

Your response

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<p>Question 1: Do you plan to use Q/V and/or E bands for gateways in the UK? Please provide further detail as follows:</p> <p>a) Which bands are you planning to use?</p> <p>b) When and for what purposes?</p> <p>c) How much spectrum do you anticipate will be needed in each band referred to in 1a) (indicating the total uplink and total downlink spectrum required)? Please provide evidence to support your capacity estimation.</p> <p>d) If you anticipate needing access to both Q/V and E band please explain the reasons. Provide supporting evidence explaining how you determine how much spectrum will be required for future gateways, and how this demand changes over time.</p> <p>e) What factors would influence your decision to place one or more gateway(s) in the UK? How many gateway locations do you anticipate needing in the UK for each of the frequency bands referred to in 1a). Why?</p>	<p>GSOA salutes Ofcom’s initiative to further explore industry needs in the Q/V and E bands and to allow access for satellite gateways use. Satellite connectivity is important to help meeting the growing connectivity demands of UK consumers and businesses incl. in remote areas where terrestrial networks cannot reach, as well as to connect aircraft and ships.</p> <p>Q/V bands are key for the future of satellite services; access to Q/V bands plays a critical role in enabling feeder links for the next generation of high and very high throughput satellite systems. The satellite industry is massively innovating and growing at a rapid pace and Q/V band spacecraft and terminal technology is becoming more mature and cost-effective. Many of GSOA’s members have either started or are intending to use extensively the FSS allocation in Q/V band for feeder links for future generations of their gateways.¹</p> <p>Any new approach to licensing gateway earth stations in the Q/V band should be based on ensuring access to substantial, contiguous spectrum particularly in the uplink direction for operation of commercial satellite services in the UK and ensuring coexistence with other users.</p> <p>We note that the frequencies 40.5 – 42.5 GHz and 51.4-52.4 GHz are currently not allocated to the FSS in the UK. We respectfully call upon Ofcom to extend the UK allocations to the FSS to include those frequency ranges to align with the ITU RR (see also our response to Q.6 below regarding NGSO).</p> <p>For example, Intelsat Next Generation Satellites Epic 2.0 are designed to include the use of Q/V for gateway links. Intelsat is also assuming frequencies within the range of 37.5-40.5 GHz dual polarization for the downlink and within the range of 47.2-50.2 GHz dual polarization for the uplink. Another example is with near-future satellites SES-25 and SES-26 which gateways will also be using Q/V</p>

¹ See p. 46 of Ofcom’s Space Spectrum Strategy Annex, published 10 November 2022. [Statement: Space spectrum strategy - Ofcom](#)

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	band spectrum to serve customers in the satellite coverage area (incl. UK), with 47.2-52.4 GHz for the uplink and 37.5-40.5 GHz for the downlink.
<p>Question 2: To help us understand the services that the gateways will support, please provide the following information:</p> <p>a) Which downstream services do you anticipate serving with Q/V or E band gateways deployed in the UK?</p> <p>b) For each service in your answer to 2a) please explain which, if any, of these services will be available in the UK and who they would serve.</p> <p>c) For your response to 2b) please indicate when these services are expected to become available globally and to UK consumers.</p> <p>d) Are gateways in the UK required in order to serve UK consumers? If not, do you have plans for gateways (which will use Q/V/E) in other countries, which could be used to serve the UK?</p> <p>e) Do you plan to deploy gateways in the UK to serve consumers in countries other than the UK? If yes, please provide reasons for this approach.</p> <p>f) Are there any other identifiable benefits to UK people and businesses of locating gateways in the UK? If so, please provide evidence of this.</p>	<p>Growing consumer demand for data connectivity has resulted in increasingly congested use of spectrum in lower frequency ranges. Q/V bands are particularly suitable for satellite services due to their sizeable contiguous spectrum and the possibility to offer larger bandwidth availability, enabling a wide range of applications (i.e. high-speed broadband, mobility services, etc.).</p> <p>GSOA supports the development of a licensing regime for satellite GWs in the Q/V as a key step for boosting the growth of the satellite industry in the UK, and for enabling high-data-rate satellite services.</p> <p>Some GSOA members already operate gateways in Q/V bands located in other countries to serve UK territory. This can be due to the current regulation in UK where the spectrum is not available for such usage, thus preventing a local deployment. Locating gateways in UK could bring several benefits to satellite operators and users. For instance:</p> <ul style="list-style-type: none"> • traffic would land closer to the user, thus reducing latency. • it can bring geographic diversity with another gateway in another country, such as improving rain fade resiliency. • for NGSO constellations, it can increase the elevation angle under which satellites are seen or extend time-window of visibility, thus improving service quality.
<p>Question 3: Do you have any information on gateways that are planned to be deployed in the UK in the Q/V bands including technical parameters? If so, please provide details.</p>	N/A

