ORBITAL DATACENTER SYSTEM

ATTACHMENT A

Technical Information to Supplement Schedule S

Scope and Purpose

This Technical Attachment accompanies the application of Orbital Compute Inc. ("Orbital") for authority to deploy and operate the Orbital Datacenter System, a non-geostationary orbit ("NGSO") satellite constellation. It provides the technical parameters of the System's RF communications capability, orbital configuration, antenna design, spectrum compliance, and debris mitigation approach as required under Part 25 of the FCC's 47 C.F.R. § 25.117 rules.

Communications

The Orbital Datacenter System's primary data path relies on optical intersatellite links to third-party constellations, with no routine use of radio frequency spectrum for payload data. To ensure reliable command and control of the constellation, Orbital requests backup Ka-band authorization for telemetry, tracking, and command ("TT&C") in the NGSO Fixed-Satellite Service ("FSS") primary bands: 18.8–19.3 GHz (space-to-Earth) and 28.6–29.1 GHz (Earth-to-Space), as designated under 47 C.F.R. § 2.106 n.NG165. This backup TT&C capability would be available to satellites within their authorized orbital shells as well as during orbit-raising and de-orbit transition phases. The Commission has recognized backup TT&C authority as serving the public interest for next-generation space station systems, and has authorized analogous operations for geostationary systems under §§ 25.282 and 25.283. Orbital will operate on a non-protected, nonharmful interference basis relative to co-primary non-federal NGSO FSS users and will coordinate with NTIA regarding Federal operations as required under footnote US334 of the U.S. Table of Frequency Allocations.

Constellation Orbit

The Orbital Datacenter System is a low earth orbit constellation of free-flying satellites forming a distributed datacenter for enterprise and consumer computing workloads. Satellites will occupy discrete near-circular orbital shells, each spanning up to 50 km in altitude, within a total operating range of 500 km to 850 km. All shells will be sun-synchronous, with inclinations ranging from approximately 97.4° at 500 km to approximately 98.7° at 850 km. The sun-synchronous geometry provides near-continuous solar illumination, which is essential to powering energy-intensive compute hardware without heavy battery storage. Every satellite in the constellation will share a common design across power generation, mass, physical dimensions, propulsion, and communications systems.

Predicted Space Station Antenna Gain Contours

The System's Ka-band TT&C antennas are steerable parabolic dishes with a peak transmit gain of 40 dBi at boresight and a minimum operational elevation angle of 30 degrees. The Schedule S filing includes representative antenna beam contours for operations at the 500 km and 850 km altitude boundaries, modeled at both 0° and 60° off-nadir pointing angles. These contours are representative of performance across the full operating altitude range and elevation envelope. Onboard power control allows the satellite to adjust transmit levels to hold power flux density ("PFD") at the Earth's surface within applicable limits. The maximum effective isotropic radiated power ("EIRP") density at each boundary altitude is shown below.

Altitude [km]	Max EIRP [dBW/Hz]	Transmit Beams
500	-58.2	TX1
850	-52.4	TX2

Compliance with PFD Limits

Orbital's Ka-band downlink beams are designed to comply with the PFD limits established in ITU-R Article 21, Table 21-4, which the Commission incorporates by reference in Section 25.146(a)(1). Compliance is maintained through onboard adjustment of transmit power, which can be commanded throughout all mission phases to ensure PFD levels remain within regulatory limits at any point within the operating altitude range.

Interference Analysis

Because the System conducts all routine data communications over optical intersatellite links, its RF footprint is minimal. The only radio frequency emissions are from backup Ka-band TT&C antennas, which feature narrow beamwidths (40 dBi gain) and steerable pointing. Orbital requests authority to operate these antennas in spectrum the Commission has designated for NGSO FSS on a primary basis and for which Article 22 equivalent power flux-density ("EPFD") limits do not apply. All TT&C transmissions will be conducted on a non-interference, non-protected basis with respect to co-primary non-federal NGSO FSS operations. Orbital will complete coordination with NTIA and affected federal users prior to commencing operations, consistent with footnote US334.

ITU Filings

Orbital has not yet filed satellite network information with the ITU. Orbital will initiate the appropriate ITU filing process in due course and accepts responsibility for all associated cost-recovery fees.

Orbital Debris Mitigation

A detailed Orbital Debris Assessment Report ("ODAR") is provided as a separate exhibit. The following summarizes key elements of Orbital's debris mitigation plan.

Orbital has designed the System for active controllability, transparency, and reliable disposal. Each satellite carries a triple-redundant, low-complexity propulsion system with propellant reserves sufficient for orbit raising, operational station-keeping and collision avoidance, and end-of-life deorbit. Collision avoidance is performed continuously across all mission phases, including during disposal maneuvers, using conjunction screening thresholds that are more conservative than prevailing industry standards. Orbital will review every conjunction alert, take feasible steps to reduce risk, coordinate with other operators where possible, and assume maneuver responsibility when coordination is not achievable and risk exceeds Orbital's internal thresholds.

All spacecraft in the constellation exceed 10 cm in their smallest dimension. Each satellite autonomously determines its position via GNSS and onboard sensors and reports state vectors to the ground in real time to support rapid cataloguing. Every satellite carries a unique telemetry identifier and will be registered with USSPACECOM's 18th Space Defense Squadron before deployment, with ephemeris and covariance data — including planned maneuvers — uploaded to Space-Track.org promptly after launch. Orbital will maintain 24/7 contact information for both routine and emergency coordination and will transition to NORAD catalog numbers once assigned.

The System is designed to minimize debris generation. Collision probability with trackable objects (10 cm and larger) will remain below 0.001 over each satellite's mission lifetime, and the probability of loss of control from small debris or micrometeoroid impact will be kept below 0.01 per satellite. The design avoids debris-creating features: there are no planned debris releases during normal operations, no tethers, no proximity operations, and no separable deployments. Explosion risk is addressed through minimization of stored-energy hazards, fault detection and isolation logic, and end-of-life passivation procedures that remove all stored energy prior to disposal.

Atmospheric re-entry is the primary disposal method. Each satellite maintains propellant reserves for collision avoidance during the disposal transit and is designed to achieve at least a 0.99 probability of successful disposal through fault-tolerant TT&C, onboard autonomy, and margins covering credible single-failure scenarios. Controlled re-entry over unpopulated areas will be attempted where feasible; otherwise re-entry will be uncontrolled. The satellites employ a designed-for-demise approach so that no component survives re-entry with kinetic energy exceeding 15 joules, and overall re-entry casualty risk will remain below 1 in 10,000 per spacecraft as evaluated under NASA DAS or an equivalent methodology. Orbital will coordinate with NASA regarding any transits through altitudes used by crewed spacecraft, including the International Space Station and Tiangong.