

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of Applications by	)	
	)	
Orbcomm License Corp.	)	
	)	
For Authority to Modify its Non-Voice, Non-Geostationary Satellite System	)	File No. SAT-MOD-20070531-00076
	)	File No. SAT-AMD-20071116-00161
	)	Call Sign: S2103
	)	
For Modification of System License to Extend the License Term	)	File No. SAT-MOD-20070302-00041
	)	
For Milestone Extension and Extension of Launch Authority	)	File No. SAT-MOD-20020329-00246
	)	File No. SAT-AMD-20020930-00247
	)	
For Special Temporary Authority	)	File No. SAT-STA-20070919-00127

**ORDER AND AUTHORIZATION**

**Adopted: March 21, 2008**

**Released: March 21, 2008**

By the Chief, International Bureau and the Chief, Office of Engineering and Technology:

**I. INTRODUCTION**

1. With this Order, we authorize Orbcomm License Corp. (Orbcomm) to construct, launch, and operate 24 new satellites to replenish and enhance its non-voice, non-geostationary satellite orbit mobile satellite system. This authorization will allow Orbcomm to continue providing two-way messaging and asset tracking and monitoring services, and will permit Orbcomm to augment its service with additional radiofrequency capacity. We also grant Orbcomm an extension of the term of its license, to permit continued operations of both its on-orbit and yet-to-be-launched satellites.

**II. BACKGROUND**

2. Orbcomm is currently the only authorized Little LEO<sup>1</sup> system operator. The Commission first granted a Little LEO license to Orbcomm in 1994, initially authorizing a constellation of 36 satellites, consisting of four lower-inclination orbital planes with eight satellites each, and two high-inclination orbital planes with two satellites each.

3. In the 1998 *Additional Satellites Authorization*, the International Bureau modified the Orbcomm system license to expand the constellation by 12 satellites, to an authorized constellation of 48 satellites.<sup>2</sup> Specifically, Orbcomm was authorized to operate with four orbital planes, each at a 45-degree inclination, with eight evenly spaced satellites in each of those planes. The altitude of satellites in

<sup>1</sup> "Little LEO" commonly refers to a non-voice, non-geostationary satellite orbit mobile-satellite service system, operating in low-Earth orbit using the 137-138 MHz, 148-150.05 MHz, and 400.15-401 MHz frequency bands.

<sup>2</sup> Orbital Communications Corp., *Order and Authorization*, 13 FCC Rcd 10828 (Int'l Bur. 1998) (*Additional Satellites Authorization*).

those planes is based on an immediate post-launch altitude of 825 kilometers. In addition, Orbcomm was authorized to operate eight evenly spaced satellites in each of two additional planes, one plane with a 70-degree inclination and one with a 108-degree inclination. The altitude of satellites in these high-inclination planes was based on an immediate post-launch altitude of 775 kilometers. Subsequently, the Bureau authorized further modifications to some of the orbital parameters and to the configuration of the constellation.<sup>3</sup> Orbcomm eventually launched 36 satellites.<sup>4</sup>

4. As a condition of the *Additional Satellites Authorization*, Orbcomm was required to launch the first two of the additional satellites by September 2002, and to launch the remaining 10 satellites by March 2004. In March 2002, Orbcomm requested a six-month extension of the milestone for launch of the first two additional satellites.<sup>5</sup> In September 2002, Orbcomm requested a three-year extension of launch authority for all 12 of the additional satellites.<sup>6</sup> In addition, in March 2007, Orbcomm filed a modification application requesting to extend the term of its system license for 15 years.<sup>7</sup>

5. Orbcomm filed a further modification application on May 31, 2007, seeking authority to construct, launch, and operate 25 new satellites to be launched in two phases.<sup>8</sup> In its May 31 application, Orbcomm indicated that the first phase of deployment for the 25 new satellites would consist of a single plane of seven satellites to be launched into a circular orbit at an altitude of 690 kilometers, which would then be gradually raised to a final circular operational orbit inclined at 48.5 degrees at an altitude of 750 kilometers. The second phase of deployment would consist of 18 satellites to be later deployed to operate in three planes of six satellites each, inclined in circular orbits at 48.5 degrees at an altitude of 750 kilometers.

6. In addition to proposed changes to its constellation design, Orbcomm's modification application requested authority to operate using additional radio frequencies. Orbcomm requested authority for all 25 new satellites to receive Automatic Identification System (AIS) signals in the

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<sup>3</sup> See *Orbital Communications Corp., Order and Authorization*, 13 FCC Rcd 17525 (Int'l Bur. Sat. and Radiocomm. Div. 1998) (Orbcomm was authorized to substitute one of the four orbital planes at 45° inclination for an equatorial plane (a plane at zero-degree inclination)). In 2002, Orbcomm was authorized to decrease the number of satellites in its two highly-inclined orbital planes, to operate a fourth plane of satellites at 45° inclination, and to increase the altitude of the satellites in the equatorial plane. *Orbital Communications Corp. Application for Modification of its Authorization to Construct, Launch and Operate a Non-Voice, Non-Geostationary Mobile-Satellite System in the 137-138 and 148-150.05 MHz Frequency Bands, Order and Authorization*, 17 FCC Rcd 6337-38 ¶¶ 3-5 (Int'l Bur. 2002).

