EXHIBIT A

TECHNICAL ANNEX FOR APEX ARIES 1 SATELLITE

TABLE OF CONTENTS

I. SCOPE AND PURPOSE

This exhibit offers additional technical information regarding the Apex Aries 1 non-geostationary orbit ("NGSO") satellite.

II. GENERAL DESCRIPTION

The following tables summarize Apex Aries 1's radiofrequency and earth station characteristics.

Table 1: Frequency Plan

Beam ID	UDA	UDB	SDA	SDB	SUA	SUB
Description	UHF Downlink (Space-to-Earth)	UHF Downlink (Space-to-Earth)	S-band Downlink (Space-to-Earth)	S-band Downlink (Space-to-Earth)	S-band Uplink (Earth-to-Space)	S-band Uplink (Earth-to-Space)
Frequency Band (MHz)[1]	400.5; 401.5[2]	400.5; 401.5[3]	2287.5	2287.5	2049	2049
Bandwidth	2.64 kHz	65.280 kHz	168.8 kHz	1 MHz	150 kHz	150 kHz
Transmit Power (dBW)	0.8	3	-8.45	-0.72	20	16
Transmit Antenna Gain (dBi)	0	0	6	5	40	39.4
EIRP (dBW)	0.8	3	-2.5	4.3	60	55.4
Polarization	Linear	Linear	RHCP	RHCP	RHCP	RHCP
Receive Antenna G/T (dB/K)	-19	-19	12.6	12.6	-39.0	-39.0

[1] Apex Aries 1 will passively receive Global Positioning System or GPS L1 (1575.42 MHz), L2 (1227.60 MHz), and L5 (1575.42 MHz) signals for on-orbit determination. Such operations are with pre-existing signals that have not been altered to provide service to Apex Aries 1. *See, e.g.*, Loft Orbital Solutions Inc., Stamp Grant, IBFS File No. SAT-LOA-20220606-00057, at n.4 (granted Nov. 15, 2022); Spire Global, Inc., Stamp Grant, IBFS File No. SAT-MOD-20200603-00065, at 3 (granted Nov. 9, 2022).

[2] Apex includes two band possibilities for coordination flexibility but will only use one pending coordination.

[3] Apex includes two band possibilities for coordination flexibility but will only use one pending coordination.

Table 2: Earth Station Plan

Earth Station Location	Coordinates	# Passes Per Day	Average Contact Duration Per Day (Minutes)	GS Rx (Beam ID)	GS Tx (Beam ID)
Pretoria, South Africa	25.86° S, 28.45° E	4	8 min pass avg	UDA UDB SDA SDB	SUA
Boden, Sweden	65.8° N, 21.68° E	11	8 min pass avg	UDA UDB SDA SDB	SUA
Currans Hill, Australia	34.04° S, 150.77° E	<1 (only specific activities)	8 min pass avg	SDA SDB	SUB
Zallaq, Bahrain	26.05° N, 50.5° E	<1 (only specific activities)	8 min pass avg	SDA SDB	SUB
Dublin, Ireland	53.4 ° N, 6.22° W	<1 (only specific activities)	8 min pass avg	SDA SDB	SUB
Peterborough, Southern Australia	32° 57' 43.2" S, 138° 50' 58.2" E	<1 (only for backup purposes)	8 min pass avg	SDA SDB	SUB
Nangetty, Western Australia	29° 00' 37.5" S, 115° 20' 30.0" E	<1 (only for backup purposes)	8 min pass avg	SDA SDB	SUB
Absheron, Azerbaijan	40° 27' 58.6" N, 49° 29' 08.9" E	<1 (only for backup purposes)	8 min pass avg	SDA SDB	SUB
Plana, Bulgaria	42° 28' 58.6" N, 23° 26' 43.0" E	<1 (only for backup purposes)	8 min pass avg	SDA SDB	SUB
Puertollano, Spain	38° 40' 26.5" N, 4° 09' 43.3" W	<1 (only for backup purposes)	8 min pass avg	UDA UDB	SUB
Blönduós, Iceland	65° 38' 50.5" N, 20° 14' 45.9" W	<1 (only for backup purposes)	8 min pass avg	SDA SDB	SUB
Vimercate, Italy	45° 35' 36.0" N, 09° 21' 44.0" E	<1 (only for backup purposes)	8 min pass avg	UDA UDB	SUB

