ENGINEERING REPORT:

APPLICATION FOR NEW FM BOOSTER STATION
for
KUFX (FM) CHANNEL 253B, 98.5 MHz
SAN JOSE, CA

CITICASTERS LICENSES, INC.

1/2002

Table of Contents

1. Purpose of Report

This Engineering Report is part of an application for a new FM Booster station for FM Station KUFX San Jose, CA by Citicasters Licenses, Inc.

2. Facilities Proposed

The proposed operation will be an FM Booster Station on FM Channel 253 (98.5 MHz) with a maximum lobe effective radiated power of 2.8 kilowatts (vertical only) and antenna height above average terrain of –63.36 meters. Operation is proposed with a vertically polarized Scala CL-FM/VAM composite antenna side mounted on a 23 meter wooden pole. The proposed FM Booster site location is shown in Exhibit 1-A of this report. Tabulated height above average terrain data is shown in Exhibit 6 of this report.

3. Service Area

The proposed FM Booster station complies with 47 C.F.R. Section 74.1232 (f). The service contour of the proposed FM Booster station falls completely within the protected coverage contour for KUFX. The location of the protected contour for KUFX and the service contour for the proposed FM Booster station are shown in Exhibit 11-A of this report.

4. Interference

The proposed operation complies with the applicable sections of 47 C.F.R. Section 74.1204.

Specifically, the proposed FM Booster station complies with 47 C.F.R Section 74.1204 (g). The proposed operation meets the required separation distances set out in section 73.207 for stations 53 or 54 channels removed. An FM Spacing Study is included as Exhibit 12-A1 of this report. The proposed FM Booster station was treated as its FM radio station broadcast station equivalent (class A) as determined by 47 C.F.R. Section 73.210 and 73.211. The study reveals no short spacings to any station 53 or 54 channels removed from the proposed FM Booster station. In addition, a TV Channel 6 Spacing Study is included as Exhibit 12-A1B of this report to show compliance with 47 C.F.R. 73.207 (c). The proposed FM Booster station was treated as its FM radio station broadcast station equivalent (class A) as determined by 47 C.F.R. Section 73.210 and 73.211.

Specifically, the proposed FM Booster station complies with 47 C.F.R Section 74.1204 (i). The proposed operation meets the requirement that the signal of any first adjacent station must exceed the signal of the booster station by 6 dB at all points within the protected contour of any first adjacent channel station. A tabulation of all first adjacent stations located within a 200 km radius of the proposed FM Booster station is shown in Exhibit 12-A2A of this report. The protected contours of each first adjacent station and the service contour of the proposed FM Booster station are shown in Exhibit 12-A2B of this report.

The proposed FM Booster station will not operate in the reserved band (channels 201-220) and thus is not required to comply with 47 C.F.R. Section 74.1205.

5. NIER Study

In addition to the proposed FM Booster station, FM Booster station KISQ-FM2 is located on the proposed site. This is a controlled access site.

The power density calculations for this report were made in accordance with the methods outlined in the report “Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields” (OET Bulletin 65 Edition 97-1 August 1997). All calculations are based on vertical plane relative field data supplied by the manufacturer of the antennas and follow the procedure shown in OET Bulletin 65.

The following equation from OET Bulletin 65 Edition 97-1 was used to calculate the ground level power density from each antenna at incremental distances from the base of the supporting structure out to 500 meters:

Formula (7) from Section II of OET 65:

$$S= (2.56) (EIRP)/(4) (PI) (R)^2$$

Where:
S = Highest power density (mW/cm^2) at ground level
R = Distance from center antenna to ground in cm,
EIRP = 1.64 times ERP relative to dipole in mW,

Proposed FM Booster Station NIER Analysis

The calculated power density from the proposed FM Booster station utilizes vertical plane relative field data provided by the manufacturer for the Scala CL-FM/VAM antenna array. Tabulated vertical plane relative field data is provided in Exhibit 15-A1. The highest calculated ground level power density occurs 14 meters from the base of the supporting structure. The power density at this point is calculated to be 0.0246 mW/cm^2. This is 2.5% of 1 mW/cm^2 which is the ANSI standard for controlled environments such as this one. This is 12.3% of 0.2 mW/cm^2 which is the ANSI standard for uncontrolled environments.

Station: proposed FM Booster with antenna up 13 meters and ERP 2.8 kW

$$S = \frac{(2.56)\,(1.64)\,(1000)\,(2{,}800)\,(0.310)^2}{(4)\,(3.14)\,(1{,}910)^2}$$

Max field 0.31, 54 deg down at 14 meters horizontal.
MAX S = 1.0 mW/cm^2 for FM station between 88 and 108 mHz
ERP = (horizontal plus vertical times field $factor^2$.)

S= 0.0246 mW/cm^2, 2.5 % of Controlled Exposure allowed.
S= 0.0246 mW/cm^2, 12.3 % of Uncontrolled Exposure allowed.

KISQ-FM2 NIER Analysis

The calculated power density from the FM Booster station KISQ-FM2 utilizes vertical plane relative field data provided by the manufacturer for the Scala 4CL-FM/CP antenna array. This antenna consists of two cross polarized, horizontal and vertical, antenna arrays. Vertical plane characteristics for each array, horizontal and vertical, were analyzed individually for compliance. Tabulated vertical plane relative field data is provided in Exhibit 15-A2.

The highest calculated ground level power density for the horizontally polarized array occurs 12.0 meters from the base of the supporting structure. The power density at this point is calculated to be 0.0048 mW/cm^2. This is 0.5% of 1 mW/cm^2 which is the ANSI standard for controlled environments such as this one. This is 2.4% of 0.2 mW/cm^2 which is the ANSI standard for uncontrolled environments.

Station: KISQ-FM2 Horizontally polarized array with antenna up 23 meters and ERP 10.0 kW

$$S = \frac{(2.56)\,(1.64)\,(1000)\,(10{,}000)\,(0.098)^2}{(4)\,(3.14)\,(2{,}594)^2}$$

Max field 0.10, 65 deg down at 12 meters horizontal.
MAX S = 1.0 mW/cm^2 for FM station between 88 and 108 mHz
ERP = (horizontal plus vertical times field factor^2.)

S= 0.0048 mW/cm^2, 0.5 % of Controlled Exposure allowed.
S= 0.0048 mW/cm^2, 2.4 % of Uncontrolled Exposure allowed.

The highest calculated ground level power density for the vertically polarized array occurs 29.0 meters from the base of the supporting structure. The power density at this point is calculated to be 0.0052 mW/cm^2. This is 0.5% of 1 mW/cm^2 which is the ANSI standard for controlled environments such as this one. This is 2.6% of 0.2 mW/cm^2 which is the ANSI standard for uncontrolled environments.

