

ENR 1.1 GENERAL RULES

1.1.1 ROYAL FLIGHTS AND FLIGHTS FOR NOMINATED VERY IMPORTANT PERSONS

1.1.1.1 Military registered Air Systems may be selected for Royal Flights or flights for nominated Very Important Persons (VIPs). In addition to the Societal Concern factor (Refer to RA 1210 – Ownership and Management of Operating Risk (Risk to Life)), which this tasking may introduce, military registered Air Systems also have greater latitude for deferment of maintenance activity and installation of modifications with limited Airworthiness evidence, than is the case for civil registered Air Systems. RA 4053 requires that orders and procedures are issued to ensure the decisions affecting the Airworthiness of an Air System, to be used for a Royal Flight or flights for nominated VIPs, are reviewed to confirm their continued validity and to determine if any action is required.

1.1.1.2 Regulation 4053(1) - Air System Selection and Preparation.

1.1.1.2.1 The Military Continuing Airworthiness Manager ((Mil CAM) Refer to RA 1011 - Military Continuing Airworthiness Manager Responsibilities.) shall ensure that orders and procedures are promulgated to identify the Continuing Airworthiness actions required when providing an Air System for a Royal Flight or a flight for a nominated VIP.

1.1.1.3 Means of Compliance. The orders and procedures for Royal Flights and flights for nominated VIPs should include as a minimum:

- a. Instructions for the selection and preparation of an Air System, including the action to be taken if there is insufficient time to complete these instructions.
- b. Identification of the person(s) authorized to select the specific Air System to be used.
- c. Identification of the person(s) responsible for ensuring that the necessary preparation procedures are carried out.
- d. Details of any restriction on the ability of engineering personnel to make decisions with Airworthiness implications during the tasking period.

1.1.1.4 Guidance. A Royal Flight is one that is organized through the **Head** of Royal Travel. Adoption of the orders and procedures required by this Regulation for other nominated VIPs (The decision on who is to be accorded VIP status is a single Service matter. Further guidance is available in RA 2340 – Flying of Passengers on UK Military Aircraft.) is at the discretion of the appropriate Aviation Duty Holder (ADH) or AM(MF). This RA need not be applied to members of the Royal Family serving in the Armed Forces when they fly or are flown in military registered Air Systems, as part of their military duties.

1.1.1.4.1 The orders and procedures issued in compliance with this RA support the instructions or orders for the carriage of passengers on military registered Air Systems issued by ADHs and AM(MF)s (Refer to RA 2340 – **Supernumerary Crew and Passengers**).

1.1.1.4.2 The selection and preparation criteria for an Air System will include a review of the Air System configuration including, but not limited to, the following considerations:

- a. Embodiment of all safety modifications.
- b. Embodiment of applicable mandatory Technical Instructions (Technical Instructions include Special Instructions (Technical) (SI(T)), relevant Airworthiness Directives and equivalent instructions issued by Authorities).
- c. Removal of modifications without a full clearance in the Release to Service.

1.1.1.4.3 The selection and preparation criteria for an Air System will include a review of the Technical Log and recent maintenance history to confirm that:

- a. The selected Air System is not manifesting any unsatisfactory Fault trends.
- b. The Limitations and Acceptable Deferred Faults remain acceptable for the required Flight(s).
- c. Any extensions applied to lifed components are appropriate and acceptable for the planned tasking.

1.1.1.4.4 Where an Air System may be used for a Royal Flight or a flight for a nominated VIP, which takes place partly or entirely within an operational Theatre, **the Mil CAM** may consider the issue of supplementary instructions to reflect any circumstances specific to that Theatre.

1.1.1.4.5 ADHs and AM(MF)s may wish to be consulted or informed regarding Air System selection and preparation for Royal Flights and/or flights for nominated VIPs, as this may require additional Societal Concern (Refer to RA 1210 – Ownership and Management of Operating Risk (Risk to Life)) considerations based upon the status of the passenger(s), the operating environment and existing Risk to Life (RtL) assessments for their Area of Responsibility (AoR). ADHs and AM(MF)s retain responsibility for ensuring that RtL for Royal Flights and flights for nominated VIPs in their respective AoRs remain As Low As Reasonably Practicable and Tolerable.

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1.1.1.5.1 For further details see Military Aviation Authority (MAA) - Regulatory Article 4053 - Royal Flights And Flights For Nominated Very Important Persons.

