Military Aviation Authority
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Pre-Season
Flying Display Symposium

2026

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Evan Davies

Display Symposium Co-ord

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Paul Sall

Air Display Lead
CAA General Aviation Unit

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Introductory Video

Display Season 2025

Planes TV

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Glenn Bradley

Head of Flight Operations

CAA - SARG

Aims of the Symposium

- Regulatory feedback
- Safety awareness
- Human Factors discussions
- Review DS 2025; Identification of lessons learnt and disseminate best practice
- Engage with Regulators.

Paul Sall
Air Display Lead

Military Aviation Authority
MAA

Tuesday 24 March 2025

UK Civil Aviation Authority

Start	End	Session	Speaker/Lead
1000	1100	Main Symposium Registration Arrival Tea/ Coffee (provided)	CAA/ MAA
1100	1115	Welcome and Introductions	CAA/ MAA
1115	1200	Display Season 2025 Trends Analysis and DS 25 Safety Survey CAP 403, CAP 1724 and RA2335	CAA/ MAA
1200	1230	CAA Feedback Session - General	CAA
1230	1300	Military Display Events	Gp Capt Robbie Lees
1300	1400	Lunch (provided)	
1400	1430	CHIRP Reporting from Air Displays BADA Report	Bill Dean Peter Reoch
1430	1530	HF – Baines Simmons and Facilitated Discussion • Shuttleworth • F-16	CAA Tom Saunders (Baines Simmons) Sid Shirley/ Dave Middleton
1530	1600	NOTAMs/ RA(T)	David Ridley (CAA)
1600	1615	Interval	
1615	1700	Airshow Accident Analysis & FDD toolkit	Rich Pillans
1700	1800	Civilian Formation Teams	Team Raven Tiger 9 Turbulent Display Team
1800	1810	Washup/ Questions & Brief for Day Two	CAA
1810	2000	Cash Bar & Fork Supper	

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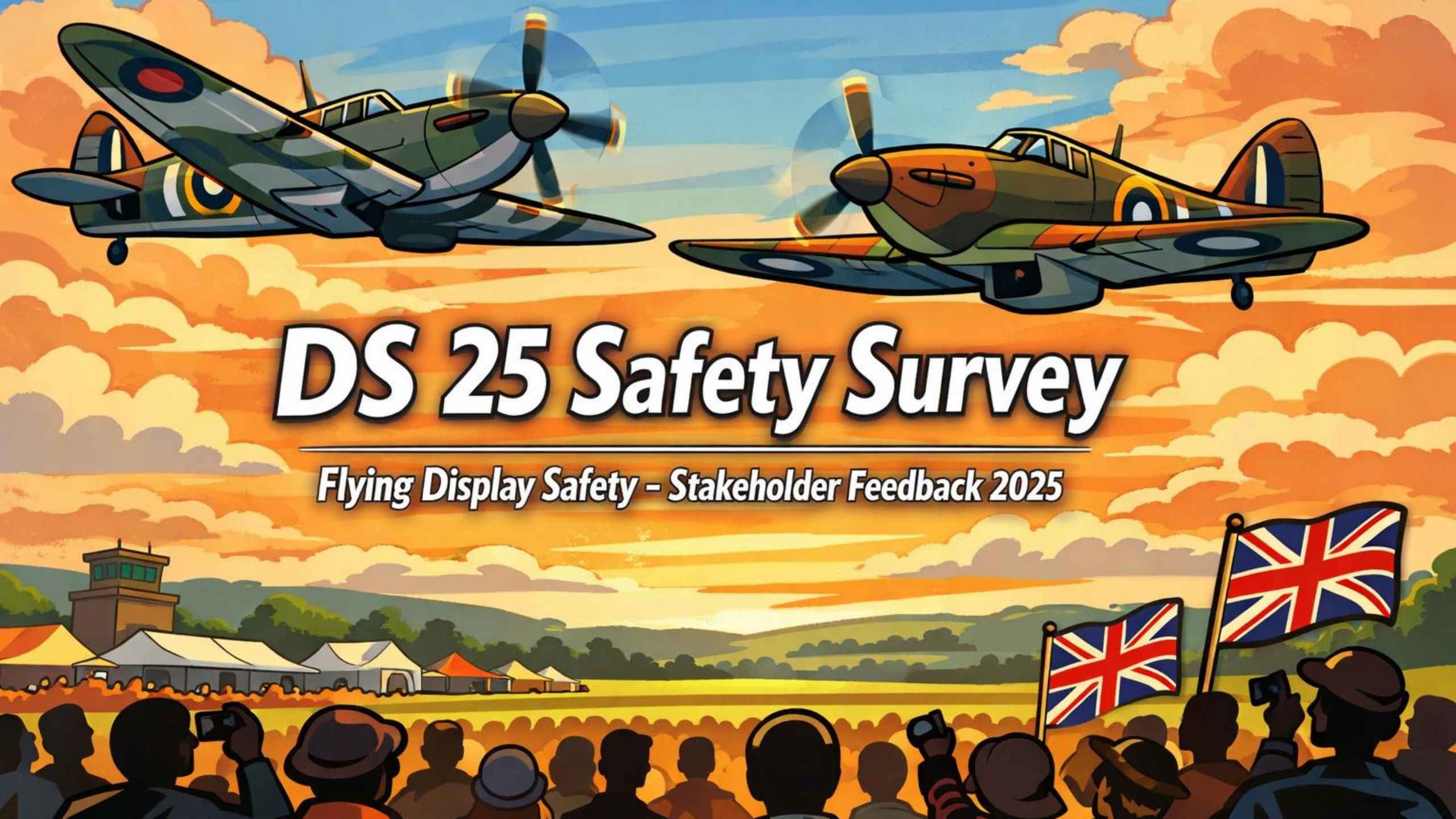
Wednesday 25 March 2025

UK Civil Aviation Authority

Start	End	Session		Speaker/Lead
0900	0930	Royal International Air Tattoo –Controlling the Air		Gary Elson
0930	0945	Why have a Commentator?		Joe McGrath
		Syndicate 1 Room	Syndicate 2 Room	Syndicate 3 Room
		DAE/ Display Pilots (PZ)	FDD (PB)	EO (PR)
1000	1115	Andy Goodall – T28 engine failure Paul Szluha – B17 incident Rob McCrea – Army Air Corps LIs Tony De Bruyn – Do's and Don'ts	CAA feedback STOP Call discussion Display Scenario Discussion	BADA led – PR Crisis Comms Planning
1115	1130	Reports to Main Forum		Syndicate Member
1130	1200	Coffee/Tea (Provided)		
1200	1245	LIV event/ FCC construct		Dave Walton – TSA Consulting
1245		Parish Notices (To include deadlines for FDD course applications)		CAA
	1300	Closing Remarks		MAA

DS 25 - What you told us


DS 25 Safety Survey
Flying Display Safety – Stakeholder Feedback 2025

DS25 – Safety Survey

Aim

- To support and inform the Safety Performance Indicators so as to monitor, identify and analyse the contributing or causal factors for occurrences during civil flying displays

and

- if necessary, to review or introduce additional safety mitigations

Picture: Steven Comber

Military Aviation Authority
MAA

DS25 – Safety Survey

UK Civil Aviation Authority

- Open between 17th September and 17th November 2025

- Available to all who play a role in UK Flying Displays

- Anonymous

Picture: Steven Comber

DS25 – Safety Survey

So, who responded?

- Only 73 members of the community responded which equates to around 20%
  - Slightly more than in 2025!

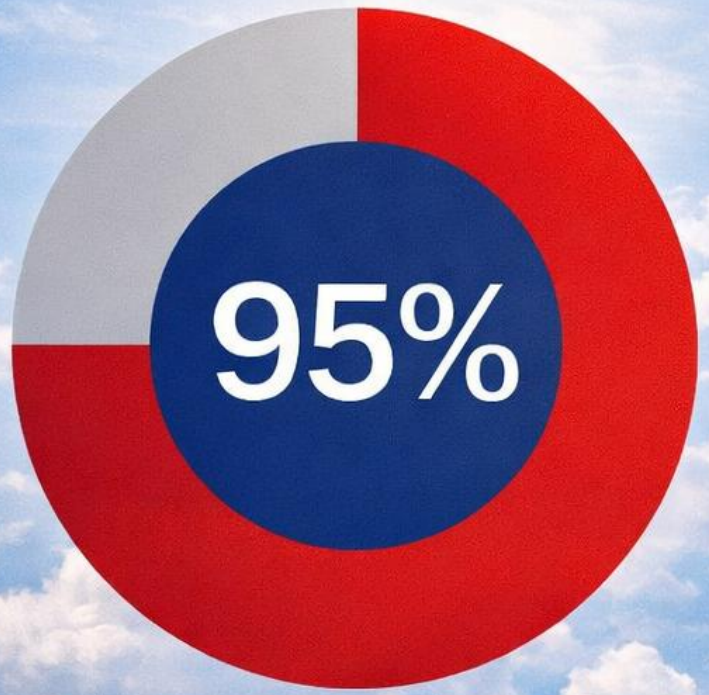
- Majority of responders had more than 10 years display experience, more than 5,000 hours, and were over 50 years old

Picture: Steven Comber


T2-
T28
What you told us

Just Culture is Thriving –

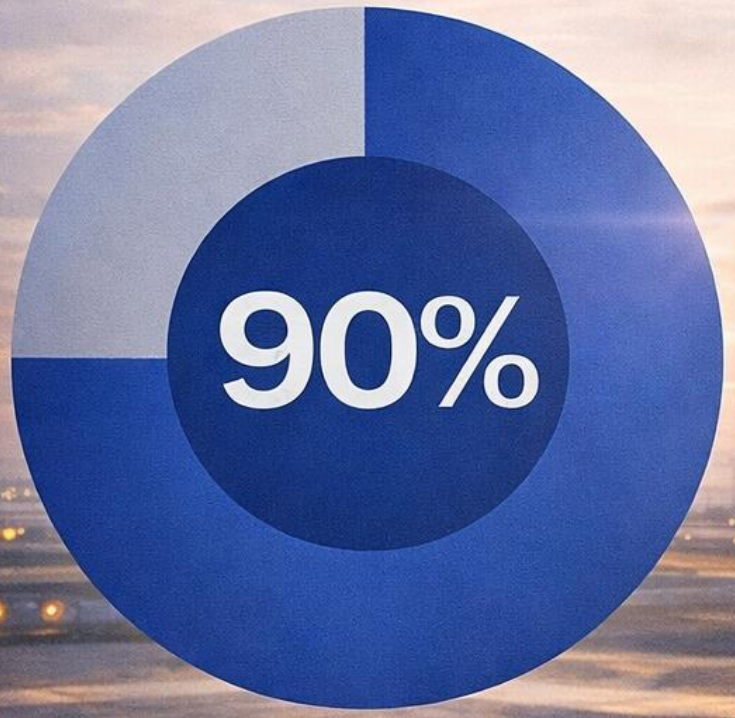
95% feel the flying display community has a strong just culture.

