

**Construction Permit Special Operating Conditions**

Construction Permit

**United States of America  
FEDERAL COMMUNICATIONS COMMISSION  
FM BROADCAST STATION CONSTRUCTION PERMIT**

Authorizing Official:

Official Mailing Address:

FAMILY STATIONS, INC.  
4135 NORTHGATE BOULEVARD  
SUITE 1  
SACRAMENTO CA 95834

Rodolfo F. Bonacci  
Assistant Chief  
Audio Division  
Media Bureau

Facility ID: 85834

Grant Date: May 16, 2005

Call Sign: KPFR

The authority granted herein has  
no effect on the expiration date  
of the underlying construction  
permit.

Permit File Number: BMPED-20050209AVB

This permit modifies permit no.: BPED-19970318MA.

Subject to the provisions of the Communications Act of 1934, as amended, subsequent acts and treaties, and all regulations heretofore or hereafter made by this Commission, and further subject to the conditions set forth in this permit, the permittee is hereby authorized to construct the radio transmitting apparatus herein described. Installation and adjustment of equipment not specifically set forth herein shall be in accordance with representations contained in the permittee's application for construction permit except for such modifications as are presently permitted, without application, by the Commission's Rules.

Commission rules which became effective on February 16, 1999, have a bearing on this construction permit. See Report & Order, Streamlining of Mass Media Applications, MM Docket No. 98-43, 13 FCC RCD 23056, Para. 77-90 (November 25, 1998); 63 Fed. Reg. 70039 (December 18, 1998). Pursuant to these rules, this construction permit will be subject to automatic forfeiture unless construction is complete and an application for license to cover is filed prior to expiration. See Section 73.3598.

Equipment and program tests shall be conducted only pursuant to Sections 73.1610 and 73.1620 of the Commission's Rules.

**Construction Permit Special Operating Conditions**

Construction Permit

Callsign: KPFR

Permit No.: BMPED-20050209AVB

Name of Permittee: FAMILY STATIONS, INC.

Station Location: OR-PINE GROVE

Frequency (MHz): 89.5

Channel: 208

Class: C1

Hours of Operation: Unlimited

Transmitter: Type Accepted. See Sections 73.1660, 73.1665 and 73.1670 of the Commission's Rules.

Transmitter output power: As required to achieve authorized ERP.

Antenna type: Directional

Antenna Coordinates: North Latitude: 45 deg 19 min 58 sec

West Longitude: 121 deg 42 min 48 sec

Horizontally Polarized Antenna	Vertically Polarized Antenna
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Effective radiated power in the Horizontal Plane (kW):	7.0
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Height of radiation center above ground (Meters):	18
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Height of radiation center above mean sea level (Meters):	1853
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Height of radiation center above average terrain (Meters):	510
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Antenna structure registration number: Not Required

Overall height of antenna structure above ground: 20 Meters

Obstruction marking and lighting specifications for antenna structure:

It is to be expressly understood that the issuance of these specifications is in no way to be considered as precluding additional or modified marking or lighting as may hereafter be required under the provisions of Section 303(q) of the Communications Act of 1934, as amended.

None Required

Special operating conditions or restrictions:

- 1 Waiver of 47 C.F.R. Section 73.1125 was previously granted to allow operation of this facility as a satellite operation of the following station:

KUFR(FM), Salt Lake City, UT

**Construction Permit Special Operating Conditions**

Construction Permit

Callsign: KPFR

Permit No.: BMPED-20050209AVB

Special operating conditions or restrictions:

