

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	$P l x M x m / 4$	0.431	meters^2
l = Length of Near Field	$M^2 / 4 k$	24	meters
L = Beginning of Far Field	$0.6 M^2 / k$	58	meters
G = Antenna Gain @ 30 GHz	$n (4 x P l x A) / k^2$	36,295	(45.6) dBi
a = Area of Feed Mouth	$P l x w x h / 4$	0.002	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	$4 n P / A$	0.31	< FCC MPE Limit
2 Far Field	$G P / (4 (P I) L^2)$	0.04	< FCC MPE Limit
3 Transition	<= Nr Fld Region	0.31	< FCC MPE Limit