Engineering Exhibit

Interference Analysis

According to 47 C.F.R. §74.1204(a), translators, such as the one proposed herein, are required to protect all existing FM stations from interference due to overlap of their protected contour with the interfering contour of the new station. To determine the best operating frequency for the proposed translator, a frequency search was performed (page 4). The numbers in the column labeled "*OUT*" are of relevance as an indication of overlap or close spacing caused by the proposed translator, there is no requirement that interfering contours from the existing station (labeled "*IN*") not intersect the service contour of the new translator.

KEFX is a licensed, Class C station on Channel 205 operating at 100 kilowatts effective radiated power in Twin Falls, Idaho. The proposed transmitter site is located entirely within the 60 dBu F(50,50) protected contour of KEFX.

KAWZ is a 100 kilowatt Class C station licensed for operation in Twin Falls, Idaho on Channel 210. The proposed transmitter site is located entirely with in the 60 dBu F(50,50) protected contour of KAWZ.

47 C.F.R. §74.1204(a) states that "an application for an FM translator station will not be accepted for filing if the proposed operation would involve overlap of predicted field strength contours with any other authorized station, including commercial and noncommercial educational FM broadcast stations, FM translators and Class D (secondary) noncommercial educational FM stations." However, §74.1204(d) states that "the provisions of this section concerning prohibited overlap will not apply where the area of such overlap lies entirely over water. In addition, *an application otherwise precluded by this section will be accepted if it can be demonstrated that no actual interference will occur due to intervening terrain, lack of population or such other factors as may be applicable*." (Emphasis added)

Using the undesired-to-desired ratio method regarding interference to a second adjacent frequency[1], "interference is predicted to occur where the translator's undesired signal exceeds the protected station's desired signal by more than 40 dB."[2] To determine the signal strength, in dBu, in which predicted interference will occur, PCC plotted KEFX's smallest contour[3] (strongest signal) that would encompass the

[1] *Second Report and Order*, FCC 00-368 at 9 and 39.
[2] *Memorandum Opinion and Order*, FCC 02-244 at 5 and 6. (In response to Application of Living Way Ministries, Inc., File No. BPFT-19981001TA.)
[3] PCC has chosen to conduct its interference analysis using KEFX only. KEFX is the station with the closest adjacency (second adjacent) and both KEFX and KAWZ are transmitting from the same location with the same pattern and same power. PCC is using KEFX on the worst-case scenario basis.

proposed transmitter site. As seen on pages 6 and 7, the 88.25 dBu F(50,50) protected contour of KEFX wholly encompasses the transmitter location. The predicted interfering contour of the proposed station is then the 128.25 dBu F(50,10) [88.25 + 40 = 128.25]. This contour is also wholly encompassed by the 88.25 dBu F(50,50) protected contour.

To plot this predicted interference area, one must first determine the distance from the tower to the 128.25 dBu F(50,10) contour. Using the free space calculation,

$RAD_m = ([23.102 \times (v\mathbf{W})] / [e^{(\mathbf{y}/8.6597)} \times 10^{-6}]) / 3.2808$

Where: RAD_m = Radius of contour in meters from COR
W = ERP in Watts
Y = Contour in dBu

the distance from the transmit Center of Radiation to where predicted interference will conjecturally cease can be calculated. Following is the use of the free space calculation to establish this distance:

$RAD_m = ([23.102 \times (v\mathbf{190})] / [e^{(\mathbf{128.25}/8.6597)} \times 10^{-6}]) / 3.2808$

$RAD_m = ([23.102 \times (13.784)] / [e^{(\mathbf{14.80998187})} \times 10^{-6}]) / 3.2808$

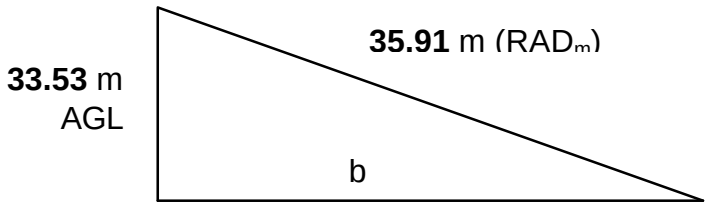
$RAD_m = ([23.102 \times (13.784)] / [\mathbf{2703294.764} \times 10^{-6}]) / 3.2808$

