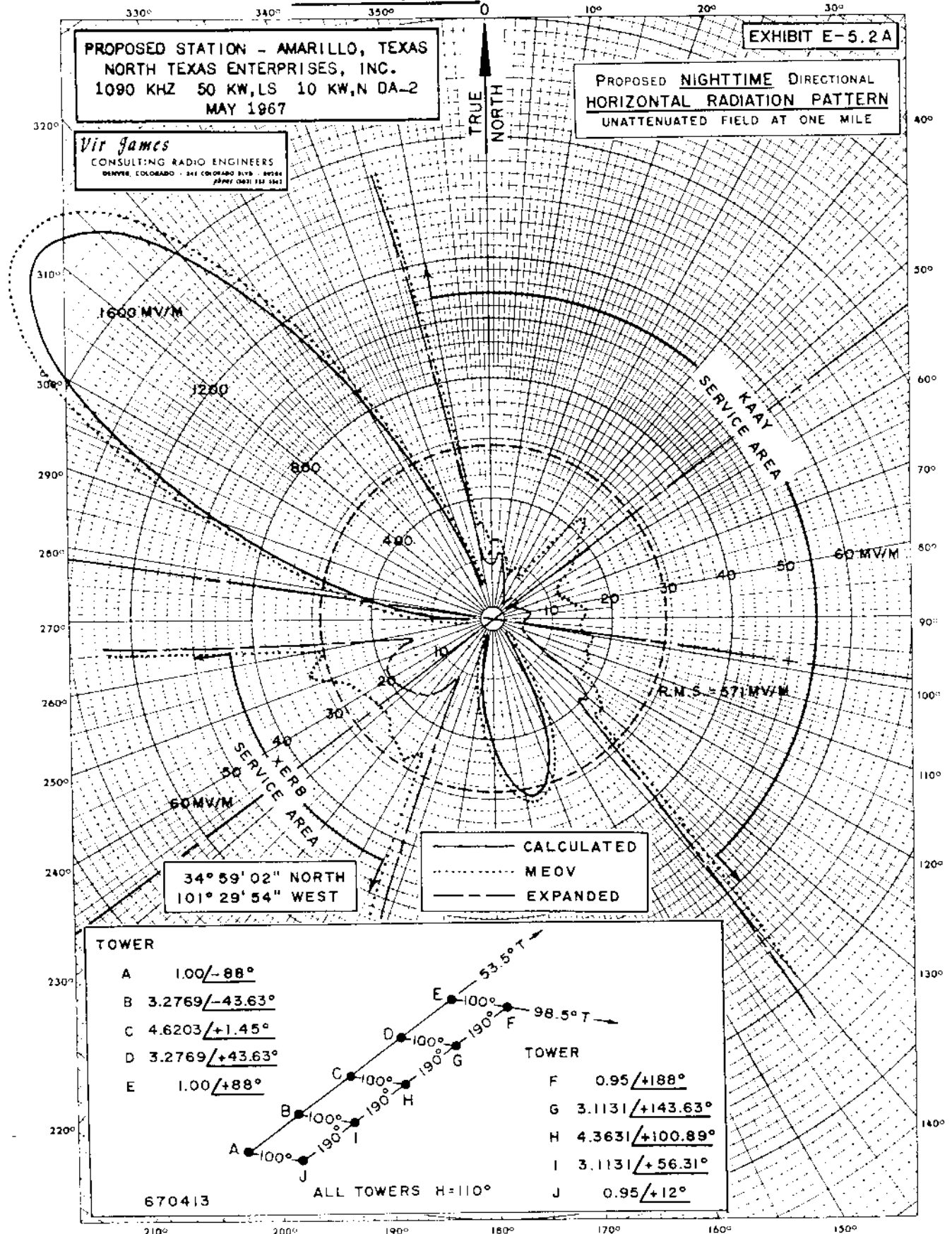
FCC File No. BP-18118
Accepted 5-21-68

New; North Texas Enterprises, Inc.
Amarillo, Texas

1090 kc

Proposed Night
(5-28-68ct)

New; North Texas Enterprises, Inc. 10kw, 50kw-LS, DA-2, U
Amarillo, Texas 1090 kc



FCC File No. BP-18118
Accepted 5-21-68

New; North Texas Enterprises, Inc.
Amarillo, Texas

1090 kc

Proposed Night Nulls
(5-28-68ct)

New; North Texas Enterprises, Inc. 10kw, 50kw-LS, DA-2, U
Amarillo, Texas 1090 kc

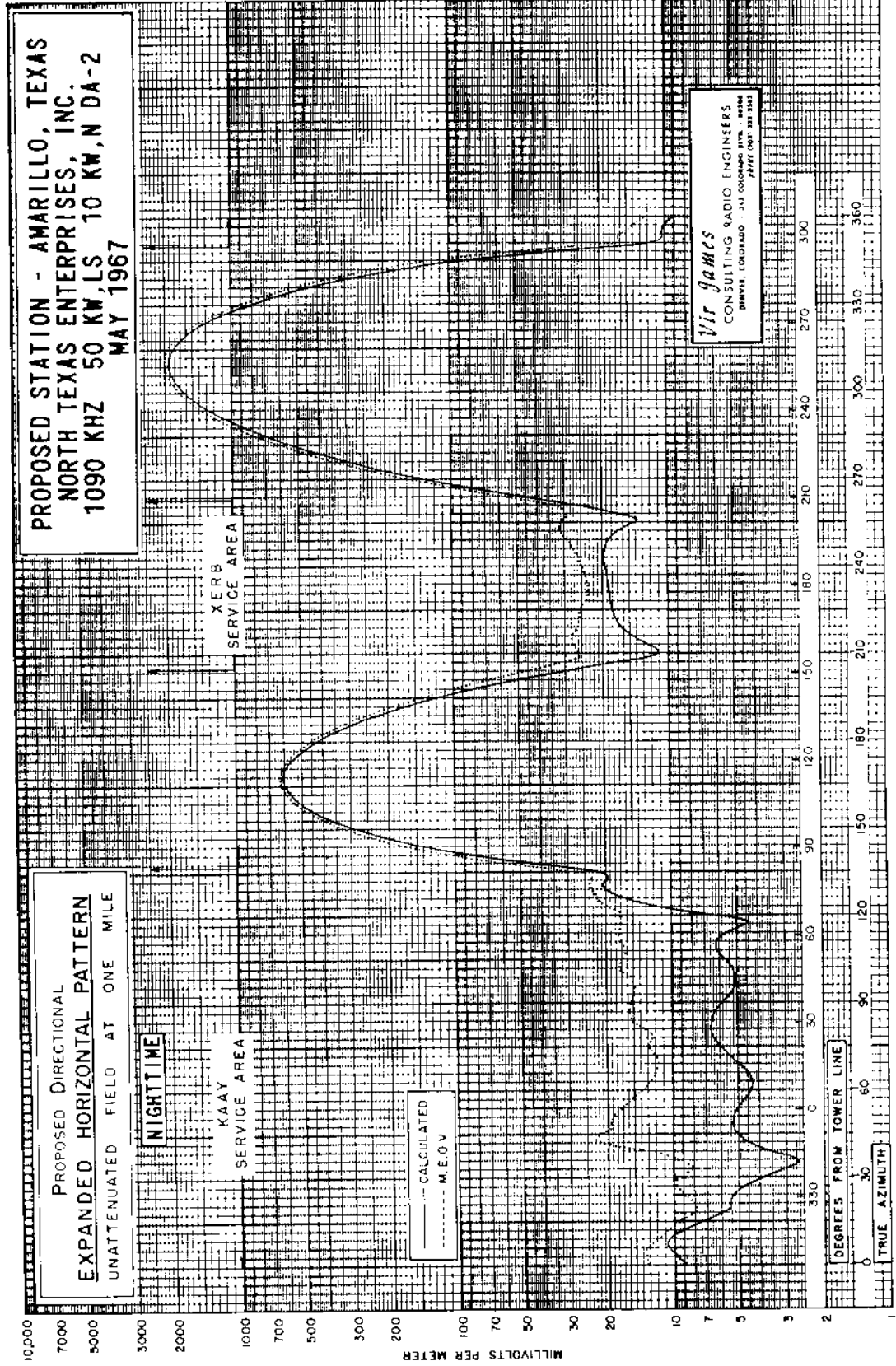


EXHIBIT E-5.2B

NEW

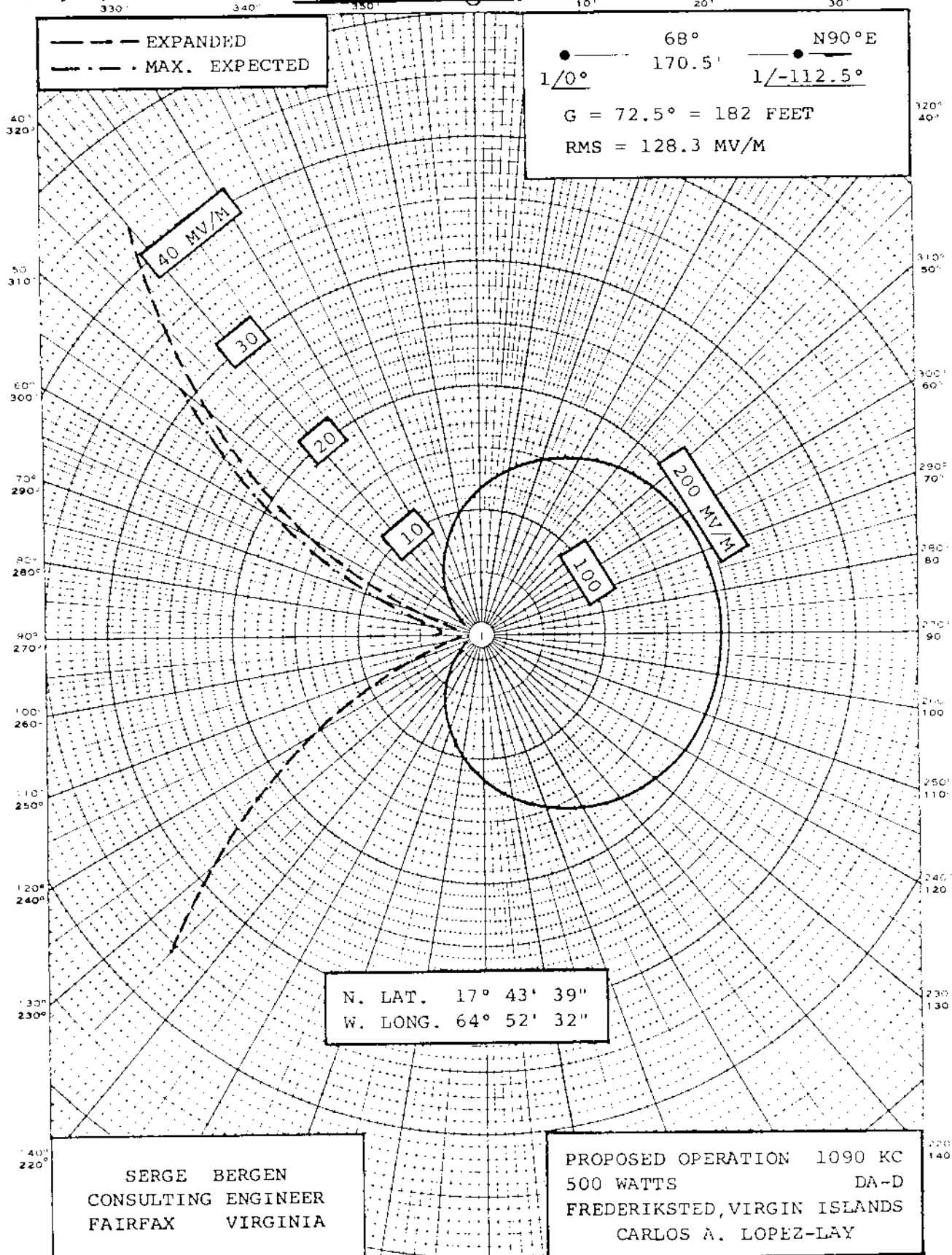
Proposed Day
(8-22-69ct)

New; Carlos A. Lopez-Lay
Frederiksted, St. Croix, V.I.

500w, DA-D, D
1090 kc

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

NO. 340-B DIETZGEN GRAPH PAPER
POLAR CO-ORD



FCC File No. BP-18486
Accepted 8-13-69

New; Carlos A. Lopez-Lay
Frederiksted, St. Croix, V.I.

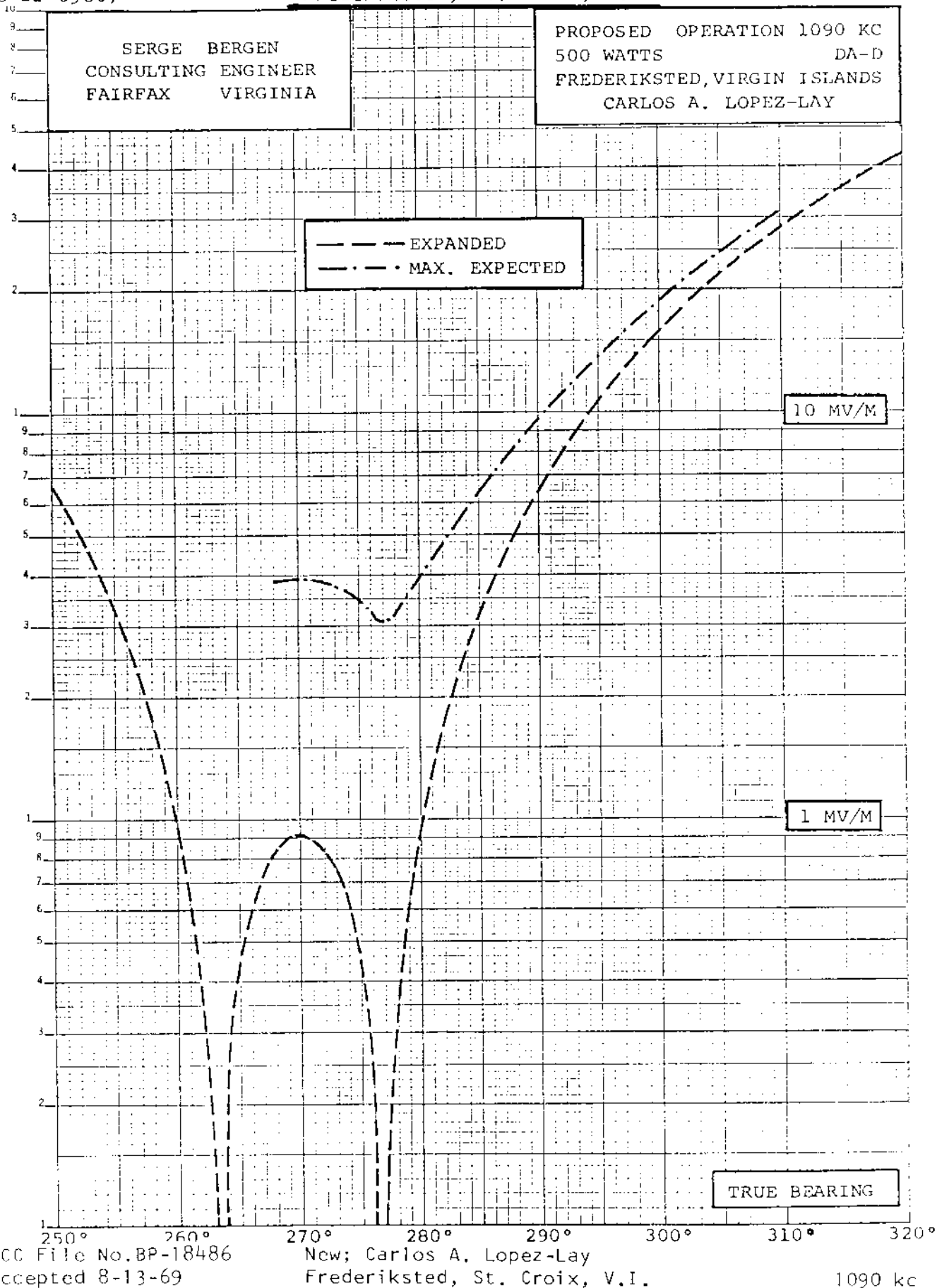
1090 kc

Proposed Day Nulls
(8-22-69ct)

New; Carlos A. Lopez-Lay
Frederiksted, St. Croix, V.I.

500w, DA-D, D
1090 kc

45 5490
RECEIVED
FEDERAL BUREAU OF INVESTIGATION
U.S. DEPARTMENT OF JUSTICE



XEOD

DESCRIPTION SHEET
(6-20-58g)

Station XEOD 1kw, DA-N,U, Class II
Veracruz, Veracruz, Mexico 1090 KC

Oficina Interamericana de Radio - PAU
OIR/NARBA 2049 Mexico / C. 2114
La Habana. 8. IV. 58.-

DESCRIPCION DEL SISTEMA DIRECCIONAL DE RADIACION.

Operación Nocturna.

ESTACION X.E.O.D.
FRECUENCIA 1090 Khz.
CLASE II.

ESTUDIOS EN Veracruz Ver.
POTENCIA 1000 Watts.
LISTA DE CAMBIOS 201

FECHA Marzo 12, 1957.

LOCALIZACION GEOGRAFICA DEL
SISTEMA RADIADOR
AUTORIZADO PARA OPERACION
NUMERO DE ELEMENTOS RADIADORES
TIPO DE ELEMENTOS RADIADORES
TORRES
ALTURA SOBRE AISLADORES
SEPARACION ENTRE TORRES
MAGNITUDES RELATIVAS DE CORRIEN-
TES
DEFASAMIENTO
AZIMUT DEL EJE DE LAS TORRES
RAIZ CUADRATICA MEDIA TEORICA
INTENSIDAD DE CAMPO R.C.M. NO
ATENUADO A UN KILOMETRO POR KI
LOWATT DE POTENCIA RADIADA.

LONGITUD: 96°-09'-55" W
LATITUD: 19°-12'-25" N
Continua AD-N.
DOS
Torres Verticales.
Norte Sur.
68.80 Mts. 90°
76.45 Mts. 100°
1 1
90° 0°
345°
175 mV/m

175 mV/m.

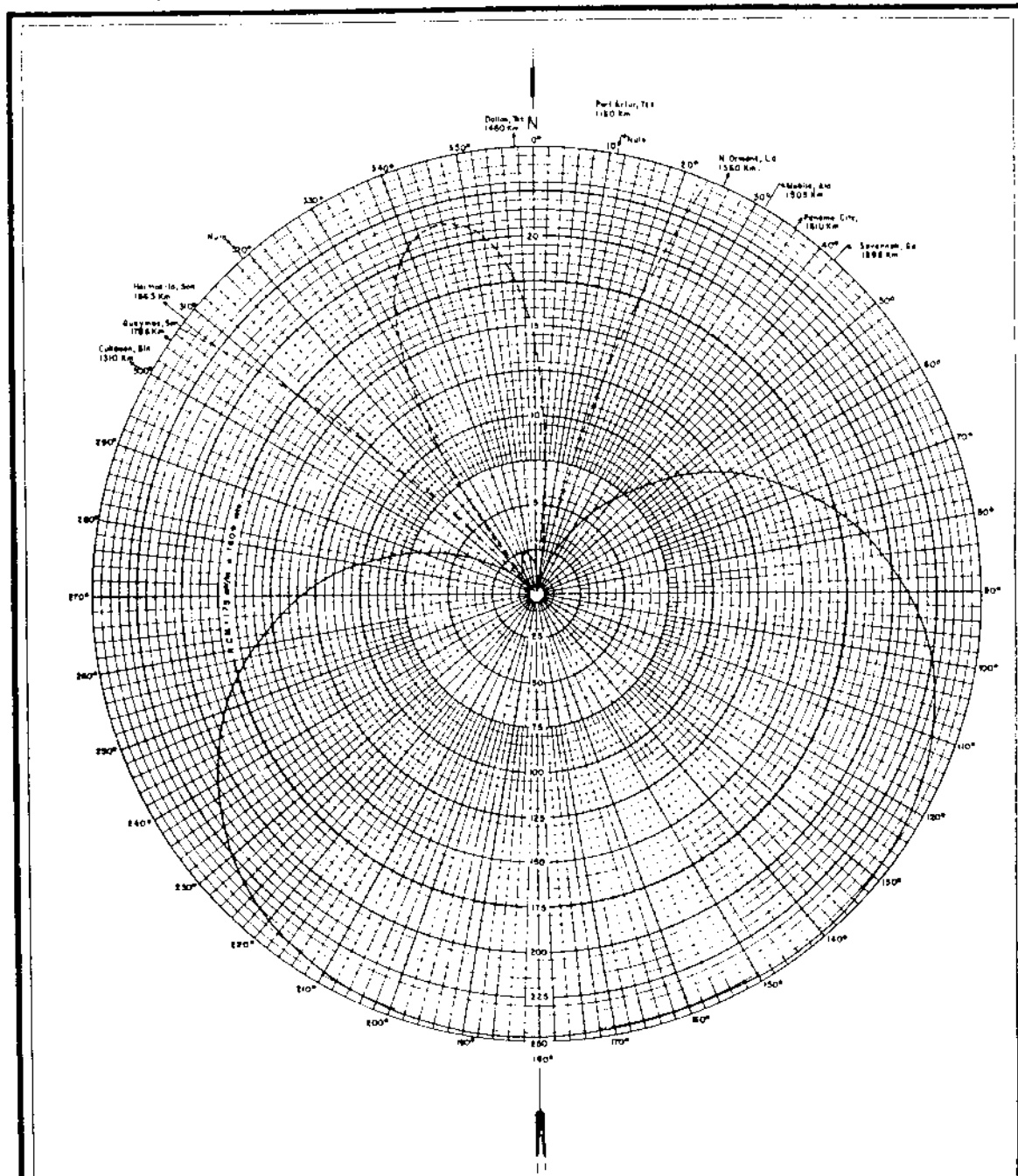
APPROBO:
RUL

REVISO:
J.

