Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Xona Space Systems, Inc.	)	File No. SAT-AMD-20251119-00328
	)	
Amendment to the Xona System Radionavigation-Satellite Service, Space Operation Service, and Inter-Satellite Service License Application	)	Call Sign: S3177

APPLICATION

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November 26, 2025

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EXHIBITS

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NARRATIVE

In this application, Xona amends the pending Xona System space station license request to enhance its next-generation space-based positioning, navigation, and timing ("PNT") offering.[1] Specifically, Xona –

- updates the 2025-2110 MHz (Earth-to-space) and 2200-2290 MHz (space-to-Earth) characteristics and corresponding earth stations for the telemetry, tracking, and command ("TT&C") links;
- adds the 3700-4200 MHz (space-to-space) band for the feeder links;
- seeks FCC rule waivers regarding frequency assignments (47 C.F.R. § 2.102(a)) and the frequency allocation table (47 C.F.R. § 2.106) for the 1525-1559 MHz, 1626.5-1660.6 MHz, and 3700-4200 MHz (space-to-space) feeder links;
- provides a complete orbital debris mitigation plan ("ODMP");
- seeks deferral of 5000-5010 MHz ("5 GHz") (Earth-to-space) for the feeder links and 5010-5030 MHz (space-to-Earth) for the service links; and
- removes 8025-8400 MHz (space-to-Earth) for the service and TT&C links.[2]

[1] *See generally* Xona, Application, ICFS File No. SAT-LOA-20230711-00165 (filed July 11, 2023) ("Initial Application").

[2] Xona also notes that the GPS Innovation Alliance ("GPSIA") has withdrawn its pending petition to deny the Initial Application. *See* Letter from Lisa Dyer, Executive Director, GPSIA, to Marlene H. Dortch, Secretary, FCC, ICFS File No. SAT-LOA-20230711-00165 (filed Nov. 26, 2025) (attached).

Xona incorporates by reference all previously submitted information except for the details clarified in this amendment application package (see page i). The requested federal concurrence date is no later than February 24, 2026, and the requested license issue date is no later than August 1, 2026.

I. MISSION AUTHORITY CLARIFICATION

Xona seeks launch, operational, and replenishment authority for 258 satellites. The requested authority would allow Xona to (1) have up to 258 satellites simultaneously use the service; feeder; and TT&C links at any time from the deployment, operational, and post-mission disposal altitudes and (2) replenish satellites during the license term.[3]

II. FREQUENCY PLAN COMPLIANCE

Table 1 captures the updated frequency plan and allocation table compliance status.

Table 1: Frequency Plan[4]

Band (MHz)	Link Direction	Link Type	Frequency Allocation Table Compliance?
1164-1215	space-to-Earth	Service	Yes (RNSS[5])
1525-1559	space-to-space (GEO-to-LEO)[6]	Feeder	No (waiver requested in § III)
1559-1610	space-to-Earth	Service	Yes (RNSS)
1626.5-1660.5	space-to-space (LEO-to-GEO)	Feeder	No (waiver requested in § III)
2025-2110	Earth-to-space (only outside US)	TT&C	Yes (SpaceOps[7])
2200-2290	space-to-Earth (only outside US)	TT&C	Yes (SpaceOps)

[3] The ODMP defines the deployment, operational, and post-mission disposal altitudes.

[4] For satellite positioning determination, Xona would only passively monitor the readily accessible civilian Global Positioning System ("GPS") L1 (center frequency of 1575.42 MHz), L2 (center frequency of 1227.60 MHz), and L5 (center frequency of 1176.45 MHz) and Galileo E1 (center frequency of 1575.42 MHz) and E5 (center frequency of 1191.795 MHz) signals.

[5] RNSS is radionavigation-satellite service.

[6] GEO means geostationary-Earth orbit. LEO means low-Earth orbit.

[7] SpaceOps is space operation service.

Band (MHz)	Link Direction	Link Type	Frequency Allocation Table Compliance?
3700-4200	space-to-space (GEO-to-LEO)	Feeder	No (waiver requested in § III)

III. WAIVER REQUEST (47 C.F.R. §§ 2.102(A), 2.106)

Waiver is appropriate when (i) special circumstances warrant a deviation from the general rule; and (ii) such deviation would serve the public interest better than strict adherence to the rule.[8] The Commission may consider hardship, equity, or better policy implementation when evaluating a request.[9] Further, the Commission generally grants a waiver of the frequency allocation table "when there is little potential for interference into any service authorized under the [table] and when the non-conforming operator accepts any interference from authorized services."[10] All prior waiver requests are incorporated by reference except as noted below.[11]

The proposed space-to-space operations are non-conforming with the frequency allocation table. As a result, Xona seeks a waiver of the FCC rules regarding frequency assignments (47 C.F.R. § 2.102(a)) and the frequency allocation table (47 C.F.R. § 2.106).

[8] *See* 47 C.F.R. § 1.3; *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990); *see also WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969).

[9] *See id.*

[10] *See The Boeing Company Application for Blanket Authority to Operate Up to Eight Hundred Technically Identical Transmit and Receive Mobile Earth Stations Aboard Aircraft in the 14.0- 14. GHz and 11.7-12.2 GHz Frequency Bands*, Order and Authorization, 16 FCC Rcd 22645 ¶ 12 (IB & OET 2001) (internal punctuation omitted). *See generally Application of Fugro-Chance, Inc. for Blanket Authority to Construct and Operate a Private Network of Receive-Only Mobile Earth Stations*, Order and Authorization, 10 FCC Rcd 2860 (IB 1995); *Application of Motorola Satellite Communications, Inc. for Modification of License*, Order and Authorization, 11 FCC Rcd 13952 (IB 1996).

