





Phil Hoodll
IWM Duxford



Welcome

CAA Air Display Lead – Paul Sall





Aims



- **Regulatory feedback**
- **Safety awareness**
- **Human Factors Discussion**
- **Identification of lessons learnt and to disseminate best practice to DAEs, Display Pilots, Event Organisers and FDDs.**
- **Provide the display community with an opportunity to share feedback with regulators**



Morning Agenda

Time	Title
1000	Welcome and Introductions
1010	2024 Display Season - Review
1025	SRG 1305 / Assurance Visits – Issues and Trends arising
1105	MAA – season de-brief
1120	Infringements - Reporting and Avoidance
1140	Coffee
1210	The Purple Guide - Air Display Chapter
1225	CAP Updates - CAP403 and CAP1724
1230	RA Updates – RA 2335
1245	DS 24 - Safety Survey
1255	Drone – Operation, Deployment, Detection
1315	CAA / MAA – Closing comments / Future dates
1320	LUNCH



Afternoon Agenda



1320	LUNCH
1415	BADA - Chairman's Update
1420	What Went Right in 2024
1435	Experiences of a Tyro in 24 and what happened to the class of 23
1455	The BADA EO Summit
1505	Coffee
1535	Marketing your Display Act – The BADA Marketplace.
1545	RFFS - What level of cover do you actually need?
1555	Sustainability - An update on BADA's efforts.
1610	The BADA Awards
1625	BADA Closing Comments



2024 Flying Display Season Annual Review

Gary Elson
BADA



GARY ELSON

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SEA FRONT

- Bournemouth
- Eastbourne
- Swansea
- Blackpool
- Clacton
- Torbay
- Cleethorpes
- Scarborough AFD
- Southport
- Teignmouth
- Guernsey
- Jersey
- Ayr
- Portrush
- Withernsea

LAND

Abingdon
Cosby
Old Buckenham
East Kirkby
Midlands
Little Gransden
Headcorn
Shuttleworth (7 shows)
Duxford (5 Flying Days & 2 big shows)
Lee on Solent
RIAT
Cosford
Sywell
Longleat
Compton Abbas

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The background of the slide is a photograph of an air display. Two biplanes are flying in the sky, one slightly higher and further away than the other. Below them, a large crowd of spectators is gathered, many holding cameras or binoculars, watching the display. The scene is set outdoors with a line of trees in the distance under a clear sky.

**In 2024, an estimated 4.2 million spectators
visited air displays across the UK**

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'To encourage, promote and advance Safety and Standards in British Air Displays'



The background of the slide is a photograph of an air display. In the upper half, several military jets are flying in a formation against a blue sky with scattered white clouds. A large, semi-transparent Union Jack flag is overlaid on the sky. In the lower half, a crowd of people is seen from behind, looking towards the sky. The overall color scheme is dominated by blue tones.

**In 2024, at least £150 million of
economic benefit was generated
for the UK economy by air displays**

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THE SEAFRONT

- Return of Portrush
- Record attendance @ Blackpool, Cleethorpes & Ayr
- Torbay reduced Council contribution by 65%

- Loss of Rhyl, Sidmouth & Folkestone due to “Maple Hawk”
- Budgets continue to be squeezed
- Bournemouth reduced to 3-day event

- Economic impact £130 million+
- Attendance 2,890,000 (down 5%)

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LAND SHOWS

- 3 new events - Longleat, Sywell, Compton Abbas
- Return of Lee on Solent - 6-year deal
- RIAT sellout all 3 days
- Shuttleworth new look

- Abingdon postponement
- Headcorn costs increase - attendance falling

- Economic impact £17 million +
- Attendance 506,000 (up 12%)

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ATTENDANCE & ECONOMIC IMPACT

YEAR	ATTENDANCE	EC.IMPACT
2014	5.7 million (Lancaster & excellent weather)	£79 million
2015	5.5 million (Vulcan)	
2016	4.8 million (poor weather & no stand-out act)	
2017	4.6 million (poor weather)	£100 million
2018	5.3 million (excellent weather)	£130 million
2019	4.9 million (RAFAT tour)	£120 million
2020	COVID (Only 4 venues)	
2021	1.4 million (38% sea front / 93% small)	
2022	4.4 million (loss of big shows)	£100 million
2023	4.2 million	£130 million
2024	4.2 million (RAFAT tour)	£150 million

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UK LARGEST OUTDOOR SPECTATOR EVENTS

1:	FOOTBALL	27 million
2:	MUSIC FESTIVALS	6.5 million
3:	HORSE RACING	5.5 million
4:	AIR DISPLAYS	4.2 million
5:	AGRICULTURAL SHOWS	3.93 million

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ANY QUESTIONS?



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SRG 1305

Assurance Visits – Issues and Trends arising

Richard Crockett
CAA FSO





Warning Calls





30% of all "Too Close" calls involved formation displays.





An easy way get a “Too Low” Call...



During a formation display, a “*Too Low*” call was made because the lead was flying to their DA minima of 30 feet. Unfortunately, the minimum display height, and the wingman's DA were both 50 feet.



An on-crowd wind was the principal factor in almost half of all “Too Close” calls.





17% of all “Too Low” calls - aircraft had not achieved SERA when exiting display areas





5% of all “Too Close” calls were caused due to pilot’s adjusting their display because of inclement weather, or nearby avoids.





Drone Activity



Up by 30 % in DS
2024





Lessons Learnt





FDD's, try to keep your space as sterile as possible, and only allow in the essential people you need for your event.





Where entry into controlled airspace is necessary for your display, aim to coordinate with the ATSU as early as possible, ideally before submitting your Permission application to the CAA.





FDDs, collaborate closely with your EO's to prevent any unexpected last-minute changes that could affect the flying display.





FDDs, have you got everything you need for your event? For example, a Rule(10) Exemption, or an Article 89 Permission.



Can your signalling lamp be seen on a bright day? What other options are available to you?





Warning Calls





Warning calls are designed to support the FDD & FCC in ensuring a safe and effective flying display by helping pilots assess height and distance.



The sole purpose of warning calls is to offer guidance and enhance safety and are under no circumstances are a punitive measure.

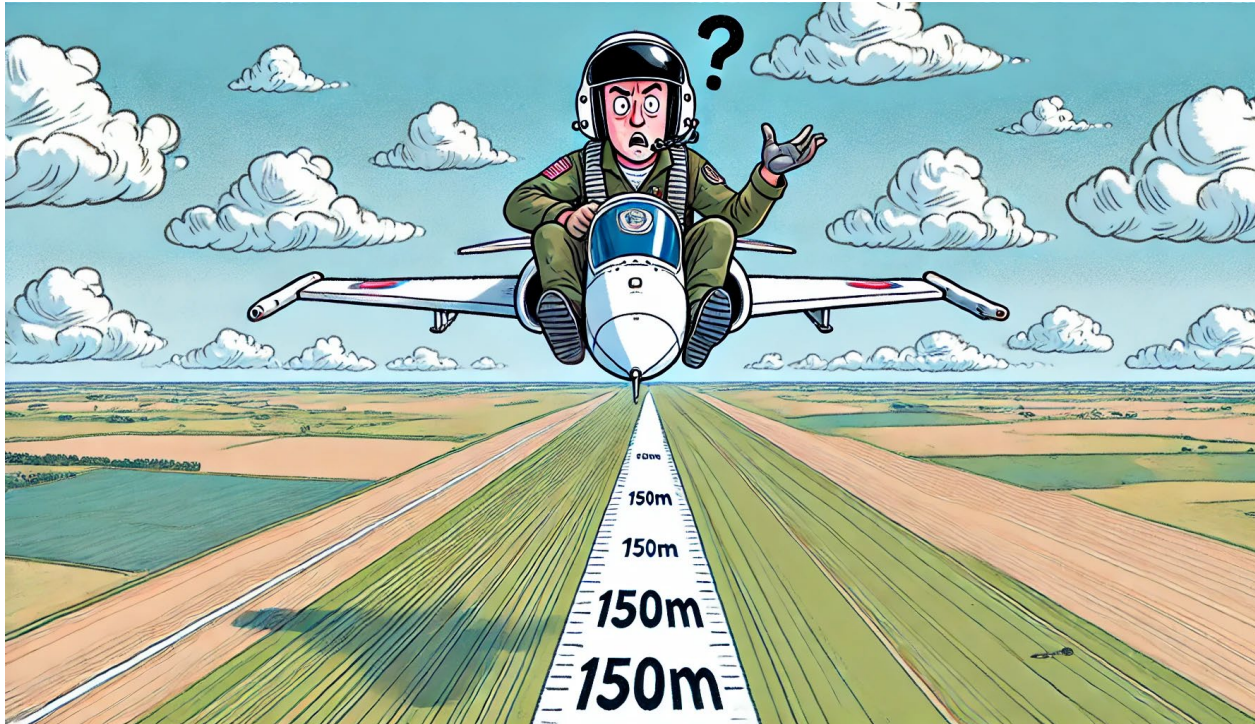


FDDs should consider the safest and most suitable moment to issue a Warning, Terminate, or Stop call, ensuring that it doesn't create an unnecessary distraction for pilots during critical phases of their display.