<sup>4</sup> Through space station failure and attrition in subsequent years, Orbcomm currently maintains a constellation of 30 operational satellites. See *Orbcomm License Corp., IBFS File No. 20070302-00041* at 3 (filed March 2, 2007) (Orbcomm License Extension Application).

<sup>5</sup> *Orbcomm License Corp., IBFS File No. SAT-MOD-20020329-00246* (filed March 29, 2002) (March 2002 Extension Request). The International Bureau granted authority to assign the assets of the Orbcomm system to Orbcomm License Corp. and Orbcomm LLC, in connection with the licensee's bankruptcy reorganization. *Application of Orbital Communications Corp. and Orbcomm Global, L.P. (Assignors) for Consent to Assign Non-Common Carrier Earth and Space Station Authorizations, Experimental Licenses, and VSAT Network to Orbcomm License Corp. and Orbcomm LLC (Assignees), Order and Authorization*, 17 FCC Rcd 4496 (Int'l Bur. 2002).

<sup>6</sup> *Orbcomm, LLC and Orbcomm License Corp., Request for Extension of Launch Authority, IBFS File No. SAT-AMD-20020930-00247* (filed Sept. 30, 2002).

<sup>7</sup> *Orbcomm License Extension Application*.

<sup>8</sup> *Modification Application of Orbcomm License Corp., IBFS File No. SAT-MOD-20070531-00076* (Modification Application). Orbcomm indicates that authorization of the proposed new satellites will effectively render moot its pending milestone extension requests relating to the 12 satellites authorized in the *Additional Satellites Authorization*. *Modification Application* at 4, n. 8.

161.9625-161.9875 MHz and 162.0125-162.0375 MHz frequency bands (AIS bands). AIS is a shipboard broadcast system that transmits a marine vessel's identification and position to aid in navigation and maritime safety.<sup>9</sup> Orbcomm also seeks assignment of additional downlink Little LEO frequencies for operation by satellites in its second phase.<sup>10</sup> On October 5, 2007, the Commission dismissed, without prejudice to re-filing, a portion of Orbcomm's Modification Application requesting authority to operate tracking, telemetry, and control (TT&C) in the 435 MHz frequency band.<sup>11</sup> The Modification Application was placed on public notice on October 5, 2007. In an amendment filed in November 2007, Orbcomm also seeks waiver of Commission rules to operate bi-directional TT&C in the 435 MHz frequency band with satellites in its first phase, on a limited short-term basis immediately after launch.<sup>12</sup> The amendment was placed on public notice on November 30, 2007. No comments were filed on either the modification application or the amendment. On February 29, 2008, Orbcomm filed a letter indicating that the first phase of deployment of new satellites would consist of a single plane of six satellites, rather than seven.<sup>13</sup>

### III. DISCUSSION

#### A. Constellation Modifications

7. Orbcomm seeks authority to construct, launch, and operate 24 new satellites. Because the proposed new satellites are not technically identical to the authorized "first-generation" satellites, application filing requirements apply.<sup>14</sup> In its application, Orbcomm seeks authority to modify its license by adding newly-designed satellites to the existing Orbcomm Little LEO system, with additional radiofrequency capacities. Describing public interest considerations in support of its application for new satellites, Orbcomm states that all of its proposed satellites are designed to be "backwards compatible," so that current customers may continue to use their subscriber communicators, ensuring continuity of service to hundreds of thousands of customers.<sup>15</sup> Orbcomm asserts that its proposed new satellites will take advantage of advances in small satellite technology, and increase the amount of data that can be transmitted by subscriber transceivers. Orbcomm also states that its proposed new satellites and orbital configuration will provide improved coverage and capacity in its system. In light of these considerations, we find that it is in the public interest to authorize Orbcomm to construct, launch, and operate 24 new satellites, with orbital parameters as specified in its Modification Application. These new satellites will enhance the valuable service that Orbcomm's Little LEO system has been providing for more than a decade, and will allow growth and expansion of the Orbcomm system.

<sup>9</sup> Modification Application at 20 n. 32.

<sup>10</sup> Modification Application at 1 (requesting assignment of the "System 1" frequencies, as described in Amendment of Part 25 of the Commission's Rules to Establish Rules and Policies Pertaining to the Second Processing Round of the Non-Voice, Non-Geostationary Mobile Satellite Service, *Report and Order*, 13 FCC Rcd 9111, 9123-24 ¶¶ 28-30 (1997) (*Second Processing Round Report and Order*)).

<sup>11</sup> Letter from Robert G. Nelson, Chief, Satellite Division, to Stephen L. Goodman and Walter H. Sonnenfeldt, counsel for Orbcomm License Corp., DA 07-4160 (Oct. 5, 2007). The Commission noted Orbcomm's indication that it was considering uplink capabilities in the 400 MHz band, but this frequency band is allocated for space-to-Earth downlink transmissions only. *Id.* at 2.

