

ENGINEERING REPORT
KSHO-TV - LAS VEGAS, NEVADA
CHANNEL 13 - 0.430 KW ERP



March, 1956

GRANT R. WRATHALL
Radio Engineer
Aptos, California

Engineering report of January, 1956, was prepared assuming 200-watt visual transmitter power output. In this report 150-watt transmitter power output is assumed. Signal contours for both transmitter power operations are shown on the exhibit maps. Transmitter power output is the only change proposed in this engineering amendment.

TELEVISION BROADCAST ENGINEERING DATA Name of applicant
Moritz Zenoff

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 D, complete all paragraphs of this form; if change E 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 7. For changes G through I, complete only paragraph 2 and the appropriate other paragraphs; for change J, complete only paragraphs 2, 5 and 16(b).)

A. Construct a new station
 B. Change effective radiated power or antenna height above average terrain
 C. Change transmitter location
 D. Change frequency
 E. Change antenna system
 F. Construct or change auxiliary antenna system
 G. Change transmitter
 H. Install auxiliary or alternate main transmitter
 I. Other changes (specify) **visual monitors**
 J. Change studio location

2. Facilities requested

Frequency 210 — 216 Mc. Channel No. 13

Effective Radiated Power (visual) In dbk: -3.66
 In kw: 0.430

Effective Radiated Power (aural) In dbk: -6.65
 In kw: 0.215

Antenna height above average terrain 139.6 feet

3. Station location (principal community)

state Nevada City or town Las Vegas

4. Transmitter location

State Nevada County Clark

City or town Las Vegas Street Address (or other identification) Fremont Hotel 2nd and Fremont

5. Main studio location

State Nevada County Clark

City or town Las Vegas Street address Fremont Hotel 2nd and Fremont

6. Transmitters

Visual

Make	Type No.	Rated power
<u>Adler</u>	<u>VST-150A</u>	In dbk: <u>-8.26</u> In kw: <u>0.15</u>
Make	Type No.	Rated Power
<u>Adler</u>	<u>VST-150A</u>	In dbk: <u>-11.25</u> In kw: <u>0.075</u>

Aural

Make	Type No.	Rated Power
<u>Adler</u>	<u>VST-150A</u>	In dbk: <u>-11.25</u> In kw: <u>0.075</u>

If the above transmitters are composite or of types for which data have not been filed with the F.C.C., attach as Exhibit No. a complete showing of transmitter details in accordance with the Commission's Rules. The showing should include schematic diagrams, makes and types of tubes, operating constants of the last radio stages, full details of frequency control, vestigial sideband filter (if used), multiplex networks and isolation networks. If changes are to be made in a licensed transmitter, include a schematic diagram and give full details of the changes. **FCC approved**

(a) Describe in Exhibit No. means which will be used for determining and maintaining power output of the transmitters to the values specified in this application. **See specifications on file**

(b) Multiplexer: Make None required Type No. _____

Rated input power _____ dbk

Rated loss: Visual _____ db Aural _____ db

7. (a) Antenna structure

Is the proposed construction in the immediate vicinity of any other radio station or will the proposed transmitting antenna be supported by the antenna structure of any other radio station? If "Yes", attach as Exhibit No. complete engineering data showing details and effect upon other station. Yes No

Will proposed structure be constructed on the top of a building? If "Yes", state height 215' Yes No
 of building (distance from ground to base of proposed structure) in feet.

Overall height in feet above ground. Overall height in feet above mean sea level. (Do not include the height of any obstruction lighting which may be required.)

240.5' 2256.5'

Height of antenna radiation center in feet above mean sea level. 2246.5' feet

Geographical coordinates of antenna (to nearest second)

North latitude 36 10 12.5 West longitude 115 8 34

How were coordinates determined? From 1/62,500 topo map

Indicate by check mark the zone in which structure is located. 1 2 3

(b) Antenna data

Visual

Make	Type No.
<u>Prodelin</u>	<u>RTV - 4</u>

Number of sections	Rated input power in dbk	Power gain in db
<u>4</u>	<u>8.9</u>	<u>6.00</u>

Aural (if separate) Same as for visual

Make	Type No.

Number of sections	Rated input power in dbk	Power gain in db

If directional antenna is proposed, give full details including horizontal and vertical plane radiation patterns, as **Non-directional**
 Exhibit No. _____

Is electrical or mechanical beam tilting proposed? If so, describe fully in Exhibit No. including horizontal and pertinent vertical radiation patterns. Yes No

Will antenna be altered to provide null fill-in? Yes No

If yes, describe fully in Exhibit No.

