

## Exhibit E-2

### Special Operating Conditions or Restrictions

In FCC Form 302FM, Section III, Number 8, the applicant is asked to provide an Exhibit providing proof of compliance with regards to Special Operating Conditions or Restrictions.

1. 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.

Unless Personnel are actually climbing the antenna structure, the radiation level is within the occupational guidelines when the station is operating at full power. In the event of work on the antenna structure, the transmitter power of any transmitter will be reduced to the extent required, and possibly shut down if necessary, to allow safe work in the immediate region of the antenna.

2. 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 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.

Included in this exhibit is a detailed proof-of-performance provided by the antenna manufacturer.

3. 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.

Included in this exhibit is a detailed proof-of-orientation provided by a licensed local surveyor.

4. 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 a qualified engineer that the antenna was installed pursuant to the manufacturer's instructions and list the qualifications of the certifying engineer.

Included in this exhibit is an affidavit certifying that the directional antenna was installed pursuant to the manufacturer's instructions, and that the installation was overseen by a qualified engineer.

5. 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 (ERP): 100 kilowatts.

Principle minimum and its associated ERP limit:  
80 degrees True: 15.5 kilowatts.

Please refer to the manufacturer's technical notes, included in this exhibit. The composite pattern's RMS is 0.915 and the measured pattern's RMS is 0.785. This demonstrates that the measured pattern is 85.8% of the composite pattern approved by the Commission as stated on page 2 of the manufacturer's technical notes.

Also referencing the manufacturer's technical notes, the relative field at the 80-degree radial is 0.235. With 100kW at the maximum relative field, this gives 5.5kW at the 80 degree radial which is less than the composite pattern's 80-degree radial.

6. BEFORE PROGRAM TESTS COMMENCE, sufficient measurements shall be made to establish that the operation authorized in

this construction permit is in compliance with the spurious emissions requirements of 47 C.F.R. Sections 73.317(b) through 73.317(d). All measurements must be made with all stations simultaneously utilizing the shared antenna. These measurements shall be submitted to the Commission along with the FCC Form 302-FM application for license.

Included in this exhibit is a detailed proof-of-performance demonstrating compliance to 47 C.F.R. 73.317(b) through (d).

7. Permittee has specified use of the antenna listed below to demonstrate compliance with the FCC radiofrequency electromagnetic field exposure guidelines. If any OTHER type or size of antenna is to be used with the facilities authorized herein, THE AUTOMATIC PROGRAM TEST PROVISIONS of 47 C.F.R. SECTION 73.1620 WILL NOT APPLY. In THAT case, a FORMAL REQUEST FOR PROGRAM TEST AUTHORITY must be filed in conjunction with FCC Form 302-FM, application for license, BEFORE program tests will be authorized. The request should be made at least 10 days prior to the date on which program tests are desired to commence. The request must include a revised RF field showing to demonstrate continued compliance with the FCC guidelines.

The antenna specified in the construction permit was a 12 bay (1/2 wavelength interspaced) elliptically polarized array. The actual array used is a 12 bay (full wavelength interspaced) vertically polarized array. Included in this exhibit is a copy of the formal request for program test authority with an RF Hazard Analysis demonstrating compliance to the FCC radiofrequency electromagnetic field exposure guidelines.

S.O. 21532

Report of Test 6510BB-12-CF-DA

for

CALVARY CHAPEL OF TWIN FALLS, INC.

KEFX TWIN FALLS, ID

## **OBJECTIVE:**

The objective of this test was to demonstrate the directional characteristics of a 6510BB-12-CF-DA to meet the needs of KEXX and to comply with the requirements of the FCC construction permit, file number BMPED-19990521IL.

## **RESULTS:**

The measured azimuth pattern for the 6510BB-12-CF-DA is shown in Figure 1. Figure 1A the Tabulation of the Vertical Polarization. The calculated elevation pattern of the antenna is shown in Figure 3. Construction permit file number BMPED-19990521IL indicates that the Vertical radiation component shall not exceed 100 kW at any azimuth and is restricted to the following values at the azimuths specified:

80 Degrees T: 15.5 kW

From Figure 1, the maximum radiation of the Vertical component occurs at 166 Degrees T to 177 Degrees T and at 243 Degrees T to 283 Degrees T. At the restricted azimuth of 80 Degrees T the Vertical component is 12.58 dB down from the maximum of 100 kW, or 5.5 kW.

