

## RA 2335 - Flying Displays and Special Events

### Rationale

*Fundamental objectives of MOD communication strategy include: enhancement of the reputation and image of Defence; direct PR engagement at events; and support to recruiting and the UK defence industry. To support this strategy and where operational commitments and resources allow, the single Services endeavour to provide aircraft to participate at a number of military and civil Flying Displays and Special Events throughout the year.*

*Display flying is not without risk; the MAA aims to ensure it has appropriate and targeted regulations in place to ensure any risk to life is mitigated to as low as reasonably practicable. Flight safety, spectator safety and the safety of anyone living or working in the area is to be the paramount consideration in the planning and conduct of Flying Displays and Special Events. These regulations apply: to Flying Displays and Special Events at MOD establishments in the UK; to Flying Displays and Special Events where the only participants are military aircraft; to all UK military aircraft<sup>1</sup> participating<sup>2</sup> at Flying Displays and Special Events worldwide; and to all foreign military aircraft participating at civilian<sup>3</sup> and military Flying Displays in the UK.*

*► In line with Civil Aviation Publication(CAP) 403, ◀ where UK military or foreign military aircraft participate in civilian Flying Displays and Special Events in the UK, civilian Flying Display Directors (FDD) are to note the more restrictive of the relevant regulations (military or civilian) apply.*

### Contents

**2335(1): Flying Display Organization, Management and Participation**

**2335(2): Display Crew Training & Authorization**

**2335(3): Flying Display Separation Distances, Minima and Restrictions**

### Regulation 2335(1)

#### Flying Display Organization, Management and Participation

2335(1) Heads of Establishment (HoE)<sup>4</sup> **shall** be ► **the individual** ◀ responsible for: the administration, organization and safety management of Flying Displays held on or over MOD establishments, or over a non-MOD area<sup>5</sup> which has been allocated for the participation of only military aircraft; and actively managing an environment that accommodates the safe operation of participating aircraft. They **shall** ► **ensure that** ◀ both an Event Organizer (EO) and a separate suitably experienced FDD ► **have been appointed** ◀<sup>6</sup>.

Aviation Duty Holders and Accountable Managers (Military Flying) (AM(MF)) **shall** retain responsibility for the safe operation of air systems in their Area of Responsibility (AoR) at Flying Displays and Special Events.

<sup>1</sup> ► Including Remotely Piloted Air Systems (RPAS) (except Class 1(a)). ◀

<sup>2</sup> For the purpose of this regulation, participation shall be taken to include both static and dynamic activity.

<sup>3</sup> ► Ref CAP 403 Ch1 Part A Para 1.16-18.135. ◀

<sup>4</sup> For the purposes of this regulation, HoE shall also be taken to apply to the Senior Responsible Officer where appointed, for an event over a non-MOD area which has been allocated for the participation of only military aircraft.

<sup>5</sup> Such as civilian venues used for an Armed Forces Day event.

<sup>6</sup> For relevant civilian Flying Displays the FDD is the person responsible to the CAA for the safe conduct of the Flying Display and is named as such on the Permission issued under Article 162 of the Air Navigation Order (ANO) (noting that for smaller civilian events the FDD could also be airborne as a participant).

**Acceptable  
Means of  
Compliance  
2335(1)**

**Flying Display Organization, Management and Participation**

1. **Categorization of Event.** Aviation Duty Holders and AM(MF), or HoE **should** determine the ► **categorization of flying activity conducted under this RA in accordance with guidance at paragraphs 20-22.** ◀
2. **Authority to Conduct Flying Displays and Special Events.** Authority to conduct a Flying Display or Special Event at a MOD establishment **should** be given by the HoE, or his superiors. Administrative arrangements for such events **should** be detailed in Orders or Instructions.
3. **Responsibilities of Display Executives.**
  - a. The EO is the person who **should** be responsible for all matters pertaining to the wider planning and execution of the Flying Display and for the safety of the general public.
  - b. For the conduct of the Flying Display the FDD **should** hold authority for all matters affecting Flight Safety and have primacy over the EO in this regard. The FDD **should** be responsible for:
    - (1) The co-ordination, control and safety of all flying activities;
    - (2) Flying discipline;
    - (3) The scrutiny of all participants' Public Display Authority (PDA) or national equivalent, ► **CAA Display Authorization (DA) or CAA Letter of Exemption** ◀ for regulatory compliance;
    - (4) The briefing and debriefing of participating aircrew;
    - (5) Control of the Flying Display programme and cancellation or modification to the programme in the case of adverse weather or other conditions that directly affect the event;
    - (6) ► **Ensuring appropriate orders** ◀ for the Display ► **are in place** ◀, including orders for incident and post-crash management:
      - (a) Coordinating the completion of ► **RA2335** ◀ Annex B, ► **C and D** ◀ Forms for ► ◀ their event and seeking agreement from the MAA on their participation;
      - (b) ► **The validation of foreign display participants as required.** ◀
4. **Flying Control Committee.** A Flying Control Committee (FCC) **should** be appointed by the ► ◀ FDD ► **for air displays and special events where 4 or more items<sup>7</sup> are participating** ◀, with appropriate Terms of Reference (ToR) that include the following as a minimum:
  - a. To assist the FDD in the safe execution of the Flying Display;
  - b. To assist the FDD in monitoring display standards;
  - c. ► **To assist the FDD in the validation of any display items;** ◀
  - d. To provide specialist knowledge for specific display items;
  - e. To offer in-depth opinion in the case of infringement of the regulations;
  - f. To be available throughout the period of the Flying Display;
  - g. To advise on restrictions or additional limitations where required;
  - h. To monitor the conduct of all display participants for regulatory compliance, with the clear authority of the FDD to intervene or stop, on the grounds of safety, any display item or, in extreme cases where the FDD cannot be consulted, the whole Flying Display and;
  - i. To assist the FDD in other duties as directed and agreed.

