ENGINEERING SUPPLEMENT
for
APPLICATION FOR PROPOSED
F M BROADCASTING STATION
by
LOS ANGELES BROADCASTING CO., INC.
of
Los Angeles, Calif.

INDEX TO ENGINEERING SUPPLEMENT

GENERAL ENGINEERING STATEMENT

The Engineering data contained in this supplement refers to the application by the Los Angeles Broadcasting Company, Inc., of Los Angeles, California, for a construction permit for a High Frequency Broadcast Station using Frequency Modulation.

The station will have its Main Studio at 645 South Mariposa Avenue, in Los Angeles.

The Transmitter is to be located on a mountain northeast of Pasadena, California. The exact location of the transmitter will be at

34 degrees 12 minutes 18 second North Latitude

118 degrees 4 minutes 14 seconds West Longitude.

The transmitter site is in the Mount Wilson area of the San Gabriel Mountains at an elevation of 4300 feet above mean sea level.

The coverage requested in this application is for 10,760 square miles within the 50 uv/m contour as based on average elevation prediction methods. When "line of sight" conditions are met, the coverage is estimated at 7,240 square miles within the 50 uv/m meter contour.

It is proposed to use a thousand watt transmitter operating with one thousand watts output. It is assumed that the transmitter and antenna will be so located that the coaxial transmission line will be 100 feet long. The manufacturer's rated efficiency of a line of this length is 93%, thus 930 watts will be delivered to the antenna. A six bay turnstile antenna is proposed having a field gain of two. The effective power radiated thus will be 3,720 watts.

It is proposed to support the turnstile antenna on a self-supporting steel derrick fifty feet high. The radiating elements are twenty-five feet eight inches high and with four feet of clearance at the bottom, and one foot ten inches at the top, the over-all height is thus eighty-one feet eight inches. The height from the ground to the center of the radiating elements is thus sixty-one feet above the ground level, and 4367 feet above mean sea level.

The preceeding figures of 3720 watts of power at an elevation of 4367 feet above mean sea level were used in computing the expected coverage.

There are three airports within ten miles of the proposed transmitter site. The distances and bearings from the transmitter site follow:

Monrovia Airport	5.5 miles at 140° true.
El Monte Airport	8.0 miles at 168° true.
Rosemead Airport	9.5 miles at 180° true.

The proposed site is 18 miles from the center of green airway No. 5, and 19 miles from the center of amber airway No. 1. (Airports and Airways are shown on Exhibit No.3).

Two Standard Broadcast Stations are within eight miles of the proposed transmitter site. They are KPPC and KWKW, both located in Pasadena, California. The weather station of the U.S.Engineers, WCDJ, also is within eight miles of the proposed \ite.

There are no buildings or markings for air navigation he vicinity of the site.

METHOD OF ESTIMATING SERVICE CONTOURS

The method outlined in the Commission's Proposed
Standards of Good Engineering Practice Concerning F M
Broadcast Stations, July 28, 1945, was used for estimating
the service contours.

Elevations were taken along ten radials from the
transmitter site. These elevations were tabulated from
U.S. Geological Survey Topographic Maps having a scale of
1/24,000.

The average elevation of the two to ten mile
sector on each radial was calculated and subtracted from
the transmitter antenna height. The effective height
of the transmitter antenna thus obtained and the
effective radiated tower was used with the new F.C.C.
98 Mc Charts to locate the one thousand microvolt per
meter and fifty microvolt per meter contours.

When the average elevation for Radial A in the
two to ten mile sector was calculated, it was found that
the effective elevation of the antenna w as negative.
This indicated zero signal to the north and inspection
of Radial A shows that this is probably the case since
the mountain rises to more than five thousand feet in
this direction. "Line of sight" transmission is possible
in this direction for a distance of only 1.5 miles.

"Line of sight" transmission occurs for only .5
miles along Radial B, 5.4 along Radial C, and 2.65 miles
along Radial J. Since the terrain is very irregular and
contains deep canyons along Radials B, C, and J, the
average elevation prediction method indicates a good signal

covering quite a large area in these directions. Any service received along Radials A, B, C, or J would be several hundred feet below the "line of sight." There is practically no population involved in these areas and the only question is in the matter of square miles covered. Exhibit No. 1 shows the service area as predicted by the elevation method and the dotted line is an approximate line where the transmission becomes "line of sight" to the predicted contours.

Exhibit No. 3 shows only the contours as predicted by the average elevation method.

The oblique aerial photograph of Exhibit No. 5 shows the transmitter location and the ridge of mountains directly to the north of the proposed site. The observer is looking northeast to the transmitter site.

METHOD OF DETERMINING POPULATION AND AREA SERVED

The area within the 1000 and 50 uv/m contours for both predicted and limited service areas shown in Exhibit No. 1 was measured with a planimeter. These areas are as follows:

Elevation Prediction Method.

1000 uv/m contour 5,000 square miles

50 uv/m contour 10,760 square miles

Elevation Prediction Method less area definitely out of line of sight.

1000 uv/m contour 4,240 square miles

50 uv/m contour 7,240 square miles

The population within the predicted contours was estimated by drawing the contours on a U.S. Minor Civil Division Map. Uniform distribution of population was assumed when one of the contours passed through a civil division. Populations follow:

By Elevation Prediction Method.

1000 uv/m contour 3,003,389 persons

50 uv/m contour 3,061,572 persons *

By Elevation Prediction Method less area definitely out of line of sight.

1000 uv/m contour 2,992,289 persons

50 uv/m contour 3,045,788 persons *

* Cities of over 10,000 persons within the 50 uv/m contour and outside the 1000 uv/m contour excluded.

