Consultation response form

Please complete this form in full and return to SharedAccess6GHz@ofcom.org.uk.

Consultation title	Enabling spectrum sharing in the upper 6 GHz band
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Confidentiality

We ask for your contact details along with your response so that we can engage with you on this consultation. For further information about how Ofcom handles your personal information and your corresponding rights, see Ofcom's General Privacy Statement.

Your details: We will keep your contact number and email address confidential. Is there anything else you want to keep confidential? Delete as appropriate.	No
Your response: Please indicate how much of your response you want to keep confidential. Delete as appropriate.	None
For confidential responses, can Ofcom publish a reference to the contents of your response?	N/A

Your response

Question	Your response
Question 1: Do you agree with our proposals to add the 6425-7070 MHz band to the Shared Access framework?	Confidential – N The Dynamic Spectrum Alliance (DSA) applauds Ofcom for taking this important step toward enabling greater use of the upper 6 GHz band by proposing to authorize use by RLAN equipment, including Wi-Fi devices. As DSA has indicated in prior filings, we believe it is imperative for U.K. consumers and enterprises alike to be able to take advantage of the full 1200 MHz of the 6 GHz band for use by a variety of license-exempt device categories and use cases, while protecting incumbent services from receiving harmful interference. Categories of 6 GHz RLAN devices include very low power (VLP) devices that operate indoors and outdoors, low power indoor (LPI) devices, and standard power (SP) devices that can operate indoors or outdoors,[1] based on the Wi-Fi family of standards. Wi-Fi remains the single most impactful wireless technology to extend broadband connectivity to the user. Maintaining the Quality of Service ('QoS') of Wi-Fi will therefore be critical to the success of the U.K.'s gigabit-broadband initiative. However, while supportive of Ofcom's efforts to enable access to the upper 6 GHz band, DSA has concerns regarding Ofcom's proposal to extend the Shared Access licensing framework to this particular band. While Ofcom proposes to enable access to part of the upper 6 GHz under the existing mobile allocation in the Radio Regulations, DSA believes the proposed licensing framework will not adequately fulfil Ofcom's stated objectives of: a) providing the targeted user groups, i.e., industrial, business, and research, with cost-effective connectivity, and b) using the upper 6 GHz spectrum more efficiently. DSA is further concerned that Ofcom's proposal does not consider consumer needs for gigabit speed and low-latency wireless connectivity, which require access to additional mid-band spectrum for Wi-Fi 6E and, in the future, Wi-Fi 7. It is our view that the best use for the whole 6 GHz band (5925-7125 MHz) is for licence-exempt operations, rather dividing it between licence-exempt and hyper-localized licensed operations. As DSA has noted previously, the evolution of Wi-Fi 6E to next generation Wi-Fi, known as Wi-Fi 7, will necessitate access to the full 1200 MHz bandwidth from 5925-7125 MHz to support current and emerging innovative use cases. Wider channel bandwidths increase spectrum efficiency and enable the delivery of high-bandwidth applications and services. Were the upper 6 GHz band licensed as proposed, it would limit license-exempt operations to a single 320 MHz channel in the lower 6 GHz band. Technological advances and accelerating deployments of ultra-fast access networks (fibre, cable, and Fixed Wireless Access) will provide speeds in excess of 1 Gigabit per second (Gbps) to households, enterprises, and public institutions. Some broadband providers are already offering residential customers Fibre to the Home (FTTH)

[1] Standard power devices intended for outdoor use incorporate an emission mask that limits emission above an angle to the horizon, as determined by the National Regulatory Agency.