<sup>7</sup> ► **A display team (such as RAFAT, BBMF, and Black Cats) can be categorized as a single display item.** ◀

**Acceptable  
Means of  
Compliance  
2335(1)**

5. **Applicability of these Regulations.** Where orders issued for Display Flying, or by the EO/FDD for any specific Flying Display, differ from those imposed by this Regulatory Article (RA), the more stringent limitations **should** be observed. In addition:
- ▶ STANAG 3533<sup>8</sup>. ◀** The UK has ratified STANAG 3533 and, at any display where aircraft of more than one NATO nation are appearing, and thus, more stringent limits in the STANAG 3533 **should** be applied.
  - ▶ CAP403. ◀** Civilian Flying Displays are conducted under the auspices of the Air Navigation Order (ANO), **▶ ◀ Civil Aviation Publication 403 (CAP 403) (Flying Displays and Special Events: A Guide to Safety and Administrative Arrangements) ▶ and, site specific CAA permissions or exemption granted for the event. ◀** All military participants at civil Flying Displays **should** be compliant with these documents, observing the more stringent limitation where they differ from the MRP **▶ or STANAG 3533. ◀** A signed PDA **should** be used as a CAA Display Authorization (DA) equivalent.
6. **Display Venues.** Aviation Duty Holders and AM(MF) **should** take all reasonable measures to assure himself that display venue at which his aircraft perform are suitable, safe and appropriate to the aircraft type and display sequence.
7. **UK Military Display Participants.** UK military display participants **should** operate to an approved Display Sequence. Copies of the Display Sequence and clearances **should** be notified to FDDs in advance of the displays at which they are to appear. Participants **should not** normally be permitted to depart from their standard Display Sequence, unless otherwise authorized to accommodate local requirements, and they **should not** perform if a FDD cannot accept their Display Sequence. **▶ Additionally, UK military display participants at any Flying Display or Special Event over a non-MOD area should ensure that the appropriate CAA permission/exemption is in place or that the MAA has been notified of the event<sup>9</sup>. ◀**
8. **Foreign Military Display Participants.** FDDs **should** ensure that Foreign military display participants:
- Are approved to participate **▶ by the MAA; ◀**
  - ▶ ◀ Operate in accordance with the more stringent of the limitations ▶ as per para 5 above; ◀**
  - Are certified medically fit for display flights in aircraft type in accordance with their national requirements;
  - Provide **▶ a national PDA or equivalent and ◀** a completed assessment questionnaire to FDD, RA2335 Annex B, at least 1 month before planned display date;
  - Gain validation of their routine when directed by MAA and/or FDD, by **▶ ◀ FDD/FCC observation of the proposed routine prior to display participation.**
9. **Civilian Participants at MOD Establishments.** FDDs **should** ensure that pilots flying civilian-registered aircraft hold a valid CAA DA or a CAA letter of exemption as evidence of their competence to display. The FDD, with the support of his FCC, **should** ensure that civilian participants do not breach the minima permitted by their CAA DA or CAA letter of exemption.
10. **▶ Validation of Display Items. Validation of display items, when required, should be carried out by the FDD with the assistance of the FCC, and should not take place during the Flying Display or Special Event. ◀**
11. **Static Displays and Spare Aircraft.** Aircraft approved to participate in Static Displays or deploy as spare airframes, **should** arrive and depart venues using standard manoeuvres for the platform (e.g. run in and break to land). Other non-standard or aerobatic manoeuvres constitute display flying requiring a PDA.

<sup>8</sup> **▶ For the purpose of this RA, STANAG 3533 refers to both the STANAG and accompanying document AFSP-05. ◀**

<sup>9</sup> See also para 27.

**Acceptable  
Means of  
Compliance  
2335(1)**

12. **Notification of Flying Displays.** The FDD is responsible for notifying the CAA ►◀ of unusual aerial activity, in accordance with ► the UKAIP and CAP 403.◀ In addition, where jet aerobatic teams are displaying, or where the FDD considers it necessary, the FDD **should** request Restricted Airspace (Temporary) (RA(T)) in ► accordance with CAP 403<sup>10</sup>◀.
13. **Spectator Safety.** The FDD **should not** permit any manoeuvre likely to jeopardise the safety of spectators in the event of an aircraft malfunction or aircrew misjudgement. Likewise, arrangements on the ground **should** be made to ensure safety risks to spectators are as low as reasonably practicable.
14. **Participant and Spectator Separation.** To ensure safe separation between spectators and participants during the display, FDDs **should** ensure that the minimum horizontal and vertical separation distances detailed in RA2335(3) are complied with by all participants.
15. **Ground Markings.** Full use **should** be made of existing ground features such as runways and supplemented as necessary by other visual means including Day-Glo markers (preferably with vertical extent) and lighting. Markers **should** be fixed firmly to minimise the effect of helicopter/VTOL downwash. The following ground markings **should** be provided:
- a. **Display Line.** In order that display pilots can identify the minimum separation distance from the crowd specified above, a Display Line **should** be marked, normally parallel to the main crowd line and 230m from it. This requirement may be waived at the discretion of the FDD if there is a suitable and easily recognisable physical feature that can be used as a display line (e.g. runway edge, centreline etc), provided that it satisfies the orientation and minimum distance criteria specified above.
  - b. **Display Datum.** A Display Datum **should** be clearly marked on the Display Line, to indicate the point on which individual displays should be based. It will normally be abeam the central point of the main Crowd Line. This ► marking◀ requirement may be waived at the discretion of the FDD if there is a suitable and easily recognisable physical feature that can be used as a display datum (e.g. main runway intersection etc), provided that the position satisfies the criteria above.
  - c. **Supplementary Markings.** FDDs **should** also provide additional markings to assist pilots to identify appropriate minimum distances from the Crowd Line for various aspects of their display, where these are different from the normal 230m minimum. These markings may include supplementary display lines but, in this event, pilots **should** be individually and collectively briefed on the line approved for their display. Details **should** also be set out in any written briefing.
16. **Boundaries of Responsibility.** It is recognized that there will be some overlap of the safety management responsibilities between the FDD and the EO. Therefore FDDs and EOs **should** agree these responsibilities within their ToR. In particular, but not limited to, the location of car parks, spectator enclosures ► (including pre-event viewing areas),◀ aircraft parking, refuelling areas and emergency vehicle access **should** be considered.
17. **Control of Explosives.** Use of explosives for simulated ground-bursts, smoke or other special effects **should** be strictly controlled by a competent person appointed by the EO. Debris from such effects **should** not impinge on aircraft, spectators or the runway/taxiways and the scale of any effects **should** be known prior to the event. Briefings for ground officials and display crews **should** draw attention to the hazardous nature of such devices. Furthermore, participants **should** be appropriately authorized for such activity.
18. ► **Event Crash Plan.** The FDD **should** ensure that an appropriate event crash plan is in place to cover an aircraft accident on or near the display venue during the