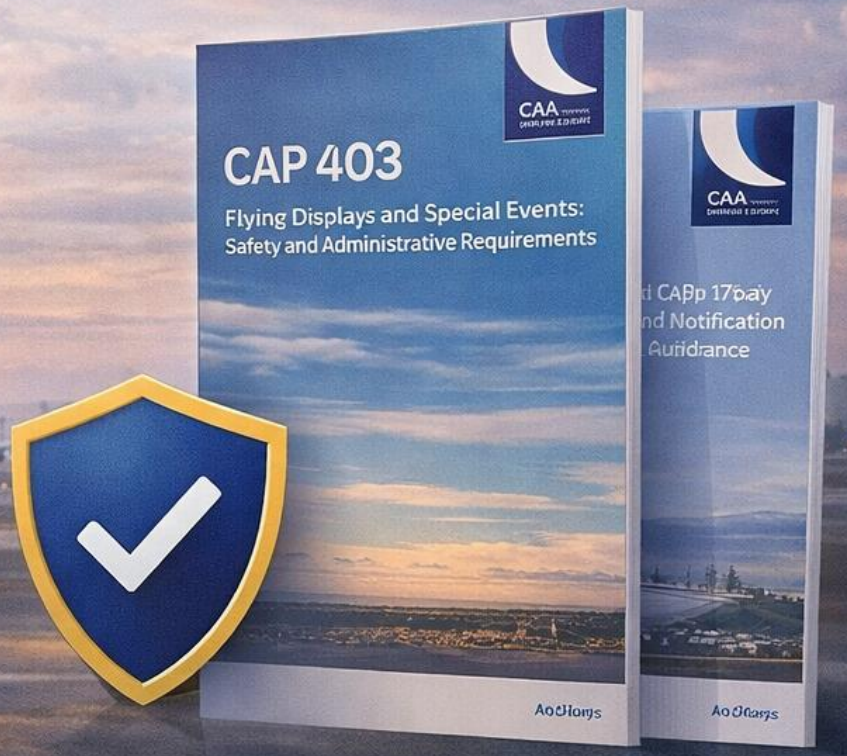



Human Factors Matter — 85% use human
factors knowledge to improve safety.
85%
AVIATION CHECKLIST
ENGINE START

Unprecedented Confidence in Safety Improvements

90% of respondents believe that changes to **CAP403** and **CAPT724** have enhanced **flying display** safety



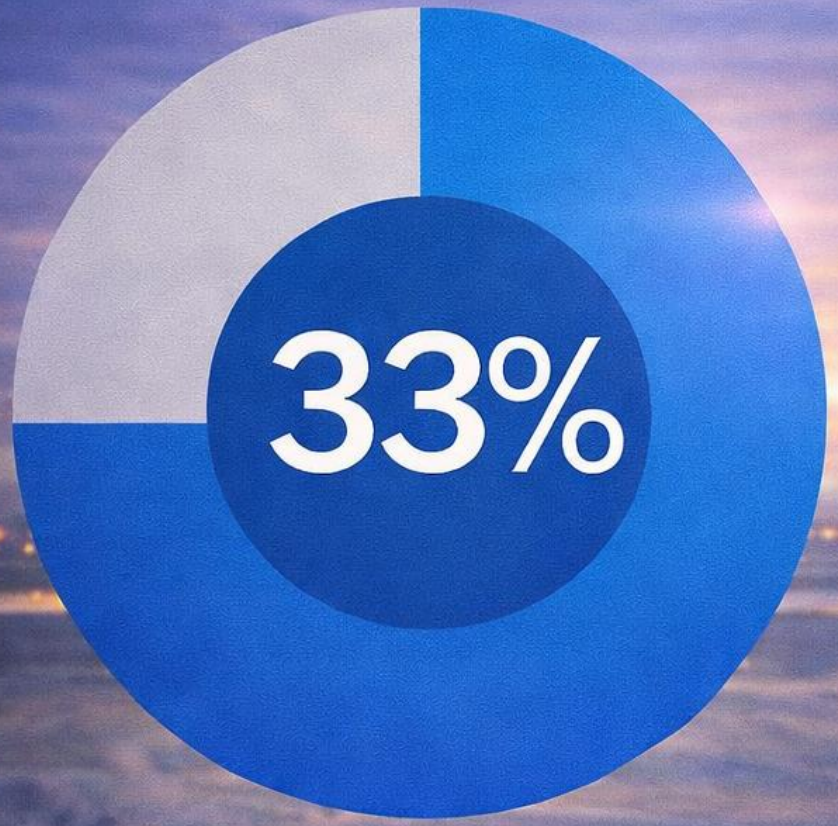


Trust in Stakeholder Reporting Holds Strong

Confidence that all stakeholders report issues remains high at **90%**, showing a positive trend from **77%** in 2022.

Fatigue Monitoring Needs Attention

33% feel that airshow organisations do not monitor fatigue



Unreasonable Pressure – 16%

feel that airshow organisations **pressure people into cutting corners**

Need for **Stronger Fatigue Monitoring & Safety Culture**

- Speak Up
- Stick to Checks
- No Unnecessary Pressure


Incident Reporting Needs Focus
Nearly 20% of all respondents reported feeling uneasy about reporting observed safety concerns.
20%
Don't Rock the Boat
Fear of Consequences
INCIDENT REPORT
Transparency
Support
No Retaliation


Bending the Rules?
16% believe that others deviate from the rules
16%
Bad Habit
Shortcut
WORKAROUND
DISPLAY BRIEF
CHECKLIST BENT
SKIPPED
Skipped
Compromise Safety
+ Normalising Deviation
+ Ignore Procedures


Cause for concern?
78%
89%
89%
5 year low. Only 78% feel that reporting of safety violations, unsafe behaviour or human error is encouraged
(previous high of 89%)

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Overall Safety Culture — Strong and Improving

- Safety culture remains strong
- Confidence in CAP updates is high
- Just Culture is widely embedded
- Human factors awareness is well established

Takeaway line:

👉 The foundations of flying display safety are robust and trusted.

Picture: Steven Comber

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Emerging Risks?

- **Fatigue monitoring:** 33% feel it is not consistently monitored
- **Unreasonable pressure:** 16% feel pressure to cut corners
- **Rule deviation:** 16% believe others sometimes deviate from rules
- **Reporting confidence:** Nearly 20% feel uneasy raising concerns
- **Encouragement to report:** Down to **78% (5-year low)**

Takeaway:

These findings do not suggest widespread non-compliance, but they highlight growing operational pressures, and inconsistent use of best practice.

Picture: Steven Comber

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What could be done better EOs, FDDs, Display Pilots and DAEs:

- Be clearer about fatigue management
- Strive to show Just Culture in action
- Keep normalising “stop and speak up”
- Reinforce that safety comes before delivery
- Make it easier and safer to report concerns

Picture: Steven Comber


SRG 1305 Feedback

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DS25 – SRG 1305 Feeback

UK Civil Aviation Authority

Picture: Steven Comber

DS25 – SRG 1305 Feedback

Remotely Piloted Air System (RPAS) Activity Continues to Rise

- Continue to engage with Police and Military C-UAS units.
- Increase media presence to strengthen public understanding.
- Ensure comprehensive reporting of illegal RPAS activity.

Picture: Steven Comber

Military Aviation Authority
MAA

DS25 – SRG 1305 Feedback

UK Civil Aviation Authority

There were no STOP calls during DS 25

- Keep doing what works: solid briefs, disciplined minima, proactive use of Warning Calls.

Picture: Steven Comber

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DS25 – SRG 1305 Feedback

UK Civil Aviation Authority

There was a 9% increase in Too Close Calls, with on-crowd wind identified as the principal factor.

- Continue to ensure that on-crowd winds are fully briefed.
- Consider the impact of wind on formation displays—particularly for lighter aircraft.

