

ENGINEERING REPORT
Proposed NEW
Non-Commercial Educational FM
On Channel 218, 91.5 mHz
At Denison, TX
February, 1997

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E. HAROLD MUNN, JR. & ASSOCIATES, INC.
Broadcast Engineering Consultants
Coldwater, MI 49036

Section V-B - FM BROADCAST ENGINEERING DATA

FOR COMMISSION USE ONLY

File No. _____
 ASB Referral Date _____
 Referred by _____

Name of Applicant

Bible Broadcasting Network, Inc.

Call letters (if issued)

Is this application being filed in response to a window? ☐ Yes ☒ No

If Yes, specify closing date: _____

Purpose of Application: (check appropriate boxes)

- | | |
|--|---|
| <input checked="" type="checkbox"/> Construct a new (main) facility | <input type="checkbox"/> Construct a new auxiliary facility |
| <input type="checkbox"/> Modify existing construction permit for main facility | <input type="checkbox"/> Modify existing construction permit for auxiliary facility |
| <input type="checkbox"/> Modify licensed main facility | <input type="checkbox"/> Modify licensed auxiliary facility |

If purpose is to modify, indicate below the nature of change(s) and specify the file number(s) of the authorizations affected.

- | | |
|---|--|
| <input type="checkbox"/> Antenna supporting-structure height | <input type="checkbox"/> Effective radiated power |
| <input type="checkbox"/> Antenna height above average terrain | <input type="checkbox"/> Frequency |
| <input type="checkbox"/> Antenna location | <input type="checkbox"/> Class |
| <input type="checkbox"/> Main Studio location | <input type="checkbox"/> Other (Summarize briefly) |

File Number(s) _____

1. Allocation:

Channel No.	Principal community to be served:		
218	City Denison	County Grayson	State TX

Class (check only one box below)

- ☒ A ☐ B1 ☐ B ☐ C3
☐ C2 ☐ C1 ☐ C ☐ D

2. Exact location of antenna.

(a) Specify address, city, county and state. If no address, specify distance and bearing relative to the nearest town or landmark.
 1 km N. of St.Rd. 691, 1.6 km S. of Denison, Grayson Co., TX

(b) Geographical coordinates (to nearest second). If mounted on element of an AM array, specify coordinates of center of array. Otherwise, specify tower location. Specify South Latitude or East Longitude where applicable; otherwise, North Latitude or West Longitude will be presumed.

Latitude	33° 42' 38"	Longitude	96° 34' 20"
----------	-------------	-----------	-------------

3. Is the supporting structure the same as that of another station(s) or proposed in another pending application(s)? ☒ Yes ☐ No

If Yes, give call letter(s) or file number(s) or both. various land mobile, K214CK

If proposal involves a change in height of an existing structure, specify existing height above ground level including antenna, all other appurtenances, and lighting, if any.

DNA _____

4. Does the application propose to correct previous site coordinates?
If Yes, list old coordinates.

☐ Yes ☒ No

Latitude ° ' "	Longitude ° ' "
-------------------------------	--------------------------------

5. Has the FAA been notified of the proposed construction?

☐ Yes ☒ No

If Yes, give date and office where notice was filed and attach as an Exhibit a copy of FAA determination, if available.

Exhibit No.

Not required no change in tower heights

Date _____ Office where filed _____

6. List all landing areas within 8 km of antenna site. Specify distance and bearing from structure to nearest point of the nearest runway.

Landing Area	Distance (km)	Bearing (degrees True)
(a) <u>Grayson</u>	<u>7.5</u>	<u>270</u>
(b) _____	_____	_____

7. (a) Elevation: *(to the nearest meter)*

(1) of site above mean sea level; 214 meters

(2) of the top of supporting structure above ground (including antenna, all other appurtenances, and lighting, if any); and 134 meters

(3) of the top of supporting structure above mean sea level [(aX1) + (aX2)] 348 meters

- (b) Height of radiation center: *(to the nearest meter)* H = Horizontal; V = Vertical

(1) above ground 58 meters (H)

58 meters (V)

(2) above mean sea level [(aX1) + (bX1)] 272 meters (H)

272 meters (V)

(3) above average terrain 63 meters (H)

63 meters (V)

8. Attach as an Exhibit sketch(es) of the supporting structure, labelling all elevations required in Question 7 above, except item 7(bX3). If mounted on an AM directional-array element, specify heights and orientations of all array towers, as well as location of FM radiator.

Exhibit No.
E-3

9. Effective Radiated Power:

(a) ERP in the horizontal plane 4 kw (H*) 4 kw (V*)

- (b) Is beam tilt proposed?

☐ Yes ☒ No

If Yes, specify maximum ERP in the plane of the tilted beam, and attach as an Exhibit a vertical elevational plot of radiated field.

Exhibit No.

_____ kw (H*) _____ kw (V*)

*Polarization

10. Is a directional antenna proposed?

☐ Yes ☒ No

If Yes, attach as an Exhibit a statement with all data specified in 47 C.F.R. Section 73.316, including plot(s) and tabulations of horizontally and vertically polarized radiated components in terms of relative field.

Exhibit No.

11. Will the main studio be located within the 70 dBu or 3.16 mV/m contour?

☒ Yes ☐ No

If No, attach as an Exhibit justification pursuant to 47 C.F.R. Section 73.1125.

Exhibit No.

12. Are there: (a) within 60 meters of the proposed antenna, any proposed or authorized FM or TV transmitters, or any nonbroadcast *(except citizens band or amateur)* radio stations; or (b) within the blanketing contour, any established commercial or government receiving stations, cable head-end facilities, or populated areas; or (c) within ten (10) kilometers of the proposed antenna, any proposed or authorized FM or TV transmitters which may produce receiver-induced intermodulation interference?

☒ Yes ☐ No

If Yes, attach as an Exhibit a description of any expected, undesired effects of operations and remedial steps to be pursued if necessary, and a statement accepting full responsibility for the elimination of any objectionable interference (including that caused by receiver-induced or other types of modulation) to facilities in existence or authorized or to radio receivers in use prior to grant of this application. *(See 47 C.F.R. Sections 73.315(b), 73.316(d) and 73.318.)*

Exhibit No.
A

13. Attach as an Exhibit a 7.5 minute series U.S. Geological Survey topographic quadrangle map that shows clearly, legibly, and accurately, the location of the proposed transmitting antenna. This map must comply with the requirements set forth in Instruction D for Section V. Further, the map must clearly and legibly display the original printed contour lines and data as well as latitude and longitude markings, and must bear a scale of distance in kilometers.

Exhibit No.
E-5

14. Attach as an Exhibit *(name the source)* a map which shows clearly, legibly, and accurately, and with the original printed latitude and longitude markings and a scale of distance in kilometers:

Exhibit No.
E-1

(a) the proposed transmitter location, and the radials along with profile graphs have been prepared;

(b) the 1 mV/m predicted contour and, for noncommercial educational applicants applying on a commercial channel, the 3.16 mV/m contour; and

(c) the legal boundaries of the principal community to be served.

15. Specify area in square kilometers (1 sq. mi. = 2.59 sq. km.) and population (latest census) within the predicted 1 mV/m contour.

Area 1293 sq. km.

Population 74,722

16. Attach as an Exhibit a map *(Sectional Aeronautical charts where obtainable)* showing the present and proposed 1 mV/m (60 dbu) contours.