To support the FDD, a SQEP FCC should be utilised who not only understand the types of aircraft being displayed, but also have a thorough knowledge of the relevant display lines for those aircraft.



Additionally, both the FDD and FCC must be familiar with the criteria which allow certain aircraft to display on the 150m line.



Post-Display Season Symposium

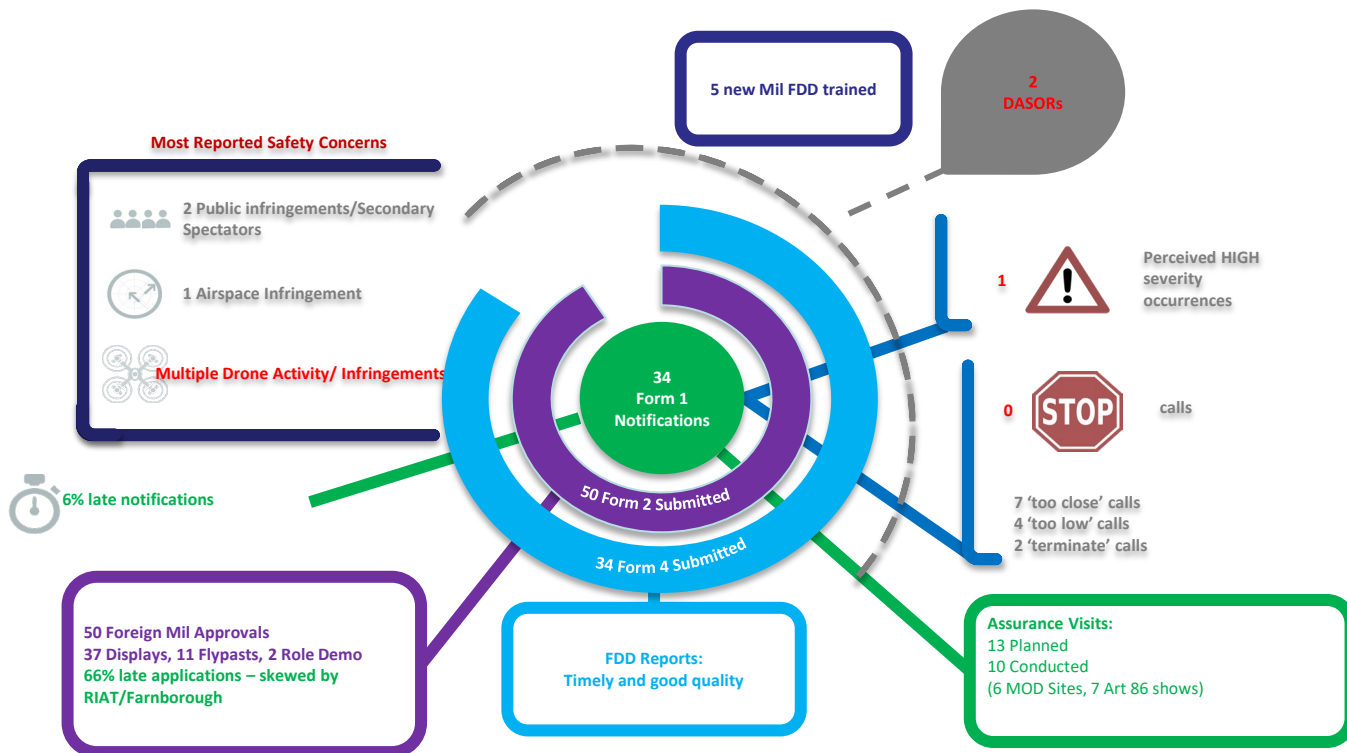
Wing Commander Russ Lavis

&

Wing Commander Dave 'Midds' Middleton



MAA 2024 SUMMARY



Key Takeaway: With exception of Summit Air activity, generally a safe season.



2024 Defence Achievements



■ Requests (requesting 1 or more Mil asset):

- 105 UK Display events
- 47 Overseas Display events
- 1100+ flypast requests (non-display events)

■ Allocated:

- 85 UK Display events
- 18 Overseas events
- 900+ Flypasts

■ Achieved (Events with at least 1 successful Mil display):

- 81 UK Display events
- 18 Overseas events
- 150+ Flypasts





MAA Assurance Observations

- No MOD Stop Calls – FDD coordination with RED 10 improved.
- Disconnecting Main Display Brief from event day – works for Seaside shows?
- Drones are becoming a significant issue (predominantly at civil events). Figures are startling. How will you detect Drone activity?
- RA 2335 versus CAP403 – most restrictive – FDD's do not always brief.
- Interaction between FDD/ATCOs – 2 Gp investigating development of Display related material for MOD ATM personnel.
- Late forms/inaccurate completion – perennial issue and adds friction to the system – main bulk of submissions from RIAT/Farnborough.
- Overall quality of risk assessments variable and completed very late in the process– but improving.



Conclusion



- A Safe Season but..... Risk articulation variable – Risk Assessments are not shelf-ware and need to be continually updated.
- Continued Evidence of proactive and effective management by FDD at events, but pre-display submission quality and timeliness need to be improved – help us to help you.
- Work required to amend RA 2335 – NPA Dec 24 – planned final version release date Feb/Mar 25.
- Development of MAA Display assurance schedule complete Spring 25 – expect to hear from us then.
- Good engagement with MAA for assurance visits - thank you for hosting us so well.

Questions?



FDD Risk Assessments

Wg Cdr Dave Middleton
MAA



Flying Display Symposium 2024

Review of Airspace Infringements

Rob Gratton
Principal, Airspace Infringements Team



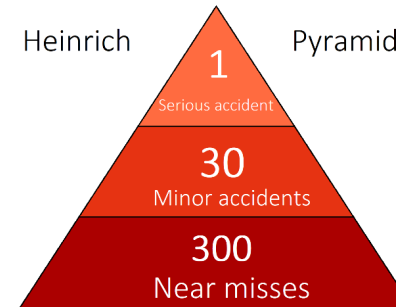
Scope

- Refresh of reporting
- What do we want to review - casefiles
- How is a case reviewed



Background

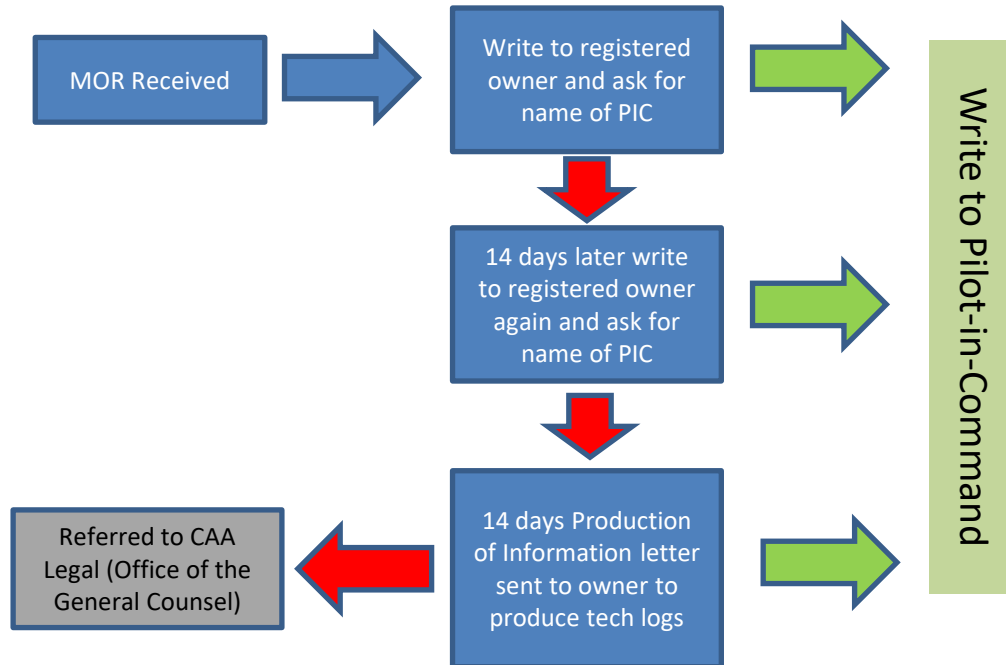
- Risk:
 - Participants.
 - Third Parties.
 - Sponsor/FDD.