Station: KISQ-FM2 Vertically polarized array with antenna up 23 meters and ERP 10.0 kW

$$S = \frac{(2.56)\,(1.64)\,(1000)\,(10{,}000)\,(0.146)^2}{(4)\,(3.14)\,(3{,}701)^2}$$

Max field 0.15, 52 deg down at 29 meters horizontal.
MAX S = 1.0 mW/cm^2 for FM station between 88 and 108 mHz
ERP = (horizontal plus vertical times field factor^2.)

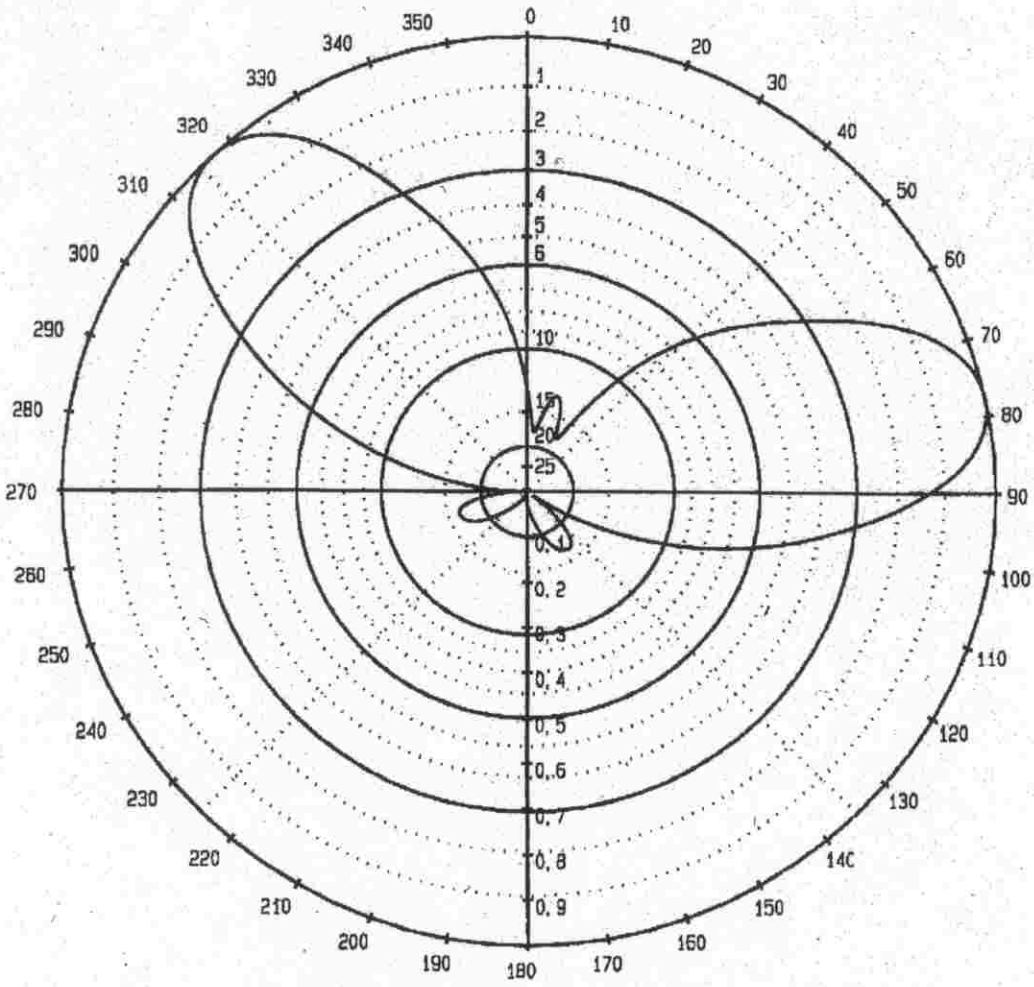
S= 0.0052 mW/cm^2, 0.5 % of Controlled Exposure allowed.
S= 0.0052 mW/cm^2, 2.6 % of Uncontrolled Exposure allowed.

Based on the analysis of both the current and proposed operations shown above for this site, the proposed FM booster station complies with 47 C.F.R. Section 1.1306 with regard to maximum permissible radio frequency electromagnetic exposure limits for controlled and uncontrolled environments.

Public access to the site is restricted and the antenna structure is posted with warning signs. Pursuant to OET Bulletin 65, all station personnel and contractors are required to follow appropriate safety procedures before any work is done on the site, including reducing or removing power before any maintenance work begins.

The permittee/licensee, in coordination with other users of the site, must reduce power or cease operation as necessary to protect persons having access to the site, structure or antenna from radio frequency radiation in excess of FCC guidelines.

Proposed FM Booster Station
Directional Antenna Data



frequency in MHz 98.500
down-tilt in ° .0
max / mean in dB 6.24

KSJO / KUFO

S C A L A Medford Oregon	2 x 2 CL-FM/VRM Log-Periodic array	Typ Nr.
MB 16.10.** 17:19	Frequency: 98.5 Mhz.	Bl.:

simulation with typical exactness of +/- 8% of max signal

Azimuth Radiation Pattern in % and dB at downtilt: .0

f = 98.500MHz

azimuth	%	dB	azimuth	%	dB
0	23.3	-12.6	180	3.2	-30.0
5	14.1	-17.0	185	2.2	-33.1
10	15.6	-16.2	190	1.2	-38.1
15	21.2	-13.5	195	.8	-41.9
20	21.1	-13.5	200	.8	-41.9
25	15.6	-16.1	205	1.2	-38.2
30	14.1	-17.0	210	2.2	-33.1
35	23.2	-12.7	215	3.2	-29.9
40	35.2	-9.1	220	4.3	-27.2
45	46.4	-6.7	225	6.1	-24.3
50	56.2	-5.0	230	8.3	-21.6
55	65.7	-3.6	235	11.0	-19.2
60	76.3	-2.4	240	13.3	-17.5
65	87.0	-1.2	245	14.8	-16.6
70	95.3	-.4	250	15.4	-16.2
75	99.5	.0	255	14.8	-16.6
80	99.6	.0	260	11.7	-18.7
85	95.2	-.4	265	6.1	-24.3
90	86.1	-1.3	270	2.3	-32.6
95	73.9	-2.6	275	11.4	-18.9
100	60.9	-4.3	280	22.5	-13.0
105	48.0	-6.4	285	35.0	-9.1
110	34.9	-9.1	290	47.9	-6.4
115	22.5	-13.0	295	61.0	-4.3
120	11.4	-18.9	300	73.9	-2.6
125	2.3	-32.6	305	86.1	-1.3
130	6.2	-24.1	310	95.2	-.4
135	11.7	-18.6	315	99.6	.0
140	14.8	-16.6	320	99.5	.0
145	15.4	-16.2	325	95.2	-.4
150	14.7	-16.6	330	87.0	-1.2
155	13.3	-17.5	335	76.3	-2.4
160	11.0	-19.2	340	65.7	-3.6
165	8.3	-21.6	345	56.1	-5.0
170	6.1	-24.3	350	46.4	-6.7
175	4.3	-27.3	355	35.4	-9.0
180	3.2	-30.0	360	23.3	-12.6

maximum fieldstrength was found at:
azimuth 317.
downtilt 0.

