The following is in response to the comments and concerns filed by Cosmos Broadcasting Corporation ("Cosmos") in connection with the Request for Waiver filed by LoJack Corporation ("LoJack"). LoJack has requested a waiver of the rules, defined in Section 90.20(e)(6), to allow increasing the duty cycle of their stolen vehicle recovery systems transmissions to 1800 milliseconds every 300 seconds. The current rule allows for a maximum transmitted duty cycle of 200 milliseconds every ten seconds.

Cosmos' concerns are for possible interference from LoJack's stolen vehicle recovery systems to their Channel 7 DTV, 174-180 MHz, station reception. The following analysis and explanation is intended to relieve these concerns and is based on the current FCC interference protection requirements for DTV and NTSC interference requirements.

The LoJack systems operate on a frequency of 173.075 MHz, their transmitters will have an effective radiated power (ERP) of approximately 200-300 milliwatts. These transmitters will transmit at considerably lower ERP than their current base stations, which operate at an ERP of 300 Watts. The estimated ERP of the new transmitters is based on two conditions, 1) their antenna's are not very efficient, and 2) they are hidden *within* the automobile. These conditions will greatly effect, attenuate, the actual ERP from their 2 Watt mobile-to-base transmitter.

Under the current FCC Rules, the interference protection ratio requirements for desired-to-undesired (D/U) signals for NTSC and DTV are:

Lower 1st Adjacent Channels

1. NTSC to NTSC = D/U ration = -3dB
2. NTSC to DTV = D/U ratio = -48dB

Note: The NTSC D/U ratios are specified for **video carrier** amplitudes.

For this interference analysis we will use and compare the FCC's existing protection requirements for both NTSC-to-NTSC, and NTSC-to-DTV interference. For interference analysis purposes we feel that standard NTSC TV sound carrier modulation (frequency modulation) is comparable, similar, to the proposed LoJack systems transmissions.

Through extensive lower 1st adjacent channel NTSC TV receiver interference testing, we have found that interference to NTSC receiving from another NTSC transmission is primarily caused by the sound carriers from the interfering NTSC signals, as apposed to their associated video carrier frequencies and amplitudes. The sound carrier of a standard NTSC TV signal is nominally about 10 dB lower in amplitude than its associated video carrier. Therefore, the interference protection D/U ration for NTSC-to-NTSC (sound carrier) interference is approximately +7dB, or, an undesired FM carrier 7 dB *below* the desired channel's carrier.

At DTV Channel 7's frequency band, and at the operating frequency of the LoJack transmitters, the current FCC Rule for DTV-to-DTV interference is a D/U ratio of -48 dB, or, an interference signal 48 dB *higher* than the desired channel's carrier. This would equate to an *equivalent* NTSC interference protection D/U ratio of -38dB, or an undesired FM carrier 38 dB *higher* than the desired DTV carrier. A DTV receiver would have approximately 45 dB ($-38dB_{NTSC\ Equivalent} - 7dB_{NTSC\ Limit}$) better interference rejection than is currently required for NTSC interference protection.

A note should be made that the equivalent NTSC interference D/U requirements were specified for broadband FM signals (TV Sound) and that the LoJack transmissions will be narrowband transmissions.

In conclusion, interference to DTV Channel 7 from a LoJack transmission would not occur until the LoJack carrier's amplitude is approximately 48 dB *higher*

than the DTV's carrier level at a receiver's input port, or 10 dB *higher* than is shown in the *equivalent* NTSC example above.

Tom, I don't know why we did all this, this way, the difference between the NTSC/NTSC and the NTSC/DTV D/U's (in the rules) is ***45 dB***, and the D/U for NTSC/DTV (in the rules) is ***-48.*** Seems to me that we got the same answer, anyway.