NORTHERN LIMIT OF LINE OF SIGHT
COVERAGE

1000 uv/m contour

J

B

A

I

C

TRANSMITTER SITE

NOR

D

H

G

F

E

EXHIBIT NO. 1

COVERAGE MAP
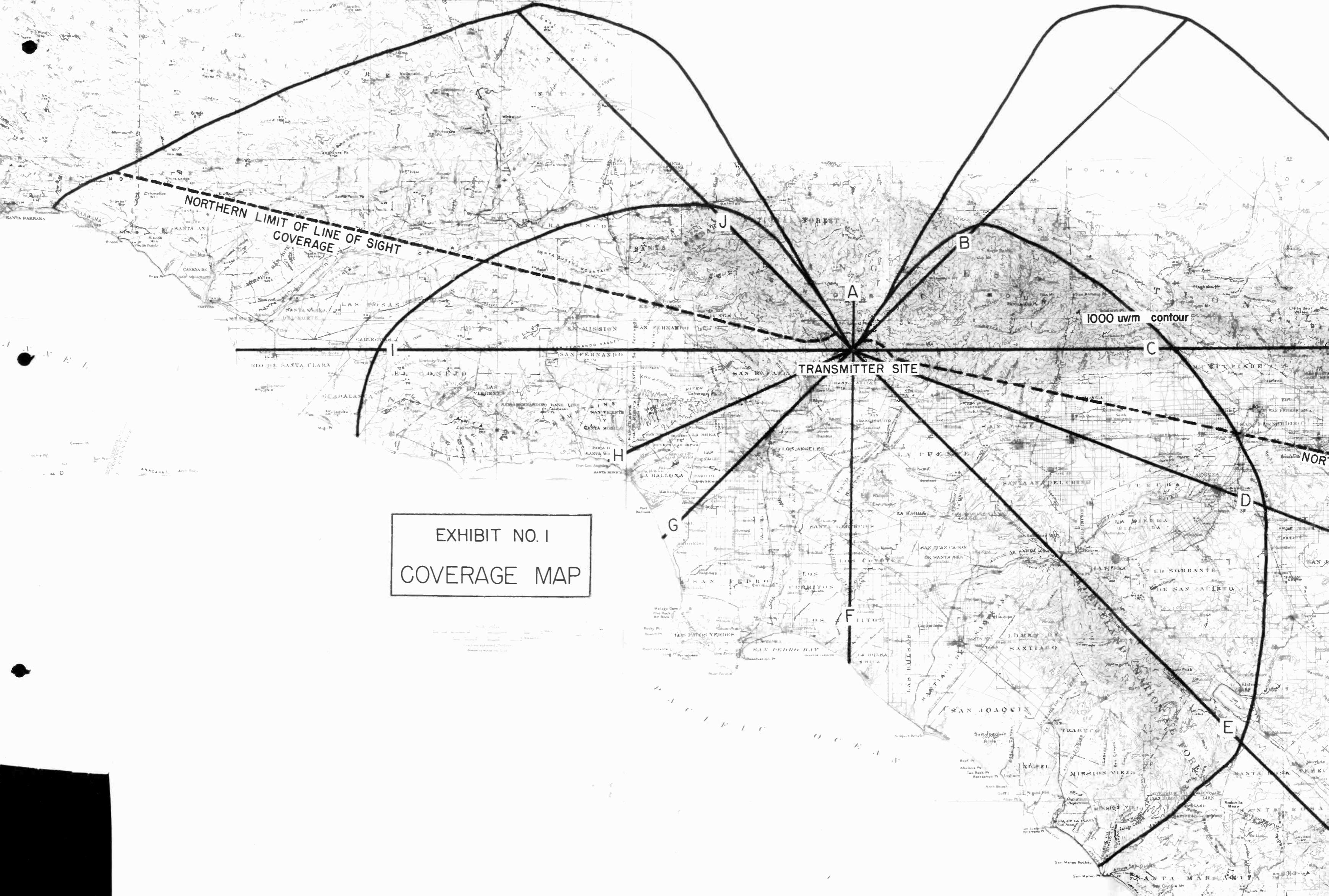
RADIAL A
