



Scope







Aims

- Regulatory feedback
- Safety awareness
- Human factors training
- 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, in order to improve the Flying Display environment as a whole.



Wednesday 23 March 2022

Start	End	Session	Speaker/Lead	
1200	1300	Registration		
1300	1315	Welcome and Introductions	Michael Macdonald	
1315	1345	Display Season 2020-21 Trends Analysis	Paul Sall & Wg Cdr Ben Smy	
1345	1415	CAP 403, CAP 1724 and RA2335 changes Walk Through	Paul Szulha	
1415	1515	Cognitive Bias	Ian Holder, Baines Simmons	
1515	1545	Coffee/Tea (Provided)		
1545	1645	The DAE role in Human Performance	Ian Holder, Baines Simmons	
1645	1745	Risk Briefing	David Cooper	
1745	1800	Washup/Questions & Brief for Day Two		
1800	2000	Fork Supper (Provided)		



Thursday 24 March 2022

Start	End	Session		Speaker/Lead		
0900	0930	CHIRP			Steve Forward	
0930	0945	Centrix Reporting			Alistair Williams	
0945	1030	FDD/FCC Display Monitoring			Les Garside Beattie	
1030	1100	Coffee/Tea (Provided)				
1100 - 1230		Syndicate 1 Room tbc		Syndicate 3 Room tbc		
		FDD/DAE/Display Pilot - P Sall			Event Organisers - George Bacon	
		Dunsfold Incident Review – R Goodwin AFDD/FDD update – P Sall			Environmental Issues	
1230	1330	Lunch (Provided)				
1330 - 1430		Syndicate 1 Room tbc	Syndicate 2 Room tbc		Syndicate 3 Room tbc	
		FDD Lossiemouth Air Show Lls - Sqn Ldr Greenhowe	DAE/Display Pilots - Paul Szluha		Event Organisers - George Bacon	
1430	1445	Q&A and Group Feedback				
1445	1500	BADA Update				
1500		Closing Remarks				

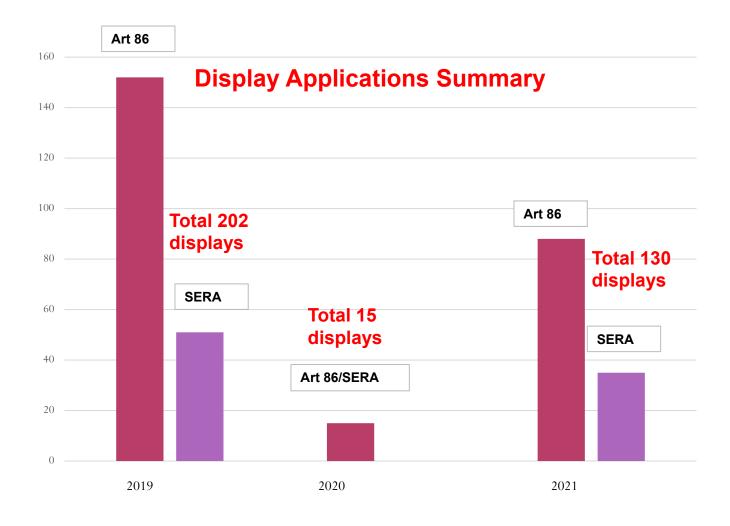


DS 21

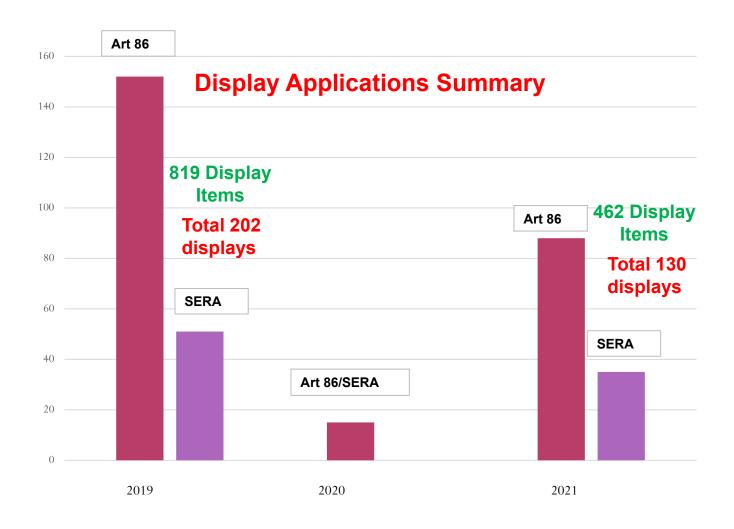
- Facts and Figures
- Post Event Feedback
- Assurance Visit Trends
- MAA report
- DS 21 Safety Survey
- Precis of Out of Season Work strands