1.1.2 ROYAL LOW LEVEL CORRIDORS

1.1.2.1 Members of The Royal Family afforded such status by the Director of Royal Travel, The Royal Household (When so directed by the Civil Aviation Authority (CAA) Head of Airspace, Aerodromes and Air Traffic Management (Hd AAA) certain flights within UK airspace by Sovereigns and Heads of State of foreign countries and, where appropriate, Prime Ministers of Commonwealth countries may also be afforded Royal Flight status.) are routinely flown in the UK by Royal Helicopter (Helicopters from The Queen's Helicopter Flight (TQHF), 32 (The Royal) Squadron and civilian chartered helicopters.) The dynamic nature of military low flying may constitute a hazard to the safe conduct of Royal Helicopter flights; therefore, Royal Helicopter flights are conducted within the confines of a Royal Low Level Corridor (RLLC) (A RLLC is a series of check points and/or turning points promulgated by Notification Message and/or Notice to Airmen (NOTAM). The CAA Airspace Regulation (Utilisation) is responsible for the coordination and notification of RLLC for Royal Helicopter flights.) which are subject to specific conditions to ensure that adequate separation is achieved between military Air Systems (AS) and the Royal Helicopter.

1.1.2.2 Regulation 3237(1) - Royal Low Level Corridors.

1.1.2.2.1 Heads of Establishment, Aviation Duty-Holders (ADHs), Accountable Managers (Military Flying) (AM (MF)) and ADH-facing organizations shall ensure that military AS maintain adequate separation from Royal Helicopter flights

1.1.2.3 Compliance.

1.1.2.3.1 Air Traffic Services (ATS). Prior to entering, and when operating inside, RLLCs, controllers and AS operators should ensure that the military AS is in receipt of an ATS (either under Visual Flight Rules (VFR) or Instrument Flight Rules (IFR)) from:

- a. The same Air Traffic Control (ATC) unit that is controlling the Royal Helicopter, or;
- b. Another ATC unit that has established radar contact with the Royal Helicopter.

1.1.2.3.2 Separation Standards. In addition to the requirements of RA 3237(1) para 1, standard separation should be applied between military AS and the Royal Helicopter in accordance with RA 3228 - Separation Standards., with the following exceptions:

- a. Light aeroplanes and helicopters operating under VFR with an Indicated Air Speed of 140 kt or less should be provided with sufficient traffic information to assist the military AS operator to keep well clear of the Royal Helicopter, or;
- b. Military AS operating VFR above 140 kts with the approval of the Royal Helicopter Commander.

1.1.2.4 Guidance.

1.1.2.4.1 Civilian pilots flying near the route must keep a good look out and maintain adequate separation from the Royal Helicopter.

1.1.2.4.2 Additional guidance material can be found in the UK Civil Aeronautical Information Publication (AIP) ENR 1.1 paragraph 4.4 Royal Flights.

1.1.2.5 Regulation And Governance.

1.1.2.5.1 For further details see Military Aviation Authority (MAA) - Regulatory Article 3237 - Royal Low Level Corridors

1.1.3 REDUCED VERTICAL SEPARATION MINIMUM (RVSM)

Growing demand to increase airspace capacity has resulted in the Reduced Vertical Separation Minimum (RVSM) Programme which has, in turn, introduced an additional 6 flight levels between FL 290 and FL 410 through the reduction of vertical separation between those flight levels from 2000 ft to 1000 ft. In order to fully exploit airspace worldwide there is a requirement to comply with the appropriate civil RVSM standards.

1.1.3.1 Regulation 1390(1) - Reduced Vertical Separation Minimum.

1.1.3.1.1 Aviation Duty Holders and Accountable Managers (Military Flying) (AM(MF)) shall ensure that for RVSM operations their UK military Air Systems are appropriately approved.

1.1.3.2 **Compliance.** UK military Air Systems that regularly use the civil Air Traffic Service structure as General Air Traffic (GAT) should comply with civil RVSM regulatory requirements.

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1.1.3.3 RVSM Approval Process.

1.1.3.3.1 Capability Directors, Aircraft Operating Authorities, Aviation Duty Holders, AM(MF), Project Team Leaders and Type Airworthiness Authorities (TAA) should:

- a. Determine those air systems requiring RVSM capability and, thereafter;
- b. Ascertain the respective Air System RVSM specification requirements.

