

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

\_\_\_\_\_  
In the Matter of )  
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**Star One S.A.** ) File No. \_\_\_\_\_  
 )  
Letter of Intent for Authority )  
to Access the U.S. Market Using )  
Extended Ku-band Spectrum on the )  
Star One C3 Satellite from 75° W.L. )  
\_\_\_\_\_ )

To: The International Bureau

**LETTER OF INTENT**

Star One S.A.

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September 14, 2011

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**LETTER OF INTENT**

Star One S.A. (“Star One”), by its attorneys, respectfully files this Letter of Intent with the Commission – pursuant to Section 25.137 of the Commission’s rules, the *DISCO II First Reconsideration Order*, and the *Space Station Licensing Reform Order*<sup>1</sup> – to provide Fixed Satellite Service (“FSS”) services into the United States in the Extended Ku-band from the Star One C3 satellite at 75° W.L., a satellite licensed under the authority of the administration of Brazil.<sup>2</sup>

Star One has been licensed by Brazil to operate the Star One C3 satellite at the 75° W.L. orbital location.<sup>3</sup> Star One will provide a wide array of FSS services from the Star One C3

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<sup>1</sup> See 47 C.F.R. § 25.137; see also *Amendment of the Commission’s Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States*, First Order on Reconsideration, 15 FCC Rcd. 7207 (1999) (“*DISCO II First Reconsideration Order*”); *Amendment of the Commission’s Space Station Licensing Rules and Policies*, First Report and Order and Further Notice of Proposed Rulemaking, 18 FCC Rcd. 10760 (2003) (“*Space Station Licensing Reform Order*”).

<sup>2</sup> See Anatel Term Right of Exploitation, Act No. 63.338 (attached as “Attachment B”).

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

satellite in the C-, Ku-, and Extended C- and Extended Ku-band frequencies throughout North, Central, and South America. Star One seeks to offer satellite communications services on routes to, from, and within the United States in Extended Ku-band spectrum.<sup>4</sup> As demonstrated herein, permitting Star One C3 to serve the United States in the Extended Ku-band from 75° W.L. would strongly serve the public interest.

In addition, to the extent necessary, Star One requests a waiver of certain milestones and a partial waiver of the requirement to post a \$3 million bond pursuant to Sections 25.137, 25.164, and 25.165 of the Commission's rules. Star One has entered into a non-contingent contract with Orbital Sciences Corporation ("Orbital") for the construction of Star One C3, has completed critical design review ("CDR") for the satellite, and has commenced construction of the satellite.<sup>5</sup> Accordingly, the first three milestone requirements for Star One C3 have already been met. Moreover, because these milestones have been satisfied, the Commission should reduce the amount of the bond that Star One must post for the Star One C3 satellite to \$750,000.<sup>6</sup>

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<sup>4</sup> The Star One C3 Extended Ku-bands encompass 13.75-14.0 GHz (downlink) and 10.95-11.2 GHz (uplink).

<sup>5</sup> See Section II, *infra*, and Attachments D and E.

<sup>6</sup> 47 C.F.R. § 25.165(d) permits a GSO-like licensee to reduce the amount of the bond by 25 percent of the original bond amount upon meeting each implementation milestone in Section 25.164. The bond and milestone requirements in Sections 25.164 and 25.165 apply to space stations that seek to serve the United States through a Letter of Intent. See 47 C.F.R. § 25.137(d).

**I. ALLOWING THE C3 SATELLITE TO SERVE THE UNITED STATES IN THE EXTENDED KU-BAND WOULD SERVE THE PUBLIC INTEREST**

In the *DISCO II Order*, the Commission set forth the public interest analysis applicable in evaluating requests to use non-U.S. licensed space stations to provide satellite service in the United States.<sup>7</sup> This analysis considers the effect on competition in the United States, spectrum availability, eligibility, and operating (*e.g.*, technical) requirements, and national security, law enforcement, foreign policy, and trade concerns.<sup>8</sup> These factors support granting this Letter of Intent for Star One C3.

**A. Competition Considerations**

Star One will operate C3 at the 75° W.L. orbital location pursuant to authorizations granted by the Brazilian National Telecommunications Agency (“Anatel”).<sup>9</sup> Brazil is a member of the World Trade Organization (“WTO”), and Star One seeks access to the U.S. market to provide FSS services covered by the WTO Basic Telecommunications Agreement. Accordingly, the Commission applies a presumption in favor of granting Star One’s request to serve the United States in the Extended Ku-band, and Star One is not required to make the effective competitive opportunities demonstration set forth in Section 25.137(a)(2) of the Commission’s rules.<sup>10</sup>

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<sup>7</sup> See *Amendment of the Commission’s Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States*, 12 FCC Rcd. 24094 ¶ 29 (1997) (“*DISCO II Order*”).

<sup>8</sup> See generally *id.* ¶¶ 30-182.

<sup>9</sup> See Exhibit B.

<sup>10</sup> See 47 C.F.R. § 25.137(a)(2); see also *DISCO II Order* ¶ 39 (“We adopt our proposal to apply a presumption in favor of entry in considering applications to access non-U.S. satellites licensed by WTO Members to provide services covered by the U.S. commitments under the WTO Basic Telecom Agreement.”); *id.* ¶ 64 (“[W]e will not evaluate the effective competitive opportunities in the route market for non-U.S. satellites licensed by a WTO Member providing

Significantly, the Commission has already authorized Star One to access the U.S. market through placement of satellites on the Permitted Space Station List.<sup>11</sup> Nothing has changed that would alter the Commission's prior conclusions with respect to the pro-competitive benefits of Star One's access to the U.S. market. Moreover, the successful operations of both Star One C1 and Star One C2 as Permitted List satellites supports granting this Letter of Intent for Star One C3.

Open access to the U.S. market for the Star One C3 satellite will help continue to fulfill the promise of the WTO Basic Telecommunications Agreement with respect to satellite communications services. Service from the Star One C3 satellite will enhance competition in the FSS services market, thereby stimulating lower rates, improving service quality, increasing service options, and fostering technological innovation. The Commission has consistently relied on these same public interest benefits in granting similar requests for foreign satellites to access the U.S. market.<sup>12</sup>

## **B. Spectrum Availability**

The Star One C3 satellite will provide service from the 75° W.L. orbital location pursuant to a satellite authorization issued by Anatel and satellite network coordination information filed by Brazil with the International Telecommunication Union. This Letter of Intent proposes to

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WTO-covered services. Thus, we will not perform an ECO-Sat test on any route, whether a WTO route market or a non-WTO route market.”)

<sup>11</sup> See *Stamp Grant*, File No. SAT-PPL-20050706-00143, Call Sign S2677 (granted Mar. 29, 2006) (“*Star One C1 Order*”); *Stamp Grant*, File No. SAT-PPL-20050708-00144, Call Sign S2678 (granted Sept. 9, 2005) (“*Star One C2 Order*”).

<sup>12</sup> See, e.g., *Stamp Grant*, File No. SAT-LOI-20091110-00119, Call Sign S2753 (granted May 5, 2010); *Stamp Grant*, File Nos. SAT-LOI-20080107-00006, SAT-AMD-20080623-00131, SAT-AMD-20090213-00023, Call Sign S2747 (granted Aug. 18, 2009).

access the U.S. market with C3 only in the Extended Ku-band between 13.75-14.0 GHz for uplink and 10.95-11.2 GHz for downlink.

In the *DISCO II Order*, the Commission determined that, given the scarcity of geostationary orbital locations and spectrum resources, it would consider spectrum availability as a factor in determining whether to allow a foreign satellite to serve the United States.<sup>13</sup> The Commission further stated that when grant of access would create interference with U.S.-licensed systems, it may impose technical constraints on the foreign system's operations in the United States or, when conditions cannot remedy the interference, deny access. This is not of concern here.

Currently there are no operational Extended Ku-band satellites two degrees away from the 75° W.L. location, nor are there any pending applications before the Commission to use the Extended Ku-bands at a location two degrees away from 75° W.L. Nevertheless, as the Commission is aware, Star One has held productive coordination discussions with U.S. satellite operators and concluded a number of coordination agreements. Star One will operate the Star One C3 satellite in accordance with those agreements and in conformity with the Commission's two-degree spacing rules. Thus, allowing Star One to serve the United States using the Star One C3 satellite at 75° W.L. will neither adversely affect the operations of any U.S.-licensed satellites nor contravene the Commission's spectrum/frequency management policies.

### **C. Eligibility Requirements**

The Commission has concluded that non-U.S. space station operators must meet the same qualifications as U.S.-licensed space station operators to obtain a satellite license.<sup>14</sup> The

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<sup>13</sup> See *DISCO II Order* ¶ 150.

<sup>14</sup> See *id.* ¶¶ 154-59.

information provided in this Letter of Intent, associated attachments, and the accompanying FCC Form 312 demonstrate that Star One satisfies the Commission's requirements.

### **1. Legal Requirements**

The Commission will grant a Letter of Intent for a foreign satellite operator to serve the United States where the request is accompanied by the information demonstrating compliance with Sections 25.114 (applications for space station authorizations) and 25.137 (application requirements for earth stations operating with non-U.S. licensed space stations) of the Commission's rules.<sup>15</sup>

The general legal information required by Section 25.114 (*e.g.*, submission of a comprehensive proposal on FCC Form 312 and applicant information)<sup>16</sup> is set forth in the accompanying FCC Form 312 and its attachments, and the public interest considerations supporting grant are discussed throughout this Letter of Intent.<sup>17</sup> Star One provides the following additional legal information required by Section 25.114:

- Star One seeks to serve the United States from 75° W.L. with the Star One C3 satellite using Extended Ku-band frequencies;<sup>18</sup>
- Star One seeks to provide service in the United States using any available transponder with U.S. coverage on a non-common carrier basis only through satellite transponder leases and other individual contractual arrangements;<sup>19</sup> and

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<sup>15</sup> See *DISCO II First Reconsideration Order* ¶¶ 10, 16, 28-30. Section 25.114 sets forth certain technical application requirements which are addressed, *infra*, in Section I.C.2 of this petition and the Technical Appendix attached hereto. See Star One C3 Technical Appendix (Attachment A).

<sup>16</sup> See 47 C.F.R. § 25.114(a), (c)(1)-(2).

<sup>17</sup> *Id.* § 25.114(c)(16).

<sup>18</sup> *Id.* § 25.114(c)(3).

<sup>19</sup> *Id.* § 25.114(c)(14).



- A satellite construction contract for Star One C3 has already been executed with Orbital, critical design review has been completed, and construction of the satellite has begun. Star One plans to launch the Star One C3 satellite in 2012, years ahead of the Commission's 5-year launch and operation milestone requirement for geostationary satellites.<sup>20</sup>

With respect to the legal qualification information required by Section 25.137, the Star One C3 satellite is licensed by Brazil, a WTO member nation, and will provide services covered by the WTO Basic Telecommunications Agreement. Accordingly, Star One is not required to make an effective competitive opportunities demonstration, and the Commission instead applies a presumption in favor of entry.<sup>21</sup> The additional legal information required by Section 25.137 of the Commission's rules is provided in this Letter of Intent, in the attached ownership Attachment,<sup>22</sup> and in the associated FCC Form 312.<sup>23</sup> In view of the foregoing, Star One plainly meets the Commission's legal requirements for serving the United States with a foreign-licensed satellite in the Extended Ku-band.

## **2. Technical Requirements**

Included with this Letter of Intent are a Technical Appendix (including an Orbital Debris Mitigation Plan), a Schedule S, and relevant antenna gain contour data. In addition, Star One provides the following technical information required by Sections 25.114 and 25.137 of the Commission's rules:

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<sup>20</sup> See Part II and Exhibit 4, *infra*.

<sup>21</sup> See 47 C.F.R. § 25.137(a)(1)-(2).

<sup>22</sup> See Star One Ownership and Officers and Directors (attached as Attachment C).

<sup>23</sup> The Commission now requires electronic filing of Letters of Intent to serve the U.S. market using foreign-licensed satellites. Accordingly, please refer to the electronic version of FCC Form 312 to which this narrative is attached.

- **General Description of the Star One C3 Satellite.**<sup>24</sup> The Star One C3 satellite is a state-of-the-art hybrid C-/Ku-band communications satellite based on the Orbital Sciences Corporation Enhanced Star 2.4 spacecraft bus. Designed to provide service throughout the Americas, the satellite will offer services in the United States in Extended Ku-band only. Star One C3 has 6 transponders utilizing the Extended Ku-band, each with a bandwidth of 72 MHz, and each using both linear polarizations, thereby employing full dual-frequency re-use. Each Extended Ku-band transponder can switch between the satellite's 2 Ku-band beams: the Brazilian beam and the Andean beam. The Andean beam covers portions of the southeastern United States.
- **Technical Information Regarding Radio Frequencies, Emissions, and Antenna Characteristics.**<sup>25</sup> The information required by Section 25.114(c)(5) as it relates to the Extended Ku-band payload of the Star One C3 satellite is provided in the attached Technical Appendix and the accompanying Schedule S submission, including the following: (i) radio frequencies and polarization plans; (ii) center frequency and polarization of transponders; (iii) emission designators and allocated bandwidth of emissions; (iv) final amplifier output power; (v) identification of which antenna beams are connected or switchable to each transponder and TT&C function; (vi) receiving system noise temperature; (vii) relationship between satellite receive antenna gain pattern and gain-to-temperature ratio and saturation flux density for each antenna beam; (viii) gain of each transponder channel (between output of receiving antenna and input of transmitting antenna) including any adjustable gain step capabilities; and (ix) predicted receiver and transmitter channel filter response characteristics.
- **Orbital Location and Predicted Space Station Antenna Gain Contours.**<sup>26</sup> Star One C3 will operate at 75° W.L. pursuant to satellite authorizations issued by Anatel. The satellite has been specifically designed for deployment at the 75° W.L. orbital location, and the coverage areas and antenna gain contours of Star One C3 are given in GXT format and embedded in the accompanying Schedule S submission.
- **Description of Services to Be Provided and Areas to Be Served.**<sup>27</sup> As discussed previously, the Star One C3 satellite will provide Extended Ku-

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<sup>24</sup> See 47 C.F.R. § 25.114(c)(4).

