

This Statement has been prepared for ***KSE Radio Ventures, LLC***, (“*KSE Radio*”), licensee of Station KIMN(FM), Denver, CO. *KSE Radio* holds a Construction Permit (“CP”), FCC File Number 0000197168, authorizing a new Auxiliary facility for FM Station KIMN to operate on an antenna support structure near its main facility. The construction authorized in the CP has been completed. Installation and adjustment of the systems necessary to operate with the authorized new facilities have been completed. As such, this facility is now able to operate in compliance with the terms and conditions of its CP. *Program Test Authority* (“PTA”) is herein respectfully requested on behalf of *KSE Radio*.

The KXKL Construction Permit is subject to seven Special Operating Conditions, which are discussed in the following paragraphs.

The antenna used for this KIMN Auxiliary facility is being re-used from an earlier Auxiliary for the same station and frequency. The original Proof of Performance is provided as a separate attachment. Discussion with Mr. Dale Bickel on the FCC staff resulted in a recommendation to file the original proof with an explanation as found here. I have attached a copy of this correspondence as a separate attachment, FCC correspondence, “FM auxiliary application or KIMN (FID 59597).txt” which will be filed with this letter, The proposed antenna is a Cavity-Backed Radiator design, which generally provides a pattern that is independent of, or is not influenced significantly by the supporting structure. The Proof of Performance was measured and provided with the maxima at 0 degrees. The surveyor’s report (provided in a separate attachment) informs us that the antenna is mounted with a rotation of 67 degrees from True North. Aside from these noted differences, the attached Proof of Performance reflects the current installation. A copy of the email from Mr. Bickel is provided as an attachment.

RF exposure measurements in and around the site have been completed, while operating the same facility under STA (see file 0000196725). Measurements were taken with the authorized facility on the air, and with the main facility turned off. As demonstrated in the attached report, RF exposure readings for the Auxiliary facility for all locations, with the exception of one, were below the levels recorded while the main facility was operational. In no case did the levels outside the fence exceed the general population limits. Therefore, no changes to fence or signage locations are necessary. The transmitter site is in common with several other broadcasters. The RF exposure plan for locations inside the fence area has been updated with the site manager.



KSE Radio 720 South Colorado Blvd, Denver, Co 80246

## Certification

I, Jason M Gorodetzer, the current Chief Engineer of KSE radio, hereby certify that I have thoroughly inspected the installation of the KIMN Auxiliary antenna referenced in the application. The person who oversaw the physical installation, Barry Thomas is deceased, but, after a thorough inspection of the work he oversaw I certify that, to the best of my knowledge, the antenna is installed in compliance with the standards of good engineering practice, meets the technical requirements outlined in this application, and is complete.

I further certify that I am an experienced broadcast engineer with close to 30 years of experience in the field. I am the Chief engineer of KSE Radio (KIMNFM)

Signed this 28<sup>th</sup> day of September, 2022



Jason M Gorodetzer



KSE Radio 720 South Colorado Blvd, Denver, Co 80246

TECHNICAL MANUAL

TAC-1M FM ANTENNA  
KXLT-FM, DENVER, COLORADO  
790-4656-001



T.M. No. 2003-004

## SECTION I GENERAL DESCRIPTION

### 1.1.0 INTRODUCTION

1.1.1 This technical manual contains information necessary to install, test, operate, and service the TAC-1M FM ANTENNA for KXLT-FM, Denver, Colorado. The various sections in this technical manual provide the following types of information:

- a. SECTION I, GENERAL DESCRIPTION, provides a description of the equipment, identifies the major components, and lists the specifications.
- b. SECTION II, PRINCIPLES OF OPERATION, provides a description of how the antenna operates.
- c. SECTION III, INSTALLATION, provides information relative to the installation of the antenna components and the installation of the components on the tower/mounting structure.
- d. SECTION IV, MAINTENANCE, provides information pertaining to preventive and scheduled maintenance.
- e. SECTION V, TEST REPORT, provides data measured at the Harris Antenna Test site to demonstrate the measured electrical and radiation characteristics of the antenna. This section

also provides other reports required by the customer specifications.

- f. SECTION VI, PARTS LIST, provides information for ordering replacement parts and assemblies.
- g. SECTION VII, DRAWINGS, provides the drawings necessary for installation and maintenance of the antenna.

### 1.2.0 EQUIPMENT SUPPLIED

1.2.1 The TAC-1M FM ANTENNA supplied, is shown on HARRIS installation drawing 843-4996-031. HARRIS parts list 790-4656-001 identifies all major components supplied.

### 1.3.0 GENERAL DESCRIPTION

1.3.1 The antenna supplied for KXLT-FM is a TAC-1M FM ANTENNA. The antenna is designed to meet the requirements for a directional standby antenna as requested. Antenna is designed for operation at 100.3 mc.

1.3.2 The following is a list of general specifications:

**Table 1-1. Electrical Specifications.**

<u>FUNCTION</u>	<u>CHARACTERISTIC</u>
Elevation power gain, main lobe (RMS gain)	At 100.3 MHz: .42 (-3.77 dB)
Azimuthal power gain, main lobe (RMS gain) (H-pol)	At 100.3 MHz: 3.91 (5.92dB)
Peak gain (H-pol)	At 100.3 MHz: 1.64 (2.15dB)
Electrical beam tilt	.0°
1st Null Fill	0%
Average (RMS) Power Rating	25 kW @ 40° C. and 5 psi dry nitrogen.
Input VSWR	Better than 1.10 at 100.3 Mc. +/- 200 Kc.
Input Connector	50 ohm single line 3-1/8"EIA

**Table 1-2. Mechanical Characteristics**

<u>FUNCTION</u>	<u>CHARACTERISTIC</u>
Overall Height of Antenna (Side mounted on customer structure)	6.25 ft.
Radiation Center Height Above Antenna Base	3.12 ft.
Input Connection	Single 3-1/8 inch 50 Ohm EIA
Horizontal Shear @ 50 PSF EIA -222C (No Ice) (excluding mast section)	750 lbs.
Weight (Excluding brackets, mounting structure and feed system)	175 lbs.

