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VIA ELECTRONIC MAIL

Brian D. Weimer
Counsel to Orbital Sidekick, Inc.
Sheppard Mullin Richter & Hampton LLP
2099 Pennsylvania Avenue N.W., Suite 100
Washington, DC 20006
bweimer@sheppardmullin.com

Re: Orbital Sidekick, Inc., IBFS File No. SAT-LOA-20210520-00069; Call Sign S3089

Dear Mr. Weimer:

On May 20, 2021, Orbital Sidekick, Inc. (OSK) filed the above-referenced application requesting authority to deploy and operate six satellites in low-Earth orbit in connection with its Global Hyperspectral Observation Satellite (GHOST) constellation. We note initially that the application has been revised substantially two times to date.¹ As identified more specifically below, the application as revised includes multiple incomplete or inconsistent statements concerning center frequencies and frequency ranges on which the satellite will operate, and on other matters. The Commission's rules provide that an application is unacceptable for filing and will be returned to the applicant if the application is defective with respect to "completeness of answers to questions, informational showings, internal inconsistencies, execution, or other matters of a formal character."²

Accordingly, we dismiss the application as defective, without prejudice to refiling.³

The information for Ka-band frequencies as specified in the OSK Further Revised Schedule S and OSK Revised Technical Annex include the following incomplete or inconsistent information:

1. Table 2b in the OSK Revised Technical Annex lists the center frequency for A-RH on GHOST-03 and GHOST-05 as 26.250 GHz, but the OSK Further Revised Schedule S lists the center frequency for A-RH as 25.725 GHz.⁴

¹ In the first revision, OSK provided a Cover Letter, a Revised Schedule S, and a Revised Attachment B - Technical Annex (OSK Revised Technical Annex). In the second revision, OSK provided a Further Revised Schedule S and Cover Letter (OSK Further Revised Schedule S).

² 47 CFR § 25.112(a)(1).

³ If OSK refiles an application identical to the one dismissed, with the exception of making the corrections addressed in this letter and supplying the missing information discussed in this letter, it need not pay another application fee. See 47 CFR § 1.1111(d).

⁴ OSK Revised Technical Annex at 69; OSK Further Revised Schedule S at 23.

2. Table 2b in the OSK Revised Technical Annex lists the center frequency for A-LH on GHOS-04 and GHOS-06 as 26.250 GHz, but the OSK Further Revised Schedule S lists the center frequency for A-LH as 25.725 GHz.⁵
3. Figure 1 in the OSK Revised Technical Annex shows the center frequency for B-RH as 26.250 GHz in the long-term plan, and Figure 5 shows the center frequency for B-RH on GHOS-03 as 26.250 GHz.⁶ Table 2b lists the center frequency for B-RH on GHOS-03 as 25.725 GHz.⁷
4. Figure 2 in the OSK Revised Technical Annex shows the center frequency for B-LH as 26.250 GHz in the long-term plan, and Figure 6 shows the center frequency for B-LH on GHOS-04 as 26.250 GHz.⁸ Table 2b lists the center frequency for B-LH on GHOS-04 as 25.725 GHz.⁹
5. Figure 6 in the OSK Revised Technical Annex lists the center frequency for A-LH on GHOS-04 as 25.725 GHz, and Figure 8 lists the center frequency for A-LH on GHOS-06 as 25.725 GHz.¹⁰ Figure 2 lists the center frequency for A-LH as 25.775 GHz in the long-term plan.¹¹ Table 2b lists the center frequency for A-LH on GHOS-04 and GHOS-06 as 26.250 GHz.¹²
6. Figure 1 in the OSK Revised Technical Annex lists the center frequency for A-RH as 25.725 GHz in the long-term plan, Figure 5 lists the center frequency for A-RH on GHOS-03 as 25.725 GHz, and Figure 7 lists the center frequency for A-RH on GHOS-05 as 25.725 GHz.¹³ Table 2b lists the center frequency for A-RH on GHOS-03 and GHOS-05 as 26.250 GHz.¹⁴
7. Figures 3 and 4 in the OSK Revised Technical Annex seem to indicate that the center frequencies for C-RH on GHOS-01 and C-LH on GHOS-02 are 28.600 GHz.¹⁵ Figures 7 and 8 list the center frequencies for C-RH on GHOS-05 and C-LH on GHOS-06 as 26.775 GHz.¹⁶ Figures 1 and 2 list

⁵ *Id.*

⁶ OSK Revised Technical Annex at 68, 71.

⁷ *Id.* at 69.

⁸ *Id.* at 68, 71.

⁹ *Id.* at 69.

¹⁰ *Id.* at 71-72.

¹¹ *Id.* at 68.

¹² OSK Revised Technical Annex at 69.

¹³ *Id.* at 68, 71-72.

¹⁴ *Id.* at 69.

¹⁵ *Id.* at 70.

