

FCC OET-65 RF Exposure Study - Satellite Uplink Facility  
**NECN 4.5 meter Digital Ku-band uplink**      **ASC Model ES45T-T-1**

FCC Maximum Permissible Exposure Levels	Source	Units
Public/uncontrolled area exposure limit	47CFR §1.1310	1 mW/cm <sup>2</sup>
Occupational/controlled area exposure limit	47CFR §1.1310	5 mW/cm <sup>2</sup>

**Input Data**

Antenna Diameter	datasheet	450.0 cm	
Antenna surface area	calculated	159043 cm <sup>2</sup>	
Sub-reflector diameter	measured	n/a cm	Prime focus antenna
Sub-reflector area	calculated	n/a cm <sup>2</sup>	
Feed flange diameter	datasheet	19.500 cm <sup>2</sup>	
Feed flange area	calculated	299	
Frequency	(entry)	14250 MHz	
Wavelength (speed of light = 299,792,458 m/s)	calculated	2.104 cm	
Transmit power at flange	Application	23600 milliwatts	
Antenna gain	datasheet	53.6 dBi	
Antenna gain factor	calculated	229087	
Height of base of antenna above ground/roof	datasheet	1 m	
Height of center of antenna above ground/roof	datasheet	3.69 m	
Minimum Elevation Angle	(entry)	5.4 degrees	
Minimum Elevation Angle	calculated	0.09425 radians	

**Results calculated using FCC Bulletin OET-65 (Edition 97-01 August 1997)**

			FCC Maximum Permissible Exposure (MPE)	
			Uncontrolled	Controlled
Maximum power density at antenna surface	Eq. 11 Pg 27	0.59 mW/cm <sup>2</sup>	Below FCC MPE	Below FCC MPE
Power density at subreflector	Eq. 11 Pg 27	N/A mW/cm <sup>2</sup>	N/A	N/A
Power density at feed flange	Eq. 11 Pg 27	316.09 mW/cm <sup>2</sup>	Potential Hazard	Potential Hazard
Extent of near-field	Eq. 12 Pg 27	24064 cm		
Maximum near-field power density	Eq. 13 Pg 28	0.3 mW/cm <sup>2</sup>	Below FCC MPE	Below FCC MPE
Aperture efficiency	Eq. 14 Pg 28	0.51		
Distance to beginning of far-field	Eq. 16 Pg 29	57752.45 cm		
Power density at end of the transition region	Eq. 17 Pg 29	0.13 mW/cm <sup>2</sup>	Below FCC MPE	Below FCC MPE
Maximum far-field power density	Eq. 18 Pg 29	0.129 mW/cm <sup>2</sup>	Below FCC MPE	Below FCC MPE

**Main Beam Far-field region safe exposure distances**

Minimum distance for public/uncontrolled exposure	Eq. 18 Pg 29	207.42 meters
Height at minimum antenna elevation angle	calculated	23.21 meters
Horizontal distance	calculated	206.5 meters
Minimum distance for occupational/controlled exposure	Eq. 18 Pg 29	92.76 meters
Height at minimum antenna elevation angle	calculated	12.42 meters
Horizontal distance	calculated	92.35 meters

**Off-Axis Near Field/Transition Region safe exposure distances from antenna**

(20 dB reduction in power density at distances greater than one antenna diameter from the main beam center.)				
Maximum off-axis near field power density	OET-65 Pg 30	0.0030 mW/cm <sup>2</sup>	Below FCC MPE	Below FCC MPE
Public/uncontrolled exposure off-axis distance	Eq. 13 Pg 28	4.5 meters		
Occupational/controlled exposure off-axis distance	Diam/or Eq 17	4.5 meters		

**Off-Axis Far Field safe exposure distances from the antenna**

(Based on side lobe attenuation required by FCC 25.209(a)(2))		
Angle off main beam axis (1 to 48 degrees)	(entry)	5 degree(s)
Off-axis antenna gain factor	OET-65 Pg 30*	28
Minimum distance for public/uncontrolled exposure	Eq. 18 Pg 29 **	577.52 meters

\* Gain converted from dBi to linear multiple

\*\* If calculated distance is less than the start of the far field region, the distance to the start of the far field region is used.

**Uplink Remote Control Point Data**  
**NECN 4.5 meter Digital Ku-band uplink**

**Location: 30 Rockefeller Plaza**  
**New York, NY 10112**

**Telephone Number: (212) 664-1900**