The R.M.S. of the Vertical component is 0.785. The total Vertical power gain is 22.297. See Figure Four for calculations. The R.M.S. of the FCC composite pattern is 0.915. Therefore this Pattern complies with the FCC requirement of 73.316(c)(2)(ix)(A).

**METHOD OF DIRECTIONALIZATION:**

One bay of the 6510BB-12-CF-DA was mounted on a tower of exact scale to a T.S. Inc. PB5 tower. 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-19990521IL, a single level of the 6510BB-12-CF-DA was set up on the Howell Laboratories scale model antenna pattern measuring range. A scale of 4.5:1 was used.

**SUPERVISION:**

The tests were carried out under the direction of Robert A. Surette, Manager of RF Engineering. 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 both full size and scale model pattern measurements since 1974 as an RF Engineer with Shively Labs and with Dielectric Communications (a unit of General Signal). He is currently an Associate Member of the Association of Federal Communications Consulting Engineers and a Member of IEEE.

**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 8505 Network Analyzer

PC Based Controller

Hewlett Packard 7550A Graphics Plotter

The test equipment is calibrated to MIL-STD-45662.

**TEST PROCEDURES:**

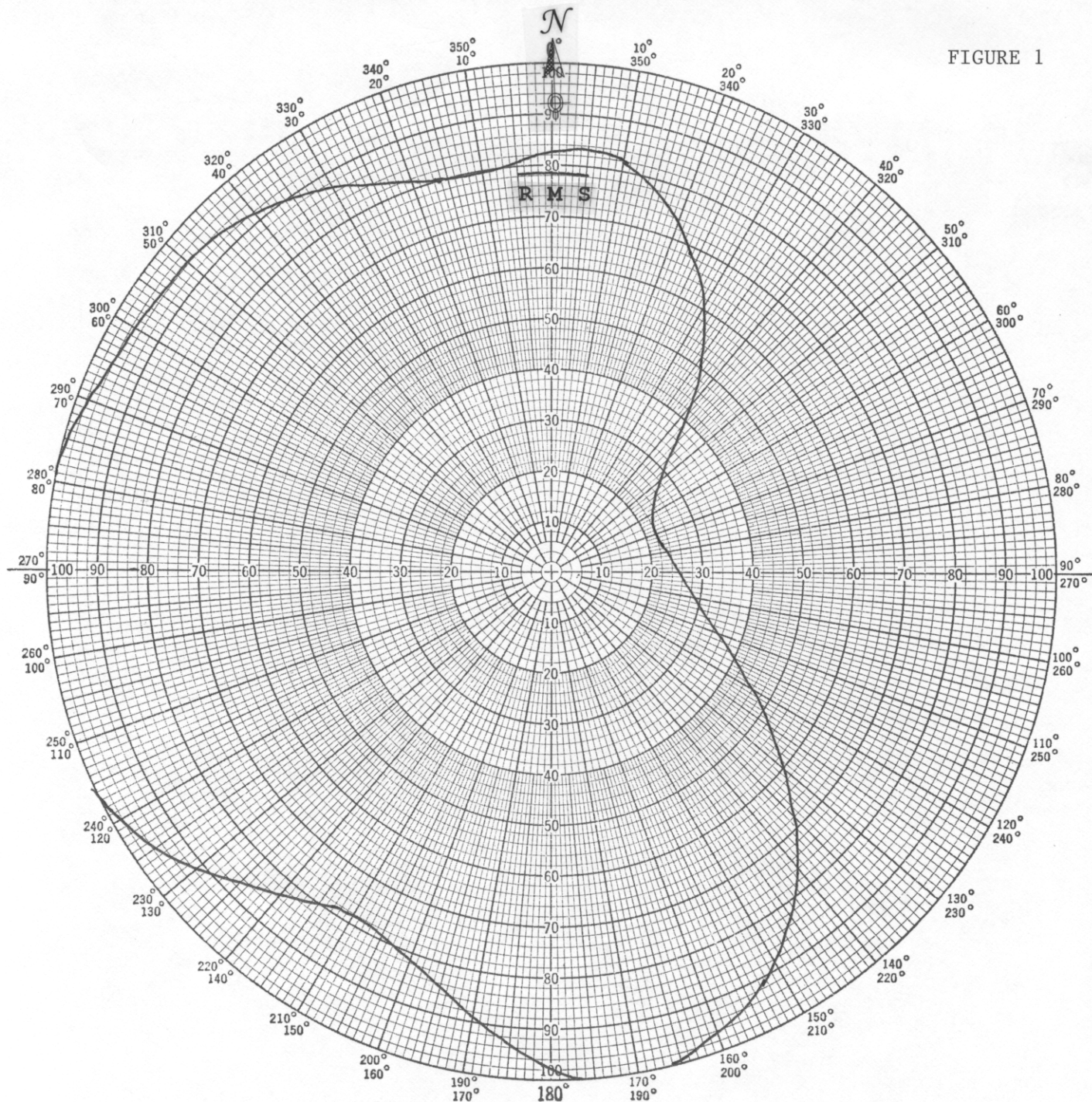
The corner reflector is mounted so that the horizontal and vertical azimuth patterns are measured independently by rotating the corner reflector by 90 degrees. The network analyzer was set to 400.05 MHz. Calibrated pads are used to check the linearity of the measuring system. For example, 6 dB padding 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 21532  
February 22, 2001

