

EXHIBIT C

FCC Form 312: Response to Question 35 *Waiver Requests*

Section 25.202(g): DIRECTV requests a limited waiver of the requirement in Section 25.202(g) of the Commission's rules that TT&C functions be conducted at the edges of the bands in which service is being provided. DIRECTV-8, which is a hybrid DBS/Ka-band satellite, has been designed to use 14 GHz FSS frequencies solely for the purpose of conducting transfer orbit TT&C operations. The Commission has found that the use of the 14 GHz band for TT&C of a DBS satellite system is "in conformity with the international and [U.S.] domestic Tables of Frequency Allocations."¹ However, because Section 25.202(g) generally requires use of frequencies at the edge of service bands, a waiver of this rule is required in order for a DBS operator to use 14 GHz frequencies for TT&C operations.² The Commission has recognized that, as opposed to on-station TT&C, the use of 14 GHz frequencies solely for transfer orbit purposes is a "relatively short-term" function, and consequently the Commission is amenable to evaluating requests to use FSS frequencies for transfer orbit TT&C of DBS satellites on a case-by-case basis.³

In this case, a waiver of Section 25.202(g) is required because Loral Skynet, which will be conducting transfer orbit TT&C on behalf of DIRECTV, uses Intelsat ground stations around the world and none of these stations are equipped with 17 GHz command capabilities. Thus, 14 GHz FSS frequencies must be used for the transfer orbit TT&C of DIRECTV-8. The requested use of these frequencies is extremely limited, both in scope and duration. DIRECTV proposes to use only 4 MHz of spectrum in the 14 GHz band.⁴ These frequencies will be used *only* for transfer orbit during the "mission" phase of the launch of DIRECTV-8 and will never be used for normal on-orbit TT&C operations of DIRECTV-8 even on a contingency basis. DIRECTV estimates that, barring unforeseen circumstances, the need to use 14 GHz frequencies for transfer orbit TT&C will last only for approximately a ten-day period after the satellite is launched. The Commission recently granted a similar waiver with respect to DIRECTV-7S based on precisely the same set of facts.⁵

¹ *MCI Telecommunications Corp.*, 14 FCC Rcd. 9966 at ¶ 15 (Int'l Bur. 1999).

² *Id.* To the extent a waiver is necessary for the Ka-band payload on DIRECTV-8 to rely on the use of frequencies authorized for use by the satellite's DBS payload for on-station TT&C, DIRECTV requests such a waiver as well.

³ *See DIRECTV Enterprises, LLC*, 19 FCC Rcd. 7754 at ¶ 13 (Int'l Bur. 2004)(*citing Policies and Rules for the Direct Broadcast Satellite Service*, 17 FCC Rcd. 11331 at ¶ 132 (2002)).

⁴ DIRECTV-8 will use two channels, centered at 14003.0 MHz and 14497.0 MHz, with 2 MHz bandwidth each.

⁵ *See id.* at ¶¶ 11-14.

DIRECTV's limited use of 14 GHz frequencies for transfer orbit TT&C will pose minimal risk to the operations of other in-orbit satellites. During the brief period during which the 14 GHz band will be used for transfer orbit command operations, DIRECTV will follow well-developed and widely-accepted industry practices for conducting transfer orbit, which include ensuring that no harmful interference occurs into the operation of any operating satellite. (As noted above, DIRECTV's TT&C provider for this satellite during this phase will be Loral Skynet, which is very experienced in such matters, as well.)

In these circumstances, there is good cause to grant the limited waiver requested.⁶ Because of the very limited scope and duration of the relevant operations, the requested waiver will not undermine the policy objective of the rule. Furthermore, strict adherence to Section 25.202(g)'s requirements in this instance would greatly hinder the deployment of DIRECTV-8 and the realization of the public interest benefits associated with DIRECTV's operation of that satellite s discussed herein.

Accordingly, DIRECTV requests a limited waiver of Section 25.202(g) to allow the use of 14 GHz FSS frequencies solely for the purpose of conducting transfer orbit TT&C operations.