$RAD_m = (\mathbf{318.438} / \mathbf{2.703294764}) / 3.2808$

$RAD_m = \mathbf{117.7963} / 3.2808$

$RAD_m = \mathbf{35.91}$

After the distance of theoretical interference has been calculated, it is necessary to determine what land area, if any, this contour encompasses. Employing the Pythagorean theorem ($c^2 = a^2 + b^2$), an area circum-navigating the transmitter location to which potential interference may exist can be concluded with little effort.



$\mathbf{35.91}^2 = \mathbf{33.53}^2 + b^2$

1289.53 = **1124.26** + b^2

1289.53 – **1124.26** = b2

165.27 = b^2

b = **12.86** m

Thus, the radius of where the 128.25 dB contour encompasses the ground extends a mere **12.86** meters or **42.2** feet. Page 8 of this exhibit is an enlargement of the pertinent area of the FILER, IDAHO, USGS Quadrangle demonstrating the proposed translator's area of potential interference to the off-the-air signal of KEFX. Evidenced by this plot, there exists a lack of population within the 128.25 dBu F(50,10) interference area that encompasses the surrounding terrain, demonstrating compliance with the provision of §74.1204(d) stated above.

The only structures found within the proposed potential interference area have been identified as nonresidential, broadcast structures containing transmitting equipment, located within a fenced, controlled environment, off limits to public travel. Because the proposed translator creates a theoretical interference zone, *only in a nonresidential, unpopulated area*, that extends a mere 42.2 feet and in which exists a "lack of population", *or even potential population*, in the proposed translator's 128.25 dBu F(50,10) interference contour, the proposed translator is in compliance with the provision of 47 C.F.R. §74.1204(d).

I.F. Analysis

Page 4 of this exhibit shows that the proposed translator's interfering contour will not overlap the protected contour(s) of stations that are 53 or 54 channels away.

Twin Falls, Idaho
Interference Analysis

REFERENCE CH# 207D - 89.3 MHz, Pwr= 0.19 kW, HAAT=112.6M, COR= 1180 M DISPLAY DATES

42 33 06 N Average Protected F(50-50)= 12.7 km DATA 05-06-03
114 30 59 W Ave. F(50-10) 40 dBu= 43.6 54 dBu= 19.0 80 dBu= 4.0 100 dBu= 1.0 SEARCH 06-12-03

CH CALL	TYPE AZI. DIST	LAT.	Pwr(kW) COR(M)	PRO(km)	*IN*	*OUT*
CITY	STATE <-- FILE #	LNG.	HAAT(M) INT(km)	LICENSEE	(Overlap in km)	
210C KAWZ	LIC DE 22.8 21.47	42 43 47	100 1475	10.1	0.39	-55.72*
Twin Falls	ID 202.8 BLED20010305AAO	114 24 52	353 0.9	Calvary Chapel Of Twin Fal		
205C KEFX	LIC DV 22.8 21.47	42 43 47	100 1475	10.1	0.39	-55.72*
Twin Falls	ID 202.8 BLED20010227AAI	114 24 52	353 0.9	Calvary Chapel Of Twin Fal		
210C0 KAWZ.C	CP VX 22.8 21.47	42 43 47	100 1475	10.1	0.39	-55.72*
Twin Falls	ID 202.8 BPED20030103AAR	114 24 52	353 0.9	Calvary Chapel Of Twin Fal		
205C0 KEFX.C	CP VX 22.8 21.47	42 43 47	100 1475	10.1	0.39	-55.72*
Twin Falls	ID 202.8 BPED20030103AAQ	114 24 52	353 0.9	Calvary Chapel Of Twin Fal		
06-2C KPVI	LI HN 76.2 182.44	42 55 15	100 2078	147.6	To Grd B= 53.32	
Pocatello	ID 256.2 BLCT2335	112 20 44	615 208.2	Oregon Trail Broadcasting		

"*"Affixed to 'IN' or 'Out' values = site inside protected contour.
ERP and HAAT are on direct line to and from reference station.

