3 March 2006

ENGINEERING REPORT
RADIOFREQUENCY ELECTROMAGNETIC FIELD ASSESSMENT

This engineering report has been prepared on behalf of Raven Radio Foundation, licensee of KCAW, Sitka, Alaska, as part of an application to reduce power to 3.6 KW ERP and to commence digital broadcasting using separate antennas for the FM and digital services.

An engineering analysis of the facilities proposed was performed to ascertain their compliance with the regulations regarding human exposure to radiofrequency electromagnetic fields outlined in FCC OET Bulletin 65 (Edition 97-01).

For its FM service, the applicant proposes to operate at 3.6 KW ERP, circularly polarized, using a Shively 6813-4/SS antenna side mounted at the 9.5 meter level of a 15 meter tower located on the roof of a 22 meter former aircraft control tower. This antenna consists of four radiating elements spaced one half wavelength apart.

For its digital radio service, the applicant proposes to operate at 0.036 KW ERP, circularly polarized, using a Shively 6813-1 antenna side mounted at the 4 meter level of the same tower. This antenna consists of a single radiating element.

Access to the roof is restricted by a locked door. While the roof is not normally accessible to the general public, the applicant chooses to show that the general public/uncontrolled MPE standard is not exceeded anywhere on the roof.

The tower is located central to the 8.6 m by 10.5 m rectangular flat roof. Therefore the farthest distance a person can be from the base of the tower while on the roof is 6.8 meters.

Attached is a table showing the radiofrequency electromagnetic power density contributions from the FM antenna and the digital antenna in a plane lying 2 meters above the roof. The rightmost column shows the aggregate power density. Included also is a graph of the aggregate power density versus distance from the tower. These power densities were calculated using the Commission's FMModel computer program. Attached also are the graphs produced by the FMModel program from which this data was taken.

The greatest aggregate power density within the confines of the rooftop occurs 2 meters from the base of the tower and is equal to 128.8 microwatts per centimeter squared. This represents 64.4% of the general public/uncontrolled MPE standard.

Attached also is the graphical output of the Commission's FMModel program showing the predicted radiofrequency electromagnetic power density versus distance from the tower base in a plane 2 meters above ground level produced by the FM antenna. The greatest power density occurs approximately 116 meters from the antenna and is equal to 6.7 microwatts per centimeter squared, which represents 3.35% of the general public/uncontrolled standard.

Attached also is the graphical output of the commission's FMModel program showing the predicted radiofrequency electromagnetic power density versus distance from the

tower base in a plane 2 meters above ground level produced by the digital antenna. The greatest power density occurs approximately 25 meters from the antenna and is equal to 0.89 microwatts per centimeter squared, which represents 0.45% of the general public/uncontrolled standard.

Therefore, the applicant believes that the facilities proposed herein meet the requirements spelled out in 47CFR§1.1310 as regards human exposure to radiofrequency electromagnetic fields and therefore the instant application is not subject to environmental processing.

I, Gray Frierson Haertig hereby affirm that:

I have been retained by the Rave Radio Foundation to prepare this report;

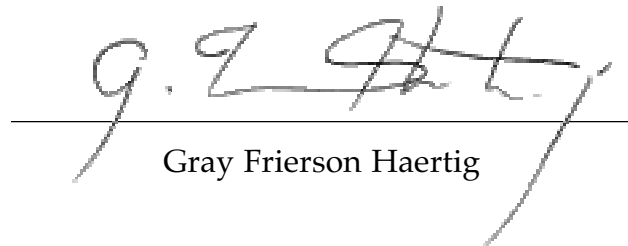I am the owner and principal engineer of Gray Frierson Haertig & Assoc.;

I have a particular interest and expertise in the evaluation of radiofrequency electromagnetic fields and assessing their impact on human exposure;

All statements made herein are true to the best of my knowledge and reflect the actual facts of the matter;

I am a radio engineer of 40 years experience;

And my credentials are a matter of record with the Commission.

Respectfully submitted this 3rd day of March 2006.