FIGURE 1



## Shively Labs

PROJECT NAME KEFX TWIN FALLS, ID  
 PROJECT NUMBER 21532 DATE 2/21/01  
 MODEL ( X ) FULL SCALE ( ) FREQUENCY 400.05/88.9 MHz  
 POLARIZATION VERTICAL  
 CURVE PLOTTED IN: VOLTAGE ( X ) POWER ( ) DB ( )  
 OBSERVER RAS

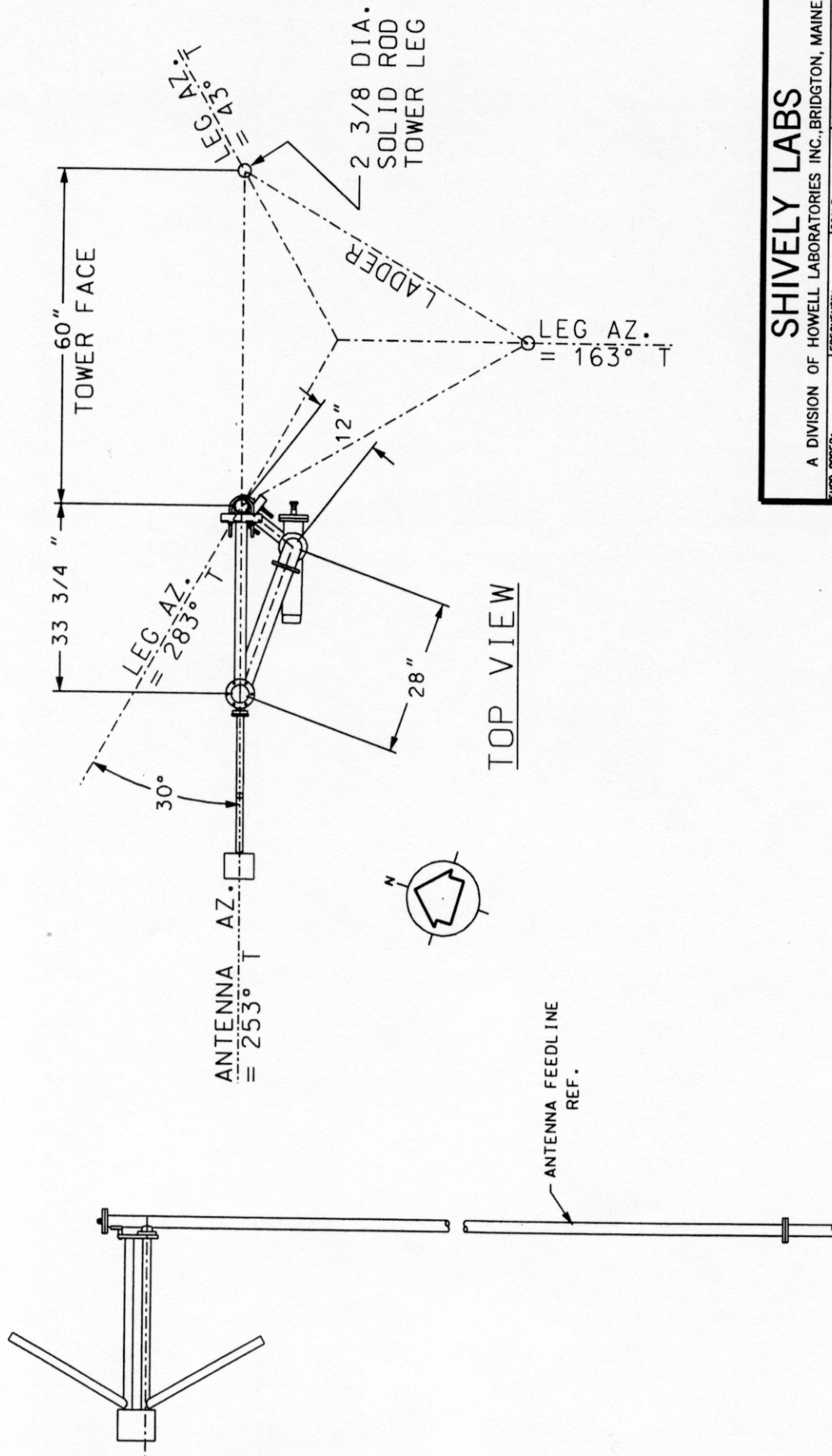
ANTENNA TYPE 6510BB-12-CF-DA  
 PATTERN TYPE DIRECTIONAL AZIMUTH  
 REMARKS: SEE FIGURE 2 FOR MECHANICAL  
DETAILS

Figure 1A

S/O 21532  
TABULATION OF HORIZONTAL POLARIZATION  
KEFX TWIN FALLS, ID

DEGREE	RELATIVE FIELD	DEGREE	RELATIVE FIELD
0	0.825	180	0.980
10	0.820	190	0.890
20	0.735	200	0.815
30	0.610	210	0.780
40	0.430	220	0.835
45	0.340	225	0.870
50	0.285	230	0.915
60	0.235	240	0.980
70	0.220	250	1.000
80	0.235	260	1.000
90	0.255	270	1.000
100	0.290	280	1.000
110	0.350	290	0.980
120	0.460	300	0.955
130	0.605	310	0.940
135	0.680	315	0.935
140	0.760	320	0.915
150	0.885	330	0.870
160	0.965	340	0.815
170	1.000	350	0.800