KSJO / KUFO

SCALA Medford Oregon	2 x 2 CL-FM/VRM Log-Periodic array	Typ Nr.
MB 16.10.** 17:19	Frequency: 98.5 Mhz.	Bl.:

Dimensions and Feeding of Antenna System
antenna type: K52221. log.-per antenna verti 87.5-108 MHz

operating f in MHz :	98.500	.000	.000	.000	.000
database f in MHz :	975				
max. azimut angle	180	max. declination	90	cable design frequency:	98.500 MHz
compensation in % :	.00	.00	.00	.00	.00

bay	height	v-feed power	cab-ph	fix-ph	panel	azipos	azidir	radius	tanoff	radoff	tilt	power	cab-ph	fix-ph
2	3100	1.0	0	0	1	77.0	77.0	254.0	-1000.0	.0	.0	1.0	0	0
					2	77.0	77.0	254.0	1000.0	.0	.0	1.0	0	0
bay	height	v-feed power	cab-ph	fix-ph	panel	azipos	azidir	radius	tanoff	radoff	tilt	power	cab-ph	fix-ph
1	0	1.0	0	0	1	318.0	318.0	254.0	-1000.0	.0	.0	1.0	0	0
					2	318.0	318.0	254.0	1000.0	.0	.0	1.0	0	0

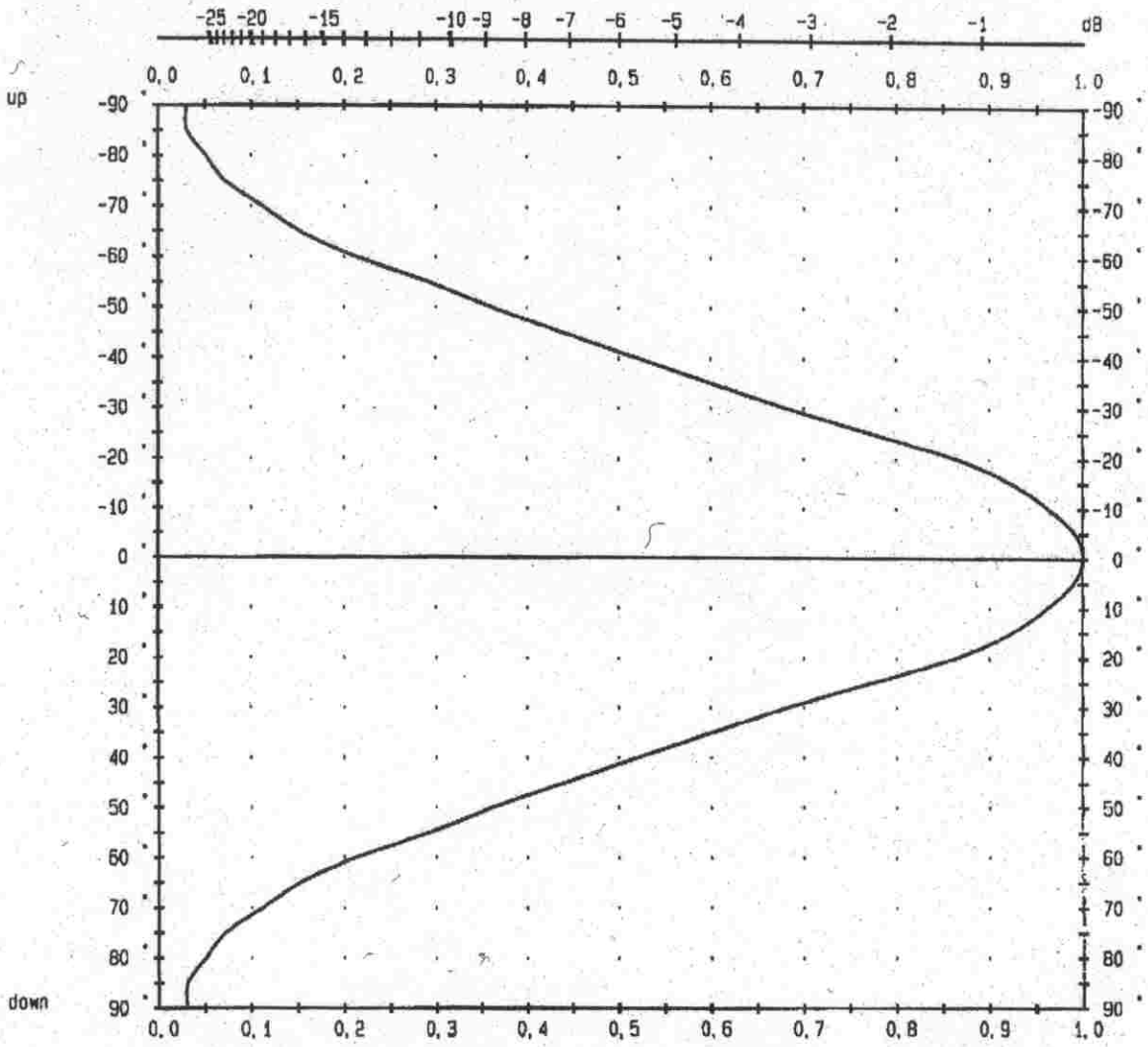
Directivity from HRP and zoomed VRP

operating f in MHz :	98.500	.000	.000	.000	.000
operating channel :	0	0	0	0	0
HRP max/mean in dB :	6.24	.00	.00	.00	.00
VRP omnidir in dB :	.90	.00	.00	.00	.00
directivity in dB :	7.14	.00	.00	.00	.00
harness losses :	.00	.00	.00	.00	.00
gain in dB :	7.14	.00	.00	.00	.00

allow +-0.5 dB tolerance for pattern variations
harness parameters at cable design frequency:
bay feeder : .0 m áÄÄσ⌐└⌐ (a = .00 dB)
antenna cable: .0 m áÄÄσ⌐└⌐ (a = .00 dB)