Exhibit No.
DNA

Enter the following from Exhibit above:

Gain Area _____ sq. mi.

Loss Area _____ sq. mi.

Percent change (gain area plus loss area as percentage of present area) _____ %.

If 50% or more this constitutes a major change. Indicate in question 2(c), Section I, accordingly.

17. For an application involving an auxiliary facility only, attach as an Exhibit a map (*Sectional Aeronautical Chart or equivalent*) that shows clearly, legibly, and accurately, and with latitude and longitude markings and a scale of distance in kilometers:

Exhibit No.

(a) the proposed auxiliary 1 mV/m contour; and

(b) the 1 mV/m contour of the licensed main facility for which the applied-for facility will be auxiliary. Also specify the file number of the license. See 47 C.F.R. Section 73.1675. (File No. _____)

18. Terrain and coverage data (*to be calculated in accordance with 47 C.F.R. Section 73.313*).

Source of terrain data: (*check only one box below*)

☒ Linearly interpolated 30-second database

☐ 7.5 minute topographic map

(Source: NGDC TGP-0050)

☐ Other (*briefly summarize*)

Radial bearing (degrees True)	Height of radiation center above average elevation of radial from 3 to 16 km (meters)	Predicted Distances to the 1 mV/m contour (kilometers)
0	72.1	22.1
45	85.0	23.9
90	91.1	24.7
135	73.1	22.3
180	57.3	20.0
225	35.4	15.3
270	44.5	17.4
315	43.0	17.1

Allocation Studies

(See Subpart C of 47 C.F.R. Part 73)

19. Is the proposed antenna location within 320 kilometers (199 miles) of the common border between the United States and Mexico?

☐ Yes ☒ No

If Yes, attach as an Exhibit a showing of compliance with all provisions of the Agreement between the United States of America and the United Mexican States concerning Frequency Modulation Broadcasting in the 88 to 108 MHz band.

Exhibit No.

20. Is the proposed antenna location within 320 kilometers of the common border between the United States and Canada?

☐ Yes ☒ No

If Yes, attach as an Exhibit a showing of compliance with all provisions of the Working Agreement for Allocation of FM Broadcasting Stations on Channels 201-300 under The Canada-United States FM Agreement of 1947.

Exhibit No.

21. If the proposed operation is for a channel in the range from channel 201 through 220 (88.1 through 91.9 MHz), or if this proposed operation is for a class D station in the range from Channel 221 through 300 (92.1 through 107.9 MHz), attach as an Exhibit a complete allocation study to establish the lack of prohibited overlap of contours with other U.S. stations. The allocation study should include the following:

Exhibit No.

E-7

- (a) The normally protected interference-free and the interfering contours for the proposed operation along all azimuths.
- (b) Complete normally protected 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) When necessary to show more detail, an additional allocation study will be attached utilizing a map with a larger scale to clearly show interference or absence thereof.
- (g) A scale of kilometers and properly labeled longitude and latitude lines, shown across the entire Exhibit(s). Sufficient lines should be shown so that the location of the sites may be verified.
- (h) The name of the map(s) used in the Exhibit(s).

22. With regard to any stations separated by 53 or 54 channels (10.6 or 10.8 MHz) attach as an Exhibit information required in 1/ *(separation requirements involving intermediate frequency (i.f.) interference)*.

Exhibit No.

E-7

23.(a) Is the proposed operation on Channel 218, 219, or 220?

☒ Yes ☐ No

(b) If the answer to (a) is yes, does the proposed operation satisfy the requirements of 47 C.F.R. Section 73.207?

☒ Yes ☐ No

(c) If the answer to (b) is yes, attach as an Exhibit information required in 1/ regarding separation requirements with respect to stations on Channels 221, 222 and 223.

Exhibit No.

E-7

(d) If the answer to (b) is no, attach as an Exhibit a statement describing the short spacing(s) and how it or they arose.

Exhibit No.

1/ A showing that the proposed operation meets the minimum distance separation requirements. Include existing stations, proposed stations, and cities which appear in the Table of Allotments; the location and geographic coordinates of each antenna, proposed antenna or reference point, as appropriate; and distance to each from proposed antenna location.

SECTION V-B - FM BROADCAST ENGINEERING DATA (Page 6)

- (e) If authorization pursuant to 47 C.F.R. Section 73.215 is requested, attach as an Exhibit a complete engineering study to establish the lack of prohibited overlap of contours involving affected stations. The engineering study must include the following:

Exhibit No.
DNA

- (1) Protected and interfering contours, in all directions (360), for the proposed operation.
- (2) Protected and interfering contours, over pertinent arcs, of all short-spaced assignments, applications and allotments, including a plot showing each transmitter location, with identifying call letters or file numbers, and indication of whether facility is operating or proposed. For vacant allotments, use the reference coordinates as transmitter location.
- (3) When necessary to show more detail, an additional allocation study utilizing a map with a larger scale to clearly show prohibited overlap will not occur.
- (4) A scale of kilometers and properly labeled longitude and latitude lines, shown across the entire exhibit(s). Sufficient lines should be shown so that the location of the sites may be verified.
- (5) The official title(s) of the map(s) used in the exhibits(s).

24. Is the proposed station for a channel in the range from Channel 201 to 220 (88.1 through 91.9 MHz) and the proposed antenna location within the distance to an affected TV Channel 6 station(s) as defined in 47 C.F.R. Section 73.525?

☐ Yes ☒ No

If Yes, attach as an Exhibit either a TV Channel 6 agreement letter dated and signed by both parties or a map and an engineering statement with calculations demonstrating compliance with 47 C.F.R. Section 73.525 for each affected TV Channel 6 station.

Exhibit No.

25. Is the proposed station for a channel in the range from Channel 221 to 300 (92.1-107.9 MHz)?

☐ Yes ☒ No

If Yes, attach as an Exhibit information required in 1/. (Except for Class D (secondary) proposals.)

Exhibit No.

26. Environmental Statement (See 47 C.F.R. Section 1.1301 et seq.)

Would a Commission grant of this application come within Section 1.1307 of the FCC Rules, such that it may have a significant environmental impact?

☐ Yes ☒ No

If you answer Yes, submit as an Exhibit an Environmental Assessment required by Section 1.1311.

Exhibit No.

If No, explain briefly why not.

This application meets the requirements of OST Bulletin No.65 and is categorically excluded from environmental processing pursuant to §1.1306 of the Commission's Rules, because it does not (1) involve a site location specified under §1.1307(a)(1)-(7); (2) involve high intensity lighting under §1.1307(a)(8); or (3) result in human exposure to radio frequency radiation in excess of the applicable standard specified in §1.1307(b) of the Commission's Rules.

CERTIFICATION

I certify that I have prepared this Section of this application on behalf of the applicant, and that after such preparation, I have examined the foregoing and found it to be accurate and true to the best of my knowledge and belief.