<sup>10</sup> The establishment of a RA(T) requires the issue of a statutory instrument by the Department for Transport. The requirement is to be notified a minimum of ► 120 days◀ in advance of the event.

**Acceptable  
Means of  
Compliance  
2335(1)**

period of a public display. ◀

19. ▶ **Reporting.** ◀ All FDDs hosting ▶ ◀ foreign military participants **should** provide written feedback to the MAA using the proforma at RA2335 Annex C ▶ **and Annex D where applicable.** ◀

**Guidance  
Material  
2335(1)**

## Flying Display Organization, Management and Participation

### Control of Flying Displays

20. **Categorization as a Flying Display.** Where the event is open to the general public, paying or not, or the event is advertised with an expectation that the public will gather to witness the event, it will be considered a Flying Display<sup>11</sup>. Where any doubt exists in categorization, the MAA may be consulted for advice ▶ ([DSA-MAA-Display@mod.uk](mailto:DSA-MAA-Display@mod.uk)) ◀.

21. **Categorization as a Special Event.** Flying events not open to the general public, but which are attended by dependants or specifically invited personnel, will normally be categorized as Special Events. For example; Families Days, Ship Displays and minor events for Service publicity and recruiting, such as helicopter visits to schools, Military Ceremonial Events and civil events not regulated by the ANO. ▶ **In such cases** ◀, the HoE and/or the participants' Aviation Duty Holder or AM(MF) must stipulate the applicability of the display regulations, ▶ **including any requirement for display executives and a FCC,** ◀ and the safety criteria to be used for such events. If it is predicted that the general public will gather, as aviation enthusiasts, in off-site viewing areas, the EO will include such gatherings in his risk assessment.

22. ▶ **Categorization as** ◀ **a Role Demonstration or Flypast.** Role Demonstrations are defined as manoeuvres and procedures which describe the day-to-day capability of the aircraft. A Flypast is defined as aircraft flying, either singly or in formation, past a reviewing stand or any specific point along a pre-planned route without manoeuvring, other than when necessary for safe and accurate navigation. Accordingly, they will not include aerobatic manoeuvres. Therefore, Role Demonstrations and Flypasts do not constitute Display Flying ▶ **(and need not be categorized as a Flying Display).** Nonetheless, in such cases, the HoE and/or the participants' Aviation Duty Holder or AM(MF) must stipulate the safety criteria to be used for such events and the applicability of the display regulations. Furthermore, if it is predicted that the general public will gather, Aviation Duty Holders and AM(MF)s will include such gatherings in their risk assessment. ◀

23. **Public Display Authority Form.** The PDA Form ▶ **(Annex A)** ◀ includes the following: details of the pilot's experience; currency on type; the display sequence (Full, Rolling or Flat as appropriate) and limitations (e.g. weather minima); display duration; limited display and basic manoeuvres; and permitted modifications to the display routines. Following approval of the display by Operating Duty Holder or AM(MF), copies of the PDA Form will be attached to the authorization records to facilitate authorization of rehearsals and performances of the display.

24. **Event Organizer.** The EO will be the executive officer responsible for the planning, organization and wider aspects of the Flying Display. The EO is ultimately responsible for the conduct of the event and the safety of the general public, but is subordinate to FDD in matters relating to Air Safety. The post of EO may be held by a suitably experienced serviceman or civilian. ▶ ◀

25. **Flying Display Director.** The FDD will be suitably experienced commensurate with the task. The FDD will arrange for the briefing of participants; all military and civil participants will attend a display briefing or receive a telephone brief prior to their display. Where circumstances dictate, more than one briefing may be necessary to cater for all participants. ▶ **For events where the only participants are military, and the number of display items does not exceed 3, an airborne FDD may be used.** ◀ Where further advice or guidance is considered necessary, FDDs may contact the MAA for advice ▶ ([DSA-MAA-Display@mod.uk](mailto:DSA-MAA-Display@mod.uk)) ◀

26. **Flying Control Committee.** ▶ **The FCC will consist of Suitably Qualified and**

<sup>11</sup> ▶ Subject to the exception for Role Demonstrations and Flypasts as per para 22. ◀



**Guidance  
Material  
2335(1)**

**Experienced Personnel (SQEP) as appropriate for the event.** The FCC ◀ will typically consist of the FDD, who will normally act as Chairman of the committee, and additional members co-opted from nominated military or approved civilian individuals who have the requisite expertise of Display Flying and/or organization. At large venues the chairmanship of the FCC may be delegated.

