

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of )  
 )  
Spectrum Task Force Requests Information on ) ET Docket No. 10-123  
Frequency Bands Identified by NTIA as )  
Potential Broadband Spectrum )

**COMMENTS OF THE SATELLITE INDUSTRY ASSOCIATION**

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## **SUMMARY**

The Commission must determine whether extended C-band spectrum can be reallocated to allow new terrestrial services without endangering critical satellite operations. The terms of any such reallocation must ensure that existing and future satellite use of the 3600-3650 MHz band will be protected. Additionally, if the Commission pursues reallocation of the 4200-4220 MHz band, it must implement strict limits to prevent adjacent band interference.

Multiple satellite operators and earth station licensees use frequencies in the 3600-3650 MHz band to satisfy the demands of military, commercial and government customers. These services include lifeline connectivity, emergency restoration, secure government communications, U.S. Internet backbone connectivity to expand Internet services in developing nations, transoceanic voice and data trunking for international carriers, and video distribution and contribution for programming providers. The band is also used for telemetry transmissions that are essential to ensure spacecraft can operate safely.

The Commission must ensure that these critical satellite operations are not disrupted. Accordingly, if the Commission decides to pursue reallocation of the 3600-3650 MHz band, it should limit any new terrestrial usage to fixed point-to-point microwave systems subject to sharing on a co-primary basis with existing and future satellite facilities. Such terrestrial systems could be used to meet growing demand for wireless backhaul capacity. At the very least, the Commission must apply the same protections for incumbent satellite earth stations that were adopted when the 3650-3700 MHz band was reallocated, including grandfathering, 150-km coordination zones, and power limits on terrestrial systems.

The Commission must also consider the impact on satellite services if it proceeds with steps to reallocate the 4200-4220 MHz frequencies that are immediately adjacent to core C-band satellite spectrum. Specifically, the Commission should implement strict adjacent band

emission limits for any new terrestrial operations in this band to ensure that satellite communications services and critical telemetry signals in the conventional C-band are not subject to harmful interference.

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The Satellite Industry Association (“SIA”) hereby submits its comments in response to the Commission’s Public Notice in the above-captioned proceeding, which seeks input regarding spectrum identified by the National Telecommunications and Information Administration (“NTIA”) for potential reallocation in order to accommodate wireless broadband.<sup>1</sup> As discussed below, if the Commission decides to permit new terrestrial operations in the extended C-band, it must take steps to ensure existing and future satellite operations in both extended and conventional C-band spectrum are protected from harmful interference.<sup>2</sup>

SIA is a U.S.-based trade association providing worldwide representation of the leading satellite operators, service providers, manufacturers, launch services providers, and ground equipment suppliers.<sup>3</sup> Since its creation fifteen years ago, SIA has become the unified

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<sup>1</sup> Spectrum Task Force Requests Information on Frequency Bands Identified by NTIA as Potential Broadband Spectrum, Public Notice, ET Docket No. 10-123, DA 11-444 (rel. Mar. 8, 2011) (“Notice”).

<sup>2</sup> The conventional C-band refers to downlink (space-to-Earth) spectrum at 3700-4200 MHz and uplink (Earth-to-space) spectrum at 5925-6425 MHz. The adjacent frequencies, including the 3600-3700 MHz downlink (space-to-Earth) spectrum and 5850-5925 MHz uplink (Earth-to-space) spectrum, are referred to as the extended C-band.

<sup>3</sup> SIA Executive Members include: Artel, Inc.; The Boeing Company; CapRock Communications, Inc.; The DIRECTV Group; Hughes Network Systems, LLC; DBSD North America, Inc.; Echostar Satellite Services, LLC; Integral Systems, Inc.; Intelsat S.A.; Iridium

voice of the U.S. satellite industry on policy, regulatory, and legislative issues affecting the satellite business. As the primary representative of the U.S.-based satellite industry, SIA has a direct stake in the issues raised in the Notice relating to spectrum currently allocated for, and intensively used by, satellite services.