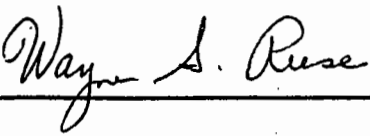
Name (Typed or Printed) Wayne S. Reese, President E.Harold Munn,Jr.& Associates, Inc.	Relationship to Applicant (e.g., Consulting Engineer) Technical Consultant
Signature 	Address (Include ZIP Code) Box 220 Coldwater MI 49036-0220
Date February 4, 1997	Telephone No. (Include Area Code) (517) 278-7339

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CERTIFICATION OF CONSULTANT

The firm of E. Harold Munn, Jr. & Associates, Inc., Broadcast Engineering Consultants, with offices at 100 Airport Drive, Coldwater, Michigan, has been retained for the purpose of preparing the technical data submitted in this report.

The data utilized in this report was taken from the FCC Secondary Database and other data on file. While this information is believed accurate, errors or omissions in the database and file data are possible. This firm may not be held liable for damages as a result of those data errors or omissions.

The report has been prepared by or under the direction of the undersigned, whose qualifications are a matter of record before the Federal Communications Commission.

I declare under penalty of perjury that the contents of this report are true and accurate to the best of my knowledge and belief.

E. Harold Munn, Jr. & Associates, Inc.

February 4, 1997

by Virgil M. Royer
Virgil M. Royer, Staff Engineer

by Wayne S. Reese
Wayne S. Reese, President

100 Airport Drive, Box 220
Coldwater, Michigan 49036-0220

(517) 278-7339

DISCUSSION

This firm was retained to prepare the required engineering report in support of an application on behalf of Bible Broadcasting Network, Inc. This application requests a new Educational FM Station, to operate serving Denison, Texas. It has been determined that FM Channel 218, 91.5 mHz, may be used at the site proposed, in full conformance with the provisions of the rules. The station will operate with an effective radiated power of 4.0 kW, and an antenna height above terrain of 63 meters. Allocation details concerning the use of this channel are included as Exhibit E-7 of this report. There will be no prohibited contour overlap between the proposed station and any known existing or proposed full-service stations.

The transmitter site proposed in this application is not within the affected radius of a Channel 6 television station.

Due consideration has been given to protection against human exposure to radiofrequency radiation. A detailed study is part of this section.

The proposed 1.0 mV/m contour has been calculated in accordance with the Rules, and the plotted data forms Exhibit E-1 of this report. The vertical plan diagram for the proposed support tower is included as Exhibit E-3.

The FAA has not been notified of this proposed antenna addition to the tower, as there is no height increase.

The service contour exhibit, E-1 used 360 bearings of terrain calculations to develop the data for the computer generated plots. This shows the effect of the terrain on the contour shape. All area computations were based on the contours as plotted.

DISCUSSION Cont.

The following tabulation of the distances to the proposed service contours results from calculations performed in accordance with §73.313(d) and §73.333 Figure 1.

TERRAIN AND CONTOUR DATA Proposed Channel 218A

ERP = 4 kW
FM - 2-6 Tables 30 Sec

Azimuth Deg T.	Ave. Elev. 3 to 16 km Meters AMSL	Effective Antenna Height, Meters AAT	ERP (dBk)	F(50-50) Distance to 60 dBu Contour km
0	199.9	72.1	6.021	22.1
45	187.0	85.0	6.021	23.9
90	180.9	91.1	6.021	24.7
135	198.9	73.1	6.021	22.3
180	214.7	57.3	6.021	20.0
225	236.6	35.4	6.021	15.3
270	227.5	44.5	6.021	17.4
315	229.0	43.0	6.021	17.1

Ave. = 209.3 M		62.7 M		

Antenna Radiation Center AMSL = 272.0 M

Geographic Coordinates:

North latitude: 33 42 38

West longitude: 96 34 20

STATEMENT OF COMPLIANCE WITH RF EXPOSURE GUIDELINES

REVISED FOR NEW Ch.218

at Denison, Texas

The Commission requires an engineering study regarding compliance with the guidelines for human protection from radiofrequency radiation. This report section is in response to that provision of the Rules.

The Federal Communications Commission, as of January 1, 1986, and revised effective January 1, 1997, has set forth guidelines for RF radiation protection as issued by the American National Standards Institute (ANSI). The following steps have been taken by the licensee of this facility to insure proper protection from potentially high RF energy levels to station personnel and the public in general.

The radiation center of the FM antenna is located at a height above ground sufficient to provide full compliance with the FCC guidelines concerning human exposure to radiofrequency radiation to observers on the ground.

In the event repairs or maintenance would be required on the antenna support structure, or the antenna which could result in potential exposure to fields in excess of the ANSI standards, the operating power of the station will be reduced, or the facility shut down for such time as may be required for the repairs and/or maintenance to be completed. An agreement, signed by all parties with access to the site is in effect concerning the required power reductions or cessation of operations.

To verify that this facility as constructed meets the requirements of the guidelines, calculations have been made using the appropriate formulae of OST Bulletin No.65. The antenna in use is expected to be a three (3) bay antenna. The antenna is a Shively bearing a model number 6810-3.

The calculations use the technique outlined in the EPA report titled: An Engineering Assessment of the Potential Impact of Federal Radiation Protection Guidance on the AM, FM, and TV Broadcast Services (Gailey & Tell, April, 1985). All calculations contained herein are based on the measured element patterns for the antenna, and follow the procedure shown in the Gailey & Tell report. The patterns were identified by applying the procedure outlined in the report to the measurement data contained in the report titled Element Pattern Measurements on FM Antennas (EPA-520/6-85-107, June 1985). The antenna has been designated an EPA Type 6 element due to the construction.

RF Exposure Guideline Compliance, Cont.

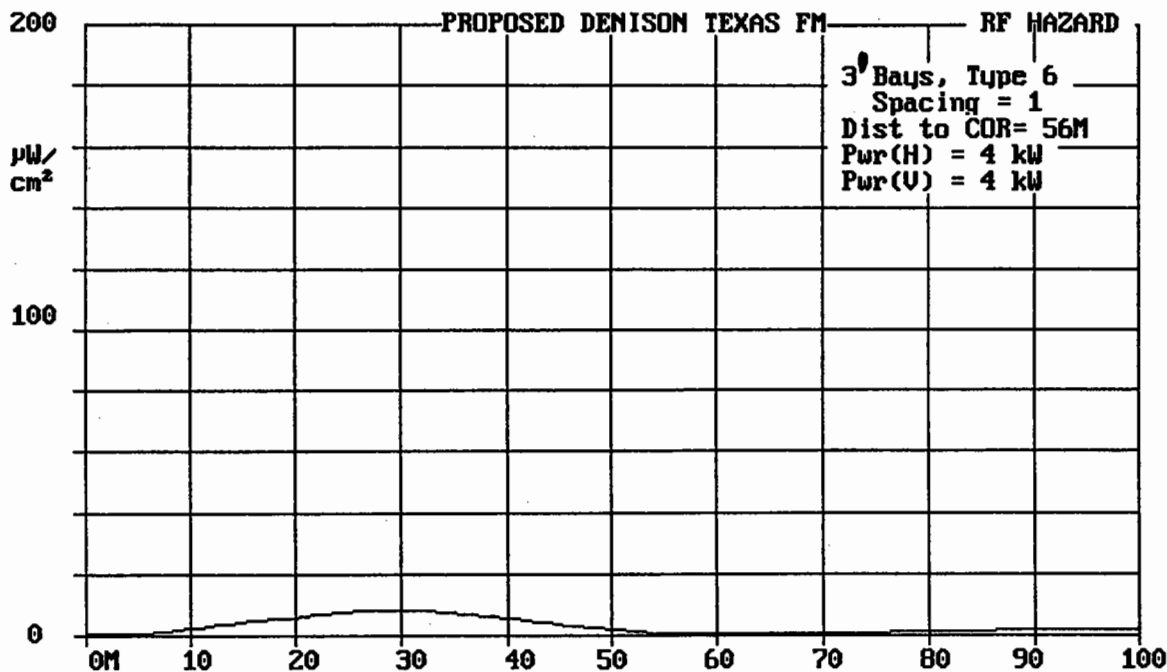
The tabulated and plotted field data which is included in this section shows that the ANSI protection guideline will not be exceeded in proximity to the station.

