EXHIBIT E-1 ENGINEERING DATA APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT, BP-19646 TO CHANGE MEOV's BERRENDO BROADCASTING COMPANY KBCQ 50KW-U, DA-2 1020 KHz ROSWELL, NEW MEXICO

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Lohnes and Culver

Washington, D. C.

September, 1975

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INTRODUCTION

Berrendo Broadcasting Company holds a construction permit, BP-19646, to increase nighttime power of standard broadcast station KBCQ from 10 kw to 50 kw on 1020 KHz. An application is being filed for modification of that construction permit to increase the maximum expected operating values (MEOV's) in certain directions. There are no other changes proposed. This exhibit contains engineering data in support of that application.

PROPOSED MEOV's

The KBCQ 50 kw nighttime horizontal plane radiation pattern is included with this exhibit as Figure 1 and the nighttime radiation patterns for the elevation angles 5° through 60° as Figures 1A through 1L. The theoretical patterns and parameters of the KBCQ array are unchanged from those shown on Figures 1, 1A through 1L of Exhibit E, dated May, 1975 on file in BP-19646. The revised MEOV's are shown on the attached radiation patterns.

There are no changes in the MEOV's specified to the west, in the direction of KGBS and on the major lobes to the south and northwest. There are slight increases in the MEOV's in some directions to the northeast, east and southeast. There will be no objectionable interference caused to any other existing station based on

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WRH

the revised MEOV's.

PROTECTION OF KDKA

The KDKA 0.5 mv/m 50% skywave and the predicted KBCQ 0.025 mv/m 10% skywave contours are shown on the map attached as Figure 2. The KDKA contour is based on the notified radiation of 2100 mv/m and the KBCQ contour on the MEOV's specified in this application. There is no overlap of the two contours and therefore no interference predicted to KDKA.

A detailed interference study which shows the allowable and proposed radiations from KBCQ towards 11 points on the KDKA 0.5 mv/m 50% skywave contour is given in the tabulations, Figures 2A and 2B of this exhibit. Figure 2A shows the computed great circle distance and bearing from KDKA and KBCQ to Points A through L on the KDKA 0.5 mv/m contour. Those points are shown on the map, Figure 2. Figure 2B is a tabulation of the allowable radiations towards those points on the KDKA contour and the proposed MEOV's in each of those directions. In all cases the proposed MEOV is less than the allowable radiation.

Respectfully submitted,

LOHNES AND CULVER

izabeth L. Dahlbera

Registered Professional Engineer District of Columbia, Reg. No.869

September, 1975

WRH

District of Columbia City of Washington) ss:

ELIZABETH L. DAHLBERG, being duly sworn upon oath, deposes and says that she is a consulting radio engineer, employed by Lohnes and Culver, Washington, D. C.;

That she is a graduate of Hunter College of the City of New York; that she holds the degree of Bachelor of Arts, awarded by that Institution in 1940; that she is a Registered Professional Engineer, No. 869, licensed to practice in the District of Columbia;

That she has been engaged in the field of consulting radio engineering since 1945; that she has designed many directional antenna systems, has submitted reports of a technical engineering nature to the Federal Communications Commission and has appeared as an expert engineering witness before the Federal Communications Commission;

That the calculations and exhibits contained and described in the attached report were made under her personal supervision and direction; that all of the facts and data contained in the attached report are true and correct of affiant's personal knowledge; and that any statement made in the attached report and shown as being made on information and belief are believed to be true and correct as therein appearing.

Mabeth L Dahlberg

Sworn to and subscribed before me, this the <u>17th</u> day of <u>September</u> A. D., 1975

Notory Public)

My Commission expires

























UNITED STATES

E M

Seale Manue Lambert Zenithal Equal Area Projection



FIGURE 2A GREAT CIRCLE DISTANCE AND BEARING CALCULATION TOWARDS POINTS ON KDKA 0.5 MV/M 50% SKYWAVE CONTOUR KBCQ 50KW-U, DA-2 1020 KHz ROSWELL, NEW MEXICO

