Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C. 20554

In the Matter of	)	
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Orbital Compute Inc.	)	
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Application for License	)	File No.
for the Orbital Datacenter System	)	
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APPLICATION FOR LAUNCH AND OPERATING AUTHORITY FOR THE ORBITAL DATACENTER SYSTEM

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Orbital Compute Inc. ("Orbital") respectfully requests authority from the Federal Communications Commission ("Commission") to deploy and operate a constellation of up to 100,000 non-geostationary orbit ("NGSO") satellites (the "Orbital Datacenter System" or "System"). The System will operate as a distributed datacenter in space, providing AI inference powered by solar energy and cooled by radiative dissipation to space.

The Orbital Datacenter System consists of free-flying satellites operating as nodes in a distributed computing network. Each satellite carries servers to handle AI inference workloads. The System leverages the unique physics of the orbital environment: near-constant solar illumination in sun-synchronous orbit provides continuous power generation without terrestrial grid dependency, while the near-absolute-zero thermal environment of space enables passive radiative cooling of high-performance computing hardware — eliminating the energy-intensive cooling infrastructure required by terrestrial data centers.

Orbital proposes to operate the System in sun-synchronous circular orbits at altitudes between 500 km and 850 km, with nominal 06:00 local time of ascending node. This altitude range has been selected based on trade-offs between solar exposure, radiation environment, atmospheric drag, and accessibility from planned launch sites. The satellites will be deployed in discrete near-circular orbital shells with a width of up to 50 km. All satellites within the constellation will be functionally identical in terms of power generation, mass class, physical dimensions, maneuverability, and communications capability, with variable computing hardware payloads.

The System will rely primarily on optical inter-satellite links ("ISLs") to third-party constellations — including those operated by Starlink, Amazon, and others — which will, in turn, relay traffic to authorized earth stations. Orbital's satellites will not conduct daily ground communications via RF or optical means except through these third-party networks.

As a backup for telemetry, tracking, and command ("TT&C") operations, Orbital requests authorization to operate in the Ka-band on a non-geostationary, non-interference, unprotected basis: (1) Space-to-Earth: 18.8–19.3 GHz and (2) Earth-to-Space: 28.6–29.1 GHz. These frequency bands are allocated to the non-geostationary fixed-satellite service ("NGSO FSS") on a primary basis. See 47 C.F.R. § 2.106, n.NG165. Orbital will operate on a non-interference, non-protection basis with respect to co-primary NGSO FSS operators, and will coordinate with NTIA as required per footnote US334 of the U.S. Table of Frequency Allocations.

The System's primary reliance on optical inter-satellite links represents the most spectrum-efficient approach to satellite communications. By conducting substantially all data transfer via optical links, Orbital minimizes its use of radio frequency spectrum. The Ka-band

allocation is requested solely for backup TT&C operations, ensuring the System places negligible demand on shared spectrum resources.

Orbital is committed to responsible space operations and comprehensive orbital debris mitigation. Key features of the System's debris mitigation approach include: (1) automated collision avoidance capabilities for low-latency risk assessment and response; (2) high-thrust, low-complexity propulsion systems enabling precise maneuvers throughout the satellite lifecycle; (3) transparent operator coordination with data sharing and proactive mitigation of high-risk conjunctions; (4) initial deployment at lower altitudes before orbit raising to operational altitude, ensuring rapid natural deorbit in the event of early-stage failures; (5) triple-redundant propulsion with sufficient propellant reserves for orbit raising, station-keeping, collision avoidance, and end-of-life disposal; and (6) full demisability design ensuring complete burn-up on re-entry and posing no calculable risk to people on the ground.

A detailed Orbital Debris Assessment Report ("ODAR") is provided as Exhibit E to this application.

Grant of this application would serve the public interest by advancing the development of space-based computing infrastructure that addresses a critical bottleneck in global AI development: the terrestrial power grid. Global AI compute demand is growing exponentially, but terrestrial datacenter expansion is constrained by power availability, grid interconnection timelines, and cooling water scarcity. Space-based data centers powered by solar energy represent a sustainable, scalable solution that complements terrestrial infrastructure without competing for scarce grid resources.

Orbital's system will provide cost-effective AI computing capacity accessible to companies, organizations, and end users. The System's solar-powered design eliminates the carbon footprint associated with fossil-fuel-dependent terrestrial data centers, contributing to global sustainability goals.

For the foregoing reasons, Orbital Compute Inc. respectfully requests that the Commission grant this application for authority to launch and operate the Orbital Datacenter System.

Respectfully submitted,

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CEO & Founder
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