<sup>12</sup> Orbcomm License Corp. Supplemental Authorization Request, File No. SAT-AMD-20071116-00161 (Amendment).

<sup>13</sup> Letter from Walter H. Sonnenfeldt, counsel for Orbcomm License Corp., to Robert Nelson, Chief, Satellite Division (Feb. 29, 2008).

<sup>14</sup> See 47 C.F.R. § 25.142(a)(5). Because the six non-geostationary satellites in the first phase of launch involve the same Little LEO frequencies and service areas as authorized, the bond requirements do not apply. 47 C.F.R. § 25.165(e).

<sup>15</sup> Modification Application at 11.

## B. Radiofrequency Modifications

8. In addition to its request for new satellites, Orbcomm requests modification of its authorization to add frequencies and bandwidth capacity, and to make other changes that reflect improvements in technology since its satellites were first designed more than a decade ago.<sup>16</sup> Specifically, Orbcomm requests assignment to the “System 1” frequencies, as described in the *Second Processing Round Report and Order*.<sup>17</sup> Orbcomm also seeks waiver of Commission rules and authority for all 24 of its proposed new satellites to receive signals in the AIS bands, as well as waiver of Commission rules so that its six first phase satellites can conduct TT&C operations in the 435 MHz frequency band for a limited time.

9. Orbcomm’s on-orbit satellites operate with technical parameters designed to prevent interference to other operations, including Federal government operations. Orbcomm proposes to operate the new satellites consistent with such technical parameters. Specifically, Orbcomm indicates that the power flux-density at the Earth’s surface of its downlink transmissions in the 137-138 MHz frequency band will not exceed -125 dB (W/m<sup>2</sup>/4 kHz).<sup>18</sup> Orbcomm states that it will continue to use its Dynamic Channel Activity Assignment System (DCAAS) to prevent interference to terrestrial operations in the 148-150.05 MHz frequency band.<sup>19</sup> Orbcomm’s satellites are or will be designed and constructed to limit out of band emissions, providing protection for radio astronomy operations in adjacent bands.<sup>20</sup> In addition, Orbcomm’s operations, including the new satellites, will continue to be subject to the agreement between Orbcomm and the National Oceanic and Atmospheric Administration, required as part of the *Additional Satellites Authorization*.<sup>21</sup> In addition, Orbcomm’s fixed and mobile earth stations will continue to be subject to requirements of Footnote US323 of the United States Table of Frequency Allocations.<sup>22</sup>

10. **Little LEO Frequencies.** We grant Orbcomm’s request for assignment of the “System 1” Little LEO frequency bands. In the *Second Processing Round Report and Order*, the Commission concluded that there was sufficient spectrum available for five Little LEO licensees: three licenses to second-round applicants not previously authorized, and two licenses to existing Little LEO licensees, Orbcomm and Volunteers in Technical Assistance (VITA), for modifications to their systems.<sup>23</sup> In subsequent years, all the Little LEO licensees except Orbcomm have either surrendered their

<sup>16</sup> Modification Application at 8-9.

<sup>17</sup> 13 FCC Rcd at 9123-24 ¶¶ 28-30.

<sup>18</sup> Modification Application at 33.

<sup>19</sup> Orbcomm’s existing and new satellites will continue to operate with one 50 kHz feeder link in each direction, centered at 148.61 MHz (uplink) and 137.56 MHz (downlink). Orbcomm does not request authority to operate feeder links in any other frequencies. Modification Application at 10-12.

<sup>20</sup> Modification Application at 34-37.

<sup>21</sup> 13 FCC Rcd at 10836 ¶ 19, 10844 ¶ 42.

<sup>22</sup> Footnote US 323 provides that: “In the 148-149.9 MHz band, no individual mobile earth station shall transmit, on the same frequency being actively used by fixed and mobile stations and shall transmit no more than 1% of the time during any 15 minute period; except, individual mobile earth stations in this band that do not avoid frequencies actively being used by the fixed and mobile services shall not exceed a power density of -16 dBW/4kHz and shall transmit no more than 0.25% of the time during any 15 minute period. Any single transmission from any individual mobile earth station operating in this band shall not exceed 450 ms in duration and consecutive transmissions from a single mobile earth station on the same frequency shall be separated by at least 15 seconds. Land earth stations in this band shall be subject to electromagnetic compatibility analysis and coordination with terrestrial fixed and mobile stations.”

