

Cleveland Park Citizens Association

*P.O. Box 11444
Washington, D.C. 20008*

October 21, 2002

Zoning Commission of the District of Columbia
c/o Mr. Alberto P. Bastida, AICP
Secretary to the Zoning Commission
Office of Zoning
441 4th Street, NW, Suite 210
Washington, DC 20001

Re: Case No. 01-02 (Text Amendment – Regulation
of Antennas, Antenna Towers, and Monopoles)

Dear Commissioners:

I would like to submit for the record a letter and attachments from Deb Carney, Attorney for Canyon Area Residents for the Environment, Inc., the group whose efforts to oppose a large broadcast tower outside Denver, Colorado, were the subject of the documentary "Broadcast Blues," which was shown at the March 5, 2001 Zoning Commission antenna roundtable. The discrepancies between the RF radiation emissions certified by the engineer for the KOSI-FM antennas on Lookout Mountain, Mr. Jules Cohen, and the actual emission level measured by Dr. Robert Cleveland of the Federal Communications Commission illustrate the need to have actual field measurements of RF radiation emission levels. Dr. Cleveland's measuring of these antennas was shown in the documentary.

Sincerely,



Ann Hume Loikow
Second Vice President

ZONING COMMISSION
District of Columbia
Case 01-02
ZONING COMMISSION
District of Columbia
CASE NO. 01-02
EXHIBIT NO. 105



Canyon Area Residents for the Environment, Inc.

Golden, Colorado 80401

C.A.R.E., 25958 Genesee Trail Road, PMB 203, Golden, CO 80401-5700

C.A.R.E. Web Page <http://www.c-a-r-e.org>

Dick Bartlett, President

(E-Mail: dickbartlett@newmail.com)

C.A.R.E. is a coalition of homeowners' associations & neighborhoods in the Mount Vernon Canyon. Since 1987 it has served as an umbrella organization representing the central mountain communities of Jefferson County - from Clear Creek to Bear Creek, the Hogback to Rainbow Hills.

October 17, 2002

Via Fax: 202-363-8223

Dear Ann:

Enclosed are the FCC records documenting that Jules Cohen represented that the KOSI FM broadcast tower and antenna would not exceed the FCC RF radiation limits. These radiation limits were in fact exceeded on a number of occasions after KOSI started broadcasting. In the documentary film, "Broadcast Blues", Dr. Robert Cleveland discusses the RF limits with a female reporter. I was present during the filming. That location is next to the KOSI tower. That location was in fact over the RF limits.

Sincerely,

Deb Carney,

Attorney for CARE

21789 Cabrini Boulevard

Golden, Colorado 80401

303-526-0214

e-Mail: deb@carneylaw.net

ENGINEERING FIRM

OK-ENB

KIRKLAND, ELLIS & ROWE

1776 K STREET, N. W.

WASHINGTON, D. C. 20006

TELEPHONE (202) 833-8400

CHICAGO OFFICE
KIRKLAND & ELLIS
PRUDENTIAL PLAZA
CHICAGO, ILLINOIS 60601
(312) 726-2929

January 18, 1972

KIRKLAND, ELLIS & ROWE
H. RUSSELL
C. BEELER
J. S. PATTERSON
P. RUSSELL ZAGAN
CHARLES R. LUTER
ALOYSIUS B. MCCABE
JOHN P. MANWELL
JAMES M. JOHNSTONE
ERWIN G. KRASNOW
STEPHEN A. BROWN
ROBERT A. BEIZER

JOHN L. BARTLETT
WARWICK R. FURR II
RICHARD C. LOWERY
PAUL M. HYMAN
JAMES H. WALLACE, JR.
THEODORE A. SHMANDA
NOLAN E. CLARK
THOMAS B. CARR
BRUCE L. McDONALD
STEPHEN A. HERMAN
EDWARD W. WARREN
L. MARK WINE
ROBERT H. SWART
THOMAS F. HUMPHREY
MICHAEL YOURSBROW

Mr. Ben F. Waple, Secretary
Federal Communications Commission
Washington, D.C. 20554

Re: KOSI-FM
Denver, Colorado

Dear Mr. Waple:

On behalf of our client, Armstrong Broadcasting Corporation, there is submitted herewith, in triplicate on FCC Form 301, an application for a construction permit authorizing the installation of the former main transmitter of KOSI-FM as an auxiliary (which will be located at the station's new transmitter site) and the installation of a standby antenna on a separate supporting pole. There is also submitted an additional copy of Section V-G.