- Submit a Mandatory Occurrence report via ECCAIRS 2 - <https://aviationreporting.eu/en>
- Submit an ABANL (Alleged Breach of Air Navigation Legislation) - <https://www.caa.co.uk/our-work/make-a-report-or-complaint/report-something/report-and-alleged-breaches-of-air-navigation-legislation/>

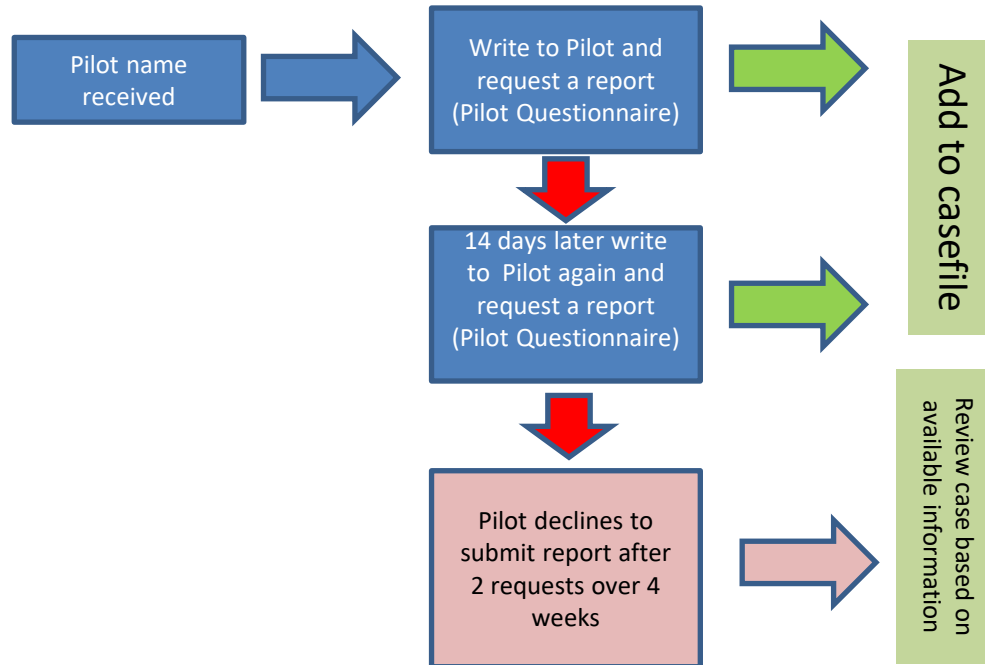


Casefile Compilation Letter to Owner



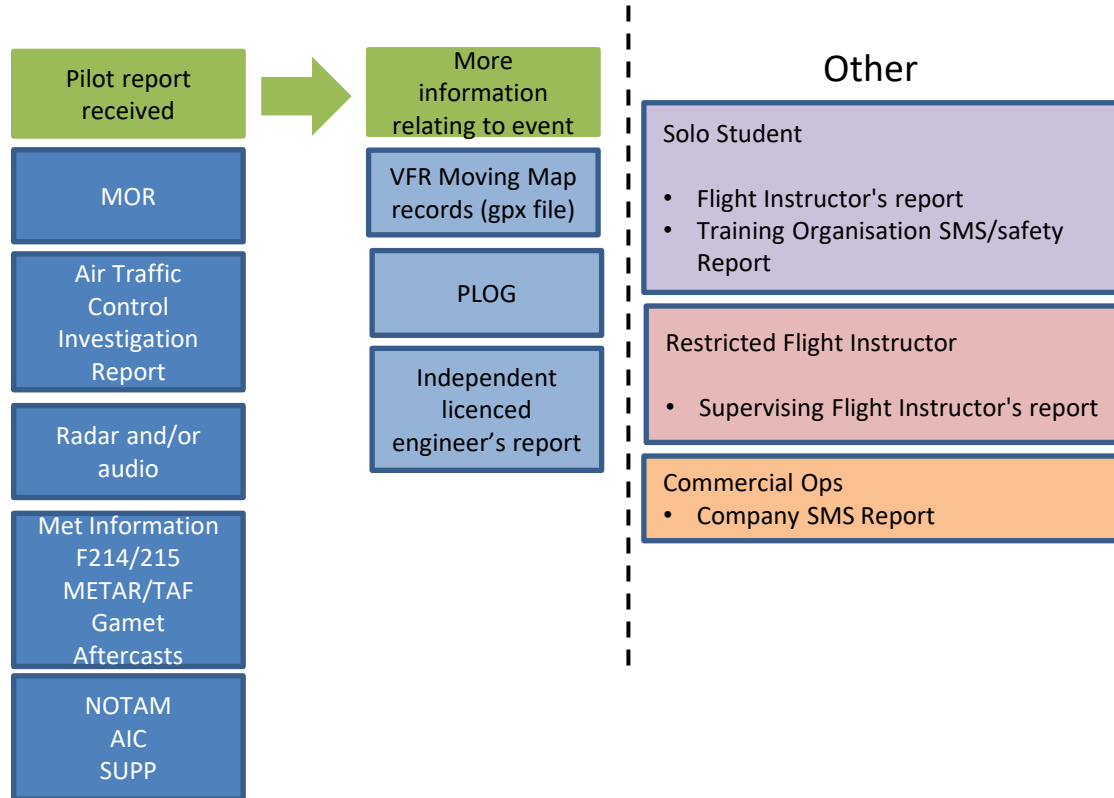


Casefile Compilation Letter to Pilot-in- Command



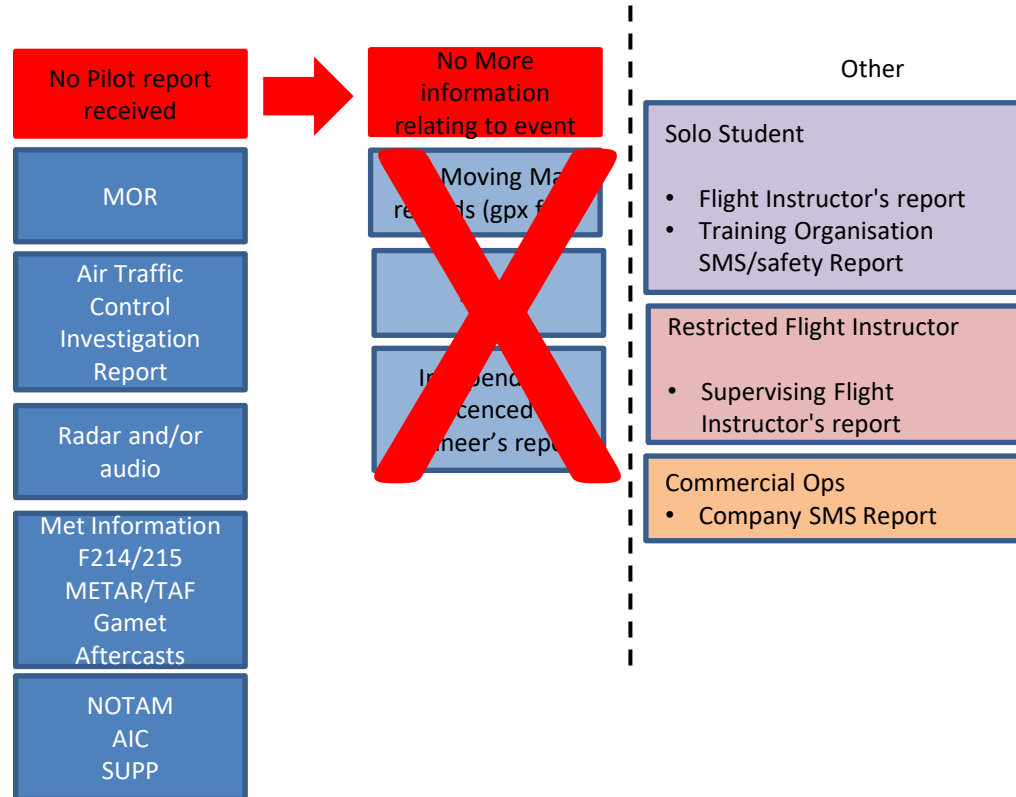


Casefile Compilation





Casefile Compilation





Casefile Review

- Tier 2 – (Minor)
 - First time with no loss of separation or no safety intervention measures
- Tier 1 (Intermediate & Major)
 - Loss of Separation
 - Safety Intervention Measures applied
 - Repeat Infringer