<sup>23</sup> *Second Processing Round Report and Order*, 13 FCC Rcd at 9122 ¶ 25.

authorization or have failed to meet system construction milestones.<sup>24</sup> With the license surrenders and terminations, the Commission has announced that the spectrum segments assigned to systems other than Orbcomm are available<sup>25</sup> under the first-come, first-served procedure described in the Commission's *First Space Station Reform Order*.<sup>26</sup> As the first applicant for the spectrum, we assign Orbcomm the spectrum previously identified for System 1.<sup>27</sup> As Orbcomm observes in its application, sufficient Little LEO spectrum remains available to license three other Little LEO systems after assigning System 1 frequencies to Orbcomm.<sup>28</sup> This action is subject to Orbcomm not commencing operations until coordination is completed under footnote US 324 of the Table of Frequency Allocations.<sup>29</sup>

11. We also grant Orbcomm's request, and permit it to operate in other available Little LEO spectrum until such time as another U.S.-licensed Little LEO system begins operations.<sup>30</sup> Orbcomm must operate jointly in the Little LEO spectrum with any other licensees operating in the System 2, System 3, and VITA system segments under the plan adopted in the *Second Processing Round Report and Order* if and when an applicant is authorized to operate in any of those designated system segments. In the interim, however, we find it in the public interest to allow the one operating Little LEO system to put allocated Little LEO spectrum to productive use, rather than holding the spectrum sub-bands vacant in reserve for future applicants. This means that Orbcomm operations using frequencies other than its primary assigned frequencies are on a non-harmful interference basis with respect to any other lawfully operating radiofrequency operations.<sup>31</sup> Upon commencement of operations by another U.S.-licensed Little LEO system, Orbcomm may operate only in its primary assigned frequency bands, consistent with the plan adopted by the Commission in the *Second Processing Round Report and Order*.

12. **Automatic Identification System Frequencies.** Orbcomm requests modification of its authorization to incorporate an AIS receiver payload onboard all of its proposed new satellites.<sup>32</sup> In 2006, the Commission added footnote US399 to the Table of Frequency Allocations, to reflect designation of AIS channels by the Commission and the National Telecommunications and Information Administration

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<sup>24</sup> E-Sat, Inc., *Memorandum Opinion and Order*, 18 FCC Rcd 7662 (Int'l Bur. 2003); Final Analysis Communication Services, Inc., *Memorandum Opinion and Order*, 19 FCC Rcd 4768 (Int'l Bur. 2004); Leo One Worldwide, Inc., *Memorandum Opinion and Order*, 19 FCC Rcd 5369 (Int'l Bur. 2004).

<sup>25</sup> See Policy Branch Information, Spectrum Available, *Public Notice*, Report No. SPB-202, DA 04-732, 19 FCC Rcd 4804 (Int'l Bur. Sat. Policy Br. 2004) (Final Analysis spectrum); Policy Branch Information, Spectrum Available, *Public Notice*, Report No. SPB-205, DA 04-791, 19 FCC Rcd 5368 (Int'l Bur. Sat. Policy Br. 2004) (Leo One spectrum); Policy Branch Information, *Public Notice*, Report No. SPB-00334, DA 05-3278, 20 FCC Rcd 20273 (Int'l Bur. Sat. Policy Br. 2005) (VITA spectrum).

<sup>26</sup> Amendment of the Commission's Space Station Licensing Rules and Policies and Mitigation of Orbital Debris, *First Report and Order and Further Notice of Proposed Rulemaking*, IB Docket No. 02-34, 18 FCC Rcd 10760, 10792 (2003) (*First Space Station Reform Order*).

<sup>27</sup> Because Orbcomm is assigned additional spectrum, we impose a satellite bond. This is consistent with our policy of imposing a bond on next generation satellites that are authorized to operate in additional satellite frequency bands. Amendment of the Commission's Space Station Licensing Rules and Policies, *First Order on Reconsideration and Fifth Report and Order*, IB Docket No. 02-34, 19 FCC Rcd 12637, 12659 ¶59 (2004).

<sup>28</sup> Modification Application at 24-25.

<sup>29</sup> Footnote US 324 provides that: "Federal and non-Federal satellite systems in the 400.15-401 MHz band shall be subject to electromagnetic compatibility analysis and coordination."

<sup>30</sup> Modification Application at Form 312, Schedule S, block S2: Operating Frequency Bands.

<sup>31</sup> See ¶¶ 22(a), 23(a), *infra*.

<sup>32</sup> Modification Application at 20. The two frequency bands requested are 161.9625-161.9875 MHz (AIS 1 with a center frequency at 161.975 MHz), and 162.0125-162.0375 MHz (AIS 2 with a center frequency at 162.025MHz).

(NTIA).<sup>33</sup> Orbcomm seeks authority to receive AIS signals from ships. The frequency bands in which these signals are transmitted are not, however, allocated in the United States for satellite services.<sup>34</sup>

13. Orbcomm seeks waiver of Commission rules to the extent necessary to permit its proposed AIS operations.<sup>35</sup> Orbcomm was awarded a contract by the U.S. Coast Guard to develop and demonstrate the ability to receive, collect, and forward AIS data over the Orbcomm satellite system.<sup>36</sup> Orbcomm proposes to forward AIS information gathered by its satellites through its Little LEO system feeder links to an Orbcomm gateway, and then through the Orbcomm Network Control Center to the Coast Guard, in support of the Coast Guard's maritime domain awareness program.<sup>37</sup> Orbcomm hopes to demonstrate that its satellites can collect and forward AIS data from ships located well beyond the coasts of the United States in a cost effective and timely fashion.<sup>38</sup>

