TECHNICAL EXHIBIT
PREPARED IN SUPPORT OF
FM STATION KRFR
FCC FILE NO. BPH-20030102AAV
FCC FACILITY ID 35953
SHAFTER, CALIFORNIA
CH 226A   4 KW   123 M

This technical exhibit was prepared on behalf of FM station KRFR at Shafter, California in support of its response to the FCC's letter dated April 21, 2003 ("FCC Letter") concerning the pending minor change application of KRFR, FCC File No. BPH-20030102AAV.[1] The KRFR application contained a supplemental showing demonstrating compliance with the community of license coverage requirements of Section 73.315. The FCC letter indicates that the KRFR application did not demonstrate that the proposed operation complied with Section 73.315 as it failed to demonstrate that a supplemental showing was warranted and also did not include a map depicting the city limits of Shafter and the principal community contours.

The purpose of this Technical Exhibit is to provide information demonstrating that a supplemental showing is warranted based on the FCC's guidelines for considering supplemental showings in the context compliance with coverage of the community of license (Section 73.315).[2] In addition, it is also demonstrated that the KRFR application complies with the community of license coverage requirements of Section 73.315 based on the supplemental showing.

Station KRFR is currently licensed (FCC File No. BLH-19950621KD) to operate on channel 282A (104.3 MHz) at Shafter, California with an effective radiated power (ERP) of 6 kilowatts (kW) and an antenna height above average terrain (HAAT) of 93 meters. As a result of the Report and Order in MB Docket No. 02-58, the license of KRFR was modified to specify operation on channel 226A and KRFR was ordered to file a minor change application specifying operation on channel 226A. The pending KRFR application (FCC File No. BPH-20030102AAV) proposes to change transmitter site and operate on channel 226A with an ERP of 4 kW and an HAAT of 123 meters. The KRFR application proposes operation as a Section 73.215 station with

[1] In re: KRFR(FM), Shafter, CA, American General Media of Texas, Inc., Facility, Facility ID No. 35953, BPH-20030102AAV.
[2] See *Certain Minor Changes Without a Construction Permit*, FCC 97-270, 12 FCC Rcd 12371 (1997) at 12401-12403 (paragraphs 67-72).

respect to a short-spacing with KCBS-FM at Los Angeles, California.

Demonstration that Consideration of a Supplemental Showing is Warranted

As noted in the FCC letter and KRFR application, the 70 dBu contour based on the FCC's standard prediction method will not provide coverage to at least 80% of Shafter, California. However, using terrain sensitive propagation models, the 70 dBu contour is predicted to encompass at least 80% of Shafter (see Longley-Rice/PTP Coverage below) as required by Commission rules. It is believed that a supplemental showing using an alternative contour prediction method is justified in this instance in accordance with Section 73.313(e) due to the "flat terrain" along radials towards Shafter. In this regard, it is noted that the F(50,50) curves presume average terrain with a terrain roughness (or Δh) of 50 meters, whereas based on the methods of Section 73.313, Δh was determined to be between 15 and 20 meters along several radials through Shafter, with the average being 17.5 meters. Specifically, Δh was determined at 278° true, the direct bearing through the Shafter reference point[3], as well as along additional radials through Shafter at 255°, 265° and 288° true.[4] The following tabulates Δh for each radial as well as the average for all four (4) radials.

Radial	Δh (meters)
255° T	15
265° T	15
278°T	20
288°T	20
Average	*17.5*

[3] The geographic coordinates for the Shafter reference point are N35°30'02", W119°16'15" as listed in the Geographic Names Information System.

[4] Δh was determined along each radial for the terrain segment from 10 km to 25 km, the furthest point of Shafter from the proposed KRFR transmitter site. Terrain data was derived from the Defense Mapping Agency 3-second database at 0.1-km intervals along each radial.

The FCC considers terrain to "depart widely" from the 50 meter Δh standard where the Δh value is 20 meters or less or 100 meters or greater. As indicated above, Δh was determined to be between 15 and 20 meters along the radials through Shafter, with the average being 17.5 meters.

Furthermore, the FCC has previously accepted use of an alternate method to determine the location of the principal community contour for a proposal involving terrain which was similar to that proposed herein. Specifically, Figure 7 is a copy of a Memorandum dated September 30, 1992 from the Propagation Analysis Branch of the Commission's Office of Engineering Technology (OET Memorandum) concerning a showing that the principal community contour for FM station KALF at Red Bluff, California encompassed the station's proposed main studio (FCC File No. BLH-851125KH). As noted by the OET Memorandum (see Sheet 2 of Figure 7 at paragraph 5), the KALF transmitting antenna was located at a very high site overlooking a smooth valley. The KRFR site is similarly located at a point of high elevation overlooking a smooth valley. This is apparent by a comparison of the terrain profile contained in the OET Memorandum (see Sheet 7 of Figure 7) and the terrain profiles contained herein (Figures 1, 2, 3 and 4). The OET Memorandum concluded that the terrain in the direction of the main studio departed from the average terrain and that the main studio was within the principal community contour based on an alternate method (see Sheet 1 of Figure 7).

Longley-Rice/PTP Coverage

Both the Longley-Rice prediction method[5] and the FCC's supplemental point-to-point ("PTP") prediction method, as set forth in the Notice of Proposed Rule Making in MM Docket No. 98-93 ("Docket 98-93"), were used as more precise

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[5] Rice, P.L., A.G. Longley, K.A. Norton, and A.P. Barsis, "Transmission Loss Predictions for Tropospheric Communication Circuits," Technical Note 101 (Issued May 7, 1965, Revised January 1, 1967) National Bureau of Standards, Boulder, Colorado.

See also Longley, A.G., and P.L. Rice, "Prediction of Tropospheric Radio transmission Loss Over Irregular Terrain: A Computer Method-1969,"" ESSA Technical Report ERL-ITS 67, Institute for Telecommunications Sciences, Boulder, Colorado, July 1968.

alternatives to the Commission's standard prediction method to determine the location of KRFR's proposed 70 dBu contour.

For the Longley-Rice method, terrain profiles were prepared for the 278° radial along with additional radials at 255°, 265° and 288° true. Figures 1, 2, 3 and 4 depict the 255°, 265°, 278° and 288° true terrain profiles, respectively. The terrain data was derived from the Defense Mapping Agency 3-second database. Using these terrain elevations, calculations of the field strength were made at 0.1-km intervals along each radial using the Longley-Rice prediction method. The following parameters were employed in the calculations:

Model	Point-to-point irregular
Location Variability	50%
Time Variability	50%
Situation Variability	50%
Frequency	93.1 MHz
Polarization	Horizontal
Conductivity	0.005 S/m
Dielectric Constant	15.0
Transmitter Antenna Height AMSL	331 m
Transmitting Antenna	Nondirectional
Maximum Effective Radiated Power	4000 W
Receive Antenna Height	9.1 m
Clutter Factor	5 db

As indicated, a 5 dB clutter factor was used to take into account field strength variations due to local clutter (e.g. trees, buildings).[6] The results of the study are illustrated graphically on Figures 1, 2, 3 and 4. The field strength data along each radial was analyzed to determine the "median" values using polynomial curve fitting (based on the method of least squares).[7] The location of the "median" 70 dBu field strength level is indicated on each radial based on this

[6] Use of a 5 dB clutter factor appears "conservative" for the propagation paths considered here. For instance, a 2 dB clutter factor was used by OET to establish that KALF-FM encompassed its main studio location with its principal community contour (see Sheet 3 of Figure 7). In addition, Bullington indicated that the average loss from surrounding trees for horizontal polarization may be 2 to 3 dB (see Kenneth Bullington, "Radio Propagation at Frequencies Above 30 Megacycles, Proc IRE, October, 1947.

[7] The polynomial equation used for the analysis is shown on each graph as a dashed line along with the R-squared value, which helps determine the line of best fit.

analysis. The following tabulates the distance to the 70 dBu along each radial based on the FCC's standard prediction method [F(50,50)] and the Longley-Rice alternate terrain method, the difference and percent change:

Radial	70 dBu Field Strength (km)		Difference	
	FCC F(50,50)	Longley-Rice	km	Percent
255°T	20.9	32.0	11.1	+53
265°T	20.6	31.7	11.1	+54
278°T	20.1	29.6	9.5	+47
288°T	19.6	28.0	8.4	+43

The difference between the distances to the 70 dBu contour exceeds 10 percent.

Figure 5 is map showing 70 dBu contours based on the FCC's standard prediction method [F(50,50)] and the alternate terrain method (Longley-Rice). Also shown are the legal boundaries of Shafter based on the 2000 Census, the KRFR transmitter site, the Shafter reference point and the 60 dBu contour based on the FCC's standard prediction method [F(50,50)]. As indicated, the 70 dBu contour based on the Longley-Rice method encompasses 100% of the Shafter city limits.

For the PTP method, the program developed by the FCC's Office of Engineering Technology (OET) and Mass Media Bureau (MMDB) was used to determine the distances to the 70 dBu contour along the 72 equally spaced radials from 0° clockwise to 355° true. The 70 dBu contour based on the PTP method is depicted by a "dashed" line on Figure 5. It has been determined that the 70 dBu contour based on the PTP method encompasses 99% of the Shafter city limits.[8]

The elevation and field strength data used to prepare the graphs and coverage map are attached as Figure 6.

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[8] The Shafter city limits encompass a total area of 46.6 square kilometers, and the 70 dBu contour based on the PTP method encompasses 46.2 square kilometers of Shafter(46.2/46.6=0.99).

The following provides a sample Longley-Rice calculation at the Shafter reference point location.

Free Space Field (4 kW @ 22.3 km)	86 dBu
Additional estimated transmission loss	5 dB
Clutter Loss	5 dB
Net received field	76 dBu

Conclusion

As demonstrated above, use of a supplemental showing is warranted based on the FCC's guidelines for considering supplemental showings in the context compliance with coverage of the community of license (Section 73.315). In addition, the KRFR application complies with the community of license coverage requirements of Section 73.315 based on the supplemental showing.

