ENGINEERING EXHIBITS
FOR
JOHN A. BARNETT
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

PREPARED BY:

GAUTNEY & JONES

RADIO ENGINEERS WASHINGTON, D. C.

May, 1962

GAUTNEY & JONES
CONSULTING ENGINEERS
WASHINGTON, D. C.

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Broadcast Application | FEDERAL COMMUNICATIONS COMMISSION | Section V-A

STANDARD BROADCAST ENGINEERING DATA

Name of applicant: John A. Barnett

1. Purpose of authorization applied for: (Indicate by check mark)
(If application is for a new station or for any of the changes numbered B through F, complete all paragraphs of this form; if change G is of a character which will change coverage or increase the overall height of the antenna structure more than 20 feet, answer all paragraphs, otherwise complete only paragraphs 2 and 10 and the appropriate other paragraphs; for changes H through M, complete only paragraph 2 and the appropriate other paragraphs; for change N complete only paragraphs 2 and 5.)

- A. [X] Construct a new station
- B. [ ] Change power
- C. [ ] Change transmitter location
- D. [ ] Change frequency
- E. [X] Approval of site and antenna
- F. [ ] Special Service Authorization
- G. [ ] Change in antenna system (including addition of FM and TV antennas)
- H. [ ] Change frequency control equipment
- I. [ ] Change tubes in last radio stage
- J. [ ] Change system of modulation
- K. [ ] Change transmitter
- L. [ ] Install auxiliary or alternate main transmitter
- M. [ ] Other changes (specify)
- N. [ ] Change studio location

If this application is not for a new station, summarize briefly the nature of the changes proposed.

2. Facilities requested

Frequency	Hours of operation	Power in kilowatts Night	Power in kilowatts Day
1020 kc	Unlimited	10	50

3. Station location

State	City or town
New Mexico	Roswell

4. Transmitter location

State	County
New Mexico	Chaves
City or town	**Street Address (or other identification)**
Roswell	Old Roswell-Clovis Hwy.

5. Main studio location

State	County
New Mexico	Chaves
City or town	**Street and number, if known**
Roswell	1717 W. Second Street

6. Remote control point location

State	City or town
NONE	

Street Address (or other identification)

7. Transmitter

Make	Type No.	Rated Power
RCA	BTA-50H	50 kw

(If the above transmitter has not been accepted for licensing by the F.C.C., attach as Exhibit No. -- a complete showing of transmitter details. Showing should include schematic diagram and full details of frequency control. If changes are to be made in licensed transmitter include schematic diagram and give full details of change.)

8. Modulation monitor

Make	Type No.
RCA	BW-66F

9. Frequency monitor

Make	Type No.
RCA	BW-11A

10. Antenna system, including ground or counterpoise

Non-Directional Antenna: Day [ ] Night [ ]

Directional Antenna:
- Day only (DA-D) [ ]
- Night only (DA-N) [ ]
- Same constants and power day and night (DA-1) [ ]
- Different constants or power day and night (DA-2) [X]

(If a directional antenna is proposed submit complete engineering data. Show clearly whether directional operation is for day or night or both. If day and night patterns are different give full information on each pattern. This information is in addition to the information in Paragraph 10 and is submitted as Exhibit No. 1-19 and signed by the engineer who designed the antenna system.)

Type radiator	Height in feet of complete radiator above base insulator, or above base if grounded.
Vertical	241
Overall height in feet above ground. (Without obstruction lighting)	**Overall height in feet above mean sea level. (Without obstruction lighting)**
244	3816
Overall height in feet above ground. (With obstruction lighting)	**Overall height in feet above mean sea level. (With obstruction lighting)**
247	3819
If antenna is either top loaded or sectionalized, describe fully as Exhibit No.	

Excitation: Series [X] Shunt [ ]

Geographic coordinates to nearest second.
For direction antenna give coordinates of center of array.
For single vertical radiator give tower location.

North latitude	West longitude
33° 27' 46"	104° 30' 00"

If not fully described above, give further details and dimensions including any other antennas mounted on tower and associated isolation circuits as Exhibit No. 20 (Height figures should not include obstruction lighting.)

Submit as Exhibit No. 21 a plat of the transmitter site showing boundary lines, and roads, railroads, or other obstructions; and also layout of the ground system or counterpoise. Show number and dimensions of ground radials or if a counterpoise is used, show height and dimensions.

11. Attach as Exhibit No. 22,23 a sufficient number of aerial photographs taken in clear weather at appropriate altitudes and angles to permit identification of all structures in the vicinity. The photographs must be marked so as to show compass directions, exact boundary lines of the proposed site, and locations of the proposed 1000 mv/m contour for both day and night operation. Photographs taken in eight different directions from an elevated position on the ground will be acceptable in lieu of the aerial photographs if the data referred to can be clearly shown.

WRH

12. Allocation Studies:

A. Attach as Exhibit No. 24-27 map or maps, having reasonable scales, showing the 1000, 25, 5, 2, normally protected and interference-free contours in mv/m for both day and night operation both existing and as proposed by the application. (NOTE: The 2 mv/m night contour need not be supplied if service is not rendered thereto.)

B. (1) For daytime operation, attach as Exhibit No. 28 an allocation study, utilizing Figure M-3 of the Rules or an accurate full scale reproduction thereof and using pertinent field strength measurement data where available, a full scale exhibit of the entire pertinent area to show the following:

(a) Normally protected, the interference-free, and the interfering contours for the proposed operation along all azimuths.

(b) Complete normally protected and interference-free contours of all other proposals and existing stations to which objectionable interference would be caused.

(c) Interfering contours over pertinent arcs of all other proposals and existing stations from which objectionable interference would be received.

(d) Normally protected and interfering contours over pertinent arcs of all other proposals and existing stations which require study to show the absence of objectionable interference.

(e) Plot of the transmitter location of each station or proposal requiring investigation, with identifying call letters, file numbers, and operating or proposed facilities.

(f) Properly labeled longitude and latitude degree lines, shown across entire exhibit.

(2) For daytime operation, when necessary to show more detail, attach as Exhibit No. -- an additional allocation study, utilizing World or Sectional Aeronautical charts to clearly show interference or absence thereof.

(3) For daytime operation, attach as Exhibit No. 29 a tabulation of the following:

(a) Azimuths along which the groundwave contours were calculated for all stations or proposals shown on allocation study exhibits required by Paragraph 12B above.

(b) Inverse distance field strength used along each azimuth.

(c) Basis for ground conductivity utilized along azimuths specified in (3) (a). If field strength measurements are used, the measurements must be either submitted or be properly identified as to location in Commission files.

C. For nighttime operation, attach as Exhibit No. 30-40 , allocation data to include the following:

(1) Proposed nighttime limitation to other existing or proposed stations with which objectionable interference would result, as well as those other proposals and existing stations which require study to clearly show absence of objectionable interference.

(2) All existing or proposed nighttime limitations which enter into the nighttime R.S.S. limitation of each of the existing or proposed facilities investigated under C (1) above.

(3) All existing and proposed limitations which contribute to the R.S.S. nighttime limitation of the proposed operation, together with those limitations which must be studied before being excluded.

(4) A detailed interference study plotted upon an appropriate scale map if a question exists with respect to nighttime interference to other existing or proposed facilities along bearings other than on a direct line toward the facility considered.

(5) Utilizing an appropriate scale map, clearly show the normally protected and interference-free contours of each of the existing and proposed stations which would receive nighttime interference from the proposed operation.

(6) The detailed basis for each nighttime limitation calculated under C (1) (2) (3) and (4) above, including a copy of each pertinent radiation pattern in the vertical plane and basis therefor.

13. Attach as Exhibit No. 41 tables of the areas and populations within the contours included in Paragraph 12 (A) above, as well as within the normally protected and interference-free contours of each station or proposed operation to which interference would be caused according to the Commission Rules.

(NOTE: See the Standard Broadcast Technical Standards. All towns and cities having populations in excess of those given in Section 3.182(g) are not to be included in the tabulation of populations within the service contours. The 1950 or later Census Minor Civil Division maps are to be used in making population counts, subtracting any towns or cities not receiving adequate service, and where contours cut a minor division assuming a uniform distribution of population within the division, to determine the population included in the contours unless a more accurate count is made.)

14. Attach as Exhibit No. --- map or maps having reasonable scales clearly showing the following:

(a) Proposed antenna location

(b) General character of the city or metropolitan district, particularly the retail business, wholesale business, manufacturing, residential, and unpopulated areas (by symbols, cross-hatching, colored crayons, or other means)

(c) Heights of buildings or other structures and terrain elevations in the vicinity of the antenna, indicating the location thereof.

(d) Transmitter location and call letters of all radio stations (except amateur) and the location of established commercial and government receiving stations within 2 miles of the proposed transmitter location. Call letters and locations of broadcast stations, including FM and television, within 5 miles must be shown.

(e) Terrain

15. If this application is for modification of construction permit state briefly as Exhibit No. --- the present status of construction and indicate when it is expected that construction will be completed.

I certify that I am the ~~XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX~~ Consulting Engineer for the applicant of the radio station for which this application is submitted and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief. (This signature may be omitted provided the engineer's original signed report of the data from which the information contained herein has been obtained is attached hereto.)

Date June 1, 1962

George E. Gautney

~~XXXXXXXXXXXXXXXXXX~~ Consulting Engineer

Broadcast Application | FEDERAL COMMUNICATIONS COMMISSION | Section V-G (Antenna)

ANTENNA AND SITE INFORMATION
(see instruction B Section I)

Name of applicant: John A. Barnett

Address where applicant can be reached in person: Box 670 Roswell, New Mexico

Since this Section is submitted to the Regional Airspace Subcommittee of the Air Coordinating Committee for clearance in connection with obstructions to air navigation, it is necessary that all the data called for be supplied. Previously and separately filed data must not be incorporated by reference.

Legal Counsel: Koteen & Burt

Address: 1000 Vermont Ave., N. W., Wash., DC

Consulting Engineer: Gautney & Jones

Address: 930 Warner Building, Wash., D. C.

Class of station: Standard

Facilities requested: 1020kc - 10kw/50kw-U

1. Location of antenna

State	County	City or Town
New Mexico	Chaves	Roswell

Exact antenna location (street address) (If outside city limits, give distance and direction from, and name of nearest town)

Old Roswell-Clovis Highway, 3 miles North of Roswell City limits

Geographic coordinates (to be determined to nearest second. For directional antenna give coordinates of center of array.) For single vertical radiator give tower location.

North latitude	West longitude
33° 27' 46"	104° 30' 00"

Purpose of application (Check appropriate box)

a. New antenna construction [X]
b. Alteration of existing antenna structures [ ]
c. Change in location [ ]

2. Features of surrounding terrain

List any natural formations or existing man-made structures (hills, trees, water tanks, towers, etc.) which, in the opinion of the applicant, would tend to shield the antenna from aircraft and thereby minimize the aeronautical hazard of the antenna.

None

Submit as Exhibit No. 42 a chart on which is plotted the exact location of the antenna site, and also the relative location of the natural formations and/or the existing man-made structures listed above.

The chart used shall be an Instrument Approach Chart (or the landing chart on reverse side thereof), or a Sectional Aeronautical Chart, choice depending upon proximity of antenna site to landing areas. 1/ In general, the Sectional Aeronautical Chart should be used only where the antenna site is more than 10 miles from a landing area for which an Instrument Approach Chart is unobtainable. Such chart may be purchased from the U. S. Coast and Geodetic Survey, Washington 25, D. C.

1/ If the proposed antenna site is within the boundaries of a landing area for which no Instrument Approach Chart is available, submit a self-made, large scale map showing antenna site, runway(s) and existing man-made structures listed above.

FAA Form 117 filed with Regional Office May 29, 1962

3. Designation, distance, and bearing to center line of nearest established airway within 5 miles: V 14; 4.4 miles; 153° True

4. List all landing areas within 10 miles of antenna site. Give distance and direction to the nearest boundary of each landing area from the antenna site.

Landing Area	Distance	Direction
(a) Roswell	4.2 miles	215° True
(b) Walker AFB	10.0 miles	190° True
(c)		

5. Description of antenna system (If directional, give spacing and orientation of towers).

Three (3) towers spaced 375' apart, orientated on a bearing of 60° True

Type: Vertical

Description of tower(s): Structural Steel

Self-supporting | Guyed X | Tubular (Pole)

Tower (height figures should include obstruction lighting)	#1	#2	#3	#4	#5	#6
Height of radiating elements	244	244	244			
Overall height above ground	247	247	247			
Overall height above mean sea level	3819	3819	3819			

If a combination of Standard, FM, or TV operation is proposed on the same multi-element array (either existing or proposed) submit as Exhibit No. a horizontal plan for the proposed antenna system, giving heights of the elements above ground and showing their orientation and spacing in feet. Clearly indicate if any towers are existing.

Submit as Exhibit No. 20 a vertical plan sketch for the proposed total structure (including supporting building if any) giving heights above ground in feet for all significant features. Clearly indicate existing portions, noting painting and lighting.

Is the proposed antenna system designed so that obstruction lights may be installed and maintained at the uppermost point(s)? Yes [X] No [ ]

6. Is the proposed site the same or immediately adjoining the transmitter-antenna site of other stations authorized by the Commission or specified in another application pending before the Commission? Yes [ ] No [X]

If the answer is "Yes", give

Call letters	File numbers

Date June 1, 1962

George E. Gautney
Signature of Engineer preparing data

U.S. GOVERNMENT PRINTING OFFICE : 1960 O—547293

FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON 25, D. C.

FCC Form 202
March 1961

STANDARD BROADCAST RMS AND RADIATION PATTERN DATA

Form Approved
Budget Bureau No. 52-R175

	APPLICANT OR LICENSEE:	CITY:	STATE:	IDENTIFICATION
1.	John A Barnett	Roswell	NM	

	DEG	MIN	SEC	DEG	MIN	SEC	FILE DATE	RAD DAY (MV/M)	AZ (DEG)	RAD NITE (MV/M)	AZ (DEG)
2.	33	27	46	104	30	00		235	310	982	310

	CALL	FILE	NUMBER	P DAY (KW)	N DAY	P NITE	N NITE	CODE	STA. D N	DAY DATE	F/P	NITE DATE	F/P	FREQ (KC)	APLRMS-DAY	APLRMS-NITE	CL	REF AZ D	REF AZ N
3.				50	03	10	03	DA 2 U	PP	620424	P	620423	P	1020	1360	600	2A	000	000

	FIELD RATIO	HEIGHT (DEG)	REL. PHASE (DEG)	SPACING (DEG)	Φ (DEG)	BASE/LOOP RES. (Ω)	$^{0}/_{1}$	#	D	N	A (H_1)	B (TL_1)	C (H_2)	D (TL_2)
4.	10	900	-505	0	0	2	0							
	2005	900	93	140	600	2	0							
	10	900	505	140	600	2	0							
	0													
	10	900	-505	0	0	2	0							
	1981	900	235	140	600	2	0							
	10	900	505	140	600	2	0							
	0													
22.														

SPECIAL ANGLES AND ELEVATIONS

Φ_0	$\Delta\Phi$	Φ_N	θ_0	$\Delta\theta$	θ_N
23.					

F.C.C. • WASHINGTON, D. C.

GEORGE E. GAUTNEY
CARL T. JONES

TELEPHONE: NATIONAL 8-7757
NATIONAL 8-6978

GAUTNEY & JONES
CONSULTING RADIO ENGINEERS
930 WARNER BUILDING
WASHINGTON 4, D. C.

STATEMENT OF GEORGE E. GAUTNEY
IN CONNECTION WITH
APPLICATION FOR CONSTRUCTION PERMIT
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

Applicant: John A. Barnett

I am a Consulting Radio Engineer, a partner in the firm of Gautney & Jones, with offices in the Warner Building, Washington, D. C.

My education and experience are a matter of record with the Federal Communications Commission. I am a Registered Professional Engineer in the District of Columbia, Registration No. 602.

I have been authorized by the applicant to prepare the following statement and associated exhibits to be filed with and made a part of an application for construction permit requesting authority to erect and operate a new standard broadcast station in Roswell, New Mexico, on the frequency of 1020 kilocycles with a power of 10 kilowatts night, 50 kilowatts day, and utilizing different directional antenna systems for day and night operation (DA-N).

It will be noted that the frequency and facilities requested herein correspond to the requirements for a Class II-A channel allocated by the Federal Communications Commission to New Mexico in the final Report and Order in the matter of Docket No. 6741. Reference to Pages 31 and 41 of the attached exhibits will show that 91 per cent of the area within the nighttime interference-free contour of the station is "white area" and 24.8 per cent (essentially 25 per cent) of the population within the nighttime interference-free contour is without primary nighttime service from any existing station.

In examining Page 30 of the attached exhibits, it should be kept in mind that KDKA, operating on 1020 kilocycles in Pittsburgh, Pennsylvania, utilizes a sectionalized vertical antenna. Numerous attempts to obtain detailed information on either the sectionalizing method used or the equivalent vertical section from the Commission's files have been unsuccessful. Accordingly, the 0.5 mv/m 50 per cent of the time sky wave contour of KDKA has been based entirely on the ground plane radiation of that station. This results in a slightly extended 0.5 mv/m sky wave contour for KDKA. Had the proper vertical section or means to obtain this vertical section been available, the protection from the proposed station in Roswell toward KDKA would have been even greater than is shown on Page 30.

It should also be noted that KGBS operates on 1020 kilocycles in Los Angeles, California, for some nighttime hours during the week. No attempt has been made herein to show the interference-free contour of KGBS nor has any attempt been made to compute the interference which that station would cause to the proposal herein during the few hours KGBS operate at night since the construction permit granted to KGBS on October 28, 1959, (BP-7193), contained the following two conditions:

4. Permittee shall accept any interference that may result due to the operation of a new unlimited time station within the State of New Mexico in the implementation of the 3rd Notice of Proposed Rule Making in Docket 6741.

5. Permittee shall modify its 50-kilowatt limited time operation if and when a new Class II Unlimited Time Station, located within the State of New Mexico, on 1020 kilocycles assigned in implementation of the 3rd Notice of Proposed Rule Making in Docket 6741, commences program tests, so that the nighttime limitation caused by KPOP to such new unlimited time would not exceed the night operation of KDKA, Pittsburgh, Pennsylvania.

The attached exhibits were prepared under my direction and are believed to be true and correct. The information contained in Sections V-A and V-G of FCC Form 301 was supplied by me.

George E. Gautney
George E. Gautney

WASHINGTON)
) SS:
DISTRICT OF COLUMBIA)

I, George E. Gautney, being first duly sworn, upon oath depose and say that the facts contained in the foregoing statement by me subscribed are true of my own personal knowledge except those stated on information and belief, and those facts I verily believe to be true.

George E. Gautney
George E. Gautney

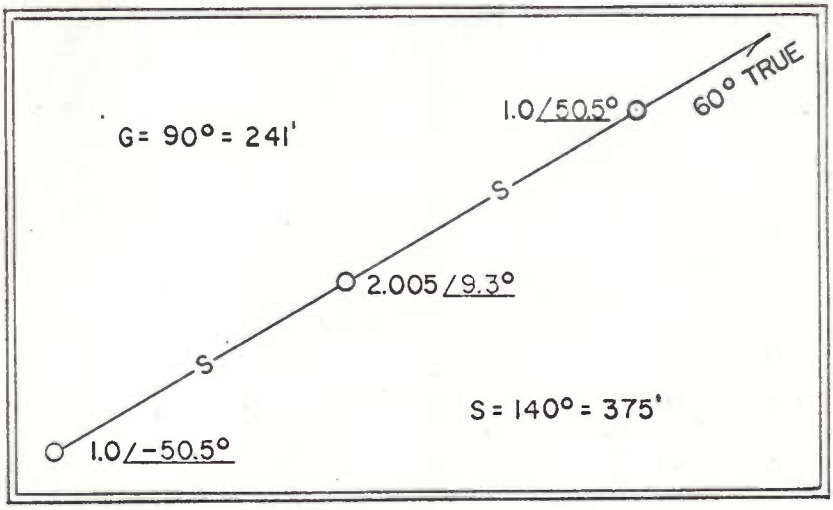
Subscribed and sworn to before me this first day of June, 1962.

