Tecore, Inc.

Health Protection and Radiation Hazards

1.0 INTRODUCTION

This document provides information regarding the assessment of Health Protection and Radiation Hazards expected from the RAVEN. The following calculations are presented to show that the RAVEN is compliant with the North American requirements as described in FCC OET Bulletin 65.

2.0 RADIATION HAZARDS

2.1 CABINET RADIATION

The maximum radiated power levels authorized by the FCC EMC specifications are:

- -36 dBm (or E=2.7 mV/m) for frequencies between 30 MHz and 1 GHz,
- -30 dBm (or E=5.4 mV/m) for frequencies above 1 GHz

According to FCC OET Bulletin 65, the power density is linked to the E field by the relation

$S = E^2/3770$

As a consequence, the maximum power density radiated by the equipment will be:

- $S = 1.9*10^{-9}$ mW/cm^2 for frequencies between 30 MHz and 1 GHz
- $S = 7.9*10^{-9}$ mW/cm^2 for frequencies above 1 GHz

The maximum power density is far below the Maximum Permissible Exposure (MPE) levels shown in Table 1 and therefore the RAVEN is compliant with this requirement.

2.2 ANTENNA RADIATION

The North American Maximum Permissible Exposure (MPE) levels for general population (uncontrolled exposure areas) are defined in Table 1 below.

Frequency Range (MHz)	MPE (S, mW/cm^2)
30 - 300	0.2
300 – 1500	f/1500
1500 - 12750	1.0

Table 1, MPE Levels for General Population (Uncontrolled Exposure Areas)

Antenna Radiation Calculation:

Considerations:

- HPA Configured for Maximum Transmit Power = 20 Watts [G]
- Antenna Gain = 18 dBi (Highest Gain Possible) [P]

As described in FCC OET Bulletin 65, the power density can be estimated by the following formula:
$S = (P*G)/4\pi R^2$
Where G is the antenna gain, P is the HPA Maximum Transmit Power and R is the distance from the antenna

The Maximum Permissible Exposure (MPE) level for uncontrolled access locations is
$S = f/1500 = 824/1500 = 0.55\ mW/cm^2$

As a consequence, the safe distance approach can be calculated as,
R = 4.3 m

This is the distance at which the limit level will be reached in the main beam of the antenna.

Although the RAVEN is a transportable product it does not have integral antennas and requires connection to a permanent or semi-permanent antenna system. The antenna used would be mounted on a tower or similar mounting structure 10s of meters in height and therefore would provide adequate safe distance to the general population. It should also be noted that exposures inside buildings can be expected to be reduced by at least 10 to 20 dB due to the attenuation caused by building material in the wall and roof of the building (source: FCC OET Bulletin 65).

Based on the above information the RAVEN is compliant to the MPE requirements as per FCC OET Bulletin 65.