LOCATION 1 KDKA 2 KBCQ 3 PT.A 4 PT.B 5 PT.C 6 PT.D 7 PT.E 8 PT.F 9 PT.G 10 PT.H 11 PT.I 12 PT.J 13 PT.K 14 PT.L	NORTH LATIT 40 33 33 27 48 25 47 4 45 11 43 10 41 7 39 5 37 7 35 16 33 35 32 6 30 18 28 54	UDE 25 53 43.8 42.5 15.6 58.3 50.8 34.2 28.8 34.4 30.6 36.8 34.1 17.2	WEST LONGITUDE 79 57 8 104 29 58 92 27 13.4 93 44 18.2 94 53 48.2 95 31 14.6 95 38 35.9 95 18 26.8 94 33 36.9 93 26 59.8 94 33 36.9 93 26 59.8 94 19 50.9 87 19 34.3 82 42 21.1
FROM KDKA TO:			
LOCATION	DISTANCE	BEARING	MID LATITUDE
2 KBCQ 3 PT.A 4 PT.B 5 PT.C 6 PT.D 7 PT.E 8 PT.F 9 PT.G 10 PT.H 11 PT.I 12 PT.J 13 PT.K	1434.41 819.96 819.96 819.96 819.96 819.96 819.96 819.96 819.96 819.96 819.96 819.96	257.9 315.7 307.9 297.9 287.9 277.9 267.9 257.9 247.9 237.9 227.9 212.6 191.8	37.6 44.7 44 43.1 42.1 41.1 40.1 39.1 38.1 38.1 37.2 36.4 35.5 34.7
1808 HBC0 TO:			
LOCATION	1115TANCE	BEARING	MID LATITUDE
1 KDKA 3 PT.A 4 PT.B 5 PT.C 6 PT.D 7 PT.E 8 PT.F 9 PT.G 10 PT.H 11 PT.I 12 PT.J 13 PT.K 14 PT.L	1434.41 1206.67 1096.03 957.27 828.15 718.54 642.31 614.45 642.06 718.11 827.6 1029.46 1323.37	62.9 27.5 27.4 29.4 33.2 40.1 52.9 75.8 92.6 97.9 97.9	37.6 41.1 40.4 39.4 38.4 37.4 36.4 35.4 34.5 33.7 33.7 33.7 33.2

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FIGURE 2B NIGHTTIME SKYWAVE PROTECTION OF KDKA, PITTSBURGH, PA. KBCQ 50KW-U, DA-2 1020 KHz ROSWELL, NEW MEXICO

FROM KBCQ TOWARDS POINTS ON KDKA 0.5 MV/M 50% SKYWAVE CONTOUR

	True	Distance	Vertical	Allowable	Proposed MEOV	
Point	Bearing	(Miles)	Angle (V)	Radiation @ V	<u> </u>	<u> </u>
Α	27.5°	1207	0 - 2.3°	135 mv/m	73 mv/m	74 mv/m
В	2/.7	1096	1 - 3.5	102	71	72
С	29.4	957	2 - 5	67.6	60	61
D	33.2	828	3.5 - 7	46.7	42	43
Ε	40.0	719	4./ - 8.7	34.7	30	30
F	50.1	642	5.8 - 10.2	28.1	27	27
G	62.9	614	5.2 - 10.8	26.2	25.5	25
н	75.7	642	5.8 - 10.2	28.1	27	27
I	85.8	718	4.7 - 8.7	34.7	31	31
J	92.6	828	3.5 - 7	46.7	43	45
К	97.6	1029	1.5 - 4.3	83.9	74	75
L	97.9	1323	0 - 1	176	78	78

Lohnes and Culver

Prepared by

Washington, D. C.