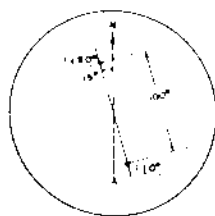
PROPOSED NIGHT
(6-20-58g)

Station XEOD
Veracruz, Veracruz, Mexico

1kw, DA-N,U
1090 KC



PATRON DE RADIACION HORIZONTAL CALCULADO EN mV/m a 1609 m/s.



X E O D

CONGREGACION DE VERGARA, VER

1090 KHz.
1000 Watts.

Diseño

MANUEL CASTELLANOS MOLINA
Comunicaciones Electricas

X E O D

DESCRIPTION SHEET
(6-20-58g)

Station XEOD
Veracruz, Veracruz, Mexico

1kw, DA-N, U, Class II
1090 KC

PATRON DE RADIACION EN EL PLANO VERTICAL.

INTENSIDAD DE CAMPO EN mV/m a 1609 mts

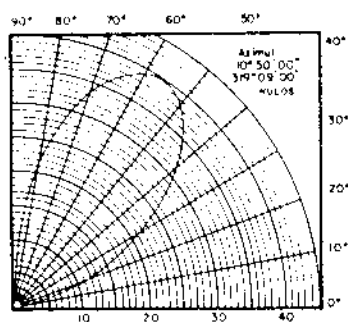


Fig. 1

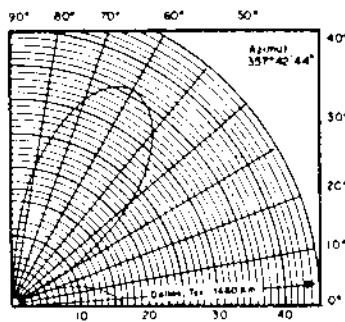


Fig. 2

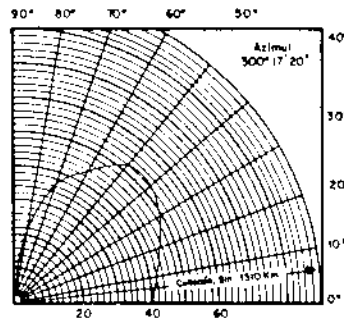


Fig. 3

δ
0°
10°
20°
30°
40°
50°
60°
70°
80°
90°

Fig. 1 Azimut 10° 51' 00" 319° 09' 00" mV/m
0 00
2 87
10 74
21 21
31 43
38 31
39 20
33 11
20 64
00 00

Fig. 2 Azimut 35° 42' 44" mV/m
16 260
12 771
3 291
9 726
22 893
32 645
36 060
31 828
20 319
00 00

Fig. 3 Azimut 300° 17' 20" mV/m
40 689
41 926
45 639
49 574
52 519
52 197
43 683
36 382
21 408
00 00

δ
0°
10°
20°
30°
40°
50°
60°
70°
80°
90°

X E O D

CONGREGACION DE VERGARA, VER.

1090 KHz.
1000 Watts.

Diseño

MANUEL CASTELLANOS MOLINA
Comunicaciones Eléctricas

DESCRIPTION SHEET
(6-20-58g)

Station XEOD
Veracruz, Veracruz, Mexico

1kw, DA-N,U, Class II
1090 KC

PATRON DE RADIACION HORIZONTAL TABULADO

XEOD

1000 Watts.

1090 KHz.

Congregación de Vergara, Ver.

$$E = 247.45 f(\theta) \cos \left[\frac{ka}{2} \cos \psi + \frac{\theta}{2} \right]$$

Para $\theta = 0^\circ$

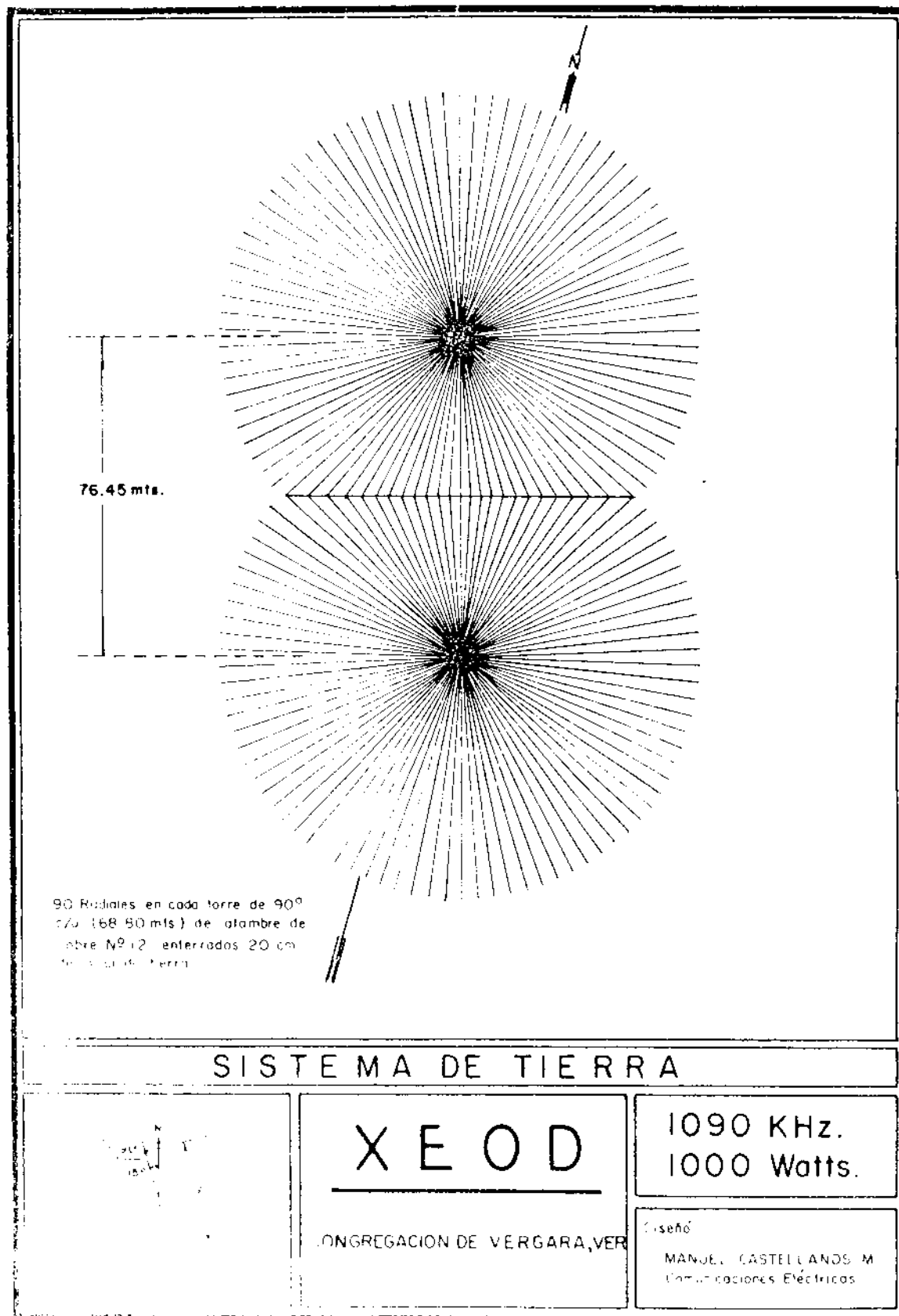
(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
ψ	$\cos \psi$	$ka/2 \cos \psi$	$ka/2 \cos \psi + \frac{\theta}{2}$	$\cos (IV)$	$247.45 \times (V/m)$	Azimuth = $\psi - 15^\circ$
0°	1.000	50°	95°	-0.0872	21.490	345°
$5^\circ - 355^\circ$	0.9962	49.810°	$94^\circ 49'$	-0.0840	20.786	$350^\circ - 340^\circ$
$15^\circ - 345^\circ$	0.9659	48.295°	$93^\circ 18'$	-0.0575	14.228	$0^\circ - 330^\circ$
$25^\circ - 335^\circ$	0.9063	45.315°	$90^\circ 19'$	-0.0055	1.361	$10^\circ - 320^\circ$
$35^\circ - 325^\circ$	0.8192	40.960°	$85^\circ 58'$	0.0704	17.420	$20^\circ - 310^\circ$
$45^\circ - 315^\circ$	0.7071	35.355°	$80^\circ 21'$	0.1676	41.472	$30^\circ - 300^\circ$
$55^\circ - 305^\circ$	0.5736	28.680°	$73^\circ 41'$	0.2809	69.509	$40^\circ - 290^\circ$
$65^\circ - 295^\circ$	0.4226	21.130°	$66^\circ 08'$	0.4046	100.118	$50^\circ - 280^\circ$
$75^\circ - 285^\circ$	0.2588	12.940°	$57^\circ 56'$	0.5363	132.707	$60^\circ - 270^\circ$
$85^\circ - 275^\circ$	0.0872	4.360°	$49^\circ 22'$	0.6514	161.189	$70^\circ - 260^\circ$
$95^\circ - 265^\circ$	-0.0872	-4.360°	$40^\circ 38'$	0.7589	187.789	$80^\circ - 250^\circ$
$105^\circ - 255^\circ$	-0.2588	-12.940°	$32^\circ 04'$	0.8474	209.689	$90^\circ - 240^\circ$
$115^\circ - 245^\circ$	-0.4226	-21.130°	$23^\circ 52'$	0.9145	226.293	$100^\circ - 230^\circ$
$125^\circ - 235^\circ$	-0.5736	-28.680°	$16^\circ 19'$	0.9597	237.478	$110^\circ - 220^\circ$
$135^\circ - 225^\circ$	-0.7071	-35.355°	$9^\circ 39'$	0.9858	243.936	$120^\circ - 210^\circ$
$145^\circ - 215^\circ$	-0.8192	-40.960°	$4^\circ 02'$	0.9976	246.856	$130^\circ - 200^\circ$
$155^\circ - 205^\circ$	-0.9063	-45.315°	$-0^\circ 19'$	1.000	247.450	$140^\circ - 190^\circ$
$165^\circ - 195^\circ$	-0.9659	-48.295°	$-3^\circ 18'$	0.9983	247.029	$150^\circ - 180^\circ$
$175^\circ - 185^\circ$	-0.9962	-49.810°	$-4^\circ 49'$	0.9964	246.559	$160^\circ - 170^\circ$
$180^\circ -$	-1.000	-50°	-5°	0.9962	246.509	165°

XEOD

DESCRIPTION SHEET
(6-20-58g)

Station XEOD
Veracruz, Veracruz, Mexico

1kw, DA-N,U, Class II
1090 KC



1. VISTA LA TORRE

Description Sheet
(8-23-63ct)

Station XERB
Rosarito, Baja California, Mexico

50kw, DA-N, U, Class II
1090 kc

INTERAMERICANA DE RADIO, S. A.

X E R B

ROSARITO

50,000
WATTS

TEJUNA BAJA CALIFORNIA

DESCRIPCION DEL SISTEMA DIRECCIONAL DE RADIACION

{ Operación.....AD-N.....}...#

ESTACION XERB

ESTUDIOS EN Rosarito, B. C.

FRECUENCIA 1090 Khz

POTENCIA 50,000 Watts

CLASE FE

LISTA DE CAMBIOS

(Para llenarse por la Dirección --
Gral. de Telecomunicaciones).

FECHA

(Para llenarse por la Dirección --
Gral. de Telecomunicaciones).

LOCALIZACION GEOGRAFICA DEL
SISTEMA RADIADOR

LONGITUD: 117°05' 00 W.

LATITUD: 32° 25' 30" N.

AUTORIZADO PARA OPERACION

NOCTURNA

NUMERO DE ELEMENTOS RADIADO
RES.

3 elementos

TIPO DE ELEMENTOS RADIADORES

Verticales soportadas con rete-
nidas.

TORRES

ALTURA SOBRE LOS AISLADORES

136 Mts. 180°

SEPARACION ENTRE TORRES

141.44 Mt. (185°)

MAGNITUDES RELATIVAS DE CO-
RRIENTES.

1.00 2.00 1.00

DEFASAMIENTO

0.0 0.0 0.0

AZIMUT DEL EJE DE LAS TORRES

N 65° 00' 00" E

RAIZ CUADRATICA MEDIA TEORICA

1600 mv/m/milla

INTENSIDAD DE CAMPO R.C.M. NO
ATENUADO A UN KILOMETRO POR -
KILOWATT DE POTENCIA RADIADA.

213 mv/m

DESCRIPTION SHEET
[Figure 1]

Station XERB 50kw, DA-N,U
Rosarito, Baja California, Mexico

1090 KC

ASSOCIATE ENGINEERS

A. PETERSON
C. M. DANIELL
R. L. HAMMETT
J. G. ROUNTREE

A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEERS
HIGHLAND PARK VILLAGE
DALLAS 5, TEXAS

SPECIFICATIONS OF PROPOSED ANTENNA FOR STATION XERB

FREQUENCY	1090 KILOCYCLES
RATED POWER	50,000 WATTS DIRECTIONAL
NUMBER OF TOWERS	3 TOWERS
TYPE OF TOWERS	GUYED UNIFORM CROSS SECTION
TOWER BASE WIDTH	1% OF TOWER HEIGHT
TYPE OF FEED	SERIES FEED
TOWER HEIGHT ABOVE INSULATOR	136.0 METERS - 446' 10"
TOWER HEIGHT ABOVE GROUND	137.5 METERS
LINE OF TOWERS	SEE FIGURE 4
TOWER SPACING	SEE FIGURE 4
GROUND SYSTEM	SEE FIGURE 4
TOWER FIELD RATIO	SEE FIGURE 3
TOWER FIELD PHASE	SEE FIGURE 3

LOCATION

ROSARITO, B. C.

N. LAT.	32° 18' 00"
W. LONG.	117° 01' 05"

DIRECTIONAL ANTENNA DESIGN FORMULAE

$$F(E): M_x + 2M_y \cos(U_y - S_y \cos \theta \cos \phi)$$

$$F(\theta): \frac{\cos(G \sin \theta) - \cos G}{\cos \theta (1 - \cos G)}$$

$$K: R.M.S. / R.M.S.$$

$$E: F(E) \times F(\theta) \times K$$

WHERE:

- E IS FIELD INTENSITY IN MILLIVOLTS PER METER AT ONE MILE
K IS FACTOR ADJUSTING R.M.S. OF CALCULATED PATTERN TO
R.M.S. IN MV/M EXPECTED FROM THE ARRAY
M_x IS CURRENT RATIO OF CENTER TOWER WITH RESPECT TO UNIT VECTOR
M_y IS CURRENT RATIO OF END TOWERS WITH RESPECT TO UNIT VECTOR
U_y IS PHASE DIFFERENCE BETWEEN CENTER TOWER AND END TOWERS
S_y IS DISTANCE FROM CENTER TOWER TO END TOWERS
Φ IS ANGLE FROM LINE OF TOWERS TO RADIATION VECTOR
θ IS ANGLE FROM HORIZONTAL TO RADIATION VECTOR
G IS HEIGHT OF THE TOWERS.

DESCRIPTION SHEET
[Figure 3]

Station XERB 50kw, DA-N,U
Rosarito, Baja California, Mexico

1090 KC

DIRECTIONAL ANTENNA CALCULATIONS

GIVEN:

RATED POWER	50,000	WATTS
M_x	2.00	
M_y	1.00	
θ_y	0.0	DEGREES
S_y	185	DEGREES
G	180	DEGREES

ASSUMED:

TOTAL PROBABLE LOSSES	7.5	PERCENT
CURRENT DISTRIBUTION		SINUSOIDAL

EXPECTED RESULTS:

TOWER NUMBER	(1)	(2)	(3)
TOWER LOCATION	WEST	CENTER	EAST
TOWER FIELD RATIO	1.0	2.0	1.0
TOWER FIELD PHASE	0.0	0.0	0.0 DEGREES

R.M.S. FIELD 1600 MILLIVOLTS PER METER

R.M.S. VECTOR 1.994 VECTOR UNITS

R.M.S. / R.M.S. K IS 803

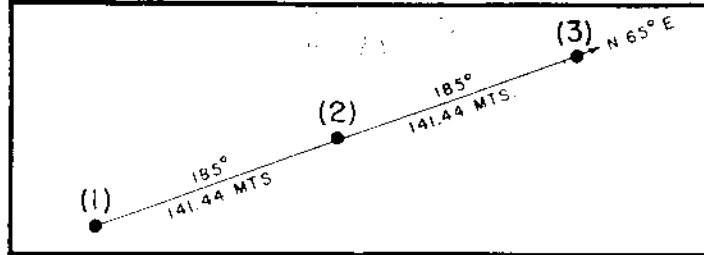
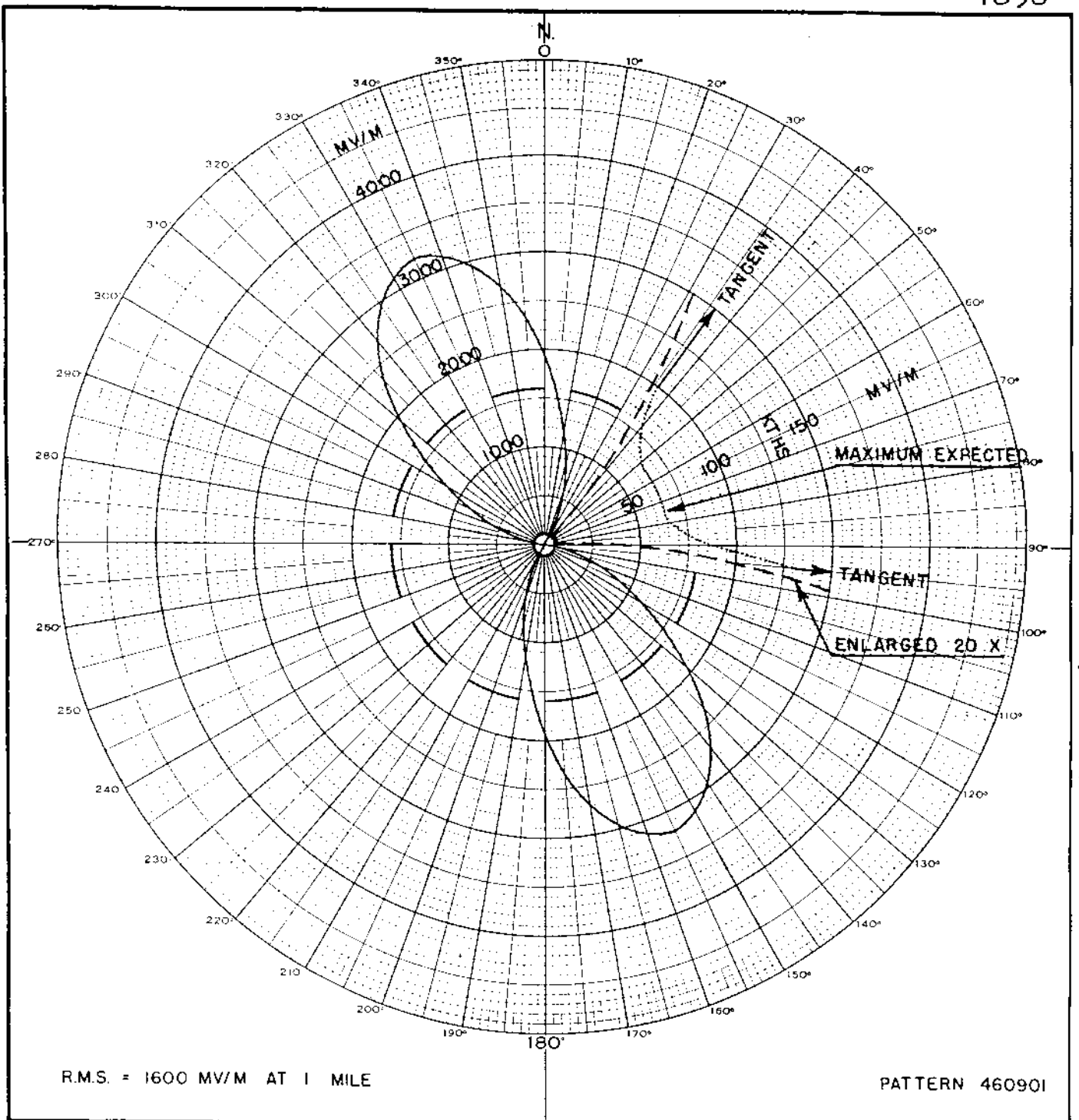
FIELD INTENSITY)
AT ONE MILE IN) E IS $F(E) \times F(\theta) \times 803$ MV/M
ANY DIRECTION)

A: 240 COPPER RADIALS 25 METERS LONG BURIED 5 TO 10 CM.
120 RADIALS EXTEND TO 138 METERS OR POINT OF OVERLAP
BURIED 15 TO 20 CM.

B: 10 CM. COPPER STRAP AROUND EACH TOWER AT RADIUS OF
25 METERS.

C: 10 CM. COPPER STRAP BETWEEN THE OVERLAPPING RADIALS.

D: 10 CM. COPPER STRAP BETWEEN THE TOWERS.



A. EARL CULLUM, JR.
CONSULTING RADIO ENGINEERS
DALLAS TEXAS

TOWER	(1)	(2)	(3)
FIELD	1.00	2.00	1.00
PHASE	0.0°	0.0°	0.0°

RADIO STATION XERB
PROPOSED 1090 KC. 50 KW. DA.
FIGURE 5A

DESCRIPTION SHEET
[Figure 5B]

Station XERB 50kw, DA-N,U
Rosarito, Baja California, Mexico

1090 KC

RADIO STATION XERB

1090 KC 50 KW DA

HORIZONTAL RADIATION PATTERN

BEARINGS	Φ	F (E)	E (MV/M)
245-065	00	0.0076	6.1
240-250-060-070	05	0.0054	4.3
235-255-055-075	10	0.0014	1.1
230-260-050-080	15	0.0006	0.5
225-265-045-085	20	0.0116	9.3
220-270-040-090	25	0.0460	37.
215-275-035-095	30	0.1194	96.
205-285-025-105	40	0.4300	346.
195-295-015-115	50	1.364	830.
185-305-005-125	60	1.913	1538.
175-315-355-135	70	2.910	2338.
165-325-345-145	80	3.692	2965.
155-335	90	4.000	3212.

