

**Exhibit B**  
**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 CryoSat-2 Satellite.<sup>1</sup> 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..."<sup>2</sup> USN seeks authority to support the needed testing ranging calibration campaign using CryoSat-2 in preparation for the 2Q-2018 launch and (LEOP) support of Sentinels 3B , 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 LEOP 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.<sup>3</sup> The Commission may grant a waiver for good cause shown.<sup>4</sup> 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 testing (pre-LEOP) support for CryoSat-2 . Thus, any information sought by Section 25.114 that is not relevant to the LEOP – 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 CryoSat-2 satellite, nor is USN in contractual privity with that operator. Rather, USN has contracted with Swedish Space Corporation, Solna Sweden (SSC) to support the calibration campaign in preparation for the Launch and Early Orbit (LEOP) portion in S-Band of the Sentinels satellite prior to its operation.

As evidenced by the Comsearch report attached to this request, USN has coordinated the test of the CryoSat-2 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.

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<sup>1</sup> FCC Form 312 Section B

<sup>2</sup> 47 C.F.R. § 25.137(a)

<sup>3</sup> 47 C.F.R. §§25.137 and 25.114

<sup>4</sup> 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 LEOP 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 while the satellite is on the way to its low earth 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.<sup>5</sup> 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 12 days (over a 6 week period) of testing support of the CryoSat-2 satellite.

It is USN’s understanding that CryoSat-2 is licensed by ESA (European Space Agency). CryoSat-2 is the second of the series 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.

Finally, USN notes that it expects to communicate with the CryoSat-2 satellite using its U.S. earth station for a period of 12 days. Requiring USN to obtain technical and legal information from an unrelated party, where there is no risk of interference and the operation will cease within 12 days (over a 6 week period) would pose undue hardship without serving underlying policy objectives. Given these particular facts, the waiver sought herein is appropriate.

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<sup>5</sup> 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).<sup>6</sup> 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 testing of the CryoSat-2 satellite in preparation for the LEOP of the Sentinels 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."<sup>7</sup> 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.

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<sup>6</sup> 47 C.F.R. §2.106

<sup>7</sup> Previously approved STA's for Universal Space Network SES-STA-20020725-01174; SES-STA-20021112-02008; SES-STA-20040315-00475

# USN calibration campaign using CryoSat-2 from Alaska

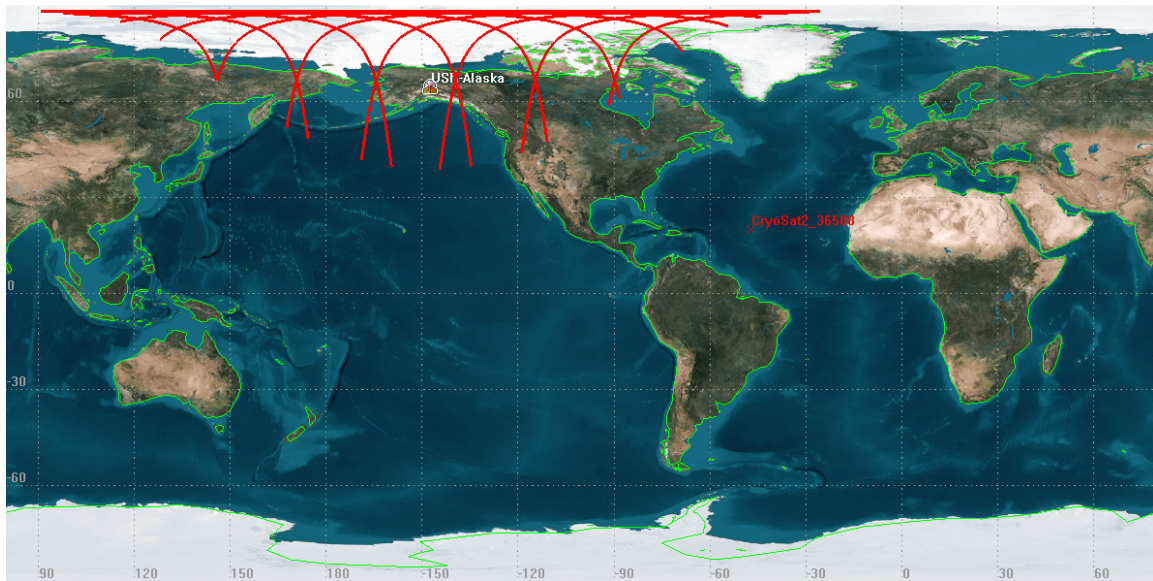
CryoSat-2 is an on-orbit scientific satellite for the European Union launched to measure polar ice thickness. CryoSat-2 is being used as a calibration target of opportunity to assure that USN-Alaska ground station is certified for the upcoming launch of the ESA Sentinels 3B spacecraft in April 2018. To calibrate the USN systems requires test passes conducted with the on orbit CryoSat-2 spacecraft (Norad ID = 36508). Downlink Frequency = 2201.0 MHz and Uplink = 2026.75 MHz