## I. INTRODUCTION

The Public Notice requests comment regarding steps the Commission can take to promote wireless broadband deployment in spectrum identified by NTIA for potential reallocation.<sup>4</sup> The Notice explains that based on its analysis to date, NTIA has proposed reallocation of two bands, 1695-1710 MHz and 3550-3650 MHz.<sup>5</sup> NTIA is also continuing to assess additional spectrum, including the 4200-4220 MHz band, for possible future reallocation recommendations.<sup>6</sup>

As discussed in the Notice, the 3600-3650 MHz band is allocated in the U.S. on a primary basis for the fixed-satellite service (“FSS”), limited to international systems.<sup>7</sup> Satellite operations could also be affected by changes to use of the 4200-4220 MHz band, which is immediately adjacent to core satellite spectrum in the conventional C-band.

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Communications Inc.; LightSquared; Lockheed Martin Corporation; Loral Space & Communications, Inc.; Northrop Grumman Corporation; Rockwell Collins Government Systems; SES WORLD SKIES; and TerreStar Networks, Inc. SIA Associate Members include: Arqiva Satellite and Media; ATK Inc.; Cisco; Cobham SATCOM Land Systems; Comtech EF Data Corp.; DRS Technologies, Inc.; Eutelsat, Inc.; GE Satellite; Globecom Systems, Inc.; Glowlink Communications Technology, Inc.; iDirect Government Technologies; Inmarsat, Inc.; Marshall Communications Corporation; Orbital Sciences Corporation; Panasonic Avionics Corporation; Segovia, Inc.; Spacecom, Ltd.; Spacenet Inc.; Stratos Global Corporation; TeleCommunication Systems, Inc.; Telesat Canada; Trace Systems, Inc.; and ViaSat, Inc. Additional information about SIA can be found at <http://www.sia.org>.

<sup>4</sup> Notice at 1.

<sup>5</sup> *Id.*

<sup>6</sup> *Id.*

<sup>7</sup> *Id.* at 3.

SIA members have a strong interest in ensuring that existing and future satellite use of both conventional and extended C-band spectrum is protected. Accordingly, we urge the Commission to consider the impact on satellite services in evaluating whether to pursue reallocation of the 3550-3650 MHz band and to protect incumbent satellite operations in any reallocation proceeding. In addition, the Commission should take steps to prevent adjacent band interference from any new operations in the 4200-4220 MHz band.

## **II. THE COMMISSION MUST PROTECT SATELLITE SERVICES IF IT PURSUES REALLOCATION OF THE 3550-3650 MHz BAND**

Satellite downlinks in the extended C-band are used to offer essential services and are highly susceptible to terrestrial interference. The vulnerability of these important satellite operations to harmful interference weighs against attempting to introduce new terrestrial services in this spectrum. In the event that the Commission nevertheless decides to go forward with reallocation of the 3550-3650 MHz band, it must implement protections for incumbent satellite operations. By adopting a co-primary sharing framework, the Commission can ensure continuity of service to those satellite customers currently operating in the band, as well as prevent millions of dollars worth of stranded investment in extended C-band satellite capacity, without substantially constraining deployment of new terrestrial services. At a minimum, the Commission must adopt grandfathering rules designed to protect existing satellite facilities – and the services they carry – from interference.

### **A. Satellite Networks Use the 3600-3650 MHz Band to Provide Critical Services**

In weighing a possible spectrum reallocation, the Commission must carefully consider the existing uses of the band and prevent service from being disrupted. The 3600-3650 MHz band was historically used within the U.S. government for radiolocation services, but

was allocated by the International Telecommunication Union (“ITU”) decades ago for FSS use.<sup>8</sup> In 1984, the FCC added a primary allocation in the 3600-3700 MHz band for non-government FSS downlinks with a limitation restricting U.S. licensees’ use of these frequencies to international systems.<sup>9</sup> This spectrum is used heavily for operations outside of the United States, and U.S.-authorized satellite systems rely on capacity in this band for important services between the United States and other countries. Specifically, SIA member companies operate space stations and associated ground networks that provide both communications services, including services used for lifeline connectivity and emergency response, and telemetry, tracking and control (“TT&C”) functions within this portion of the extended C-band.