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KFAX

Main Studio: San Francisco, California

Frequency: 1100 kHz

Power: 50 kW

Notification List No. 1737

Date: June 9, 1977

Class: II

GEOGRAPHICAL LOCATION OF THE
CENTER OF THE ANTENNA SYSTEM:

North Latitude: 37° 37' 56"

West Longitude: 122° 07' 49"

ANTENNA CHARACTERISTICS

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

Number of elements: 4

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

TOWER:	#1(NW)	#2(NE)	#3(SE)	#4(SW)
HEIGHT ABOVE INSULATORS:	224'	224'	224'	224' (90°)
NIGHT PHASING:	0°	+52	+106°	+54°
NIGHT FIELD RATIO:	1	0.92	0.92	1
DAY PHASING:	0°	+52°	+106°	+54°
DAY FIELD RATIO:	1	0.89	0.89	1

SPACING AND

ORIENTATION: The towers are located at the vertices of a rectangle the long sides of which are 324' (130°) in length on a line bearing 70° true. The short sides are 224' (90°) in length on a line bearing 160° true.

GROUND SYSTEM: 120-224' equally spaced copper radials plus a 32' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of system are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL	STANDARD
Day	$\frac{\text{RMS}}{1458} \text{ mv/m}$	$\frac{\text{RMS}}{-} \text{ mv/m}$
Night	1276 mv/m	1136 mv/m

(Cont'd)

KFXA

2.

Note: Please retain the Daytime directional antenna radiation pattern notified for station KFXA in United States Change List Number 973 dated August 22, 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.

CTR NO 30111A

KFAX

PROPOSED DAY
(4-10-61g)

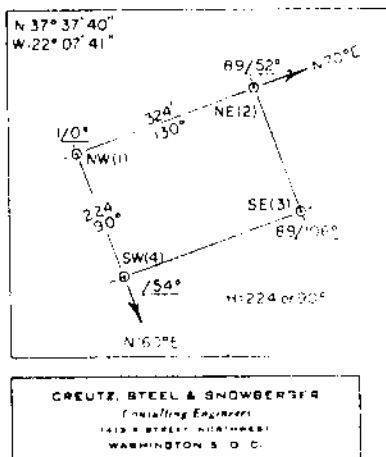
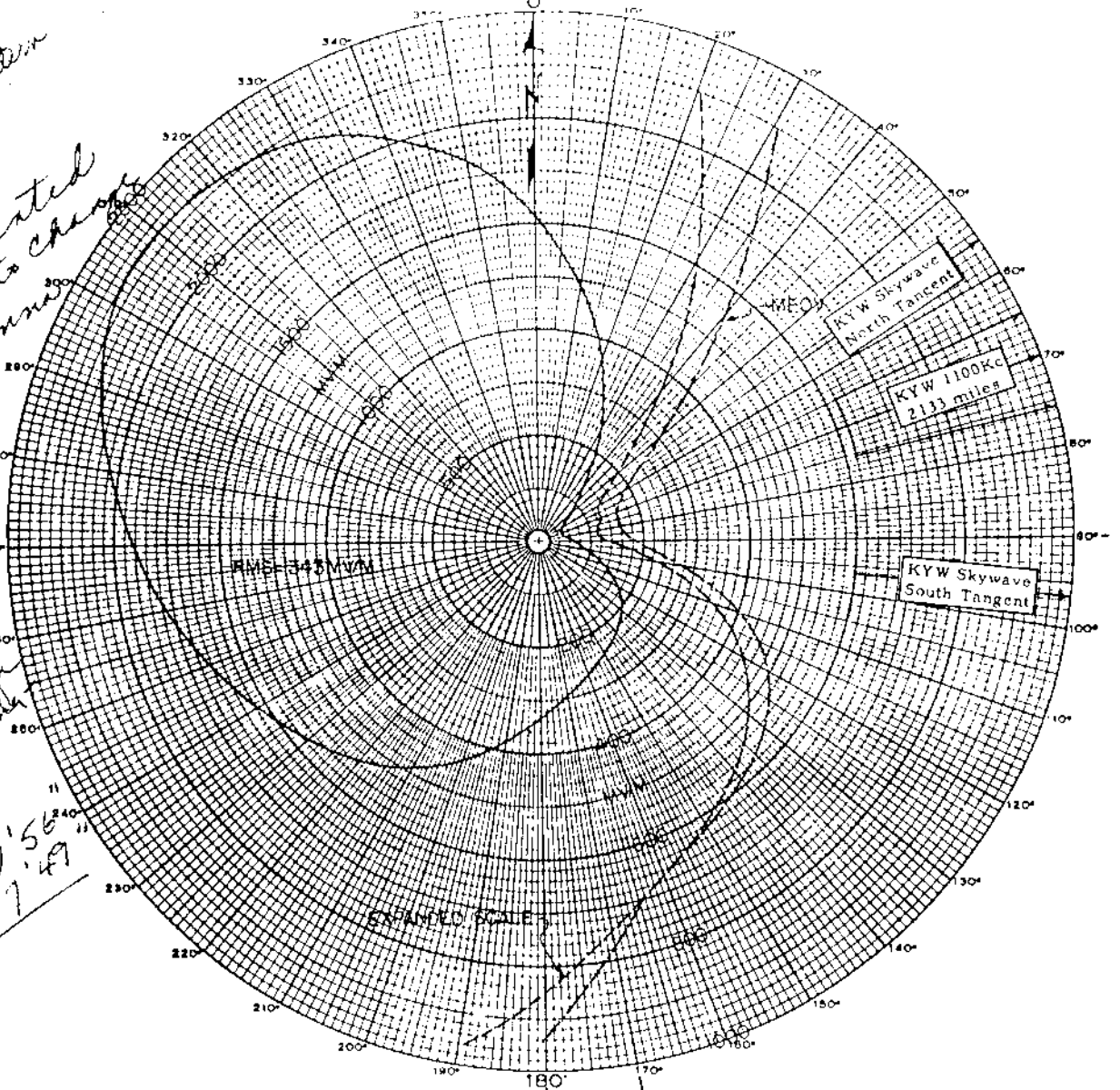
Station KFAX
San Francisco, California

1kw, 50kw-LS, DA-D, L-KYW
1100 KC

10-4-61
Antenna M24 to
be changed in 1A-tation
L 9419-

BP-18438 Granted
2-23-67
Daytime antenna
transmitter
station

BP-18438 an
application
was accepted
(2-7-67) by
FCC to change
daytime antenna
transmitter
location to:
N. Lat. 37°37'56"
W. Long. 122°07'49"



CREUTZ, STEEL & SNOWBERGER
Consulting Engineers
1412 K STREET, N.W. WASHINGTON
WASHINGTON D. C.

FIGURE 2
PROPOSED HORIZONTAL RADIATION PATTERN
KFAX SAN FRANCISCO, CALIFORNIA
1100 KC 50KW DA-D
FEBRUARY 1961

FCC File No. BMP-9378
Accepted 3-24-61

KFAX
San Francisco, California 1100 KC

KFAX

Measured Day
(3-27-70ct)

Station KFAX
San Francisco, California

1kw, 50kw-LS, DA-D, L-WKYC
1100 kc

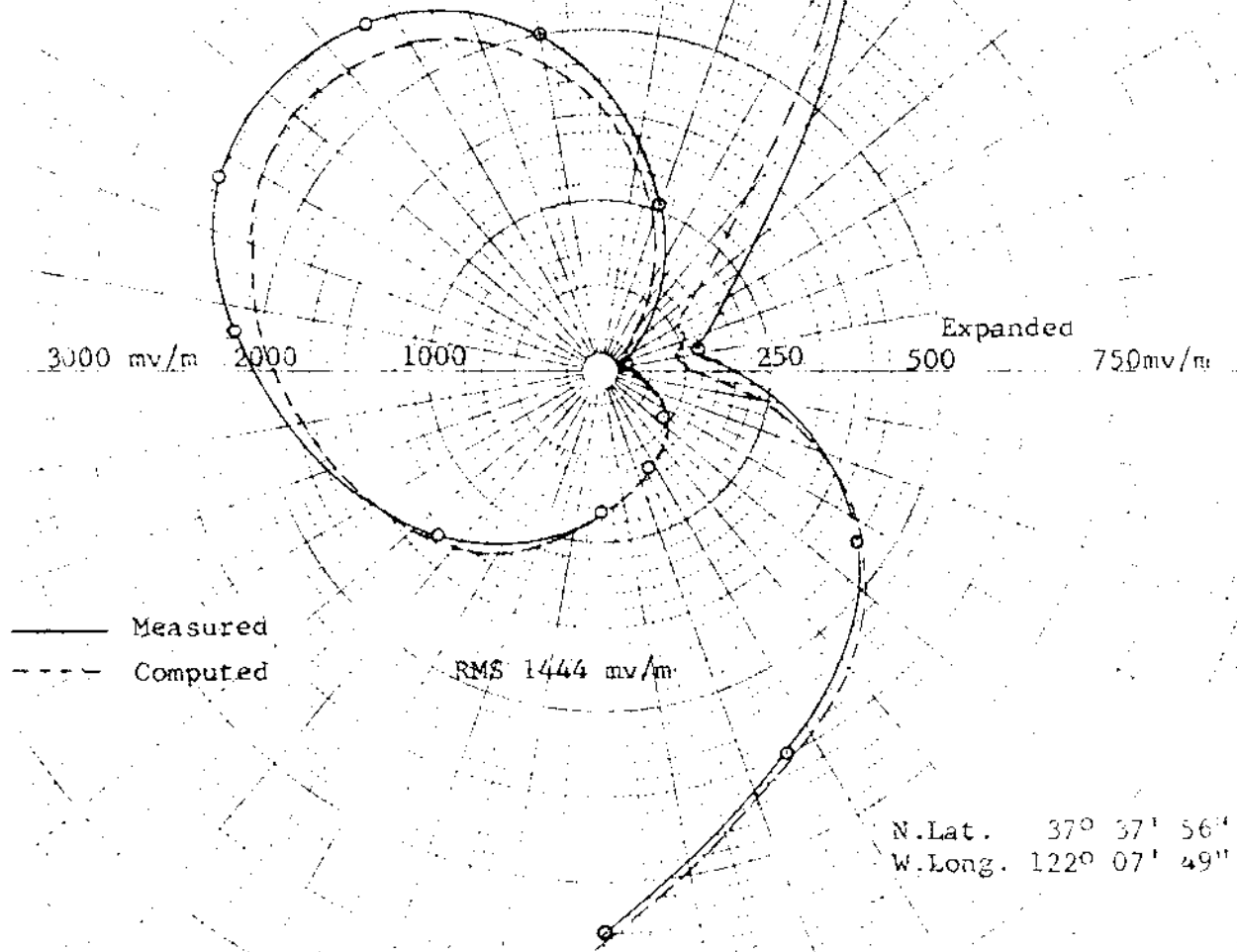
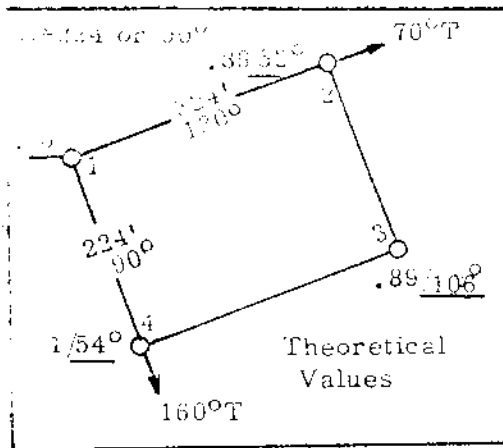


FIG. 2

MEASURED HORIZONTAL RADIATION
KFAX 1100 KC 50.0 KW DA-D
SAN FRANCISCO, CALIFORNIA

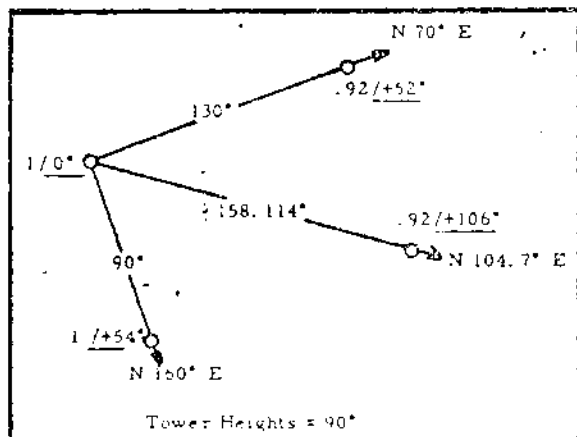
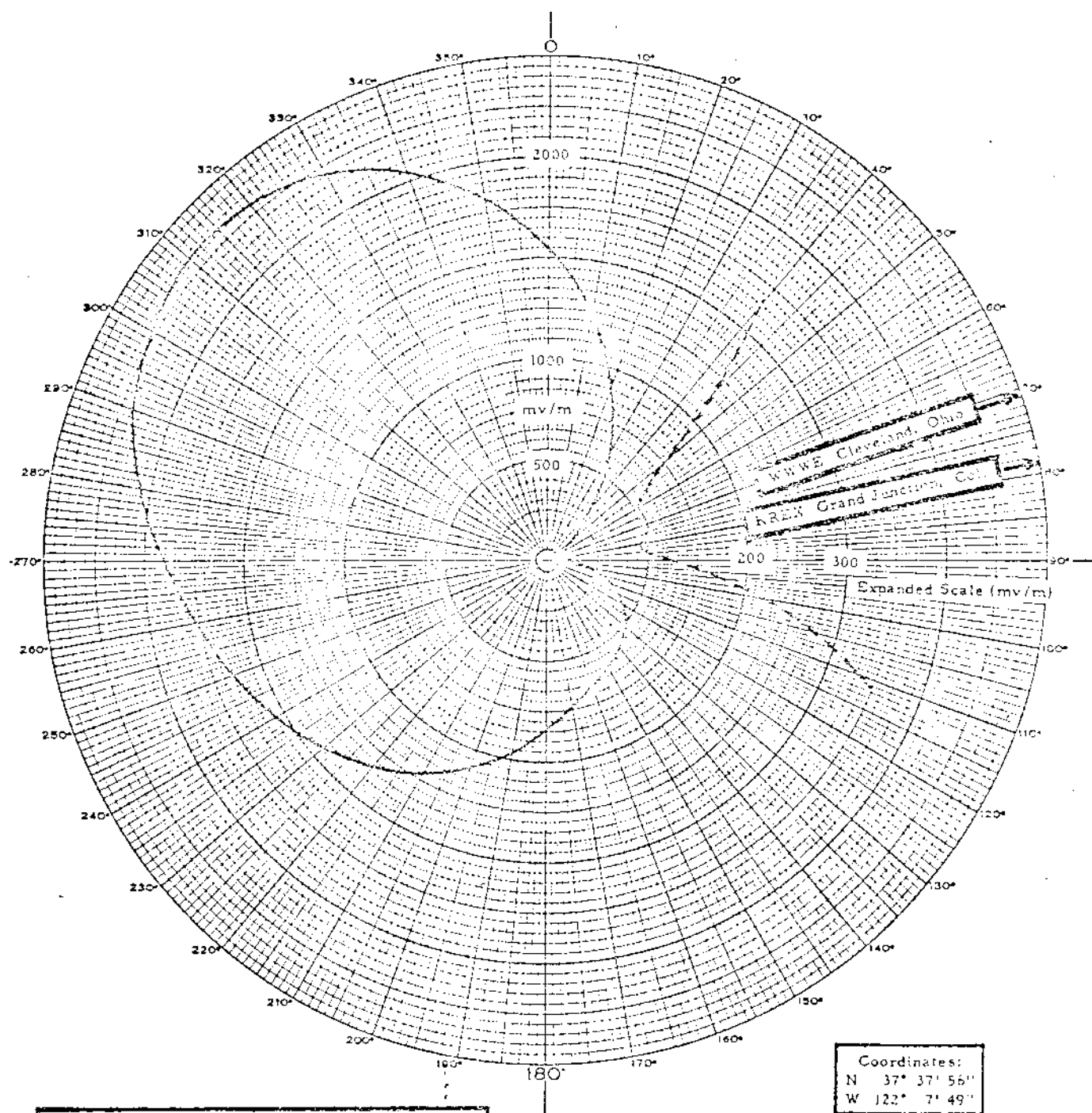
E. D. Associates Inc., Consulting Radio Engineers, San Carlos, Calif.

K FAX

1kw, 50kw-LS, DA-D, L-WKYC
a 1100 kc



KFAX

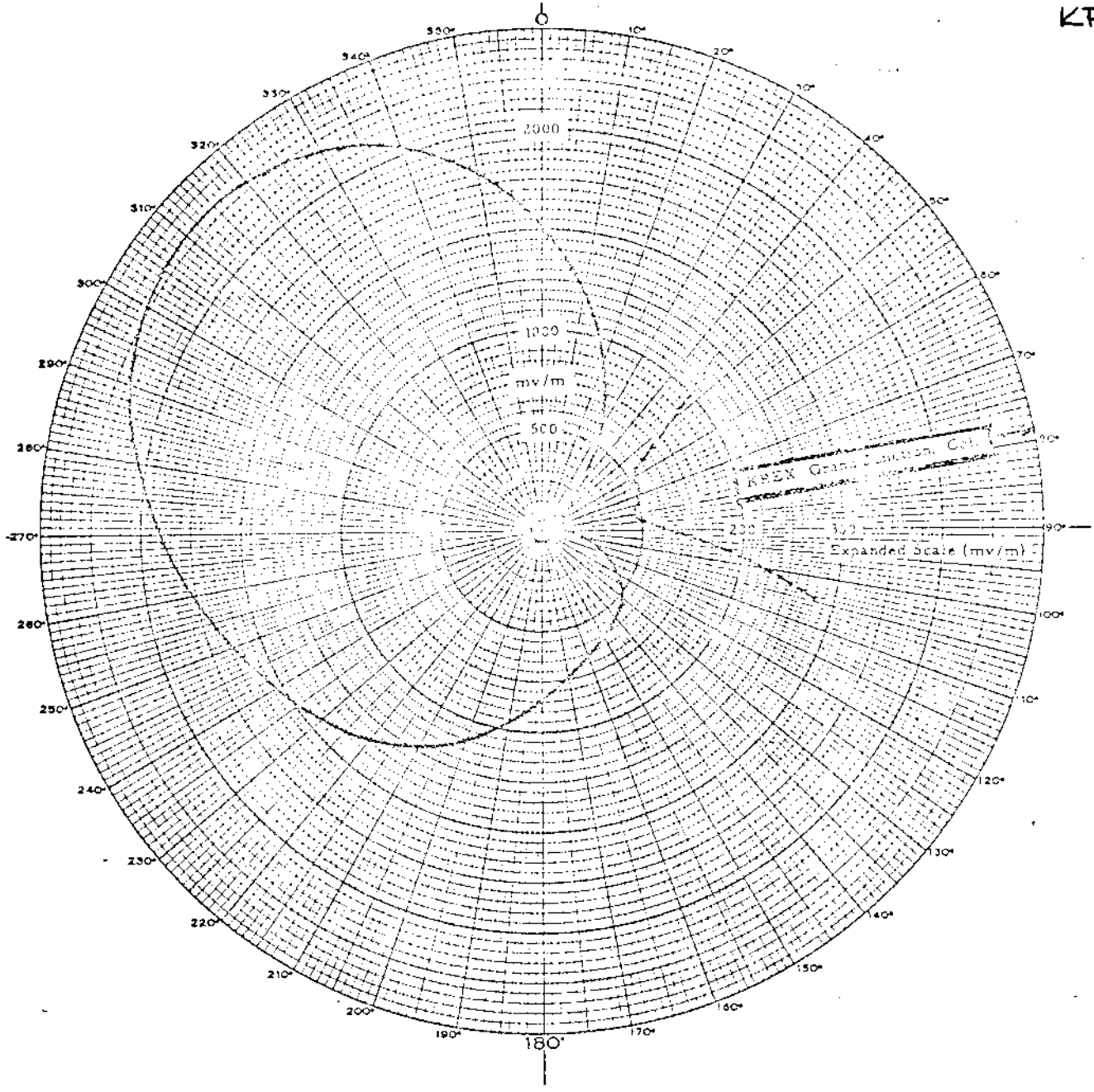


Theoretical Pattern RMS = 1276 mv/m
Standard Pattern RMS = 1341 mv/m
Theoretical Pattern RSS = 1136 mv/m

FIGURE 1
PROPOSED NIGHTTIME
HORIZONTAL STANDARD RADIATION PATTERN
KFAX SAN FRANCISCO, CALIFORNIA
1100 KHz 50 KW DA-2
AUGUST 1975