There is submitted herewith our firm's check in the amount of \$50.00 to cover the requisite filing fee.

Should any question arise concerning this matter, kindly advise the undersigned.

Respectfully submitted,

E-G. K.

Erwin G. Krasnow

EGK:ldr

000195

FCC Form 301
January 1971

Section I
UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION

Application for Authority to Construct a New Broadcast
Station or Make Changes in an Existing Broadcast Station

Form Approved
Budget Bureau No. 52-R0014

INSTRUCTIONS

A. This form is to be used in applying for authority to construct a new standard, commercial FM, or television broadcast station, or to make changes in existing broadcast stations. This form consists of this part, Section I, and the following sections:

- Section II, Legal Qualifications of Broadcast Applicant
Section III, Financial Qualifications of Broadcast Applicant
Section IV-A, Statement of Program Service of Broadcast Applicant (AM-FM)
Section IV-B, Statement of Program Service of Broadcast Applicant (TV)
Section V-A, Standard Broadcast Engineering Data
Section V-B, FM Broadcast Engineering Data
Section V-C, Television Broadcast Engineering Data
Section V-G, Antenna and Site Information
Section VI, Equal Employment Opportunity Program

B. Prepare three copies of this form and all exhibits. Sign one copy of Sections I, IV-A, and IV-B. Prepare one additional copy (a total of four) of Section V-G and associated exhibits, and one additional copy (a total of four) of Section V-C and associated exhibits. File all the above with Federal Communications Commission, Washington, D. C. 20554. A SEPARATE AND COMPLETE APPLICATION (IN TRIPLICATE) MUST BE FILED FOR EACH AM STATION, EACH FM STATION, AND EACH TV STATION.

C. Number exhibits serially in the space provided in the body of the form and list each exhibit in the space provided on page 2 of this Section. Show date of preparation of each exhibit, antenna pattern, and map, and show date when each photograph was taken.

D. The name of the applicant stated in Section I hereof shall be the exact corporate name, if a corporation; if a partnership, the names of all partners and the name under which the partnership does business; if an unincorporated association, the name of an executive officer, his office, and the name of the association. In other Sections of the form the name alone will be sufficient for identification of the applicant.

E. Information called for by this application when is already on file with the Commission (except that called for in Section III which is more than 90 days old and in Section V-G) need not be refilled in this application provided (1) the information is now on file in another application or FCC Form filed by or on behalf of this applicant; (2) the information is identified FULLY by reference to the file number (if any) the FCC form number, and the filing date of the application or other form containing the information and the page or paragraph referred to, and (3) after making the reference, the applicant states: "No change since date of filing." Any such reference will be considered to incorporate into this application all information, confidential or otherwise, contained in the application or other form referred to. The incorporated application or other form will thereafter, in its entirety, be open to the public. (See Section 1.926 of the Commission's Rules and Regulations, "Records to be maintained locally for public inspection by applicants, permittees, and licensees.")

F. This application shall be personally signed by the applicant, if the applicant is an individual; by one of the partners, if the applicant is a partnership; by an officer, if the applicant is a corporation; by a member who is an officer, if the applicant is an unincorporated association; by such duly elected or appointed officials as may be competent to do so under the laws of the applicable jurisdiction, the applicant is an eligible government entity; or by the applicant's attorney in case of the applicant's physical disability or of his absence from the United States. The attorney shall, in the event he signs for the applicant, separately set forth the reason why the application is not signed by the applicant. In addition, if any matter is stated on the basis of the attorney's belief only (rather than his knowledge), he shall separately set forth his reasons for believing that such statements are true.

G. Before filling out this application, the applicant should familiarize himself with the Communications Act of 1934, as amended, Parts 1, 2, 73 and 17 of the Commission's Rules and Regulations and the Standards of Good Engineering Practice.

