FCC LICENSE APPLICATION FORM 312 & Exhibit B/Ba

VARIABLES:

Antenna Diameter	1.5	*meters*	D
Sub-reflector Diameter	0.000	*cm*	Ds
Antenna Gain	45.20	*dB*	G
Antenna Aperture Efficiency	0.6790		
Center Frequency	14.250	*GHz*	Cf
HPA Power Out	180	*Watts*	P1
Path Loss	1.1	*dB*	IL
BW in Hz	24	*MHz*	
Elevation	15.00	*degrees*	
Truck roof elevation	104.00	*inches*	
Maximum dish height above dish base	144.00	*inches*	

CALCULATIONS:

ANT Gain - [32 - 25 log (degrees ele)]	42.602	
HPA Power Out	22.553	*dB*

FCC FORM 312 ENTRIES:

Max Antenna Height above ground level	6.30	*meters*	B5(c)
Building height above ground level	2.64	*meters*	B5(e)
Max Antenna Height above rooftop	3.66	*meters*	B5(f)
Total input power at antenna flange	139.72	*Watts*	B5(g)
Total EIRP for all carriers:	66.65	*dBW*	B5(h)
EIRP max density toward horizon:	-2.95	*dBW/4kHz*	B6(i)
Maximum EIRP per carrier:	66.65	*dBW*	B7(f)
Maximum EIRP Density per carrier:	28.87	*dBW/4kHz*	B7(g)

FORMULAS:

Total EIRP:	Antenna Gain + HPA Power Out - Path Loss
Maximum EIRP Density toward the horizon:	Total EIRP - Antenna Gain - [32 - 25 log (degrees elevation)] - 27
Maximum EIRP Density per Carrier:	EIRP - 10 log (BW 4 KHz)
Maximum EIRP per Carrier:	Max Power Density per carrier + 10 Log (BW 4KHz)

RF RADIATION HAZARD ANALYSIS
Exhibit #B

Antenna Diameter, (D) = 1.5 meters / 4.922 Feet
Antenna Surface Area, (Sa) = 1.767 sq meters
Subreflector Diameter, (Ds) = 0 centimeters
KU Wavelength at 14.25 GHz (LAMBDA) = 0.0211 meters
Power at output of VPC flange = 22.553 dB
Path Loss to OMT (IL) = 1.1 dB
Power at OMT, (P) = 139.72 Watts
Antenna Gain at 14.250 GHz, (G)= 45.2 dBi (2 port antenna gain)
Antenna Gain given in Power Ratio, (Ges) = 3.311E+04
Antenna Aperture Efficiency (N) = 0.679

Region	Radiation Level	Hazard Assessment
Far Field, (Rf) = 63.981 meters / 209.922 Feet	8.994 mW/cm sq	Potential Hazard
Near Field, (Wf) = 26.659 meters / 87.467 Feet	21.475 mW/cm sq	Potential Hazard
Transition Region (Rt) Ru<Rt<Rf	equal to or less than 21.475 mW/cm sq	Potential Hazard
Between Main Reflector and Subreflector (Ws)	N/A (no subreflector)	
Main Reflector Region (Wm)	15.814 mW/cm sq	Potential Hazard
Power Density Between Reflector and Ground	7.907 mW/cm sq	Potential Hazard
Far Field Off Axis (WF)	0.09 mW/cm sq	Meets ANSI Requirements
Near Field Off Axis (WN)	0.215 mW/cm sq	Meets ANSI Requirements

