



LUXEMBOURG
SPACE AGENCY



THE GOVERNMENT
OF THE GRAND DUCHY OF LUXEMBOURG
Ministry of the Economy

LUXEMBOURG REGISTRY OF SPACE OBJECTS

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Introduction

The Registry of Space Objects (the National Registry) for which the Grand Duchy of Luxembourg assumes registration obligation is established following the Convention on Registration of Objects Launched into Outer Space, adopted by the United Nations (UN) General Assembly in New York on 12 November 1974 (the Convention), and the Law of 15 December 2020 on Space Activities.

On 27 January 2021, Luxembourg adhered to the [Convention on the Registration of Space Objects](#), becoming the 70th State Party to the Convention. The UN General Assembly adopted the Convention in 1974 to assist in the identification of space objects, address issues regarding States Parties responsibilities concerning their space objects, and ensure open access to the information provided by States and international intergovernmental organizations.

The Registration Convention ensures that a central registry of objects launched into outer space is established and maintained by the Secretary-General of the UN. Thus, once a space object is launched and as soon as practicable, the Registration Convention requires the 'State of registry' to furnish information about the launched space object to the Secretary-General. The UN keeps information provided by State Parties relating to the space objects and the space activity on its website. Furthermore, the Registration Convention requires Luxembourg to maintain its own appropriate registry of space objects, also embodied in Chapter 7, Article 15 in the [Law of 15 December 2020](#).

Prior to becoming a State Party to the Registration Convention, Luxembourg voluntarily provided registration information of space objects under [Resolution 1721 B \(XVI\)](#). Following adherence to the Convention, registration submissions are in accordance with Article IV of the Convention.

For information regarding registration information of space objects already submitted by Luxembourg to the UN, please refer to the United Nations Office for Outer Space Affairs (UNOOSA) [website](#).

Definition of Terms

Apogee: The furthest distance in the space object's orbit from the surface of the body it is orbiting.

Change of Status: The date of the space object's decay, reentry, recovery, deorbit, or landing.

Change of Status in Operations:

Date when space object is no longer functional: The date using Coordinated Universal Time (UTC) (also referred to as Greenwich Mean Time (GMT)) when the space object ceases to perform operational functions for the State of registry.

Date when space object is moved to a disposal orbit: The date using Coordinated Universal Time (UTC) when the space object is moved into a disposal orbit. See COPUOS Space Debris Mitigation Guidelines for recommendations on disposal orbits, [link](#)

Physical conditions when space object is moved to a disposal orbit: The physical conditions when the space object is moved into a disposal orbit. Conditions can include the change in orbit (e.g. +300 km above GSO), passivation of the space object and other measures as recommended in the COPUOS Space Debris Mitigation Guidelines.

Change of Supervision of the Space Object:

Date of change in supervision: The date using Coordinated Universal Time (UTC) (also referred to as Greenwich Mean Time (GMT)) when the new owner or operator takes supervision of the space object.

Identity of the new owner or operator: The identity of the new owner or operator of the space object.

Change of orbital position in the geostationary orbit

Previous orbital position: The previous operational location of the space object in \pm degrees East along the equator from the Greenwich meridian.

New orbital position: The new operational location of the space object in \pm degrees East along the equator from the Greenwich meridian.

Change of function of the space object: The function of the space object following change in supervision.

COSPAR International Designator: Alphanumeric designator established by the Committee on Space Research (COSPAR) for space objects that successfully reach Earth orbit and beyond. The designator can be obtained from the [Online Index of Objects Launched into Outer Space](#).

Date of Launch: The date of launch of the space object using Coordinated Universal Time (UTC) (also referred to as Greenwich Mean Time (GMT)).

General Function of Space Object: General information on the space object. Can include mission objectives, frequency plans, etc. If required, please attach text in a separate page.

Geostationary Position: Applicable only to space objects in the geostationary orbit. Planned and/or actual location of space object in \pm degrees East along the equator from the Greenwich meridian (e.g. for 10.5 degrees West, use -10.5 degrees East).

Inclination: The angle relative to the equator of the Earth or celestial body the space object is orbiting. Measured counter-clockwise from the equator, stated in degrees.

Launching State: a) A State that launches or procures the launching of a space object; b) A State from whose territory or facility a space object is launched. In accordance with Article II of the Registration Convention, only one State of registry can exist for a space object. When more than one launching State exists, they should jointly determine which State should register the space object.

Nodal period: Time taken by the space object to complete one revolution around the body it is orbiting.

Perigee: The closest distance in the space object's orbit from the surface of the body it is orbiting.

State of Registry / Intergovernmental Organization: The launching State that carries the space object on its national registry of objects into outer space or the organization that has declared its acceptance of the rights and obligations provided for in accordance with Article VII of the Registration Convention. In accordance with Article II of the Registration Convention, only one State of registry can exist for a space object. When more than one launching State exists, they should jointly determine which State should register the space object.

Territory or location of launch: The territory or location of the launch of the space object. For a table of global launch locations, see <http://www.unoosa.org/oosa/SORegister/resources.html>

Website: Address on the World Wide Web for information on the space object/mission/operator.

ASTRA 1A

COSPAR International 1988-109B

Designator:

National Designation No.: /

Owner / Operator Name: Société Européenne des Satellites (SES
ASTRA S.A.)

Launch Date and Time: 11/12/1988

Launch Location: Kourou, French Guiana

Launch Vehicle Name: Ariane

Date of Decommissioning: 10/12/2004

Additional Information: The satellite is in a graveyard orbit, at a minimum perigee altitude of 400 km above the geostationary orbit

Entry Date into National Registry: 02/03/2021ⁱ

ASTRA 1B

COSPAR International 1991-015A

Designator:

National Designation No.: /

Owner / Operator Name: SES ASTRA S.A.

