

21 December 2023

Re: Response of Echostar Mobile Limited to Draft RSPG Draft Opinion

Submitted to: CNECT-RSPG@ec.europa.eu

EchoStar Mobile Limited (EML) submits these comments in response to the “Draft RSPG Opinion on assessment of different possible scenarios for the use of frequency bands 1980-2010 MHz and 2170-2200 MHz by the Mobile Satellite Services beyond 2027” prepared by the Radio Spectrum Policy Group (**RSPG**) dated 25 October 2023 (**RSPG Draft Opinion**).

1. Executive Summary

The RSPG Draft Opinion has been prepared by RSPG at the request of the European Commission for RSPG to: (a) consider the current and future use of the 1980-2010 MHz and 2170-2200 MHz frequencies (**2 GHz Frequencies**); and (b) propose recommendations for how to licence the 2 GHz Frequencies to maximize their efficient use and the socio-economic impact across the European Union (**EU**) in a coordinated manner.

The RSPG Draft Opinion is not sufficient for the Commission to rely on for the purposes of deciding on the future of the 2 GHz Frequencies.

The RSPG Draft Opinion identifies several innovative MSS services which can be provided using the 2 GHz Frequencies, and which are currently being provided by EML or in development for provision in the short term. While RSPG recognizes the important services provided by EML today utilizing the 2 GHz Frequencies, and the important services it will continue to provide in the future, the RSPG Opinion goes on to present the European Commission with several spectrum segmentation options which would disrupt EML’s MSS operations (which are already providing valuable MSS services to EU customers, as noted above) and therefore also cause disruptions to the internal market for MSS within the EU.

The RSPG Draft Opinion provides almost no consideration of whether the current licensees can, based on their current activities to date and future plans for investment into the 2 GHz band, achieve the European Commission’s goal of developing a competitive internal market for MSS, and therefore whether a change in the licensing approach is in fact required. This must be adequately addressed by the Draft RSPG Opinion and RSPG must provide a transparent view to the European Commission on the risks of losing the investments into innovation and development which the two current operators have planned if the European Commission were to adopt RSPG’s current recommendations.

Further to this, recommendations presented by RSPG are not backed by a robust analysis which:

- assesses whether the licensing options would provide sufficient bandwidth to facilitate provision of a competitive commercial service to benefit customers and to encourage investment;
- provides a justification for why the licensing options presented would provide the greatest benefit to the EU compared to the current licensing approach; and

- considers the practical consequences and disruption its recommendations will have to the development of the 2 GHz band (including competitive developments within the band, and proposed investment) during the current licensing period (i.e., before 2027).

Separate to the above, the recommendations presented in the RSPG Draft Opinion are flawed as they do not challenge assumptions which create an artificial sense of scarcity of spectrum available to develop MSS services and overstated demand for the 2 GHz Frequencies. RSPG does not provide an adequate consideration of a number of relevant matters which are crucial to developing recommendations in respect of how to licence the 2 GHz Frequencies. This includes:

- an analysis of all relevant spectrum bands available for MSS innovation and development, and whether the RSPG proposal to further segment the 2 GHz Frequencies is necessary, especially in light of the heavy use of this band globally and the potential for availability of new IoT spectrum across the globe in light of the new WRC-27 agenda item on low data rate MSS;
- an analysis of the bands the potential new MSS services identified by RSPG are likely to develop in and therefore whether demand for the 2 GHz Frequencies is overstated;
- consideration of whether the new potential uses of the 2 GHz Frequencies identified by RSPG are likely to develop and be deployed commercially over the relevant licence period under consideration (i.e., from 2027 onwards) so as to justify a change in licensing approach now;
- an analysis of whether the spectrum segmentation recommendations proposed would in fact facilitate the investment required to achieve the competition and innovation sought, as compared to what the current licensees have planned; and
- consideration of competition arising from services outside of the 2 GHz band and from other non-MSS based services, which would drive innovation and development in MSS services in the 2 GHz band.

With all the matters above taken into account, RSPG should not propose any major changes to the licensing of the 2 GHz Frequencies, as there is a very real risk that the RSPG's recommendations will weaken the internal market for MSS services, consequently making the EU risk losing the potential the S-Band has, as a band for commercial MSS service deployment.

Instead, EML urge RSPG to propose that:

- the European Commission renew the licences of the existing MSS operators for the full 2 x 15 MHz of frequencies they currently hold. This will permit such licensees to continue to invest in and develop the 2 GHz Frequencies in accordance with their current plans; and
- the European Commission take a long-term strategic approach to spectrum management and recommend action be taken to increase spectrum allocations available for MSS services to address the increasing demand for spectrum and to enable a truly competitive market for MSS in the EU to develop.

