

JOHN J. MULLANEY  
JOHN H. MULLANEY, P.E. (1994)  
ALAN E. GEARING, P.E.  
TIMOTHY Z. SAWYER

**MULLANEY ENGINEERING, INC.**

9049 SHADY GROVE COURT  
GAITHERSBURG, MD 20877  
301-921-0115 Voice  
301-590-9757 Fax  
Mullaney@MullEngr.com



**ENGINEERING EXHIBIT EE:**

**AM BROADCAST STATION KIGS  
PEREIRA BROADCASTING  
HANFORD, CALIFORNIA  
620 kHz Class B 1.0 kW-N&D DA-N-U**

**22 July 2011**

FCC FACILITY ID NUMBER 51122

**ENGINEERING EXHIBIT  
IN SUPPORT OF  
AN APPLICATION FOR  
CONSTRUCTION PERMIT TO  
MODIFY NIGHTTIME PATTERN AUGMENTATIONS**



## **ENGINEERING EXHIBIT EE:**

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## **DECLARATION**

I, Alan E. Gearing, declare and state that I am a graduate electrical engineer with a Bachelor of Science degree in Electrical Engineering from SUNY University at Buffalo, that I am a registered professional engineer in the District of Columbia (since 1979), and that I have provided engineering services in the area of broadcasting and radio communications since 1973. My qualifications as an expert in radio engineering are a matter of record with the Federal Communications Commission. I am a senior engineer with the firm of Mullaney Engineering, Inc., consulting broadcast and radio communications engineers with offices in Gaithersburg, Maryland.

The firm of Mullaney Engineering, Inc., has been retained by PEREIRA BROADCASTING to prepare the instant engineering exhibit in support of: *An Application for Construction Permit to Modify Nighttime Pattern Augmentations* for existing Class B AM broadcast station KIGS, licensed to HANFORD, CALIFORNIA (FCC FACILITY ID NUMBER 51122).

All facts contained herein are true of my own knowledge except those stated to be on information and belief, and as to those facts, I believe them to be true. I declare under penalty of perjury that the foregoing is true and correct.

A handwritten signature in blue ink that reads 'Alan E. Gearing'. The signature is written in a cursive style and is positioned above a solid black horizontal line.

Alan E. Gearing, P.E.  
District of Columbia Number 7406  
Executed on the 22<sup>nd</sup> day of July 2011



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**22 July 2011**

### **NARRATIVE STATEMENT:**

#### **I. GENERAL:**

This narrative statement has been prepared on behalf of PEREIRA BROADCASTING (hereinafter "Pereira"), licensee of AM Broadcast Station KIGS, 620 kHz, Hanford, California (FCC FACILITY ID NUMBER 51122).

As discussed in more detail in a companion Application for License (FCC Form 302-AM), the KIGS nighttime directional array has been substantially refurbished. Field strength measurements taken subsequent to the array refurbishment indicated that the KIGS nighttime directional pattern needed to be readjusted. The pattern readjustment has been completed and a full proof of performance has been carried out. The measured inverse distance field strengths for the readjusted KIGS night pattern are within the authorized KIGS modified standard pattern envelope, except in the directions of the two pattern minima. **The purpose of the instant application is to alter the augmentations for the existing KIGS modified nighttime standard pattern to encompass these measured inverse distance fields.**

Also, during the recent work on the KIGS array, it was discovered that the geographic coordinates for the array towers were in error. Since the correction to the array center coordinates is less than  $\pm 3$  seconds of latitude and/or longitude, under current FCC Rules [see §73.1690(b)(2)] this correction ordinary would not, by itself, require a construction permit. However, since the instant construction permit application is being filed for other purposes anyway,



for convenience, information relative to the coordinate correction is being provided herein.

The instant proposal will not cause or receive prohibited interference to or from any known existing or proposed radio stations. The changes proposed herein fall within the definition of a minor change as given in §73.3571 of the FCC Rules.

Answers to questions in FCC Form 301, Section III-A are incorporated in this statement and the accompanying Figures and Tables.

**II. ENGINEERING DISCUSSION:**

**A. Correction to Tower and Array Center Coordinates:**

During the work refurbishing the KIGS directional array, an error was discovered in the geographic coordinates previously specified for the KIGS towers and array center. The correct tower coordinates have been verified with on-site GPS measurements. New FAA "Determinations of No Hazard to Air Navigation" have been obtained for the corrected tower coordinates and the FCC's Antenna Structure Registration (ASR) records for the KIGS towers have been updated to reflect the corrected coordinates and the new FAA determinations. No change has been made in the towers' actual locations.