¹⁶ *Id.* at 72.

the center frequencies for C-RH and C-LH as 26.775 GHz in the long-term plan.¹⁷ Tables 2a and 2b list the center frequencies for C-RH and C-LH as 26.775 GHz.¹⁸

8. Figures 3 and 4 in the OSK Revised Technical Annex appear to have the lower (unmodulated) edge and center frequency for the D-links both at 26.800 GHz.¹⁹

9. Table 2b in the OSK Revised Technical Annex lists the center frequency for A-RH as 26.250 for both GHOS-03 and GHOS-05. However, Table 2b lists the bottom frequency for these channels as 25.500 GHz and the top frequency as 25.950 GHz.²⁰

10. Table 2b in the OSK Revised Technical Annex lists the center frequency for A-LH as 26.250 for both GHOS-04 and GHOS-06. However, Table 2b lists the bottom frequency for these channels as 25.500 GHz and the top frequency as 25.950 GHz.²¹

In addition, the Orbital Debris Assessment Report (ODAR) includes apparently inconsistent statements, including on several key factual matters:

11. The area-to-mass values vary across calculations in the Orbital Debris Assessment Report. OSK states the value is 0.0092 m²/kg,²² uses the value 0.009 m²/kg in Figure 1,²³ and uses the value 0.01 m²/kg for all calculations in Appendix A.²⁴

12. The cover page of the Orbital Debris Assessment Report states that DAS 3.1.2 was used. However, OSK later references DAS 2.1.1.²⁵

13. In one section of the application, OSK states that the external dimensions of the GHOS satellites are 0.56 cm x 0.56 cm x 111.3 cm.²⁶ However, in a different section, OSK states that the dimensions are 56 cm x 0.057 cm x 56 cm.²⁷

¹⁷ *Id.* at 68.

¹⁸ OSK Revised Technical Annex at 69.

¹⁹ *Id.* at 70.

²⁰ *Id.* at 69.

²¹ *Id.*

²² OSK ODAR at 12.

²³ *Id.* at 13.

²⁴ *Id.* at 16-27.

²⁵ *Id.* at 12.

²⁶ OSK Legal Narrative at 2.

²⁷ OSK ODAR at 3.

14. When providing the spacecraft description of the GHOS^t spacecraft, under the section titled, “Fluids in Pressurized Batteries,” OSK states, “None. Capella uses unpressurized standard Lithium Ion battery cells.”²⁸ In any re-filed application, this information should be provided for the OSK spacecraft. If an ODAR for another FCC satellite application was used as a template for the OSK ODAR, please carefully review the entire ODAR to ensure that it is factually accurate for the OSK spacecraft and that the ODAR accurately reflects the steps undertaken by OSK to complete the ODAR.

Finally, in any refiled application, please provide the following additional information in order to assist the Commission in processing this application:

1. Please indicate whether all satellites will be technically identical.²⁹
2. In one section of the application, OSK writes that the orbital altitude will be 525+75/-25 km.³⁰ In another section, OSK writes that the satellites will be “deployed to a target altitude of 525 km, and no higher than 600 km,”³¹ and, in another, that “[t]he GHOS^t satellites described in this application will operate at an altitude between 500 and 600 km.”³² Please specify the uncertainties that OSK is addressing by specifying the range of launch altitudes as such.
3. Please elaborate on whether, and if so, how the GHOS^t satellites will avoid collision with habitable space stations.³³ Also, please indicate whether OSK will be working with a particular tracking entity for purposes of space situational awareness, or will otherwise be supplying information to habitable space stations.
4. OSK states that the GHOS^t system complies with the PFD level provided in SA.1862. However, OSK also states that, in the alternative, if the GHOS^t system did not comply with the power-flux density (PFD) level in SA.1862, OSK could make small adjustments in its operating schedule.³⁴ Please address whether the OSK satellites will in fact comply with the PFD level provided in SA.1862, including describing with specificity the methods that will be used for ensuring compliance. In addition, please describe any operational schedule scenarios that would result in excess of those specified in SA.1862, and the steps that will be taken to avoid those scenarios.
5. Please provide a detailed list of steps that OSK will take when it receives a conjunction data message (CDM) along with the timeframes for each step.

²⁸ OSK ODAR at 5.

²⁹ See 47 CFR § 25.122(b).

³⁰ OSK ODAR at 2-3.

³¹ OSK Legal Narrative at 6.

³² *Id.* at 4.

³³ See 47 CFR § 25.122(c)(5).

³⁴ OSK Revised Technical Annex at 85.

6. Please provide the achievable change in altitude of the spacecraft within a 48-hour period if the spacecraft must perform a collision avoidance maneuver.
7. Please provide the make and model of the radio being used to communicate with the Globalstar constellation.
8. Please provide all operational flight configurations. Is there a high-drag configuration? Low-drag? Will the spacecraft be tumbling at any point during the active mission lifetime of the satellite? Please provide the area-to-mass values and orbital lifetimes for all planned configurations (at both the lowest and highest insertion altitudes). Additionally, please provide the orbital lifetime for a satellite that is non-functional (not responsive to commands, including any commands with respect to components of the spacecraft that must be commanded in order to deploy) following release from the launch vehicle at the highest intended insertion altitude.
9. OSK states that the GHOS^t satellites will use GPS modules. Please specify the GPS signals that OSK intends to utilize.³⁵
10. OSK states, “After the spacecraft has demonstrated all relevant technologies and completed payload operations, the spacecraft will be left to deorbit in the given period to comply with regulation requirements.”³⁶ However, OSK does not provide (1) whether the spacecraft be commanded into a high- or low- drag configuration prior to end-of-life (EOL), (2) whether the spacecraft will be left tumbling, (3) any additional information on any EOL configuration changes to the spacecraft, (4) the expected altitude at EOL for a spacecraft with an insertion altitude at the lowest value, or (5) the EOL altitude for a spacecraft with an initial insertion altitude at the highest value. Please provide the additional enumerated information.

Accordingly, pursuant to Section 25.112(a)(1) of the Commission’s rules, we dismiss the OSK application as defective without prejudice to refileing.

Sincerely,

Karl A. Kensinger

Karl A. Kensinger
Chief, Satellite Division
International Bureau

³⁵ OSK ODAR at 3.

³⁶ *Id.*