Note: For further details, see Installation Drawing 843-4996-031.

888-2003-004

**WARNING: Disconnect primary power prior to servicing.**

## SECTION II PRINCIPLES OF OPERATION

### 2.1.0 INTRODUCTION

2.1.1 This section of the technical manual contains a functional description of the TAC-1M FM ANTENNA.

### 2.2.0 FUNCTIONAL DESCRIPTION

2.2.1 The antenna supplied for KXLT-FM is a Harris Corporation Type TAC-1M, 1-Bay, cavity backed radiator, circularly polarized FM antenna.

2.2.2 The TAC-1M consists of 1 cavity backed radiator (CBR) element mounted on customer supplied structure. Equal power split and quadrature phasing between element halves produces a right hand circularly polarized Cos shaped directional azimuth pattern when properly configured on customer's customers structure.

2.2.3 The antenna is designed to radiate a circularly polarized signal at 100.3 MHz.

2.2.4 In order to further decrease the sensitivity of the antenna to extremely adverse weather conditions a feed point radome is included on the antenna.

### 2.3.0 THEORY OF OPERATION

2.3.1 The basic element of this antenna is the cavity backed radiator (CBR). The concept of the CBR, for circular polarization, is the use of crossed dipoles fed in quadrature phase and located in the aperture of a circular backing cavity. The crossed dipoles excite the entire cavity with a rotating RF field in a plane parallel to the dipoles. The resultant RF field is right hand polarized, the field rotating clockwise as viewed from behind the radiator.

2.3.2 The phase quadrature is accomplished by a phase difference of 90 electrical degrees between the orthogonal dipoles.

2.3.3 Radiation patterns, associated beam width and directivity are determined to a large extent by the size of the cavity aperture. The size and geometry of the dipole has less pattern effect than the cavity. The size and geometry of the dipole controls the antenna impedance and VSWR.

2.3.4 The backing cavity performs three important electrical functions:

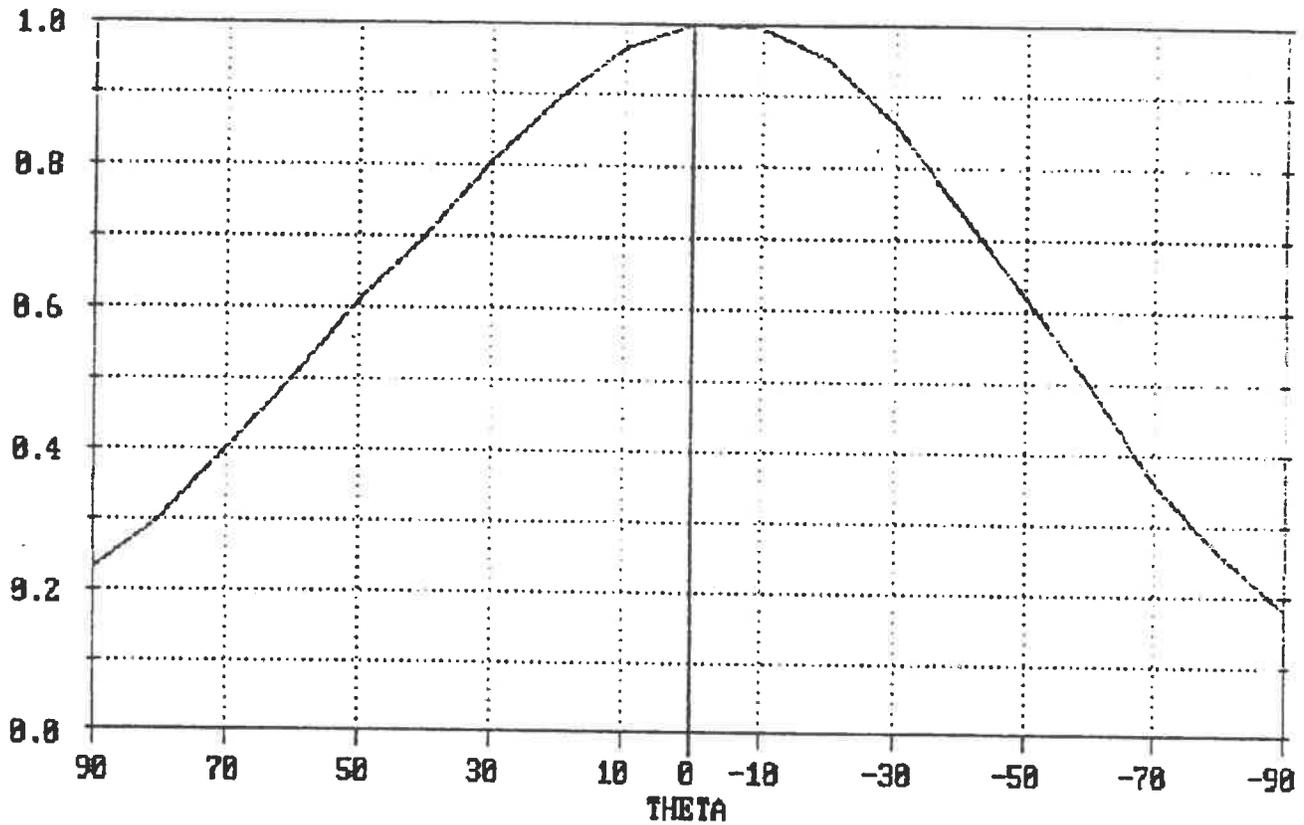
- a. First, it helps to isolate the radiating elements from the tower or mounting structure, and, to a large degree, from adjacent elements;
- b. Second, the backing cavity provides sharper beamwidth and more gain than achievable with the dipoles alone. The entire aperture of the cavity is excited to provide a larger effective area for each dipole;
- c. Third, the backing cavity provides pattern control so that the antenna pattern beamwidth is nearly equal in both the E and H planes for both horizontal and vertical polarizations. The presence of a tower/mounting structures somewhat deteriorates this ideal pattern symmetry.
- d. This "cavity" pattern control technique allows the dipoles to be manipulated for optimum impedance bandwidth, with negligible disturbance of the pattern.