Launch Date and Time: 02/03/1991

Launch Location: Kourou, French Guiana

Launch Vehicle Name: Ariane

Date of Decommissioning: 12/07/2006

Additional Information: The satellite is in a graveyard orbit, at a minimum perigee altitude of 500 km above the geostationary orbit

Entry Date into National Registry: 02/03/2021ⁱ

ASTRA 1C

COSPAR International 1993-031A

Designator:

National Designation No.: /

Owner / Operator Name: SES ASTRA S.A.

Launch Date and Time: 12/05/1993

Launch Location: Kourou, French Guiana

Launch Vehicle Name: Ariane

Date of Decommissioning: 31/07/2014

Additional Information: The satellite is in a graveyard orbit, at a minimum perigee altitude of 387 km above the geostationary orbit

Entry Date into National Registry: 02/03/2021ⁱ

ASTRA 1D

COSPAR International 1994-070A
Designator:
National Designation No.: /

Owner / Operator Name: SES ASTRA S.A.
Launch Date and Time: 31/10/1994
Launch Location: Kourou, French Guiana
Launch Vehicle Name: Ariane

Nodal Period: 1,435.8-1,436.4 minutes
Inclination: Uncontrolled inclination since 22/10/2007. Orbital inclination is therefore increasing over time and was 9.2 degrees on 10/08/2020
Apogee: 35,820 kilometers
Perigee: 35,752 kilometers
Geostationary Position: 73,0 degrees West since 30/11/2017

General Function of Object: Encrypted and unencrypted transmission of radio, television and multimedia data services and of occasional-use services

Entry Date into National Registry: 02/03/2021ⁱ

Annex 1: ASTRA 1D

Date of Decommissioning:	15/11/2021
Additional Information:	The satellite is in a graveyard orbit, at a minimum perigee altitude of 351 km above the geostationary orbit
Entry Date into National Registry:	16/11/2021

ASTRA 1E

COSPAR International 1995-055A

Designator:

National Designation No.: /

Owner / Operator Name: SES ASTRA S.A.

Launch Date and Time: 19/10/1995

Launch Location: Kourou, French Guiana

Launch Vehicle Name: Ariane

Date of Decommissioning: 12/06/2015

Additional Information: The satellite is in a graveyard orbit, at a minimum perigee altitude of 390 km above the geostationary orbit

Entry Date into National Registry: 02/03/2021ⁱ

ASTRA 1F

COSPAR International 1996-021A
Designator:
National Designation No.: /

Owner / Operator Name: SES ASTRA S.A.
Launch Date and Time: 08/04/1996
Launch Location: Baikonur, Kazakhstan
Launch Vehicle Name: Proton

Date of Decommissioning: 04/11/2020
Additional Information: The satellite is in a graveyard orbit, at a minimum perigee altitude of 312 km above the geostationary orbit

Entry Date into National Registry: 02/03/2021ⁱ

ASTRA 1G

COSPAR International 1997-076A

Designator:

National Designation No.: /

Owner / Operator Name: SES ASTRA S.A.

Launch Date and Time: 02/12/1997

Launch Location: Baikonur, Kazakhstan

Launch Vehicle Name: Proton

Nodal Period: 1,435.8-1,436.4 minutes

Inclination: Uncontrolled inclination since 23/05/2014. Orbital inclination is therefore increasing over time and was 4.7 degrees on 10/08/2020

Apogee: 35,820 kilometers

Perigee: 35,752 kilometers

Geostationary Position: 63.24 degrees East since 18/08/2019

General Function of Object: Encrypted and unencrypted transmission of radio, television and multimedia data services

Entry Date into National Registry: 02/03/2021ⁱ

Annex 1: ASTRA 1G

New Basic Orbital Parameters

Inclination:	Uncontrolled inclination since 23/05/2014. Orbital inclination is therefore increasing over time and was 5.2 degrees on 10/02/2021
Geostationary position:	19.4 degrees East from 10/02/2021
Entry Date into National Registry:	02/03/2021

ASTRA 2A

COSPAR International 1998-050A

Designator:

National Designation No.: /

Owner / Operator Name: SES ASTRA S.A.

Launch Date and Time: 30/08/1998

Launch Location: Baikonur, Kazakhstan

Launch Vehicle Name: Proton

Nodal Period: 1,435.8-1,436.4 minutes

Inclination: Uncontrolled inclination since 10/08/2018. Orbital inclination is therefore increasing over time and was 1.8 degrees on 10/08/2020

Apogee: 35,820 kilometers

Perigee: 35,752 kilometers

Geostationary Position: 28 degrees East since 06/08/2020

General Function of Object: Encrypted and unencrypted transmission of radio, television and multimedia data services

Entry Date into National 02/03/2021ⁱ

Registry:

ASTRA 1H

COSPAR International 1999-033A
Designator:
National Designation No.: /

Owner / Operator Name: SES ASTRA S.A.
Launch Date and Time: 18/06/1999
Launch Location: Baikonur, Kazakhstan
Launch Vehicle Name: Proton

Date of Decommissioning: 12/10/2019
Additional Information: The satellite is in a graveyard orbit, at a minimum perigee altitude of 340 km above the geostationary orbit

Entry Date into National Registry: 02/03/2021ⁱ

ASTRA 2B

COSPAR International 2000-054A

Designator:

National Designation No.: /

Owner / Operator Name: SES ASTRA S.A.