Earth Station Location	Coordinates	# Passes Per Day	Average Contact Duration Per Day (Minutes)	GS Rx (Beam ID)	GS Tx (Beam ID)
Lomazzo, Italy	45° 41' 50.0" N, 09° 02' 05.0" E	<1 (only for backup purposes)	8 min pass avg	UDA UDB	
Kandy, Sri Lanka	7° 16' 27.2" N, 80° 43' 29.5" E	<1 (only for backup purposes)	8 min pass avg	SDA SDB	SUB
Awarua, New Zealand	46° 31' 41.2" S, 168° 22' 45.1" E	<1 (only for backup purposes)	8 min pass avg	SDA SDB	SUB
Santa Maria, Azores, Portugal	36° 59' 51.2" N, 25° 08' 14.3" W	<1 (only for backup purposes)	8 min pass avg	SDA SDB	SUB
Unst, Shetland, United Kingdom	60° 44' 52.8" N, 00° 51' 28.8” W	<1 (only for backup purposes)	8 min pass avg	UDA UDB SDA SDB	SUB

The following table captures all the satellite payloads.[4]

Table 3: Payloads[5]

Payload	Function
Astroscale Docking Plate	docking plate flight heritage
Apex Payload Camera	diagnostic camera for solar array deployment and tumbling verification
Ubotica XE-2	edge compute processor for in-space computation demonstration
Ubotica CogniSAT	diagnostic camera for wide field-of-view imaging of solar array deployment and tumbling verification
Northrop Grumman Power Amplifier	X-band power amplifier technical demonstration[6]

III. CESSATION OF TRANSMISSIONS AND STOP BUZZER

Apex Aries 1 will be capable of immediately ceasing operations upon becoming aware of harmful interference in compliance with section 5.84.[7] The stop buzzer contact information for this mission follows.

Ian Cinnamon
4940 Sepulveda Boulevard
Culver City, CA 90230
ian.cinnamon@apexspace.com
+1 424-320-2739

[4] All will stay on board the satellite.

[5] None have radiofrequency components requiring licensing except the power amplifier.

[6] This payload will not transmit or receive unless Apex secures future FCC authorization.

[7] 47 C.F.R. § 5.84.

IV. SPECTRUM SHARING ANALYSIS

Interference between Apex Aries 1 and other systems is unlikely. Space operation and space research service systems normally communicate only in short periods of time while visible from the dedicated earth stations (typically less than 10 minutes for a single pass). For interference to occur, either another operator's satellite would have to travel through the antenna beam of Apex Aries 1's serving earth station or the Apex Aries 1 satellite would have to pass through the antenna beam of the other operator's serving earth station and both systems would need to transmit at the same time on overlapping frequencies. In such a very unlikely event, interference avoidance is possible by coordinating the communications so that they do not occur simultaneously in the time, frequency, and geographic dimensions. Apex commits to such coordination in all frequency bands. Further, as demonstrated in the following sub-sections, Apex Aries 1 satisfies relevant in-band and adjacent-band power limits.

