

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 (FOC1 and FOC2, first and second 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 launch and early orbit support (“LEOP”) of the GALILEO (FOC1 and FOC2) 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 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.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 LEOP support for GALILEO (FOC1 and FOC2). 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 GALILEO (FOC1 and FOC2) satellites, nor is USN in contractual privity with that operator. Rather, USN has contracted with Swedish Space Corporation, Solona Sweden (SSC) to support the Launch and Early Orbit (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 LEOP of the GALILEO (FOC1 and FOC2) satellites with potentially affected terrestrial operators. Moreover, as with any STA, USN will conduct the 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 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 medium 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.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 14 days of LEOP support of the GALILEO (FOC1 and FOC2) satellite.

It is USN’s understanding that GALILEO (FOC1 and FOC2) is licensed by ESA (European Space Agency). GALILEO (FOC1 and FOC2) are the third and fourth 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 (FOC1 and FOC2) satellite using its U.S. earth station for a period of 14 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 14 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 LEOP of the GALILEO (FOC1 and FOC2) 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.

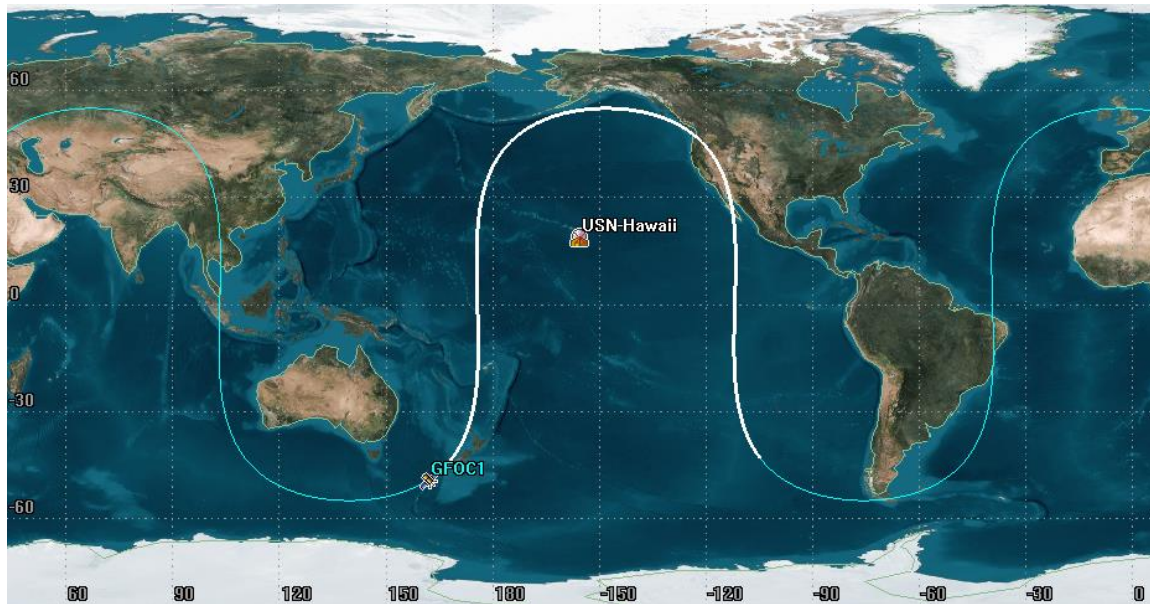
⁶ 47 C.F.R. §2.106

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

LEOP support of Galileo Constellation (FOC1 and FOC2) from USN's Hawaii ground station

Galileo FOC1 and FOC2 are the first and second spacecraft of the “Full Operational Capability” of the Galileo navigation constellation for the EU. The launch consists of 2 spacecraft (FOC1 and FOC2) that will be launched from French Guiana on a Soyuz vehicle on August 21st, 2014 at 12:31:13 UTC. USN has been contracted to support the Galileo spacecraft LEOP(s) for a period of up to 14 days.

The spacecraft(s) are a Medium Earth Orbiting (MEO) spacecraft in a high mid-latitude orbit (55 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.



FOC1 and FOC2 nominal orbit and Hawaii coverage

The spacecrafts will be supported from injection and three subsequent orbital maneuvers for spacing of FOC1 and FOC2. The below analysis covers all possible visibilities from USN Hawaii, but not all visibilities will be supported.

FOC1 and FOC2 injection and coverage of pass #1-3

Both spacecraft are still in same antenna beamwidth after injection for the first several hours and then begin to drift apart. For the first several hours FOC1 and FOC2 are supported by selecting different RF frequencies. Subsequent to the first several hours the spacecraft(s) are supported separately. Post maneuver TLE's and maximum visibilities are shown below for each event and each spacecraft.

