

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

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

NOVEMBER 2003

EXHIBIT E-10RHS  
FCC FORM 349 APPLICATION  
FOR FM TRANSLATOR STATION CONSTRUCTION PERMIT  
(a Minor Change)  
K252BX  
Salisbury Broadcasting Colorado, L.L.C.  
FM CHANNEL 252 / 98.3 MHz.  
GLENWOOD SPRINGS , COLORADO

## 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 WORST case requirement of 3 meters height above ground level requirement for the radiation center of the proposed single bay FM broadcast antenna. A total horizontal effective radiated power of 0.009 kilowatts was used for this study and determination. The radiation center of the FM broadcast antenna system is proposed to be at 42 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 Scala FMO-Horizontally Polarized antenna.

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 has been 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 0.0519 MICROWatts/cm<sup>2</sup> at a distance of 22 meters from the base of the antenna support structure at a height of 2.0 meters above ground level. This is less than one tenth of one percent of the allowable RF power density for uncontrolled areas under the FCC and ANSI/EPA Guidelines, being limited to: 1.00mW/cm<sup>2</sup> for controlled areas and 200.0 microwatts/cm<sup>2</sup> for uncontrolled areas. 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.

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:

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

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

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 EPA Type 1 Dipole element is used on the Scala FMO-CP Antenna Type 1 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.

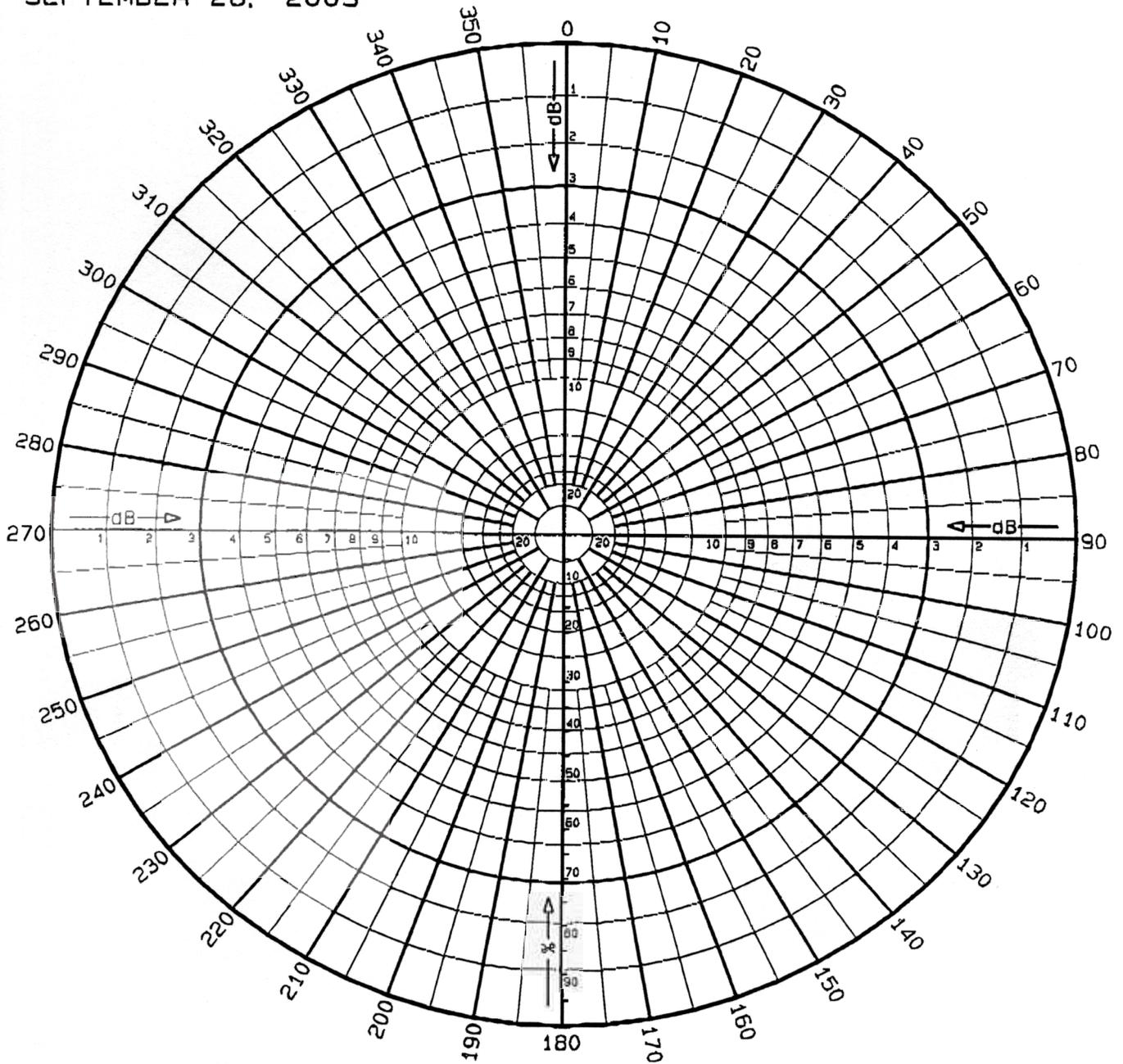
The General Public will not have access to the site because the site access road is fenced off from General Public access. The only access to the site is by locked gate and fence. Only authorized personnel have access to the locked gate. This will prevent General Public access to the actual site. There is no RFR level on the site that exceeds the General Public Uncontrolled Exposure Limit of 200.0 microwatts/cm<sup>2</sup>.