Conclusion: Based on the above analysis, harmful areas of Radiation do exist in areas around the antenna and in the path of the antenna toward the satellite that it is pointed at. The Area occupied by the general public will not exceed the ANSI limit of 1 mW cm sq. because the antenna is mounted on top of the truck, which is at least 8 feet above the ground, and safety increases with look angles used by the Satellites in the United States on Dom. Sat. arch. The areas on the ground and behind the antenna are 100 times less power (20dB) when at a min. of the dia. of the reflector. This is reflected in the Off Axis figures as seen above (WF) & (WN). The SNG will be marked with the standard radiation hazard warnings, and on the antenna itself. The warning signs will warn personnel to avoid the area around and in front of the reflector when the transmitter is operating. To ensure compliance with safety limits, the earth station transmitter will be turned off and marked to remain off whenever maintenance and repair personnel are required to work in the areas of potential hazard as defined in the above study. Additionally the earth station personnel will be trained to insure that the antenna path is clear at all times while the transmitter is in operation. The only access to the roof of the truck is a stored ladder which will only be used when the transmitter is off and not accessible by the general public.

Note: See Exhibit #Ba for how the above calculations were made.

Exhibit Ba Analysis of Non-Ionizing Radiation

Antenna Diameter, (D) =	$D := 1.5$ meters	$D \cdot 3.281 =$	4.922 Feet
Antenna Surface Area, (Sa) =	$Sa := \pi \cdot \frac{D \cdot D}{4}$	$Sa =$	1.767 sq meters
Subreflector Diameter, (Ds) =	$Ds := 0$ cm	$Ds \cdot .3937 =$	0.000 Inches
Area of Subreflector, (As) =	$As := \pi \cdot \frac{Ds \cdot Ds}{4}$	$As =$	0.000 sq cm
Center Frequency, (Cf) =	$Cf := 14.250$ GHz		
Wavelength at (Cf), ($Lambda$) =	$Lambda := 0.0211$ meters C-Band = .049 Ku-Band = .0211		
Transmit Power at HPA or VPC Flange, (P1) =	P1 := 180.00 watts	$P2 := \log(P1) \cdot 10$	P2 = 22.553 dB
Path Loss from HPA or VPC to OMT, (IL) =	Loss := 1.1 dB		
Power at OMT, (P)=	P3 := P2 - Loss	P3 =	21.453 OMT Pwr in dB
	$P := 10^{\frac{P3}{10}}$	$P =$	139.72 OMT Pwr in watts
Antenna Gain at (Cf), (Gain)=	Gain := 45.20 dBi		
Antenna Gain Converted to Power Ratio, (Ges)=	$Ges := 10^{\frac{Gain}{10}}$	Ges =	3.311E+04 Ratio
Antenna Aperture Efficiency, (n)=	n := 0.679		

Far Field (Rf)=	$Rf := \frac{.60 \cdot (D \cdot D)}{Lambda}$	$Rf =$ $Rf \cdot 3.281 =$	63.981 meters 209.92 feet
Far Field Power Density (Wf)=	$Wf := \frac{Ges \cdot P}{4 \cdot \pi \cdot (Rf \cdot Rf)} \cdot .1$	$Wf =$	8.994 mw sq cm
Near Field (Rn) =	$Rn := \frac{(D \cdot D)}{4 \cdot Lambda}$	$Rn =$ $Rf \cdot 3.281 =$	26.659 meters 87.467 feet
Near Field Power Density (Wn)=	$Wn := \frac{16 \cdot n \cdot P}{\pi \cdot (D \cdot D)} \cdot .1$	$Wn =$	21.475 mw sq cm
Transition Region (Rt)=	$Rt := Wn \cdot 1$	$Rt =$	21.475 mw sq cm (Equal to or less than)
Pwr Density at Sub Reflector (Ws)=	$Ws := \frac{2 \cdot P}{As} \cdot 1000$		N/A
Main Reflector Region Pwr Density (Wm)=	$Wm := \frac{2 \cdot P}{Sa} \cdot .1$	$Wm =$	15.814 mw sq cm
Pwr Density between main reflector and ground (Wg)=	$Wg := \frac{P}{Sa} \cdot .1$	$Wg =$	7.907 mw sq cm
Far Field Off Axis (WF)=	$WF := Wf \cdot .01$	$WF =$	0.090 mw sq cm
Near Field Off Axis (WN)=	$WN := Wn \cdot .01$	$WN =$	0.215 mw sq cm