27. **Military Flying Displays and Special Events Over Non-MOD Areas.** Article 162 of CAP 393 (ANO) permits ▶ the organization of ◀ an event at, or over, non-MOD land at which the only participating aircraft are military aircraft. ▶ In such circumstances;

- a. The MAA must be informed;
- b. The MAA will act as regulator for the event in liaison with the CAA; and,
- c. RA2335 applies.

It must be noted that the organization and management of such displays and events in themselves do not require a direct military command chain; the MAA may be contacted for further advice. ◀

28. **Validation of Foreign Military Participants at UK Flying Display and Special Events.** On behalf of the CAA, the MAA maintains oversight of all foreign military participants at UK Flying Displays, and approves participation based upon consideration of the submitted Annex B form and accompanying National PDA or ▶ equivalent ◀ and ribbon diagrams. ▶ For the purpose of this regulation, Validation is the determination that a display item is compliant with RA2335, and safely adheres to the planned routine. The MAA and/or the FDD can mandate the validation of any display item. When the MAA mandates validation, then that validation may take place at any display venue within the same display season and, where a participant has more than one authorized display routine, then validation of any one of the routines is accepted by the MAA as sufficiently appropriate to validate all display routines. ◀ All validations will be conducted by ▶ SQEP ◀ observation of the proposed routine. ▶ Post validation decision, the FDD will submit an ANNEX D to RA2335 to DSA-MAA-Display@mod.uk, where this Annex will be held as a record and remain accessible by request to the MAA via email (DSA-MAA-Display@mod.uk). ◀

29. **Public Safety.** Specific minimum requirements for public safety are:

- a. Spectator areas (defined as designated spectator enclosures and associated car parks) must be clearly delineated by barriers. The forward boundary of the spectator area, beyond which the display itself is carried out, is referred to within this Regulation as the 'Crowd-Line'. At venues where the spectator area also defines sides, the crowd-line is, for the purpose of an aircraft maintaining the correct lateral clearances, to be considered to run along the front and down the sides of the spectator area.
- b. Adequate markings will be set up in the display area to enable display pilots to maintain appropriate separation from the spectator areas. Details of separation distances and ground markings are given in RA2335(3). ▶ ◀
- c. Aircraft approach and departure routes to the display area will be chosen to avoid overflight of the spectator areas. These routes will also provide maximum safety for adjacent populated areas.
- d. Aircraft parking areas will be out of bounds to spectators when engines are running or aircraft are taxiing.
- e. Suitable routes for emergency vehicles will be established, clearly marked, and kept free from obstruction at all times.

30. ▶ ◀

31. **Audit and Assurance Activity.** The MAA will assure regulatory compliance and safety standards at military Flying Displays, Special Events and civil displays where there is military participation, through a combination of formal audits and assurance visits. Notification will normally be given to the EO or FDD in adequate time stating that an audit or assurance visit will take place. However, the MAA may inspect any Flying Display or Special Event where there is military participation without notice.

32. **Civil Participants Operating Minima.** The CAA has granted the MOD an

**Guidance  
Material  
2335(1)**

annual clearance for civilian participants holding a CAA DA or CAA letter of exemption to operate below the minima stated in the ANO Rules of the Air, Rules 5 & 6 (Low Flying), during a military event at an active government aerodrome. This clearance is obtained annually and held by the MAA.

33. **Insurance Requirements.** Event Organizers of Flying Displays and Special Events must ensure that appropriate insurance arrangements are in place for all participating aircraft, whether Static Display, Flypast, Role Demonstration or full Flying Display. ▶◀

34. **Participation of non-RTS UK Military Registered Aircraft.** Participation of non-RTS UK military registered aircraft at Flying Displays or Special Events requires the agreement of the Aviation Duty Holder or AM(MF) and the MAA.

**Regulation  
2335(2)**

**Display Crew Training & Authorization**

2335(2) Aviation Duty Holders and AM(MF) **shall** ensure that aircrew participating in Flying Displays, and Special Events are appropriately trained, ▶ **approved** ◀, authorized and supervised.

**Acceptable  
Means of  
Compliance  
2335(2)**

**Display Crew Training & Authorization**

35. **Display Approval.** Aircrew **should** hold a valid PDA prior to performance of a ▶ **flying display routine at a Flying Display or Special Event.** ◀

36. **Pre-Season Display Work-up and PDA.** Pre-season display practices **should** be personally authorized by the display pilot's supervisor and **should** be of a progressive nature leading, in stages, down to final approved display heights, and initially conducted only over his own airfield. Consideration **should** be given to the use of appropriate simulators for initial practices and the involvement of the previous season's display pilot during practice and validation. Each practice display sortie **should** be monitored from the ground by the display pilot's supervisor. If available, Head Up Display (HUD), Video Air Data Recorder (VADR) or camcorder video **should** be used for display practice debriefs. A record of display practices detailing weather, runway, etc. **should** be kept in the Pilot's training folder. The display pilot's Approving Officer<sup>12</sup> ▶ **or Flight Operations Post Holder**<sup>13</sup>, ◀ and the supervisor **should** annotate, and sign, the training folder whenever the pilot is cleared to a lower height. The display aircrew and sequence **should** be approved by the Operating Duty Holder or AM(MF) using the PDA Form, at Annex A, as the mechanism to signify that final approval has been granted.