STEEL, ANDRUS & ADAIR
CONSULTING ENGINEERS
2028 K STREET, N.W.
WASHINGTON, D.C. 20006

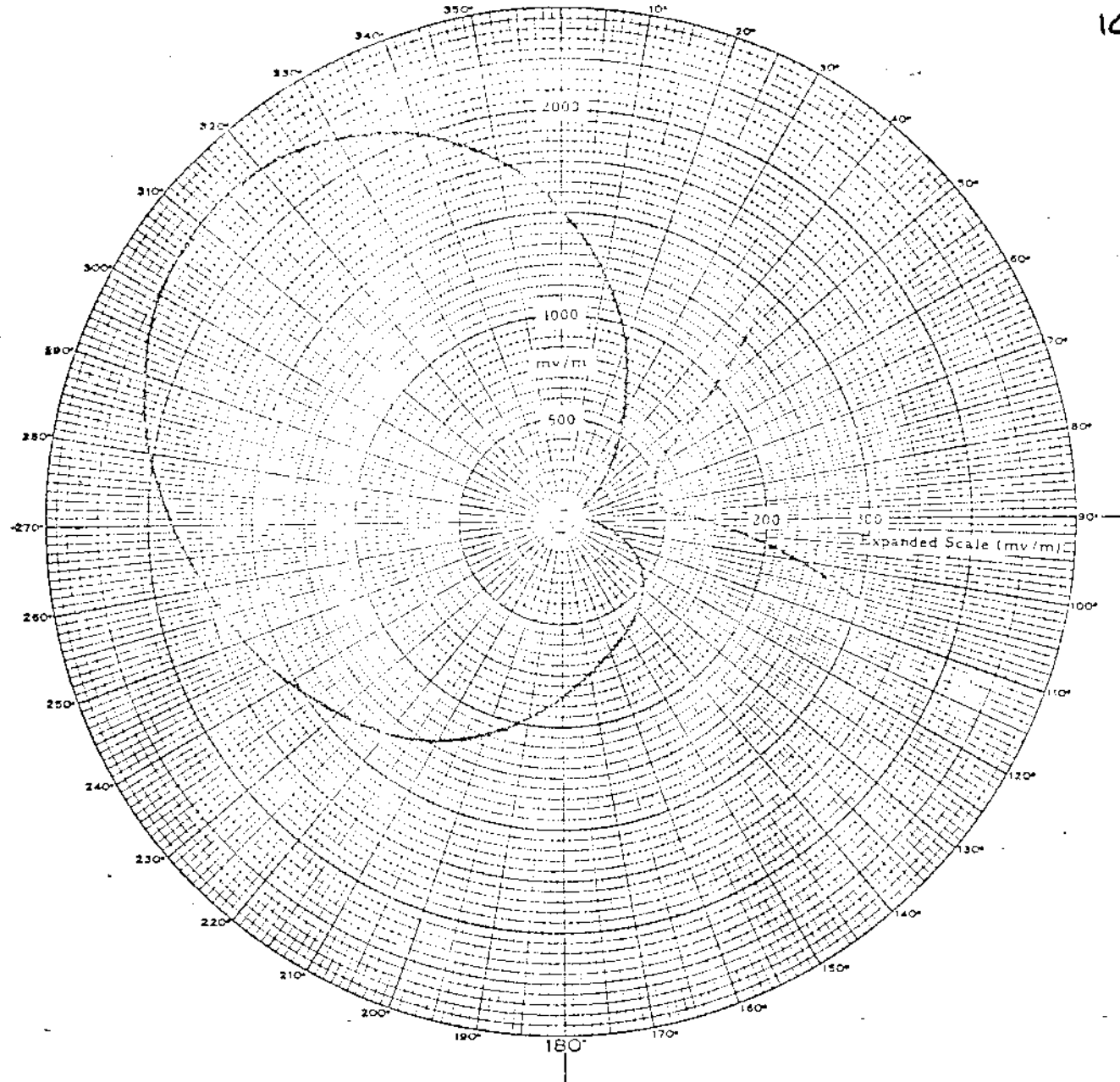
KFAX



STEEL, ANDRUS & ADAIR
CONSULTING ENGINEERS
1021 K STREET N.W.
WASHINGTON D.C. 20006

FIGURE 2
PROPOSED NIGHTTIME 5 DEGREE VERTICAL
STANDARD RADIATION PATTERN
KFAX SAN FRANCISCO, CALIFORNIA
1100 KHz 50 KW DA-2
AUGUST 1975

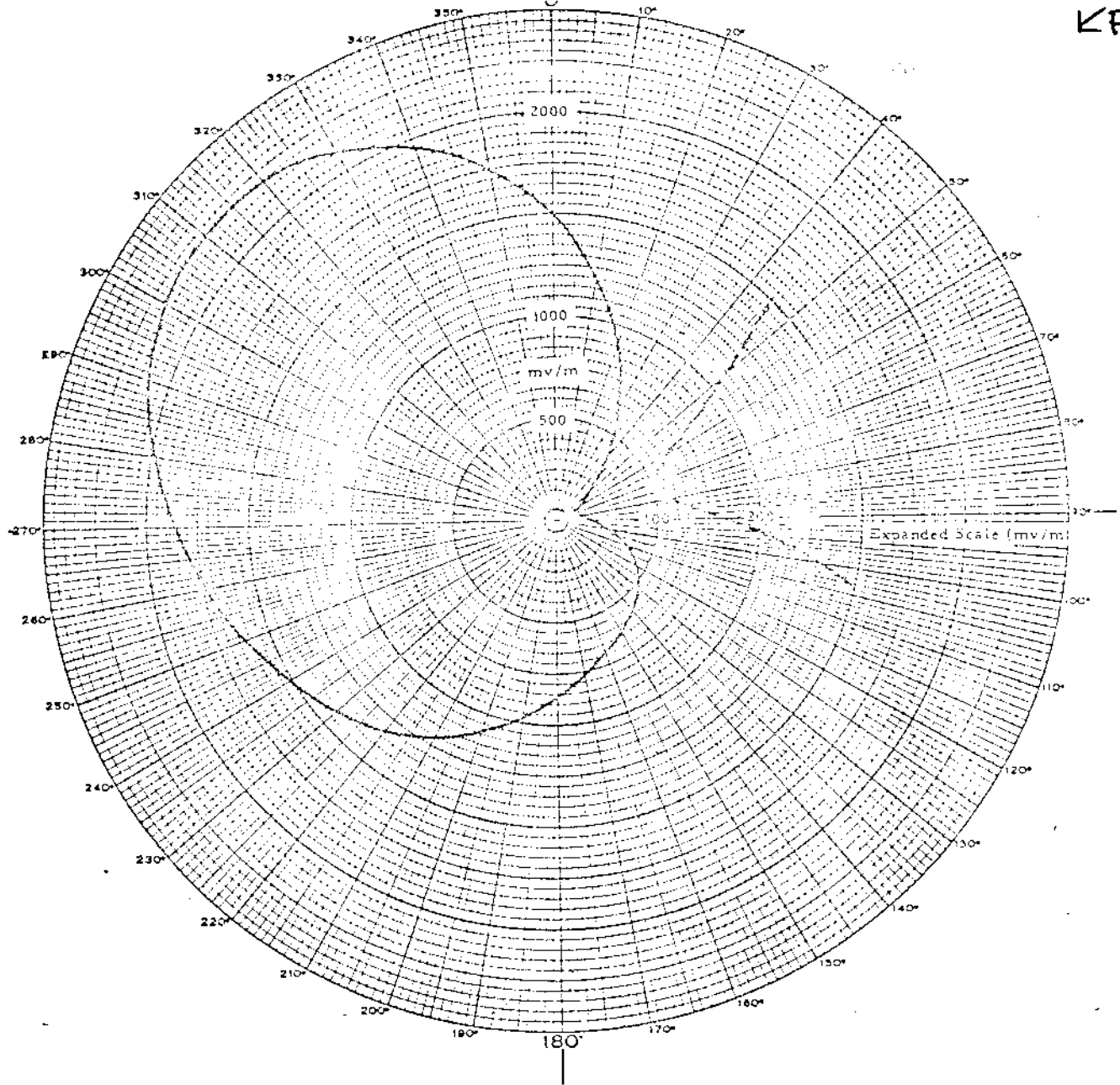
KFAX



STEEL, ANDRUS & ADAIR
CONSULTING ENGINEERS
2075 K STREET, N.W.
WASHINGTON, D.C. 20006

FIGURE 3
PROPOSED NIGHTTIME 10 DEGREE VERTICAL
STANDARD RADIATION PATTERN
KFAX SAN FRANCISCO, CALIFORNIA
1100 KHz 50 KW DA-2
AUGUST 1975

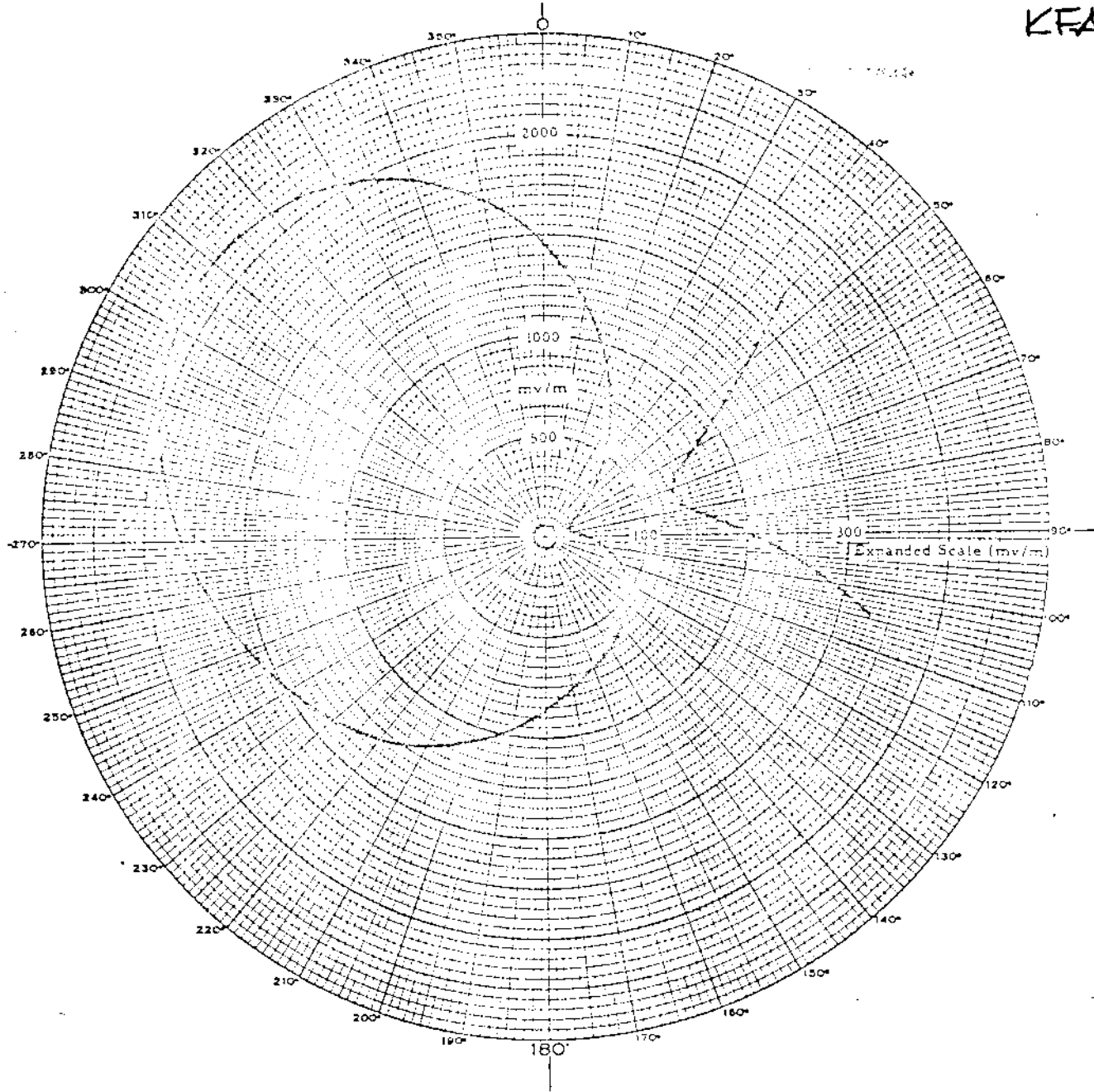
KFAX



STEEL, ANDRUS & ADAIR
CONSULTING ENGINEERS
2025 G STREET N.W.
WASHINGTON D.C. 20004

FIGURE 4
PROPOSED NIGHTTIME 15 DEGREE VERTICAL
STANDARD RADIATION PATTERN
KFAX SAN FRANCISCO, CALIFORNIA
1100 KHz 50 KW DA-2
AUGUST 1975

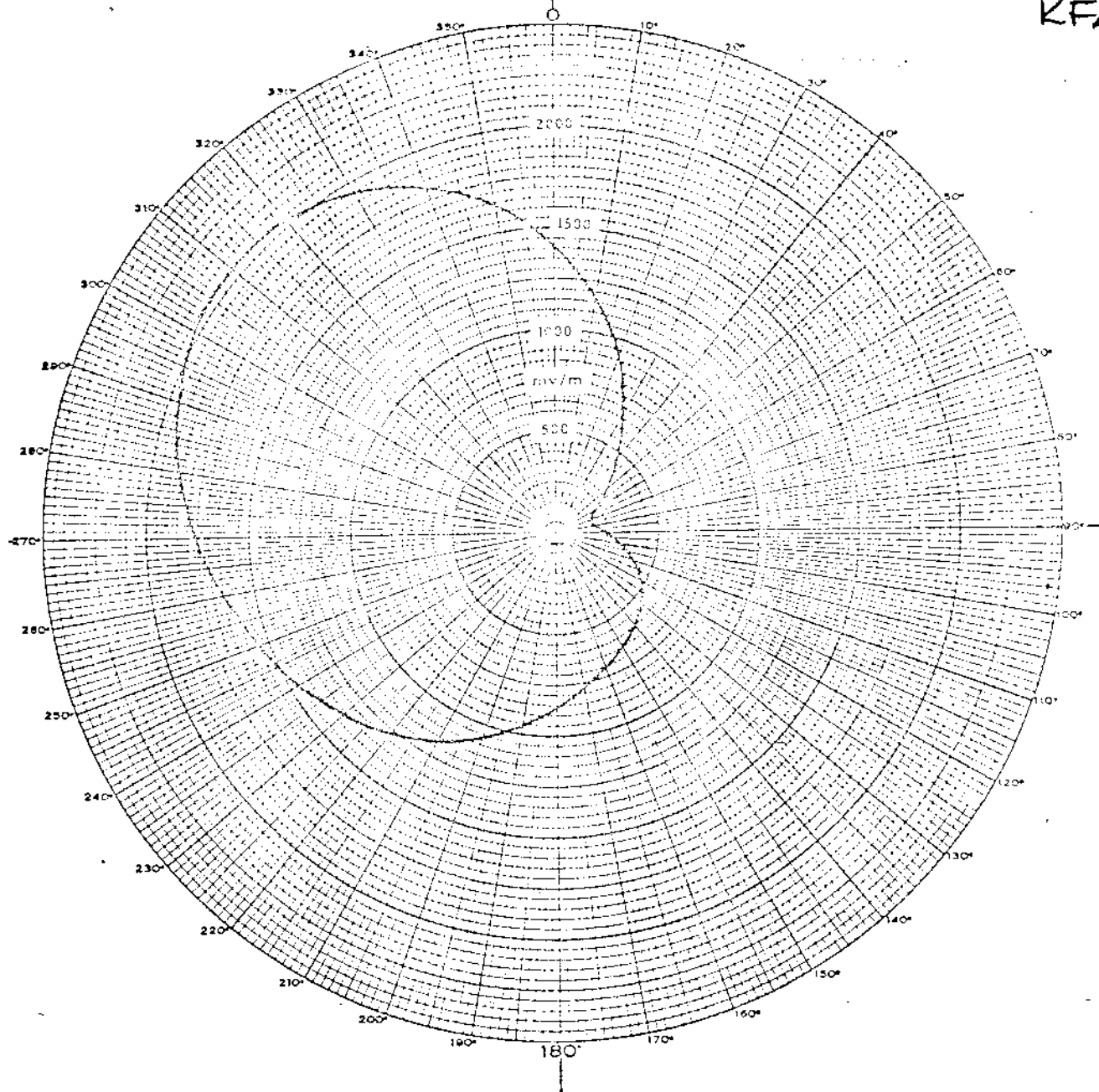
KFAX



STEEL, ANDRUS & ADAIR
CONSULTING ENGINEERS
2025 K STREET N.W.
WASHINGTON, D.C. 20004

FIGURE 5
PROPOSED NIGHTTIME 20 DEGREE VERTICAL
STANDARD RADIATION PATTERN
KFAX SAN FRANCISCO, CALIFORNIA
1100 KHz 50 KW DA-2
AUGUST 1975

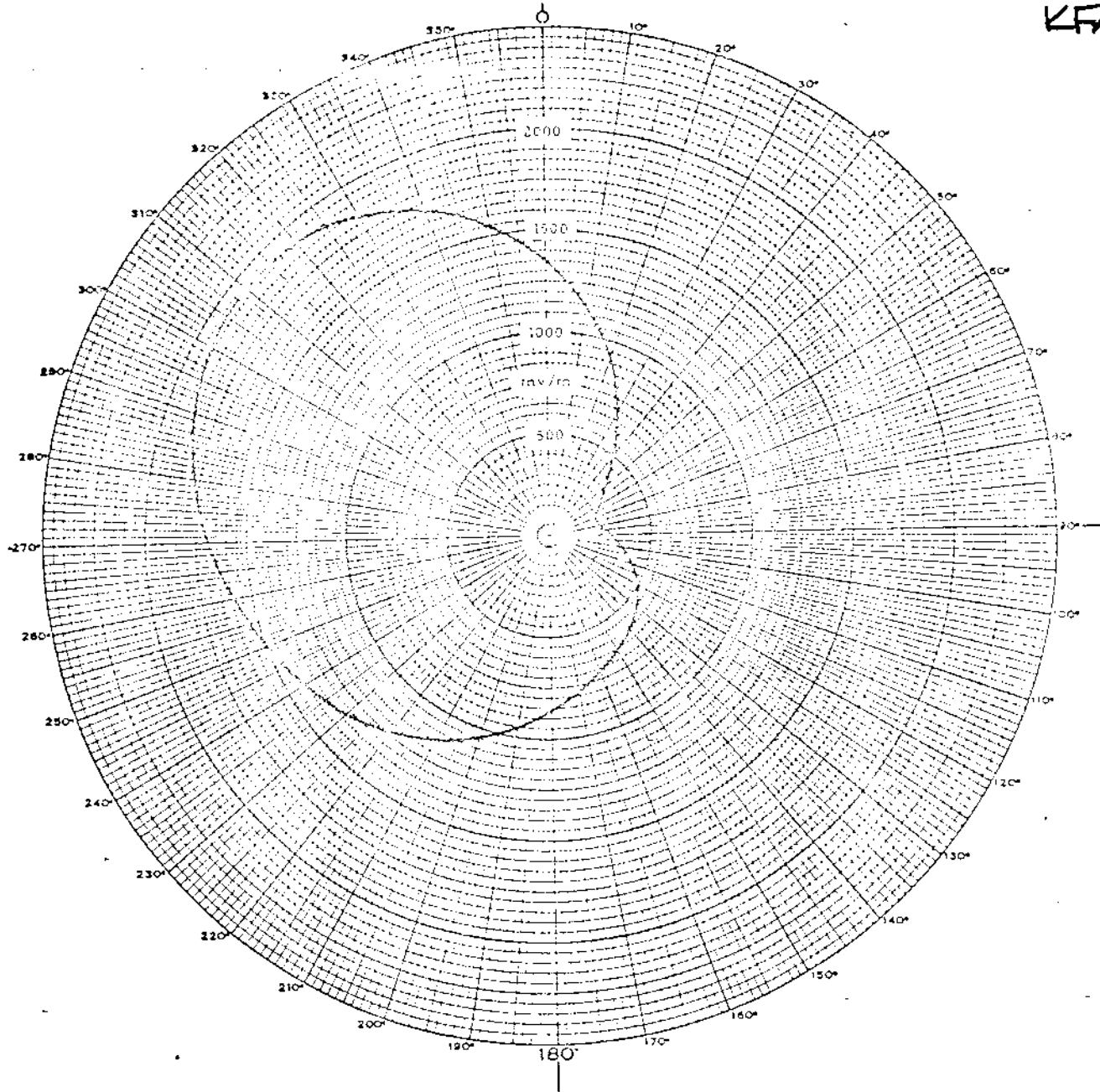
KFAX



STEEL ANDRUS & ADAIR
CONSULTING ENGINEERS
2029 K STREET N.W.
WASHINGTON D.C. 20008

FIGURE 6
PROPOSED NIGHTTIME 25 DEGREE VERTICAL
STANDARD RADIATION PATTERN
KFAX SAN FRANCISCO, CALIFORNIA
1100 KHz 50 KW DA-2
AUGUST 1975

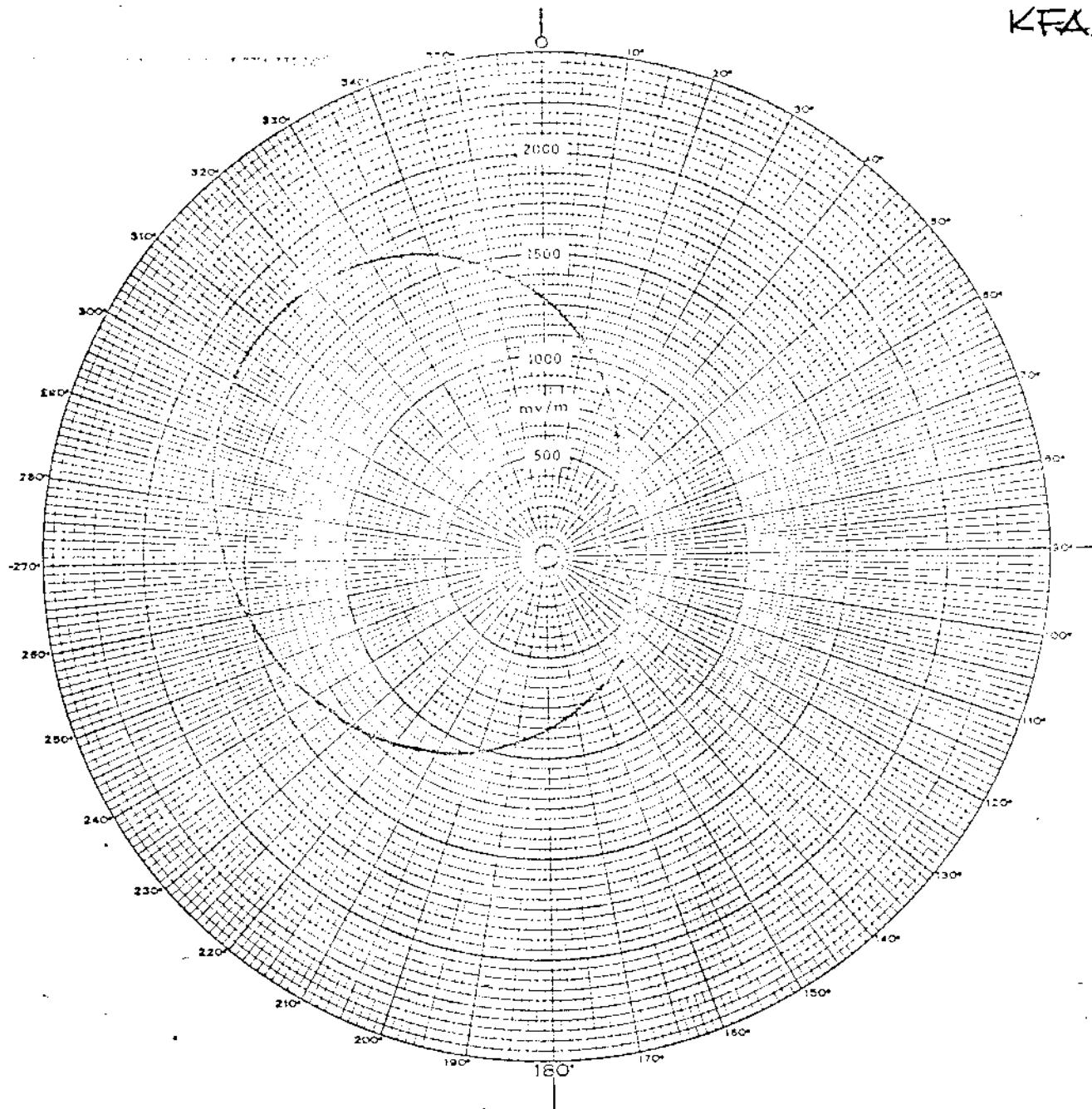
KFAX



STEEL, ANDRUS & ADAIR
CONSULTING ENGINEERS
2028 K STREET N.W.
WASHINGTON D.C. 20006

FIGURE 7
PROPOSED NIGHTTIME 30 DEGREE VERTICAL
STANDARD RADIATION PATTERN
KFAX SAN FRANCISCO, CALIFORNIA
1100 KHz 50 KW DA-2
AUGUST 1975