The data obtained shows that full compliance with the guidelines is attained.

The maximum calculated RF field in proximity to the station at 2 meters above ground is 0.00796 mW/cm², at about 29 meters from the tower base. This is only 0.796 % of the permitted "controlled access" field of 1.0 mW/cm², and 3.98 % of the "uncontrolled access" limit of 0.2 mW/cm².

In addition to the protection provided by the antenna design, access to the area will be restricted by locked gates and other security measures. The area will be marked with appropriate signs, warning of the potential for exposure to radiofrequency fields.

There are no other FM or TV broadcast transmitters within 100 meters of the antenna site.



DISTANCE FROM RADIATOR (Meters) VERSUS POWER DENSITY (Microwatt/Square cm)

Dist (M)	PD (H)	PD (V)	Total (uW/cm2)
0.00	0.256	0.170	0.426
1.00	0.287	0.170	0.457
2.00	0.320	0.170	0.490
3.00	0.354	0.170	0.524
4.00	0.390	0.170	0.559
5.00	0.435	0.178	0.613
6.00	0.570	0.274	0.844
7.00	0.720	0.390	1.110
8.00	0.886	0.524	1.410
9.00	1.065	0.676	1.741
10.00	1.249	0.851	2.100
11.00	1.383	1.100	2.482
12.00	1.519	1.373	2.892
13.00	1.656	1.669	3.325
14.00	1.792	1.983	3.775
15.00	1.927	2.312	4.239
16.00	2.089	2.470	4.559
17.00	2.247	2.623	4.870
18.00	2.400	2.768	5.168
19.00	2.546	2.904	5.450
20.00	2.683	3.029	5.712
21.00	2.879	3.186	6.065
22.00	3.106	3.356	6.462
23.00	3.320	3.510	6.830
24.00	3.517	3.645	7.162
25.00	3.693	3.760	7.453
26.00	3.846	3.853	7.700
27.00	3.920	3.920	7.840
28.00	3.962	3.962	7.924
29.00	3.980	3.980	7.959
30.00	3.973	3.973	7.946
31.00	3.942	3.942	7.883
32.00	3.887	3.887	7.773

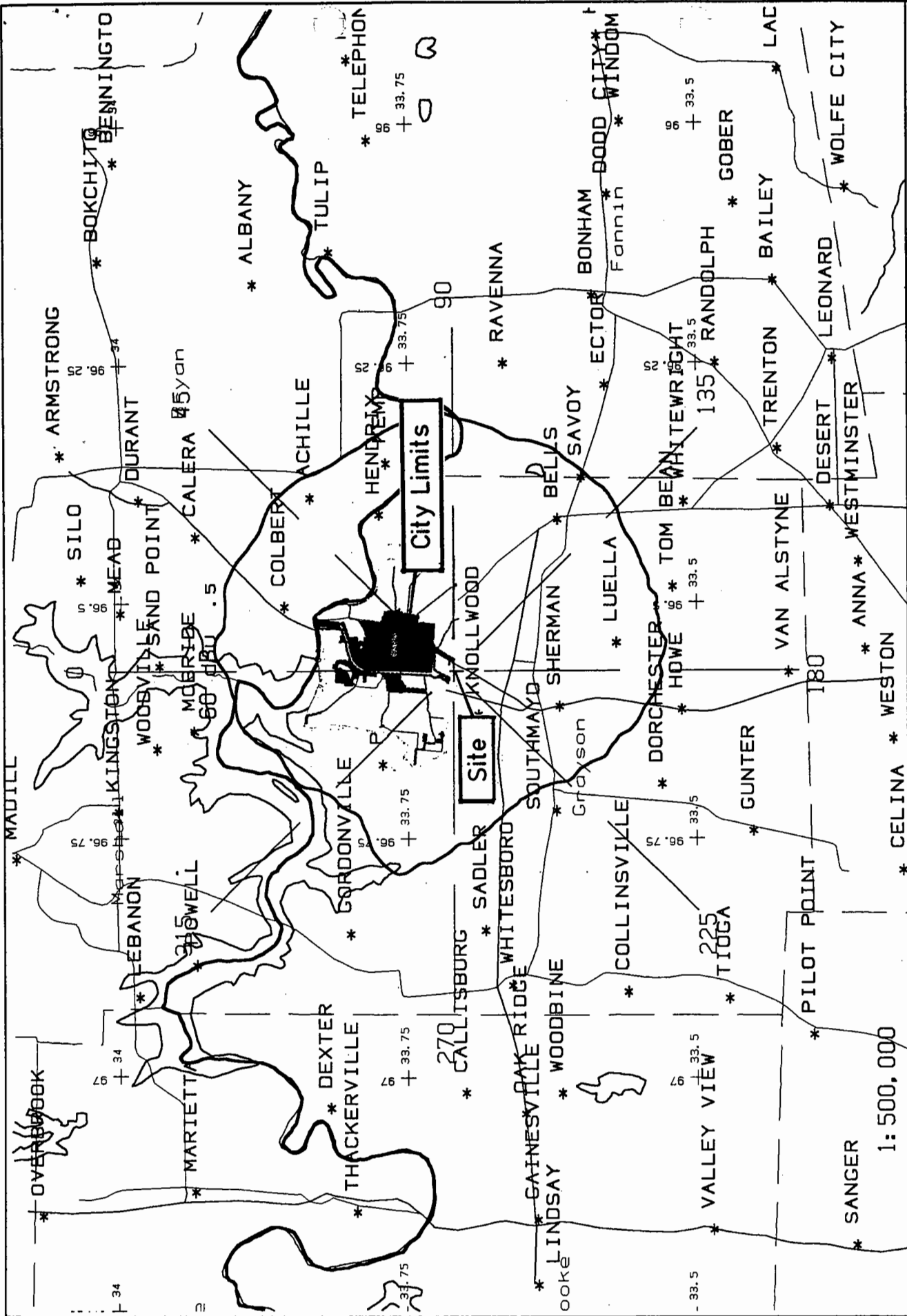
EXHIBIT A

The transmitting facility is so located that there is some resident population within the predicted "blanketing" contour, as defined in 47 C.F.R. §73.318. The applicant agrees that full compliance with the procedures and requirements of §73.318(b)(d) will be attained.

The applicant will take such engineering steps as may be required to satisfy complaints of "blanketing" including, but not limited to, the installation of filters, traps, or other devices to satisfy said complaints within the specified time period.

The proposed transmitter is located within 10 km of other existing or proposed FM and TV transmitters. This applicant does not believe that there would be any adverse effects on the operation of any other facility as a result of a grant of this application.

