

# ***KLEIN BROADCAST ENGINEERING, L.L.C.***

*dedicated to improving the science and technology of radio & television communications*

**DECEMBER 2004**

**FCC FORM 302-FM APPLICATION  
for  
STATION LICENSE to COVER CONSTRUCTION PERMIT  
&  
PROGRAM TEST AUTHORITY  
FCC File # BPH-20020813ABK  
N R C BROADCASTING, INC.  
K T U N (FM)  
FM CHANNEL 269 C1 / 101.7mHz.  
EAGLE , COLORADO**

## **INTRODUCTION and ENGINEERING STATEMENT**

The firm of Klein Broadcast Engineering, L.L.C, has been retained by the licensee of KTUN(FM), to prepare the engineering calculations and exhibits required by FCC Form 302-FM, an application for FM Broadcast Station License to cover the above captioned outstanding construction permit and Program Test Authority.

The specifications of the facility are as follows:

### Summary of Proposed Operation:

Effective Radiated Power	12.0 kW	H & V
Antenna Height Above Average Terrain	674 meters	H & V
Antenna Radiation Center Above Mean Sea Level	3171 meters	H & V
Antenna Radiation Center Above Ground Level	25 meters	H & V

These specifications are exactly as specified in the station's FCC Construction Permit, FCC File Number BPH-20020813ABK.

**FCC FORM 302-FM**

**INTRODUCTION and ENGINEERING STATEMENT** cont'd page two: KTUN(FM)

The valid construction permit has eight "Special Operating Conditions or Restrictions." They are addressed below.

**SPECIAL OPERATING CONDITIONS or RESTRICTIONS #1.**

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 there from, 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 test facilities and equipment employed, including appropriate photographs or sketches and a description of the test procedures, including scale factor, measurements frequency and equipment calibration.

**FCC FORM 302-FM**

**INTRODUCTION and ENGINEERING STATEMENT** cont'd page three: KTUN(FM)

**ANSWER to SPECIAL OPERATING CONDITION #1.**

The applicant and permittee has installed the antenna type and model specified herein.

The antenna employed in an Electronics Research, Inc., model, MP-4AC-DA-HW-SP, center fed, four section, half wavelength spaced, E.P.A. Type 3 (three) FM broadcast antenna. All of the information requested in Special Operating Condition #1, is contained in Engineering EXHIBIT E-2 of this instant application.

**SPECIAL OPERATING CONDITION or RESTRICTION #2.**

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.

**ANSWER to SPECIAL OPERATING CONDITION #2.**

Engineering EXHIBIT E-3 is the stamped affidavit and certification requested by Special Operating Condition or Restriction #3, from Theodore J. Archibeque, a Registered Professional Land Surveyor in the State of Colorado and President of Archibeque Land Consulting, Ltd. , a professional land surveying company in Eagle, Colorado.

**FCC FORM 302-FM**

**INTRODUCTION and ENGINEERING STATEMENT** cont'd page four: KTUN(FM)

**SPECIAL OPERATING CONDITION or RESTRICTION #3.**

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 a list of qualifications of the certifying engineer.

**ANSWER to SPECIAL OPERATING CONDITION #3.**

Engineering EXHIBIT E-4 is an affidavit of Consulting Broadcast Engineer, Elliott Kurt Klein, who witnessed the directional antenna proof-of-performance tests personally at the Electronics Research, Inc., test range near Booneville, Indiana.

Mr. Klein was also personally present during the entire installation of the directional antenna system employed at KTUN(FM) and directed the installation strictly according to the antenna manufacturer's instructions. The engineering qualifications of Elliott Kurt Klein are a matter of record with the Federal Communications Commission, as he has been in practice before the Commission for the past thirty-seven years. He as also designed many directional antennas for both radio and television stations and has made applications for construction permits and licensing before the Federal Communications Commission of these directional antenna systems over almost four decades.

**FCC FORM 302-FM**

**INTRODUCTION and ENGINEERING STATEMENT** cont'd page five: KTUN(FM)

**SPECIAL OPERATING CONDITION or RESTRICTION #4.**

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:

12.0 kilowatts

Principal minima and their associated field strength limits:

110 degrees true: 2.10 kilowatts

**ANSWER to SPECIAL OPERATING CONDITION #4.**

Compliance with the radiation limitations set forth in Special Operating Condition or Restriction #4 is demonstrated in the tabulation of the composite radiation pattern tabulation contained in Engineering EXHIBIT E-2 of the instant application.

**FCC FORM 302-FM**

**INTRODUCTION and ENGINEERING STATEMENT** cont'd page six: KTUN(FM)

**SPECIAL OPERATING CONDITION or RESTRICTION #5**

Pursuant to a grant of this construction permit and the authority found in Sections 4 (i) , 5 (c) (1), 303 and 307 (b) of the Communications Act of 1934, as amended, and Sections 0.61, 0.204 (b), 0.283, 1.420, 73.203 (b), and 73.3573 of the Commission's Rules, the FM Table of Allotments, 47 C.F.R. Section 73.202 (b), IS AMENDED as follows:

Community	Channel No.
Eagle, CO	Add 269C1, Delete 268C

Pursuant to Section 316 (a) of the Communications Act of 1934, as amended, license BLH-19840427DO IS MODIFIED to specify operation on Channel 269C1 in lieu of Channel 268C.

