

FCC OET-65 RF Exposure Study - Satellite Uplink Facility
WNBC Digital Ku-band transportable uplink - "H-O"

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

Input Data

Antenna Diameter	datasheet	135.0 cm
Antenna surface area	calculated	14314 cm ²
Sub-reflector diameter	measured	N/A cm
Sub-reflector area	calculated	N/A cm ²
Feed flange diameter	estimated	7.144 cm
Feed flange area	calculated	40 cm ²
Frequency	(entry)	14250 MHz
Wavelength (speed of light = 299,792,458 m/s)	calculated	2.104 cm
Transmit power at flange	Application	87100 milliwatts
Antenna gain	datasheet	43.5 dBi
Antenna gain factor	calculated	22387
Height of base of antenna above ground	measured	2.95 m
Height of center of antenna above ground	measured	3.62 m
Minimum Elevation Angle	(entry)	15 degrees
Minimum Elevation Angle	calculated	0.26180 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	24.34 mW/cm ²	Potential Hazard	Potential Hazard
Power density at subreflector	Eq. 11 Pg 27	0 mW/cm ²	N/A	N/A
Power density at feed flange	Eq. 11 Pg 27	8692.32 mW/cm ²	Potential Hazard	Potential Hazard
Extent of near-field	Eq. 12 Pg 27	2166 cm		
Maximum near-field power density	Eq. 13 Pg 28	13.41 mW/cm ²	Potential Hazard	Potential Hazard
Aperture efficiency	Eq. 14 Pg 28	0.55		
Distance to beginning of far-field	Eq. 16 Pg 29	5197.72 cm		
Power density at end of the transition region	Eq. 17 Pg 29	5.59 mW/cm ²	Potential Hazard	Potential Hazard
Maximum far-field power density	Eq. 18 Pg 29	5.744 mW/cm ²	Potential Hazard	Potential Hazard

Main Beam Far-field region safe exposure distances

Minimum distance for public/uncontrolled exposure	Eq. 18 Pg 29	124.57 meters
Height at minimum antenna elevation angle	calculated	35.86 meters
Horizontal distance	calculated	120.32 meters
Minimum distance for occupational/controlled exposure	Eq. 18 Pg 29	55.71 meters
Height at minimum antenna elevation angle	calculated	18.04 meters
Horizontal distance	calculated	53.81 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.)			
	OET-65 Pg 30		
Maximum off-axis near field power density	Eq. 13 Pg 28	0.1341 mW/cm ²	Below FCC MPE
Public/uncontrolled exposure off-axis distance	Diam/or Eq 17	1.35 meters	Below FCC MPE
Occupational/controlled exposure off-axis distance	Diam/or Eq 17	1.35 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)	15 degree(s)
Off-axis antenna gain factor	OET-65 Pg 30*	2
Minimum distance for public/uncontrolled exposure	Eq. 18 Pg 29 **	51.98 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.