

Your response

Question	Your response
Question 1: Do you have any comments on our impact assessments as set out in Annex 1? Please specify whether your comments relate to: • our wider impact assessment; • our equality impact assessment; or • our Welsh language impact assessment.	Confidential? – N Our comments relate to both the wider impact assessment and the equality impact assessment. The 450 Alliance supports Ofcom’s overall aim of enabling innovative use of spectrum for drones, and welcomes the structured, evidence-based approach taken in this consultation, including the detailed coexistence analysis in Annex 1 with more detailed analyses in Annex 3 and in Annex 4. We observe, however, that 450 MHz is one of the most intensively used bands in the UK spectrum inventory, and one of the most sensitive from a cross-border perspective. Ofcom’s coexistence analysis in Section 4 and Annex 3 concentrates on domestic UK users of the band and addresses international coordination only in general terms, via a Memorandum of Understanding with Ireland (paragraphs 4.26–4.28). No equivalent treatment is given to coordination with France, Belgium and the Netherlands across the Channel and southern North Sea, nor to the particular risks created by airborne emitters as opposed to the ground-based business radio deployments for which existing coordination arrangements were designed. The harmonised technical conditions for the 450–470 MHz band in Europe are set out in ECC Decision (19)02, referenced at paragraph 4.19 of the consultation. This decision establishes a common channelling arrangement, including a consistent duplex direction (uplink in the lower part, downlink in the higher part of each paired sub-band), that underpins the design of 3GPP-compliant LTE450 and 5G networks operating in bands 31, 72, 87 and 88 in numerous countries, including France, Germany, Ireland and the Netherlands. The UK’s channel plan for business radio in the 450–470 MHz band, as illustrated in Figure 4.1 of the consultation, does not follow this harmonised arrangement in the same way: business radio licences are assigned without a fixed duplex direction, so the direction of transmission in a given UK channel does not necessarily mirror the direction used for the same or adjacent frequencies by 3GPP networks across the Channel, the southern North Sea and the Irish border. In effect, for part of the shared 450–470 MHz range, the UK’s channel plan is reversed relative to the harmonised European arrangement. This asymmetry already causes real interference in practice. Our members operating LTE450 and 5G networks in the countries neighbouring the UK have reported base-station receive interference originating from UK 450 MHz transmissions, and have in turn had to apply additional guard bands and coordination margins to protect UK users, precisely because the direction of transmission cannot be assumed to be symmetrical across the border.

Question	Your response
	In addition to this issue, there is also the additional interference risk due to the drones' altitudes. We recognise that Ofcom's coexistence analysis (Annex 3) already accounts for the greater coordination challenge posed by drones' higher operating altitude and mobility relative to typical business radio use (paragraph 4.20), and welcome the proposed exclusion zones, adjacent-channel separation and height/power limits (100m AGL, 10W ERP) as reasonable steps to protect co-channel and adjacent-channel UK users. However, these measures again are calibrated against domestic UK service areas and thresholds, and we are concerned they may not adequately capture cross-border propagation risk, for three reasons: • Elevated antenna height: an airborne transmitter at up to 100m AGL has a substantially extended radio horizon compared with a typical business radio base station at 15m AGL (as assumed in Ofcom's own methodology, paragraph 4.31, footnote 34). Combined with over-sea propagation paths, which typically experience less attenuation than over-land paths, this could extend the effective interference range of UK drone deployments well beyond what current coordination arrangements for ground-based business radio anticipate — particularly relevant along the English Channel and southern North Sea coasts, and along the Irish land border. • Frequency flexibility across the full 450–470 MHz range: paragraph 4.61 proposes that drone radio equipment be required to be “fully frequency flexible to operate between 450–470 MHz”. Given the reversed duplex arrangement described above, this flexibility means a UK drone licensee could, over time or through licence variation, be assigned a frequency corresponding to the downlink (base station transmit, and receive-sensitive uplink) sub-band used by a neighbouring 3GPP network, rather than remaining fixed to the frequencies assessed in Ofcom's initial coexistence analysis. • Airborne mobility: unlike a fixed business radio base station, a drone's pattern of operation within its designated service area and exclusion zone (paragraphs 4.56–4.58) may vary over the life of a licence, including its proximity to international borders or coastlines. Considering the situation within the UK borders, statement A1.3 in Annex 1 states: <i>In the case of 450 MHz, availability would be mostly limited to rural and remote areas including many areas in Scotland. This is due to higher use of the band by existing business radio users especially in England and in urban areas.</i> Please note however that utilities currently tend to rely on wireless communications especially in such rural areas, so that interference in rural areas may turn out to be harmful for critical infrastructures there. So even in regions

