



## PRECISION SURVEYS, INC.

January 17, 2003

Mr. Jim Garcia  
J-Tec Construction  
PO Box 93247  
Albuquerque, NM 87199

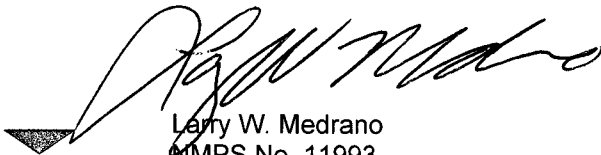
**RE: CLEAR CHANNEL COMMUNICATIONS TOWER-SANDIA CREST, BERNALILLO COUNTY, NM**

Dear Mr. Garcia,

I performed a field survey of the referenced tower on December 16, 2002. The basis of bearings for the survey was between National Geodetic Survey monuments "Sandia" and "Sandia Az". All azimuths were rotated from grid north (NAD 1983) to geodetic north. A reference azimuth point was placed off the south tower leg at an azimuth of 217°00'00". The orientation of the antennae to this reference mark was verified as correct.

Please call me if you have any questions or if you need additional information.

Sincerely,



Larry W. Medrano  
NMPS No. 11993  
President

8414 - D JEFFERSON ST NE

ALBUQUERQUE, NEW MEXICO 87113

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Michael Stark, Director of Engineering  
New Mexico Operations  
2700 San Pedro Blvd. NE  
Albuquerque, NM 87110-3333  
(505) 830-6473, Fax (505) 830-6599

**Federal Communications Commission**

**Re: Permit File Number BXPB-20020503AAA, Facility ID 65704  
(Construction Permit for KTEG Auxiliary Antenna)**

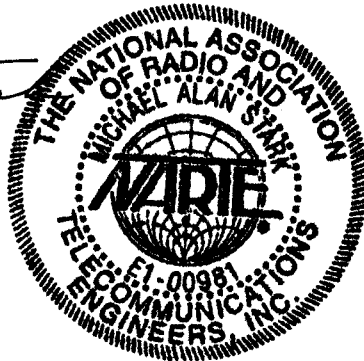
**Pursuant to Special operating conditions specified in this permit:**

- The Scala model CL-FM antenna for this facility is hereby certified to have been installed per the manufacturers specifications, and in such a manner as to preclude any pattern distortion by near field objects from that specified in the Kathrein-Scala Corp. field pattern specifications. The manufacturers measured pattern data is attached. Also see Feb.7, 2003 correspondence from Mike Johnson of Kathrein-Scala regarding this issue.
- The antenna is installed on an Azimuthal alignment of 217 degrees True in compliance with permit specifications. The antenna bearing was then verified by a licensed surveyor to assure proper alignment. (Surveyors affidavit included in this package)
- I personally supervised the installation of this antenna.
- My qualifications to certify this installation include:
  - I am licensed by the FCC (# PG-15-12764 (formerly # P1-15-20220))
  - I am a certified engineer per the National Association of Radio and Telecommunications Engineers (NARTE cert. # E1-000981).
  - I have over thirty years of RF engineering and telecommunications experience.
  - I am currently employed by Clear Channel Radio as Director of Engineering / New Mexico Operations.

**Certified by my hand the tenth day of February, 2003**

A handwritten signature in cursive script that reads 'Michael A. Stark'.

**Michael A. Stark**



**FACSIMILE****Kathrein Inc., Scala Division**

Post Office Box 4580  
Medford, OR 97501 (USA)  
[www.kathrein-scala.com](http://www.kathrein-scala.com)

Phone: (541) 779-6500  
Fax: (541) 779-6575  
e-mail:  
[mjohnson@kathrein.com](mailto:mjohnson@kathrein.com)

*Office Hours: 7:30am-5:00pm Pacific Time, Monday-Friday*

TO: **Clear Channel**  
ATTENTION: **Gil Garcia  
Kevin Douglas  
Mike Stark**  
FAX NUMBER: **918-664-3066**