September, 1975

FCC Form 301		PEDERAL COMMUNIC	ATIONS COMMISSION		Section V-A
STANDARD BROADCAST ENGINEERING DATA		Name of applicant			
		Generating			
for, each category are	rk the purpose of the	s application. (The ite of the category.)	ms of this Section that a	re applicable to, and must be a	answered
[_]Construct a new s	tation] Install new Auxiliary	Transmitter	
city or town	cation to a different	L.	Transmitter	and 10	
Change power	r location	Ĺ] Change transmitter (no accepted)	on type	
Change frequency	Charge transmitter location		Change Main Studio Location to 2 thru 7		
Change from DA to Non-DA A All Change from Non-DA to DA items		at transmitter site			
Change in antenna system			Other (specify):	2 thru 7	
by addition of FM	or TV antenna)]		(and appropria other items)	10
If this application is no	t for a new station, s	summarize briefly the na	ature of the changes pro	posed	
For modificati	ion of construc	tion permit, BP-	19646, to change	e MEOV's.	
2. Facilities requested	· · · ·		10. Antenna system, incl	uding ground or counterpoise	lo chanae
Prequency	Hours of operation	Power is kilowatts	Non-Directional Antenna;	Directional Antenna:	
1020 kHz	Unlimited	50 50	Day Night	Day only (DA-D)	
				Night only (DA-N)	
3. Station location State	City or town		-	Same constants and powe and night (DA-1)	er day
New Mexico	Roswe	:11		Different constants or day and night (DA-2)	pover
4. Transmitter location		(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			
State	County		are different give full info to the information in Parag	rmation on each pattern. This informa raph 10 and is submitted as Exhibit	tion is in addition No.
New Mexico	Chave		and signed by the engineer	who designed the antenna system.)	
City or town	Old Decure	11 Classia	Type radiator	Height in feet of com above base insulator,	plete radiator or above base if
Roswell	Highway		grounded.		
5. Main studio location	1		Overall height in feet above ground. (Without obstruction lighting) Overall height in level. (Without o		
State Now Movice	County	Voc			above mean sea uction lighting)
	Street and number of J		-		
Roswell	Roswell-Cloy	vis Highway	Overall height in feet above ground. (With obstruction lighting)		
6. Remote control point loca	tion None		-		
State	City or town		If antenna is either ton ioa	ded or sec-	ion lighting)
			tionalized, describe fully (No.	as Exhibit	
Street Address (or other ident	ification)				
7 Transmitter No. c	hange		Excitation	Series 📋	Shunt 🗌
Nake I to C	Type No.	Rated Power	Geographical coordina For directional antenn	tes (to nearest second). A give coordinates of center of	farray.
			For single vertical rad North latitude	liator give tower location. West longitude	
			33 27 5	53 ["] 104° 29	9 ' 58 ["]
(If the above transmitter has	not been accepted for li	censing by the P.C.C., at-			
tech as Exhibit No. Showing should include schemat	as Exhibit No. a complete showing of transmitter details. If not fully described above, give further details and dimensions includin ng should include achematic diagram and full details of frequency control. If other antennas mounted on tower and associated isolation circuits as Exhibit No.		including any lits as Exhibit		
full details of change.)	nees transmitter include	scommatic diagram and give	No. (Height figures should not include obs	truction lighting.)
Submit as Exhibit No. a p			a plat of the transmitter sit	e showing boundary	
S. Antenna monitor Jines, and roads, railroads, or other obstructions; and also layout of the g system or counterpoise. Show number and dimensions of ground radials or if a poise is used, show height and dimensions.			out of the ground als or if a counter-		
Potomao Inc	trumente	туре нь. РАА 10	11. Attach as Exhibit No.	a sufficient number of an	erial photographs
	dulation Ma	nitor	tion of all structures show compass directions	in the vicinity. The photographs sust , exact boundary lines of the propose	be marked so as to d site, and loca-
Lante	Julation 1910	Type No.	tions of the proposed if graphs taken is eight di ground will be acceptab	uuu wv/m contour for both day and nigh Ifferent directions from an elevated p le in lieu of the merial photographs i	t operation. Photo- position on the f the data referred
No cho	inge		to can be clearly shown.		