2.3.5 Equal power is fed to each pair of dipoles. The dipole labeled 0° is fed with a 1 5/8" heliax cable with a reference length determined by the customer. The 90° dipole is fed with a 1 5/8" heliax cable that is 27.09" longer than the reference cable going to the 0° side.

Pattern No. 1

MEASURED RELATIVE FIELD 1 ELEMENT

July 31, 1981  
11:01 AM  
Pattern No.: 073180-001  
Designed by: WAK

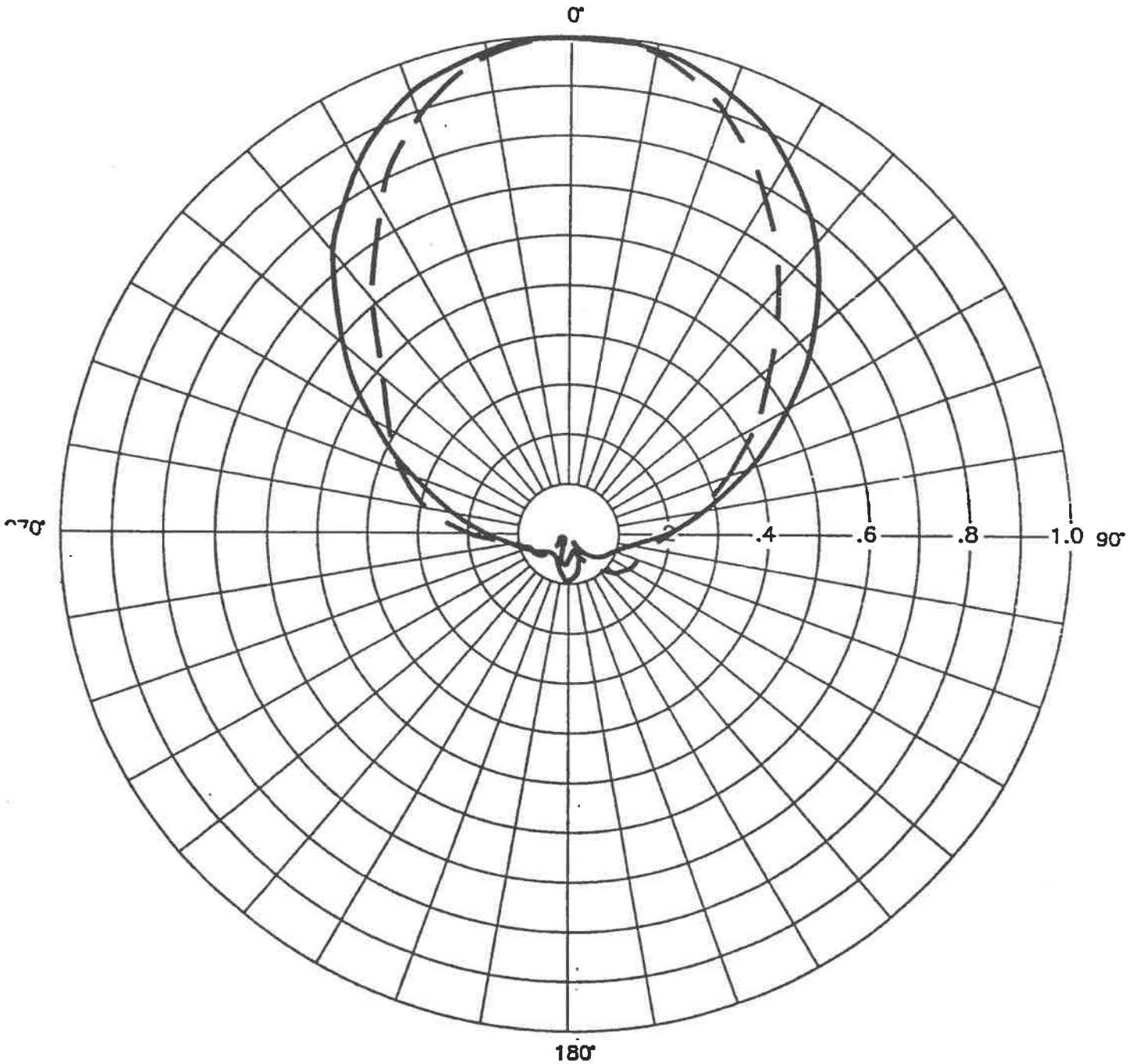


Relative Field Plot

Station: KXLT  
Location: COLORADO  
Channel: 100.3  
Antenna: TAC 1M  
Elevation Gain Maximum: 0.42 -3.77 dB Each Polarization.  
Elevation Gain Horizontal: 0.42 -3.77 dB Each Polarization.  
General Comments: 1 ELEMENT