Launch Date and Time: 14/09/2000

Launch Location: Kourou, French Guiana

Launch Vehicle Name: Ariane 5

Nodal Period: 1,435.8-1,436.4 minutes

Inclination: Uncontrolled inclination since 07/06/2014. Orbital inclination is therefore increasing over time and was 4.6 degrees on 10/08/2020

Apogee: 35,820 kilometers

Perigee: 35,752 kilometers

Geostationary Position: 19.6 degrees East since 01/10/2019

General Function of Object: Encrypted and unencrypted transmission of radio, television and multimedia data services

Entry Date into National 02/03/2021ⁱ

Registry:

Annex 1: ASTRA 2B

New Basic Orbital Parameters

Additional Information:

The satellite is in a graveyard orbit, at a minimum perigee altitude of 340 km above the geostationary orbit

Apogee: 36,221 kilometers

Perigee: 36,124 kilometers

Entry Date into National Registry:

15/07/2021

ASTRA 2D

COSPAR International 2000-081A

Designator:

National Designation No.: /

Owner / Operator Name: SES ASTRA S.A.

Launch Date and Time: 20/12/2000

Launch Location: Kourou, French Guiana

Launch Vehicle Name: Ariane 5

Nodal Period: 1,435.8-1,436.4 minutes

Inclination: Uncontrolled inclination since 22/04/2014. Orbital inclination is therefore increasing over time and was 5.9 degrees on 10/08/2020

Apogee: 35,820 kilometers

Perigee: 35,752 kilometers

Geostationary Position: 57.25 degrees East since 05/03/2020

General Function of Object: Encrypted and unencrypted transmission of radio, television and multimedia data services

Entry Date into National Registry: 02/03/2021ⁱ

Annex 1: ASTRA 2D

New Basic Orbital Parameters

Nodal Period:	1,435.8-1,436.4 minutes
Inclination:	Uncontrolled inclination since 22/04/2014. Orbital inclination is therefore increasing over time and was 6.74 degrees on 08/10/2021
Apogee:	35,820 kilometers
Perigee:	35,752 kilometers
Geostationary Position:	23,7 degrees East since 04/10/2021
Entry Date into National Registry:	09/10/2021

ASTRA 2C

COSPAR International 2001-025A

Designator:

National Designation No.: /

Owner / Operator Name: SES ASTRA S.A.

Launch Date and Time: 16/06/2001

Launch Location: Baikonur, Kazakhstan

Launch Vehicle Name: Proton

Nodal Period: 1,435.8-1,436.4 minutes

Inclination: Uncontrolled inclination since 09/11/2016. Orbital inclination is therefore increasing over time and was 3.0 degrees on 10/08/2020

Apogee: 35,820 kilometers

Perigee: 35,752 kilometers

Geostationary Position: 23.7 degrees East since 23/05/2018

General Function of Object: Encrypted and unencrypted transmission of radio, television and multimedia data services

Entry Date into National 02/03/2021ⁱ

Registry:

Annex 1: ASTRA 2C

New Basic Orbital Parameters

Nodal Period:	1,435.8-1,436.4 minutes
Inclination:	Uncontrolled inclination since 09/11/2016. Orbital inclination is therefore increasing over time and was 3.85 degrees on 18/08/2021
Apogee:	35,820 kilometers
Perigee:	35,752 kilometers
Geostationary Position:	72.5 degrees West since 23/05/2018
Entry Date into National Registry:	30/08/2021

ASTRA 3A

COSPAR International 2002-015B
Designator:
National Designation No.: /

Owner / Operator Name: SES ASTRA S.A.
Launch Date and Time: 29/03/2002
Launch Location: Kourou, French Guiana
Launch Vehicle Name: Ariane 4

Nodal Period: 1,435.8-1,436.4 minutes
Inclination: Uncontrolled inclination since 29/03/2012. Orbital inclination is therefore increasing over time and was 6.0 degrees on 10/08/2020
Apogee: 35,820 kilometers
Perigee: 35,752 kilometers
Geostationary Position: 86.85 degrees West since 06/12/2019

General Function of Object: Encrypted and unencrypted transmission of radio, television and multimedia data services; occasional-use services and very small aperture terminal (VSAT) services

Entry Date into National Registry: 02/03/2021ⁱ

ASTRA 1KR

COSPAR Designator:	International	2006-012A
National Designation No.:		/
Owner / Operator Name:		SES ASTRA S.A. (through its subsidiary SES ASTRA 1KR S.à r.l.)
Launch Date and Time:		20/04/2006
Launch Location:		Cape Canaveral, United States of America
Launch Vehicle Name:		Atlas V
Nodal Period:		1,435.8-1,436.4 minutes
Inclination:		0.10 degrees
Apogee:		35,820 kilometers
Perigee:		35,752 kilometers
Geostationary Position:		19.2 degrees East
General Function of Object:		Encrypted and unencrypted transmission of radio, television and multimedia data services
Entry Date into National Registry:		02/03/2021 ⁱ

ASTRA 1L

COSPAR Designator:	International	2007-016A
National Designation No.:		/
Owner / Operator Name:		SES ASTRA S.A. (through its subsidiary SES ASTRA 1L S.à r.l.)
Launch Date and Time:		04/05/2007
Launch Location:		Kourou, French Guiana
Launch Vehicle Name:		Ariane 5
Nodal Period:		1,435.8-1,436.4 minutes
Inclination:		0.10 degrees
Apogee:		35,820 kilometers
Perigee:		35,752 kilometers
Geostationary Position:		19.2 degrees East
General Function of Object:		Encrypted and unencrypted transmission of radio, television, multimedia data and broadband services
Entry Date into National Registry:		02/03/2021 ⁱ

ASTRA 1M

COSPAR International 2008-057A
Designator:
National Designation No.: /

Owner / Operator Name: SES ASTRA S.A. (through its subsidiary
SES ASTRA 1M S.à r.l.)
Launch Date and Time: 05/11/2008
Launch Location: Baikonur, Kazakhstan
Launch Vehicle Name: Proton-M/Breeze-M

Nodal Period: 1,435.8-1,436.4 minutes
Inclination: 0.10 degrees
Apogee: 35,820 kilometers
Perigee: 35,752 kilometers
Geostationary Position: 19.2 degrees East

General Function of Object: Encrypted and unencrypted transmission of
radio, television and multimedia data
services