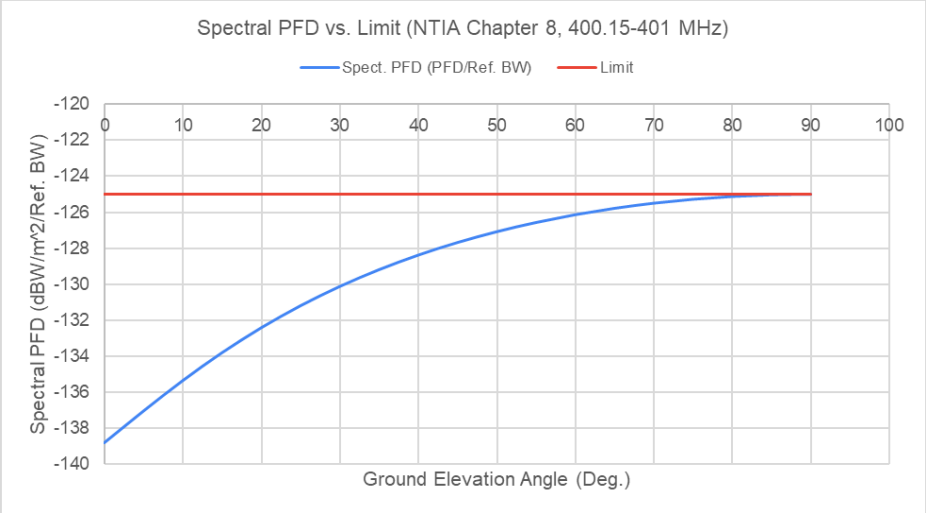
A. In-Band Power Limit Analysis

i. Downlink: 400.5 MHz or 401.5 MHz

A power flux-density ("PFD") coordination trigger (-125 dBW/m^2/4kHz at all elevation angles) applies in UHF bands for mobile-satellite service systems.[8] Although the same threshold does not apply to space operation service systems, Apex will not exceed this threshold at a nominal 550 km altitude.[9] At lower altitudes, Apex Aries 1 will backoff the transmit power to stay within the limit.

[8] *See* ITU RR Appendix 5, Annex 1.

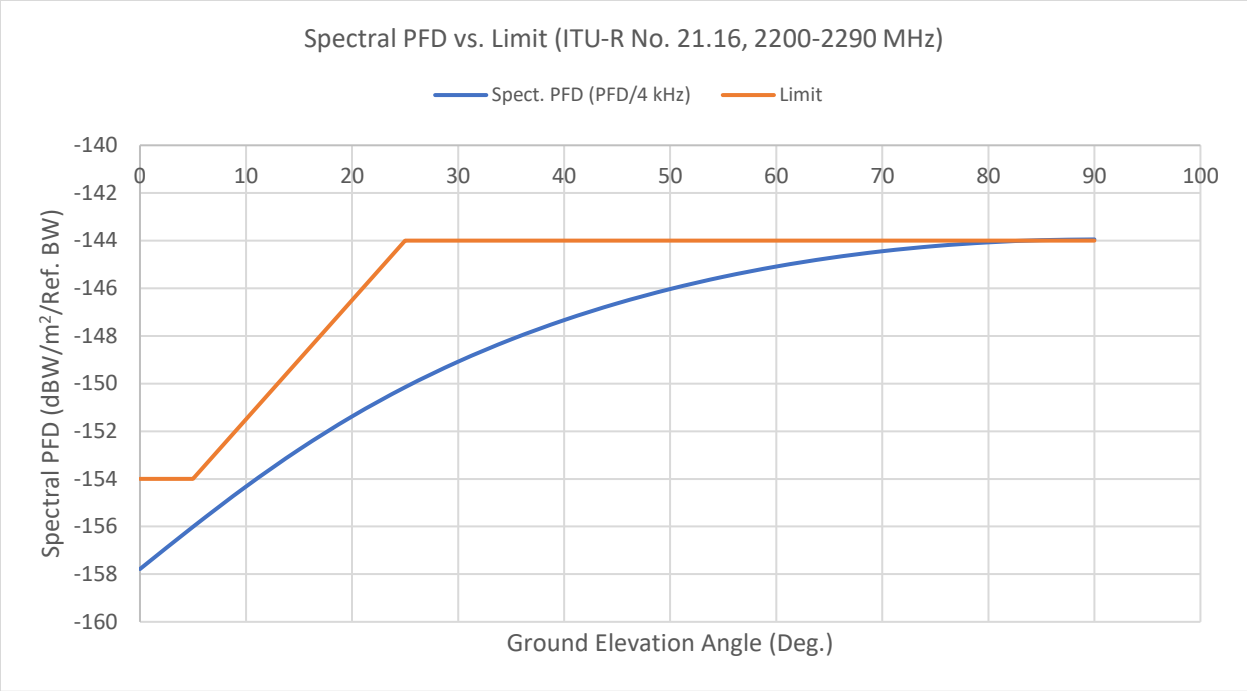
[9] At the time of analysis, this value was the nominal altitude. SpaceX has recently updated it to 525 km +/- 20 km.