MEASURED H AND V POLARIZATIONS  
H-POL SOLID LINE V-POL DASHED LINE



PATTERN NO. 112990-1-2  
FREQUENCY 100.3 MHz.  
WITH BACKSCREEN

H-POL GAIN = 3.91 (5.92dB) RMS = .506  
V-POL GAIN = 4.46 (6.49dB) RMS = .474

Station:	KXLT	November 29, 1990
Location:	DENVER	10:41 AM
Channel:	100.3	Pattern No.: 112990-001
Antenna:	TAC-1M	Designed by: WAK
Azimuthal Gain:	3.9      5.92 dB	
General Comments:	HORIZONTAL POLARIZATION WITH SCREEN	

Angle	Field	Angle	Field	Angle	Field
-----	-----	-----	-----	-----	-----
-179.0	0.0945	-150.0	0.0600	-120.0	0.0630
-178.0	0.0940	-149.0	0.0600	-119.0	0.0649
-177.0	0.0935	-148.0	0.0600	-118.0	0.0668
-176.0	0.0930	-147.0	0.0600	-117.0	0.0687
-175.0	0.0925	-146.0	0.0600	-116.0	0.0706
-174.0	0.0920	-145.0	0.0600	-115.0	0.0725
-173.0	0.0915	-144.0	0.0600	-114.0	0.0744
-172.0	0.0910	-143.0	0.0600	-113.0	0.0763
-171.0	0.0905	-142.0	0.0600	-112.0	0.0782
-170.0	0.0900	-141.0	0.0600	-111.0	0.0801
-169.0	0.0880	-140.0	0.0600	-110.0	0.0820
-168.0	0.0860	-139.0	0.0602	-109.0	0.0850
-167.0	0.0840	-138.0	0.0604	-108.0	0.0880
-166.0	0.0820	-137.0	0.0606	-107.0	0.0910
-165.0	0.0800	-136.0	0.0608	-106.0	0.0940
-164.0	0.0780	-135.0	0.0610	-105.0	0.0970
-163.0	0.0760	-134.0	0.0612	-104.0	0.1000
-162.0	0.0740	-133.0	0.0614	-103.0	0.1030
-161.0	0.0720	-132.0	0.0616	-102.0	0.1060
-160.0	0.0700	-131.0	0.0618	-101.0	0.1090
-159.0	0.0690	-130.0	0.0620	-100.0	0.1120
-158.0	0.0680	-129.0	0.0621	-99.0	0.1171
-157.0	0.0670	-128.0	0.0622	-98.0	0.1222
-156.0	0.0660	-127.0	0.0623	-97.0	0.1273
-155.0	0.0650	-126.0	0.0624	-96.0	0.1324
-154.0	0.0640	-125.0	0.0625	-95.0	0.1375
-153.0	0.0630	-124.0	0.0626	-94.0	0.1426
-152.0	0.0620	-123.0	0.0627	-93.0	0.1477
-151.0	0.0610	-122.0	0.0628	-92.0	0.1528
		-121.0	0.0629	-91.0	0.1579

Station: KXLT  
 Location: DENVER  
 Channel: 100.3  
 Antenna: TAC-1M  
 Azimuthal Gain: 3.9 5.92 dB  
 General Comments: HORIZONTAL POLARIZATION WITH SCREEN

November 29, 1990  
 10:41 AM  
 Pattern No.: 112990-C01  
 Designed by: WAK

Angle	Field	Angle	Field	Angle	Field
-90.0	0.1630	-60.0	0.4700	-30.0	0.8610
-89.0	0.1704	-59.0	0.4840	-29.0	0.8691
-88.0	0.1778	-58.0	0.4980	-28.0	0.8772
-87.0	0.1852	-57.0	0.5120	-27.0	0.8853
-86.0	0.1926	-56.0	0.5260	-26.0	0.8934
-85.0	0.2000	-55.0	0.5400	-25.0	0.9015
-84.0	0.2074	-54.0	0.5540	-24.0	0.9096
-83.0	0.2148	-53.0	0.5680	-23.0	0.9177
-82.0	0.2222	-52.0	0.5820	-22.0	0.9258
-81.0	0.2296	-51.0	0.5960	-21.0	0.9339
-80.0	0.2370	-50.0	0.6100	-20.0	0.9420
-79.0	0.2476	-49.0	0.6240	-19.0	0.9460
-78.0	0.2582	-48.0	0.6380	-18.0	0.9500
-77.0	0.2688	-47.0	0.6520	-17.0	0.9540
-76.0	0.2794	-46.0	0.6660	-16.0	0.9580
-75.0	0.2900	-45.0	0.6800	-15.0	0.9620
-74.0	0.3006	-44.0	0.6940	-14.0	0.9660
-73.0	0.3112	-43.0	0.7080	-13.0	0.9700
-72.0	0.3218	-42.0	0.7220	-12.0	0.9740
-71.0	0.3324	-41.0	0.7360	-11.0	0.9780
-70.0	0.3430	-40.0	0.7500	-10.0	0.9820
-69.0	0.3557	-39.0	0.7611	-9.0	0.9838
-68.0	0.3684	-38.0	0.7722	-8.0	0.9856
-67.0	0.3811	-37.0	0.7833	-7.0	0.9874
-66.0	0.3938	-36.0	0.7944	-6.0	0.9892
-65.0	0.4065	-35.0	0.8055	-5.0	0.9910
-64.0	0.4192	-34.0	0.8166	-4.0	0.9928
-63.0	0.4319	-33.0	0.8277	-3.0	0.9946
-62.0	0.4446	-32.0	0.8388	-2.0	0.9964
-61.0	0.4573	-31.0	0.8499	-1.0	0.9982