Entry Date into National 02/03/2021ⁱ
Registry:

ASTRA 3B

COSPAR Designator:	International	2010-021A
National Designation No.:		/
Owner / Operator Name:		SES ASTRA S.A. (through its subsidiary SES 3B S.à r.l.)
Launch Date and Time:		21/05/2010
Launch Location:		Kourou, French Guiana
Launch Vehicle Name:		Ariane 5
Nodal Period:		1,435.8-1,436.4 minutes
Inclination:		0.10 degrees
Apogee:		35,820 kilometers
Perigee:		35,752 kilometers
Geostationary Position:		23.5 degrees East since 10/06/2010
General Function of Object:		Encrypted and unencrypted transmission of radio, television, multimedia data, VSAT and broadband services
Entry Date into National Registry:		02/03/2021 ⁱ

ASTRA 1N

COSPAR International 2011-041A

Designator:

National Designation No.: /

Owner / Operator Name: SES ASTRA S.A. (through its subsidiary
SES 1N S.à r.l.)

Launch Date and Time: 06/08/2011

Launch Location: Kourou, French Guiana

Launch Vehicle Name: Ariane 5

Nodal Period: 1,435.8-1,436.4 minutes

Inclination: 0.10 degrees

Apogee: 35,820 kilometers

Perigee: 35,752 kilometers

Geostationary Position: 19.2 degrees East since 28/02/2014

General Function of Object: Encrypted and unencrypted transmission of
radio, television, multimedia data, VSAT
and broadband services

**Entry Date into National
Registry:** 02/03/2021ⁱ

Vesselsat 1

COSPAR International 2011-058C
Designator:
National Designation No.: /

Owner / Operator Name: LuxSpace S.à r.l.
Launch Date and Time: 12/10/2011
Launch Location: Sriharikota, India
Launch Vehicle Name: PSLV-CA

Nodal Period: 102.10 minutes
Inclination: 20 degrees
Apogee: 867 kilometers
Perigee: 847 kilometers

Additional Information: The object is still in orbit but is no longer operational

Entry Date into National Registry: 02/03/2021ⁱ

ASTRA 2F

COSPAR International 2012-051A
Designator:
National Designation No.: /

Owner / Operator Name: SES ASTRA S.A. (through its subsidiary
SES ASTRA 2F S.à r.l.)
Launch Date and Time: 28/09/2012
Launch Location: Kourou, French Guiana
Launch Vehicle Name: Ariane 5

Nodal Period: 1,435.8-1,436.4 minutes
Inclination: 0.10 degrees
Apogee: 35,820 kilometers
Perigee: 35,752 kilometers
Geostationary Position: 28.2 degrees East

General Function of Object: Encrypted and unencrypted transmission of
radio, television, multimedia data, VSAT
and broadband services

Entry Date into National 02/03/2021ⁱ
Registry:

Vesselsat 2

COSPAR International 2012-001B

Designator:

National Designation No.: /

Owner / Operator Name: LuxSpace S.à r.l.

Launch Date and Time: 09/01/2012

Launch Location: Taiyuan LC-9, China

Launch Vehicle Name: Chang Zheng 4B Y26

Additional Information: The satellite has not been in orbit since 27/10/2016

Entry Date into National Registry: 02/03/2021ⁱ

ASTRA 2E

COSPAR International 2013-056A
Designator:
National Designation No.: /

Owner / Operator Name: SES ASTRA S.A. (through its subsidiary
SES ASTRA 2E S.à r.l.)
Launch Date and Time: 29/09/2013
Launch Location: Baikonur, Kazakhstan
Launch Vehicle Name: Proton-M/Breeze-M

Nodal Period: 1,435.8-1,436.4 minutes
Inclination: 0.10 degrees
Apogee: 35,820 kilometers
Perigee: 35,752 kilometers
Geostationary Position: 28.5 degrees East since 31/07/2015

General Function of Object: Encrypted and unencrypted transmission of
radio, television, multimedia data, VSAT
and broadband services

Entry Date into National 02/03/2021ⁱ
Registry:

ASTRA 5B

COSPAR International 2014-011B
Designator:
National Designation No.: /

Owner / Operator Name: SES ASTRA S.A. (through its subsidiary
SES ASTRA 5B S.à r.l.)
Launch Date and Time: 22/03/2014
Launch Location: Kourou, French Guiana
Launch Vehicle Name: Ariane 5

Nodal Period: 1,435.8-1,436.4 minutes
Inclination: 0.10 degrees
Apogee: 35,820 kilometers
Perigee: 35,752 kilometers
Geostationary Position: 31.5 degrees East

General Function of Object: Encrypted and unencrypted transmission of
radio, television, multimedia data, VSAT
and broadband services

Entry Date into National 02/03/2021ⁱ
Registry:

ASTRA 2G

COSPAR Designator:	International	2014-089A
National Designation No.:		/
Owner / Operator Name:		SES ASTRA S.A. (through its subsidiary SES ASTRA 2G S.à r.l.)
Launch Date and Time:		27/12/2014
Launch Location:		Baikonur, Kazakhstan
Launch Vehicle Name:		Proton-M/Breeze-M
Nodal Period:		1,435.8-1,436.4 minutes
Inclination:		0.10 degrees
Apogee:		35,820 kilometers
Perigee:		35,752 kilometers
Geostationary Position:		28.5 degrees East since 16/06/2015
General Function of Object:		Encrypted and unencrypted transmission of radio, television, multimedia data and broadband services and of governmental and institutional communication services
Entry Date into National Registry:		02/03/2021 ⁱ

Govsat-1 (SES-16)

COSPAR International 2018-013A

Designator:

National Designation No.: /

Owner / Operator Name: LuxGovSat S.A.