Display Season 21









Display Season 21



- Safety Notice (SN)-2020/008 and 2021/010
 Display Flying Currency
- DS 21 Flying Display applications are at c60% of DS 19
- Number of items flown in DS 21 is at c56% of DS 19
- Smaller displays numbers similar to DS 19
- Larger Scale displays significant decrease with some sites adopting crowd caps
- Sea Front displays only 6 out of a usual 16 took place



Display Season 21Facts & Figures

8 FDDs Accredited 12 Revalidated 28 AFDD Accredited 5 New DAEs 1 DAE Retired

9 Occurrence Reports (MORs)



Most reported safety concerns



4 Mechanical malfunctions
0 Public



infringements



5 Airspace infringements



1 Drone activity/ infringements



51% Late applications

10% Applications <7 days

98% Applications processed

25% Permissions issued less than 14 days to the event



O STOP calls

10 'too close' calls
16 too low' calls

3 'terminate' calls

High

severity

occurrences

11
Assurance Visits conducted by the UK
CAA (8% of all displays)

98% of FDD reports considered of good quality

SRG 1305 Feedback



FDD/AFDD Post-Display Reports

- Post Event Reporting Process is now well established
- Common issues arising:
 - Poor engagement from SAG/Emergency Services at some events
 - SRG 1327:
 - Incomplete, inaccurate or late submission from DAs
 - Hazardous material info incomplete
 - NOTAM and RA(T) incursions:
 - Continue to be an issue and is being raised through CAA Infringement Coordination Group
 - Trends developing:
 - Early in the season a reoccurring incident was noted through the reporting and addressed
 - No ongoing trends noted

SRG 1305 Feedback



FDD/AFDD Post-Display Reports

2021 - Lessons Learnt

- SRG 1305 Post Event Report Feedback form needs to be more user friendly and allow for improved data and automatic capture
 - Online Dynamic PDF is being scoped
- Event Organiser changing layout at single item events and not informing AFDD
 - Discuss further at Pre Display Symposium EO Breakout Sessions
- Greater flexibility required in Permission content to reduce Last Minute Changes to permission



Display Assurance Visit

CAA visited 11 events

- Aim:
- Planning and delivery in line with CAPs
- Share Best Practice from events

'Good Practice' identified

- FDD/FCC pre-briefing, display minima, next item, division of responsibilities – who is monitoring what?
- Display Minima Briefing FCC know what to expect
 - Display Minima Briefing Sheet
- Production of clear Terms of Reference for the FCC
- Positive FDD / Display Pilot interactions pre-display
- Early designation of the Display Area (minimal avoids)



Display Assurance Visit

- Points Identified
 - FDD Briefing varied in quality and depth
 - Pilots Notes varied in accuracy, quality and depth
 - RAs/Maps CAP 403 guidance
 - Not all FDDs use a Display Minima Briefing Sheet



Post Season Symposium

9 Nov 21

Wing Commander Ben Smy

DSA-MAA-Display@mod.gov.uk



Key Takeaways from 2021

- New Regulation issued Feb 2021 (MAA RA 2335) to align to CAA CAP 403
- Punctuated season with a paucity of events
- New techniques, practices, methodologies and approaches
 - Time to develop vs time for skill fade.
- Some updating of forms required! Always check "MAA RA 2335" via gov.uk
- Form 1 and 4 submission deadlines (and absence of forms).



MAA regulated events

	DS 17	DS 18	DS 19	DS 20	DS21
Military Regulated Flying Displays	46	43	34	22	30



Final MAA thoughts.....



DS21 Safety Survey

- 17 Questions
- Survey in 2018, 2019 and 2021
- Survey 2021 84 respondents an increase of 28 from 2019
- No significant trends noted



Some Comments from the Survey

FDDs and EOs should not schedule inappropriate or unrehearsed formations/scenarios in a display, just to circumnavigate the CAA charging structure. Furthermore, DA holders should not agree to them if uncomfortable with the aircraft or pilots they are flying with, or their ability to fly safely during the slot.

Making sure there is always a "margin", be it in minima, timing, performance etc. Open and honest reporting, a Just Culture.

