

Small-scale radio multiplex licences

Guidance notes for applicants and licensees

Guidance Note

Published 28 January 2025



Contents

Section

1. Overview	3
2. What is a small-scale radio multiplex licence?.....	4
3. Information about applying for a small-scale radio multiplex licence	5
4. Completing the application form.....	14
5. From licence award to launch.....	35
6. Information for small-scale radio multiplex licensees	43
7. Post-launch changes to transmission arrangements	50

Annex

A1. Miscellaneous technical information and guidance.....	54
A2. Planning tool settings and comparison predictions	61
A3. Guide to launching flowcharts	65
A4. Frequently asked questions.....	72

1. Overview

- 1.1 These notes are intended to help applicants for small-scale radio multiplex licences understand the licensing process, assist them in preparing high quality and appropriately evidenced applications, and enable new licensees to understand their licence conditions and associated obligations. The guidance notes should not be relied upon as legal advice, nor be understood as modifying the effect of the statutory requirements or the conditions of the licence.
- 1.2 Applicants should seek their own legal advice on the licensing process and requirements, and when making their own independent assessment on the information that should be included in their application.
- 1.3 In providing the information in these guidance notes, Ofcom is not making, nor implying any judgements on the commercial prospects (or otherwise) of licensed services, or that they will be profitable.
- 1.4 Ofcom makes no representation or warranty, express or implied, with respect to information contained in these guidance notes (together with the standard form licence and other documents referred to in this document) or with respect to any written or oral information made or to be made available to any potential applicant or its professional advisers. Any liability therefore is expressly disclaimed.
- 1.5 This document, published on 28 January 2025, is a revised version of the small-scale radio multiplex guidance notes that were first published by Ofcom on 1 September 2020. They were subsequently revised on 1 June 2021, 25 January 2022, 14 July 2022, 30 March 2023, 18 July 2023, and 2 January 2024.
- 1.6 In this latest revision of these notes we have added guidance on engineering tests and silent audio services to Annex A1, and there is a new 'frequently asked question' on local ownership overlaps at Annex A4. Note that Annex A1 (formerly 'DAB spectrum allocation - Band III background') has been renamed to 'Miscellaneous technical information and guidance'.
- 1.7 These guidance notes (and the relevant application forms) may be further updated from time to time. Licensees should check Ofcom's website to make sure they are using the most recent version. Ofcom may alter or correct any part of this document. Licensees should also be aware that certain key features such as fees, procedures and content codes, may also change in the future.

2. What is a small-scale radio multiplex licence?

- 2.1 Radio multiplex services are bundles of radio channels that have been digitised and compressed to use less spectrum, which are then transmitted using a single frequency block. Owners of DAB digital radios can listen to many channels broadcast by a (smaller) number of radio multiplex services. There are three types of radio multiplex service: national, local and small-scale.
- 2.2 Small-scale radio multiplex services (often referred to as ‘small-scale DAB’) are the most recent of the three types or ‘layers’ of multiplex, enabled by the Small-scale Radio Multiplex and Community Digital Radio Order 2019 which applies the Broadcasting Act 1996 with modifications for the purposes of licensing small-scale radio multiplexes. These multiplex services are intended to employ a way of transmitting digital radio that uses advances in software and low-cost computer technology to provide a flexible and inexpensive approach to the terrestrial broadcast of digital radio services to a relatively small geographic area. By targeting relatively small geographic areas, small-scale radio multiplex services provide a route to digital for existing community and smaller commercial analogue services (and new services) which wish to target a smaller area than the coverage area of a national or local radio multiplex.
- 2.3 A small-scale radio multiplex licence is required to operate a small-scale radio multiplex service. A separate licence is required for each multiplex being operated, and it is possible for a licensee to hold several such licences, subject to limitations explained in Section 3. A small-scale radio multiplex licence only covers the operation of the multiplex itself, and not the individual radio stations (known as ‘digital sound programme services’) transmitted by the multiplex. These radio stations require their own licences - either a [Community \(C-DSP\) licence](#) or a [standard \(DSP\) licence](#).
- 2.4 A [sample small-scale radio multiplex licence](#) is available on the Ofcom website. We describe some key features of the licence in Section 5, but this is not intended to be exhaustive.

3. Information about applying for a small-scale radio multiplex licence

This section contains important information you should take into account before submitting your small-scale radio multiplex licence application form to Ofcom.

Eligibility and ownership restrictions

General disqualifications

- 3.1 It is important to be aware of the eligibility and ownership restrictions in relation to a small-scale radio multiplex licence. Some of these are the same as apply to other types of Broadcasting Act licence, but others are specific to small-scale DAB.¹ These restrictions were included principally to restrict the extent to which there is overlap in the ownership of the national, local and small-scale layers of radio multiplexes, and to avoid concentration of ownership of small-scale multiplexes, particularly within a locality.
- 3.2 As is the case for local and national radio multiplex licences, and many other classes of Ofcom licence, disqualified persons under Part II of Schedule 2 of the Broadcasting Act 1990 cannot hold a small-scale radio multiplex licence. This includes certain types of ‘political’ body (such as a local authority or political party), religious bodies, bodies receiving more than 50% of their income from public funds, the BBC and S4C, and advertising agencies. It also includes bodies in which such groups or individuals are participants. We do not go into detail on these disqualifications in the notes of guidance but ask relevant questions in the application form. We strongly recommend potential applicants which are, or are linked to, these types of potentially disqualified person to seek independent advice prior to application. We would not be able to grant a licence to a disqualified person and would be required to take steps to revoke a licence if information emerged post-grant that a licensee was disqualified.

Specific disqualifications

- 3.3 The disqualifications which are specific to small-scale radio multiplex licences are contained in section 44A of the Broadcasting Act 1996 as modified by the 2019 Order. The first of these is that a licensee must be a body corporate.² There are a wide variety of types of body corporate including companies limited by shares, companies limited by guarantee, limited liability partnerships, and community interest companies. Individuals and unincorporated associations can hold some other types of Ofcom licence, but they are disqualified from holding a small-scale radio multiplex licence. However, it should be generally relatively

¹ See, in particular, sections 44 and 44A of the Broadcasting Act 1996 as modified by the Small-scale Radio Multiplex and Community Digital Radio Order 2019.

² Section 44A(1)(a) of the 1996 Act as modified by the Order.

straightforward for a person or group in that position to establish a company which would be able to apply for and hold a licence.

- 3.4 Other disqualifications in section 44A are of relevance if the applicant, or a participant in the applicant, is already involved in operating other radio multiplexes (whether at the national, local, or small-scale layer) or in a national (analogue) sound broadcasting service. This is a complex area where applicants should seek independent advice where relevant, but we summarise the key provisions in the following paragraphs.

Those involved in a national radio multiplex or national sound broadcasting licensee

- 3.5 Holders of a national radio multiplex licence³ or national sound broadcasting licence⁴, and those “connected” with such licence holders, are disqualified from holding a small-scale radio multiplex licence. Connected parties include those controlled by - or controlling - a licensee. This means that the licensee of a national radio multiplex or national sound broadcasting service cannot hold a small-scale radio multiplex licence, and nor can another member of its corporate group.⁵ Note that this is a simplified description of the definition of “connected” parties which can be found in Schedule 2 of the 1990 Act. Where an applicant is linked via ownership/control with a multiplex licensee, it is important that they carefully consider the detailed definition, seeking independent legal advice as required (Ofcom is not able to provide such advice to individual applicants).
- 3.6 A body covered by this broad disqualification can in some circumstances be a “participant” in a small-scale radio multiplex licensee (i.e. hold a legal or beneficial interest in shares or voting rights). However, there are two important limitations:
- a) Shareholding and voting rights are strictly limited to 30%. If a national radio multiplex or national sound broadcasting licensee (or connected person) has an interest of over 30% in a body corporate, that body corporate is disqualified from holding a small-scale radio multiplex licence.⁶
 - b) Additionally, a national radio multiplex or national sound broadcasting licensee (and connected persons) can only be a participant in up to six small-scale radio multiplex licensees. That is, even if they keep their shareholdings or voting interests below the 30% threshold, they cannot be a participant in more than six such licensees.⁷

Those involved in a local radio multiplex licensee

- 3.7 There is a more limited disqualification for local radio multiplex licensees and connected persons (again, this essentially covers members of their corporate group, but independent legal advice should be sought where there is uncertainty). These are disqualified from holding a small-scale radio multiplex licence, but only if the coverage area of their local radio multiplex service overlaps with that of the small-scale radio multiplex service in question.⁸

³ There are the two national radio multiplexes held by Digital One and Sound Digital.

⁴ These are the national analogue commercial radio services that currently broadcast as Classic FM, Absolute Radio and Talk Sport.

⁵ Section 44A(1)(d) of the 1996 Act as modified by the Order.

⁶ Section 44A(1)(e) of the 1996 Act as modified by the Order.

⁷ Section 44A(1)(f) of the 1996 Act as modified by the Order.

⁸ Section 44A(1)(g) of the 1996 Act as modified by the Order.

- 3.8 There is no materiality threshold in relation to the size of the overlap between the small-scale and local radio multiplex in question. Any overlap between coverage areas, regardless of how small, will trigger the disqualification.
- 3.9 A local radio multiplex licensee can, however, be a participant in an overlapping small-scale radio multiplex licensee in some circumstances (again, this covers shareholders or those with voting rights). This participation is strictly limited to a 30% interest. If a local radio multiplex licensee (or connected person) has an interest of over 30% in a body corporate, that body corporate is disqualified from holding a small-scale radio multiplex licence.⁹

Those involved in other small-scale radio multiplex licensees

- 3.10 A corporate body can hold more than one small-scale radio multiplex licence. However, a licensee and connected persons (again, essentially members of its corporate group but independent legal advice should be sought where there is uncertainty) cannot hold more than 20% of all such licences that have been granted.¹⁰ Additionally, a corporate body is disqualified if it has as a participant a person which is a participant in corporate bodies, which when taken together, hold more than 20% of such licences.¹¹ The term “participant” is defined in the 1990 Act, but it should be noted that it covers both legal and beneficial holding of shares or voting power in a company, and there is not a lower limit on the size of that holding. However, this does not limit other kinds of involvement by one individual or company in multiple licensees, such as provision of professional advice on a contractual basis, so long as this does not involve meeting the legal definition of “participant”.
- 3.11 We would advise prospective licensees wishing to hold multiple small-scale radio multiplex licences, as a purely practical point, to build in a degree of headroom to avoid a situation where a third party surrendering a licence might push them into triggering the disqualification in future. For example, if a licensee held exactly 20 of 100 licences in issue, they would not trigger the disqualification. However, they would risk a situation where an entirely unrelated licensee surrendering their licence (so only 99 were in issue) would disqualify them in relation to all 20 licences. Holding 18 or 19 licences instead of the full 20 technically permitted would substantially reduce that risk. In relation to the rule on overlapping participation, clearly managing the involvement of a shareholder or other participant in otherwise unrelated licensees is more challenging. However, we ask questions relevant to this matter on application and, post-award, would require prompt action to address a potential disqualification if one came to light (for example due to subsequent awards or shareholding changes).
- 3.12 Perhaps the most complex disqualification relates to situations where a small-scale radio multiplex licensee or connected person (again, essentially members of its corporate group but independent legal advice should be sought where there is uncertainty) holds multiple licences whose coverage areas overlap with one and the same local radio multiplex coverage area “to a significant extent”. The legislation leaves it to Ofcom’s discretion to determine what this means, but we interpret significance in light of section 50(2)(c) of the 1996 Act, which refers to the desirability of ensuring, where a single small-scale radio multiplex overlaps with a local radio multiplex, the population in that overlap is less than 40% of the population in the coverage area of the local radio multiplex. With this in mind,

⁹ Section 44A(1)(h) of the 1996 Act as modified by the Order.

¹⁰ Section 44A(1)(b) of the 1996 Act as modified by the Order.

¹¹ Section 44A(1)(c) of the 1996 Act as modified by the Order.

we consider that the disqualification applies if a small-scale radio multiplex licensee (including any connected person) holds licences which collectively cover more than 40% of the population covered by a single local radio multiplex. We have stated our intention to apply this strictly, so the 40% threshold cannot be crossed even by a small amount.

3.13 To provide some examples:

- a) If a licensee holds a single small-scale radio multiplex licence the coverage of which includes 20% of the population covered by a particular local radio multiplex licence, it can apply for and hold a further small-scale radio multiplex licence which extends that overlap as long as the total overlap remains below 40%. So, even if this was a fairly large 15% overlap, say, with the local radio multiplex we would not consider this to trigger the disqualification.
- b) Similarly, a licensee could hold multiple small-scale radio multiplex licences with relatively minor overlaps with a single local radio multiplex (e.g. it might have two licences each covering a different 10% of the population of the local radio multiplex, and three more each covering 5% - this would be a total of 35% which would not trigger the disqualification).
- c) However, a licensee with a small-scale radio multiplex licence covering only fractionally under 40% of a single local radio multiplex would not be able to hold further licences overlapping, even only slightly, with that local radio multiplex. This is because any overlap, however small, leading to the 40% threshold being breached would trigger the disqualification.

Submitting a valid application

3.14 Please read these guidance notes carefully before applying for a licence. Section 4 sets out detailed instructions on how to complete the application form, which is divided into Part A (public) and Part B (confidential). These guidance notes also contain important information that applicants and licensees need to know, so should be read in full.

3.15 If you still have a query, you can contact Ofcom by email (smallscaleDAB@ofcom.org.uk). We cannot provide legal advice or pre-approve applications but can answer general questions.

3.16 These guidance notes and the application form may be revised from time to time. Applicants should check the Ofcom website prior to submitting their application to ensure that they have read and completed the current version of these documents.

3.17 Applications may be submitted in Welsh. Any application submitted in Welsh will be treated no more or less favourably than an application submitted in English.

3.18 You must answer all questions in the application form and respond "N/A" to any questions that do not apply to the applicant. Please answer all questions as fully as possible, expand boxes or use extra sheets if required, and, if necessary, send copies of other documents to illustrate an answer. You must also provide the supporting documentation listed in these guidance notes (and in Section 7 of Part B of the application form). We strongly prefer to receive application forms which have been completed on a computer - we request that applicants download the current editable version of the application form (which is divided into Part A and Part B) from our website and complete it on a computer. Ofcom will accept handwritten application forms, but they must be filled in using block capitals. Ofcom may

reject applications made using an old version of the form and any application forms that are illegible.

- 3.19 Ofcom may reject applications which do not meet the following criteria:
- a) The declaration at the end of each of Part A and Part B of the application form must be signed and dated.
 - b) The person who signs and makes the declarations on behalf of the applicant must be:
 - i) a director of the company or the company secretary (where the applicant is a company); or
 - ii) a designated member (where the applicant is a Limited Liability Partnership).
 - c) All supporting documents as requested in the checklist in Section 7 of Part B the application form must be supplied in legible form and translated into English or Welsh where applicable.
- 3.20 If you are completing the form as an agent, i.e. you are acting on the applicant's behalf, please note that you cannot sign it on your client's behalf, and that the person signing the form needs to have personally checked the truth and completeness of the responses given. If your client wishes you to be Ofcom's main contact in relation to the application, please make this clear in an accompanying letter, and provide evidence of your authority to act on behalf of the applicant. The form should include information about the applicant, not the agent. If Ofcom has further questions once the application has been submitted, we will direct these to the applicant, not to the agent, but we will accept responses from the agent.
- 3.21 Applicants must make their own independent assessment after taking their own professional advice and making such further investigations as they deem necessary on all relevant matters.

Supporting documentation

- 3.22 You must provide a range of supporting documentation when submitting the application form. Please refer to the checklist in Section 7 of Part B of the application form before submitting your application. Please note that we reserve the right to reject incomplete applications, so it is important you provide all necessary documents in your application.

Submitting your application form to Ofcom

- 3.23 The application form (please ensure you complete both Part A and B) and required supporting documents must be submitted by email to smallscaleDAB@ofcom.org.uk by the specified closing-date. The deadline for receipt of applications will be strictly enforced, so you are advised to submit your application in plenty of time to allow for any potential delivery problems. Handwritten applications and required supporting documents should be scanned and attached to an email.
- 3.24 You should receive a response from smallscaleDAB@ofcom.org.uk confirming that your application has been received by Ofcom. If you do not receive a response, it is likely your application has not been received and you should contact Ofcom's Contact Centre on 0300 123 3333 and ask to leave a message for the Broadcast Licensing team, who will respond to your message as soon as possible.
- 3.25 If there is a compelling reason why you cannot submit the application form and/or the supporting documentation by email, you must contact Ofcom in advance (at least one week

in advance of any submission deadline) to discuss this. In such cases, please call Ofcom's Contact Centre on 0300 123 3333 and ask to leave a message for the Broadcast Licensing team, who will respond to your message as soon as possible. Alternatively, you can email smallscaleDAB@ofcom.org.uk. If permission is given, the applicant must write "Small-scale radio multiplex licence application" on the envelope.

- 3.26 Ofcom will send an acknowledgment of applications received by post within five working days of receipt.
- 3.27 Ofcom may reject applications submitted by post without Ofcom's prior approval.
- 3.28 Ofcom cannot receive emails larger than 35 MB. If your application email exceeds this limit, please send your supporting documents in a separate email, or emails, clearly stating the applicant's name in the subject line of the email along with the name of the multiplex being applied for.
- 3.29 Submission of an application will be taken as evidence that the applicant is willing to accept a licence if one is granted, on the terms set out in these guidance notes and in the standard form licence for a small-scale radio multiplex licence. Submission of an application also indicates the applicant's consent for Ofcom to publish the non-confidential 'Part A' application form (and any non-confidential supporting documents submitted alongside the application) on its website.

Application Fee

- 3.30 The application must be accompanied by the application fee. Ofcom will not assess an application until the fees have been received in Ofcom's bank account.
- 3.31 The current application fee is £500 per application. The application fee is non-refundable.
- 3.32 Application fees are reviewed by Ofcom annually, and applicants should consult the Ofcom website for the most up-to-date fees. Our tariff tables are published no later than 31 March each year.
- 3.33 Payments should be made by bank transfer (BACS/CHAPS), with a confirmation of payment emailed to ofcom.remittances@ofcom.org.uk, copied to broadcast.licensing@ofcom.org.uk, immediately after the applicant has instructed their bank to make the payment.
- 3.34 To ensure that Ofcom can identify the payment, it must include a payment reference which is the applicant's postcode, in the case of a company, partnership or unincorporated body applying for the licence, the applicant's name will be the name of the company, LLP, partners or members of an unincorporated body who have applied for the licence, not the individual who has submitted the application on its behalf.
- 3.35 The bank details to be used to pay the application fee are:

Account Name: Office of Communications
Bank details: Lloyds Bank, 69-73 Borough High Street, London SE1 1NQ
Account number: 00782415
Sort code: 30-97-90
BIC: LOYDGB21351
IBAN: GB05 LOYD 3097 9000 7824 15
SWIFT: LOYD GB 2L

Assessment process

- 3.36 We will assess applications against the statutory assessment criteria and our general duties, based upon the proposals presented in the completed application. It is the applicant's responsibility to ensure that submitted applications are complete and conform fully to the requirements set out above and in Section 4 below. Once received, no material amendments to the application may be made by the applicant nor any new material introduced, without the agreement of Ofcom. Ofcom will not agree to any such amendment which it considers would prejudice the public consultation on the applicant's proposals or would be unfair to any third party such as another applicant for the licence.
- 3.37 In the course of assessing applications, Ofcom may seek clarification and/or amplification of proposals in any application and require any applicant to furnish such additional information in such form or verified in such manner as we may specify. This will usually be done through contacting the individual nominated in the application.
- 3.38 The award decision will be announced as soon as practicable after it has been taken.¹² Where awards have been made, we also propose to publish the key determining factors which led to our decision to award to a successful applicant. Note: we intend to award only one small-scale radio multiplex licence for each area that we advertise (i.e. we have no plans to award additional small-scale radio multiplex licences for a given area once a small-scale radio multiplex service has been licensed by us to serve that area because of limited spectrum availability across the UK).

Timescales for assessing applications

- 3.39 As a guideline, our aim is to reach an award decision on a licence within six months of the closing-date for applications, though it may take significantly longer for us to assess applications if there are particularly high numbers of licences being advertised, or a high number of applications are received for particular licences. The timeframe also assumes that full and accurate information has been provided by the applicant in the application form and accompanying documentation. Applications will not be assessed unless all the requested information has been submitted. Note that applications for which potential issues arise relating the ownership restrictions and eligibility requirements may take longer to assess.

Between application and award

- 3.40 It is understandable that applicants may wish to continue to develop launch plans following submission of an application. This may include, for example, by continuing discussions with prospective DSP/CDSP providers in the locality, with financial backers, and with those involved in implementing the applicant's technical plan.
- 3.41 However, Ofcom cannot accept amendments to submitted applications after the closure of applications. This is to ensure fairness to all applicants, particularly given that non-

¹² Before we can announce the award of licences for areas that are in macros areas, we will need additional time to allocate frequencies, and therefore expect to announce the award of all localities contained within a macro area in a single batch (although we do not rule out earlier announcement for some localities if practicable in spectrum planning terms).

confidential versions of all applications are published by Ofcom as required by the legislation to enable third party comments.

- 3.42 It is possible to withdraw an application where, for example, an applicant is no longer confident that it would be in a position to launch within the 18-month maximum period allowed between award and launch. Any withdrawal of an application should be notified promptly to Ofcom. Significant caution is, however, required in communicating with other applicants, whether in the same or another locality. Competition law has rules around bidding and can prohibit certain agreements between applicants. This is potentially relevant, particularly where applicants communicate with a view to agreeing that one of them will withdraw an application, or refrain from bidding in an area yet to be advertised in exchange for an inducement. Note that similar rules can apply to preparation of applications and contact between licensing rounds.