<sup>25</sup> *Id.* § 25.114(c)(5).

<sup>26</sup> *Id.* § 25.114(c)(6)-(7).

<sup>27</sup> *Id.* § 25.114(c)(8).

band FSS services covered by the WTO Basic Telecommunications Agreement throughout the Americas, including substantial portions of the United States, from the 75° W.L. orbit location. Star One does not seek authority to provide direct broadcast satellite, direct-to-home, or direct audio radio services. The link budgets and interference analyses included in Annex 1 of the attached Technical Appendix provide additional information regarding the transmission characteristics for various proposed carriers, including typical earth station parameters, modulation parameters, and overall link performance.

- **Accuracy with which the Orbital Inclination, the Antenna Axis Attitude, and Longitudinal Drift Will Be Maintained.**<sup>28</sup> See Technical Appendix at Section 8.4.
- **Power Flux Density Levels.**<sup>29</sup> See Technical Appendix at Annex 1.
- **Arrangement for Tracking, Telemetry, and Control.**<sup>30</sup> See Technical Appendix at Section 5.
- **Physical Characteristics of the Space Station.**<sup>31</sup> See Technical Appendix at Section 2.
- **Interference Analysis.**<sup>32</sup> See Technical Appendix at Annex 1.
- **Orbital Debris Mitigation.** Star One's orbital debris mitigation plan for the Star One C3 satellite is found in Section 8 of the Technical Appendix.

The data provided by Star One in this Letter of Intent and the attached Technical Appendix satisfies the technical information requirements of the Commission's rules.

### 3. Technical Waivers

Star One requests no technical waivers for the Star One C3 satellite and its operations.

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<sup>28</sup> *Id.* § 25.114(c)(9).

<sup>29</sup> *Id.* § 25.114(c)(10).

<sup>30</sup> *Id.* § 25.114(c)(11).

<sup>31</sup> *Id.* § 25.114(c)(12).

<sup>32</sup> *Id.* § 25.114(c)(17); see also *id.* § 25.140(b)(2).

## II. REQUEST FOR WAIVER OF CERTAIN MILESTONES AND PARTIAL WAIVER OF BOND REQUIREMENTS

The Commission will waive its rules “if good cause therefor is shown.”<sup>33</sup> Pursuant to 47 C.F.R. §§ 25.137(d) and 25.165(a)(1), non-U.S.-licensed satellite operators seeking to access the U.S. market must demonstrate that the non-U.S.-licensed space station has complied with all applicable Commission requirements for non-U.S.-licensed systems to operate in the United States,<sup>34</sup> including both the construction milestone requirements<sup>35</sup> and the requirement to post a \$3 million bond within 30 days of license grant.<sup>36</sup> The two requirements are linked in that as each milestone is met, the GSO-like satellite licensee is entitled to reduce the amount of the original bond by \$750,000.<sup>37</sup>

Star One requests, to the extent necessary, a waiver of the Commission’s contract execution, CDR, and commencement of construction milestones.<sup>38</sup> As noted earlier, Star One has already entered into a non-contingent contract with Orbital for the construction of the Star One C3 satellite. A redacted copy of the satellite construction contract is included as Attachment D to this Letter of Intent. Moreover, CDR for the satellite has been completed and construction has commenced. Redacted copies of documents relating to satellite’s CDR and the construction status of the satellite are included as Attachment E to this Letter of Intent. Star One will submit

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<sup>33</sup> *Id.* § 1.3.

<sup>34</sup> *Id.* § 25.137(d).

<sup>35</sup> *Id.* § 25.164(a).

<sup>36</sup> *Id.* § 25.165(a).

<sup>37</sup> *Id.* § 25.165(d).

<sup>38</sup> *Id.* § 25.164(a)(1)-(2). The Commission may conclude, however, that a waiver of the milestone requirements is not necessary for applicants that demonstrate that one or more milestones have already been satisfied.

unredacted copies of both Attachments D and E to the Commission separately with a request for confidentiality.

As the attached documentation shows, CDR has been completed and construction of the Star One C3 satellite has commenced. Orbital has submitted a certification that CDR has been complete and that Star One has paid in full for the CDR milestone under the satellite construction contract.<sup>39</sup> In addition, the photographs of significant components of the Star One C3 satellite under construction in Orbital's facilities demonstrate that construction of the Star One C3 satellite is well underway and will accommodate a 2012 launch.<sup>40</sup> Accordingly, the Commission should find that these two additional milestones have already been met.

Because the first three milestones have been met, Star One requests a partial waiver of the bond requirement to reduce the initial bond amount to \$750,000. There is good cause for this action because the purpose of the bond requirement – to secure compliance with the Commission's satellite construction milestones – would not be undermined. Star One has already satisfied the contract execution, CDR, and commencement of construction milestones, and it would be pointless to impose the full \$3 million bond amount because Star One would immediately be able to show that it is entitled to reduce the amount of the bond by \$2.25 million.<sup>41</sup> Instead, the Commission should reduce the initial bond amount to \$750,000 – the amount that would normally secure a GSO-like satellite licensee's compliance with the Commission's last remaining implementation milestone (launch and operation). Such action would be fully consistent with the Commission's past actions placing the Star One C2 satellite

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<sup>39</sup> See Attachment E.

<sup>40</sup> See *id.*

<sup>41</sup> See 47 C.F.R. § 25.165(d).

on the Permitted Space Station List with an associated \$750,000 bond when that satellite was already under construction.<sup>42</sup>

### **III. WAIVER PURSUANT TO SECTION 304 OF THE COMMUNICATIONS ACT**

In accordance with Section 304 of the Communications Act of 1934, as amended, Star One hereby waives any claim to the use of any particular frequency of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise.

### **IV. CONCLUSION**

For the foregoing reasons, granting Star One's Letter of Intent to serve the United States with the Star One C3 satellite in the Extended Ku-band from the 75° W.L. orbital location would strongly serve the public interest. Specifically, allowing such access would enhance competition by providing consumers more alternatives in choosing communications providers and services, thereby stimulating lower rates, improving service quality, increasing service options, and fostering technological innovation. In addition, there are no national security, law enforcement, foreign policy, or international trade concerns that arise in the context of this request, and the operations of the Star One C3 satellite will neither adversely affect the operations of any U.S.-licensed satellite nor contravene the Commission's spectrum and frequency management policies.

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<sup>42</sup> See *Star One C1 Order*, Attachment, at 3 (imposing a single launch milestone and an associated bond of \$750,000 as a condition to the satellite's authorization).

Respectfully submitted,

/s/

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September 14, 2011

# **Attachment A**

## **Technical Appendix**



# **STAR ONE C3**

## **ATTACHMENT A**

### **Technical Information to Supplement Schedule S**

#### **A.1 Scope**

This Attachment contains additional information required by § 25.114(c) of the Commission's rules and other sections of the FCC Part 25 rules that cannot be entered into the Schedule S submission.

#### **A.2 General Description**

The STAR ONE C3 satellite will operate at the nominal 75° W.L. orbital location. The STAR ONE C3 satellite is a hybrid satellite which will provide a range of Fixed Satellite Service ("FSS") services to various countries within International Telecommunication Union ("ITU") Region 2 using the C- and Ku-band frequencies. The satellite will employ 28 C-band transponders and 18 Ku-band transponders using both linear polarizations, thereby providing dual frequency re-use.

The only bands the satellite is capable of using to provide service to the United States are the extended Ku-bands; specifically the 13.75-14.0 GHz / 10.95-11.2 GHz bands. Accordingly, the technical information contained herein and in the associated Schedule S form describes only the extended Ku-band payload of the satellite.

The extended Ku-band payload consists of 6 transponders, each with a bandwidth of 72 MHz. The satellite has two Ku-band beams (each in both uplink and downlink directions): a Brazilian beam and an Andean beam. The Andean beam includes coverage of the Southeastern portion of

the United States. Each extended Ku-band transponder can be switched between the two beams, in both uplink and downlink directions, for a total of four possible beam inter-connections.

### **A.3 Predicted Space Station Antenna Gain Contours**

The STAR ONE C3 antenna gain contours for the Brazilian and Andean receive and transmit beams, as required by § 25.114(d)(3), are given in GXT format and embedded in the associated Schedule S submission.

### **A.4 Services to be Provided**

The STAR ONE C3 satellite will provide a variety of FSS services ranging between narrowband to wideband digital services. Representative link budgets, which include details of the transmission characteristics, performance objectives and earth station characteristics, are provided in the associated Schedule S submission.

### **A.5 Arrangement for Telemetry, Tracking, & Command (“TT&C”)**

The command system will control spacecraft operation through all phases of the mission by receiving and decoding commands to the spacecraft. Additionally, it will serve as the uplink receiver for ranging signals. The command subsystem features two command receivers each one set to receive one of the two STAR ONE C3 command frequencies. Uplink commands are received at the C-band command receivers either via the dedicated on-station C-band antenna or through the omni-directional and wide coverage antennas. The receiving antennas are permanently connected to the command receivers, and the on-station C-band antenna has the capability to be disconnected from the command receivers using switches. The receivers demodulate the uplink signal and recover the command data. All receivers are powered and accessible throughout mission life.

The telemetry system is comprised of two redundant telemetry transmitters. Telemetry data from the spacecraft is collected by the bus and payload remote units or directly from the spacecraft units themselves. The Data Handling subsystem collects the data, which is forwarded to the telemetry transmitters in a continuous stream. The telemetry transmitters will also serve as the downlink transmitter for ranging. The normal telemetry stream is phase-shifted-keyed onto a sub-carrier. For normal on-station operation, telemetry is provided via the C-band communications antenna. During transfer orbit and emergency situations, the omni-directional and wide coverage antennas will be used to transmit the telemetry signals.

In addition, two conventional Ku-band downlink beacons will be continuously transmitted by the satellite via the Ku global horns.

All TT&C operations will be conducted from Brazilian territory. Star One does not seek Commission authorization for TT&C transmissions.

#### **A.6 Satellite Transponder Frequency Responses**

The predicted receiver and transmitter frequency responses of the 72 MHz channels, as measured between the receive antenna input and transmit antenna, are shown in Table A.6-1 below. In addition, the frequency tolerances of § 25.202(e) and the out-of-band emission limits of § 25.202(f) (1), (2) and (3) will be met.

**Table A.6-1 - Ku-Band Typical Receiver and Transmitter Filter Responses**

Offset from Channel Center Frequency (MHz)	Attenuation Relative to Peak Level (dB)	
	Input Section	Output Section
±24	0.28	0.18
±32	0.71	0.50

±36	1.15	1.71
±44	19.0	9.0
±48	30.0	20.0
±50	33.0	22.0
±60	37.0	23.0

**A.7 Interference and Power Flux Density (“PFD”) Analyses**

The interference and PFD analyses are contained in Annex 1 of this Attachment.

**A.8 Orbital Debris Mitigation Plan**

**A.8.1 Spacecraft Hardware Design**

The spacecraft is designed such that no debris will be released during normal operations. Star One has assessed the probability of collision with meteoroids and other small debris (<1 cm diameter) and has taken the following steps to limit the effects of such collisions: (1) critical spacecraft components are located inside the protective body of the spacecraft and properly shielded; and (2) all spacecraft subsystems have redundant components to ensure no single-point failures. The spacecraft will not use any subsystems for end-of-life disposal that are not used for normal operations.

**A.8.2 Minimizing Accidental Explosions**

Star One has assessed the probability of accidental explosions during and after completion of mission operations. The spacecraft is designed in a manner to minimize the potential for such explosions. As part of the end-of-life activities, the satellite’s energy sources will be rendered inactive, such that debris generation will not result from the conversion of energy sources on board the spacecraft into energy that fragments the satellite. This will be accomplished by depleting all propellant tanks, venting all pressurized systems, and leaving all batteries in a state

of permanent discharge by isolation of the battery charge circuits and leaving certain loads connected to the batteries.

### **A.8.3 Safe Flight Profiles**

In considering current and planned satellites that may have a station-keeping volume that overlaps the STAR ONE C3 satellite, Star One has reviewed the lists of FCC licensed satellite networks, as well as those that are currently under consideration by the FCC. In addition, non-Brazilian networks for which a request for coordination has been published by the ITU within  $\pm 0.2$  degrees of  $75^\circ$  W.L. have also been reviewed. Only those networks that either operate, or are planned to operate, and have an overlapping station-keeping volume with the STAR ONE C3 satellite, have been taken into account in the analysis.

Based on these reviews, there are two satellites operating nominally at  $75^\circ$  W.L.: the BRASILSAT B3 satellite operated by Star One and the GOES 13 satellite operated by NOAA. With respect to published ITU filings, other than the Brazilian and USA networks that are filed at  $75^\circ$  W.L. on behalf of the aforementioned operational satellites, there is also a Luxembourg filing and a Papua New Guinea filing, both at  $75^\circ$  W.L. Star One can find no evidence that the Luxembourg and Papua New Guinea networks are being progressed towards launch.