If a long-term renewal of the current licensee's authorizations is not possible, given the MSS market is still developing and is subject to many unknowns, RSPG should also consider extending the current licensee's authorizations for at least 10 years while the European Commission works through this issue further.

EML's response is structured as follows:

- **Section 2** – sets out EML’s current progress as a licensee, its current innovation and development of MSS services in the 2 GHz band, and its plans for future investment in the band.
- **Section 3** – sets out omissions in the analysis on which the RSPG Draft Opinion is based; and
- **Section 4** – sets out strategic risks which would arise from the European Commission adopting the recommendations in the RSPG Draft Opinion and EML’s concluding remarks.

2. EML’s innovation and development of the 2 GHz Frequencies

EML has provided input to the RSPG as part of the RSPG’s “*Questionnaire on the Future Use of the 2 GHz Band in the European Union*” dated 30 June 2023 (**June Questionnaire**) in respect of its current operations, the innovation and development which it is planning for the 2 GHz Frequencies now and in the future and its planned investment into the band. Despite this, there has been no consideration by the RSPG as to whether EML can deliver the outcomes RSPG is now aiming to achieve through its recommendations.

As stated in EML’s response to the June Questionnaire, EML is best positioned to deliver on the promise of the 2 GHz band to Europe and the world for the following reasons:

- EML is a publicly traded company with more than 50 years of demonstrated innovation and success in the global satellite communications market, as both a satellite operator and technology provider. EML and DISH Network (**DISH**) (an affiliate of EML’s parent company, EchoStar Corporation, with whom EchoStar Corporation has combined with as part of a restructuring in December of this year), have already spent billions of Euros to develop 5G Stand Alone, ORAN, and 2 GHz band satellite systems and technology, and they are best positioned financially and with existing spectrum and in-orbit satellite assets to build on this investment and create a unique, multi-mode wideband global NTN capability to benefit EU customers.
- EML holds very high priority International Telecommunications Union (**ITU**) rights for both geostationary and non-geostationary satellite networks. This includes the highest priority ITU global rights for its EchoStar XXI satellite network in the 2 GHz-band over large portions of Region 1 and the highest priority rights for two GSO networks over large portions of Region 2. In addition, EML holds the highest-priority global ITU rights for a global Non-Geostationary Satellite Orbit (**NGSO**) system in the 2 GHz-band, with deployment planned in 2024. Moreover, EML holds a German ITU LEO filing for a LEO satellite system that supports its 3GPP 5G NTN direct-to-device services with deployment beginning in the 2026-2027 time frame, among other ITU filings that support its planned global S band satellite system.
- EML and its affiliates have significant market access rights, including an exclusive nationwide license in the United States for the 2 GHz MSS and terrestrial band, as well as MSS and CGC authorizations in other portions of Europe and the world. EML’s uniquely strong market access rights around the world and high priority filings mean that EML’s services are highly competitive and the value for the ecosystem and end customers is dramatically increased, given the capital investment is efficiently spread over a wider geography.
- EML has multiple advantages over other proposed direct-to-device networks. For example, the 2 GHz band, where EML and its affiliates operate, is specifically allocated to MSS and is already

harmonized globally for MSS, unlike the spectrum in networks proposed by SpaceX, Lynk Global, and AST, which use spectrum licensed for terrestrial cellular networks.¹ Therefore, EML is not limited to operate under ITU Radio Regulation 4.4, requiring operation on a non-interference basis. Unlike the spectrum available in the big LEO band, the 2 GHz-band provides EML access to a significant amount of spectrum to provide users with quality wideband and other MSS services, including voice, email, and texting, rich messaging and data services. Further, EML plans to take full advantage of 3GPP standardized NTN Release 17 and future releases, which will provide further enhancements to the services EML is able to offer using its MSS systems, including to deploy a complete satellite and CGC network offering 5G and IoT services.

- EML also has the financial wherewithal and technical capability to bring true wideband NTN-NR capabilities to the global market (in contrast to the many New Space startups focusing on very low bandwidth/very low-capacity services in the S band). EML is a successful public company with a very strong balance sheet and the ability to bring forward the billions of Euros necessary to deploy a global NTN-NR network. Moreover, through its Hughes Networks Systems subsidiary, EML has a 50-year heritage in delivering cutting-edge satellite services to the global marketplace, which includes providing key technologies and infrastructure to most of the principal global MSS and other NGSO operators over the last 30 years.
- The Echostar XXI satellite was launched only six years ago on 8 June 2017. Given the satellite lifespan of 15/20+ years, a lack of renewal of the license would effectively be against space sustainability principles, as the satellite's use would be seriously reduced.

The potential for EML to develop the 2 GHz Frequencies should not be understated by RSPG to the European Commission when addressing the future of how the band should be licensed. RSPG should consider and advise the European Commission on the risks that would arise from re-licensing spectrum held by EML to another operator or reducing the amount of authorized spectrum held by EML.