Picture: Steven Comber

DS25 – SRG 1305 Feedback

Too Low calls remain at a steady state

However, the main reasons for too-low calls during the season were:

- Flying below display location minima, whilst remaining above DA minima - **#1 cause**
- Descending below minimum aerobatic height
- Not fully accounting for the DA minima of all formation members
- Flying below SERA when either entering, or leaving the display area
- Initiating pyrotechnics below the Minimum Pyro Release Height (MPRH)

Picture: Steven Comber

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DS25 – SRG 1305 Feedback

UK Civil Aviation Authority

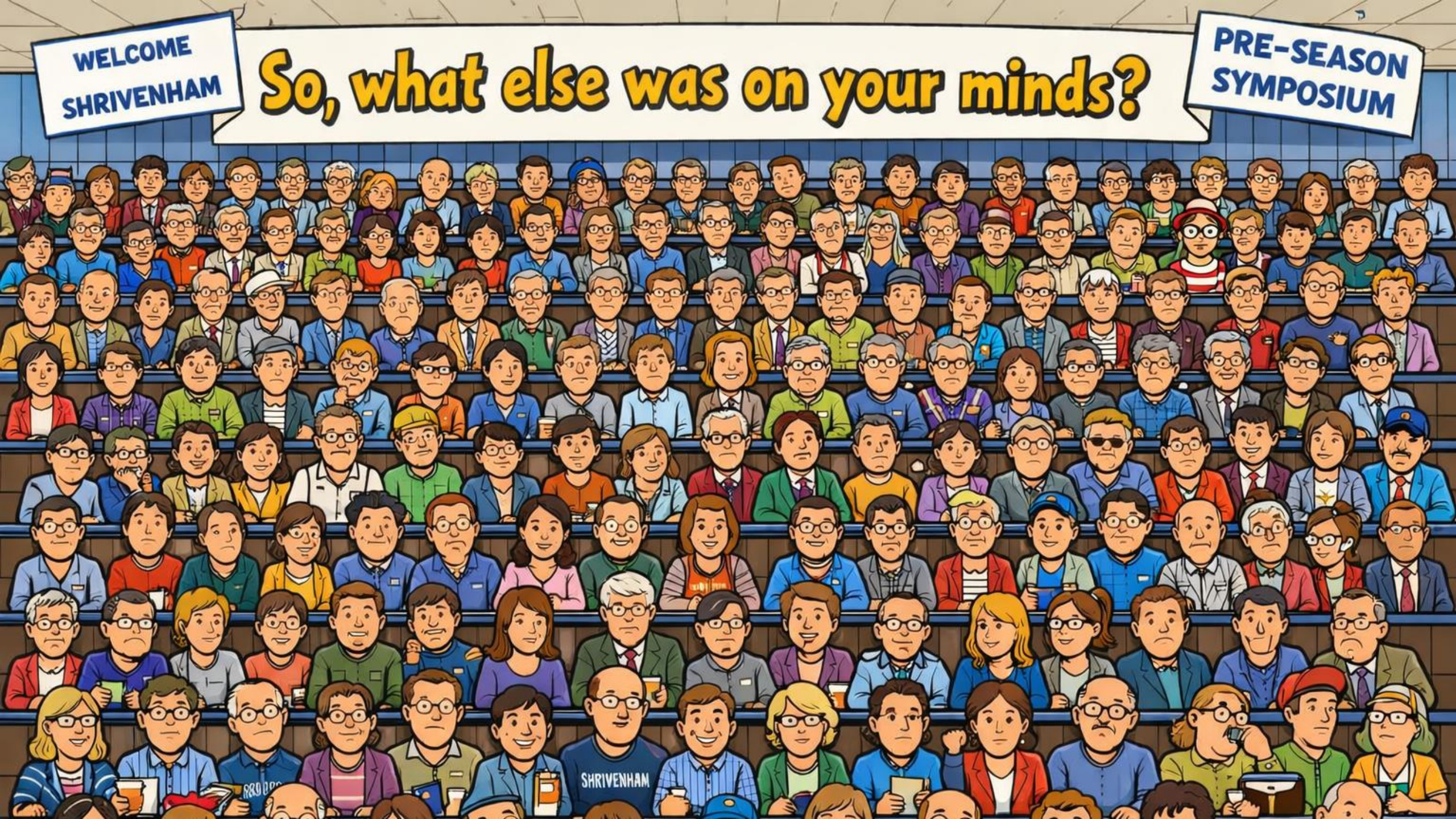
Terminate Calls Increased Significantly

There was a **250% increase in Terminate Calls**, rising from **4 in DS24 to 14 in DS25**.

The primary causes were:

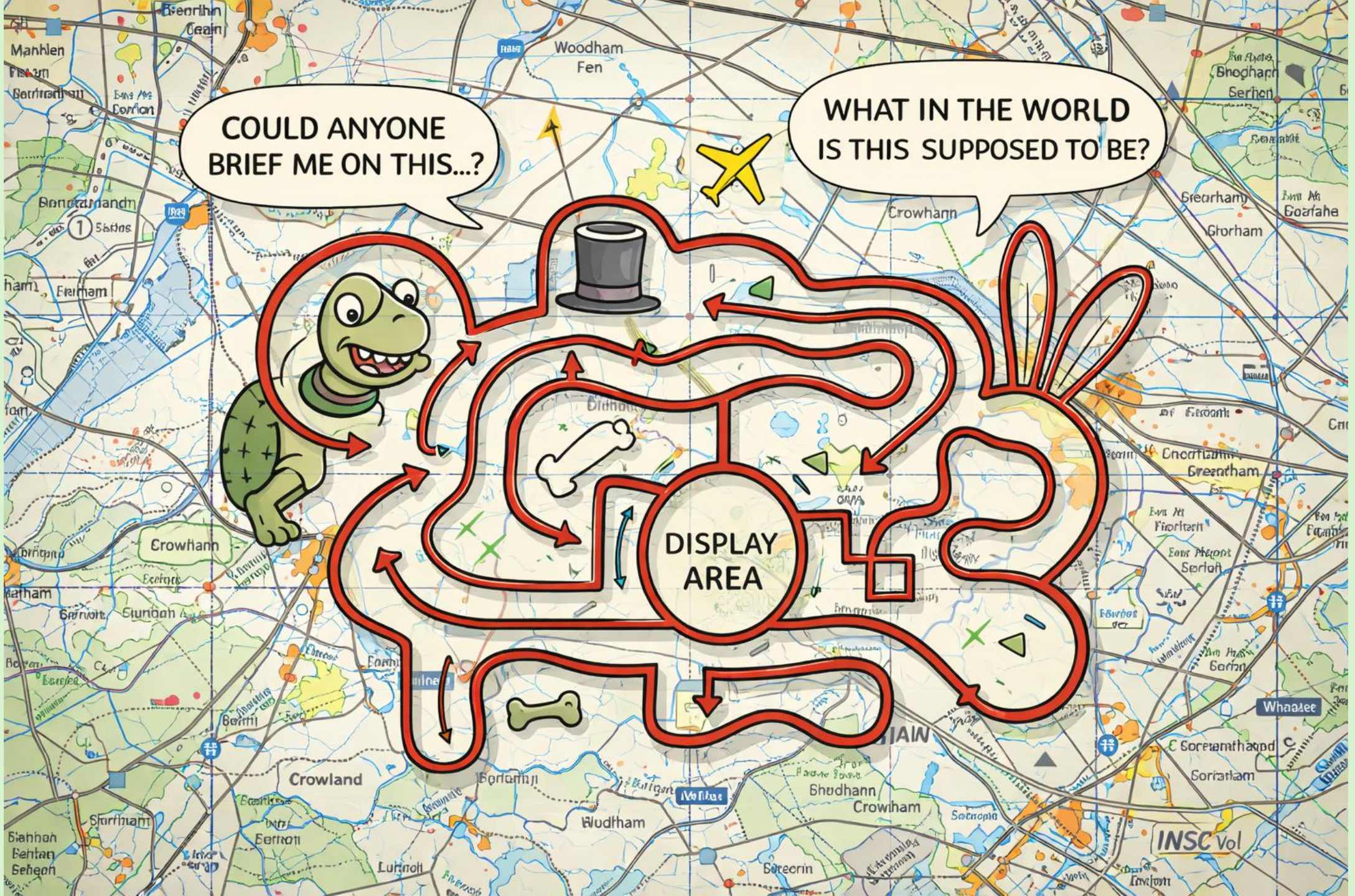
- **50%** – Poor weather conditions
- **40%** – Mechanical issues
- **10%** – Suspected airspace intrusions

Picture: Steven Comber


WELCOME SHRIVENHAM
So, what else was on your minds?
PRE-SEASON SYMPOSIUM
SHRIVENHAM

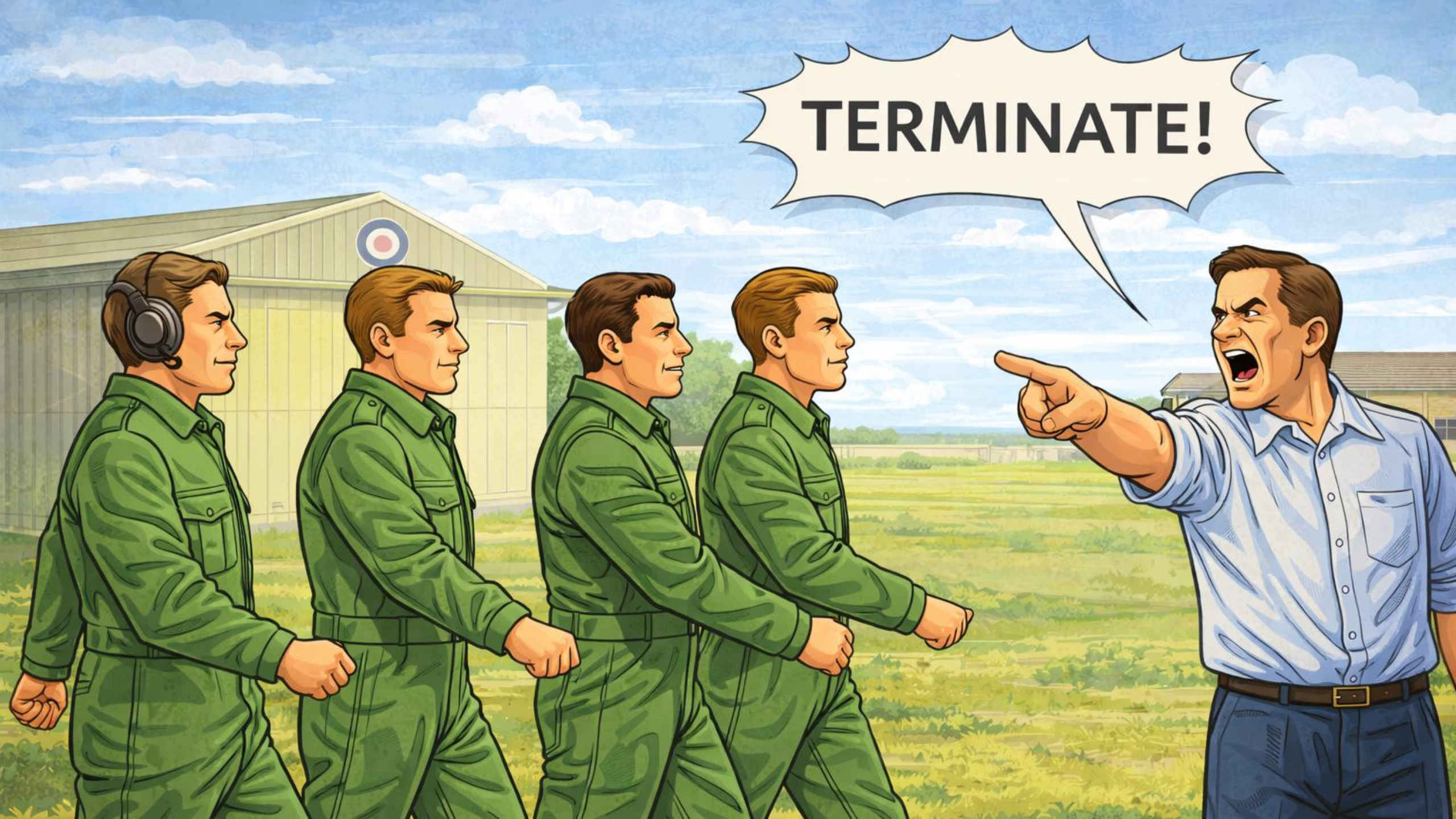

BRIEFING
TARGET
WEATHER
ESCORT


DISPLAY DEBRIEFING
MANEUVRES
- ROLLS
- TWISTERS
- BREAKS
TIMING
- LINE OFF
- LIGHTS
FORMATION
CROSSOVERS
DIAMOND
DIAGRAMS


