Radiation Hazard Study

General Dynamics/Prodelin 1244, 2.4 Meter Antenna, C Band
All of the Equations below use the following units!
Antenna Gain 42dbi = 15848.93 @ 6.175GHz
Power to feed Max +25.11DBW 325 watts
Antenna diameter 2.4 meters
Distance to satellite 39,000 KM or 39,000,000 meters
λ = wavelength @ 6.175GHz **(.048582995941)** meters

Equations from OET Bulletin #65, oet65.pdf

Page # 27 equation #11 Antenna surface
P = Power to feed in **Watts (325)**
A = Antenna diameter in **Meters (2.4)**
S (surface) = 541.66

Page # 27 equation #12 Extent of Near field
D = Antenna diameter in **Meters (2.4)**
λ = Wavelength in **Meters** using midband frequency of 6.175GHz **(.048582995941)**
Rnf = 29.64

Page # 28 equation #13 & 14 Max near field power density & Aperture efficiency
P = Power to feed in **Watts (325)**
D = antenna diameter in **Meters (2.4)**
λ = Wavelength in **Meters** using midband frequency of 6.175GHz **(.048582995941)**
Snf = 189.09
Aperture efficiency = .658

Page # 29 Equation #16 Distance to beginning of far field
D = Antenna diameter in **Meters (2.4)**
λ = Wavelength in **Meters** using midband frequency of 6.175GHz **(.048582995941)**
Rff = 71.13

Page # 29 Equation #17 Transition region
distance between Rnf - Rff
71.13 - 29.64

Page # 29 Equation # 18 Power density
S = Power density at a distance of (39,000 KM)
P = Power to feed in **Watts (325)**
R = Distance in **Meters** to Satellite **(39,000,000)**
Sff = 2.6949102 -10 Watts or -95.67 dbw/m squared

Via Sky Communications E000281

Radiation Hazard Study

General Dynamics/Prodelin 1244, 2.4 Meter Antenna, KU Band
All of the Equations below use the following units!
Antenna Gain 49.2dbi = 83176.37 @ 14.25GHz
Power to feed Max +27DBW 500 watts
Antenna diameter 2.4 meters
Distance to satellite 39,000 KM or 39,000,000 meters
λ = wavelength @ 14.25GHz .0210526 meters

Equations from OET Bulletin #65, oet65.pdf

Page # 27 equation #11 Antenna surface
P = Power to feed in **Watts (500)**
A = Antenna diameter in **Meters (2.4)**
S (surface) = 833.3

Page # 27 equation #12 Extent of Near field
D = Antenna diameter in **Meters (2.4)**
λ = Wavelength in **Meters** using midband frequency of 14.25GHz **(.0210526)**
Rnf = 68.4

Page # 28 equation #13 & 14 Max near field power density & Aperture efficiency
P = Power to feed in **Watts (500)**
D = antenna diameter in **Meters (2.4)**
λ = Wavelength in **Meters** using midband frequency of 14.25GHz **(.0210526)**
Snf = 286.47
Aperture efficiency = .648

Page # 29 Equation #16 Distance to beginning of far field
D = Antenna diameter in **Meters (2.4)**
λ = Wavelength in **Meters** using midband frequency of 14.25GHz **(.0210526)**
Rff = 164.16

Page # 29 Equation #17 Transition region
distance between Rnf - Rff
164.16 - 68.4

Page # 29 Equation # 18 Power density
S = Power density at a distance of (39,000 KM)
P = Power to feed in **Watts (500)**
R = Distance in **Meters** to Satellite **(39,000,000)**
Sff = 2.17585 –9 Watts or -86.62 dbw/m squared

Via Sky Communications E000281