3GPP NTN standards, which were developed to provide highly efficient and technically elegant integration of terrestrial and non-terrestrial networks, have enabled the creation of commercial devices and infrastructure today. However, for MSS to succeed beyond the trials and current deployments, there must be proof of a scalable MSS operation (and therefore economically viable MSS business) to gain the necessary financial backing for relevant investment.

EML (like any operator) is only able to make the investments and obtain the financial backing required to provide the planned benefits set out in this section where there is regulatory certainty that it will continue to hold the full 2 x 15 MHz of 2 GHz Frequencies it is currently licensed to facilitate an economically viable MSS business and a powerful scalable system. This is a matter which impacts investment in the current licensing period and the future licensing period (i.e., from 2027 onwards).

i. EML's current services in the 2 GHz band

As noted in EML's response to RSPG's June Questionnaire, today EML operates its first generation 2 GHz band MSS network using its EchoStar XXI satellite, and provides a range of narrow and wide-band

¹ Addressing the regulatory issues associated with such satellite networks is on the Agenda for the 2027 World Radiocommunications Conference.

data services leveraging 3GPP NTN-IoT, LoRa and GMR-1 technologies. As shown before, we are seeing significant use of our latest services, LoRa and NTN-IoT, in particular.

EML started commercial operations of MSS in December 2017. EML's most recent new product offerings include 3GPP-NTN direct-to-smartphone and IoT LoRa two-way messaging services.

As for MSS, EML follows a wholesale business model approach to onboard distribution partners – classified as device makers, OEMs and system integrators – and integrates the EM2050 radio module in end to end solutions.

After the first twelve months of commercial operations of our LoRa services, results are as follows:

- To date EML has 6 active distribution partners addressing several verticals including utilities, critical infrastructure (rail and road), government/defense and urban air mobility.
- Signed up 11 partners and is on track to onboard 12 commercial partners by 31/12/2023.
- Integrated the EM2050 radio module in 10 IoT applications each developed by the onboarded partners.
- Created the EchoStar Mobile marketplace.
- Direct to satellite services have been adopted by the following key verticals: agritech, environmental monitoring, infrastructure utilities and asset tracking.
- Delivered more than 20 million messages over the network.
- As result of European business development activities in Q1 2024 EML will expand in United States with pre-commercial direct to satellite service in the 2 GHz band.

The urban air mobility use case has also gained a lot of interest in the recent years and in May 2023 EML has partnered with SkyFive and Airbus to experiment the development of hybrid CGC/MSS connectivity for command-and-control type of applications for companies such as Volocopter. EML in 2021 announced collaboration with Sequans to develop LTE band 65 in the Cassiopeia platform and two years later in April 2023 SkyFive and Sequans introduced the world's smallest airborne terminal for air to ground communications. Though the use of experimental CGC licenses in Germany, Airbus, SkyFive and EML will continue to test current and future satellite technologies (i.e., 3GPP 5G NTN NR) to pave the way for advanced air mobility. EML is also actively examining other CGC use cases.

ii. EML's innovation in the 2 GHz band

In terms of innovation which EML is leading on, EML is pursuing technological and commercial development of both narrowband and wideband use cases. Narrowband services are well on the way with LoRa and will be expanded with NB IoT as technology becomes available. Wideband services started with the development of GMR1-3G technology but to benefit the economy of scale and drive massive adoption further development is required by the 3GPP NTN NR body. It is expected that by 2025 3GPP release 18/19 will be mature and foster commercialization of new modems. To address the emerging market demands in satellite IoT, on the narrowband side, EML launched in November 2022 the first and only pan European Satellite IoT network for direct to sensor satellite connectivity.

Further to the above, EML, through its sister company Hughes, has developed cutting edge technology for user terminals (UT) and the ground segment deployed at its teleport in Griesheim (DE).

- The Hughes 4200 UT provides voice, data and streaming services with data rates up to 290 Kbps uplink and 256 kbps downlink.
- The Hughes 4500 and Hughes 4510 UTs on the other hand provide data only services targeting machine to machine type of communications.

- The Hughes 4510 UT provides in addition complementary LTE connectivity allowing smart routing at the edge (e.g., route different IP streams on different wireless access depending on data criticality). All UTs are tagged as wideband solutions and implement the GMR-1 3G specifications.

EML is a strong supporter of standard based solutions. EML's current direct to satellite IoT services leverage the LoRa technology and LoRaWAN specifications standardized by the LoRa Alliance. LoRaWAN has been formally endorsed by the ITU in 2021 as the global standard for low-power wide-area-network (LPWAN). To drive the development of LoRaWAN specifications for satellite use case, EML has joined the Board of Directors and currently leads the Satellite Task Force with the goal to standardize interoperability between satellite and terrestrial networks.