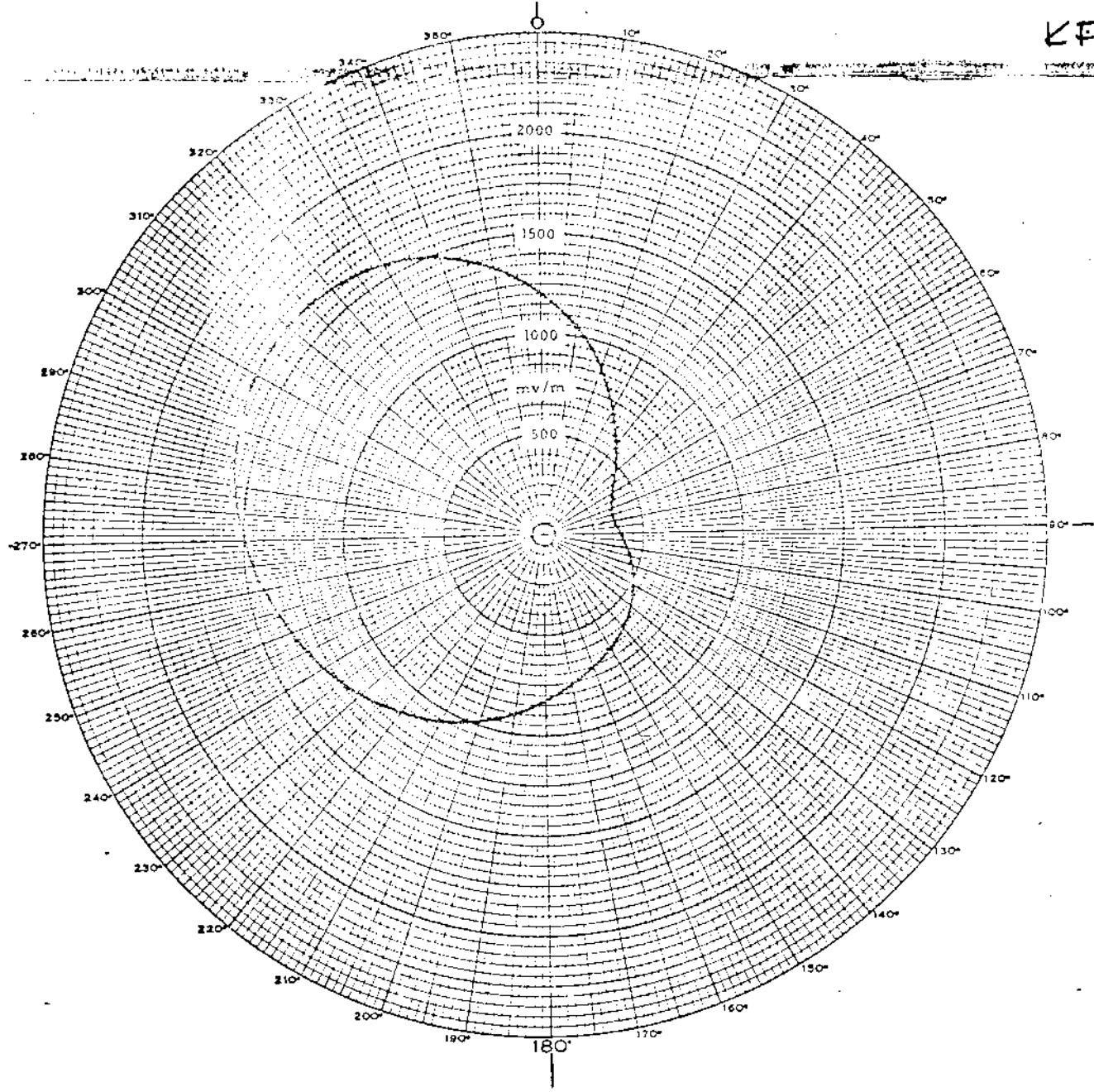
KFAX



STEEL, ANDRUS & ADAIR
CONSULTING ENGINEERS
2029 K STREET N.W.
WASHINGTON, D.C. 20008

FIGURE 8
PROPOSED NIGHTTIME 35 DEGREE VERTICAL
STANDARD RADIATION PATTERN
KFAX SAN FRANCISCO, CALIFORNIA
1100 KHz 50 KW DA-2
AUGUST 1973

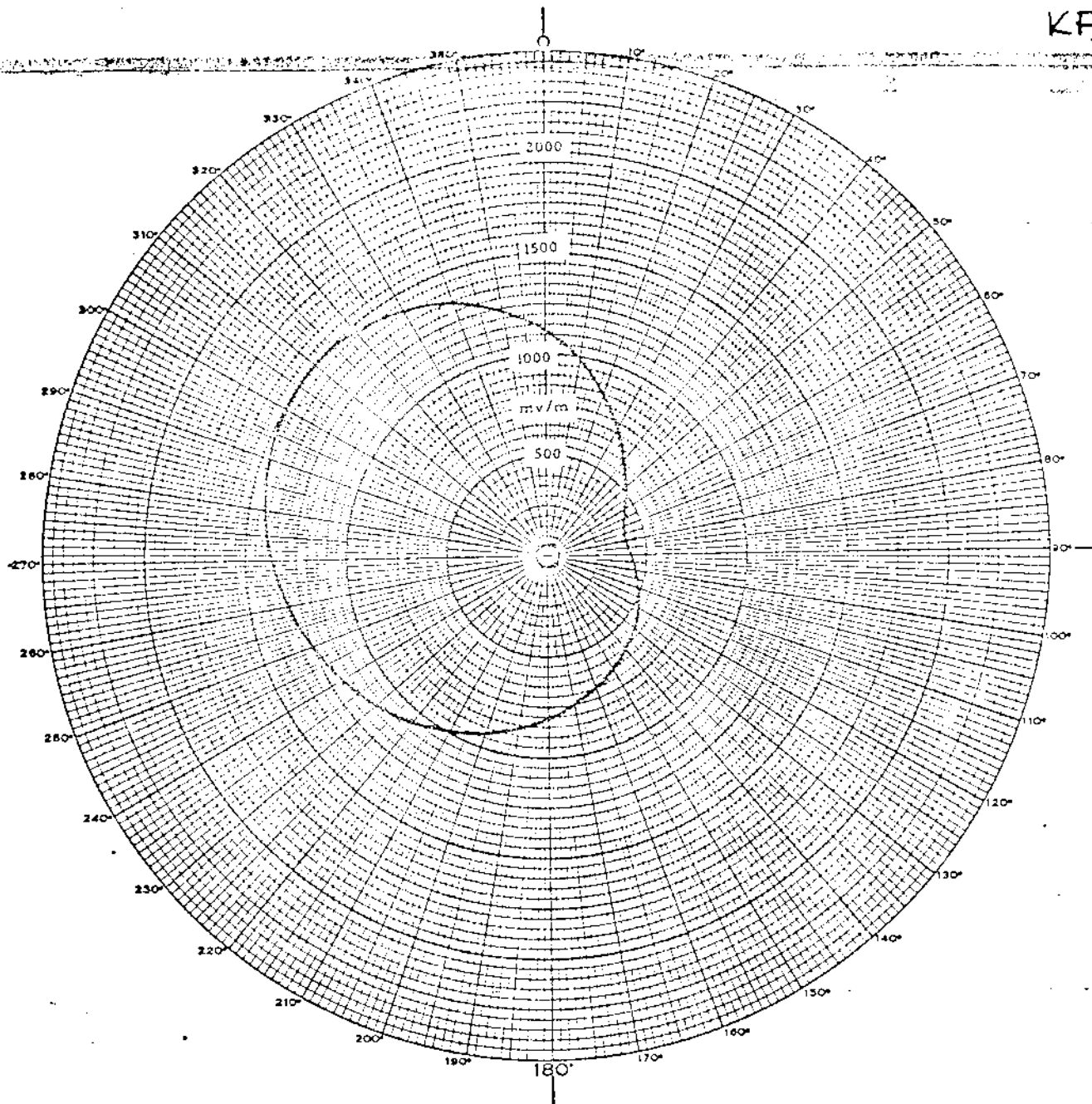
KFAX



STEELMANORUS & ADAIR
CONSULTING ENGINEERS
2029 K STREET, N.W.
WASHINGTON, D.C. 20006

FIGURE 9
PROPOSED NIGHTTIME 40 DEGREE VERTICAL
STANDARD RADIATION PATTERN
KFAX SAN FRANCISCO, CALIFORNIA
1100 KHz 50 KW DA-2
AUGUST 1975

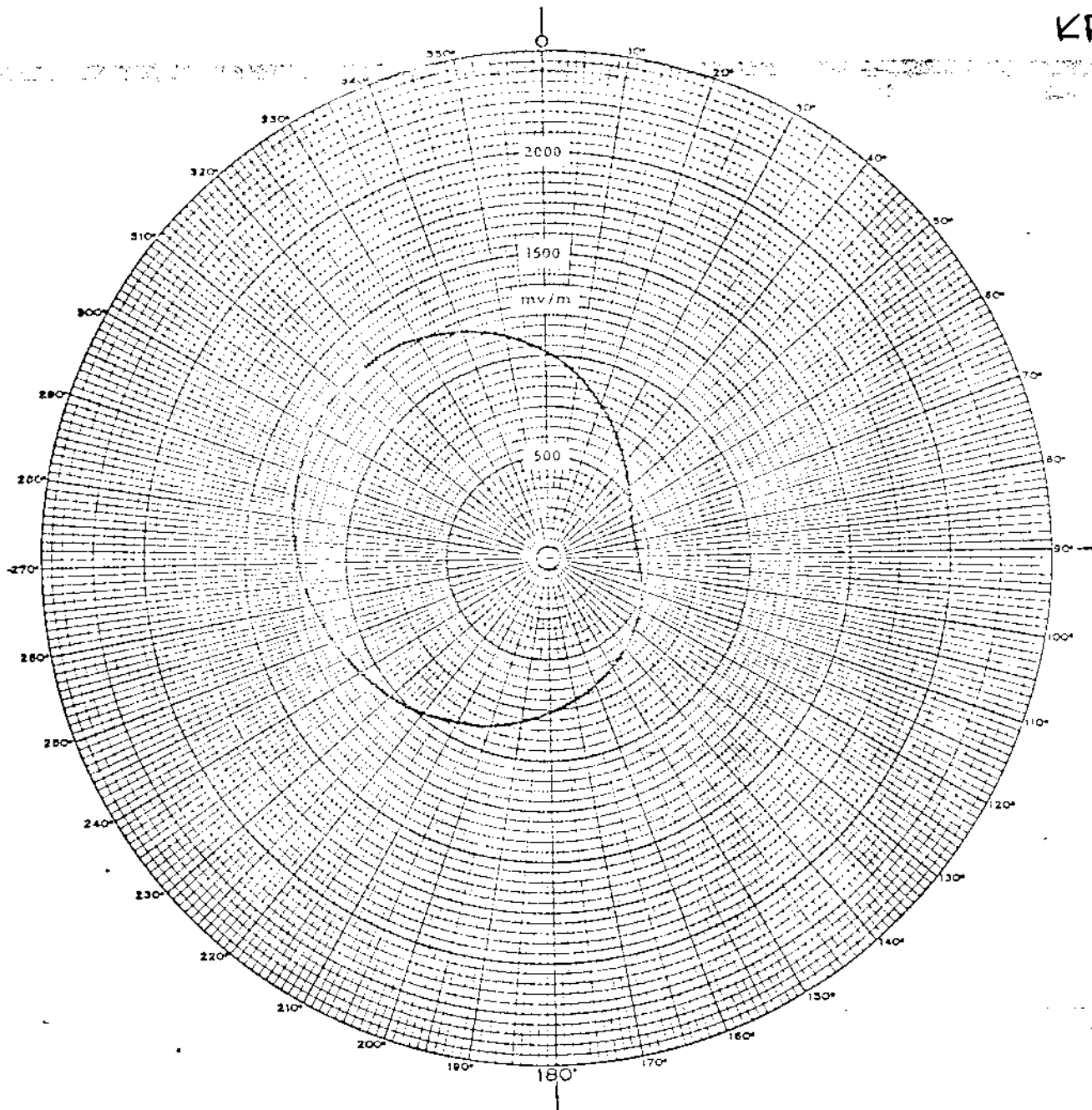
KFAX



STEEL, ANDRUS & ADAIR
CONSULTING ENGINEERS
3328 K STREET N.W.
WASHINGTON, D.C. 20004

FIGURE 10
PROPOSED NIGHTTIME 45 DEGREE VERTICAL
STANDARD RADIATION PATTERN
KFAF SAN FRANCISCO, CALIFORNIA
1100 KHz 50 KW DA-2
AUGUST 1975

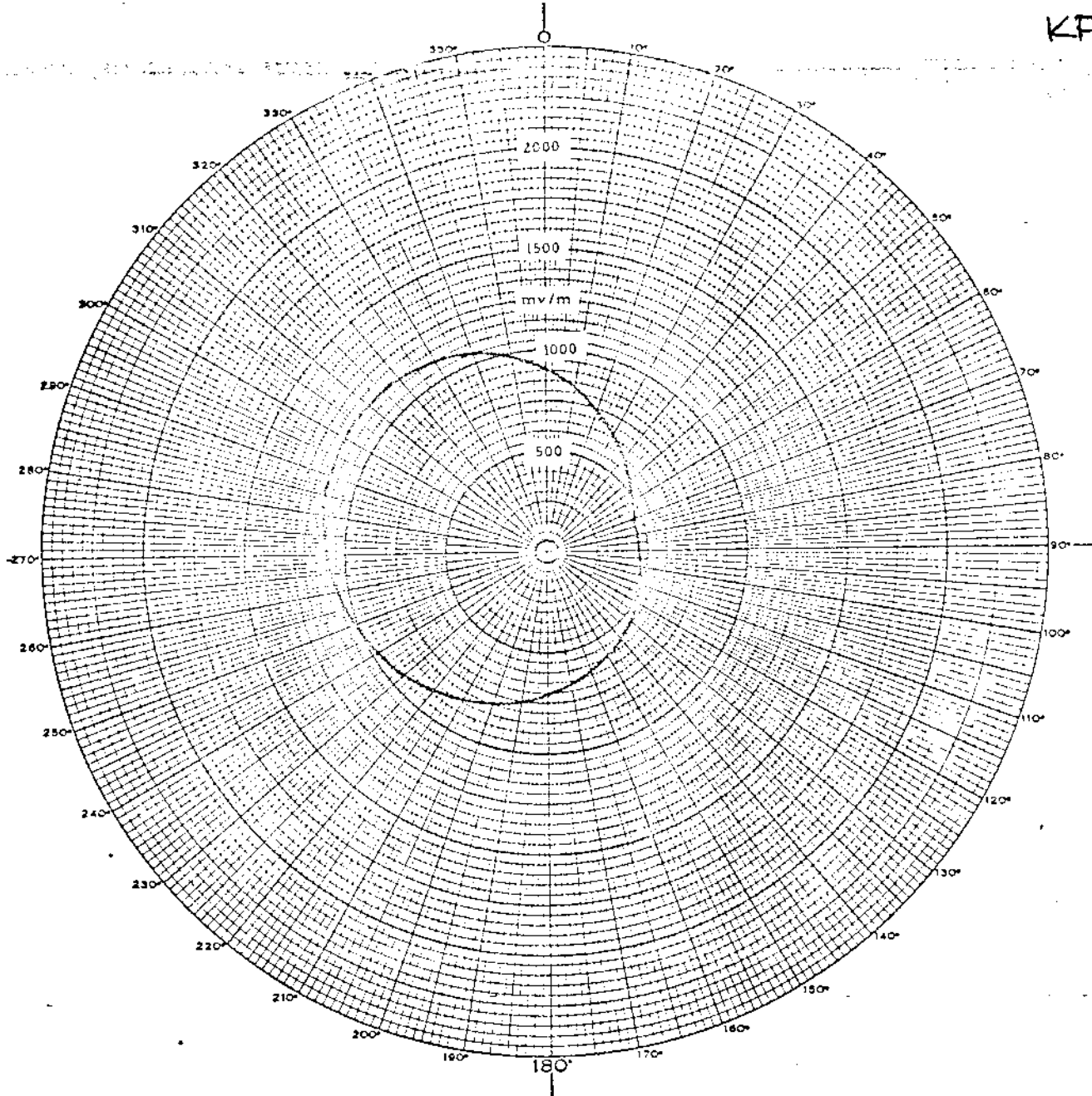
KFAX



STEEL, ANDRUS & ADAIR
CONSULTING ENGINEERS
2029 K STREET N.W.
WASHINGTON, D.C. 20006

FIGURE II
PROPOSED NIGHTTIME 50 DEGREE VERTICAL
STANDARD RADIATION PATTERN
KFAF SAN FRANCISCO, CALIFORNIA
1100 KHz 50 KW DA-2
AUGUST 1975

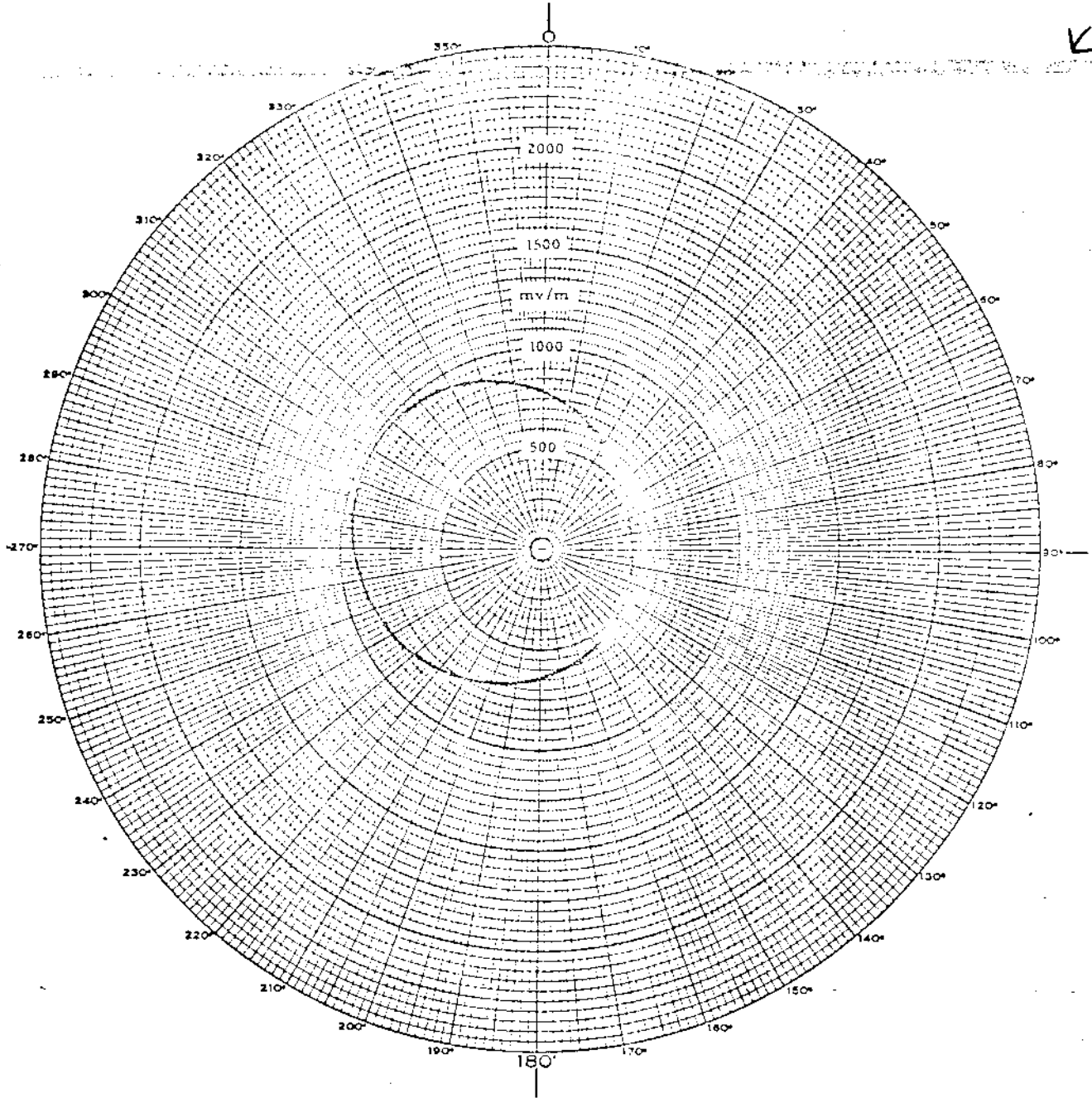
KFAX



STEEL, ANDRUS & ADAIR
CONSULTING ENGINEERS
3029 K STREET, N.W.
WASHINGTON, D. C. 20004

FIGURE 12
PROPOSED NIGHTTIME 55 DEGREE VERTICAL
STANDARD RADIATION PATTERN
KFAX SAN FRANCISCO, CALIFORNIA
1100 KHz 50 KW DA-2
AUGUST 1975

KFAX



STEEL, ANDRUS & ADAIR
CONSULTING ENGINEERS
2029 K STREET, N.W.
WASHINGTON, D.C. 20006

FIGURE 13
PROPOSED NIGHTTIME 60 DEGREE VERTICAL
STANDARD RADIATION PATTERN
KFAX SAN FRANCISCO, CALIFORNIA
1100 KHz 50 KW DA-2
AUGUST 1975

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KFAX

Main Studio: San Francisco, California

Frequency: 1100 kHz

Power: 50kw Night 50kw Day

Notification List No. 1773

Date: March 29, 1978

Class: II

GEOGRAPHICAL LOCATION OF THE
CENTER OF THE ANTENNA SYSTEM:

North Latitude: 37° 37' 56"

West Longitude: 122° 07' 49"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-1)

Number of elements: 4

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

TOWER:	NW (#1)	NE (#2)	SE (#3)	SW (#4)
HEIGHT ABOVE INSULATORS:	224'	224'	224'	224' (90.2°)
PHASING:	0	+52	+106	+54
FIELD RATIO:	1.0	.92	0.92	1.0

SPACING AND
ORIENTATION:

The towers are located at the vertices of a rectangle long sides of which are 324' (130°) in length on a line bearing 70° true. The short sides are 224' (90°) in length on a line bearing 160° true.