For example, Inmarsat uses the 3600-3700 MHz band to provide feeder links for its global fleet of L-band MSS satellites.<sup>10</sup> These feeder links support many critical safety-of-life functions by enabling rapid restoration of communications after natural disasters. Inmarsat has a formal agreement with the ITU to enable the United Nations agency to help countries better prepare for and respond during disasters.<sup>11</sup> Inmarsat’s Broadband Global Area Network (“BGAN”) technology has played and continues to play a critical role supporting government and non-governmental agencies, such as Télécoms Sans Frontières (“TSF”) and the American Red Cross, as well as international news organizations in response to global disasters including

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<sup>8</sup> See Table of Allocations, 47 C.F.R. § 2.106.

<sup>9</sup> See *id.*, note US245. See also *Amendment of Part 2 of the Commission’s Rules Regarding Implementation of the Final Acts of the World Administrative Radio Conference, Geneva, 1979*, Second Report and Order, FCC 83-511, 49 Fed. Reg. 2,357 (1984). In this decision, the Commission also allocated the 5850-5925 MHz band to the FSS.

<sup>10</sup> Inmarsat distributors such as Vizada, Inc. also hold Commission licenses for extended C-band operations. See call signs KA31, KA249, KA312, KA313, KB34, WA28, WB36, E980136, E980137 & E000284

<sup>11</sup> See Inmarsat News, ITU deploys BGAN for telemedicine after Pakistan floods (Nov. 26, 2010), available at <http://www.inmarsat.com/About/Newsroom/00036872.aspx>.

the recent Japanese earthquakes and tsunami, Chilean earthquake, Christchurch, New Zealand earthquake, Pakistan floods, Gulf of Mexico oil spill and Chilean mine disaster.<sup>12</sup>

Inmarsat has also introduced new services over its L-band/extended C-band MSS satellite network, including the IsatPhone Pro handheld and low data rate services, launched in 2010.<sup>13</sup> The IsatPhone Pro is the first product in Inmarsat's Global Satellite Phone Service ("GSPS") family and will support satellite telephony, including circuit switched voice, voicemail, Bluetooth for hands free use, and supplementary services. In 2011 the IsatPhone Pro will also support text and e-mail messaging. Since its release in June 2010, the IsatPhone Pro has proven to be invaluable in disaster situations across the globe.<sup>14</sup>

Extended C-band frequencies are also used to provide important fixed-satellite services. More than a dozen entities hold multiple Commission authorizations to operate FSS

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<sup>12</sup> See, e.g., Inmarsat News, TSF flies in as Chile reels from 8.8 earthquake (Mar. 1, 2010), available at <http://www.inmarsat.com/About/Newsroom/00028706.aspx>; Christchurch earthquake relief efforts trigger data surge (Feb. 25, 2011), available at <http://www.inmarsat.com/About/Newsroom/00037161.aspx>; Gulf of Mexico oil spill: BGAN plugs comms hole (June 11, 2010), available at <http://www.inmarsat.com/About/Newsroom/00032280.aspx>; TSF ends Pakistan mission after calls help 94,000 people (Oct. 4, 2010), available at <http://www.inmarsat.com/About/Newsroom/00036487.aspx>. See also Inmarsat News, TSF teams respond to floods in southern Thailand (Nov. 5, 2010), available at <http://www.inmarsat.com/About/Newsroom/00036820.aspx>; TSF deployed after tsunami sweeps Indonesian islands (Nov. 1, 2010), available at <http://www.inmarsat.com/About/Newsroom/00036814.aspx>; Emergency comms kit helps save lives after typhoon (July 26, 2010), available at <http://www.inmarsat.com/About/Newsroom/00036080.aspx>.

<sup>13</sup> See Inmarsat News, Inmarsat launches its first global handheld, IsatPhone Pro (June 15, 2010), available at <http://www.inmarsat.com/About/Newsroom/00032284.aspx>.