Furthermore, as the development of 3GPP NTN NB IoT progresses, EML has established pre-commercial testing for 3GPP release 17 NB IoT based solutions aiming at commercialization as technology becomes mature, which is well underway as Release 18 is due out this year. EML's vision is to converge both LoRa and NB IoT in the same IoT platform to offer seamless customer experience regardless of the underlying technology (different use cases have different requirements in terms of message size, battery consumption, round trip time, combining both technologies creates a unique selling proposition).

Development of the NTN infrastructure based on ORAN standards provides a unique opportunity to build on the development that DISH has undertaken to create the world's first cloud-native 5G Stand Alone network and extend the architecture to support both terrestrial and non-terrestrial networks. The potential use of an ORAN RAN Intelligent Controller (RIC) to manage scarce satellite resources and enable scale over time together with standard ORAN components will advance the state of technology available across the industry.

iii. EML investment

As noted in EML's response to RSPG's June Questionnaire, earlier this year EML announced it had begun construction of its first phase next-generation 2 GHz band low earth orbit (LEO) satellite network, which is expected to commence commercial operations in late 2024. This was based on customer demand across Europe and the United Kingdom for EML's LoRa IoT services.

EML's vision goes beyond this initial LEO constellation and EML is actively planning for the buildout of a significantly larger LEO constellation which would provide continuous, global direct to device services based on 3GPP NTN-NR and use of dedicated MSS spectrum which EML is currently authorised to use. EML is currently evaluating proposals from over a dozen spacecraft and payload suppliers spanning traditional and New Space suppliers to build out this network. EML is also in active discussion with financial and strategic partners throughout Europe and the globe needed to build and operate a successful global network.

Further, EML has a growing physical and personnel presence in the EU and elsewhere. As part of the NTN network, EML has additional plans for ground infrastructure investments in Europe and is seriously considering the use of EU based manufacturers for both the space and ground components of this network. Such investment will bring broader benefits to the single EU market and the EU economy.

EML is also investing significant effort in working with relevant industry groups in programs of work which are crucial to ensuring the availability of user equipment for use with NTN services, including working with ETSI in the development of the harmonized EN standards for NR-NTN and for IOT-NTN

terminals in S and L band, and working with GSMA on development of test cases for interoperability and performance of NTN UE based on 3GPP specifications against GSMA user requirements.

The investment we have made provides clear evidence that EML is committed to innovation and development of a market for MSS services in the EU. However, EML cannot guarantee that such investment will continue without regulatory certainty that its 2 GHz Frequency authorizations will be renewed after their initial expiry in 2027.

Given the long-term return on investment the Echostar XXI satellite and its ecosystem represents, limiting its use across the EU by reason of a change in licensing regulations for the benefit of new equally expensive systems would be adversely and seriously affecting the value European end consumer would get from the use of such systems.

iv. Opportunities for a truly global MSS service for EU customers

It is not feasible for an operator to solely focus on one region. EML has previously provided input to RSPG in response to RSPG's June Questionnaire that most of EML's European customers are pursuing global business plans, and in every case they have expressed a desire for EML's services to be expanded and developed into a global service capability. This matter has not been given adequate consideration by RSPG.

The need for global and integrated satellite services is shown by the consolidation occurring in the satellite industry through recent merger and acquisitions, such as the Viasat/Inmarsat and Eutelsat/OneWeb mergers. Accordingly, any MSS services which are developed in the 2 GHz band will only be economically feasible if the system operates globally.

In the United States, DISH is the exclusive licensee in the S band, holding 20 MHz x 2 of such spectrum. As noted above, earlier this month, Echostar Corporation (EML's parent company) and DISH combined as part of a restructuring, which creates a unique opportunity for EML to best utilize the 2 GHz Frequencies so as to provide EU customers with the robust and seamless global MSS service which they are demanding. Without such a global service, there is a risk that customers may look to other services, resulting in the 2 GHz band being under used. In addition, EML and its affiliates hold 2 GHz band authorisations in many other countries.

v. Corrections to factual inaccuracies set out in the Draft RSPG Opinion relating to EML

The RSPG Draft Opinion includes several factual inaccuracies in respect of EML. In Annexure A to this response, EML sets out these inaccuracies and provides the correct information for the RSPG's reference. Such inaccuracies must be corrected by RSPG in any final recommendation provided to the Commission.

3. Omissions in the RSPG analysis

The approach to licensing which RSPG has adopted for the purposes of the RSPG Draft Opinion appears to be solely focused on presenting options to the European Commission to increase the number of licensees operating in the 2 GHz band.

In this section, EML sets out a number of factual and contextual matters which suggest that a strategic and long term spectrum management approach is required to address the issue of limited spectrum in the face of growing demand for such spectrum for MSS services.

i. Spectrum availability for development of MSS services

While RSPG has been tasked by the European Commission to propose plans for managing the 2 GHz Frequencies, the RSPG's proposals cannot be made in isolation of broader spectrum management activities.