H. BE SURE ALL NECESSARY INFORMATION IS FURNISHED AND ALL PARAGRAPHS ARE FULLY ANSWERED. IF ANY PORTIONS OF THE APPLICATION ARE NOT APPLICABLE, SPECIFICALLY SO STATE. DEFECTIVE OR INCOMPLETE APPLICATIONS MAY BE RETURNED WITHOUT CONSIDERATION.

File No. **BPH-7750**

1. Name of applicant (See instruction D)

Armstrong Broadcasting Corporation

Street Address

Post Office Box 98

City

Aurora

State

Colo.

ZIP Code

80010

2. Name and address of person to whom communications should be sent, if different from item 1

Name

William L. Armstrong at the above

Street Address

address

City

State

ZIP Code

3(a). Purpose of application (check one)

☐ New Station

☒ Change existing station facilities *

(b). If this application is for a change in existing facilities, complete Section I plus any other Sections necessary to show all substantial changes in information previously filed with the Commission, and indicate below the Sections completed and filed with this application.

Section II		Section V-A
Section III	x	Section V-B
Section IV-A		Section V-C
Section IV-B	x	Section V-G
		Section VI

4. Requested facilities

Type of station (AM Standard, FM, Television)

FM

Frequency	Call	Channel	Power in kilowatts	Minimum hours operation daily
101.1	KOST	No.	See Engineer- ing Statement	18
	FM	286		

Hours of operation

Unlimited **XX**

Daytime only

Limited

Sharing with
(Specify Stations) *

DNA

Other
(Specify)

DNA

Station location

City

Denver

State

Colorado

5. In the space below refer to information already on file with the Commission which, in accordance with instruction E, may be incorporated in this application by proper reference.

File or Form No. and Date	Section No.	Paragraph No.
See BPH-7505, granted July 20, 1971	Exhibit No. 1 (balance sheet)	

FOR COMMISSION USE ONLY

*Construction permit for an auxiliary transmitter and antenna.

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**FINANCIAL QUALIFICATIONS
OF BROADCAST APPLICANT**

NAME OF APPLICANT

Armstrong Broadcasting Corporation

The Commission is seeking in the questions that follow information as to contracts and arrangements now in existence, as well as any arrangements or negotiations, written or oral, which relate to the present or future financing of the station; the questions must be answered in the light of this instruction.

IF CONTEMPLATED EXPENDITURES ARE LESS THAN \$5,000 COMPLETE PARAGRAPH 1 OF SECTION III ONLY.

1. a. Give estimated initial costs of making installation for which application is made. If performed under a contract for the completed work, the facts as to such contract must be stated in lieu of estimates as to the several items. In any event, the cost shown must be the costs in place and ready for service, including the amounts for labor, supervision, materials, supplies and freight. Cost items such as professional fees, mobile and STL equipment, non-technical studio furnishings, etc., should be included under "Other Items" below, and itemized

	COLUMN I (USE ONLY WHEN ITEMIZING)	COLUMN II (TOTAL)
<u>Antenna System:</u> (Including antenna, antenna tower, transmission line, phasing equipment, ground system, coupling equipment and tower lighting.) Four-bay antenna	\$	\$ <u>3,500.00</u>
<u>RF Generating Equipment:</u> (Including transmitter, tubes, filters, diplexer, remote control equipment, and automatic logger.)		_____
<u>Monitoring and Test Equipment:</u> (Including frequency monitor, phase monitor, modulation monitor, oscilloscope, dummy load, vectorscope, video monitors.)		_____
<u>Program Origination Equipment:</u> (Including control consoles, film chains, cameras, audio tape equipment, video tape equipment, program and distribution amplifiers, limiters, and transcription equipment.)		_____
<u>Acquiring Land:</u>		_____
<u>Acquiring, Remodeling or Constructing Buildings:</u>		_____
<u>Other Items:</u> (Itemize Below)		
Legal Costs: Transmitter and transmission	_____	
Engineering Costs: line on hand	_____	
Installation Costs:	_____	
Other Miscellaneous:	_____	
<u>Total Other Items:</u>		<u>3,500.00</u>
<u>Total Construction Costs:</u>		_____
<u>Add Estimated Cost of Operation for First Year:</u>		
<u>Total First Year Costs To Be Met By Applicant:</u>	No charge	_____
<u>Estimated Revenues For First Year:</u>	No charge	_____

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Item 1 (continued)

b. State the basis of the estimates in (a), Page 1, Section III, including (in the case of an application for a new broadcast station) complete itemization of cost of operation for the first year, including cost of proposed programming, as Exhibit No. _____ to this application. **N/A**

c. The proposed construction is to be financed and paid for in the following manner. The financial plan should provide for sufficient funds to construct the station and operate it for a period of one year. If the applicant plans to rely on revenues from operation of the proposed station for any portion of operating expenses, supply as Exhibit No. _____ data in support of revenue estimate.

