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May 31, 2022

BY ELECTRONIC FILING

Marlene Dortch
Secretary
Federal Communications Commission
45 L Street NE
Washington, DC 20554

Re: Starlink Unauthorized Mobile Operations, SES-LIC-20210803-01361, Call Sign E210310; SES-LIC-20210309-00698, Call Sign E210092; SES-AMD-20210731-01295, E210092; SES-LIC-20210803-01360, E210309; 0190-EX-CN-2022, WM2XNK

Dear Ms. Dortch:

DISH Network Corporation (“DISH”) submits the enclosed letter, sent by DISH to SpaceX on May 27, 2022, into the record of the above-captioned proceedings.

Respectfully submitted,

/s/ Pantelis Michalopoulos
Pantelis Michalopoulos
Counsel to DISH Network Corporation

Attachment

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May 27, 2022

BY EMAIL

David Harris
Acting General Counsel
SpaceX
1155 F Street, NW
Suite 475
Washington, DC 20004

Re: Starlink Unauthorized Mobile Operations, SES-LIC-20210803-01361, Call Sign E210310; SES-LIC-20210309-00698, Call Sign E210092; SES-AMD-20210731-01295, E210092; SES-LIC-20210803-01360, E210309; 0190-EX-CN-2022, WM2XNK

Dear Mr. Harris:

On behalf of DISH Network Corporation (“DISH”), we are writing to alert you to recent public statements made by SpaceX and its Chief Executive Officer strongly suggesting that SpaceX is violating the rules of the Federal Communications Commission, including the need for FCC authority before SpaceX’s Starlink system may communicate with Earth stations in motion (“ESIMs”)¹ and the prohibition on any company engaging in such communications in the 12.2-12.7 GHz (“12 GHz”) band. What is more, these statements actively encourage and solicit Starlink customers to break these rules. This is a serious matter. It exposes SpaceX to liability for violating Commission rules and possibly for damaging private parties. ESIM communications on Starlink increase the potential for interference with the satellite television service received from DISH by millions of households. As DISH has explained, Starlink ESIMs may activate Starlink beams in areas where satellites would not otherwise have been active, threatening satellite television customers in the area.² We therefore ask that you immediately retract these statements and clarify that Starlink ESIM operations are not legal and no customer should try them, by using media of equal reach to the ones where these statements were made.

¹ Earth stations in motion is a term that collectively includes Earth Stations on Vessels (ESVs), Vehicle-Mounted Earth Stations (VMESs), and Earth Stations Aboard Aircraft (ESAAs). *See* 47 C.F.R. § 25.103.

² *See* Petition to Return, Dismiss, or Deny of DISH Network Corp., Application for Earth Stations Authorizations, SpaceX Services, Inc., SES-LIC-20210309-00698, Call Sign E210092, at 6 (May 21, 2021); DISH Network Corp., Petition to Deny Waiver Request, SES-LIC-20210803-01361, Call Sign E210310, at 4 (Jan. 21, 2022).

Mr. Musk recently tweeted: “Starlink does work on vehicles in motion, including planes, but not yet reliably.”³ In the same vein, SpaceX tweeted: “Starlink for RVs is available now wherever Starlink has coverage, and users can check the availability map for service areas before hitting the road.”⁴

SpaceX has filed numerous applications for the authority to provide service to commercial ESIMs.⁵ None has been granted.⁶ No grant means no authority. It means that Starlink ESIM operations are prohibited. For the 12 GHz band, the problem is even more serious. Not only does SpaceX lack authority to provide ESIM communications; *everyone* lacks such authority because of a generally applicable prohibition: the 12 GHz band is not authorized for ESIMs communicating with non-geostationary orbit (“NGSO”) satellites.⁷ Indeed, the Commission specifically excluded the 12 GHz band from its order authorizing mobile earth stations for NGSO systems,⁸ and recently affirmed its longstanding prohibition on even itinerant, “temporary fixed” operations in the band.⁹ Thus, for the 12 GHz band, SpaceX has not only had to request authority to engage in ESIM communications, but has also had to request a waiver of the general ESIM prohibition. Neither has been granted. For the 12 GHz band, therefore, ESIM operations are subject to a double prohibition. SpaceX appears to be violating both.

³ Elon Musk (@ElonMusk), Twitter (May 24, 2022, 9:18 AM ET)
<https://twitter.com/elonmusk/status/1529089543969943553>.

⁴ SpaceX (@SpaceX), Twitter (May 24, 2022, 3:51 PM ET)
<https://twitter.com/SpaceX/status/1529188236781793280>.

⁵ See SpaceX Services, Inc., IBFS File No. SES-LIC-20210803-01361 (filed Aug. 3, 2021); IBFS File No. SES-LIC-20210803-01360 (filed July 30, 2021); IBFS File No. SES-AMD-20210731-01295 (filed July 30, 2021); IBFS File No. SES-LIC-20210309-00698 (filed Mar. 5, 2021).