KSJO / KUFO

S C A L A Medford Oregon	2 x 2 CL-FM/VRM Log-Periodic array	Typ Nr.
MB 16.10.** 17:19	Frequency: 98.5 Mhz.	Bl.:



frequency in MHz 98.500
azimut in ° 78.0
omni-dir in dBd .90

KSJO / KUFO

S C A L A Medford Oregon	2 x 2 CL-FM/VRM Log-Periodic array	Typ Nr.
MB 16.10.** 17:19	Frequency: 98.5 Mhz.	Bl.:

EXHIBITS

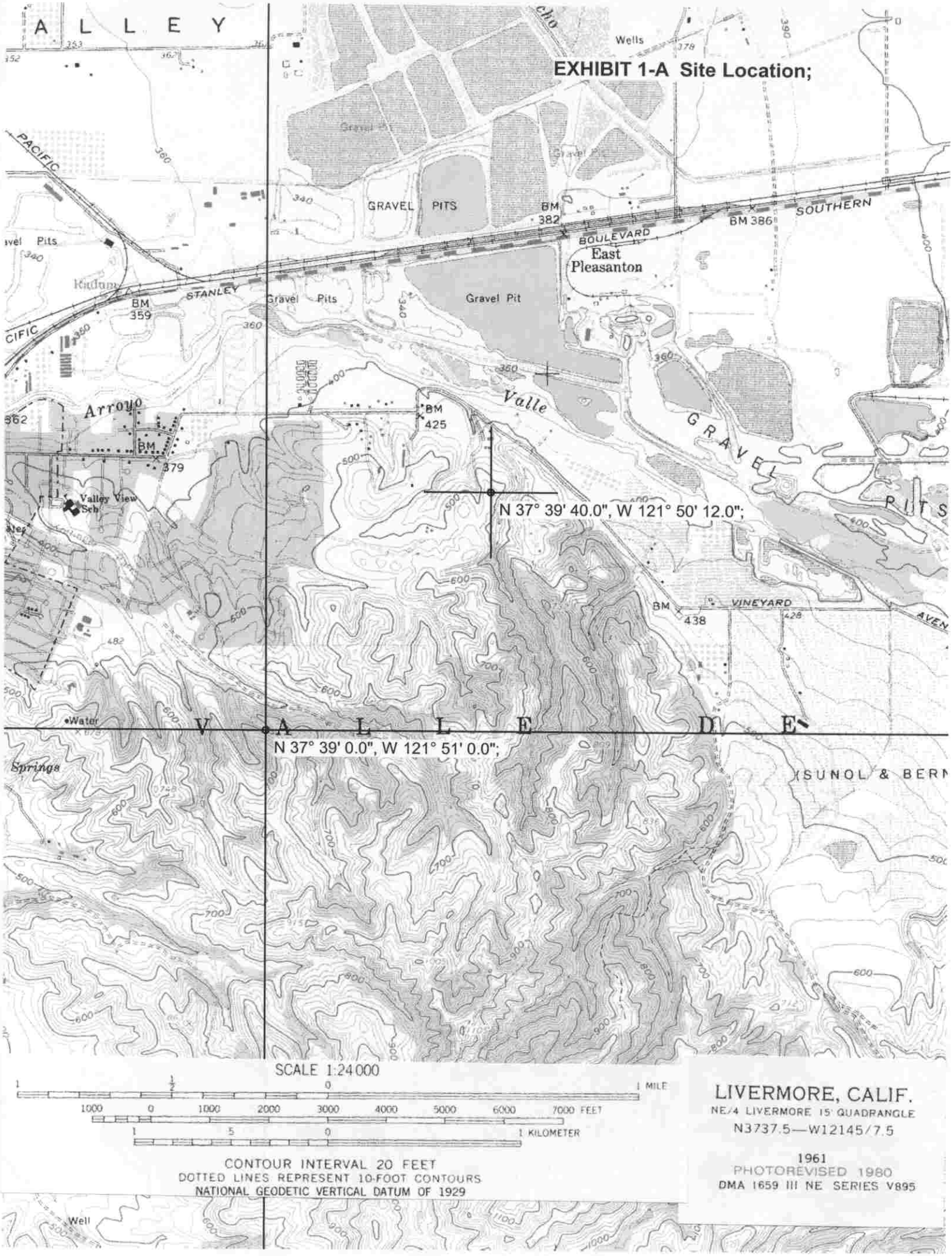


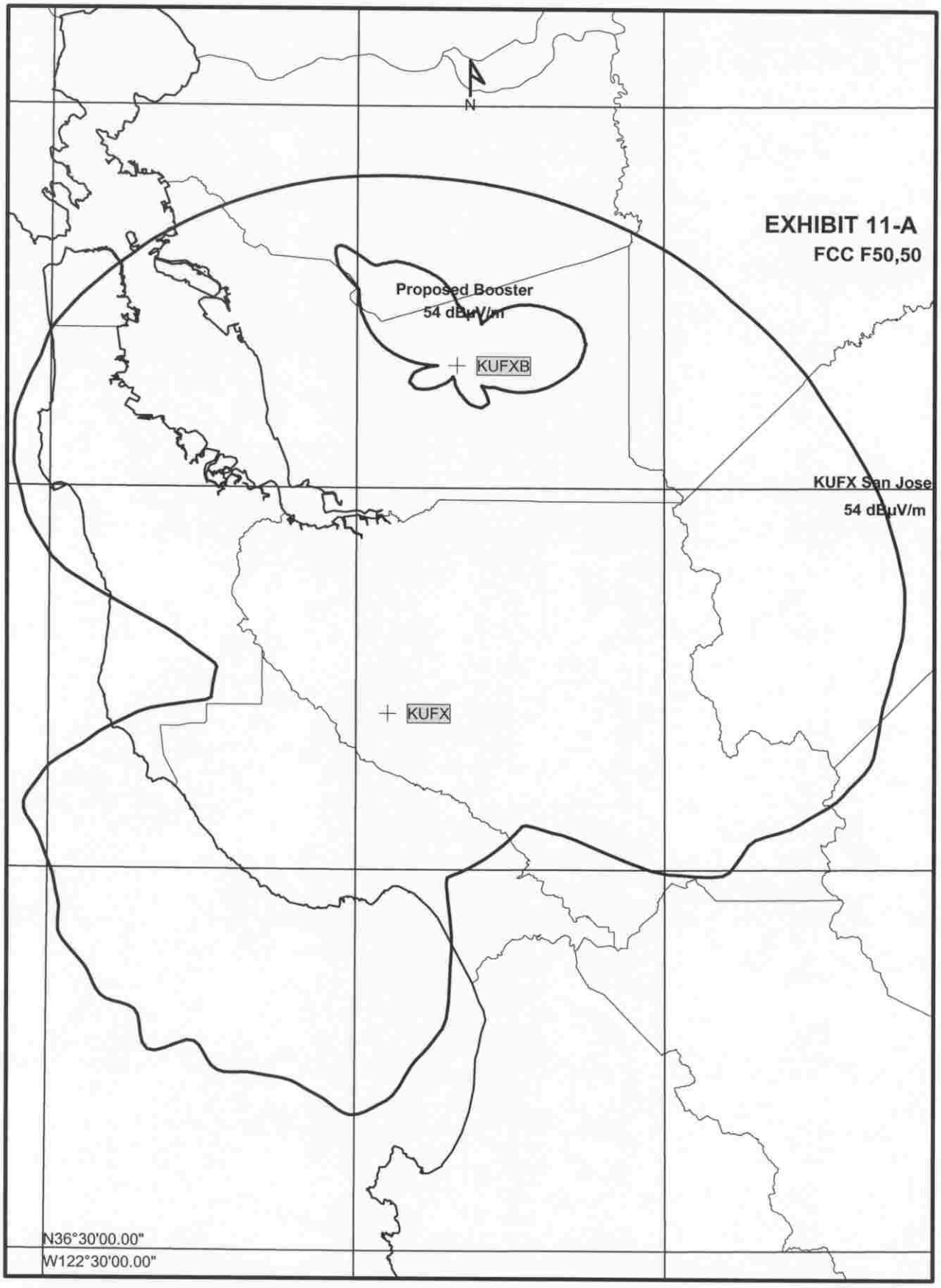
EXHIBIT 1-A Site Location;
N 37° 39' 40.0", W 121° 50' 12.0";
N 37° 39' 0.0", W 121° 51' 0.0";
V A L L E Y
A L L E Y
PACIFIC
STANLEY
SOUTHERN
BOULEVARD
East Pleasanton
GRAVEL PITS
Gravel Pit
Gravel Pits
BM 382
BM 386
BM 359
BM 425
BM 379
BM 438
Arroyo
Valley View Sch
VINEYARD
Water
Springs
SCALE 1:24 000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER
CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929
LIVERMORE, CALIF.
NE/4 LIVERMORE 15' QUADRANGLE
N3737.5—W12145/7.5
1961
PHOTOREVISED 1980
DMA 1659 III NE SERIES V895

