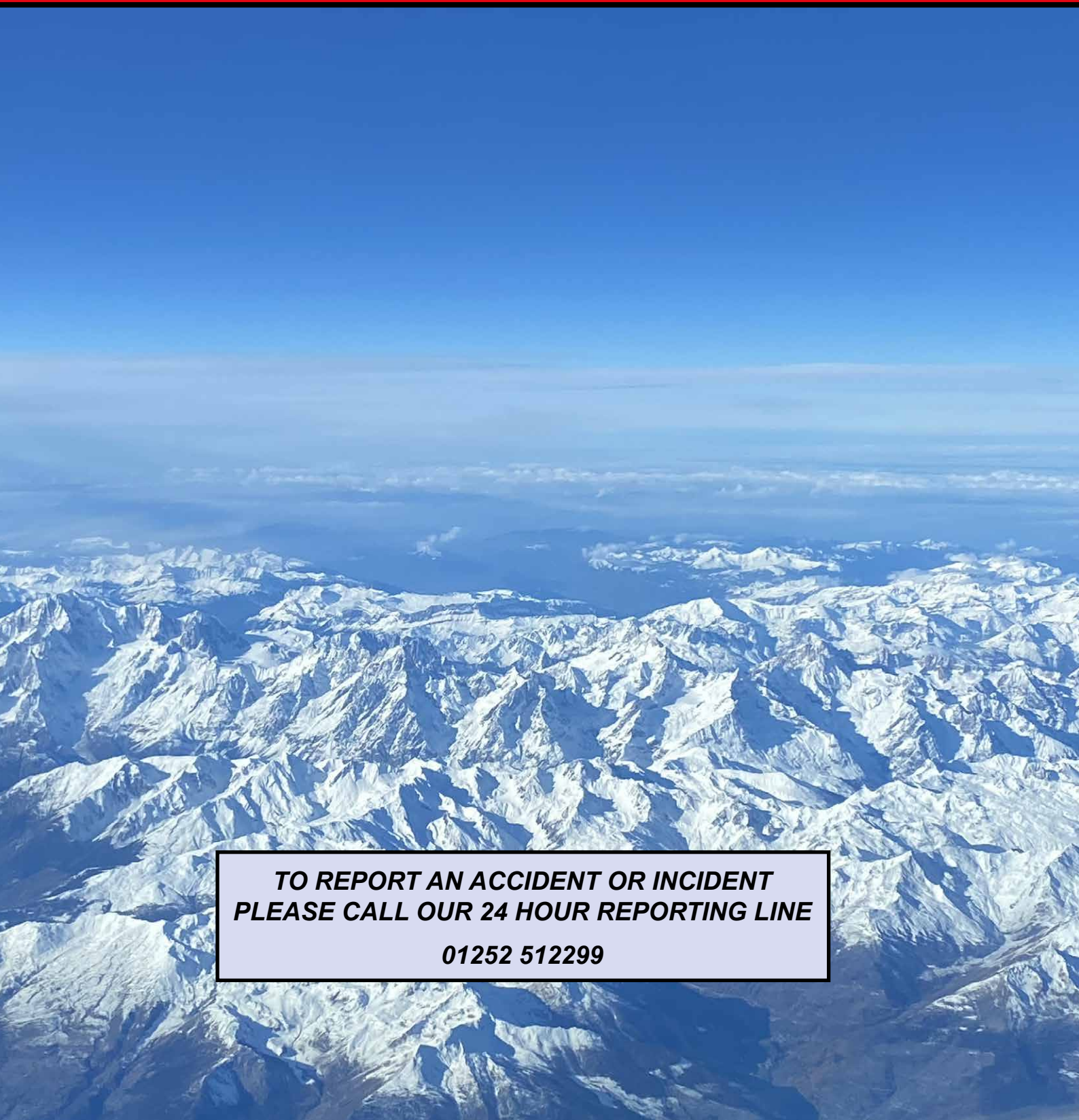
AAIB
Air Accidents Investigation Branch

AAIB Bulletin 5/2023



TO REPORT AN ACCIDENT OR INCIDENT
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(ALL TIMES IN THIS BULLETIN ARE UTC)

AAIB Correspondence Reports

These are reports on accidents and incidents which were not subject to a Field Investigation.

