

► This RA has been substantially re-written; for clarity, no change marks are presented – please read RA in entirety ◀

RA 2320 – Role Specific Remotely Piloted Air Systems

Rationale

The use and number of UK military Remotely Piloted Air Systems (RPAS) will continue to increase. This could present a Risk to Life (RtL) to RPAS operators, manned Air Systems and other personnel if operated in an unsafe or unregulated manner. This Regulatory Article requires that Aviation Duty Holders (ADH) and Accountable Managers (Military Flying) (AM(MF)) operate their RPAS in a manner that keeps the RtL As Low as Reasonably Practicable (ALARP) and Tolerable.

Contents

Definitions relevant to this RA

2320(1): Remotely Piloted Air Systems Collision Avoidance

2320(2): Control of Remotely Piloted Air Systems

2320(3): Management of Control data-link

2320(4): Remotely Piloted Air Systems Operating Bases

Definitions

Definitions relevant to this RA

1. **Layered Safety Approach.** A range of measures to reduce the likelihood of loss of safe separation of an RPAS with other air users.

Regulation

2320(1)

Remotely Piloted Air Systems Collision Avoidance

- 2320(1) ADHs / AM(MF)s **shall** operate RPAS with due consideration for the safety of vessels, vehicles, structures and personnel.

Acceptable Means of Compliance 2320(1)

Remotely Piloted Air Systems Collision Avoidance

2. ADHs / AM(MF)s **should** ensure that the RtL from collision of RPAS with any vessels, vehicles, structures, personnel or the surface is ALARP and Tolerable. Where this cannot be achieved through Visual Line of Sight (VLOS) operations or the use of an appropriate Detect & Avoid capability¹, this **should** be achieved, using a Layered Safety Approach.

Inside UK Airspace

3. Beyond Visual Line of Sight (BVLOS) operations **should** only be conducted if:
 - a. They employ an appropriately approved Detect & Avoid capability to enable compliance with the Rules of the Air² appropriate to the class of airspace, or;
 - b. They are flown using a Layered Safety Approach that specifically requires flight in segregated airspace³.
4. All BVLOS RPAS operations **should** be appropriately notified to other airspace users and approved by the relevant Airspace Control Authority.
5. RPAS operations within designated UK Danger Areas^{3, 4} **should** be approved by the relevant Danger Area Airspace Controlling Authority. When operated in accordance with (iaw) specific range or operational area operating instructions, ADH / AM(MF) orders **should** as a minimum:
 - a. Meet the requirements of the Danger Area Airspace Controlling Authority.
 - b. Meet the range safety requirements⁴ and any other orders or conditions issued by the Danger Area Airspace Controlling Authority.

¹ The "Detect & Avoid capability" is a combination of equipment, maintenance procedures, training, operating procedures, etc.

² Refer to RA 2307 – Rules of the Air.

³ Refer to MAA02 – MAA Master Glossary.

⁴ Refer to DSA 03.OME Part 3 (Formerly JSP 403 Volume 2) – Defence Code of Practice (DCOP) for Ranges.

**Acceptable
Means of
Compliance
2320(1)**

- c. Meet the requirements of Standard Agreement (STANAG) 2402 and take into account range / area specific advice. The details of STANAG 2402 are available to Defence Contractor Flying Organizations⁵ by request to the MAA.

Outside UK Airspace

6. ADH / AM(MF)s **should** ensure that RPAS operations outside UK airspace are conducted iaw either:
- a. The relevant national or international legal requirements, or;
 - b. For operations conducted under Crown Prerogative (ie not under The International Civil Aviation Organization (ICAO) procedures):
 - (1) Under 'Due Regard'⁶ and:
 - (2) Operated outside Controlled Airspace, unless the Controlled Airspace has been created or assigned for the purposes of the RPAS operation.

**Guidance
Material
2320(1)**

Remotely Piloted Air Systems Collision Avoidance

7. **Layered Safety Approach.** The Layered Safety Approach concept requires the following as a minimum to be considered, by the ADH / AM(MF)⁷:
- a. Utilization of Segregated Airspace which will be notified using the appropriate aeronautical notification methods⁸. This must include a means of separating the RPAS from other Air Systems that may be operating within the same segregated airspace, and a means of avoiding collisions with other Air Systems operating within the same segregated airspace, in case of failure of the primary means of separation.
 - b. Provision of suitable surveillance of the operating area which allows for the detection of intruding Air Systems during the period of operation of the RPAS.
 - c. A method of communication between the surveillance provider(s) and the Remote Pilot.
 - d. A method of providing the precise location of the RPAS at all times.
 - e. A method of providing conspicuity to other airspace users (eg Automatic Dependent Surveillance-Broadcast (ADS-B)).
 - f. A method of avoiding intruding Air Systems (ability to manoeuvre the RPAS out of harm's way, cut down etc) while remaining within the notified area.
8. **Segregated Airspace.** Segregated Airspace, for the purposes of this regulation, means airspace specifically designated for RPAS operations that will:
- a. Be established, and appropriate warnings issued for the purpose of RPAS operations (even if within an existing Danger Area or other airspace reservation), and;
 - b. Have specific geographic, horizontal, vertical, and time boundaries, and;
 - c. Include transit corridors from / to the take-off / landing area to / from the planned operating area, and;
 - d. If outside a designated UK Danger Area, be agreed with the Civilian Aviation Authority (CAA) Safety and Airspace Regulation Group.
 - e. In the UK Flight Information Region (FIR), Segregated Airspace includes Airspace established for RPAS operations (permanent or tactical), designated Danger Areas, existing Controlled Airspace (Classes A-D) when in agreement