14. Section 1.3 of the Commission's rules authorizes the Commission to waive its rules for "good cause shown."<sup>39</sup> Waiver is appropriate only if special circumstances warrant a deviation from the general rule and such deviation would better serve the public interest than would strict adherence to the general rule.<sup>40</sup> Generally, the Commission may grant a waiver of its rules in a particular case only if the relief requested would not undermine the policy objective of the rule in question and would otherwise serve the public interest.<sup>41</sup>

15. The Commission may grant a waiver of the Table of Allocations for non-conforming uses of spectrum when there is little potential for interference into any service authorized under the Table of Allocations.<sup>42</sup> Because Orbcomm will only receive existing AIS signals transmitted by maritime vessels, there is no risk of additional interference. We find that it is in the public interest to waive the Table of Frequency Allocations to the extent necessary to permit Orbcomm to launch and operate satellites capable of receiving the requested AIS frequencies.<sup>43</sup> Further, we condition the authorization to require that Orbcomm not claim protection from interference caused to it by any other lawfully operating radiofrequency operations in these bands.

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<sup>33</sup> Amendment of the Commission's Rules Regarding Maritime Automatic Identification Systems, *Report and Order and Further Notice of Proposed Rulemaking and Fourth Memorandum Opinion and Order*, WT Docket No. 04-344, 21 FCC Rcd 8892 (2006) (*Maritime Automatic Identification Systems FNPRM*).

<sup>34</sup> The bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz were allocated at WRC-07 to the mobile-satellite service (Earth-to-space) on a secondary basis for the reception of AIS emissions. COM4/332/20 (WRC-07).

<sup>35</sup> Modification Application at 40.

<sup>36</sup> Modification Application at 20, Amendment at 6.

<sup>37</sup> Modification Application at 3 n.5.

<sup>38</sup> Amendment at 6.

<sup>39</sup> See Section 1.3 of the Commission's rules, 47 C.F.R. § 1.3. See also *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969) (*WAIT Radio*); *Northeast Cellular Telephone Co.*, 897 F.2d 1164 (D.C. Cir. 1990) (*Northeast Cellular*).

<sup>40</sup> *Northeast Cellular*, 897 F.2d at 1166.

<sup>41</sup> *WAIT Radio*, 418 F.2d at 1157.

<sup>42</sup> *Fugro-Chance, Inc., Order and Authorization*, 10 FCC Rcd 2860 (Int'l Bur. 1995) (authorizing operations of receive-only mobile earth terminals in the 11.7-12.2 GHz band on a non-interference basis).

<sup>43</sup> The Commission is currently considering in its pending AIS rulemaking proceeding whether satellite AIS operations are inconsistent with the Table of Allocations and, if so, whether the Table should be amended. See *Maritime Automatic Identification Systems NPRM*, 21 FCC Rcd at 8934 n.291. Grant of Orbcomm's waiver request is without prejudice to, and conditioned on, the outcome of that proceeding.

16. *Telemetry, Tracking, and Control in the 435 MHz Frequency Band.* Orbcomm requests authorization to launch its first phase of six satellites in early 2008 with the capacity to operate TT&C links for initial deployment operations and possible future emergency restoration capability in the 435 MHz frequency band. Specifically, Orbcomm requests authority to operate two half-duplex, bi-directional 15 kHz channels at the 435.465 MHz and 435.515 MHz center frequencies. The international allocation for these frequencies is to radiolocation on a primary basis in all regions, and to amateur service on a secondary basis in Regions 2 and 3 and on a primary basis in Region 1.<sup>44</sup> The 2003 World Radiocommunication Conference in Geneva (WRC-03) allocated the 435 MHz band to the Earth Exploration Satellite Service (EESS) on a secondary basis throughout the world, and adopted an international footnote (5.279A) that effectively limits the operational use of the band to areas outside the United States.<sup>45</sup> At WRC-03, this EESS allocation was limited to areas outside the United States, based on Department of Defense concerns about the protection of its radiolocation systems. Orbcomm requests satellite transmissions only when within line-of-sight of three earth stations authorized by the Administrations of Germany or Russia (at Kaluga and Omsk), except for an initial 435 MHz beacon signal transmitted immediately after launch, until acquired by an earth station that commands the satellite to cease beacon transmissions. In the United States, the band is allocated to the radiolocation service on a primary basis for Federal use, and to the amateur service on a secondary basis.<sup>46</sup> In addition, the band is allocated for amateur satellite service both in the United States and internationally.<sup>47</sup>

17. The proposed Orbcomm TT&C links will communicate with two existing earth stations in Russia and possibly a third in Germany. Orbcomm plans to transfer all TT&C operations to its regular in-band Little LEO gateway links on the communications payloads once the initial deployment and testing phase for the spacecraft is complete, anticipating that this process will be complete within four weeks after launch.<sup>48</sup> At that point, transmissions over the 435 MHz frequency band will be disabled, not to be used again except in the case of emergency restoration operations in the event of a gateway link failure, in which case restoration TT&C operations would be very limited in time, perhaps involving a single pass of the affected satellite over Earth while the satellite communications payload is “rebooted.” Orbcomm also observes that amateur radio satellites have operated successfully in this frequency band without causing harmful interference, and Orbcomm notes that the EESS was permitted to conduct short duration pre-