N. 0° E.
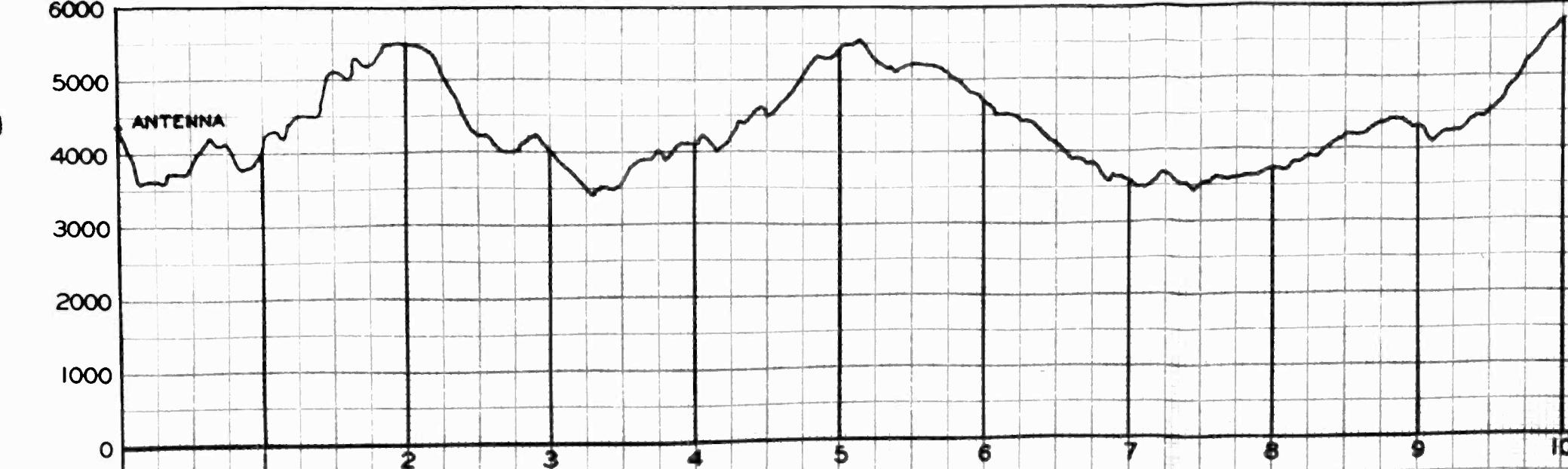
RADIAL B
N. 45° E.
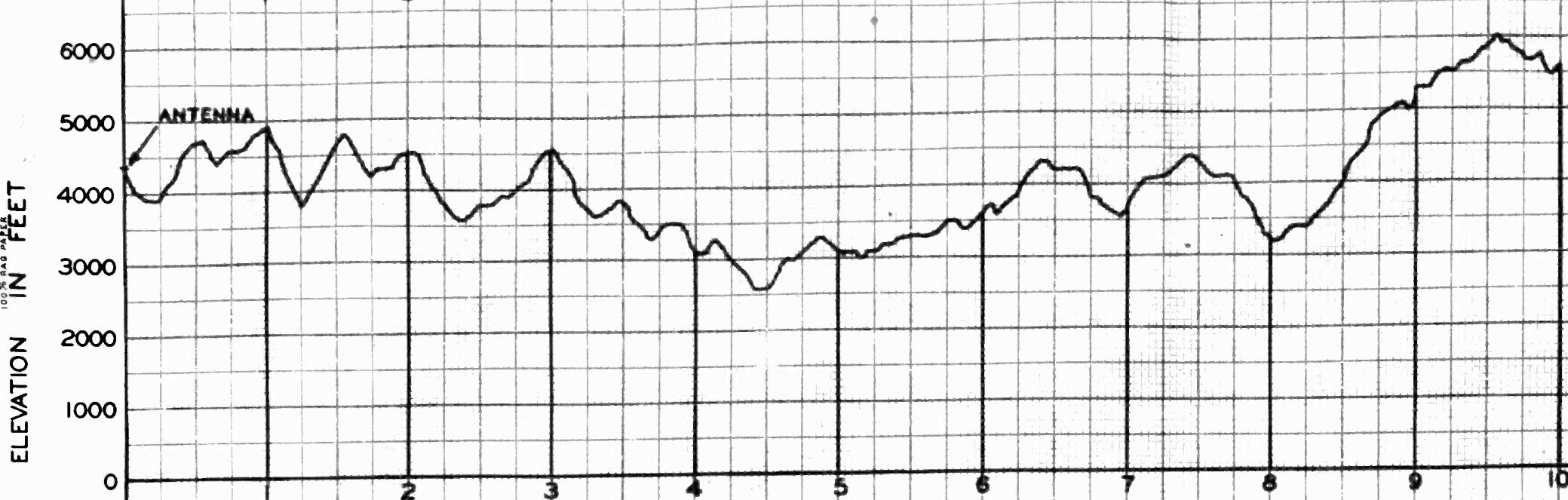
RADIAL C
N. 90° E.
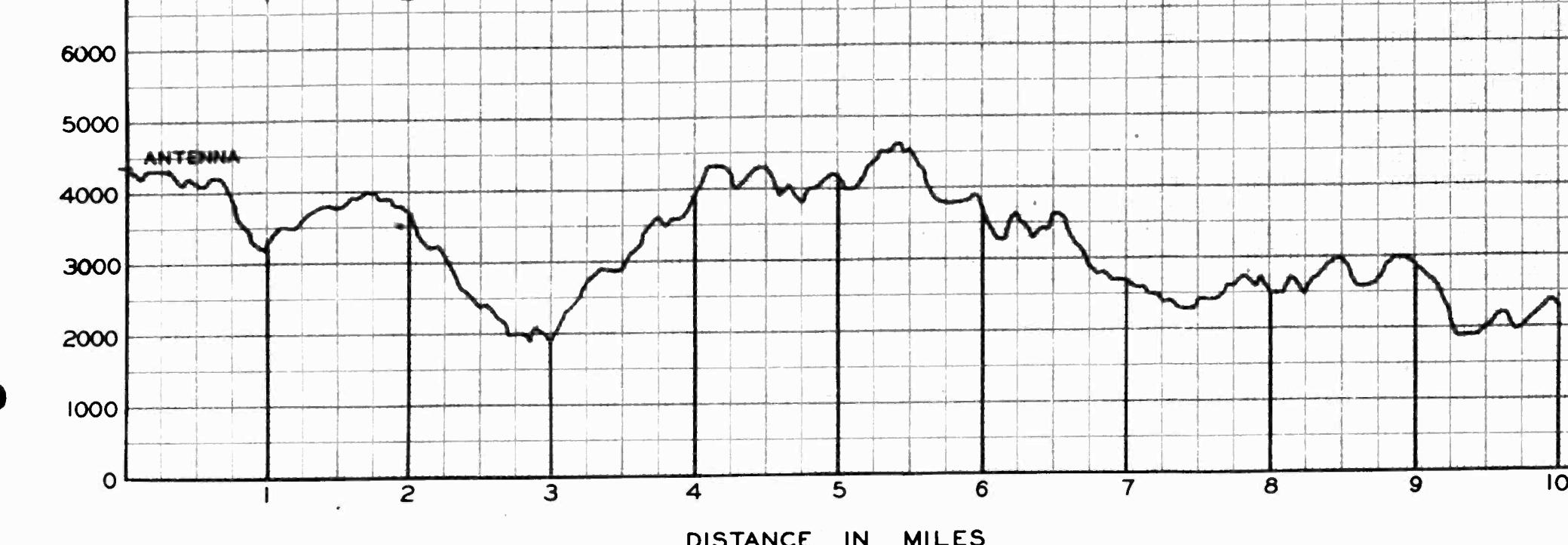
ELEVATION IN FEET