They are wholly, or largely, based on information provided by the aircraft commander in an Aircraft Accident Report Form (AARF) and in some cases additional information from other sources.

The accuracy of the information provided cannot be assured.

SERIOUS INCIDENT

Aircraft Type and Registration:	Airbus A350-1041, G-XWBL
No & Type of Engines:	2 Rolls-Royce Trent XWB-97 turbofan engines
Year of Manufacture:	2021 (Serial no: 547)
Date & Time (UTC):	22 January 2023 at 0519 hrs
Location:	In flight over the coast of North Africa
Type of Flight:	Commercial Air Transport (Passenger)
Persons on Board:	Crew - 15 Passengers - 323
Injuries:	Crew - 1 (Serious) Passengers - None 1 (Minor) 13 (None)
Nature of Damage:	No damage reported
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	56 years
Commander's Flying Experience:	21,594 hours (of which 1,422 were on type) Last 90 days - 199 hours Last 28 days - 85 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and flight data analysis by the aircraft manufacturer

Synopsis

The aircraft entered unexpected turbulence during the cruise. A member of cabin crew in the galley was lifted off their feet and when they fell back to the floor they injured their shoulder and hip. A second cabin crew member received a minor cut from fragments of a cup dropped by the original cabin crew member when they fell.

History of the flight

While in the cruise at FL360/M0.85, with autopilot engaged and passenger seatbelt signs off, the aircraft encountered unexpected turbulence. The flight crew immediately switched the seatbelt signs on, but the turbulence event came and went very quickly.

As a precaution, even though there were no more instances of turbulence, the seatbelt signs were kept on until the cabin crew confirmed to the commander that the cabin was secure. At this point, he was also informed that two of the cabin crew had been injured as a result of the turbulence. The most severely injured person had been drinking a cup of tea when the turbulence started and was moving to the galley sink to dispose of it when the severity of the aircraft's motion lifted them off their feet. They then fell to the floor, suffering injuries to their shoulder and hip as a result. One of the other cabin crew members received a minor cut to their ankle caused by fragments from the ceramic cup which had shattered after being

dropped by their falling colleague. Having taken medical advice, the commander elected to continue to the planned destination where the seriously injured crew member was taken to hospital. It was later established they had sustained a badly bruised shoulder and two pelvic fractures.

Recorded information

Analysis of flight data recordings confirmed that the turbulence event lasted for 20 seconds, during which the vertical g loading varied between 0 G and +1.47 G. The aircraft's speed briefly reached a maximum of M0.892, with the time above M_{MO}[1] (M0.89) being less than one second. While the speed was above M_{MO} the Master Warning sounded but the maximum Mach reached did not activate the M_{MO} warning (trigger threshold M0.896). The aircraft's altitude varied between 35,950 ft and 36,080 ft, with a vertical speed variation of between +1,100 ft/min and -1,460 ft/min. The autopilot remained engaged throughout the event. Post-flight data analysis confirmed no load exceedances had occurred during the event.

Commander's observation

While it would not have prevented the crew member being injured walking to the sink to dispose of their hot tea, the commander commented that this event was a reminder, to passengers and crew alike, that unexpected turbulence is a normal operating hazard and wearing seatbelts when seated is a sensible precaution, even if the seatbelt signs are not illuminated.

Footnote

[1] Maximum operating Mach number.

SERIOUS INCIDENT

Aircraft Type and Registration:	AW109SP, G-TAAS
No & Type of Engines:	2 Pratt & Whitney Canada PW207C turboshaft engines
Year of Manufacture:	2013 (Serial no: 22305)
Date & Time (UTC):	12 August 2022 at 1051 hrs
Location:	Cardiff
Type of Flight:	Commercial Air Transport
Persons on Board:	Crew - 1 Passengers - 4
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	None reported
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	59 years
Commander's Flying Experience:	13,700 hours (of which 40 were on type) Last 90 days - 46 hours Last 28 days - 6 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

The helicopter landed at a hospital elevated helipad that was not prepared with fire cover and traffic management because the hospital was not aware of its imminent arrival. The message reporting the departure was sent too late and using an unreliable communication method. The method for pilots to visually confirm the helipad was ready during the approach was not emphasised in the site-specific procedures provided by the hospital and the operator. The operator has taken action to improve communications and review the procedures for all elevated hospital helipads it uses.

