

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 GALILEO (GSAT215, GSAT216, GSAT217, and GSAT218), sixteenth thru nineteenth spacecraft of the “Full Operational Capability” series) 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 the needed Telemetry, Tracking, and Control (“TT&C”) during orbit raising support (“post-LEOP”) of the GALILEO (GSAT215, GSAT216, GSAT217, and GSAT218) spacecraft from launch to medium earth orbit, 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 post-LEOP orbit raising 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 post-LEOP orbit raising support for GALILEO (GSAT215, GSAT216, GSAT217, and GSAT218). Thus, any information sought by Section 25.114 that is not relevant to the post-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 GALILEO (GSAT215, GSAT216, GSAT217, and GSAT218) satellites, nor is USN in contractual privity with that operator. Rather, USN has contracted with Swedish Space Corporation, Solna Sweden (SSC) to support the orbit raising (post-LEOP) portion in S-Band of the satellite prior to its operation.

As evidenced by the Comsearch report attached to this request, USN has coordinated the post-LEOP of the GALILEO (GSAT215, GSAT216, GSAT217, and GSAT218) satellites with potentially affected terrestrial operators. Moreover, as with any STA, USN will conduct the post-LEOP 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 post-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 operational 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 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 27 days of post-LEOP support of the GALILEO (GSAT215, GSAT216, GSAT217, and GSAT218) satellites.

It is USN’s understanding that GALILEO (GSAT215, GSAT216, GSAT217, and GSAT218) is licensed by ESA (European Space Agency). GALILEO (GSAT215, GSAT216, GSAT217, and GSAT218) are the sixteenth thru nineteenth spacecraft of the European navigation constellation. The spacecraft family is primarily 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 GALILEO (GSAT215, GSAT216, GSAT217, and GSAT218) satellite using its U.S. earth station for a period of 27 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 27 days would pose undue hardship without serving underlying policy objectives. 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 post-LEOP of the GALILEO (GSAT215, GSAT216, GSAT217, and GSAT218) 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.

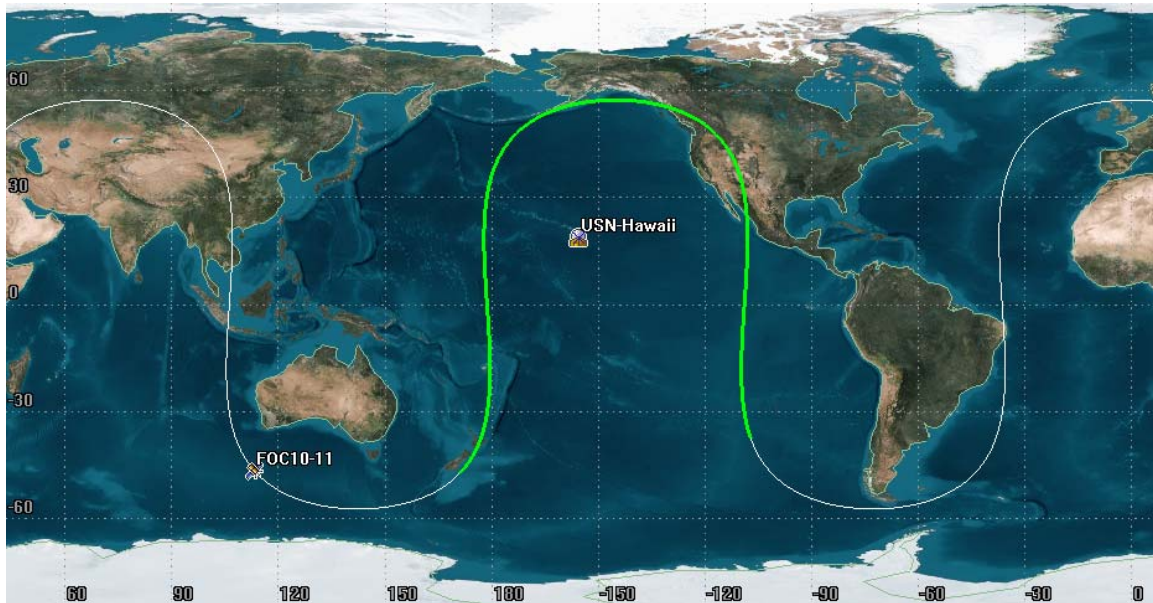
⁶ 47 C.F.R. §2.106

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

Orbit Raising support of Galileo Constellation Launch Flight #9 (GSAT215, GSAT216, GSAT217, and GSAT218 vehicles) from USN’s Hawaii ground station

Galileo Flight #9 will place the 16th, 17th, 18th, and 19th spacecraft of the “Full Operational Capability” in their operational orbit of the Galileo navigation constellation for the EU. The launch consists of 4 spacecraft that will be launched from French Guiana on an Ariane 5 ES vehicle on December 12th 2017 at 18:36:07 UTC. USN has been contracted to support the Galileo spacecraft orbital maneuvering and spacing campaign for a period of 27 days.