HAAT Study for: Proposed Booster 37-39-40
Location: Pleasanton, CA 30" Terrain Database 121-50-12

Site Elevation Above Mean Sea Level: 156 meters
Height of Radiation Center Above Ground: 13 meters

Height of Radiation center Above Mean Sea Level: 169 meters

AZ(deg)	Avg El 3-16 km	HAAT
000	229.44 meters	- 60.44 meters
045	193.89 meters	- 24.89 meters
090	211.67 meters	- 42.67 meters
135	380.00 meters	-211.00 meters
180	232.78 meters	- 63.78 meters
225	187.22 meters	- 18.22 meters
270	296.11 meters	-127.11 meters
315	127.78 meters	- 41.22 meters
Total Average	232.36 meters	- 63.36 meters


N
EXHIBIT 11-A
FCC F50,50
Proposed Booster
54 dBµV/m
KUFXB
KUFX San Jose
54 dBµV/m
KUFX
N36°30'00.00"
W122°30'00.00"

73.207 Spacing Study

FM Study for: Proposed Booster FCC DB Date: 12/20/2001 37-39-40
Location: PLEASANTON, CA Channel Class: A 121-50-12

[*] by HAAT indicates calculated as missing in database.
[^] by HAAT indicates value taken from 1999 VAX file.

Call Status	City, State Proponent	Chan	Class	Freq	kW	File Number	HAAT	Latitude Longitude	Dist. Azm.	Required Clear (km)	
>>>>>>>> Study For Channel 253 98.5 mHz <<<<<<<<											
KUFX	SAN JOSE, CA	253	B	98.5	10.0			37-12-17	51.6	178	
LIC	Fac. No. 65415					BMLH-20010711AC0	268	121-56-56	191.1	-126.4	SHORT
	Use of 73.215 for short spacing requires:						143			-91.4	SHORT
KRXQ	SACRAMENTO, CA	253	B	98.5	50.0			38-38-53	127.3	178	
LIC	Fac. No. 20354					BLH-19931005KB	151	121-05-51	30.4	-50.7	SHORT
	Use of 73.215 for short spacing requires:						143			-15.7	SHORT
KSOL	SAN FRANCISCO, CA	255	B	98.9	6.10			37-45-19	55.2	69	
LIC	Fac. No. 70032					BLH-19990723KF	409	122-27-06	281.1	-13.8	SHORT
	Use of 73.215 for short spacing requires:						63			-7.8	SHORT
KZOL	SANTA CRUZ, CA	256	B	99.1	1.10+			37-06-39	61.1	69	
LIC	Fac. No. 70033					BLH-19900116KE	796	121-50-37	180.6	-7.9	SHORT
	Use of 73.215 for short spacing requires:						63			-1.9	SHORT
KISQ	SAN FRANCISCO, CA	251	B	98.1	100.			37-51-04	61.9	69	
LIC	Fac. No. 59964					BLH-19871207KE	293	122-29-49	290.1	-7.1	SHORT
	Use of 73.215 for short spacing requires:						63			-1.1	SHORT
KISQ	SAN FRANCISCO, CA	251	B	98.1	100.			37-51-04	61.9	69	
LIC	Fac. No. 59964					BMLH-20000830AFM	293	122-29-49	290.1	-7.1	SHORT
	Use of 73.215 for short spacing requires:						63			-1.1	SHORT
KWNN	TURLOCK, CA	252	A	98.3	2.00			37-34-46	87.9	72	
LIC	Fac. No. 60427					BLH-19871001KC	119	120-50-48	95.6	+15.9	CLEAR

TV Channel 6 Spacing Study

TV Study for: Proposed Booster FCC DB Date: 12/20/2001 37-39-40
Location: PLEASANTON, CA ZONE: 2 121-50-12

CALL STATUS	LOCATION STATE	CHANNEL ZONE	ERP:KW(DA) HAAT	LATITUDE LONGITUDE	DISTANCE BEARING	REQUIRED CLEAR (km)	
>>>>>>>> Study For Channel: 6 <<<<<<<<							
KVIQ	EUREKA,CA	6 -	100.	40-43-36	387.1	22.0	CLEAR
LIC TV	BLCT-1115	ZONE:2	530	123-58-18	332.2	+365.1	
KSBY	SAN LUIS OBISPO,CA	6 +	100.	35-21-37	276.4	22.0	CLEAR
LIC TV	BLCT-1159	ZONE:2	543	120-39-17	157.1	+254.4	
KVIE	SACRAMENTO,CA	6 Z	100.	38-16-18	73.7	22.0	CLEAR
CP TV	BPET-19990927ABV	ZONE:2	550	121-30-22	23.1	+51.7	
KVIE	SACRAMENTO,CA	6 Z	100.	38-16-18	73.8	22.0	CLEAR
LIC TV	BLET-19861201L1	ZONE:2	567	121-30-18	23.2	+51.8	