- 2 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, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.
- 3 Warning signs which describe the radiofrequency electromagnetic field radiation hazard must be posted at appropriate intervals. Access must be restricted to prevent the exposure of humans to RF emissions in excess of the FCC guidelines (OET Bulletin 65, Edition 97-01, released August 1997). Permittee shall submit documentation of compliance with this special operating condition when filing FCC Form 302, application for license.
- 4 BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee shall submit the results of a complete proof-of-performance to establish the horizontal plane radiation patterns for both the horizontally and vertically polarized radiation components. This proof-of-performance may be accomplished using the complete full size antenna, or individual bays therefrom, mounted on a supporting structure of identical dimensions and configuration as the proposed structure, including all braces, ladders, conduits, coaxial lines, and other appurtenances; or using a carefully manufactured scale model of the entire antenna, or individual bays therefrom, mounted on an equally scaled model of the proposed supporting structure, including all appurtenances. Engineering exhibits should include a description of the antenna testing facilities and equipment employed, including appropriate photographs or sketches and a description of the testing procedures, including scale factor, measurements frequency, and equipment calibration.
- 5 BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee shall submit an affidavit from a licensed surveyor to establish that the directional antenna has been oriented at the proper azimuth.
- 6 BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee/licensee shall submit an affidavit that the installation of the directional antenna system was overseen by a qualified engineer. This affidavit shall include a certification by the engineer that the antenna was installed pursuant to the manufacturer's instructions and list the qualifications of the certifying engineer.
- 7 The relative field strength of neither the measured horizontally nor vertically polarized radiation component shall exceed at any azimuth the value indicated on the composite radiation pattern authorized by this construction permit.

A relative field strength of 1.0 on the composite radiation pattern herein authorized corresponds to the following effective radiated power:

7 kilowatts.

Principal minima and their associated field strength limits:

310 - 320 degrees True: 0.59 kilowatts

\*\*\* END OF AUTHORIZATION \*\*\*

***Family Stations, Inc.  
KPFR (CP), Pine Grove, OR  
302-FM License Application  
BMPED-20050209AVB  
Facility ID 85834***

***Exhibit 10  
June 2005***

**Construction Permit Special Operating Conditions**

Special Operating Condition 2

The permittee/licensee in coordination with other users of the site will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines. Contact representative information will be posted at the site.

**Construction Permit Special Operating Conditions**

Special Operating Condition 3

**EVALUATION OF ENVIRONMENTAL EFFECTS OF RF EMISSIONS**

**KPFR-FM 89.5 mHz  
Pine Grove, OR**

**INTRODUCTION**

On May 29, 2005, radiofrequency power density measurements were made around the FM transmitting facility for KPFR-FM, 89.5 mHz, Pine Grove, Oregon. The measurements were made from 1:30 PM to 2:30 PM. The transmitter power output was 5,000 Watts and connected to the Shively Labs Model 6513-1DA directional antenna.

**SITE ACCESS AND LOCATION**

The KPFR-FM transmitter site is located in a relatively remote location accessible only by a restricted access, unpaved utility road. The transmitter building is posted with the appropriate RFR warning signs on both ends of the building.

**MEASUREMENT PROCEDURES**

Measurement procedures used are outlined in OET Bulletin 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, Edition 97-01, released August 1997; Supplement A: Additional Information for Radio and Television Broadcast Stations, and the Narda Model 8718B Users Guide. Spatially averaged measurements were made at the point where the highest field was found.

**TEST EQUIPMENT USED**

A Narda Model 8718B, SN1314, Electromagnetic Radiation Survey Meter with Narda Model B8722D, SN15018, Isotropic Shaped Electric Field Probe was used to make the measurements.

The Narda Model 8718B Electromagnetic Radiation Survey Meter allows for accurate and repeatable spatially averaged measurements through the use of its time averaging feature. A single keystroke implements the meter's time averaging function as the probe is swept through an area that approximates that of the human body.

The spatially averaged measurements were made by standing on the point where the highest field was observed and with the averaging timer running, moving the probe slowly from a height of 6 feet (1.9 m) to the ground for "head-to-toe" average. This process was repeated eight times while standing in the same place and turning the body for each head-to-toe sweep while facing a different direction.

**CONCLUSION**

The measured field around the FM transmitter site was below the FCC General Population /Uncontrolled Environment MPE. Spatially averaged measurements were