Engineering Exhibit

Guide to Interpretation
of
Interference Checks on Page 4 of Engineering Exhibit

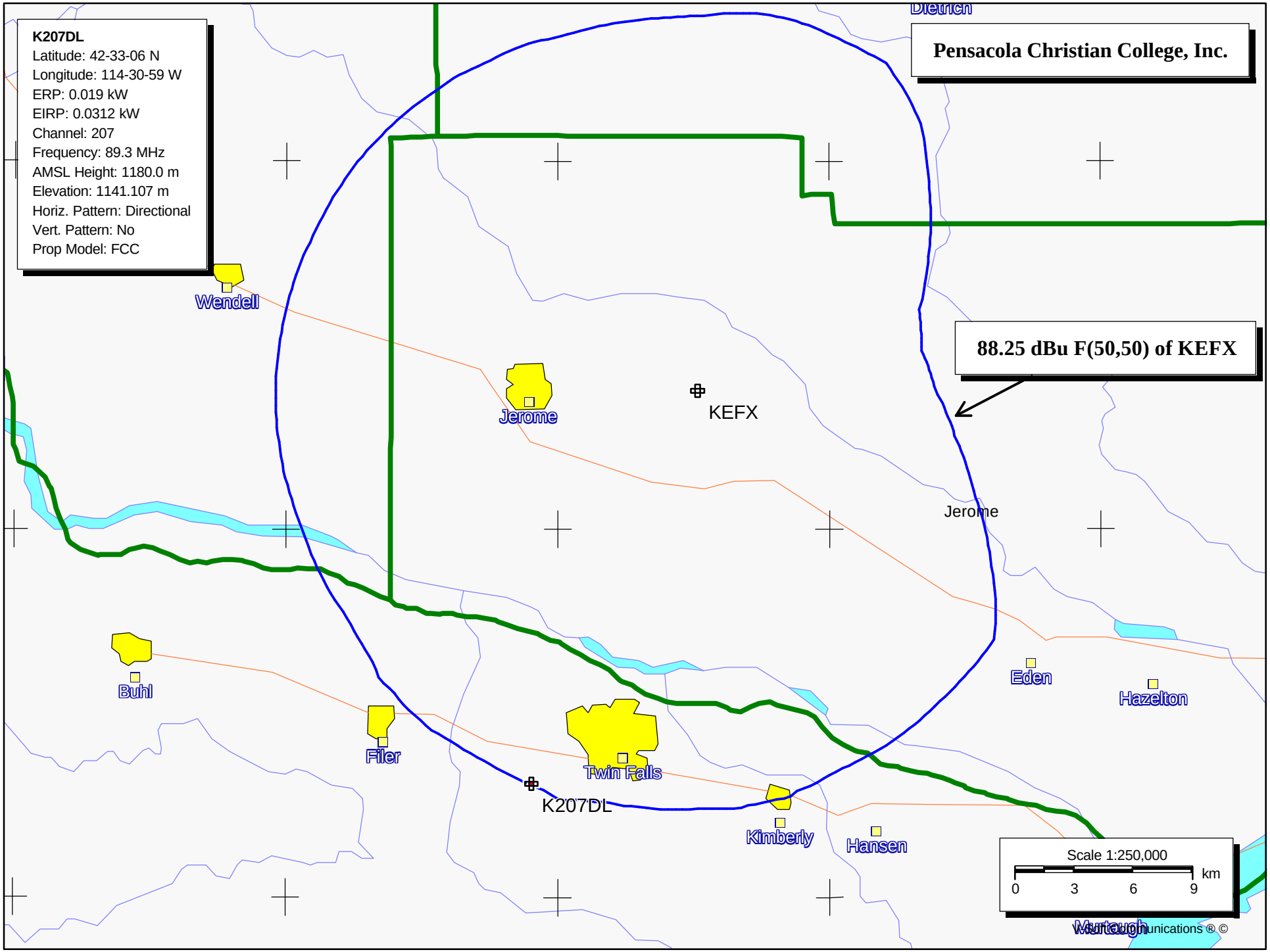
The computer printout should be self-explanatory for the most part. The parameters of the station being checked, (reference station) are printed in the heading. The 60dBu protected contour is predicted from the Commission's F(50-50) table, while the 40, 54, 80 and 100 dBu contours are interference contours derived from the Commission's F(50-10) table. Contour distances are in kilometers and are predicted using spline interpolation from data points identical to those published in Report No. RS 76-01 by Gary C. Kalagian. Critical contour distances are determined using the Commission's TVFMINT FORTRAN subroutine. When interference contour distances are less than 16 kilometers the F(50-50) tables are used. If signal contour distances are less than 1.6 km the free-space equation is used.