The original aim of the European Commission in licensing the 2 GHz Frequencies was to “facilitate a competitive internal market for Mobile Satellite Services and ensure gradual coverage everywhere in the EU”. There is no reason why RSPG should see the 2 GHz Frequencies as the only band where MSS services can develop; it is likely that a user will consider MSS services deployed across other spectrum bands.

RSPG should therefore analyse whether there are additional bands which have been allocated to MSS where competition could develop and take into account spectrum bands that will likely be allocated to MSS over the relevant licensing period under consideration, before recommending the further segmentation of the 2 GHz Frequencies. On this point, EML note that:

- MSS systems currently operate in other spectrum bands allocated to MSS, including the L band (such as systems operated by Inmarsat, Global Star, Ligado and Iridium), and in the sub-GHz band (such as systems operated by Orbcomm and Kinéis).
- RSPG should also more broadly consider whether bands capable of use for MSS services, but currently used for terrestrial services, should be re-licensed to MSS operators.

In Europe, Band 1 (2 GHz) is currently being used for terrestrial services and is adjacent to the MSS S band and could easily be used for MSS services. Band 3 (1.8 GHz) sits between the MSS S and L bands and is also technically compatible with MSS services. Band 7 (2.6 GHz) could be ideal for MSS services as it shares the technical characteristics of the MSS bands and has likely been used primarily in densely populated areas due to reduced propagation vs other bands in terrestrial networks. Lower frequency bands such as Band 8 (900 MHz), Band 20 (800 MHz) and Band 28 (700 MHz), which will require larger satellite antennas can however also be used for MSS services as evidenced by other satellite operators who claim to be using them in the United States with legacy LTE devices.

- There has been significant work undertaken since World Radio Conference (WRC) 2019 (WRC-19) to study potential new spectrum allocations for MSS. As part of resolutions adopted at WRC-23, new agenda items for WRC-27 have been adopted, including relating to making spectrum available for low data rate services to support IoT in the 1 and 2 GHz band range (WRC-23 Resolution COM6/8),² and possible new frequency allocations to MSS in the 2 GHz band for generic MSS services (WRC-23 Resolution COM6/10).³ These allocations, if made at WRC-27,

² This includes the following frequency bands: frequency bands 1427-1432 MHz (space-to-Earth), 1645.5-1646.5 MHz (space-to-Earth) (Earth-to-space), 1880-1920 MHz (space-to-Earth) (Earth-to-space) and 2010-2025 MHz (space-to-Earth) (Earth-to-space)

³ This includes the following frequency bands: 2010-2025 MHz (Earth-to-space) and 2160-2170 MHz (space-to-Earth) in Regions 1 and 3 and 2120-2160 MHz (space-to-Earth) in all Regions.

would make an significant amount of spectrum available to be licensed to MSS operators in Europe and globally in addition to the 2 GHz Frequencies.⁴

It is likely that such allocations will be made and become available during the relevant licensing period (i.e., from 2027 and onwards). Failing to take a broader spectrum management approach and consider such developments over the relevant licensing period will impose unnecessary limitations and constraints on operators and results in an inefficient licensing approach being adopted. In addition, unlike the S Band, which is already heavily licensed throughout the globe with existing and planned networks in use, these frequencies, if allocated, will not have this encumbrance.

In light of the above, a proposal to segment the 2 GHz Frequencies would be short sighted, and detrimental for spectrum management in the EU. Based on the RSPG's segmentation proposal, operators could hold small lots of spectrum over multiple frequency bands, requiring an expensive defragmentation process in the future.

EML urges RSPG to recommend that the European Commission take a longer-term strategic approach and:

- renew the existing licensee's authorizations;
- develop a strategy to support new MSS allocations being made at WRC-27 (including participating in relevant studies mandated by WRC-23 to investigate whether such allocations are feasible and development of appropriate regulatory measures to facilitate such allocations being made) and make plans for harmonization of the use of such frequencies within the EU once they become available for use, as per the current MSS/CGC framework;
- support the development of MSS services in the currently available bands for MSS; and
- develop a roadmap considering any additional spectrum bands that can be studied and made available for use by MSS systems.