	COLUMN I (USE ONLY FOR LOANS AND DEFERRED CREDIT)	COLUMN II (NET TOTAL)
<u>Existing Capital:</u> Will be paid for from cash	\$	\$
<u>New Capital:</u> on hand--see Exhibit No. 1		
<u>Loans from Banks or Others:</u> (balance sheet of BPH-7505, granted July 20, 1971)		
(Less repayments of principal and interest @ _____% due during first year):		
<u>Net Total Available from Loans:</u>		
<u>Profits from Existing Operations:</u>		
<u>Donations:</u>		
<u>Other Sources:</u> (Specify)		
<u>Deferred Credit from Equipment Supplier:</u>		
(Note: If 1st payment is due upon shipment, include 14 monthly payments. If due in 30 days, 13 monthly payments. If due in 60 days, 12 monthly payments, etc.)		
(a) <u>Less:</u> Down Payment _____%		
(b) <u>Less:</u> 1st Year Payment to Principal		
(c) <u>Less:</u> 1st Year Interest @ _____%		
<u>Net Deferred Credit Available:</u>		
<u>Net Total Available:</u>		

2. a. Attach as Exhibit No. _____ a detailed balance sheet of applicant as at the close of a month within 90 days of the date of the application showing applicant's financial position. If the status and composition of any assets and liabilities on the balance sheet are not clearly defined by their respective titles, attach as Exhibit No. _____ schedules which give a complete analysis of such items.

b. Attach as Exhibit No. _____ a statement showing the yearly net income, after Federal income tax, for each of the past 2 years received by applicant from any source.

3. Furnish the following information with respect to the applicant only. If the answer is "None" to any or all items, specifically so state:

a. Amount of funds on deposit in bank or other depository:

\$

b. Name and address of the bank in which deposited (Include ZIP Code)

c. Name and address of the party in whose name the money is deposited (Include ZIP Code)

d. Conditions of deposit (in trust, savings, subject to check, on time deposit, who may draw on account and for what purpose, or other condition).

e. Are the funds deposited for the specific purpose of constructing and operating the station? ☐ Yes ☐ No
If "No," explain.