COULD ANYONE BRIEF ME ON THIS...?
WHAT IN THE WORLD IS THIS SUPPOSED TO BE?
DISPLAY AREA


They are too low –
We must tell the pilot!
N3 AP
FLYING CONTROL


Is that an aeroplane or a helicopter?
N3 AP
FLYING CONTROL


TERMINATE!


FLYING CONTROL
CAA
CERTIFICATE OF ACCREDITATION
CAA
CERTIFICATE OF ACCREDITATION
CAA
CERTIFICATE OF ACCREDITATION


If it’s big and clever, it’ll be me doin’ it!
DISPLAY BRIEFING
TIMING
FORMATION:
MANOEUVRES:
SAFETY:
CAA
CERTIFICATE OF ACCREDITATION
CAA
CERTIFICATE OF ACCREDITATION


How about a double roll.
with opposite half Cubans?
I love it!
Let's go for it!
DISPLAY PLANS
TIMING ROWL:
OPPOSITE HALF CUBANS:


Thanks for being so honest, that was exactly the right decision
FLYING DISPLAY DIRECTOR


YOUR BIGGEST
COMPETITOR


SOFT ICE CREAM
99
Flake
COLD DRINKS

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Regulatory Update

Paul Szluha

Flight Standards Officer

CAA Air Display Regulation Team

Regulatory Update

CAP 403

- *Public consultation 08/12/25 - 02/01/26*
- *11 respondents, 43 comments*
- *Published 09/02/26*

CAP 1724

- *Public consultation 05/01/26 - 30/01/26*
- *8 responses, 43 comments*
- *Published 09/03/26*

Paul Szluha
EOO

Regulatory Update

CAP 403 / 1724 common changes

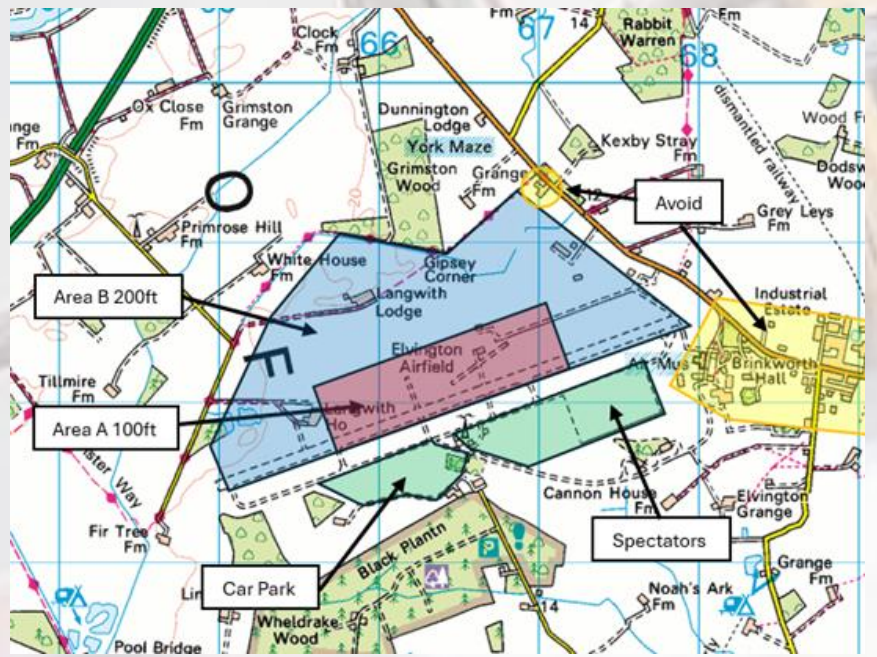
- *Minimal change*
- *Further clarification*
- *Minor editorial changes*
- *Existing paras split to provide extra clarity*

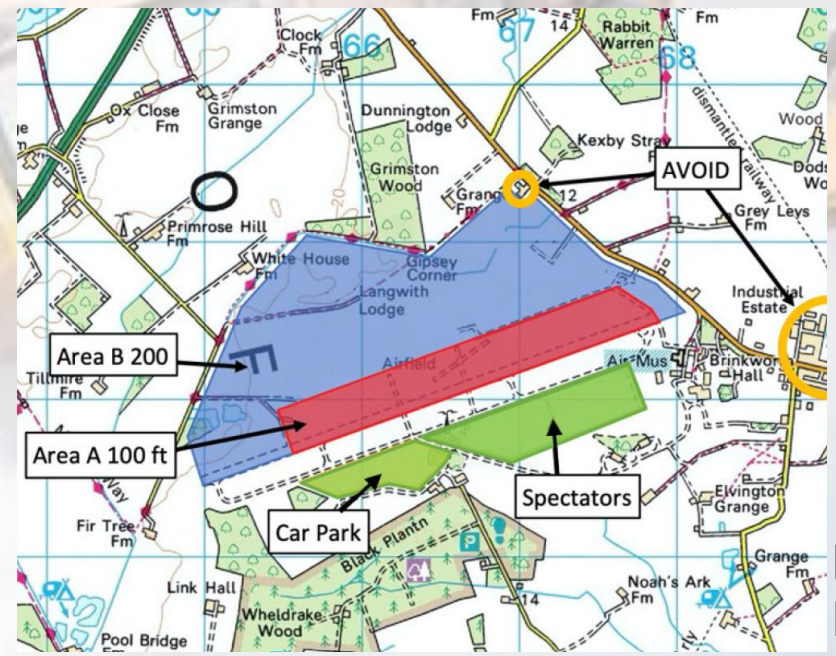
Paul Szluha
EOO

Regulatory Update

CAP 403 changes

- *Application maps must show an appropriate separation between display area and surrounding infrastructure*





Paul Szluha
EOO

Regulatory Update

CAP 403 changes

- *Parachuting display items do not need to be included within the number of items when calculating the Tier level*

- *However, consideration should be given to the effect on complexity*

Paul Szluha
EOO

Regulatory Update

CAP 403 changes

Over-flight of spectators

- *Civilian display aircraft **should not** overfly the Spectator Area save for an emergency situation*
    - *For example, if lateral separation is misjudged, maintaining controlled flight **must** take priority over regulatory compliance*
- *Previous wording: Civilian display aircraft are not permitted to overfly the Spectator Area.*

Paul Szluha
EOO

Regulatory Update

CAP 403 changes

Documents check

- *A certified declaration as contained at SRG1327 is considered to be acceptable documentation for civilian pilots to provide to the FDD.*
- *FDDs **may** produce an alternative method if preferred and have the right to check all documentation at their discretion.*

Paul Szluha
EOO

Regulatory Update

CAP 403 changes

- *Accredited FDDs may access DAs by visiting the CAA website*
- *Parachuting requirements stripped out to avoid duplication with CAP 660*

Paul Szluha
EOO

Regulatory Update

CAP 403 changes

Appendix A – Risk Assessments

- *Additional guidance*
- *Revised SRG1303T RA Template*
- *New template examples provided to illustrate new guidance*

FDDs note:

- *The CAA Risk Assessment Template may be used to submit Risk Assessment information,* ***but other formats are acceptable****.*

Paul Szluha
EOO

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Regulatory Update

UK Civil Aviation Authority

CAP 1724 changes

800hp disconnect

- *800hp / 2730kg was introduced as a boundary wrt minimum experience and currency in 2016*
- *It doesn't correlate to DA categories*

aircraft category[25]. The following **should** be used as a guide when considering the minimum level of experience required before a DA application can be considered:

i) Pilots ~~of aircraft~~ with piston engines of 800hp or greater, 2730kg mass or greater, jet powered, ~~helicopter or gyroplane~~ - ~~a minimum of 500~~ hours total time, of which not less than 300 hours **should** be as pilot-in-command

Display aircraft	Within 90 days of date of display	Within 30 days of date of display
All except those included below	3 complete display routines flown or practised	1 complete display routine flown or practised **in DA category**
800 hp or greater, and / or 2730 kg or greater, and / or Jet powered	3 complete display routines flown or practised **in DA category**	1 complete display routine flown or practised **in DA category**

Description	Group	Category	Description
Single Engine Piston, Turbo Prop & Electric Aeroplanes	SE	A	≤200 hp (shp) / 149 kW
		B	201 hp (shp) / 150 kW to ≤600 hp (shp) / 447 kW
		C	>600 hp (shp) / 448 kW

aul Szluha
OO

Regulatory Update

CAP 1724 changes

800hp disconnect

- *800hp / 2730kg was introduced in 2016 as a boundary wrt minimum experience and currency*
- *It doesn't correlate to DA categories*

Display aircraft	Within 90 days of date of display	Within 30 days of date of display
All except those included below	3 complete display routines flown or practised	1 complete display routine flown or practised **in DA category**
Greater than 600 hp and / or Jet powered	3 complete display routines flown or practised **in DA category**	1 complete display routine flown or practised **in DA category**

experience, total time on both the display aircraft type and display aircraft category[25]. The following **should** be used as a guide when considering the minimum level of experience required:

i) Pilots of aircraft with piston engines greater than 600hp, jet powered, helicopter or gyroplane - a minimum of 500 hours total time, of which not less than 300 hours **should** be as pilot-in-command

Description	Group	Category	Description
Single Engine Piston, Turbo Prop & Electric Aeroplanes	SE	A	≤200 hp (shp) / 149 kW
		B	201 hp (shp) / 150 kW to ≤600 hp (shp) / 447 kW
		C	>600 hp (shp) / 448 kW

aul Szluha
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Regulatory Update

CAP 1724 changes

Ground assessment discussion points

- *5.6. Discussion topics, at the DAEs discretion, may include:*

*v) manoeuvres that direct energy towards spectators. These manoeuvres **should** be discussed together with reorientation options but consider that changes may shift risk to other parties.*

Paul Szluha
EOO

Regulatory Update

CAP 1724 changes

Ground assessment discussion points

- *5.6. Discussion topics, at the DAEs discretion, may include:*

vi) margins. Elicit from the applicant that mandated minimum height(s) and lateral separation distance(s) are absolute minima, not targets. Recommend incorporating margins beyond these minima (as appropriate) when planning a display.

