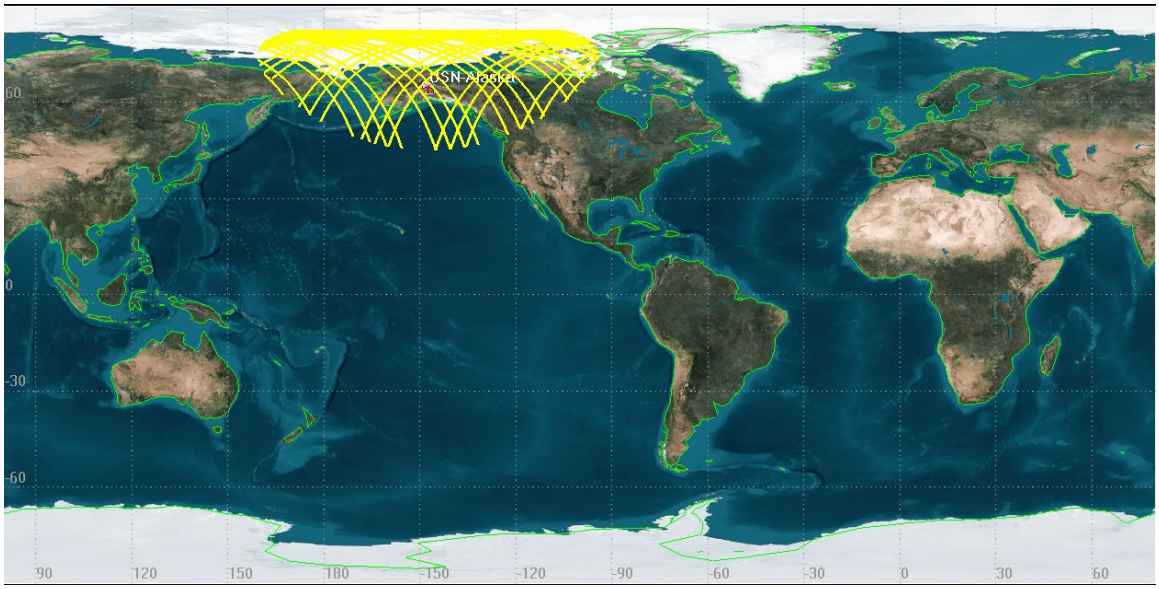
USN LEOP support for Cosmo-SkyMed2 from Alaska

By this application, SSC Space US, Inc. dba Universal Space Network (collectively, "USN"),[1] a Delaware Corporation, seeks FCC approval to support the Cosmo-SkyMed2 (CSG-2) LEOP. CSG-2 is the second generation earth observation science satellites launched by ESA to serve the European Union. CSG-2 will be launched from Cape Canaveral Florida on a SpaceX Falcon-9 no earlier than November 18th, 2021 at 23:11:12 UTC. The Alaska station has been requested to support this launch for a period of 10 days.

The LEOP is scheduled to be conducted with the majority of contacts in the first few days followed by potentially one a day for the duration of the support. The first 3 days of expected passes are shown below, but are subject to change depending on time of launch and all passes will not be supported.

CSG-2
1 98761U 19092A 21323.00000000 .00000000 00000+0 -91908-4 0 9992
2 98761 97.8691 144.6383 0003771 135.7993 183.0983 14.81814902 4514



USN Alaska typical day coverage of CSG-2 LEOP November 2021

	Downlink	Uplink
CSG-2	2230.000. MHz	2053.458 MHz

[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.