# SHIVELY LABS

A DIVISION OF HOWELL LABORATORIES INC., BRIDGTON, MAINE, USA

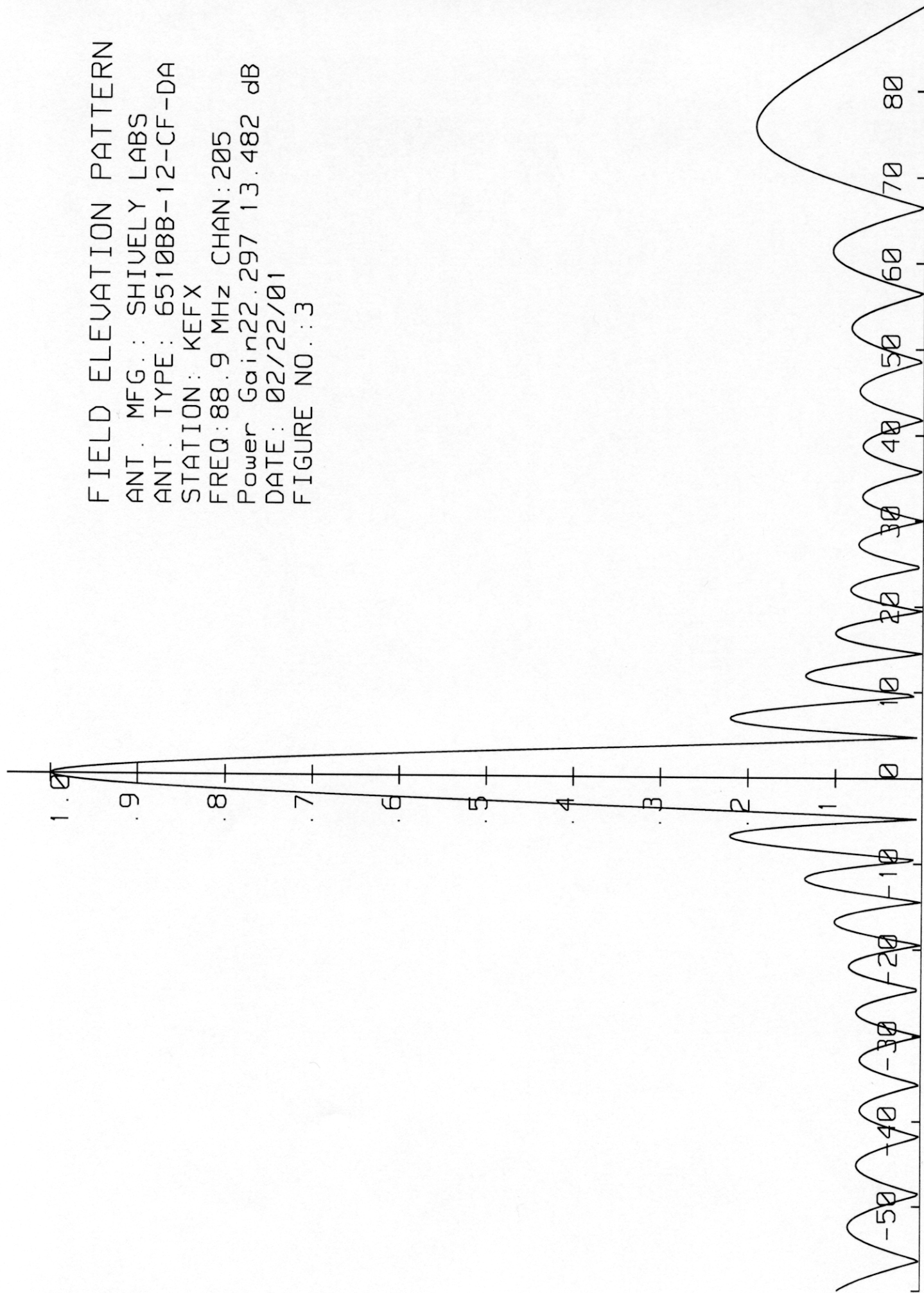
SHOP ORDER:	FREQUENCY:	SCALE:	DRAWN BY:	APPROVED BY:
21,532	88.9/89.9 MHZ.	N.T.S.	APL	

TITLE:  
MODEL 6510BB-12-CF-DIRECTIONAL ANTENNA  
FM STATION

DATE:  
10/31/00

FIGURE 2

FIELD ELEVATION PATTERN  
ANT. MFG.: SHIVELY LABS  
ANT. TYPE: 6510BB-12-CF-DA  
STATION: KEFX  
FREQ: 88.9 MHz CHAN: 205  
Power Gain 22.297 13.482 dB  
DATE: 02/22/01  
FIGURE NO.: 3