37. Following the granting of PDA, authorization for each display performance or rehearsal need only include the time and location. Deviations from the clearances or permitted modifications to the routine or display sequence, as detailed on the approved PDA Form, **should not** be permitted without re-ratification by the Operating Duty Holder or AM(MF).

38. **Role Demonstrations and Flypasts.** As Role Demonstrations and Flypasts do not constitute Display Flying ▶ **they** ◀ do not necessarily require a PDA, ▶ **but** ◀ Aviation Duty Holders and AM(MF)s **should** approve Role Demonstration manoeuvres. Aviation Duty Holder and AM(MF) Orders **should** detail the approval mechanism, clearance procedures and the authorization process for Flypasts and Role Demonstrations. Safety management procedures, limitations and restrictions for Role Demonstration, where they differ from those contained in this RA, **should** be detailed in Orders. Orders **should** cover the authorization process and any additional training that may be required for crews conducting Role Demonstrations. ▶ **In some cases** ◀ the Aviation Duty Holders or AM(MF)s may assess Role Demonstrations or Flypasts as bordering on Display Flying and **should** re-categorise the sequence as a ▶ **Flying Display routine** ◀ that requires a PDA.

39. **Mixed Formations.** Approval for mixed formation Flypasts and Role

<sup>12</sup> See MAA02.

<sup>13</sup> ▶ **For contractor flying organizations; see also RA1024.** ◀

**Acceptable  
Means of  
Compliance  
2335(2)**

Demonstrations **should** be obtained from Aviation Duty Holders and AM(MF).

40. **Flight Authorization.** All ► **Flying Display routines**, ◀ Role Demonstrations and Flypasts **should** be authorized in accordance with Aviation Duty Holder or AM(MF) Orders. Aviation Duty Holders and AM(MF) **should** promulgate a list of those officers, specified by name, empowered to ► **do so** ◀.

**Guidance  
Material  
2335(2)**

**Display Crew Training & Authorization**

41. **Parachuting**<sup>14</sup>. When participating at an approved display, MOD approved sport parachute display teams ► **will** ◀ be deemed to be on duty. Teams ► **will** ◀ be in possession of a valid Parachuting Permission and Exemption Certificate issued by the CAA, and the parachute display ► **must** ◀ be conducted in accordance with Aviation Duty Holders or AM(MF) Orders. Team Leaders ► **will** ◀ be responsible for the parachuting and flying operations carried out by that Display Team, the provision of a qualified Drop Zone Controller, and ensuring adequate liaison and co-ordination with the FDD or EO. Additional regulations for Parachute Demonstrations at Flying Displays are contained in RA2335(3).

42. **Civilian Participants.** Pilots flying civilian registered aircraft must hold a valid CAA DA or CAA Letter of Exemption as evidence of their competence to display.

43. **Commercial Aircraft ► Displays Over MOD Areas.** ◀ Commercial aircraft pilots flying non-aerobatic displays in commercial passenger or transport aircraft will not normally hold a DA. Additionally, the CAA will not issue a DA Exemption to cover displays held over MOD property. In this case the FDD, allowing at least one week's notice, will seek the advice of the CAA, Head of Flight Operations and Inspections General Aviation. ► **After consultation with the CAA**, ◀ the FDD may then, at his discretion, authorize the pilot of a commercial aircraft to display without a DA or DA Exemption.

**Regulation  
2335(3)**

**Flying Display Separation Distances, Minima and Restrictions**

2335(3) Authorized minimum vertical and horizontal separation distances, and other applicable minima and restrictions **shall** be complied with at all times during a display.

**Acceptable  
Means of  
Compliance  
2335(3)**

**Flying Display Separation Distances, Minima and Restrictions**

44. Deliberate over flight of spectator areas **should** be forbidden, other than for flight safety reasons, ► **or for specific manoeuvres**<sup>15</sup> **where a regulatory waiver has been issued by the MAA.** ◀

45. Crossover and interlacing manoeuvres flown towards the spectator enclosures by fixed wing aircraft **should** be prohibited unless specifically approved by the Aviation Duty Holder or AM(MF). Such manoeuvres **should** be subject to a robust risk assessment and be completed before the lateral separation minima below.

46. **Lateral Separation.** The following minimum lateral separation distances ► **should** ◀ apply to all military display aircraft at all military and civilian flying displays. ► ◀ Where a FDD, a Display Pilot, or his operating authority considers that a greater separation is required for any specific aircraft or manoeuvre, that minimum **should** be identified and complied with. If it becomes apparent, either before or during the Display, that the appropriate minima cannot be guaranteed, the Display **should** be cancelled or abandoned. In the case of displays at airfields/locations where spectator areas are on both sides of the Display Axis, the minimum distances between the Display Line/runway edge and the spectator areas, specified below, **should** apply on both sides of the Display Line/runway edges. Absolute minima are as follows:

- a. **Ground Operations.** During all ground operations, including refuelling, servicing and at any time when engines or rotors are running, a minimum

<sup>14</sup> ► While parachuting itself does not constitute a display item under RA2335, this para is included for the assistance of the EO and FDD.