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.

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 The Proposed New FM Translator Station at Rifle, Colorado, 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. Elevation Pattern Plot

SEPTEMBER 26, 2003



ONE FMO CROSSED DIPOLE ANTENNA  
BROADBAND 88-108 MHz.  
GAIN: -3.0 dBd.  
POWER GAIN: 0.5  
HORIZONTAL POLARIZATION  
VERTICAL PLANE PATTERN

90 DEGREES = HORIZON

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EXHIBIT E-10 Elevation Pattern Tabulation

ONE BAY, FMO CROSSED DIPOLE ANTENNA  
HORIZONTAL POLARIZATION - VERTICAL PLANE PATTERN

Azimuth	Relative Field	Relative dB	dBd	Power Gain
90	1.000	0.0	-3.0	0.501
91	1.000	0.0	-3.0	0.501
92	1.000	0.0	-3.0	0.501
93	1.000	0.0	-3.0	0.501
94	1.000	0.0	-3.0	0.501
95	1.000	0.0	-3.0	0.501
96	1.000	0.0	-3.0	0.501
97	1.000	0.0	-3.0	0.501
98	1.000	0.0	-3.0	0.501
99	1.000	0.0	-3.0	0.501
100	1.000	0.0	-3.0	0.501
101	1.000	0.0	-3.0	0.501
102	1.000	0.0	-3.0	0.501
103	1.000	0.0	-3.0	0.501
104	1.000	0.0	-3.0	0.501
105	1.000	0.0	-3.0	0.501
106	1.000	0.0	-3.0	0.501
107	1.000	0.0	-3.0	0.501
108	1.000	0.0	-3.0	0.501
109	1.000	0.0	-3.0	0.501
110	1.000	0.0	-3.0	0.501
111	1.000	0.0	-3.0	0.501
112	1.000	0.0	-3.0	0.501
113	1.000	0.0	-3.0	0.501
114	1.000	0.0	-3.0	0.501
115	1.000	0.0	-3.0	0.501
116	1.000	0.0	-3.0	0.501
117	1.000	0.0	-3.0	0.501
118	1.000	0.0	-3.0	0.501
119	1.000	0.0	-3.0	0.501
120	1.000	0.0	-3.0	0.501
121	1.000	0.0	-3.0	0.501
122	1.000	0.0	-3.0	0.501
123	1.000	0.0	-3.0	0.501
124	1.000	0.0	-3.0	0.501
125	1.000	0.0	-3.0	0.501
126	1.000	0.0	-3.0	0.501
127	1.000	0.0	-3.0	0.501
128	1.000	0.0	-3.0	0.501
129	1.000	0.0	-3.0	0.501
130	1.000	0.0	-3.0	0.501
131	1.000	0.0	-3.0	0.501
132	1.000	0.0	-3.0	0.501
133	1.000	0.0	-3.0	0.501
134	1.000	0.0	-3.0	0.501
135	1.000	0.0	-3.0	0.501
136	1.000	0.0	-3.0	0.501
137	1.000	0.0	-3.0	0.501
138	1.000	0.0	-3.0	0.501
139	1.000	0.0	-3.0	0.501
140	1.000	0.0	-3.0	0.501

