Analysis of Non-ionizing Radiation
For VERTEXRSI 1.8 Meter Antenna

This report analyzes the non-ioninizing radiation levels for an earth station using the VertexRSI antenna. The equations used in these calculations are presented in the Office of Science and Technology Bulletin No. 65, Oct. 1985 as revised in 1997 in Edition 97-01. The purpose of this analysis is to determine the power flux densities in the far field, near field, transition region, between the sub- and main-reflector surface, and between the antenna edges and ground. Per FCC R&O 96-326, the maximum level of non-ionizing radiation is limited to a power density of 5 milliwatts per square centimeter over any 6 minute in a controlled environment. The maximum level of non-ionizing radiation is limited to a power density of 1 milliwatt per square centimeter over any 30 minutes in a uncontrolled environment.

Antenna Diameter	180	cm
Antenna Aperture Area	25471	cm**2
Subreflector Diameter	0	cm
Area of Subreflector	0	cm**2
Frequency	14.25	GHz
Wavelength	2.10	cm
Transmit Power at Flange	70	Watts
Antenna Gain	47.00	dB
Antenna Aperture Efficiency	0.69	

Far Field Calculations

Distance to the beginning of far field	9249	cm
On axis power density in the far field	3.26	mW/cm**2

Near Field Calculations

Distance to the end of near field	3854	cm
Near Field Power Density	7.62	mW/cm**2

Transition Region Calculation

The transition region is located between the near and far field regions. As stated above, the power density begins to decrease with distance in the transition region.

While the power density decreases inversely with distance in the transition region, the power density decreases inversely with the square of the distance in the far field region. The maximum power density in the transition region will not exceed that calculated for the near field region.

Main Reflector Region

The power density in the main reflector region is determined in the same manner as the power density in the subreflector above.

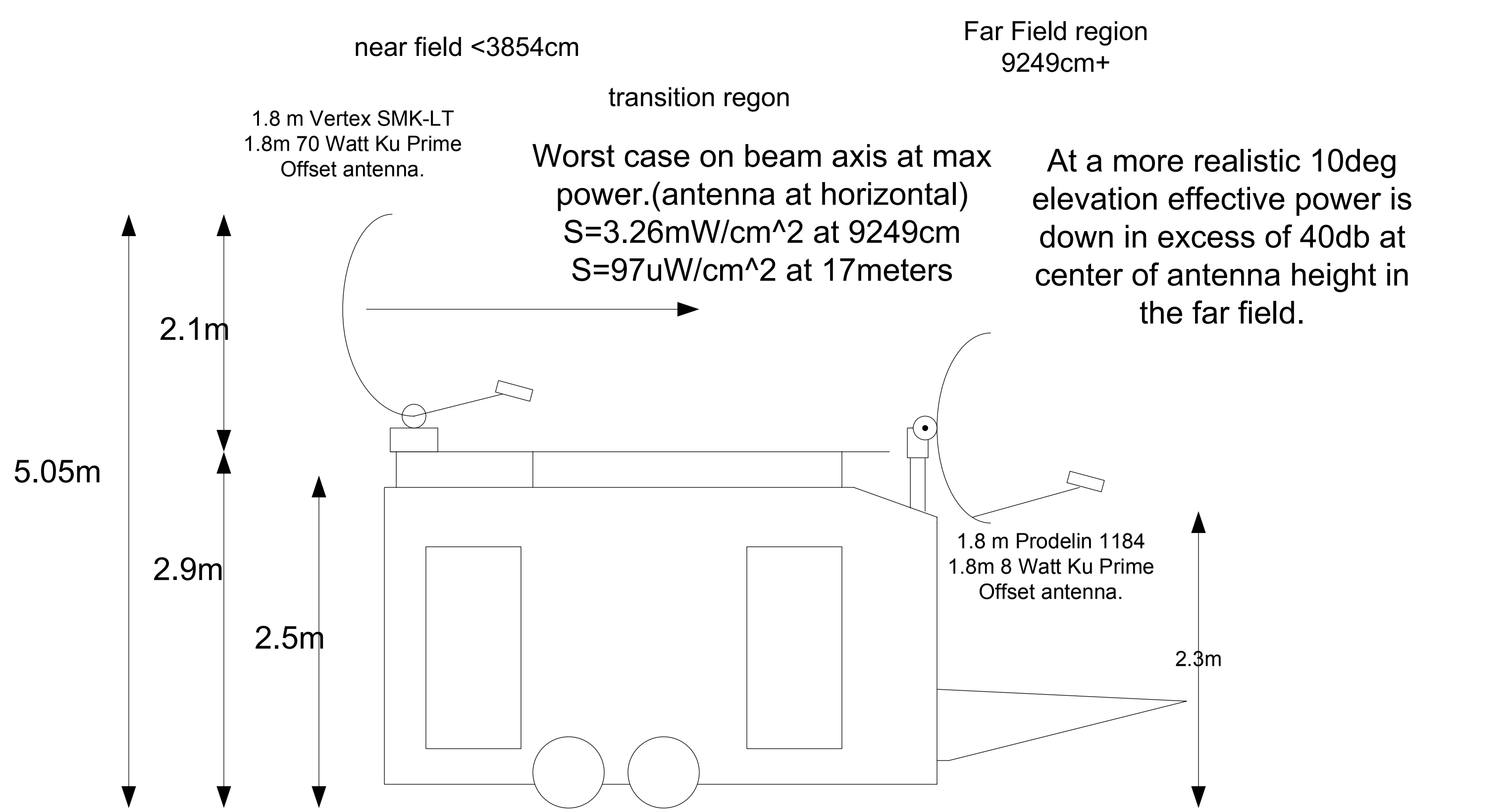
Power density at the main reflector edge	5.50	mW/cm**2