Publication of information about applications and licensed services

- 3.43 The application form is in two parts. Part A contains non-confidential information and part B contains confidential information. Part A will be published on Ofcom's website following the closing-date for applications. Ofcom will take into account any comments received from the public, which can be made to it with respect to the applications submitted.
- 3.44 In submitting an application, you agree that, should a licence be granted, Ofcom may publish contact details for the licensee (specified in Part A of the application form), which may include personal data, on the Ofcom website and/or in other relevant publications. If you have any questions about the information that we publish, or there are any changes to this information, you should contact us by email at smallscaleDAB@ofcom.org.uk.
- 3.45 Ofcom considers issued small-scale radio multiplex licences to be public documents and will make copies of licences available to third parties on request, as well as publishing on our website a consolidated list of [technical parameters for broadcast radio transmitters](#) that contains details of each multiplex licensee's transmitters and the services carried within their multiplexes. We may, for the purposes of interference management, share certain technical details of proposed transmitter locations and parameters with other parties post-award, but prior to granting licences.

Data protection

- 3.46 We require the information requested in the application form and information requested following the award of a licence in order to carry out our licensing duties under the Broadcasting Act 1990, Broadcasting Act 1996 and Communications Act 2003. Please see Ofcom's General Privacy Statement for further information about how Ofcom handles your personal information and your corresponding rights.

Keeping up to date with broadcasting matters

- 3.47 We strongly recommend that you sign up to receive Ofcom's regular email updates on broadcasting matters, which include a monthly radio licensing update which lists new services licensed, licences revoked, licence transfers, and changes to licensed services during the past month. To sign up to receive these communications, please visit www.ofcom.org.uk/email-updates/ and select 'Broadcasting' sector updates.

4. Completing the application form

This section of the guidance notes provides information on the sections of the small-scale radio multiplex licence application form, to help you fill in your application correctly.

Applicant's details

The following information relates to completing Section 3 of Part A and Section 2 of Part B of the application form

- 4.1 Applications should be made in the name of a single legal entity; this must be a body corporate. If the application is successful, Ofcom will award the licence to the legal entity named in the application.
- 4.2 The details requested in this section include company registration number and contact information. We are asking for this information so that Ofcom knows precisely who to contact at the applicant company during the application process and if a licence is granted.
- 4.3 If you are granted a licence, it will be a condition of your licence that the licence holder must notify Ofcom as soon as possible of certain changes to the information provided in this section.
- 4.4 If any of the individuals named in your responses are known by more than one name/version of their name, all names must be provided.
- 4.5 In Part B of the application form, the applicant is asked for contact details for the following contacts:
 - **Person authorised to make the application:** This is the person who is duly authorised by the applicant for the purposes of making the application. If the applicant is a company, details of the company secretary or a director must be provided.
 - **Licence contact:** The licence contact is the day-to-day contact for Ofcom on licensing matters. Examples of the type of communication between the licence contact and Ofcom could be questions regarding ownership of the licensee company; changes to the licence; and responding to information requests.
 - **Technical contact:** Contact details for Ofcom regarding any technical queries.
 - **Public contact:** Contact details for publication on the Ofcom website and/or in other relevant Ofcom publications. When a licence is granted, the name of the service, contact details for the licensee and a brief description of the licensed service are published on the Ofcom website.
 - **Billing/Finance contact:** Contact details for Ofcom regarding invoicing/payment of annual licence fees.

Details of officers of and participants in the applicant

The following information relates to completing Section 3 of Part A of the application form.

- 4.6 A small-scale radio multiplex licence can only be held by a body corporate. Therefore, unlike some other categories of Ofcom licence, which can be held by individuals, unincorporated bodies or partnerships which are not incorporated as LLPs, this Section is relevant to all applicants.
- 4.7 Before completing Section 3 of Part A of the application form, you should read [Ofcom's guidance on the definition of 'control' of media companies](#).
- 4.8 Certain persons are disqualified from holding a broadcast licence. This section asks the questions which enable us to consider this for those types of disqualification which apply specifically to bodies corporate. It also asks questions which are relevant to our assessment of the applicant's fitness and propriety to hold a broadcast licence.
- 4.9 In Section 3 of Part A, we are asking for details of the applicant's directors or (in the case of LLPs) designated members, and participants (i.e. shareholders and others possessing voting power in the applicant such as guarantors/members in the case of companies limited by guarantee). Note that a director and a participant are not the same thing, and an individual or company may be one or both of these. It is important to be clear in completing your application as to the distinction.
- 4.10 Where applicable, we are also asking for details of those connected with the applicant. Schedule 2 of the 1990 Act provides more information on what "connected" means, but this would include bodies corporate controlled by or controlling the applicant, bodies corporate under common control with the applicant (i.e. those also controlled by the person in control of the applicant), and bodies corporate controlled by directors of the applicant. Therefore, as well as questions on officers and participants, we ask a series of quite detailed questions on potentially connected persons.
- 4.11 If any of the individuals named in your responses are known by more than one name/version of their name, all names must be provided.
- 4.12 The response boxes and tables should be expanded or repeated where necessary or provided in a separate annex.

Eligibility requirements

The following information relates to completing Section 3 of Part A and Section 4 of Part B of the application form

- 4.13 Ofcom has a duty to ensure that anyone who applies for a broadcasting licence is fit and proper to hold one.¹³
- 4.14 When considering whether an applicant is fit and proper to hold a licence, Ofcom will look at – for example – whether individuals who are likely to exercise control over the applicant and its activities (e.g. directors, substantial shareholders or members) have any criminal convictions (in any jurisdiction), or whether they have ever been declared bankrupt.

¹³ Under section 3 of the Broadcasting Acts 1990 and 1996.

- 4.15 In addition, certain categories of people are disqualified from holding a licence or participating above a certain level in a body which holds a licence. These restrictions are set out in Part 2 of Schedule 2 to the Broadcasting Act 1990.
- 4.16 In determining whether a person is “fit and proper”, a number of issues will be considered which could include, but are not limited to:
- Unspent criminal convictions;
 - Bankruptcy and insolvency;
 - Disqualification of directors;
 - Removal from a professional or trade body; and
 - Previous broadcasting compliance history (e.g. licence applications, sanctions).
- 4.17 Some questions in this section ask for previous licence numbers (if known). If these are not known, please provide the licence type.
- 4.18 Information provided in this section of the form will not necessarily result in the applicant being refused a licence – this will depend on all the circumstances of the applicant as a whole – but Ofcom may ask for further details.
- 4.19 If information is relevant to determining whether an applicant is a disqualified person, it is an offence for the applicant to supply false information or to withhold information with the intention of misleading Ofcom. If a person is convicted in such cases, the court may make an order disqualifying the applicant from holding a licence for a specified period. A disqualification order applies to both the individual concerned and to any company of which he or she is a director or involved in the management of (whether directly or indirectly).
- 4.20 If the applicant or the form signatory fails without reasonable excuse at the date of signing the declaration in Section 8 of Part B to declare any matter of which Ofcom subsequently becomes aware, and which we consider to be relevant to the applicant’s eligibility to hold a licence, we will take that into account when determining the question of whether the applicant/licensee remains fit and proper to hold a licence.

Disqualifications/ownership restrictions

- 4.21 There are two categories of disqualifications relevant to small-scale radio multiplex licences. The Broadcasting Act 1990¹⁴ lays down restrictions on who may hold Ofcom’s broadcasting licences. These apply to many types of Ofcom broadcasting licence in addition to small-scale radio multiplex licences. The Broadcasting Act 1996¹⁵ has more specific restrictions relating to small-scale radio multiplex licences, and particularly overlaps in ownership with other types of licensee. These latter restrictions are set out in Section 3 of this document.
- 4.22 Under the general disqualifications in the Broadcasting Act 1990, the following are among those who are disqualified from holding a small-scale radio multiplex licence¹⁶:

¹⁴ As amended by the Broadcasting Act 1996 and the Communications Act 2003.

¹⁵ See, in particular, section 44A of the Broadcasting Act 1996 as modified by the Small-scale Radio Multiplex and Community Digital Radio Order 2019.

¹⁶ In accordance with the Broadcasting Act 1990 (as amended).

- a local authority¹⁷;
- a political body;
- a religious body;
- an advertising agency;
- a publicly funded body;
- a company controlled by a body in one of the above categories (or its officers or associates), or controlling such a body, or in which one of the above bodies has a stake exceeding 5%;
- a company in which anyone who has been convicted within the last five years of specified transmitting offences (colloquially, radio piracy) is concerned.¹⁸

4.23 If information is relevant to determining whether an applicant is a disqualified person, it is an offence for the applicant to supply false information or to withhold information with the intention of misleading Ofcom. If a person is convicted in such cases, the court may make an order disqualifying the applicant from holding a licence for a specified period.¹⁹ A disqualification order applies to both the individual concerned and to any company of which he or she is a director or involved in the management of (whether directly or indirectly).

4.24 If the applicant or the form signatory fails without reasonable excuse at the date of signing the declarations in both parts of the form to declare any matter of which Ofcom subsequently becomes aware, and which we consider to be relevant to the applicant's eligibility to hold a licence, we will take that into account when determining the question of whether the applicant/licensee, remains fit and proper to hold a licence.

Extent of proposed coverage area (Part A)

The following information relates to completing Section 2 of Part A of the application form

- 4.25 In this part of your application, you will need to tell us about the coverage that you expect your multiplex to achieve.
- 4.26 The coverage and transmitter network you propose in the application will form a major part of our assessment. If you are awarded a licence, the proposals will form part of the licence award and will become a licence commitment that you will be obliged to build.
- 4.27 Ofcom accepts that some limited changes to the proposed network may be unavoidable, for example amendments might be required if you have practical difficulties when finalising the design of your sites that could not reasonably have been foreseen in the course of

¹⁷ Except where the service is provided exclusively for the purposes of carrying out the functions of a local authority under Section 142 of the Local Government Act 1972 (as amended) provision by local authorities of information relating to their activities.

¹⁸ See section 89 of the Broadcasting Act 1990. Transmitting offences include those under sections 35 to 38 inclusive and Part 5 of the Wireless Telegraphy Act 2006 (unlawful use of wireless telegraphy for broadcasting) and section 97 of the Broadcasting Act 1990 (unlicensed provision of an independent radio service). As noted above, other criminal convictions may also be relevant to fitness and propriety, but the specified transmitting offences automatically give rise to disqualification (if the conviction was within the past five years).

¹⁹ See sections 144 to 146 of the Broadcasting Act 1996.

preparing the application. However, if the network cannot be implemented substantially as proposed, we would need to consider revoking your licence award. We will not be able to agree significant deviations from what you proposed in your application and you should therefore ensure you are realistic in your choice of coverage and transmitter sites, including ensuring that the applicant and site owner have arrived at a clear position on access, implementation and cost. In general, Ofcom will not look favourably on post-award changes intended to enhance viability at the expense of coverage as the issue of cost should have been thoroughly considered by the applicant in preparing its application. This is particularly the case where competing applications are received, as such deviations would risk unfairness to unsuccessful applicants. But it is also relevant in areas which are not competed as Ofcom could have decided not to make an award at that stage, and such plans will have been relevant to third parties commenting on the original application, C-DSP/DSP services indicating support etc.

- 4.28 Ofcom realises that new sites might become available between licence application and submission / approval of the final plan. While your application will be judged on the plan to which you commit in submitting your application, provided they are submitted with the final plan Ofcom will be willing to consider additional sites before launch. More information is given in paragraphs 5.8 to 5.12.
- 4.29 In particular, you should set out in the application only the coverage and transmission network that you can commit to building and realistically expect to have on air within 18 months following licence award. In assessing your application, we will consider only coverage that you undertake to deliver within 18 months and not any longer-term coverage aspirations. If your network consists of more than one transmitter, you should aim to implement all transmitters at the same time. Although Ofcom may be willing to accept a short delay between implementation if it is unavoidable. In any case, all transmitters in the final technical plan must be implemented and on-air within 18 months of award. Failure to do so may lead to revocation of the licence.
- 4.30 In some cases, for example where it only becomes clear post-award that the successful applicant has identified an opportunity to implement a transmitter in addition to those it committed to in the application within the 18-month period, it may be possible for Ofcom to approve this before grant of the licence as an enhancement to a transmitter network. However, this is at Ofcom's sole discretion and will be dependent on matters including availability of Ofcom resource, potential impact on surrounding areas where Ofcom plans to advertise licences, and time available in the 18-month launch window. It will also be limited to genuine enhancements rather than changes extending coverage in one area but reducing it in another.
- 4.31 Where Ofcom does not exercise its discretion to allow an enhancement post-award but pre-grant, it is unlikely that Ofcom will be in a position to consider applications to approve enhancements until all small-scale radio multiplex licences are awarded and implemented, particularly given the resource requirement of considering such changes and the potential impact on surrounding areas where Ofcom will need to take account of other licensees' coverage aspirations. Further information on post-award changes is provided in Section 5 of this document.

Description of coverage area

- 4.32 Part A Q2.1 asks you to provide a summary of the coverage that you expect your proposed transmitter(s) to achieve. You should describe the geographical areas within the advertised

area and also outside the advertised area that you expect to serve and can refer to the coverage prediction map that you will need to provide as set out below.

Transmitter sites summary

- 4.33 Part A Q2.2 asks you fill out the table setting out summary details of you proposed transmitter sites, filling out one row for each transmitter, including details of the site name, National Grid Reference (NGR), the antenna height above ground level, the antenna type (and bearing of its maximum radiation if directional), whether the antenna is used by existing DAB services and the proposed Effective Radiated Power (ERP).

Coverage prediction map

- 4.34 In Part A Q2.3, you are required to provide a map showing the coverage that your proposed transmitter(s) expect to achieve. This map must be included in the body of Part A of the application form, and not sent as a separate annex, and it should only include coverage provided by the transmitters you are committing to build within 18 months if you are awarded a licence. The map should show the areas where signal levels are predicted to be equal to or greater than 63 dB μ V/m at 10m above ground level. The map should also show the outline of the advertised area of the licence for which you are applying.
- 4.35 Ofcom has made available on its website [outlines of all the advertised licence areas in Geographic Information System \(GIS\) format](#) so that applicants can import the relevant advertised area shape into a mapping tool.

Method and models used for estimating coverage

- 4.36 In the text box in Part A Q2.4, you should describe the method that you have used to predict coverage. Please enter details of the tool used to predict coverage and produce the map provided in response to Part A Q2.3, including any details on the specific prediction model, settings and any data sets used (terrain, clutter, population data etc).

Ofcom assessment of an applicant's coverage

- 4.37 Ofcom will assess an applicant's proposed coverage based on the definition of useable indoor reception contained in our [Digital Radio Technical Code](#). This equates to a field strength of 63 dB μ V/m at 10m above ground level (agl). We will assume all coverage to be noise limited and will not take into account interference from other services using the same frequency either in the UK or in other countries. This is because we do not have information for unimplemented small-scale DAB areas, or when other countries will make use of their agreed spectrum rights in this band.
- 4.38 Ofcom will not assess mobile or outdoor coverage (which equates to a field strength of 54 dB μ V/m at 10m agl). Although outdoor coverage will be possible, we cannot protect all of the areas served down to 54 dB μ V/m when other services make use of the same frequency block elsewhere. Applicants should therefore note that the outdoor coverage area is likely to change over time as more services come on-air.
- 4.39 Ofcom will use the commercially available ATDI HTZ Communications frequency planning tool for the assessment of small-scale DAB coverage, as well as for assessing overlaps and interference described later in this section. Other suites of planning software are available, as are companies providing consultancy services in this field. Use of different planning tools, datasets and planning algorithms will give different outputs (sometimes significantly so). However, to provide a like for like comparison of - and between - applications Ofcom will

use the HTZ Communications tool. Ofcom's interpretation and assessment of coverage predictions will be final.

- 4.40 The tool settings and datasets that Ofcom will use are detailed in Annex A2 of this document. We strongly encourage applicants and any contractors they may use to produce coverage predictions to read this annex carefully. We have also provided some examples illustrating how deviation from those settings and datasets can give markedly different results.

Extent of proposed coverage area (Part B)

The following information relates to completing Section 3 in Part B of the application form

Technical plan: transmission characteristics

- 4.41 In this part of the application form you are asked to provide information on the transmission characteristics of your proposed transmitter site(s). This information will be used by Ofcom to verify:
- the coverage that your transmitter(s) might achieve both inside and outside the advertised licence area;
 - the amount by which your coverage area overlaps with the licensed area of any local radio multiplex services;
 - the amount of interference your transmitters would put into the licensed areas of other small-scale or local radio multiplex services where all of the multiplex services are either using, or are planned to use, the same frequency;
 - the impact your transmitters may have on the coverage of other DAB services being broadcast in the area (i.e. the risk they may punch holes in the coverage of other services); and
 - that the signal levels your transmitter(s) put into any country outside the UK is within the international rights we have agreed with those countries.

Table of transmission characteristics (Part B Q3.1)

- 4.42 Applicants will need to supply their transmission characteristics (transmitter locations, powers etc.) in a separate electronic file to ensure that Ofcom can process applications in an accurate and consistent manner. A [transmission characteristics template spreadsheet](#) in the required format (also containing example site data) is available for applicants on the Ofcom website. Applicants must not change the format of this file or add extra columns and must be submitted as a spreadsheet or CSV format file.
- 4.43 A single row of values must be given for each proposed transmitter site. The information required in the file is as follows:
- Column A – Enter the words 'Site one', 'Site two' on subsequent rows up to the number of transmitters that you are proposing;
 - Column B – the name of the licence for which you are applying;
 - Column C – the name of the applicant i.e. the body corporate that will hold the licence
 - Column D – the name of the proposed transmitter site;
 - Column E – the address of the site including a post code where available;

- Column F – the national grid reference of the site to 10 metre accuracy in the format: AB12345678 (for GB National Grid references) or A12345678 (for Irish National Grid References);
- Column G - the height of the site in metres above mean sea level;
- Column H – the proposed maximum effective radiated power²⁰;
- Column I – the antenna height in metres above ground level;
- Column J – whether the antenna is directional (D) or non-directional (ND);
- Column K to AT – the antenna pattern in the horizontal plane. This should be presented as 36 integer values in decibels at 10-degree intervals starting from 0° through to 350°. The values should be normalised so that 0dB corresponds to the peak gain of the antenna and any restriction given as a positive value. No negative values should be included. The template spreadsheet contains examples of both directional and omnidirectional (non-directional) antenna patterns. The antenna pattern data provided should take into account any influence of the antenna's supporting structure (e.g. where a non-directional aerial is mounted on the side of a tower, the presence of the structure will create a directional characteristic for the antenna system as a whole). This is likely to require some theoretical calculation or modelling by the licensee, its technical contractor or the antenna manufacturer. If applicants wish to provide vertical pattern information in addition to horizontal pattern information, they should contact Ofcom in advance at broadcastradioeng@ofcom.org.uk to confirm the format in which they can provide that information.

Guidance on transmitter characteristics

- 4.44 There is only a very limited amount of spectrum available for small-scale radio multiplex services. Each frequency will need to be used many times across the UK by different multiplexes. For this to be possible, each small-scale DAB transmitter network will need to be designed to minimise outgoing interference to others using the same frequency. It is to be expected that delivering coverage of an entire small-scale DAB licence area may not always be possible, particularly for large rural ones. Ofcom will assess applications with the expectation that a successful applicant will implement the transmitter network as submitted within the application.
- 4.45 Applicants should therefore take the following guidance into account when designing their transmitter networks:
- a) Main transmitters should generally have effective radiated powers of no greater than 100 watts, with many transmitters being significantly lower in power. Keeping to modest powers will also help to keep interference between areas using the same frequency block manageable and minimise hole punching to the coverage of other DAB services;
 - b) Any transmitter at the periphery of the coverage area should have a directional antenna with the main beam directed into the advertised licence area;

²⁰ Effective Radiated Power or ERP is the product of the transmitter's output power multiplied by the net antenna gain. The net antenna gain is the maximum antenna gain reduced by the loss of the feeder cable and any filtering between the transmitter and antenna. Example: a 100 watt transmitter feeding a 6dB gain antenna (6dB gain is a x4 power gain) via a feeder with 3dB loss (3dB loss is a halving of power, or x0.5 gain) would have an ERP of 200 watts (100W x 4 x 0.5).

- c) Transmitters are expected to be located within the advertised licence area, although in certain circumstances a site which is a short distance outside the advertised area may be acceptable, for example if it is the most practical option for serving a particular population centre within the advertised area;
- d) Non-directional (also known as omni-directional) antennas should only be used close to the centre of the advertised licence area; and
- e) Use of terrain shielding can be effective in reducing outgoing interference.
- f) Due to the outgoing interference caused, antennas at high heights or on elevated sites are generally likely to be problematic, even at very low powers.
- g) To maximise the likelihood of being able to build the transmitter network as proposed, applicants should seek to obtain outline agreement with transmission site owners for use of the sites, and have obtained and included expected site costs in their financial plans.

Single frequency networks (Part B Q3.2)

- 4.46 If you are proposing to build more than one transmitter you will need to operate them as a single frequency network ('SFN') to ensure they do not interfere with each other (and thereby significantly reduce the effective coverage of the multiplex). Implementing this type of network requires all transmitters to carry the same information, and to be synchronised and locked with each other so that the signal from each transmitter combines constructively with those transmitted by the others rather than causing destructive interference.
- 4.47 The radiated signals must be transmitted within a small time window such that the signals from each transmitter (including reflections) should arrive within 246 μ s of each other at receivers within the target coverage area. Establishing and maintaining a SFN is likely to require some technical expertise. If the transmitters drift out of synchronisation then areas of interference will begin to appear where reception is degraded or lost. These areas are known as 'mush zones' and will grow in size as the drift increases.
- 4.48 Although the use of SFNs is more technically challenging than using a stand-alone transmitter, an SFN has significant benefits due to the diverse signal paths from the transmitters to the receiver and the constructive addition of the wanted signals. This can lead to a reduction in the number of reception holes (areas of poor or marginal reception within the overall multiplex coverage area). Using multiple modest-power transmitter sites instead of a single high power transmitter also allows the service area to be planned to more precisely to match the wanted coverage area while helping to manage outgoing interference. Deploying additional sites does obviously raise the cost of building and operating the network, but one DAB multiplex is able to carry many programme services.
- 4.49 If you are proposing to operate an SFN, please tell us in the answer box how you propose to establish and maintain the synchronisation between transmitters.