In the event adverse effects are noted, including but not limited to receiver-induced or other types of modulation, the applicant accepts full responsibility for the elimination of any objectionable interference to facilities in existence or authorized, or to radio receivers in use prior to grant of this application.



Prop. Denison TX Ch. 218A 4kW 63m HAAT		EXHIBIT E-1	
N. Lat. 33 42 38	W. Lng. 96 34 20	MUNN & ASSOC 02/97	

EXHIBIT E-2

SOURCE OF TOPOGRAPHIC DATA

The topographic data employed in this application is based on the 30" topographic database, NGDC-TGP-0050. Linear interpolation was employed between datapoints.

The averages calculated include 131 points between 3 and 16 km from the transmitter site proposed in this application.

The transmitter site elevation was determined by means of 7.5' series topographic mapping. The site coordinates were also developed from the 7.5' series map, and are based on NAD-27 datum. A portion of that map is included as Exhibit E-5 .

Elevations in feet have been converted to meters, using the following formula:

$$H(\text{meters}) = h(\text{feet}) * 0.3048$$

For application purposes, the resultant metric elevation has been rounded to the nearest meter.

EXHIBIT E-3

VERTICAL PLAN OF ANTENNA SYSTEM

Site Location:

NL 33° 42' 38"; WL 096° 34' 20"

Site Owner: Mobile Comm.

1 km N. of St.Rd. 691, 1.6 km S. of Denison,
Grayson Co., Texas

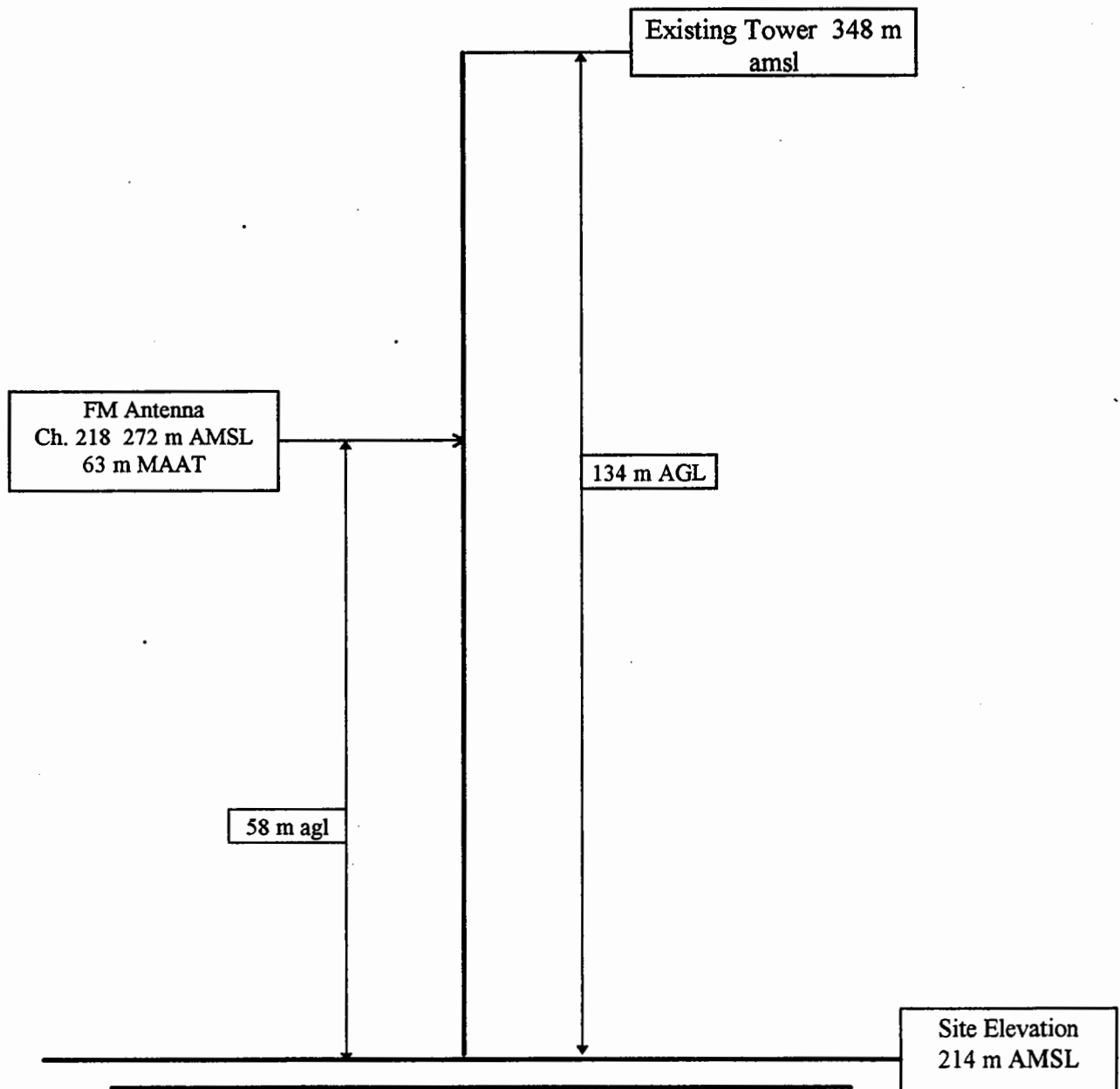


EXHIBIT E-4

PROPOSED FM OPERATING SPECIFICATIONS

Applicant: Bible Broadcasting Network, Inc. **Call:** New
City of License: Denison, TX

Frequency: 91.7 MHz **Channel:** 218A
ERP: 4.0 kW **HAAT:** 63 (meters)

Site Coordinates: NL 33° 42' 38"; WL 096° 34' 20"

Transmitter Location: 1 km N. of St. Rd. 691, 1.6 km S. of Denison

County: Grayson

State: TX

Proposed Operation: Class A

Effective Radiated Power: 4.0 (kW) H 4.0 (kW) V (Non-Directional)

Height of Antenna Radiation Center Above:

	<u>Average Terrain</u>	<u>Mean Sea Level</u>	<u>Ground</u>
Horizontal	63 meters	272 meters	58 meters
Vertical	63 meters	272 meters	58 meters