Station: KXLT  
 Location: DENVER  
 Channel: 100.3  
 Antenna: TAC-1M  
 Azimuthal Gain: 3.9 5.92 dB  
 General Comments: HORIZONTAL POLARIZATION WITH SCREEN

-November 29, 1990  
 10:41 AM  
 Pattern No.: 112990-001  
 Designed by: WAK

Angle	Field	Angle	Field	Angle	Field
-----	-----	-----	-----	-----	-----
0.0	1.0000	30.0	0.8700	60.0	0.5200
1.0	0.9983	31.0	0.8605	61.0	0.5075
2.0	0.9966	32.0	0.8510	62.0	0.4950
3.0	0.9949	33.0	0.8415	63.0	0.4825
4.0	0.9932	34.0	0.8320	64.0	0.4700
5.0	0.9915	35.0	0.8225	65.0	0.4575
6.0	0.9898	36.0	0.8130	66.0	0.4450
7.0	0.9881	37.0	0.8035	67.0	0.4325
8.0	0.9864	38.0	0.7940	68.0	0.4200
9.0	0.9847	39.0	0.7845	69.0	0.4075
10.0	0.9830	40.0	0.7750	70.0	0.3950
11.0	0.9792	41.0	0.7630	71.0	0.3835
12.0	0.9754	42.0	0.7510	72.0	0.3720
13.0	0.9716	43.0	0.7390	73.0	0.3605
14.0	0.9678	44.0	0.7270	74.0	0.3490
15.0	0.9640	45.0	0.7150	75.0	0.3375
16.0	0.9602	46.0	0.7030	76.0	0.3260
17.0	0.9564	47.0	0.6910	77.0	0.3145
18.0	0.9526	48.0	0.6790	78.0	0.3030
19.0	0.9488	49.0	0.6670	79.0	0.2915
20.0	0.9450	50.0	0.6550	80.0	0.2800
21.0	0.9375	51.0	0.6415	81.0	0.2710
22.0	0.9300	52.0	0.6280	82.0	0.2620
23.0	0.9225	53.0	0.6145	83.0	0.2530
24.0	0.9150	54.0	0.6010	84.0	0.2440
25.0	0.9075	55.0	0.5875	85.0	0.2350
26.0	0.9000	56.0	0.5740	86.0	0.2260
27.0	0.8925	57.0	0.5605	87.0	0.2170
28.0	0.8850	58.0	0.5470	88.0	0.2080
29.0	0.8775	59.0	0.5335	89.0	0.1990

Station: KXLT  
 Location: DENVER  
 Channel: 100.3  
 Antenna: TAC-1M  
 Azimuthal Gain: 3.9 5.92 dB  
 General Comments: HORIZONTAL POLARIZATION WITH SCREEN

November 29, 1990  
 10:41 AM  
 Pattern No.: 112990-001  
 Designed by: WAK

Angle	Field	Angle	Field	Angle	Field
-----	-----	-----	-----	-----	-----
90.0	0.1900	120.0	0.0900	150.0	0.0120
91.0	0.1830	121.0	0.0880	151.0	0.0148
92.0	0.1760	122.0	0.0860	152.0	0.0176
93.0	0.1690	123.0	0.0840	153.0	0.0204
94.0	0.1620	124.0	0.0820	154.0	0.0232
95.0	0.1550	125.0	0.0800	155.0	0.0260
96.0	0.1480	126.0	0.0780	156.0	0.0288
97.0	0.1410	127.0	0.0760	157.0	0.0316
98.0	0.1340	128.0	0.0740	158.0	0.0344
99.0	0.1270	129.0	0.0720	159.0	0.0372
100.0	0.1200	130.0	0.0700	160.0	0.0400
101.0	0.1175	131.0	0.0690	161.0	0.0445
102.0	0.1150	132.0	0.0680	162.0	0.0490
103.0	0.1125	133.0	0.0670	163.0	0.0535
104.0	0.1100	134.0	0.0660	164.0	0.0580
105.0	0.1075	135.0	0.0650	165.0	0.0625
106.0	0.1050	136.0	0.0640	166.0	0.0670
107.0	0.1025	137.0	0.0630	167.0	0.0715
108.0	0.1000	138.0	0.0620	168.0	0.0760
109.0	0.0975	139.0	0.0610	169.0	0.0805
110.0	0.0950	140.0	0.0600	170.0	0.0850
111.0	0.0945	141.0	0.0552	171.0	0.0860
112.0	0.0940	142.0	0.0504	172.0	0.0870
113.0	0.0935	143.0	0.0456	173.0	0.0880
114.0	0.0930	144.0	0.0408	174.0	0.0890
115.0	0.0925	145.0	0.0360	175.0	0.0900
116.0	0.0920	146.0	0.0312	176.0	0.0910
117.0	0.0915	147.0	0.0264	177.0	0.0920
118.0	0.0910	148.0	0.0216	178.0	0.0930
119.0	0.0905	149.0	0.0168	179.0	0.0940
				180.0	0.0950

POLAR PATTERN RELATIVE FIELD DATA

Station:	KXLT	November 29, 1990
Location:	DENVER	11:22 AM
Channel:	100.3	Pattern No.: 112990-002
Antenna:	TAC-1M	Designed by: WAK
Azimuthal Gain:	4.5      6.49 dB	
General Comments:	VERTICAL POLARIZATION WITH SCREEN	