Tier 2:

4 members of AI Team:

- 1 ATCO
- 2 FISO
- 1 ATC Ops
- 1 PPL(A)
- 1 PPL(H)
- 1 Microlight FI
- 1 FRTOL Examiner
- All previous Airspace Regulation

Tier 1:

Infringement Coordination Group:

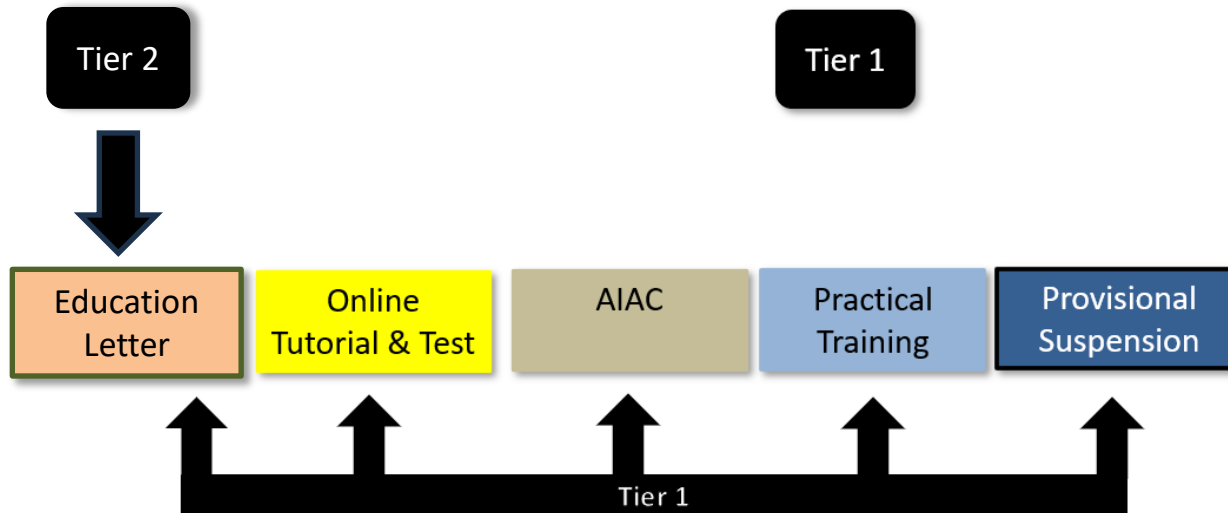
- Airspace, Air Traffic Management & Aerodromes
- General Aviation Unit
- Flight Operations inc FE(A) and FE(H)
- Office of the General Counsel
- Licencing
- Military Aviation Authority



Casefile Review

Underpinned by a Just Culture

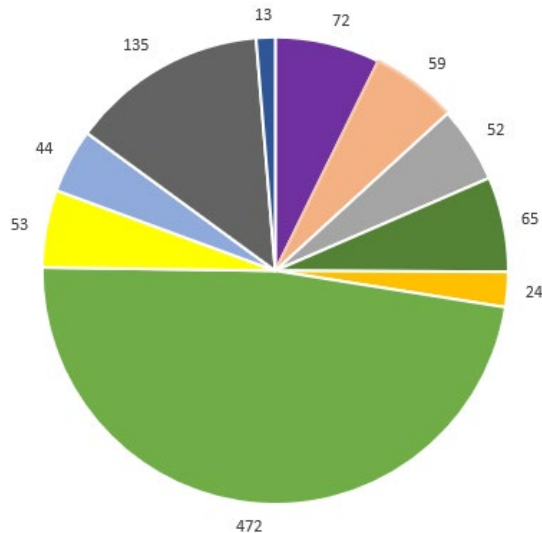
Focus on education/training to prevent a recurrence/assure competence:





Casefile Decisions to 31 Oct 24

	TOTAL	%
No AI	72	7.3
Unknown	59	6.0
AI but NFA	52	5.3
Military	65	6.6
Student	24	2.4
Education Letter	472	47.7
Online Tutorial & Test	53	5.4
Practical Training	44	4.4
AIAC	135	13.7
Provisional Suspension	13	1.3



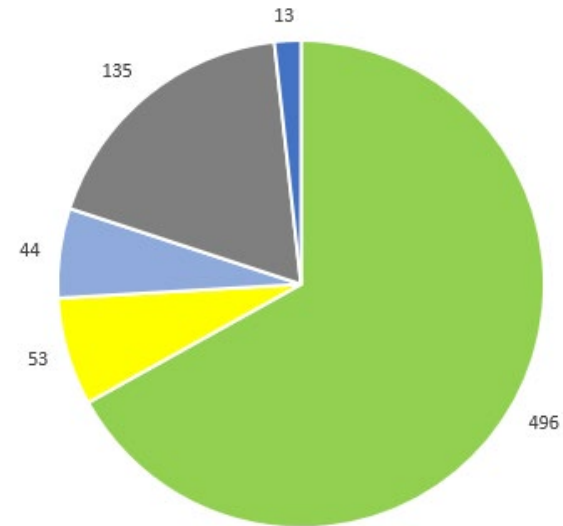


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Student	24	2.4
Education Letter	472	47.7
Online Tutorial & Test	53	5.4
Practical Training	44	4.4
AIAC	135	13.7
Provisional Suspension	13	1.3
	989	100

	TOTAL	%
Education Letter	496	66.9
Online Tutorial & Test	53	7.2
Practical Training	44	5.9
AIAC	135	18.2
Provisional Suspension	13	1.8
	741	100

When Pilot Action/Inaction identified as Root Cause





Casefile Decisions

- Not all AI result from pilot action/inaction:
 - Discuss with Airspace Classification Team and/or Airspace Regulation;
 - Refer to Air Traffic Management Regulation;
 - Refer to Aeronautical Information Management Regulation;
 - Refer to Aerodrome Inspectors;
 - Engage with VFR Moving Map companies.



Thank you

Any Questions?

Infringements@caa.co.uk



Coffee





The Purple Guide

Vanessa Mawer
Emergency Planning College –
Cabinet Office



www.thepurpleguide.co.uk



the purpleguide

to Health, Safety and Welfare at Outdoor Events



History....



- Monsters of Rock 1988
- Guns and Roses
- 'accidental death'
- Working party to discuss safety at concerts



History....



- Editions 1 & 2 – HSE
- Editions 1 & 2 – book form




Now....



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National Security Ve... weConnect | active... Sage Business Clou... Sign in to your Use... Find a Route - plot... Log in to Royal Ban... Maps Firstport Hampers Greeting Cards & A... Narpo Lincolnshire...



to Health, Safety and Welfare at Outdoor Events

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About the Purple Guide

Originally published by the Health & Safety Executive, the Purple Guide is designed to provide guidance for event organisers, suppliers, local authorities and others involved in the outdoor events industry. Publication of the Guide was taken over by the Events Industry Forum in 2012 when the original guidance was updated. Since then, the guidance has been substantially expanded and continues to be developed.

Those subscribing to the Guide receive notification of any new chapters and updates as they are completed together with regular ebulletins to keep them up-to-date with the work of the Forum.

The Guide has been written by UK event professionals primarily for the UK. Outside the UK, while the principles of the Guide should still apply, account will need to be taken of local regulations."

Note: The Guide is protected by copyright and must not be copied, reproduced or commercialised in any way without the prior written agreement of EIF Ltd.

Accessing the Purple Guide

There is a [subscription of £25 plus VAT](#) for 12 months access to the Purple Guide website, including all updates and additional guidance that may be added during that period.

£211k Awarded

With funds raised since the relaunch of the Purple Guide, the Events Industry Forum (EIF) has issued £211,000 in grants supporting and developing the industry.

