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ATTORNEYS AT LAW

June 16, 2008

BY ELECTRONIC FILING

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: *IB Docket No. 06-123*

Dear Ms. Dortch:

Among the issues raised by the further notice of proposed rulemaking in this proceeding is whether applicants should be required to submit information on the off-axis gain of transmitting antennas on 17/24 GHz BSS spacecraft.[1] In its comments, DIRECTV argued that all applicants should be required to submit detailed information – including measured data over an angular range of ±90° in the plane of the GSO arc – to enable DBS operators to assess the potential for interference and protect their operations in the future.[2] After further consideration of the issues and discussions with the International Bureau staff, DIRECTV has concluded that it should revise its position to capture a greater range of potential operational scenarios, afford greater flexibility with respect to the nature of the submission, and better specify the timing of the submission(s) required. The basis for this revised approach is discussed below and incorporated into the text of a proposed rule attached hereto.

For purposes of this discussion, we define three axes of orientation for the satellite as follows: (1) the X-axis runs through the center of the satellite and parallel to a line tangent to the satellite orbit (*i.e.*, East/West direction); (2) the Y-axis runs through the

1 *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, ¶ 185 (2007) ("*FNPRM*").

2 *See* Comments of DIRECTV, Inc., at 6 (filed Nov. 5, 2007) ("DIRECTV Comments").

center of the satellite and parallel to the sub-satellite line of longitude (*i.e.*, North/South direction); and (3) the Z-axis is orthogonal to the other two axes, running from the center of the satellite to the center of the Earth. These axes are illustrated in Figure 1 below.

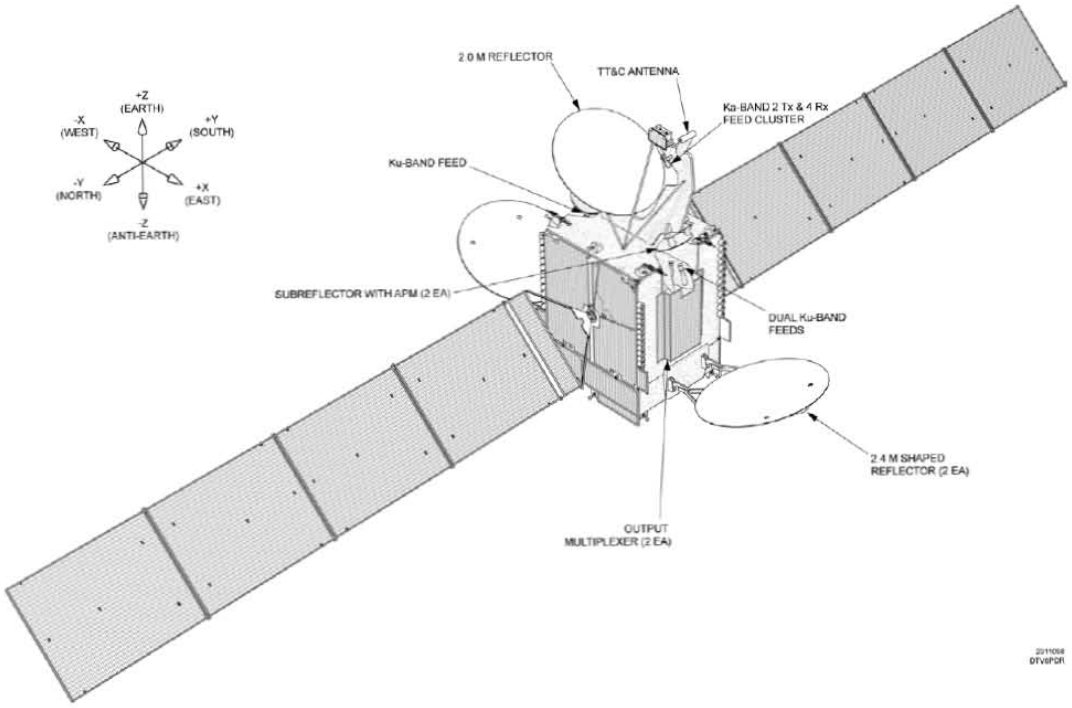

Figure 1. Satellite Axes

DIRECTV's original comments called for submission of antenna gain information in the plane defined by the X- and Z-axes, starting at the Z-axis and extending over a 90° range of arc to both the East and West, resulting in an inverted semi-circle with its base along the X axis. The intention was to capture the off-axis antenna gain in the direction of adjacent satellites located in geostationary orbit. Such data would likely be sufficient to assess potential interference resulting from 17/24 GHz BSS operations at the orbital location specified in the initial application.