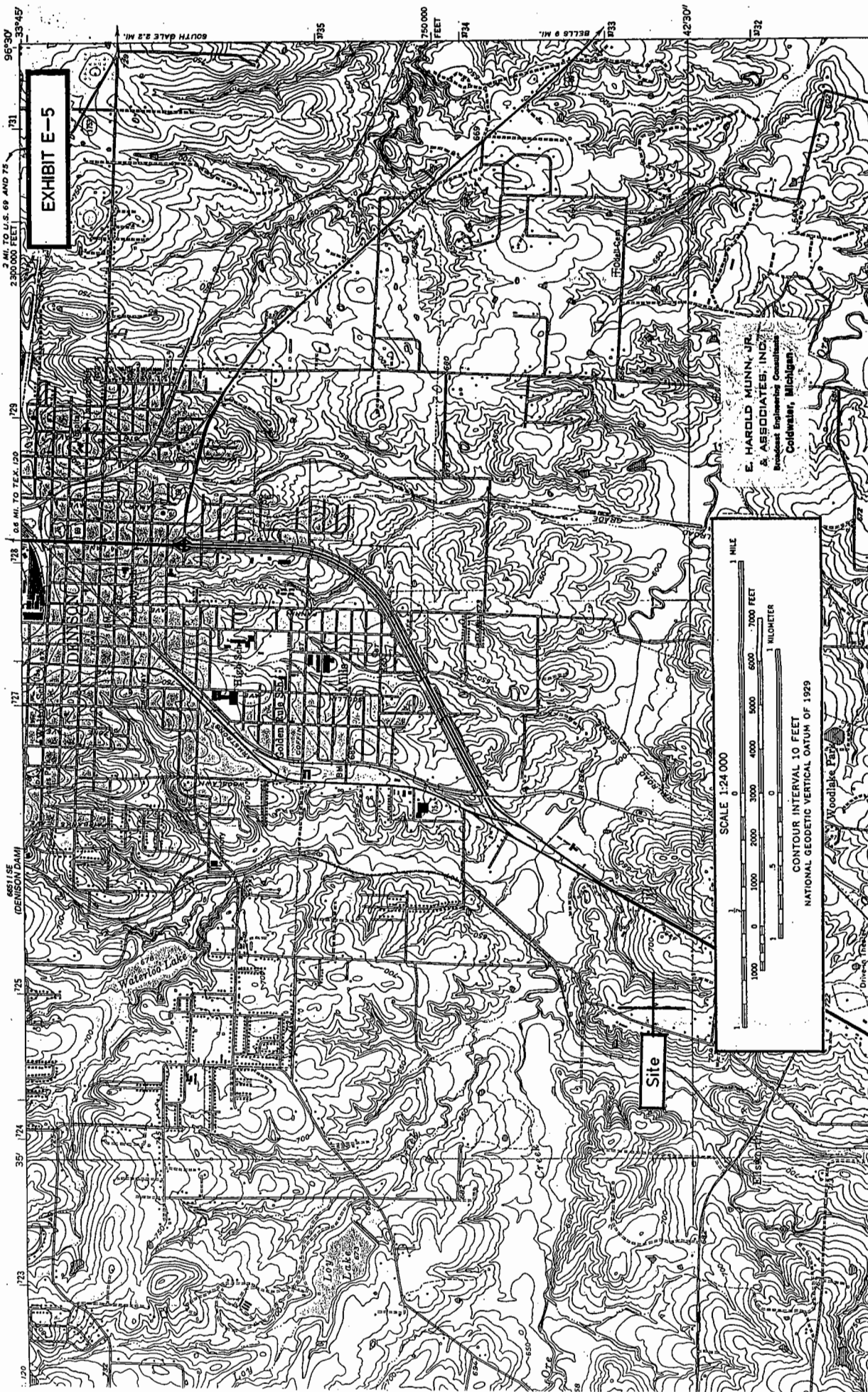
Elevation of Tower Site-----: 214 meters AMSL

Overall Height of Supporting Structure Above Ground-----: 134 m

Overall Height of Supporting Structure Above Mean Sea Level: 348 m

All heights "rounded" to nearest meter for Section V-B of Form 340

EXHIBIT E-5



SCALE 1:24 000
1 MILE
0 1000 2000 3000 4000 5000 6000 7000 FEET
0 1 2 3 4 5 KILOMETER
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

E. HAROLD MUNN, JR.
S. ASSOCIATES, INC.
Professional Engineering Consultants
Coldwater, Michigan

Site

EXHIBIT E-5(A)

DALLAS-FT WORTH SECTIONAL AERONAUTICAL CHART SCALE 1:500,000

E. HAROLD MUNN, JR.
& ASSOCIATES, INC.
Broadcast Engineering Consultants
Coldwater, Michigan



EXHIBIT E-6

TABULATION OF POPULATION AND AREA

**Prop. 218(A)
Denison, Texas**

CONTOUR POPULATION AREA

1.0 mV/m	74,722	1,293 km²
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The population within the 1.0 mV/m contour was determined by superimposing the desired contour onto U.S. Standard Civil Division maps of the 1990 Census, and assuming uniform population distribution within each minor civil division. The data was computer generated.

The service area was determined by measurement of the contour map Exhibit E-1, using computer calculations and 360 terrain radials.

EXHIBIT E-7

ALLOCATION STUDY FOR THE USE OF CHANNEL 218A

91.5 mHz

At Denison, TX

This exhibit shows the calculated spacings between the proposed Class A site and the other facilities which may be affected in the allocation. The relationships between the proposed operation and the existing stations are tabulated.

This exhibit shows that there will be no prohibited contour overlap to any station in contravention of the Rules of the Commission, or any treaty obligations of the United States of America.

The station, operating as proposed, would **not** create or receive overlap. There is one (1) facility existing or authorized close enough to the transmitter site to require further study. That is KVTT(FM), Dallas, TX on Channel 219. There is sufficient clearance to other stations that no additional study is believed to be needed.

The INTERDLG© maps of the protected 1 mV/m contours in this exhibit show compliance with the rules concerning the affected station. The tabulation of distances to interference contours provided by the FMOVER© tabulations included in this section provides the support for the map exhibits.

The required tabulation of protected and interference contours from the proposed Channel 218 station is included in this section.

EXHIBIT E-7 Cont.

The following tabulation of the distances to the proposed service contours results from calculations performed in accordance with §73.313(d) and §73.333 Figure 1, 1(a).

Predicted Signal Contours:

33 42 38 - Proposed
96 34 20 - Protected and Interference Contours

ERP = 4 kW, 6.021 dBk FM - 2-6 Tables 30 Sec							
Radial	HAAT	kW	dBk	Field	60 dBu.5	80 dBu.1	54 dBu.1
0 Degr.	72.1M	4.000	6.021	1.000	22.1	6.9	33.0
10 Degr.	76.0M	4.000	6.021	1.000	22.7	7.1	34.0
20 Degr.	82.0M	4.000	6.021	1.000	23.5	7.4	35.5
30 Degr.	79.7M	4.000	6.021	1.000	23.2	7.3	35.0
40 Degr.	83.1M	4.000	6.021	1.000	23.7	7.4	35.8
50 Degr.	84.6M	4.000	6.021	1.000	23.9	7.5	36.1
60 Degr.	79.9M	4.000	6.021	1.000	23.2	7.3	35.0
70 Degr.	84.2M	4.000	6.021	1.000	23.8	7.5	36.0
80 Degr.	91.7M	4.000	6.021	1.000	24.8	7.8	37.7
90 Degr.	91.1M	4.000	6.021	1.000	24.7	7.8	37.6
100 Degr.	83.7M	4.000	6.021	1.000	23.7	7.4	35.9
110 Degr.	82.8M	4.000	6.021	1.000	23.6	7.4	35.7
120 Degr.	79.8M	4.000	6.021	1.000	23.2	7.3	35.0
130 Degr.	77.4M	4.000	6.021	1.000	22.9	7.2	34.4
140 Degr.	67.1M	4.000	6.021	1.000	21.4	6.7	31.7
150 Degr.	63.3M	4.000	6.021	1.000	20.9	6.5	30.7
160 Degr.	62.9M	4.000	6.021	1.000	20.8	6.5	30.6
170 Degr.	59.7M	4.000	6.021	1.000	20.3	6.3	29.9
180 Degr.	57.3M	4.000	6.021	1.000	20.0	6.2	29.3
190 Degr.	51.4M	4.000	6.021	1.000	18.9	5.9	27.7
200 Degr.	45.4M	4.000	6.021	1.000	17.6	5.5	25.9
210 Degr.	41.8M	4.000	6.021	1.000	16.8	5.3	24.8
220 Degr.	36.3M	4.000	6.021	1.000	15.5	4.9	23.1
230 Degr.	31.5M	4.000	6.021	1.000	14.5	4.5	21.6
240 Degr.	28.8M	4.000	6.021	1.000	14.2	4.4	21.1
250 Degr.	32.7M	4.000	6.021	1.000	14.7	4.6	22.0
260 Degr.	38.8M	4.000	6.021	1.000	16.1	5.1	23.9
270 Degr.	44.5M	4.000	6.021	1.000	17.4	5.5	25.7
280 Degr.	53.1M	4.000	6.021	1.000	19.2	6.0	28.1
290 Degr.	58.2M	4.000	6.021	1.000	20.1	6.2	29.5
300 Degr.	45.0M	4.000	6.021	1.000	17.5	5.5	25.8
310 Degr.	43.1M	4.000	6.021	1.000	17.1	5.4	25.2
320 Degr.	46.5M	4.000	6.021	1.000	17.9	5.6	26.3
330 Degr.	50.6M	4.000	6.021	1.000	18.7	5.8	27.4
340 Degr.	59.0M	4.000	6.021	1.000	20.2	6.3	29.7
350 Degr.	66.7M	4.000	6.021	1.000	21.4	6.7	31.6

