

RADIATION CALCULATIONS FOR 6.10 meter EARTH STATION			
Nomenclature	Formula	Value	Unit
INPUT PARAMETERS			
M = Antenna Aperture Major Axis m = Antenna Aperture Minor Axis d = Diameter of Feed Mouth f = frequency		6.10 6.10 0.152 14.25	meters meters meters GHz
P = Max Power into Antenna		70.0	Watts
n = Aperture Efficiency		65%	
k = Wavelength @ 14.25 GHz		0.0210	meters
CALCULATED VALUES			
A = Area of Reflector	$\pi \times M \times m / 4$	29.225	meters ²
l = Length of Near Field	$M^2 / 4k$	442	meters
L = Beginning of Far Field	$0.6M^2 / k$	1061	meters
G = Antenna Gain @ 14.25 GHz	$n(4 \times \pi \times A) / k^2$	539,338	(57.3) dBi
a = Area of Feed Mouth	$\pi \times d^2 / 4$	0.0181	meters ²
POWER DENSITY CALCULATIONS			
Region	Maximum Power Density in Region		Hazard Assessment (FCC MPE Limit = 1 mW/cm ²)
	Formula	Value (mW/cm ²)	
1 Near Field	$4nP/A$	0.62	< FCC MPE Limit
2 Far Field	$GP / (4(\pi)L^2)$	0.27	< FCC MPE Limit
3 Transition	<= Nr Fld Region	0.62	< FCC MPE Limit
4 Near Reflector Surface	$4P/A$	0.96	< FCC MPE Limit
5 Between Reflector & Ground	P/A	0.24	< FCC MPE Limit
6 Between Subreflector and Feed	$4P/a$	1543.1	> FCC MPE Limit (See Exhibit A)