<sup>15</sup> Such as crowd rear arrivals. ◀



**Acceptable  
Means of  
Compliance  
2335(3)**

separation of 15m **should** be maintained between spectator areas and the nearest point of the aircraft concerned. This limit applies to aircraft taxiing or air-taxiing, except when such taxiing is away from a marked taxiway and without the assistance of a marshaller, when the minimum clearance is increased to 65m.

b. **In-Use Runways.** The minimum separation between the nearer edge of any runway used for conventional fixed-wing take-off and landings and the crowd-line **should** be 100m. However, for light aircraft with a Maximum All Up Mass (MAUM) of less than 1200 kg, and a take-off and landing speed of less than 100 KIAS, this separation may be decreased to 65m. Other than for emergencies, a runway **should** only be used for non-standard take-off or landing (defined as one not practised as a Standard Operating Procedure (SOP) for that aircraft), if its edge is at least 230m from the crowd at all points.



c. **In Flight.** The normal minimum separation between the crowd-line and aircraft displaying in flight, including rotary-wing displays that involve aerobatics, **should** be 230m. However, where the displaying aircraft is at a speed in excess of 300 KIAS, and has a velocity vector towards a spectator area, this minimum separation **should** be increased to 450m. For the following aircraft and activities, reduced minimum separations as specified **should** be permitted:

(1) **Light Aircraft.** For light aircraft, with a MAUM of less than 1200 kg and operating at speeds of less than 150 KIAS throughout their display, the minimum separation **should** be 150m.

(2) **Rotary-wing.** For normal take-off and landing, and during transitional manoeuvres, the minimum separation **should** be ▶65◀m. For other stages of non-aerobatic flight, or at any time when an under slung load is carried, the minimum separation **should** be 100m.

(3) **VSTOL Aircraft.** For vertical take-off and landing, and during ▶ non wing borne ◀ flight at low speed, the minimum separation **should** be 150m. By the time conventional wing borne flight is achieved, the aircraft **should** be at the normal minimum separation of 230m.

(4) **Balloons.** At displays where balloons operate, FDDs **should** follow the guidance in Chapter 8 of CAP 403. The minimum separation distance **should** be 20m. Refuelling **should** take place in an area to which the public does not have access. The propane tanker or fuel dump **should** be separated from any large gathering of people by a distance of 100m and sited so as to avoid possible drainage of propane towards such an area.

(5) **Airships.** Airships are operated as lighter-than-air aircraft, and as such, **should** be subject to regulations applying to fixed wing aircraft.

(6) **Model Aircraft** ▶◀. Where ▶model aircraft◀ are operated at Flying Displays, they **should** be flown within line-of-sight of the operator, and in accordance with the regulations covering public safety. FDDs **should** follow the guidance given in CAP 403 (Ch 4 Para16) and CAP 658, Model Aircraft; a Guide to Safe Flying.

(7) ▶ **Class 1(a) Remotely Piloted Air Systems (RPAS)**<sup>16</sup>. Class 1(a) RPAS **should not** be operated in a manner that presents undue risk or hazard to any person, vessel, structure, vehicle or infrastructure. ◀

47. **Display Minima** ▶<sup>17</sup>◀. Aviation Duty Holders and AM(MF) **should** specify minimum heights for Display Flying, Roll Demonstrations and Flypasts flown by their aircrew ▶at Flying Displays and Special Events◀, dependent upon the aircraft type, aircrew experience and location of event. However, they **should not** be less than the Minimum Separation Distance (MSD) specified below:

a. **Singleton Only - Straight and Level Flypast**

<sup>16</sup> ▶ See RA1600(1) and RA1600(2).

<sup>17</sup> The more restrictive of RA2335 or any local/national minima applies (such as UKLFS or other national orders). ◀

**Acceptable  
Means of  
Compliance  
2335(3)**

Either:

- (1) **Up to max 20° angle of bank**
  - (a) Fixed wing aircraft: 100 ft MSD.
  - (b) Rotary wing aircraft: 50 ft MSD.

or,

- (2) **All Aircraft Types when part of an approved PDA sequence.** Up to max 89° angle of bank and minimum of 100 ft MSD when part of approved PDA sequence and flown straight and level no closer to the crowd line than the display line at a Flying Display.

In all cases:

- (3) **Post Flypast Manoeuvre.** Having completed a flypast, a maximum of 60° angle of bank **should** be used to achieve the appropriate MSD at sub-para b or c (below).
- b. **Aerobatic manoeuvres and inverted flight** - 300 ft MSD

**Note:**

Where one aerobatic manoeuvre is followed by another, or is linked by non-aerobatic manoeuvres, the minimum height is 300 ft MSD. For rotary wing aircraft positioning for a landing sequence or other non aerobatic profile and once certain of capturing the minimum height during the recovery from an aerobatic manoeuvre, descent to the minima, specified in sub-para c below, may be made.

c. **All other manoeuvres**

- (1) Fixed-wing aircraft: 300 ft MSD.
- (2) Rotary-wing aircraft: 100 ft MSD.

d. **Rotary-wing and VSTOL aircraft.** Rotary-wing and VSTOL aircraft may operate below the above MSDs during hovering and transition manoeuvres.

e. **Manoeuvre After Take-Off.** Once safely airborne and not below 50 ft MSD throughout the manoeuvre, the pilot may commence a turn away from the crowd line to capture the appropriate Display Line. Angles of bank up to 60° **should** be used and a positive climbing vector **should** be maintained throughout the manoeuvre. The pilot **should** achieve the following criteria:

- (1) **On crossing the appropriate display line.** Be at or above 100 ft MSD.
- (2) **When 180° displaced from the take-off direction.** Be at or above 300 ft MSD.

48. **Non-Display Flypast Minima.** Aviation Duty Holders and AM(MF) **should** specify minimum heights for Flypasts not conducted as part of an Air Display. These heights **should** be dependent upon the aircraft type, aircrew experience and location of event. However, they **should not** be less than the MSD specified below:

a. **Singleton Only - Straight and Level Flypast - Up to max 20° angle of bank:**

- (1) Fixed wing aircraft: 250 ft MSD.
- (2) Rotary wing aircraft: 100 ft MSD.

b. **Formation Flypast - Straight and Level Flypast - Up to max 20° angle of bank:**

- (1) Fixed wing aircraft: 500 ft MSD.
- (2) Rotary wing aircraft: 250 ft MSD.

