

**December 2020**  
**FM Translator K245CT**  
**Clifton, AZ Channel 245D**  
**Compliance with Special Operating Conditions**

**Facilities Constructed**

FM translator K245CT has been constructed in compliance with the terms and conditions of construction permit BNPFT-20171201AOX. Operation will be on Channel 245D (96.9 MHz) with an effective radiated power of 50 watts. The antenna is mounted on an existing tower on Guthrie Peak.

**Special Operating Condition #3**

Condition #3 was incorrectly applied to this construction permit. That condition states:

*Since the application proposes to mount its FM antenna above the co-located existing directional antenna of KFMM(FM), Thatcher, AZ, the permittee must submit, with the FCC Form 350, application for license, an exhibit including a statement from the manufacturer of KFMM's directional antenna stating that the proposed antenna will have no adverse effect on the directional antenna pattern.*

The basic premise of this condition – that the K245DC antenna will be mounted above the KFMM antenna – is incorrect. The K245DC antenna is authorized at 10 meters AGL, while the KFMM antenna is licensed at 23 meters AGL. Consequently, the K245DC antenna and transmission line can have no effect on the KFMM directional antenna pattern. No statement from the manufacturer of the KFMM antenna is necessary to establish this.

**Special Operating Condition #2**

Condition #2 calls for RF exposure measurements on the roof and inside the transmitter building. Measurements are not believed to be necessary in this instance.

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on

the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

*D* is the distance in meters from the center of radiation to the calculation point.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 500 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by K245CT assume a Type 4 element pattern, which is the element pattern specified in the Commission's FMModel software for the Shively SLV-1 proposed for use. The highest calculated ground level power density occurs at a distance of 9 meters from the base of the antenna support structure. At this point the power density is calculated to be 15.1  $\mu W/cm^2$ .

Calculations of the ground-level power density maxima produced by K245CT and the other stations on this tower are summarized in the following table:

Call	Avg or Peak ERP Antenna Model	Relative Field	Height AGL	Calculated Max Exposure	Gen Pop FCC Limit	% of Limit
K245DC 245D	0.050 kW H 0.050 kW V SHI SLV-1	FMModel Type 4	10 m	15.1 $\mu W/cm^2$	200 $\mu W/cm^2$	7.6%
KFMM 256C1	6.4 kW H 6.4 kW V JAM JSCP-3S DA	FMModel Type 2	23 m	150.8 $\mu W/cm^2$	200 $\mu W/cm^2$	74.5%
KFMR 247C1	1.7 kW H 1.7 kW V SHI SLV-2 (0.75) 2-bay 0.75 wave	FMModel Type 4	12 m	73.0 $\mu W/cm^2$	200 $\mu W/cm^2$	36.5%
KSFQ 215C2	0.6 kW V SCA FMV2 2-bay 0.61 wave	FMModel Type 1	17 m	9.3 $\mu W/cm^2$	200 $\mu W/cm^2$	4.7%