Ground System: 120-154' to 225' equally spaced copper radials plus a 32' square ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers. Centers of system are bonded together.

PROTECTED EFFECTIVE FIELDS AT RATED POWER:

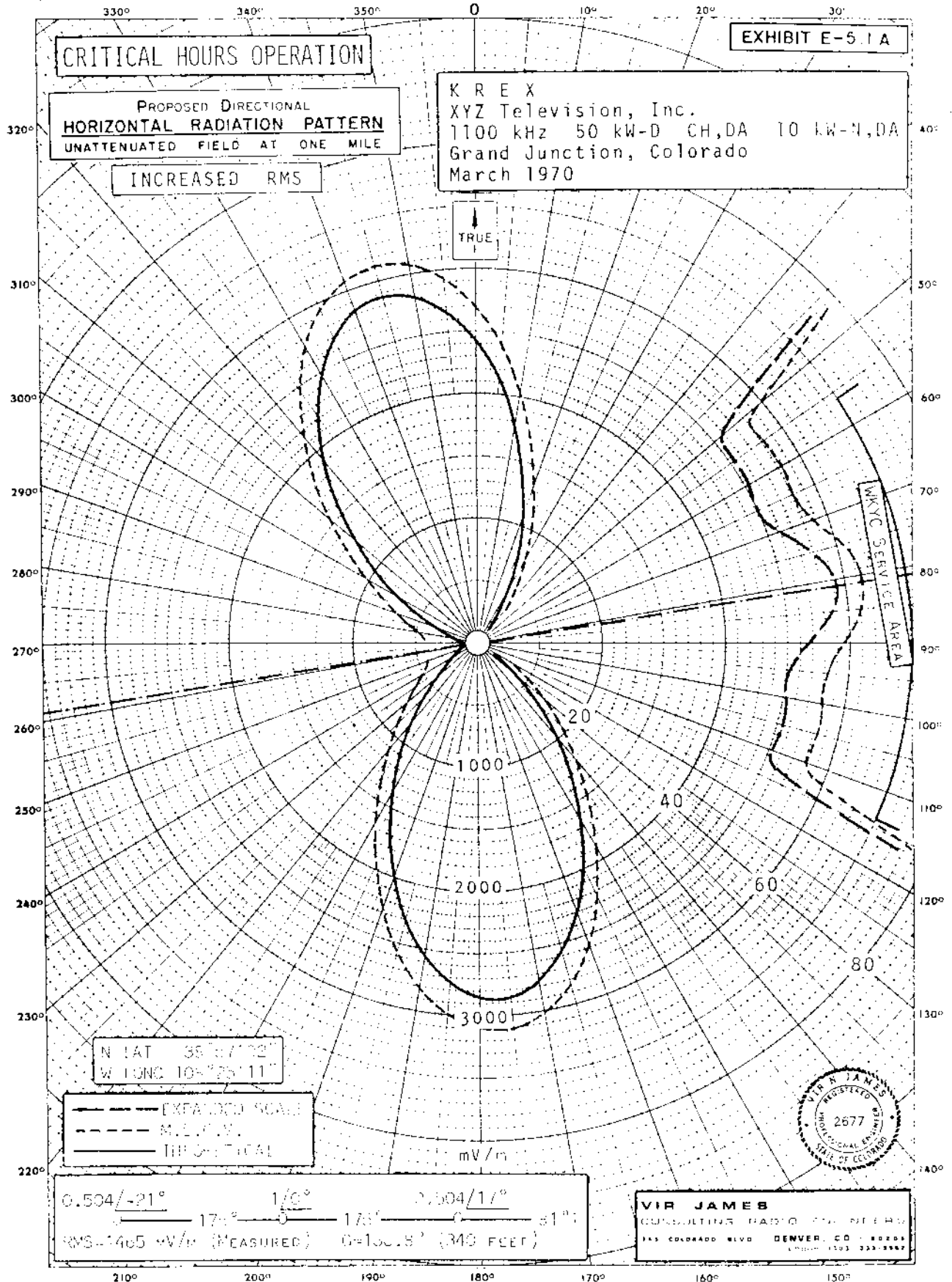
THEORETICAL		STANDARD
<u>RMS</u>	<u>RSS</u>	<u>RMS</u>
1276 mv/m	1136 mv/m	1341 mv/m

Note: Please retain the Nighttime directional antenna radiation pattern notified for Station KFAX in United States Change List Number 1737 dated June 9, 1977 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. Daytime and nighttime operation of the station will use the same directional antenna radiation pattern previously notified for nighttime operation.

Proposed Day (CH)
(1-22-71ct)

Station KREX
Grand Junction, Colorado

KREX
10kw, 50KW-LS, DA-2, U
1100 kc



FCC File No. BP-18947
Accepted 1-13-71

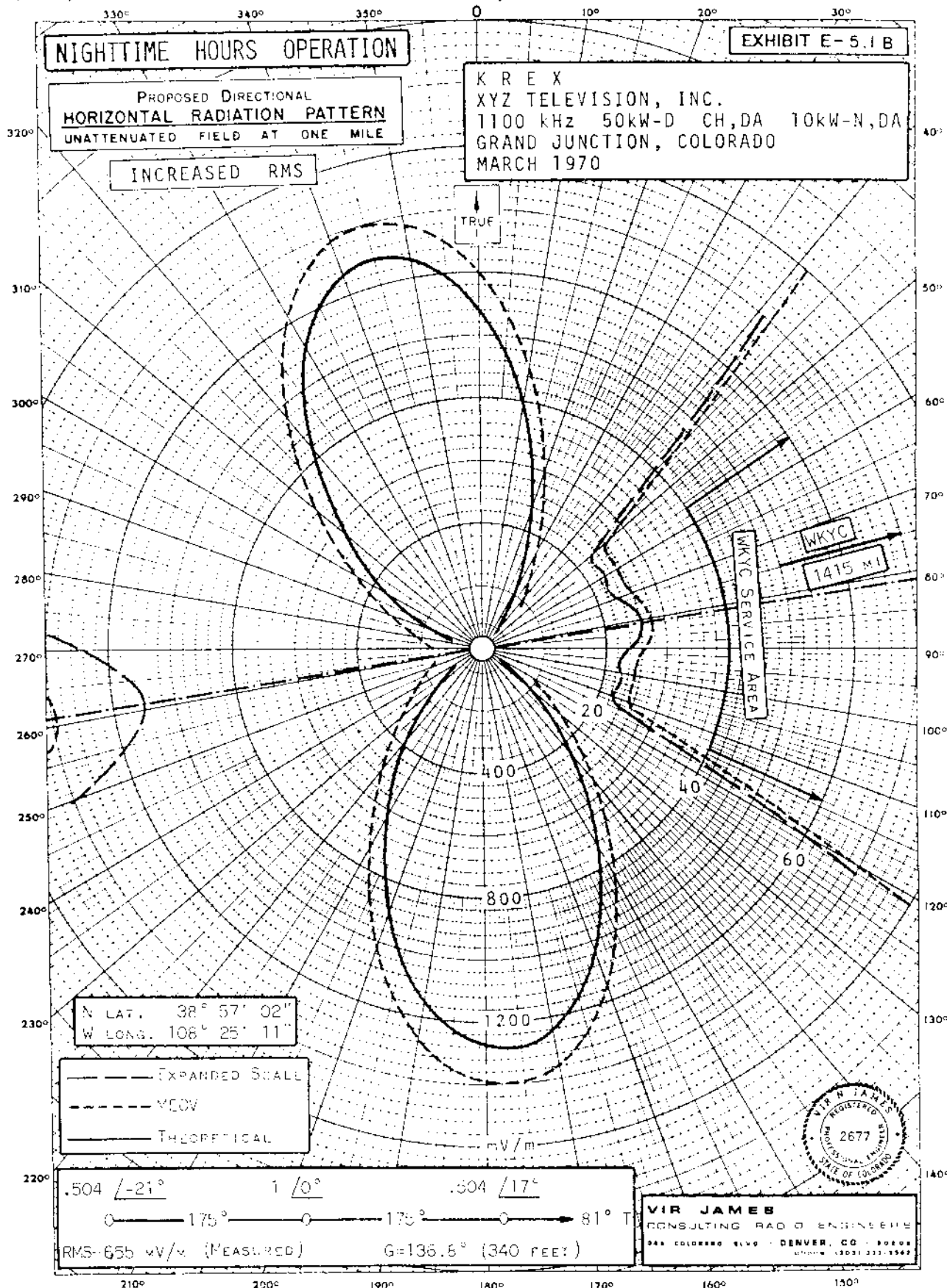
Station KREX
Grand Junction, Colorado

1100 kc

Proposed Night
(1-22-71ct)

Station KREX
Grand Junction, Colorado

KREX
10kw, 50kw-LS, DA-2, U
1100 kc



KREX

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

Station KREX
Grand Junction, Colorado

10kw, 50kw-LS, DA-2, U
1100 kc

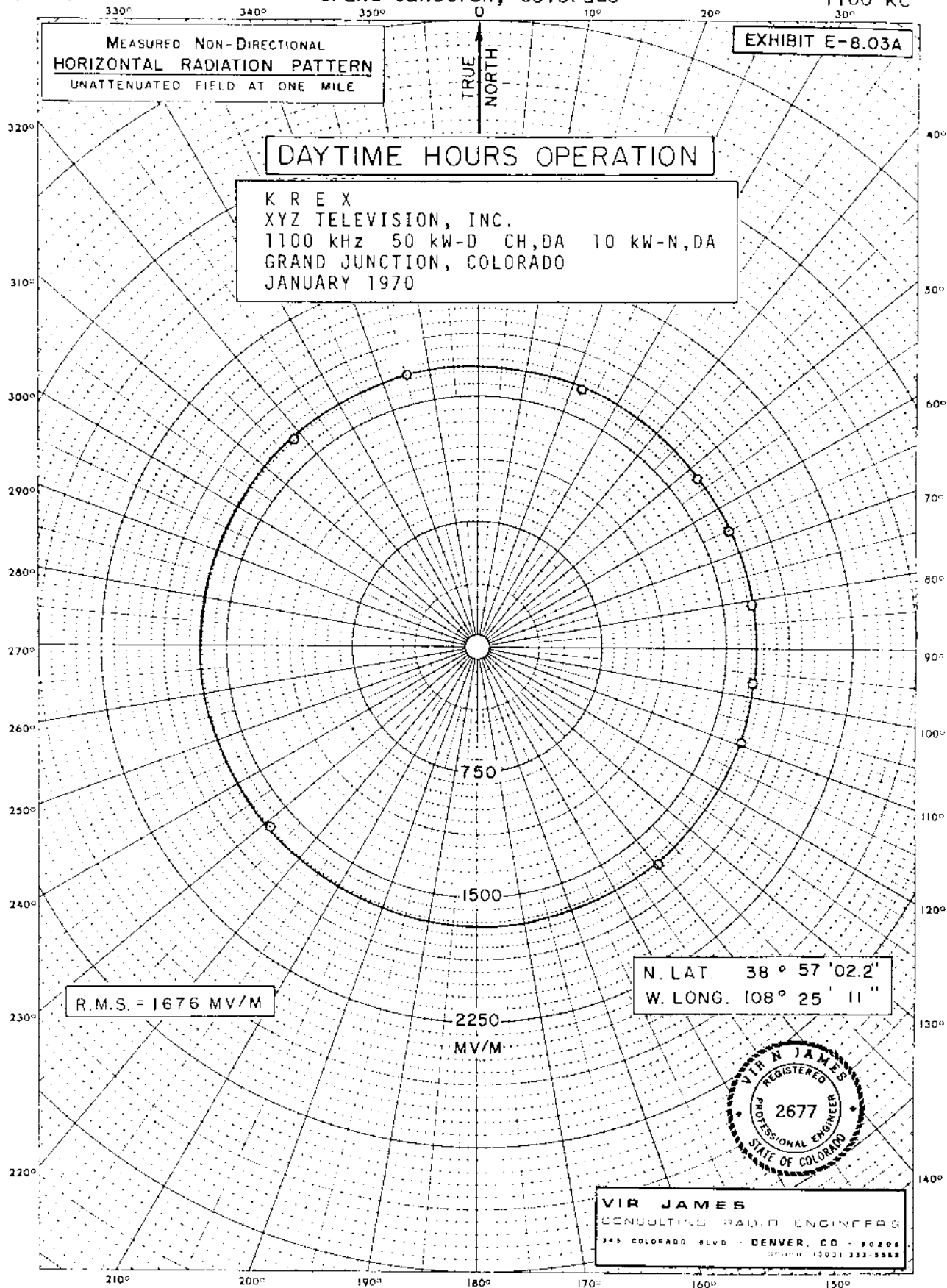
MEASURED NON-DIRECTIONAL
HORIZONTAL RADIATION PATTERN
UNATTENUATED FIELD AT ONE MILE

EXHIBIT E-8.03A

DAYTIME HOURS OPERATION

K R E X
XYZ TELEVISION, INC.
1100 KHz 50 kW-D CH, DA 10 kW-N, DA
GRAND JUNCTION, COLORADO
JANUARY 1970

SEE
REVERSE
SIDE 7/79/70



FCC File No. BL-12595
Accepted 4-9-70

Station KREX
Grand Junction, Colorado

1100 kc

KREX

Measured Day (CH)
(4-29-70ct)

Station KREX
Grand Junction, Colorado

10kw, 50kw-LS, DA-2, U
1100 kc

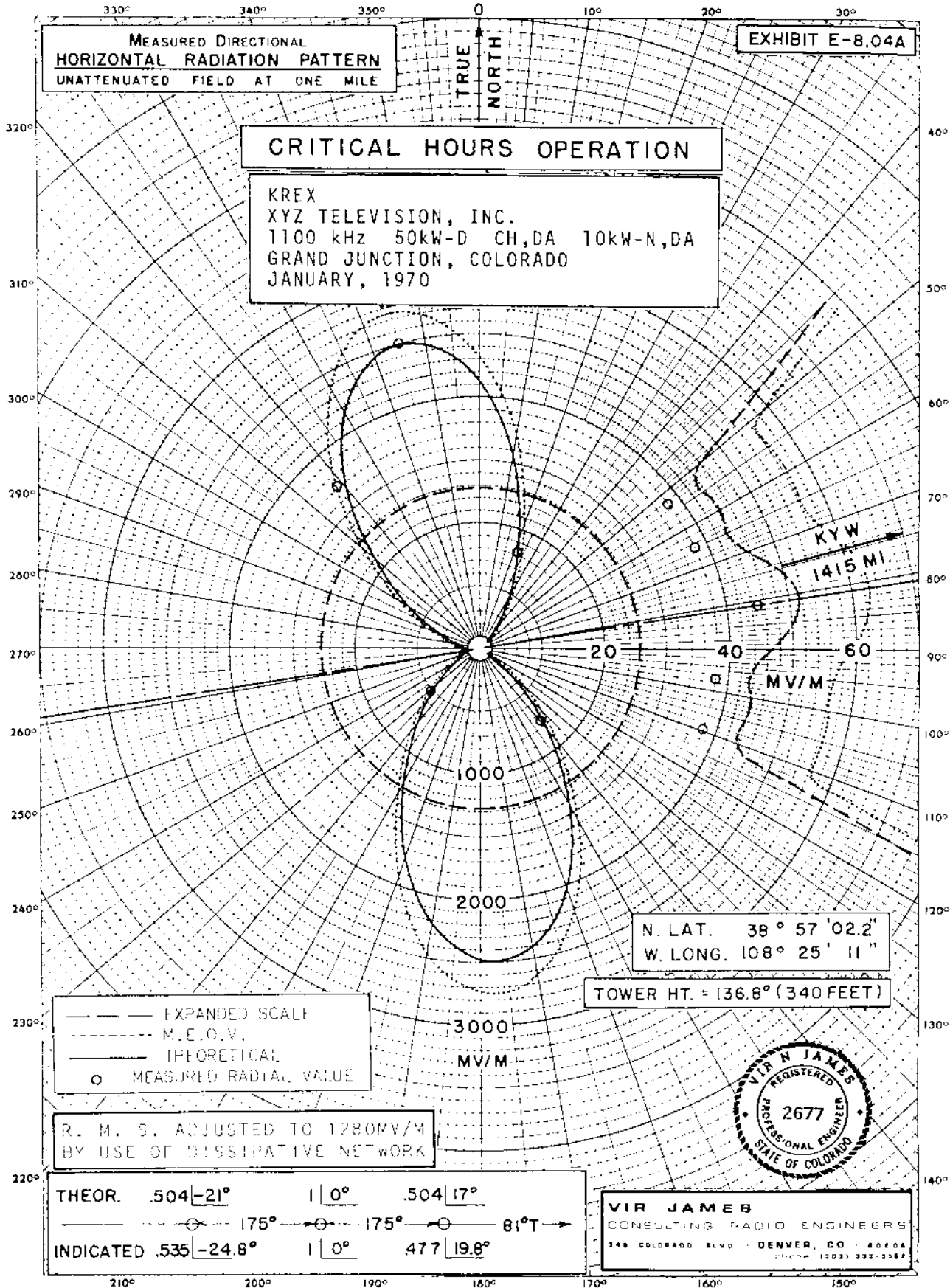
MEASURED DIRECTIONAL
HORIZONTAL RADIATION PATTERN
UNATTENUATED FIELD AT ONE MILE

EXHIBIT E-8.04A

CRITICAL HOURS OPERATION

KREX
XYZ TELEVISION, INC.
1100 kHz 50kW-D CH, DA 10kW-N, DA
GRAND JUNCTION, COLORADO
JANUARY, 1970

SEE
REVERSE
SIDE



FCC File No. BL-12595
Accepted 4-9-70

Station KREX
Grand Junction, Colorado

1100 kc

KREX

Measured Night
(4-29-70ct)

Station KREX
Grand Junction, Colorado

10kw, 50kw-LS, DA-2, U
1100 kc

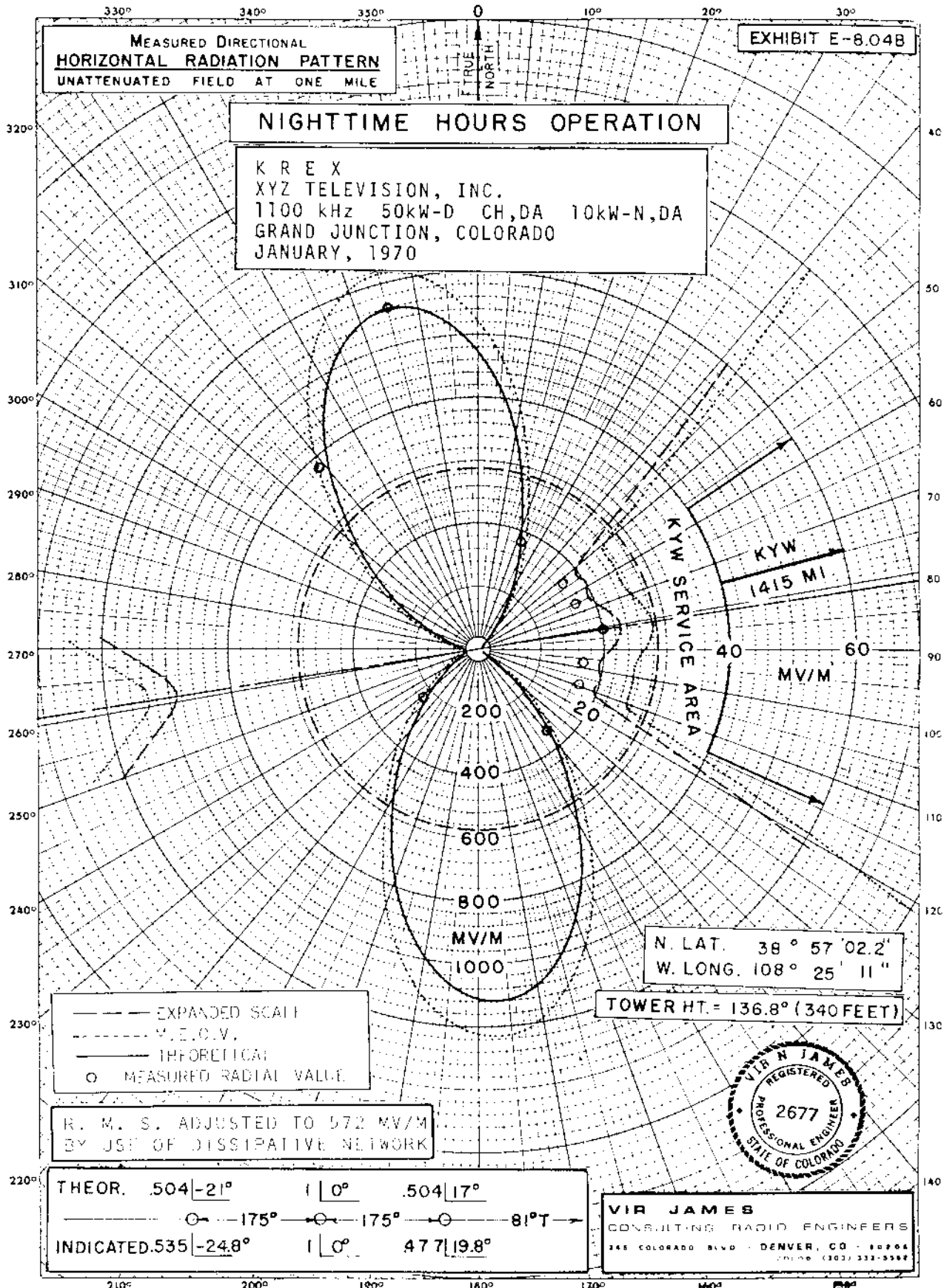
EXHIBIT E-8.04B

MEASURED DIRECTIONAL
HORIZONTAL RADIATION PATTERN
UNATTENUATED FIELD AT ONE MILE

NIGHTTIME HOURS OPERATION

K R E X
XYZ TELEVISION, INC.
1100 kHz 50kW-D CH, DA 10kW-N, DA
GRAND JUNCTION, COLORADO
JANUARY, 1970

SEE
REVERSE
SIDE



FCC File No. BL-12595
Accepted 4-9-70

Station KREX
Grand Junction, Colorado

1100 kc

KREX

Proposed Day (CH)
(9-26-68ct)