If you have a project or idea which you believe may qualify for support, visit the [EIF website](#) to learn more.

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Edition 3....



- Edition 3 – Event Industry Forum (EIF)
 - Multi disciplinary
 - From industry and governing bodies
 - ‘Backed’ by HSE
- Edition 3 - subscription and downloadable
 - £25 plus VAT (single subscription)



Edition 3....



- Regular review of chapters/continual updating
- Update emails when new chapters added/current ones updated
- Grant funding to support and develop the industry



Edition 3....



- **Stand out chapters –**
 - Chapter 5 – medical provision
 - Chapter 25 – working in a safety advisory group
 - Chapter 42 – Zone Ex
 - Chapter 43 – Air Displays

				30. Coping with the Weather
				31. Insurance
				32. Accessibility
				40. Water Provision
				41. Recruitment and Management of Volunteers for Outdoor Events
				42. Zone Ex
				43. Air Displays
				37. Events involving Vehicles
				38. Environmental Sustainability
				39. Events on or Around Water

Emergen

Pandemic for Outdoor Events



Chapter 43....



KEY POINTS:

- Air displays require permission from the CAA and must be overseen by a Flying Display Director (FDD) with a CAA Accreditation
- Risk Assessments must be completed by the FDD in liaison with the Event Organiser (EO)
- Aircraft may only be flown in displays by pilots holding a Display Authorisation (DA) the validity of which is checked by the FDD
- SAG Liaison, or its equivalent where a SAG does not exist, is a required part of the
- FDD's procedures in applying for a Flying Display
- Planning early is always advisable; there are strict timeframes in advance of an event for the required permission process
- Military aircraft participation (for example, the Red Arrows) must usually be applied for by the end of September in the year prior to the flying display
- Directories of FDDs are available from both the CAA and British Air Display Association.
- FDDs can often provide the best guidance as to the aircraft displays available and suitable for a given location
- Weather can, of course, be a considerable factor and clear parameters are set by the CAA. Ultimately the FDD and DA decide what can safely be flown in the prevailing conditions
- The FDD is an accredited expert and will make decisions based on safety which have to be accepted.



Legal Status of PG....

- It's guidance
- Quoted in MAI
- 'The Highway Code'



Questions?





CAP Updates

- *Mostly minor editorial / clarification changes*
- *Links – new appendix (both CAPS)*
- *250kt Approvals now state that CAP 403 wx limits may apply for:*
 - *Flying Displays*
 - *Display practice where a CAA Permission is in place*
- *Clarification that all references to 'pilot' throughout both CAPs refers to the 'Pilot-in-Command'*



CAP Updates

CAP 403 Separation Distances – use of 150 metres

Current situation

- *All aircraft display no closer than 230m, unless
 - *<1200kg AND speed <150kts when 150m can be used.**
- *Aircraft with a MTOM >1200kg and speed <150 KIAS OR MTOM < 1200kg and speed >150 KIAS may display at 150m providing a CAA Exemption is held.*
- *CAA Exemptions based upon Kinetic Energy being less than the 1200Kg/150KIAS example aircraft.*
- *All 150m Exemptions include standard conditions*



CAP Updates

CAP 403 Separation Distances

150 Metre Proposal

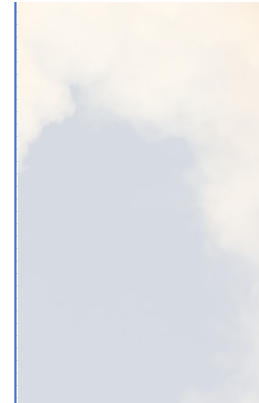
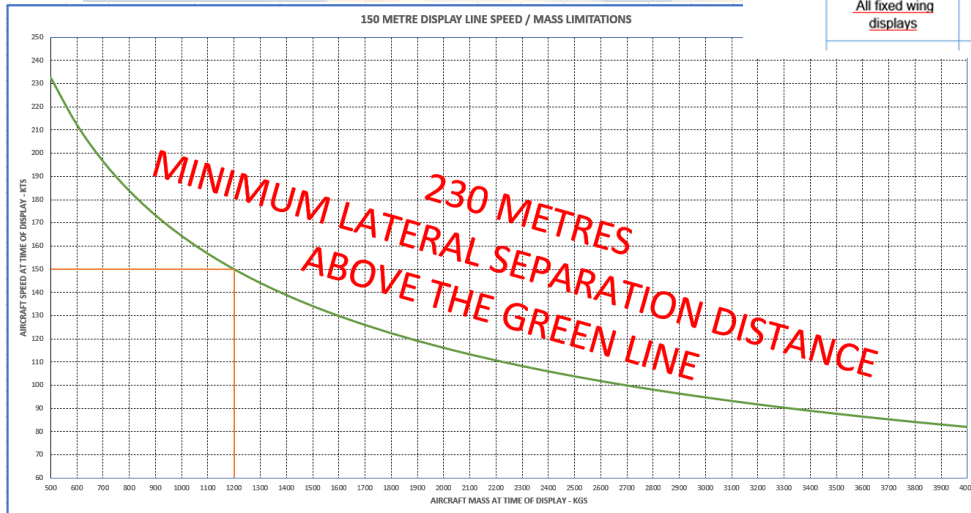
- Publish the standard conditions
- Do away with CAA Exemptions

5.39 The minimum lateral Separation Distances between display aircraft and Crowd Line are as follows:

Type of aircraft	Type of display	Separation distance
All aircraft	All displays	230 metres
All aircraft	Speed greater than 300KIAS with velocity vector towards crowd	450 metres

For the following aircraft and activities, reduced minimum separations are permitted:

Type of aircraft	Type of display	Separation distance
All fixed wing displays	Refer to 150 metre speed / mass limitations graph	150 metres





CAP Updates

CAP 403 Separation Distances – use of 75 metres

Current situation

- *Aircraft may operate to a 75m Lateral Separation distance provided they hold a CAA Exemption.*
- *Exemptions are based upon an aircraft:*
 - a) being able to display at 150m*
 - b) being able to safely display at 75m with reference to the criteria contained in the 1993 Cranfield Study.*
- *All Exemptions contain standard conditions*



CAP Updates

CAP 403 Separation Distances – use of 75 metres

Proposal

- Publish the standard conditions
- Do away with CAA Exemptions

<u>Type of aircraft</u>	<u>Type of display</u>	<u>Maximum height inside 150 metres</u>	<u>Maximum on-crowd wind component inside 150 metres</u>	<u>Separation distance</u>
Light Aircraft (mass less than 1200kg and maximum speed 100KIAS (at time of display))	Non-aerobatic	200 feet	10 kts	75 metres
<u>Inside 150 metres</u>				
1) <u>When turning onto, or parallel to the 75m line, the maximum permitted bank angle is 45 degrees.</u>				
2) <u>Height-gaining manoeuvres with any on crowd vector must not be performed.</u>				
<u>Use of the 75m line is not permitted at any Flying Display where the minimum height stated on the CAA Permission is 200 feet AGL or higher.</u>				

5.38 The FDD is responsible for assessing whether or not operation to a permitted Separation Distance is appropriate to the specific venue, therefore, operation to a permitted Separation Distance requires the agreement of the FDD.



CAP Updates

Initial DA application process proposal

- *New form for initial DA applicants (similar to USA process)*

Why do we need it?

- *To give CAA more oversight of new DA candidates*
- *To bolster the SRG 1303B assessment*
- *To help DAEs with decision making / spread the burden*
- *To prevent applications coming in without awareness (done deal)*
- *To communicate with the DAE to share any intel*



CAP Updates

Initial DA application process proposal

Purpose

- *Filter out undesirables*
- *Consider an applicant's motivation*
- *A closer look at an applicant's experience / background / suitability*
- *A move towards stopping "DAE shopping"*



CAP Updates

Initial DA application process proposal

How it will work

- *New form to be submitted to CAA in advance of initial DA application*
 - *Ideally before any mentoring or workup has commenced*
- *CAA will:*
 - *Process form*
 - *Carry out B & A assessment*
 - *Contact references*
 - *Contact DAE with a 'Yes' / 'No'*
 - *Issue provisional DA number to prospective DA holder*



CAP Updates



Legal Direction

- **Review of LTP Display oversight**
 - CAP Update to outline Details for Consultation
- **DA Holder**
 - Practice to be within scope of DA
 - Any Practice to 'upgrade limits' to be overseen by DAE
- **Non-DA Holder**
 - Practice to be overseen by DAE if below SERA limits
- **LTP Process**
 - All LTP Display Applications to include a RA
 - LTP permissions will include a Template for the recording of all LTP activity
 - Template to be submitted to GAU every 3 months.