[11] *See* Initial Application, Legal Narrative § IV; Letter from George V. John, Counsel to Xona, ICFS File No. SAT-LOA-20230711-00165 (filed June 12, 2024).

A. Background

The Xona System would use commercially available satellite-to-satellite links with authorized and coordinated GEO satellites. The Xona System would transmit in 1626.5-1660.5 MHz for TT&C when out of range of ground stations. It would receive in 1525.0-1559.0 MHz and 3700-4200 MHz for TT&C data when out of range of ground stations and service data including RNSS corrections to combine multiple position and timing references to precisely determine Xona System satellites' orbital location and enable the satellites to transmit powerful and secure GPS-like ranging signals to end users in other frequency bands. Xona, as a non-conforming operator, accepts any interference from authorized services.

Xona uses non-RNSS bands on a non-conforming basis to overcome currently present technical limitations. TT&C cannot occur in RNSS-allocated bands at this time due to the nature of RNSS, which has relatively weaker signals that are more susceptible to harmful interference. Further, the 5 GHz RNSS feeder links are not yet ready to support RNSS correction data transmittal.

The proposed non-conforming operations would benefit the public by supporting the development of the first commercial US-based LEO constellation providing PNT services. These capabilities would be stronger, more secure, and more available than existing RNSS. Using the proposed bands would enable immediate TT&C and RNSS corrections data relay without waiting for the Xona System to be within view of a ground station as currently required if satellite-to-satellite links are not used. Approving this waiver request, therefore, supports the public interest.

B. 1525-1559 MHz (space-to-space; GEO-to-LEO)

The proposed 1525-1559 MHz satellite-to-satellite usage is on a non-conforming, but non-interfering, basis. The band hosts a mobile-satellite service ("MSS") space-to-Earth allocation.[12] The LEO-based Xona System satellite would receive directly from GEO-based Inmarsat satellites in this band, however. Although the allocations in this frequency band do not include a directional indicator for satellite-to-satellite communications, the Xona System satellite's reception of these frequencies would not in any way alter the interference environment because the received signal would be indistinguishable in its technical characteristics from signals transmitted in the allocated space-to-Earth direction.

C. 1626.5-1660.5 MHz (space-to-space; LEO-to-GEO)

The proposed 1626.5-1660.5 MHz satellite-to-satellite usage is on a non-conforming, but noninterfering, basis. The band hosts an MSS Earth-to-space allocation.[13] The LEO-based Xona System satellites would transmit directly to GEO-based Inmarsat satellites in this band, however. The signals would occur on a limited basis for data requiring transmission prior to available downlink opportunities directly to ground stations. The signals would occur on frequencies that Inmarsat assigns to the spaceborne Inmarsat terminal onboard each Xona System satellite. Such assignment would be consistent with Inmarsat's coordination agreements with other operators in the band to ensure that no other authorized user would be transmitting at the same time and on the same frequency as Xona's satellite-to-satellite transmissions to prevent harmful interference. As mentioned above, the primary anticipated use is TT&C and RNSS correction data relay with low latency to maximize effectiveness in achieving high precision orbit determination along with

[12] *See* 47 C.F.R. § 2.106.

[13] *See id*.

service data passthrough without the need to wait until the satellite is within view of Xona's ground station. The communication protocol this link uses is designed to transmit the minimum amount of information necessary and only actively transmit when there is information to send. Xona, therefore, anticipates that its satellite-to-satellite transmissions would be extremely brief and infrequent and prevent any harmful interference to other operators even absent the time- and frequency-based coordination built into Inmarsat's channel assignment process.

Protecting in-band operations at altitudes above the Xona System. Potential victim receivers may occupy altitudes above the Xona System when it transmits co frequency from LEO to GEO.[14] The -12.2 dB interference-to-noise ratio ("I/N") ($\Delta T/T = 6\%$) threshold is commonly enlisted to assess spectrum sharing feasibility in such a scenario.[15] Each Xona System satellite clears this threshold with significant margin. Table 1 offers a link budget analysis including the GEO satellite characteristics,[16] Xona System satellite characteristics, and I/N calculations.

Table 2: Link Budget Analysis

Parameter	Value	Value	Units
LEO Altitude	1080	1080	km
GEO Altitude	35,786	35,786	km
Minimum LEO-to-GEO Slant Range	34,706	34,706	km
Free Space Path Loss	187.41	187.41	dB
Transmit Power	1.5	1.5	dBW
Transmit Antenna Gain	9.0	9.0	dBi
Signal Bandwidth	200	200	kHz
Receive Antenna Gain (Low)	22	–	dBi

[14] *See generally* FCC ICFS; ITU Space Explorer. Based on these resources, a GEO satellite is the likely potential victim.

[15] *See, e.g.*, ITU Radio Regulations Appendix 8 (method of calculation for determining if coordination is required between GEO networks sharing the same frequency bands).

[16] *See* Space-to-space links in Mobile-satellite service (MSS) allocations in the frequency bands 1 518- 1 544 MHz, 1 545-1 559 MHz, 1 610-1 645.5 MHz, 1 646.5-1 660 MHz, 1 670-1 675 MHz and 2 483.5- 2 500 MHz, ITU Working Document Regarding WRC-27 Agenda Item 1.11, Document 4C/204-E at Annex 12 (Oct. 23, 2024).