1.1.3.3.2 Once the Air System RVSM specification requirements are established then:

- a. For UK military registered Air Systems operated in the Service Environment the TAA should:
 - i. Apply RA 5810 – Military Type Certificate (MRP 21 Subpart B) for new Air Systems and Major Changes to Type Design;
 - ii. Ensure, for Type Design Changes other than Major, that an evaluation process is undertaken in line with the intent of RA 5810 and the TAE 5000 series;
 - iii. Ensure that any RVSM equipment clearances are included in the respective Air System Release to Service Recommendation (RTSR) in accordance with RA 1300 (Specifically RA 1300 – Release to Service, Annex A, Part C.17 (Navigation Systems and Sensors)) for subsequent authorization by the Release to Service Authority;
- b. For UK military Air Systems not operated in the Service Environment:
 - i. The appointed TAA should ensure that any RVSM equipment clearances are included in the Baseline References to the Certificate of Usage (See also: RA 1019 – Sponsor of Military Registered Civil-Owned Aircraft – Air Safety Responsibilities; and RA 1123 – Certificate of Usage for Military Registered Civil-Owned Aircraft) (CofU) or, where the operation is under a Military Permit to Fly (MPTF) (See also RA 5880 – Military Permit to Fly (MRP 21 Subpart P)), in the relevant Declaration of Compliance;
 - ii. The AM(MF) should supply all the required supporting evidence as part of any application for UK military Air System registration.

1.1.3.3.3 For RVSM operations:

- a. Operating Duty Holders should:
 - i. Ensure that RVSM vertical navigation performance capability is compliant with the criteria of the RVSM Minimum Aircraft System Performance Specifications (MASPS);
 - ii. Include RVSM specifications and systems (across all Defence Lines of Development (DLoD)) in their Air System Safety Cases (ASSC);
- b. AM(MF) should be able to demonstrate the following RVSM specifications and systems (across DLoDs as applicable) to the relevant sponsor and TAA:
 - i. For UK military Air Systems not being operated under a Release to Service (RTS):
 - Air System compliance method and build standard including Minimum Equipment Lists (MEL)(where used);
 - RVSM vertical navigation performance capability is compliant with the criteria of the RVSM MASPS;
 - Performance and analytical data showing compliance with RVSM performance criteria;
 - The limitations articulated in the CofU, and/or MPTF or Contractor Flight Release.
 - ii. For UK military Air Systems operated under a RTS:
 - RVSM vertical navigation performance capability is compliant with the criteria of the RVSM MASPS;
 - The limitations articulated in the RTS.
 - iii. The training programmes (ab-initio and continuation), aircrew practices and procedures (standard and emergency) pertinent for operation in RVSM designated airspace.

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c. Operating Duty Holders and AM(MF) should:

i. Ensure and stipulate in Orders the MEL (where used) to achieve RVSM compliance;

ii. Ensure aircrew are qualified and competent both in the operation of military Air System RVSM equipment and relevant procedures needed for operation in RVSM airspace;

iii. Assert compliance to the Defence Airspace and Air Traffic Management (DAATM) organization using Appendix D to EUROCONTROL Guidance Material for the Certification of State Aircraft in European RVSM Airspace (<https://www.eurocontrol.int/sites/default/files/content/documents/official-documents/guidance/2014-rvsm-military-guidance-v2-0-may-2014.pdf>);

iv. Ensure that flight plans are appropriately annotated for those Air Systems with a valid RVSM approval.

1.1.3.3.4 DAATM should:

a. Act as the point of contact with the European Regional Monitoring Agency (RMA) for RVSM matters regarding UK military Air Systems;

b. Maintain a centralised up-to-date database of RVSM approvals for UK military Air Systems, ensuring the database is available to the European RMA;

c. Provide regular updates regarding UK military RVSM approvals, de-registrations and withdrawals to the European RMA.

1.1.3.4 Guidance.

1.1.3.4.1 RVSM creates requirements for airworthiness certification (Airworthiness certification for UK military registered Air Systems operated in the Service Environment is through the Military Air Systems Certification Process (see RA 5810), RTSR assurance and ASSC processes. For UK military registered Air Systems not being operated in the Service Environment airworthiness is assured by the appointed TAA (through a CofU or MPTF (RA1121, RA 1123, RA 5880))) and operating approval to use RVSM systems in RVSM designated airspace. This regulation is designed to outline the route to RVSM approval for UK military registered Air Systems. This regulation does not aim to detail the RVSM MASPS.

1.1.3.4.2 When the appropriate RTS and Safety Statement are in place Operating Duty Holders may assert compliance to DAATM.

1.1.3.4.3 When the appropriate CofU and supporting documents are in place AM(MF) may assert compliance to DAATM.

1.1.3.4.4 When the relevant RVSM approval process (Operating Duty Holder or AM(MF) specifics as per para 4) has been completed then the respective UK military Air System can be considered as having achieved RVSM operating approval (Note: the term "RVSM-APPROVED" will be used to indicate that an aircraft has been granted RVSM approval) in the civilian domain.

1.1.3.4.5 Aircraft that have an RVSM operating approval may operate in RVSM airspace worldwide.

1.1.3.4.6 DAATM (DAATM-All@mod.uk) is the focal point regarding RVSM policy. DAATM will also provide guidance on forthcoming changes to legislation to the Capability areas and MAA through the International Aviation Regulation and Compliance Community of Interest.