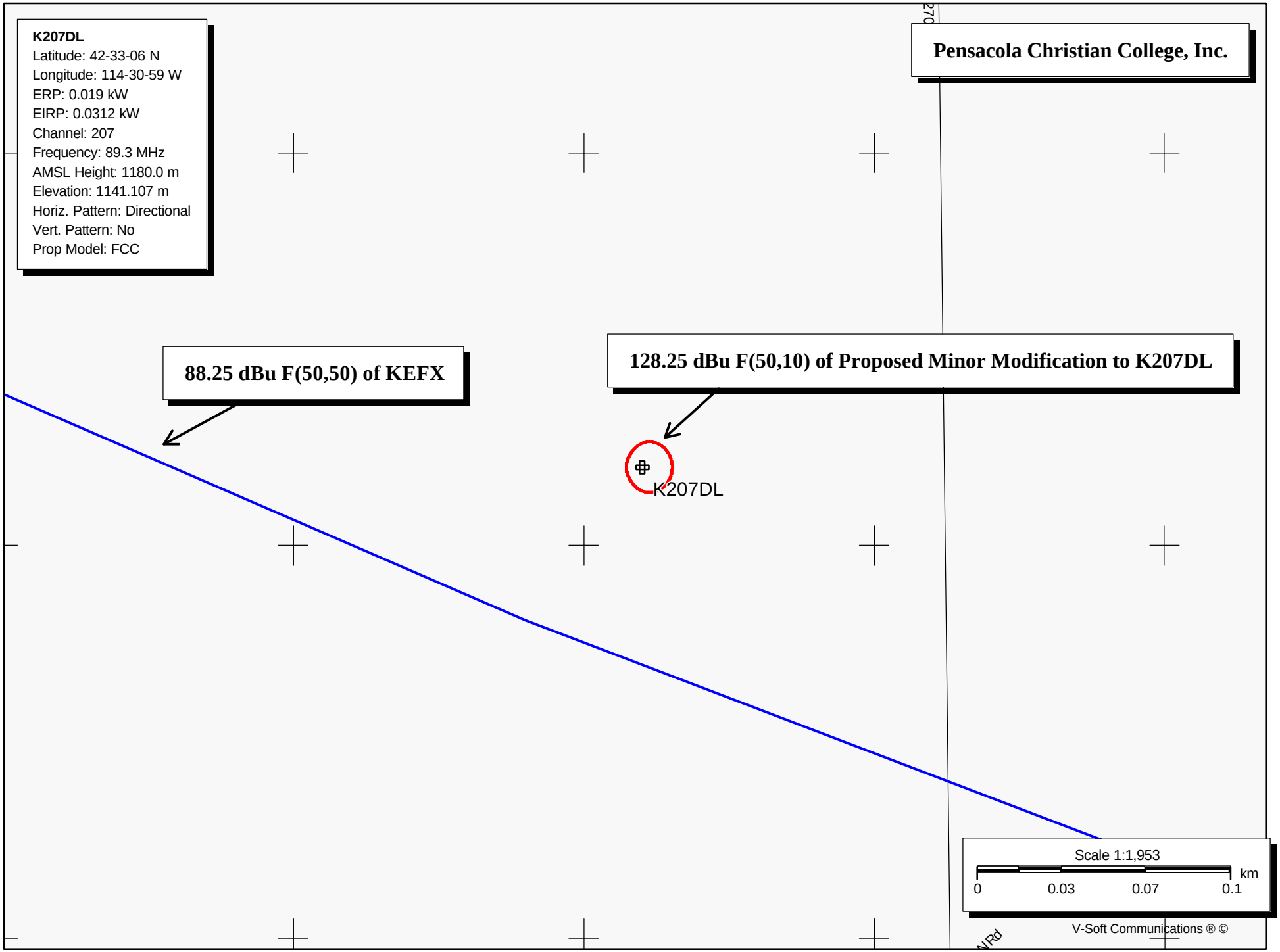
The column listed "*IN*" is the sum of the reference station's 60 dBu protected contour and the data file station's interference contour subtracted from the distance between the stations. (All distances are derived by the method detailed in Sec. 73.208 of the Rules and Regulations as amended in Docket 80-90.) Therefore, the column is a measure of incoming interference. Negative distances in this column indicate the presence of interference. Listed antenna heights are the average heights of eight standard radials as found in the Commission's records unless otherwise noted, in which case the specific antenna heights along the azimuths between the reference station and the database station are used and vice versa. The column labeled "* OUT *" shows the distance of kilometers of overlap or clearance between the reference station's interference contour and the database station's protected contour. Negative distance figures in this column indicate outgoing interference.