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            Gray Frierson Haertig

Aggregate Rooftop Radiofrequency
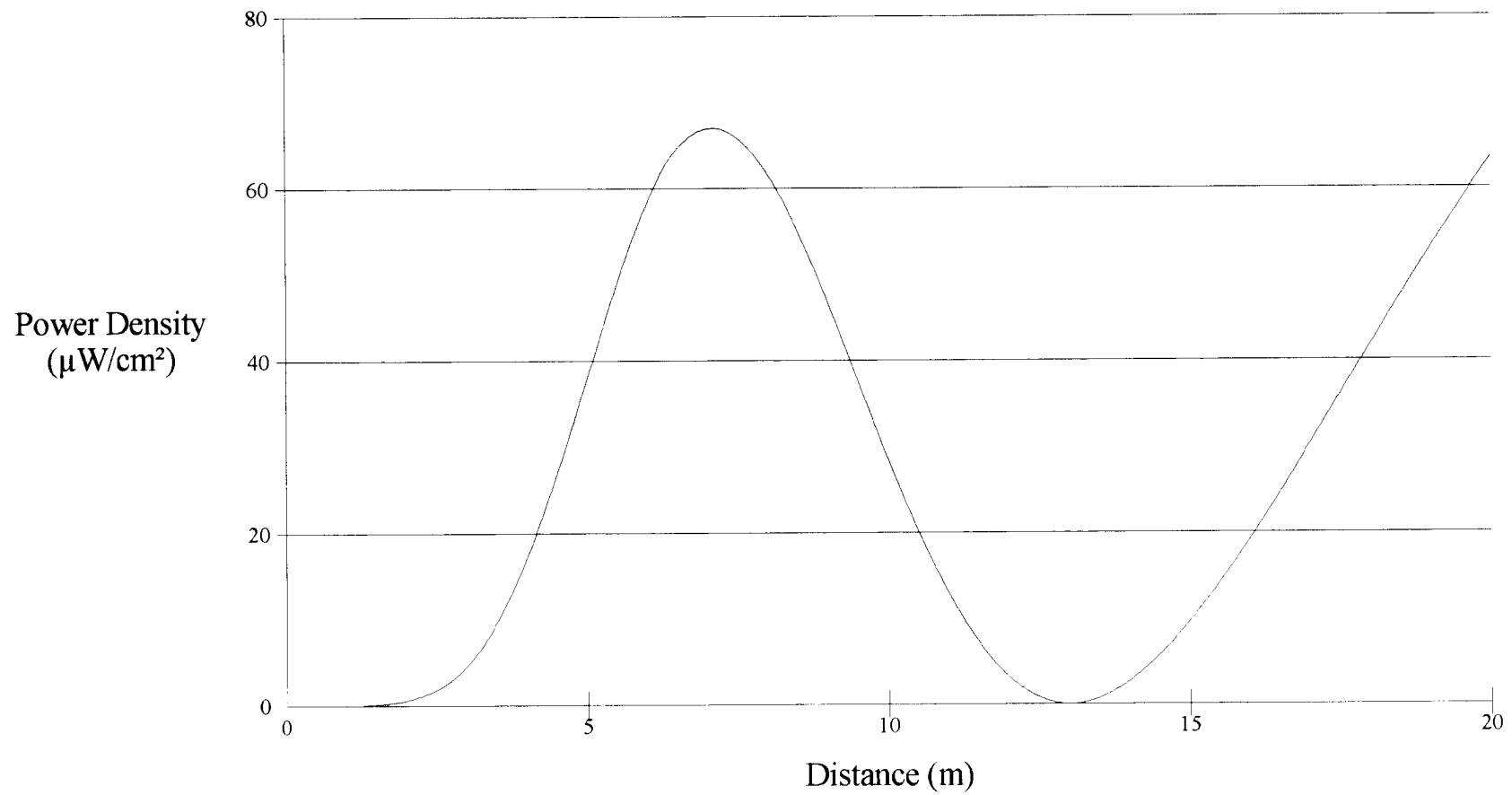## Electromagnetic Power Density
KCAW, Sitka, Alaska

