

This information sheet provides details about Private Business Radio (PBR). A business radio system is used to pass messages between a base station and mobile sets and mobile to mobile as an aid to conducting business. The different Business Radio licences allow the licensee to operate different types of systems in accordance with licence conditions and Wireless Telegraphy legislation.

Reverse Frequency Working for Private Business Radio (PBR)

OfW70 (previously Radiocommunications Agency information sheet RA 360)

1. What is Reverse Frequency Working?

The commonest way of controlling a PBR base station is via a landline – but it can also be done by sending messages from a fixed control point (normally a permanently located mobile transmitter) on the frequency used by the licensee.

The control point acts as a main base station but uses the frequencies normally assigned to a mobile, i.e. it transmits on the normal base station 'receive' frequency and receives on the normal base station 'transmit' frequency – hence the term 'Reverse Frequency Working' (RFW).

The control point must be within the normal service area of the base station, and is normally sited on the licensee's premises or at a location from which control is required, such as an office or a transport depot. The remote base station re-transmits messages received from the control point. All business radios used as control points must meet a current base station specification at the time of installation.

RFW, which can be used only if the licensee operates in 'dual frequency' mode, is one of several methods that can be used to connect a remote base station to the licensee's business location. Other methods include connection by landline, dial-up landline, microwave link and low-power device. Details of these methods can be found in the following Ofcom (Office of Communications) information leaflets:

- OfW53 (*Remote Control of Base Stations by Landlines*); and
- OfW71 (*Remote Control of PBR Systems Using Licence-Exempt, Low-Power Devices*).

The main advantage of RFW is its ease and speed of installation.

2. Applying for permission to use RFW

New applicants

If you are a potential licensee planning to install a new PBR system, you can apply for RFW at the same time as you apply for your licence using application form Of21.

Existing licensees

You can apply to add RFW to your existing PBR system using form Of21 or by letter. You must supply details of the RFW control point's address and national grid reference, the height of the top of the control point antenna above ground level and its direction of maximum radiation in degrees east of north. Send your application to your usual Ofcom contact point – either the relevant local Ofcom office or the Ofcom Contact Centre.

3. Evaluating your application

We will evaluate your application according to the type of channel used. There are four main types of channel: shared wide-area, regionally exclusive, on-site and nationally exclusive.

a) Shared wide-area and regionally exclusive channels

RFW will generally be allowed, except in circumstances where we judge that its use would adversely affect existing or future planned use of the spectrum.

Where RFW is used, antenna height and power will normally be limited to 10 metres and 5W respectively. The maximum operational range will typically be 30km. These limits are flexible, as long as:

- you can supply acceptable reasons; and
- the locally available spectrum can accommodate an increased limit.

Most applications in rural areas will be allowed, but restrictions on the use of RFW mean that applications in major urban areas are likely to be refused. We may refuse your application if we think your proposed RFW installation could adversely affect the quality of service received by other licensees, or could constrain our ability to make assignments to future licensees.

b) On-site channels

As on-site channels use low powers and antenna heights, RFW will normally be allowed – except where there is exceptional channel congestion or special restrictions apply. Typically the maximum on-site operational range is 3km.

c) Nationally exclusive channels

RFW will normally be allowed. Again the maximum operational range is typically 30km. Please note that we will not accept any channel congestion caused by your own RFW as a valid reason for requesting additional channels.

4. If your application is successful

If your RFW application is successful, we will issue a licence schedule showing the details of your RFW control point. On shared wide-area channels, only one RFW fixed mobile control point is normally allowed per base station; however, we may allow additional control points in certain cases, if you can justify the need for more than one control point on operational grounds.

In such cases, please note that each control point may be used only to connect to the remote main base station. We will allow extra control points solely for the purpose of facilitating use of the mobile units. Communication between control points is not permitted, except for system control signalling; control tones must be used to prevent the control points from communicating with each other.

You may not use more than one control point if this may cause interference to other users, or may adversely affect existing or future planned use of the spectrum.

You must not buy or install RFW equipment before you have received a schedule authorising RFW as a method of control. The schedule will state the location and national grid reference for the control point, antenna characteristics, antenna height, direction of maximum radiation and power.

RFW is available on a non-interference basis. If your RFW equipment causes interference to other radio users, we may require you to make technical modifications to the RFW control point or to cease your operations.

5. If your application is unsuccessful

All applications are given full and careful consideration, but we may not be able to meet all requests for RFW, particularly in areas of dense PBR use. Where spectrum is scarce, we must give priority to making channels available for communication to and from mobiles for which there is no non-radio alternative.

If your application is refused, your local Ofcom office may be able to suggest changes to your request so that it is more likely to succeed when you apply again.

6. Technical requirements of your control point installation

Equipment used as the control point of a RFW system must meet the following standards:

- The unit must have been type-approved to relevant current standards as a base station and be connected to an appropriate power supply.
- If you use a shared wide-area channel and the use of talkthrough is not authorised, you must use 'tone translation' techniques to prevent mobile-to-mobile communications.
- The maximum effective radiated power (ERP) on shared wide-area channels is 5W, but specific ERP levels will be laid out on your licence schedule. The assigned ERP level may be reviewed and increased if your operational requirements justify this.

7. Further information

If you have any questions on RFW, please speak to your radio supplier or contact the Ofcom Contact Centre.

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