

KLEIN BROADCAST ENGINEERING, L.L.C.

dedicated to improving the science of radio and television communications

JULY 2004

EXHIBIT E-10RHS
FCC FORM 301-FM APPLICATION
FOR FM BROADCAST STATION CONSTRUCTION PERMIT & ONE STEP UPGRADE to CLASS C
(A MINOR CHANGE)
HBG RADIO ONTARIO, L.L.C.
K S R V – F M
FM CHANNEL 241 C / 96.1 mHz.
ONTARIO , OREGON

RF RADIATION HAZARD COMPLIANCE STATEMENT

The facilities proposed herein by the applicant, permittee or licensee, in this Engineering Exhibit comply with FCC O.S.T. Bulletin #65 and #65A as revised (1997) and the ANSI C-95.1-1982 RF and ANSI C95.1992 and the NCRP exposure guidelines. The interpolation of the figures from the above referenced document, page 18, supplement “A”, shows a BEST case requirement of 30.9 meters height above ground level requirement for the radiation center of the installed six (6) bay half wave length spaced FM broadcast antenna. A combined vertical and horizontal effective radiated power of 98.0 kilowatts was used for this study and determination (49.0 kW Horiz. & 49.0kW Vert.) The radiation center of the FM broadcast antenna system is proposed to be at 66 meters above ground level (AGL), well within the requirement for the antenna as determined from the above referenced documents. The antenna specified for use is an Electronics Research, Inc., model MP-6AC-DA-HW, EPA Type 3, six (6) section, 0.5 wave length spaced, circularly polarized antenna. The antenna manufacturer, Electronics Research, Inc., states its antenna meets the BEST case requirements for downward radiation pattern according to the FCC O.S.T. Bulletin #65 Guidelines. The antenna proposed uses -2.10 degrees of beam tilt, with no null fill. The applicant has proposed an antenna with half wavelength spacing to greatly reduce the downward radiation at and around the proposed site.

Occupational compliance is certified by the reduction of operating power or the complete cessation of operation during such time maintenance personnel are on the antenna support structure. A transmitter "LOCK OUT" circuit will be installed to prevent accidental turn on of the transmission equipment during the time maintenance personnel are on the antenna support structure. The applicant, permittee or licensee will cooperate with other site users in order to comply with The FCC Guidelines on Human Exposure to Non-Ionizing RF Radiation.

In addition to the preceding the applicant, permittee or licensee, has by computer program, performed additional calculations to predict RF power density at the base of the antenna support structure. This program predicts a maximum power density of 9.0172 uWatts/cm² at a distance of 382 meters from the base of the antenna support structure at a height of 2.0 meters above ground level. This is 4.5 percent of the allowable RF power density for Uncontrolled areas under the FCC and ANSI/EPA Guidelines, being limited to: 200.0 microwatts/cm² for Uncontrolled areas and 1.00mW/cm² or (1,000 microwatts/cm²) for Controlled areas (areas within fencing). All other power density was calculated to be below this maximum predicted level for a distance of 0 to 1000 meters distance from the base of the antenna support structure at 2.0 meters above ground level. There are other sources of RFR near the proposed KSRV-FM site but because the contribution from the facility proposed to the RFR levels at the proposed site is less than 5% of the allowable maximum (200.0 uW/cm²) in the uncontrolled areas, any further study of the RFR levels contributed from other sources is not required as excluded in OET Bulletin #65 as amended to date.

The computer program employed for the RFR analysis in this engineering exhibit uses either the Near Field or Far Field method for the calculation of power density and was written by the Commission's O.E.T. staff. In this particular case the Far Field Method was used. The formula used by the computer program was derived from the FCC O.S.T. Bulletin #65, as revised to date.

The formula may be stated in the following manner:

$$E(V/m) = \frac{1.6 * 221.72 * \text{SQRT}(\text{ERP}) * (\text{element pattern factor}) * (\text{array factor})}{\text{DIST}}$$

$$H(A/m) = \frac{1.6 * 0.588 * \text{SQRT}(\text{ERP}) * (\text{element pattern factor}) * (\text{array factor})}{\text{DIST}}$$

Where:

ERP = effective radiated power in kilowatts, relative to a half wave dipole.