Distance From Tower meters	FM Power Density $\mu W/cm^2$	HD Power Density $\mu W/cm^2$	Total Power Density $\mu W/cm^2$
0.25	0.0	8.2	8.2
0.5	0.0	27.1	27.1
0.75	0.0	49.4	49.4
1	0.0	76.4	76.4
1.25	0.0	99.3	99.3
1.5	0.1	115.9	116.0
1.75	0.3	125.4	125.7
2	0.8	128.0	128.8
2.25	1.1	127.5	128.6
2.5	1.9	124.1	126.0
2.75	3.0	119.0	122.0
3	4.7	112.9	117.6
3.25	6.9	106.6	113.5
3.5	9.8	100.0	109.8
3.75	13.2	92.7	105.9
4	17.3	86.0	103.3
4.25	22.0	79.9	101.9
4.5	27.1	74.8	101.9
4.75	32.5	70.2	102.7
5	38.1	65.9	104.0
5.25	43.7	61.9	105.6
5.5	49.0	58.2	107.2
5.75	53.9	54.5	108.4
6	58.3	51.1	109.4
6.25	62.0	48.0	110.0
6.5	64.6	45.2	109.8
6.75	66.2	42.5	108.7
7	66.9	40.1	107.0
7.25	68.8	37.9	106.7
7.5	65.9	35.9	101.8
7.75	64.1	33.9	98.0
8	61.6	32.1	93.7