FROM: **Mike Johnson**

DATE: **February 7, 2003**

Ref: Radiation pattern distortion

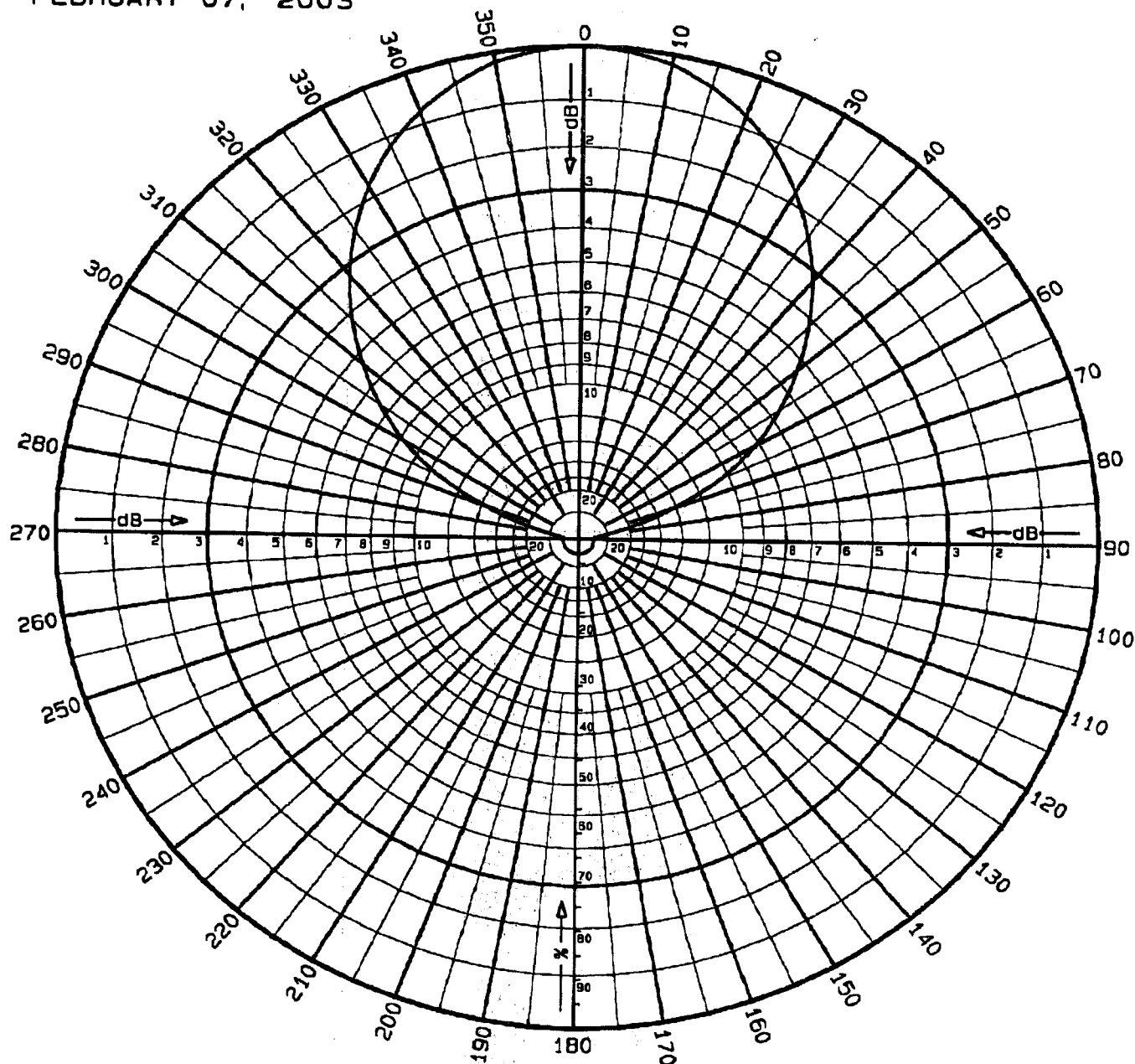
The published radiation patterns for the Kathrein-Scala, CL-FM Log-periodic antennas were measured with the antenna attached to a single 2-3/8" (60mm) outside diameter pipe mast.

The CL-FM log periodic antenna has such a high front-to-back ratio (>25 dB) in it's pattern that the radiation pattern is virtually undistorted by any but the largest of mounting structures (i.e. face mounting to flat plates greater than 1/2 wave length).