Extent of proposed coverage area: general information applicable to both Parts A and B

- 4.50 Ofcom is not asking specific questions on the matters listed in paragraphs 4.53 to 4.82 and applicants do not need to provide any information or respond to any of these points. We are providing this information to assist applicants in developing technical proposals that will

be compliant with the requirements of the licence advertisement and the underlying legislation.

- 4.51 In designing the coverage that their transmitter site(s) will achieve, applicants should carry out sufficient work to satisfy themselves that:
- a) The proposed coverage will serve the intended number of households within and outside the advertised licence area;
 - b) The number of people contained in any coverage falling outside the advertised licence area would not exceed 30% of the total population within the advertised licence area (note that this constraint is intended to maintain the integrity of the overall spectrum plan, and to ensure there is sufficient spectrum for all of the planned licence areas);
 - c) The proposed coverage will not overlap more than 40% of the population within any local radio multiplex service's licensed area; and
 - d) The proposed transmitter(s) will not cause significant interference to other radio multiplex services. This means signal levels must be below 38 dB μ V/m (at 10m height) in the licence area of any other small-scale radio multiplex service using the same frequency block elsewhere, or 29 dB μ V/m (at 10m height) into the licence area of local or national radio multiplex services using the same frequency block elsewhere.
- 4.52 Ofcom will carry out assessments of each of the above criteria using the information in the Transmission Characteristics Table provided by applicants in response to Q 3.1 in Part B of the application form.
- 4.53 Ofcom strongly advises applicants to carry out their own assessments of each criterion listed above to satisfy themselves that the transmitter(s) they are proposing will serve the areas and number of people intended, as well as being compliant with the overspill, overlap and interference requirements.
- 4.54 Ofcom may reject applications if either the amount of coverage outside the advertised licence area is excessive or the degree of overlap with a local radio multiplex service would exceed the permissible amount, or interference into other licence areas would be significant according to Ofcom's own modelling. We will take into account in awarding licences that, where a submitted plan would require adjustments to remain within permitted thresholds before a licence could be issued and the service launched, this would have a bearing on our assessment of the coverage the resulting plan might achieve and also the ability of the applicant to establish the service.

Frequency planning software

- 4.55 In order to provide an assessment of coverage, both within and outside of the advertised licence area, and of any overlap with local radio multiplex services and interference to co-block small-scale radio multiplex services, specialist frequency planning software will need to be used. Additionally, the use of geographical information system (GIS) mapping software might be required. A range of companies offer frequency planning services, and applicants may choose to contract this work to third-party specialists.
- 4.56 For applicants' analyses of their coverage, Ofcom has provided files on its [website](#) containing the following data:

- The boundary contour and population of every small-scale radio multiplex licence area²¹ (in MapInfo Interchange Format);
 - All small-scale radio multiplex licence areas as a single Google Earth (KML) file;
 - A raster graphic map (in PNG format) file of every small-scale radio multiplex licence area;
 - The boundary contour and the population of each local radio multiplex service licensed area (in MapInfo Interchange Format); and
 - A population file (adults aged 15+) for the whole UK.
- 4.57 As small-scale radio multiplex services come on-air, their predicted coverage will be published on Ofcom's [website](#).
- 4.58 Files made available in the MapInfo Interchange Format of the MapInfo GIS tool used by Ofcom can be imported into other GIS applications such as ArcView and QGIS, as well as some frequency planning tools.

Coverage area

- 4.59 Using the HTZ planning tool with settings detailed in Annex A3, Ofcom will assess the likely coverage that could be achieved by transmitters with the characteristics listed in the electronic file provided in response to Part B Q3.1. We will count coverage as any area where the proposed transmitters are predicted to provide a provide a signal strength of at least 63 dB μ V/m at 10m agl.

Population estimates

- 4.60 When assessing population coverage, we will consider the following:
- a) the adult population (aged 15+) contained in the areas served by a signal strength of at least 63 dB μ V/m at 10m agl that is inside the advertised licence area;
 - b) the adult population (aged 15+) contained in the areas served by a signal strength of at least 63 dB μ V/m at 10m agl that is outside the advertised licence area;
 - c) the total population that is contained in the advertised licence area you are applying for (this information is contained in the licence advertisement).
- 4.61 We will use these figures to assess how much of the advertised licence area your proposed transmitter network will serve, and also to assess what percentage lies outside the advertised licence area. The percentage of coverage outside of the advertised licence area should not exceed 30% of the total advertised licence area population.

Overlap with local multiplexes

- 4.62 The Small-scale Radio Multiplex and Community Digital Radio Order 2019 stipulates that where the area or locality for which the service is provided does not overlap with the coverage area of a local radio multiplex service, the size of that area or locality must not be larger than 7,500 square kilometres. This 'hard' limit would only apply to those parts of Scotland where no local radio multiplex service presently exists. The largest licence area in

²¹ The boundary contours will initially be the area shapes ('polygons') that Ofcom intends to include in advertisements for scale-scale DAB radio multiplex licences. These will gradually be replaced by licensed area shapes based on actual coverage as small-scale multiplexes launch.

the Ofcom small-scale DAB plan is approximately 2,000 square kilometres less than this limit. Therefore, we do not expect the limit to be an issue in practice.

- 4.63 Where the coverage of a small-scale radio multiplex service overlaps that of a local radio multiplex service, the same legislation sets out that it is desirable for Ofcom to have regard to ensuring that the population of the overlapping area is less than 40% of the population contained in the licensed area of the local radio multiplex service.
- 4.64 Other than in any exceptional circumstances specified by Ofcom in the advertisement, applicants should therefore ensure that the coverage provided by their proposed transmitter arrangement does not overlap any local radio multiplex service's licensed area by more than 40% of the population in the local radio multiplex service's licensed area. The local radio multiplex's licensed area is in many cases likely to be larger than the actual coverage area it achieves. Ofcom will assess the adult population within the licence area of each local radio multiplex service that is predicted to be also served by the applicant's small-scale radio multiplex service (i.e. a signal level of at least 63 dB μ V/m at 10m above ground level).
- 4.65 If your predicted coverage (calculated using the tool and settings in Annex A3) falls entirely within the advertised licence area, you do not need to carry out this assessment as Ofcom has designed all advertised licence areas to fall below the 40% overlap limit with local radio multiplex services.
- 4.66 Even if your coverage is entirely contained within an advertised licence area, you must consider overlaps if you are intending to apply for more than one small-scale radio multiplex licence which overlaps with the same local radio multiplex service's licensed area. There are restrictions on corporate bodies and/or connected persons from holding two or more small-scale radio multiplex licences that overlap the same local radio multiplex service to a significant extent (see paragraphs 3.12 and 3.13). Applicants that intend applying for more than one small-scale radio multiplex licence whose coverage might overlap the same local radio multiplex service, must also satisfy themselves that the combined coverage of their proposed small-scale radio multiplex services do not overlap with more than 40% of the population contained within that local radio multiplex service's licensed area.

Outgoing interference

- 4.67 There are six frequency blocks (7D, 8A, 8B, 9A, 9B and 9C) that Ofcom intends using to accommodate small-scale radio multiplex services where possible. These blocks have been cleared of non-DAB users in the UK. However, Ofcom is aware that there is some potential for small-scale DAB services operating on block 7D to cause interference to Private Mobile Radio services operating on lower adjacent frequencies. This should only occur where services use a common site with limited antenna separation. Careful planning and design is expected to avoid any interaction in the majority of cases, but applicants should take this into account during their site selection process. Further information on coexistence between small-scale DAB and other spectrum users is provided in Annex A1.
- 4.68 As there are potentially more than 200 small-scale radio multiplex services to be licensed, those six frequencies will need to be used many times over across the UK. It is possible for different services to use the same frequency in different parts of the country if the technical parameters of each are planned carefully to prevent interference occurring between users of the same frequency (this is known as co-block interference). In the six frequency blocks,

any co-block interference would occur between a small-scale radio multiplex service and other small-scale radio multiplex services elsewhere.

- 4.69 In some areas of the UK, the six frequency blocks will not be sufficient to accommodate all of the potential small-scale radio multiplex services we have planned. In addition, not all six blocks will be available across the whole of the UK, principally due to international constraints. Where possible, in such areas Ofcom intends making available frequency blocks in the range 10B to 12D, which are used by local and national radio multiplex services elsewhere in the UK. In these areas, co-block interference may occur between a small-scale radio multiplex service, other small-scale radio multiplex services and local or national radio multiplex services.
- 4.70 In our [Statement on Licensing small-scale DAB](#), we set out the following:
- A small-scale radio multiplex service using one of the six frequency blocks (7D, 8A, 8B, 9A, 9B and 9C) will be limited to transmitting no more than 38 dB μ V/m at 10m into the coverage area(s) of any other small-scale radio multiplex service(s) using the same frequency block (except for small exceptions as described in 4.78 below).
 - Where a small-scale radio multiplex service uses one of the frequency blocks 10B to 12D, this level will be reduced to 29 dB μ V/m to protect the outdoor coverage of local or national radio multiplex services.
 - The small-scale radio multiplex service can generally expect to receive incoming interference of no more than 38 dB μ V/m from other radio multiplex services using the same frequency block, except in small parts of its licensed area.
- 4.71 The above figures are based on a wanted signal of 63 dB μ V/m for small-scale DAB²², 54 dB μ V/m for local and national DAB²³, and a protection ratio²⁴ of 25 dB.
- 4.72 Therefore, the incoming interference within a small-scale radio multiplex licence area using the same frequency block should not normally exceed 38 dB μ V/m at 10m above ground level (63 dB μ V/m – 25 dB = 38 dB μ V/m). Where a small-scale radio multiplex service uses a block between 10B to 12D and a local or national DAB service requires protection, the interference within the local or national DAB licence area will need to be limited to 29 dB μ V/m. The advertisement will set out the frequency block intended to be used for each small-scale radio multiplex services and which other proposed services are planned to use the same frequency block. When assessing the incoming interference to a co-block small-scale radio multiplex service licence area, Ofcom will exercise some flexibility. We will consider where any interference falls and may allow some interference above the threshold in parts of small-scale or local radio multiplex licensed areas which are less populated and/or have fewer major roads.

Changes to the small-scale DAB spectrum plan

- 4.73 It may become necessary for Ofcom to make changes to the spectrum plan for future small-scale radio multiplex services. A non-exhaustive list of the reasons we may need to implement such changes is provided below:

²² Representing the level required for indoor coverage

²³ Representing the level needed for outdoor (in car) coverage

²⁴ Protection ratio is a ratio of the wanted to unwanted signal. In this example, the wanted signal needs to be 25dB greater than the unwanted signal.

- a) To take account of implemented networks, especially where only a small part of an advertised licence area is being served;
 - b) To revise the plan should we receive no applications for some areas;
 - c) If we decide to add areas to the plan in response to emerging demand; and
 - d) To reflect the impact of changes in the frequency usage of neighbouring countries and consequent changes to our plans for coordinating frequency use in the UK.
- 4.74 With the exception of possibly changing frequency block (for reasons including those listed above), Ofcom does not expect to need to require existing licensees to make changes to their on-air transmission network, nor to lose the ability to implement sites that they have committed to build within the 18 months of licence award.
- 4.75 Following award, the applicant will need to confirm and agree a final technical plan with Ofcom before the licence is granted and transmitters can come on air. The coverage that licensees commit to achieve through that final technical plan will become the area that they are licensed to serve, and the former advertised area ‘polygons’ will cease to have any licensing significance. As Ofcom advertises and licences further small-scale DAB areas and our frequency plan evolves, we will protect those licensed areas against interference.
- 4.76 While such changes will leave some flexibility for licensees to seek coverage changes in the future, it might restrict opportunities for licensees to significantly enlarge their coverage post-launch as Ofcom will not protect from interference the parts of the original advertised area that are unserved by a licensee’s final technical plan.
- 4.77 Should a licensee propose an enhancement such as an additional transmitter to Ofcom between the award and granting of the licence, Ofcom will seek to include that enhancement if it is consistent with the legislative criteria and spectral constraints described in this document, and only if the licensee commits to building the enhancement within 18 months of licence award.
- 4.78 Small-scale licence areas defined in the plan will evolve over time. Further information on this is given in Annex A1.

Frequency changes

- 4.79 As mentioned above, usage of the spectrum by neighbouring administrations is not yet fixed. Consequently, it is possible that the level of incoming interference on small-scale DAB frequencies could increase significantly at some time in the future. Ofcom will try to identify such issues at the time of the licence advertisement. In the most problematic cases Ofcom will endeavour to identify an alternative frequency for any affected multiplexes. Such a frequency change would be carried out at the licensee’s own cost. In planning their transmission equipment, licensees may need to consider how the cost of such a frequency change might be minimised through the use of frequency agile components.

Non-compliant applications

- 4.80 It is to be expected that the technical proposals contained in some applications received by Ofcom may raise issues of compliance (for example, if we establish that the applicant’s planned population coverage overlaps that of a local radio multiplex service by more than 40%). We reserve the right to reject non-compliant applications and, whilst we may clarify points of detail with particular applicants where multiple applications are received, in the

interests of fairness to compliant applicants it will not be possible to allow substantive changes by applicants.

Electromagnetic fields and public safety

- 4.81 All uses of radio spectrum generate electromagnetic fields (EMF) and there are internationally agreed [guidelines](#) published by the International Commission for Non-Ionising Radiation Protection (ICNIRP) to help ensure services operate in a way that will not adversely affect health. Every Ofcom licence that permits transmission at a power above 10W EIRP (or 6.1W ERP) will require the licensee to comply with the general public limits for exposure to EMF specified by ICNIRP. This includes small-scale DAB multiplex licenses.
- 4.82 Applicants should ensure that they consider public safety when choosing where their equipment is located to ensure that there is an adequate separation distance between transmitting antenna(s) and members of the general public to comply with the ICNIRP limit. Ofcom has made an [EMF calculator](#) available on its website that will calculate the separation distance to help licensees check their compliance with this condition. Applicants and licensees can find [Guidance on EMF compliance and enforcement](#) on the Ofcom website.

Ability to establish the proposed service (Part A)

The following information relates to completing Section 3 of Part A of the application form.

- 4.83 One of the requirements of small-scale DAB legislation is that the service (by which we mean the full service committed to in the final technical plan) must be on-air within 18 months of the licence award. To assess an applicant's ability to establish a small-scale radio multiplex service, Ofcom will require applicants to provide a detailed account (and plans) reflecting their understanding of what they consider to be required to bring the service on-air successfully.

Financial resources

- 4.84 In Q3.17 of Part A of the application form, we ask you to set out what you believe – at a high level – the cost of establishing your small-scale radio multiplex service will be, broken down into the main constituent parts. This is likely to include (where applicable) costs such as the cost of equipment, transmitter site rental, office and staff/ contractor costs. Q3.18 asks you to set out how those costs will be met (in terms of the different types of funding the applicant plans to utilise), and Q3.19 asks for details of the providers of this funding.
- 4.85 Q5.4 of Part B of the application form asks for evidence to be supplied (for example, a bank statement) of the availability of the funding required to establish the multiplex, if this is not available to Ofcom through accounts filed at Companies House (for example, where an individual is proposing to provide a director's or shareholder's loan to the applicant company).
- 4.86 In the course of assessing this part of your application, Ofcom may subsequently request evidence of projected costs. This could include written cost estimates or heads of terms agreements from third party suppliers or contractors.

- 4.87 Ability to establish the proposed service, which includes consideration of financial resources, is one of the statutory award criteria. Applications will be judged competitively in the detail and robustness of all of the cost information required in this section.

Relevant expertise and experience

- 4.88 In Q3.21 in Part A of the application form, we will need details of who will be carrying out the day-to-day management of the multiplex.
- 4.89 In Q3.22, we want to know the identity of the individuals in the applicant group, or the details of outsourced contractors, who will be carrying out the installation and maintenance of your transmission and multiplexing systems. This should include a brief summary of the individual or company's experience to date.
- 4.90 In relation to your responses to questions 3.21 and 3.22, Ofcom may request evidence of a person's (or company's) experience and qualifications. This could include, for example, requests to see CVs, references or certificates of qualification.
- 4.91 We ask you to outline the status of the contractual negotiations with any third parties or contractors that you intend using to install and maintain transmission or multiplexing equipment, or to provide general day-to-day management of the multiplex.
- 4.92 Applications will be judged competitively in the detail and robustness of all of the information required in this section.

Timetable for coverage roll-out

- 4.93 Q3.23 and 3.24 in Part A asks you to provide a description and an outline project plan with timeline (for example a Gantt chart) of the main activities that you plan to undertake to launch your small-scale radio multiplex service. You can find a non-exhaustive list of some of the activities in Section 5 of this document.

Ability to establish the proposed service (Part B)

The following information relates to completing Section 5 of Part B of the application form.

Confidential appointments

- 4.94 Q5.1 of Part B of the application form asks you to provide details of any individuals or contractors who will be involved in the management and operation of the multiplex service, but who cannot be identified at this stage. As with the individuals or contractors who can be listed in Part A of the application, we may, on a confidential basis, request further evidence of a person's (or company's) experience and qualifications. This could include, for example, requests to see CVs, references or certificates of qualification.

Establishment of transmitter sites and the multiplex network

- 4.95 In this part of the application, you are asked to provide information relating to the practical implementation of each of the transmitters you are proposing to build. Ofcom will use this information to assess how practical your proposals are.

Transmitter Implementation Tables (Part B Q5.2)

4.96 Q5.2 of Part B of the application form asks you to complete a separate Transmitter Implementation Table for each transmitter site that you have entered into the spreadsheet submitted in response to Part B Q3.1 of the application form.

- a) Row A: provide the site name, which should be consistent with the name in the file produced in response to Part B Q3.1.
- b) Row B: explain what type of site it is. Example responses could include: 'existing mobile communications site'; 'existing broadcast site'; or 'building rooftop'.
- c) Row C: provide basic site details. This must include the national grid reference, site and antenna height above ground level, maximum effective radiated power and, where relevant, the site address.
- d) Row D: tell us what kind of antenna you are planning to use at the site, for example a '6dB colinear antenna', 'folded dipole' or 'three element Yagi'. Please provide details of the manufacturer and product code if you have already chosen a specific product.
- e) Row E: describe where the antenna will be mounted and state what effect the mounting structure will have on the radiation pattern. Example responses could include 'on an existing mast or tower', or 'on a new pole attached to a building'. Applicants should provide a photograph showing the entire building or structure upon which the antenna will be mounted along with the environment around the site. A second photograph of the portion of the supporting structure or location where the antenna will be mounted should be supplied with the proposed antenna position indicated on it. If applicable, supply additional photographs of any antennas of other services mounted immediately above, below, and at the same level as your proposed antenna. Please state whether you expect planning permission to be required for the antenna.
- f) Row F: indicate whether you will be sharing a transmitting antenna with other radio multiplex transmissions. This will only be the case if you are planning to use an existing broadcasting site and intend to feed your signals into an existing antenna. If this is your plan, please list what other multiplex services will share the same antenna.
- g) Row G: describe how the feeder cable will be routed between the antenna and the transmitter. For example, will it use an existing cable duct in a building, or a cable tray outside?
- h) Row H: describe where you are planning on locating the transmitter on the site. For example, this may be a freestanding cabin (if so, give its approximate on-site location), or a space in an existing building (again, provide details). Applicants should satisfy themselves that sufficient space is available in this location for all the required equipment.
- i) Row I: indicate whether any building work be required to accommodate the transmitter or cabling. If so, please describe briefly what works will be required. Also indicate whether planning permission will be needed for these building works and how long this is expected to take. If the proposed structure is a listed building state if any consents will be required for its use and how long these will take to be obtained.
- j) Row J: describe what arrangements you will make for powering the equipment. Is there power available in your proposed equipment room or will new circuits need to be provided? Will it be possible to connect to the landlord's power supply, or will you need to make your own arrangements with an electricity company for a new supply?
- k) Row K: Please tell us how the transmitter will be provided with a feed of the multiplex programme material it will be broadcasting. For example, this might be achieved by a cable if the transmitter is located in the same room as the multiplexer, or by a data circuit or wireless link if they are in separate locations.

- l) Row L: describe the status of any agreements with the site landlord and/or any tenants (if necessary). In order to ensure that you will be able to access the site, Ofcom will require details of the site owner and confirmation that the site owner is willing to accommodate your equipment. A formal agreement is not required at the application stage, although Ofcom will be looking for written agreement in principle to show that you have engaged with site landlords. You should supply a copy of any outline agreement and must state the expected cost of using the site along with the expected time needed to finalise access agreements with the landlord.
- m) Row M: indicate whether you have agreed with all necessary parties regarding the works described in the entries 'C to L above'. You should provide the name of each of the relevant parties and confirm that they have seen and agreed your proposals (to the extent that this includes new works). You must also supply an estimate of the cost of carrying out this work. In some cases, a landlord will specify who can carry out work on their site or require appropriately certified individuals, please confirm if this will be the case.
- n) Row N: please tell us how long you expect to take to bring the transmitter on-air following licence award and a desired target date (if you have one). The timescale should take account of factors including site access negotiations and legal processes, planning permissions, equipment procurement, installation of equipment and compliance checks.
- o) Row O: Taking account of the information in section three of Ofcom's Technical Policy Guidance for DAB Multiplex Licensees and the following section of this document, describe the measures you have taken to avoid hole-punching and the likely impact you expect this transmitter to have upon other multiplexes.
- p) Row P: state how far the transmitter site is from the nearest residential housing (as the crow flies).
- q) Row Q: state how far the transmitter site is from the nearest major road (as the crow flies). Count only the distance to the nearest 'A' road or motorway.