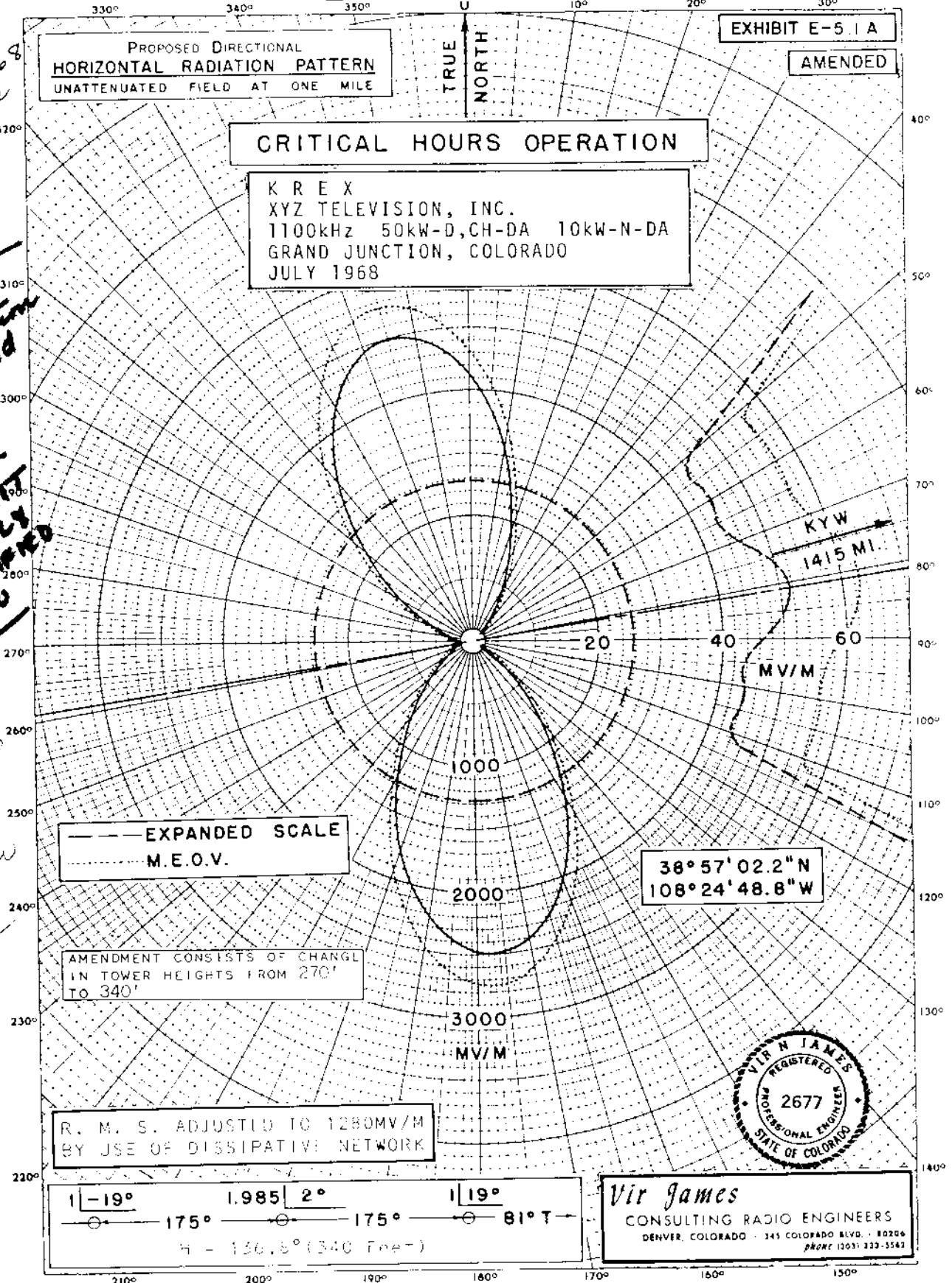
Station KREX
Grand Junction, Colorado

10kw, 50kw-LS, DA-2, U
1100 kc

*Granted 9/30/68
NCP to make
changes in
directional
antenna
system.*

*2-18666
application
was accepted
1-13-69
FCC TO
REPLACE EX-
PIRED PERMIT
(BP-15324
AS MODIFIED
BMP-12500*

*BP-18666
Granted
1-20-69
to replace
expired
permit for
changes*



FCC File No. BMP-12500
Accepted 9-19-68

Station KREX
Grand Junction, Colorado

1100 kc



Vir James
CONSULTING RADIO ENGINEERS
DENVER, COLORADO - 345 COLORADO BLVD. - 80206
phone (303) 232-3543

1100 kc

Granted 9/30/68
 CP to make
 changes
 in DA
 system

P 13466
 approved
 as accepted
 -13-68 by the
 FCC Director
 issued permit
 P-15328 as
 modified
 P-15500

BP-18666
 Granted 11-20-69
 P to replace
 issued permit
 for changes

Proposed Night Nu113
 (9-26-68ct)

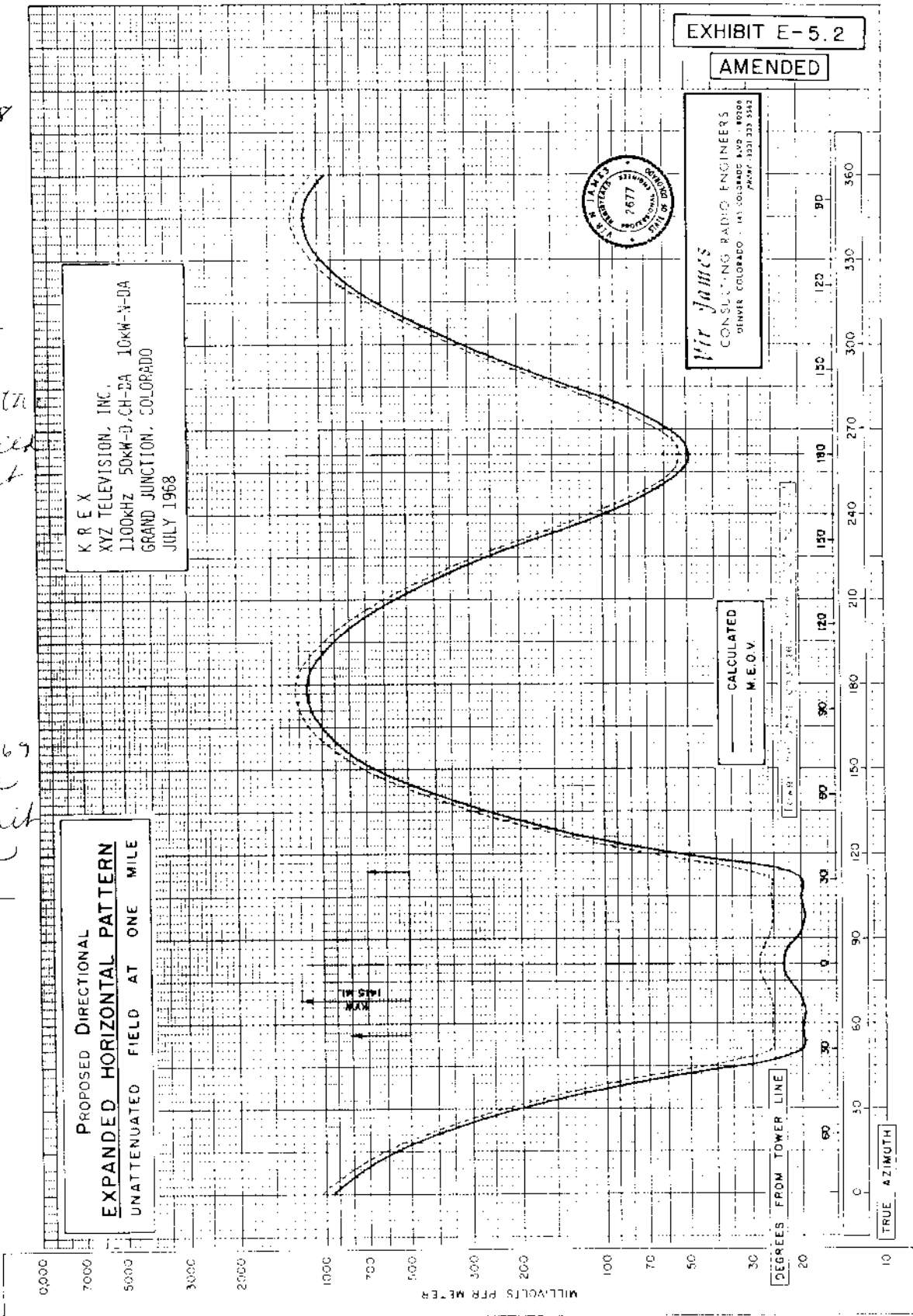
10kw, 50kw-LS, DA
 1100 KC
 Station KREX
 Grand Junction, Colorado

PROPOSED DIRECTIONAL
 EXPANDED HORIZONTAL PATTERN
 UNATTENUATED FIELD AT ONE MILE

KREX
 XYZ TELEVISION, INC.
 1100KHZ 50KW-D, CH-2A 10KW-N-DA
 GRAND JUNCTION, COLORADO
 JULY 1968

EXHIBIT E-5.2
 AMENDED

Vir James
 CONSULTING RADIO ENGINEERS
 DENVER, COLORADO 80206
 PHONE 333-3333



FCC File No. BMP-12500
 Accepted 9-19-68
 Station KREX
 Grand Junction, Colorado
 1100 KC

PROPOSED DAY
(11-9-56g)

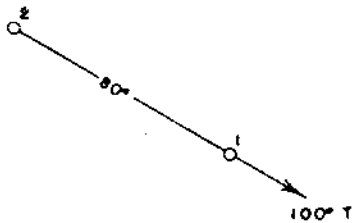
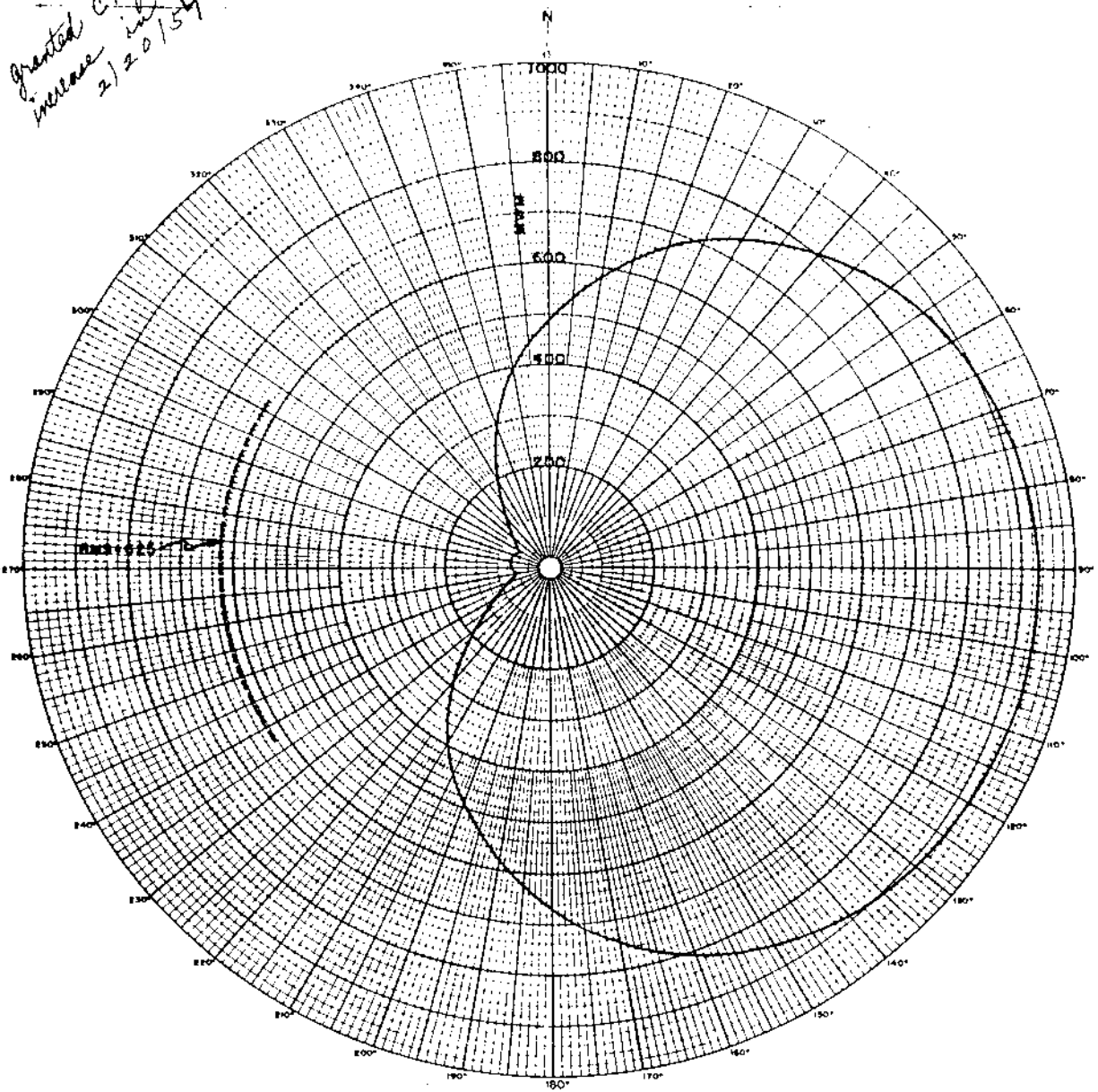
Station W H L I
Hempstead, New York

10 KW, DA-D, D

1100KC

WHLI

*Granted CP for
increase in power
2/20/54*



LATITUDE 40° 41' 06"
LONGITUDE 73° 36' 38"

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	M/V M FOR 1 KW	HEIGHT DEG
1	S	—	0	1	194.5	102.6
2	E	80	105	1.14		(255')
D I A G R A M						

HORIZONTAL RADIATION PATTERN
FOR

PROPOSED WHLI
HEMPSTEAD, L.I., N.Y.
1100 KC 10 KW DA-D

560925

KEAR AND KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D. C.

FCC File No.
BP-6881

Accepted 10-31-56

WHLI
Hempstead, New York

1100 K C

WHLI

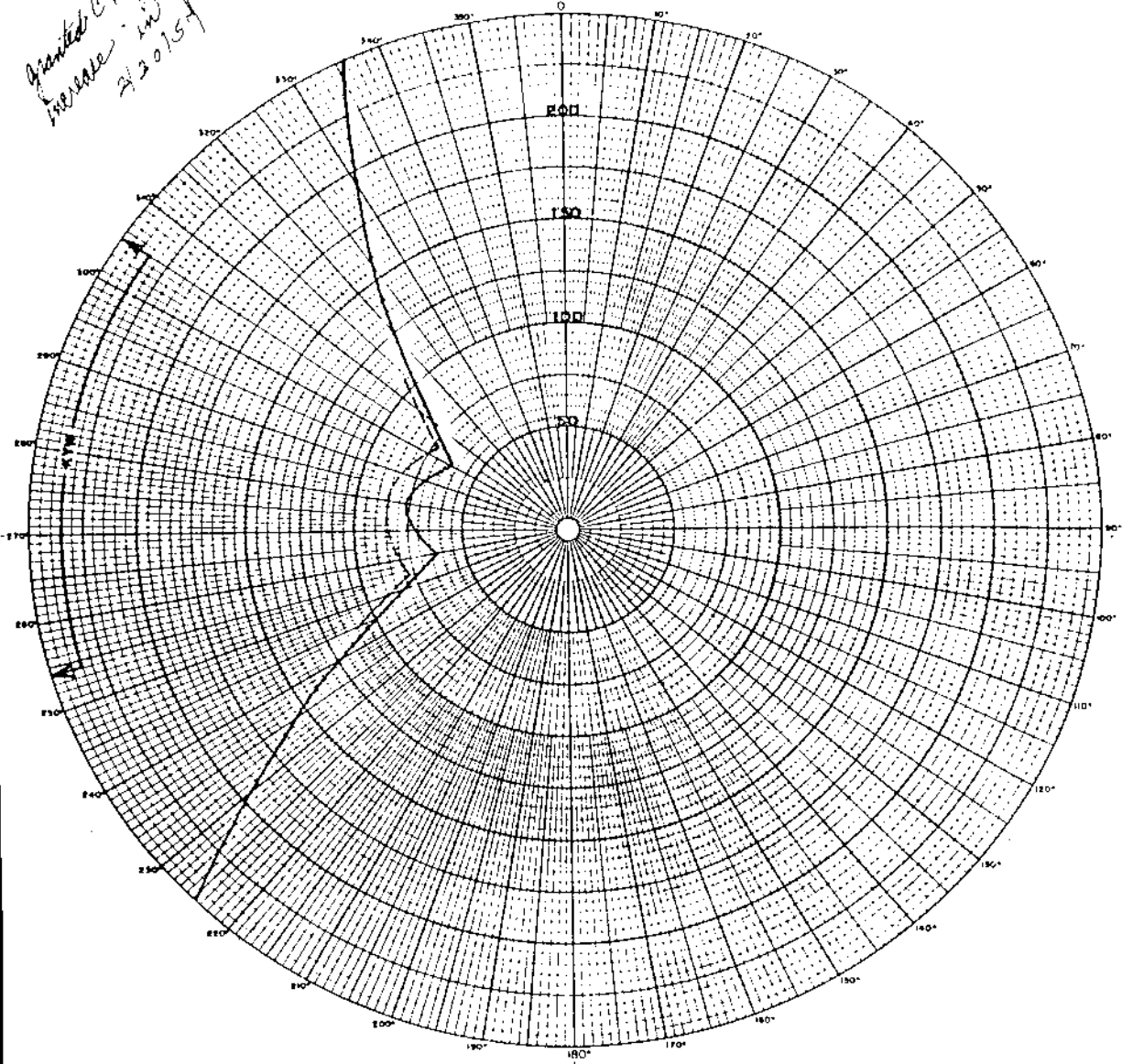
PROPOSED DAY NULL
(11-9-56g)

Station W H L I
Hemstead, New York

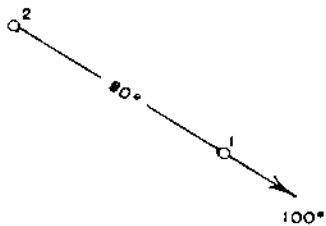
10 KW, DA-D, D

1100 K C

*Granted CP for
increase in power
2/20/57*



MEOV-----



LATITUDE 40° 41' 06"
LONGITUDE 73° 36' 38"

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	M.V.M. FOR 1 KW	HEIGHT DEG
1	—	—	0	1	194.5	102.6
2	S E E	80	105	1.14		(255)
D I A G R A M						

EXPANDED SCALE
HORIZONTAL RADIATION PATTERN
FOR
PROPOSED WHLI
HEMPSTEAD, L.I. N.Y.
1100 KC 10 KW DA-D
560925

KEAR AND KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D. C.