For portions marked "On File" see original application filed May, 1955 (Engineering Report) and amendment of January 10, 1956.

8. Transmission line proposed to supply power to the antenna from the transmitter **Same as visual**

(a) Visual			(b) Aural (if separate)		
Make	Type No.	Rated input power in dbk	Make	Type No.	Rated input power in dbk
Styroflex or equivalent	1 5/8	9.0			
Size (nominal inside transverse dimensions) in inches	Length in feet	Power loss in db for this length	Size (nominal inside transverse dimension) in inches	Length in feet	Power loss in db for this length
1.472	400	1.4			

9. Proposed operation

(a) Visual				(b) Aural			
Transmitter power output (after vestigial side-band filter, if used) In dbk:	Multiplexer loss in db:	Input to transmission line in dbk:		Transmitter power output In dbk:	Multiplexer loss in db:	Input to transmission line in dbk:	
-8.26	0	-8.26		-11.25	0	-11.25	
In kw: 0.15				In kw: 0.075			
Transmission line power loss in db:	Antenna input power in dbk:	Antenna power gain in db:	Effective radiated power In dbk:	Transmission line power loss in db:	Antenna input power in dbk:	Antenna power gain in db:	Effective radiated power In dbk:
-1.4	-9.66	+6.00	-3.66	-1.4	-12.65	+6.0	-6.65
			In kw: 0.430				In kw: 0.215

10. Modulation monitors

(a) Visual monitor or monitoring equipment	
Make Key Lab	Type No. ARM-13A
(b) Aural monitor	
Make Hewlett Packard	Type No. 335 ER

11. Frequency monitors

(a) Visual monitor		
Make Hewlett Packard	Type No. 335 ER	Accuracy ±300 cps
(b) Aural monitor		
Make Hewlett Packard	Type No. 335 ER	Accuracy ±1000 cps

12. If the above monitors or monitoring equipment have not been approved by the F.C.C., include as Exhibit No. a brief technical description of each.
FCC approved

13. Will the studios, cameras, microphones, and other equipment proposed for transmission of programs be designed for compliance with the Commission's Rules? Yes No

14. (a) Attach as Exhibit No. **D and C** a map(s) (topographic where obtainable, such as U. S. Geological Survey quadrangles) for the area within 15 miles of the proposed transmitter location and show drawn thereon the following data:

- Proposed transmitter location—accurately plotted;
- Transmitter location and call letters of all known radio stations (except amateur) and the location of known commercial and government receiving stations within 2 miles of the proposed transmitter location;
- Character of the area within 2 miles of proposed transmitter location, suitably designated as to residential, business, industrial, and rural nature;
- At least eight radials each extending to a distance of ten or more miles from the proposed transmitter location, one or more of which must extend through the principal city to be served.

ON FILE

(b) Attach as Exhibit No. **D ON FILE** profile graphs with reasonably large scales for the radials in (a) (5) above. Each graph shall show the elevation of the antenna radiation center. Identify each graph by its bearing from the proposed transmitter location. Direction of true north shall be zero azimuth, with angles measured clockwise. Show source of topographical data on each.

15. From the profile graphs in 14(b), for the eight mile distance between two and ten miles from the proposed transmitter location, and in accordance with the procedure prescribed in the Commission's Rules, supply the following tabulation of data:

Radial bearing (degrees true)	Average elevation of radial (2-10 mi.) in feet above mean sea level	Height in feet of antenna radiation center above average elevation of radial (2-10 mi.)	Effective radiated power in radial direction	Predicted distance in miles to the Grade A contour	Predicted distance in miles to the Grade B contour
0	2064	182.5	-3.66 dbk	3.0 mi.	10.0 mi.
45	1885	361.5	-3.66	4.2	15.2
90	2070	176.5	-3.66	2.95	9.9
135	1755	491.5	-3.66	4.7	17.5
180	2076	170.5	-3.66	2.9	9.9
225	2296	49.5	-3.66	2.85	9.5
270	2462	-215.5	-3.66	2.85	9.5
315	2247	0.5	-3.66	2.85	9.5

Note: 225°-315° radials assumed to produce coverage equal to minimum in other directions or to limits of line of sight from antenna structure.

*Radial over principal community if not included above. Do not include in average.

Antenna height above average terrain **139.6** feet (must be identical with Paragraph 2)

For portions marked "On File" see original application filed May, 1955 (Engineering Report) and amendment of January 10, 1956.