Parameter	Value	Value	Units
Receive Antenna Gain (High)	–	44	dBi
Interference Power Density at GEO	–207.91	–185.91	dBW/Hz
Boltzmann's Constant	1.38×10^{-23}	1.38×10^{-23}	J/K
Receive Noise Temperature	630	630	K
Receive Thermal Noise	–147.60	–147.60	dBW/Hz
I/N	**–60.3**	**–38.3**	**dB**

The Xona System satellite transmission has a 48.1 dB margin for the low-gain GEO satellite receiver case and a 26.1 dB margin for the high-gain GEO satellite receiver case.

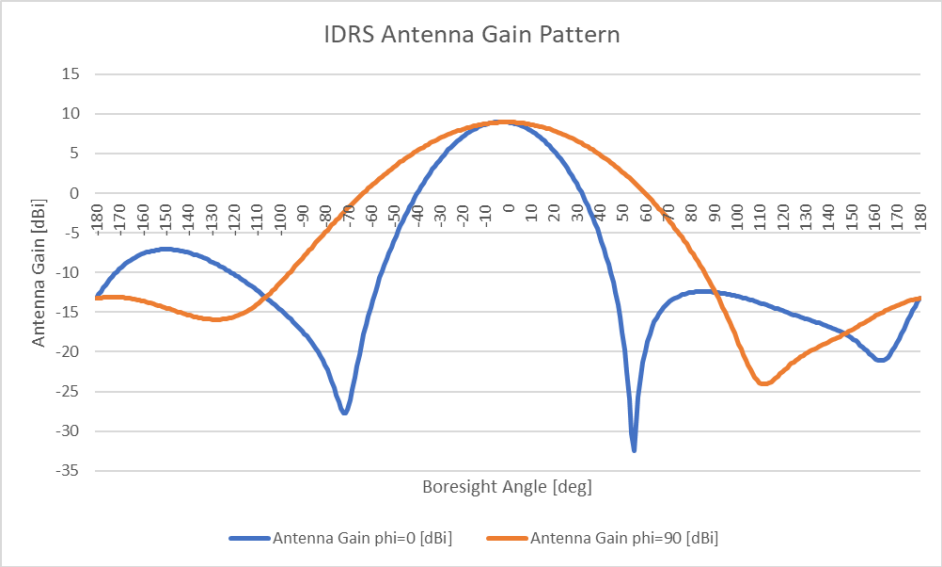
Protecting in-band operations at altitudes below the Xona System. Potential victim operators could be receiving in 1626.5-1660.5 MHz at altitudes below the Xona System satellite when it transmits co frequency from LEO to GEO.[17] *First*, such transmissions should occur only when within the cone of the receiving GEO satellite's apex.[18] *Second*, such transmissions should remain within the envelope of the recorded characteristics of the associated transmitting earth stations of the GEO MSS network with which it communicates.[19] Consistent with these principles, the Xona System satellite would (1) transmit only within the Inmarsat GEO satellite coverage cone by using the Figure 1 off-axis antenna gain pattern and (2) operate consistent with Inmarsat's earth stations that may transmit in the band today.

[17] *See generally* FCC ICFS; ITU Space Explorer.

[18] *See, e.g.*, Use of the frequency bands 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz by the inter-satellite service, Resolution 679 (WRC-23).

[19] *See id*.

Figure 1: Off-Axis Antenna Gain Pattern



Protecting adjacent-band operations. Xona's proposed operations must occur on a non-protected, non-interference basis and safeguard incumbent spectrum users, including Iridium, against out-of-band-emissions ("OOBE") interference. Xona and Iridium have discussed this obligation, and Iridium is satisfied with Xona's OOBE performance commitment.[20]

D. 3700-4200 MHz (space-to-space; GEO-to-LEO)

The proposed 3700-4200 MHz (space-to-space) usage is on a non-conforming, but non-interfering, basis. This band hosts fixed-satellite service (space-to-Earth), fixed service, and mobile service allocations in the international and US frequency allocation tables.[21] It omits any space radiocommunication service (space-to-space) allocation for SES's GEO satellites to transmit to Xona's LEO satellites. Despite this omission, the Xona System's reception of these frequencies would be consistent with prior FCC approvals and not in any way alter the interference

[20] *See* Letter from George John, Counsel to Xona, to Marlene H. Dortch, Secretary, FCC, ICFS File No. SAT-LOA-20230711-00165 (filed Sept. 26, 2023).

[21] *See* 47 C.F.R. § 2.106.

environment for at least three reasons.[22] *First*, as mentioned above, Xona would accept the frequency assignment on a non-interference, non-protected basis. *Second*, the Xona System's LEO satellites would receive the same 3700-4200 MHz signals from SES GEO satellites that SES Earth stations normally receive. Xona's reception of the signals would not change or increase the interference potential. *Third*, SES would assign the center frequency and can change it over time based on its regulatory, coordination, and operational requirements.

IV. NOAA LICENSING STATUS

Each Xona System satellite will have a camera system for mission assurance purposes (monitoring solar array deployment and supporting satellite detumbling). Xona is collaborating with the National Oceanic and Atmospheric Administration to secure a waiver or authorization before operating this system.

[22] *See, e.g.*, Planet Labs PBC, Stamp Grant, ICFS File No. SAT-MOD-20240723-00157, at Condition 14 (granted Nov. 21, 2024 and reissued July 10, 2025).

