

USN Support for Sentinels 1A, 1B, 2A, 2B, 3A, 3B from Alaska

Sentinel is a mission of the European Space Agency, set to start transmitting 15 April 2023.

Planned support from SSC is for a period of 180 days. Below are the summarized orbital parameters.

Parameter	SENTINEL-1	SENTINEL-2	SENTINEL-3
Ranging tone (TT&C links)	100 kHz to 448 kHz	100 kHz to 1500 kHz	448 kHz
Local Time Ascending Node, LTAN (Right Ascension of Ascending Node,	18:00	10:30 (LTDN)	10:00 (LTDN)
Orbit at epoch date	01.01.2018 18:00 UTCG	01.01.2018 10:30 UTCG	01.01.2018 10:00 UTCG
RAAN	11.10	78.3	70.7
Apogee (km)	701.2	794.4	808.1
Perigee (km)	684.5	777.8	791.5
Argument of Perigee	0	0	90
Mean Anomaly	359.9/179.9	179.9/359.9	359.9/179.9
Mean Inclination	98.19	98.62	98.65
Peak Gain (dB)	-2.2/6.3	-2.2/6.3	-2.5/6.6
Range of satellite arc E/W limit	63,84	62,41	62,03
G/T at Max. Gain Point	-37,42	-35,02	-31,6

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. (USN) is provided limited legal and technical information for the Sentinels 1-3 (A and B) Satellites.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 critical events for the Sentinel 1-3 (A and B) spacecraft, and 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 critical spacecraft risk mitigation support on a special temporary basis is a request to serve the United States with a non-U.S.-licensed satellites, 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. The US public interest is supported by the sharing of collected data with the United States government.

In this case, good cause for a waiver of portions of Section 25.114 exists. USN seeks authority to conduct data collection testing support for Sentinels 1-3 (A and B). Thus, any information sought by Section 25.114 that is not relevant to the critical 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 1-3 (A and B) satellites, nor is USN in contractual privity with that operator. Rather, USN has contracted with Swedish Space Corporation, Solna Sweden (SSC) to support the mission in S and X-Band of the Sentinels 1-3 (A and B) satellites.

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 testing 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 satellites systems have effective competitive opportunities to provide analogous services” in other countries. Here, there is no commercial service being provided by the satellites; USN is providing receive only data collection while the satellites are in a non-geostationary orbit. 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 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 to conduct the 180-day critical support of the Sentinels 1-3 (A and B) satellites.

It is USN’s understanding that Sentinels 1-3 (A and B) are licensed by the European Space Agency of France. Sentinels 1-3 (A and B) are spacecraft meant to serve France, with data shared with the US. Thus, the purpose of Section 25.137 – to ensure that U.S. satellites 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.

Finally, USN notes that it expects to communicate with the Sentinels 1-3 (A and B) satellites using its U.S. earth station for a period of 180 days. Requiring USN to obtain technical and legal information from an unrelated party, where there is no risk of interference. Given these particular facts, the waiver sought herein is appropriate.

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 critical support for the Sentinels 1-3 (A and B) satellites. 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.

⁵ 47 C.F.R. §25.137(d)(4)

⁶ 47 C.F.R. §2.106

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: Support for Sentinels 1A, 1B, 2A, 2B, 3A, 3B

Start Date: 15 April 2023

End Date: 12 October 2023

Site Location: North Pole, AK

Latitude: 64 deg 48' 15.3" N (NAD-83)

Longitude: 147 deg 30' 00.8" W (NAD-83)

Transmit frequency: 2254.1 MHz and 8177.5 MHz

Polarization: R/L

Antenna manufacturer: Datron

Antenna Size in meter: 13m

Antenna model: 1453

Antenna Gain Transmit: 59.1 dBi @ 8096 MHz and 45.1 dBi @ 2254.1 MHz

<u>Frequency Band</u> (MHz)	<u>Emissions</u>	<u>Max.EIRP</u> (dBW)	<u>Max.EIRP Density</u> (dBW/4KHz)
2253-2255.2	2M20G1D	69	11.98
8025-8330	140MG1D	69	11.98

Satellite: Sentinels 1A, 1B, 2A, 2B, 3A, 3B