16. Attach as Exhibit No. **I and II** ^{map(s)} (Sectional Aeronautical charts where obtainable, preferably without aeronautical overlay) of the area proposed to be served and shown drawn thereon:

- (a) Proposed transmitter location and the radials along which the profile graphs have been prepared;
- (b) The studio location and boundaries of the principal community; **Studio in lower part of hotel**
- (c) The predicted Grade A and Grade B contours from 12 above;
- (d) The required minimum field strength contour;
- (e) Scale of miles.

17. Attach as Exhibit No. **F thru P** **On File** a sufficient number of aerial photographs taken in clear weather at appropriate altitudes and angles to show the nature of the surrounding terrain in the vicinity of the proposed transmitter site. The photographs must be marked so as to show compass directions. Photographs taken in eight different directions from an elevated position on the ground will be acceptable in lieu of the aerial photographs if the area can be clearly shown.

Give date photographs were taken.

On File

18. Will the minimum required value of field strength predicted in accordance with the method prescribed in the Commission's Rules, be provided over the entire principal community proposed to be served?

Areas will have signal of 77 db or more - See Exhibit IV

Yes No

19. Will the main studio be located within the limits of the principal community proposed to be served.

Yes No

20. (a) Does the proposed transmitter location comply with the minimum separation requirements of the Commission's Rules?

Yes No

- (b) If any co-channel separations are proposed that are less than the applicable minimum separation requirement plus 20 miles, or if other channel separations are proposed that are less than the applicable minimum separations plus 10 miles, list such separations below. (Include existing stations, proposed stations and cities which appear in the table of assignments; the location and geographical coordinates of each antenna, proposed antenna or reference point as appropriate; the distance to each from the proposed transmitter location; and the method used in each instance to measure the distance.) If none, so state.

None

21. If this is an application 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.

Station expects to begin broadcasting within 30 days after grant of this modification if equipment can be delivered as scheduled.

A F F I D A V I T

State of California)
County of Santa Cruz) S S

Subscribed and sworn to before me this 2nd day of March, 1956.