Hole punching – general guidance²⁵

- 4.97 When planning a DAB transmitter network, it is important to take account of the impact that new transmitter sites will have on reception of existing DAB programme services. A phenomenon known as 'hole punching' (sometimes called adjacent channel interference, or 'ACI') can occur when radio receivers in close proximity to a DAB transmitter site are prevented from receiving other DAB services not transmitted from that site. This occurs because the locally transmitted signals are very much stronger than other services that are broadcast from more distant transmitters. Once the signal strength difference exceeds a certain value, radio sets cease being able to receive the weaker signals. This is rather like someone sitting nearby and speaking loudly, preventing you hearing what is being said on a TV set across the room.
- 4.98 This mechanism leads to a 'hole' in coverage around the transmitter site. The size of this hole could be in the range of a few hundred metres to more than a kilometre. In-home reception can also be affected where households lie near the transmitter site, and the effect can also affect reception in cars if the transmitter site is close to a road.
- 4.99 The extent of any reception hole will depend on many factors. These include not only the transmission parameters of the nearby and more distant services, but also the listener's

receiver itself. More detailed information on hole punching and how to minimise its impact is given in Ofcom's [Technical Policy Guidance for DAB Multiplex Licensees](#).

- 4.100 At a particular transmitter site, this interference potentially affects all DAB services not broadcast from the same site including local and national and, in future, small-scale radio multiplex services. As Ofcom's Technical Guidance note sets out, mitigation measures are sometimes required. These can include making changes at the transmitter end (by amending antenna locations or transmit powers, or even choosing a different site). Where the loss of coverage of other services is extensive, the proposer of the new transmitter could provide a small transmitter to reinstate the coverage lost by other services. However, this option may not be straightforward or cheap to implement. It is therefore best to minimise the opportunity for hole punching at the design stage.
- 4.101 When designing your network, you need to be aware that hole-punching can also impact on your own proposed service. If you do not have a transmitter site close to an existing DAB site your own small-scale DAB coverage may be subject to hole-punching, meaning that households or cars near the other transmitter will potentially not be able to receive your service.
- 4.102 For all radio services, the 'polluter pays' principle applies. New site owners are required to fix significant problems caused to existing services. The new service will also have to accept any impact caused by the transmitters of other existing services.
- 4.103 Applicants should take into account the impact their technical plan may have on reception of other multiplex services that are available in the vicinity of their proposed transmitters.
- 4.104 Ofcom's [Technical Policy Guidance for DAB Multiplex Licensees](#) outlines the methodology for seeking site agreement from Ofcom and the degree of liaison required with other DAB licensees. We expect you to have taken account of the process during your application.
- 4.105 We will consider the potential impact that your proposed transmitters will have on the reception of other radio multiplex services. We will use the results of this assessment to judge how likely it is that the proposed transmitters(s) can be established. We will use the information you have provided in the transmitter implementation table in Section 5 of the application form to make this assessment.

Network arrangement (Part B Q5.3)

- 4.106 This question asks you to provide a simple block diagram showing the location of the major components of your radio multiplex system, including the programme services (if you know which these will be), the multiplexer that combines the services together and the transmitters that will broadcast the signal. It also asks you to indicate how these constituent parts will be connected together and what kind of circuits you plan to use and who you expect to use to provide them. Note that while a 4G or 5G modem can under some circumstances provide a satisfactory programme feed to a transmitter, performance can be unreliable at times, depending on the traffic demand placed upon the mobile network to which the modem is connected.

Evidence of funding

- 4.107 If evidence of proposed funding (as set out in Part A of the application form) is not available to Ofcom through accounts filed at Companies House (for example, where an individual is proposing to provide a director's or shareholder's loan to the applicant company), please

provide evidence of this funding, such as bank statements, as a confidential annex to Part B of your application (Q5.4).

Involvement of C-DSP providers; demand or support from programme providers

The following information relates to completing Section 4 of Part A of the application form.

- 4.108 Section 51(2)(ca) of the 1996 Act requires Ofcom to take into account the desirability of awarding a small-scale radio multiplex licence to a body corporate that is providing – or proposing to provide – a C-DSP service in the locality being advertised (or involving such a person as a participant in the licence-holding company).
- 4.109 Section 51(2)(f) of the 1996 Act requires Ofcom to take into account evidence that the applicant has support from providers interested in having their existing or planned programme services carried on the proposed small-scale radio multiplex service.
- 4.110 For the second of these statutory criteria, the evidence we will consider can come from existing holders of DSP licences, or from programme service providers who intend to apply for (or have already applied for) DSP or C-DSP licences, which would include but not be limited to the holders of existing analogue community and local commercial radio licences. Preference will be given to applicants who can demonstrate that they will be in a position to carry a number of services on both reserved and unreserved capacity.
- 4.111 We do not require applicants to provide us with a definitive, full line up of services they intend to provide, or details about the content of those services. However, we will consider how confident it is possible to be, based on the evidence provided by the applicant in response to Q4.4, Part A, that the demand or support will translate into carriage on the multiplex following launch. Applicants should be aware that evidence in an application of advanced discussions with potential programme providers, including those with existing presence in the locality, will tend to give more confidence than generic, in principle expressions of interest.
- 4.112 We would emphasise that it is open to an individual prospective DSP or C-DSP provider to indicate demand or support for the service proposed by any number of applicants. There is no requirement for any such prospective provider to express a preference between applicants, although they may choose to do so if they wish (for example based on coverage patterns, proposed charges, or any other relevant features of applicants).
- 4.113 Note that a “participant” for the purposes of section 51(2)(ca) does not mean the same as a director and is defined in Part I of Schedule 2 of the Broadcasting Act 1990. It would include a shareholder of a company limited by shares and a member/guarantor of a company limited by guarantee. So where a C-DSP is involved at the board level but not as a participant, this does not technically amount to participation under sub-section (ca). However, it can be considered as strongly indicative of demand and support for provision of the service under section 51(2)(f) so involvement of C-DSPs as directors as well as participants is considered positively.

Fair and effective competition

The following information relates to completing Section 5 of Part A and Section 6 of Part B of the application form.

- 4.114 Section 51(2)(g) of the 1996 Act requires Ofcom to assess whether, in contracting or offering to contract with programme service providers, the small-scale radio multiplex licence applicant has acted in a manner calculated to ensure fair and effective competition in the provision of such services.
- 4.115 In assessing applications, we therefore need to have confidence that the prospective small-scale radio multiplex licence applicant has been proactive and approached a wide range of potential service providers, in particular those currently holding either a community radio, community digital sound programme service, local digital sound programme service or local commercial analogue licence which relates to a service which is already provided in the area. Negotiations that have taken place between the applicant and potential service providers need to have been demonstrably fair, and the terms of any contract for service provision must be fair and non-discriminatory.
- 4.116 Q6.1 (in the confidential 'Part B' of the application form) requires you to provide a list of all prospective providers of digital sound programme services with whom you have had contact prior to and during the preparation of this application, at the initiative of either party, and in whatever form. It asks you to summarise the nature of the proposals discussed. It also asks you to provide as a confidential annex relevant supporting documentation (e.g. records of discussions, emails, letters, and any proposed rate cards and/or proposed carriage contracts which have been shown to potential service providers).

5. From licence award to launch

These guidance notes set out key information you may find useful in relation to the period between the award of a small-scale radio multiplex licence and the granting of the licence prior to the launch of the service.

Licence award

- 5.1 Ofcom will usually assess applications for multiplex licences and make decisions on licence awards in batches. The successful applicant for each advertised area will be informed shortly after the decision has been made and a summary of the licence area assessment will be published on the Ofcom website.
- 5.2 An award letter will be sent to the successful applicant confirming the award and detailing the next steps. The letter will specify:
- a) The name of the company to whom the licence has been awarded;
 - b) The licensing requirements under the Wireless Telegraphy Act 2006 and Broadcasting Act 1996 along with the current fees;
 - c) The frequency block to be used by the service (which may be different to that advertised);
 - d) The deadline date by which all transmitters must be on-air and the service launched. The deadline is a legal requirement which Ofcom is not at liberty to extend;
 - e) The requirement to supply a final technical plan in a timely manner. Ofcom will not seek to clear the plan supplied with the application unless this is confirmed in writing post-award;
 - f) In outline how Ofcom will assess the supplied final technical plan;
 - g) The need to review the corporate structure of the company prior to the grant of licence;
 - h) How the licence area will be re-defined after launch. This will include the expected licence name which will exclude any urban areas named in the advertisement that Ofcom predicts will not be served by the technical plan supplied with the application.
- 5.3 The letter may also specify any issues in the application that will need to be resolved before a licence is granted (although the successful applicant should not assume the letter will be exhaustive, and further issues may arise at a later date). These may include:
- a) Any ownership concerns, which may include:
 - i) Where multiple small-scale DAB licences awarded to the same body corporate serve more than 40% of the population of the same local radio multiplex service's licensed area;
 - ii) Where ownership of the licence would cause the limit of 20% of all licences awarded to be exceed; and
 - iii) Where the involvement of an individual or company within the applicant gave rise to other possible issues over disqualification.
 - b) Where, by Ofcom's calculations:
 - i) The predicted coverage of the technical plan will serve more than 40% of a local DAB licence area;

- ii) The predicted coverage of the technical plan will serve more than 30% of the small-scale DAB licence area population outside of the licence area;
 - iii) One or more of the technical plan transmitter sites will cause significant hole-punching;
 - iv) Outgoing interference to one or more small-scale DAB licence areas or local radio multiplex service licensed areas exceed the levels set out in the advertisement; and
 - v) Any international constraints set out in the advertisement are exceeded.
- 5.4 Where a technical constraint is exceeded, Ofcom will include an example measure for how the non-compliance might be resolved. These suggestions will tend to be power reductions or additional antenna pattern restrictions. As we do not have full knowledge of an applicants' requirements or the options open to it the suggestions should be considered as only one method of resolving the non-compliance, and other measures that can achieve the same result may also be acceptable. While Ofcom cannot act as a transmission consultant, we will be willing to discuss alternative resolutions, and to provide clarification on any of the matters set out in the award letter.

Preparing for launch

- 5.5 There is a strict 18-month deadline on beginning to provide a small-scale radio multiplex service following award. Where a licence has been awarded but not granted, section 51(6) allows Ofcom to revoke an award if we have reasonable grounds to believe the multiplex service (by which we mean the full service committed to in the final technical plan) will not be operational within 18 months of award. Similarly, section 53(1)(aa) applies the same rule where a licence has been granted but is yet to come into force.
- 5.6 Ofcom wants to avoid a long-time lag between the award of a licence and the small-scale radio multiplex service being available to consumers, and therefore to avoid inefficient use of spectrum. During the 18-month period, Ofcom expects the successful licensee to conduct the necessary work to implement its technical plan, and in particular ensure that it allows adequate time to do the following:
- a) Appoint specialists and contractors working on its behalf;
 - b) Finalise negotiations regarding access to sites and other infrastructure, including any sharing agreements;
 - i) This may also include obtaining planning permission, such as for antenna mounting or equipment housings,
 - ii) Where required, identifying personnel appropriately trained and certified to install equipment on that owners' infrastructure, such as aerial riggers,
 - iii) Licensees should be aware that some site owners and management companies will take many months to finalise these agreements and you are advised to begin these discussions as soon as possible after award,
 - c) Seek agreement from Ofcom for the proposed technical plan. As the coverage proposed by an applicant is an award criterion (both in terms of deciding whether to award a licence and, in a competed area, to whom it should be awarded), it is important that the final plan does not differ materially from what was proposed in the application, and any change to the plan will need to deliver broadly equivalent coverage. Failure to deliver the coverage commitments set out in the application may lead to Ofcom not approving a final technical plan and ultimately revocation of the award on the basis that an

approved final technical plan is required prior to launch of the service (which must take place within the 18 month statutory period from award).

- d) Final site details²⁶ need to be sent to Ofcom for approval. Where a change to the application technical plan is proposed to a small-scale DAB transmitter plan, site details will be required for each modified site via the [small-scale DAB final transmitter plan site details document](#). Where a significant change is proposed to the application plan, the Ofcom award panel will review the impact of these changes, and if they result in significant changes to the coverage likely to be achieved by the multiplex, the licensee may be required to further revise their new plan to better match the application plan. All sites will need formal approval from Ofcom, otherwise the transmitters will not be able to come on air. Approval of a technical plan that does not have specific technical requirements²⁷ will take two to four months depending on the complexity of the plan, and the number of other applications Ofcom is considering. Final transmitter plans should be sent in the same electronic format²⁸ as for licence applications to: BroadcastRadioEng@Ofcom.org.uk. The title of your email should use the title format “[Area Name] small-scale DAB multiplex – final technical plan” with the name of the advertised area for which you are submitting the plan substituted for [Area name].
- e) To have built the DAB multiplexing and signal distribution system²⁹ including:
- i) Installation of the multiplexing centre and associated equipment;
 - ii) Signal encoding for programme services and distribution of the signal feeds to the multiplexing centre; and
 - iii) Distribution of the multiplexed signal to the transmission site(s);
- f) Finalise carriage agreements with the providers of the programme services that your multiplex will carry at launch,
- g) Obtain Service ID codes (mandatory) and Transmitter Identification Information Codes (optional) from Ofcom,
- h) Obtain an Ensemble ID code f(mandatory) from Ofcom and specify short and long labels. Ofcom will apply the following guidelines in respect of Ensemble labels:
- i) They must be unique – i.e. not used by any existing DAB service;
 - ii) They must not cause confusion, for example by containing a place name of an unserved area or population centre;
 - iii) While desirable, they are not required to include the service area name;
 - iv) They should not be likely to cause offence;
 - v) Ideally they should not change over the duration of the licence.

²⁶ These should include all confirmed transmitter sites, transmitter powers, antenna heights and patterns. If directional antenna patterns are proposed or required, the licensee should provide evidence of the confirmed antenna pattern taking account of the structure that it is mounted upon, which is likely to require some theoretical calculation or modelling by the licensee, its technical contractor or the antenna manufacturer.

²⁷ Any specific technical requirements relating to an award would be set out in the letter set to successful applicants confirming the award of their licence. Where there are specific technical requirements listed in the letter, Ofcom will need to check that you have satisfied those specific requirements. If we find that you have not completely satisfied the specific requirements, it will take us longer to complete clearance of your plan, as you will need to make further changes, and re-submit it to us. We envisage that this process could take several months.

²⁸ Final Technical Plans should comprise a [Table of transmission characteristics template](#) together with a completed [small-scale DAB final transmitter plan site details document](#) for each transmitter.

²⁹ Section 2 of the Ofcom Technical Policy Guidance for DAB Multiplex Licensees and Section 3 of Ofcom’s Digital Technical Code gives more details regarding multiplex technical management. Once launched, Ofcom will publish the technical parameters of the services DAB transmitters and the service line up on its website.

- i) Confirm when the transmitters are planned to come on air and arrange with Ofcom for the licence to be granted with an agreed date when transmissions are expected to commence (see 'Grant of the licence' and 'Commencement date' below);
- j) At least 20 working days before the commencement date, send details of the final equipment and antennas that have been installed to Ofcom for checking against the antenna patterns included in the licence to broadcastradiocompliance@ofcom.org.uk. Where the structure upon which the antenna is mounted is likely to affect the antenna pattern, a modelled pattern using a suitable antenna modelling package must be provided;
- k) Inform other radio multiplex licensees when your transmitter is due to come on air, giving them two weeks' notice. If Ofcom's analysis suggests there is a risk of hole punching occurring, you should share that analysis with the potentially affected licensees and put in place appropriate mitigation measures. Details of the process that licensees must follow are provided in the procedure for launching new transmitters set out in Ofcom's [Technical Policy Guidance for DAB Multiplex Licensees](#);
- l) Commission and test the transmitter equipment for compliance with Ofcom's Digital Radio Technical Code and EMF licence condition. Once the licence has been granted and has commenced, you can carry out final on-air compliance checks for each transmitter. If these are satisfactory and confirm full compliance with the licence's technical requirements, the transmitter(s) can remain on air (otherwise the non-compliant transmitter(s) must be switched off until they can be brought into compliance); and
- m) Provide Ofcom with evidence of compliance with the licence and Digital Radio Technical Code within five working days of putting any transmitter into service via email to broadcastradiocompliance@ofcom.org.uk. The tests carried out under i) and the associated evidence sent to Ofcom should provide a reasonable confidence level that transmissions will remain compliant with the Wireless Telegraphy Act licence after commissioning. There is a checklist in the Broadcast Transmitter Guidance section of <https://www.ofcom.org.uk/spectrum/information> that provides a list of the tests that licensees will need to carry out to demonstrate compliance. The checklist includes a minimum set of tests to confirm compliance with the requirements of the Wireless Telegraphy Act licence only, and is not an exhaustive list of commissioning tests to confirm the satisfactory operation of the radio multiplex. Annex A1 includes some additional guidance on measuring the quality of the transmitted signal.

5.7 A flowchart illustrating the major activities in arranging for launch is given Annex A3.

Seeking to add sites to the pre-launch network

5.8 When an applicant supplies their final technical plan, they may propose sites beyond those specified in their original application plan. Ofcom expects an applicant to apply with a transmission network that it can commit to building and realistically expect to have on air within 18 months following licence award. We are aware that between submission of the application and the final technical plan enhancements may be identified. This is not an opportunity to change the commitments in your application, but to improve upon them should you wish to do so.

5.9 Details for any additional sites must be supplied by the applicant as part of their final technical plan and be implemented within 18 months of the original licence award, at the same time that the applicant's other transmitters are planned to come on air. For any

additional site a [new small-scale DAB final transmitter plan site details document](#) will be required to include the site details.

- 5.10 In developing plans for potential additional sites, applicants must have regard to the technical constraints that apply to all individual transmitters and to the multiplex as a whole:
- a) The coverage of the small-scale multiplex service including the additional coverage must not overlap more than 40% of the population within any local radio multiplex service's licensed area;
 - b) The number of people contained in any coverage falling outside the advertised licence area should not exceed 30% of the total population within the advertised licence area;
 - c) The proposed transmitter(s) must not cause significant interference to other radio multiplex services as specified in the original advertisement;
 - d) The proposed transmitter(s) must not cause significant hole-punching interference to the coverage of other radio multiplex services;
 - e) The proposed transmitter must not exceed the limits specified in the original advertisement for outgoing international interference.
- 5.11 Additional site(s) should in Ofcom's judgement also not seek to extend coverage into significant parts of population centres within an adjacent small-scale DAB licence area (i.e. population centres already covered by a launched small-scale multiplex, expected to be covered by an awarded but yet to be launched multiplex, or within a locality Ofcom plans to award in future).
- 5.12 Along with the final plan, Ofcom will provide feedback to the licensee on any additional sites. At this time non-compliances and hole-punching impacts will be identified. Should an extra site be non-compliant Ofcom will allow the applicant one opportunity to provide a revised submission for re-assessment. If the required changes are not acceptable to the licensee, then they can withdraw the proposal.

Grant of the licence

- 5.13 A small-scale radio multiplex service cannot commence broadcasting until the licence has been formally granted by Ofcom – i.e. the legal status of the licence has moved from 'award' to 'grant.' Before we can grant a Broadcasting Act licence, and an accompanying Wireless Telegraphy Act licence, the successful applicant will need to have completed the technical steps set out above in paragraph 5.6, up to and including step (d) – the sending final transmitter site details to Ofcom for approval.
- 5.14 In addition, prior to granting (and then issuing) the licence, we will need to check with the successful applicant that there have not been any changes to the information originally provided to us in its application form (for example, that the directors and/or shareholders of the body corporate have not changed). If there have been changes, Ofcom will need a new 'original declaration' to be completed so that we can assess whether the prospective licensee remains both eligible and 'fit and proper' to hold the licence.

Annual licence fee

- 5.15 Each small-scale radio multiplex licensee is required to pay an annual Broadcasting Act licence fee. The annual licence fee for a small-scale radio multiplex licence is £500.

- 5.16 The licence fee is payable from the beginning of the licence period, which will be the date of the commencement of broadcasting of one or more services on the multiplex. This fee is payable for as long as the licence is in issue.
- 5.17 No fee will be payable in respect of the licence issued under the Wireless Telegraphy Act 2006.
- 5.18 Annual fees are reviewed by Ofcom annually, and applicants should consult the Ofcom website for the most up-to-date fees. Our tariff tables are published no later than 31 March each year.
- 5.19 The three methods for paying your fees are set out below:
- 5.20 **Paying online:** For existing licensees, we offer the facility to pay for your annual licence fees online by credit or debit card, through our online payment portal. We accept all major credit/debit card types against any invoice with a value of up to £5,000. To use our online payment service, you will need your Customer Reference Number and Invoice Number, which can be found on your invoice. We know that security is an important concern for our customers when it comes to making online payments, therefore Ofcom works with Sage Pay, who holds a PCI DSS Certificate of Compliance for security, to ensure the protection of card details.
- 5.21 **Paying by BACS transfer:** annual licence fees can be paid directly by BACS transfer using your Invoice Number as a reference. Confirmation of payment, including your Customer Reference Number and Invoice Number, should be emailed to ofcom.remittances@ofcom.org.uk.
- 5.22 The bank details to be used to pay the annual licence fee are:

Account Name: Office of Communications

Bank details: Lloyds Bank, 69-73 Borough High Street, London SE1 1NQ

Account number: 00782415

Sort code: 30-97-90

BIC: LOYDGB21351

IBAN: GB05 LOYD 3097 9000 7824 15

SWIFT: LOYD GB 2L

- 5.23 **Paying by Direct Debit:** if you wish to pay your annual licence fee by direct debit, please submit a direct debit mandate form.