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<sup>44</sup> 47 C.F.R. § 2.106. For frequency allocation purposes, the International Telecommunication Union (ITU) has divided the world into three Regions. ITU Region 1 includes Europe, Africa, territories of the former U.S.S.R. in Asia, as well as portions of the Arctic, Atlantic and Pacific Oceans. ITU Region 2 includes North and South America. ITU Region 3 includes Southern Asia, Australia, New Zealand, and some Pacific Islands. Section 2.104 of the Commission's rules provides a detailed description of the ITU Regions along with a map of the world with designations of respective ITU Regions. 47 C.F.R. § 2.104.

<sup>45</sup> Amendment of Parts 2, 25, and 73 of the Commission's Rules to Implement Decisions from the World Radiocommunication Conference (Geneva, 2003) (WRC-03) Concerning Frequency Bands Between 5900 kHz and 27.5 GHz and to Otherwise Update the Rules in this Frequency Range, *Report and Order*, ET Docket No. 04-139, 20 FCC Rcd 6570, 6614 (2005) (*WRC-03 Implementing Order*). At the request of the National Telecommunications and Information Administration (NTIA), the Commission also allocated the band to EESS on a secondary basis for Federal use, and required that space stations operating under the allocation not cause harmful interference to, nor claim protection from, the radiolocation, amateur, and amateur-satellite services in the United States. *WRC-03 Implementing Order*, 20 FCC Rcd at 6616. The Commission explained that this action would permit the National Aeronautics and Space Administration (NASA) to perform limited pre-operational testing of its systems within line-of-sight of its U.S. control stations. *Id.*

<sup>46</sup> 47 C.F.R. § 2.106, footnotes G2, US217, and US7. *See also, WRC-03 Implementing Order*, 20 FCC Rcd at 6614.

<sup>47</sup> 47 C.F.R. § 2.106 footnote 5.282; ITU Radio Regulations Note 5.282.

<sup>48</sup> Amendment at 4. Orbcomm's current in-band TT&C operations are conducted on a 50 kHz uplink centered on 149.61 MHz, and a 50 kHz downlink centered on 137.67 MHz. Modification Application at 10.

operational testing in this band.<sup>49</sup> Orbcomm asserts that its limited use of this band for pre-operational testing of satellites with earth stations in Russia and Germany is similar to the limited duration permissible use of the band by NASA for pre-operational testing.<sup>50</sup>

18. Orbcomm seeks a waiver of the Commission's rules to the extent necessary to conduct TT&C operations in the band for a short term after launch of its first phase of six satellites.<sup>51</sup> Orbcomm explains that expedited construction of the first phase satellites was made possible by installing main communications payload components, already constructed by its original satellite manufacturer, in satellite buses already constructed by Polyot, a leading Russian satellite manufacturer.<sup>52</sup> Consequently, Orbcomm stresses that its satellites are prepared for launch in the very near future. The requested 435 MHz TT&C links are an embedded component of the Polyot satellite bus design, providing the only TT&C connectivity available during the initial spacecraft deployment phase, and are required to command deployment of the buses and the Orbcomm communications payload, including the communications payload antenna.<sup>53</sup>

19. Orbcomm's proposed short-term space station TT&C operations are consistent with operating on a non-harmful interference basis. Accordingly we condition Orbcomm's authority in this band to provide that Orbcomm shall not cause, and cannot claim protection from, harmful interference. We note that Orbcomm relates that Polyot, the Russian manufacturer of the satellite buses for these six satellites, has employed these frequencies and the two Russian earth stations for a number of prior successful launches, reportedly without causing any harmful interference.<sup>54</sup> We also note that existing allocations in this frequency band have provided for similar short-duration, pre-operational testing.

20. We find that waiver of two rules to grant Orbcomm's request is in the public interest. The first rule, Section 25.202(g), effectively limits operators to TT&C links in the same frequency bands as their primary service operations.<sup>55</sup> The purpose of this rule is to simplify the coordination process for satellite systems, to provide an incentive for an operator to maximize the efficiency of its system's TT&C operations, and to minimize the constraints placed on other satellite operations.<sup>56</sup> We waive this rule based upon the extremely limited scope and duration of frequency use on a non-harmful interference basis and the limited nature of other satellite use of this band. The second rule, Section 25.112(a)(3), requires dismissal of applications seeking authority to operate in a frequency band not allocated under the International Telecommunication Union Radio Regulations.<sup>57</sup> In adopting that rule, the Commission sought to avoid delays in the initiation of service caused by applications being filed years before necessary allocations were adopted.<sup>58</sup> Because Orbcomm is not seeking to operate in the 435 MHz frequency band pursuant to an allocation, but will operate on a non-harmful interference basis with

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<sup>49</sup> 47 C.F.R. § 2.106 US footnote 397.