It is also critical that the European Commission recognises the need for its spectrum management activities to align with broader global developments in light of the global nature of satellite services (as set out in section 2(iv)). The 2 GHz Frequencies are also licenced to EchoStar and other operators in countries around the globe for MSS or MSS/CGC including in the United States, across Latin America including Mexico, Chile, Colombia and Panama, in in , the United Kingdom and other non-EU countries across Europe, Saudi Arabia and many other countries. If the European Commission were to re-licence part of the 2 GHz Frequencies in Europe solely to grow narrowband MSS applications, then this would remove the capability for these frequencies to be used on a global basis for broader MSS services and reduce the capability of operators providing a robust global service which customers are demanding. In addition, with existing licenses already awarded for MSS in these bands in many countries, it would be impossible for a European narrowband operator to access these bands. For this reason, if the European Commission wishes to progress narrowband MSS applications, the new agenda items developed as part of WRC-23 to be considered at WRC-27 as summarised above should be prioritised.

ii. Overstated demand for the 2 GHz Frequencies

⁴ This is in addition to the MSS spectrum under study for MSS/IMT for consideration for allocation at the 2027 World Radiocommunications Conference.

RSPG has identified potential new uses of the 2 GHz Frequencies. However, before concluding that the 2 GHz Frequencies need to be re-allocated or segmented to permit such new uses to develop, RSPG should ensure that its recommendations are not based on an overstated demand for the 2 GHz Frequencies. The RSPG Draft Opinion does not consider whether it is realistic that the new use cases identified will develop, both within the 2 GHz band and within the relevant licensing period under consideration (i.e., from 2027 and onwards).

EML raises the following points that suggest that demand may be overstated for the 2 GHz Frequencies:

- RSPG highlights in section 2.6.2 of the RSPG Draft Opinion that NTN-D2D and NTN-D2C are two use cases for the 2 GHz Frequencies. However, the most obvious early use case for such technologies (and therefore where investment will be targeted) are direct to device-based services to un-modified cell phones.

The spectrum that will be used for such services will rely on traditional terrestrial cellular spectrum held by mobile network operators, rather than frequencies in the 2 GHz band, for operators such as Lynk and AST & Science. The fact that RSPG has noted that a full 2 x 15 MHz of spectrum is required for direct to device services suggests that large chunks of spectrum may sit unutilized if allocated to a direct to device operator.

- RSPG notes further in section 2.6.2 of the RSPG Draft Opinion that it has “noted interest of various stakeholders for various types of MSS services”. However, it is not clear from the opinion if stakeholders have directly informed RSPG of their interest in deploying MSS services in the 2 GHz Band, or if RSPG has more generally identified service providers of MSS services (irrespective of what frequency band they operate in). On this point, many of the operators identified by RSPG are proposing to provide relevant MSS services using systems operating in the Ku or Ka band, and a move into the 2 GHz band would represent a significant change to their operations. As such, it is not clear whether the apparent demand or interest in 2 GHz Frequencies for deployment of MSS services is overstated.
- RSPG sets out IoT as a potential service to be deployed using the 2 GHz Frequencies. While IoT is a relevant MSS use case, no commercially funded IoT satellite system has launched and has been successful as the demand currently does not exist for this use case alone. The demand for IoT services is not currently large enough for IoT players to launch IoT specific networks which require a high level of CAPEX investment.

There have been examples of IoT satellite networks abandoning plans for network deployment in favour of relying on capacity from other satellite operators:⁵

- Hiber, a satellite IoT connectivity firm, abandoned development of its IoT satellite network in 2021 and has moved to leasing capacity from satellite operators.⁶

⁵ [Satellite IoT grows as use cases and coverage needs expand \(verdict.co.uk\)](https://www.verdict.co.uk/satellite-iot-grows-as-use-cases-and-coverage-needs-expand/)

⁶ [Hiber partners with Inmarsat for satellite IoT network - DCD \(datacenterdynamics.com\)](https://www.datacenterdynamics.com/en/news/hiber-partners-with-inmarsat-for-satellite-iot-network-dcd/)

- There have been reports that Swarm, a provider of satellite connectivity for IoT, has informed customers that it will no longer be selling new IoT devices as of June 2023.⁷
- Myriota, a provider of direct-to-orbit satellite connectivity for IoT use, has partnered with Spire, rather than deploy its own satellite network.⁸

EML, however, has a robust MSS business and access to required funding to develop a global S band NTN-LEO, and today is already providing the full range of MSS services identified by RSPG, including IoT services.

If RSPG is to consider other licensees for the 2 GHz Frequencies, RSPG must also ensure that those who express an interest in the 2 GHz Frequencies can establish through evidence that such spectrum will in fact be used and developed within the relevant licensing period (i.e., from 2027 onwards).

As part of the authorisation process adopted by the European Commission under *Decision No. 626/2008/EC on the selection and authorisation of systems providing mobile satellite services*, operators who demanded 2 GHz band spectrum were required to establish through clear evidence that they would realistically be able to make use of the spectrum and develop the market for MSS services in the EU. This included through providing clear evidence that a MSS system had been filed with the ITU, that there was an arrangement in place for satellite manufacture, contractual arrangements in place for a ground network, and launch agreements in place, etc.