First Adjacent Channel Study

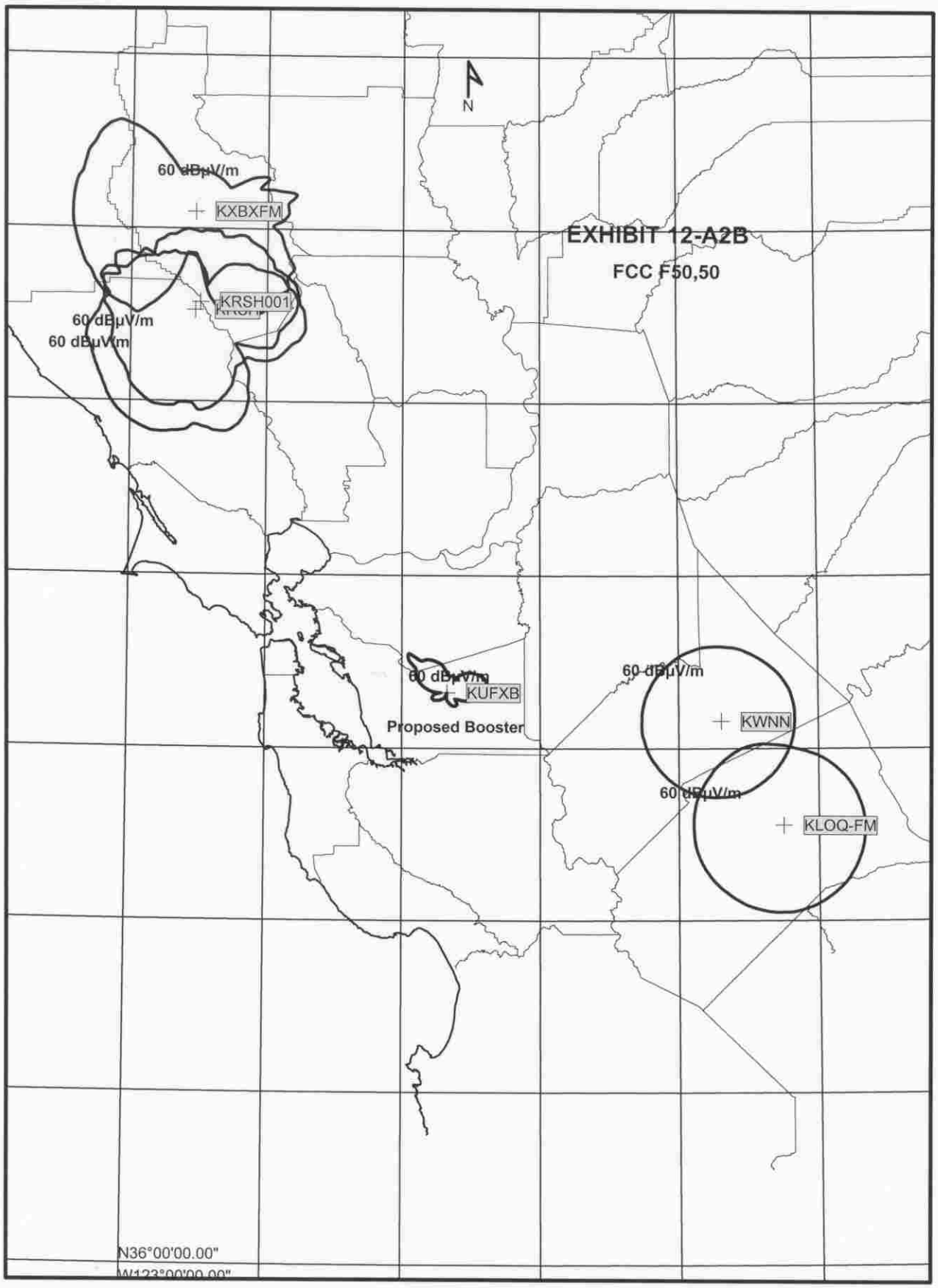
1st Adj Study for: Proposed Booster FCC DB Date: 12/20/2001 37-39-40
Location: Pleasanton, CA Channel Class: D 121-50-12

[*] by HAAT indicates calculated as missing in database.
[^] by HAAT indicates value taken from 1999 VAX file.

Call	City, State	Chan	Class	Freq	kW	Latitude	Dist.
Status	Proponent	File Number			HAAT	Longitude	Azm.

>>>>>>>> Study For Channel 253 98.5 mHz <<<<<<<<
All first adjacent stations within 200 km of proposed coordinates

KWNN	TURLOCK, CA	252	A	98.3	2.00	37-34-46	87.9
LIC	Fac. No. 60427	BLH-19871001KC			119	120-50-48	95.6
KLOQFM	WINTON, CA	254	A	98.7	6.00	37-16-41	115.2
LIC	Fac. No. 65374	BLH-19990119KH			91	120-37-35	111.3
KRSH	MIDDLETOWN, CA	254	A	98.7	.340	38-45-55	147.1
CP	Fac. No. 72925	BMPH-19930406IA			420	122-45-54	326.7
KRSH	MIDDLETOWN, CA	254	A	98.7	.165	38-47-16	148.3
CP	Fac. No. 72925	BPH-19990329IF			572	122-44-50	327.8
KXBXFM	LAKEPORT, CA	252	A	98.3	4.80	39-02-56	174.2
LIC	Fac. No. 49198	BLH-20010207AAH			112	122-46-03	332.4


N
60 dBµV/m
KXBXFM
EXHIBIT 12-A2B
FCC F50,50
KRSH001
60 dBµV/m
60 dBuV/m
60 dBµV/m
KUFXB
Proposed Booster
60 dBµV/m
KWNN
60 dBµV/m
KLOQ-FM
N36°00'00.00"

sxsclfm-vrm98

327.00	92.4	-.7
328.00	90.8	-.8
329.00	88.9	-1.0
330.00	87.0	-1.2
331.00	84.9	-1.4
332.00	82.8	-1.6
333.00	80.7	-1.9
334.00	78.5	-2.1
335.00	76.2	-2.4
336.00	74.1	-2.6
337.00	71.9	-2.9
338.00	69.7	-3.1
339.00	67.6	-3.4
340.00	65.7	-3.6
341.00	63.7	-3.9
342.00	61.9	-4.2
343.00	60.0	-4.4
344.00	58.0	-4.7
345.00	56.2	-5.0
346.00	54.3	-5.3
347.00	52.4	-5.6
348.00	50.3	-6.0
349.00	48.4	-6.3
350.00	46.3	-6.7
351.00	44.2	-7.1
352.00	42.1	-7.5
353.00	39.9	-8.0
354.00	37.7	-8.5
355.00	35.2	-9.1
356.00	33.0	-9.6
357.00	30.6	-10.3
358.00	28.1	-11.0
359.00	25.7	-11.8
360.00	23.3	-12.7