Anna A. Hammond
Notary Public, D. C.

My Commission expires May 14 1963

(SEAL)

DAYTIME DIRECTIONAL ANTENNA ARRAY
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2



Equation of the Array:

$$E = 560 \left(\angle 2 \cos (S/2 \cos \phi + 21.1) \angle 2 \cos (S/2 \cos \phi + 29.4) \angle + j\, 0.3243 \right)$$

Where:

E = Unattenuated inverse field at one mile (in mv/m)
S = Spacing between towers in degrees (140°)
ϕ = Horizontal angle from 60° True

Example:

Az. = 0°, $\phi = 60^\circ$

$$E = 560 \left(\angle 2 \cos (35.0 + 21.1) \angle 2 \cos (35 + 29.4) \angle + j\, 0.3243 \right)$$

$$E = 560 \angle (2 \cos 56.1)(2 \cos 64.4) + j\, 0.3243 \angle$$

$$E = 560 \angle (1.1156)(0.8642) + j\, 0.3243 \angle$$

$$E = 560\ (0.9641 + j\, 0.3243)$$

$$E = 560\ (1.016)$$

$$E = 569 \text{ mv/m}$$

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May, 1962

TABULATION OF DAYTIME RADIATED FIELDS
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

Ø	Unattenuated Inverse Field (mv/m)
0	180.2
10	180.0
20	180.3
30	180.0
40	193.0
50	303.0
60	569.0
70	964.0
80	1412.0
90	1832.0
100	2122.0
110	2235.0
120	2172.0
130	1982.0
140	1732.0
150	1489.0
160	1295.0
170	1175.0
180	1132.0

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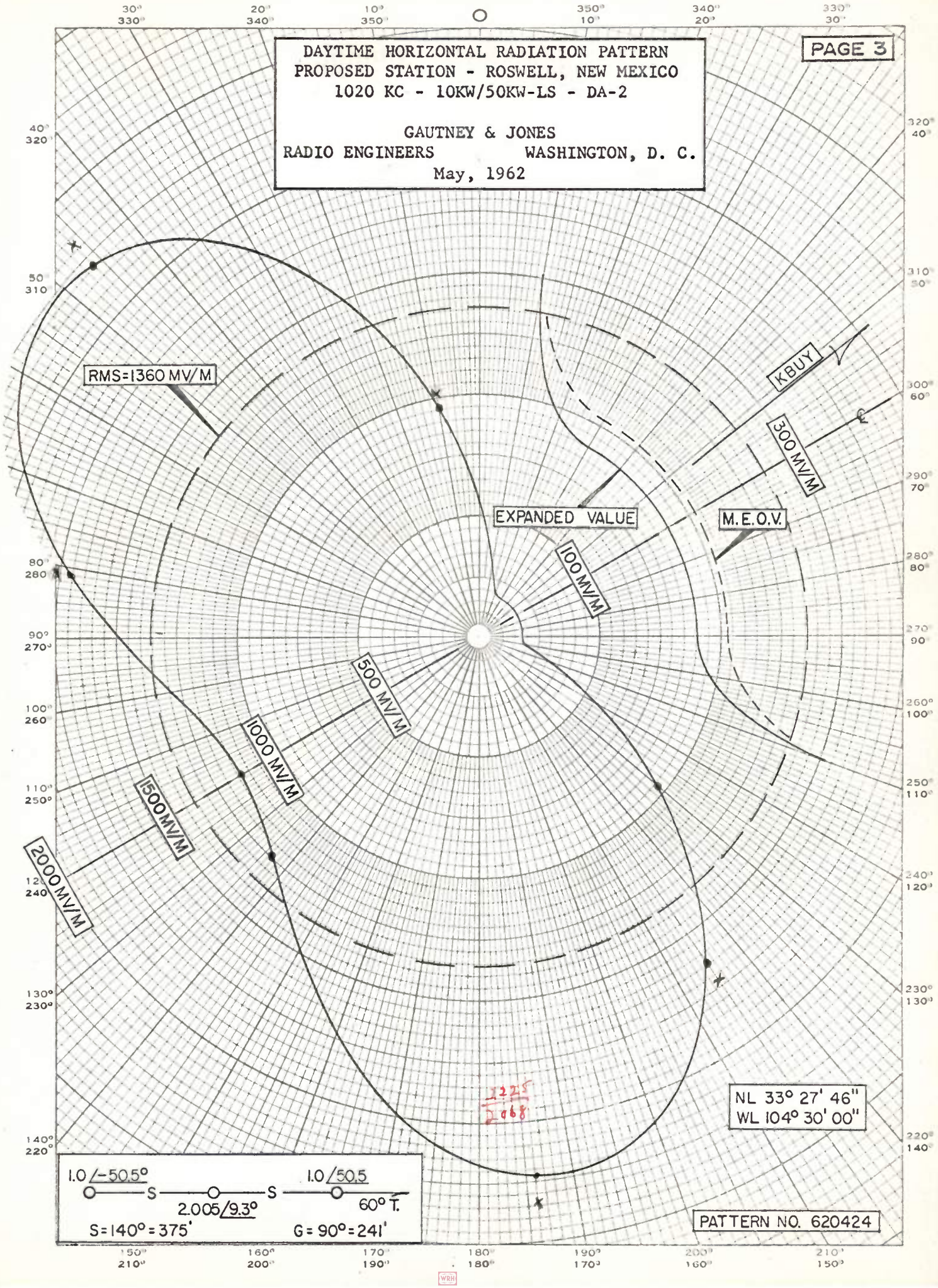
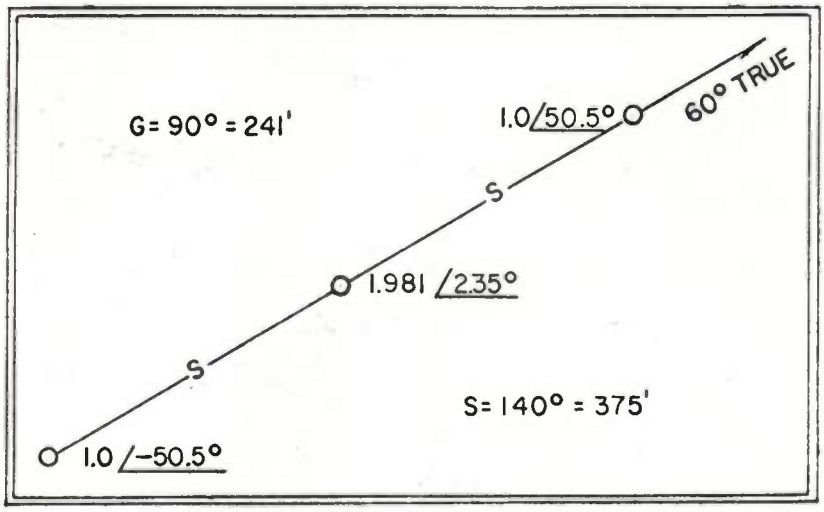
May, 1962


DAYTIME HORIZONTAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2
GAUTNEY & JONES
RADIO ENGINEERS WASHINGTON, D. C.
May, 1962
PAGE 3
RMS=1360 MV/M
KBUY
300 MV/M
EXPANDED VALUE
M.E.O.V.
100 MV/M
500 MV/M
1000 MV/M
1500 MV/M
2000 MV/M
NL 33° 27' 46"
WL 104° 30' 00"
1.0 /-50.5°
S
2.005/9.3°
S
1.0 /50.5
60° T.
S=140°=375'
G=90°=241'
PATTERN NO. 620424
EUGENE DIETZGEN CO.
PRINTED IN U.S.A.
NO. 340-P DIETZGEN GRAPH PAPER
POLAR CO-ORDINATE

NIGHTTIME DIRECTIONAL ANTENNA ARRAY
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2



Equation of the Array:

$$E = 247f(\theta)\left(\angle 2\cos(S/2\cos\phi\cos\theta+21.1)\angle 2\cos(S/2\cos\phi\cos\theta+29.4)\angle+j0.081\right)$$

Where:

E = Unattenuated inverse field at one mile (in mv/m)
S = Spacing between towers in degrees (140°)
ϕ = Horizontal angle from 60° True
θ = Vertical angle from horizontal
$f(\theta)$ = Radiation factor for a 90° antenna at the vertical angle θ

Example:

Az. = 0°, $\phi = 60^\circ$, $\theta = 30^\circ$

$$E = 201.7\left(\angle 2\cos(30.3+21.1)\angle 2\cos(30.3+29.4)\angle+j\,0.081\right)$$

$$E = 201.7\ \angle(2\cos 51.4)(2\cos 59.7)+j\,0.081\angle$$

$$E = 201.7\ \angle(1.2478)(1.0090)+j\,0.081\angle$$

$$E = 201.7\,(1.259+j\,0.081)$$

$$E = 201.7\,(1.2593)$$

$$E = 254.0 \text{ mv/m}$$

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May, 1962

TABULATION OF NIGHTTIME RADIATED FIELDS
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

Ø	θ = 0°	θ = 5°	θ = 10°	θ = 15°	θ = 20°	θ = 25°	θ = 30°
0	20.2	20.0	19.6	19.2	18.8	17.9	16.3
10	20.0	19.9	19.6	19.4	18.9	17.7	16.5
20	20.6	20.6	20.1	19.5	18.4	17.6	19.5
30	20.0	19.9	19.9	20.0	21.7	27.0	36.1
40	37.6	38.4	41.3	46.3	53.9	64.4	76.8
50	109.4	111.1	114.5	120.0	128.0	138.0	149.0
60	239.0	239.0	242.4	244.0	247.0	251.0	254.0
70	417.0	415.0	414.0	408.0	404.0	396.0	384.0
80	618.0	614.0	607.0	595.0	576.0	554.0	527.0
90	803.0	796.0	783.0	763.0	733.0	697.0	655.0
100	932.0	926.0	911.0	883.0	846.0	801.0	751.0
110	982.0	978.0	962.0	931.0	884.0	850.0	798.0
120	954.0	948.0	937.0	915.0	882.0	844.0	796.0
130	870.0	867.0	838.0	843.0	820.0	794.0	758.0
140	760.0	759.0	754.0	746.0	735.0	719.0	695.0
150	652.0	651.0	652.0	652.0	648.0	645.0	633.0
160	565.0	567.0	570.0	575.0	578.0	581.0	580.0
170	512.0	513.0	517.0	525.0	532.0	540.0	544.0
180	493.0	496.0	500.0	519.0	517.0	527.0	532.0

Ø	θ = 35°	θ = 40°	θ = 45°	θ = 50°	θ = 55°	θ = 60°
0	18.3	26.1	41.7	61.3	82.1	100.0
10	19.0	29.4	46.0	65.5	85.1	103.0
20	26.9	41.0	59.0	78.5	97.0	113.0
30	49.0	65.2	83.7	102.0	118.0	129.0
40	91.3	108.0	124.0	137.5	148.0	154.0
50	160.0	172.0	181.0	187.0	189.0	184.5
60	256.0	256.0	253.0	247.0	236.0	220.0
70	373.0	356.0	338.0	315.0	289.0	258.0
80	495.0	469.0	425.0	386.0	343.0	298.0
90	608.0	557.0	504.0	447.0	392.0	335.0
100	693.0	631.0	566.0	500.0	432.0	366.0
110	738.0	672.0	605.0	531.0	461.0	388.0
120	740.0	680.0	617.0	546.0	476.0	404.0
130	714.0	665.0	610.0	545.0	479.0	408.0
140	669.0	631.0	587.0	534.0	475.0	409.0
150	616.0	591.0	561.0	518.0	466.0	406.0
160	572.0	558.0	535.0	501.0	457.0	403.0
170	544.0	535.0	519.0	490.0	450.0	400.0
180	533.0	528.0	512.0	486.0	448.0	398.0

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NIGHTTIME HORIZONTAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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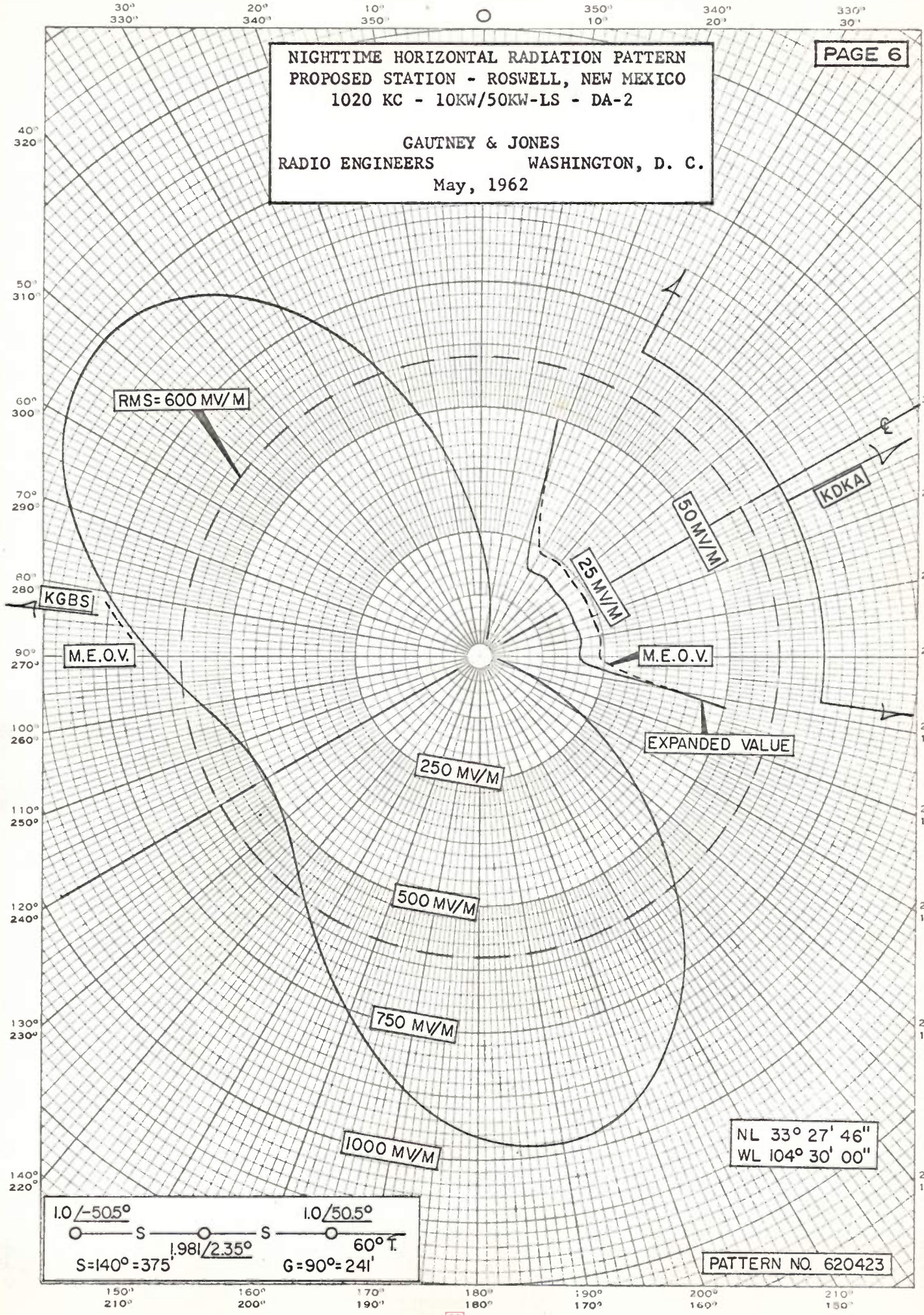