Roof Level Radiofrequency Power Density

Power Density (µW/cm2) vs Distance from Tower (meters)
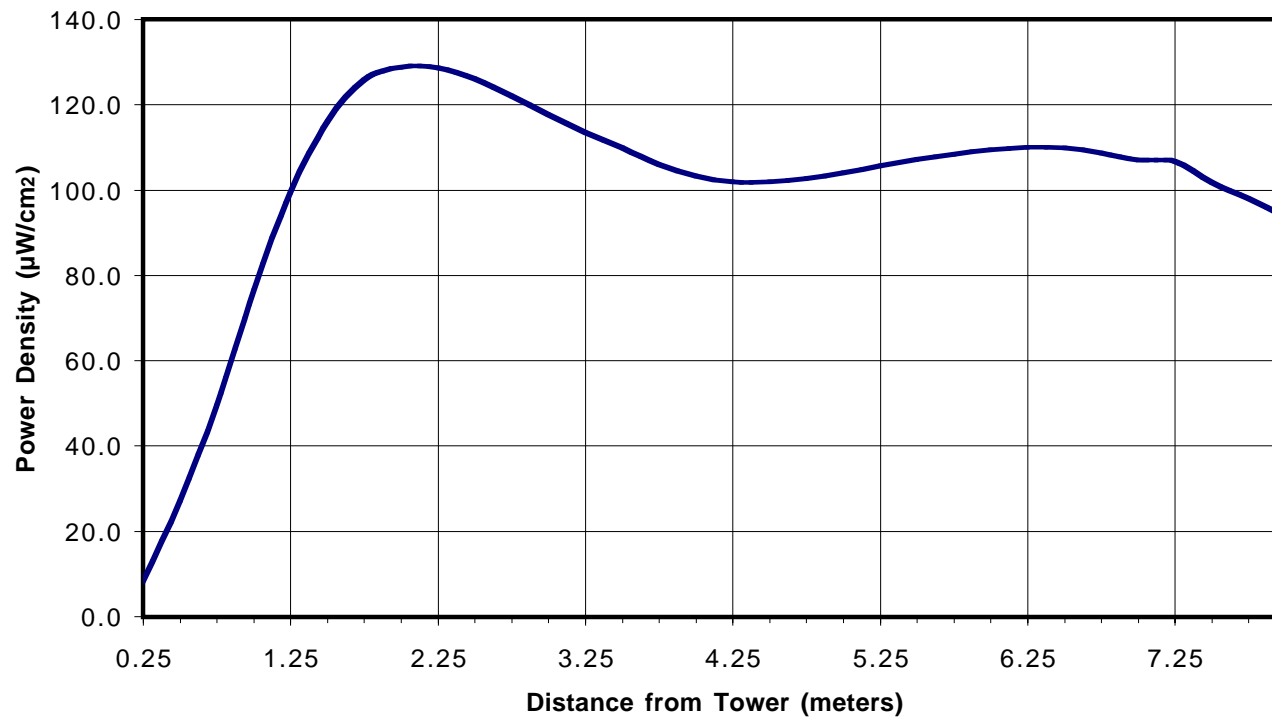
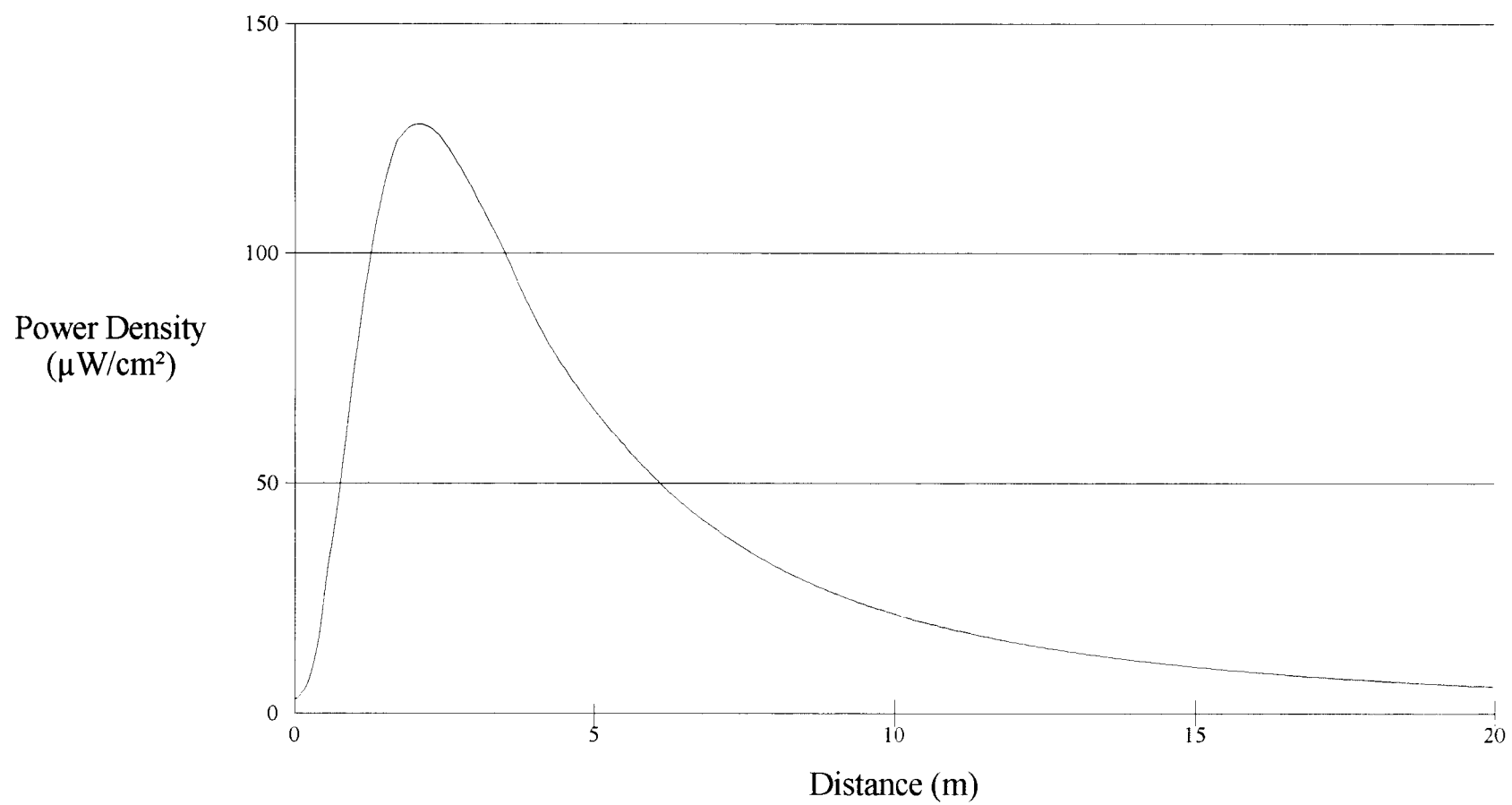Radiofrequequency Electromagnetic Field
FM Antenna - Rooftop Level

