

FCC OET-65 RF Exposure Study - Satellite Uplink Facility  
**NBC TOWBOY R (has no current FCC License)**

**Antenna Vendor:** AVL  
**Antenna Size:** 1.6m  
**Amplifier Make/Model:** MCL MT2300  
**Amplifier Max Power:** 200w.

FCC Maximum Permissible Exposure Levels	Source	Units	Notes
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	160.0	cm	
Antenna surface area	calculated	20106	cm <sup>2</sup>	
Feed flange diameter	measured	6.350	cm	WR-75
Feed flange area	calculated	32	cm <sup>2</sup>	
Frequency	(entry)	14000	MHz	
Wavelength (speed of light = 299,792,458 m/s)	calculated	2.141	cm	
Transmit power at flange	datasheet	200000	milliwatts	
Antenna gain	datasheet	45.4	dBi	
Antenna gain factor	calculated	34674		
Height of base of antenna above ground	measured	2.8651	m	
Height of center of antenna above ground	measured	3.6576	m	
Minimum Elevation Angle	(entry)	5	degrees	
Minimum Elevation Angle	calculated	0.08727	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	39.78873577	mW/cm <sup>2</sup>	Potential Hazard	Potential Hazard
Power density at feed flange	Eq. 11 Pg 27	25261.12309	mW/cm <sup>2</sup>	Potential Hazard	Potential Hazard
Extent of near-field	Eq. 12 Pg 27	2989	cm		
Maximum new-field power density	Eq. 13 Pg 28	25.03835335	mW/cm <sup>2</sup>	Potential Hazard	Potential Hazard
Aperture efficiency	Eq. 14 Pg 28	0.629282456			
Distance to beginning of far-field	Eq. 16 Pg 29	7172.962303	cm		
Power density at end of the transition region	Eq. 17 Pg 29	10.43264723	mW/cm <sup>2</sup>	Potential Hazard	Potential Hazard
Maximum far-field power density	Eq. 18 Pg 29	10.726	mW/cm <sup>2</sup>	Potential Hazard	Potential Hazard

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

Minimum distance for public/uncontrolled exposure	Eq. 18 Pg 29	234.9146307	meters
Height at minimum antenna elevation angle	calculated	24.13175912	meters
Horizontal distance	calculated	234.0207096	meters
Minimum distance for occupational/controlled exposure	Eq. 18 Pg 29	105.0570166	meters
Height at minimum antenna elevation angle	calculated	12.81392231	meters
Horizontal distance	calculated	104.657243	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	0.2504	mW/cm <sup>2</sup>	Below FCC MPE	Below FCC MPE
Public/uncontrolled exposure off-axis distance	Eq. 13 Pg 28	1.6	meters		
Occupational/controlled exposure off-axis distance	Diam/or Eq 17	1.6	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  
\* 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 shown.

Eq. 18 Pg 29 \*\* 71.72962303 meters

Parameters

Transmitter output	200 watts
Waveguide loss	N/A
Power at flange	200
Antenna	AVL 1.6m
Maximum EIRP per carrier	68.41029996 dBk
Emission Type	36M0G7W (1 carrier Digital)
Bandwidth	36000 kHz
Maximum EIRP Density per carrier	28.86787486 dBW/4kHz