ii. Downlink: 2287.5 MHz

PFD limits are specified in ITU Radio Regulations Table 21-4. Apex calculated the maximum PFD levels for the Apex Aries 1 transmissions and determined that the downlink PFD levels of the Apex Aries 1 carriers do not exceed the ITU limits. The figure below illustrates the PFD analysis results for the Apex Aries 1 spacecraft downlinking in its maximum EIRP spectral density configuration (-144.6 dBW/m^2/4kHz) at a nominal 550 km altitude.[10] At lower altitudes, Apex Aries 1 will backoff the transmit power to stay within the limit.

[10] At the time of analysis, this value was the nominal altitude. SpaceX has recently updated it to 525 km +/- 20 km.



B. Adjacent-Band Power Limit Analysis

International power spectral density limits protect deep space ground receivers that may operate adjacent to the 2200-2290 MHz band. ITU-R Recommendation SA.1157 specifies the spacecraft power spectral flux density falling within the deep space network band shall be less than -257 dBW/m^2*Hz in 2290-2300 MHz MHz. Apex Aries 1 will meet this limit due to sufficient geographic separation when over Goldstone, California, United States; Canberra, Australia; and Madrid, Spain and/or frequency spacing.

V. ORBITAL DEBRIS RISK MITIGATION PLAN

Apex has completed an orbital debris assessment report ("ODAR") for Apex Aries 1. See Exhibit B. Apex used the National Aeronautics and Space Administration ("NASA") Debris Assessment Software ("DAS") v3.2.5 and is compliant with every NASA standard and relevant FCC rule. The following subsections offer a high-level ODAR summary.

A. Spacecraft Hardware Design

Apex confirms that Apex Aries 1 will not undergo any planned release of debris during

its normal operations. In addition, all separation and deployment mechanisms, and any other potential debris source, will be retained by the spacecraft. Apex has also assessed the probability of Apex Aries 1 becoming a source of debris by collision with small debris or meteoroids of less than one centimeter in diameter that could cause loss of control and prevent post-mission disposal.

B. Minimizing Accidental Explosions

Apex is designing its spacecraft in a manner that limits the probability of accidental explosion. Apex has assessed the possibility of accidental explosions during and after completion of mission operations through failure mode verification analysis. As part of the satellite manufacturing process, Apex has taken steps to ensure that debris generation will not result from the conversion of energy sources onboard Apex Aries 1 into energy that fragments the satellite. All sources of stored energy onboard the spacecraft will have been depleted or safely contained when no longer required for mission operations or post-mission disposal.

C. Safe Flight Profile

Apex has assessed and limited the probability of Apex Aries 1 becoming a debris source by accidental collisions with large debris or other operational spacecraft. Apex will work closely with its launch provider to ensure that the satellite is deployed in such a way to minimize the potential for in-plane collision. The attached ODAR shows the DAS simulation outputs and appropriate analyses.

Apex will track Apex Aries 1 passively using its GPS receiver and register the satellite with the 18th Space Control Squadron or successor entity. Apex will engage with operators of constellations and other space stations in the same orbit to ensure safe and coordinated space operations. Apex will provide all relevant agencies, the 18th Space Control Squadron or successor entity engaged in space situational awareness, and other operators with any

information they need to assess risks and ensure safe flight profiles (particularly for inhabitable space stations, as necessary), as well as contact information for Apex personnel at its headquarters. If Apex receives a conjunction warning, Apex will coordinate with the other satellite operator, including sharing ephemeris data and other appropriate operational information.

D. Post-Mission Disposal

Apex has conducted the preliminary reentry risk analysis using DAS. As modeled, Apex Aries 1 will burn up completely during uncontrolled re-entry within 5 years after mission completion.

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 5 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/ Ian Cinnamon

Ian Cinnamon
4940 Sepulveda Boulevard
Culver City, CA 90230
ian.cinnamon@apexspace.com
+1 424-320-2739