KOSI-FM Auxiliary Transmitter and Antenna

FCC Form 301		FEDERAL COMMUNICATIONS COMMISSION		Section V-B	
FM BROADCAST ENGINEERING DATA		Name of applicant Armstrong Broadcasting Corporation		OK-6444	
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 10 and the appropriate other paragraphs; for changes F through H, complete only paragraph 2 and the appropriate other paragraphs; for change I, complete only paragraphs 2 and 5.) 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. ☐ Change transmitter G. ☒ Install auxiliary or alternate main transmitter H. ☒ Other changes (specify) auxiliary antenna I. ☐ Change studio location If this is not for a new station, summarize briefly the nature of the changes proposed. Installation of formerly licensed main transmitter at new transmitter site as an auxiliary and installation of standby antenna on separate supporting pole.					
2. Facilities requested		9. Frequency monitor			
Frequency 101.1 Mcs.		Channel No. 266		Make McMartin Type No. TBM-3000A	
Effective Radiated Power See Eng. kw Horizontal Statement Vertical Statement		Antenna height above average terrain See Eng. feet Horizontal Statement Vertical Statement			
3. Station location		10. (a) Antenna structure:			
State Colorado		Is the proposed construction in the immediate vicinity or does it serve to modify the construction of any standard broadcast station, FM broadcast station, television broadcast station, or other class of radio station? If "Yes", attach as Exhibit No. Eng. complete engineering data thereon. YES ☒ NO ☐			
City or town Denver		Submit as Exhibit No. Eng. a vertical plan sketch for the proposed tower structure (including supporting building if any) giving heights above ground in feet for all significant features.			
4. Transmitter location (principal community)		Overall height in feet above ground. (Without obstruction lighting) 60 Overall height in feet above mean sea level. (Without obstruction lighting) 7350			
State Colorado		Overall height in feet above ground. (With obstruction lighting) 60 Overall height in feet above mean sea level. (With obstruction lighting) 7350			
County Jefferson		Height of antenna radiation center in feet above mean level. Horizontal 7335 Vertical			
City or town Near Golden		Geographical coordinates of antenna (to nearest second): North latitude 39° 43' 45" West longitude 105° 14' 06"			
5. Main studio location		(b) Antenna data			
State Colorado		County Adams		Make CCA Type No. or description FMC-HP-4	
City or town Aurora		Street address 1565 Elmira St.		No. of sections Horizontal 4 Vertical 4 Antenna power gain Horizontal 2.15 Vertical 2.15	
6. Remote control point location		If directional antenna is proposed, give full details including horizontal and vertical plane radiation patterns, as Exhibit No. Not applicable			
State Colorado		Is electrical or mechanical beam tilting proposed? YES ☐ NO ☒			
City or town Aurora		If so, describe fully in Exhibit No. including horizontal and pertinent vertical radiation patterns.			
Street Address (or other identification) Main studio 1565 Elmira St.		Will antenna be altered to provide null fill-in? YES ☐ NO ☒			
7. Transmitter		If yes, describe fully in Exhibit No.			
Make RCA		Type No. BTF-5E		Rated Power 5.0kW	
8. Modulation monitor		Make McMartin Type No. TBM-4500A			

FCC Form 301

FM BROADCAST ENGINEERING DATA

Section V-B, Page 2

1000.00

KOSI-FM Auxiliary Transmitter and Antenna

FEDERAL COMMUNICATIONS COMMISSION		Section V-G (Antenna)																					
ANTENNA AND SITE INFORMATION (See instruction B, Section I)		Name of applicant Armstrong Broadcasting Corporation																					
Legal Owner Kirkland, Ellis and Rowe Address 1776 K Street, N. W. Washington, D. C. 20006		Purpose of application (Check appropriate box) a. New antenna construction ☒ b. Alteration of existing antenna structures ☐ c. Change in location ☐																					
Consulting Engineer Jules Cohen and Associates Address 1145 19th Street, N. W. Washington, D. C. 20036		2. Features of surrounding terrain List any natural formations or existing man-made structures (hills, trees, water towers, 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. Existing tower 120 feet taller than proposed antenna approximately 40 feet away.																					
Class of station FM		Facilities requested Auxiliary transmitter & antenna																					
1. Location of antenna State Colorado County Jefferson City or Town near Golden																							
Exact antenna location (street address) (if outside city limits, give distance and direction from, and name of nearest town) Lookout Mountain, approximately 2 miles southwest of Golden.																							
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 39° 43' 45" West longitude 105° 14' 06"																							
3. Obstruction, distance, and bearing to center line of nearest established airway within 5 miles. None																							
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. <table border="1"> <thead> <tr> <th>Landing Area</th> <th>Distance</th> <th>Direction</th> </tr> </thead> <tbody> <tr> <td>a. Mount Falcon (private)</td> <td>6.1 miles</td> <td>South</td> </tr> <tr> <td>b. _____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>c. _____</td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Landing Area	Distance	Direction	a. Mount Falcon (private)	6.1 miles	South	b. _____	_____	_____	c. _____	_____	_____								
Landing Area	Distance	Direction																					
a. Mount Falcon (private)	6.1 miles	South																					
b. _____	_____	_____																					
c. _____	_____	_____																					
5. Description of antenna system (If directional, give spacing and orientation of towers). 4-bay FM antenna on 60' wood pole.																							
Type Description of tower(s) <table border="1"> <thead> <tr> <th>Self-supporting</th> <th>X</th> <th>Guyed</th> <th>Tubular (Pole)</th> </tr> </thead> <tbody> <tr> <td>Tower height figures should include observation lighting?</td> <td></td> <td>#1</td> <td>#2</td> </tr> <tr> <td>Height of radiating elements</td> <td>29.2'</td> <td></td> <td></td> </tr> <tr> <td>Overall height above ground</td> <td>60'</td> <td></td> <td></td> </tr> <tr> <td>Overall height above mean sea level</td> <td>7350'</td> <td></td> <td></td> </tr> </tbody> </table>				Self-supporting	X	Guyed	Tubular (Pole)	Tower height figures should include observation lighting?		#1	#2	Height of radiating elements	29.2'			Overall height above ground	60'			Overall height above mean sea level	7350'		
Self-supporting	X	Guyed	Tubular (Pole)																				
Tower height figures should include observation lighting?		#1	#2																				
Height of radiating elements	29.2'																						
Overall height above ground	60'																						
Overall height above mean sea level	7350'																						
If a combination of standard, FM, or TV operation is proposed on the same multi-element array (either existing or proposed) submit as Exhibit (a) 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. Not applicable																							
Submit as Exhibit (b) 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 ☐ No ☒																							
Is the antenna to be located on 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																							
Name of station (If "Call" give CALL LETTERS KOSI-FM)		FILE NUMBER																					
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. Jan. 6, 1972 Signature Jules Cohen (Check appropriate box below) ☐ Technical Director ☐ Chief Operator ☒ Registered Professional Engineer ☒ Consulting Engineer																							