FCC File No.
BP-6881

Accepted 10-31-56

WHLI
Hemstead, New York

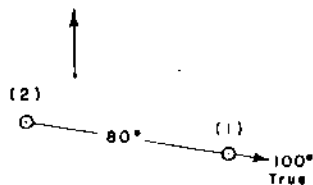
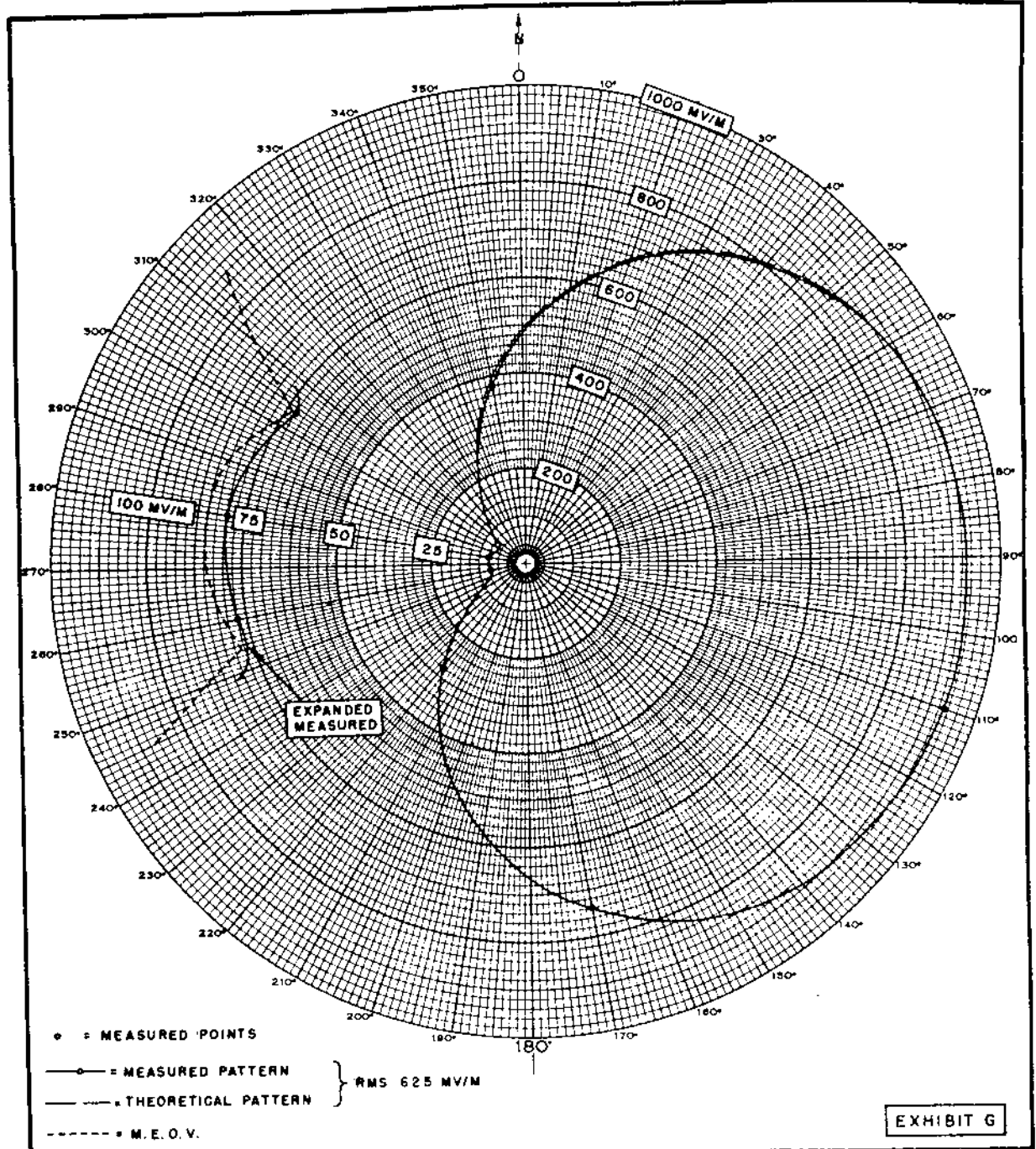
1100 K C

WHLI

Measured Day
(3-26-65ct)

Station WHLI
Hempstead, New York

10kw, DA-D, D
1100 kc



LATITUDE		40° 41' 06" North				
LONGITUDE		73° 36' 38" West				
ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	REV M FOR 1 KW	HEIGHT DEG
1	—	—	0	1	194.5	102.6
2	SEE D I A G R A M	80	105	1.14		(255)

MEASURED & THEORETICAL
HORIZONTAL PLANE PATTERN
FOR
WHLI
HEMPSTEAD, NEW YORK
1100 KC 10 KW DA-D
640923

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D. C.

FCC File No. BZ-5410
Accepted 3-2-65

Station WHLI
Hempstead, New York

1100 kc

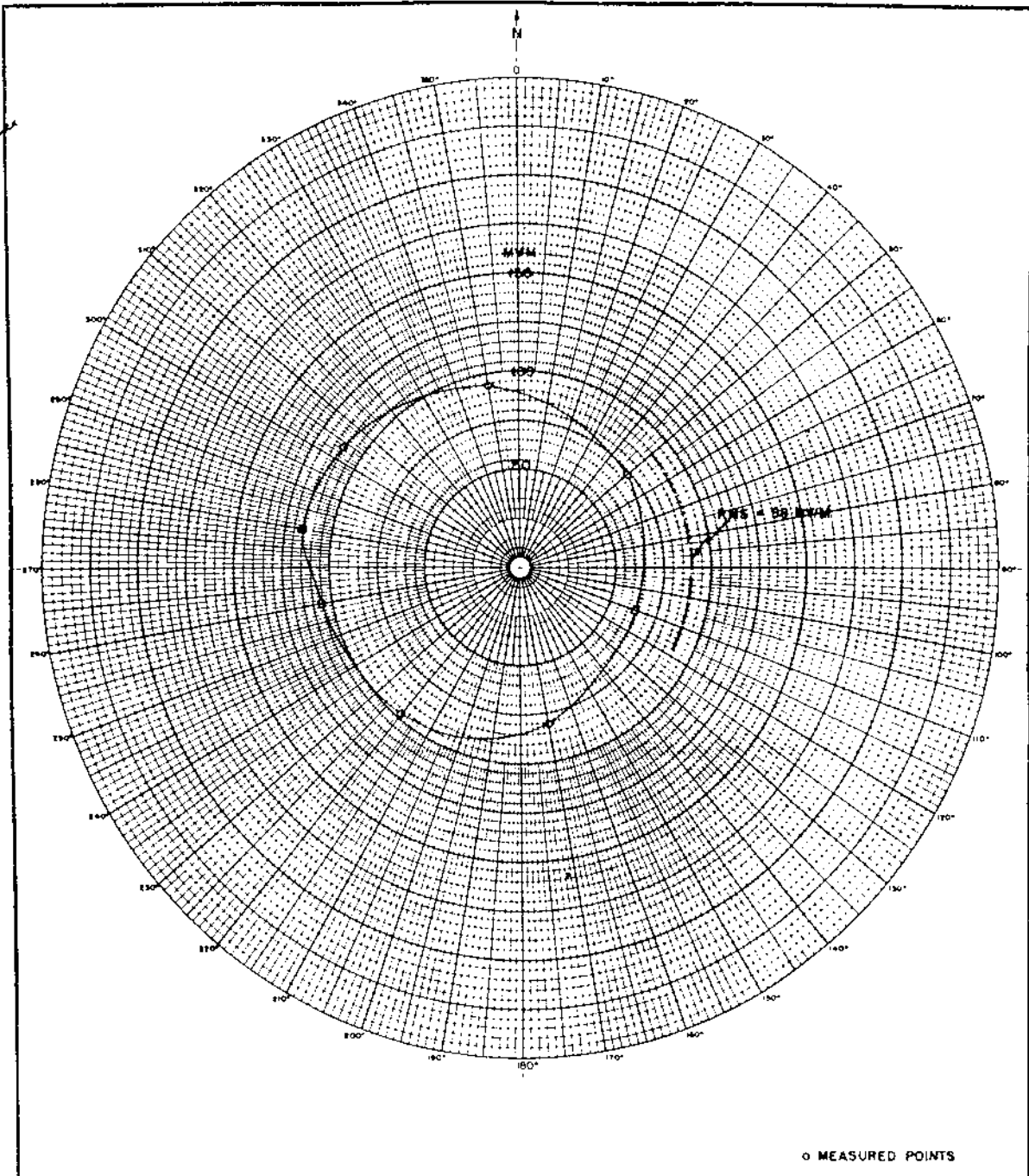
WHLI

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

Station WHLI 10kw, DA-D,D
Hempstead, L.I., New York

1100 KC

*Granted license
7/15/58 for increase
in power & for
PA system*



LATITUDE 40° 41' 08"		MEASURED HORIZONTAL RADIATION PATTERN FOR PRESENT WHLI	
LONGITUDE 73° 36' 38"		HEMPSTEAD, L.I. NEW YORK	
ANTENNA HEIGHT 1100 KC		250 W DAY	
AZIMUTH DEG		580 315	
SPACING DEG		KEAR AND KENNEDY	
PHASING DEG		CONSULTING ENGINEERS	
FIELD RATIO		WASHINGTON, D.C.	
M/V/M FOR 1 KW			
HEIGHT DEG			

FCC File No. BL-7077
Accepted 4-10-58

WHLI
Hempstead, L.I., New York

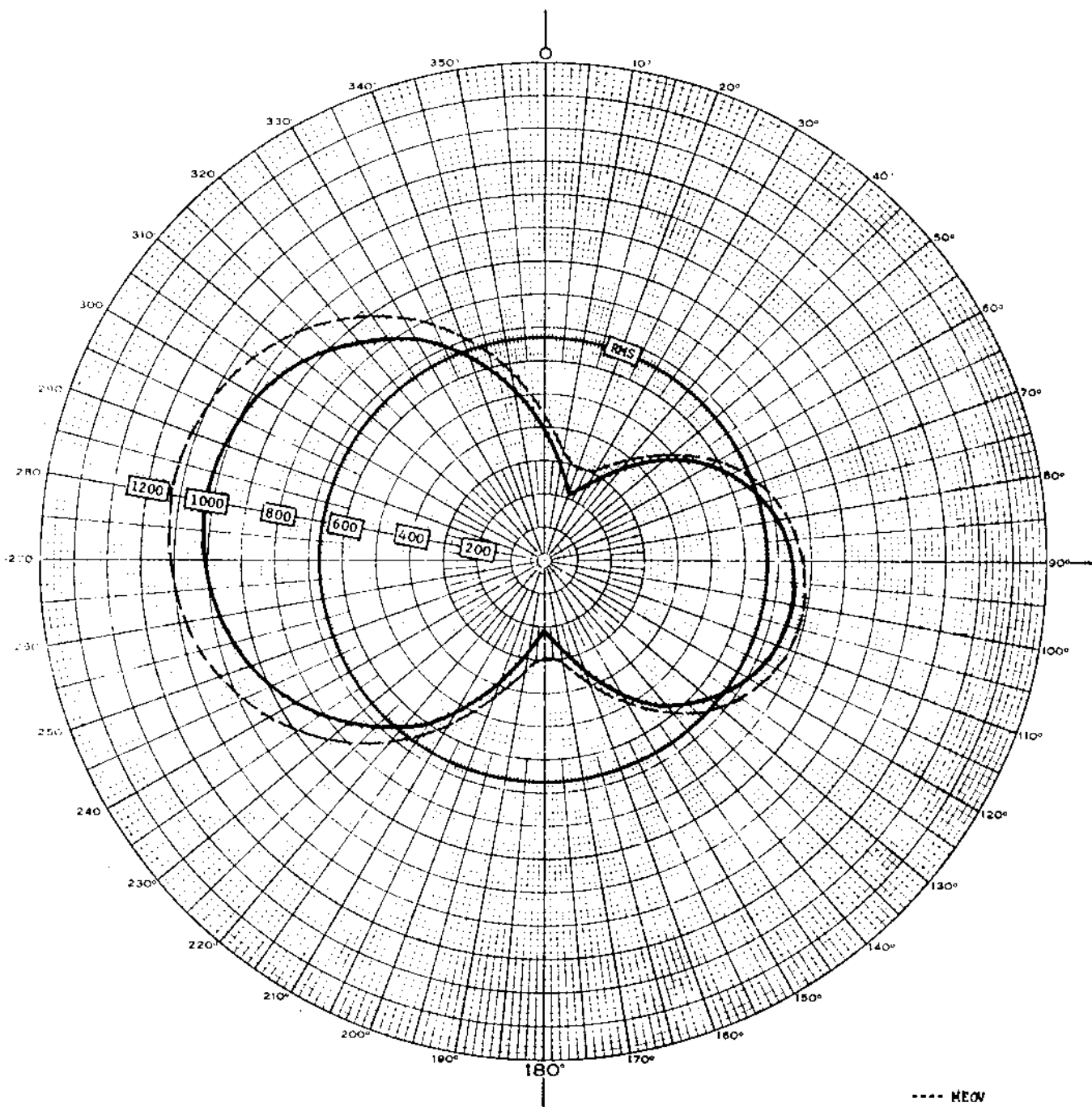
1100 KC

Proposed Day
(3-30-66CT)

Station WLBB
Carrollton, Georgia

10kw, EA-CH, D
1100 kc

WLBB



TOWER PLACEMENT SKETCH		PATTERN PARAMETERS								STATION DATA		
1.00/000° #1 — 70.0° — #2 — 750/+167° #2 — 101.0° — G₁ = 161° G₂ = 101°		TOWER No.	ELECTRICAL HEIGHT G°	TRUE TOWER ORIENTATION θ°	SPACING S°	PHASING φ°	HORIZONTAL FIELD E _{min}	FIELD RATIO F	ELEV ANGLE θ°	ELEVATION RMS FIELD E _{max}	CALL	WLBB
1	161°	000°	00°	000°	1.000	0				FREQUENCY	1100 kc	
2	101°	100°	70°	+167°	0.750	10				POWER	10.0 kw	
3						20				TIME OF OPERATION	CH	
4						30				TYPE OF OPERATION	DA	
5						40				DAYTIME TOWERS	1-2	
6						50				NIGHTTIME TOWERS	xxx	
7						60				NO RADIALS PER TOWER	120	
8						70				LENGTH OF RADIALS	167 to 300 ft	
9						80				GROUND SCREEN DIMENSION	24 x 24'	
10										LAT.	33° 36' 34"	
										LONG.	85° 05' 12"	
RMS 673.6 mV/m P₁ = 10.0 kw										SUPERSEDES PATTERN No 650810A		
DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐												
CLAUDE M. GRAY CONSULTING RADIO ENGINEER BIRMINGHAM, ALA.		EXHIBIT 1-A-5 PROPOSED HORIZONTAL RADIATION PATTERN 0° ELEVATION RADIO STATION WLBB CARROLLTON, GEORGIA										

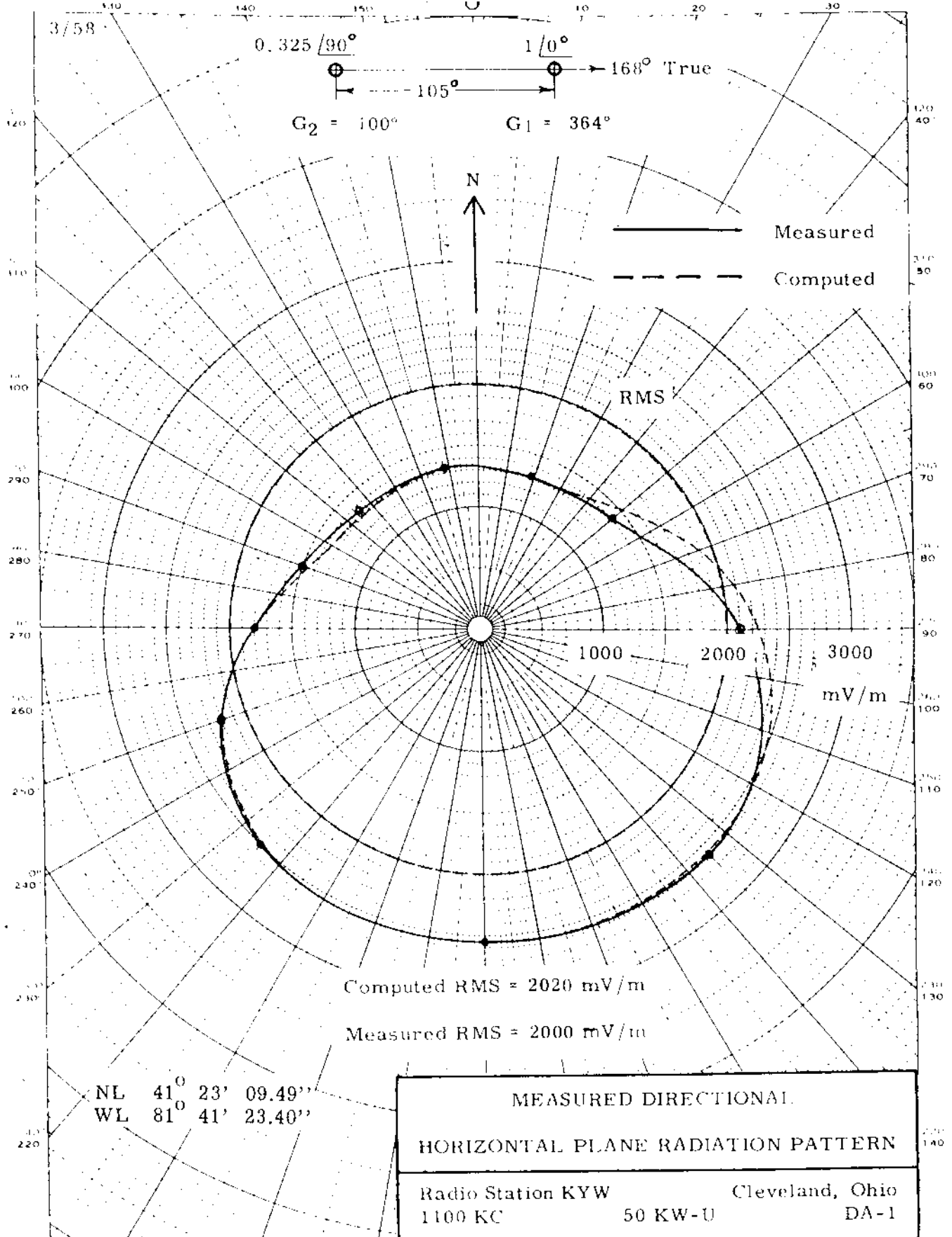
WWWE

~~KYW~~
WKYC

MEASURED DAY & NIGHT
(4-9-58g)

Station KYW
Cleveland, Ohio

50kw, DA-1,U
1100 KC



FCC File No. BL-7062
Accepted 4-1-58

KYW
Cleveland, Ohio

1100 KC

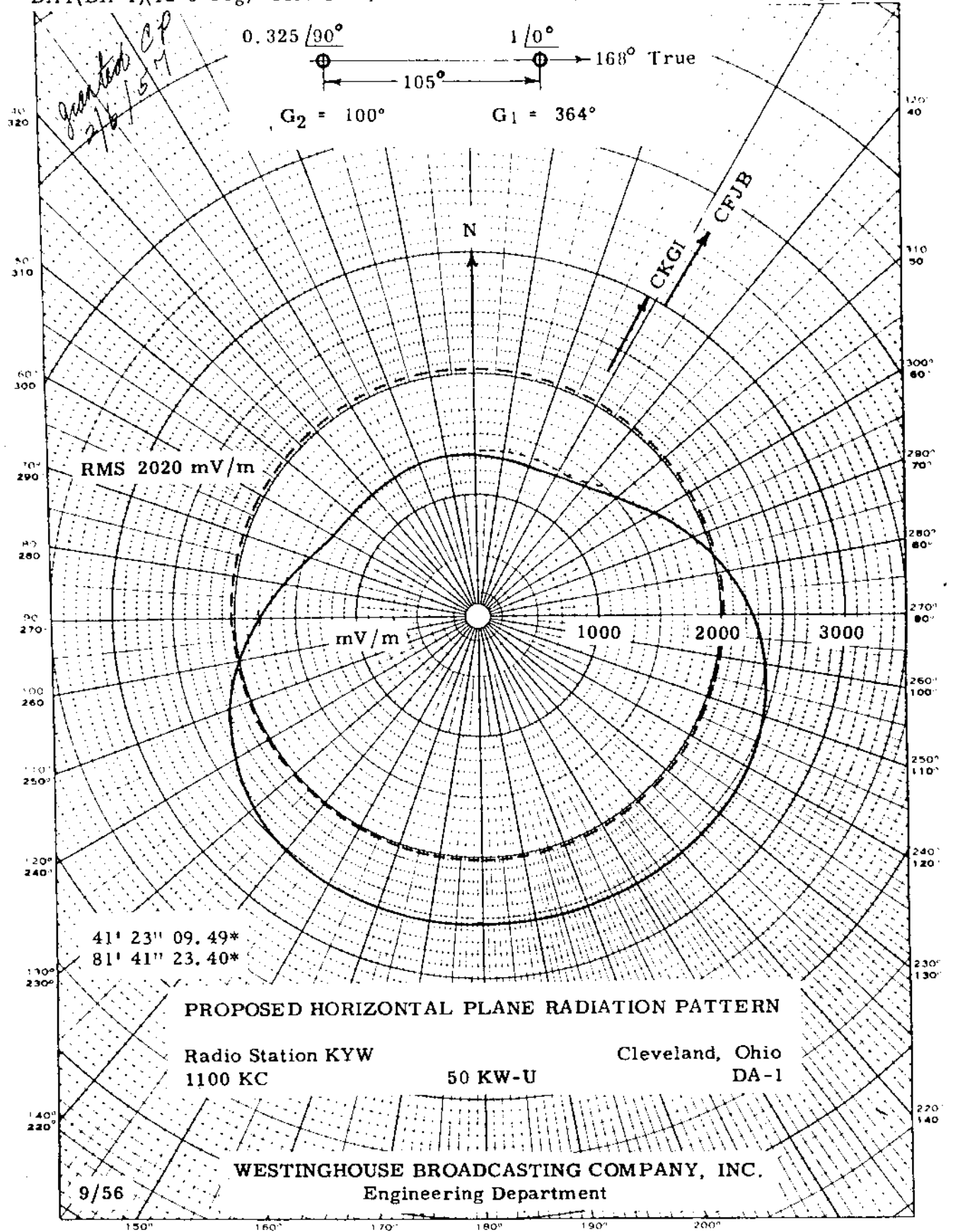
www E

~~KYW~~ www E
WKYC

PROPOSED NIGHT & Station KYW
DAY(DA-1)(12-3-56g) Cleveland, Ohio

DA-1, U
50KW-D, 50KW-N

1100 KC



FCC File No.
BP10,664

Accepted 9-19-56

KYW
Cleveland, Ohio

1100KC

Fig. A-1