<sup>14</sup> See, e.g., Inmarsat News, Independent study validates claims for IsatPhone Pro (Feb. 4, 2011), available at <http://www.inmarsat.com/About/Newsroom/00037098.aspx>; IsatPhone Pro proves invaluable during Queensland cyclone (Feb. 9, 2011), available at <http://www.inmarsat.com/About/Newsroom/00037109.aspx>.

space stations and earth stations using this spectrum.<sup>15</sup> Intelsat alone has 12 U.S.-licensed satellites with the capability of providing services in all or portions of the 3600-3650 MHz band. SES WORLD SKIES operates another four satellites within its global fleet with the capability of serving the United States using this band. A wide variety of services is being provided on these FSS satellites, including end-to-end communications solutions to military, commercial and government customers. Typical FSS applications include IP trunking to expand retail Internet services in developing nations and other underserved regions, international video distribution for U.S. programmers, broadband connectivity for enterprises and government, secure government communications, international private lines for dedicated global service, and restoration capability to establish short-term networks in the event of disasters or full-time networks to keep businesses running.

As an ITU report has explained in discussing the extensive FSS use of conventional and extended C-band frequencies throughout the world:

The low atmospheric absorption in these bands enables highly reliable space-to-earth communication links with wide service coverage, particularly in, but not limited to, geographical areas with severe rain fade conditions. The wide coverage enables services to be provided to developing countries, to sparsely populated areas and over large distances.<sup>16</sup>

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<sup>15</sup> See, e.g., licenses held by: AT&T Corp. (call signs KA91, KA273, KA318, KA351, KA378, KA413, KA444, KB32, WA21, WA33, E980066 & E980493); Hawaii Pacific Teleport, LP (call signs E010016 & E030087); MCI Communications Services, Inc. (call signs KA28, KA221, KA323, KA349, KA386, E930190, E990175, E000306, E000589, E000700 & E010140); Reuters America LLC (call sign E950436); and Sprint Communications Co., LP (call sign KA231).

<sup>16</sup> Report ITU-R M.2109, "Sharing studies between IMT Advanced systems and geostationary satellite networks in the fixed-satellite service in the 3400-4200 and 4500-4800 MHz frequency bands," (2007) ("Report ITU-R M.2109") at 4.

These networks represent a substantial long-term investment in satellite capacity and associated ground equipment, and the Commission should avoid stranding that investment in any future actions relating to this spectrum. Satellites that use this spectrum that have already been launched (or which are about to be launched) cannot be reconfigured to use other spectrum if the 3600-3650 MHz spectrum is reallocated.

Extended C-band frequencies are also used for TT&C.<sup>17</sup> Reliable reception of TT&C signals, which allows the operator to track and monitor the status of in-orbit satellites' position, health and operational characteristics, is essential to safe spacecraft operations. Disruption of these signals could mean loss of control over a given satellite and increased risk of collision with other space objects. Accordingly, the Commission must ensure that satellite telemetry communications do not experience harmful interference from any new terrestrial operations introduced in the extended C-band.

**B. To Prevent Stranded Investment, the Commission Should Require that Any New Terrestrial Operations in the 3600-3650 MHz Band Be Compatible with Satellite Networks**

Given the essential nature of the services being provided by satellite networks in the extended C-band today, the Commission must ensure that those uses are protected in the event the Commission decides to introduce new terrestrial operations in the band. The Commission should evaluate any new terrestrial services based on compatibility with satellite operations and permit the terrestrial uses only on a co-primary basis with existing and future satellite facilities. A co-primary framework will ensure that satellite services in the band continue to thrive without significantly limiting terrestrial deployment.

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<sup>17</sup> See, e.g., Intelsat North America LLC, File No. SAT-A/O-2009122300151, call sign S2804, grant-stamped Apr. 2, 2010, Attachment at ¶ 6 (authorizing the Intelsat 25 satellite to conduct telemetry at 3630 MHz).

In particular, the Commission should consider limiting terrestrial use of the spectrum to fixed point-to-point microwave systems.<sup>18</sup> Such systems already share spectrum successfully today on a co-primary basis with satellite networks in the conventional C-band through careful coordination under the Commission's rules.<sup>19</sup> By applying the same coordination principles, the Commission could facilitate efficient use of the 3600-3650 MHz band, allowing continued robust use of the frequencies for satellite operations while also opening up additional spectrum for fixed microwave links.

New fixed wireless facilities in the extended C-band could be used to meet demand for wireless backhaul, for instance. As mobile data use has increased, the need for wireless backhaul capacity has similarly grown.<sup>20</sup> The Commission has expressly recognized the requirement to expand the availability of wireless backhaul capacity in order to meet this growing demand.<sup>21</sup> Making extended C-band frequencies available for fixed microwave facilities on a co-primary basis with earth station operations could help satisfy this significant demand.