DISTANCE IN MILES

All elevations tabulated from
U.S. Geological Survey Topography
Quadrangle Sheets.

EXHIBIT 2A

ANTENNA

KEUFFEL & ESSER CO. N.Y.
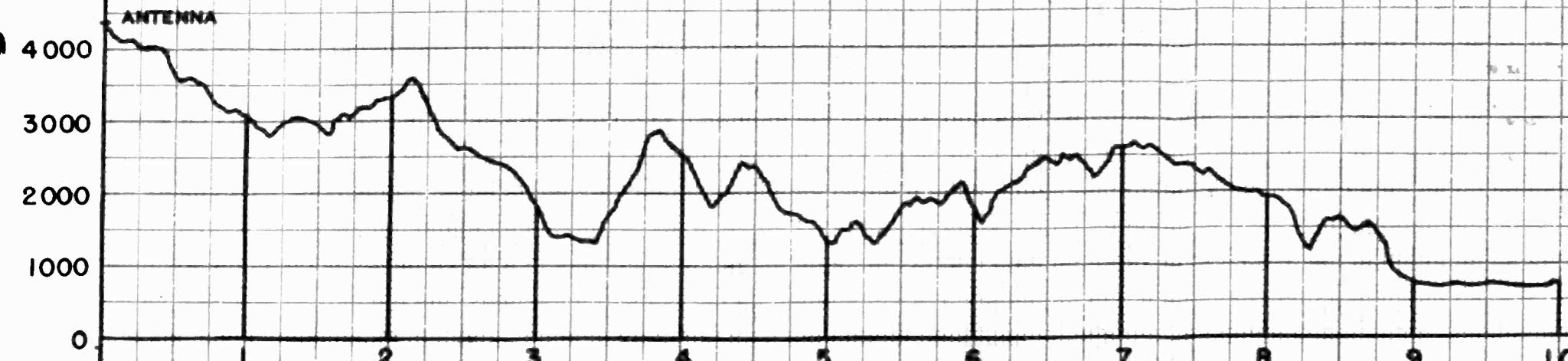
RADIAL D
N. 110° E.
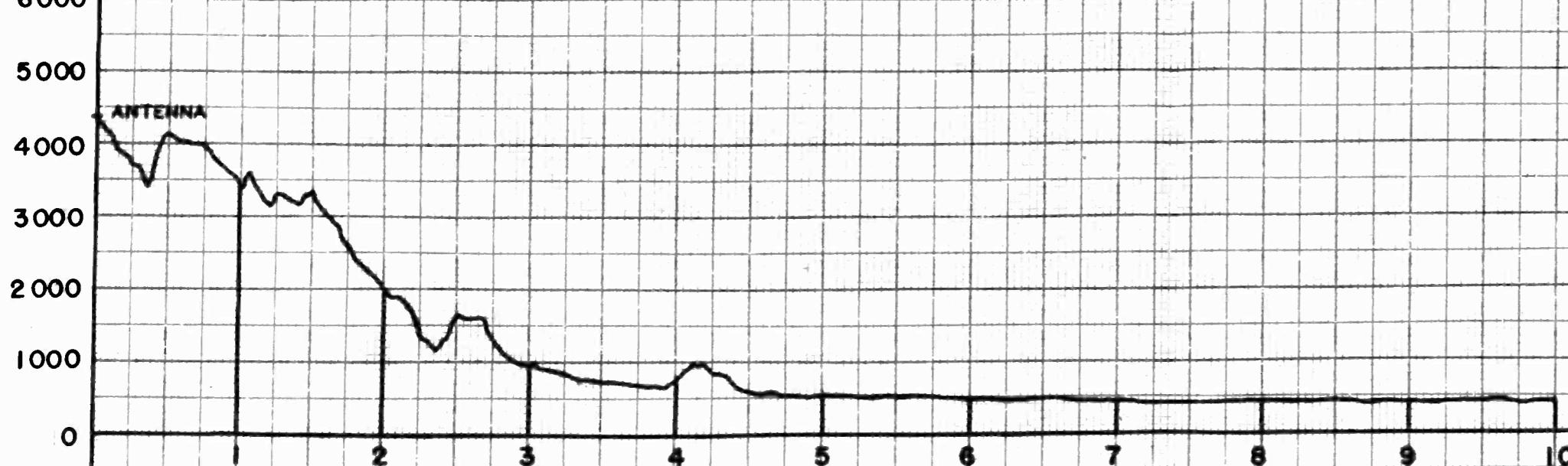
RADIAL E
N. 135° E.