⁶ The only exception is an experimental license confined to a total of five terminals. See Space Exploration Holdings, LLC, Call Sign WM2XNK, ELS File No. 0190-EX-CN-2022 (granted May 26, 2022).

⁷ 47 C.F.R. § 25.202(a)(10)(ii) (listing “frequencies . . . available for use by Earth Stations in Motion (ESIMs) communicating with NGSO FSS space stations” but not including the 12 GHz band).

⁸ See Amend. of Parts 2 & 25 of the Commission’s Rules to Facilitate the Use of Earth Stations in Motion Communicating with Geostationary Orbit Space Stations in Frequency Bands Allocated to the Fixed Satellite Service & Facilitating the Communications of Earth Stations in Motion with Non-Geostationary Orbit Space Stations, *Second Report and Order and Further Notice of Proposed Rulemaking*, 35 FCC Rcd. 5137, 5153-54 ¶¶ 45-46 (2020).

⁹ 47 C.F.R. § 25.151(e) (“The temporary fixed earth station will operate only in the conventional Ku-band (14.0-14.5 GHz and 11.7-12.2 GHz bands”); Expanding Flexible Use of the 12.2-12.7 GHz Band, *Notice of Proposed Rulemaking*, 36 FCC Rcd. 606, 612 ¶ 15 (2021) (“The Commission also agreed with comments of the MVDDS 5G Coalition that MVDDS should not have to protect any non-fixed NGSO-FSS operations in the band, *if authorized in the future, because such operations had not been contemplated under the longstanding first-in-time MVDDS/NGSO FSS sharing approach.*”) (emphasis added).

SpaceX's knowledge of the limitations placed on ESIMs is further evidenced by its customer agreement, which states: "IN-MOTION USE PROHIBITED. SERVICES IN-MOTION ON A VEHICLE OR VESSEL (e.g., CARS, VANS, RVs, BOATS) IS PROHIBITED, WILL VOID THE LIMITED WARRANTY OF YOUR KIT, AND MAY BE GROUNDS FOR TERMINATION OF YOUR AGREEMENT WITH STARLINK PER SECTION 12 OF THESE TERMS. AT THIS TIME, STARLINK IS NOT CONFIGURED TO BE SAFELY USED IN-MOTION OR INSTALLED ON A VEHICLE OR VESSEL."¹⁰ This is impossible to reconcile with the statements of SpaceX and its CEO announcing enthusiastically the prohibited activity and urging multitudes to partake in it.

In a series of tweets, Mr. Musk has stated that Starlink is available on vehicles, but nowhere cautions that the service cannot be used on *moving* vehicles. Mr. Musk first announced:¹¹



Starlink now available for RVs, campers & other large vehicle users (note, antenna too big for cars)

Mr. Musk also tweeted:¹²



Replying to @thesheetztweetz

Starlink does work on vehicles in motion, including planes, but not yet reliably

Mr. Musk was not sharing these thoughts with an intimate circle of confidantes and associates. He was sharing them with his 95 million Twitter followers, fully aware of the

¹⁰ Starlink Pre-Order Agreement ¶ 6, <https://www.starlink.com/legal/documents/DOC-1020-91087-64?regionCode=US> (last visited May 27, 2022).

¹¹ Elon Musk (@ElonMusk), Twitter (May 23, 2022, 7:11 PM ET) <https://twitter.com/elonmusk/status/1528876319362240514>.

¹² Elon Musk (@ElonMusk), Twitter (May 24, 2022, 9:18 AM ET) <https://twitter.com/elonmusk/status/1529089543969943553>.

potential for many retweets. Nor did he qualify them by saying that the advertised availability is an illegal act. And, sure enough, he did not specify that the service is available only to parked or incapacitated RVs, or only to planes at the airport or at the hangar. In fact, he explicitly referred to “vehicles in motion.”

Mr. Musk’s second tweet was sent the day after SpaceX announced that Starlink is now available for use on recreational vehicles, giving customers the wrong impression that *mobile* use of the service is now allowed. Likewise, in tweets announcing that Starlink is now available for recreational vehicles or camping, SpaceX failed to note that the service cannot be used on vehicles in motion:

- “*Starlink for RVs can be used anywhere Starlink provides service and is ideal for camping and other activities in rural or remote locations where internet access has been unreliable or completely unavailable*”¹³
- “It’s ideal for travel or camping to any location internet access has been unreliable or completely unavailable.”¹⁴
- “Starlink for RVs is available now wherever Starlink has coverage, and users can check the availability map for service areas before hitting the road.”¹⁵

“Can be used” is an invitation to use. And, like Mr. Musk, SpaceX certainly did not say that Starlink for RVs can be used only when the RV is immobile. The page of the SpaceX website promoting the new service for RVs states only that “Starlink for RVs is not designed for use while in motion.”¹⁶ But “not designed for use while in motion” is very different from “forbidden.” The SpaceX pre-order agreement’s warning that the activity is prohibited¹⁷ has been forgotten, and in its place is a watered-down caution to remember your antenna’s design limits when you start the jet down the runway.