The BRASILSAT B3 satellite operates nominally at  $75^\circ$  W.L. with a maximum east-west station-keeping of  $\pm 0.1^\circ$ . The GOES 13 satellite operates nominally at  $75^\circ$  W.L. with a maximum east-west station-keeping of  $\pm 0.5^\circ$ . Star One and NOAA have an arrangement whereby the inclination-eccentricity separation technique is used in order to avoid a collision when the two satellites are in proximity of each other. For this purpose, flight dynamics teams from both companies exchange maneuver schedules and orbit data directly on a weekly basis. In addition, a neighborhood watch tool is used for monitoring close approaches between the collocated satellites through the Space Data Association.

EchoStar has Commission authorization to operate the 17/24 GHz ECHOSTAR EX-4 satellite at 75° W.L. After discussion with Star One, EchoStar plans to operate its satellite at 75.15° W.L., thereby avoiding any station-keeping volume overlap with the STAR ONE C3 satellite. EchoStar has a pending application before the Commission seeking authorization to operate its satellite at 75.15° W.L.<sup>1</sup> Both the STAR ONE C3 and ECHOSTAR EX-4 satellites will be operated with an east-west station-keeping tolerance of 0.05°.

The STAR ONE C3 satellite will be temporarily collocated with the BRASILSAT B3 satellite as traffic is transferred from the latter to the former. After traffic transfer is complete, the BRASILSAT B3 satellite will be located to another orbital location such that there will be no station-keeping volume overlap between the two satellites. During the period of collocation, Star One will use the inclination-eccentricity technique to ensure adequate separation between the satellites.

#### **A.8.4 Post Mission Disposal Plan**

At the end of the operational life of the STAR ONE C3 satellite, Star One will maneuver the satellite to a disposal orbit with a minimum perigee of 300 km above the normal geosynchronous (“GSO”) operational orbit. This proposed disposal orbit altitude is based on the following calculation, as required in § 25.283:

$$\text{Total Solar Pressure Area “A”} = 84.01 \text{ m}^2$$

$$\text{“M”} = \text{Dry Mass of Satellite} = 1402 \text{ kg}$$

$$\text{“C}_R\text{”} = \text{Solar Pressure Radiation Coefficient} = 1.0$$

Therefore the Minimum Disposal Orbit Perigee Altitude:

---

<sup>1</sup> See EchoStar Satellite Operation Corporation, *Request to Amend Application to Modify Authority*, Call Sign S2725, File No. SAT-AMD-20110427-00080 (filed Apr. 27, 2011).

$$\begin{aligned}
&= 36,021 \text{ km} + 1000 \times C_R \times A/m \\
&= 36,021 \text{ km} + 1000 \times 1.0 \times 84.01/1402 \\
&= 36,080.9 \text{ km} \\
&= 294.9 \text{ km above GSO (35,786 km)}
\end{aligned}$$

To provide margin, the nominal disposal orbit will be increased to 300 km. This will require 12 kg of propellant that will be reserved, taking account of all fuel measurement uncertainties, to perform the final orbit raising maneuvers.

### **A.9 Spacecraft Characteristics**

Spacecraft physical and electrical characteristics are included in the associated Schedule S form.

The spacecraft reliability is consistent with current manufacturing standards in place for the major suppliers of space hardware. Payload and bus design reliability are both greater than 0.8 with an overall spacecraft reliability to EOL of greater than 0.7. Transponder sparing is consistent with documented failure rates which allow attaining the overall reliability stated above.

### **A.10 Use of the 13.75-14.0 GHz and 10.95-11.2 GHz Bands**

Star One is aware that operations in the 13.75-14.0 GHz and 10.95-11.2 GHz frequency bands are subject to certain limitations and obligations which Star One accepts and will fulfill.

For operations in the 13.75-14.0 GHz band (Earth-to-space), Star One accepts the following conditions:

- Pursuant to footnote US337 of the United States Table of Frequency Allocations, 47 C.F.R. § 2.106, n.US337, any earth station located in the United States and its possessions communicating with the STAR ONE C3 satellite in the 13.75-14.0 GHz band is required

to coordinate through National Telecommunications and Information Administration's ("NTIA's") Interdepartment Radio Advisory Committee's ("IRAC's") Frequency Assignment Subcommittee ("FAS") to minimize interference to the National Aeronautics and Space Administration Tracking and Data Relay Satellite System, including manned space flight.

- Operations of any earth station located in the United States and its possessions communicating with the STAR ONE C3 satellite in the 13.75-14.0 GHz band shall comply with footnote US356 to United States Table of Frequency Allocations, 47 C.F.R. § 2.106, n.US356, which specifies a mandatory minimum antenna diameter of 4.5 meters. Operations of any earth station located outside the United States and its possessions communicating with the STAR ONE C3 satellite in the 13.75-14.0 GHz band shall be consistent with footnote 5.502 to the ITU Radio Regulations.
- Operations of any earth station located in the United States and its possessions communicating with the STAR ONE C3 satellite in the 13.77-13.78 GHz band shall comply with footnote US357 to the United States Table of Frequency Allocations, 47 C.F.R. § 2.106, n.US357, which specifies that a required maximum EIRP density of emissions not exceed 71 dBW in any 6 MHz band. Operations of any earth station located outside the United States and its possessions communicating with the STAR ONE C3 satellite in the 13.77-13.78 GHz band shall comply with footnote 5.503 to the ITU Radio Regulations, which specifies a required maximum EIRP density of emissions; the level being dependent on the size of the antenna.

Operations in the 10.95-11.2 GHz band (space-to-Earth) will be limited to international operations in accordance with footnote NG104 to the United States Table of Frequency Allocations, 47 C.F.R. § 2.106, n.NG104, and footnote 2 of Section 25.202(a)(1) of the Commission's rules, 47 C.F.R. § 25.202(a)(1).



---

**CERTIFICATION OF PERSON RESPONSIBLE FOR PREPARING  
ENGINEERING INFORMATION**

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in this application, that I am familiar with Part 25 of the Commission's rules, that I have either prepared or reviewed the engineering information submitted in this application and that it is complete and accurate to the best of my knowledge and belief.

/s/

-----

Stephen D. McNeil  
Telecomm Strategies Canada, Inc.  
Ottawa, Ontario, Canada  
(613) 270-1177

## ANNEX 1

### INTERFERENCE AND PFD ANALYSES

#### 1.0 Interference Analyses

Currently there are no operational extended Ku-band satellites two degrees away from the 75° W.L. location, nor are there any pending applications before the Commission to use the extended Ku-bands at a location two degrees away from 75° W.L. In order to demonstrate two-degree compatibility, the transmission parameters of the STAR ONE C3 satellite have been assumed as both the wanted and interfering transmissions.

Table 1 provides a summary of the transmission parameters derived from the STAR ONE C3 link budgets that are embedded in the Schedule S form and which were used in the interference analysis. The interference calculations assumed a 1 dB advantage for topocentric-to-geocentric conversion, all wanted and interfering carriers are co-polarized and all earth station antennas conform to a sidelobe pattern of  $29-25 \log(\theta)$ . The C/I calculations were performed on a per Hz basis.

Table 2 shows the results of the interference calculations in terms of the overall C/I margins. The table is provided in a format similar to that of the output of the Sharp Adjacent Satellite Interference Analysis program. It can be seen that the majority of the C/I margins are positive, although there are a few negative margins. The worst case negative C/I margin is 1.8 dB which is considered acceptable.

**Table 1. STAR ONE C3 Typical Extended Ku-band Transmission Parameters**

<b>Carrier ID</b>	<b>Emission Designator</b>	<b>Bandwidth (MHz)</b>	<b>Tx E/S Gain (dBi)</b>	<b>Uplink EIRP (dBW)</b>	<b>Downlink EIRP (dBW)</b>	<b>Rx E/S Gain (dBi)</b>	<b>C/I Criterion (dB)</b>
1	445KG7W	0.445	54.5	51.6	31.5	41.0	17.9
2	1M78G7W	1.778	54.5	55.8	30.7	44.5	17.9
3	6M33G7W	6.330	54.5	61.4	36.3	47.0	18.0
4	17M9G7W	17.900	54.5	65.8	40.7	43.0	16.1
5	36M0G7W	36.000	54.5	68.8	43.7	47.0	18.7
6	72M0G7W	72.000	54.5	81.9	49.2	43.0	18.7
7	445KG7W	0.445	54.5	50.0	31.5	41.0	17.9
8	1M78G7W	1.778	54.5	55.8	33.3	44.5	17.9
9	6M33G7W	6.330	54.5	61.4	38.9	47.0	18.0
10	17M9G7W	15.652	54.5	65.8	43.3	41.0	16.1
11	36M0G7W	36.000	54.5	68.8	46.3	47.0	18.7
12	72M0G7W	72.000	54.5	79.5	51.5	43.0	18.7
13	445KG7W	0.445	54.5	49.7	24.6	44.5	17.9
14	1M78G7W	1.778	54.5	55.8	30.7	44.5	17.9
15	6M33G7W	6.330	54.5	61.4	36.3	47.0	18.0
16	17M9G7W	15.652	54.5	65.8	40.7	41.0	16.1
17	36M0G7W	36.000	54.5	68.8	43.7	47.0	18.7
18	72M0G7W	72.000	54.5	81.9	49.2	43.0	18.7

**Table 2. Summary of the overall link C/I margins (dB).**

		Interfering Carriers																	
Carrier ID		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>Wanted Carriers</b>	1	2.5	8.9	8.8	9.0	9.0	4.5	2.6	6.6	6.5	6.0	6.7	2.9	9.0	8.9	8.8	8.4	9.0	4.5
	2	-0.8	5.8	5.7	5.8	5.8	1.8	-0.7	3.4	3.3	2.8	3.4	0.0	5.9	5.8	5.7	5.2	5.9	1.8
	3	1.6	8.0	7.9	8.0	8.0	3.2	1.7	5.7	5.6	5.1	5.8	1.7	8.0	8.0	7.9	7.4	8.0	3.2
	4	-0.5	6.1	6.0	6.1	6.2	2.5	-0.5	3.6	3.6	3.1	3.7	0.5	6.2	6.1	6.0	5.5	6.2	2.5
	5	0.8	7.1	7.0	7.2	7.2	2.3	0.9	4.8	4.8	4.3	4.9	0.9	7.2	7.1	7.0	6.6	7.2	2.3
	6	0.1	6.8	7.1	6.3	6.3	3.5	0.1	4.3	4.6	3.7	3.7	1.1	6.9	6.8	7.1	6.3	6.3	3.5
	7	2.4	8.7	8.6	8.7	8.7	3.7	2.5	6.4	6.3	5.9	6.5	2.3	8.7	8.7	8.6	8.1	8.7	3.7
	8	1.7	8.1	8.0	8.1	8.1	3.2	1.8	5.8	5.7	5.2	5.9	1.8	8.1	8.1	8.0	7.5	8.1	3.2
	9	4.0	10.0	10.0	10.1	10.1	4.3	4.2	8.0	7.9	7.4	8.0	3.2	10.1	10.1	10.0	9.5	10.1	4.3
	10	0.7	7.3	7.2	7.3	7.3	3.5	0.8	4.8	4.8	4.3	4.9	1.6	7.4	7.3	7.2	6.7	7.3	3.5
	11	3.2	9.2	9.1	9.2	9.3	3.4	3.3	7.1	7.0	6.6	7.2	2.3	9.3	9.2	9.1	8.7	9.3	3.4
	12	2.6	9.4	9.7	8.8	8.8	5.9	2.7	6.8	7.1	6.3	6.3	3.5	9.5	9.4	9.7	8.8	8.8	5.9
	13	-0.8	5.7	5.6	5.7	5.8	1.7	-0.7	3.3	3.2	2.8	3.4	-0.1	5.8	5.7	5.6	5.2	5.8	1.7
	14	-0.8	5.8	5.7	5.8	5.8	1.8	-0.7	3.4	3.3	2.8	3.4	0.0	5.9	5.8	5.7	5.2	5.9	1.8
	15	1.6	8.0	7.9	8.0	8.0	3.2	1.7	5.7	5.6	5.1	5.8	1.7	8.0	8.0	7.9	7.4	8.0	3.2
	16	-1.8	4.8	4.8	4.9	4.9	1.6	-1.8	2.3	2.3	1.8	2.4	-0.6	4.9	4.8	4.8	4.3	4.9	1.6
	17	0.8	7.1	7.0	7.2	7.2	2.3	0.9	4.8	4.8	4.3	4.9	0.9	7.2	7.1	7.0	6.6	7.2	2.3
	18	0.1	6.8	7.1	6.3	6.3	3.5	0.1	4.3	4.6	3.7	3.7	1.1	6.9	6.8	7.1	6.3	6.3	3.5

## 2.0 PFD Analyses

Star One will operate the STAR ONE C3 satellite such that all extended Ku-band downlink transmissions will comply with the PFD limits of §25.208(b). The maximum downlink EIRP density that will be transmitted by the Andean and Brazilian beams is -22 dBW/Hz.

Tables 3 through 6 show the maximum PFD levels that will occur at various angles of arrival for each of the Ku-band beams when transmitting with a downlink EIRP density of -22 dBW/Hz. The tables demonstrate compliance with §25.208(b) in all cases.