RADIAL F
N. 180° E.

All elevations tabulated from
U.S. Geological Survey Topography
Quadrangle Sheets.

EXHIBIT 2B

ELEVATION IN FEET

MILES

RADIAL G

N.225° E.

All elevations tabulated from
U.S. Geological Survey Topography
Quadrangle Sheets.

EXHIBIT 2C

ANTENNA

CITY HALL

EXPOSITION PARK

PACIFIC
OCEAN

FEET

MILES
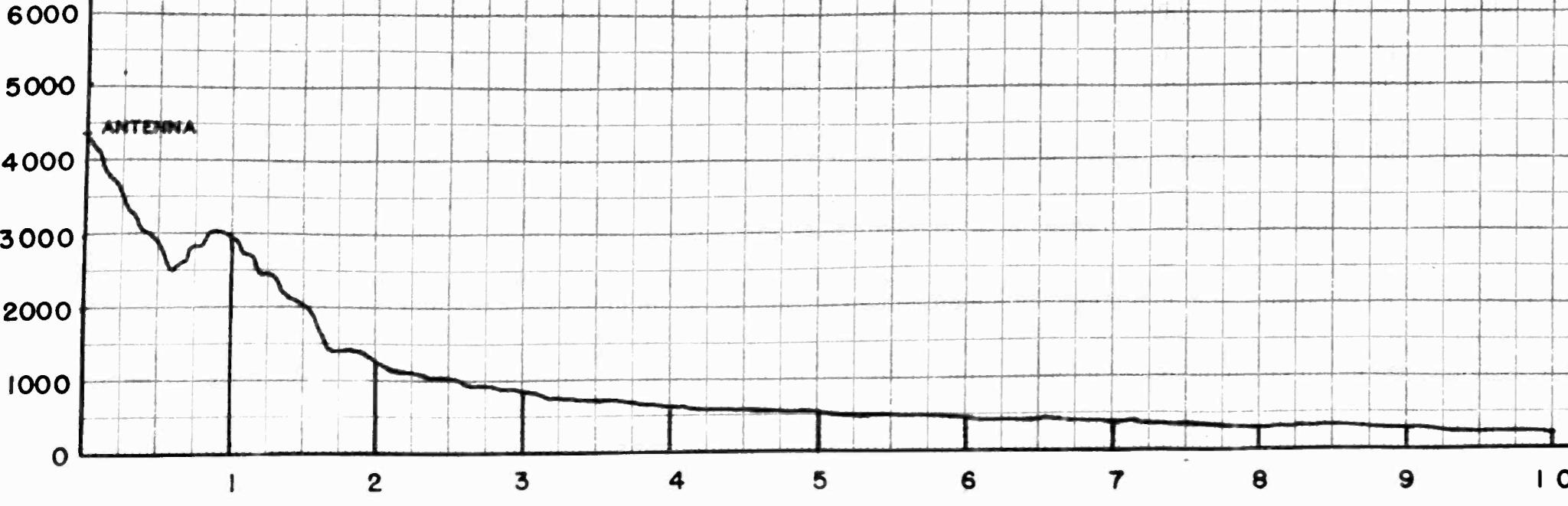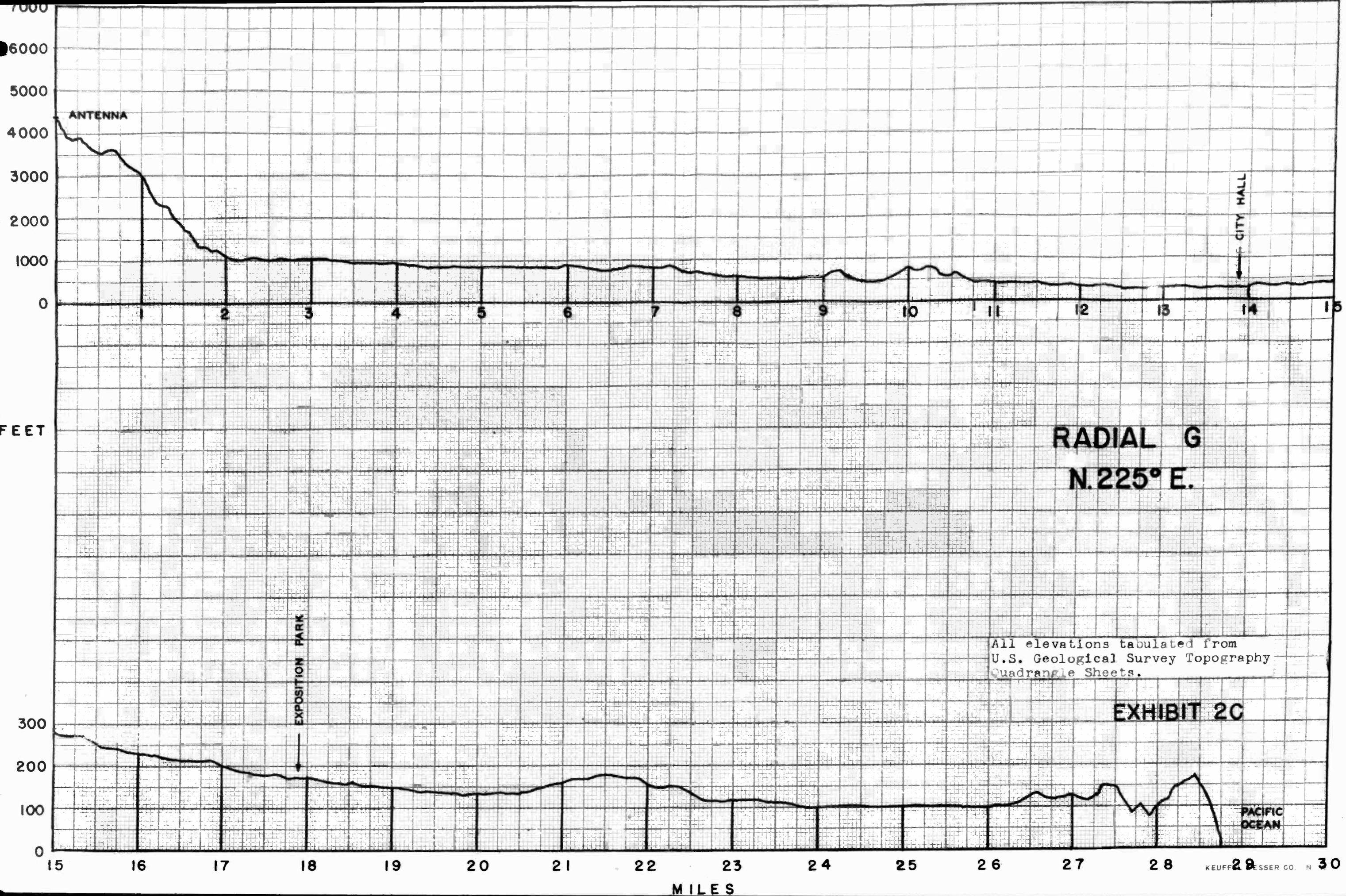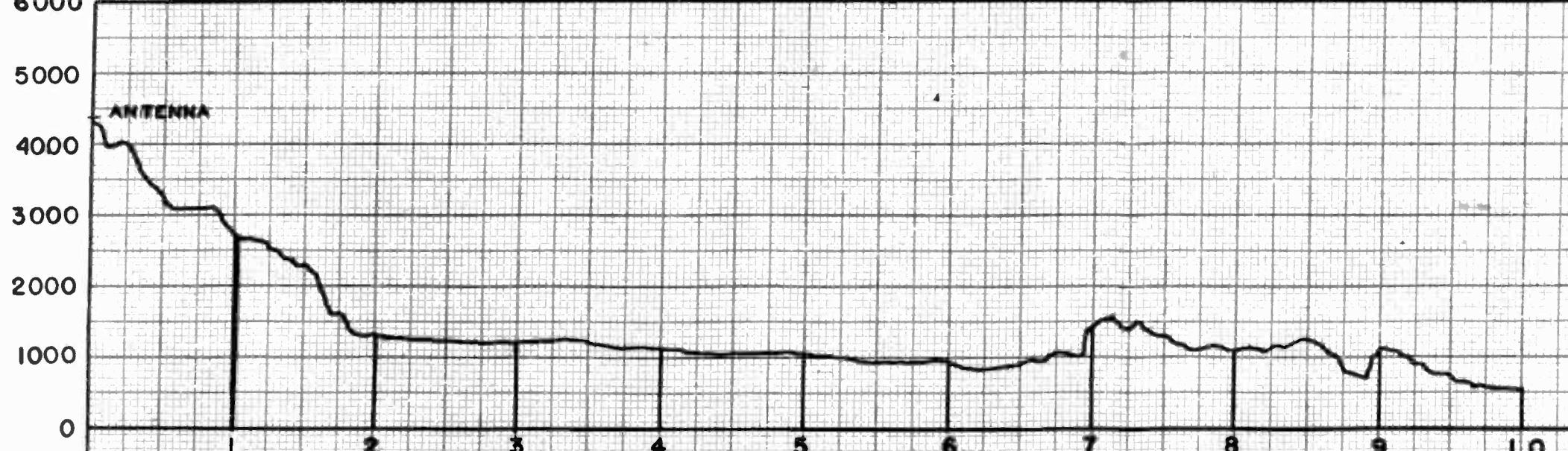
RADIAL H
N.245° E.

