

Drone Detection Radar

Office of Communications (Ofcom) Wireless Telegraphy Act 2006

Licence number: XXXXXX
Date of issue: XXXXXX
Payment interval: 12 months

1. The Office of Communications (Ofcom) grants this wireless telegraphy licence ("the Licence") to:

XXXXXX ("the licensee")
(Company Registration number: XXXXXX)
ADDRESS

to establish, install and use wireless telegraphy stations and/or wireless telegraphy apparatus as described in the schedules to this Licence (together "the Radio Equipment") subject to the terms set out below.

2. This Licence is issued by the Office of Communications ("Ofcom") on [DATE] and replaces any previous authority granted in respect of the service subject to this Licence by Ofcom or by the Secretary of State.
3. This Licence authorises [LICENSEE] ("the Licensee") to establish, install and/or use radio transmitting and/or receiving stations and/or radio apparatus as described in the schedule(s) (hereinafter together called "the Radio Equipment") subject to the terms set out below and subject to the terms of the General Licence Conditions booklet. (Version OfW 597).

Issued by Ofcom

Office of Communications

SCHEDULE 1 TO LICENCE NUMBER: **XXXXXXXXXX**

Licence category: Aeronautical - Drone Detection Radar

Description of Radio Equipment

1. References in this schedule to the Radio Equipment are references to any wireless telegraphy station or wireless telegraphy apparatus that is established, installed and/or used under this schedule.
2. The Radio Equipment must conform to [The Radio Equipment Regulations 2017](#) (Statutory Instrument 2017 No. 1206).

Special conditions relating to the Radio Equipment

3.
 - a) The Radio Equipment shall operate on a non-interference and non-protected basis. For the avoidance of doubt, this means that the licensee may not claim protection from and must not cause undue interference to other authorised uses of radio.
 - b) The Licensee may be required to take additional measures to ensure that the establishment, installation and use of the Radio Equipment does not cause undue interference to receiving stations and/or radio apparatus operated by other users of radio.
 - c) During the period that this Licence remains in force, unless consent has otherwise been given by Ofcom, the Licensee shall compile and maintain accurate written records of the following details relating to the Radio Equipment:
 - i) postal address (including post code);
 - ii) National Grid Reference, to at least 10m resolution;
 - iii) radio frequencies which the Radio Equipment uses; and
 - iv) transmitted power.and the Licensee must produce these records if requested by any person authorised by Ofcom.
 - d) The Licensee shall submit to Ofcom copies of the records detailed in subparagraph 3(c) above at such intervals as Ofcom may notify to the Licensee.
 - e) The Licensee shall submit to Ofcom in such manner and within such period as specified by Ofcom, such other information in relation to the Radio Equipment, or any wireless telegraphy station or wireless telegraphy apparatus which the Licensee is planning to use, as Ofcom may from time to time request. Such information may include, but is not limited to, information in relation to the radio frequency, transmitted power and date of first use for wireless telegraphy stations or wireless telegraphy apparatus to be established, installed or used within such timeframe and in such areas as Ofcom may reasonably request.

4. The Licensees must ensure that all Radio Equipment is established, installed, modified and used only in accordance with the provisions specified in schedule 2 (EMF Licence Condition) of this Licence.

Technical Conditions for the Radio Equipment

5. The Radio Equipment shall be used in accordance with the technical conditions set out in Table 1 of the Licence.

Table 1: Technical licence conditions [OFCOM will delete one of the columns before issuing the licence, to reflect the band requested in the application]

	24GHz	16 GHz
Authorised Service Area	UK wide including territorial seas [and Isle of Man and Channel Islands, subject to their agreement], subject to 1km exclusion zones to protect radioastronomy as defined in Table 2. Airborne use not permitted.	Within X m of location X (deployment location including radius to be provided by applicant). Airborne use not permitted.
Permitted Frequencies	24067.5 MHz – 24232.5 MHz	15700 MHz – 16600 MHz
Maximum Effective Radiated Power	23.9 dBW ERP	53dBW ERP (or lower depending on requested power, and outcome of the coordination process)
Emissions	To be supplied by the applicant	To be supplied by the applicant
Out of band emissions limited at	-45.2 dBW/MHz	To be supplied by the applicant, and confirmed via the coordination process

Table 2: RAS site locations. 24 GHz drone detection radars must not deploy within 1km of these sites.