S.O. 21532

VALIDATION OF GAIN CALCULATION

KEFX TWIN FALLS, ID

MODEL 6510BB-12-CF-DA

Elevation Gain of 6510BB-12-CF-DA equals 13.74

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

Vertical Azimuth Gain equals  $1/(\text{RMS})^2$   
 $1/(0.785)^2 = 1.6228$

\* Total Vertical Gain is Elevation Gain times Azimuth Gain  
 $13.74 \times 1.6228 = 22.297$

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ERP divided by Vertical Gain equals Antenna Input Power  
 $100 \text{ kW} \div 22.297 = 4.485 \text{ kW}$

**EHM Engineers, Inc.**  
ENGINEERS / SURVEYORS / PLANNERS

IN THE FIELDS OF:  
PLANNING  
SURVEYING  
HIGHWAYS  
WATER  
SEWAGE  
STRUCTURAL  
SUBDIVISIONS  
BRIDGES  
ENVIRONMENTAL  
QUALITY CONTROL  
CONSTRUCTION MGMT.

February 16, 2001

John C. Hall  
CSN International, Inc.  
4002 N. 3300 E.  
Twin Falls, Idaho 83301

Re: KEFX, KAWZ, Twin Falls, Idaho  
Antenna Survey

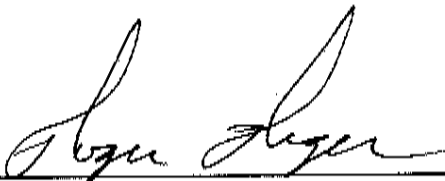
Dear Mr. Hall:

I have surveyed the KEFX, KAWZ transmission installation FM directional antenna at the proposed tower site and have determined the true north AZIMUTH of the antenna to be 252°53'26".

The azimuth was determined using a survey grade trimble RTK 4700 Global positioning system based on WGS 84 ellipsoidal datum.

The precision of the Azimuth is  $\pm 0.5$  degrees.



  
Roger Kruger  
Registered Professional Land Surveyor  
License No. 1000

**Affidavit Certification and Qualifications of Supervising Engineer**  
In support of FCC Form 302-FM  
KEFX, Twin Falls, Idaho, FCC File Number BMPED-19990521IL

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The proposed facility in construction permit is constructed as permitted in the current construction permit FCC File Number BMPED-19990521IL. I have overseen all aspects of the KEFX site and directional antenna assembly and installation. I certify that the station is built as permitted. The directional antenna system was installed exactly as the manufacturer (Shively Labs/ Howell Laboratories, Inc.) specified and the antenna orientation as specified by the FCC permit and the manufacturer was measured and verified by a Licensed Professional Surveyor in the State of Idaho. The surveyor's certification is attached in this exhibit.

I certify, under penalty of perjury, that I am a Broadcast Engineer and am familiar with all aspects of the FCC regulations that concern this project. I have been a broadcast engineer since 1996, and am recognized by the Society of Broadcast Engineers (Member #18825).



**John Calvin Hall**  
Broadcast Engineer  
CSN, International

26 FEB 01  
**Date**

## Spurious Emissions Compliance

Special Operating Condition of KEFX construction permit (BMPED-19990521IL) states, “*BEFORE PROGRAM TESTS COMMENCE, sufficient measurements shall be made to establish that the operation authorized in this construction permit is in compliance with the spurious emissions requirements of 47 C.F.R. Sections 73.317(b) through 73.317(d). All measurements must be made with all stations simultaneously utilizing the shared antenna. These measurements shall be submitted to the Commission along with the FCC Form 302-FM application for license.*”

### **47 C.F.R. 73.317 (b)**

47 C.F.R. 73.317 (b) states, “*Any emission appearing on a frequency removed from the carrier by between 120 kHz and 240 kHz inclusive must be attenuated at least 25 dB below the level of the unmodulated carrier. Compliance with this requirement will be deemed to show the occupied bandwidth to be 240 kHz or less.*”

The spurious emissions study placed the peak, unmodulated, carrier at -19.9dB. From -120kHz to -240kHz and from +120kHz to +240kHz the peak emissions ranged between -94.3dB to -95.3dB with an attenuation between 74.4dB and 75.4dB respectively.