RADIAL I
N.270° E.
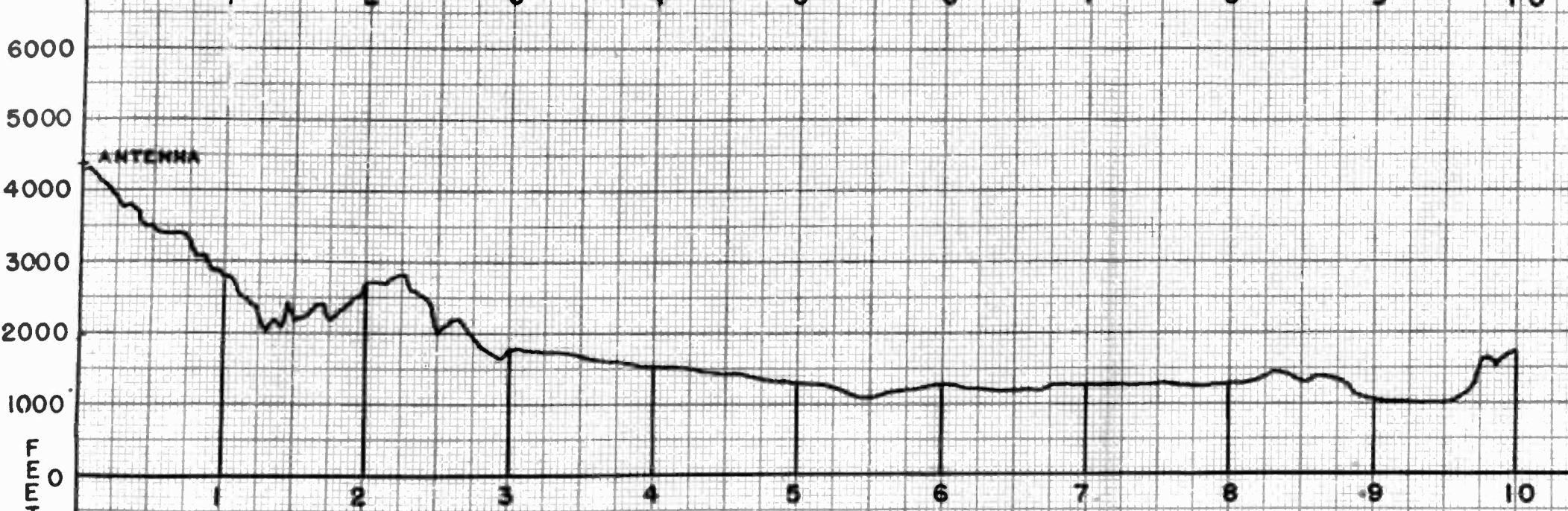
RADIAL J
N.315° E.
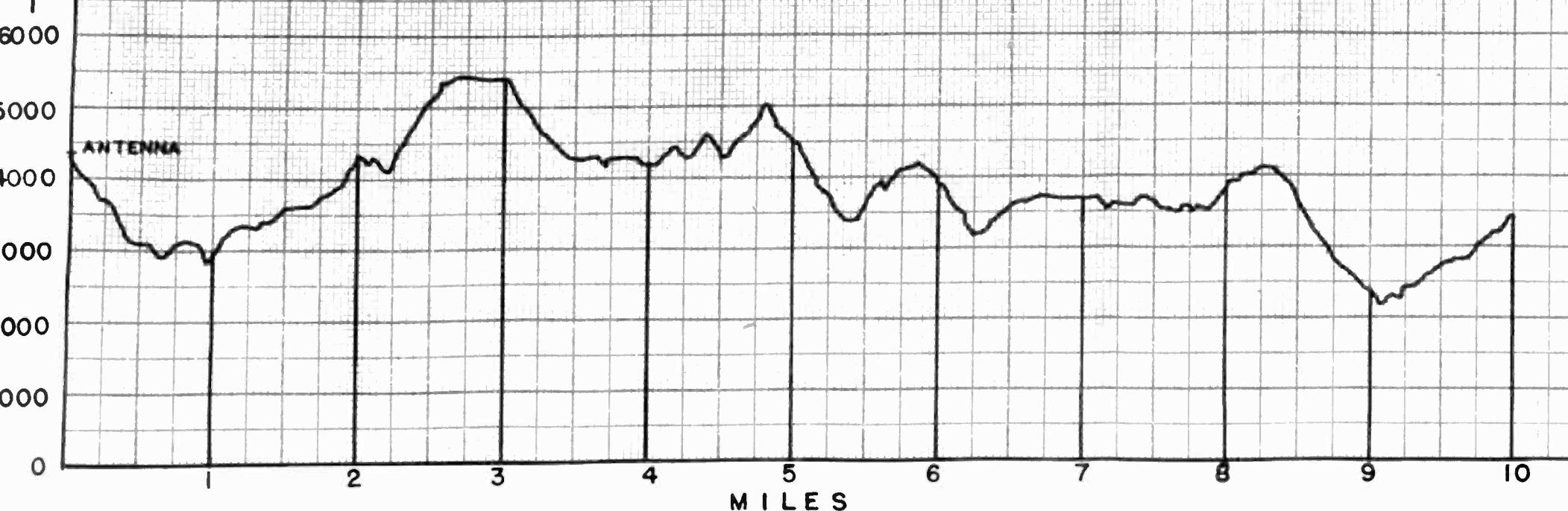
All elevations tabulated from
U.S. Geological Survey Topography
Quadrangle Sheets.