Ensuring fair and effective competition

- 5.24 The standard form small-scale radio multiplex licence includes provisions on ensuring fair and effective competition (clause 11) and on reservation of capacity for C-DSPs, publication of a rate card, and provision of information for related purposes to Ofcom (clause 6).
- 5.25 Prospective licensees need to be aware of the requirements in dealing with third parties, particularly those seeking to obtain capacity, whether reserved or unreserved. In particular, it is noted that clause 11(1)(a) refers to the requirement to, “not enter into or maintain any arrangements, or engage in any practice, which is prejudicial to fair and effective

competition” (emphasis added) so this is potentially relevant to arrangements predating the grant of the licence.

Licensed area and extent of coverage

- 5.26 The geographical areas defined in advertisements for small-scale radio multiplex licences provide a framework against which applicants can target their coverage, and have been produced by Ofcom taking into account where there is likely to be demand from applicants and spectrum available. Once a small-scale radio multiplex licence has been granted in a particular area, the coverage achieved by implementation of the final technical plan accepted by Ofcom following the above process becomes the small-scale radio multiplex service’s licensed area and the former advertised area ‘polygons’ cease to have any licensing significance. As Ofcom advertises and licences further small-scale DAB areas and our frequency plan evolves, we will protect those licensed areas, rather than the advertised polygon, against interference.
- 5.27 The six frequency blocks that Ofcom will principally be using for small-scale DAB have been vacated by other UK services and, at the time of writing, there are very limited services broadcasting in neighbouring countries. Early small-scale DAB services should therefore experience minimal interference from other broadcast services and coverage will extend as far as the signal is strong enough to be received and overcome the noise inherent in listeners’ radio sets (this is called ‘noise limited’ coverage). As a result, early services may be heard over larger areas than would be the case if we are able to license small scale multiplexes in all of the areas where we expect to use the same frequency block. Outdoor (in-car) coverage maybe also be available over a wider area initially for the same reason. As further small-scale DAB services in the UK and new DAB services in neighbouring countries come on-air, coverages may vary to some extent.

Compliance checks

- 5.28 It is the licensee’s responsibility to ensure its transmitter system complies with the technical parameters set out in its Wireless Telegraphy Act licence. Compliance checks can be carried out by the licensee, a transmission provider or other competent engineer. A list of the checks required to be carried out by the licensee or its contractor to demonstrate compliance with the licence and the Ofcom Digital Technical Code is available on the Ofcom website in the Broadcast Transmitter Guidance section of <https://www.ofcom.org.uk/spectrum/frequencies/spectrum-information>.
- 5.29 The majority of transmitter testing and commissioning can be carried out into a ‘dummy load’ without radiating on-air and can therefore be carried out ahead of the licence being granted. It is important that equipment is allowed to operate for a period before final measurements are taken to allow it to achieve a normal operating temperature, as the performance of some components (particularly filters) can vary with temperature.
- 5.30 A final check of compliance will need to be carried out of each transmitter operating into its antenna. This test can be carried out with the multiplex carrying normal programme services (i.e. C-DSP or DSP services), or test signals. This final on-air check will require the multiplex licence to have been granted and to have commenced, as it is an offence to radiate signals without a valid Wireless Telegraphy Act licence. If the final checks confirm that the transmitter complies with the requirements set out in the multiplex licence, it can

remain on-air. If it is not, the transmitter must be switched off (except for testing) until remedial work is carried out to bring it into specification. Final results of the checks will need to be emailed to Ofcom at broadcastradiocompliance@ofcom.org.uk for checking within five working days of the transmitter becoming operational. If Ofcom does not receive confirmation of compliant performance within that time, we reserve the right to require the service to be switched off until such time that we do receive evidence of compliance.

- 5.31 Ofcom may in some circumstances attend site to carry out its own checks. Where Ofcom carries out compliance checks we will only carry out the minimum checks to confirm that a site is operating within the limits set out in the licensee's Wireless Telegraphy Act licence. Some aspects of the transmission system, such as signal distribution and SFN operation, have no impact on the transmitted signal's propensity to cause interference to other spectrum users and will not be checked by Ofcom. Once compliance checks have been completed no modifications to the transmitter's RF characteristics are allowed without prior permission from Ofcom. Ofcom will expect to assess the compliance of all transmitters during the same visit, if it chooses to visit a licensee's area to check transmitter compliance.
- 5.32 If Ofcom carries out a site compliance check and a transmitter fails a compliance check, Ofcom will terminate the compliance test visit and leave site (unless the non-compliance is minor and can be remedied quickly by the licensee or its contractor on the spot). Ofcom will not return to site until the licensee has provided written confirmation that the transmitter system is compliant. Following a failure of a compliance test, Ofcom will charge for the return visit if, in the opinion of the Ofcom representative, the non-compliance has arisen due to the negligence of the licensee or its contractor or could otherwise have reasonably been foreseen. The charge (as of September 2020) would be up to £775 per day.

Commencement date

- 5.33 The commencement date contained in the licence will be the date on which the small-scale radio multiplex service starts broadcasting (and therefore needs to be agreed with Ofcom in advance). As previously noted, the legislation requires a small-scale radio multiplex service must commence broadcasting within 18 months of the date of licence award.
- 5.34 Prior to launch, the licensee should ensure that each of the programme services that it plans to carry on its multiplex service holds either a DSP or C-DSP licence issued by Ofcom, and that it has a record of the Ofcom licence number for each programme service broadcast.

Coverage maps

- 5.35 Once a service has launched, Ofcom will produce a coverage map for the service based on the agreed final technical plan including any amendments as detailed above. The maps will be published on our [website](#).
- 5.36 We will not publish maps nor consider a plan to be completely finalised until the multiplex has launched. This is to avoid confusion if late changes to the plan are necessary due to implementation issues. All changes to the Technical Plan must be approved by Ofcom.

6. Information for small-scale radio multiplex licensees

These guidance notes highlight key features of a small-scale radio multiplex licence. They are not intended to be comprehensive.

Licence duration, technical standards and renewal

- 6.1 A small-scale radio multiplex licence will be awarded for a period of up to seven years, with a further potential renewal period of five years.
- 6.2 You must provide your small-scale radio multiplex service to a reasonable standard of technical quality and reliability throughout the licence term. This differs slightly from local and national radio multiplex services which must meet a ‘high’ standard, but it still requires a continuous service to be provided and operation within published Ofcom technical guidance. An annex to your licence will set out transmitter locations and other technical information and, in common with other multiplex services, you will also hold a Wireless Telegraphy Act licence with further technical parameters. Any changes to technical arrangements would require application for licence variation (see below). Licensees must also observe the provisions of Ofcom’s [Digital Radio Technical Code](#).
- 6.3 An application for licence renewal needs to be made by the licence holder within a window that will open 18 months before the licence would otherwise expire, and which closes six months before it would otherwise expire. This is a strict statutory requirement, and applications outside this renewal window cannot be accepted by Ofcom. Licensees will be responsible for ensuring that they apply for renewal in a timely manner – Ofcom will not send out reminder letters or e-mails. Details of the renewal process (for example, the information that you will need to provide us with) will be published once a significant number of services have been licensed, and well before the application windows for the earliest-expiring licences commence.
- 6.4 On renewal Ofcom may require the submission of a supplementary technical plan, addressing technical guidance from Ofcom (which may, for example, be relevant if there has been a change in technical standards over the licence period).
- 6.5 For the renewed licence period, Ofcom may require adjustments to the amount of capacity on the multiplex reserved for C-DSP services (see below). This may be relevant if there is evidence of unmet demand for capacity from such services in the area which, in Ofcom’s view, may be accommodated without undermining the viability of the multiplex.
- 6.6 We may refuse to renew a licence if the applicant has failed to comply with licence conditions or has failed to submit a supplementary technical plan as required, or if we are not satisfied the licensee could provide a service complying with conditions on renewal.

Transfers and other changes to your licence

- 6.7 If there are any changes to your contact details once the licence has been granted, the licensee must inform Ofcom immediately by emailing broadcast.licensing@ofcom.org.uk.

- 6.8 Once operational, Ofcom will need to be notified of changes to the line-up of programme service providers broadcasting on your multiplex, and/or the technical specifications. This information will be published on our website. While small-scale radio multiplex service licensees do not need Ofcom to agree changes to programme services, **we will need five working days' notice before such changes are applied**. Details of how to inform Ofcom of programme service changes will be communicated to successful applicants in advance of the launch of their multiplex services.
- 6.9 If you wish to transfer your licence, it is important to note that this can only be done with Ofcom's prior written consent. A request for consent to transfer a licence must be submitted in writing by the proposed transferee using Ofcom's 'Original Declaration' form. The form, which can be requested from broadcast.licensing@ofcom.org.uk, must be accompanied by a written letter from an authorised individual.³⁰
- 6.10 To be able to consent to a transfer of a licence, Ofcom must be satisfied that the proposed transferee can comply with all of the conditions of the licence. We will therefore require the same information about the proposed transferee, as when considering an application for a licence from a new applicant. We may need to ask for further information before deciding whether to consent to a transfer of a licence.
- 6.11 We will not generally consider a transfer application if the current licensee has outstanding annual licence fees specific to the licence in question.
- 6.12 If consent to transfer the licence is granted, it is for the relevant parties to effect the transfer of the licence. Once the transfer has taken place, the transferor must inform Ofcom in writing (within three months of consent), that the transfer has been completed. We will not be able to amend our records to reflect the transfer until we have received this information. This confirmation should be signed by an authorised individual³¹, and include both the date of the signature and the date that the transfer was completed. A notice of transfer will then be issued by Ofcom to the new licensee.
- 6.13 Ofcom may vary your licence by a notice served on the licensee. This can either be with your consent or, in the absence of consent, provided that you have been given a reasonable opportunity to make representations to Ofcom about the proposed variation.

Reservation of capacity for C-DSP services

- 6.14 An important condition of a small-scale radio multiplex licence which differs from other radio multiplex licences is that broadcast capacity for Community Digital Sound Programme ('C-DSP') licence holders must be reserved. The number of slots required will be specified in the original licence advertisement published by Ofcom, and this will be reflected in the licence. The legislation requires Ofcom to ensure sufficient capacity is reserved for a minimum of three C-DSP services, but we may reserve more based on our assessment of what is appropriate in the particular locality.

³⁰ In the case of: a) a company, this will be a director, the company secretary or clerk; b) a partnership, this will be a partner or another person who is in control of the business; and c) an unincorporated body or association, this will be a member of the organisation's governing body.

³¹ In the case of: a) a company, this will be a director, the company secretary or a designated member in the case of Limited Liability Partnership; b) a partnership, this will be a partner; and c) an unincorporated body or association, this will be a member of the organisation's governing body.

- 6.15 The amount of capacity that must be reserved by the small-scale radio multiplex licensee should be calculated on the basis that each C-DSP service must be able to occupy a minimum of 36 capacity units (equivalent to 48 kbit/s using DAB+ (i.e. HE-AAC audio encoding) with protection level EEP3A). To clarify how this will be embodied in small-scale radio multiplex licences, and taking an example where a small-scale radio multiplex licence is required to reserve capacity for three C-DSP services:
- a) If it has no C-DSP services currently on the multiplex it must keep 108 capacity units (equivalent to 144 kbit/s or 3 x 48 kbit/s) empty and ready for three C-DSP services at all times;
 - b) If it has one current C-DSP service occupying 36 capacity units or more, it must have 72 capacity units (equivalent to 96 kbit/s or 2 x 48 kbit/s) empty and ready; and
 - c) If it has two C-DSP services each occupying 36 capacity units or above, it must have 36 capacity units (equivalent to 48 kbit/s) empty and ready.
- 6.16 It is important to emphasise that the legislation and licences are clear that this capacity is *solely* for the broadcast of C-DSP services and cannot be occupied by any other programme services, even on a short-term basis. If an individual C-DSP service wishes to occupy less than 36 capacity units, the remaining reserved capacity must still be kept free. For example, in the example mentioned above, if the multiplex has only one current C-DSP occupying only 24 capacity units (equivalent to a bitrate of 32 kbit/s) it must have 84 capacity units (2 x 36 plus the “spare” 12 capacity units) empty and ready for other C-DSP services.
- 6.17 It is up to the small-scale radio multiplex licensee to determine how to allocate its reserved capacity. The amount of that reserved capacity is the only regulatory requirement. Put another way, to use the example above, the fact that Ofcom has specified that capacity must be reserved for three C-DSP services simply determines the overall amount of capacity to be reserved (i.e. 3 x 36 capacity units = 108 capacity units). It does not mean that only three C-DSP services can be carried. The number of C-DSP services to be carried in those 108 capacity units is for the small-scale radio multiplex licensee to determine. For example, six C-DSP services could be carried if each occupied 18 capacity units.
- 6.18 In order to ensure you are compliant with these rules, you should check that a broadcaster seeking carriage on reserved capacity does in fact hold a C-DSP licence which contains a reference in the Key Commitments annexed to that licence to your particular small-scale radio multiplex service.
- 6.19 You may, under limited circumstances, apply to vary the reservation of capacity. However, you can only do so if more than three years have passed since the licence was granted, and part of the reserved capacity remains unused. If you are seeking to reduce the amount of reserved capacity, we will require evidence that you have taken all reasonable steps to identify persons interested in providing a C-DSP service and have acted reasonably in offering to contract with potential services. You also cannot, under any circumstances, apply to reduce the reservation below the statutory minimum of three slots (i.e. 108 capacity units).

Information requirements on carriage fees and services carried

- 6.20 All small-scale radio multiplex licensees are required to publish a current ‘rate card’ on their website, and to provide Ofcom with details of the carriage fees currently being paid by programme service providers on the multiplex.
- 6.21 Small-scale radio multiplex licensees are also required to maintain up-to-date information on their website on the programme services they are carrying, as well as to notify Ofcom in advance of changes to that list (including whether or not the services listed occupy reserved capacity). This is to ensure that Ofcom has up-to-date information on the programme services being carried on a small-scale radio multiplex service and will allow us to identify where DSP and C-DSP services are broadcasting for the purposes, for example, of standards complaints, and to monitor the use of reserved capacity. Changes to programme services do not require Ofcom approval.

Provision of information

- 6.22 You must supply to Ofcom by such deadline as we may provide any information that we may require for carrying out our duties. This includes (but is not limited to) information about the licensee’s corporate structure, any information that Ofcom may need to determine whether the licensee is on any ground a “disqualified” person³², information about the diversity characteristics of the licensee’s employees and its equal opportunities arrangements and financial information used for market monitoring and the publication of sectoral statistics information relevant to the calculation of annual licence fees.
- 6.23 Your licence also obliges you to inform Ofcom about changes to the nature, characteristics or control of the licensee body.
- 6.24 You should notify Ofcom in writing of the following changes as soon as reasonably practicable, and no later than 28 days from the changes taking place:
- Proposals affecting the control of the licensee, and changes in control.
 - Changes in shareholders and directors.
- 6.25 You should notify Ofcom in writing immediately of the following changes:
- Changes in management, key staff and contact details.
 - If the licensee becomes aware that any order is made or resolution passed which would result in the licensee going into administration, liquidation, or if the licensee may become insolvent.
- 6.26 If a court judgment is passed against the licensee or the licensee is convicted of a criminal offence. We require the above information in order to carry out our licensing duties. Please see ‘Ofcom’s Privacy Statement’ <https://www.ofcom.org.uk/about-ofcom/corporate-policies/general-privacy-statement> for further information about how Ofcom handles your personal information and your corresponding rights.

³² Under Schedule 2, Part II of the Broadcasting Act 1990 or section 44A of the Broadcasting Act 1996.

Revocation and surrender of licence

- 6.27 If you are no longer able to provide a service, the licence should be surrendered. To surrender your licence, you must write to Ofcom. The letter must be signed by an authorised individual on behalf of the licensee.³³ The letter should make clear the date upon which you wish to surrender the licence, i.e. either the date of the letter or a date in the future.
- 6.28 Ofcom may consider revocation of the licence as a possible sanction where you breach your licence. Reasons for revocation include, but are not limited to:
- the licensee has failed to pay its annual licence fees or provide information requested by Ofcom;
 - the licensee has ceased to provide the licensed service to a reasonable technical standard and the absence of a timely and feasible plan to rectify this makes it appropriate to revoke;
 - the licensee has provided false information (or withheld information) with the intention of misleading Ofcom;
 - the licensee becomes a “disqualified” person;³⁴
 - any change takes place affecting the nature, characteristics or control of the licensee which, if in place originally, would have resulted in Ofcom not granting the licence;
 - Ofcom ceases to be satisfied that the licensee is “fit and proper” to hold a licence;³⁵
 - the licensee fails to comply with any requirement to hold (or have held on his behalf) a licence under the Wireless Telegraphy Act 2006, or if the licensee ceases to comply with the requirements as set out in Chapter 1, Part 2 of the Communications Act (relating to electronic communications networks and services);
 - the licensee is placed in administration or liquidation, or becomes insolvent.
- 6.29 Before revoking a licence, Ofcom must first notify the licensee of its intention to revoke and give the licensee a reasonable opportunity to make representations.

Fair and effective competition

- 6.30 Ofcom has a duty to ensure fair and effective competition in the provision of licensed services and services connected with them. Your licence therefore includes a condition requiring you:
- not to enter into or maintain any arrangements or engage in any practices which are prejudicial to fair and effective competition in the provision of licensed services or connected services;

³³ In the case of: a) a company, this will be a director, the company secretary or clerk; b) a partnership, this will be a partner or another person who is in control of the business; and c) an unincorporated body or association, this will be a member of the organisation’s governing body.

³⁴ Under Schedule 2, Part II of the Broadcasting Act 1990 or section 44A of the Broadcasting Act 1996.

³⁵ Under section 3 of the Broadcasting Acts 1990 and 1996.

- to comply with any code or guidance approved by Ofcom for the purpose of ensuring fair and effective competition in the provision of licensed services or connected services; and
 - to comply with any direction given by Ofcom for that purpose. Ofcom has adopted this general policy because of the merits of ex ante regulation in securing fair and effective competition.
- 6.31 Your licence also prevents you from offering to enter into an agreement with a programme service provider where the terms of that agreement show undue discrimination towards a particular person or a class of such persons.
- 6.32 It is important to note that this does not prevent you from offering more favourable terms to C-DSPs accessing reserved capacity than to DSPs accessing unreserved capacity. Only C-DSPs are able to access reserved capacity, and the different demand conditions are likely to justify a different approach.
- 6.33 In general, when contracting with programme service providers for multiplex capacity, we would expect small-scale multiplex operators to deal with programme service providers on a ‘first come, first served’ basis. In some cases, we recognise that initial carriage agreements may have already been drawn up between programme service providers and prospective multiplex operators prior to the multiplex application being submitted and the licence being awarded. This is legitimate given that, under the statutory assessment criteria for the assessment of multiplex licence applications, multiplex applicants need to demonstrate evidence of demand and support for their proposed multiplex service, which will mean engaging with prospective programme providers (and, potentially, entering into prospective carriage agreements with them).
- 6.34 It may be the case that, on occasions, the demand for capacity on the multiplex exceeds availability. This means the multiplex operator may need to choose between competing programme service providers for available capacity on the multiplex. In this situation, and all other things being equal, it would be legitimate for the multiplex owner to favour one type of programme service over another, provided that the selection criteria has previously been made transparent (i.e. it is in the public domain and clearly set out by the multiplex operator on its website and any material sent to prospective programme service providers). Examples of such criteria could include giving priority to programme services that are locally owned and based; giving priority to a programme service provider who wishes to broadcast something different to the type of programme content that is already available on the multiplex; or giving priority to non-profit making services, such as hospital radio stations.
- 6.35 Before taking enforcement action under the licence pursuant to this condition, Ofcom would need to consider whether, in the circumstances, it would be more appropriate to proceed by enforcing the relevant provisions of the Competition Act 1998 rather than by enforcing the licence condition.

Equal opportunities and training

- 6.36 Licensees which employ more than 20 people and operate for more than 31 days in a year are required to put in place arrangements for the promotion of training and equal opportunities. Specifically, licensees must:
- make and from time-to-time review arrangements for promoting equal employment opportunities in relation to sex, race and disability. Examples of such arrangements may

include policies and initiatives designed to help licence holding companies employ and retain a diverse workforce;

- make and from time-to-time review arrangements for training staff. Examples of such arrangements may include mentoring schemes or professional skills training programmes;
- take appropriate steps to make those affected by the arrangements specified above aware of them;
- publish yearly observations on the current operation and effectiveness of their arrangements. Companies may, for example, devote a section of their annual report to their training and equal opportunities programmes; and
- provide Ofcom with a copy of annual observations detailing the current operation and effectiveness of their arrangements when requested.

Sanctions

- 6.37 Ofcom can impose sanctions on a licensee for breaches of the licence conditions. The sanctions available to Ofcom include revocation (see above), reduction in licence term, and a financial penalty of up to £100,000.
- 6.38 In cases where Ofcom has instigated sanctions procedures against an existing licensee which may lead to the revocation of any licences(s) it holds, it will not generally consider any applications for transfers of licences by the same licensee or by a person/body connected to that licensee until such time as that aspect of the sanctions procedure against the existing connected licensee is concluded. Similarly, Ofcom will not generally consider transfer applications either to or from a licensee while a sanctions procedure which may lead to licence revocation is ongoing.