Observatory	Location	Ordnance Survey National Grid Reference
Cambridge (CA)	Cambridge	TL 39400 54000
Darnhall (DA)	Cheshire	SJ 64275 62265
Defford (DE)	Worcestershire	SO 90200 44700
Jodrell Bank (JB) Mark II telescope	Cheshire	SJ 79650 70950
Knockin	Shropshire	SJ 32855 21880

Interpretation of terms in this schedule

6. In this schedule:

- a) "non-interference and non-protected" means that no harmful interference may be caused to any radiocommunication services that are entitled to protection and that no claim may be made for protection of the Radio Equipment against harmful interference originating from authorised uses of radio;
- b) "base station" means a radio transmitter, including a radar transmitter, not intended to be used while in motion to provide a communications service, typically used in mobile or broadcasting radio systems (if relevant).
- c) "EIRP" means equivalent isotropically radiated power which is the product of the power supplied to an antenna and the absolute or isotropic antenna gain in a given direction relative to an isotropic antenna.

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SCHEDULE 2 TO LICENCE NUMBER: **XXXXXXXXXX**

EMF Licence Condition

Licence category: Aeronautical - Drone Detection Radar

Sites which are not shared with another licensee

1. The Licensee shall only establish, install, modify or use Relevant Radio Equipment if the total electromagnetic field exposure levels produced by the Licensee's On-Site Radio Equipment do not exceed the basic restrictions² in the relevant tables for general public exposure identified in the ICNIRP Guidelines³ in any area where a member of the general public is or can be expected to be present when transmissions are taking place.

Sites which are shared with another licensee

2. In the case of a shared site where the Shared Site Exemption applies to the Licensee, the Licensee shall comply with paragraph 1 above.
3. In the case of a shared site where the Shared Site Exemption does not apply to the Licensee, the Licensee shall only establish, install, modify or use the Relevant Radio Equipment if:
 - a) the total electromagnetic field exposure levels produced by the Licensee's On-Site Radio Equipment, together with

- b) the total electromagnetic field exposure levels produced by all other wireless telegraphy stations and wireless telegraphy apparatus operated by another licensee on the same site for which the Licensee can reasonably assume that a Shared Site Exemption does not apply, do not exceed the basic restrictions⁴ in the relevant tables for general public exposure identified in the ICNIRP Guidelines⁵ in any area where a member of the general public is or can be expected to be present when transmissions are taking place.

Emergency Situations

4. The obligations in paragraphs 1, 2 and 3 above will not apply if the Relevant Radio Equipment is being used for the purpose of seeking emergency assistance or reporting and responding to

² Compliance with the reference levels for general public exposure identified in the ICNIRP Guidelines will ensure compliance with the basic restrictions.

³ The relevant tables for general public exposure are identified in Ofcom's "Guidance on EMF Compliance and Enforcement".

⁴ Compliance with the reference levels for general public exposure identified in the ICNIRP Guidelines will ensure compliance with the basic restrictions.

⁵ The relevant tables for general public exposure are identified in Ofcom's "Guidance on EMF Compliance and Enforcement".

an emergency situation (in the vicinity of that situation) including for search and rescue activities and maritime emergency communications⁶.

Relationship with authorised transmission levels

5. The Licensee shall comply with paragraphs 1, 2 and 3 above notwithstanding the maximum transmission levels authorised in the Licence.

Records

6. The Licensee shall keep, or shall procure that a third party shall keep, and shall make available to Ofcom on request, records (including the type of records identified in Ofcom's "Guidance on EMF Compliance and Enforcement") that demonstrate how it has complied with paragraphs 1, 2 and 3 above when Relevant Radio Equipment is established, installed, modified or used.

Ofcom's "Guidance on EMF Compliance and Enforcement"

7. When evaluating its compliance with paragraphs 1, 2 and 3 above, the Licensee shall take into account Ofcom's "Guidance on EMF Compliance and Enforcement" that is in force at the relevant time.

Interpretation

8. In this schedule:

- a) "**dB**" means the ratio in dB (decibel) when comparing the gain of the antenna to the gain of an isotropic antenna. An isotropic antenna is a theoretical antenna which radiates power uniformly in all directions;
- b) "**EIRP**" means equivalent isotropically radiated power which is the product of the power supplied to an antenna and the absolute or isotropic antenna gain in a given direction relative to an isotropic antenna;
- c) "**ERP**" means effective radiated power which is the product of the power supplied to an antenna and its gain in a given direction relative to a half-wave dipole;
- d) "**general public**" means any person who is not: (a) the Licensee, owner, operator or installer of the Relevant Radio Equipment; or (b) acting under a contract of employment or otherwise acting for purposes connected with their trade, business or profession or the performance by them of a public function;⁷

⁶ Further information on emergency situations is set out in Ofcom's "Guidance on EMF Compliance and Enforcement".