JULES COHEN & ASSOCIATES

CONSULTING ELECTRONICS ENGINEERS
WASHINGTON, D. C.

ENGINEERING EXHIBIT
APPLICATION FOR PERMIT TO INSTALL
AUXILIARY TRANSMITTER AND ANTENNA
ARMSTRONG BROADCASTING CORPORATION
RADIO STATION KOSI-FM
DENVER, COLORADO

Engineering Statement

The engineering exhibit of which this statement is part was prepared on behalf of Armstrong Broadcasting Corporation, licensee of broadcast station KOSI-FM, in support of an application for permit to construct an auxiliary antenna and install an auxiliary transmitter at the authorized location of the KOSI-FM main transmitting facility on Lookout Mountain near Denver, Colorado.

The applicant proposes to relocate the five-kilowatt transmitter formerly licensed as the main transmitter (at a different location) to the present operating location of KOSI-FM on Lookout Mountain. Proposed also is the installation of a four-bay, circularly-polarized FM antenna on a wooden pole 60 feet in height which would be erected adjacent to the transmitter building on the side opposite from the existing tower supporting the KOSI-FM main antenna. Considered from an air hazard standpoint, the proposed 60-foot pole is shielded by the existing 180-foot tower located less than 40 feet away, therefore no notification to the Federal Aviation Administration is required.

000204

JULES COHEN & ASSOCIATES
CONSULTING ELECTRONICS ENGINEERS
WASHINGTON, D. C.

Engineering Statement
KOSI-FM, Denver, Colorado

Page 2

The auxiliary equipment proposed to be installed is an RCA type BTF-5E five-kilowatt transmitter and a CCA type FMC-HP-4 circularly-polarized antenna with gain of 2.15 in both the horizontal and vertical planes of polarization. No directionalization or beam tilt of the antenna is proposed. The transmission line would be approximately 50 feet of Andrew type HJ8-50B three-inch Heliax. Detailed engineering specifications for the installation are shown herein as Figure 1 and a sketch showing the antenna arrangement is included herein as Figure 2.

Depending upon the particular emergency which arises, the auxiliary transmitter and antenna are to be used either together or in combination with the main transmitter and antenna. Three possible modes of emergency operation are contemplated: main transmitter with auxiliary antenna, auxiliary transmitter with auxiliary antenna, or auxiliary transmitter and main antenna. In any of the three possible emergency modes of operation, the entire city of Denver would lie within the predicted 70 dBu contour. Coverage maps for emergency operation have not been prepared because such operation is expected to be required only rarely. As a matter of interest, the distances to contours for the three emergency modes of operation have been calculated and are shown herein as Figure 3.

s/ Jules Cohen

Subscribed and sworn to before me this 6th day of January, 1972.