Power Density vs Distance

Radiofrequency Electromagnetic Field
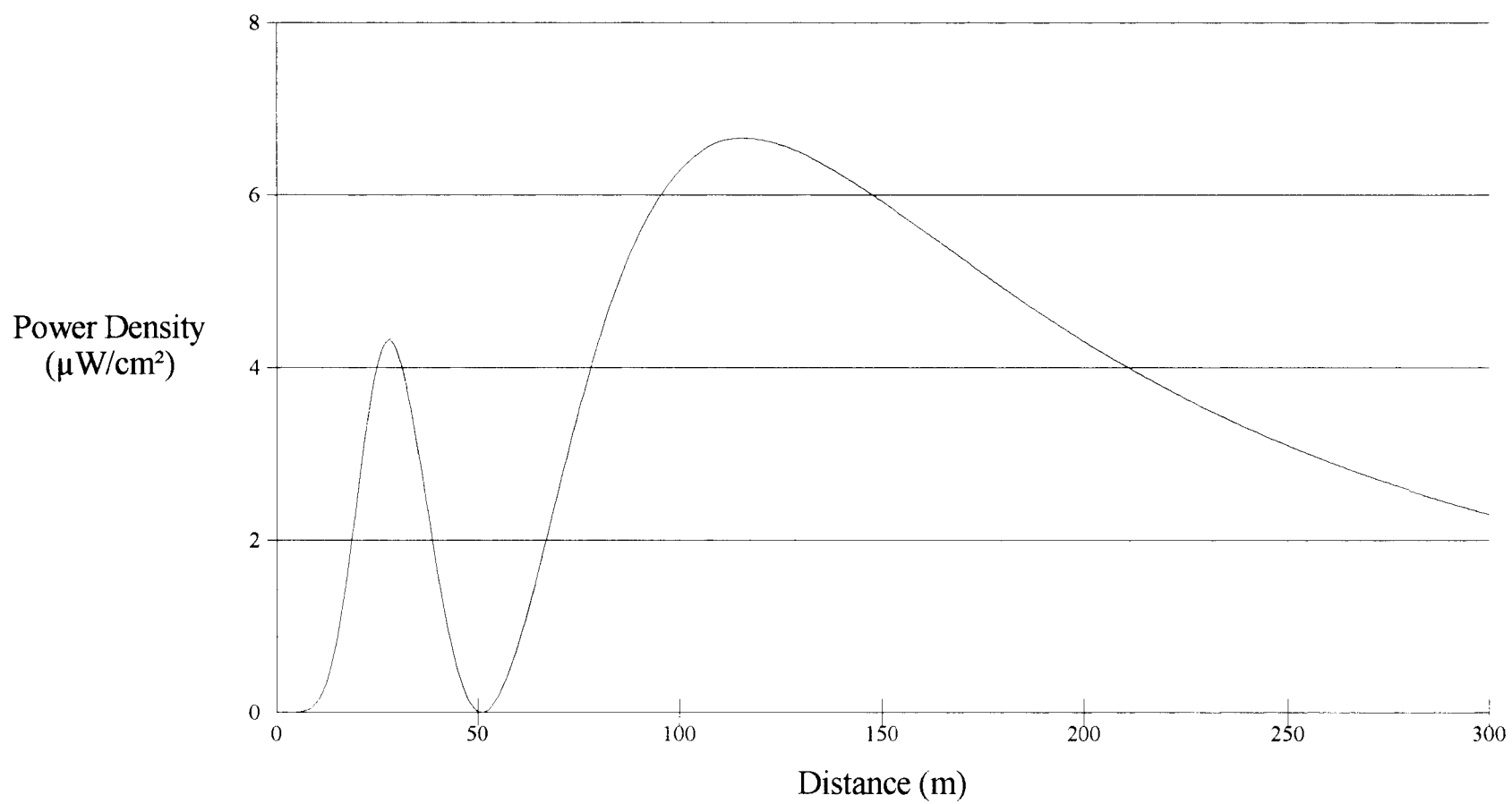## Digital Antenna - Rooftop Level

Power Density vs Distance

Power Density (μW/cm^2)

Distance (m)

Radiofrequency Electromagnetic Field
FM Antenna - Ground Level

Power Density vs Distance

Radiofrequency Electromagnetic Field
Digital Antenna - Ground Level

Power Density vs Distance

Power Density
(µW/cm²)

Distance (m)