

RADIATION CALCULATIONS FOR		0.74 meter EARTH STATION	
Nomenclature	Formula	Value	Unit
INPUT PARAMETERS			
M = Antenna Aperture Major Axis		0.98	meters
m = Antenna Aperture Minor Axis		0.56	meters
w = Major Axis of Feed Mouth		0.065	meters
h = Minor Axis of Feed Mouth		0.042	meters
P = Max Power into Antenna		0.5	Watts
n = Apperture Efficiency		67%	
k = Wavelength @ 30 GHz		0.0100	meters
CALCULATED VALUES			
A = Area of Reflector	$\frac{\pi M m}{4}$	0.431	meters <sup>2</sup>
l = Length of Near Field	$\frac{M^2}{4k}$	24	meters
L = Beginning of Far Field	$\frac{0.6M^2}{k}$	58	meters
G = Antenna Gain @ 30 GHz	$\frac{n(4\pi A)}{k^2}$	36,295	(45.6) dBi
a = Area of Feed Mouth	$\frac{\pi w h}{4}$	0.002	meters <sup>2</sup>
POWER DENSITY CALCULATIONS			
Region	Maximum Power Density in Region		Hazard Assessment (FCC MPE Limit = 1 mW/cm <sup>2</sup> )
	Formula	Value (mW/cm <sup>2</sup> )	
1 Near Field	$\frac{4nP}{A}$	0.31	< FCC MPE Limit
2 Far Field	$\frac{GP}{(4\pi)L^2}$	0.04	< FCC MPE Limit
3 Transition	<= Nr Fld Region	0.31	< FCC MPE Limit