My commission expires
October 31, 1976

s/ Anne Mazor
Notary Public, D.C.
(SEAL)

000205

ENGINEERING EXHIBIT
APPLICATION FOR PERMIT TO INSTALL
AUXILIARY TRANSMITTER AND ANTENNA
ARMSTRONG BROADCASTING CORPORATION
RADIO STATION KOSI-FM
DENVER, COLORADO

Engineering Specifications

Channel	266C
Frequency	101.1 MHz
Transmitters	
Main	CCA FM 20,000DS, 20 kW
Auxiliary	RCA BTF-5E, 5 kW
Antennas	
Main	
Type	CCA FMC-HP-12
Gain (Horizontal and Vertical Planes of Polarization)	
Horizontal Plane	5.15
Maximum (1° Below Horizontal)	6.00
Auxiliary	
Type	CCA FMC-HP-4
Gain (Horizontal and Vertical Planes of Polarization)	2.15
Transmission line	
Type	Andrew HJ8-50B
Size	3"
Length	
Main	115'
Auxiliary	50'
Efficiency	
Main	96%
Auxiliary	98.4%

000206

Height of auxiliary FM antenna radiation center above mean sea level	7335'
Average elevation of radials, 2 to 10 miles	6631'
Height of auxiliary antenna radiation center above average terrain	704'