1.1.3.4.7 Guidance on RVSM policy, approval and processes may be found in the following documents:

a. ICAO 'Doc 9574 AN/934 Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive' (http://code7700.com/pdfs/icao_doc_9574.pdf);

b. Eurocontrol document 'Guidance Material for the Certification and Operation of State Aircraft in European RVSM Airspace' (<https://www.eurocontrol.int/sites/default/files/content/documents/official-documents/guidance/2014-rvsm-military-guidance-v2-0-may-2014.pdf>).

1.1.3.4. The European RMA is obliged to maintain a database of RVSM approvals, and will periodically compare samples of flight plan data where RVSM approval has been stated with the database of approvals.

1.1.3.4.9 UK military Air Systems without RVSM approval may not operate as GAT within RVSM airspace with 1000 ft vertical separation. However, such Air Systems may file a flight plan to fly inside RVSM airspace with 2000 ft vertical separation with exemption status; however, the routing offered may not be optimal.

1.1.3.5 Regulation And Governance

1.1.3.5.1 For further details see Military Aviation Authority (MAA) - Regulatory Article 1390 - Reduced Vertical Separation Minimum (RVSM)

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1.1.4 AIR SYSTEM FORMATIONS

1.1.4.1 Due to the specific nature of Air System formations, they require additional procedures to ensure safe and efficient flight.

1.1.4.2 **Regulation 3234(1) - Air System Formations.**

1.1.4.2.1 A controller shall consider a formation as a single unit for controlling purposes when the formation is operating within specified parameters.

1.1.4.3 **Compliance.**

1.1.4.3.1 Formations should be considered as a single unit for separation purposes provided that:

a. The formation elements are contained within 1 nm laterally and longitudinally for military Air Systems or 0.5 nm laterally and longitudinally for civil Air Systems, and at the same level (At the same level is defined as operating within 100 feet vertically of the lead air system).

b. Where the formation contains a mix of military and civil Air Systems, the military distances (1 nm and at the same level) should be applied.

c. Where a civil formation is undertaking a military task, the formation should adopt the military formation distances (1 nm and at the same level).

d. Within Class G airspace only, at the controller's discretion, these limitations can be increased to 3 nm and/or up to 1000 ft vertically.

e. The formation, although operating outside the parameters given above, has been the subject of an Airspace Utilisation Section (AUS) Airspace Coordination Notification (ACN) or tactical negotiation between appropriate military supervisors and civilian watch managers.

1.1.4.4 **Guidance.**

1.1.4.4.1 Within a formation of military Air Systems the formation leader is responsible for separation between units comprising the formation; this is defined as Military Accepts Responsibility for Separation of Air systems (MARSA).

1.1.4.4.2 In all classes of airspace individual formation elements, except the lead Air System, will be instructed to squawk standby.

1.1.4.4.3 When controlling a formation, controllers will identify the number of formation elements in handovers, requests for Cleared Flight Path, verbal coordination or when passing Traffic Information on landline or on Radiotelephony (RT).

1.1.4.4.4 All Air Systems will fly at the same level; where this is not possible formations will be split into elements separated by the prescribed Air Traffic Control (ATC) separation minima, in accordance with RA 3228, Separation Standards, before entering Controlled Airspace (CAS). Such elements may be either individual Air Systems or smaller formations that can fly within 1 nm (military)/0.5 nm (civil) laterally and longitudinally and at the same level. Each element will be assigned a discrete Secondary Surveillance Radar (SSR) code.

1.1.4.4.5 Formations may be stepped-down vertically from the leader and can occupy more than one flight level. It is essential that the controller providing the service is aware of the flight levels blocked by the formation and ensures that, where applicable, it adheres to the Altitude Reservation (ALTRV) authorized in the CAN.

1.1.4.4.6 **United States Air Force Europe (USAFE) tanker formations.** If the climb to cruising level is stopped at an intermediate level, the formation will step-down at 500 ft levels from the leader. However, once cruising level is achieved, the formation will stack-up at 500 ft levels from the leader. Each element of the formation will be separated horizontally from the leader by 1 nm.

1.1.4.4.7 **Formation Procedures Within CAS**

1.1.4.4.7.1 Prior to a formation entering CAS, controllers will obtain confirmation on RT that all formation elements are contained within 1 nm laterally and longitudinally for military Air Systems or 0.5 nm laterally and longitudinally for civil Air Systems, and at the same level.

1.1.4.4.7.2 When a formation has been cleared to climb or descend in CAS, controllers will obtain confirmation that all elements have reached the assigned level. If the vacation of a level is relevant for the purposes of coordination, controllers will obtain confirmation that all elements have vacated the level.

