

**Exhibit B**  
**PanAmSat Licensee Corp.**  
**Ellenwood, Georgia**  
**Vertex 7.2 Meter Earth Station**  
**Call Sign: E940532**

**Compliance with FCC Report & Order (FCC96-377) for the 13.75 - 14.0 GHz Band**  
**Analysis and Calculations**

**1. Background**

This Exhibit is presented to demonstrate the extent to which the PanAmSat Licensee Corp. satellite earth station in Ellenwood, GA is in compliance with FCC Report & Order 96-377. The potential interference from the earth station to US Navy shipboard radiolocation operations (RADAR) and the NASA space research activities in the 13.75 - 14.0 GHz band is addressed in this exhibit. The parameters for the earth station are:

**Table 1. Earth Station Characteristics**

• Coordinates (NAD83):	33° 39' 50.4" N, 84° 16' 18.7" W
• Satellite Location for Earth Station:	Intelsat IS-11 at 43.0° W
• Frequency Band:	13.75-14.0 GHz for uplink
• Polarizations:	Linear and Circular
• Emissions:	750KF2D
• Modulation:	Digital
• Maximum Aggregate Uplink EIRP:	78.6 dBW for all Carriers
• Transmit Antenna Characteristics	
Antenna Size:	7.2 meters in Diameter
Antenna Type/Model:	Vertex
Gain:	58.4 dBi
• RF power into Antenna Flange:	20.2 dBW / 750 kHz or -2.5 dBW/4 kHz (Maximum)
• Minimum Elevation Angle:	
Ellenwood, Ga.	31.3° @ 122.3° Az. (Intelsat IS-11)
• Side Lobe Antenna Gain:	32 - 25*log(θ)

Because the above uplink spectrum is shared with the Federal Government, coordination in this band requires resolution data pertaining to potential interference between the earth station and both Navy Department and NASA systems. Potential interference from the earth station could impact the Navy and/or NASA systems in two areas. These areas are noted in FCC Order 96-377 and consist of (1) Radiolocation and radio navigation and (2) Data Relay Satellites.

Summary of Coordination Issues:

- 1) Potential Impact to Government Radiolocation (Shipboard Radar)
- 2) Potential Impact to NASA Data Relay Satellite Systems (TDRSS)

**2. Potential Impact to Government Radiolocation (Shipboard Radar)**

Radiolocation operations (RADAR) may occur anywhere in the 13.4 - 14 GHz frequency band aboard ocean going United States Navy ships. The FCC's Order 96-377 allocates the top 250 MHz of this 600 MHz band to the Fixed Satellite Service (FSS) on a co-primary basis with the radiolocation operations and provides for an interference protection level of -167 dBW/m<sup>2</sup>/4 kHz.

The closest distance to the shoreline from the Ellenwood, GA earth station is approximately 369 km southeast toward the Atlantic Ocean. The calculation of the power spectral density at this distance is given by:

1. Clear Sky EIRP:	78.60 dBW
2. Carrier Bandwidth:	750 kHz
3. PD at antenna input:	-2.5 dBW/4 kHz
4. Transmit Antenna Gain:	58.4 dBi
5. Antenna Gain Horizon:	FCC Reference Pattern
6. Antenna Elevation Angle:	31.3° Toward Intelsat IS-11 (122.3° Az.)

The existing earth station will radiate toward the ocean according to its off-axis side-lobe performance. A conservative analysis, using FCC standard reference pattern, results in off-axis antenna gains of -5.0 dBi towards the Atlantic Ocean.

The signal density at the shoreline, through free space is:

$$\begin{aligned} \text{PFD} &= \text{Antenna Feed Power density (dBW/4 kHz)} + \text{Antenna Off-Axis Gain (dBi)} - \text{Spread Loss (dBw-m}^2\text{)} \\ &= -2.5 \text{ dBW/4 kHz} + (-5.0 \text{ dBi}) - 10 \cdot \log[4\pi \cdot (369000 \text{ m})^2] \\ &= -129.8 \text{ dBW/m}^2/4 \text{ kHz} + \text{Additional Path Losses} (\sim 87.0 \text{ dB}) \end{aligned}$$

Our calculations show additional path loss of approximately 87.0 dB including absorption loss and earth diffraction loss for the actual path profiles from the proposed earth station to the nearest shoreline.

The calculated PFD including additional path losses to the closest shoreline location is  $-216.8 \text{ dBW/m}^2/4 \text{ kHz}$ . This is 49.8 dB below the  $-167 \text{ dBW/m}^2/4 \text{ kHz}$  interference criteria of R&O 96-377.

Therefore, there should be no interference to the US Navy RADAR from the Ellenwood, GA earth station due to the distance and the terrain blockage between the site and the shore.

### **3. Potential Impact to NASA's Data Relay Satellite System (TDRSS)**

The geographic location of the PanAmSat Licensee Corp. earth station in Ellenwood, GA is outside the 390 km radius coordination contour surrounding NASA's White Sands, NM ground station complex. Therefore, the TDRSS space-to-earth link will not be impacted by the PanAmSat earth station in Ellenwood, GA.

The TDRSS space-to-space link in the 13.772 to 13.778 GHz band is assumed to be protected if an earth station produces an EIRP less than  $71 \text{ dBW/6 MHz}$  in this band. The 7.2 meter earth station dish will not operate in any portion of the 13.72-13.78 GHz band. It will only operate in a 750 KHz bandwidth around 13.995 GHz. Therefore, there will be no interference to the TDRSS space-to-space link.

### **4. Summary and Conclusions**

The results of the analysis and calculations performed in this exhibit indicate compatibility between the proposed earth station operations at the Ellenwood, GA earth station and the US Navy and NASA systems space-to-earth link. These analyses have been based on the assumption of 750 kHz bandwidth carriers.

No interference to US Navy RADAR operations from the Ellenwood, Georgia earth station will occur.