Ave. HAAT= 62.0M, Ant. COR= 272.0M AMSL

E. HAROLD MUNN, JR. & ASSOCIATES, INC.
Broadcast Engineering Consultants
Coldwater, MI 49036

02-04-1997

E. Harold Munn Jr. & Associates Inc.

517 278-7339

CH# 218A - 91.5 MHz

EXHIBIT E-7 Channel Allocation Study

INTERFERENCE CHECKS WITH NEW, DENISON, TX at N. LAT. 33 42 38 W. LNG. 96 34 20

PWR = 4 kW H.A.A.T. = 63 M C.O.R. = 272 M AMSL

Protected F(50-50) 60 dBu = 20.47 km

F(50-10) 40 dBu = 72.47 54 dBu = 31.04 80 dBu = 6.47 100 dBu = 2.16

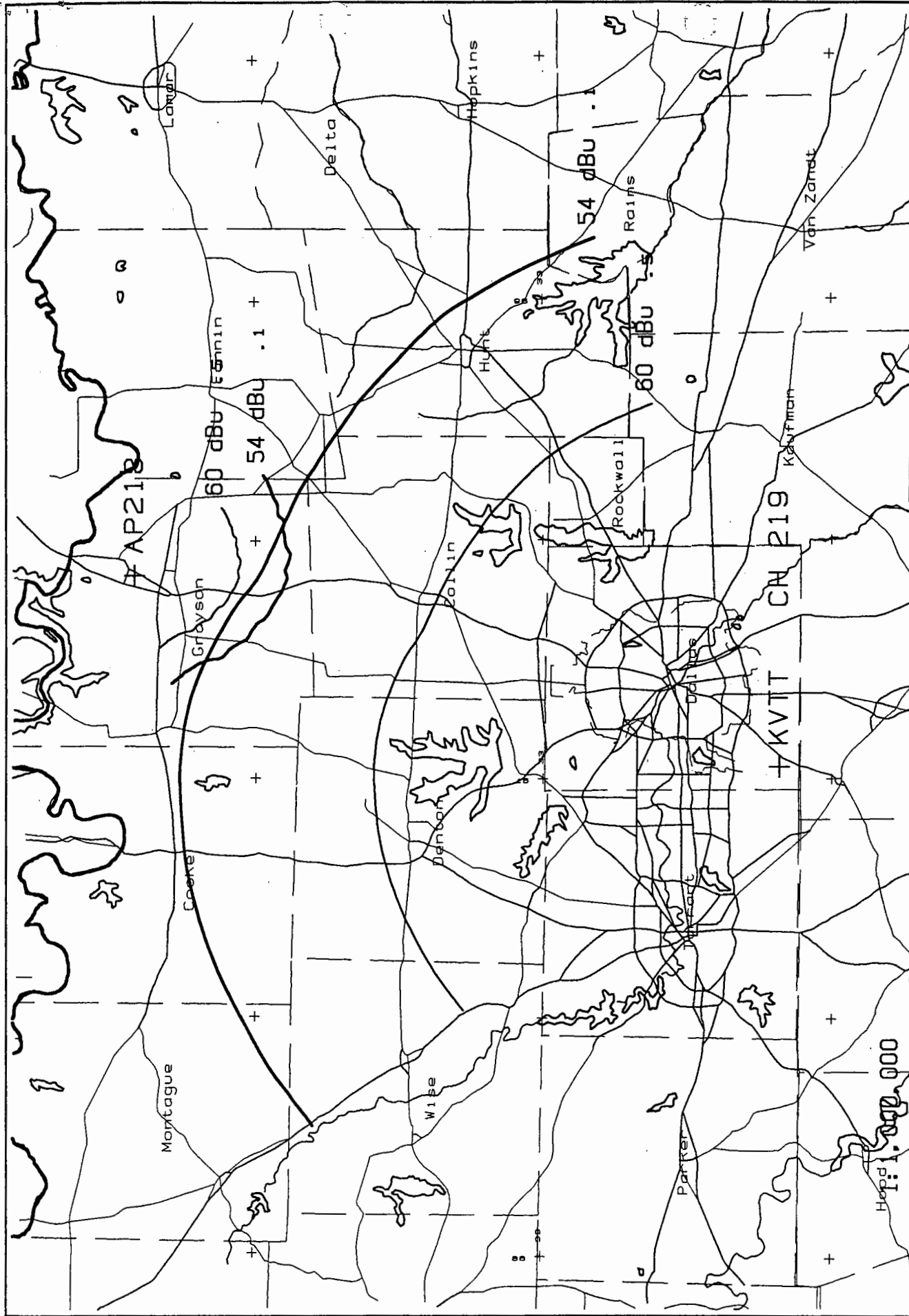
F(50-10) 37 dBu = 84.65 51 dBu = 36.92 77 dBu = 7.69 97 dBu = 2.56