Under the "BEARING" column, the first row of numbers indicate the bearings from true north of the data base stations in relationship with the reference station, while the numbers in the second row indicate the reverse bearings from the database station to the reference station.

The columns labeled "INT" and "PRO" hold the distance in kilometers of the appropriate interference contour and the protected contour of a data base station.

For I.F. relationships the "IN" and "OUT" columns change their significance. The letter "R" stands for the minimum required distance in kilometers, while the letter "M" in the next column follows the available clear space separation in kilometers or "Margin". This same procedure is used for all Canadian and Mexican spacing. Minimum separation distances were taken from Sec 73.207 of the rules as amended. Canadian separation distances were derived from the "Canadian/American Working Agreement". The first three letters of the "TYPE" column identify the current FCC status of the stations. The fourth letter will be a "D" or "Z" (Sec.73.215) if the facility is directional. The fifth letter will be an E, H or V depending on the type of antenna polarization. The sixth letter will be a 'Y' if the antenna uses beam tilt.


K207DL
Latitude: 42-33-06 N
Longitude: 114-30-59 W
ERP: 0.019 kW
EIRP: 0.0312 kW
Channel: 207
Frequency: 89.3 MHz
AMSL Height: 1180.0 m
Elevation: 1141.107 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: FCC
Pensacola Christian College, Inc.
88.25 dBu F(50,50) of KEFX
Dietrich
Wendell
Jerome
KEFX
Jerome
Buhl
Filer
Twin Falls
K207DL
Kimberly
Hansen
Eden
Hazelton
Murtaugh
Scale 1:250,000
0 3 6 9 km
Mapmaker Communications ® ©