V. CONCLUSION

As demonstrated in this application, the requested grant would serve the public interest. Xona, therefore, respectfully requests that the Commission authorize the launch, operation, and replenishment of the Xona System.

Respectfully submitted,

/s/ Christina Youn

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November 26, 2025

ATTACHMENT A
Technical Appendix and Engineering Certification

I. INTRODUCTION

This technical appendix incorporates all prior related submissions, supplements the interference mitigation disclosures, and clarifies certain Schedule S parameters.

II. INTERFERENCE MITIGATION

Xona remains committed to coordination and satisfying all relevant interference-protection standards.

A. All Bands – Incumbent Service(s) Coordination (47 C.F.R. §§ 2.102, 2.104, 2.105, 2.106)

Xona is dedicated to collaboratively engaging with other operators consistent with Federal Communications Commission ("FCC") regulations. It successfully coordinated the Xona In-Orbit Validation ("IOV") satellite with United States ("US") federal spectrum users and will do the same for the Xona System using the attached coordination information spreadsheet.

B. 1164-1300 MHz and 1559-1610 MHz

1. RNSS Coordination (Resolution 610 (rev.WRC-19))

For the 1164-1300 MHz and 1559-1610 MHz operations, operator-to-operator coordination is the default standard between different radionavigation-satellite service ("RNSS") networks and/or systems. New RNSS systems are required to demonstrate they will not cause unacceptable levels of interference through compatibility analysis.

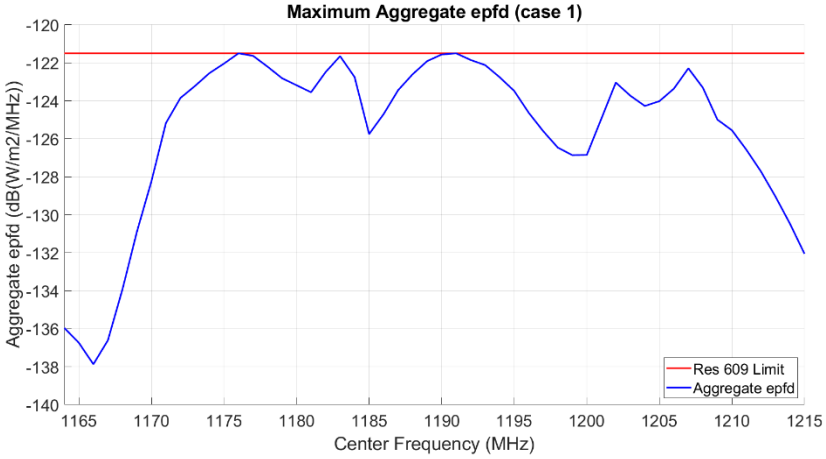
Xona is coordinating with both national and international operators in the RNSS bands to demonstrate the Xona System would not cause unacceptable interference (like the previously

coordinated and approved Xona IOV satellite). A compatibility analysis was presented at the 2025 ION GNSS+ Conference and is publicly available.[1]

2. ARNS Protection (Resolution 609 (rev.WRC-07))

For the Xona System's 1164-1300 MHz operations, an annual consultation meeting protects adjacent-frequency aeronautical radionavigation service ("ARNS") operators. For the 2024 consultation meeting, the Xona System was included with no aggregate equivalent power flux-density ("EPFD") limit exceedance. For the 2025 consultation meeting ("CM-22"), Figure 1 represents the aggregate EPFD calculation submitted by the US.

Figure 1: Resolution 609 Aggregate EPFD Calculations by US for CM-22



The Xona System remains compliant because there is no calculated exceedance.

3. RAS Protection (Resolution 739 (rev.WRC-19))

For the Xona System's 1559-1610 MHz operations, interference protection criteria safeguard radio astronomy service ("RAS") from adjacent-frequency space-based interference. The Xona System minimizes out-of-band ("OOB") emissions in the 1610.6-1613.8 MHz band by using bandwidth-efficient modulation and filtering to achieve a worst-case power flux-density

[1] *See generally* Tyler G. R. Reid et al., *Xona Pulsar Compatibility with GNSS*, arXiv (Sept. 19, 2025), https://tinyurl.com/2xwmhqv3.

("PFD") of -224.6 dBW/(m²·20kHz) at the Earth's surface. Based on this PFD and the Rec. ITU-R M.1583 methodology, the Xona System is not expected to cause radio astronomy data loss beyond the 2% threshold in Rec. ITU-R RA.1513.[2] Table 1 shows OOB emission levels and the associated compliance.

Table 1: Xona System Single Worst-Case OOB Emission in 1610.6-1613.8 MHz

Variable	Value	Unit
EIRP Density OOB without Filter	-63.9	dB(W/20kHz)
Radio Astronomy Band Filter Attenuation	29	dB
EIRP Density OOB with Filter	-92.9	dB(W/20kHz)
Operational Satellite Altitude	1080	km
Maximum OOB Emission PFD at Earth's Surface	-224.6	dBW/(m²·20kHz)

C. 2200-2290 MHz

1. FS and MS Protection (ITU RR Table 21-4)

For the Xona System's 2220-2290 MHz operations, PFD limits protect terrestrial fixed service ("FS") and mobile service ("MS") from co-frequency space-based interference. Figure 2 and Figure 3 show Xona's representative PFD compliance with the ITU Radio Regulations ("RR") Table 21-4 limits at the nominal deployment and post-mission disposal altitudes.