### **47 C.F.R. 73.317 (c)**

47 C.F.R. 73.317 (c) states, “*Any emission appearing on a frequency removed from the carrier by more than 240 kHz and up to and including 600 kHz must be attenuated at least 35 dB below the level of the unmodulated carrier.*”

The spurious emissions study placed the peak, unmodulated, carrier at -19.9dB. From -240kHz to -600kHz and from +240kHz to +600kHz the peak emissions ranged between -95.3dB to -97.6dB with an attenuation between 75.4dB and 77.7dB respectively.

### **47 C.F.R. 73.317 (d)**

47 C.F.R. 73.317 (d) states, “*Any emission appearing on a frequency removed from the carrier by more than 600 kHz must be attenuated at least  $43 + 10 \log_{10}(\text{Power, in watts})$  dB below the level of the unmodulated carrier, or 80 dB, whichever is the lesser attenuation.*”

The spurious emissions study placed the peak, unmodulated, carrier at -19.9dB. From -600kHz onward and from +600kHz onward the peak emissions were unreadable since the background noise was around -100dB and less. While performing an on/off test with the transmitters, there were no spurious emissions discernable.

## Formal Request for Program Test Authority

Special Operating Condition of KEFX construction permit (BMPED-19990521IL) states, "Permittee has specified use of the antenna listed below to demonstrate compliance with the FCC radiofrequency electromagnetic field exposure guidelines. If any OTHER type or size of antenna is to be used with the facilities authorized herein, THE AUTOMATIC PROGRAM TEST PROVISIONS of 47 C.F.R. SECTION 73.1620 WILL NOT APPLY. In THAT case, a FORMAL REQUEST FOR PROGRAM TEST AUTHORITY must be filed in conjunction with FCC Form 302-FM, application for license, BEFORE program tests will be authorized. The request should be made at least 10 days prior to the date on which program tests are desired to commence. The request must include a revised RF field showing to demonstrate continued compliance with the FCC guidelines."

The antenna specified in the construction permit was a 12 bay (1/2 wavelength interspaced) elliptically polarized array. The actual array used is a 12 bay (full wavelength interspaced) vertically polarized array.

### Radiation Hazard Study

The 12-Bay (vertically polarized) transmitting antenna at the proposed site would be operating with 100kWatts ERP at its center of radiation 165 meters above the level of assessment.

Several stations are located on this tower. On a 90ft appurtenance (located on top of the 600 ft tower) is KMVT (CBS Affiliate, Channel 11) TV station, broadcasting 316kW (Horizontally Polarized) at 196.6m Above Ground Level. KAWZ (BMPED-19990521MB) and KEFX (BMPED-19990521IL) are two 100kW stations combined on the single 12-bay array.

Appendix C of OST Bulletin No. 65 (second edition) specifies the maximum radiation in 30MHz to 300MHz region should be limited to 1000  $\mu\text{W}/\text{cm}^2$  for occupational / controlled exposure and 200  $\mu\text{W}/\text{cm}^2$  for general population/ uncontrolled exposure.

This application was evaluated with the Commission's **FMModel** program, acquired from the FCC Office of Engineering Technology (OET) Internet Site, using the **Shively 6800 Series element pattern** for both KAWZ and KEFX, and the **Dipole Element Pattern** was used for KMVT. The combined station produces its maximum, average-man compensated, ground level radiation is 64.33  $\mu\text{W}/\text{cm}^2$  at 32.8 meters from the base of the evaluation (KMVT = 58.69  $\mu\text{W}/\text{cm}^2$ , KAWZ = 2.82  $\mu\text{W}/\text{cm}^2$ , KEFX = 2.82  $\mu\text{W}/\text{cm}^2$ ). This is 6.43% of the occupational exposure limit specified in OST Bulletin No. 65 and 32.16% of the general population exposure limit, mentioned above.

Permittee formally requests program test authority for KEFX (BMPED-19990521IL), since it has been demonstrated that the current antenna array is in compliance with the FCC radiofrequency electromagnetic field exposure guidelines.



John Calvin Hall  
Broadcast Engineer

26 FEB 01  
Date