The attached technical statement has been prepared by or under the direct supervision of W. Jeffrey Reynolds, technical consultant with the firm of du Treil, Lundin and Rackley, Inc., a telecommunications consulting firm located in Sarasota, Florida, who states that his qualifications are a matter of record with the Federal Communications Commission, having been presented on previous occasions. All data and statements contained herein are true and correct to the best of his knowledge and belief.

W. Jeffrey Reynolds

W. Jeffrey Reynolds

du Treil, Lundin & Rackley, Inc.
201 Fletcher Avenue
Sarasota, Florida 342387
(941) 329-6000
JEFF@DLR.COM

April 28, 2003

KRFR, SHAFTER, CALIFORNIA - 255 DEGREES TRUE

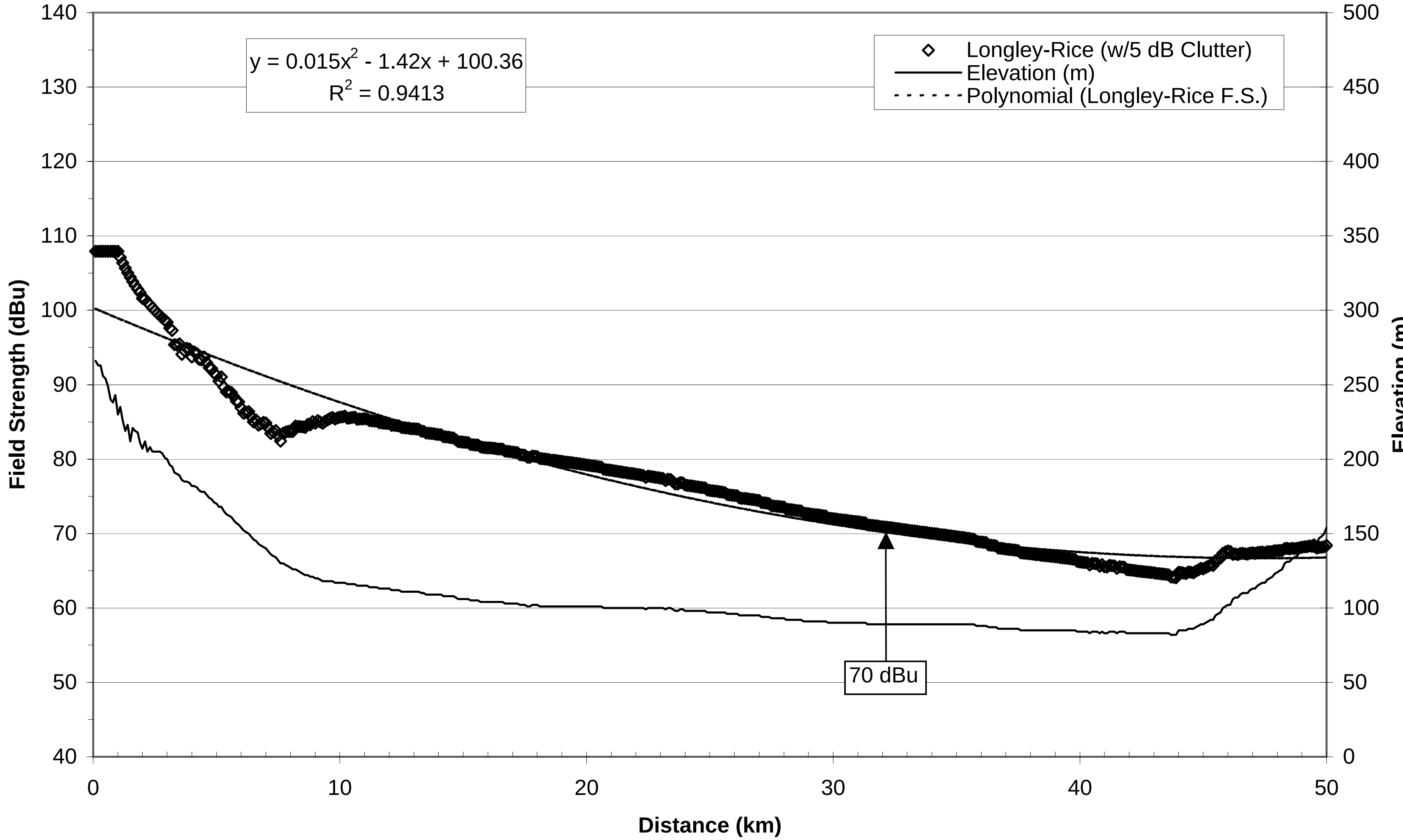


Figure 1

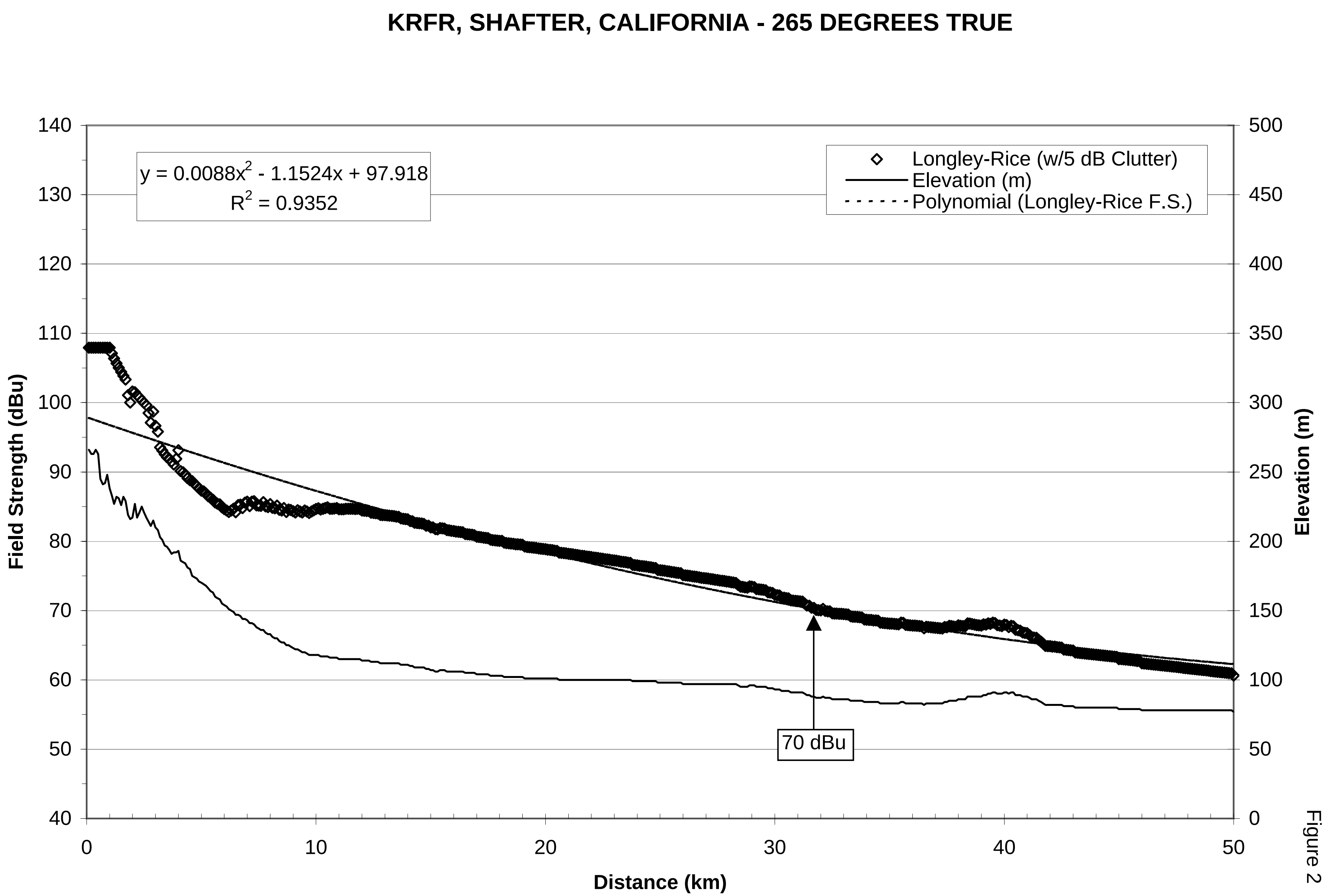

KRFR, SHAFTER, CALIFORNIA - 265 DEGREES TRUE
y = 0.0088x2 - 1.1524x + 97.918
R2 = 0.9352
Longley-Rice (w/5 dB Clutter)
Elevation (m)
Polynomial (Longley-Rice F.S.)
70 dBu
Field Strength (dBu)
Elevation (m)
Distance (km)
140
130
120
110
100
90
80
70
60
50
40
500
450
400
350
300
250
200
150
100
50
0
0
10
20
30
40
50