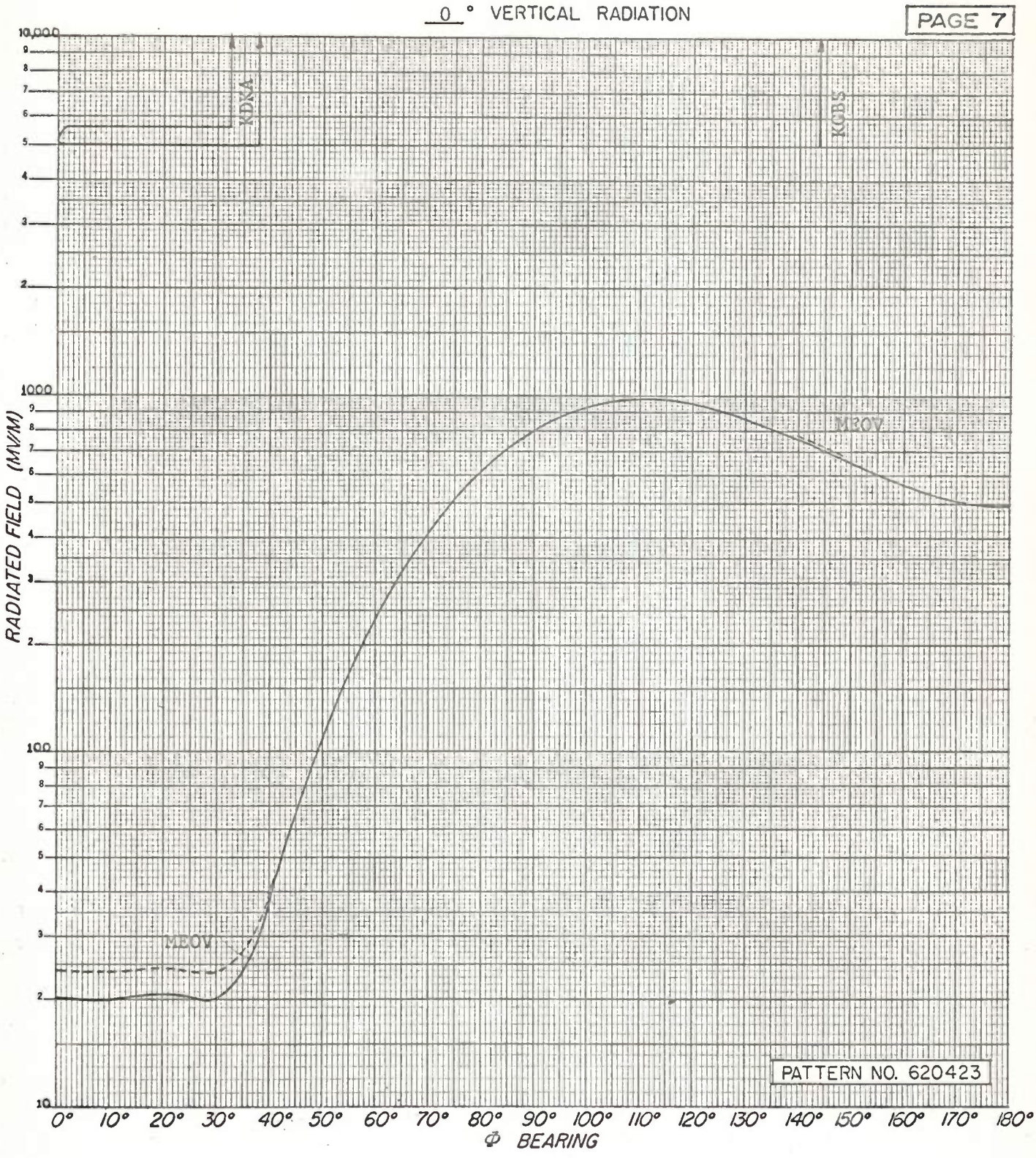

HORIZONTAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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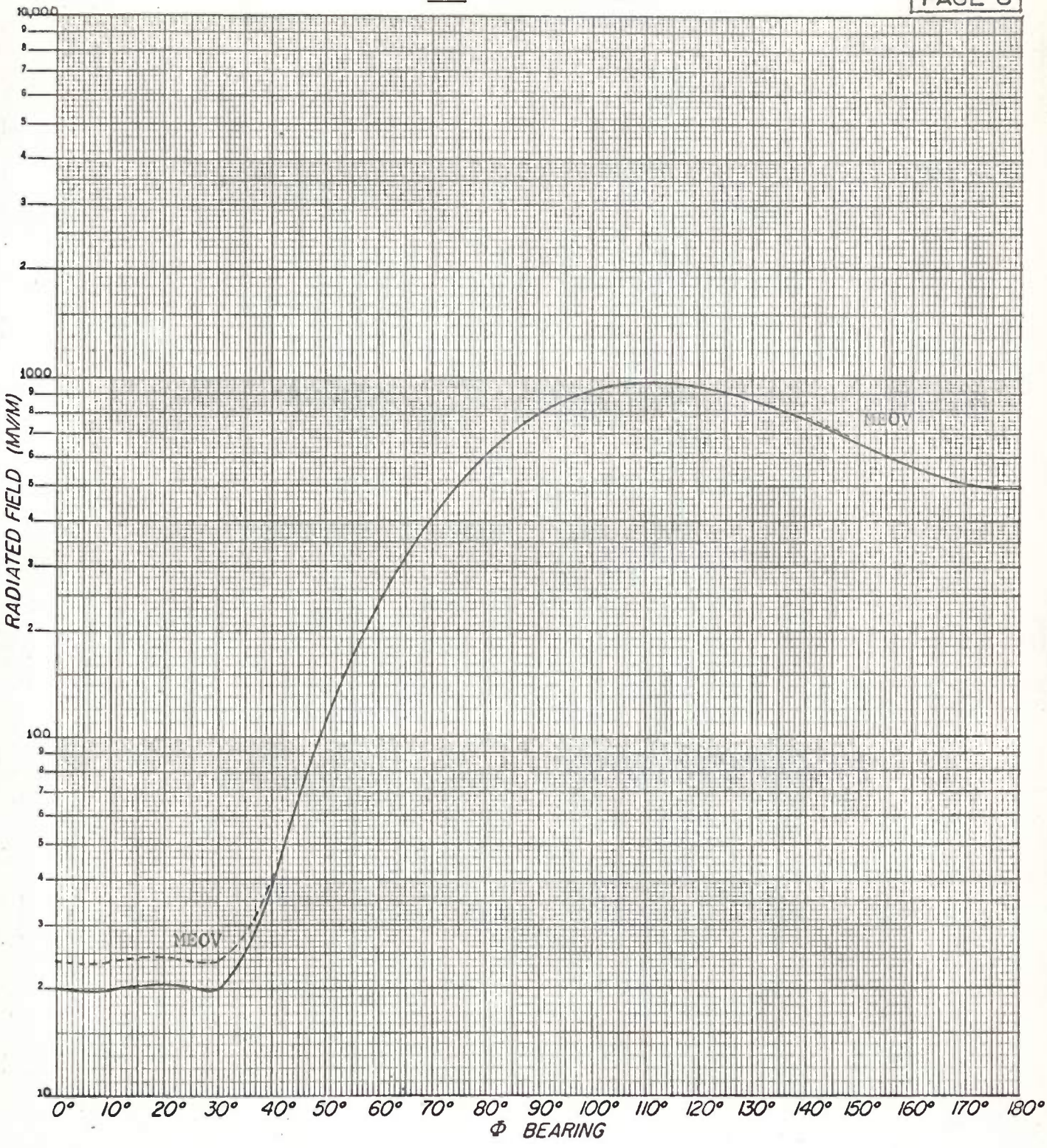
5 ° VERTICAL RADIATION



VERTICAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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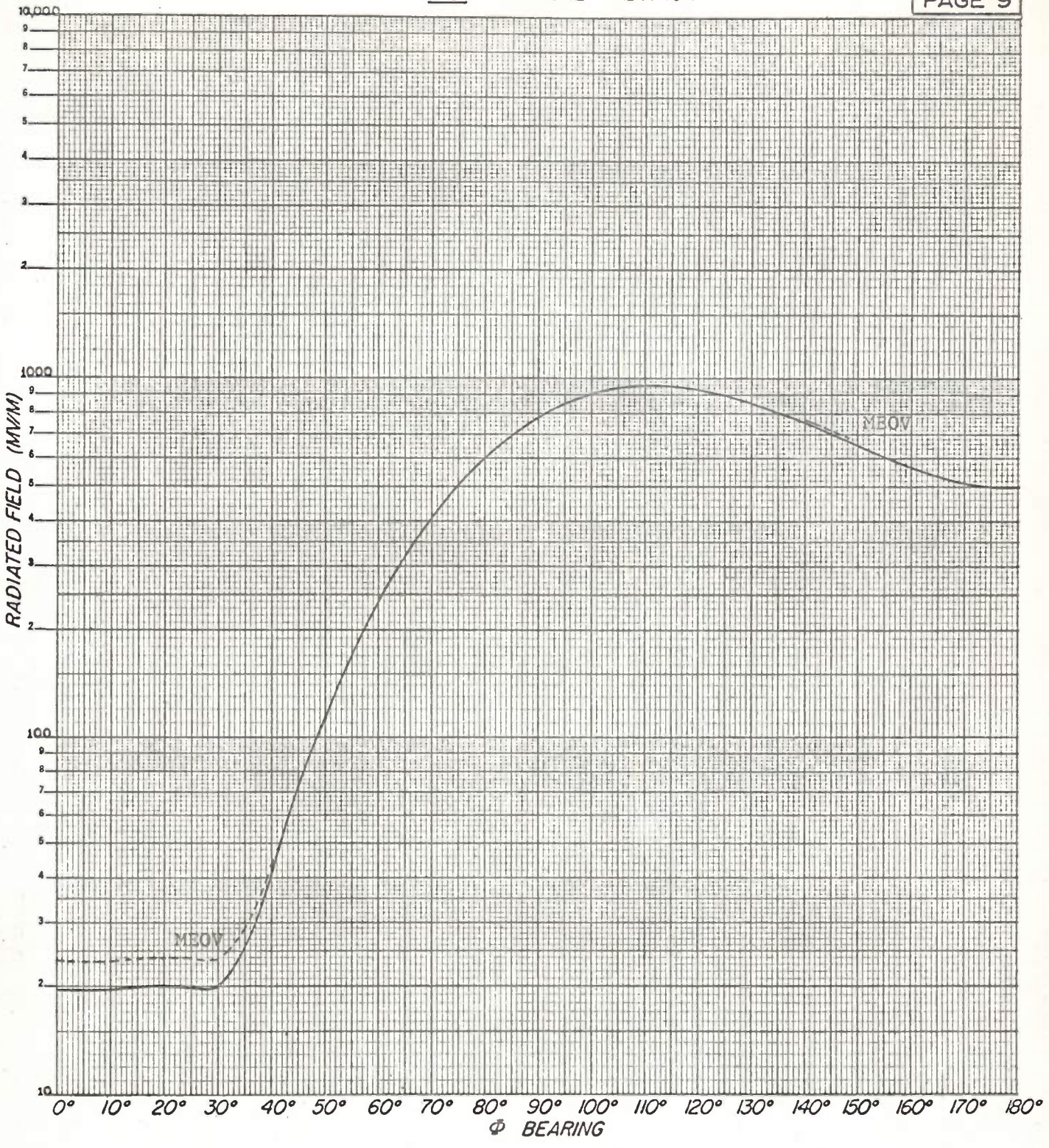
10 ° VERTICAL RADIATION



VERTICAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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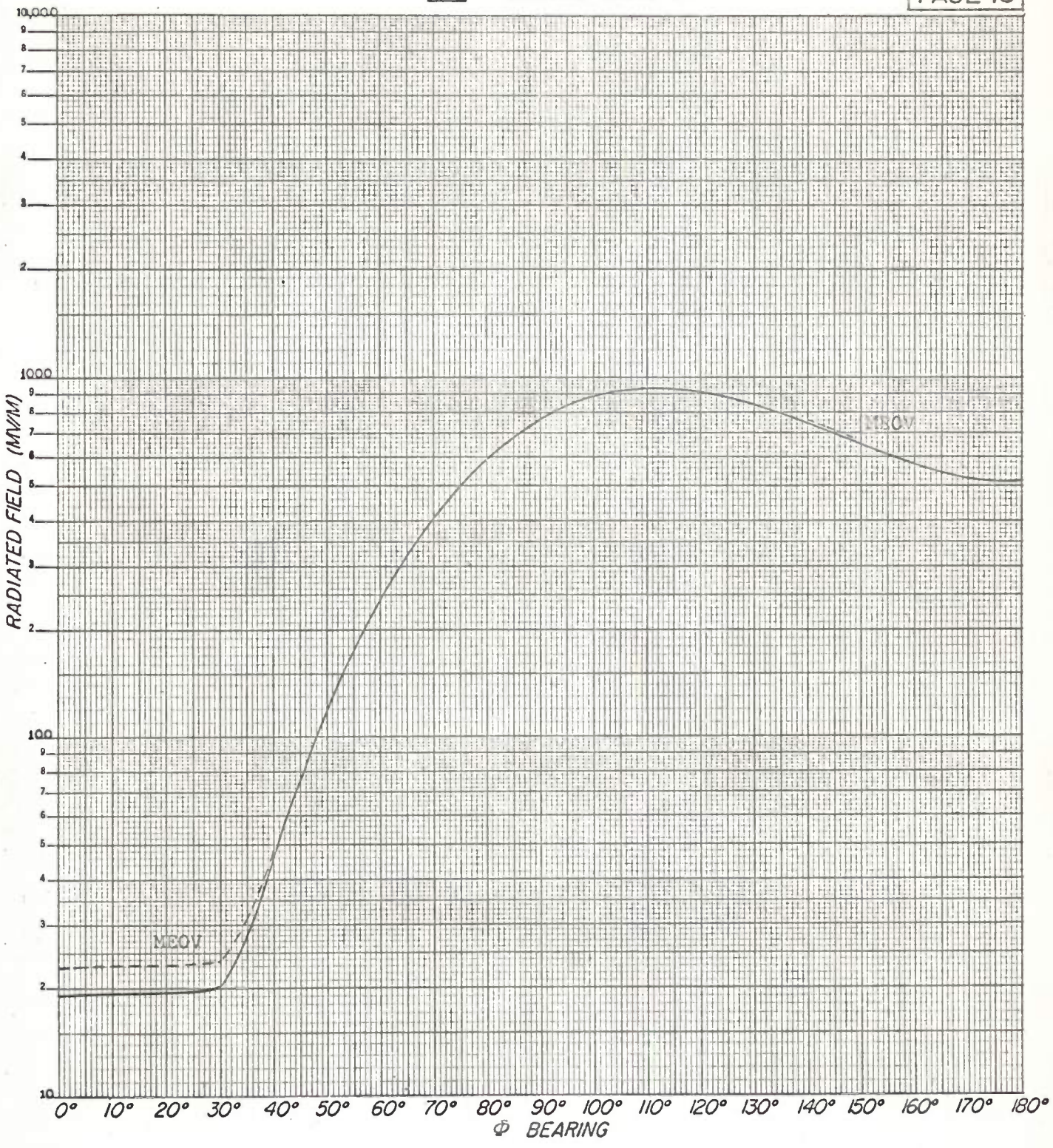
15 ° VERTICAL RADIATION



VERTICAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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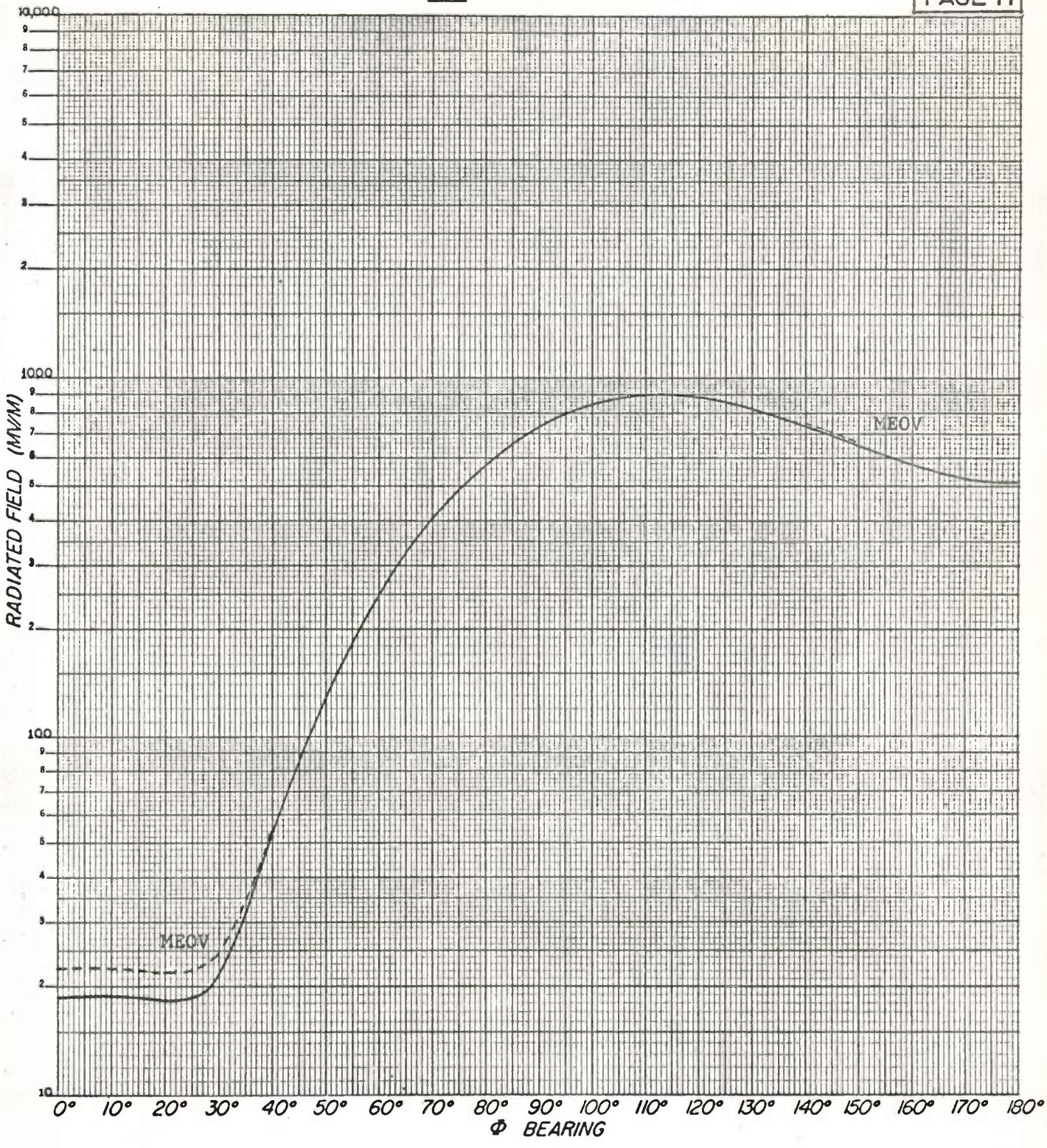
May, 1962

20° VERTICAL RADIATION



VERTICAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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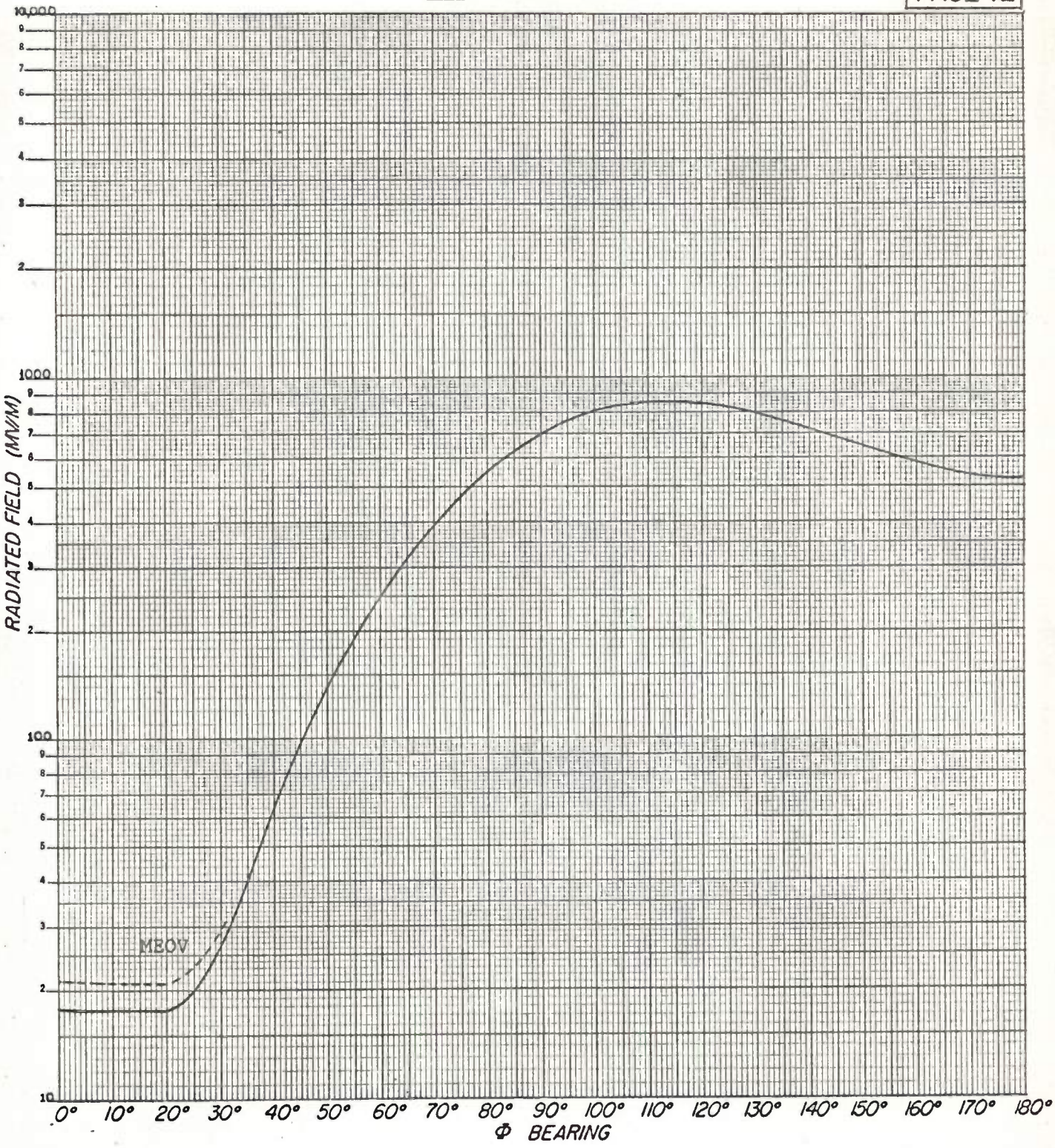
25° VERTICAL RADIATION



VERTICAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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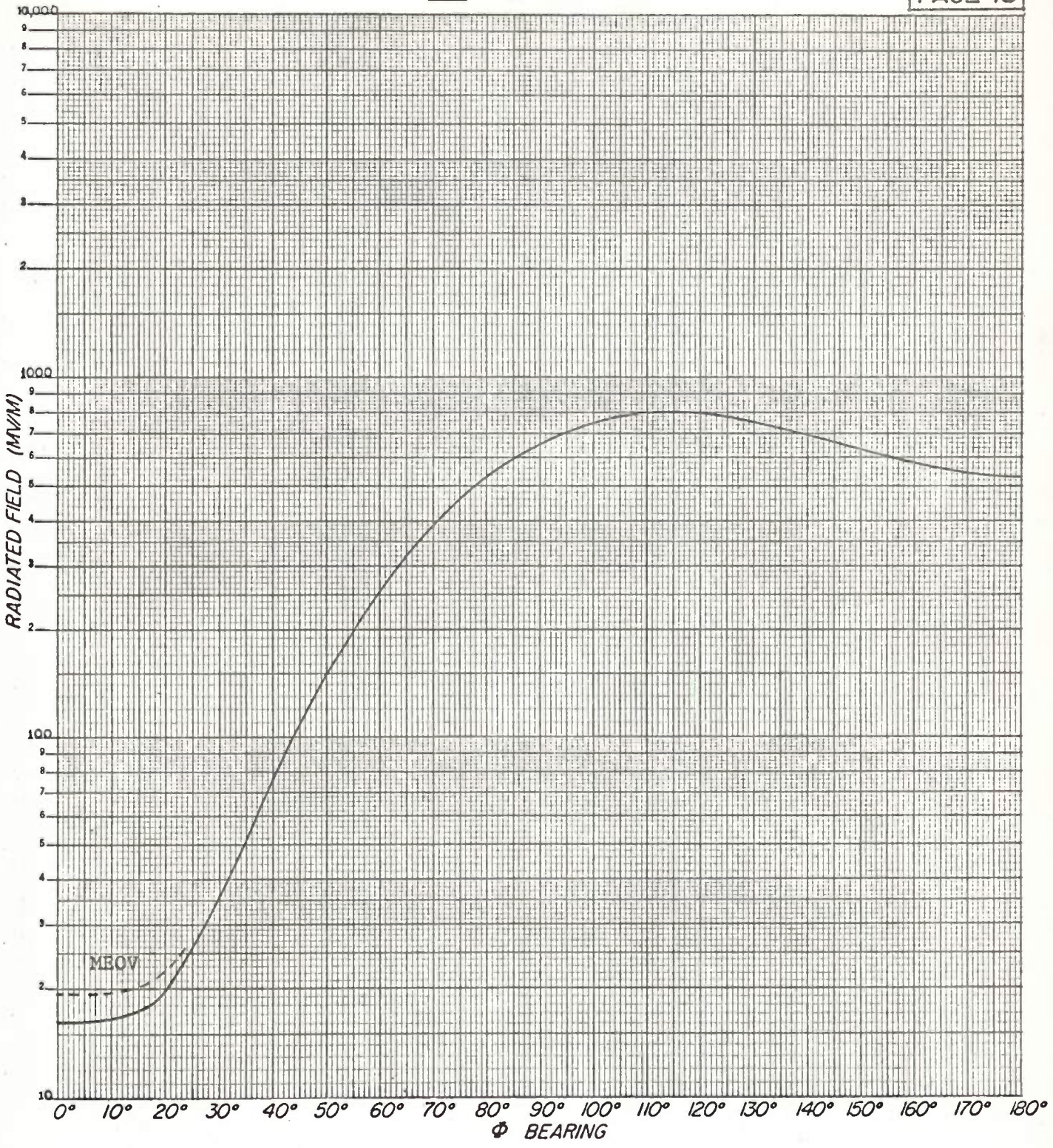
30° VERTICAL RADIATION



VERTICAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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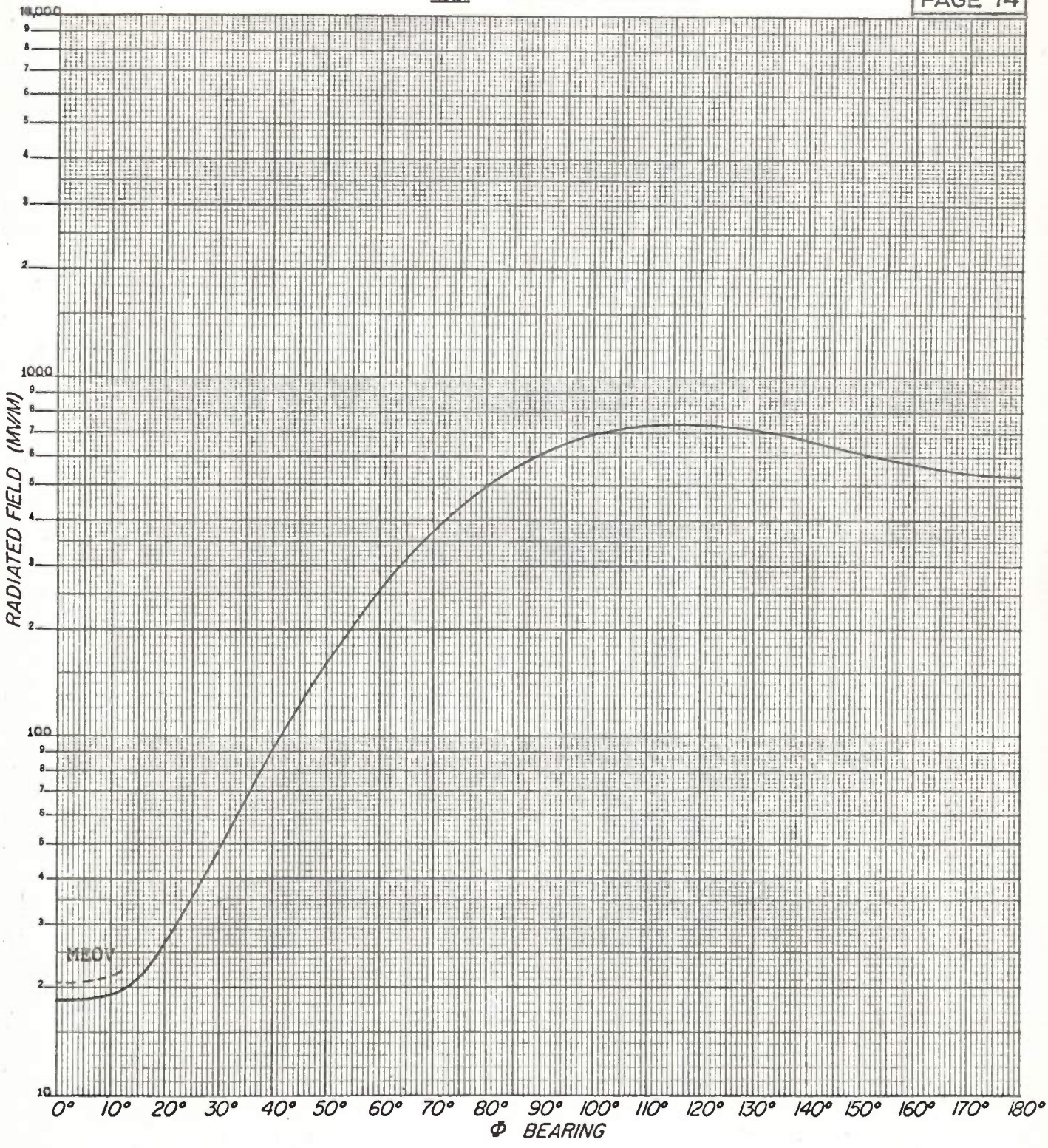
35° VERTICAL RADIATION



VERTICAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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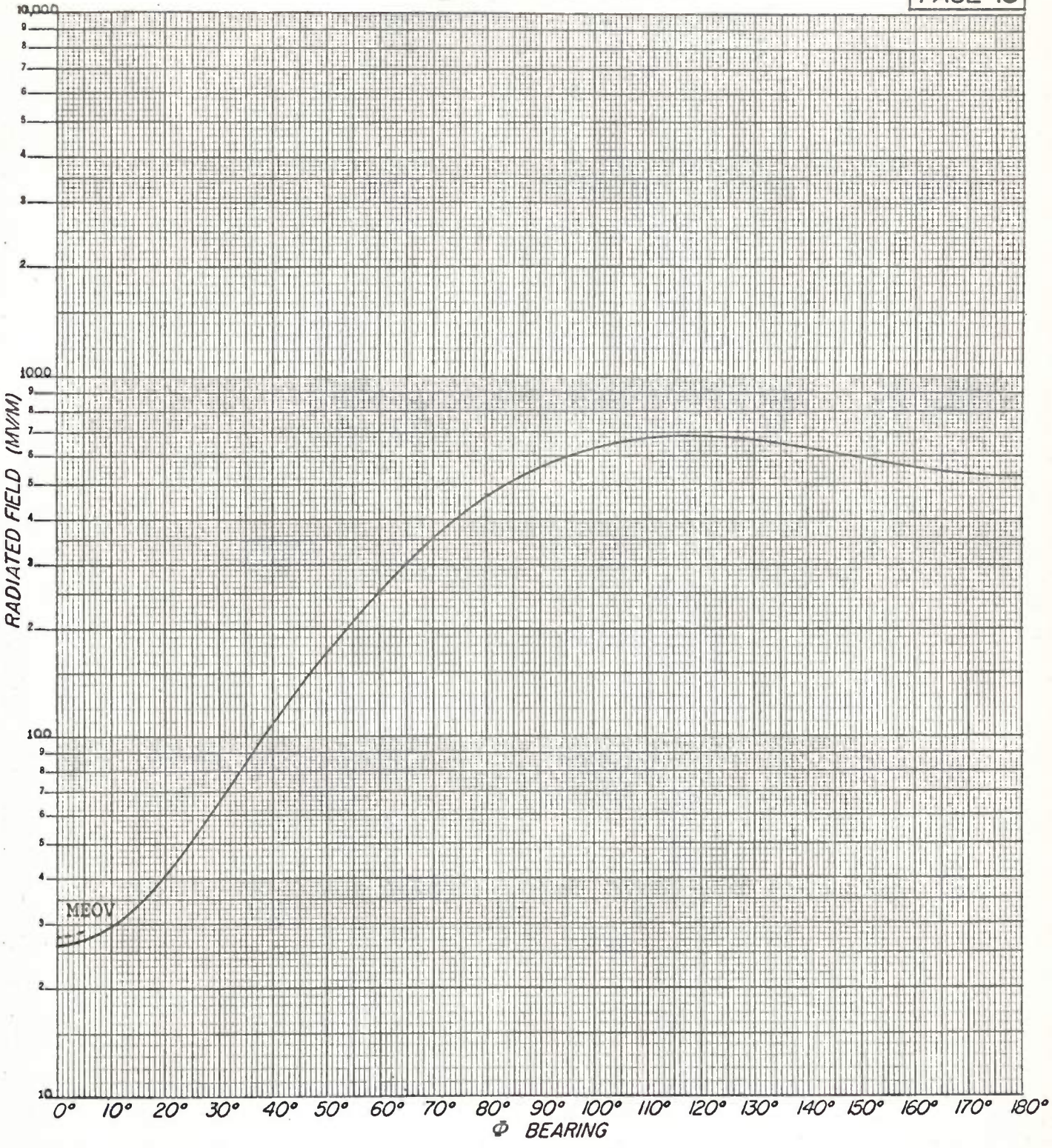
40° VERTICAL RADIATION



VERTICAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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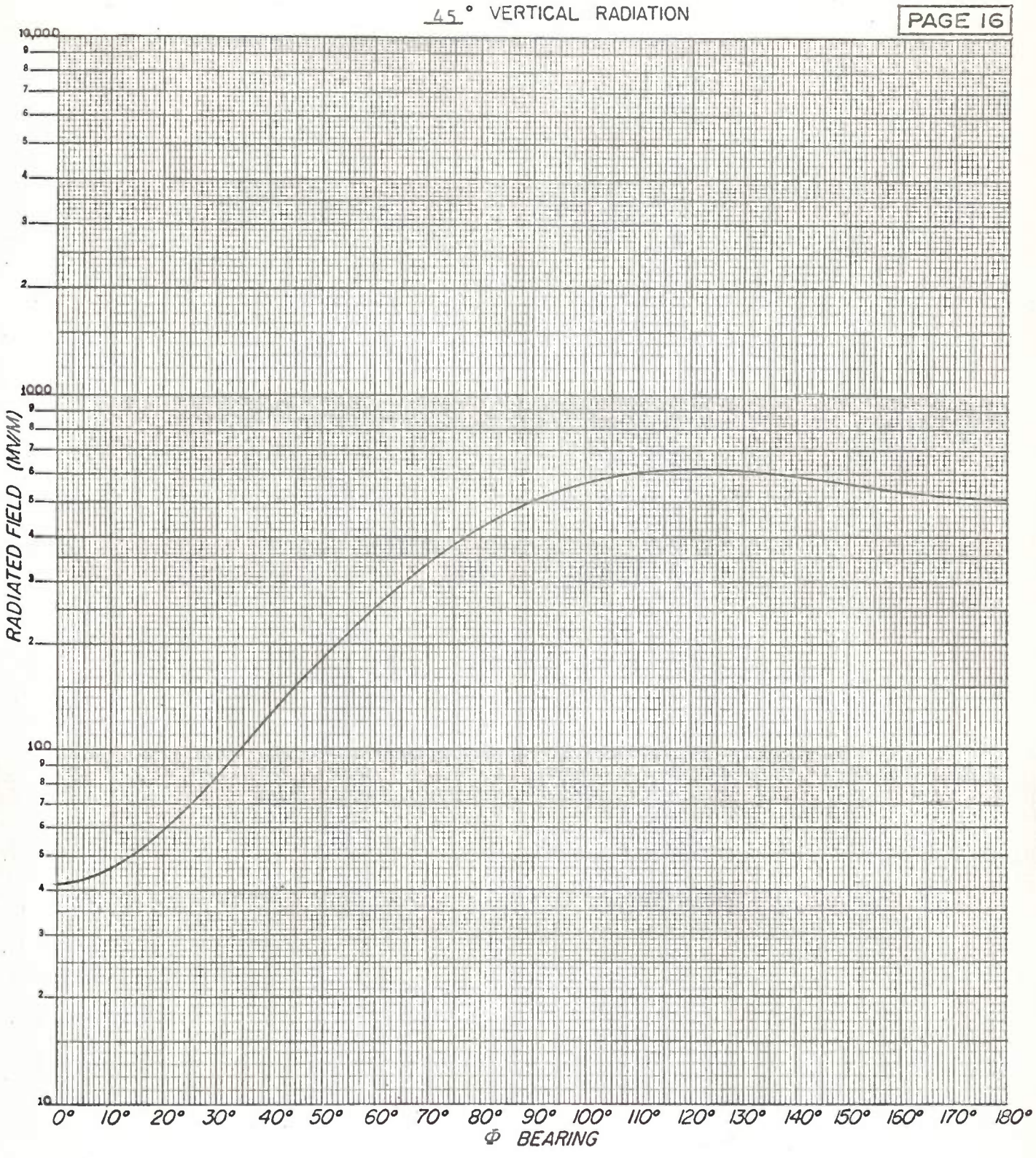

VERTICAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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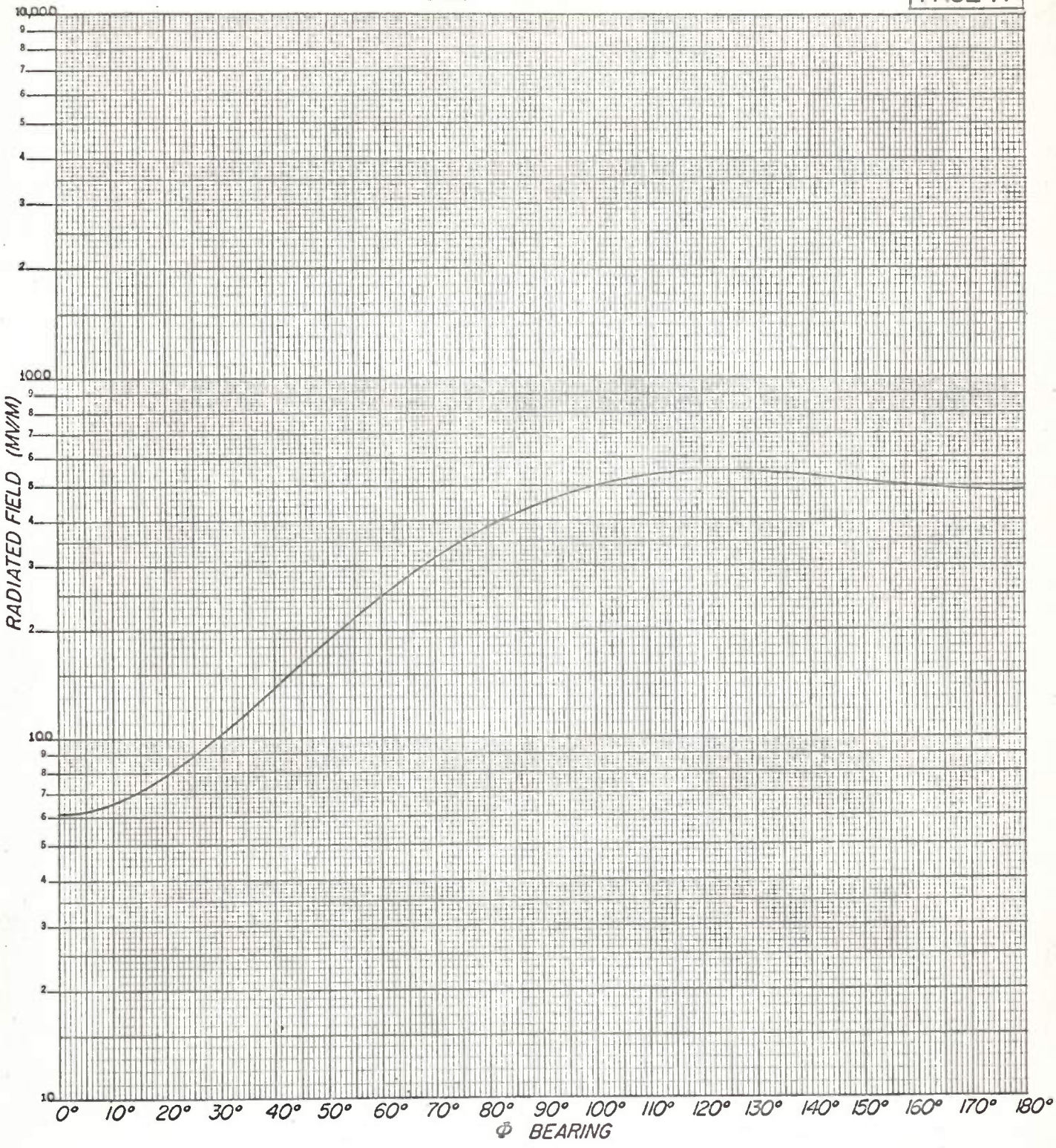
50° VERTICAL RADIATION



VERTICAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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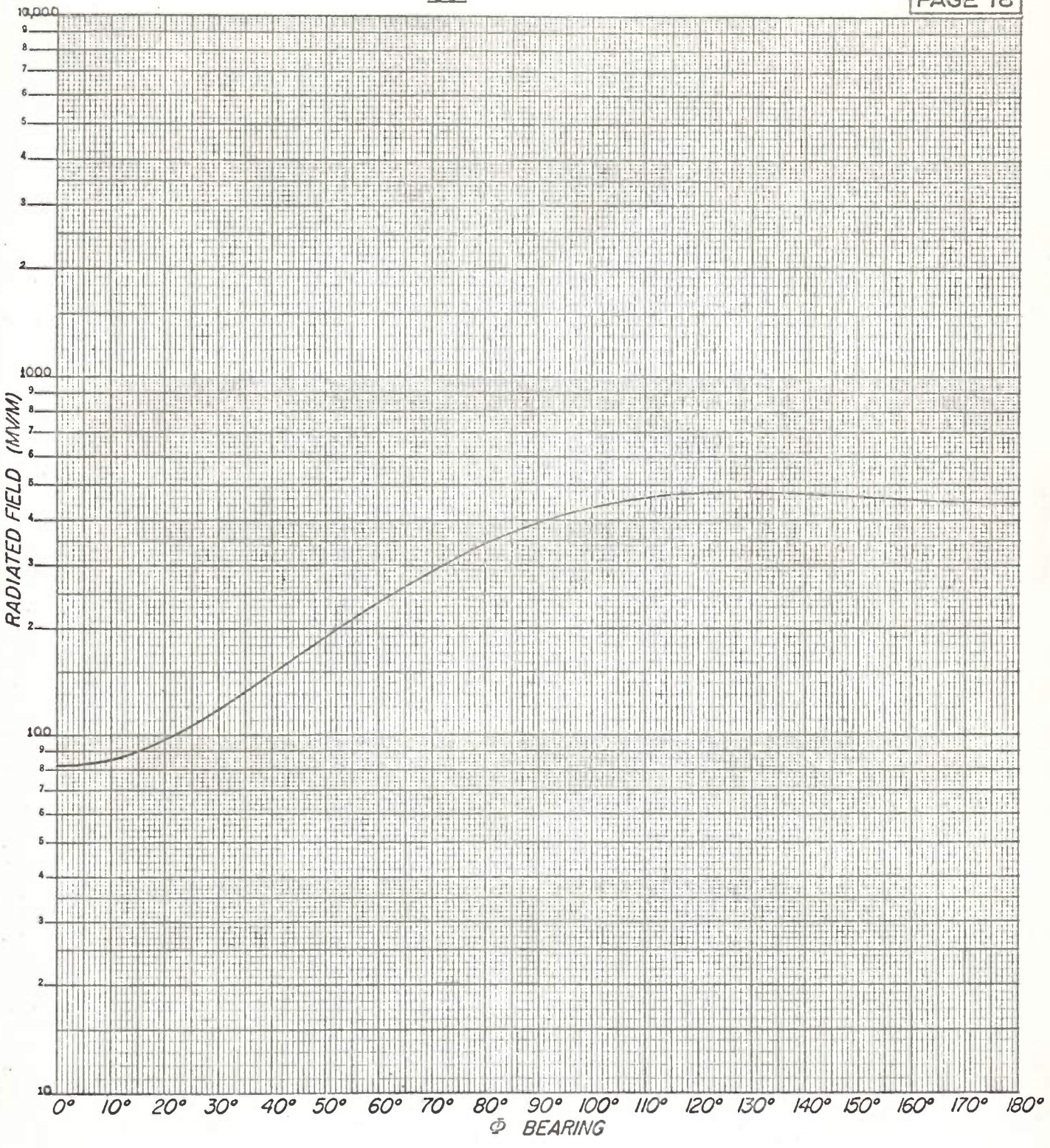
55° VERTICAL RADIATION



VERTICAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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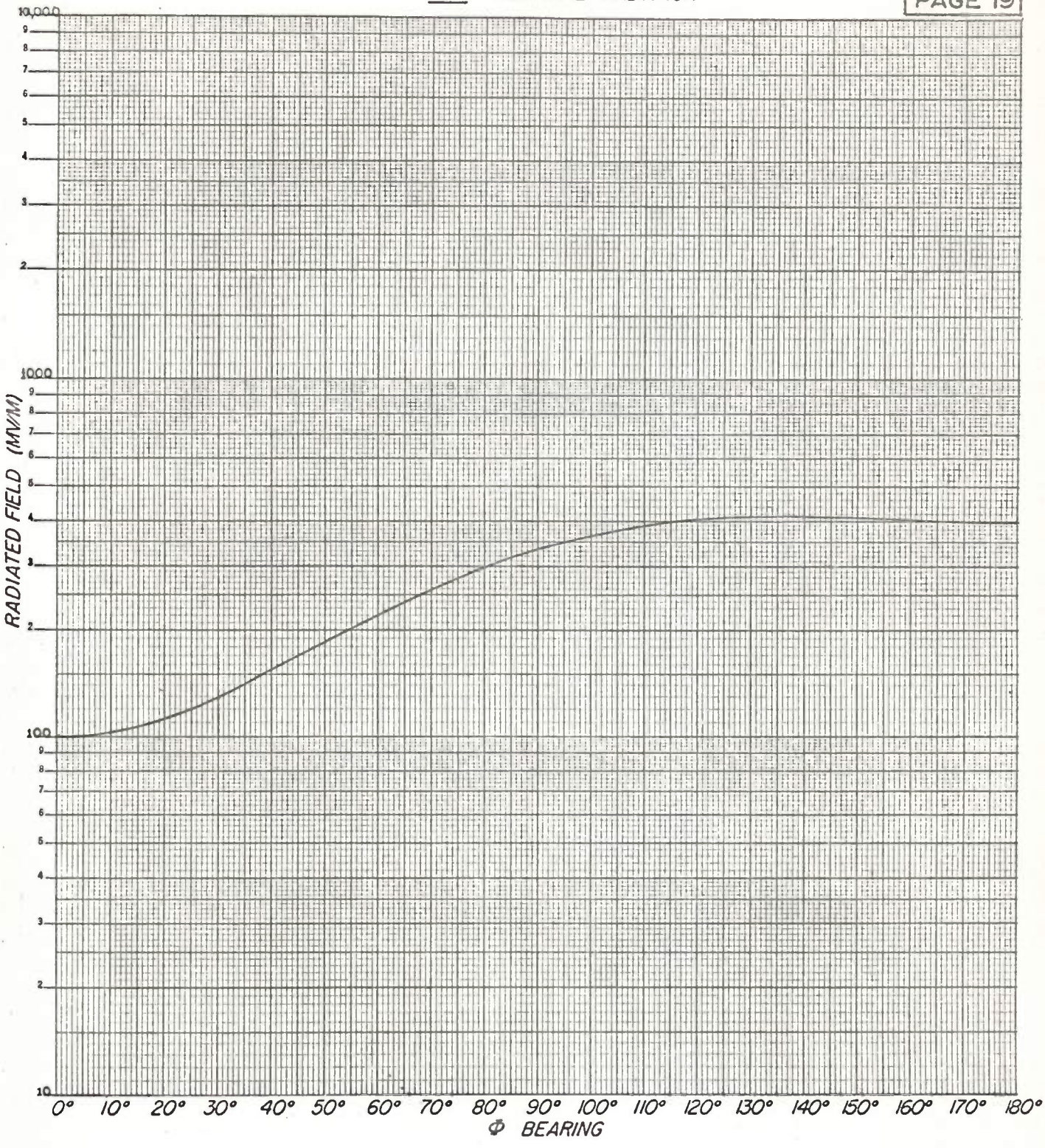
WRH

60° VERTICAL RADIATION



VERTICAL RADIATION PATTERN
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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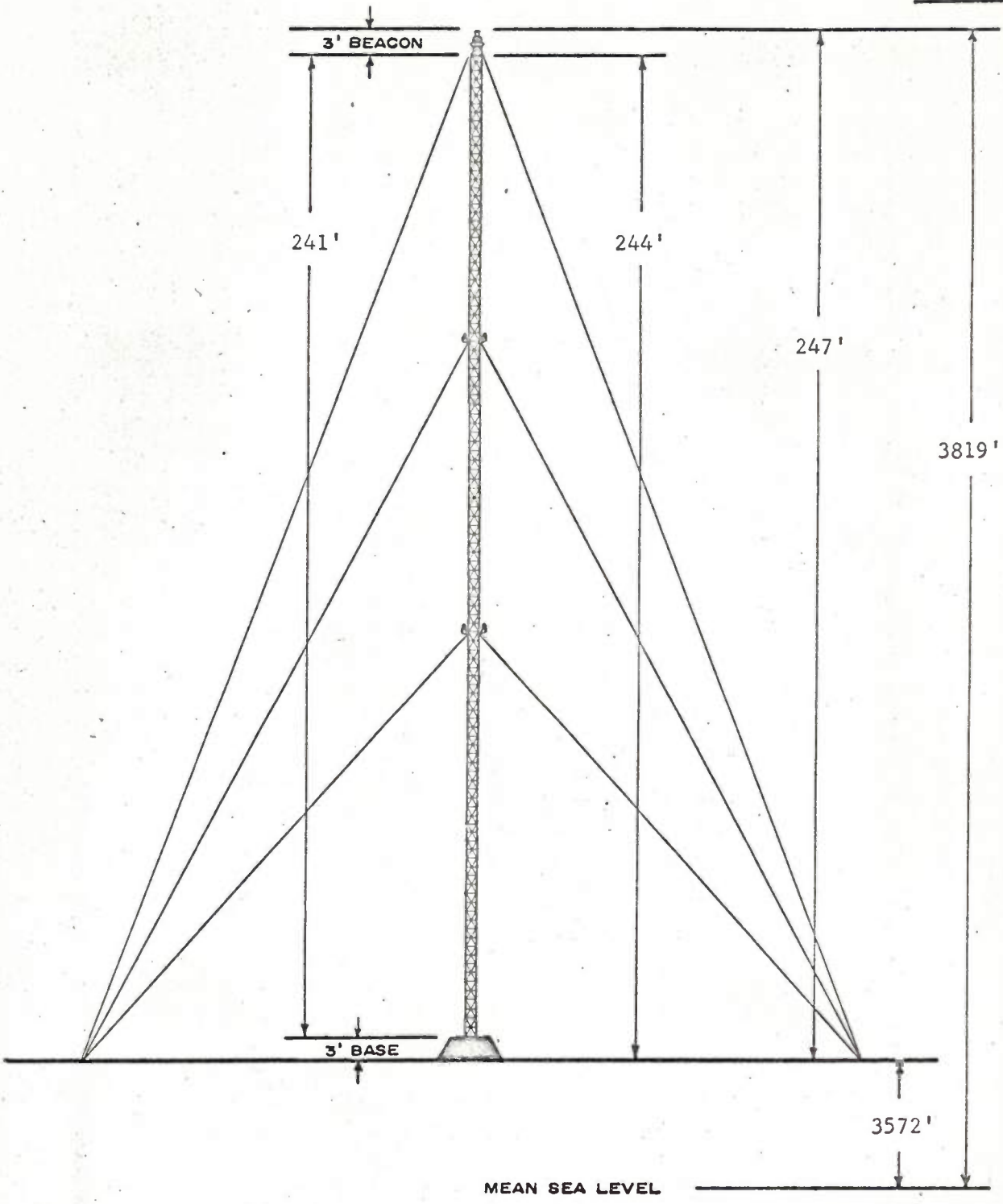

VERTICAL SKETCH OF ANTENNA
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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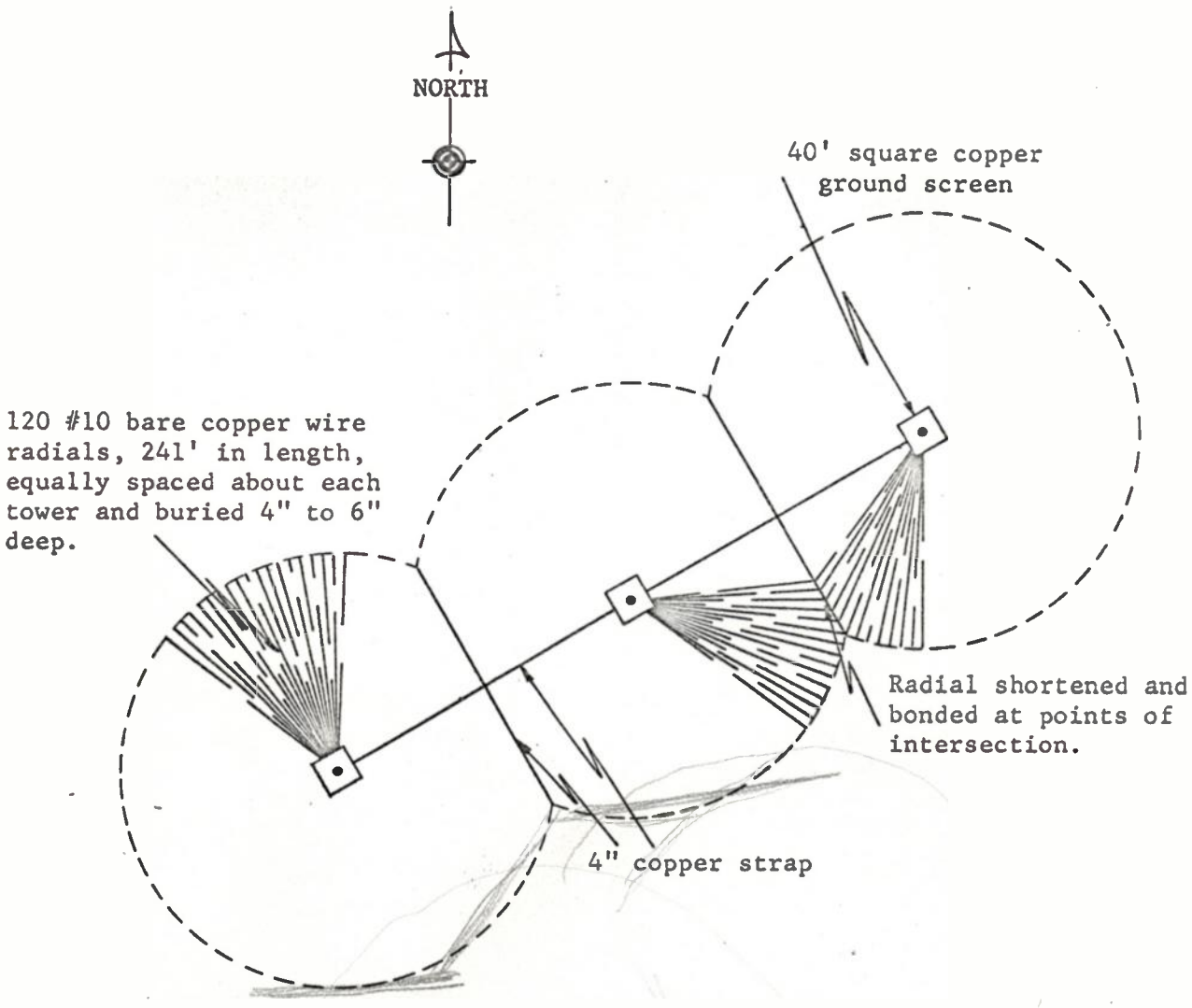
May, 1962



SKETCH OF GROUND SYSTEM
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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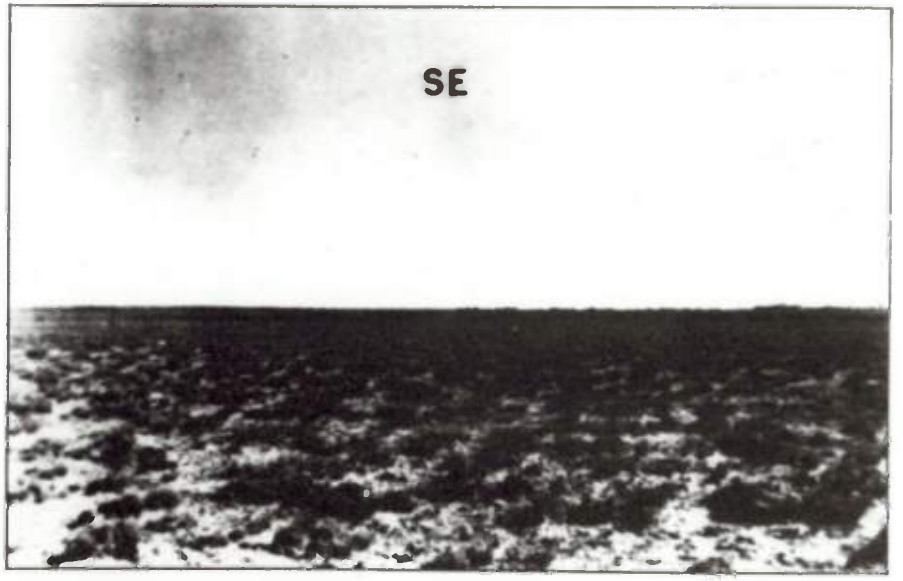

SITE PHOTOGRAPHS
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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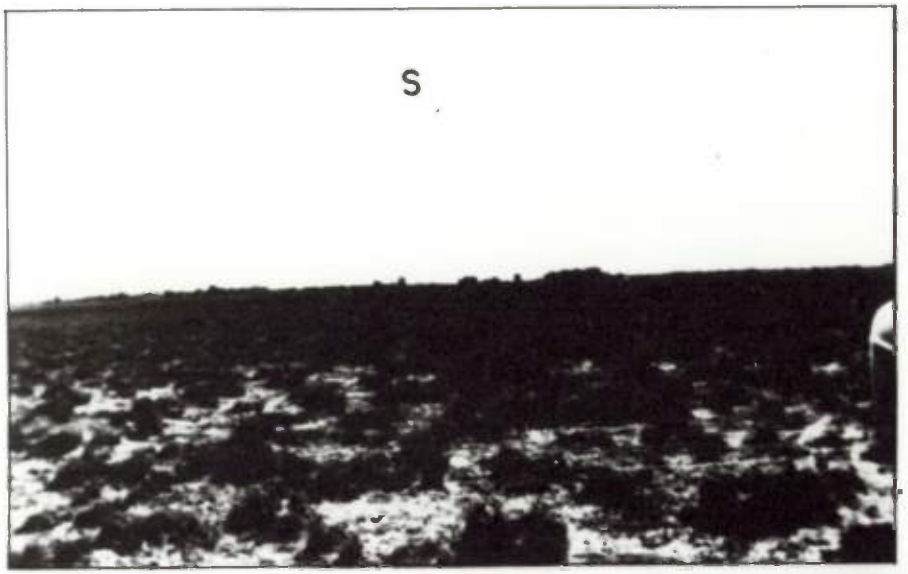