AZIMUTH ANGLE FOR VRP : 317.0

ELEVATION (°)	RELATIVE FIELD (%)	(dB)
HORIZON → .00	100.0	.0
-1.00	99.9	.0
-2.00	99.8	.0
-3.00	99.6	.0
-4.00	99.4	-.1
-5.00	99.0	-.1
-6.00	98.6	-.1
-7.00	98.0	-.2
-8.00	97.5	-.2
-9.00	96.8	-.3
-10.00	96.1	-.3

-11.00	95.5	-.4
-12.00	94.8	-.5
-13.00	94.0	-.5
-14.00	93.2	-.6
-15.00	92.3	-.7
-16.00	91.3	-.8
-17.00	90.3	-.9
-18.00	89.1	-1.0
-19.00	87.8	-1.1
-20.00	86.4	-1.3
-21.00	84.8	-1.4
-22.00	83.0	-1.6
-23.00	81.2	-1.8
-24.00	79.3	-2.0
-25.00	77.4	-2.2
-26.00	75.5	-2.4
-27.00	73.7	-2.7
-28.00	71.8	-2.9
-29.00	70.0	-3.1
-30.00	68.2	-3.3
-31.00	66.6	-3.5
-32.00	64.9	-3.8
-33.00	63.3	-4.0
-34.00	61.7	-4.2
-35.00	60.1	-4.4
-36.00	58.5	-4.7
-37.00	56.9	-4.9
-38.00	55.3	-5.1
-39.00	53.7	-5.4
-40.00	52.1	-5.7
-41.00	50.5	-5.9
-42.00	48.9	-6.2
-43.00	47.3	-6.5
-44.00	45.7	-6.8
-45.00	44.1	-7.1
-46.00	42.5	-7.4
-47.00	40.9	-7.8
-48.00	39.3	-8.1
-49.00	37.7	-8.5
-50.00	36.2	-8.8
-51.00	34.8	-9.2
-52.00	33.4	-9.5
-53.00	32.1	-9.9
-54.00	30.7	-10.3
-55.00	29.3	-10.7
-56.00	27.7	-11.2
-57.00	26.0	-11.7
-58.00	24.4	-12.2

-59.00	22.8	-12.8
-60.00	21.3	-13.4
-61.00	19.9	-14.0
-62.00	18.7	-14.6
-63.00	17.5	-15.2
-64.00	16.3	-15.7
-65.00	15.3	-16.3
-66.00	14.4	-16.8
-67.00	13.5	-17.4
-68.00	12.7	-17.9
-69.00	12.0	-18.4
-70.00	11.2	-19.0
-71.00	10.4	-19.7
-72.00	9.5	-20.5
-73.00	8.7	-21.3
-74.00	7.9	-22.1
-75.00	7.2	-22.9
-76.00	6.7	-23.5
-77.00	6.2	-24.1
-78.00	5.8	-24.7
-79.00	5.5	-25.3
-80.00	5.1	-25.8
-81.00	4.6	-26.7
-82.00	4.2	-27.6
-83.00	3.8	-28.5
-84.00	3.4	-29.4
-85.00	3.1	-30.3
-86.00	3.0	-30.6
-87.00	2.9	-30.6
-88.00	3.0	-30.6
-89.00	3.0	-30.5
-90.00	3.1	-30.3

NADIR ↓

TWO CL-FM LOG-PERIODICS, VERTICAL STACKED
HORIZONTAL POLARIZATION - VERTICAL PLANE PATTERN

Azimuth	Relative Field	Relative dB	dBd	Power Gain
90	1.000	0.0	9.5	8.913
91	0.998	-0.0	9.5	8.913
92	0.995	-0.0	9.5	8.913
93	0.990	-0.1	9.4	8.710
94	0.984	-0.1	9.4	8.710
95	0.977	-0.2	9.3	8.511
96	0.967	-0.3	9.2	8.318
97	0.956	-0.4	9.1	8.128
98	0.944	-0.5	9.0	7.943
99	0.930	-0.6	8.9	7.762
100	0.915	-0.8	8.7	7.413
101	0.897	-0.9	8.6	7.244
102	0.878	-1.1	8.4	6.918
103	0.858	-1.3	8.2	6.607
104	0.836	-1.6	7.9	6.166
105	0.815	-1.8	7.7	5.888
106	0.791	-2.0	7.5	5.623
107	0.766	-2.3	7.2	5.248
108	0.741	-2.6	6.9	4.898
109	0.715	-2.9	6.6	4.571
110	0.689	-3.2	6.3	4.266
111	0.661	-3.6	5.9	3.890
112	0.634	-4.0	5.5	3.548
113	0.606	-4.4	5.1	3.236
114	0.578	-4.8	4.7	2.951
115	0.549	-5.2	4.3	2.692
116	0.520	-5.7	3.8	2.399
117	0.491	-6.2	3.3	2.138
118	0.462	-6.7	2.8	1.905
119	0.433	-7.3	2.2	1.660
120	0.405	-7.8	1.7	1.479
121	0.377	-8.5	1.0	1.259
122	0.349	-9.2	0.3	1.072
123	0.321	-9.9	-0.4	0.912
124	0.294	-10.6	-1.1	0.776
125	0.269	-11.4	-1.9	0.646
126	0.243	-12.3	-2.8	0.525
127	0.218	-13.2	-3.7	0.427
128	0.194	-14.2	-4.7	0.339
129	0.171	-15.3	-5.8	0.263
130	0.149	-16.5	-7.0	0.200
131	0.128	-17.9	-8.4	0.145
132	0.107	-19.4	-9.9	0.102
133	0.087	-21.2	-11.7	0.068
134	0.069	-23.3	-13.8	0.042
135	0.051	-25.9	-16.4	0.023
136	0.034	-29.3	-19.8	0.010
137	0.018	-34.7	-25.2	0.003
138	0.010	-40.0	-30.5	0.001
139	0.010	-40.0	-30.5	0.001
140	0.023	-32.9	-23.4	0.005