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<sup>18</sup> Terrestrial mobile operations pose a greater interference threat to satellite downlinks and are impractical to coordinate, so the Commission should not allow terrestrial mobile use of the 3600-3650 MHz band on a co-primary basis.

<sup>19</sup> The coordination framework for C-band earth station and terrestrial fixed station licensing is set forth in Sections 25.203 and 101.103 of the Commission's rules, 47 C.F.R. §§ 25.203 & 101.103.

<sup>20</sup> See, e.g., *Mobile Data Growth Boosting Backhaul Demand* (May 27, 2009), available at <http://gigaom.com/2009/05/27/mobile-data-growth-boosting-backhaul-demand> (a market research firm estimates that carriers worldwide will need 90,000 Gbps of last mile backhaul capacity by the end of 2013 to support global cellular and WiMAX networks, and microwave links account for a significant portion of backhaul cell site connections).

<sup>21</sup> See *In the Matter of Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees*, Notice of Proposed Rulemaking and Notice of Inquiry, WT Docket No. 10-153, FCC 10-146 (rel. Aug. 5, 2010) at ¶¶ 2-4 (discussing growth in demand for wireless backhaul and increasing reliance on microwave capacity for backhaul).

Furthermore, a co-primary sharing structure would not represent a significant barrier to deployment of new terrestrial facilities. As the Notice explains, under NTIA's reallocation proposal, "non-Federal users would be prohibited from operating up to as much as 570 km from the U.S. coastline, and additional exclusion zones would be established for ten locations."<sup>22</sup> These exclusion zones are designed to prevent interference from Federal ship-borne radars to terrestrial operations.<sup>23</sup> Because satellite operations in this band are limited to international service, most of the U.S. earth stations authorized to operate in these frequencies can be expected to be located within these coastal exclusion zones. For the extended C-band earth stations located outside these zones, the international-service-only restriction would also naturally limit the number of earth stations with which terrestrial stations would have to coordinate.<sup>24</sup> For these reasons, granting co-primary interference protection to future earth station facilities in the 3600-3650 MHz band is unlikely to place any material limits on the areas within which new terrestrial networks in these frequencies could otherwise be deployed.

The substantial overlap between the coastal exclusion zones surrounding federal radar operations and the locations of extended C-band earth stations suggests that the concerns underlying the Commission's 2005 decision regarding allowing new satellite earth station applications in the 3650-3700 MHz band are inapplicable here.<sup>25</sup> Establishing a regime where

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<sup>22</sup> Notice at 3 (footnote omitted).

<sup>23</sup> *Id.*

<sup>24</sup> For example, the Commission has explained that the purpose of the international-only restriction on earth stations operating in the extended Ku-band was to "limit the expansion of FSS in the 11 GHz band and protect the future use of the band for FS." *FiberTower, Inc.*, Report and Order, DA 06-1216, 21 FCC Rcd 6386, 6395 (WTB 2006) (footnote omitted).

<sup>25</sup> The Commission declined to allow new earth station deployments in the 3650-3700 MHz band on a co-primary based on the fear that it would impede widespread use of the band by terrestrial facilities. *See Wireless Operations in the 3650-3700 MHz Band*, Report and Order and Memorandum Opinion and Order, FCC 05-56, 20 FCC Rcd 6502 (2005) ("3650-3700 MHz Order") at ¶ 21, *recon. granted in part*, Memorandum Opinion and Order, 22 FCC Rcd 10421

terrestrial fixed services can operate on a co-primary basis with satellite uses would avoid stranding the substantial investment satellite network operators have made in extended C-band capacity. Such co-primary operations would also allow the continuation and evolution of critical satellite services, while accommodating new terrestrial use of the spectrum.

**C. At a Minimum, the Commission Must Protect Existing Earth Stations in the 3600-3650 MHz Band**

As discussed above, allowing co-primary satellite and terrestrial use of the 3600-3650 MHz band best balances the public interest in robust use of deployed satellite capacity with the desire to introduce new terrestrial services. However, if the Commission declines to take this approach, and to instead relegate future FSS earth stations to secondary status relative to new terrestrial fixed or mobile services, it must at least ensure that existing earth stations in the band are protected from interference due to any such terrestrial operations.