**Table 3. Maximum PFD Levels of Beam ANDDH.**

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m <sup>2</sup> /4 kHz)	Spreading Loss (dBW/m <sup>2</sup> )	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m <sup>2</sup> /4 kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-20	-169.4	19.4
5°	-150.0	-163.3	-20	-169.3	19.3
10°	-147.5	-163.2	-20	-169.1	21.6
15°	-145.0	-163.0	-19	-168.0	23.0
20°	-142.5	-162.9	-18	-166.9	24.4
25°	-140.0	-162.8	-17	-165.8	25.8
78.5° (Peak)	-140.0	-162.5	0.0	-148.1	8.1

**Table 4. Maximum PFD Levels of Beam ANDDV.**

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m <sup>2</sup> /4 kHz)	Spreading Loss (dBW/m <sup>2</sup> )	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m <sup>2</sup> /4 kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-20	-169.4	19.4
5°	-150.0	-163.3	-20	-169.3	19.3
10°	-147.5	-163.2	-19.5	-168.6	21.1
15°	-145.0	-163.0	-19	-168.0	23.0
20°	-142.5	-162.9	-18	-166.9	24.4
25°	-140.0	-162.8	-15	-163.8	23.8
79° (Peak)	-140.0	-162.5	0.0	-148.1	8.1

**Table 5. Maximum PFD Levels of Beam BRADH.**

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m <sup>2</sup> /4 kHz)	Spreading Loss (dBW/m <sup>2</sup> )	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m <sup>2</sup> /4 kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-20.0	-169.4	19.4
5°	-150.0	-163.3	-19.0	-168.3	18.3
10°	-147.5	-163.2	-18.0	-167.1	19.6
15°	-145.0	-163.0	-17.0	-166.0	21.0
20°	-142.5	-162.9	-16.0	-164.9	22.4
25°	-140.0	-162.8	-9.9	-158.7	18.7
47.5° (Peak)	-140.0	-162.4	0.0	-148.4	8.4

**Table 6. Maximum PFD Levels of Beam BRADV.**

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m <sup>2</sup> /4 kHz)	Spreading Loss (dBW/m <sup>2</sup> )	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m <sup>2</sup> /4 kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-20.0	-169.4	19.4
5°	-150.0	-163.3	-19.0	-168.3	18.3
10°	-147.5	-163.2	-18.0	-167.1	19.6
15°	-145.0	-163.0	-17.0	-166.0	21.0
20°	-142.5	-162.9	-14.8	-163.7	21.2
25°	-140.0	-162.8	-9.0	-157.8	17.8
47.5° (Peak)	-140.0	-162.4	0.0	-148.4	8.4

## **Attachment B**

### **Anatel Term of Right of Exploitation**



**ROBERTO VERAS BICA**  
**Tradutor Público e Intérprete Comercial – Inglês**  
**Sworn Translator**  
**JUCEMG Nº 734**  
**CPF/MF 634.302.748-34**

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Av. Dr. Carlos Soares 37 – Centro – Visconde de Rio Branco – MG – Brasil - CEP 36520  
Email: [rvbica@gmail.com](mailto:rvbica@gmail.com)



Doc. No. LT-136.045(001) Livro 005 Fl. 859 – 861

I, the undersigned, Sworn Public Translator and Commercial Interpreter, with full faith and credit throughout the Federative Republic of Brazil, duly appointed and commissioned by the Board of Trade of the State of Minas Gerais (JUCEMG) and registered therewith under No. 734, DO HEREBY CERTIFY AND ATTEST that a document set forth in the Portuguese language was presented to me for translation into English, which I have lawfully performed, by virtue of my Official Capacity, as follows: -----

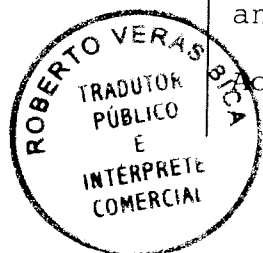
-----  
-----**NATIONAL AGENCY FOR TELECOMMUNICATIONS**-----

----- ACT No. 63.338, OF JANUARY 30, 2007-----  
-----

**THE BOARD OF DIRECTORS OF THE NATIONAL AGENCY FOR TELECOMMUNICATIONS - ANATEL**, in the exercise of the powers conferred on it by Art 22 of Law No. 9.472, of July 16, 1997, and Art 35 of the NATIONAL AGENCY FOR TELECOMMUNICATIONS By-laws, approved by Decree No. 2.338, of October 7, 1997,-----

WHEREAS the basic principles set forth in Law No. 9.472, of 1997, as well as the provisions of Bidding Rules for Concession, Permission and Authorization of Telecommunication Services and Authorization for Use of Radiofrequency of Telecommunications Services, approved by Resolution No. 65, of October 29, 1998, are taken into account;-----

WHEREAS authorization to open the bidding process and the approval of the Notice, respectively through Acts No. 61.203 and No. 61.204, both of October 4,



**ROBERTO VERAS BICA**  
**Tradutor Público e Intérprete Comercial – Inglês**  
**Sworn Translator**  
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**CPF/MF 634.302.748-34**

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Av. Dr. Carlos Soares 37 – Centro – Visconde de Rio Branco – MG – Brasil - CEP 36520  
Email: [rvbica@gmail.com](mailto:rvbica@gmail.com)

2006, regarding bidding No. 005/2006/SPV-Anatel, are taken into account;-----

WHEREAS the approval of adjudication of the subject matter of such bid, regarding the 1<sup>st</sup> Stage, by the Board of Directors of this Agency, through Dispatch No. 613/2006 - CD, recorded in the Administrative Procedure No. 53500.023874/2005, is taken into account;-----

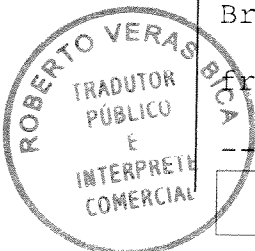
WHEREAS resolution taken at its Meeting No. 421, held on January 30, 2007, is also taken into account, resolve:-----

Art 1 Grant STAR ONE S/A the Right of Exploration of Brazilian Satellite for Transportation of Telecommunication Signals, upon non-exclusive occupation of the orbital position 75° W, for a period of 15 (fifteen) years, from the date of publication of the extract of the Instrument of Right of Exploration of Satellite in the Federal Official Gazette.-----

Art. 2 Authorize the use of radiofrequencies associated with the Right of Exploration of Brazilian Satellite granted in Art. 1, in the frequency ranges listed below:-----

Frequency ranges Earth-space

Frequency ranges space-Earth



**ROBERTO VERAS BICA**  
**Tradutor Público e Intérprete Comercial – Inglês**  
**Sworn Translator**  
**JUCEMG Nº 734**  
**CPF/MF 634.302.748-34**

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Av. Dr. Carlos Soares 37 – Centro – Visconde de Rio Branco – MG – Brasil - CEP 36520  
Email: [rvbica@gmail.com](mailto:rvbica@gmail.com)

5.850 to 6.425 MHz	3.625 to 4.200 MHz
6.432 to 6.472 MHz	10,95 GHz to 11,20 GHz
6.480 to 6.520 MHz	11,70 to 12,20 GHz
13,75 to 14,50 GHz	1.452 to 1.492 MHz
	2.160 to 2.200 MHz

-----  
Art. 3 This Act shall enter into force on the date  
of publication of its extract in the Federal  
Official Gazette.-----

-----  
(There appears signature)-----

PLINIO DE AGUIAR JUNIOR-----

Chairman of the Board-----

-----  
200790013182-----  
-----

THIS WAS THE FULL TEXT of said document, the true  
translation whereof I ATTEST.-----

WITNESS MY HAND AND SEAL, this June 30, 2011.-----




**AGÊNCIA NACIONAL DE TELECOMUNICAÇÕES**

**ATO N.º 63.338, DE 30 DE JANEIRO DE 2007**

**O CONSELHO DIRETOR DA AGÊNCIA NACIONAL DE TELECOMUNICAÇÕES**  
– ANATEL, no uso das atribuições que lhe foram conferidas pelo Art. 22 da Lei n.º 9.472, de 16 de julho de 1997, e Art. 35 do Regulamento da Agência Nacional de Telecomunicações, aprovado pelo Decreto n.º 2.338, de 7 de outubro de 1997,

CONSIDERANDO os princípios fundamentais estabelecidos na Lei n.º 9.472, de 1997, bem como o disposto no Regulamento de Licitação para Concessão, Permissão e Autorização de Serviços de Telecomunicações e Autorização de Uso de Radiofrequência dos Serviços de Telecomunicações, aprovado pela Resolução n.º 65, de 29 de outubro de 1998;

CONSIDERANDO a autorização para abertura do procedimento licitatório e a aprovação do Edital, por meio, respectivamente, dos Atos n.º 61.203 e n.º 61.204, ambos de 4 de outubro de 2006, referente à licitação n.º 005/2006/SPV-Anatel;

CONSIDERANDO a homologação da adjudicação do objeto da referida licitação, referente à 1ª Etapa, pelo Conselho Diretor desta Agência, por meio do Despacho n.º 613/2006 – CD, exarado no Procedimento Administrativo n.º 53500.023874/2005;

CONSIDERANDO deliberação tomada em sua Reunião n.º 421, realizada em 30 de janeiro de 2007, resolve:

Art.1º Conferir à STAR ONE S/A o Direito de Exploração de Satélite Brasileiro para Transporte de Sinais de Telecomunicações, mediante ocupação, sem exclusividade, da posição orbital 75º W, pelo prazo de 15 (quinze) anos, contado da data da publicação do extrato do Termo de Direito de Exploração de Satélite no Diário Oficial da União.

Art.2º Autorizar o uso das radiofrequências associadas ao Direito de Exploração de Satélite Brasileiro conferido no Art. 1º, nas faixas de frequências abaixo relacionadas:

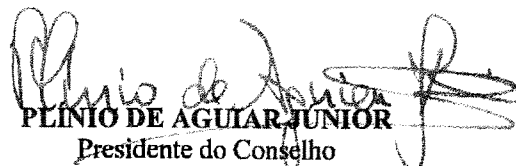
**Faixas de frequências Terra-espaço**

5.850 a 6.425 MHz  
6.432 a 6.472 MHz  
6.480 a 6.520 MHz  
13,75 a 14,50 GHz

**Faixas de frequências espaço-Terra**

3.625 a 4.200 MHz  
10,95 GHz a 11,20 GHz  
11,70 a 12,20 GHz  
1.452 a 1.492 MHz  
2.160 a 2.200 MHz

Art. 3º Este Ato entra em vigor na data de publicação de seu Extrato no Diário Oficial da União.

  
**PLÍNIO DE AGUIAR JUNIOR**  
Presidente do Conselho

## Attachment C

### Star One Ownership & Officers & Directors

Empresa Brasileira de Telecomunicações S.A. (“Embratel”), a Brazilian corporation, owns 100% of the voting shares of Star One S.A. The address of Embratel is Av. Presidente Vargas 1012, 20071-910, Rio de Janeiro, Brazil. Embratel Participações S.A., a Brazilian company, owns 99.45% of the voting shares of Embratel, with the remaining 0.55% of Embratel’s voting shares widely held by pension funds, institutions, and individuals, many of whom are not U.S. nationals. The address of Embratel Participações S.A. is Rua Regente Feijó, 166, 16º andar, S/ 1687-B, Rio de Janeiro, Brazil.

Telmex Solutions Telecomunicações Ltda., a Brazilian limited-liability company, and Controladora de Servicios de Telecomunicaciones S.A. de C.V., a Mexican company, own 54.77% and 43.44%, respectively, of the voting shares of Embratel Participações S.A. The address of Telmex Solutions Telecomunicações Ltda. is Rua Regente Feijó, 166, 16º andar, 1687- C, Rio de Janeiro, Brazil. No other shareholder holds more than 10% of the voting shares of Embratel Participações S.A.

Telmex Solutions Telecomunicações Ltda is 100% owned by Controladora de Servicios de Telecomunicaciones S.A. de C.V., which is 100% owned by Telmex Internacional S.A.B. DE C.V., a Mexican company.

#### *Star One S.A. Officers (Country of Citizenship)*

Gustavo Silbert – Chief Executive Officer (Brazil)  
Lincoln Amazonas Antunes de Oliveira – V.P. & Chief Engineering Officer (Brazil)  
Ana Beatriz Gorini – Chief Administrative and Financial Officer (Brazil)  
Mauro Wajnberg – Chief Space Segment Business Officer (Brazil)  
Luiz Otavio Vasconcelos Prates – Chief External Affairs Officer (Brazil)  
Francisco Carlos Perrota – Chief Sales and Marketing Officer (Brazil)  
Luis Fernando de Aguillar Pinho – Chief Operations Officer  
André Correa – Chief Juridical Officer (Brazil)

#### *Star One S.A. Directors (Country of Citizenship)*

José Formoso Martinez – Chairman (Brazil)  
Gustavo Silbert (Brazil)  
Antônio Oscar de Carvalho Petersen Filho (Brazil)  
Isaac Berensztejn (Brazil)  
Ivan Campagnolli Junior (Brazil)  
Antônio João Filho (Brazil)

**Attachment D**

**(Redacted) Satellite Construction Contract**

**SATELLITE EQUIPMENT PURCHASE CONTRACT**

**BETWEEN**

**STAR ONE S.A.**

**AND**

**ORBITAL SCIENCES CORPORATION**

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*105*

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APPENDIX A Orbital's Subcontractor List [REDACTED]

APPENDIX B [REDACTED] [REDACTED]

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*Jacob*  
106

Satellite Equipment Purchase Contract (the "Contract") dated as of December 18, 2009 by and between **Star One S.A.** ("Star One"), a *sociedade por ações* duly organized and existing under the laws of the Federative Republic of Brazil, having its principal offices at Av. Presidente Vargas, 1012, 6º. andar, Centro, CEP 20071-910, Rio de Janeiro, RJ, Brazil, and **Orbital Sciences Corporation** ("Orbital" or "Contractor"), a Corporation duly organized and existing under the laws of the State of Delaware and having its principal place of business at 21839 Atlantic Boulevard, Dulles, Virginia 20166, U.S.A. (Star One and Orbital, each a "Party" and collectively, the "Parties").