EML urges RSPG to ensure that no spectrum be taken off existing licensees without a real and established plan to develop the spectrum having been demonstrated to the European Commission. Without such an evidentiary threshold, RSPG risks stifling investment into the EU market for MSS services by the two current licensees only on the promise of potential investment.

iii. RSPG must not downplay the importance of CGC/MSS services

RSPG should not minimise CGC and generic MSS services as use cases for the 2 GHz Frequencies. EML is already actively testing the use of MSS/CGC to support urban air mobility. In addition, EML is seeing a demand for MSS/CGC us for mission critical applications including by defence and industrial customers, and by energy producers. CGC/MSS capability is particularly valuable to provide a hybrid support to meet user demands for both satellite and terrestrial services, such as for utilities.

iv. Licensing options must facilitate service provision, not hinder service provision

In section 2 of the RSPG Draft Opinion, RSPG notes that for many MSS use cases of the 2 GHz Frequencies there is no opportunity for spectrum sharing and a full 2 x 15 MHz of spectrum would be required (with the exception of NB-IOT where RSPG state that 5 MHz or less is required, and LoRa where a required capacity has not been identified by RSPG).⁹

Despite this acknowledgement, the RSPG Draft Opinion goes on to present a segmentation of the 2 GHz Frequencies based on the following segmentation options:

⁷ [SpaceX's Swarm Technologies is halting new device sales | TechCrunch](#)

⁸ [Spire Global and Myriota partner to re-imagine Internet of Things connectivity](#)

⁹ At paragraph 3.2.1.1.1 of the RSPG Draft Opinion, it is noted that the current selected operators require a minimum 2 x 15 MHz for CGC supporting EAN; at paragraph 3.2.2.1.1, it is noted that generic spectrum requirements for MSS is 2 x 15 MHz; and at paragraph 3.2.4.1.1, it is noted that the spectrum required to implement 5G MSS NTN is 2 x 15 MHz.

- Four potential operators: two with each 2 x 10 MHz, and two with each 2 x 5 MHz;
- Three potential operators: each with 2 x 10 MHz; or
- Three potential operators: one with 2 x 15 MHz, one with 2 x 10 MHz and one with 2 x 5 MHz.

However, the RSPG Draft Opinion does not include any substantive analysis in respect of how each of these segmentation options have been prepared, nor how each would facilitate competition nor enable a competitive service to be provided to benefit customers, as compared to the current segmentation of two current licensees holding 2 x 15 MHz of frequencies each. It does not demonstrate either that licensing only one or two extra operators in respect to the current licensing regime would satisfy the requirements of the stakeholders' listed in section 2.6.2.

EML urges RSPG to ensure that any licensing option presented to the European Commission be backed by a robust analysis, rather than a short-sighted goal of increasing the number of licensees using the 2 GHz Frequencies. Without this broader analysis, the RSPG's recommendations could have the result of making the 2 GHz Frequencies commercially unattractive for all operators.

In respect of spectrum requirements:

- As stated in EML's response to RSPG's June Questionnaire, any individual operator in the S-band needs at least 2 x 15 MHz of spectrum to be able to deploy robust global wideband NTN-NR services. The requirement is based on the 5 MHz channelization of NTN-NR, the limits of spectral efficiency and the need for spectrum reuse to avoid interference, as well as having sufficient spectrum to meet growing user demands.

As a current licensee of 2 GHz Frequencies EML requires a full 2 x 15 MHz for a viable MSS operation in order to grow its NTN MSS services across Europe. Providing sufficiently large spectrum blocks is essential not only to EML providing a viable service for its customers, but also to allow EML to provide a robust service which will need to be competitive against other operators including terrestrial service providers. The RSPG's spectrum segment options do not recognize the cost of global satellite systems and the need for the ability to scale operations to make these services viable. The smaller segment sizes proposed by RSPG place a limit on the services which can be provided, and has the effect of negatively impacting the MSS business cases for investment.

Qualcomm's retreat from its foray into D2D services, based on the Iridium technology, is evidence that proprietary subscale operators cannot compete over time in creating wide scale adoption of MSS services.

- The 2 x 5 MHz pairings proposed by RSPG would effectively constrain a licensed operator to investing in a NB-IoT specific network for the EU. As set out in section 3(ii) above, it is unlikely that an operator would make the investment in developing and rolling out a 2 GHz specific IoT satellite system as there is no current business case for global IoT MSS services to support such investment and there is already a number of countries, including the United States, where the 2 GHz band is licensed and therefore, unavailable to new entrants.
- EML note that many of the operators of the potential new services identified by RSPG focus on one particular service, and that licensing the spectrum to such operators would limit the potential

for innovation in the band, for example, AST & Science and Lynk currently only focus on NTN D2D but would require ideally 2 x 15 MHz to provide a workable service.