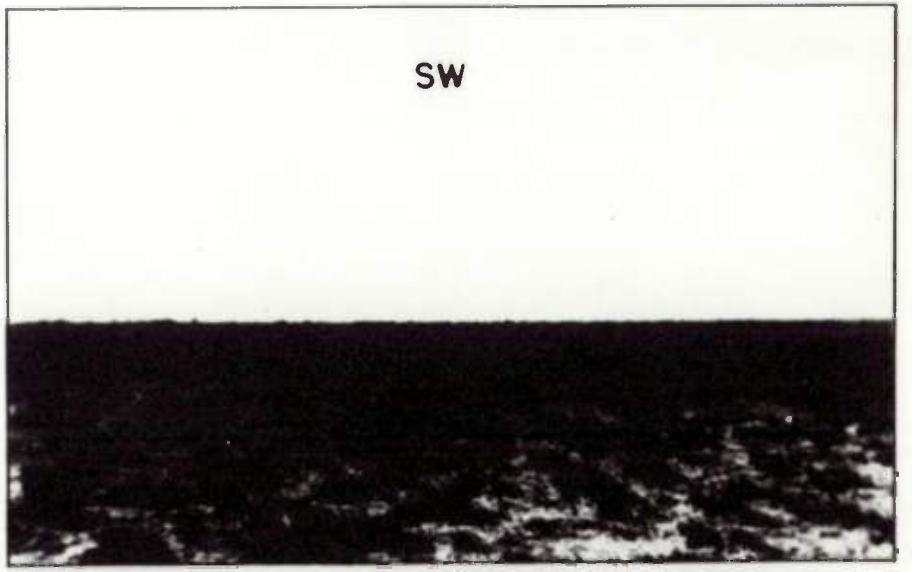

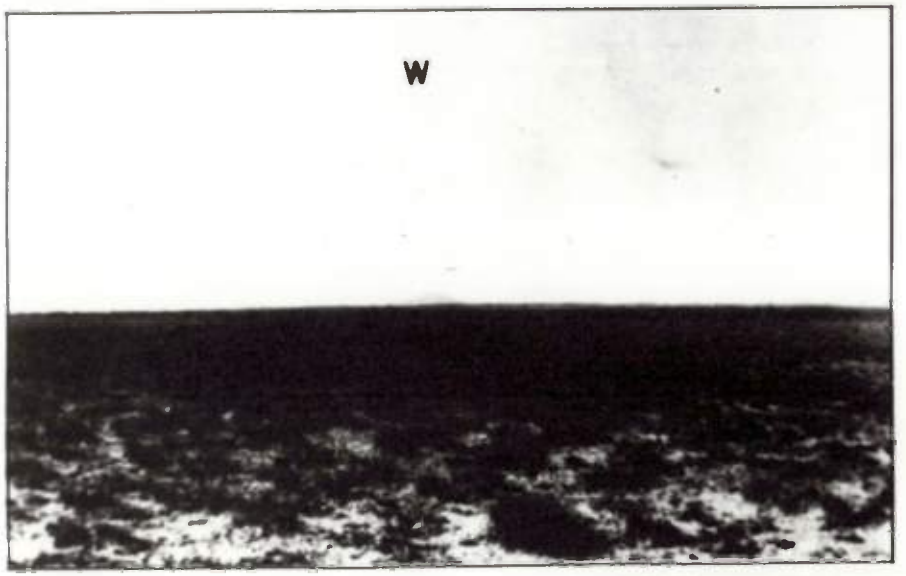

SITE PHOTOGRAPHS
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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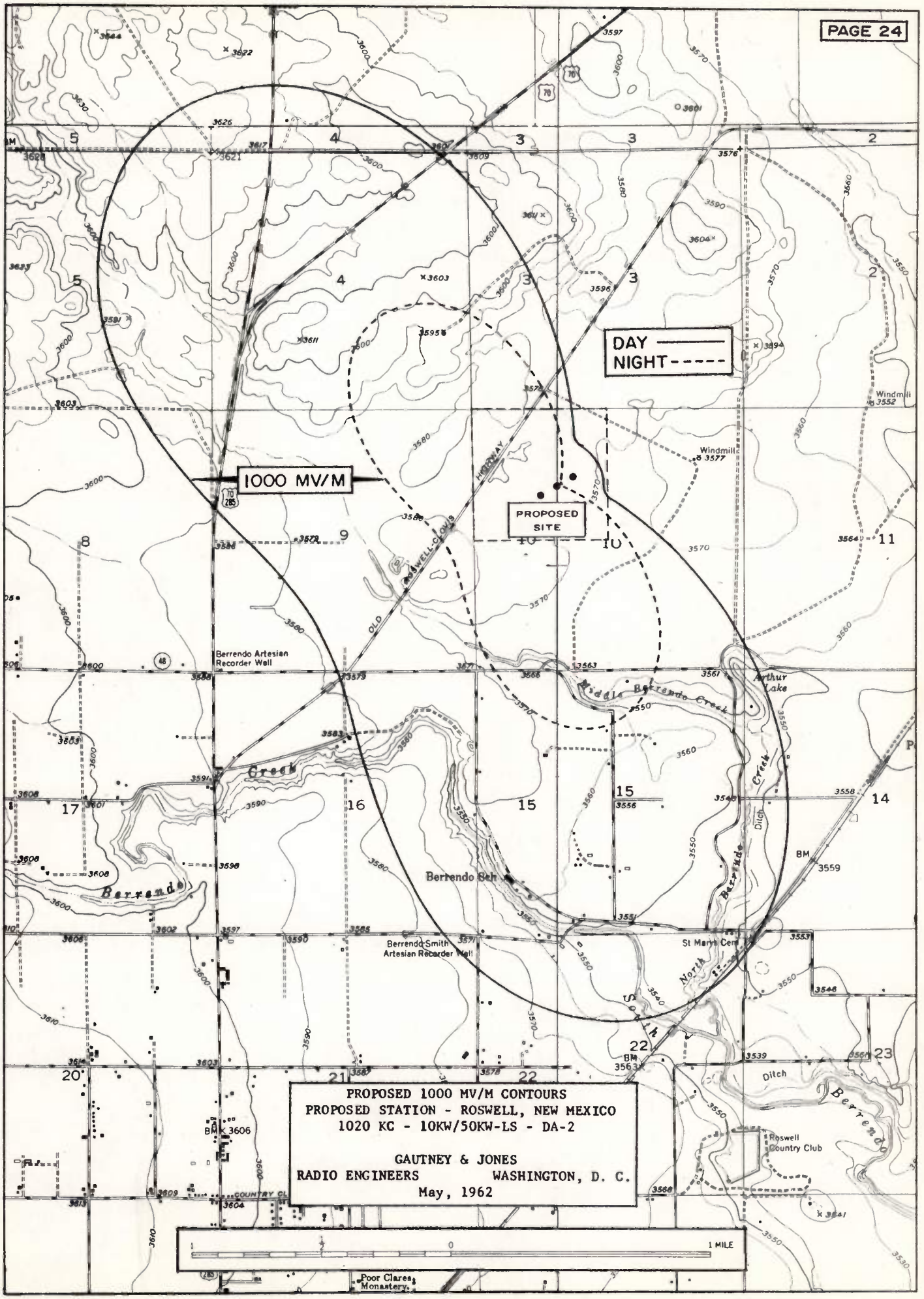
May, 1962



PROPOSED 1000 MV/M CONTOURS
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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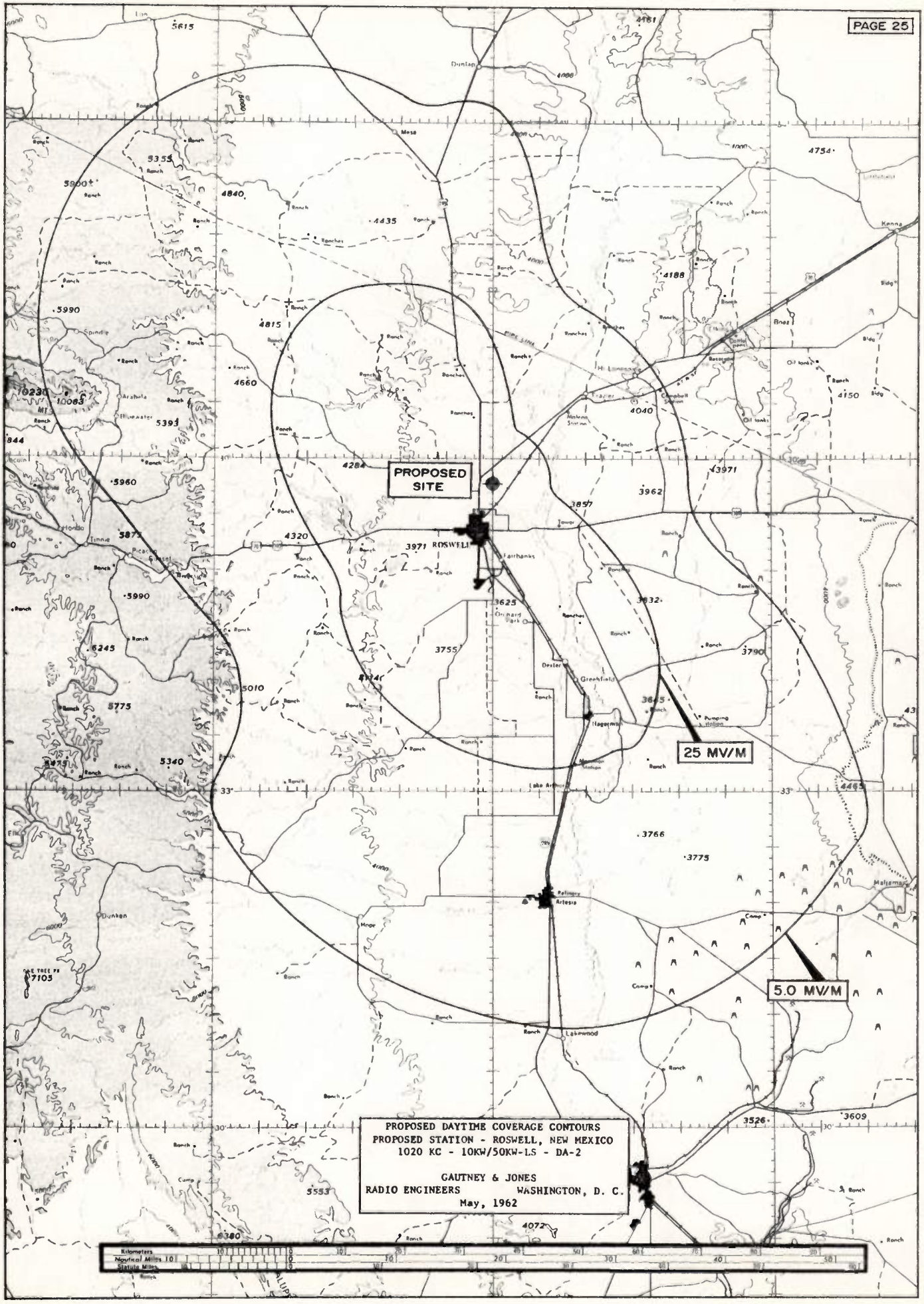

PROPOSED DAYTIME COVERAGE CONTOURS
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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PAGE 26
PROPOSED SITE
2.0 MV/M
0.5 MV/M
NEW MEXICO
TEXAS
PROPOSED DAYTIME COVERAGE CONTOURS
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2
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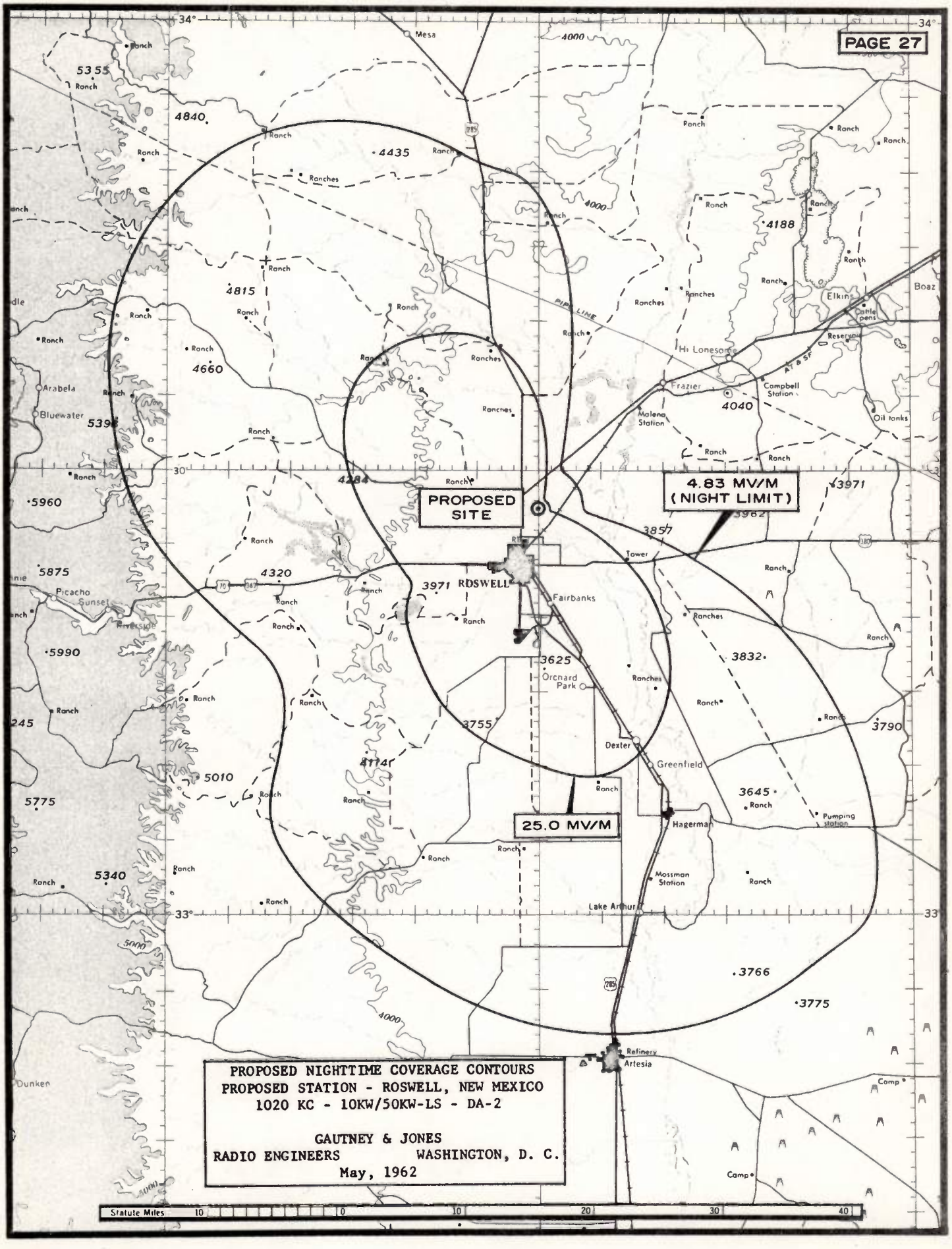
May, 1962



PROPOSED NIGHTTIME COVERAGE CONTOURS
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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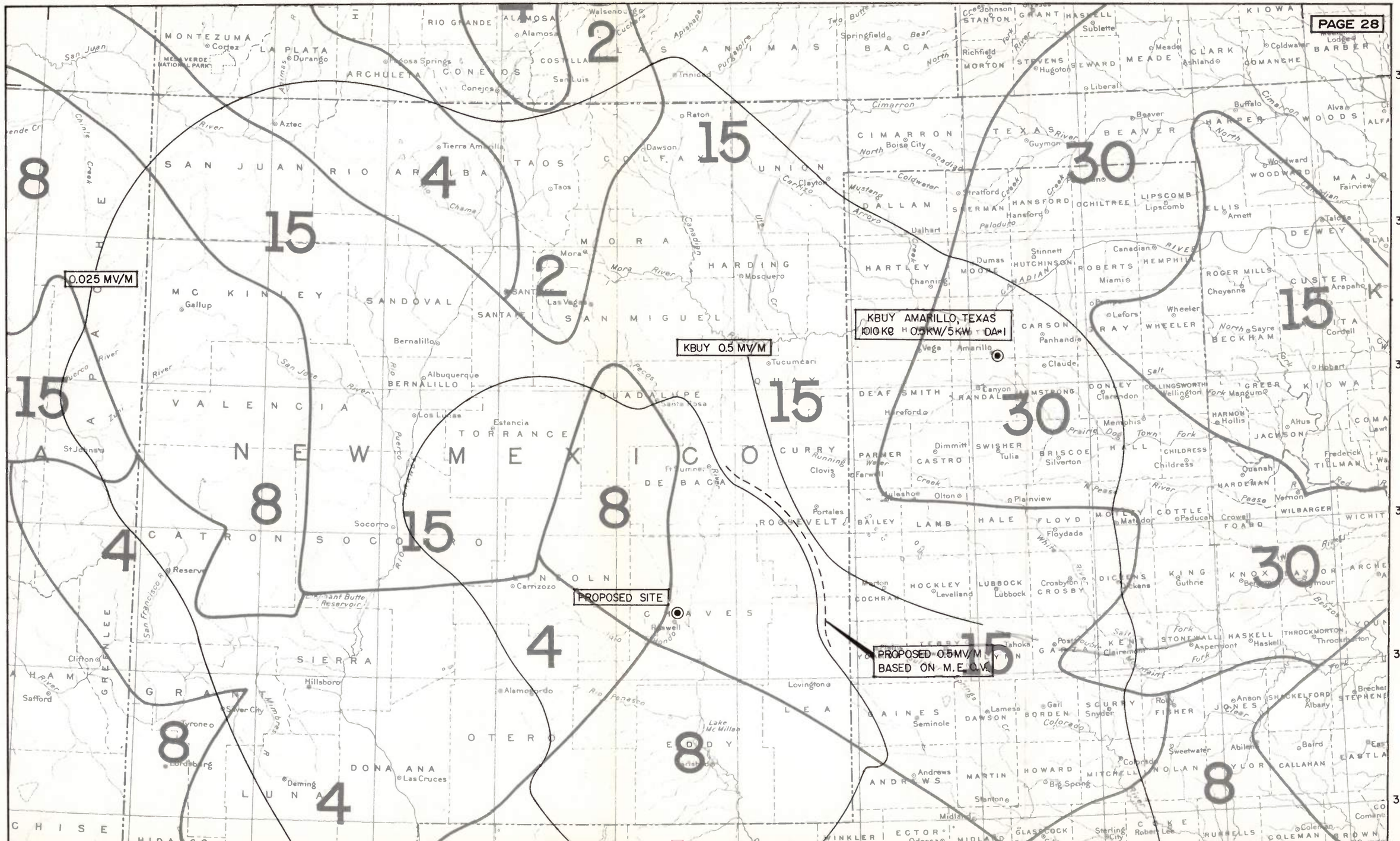
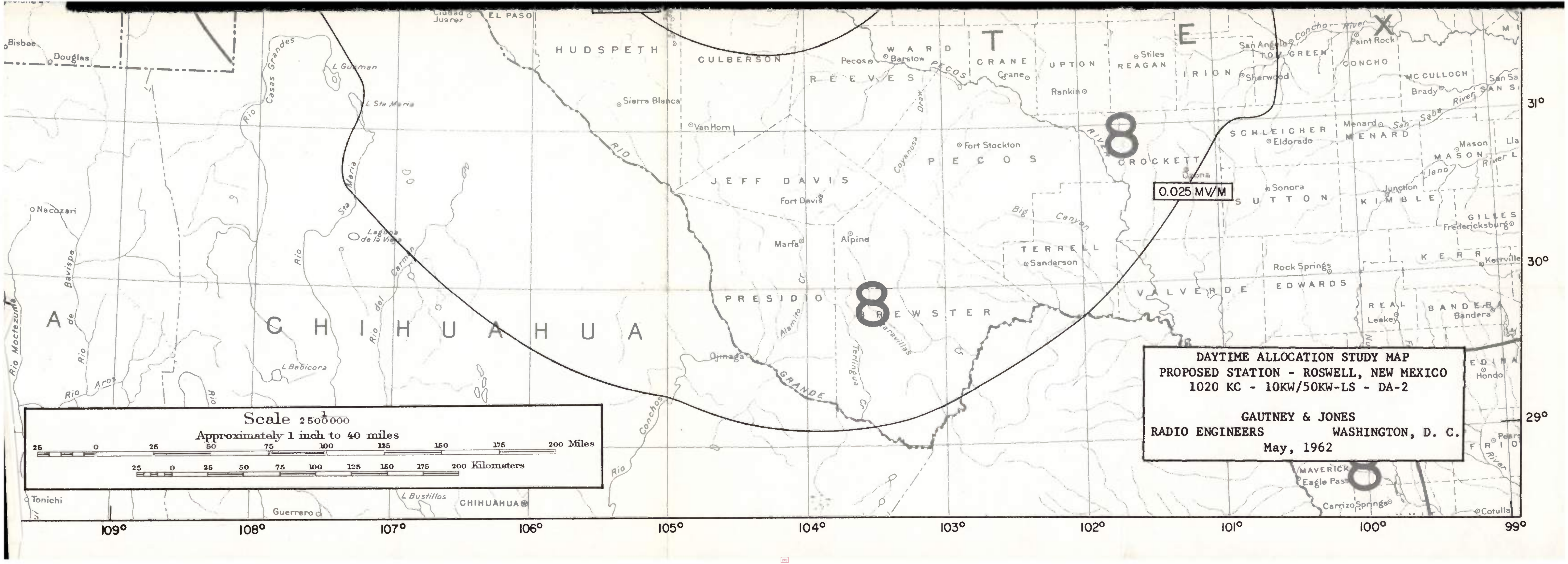
May, 1962


0.025 MV/M
KBUY 0.5 MV/M
KBUY AMARILLO, TEXAS
1010 KC 0.5KW/5KW DA-1
PROPOSED SITE
PROPOSED 0.5MV/M
BASED ON M.E.C.V.
37°
36°
35°
34°
33°
32°
NEW MEXICO
TEXAS
8
15
4
2
30


DAYTIME ALLOCATION STUDY MAP
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2
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Scale 1/2500000
Approximately 1 inch to 40 miles
25 0 25 50 75 100 125 150 175 200 Miles
25 0 25 50 75 100 125 150 175 200 Kilometers
0.025 MV/M
8
8
8
T E X
C H I H U A H U A
A
HUDSPETH
CULBERSON
WARD
CRANE
UPTON
REAGAN
IRION
TOM GREEN
CONCHO
MC CULLOCH
REEVES
PECOS
JEFF DAVIS
CROCKETT
SCHLEICHER
MENARD
MASON
SUTTON
KIMBLE
GILLES
TERRELL
KERR
PRESIDIO
BREWSTER
VALVERDE
EDWARDS
REAL
BANDERA
MEDINA
FRIO
MAVERICK
Bisbee
Douglas
Nacozari
Tonichi
Ciudad Juarez
EL PASO
Sierra Blanca
Van Horn
Pecos
Barstow
Crane
Rankin
Stiles
Sherwood
San Angelo
Paint Rock
Brady
Eldorado
Menardo
Mason
Fort Stockton
Fort Davis
Marfa
Alpine
Ozona
Sonora
Junction
Fredericksburg
Sanderson
Rock Springs
Kerrville
Leakey
Bandera
Hondo
Ojinaga
Eagle Pass
Carrizo Springs
Cotulla
Guerrero
CHIHUAHUA
L Guzman
L Sta Maria
L Babicora
L Bustillos
Laguna de la Vieja
Rio Casas Grandes
Rio Sta Maria
Rio del Carmen
Rio Moctezuma
Rio de Bavispe
Rio Aros
Rio Conchos
RIO GRANDE
PECOS RIVER
Concho River
San Saba River
Llano River
Frio River
Big Canyon
Coyanosa Draw
Alamito Cr
Terlingua Cr
Maravillas Cr
31°
30°
29°
109°
108°
107°
106°
105°
104°
103°
102°
101°
100°
99°