Launch Date and Time: 31/01/2018

Launch Location: Cape Canaveral, United States of America

Launch Vehicle Name: SpaceX Falcon 9

Nodal Period: 1,435.8-1,436.4 minutes

Inclination: 0.05 degrees

Apogee: 35,820 kilometers

Perigee: 35,752 kilometers

Geostationary Position: 21.42 degrees East

General Function of Object: Provision of governmental and institutional communication services

Entry Date into National Registry: 02/03/2021ⁱ

FM91, LEMUR 2 REMY-COLTON

COSPAR International 2018-111J
Designator:
National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à r.l.
Launch Date and Time: 27/12/2018
Launch Location: Vostochny Cosmodrome, Russian Federation
Launch Vehicle Name: Soyuz 2.1 a

Nodal Period: 96.2 minutes
Inclination: 97.73 degrees
Apogee: 576 kilometers
Perigee: 576 kilometers
Longitude of the Ascending Node: 139.3 degrees

General Function of Object: Earth exploration and meteorology ("Automatic Identification System" (AIS), "Automatic Dependent Surveillance-Broadcast" (ADS-B), "Global Navigation Satellite System Radio Occultation/Reflectometry" (GNSS-RO/R))

Entry Date into National Registry: 02/03/2021ⁱ

FM92, LEMUR 2 GUSTAVO

COSPAR Designator:	International	2018-111K
National Designation No.:		/
Owner / Operator Name:	Spire Global Luxembourg S.à r.l.	
Launch Date and Time:	27/12/2018	
Launch Location:	Vostochny Cosmodrome,	Russian Federation
Launch Vehicle Name:	Soyuz 2.1 a	
Nodal Period:	96.2 minutes	
Inclination:	97.72 degrees	
Apogee:	577 kilometers	
Perigee:	577 kilometers	
Longitude of the Ascending Node:	139.3 degrees	
General Function of Object:	Earth exploration and meteorology (AIS, ADS-B, GNSS-RO/R)	
Entry Date into National Registry:	02/03/2021 ⁱ	

FM93, LEMUR 2 CHRISTINAHOLT

COSPAR Designator:	International	2018-111G
National Designation No.:		/
Owner / Operator Name:	Spire Global Luxembourg S.à r.l.	
Launch Date and Time:	27/12/2018	
Launch Location:	Vostochny Cosmodrome,	Russian Federation
Launch Vehicle Name:	Soyuz 2.1 a	
Nodal Period:	96.2 minutes	
Inclination:	97.73 degrees	
Apogee:	574 kilometers	
Perigee:	574 kilometers	
Longitude of the Ascending Node:	139.3 degrees	
General Function of Object:	Earth exploration and meteorology (AIS, ADS-B, GNSS-RO/R)	
Entry Date into National Registry:	02/03/2021 ⁱ	

FM94, LEMUR 2 ZO

COSPAR Designator:	International	2018-111L
National Designation No.:		/
Owner / Operator Name:	Spire Global Luxembourg S.à r.l.	
Launch Date and Time:	27/12/2018	
Launch Location:	Vostochny Cosmodrome,	Russian Federation
Launch Vehicle Name:	Soyuz 2.1 a	
Nodal Period:	96.2 minutes	
Inclination:	97.72 degrees	
Apogee:	579 kilometers	
Perigee:	579 kilometers	
Longitude of the Ascending Node:	139.3 degrees	
General Function of Object:	Earth exploration and meteorology (AIS, ADS-B, GNSS-RO/R)	
Entry Date into National Registry:	02/03/2021 ⁱ	

FM95, LEMUR 2 TINYKEV

COSPAR Designator:	International	2018-111H
National Designation No.:		/
Owner / Operator Name:	Spire Global Luxembourg S.à r.l.	
Launch Date and Time:	27/12/2018	
Launch Location:	Vostochny Cosmodrome,	Russian Federation
Launch Vehicle Name:	Soyuz 2.1 a	
Nodal Period:	96.2 minutes	
Inclination:	97.73 degrees	
Apogee:	575 kilometers	
Perigee:	575 kilometers	
Longitude of the Ascending Node:	139.3 degrees	
General Function of Object:	Earth exploration and meteorology (AIS, ADS-B, GNSS-RO/R)	
Entry Date into National Registry:	02/03/2021 ⁱ	

FM96, LEMUR 2 SARAHBETTYBOO

COSPAR Designator:	International	2018-111N
National Designation No.:		/
Owner / Operator Name:	Spire Global Luxembourg S.à r.l.	
Launch Date and Time:	27/12/2018	
Launch Location:	Vostochny Cosmodrome,	Russian Federation
Launch Vehicle Name:	Soyuz 2.1 a	
Nodal Period:	96.2 minutes	
Inclination:	97.72 degrees	
Apogee:	582 kilometers	
Perigee:	582 kilometers	
Longitude of the Ascending Node:	139.3 degrees	
General Function of Object:	Earth exploration and meteorology (AIS, ADS-B, GNSS-RO/R)	
Entry Date into National Registry:	02/03/2021 ⁱ	

FM97, LEMUR 2 NATALIEMURRAY

COSPAR International 2018-111M
Designator:
National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à r.l.
Launch Date and Time: 27/12/2018
Launch Location: Vostochny Cosmodrome, Russian Federation
Launch Vehicle Name: Soyuz 2.1 a

Nodal Period: 96.2 minutes
Inclination: 97.72 degrees
Apogee: 580 kilometers
Perigee: 580 kilometers
Longitude of the Ascending Node: 139.3 degrees

General Function of Object: Earth exploration and meteorology (AIS, ADS-B, GNSS RO/R)

Entry Date into National Registry: 02/03/2021ⁱ

FM98, LEMUR 2 DAISY-HARPER

COSPAR Designator:	International	2018-111P
National Designation No.:		/
Owner / Operator Name:	Spire Global Luxembourg S.à r.l.	
Launch Date and Time:	27/12/2018	
Launch Location:	Vostochny Cosmodrome,	Russian Federation
Launch Vehicle Name:	Soyuz 2.1 a	
Nodal Period:	96.2 minutes	
Inclination:	97.72 degrees	
Apogee:	584 kilometers	
Perigee:	584 kilometers	
Longitude of the Ascending Node:	139.3 degrees	
General Function of Object:	Earth exploration and meteorology (AIS, ADS-B, GNSS-RO/R)	
Entry Date into National Registry:	02/03/2021 ⁱ	

FM99, LEMUR 2 JOHANLORAN

COSPAR International 2019-018G

Designator:

National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à r.l.