¹³ SpaceX (@SpaceX), Twitter (May 23, 2022, 5:11 PM ET) <https://twitter.com/SpaceX/status/1528846007148363776> (emphasis added).

¹⁴ SpaceX (@SpaceX), Twitter (May 24, 2022, 12:17 PM ET) <https://twitter.com/SpaceX/status/1529134554543366146>.

¹⁵ SpaceX (@SpaceX), Twitter (May 24, 2022, 3:51 PM ET) <https://twitter.com/SpaceX/status/1529188236781793280>.

¹⁶ Starlink for RVs, <https://www.starlink.com/rv> (last visited May 27, 2022).

¹⁷ See Starlink Pre-Order Agreement ¶ 6, <https://www.starlink.com/legal/documents/DOC-1020-91087-64?regionCode=US> (last visited May 27, 2022).

These encouragements to unlawfulness have had exactly the intended results. Citing to one of the above tweets from Mr. Musk, a user on the Starlink Reddit forum posted, “**Starlink works in motion.**”¹⁸



A Starlink customer has even posted a video testing the system while driving entitled “DRIVING with Starlink - MOBILE ROAMING at 80 MPH!”¹⁹

A further tweet by Mr. Musk raises questions about his own ESIM use:²⁰



As mentioned, SpaceX has an experimental authorization to test the Starlink service aboard aircraft, limited to a total of five user terminals and to transmitting in the 14-14.5 GHz

¹⁸ Starlink Works in Motion, Reddit (May 24, 2022, 10:07 AM ET)
https://www.reddit.com/r/Starlink/comments/uwroll/starlink_works_in_motion.

¹⁹ DRIVING with Starlink - MOBILE ROAMING at 80 MPH!, YouTube (Mar. 13, 2022)
<https://www.youtube.com/watch?v=8PDVURvWeg&t=357s>

²⁰ Elon Musk (@ElonMusk), Twitter (May 23, 2022, 7:06 PM ET)
<https://twitter.com/elonmusk/status/1528875120093286401>.

band.²¹ Even if Mr. Musk’s “testing” does not exceed the bounds of the authorized experiment, the CEO’s private jet is an unlikely venue for the experimentation such short-term licenses contemplate. Experimenting usually involves instrumentation and measurement, not a company officer’s subjective views about his ability to post tweets using the experimental service from 20,000 feet.²²

If Starlink customers, relying on Mr. Musk’s tweets and SpaceX promotional materials, use Starlink terminals while in motion, such activities will substantially increase the chance of interference into DBS antennas in the 12 GHz band. The moving earth stations will generate requests for service, triggering Starlink satellite beams to make transmissions that would otherwise not have happened; they could thus cause interference into DBS dishes that otherwise would experience none. This is particularly concerning because as DISH has explained, SpaceX’s system violates the Equivalent Power Flux Density (“EPFD”) limits adopted by the ITU and the Commission to protect satellite-television customers.²³

SpaceX is not above the law.

SpaceX and its CEO must therefore place a notice on their Twitter feeds and on <https://www.starlink.com/rv> stating that ESIM use is explicitly not authorized. SpaceX must also state that any prior statements to the contrary were in error and are being rescinded. Similarly, SpaceX must explain what steps it is currently taking to monitor and limit unauthorized mobile vehicle operations. For example, what systems does Starlink have in place to monitor mobile use by customers? Is SpaceX actively checking for such use? How many customers have received warnings or account terminations for unauthorized mobile use?

DISH reserves all rights arising from SpaceX’s conduct, and requests a full response to this letter no later than COB, June 1, 2022.

²¹ See Space Exploration Holdings, LLC, Call Sign WM2XNK, ELS File No. 0190-EX-CN-2022 (granted May 26, 2022).

²² In its application for the experimental license, SpaceX acknowledged that “downlink band[s] are shared with other commercial and government services,” but discounted the risk to those services by stating that “these earth stations would not transmit in those [downlink] bands and thus could not cause any interference to other operators using those bands.” Space Exploration Holdings, LLC, Call Sign WM2XNK, ELS File No. 0190-EX-CN-2022, Purpose of Experiment Narrative at 2 (granted May 26, 2022). This is a hollow assurance: as mentioned, ESIM communications may trigger *satellite* transmissions in those shared bands from satellite beams that otherwise would not have been activated.

²³ See Reply of DISH Network Corp. to Opposition and Response to Comments of Space Exploration Holdings, LLC, File Nos. SAT-LOA-20200526-00055, SAT-AMD-20210818-00105 (Mar. 8, 2022); Letter from Jeffrey Blum, DISH, to Marlene Dortch, FCC, File No. SAT-MOD-20200417-00037 (Apr. 23, 2021).

David Harris
May 27, 2022
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Respectfully submitted,

/s/ Pantelis Michalopoulos
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Counsel to DISH Network Corporation

cc: William M. Wiltshire, Counsel for SpaceX
Tom Sullivan, Chief, International Bureau
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