EXHIBIT 2D

FEET

MILES

EXHIBIT NO. 3
AERONAUTICAL CHART

WCDJ

TRANSMITTER SITE

PASADENA

KPPC

KWKW

EXHIBIT NO. 4
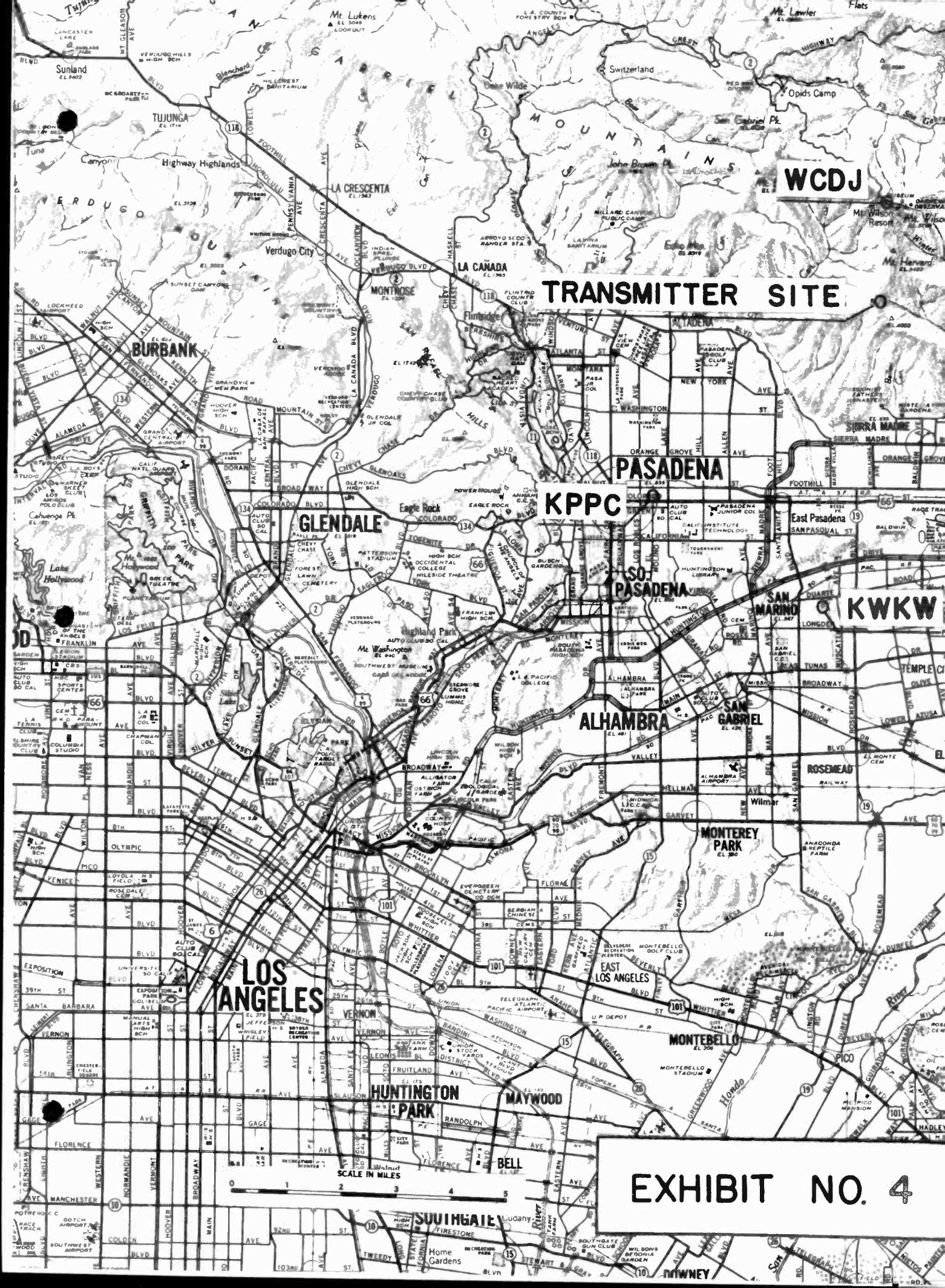
AERIAL PHOTOGRAPHS

TRANSMITTER SITE

SIERRA MADRE

ALTADENA

U.S. NO. 66

PASADENA BUSINESS
DISTRICT

BROOKSIDE PARK

ORANGE GROVE AVE. TO FREEWAY TO LOS ANGELES

VISTA DEL ARROYO
HOTEL

ROSE BOWL

COLORADO ST.
BRIDGE

U.S. NO. 6

COLORADO BLVD.

TRANSMITTER
SITE

TRANSMITTER SITE

EXHIBIT NO. 6
TOPOGRAPHIC MAP

Scale 1/250000

| 2 | 0 | 2 | 4 | 6 | 8 | 10 Miles |

| 2 | 0 | 2 | 4 | 6 | 8 | 10 Kilometers |

Contour interval 250 feet.
Datum is mean sea level.
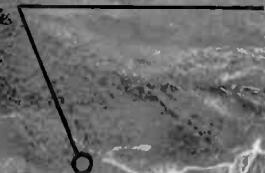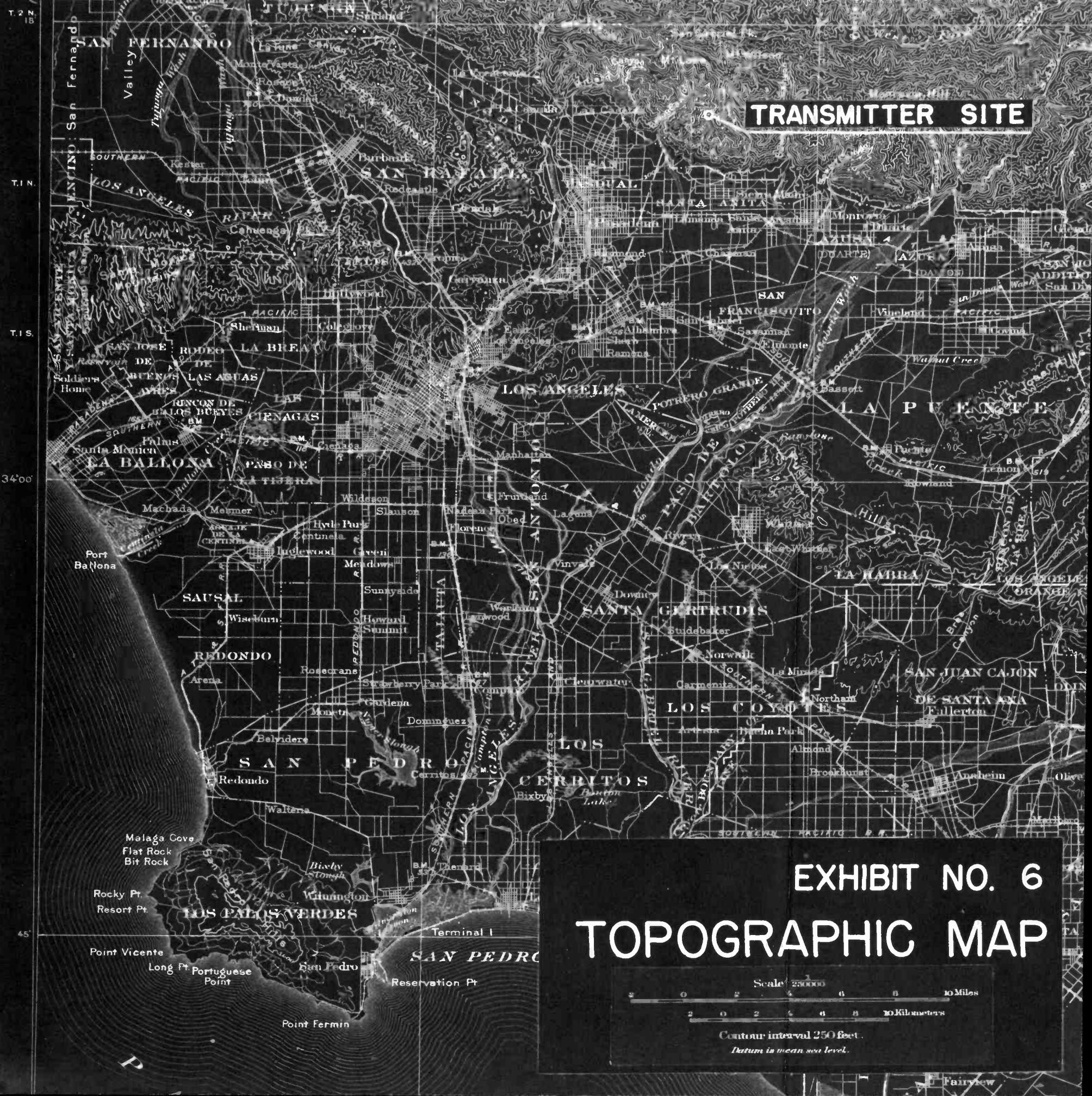
QUALIFICATION SHEET

All of the engineering information contained in this
application was compiled by Ron Oakley, 2785 Cedar Ave.,
Long Beach, California.

His qualifications follow:

Previous work presented to and accepted by
your Commission.

Entered radio as amateur in 1924, receiving
call letters 6JA. Active as amateur operator
until 1931 during which time also worked in
radio service and set manufacturing.

Entered commercial radio broadcasting in 1931
and employed continuously since then in the
radio broadcasting field.

Experience includes transmitter and studio con-
struction, field strength measurements, sky-wave
measurements, and design and adjustment of
directional antenna system. Appointed KGER
transmitter supervisor in 1937 and has been
Chief Engineer of KGER since February 1943.

Formal eduction at Long Beach Polytechnic High
School and the University of Southern California.
Member of the Institute of Radio Engineers.