	Downlink	Uplink
FOC1	2221.995 MHz	2046.051 MHz
FOC2	2225.024 MHz	2048.887 MHz

GFOC1-injection

1 99997 51999A 14233.67998611 +.00000000 +00000-9 +69797-3 2 00001
2 99997 055.0288 100.8659 0004838 254.7598 347.2647 01.67807170000005

GFOC2-injection

1 99998 51999B 14233.67998611 +.00000000 +00000-9 +69797-3 2 00002
2 99998 055.0288 100.8659 0003707 045.1785 196.8459 01.68014387000000

FOC1

Access	Start Time (UTCG)	Stop Time (UTCG)
1	21 Aug 2014 18:20:59	22 Aug 2014 06:24:18
2	23 Aug 2014 03:55:09	23 Aug 2014 19:57:46
3	24 Aug 2014 17:45:14	25 Aug 2014 05:45:59

FOC2

1	21 Aug 2014 18:21:02	22 Aug 2014 06:22:43
2	23 Aug 2014 03:50:28	23 Aug 2014 19:51:40
3	24 Aug 2014 17:38:08	25 Aug 2014 05:36:06

FOC1 Maneuvers and possible support times pass #4 - 13

GFOC1-V1

1 99997 51999A 14237.02208681 +.00000000 +00000-9 +69797-3 2 00005
2 99997 055.0307 100.7748 0005390 259.1868 201.8854 01.67822712000002

No passes visible from this maneuver

GFOC1-V2

1 99997 51999A 14237.84883218 +.00000000 +00000-9 +69797-3 2 00000
2 99997 055.0312 100.7528 0005223 261.0177 339.5876 01.67847990000002

Access	Start Time (UTCG)	Stop Time (UTCG)
4	26 Aug 2014 03:09:47	26 Aug 2014 18:30:00

Note that spacecraft stays in view of Hawaii during the maneuver #2 below, therefore this continues to be pass #5.

GFOC1-V3

1 99997 51999A 14238.77173264 +.00000000 +00000-9 +69797-3 2 00006
2 99997 055.0318 100.7277 0004761 263.8557 174.4649 01.67858931000008

Access	Start Time (UTCG)	Stop Time (UTCG)
5	26 Aug 2014 18:30:00	26 Aug 2014 19:18:22
6	27 Aug 2014 17:08:21	28 Aug 2014 05:04:27
7	29 Aug 2014 02:17:31	29 Aug 2014 18:38:05
8	30 Aug 2014 16:31:13	31 Aug 2014 04:20:59
9	1 Sep 2014 01:18:12	1 Sep 2014 10:58:21
10	1 Sep 2014 12:22:49	1 Sep 2014 17:57:41
11	2 Sep 2014 09:29:17	2 Sep 2014 10:56:26
12	2 Sep 2014 15:54:11	3 Sep 2014 03:34:58
13	4 Sep 2014 00:08:36	4 Sep 2014 10:16:21

FOC2 Maneuvers and possible support times pass #4 - 14

GFOC2-V1

1 99998 51999B 14237.59188542 +.00000000 +00000-9 +69797-3 2 00001
2 99998 055.0310 100.7594 0039449 266.0046 182.2510 01.69086769000000

Access	Start Time (UTCG)	Stop Time (UTCG)
4	26 Aug 2014 02:42:22	26 Aug 2014 11:47:00

Note that spacecraft stays in view of Hawaii during the maneuver #2 below, therefore this continues to be pass #5.

GFOC2-V2

1 99998 51999B 14238.49128009 +.00000000 +00000-9 +69797-3 2 00003
2 99998 055.0316 100.7230 0003340 144.8635 131.0338 01.70208670000000

Access	Start Time (UTCG)	Stop Time (UTCG)
5	26 Aug 2014 11:47:00	26 Aug 2014 18:43:53
6	27 Aug 2014 10:00:48	27 Aug 2014 11:17:38

GFOC2-V3

1 99998 51999B 14239.47820023 +.00000000 +00000-9 +69797-3 2 00007
2 99998 055.0371 100.6932 0001961 060.3046 100.4545 01.70341875000000

Access	Start Time (UTCG)	Stop Time (UTCG)
7	27 Aug 2014 16:13:58	28 Aug 2014 03:30:55
8	28 Aug 2014 22:56:26	29 Aug 2014 09:42:52
9	29 Aug 2014 13:21:11	29 Aug 2014 16:23:15
10	30 Aug 2014 07:17:34	30 Aug 2014 12:19:29
11	30 Aug 2014 14:09:21	30 Aug 2014 23:33:31
12	31 Aug 2014 20:01:52	1 Sep 2014 07:42:36
13	2 Sep 2014 05:03:08	2 Sep 2014 20:37:58
14	3 Sep 2014 17:49:43	4 Sep 2014 05:37:35

Flux Density impinging on the ground in Hawaii from Galileo FOC1 and FOC2

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 FOC 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:

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

$$\text{Flux density} = 1.127 \times 10^{-16} \text{ Watts/meter}^2$$

Or

$$\text{Flux density} = 1.127 \times 10^{-17} \text{ mW/cm}^2$$