Figure 2

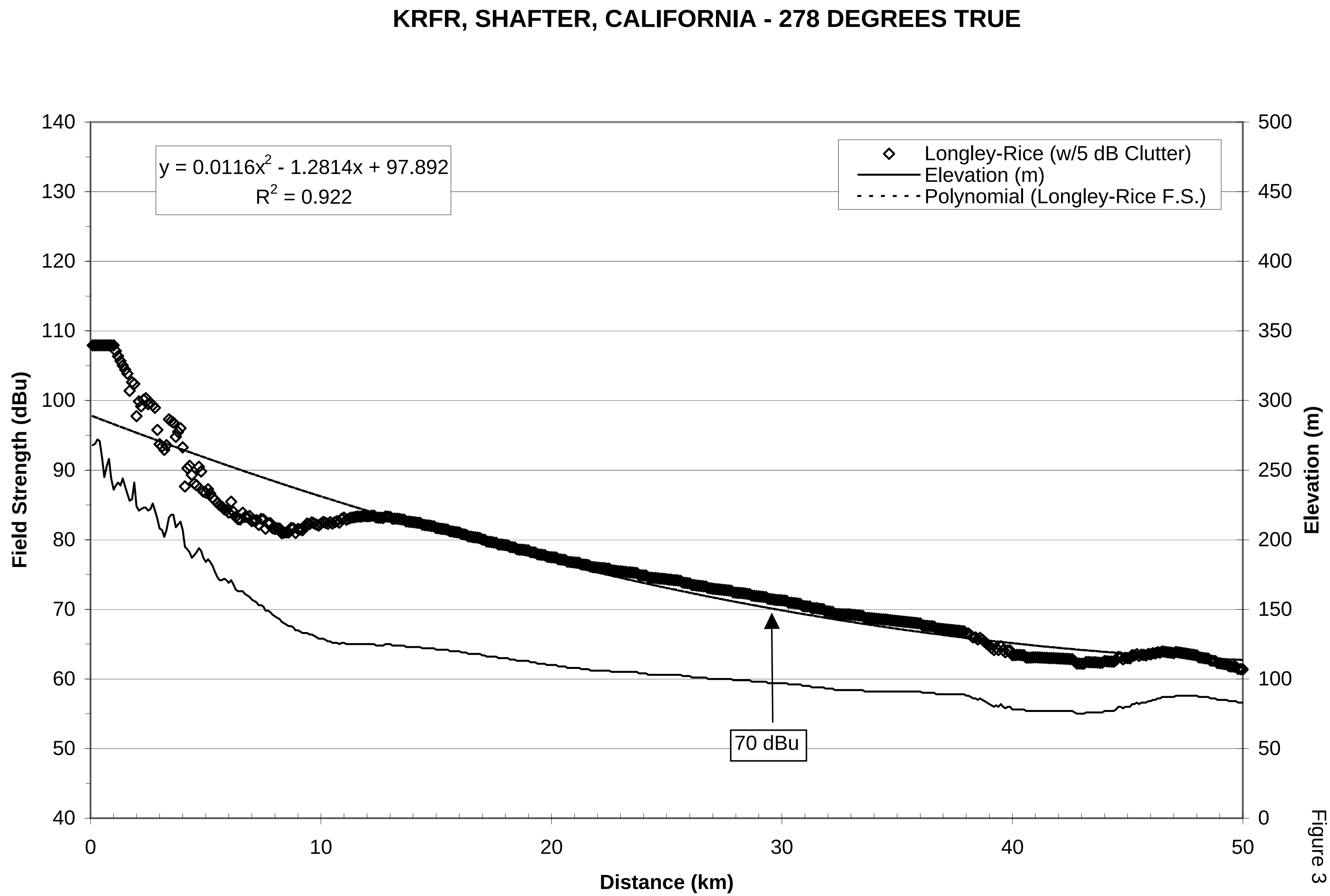

KRFR, SHAFTER, CALIFORNIA - 278 DEGREES TRUE
y = 0.0116x2 - 1.2814x + 97.892
R2 = 0.922
Longley-Rice (w/5 dB Clutter)
Elevation (m)
Polynomial (Longley-Rice F.S.)
Field Strength (dBu)
Elevation (m)
Distance (km)
70 dBu
140
130
120
110
100
90
80
70
60
50
40
500
450
400
350
300
250
200
150
100
50
0
10
20
30
40
50

Figure 3

KRFR, SHAFTER, CALIFORNIA - 288 DEGREES TRUE

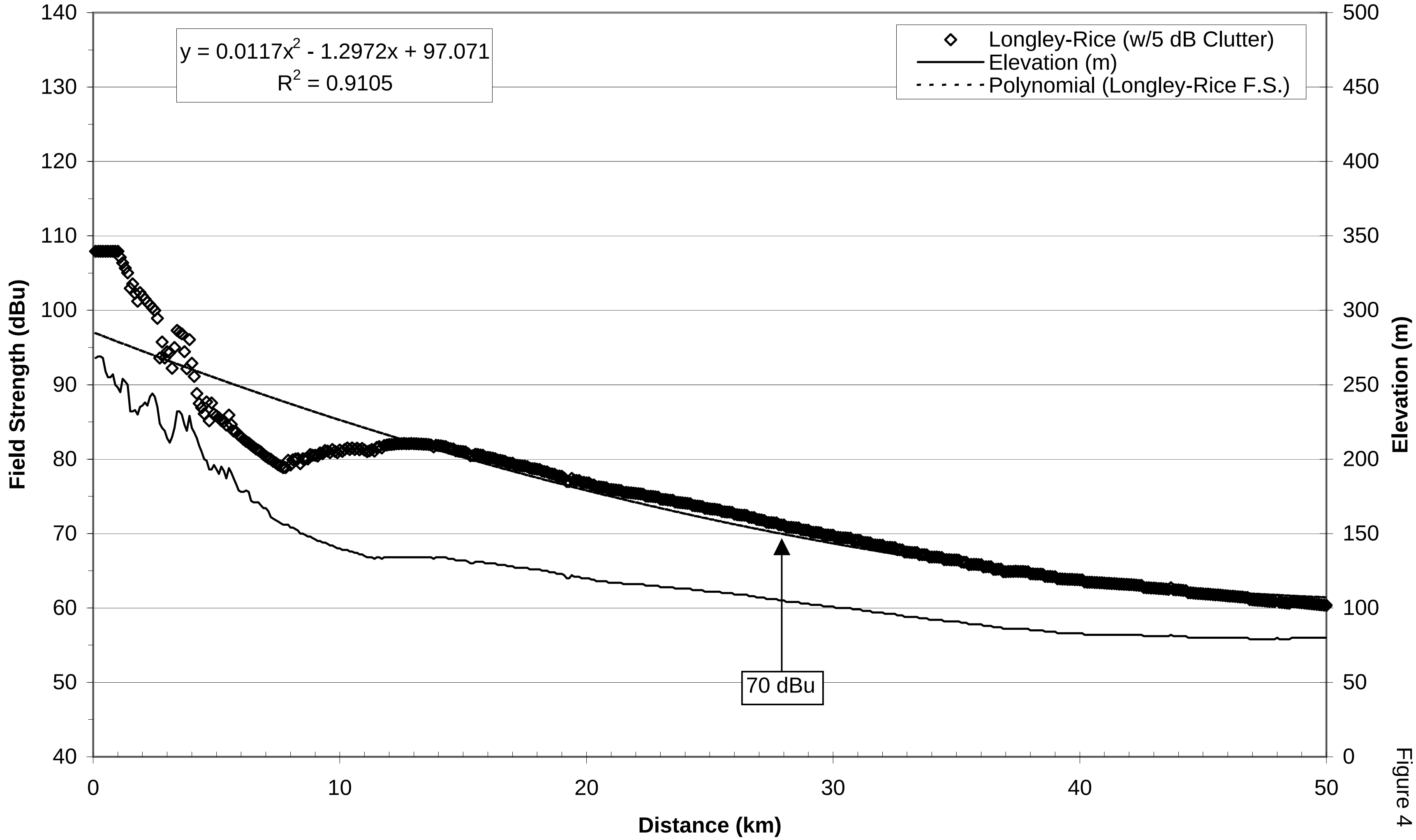
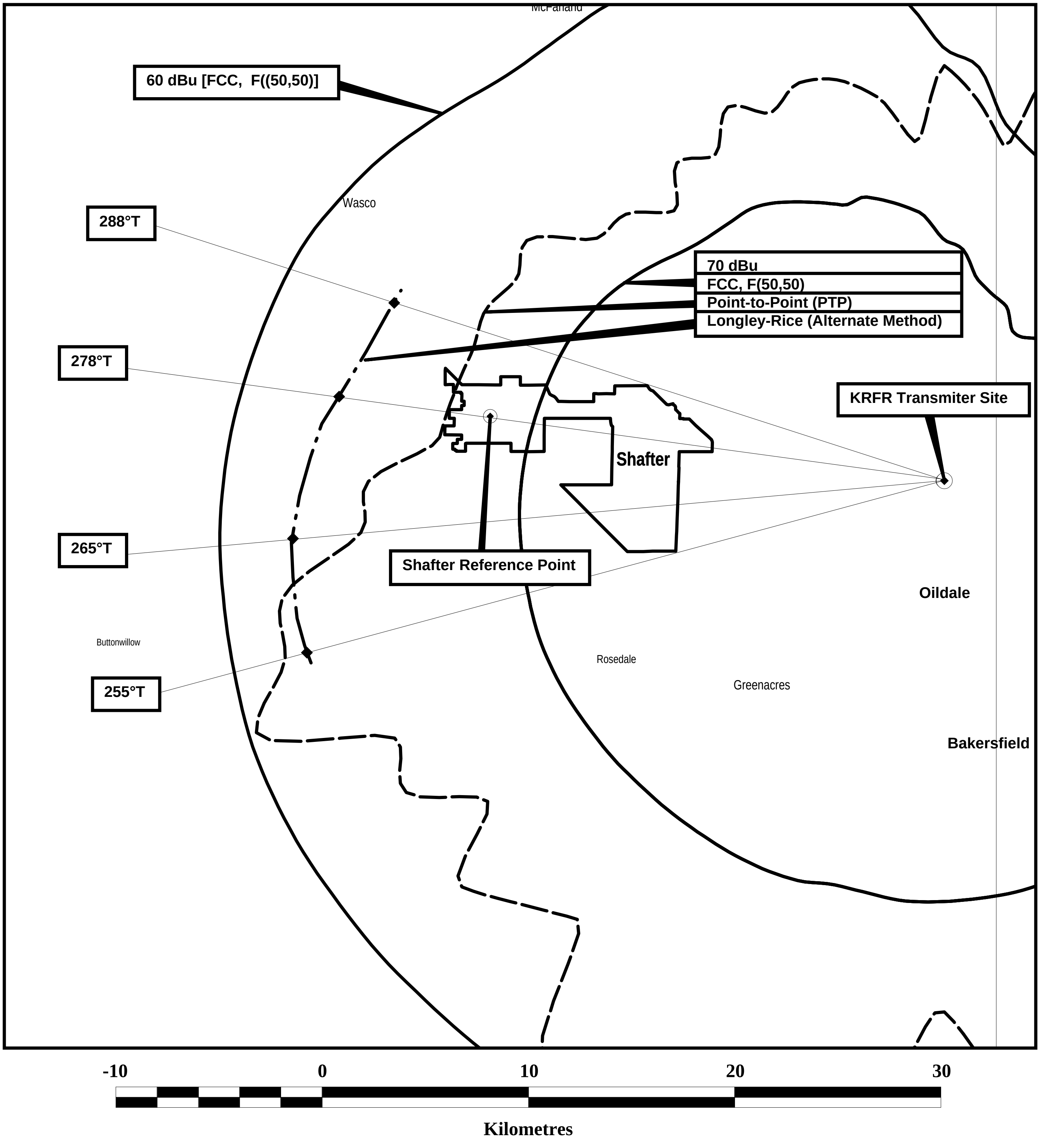