The spacecraft is a Low Earth Orbiting (LEO) spacecraft in a polar orbiting at 92 degrees inclination with a near circular orbit of altitude of 725 Km.

The calibration ranging campaign consists of up to 12 passes over four discrete weeks (Feb 5<sup>th</sup>, Feb 26<sup>th</sup>, Mar 5<sup>th</sup>, and Mar 12<sup>th</sup>) at the USN tracking station in Alaska. The exact pass schedule is still TBD, but for planning the probable passes are shown below.

## CRYOSAT 2

```
1 36508U 10013A 17337.94350148 .00000070 00000-0 16405-4 0 9999  
2 36508 92.0295 243.3036 0009619 115.6994 244.5208 14.52174240405815
```



**USN Alaska probable passes 6 Feb 2018 thru 8 Feb 2018 utc**

6 Feb 2018 06:02:17	6 Feb 2018 06:14:15
7 Feb 2018 06:50:34	7 Feb 2018 07:02:13
8 Feb 2018 05:59:50	8 Feb 2018 06:11:47

**USN Alaska probable passes 26 Feb 2018 thru 28 Feb 2018 utc**

26 Feb 2018 05:37:44	26 Feb 2018 05:49:28
27 Feb 2018 04:47:01	27 Feb 2018 04:58:50
28 Feb 2018 05:35:16	28 Feb 2018 05:46:59

**USN Alaska probable passes 6 Mar 2018 thru 8 Mar 2018 utc**

6 Mar 2018 05:27:53	6 Mar 2018 05:39:28
7 Mar 2018 04:37:10	7 Mar 2018 04:49:00
8 Mar 2018 05:25:26	8 Mar 2018 05:36:57

**USN Alaska probable passes 13 Mar 2018 thru 15 Mar 2018 utc**

13 Mar 2018 04:29:46	13 Mar 2018 04:41:35
14 Mar 2018 03:39:04	14 Mar 2018 03:50:40
15 Mar 2018 04:27:18	15 Mar 2018 04:39:06

## Flux Density impinging on the ground in Alaska from CryoSat-2

The Flux density is calculated as:

$$\text{Flux density} = \text{EIRP} \div (4 \pi Rse^2)$$

Where **Rse** is the distance from spacecraft to the ground.

Where **EIRP** is the Effective Isotropic Radiated Power of the Spacecraft.

Data from the spacecraft vendor indicates that the nominal EIRP of CryoSat-2 is -15.5 dBW. The altitude (and thus the closest distance to earth during an overhead pass) is = 725 Km.

Converting -15.5 dBW to scalar watts = 0.028 watts transmitted at 2201.0 MHz

Therefor:

$$\text{Flux density} = 0.028 \div (4 \pi * 725,000 \text{ meters}^2)$$

**Flux density = 4.239 x 10<sup>-15</sup> Watts/meter<sup>2</sup>**

Or

**Flux density = 4.239 x 10<sup>-16</sup> mW/cm<sup>2</sup>**