- Due to the lack of scale and standardization in MSS systems, costs have remained inordinately high which has limited demand. Only when multiple services can be provided by networks with scale, that they can be profitable.¹⁰

In view of the above matters, the European Commission should licence the spectrum to an operator who has the greatest ability to develop each of the relevant use cases, rather than splitting the spectrum into small unusable segments.

EML has already set out its plans for the 2 GHz Frequencies in section 2 above, and is one of the few operators with an interest across all of the use cases for the 2 GHz Frequencies as set out in the table at 2.6.2 of the RSPG Draft Opinion and has the financial and technological resources to ensure the 2 GHz band is put to its highest and best use across Europe.

v. Competition driving innovation and development can also arise from outside the 2 GHz band and non-MSS based services

EML notes that competition driving innovation and development within 2 GHz is not limited to other 2 GHz MSS operators. Competition can exist at a broader service/use case level and is not necessarily spectrum specific.

As set out in section 3(i), MSS systems can and do operate in other bands and such systems can provide competitive pressures on the existing licensees to innovate and develop in the 2 GHz band. Competitive pressure also exists from terrestrial services, which can further encourage development of innovative MSS services.

4. Risks arising from the RSPG Draft Opinion and concluding remarks

As was set out in EML's response to RSPG's June Questionnaire, the key cost that the EU will incur if it does not renew EML's 2 x 15 MHz authorization in the EU is the potential loss of the opportunity to lead global S band NTN development, and potentially, failure to realize for the EU and globally the benefits to be provided by true wideband S band NTN-NR services.

The only way for the EU to ensure it remains at the forefront of NTN development and access to wideband NTN services is to renew the current licensing of two current operators for at least 2 x 15 MHz of S band spectrum, and the best way to make sure that spectrum is developed rapidly and to its highest and best use is to renew EML's license in particular.

The European Commission should continue to demonstrate the foresight it had in developing the current S band regime by committing to renew EML's EU S band licenses at the earliest possible date. This will

¹⁰ An example is in the widescale use of 2G technology to provide IOT services. IOT services, which can in some instances use low bandwidth services, can leverage low cost 2G to meet market demand. 4G and 5G networks will be no different where services such as NB-IOT / NTN-IOT can be deployed in a single in-band, guard-band or out of band resource block and hence efficiently integrated with other 4G and 5G services. There is no question of long term demand. As we move toward more and more computing everywhere, reduced costs and scale will enable satellite services to bring new benefits to consumers.

give EML the comfort it requires to move forward aggressively with its NTN-NR program and ensure robust European-based NTN-NR services are brought forward in the shortest possible timeframe.

Respectfully submitted,

Jennifer A. Manner
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Annexure A

A.1 Individual Rights for Earth calibration Stations

In section 1.1.1.2 of the Draft RSPG Report, RSPG states that EML has individual rights of use for Earth calibration stations in Denmark (1), Greece (2), Ireland (1), Poland (1), Portugal (1) and Spain (1).

This list is incorrect. EML has been granted individual rights of use for Earth Calibration Stations in Europe and the UK as set out below:

- Cyprus (1)
- Denmark (1)
- France (1)
- Germany (1)
- Greece (3)
- Ireland (1)
- Italy (1)
- Malta (1)
- Poland (1)
- Portugal (1)
- Romania (1)
- Spain (1)
- Sweden (1)
- UK (1)

A.2 List of CGC/MSS authorisations granted by EU Member States

In section 1.1.2.1 of the Draft RSPG Opinion, RSPG sets out the rights of use and authorisations granted by EU Member States to EML. The list provided by RSPG is not complete.

EML provides an updated list of MSS Authorisations granted by EU Member States (excluding EU candidate countries) below:

Country
Austria
Belgium
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary

Country
Ireland
Italy
Latvia
Lithuania
Luxembourg
Malta
Netherlands
Poland
Portugal
Romania
Slovakia
Slovenia
Spain
Sweden

In addition, EML holds several CGC authorisations across the EU Member States.

A.3 Date of Acquisition of Solaris Mobile

In section 1.2.1 of the Draft RSPG Opinion, RSPG states that “*Echostar Corporation has acquired in January 2014 all stock in Solaris Mobile, which was the selected operator for MSS 2GHz by the Selection decision [...]*”.

EML notes that this is incorrect. Solaris Mobile was acquired by Echostar Corporation in December 2013.

A.4 CGC Stations

In section 1.1.1.2 RSPG states that “*Operator Echostar has two regional CGC individual authorisations in Germany*”. In section 1.2.1.2 of the Draft RSPG Opinion, RSPG states that “*EchoStar holds four licences for CGC base stations in Germany and has additional applications pending*”.

EML notes that this is incorrect. EML holds authorisations for, and has deployed, eight CGC stations in Germany in total.