	connectivity with data rates exceeding 10 Gbps. By 2030, peak data rates between 50 and 100 Gbps are expected.[2] These data rates will have to be made available to users, most of whom will be using their connected devices indoors, with most devices being connected through Wi-Fi. To respond to these demands, additional licence-exempt mid-band spectrum for LPI and VLP needs to be made available. DSA also believes that there is a market need for Wi-Fi SP indoor and outdoor devices, which can operate in the upper 6 GHz band, provided that a suitable coordination mechanism is established to avoid interference to incumbent users. Rather than extending the Shared Access licence framework, which will have a number of negative consequences for Wi-Fi SP adoption as proposed, DSA recommends that Ofcom instead consider implement of an Automated Frequency Coordination (AFC) system to enable more flexible license-exempt operations while also ensuring protection of incumbent users.
Question 2: Do you have any comments on potential uses for this licence?	Confidential – N In its proposal, Ofcom names industrial and research applications, such as factory robots and sensors, Augmented Reality (AR), healthcare monitors, wireless medical equipment, and private network connections, as targets for licensed shared access. DSA is of the opinion that, while there may be some very specific applications that could benefit from a licencing regime, the large majority of the mentioned applications can be realised with licence-exempt technologies, and specifically Wi-Fi 6E and Wi-Fi 7. In order to use spectrum most efficiently, applications necessitating a licenced regime could instead utilise the 3.8-4.2 GHz band, which was made available for use by private and local networks. We note that stringent QoS requirements that in the past might have justified the use of licensed technologies typically exist in enterprise environments where networks are carefully managed. Unlike previous generations of Wi-Fi, Wi-Fi 6/6E and Wi-Fi 7 are based on OFDMA technology and are thereby able to achieve very high QoS levels, particularly in managed networks. There are various other QoS-enhancing mechanisms and features, particularly in Wi-F 7, such as multi-link operation that will improve throughput by aggregating links, enhance reliability by transmitting multiple copies of the same frame in separated links, decrease channel access delay by selecting the first available link in terms of latency, and enable isolation of time-sensitive traffic from other network traffic. Education and healthcare are two prominent and societally relevant use cases that will greatly benefit from the possibilities offered by Wi-Fi 6E and Wi-Fi 7, provided that also the upper 6 GHz band will be made available for licence-exempt use. Given that Wi-Fi Alliance-certified products are available for the full 6 GHz band (5925-7125 MHz), DSA strongly recommends that Ofcom consider the impact of its proposed licencing framework on consumer needs and adoption. While licencing the 6425-7070 MHz band for low-power communications indoors might be sufficient for certain limited industrial, business, and research uses, it will not address the need for additional access to mid-band licence-exempt spectrum for mass-market consumer use. Noting Ofcom is participating in the international preparations for WRC-23, DSA does not believe that an IMT identification is needed under WRC-23 Agenda Item 1.2, but rather that the band should be made

[2] Analysys Mason: Full-fibre access as strategic infrastructure: strengthening public policy for Europe, June 2020. BREKO: Breitband Kompass 2016-2017, IEEE ComSoc: “More Bandwidth, Please” (presentation)

	available on a licence-exempt basis in the same manner that the lower 6 GHz band is available for LPI Wireless Access Systems / Radio Local Area Networks (WAS/RLAN) and VLP portable indoor/outdoor WAS/RLAN, and that Ofcom consider use of an AFC in lieu of licensing to coordinate SP device operations.
Question 3: Do you have any comments on our proposed licence conditions, licence fee or minimum separation distance?	Confidential – N DSA appreciates Ofcom's efforts to remain flexible in its licensing approach for the 6 GHz band. However, we are concerned that, were Ofcom to adopt its current proposal, including the possibility of future license revocation, the resulting market uncertainty could inadvertently discourage market adoption. Considering industry's experience with Ofcom's decision in 2018 to expand the 60 GHz band to 71 GHz for Multi-Gigabit Wireless Systems, followed by its decision the following year to support IMT identification in 66-71 GHz, and the subsequent WRC-19 decision, the *caveat emptor* regarding potential license revocation is warranted and appreciated. Potential licensees, though, may choose to take a rational wait-and-see approach, which would delay investment decisions and subsequent adoption, especially if there is any prospect that WRC-23 may be delayed. Furthermore, DSA disagrees with Ofcom's assumption that consumers will benefit if the upper 6 GHz band were licensed for 5G. Consumers would actually be harmed because there would be no licence-exempt access to the full 6 GHz band as a result. In its proposal, Ofcom states "Indoor-only licences are not subject to detailed technical coordination before they are issued, as building attenuation provides sufficient protection to other users." DSA agrees with this assessment, and as such, does not believe that licensing LPI devices is necessary. Furthermore, given that Ofcom considers Wi-Fi to be the technology likely to dominate the upper 6 GHz band under these conditions, DSA notes that a 100-metre minimum separation distance between networks would be unnecessary because Wi-Fi technology is capable of self-coordination and coexistence. More broadly, DSA is concerned that the proposed £320 per annum per license fee and the 50-meter radius around a central coordinate will discourage consumer and small businesses adoption. At the proposed power levels in the upper 6 GHz band, a typical home will require a Wi-Fi radio and range extenders. It is unclear if Ofcom will require each Wi-Fi range extender operating in the upper 6 GHz band to obtain its own license and maintain minimum separation distances. The impracticality of this approach would have a chilling effect on adoption by consumers and small businesses. Additionally, the advertised 100-meter minimum separation distance between the centre point of any two user licenses will certainly make deployments in densely populated areas and multi-story buildings much more challenging, especially if the licenses are made available on a first come / first serve basis. DSA generally agrees that "further work to understand whether and how licence exempt Wi-Fi or licensed 5G mobile can share the band" is warranted. To that end, DSA recommends that the topic of identifying bands that will support additional access to licenced mid-band spectrum be expanded to look beyond merely the 6 GHz band as there are other mid-band spectrum bands already identified for IMT.

Question 4: Do you have any comments on our technical analysis?	Confidential – N DSA is not familiar with studies focusing on “technical compatibility work to establish whether and how 5G mobile and licence-exempt Wi-Fi could share the band with each other”. We would be interested in understanding Ofcom’s plans for these studies.

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