Figure 4



70 DBU - SUPPLEMENTAL SHOWING
STATION KRFR
SHAFTER, CALIFORNIA
CH 226A 4 KW 123 M

TABULATION OF ELEVATION AND LONGLEY-RICE FIELD STRENGTH DATA

Distance (km)	255 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	265 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	278 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	288 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)
0.1	108	266	108	266	108	268	108	268
0.2	108	263	108	263	108	269	108	269
0.3	108	263	108	263	108	272	108	269
0.4	108	256	108	266	108	271	108	268
0.5	108	254	108	263	108	259	108	259
0.6	108	249	108	245	108	245	108	255
0.7	108	240	108	241	108	253	108	255
0.8	108	238	108	242	108	258	108	257
0.9	108	243	108	248	108	244	108	250
1	108	230	108	238	108	236	108	248
1.1	107	235	107	233	107	239	107	245
1.2	106	226	106	227	106	241	106	254
1.3	106	219	106	232	106	239	106	252
1.4	105	223	105	231	105	244	105	250
1.5	104	212	104	226	104	238	103	232
1.6	104	221	104	232	104	233	104	232
1.7	103	219	103	229	101	228	102	233
1.8	103	218	101	219	103	229	101	230
1.9	102	211	100	216	102	241	102	235
2	102	207	102	217	98	224	102	236
2.1	102	212	102	227	100	221	102	238
2.2	101	205	101	217	99	222	101	236
2.3	101	208	101	221	100	223	101	242
2.4	100	205	100	225	100	223	100	244
2.5	100	205	100	221	99	221	100	242
2.6	100	205	100	217	100	222	99	235
2.7	99	205	98	214	99	226	94	224
2.8	99	204	97	211	99	221	96	221
2.9	99	201	99	215	96	215	94	219
3	98	200	97	210	94	208	94	214
3.1	98	196	96	208	93	207	94	211
3.2	97	195	94	203	93	202	92	215
3.3	95	191	93	201	94	207	95	221
3.4	95	190	93	197	97	216	97	232
3.5	96	189	92	196	97	218	97	232
3.6	94	186	92	194	97	218	97	230
3.7	95	185	92	191	95	209	94	223
3.8	95	185	91	192	95	211	92	219
3.9	95	184	92	192	96	213	96	229
4	94	182	93	193	93	207	93	221
4.1	94	182	90	186	88	195	91	218
4.2	94	181	90	185	90	193	89	214
4.3	93	179	90	184	91	191	87	209
4.4	93	178	89	181	89	187	87	205
4.5	94	178	89	180	88	189	86	200
4.6	93	176	89	175	88	191	88	199

Distance	255 Degrees True Longley-Rice (w/5 dB Clutter)	Elevation	265 Degrees True Longley-Rice (w/5 dB Clutter)	Elevation	278 Degrees True Longley-Rice (w/5 dB Clutter)	Elevation	288 Degrees True Longley-Rice (w/5 dB Clutter)	Elevation
(km)	dB	(m)	dB	(m)	dB	(m)	dB	(m)
4.7	92	174	88	174	90	194	85	193
4.8	92	173	88	173	90	192	88	193
4.9	92	171	88	171	87	187	86	196
5	91	170	87	170	87	184	86	193
5.1	90	168	87	169	87	186	86	190
5.2	91	168	87	168	87	184	85	195
5.3	90	165	86	166	86	181	85	192
5.4	89	163	86	164	86	177	85	187
5.5	89	162	86	163	85	173	86	194
5.6	89	161	86	160	85	171	85	191
5.7	88	159	85	159	85	171	84	187
5.8	88	157	85	158	84	172	84	183
5.9	88	156	85	155	84	171	83	179
6	87	154	85	154	84	169	83	178
6.1	86	152	84	153	85	171	83	178
6.2	86	151	84	151	84	168	82	179
6.3	86	150	84	150	83	164	82	178
6.4	86	148	85	149	83	163	82	172
6.5	85	146	84	147	83	163	82	171
6.6	85	145	85	147	84	163	81	171
6.7	85	143	85	146	83	161	81	171
6.8	85	142	85	144	83	160	81	169
6.9	85	141	86	144	83	159	81	167
7	85	140	86	143	83	157	80	167
7.1	84	138	85	141	83	156	80	165
7.2	83	136	86	141	83	155	80	161
7.3	84	135	86	140	82	153	80	160
7.4	84	134	85	138	83	153	80	159
7.5	83	132	85	137	83	152	79	158
7.6	82	130	85	136	82	149	79	157
7.7	83	130	86	136	82	149	79	156
7.8	84	129	85	134	82	148	79	156
7.9	84	128	85	133	82	146	80	156
8	84	127	85	133	82	145	79	154
8.1	84	126	85	131	82	144	80	154
8.2	84	126	85	130	82	143	80	153
8.3	84	125	85	130	81	141	80	152
8.4	84	124	85	128	81	140	79	150
8.5	84	123	84	127	81	139	80	150
8.6	84	122	85	127	81	138	80	149
8.7	85	122	84	125	82	138	80	148
8.8	85	121	85	125	82	137	81	148
8.9	85	121	85	124	81	135	81	147
9	85	120	84	123	82	135	81	146
9.1	85	120	84	122	81	134	80	145
9.2	85	119	84	122	81	133	81	145
9.3	85	118	84	121	82	133	81	144
9.4	85	118	84	120	82	133	81	144

Distance (km)	255 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	265 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	278 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	288 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)
9.5	85	118	84	120	82	132	81	143
9.6	85	118	84	119	83	132	81	142
9.7	86	118	84	118	82	131	81	142
9.8	85	117	84	118	82	130	81	141
9.9	86	117	84	118	82	129	81	140
10	86	117	85	118	82	129	81	140
10.1	86	117	85	118	83	129	81	139
10.2	86	117	85	117	82	128	81	139
10.3	86	116	85	117	82	127	82	139
10.4	86	116	85	117	83	127	81	138
10.5	86	116	85	117	82	126	82	138
10.6	86	116	85	116	83	126	81	137
10.7	85	115	85	116	83	126	81	137
10.8	85	115	85	116	82	125	81	136
10.9	85	115	85	116	83	126	81	136
11	85	115	85	115	83	126	81	135
11.1	85	115	85	115	83	125	81	134
11.2	85	114	85	115	83	125	81	134
11.3	85	114	85	115	83	125	81	134
11.4	85	114	85	115	83	125	81	133
11.5	85	114	85	115	83	125	82	134
11.6	85	113	85	115	83	125	82	134
11.7	85	113	85	115	83	125	81	133
11.8	85	113	85	115	83	125	82	134
11.9	85	113	85	115	83	125	82	134
12	85	113	84	114	83	125	82	134
12.1	85	112	84	114	83	125	82	134
12.2	85	112	84	114	83	125	82	134
12.3	85	112	84	114	83	125	82	134
12.4	84	112	84	113	83	124	82	134
12.5	84	111	84	113	83	124	82	134
12.6	84	111	84	113	83	124	82	134
12.7	84	111	84	113	83	124	82	134
12.8	84	111	84	112	83	125	82	134
12.9	84	111	84	112	83	125	82	134
13	84	111	84	112	83	125	82	134
13.1	84	111	84	112	83	124	82	134
13.2	84	111	84	112	83	124	82	134
13.3	84	110	84	112	83	124	82	134
13.4	84	110	84	112	83	124	82	134
13.5	84	109	84	112	83	124	82	134
13.6	83	109	84	112	83	124	82	134
13.7	83	109	83	111	83	123	82	134
13.8	83	109	83	111	83	123	82	133
13.9	83	109	83	111	83	123	82	134
14	83	109	83	111	83	123	82	134
14.1	83	109	83	110	82	123	82	134
14.2	83	108	83	110	82	123	82	134