Paul Szluha
EOO

Regulatory Update

CAP 1724 changes

Aerobatic skill levels

- *Clarification of the existing intent that multiple continuous rolls are an advanced manoeuvre*

Standard level (aS) aerobatics

6.3. The permitted manoeuvres for aS aerobatic authorisations are as follows

a) **Spins.** Erect Spins of one turn
b) **Stall turns**. Stall turns
c) **Loops and eights**. Inside circular loops, loops with roll off the top, 'Cuban 8s'
d) **Rolls**. Single aileron rolls and barrel rolls

Intermediate level (aI) aerobatics

6.4. The permitted manoeuvres for aI aerobatic authorisations include those for aS above and the following:

a) **Spins.** Erect spins of up to two turns
b) **Stall turns**. Stall turns with rolls in the vertical
c) **Loops and eights.** Inside half loops, reverse Cuban 8s, square loops.
d) **Rolls**. Slow rolls, hesitation rolls, positive flick rolls. Rolls can be inserted in other figures

Advanced level (aA) aerobatics

d) **Rolls**. Multiple continuous rolls, multiple flick / snap rolls (positive and negative), rolling turns

d) **Rolls**[34]. Single aileron roll, single barrel roll

d) **Rolls**[35]. Single slow roll, single hesitation roll, single positive flick roll. Rolls can be inserted in other figures

[34] A pause in a steady attitude must be inserted before repeating a rolling manoeuvre.
[35] A pause in a steady attitude must be inserted before repeating a rolling manoeuvre.

Paul Szluha
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Regulatory Update

CAP 1724 changes

Formation skill levels

- *Basic level max bank and pitch increased to 45˚*

Tailchase skill levels

Tailchasing skill levels

Abbreviation	No of aircraft	Description and limitations
t2	Max 2	Tailchases of up to two aircraft
t3	Max 3	Tailchases of up to three aircraft
t4	Max 4	Tailchases of up to four aircraft

Paul Szluha
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Regulatory Update

CAP 1724 changes

DA Validity clarification

Initial issue DAs

11.3. Initial issue DAs are valid for a period of 6 months[47] from the date of evaluation.

13 month DAs

11.5. DAs are valid for 13 months from the date of evaluation.

DA Expiry

11.9. For all DAs, after 36 months from the date of the last evaluation, if a DA has not been renewed it is considered expired.

Paul Szluha
EOO

Regulatory Update

CAP 1724 changes

DA Renewal cycle clarification

DA Renewal cycle

11.32. A display pilot **shall not** have a DA evaluation conducted by the same DAE for more than two consecutive rolling years[56].

11.33. However, a display pilot **may** have a DA evaluation conducted by the same DAE multiple times within a period of two consecutive rolling years.

11.34. The requirements above apply also for the renewal of a lapsed or expired DA.

Paul Szluha
EOO

Regulatory Update

CAP 1724 changes

DA Exemption clarification

DA Exemptions

11.43 DA Exemptions are for use in cases of urgent operational needs or urgent unforeseeable circumstances. They are not intended for use at multiple events.

11.44 Obtaining a full UK DA **must** always be considered the first option.

Paul Szluha
EOO

Regulatory Update

Other points

- ***Symposium attendance date***

United Kingdom Civil Aviation Authority

DISPLAY AUTHORISATION (Page 2 of 2)
RECORD OF TEST AND COMPETENCE

Name: [redacted] Licence No: [redacted] DA No: [redacted]

The holder of this certificate successfully passed a test of their ability to display aircraft in the following categories with the following Display Authorisation Evaluator(s).

Aircraft Category	Skill Level	Date of Evaluation	Valid Until	DAE Number	DAE Name
Z	N/A	19 July 2021	19 January 2022	086	D Head
Z	N/A	12 May 2022	12 June 2023	086	D Head
Z	N/A	28 July 2023	28 August 2024	099	P Kuypers
Z	N/A	25 July 2024	28 August 2025	099	P Kuypers
Z	N/A	21 August 2025	21 September 2026	108	J Corley

PREVIOUS RECORD OF TEST HISTORY

A	B	C	D	E
Date of Test	Aircraft Category	DAE Name	DAE No.	Date of Expiry
09 September 2020	Z	D Head	086	09 March 2021
Date of last Symposium attendance (Refer to CAP 1724 for Symposium attendance requirements)		29 March 2023		

DISPLAY AUTHORISATION TEMPORARY VALIDATION OF EXISTING SCHEDULE 1 PRIVILEGES

I the undersigned, being a person authorised by the Civil Aviation Authority to sign Certificates of Test and Competence in respect of a Display Authorisation, certify that I am satisfied that on the date shown below, the holder of this certificate successfully passed a test of their ability to display.

Aircraft type: ..... DA Category: .....

CAP 1724 Aerobatic Skill Level: ..... (if non-aerobatic enter N/A)

CAP 1724 Formation Skill Level: ..... (if solo enter N/A)

Other: ..... (for example Limbo, Flour bombing, Stand-on-wing, etc)

DAE Signature: ..... DAE Name:..... DAE Number:.....

Date of Issue: .....

This temporary validation is only to be used to validate **existing** Schedule 1 privileges as depicted in the table above and cannot be used to validate any DA upgrade. The DA categories and skill levels entered in this temporary validation **must not** exceed those depicted in Schedule 1 above.

This temporary validation is valid for 28 days from the date of issue, after which the holder **must** apply for and fly under a newly issued Display Authorisation issued by the UK CAA.

Paul Szluha
EOO

Regulatory Update

Other points

- ***LTP records***
  - *Permission holders must still keep records*

However

- *Records no longer need to be submitted*

But

- *Records must still be kept and produced when requested*

Paul Szluha
EOO

Regulatory Update

Other points

- ***DAN (initial DA pre-notification form) feedback***

  - *Introduced 2025*
  - *76 DANs received and processed, 2 rejected*
  - *Give DAEs feedback / intel before evaluation*
  - *Work with DAEs and candidates to manage expectations*
  - *Applicable for ALL initial issues*

Paul Szluha
EOO

Regulatory Update

Other points

- ***Madness forms***
- *1303Bs are still being unnecessarily submitted where:*
  - *there has been no change*
  - *the DAE has insisted*
- *SRG1303Bs are required:*
  - *for all initial issue DA applications*
  - *where there has been a change to previously declared information*
  - *for DAEs & FDDs prior to re-appointment / re-accreditation*

Regulatory Update

Significant increase in late DA applications

- *Requests for us to process applications quickly because they are 'needed for the weekend'*
- *Message from a DAE "given that you'll know your DA expiry date for about a year, it's not ideal to phone a DAE on a Friday morning and claim "emergency" to get it renewed before Saturday!!"*

DISPLAY AUTHORISATION TEMPORARY VALIDATION OF EXISTING SCHEDULE 1 PRIVILEGES

I the undersigned, being a person authorised by the Civil Aviation Authority to sign Certificates of Test and Competence in respect of a Display Authorisation, certify that I am satisfied that on the date shown below, the holder of this certificate successfully passed a test of their ability to display.

Aircraft type: ..... DA Category: .....

CAP 1724 Aerobatic Skill Level: ..... (if non-aerobatic enter N/A)

CAP 1724 Formation Skill Level: ..... (if solo enter N/A)

Other: ..... (for example Limbo, Flour bombing, Stand-on-wing, etc)

DAE Signature: ..... DAE Name:..... DAE Number:.....

Date of Issue: .....

This temporary validation is only to be used to validate **existing** Schedule 1 privileges as depicted in the table above and cannot be used to validate any DA upgrade. The DA categories and skill levels entered in this temporary validation **must not** exceed those depicted in Schedule 1 above.

This temporary validation is valid for 28 days from the date of issue, after which the holder must apply for and fly under a newly issued Display Authorisation issued by the UK CAA.

5.17. Following successful evaluation, the DAE will provide a recommendation for issue / renewal / upgrade using form SRG 1300 which **shall** be submitted, by the applicant, to the CAA GA Unit[34] for approval. The

[34] Any completed paperwork **must** be received by the CAA no later than 14 days from the date of the evaluation with at least 28 days allowed for the processing of correctly completed and submitted forms.

Paul Szluha
EOO

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MAA

Regulatory Update

UK Civil Aviation Authority

QUESTIONS

Paul Szluha
EOO

Pre-Season Display Symposium

MAA

Wg Cdr Russ Lavis
Wg Cdr Dave Middleton

MAA OVERSIGHT - DS25

- 12 Oversight visits conducted.
- Warning Calls:
  - **Too Close:** 10 **Too Low:** 4 **Terminate:** 4 (all pilot initiated).
- Drones – still pose a significant threat.
- PA Systems – impact of failure?

PUBLIC ADDRESS SYSTEMS – A SAFETY SYSTEM

- RA 2335 & CAP 403 mandate their use.
- Key safety system – direct link to spectators.
- Commentator is a key member of the team.
- Redundancies & Contingencies – what if the system fails?
- Risk Assessment – should form part of the event RA, golden thread flowing through to the orders for the event.