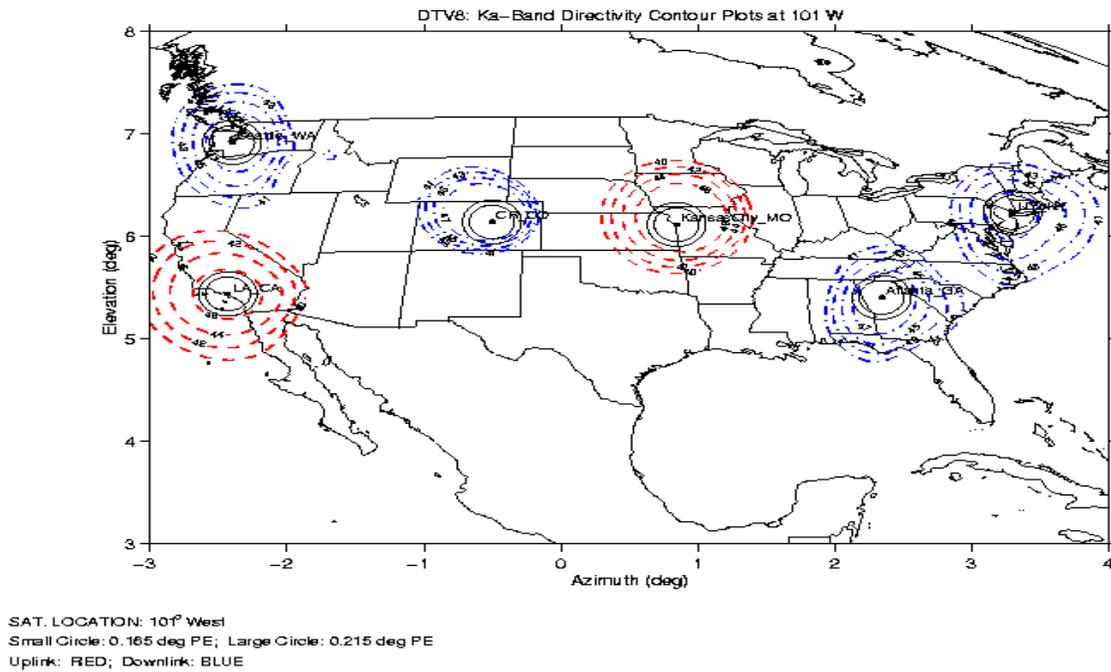
Section 25.210(d): DIRECTV requests a partial waiver of the requirement for full frequency reuse set forth in Section 25.210(d) of the Commission's rules. The rule requires frequency reuse through the use of orthogonal polarizations within the same beam and/or through the use of spatially independent beams. The proposed DIRECTV-8 satellite is configured such that two of its receive beams (Seattle and Atlanta) use RHCP and the other two receive beams (Castle Rock and New York) use LHCP. As can be seen from Figure W1, this configuration of transmit and receive antennas does, in fact, cover geographically separated areas. In addition, the Seattle and Castle Rock receive beams operate in the 29.5-30.0 GHz band and the Atlanta and New York beams operate in the 28.35-28.6 GHz and 29.25-29.5 GHz bands. With this configuration, any given 250 MHz uplink channel can be received in RHCP or LHCP; however, due to the limitations on beam interconnectivity, the same uplink channel cannot be re-used between uplink beams.

DIRECTV-8 is a hybrid satellite, capable of operating in both the Ka-band and the DBS band. A hybrid spacecraft affords significant cost advantages and operating efficiencies, but it also creates design issues as all of the various missions compete for the available resources on the satellite. Certain design compromises must be made to accommodate operations in two bands. Moreover, this process was further complicated by the fact that DIRECTV acquired the satellite as a nearly-completed work in progress that was no longer wanted by Loral's original customer. Using a nearly complete satellite will greatly accelerate DIRECTV's timetable and allow it to meet the impending June 25, 2005 launch and operation milestone applicable to DIRECTV's Ka-band

⁶ See 47 C.F.R. § 1.3; *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1166 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

authorization at 101° W.L.; however, it also places many constraints on the flexibility available for spacecraft design to meet DIRECTV's objectives. In addition, DIRECTV faced severe limitations on the supply of space-qualified hardware for operations in the Ka-band, which is still in the earliest stages of commercial deployment. Given these constraints, changing the design of the overall communications system was simply not practicable. In similar circumstances, the Commission has in the past waived the full frequency reuse requirements set forth in Section 25.210 of the Commission's rules.⁷ DIRECTV requests such a waiver here.

Figure W1. Ka-Band Uplink/Downlink Coverage Contours



Section 25.210(i): DIRECTV requests a waiver of the requirement in Section 25.210 (i) of the Commission's rules that space station antennas in the Fixed-Satellite Service be designed to meet a cross-polarization isolation of 30 dB within the primary coverage area of the antenna. The DIRECTV-8 transmit and receive antennas have been designed to meet a cross-polarization requirement of 27 dB, however current predictions indicate an actual minimum cross-polarization isolation of 24 dB for receive antenna and 21 dB for transmit antennas.

⁷ See, e.g., *PanAmSat Licensee Corp.*, 17 FCC Rcd. 10483, 10491-92 (Int'l Bur. 2002).

Cross-polarization interference can result from either ground terminal or spacecraft polarization imperfections, or from atmospheric effects such as rain. While the satellite does not technically provide 30 dB cross-polarization isolation over the entire coverage area as required by Section 25.210(i) of the Commission's rules, cross-polarization interference is an intra-system design issue and does not affect inter-system coordination, and thus will not affect other Ka-band satellite systems. Moreover, DIRECTV-8 employs digital modulation with forward error correction coding on both polarization senses to reduce the system sensitivity to cross-polarization interference. The expected cross-polarization isolation was fully anticipated in the link budgets for the services that this satellite is intended to provide. Accordingly, DIRECTV requests a waiver of the 30 dB cross-polarization isolation requirement of Section 25.210(i).

Section S7 of Schedule S: Section S7 of Schedule S calls for information on the Space Station Antenna Beam Characteristics of each beam of the satellite. Most of the information called for in this section of Schedule S has been provided. However, there are certain characteristics for which it is not possible for DIRECTV to respond directly to Schedule S. These characteristics are discussed below.

Item S7(p) calls for minimum saturation power flux density for space station receive beams. In the DIRECTV-8 design, however, the Ka-band receive beams are routed through an automatic level control ("ALC") amplifier which precedes the TWTA. This ALC will maintain a constant input level to the TWTA. As such, there is no particular value that can be specified for item S7(p). What has been specified instead is the minimum flux density at the satellite input that will produce the maximum per channel 41.8 dBW EIRP.

DIRECTV requests that the Commission accept the proffered information and waive any further information requirement under Section S7 of Schedule S.