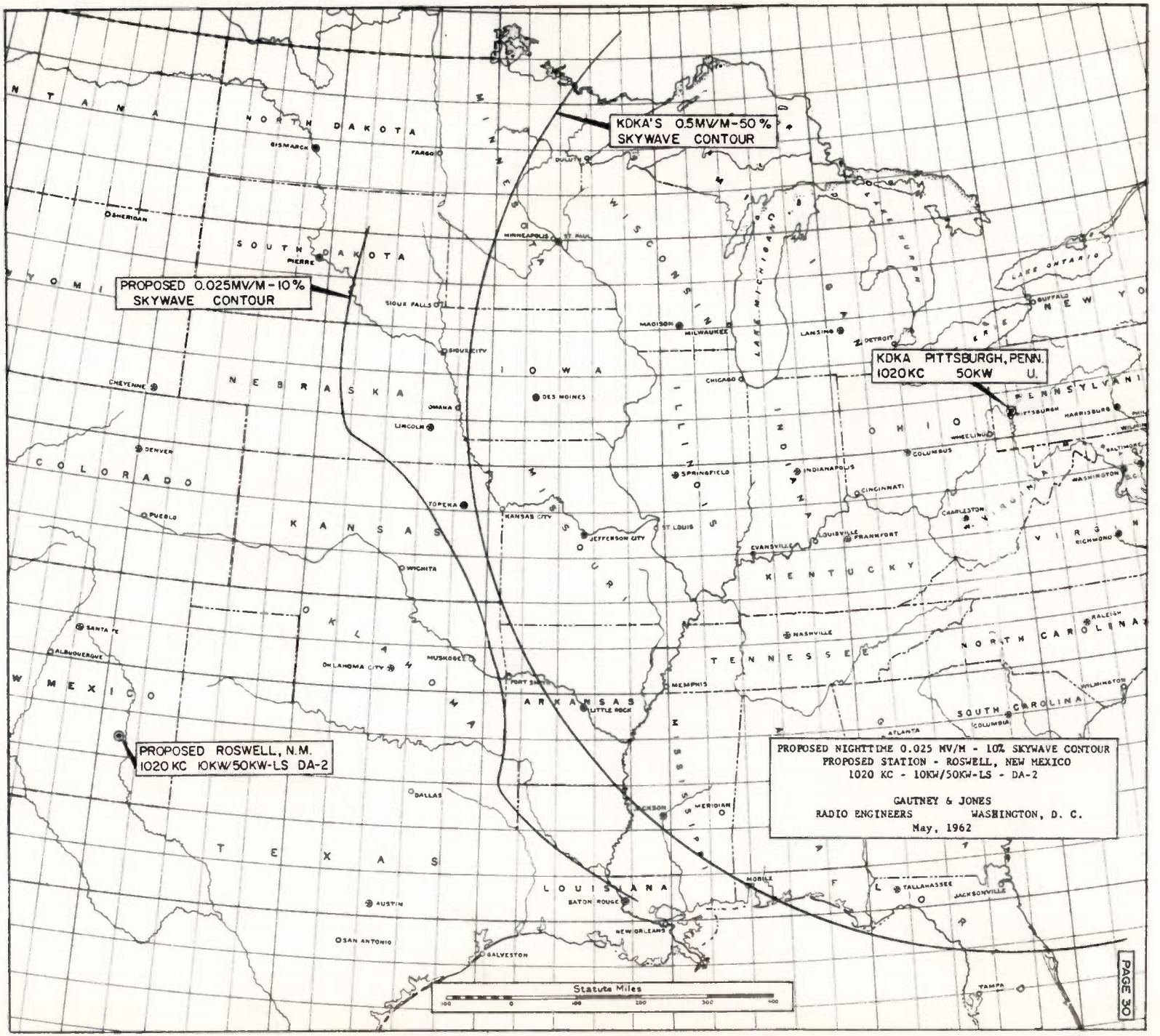
STATION CONSIDERED IN DAYTIME ALLOCATION
PROPOSED STATION - ROSWELL, NEW MEXICO
1120 KC - 10KW/50KW-LS - DA-2

KBUY - AMARILLO, TEXAS

KBUY operates on 1010 kilocycles with a power of 500 watts nighttime and 5 kilowatts daytime using the same directional pattern day and night. KBUY's 0.5 mv/m contour was determined by using the nighttime measured pattern expanded to 5 kilowatts. Conductivities were taken from the KBUY Proof of Performance in the pertinent direction and Figure M-3.

PROPOSED STATION - ROSWELL, NEW MEXICO

All contours of the proposed Roswell station were determined using the theoretical radiated fields and Figure M-3.


KDKA'S 0.5MV/M-50% SKYWAVE CONTOUR
PROPOSED 0.025MV/M-10% SKYWAVE CONTOUR
KDKA PITTSBURGH, PENN. 1020KC 50KW U.
PROPOSED ROSWELL, N.M. 1020 KC 10KW/50KW-LS DA-2
PROPOSED NIGHTTIME 0.025 MV/M - 10% SKYWAVE CONTOUR
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2
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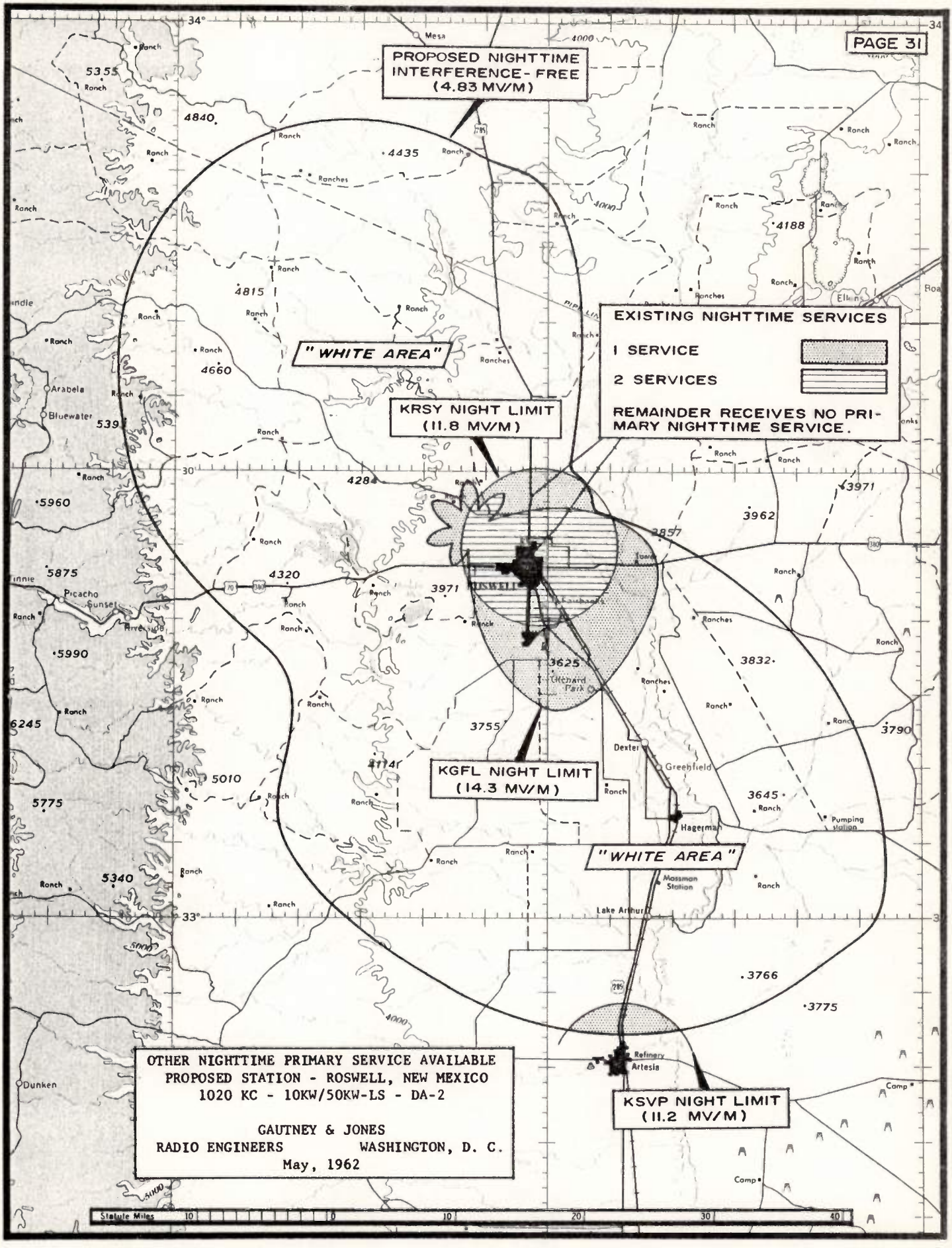
Statute Miles
MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
NEBRASKA
COLORADO
KANSAS
OKLAHOMA
TEXAS
NEW MEXICO
IOWA
MINNESOTA
WISCONSIN
ILLINOIS
MICHIGAN
INDIANA
OHIO
KENTUCKY
TENNESSEE
MISSOURI
ARKANSAS
LOUISIANA
MISSISSIPPI
ALABAMA
GEORGIA
SOUTH CAROLINA
NORTH CAROLINA
VIRGINIA
PENNSYLVANIA
NEW YORK
BISMARCK
FARGO
DULUTH
SHERIDAN
PIERRE
MINNEAPOLIS
ST. PAUL
SIOUX FALLS
SIOUX CITY
MADISON
MILWAUKEE
LANSING
DETROIT
BUFFALO
LAKE ONTARIO
CHEYENNE
OMAHA
DES MOINES
CHICAGO
LINCOLN
DENVER
PUEBLO
TOPEKA
KANSAS CITY
ST. LOUIS
JEFFERSON CITY
SPRINGFIELD
INDIANAPOLIS
COLUMBUS
CINCINNATI
WHEELING
PITTSBURGH
HARRISBURG
BALTIMORE
WASHINGTON
CHARLESTON
WICHITA
EVANSVILLE
LOUISVILLE
FRANKFORT
RICHMOND
SANTA FE
ALBUQUERQUE
OKLAHOMA CITY
MUSKOGEE
FORT SMITH
NASHVILLE
MEMPHIS
LITTLE ROCK
RALEIGH
WILMINGTON
COLUMBIA
ATLANTA
DALLAS
JACKSON
MERIDIAN
AUSTIN
SAN ANTONIO
GALVESTON
BATON ROUGE
NEW ORLEANS
MOBILE
TALLAHASSEE
JACKSONVILLE
TAMPA



OTHER NIGHTTIME PRIMARY SERVICE AVAILABLE
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

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ROSWELL, NEW MEXICO, NIGHT LIMIT
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

FROM	KDKA Pittsburgh, Pa.						
1. Miles	1435						
2. Mid-Point Lat.	--						
3. Azimuth Angle	ND						
4. Horizontal Radiation	2100						
5. Min.-Max. $\Delta\psi$ ($\Delta\otimes$)	0°						
6. Max. Rad. within $\Delta\otimes$	2100						
7. Skywave Field	0.0115						
8. LIMIT	4.83						

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KGBS - LOS ANGELES, CALIFORNIA, NIGHT LIMIT
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

FROM	Proposed Station Roswell, N. M.						
1. Miles	787						
2. Mid-Point Lat.	---						
3. Azimuth Angle	276.2°						
4. Horizontal Radiation	732						
5. Min.-Max. $\Delta\alpha$ ($\Delta\otimes$)	3.9°/ 7.5°						
6. Max. Rad. within $\Delta\otimes$	731.2*						
7. Skywave Field	0.060						
8. LIMIT	8.77						

* MEOV

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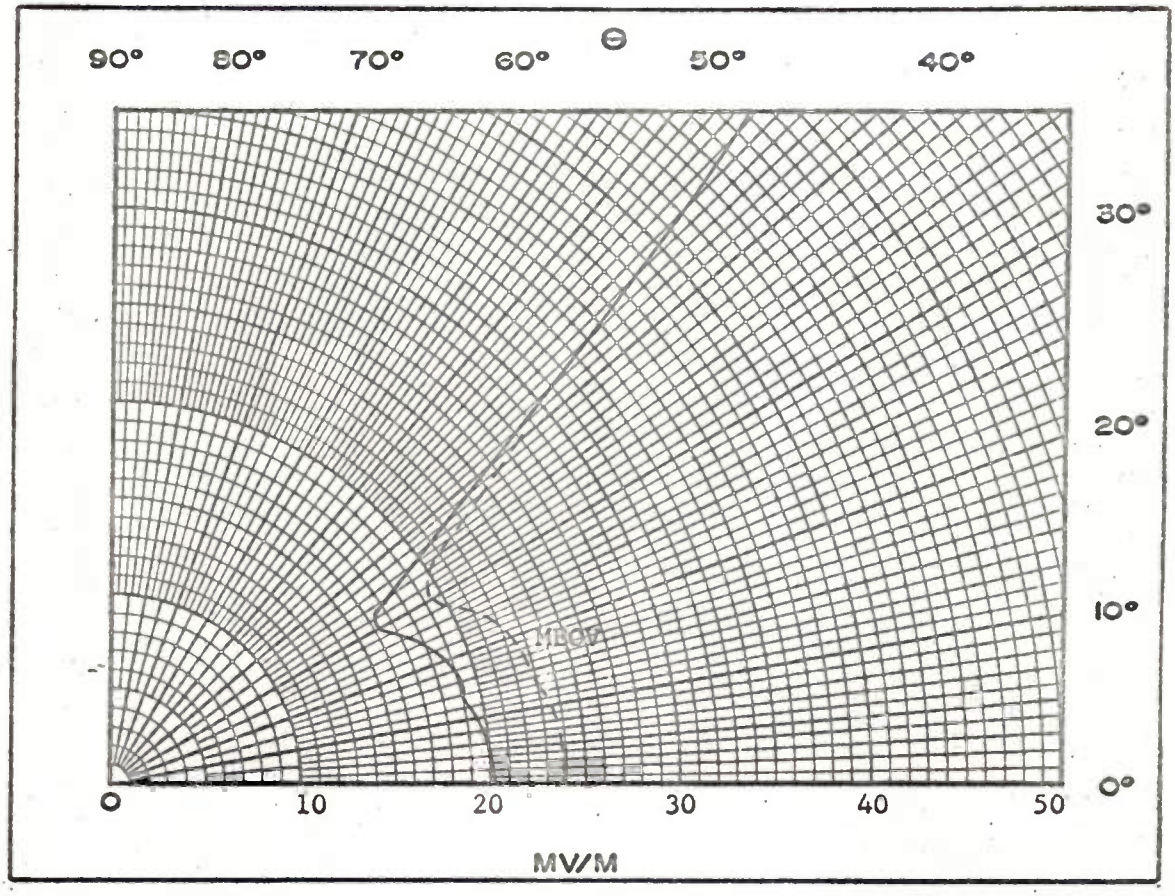
PROPOSED VERTICAL SECTION TOWARD KDKA
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

AZIMUTH = 60°



Tabulation of Radiated Fields

θ	E (mv/m)	MEOV
0°	20.0	24.0
5°	20.0	23.8
10°	19.6	23.6
15°	19.2	22.9
20°	18.8	22.3
25°	17.9	21.2
30°	16.3	19.4
35°	18.3	20.8
40°	26.1	27.6
45°	41.7	
50°	61.3	
55°		
60°		

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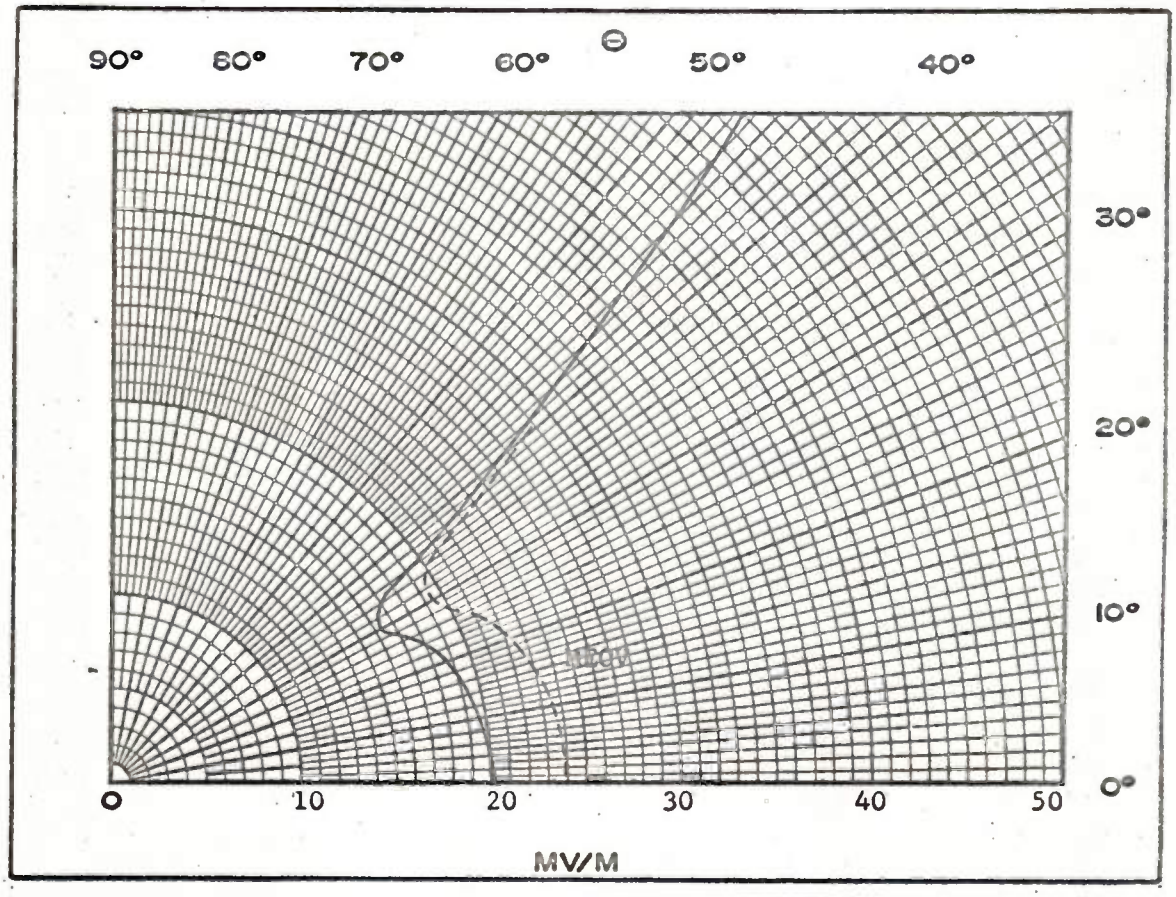
May, 1962

PROPOSED VERTICAL SECTION TOWARD KDKA
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

AZIMUTH = 63° TRUE



Tabulation of Radiated Fields

θ	E (mv/m)	MEOV
0°	20.2	24.0
5°	20.0	23.8
10°	19.6	23.6
15°	19.2	22.9
20°	18.8	22.3
25°	17.8	21.1
30°	16.3	19.4
35°	17.5	20.1
40°	26.5	28.0
45°	41.6	
50°	61.2	
55°	82.0	
60°	99.8	