DIST = distance in meters from the antenna radiation center to the observation point in meters.

The 1.6 factor found in the ANSI/EPA formula and used above at the beginning of each equation takes into account possible contributions from ground reflections. The element pattern factor in a linearly interpolated relative field value at the appropriate depression angle below the horizon as taken directly from the EPA data. The array factor is computed at the appropriate depression angle using the number of antenna elements, when normalized to 1.0 in the main lobe. This array factor only applies to antenna arrays of point sources where each source has equal power distribution and phase, and are uniformly spaced. The element patterns themselves can be associated with particular antenna designs. As of May 1986 there were six (6) element types identified for FM antennas as listed in the ANSI/EPA data and FCC Bulletin #65. The "crossed ring" EPA Type 3 element is used on the Electronics Research, Inc., model MP-6AC-DA-HW, EPA Type 3 is listed in the EPA data and was used for the calculations contained herein. There were two types listed for television, one for VHF and one for UHF.

The General Public will not have access to the site because the site is in a sparsely populated , mountainous , rural area. The only access to the site is by dirt road. The actual antenna support structure base will be protected by a locked gate and fence. The locked gate and fence will be installed around the entire perimeter of the base of antenna support structure and transmission equipment building. Only authorized personnel have access to the locked gate. This will prevent General Public access to the actual site.

The applicant, permittee or licensee, will install and post RF Radiation Hazard Warning Signs in and around the site at approximately eye level for additional warning and safety.

A vertical pattern plot of the Electronics Research, Inc., model MP-6AC-DA-HW (EPA Type 3) antenna to be employed at KSRV-FM is included with this exhibit and is marked Exhibit E-10 Figure 1. This plot clearly shows this antenna has greatly reduced downward radiation and meets the BEST case requirements of FCC Bulletin #65, as amended to date. The plot marked Exhibit E-10 Figure 2. is a plot of the actual calculated power density in microwatts/cm² vs. distance. This plot shows the calculated maximum predicted power density of 9.0172 uW/cm² occurring at 382 meters distant from the base of the antenna support structure (4.5% of the allowable limit for uncontrolled areas, being 200.0 uW/cm²). It also shows, graphically, that all other calculated power density RFR levels are below this maximum between 0 meters and 1000 meters distant from the base of the antenna support structure.

The preceding assures compliance with the FCC, ANSI and NCRP requirements. Based on the preceding documents, tables, guidelines and calculations, the proposed operation of the main transmission facility for KSRV-FM FM Broadcast Station is in compliance with the FCC O.S.T. Bulletin #65 and the ANSI C-95.1-1992 and the NCRP RF Exposure Guidelines as amended to date. The applicant, permittee or licensee certifies compliance with the ANSI, NCRP and FCC Human Exposure Guidelines to Non-Ionizing RF Radiation.

EXHIBIT E-10 Figure #1.