TWO CL-FM LOG-PERIODICS, VERTICAL STACKED
HORIZONTAL POLARIZATION - VERTICAL PLANE PATTERN

Azimuth	Relative Field	Relative dB	dBd	Power Gain
141	0.034	-29.3	-19.8	0.010
142	0.045	-26.9	-17.4	0.018
143	0.055	-25.2	-15.7	0.027
144	0.064	-23.9	-14.4	0.036
145	0.071	-22.9	-13.4	0.046
146	0.078	-22.1	-12.6	0.055
147	0.084	-21.5	-12.0	0.063
148	0.089	-21.0	-11.5	0.071
149	0.094	-20.6	-11.1	0.078
150	0.097	-20.2	-10.7	0.085
151	0.099	-20.1	-10.6	0.087
152	0.100	-20.0	-10.5	0.089
153	0.101	-19.9	-10.4	0.091
154	0.100	-20.0	-10.5	0.089
155	0.099	-20.1	-10.6	0.087
156	0.096	-20.4	-10.9	0.081
157	0.092	-20.7	-11.2	0.076
158	0.087	-21.2	-11.7	0.068
159	0.081	-21.8	-12.3	0.059
160	0.075	-22.5	-13.0	0.050
161	0.071	-23.0	-13.5	0.045
162	0.066	-23.6	-14.1	0.039
163	0.061	-24.3	-14.8	0.033
164	0.055	-25.2	-15.7	0.027
165	0.049	-26.2	-16.7	0.021
166	0.045	-27.0	-17.5	0.018
167	0.040	-28.0	-18.5	0.014
168	0.035	-29.2	-19.7	0.011
169	0.029	-30.6	-21.1	0.008
170	0.024	-32.4	-22.9	0.005
171	0.022	-33.0	-23.5	0.004
172	0.021	-33.7	-24.2	0.004
173	0.019	-34.5	-25.0	0.003
174	0.017	-35.4	-25.9	0.003
175	0.015	-36.4	-26.9	0.002
176	0.015	-36.4	-26.9	0.002
177	0.015	-36.4	-26.9	0.002
178	0.015	-36.3	-26.8	0.002
179	0.015	-36.3	-26.8	0.002
180	0.015	-36.3	-26.8	0.002

TWO CL-FM LOG-PERIODICS, VERTICAL STACKED
VERTICAL POLARIZATION - VERTICAL PLANE PATTERN

Azimuth	Relative Field	Relative dB	dBd	Power Gain
90	1.000	0.0	9.5	8.913
91	0.995	-0.0	9.5	8.913
92	0.987	-0.1	9.4	8.710
93	0.976	-0.2	9.3	8.511
94	0.963	-0.3	9.2	8.318
95	0.948	-0.5	9.0	7.943
96	0.928	-0.6	8.9	7.762
97	0.906	-0.9	8.6	7.244
98	0.882	-1.1	8.4	6.918
99	0.856	-1.4	8.1	6.457
100	0.828	-1.6	7.9	6.166
101	0.794	-2.0	7.5	5.623
102	0.759	-2.4	7.1	5.129
103	0.722	-2.8	6.7	4.677
104	0.684	-3.3	6.2	4.169
105	0.646	-3.8	5.7	3.715
106	0.604	-4.4	5.1	3.236
107	0.562	-5.0	4.5	2.818
108	0.520	-5.7	3.8	2.399
109	0.478	-6.4	3.1	2.042
110	0.436	-7.2	2.3	1.698
111	0.394	-8.1	1.4	1.380
112	0.352	-9.1	0.4	1.096
113	0.311	-10.1	-0.6	0.871
114	0.272	-11.3	-1.8	0.661
115	0.233	-12.6	-3.1	0.490
116	0.196	-14.2	-4.7	0.339
117	0.159	-15.9	-6.4	0.229
118	0.125	-18.1	-8.6	0.138
119	0.092	-20.7	-11.2	0.076
120	0.061	-24.3	-14.8	0.033
121	0.031	-30.1	-20.6	0.009
122	0.010	-40.0	-30.5	0.001
123	0.022	-33.0	-23.5	0.004
124	0.047	-26.6	-17.1	0.019
125	0.069	-23.2	-13.7	0.043
126	0.089	-21.0	-11.5	0.071
127	0.108	-19.4	-9.9	0.102
128	0.124	-18.1	-8.6	0.138
129	0.139	-17.2	-7.7	0.170
130	0.151	-16.4	-6.9	0.204
131	0.161	-15.9	-6.4	0.229
132	0.168	-15.5	-6.0	0.251
133	0.173	-15.2	-5.7	0.269
134	0.177	-15.1	-5.6	0.275
135	0.178	-15.0	-5.5	0.282
136	0.178	-15.0	-5.5	0.282
137	0.176	-15.1	-5.6	0.275
138	0.172	-15.3	-5.8	0.263
139	0.166	-15.6	-6.1	0.245
140	0.159	-16.0	-6.5	0.224

TWO CL-FM LOG-PERIODICS, VERTICAL STACKED
VERTICAL POLARIZATION - VERTICAL PLANE PATTERN

Azimuth	Relative Field	Relative dB	dBd	Power Gain
141	0.153	-16.3	-6.8	0.209
142	0.145	-16.7	-7.2	0.191
143	0.137	-17.3	-7.8	0.166
144	0.127	-17.9	-8.4	0.145
145	0.116	-18.7	-9.2	0.120
146	0.108	-19.3	-9.8	0.105
147	0.100	-20.0	-10.5	0.089
148	0.091	-20.8	-11.3	0.074
149	0.081	-21.8	-12.3	0.059
150	0.071	-23.0	-13.5	0.045
151	0.065	-23.7	-14.2	0.038
152	0.059	-24.5	-15.0	0.032
153	0.053	-25.5	-16.0	0.025
154	0.047	-26.6	-17.1	0.019
155	0.040	-27.9	-18.4	0.014
156	0.036	-28.8	-19.3	0.012
157	0.032	-29.9	-20.4	0.009
158	0.028	-31.2	-21.7	0.007
159	0.023	-32.7	-23.2	0.005
160	0.019	-34.6	-25.1	0.003
161	0.017	-35.4	-25.9	0.003
162	0.015	-36.4	-26.9	0.002
163	0.013	-37.5	-28.0	0.002
164	0.011	-38.8	-29.3	0.001
165	0.010	-40.0	-30.5	0.001
166	0.010	-40.0	-30.5	0.001
167	0.010	-40.0	-30.5	0.001
168	0.010	-40.0	-30.5	0.001
169	0.010	-40.0	-30.5	0.001
170	0.010	-40.0	-30.5	0.001
171	0.010	-40.0	-30.5	0.001
172	0.010	-40.0	-30.5	0.001
173	0.010	-40.0	-30.5	0.001
174	0.010	-40.0	-30.5	0.001
175	0.010	-40.0	-30.5	0.001
176	0.010	-40.0	-30.5	0.001
177	0.010	-40.0	-30.5	0.001
178	0.010	-40.0	-30.5	0.001
179	0.010	-40.0	-30.5	0.001
180	0.010	-40.0	-30.5	0.001