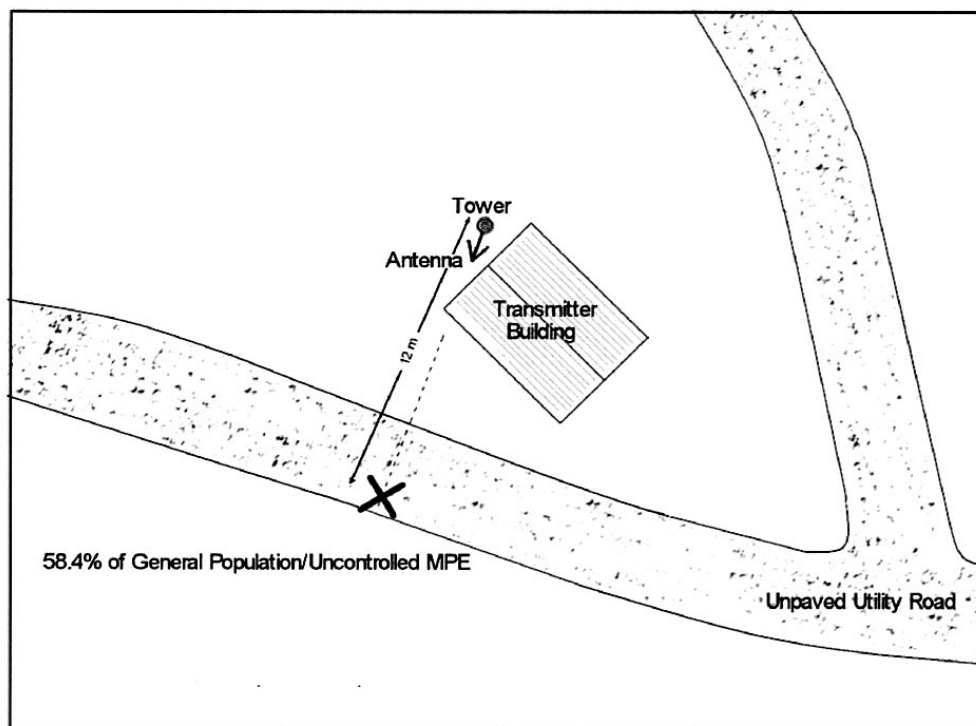


**Construction Permit Special Operating Conditions**

Special Operating Condition 3

made at the point where the highest field was observed (marked "X" on the map below) and the averaged readings did not exceed 58.4% of the FCC General Population/Uncontrolled Environment MPE.

Appropriate warning signs are posted on the transmitter building. A sign will be posted at the base of the antenna tower warning that the KPFR transmitter must be turned off before climbing the structure.



I, James A. Dalke, prepared this report. All representations in this report are true to the best of my knowledge. I have been a broadcast engineer for more than 30 years with experience in broadcast transmission facility construction and installation. I am a Senior Member of the Society of Broadcast Engineers, Member No. 16125. I am Certified by the SBE as a Professional Broadcast Engineer. I hold FCC General Radiotelephone License PG144548.

Sincerely,

James A. Dalke, CPBE  
June 1, 2005

**Construction Permit Special Operating Conditions**

Special Operating Conditions 4 & 7

# Shively Labs

a division of Howell Laboratories, Inc.

- An Employee-Owned Company -

P. O. Box 389 Harrison Rd.,  
Bridgton, Maine 04009 USA

(207) 647-3327

888-SHIVELY

Fax: (207) 647-8273

E-mail: sales@shively.com

Web site: www.shively.com

S.O. 23866

Report of Test 6513-1-DA

for

FAMILY STATIONS, INC.

KPFR 89.5 MHz PINE GROVE, OR

**OBJECTIVE:**

The objective of this test was to demonstrate the directional characteristics of a 6513-1-DA to meet the needs of KPFR and to comply with the requirements of the FCC construction permit, file number BMPED-20050209AVB.

**RESULTS:**

The measured azimuth pattern for the 6513-1-DA is shown in Figure 1. Figure 1A shows the Tabulation of the Vertical Polarization. The calculated elevation pattern of the antenna is shown in Figure 3. Construction permit file number BMPED-20050209AVB indicates that the Vertical radiation component shall not exceed 7.0 kW at any azimuth and is restricted to the following values at the azimuths specified:

310 - 320 Degrees T: 0.59 kW

From Figure 1, the maximum radiation of the Vertical component occurs at 186 Degrees T to 216 Degrees T. At the restricted azimuth of 310 - 320 Degrees T the Vertical component is 11.21 dB down from the maximum of 7.0 kW, or 0.53 kW.

**Construction Permit Special Operating Conditions**

Special Operating Conditions 4 & 7

Test Report 6513-1-DA  
KPFR  
Page Two

The R.M.S. of the Vertical component is 0.633. The total Vertical power gain is 2.276. See Figure 4 for calculations. The R.M.S. of the FCC composite pattern is 0.690. Therefore this Pattern complies with the FCC requirement of 73.316(c)(2)(ix)(A).