History of the flight

The purpose of the flight was to position medical personnel from a Bristol hospital to one in Cardiff, to collect a patient for transfer to a hospital in Plymouth.

A staffed 'airdesk' facility managed task requests, flight following and operational booking for the helicopter. The pilot was required to communicate with the airdesk staff who would then coordinate with the hospitals involved. The Cardiff hospital was aware of the planned transfer and an estimated time of arrival of the helicopter, and the procedure required the airdesk to inform them when it was enroute.

At Bristol, the medical personnel were ready quicker than expected and the flight departed earlier than planned, at 1039 hrs. Shortly after the helicopter took off, one of the passengers

used a messaging app to inform the airdesk of the departure. The message was not received until 1052 hrs, after the helicopter had landed, so the airdesk did not inform the hospital that the helicopter was en route.

The flight was conducted in bright sunlight with good visibility and no cloud. The wind was from 070° at 13 kt. The pilot approached from the south-west and reported that from this direction a building obscured the view of the helipad until the landing decision point, but the site was observed to be clear during the pre-landing recce.

The helicopter arrived at 1051 hrs, nine minutes before the initial estimated time of arrival. As it reached a hover over the helipad one of the passengers noticed the pad lights were off and the required two firefighting personnel were not present. The pilot judged that it was safer to land from the stable hover than to go around, so proceeded with the landing.

Aerodrome information

The helipad at the Cardiff hospital is 30 m in diameter and 30 ft above ground level. It is an elevated site that requires firefighting personnel to be present during landings. The hospital procedure also requires pedestrian and traffic management during helicopter movements. At this site, the presence of lights turned on at the helipad is the primary cue for pilots to confirm that the site is available and prepared for a landing.

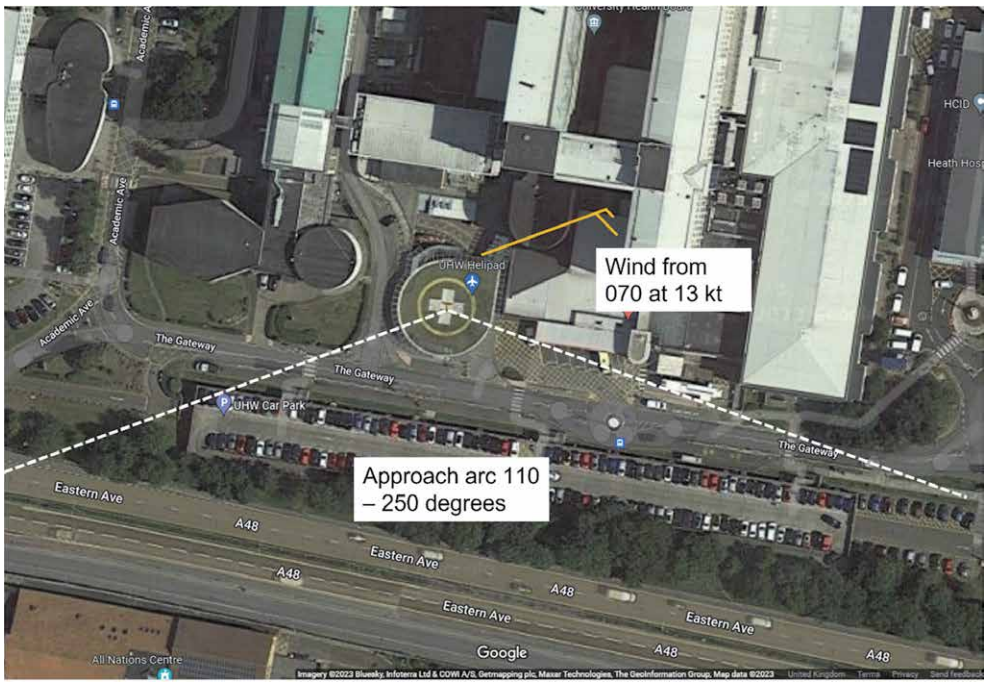


Figure 1

Aerial view of the Cardiff hospital helicopter landing site

Other information

Neither the hospital procedure nor the operator's survey document for the site explicitly instructed pilots to confirm the landing site was prepared with the appropriate fire cover or

what cues to use to confirm this. However, the operator's Flying Staff Instruction for the use of elevated Final Approach and Take Off areas (FATOs) did state that pilots must ensure, on arrival by air, that the site is either clearly manned or has its lights turned on. The operator commented that pilots require specific training and assessment to land at elevated helipads, and looking for lights or firefighters' helmets is standard procedure for any such landing.