The spacecraft(s) are a Medium Earth Orbiting (MEO) spacecraft in a high mid-latitude orbit (56 degrees) with a near circular orbit of altitude of 23400 Km. This orbit allows a nominal 1 visibility over the USN Hawaii station every day. Each spacecraft contact is on the order of 1 to 16 hours.



GSAT215, GSAT216, GSAT217, and GSAT218 nominal orbit and Hawaii coverage

The spacecraft’s will be supported approximately 6 weeks after launch to maneuver them into their proper operational orbital spacing. GSAT215 and GSAT216 will be maneuvered from January 26th – February 2nd, 2018 and GSAT217 and GSAT218 will be maneuvered from February 13th – 20th, 2018. USN is not scheduled to support any of these spacecraft’s from February 3rd – 12th, 2018, but could be called to support for anomalies and schedule conflicts with other ground station resources. The below analysis covers all possible visibilities from USN Hawaii, but not all visibilities will be supported.

Spacecraft on orbit

At the beginning of the orbit raising campaign the spacecraft's have all been sitting in a preliminary orbit for about 6 weeks. This campaign is required to raise and space each spacecraft to its operational position. Three maneuvers will be conducted on each of the four spacecraft. Post maneuver TLE's and maximum visibilities are shown below for each event and each spacecraft.

	Downlink	Uplink
GSAT215	2215.818 MHz	2040.399 MHz
GSAT216	2234.232 MHz	2057.355 MHz
GSAT217	2228.094 MHz	2051.703 MHz
GSAT218	2221.956 MHz	2046.051 MHz

GSAT215-initial orbit

1 98989 17999A 17352.90667824 +.00000000 +00000-9 +75604-3 2 00007
2 98989 056.9890 306.7276 0004465 242.3504 072.0278 01.69748470000004

GSAT216-initial orbit

1 98987 17999B 17353.42355324 +.00000000 +00000-9 +75337-3 2 00005
2 98987 056.9934 306.7066 0003159 237.1583 048.0125 01.70883419000005

GSAT217-initial orbit

1 98988 17999C 17357.32340278 +.00000000 +00000-9 +75179-3 2 00005
2 98988 057.0005 306.6116 0001719 090.9073 113.0296 01.71687127000002

GSAT218-initial orbit

1 98986 17999D 17356.76188657 +.00000000 +00000-9 +75324-3 2 00003
2 98986 056.9911 306.6128 0002253 270.2483 298.4626 01.71057033000001

GSAT215 Initial Orbit Checkout pass

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
1	26 Jan 2018 10:01:25	26 Jan 2018 15:34:49

GSAT215 Maneuvers and possible support times pass # 2 - 8

GSAT215-V1

1 98989 17999A 18027.61848380 +.00000000 +00000-9 +75700-3 2 00000
2 98989 056.9599 305.6343 0015735 273.9878 188.8561 01.70093811000004

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
2	27 Jan 2018 22:54:07	28 Jan 2018 10:09:46
3	29 Jan 2018 08:00:57	29 Jan 2018 14:58:13

GSAT215-V2

1 98989 17999A 18029.66375000 +.00000000 +00000-9 +75790-3 2 00000
2 98989 056.9587 305.5779 0001218 277.6762 357.5843 01.70458902000001

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
4	29 Jan 2018 16:57:11	29 Jan 2018 22:58:35
5	30 Jan 2018 20:56:17	31 Jan 2018 01:44:00*

* Note that spacecraft stays in view of Hawaii during TLE update V3 below, therefore visibility continues into pass #6.

GSAT215-V3

1 98989 17999A 18031.07265046 +.00000000 +00000-9 +75794-3 2 00000
2 98989 056.9575 305.5393 0002109 261.0741 158.7627 01.70476769000006

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
6	31 Jan 2018 01:44:00	31 Jan 2018 07:55:50
7	1 Feb 2018 05:16:27	1 Feb 2018 13:26:33
8	1 Feb 2018 16:55:47	1 Feb 2018 20:39:54

GSAT216 Initial Orbit Checkout

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
1	27 Jan 2018 05:52:41	27 Jan 2018 13:52:47

GSAT216 Maneuvers and possible support times pass # 2 - 8

GSAT216-V1

1 98987 17999B 18028.12783565 +.00000000 +00000-9 +75386-3 2 00008
2 98987 056.9597 305.6206 0009461 229.4574 001.5042 01.70687280000000

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
2	28 Jan 2018 12:35:28	28 Jan 2018 14:52:11
3	28 Jan 2018 19:24:25	29 Jan 2018 04:42:15
4	30 Jan 2018 01:19:02	30 Jan 2018 03:45:00*

* Note that spacecraft stays in view of Hawaii during TLE update V2 below, therefore visibility continues into pass #5.

