

Narrative

USN TT&C Routine support for Sentinel-1D from Alaska

Sentinel or Copernicus is a mission of the European Space Agency which measures ocean currents in cooperation with the USA. This request is for a 180- day STA to start on Dec. 8th 2026 supporting TT&C routine operations of the Sentinel-1D. This is a continuation of SES-STA-20260203-01103. Sentinel-1D adjust to fly in tandem with Sentinel-1C, orbiting on opposite sides of the globe, 180° apart. When fully commissioned and enter the routine phase, it will replace Sentinel-1A. A request was also submitted on January 31st 2023 for a long-term license, SES-LIC-20230130-00146 for Sentinel 1,2,3.

The US is a signatory of Copernicus (Sentinels) cooperation agreement since October 2015. NASA and NOAA are co-funders of Copernicus Sentinel-6 together with the European Commission, ESA and EUMETSAT (Metop satellites).

Sentinel 1D is a C-SAR satellite that is to be part of the Sentinel 1 constellation. After the commissioning phase Sentinel 1D is going to replace Sentinel 1A (lunched in April 2014) that will be decommissioned and taken out of service. The C-SAR data that the Sentinel 1D satellite is producing is used to monitoring marine: Sea-ice levels and conditions, oil spills, ship activity, marine winds and Land monitoring: agriculture, forestry, land subsidence and Emergency response: flooding, landslides, volcanoes and earthquakes.

S/C	Downlink (MHz)	Uplink (MHz)
Sentinal-1D	2253.00-2255.2	2075.266-2076.034

Flux Density impinging on the ground in Alaska from Sentinels-1D

The Flux density is calculated as:

flux density = $\frac{\text{EIRP}}{4\pi\text{RSE}^2}$ where RSE is the distance from spacecraft to the ground, and EIRP is the Effective Isotropic Radiated Power of the spacecraft.

Data from the spacecraft vendor indicates that the nominal EIRP of the Sentinel-1D spacecraft is -

Data from the spacecraft vendor indicates that the maximum EIRP of Sentinel- 1D is -13.2 dBW. The closest distance to earth during an overhead pass is 684.5 km.

Converting -13.2 dBW to scalar Watts = 0.04786 Watts transmitted at 2254.100 MHz
Therefor:

Flux density = 8.129×10^{-15} Watts/meter²

Or

Flux density = 8.129×10^{-16} mW/cm²

Waiver
Exhibit C
PETITION FOR WAIVER OF SECTION 25.137 AND 25.114 AND OF
THE U.S. TABLE OF FREQUENCY ALLOCATIONS

I. TO THE EXTENT THEY APPLY, GOOD CAUSE EXISTS FOR A WAIVER OF CERTAIN PORTIONS OF SECTIONS 25.137 AND 25.114

Universal Space Network, Inc. (dba USN) is provided limited legal and technical information for the Sentinels-1D Satellite.¹ Pursuant to Section 25.137 of the Federal Communications Commission's ("Commission" or "FCC") rules, the same technical information required by Section 25.114 for U.S.-licensed space station, and certain legal information, must be submitted by earth station applicants "requesting authority to operate with a non-U.S. licensed space station to serve the United States..."² USN seeks authority to support the TT&C LEOP and routine operations for the Sentinel-1D spacecraft, not commercial service to the United States, and thus believes that Section 25.137 does not apply.

To the extent the Commission determines, however, that USN's request for authority to provide TT&C LEOP and routine support on a special temporary basis is a request to serve the United States with a non- U.S.-licensed satellite, USN respectfully requests a waiver of Sections 25.137 and 25.114 of the Commission's rules, to the extent that USN has not herein provided the information required by these rules.³ The Commission may grant a waiver for good cause shown.⁴ A waiver is therefore appropriate if special circumstances warrant a deviation from the general rule, and such a deviation will serve the public interest.

In this case, good cause for a waiver of portions of Section 25.114 exists. USN seeks authority only to conduct TT&C LEOP and routine support for Sentinel-1D. Thus, any information sought by Section 25.114 that is not relevant to the TT&C support— e.g., antenna patterns, energy and propulsion and orbital debris - USN does not have. In addition, USN would not easily be able to obtain such information because USN is not the operator of the Sentinels-1D satellite, nor is USN in contractual privity with that operator. Rather, USN has contracted with Swedish Space Corporation, Solna Sweden (SSC) to support the TT&C LEOP and routine portion in S-Band of the Sentinels-1D satellite.

As evidenced by the Comsearch report attached to this request, USN has coordinated the TT&C support of the Sentinel-1D satellite with potentially affected terrestrial operators. Moreover, as with any STA, USN will conduct the test on an unprotected, non-interference basis to government operations.

¹ FCC Form 312 Section B

² 47 C.F.R. § 25.137(a)

³ 47 C.F.R. §§25.137 and 25.114

⁴ 47 C.F.R. §1.3

Because it is not relevant to the service for which USN seeks authorization, and because obtaining the information would be a hardship, USN seeks a waiver of all the technical and legal information required by Section 25.114, to the extent it is not provided herein. As noted above, USN has provided the required information to the extent that it is relevant to the TT&C LEOP and routine service for which USN seeks authorization.