Distance (km)	255 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	265 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	278 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	288 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)
14.3	83	108	83	109	82	123	82	134
14.4	83	108	83	109	82	122	81	133
14.5	83	108	83	109	82	122	81	133
14.6	83	108	83	109	82	122	81	133
14.7	83	107	83	109	82	122	81	132
14.8	82	106	82	108	82	122	81	132
14.9	82	106	82	108	82	122	81	132
15	82	106	82	107	82	121	81	132
15.1	82	106	82	107	82	121	81	132
15.2	82	106	82	106	82	121	81	131
15.3	82	105	82	106	82	121	80	130
15.4	82	105	82	107	81	121	80	130
15.5	82	105	82	107	81	121	81	131
15.6	82	105	82	107	81	120	81	131
15.7	82	104	82	106	81	120	81	131
15.8	82	104	82	106	81	120	81	131
15.9	82	104	82	106	81	120	80	130
16	82	104	81	106	81	120	80	130
16.1	81	104	81	106	81	119	80	130
16.2	81	104	81	106	81	119	80	130
16.3	81	104	81	106	81	119	80	130
16.4	81	104	81	106	80	118	80	129
16.5	81	104	81	105	80	118	80	129
16.6	81	104	81	105	80	118	80	129
16.7	81	103	81	105	80	118	80	129
16.8	81	103	81	105	80	118	80	128
16.9	81	103	81	105	80	118	79	128
17	81	103	81	104	80	117	79	128
17.1	81	103	81	104	80	117	79	127
17.2	81	103	81	104	80	116	79	127
17.3	81	102	81	104	80	116	79	127
17.4	81	102	80	104	80	116	79	127
17.5	81	102	80	104	80	116	79	127
17.6	80	101	80	103	80	116	79	127
17.7	80	101	80	103	79	115	79	126
17.8	80	102	80	103	79	115	79	126
17.9	80	102	80	103	79	115	79	126
18	80	102	80	103	79	115	79	126
18.1	80	101	80	103	79	115	79	126
18.2	80	101	80	102	79	114	78	125
18.3	80	101	80	102	79	114	78	125
18.4	80	101	80	102	79	114	78	125
18.5	80	101	80	102	79	113	78	124
18.6	80	101	80	102	79	113	78	124
18.7	80	101	80	102	79	113	78	124
18.8	80	101	80	102	79	113	78	123
18.9	80	101	80	102	78	113	78	123
19	80	101	79	102	78	113	78	123

Distance	255 Degrees True Longley-Rice (w/5 dB Clutter)	Elevation	265 Degrees True Longley-Rice (w/5 dB Clutter)	Elevation	278 Degrees True Longley-Rice (w/5 dB Clutter)	Elevation	288 Degrees True Longley-Rice (w/5 dB Clutter)	Elevation
(km)	dB	(m)	dB	(m)	dB	(m)	dB	(m)
19.1	80	101	79	101	78	112	77	122
19.2	80	101	79	101	78	112	77	120
19.3	80	101	79	101	78	112	77	120
19.4	80	101	79	101	78	111	77	122
19.5	79	101	79	101	78	111	77	121
19.6	79	101	79	101	78	111	77	121
19.7	79	101	79	101	78	111	77	121
19.8	79	101	79	101	78	110	77	120
19.9	79	101	79	101	78	110	77	120
20	79	101	79	101	77	110	77	120
20.1	79	101	79	101	77	110	77	120
20.2	79	101	79	101	77	110	77	119
20.3	79	101	79	101	77	109	77	119
20.4	79	101	79	101	77	109	76	118
20.5	79	101	79	101	77	109	76	118
20.6	79	101	78	100	77	109	76	118
20.7	79	100	78	100	77	108	76	118
20.8	79	100	78	100	77	108	76	118
20.9	79	100	78	100	77	108	76	117
21	78	100	78	100	77	108	76	117
21.1	78	100	78	100	77	108	76	117
21.2	78	100	78	100	77	108	76	117
21.3	78	100	78	100	76	107	76	117
21.4	78	100	78	100	76	107	76	117
21.5	78	100	78	100	76	107	76	116
21.6	78	100	78	100	76	107	76	116
21.7	78	100	78	100	76	106	76	116
21.8	78	100	78	100	76	106	75	116
21.9	78	100	78	100	76	106	75	116
22	78	100	78	100	76	106	75	116
22.1	78	100	78	100	76	106	75	116
22.2	78	100	78	100	76	106	75	116
22.3	78	100	78	100	76	106	75	116
22.4	78	99	78	100	76	106	75	115
22.5	78	100	77	100	76	106	75	115
22.6	78	100	77	100	76	105	75	115
22.7	78	100	77	100	76	105	75	115
22.8	78	100	77	100	76	105	75	115
22.9	78	100	77	100	75	105	75	115
23	77	100	77	100	75	105	75	114
23.1	77	100	77	100	75	105	75	114
23.2	77	99	77	100	75	105	75	114
23.3	77	100	77	100	75	105	75	114
23.4	77	100	77	100	75	105	74	114
23.5	77	99	77	100	75	105	74	114
23.6	77	98	77	100	75	105	74	113
23.7	77	98	77	100	75	105	74	113
23.8	77	99	77	99	75	104	74	113

Distance	255 Degrees True Longley-Rice (w/5 dB Clutter)	Elevation	265 Degrees True Longley-Rice (w/5 dB Clutter)	Elevation	278 Degrees True Longley-Rice (w/5 dB Clutter)	Elevation	288 Degrees True Longley-Rice (w/5 dB Clutter)	Elevation
(km)	dB	(m)	dB	(m)	dB	(m)	dB	(m)
23.9	77	99	77	99	75	104	74	113
24	77	98	77	99	75	104	74	113
24.1	76	98	76	99	75	104	74	113
24.2	76	98	76	99	75	103	74	113
24.3	76	98	76	99	75	103	74	112
24.4	76	98	76	99	75	103	74	112
24.5	76	98	76	99	75	103	74	112
24.6	76	98	76	99	74	103	74	112
24.7	76	98	76	99	74	103	74	112
24.8	76	98	76	99	74	103	73	111
24.9	76	97	76	98	74	103	73	111
25	76	97	76	98	74	103	73	111
25.1	76	97	76	98	74	103	73	111
25.2	76	97	76	98	74	103	73	111
25.3	76	97	76	98	74	103	73	111
25.4	76	97	76	98	74	103	73	111
25.5	76	97	76	98	74	103	73	110
25.6	76	97	76	98	74	103	73	110
25.7	75	96	75	98	74	102	73	110
25.8	75	96	75	98	74	102	73	110
25.9	75	96	75	98	74	102	73	110
26	75	96	75	97	74	102	73	109
26.1	75	96	75	97	73	101	73	109
26.2	75	95	75	97	73	101	73	109
26.3	75	95	75	97	73	101	72	109
26.4	75	95	75	97	73	101	72	109
26.5	75	95	75	97	73	101	72	109
26.6	75	95	75	97	73	101	72	108
26.7	75	95	75	97	73	101	72	108
26.8	75	95	75	97	73	100	72	108
26.9	74	95	75	97	73	100	72	107
27	74	95	75	97	73	100	72	107
27.1	74	94	75	97	73	100	72	107
27.2	74	94	75	97	73	100	72	107
27.3	74	94	75	97	73	100	72	106
27.4	74	94	74	97	73	100	71	106
27.5	74	93	74	97	73	100	71	106
27.6	74	93	74	97	73	100	71	106
27.7	74	93	74	97	73	100	71	106
27.8	74	93	74	97	73	100	71	105
27.9	74	93	74	97	72	99	71	105
28	74	93	74	97	72	99	71	105
28.1	73	92	74	97	72	99	71	104
28.2	73	92	74	97	72	99	71	104
28.3	73	92	74	97	72	99	71	104
28.4	73	92	74	96	72	99	71	104
28.5	73	92	73	95	72	99	71	104
28.6	73	92	73	95	72	99	71	104

Distance (km)	255 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	265 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	278 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	288 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)
28.7	73	92	73	95	72	98	71	103
28.8	73	91	73	95	72	98	70	103
28.9	73	91	74	96	72	98	70	103
29	73	91	73	96	72	98	70	103
29.1	73	91	73	96	72	98	70	102
29.2	73	91	73	95	72	98	70	102
29.3	73	91	73	95	72	98	70	102
29.4	72	91	73	95	72	97	70	102
29.5	72	91	73	95	71	97	70	102
29.6	72	91	73	95	71	97	70	101
29.7	72	91	73	94	71	97	70	101
29.8	72	90	73	94	71	97	70	101
29.9	72	90	73	94	71	97	70	101
30	72	90	72	93	71	97	70	101
30.1	72	90	72	93	71	97	70	100
30.2	72	90	72	93	71	97	69	100
30.3	72	90	72	92	71	96	69	100
30.4	72	90	72	92	71	96	69	100
30.5	72	90	72	92	71	96	69	100
30.6	72	90	72	92	71	96	69	100
30.7	72	90	71	91	71	96	69	100
30.8	72	90	71	91	71	96	69	99
30.9	72	90	71	91	71	95	69	99
31	72	90	71	91	70	95	69	99
31.1	72	90	71	91	70	95	69	99
31.2	71	90	71	91	70	95	69	98
31.3	71	90	71	90	70	94	69	98
31.4	71	89	71	89	70	94	69	98
31.5	71	89	71	89	70	94	69	98
31.6	71	89	70	88	70	94	69	97
31.7	71	89	70	88	70	94	68	97
31.8	71	89	70	87	70	94	68	97
31.9	71	89	70	87	70	93	68	97
32	71	89	70	87	70	93	68	97
32.1	71	89	70	88	70	93	68	96
32.2	71	89	70	87	70	93	68	96
32.3	71	89	70	87	69	92	68	96
32.4	71	89	70	87	69	92	68	96
32.5	71	89	70	86	69	92	68	96
32.6	71	89	70	86	69	92	68	95
32.7	71	89	70	86	69	92	68	95
32.8	71	89	70	86	69	92	68	95
32.9	71	89	70	86	69	92	68	94
33	70	89	70	86	69	92	68	94
33.1	70	89	69	86	69	92	67	94
33.2	70	89	69	86	69	92	67	94
33.3	70	89	69	85	69	92	67	94
33.4	70	89	69	85	69	92	67	94