METHOD OF DIRECTIONALIZATION:

One bay of the 6513-1-DA was mounted on a pole of exact scale to a pole at the KPFR site. The spacing of the antenna to the tower was varied to achieve the vertical pattern shown in Figure 1. See Figure 2 for mechanical details.

METHOD OF MEASUREMENT:

As allowed by the construction permit, file number BMPED-20050209AVB, a single level of the 6513-1-DA was set up on the Howell Laboratories scale model antenna pattern measuring range. A scale of 4.5:1 was used.

SUPERVISION:

Mr. Surette was graduated from Lowell Technological Institute, Lowell, Massachusetts in 1973 with the degree of Bachelor of Science in Electrical Engineering. He has been directly involved with design and development of broadcast antennas, filter systems and RF transmission components since 1974, as an RF Engineer for six years with the original Shively Labs in Raymond, ME and for a short period of time with Dielectric Communications. He is currently an Associate Member of the AFCCE and a Senior Member of IEEE. He has authored a chapter on filters and combining systems for the latest edition of the CRC Electronics Handbook and for the 9<sup>th</sup> Edition of the NAB Handbook.



**Construction Permit Special Operating Conditions**

Special Operating Conditions 4 & 7

Test Report 6513-1-DA  
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Page Three

**EQUIPMENT:**

The scale model pattern range consists of a wooden rotating pedestal equipped with a position indicator. The scale model bay is placed on the top of this pedestal and is used in the transmission mode at approximately 20 feet above ground level. The receiving corner reflector is spaced 50 feet away from the rotating pedestal at the same level above ground as the transmitting model. The transmitting and receiving signals are carried to a control building by means of RG-9/U double shielded coax cable.

The control building is equipped with:

Hewlett Packard Model 8753 Network Analyzer  
PC Based Controller  
Hewlett Packard 7550A Graphics Plotter

The test equipment is calibrated to ANSI/NCSL Z540-1-1994.

**TEST PROCEDURES:**

The corner reflector is mounted so that the horizontal and vertical azimuth patterns are measured independently by rotating the corner reflector by 90 degrees. The network analyzer was set to 402.75 MHz. Calibrated pads are used to check the linearity of the measuring system. For example, 6 dB padding yields a scale reading of 50 from an unpadding reading of 100 in voltage. From the recorded patterns, the R.M.S. values are calculated and recorded as shown in Figure 1.

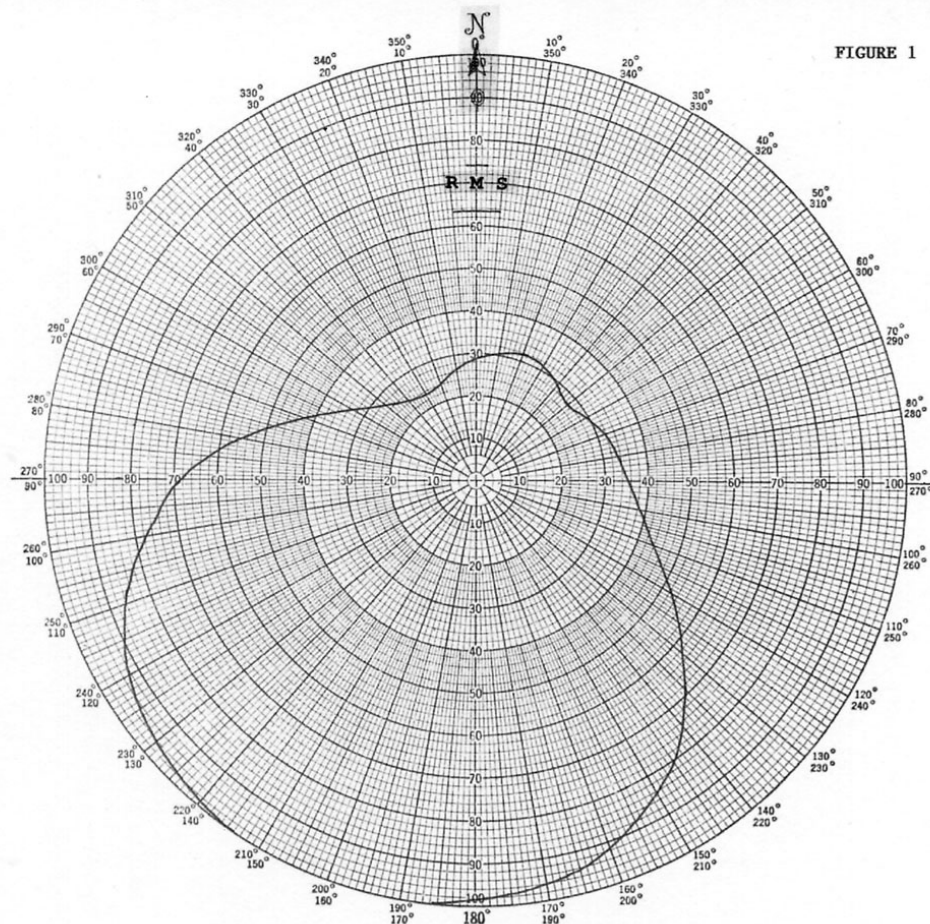
Respectfully submitted by:



Robert A. Surette  
Manager of RF Engineering  
S/O 23866  
June 10, 2005

**Construction Permit Special Operating Conditions**

Special Operating Conditions 4 & 7



**Shively Labs**

PROJECT NAME KPFR PINE GROVE, OR  
PROJECT NUMBER 23866 DATE 6/9/05  
MODEL ( X ) FULL SCALE ( ) FREQUENCY 402.75/89.5 MHz  
POLARIZATION VERTICAL  
CURVE PLOTTED IN: VOLTAGE ( X ) POWER ( ) DB ( )  
OBSERVER RAS

ANTENNA TYPE 6513-1-DA  
PATTERN TYPE DIRECTIONAL AZIMUTH  
REMARKS: SEE FIGURE 2 FOR MECHANICAL  
DETAILS

SHIVELY LABS, A DIVISION OF HOWELL LABORATORIES, INC. BRIDGTON, ME 04009 (207) 647-3327

**Construction Permit Special Operating Conditions**

Special Operating Conditions 4 & 7

**Figure 1A**

S/O 23866  
TABULATION OF VERTICAL POLARIZATION  
KPFR PINE GROVE, OR

DEGREE	RELATIVE FIELD	DEGREE	RELATIVE FIELD
0	0.290	180	0.985
10	0.305	190	1.000
20	0.315	200	1.000
30	0.310	210	1.000
40	0.290	220	0.990
45	0.280	225	0.975
50	0.280	230	0.960
60	0.295	240	0.925
70	0.320	250	0.860
80	0.335	260	0.775
90	0.355	270	0.685
100	0.385	280	0.550
110	0.440	290	0.420
120	0.525	300	0.330
130	0.630	310	0.275
135	0.690	315	0.255
140	0.750	320	0.245
150	0.845	330	0.235
160	0.915	340	0.240
170	0.960	350	0.265