Angle	Field	Angle	Field	Angle	Field
-----	-----	-----	-----	-----	-----
-179.0	0.0591	-150.0	0.0100	-120.0	0.0820
-178.0	0.0592	-149.0	0.0129	-119.0	0.0821
-177.0	0.0593	-148.0	0.0158	-118.0	0.0822
-176.0	0.0594	-147.0	0.0187	-117.0	0.0823
-175.0	0.0595	-146.0	0.0216	-116.0	0.0824
-174.0	0.0596	-145.0	0.0245	-115.0	0.0825
-173.0	0.0597	-144.0	0.0274	-114.0	0.0826
-172.0	0.0598	-143.0	0.0303	-113.0	0.0827
-171.0	0.0599	-142.0	0.0332	-112.0	0.0828
-170.0	0.0600	-141.0	0.0361	-111.0	0.0829
-169.0	0.0583	-140.0	0.0390	-110.0	0.0830
-168.0	0.0566	-139.0	0.0421	-109.0	0.0868
-167.0	0.0549	-138.0	0.0452	-108.0	0.0906
-166.0	0.0532	-137.0	0.0483	-107.0	0.0944
-165.0	0.0515	-136.0	0.0514	-106.0	0.0982
-164.0	0.0498	-135.0	0.0545	-105.0	0.1020
-163.0	0.0481	-134.0	0.0576	-104.0	0.1058
-162.0	0.0464	-133.0	0.0607	-103.0	0.1096
-161.0	0.0447	-132.0	0.0638	-102.0	0.1134
-160.0	0.0430	-131.0	0.0669	-101.0	0.1172
-159.0	0.0397	-130.0	0.0700	-100.0	0.1210
-158.0	0.0364	-129.0	0.0712	-99.0	0.1302
-157.0	0.0331	-128.0	0.0724	-98.0	0.1394
-156.0	0.0298	-127.0	0.0736	-97.0	0.1486
-155.0	0.0265	-126.0	0.0748	-96.0	0.1578
-154.0	0.0232	-125.0	0.0760	-95.0	0.1670
-153.0	0.0199	-124.0	0.0772	-94.0	0.1762
-152.0	0.0166	-123.0	0.0784	-93.0	0.1854
-151.0	0.0133	-122.0	0.0796	-92.0	0.1946
		-121.0	0.0808	-91.0	0.2038

POLAR PATTERN RELATIVE FIELD DATA

Station:	KXLT	November 29, 1990
Location:	DENVER	11:22 AM
Channel:	100.3	Pattern No.: 112990-002
Antenna:	TAC-1M	Designed by: WAK
Azimuthal Gain:	4.5      6.49 dB	
General Comments:	VERTICAL POLARIZATION WITH SCREEN	

Angle	Field	Angle	Field	Angle	Field
-----	-----	-----	-----	-----	-----
-90.0	0.2130	-60.0	0.4230	-30.0	0.7630
-89.0	0.2215	-59.0	0.4305	-29.0	0.7756
-88.0	0.2300	-58.0	0.4380	-28.0	0.7882
-87.0	0.2385	-57.0	0.4455	-27.0	0.8008
-86.0	0.2470	-56.0	0.4530	-26.0	0.8134
-85.0	0.2555	-55.0	0.4605	-25.0	0.8260
-84.0	0.2640	-54.0	0.4680	-24.0	0.8386
-83.0	0.2725	-53.0	0.4755	-23.0	0.8512
-82.0	0.2810	-52.0	0.4830	-22.0	0.8638
-81.0	0.2895	-51.0	0.4905	-21.0	0.8764
-80.0	0.2980	-50.0	0.4980	-20.0	0.8890
-79.0	0.3046	-49.0	0.5100	-19.0	0.8973
-78.0	0.3112	-48.0	0.5220	-18.0	0.9056
-77.0	0.3178	-47.0	0.5340	-17.0	0.9139
-76.0	0.3244	-46.0	0.5460	-16.0	0.9222
-75.0	0.3310	-45.0	0.5580	-15.0	0.9305
-74.0	0.3376	-44.0	0.5700	-14.0	0.9388
-73.0	0.3442	-43.0	0.5820	-13.0	0.9471
-72.0	0.3508	-42.0	0.5940	-12.0	0.9554
-71.0	0.3574	-41.0	0.6060	-11.0	0.9637
-70.0	0.3640	-40.0	0.6180	-10.0	0.9720
-69.0	0.3699	-39.0	0.6325	-9.0	0.9748
-68.0	0.3758	-38.0	0.6470	-8.0	0.9776
-67.0	0.3817	-37.0	0.6615	-7.0	0.9804
-66.0	0.3876	-36.0	0.6760	-6.0	0.9832
-65.0	0.3935	-35.0	0.6905	-5.0	0.9860
-64.0	0.3994	-34.0	0.7050	-4.0	0.9888
-63.0	0.4053	-33.0	0.7195	-3.0	0.9916
-62.0	0.4112	-32.0	0.7340	-2.0	0.9944
-61.0	0.4171	-31.0	0.7485	-1.0	0.9972

POLAR PATTERN RELATIVE FIELD DATA

Station: KXLT  
 Location: DENVER  
 Channel: 100.3  
 Antenna: TAC-1M  
 Azimuthal Gain: 4.5 6.49 dB  
 General Comments: VERTICAL POLARIZATION WITH SCREEN