Communicate, share information without fear or favour - there is no monopoly on wisdom and no safety in secrecy..

Familiarity with the regs, even basic ones, and also attitude towards completion of paperwork and other requirements

Make sure the FDD is fully involved in the planning and preparation of an air display and isn't just a figurehead and a name on the permission

To know their own display routine, be aware of what to do when things go wrong - and practice, practice, practice

Get out of the mentality of 'this is how we did it last year'

Display a greater degree of moral courage to do the 'right thing' when witnessing something that needs to be addressed.

- Civil Aviation Authority
- What do you consider to be the most significant actions EOs / AFDDs / FDDs / DAs / SAGs can take to improve air display safety......
- 4 Themes: Honest reporting, problems with 'old school' guys, better FDD briefings, simplify the regulations.

2019	2021
Open and honest reporting in a Just Culture so that people can learn from errors and mistakes without fear of retribution. I think that the civilian world is still well behind the military in this respect.	Foster an open and honest culture where people speak openly about their mistakes. I find there is an issue with the 'older generation' (in general) that they hold their mistakes close and are unwilling to share based on the culture when they were learning to fly be that in the military or civilian worlds.
Get rid of the regime of "old school" FDD's who pitch up on the day and know nothing about the site or event. V poor brief by FDD.	Get rid of the old boys network. I have displayed at events with excellent organisation, feedback and encouragement in a proactive manner, dealing with incidents in a pragmatic safe and well thought out manner. I have also displayed at a major event where the exact opposite is true.
Consistency of approach across safety related matters from presentation of documents (by DA holders) to common Pilot Briefing documents (by FDD's) for example.	Reporting and confronting deviance from accepted or regular practice. Comprehensive, clear briefing
Simplify the rules and reduce the size of the rule books. This way you have more chance of the display pilots properly reading and understanding them.	Cut out needless regulation, simplify the CAPs and focus on the basics of safe display flying.



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

2019	2021
The rise in the use of Drones/UAVs in the vicinity of display venues and the risk of MAC with an aero-system.	The biggest concern going into this year was the currency of display pilots and organisers. However, an outstanding attitude towards safety has been displayed this year mitigating this concern.
Some of the best pilots are the older ones but those responsible for supervision need to carefully monitor for any signs of slowing up or other age-related issues. Separately, any signs of over-confidence, arrogance or non-acceptance of criticism are warning signs.	My biggest concern are some people pushing the limits of the regulations, exploiting loopholes or seemingly ignoring the rules. The latter is in relation to pyro displays, my worry is through their exploits it will detract and cause further regulation and restriction for others who comply and prevent any further relaxation of the current rule set.
Pilots flying too many shows in a short period of time. Therefore, not having enough time to focus on the specific operating procedures for one specific site.	Too many no-fly. areas in what should be the display area
The lack of a just culture from the CAA. The CAA have demonstrated their resolve in the past to punish people for making mistakes, therefore nobody will talk to them any more and we don't all get the opportunity to learn from events that could prevent accidents unless you seek out the individuals involved if they and you are willing / comfortable.	Secret shoppers at displays causing distraction by hiding in hedges on display lines



 The Air Display organisations and people I worked with or observed during this year's display season......

	2018	2019	2021
	Agree/Strongly Agree	Agree/Strongly Agree	Agree/Strongly Agree
Have a strong safety culture	93.44	94.94	91.67
Rarely deviate from operating procedures, flying regulations or general flight discipline	85.25	92.85	89.29
Report all adverse incidents, near misses and issues encountered during a flying display	70.69	78.18	77.11
Operate a just culture where the reporting of safety violations, unsafe behavior or human error is encouraged	77.59	78.58	78.57



CAA - Precis of Out of Season Work

Paul Szluha





- Minimum change with clarifications and minor editorial amendments but with consideration of:
 - Low approach and go-around / touch and go
 - DA Minima off airfield
 - Radio Failure
 - Initial Consultation with FDFG and then Public Consultation





- FDFG Consultation of any significant changes is ongoing
- Public consultation: 14 December 2021 14 January 2022
- FDFG Review of Final of CAP 403 Ed 19
- Target publication date: 25 February 2022



CAP 1724 Edition 4

Minimum change with clarifications and minor editorial amendment but with consideration of:

- Aerobatic and DA category clarification
- Review Initial Issue DA requirements
- Output from DAE Seminar as required

In Consultation with DAEs



CAP 1724 Edition 4

- Public consultation: 19 January 2022 16 February 2022
- FDFG DAE Review early March
- Target publication date: 16 March 2022



LTP Display Practice review

- Clarification of DAE briefing requirement
- DAE Briefing sheet
- Clarification of what is required to be logged when LTP used.