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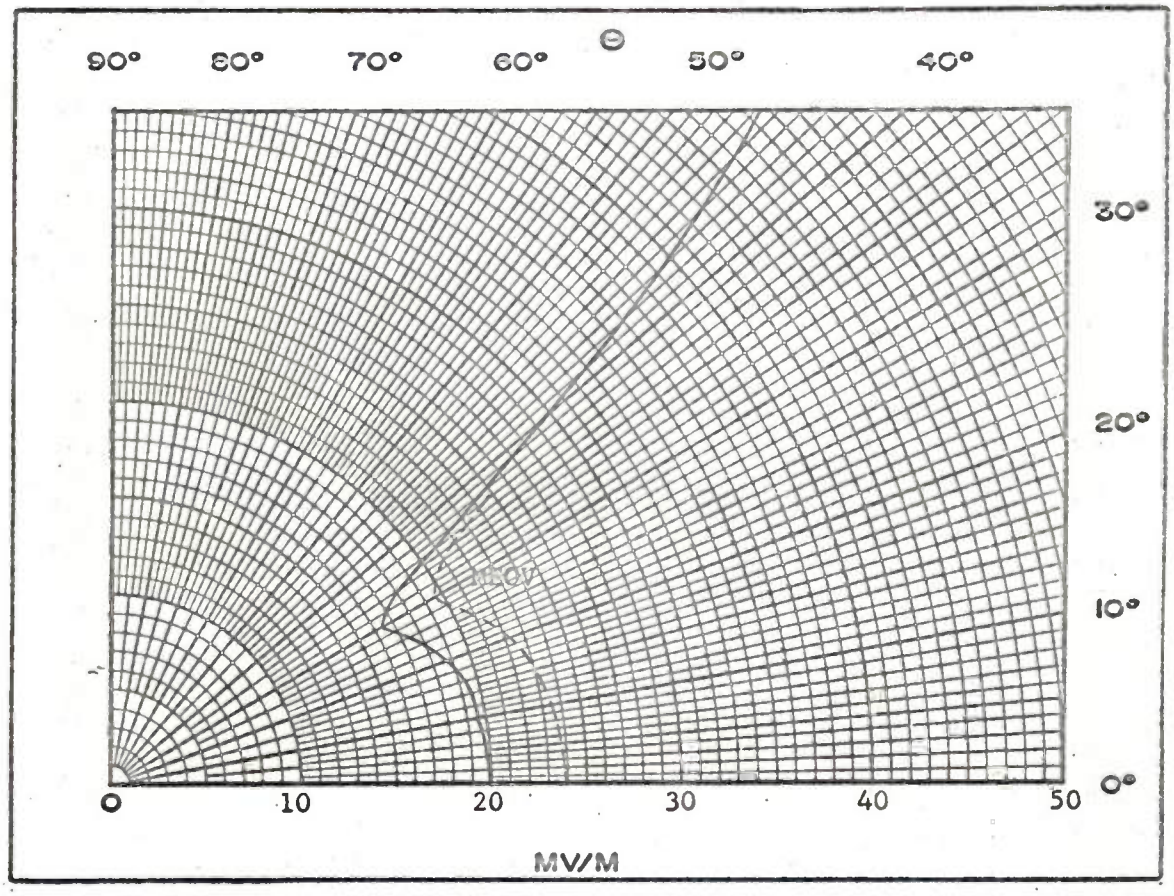
May, 1962

PROPOSED VERTICAL SECTION TOWARD KDKA
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

AZIMUTH = 50° & 70°



Tabulation of Radiated Fields

θ	E (mv/m)	MEOV
0°	20.0	23.9
5°	19.9	23.7
10°	19.6	23.4
15°	19.4	23.0
20°	18.9	22.3
25°	17.7	21.0
30°	16.5	19.6
35°	19.0	21.4
40°	29.4	
45°	46.0	
50°	65.5	
55°		
60°		

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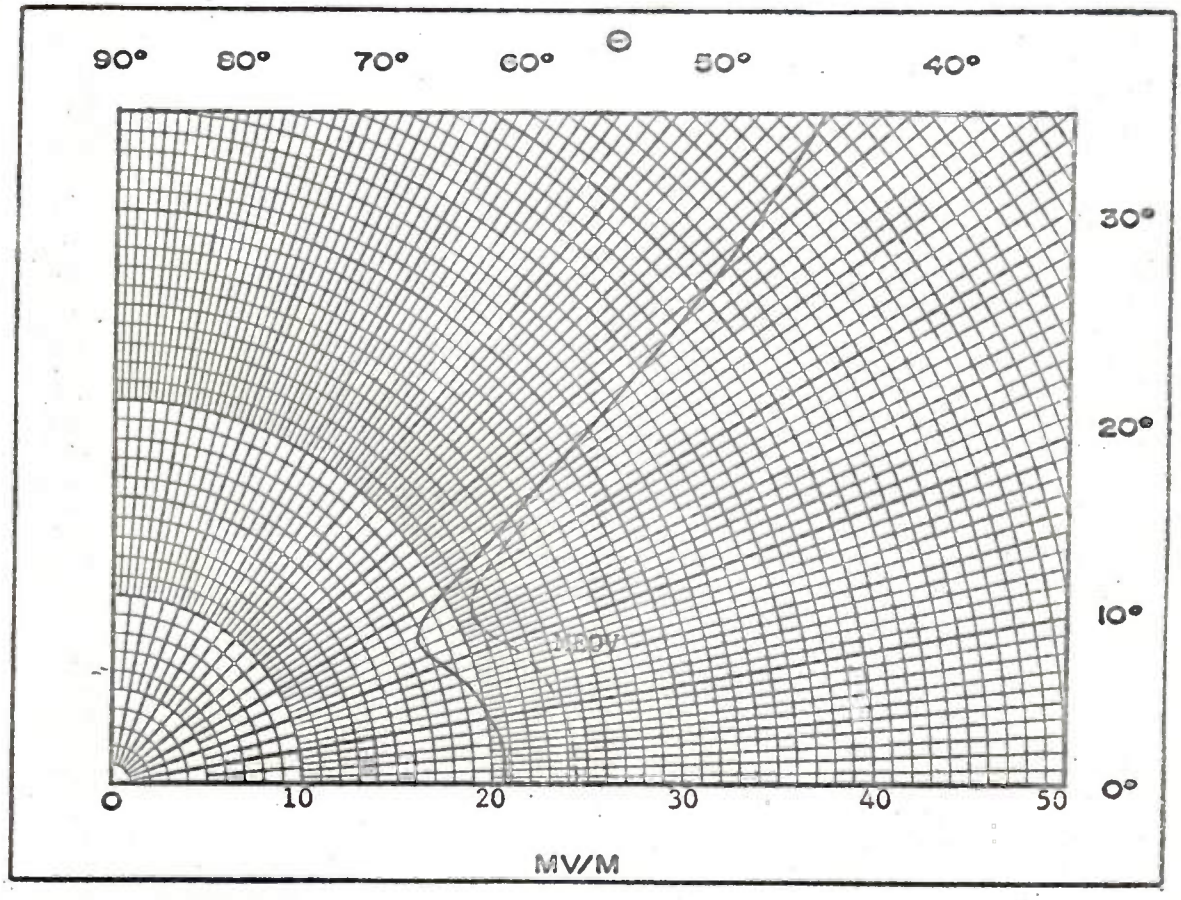
PROPOSED VERTICAL SECTION TOWARD KDKA
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

AZIMUTH = 40° & 80°



Tabulation of Radiated Fields

θ	E (mv/m)	MEOV
0°	20.6	24.4
5°	20.6	24.3
10°	20.1	23.8
15°	19.5	23.2
20°	18.4	21.9
25°	17.6	20.9
30°	19.5	22.2
35°	26.9	
40°	41.0	
45°	59.0	
50°	78.5	
55°		
60°		

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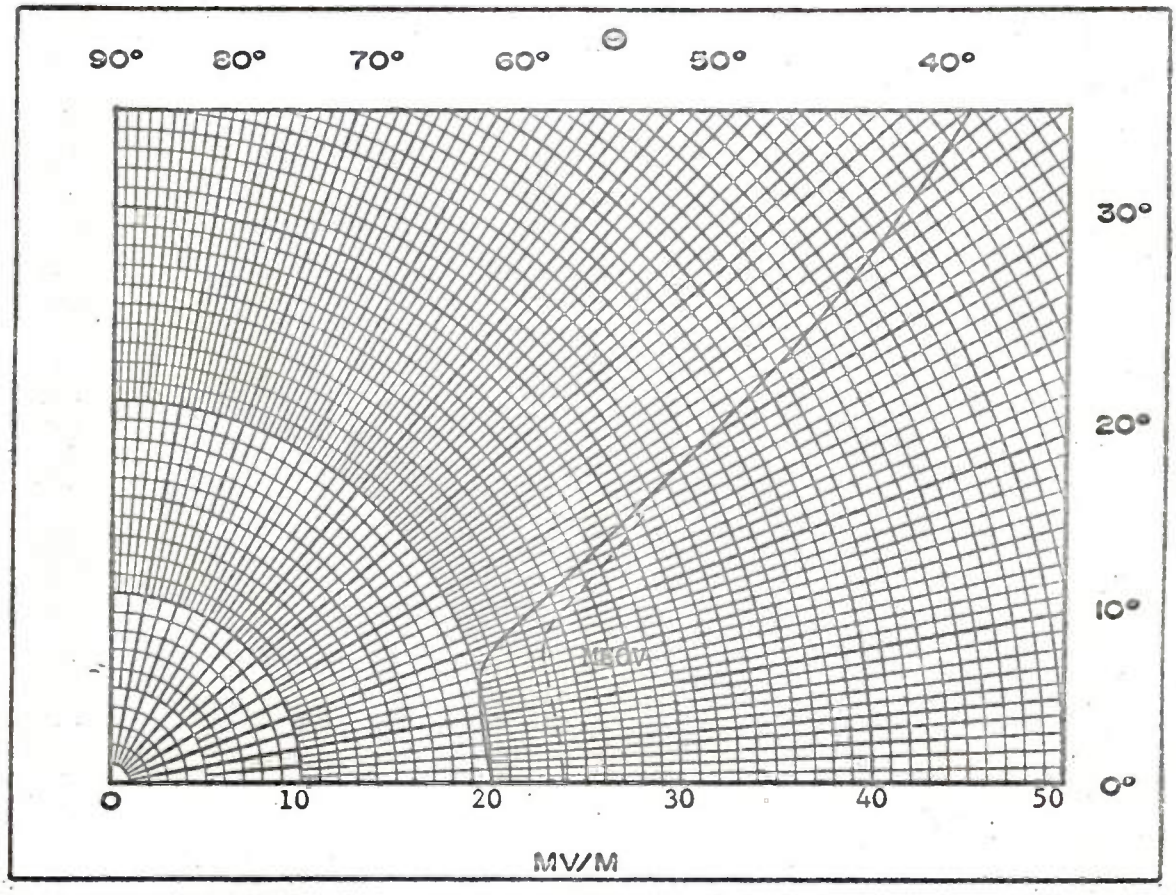
May, 1962

PROPOSED VERTICAL SECTION TOWARD KDKA
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

AZIMUTH = 30° & 90°



Tabulation of Radiated Fields

θ	E (mv/m)	MEOV
0°	20.0	23.9
5°	19.9	23.7
10°	19.9	23.6
15°	20.0	23.6
20°	21.7	24.7
25°	27.0	29.3
30°	36.1	
35°	49.0	
40°	65.2	
45°	83.7	
50°	102.0	
55°		
60°		

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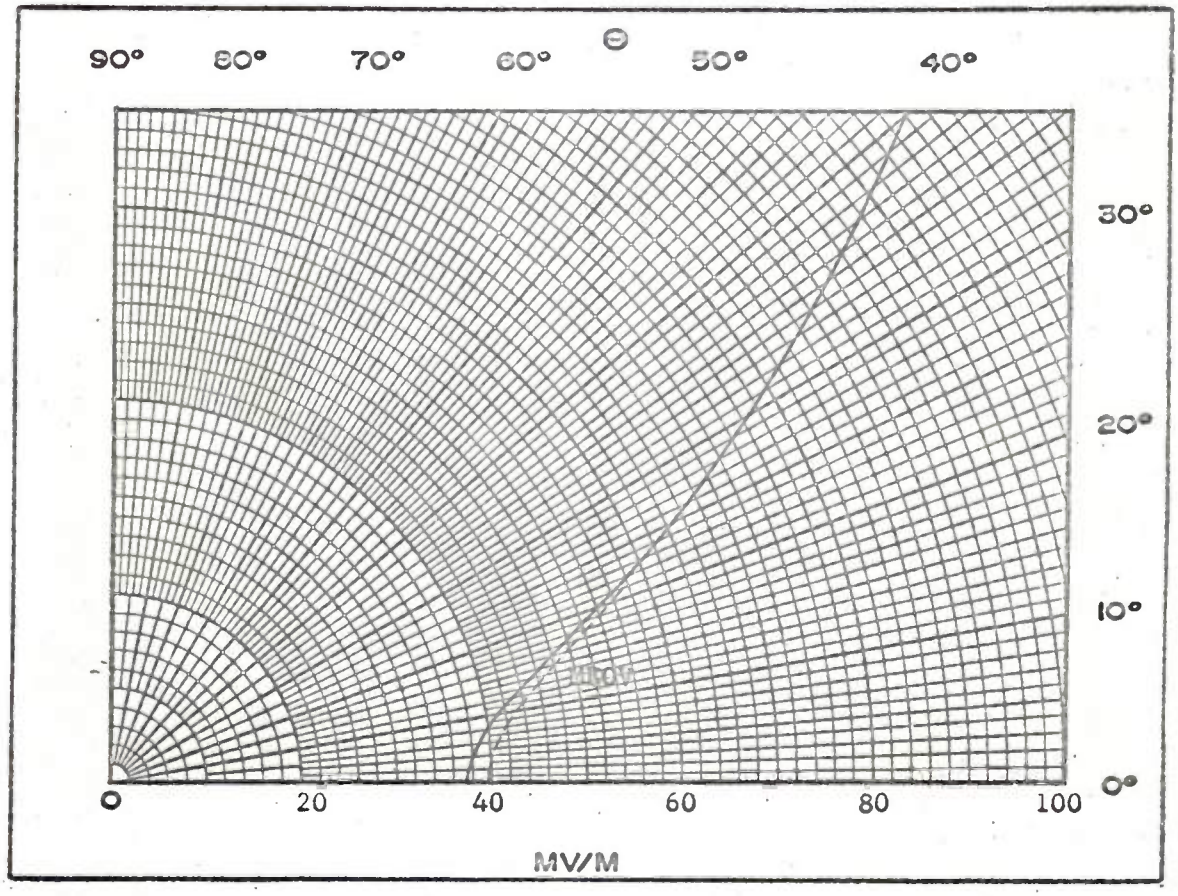
PROPOSED VERTICAL SECTION TOWARD KDKA
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

AZIMUTH = 20° & 100°



Tabulation of Radiated Fields

θ	E (mv/m)	MEOV
0°	37.6	39.9
5°	38.4	40.5
10°	41.3	43.3
15°	46.3	48.0
20°	53.9	55.1
25°	64.4	
30°	76.8	
35°	91.3	
40°	108.0	
45°	124.0	
50°	137.5	
55°		
60°		

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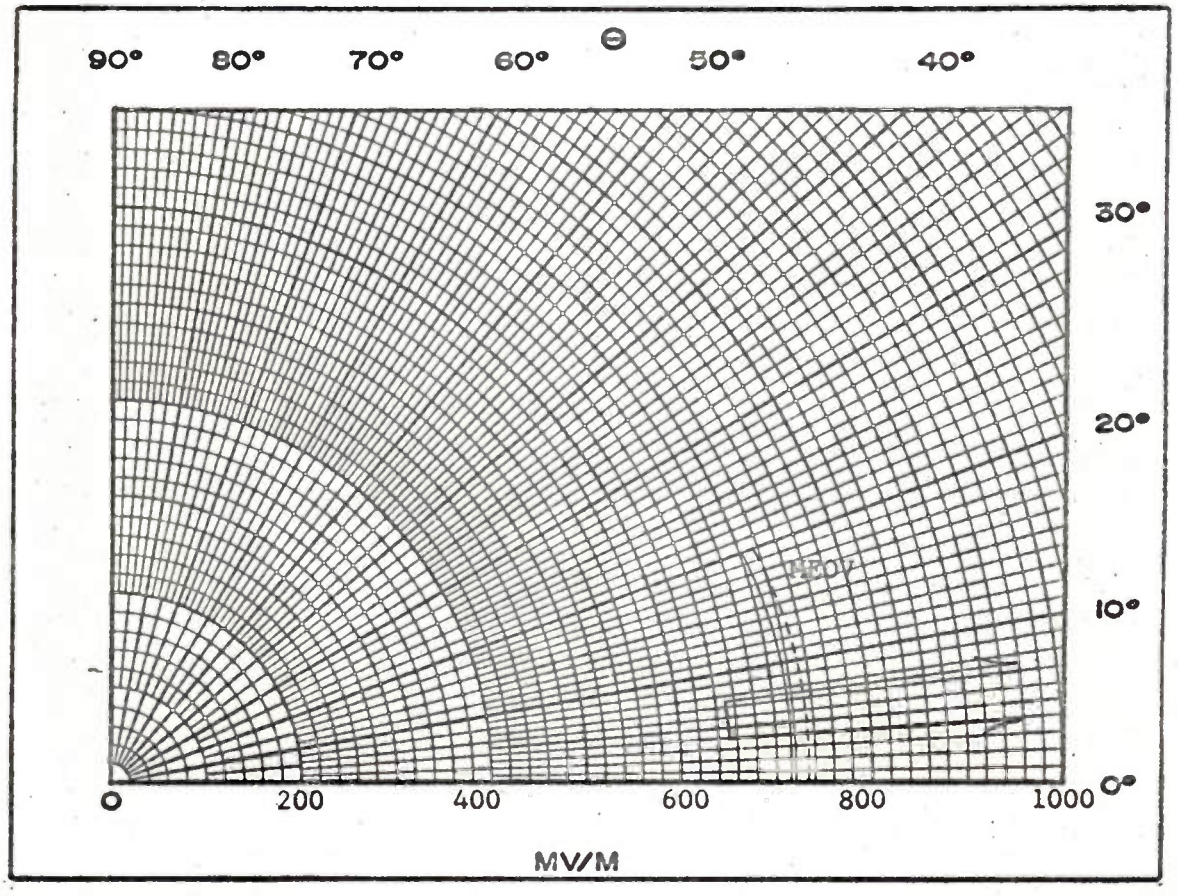
PROPOSED VERTICAL SECTION TOWARD KGBS
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

AZIMUTH = 276.2°



Tabulation of Radiated Fields

θ	E (mv/m)	MEOV
0°	717.4	732.0
5°	716.7	731.4
10°	714.3	729.2
15°	709.7	723.8
20°	701.9	715.1
25°		
30°		
35°		
40°		
45°		
50°		
55°		
60°		

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May, 1962

TABULATION OF POPULATIONS AND AREAS SERVED
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

DAYTIME OPERATION

Contour (mv/m)	Population	Area (sq. mi.)
1000.0	Less than 100	2.6
25.0	49,700	1,260
5.0	73,159	5,250
2.0	107,216	11,300
0.5	152,768	35,100

NIGHTTIME OPERATION

Contour (mv/m)	Population	Area (sq. mi.)
1000.0	Less than 25	1.05
25.0	44,041	530
4.83 (NL)	54,899	2,550
"White Area"	13,631 (24.8%)	2,320 (91%)

Population was based on 1960 Census of the United States. Cities having a population of 2,500 or over and receiving less than 2.0 mv/m are not included. Areas were determined by use of a planimeter.

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May, 1962

ENGINEERING EXHIBITS
FOR
JOHN A. BARNETT
PROPOSED STATION - ROSWELL, NEW MEXICO
1020 KC - 10KW/50KW-LS - DA-2

PREPARED BY:

GAUTNEY & JONES

RADIO ENGINEERS WASHINGTON, D. C.

May, 1962