**Acceptable  
Means of  
Compliance  
2335(3)**

c. **Congested Areas.** Approval for Flypasts below 2000 ft MSD over towns and congested areas detailed in the UK Low Flying Handbook (UKMLFHB) **should** be obtained in advance by the Aviation Duty Holder or AM(MF). All flypasts over London, within the Specified Area (as detailed UKMLFHB), require the prior permission of ACAS; requests for such permission **should** be forwarded through the Aviation Duty Holder or AM(MF) to MOD Air Staff (Lower Airspace) ([CAS-AS LFOS OC@mod.uk](mailto:CAS-AS LFOS OC@mod.uk), 01780 417184).

49. **Weather Minima.** The Aviation Duty Holder or AM(MF) **should** stipulate the minimum weather conditions for displays by aircraft under their command. The limitations given below are absolute minima:

*Table 1. Weather Minima.*

TYPE OF DISPLAY	VISIBILITY	CLOUD	
1. Limited Flying Display by VSTOL aircraft and helicopters. (Hovering, ground-cushion and ► non wing borne ◀) Notes (i) and (ii)	1 km	200 ft Base (AGL)	
2. Limited Flying Display by light aircraft with stalling speed below 50 kts Notes (i) and (ii)	1 km	300 ft Base (AGL)	
3. Flying display by all other aircraft. Notes (ii) and (iii)	3.7 km	Fixed Wing	1000 ft Base (AGL)
		Rotary Wing	500 ft Base (AGL)
4. Flypast – Fixed Wing	3.7 km	500 ft vertical separation from cloud	
5. Flypast – Rotary Wing	2.0 km		

**Note:**

(i) Provided the aircraft or helicopter is taking off from the display-site.

(ii) Subject to FDD approval, aircraft unable to display because of low cloud base may fly; an instrument approach to land, touch-and-go or low approach, limited basic manoeuvres and circuits. 200 ft minimum vertical separation from the prevailing cloud base is to be maintained and the visibility is not to be less than 3.7 km.

(iii) Where weather conditions require participants to undertake a Rolling Display, manoeuvres with high vertical extent (e.g. stall turns) **should** be avoided in routines.

50. **Minima for Civilian Participants.** The CAA DA specifies the minimum heights within which the holder may display, and FDDs **should** consider permitting pilots to operate to those minima with the approval of the HoE. FDDs **should** also consider permitting CAA DA holders flying civilian registered aircraft to display at lateral distances from the crowd line as specified in CAP 403. However, FDDs **should** exercise their discretion to impose more stringent vertical or lateral limits if considered necessary.

51. **Permitted Manoeuvres.** Aircraft Commanders **should** ensure that aircraft are not flown outside the normal limitations of the Release to Service, the Military Flight Test Permit or the Certificate of Usage, or exceed other more stringent limits that may have been ordered.

52. **Performance Limitations.**

**Acceptable  
Means of  
Compliance  
2335(3)**

- a. **Speed.** An absolute true limit of Mach 0.90 or 600 kts, whichever is reached first **should not** be exceeded in flight. ► ◀
- b. **Multi-Engine Fixed-Wing Aircraft.** Multi-engine fixed-wing aircraft **should not** fly below the speed at which it is still possible to climb away, without change of configuration, if any one engine fails.
53. **Other Flying Display and Special Event Restrictions:**
- a. **Control of Engines.** Engines **should not** be deliberately shut down or feathered in flight; symmetrical thrust **should** be maintained at all times. In the event of an engine failure or unintended shutdown, the display sequence **should** be terminated.
- b. **Armament.** Live weapons **should not** be carried at Flying Displays or Special Events and all weapons circuit-breakers and switches **should** be in the 'safe' condition (except for flares and pyrotechnics when approved under the conditions at sub-para e).
- c. **Rotary-wing.** Rotary-wing aircraft, especially those with suspended loads, **should not** be flown in such proximity to buildings or aircraft on the ground as to cause a possible hazard if the load were to become detached or the aircraft suffer control difficulties.
- d. **Parachute Demonstrations.** During the whole period scheduled for parachuting, all flying activity within the descent airspace and drop zone, except that which is necessary for dispatching parachutists, **should** cease. All engines of fixed wing aircraft and helicopter rotors on the ground within an area defined by the FDD **should** be shut down until the last parachutist has landed.
- e. **Use of Flares and Pyrotechnics.** The use of flares and pyrotechnics from the air during a Flying Display **should** be subject to a specific risk assessment and final approval by the Aviation Duty Holder or AM(MF) and the FDD. Flares, signal cartridges and Verey pistol smoke cartridges, **should** only be fired from such a height and position that prevents any remnants of the device landing among spectators, near taxiing or static aircraft, supporting personnel or ground equipment.

**Guidance  
Material  
2335(3)**

**Flying Display Separation Distances, Minima and Restrictions**

54. ► The MAA Regulatory Publications apply to all RPAS in the Defence Aviation Environment with the exception of RPAS categorised as Class 1(a) which are exempt from the other regulations in the MRP except RA 1600(1) and RA 1600(2). ◀

**ANNEX A  
PUBLIC DISPLAY AUTHORITY FORM**

Reference: **RA2335**

Date: .....

..... is authorized to carry out the following display flying routine in.....aircraft for the period from ..... to ..... inclusive in accordance with RA2335 (may be for a single occasion or for a display season / period).