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<p>Question 4: Do you have any comments on the spectrum sharing considerations set out for the gateway downlink and uplink in the Q/V bands? If so, please provide details.</p>	<p>Any new approach to licensing Q/V bands will need to ensure that satellite earth stations are adequately protected from any other existing and future users of the same and/or adjacent bands, and that satellite gateways continue to have access to the full available satellite allocations in a meaningful way on the long-term. A clear and stable regulatory environment is important to give confidence to the industry in investing in these new systems and technologies.</p> <p>We commend Ofcom’s approach to ensuring that appropriate sharing conditions are put in place to manage potential risk of undue interference before adopting specific proposals, as per Section 4 of the consultation document.</p>
<p>Question 5: Do you have any additional information which could facilitate our consideration of coexistence between gateway uplink/downlink and other services in the Q/V band and adjacent bands, as appropriate? If so, please provide details.</p>	<p>Sharing of spectrum between gateways and fixed links benefits of decades of experience with proven rules and conditions of mutual coordination. This approach of mutual coordination, on a first come – first served basis, should be used as a reference to facilitate deployment of gateways in the whole Q/V band.</p> <p>We recommend that Ofcom duly takes into account the measures prescribed by the ECC/DEC/(21)01² to ensure appropriate coordination with terrestrial mobile services and radioastronomy.</p>
<p>Question 6: What are your views on enabling NGSO gateway earth stations to access the 51.4 – 52.4 GHz band before WRC-27 concludes?</p>	<p>We note that the 51.4-52.4GHz frequency band is not allocated to FSS in the UK. However, with WRC-19 decisions, there is an international allocation limited to GSO networks (Earth-to-Space). We invite Ofcom to consider adding the band for FSS to the national FAT.</p> <p>In a near future, industry will need access to multiple GHz for gateway stations plus spectrum for broadband access user terminals (fixed and mobile). The Q/V band spacecraft and terminal technology is falling in price and link budget data in the ITU Study Group 4 (WP 4A) shows feasibility of Q/V user terminals (35cm+ diameter) and lastly the FCC has already licenced Q/V systems (e.g. HNS and Audacy). Five pending licence applications for non-</p>

² [ECC Decision \(21\)01 \(cept.org\)](http://www.eccp.org/Decision/2101)

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	<p>GSOs in Q/V (i.e. O3b, SpaceX, Theia, WorldVu, and Boeing).</p> <p>Also, we kindly note that WRC-27 Agenda Item 1.3 is considering the use of the frequency band 51.4-52.4 GHz to enable use by gateway earth stations transmitting to NGSO orbit systems in the FSS (Earth-to-space).</p> <p>GSOA is of the opinion that Ofcom should wait until the studies on WRC-27 AI 1.3 are completed before adopting a decision.</p>
<p>Question 7: What are your views on initially enabling access to 37.5 – 40.5 GHz for gateways, with a later consideration of the 40.5 – 43.5 GHz frequency range? Do you consider 42.5 – 43.5 GHz to be usable in the uplink?</p>	<p>Given the current situation w.r.t existing Spectrum Access Licenses in the 40.5-43.5GHz band, GSOA supports Ofcom’s proposal to enable access for satellite downlink at 37.5-40.5GHz as a solution to maximize capacity in the near term, with a later consideration of the 40.5-43.5GHz frequency range, for which there is no existing allocation to FSS in the UK FAT at the moment. However, GSOA believes that, in order to establish visibility on the regulatory framework to be applicable in this band, Ofcom should already engage reevaluation of the situation, in anticipation of 2028, to provide sufficient notice for planning and engaging significant investments.</p> <p>Regarding satellite uplink, we respectfully request Ofcom to consider allowing further access for satellite gateways to the 42.5-43.5GHz band in addition to the 47.2-50.2 and 50.4-52.4GHz frequency bands. Coexistence between 42.5-43.5 GHz uplink and 37.5-42.5GHz downlink can be managed by operators when designing their satellites.</p>
<p>Question 8: Do you have any information on gateways that are planned to be deployed in the UK in E band including technical parameters? If so, please provide details.</p>	<p>GSOA notes that there is a general demand for higher frequencies, including E-band, within the satellite community. Some of our members’ next-generation constellations are expected to use spectrum in the E-band for gateways to meet the growing demand of consumers.</p>
<p>Question 9: Do you have any comments on the spectrum sharing considerations set out for the gateway downlink and uplink in E band? If so, please provide details.</p>	<p>N/A</p>

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<p>Question 10: Do you have any additional information which could facilitate our consideration of coexistence between gateway uplink/downlink and other services in E band and adjacent bands, as appropriate? If so, please provide details.</p>	<p>N/A</p>
<p>Question 11: What are your views on considering enabling gateways to use E band before WRC-27 concludes?</p>	<p>Noting that there are currently regulatory gaps w.r.t the management of interference between the services allocated in the E-band to be addressed by the WRC-27, GSOA suggests that Ofcom adopts the “later option” as per para 4.39 b) of the consultation document and wait until after the outcomes of the WRC-27, before prescribing any sharing and compatibility conditions in the E-band. This would allow for greater regulatory certainty.</p>
<p>Question 12: Are there any other points that you deem would be helpful in our consideration of Q/V and E bands for future gateways? In providing your response, please include as much supporting evidence as you can.</p>	<p>GSOA notes that Q/V bands are also expected to play an important role for satellite user terminals, in addition to gateway Earth Stations. Several satellite operators have already announced such plans.</p> <p>GSOA underlines that under the WRC-27 Agenda Item 1.1, technical studies are expected for the development and adoption of the technical and operational conditions, as well as of the appropriate regulatory measures for the use of the frequency bands 47.2-50.2 GHz and 50.4-51.4 GHz (Earth-to-space), or parts thereof, by aeronautical and maritime earth stations in motion (ESIMs) communicating with both GSO and NGSO space stations in the FSS in accordance with Res 176 (Rev.WRC-23).</p> <p>In this context, we respectfully ask Ofcom to consider expanding access for use by satellite user terminals, too.</p>