

RADIATION HAZARD CALCULATIONS FOF		3.5 meter EARTH STATION	
Nomenclature	Formula	Value	Unit
INPUT PARAMETERS			
D = Antenna Diameter		3.73	meters
d = Diameter of Feed Mouth		0.031	meters
P = Max Power into Antenna		125	Watts
n = Apperture Efficiency		56%	
k = Wavelength @ 30 GHz		0.0100	meters
CALCULATED VALUES			
A = Area of Reflector	$\pi D^2/4$	10.927	meters <sup>2</sup>
l = Length of Near Field	$D^2/4k$	348	meters
L = Beginning of Far Field	$0.6D^2/k$	835	meters
G = Antenna Gain @ 30 GHz	$n(\pi D/k)^2$	769,066	58.9 dBi
a = Area of Feed Mouth	$\pi d^2/4$	0.0007	meters <sup>2</sup>
POWER DENSITY CALCULATIONS			
Region	Maximum Power Density in Region		Hazard Assessment (FCC MPE Limit = 5 mW/cm <sup>2</sup> )
	Formula	Value (mW/cm <sup>2</sup> )	
1 Near Field	$4nP/A$	2.56	< FCC MPE Limit
2 Far Field	$GP/(4(\pi)L^2)$	1.10	< FCC MPE Limit
3 Transition	$\leq N_r$ Fld Region	2.56	< FCC MPE Limit
4 Near Reflector Surface	$4P/A$	4.58	< FCC MPE Limit
5 Between Reflector & Ground	$P/A$	1.14	< FCC MPE Limit
6 Between Subreflector and Feed	$4P/a$	68435.3	> FCC MPE Limit (See Attachment 1)