

RADIATION CALCULATIONS FOR 0.74 meter EARTH STATION			
Nomenclature	Formula	Value	Unit
INPUT PARAMETERS			
M = Antenna Aperture Major Axis m = Antenna Aperture Minor Axis w = Major Axis of Feed Mouth h = Minor Axis of Feed Mouth P = Max Power into Antenna n = Apperture Efficiency k = Wavelength @ 30 GHz		0.98 0.56 0.065 0.042 4.0 67% 0.0100	meters meters meters meters Watts meters
CALCULATED VALUES			
A = Area of Reflector l = Length of Near Field L = Beginning of Far Field G = Antenna Gain @ 30 GHz a = Area of Feed Mouth	$P l x M x m / 4$ $M^2 / 4 k$ $0.6 M^2 / k$ $n(4 x P l x A) / k^2$ $P l x w x h / 4$	0.431 24 58 36,295 0.002	meters ² meters meters (45.6) dBi meters ²
POWER DENSITY CALCULATIONS			
Region	Maximum Power Density in Region		Hazard Assessment (FCC MPE Limit = 5 mW/cm ²)
	Formula	Value (mW/cm ²)	
1 Near Field	$4 n P / A$	2.49	< FCC MPE Limit
2 Far Field	$G P / (4 (P I) L^2)$	0.35	< FCC MPE Limit
3 Transition	<= Nr Fld Region	2.49	< FCC MPE Limit
4 Near Reflector Surface	$4 P / A$	3.71	< FCC MPE Limit
5 Between Reflector & Ground	P / A	0.93	< FCC MPE Limit
6 Between Reflector and Feed	$4 P / a$	737.4	> FCC MPE Limit (See Attachment 1)