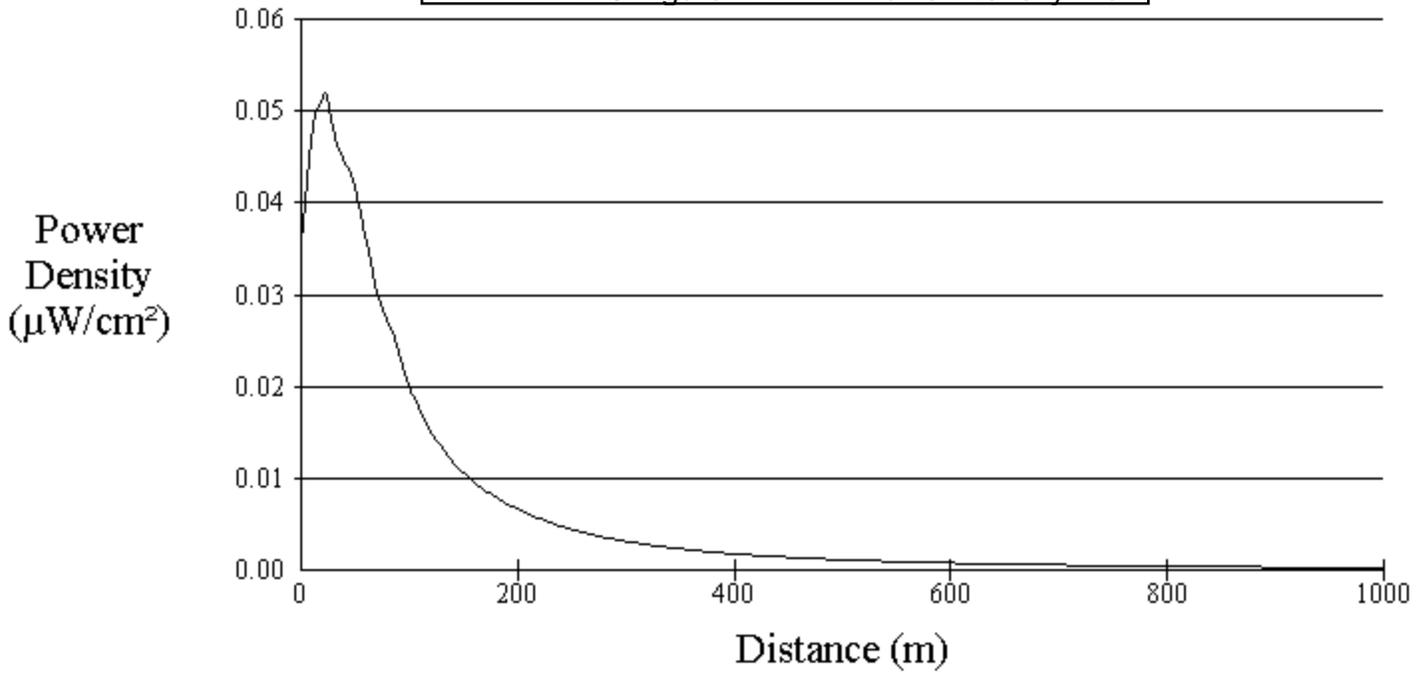
EXHIBIT E-10 Elevation Pattern Tabulation cont'd

ONE BAY, FMO CROSSED DIPOLE ANTENNA  
HORIZONTAL POLARIZATION - VERTICAL PLANE PATTERN

Azimuth	Relative Field	Relative dB	dBd	Power Gain
141	1.000	0.0	-3.0	0.501
142	1.000	0.0	-3.0	0.501
143	1.000	0.0	-3.0	0.501
144	1.000	0.0	-3.0	0.501
145	1.000	0.0	-3.0	0.501
146	1.000	0.0	-3.0	0.501
147	1.000	0.0	-3.0	0.501
148	1.000	0.0	-3.0	0.501
149	1.000	0.0	-3.0	0.501
150	1.000	0.0	-3.0	0.501
151	1.000	0.0	-3.0	0.501
152	1.000	0.0	-3.0	0.501
153	1.000	0.0	-3.0	0.501
154	1.000	0.0	-3.0	0.501
155	1.000	0.0	-3.0	0.501
156	1.000	0.0	-3.0	0.501
157	1.000	0.0	-3.0	0.501
158	1.000	0.0	-3.0	0.501
159	1.000	0.0	-3.0	0.501
160	1.000	0.0	-3.0	0.501
161	1.000	0.0	-3.0	0.501
162	1.000	0.0	-3.0	0.501
163	1.000	0.0	-3.0	0.501
164	1.000	0.0	-3.0	0.501
165	1.000	0.0	-3.0	0.501
166	1.000	0.0	-3.0	0.501
167	1.000	0.0	-3.0	0.501
168	1.000	0.0	-3.0	0.501
169	1.000	0.0	-3.0	0.501
170	1.000	0.0	-3.0	0.501
171	1.000	0.0	-3.0	0.501
172	1.000	0.0	-3.0	0.501
173	1.000	0.0	-3.0	0.501
174	1.000	0.0	-3.0	0.501
175	1.000	0.0	-3.0	0.501
176	1.000	0.0	-3.0	0.501
177	1.000	0.0	-3.0	0.501
178	1.000	0.0	-3.0	0.501
179	1.000	0.0	-3.0	0.501
180	1.000	0.0	-3.0	0.501

# Power Density vs Distance

EXHIBIT E-10 Figure #2. RFR Power Density Plot



Office of Engineering and Technology

Distance (m):     Antenna Type:

Horizontal ERP (W):     Number of Elements:

Vertical ERP (W):     Element Spacing:

Antenna Height (m):

Maximum RFR Power Density Level = 0.0519uW/cM2 (microwatts) at 22 meters distance from the base of the antenna support structure, 2 meters above ground level.

Antenna Proposed: Scala model FMO (omni-directional) Horizontal Polarization only

Antenna Radiation Center 42 meters above ground level