Launch Date and Time: 01/04/2019

Launch Location: Sriharikota, Andhra Pradesh, India

Launch Vehicle Name: PSLV

Nodal Period: 94.6 minutes

Inclination: 97.4 degrees

Apogee: 512.4 kilometers

Perigee: 495.8 kilometers

Longitude of the Ascending Node: 140.7 degrees

General Function of Object: Earth exploration and meteorology (AIS, ADS-B, GNSS-RO/R)

Entry Date into National Registry: 02/03/2021ⁱ

FM100, LEMUR 2 BEAUDACIOUS

COSPAR International 2019-018H

Designator:

National Designation No.: /

Owner / Operator Name:

Spire Global Luxembourg S.à r.l.

Launch Date and Time:

01/04/2019

Launch Location:

Sriharikota, Andhra Pradesh, India

Launch Vehicle Name:

PSLV

Nodal Period:

94.6 minutes

Inclination:

97.4 degrees

Apogee:

513.1 kilometers

Perigee:

496.1 kilometers

Longitude of the Ascending Node:

140.7 degrees

General Function of Object:

Earth exploration and meteorology (AIS, ADS-B, GNSS-RO/R)

Entry Date into National Registry:

02/03/2021ⁱ

FM101, LEMUR 2 ELHAM

COSPAR International 2019-018J

Designator:

National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à r.l.

Launch Date and Time: 01/04/2019

Launch Location: Sriharikota, Andhra Pradesh, India

Launch Vehicle Name: PSLV

Nodal Period: 94.5 minutes

Inclination: 97.4 degrees

Apogee: 511.8 kilometers

Perigee: 495.1 kilometers

Longitude of the Ascending Node: 140.7 degrees

General Function of Object: Earth exploration and meteorology (AIS, ADS-B, GNSS-RO/R)

Entry Date into National Registry: 02/03/2021ⁱ

FM102, LEMUR 2 VICTOR-ANDREW

COSPAR International 2019-018K

Designator:

National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à r.l.

Launch Date and Time: 01/04/2019

Launch Location: Sriharikota, Andhra Pradesh, India

Launch Vehicle Name: PSLV

Nodal Period: 94.5 minutes

Inclination: 97.4 degrees

Apogee: 511.6 kilometers

Perigee: 495.1 kilometers

Longitude of the Ascending Node: 140.7 degrees

General Function of Object: Earth exploration and meteorology (AIS, ADS-B, GNSS-RO/R)

Entry Date into National Registry: 02/03/2021ⁱ

FM144, LEMUR 2 SUSURRUS

COSPAR International 2020-068S

Designator:

National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à r.l.

Launch Date and Time: 28/09/2020

Launch Location: Plesetsk, Russian Federation

Launch Vehicle Name: Soyuz-2.1 b/Fregat

Nodal Period: 96.0 minutes

Inclination: 97.66 degrees

Apogee: 575 kilometers

Perigee: 475 kilometers

Longitude of the Ascending Node: 28.38 degrees

General Function of Object: Earth exploration and meteorology, Inter-Satellite Link experimentation

Entry Date into National Registry: 02/03/2021ⁱ

FM145, LEMUR 2 SLICERS

COSPAR International 2020-068Q

Designator:

National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à r.l.

Launch Date and Time: 28/09/2020

Launch Location: Plesetsk, Russian Federation

Launch Vehicle Name: Soyuz-2.1 b/Fregat

Nodal Period: 96.0 minutes

Inclination: 97.66 degrees

Apogee: 575 kilometers

Perigee: 475 kilometers

Longitude of the Ascending Node: 28.38 degrees

General Function of Object: Earth exploration and meteorology, Inter-Satellite Link experimentation

Entry Date into National Registry: 02/03/2021ⁱ

FM137, LEMUR 2 BAXTER-OLIVER, LEMUR 2 V4.7

COSPAR International 1998-067RV
Designator:
National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à r.l.
Launch Date and Time: 03/10/2020
Launch Location: Wallops, Virginia, United States
Launch Vehicle Name: Antares

Nodal Period: 93.1 minutes
Inclination: 51.6 degrees
Apogee: 421 kilometers
Perigee: 409 kilometers
Longitude of the Ascending Node: 8.25 degrees (RAAN, M50)

General Function of Object: Earth exploration and meteorology, Inter-Satellite Link experimentation

Additional Information: The satellite was deployed from the International Space Station (ISS) on 05/11/2020

Entry Date into National Registry: 02/03/2021ⁱ

Annex 1: FM137, LEMUR 2 BAXTER-OLIVER, LEMUR 2 V4.7

Date of Decommissioning:	19/12/2021
Additional Information:	The satellite re-entered Earth's atmosphere on 19/12/2021, burning up completely with no material reaching the Earth's surface.
Entry Date into National Registry:	01/02/2022

FM142, LEMUR 2 DJARA, LEMUR 2 V4.8

COSPAR Designator:	International	1998-067RW
National Designation No.:		/
Owner / Operator Name:		Spire Global Luxembourg S.à r.l.
Launch Date and Time:		03/10/2020
Launch Location:		Wallops, Virginia, United States
Launch Vehicle Name:		Antares
Nodal Period:		93.1 minutes
Inclination:		51.6 degrees
Apogee:		421 kilometers
Perigee:		409 kilometers
Longitude of the Ascending Node:		8.57 degrees (RAAN, M50)
General Function of Object:		Earth exploration and meteorology (AIS, ADS-B, GNSS-RO/R)
Additional Information:		The satellite was deployed from the International Space Station (ISS) on 05/11/2020
Entry Date into National Registry:		02/03/2021 ⁱ

Annex 1: FM142, LEMUR 2 DJARA, LEMUR 2 V4.8

Date of Decommissioning:

03/01/2022

Additional Information:

The satellite re-entered Earth's atmosphere on 03/01/2022, burning up completely with no material reaching the Earth's surface.