FCC	C Form 301 STANDARD BROADCAST ENGINEERING DATA	Section V-A, Page 2
12.	P. Allocation Studies:	
Α.	• Attach as Exhibit No. map or maps, having reasonable scales, showing the 10 and interference-free contours in mv/m for both day and night operation both existing a On the map or maps showing the 25 mV/m, 5 mV/m and interference-free contours, clea the proposed community of license and the business and residential areas therein. Sub or sources relied upon for the placement of those boundaries. (NOTE: The 2mv/m night service is not rendered thereto.) On file	000, 25, 5, 2, normally protected nd as proposed by the application. arly indicate the legal boundaries of mit a statement identifying the source ht contour need not be supplied if
В.	. (1) For daytime operation, attach as Exhibit No. N/A an allocation study, utilizing accurate full scale reproduction thereof and using pertinent field strength measurement exhibit of the entire pertinent area to show the following:	g Figure M-3 of the Rules or an data where available, a full scale
	(a) Normally protected, the interference-free, and the interfering contours for the pi	roposed operation along all azimuths.
	(b) Complete normally protected and interference-free contours of all other proposa objectionable interference would be caused.	ls and existing stations to which
	(c) Interfering contours over pertinent arcs of all other proposals and existing stati ference would be received.	ions from which objectionable inter-
	(d) Normally protected and interfering contours over pertinent arcs of all other proprequire study to show the absence of objectionable interference.	oosals and existing stations which
	(e) The 0.1 mv/m groundwave contour of Class I-B stations and appropriate studies tion 73.187 when operation is proposed on a U. S. Class I-B channel.	s to establish compliance with Sec-
	(f) Plot of the transmitter location of each station or proposal requiring investigat file numbers, and operating or proposed facilities.	ion, with identifying call letters,
	(g) Properly labeled longitude and latitude degree lines, shown across entire exhib	bit.
	(2) For daytime operation, when necessary to show more detail, attach as Exhibit No. study, utilizing World or Sectional Aeronautical charts to clearly show interference or	N/A an <u>additional</u> allocation absence thereof.
	(3) For daytime operation, attach as Exhibit No. N/A a tabulation of the follow	ing.
	(a) Azimuths along which the ground wave contours were calculated for all station tion study exhibits required by B(1).	s or proposals shown on alloca-
	(b) Inverse distance field strength used along each azimuth.	
	(c) Basis for ground conductivity utilized along azimuths specified in (3) (a). If f used, the measurements must be either submitted or be properly identified as to lo	ield strength measurements are location in Commission files.
C.	. For nighttime operation, attach as Exhibit No. E-1 , allocation data to include the f	ollowing:
	(1) Proposed nighttime limitation to other existing or proposed stations with which obj as well as those other proposals and existing stations which require study to clearly s interference.	ectionable interference would result, show absence of objectionable
	(2) All existing or proposed nighttime limitations which enter into the nighttime R.S.S. or proposed facilities investigated under C (1) above.	limitation of each of the existing
	(3) All existing and proposed limitations which contribute to the R.S.S. nighttime limit together with those limitations which must be studied before being excluded.	tation of the proposed operation,
	(4) A detailed interference study plotted upon an appropriate scale map if a question e ference to other existing or proposed facilities along bearings other than on a direct li	ine toward the facility considered.
	(5) Utilizing an appropriate scale map, clearly show the normally protected and interfe existing and proposed stations which would receive nighttime interference from the pro-	erence-free contours of each of the opposed operation.
	6. The detailed basis for <u>each</u> nighttime limitation calculated under C (1) (2) (3) and (pertinent radiation pattern in the vertical plane and basis therefor.	4) above, including copy of each
12	3. Attach as Exhibit No. On file tables of the areas and populations within the con	tours included in Paragraph 12(A)

- 13. Attach as Exhibit No. On file 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. In determining the population that would receive primary service, the field intensity levels required are those given in Section 73.182(g). The latest U. S. Census Minor Civil Division and/or subdivisions such as Enumeration Districts or Block Statistics are to be used in making population counts. The populations of places or portions thereof, within any contour, which would not receive a primary service, are to be listed. Where contours cut a division or subdivision, a uniform distribution of population within the division or subdivision is to be assumed in determining the population included in the contours, unless a more accurate count is made).

14. Attach as Exhibit No. On file 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. status of construction and indicate when it is expected that construction will be completed. the present

I certify that I represent the applicant in the capacity indicated below and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief.

Date September 17, 1975

Signature_ (check appropriate box below)

Chief Operator

Technical Director Ct Registered Professional Engineer

- Consulting Engineer
- Consulting Engineer



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