Notary Public _____

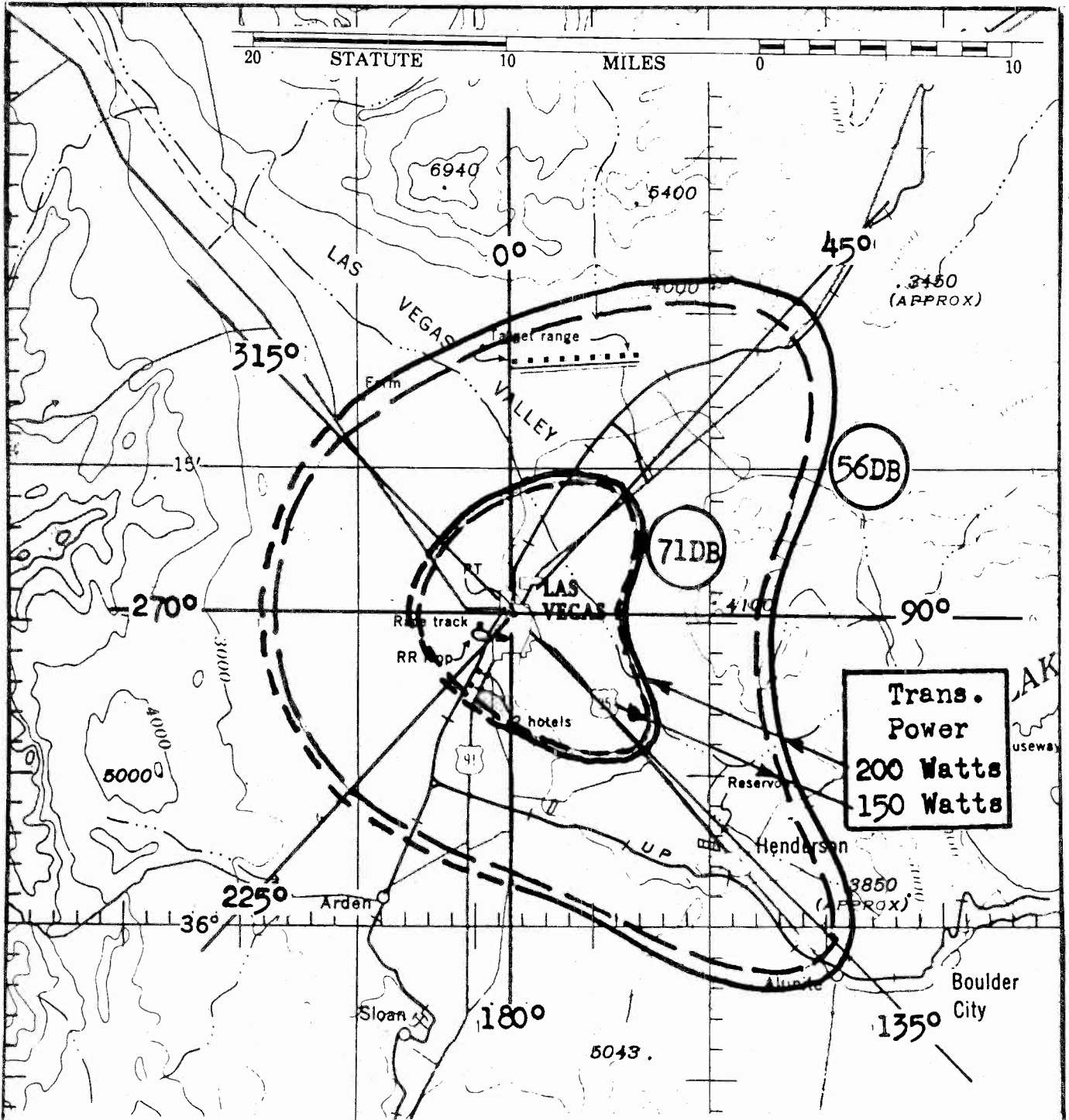
My Commission Expires _____

I certify that I am the Technical Director, Chief Engineer, or Consulting Engineer 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.)