RA 2335 – 2026 CHANGES

Display Flying Update for DS26

- RA2335 updated annually to remain synchronised with CAA documentation
- Issue 14 published Jan 26, updated Display Forms published Feb 26.
- DS26 – RA2335 Issue 14 – Minimal impact on Display Teams – focus on HoE/FDD/EO:
- Use of Pyrotechnics – Conduct risk assessment and have a plan – Post RIAT grass fire
- Parachute Displays do not count as an Item in terms of Tiers (although they could increase complexity)
- Use of PA Systems at MOD regulated events – identified as a regulatory gap
- Foreign Mil Flypasts – include profile on Form 2 – helps with MAA understanding of activity
- FDD/ATC interaction – Define periods of responsibility – Clear lines of ownership for FDD
- FDD Mil currency: accept civ event at the appropriate Tier – adds flexibility to our benefit
- Requirement to consider drone detection/defeat capability

Parachuting Update for DS26:

- SUA required - minimum of 5,000 square metres min width 50 metres - clarify this is a regulatory requirement
- 15m requirement from the SUA to the crowd – impact on Cordon to 80m min – display teams not honouring the safety distance

QUESTIONS?

CAA Feedback

Philip Brown

Flight Standards Officer

CAA Air Display Regulation Team

CAA Feedback

Scope:

- AFDD Events
- FDD Mentoring
- CAA / MAA Same Day Events
- SERA as a Mitigation
- The Dangers of AI

Philip Brown
FSO, CAA ADRT

AFDD Events

CAP403:

A Pilot holding a UK Display Authorisation (DA) participating in **their own single item** Flying Display who is responsible to the CAA for the safe conduct of that Flying Display

AFDD Events

CAP403:

...A suitable person... must be present on the ground.

...Pilots may act as AFDDs at events consisting of up to 3 single Display Items per day at the location of the event.

...only one item shall be airborne in the vicinity [2nm] of the Display Area at any one time.

AFDD Events

AFDD Display Applications:

A single application specifying one ‘master’ AFDD

A single Flying Display Risk Assessment, made and signed by all AFDDs involved.

The CAA may require a ground based FDD to be in place.

FDD Mentoring

Requirement:
CAP403 Appendix C – Flying Display Director Accreditation

Initial Courses - mentored.

Upgrades - mentored/shadow activity.

We need to see a record of training from the Mentor.

SERA as a Risk Mitigation

SERA allows:

- **most** flying activity above over the congested areas of cities, towns or settlements or over an open-air assembly of persons at a height of at least 1000 ft above the highest obstacle within a radius of 600 m from the aircraft [**SERA 5005(f)(1)**]
- any flying activity away from congested areas at a height of at least 500ft above the ground or water, or 500 ft above the highest obstacle within a radius of 150 m (500 ft) from the aircraft [**SERA 5005(f)(2)**]

BUT…

SERA as a Risk Mitigation

Flying Displays:

- include higher-risk activities at lower levels;
- concentrate a higher number of aircraft, for an equivalent period, in the same area;
- put the onus on the FDD, not the pilot, to provide a safe flying environment.

So…

SERA as a Risk Mitigation

SERA is only a minimum legal requirement for general flying.

It might not reduce the risk at your flying display to ALARP.

CAA/ MAA Same Place & Day Events

Ground-based FDD event, same site:

Have one display permission to encompass all items

Military Aviation Authority
MAA

The Dangers of AI

UK Civil Aviation Authority

Aircraft groups and categories

9.1. The following table illustrates the Display Authorisation aircraft grou and categories.

Description	Group	Category	Description
Single Engine Piston, Turbo Prop & Electric Aeroplanes	SE	A	≤200 hp (shp) / 149 kW
		B	201 hp (shp) / 150 kW to ≤600 hp (shp) / 447 kW
		C	>600 hp (shp) / 448 kW
Multi Engine Piston, Turbo Prop & Electric Aeroplanes	ME	D	≤300 hp (shp) / 223 kW total
		E	301 hp (shp) / 224 kW to ≤600 hp (shp) / 448 kW total
		F	>600 hp (shp) / 448 kW total, single pilot
		Z	>600 hp (shp) / 448 kW total, multi-pilot/crew
Jet Powered Aeroplanes	JPA	G1	Straight wing, single engine jet aircraft
		G2	Swept wing, single engine jet aircraft
		H1	Straight wing, multi engine jet aircraft
		H2	Swept wing, multi engine jet aircraft
Helicopters	HEL	L	Helicopters

Philip Brown
FSO, CAA ADRT

The Dangers of AI

"*Here's the official breakdown of UK CAA Display Authorisation (DA) categories A–E, as per the latest guidance in CAP 1724 (Edition 7, effective March 10, 2025)*":

A: Single-Engined Piston aircraft (SEP) Displays in SEP group only

B: Multi-Engined Piston & Turboprops (merged group) Covers display in MEP and TPA groups

C: Helicopters & Gliders Includes all rotorcraft and glider types

D: Jet-Powered Aircraft (both straight-wing and swept-wing) Covers all jet aircraft across H1 (straight) and H2 (swept)

E: Unrestricted / "All Types" Full scope across SEPs, MEP/TPA, Helicopter/Glider, and Jets

The Dangers of AI

"Display Authorisation Categories"

*In the UK, **Display Authorisation (DA) categories** are issued by the CAA under **CAP 403** and define **what level of display flying a pilot is permitted to carry out**. These categories are often referred to by their **letter designations**.*

Below is the standard, current framework 👇

Fixed-Wing Display Authorisation – Minimum Heights

DA Category	Display Type	Typical Minimum Height
Category A	Non-aerobatic	500 ft AGL
Category B	Standard aerobatic	300 ft AGL
Category C	Advanced aerobatic	200 ft AGL
Category D	Unlimited aerobatic	100 ft AGL

The Dangers of AI

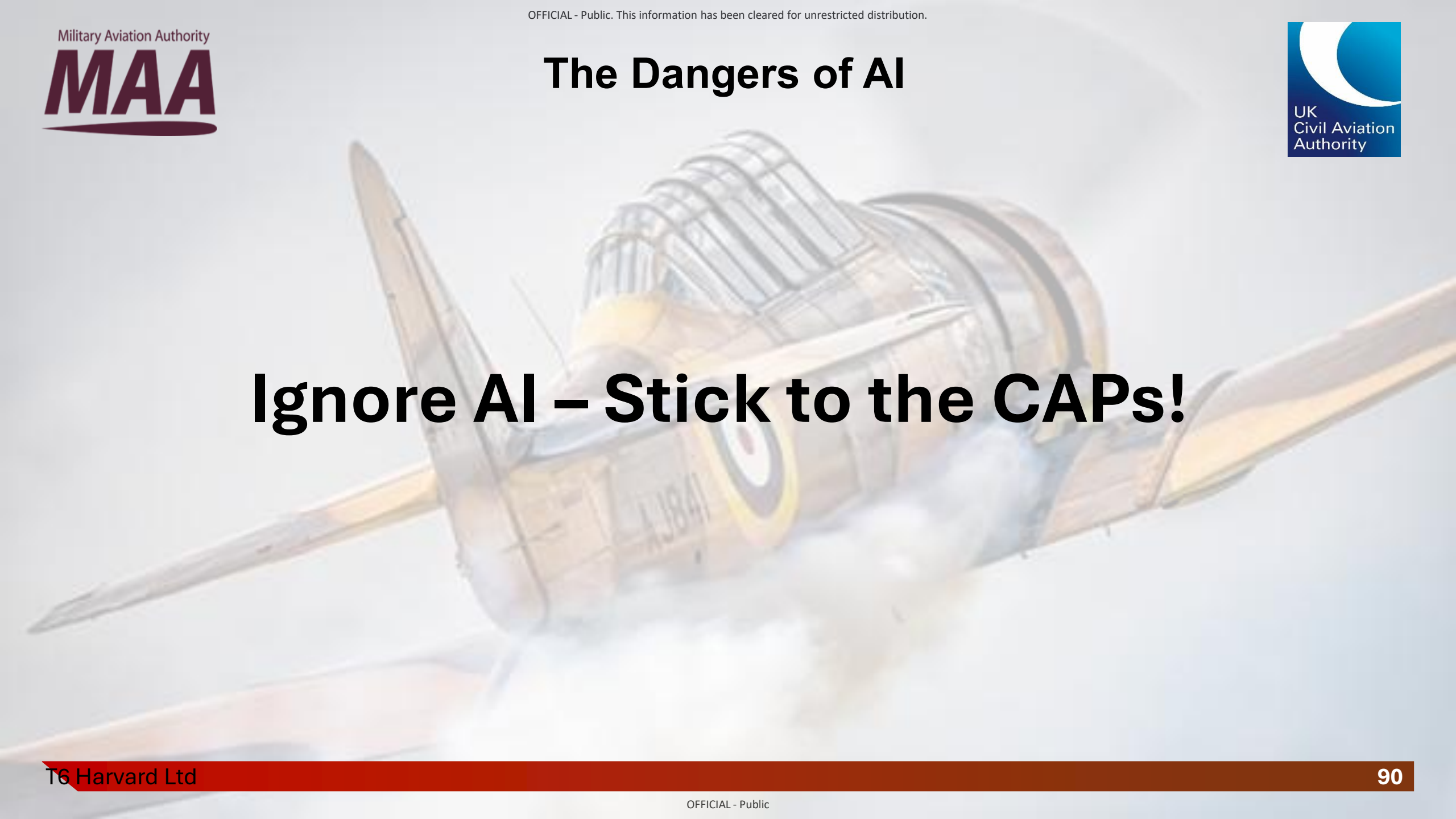
Helicopter Display Authorisation (HDA)
Specific to rotary-wing aircraft

Covers: Hovering, Pirouettes, Transitions, Low-speed and high-power manoeuvres

(Aerobatic categories A–D do not apply to helicopters.)