7. Post-launch changes to transmission arrangements

- 7.1 Ofcom is not able to consider large numbers of applications from small-scale radio multiplex licensees to make technical changes to their on-air services while we continue to advertise and award new small-scale radio multiplex licences.
- 7.2 This is due in particular to the resource requirement of considering such changes, and the potential impact on surrounding areas where Ofcom will need to take account of other licensees' coverage aspirations and the overall pattern of spectrum use.
- 7.3 However, we recognise there may be circumstances in which a licensee will need or wish to change its technical arrangements. When resources allow, we will aim to consider any such requests in the following descending order of priority:
- i) Where a licensee needs to amend its transmission arrangements due to force majeure or external imperatives over which the licensee has no control (e.g. where a transmitter site is located on a building that is going to be demolished).
 - ii) Where a licensee can to Ofcom's satisfaction demonstrate, with evidence, that continuing with an existing transmission site would render the multiplex service unviable and result in its cessation.
 - iii) Where a licensee needs to amend its technical arrangements to recover coverage lost as a result of an unanticipated issue when implementing its agreed final technical plan.
 - iv) Where a licensee wishes to change its transmission arrangements for any reason not covered by 1–3 above. As these are the lowest priority, we are unlikely to be in a position to consider many such requests until we have completed the programme of licensing new services (particularly with more complex cases). Given this likely delay, we will contact the licensee when we are able to consider their request to confirm the change is still required.

Statutory framework

- 7.4 Under section 54A of the Broadcasting Act 1996 as modified by the Small-scale Radio Multiplex and Community Digital Radio Order 2019 ("BA1996"), Ofcom is able to vary a small-scale radio multiplex licence by
- a) varying the frequency on which the licensed service is required to be provided,
 - b) reducing the area or locality in which the licensed service is required to be available, or
 - c) extending that area or locality to include an adjoining area or locality.
- 7.5 The legislation further specifies that Ofcom must have received an application for the variation from the licence holder, and that this application must include a technical plan relating to the service proposed to be provided under the licence indicating, in particular—
- a) the area or locality which would be within the coverage area of the service,
 - b) the timetable in accordance with which that coverage would be achieved, and
 - c) the technical means by which it would be achieved.

- 7.6 Before deciding whether to grant the application, Ofcom must publish a notice specifying the proposed variation of the licence, and a period in which representations may be made to Ofcom about the proposal.
- 7.7 Finally, the legislation specifies that Ofcom may vary a licence in accordance with an application only if they are satisfied that doing so would not unacceptably reduce the number of community or local digital sound programme services available to persons living in the area or locality for which, before the proposed variation, the small-scale radio multiplex service is required to be available.

Application and assessment procedure

- 7.8 An application to change the transmission arrangements of a small-scale radio multiplex service must include the following:
- A revised technical plan, consisting of the spreadsheet of site parameters, textual documents, site photos, modelled antenna pattern, etc.
 - Evidence that heads of terms for access to any new site have been agreed, including costs, any other permissions required, etc.
 - An explanation of the reason(s) for the proposed change, together with any supporting evidence and/or documentation.
 - The timeline for implementing the change. Agreed changes must be implemented within 12 months, to enable Ofcom to efficiently manage the spectrum allocated for small-scale radio multiplex services.
- 7.9 Ofcom will first assess whether a requested change in transmission arrangements constitutes a frequency change, a reduction in the licensed area, or an extension of the licensed area to an adjoining area.
- 7.10 Where a request, if approved, would result in a change of frequency or a decrease in overall coverage of the multiplex service (as measured by adult population coverage), Ofcom will generally consider these to fall within the scope of section 54A of the BA1996 and thus will need to be consulted upon before Ofcom can reach a decision.
- 7.11 Where a request, if approved, would result in an overall increase in coverage for the multiplex service (as measured by adult population coverage), Ofcom will determine whether it constitutes an extension of the area in which the licensed service is required to be available to include an adjoining area. We interpret ‘adjoining area’ in this context to mean an area of new coverage outside the existing licensed area which, whether measured in terms of the specific location(s), geographical size(s) or population coverage(s), could reasonably be considered to be material – we recognise there is a difference between overspill coverage that is unavoidable and intentional extra coverage. We will also take account of whether that adjoining area is, or will potentially be, served by another small-scale radio multiplex service, and whether it was or wasn’t part of the original area advertised by Ofcom.
- 7.12 If we determine that the proposed change in transmission arrangements would result in an extension of the licensed area to an adjoining area, the request will need to be consulted upon before Ofcom can reach a decision.

- 7.13 In circumstances where a change would result in an overall increase in coverage for the multiplex service but not constitute an extension of the licensed area to an adjoining area, we will nevertheless also consider whether any coverage which is lost as a result of the changes is of sufficient magnitude and/or significance such that a consultation would still be appropriate. In reaching this view, we will have regard to the extent of any coverage losses both in terms of the absolute numbers of people who are predicted to lose coverage of the multiplex service, but also in terms of the geographical location(s) where coverage is predicted to be lost. We are likely to attach greater weight to coverage losses in the core population centre(s) of the licensed area than to losses at the periphery of the licensed area, or where losses are dispersed across sparsely-populated areas.
- 7.14 Any consultation will be published on the Ofcom website, normally for a duration of four weeks. Ofcom will then review any responses before making a final decision.

Decision-making

- 7.15 For all requests to change transmission arrangements, Ofcom will not give its approval unless it is satisfied in relation to all of the following technical requirements:
- Overlap with any relevant local multiplex(es) remains not greater than 40% (in line with the policy intention of section 50(2A)(c) of the BA1996 to limit such overlaps).
 - Any international constraints are adhered to.
 - There is no significant increase in the level of interference to multiplexes elsewhere:
 - > For on-air multiplexes elsewhere, this means no significant impact to their actual coverage;
 - > For polygon areas that have not yet been advertised, or small-scale multiplexes where a licence has been awarded but not yet granted, this means ensuring there is no significant impact when considering the entire population in the polygon area as at initial assessment.
- 7.16 Ofcom will also consider:
- Whether the reason(s) for making the change is adequately supported by evidence. In particular, we would not normally approve a reduction in coverage unless continuing with the current Technical Plan is demonstrably not feasible, and feasibility cannot reasonably be achieved through less impactful means.
 - Whether there is evidence the licensee has taken reasonable steps to minimise any adverse impacts from changes to its coverage, and that any changes in coverage involving coverage reduction or extension into the coverage area of neighbouring small-scale multiplexes are unavoidable. This should include an indication of all other sites that were investigated and any reasons for selecting a preferred site.
 - Whether any increase of overlap (or new overlaps) with the coverage of other small-scale radio multiplex services is excessive. Whilst some overlap between small-scale multiplexes is inevitable, and changes to transmission arrangements may alter this overlap, in general we would consider this should represent no more than a small proportion of the other multiplex's coverage (if on-air) or polygon (if not yet launched, or yet to be advertised), and extending coverage to a material extent into a key population centre served by a launched or planned small scale multiplex service should be avoided.

7.17 In addition, for any variation requests which are subject to consultation in accordance with section 54A of the Broadcasting Act 1996, Ofcom must first be satisfied in relation to the statutory criterion specified in paragraph 7. If Ofcom is so satisfied, we will have regard to the following additional criteria when determining whether to vary the licence:

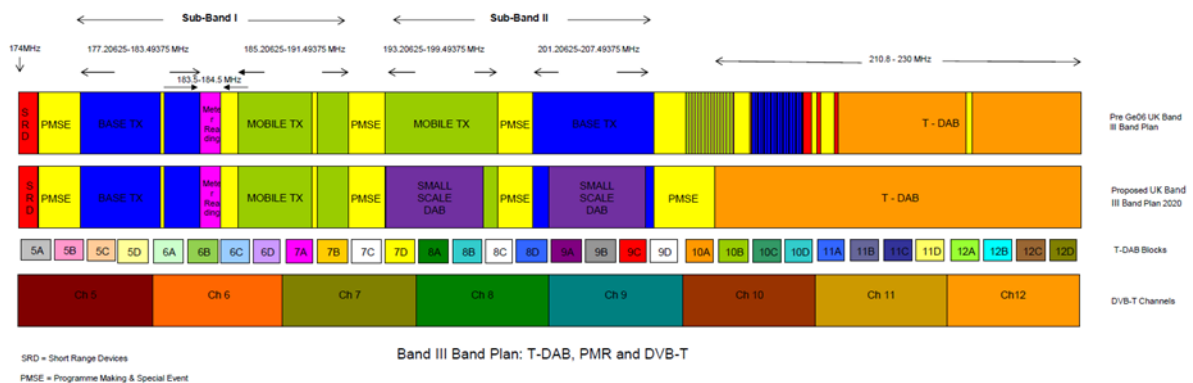
- whether the change in transmission arrangements would be calculated to maintain or promote the development of digital sound broadcasting otherwise than by satellite;
- whether the licensee's proposed coverage plan is satisfactory;
- whether the licensee has the ability to maintain the licensed service;
- whether there are sufficient safeguards in place to protect the rights and interests of stations carried on the multiplex and the rights and interests of other multiplex operators (and the stations they carry); and
- any other factors that appear relevant to the particular case.

A1. Miscellaneous technical information and guidance

DAB spectrum allocation – Band III background

- A1.1 Internationally allocated spectrum for DAB is between 174 and 230 MHz, generally referred to as VHF Band III. This spectrum is allocated to broadcasting services, both DAB and DVB. At the International Telecommunications Union (ITU) Regional Radio Conference held in Geneva in 2006 (Ge06) frequency allocations for DAB and DVB were agreed across Europe and beyond. These allocations are all recorded in the ITU Ge06 Plan. In the UK, additionally, there is a co-primary allocation to private mobile radio (PMR) in the lower part of Band III. Use of this spectrum for PMR was agreed with France, Belgium and The Netherlands but not with the Republic of Ireland. In the UK the Band III is sub-divided in three parts or sub-bands.
- A1.2 In addition to broadcast and PMR services, there are allocations for several other, secondary, users. These include short range devices such as assistive listening devices and wireless microphones used for programme making and special events.
- A1.3 At Ge06 the UK agreed to migrate any PMR users in the centre part of the Band, sub-band II, into the lower part, sub-band I. This was to enable the implementation of DAB & DVB in neighbouring countries. Notice to quit the sub-band was issued to any remaining PMR users in sub-band II and any that do not migrate lost protection from June 2020. The diagram below shows the relationship and evolution of VHF Band III since the Ge06 conference.

Figure 1: Band III band plan



- A1.4 Sub-band II is now vacant in the UK and has been allocated for DAB services. The DAB allocations available in this spectrum are blocks 7D, 8A, 8B, 9A, 9B and 9C. It is these blocks which Ofcom will use for most small-scale DAB services. Where small-scale DAB requirements are high or there are exceptionally high levels of interference from abroad, spectrum in sub-band III (blocks 10B to 12D) may also be used if available.
- A1.5 To date few DAB services have been implemented in sub-band II by neighbouring countries, although some are now launching. Most neighbouring administrations are also developing plans to convert any DVB allocations to DAB.

- A1.6 There are no allocations for UK small-scale DAB in the Ge06 Plan and any new services will need to be coordinated. The UK has been discussing our plans for small-scale DAB with a view to seeking access to the spectrum and developing coordination agreements. This work is on-going, and some agreements are now in place with neighbouring administrations.
- A1.7 So far, these agreements have been based upon the total interference from all co-block small-scale DAB services at neighbouring countries' coastal test points. In these cases, each small-scale DAB service will need to be restricted so that when considered with other co-block services, the test point levels are not exceeded. Ofcom does not expect to be able to negotiate any future increase to these test point levels.
- A1.8 We hope to have all remaining agreements in place by early 2024, or sooner if possible. This timescale is subject to the evolving plans in other countries, as well as how small-scale DAB rolls-out in the UK. However, we are at this stage fairly certain that only a restricted number of blocks will be available in some coastal areas, and others may be subject to high levels of incoming interference.
- A1.9 Prospective licensees should be aware that the coverage their service achieves may change slightly as small-scale DAB services progressively launch. This is because the spectrum we are using for small-scale DAB was initially vacant, but will become increasingly busy, with a consequential increase in interference between services. Coverage (especially outdoors) can be expected to reduce, as other small-scale DAB services come into operation. As services in neighbouring countries launch, we also expect some coverage areas to reduce particularly during periods of enhanced propagation. This will apply especially in southern England, East Anglia, west Wales and Northern Ireland.

Multiplexing / signal distribution

- A1.10 Analogue broadcast services provide only a single programme stream while a DAB service carries multiple audio and, possibly, data services. While there is not a hard limit on the number of services that can be carried, if DAB+ is used around 20 or more are possible depending upon the multiplexing equipment used. The services carried need to be brought to a single point and combined, a process called multiplexing. The multiplex signal then needs to be distributed to the transmitter(s). There are numerous methods for the signals to be distributed around the network with varying levels of reliability, resilience, quality and cost. Diverse routing of duplicate circuits for critical signals might also be considered.
- A1.11 While the line-up of services may not be available for the application itself, Ofcom will need details of how applicants expect to carry out multiplexing. We will need to understand; where multiplexing is expected to take place, how programme feeds will be brought to the multiplexing location, the type of feeds (bearer circuits) to be used and the equipment used for encoding and multiplexing as well as how the multiplexed signal will be distributed to and between the transmitters and the types of circuits used for this. This information may be supplied as a mix of network diagrams, tables, maps and text.

Bit rates: DAB versus DAB+ and error protection levels

- A1.12 Unlike VHF/FM or MF/AM services it is possible to vary the quality of the individual programme services on a DAB multiplex. This is achieved by varying the allocation of multiplex capacity to individual services in accordance with their requirements. For

example, lower bitrates could be allocated for a speech only service or a mono service, while higher bitrates are assigned to a classical music service.

- A1.13 A further consideration is the ratio of programme to error correction data to broadcast information. DAB allows for five different levels of error correction with 1 being the highest (most correction data) and 5 being the lowest (least correction data). The Ofcom digital technical code requires a minimum error protection of level 3. Ofcom's predictions of coverage and interference will be carried out assuming the use of error protection level 3 only. Use of error protection level 3 allows for a total of 1152 Kbits to be allocated to services. Use of level 2 or 1 is permitted (with Ofcom's prior consent) and may help improve coverage slightly or robustness in the presence of interference but will reduce the capacity available for audio and data services. Ofcom's Technical Code does not permit use of error protection levels 4 or 5.³⁶
- A1.14 There are two versions of DAB; the original version known simply as 'DAB' and the more efficient 'DAB+', a newer version which uses more advanced coding and compression standards. Services using either version can be transmitted on the same multiplex simultaneously. DAB+ allows for four different levels of error correction with EEP1 being the highest (most correction data) and EEP4 being the lowest (least correction data). The Ofcom digital technical code requires a minimum error protection of level EEP3. Even where DAB+ is used, Ofcom's predictions of coverage and interference will be carried out using standard DAB with error protection level UEP3. DAB+ has several differences when compared to DAB:
- It uses a more efficient compression algorithm than DAB which allows for the carriage of around twice the number of services.
 - It has additional error coding that is slightly more robust for a given protection level compared to DAB. However, the extra coding does lead to longer decoding delay at the receiver.
 - Older receivers are not DAB+ enabled. However, all receivers with a digital tick are DAB+ compatible, including almost all car receivers.
 - DAB is licence free whilst a DAB+ patent licence is still payable.
 - Using DAB+ error protection level EEP2 or EEP1 can give a significant improvement in coverage for any programme services that use it. Therefore, prior Ofcom approval will be required for the use of these error protection levels to ensure that the 40% population overlap with local DAB services is not exceeded.
- A1.15 It is for the multiplex operator and the programme service provider to agree upon the bitrate used for each service and whether to use DAB or DAB+. Ofcom requires small-scale DAB services to be broadcast in a reasonable standard in terms of technical quality and reliability.

Evolution of the frequency plan

- A1.16 As mentioned above, only a limited number of frequency blocks are available for use by small-scale DAB multiplexes. This means that frequency re-use will inevitably be intensive

³⁶ A very small number of historical services that pre-date the current policy operate with error protection level 4.

and tightly constrained. There will therefore be an ongoing optimisation of the plan as the overall programme of small-scale DAB progresses. In each licence advertisement, Ofcom will specify several areas which could potentially use the same frequency, many of which may be adjacent to each other. As more licences are awarded, the spectrum requirements for small-scale DAB will become clearer. As small-scale DAB services launch their predicted noise-limited coverages will be published which will then form the basis of their licensed area. When the service launches, the advertised area will cease to have any relevance. When the final coverage of a multiplex is confirmed, Ofcom may remove from the title of our published coverage map and the licence the names of any places that were used in the original advertisement, but which will not be served. For example, if we advertised a polygon for 'Trumpton, Chigley & Camberwick Green', but the licensee's technical plan did not serve Chigley, the licence and coverage maps would be labelled as 'Trumpton & Camberwick Green'.

- A1.17 The predicted licensed area will include any overspill outside of the original advertised area although Ofcom will not seek to protect isolated patches of coverage. Any parts of the originally advertised area that are not served will not form part of the final licensed area.
- A1.18 Future applicants and licensees will only be required to protect the final licensed area. Coverage will be based upon Ofcom predictions and a coverage map of the small-scale DAB service will be published on the Ofcom website after all transmitters in the area have launched. The guidance and supporting data for the advertised area will remain on the Ofcom website to assist future applicants. Ofcom will seek to protect the licensed area from interference caused by other multiplexes that launch subsequently on the same frequency block, although small changes in coverage will inevitably occur due to mutual interference between some multiplexes.
- A1.19 If Ofcom does not receive an acceptable application for an advertised area and is not able to make a licence award, we may, at our discretion, decide to remove it from the small-scale DAB area plan. In relation to macro areas, as noted above, it may not prove possible to make an award in all advertised localities even if there are acceptable applications, due to spectrum availability constraints. Similarly, we may remove such areas from the small-scale DAB area plan.

Coexistence with other licensed spectrum users and resolving interference

- A1.20 All radio transmitters regardless of technology produce some level of signal outside the bandwidth in which they are licensed to operate. Radio receivers are also imperfect, and do not filter or block all unwanted signals on frequencies outside the range they are trying to receive.
- A1.21 Wireless Telegraphy Act licences (or Interface Requirements for devices exempt from licensing) set limits on the level of emissions outside the licensed bandwidth with a view to minimising the risk of interference to other spectrum users.
- A1.22 The Wireless Telegraphy Act licence granted to a small-scale DAB multiplex licensee provides authorisation to transmit the service and, together with the Digital Radio Technical Code, sets out the relevant limits on emissions. The tests listed in the Commissioning test checklist referred to in Section 5 are a minimum set of measurements that aim to confirm compliance with the Wireless Telegraphy Act licence.

- A1.23 Satisfactory completion of the Commissioning test checklist and compliance with the licence does not however guarantee that that interference will not occur. In some circumstances a small-scale DAB service may cause interference to another spectrum user. If both services are operating in compliance with their licences and have been adequately engineered, the likelihood of this occurring is low, and usually only where one service's transmitter is located very close to another service's receiver, for example on the same building rooftop or transmission mast. The risk of interference increases where some of the following apply:
- a) Transmit and receive antennas are mounted physically close to each other
 - b) Transmit and receive frequencies are fairly close together
 - c) The receiver is operating in a low field strength (i.e. trying to receive a weak signal)
 - d) Transmitter powers are high
- A1.24 The mechanisms through which interference may occur vary, although are mostly due to either or both of
- a) the transmitter putting too much signal into the affected receiver, causing intermodulation, usually leading to a complete ceasing of operation; and/or
 - e) out of band emissions from the transmitter falling on the receiver's bandwidth and increasing the noise level it sees, thus leading to a degradation in performance, or complete loss of service.
- A1.25 Where interference between services occurs, common solutions are to add bandpass or notch filtering to a receiver in the case of overloading, or notch filtering to a transmitter in case of out of band emissions. Alternatively, increasing the isolation between antennas by moving either the transmit or receive antenna may reduce or solve the problem.
- A1.26 Should a problem occur, Ofcom expects the licensees to work constructively to resolve the issue. If both parties are operating in compliance with their licence, we would generally expect that the licensee operating the last service to come on-air (i.e. whose transmitter initiated the interference issue) to lead on finding a solution that is mutually acceptable to the parties involved.

Further information

Ofcom provides information on interference to radiocommunications equipment here:

<https://www.ofcom.org.uk/spectrum/interference/interference-to-radiocommunications-apparatus>

Ofcom may be able to investigate cases of interference to a wireless service:

<https://www.ofcom.org.uk/make-a-complaint/complain-about-wireless-interference/>

The [Federation of Communication Services](#) (FCS) is a not-for-profit industry association for organisations which deliver voice and data communications for business and public sector customers in the UK. You can find guidance on reducing interference in its [Code of Practice for Business Radio Site Engineering](#).

Signal quality

- A1.27 As set out in A1.20, the tests listed in the Commissioning test checklist aim to confirm compliance with the Wireless Telegraphy Act licence and minimise the risk of interference occurring to other services, and this is consistent with our spectrum management duties.

The tests do not check the quality of the transmitted signal, other than to confirm its power and frequency.

- A1.28 Modulators and transmitters are not perfect devices, and each introduces a degree of distortion within a transmitted signal. If kept controlled within a well-engineered system, these distortions will not significantly affect the de-codability or coverage of the transmitted service.
- A1.29 Licensees should ensure that they carry out sufficient checks to satisfy themselves that the signals they are transmitting are of an adequate quality, as this will help to ensure that their licensed service is available to listeners within the expected coverage area.
- A1.30 Communications specialists commonly use Modulation Error Ratio (MER) or Error Vector Magnitude (EVM) to measure the quality of a transmitted or received digitally modulated signal. Both measures consider the error of a transmitted (or received) digital constellation compared with the positions in an ideal constellation.