CAP Updates

CAP 403

- *Public consultation: 09/12/24 – 03/01/25*
- *Publication date: 10/02/25*

CAP 1724

- *Public consultation: 16/01/25 – 12/02/25*
- *Publication date: 10/03/25*
- *Notification via Skywise*
- *Please send feedback – even if no comment*



Wg Cdr Dave Middleton
MAA



RA 2335 – 2025 Changes



- Regulations for Display Parachuting introduced – RA2335(5) – Why?
 - Display Parachuting currently conducted in a regulatory vacuum – contributed to Summit Air situation?
- RA2335(5) – Display Parachuting to cover:
 - Display Parachuting Organization.
 - Management/Roles and Responsibilities.
 - Training & Practises.
 - Separation Distances.
 - Minima and Restrictions.
- Must support/be supported by introduction of RA1700 Series.
- FDD Accreditation broken out into separate section – lifted to AMC.
- RPAS Guidance Material lifted to AMC – we can assure against it.
- Validation defined.
- Alignment with RA2330 – Flypast minima to be introduced in RA2330 re Congested Areas/Gatherings of people.

Key Takeaway: Step change for Parachuting Display Teams – will now be regulated.



2024 Flying Display Safety Survey

Paul Sall
CAA Air Display Lead



2024 Flying Display Safety Survey



Safety indicators used to:

monitor, identify and analyse contributing or causal factors for occurrences during civil flying displays

and, if necessary,

to review or introduce additional safety mitigations.



2024 Flying Display Safety Survey



- ✓ **17 Questions**
- ✓ **5th meaningful year (Covid)**
- ✓ **43 respondents to date (interim data)**



2024 Flying Display Safety Survey



Respondents Thus Far

	2019	2021	2022	2023	2024
Tyro Display Pilot (TDA)	1.79%	0.00%	5.17%	6.25%	0.00%
Display Pilot (DA)	42.86%	65.48%	68.97%	58.33%	60.47%
Display Pilot Evaluator (DAE)	7.14%	14.29%	37.93%	29.17%	23.26%
Flying Display Director (FDD)	39.29%	34.52%	21.41%	31.25%	20.93%
Flying Control Committee (FCC)	26.79%	23.81%	18.97%	25.00%	18.60%
Event Organiser (EO)	5.36%	8.33%	1.72%	2.08%	6.98%
Air Display Event Commentator	3.57%	3.57%	0.00%	2.08%	0.00%

* yellow highlights indicate an increase from 2023 to 2024



2024 Flying Display Safety Survey



Analysis of Responses Thus Far

The Survey suggests a stable just environment, where regulations are adhered to and reporting of adverse incidents, errors and unsafe behavior or human error is reported or encouraged



2024 Flying Display Safety Survey



Comments from the survey

What is the biggest air display-related safety concern you have?

Ad hoc mixed type formations

Pilots with multiple commitments.

Formation flying, specifically pilots who have gained a formation skill level but do not remain current or who have a poor background knowledge of formation principles



2024 Flying Display Safety Survey



What is the biggest air display-related safety concern you have?

- There seem to have been a number of incidents and near misses this last season and the whole industry need to maintain vigilance to ensure that these do not become more frequent or more serious.



2024 Flying Display Safety Survey



Have you witnessed or do you have any flying display related concerns? If so, what are they?

- I watch carefully for signs of complacency or over-confidence, danger signs in my view.
- FCC lack of knowledge allowing displays to continue when clearly it is going wrong
- Timeliness of stop or warning calls



2024 Flying Display Safety Survey



The 'So what'

- Appropriate briefings/debriefings for the activity.
- Warning Calls should be considered normal practice for Safety and Learning.
- Review and address risks emerging
- Please continue to Engage with the CAA/MAA if you see a potential issue or something of concern



2024 Flying Display Safety Survey



The Survey remains open until the end of November

Please complete it by using this QR code:





Future Dates



Paul Sall
CAA Air Display Lead



FDD Cses Defence Academy

10 December 2024 – FDD Revalidation (Closed)

11 December 2024 – AFDD Accreditation (Closed)

11-12 December 2024 – FDD Initial Accreditation (Closed)

Courses are now open to new applicants:

15 April 2025 – FDD Revalidation

16 April 2025 – AFDD Accreditation (Initial & Reval)

16-17 April 2025 – FDD Initial Accreditation



Display Symposia Aims



- **Regulatory feedback**
- **Safety awareness**
- **Human Factors Discussion**
- **Identification of lessons learnt and to disseminate best practice to DAEs, Display Pilots, Event Organisers and FDDs.**
- **Provide the display community with an opportunity to share feedback with regulators**



Display Symposia

- *2025 Pre-Display Season Symposia 18/19 March 2025 at Defence Academy*
- *2025 Post Display Season Symposia*
 - *Subsumed in BADA Seminar*
 - ***Trial for 2025***



Display Symposia

- *DA/FDD Display Symposia attendance to change to 1 in 4 Pre-Display Symposia*
 - *Investigate Online Participation*





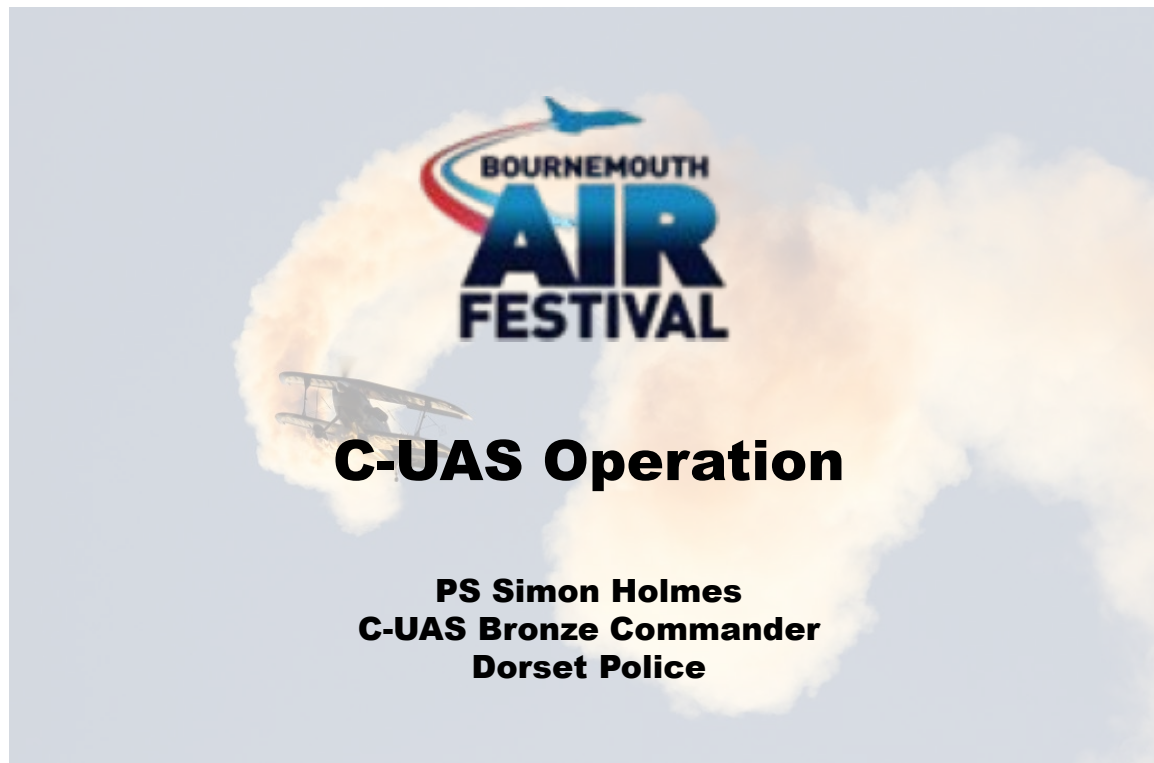
Pre-Display Symposium

- **18/19 March 25 Defence Academy**
 - US and Canadian Air Show Regulators
 - Possibly NZ
 - Saudi Arabia Representation





Drones





Drones

- The Bournemouth Air Festival (BAF) is an annual event which takes place along Bournemouth and Boscombe seafront, with the main air displays taking place between Bournemouth and Boscombe piers.
- BAF features flying displays from both military and civilian aircraft, as well as ground displays along the promenade and Overcliff including exhibition stands, trading stalls, funfairs, and other family entertainment.
- The event is organised by Bournemouth, Christchurch, and Poole (BCP) Council and is free to the public to attend. It has been running since 2008 and has attracted over 10 million people since starting. The 2024 Festival saw in excess of 600,000 people attend over the three-day event.