TABULATION OF AVERAGE ELEVATIONS

INTERVAL OF SECTOR	RADIAL A NOE	RADIAL B N45E	RADIAL C N90E	RADIAL D N110E	RADIAL E N135E	RADIAL F N180E	RADIAL G N225E	RADIAL H N245E
0 to 1 mile	3900	4400	4100	3780	3900	3200	3600	3480
1 to 2 "	4800	4400	3780	3060	2940	2000	1840	2100
2 to 3 "	4520	4000	2700	2720	1460	1000	1050	1220
3 to 4 "	3820	3800	3080	2000	760	780	950	1220
4 to 5 "	4740	3040	4100	2000	610	570	875	1070
5 to 6 "	5120	3300	4260	1700	505	500	860	970
6 to 7 "	4115	4100	3260	2320	490	430	860	910
7 to 8 "	3620	4080	2560	2380	435	360	700	1360
8 to 9 "	4135	4120	2790	1460	435	300	560	1100
9 to 10 "	4870	5700	2300	780	430	250	580	780
10 to 11 "							620	
11 to 12 "							400	
12 to 13 "							300	
13 to 14 "							290	
14 to 15 "							305	
15 to 16 "							250	
16 to 17 "							220	
17 to 18 "							180	
18 to 19 "							160	
19 to 20 "							140	
20 to 21 "							140	
21 to 22 "							170	
22 to 23 "							130	
23 to 24 "							110	
24 to 25 "							102	
25 to 26 "							100	
26 to 27 "							120	
27 to 28 "							116	
28 to 29 "							98	

TABULATION OF AVERAGE SLIPPAGE

INTERVAL OF SECTION	RADIAL A	RADIAL B	RADIAL C	RADIAL D	RADIAL E	RADIAL F	RADIAL G	RADIAL H
0 to 1 mile	5800	4400	4100	3750	5100	5200	5690	5480
1 to 2 "	4860	4400	4760	3050		3000	1940	2120
2 to 3 "	4320	4000	2700	3725		1000	1050	1320
3 to 4 "	3820	3300	3050	2000	760	730	850	1230
4 to 5 "	4740	3040	4100	2000			375	1070
5 to 6 "		3300	4250	1700	50	400		970
6 to 7 "	4115	4100	3860	2940		450	900	810
7 to 8 "	4580	4030	2860	2350		560	700	1500
8 to 9 "	4135	4120	2700			800		1100
9 to 10 "		3700	2500	790	450			780
10 to 11 "								650
11 to 12 "								420
12 to 13 "								305
13 to 14 "								215
14 to 15 "								375
15 to 16 "								550
16 to 17 "								225
17 to 18 "								190
18 to 19 "								100
19 to 20 "								140
20 to 21 "								140
21 to 22 "								170
22 to 23 "								130
23 to 24 "								110
24 to 25 "								126
25 to 26 "								
26 to 27 "								104
27 to 28 "								
28 to 29 "								

TABULATION OF AVERAGE ELEVATIONS (continued)

INTERVAL OF SECTOR	RADIAL I N270E	RADIAL J N315E
0 to 1 mile	3600	3300
1 to 2 miles	2360	3580
2 to 3 "	2180	4960
3 to 4 "	1600	4650
4 to 5 "	1440	4650
5 to 6 "	1220	3900
6 to 7 "	1260	3620
7 to 8 "	1270	3680
8 to 9 "	1380	3500
9 to 10 "	1200	2760

TABULATION OF AVERAGE ELEVATIONS (continued)

INTERVAL OF FACTOR	RADIAL 1 VOL.	RADIAL 4 METER
0 to 1 mile	3650	3500
1 to 2 miles	2360	358.
2 to 3 "	2180	4960
3 to 4 "	1600	4650
4 to 5 "	1440	4650
5 to 6 "	1250	3500
6 to 7 "	1260	3650
7 to 8 "	1270	3680
8 to 9 "	1280	3500
9 to 10 "	1200	2760

TABULATION OF DISTANCES TO
PREDICTED CONTOURS

RADIAL	Distance to 50 uv/m Contour	Distance to 1000 uv/m Contour	Effective Antenna Elevation	Effective Radiated Power
A	0	●	-0.5 ft.	3720 watts
B	50 miles	19.5 miles	350 "	3720 "
C	70.5 "	35.0 "	1236 "	3720 "
D	90.0 "	49.0 "	2447 "	3720 "
E	105.0 "	60.5 "	3687 "	3720 "
F	107.0 "	61.0 "	3843 "	3720 "
G	104.0 "	60.0 "	3563 "	3720 "
H	101.0 "	58.0 "	3289 "	3720 "
I	97.0 "	54.00 "	2723 "	3720 "
J	51.0 "	22.0 "	414 "	3720 "

TABULATION OF DISTANCES TO PREDICTED CONTOURS

RADIAL	Distance to 50 uv/m Contour	Distance to 1000 uv/m Contour	Effective Antenna Elevation	Effective Radiated Power
A	0	8	-0.5 ft.	3720 watts
B	60 miles	1.5 miles	550 "	3720 "
C	70.5 "	55.0 "	1236 "	3720 "
D	70.0 "	54.0 "	2447 "	3720 "
E	105.0 "	50.5 "	3627 "	3720 "
F	107.0 "	51.0 "	3543 "	3720 "
G	104.0 "	50.0 "	3525 "	3720 "
H	101.0 "	58.0 "	3388 "	3720 "
I	97.0 "	54.00 "	3733 "	3720 "
J	81.0 "	22.0 "	414 "	3720. "

STATE OF CALIFORNIA   )
) SS:
COUNTY OF LOS ANGELES)

        Ron Oakley, being duly sworn, upon his oath deposes and says that the facts stated in the foregoing, together with all the exhibits attached thereto, are true of his own knowledge, except as to such statements as therein stated to be on information and belief, and as to such statements he believes them to be true.
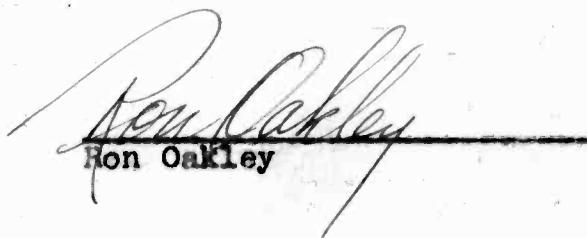
_____
                                      Ron Oakley

Sworn and subscribed before me this   _____28_____   day of

_____September_____, 1945.
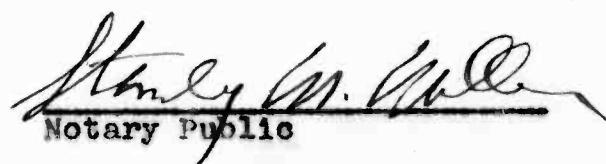
_____
                                        Notary Public

My commission expires _____

                               My Commission Expires Dec. 3, 1946