WHEREAS Star One wants to procure, and Orbital wants to supply, a telecommunication satellite system, in accordance with the terms and conditions contained in this Contract and its Appendices, Technical Specifications and any other document made part of this Contract.

NOW, THEREFORE, the Parties hereby agree as follows:

#### **ARTICLE 1 Definitions and Interpretation**

**1.1 Definitions.** As used in this Contract, the following terms shall have the following meanings:

"Activities" means all activities, works, studies, acts and tests to be performed; Satellite, materials, articles, data, Documentation, equipment, matters and things to be furnished; and rights to be granted under the Contract.

"Appendix" means any of the Appendices listed in Article 3.1 and attached hereto.

"Associate" means any Person who shall act, directly or indirectly, on behalf of or at the direction of either Party to fulfill the obligations undertaken by such Party in the Contract, including, without limitation, consultants, employees, officers, directors or agents of such Party.

"Available for Shipment" means that the Satellite has successfully passed the Pre-Shipment Review, and has been declared, subject to Star One's approval, ready to be shipped either to the Launch Site, or to storage.

"Constructive Total Loss" shall have the meaning given to it in the applicable Launch and in-orbit insurance or any replacement insurance policy.

"Contract Price" means the total price set forth in this Contract, as defined in Article 4, to be paid to Orbital for the satisfactory in-orbit delivery of the Satellite.



[REDACTED]

"Critical Design Review" means the Review as described in Exhibit B1 of the Technical Specifications.

"Documentation" means all documentation to be delivered pursuant to this Contract, as listed in Exhibit B1 of the Technical Specifications and Exhibit E of the Technical Specifications.

"Effective Date of Contract" or "EDC" means the date as defined in Article 29 of the Contract.

"Exhibit" means any of the exhibits listed in the Technical Specifications.

"Final Acceptance" means the final acceptance as determined pursuant to Article 22.6.

"Final Acceptance Review" or "FAR" means the review as described in Exhibit B1 of the Technical Specifications.

"Handover" means the final handover, i.e., the official transfer of operations control of the Satellite from Orbital to Star One, that shall occur upon successful completion of the Final Handover Meeting, in accordance with Exhibit B1.

"In-Orbit Acceptance Review" means the review as described in Exhibit B1 of the Technical Specifications.

"IOT position" means the position at which the in orbit tests will be performed.

"Launch" or "Launching" means the launch as defined by Launch Vehicle Manufacturer in the Launch Contract.

"Launch Date" means the intended date of the Launch.

"Launch Contract" means the contract between Orbital and the Launch Vehicle Manufacturer for the provision of Launch.

"Launch Site" means the Launch facility provided by the Launch Vehicle Manufacturer.

"Launch Vehicle" means the vehicle to be provided by the Launch Vehicle Manufacturer, as approved by Star One, which shall be integrated with the Satellite and used for the purpose of the Launch of the Satellite into geostationary transfer orbit.

"Launch Vehicle Manufacturer" means [REDACTED]

"Lender" means the bank(s) that shall make a loan (loans) and/or provide an export credit (credits) to Star One.

"Milestone" means each event contained in the Appendix D.

"Milestone Payment" means payment of any Milestone identified in the payment plan in Appendix D of the Contract.

"Partial Loss" shall have the meaning given to it in the applicable Launch and in-orbit insurance or any replacement insurance policy.

"Person" means any individual, corporation, unincorporated association, business trust, estate, shareholdership, trust, nation or political subdivision or agency thereof or any other entity.

"Preliminary Acceptance" means the preliminary acceptance as determined pursuant to Article 22.5.

"Pre-Shipment Review" or "PSR" means the review as described in Exhibit B1 of the Technical Specifications.

"Satellite" means the satellite or satellites to be delivered in-orbit by Orbital to Star One as part of this Contract. Satellite and Spacecraft shall have the same meaning under the context of this Contract.

"Minimum Maneuver Lifetime" means the period defined as such in Exhibit A3 of the Technical Specifications.

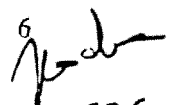
"Minimum Operational Lifetime" means the period defined as such in Exhibit A3 of the Technical Specifications.

"Specified Orbit Location" means with respect to the Satellite, the geostationary orbit location(s) specified in accordance with Exhibit A2 of the Technical Specifications on which the Satellite will be positioned during the operational lifetime.

"Subcontractor" means a person, firm, corporation or business entity which has been engaged by Orbital to provide a portion of the Activities covered by the Contract under the exclusive responsibility of Orbital.

"Successfully Separated Satellite" means the Satellite that has been properly separated from the Launch Vehicle, as defined in Article 8.

"Technical Specifications" means the technical specifications as set forth in its Exhibits: Exhibit B1 - Statement of Work Requirements, Exhibit A1 - System Requirements, Exhibit A2 - Payload Requirements, Exhibit A3 - Satellite Requirements, Exhibit C - Test Requirements, Exhibit D - Product Assurance Requirements, Exhibit E - Launch System

  
TDC

Requirements, Exhibit B2 - Training, Operation and Maintenance Statement of Work requirements, Exhibit B3 - Mission Support Statement of Work.

[REDACTED]

"Total Loss" shall have the meaning given to it in the applicable Launch and in-orbit insurance or any replacement insurance policy.

"Transponder" means the combination of connected elements within the overall communications subsystems of the Satellite that taken together provide a distinct and unique transmission capability as defined in Exhibit A2 of the Technical Specifications.

"Use" means any use, disclosure, and duplication, of information necessary for use in connection with the evaluation and operation of the Satellite.

"Working Day" means a day on which Star One, Orbital and Lenders are open for business.

## 1.2 Interpretation

In this Contract,

- (i) any reference to any contract, agreement or document shall mean such contract, agreement or document as supplemented, amended or modified from time to time in accordance with its terms;
- (ii) the term "days" shall mean calendar days;
- (iii) in the computation of periods of time from a specified date to a later specified date, the word "from" means "from and including" and the words "until" and "to" mean "to and including";
- (iv) all references to Articles herein are to the Articles of the Contract unless otherwise specified; and
- (v) words of any gender include each other gender and the definitions in this Contract shall apply equally to both the singular and plural.

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**ARTICLE 2 Scope of the Contract**

2.1 Star One undertakes to purchase and Orbital undertakes to deliver the Satellite in-orbit, in accordance with the provisions of the Contract.

2.2 The scope of this Contract does not include [REDACTED] which shall be negotiated and acquired by Star One from Orbital in the frame of a dedicated contract ([REDACTED]).

2.3 [REDACTED]

**ARTICLE 3 Description of the Activities**

3.1 The Activities to be performed by Orbital for delivery in-orbit of the Satellite are set forth in Appendices A, B, C and D and in the Technical Specifications, which are made part of the Contract. All the above listed Appendices and the Technical Specifications shall be applicable at the latest issue agreed between Orbital and Star One.

3.2 Each page of each Appendix and of the Technical Specifications shall be initialed by a duly appointed representative of each Party. Should there be any ambiguity, discrepancy or inconsistency among any of the Appendices and the Technical Specifications and the remaining terms and conditions of the Contract, such ambiguity, discrepancy or inconsistency shall be resolved by giving precedence to the Contract and then to the Appendices in the order listed in Article 3.1 and to the Technical Specifications (in the order as listed in Article 1.1).

**ARTICLE 4 Prices and Taxes**

4.1 In consideration for the in-orbit delivery of the Satellite, Star One shall pay to Orbital the Contract Price [REDACTED]

4.2 [REDACTED]

8  
Roder  
12C

[REDACTED]

4.3

[REDACTED]

4.4

[REDACTED]

4.4.1

[REDACTED]

4.5

[REDACTED]

4.5.1

[REDACTED]

**ARTICLE 5 Satellite/Equipment Transportation**

5.1

[REDACTED]

**ARTICLE 6 Master Program Schedule and Delivery Schedule**

6.1 The Master Program Schedule includes the main events and Milestones with respect to the performance of this Contract and it will be part of a Quarterly Progress Report.

9  
*[Handwritten signature]*

6.2 The Launch Date currently planned for the Satellite is [REDACTED]. Any modification of this Launch Date shall be discussed and agreed by the Parties.

6.3 Notwithstanding the above, Orbital's delivery schedule for making the Satellite Available for Shipment to the Launch Site is [REDACTED].

6.4 The date currently planned for the Handover is [REDACTED].

**ARTICLE 7 Payment Method**

**Milestone Payments**

7.1 Orbital shall be entitled to invoice Star One for Milestone Payment upon successful completion of each associated [REDACTED].

7.1.1 [REDACTED]

7.1.2 [REDACTED]

7.1.2.1 [REDACTED]

7.1.3 [REDACTED]

7.2 [REDACTED]

**Payment General Provisions**

7.3 Payments to be effected by Star One to Orbital shall not exempt Orbital from its obligations under the Contract, nor shall such payments imply Star One's acceptance of supplies or Activities for which payments were made.

7.4 Any payment otherwise due on a day that is not a Working Day shall be due on the next succeeding Working Day. Any payment by Star One shall be deemed to



have been made when Orbital's bank account has been credited for the amount of such payment.

7.5 Overdue payments under this Contract shall bear interest for each day from the date the payment was due until, but not including, the date of effective payment. Interest shall be accrued in accordance with [REDACTED]

[REDACTED] Payment of interest does not excuse the defaulting Party from its obligations hereunder, and the other Party is still entitled to its other remedies in this Contract.

7.5.1 The provisions of Article 7.5 shall not apply [REDACTED]

#### **Calendar payments modifications**

7.6 The calendar payments indicated in the Payment Plan contained in the Appendix D of the Contract ("Calendar Payments") shall be modified in the following events: (i) effective date of the Launch Contract does not occur [REDACTED] in this case the Calendar Payments [REDACTED]

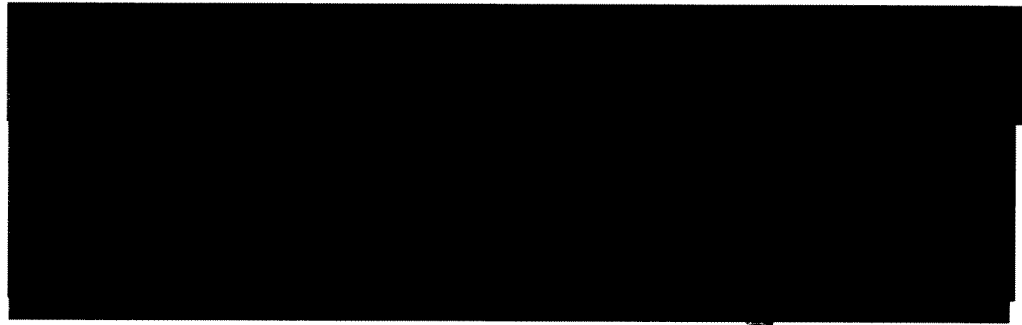
(ii) if the payment obligations contained in the Launch Contract are postponed, [REDACTED]

#### **ARTICLE 8 Successfully Separated Satellite**

8.1 **Successfully Separated Satellite.** A Satellite, after Launch, shall be deemed to be a Successfully Separated Satellite if:

(a) The transfer orbit and Satellite attitude, following the separation of the Satellite from the Launch Vehicle, to be specified in the Launch Contract and the Mission Plan document, as defined in Exhibit B1 of the Technical Specifications, meets the following required criteria:

[REDACTED]



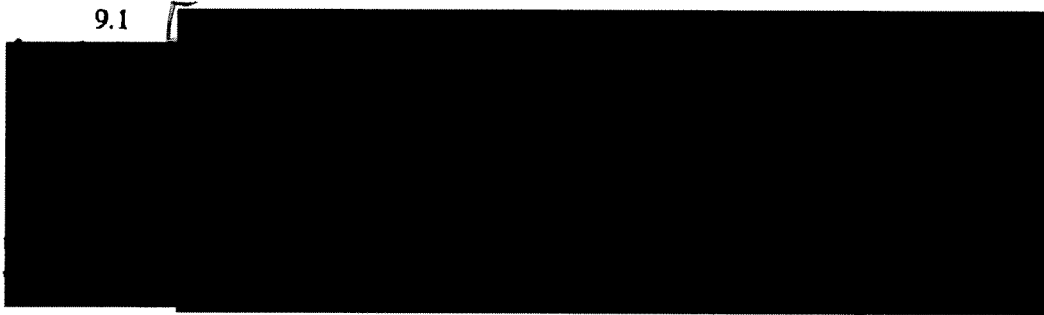
If the attained transfer orbit/Satellite attitude does not meet the criteria stated in 8.1 (a) above but the calculated operational lifetime, using on-station actual remaining propellants, determined after the Satellite has been positioned at its geosynchronous Specified Orbit Location, is greater than or equal to the Minimum Operational Lifetime, then the Satellite shall be deemed to have been a Successfully Separated Satellite.

