

TXO

Applying for a radio licence? Here's all you need to know

First edition

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Registered in England & Wales:
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VAT Registration No: GB840431165





As a group, here at TXO, we have been designing and delivering radio systems and solutions for decades. We consult, design, provide system integration, project management, install, commission, site survey and provide maintenance of communications systems to the offshore sector.

Although we've been doing it for years, we know that the technicalities of radio, the design process and the subsequent Ofcom licence application process is very involved and technical. For our friends overseas, Ofcom is the communications regulator in the UK. So, if you want to use a radio system anywhere in the UK for your business, you'll need a licence from Ofcom. In this guide we put our expertise into telling you all you need to know about applying for a licence for radio frequencies.

Design

The way that a system is designed depends upon its intended use. For example it may be for a small factory or warehouse where communication with staff is essential. Another example is a business that needs to keep in contact with its staff offsite in places where there is no fixed working location.

Larger businesses may need to connect two or more locations together with high-capacity data links where point-to-point microwave radio is the best and/or the most cost-effective solution. Possible scenarios where a radio system is the best solution are countless.

The design process must start with the radio frequency (RF) planning phase. Here the geographic areas and locations that need to be served or connected are reviewed. It is decided which technology, optimal frequencies and antenna types are best used to meet the RF planning design. After scoping out this information the client's requirements should be distilled down into an optimum system design and process of the Ofcom licensing.

Some of our clients have told us that they find dealing with licensing themselves confusing and complex, preferring to leave this activity to a licence application partner, like us. Ofcom's website provides access to licence application forms and permits but note that some applications need to be completed online. Access to the necessary technical information is essential to complete the application. The information required will depend upon the type of licence you are applying for.

We understand the complexities of this process and know that our customers often don't have the time that's needed to put into these applications. Why rush and risk getting something wrong? By choosing a telecoms partner like TXO you can make the most of our expertise in this area and we are completely flexible to be as involved as you'd like in the process. We're here to give you hassle-free help whenever you need it.



Why apply for a licence?

Unless the spectrum you plan on using is unlicensed, there is a legal requirement to hold a licence issued by Ofcom. Unlicensed spectrum may be subject to overuse and interference in some locations so it's not recommended for critical services.

In issuing licences to fixed locations, Ofcom aim to minimise the potential for interference both to your use of the spectrum, and any interference that you may cause others.

Ofcom offer a wide range of radiocommunications licences – a list of licences and their details can be found on the [Ofcom website](#). In this document we'll be going into more detail on the most common licence types, including business radio, maritime radio, aeronautical, fixed terrestrial links, and satellite.

Business radio

Business radio is the new licence name for private mobile radio (PMR) or digital mobile radio (DMR). Business radio is well used across the UK by businesses in many industries, including offshore installations. Business radio requirements can be as simple as several portable 'walkie-talkie' style handsets on the same frequency, used locally.

Business radio area defined licence

For this licence you will select the geographic area you wish to cover with your radio system. This can be for the whole of the UK, or a single national region or multiple regions. Licensing can be much more local where Ofcom offers licensing in grid squares. The more area you cover, the more your licence costs until the cap is reached.

The following figure, extracted from the application form, details the technical information required to apply for this licence.

C

Spectrum details

C.1

Please indicate your preferred choice of frequency band
(As it may not be possible to assign your preferred band, you should also indicate a second choice.)

☐ Paging
26.225 to 49.49375 MHz

☐ VHF-Low
68.08125 to 87.49375 MHz

☐ VHF-High
165.04375 to 173.09375 MHz

☐ UHF-1 *
425.00625 to 449.49375 MHz

☐ Band 1
55.75 to 68.0 MHz

☐ VHF-Mid
137.9625 to 165.04375 MHz

☐ Band III *
177.20625 to 207.49375 MHz

☐ UHF-2
453.00625 to 466.08750 MHz

* Please note that assignments in UHF1s are subject to co-ordination with other users of the band. Also, duplex channels are only available in certain major conurbations

* Please note for Band III there will be changes as a result of the RRC-06 Treaty that may affect the longer term availability of some channels. The latest information on Band III is available in the Business Radio section of the Ofcom website.

C.2

Please indicate if the proposed system is analogue or digital

☐ Analogue

☐ Digital

C.3

How many channels do you require?

☐ No. of dual frequency channels

☐ No. of single frequency channels

C.4

Please specify the channel bandwidth you require:

☐ 6.25 kHz

☐ 12.5 kHz

☐ 25 kHz

☐ Other

C.5

Do you have a preferred Base and/or Mobile transmit frequency?

Optional	Base transmit frequency (MHz)	Mobile transmit frequency (MHz)	Channel Bandwidth (kHz)
Channel 1	<input type="text"/>	<input type="text"/>	<input type="text"/>
Channel 2	<input type="text"/>	<input type="text"/>	<input type="text"/>
Channel 3	<input type="text"/>	<input type="text"/>	<input type="text"/>
Channel 4	<input type="text"/>	<input type="text"/>	<input type="text"/>
Channel 5	<input type="text"/>	<input type="text"/>	<input type="text"/>
Channel 6	<input type="text"/>	<input type="text"/>	<input type="text"/>

Source: Ofcom website, 24th March 2022

Business radio light licence

Simple site light: This licence authorises the use of a radio system operating a base station and mobile stations within a small geographical area (typically 1 kilometre or less). Ofcom does not assign specific frequencies to licensees. Instead, licensees have access to a range of frequencies and must share and self-coordinate with other Simple Site Light licensees (for example by selecting unused channels).