To be discussed with DAEs at DAE Seminar in December



PYRO and Night Display Study

C10% of DS 21 Flying Displays were Twilight Pyro Displays:

- Increasing demand, combined with requests to display after Twilight
- GA & RPAS Unit seeks to commission a Formal Study in the use of airborne Pyrotechnics and its associated Flying Display parameters before and after twilight as defined in CAP 403.



PYRO and Night Display Study

- DRAFT Aim The study should engage with interested parties, current practitioners of night and pyrotechnic display activity and other DAEs, to provide summary recommendation/s on the suitability or otherwise of Flying Display activity with pyrotechnic activity before and after twilight, and any associated limitations or restrictions
- Report by 1 April 2022
- CAP 403 Ed 19 will be published as planned but reissued with an amended Chapter 16 once the Study is completed





- Currently Planning for:
- 14 Dec 21 FDD Revalidation Course Defence Academy Shrivenham
- 15 Dec 21 AFDD Course Defence Academy Shrivenham
 - Will now be an online correspondence course
- 15-16 Feb 22 FDD Initial Course Defence Academy Shrivenham
- Further Reval course being scoped for 1st qtr 2022



FDD Courses 2022

Clear Requirement to review FDD Course construct for 2022 onwards

- **2017/18** 127 FDDs
- 2021 46 current FDDs and 28 AFDDs
- 2022 Course needs to grow FDD Cadre and Revalidation in a more flexible manner, rather than one FDD Revalidation course each year



FDD Courses 2022

- FDD Course Consultation Paper will be distributed by the end of 2021
- Possibilities include:
 - Modular FDD Course to accommodate initial FDD and initial AFDD Accreditation
 - Followed by 'in the field' revalidation
- These are initial thoughts please contribute to the consultation paper or drop me an email



Break





SO2 Air Events - RAF Ceremonial & Air Events Team
Squadron Leader William McMiken BSc(Hons) RAF









- 2021- Achievements
- 2021- Challenges
- 2022- Team Availability
- 2022- Expectation







Civil Aviation Authority

- Requests(before cancellations)
 - 110 UK Display events
 - 40 Overseas events
- Achieved:
 - 60 UK Display events
 - 11 Overseas events
- All events that went ahead were accommodated









Civil Aviation Authority

- Dynamic Programme
 - Covid Cancellations
 - Short Notice Turnaround- Thank you CAA!
 - Weather!
- Balancing operational capability vs evolving requirement
- Expectation:
 - RAFAT viewed as a governmental "Brand UK" asset
 - Short Notice Availability







RAFAT 2021





- 37 Displays at 31 Events
 - G7 Summit Cornwall
 - Pacific Future Forum-Portsmouth
- 6 Overseas Display Events
 - Croatia
 - Estonia
 - Belgium
 - Poland
 - Malta
 - UAE

- 19 Flypast Events
 - D-Day
 - Queens Birthday
 - NAFD
 - EURO Final Wembley
 - Great North Run



BBMF 2021



- 33 UK Displays
- 1 Overseas Display Event
 - Czech Republic- Dakota
- 242 Flypast Events

- 759 Events planned
- 420 Events cancelled (Covid)
- 339 Events remaining
- 59 Lost to weather
- 5 Lost to Serviceability

• Achieved 81% of requests.







Typhoon 2021

- 19 UK Displays
 - 8 Civil Events
 - 7 Mil Events
- 5 Overseas Displays
 - Finland
 - Hungary
 - France







Chinook Display

- Bournemouth
- Jersey
- Guernsey
- 5 Mil Events
- 1 Overseas Display Event
 - Puma Static Slovakia











- Black Cats Wildcat Display
 - Bournemouth
 - Sidmouth
 - 1 Military
- 1 Overseas Display Event
 - Belgium- Sanicole







RAF Falcons 2021

26 UK Displays

- 2 Air Shows-
 - Midlands/ Duxford
- 9 Public (non air show)
 - F1 Silverstone
 - Balmoral Show NI
- 10 Military events

1 Overseas Display Events

France- Luxeuil Air Show







RAF Falcons 2022

- Large Ground Engagement Potential
- Smaller Jump Window
- Adaptable Display
- Reduced Display Charge