1.1.4.4.7.3 When crossing CAS all elements in the formation will monitor the relevant ATC frequency.

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1.1.4.4.7.4 Formation Joins Within CAS. Controllers will only permit a formation to join-up in CAS under the following circumstances:

- a. When an Air System has an emergency and a formation join-up is essential.
- b. Formations commencing a join-up prior to entering CAS are permitted to complete their join within CAS, when conditions allow, subject to maintaining standard separation from other Air Systems.
- c. Within Class C airspace, controllers can allow formations to join; however, they will give appropriate consideration to the formation's proximity to Upper Air Routes and other airspace users.
- d. All elements involved in a formation join will transpond Mode 3A and C until established in formation.

1.1.4.4.7.5 **Formation Splits Within CAS.** Controllers can permit formation splits in CAS giving due regard to other airspace users and coordination requirements.

1.1.4.4.8 **Formation Procedures Outside CAS.**

1.1.4.4.8.1 A formation, with elements keeping station visually or by radar, of more than 1 nm length can receive an Air Traffic Service (ATS) outside CAS as follows:

- a. The lead Air System will squawk Mode 3A and C. If the stream extends for 3 nm or more, the last Air System will also squawk. For longer streams, intermediate Air Systems will squawk as appropriate.
- b. Flight Information Service (FIS) will be given to the lead Air System only.
- c. Controllers will identify the full extent of the stream formation during radar handovers, when effecting Coordination and passing Traffic Information to other controllers.

1.1.4.4.8.2 Formation Join-up Procedures. Formation join-up procedures will be as follows:

- a. **Visual Meteorological Conditions (VMC).** Individual Air Systems can rendezvous, either by ground controlled vectors, or by internal aids, with the final join-up being made visually. The initial minimum vertical separation will be 2000 ft below the formation, but if the pilot is not visual with the formation when established in trail, vertical separation can be reduced to 1000 ft below with the agreement of both the formation leader and the pilot of the joining Air System. From this position, with the consent of the formation leader, the Air System can be cleared to climb visually and join the formation. From this point the formation leader is responsible for separation (MARSAs) between the units and the controller will address his instructions only to the formation leader.
- b. **Instrument Meteorological Conditions (IMC).** When, for operational reasons, IMC join-ups are essential, the following procedures will be applied:
 - i. The initial phase of the join-up will be achieved either by ground controlled vectors or by use of Air System internal aids to a point no less than 5 nm horizontally from the formation leader and within 2000 ft vertically.
 - ii. At this point the position of the joining Air System will be passed to the formation leader and confirmation obtained that he is willing to assume responsibility for separation between his Air System, the Air System comprising the formation and the joining Air System. From this point MARSAs apply.
 - iii. The final join-up will be completed using Air System internal aids under the direction of the formation leader. The joining Air System will squawk standby when the join-up is complete.

1.1.4.4.8.3 **Formation split procedures.** Formation splits will be carried out by one controlling agency only. Handover of control to another ATS provider will not be attempted until the formation split has been completed.

1.1.4.4.8.4 **Achieving Vertical Separation.** The controller will agree with the formation leader whether individual Air Systems will be climbing to a level (level may be used to refer to flight level, altitude or height) above, or descending to a level below, the formation level to achieve standard vertical separation, in accordance with RA 3228, Separation Standards. With the approval of the controller, individual Air Systems can depart the formation visually in the pre-notified sequence on the instructions of the formation leader, and climb or descend to the assigned level. The controller must confirm that an Air System is established at its assigned flight level, identified and placed under an ATS, before authorizing the formation leader to instruct the next Air System to depart the formation.

1.1.4.4.8.5 **Applying Vectors.** The controller will agree with the formation leader the vectors that individual Air Systems will follow when departing the formation to achieve standard horizontal separation, in accordance with RA 3228, Separation Standards. With the approval of the controller, individual Air Systems can depart the formation visually, in the pre-notified sequence, on the instructions of the formation leader, maintaining the assigned level and flying the agreed vector. When standard separation has been achieved, the controller must identify the Air System in accordance with RA 3227, Methods of Identification, and place it under an ATS before authorizing the formation leader to instruct the next Air System to depart the formation.

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1.1.4.4.8.5 **Station Keeping Equipment (SKE) Formations.** C130 SKE formations will only be exempted from the requirements of paragraph 1 when:

- a. Lead and tail Air Systems are squawking (with Mode C).
- b. The flight is operating in accordance with a relevant Airspace Coordination Notice (ACN).
- c. Prior to the formation entering CAS, the controller has obtained a confirmation on RT that all elements are at the assigned level.

