

BRIEFING SHEET UNITED KINGDOM



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Date Of Publication
16 Oct 2023

Notes

- (a) All times are UTC.
- (b) References are to the UK AIP.
- (c) Information, where applicable, should also be used to amend appropriate charts.



NOTIFICATION OF RF JAMMING TRIALS (GNSS AND ISM BAND (UAS C2)) ENDURING LOOK SERIES – RAF SPADEADAM 23 – 26 OCTOBER 2023

1. Introduction

- a. In accordance with UK procedures for the control of non-operational jamming, this briefing sheet gives notification of radio jamming and signal interference activity, to intentionally provide interference to Global Navigation Satellite System (GNSS) signals, including the Global Positioning System (GPS). There will also be limited occurrences of jamming in Industrial, Scientific & Medical (ISM) frequency bands used by licence exempt short range devices, impacting UAS Command & Control (C2) signals and electronic situational awareness devices.
- b. This briefing sheet includes the details and locations of the GNSS and ISM band jamming, description of the predicted effects and a point of contact for further information or in case of emergency.

2. Dates, Times and Location

- a. **Date:** 23 – 26 October 2023 as notified by NOTAM.
- b. **Location:** Jammers will be located within 2 NM from 550306N 0023318W.
- c. **Time:** The jamming will be limited to the daily hours of **0900 – 1800 UTC**.
- d. **Duration and Pattern:** GNSS and ISM band jamming will be limited to the time required to demonstrate the desired effect on the target. Each GNSS serial shall not exceed 2 minutes, with a maximum of 5 serials per hour. Each ISM serial shall not exceed 1 minute, with a maximum of 5 serials per hour, conducted concurrently with GNSS serials.

3. GNSS Jamming

- a. The areas within which a GNSS receiver is potentially likely to encounter jamming and/or interference with potential for incorrect readings is outlined below. No allowance is made for airframe masking or the reduction of antenna gain towards the horizon seen in all receiver systems. Therefore, the worst possible case for receiver vulnerability is considered.
- b. The impact estimated at each level identified should be assumed to extend as illustrated to the level below it, i.e. estimated coverage for 10,000 FT should be assumed down to 5000 FT. If further information is required on the interpretation of this information please contact the CAA using the contact information in section 7.
- c. Predictions show that the coverage area where GNSS signals are likely to be affected is as follows:

2 M AGL

Areas with clear line of sight to the transmitter site up to 28.6 NM.

25 M AGL

Areas with clear line of sight to the transmitter site up to 28.6 NM.

2000 FT AMSL

To a maximum possible range of 30 NM.

4000 FT AMSL

To a maximum possible range of 30 NM.

8000 FT AMSL

To a maximum possible range of 30 NM.

10,000 FT AMSL

To a maximum possible range of 30 NM.

20,000 FT AMSL

Unlikely to a maximum possible range of 30 NM.

Expected to a range of 15 NM.

40,000 FT AMSL

Unlikely to a maximum possible range of 30 NM.

Expected to a range of 15 NM.

- d. Impact area may exceed the maximum height represented and should be assumed to continue beyond the altitude specified as described for the maximum altitude listed.
- e. The following frequencies will be affected:
1559 MHz – 1612 MHz (GNSS L1/E1 band);
1597.550 MHz – 1605.890 MHz (GLONASS G1 band).

4. **UAS C2 Jamming**

- a. The areas within which a UAS C2 and other ISM band devices may potentially encounter jamming and/or interference is outlined below. No allowance is made for airframe masking or other factors. Therefore, the worst possible case for receiver vulnerability is considered.
- b. ISM band jamming (impacting UAS C2 and electronic situational awareness devices) coverage as follows:

400 M AGL

Areas with clear line of sight to the transmitter site up to 14.3 NM.

- c. Impact area may exceed the maximum height represented and should be assumed to continue beyond the altitude specified as described for the maximum altitude listed.
- d. The following frequencies will be affected:
Licence exempt frequencies (432 MHz – 446 MHz, 902 MHz – 928 MHz, 2402 MHz – 2485 MHz, 5725 MHz – 5875 MHz).

5. **Use of GNSS**

- a. Although GNSS equipment is an accepted means of compliance with B-RNAV and P-RNAV requirements, one of the conditions of its use is that the aircraft must carry serviceable radio navigation equipment in order to allow reversionary means of navigation. Operators of aircraft should not rely on GNSS for B-RNAV and P-RNAV operations in the areas predicted to be affected by the jamming trials and should be prepared to revert to the alternative means of navigation.
- b. For IFR en-route and terminal area operations, only radio navigation equipment required by the rules for IFR operations should be used.
- c. For VFR operations, conventional means of navigation including dead reckoning should always be used.
- d. Operators of aircraft should be prepared for erroneous readings if cross checking with GNSS in the area predicted to be affected by the jamming trials.
- e. Air Traffic Controllers should be alerted to the potential for aircraft to require navigation assistance during the period of the trial.

6. **Use of UAS C2 and Electronic Situational Awareness Devices**

- a. UAS command and control and some electronic situational awareness devices such as FLARM and PilotAware utilise ISM (Industrial, Scientific and Medical) frequency bands, also

known as licence exempt frequencies, which are used by a range of short range communication devices.

- b. Common allocations used by these devices include frequencies including 433 MHz, 868 MHz, 869.5 MHz, 2.4 - 2.5 GHz (2.4 GHz) and 5.725 - 5.875 GHz (5.8 GHz). Ofcom interfacing requirements document, IR2030, contains details of short range device frequency allocations, including those which can be used for airborne purposes. For further details see the Ofcom website: <https://www.ofcom.org.uk/spectrum/radio-spectrum-and-the-law/licence-exempt-radio-use/licence-exempt-devices/>.
- c. Effects on UAS C2 and other short range devices due to the presence of jamming signals can vary due to receiver characteristics, nature of the jamming equipment and proximity to the jamming source. Users of UAS C2 and electronic situational awareness devices that utilise ISM frequency bands should be aware of the potential for equipment malfunction or complete failure.

7. Points of Contact

- a. General and non-urgent queries regarding this content should be made in the first instance to email: spectrum@caa.co.uk.
- b. During the period of the exercise, the formal cease jamming contact number is: Range Management Officer via Spadeadam Range Controller: 01697-747321 Ext 6386, 6375 or 6388.

V/UHF Guard Frequencies: 121.500 MHz and 243.000 MHz, to be monitored by Spadeadam Ops throughout jamming trials.

Note: This number is only to be used in case of emergency in order to ask for jamming to cease. As with previous exercises, safety of life operations will at all times take precedence over exercise activities.