As the Commission has previously recognized, satellite services in extended C-band downlink spectrum, with antennas designed to capture weak signals generated by a satellite tens of thousands of miles away, are highly sensitive to interference. Specifically, the Commission noted that:

FSS earth stations in the 3650 MHz band use high gain antennas that are very susceptible to interference from undesired signals directed toward the main beam. As a result, operation of a . . . device located close to the earth station's main beam azimuth, even with relatively low EIRP, could cause interference at large distances.<sup>26</sup>

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(2007) (“3650-3700 MHz Recon. Order”). Coastal regions where federal systems operate are the most attractive locations for the services provided by extended C-band earth stations, so most new earth stations will be in areas where terrestrial services would be not be feasible because of Federal radar systems.

<sup>26</sup> See *id.* at ¶ 59 & n.119.

Therefore, to prevent harmful interference that would interrupt incumbent services, the Commission must incorporate explicit protections as part of any steps to introduce new terrestrial operations.

These protections should mirror those that were implemented when the 3650-3700 MHz band was reallocated. Specifically, existing earth stations should be grandfathered on a primary basis, and applicants should have an opportunity to license new earth stations with primary status.<sup>27</sup> A 150-km protection zone should be established surrounding each grandfathered earth station in which terrestrial operations will be prohibited unless all affected earth station licensees explicitly agree.<sup>28</sup>

Recognizing that “mobile operations pose a greater risk of causing interference to FSS earth stations than fixed stations,”<sup>29</sup> any terrestrial mobile use of the 3600-3650 MHz band must be subject to added restrictions. The rules should permit such operations only if enabled by a registered base station<sup>30</sup> that is subject to a peak EIRP density limit of 1 Watt/1 MHz, and if mobile terminals are power limited to 1 Watt/25 MHz.<sup>31</sup> The Commission must also impose emission limits to protect satellite operations in adjacent spectrum.<sup>32</sup>

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<sup>27</sup> See *id.* at ¶ 7 (describing grandfathering provisions applicable to 3650 MHz band earth stations and allowance for filing of additional primary earth stations within 10 miles of existing sites).

<sup>28</sup> *Id.* at ¶ 60. Applicants for terrestrial licenses must be required to certify that coordination agreements have been reached with all grandfathered earth stations within 150 km of their proposed sites, as is mandated in the 3650-3700 MHz band today. See FCC Form 601, Schedule M, Item 51 (a registration applicant must “certify that you have negotiated an agreement with the grandfathered satellite earth station Licensee to operate the station that you are registering” if the proposed site is within the 150 km protection zone around a grandfathered earth station).

<sup>29</sup> *3650-3700 MHz Order* at ¶ 51.

<sup>30</sup> *Id.*

<sup>31</sup> *Id.* at ¶ 52; 47 C.F.R. § 90.1321.

<sup>32</sup> *3650-3700 MHz Order* at ¶ 75 (adopting rules requiring that any new terrestrial operations in the 3650-3700 MHz band limit emissions into the adjacent 3600-3650 MHz and 3700-4400 MHz bands by a minimum attenuation of  $43 + 10 \log(P)$ ); 47 C.F.R. § 90.1323.

Strict enforcement of these requirements will be needed to ensure that new terrestrial networks fully comply with protections for satellite earth stations. SIA members have reported occasions in which a 3650-3700 MHz terrestrial licensee attempted to register antenna sites located within 150 km of a grandfathered earth station and inaccurately certified that the site had been coordinated with all earth station licensees. If the Commission licenses terrestrial operations in the 3600-3650 MHz band, it must monitor compliance with protections for incumbent earth stations and make clear that false coordination certifications will be subject to enforcement action.