Best regards,

Mike Johnson  
Broadcast Sales  
E-mail: [mjohnson@kathrein.com](mailto:mjohnson@kathrein.com)  
[www.kathrein-scala.com](http://www.kathrein-scala.com)

FEBRUARY 07, 2003



CL-FM/VRM/50N LOG-PERIODIC ANTENNA  
 MAX GAIN: 7.0 dBd  
 POWER-x: 5.0  
 VERTICAL POLARIZATION  
 HORIZONTAL PLANE PATTERN TAKEN WITH  
 CL-FM/VRM/50N ANTENNA MOUNTED TO A  
 2-3/8" O.D. PIPE MAST

**KATHREIN**  
 SCALA DIVISION

Post Office Box 4580 Phone: (541) 779-6500  
 Medford, OR 97501 (USA) Fax: (541) 779-3991  
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CL-FM/VRM/50N LOG-PERIODIC ANTENNA  
 VERTICAL POLARIZATION/ HORIZONTAL PLANE PATTERN

Azimuth	Relative Field	Relative dB	dBd	Power Gain
0	1.000	0.0	7.0	5.012
5	0.993	-0.1	6.9	4.898
10	0.980	-0.2	6.8	4.786
15	0.952	-0.4	6.6	4.571
20	0.916	-0.8	6.2	4.169
25	0.873	-1.2	5.8	3.802
30	0.817	-1.8	5.2	3.311
35	0.756	-2.4	4.6	2.884
40	0.690	-3.2	3.8	2.399
45	0.618	-4.2	2.8	1.905
50	0.544	-5.3	1.7	1.479
55	0.467	-6.6	0.4	1.096
60	0.390	-8.2	-1.2	0.759
65	0.300	-10.5	-3.5	0.447
70	0.190	-14.4	-7.4	0.182
75	0.110	-19.2	-12.2	0.060
80	0.050	-26.0	-19.0	0.013
85	0.030	-30.5	-23.5	0.004
90	0.030	-30.5	-23.5	0.004
95	0.030	-30.5	-23.5	0.004
100	0.030	-30.5	-23.5	0.004
105	0.030	-30.5	-23.5	0.004
110	0.030	-30.5	-23.5	0.004
115	0.030	-30.5	-23.5	0.004
120	0.030	-30.5	-23.5	0.004
125	0.030	-30.5	-23.5	0.004
130	0.030	-30.5	-23.5	0.004
135	0.030	-30.5	-23.5	0.004
140	0.030	-30.5	-23.5	0.004
145	0.030	-30.5	-23.5	0.004
150	0.030	-30.5	-23.5	0.004
155	0.030	-30.5	-23.5	0.004
160	0.030	-30.5	-23.5	0.004
165	0.030	-30.5	-23.5	0.004
170	0.030	-30.5	-23.5	0.004
175	0.030	-30.5	-23.5	0.004
180	0.030	-30.5	-23.5	0.004
185	0.030	-30.5	-23.5	0.004
190	0.030	-30.5	-23.5	0.004
195	0.030	-30.5	-23.5	0.004
200	0.030	-30.5	-23.5	0.004
205	0.030	-30.5	-23.5	0.004
210	0.030	-30.5	-23.5	0.004
215	0.030	-30.5	-23.5	0.004
220	0.030	-30.5	-23.5	0.004
225	0.030	-30.5	-23.5	0.004
230	0.030	-30.5	-23.5	0.004
235	0.030	-30.5	-23.5	0.004
240	0.030	-30.5	-23.5	0.004
245	0.030	-30.5	-23.5	0.004
250	0.030	-30.5	-23.5	0.004

CL-FM/VRM/50N LOG-PERIODIC ANTENNA  
VERTICAL POLARIZATION/ HORIZONTAL PLANE PATTERN

Azimuth	Relative Field	Relative dB	dBd	Power Gain
255	0.030	-30.5	-23.5	0.004
260	0.030	-30.5	-23.5	0.004
265	0.030	-30.5	-23.5	0.004
270	0.030	-30.5	-23.5	0.004
275	0.030	-30.5	-23.5	0.004
280	0.050	-26.0	-19.0	0.013
285	0.110	-19.2	-12.2	0.060
290	0.190	-14.4	-7.4	0.182
295	0.300	-10.5	-3.5	0.447
300	0.390	-8.2	-1.2	0.759
305	0.467	-6.6	0.4	1.096
310	0.544	-5.3	1.7	1.479
315	0.618	-4.2	2.8	1.905
320	0.690	-3.2	3.8	2.399
325	0.756	-2.4	4.6	2.884
330	0.817	-1.8	5.2	3.311
335	0.873	-1.2	5.8	3.802
340	0.916	-0.8	6.2	4.169
345	0.952	-0.4	6.6	4.571
350	0.980	-0.2	6.8	4.786
355	0.993	-0.1	6.9	4.898