Programme loudness

- A1.31 Feedback Ofcom has received suggests that some listeners and people working in the radio industry are unhappy with differences in loudness when tuning between radio services. While large differences in loudness are unlikely to be harmful, they can be annoying for listeners, requiring them to adjust the volume on their radio sets when changing radio stations.
- A1.32 While Ofcom does not regulate the loudness of radio services, we encourage radio station licensees, and DAB multiplex licensees to work together with the aim of maintaining a reasonably consistent level of subjective loudness across the radio services carried on a multiplex. With that in mind, we suggest licensees pay attention to recommendations made by the International Telecommunications Union (ITU) and European Broadcasting Union (EBU) that have been developed over the last decade with the aim of measuring and controlling subjective loudness.
- A1.33 The ITU carried out work in the early 2010s on recommended methods for measuring the subjective loudness of programmes, these being captured in its Recommendations BS.1770 Algorithms to measure audio programme loudness and true-peak audio level and BS1771 Requirements for loudness and true-peak indicating meters. These methods were included in the EBU's recommendations for controlling the loudness of radio services which can be found in its document R 128 s3 Loudness in Radio.
- A1.34 Subjective loudness is a measure of how loud a person perceives a particular programme to be, and this can differ considerably from the traditional method of limiting only the peak loudness of a programme, particularly where differing material is played (e.g. speech or music) and the degree of audio processing that is applied. We therefore recommend that licensees pay attention to the recommendations listed above. Packages incorporating the recommended measurement algorithms are available and incorporated into playout software.

Silent services and test streams

- A1.35 In order to prevent listener confusion or potentially undesirable receiver behaviour, multiplex licensees should avoid including audio service components and associated

signalling for programme services which do not contain active audio (i.e. services which can be stored in the service list in listeners' receivers, but which consist of silence).

- A1.36 It is particularly important to avoid signalling a silent service where its *Service Id* (Sid) code matches an existing FM station's *RDS Program Identification* (PI) code, or where its Sid code matches the Sid code of a DAB programme service which is already carried on a separate multiplex. For the avoidance of doubt, DSP and C-DSP services on a multiplex may use their existing FM RDS PI code as their Sid on a DAB multiplex, but only if the service on DAB is identical to the FM version which is already being broadcast.
- A1.37 Transmitting engineering test streams on the multiplex is permissible for short periods prior to the multiplex's launch or prior to the addition of new programme services. Such test streams should be limited to audio test tones and service announcements, and should be labelled appropriately. Each test stream should be allocated a unique Sid (which can be provided by Ofcom on request). Engineering test streams should not use an Sid or a PI code for an already-active service.
- A1.38 There is no requirement for multiplex operators to transmit 'placeholders' for services which may launch in the future on a small-scale multiplex, regardless of whether such services are expected to be C-DSPs or DSPs, or in relation to the capacity reserved for C-DSPs.

A2. Planning tool settings and comparison predictions

A2.1 In this Annex we provide:

- a) General guidance on coverage planning tools;
- f) The settings that Ofcom uses when using the HTZ planning tool; and
- g) An example of the different figures that can arise when different settings are used on a planning tool.

Planning model data sets and settings

A2.2 As set out in the main body of these Notes of Guidance, Ofcom will use the HTZ planning tool to assess applications for small-scale multiplex licences. Ofcom will not penalise applicants for using alternative planning tools, although applications based on coverage predictions that are radically different may need significant adjustments to their technical plans to be compliant with the limits on overlap and overspill coverage, co-block interference and international constraints.

A2.3 Applicants are therefore strongly encouraged to use planning tools that incorporate the following:

- a) An appropriate propagation model suitable for planning broadcast transmission (point to area) using Band III frequencies;
- h) Terrain data to take account of the height of land;
- i) Clutter data to take account of the environment on top of the land, i.e. whether it is rural and open or urban and more built-up; and
- j) The ability to sum the individual transmitters of the applicants' network.

General guidance

A2.4 Many planning algorithms are available, generally each one is designed for a specific purpose. This may relate to the frequency band over which they are accurate or a specific type of service or application. For the planning of small-scale DAB, an algorithm that calculates field strength along a path profile should be used. Algorithms such as ITU-R Recommendation P-1546 (or P-370 that P-1546 replaced in 2001) do not use path profiles and are more appropriate general site planning so should not be used. For specific site planning the models described in ITU-R Recommendation 1812 or a combination of Recommendations 525 & 526 would be more appropriate where. Other bespoke models, such as the one used by Ofcom, are also valid.

A2.5 For information, Table 1 below shows some examples of the different predictions that a planning tool can deliver when settings and algorithms are altered. The coverage and overlap figures were produced for the same example two-transmitter network, with the results obtained by using different specified settings for each row. In each case the same terrain and clutter models were accessible by the tool.

Table 1: Variations in planning tool results

	Coverage inside licence area (%)	Coverage outside licence area (%)	Overlap with local multiplex (%)
Ofcom settings	97.1	35.7	49.1
Rec 370	63.8	11.0	29.2
Rec 370 + power sum	94.2	5.3	38.9
Rec 370 at 1.5m	70.3	0	27.5
Rec 1546 + power sum	82.5	0.8	32.5
Rec 1812 + power sum	79.0	6.5	33.2
Rec 1812+ Siradel clutter data	89.4	23.5	43.0

- A2.6 Clutter can be used in one of two ways. Firstly, as a simple attenuation loss that is applied around the receive point (as used in Ofcom’s model) or as an additional height defined by the clutter type added along the path between transmitter and receiver.
- A2.7 When carrying out their predictions and coverage assessments applicants will need to consider which settings, etc. are the most appropriate for their systems.

Datasets and settings used by Ofcom with the HTZ planning tool

Datasets

- Ordnance Survey terrain data – 50 metre resolution
- Infoterra clutter data – 50 metre resolution,
 - > using fixed attenuation around the receive point. See clutter parameters screenshot below for more information which shows the clutter types used and the attenuation applied to each.
- Adult population derived from the 2011 census,
 - > Ofcom has provided 2011 census data for the UK as well as all local and small-scale DAB licence areas on its website.

Figure 2: Screenshot of the HTZ Communications clutter settings used by Ofcom

Clutter code	Name	dB/km - Atten (dB)	Clutter height	Reflection coef. (0-1)	Erlang/km2	Surface factor	Diffraction factor	Stddev (dB)		
0	Unused	0.0	0.0	0	0.300	1.0000	1.000	1.00	<input checked="" type="checkbox"/> rx ground	
1	dense urban	0.0	8.0	0	0.300	1.0000	1.000	1.00	<input checked="" type="checkbox"/> rx ground	
2	urban 15 m	0.0	8.0	0	0.300	1.0000	1.000	1.00	<input checked="" type="checkbox"/> rx ground	
3	industry	0.0	8.0	0	0.300	1.0000	1.000	1.00	<input checked="" type="checkbox"/> rx ground	
4	suburban	0.0	6.0	0	0.300	1.0000	1.000	1.00	<input checked="" type="checkbox"/> rx ground	
5	village	0.0	6.0	0	0.300	1.0000	1.000	0.60	1.00	<input checked="" type="checkbox"/> rx ground
6	park / recreatic	0.0	4.0	0	0.300	1.0000	1.000	1.00	1.00	<input checked="" type="checkbox"/> rx ground
7	open	0.0	2.0	0	0.300	1.0000	1.000	1.00	1.00	<input checked="" type="checkbox"/> rx ground
8	open in urban	0.0	4.0	0	0.300	1.0000	1.000	0.40	1.00	<input checked="" type="checkbox"/> rx ground
9 *	forest	0.0	4.0	0	0.300	1.0000	1.000	1.00	1.00	<input checked="" type="checkbox"/> rx ground
10	water	0.0	0.0	0	0.300	1.0000	1.000	1.00	1.00	<input type="checkbox"/> rx ground
11	user 2	0.0	0.0	0	0.300	1.0000	1.000	1.00	1.00	<input type="checkbox"/> rx ground
12	indoor 2 floors	0.0	0.0	0	0.300	1.0000	1.000	1.00	1.00	Rx ground
13	indoor 4 floors	0.0	0.0	0	0.300	1.0000	1.000	1.00	1.00	
14	indoor 6 floors	0.0	0.0	0	0.300	1.0000	1.000	1.00	1.00	
15 *	indoor 8 floors	0.0	0.0	0	0.300	1.0000	1.000	1.00	1.00	
16 *	indoor 10 floors	0.0	0.0	0	0.300	1.0000	1.000	1.00	1.00	
17 *	indoor 15 floors	0.0	0.0	0	0.300	1.0000	1.000	1.00	1.00	
18 *	indoor 20 floors	0.0	0.0	0	0.300	1.0000	1.000	1.00	1.00	
19 **	Border*	0.0	0.0	0	0.300	1.0000	1.000	1.00	1.00	

init all 0 auto

dB/km Height factor: 1.0
 Flat+diffraction Building entry loss: P.2109 0.0 dB
 CCIR Ref. frequency: 199 MHz
 User No diffraction if clutter code = -1 -1=none
 Tuning
 None
 TSB-88

Path/Sub/Rx cov (R):
 T/R over clutter
 T/R over ground
 T/R over ground relaxed

Tx/Jam/MW (T):
 T/R over clutter
 T/R over ground

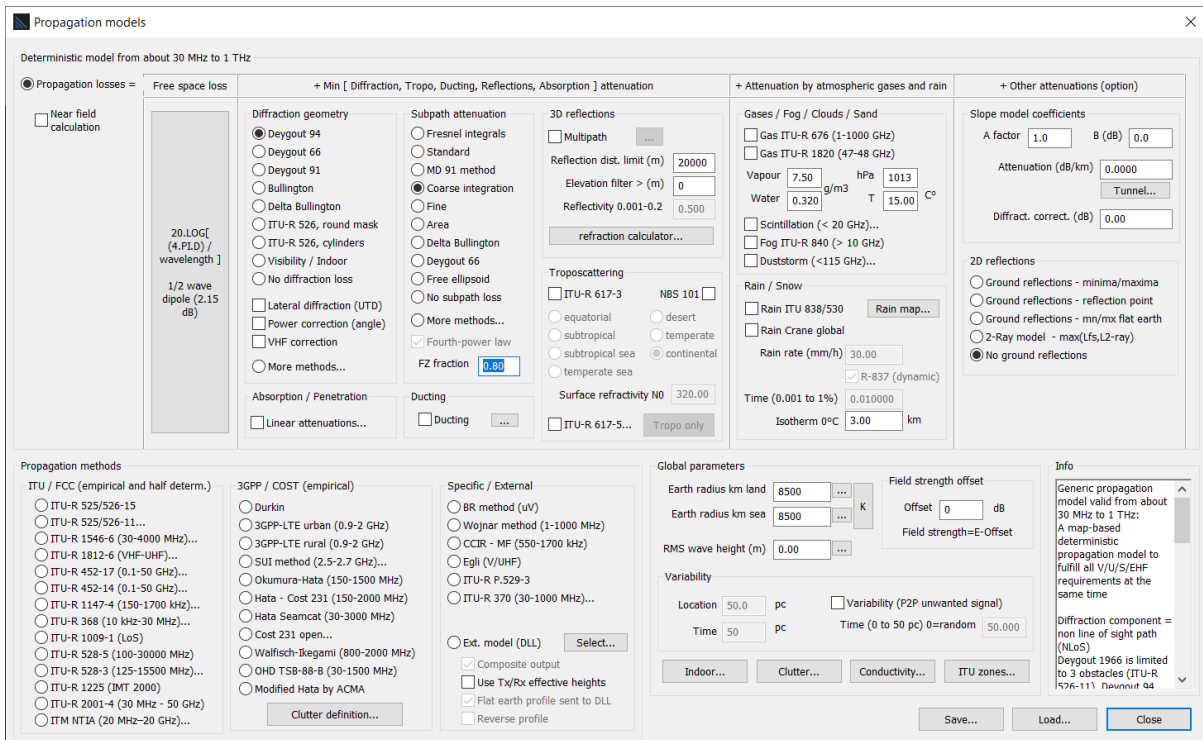
Default Tip... Load... Save... OK Cancel

HTZ settings

- Model pre-set – Fresnel
- Diffraction geometry – Deygout 94
- Subpath attenuation – coarse integration
- FZ fraction 0.8
- Earth radius (sea and land) - 8,500km.
 - > This equates to 4/3 Earth radius for predicting wanted coverage during normal (50% time) propagation conditions.

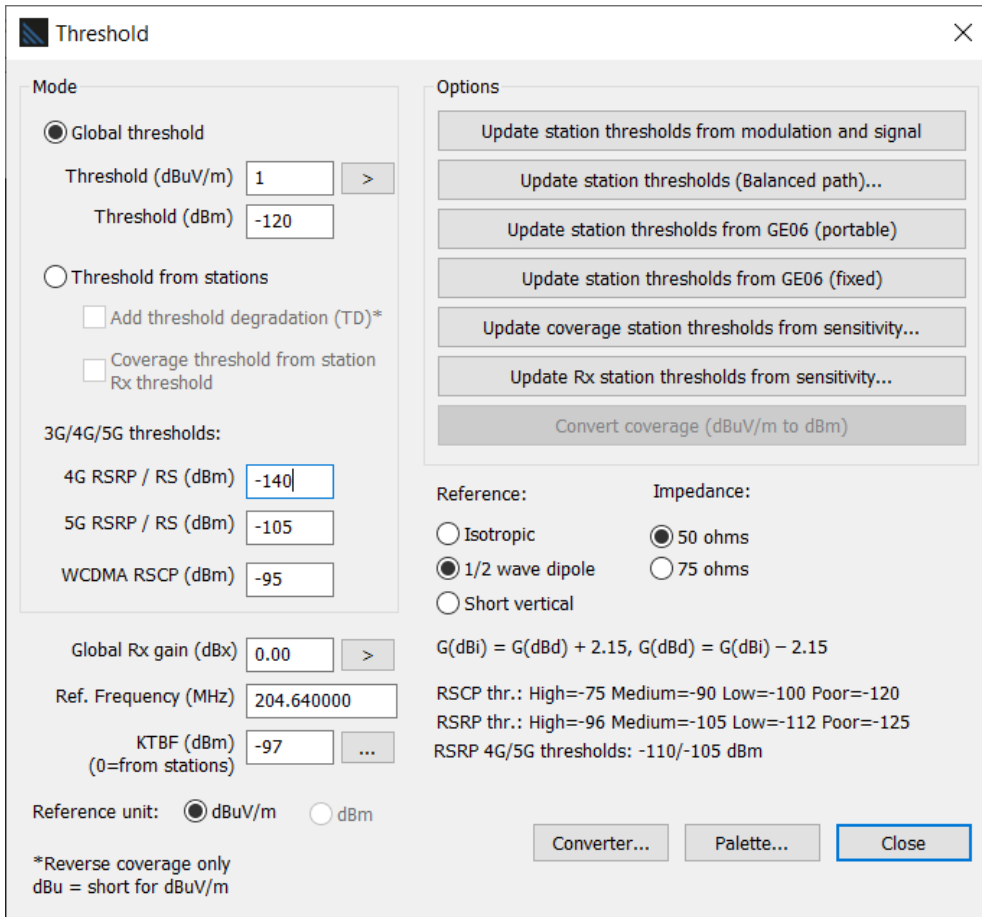
A2.8 These settings are shown in the screenshot in Figure 3 below. Figure 4 also shows the Threshold settings used by Ofcom.

Figure 3: Screenshot of HTZ Propagation models settings



Note : Deygout 94 is the same as 94-2 in the previous version of the software.

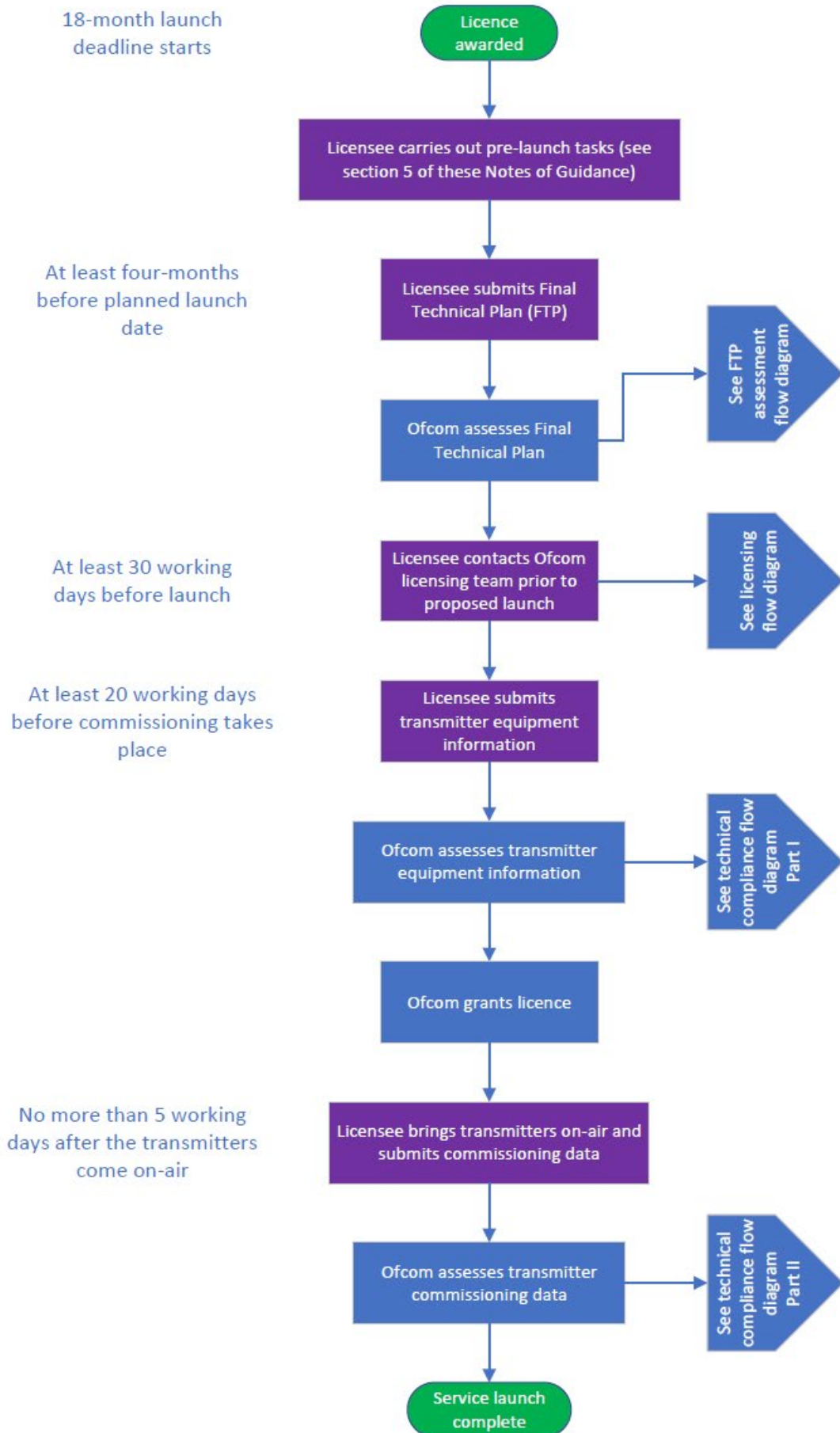
Figure 4: Screenshot of the Threshold settings in HTZ used by Ofcom



A3. Guide to launching flowcharts

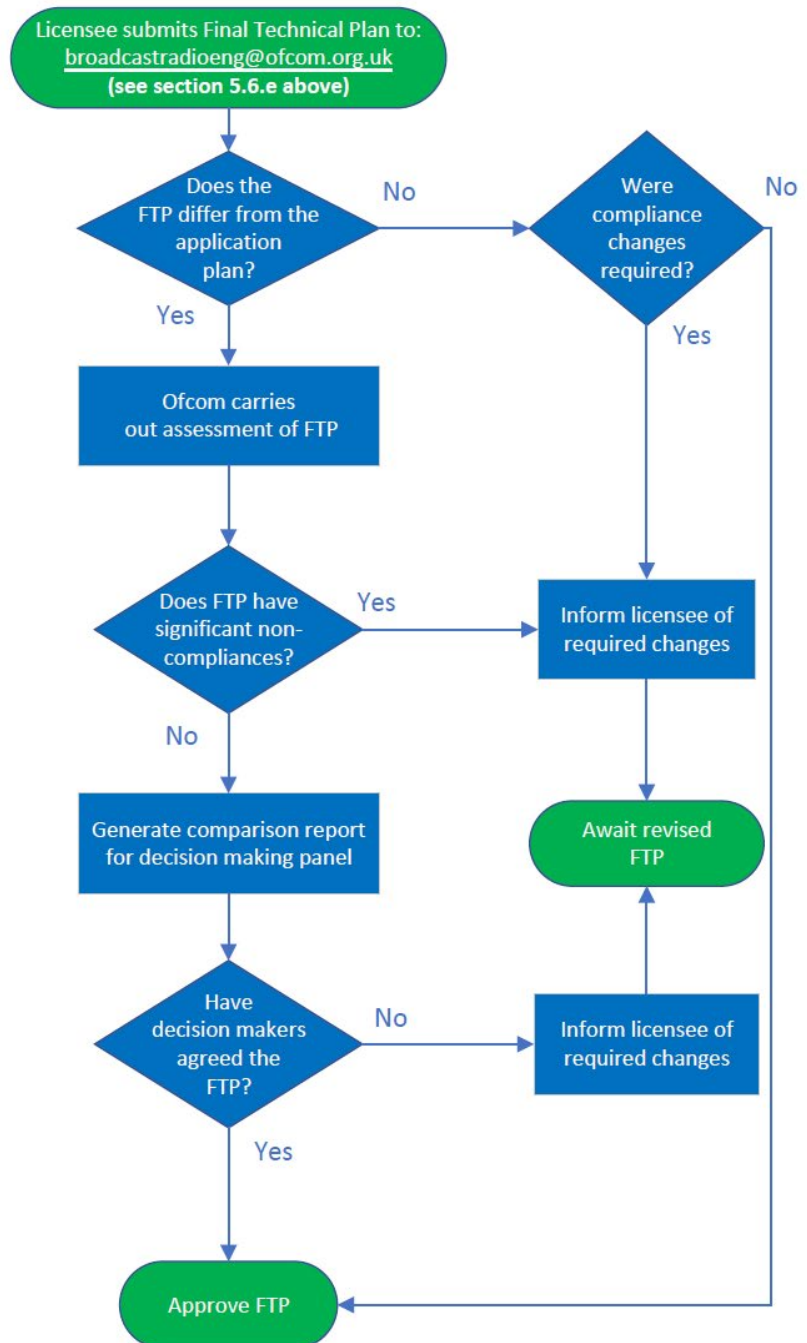
- A3.1 The flowcharts contained in this annex are intended as a top-level guide to the steps required between award and launch of a small-scale DAB multiplex, and for any post-launch transmission changes. They are meant to identify the main interactions between the licensee and Ofcom and the processes each needs to undertake.
- A3.2 Green shapes indicate the start or end of a process, purple shapes indicate an input or process required from the licensee and blue shapes an Ofcom action. From the Top-level flowchart there are call outs to flowcharts depicting a more detailed sub-process.