November 29, 1990  
 11:22 AM  
 Pattern No.: 112990-002  
 Designed by: WAK

Angle	Field	Angle	Field	Angle	Field
-----	-----	-----	-----	-----	-----
0.0	1.0000	30.0	0.7950	60.0	0.4400
1.0	0.9978	31.0	0.7825	61.0	0.4310
2.0	0.9956	32.0	0.7700	62.0	0.4220
3.0	0.9934	33.0	0.7575	63.0	0.4130
4.0	0.9912	34.0	0.7450	64.0	0.4040
5.0	0.9890	35.0	0.7325	65.0	0.3950
6.0	0.9868	36.0	0.7200	66.0	0.3860
7.0	0.9846	37.0	0.7075	67.0	0.3770
8.0	0.9824	38.0	0.6950	68.0	0.3680
9.0	0.9802	39.0	0.6825	69.0	0.3590
10.0	0.9780	40.0	0.6700	70.0	0.3500
11.0	0.9704	41.0	0.6570	71.0	0.3420
12.0	0.9628	42.0	0.6440	72.0	0.3340
13.0	0.9552	43.0	0.6310	73.0	0.3260
14.0	0.9476	44.0	0.6180	74.0	0.3180
15.0	0.9400	45.0	0.6050	75.0	0.3100
16.0	0.9324	46.0	0.5920	76.0	0.3020
17.0	0.9248	47.0	0.5790	77.0	0.2940
18.0	0.9172	48.0	0.5660	78.0	0.2860
19.0	0.9096	49.0	0.5530	79.0	0.2780
20.0	0.9020	50.0	0.5400	80.0	0.2700
21.0	0.8913	51.0	0.5300	81.0	0.2632
22.0	0.8806	52.0	0.5200	82.0	0.2564
23.0	0.8699	53.0	0.5100	83.0	0.2496
24.0	0.8592	54.0	0.5000	84.0	0.2428
25.0	0.8485	55.0	0.4900	85.0	0.2360
26.0	0.8378	56.0	0.4800	86.0	0.2292
27.0	0.8271	57.0	0.4700	87.0	0.2224
28.0	0.8164	58.0	0.4600	88.0	0.2156
29.0	0.8057	59.0	0.4500	89.0	0.2088

POLAR PATTERN RELATIVE FIELD DATA

Station: KXLT  
 Location: DENVER  
 Channel: 100.3  
 Antenna: TAC-1M  
 Azimuthal Gain: 4.5 6.49 dB  
 General Comments: VERTICAL POLARIZATION WITH SCREEN

November 29, 1990  
 11:22 AM  
 Pattern No.: 112990-002  
 Designed By: WAK

Angle	Field	Angle	Field	Angle	Field
-----	-----	-----	-----	-----	-----
90.0	0.2020	120.0	0.1420	150.0	0.0580
91.0	0.1978	121.0	0.1403	151.0	0.0552
92.0	0.1936	122.0	0.1386	152.0	0.0524
93.0	0.1894	123.0	0.1369	153.0	0.0496
94.0	0.1852	124.0	0.1352	154.0	0.0468
95.0	0.1810	125.0	0.1335	155.0	0.0440
96.0	0.1768	126.0	0.1318	156.0	0.0412
97.0	0.1726	127.0	0.1301	157.0	0.0384
98.0	0.1684	128.0	0.1284	158.0	0.0356
99.0	0.1642	129.0	0.1267	159.0	0.0328
100.0	0.1600	130.0	0.1250	160.0	0.0300
101.0	0.1587	131.0	0.1223	161.0	0.0307
102.0	0.1574	132.0	0.1196	162.0	0.0314
103.0	0.1561	133.0	0.1169	163.0	0.0321
104.0	0.1548	134.0	0.1142	164.0	0.0328
105.0	0.1535	135.0	0.1115	165.0	0.0335
106.0	0.1522	136.0	0.1088	166.0	0.0342
107.0	0.1509	137.0	0.1061	167.0	0.0349
108.0	0.1496	138.0	0.1034	168.0	0.0356
109.0	0.1483	139.0	0.1007	169.0	0.0363
110.0	0.1470	140.0	0.0980	170.0	0.0370
111.0	0.1465	141.0	0.0940	171.0	0.0392
112.0	0.1460	142.0	0.0900	172.0	0.0414
113.0	0.1455	143.0	0.0860	173.0	0.0436
114.0	0.1450	144.0	0.0820	174.0	0.0458
115.0	0.1445	145.0	0.0780	175.0	0.0480
116.0	0.1440	146.0	0.0740	176.0	0.0502
117.0	0.1435	147.0	0.0700	177.0	0.0524
118.0	0.1430	148.0	0.0660	178.0	0.0546
119.0	0.1425	149.0	0.0620	179.0	0.0568
				180.0	0.0590



## DIRECTIONAL ANTENNA TOWER LOCATION REPORT

**TO:** KSE RADIO / ALTITUDE RADIO NETWORKS

**SITE LOCATION:**

2504 S. GRAPEVINE ROAD, IDLEDALE, CO 80453  
MOUNT MORRISON  
SOUTHWEST QUARTER SECTION 27, TOWNSHIP 4 SOUTH, RANGE 70 WEST 6<sup>TH</sup> P.M.  
COUNTY OF JEFFERSON, STATE OF COLORADO.