Simple UK light: This licence authorises the use of hand-portable or mobile radio equipment anywhere within the UK. Base station use is not permitted. Licensees have access to a range of frequencies spread across four business radio frequency bands and must share and self-coordinate with other Simple UK Light licensees.

Be aware that you are not allocated your own dedicated frequency but a range of frequencies. Ofcom warns you not to purchase equipment until your licence is issued. If you intend to use a base station, then the following extract from the application shows you what you need to know.

D. Base station details (for simple site only)

D.1 Please provide the address of the base station:

Address

Postcode

Country

D.2 Site locations (inaccurate information may lead to the application being declined):

Choose one of the following possibilities to input the data

GB National Grid Reference

(1-metre accuracy, e.g. TQ 32284 80497)

T

Q

3

2

2

8

4

8

0

4

9

7

or

WGS84 Latitude/Longitude

(e.g. 51:30:28.540N 0:5:43.005W)

5

1

3

0

2

8

.

5

4

0

N

0

0

0

5

4

3

.

0

0

5

☐ E

☐ W

(select E or W as appropriate)

Source: Ofcom website, 24th March 2022

Maritime licences

Maritime licences are designed to cover fixed radio applications including coastal radio stations, navigation aids and automatic identification systems (AIS). There are many licence types, they all have similar application requirements and limit the operating frequencies to a subset of the maritime band depending upon your application.

Some licences are ‘technically assigned’ and as such, have technical limitations. According to the Ofcom application, a maritime technically assigned licence is:

“A (Coastal Station Radio) CSR technically assigned licence authorises the use of a frequency or frequencies at one or more stated location(s). It specifies the technical characteristics of each station (antenna height, radiated power and so on) and the station must be operated within these parameters. The CSR technically assigned licence also permits the use of mobiles on the base station frequency within 4km of the base station, to facilitate quayside operation.”

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Whichever CSR licence you are applying for, they all have basically the same application requirements, the technical requirements are:

C **Spectrum details**

C.1 Please indicate the type(s) of channel(s) that you need

☐ **International**
To speak to any ship with normal marine radio apparatus

☐ **UK**
To speak only to those ships with your frequency programmed into their radios

☐ **Marina**
Please see notes on pages 11 and 12

☐ **How many simplex channels do you need?**

☐ **How many duplex channels do you need?**

Not applicable to CSR (Marina) licences

C.2 Please specify the channel bandwidth you require

☐ **6.25 kHz**
☐ **12.5 kHz**
☐ **25 kHz**

Not applicable to CSR (Marina) licences

6.25 kHz and 12.5 kHz are not currently available for CSR (International) licences

C.3 How many signalling codes per channel do you require? (CSR(UK) only)

☐ **CTCSS**
☐ **DCS**

Source: Ofcom website, 24th March 2022

Applications for other marine licences such as automatic identification systems (AIS) and navigational aids & radar require detailed technical information and should be left to the experts.

Aeronautical

It is the Civil Aviation Authority (CAA) that allocates ground to air frequencies, but as it is Ofcom that issues the licence, the application is supplied to them. Ofcom issues licences to cover aircraft, ground-air communications and radio navigation aids and radar. The application form can be found [here](#).



Fixed links

These radio systems are primarily for point-to-point communications and can link sites by radio over distances of a few hundred metres to many tens of kilometres.

The fixed link licence application form, OfW85 can be found [here](#). This is a 12-page document with 3 pages dedicated to the technical requirements in the sections 'technical characteristics', 'station details', and 'system details'. If you have designed the system yourself you will have the information to hand, if not, you should be able to access this information through your licence application partner, or have your partner apply for the licence in your name as part of the design process.

Satellite

A variety of satellite licences are available, a list of these is available [here](#). For receive only satellite installation there is no requirement for a licence to operate.

VSAT

Very Small Aperture Terminal (VSAT) systems deploy one or more hub sites which manage many far-end remote terminals (RTs).

Although both the hub and the RTs transmit, only the hub requires a licence. The RTs do not have an individual licence, but they must be appended to the hub site licence. It's important to remember that the system must be able to disable RTs remotely should there be a request to do so.

To use VSAT you will require a 'space segment' from a satellite service provider. Coverage available from different providers vary subtly, and you need to make the most appropriate choice for your VSAT system application as this defines things such as antenna size for RTs and base stations. System designs and bandwidth requirements are a complex issue. Here at TXO we design and manage the whole process including provision of space segment.



Summary

To be confident you are applying for the correct radio licence, you must have the right technical information to hand during the application process. Only then is your system regulatory compliant. As seen in this PDF, this varies by licence type and may include equipment type, proposed antenna type, the antenna's physical location including coordinates for a base station application, antenna height above ground, and the EIRP for your requirements.

For aeronautical, maritime, and business radio systems, the geographic coverage requirements must be known at the application stage to ensure your licence meets your operational requirements.

Our team of in-house engineers have dealt with radio licensing for many years. We are experts in radio and utilise the latest RF planning and path profiling tools to determine radio coverage and performance. We're all about providing the support you need, when you need it to help avoid any pitfalls and remove any doubt. For more information on how we can help you design and run your radio frequency project, get in touch with our team, we'd love to help.

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