Top-level Flowchart

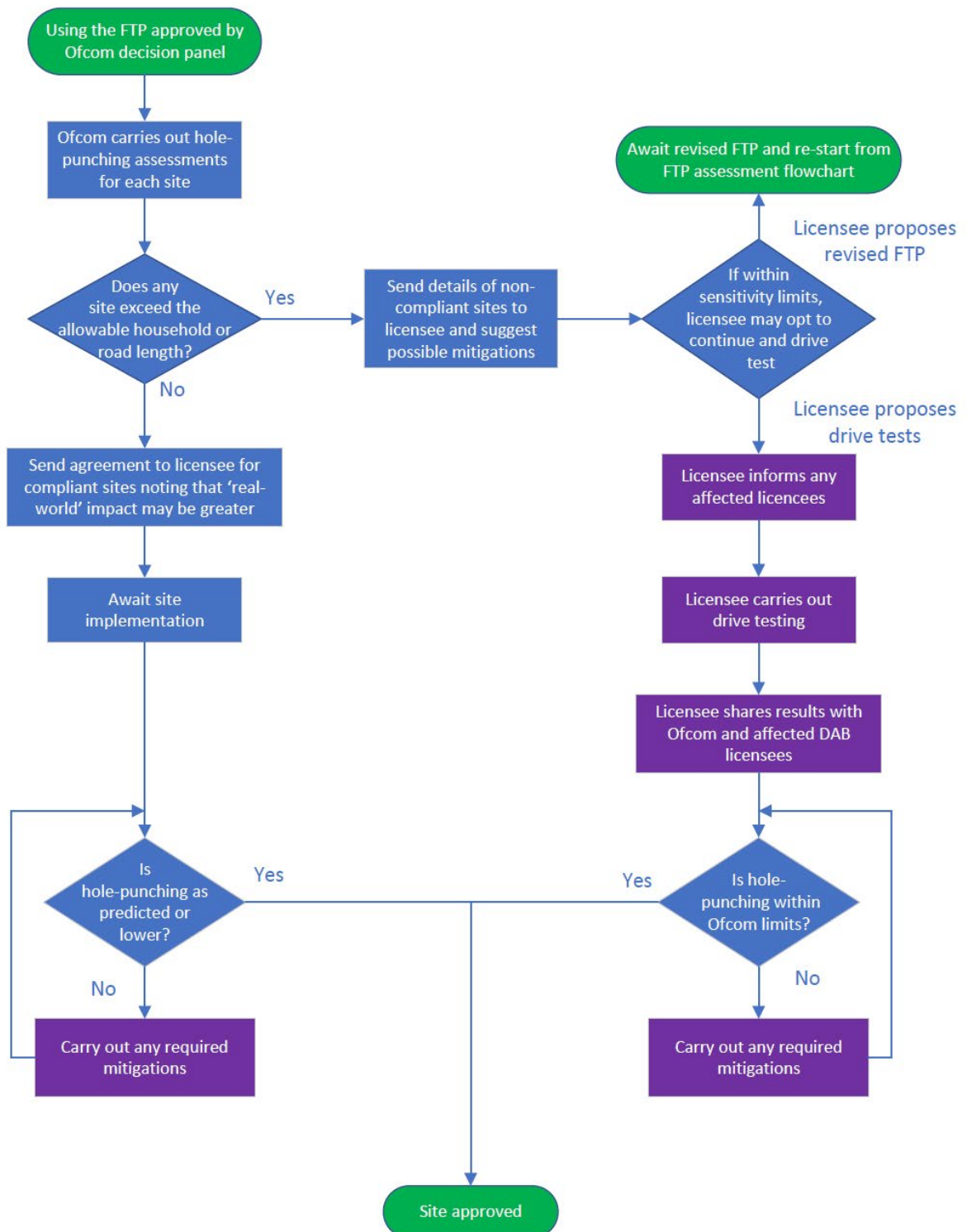


Final Technical Plan (FTP) Assessment Flowchart

At least 4 months
before proposed launch



Hole-Punching Assessment Flowchart

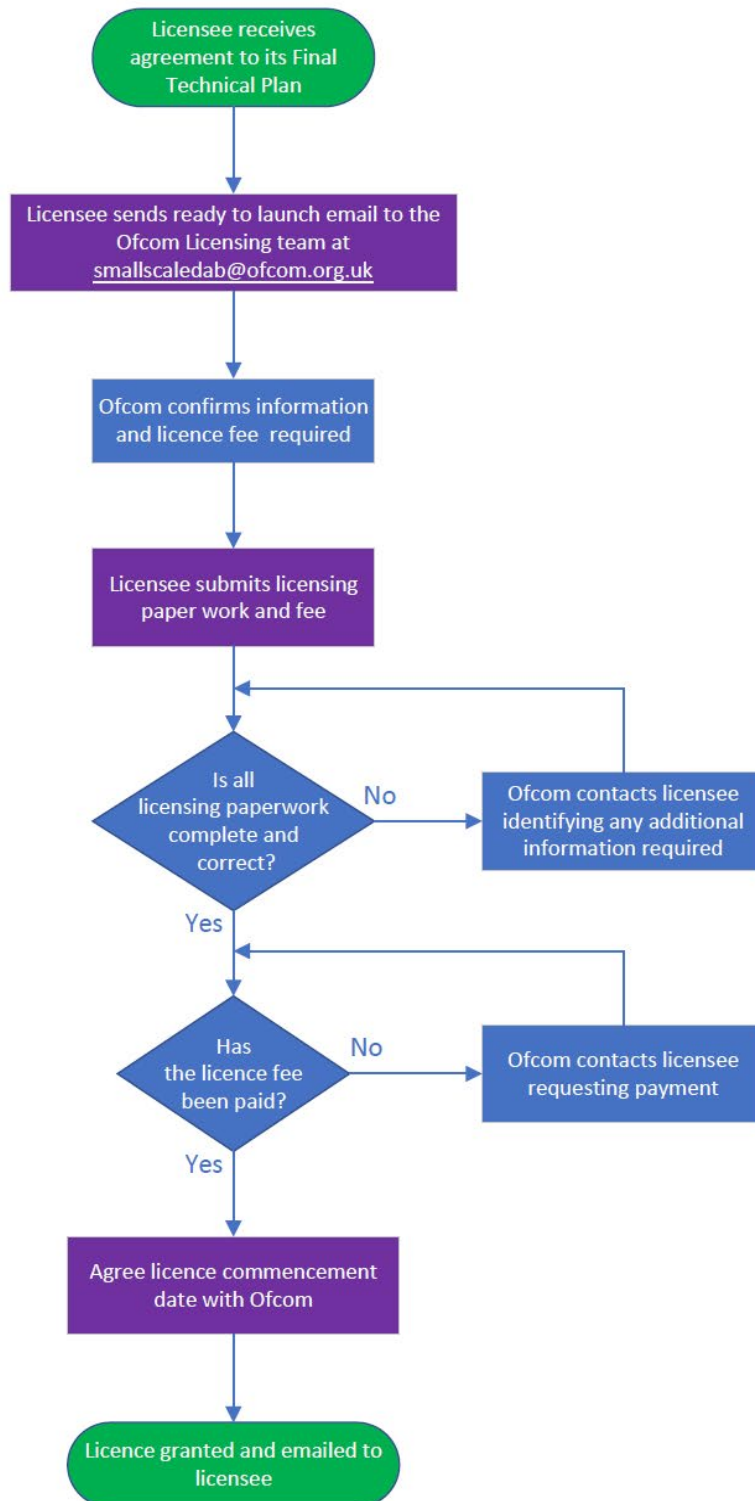


FTP = Final Technical Plan.

For further information see section 3 of the [Ofcom Technical policy guidance for DAB multiplex licensees](#).

Licensing Flowchart

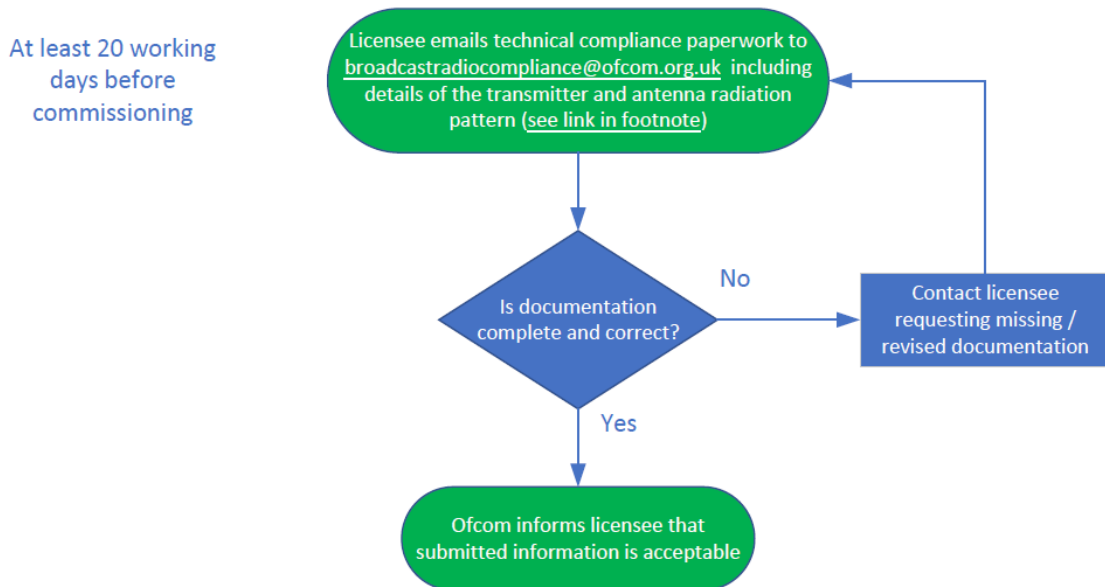
At least 30 working days before launch



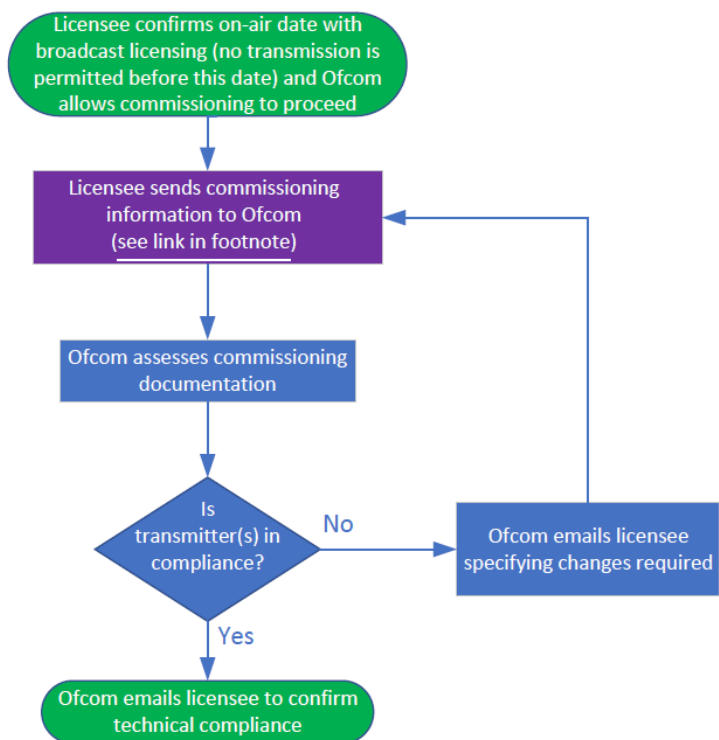
Email address to submit ready to launch notification: smallscaledab@ofcom.org.uk

Technical Compliance Flowchart

Part I – site and transmission information



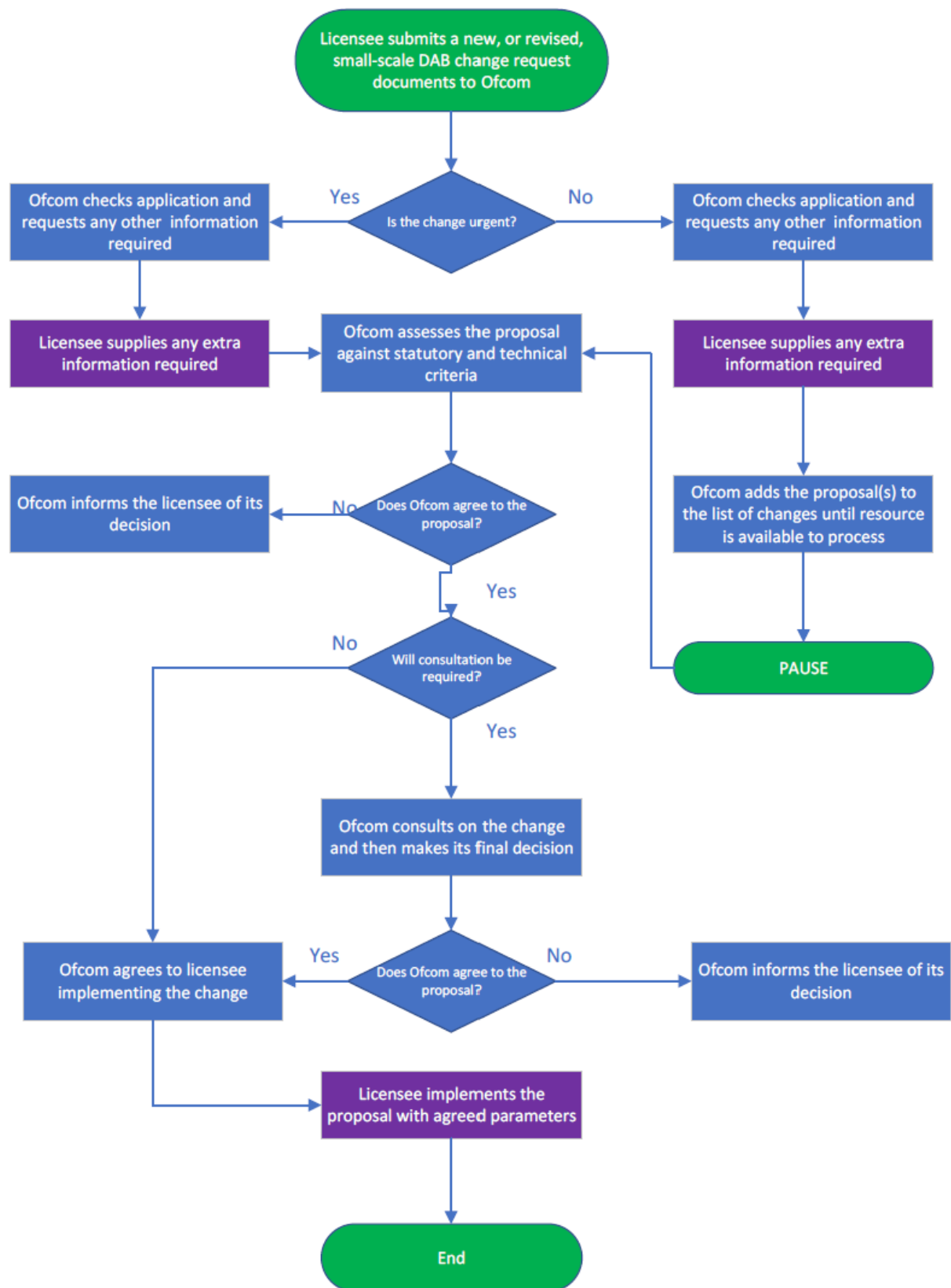
Part II – Commissioning data



Email address to submit technical compliance paperwork: broadcastradiocompliance@ofcom.org.uk

Please see the Broadcast Transmitter Guidance section of <https://www.ofcom.org.uk/spectrum/frequencies/spectrum-information> for both commissioning forms

Post-launch Coverage Change Request Flowchart



Email address to submit post launch coverage change request plans:
broadcastradioeng@ofcom.org.uk

A4. Frequently asked questions

Q. How much does a licence cost?

A. The current cost of a small-scale multiplex licence application is £500. This is non-refundable. Please see paragraphs 3.30 to 3.35 for further details. Once a licence has been issued, you will be required to pay an annual licence fee. The current fixed fee for the charging year has been set at £500 for each licence you own. For further information on annual licence fees, please see paragraphs 5.15 to 5.23

Q. I already have an existing Ofcom licence – is there a fast-track application process?

A. There is no fast-track application process. Ofcom licensees must follow the same process as all other applicants.

Q. Where can I find information about small-scale multiplex licences that have already been awarded by Ofcom?

A. A list of small-scale multiplexes that are currently on-air can be found on our website at <https://static.ofcom.org.uk/static/radiolicensing/html/radio-stations/smallscaldigital/smallscaldigital-main.htm>. Coverage maps for multiplexes that have launched are also available, at <https://www.ofcom.org.uk/tv-radio-and-on-demand/coverage-and-transmitters/small-scale-dab>. For multiplexes that have been licensed by Ofcom but have not yet launched, award statements are available at <https://www.ofcom.org.uk/tv-radio-and-on-demand/digital-radio/small-scale-multiplex-applications>.

Q. Can I own minority shareholdings, or hold directorships, in lots of different small-scale multiplex services in different parts of the UK?

A. This is a complex area, where you are advised to seek independent legal advice if you plan to be involved in multiple multiplex services, noting the definitions in Schedule 2 of the Broadcasting Act 1990. However, under the legislation, a body corporate, including “connected” persons, cannot hold more than 20% of small-scale multiplex licences currently in issue. Additionally, a body corporate cannot hold a licence if it has as a “participant” someone who is a participant in bodies corporate holding more than 20% of small-scale multiplex licences in issue. A “participant” is someone who holds or is beneficially entitled to shares, or has voting power, in a body corporate, so would apply even to minority shareholdings, but not to a director, consultant or employee without such a stake. In short, multiple minority shareholdings can potentially raise eligibility issues in some circumstances. These restrictions come into force when a licence is granted, rather than awarded, by Ofcom. Licences will normally be granted close to the launch date of a multiplex.

Q. Can I be involved in small-scale multiplexes that adjoin, or are close to, each other, and will therefore potentially be able to provide contiguous coverage for programme services?

A. There is no general rule that prevents the same individual or company from being involved in small-scale multiplexes which cover adjacent areas. The exception to this is if the coverage areas of the small-scale multiplexes concerned collectively overlap the coverage area of a local radio multiplex by more than 40% (as measured by adult population). In those circumstances, you would need to consider whether the small-scale multiplex licensees concerned are “connected persons” as that term is used in Part I of Schedule 2 of the Broadcasting Act 1990. This can be a complex assessment requiring your own independent

advice. However, in broad terms, licensees are connected to one another if a relationship of control exists between them, or they are under common control.

Q. Do C-DSP services broadcast on the multiplex have to be based in the local area?

A. Yes, any programme service wishing to utilise reserved capacity on a small-scale multiplex must have a physical presence within the small-scale licence area, and must be able to demonstrate that it will deliver social gain specifically to the population covered by the multiplex licence area. If these two criteria are not met, they will not be granted a C-DSP licence by Ofcom, meaning they would not be able to take up a reserved capacity slot. As set out in our statement on licensing small-scale DAB, and as we do for analogue community radio services, we would exercise sensible levels of discretion where a studio is just marginally out of the coverage area but is still clearly locally based.

Q. Can I bring on transmitters that I have committed-to in the technical plan gradually within the 18-month deadline, or do they all have to come on the air at the same time?

A. There is some scope for phased implementation subject to agreement with Ofcom. However, the overall technical plan committed-to in the application (and approved via the final technical plan) must be delivered within 18 months of the licence award. This means, for example, that if a licensee launches with one out of two proposed transmitters, the second transmitter must come on air within the 18-month launch deadline. If it does not, then the licence may be revoked and the already-broadcasting transmitter turned off. For this and some practical reasons regarding the transmitter clearance process, we prefer licensees to launch all of their committed-to transmitters at the same time. This is likely be better for listeners and the stations being carried on the multiplex, too.

Q. One of our Ofcom contacts has changed their contact details. How do I inform Ofcom?

A. If any contact details have changed, it is important that you inform Ofcom by emailing broadcast.licensing@ofcom.org.uk so that we can ensure that you receive any correspondence from us.

Q. There has been a change of control at the licensee company. How do I inform Ofcom?

A. If there has been a change of control at your licensee company, you are required to inform Ofcom as soon as you are aware of the details of the change and within 28 days of the change taking effect, by completing a [Change of Control notification form](#) which explains in greater detail what a change of control entails.

Q. Can a small-scale radio multiplex licence be transferred to another company?

A. Yes, but – unlike the change of control scenario outlined above – it is important to note that this can only be done with Ofcom’s prior written consent. A request for consent to transfer a licence must be formally submitted in writing by the existing licensee. Further details of the transfer process are at paragraphs 6.7 to 6.12 of these guidance notes.

Q. I no longer want/need my licence. What do I do now?

A. If you no longer require your licence, you can surrender it by emailing broadcast.licensing@ofcom.org.uk. In the email, please provide your licensee name and the names and licence numbers of any licences you wish to surrender.