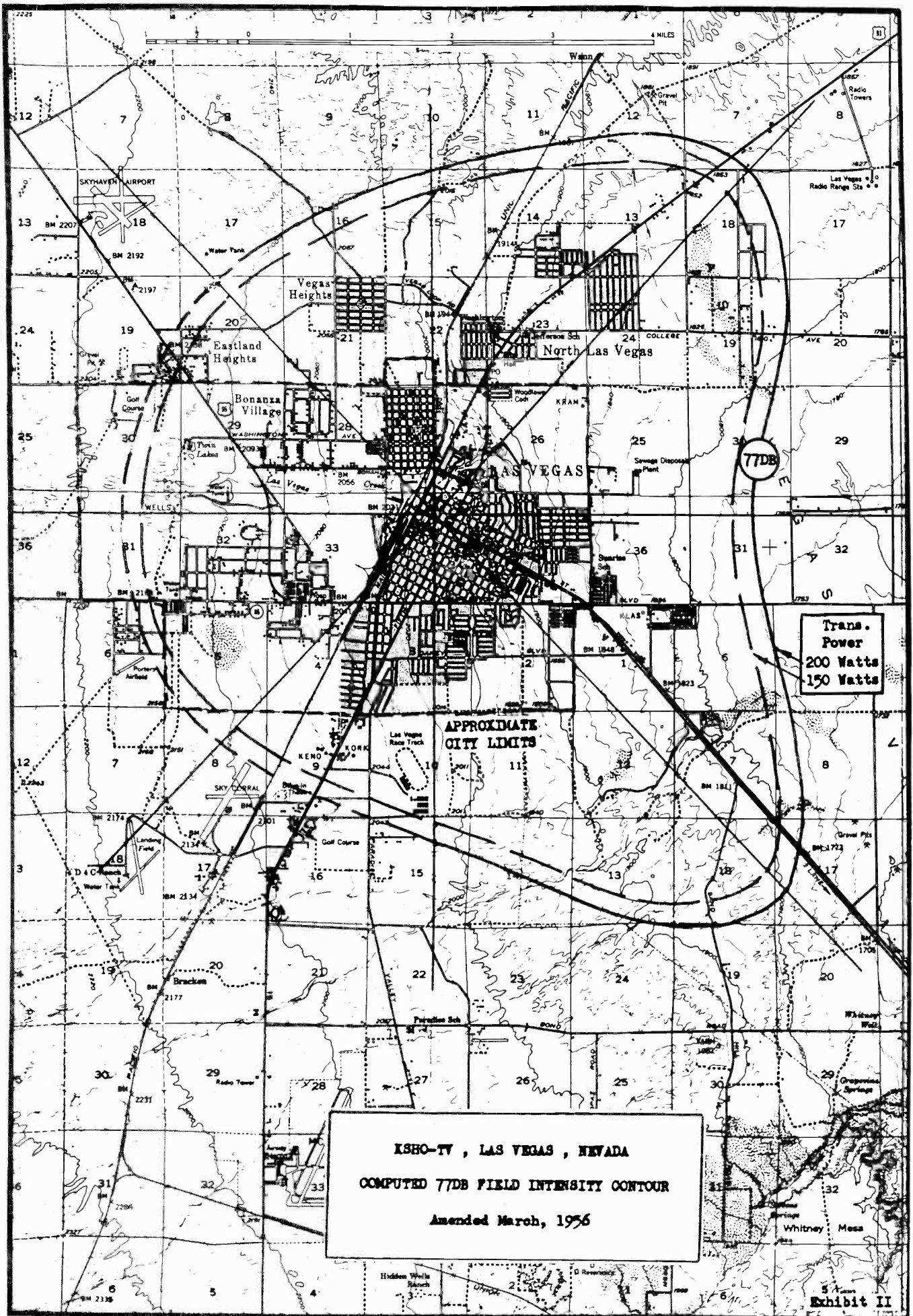
Date March 2, 1956

Grant R. Wrathall
Grant R. Wrathall, Aptos, Calif.

~~CONFIDENTIAL~~ Consulting Engineer



KSHO-TV , LAS VEGAS , NEVADA
COMPUTED FIELD INTENSITY CONTOURS
Amended March, 1956

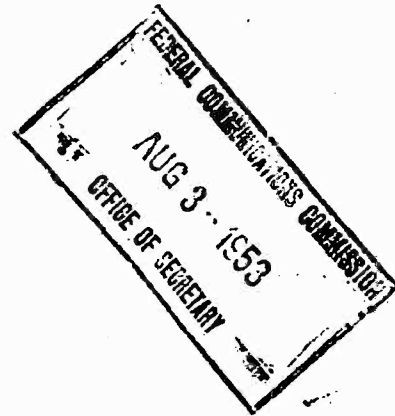


Minimum Field Over City

For Channels 7-13 FCC Rules provide a median field intensity of 77 db shall be provided over the entire principal city to be served.

Because of rough mountains approximately 18 miles distant from the site and the resulting general rise in ground elevation, "negative" antenna heights are computed for 225, 270 and 315 degree radial directions. Actually the proposed KSHO-TV antenna is visible from any point in the 225°-315° sector to, and in most locations, beyond approximately 12 miles. Based upon free-space radiation conditions the 77 db contour for proposed KSHO-TV operation will be radiated to approximately 11 miles. In order not to show greater coverage for "negative" antenna heights than for "positive" height computations, coverage in the 225°-315° sector was assumed to equal the minimum computed in the "positive" height directions. With this assumption approximately 1.5 square miles of city area west of the site is outside the computed 77 db signal contour (See Exhibit II). Most distant part of the city is 3.7 miles west of the proposed site. Since the proposed site is visible from any ground point in the western part of the city minimum fields should be computed in a realistic manner. Assuming free-space radiation the minimum field over the western sections of the city will be approximately 87.7 db. In my opinion such a field is to be expected and signal service exceeding 77 db level will be radiated over all parts of Las Vegas with the proposed modified KSHO-TV operation.

COMMERCIAL RADIO EQUIPMENT COMPANY
RADIO ENGINEERING CONSULTANTS



TV ENGINEERING APPENDIX I

Application for
NEW - TV BROADCAST STATION
Channel 4 66-72 Mcs
ERP 1.26KW (1.05 dbk) @ 328'
Big Spring, Texas

Big Spring Broadcasting Co.
July 1953



FEDERAL COMMUNICATIONS COMMISSION
AUG 3 1953
OFFICE OF SECRETARY

TELEVISION FACILITIES DIVISION
AUG 5 1953
BROADCAST BUREAU

COMMERCIAL RADIO EQUIPMENT COMPANY
RADIO ENGINEERING CONSULTANTS

TABLE OF CONTENTS

	Section V-C of FCC Form 301
	Section V-G of FCC Form 301
Exhibit No. E-1	Engineering Statement
Exhibit No. E-2	Topographic Map showing proposed site and eight radials along which profile graphs have been prepared
Exhibit No. E-3	Profile Graphs
Exhibit No. E-4	Sectional Aeronautical Chart showing Grade A and Grade B Service Contours
Exhibit No. E-5	Photographs of Site
Exhibit No. E-6	Landing Chart showing location of site in relation to airways and airports
Exhibit No. E-7	Vertical Plan Sketch