Question	Your response
	where spectrum usage density is relatively low, interference may have severe impact.
Question 2: Do you agree with our assessment of the 450 MHz and 5030-5091 MHz bands for drone control links? Do you agree there is demand for these bands in the UK (please identify any relevant use cases and locations in your response)? Are there any other frequency bands we should consider for control links?	Confidential? – N As elaborated in our answer to Question 1, the 450Alliance is of the opinion that the impact analyses for the 450 MHz band insufficiently address the combination of (a) cross border interference issues; (b) additional interference due to the ‘reversed band order’ at 450MHz in the UK and (c) higher interference risks due to the drones’ altitudes. So as far as the 450 MHz band is concerned, the 450Alliance does not agree with the proposal in Table 3.2 (to which this Question refers). Alternatives may be found in the 470-694 MHz band, for example in 3GPP bands 71 and 105. Also a combination with possible future assignments for PMSE in the 470-694 MHz may be considered.
Question 3: Do you have any comments on our proposed approach to coordinating drones with other users of the 450 MHz band? In your response, please indicate whether it relates to co-channel or adjacent channel use, and provide evidence for any coexistence issues raised.	Confidential? – N Again referring to our answer to Question 1, the 450Alliance misses the recognition of cross border interference risks, for which coordination will be much more complex than for coordination among domestic users. For the domestic situation, the methodology in Chapter 4 would in principle work, where it should be noted that business radio may be a critical service for which co-channel use may imply unacceptable risks, even if wide exclusion zones are applied. Finally, coordination between drone operators and terrestrial network operators (and among drone operators themselves) would be easier if the drone operator is required to comply with 3GPP standards. We would strongly recommend Ofcom to take this into account as well.
Question 4: Do you have any comments on our proposed 450 MHz drone authorisation approach? Please provide any specific views (including technical justification where relevant) on: • the proposed technical conditions, including operating height AGL, power, channel bandwidth, designated service area, and number of base stations; • the proposed non-technical conditions, including licence fees and term, frequency flexibility and complying with CAA rules and radio equipment standards; and • reviewing our initial authorisation approach.	Confidential? – N Please refer to our answer to Question 1 where we comment on this topic.

Question	Your response
Question 5: Do you have any comments on our proposed 5030-5091 MHz drone authorisation approach? Please provide any specific views (including technical justification where relevant) on: • the portion of the band proposed for early release (5040-5060 MHz); • the proposed technical parameters and approach to coordinating drones and/or protecting other users of the band; and • the proposal to phase out licences once there is global harmonisation, the required transition period and sunset clause.	Confidential? – N No comments
Question 6: Do you have comments on our proposal to create a new drone detection radar licence for the 24 GHz band, including the proposed technical and non-technical conditions, the proposed draft licence in Annex 12, and our coexistence analysis in Annex 6? Please provide evidence for any issues raised.	Confidential? – N No comments
Question 7: Do you have comments on our proposal to create a new drone detection radar licence for the 16 GHz band on a case-by-case basis, including the proposed technical and non-technical conditions and proposed draft licence in Annex 12? Please provide evidence for any issues raised.	Confidential? – N No comments
Question 8: Have you identified any other frequency bands we should consider for drone control links in the longer term?	Confidential? – N No comments
Question 9: Do you have any comments related to the existing satellite frequencies available for drone control links?	Confidential? – N No comments
Question 10: What are your needs and priorities for accessing spectrum for drone safety? Do you have interest in future use of 15 GHz and/or 76 GHz, or other specific frequencies and bands for similar drone safety use?	Confidential? – N No comments

Question	Your response
Question 11: Do you have any interest in ground based UAT to complement the aerial component in 978 MHz licences?	Confidential? – N No comments
Question 12: Are you interested in or do you have any plans to trial the use of ISAC for drone detection purposes?	Confidential? – N No comments
Question 13: Do you have any other comments on this consultation document?	Confidential? – N xxx