GSAT216-V2

1 98987 17999B 18030.15649306 +.00000000 +00000-9 +75436-3 2 00004
2 98987 056.9582 305.5645 0002650 269.2784 128.2406 01.70485675000003

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
5	30 Jan 2018 03:45:00	30 Jan 2018 11:56:07
6	31 Jan 2018 10:01:03	31 Jan 2018 15:13:43

GSAT216-V3

1 98987 17999B 18031.68807870 +.00000000 +00000-9 +75438-3 2 00007
2 98987 056.9568 305.5225 0002441 269.6091 347.9252 01.70477105000002

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
7	31 Jan 2018 17:39:21	1 Feb 2018 01:01:44
8	1 Feb 2018 22:42:33	2 Feb 2018 09:55:02

GSAT217 Initial Orbit Checkout

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
1	14 Feb 2018 00:00:00	14 Feb 2018 09:03:34

GSAT217 Maneuvers and possible support times pass # 2 - 10

GSAT217-V1

1 98988 17999C 18046.12274306 +.00000000 +00000-9 +75327-3 2 00002
2 98988 056.9433 305.1317 0022661 345.6589 350.9029 01.71091488000008

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
2	15 Feb 2018 06:37:19	15 Feb 2018 13:41:16
3	15 Feb 2018 15:47:19	15 Feb 2018 21:29:04
4	16 Feb 2018 19:25:07	17 Feb 2018 04:39:00*

* Note that spacecraft stays in view of Hawaii during TLE update V2 below, therefore visibility continues into pass #5.

GSAT217-V2

1 98988 17999C 18048.19395833 +.00000000 +00000-9 +75474-3 2 00003
2 98988 056.9417 305.0749 0002697 245.2379 287.0823 01.70500305000001

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
5	17 Feb 2018 04:39:00	17 Feb 2018 06:09:44
6	18 Feb 2018 03:10:41	18 Feb 2018 11:54:42
7	18 Feb 2018 15:57:10	18 Feb 2018 17:01:00*

* Note that spacecraft stays in view of Hawaii during TLE update V3 below, therefore visibility continues into pass #8.

GSAT217-V3

1 98988 17999C 18049.70938657 +.00000000 +00000-9 +75481-3 2 00006
2 98988 056.9405 305.0336 0001828 271.6444 110.8721 01.70472857000001

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
8	18 Feb 2018 17:01:00	18 Feb 2018 18:56:19
9	19 Feb 2018 10:22:47	19 Feb 2018 13:39:13
10	19 Feb 2018 17:28:56	20 Feb 2018 01:59:11

GSAT218 Initial Orbit Checkout

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
1	13 Feb 2018 00:01:00	13 Feb 2018 10:21:05

GSAT218 Maneuvers and possible support times pass # 2 - 8

GSAT218-V1

1 98986 17999D 18045.68350694 +.00000000 +00000-9 +75397-3 2 00002
2 98986 056.9428 305.1416 0011936 297.5860 356.9411 01.70767207000009

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
2	14 Feb 2018 16:24:00	14 Feb 2018 23:04:35
3	15 Feb 2018 20:50:27	16 Feb 2018 08:00:51

GSAT218-V2

1 98986 17999D 18047.74491898 +.00000000 +00000-9 +75466-3 2 00000
2 98986 056.9412 305.0853 0001548 259.5498 222.2680 01.70489104000009

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
4	17 Feb 2018 05:37:48	17 Feb 2018 13:06:23
5	17 Feb 2018 15:39:58	17 Feb 2018 20:40:20

GSAT218-V3

1 98986 17999D 18049.14608796 +.00000000 +00000-9 +75469-3 2 00006
2 98986 056.9400 305.0471 0001816 257.2239 004.5848 01.70474622000004

Access	Start Time (UTCG)	Stop Time (UTCG)
-----	-----	-----
6	18 Feb 2018 18:47:18	19 Feb 2018 05:16:36
7	20 Feb 2018 01:49:54	20 Feb 2018 11:22:11
8	20 Feb 2018 16:05:14	20 Feb 2018 18:07:41

Flux Density impinging on the ground in Hawaii from Galileo GSAT215, GSAT216, GSAT217, and GSAT218

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 each GSAT spacecraft is -1.10 dBW. Being a near circular orbit, the altitude (and thus the closest distance to earth during an overhead pass) is = 23,400 Km.

Converting -1.10 dBW to scalar watts = 0.776 watts transmitted at 2221.9 MHz

Therefor:

$$\text{Flux density} = 0.776 \div (4 \pi * 23,400,000 \text{ meters}^2)$$

Flux density = 1.127×10^{-16} Watts/meter²

Or

Flux density = 1.127×10^{-17} mW/cm²