[2] Rec. means recommendation. ITU means International Telecommunication Union. ITU-R means the ITU's Radiocommunication Sector.

Figure 2: PFD Compliance for 2200-2290 MHz Downlink with a 6 dBW EIRP Emission over 1.5-Megahertz Bandwidth at 500 km Orbit

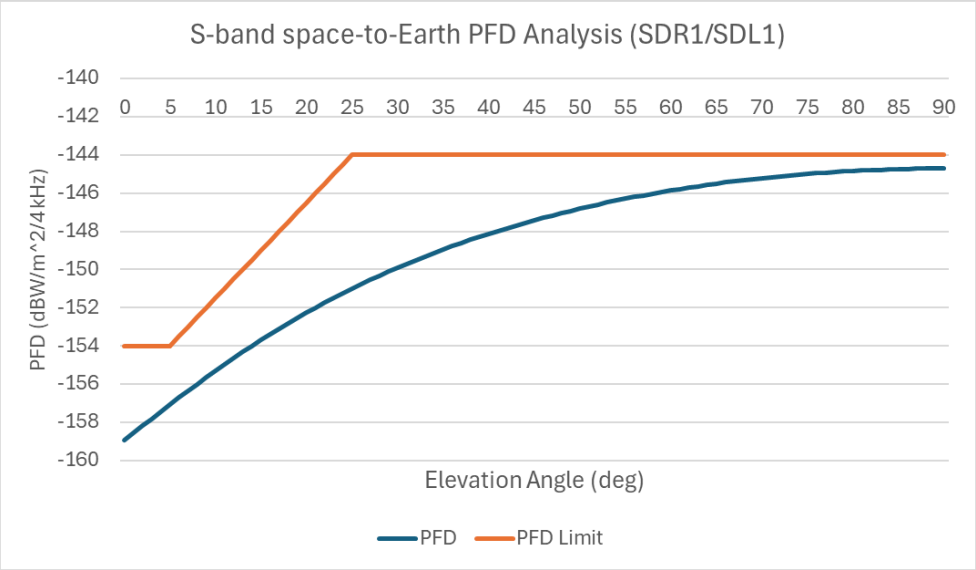
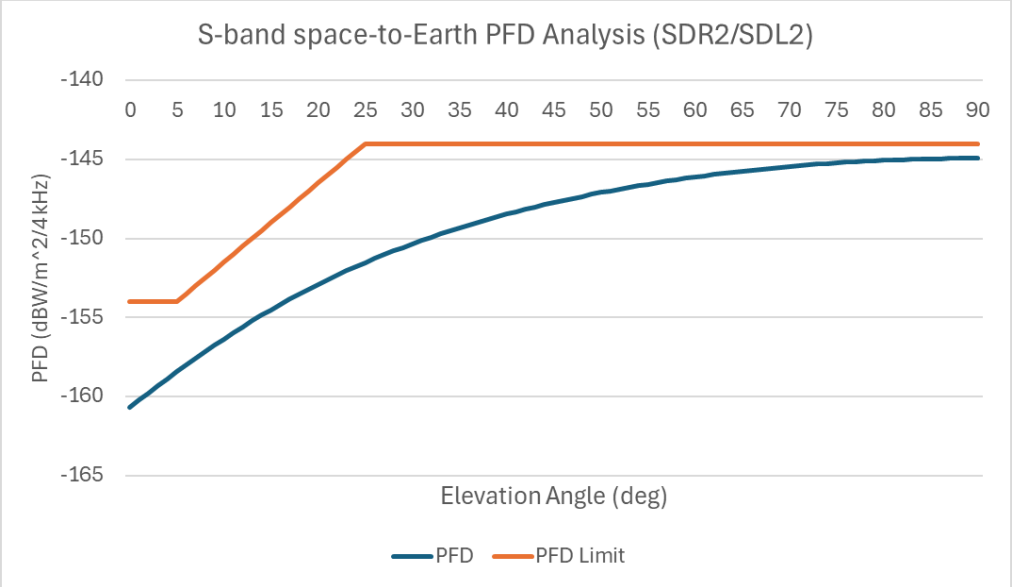


Figure 3: PFD Compliance for 2200-2290 MHz Downlink with a 0 dBW EIRP Emission over 0.81-Megahertz Bandwidth at 350 km Orbit



2. SRS Protection (Rec. ITU-R SA.1157-1)

For the Xona System's 2200-2290 MHz operations, interference protection criteria safeguard space research service ("SRS") (deep space) from adjacent-frequency space-based interference. The US federal agencies require OOB emissions limits compliance to safeguard

space research service (deep space) adjacent to the 2200-2290 MHz band. Xona will use a combination of baseband digital filtering and hardware radiofrequency filtering to ensure its OOB emissions will not interfere with authorized services in adjacent bands. Xona will also submit spectrum roll-off measurements to the US federal agencies. If such plots are unsatisfactory or Xona cannot reach agreement based on alternative mitigation measures, the Xona System will not transmit when it is visible to such deep space Earth stations.

III. SCHEDULE S AND COORDINATION SPREADSHEET CLARIFICATIONS

The attached Schedule S and coordination spreadsheet require the following clarifications given their limitations.

All links. The specified center frequency and bandwidth pairings are representative and subject to further coordination. They may change depending on how US federal coordination concludes.

SDR1, SDL1, SDR2, and SDL2 channels – PFD compliance. For operations at altitudes below 500 km, the transmission power will be reduced to remain within PFD limits.

