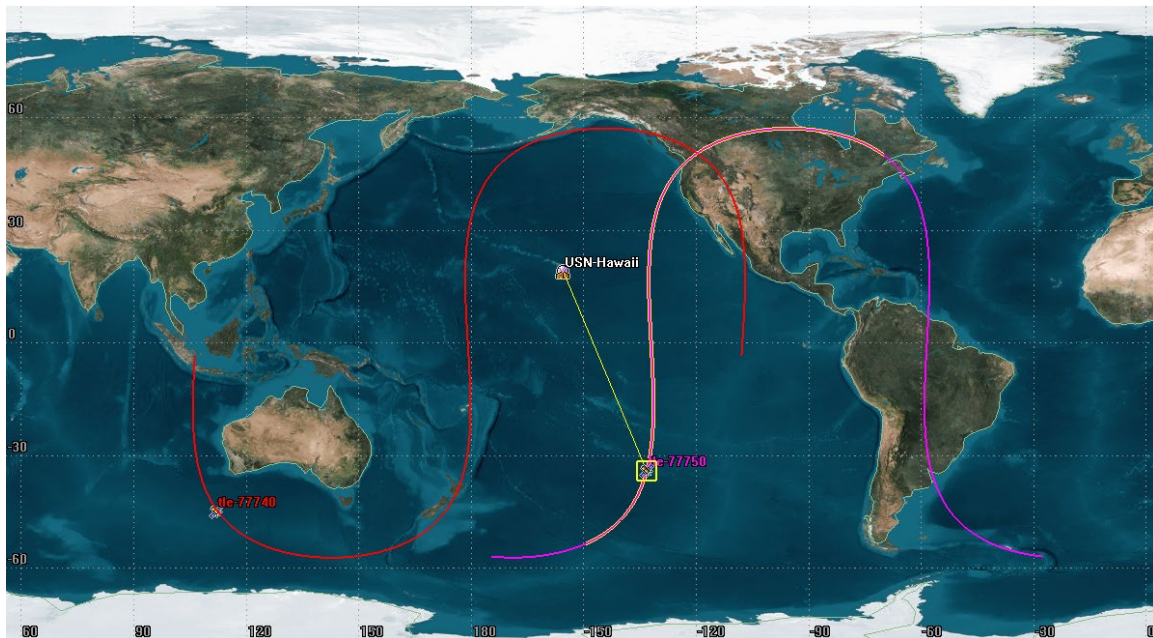


Orbit raising support of Galileo GSAT0223 and GSAT0224 navigation satellite from USN's Hawaii ground station

By this application, SSC Space US, Inc. dba Universal Space Network (collectively, "USN"),¹ a Delaware corporation, seeks an extension of existing FCC authorization to support the orbit raising support of the Galileo spacecraft(s) on its way to medium earth orbit. The spacecraft was launched on December 4, 2021 from French Guiana on a Soyuz vehicle. The Commission previously authorized LEOP support on December 2, 2021 for a 30-day period for this satellite. See FCC File No. SES-STA-20210809-01354. This request for a further extension is for up to 30 days which is currently expected to be sufficient for completion of the requested support. The proposed service will provide important support to the orbit raising of the satellite and thus enhance public safety by allowing for more contact with spacecraft to assure trajectory and is otherwise consistent with the public interest.

The spacecraft will be injected into an elliptical orbit at inclination of about 57 degrees. The spacecraft will begin orbit raising after initial orbit checkout. Each spacecraft potential visibility can range from a few hours to as much as 12 hours towards the end of orbit raising. All potential visibilities from Hawaii are shown below but not all pass time or passes will be supported, typically only a few hours each day.



Galileo Orbit Raising

¹ USN also is engaging counsel to update the entity's FRN information to reflect its corporate name, SSC Space US, Inc., rather than its former and d/b/a name. However, given the pressing nature of this request, this request is being submitted under the entity's current registration.

	Downlink	Uplink
GSAT0223 Primary TT&C	2228.094 MHz	2051.703 MHz
GSAT0224 Secondary TT&C	2234.232 MHz	2057.355 MHz

Spacecraft Orbit Raising

GSAT00223

1 77740U 21999J 22010.00000000 .00000000 00000+0 00000+0 0 00012
2 77740 57.1198 25.3864 0022505 77.8353 279.8512 1.68529918 06