2022 Availability- RAF





- RAFAT
 - Full Season Jun-Sep inclusive
- BBMF
 - Full Season Jun-Sep inclusive
 - Lancaster, Hurricane and Spitfire
- Typhoon
 - Jun-Sep limited to 12 weekends
- Tutor
 - TBC
- RAF Falcons
 - May to Oct inclusive













2022 Availability- RAF



- F-35
 - Very limited availability for Role Demo/Flypast
- P8 Posiedon
 - Very limited flypast potential
- A400M/ C-17/ Voyager
 - Operationally focused
- C130 Hercules
 - OSD 2023
 - TBC on 2022 availability







2022 Availability- JHC







- Chinook Display
 - Still TBC
- Apache Display
 - Still TBC
- Puma
 - Limited availability for static
- Confirmation by March





- Black Cats Wildcat Solo Display
 - Available Jun-Sep
- Wildcat Statics
 - Limited Availability
- Merlin Statics
 - Limited availability
- Confirmation by March







2022 Expectations





Requests

- 105 UK Display events
- 32 Overseas Display events

Priorities:

- "Building Back" and "Levelling Up"
- Queen's Platinum Jubilee Events
- Commonwealth Games

First cut

almost all events will have Mil display representation.





British Air Display Association (BADA)



Matt Wilkins - Chairman



Bournemouth Air Show

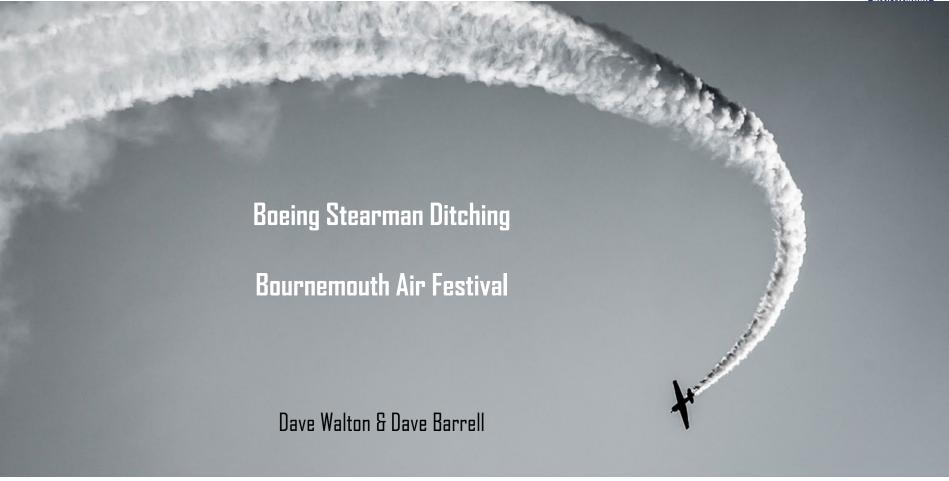
- FDD Dave Walton
- DA David Barrell
- 4 September 2021

















Scope

Background and Bournemouth Air Festival Information

Sequence of Events

Actions and Decision Making
Display Pilot
FDD & FCC Team

Learning & Thinking Points

Questions







Background and Bournemouth Air Festival Information

- Rournemouth Air Festival
- 4 day Tier 3 seafront airshow held between Boscombe and Bournemouth Piers
- Traditionally attracts very large crowds in the event space 670,000 in 2021
 - Crowd located on the beach, and also on the road on the clifftop
 - Also large numbers of people along the beaches to Christchurch and Sandbanks
- Daytime flying display from 1300-1700
 - Dusk show
- Flying Display team of 8
 - FDD
 - FCC/Deputy FDD x2
 - FCC x4
 - A/G Operator x1
- · Flying display team located on top of the cliffs