<sup>50</sup> Amendment at 5. *See WRC-03 Implementing Order*, 20 FCC Rcd at 6616.

<sup>51</sup> Modification Application at 3 n.6, Amendment at 4.

<sup>52</sup> Amendment at 3.

<sup>53</sup> Amendment at 3.

<sup>54</sup> Amendment at 3.

<sup>55</sup> *Wireless Operations in the 3650-3700 MHz Band, Report and Order and Memorandum Opinion and Order*, ET Docket No. 04-151, 20 FCC Rcd 6502, 6533 ¶ 87 (2005) (*Extended C-Band Order*).

<sup>56</sup> *Id.*

<sup>57</sup> 47 C.F.R. § 25.112(a)(3).

<sup>58</sup> *First Space Station Reform Order*, 18 FCC Rcd at 10809 ¶ 124.



respect to any allocated services in the band, that concern is not relevant in this case. Accordingly, we also waive Section 25.112(a)(3).

### C. Procedural Matters

21. In its modification application, Orbcomm indicates that authorization of the proposed new satellites will effectively render moot its pending milestone extension requests relating to the 12 satellites authorized in the *Additional Satellites Authorization*.<sup>59</sup> As a result, we dismiss the milestone extension applications. Orbcomm is no longer authorized to launch and operate 12 additional satellites under prior grants, and its future operations will be governed by the authority granted in this Order.

## IV. ORDERING CLAUSES

22. Accordingly, IT IS ORDERED that the application of Orbcomm License Corp. to modify its license (Call Sign S2103) for a non-voice, non-geostationary satellite orbit mobile satellite system, File No. SAT-MOD-20070531-00076, and SAT-AMD-20071116-00161, IS GRANTED, and Orbcomm License Corp. IS AUTHORIZED to construct, launch, and operate six satellites capable of operating in the 137-138 MHz and 148-150.05 MHz frequency bands, receiving in the 161-163 MHz frequency band, and operating with bi-directional tracking, telemetry and control links on two half-duplex, bi-directional 15 kHz channels operating at 435.465 MHz and 435.515 MHz center frequencies, in accordance with the technical specifications set forth in its application and in compliance with Commission Rules, unless expressly waived, and subject to the following conditions:

- a. Operations in the frequency bands designated for Orbital Communications Corporation in the spectrum sharing plan adopted in the *Report and Order* in "Amendment of Part 25 of the Commission's Rules to Establish Rules and Policies Pertaining to the Second Processing Round of the Non-Voice, Non-Geostationary Mobile Satellite Service," FCC 97-370, 13 FCC Rcd 9111, generally including the 148-148.25 MHz, 148.75-148.855 MHz, and 148.905-149.9 MHz uplink frequency bands, and the 137.175-137.3275 MHz, 137.4225-137.4725 MHz, 137.535-137.585 MHz, 137.650-137.750 MHz and 137.7875-137.8125 MHz downlink frequency bands shall be on a primary basis. Operations on other frequencies in the 137-138 MHz and 148-150.05 MHz frequency bands are authorized, subject to Orbcomm License Corp. operating using only frequency bands assigned to it on a primary basis, consistent with the spectrum sharing plan adopted by the Commission in that *Report and Order*, upon commencement of operations by another U.S.-licensed non-voice, non-geostationary mobile satellite system.
- b. Operations in the 161.9625-161.9875 MHz and 162.0125-162.0375 MHz frequency bands are on a non-harmful interference basis, meaning that Orbcomm License Corp. shall not claim protection from interference caused to it by any other lawfully operating radiofrequency operations.
- c. Tracking, Telemetry & Control operations at 435 MHz, after initial acquisition of the beacon signal transmitted immediately after launch, shall be limited to transmissions within line-of-sight with up to three earth stations authorized by the Administrations of Germany or Russia (at Kaluga and Omsk) for a period of four weeks following launch, and for emergency restoration thereafter, and are on a non-harmful interference basis, meaning that Orbcomm License Corp. shall not claim protection from interference caused to it by any other lawfully operating radiofrequency operations.
- d. Launch of these six satellites shall be completed no later than March 21, 2009.

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<sup>59</sup> Modification Application at 4 n.8.

23. IT IS FURTHER ORDERED that Orbcomm License Corp. IS AUTHORIZED to construct, launch, and operate 18 satellites capable of operating in the 137-138 MHz and 148-150.05 MHz, and 400.15-401 MHz frequency bands, and of receiving in the 161-163 MHz frequency band, in accordance with the technical specifications set forth in its application and in compliance with the Commission's Rules, unless expressly waived, and subject to the following conditions:

- a. Operations in the frequency bands designated for Orbital Communications Corporation in the spectrum sharing plan adopted in the *Report and Order* in "Amendment of Part 25 of the Commission's Rules to Establish Rules and Policies Pertaining to the Second Processing Round of the Non-Voice, Non-Geostationary Mobile Satellite Service," FCC 97-370, 13 FCC Rcd 9111, generally including the 148-148.25 MHz, 148.75-148.855 MHz, and 148.905-149.9 MHz uplink frequency bands, and the 137.175-137.3275 MHz, 137.4225-137.4725 MHz, 137.535-137.585 MHz, 137.650-137.750 MHz and 137.7875-137.8125 MHz downlink frequency bands, and in the frequency bands described as "System 1" in that same *Report and Order*, generally including the 148-148.25 MHz, 148.75-148.855 MHz, 148.905-149.81, and 150.05 MHz uplink frequency bands, and the 137-137.025 MHz, and 400.15-400.505, and 400.645-401 MHz downlink frequency bands, shall be on a primary basis. Operations on other frequencies in the 137-138 MHz and 148-150.05 MHz frequency bands are authorized, subject to Orbcomm License Corp. operating using only frequency bands assigned to it on a primary basis, consistent with the spectrum sharing plan adopted by the Commission in that *Report and Order*, upon commencement of operations by another U.S.-licensed non-voice, non-geostationary mobile satellite system.
- b. Operations in the 161.9625-161.9875 MHz and 162.0125-162.0375 MHz frequency bands are on a non-harmful interference basis, meaning that Orbcomm License Corp. shall not claim protection from interference caused to it by any other lawfully operating radiofrequency operations.
- c. Operations in the 400.15-401 MHz frequency band will not commence until coordination is completed under footnote US324 of the U.S. Table of Frequency Allocations.
- d. The authorization for these 18 satellites shall become null and void with no further action required on the Commission's part in the event that Orbcomm License Corp.'s space stations are not constructed, launched and placed into operation in accordance with the technical parameters and terms and conditions of this authorization by the following dates:

<b>Milestone</b>	<b>Deadline</b>
Enter Non-contingent Satellite Manufacturing Contract	March 21, 2009
Complete Critical Design Review	March 21, 2010
Begin Physical Construction of All Satellites	September 21, 2011
Complete Construction and Launch First Two Satellites in System	September 21, 2012
Certify Entire System Operational	March 21, 2014

Orbcomm License Corp. must file a performance bond with the Commission in the amount of \$5 million, pursuant to the procedures set forth in Public Notice, DA 03-2602, 18 FCC Rcd 16283 (2003), within 30 days of the date of this grant, by April 21, 2008.

24. IT IS FURTHER ORDERED that Sections 25.112(a)(3) and 25.202(g) of the Commission's Rules, 47 C.F.R. §§ 25.112(a)(3) and 25.202(g), ARE WAIVED, to permit operations of bi-directional tracking, telemetry and control links for testing on two half-duplex, bi-directional 15 kHz channels operating at 435.465 MHz and 435.515 MHz center frequencies, on the first six additional satellites launched, immediately after launch, and for a period of up to four weeks following launch, and for emergency restoration operations.

25. IT IS FURTHER ORDERED that Sections 2.102(a) and 2.106 of the Commission's Rules, 47 C.F.R. §§ 2.102(a) and 2.106, ARE WAIVED, for the purpose of permitting reception by satellites in the Orbcomm satellite system of maritime automatic identification system signals in the 161.9625-161.9875 MHz and 162.0125-162.0375 MHz frequency bands.

26. IT IS FURTHER ORDERED that Orbcomm License Corp.'s application, File No. SAT-MOD-20070302-00041, to modify the term of its license (Call Sign S2103), IS GRANTED, and Orbcomm License Corp. IS AUTHORIZED to continue the operations of its currently operational satellites, and to operate the additional satellites authorized by this *Order and Authorization*, for a term ending April 2025, provided that prior to launching any satellites as replacements for satellites in operation as of the date of this *Order and Authorization*, Orbcomm must seek and obtain prior FCC approval, through the filing of a license modification application demonstrating that the end-of-life disposal plans for such replacement satellites are consistent with appropriate limits.

27. IT IS FURTHER ORDERED that the applications of Orbcomm License Corp. to extend milestones, File No. SAT-MOD-20020329-00246 and File No. SAT-AMD-20020930-00247, are DISMISSED.

28. IT IS FURTHER ORDERED that the application of Orbcomm License Corp. for special temporary authority, File No SAT-STA-20070919-00127, IS DISMISSED.

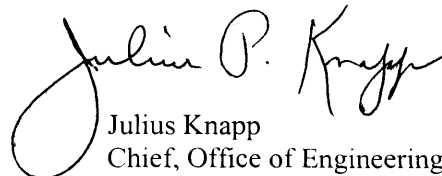
29. IT IS FURTHER ORDERED that Orbcomm License Corp. is granted 30 days from the date of the release of this *Order and Authorization* to decline this authorization as conditioned. Failure to respond within that period will constitute formal acceptance of the authorization as conditioned.

30. This *Order and Authorization* is issued pursuant to Sections 0.241 and 0.261 of the Commission's rules on delegated authority, 47 C.F.R. §§ 0.241 and 0.261, and is effective upon release.

FEDERAL COMMUNICATIONS COMMISSION



Helen Domenici  
Chief, International Bureau



Julius Knapp  
Chief, Office of Engineering and Technology