X1 and X5 channels – transmission power. For RNSS payload testing at the deployment altitude, the power will be reduced so that the ground-level received power will match the nominal operations' power.

CGEO channels – bandwidth sizes and center frequencies. The C-band GEO-to-LEO link channel will be in the 1 to 10-megahertz range. SES will assign and change the channel size and center frequency over time. The listed 5-megahertz bandwidth and 4100 MHz center frequency are placeholders.

ENGINEERING CERTIFICATION

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

/s/ Adrien Perkins

Adrien Perkins
VP, Engineering
Xona Space Systems, Inc.

ATTACHMENT B
Coordination Overview

Radiofrequency Coordination Overview

Mission Parameters [see comments sheet for clarifications]

Attribute	Value
Mission Name	Xona System (or PULSAR)
Company	Xona
Technical POC(s)	christina@xonaspace.com (Christina Youn) adrien@xonaspace.com (Adrien Perkins) argyris@xonaspace.com (Argyris Kriezis) george.john@hoganlovells.com (George John)
Number of Satellites	258
Launch Date	October 1, 2026
Lifetime	15 years (license term) 6 years (orbital lifetime per satellite)

Orbital Parameters (Choose one)

Attribute	Value		
Altitude Apogee (km)	1080 ± 35		NGSO
Altitude Perigee (km)	1080 ± 35		
Inclination (degree)	53 ± 2	97 ± 2	
Sun Sync (Y/N)	N	N	
LTAN or RAAN (as appropriate)	0, 30, 60, 90, 120, 150, 180, 210, 240, 270, 300, 330	0, 60, 120, 180, 240, 300	
Number of Orbital Planes (for Walker Constellation)	12	6	

Longitude of Orbital Slot (E)	N/A	GSO
Inclination (degree)	N/A	

Reference Body	N/A	non-Geocentric Orbits
Apoapsis (km)	N/A	
Periapsis (km)	N/A	
Inclination (degree)	N/A	

Uplink Parameters

Frequency Band	Center Frequency (MHz)	Bandwidth (MHz)	Sat Rx Noise Temp (K)	Sat Rx Ant Gain (dBi)	Polarization Type (optional)
2025-2110 MHz	2032.25	1 (@ 2032.25, 2091.75, 2104.75, 2050.00)	990 (for 1 MHz channels)	7 (for 1 MHz channels)	RHCP/LHCP
	2091.75				
	2104.75	0.14, 0.27, 0.83 (@2050.00)			
	2050.00		530 (for 0.14, 0.27, 0.83 channels)	6 (for 0.14, 0.27, 0.83 channels)	

Downlink Parameters

Frequency Band	Center Frequency (MHz)	Bandwidth (MHz)	Sat Tx Power (dBW) (at the antenna port)	Sat Tx Ant Gain (dBi)	Polarization Type (optional)
1180.4-1200.6 MHz	1190.51625	20	18.6	4.6	RHCP
1591.2-1595.5 MHz	1593.32250	4	18.6	10.5	RHCP
2200.0-2290.0 MHz	2204.75	1.5 (@ 2204.75, 2226.25, 2239.75, 2263.5)	-1 (for 1.5 channels)	7 (for 1.5 channels)	RHCP/LHCP
	2226.25				
	2239.75	0.81, 1.62, 5.0 (@2263.5)			
	2263.50		-6 (for 0.81, 1.62, 5.0 channels)	6 (for 0.81, 1.62, 5.0 channels)	

Crosslink Parameters

Frequency Band	Center Frequency (MHz)	Bandwidth (MHz)	Sat Tx Power (dBW) (at the antenna port)	Sat Tx Ant Gain (dBi)	Polarization Type (optional)	Receive Satellite Network/System	Sat Rx Noise Temp (K)	Sat Rx Ant Gain (dBi)	Duty Cycle (%) [defined as total time transmitting/total time visible]
3700-4200 MHz (GEO-to-LEO)	3700-4200 MHz (various)	1 to 10	18.1	19.2	LHCP	Xona System	315	8	100%
1525.0-1559.0 MHz (GEO-to-LEO)	1525.0-1559.0 (various)	0.2	3	44	RHCP	Xona System	100	9	100%
1626.5-1660.5 MHz (LEO-to-GEO)	1626.5-1660.5 (various)	0.2	1.5	9	RHCP	Inmarsat	630	44	100%

Receive Ground Stations

Location	Frequency Band	Lat.	Long.	Receive Gain (dBi)	Receive Noise Temp (K)	Duty Cycle (%) [defined as total time transmitting/total time visible]	Note [assumption is 5-degree minimum elevation angle]
Puertollano, Spain	2200.0-2290.0 MHz	38° 40' 21.756" (N)	4° 9' 43.3794" (W)	35	187	100%	Duty cycle % is per pass.
Punta Arenas, Chile	2200.0-2290.0 MHz	52° 56' 10.248" (S)	70° 52' 5.027" (W)	35	187	100%	
Awarua, New Zealand	2200.0-2290.0 MHz	46° 31' 43.572" (S)	168° 22' 47.532" (E)	35	187	100%	
Hartebeesthoek, South Africa	2200.0-2290.0 MHz	25° 53' 9.5634" (S)	27° 42' 20.16" (E)	35	187	100%	
Santa Maria, Portugal	2200.0-2290.0 MHz	36° 59' 51.1974" (N)	25° 8' 14.2794" (W)	35	187	100%	
Nangetty, Australia	2200.0-2290.0 MHz	29° 0' 37.476" (S)	115° 20' 29.9976" (E)	35	187	100%	
Athens, Greece	2200.0-2290.0 MHz	37° 50' 42.525" (N)	22° 37' 23.8188" (E)	35	187	100%	
Jeju, South Korea	2200.0-2290.0 MHz	33° 32' 28.32" (N)	126° 48' 57.96" (E)	35	187	100%	
Maspalomas, Spain	2200.0-2290.0 MHz	27° 46' 1.5594" (N)	15° 38' 11.04" (W)	35	187	100%	
Mauritius	2200.0-2290.0 MHz	20° 30' 5.04" (S)	57° 27' 2.16" (E)	35	187	100%	
Global	1180.4-1200.6 MHz and 1591.2-1595.5 MHz	Global	Global	N/A	N/A	100%	Duty cycle % is per pass.

