



ASTRACOMMEX REGIONAL SATELLITE COMMUNICATION INC.

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To:

Rural Development Agency

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98479 Starvalis

Celestria

National Frequency Agency

3 hertz boulevard

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98479 Starvalis

Celestria

15 February 2016

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Re: Application of Astracommex Regional Satellite Communication Inc. to the Rural Digital Fund

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I. OVERVIEW

Astracommex Regional Satellite Communication Inc. (“**Astracommex Regional**”) operates as a wholly-owned subsidiary, with all of its shares held by its parent company, Astracommex Global Satellite Communication Inc. (“**Astracommex Global**”). Together, Astracommex Regional and Astracommex Global are collectively known as the Astracommex Group.

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The Astracommex Group specializes in delivering high-capacity, low-latency broadband communication services to unserved and underserved consumers and businesses in rural and remote areas globally through the deployment of low-Earth-orbit (“**LEO**”) constellation (the “**Astra System**”). The Astra System will comprise 5000 satellites at altitudes of 400, 450, 500 and 600 km. Astracommex Regional’s constellation plans to use frequencies in the Ka-band to provide Fixed-Satellite Services (“**FSS**”) and Mobile-Satellite Services (“**MSS**”) to customers.

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This innovative service is specifically suitable to address the distinct geographic challenges of Celestria. It focuses on delivering broadband to underserved rural areas, offering a more cost-effective alternative to terrestrial telecommunication networks. Moreover, it ensures heightened reliability and resilience against potential disruptions caused by events such as tsunamis, seabed earthquakes, which could otherwise sever internet connectivity throughout Celestria.

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The Astracommex Group harnesses robust innovation capabilities rooted in its expertise in space communication. With ownership of multiple patents, including those for small, cost-effective customer terminal antenna technology and an on-board autonomous collision avoidance system, the Astracommex Group is at the forefront of technological advancement.

245 Demonstrating its commitment, the Astracommex Group has pledged a minimum investment of USD 3 billion to bolster the Astra System. Progressing steadily, the group aims to deliver affordable and dependable customer services.

In April 2014, the Astracommex Group got authorization from Nebuland’s Bureau of Space Commerce¹² to launch and operate TestSat1 and TestSat2 for testing and demonstration purposes.
250 During test rounds, the satellites successfully communicated with Telemetry, Tracking & Command earth stations in the Astral Region, Asia, Africa, Australia, and North America, South America and Europe as well as with customer terminal units and a single gateway earth station located in Nebuland. The test has fully validated the design of the Astra System and its capability for future commercial deployment. The Astracommex Group received authorization from
255 Nebuland to operate in Ka-band on Nebuland territory in August 2014.

The Astracommex Group maintains a forward-thinking approach. In October 2014, the Group announced a strategic agreement with the Cosmosis Space Agency to secure 30 Cosmo-9 launch vehicles further fortifying its deployment schedule (see Appendix A). Notably, each Cosmo-9 launch vehicle possesses the capacity to deploy 50 Astra satellites.

260 The Astracommex Group is actively developing the Astra System at its state-of-the-art, 300,000-square-foot facility in Nebuland, serving as the primary prototype and qualification facility. The project involves a dedicated team of over 700 employees, and the workforce is rapidly expanding.

II. SYSTEM ARCHITECTURE DESCRIPTION

265 A. Space Segment

- *Laser Transmitters*

Each satellite is equipped with transmitters that enable direct laser transmissions with adjacent satellites. The primary function of laser transmitters is to establish inter-satellite links. These links allow satellites to communicate directly with each other in orbit, which is crucial for minimizing
270 network latency.¹³ The orbit and relative position of Astra satellites is carefully engineered to ensure reliable data flow among the high-velocity satellites. Notably, the laser wavelength utilized

¹² The Bureau of Space Commerce is part of the Department of Commerce in Nebuland that is responsible for the authorization of commercial space activities.

¹³ In the vacuum of space, light, including laser transmissions, travels faster than it does through fiber-optic cables on Earth. This allows for more rapid transmission of data from one satellite to another.

by the Astra satellites is distinct from the wavelengths observable by optical telescopes, thereby mitigating the risk of interference with astronomical observations.

- *Autonomous Collision Avoidance System*

275 Each Astra satellite is equipped with our patented autonomous collision avoidance system to avoid collision in orbit with another satellite or other space debris. This system harnesses tracking data from both onboard sensors and data shared via the Space Surveillance Network (“SSN”). The SSN is organized by the Department of Defense of the Kingdom of Cosmosis, and is renowned for its comprehensive coverage in tracking objects in orbit around the Earth.

280 The collision avoidance system operates in real-time, constantly assessing the likelihood of collisions and making split-second decisions to alter the satellite’s course when necessary. Every Astra satellite is equipped with cutting-edge ion thrusters powered by krypton. These thrusters allow Astra satellites to change their orbits when the onboard computer determines that a maneuver is necessary to avoid a potential collision.

285 The Astracommex Group retains the capability to remotely update the software of the collision avoidance system, ensuring continuous improvement and adaptability to the new challenges in space traffic management.

B. Ground Segment

290 The Astra System plans to have around 50 to 100 gateways¹⁴ on the territory of Celestria for its service provision to the Celestrian people.

III. POST-MISSION DISPOSAL

295 We believe the best option for post-mission disposal for satellites (as well as deorbiting dysfunctional satellites) is atmospheric reentry. Astra satellites, composed of various materials including aluminum alloys, are fully demisable.¹⁵ This approach to atmospheric reentry with fully-demisable satellites is preferred over leaving satellites in orbit or constructing them from materials that could survive reentry, posing a risk of human casualties.

[the rest technical details are intentionally omitted]

Yours Sincerely,



Jeffrey Myskin

¹⁴ A gateway is a special ground station that can connects the satellite communication to the Internet (and/or public telephone networks).

¹⁵ The term “fully demisable” in the context of satellites and spacecraft refers to the capability of the entire satellite or spacecraft to completely disintegrate and burn up upon re-entry into the Earth’s atmosphere.

APPENDIX A: LAUNCH SCHEDULE

Time	Number of Satellites (cumulative)	Status	Milestone Deployment Requirement	Network Capacity (estimated)
Until 1 Feb 2016	100	deployed	N/A	N/A
1 Oct 2016 (targeted RDF launch date – if winning the bid)	200	Launches booked with Cosmosis	N/A	N/A
1 Oct 2017 (year 1)	500	Launches booked with Cosmosis	10% (500 satellites)	N/A
1 Oct 2018 (year 2)	1500	Launches booked with Cosmosis	30% (1500 satellites)	Network goes live and the internet service starts to be available to customers. Customers may anticipate to experience network delays.
1 Oct 2019 (year 3)	2500	TBD	50% (2500 satellites)	Service available to customers (with 50% of optimal service quality). The quality of service is anticipated to be comparable to, and in some cases, exceed that of most terrestrial networks.
1 Oct 2020 (year 4)	3500	TBD	70% (3500 satellites)	Service available to customers (with 70% of the optimal service quality)
1 Oct 2021 (year 5)	5000	TBD	100% (5000 satellites)	Service available to customers (with 100% of the optimal service quality)

* To become operational, the Astra System requires a minimum deployment of 1500 satellites in its designated orbits. However, until the number of satellites reaches 2500, customers can expect suboptimal internet quality. The Astra System will activate inter-satellite links when the number of satellites reaches 2500 to better reduce latency.