If the attained transfer orbit/Satellite attitude does not meet the criteria stated in 8.1 (a) above, but the calculated operational lifetime, using on-station actuals determined after the Satellite has been positioned at its geosynchronous Specified Orbit Location, is less than the Minimum Operational Lifetime, then the Satellite shall be deemed to have been a Successfully Separated Satellite, unless the Satellite is a constructive total loss as defined in the launch insurance policy but the period of time of the remaining operational lifetime shall be reduced by the amount of loss of operational lifetime due to non-nominal propellant expenditure necessary to correct for the Launch Vehicle error.

(stet)

**ARTICLE 9 Satellite Launch**

9.1



9.2



**ARTICLE 10 Title**

10.1



[REDACTED]

10.2

[REDACTED]

10.3

[REDACTED]

10.4

[REDACTED]

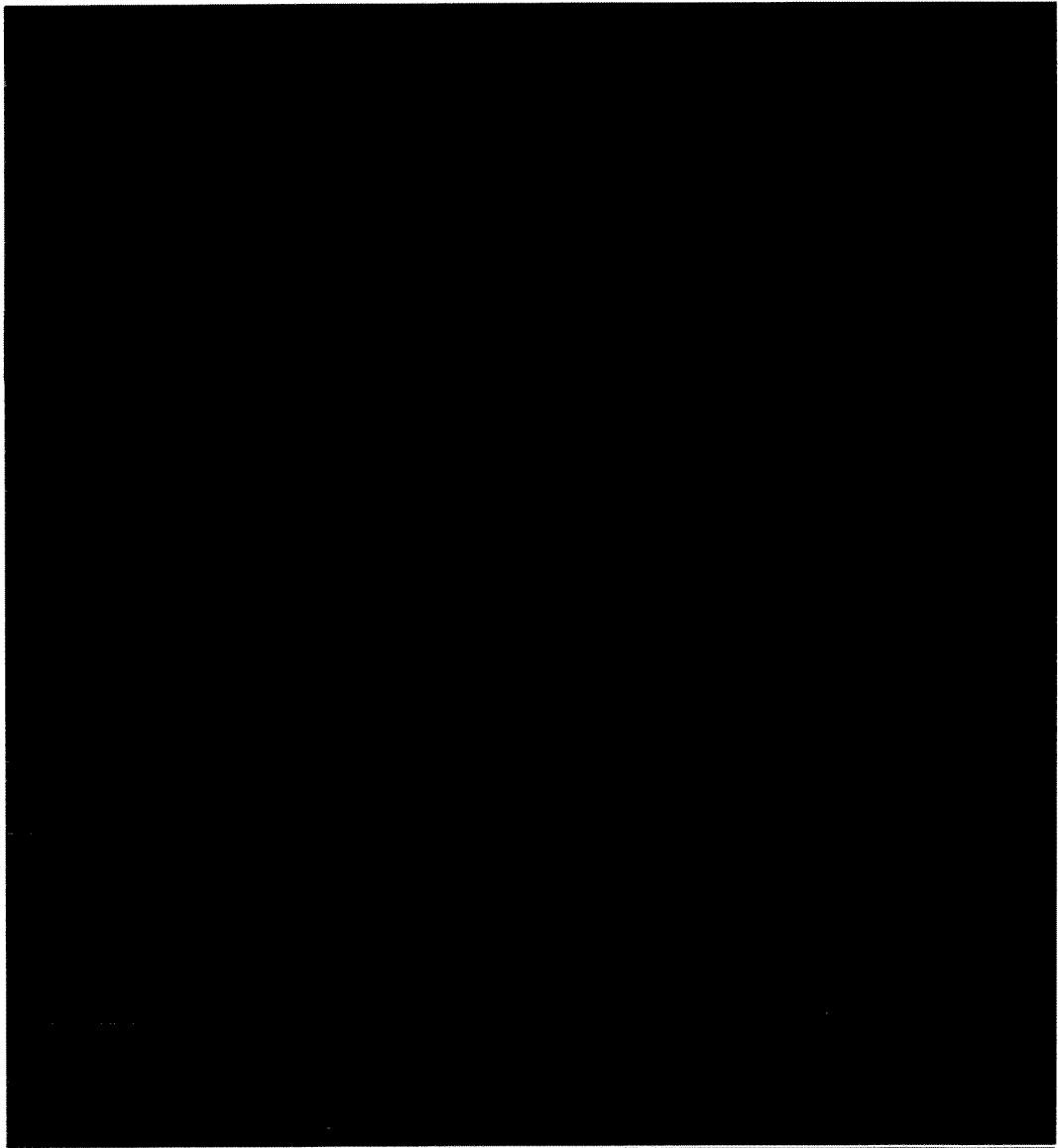
10.4.1

[REDACTED]

**ARTICLE 11 INTENTIONALLY LEFT BLANK**

**ARTICLE 12**

[REDACTED]



**ARTICLE 13 Allocation of Potential Liabilities and Risks**

13.1



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13.2

[Redacted]

13.2.1

[Redacted]

13.2.2

[Redacted]

13.3

[Redacted]

13.3.1

[Redacted]

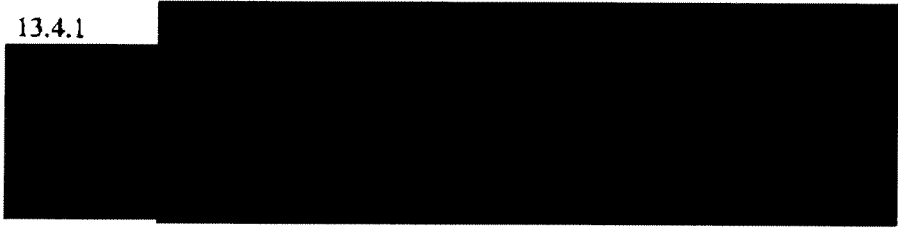
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[Redacted]

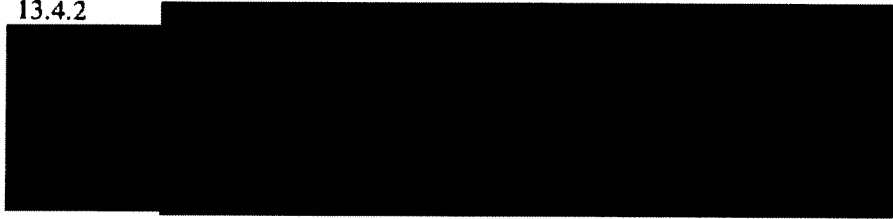
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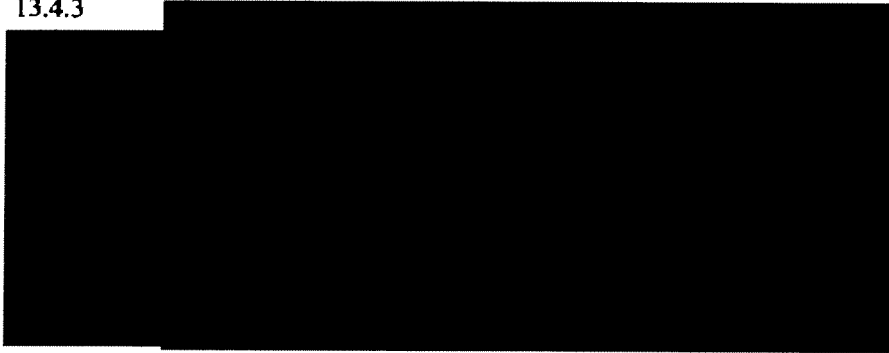
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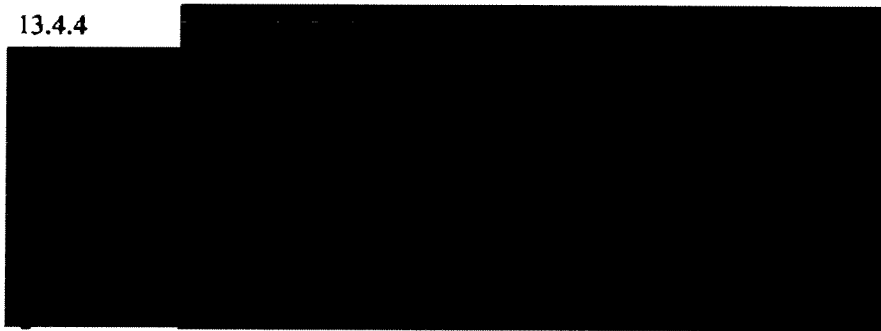
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13.4.3



13.4.4



13.5



13.5.1



13.5.2

[Redacted]

13.5.3

[Redacted]

13.6

[Redacted]

13.6.1

[Redacted]

13.6.2

[Redacted]

13.6.3

[Redacted]

[Redacted]

17  
Hodson  
AC

[REDACTED]

13.6.4

[REDACTED]

**ARTICLE 14 Responsibility for Design, Drawings and Specifications**

14.1 The submission of designs, drawings and specifications to Star One for comments or approvals, as the case may be, shall not affect the technical responsibility of Orbital for such designs, drawings and specifications.

14.2

[REDACTED]

**ARTICLE 15 Stop of Activities and Termination**

[REDACTED]

15.1

[REDACTED]

15.1.1

[REDACTED]

15.1.2

[REDACTED]



[REDACTED]

15.1.2.1

[REDACTED]

15.1.3

[REDACTED]

15.1.4

[REDACTED]

15.1.5

[REDACTED]

15.1.6

[REDACTED]

15.1.7

[REDACTED]

15.1.8

[REDACTED]

**Stop of Activities and termination by ORBITAL**

15.2

[REDACTED]

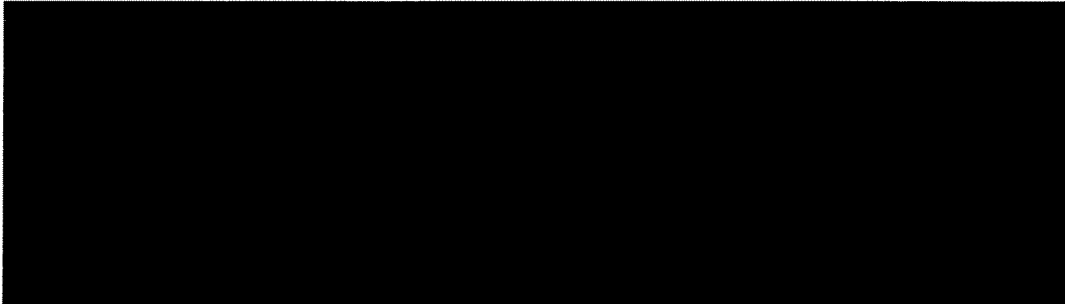
15.3

[REDACTED]

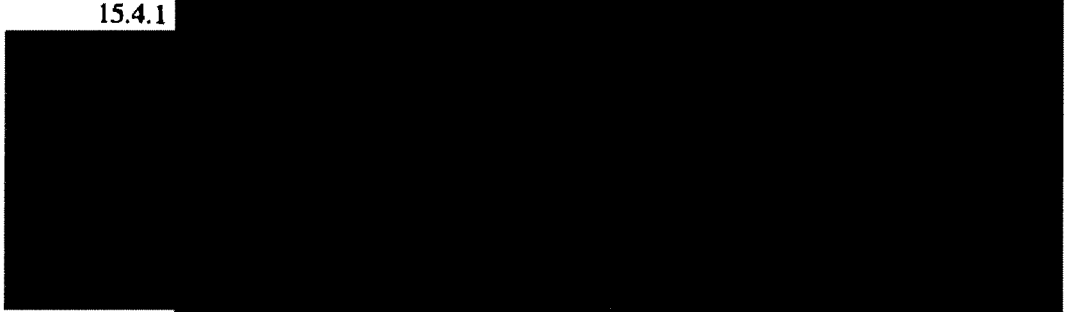
15.3.1 Orbital shall invoice Star One for such costs set forth in Article 15.2 of this Contract, and Star One shall pay such invoice

[REDACTED]

[REDACTED]



15.4.1



15.4.2



15.4.3



[REDACTED]

15.5

[REDACTED]

15.5.1

[REDACTED]

15.5.2

[REDACTED]

**ARTICLE 16 Permits and Licenses**

Orbital shall, at its own expense, obtain or arrange for all registrations, permits and licenses required for the performance of this Contract [REDACTED]

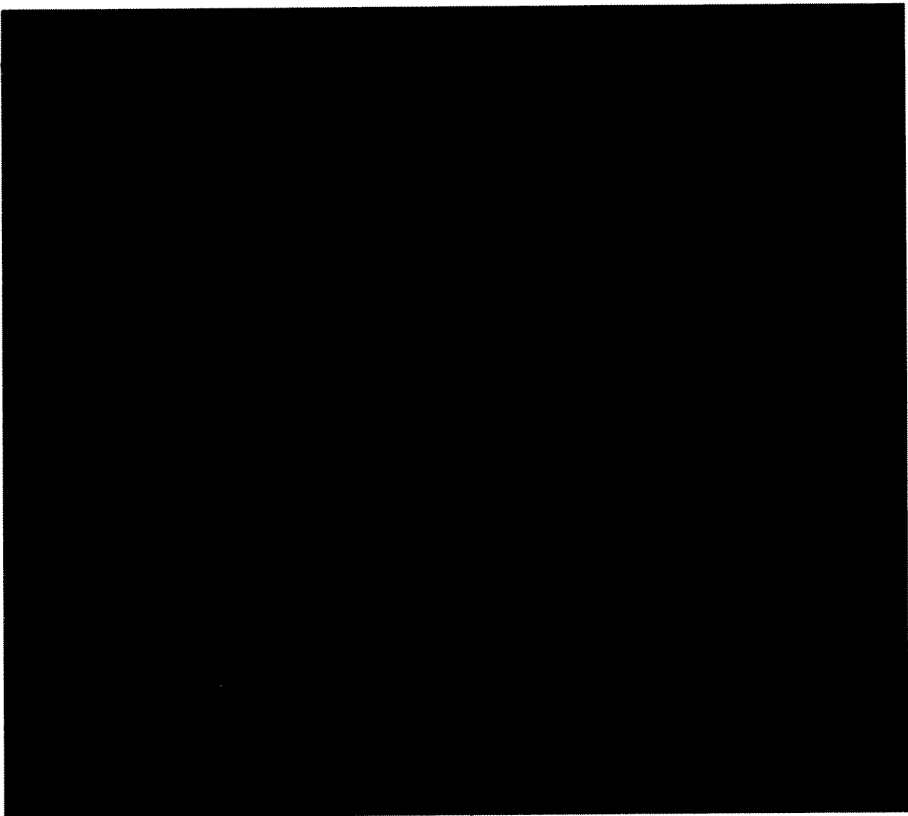
**ARTICLE 17 Storage**

17.1 Satellite storage shall comply with all the conditions contained in Exhibits B1 and C.

17.2 In case Orbital decides, and Star One agrees, to store the Satellite for reasons only attributable to Orbital and/or Orbital's Subcontractors, such storage shall be made [REDACTED]

17.3 In the event Star One directs Orbital to place the Satellite into storage at Orbital's facilities [REDACTED]

17.3.1 In the event the storage exceeds [REDACTED] the following conditions shall apply:



17.3.2 The conditions set forth in the Article 17.3.1 apply to [redacted]  
[redacted] After [redacted] the Parties shall negotiate in good faith the new  
conditions for the storage and/or disposition of the Satellite.