Distance (km)	255 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	265 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	278 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	288 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)
33.5	70	89	69	85	69	92	67	93
33.6	70	89	69	85	69	91	67	93
33.7	70	89	69	85	69	91	67	93
33.8	70	89	69	85	69	91	67	93
33.9	70	89	69	84	69	91	67	92
34	70	89	69	84	69	91	67	92
34.1	70	89	69	84	69	91	67	92
34.2	70	89	69	84	69	91	67	92
34.3	70	89	69	84	69	91	67	92
34.4	70	89	69	84	69	91	67	92
34.5	70	89	69	84	69	91	67	91
34.6	70	89	68	83	68	91	67	91
34.7	70	89	68	83	68	91	66	91
34.8	70	89	68	83	68	91	66	91
34.9	70	89	68	83	68	91	66	91
35	70	89	68	83	68	91	66	91
35.1	70	89	68	83	68	91	66	91
35.2	69	89	68	83	68	91	66	90
35.3	69	89	68	83	68	91	66	90
35.4	69	89	68	83	68	91	66	90
35.5	69	89	68	84	68	91	66	89
35.6	69	89	68	84	68	91	66	89
35.7	69	89	68	83	68	91	66	89
35.8	69	88	68	83	68	91	66	89
35.9	69	88	68	83	68	91	66	89
36	69	88	68	83	68	91	66	89
36.1	69	88	68	83	68	90	66	88
36.2	69	88	68	83	68	90	66	88
36.3	68	87	68	83	68	90	66	88
36.4	68	87	68	83	68	90	66	88
36.5	68	87	67	82	68	90	65	87
36.6	68	87	68	83	68	90	65	87
36.7	68	86	68	83	67	89	65	87
36.8	68	86	68	83	67	89	65	87
36.9	68	86	68	83	67	89	65	86
37	68	86	68	83	67	89	65	86
37.1	68	86	67	83	67	89	65	86
37.2	68	86	67	83	67	89	65	86
37.3	68	86	67	83	67	89	65	86
37.4	68	86	68	84	67	89	65	86
37.5	68	86	68	84	67	89	65	86
37.6	67	85	68	85	67	89	65	86
37.7	67	85	68	85	67	89	65	86
37.8	67	85	68	85	67	89	65	86
37.9	67	85	68	85	67	89	65	86
38	67	85	68	86	67	88	65	85
38.1	67	85	68	86	67	88	65	85
38.2	67	85	68	86	66	87	65	85

Distance (km)	255 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	265 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	278 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	288 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)
38.3	67	85	68	86	66	86	65	85
38.4	67	85	68	88	66	86	65	85
38.5	67	85	68	88	66	85	65	85
38.6	67	85	68	88	66	86	64	84
38.7	67	85	68	88	66	85	64	84
38.8	67	85	68	88	65	84	64	84
38.9	67	85	68	88	65	83	64	84
39	67	85	68	88	65	82	64	84
39.1	67	85	68	89	64	81	64	83
39.2	67	85	68	89	64	80	64	83
39.3	67	85	68	90	64	81	64	83
39.4	67	85	68	90	64	80	64	83
39.5	67	85	68	91	65	82	64	83
39.6	67	85	68	91	64	80	64	83
39.7	67	85	68	90	64	79	64	83
39.8	67	85	68	90	64	80	64	83
39.9	66	84	68	90	64	80	64	83
40	66	84	68	91	63	78	64	83
40.1	66	84	68	91	63	78	64	83
40.2	66	84	68	90	63	78	63	82
40.3	66	84	68	91	63	78	63	82
40.4	66	83	68	91	63	78	63	82
40.5	66	84	67	89	63	78	63	82
40.6	66	84	67	89	63	77	63	82
40.7	66	84	67	89	63	77	63	82
40.8	66	83	67	88	63	77	63	82
40.9	66	84	67	88	63	77	63	82
41	66	83	67	88	63	77	63	82
41.1	65	83	66	87	63	77	63	82
41.2	66	84	66	86	63	77	63	82
41.3	66	84	66	86	63	77	63	82
41.4	66	84	66	86	63	77	63	82
41.5	65	83	66	85	63	77	63	82
41.6	66	84	66	84	63	77	63	82
41.7	66	84	65	83	63	77	63	82
41.8	65	84	65	82	63	77	63	82
41.9	65	83	65	82	63	77	63	82
42	65	83	65	82	63	77	63	82
42.1	65	83	65	82	63	77	63	82
42.2	65	83	65	82	63	77	63	82
42.3	65	83	65	82	63	77	63	82
42.4	65	83	65	82	63	77	63	82
42.5	65	83	65	82	63	77	63	82
42.6	65	83	64	81	63	77	63	81
42.7	65	83	64	81	63	76	63	81
42.8	65	83	64	81	62	75	63	81
42.9	65	83	64	81	62	75	63	81
43	65	83	64	81	62	75	63	81

Distance (km)	255 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	265 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	278 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)	288 Degrees True Longley-Rice (w/5 dB Clutter) dB	Elevation (m)
43.1	65	83	64	80	62	75	63	81
43.2	65	83	64	80	62	76	63	81
43.3	65	83	64	80	62	76	63	81
43.4	65	83	64	80	62	76	63	81
43.5	65	83	64	80	62	76	63	81
43.6	64	83	64	80	62	76	63	81
43.7	64	82	64	80	62	76	63	82
43.8	64	82	64	80	62	76	62	81
43.9	64	82	64	80	62	76	62	81
44	65	85	64	80	63	77	62	81
44.1	65	85	64	80	63	77	62	81
44.2	65	85	64	80	63	77	62	81
44.3	65	85	64	80	62	77	62	81
44.4	65	86	63	80	62	77	62	80
44.5	65	86	63	80	63	78	62	80
44.6	65	86	63	80	63	80	62	80
44.7	65	87	63	80	63	80	62	80
44.8	65	88	63	80	63	79	62	80
44.9	65	89	63	80	63	80	62	80
45	65	89	63	79	63	80	62	80
45.1	65	90	63	79	63	80	62	80
45.2	66	91	63	79	63	82	62	80
45.3	66	92	63	79	63	82	62	80
45.4	66	92	63	79	64	83	62	80
45.5	66	95	63	79	63	82	62	80
45.6	67	96	63	79	63	83	62	80
45.7	67	97	63	79	63	83	62	80
45.8	67	100	63	79	63	83	62	80
45.9	68	101	63	79	64	84	62	80
46	68	102	62	78	64	84	62	80
46.1	68	102	62	78	64	85	62	80
46.2	67	106	62	78	64	85	62	80
46.3	67	107	62	78	64	86	62	80
46.4	67	107	62	78	64	86	62	80
46.5	67	109	62	78	64	87	61	80
46.6	67	110	62	78	64	87	61	80
46.7	67	110	62	78	64	87	61	80
46.8	67	110	62	78	64	87	61	80
46.9	67	112	62	78	64	87	61	79
47	67	113	62	78	64	87	61	79
47.1	67	113	62	78	64	88	61	79
47.2	67	115	62	78	64	88	61	79
47.3	67	116	62	78	64	88	61	79
47.4	68	117	62	78	64	88	61	79
47.5	67	117	62	78	64	88	61	79
47.6	68	119	62	78	64	88	61	79
47.7	68	120	62	78	64	88	61	79
47.8	68	121	62	78	64	88	61	79

	255 Degrees True Longley-Rice		265 Degrees True Longley-Rice		278 Degrees True Longley-Rice		288 Degrees True Longley-Rice	
Distance	(w/5 dB Clutter)	Elevation	(w/5 dB Clutter)	Elevation	(w/5 dB Clutter)	Elevation	(w/5 dB Clutter)	Elevation
(km)	dB	(m)	dB	(m)	dB	(m)	dB	(m)
47.9	68	123	62	78	63	88	61	79
48	68	124	62	78	63	88	61	80
48.1	68	125	62	78	63	87	61	79
48.2	68	126	62	78	63	87	61	79
48.3	68	130	62	78	63	87	61	79
48.4	68	131	62	78	63	87	61	79
48.5	68	131	61	78	63	87	61	79
48.6	68	133	61	78	63	86	61	80
48.7	68	134	61	78	63	86	61	80
48.8	68	135	61	78	63	86	61	80
48.9	68	137	61	78	62	85	61	80
49	68	139	61	78	62	85	61	80
49.1	68	141	61	78	62	85	61	80
49.2	68	142	61	78	62	85	61	80
49.3	68	145	61	78	62	85	61	80
49.4	68	145	61	78	62	84	61	80
49.5	68	146	61	78	62	84	61	80
49.6	68	144	61	78	62	84	61	80
49.7	68	147	61	78	62	84	60	80
49.8	68	148	61	78	61	83	60	80
49.9	68	150	61	78	61	83	60	80
50	68	154	61	77	61	83	60	80

UNITED STATES GOVERNMENT

memorandum

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FM BRANCH

Figure 7
Sheet 1 of 8

DATE: September 30, 1992

REPLY TO ATTN OF: William Daniel, Chief, Propagation Analysis Branch, OET

SUBJECT: Supplemental Showing of 3.16 mV/m contour of KALF-FM, Red Bluff, CA
File BLH-851125KH

TO: Dennis Williams, Chief, FM Branch, MMB

This responds to your memorandum dated July 30, 1992, requesting an evaluation of the subject application relative to principal community coverage of the station's proposed main studio.

The application included an engineering statement claiming that the proposed studio location is within the predicted 3.16 mV/m (70 dBu) contour based on NBS Technical Note 101 methodology.

We have evaluated the engineering statement and examined the terrain profile along the radial through the studio. Although some aspects of the statement are confusing, we agree that the terrain in the direction toward the studio does depart from the average elevation of the 3 to 16 kilometer section.

Based on our independent study (see attachment), we conclude that the proposed main studio is within the 70 dBu contour and thus in compliance with Section 73.1125(a).

If you have any questions concern these calculations contact Barry Wong at 653-8159.

William A. Daniel

William A. Daniel

Attachments

9-29-92
B. Wong

Figure 7
Sheet 2 of 8

Use of Supplemental Showing to Determine City Grade Contour
(KALF-FM, Red Bluff, California)

The following analysis concerns an engineering statement submitted in support of an application by McNulty Broadcasting Corp., licensee of KALF-FM, Red Bluff, California, to relocate its main studio. The purpose is to evaluate the claim that the proposed studio location is within the 3.16 mV/m (70 dBu) contour.

Station KALF-FM is operating on channel 239B (95.7 MHz) with 7 KW ERP and an antenna 386 meters HAAT. The proposed main studio location is 76.4 km away on a bearing of 107.7°N in Chico, CA. Based on the standard prediction method in Section 73.313 of the FCC Rules, the distance to the 70 dBu contour is only about 52 km.