**1. Occasion for Display**

**2. Pilot Experience**

- a. Total hours.....
- b. First Pilot hours on type.....
- c. Currency on type (hours 30 / 60 / 90 days) .....

**3. Display Sequence and Limitations**

**a. Full Display**

- (1) Routine:
- (2) Weather minima: .....Vis: .....; Cloud base: .....
- (3) Display duration: .....

**b. Limited Display (if applicable)**

- (1) Routine:
- (2) Weather minima: .....Vis: .....; Cloud base: .....
- (3) Display duration: .....

**Note:**

Absolute weather minima are given in RA2335(3). More stringent minima may be imposed on specific full and limited Flying Displays, and must be noted on this PDA Form.

**4. Permitted Modifications to Routine (s) and Approved Basic Manoeuvres.**

**Display Supervisor / Approving Officer**

Date .....Name: .....Rank: .....

Appointment: .....Signature: .....

**Operating Duty Holder / Accountable Manager (Military Flying)**

Date: .....Name: .....Rank: .....

Appointment: .....Signature: .....

This form should be completed electronically, with the exception of signatures, to allow all fields to be completed in full.



## ANNEX B

## UK FLYING DISPLAY APPROVAL QUESTIONNAIRE

This form is to be submitted by Flying Display Directors (FDD) for foreign display crew(s) intending to participate in UK air displays ►(Flying Display routines, Role Demonstrations or Flypasts)◄. The question set compliments, but does not replace the need for a national Public Display Authority (PDA) equivalent and is designed to assist the FDD and the Military Aviation Authority to assess the level of qualification and experience of the display participants. Any additional information pertinent to the display crews' experience and qualifications may also be submitted by the applicant on a separate sheet.

►The completed form is to be sent, with national PDA or equivalent◄ and ribbon diagrams, ►by the FDD to: [DSA-MAA-Display@mod.uk](mailto:DSA-MAA-Display@mod.uk)◄

To be completed in English Language.

Team Details	
► Which Nation/State/Country/Company owns the aircraft:  (such as Air Force, civilian company or other organization)	
Which Organization (Civilian, Military, Army, Navy, Air Force etc) within that Nation/State/Company operates the aircraft:  (such as Air Force, civilian company or other organization)◄	
Display Name ('Falcons' etc):	
Aircraft Type(s), number in team and. ► is the aircraft military or civilian registered:	
Is the aircraft a Development or Production build standard:	
Specific display flying authorizations/qualifications currently held:  (such as civilian display authorization, military authority to display (to include awarding body and dates awarded))◄	
Person issuing national PDA ► or equivalent:◄	
<b>Crew Experience, Qualifications and Currency</b> This section may be completed on a separate sheet and attached, but must contain the criteria listed on the left for <u>each</u> display pilot, including any reserve pilots.	
Name & Rank:	
Date appointed as display pilot ► in current organization:◄	
Total number of career flying hours on <b>all</b> aircraft types:	
Total number of career flying hours on <b>display</b> aircraft type:	
► Approximate number of air displays flown on <b>all</b> aircraft types:	
Approximate number of air displays flown on <b>display</b> aircraft type:	

Accurate number of displays flown in <b>current</b> sequence:	
Number of displays flown in previous 12 months:	
Number of air displays planned to be flown between date of this note and first UK air display:	
Last date planned for the display sequence to be flown prior to first UK air display: ◀	
Certified Medically Fit for Display Flying:	Yes/No    Date Valid Until:
Date of Last Flown Display Sequence:	
Team Position ( <i>if applicable</i> ) ( <i>Lead/Member/Reserve</i> ):	
Authorized for ( <i>Display Type</i> ) ( <i>Full/Flat</i> etc):	
Previous UK Display experience:  ▶ (include number of displays, locations, and date of last UK display (if applicable)) ◀	
Date of most recent UK Display:	

**ANNEX C**

\*Insert Privacy Markings as required\*

**POST EVENT FEEDBACK FORM**

This form **should** be completed by Flying Display Directors who have had ►◀ foreign military participants at their Flying Display or Special Event. The question set is designed to capture feedback (good and bad) relating to ►foreign◀ military participants and to pass-on good practice as well as lessons identified. Any regulatory infringements experienced at the event **should** be documented on this form, together with actions taken at the time and any proposed follow-up action. Once complete, this form **should** be emailed to: ►[DSA-MAA-Display@mod.uk](mailto:DSA-MAA-Display@mod.uk)◀

<b>Post Event Feedback Form</b>	
Name and Type of Event:	
Location:	
Date held:	
Name of FDD:	
Foreign Military Participants: (aircraft type and team name)	
Record of any regulatory infringements at event:	
Record of any flight safety concerns at event:	
FDD action taken and proposed follow-up action:	
Examples of good practice:	
Lessons identified:	

\*Insert Privacy Markings as required\*

## ▶ ANNEX D

\*Insert Privacy Markings as required

**POST VALIDATION FEEDBACK FORM**

This form **should** be completed by Flying Display Directors who have validated foreign military display items for participation at UK airshows and special events. The question set is designed to capture the evidence of safe adherence to ribbon diagrams or equivalent and compliance to the limits published in this RA. Once complete, this form **should** be emailed to: [DSA-MAA-Display@mod.uk](mailto:DSA-MAA-Display@mod.uk).

<b>Post Validation Feedback Form</b>	
Foreign Military Participant: (aircraft type and team name)	
Location:	
Date validation occurred:	
Safe adherence to ribbon diagram or equivalent:	
Compliance to RA2335 minima:	
Comments and observations to support the outcome of the validation:	
Outcome of validation:	

**Signature of FDD**

Date:

Name:

Rank/Title:

**Signature:** ◀

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