Transmit Ground Stations

Location	Frequency Band	Lat.	Long.	Transmit Gain (dBi)	Sat Tx Power (dBW) (at the antenna port)	Duty Cycle (%) [defined as total time transmitting/total time visible]	Note [assumption is 5-degree minimum elevation angle]
Puertollano, Spain	2025-2110 MHz	38° 40' 21.756" (N)	4° 9' 43.3794" (W)	34	13	100%	Duty cycle % is per pass.
Punta Arenas, Chile	2025-2110 MHz	52° 56' 10.248" (S)	70° 52' 5.027" (W)	34	13	100%	
Awarua, New Zealand	2025-2110 MHz	46° 31' 43.572" (S)	168° 22' 47.532" (E)	34	13	100%	
Hartebeesthoek, South Africa	2025-2110 MHz	25° 53' 9.5634" (S)	27° 42' 20.16" (E)	34	13	100%	
Santa Maria, Portugal	2025-2110 MHz	36° 59' 51.1974" (N)	25° 8' 14.2794" (W)	34	13	100%	
Nangetty, Australia	2025-2110 MHz	29° 0' 37.476" (S)	115° 20' 29.9976" (E)	34	13	100%	
Athens, Greece	2025-2110 MHz	37° 50' 42.525" (N)	22° 37' 23.8188" (E)	34	13	100%	
Jeju, South Korea	2025-2110 MHz	33° 32' 28.32" (N)	126° 48' 57.96" (E)	34	13	100%	
Maspalomas, Spain	2025-2110 MHz	27° 46' 1.5594" (N)	15° 38' 11.04" (W)	34	13	100%	
Mauritius	2025-2110 MHz	20° 30' 5.04" (S)	57° 27' 2.16" (E)	34	13	100%	

Comments

1. The FCC application file number is **SAT-AMD-20251119-00328**.

2. The targeted coordination response date is NLT **February 24, 2026**.

3. Xona does not have the precise RAAN/LTAN. This value is subject to specific launch timing and orbit insertion parameters that are not under Xona's control as a "rideshare" service client.

4. For S-band, Xona will only use one center frequency at a time for each satellite.

5. For S-band, Xona will reduce radiofrequency power as necessary at lower/higher altitudes to maintain operations within the PFD limits at all times.

6. For S-band, Xona will submit a spectrum roll-off plots soon and, if it does not, will employ keep-out zones over all deep space network sites to satisfy the ITU-R SA.1157-1 protection criteria.

ATTACHMENT C
Ownership Information

Xona Space Systems, Inc. ("Xona") is a privately held corporation. The following individuals hold 10% or more of the equity and/or voting interest in Xona.

Name	Outstanding	Fully Diluted	Citizenship
Craft Dayton III, LLC	24.984%	21.5000%	USA
NGP Capital Fund V, L.P.	11.866 %	10.211%	USA

The following individuals are Xona's board directors.

Name & Affiliation	Citizenship
Brian Manning (Xona)	USA
Adrien Perkins (Xona)	USA France
Sky Dayton (Craft Dayton III, LLC)	USA
Ryan Johnson (currently Verge Agriculture and Whipcord; formerly Planet Labs and Blackbridge Corporate)	Canada
Vacant (actively searching)	USA

The following individuals are Xona's officers.

Name	Title	Citizenship
Brian Manning	Chief Executive Officer	USA
Tyler Reid	Chief Technology Officer	Canada
Jonathan Wakenshaw	Chief Operating Officer	USA UK

Mailing information appears below for all Xona board directors and officers.

Xona Space Systems, Inc.
828 Airport Boulevard
Burlingame, CA 94010

ATTACHMENT D
GPSIA Petition to Deny Rescission Letter

GPS Innovation Alliance

November 26, 2025

VIA ICFS AND ELECTRONIC MAIL

Marlene H. Dortch
Secretary
Federal Communications Commission
45 L Street, NE
Washington, DC 20554

Re: Application of Xona Space Systems, Inc. for Authority to Launch and Operate a Radionavigation-Satellite Service Constellation, File No. SAT-LOA-20230711-00165 (Call Sign S3177)

Dear Ms. Dortch:

The GPS Innovation Alliance ("GPSIA") respectfully submits this letter in connection with its pending Petition to Deny the above-referenced application (the "Constellation Application") of Xona Space Systems, Inc. ("Xona") for authority to launch and operate a constellation of non-geostationary orbit satellites in the radionavigation-satellite service ("RNSS").[1] GPSIA's Petition raised several specific technical and policy issues with respect to the Xona Application.[2] To facilitate the resolution of its Petition, GPSIA offers the following updates.