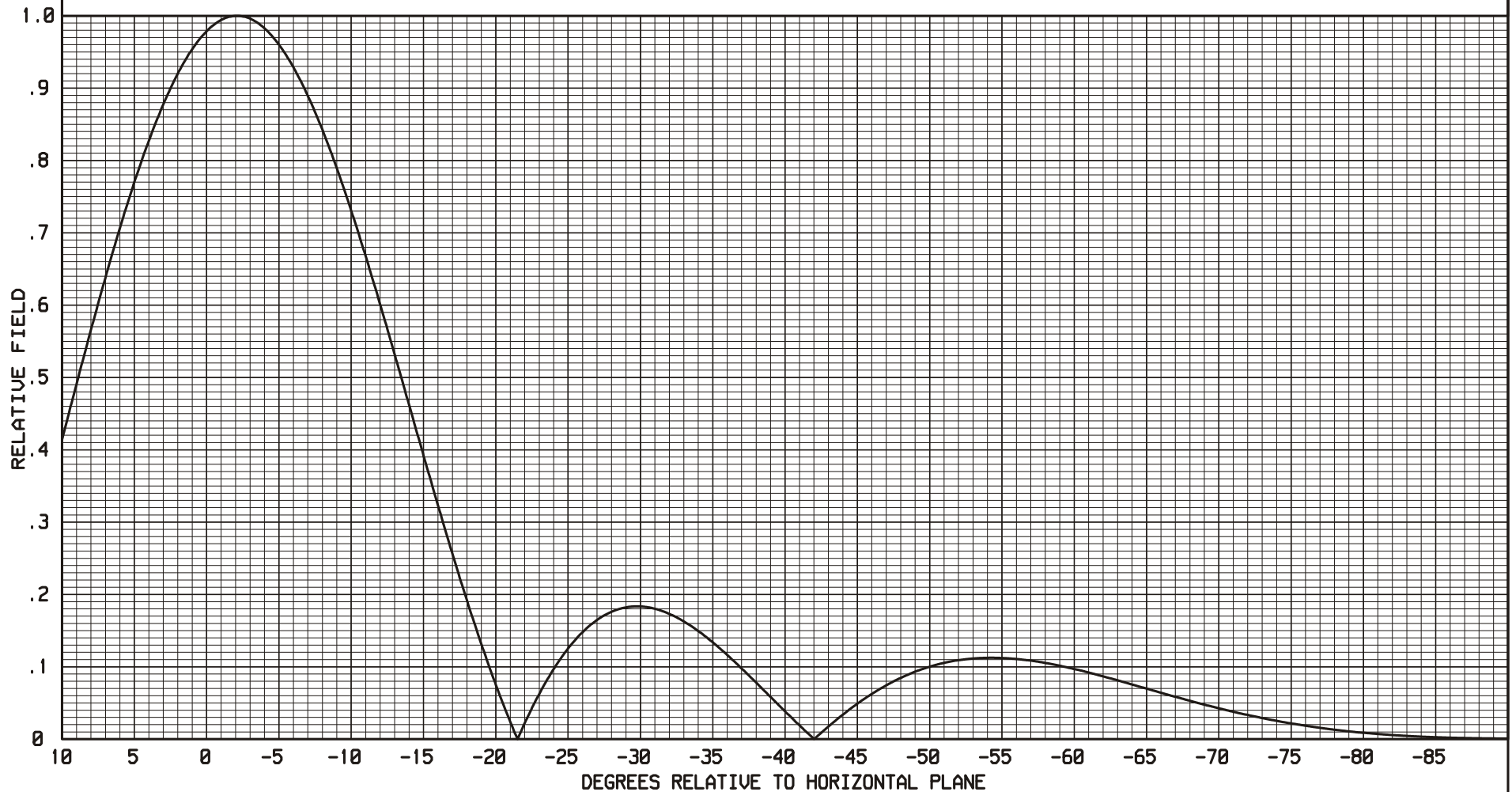
ELECTRONICS RESEARCH, INC.
7777 GARDNER ROAD
CHANDLER, IN. 47610