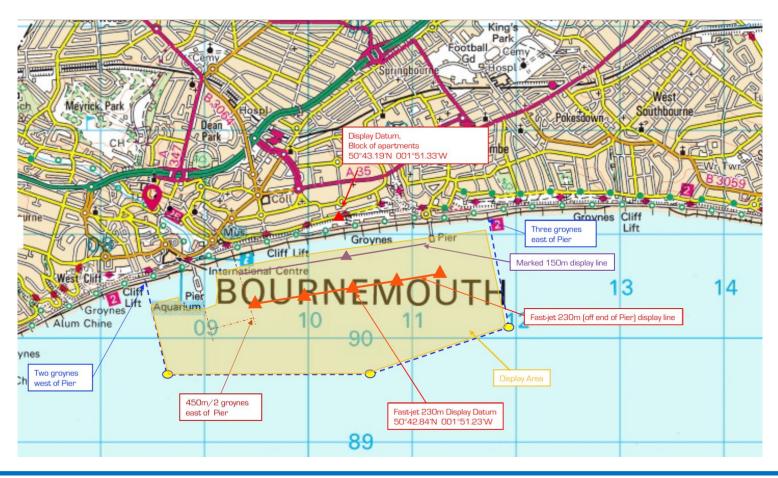
Marine Safety

- Advisory Maritime Safety Zone which also forms the display area
- Primary Safety boat plus RHIBs and jetskis
 - Policing the MSZ for infringing vessels
 - Maintaining the integrity of the MSZ by managing moorings of pleasure craft





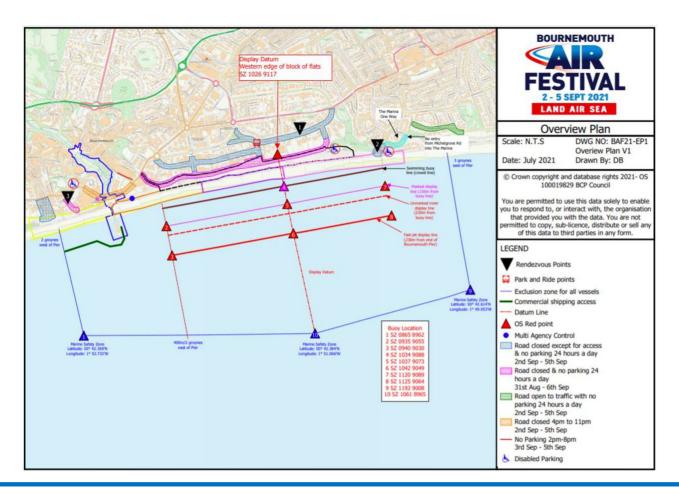


















Aerosuperbatics Wingwalking Display

- 2x Boeing Stearman biplanes
- Wingwalkers secured to a swivelling rig on the top wing
- Formation and opposition manoeuvres