The hospital's representative commented that there was close liaison between the hospital and the local air ambulance operator, but that the hospital did not have a relationship with other operators outside Wales who might use the helipad. The hospital's representative was not aware how hospital procedures could be disseminated to all potential operators.

The operator's expectation was that the pilot or passengers would communicate with the airdesk verbally by mobile phone. However, use of the messaging app was described as common practice.

Analysis

The communication method used was not reliable for use in the air, resulting in the departure message not being received until after the helicopter had landed. This degraded safety, because no firefighting service was available at the helipad, and vehicle and pedestrian movements in the vicinity were not controlled as required by the procedure.

During the recce and approach, the pilot did not confirm the landing site was ready as required for an elevated helipad. This requirement and the method for doing so was specified in the operator's Flying Staff Instruction for elevated FATOs but was not emphasised in the hospital or operator's site-specific procedures. The pilot did not realise the helipad was not ready until in a stable hover ready to land, and decided to continue with the landing because he considered this was safer than going around.

The event shows the importance of effective collaboration between hospital trusts and operators to ensure that the specific safety requirements and procedures for each hospital landing site are clearly communicated to pilots. However, there is currently no convenient mechanism for this and it requires each operator to engage with the owner of each potential landing site and each landing site owner to identify and engage with each potential operator.

Conclusion

The hospital elevated helipad was not prepared because the message informing the airdesk of the departure was sent too late and using an unreliable communication method. The pilot did not confirm the site was prepared during the approach and the requirement to do so was not emphasised in site-specific procedures.

Safety actions

Following the occurrence, the operator reviewed all elevated FATO surveys and stated that it intends to reissue them with specific guidance for each site, subject to communication with the hospitals.

Accident

Aircraft Type and Registration:	Dornier Do 28A-1, N123CA	
No & Type of Engines:	2 Lycoming O-540-A1D reciprocating engines	
Year of Manufacture:	1964 (Serial no: 3051)	
Date & Time (UTC):	26 November 2022 at 1430 hrs	
Location:	Spanhoe Airfield, Northamptonshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers – None
Nature of Damage:	Left wing slat dented, right elevator and horizontal stabiliser tip damaged	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	79 years	
Commander's Flying Experience:	4,470 hours (of which 450 were on type) Last 90 days - 6 hours Last 28 days - 1 hour	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries made by the AAIB	

Synopsis

The pilot briefly lost directional control of the aircraft during a crosswind landing in gusty conditions, resulting in the aircraft leaving the side of the runway. The pilot regained control and aborted the landing, during which the aircraft clipped some saplings as it climbed away. A functional check of the flying controls demonstrated no controllability issues, and the aircraft was flown back to the departure airfield. A post-flight examination of the aircraft by the pilot revealed damage to the left wing, right elevator and horizontal stabiliser.

History of the flight

Following a fight from Old Warden to land at Spanhoe – about 30 nm to the north-west – the pilot, before making an approach to land, circled the airfield to check the windsock was consistent with earlier forecasts of wind from 190° at 12 kt gusting 18 kt. The wind was across both of Spanhoe's unlicensed runways so the longer 700 m concrete Runway 27 (originally a taxiway) was chosen.

A long approach was made with the aircraft crabbed left into wind – there was no indication of any gusting. The pilot flew a tail-low wheeler landing, applying power on the upwind (left) engine to help yaw the aircraft onto the runway heading. The landing was slightly long. Just as the power on the left engine was reduced – with the aircraft passing a gap between buildings and hangars on the left – a "violent" gust lifted the left wing. The pilot applied

maximum aileron to lower the wing and right brake to keep the aircraft on the runway. However, the aircraft turned left through about 25° and veered off the runway onto the grassed area used for parking aircraft and vehicles. The application of full power on the left engine "did little to arrest the swing". Ground looping the aircraft "was not an option due to space available and parked vehicles", so the pilot initiated a go-around during which it was noted that the left wing had clipped some saplings adjacent to the hangars.