----THEORETICAL----
VERTICAL PLANE RELATIVE FIELD

JULY 7, 2004

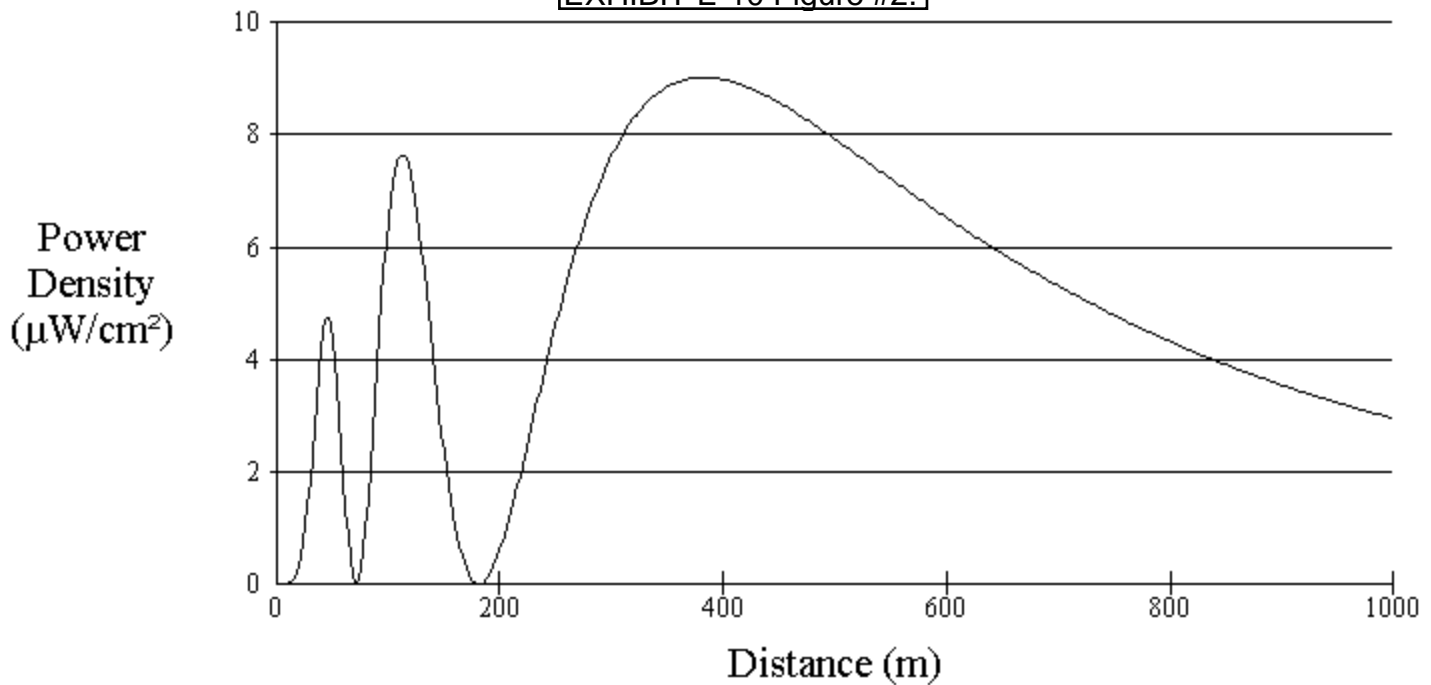
ELEMENT SPACING:
HALF-WAVE

6 ERI TYPE SHP, SHPX, LP, OR LPX ELEMENTS
-2.1 DEGREE(S) ELECTRICAL BEAM TILT
0 PERCENT FIRST NULL FILL
0 PERCENT SECOND NULL FILL
POWER GAIN IS 1.859 IN THE HORIZONTAL PLANE(1.941 IN THE MAX.)



Power Density vs Distance

EXHIBIT E-10 Figure #2.



Office of Engineering and Technology

Distance (m):	<input type="text" value="1000"/>	Antenna Type:	<input type="text" value="ERI or JAMPRO JBCP 'Rototiller' (EPA)"/>
Horizontal ERP (W):	<input type="text" value="49000"/>	Number of Elements:	<input type="text" value="6"/>
Vertical ERP (W):	<input type="text" value="49000"/>	Element Spacing:	<input type="text" value=".5"/>
Antenna Height (m):	<input type="text" value="66"/>		

Maximum Predicted RFR Power Density = 9.0172 $\mu\text{W}/\text{cm}^2$ at a distance of 382 meters from the base of the antenna support structure, at 2 meters above ground level (AGL)

Antenna Manufacturer & Model: Electronics Research, Inc., MP-6AC-DA-HW

Antenna Description: Six section, circular polarized, half wavelength spaced, EPA Type 3, directional antenna.