Technical Matters:

GPSIA's objection to the technical demonstrations in the Xona Application was interposed to express the view that Xona had not provided information sufficient for interested parties (including GPSIA) to fully evaluate current and future interference risks Xona's proposed constellation poses to the Global Positioning System ("GPS") and other Global Navigation Satellite Systems ("GNSS") (including those operated by foreign governments).[3] GPSIA and its member companies have engaged in detailed technical discussions with Xona over the course of the last two years, and have conducted independent comprehensive technical analyses. GPSIA is now satisfied that it has sufficient information to determine that Xona's proposed system will be compatible with existing operations of GPS and GNSS receivers in the 1164-1215 MHz and 1559-1610 MHz RNSS space-to-Earth frequency bands if operations are conducted in

[1] GPSIA Petition to Deny, File No. SAT-LOA-20230711-00165, filed October 2, 2023 ("GPSIA Petition").

[2] As used in this Letter, the term "Xona Application" refers to Xona's proposed operations in File No. SAT-LOA-20230711-00165 under Call Sign S3177.

[3] GPSIA Petition at 8-9.

accordance with the technical parameters described in its application[4] and the conditions described in this letter.[5]

GPSIA emphasizes that its position on compatibility with respect to Xona's proposed operations in the 1164-1215 MHz and 1559-1610 MHz RNSS frequency bands is limited specifically to the operations Xona proposes in the Constellation Application. GPSIA's position does not extend in any way to Xona operations with different technical parameters or to any additional RNSS operations in these bands by other systems or networks. Aggregate interference from additional systems operating in the RNSS bands remains a serious technical concern for GPSIA. Xona's proposed system will use a significant portion of the available margin for ensuring the protection of existing and planned RNSS based operations and users from unacceptable interference. The impact of additional proposed RNSS based systems will require careful study to determine compatibility with RNSS based operations and users, based upon the specific characteristics of additional systems and the cumulative impacts of proposed or planned systems.[6] GPSIA reserves the right to raise general and aggregate interference concerns as an objection to any future request to provide RNSS services in the bands Xona seeks to utilize.

On other technical matters, GPSIA expressed no specific opinion in its Petition on Xona's proposal to operate space-to-Earth RNSS links in the 5010-5030 MHz RNSS frequency band. The current unavailability of receivers for operation in this band makes detailed technical compatibility studies difficult and prevents empirical or other laboratory studies. Accordingly, as long as the Commission conditions any grant of authority to Xona for operations in this band on compliance with U.S. and intergovernmental coordination obligations and other regulatory obligations under the International Telecommunication Union ("ITU") Radio Regulations, GPSIA does not object to Xona technical operations in these bands as proposed in the Xona Application. GPSIA notes that this updated position too is subject to the caveat on future applications and aggregate interference concerns expressed immediately above.

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[4] GPSIA notes that Xona proposed different technical parameters in its IOV application, ICFS File No. SAT-LOA-20241215-00282 ("IOV Application")." It is GPSIA's understanding that the technical parameters in the IOV Application were proposed to support certain simulations and technical analyses and are not intended for permanent constellation operations. As such, GPSIA expresses no position on operation under these technical parameters utilizing more than one satellite and reserves the right to further analyze and comment upon any such operations.

[5] After GPSIA Filed its Petition to Deny, the Commission granted Xona's IOV Application and imposed a series of conditions in connection with the grant. In addition to the conditions identified in this draft, GPSIA's statement that it does not object to the grant of Xona's Constellation Application is subject to inclusion of conditions equivalent to conditions in the IOV grant decision.

[6] *See* GPSIA Petition at 7-9. *Xona has shared information with GPSIA showing that it has designed its system to be spectrally efficient, and our reservation of rights on cumulative impacts is not intended to question this information.*

Finally, GPSIA is prepared to rely on the Commission's enforcement and application of its rules and policies with respect to orbital debris mitigation and post-mission disposal of Xona satellites.[7]

Policy Considerations:

In its Petition, GPSIA opposed Xona's requested waiver of the Commission's processing-round rules based upon the potential for aggregate interference from multiple constellations using the RNSS bands. Based upon our reservation of rights to raise interference concerns if additional parties propose to utilize the RNSS bands in the future, GPSIA hereby confirms that it no longer objects to Xona's requested waiver.

Finally, GPSIA raised potential concerns associated with having a private party operate in the extremely important RNSS bands. However, GPSIA now believes that with the Commission's imposition of the standard orbital debris mitigation plan and the "5 Year Rule" post mission disposal requirements, as well as standard ITU compliance and intergovernmental coordination conditions, on any license or grant of authority under the Xona Constellation Application, GPSIA's concerns would be sufficiently addressed.[8] GPSIA notes that Xona has thus far undertaken its coordination obligations, including intergovernmental coordination and participation in the Resolution 609 (Rev.WRC-07) Consultation Meeting process.

Summary:

As explained above, GPSIA now believes that the Commission can proceed with its consideration of the Xona Application under the conditions set forth herein. GPSIA looks forward to continued engagement on the relevant ongoing policy matters in the appropriate fora as they arise in the future.

On behalf of GPSIA, I stand prepared to provide any additional information or answer any questions you or others may need or have.

Respectfully submitted,

// signed //

Lisa Dyer, Executive Director

cc (by email): Brian Manning, CEO and Co-Founder, Xona Space Systems

[7] *See* GPSIA Petition at 11-12.

[8] *Id. at 5.*