DA Category	Display Type	Typical Minimum Height
Category A	Non-aerobatic	500 ft AGL
Category B	Standard aerobatic	300 ft AGL
Category C	Advanced aerobatic	200 ft AGL
Category D	Unlimited aerobatic	100 ft AGL

The Dangers of AI



Ignore AI – Stick to the CAPs!

Military Aviation Authority
MAA

UK
Civil Aviation
Authority

RAF Display Events Update

Group Captain Robbie Lees

Military Aviation Authority
MAA

UK
Civil Aviation
Authority

Lunch

Back at 1400 please

CHIRP Reporting from Air Displays

Bill Dean

Interim GA & ATC Programme Manager

Confidential Human Factors Incident Reporting Programme

Military Aviation Authority
MAA

UK
Civil Aviation
Authority

BADA Report

Peter Reoch

BADA Chairman

British Air Display Association

BADA Updates – March 2026

Peter Reoch
BADA Chairman

BADA Updates

- Ongoing Work:
  - ✓ Events Industry Forum - Contributions to Purple Guide
  - ✓ All Party Parliamentary Group for Air Displays
  - ✓ Engagement with RAF SLT on RAFAT tour and wider RAF air display participation
  - ✓ REHEAT25

- Looking Ahead:
  - BADA Annual Review – 2x versions
  - Membership growth
  - Open to ideas about how we can help you…
  - REHEAT26 – new venue, new speakers, new opportunities
  - Promoting UK/European tours of exotic aircraft

COMMEMORATIVE
AIR FORCE

Coming to the UK in 2027...

REHEAT

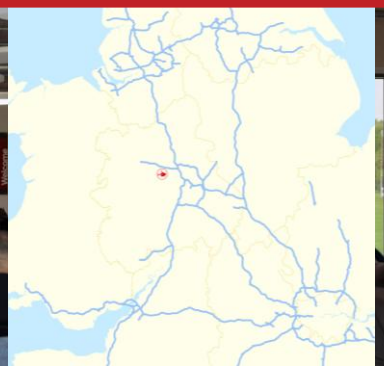
- Successor to ‘Post Season Symposium’
- 2025 edition hugely success:
  - Circa 120 Attendees
  - 22 Presentations or Panel Discussions led by over 30 industry leaders
  - Positive feedback across the board
- Review of your feedback to make this year even better:
  - Lunchtime to Lunchtime to minimise time away from the office
  - Social Evening – Same venue for dinner, awards & drinks reception
  - “Not in the South”

BADA
British Air Display Association

REHEAT26

Wednesday 21st & Thursday 22nd October
Midlands Air Ambulance HQ, Cosford

Details on the BADA Website
Tickets & Packages on sale now



Military Aviation Authority
MAA

UK
Civil Aviation
Authority

HF Facilitated Discussions

Tom Saunders

Baines Simmons

English Electric Wren Incident

July 2025

Rich Crockett

- Over 5,000 hours, including more than 4,000 hours in sailplanes.
- Past CFI of Booker GC, and SE the Thames Valley.
- Joined the Shuttleworth Collection in 2018 and began flying the Wren in 2020.
- Completed numerous successful Wren flights, ranging from short ‘hops’ to full-duration flights.

English Electric Wren

G-EBNV

Only surviving Wren in existence, and the only airworthy EE aircraft in the UK, possibly the World

First place in the1923 Lympne Light Aircraft Trials

404cc (0.4L) 7hp ABC motorcycle engine

Empty Weight 105kg

MTOW 240kg

Background

Shuttleworth’s Edwardian Aircraft

- During DS24, almost none of the aircraft were able to fly due to unsuitable weather.
- For DS25, extending the programme into the evening improved the likelihood of usable conditions.
- As a result, all the Edwardians were able to fly at the previous show.
- The post-show debrief identified reduced performance in two aircraft, likely linked to high temperatures.

- The initial forecast indicated conditions would be unsuitable for the Edwardians.
- I therefore expected to fly the Martlet in the end-of-day slot.
- Late in the first half of the show, it became apparent the forecast was inaccurate as the wind dropped.

- Before the second half of the display, the FDD delivered a follow-up display brief.

- During this brief, it was confirmed that the Edwardian slot would take place.


311
ZK311

Slot Brief

Pre-Flight Preparation

LOADING DATA & LIMITATIONS			
MWTA (lb)	Not specified		
Weighing Datum	Leading edge of wing at rib 3		
Permitted c.g, range	Not specified		
(inches aft of datum	??	to	??
Percentage SMC	1	to	1 (Gal)
Total Fuel Capacity	Tank 1	1	1 (Gal)

WEIGHT AND BALANCE CALCULATIONS			
ITEM	WEIGHT "W" (lb)	ARM "A" (in)	MOMENT "M"=W x"A')
BASIC or APS	263	23.57	6200
PILOT	190	2.5	475
		.....	
		.....	
	(Sum of W)	(A=M/W)	(Sum of M)
ZERO FUEL WEIGHT	463	14.74	6675
FUEL **FUEL**	8.65		
(Gal x 7.2 =)	8.65	– 30.125	
N/A (Gal x 7.2 =)	461.65	841.42	
	(ZFW+Fuel)		(Sum of M)
TAKEOFF STATE			
ZERO FUEL WEIGHT	4.53	14.74	
(Gal x 7.2 =)	8.65	– 30.15	
N/A	461.65	6416.42	
LANDING STATE			
ZERO FUEL WEIGHT	4.65	13.89	
LANDING STATE	461.65	641.65	