Once airborne and at a safe height (and under the watchful eye of the passenger who was also a pilot), the pilot checked the flying controls, including flaps. Establishing these were functioning correctly they returned to Old Warden for an uneventful landing, into wind, on Runway 20. A post-flight examination of the aircraft by the pilot revealed damage to the left wing and right elevator and horizontal stabiliser.

Pilot's comments

The pilot, in his assessment of the cause, noted that the safety lesson he had learned from this event was to be prepared and "expect the unexpected when least expected".

SERIOUS INCIDENT

Aircraft Type and Registration:	Reims Cessna F406, G-RVLY
No & Type of Engines:	2 Pratt & Whitney Canada PT6A-112 turboprop engines
Year of Manufacture:	1988 (Serial no: F406-0034)
Date & Time (UTC):	23 November 2022 at 0656 hrs
Location:	8 nm southwest of Isle of Man Airport
Type of Flight:	Commercial Air Transport (Cargo)
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	None
Commander's Licence:	Commercial Pilot's Licence
Commander's Age:	50 years
Commander's Flying Experience:	3,068 hours (of which 516 were on type) Last 90 days - 63 hours Last 28 days - 25 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB

Synopsis

Whilst descending towards the Isle of Man the aircraft encountered severe turbulence which resulted in significant uncontrolled climbs and descents. The aircraft descended to 1,200 ft above the ground before the pilot was able to regain control and climb away.

Isolated severe turbulence was forecast in the area. This information did not preclude the flight or the start of an approach.

History of the flight

The pilot was operating a cargo flight from East Midlands Airport to Isle of Man Airport and was scheduled to land at approximately 0700 hrs. An occluded front was forecast to pass the Isle of Man around this time. The climb and cruise were uneventful with only light turbulence at FL100. During the cruise the pilot received the 0620 hrs Isle of Man ATIS indicating Runway 08 was in use, surface wind from 120° at 26 kt, visibility 7 km in rain, clouds few at 500 ft and broken at 700 ft, temperature 9°C and sea level pressure of 977 hPa[1].

Footnote

[1] The QNH changed to 976 hPa at 0639 hrs.

The pilot was cleared to descend to FL80 and then to 3,000 ft amsl. He recalled that the turbulence intensity increased in the descent. During the descent ATC gave the pilot an updated weather report with surface wind now from 140° at 30 kt and visibility 3,000 m in heavy rain. As the aircraft approached 3,000 ft the pilot reported that the autopilot was struggling with the turbulence and was making large control inputs. At 3,000 ft the autopilot disengaged, and the pilot took manual control. However, as he routed to the south of the airport, the turbulence intensity increased to the point that he was struggling to remain within 300 ft of the cleared altitude. At 0656 hrs the pilot told ATC it was "rough as hell" and ATC offered climb or descent. The pilot asked to climb and was cleared to climb to FL60.

Radar showed the aircraft at 2,400 ft amsl when the cleared altitude was 3,000 ft. The controller saw the aircraft leave its assigned heading and start a turn to the right and could see large variations in altitude with a descending trend. The pilot recalled that he was experiencing negative g and remembered seeing the vertical speed indicator rapidly changing between 3,000 fpm climb and 3,000 fpm descent. At 0658 hrs the pilot told ATC he was "really struggling" and ATC replied that he could take "any heading you like". The pilot reported that the airspeed was not fluctuating much but the stall warning was sounding intermittently. At one point there was a marked wing drop and the controls became "sloppy" so the pilot flew a stall recovery.

The aircraft reached a minimum altitude of 1,200 ft amsl approximately 2 nm to the south south-west of the airport. Shortly afterwards, at approximately 0700 hrs, the pilot reported that he was now able to maintain a climb. By this point, the aircraft was flying away from the airport. It was in IMC throughout the incident.

ATC asked the pilot if he would like to make a second approach or divert, and the pilot decided to divert back to East Midlands Airport. The return flight was uneventful. After landing the aircraft was inspected but no damage was found.

The pilot reported that during the turbulence encounter he experienced tunnel vision, which he thought was due to the g forces he encountered. He said he was "fighting it" through the encounter "one moment pulling then pushed the next" and was struggling to complete a full recovery process between the oscillations. However, he felt the UPRT[2] training he had received helped him fly the aircraft safely out of situation.

