

## EXHIBIT B

### PROPOSED OPERATIONS

DIRECTV proposes to operate the 17/24 GHz BSS payload on DIRECTV 11 at the  $101.6^{\circ}$  W.L.  $\pm 0.3^{\circ}$  orbital location to conduct proof of concept video transmissions in this newly available BSS band to determine the feasibility of the video link. Among other things, DIRECTV also anticipates that the data it is able to collect from these operations will provide valuable insights for the Commission's pending rulemaking on certain technical and sharing issues for the 17/24 GHz BSS service.<sup>1</sup> For example, DIRECTV operates DBS satellites at the nominal  $101^{\circ}$  W.L. orbital location that use the same spectrum for uplink transmissions that the experimental payload on DIRECTV 11 uses for downlink transmissions. DIRECTV intends to assess the space path interference caused by 17/24 GHz BSS downlink transmissions on reception of uplink transmissions by nearby DBS satellites at varying levels of separation (*i.e.*, by moving up to  $0.3^{\circ}$  from  $101.6^{\circ}$  W.L., both toward and away from  $101^{\circ}$  W.L.). It also hopes to evaluate the ground path interference caused by DBS uplink earth station transmissions on reception of the 17/24 GHz BSS downlink transmissions in areas near the DBS uplink earth station site.

DIRECTV 11 is currently scheduled for launch in mid-January 2008. Accordingly, DIRECTV requests that the STA begin effective March 1, 2008 and run for up to one hundred twenty (120) days of operations by DIRECTV 11 at  $101.6^{\circ}$  W.L.  $\pm 0.3^{\circ}$  and by its earth station located in Moxee, WA.

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<sup>1</sup> See *Establishment of Policies and Service Rules for the Broadcasting Satellite Service at the 17.3-17.7 GHz Frequency Band and at the 17.7-17.8 GHz Frequency Band Internationally, and at the 24.75-25.25 GHz Frequency Band for Fixed Satellite Services Providing Feeder Links to the Broadcasting-Satellite Service and for the Broadcasting Satellite Service Operating Bi-directionally in the 17.3-17.7 GHz Frequency Band*, 22 FCC Rcd. 8842 (2007).

## **Orbital Debris Mitigation**

Pursuant to Section 5.63(e) of the Commission's rules, DIRECTV submits the following description of the design and operational strategies it will use to mitigate orbital debris.

### **Spacecraft Hardware Design**

DIRECTV has assessed and limited the amount of debris released in a planned manner during normal operations. DIRECTV 11 will not be a source of debris during launch, drift, or operating mode, as DIRECTV does not intend to release debris during the planned course of operations of the satellite.

DIRECTV has also considered the possibility of DIRECTV 11 becoming a source of debris by collisions with small debris or meteoroids that could cause loss of control of the spacecraft and prevent post-mission disposal. As such, DIRECTV has taken steps to address this possibility by incorporating redundancy, shielding, separation of components, and other physical characteristics into the satellite's design. For example, omni-directional antennas will be mounted on opposite sides of the spacecraft, and either will be sufficient to support orbit raising. The command receivers and decoders, telemetry encoders and transmitters, and the bus control electronics are fully redundant, physically separated, and located within a shielded area to minimize the probability of the spacecraft becoming a source of debris due to a collision.

### **Minimizing Accidental Explosions**

DIRECTV has implemented an overall spacecraft design that limits the probability of accidental explosion. The key areas reviewed for this purpose include leakage of propellant and mixing of fuel and oxidizer as well as NiH pressure vessels.

The basic propulsion design (including component and functional redundancy, and the placement of fuel tanks inside a central cylinder which provides a high level of shielding), propulsion subsystem component construction, preflight verification through both proof testing and analysis, and quality standards have been designed to ensure a very low risk of propellant leakage and fuel and oxidizer mixing that can result in subsequent explosions. During the mission, batteries and various critical areas of the propulsion subsystem will be continually monitored (for both pressure and temperature) to preclude conditions that could result in the remote possibility of explosion and subsequent generation of debris.

After DIRECTV 11 reaches its final disposal orbit, all on-board sources of stored energy will be depleted, all fuel line valves will be left “open,” any pressurized system will be vented, and all batteries will be left in a permanent discharge state. The solar cells will be slewed away from the sun to minimize power generation.