STANDARD PRE-FLIGHT CHECKS

CLEANLINESS CHECK – CLEAN IF NECESSARY

WEIGHT AND BALANCE

DENSITY ALTITUDE

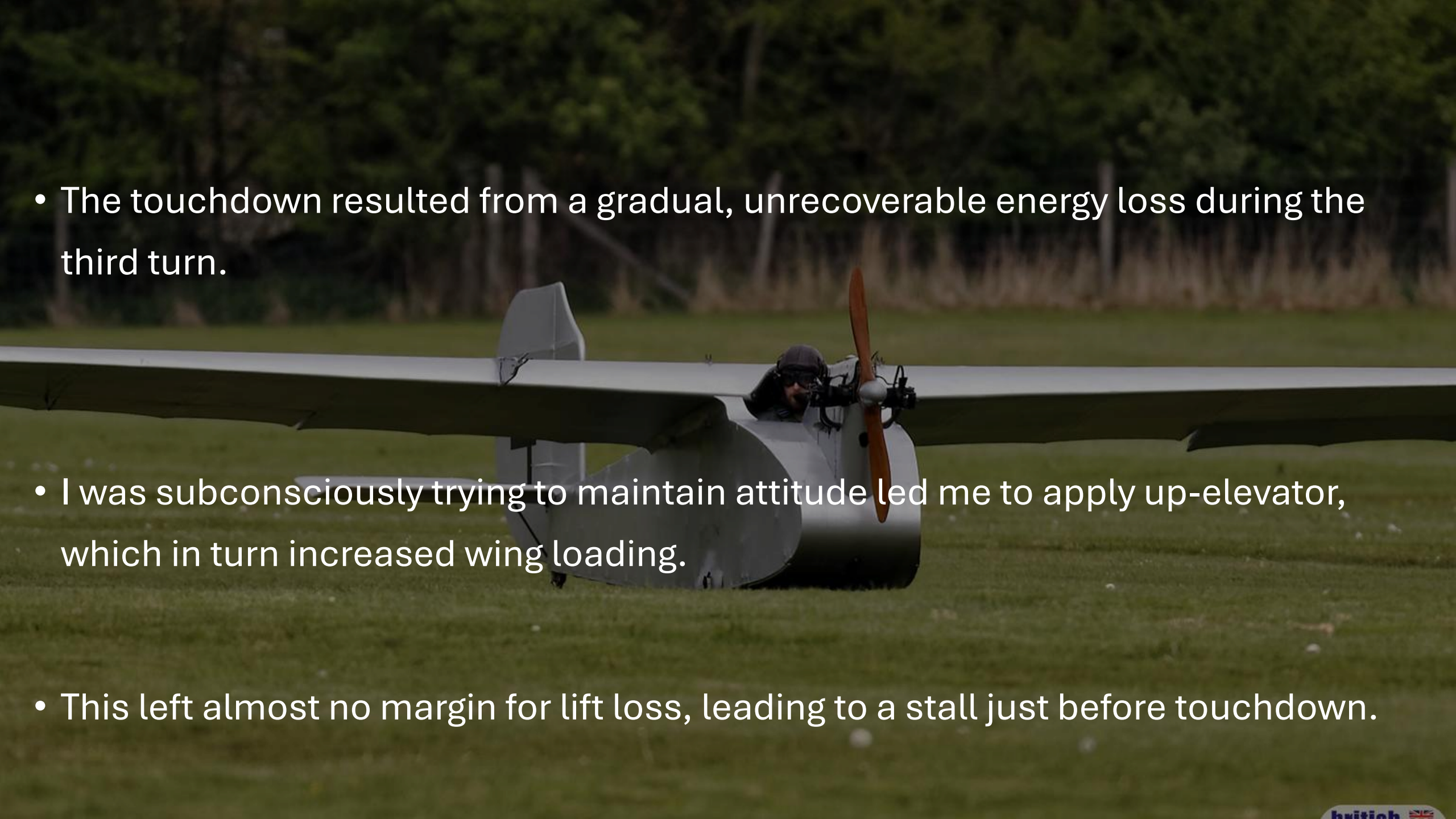
WIND CHECK

MENTAL REHERSAL


Slot as
Flown


4

Causal Factors

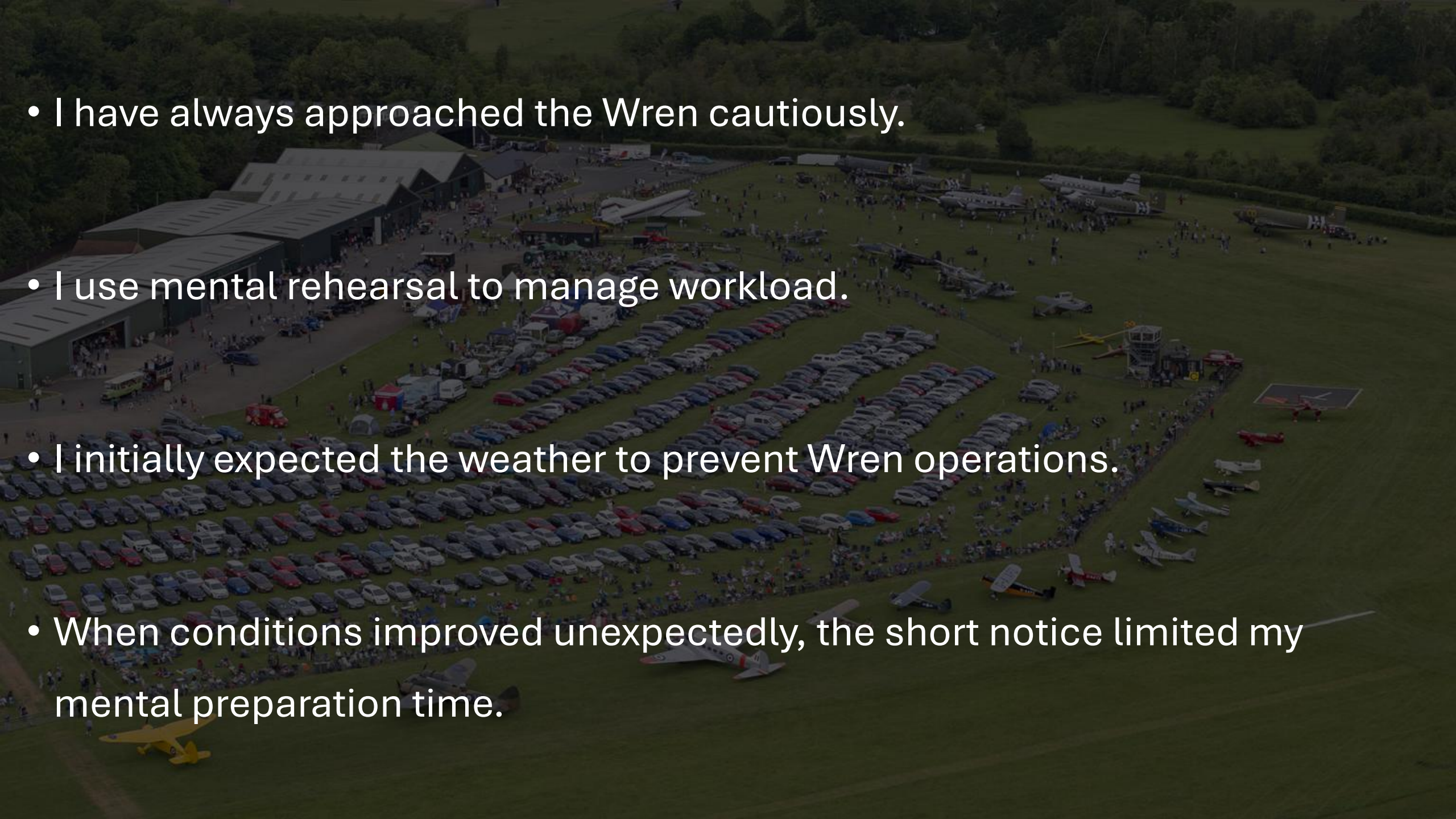


- The touchdown resulted from a gradual, unrecoverable energy loss during the third turn.

- I was subconsciously trying to maintain attitude led me to apply up-elevator, which in turn increased wing loading.

- This left almost no margin for lift loss, leading to a stall just before touchdown.

Human Factors



- I have always approached the Wren cautiously.
- I use mental rehearsal to manage workload.
- I initially expected the weather to prevent Wren operations.
- When conditions improved unexpectedly, the short notice limited my mental preparation time.

- I elected to walk the length of the airfield to watch the Typhoon display, rather than use the vehicles provided.

- This not only distracted me from the task at hand but also used valuable time that could have been spent preparing for the flight.

- I elected not to carry a radio primarily to save weight and because the Wren's small cockpit makes entry and exit challenging.

- This decision meant I was unable to maintain full situational awareness of other airborne and ground activities

- I was unaware that additional aircraft had been scheduled to fly.

- Without a radio, I couldn’t confirm whether our slot needed adjusting.

- This uncertainty diverted my attention to tower light signals and timing checks, reducing my focus on energy.

- I had the earlier briefing on low-performance aircraft, and feedback from a previous Edwardian slot, in the back of mind.

- This subconsciously led me to prioritise maintaining attitude in turns, rather than accepting a small descent to preserve energy.

- The Wren is highly popular with spectators.

- A desire to deliver an enjoyable display likely influenced my decision to commit to a full turning flight when a more cautious approach would have been far more appropriate.

Conclusions

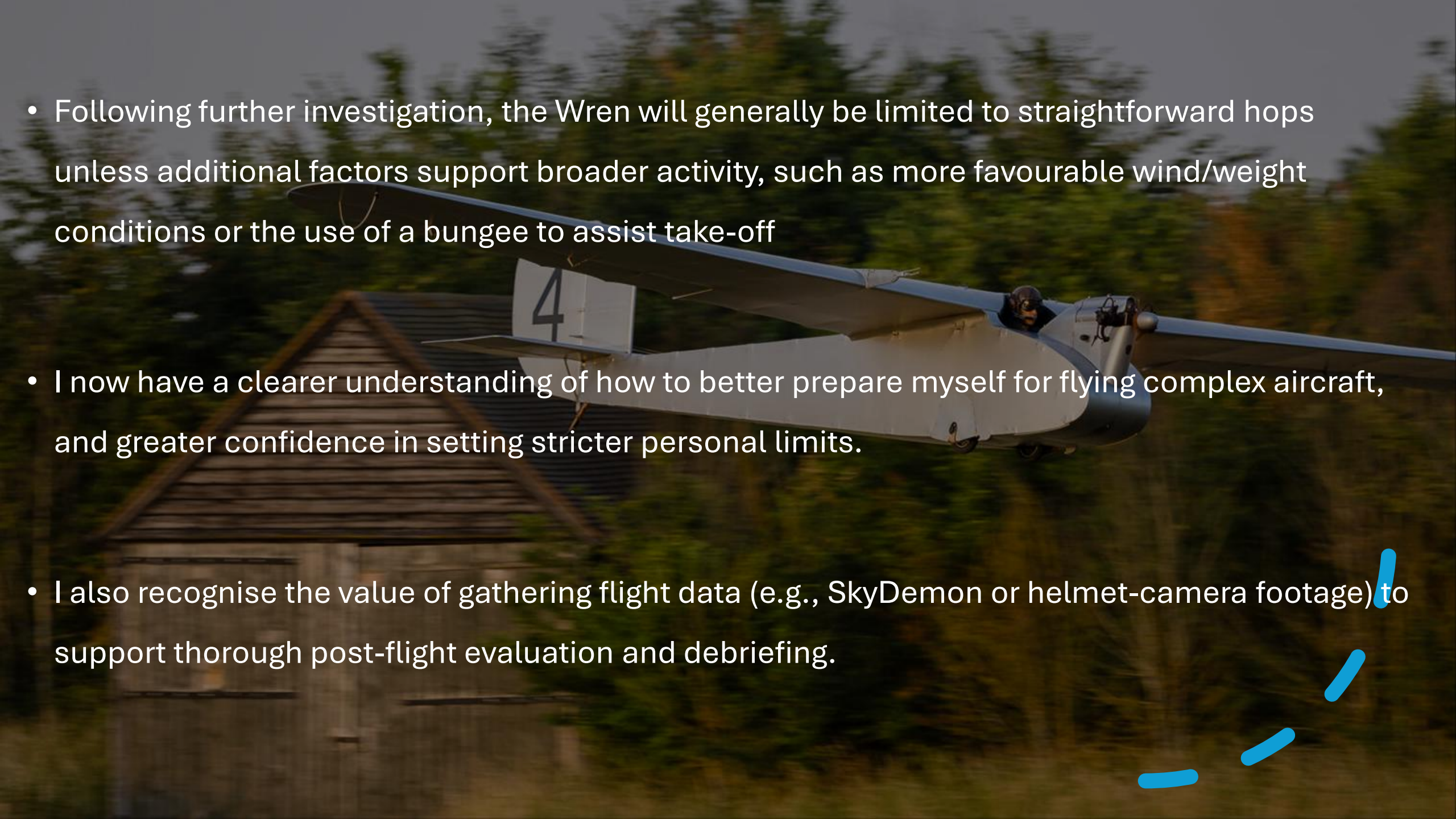
- Although I completed my normal preparations and felt broadly ready, my overall mental readiness was below optimal.

- The shorter preparation window, combined with the long gap since my last Wren flight, should have prompted me to set stricter personal limits for the display.

- From a flying perspective, the key lesson is the need to better recognise a declining energy state early and respond conservatively.

- Early indicators were present after the first hop, where a small loss of lift on the return leg showed the aircraft was already near its limits.

- Ultimately, I was trying too hard to maintain height in the turns.



- Following further investigation, the Wren will generally be limited to straightforward hops unless additional factors support broader activity, such as more favourable wind/weight conditions or the use of a bungee to assist take-off

- I now have a clearer understanding of how to better prepare myself for flying complex aircraft, and greater confidence in setting stricter personal limits.

- I also recognise the value of gathering flight data (e.g., SkyDemon or helmet-camera footage) to support thorough post-flight evaluation and debriefing.

Questions

Military Aviation Authority
MAA

UK Civil Aviation Authority

NOTAMS and RA(T)s

David Ridley
David Wayman

Military Aviation Authority
MAA

UK
Civil Aviation
Authority

Break

Back at 1615 please

Military Aviation Authority
MAA

UK Civil Aviation Authority

Airshow Accident Analysis and FDD Toolkit

Rich Pillans

FDD, Farnborough International Airshow

Military Aviation Authority
MAA

UK Civil Aviation Authority

Formation Teams

‘Sid’ Shirley
Team Raven

Jeff Milsom
Tiger 9

Alex Reynier
Turbulent Display Team

Military Aviation Authority
MAA

UK
Civil Aviation
Authority

See You Tomorrow:

0900 Start

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Presenter Name
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