1.1.4.4.8.6 With the exception of paragraph 18, formations subject to ACN action (eg, Coronet Flights) or tactical negotiation between appropriate military supervisors and civilian watch managers use best practice (eg, first and last Air Systems squawking), together with positive confirmation to ATC that all Air Systems are established in the assigned level block

1.1.4.5 **Regulation And Governance.**

1.1.4.5.1 For further details see Military Aviation Authority (MAA) - Regulatory Article 3234 - Air System Formations.

1.1.5 **SEPARATION STANDARDS**

1.1.5.1 Separation standards are provided in accordance with the airspace classification the Air System (AS) is operating within and any extra military specific requirements. A reduction in separation may impact on the Risk to Life (RtL) associated with mid air collision (MAC). Prescribed separation criteria is required in order to maintain a safe and expeditious flow of air traffic.

1.1.5.2 **Regulation 3228(1) Standard Separation - Lateral**

1.1.5.2.1 Controllers shall apply standard lateral separation between AS.

1.1.5.2.2 **Compliance**

1.1.5.2.2.1 Controllers should apply standard lateral separation between:

- a. All flights in Class A airspace.
- b. Instrument Flight Rule (IFR) flights in Class C, D and E airspace.
- c. IFR flights and Visual Flight Rule (VFR) flights in Class C airspace or at the request of the pilot if operating in Class E airspace.
- d. IFR flights and Special VFR flights.
- e. Special VFR flights.

1.1.5.2.2. Lateral separation should normally be 5nm, except when safety and/or technical assessments require alternative separation standards.

1.1.5.2.2.3 In Class G airspace, lateral separation between AS is ultimately the responsibility of the pilot; however, when providing a Deconfliction Service, controllers should provide information and advice aimed at achieving the lateral separation standards defined in CAP 774, UK Flight Information Services.

1.1.5.2.2.4 Separation standards are not prescribed between VFR flights or between VFR and IFR flights in Class D and E airspace. However, Air Traffic Control (ATC) has a responsibility to prevent collisions between known flights; therefore, controllers should, where practicable, pass appropriate Traffic Information (TI) and instructions to assist pilots to see and avoid each other.

1.1.5.2.2.5 **Reduced Lateral Separation.** Controllers should only apply reduced lateral separation of 3nm in accordance with the following requirements:

- a. Both AS are in surveillance coverage and within the assured range of the surveillance system (Air Traffic Service (ATS) Surveillance System: Primary Surveillance Radar (PSR), Secondary Surveillance Radar (SSR), Automatic Dependant Surveillance Broadcast (ADS-B) or any comparable system (Wide Area Multilateration (WAM)) that is used to determine the position of an AS in range and azimuth.) in use.
- b. Both AS are in receipt of an ATS from the same controller or are the subject of coordination.
- c. The surveillance system in use provides a data refresh rate of 5 seconds or better.
- d. Both AS are outside Controlled Airspace (CAS), other than Class D and active Temporary Reserved Areas (TRAs) 001 – 008.

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e. When the AS is operating within Class E airspace and surveillance data is provided by National Air Traffic Services (NATS) and NATS has stipulated alternative separation minima.

1.1.5.2.2.6 Secondary Surveillance Radar (SSR) (Throughout this RA, any reference to SSR is equally applicable to Wide Area Multilateration (WAM) and Automatic Dependant Surveillance Broadcast (ADS-B)). Reduced Lateral Separation **should not** be applied when providing SSR-Alone ATS.

1.1.5.2.2.7 Formations. Reduced lateral separation should not be applied when either speaking unit is a formation due to the fact that formation elements may be displaced by up to 1 nm, except where covered by a Safety Assessment as per para 2 and RA 1200 – Defence Air Safety Management.

1.1.5.2.2.8 Class E Airspace.

1.1.5.2.2.8.1 IFR:

a. **IFR v VFR Traffic.** IFR AS should be provided with TI, as far as is practical, on VFR AS. The controller should update the TI if it continues to constitute a definite hazard, or if requested by the pilot.

b. **Against Unknown Mode C Transponding Responses.** If the intentions of a transponding VFR AS are unknown, radar returns, however presented, **should not** be allowed to merge unless the AS in receipt of TI advises that he intends to avoid the other AS without the controller's assistance.

c. IFR flights **should** be provided with avoiding action when requested by the pilot. If the pilot reports that he has the unknown AS in sight further controller action may then be limited to passing traffic information. CAP 413 Radiotelephony Manual contains detail of avoiding action Radiotelephony (RT).

d. Where Class C airspace lies above Class E airspace, separation requirements should be assumed to be required on descending En-Route traffic, unless it is known that such AS will operate under VFR on entering Class E.