Through this process, DIRECTV will assess and limit the possibility of accidental explosions during mission operations and assure that all stored energy at the end of the satellite’s operation will be removed.

### **Safe Flight Profiles**

DIRECTV has assessed and limited the probability of DIRECTV 11 becoming a source of debris by collisions with large debris or other operational space stations through detailed and conscientious mission planning. DIRECTV has reviewed the list of licensed systems and systems that are under consideration by the Commission for the nominal 99° W.L. and 101.6° W.L. orbital location it has requested. In addition, in order to address non-U.S. licensed systems, DIRECTV has reviewed the list of satellite networks in the

vicinity of 99° W.L. and 101.6° W.L. for which a request for coordination has been submitted to the ITU. Only those networks that are operating, or are planned to be operating, within  $\pm 0.3^\circ$  have been taken into account in this review.

As a consequence of this review, it has been determined that only two other systems have been licensed by the Commission for, and are currently operating at, the nominal 99° W.L. location: SPACEWAY 2 at 99.2° W.L. and GALAXY 16 at 99.0° W.L. In order to address the resulting physical coordination issue, DIRECTV has applied for authority to operate DIRECTV 11 at 99.225° W.L. and SPACEWAY-2 at 99.115° W.L., such that there is no overlap of the station-keeping volumes of these DIRECTV spacecraft or GALAXY 16 at that position. There are no systems licensed by the Commission to operate within  $0.3^\circ$  of 101.6° W.L.<sup>2</sup>

Internationally, the ITU has published requests for coordination of satellite networks within  $\pm 0.3$  degrees of 99° W.L. from Canada and the United Kingdom, but has published no such filings within  $\pm 0.3$  degrees of 101.6° W.L. DIRECTV can find no evidence that satellite construction contracts have been awarded for any of these networks, nor does the Federal Aviation Administration Commercial Space Station Second Quarter 2006 Report show any pending satellite launches for these networks.

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<sup>2</sup> In addition, DIRECTV and Pegasus have applied for authority to operate satellites at 101° W.L. in the BSS expansion spectrum when it becomes available in 2007, and those applications remain pending. See FCC File Nos. SAT-LOA-19970605-00050 (DIRECTV); SAT-LOA-20020322-00033 (Pegasus). However, those applications are subject to amendment, and the 101° W.L. location does not fall on the four degree “grid” established by the Commission. See *Establishment of Policies and Service Rules for the Broadcasting Satellite Service at the 17.3-17.7 GHz Frequency Band and at the 17.7-17.8 GHz Frequency Band Internationally, and at the 24.75-25.25 GHz Frequency Band for Fixed Satellite Services Providing Feeder Links to the Broadcasting-Satellite Service and for the Broadcasting Satellite Service Operating Bi-directionally in the 17.3-17.7 GHz Frequency Band*, 22 FCC Rcd. 8842 (2007).

### **Post-Mission Disposal**

Consistent with the requirements of Section 25.283(a) of the Commission's rules, at the end of the operational life of the satellite, DIRECTV will maneuver DIRECTV 11 into a disposal orbit with an altitude no less than that calculated using the IADC formula:

$$36,021 \text{ km} + (1000 \cdot C_R \cdot A/m).$$

The calculated value of  $C_R A/m$  in this instance is based on the following parameters:

$$C_R = \text{Solar Pressure Radiation Coefficient} = 1.152$$

$$A = \text{Total Solar Pressure Area} = 167.6 \text{ m}^2$$

$$M = \text{Dry Mass of Satellite} = 3556 \text{ kg}$$

Using these values in the IADC formula results in a minimum de-orbit altitude of 36075.3 km, or approximately 289 km above geosynchronous altitude. To provide adequate margin, the nominal disposal orbit will be increased above this calculated value of 289 km to a value of 350 km. Approximately 1.6 kg of propellant will be allocated and reserved for final orbit raising maneuvers to this altitude. This value was determined through a detailed launch vehicle propellant budget analysis. In addition, DIRECTV has assessed fuel gauging uncertainty and this budgeted propellant provides an adequate margin of fuel reserve to ensure that the disposal orbit will be achieved despite such uncertainty.