F(50-10) 34 dBu = 97.03 48 dBu = 45.48 74 dBu = 9.27 94 dBu = 2.96

CH#	CALL	TYPE	* IN *	* OUT *	BEARING	DISTANCE	LAT.	PWR(kW)	INT(km)	PRO(km)
CITY	STATE	LICENSEE			<---		LNG.	HAAT(M)	COR(M)	FILE #
216A	AP216 *	AP CN	11.0	19.5	30.9	37.00 km	33 59 46	1.00	3.19	10.30
Durant		OK American Family Associatio			210.9	22.99 Mi	96 21 56	23.4*	227	BPED960610ML
> Reference HAAT at 30.9 degrees = 79.4 M, Pwr.= 4 kW, Pro. Dist. = 22.82 km, Int. Dist. = 7.23 km										
217C2	KDKR.C*	CP VN	11.7	27.6	249.1	98.82 km	33 23 22	8.00	72.21	48.81
Decatur		TX Creative Educational Media			69.1	61.40 Mi	97 33 53	312.0*	590	BPED931221MA
FCC Comment > Vertical Polarization Only										
> Reference HAAT at 249.1 degrees = 32.3 M, Pwr.= 4 kW, Pro. Dist. = 14.89 km, Int. Dist. = 22.42 km										
217C1	AP217	AP DCN	22.3	41.5	354.7	117.39 km	34 45 51	100.00	74.67	44.82
Ada		OK American Family Associatio			174.7	72.94 Mi	96 41 32	73.0	369	BPED960802MF
218D	K218BY	CP CN	-57.3	-80.9	196.5	3.99 km	33 40 34	0.14	40.86	12.38
Sherman		TX North Texas Public Broadca			16.5	2.48 Mi	96 35 04	118.0	332	BPFT950210TJ
FCC Comment > Translator For KERA, Dallas, TX										
219C	KVTT *	LI CN	1.9	27.2	196.8	129.76 km	32 35 24	100.00	109.95	74.95
Dallas		TX Research Educational Found			16.8	80.63 Mi	96 58 21	335.7*	531	BLD861212KB
> Reference HAAT at 196.8 degrees = 48.2 M, Pwr.= 4 kW, Pro. Dist. = 17.93 km, Int. Dist. = 27.6 km										
220A	KSSU *	LI CN	12.1	22.4	28.8	37.74 km	34 00 30	0.32	2.67	8.06
Durant		OK Southeastern Oklahoma Stat			208.8	23.45 Mi	96 22 30	34.6*	240	BLD821012AK
> Reference HAAT at 28.8 degrees = 80.4 M, Pwr.= 4 kW, Pro. Dist. = 22.95 km, Int. Dist. = 7.27 km										
221A	AD221	AD	31.0 R	21.7 M	157.4	52.65 km	33 16 21	6.00	2.80	28.29
Farmersville		TX Hunt Broadcasting			337.4	32.72 Mi	96 21 14	100.0	0	RM8799
FCC Comment > Alternate Site										
I.F. RELATIONSHIPS:										
272A	DE272	DE	10.0 R	37.8 M	337.0	47.77 km	34 06 24	6.00	2.80	28.29
Madill		OK Hunt Broadcasting, Inc.			157.0	29.68 Mi	96 46 30	100.0	0	RM8671
FCC Comment > Petition for Recon D95-126, 960614 by Carephil Communications										
272A	KMADFM	LI CN	10.0 R	37.8 M	337.0	47.77 km	34 06 24	3.00	2.08	20.08
Madill		OK Radio Station KMAD			157.0	29.68 Mi	96 46 30	71.0	300	BLH850523KA

Nearest CH 6 Grade B =KAUZTV at 78.94 km, Distance= 183.35 Azimuth = 277.2 Deg. T.

* Uses actual antenna radial HAAT and power toward reference



<p>Scale in km</p> <p>0 10 20 30 40 50 60 70</p>	<p>Prop. Denison, TX Ch. 218A 4kW 63m HAAT</p> <p>KVTT BLED861212KB 219C 100kW</p>	<p>EXHIBIT E-7(A)</p> <p>MUNN & ASSOC - 02/97</p>
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MUNN & ASSOC 30 Dec.
02-04-1997

EXHIBIT E-7(A) Detail Tabulation

AP218
Channel = 218
Max ERP = 4 kW
RCAMSL = 272 M
N. Lat = 334238
W. Lng = 963420

KVTT BLED861212KB
Channel = 219
Max ERP = 100 kW
RCAMSL = 531 M
N. Lat = 323524
W. Lng = 965821

Protected
60 dBu

Interfering
54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
170.0	4.000	59.7	20.3	21.2	100.000	316.7	112.0	52.5
171.0	4.000	60.7	20.5	21.1	100.000	316.9	111.7	52.6
172.0	4.000	61.5	20.6	21.0	100.000	317.1	111.4	52.7
173.0	4.000	60.9	20.5	20.8	100.000	317.5	111.3	52.8
174.0	4.000	60.0	20.4	20.6	100.000	318.0	111.2	52.8
175.0	4.000	59.2	20.3	20.4	100.000	318.5	111.2	52.8
176.0	4.000	58.3	20.1	20.2	100.000	319.2	111.2	52.8
177.0	4.000	57.2	19.9	20.0	100.000	319.9	111.2	52.9
178.0	4.000	56.3	19.8	19.8	100.000	320.6	111.2	52.9
179.0	4.000	56.8	19.9	19.7	100.000	321.3	111.0	53.0
180.0	4.000	57.3	20.0	19.5	100.000	322.0	110.8	53.0
181.0	4.000	57.8	20.0	19.4	100.000	322.7	110.6	53.1
182.0	4.000	57.2	19.9	19.2	100.000	323.6	110.6	53.2
183.0	4.000	56.5	19.8	19.0	100.000	324.6	110.6	53.2
184.0	4.000	55.9	19.7	18.8	100.000	325.6	110.6	53.2
185.0	4.000	55.2	19.6	18.6	100.000	326.6	110.7	53.3
186.0	4.000	54.7	19.5	18.4	100.000	327.6	110.7	53.3
187.0	4.000	53.9	19.4	18.3	100.000	328.7	110.7	53.3
188.0	4.000	52.9	19.2	18.1	100.000	329.7	110.9	53.3
189.0	4.000	52.2	19.0	17.9	100.000	330.6	110.9	53.3
190.0	4.000	51.4	18.9	17.7	100.000	331.6	111.1	53.4
191.0	4.000	50.7	18.7	17.5	100.000	332.4	111.1	53.4
192.0	4.000	50.1	18.6	17.4	100.000	333.3	111.2	53.4
193.0	4.000	49.8	18.6	17.2	100.000	334.0	111.3	53.4
194.0	4.000	49.5	18.5	17.0	100.000	334.8	111.3	53.4
195.0	4.000	49.1	18.4	16.9	100.000	335.5	111.4	53.4
196.0	4.000	48.6	18.3	16.7	100.000	336.2	111.5	53.4
197.0	4.000	48.0	18.2	16.5	100.000	336.9	111.6	53.4
198.0	4.000	47.5	18.1	16.4	100.000	337.5	111.7	53.4
199.0	4.000	46.6	17.9	16.2	100.000	338.2	111.9	53.4
200.0	4.000	45.4	17.6	16.1	100.000	338.7	112.2	53.4
201.0	4.000	44.1	17.3	15.9	100.000	339.3	112.5	53.3
202.0	4.000	43.3	17.1	15.8	100.000	339.8	112.7	53.3
203.0	4.000	43.0	17.1	15.6	100.000	340.3	112.8	53.3
204.0	4.000	42.8	17.0	15.5	100.000	340.8	112.9	53.3
205.0	4.000	42.4	16.9	15.3	100.000	341.3	113.0	53.2
206.0	4.000	42.1	16.9	15.2	100.000	341.7	113.2	53.2
207.0	4.000	42.0	16.8	15.1	100.000	342.2	113.2	53.2
208.0	4.000	42.1	16.9	14.9	100.000	342.6	113.3	53.2
209.0	4.000	42.1	16.9	14.8	100.000	343.1	113.3	53.2
210.0	4.000	41.8	16.8	14.6	100.000	343.5	113.5	53.2