Good cause also exists to waive portions of Section 25.137, to the extent the information required is not herein provided. Section 25.137 is designed to ensure that “U.S.-licensed satellite systems have effective competitive opportunities to provide analogous services” in other countries. Here, there is no service being provided by the satellite; USN is providing TT&C LEOP and routine support. Thus, the purpose of the information required by Section 25.137 is not implicated here. For example, Section 25.137(d) requires earth station applicants requesting authority to operate with a non-U.S.-licensed space station that is not in orbit and operating to post a bond.⁵ The underlying purpose in having to post a bond – i.e., to prevent warehousing of orbital locations by operators seeking to serve the United States – would not be served by requiring USN to post a bond in order to conduct the TT&C LEOP and routine support of the Sentinel-1D satellite.

It is USN’s understanding that Sentinel-1D is licensed by ESA (European Space Agency). Sentinel-1D is a spacecraft meant to serve the EU. Thus, the purpose of Section 25.137 – to ensure that U.S. satellite operators enjoy “effective competitive opportunities” to serve foreign markets and to prevent warehousing of orbital locations service the United States – will not be undermined by grant of this waiver request. Given these particular facts, the waiver sought herein is appropriate.

⁵ 47 C.F.R. §25.137(d)(4)

II. GOOD CAUSE EXISTS FOR A WAIVER OF THE UNITED STATES TABLE OF FREQUENCY ALLOCATIONS

USN further requests a waiver of the United States Table of Frequency Allocations ("U.S. Table") as described in section 2.106 of the rules for the frequency bands 2025 – 2110 MHz (Earth-to-Space) and 2200 – 2290 MHz (Space-to-Earth).⁶ Section footnotes allow for non-federal Government use of these bands in the United States on a case-by-case non-interference basis. Such use by USN necessitates a waiver of the U.S. Table.

Good cause exists to grant USN a limited waiver of the U.S. Table to allow TT&C support of the Sentinel-1D satellite. In considering request for case- by-case spectrum uses, the Commission has indicated that it would generally grant such waivers "where there is little potential for interference into any service authorized under the Table of Frequency Allocations and when the case-by-case operator accepts any interference from authorized services."⁷ USN will coordinate with other parties operating communication systems in compliance with the Table of Frequency Allocations to ensure that no harmful interference is caused. USN seeks to operate only pursuant to special temporary authorization and thus agrees to accept any interference from authorized services. In summary, USN's operation on a non- interference, non-protected basis support waiver of the U.S. Table.

With respect to Space Launch Services

Pursuant to Section 1.3 of the Commission's rules (47 CFR § 1.3), USN respectfully requests a waiver of certain provisions of Part 25 and Part 26 of the Commission's rules to permit the licensing and operation of a satellite earth station using the 2025–2110 MHz and 2200–2290 MHz frequency bands for Part 25, telemetry, tracking, and command (TTC) operations of its low Earth orbit (LEO) satellite constellation.

Under 47 CFR § 1.3, the Commission may waive its rules for good cause shown. USN submits that:

The proposed earth station will support TT&C operations of Sentinel-1D, which cannot be accommodated in other bands due to technical/operational constraints. Besides these bands have been used in all previous STA applications for this spacecraft, they are also technically suitable due to their propagation characteristics and compatibility with existing ground infrastructure.

These bands have been partially reallocated to space launch services under Part 26.

As per 47 CFR § 25 section 2.106, this application would not comply without a waiver due to limitations on non-federal use or non-space launch service in these bands which currently restrict or limit the use of the referenced bands due to the reallocation referenced above.

USN believe this is in the public interest, technically feasible, non-disruptive to existing services and supporting scientific research.

It is also consistent with the FCC's goals of promoting innovation, efficient use of spectrum and being in line with FCC orders and rulemakings that support flexible use of these bands (e.g., the FCC's 2023 Report and Order on commercial space launch operations 1).

This request is also consistent with prior FCC-authorized STAs, including:

Lynk Global, Inc. (File No. SES-STA-20220512-00477), which was granted temporary authority for TT&C in both bands;

Space Telecommunications, Inc. (CTC-0 CubeSat, File Number: 1082-EX-ST-2024) which was granted temporary authority for TT&C in both bands.

Geometric Energy Corporation, which received STA for TT&C in these bands for a lunar mission via a UK-based earth station

These precedents demonstrate the FCC's established practice of granting temporary, coordinated use of these bands for TT&C under appropriate conditions.

USN request a waiver to permit temporary earth station operations and continued use of the referenced bands for Part 25 TT&C satellite communications. A waiver is necessary due to the relocation of these bands.

⁶ 47 C.F.R. §2.106

⁷ Previously approved STA's for Universal Space Network SES-STA-20020725-01174; SES- STA-20021112-02008; SES-STA-20040315-00475 and SES-STA-20230515-01007

Summary of Technical Information For Coordination with NTIA/FAS/IRAC

Applicant: Universal Space Network, Inc.

File No.: _____

Call Sign: No Call Sign

Special Temporary Authority ("STA")

Purpose of operation: TT&C routine Operations support

Start Date: Dec. 8th, 2026 End Date: June 6th, 2027

Site Location: North Pole, AK

Latitude: 64 deg 48' 15.268" N (NAD-83)

Longitude: 147 deg 30' 0.771" W (NAD-83)

Transmit frequency: 2075.650 MHz

Polarization: M

Antenna manufacturer: Datron
Antenna Size in meter: 13m
Only USAK01 (13m) antenna is transmitting, the USAK03 (5.4m) antenna in Rx only
Antenna model: 1453
Antenna Gain Transmit: 45.9 dBi @ 2075.650 MH

Frequency Band (MHz)	Emissions	Max. EIRP (dBW)	Max. EIRP Density (dBW/4KHz)
2075.266-2076.034	768KG2D--	68	45,17

Satellite: Sentinel-1D