The currently specified licensed NAD27 coordinates for the KIGS array are:

Latitude: 36° 19' 37" N  
Longitude: 119° 33' 58" W

The KIGS array center coordinates corresponding to the corrected individual tower coordinates are [NAD27 Datum]:

Latitude: 36° 19' 35" N  
Longitude: 119° 33' 59" W



Figure 1 is a full-scale reproduction of portions of USGS 7.5 minute series topographic quadrangle maps showing the location of the existing KIGS transmitter/antenna site and vicinity. Figure 2 is an aerial photograph showing the site and the surrounding area. Although no actual change has been made in the tower locations or in the towers themselves, a vertical plan sketch of the KIGS antenna structures has been included for convenience and completeness. [See Figure 3]

**B. KIGS Nighttime Directional Antenna System:**

Figures 4 and 5 furnish salient information regarding the KIGS nighttime directional antenna system. No changes are proposed in any array parameters other than to the pattern augmentations. The results of a full proof of performance being submitted as part of a companion *Application for License* [FCC Form 302-AM], fully supports and justifies the changes to the KIGS nighttime directional pattern augmentations proposed herein.

**NOTE:** The theoretical RMS being specified for the KIGS nighttime directional pattern is equivalent to an assumed loss resistance of 2.59 ohms. This greater than nominal equivalent loss **was established** at the time of the original full proof-of-performance on this array **in 1948** and has been **grandfathered since**. As the only changes being proposed herein are to the pattern augmentations, with no change being made in the array's theoretical parameters, the existing authorized theoretical RMS is not affected.

The full proof of performance field strength measurements being submitted as part of the companion application for license fully support the greater than nominal equivalent loss. The theoretical pattern RMS and standard pattern RMS of both the currently authorized and proposed KIGS nighttime modified standard pattern are 292.9 mV/m@km and 307.7 mV/m@km, respectively. The RMS for the KIGS nighttime modified standard pattern proposed herein is 308.1 mV/m@km. The KIGS nighttime measured pattern RMS, based on the current full proof of performance, is 304 mV/m@km.



The measured RMS is therefore 98.7% of the proposed modified standard pattern RMS.

The applicant respectfully **requests waiver** of the pertinent portion of §73.150(b)(1)(I) of the FCC Rules, if considered necessary.

**C. Nighttime Channel Study:**

RSS calculations on 620 kHz and each first adjacent channel (610 kHz & 630 kHz) have been carried out by means of a computer program which accesses the FCC's AM station database. Table 1 is a summary showing the study results toward critical non-Class A stations. (Since 610 kHz, 620 kHz, and 630 kHz are all "regional" channels, there are no pertinent Class A stations requiring analysis.) Table 2 is a detailed tabulation of the night limit calculations summarized in Table 1.

The tabulations show that the proposed KIGS nighttime operation either **would not** enter the 25% RSS night limit of any other co-channel of first adjacent channel station or **would reduce** the contribution to the 25% RSS night limit in instances where the licensed KIGS operation enters the 25% RSS calculation<sup>1</sup>. The licensed KIGS operation does not enter any 50% RSS calculation. Consequently, the 10% reduction requirement specified in footnote 1 to §73.182(q) does not apply.

Pursuant to current Commission policy, only List A and List C Region 2 stations have been included in the calculation of RSS limits for domestic stations. List B and List D stations have been ignored in the calculation of domestic RSS limits but have been provided full interference protection. No protection is provided to facilities operating under post-sunset or pre-sunrise

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<sup>1</sup> With respect to cochannel Canadian and Mexican stations, the required protection is provided to the existing 50% RSS night limit.



authorizations nor to stations operating with secondary nighttime authorizations.

**III. SUMMARY:**

The instant proposal alters the augmentations for the existing KIGS nighttime modified standard pattern to encompass the measured inverse distance field strengths from the full proof of performance being submitted as part of a companion *Application for License*. Also, the KIGS array center geographic coordinates are being corrected.

As no change is being proposed in the KIGS nighttime directional array theoretical parameters, the modified standard pattern proposed herein continues to specify the existing authorized theoretical RMS established in 1948 and grandfathered since. As this RMS equates to a non-standard lumped loss resistance, the applicant respectfully **requests waiver** of that portion of §73.150(b)(1)(I) of the FCC Rules, if considered necessary.

In all other respects the instant proposal is believed to be **fully in compliance** with pertinent Commission's rules, regulations, and policies.

A handwritten signature in blue ink that reads 'Alan E. Gearing'. The signature is written in a cursive, flowing style.

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Alan E. Gearing, P.E.  
District of Columbia Number 7406