Region between Main Reflector and Ground

Assuming uniform illumination of the reflector surface, the power density between antenna and ground can be calculated as follows:

Power density between Reflector and Ground	2.75	mW/cm**2

Exhibit 1 RF Fields due to 1.8M Vertex Antenna at 70 watts (Max power)



Worst case of power density is in the near field= 7.62mW/cm^2 OET65 Pg 30 states that off axis power density is at least a factor of 100 less then the value calculated for the main beam. This is below the 1mW/cm^2 for uncontroled exposure. We can define a "safe zone" as latterly 180 cm from the reflector.

The metallic roof deck and trailer roofing material will provide additional attenuation for an operator in the trailer. OET 65 pg 37 suggests that 10-20dB power attenuation may be assumed by building structure. The trailer roof consists of a structural metallic deck, a metallic weather tight roof, and a layer of metallic faced thermal insulation.

Prepared by,
John Anderson
PG-1-7554
3 Feb 2006

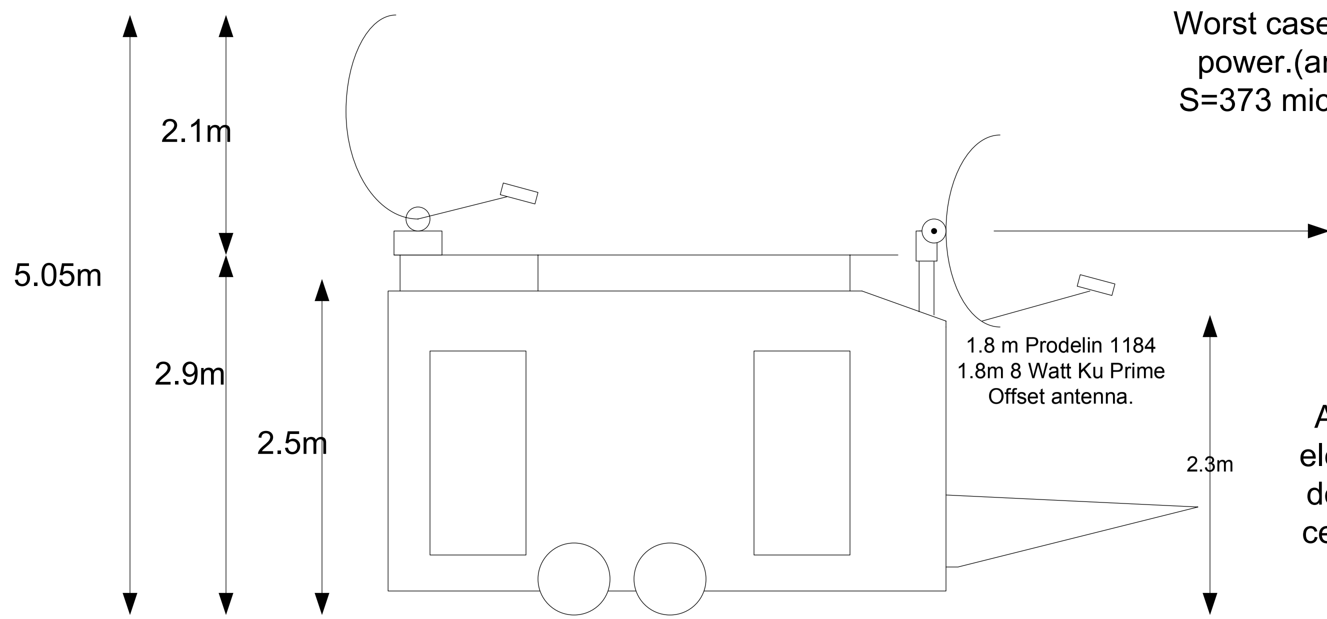
Exhibit 1 RF Fields due to Prodelin Antenna at 8 watts (Max power)

near field <3854cm

transition regon

Far Field region
9249cm+

1.8 m Vertex SMK-LT
1.8m 70 Watt Ku Prime
Offset antenna.



Worst case on beam axis at max power.(antenna at horizontal)
S=373 microW/cm^2 at 9249cm

At a more realistic 10deg elevation effective power is down in excess of 40db at center of antenna height in the far field.

3m coa to door area.

Using the methodology of OET 65 I find the worst case of power density is in the near field= 868 microW/cm^2
This is well below the 1mW/cm^2 for uncontrolled exposure. We can define a "safe zone" for this antenna operating alone as anywhere in or near the tralier.

Further the contribution of this RF energy will not significantly add to the energy of the Vertix antenna operating any power level.

Prepared by,
John Anderson
PG-1-7554
3 Feb 2006