Citing Section 73.313(e) of the FCC Rules, which permits supplemental showing using alternative prediction methods to locate the field strength contour, the applicant submitted calculations using the Longley-Rice prediction method and computations described in NBS Tech Note 101. Based on these calculations (with allowance for ground reflection and urban loss), the engineering statement concluded that the field strength level at the proposed studio would be more than 77.7 dBu.

The engineering statement includes data intended to justify the use of an alternative method of field strength prediction and calculations of field strength at the proposed studio location. We found the discussion of terrain elevations and ΔH somewhat confusing but agree that an alternative field strength prediction method is justified. Concerning predicted field strength values, the available field strength measurement data suggests that under conditions such as those involved in this case, the median field strength over a given area rarely exceeds free space levels.

We have evaluated the engineer statement and the terrain profile of the 107.7°N radial from the transmitter site through the proposed studio location. The transmitting antenna is at a very high site (1336 m above sea level) overlooking a smooth low valley. While the average terrain elevation of the 3 to 16 km segment is 336 meters above sea level, the terrain for segment from 40 to 80 km from the antenna is only about 50 meters abovesea level. The terrain 40 to 80 km from the transmitter site is widely different from the 3 to 16 km segment and therefore an alternative prediction method to locate the contour is justified.

Section 73.1125(a) concerns the location of main studio relative to the principal-community field strength contour. Since the field strength contour is determined by the F(50,50) median field field strength level, the field strength level at a single location is not sufficient to establish the location of a contour.

An area prediction method such as the standard method in Section 73.313 of the Rules which is based on F(50,50) median field strength levels, can be used to determine the distance to a contour directly. With point-to-point prediction methods or field strength measurements, the field strength level at a number of locations along the radial must be determined in order to derive the median field strength levels for the radial. Then, the median field strength levels can be used to locate the field strength contour.

For radials in areas similar to the 107.7°N radial (see figures 1 and 2), predictions based on Bullington's smooth earth method (with 2 dB correction for clutter loss) agree with the median of the measurements. We computed the median field strength for the 107.7°N radial through the proposed studio location using Bullington's smooth earth method and a 2 dB clutter loss correction. Based on our calculations (see Figure 3), the distance to the 70 dBu contour along the radial is 90 km.

Conclusions:

Because the terrain in the vicinity of the proposed studio location departs widely from the terrain in the 3 to 26 km segment, an alternative prediction method is justified. Based on our calculations, the distance to the 70 dBu contour along the 107.7°N radial is 90 km. Therefore, the proposed studio location is within the principal community contour.

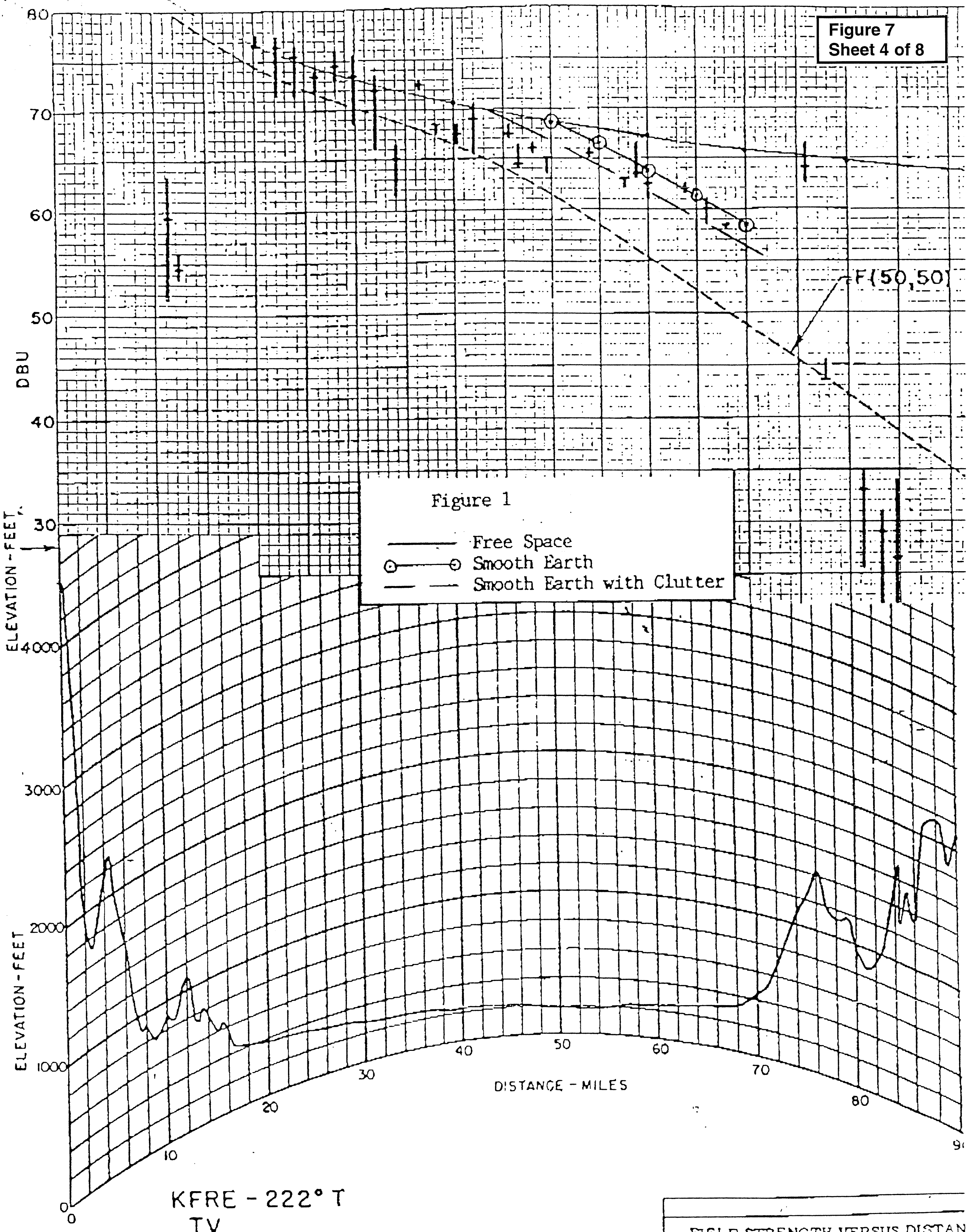
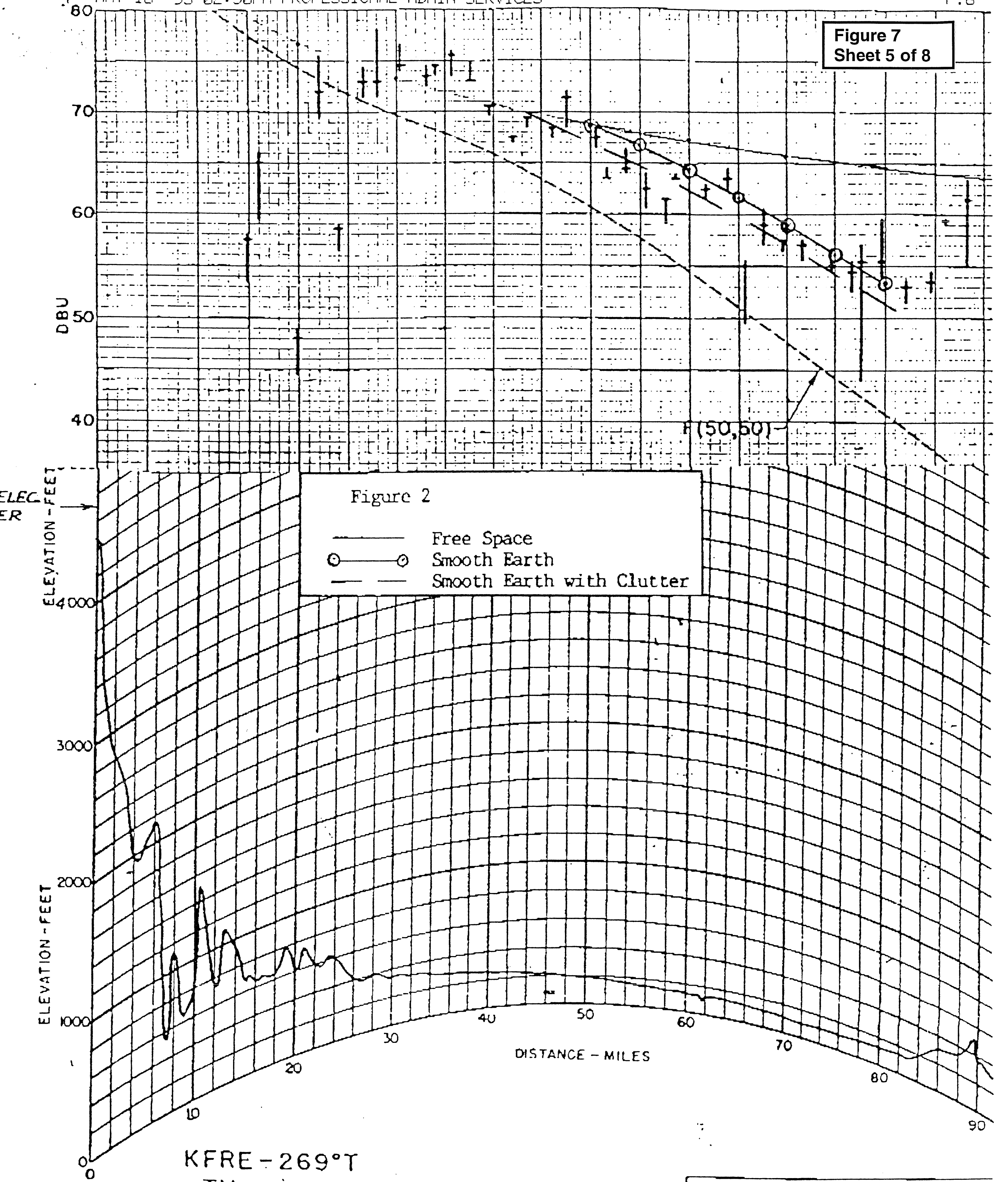