**ARTICLE 18 INTENTIONALLY LEFT BLANK**

**ARTICLE 19 Facilities and Rights for Star One's Personnel**

19.1 Orbital agrees to provide [redacted] adequate in-plant office  
space, supplies and facilities for Star One's personnel at Orbital and Orbital's  
Subcontractors premises to support establishment of Star One offices in accordance with  
Exhibit B1 of the Technical Specifications.

**ARTICLE 20 Representations, Warranties and Covenants**

20.1 Orbital and Star One each represents and warrants to, and covenants  
with, the other that:

20.1.1 Authority. It has the right, power and authority to enter into and perform its obligations under the Contract. The execution, delivery and performance of the Contract shall not result in the breach or non-performance of any document, instrument or agreement by which it is bound.

20.1.2 Partnership and Corporate Approvals. It has taken all requisite partnership or corporate action, as applicable, to approve execution, delivery and performance of the Contract, and the Contract constitutes a legal, valid and binding obligation upon itself in accordance with its terms.

20.1.3 Litigation. To the best of its knowledge, there is no outstanding or threatened judgment, pending litigation or proceeding, involving or affecting the transactions provided for in the Contract.

20.1.4 Good Faith. Each Party shall carry out its obligations under the Contract, including (without limitation) with respect to all matters requiring that a consent be given, in good faith.

#### **Undertaking of Orbital**

20.2. Orbital undertakes, to notify Star One as soon as possible of a material change in its shareholding structure or a merge into or consolidation with any other Person.

#### **ARTICLE 21 Reports, Documentation, Meetings, Reviews and Program Management**

##### **Reports and Documentation**

21.1. Progress reports, handbooks, drawings etc., shall be submitted by Orbital to Star One in accordance with the schedule, format, content, destination and quantities specified in Exhibit A of the Technical Specifications. Orbital's submission shall include Orbital's Subcontractor information.

21.2 All material, documents and reports which have been specifically produced under the Contract and are clearly identified as Activities and which are furnished pursuant to this Article shall not be released to third parties without the express written permission of Star One or Orbital, provided that this shall not preclude Orbital to use all such material internally for any purpose whatsoever.

21.2.1 All Documentation submitted by Orbital to Star One for approval shall be approved within a period of time such as notified by Orbital and agreed by Star One. [REDACTED]

**Meetings**

21.3 Star One and Orbital shall convene meetings according to the requirements of Exhibit B1 of the Technical Specifications. [REDACTED]

[REDACTED]

21.4 During the period of the Contract, Orbital shall attend meetings as specified in Exhibit B1 (the Statement of Work - SOW) at Star One headquarters and at Star One's reasonable request, in addition to the meetings specified in Article 21.3 and provided that a reasonable written advance notice of such meetings is provided to Orbital.

21.5 All Documentation shall be delivered in English, both in hard copy and electronic media, as defined in Exhibit B1.

**Reviews**

21.6 Star One and Orbital shall convene reviews according with the requirements of Exhibit B1 of the Technical Specifications. [REDACTED]

[REDACTED]

**Program Management**

21.7 Orbital shall provide management of all matters related to the performance of the Contract. [REDACTED]

[REDACTED]

21.8 Orbital shall maintain a Program Office [REDACTED]

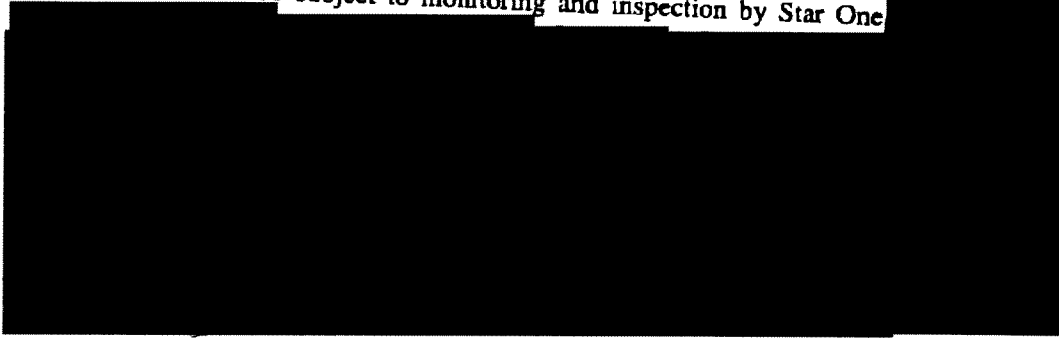
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SRS

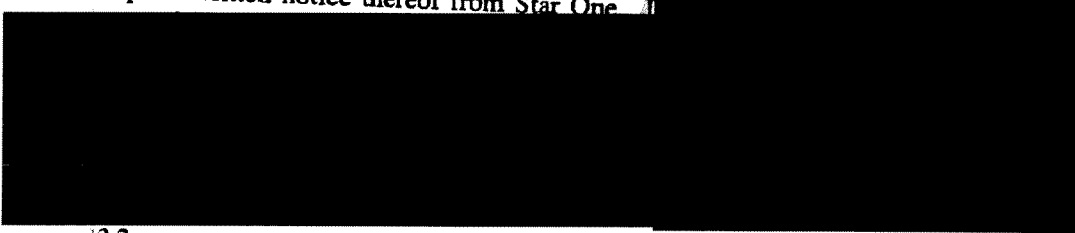
**ARTICLE 22 Inspection, Acceptance and Changes**

**Inspection**

22.1 Subject to U.S. Government export rules and regulations (which rules and regulations shall be duly demonstrated by Orbital on a case-by-case basis as requested by Star One), the performance of the scope of this Contract by Orbital and Orbital's Subcontractors shall be subject to monitoring and inspection by Star One



22.2 Remedy of any particulars or deficiencies referred to in this Article shall be accomplished by Orbital within a reasonable period of time after receipt of written notice thereof from Star One



22.3 Testing of the Satellite shall be undertaken by Orbital and Orbital's Subcontractors, in accordance with the test requirements specified in Exhibits of the Technical Specifications, complemented by the agreements reached between the Parties during the meetings and reviews set forth in the Contract.

In-plant and pre-launch test notification shall comply with the requirements, as stated in Exhibit B1 of the Technical Specifications.

22.4





**Acceptance**

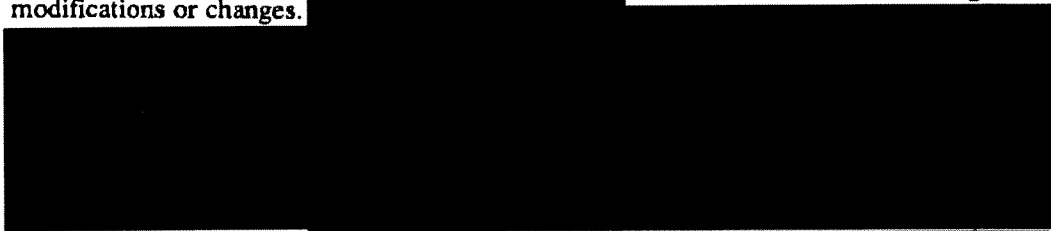
22.5 Preliminary Acceptance of the Satellite shall occur prior to the Launch as part of the process of authorization to launch.

22.6 Final Acceptance of the Satellite shall be in accordance with the requirements and conditions of the Contract, and shall occur upon completion of the Final Acceptance Review.



**Changes**

22.7 Star One may, from time to time, between the Effective Date of Contract and the date of Launch, by written change order issued by Star One, request changes within the general scope of the Contract, or delay in or place of delivery, or require additional work or direct reduction of work. Orbital may propose modifications to the Satellite during the period of the Contract, in order to improve its performance or also suggest changes within the general scope of the Contract, provided Orbital has informed Star One in writing with all appropriate information to support the request. Star One shall approve any such proposed modifications or changes prior to Orbital to making such modifications or changes.



22.8



22.9



*Alonzo* *RS*

[REDACTED]

22.10

[REDACTED]

22.11

[REDACTED]

**ARTICLE 23 Assurance, Warranty and Insurance**

**Quality of Material and Workmanship**

23.1 Except as may be otherwise specifically provided in the Contract, all equipment, materials and articles incorporated in the Satellite shall be unused, neither reworked nor refurbished, and free from defects, and they shall be designed in accordance with the Exhibit D of the Technical Specifications.

23.2 This Contract shall be performed in a skillful and workmanlike manner, following Space Agency's quality standards, and shall be consistent with the best practices in the space industry, in accordance with the Exhibit D of the Technical Specifications.

23.3

[REDACTED]

*W. J. S. B.*

**Warranties and Warranty Period**

23.4

23.4.1.

23.4.2

23.4.3

**Insurance**

23.5

23.6

23.7

23.8

*Robert SJS*

## ARTICLE 24 Confidentiality

24.1 "Confidential Information" means information that relates to the purpose stated in Article 24.2 below or that, although not related to such purpose, is, nevertheless, disclosed as a result of the Parties' discussions in that regard, and that should reasonably have been understood by the Party receiving such Confidential Information (the "Receiving Party") because of legends or other markings, the circumstances of disclosure or the nature of the information itself, to be proprietary and confidential to the Party disclosing such Confidential Information (the "Disclosing Party"), an Affiliate of the Disclosing Party or to a third party. Confidential Information may be disclosed in written or other tangible form (including on magnetic media) or by oral, visual or other means. The term "Affiliate" means any person or entity directly or indirectly controlling, controlled by, or under common control with a Party.

24.2 The Receiving Party may use the Confidential Information only for the purpose of performance of this Contract, any subcontract relating thereto and only during the period of time stated in Article 24.8. Star One may use the Confidential Information for any purpose in connection with the program.

24.3 The Receiving Party shall protect such Confidential Information from disclosure to others, using the same degree of care used to protect its own confidential or proprietary information of like importance, but in any case using no less than a reasonable degree of care. The Receiving Party may disclose Confidential Information received hereunder to:

- (i) its Affiliates who agree, in advance, in writing, to be bound by the Contract, and

its employees and its Affiliates employees who have a need to know, for the purpose of the Contract, and who are bound to protect the received Confidential Information from unauthorized use and disclosure under the terms of this Article.

Confidential Information shall not otherwise be disclosed by the Receiving Party to any third party without the prior written consent of the Disclosing Party.

24.4 The restrictions of the Contract on use and disclosure of Confidential Information shall not apply to information that:

- (a) Was publicly known at the time of the Disclosing Party's communication thereof to the Receiving Party;
- (b) Becomes publicly known through no fault of the Receiving Party subsequent to the time of the Disclosing Party's communication thereof to the Receiving Party;

(c) Was in the Receiving Party's possession free of any obligation of confidence at the time of the Disclosing Party's communication thereof to the Receiving Party; provided, however, that the Receiving Party immediately informs the Disclosing Party in writing to establish the Receiving Party's prior possession;

(d) Is developed by the Receiving Party independently of and without reference to any of the Disclosing Party's Confidential Information or other information that the Disclosing Party disclosed in confidence to any third party;

(e) Is rightfully obtained by the Receiving Party from third parties authorized to make such disclosure without restriction; or

(f) Is identified by the Disclosing Party as no longer proprietary or confidential.

24.5 In the event the Receiving Party is required by law, regulation or court order to disclose any of the Disclosing Party's Confidential Information, the Receiving Party will promptly notify the Disclosing Party in writing prior to making any such disclosure in order to facilitate the Disclosing Party seeking a protective order or other appropriate remedy from the proper authority. The Receiving Party agrees to cooperate with the Disclosing Party in seeking such order or other remedy. The Receiving Party further agrees that if the Disclosing Party is not successful in precluding the requesting legal body from requiring the disclosure of the Confidential Information, it will furnish only that portion of the Confidential Information, which is legally required and will exercise all reasonable efforts to obtain reliable assurances that confidential treatment will be accorded the Confidential Information.