Entry Date into National Registry:

01/02/2022

KSM1-A

COSPAR Designator:	International	2020-081H
National Designation No.:		/
Owner / Operator Name:		Kleos Space S.A.
Launch Date and Time:		07/11/2020
Launch Location:		Sriharikota, Andhra Pradesh, India
Launch Vehicle Name:		PSLV C49
Nodal Period:		96 minutes
Inclination:		37 degrees
Apogee:		576.60 kilometers
Perigee:		569.97 kilometers
Longitude of the Ascending Node:		99.44 degrees (RAAN)
General Function of Object:		Passive geolocation of radio transmissions for the purpose of supplying Radio Frequency (RF) reconnaissance data to the maritime situation awareness domain
Entry Date into National Registry:		02/03/2021 ⁱ

Annex 1: KSM1-A

New Basic Orbital Parameters

Additional Information:

The satellite finished Launch and Early Orbit Phase (LEOP) and has new basic orbital parameters.

Inclination:

36.9 degrees

Apogee:

577 kilometers

Perigee:

572.6 kilometers

**Entry Date into National
Registry:**

23/09/2021

KSM1-B

COSPAR Designator:	International	2020-081K
National Designation No.:		/
Owner / Operator Name:		Kleos Space S.A.
Launch Date and Time:		07/11/2020
Launch Location:		Sriharikota, Andhra Pradesh, India
Launch Vehicle Name:		PSLV C49
Nodal Period:		96 minutes
Inclination:		37 degrees
Apogee:		576.60 kilometers
Perigee:		569.97 kilometers
Longitude of the Ascending Node:		99.44 degrees (RAAN)
General Function of Object:		Passive geolocation of radio transmissions for the purpose of supplying RF reconnaissance data to the maritime situation awareness domain
Entry Date into National Registry:		02/03/2021 ⁱ

Annex 1: KSM1-B

New Basic Orbital Parameters

Additional Information:

The satellite finished Launch and Early Orbit Phase (LEOP) and has new basic orbital parameters.

Inclination: 36.9 degrees
Apogee: 581.3 kilometers
Perigee: 568.3 kilometers

Entry Date into National Registry: 23/09/2021

KSM1-C

COSPAR	International	2020-081C
Designator:		
National Designation No.:		/
Owner / Operator Name:		Kleos Space S.A.
Launch Date and Time:		07/11/2020
Launch Location:		Sriharikota, Andhra Pradesh, India
Launch Vehicle Name:		PSLV C49
Nodal Period:		96 minutes
Inclination:		37 degrees
Apogee:		576.60 kilometers
Perigee:		569.97 kilometers
Longitude of the Ascending Node:		99.44 degrees (RAAN)
General Function of Object:		Passive geolocation of radio transmissions for the purpose of supplying RF reconnaissance data to the maritime situation awareness domain
Entry Date into National Registry:		02/03/2021 ⁱ

Annex 1: KSM1-C

New COSPAR International Designator: 2020-081B

New Basic Orbital Parameters Additional Information:

The satellite finished Launch and Early Orbit Phase (LEOP) and has new basic orbital parameters.

Inclination: 36.9 degrees

Apogee: 578.8 kilometers

Perigee: 570.7 kilometers

Entry Date into National Registry: 23/09/2021

KSM1-D

COSPAR Designator:	International	2020-081B
National Designation No.:		/
Owner / Operator Name:		Kleos Space S.A.
Launch Date and Time:		07/11/2020
Launch Location:		Sriharikota, Andhra Pradesh, India
Launch Vehicle Name:		PSLV C49
Nodal Period:		96 minutes
Inclination:		37 degrees
Apogee:		576.60 kilometers
Perigee:		569.97 kilometers
Longitude of the Ascending Node:		99.44 degrees (RAAN)
General Function of Object:		Passive geolocation of radio transmissions for the purpose of supplying RF reconnaissance data to the maritime situation awareness domain
Entry Date into National Registry:		02/03/2021 ⁱ

Annex 1: KSM1-D

New COSPAR International Designator: 2020-081C

New Basic Orbital Parameters Additional Information:

The satellite finished Launch and Early Orbit Phase (LEOP) and has new basic orbital parameters.

Inclination: 36.9 degrees

Apogee: 579.8 kilometers

Perigee: 569.9 kilometers

Entry Date into National Registry: 23/09/2021

FM136, LEMUR-2 NEVA

COSPAR International 2021-006AP
Designator:
National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à. r.l.
Launch Date and Time: 24/01/2021
Launch Location: Cape Canaveral, United States
Launch Vehicle Name: SpaceX Falcon 9

Nodal Period: 95.2 minutes
Inclination: 97.5 degrees
Apogee: 525 kilometers
Perigee: 528 kilometers

General Function of Object: Earth exploration and meteorology, Inter-Satellite Link experimentation

Entry Date into National Registry: 03/03/2021

FM139, LEMUR-2 JACKSON

COSPAR International 2021-059G

Designator:

National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à. r.l.