**LEGAL DESCRIPTION (PER COUNTY ASSESSORS OFFICE):**

LOT 1, BLOCK 1, MOUNT MORRISON TELECOMMUNICATIONS / REC. NO. 2011040591

**TOWER LOCATION:**

REF FRAME: NAD\_83 (2011)  
LATITUDE: 39°40'25.42392" NORTH  
LONGITUDE: 105°13'04.79861" WEST  
GROUND ELEVATION: 7734.3 AMSL (NAVD88)

**DIRECTION:**

AZIMUTH: 67 DEGREES  
(ACCURATE WITHIN 2 DEGREES +/- FROM EXISTING CENTER OF ANTENNA)

**NGS CONTROL:**

DESIGNATION: RMCL 40 / PID: AA7134

**ACCURACY:**

HORIZONTAL: 0.1 FOOT / VERTICAL: 0.2 FOOT

**SURVEY EQUIPMENT:**

TRIMBLE R8S GPS, TRIMBLE S3 ROBOTIC TOTAL STATION AND TRIMBLE VRS NETWORK.

**SURVEY DATE:**

ON SITE FAST-STATIC GPS OBSERVATIONS WERE PERFORMED JUNE 15, 2022



WILLIAM G BUNTROCK, PLS  
COLORADO LICENSED LAND SURVEYOR NO. 35585  
TRUE NORTH SURVEYING & MAPPING, LLC  
TN 22037

ELECTROMAGNETIC EXPOSURE MEASUREMENTS  
KXKL-FM, 105.1 MHz., KIMN-FM, 100.3 MHz.  
KSE RADIO  
DENVER, COLORADO  
JULY 2022

**TABLE OF CONTENTS**

<b><u>EXHIBIT</u></b>	<b><u>TITLE</u></b>
200	TECHNICAL STATEMENT
300	RADIO FREQUENCY RADIATION MEASUREMENTS
400	TEST EQUIPMENT AND CALIBRATIONS

\* \* \* \* \*

ELECTROMAGNETIC EXPOSURE MEASUREMENTS  
KXKL-FM, 105.1 MHz., KIMN-FM, 100.3 MHz.  
KSE RADIO  
DENVER, COLORADO  
JULY 2022

EXHIBIT 200

KKSE Radio, KXKL-FM and KIMN-FM Radio, have retained the services of J.C. Humke & Associates, Inc. to assist with Radio Frequency Radiation Measurements for the certification of newly installed auxiliary transmit antennas.

RFR exposure survey equipment was leased from Advanced Test Equipment Corporation, San Diego, California. The equipment is listed in detail, including model and serial numbers, as well as calibration dates, are listed in Exhibit 400.

The newly installed transmit antennas are located in the northern portion of the fenced antenna site compound. The antennas are installed on the side of a hill, with terrain rising immediately west of the antennas, and terrain falling off to lower elevations to the east and north. On the outside of the compound fence in these areas, the terrain drops off as a sharp cliff. The property extends beyond the fence, and outer fences are in place to secure the entire property.

Measurements were performed on Wednesday July 13, 2022, between 9:30 AM And 11:45 AM MDT., by Joel Humke and Jason Gorodetzer, KSE Radio Director of Engineering. Monitoring locations were selected using the steel fence posts of the inner compound fence as reference locations, at every other fence post. The fence post for the northeast corner of the fence was selected as reference, with posts going south from this location, and west from this location. This reference point is also the highest elevation of all locations. In the data presented, this point will be listed as reference for measurements to the south and to the west.

The Mt. Morrison master antenna hosts KXKL-FM, KIMN-FM, KYGO-FM, KOSI-FM and KUVU-FM. For these measurements, first the sample locations were measured with all stations operating from the master antenna. The second set of measurements were with KXKL-FM and KIMN-FM removed from the master antenna and operating into their auxiliary antennas. All measurements obtained on the auxiliary antennas were lower than those with all on the master antenna, with the exception of location 6 posts south, which while being slightly elevated, are still within limits. Both the Narda E field probe and the Narda H field probe were used, but all of the measurements indicated with the E field probe were much lower, so they are not presented herein.

Respectfully submitted,



Joel Clark Humke  
July 16, 2022

**J.C. Humke and Associates, Inc., 5457 South Jericho Way, Centennial, CO 80015-3648**

ELECTROMAGNETIC EXPOSURE MEASUREMENTS  
KXKL-FM, 105.1 MHz., KIMN-FM, 100.3 MHz.  
KSE RADIO  
DENVER, COLORADO  
JULY 2022

EXHIBIT 300

**RADIO FREQUENCY RADIATION MEASUREMENTS**

<u>LOCATION</u>	<u>ALL STATION ON MASTER ANTENNA</u>	<u>KIMN-FM KXKL -FM AUXILIARY ANTENNA</u>
N.E. Corner post Reference	0.91 mW	0.66 mW
2 posts south	0.833 mW	0.63 mW
4 posts south	0.54 mW	0.44 mW
6 posts south	0.11 mW	0.26 mW
8 posts south	0.22 mW	0.12 mW

Continuing downhill and then behind terrain

N.E. Corner post Reference from above	0.91 mW	0.66 mW
2 posts west	0.12 mW	0.104 mW
4 posts west	0.15 mW	0.11 mW

Continue down steep hill and behind terrain

All measurements in mW/cm<sup>2</sup>

Narda HF 0191 H Field Probe (See Text)

ELECTROMAGNETIC EXPOSURE MEASUREMENTS  
KXKL-FM, 105.1 MHz., KIMN-FM, 100.3 MHz.  
KSE RADIO  
DENVER, COLORADO  
JULY 2022

EXHIBIT 400

**TEST EQUIPMENT**

Narda NBM-550 Broadband Field Meter	Serial H-1279	Cal. 9/28/20
Narda EF 0391 100 KHz.- 3 GHz. E Field Probe	Serial D-1797	Cal. 4/11/22
Narda HF 0191 27 MHz. – 1 GHz. H Field Probe	Serial D-0554	Cal. 2/4/20