### Special Operating Conditions 4 & 7



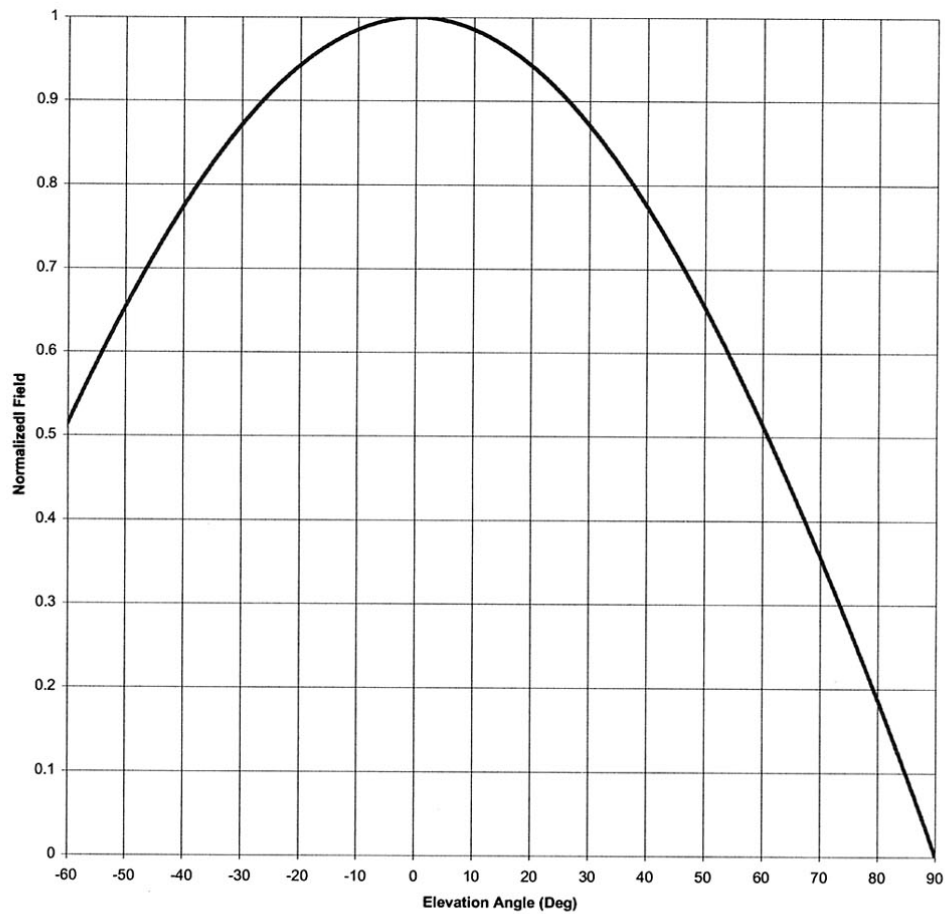
**Construction Permit Special Operating Conditions**

Special Operating Conditions 4 & 7

Antenna Mfg.: Shively Labs  
Antenna Type: 6513-1-DA  
Station: KPFR  
Frequency: 89.5  
Channel #: 208  
Figure: 3

Date: 6/9/2005

Beam Tilt	0	
Gain (Max)	2.276	3.572 dB
Gain (Horizon)	2.276	3.572 dB





**Construction Permit Special Operating Conditions**

Special Operating Conditions 4 & 7

Antenna Mfg.: Shively Labs  
 Antenna Type: 6513-1-DA

Date: 6/9/2005

Station: KPFR

Beam Tilt 0

Frequency: 89.5

Gain (Max) 2.276

3.572 dB

Channel #: 208

Gain (Horizon) 2.276

3.572 dB

Figure: 3

Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field
-90	0.000	-44	0.729	0	1.000	46	0.705
-89	0.021	-43	0.741	1	1.000	47	0.693
-88	0.040	-42	0.752	2	0.999	48	0.680
-87	0.059	-41	0.763	3	0.999	49	0.667
-86	0.078	-40	0.774	4	0.998	50	0.654
-85	0.096	-39	0.785	5	0.996	51	0.641
-84	0.114	-38	0.796	6	0.995	52	0.628
-83	0.133	-37	0.806	7	0.993	53	0.614
-82	0.151	-36	0.816	8	0.991	54	0.600
-81	0.168	-35	0.826	9	0.988	55	0.586
-80	0.186	-34	0.835	10	0.985	56	0.572
-79	0.204	-33	0.845	11	0.982	57	0.558
-78	0.221	-32	0.854	12	0.979	58	0.544
-77	0.239	-31	0.862	13	0.975	59	0.529
-76	0.256	-30	0.871	14	0.971	60	0.514
-75	0.273	-29	0.879	15	0.967	61	0.499
-74	0.290	-28	0.887	16	0.963	62	0.484
-73	0.307	-27	0.895	17	0.958	63	0.469
-72	0.324	-26	0.903	18	0.953	64	0.453
-71	0.341	-25	0.910	19	0.948	65	0.437
-70	0.357	-24	0.917	20	0.942	66	0.422
-69	0.373	-23	0.924	21	0.936	67	0.406
-68	0.390	-22	0.930	22	0.930	68	0.390
-67	0.406	-21	0.936	23	0.924	69	0.373
-66	0.422	-20	0.942	24	0.917	70	0.357
-65	0.437	-19	0.948	25	0.910	71	0.341
-64	0.453	-18	0.953	26	0.903	72	0.324
-63	0.469	-17	0.958	27	0.895	73	0.307
-62	0.484	-16	0.963	28	0.887	74	0.290
-61	0.499	-15	0.967	29	0.879	75	0.273
-60	0.514	-14	0.971	30	0.871	76	0.256
-59	0.529	-13	0.975	31	0.862	77	0.239
-58	0.544	-12	0.979	32	0.854	78	0.221
-57	0.558	-11	0.982	33	0.845	79	0.204
-56	0.572	-10	0.985	34	0.835	80	0.186
-55	0.586	-9	0.988	35	0.826	81	0.168
-54	0.600	-8	0.991	36	0.816	82	0.151
-53	0.614	-7	0.993	37	0.806	83	0.133
-52	0.628	-6	0.995	38	0.796	84	0.114
-51	0.641	-5	0.996	39	0.785	85	0.096
-50	0.654	-4	0.998	40	0.774	86	0.078
-49	0.667	-3	0.999	41	0.763	87	0.059
-48	0.680	-2	0.999	42	0.752	88	0.040
-47	0.693	-1	1.000	43	0.741	89	0.021
-46	0.705	0	1.000	44	0.729	90	0.000
-45	0.717			45	0.717		

