

**Andrea Kelly**

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**From:** Joslyn Read [jread@hns.com]  
**Sent:** Thursday, June 29, 2006 8:11 PM  
**To:** Andrea Kelly; John Martin; Kal Krautkramer; Robert  
**Cc:** Steve Doiron  
**Subject:** Re: Additional Information for SPACEWAY-3

TO: Robert Nelson, Andrea Kelley, John Martin, Kal Krautkramer

FROM: Joslyn Read, Hughes Network Systems, LLC

DATE: 29 June 2006

RE: Call Sign S2663 - Amendment of Minor Modification for SPACEWAY-3 (SAT-AMD-20060306-0025)

This is in response to your request for information on the amendment of the minor modification filed by Hughes Communications Inc. ("Hughes"). You have asked us to explain the technical constraints obligating the SPACEWAY-3 spacecraft to use spacecraft TT&C command frequencies which are not exactly on the edge of the allocated band, as is required in §25.202(g). This communication provides additional detail to that provided earlier today with regard to SPACEWAY's TT&C command frequencies.

As mentioned in our earlier correspondence, the SPACEWAY-3 ("SW3") spacecraft has been designed to receive TT&C command signals on two specific frequencies in the range from 29,500 to 29,516 MHz. The use of a main and a backup frequency is typical on geostationary orbit (GSO) satellites in order to provide an alternate command path in the event of either interference or equipment malfunction on the primary command path.

Since the original design of the SPACEWAY system was to consist of a fleet of three adjacent Ka-band GSO satellites operating at 99°W.L., 101°W.L. and 103°W.L., it was necessary to make sure that the TT&C carriers from the three satellites would not interfere with each other. For this reason, Hughes and Boeing decided to place the first command carrier for SPACEWAY-1 ("SW1") on band edge, with the primary command carrier for SPACEWAY-2 ("SW2") adjacent to that of SW1, and the primary command carrier for SW3 adjacent to that of SW2. The next adjacent carrier (fourth in line) is the secondary command carrier for SW1. The secondary command carrier for SW2 follows in fifth position, and finally, the secondary command carrier for SW3 completes the TT&C command frequency segment. These six contiguous blocks span approximately 16 MHz from band-edge to 29,516 MHz (see Figure 1 below).

It further needs to be indicated that the design of the SPACEWAY satellites is based on E1 data streams (2048 kbps) which typically have a bandwidth of approximately 2.7 MHz. While each actual command carrier is approximately 1.6 MHz in width, each command carrier is assigned an entire E1 channel since it is the next largest bandwidth step that the satellite demodulator can process. As a result, the entire SPACEWAY fleet of three satellites utilizes a total of 6 command carriers on 6 contiguous E1 bandwidth slots extending from the band edge to 25,516 MHz.

Being the third satellite in the fleet, SW3 was assigned the command carriers for the third and sixth E1 bandwidth slots from the band-edge. The design and construction of SW3 was well under way when the ownership of the SPACEWAY satellites was divided between The DirecTV Group and Hughes Communications Inc. (and its predecessors). A significant re-design of the spacecraft would have been required in order to change the TT&C command frequencies from the previously established frequency plan.

Hughes confirms that the SPACEWAY-3 TT&C command frequencies will be transmitted so as to have an EIRP density less than the levels specified in §25.138 of the FCC's rules for normal, on-station operations.

In sum, in its amendment application, Hughes has requested a waiver of §25.202(g) to maintain the present

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SPACEWAY-3 frequency plan. This waiver request, if granted, is consistent with the FCC's Ka-band emission limits in §25.138. Furthermore, grant of this waiver request will enable Hughes to begin bringing state-of-the-art high-speed broadband services by satellite to the U.S. market in mid-2007.

Please do not hesitate to contact us with any further questions.

Sincerely,

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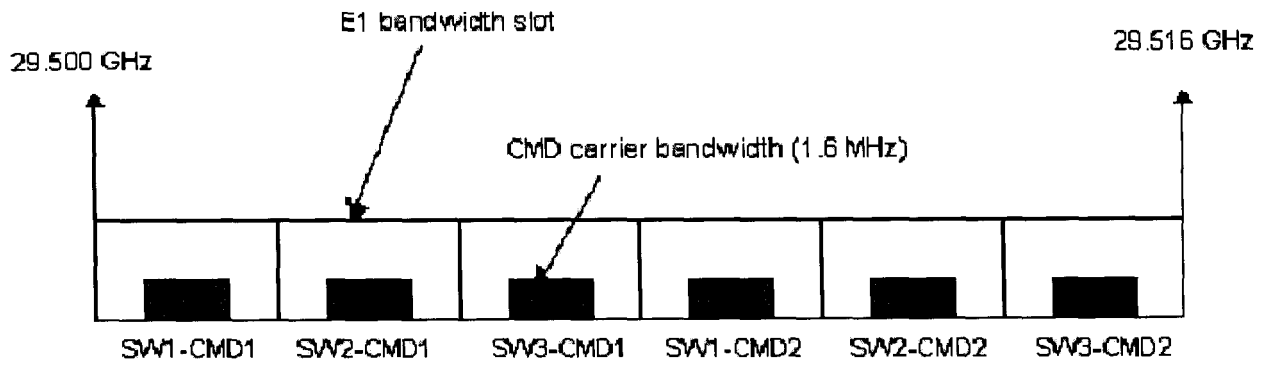


Figure 1 - Command Carrier Frequency Plan  
for SPACEWAY 1, 2 and 3

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