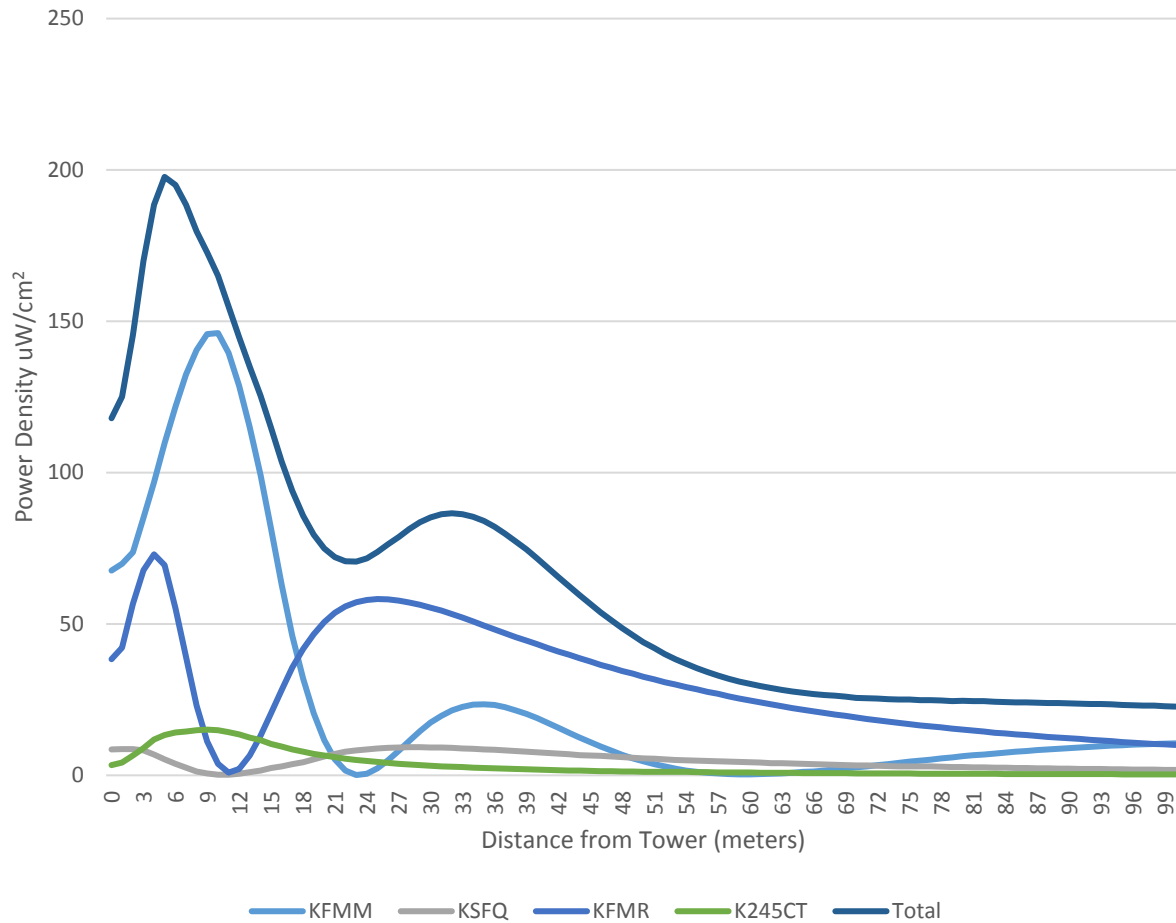
Since these four stations will all operate from a single tower, an analysis has been performed which sums their individual contributions at 1-meter increments from the base of the tower. The results of this analysis are depicted on the attached table and graph, which demonstrate that the maximum calculated ground-level power density is  $197.7 \mu\text{W}/\text{cm}^2$ , which is 98.9% of  $200 \mu\text{W}/\text{cm}^2$  (the FCC Maximum Permissible Exposure for uncontrolled environments).

The only building at the transmitter site is the transmitter shelter, an approximately 8-foot tall shelter with no permanently installed roof access. Since only trained station personnel will be allowed access to the rooftop or inside the shelter, those areas are considered to be controlled-access areas, subject to a Maximum Permissible Exposure of  $1000 \mu\text{W}/\text{cm}^2$ . Assuming a trained individual standing on the roof within this occupational area, the maximum calculated exposure for that individual would be  $365.4 \mu\text{W}/\text{cm}^2$  or 36.5% of the occupational MPE, and that only if we assume both a) that each station's maxima coincides and b) that each maxima occurs within just a few meters of the tower where the transmitter building is located (neither of which is true).

Based on the circumstances and these calculations, post-construction measurements on the roof and inside the building are not necessary, as compliance with the Commission's Maximum Permissible Exposure limits has been otherwise demonstrated. Nevertheless, the site is marked with warning signs, out of an abundance of caution.

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 radiofrequency exposure in excess of FCC guidelines.

### Sum of Ground Level Power Densities



Distance (meters)	KFMM uW/cm <sup>2</sup>	KSFQ uW/cm <sup>2</sup>	KFMR uW/cm <sup>2</sup>	K245CT uW/cm <sup>2</sup>	Total uW/cm <sup>2</sup>
0	67.6	8.6	38.4	3.4	118.0
1	69.9	8.7	42.2	4.2	125.0
2	73.7	8.7	56.6	6.5	145.5
3	85.1	8.2	67.7	9.0	170.0
4	96.8	6.9	73.0	11.8	188.5
5	109.7	5.3	69.4	13.3	197.7
6	121.8	3.8	55.2	14.2	195.0
7	132.4	2.5	39.1	14.5	188.5
8	140.5	1.3	23.0	14.9	179.7
9	145.8	0.6	11.2	15.1	172.7
10	146.1	0.2	3.8	14.9	165.0
11	139.5	0.2	0.9	14.3	154.9
12	128.6	0.5	2.1	13.5	144.7
13	115	1.0	6.5	12.5	135.0
14	99.1	1.6	13.1	11.6	125.4
15	81.3	2.4	20.6	10.4	114.7
16	62.9	3.0	28.2	9.5	103.6