### **III. RULES TO PROTECT SATELLITE OPERATIONS IN THE ADJACENT 3700-4200 MHZ BAND WILL BE ESSENTIAL IF THE COMMISSION LATER SEEKS TO REALLOCATE THE 4200-4220 MHZ BAND**

Although there are no existing satellite services in the 4200-4220 MHz band, that spectrum is immediately adjacent to conventional C-band downlink frequencies (3700-4200 MHz) that are intensively used for satellite operations. The ITU and its working groups have clearly established that out-of-band and in-band emissions from terrestrial operations below 3700 MHz can detrimentally impact satellite operations above 3700 MHz.<sup>33</sup> There is no reason to expect that terrestrial services immediately above 4200 MHz would be any less damaging to satellite services below 4200 MHz. Accordingly, the Commission must adopt rules to prevent disruption of satellite signal reception in the adjacent 3700-4200 MHz band if it goes forward with a reallocation of the 4200-4220 MHz band.<sup>34</sup>

Conventional C-band spectrum is used for numerous communications services that are critical to the U.S. public safety, national security, and economic stability. Sixty million U.S. households are served by cable systems that rely on C-band satellites for the distribution of

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<sup>33</sup> See, e.g., Report ITU-R M.2109 at 11-32.

<sup>34</sup> See Notice at 4.

hundreds of channels of video programming to over 7000 cable headends across the nation.<sup>35</sup>

C-band satellites are also used to deliver network and syndicated programming to thousands of television and radio stations nationwide. Moreover, U.S. cable programmers often rely on C-band satellite networks to relay their video programming to affiliates and distributors in other parts of the world in order to reach wider audiences.

In addition to video distribution, the C-band is also used for video contribution. Many domestic and international news organizations use C-band satellites for satellite news gathering, enabling live coverage of breaking news and sporting events from all across the United States and around the world.

C-band spacecraft are also used to provide essential communications links in areas where terrestrial infrastructure is limited, including remote parts of the United States. For example, satellites operated by SIA member SES WORLD SKIES are used by the two largest telecommunications service providers in Alaska – AT&T Alaska and GCI – to serve the requirements of customers in remote Alaska for basic voice telecommunications as well as more advanced services.

In addition, the U.S. government uses C-band satellites extensively for communications with its embassies and military bases around the world. To cite but one case in point, both conventional and extended C-band spectrum is used to help distribute the Armed Forces Radio and Television Service to members of the U.S. Armed Forces situated around the world.

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<sup>35</sup> See <http://www.ncta.com/Statistics.aspx> (last visited April 22, 2011).

Furthermore, Commission rules require TT&C channels to be located at the edge of satellite service bands.<sup>36</sup> As a result, the upper edge of the conventional C-band, immediately adjacent to the 4200-4220 MHz band being considered for reallocation, is used for TT&C by satellites with C-band communications payloads. As discussed above, reliable TT&C reception is essential to the safe operation of space stations. It is therefore critical that the Commission protect these frequencies from out-of-band interference.

The Commission has previously recognized the need for emission limits to protect conventional C-band services from interference from terrestrial stations operating in adjacent frequency bands. Specifically, when it reallocated the 3650-3700 MHz band for new terrestrial operations, the Commission adopted a limit on emissions into the adjacent bands requiring a minimum attenuation of  $43 + 10 \log(P)$  below the transmit power, combined with in-band transmit power limits of 1 Watt/1 MHz (for base stations) and 1 Watt/25 MHz (for mobile and portable stations).<sup>37</sup> The Commission determined that implementing these limits was appropriate to ensure that grandfathered satellite operations in adjacent bands are adequately protected from interference.<sup>38</sup> If the Commission decides to pursue a reallocation of the 4200-4220 MHz band, it should apply at least the same rules to protect adjacent conventional C-band signal reception.

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<sup>36</sup> See 47 C.F.R. § 25.202(g).

<sup>37</sup> See *3650-3700 MHz Order* at ¶ 75; see also *3650-3700 MHz Recon. Order* at ¶¶ 56 *et seq.* (addressing the in-band transmit power limits necessary to prevent saturation of low noise block converters on FSS earth stations in adjacent bands).

<sup>38</sup> *Id.* at ¶ 64.

#### IV. CONCLUSION

For the reasons discussed herein, SIA requests that the Commission take steps to protect existing and future satellite services in the context of any reallocation decisions involving the 3550-3650 MHz and 4200-4220 MHz bands.

Respectfully submitted,

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