**Construction Permit Special Operating Conditions**

Special Operating Conditions 4 & 7

FIGURE 4

S.O. 23866

VALIDATION OF GAIN CALCULATION

KPFR PINE GROVE, OR

MODEL 6513-1-DA

Elevation Gain of 6513-1-DA equals 0.912

The RMS values are calculated utilizing the data of a planimeter.

Vertical Azimuth Gain equals  $1/(\text{RMS})^2$   
 $1/(0.633)^2 = 2.496$

\* Total Vertical Gain is Elevation Gain times Azimuth Gain  
 $0.912 \times 2.496 = 2.276$

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ERP divided by Vertical Gain equals Antenna Input Power  
 $7.0 \text{ kW} \div 2.276 = 3.076$

**Construction Permit Special Operating Conditions**

Special Operating Condition 5



DAVID EVANS  
AND ASSOCIATES INC.

May 25, 2005

Family Stations, Inc.  
KPFR FM Radio Station

**SUBJECT: RADIO STATION KPFR (FM)  
MT. HOOD OREGON TRANSMITTER SITE  
ANTENNA DIRECTION**

To whom it may concern:

David Evans and Associates, Inc. (DEA) survey field crew under my direct supervision established a baseline on Mt. Hood, West of Timberline Lodge using two (2) 4800 Trimble GPS Receivers to obtain a Geodetic Azimuth. From this position a true bearing was established to determine the azimuth of the two-bay SHIVELY LABS MODEL NO. 6513-1DA VERTICALLY POLARIZED DIRECTIONAL FM ANTENNA (Serial No. 1056) to be 200 degrees ( $\pm 15$  minutes) from True North on May 23, 2005. Equipment used consisted of a Leica TCA 1800 Electronic Theodolite to record angles and distance to the antenna mounted on a radio tower.

DAVID EVANS AND ASSOCIATES, INC.

Patrick N. Smith, P.L.S.  
Project Surveyor

**Construction Permit Special Operating Conditions**

Special Operating Condition 6

**Dalke Broadcast Services, Inc.**  
P.O. Box 6016 Bellevue, WA 98008

May 25, 2005

KPFR-FM Radio  
Family Radio Stations  
290 Hegenberger Road  
Oakland, CA 94621

RE: Installation of directional antenna system

To whom it may concern:

On May 23, 2005, I was responsible for supervision of the installation of Shively Labs Model 6513-1DA Directional Antenna, Serial number 1056, at the KPFR-FM transmitter site located at 45° 19' 58" N, 121° 42' 48" W, pursuant to the manufacturer's installation instructions. No on-site revisions or alterations were needed or made, either electrically or mechanically.

The antenna orientation was surveyed by David Evans and Associates, Inc. and the results of the surveyor have been supplied to Family Stations separately.

I, James A. Dalke, have been a broadcast engineer for more than 30 years with experience in broadcast transmission facility construction and installation. I am a Senior Member of the Society of Broadcast Engineers, Member No. 16125, and I am Certified by the SBE as a Professional Broadcast Engineer. I hold FCC General Radiotelephone License PG144548.

Sincerely,



James A. Dalke, CPBE