Access	Start Time (YYYY:MM:DD)	Stop Time (YYYY:MM:DD)
1	2022:01:02:04:34:01.225	2022:01:02:15:52:16.881
2	2022:01:03:13:54:09.225	2022:01:03:21:28:12.382
3	2022:01:03:23:56:57.904	2022:01:04:05:12:28.246
4	2022:01:05:03:36:10.684	2022:01:05:14:39:57.048
5	2022:01:06:12:30:58.068	2022:01:06:20:39:43.533
6	2022:01:06:23:51:46.147	2022:01:07:04:06:41.403
7	2022:01:07:20:19:17.653	2022:01:07:20:55:22.181
8	2022:01:08:02:40:10.248	2022:01:08:13:13:13.207
9	2022:01:09:10:35:28.733	2022:01:09:19:47:51.801
10	2022:01:09:23:54:29.604	2022:01:10:02:56:40.035
11	2022:01:10:18:39:33.639	2022:01:10:21:29:59.125
12	2022:01:11:01:45:54.377	2022:01:11:11:10:41.908
13	2022:01:12:08:27:37.804	2022:01:12:18:53:52.311
14	2022:01:13:00:17:46.798	2022:01:13:01:28:03.378
15	2022:01:13:17:28:26.885	2022:01:13:21:34:10.502
16	2022:01:14:00:53:40.915	2022:01:14:09:08:22.930
17	2022:01:15:06:57:31.688	2022:01:15:17:58:07.924
18	2022:01:16:16:22:21.244	2022:01:16:21:30:01.321
19	2022:01:17:00:04:34.298	2022:01:17:07:42:20.710
20	2022:01:18:05:43:47.879	2022:01:18:17:00:35.721
21	2022:01:19:15:17:37.378	2022:01:19:21:18:04.529
22	2022:01:19:23:21:12.659	2022:01:20:06:29:39.810
23	2022:01:21:04:37:33.710	2022:01:21:16:00:53.211
24	2022:01:22:14:12:16.716	2022:01:22:20:55:08.777
25	2022:01:22:22:48:06.225	2022:01:23:05:22:23.665
26	2022:01:24:03:35:35.732	2022:01:24:14:58:10.596
27	2022:01:25:13:04:13.109	2022:01:25:20:19:30.957
28	2022:01:25:22:27:48.540	2022:01:26:04:17:20.667
29	2022:01:27:02:36:25.002	2022:01:27:13:50:43.595
30	2022:01:28:11:49:39.539	2022:01:28:19:34:40.223
31	2022:01:28:22:17:40.718	2022:01:29:03:12:29.832
32	2022:01:30:01:39:16.018	2022:01:30:12:34:33.921
33	2022:01:31:10:18:25.938	2022:01:31:18:44:45.365

GSAT00224

1 77750U 21999K 22010.00000000 .00000000 00000+0 00000+0 0 00316
2 77750 57.1010 25.3695 0003585 7.2817 100.3151 1.69519875 00

Access	Start Time (YYYY:MM:DD)	Stop Time (YYYY:MM:DD)
1	2022:01:02:00:51:22.962	2022:01:02:08:12:39.826
2	2022:01:03:06:05:17.709	2022:01:03:17:22:39.015
3	2022:01:04:15:23:01.604	2022:01:04:22:05:41.838
4	2022:01:04:23:59:26.032	2022:01:05:06:25:26.050
5	2022:01:06:04:28:56.162	2022:01:06:15:43:39.581
6	2022:01:07:13:32:09.577	2022:01:07:21:06:16.197
7	2022:01:07:23:41:54.725	2022:01:08:04:43:46.438
8	2022:01:09:02:59:44.165	2022:01:09:13:45:21.699
9	2022:01:10:10:58:23.358	2022:01:10:19:49:30.924
10	2022:01:10:23:48:59.006	2022:01:11:02:56:41.149
11	2022:01:11:18:30:54.090	2022:01:11:21:27:33.831
12	2022:01:12:01:35:38.234	2022:01:12:10:37:22.653
13	2022:01:13:07:44:38.476	2022:01:13:18:25:50.934
14	2022:01:14:16:42:35.956	2022:01:14:21:36:41.024
15	2022:01:15:00:18:04.509	2022:01:15:07:55:53.493
16	2022:01:16:05:43:32.895	2022:01:16:16:57:06.127
17	2022:01:17:15:00:57.717	2022:01:17:21:21:36.023
18	2022:01:17:23:16:26.739	2022:01:18:06:03:32.672
19	2022:01:19:04:03:36.059	2022:01:19:15:21:30.780
20	2022:01:20:13:14:40.348	2022:01:20:20:32:26.435
21	2022:01:20:22:47:58.274	2022:01:21:04:21:13.075
22	2022:01:22:02:32:24.235	2022:01:22:13:32:05.371
23	2022:01:23:11:03:45.444	2022:01:23:19:19:37.035
24	2022:01:23:22:47:19.683	2022:01:24:02:37:34.209
25	2022:01:24:18:17:30.729	2022:01:24:20:19:21.005
26	2022:01:25:01:06:37.959	2022:01:25:10:56:12.180
27	2022:01:26:07:40:51.895	2022:01:26:17:57:48.097
28	2022:01:26:23:26:08.421	2022:01:27:00:23:43.823
29	2022:01:27:16:20:40.806	2022:01:27:20:39:40.479
30	2022:01:27:23:46:24.456	2022:01:28:07:43:24.496
31	2022:01:29:05:23:51.359	2022:01:29:16:30:46.990
32	2022:01:30:14:38:22.104	2022:01:30:20:33:17.668
33	2022:01:30:22:37:32.112	2022:01:31:05:42:34.793
34	2022:02:01:03:39:07.743	2022:02:01:14:57:52.376

Flux Density impinging on the ground in Hawaii from Galileo GSAT0223 and GSAT0224

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 2228 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

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, (USN) is provided limited legal and technical information for the GALILEO (GSAT0223 and GSAT0224), twenty-third and twenty-fourth 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 (GSAT0223 and GSAT0224) 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 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 support for GALILEO (GSAT0223 and GSAT0224). 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 (GSAT0223 and GSAT0224) 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 (GSAT0223 and GSAT0224) 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 satellites are on their way to 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 30 days of post-LEOP support of the GALILEO (GSAT0223 and GSAT0224) satellites.

It is USN’s understanding that GALILEO (GSAT0223 and GSAT0224) is licensed by ESA (European Space Agency). GALILEO (GSAT0223 and GSAT0224) are the twenty-third and twenty-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 (GSAT0223 and GSAT0224) satellite using its U.S. earth station for a period of 30 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 30 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 (GSAT0223 and GSAT0224) 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