Figure 7
Sheet 4 of 8

FIELD STRENGTH VERSUS DISTAN
AND TERRAIN PROFILES

Figure 7
Sheet 5 of 8



FIELD STRENGTH VERSUS DISTANC
AND TERRAIN PROFILES

209.75 mc 2000 feet

Fresno, California

Association of Maximum Service

Figure 7
Sheet 6 of 8

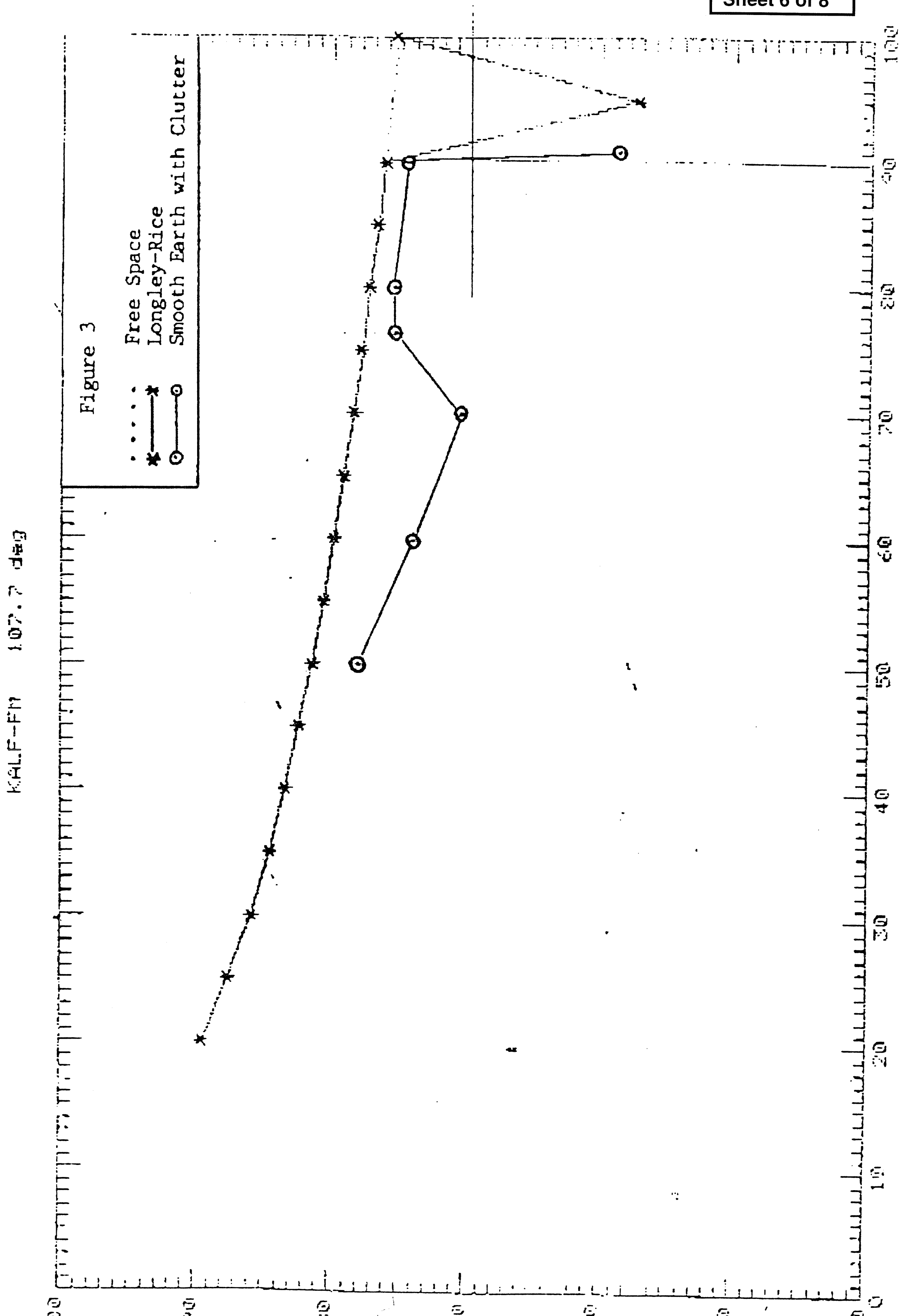


Figure 7
Sheet 7 of 8

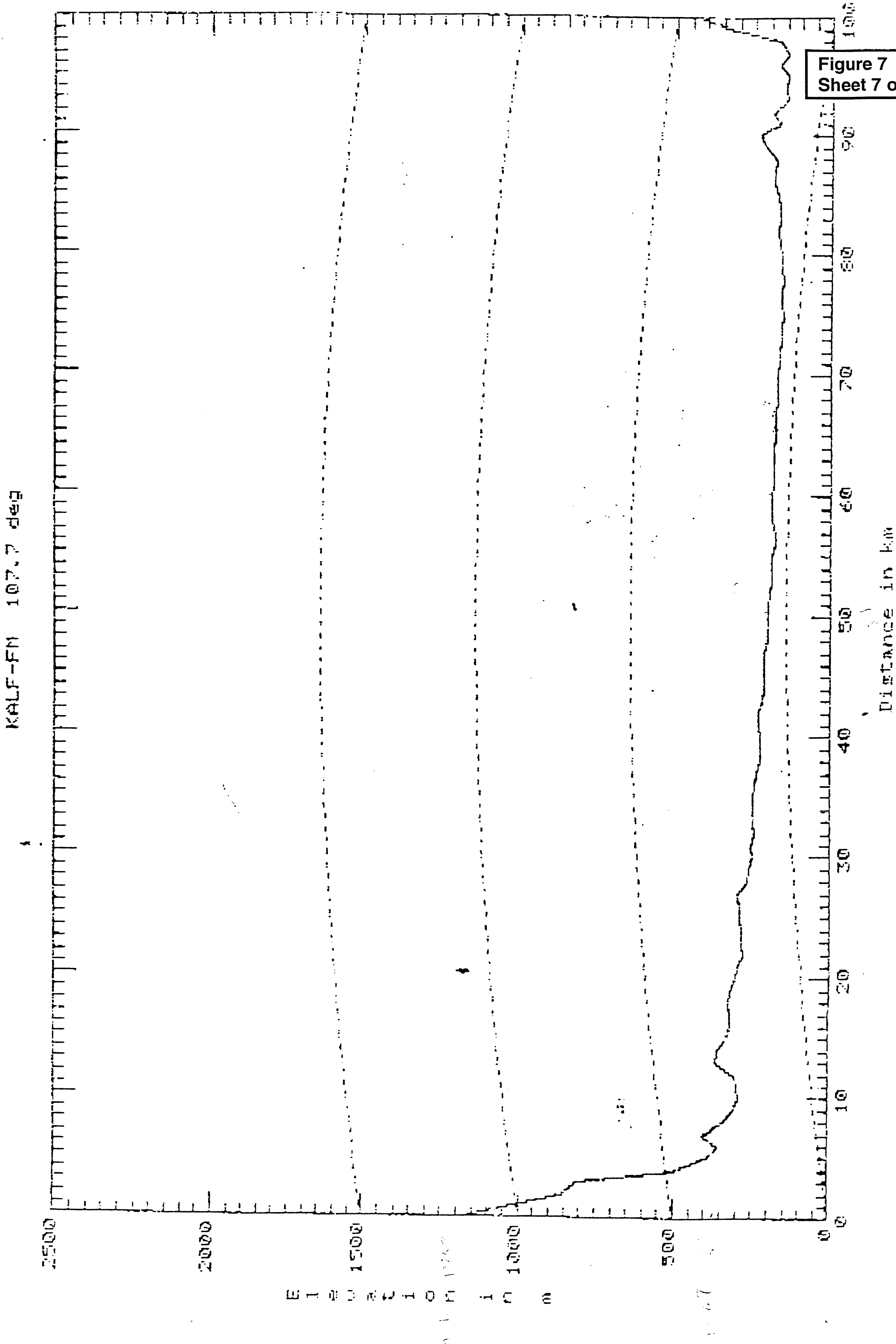


Figure 7
Sheet 8 of 8

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UNITED STATES GOVERNMENT
MEMORANDUM

DATE: 30 JUL 1992

TO: William Daniel
Chief, Propagation Analysis Branch
Room 7130, 2025 M St.

VIA: Will McGibbon
Chief, Spectrum Engineering Division
Office of Engineering and Technology

FROM: Dennis Williams
Chief, FM Branch

VIA: Larry D. Eads
Chief, Audio Services Division
Mass Media Bureau

IN RE: Supplemental showing submitted by radio Station KALF-FM, Red Bluff, California (BLH-851125KH) concerning their proposed main studio location

A supplemental showing has been submitted in support of the location of a proposed main studio for radio Station KALF-FM. The purpose of this showing is to determine if the station's proposed main studio at 312 Otterson, Chico, California receives at least a 70 dBu F(50,50) signal strength.

McNulty Broadcasting, Inc. has submitted an engineering statement prepared by Communications Engineering Services, P.C. which supports their cause. It is noted in their study that "the terrain in one or more directions from the antenna site does depart widely from the average elevation of the 3 to 16 kilometer section(s)." The showing uses the Longley-Rice Terrain Model (Tech Note 101) in predicting field strengths. Your comments are requested on whether the supplemental showing demonstrates whether the proposed main studio in fact receives at least a 70 dBu signal strength and therefore, compliance with Section 73.1125(a).

Because KALF-FM cannot relocate its main studio without the Commission addressing this issue, we request your assistance as expeditiously as possible. Attached is a copy of the supplemental engineering showing. If you have any questions, please contact Kent Prince or Robert Greenberg at 632-7166.

Dennis Williams
Dennis Williams

for Larry D. Eads

Attachment