⁵ Refer to RA 1028 – Contractor Flying Approved Organization Scheme – Responsibilities.

⁶ Refer to RA 2307(1): Rules of the Air for the definition of 'due regard'.

⁷ The MAA RPAS Letter of Endorsed Categorization may highlight additional area for consideration.

⁸ Without an approved Detect & Avoid capability, operations in the UK FIR must be conducted in Segregated Airspace or approved on a case-by-case basis should there be an Operational Imperative to do so by the RPAS Commander (refer to RA 1020 – Aviation Duty Holder and Aviation Duty Holder-Facing Organizations - Roles and Responsibilities). The MAA may be contacted for further guidance ahead of approving such operations.

**Guidance
Material
2320(1)**

with Air Navigation Service Provider (ANSP), or Controlled Airspace (temporary) when in agreement with ANSP.

**Regulation
2320(2)**

Control of Remotely Piloted Air Systems

2320(2) ADHs / AM(MF)s **shall** detail the procedures to be followed for either piloted control or automated flight of RPAS.

**Acceptable
Means of
Compliance
2320(2)**

Control of Remotely Piloted Air Systems

9. Where periods of automated flight are planned:
 - a. The Remote Pilot or RPAS Commander **should** be able to intervene immediately at any stage of the flight or;
 - b. Where it is not possible to intervene immediately (eg handover between Ground Control Stations or automated take-offs and landings), ADHs / AM(MF)s **should** specify additional mitigation (eg loss-of-link procedures) in orders.
10. Orders **should** specify the responsibilities and procedures for any Air System command and control transfers, including flight preparation, flight servicing, ground taxi, take-off, landing, and flight.
11. ADHs / AM(MF)s **should** detail in orders the emergency procedures applicable to each RPAS type, including any requirements for pre-planned emergency recovery sites.

**Guidance
Material
2320(2)**

Control of Remotely Piloted Air Systems

12. Nil.

**Regulation
2320(3)**

Management of Control data-link

2320(3) ADHs / AM(MF)s of RPAS utilizing Control data-links **shall** detail in orders, the protocols required to manage the RPAS Control data-links.

**Acceptable
Means of
Compliance
2320(3)**

Management of Control data-link

13. **Spectrum Management.** Appropriate spectrum management **should** be employed to minimize the probability of loss of, or interference to, the Control data-link.
14. **Data-Link Protection.** Measures **should** be implemented to protect the Control data-link in areas such as: protection and / or redundancy of power supplies; ability to hand-off to another site and robust land-line communications.
15. Orders to manage the loss of the control data link **should** detail the following as a minimum:
 - a. Pre-flight planning of Control data-link loss strategy, automated recovery routes and altitudes.
 - b. Deconfliction procedures.
 - c. Communications, including:
 - (1) Transponder codes⁹.
 - (2) Agencies to be contacted.
 - d. Emergency recovery protocols and locations.
 - e. Flight Termination protocols.

⁹ When the Remotely Piloted Aircraft is required to be fitted with a Transponder.

**Guidance
Material
2320(3)****Management of Control data-link**

16. Nil.

**Regulation
2320(4)****Remotely Piloted Air Systems Operating Bases**

2320(4) ADHs / AM(MF)s **shall** detail in orders, RPAS specific safety and administration considerations for all RPAS operating bases within their Area of Responsibility.

**Acceptable
Means of
Compliance
2320(4)****Remotely Piloted Air Systems Operating Bases**

17. ADHs / AM(MF)s **should** provide detailed orders for RPAS operating bases to include, as a minimum:

- a. An operating risk assessment.
- b. Airspace management, including: Air Traffic Control or surveillance provision; lost link protocols; and any Notice to Airmen (NOTAM) requirements.
- c. Spectrum management (eg Electromagnetic Compatibility) and control links.
- d. Ground operations, including: post crash management; ground manoeuvre; medical facilities; personnel and equipment safety; and procedures for managing hazardous materials.
- e. Flight plan requirements² and Diplomatic clearance requirements¹⁰.

**Guidance
Material
2320(4)****Remotely Piloted Air Systems Operating Bases**

18. Nil.

¹⁰ Refer to RA 2305 – Supervision of Flying.