Sequence of Events











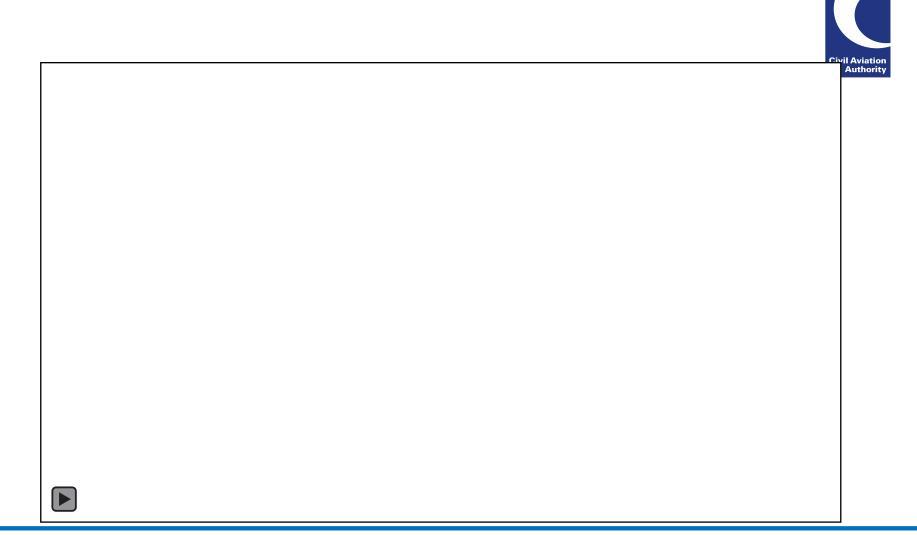








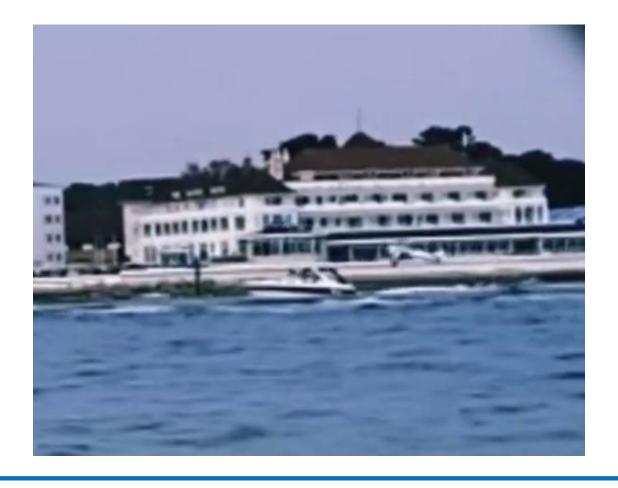








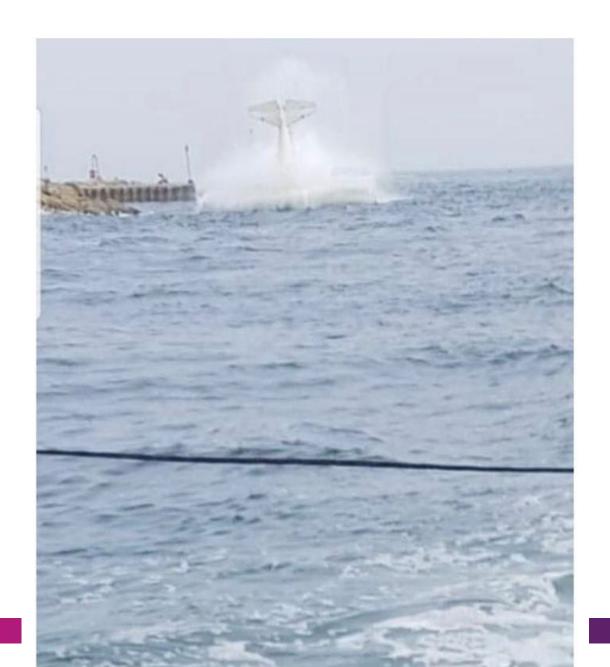




























Actions and Decision Making

Display Pilot Perspective







Actions and Decision Making

FDD perspective

- Bournemouth Multi Agency Control
- Coastguard Liaison
 - Fed into MAC for response
- Log keeping & notifications
- Confirmation of rescue, notification and stand down of response
- Reporting
 - AAIB
 - Logs
 - SMS
 - Witness statements and recollections as required







Actions and Decision Making

	04 / 09 / 21. BOURNEMOUTH
	SOMEODE IT
1519	BOURNEMONTH ATC CALLED LITTH REPORTS OF A DRONE OPPLATING
	IN VICINITY OF ST LEWINDS (NEAR MINER ARTHER). ASSESSED TO BE NO
	FACTOR TO RAFAT RECOVERY POWER AWARE AND DEALING WITH THE
	INCIDENT.
1545	LINGLAMERER I CAUS A ROWN RUNNING ENGINE DURING DISPLAY. DISPLAY
	IS TERMINATED BY WINDSWALKER AND THEY DEPART THE DISPLAY AREA TO
	THE WEST.
1546	WINGWALKER 1 REBERS ENGINE FAILURE AND POINTS NORTH
1547	WING WALKER I SEEMS TO RECOVER AND THENS WEST TOWARDS POOLE HARB
1549	SMOKE SEED FROM WHITE AIC (LINDWALKERS) IN DISTANCE CONTSIDE OF
	DISPLAM ARKA. "COMPRETE LOSS OF PONTA" CALLED BY WASWARKED I ON
	Boursepoury rowfor folia.
1549	MAYDAY CALL MASK BY WINGWALKER 2 ON BOURNEMONTH TOWER FIRE.
	REPORTED THAT " WASHARKER I IS DOWN". FOR WAGEE TO SEE THE AIC.
1551	WINGLOCK 2 REPORTS THAT WINGWALKER I ALC MAS SUNK IN POOLE 4
	BOATS ALE IN ATTENDANCE. CONST GUARD IS INFORMED.
1556	DANE RARRELL'S WIFE (DIAMA) ARRIVES AT FLYING CONTROL AND RECEIVES
	CALL FROM HER HUSSAND TO SAY THAT BOTH HE ; THE WINGLACKED
	(KIRSTEN POBJOY) HANT GET RECOVERED FROM THE WATER AND ARE NO
	INSWED.
1620	AMB NOTHED VIA DET ONLY LINE DUTY OFFICER
1625	TELEPHONE CALL FROM DAVE LAWT (MARBOUR MASTER) TO ADVISE THAT TO
	A/C HAT BEEN LOCATED AND IS NO DANGER TO NAVIGATION OR THE POSIT
	FHERY COTO CONERACK OF THE CLASH IS AVMILLABLE.
1636	AGIS CONFRM THAT THEY WILL NOT DEPLOY TO THE HEIDERT. ARE RECO
	CAN PROCEED MR BY POLICE + COASTOURARD.
1651	ALL REMAINED FLYING DISPLAY ACTIVITY CANCELLED FOR THE REMAINSON OF
	DAY, ALL RELEVANT PROMES 1460PMED