17	46.1	3.7	35.6	8.6	94.0
18	31.9	4.3	41.7	7.8	85.7
19	20.5	5.3	46.6	7.1	79.5
20	11.6	6.2	50.6	6.5	74.9
21	5.3	7.1	53.7	6.0	72.1
22	1.6	7.8	55.8	5.5	70.7
23	0.1	8.2	57.2	5.1	70.6
24	0.5	8.6	57.9	4.7	71.7
25	2.3	8.9	58.2	4.4	73.8
26	5	9.1	58.1	4.1	76.3
27	8.1	9.2	57.7	3.8	78.8
28	11.4	9.3	57.1	3.6	81.4
29	14.6	9.3	56.3	3.4	83.6
30	17.4	9.2	55.4	3.2	85.2
31	19.7	9.2	54.4	3.0	86.3
32	21.4	9.1	53.3	2.8	86.6
33	22.6	8.9	52.1	2.7	86.3
34	23.3	8.8	50.8	2.5	85.4
35	23.5	8.6	49.5	2.4	84.0
36	23.2	8.4	48.2	2.3	82.1
37	22.5	8.2	46.9	2.2	79.8
38	21.5	8.0	45.7	2.1	77.3
39	20.3	7.8	44.5	2.0	74.6
40	18.9	7.6	43.3	1.9	71.7
41	17.3	7.4	42.1	1.8	68.6
42	15.7	7.2	40.9	1.7	65.5
43	14.1	7.0	39.8	1.6	62.5
44	12.5	6.7	38.7	1.6	59.5
45	11	6.5	37.6	1.5	56.6
46	9.5	6.4	36.5	1.4	53.8
47	8.1	6.2	35.5	1.4	51.2
48	6.8	6.0	34.5	1.3	48.6
49	5.6	5.8	33.6	1.3	46.3
50	4.6	5.6	32.6	1.2	44.0
51	3.7	5.5	31.7	1.2	42.1
52	2.9	5.3	30.8	1.1	40.1
53	2.2	5.1	30.0	1.1	38.4
54	1.6	5.0	29.2	1.1	36.9
55	1.2	4.8	28.4	1.0	35.4
56	0.8	4.7	27.6	1.0	34.1
57	0.6	4.6	26.9	0.9	33.0
58	0.4	4.5	26.1	0.9	31.9
59	0.3	4.4	25.4	0.9	31.0
60	0.3	4.3	24.7	0.9	30.2
61	0.4	4.2	24.1	0.8	29.5
62	0.5	4.0	23.5	0.8	28.8
63	0.6	4.0	22.8	0.8	28.2

64	0.8	3.9	22.2	0.8	27.7
65	1.1	3.8	21.7	0.7	27.3
66	1.3	3.7	21.1	0.7	26.8
67	1.6	3.6	20.6	0.7	26.5
68	2	3.5	20.1	0.7	26.3
69	2.3	3.4	19.6	0.7	26.0
70	2.6	3.3	19.1	0.6	25.6
71	3	3.3	18.6	0.6	25.5
72	3.4	3.2	18.2	0.6	25.4
73	3.7	3.1	17.8	0.6	25.2
74	4.1	3.0	17.3	0.6	25.0
75	4.5	3.0	16.9	0.6	25.0
76	4.9	2.9	16.5	0.5	24.8
77	5.2	2.9	16.2	0.5	24.8
78	5.6	2.8	15.8	0.5	24.7
79	5.9	2.7	15.4	0.5	24.5
80	6.3	2.7	15.1	0.5	24.6
81	6.6	2.6	14.8	0.5	24.5
82	6.9	2.6	14.5	0.5	24.5
83	7.2	2.5	14.1	0.5	24.3
84	7.5	2.5	13.8	0.4	24.2
85	7.8	2.4	13.5	0.4	24.1
86	8	2.4	13.3	0.4	24.1
87	8.3	2.3	13.0	0.4	24.0
88	8.5	2.3	12.7	0.4	23.9
89	8.8	2.2	12.5	0.4	23.9
90	9	2.2	12.2	0.4	23.8
91	9.2	2.1	12.0	0.4	23.7
92	9.4	2.1	11.7	0.4	23.6
93	9.6	2.1	11.5	0.4	23.6
94	9.8	2.0	11.3	0.4	23.5
95	9.9	2.0	11.0	0.3	23.2
96	10.1	1.9	10.8	0.3	23.1
97	10.2	1.9	10.6	0.3	23.0
98	10.4	1.9	10.4	0.3	23.0
99	10.5	1.8	10.2	0.3	22.8
100	10.6	1.8	10.0	0.3	22.7