**ANSWER to SPECIAL OPERATING CONDITION #5.**

The applicant, permittee and licensee of station KTUN(FM) acknowledges, accepts and agrees with the above specification and substitution of FM Channel 269C1 in lieu of FM Channel 268C at Eagle, Colorado and on the Station License document of FM Broadcast Station KTUN(FM).

**FCC FORM 302-FM**

**INTRODUCTION and ENGINEERING STATEMENT** cont'd page seven: KTUN(FM)

**SPECIAL OPERATING CONDITION or RESTRICTION #6.**

\*\*\*\*\* This is a Section 73.215 contour protection grant \*\*\*\*\*  
\*\*\*\*\* as requested by the applicant\*\*\*\*\*

**ANSWER to SPECIAL OPERATING CONDITION #6.**

The applicant, permittee and licensee acknowledges this construction permit was processed under 47 C.F.R. Section 73.215 contour protection as requested by the applicant, permittee and licensee in the original FCC Form 301 application. The applicant agrees with this condition and accepts a grant of the covering license under these terms.

**SPECIAL OPERATING CONDITION or RESTRICTION #7.**

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 radio frequency electromagnetic fields in excess of FCC guidelines.

**FCC FORM 302-FM**

**INTRODUCTION and ENGINEERING STATEMENT** cont'd page eight: KTUN(FM)

**ANSWER to SPECIAL OPERATING CONDITION #7.**

The permittee/licensee comply with Special Operating Condition #7 and will take all necessary precautions to protect the General Public and Workers on, in or near the site, from exposure to non-ionizing radio frequency radiation in excess of FCC guidelines.

**SPECIAL OPERATING CONDITION or RESTRICTION #8.**

Permittee has specified the 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 this 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. This 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 FCC guidelines

Documentation demonstrating compliance with the FCC radiofrequency field exposure guidelines may be submitted in advance of the filing of FCC Form 302-FM. The Commission's staff will review it for compliance and respond by letter stating whether automatic PTA has been reinstated. ERI, five sections

**FCC FORM 302-FM**

**INTRODUCTION and ENGINEERING STATEMENT** cont'd page nine: KTUN(FM)

**ANSWER to SPECIAL OPERATING CONDITION #8.**

The installation of the antenna authorized by the underlying FCC construction permit was installed about a week ago in weather conditions that made it questionable if the project would be completed this year because of the snow conditions in the Rocky Mountains of Colorado. This is why there has been no prior contact with the Commission's staff regarding advance filing of any RFR analysis or study. The applicant has installed a four section, half wavelength spaced, enter fed, directional antenna system. The manufacturer is Electronics Research, Inc. and the model number of the antenna installed is MP-4AC-DA-HW-SP. A complete RFR analysis and study was completed using the antenna captioned above. The RFR analysis and study is included herein and is marker as EXHIBIT E-10 RFR ANALYSIS & STUDY. The underlying construction permit specified a five section ERI (EPA Type 3) antenna and we have installed an ERI four section, half wavelength spaced (EPA Type 3) antenna. EXHIBIT E-10 included herein shows compliance with the Commission's RF field exposure and radiofrequency electromagnetic field guidelines for exposure to the General Public in uncontrolled areas and for exposure to Workers or persons present in the controlled areas for the antenna installed at station KTUN.

**FCC FORM 302-FM**

**INTRODUCTION and ENGINEERING STATEMENT** cont'd page ten: KTUN(FM

**ANSWER to SPECIAL OPERATING CONDITION #8. cont'd**

Station KTUN is an operating station. The underlying FCC construction permit authorized this OPERATING station to change frequency and downgrade to a lower class of station ( Class C to Class C1) subsequently the operation of the station could not be suspended until PTA was granted by the Commission. The station as a Class C facility was authorized to operate with 36kW ERP H&V with the same antenna radiation center above ground of 25 meters AGL. The underlying FCC construction permit authorizes only 12kW ERP H&V with the 25 meter AGL radiation center. This engineer personally made the calculations necessary to insure compliance with the Commission's RFR guidelines BEFORE the antenna was installed and the station placed in operation with the facility authorized in FCC construction permit, FCC file number; BPH-20020813ABK, which is the underlying construction permit file number. Because this is an operating station and because the ERP has been REDUCED by 66%, the station is presently operating and continues to serve it Principal Community, Eagle, Colorado.

**FCC FORM 302-FM**

**INTRODUCTION and ENGINEERING STATEMENT** cont'd page eleven: KTUN(FM

Engineering EXHIBIT E-1 is a copy of the FCC construction permit underlying this Form 302-FM application and is included herein to aid Commission Staff in the processing of this application.

The instant application requests the Commission grant PROGRAM TEST AUTHORITY and a new STATION LICENSE for FM Broadcast Station K T U N (FM), as specified herein.

The applicant, NRC Broadcasting, Inc., respectfully requests the Commission staff consider and grant the instant application for the facilities requested herein.

Respectfully submitted,

Elliott Kurt Klein  
Consulting Broadcast Engineer

02 December 2004