Actions and Decision Making

FDD perspective

- Cancellation decision
 - Fuel
 - Airport/ATC
 - Other display crews
 - Event Staff
 - Emergency Services







Learning & Thinking Points

Display Pilot/Team Perspective

- Laminated contacts cards
- What went well? What didn't?







Learning & Thinking Points

FDD/Event Perspective

- Work & meeting locations
 - Locations
 - Distance between
 - Transport?
- Family liaison
- Multi Agency planning meetings, SAGs and table top exercise provided great preparation
 - Value of direct contacts and knowing ES colleagues
- Pilot paperwork:
 - NOK contacts
 - Hazardous information details















Flying Display Focus Group

The purpose of the FDFG is to assist the CAA in the development of Flying Display policies, procedures and guidance in order that due attention is given to the areas of interest or concern in a collective effort to maintain and improve safety at Flying Displays, for Flying Display participants, and the general public.





Flying Display Focus Group

- Cross Section Representation from the Display Community:
 - 5 DAE
 - 13 DAs
 - 11 FDDs
 - EOs
 - More DAEs are always welcome



Tyro DA on Permission

Review Display Permission wording to pre-authorise Tyros DAs to allow flexibility to FDDs without recourse to the CAA for a change in the Permission

Agreed - all 2022 permissions will pre-authorise Tyro Displays up to the appropriate number for that Tier



- CAA AR Ops Brief on RA(T)s Submissions:
 - Timeline is predicated upon ensuring all interlocutors get time to have an input into the application for a RA(T)
 - DFT will ultimately decide on whether a RA(T) is issued
 - Applicant to ensure all info, particularly on display items is detailed
 - AR Ops will ensure that early engagement takes place should there be a possibility that the RA(T) is not to be issued



- SSAC restriction of operation at Air Displays
 - Request from a number of SSAC operators to conduct SSAC activity on the same day as a flying display
 - Follow-on internal discussion Policy Change and SSAC Exemption will be amended to say:

No SSAC flight shall be conducted on the same day as a Flying Display at the same location except when the operator has conducted a specific risk assessment identifying and mitigating any significant changes. The SSAC pilot(s) must not be actively involved in the Flying Display.



- Discussion around the requirement to adhere to SERA outside a display area
- Review of the requirement to adhere to SERA with no derogation outside of a display area, meaning a minimum of 500ft even if over the sea. This is significantly more restrictive than normal UK rules of the air.
 - Flying Displays were removed from the scope of General Permissions concerning Exceptions to SERA minimum height requirements, in particular ORS4 No. 1174, following publication on 10 March 2016 of Air Accidents Investigation Branch Special Bulletin S1-2016.



ORS4 No. 1174 has now been superseded by ORS4 No. 1496 which further clarifies minimum heights applicable at Flying Displays.

Agreed: FDD/AFDD Options included:

- Larger display areas
- The use of additional display areas (e.g. Area B)
- Suitable mitigation for features within a display area (minor road etc)

Forward Look - Priorities



- Adjustment of SRG 1305 FDD Event Reporting Form
- Review 2022 FDD Course construct
- Given the hiatus in face-to-face engagement re establish attended Symposia events
- Deliver CAP 403/1724 as per schedule
- Facilitate PYRO and Night Display Study
- Continue with the timely production of Display Permissions

How you can help



- Please engage with the CAP Consultation process
- In 2021:
 - 51% of applications arrived with less than 42 days to go
 - 10% arrived with less than 14 days to go
 - It is accepted that COVID affected normal planning cycles
- Every expectation is DS 22 will be a full Display Season
- Please submit your application with at least 42 day to go to the event, with RA. Map and Schedule of Items (if applicable).

I then undertake to get the permission to you by 14 days to the event.



..... and finally

- Pre-Display Symposium
 - 23/24 March 2022 At Defence College Shrivenham

- You can email me on Paul.sall@caa.co.uk at any time
- I look forward to working together with you so that we can all achieve a safe and effective DS 22.



Questions

GA@caa.co.uk

paul.sall@caa.co.uk