USN Alaska possible passes for CSG-2 19 November – 21 November 2021 UTC

Pass	Start Time (UTCG)	Stop Time (UTCG)
1	19 Nov 2021 02:16:53	19 Nov 2021 02:21:22
2	19 Nov 2021 03:51:51	19 Nov 2021 04:01:44
3	19 Nov 2021 05:28:04	19 Nov 2021 05:38:42
4	19 Nov 2021 07:04:28	19 Nov 2021 07:13:38
5	19 Nov 2021 08:40:39	19 Nov 2021 08:47:17
6	19 Nov 2021 10:15:46	19 Nov 2021 10:21:12
7	19 Nov 2021 11:49:25	19 Nov 2021 11:56:42
8	19 Nov 2021 13:23:18	19 Nov 2021 13:33:00
9	19 Nov 2021 14:58:40	19 Nov 2021 15:09:23
10	19 Nov 2021 16:36:16	19 Nov 2021 16:45:28
11	20 Nov 2021 02:34:43	20 Nov 2021 02:41:01
12	20 Nov 2021 04:10:11	20 Nov 2021 04:20:26
13	20 Nov 2021 05:46:28	20 Nov 2021 05:56:57
14	20 Nov 2021 07:22:52	20 Nov 2021 07:31:34
15	20 Nov 2021 08:58:56	20 Nov 2021 09:05:08
16	20 Nov 2021 10:33:44	20 Nov 2021 10:39:19
17	20 Nov 2021 12:07:16	20 Nov 2021 12:15:04
18	20 Nov 2021 13:41:22	20 Nov 2021 13:51:24
19	20 Nov 2021 15:17:06	20 Nov 2021 15:27:46
20	20 Nov 2021 16:55:15	20 Nov 2021 17:03:43
21	21 Nov 2021 02:52:46	21 Nov 2021 03:00:20
22	21 Nov 2021 04:28:32	21 Nov 2021 04:39:03
23	21 Nov 2021 06:04:52	21 Nov 2021 06:15:09
24	21 Nov 2021 07:41:15	21 Nov 2021 07:49:29
25	21 Nov 2021 09:17:10	21 Nov 2021 09:23:00
26	21 Nov 2021 10:51:38	21 Nov 2021 10:57:30
27	21 Nov 2021 12:25:09	21 Nov 2021 12:33:26
28	21 Nov 2021 13:59:30	21 Nov 2021 14:09:48
29	21 Nov 2021 15:35:38	21 Nov 2021 15:46:08
30	21 Nov 2021 17:14:23	21 Nov 2021 17:21:53

Flux Density impinging on the ground in Alaska from Cosmo-SkyMed2

The Flux density is calculated as:

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

Where $\boldsymbol{Rse}$ is the distance from spacecraft to the ground.

Where $\boldsymbol{EIRP}$ is the Effective Isotropic Radiated Power of the Spacecraft.

Data from the spacecraft vendor indicates that the maximum EIRP of Cosmo-SkyMed2 is -8.83 dBW. The altitude (and thus the closest distance to earth during an overhead pass) is = 645 Km.

Converting -8.83 dBW to scalar watts = 0.130 watts transmitted at 2230.000 MHz

Therefor:

$$\boldsymbol{Flux\ density = 0.13 \div (4\pi * 645{,}000\ meters^2)}$$

Flux density = 2.486 x 10^{-14} Watts/meter^2

Or

Flux density = 2.486 x 10^{-15} mW/cm^2

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 Cosmo-SkyMed2 (CSG-2) Satellite.[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 launch and early orbit (LEOP) support of Cosmo-SkyMed2 in November 2021, 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 of Cosmo-SkyMed2. 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 Cosmo-SkyMed2 satellite, nor is USN in contractual privity with that operator. Rather, USN has contracted with Swedish Space Corporation, Solona Sweden (SSC) to support the LEOP in S-band of the Cosmo-SkyMed2 satellite.

As evidenced by the Comsearch report attached to this request, USN has coordinated the LEOP of the Cosmo-SkyMed2 satellite with potentially affected terrestrial operators. Moreover, as with any STA, USN will conduct the LEOP on an unprotected, non-interference basis to government operations.

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[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 during the launch and early orbit portion from vehicle separation for a period of up to 10 days. 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 10 days of LEOP support of the Cosmo-SkyMed2 satellite.

It is USN's understanding that Cosmo-SkyMed2 is licensed by Italy. Cosmo-SkyMed2 is the second generation 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 Cosmo-SkyMed2 satellite using its U.S. earth station for a period of 10 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 10 days would pose undue hardship without serving underlying policy objectives. Given these particular facts, the waiver sought herein is appropriate.

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[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 support of the Cosmo-SkyMed2 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." [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