⁷ There is pre-existing health and safety legislation which already requires employers to protect workers from exposure to electromagnetic fields ("EMF") including the following legislation specifically relating to EMF (as amended from time to time): [The Control of Electromagnetic Fields at Work Regulations 2016](#), [The Control of Electromagnetic Fields at Work Regulations \(Northern Ireland\) 2016](#) and [The Merchant Shipping and Fishing Vessels \(Health and Safety at Work\) \(Electromagnetic Fields\) Regulations 2016](#).

- e) "**ICNIRP Guidelines**" means the version of the Guidelines published by the International Commission on Non-Ionizing Radiation Protection for limiting exposure to electromagnetic fields which are identified in Ofcom's "Guidance on EMF Compliance and Enforcement" that is in force at the relevant time.⁸
- f) "**Licensee's On-Site Radio Equipment**" means the Relevant Radio Equipment and any other wireless telegraphy station(s) and wireless telegraphy apparatus on the same site which transmits at powers higher than 10 Watts EIRP or 6.1 Watts ERP.⁹
- g) "**Relevant Radio Equipment**" means all the Radio Equipment that is authorised by this Licence to transmit at powers higher than 10 Watts EIRP or 6.1 Watts ERP.
- h) "**Shared Site Exemption**" means any of the following three situations apply on a shared site in relation to the Licensee's or another licensee's wireless telegraphy station(s) or wireless telegraphy apparatus that is authorised to transmit at powers higher than 10 Watts EIRP or 6.1 Watts ERP:

- The first situation is that all of the licensee's wireless telegraphy station(s) or wireless telegraphy apparatus on a shared site do not transmit at a combined total radiated power in any particular direction¹⁰ that is higher than 100 Watts EIRP or 61 Watts ERP;¹¹
- The second situation is that the total electromagnetic field exposure levels produced by the licensee's wireless telegraphy station(s) or wireless telegraphy apparatus in any area where a member of the general public is or can be expected to be present when transmissions are taking place is no more than 5% of the basic restrictions or 5% of the reference levels in the relevant tables for general public exposure identified in the ICNIRP Guidelines;¹²

⁸ Ofcom's "Guidance on EMF Compliance and Enforcement" will initially require the Licensee to comply with the ICNIRP Guidelines for limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz), published in: Health Physics 74(4):494-522, dated April 1998 and available at: <https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf> ("1998 Guidelines") or the ICNIRP

Guidelines for limiting exposure to electromagnetic fields (100 kHz to 300 GHz), published in: Health Physics 118(5): 483–524; 2020 and available at: <https://www.icnirp.org/cms/upload/publications/ICNIRPrfgdl2020.pdf> ("2020 Guidelines"). However, once work on the relevant standards explaining the methodology for assessing compliance with the 2020 Guidelines has progressed sufficiently, Ofcom will publish a public consultation on updating its "Guidance on EMF Compliance and Enforcement" to explain that going forward Ofcom will be requiring the Licensee to comply with the 2020 Guidelines only. Following this public consultation, Ofcom will publish an updated version of Ofcom's "Guidance on EMF Compliance and Enforcement" on its website. Ofcom will follow the same process for any subsequent versions of the ICNIRP Guidelines.

⁹ 10 Watts EIRP is equivalent to 6.1 Watts ERP. In linear units $EIRP (W) = 1.64 \times ERP (W)$; in decibels $EIRP (dB) = ERP (dB) + 2.15$. Ofcom's "Guidance on EMF Compliance and Enforcement" explains how the Licensee can determine if wireless telegraphy station(s) or wireless telegraphy apparatus "transmits at powers higher than 10 Watts EIRP or 6.1 Watts ERP".

¹⁰ For the purpose of this situation, the combined total radiated power is a simple sum of the radiated powers (in EIRP or ERP) of all of the licensee's wireless telegraphy station(s) or wireless telegraphy apparatus on the shared site that transmits signals covering the same or overlapping areas.

¹¹ 100 Watts EIRP is equivalent to 61 Watts ERP.

¹² The relevant tables for general public exposure are identified in Ofcom's "Guidance on EMF Compliance and Enforcement".

- The third situation is where the licensee's wireless telegraphy station or wireless telegraphy apparatus has an antenna gain that is equal to or higher than 29 dBi and has a fixed beam;
- i) **"shared site"** means a site that is shared by the Licensee and at least one other licensee for the purposes of establishing, installing, modifying or using wireless telegraphy stations or wireless telegraphy apparatus;
 - j) **"site"** means a physical structure, building, vehicle or moving platform;
 - k) **"wireless telegraphy apparatus"** has the meaning given to it in section 117 of the Wireless Telegraphy Act 2006; and
 - l) **"wireless telegraphy station"** has the meaning given to it in section 117 of the Wireless Telegraphy Act 2006.

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