24.6 Except for documentation and information to be provided by Orbital under Exhibit B1 and any other technical information, all Confidential Information disclosed under the Contract (including information in computer software or held in electronic storage media) shall be and remain the property of the Disclosing Party. All such information in tangible form shall be returned to the Disclosing Party promptly upon written request or the termination or expiration of the Contract, and shall not, thereafter, be retained in any form by the Receiving Party, its Affiliates, or any employees of the Receiving Party or its Affiliates.

24.7 No licenses or rights under any patent, copyright, trademark, or trade secret are granted or are to be implied by the Contract, except as defined in this Contract.

24.8 Notwithstanding the expiration or termination of the Contract, all of the Receiving Party's nondisclosure obligations pursuant to this Article shall survive with respect to any Confidential Information received prior to such expiration or termination for a period of ten (10) years thereafter.

24.9 Except upon prior, written consent of the Disclosing Party, or as may be required by law, the Receiving Party shall not in any way or in any form disclose the existence or terms of the Contract, the discussions that gave rise to the Contract or the fact that there have been, or will be, discussions or negotiations covered by this Article.

24.10 The Receiving Party acknowledges that Confidential Information is unique and valuable to the Disclosing Party. Therefore, the Parties agree that in the event of a breach of confidentiality, the Receiving Party shall immediately inform the Disclosing Party, notify the inadvertent recipient of the Disclosing Party's proprietary interest and recover the disclosed material together with any copies, notes or correspondence concerning the Confidential Information contained in the disclosed material.

ART 25 INTENTIONALLY LEFT BLANK

ARTICLE 26 Orbital's Subcontractors.

26.1 [REDACTED] Appendix A are

ARTICLE 27 Limitation of Liability

27.1 [REDACTED]

27.2 [REDACTED]

27.3 [REDACTED]

**ARTICLE 28 Obligations of Star One**

28.1

[REDACTED]

28.2

[REDACTED]

28.3

[REDACTED]

28.4

[REDACTED]

28.4.1

[REDACTED]

**ARTICLE 29 Effective Date of Contract**

29.1 The Effective Date of Contract shall be the date when the following conditions have been fulfilled:

- a) signature of this Contract by both Parties [REDACTED]

[REDACTED]

29.2 If by fifty (50) days from the date of the signature of this Contract by both Parties, EDC has not occurred, this Contract shall become null and void, without any responsibility and/or liability and/or charge to neither Party.

### ARTICLE 30 Miscellaneous

#### Force Majeure

30.1 Neither Party shall be held responsible for any delay or failure in performance of any part of this Contract to the extent such delay or failure is caused by: lightning; explosion; war; strike; freight embargo; civil or military authority; acts of terrorism; acts or failures to act of any governmental authority (except for preemption related to civil or military satellites); or acts of God or nature ("Force Majeure Events").

Orbital shall not be responsible for delays in the performance of the Activities that are determined to have been caused by Force Majeure Events, provided, however, that Orbital or Orbital's Subcontractors have not caused by act or omission in any manner the occurrence of any such events. Orbital shall notify Star One within twenty (20) days after Orbital's knowledge of the occurrence of such an event. In the event of aggregated delays caused by Force Majeure Events longer than six (6) months, the Parties shall, promptly enter into negotiations to establish in what way the conditions can be made to suit the altered circumstances. If after a thirty (30) days negotiation period, the Parties have not reached an agreement, Star One, and not Orbital, may terminate the Contract. Should that termination occurs, provisions of Article 15.1.7 (i) shall apply.

#### Patent indemnity

30.2

30.2.1

*[Handwritten signatures]*



[Redacted]

30.2.2

[Redacted]

30.2.3

[Redacted]

**Guarantee**

30.3

[Redacted]

30.3.1/

[Redacted]

30.3.2

[Redacted]

*Handwritten signature*

[REDACTED]

30.3.3

[REDACTED]

30.3.4

[REDACTED]

**Compliance**

30.4 In the countries where the Activities will be accomplished, both Parties shall comply with national federal, state and local laws and regulations.

**Adherence to Terms and Conditions**

30.5 Failure by any Party, at any given time, to demand strict interpretation of an adherence to certain terms and conditions of the Contract or to exercise certain right hereunder, shall not in any way constitute renouncement or modification of such terms, conditions and rights and shall not affect the right of any Party to demand strict adherence or to exercise its rights, at any time during the duration of the Contract, with respect to subsequent breaches of such terms, conditions and rights.

**Applicable Law**

30.6 This Contract is governed by, and all disputes arising under or in connection with this Contract shall be resolved in accordance with, the laws of the State of New York, USA (to the exclusion of its conflict of law rules).

**Arbitration**

30.7 (a) All disputes arising in connection with this Contract that have not been settled by mutual agreement between the Parties within thirty (30) days after written notification by one Party to the other or such longer period as may be mutually agreed upon in writing, shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce.

*Robert JRS*

(b) There shall be three (3) arbitrators, one (1) nominated by the initiating party in the request for arbitration, the second nominated by the other party within thirty (30) days of receipt of the request for arbitration, and the third, who shall act as presiding arbitrator, nominated by the two parties within thirty (30) days of the appointment of the second arbitrator. If any arbitrators are not nominated within these time periods, the President of the ICC International Court of Arbitration shall make the appointment(s). Arbitrators shall not act as *amiable compositeur* or *ex aequo et bono*.

(c) The place of arbitration shall be the City of Houston, State of Texas, USA.

(d) The arbitration proceedings shall be conducted in English.

(e) The arbitrators are not empowered to award punitive damages, and each Party hereby waives any right to seek or recover punitive damages with respect to any dispute subject to arbitration arising out of or in connection with this Contract.

(f) All fees, costs and expenses of the arbitrators and of the ICC shall be borne by the Parties equally; each Party shall bear the costs and expenses, including attorneys' fees, of its own counsel, experts, witnesses and preparation and presentation of its case.

(g) Any award of the arbitral tribunal shall be final and binding on the Parties, and judgment thereon may be entered in any court of competent jurisdiction. The Parties hereby waive any right to appeal from any arbitral award.

(h) Arbitration under this Article shall be the exclusive method for resolving all disputes arising hereunder, and no Party shall commence any action or proceeding in any court with respect to any such dispute except (i) to enforce the provisions of this Article; (ii) to obtain provisional judicial assistance in aid of arbitration under this Article; or (iii) to obtain judicial recognition and enforcement of an award made in accordance with this Article.

#### Language

30.8 All oral and/or written communications relating to the Contract and to all materials and documents, including labels and markings of equipment, submitted by Orbital or Orbital's Subcontractors hereunder, shall be in the English language.

#### Amendment

30.9 No addition to, deletion of or deviation from the provisions of the Contract shall be binding against any Party, unless agreed in writing and signed by the Parties.

**United Nations Convention on Contracts for the International Sale of Goods**

30.10 The United Nations Convention on Contracts for the International Sale of Goods shall not apply to the transactions contemplated hereunder and shall not be referred to for any interpretation of the Contract.

**Severability**

30.11 If any provision of the Contract is found to be unenforceable, the remainder shall be enforced as fully as possible and the unenforceable provision shall be deemed modified to the limited extent required to permit its enforcement in a manner most closely representing the intention of the Parties as expressed herein.

**Notices**

30.12 All notices, demands, reports, orders and requests hereunder by one Party to the other shall be in writing and deemed to be duly given on the same day if sent by electronic means (*i.e.*, electronic mail or facsimile) or delivered by hand during the receiving Party's regular working hours, or on the date of actual receipt, provided it occurs on a Working Day, if sent by registered or certified mail.

All contractual correspondence to Star One will be addressed to:

[REDACTED]  
Star One S.A.  
Presidente Vargas, 1012 / 6º andar, CEP 20071-002  
Rio de Janeiro, Brazil  
[REDACTED]

All Satellite technical correspondence to Star One will be addressed to:

[REDACTED]  
Star One S.A.  
Presidente Vargas, 1012 / 6º andar, CEP 20071-002  
Rio de Janeiro, Brazil  
[REDACTED]

All contractual correspondence to Orbital will be addressed to:

ORBITAL SCIENCES CORPORATION  
21839 Atlantic Boulevard

*Paul JRS*

Dulles, Virginia, 20166 U.S.A



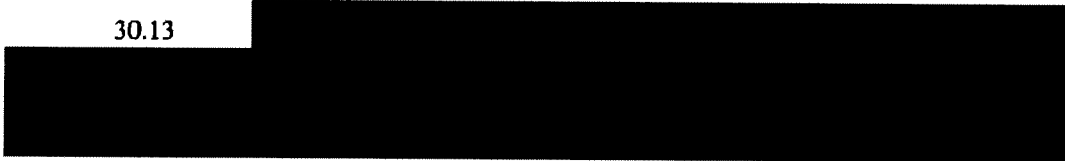
All Satellite technical correspondence to Orbital will be addressed to:

ORBITAL SCIENCES CORPORATION  
21839 Atlantic Boulevard  
Dulles, Virginia, 20166 U.S.A



In case of change of the names the Party shall notify in writing to the other Party.

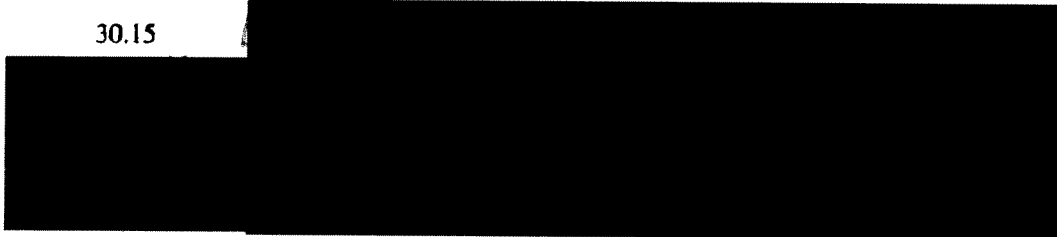
30.13



30.14 Neither Party shall assign any of its rights or obligations hereunder, except to an Affiliate or successor in interest, without the prior, written consent of the other Party, such consent not to be unreasonably withheld or delayed.

**Release of Information**

30.15



**Entire Agreement**

30.16 This Contract supersedes all communications, negotiations, and other agreements either written or oral, relating to the scope of the Contract and made pursuant to the Contract, prior to the Effective Date of this Contract. Notwithstanding the above provisions, all Activities performed and all payments made under the Contract and its Amendments shall be deemed to have been performed and made under this Contract.

*Handwritten signature/initials*

**Counterparts**

30.17. This Contract may be executed in any number of counterparts and by the Parties hereto in separate counterparts, each of which when so executed and delivered shall be deemed an original, but all such counterparts together shall constitute but one and same instrument; signature pages may be detached from separate counterparts and attached to a single counterpart so that all signatures pages are physically attached to the same document.

**No technology provision or transference**

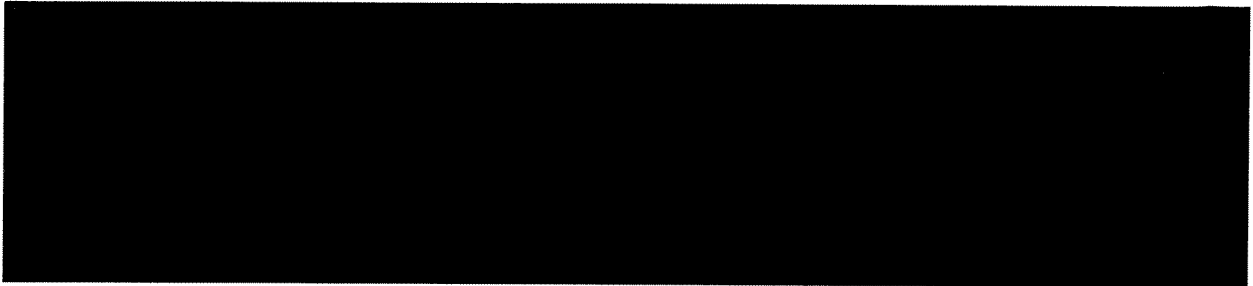
30.18 This Contract does not comprise transfer of technology.

In witness whereof, the Parties hereto have signed three (3) copies of equal content and form, so that they may produce their due and legal results.

December 18, 2009.

**By Star One:**

**By Orbital Sciences Corporation:**

A large black rectangular redaction box covering the signature area for both parties.

**Witnesses:**

A large black rectangular redaction box covering the witness area.

*SRS*

## **Attachment E**

**(Redacted) CDR and Construction Status Materials**



June 22<sup>nd</sup>, 2011

In reply please reference:  
StarOne-DK-06222011

Star One S.A.  
Av. Presidente Vargas 1012  
Rio de Janeiro, Brazil

Attention: Jose Alberto Rocha,  
Satellite Systems Manager

Subject: Certification of Critical Design Review (CDR)

Reference: Star One Satellite Equipment Purchase Contract

Dear Mr. Rocha,

This letter is to certify that the Star One C3 Satellite Critical Design Review was completed at Orbital's Dulles Virginia facilities. Also, we confirm that the milestone number 1.11, System CDR was fully (100%) paid by Star One.

Should you have any questions or concerns please do not hesitate to contact Joanne Woestman at (703)948-8491 or [Woestman.Joanne@orbital.com](mailto:Woestman.Joanne@orbital.com) and/or the undersigned.

Best regards,  
Orbital Sciences Corporation  
Space Systems Group

A handwritten signature in blue ink, appearing to read "David Keslow", written in a cursive style.

David Keslow  
Director, Business Operations  
(703) 948-8763  
[Keslow.David@Orbital.com](mailto:Keslow.David@Orbital.com)

Cc: Marcelo Laurado & Sergio Ferreira