However, it is possible that a spacecraft designed to operate at one location could later be moved to another one that would require its antenna to be biased to the East/West and/or North/South in order to cover the intended service area. In such a case, the Commission and all interested parties would be better able to assess the potential for interference from a 17/24 GHz BSS space station operating at the new orbital location if information necessary to conduct an analysis of the interference situation were provided over a wider range of operational scenarios. In order to ensure that such information is available for future assessment, DIRECTV believes that sufficient data should be provided so as to allow analysis of potential interference when the satellite is biased up to ±30° in the X-Z plane (*i.e.*, so that the data provided would be applicable over an angular

range of approximately ±30° from the X-axis in the X-Z plane).[3] Similarly, in order to account for potential bias in the North/South direction, data reflecting the effects of rotation of the antenna about the Z-axis should be provided. EchoStar has made a similar suggestion, proposing that data be provided "in planes tilted relative to the equatorial plane, rotated about the Z-axis . . . , every 10° up to ±50° relative to the equatorial plane."[4] DIRECTV believes that data applicable to the cases of ±10° and ±20° of rotation around the Z-axis would probably be sufficient for this purpose. By providing information in at least two planes and over a significant range of arc, such data will support analysis of a wide variety of operational scenarios.

Based on its many years of experience with the construction and testing of spacecraft, DIRECTV believes that such data would not be difficult to produce. Satellite manufacturers already analytically model and test transmitting antenna subsystems as a routine part of construction prior to integrating the antenna with the satellite bus. Generating the type of data being proposed by DIRECTV over the range of arcs suggested should add only incrementally to this task, both in terms of time and cost.

However, such analytical modeling and/or testing of the antenna subsystem usually do not occur until approximately nine to twelve months before scheduled launch of a satellite. Thus, while design specifications will be available earlier, the actual modeled or measured off-axis performance data likely will not be available until well after the initial application is filed and processed. The Commission's rules should recognize this fact by adopting a two-stage requirement.

- At the application stage, an applicant could use the design specification of its transmitting antenna to make a preliminary interference analysis.

- After licensing and approximately nine to twelve months prior to scheduled launch, the licensee would then be required to confirm that analysis based on modeled or measured data.[5]

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[3] DIRECTV had originally proposed that a measured antenna pattern should extend all the way to the Z-axis, but is now suggesting that data that could be used in an interference assessment be provided over a reduced angular range in recognition of the fact that the arc of interest is limited to the portion lying in the general direction of other satellites in geostationary orbit.

[4] Comments of EchoStar Satellite L.L.C., at 2 n.2 (filed Nov. 5, 2007) ("EchoStar Comments"). EchoStar also supported measurements for ± 120° from the Z axis in the X-Z plane. *Id.*

[5] To the extent the Commission adopts an off-axis power flux-density coordination trigger (as most commenters have favored (s*ee, e.g.*, DIRECTV Comments at 5; EchoStar Comments at 3-4; Comments of SES Americom, Inc., at 12 (filed Nov. 5, 2007)), compliance could be provisionally demonstrated in the application using design specifications, with a requirement that compliance be confirmed at a later date using modeled or measured data. The draft rule attached hereto includes optional language to incorporate this concept.

Because interference is almost certainly not an issue for a 17/24 GHz BSS system operating 1° or more away from an operational DBS cluster, systems proposed at such locations should be presumed not to cause harmful interference and therefore relieved of the obligation to provide an initial analysis at the application stage. However, all 17/24 GHz BSS licensees should be required to submit their modeled or measured off-axis antenna performance data prior to launch so that it is available for future contingencies.[6]

Respectfully submitted,

/s/

William M. Wiltshire
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Attachment

cc: Robert Nelson
Andrea Kelly
Karl Kensinger
Kathyrn Medley
Chip Fleming
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[6] DIRECTV believes that the antenna off-axis performance data can be submitted using any form of graphical or tabular representation, so long as it is easy to read the critical values and allows unambiguous interpretation.

PROPOSED RULE

With a coordinate system defined as follows:

- X-axis through the center of the satellite and parallel to a line tangent to the satellite orbit,
- Y-axis through the center of the satellite and parallel to the sub-satellite line of longitude, and
- Z-axis through the center of the satellite to the center of the Earth,

(1) Each applicant for a 17/24 GHz BSS space station authorization shall provide transmit antenna off-axis performance specifications for both polarizations over a range of ±30º around +90º and -90º along the X-Z plane, where 0º lies along the Z-axis. Specifications shall be provided for the case of the satellite antenna oriented as it nominally would be when deployed in orbit, and for the case where the satellite antenna is rotated around the Z-axis by ±10º and ±20º, relative to the nominal antenna orientation.

(2) Using such specified transmit antenna gain data, each applicant shall demonstrate that its proposed 17/24 GHz BSS space station [will not exceed a power flux-density of -93 dBW/m^2/24 MHz at the edge of any operational Direct Broadcast Satellite orbital location cluster (*i.e.*, nominal DBS location ±0.2°)] [will not cause harmful interference to any operating Direct Broadcast Satellite]. For purposes of this requirement, a 17/24 GHz BSS space station to be located at least 1° away from the edge of an operational Direct Broadcast Satellite orbital location cluster shall be presumed to comply, subject to rebuttal by any potentially affected party.

(3) Not less than [nine/twelve] months prior to scheduled launch of a 17/24 GHz BSS space station, the licensee shall provide modeled and/or measured transmit antenna off-axis gain data for the cases described in subsection (1) above. If the licensee submitted an analysis pursuant to subsection (2) above, it shall confirm such analysis using the modeled/measured data. If modeled data is used for this analysis, sufficient margin must be included to account for uncertainties in the modeling process.