K207DL
Latitude: 42-33-06 N
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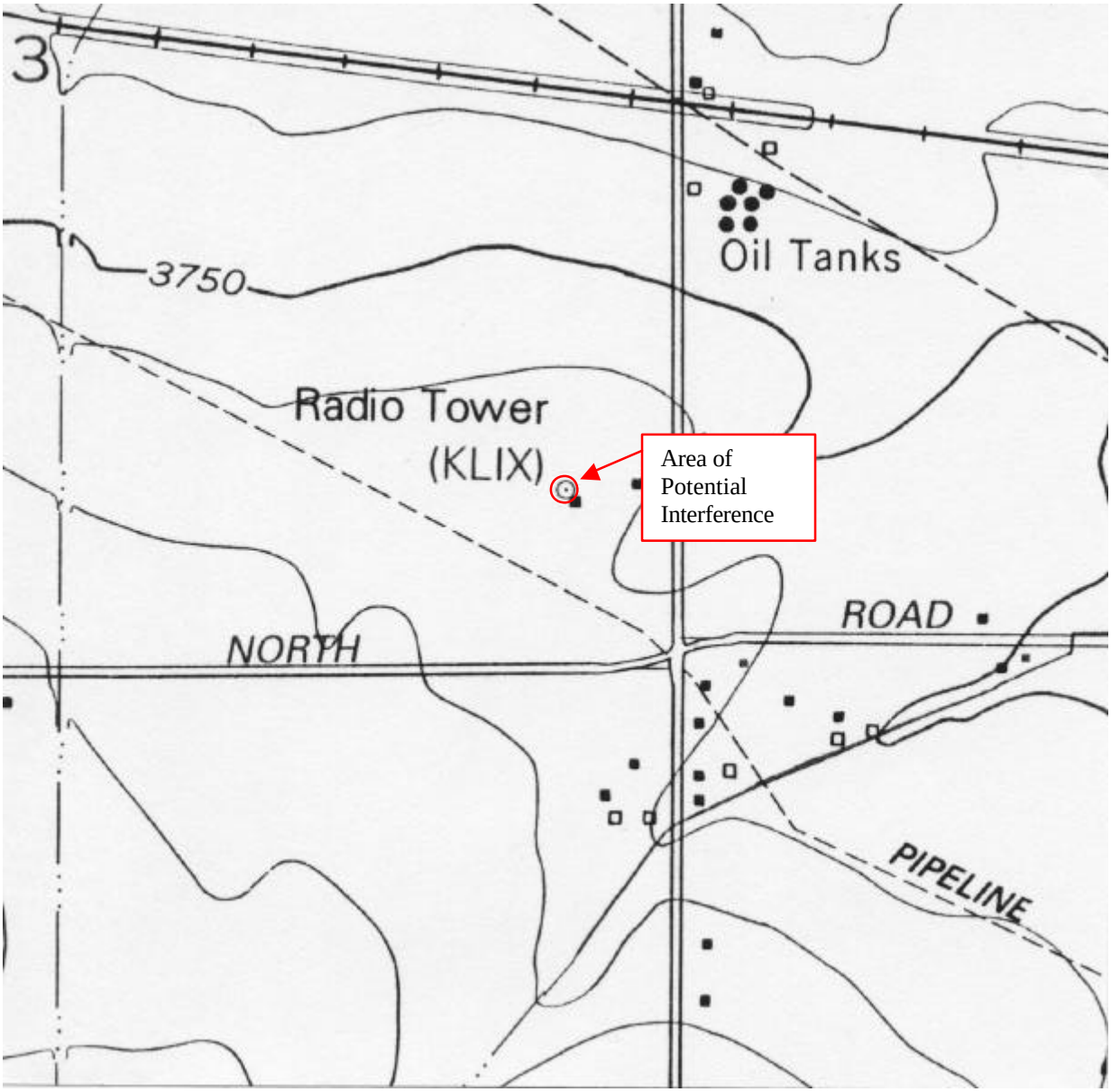
EIRP: 0.0312 kW
Channel: 207
Frequency: 89.3 MHz
AMSL Height: 1180.0 m
Elevation: 1141.107 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: FCC
Pensacola Christian College, Inc.
88.25 dBu F(50,50) of KEFX
128.25 dBu F(50,10) of Proposed Minor Modification to K207DL
K207DL
Scale 1:1,953
km
0
0.03
0.07
0.1
V-Soft Communications ® ©

Engineering Exhibit

Exhibit Showing "Lack of Population"



This is an enlarged section of the relevant USGS map FILER, IDAHO showing the F(50,10) 128.25 dBu contour overlap area. The interference zone is entirely encompassed by the F(50,50) 88.25 dBu contour of the 2nd adjacent FM station KEFX.