Drones

Illegal drone use at airshows are generally categorised in to three areas:

- Naïve – this is mostly members of the public who are unaware of the legal requirements (such as not flying in a flight restriction zone) and who generally use drones as a way of capturing pictures/videos.
- Disruption/Protest – This group are generally aware of the law but take positive actions to engage in illegal drone use for the purposes of disruption.
- Terrorism – The most serious use of drones where the drone itself could be used as an attack method or by using the drone as a delivery method for a payload. A drone could additionally be used in the planning phase of an attack to 'recce' or to film/live stream an attack on the ground.



Drones

Counter Uncrewed Aerial Systems (C-UAS) Operations

There are 4 main parts to the operation:

- Pre-event mitigation
- Detect, Track, Identify (DTI)
- Defeat
- Intervention Teams



Drones

Pre-event mitigation

These are the lowest level of C-UAS techniques and can included:

- Social media posts and media interviews
- On site signage and announcements
- Restricted Airspace (Temporary)
- Geo-fences





Drones

Detect, Track Identify (DTI)

The most common DTI system is Radio Frequency (RF) detection. This detects the RF communications between the drone and controller. The systems can provide location of the drone, altitude, heading and speed, location of the controller, drone type and serial numbers (dependant of which system and which drone is being used).

The most common DTI system is the DJI Aeroscope, This is a mobile system that will detect DJI drones only (although they make up around 80% of the consumers market). Other RF DTI systems use catalogues of known drone information to detect the drones.

Other DTI systems can use Radar, Acoustic sensors or Optical sensors.

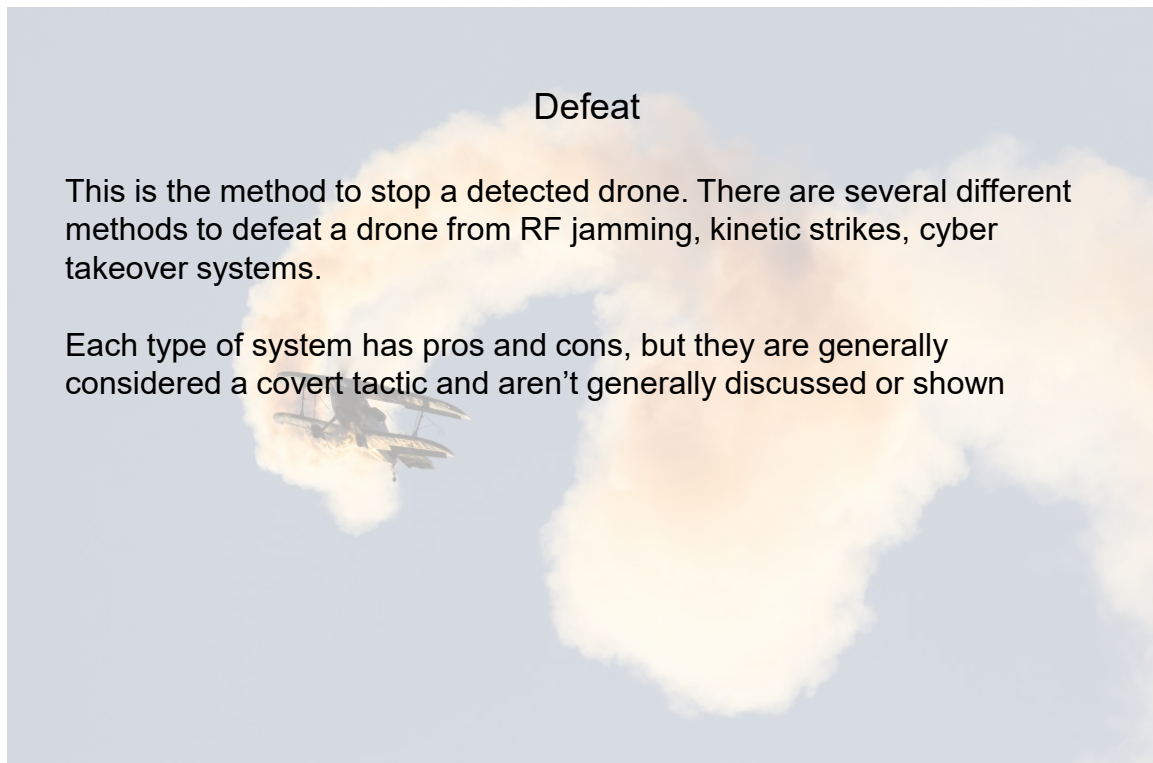


Drones

Defeat

This is the method to stop a detected drone. There are several different methods to defeat a drone from RF jamming, kinetic strikes, cyber takeover systems.

Each type of system has pros and cons, but they are generally considered a covert tactic and aren't generally discussed or shown

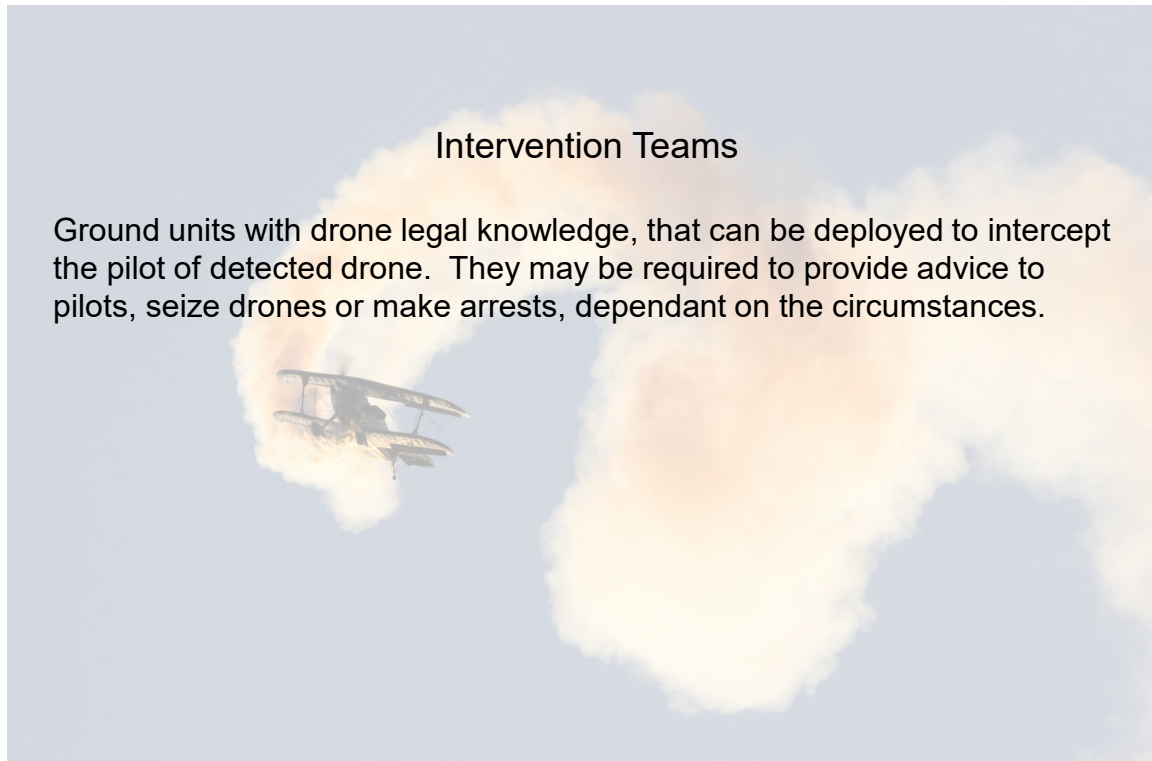




Drones

Intervention Teams

Ground units with drone legal knowledge, that can be deployed to intercept the pilot of detected drone. They may be required to provide advice to pilots, seize drones or make arrests, dependant on the circumstances.