Launch Date and Time: 30/06/2021, 19:31:00

Launch Location: Cape Canaveral, United States

Launch Vehicle Name: SpaceX Falcon 9

Nodal Period: 95.2 minutes

Inclination: 97.5 degrees

Apogee: 543.8 kilometers

Perigee: 531 kilometers

General Function of Object: Earth exploration and meteorology

Entry Date into National Registry: 30/08/2021

FM140, LEMUR-2 ANNABANANA

COSPAR International 2021-059AW

Designator:

National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à. r.l.

Launch Date and Time: 30/06/2021, 19:31:00

Launch Location: Cape Canaveral, United States

Launch Vehicle Name: SpaceX Falcon 9

Nodal Period: 95.2 minutes

Inclination: 97.5 degrees

Apogee: 543.7 kilometers

Perigee: 525.3 kilometers

General Function of Object: Earth exploration and meteorology

Entry Date into National Registry: 30/08/2021

FM143, LEMUR-2 JOHN-TREIRES

COSPAR International 2021-059AY

Designator:

National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à. r.l.

Launch Date and Time: 30/06/2021, 19:31:00

Launch Location: Cape Canaveral, United States

Launch Vehicle Name: SpaceX Falcon 9

Nodal Period: 95.2 minutes

Inclination: 97.5 degrees

Apogee: 544.3 kilometers

Perigee: 522.2 kilometers

General Function of Object: Earth exploration and meteorology

Entry Date into National Registry: 30/08/2021

FM148, LEMUR-2 AC-CUBED

COSPAR International 2021-059BA

Designator:

National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à. r.l.

Launch Date and Time: 30/06/2021, 19:31:00

Launch Location: Cape Canaveral, United States

Launch Vehicle Name: SpaceX Falcon 9

Nodal Period: 95.1 minutes

Inclination: 97.5 degrees

Apogee: 545.1 kilometers

Perigee: 519.9 kilometers

General Function of Object: Earth exploration and meteorology

Entry Date into National 30/08/2021

Registry:

FM150, LEMUR-2 CARLSANTAMARI

COSPAR International 2021-059CJ

Designator:

National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à. r.l.

Launch Date and Time: 30/06/2021, 19:31:00

Launch Location: Cape Canaveral, United States

Launch Vehicle Name: SpaceX Falcon 9

Nodal Period: 95.1 minutes

Inclination: 97.5 degrees

Apogee: 543.4 kilometers

Perigee: 519.2 kilometers

General Function of Object: Earth exploration and meteorology

Entry Date into National Registry: 30/08/2021

FM151, LEMUR-2 KRYWE

COSPAR Designator:	International	2022-003F
National Designation No.:		/
Owner / Operator Name:		Spire Global Luxembourg S.à. r.l.
Launch Date and Time:		13/01/2022
Launch Location:		Mojave Air and Space Port, United States
Launch Vehicle Name:		Virgin Orbit LauncherOne
Nodal Period:		95.22 minutes
Inclination:		45 degrees
Apogee:		500 kilometers
Perigee:		500 kilometers
General Function of Object:		Earth exploration and meteorology
Entry Date into National Registry:		08/02/2022

FM141, LEMUR-2 KING-JULIEN

COSPAR Designator:	International	2022-002AQ
National Designation No.:		/
Owner / Operator Name:		Spire Global Luxembourg S.à. r.l.
Launch Date and Time:		13/01/2022
Launch Location:		Cape Canaveral, United States
Launch Vehicle Name:		SpaceX Falcon 9
Nodal Period:		95.22 minutes
Inclination:		97.5 degrees
Apogee:		525 kilometers
Perigee:		525 kilometers
General Function of Object:		Earth exploration and meteorology
Entry Date into National Registry:		08/02/2022

FM149, LEMUR-2 RAMONAMAE

COSPAR International 2022-002AP
Designator:
National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à. r.l.
Launch Date and Time: 13/01/2022
Launch Location: Cape Canaveral, United States
Launch Vehicle Name: SpaceX Falcon 9

Nodal Period: 95.23 minutes
Inclination: 97.5 degrees
Apogee: 525 kilometers
Perigee: 525 kilometers

General Function of Object: Earth exploration and meteorology

Entry Date into National Registry: 08/02/2022

FM152, LEMUR-2 MIRIWARI

COSPAR International 2022-002BY

Designator:

National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à. r.l.

Launch Date and Time: 13/01/2022

Launch Location: Cape Canaveral, United States

Launch Vehicle Name: SpaceX Falcon 9

Nodal Period: 95.23 minutes

Inclination: 97.5 degrees

Apogee: 525 kilometers

Perigee: 525 kilometers

General Function of Object: Earth exploration and meteorology

Entry Date into National Registry: 08/02/2022

FM153, LEMUR-2 DJIRANG

COSPAR International 2022-002CC
Designator:
National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à. r.l.
Launch Date and Time: 13/01/2022
Launch Location: Cape Canaveral, United States
Launch Vehicle Name: SpaceX Falcon 9

Nodal Period: 95.23 minutes
Inclination: 97.5 degrees
Apogee: 525 kilometers
Perigee: 525 kilometers

General Function of Object: Earth exploration and meteorology

Entry Date into National Registry: 08/02/2022

FM154, LEMUR-2 ROHOVITHSA

COSPAR International 2022-002BE

Designator:

National Designation No.: /

Owner / Operator Name: Spire Global Luxembourg S.à. r.l.

Launch Date and Time: 13/01/2022

Launch Location: Cape Canaveral, United States

Launch Vehicle Name: SpaceX Falcon 9

Nodal Period: 94.52 minutes

Inclination: 97.5 degrees

Apogee: 525 kilometers

Perigee: 525 kilometers

General Function of Object: Earth exploration and meteorology

Entry Date into National Registry: 08/02/2022

ⁱ This is a formal date of the entry into the National Registry created following Article 15 of the Law on Space Activities. The information was already furnished by Luxembourg to UNOOSA in conformity with General Assembly resolution 1721 B (XVI)