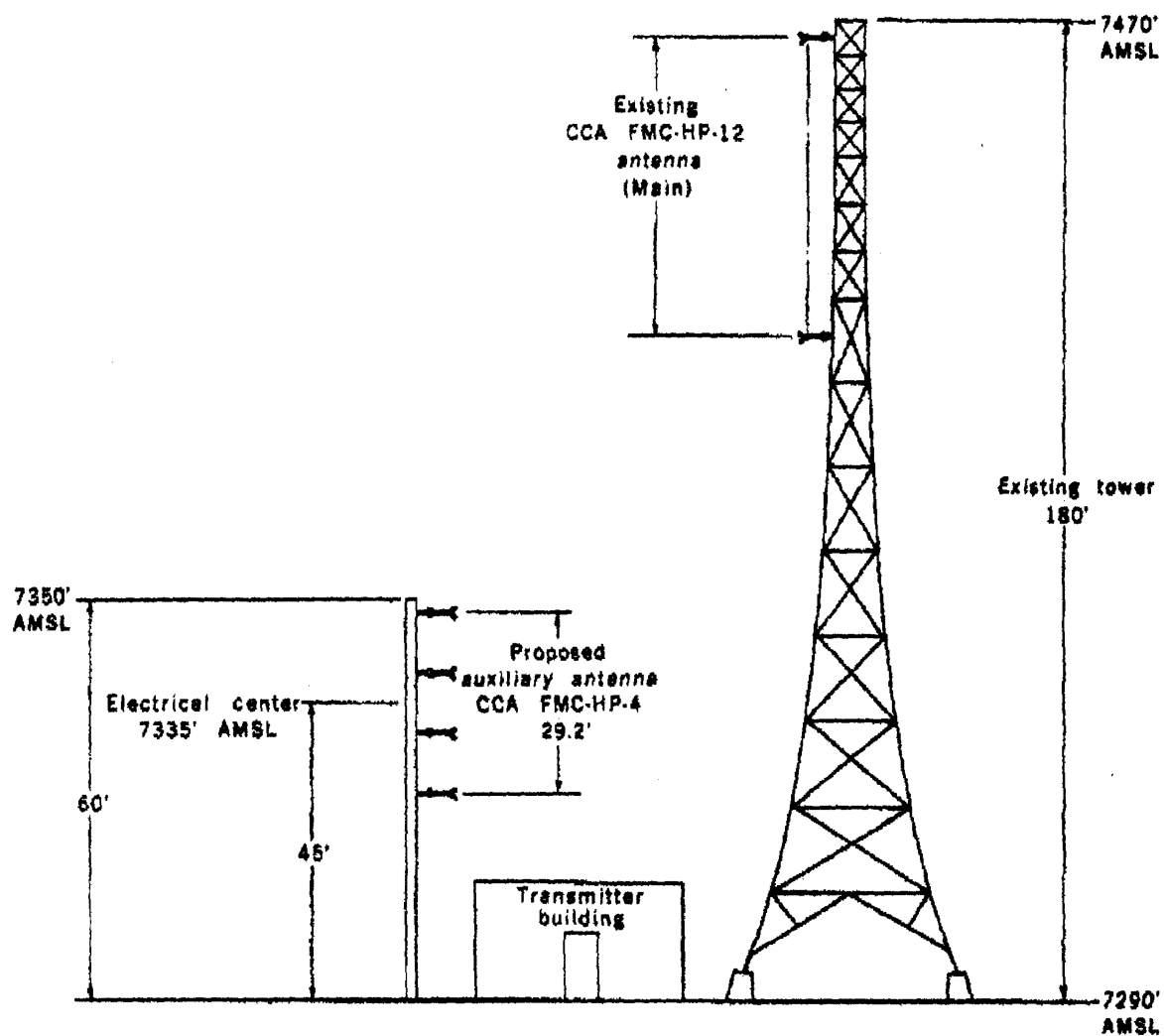
Modes of Emergency Operation

A. Main transmitter and auxiliary antenna	
Transmitter output	20 kW
Antenna input	19.7 kW
Effective radiated power	
Horizontally polarized	42.3 kW
Vertically polarized	42.3 kW
B. Auxiliary transmitter and auxiliary antenna	
Transmitter output	5 kW
Antenna input	4.92 kW
Effective radiated power	
Horizontally polarized	10.6 kW
Vertically polarized	10.6 kW
C. Auxiliary transmitter and main antenna	
Transmitter output	5 kW
Antenna input	4.8 kW
Effective radiated power	
In horizontal plane	
Horizontally polarized	24.7 kW
Vertically polarized	24.7 kW
At maximum 1° below horizontal	
Horizontally polarized	28.8 kW
Vertically polarized	28.8 kW

000207

Figure 2

JANUARY 1972



**PROPOSED ARRANGEMENT
MAIN AND AUXILIARY ANTENNAS
ARMSTRONG BROADCASTING CORPORATION
STATION KOSI-FM DENVER, COLORADO**

Jules Cohen & Associates Consulting Electronics Engineers

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ENGINEERING EXHIBIT
APPLICATION FOR PERMIT TO INSTALL
AUXILIARY TRANSMITTER AND ANTENNA
ARMSTRONG BROADCASTING CORPORATION
RADIO STATION KOSI-FM
DENVER, COLORADO

Height Above Average Terrain and
Distances to Contours

Operating Mode: Main Transmitter and Auxiliary Antenna
42.3 kW ERP

<u>Bearing</u> (degrees)	<u>Avg. Elev.</u> <u>2-10 Miles</u> (ft. AMSL)	<u>Antenna Rad. Center</u> <u>Above Avg. Terrain</u> (feet)	<u>Distance to Contour</u>	
			<u>70 dBu</u> (miles)	<u>60 dBu</u> (miles)
0	6058	1277	32	47
45	5674	1661	37.5	54
90	5597	1738	38	55
135	5853	1482	35	51
180	7104	231	13.6	23
225	7462	-127	9.3	16
270	7389	-54	9.3	16
315	7914	-579	9.3	16
Average			704	

Operating Mode: Auxiliary Transmitter and Auxiliary Antenna
10.6 kW ERP

0	6058	1277	25	39
45	5674	1661	28	44
90	5597	1738	29	45
135	5853	1482	27	42
180	7104	231	10	17
225	7462	-127	7	12
270	7389	-54	7	12
315	7914	-579	7	12
Average			704	

000200

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Figure 3
Sheet 2 of 2

Height Above Average Terrain and
Distances to Contours (continued)

Operating Mode: Auxiliary Transmitter and Main Antenna
28.8 kW ERP

<u>Bearing</u> (degrees)	<u>Avg. Elev.</u> <u>2-10 Miles</u> (ft. AMSL)	<u>Antenna Rad. Center</u> <u>Above Avg. Terrain</u> (feet)	<u>Distance to Contour</u>	
			<u>70 dBu</u> (miles)	<u>60 dBu</u> (miles)
0	6058	1358	31	46.5
45	5674	1742	36	52
90	5597	1819	37	54
135	5853	1563	33	49
180	7104	312	14.5	24
225	7462	-46	8.5	15
270	7389	27	8.5	15
315	7914	-498	8.5	15

Average 784

000210