

RADIATION HAZARD CALCULATIONS FOR 1.20 meter EARTH STATION

Nomenclature	Formula	Value	Unit
INPUT PARAMETERS			
D = Antenna Diameter		1.20	meters
d = Diameter of Feed Mouth		0.049	meters
P = Max Power into Antenna		4.0	Watts
n = Aperture Efficiency		67%	
k = Wavelength @ 30 GHz		0.0100	meters
CALCULATED VALUES			
A = Area of Reflector	$\pi D^2/4$	1.131	meters ²
l = Length of Near Field	$D^2/4k$	36	meters
L = Beginning of Far Field	$0.6D^2/k$	86	meters
G = Antenna Gain @ 30 GHz	$n(\pi D/k)^2$	95,235	49.8 dBi
a = Area of Feed Mouth	$\pi d^2/4$	0.0019	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	$4nP/A$	0.95	< FCC MPE Limit
2 Far Field	$GP/(4(\pi)L^2)$	0.41	< FCC MPE Limit
3 Transition	$\leq N_r$ Fld Region	0.95	< FCC MPE Limit
4 Near Reflector Surface	$4P/A$	1.41	< FCC MPE Limit
5 Between Reflector & Ground	P/A	0.35	< FCC MPE Limit
6 Between Reflector and Feed	$4P/a$	848.5	> FCC MPE Limit (See Attachment 1)