ANALYSIS OF NON-IONIZING RADIATION
for TELEMUNDO NETWORK INC
Site: Telemundo State: FL
Latitude: 25 50 38.7 Longitude: 80 17 56.3 (NAD83)
05-24-2006

The Office of Science and Technology Bulletin, No. 65, October 1985, specifies that the maximum level of non-ionizing radiation that a person may be exposed to over a six minute period is an average power density equal to 5 mW/cm**2 (five milliwatts per centimeter squared). It is the purpose of this report to determine the maximum power flux densities of the earth station in the far zone, near zone, transition zone, at the main reflector surface, and between the antenna edge and the ground.

Parameters which were used in the calculations:
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Antenna Diameter,	(D) = 3.8000 m		
Antenna Surface Area	(Sa) =	pi(D**2)/4	= 11.3411 m**2
Sub Reflector Diameter	(Ds) = 23.7000 cm		
Area of the Sub Reflector	(As) =	pi(Ds**2)/4	= 0.0441 m**2
Wavelength at 14.2500 GHz	(lambda) = 0.0210 m		
Transmit Power at Flange	(P) = 50.1180 Watts		
Antenna Gain at Earth Site	(GES) = 53.4000 dBi		= 218776.1624 Power Ratio: AntiLog(GES/10)
pi	=	3.1415927	
Antenna Aperture Efficiency	(n) = 0.6500		

1. FAR ZONE CALCULATIONS

Distance to the Far Zone (Df) = $\frac{(n)(D^{2})}{\lambda}$ = 446.9524 m

Far Zone Power Density (Rf) = $\frac{(GES)(P)}{4 \pi (Df^{2})}$ = 4.3678 W/m^2

= 0.4368 mW/cm^2

2. NEAR ZONE CALCULATIONS

Power Flux Density is considered to be at a maximum value throughout the entire length of this Zone. The Zone is contained within a cylindrical volume which has the same diameter as the antenna. Beyond the Near Zone, the Power Flux Density will decrease with distance from the Antenna.

Distance to the Near Zone (Dn) = $\frac{D^{2}}{4 \lambda}$ = 171.9048 m

Near Zone Power Density (Rn) = $\frac{16.0(n)P}{\pi (D^{2})}$ = 11.4897 W/m^2

= 1.1490 mW/cm^2

3. TRANSITION ZONE CALCULATIONS

The Power Density begins to decrease with distance in the Transition Zone. While the Power Density decreases inversely with distance in the Transition Zone, the Power Density decreases inversely with the square of the distance in the Far Zone. Since the maximum Power Density in the Transition Zone will not exceed the Near Zone values, it is not calculated.

4. ZONE BETWEEN THE SUB AND MAIN REFLECTORS

Transmissions from the feed horn are directed toward the Sub Reflector surface and are reflected back toward the Main Reflector. The energy between the Sub Reflector and Main Reflector surfaces can be calculated by determining the Power Density at the Sub Reflector surface as follows:

Sub Reflector Power Density = $\frac{2(P)}{As}$ = 2272.1508 W/m**2

= 227.2151 mW/cm**2

5. MAIN REFLECTOR ZONE

Main Reflector Power Density = $\frac{2(P)}{Sa}$ = 8.8383 W/m**2

= 0.8838 mW/cm**2

6. ZONE BETWEEN THE MAIN REFLECTOR AND THE GROUND

Applying uniform illumination of the Main Reflector Surface:

Main to Ground Power Density = $\frac{P}{Sa}$ = 4.4191 W/m**2

= 0.4419 mW/cm**2

CALCULATED SAFETY MARGINS SUMMARY AND EVALUATION

Safety Margin = 5.0 - Calculated Zone Value (mW/cm**2)

Zones	Safety Margins (mW/cm**2)	Conclusions
1. Far Zone	4.5632	Complies with ANSI
2. Near Zone	3.8510	Complies with ANSI
3. Transition Zone	Rf < Rt < Rn	Complies with ANSI
4. Sub to Main Reflector	-222.2151	POTENTIALLY HAZARDOUS
5. Main Reflector Surface	4.1162	Complies with ANSI
6. Main Reflector to Ground	4.5581	Complies with ANSI

7. EVALUATION

The SUB to MAIN Reflector ZONE does not comply with the ANSI standards! The system will be FENCED so that no one can enter the affected Zone while the system is in use. Additionally, the system will be shut down for servicing.