Drones

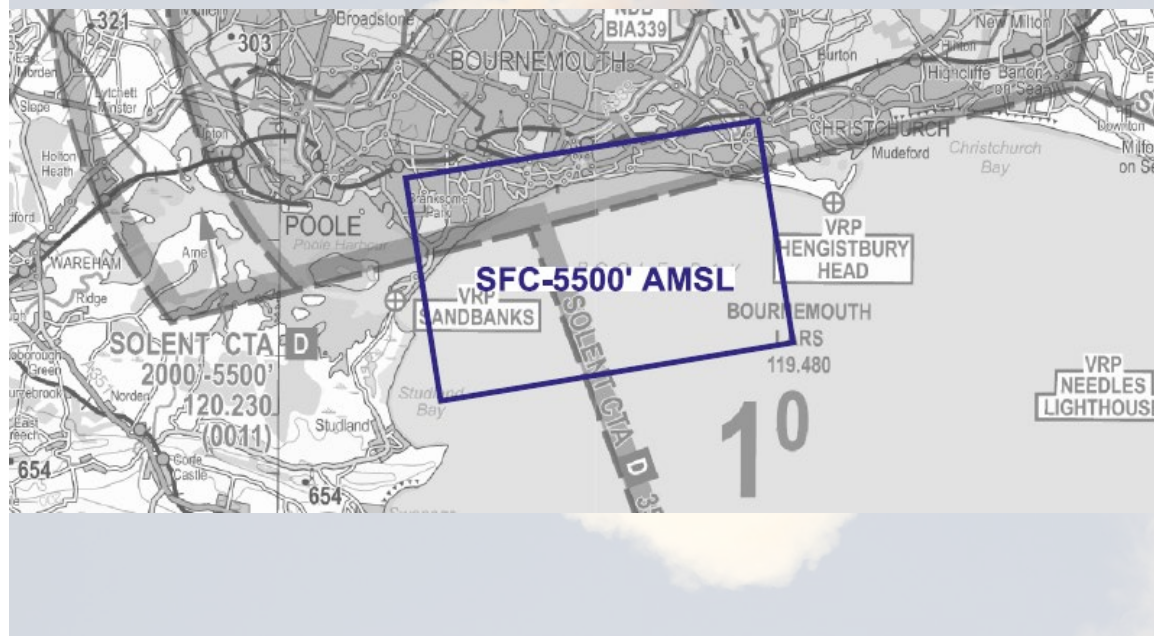
BAF Operational set-up

- RA(T) applied for by TSA as the Flying Display Directors
- DJI Geofence requested to match the RA(T)
- DTI team and Bronze Commander locate on the clifftop, located next to the Flight Director.
- Ground Intervention team made up of Police Drone Pilot locate at the cliff top but with the ability to deploy within the BAF footprint.
- Police Traffic motorcyclists already working at BAF briefed as additional ground units. They are able to get around the conurbation quicker and intercept pilots in the further extremes of the RA(T).



Drones

BAF RA(T) and Geofence

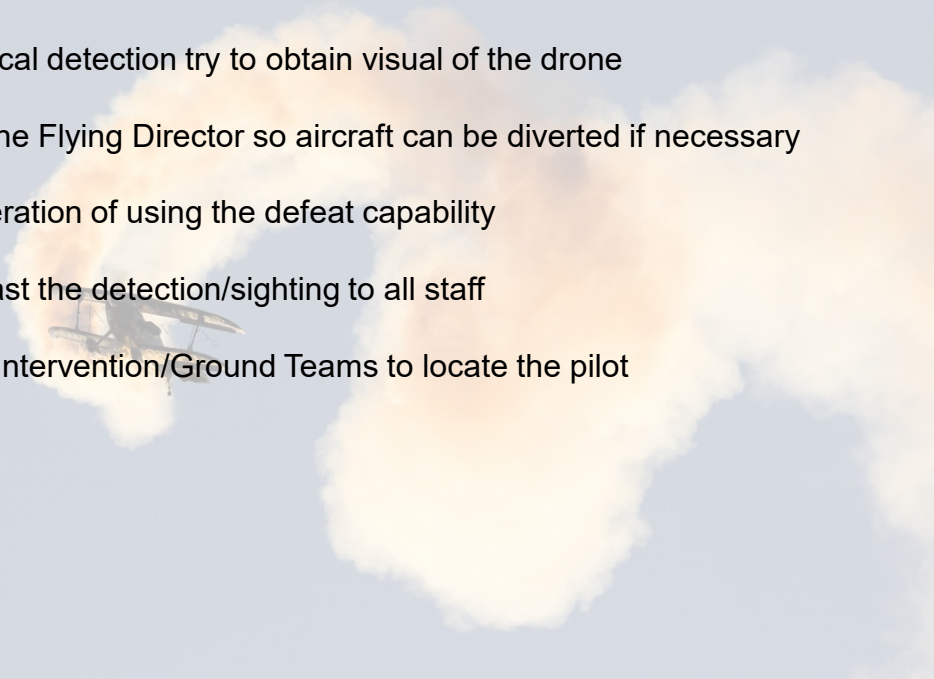




Drones

Actions of sighting/detection of a drone

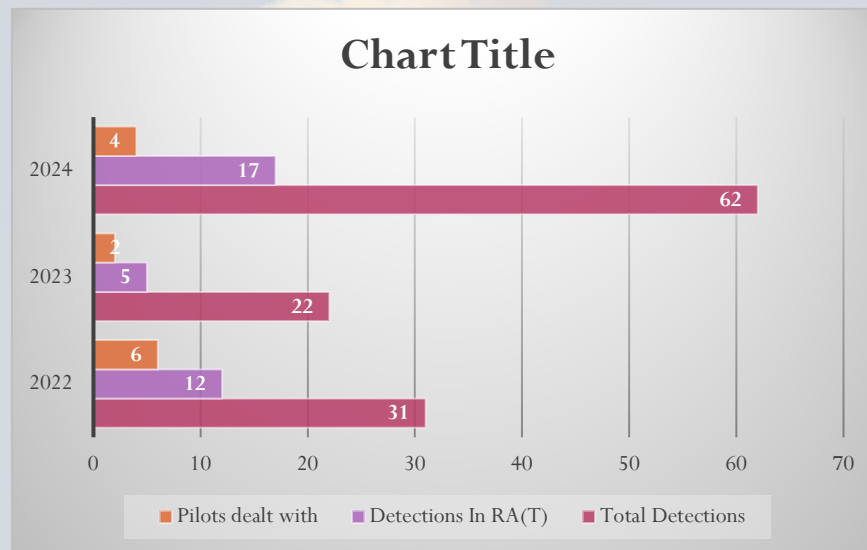
- If technical detection try to obtain visual of the drone
- Inform the Flying Director so aircraft can be diverted if necessary
- Consideration of using the defeat capability
- Broadcast the detection/sighting to all staff
- Deploy Intervention/Ground Teams to locate the pilot





Drones

Drone detections at BAF





Drones

Post event investigations

In most cases where a drone pilot has been spoken to by intervention teams, the drone will be seized at scene, the pilot details taken and then they are let go to be dealt with after the event.

We are not looking to criminalise naïve pilots, but we will look to prosecute the more dangerous actions.

For the naïve pilot that has flown within the RA(T), education is the goal. A community resolution is used to have them complete the CAA drone code and obtain FlyerID and OperatorsID. If this is completed the drone is returned and the investigation closed.

In more serious cases the pilot will be prosecuted at court with a request for the drone to be forfeited as part of the sentencing.



Drones





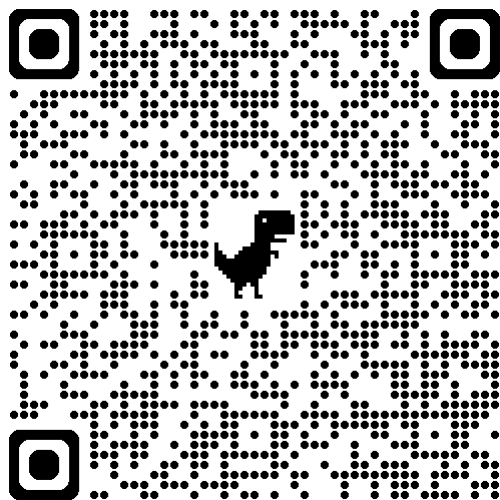
Closing Comments





Lunch





2024 Post Display
Season Seminar
FEEDBACK

2024 Flying Display
Safety Survey