1.1.5.2.2.8.2 VFR: Where a pilot requests a VFR service, such services should be provided in accordance with RA 3223 – Provision of ATS Inside Controlled Airspace and CAP774, UK Flight Information Services.

1.1.5.2.2.9 Guidance. Lateral separation based on radar exists when the distance between the centres of radar contacts does not represent less than the prescribed minimum, provided that the contacts do not touch or overlap (Associated with primary surveillance radar (PSR) returns at extremes of radar range).

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1.1.5.3 Regulation 3228(2) Standard Separation - Vertical

1.1.5.3.1 Controllers shall apply standard vertical separation between AS.

1.1.5.3.2 Compliance. Controllers should apply the following vertical separation standards:

		Conflicting Traffic					
		Class D or E VFR	Class D or E IFR	Known Traffic in Class A	Known Traffic in Class C above FL195 excluding active TRAs.	Known Traffic outside CAS below FL195 or within active TRAs	Unknown traffic outside CAS below FL195 or within active TRAs
Own Traffic	Class D or E VFR	TI (where practicable in Class E)	TI (where practicable in Class E)	-	-	-	-
	Class D or E IFR	VFR will avoid IFR. TI provided on VFR traffic, separation only provided when requested by the pilot. Note 1.	a. 1000 ft by co-ordination b. 5000 ft by use of Mode C	a. 1000 ft by co-ordination b. 5000 ft by use of Mode C	a. 1000 ft by co-ordination b. 5000 ft by use of Mode C	a. 1000 ft by co-ordination b. 5000 ft by use of Mode C c. 1000 ft by CAS deeming	a. 1000 ft by CAS deeming
	In Class A			a. 1000 ft by co-ordination b. 5000 ft by use of Mode C	a. 1000 ft by co-ordination b. 5000 ft by use of Mode C	a. 1000 ft by co-ordination b. 5000 ft by use of Mode C c. 1000 ft by CAS deeming.	a. 1000 ft by CAS deeming
	In Class C above FL195 excluding active TRAs			a. 1000 ft by co-ordination b. 5000 ft by use of Mode C	a. 1000 ft (2000ft above FL290) by co-ordination b. 5000 ft by use of Mode C	a. 1000 ft by co-ordination b. 5000 ft by use of Mode C c. 1000ft by Class C deeming.	a. 1000 ft by Class C deeming.

Note: Where such a request is made, controllers should endeavour to achieve standard separation; however, it is recognized that this may not be possible in all circumstances.

1.1.5.3.3 In Class G airspace, vertical separation between AS is ultimately the responsibility of the pilot; however, when providing a Deconfliction Service, controllers should provide information and advice aimed at achieving the separation standards defined in CAP774, UK Flight Information Services.

1.1.5.3.4 Coordination. When agreeing co-ordination, controllers should apply no less than the following vertical separation:

a. Between subsonic AS:

i. Up to FL290 – 1000 ft.

ii. Above FL290 – 2000 ft. [For Reduced Vertical Separation Minima(RVSM) Airspace see para 16]

b. When one or both AS are supersonic:

i. Up to FL450 – 2000 ft.

ii. Above FL450 – 4000 ft.

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1.1.5.3.5 Reduced Vertical Separation. Controllers should only apply reduced vertical separation of 500 ft in accordance with the following requirements:

1.1.5.3.5.1 Terminal Radar.

- a. Both AS are in surveillance coverage and within the assured range of the surveillance system in use.
- b. Both AS are in receipt of an ATS from the same controller or are the subject of military to military coordination.
- c. Both AS are below FL100 and outside CAS other than Class D.

1.1.5.3.5.2 The application of reduced vertical separation to civil AS should be exceptional rather than routine and only following agreement with the civil pilot.

1.1.5.3.5.3 Formations. Reduced vertical separation should not be applied when either speaking unit is a formation due to the fact that formation elements may be displaced by up to 100 ft, except where covered by a Safety Assessment as per para 2 and RA 1200 – Defence Air Safety Management.

1.1.5.3.5.4 Reduced Vertical Separation Minima (RVSM). Area radar controllers can apply RVSM of 1000 ft within the vertical and lateral limits of airspace notified as RVSM or RVSM transition airspace provided that:

- a. Both AS are RVSM approved.
- b. The surveillance display system shows the RVSM approval status of all AS involved to the respective controllers and the AS are subject to Standing Agreement Co-ordination Procedures, or coordination has been effected.

1.1.5.3.6 Separation Using SSR Transponder Mode C

1.1.5.3.6.1 When SSR is used to assess vertical separation, transponder Mode C responses **should** be continuously monitored to ensure that the vertical distance is never less than the prescribed minimum.

1.1.5.3.6.2 An AS in receipt of a surveillance service, whether transponding Mode C or not may be separated from other AS which are transponding Mode C but **should** be subject to the following:

- a. When the transponder Mode C of the conflicting AS has been verified, the following minimum vertical separation **should** apply:
 - i. Inside CAS, 5000 ft.
 - ii. Outside CAS, 3000 ft (Unless the SSR transponder code indicates that the transponder Mode C data has been verified, the surveillance returns, however presented, **should not** merge).
- b. **SSR Transponder Code A 0000.** Vertical separation using transponder Mode C **should not** be applied against conflicting traffic with SSR transponder code A 0000.

1.1.5.3.6.3 SSR Transponder Mode C. If an AS under control is within Class A or D airspace, the following deeming conventions **should** be employed:

- a. When transponder Mode C indicates a conflicting AS to be outside the vertical limits of CAS, radar responses can be allowed to merge provided that the SSR transponder code is not that of a unit with approval to penetrate CAS and at least 1000 ft vertical separation exists. Controllers **should** exercise caution when controlling AS crossing CAS with lateral variations in base levels to ensure separation is not eroded against traffic that is subsequently crossing a lower portion of CAS.
- b. When the AS under control is at or above FL110, any traffic transponding SSR code A 7000, 7001 or 7002 without transponder Mode C can be deemed to be outside the vertical confines of CAS and radar contacts can be allowed to merge.

1.1.5.3.6.4 Vacation of Levels. The practice whereby a controller undertakes, through use of transponder Mode C alone, to follow the climb or descent of another AS is potentially hazardous. In order to safeguard separation criteria, any stop-off level **should** be based upon a level already vacated by the other AS and not on a level expected to be reached.

1.1.5.3.7 Avoidance of unknown traffic.

1.1.5.3.7.1 Standard separation should be provided for IFR traffic if it is known or suspected that an unknown AS:

- a. Is lost or has experienced radio failure.
- b. Has inadvertently penetrated CAS.

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c. Is not squawking/transponding.

d. Is squawking SSR transponder code A 0000.

e. Is joining CAS.

1.1.5.4 Regulation 3228(3) Increased Vertical Separation Standards For Typhoon.

1.1.5.4.1 Controllers **shall** apply specified vertical separation standards to Typhoon AS when requested by the pilot.

1.1.5.4.2 Compliance.

1.1.5.4.2.1 Controllers **should** apply the following increased vertical separation standards when requested by the Typhoon pilot:

a. Typhoon vs Typhoon AS: 3000 ft.

b. Typhoon vs other AS: 2000 ft.

c. Supersonic. Standard separation should be applied in accordance with 1.4.1.3.2.

1.1.5.4.2.2 If a controller is unable to provide increased separation, the pilot should be advised and will either delay acceleration or reduce speed and/or manoeuvre to comply with standard separation. This proviso is reflected in the Typhoon Release-to- Service.

1.1.5.4.3 Guidance.

1.1.5.4.3.1 Due to possible altimeter inaccuracies at certain airspeeds and/or when manoeuvring above specified parameters at all speeds, pilots of Typhoon AS may request controllers to provide increased vertical separation against other AS. At all times the onus for providing increased terrain clearance and requesting the increased vertical separation against other AS rests entirely with the pilot.

1.1.5.5 Regulation 3228(4) Separation Standards for Radar to Visual Recoveries and Radar to Straight In Approaches.

1.1.5.5.1 Controllers sequencing AS for radar to visual recoveries and radar to straight in approaches shall ensure that Deconfliction minima are applied until specified conditions are met.

1.1.5.5.2 Compliance.

1.1.5.5.2.1 Radar to Visual Recoveries. Deconfliction minima **should** be applied until:

a. The point of confliction is in a Military Air Traffic Zone (MATZ) or Carrier Control Zone, and;

b. The pilot of the AS conducting the radar to visual recovery is visual with an AS conducting an instrument approach, and;

c. TI is passed to the pilot of the AS conducting the instrument approach, regarding the AS conducting the radar to visual approach.

d. In the event that the AS on an instrument recovery is a civil AS, the sequencing of radar to visual approaches against civil instrument traffic **should** be exceptional rather than routine and the civil pilots' agreement **should** be sought.

1.1.5.5.2.2 Radar to Straight In Approaches. AS performing radar to straight in approaches **should** also be subject to the conditions in RA 3228(4) para 1.4.1.5.2.1.

1.1.5.5.2 Regulation And Governance.

1.1.5.5.2.1 For further details see Military Aviation Authority (MAA) - Regulatory Article 3228 - Separation Standards.

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