Recorded information

A recording of the radio transmissions between the pilot and Isle of Man ATC was obtained and used to confirm the history of flight.

Figure 1 was created from radar data and shows the altitude variation as the pilot flew through the turbulence.

Footnote

[2] UPRT - upset prevention and recovery training – the objective of which is to understand how to cope with the physiological and psychological aspects of dynamic upsets in aeroplanes; and to develop the necessary competence and resilience to be able to apply appropriate recovery techniques during upsets.

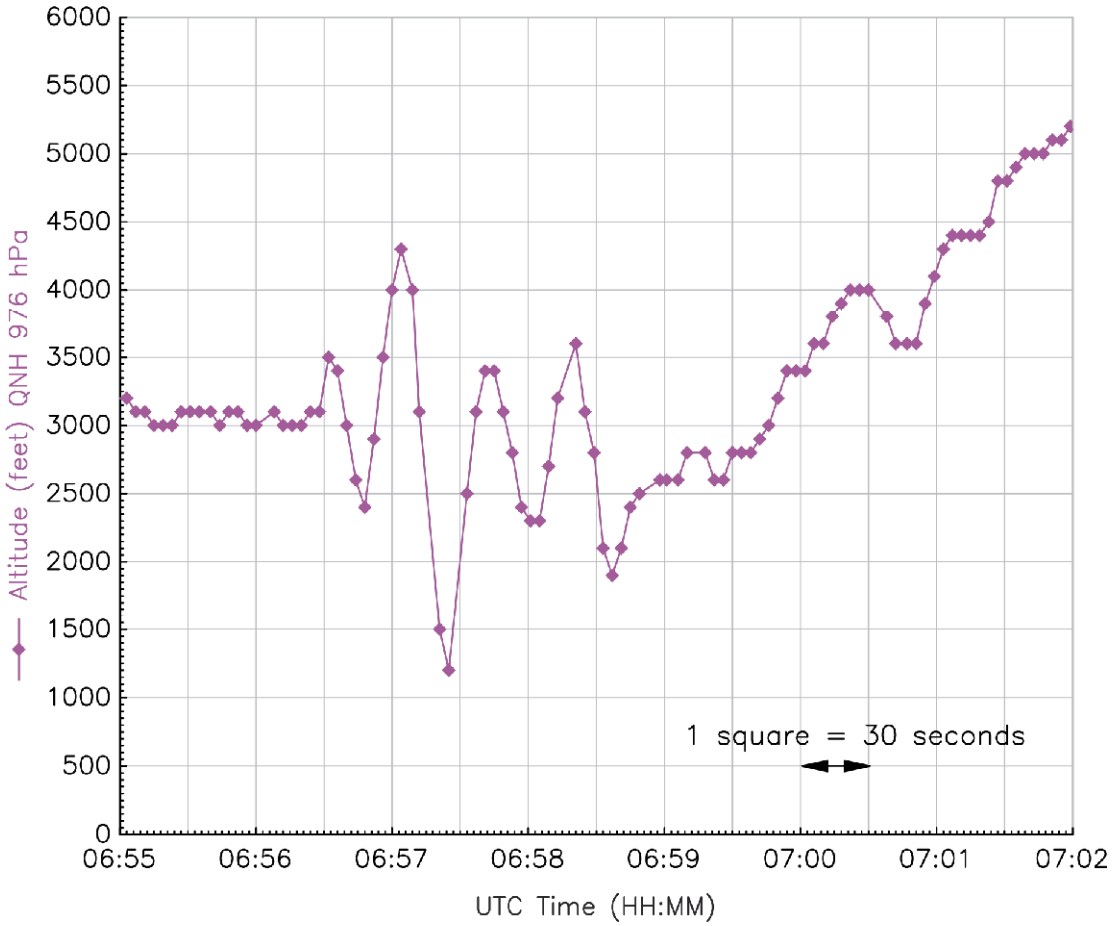


Figure 1

Plot of altitude variation from radar data during the turbulence encounter.

Aircraft information

The Reims Cessna F406 Caravan II (F406) is a twin turboprop aircraft with a maximum takeoff weight of 4,468 kg. The aircraft was not fitted with weather radar or any windshear detection equipment.

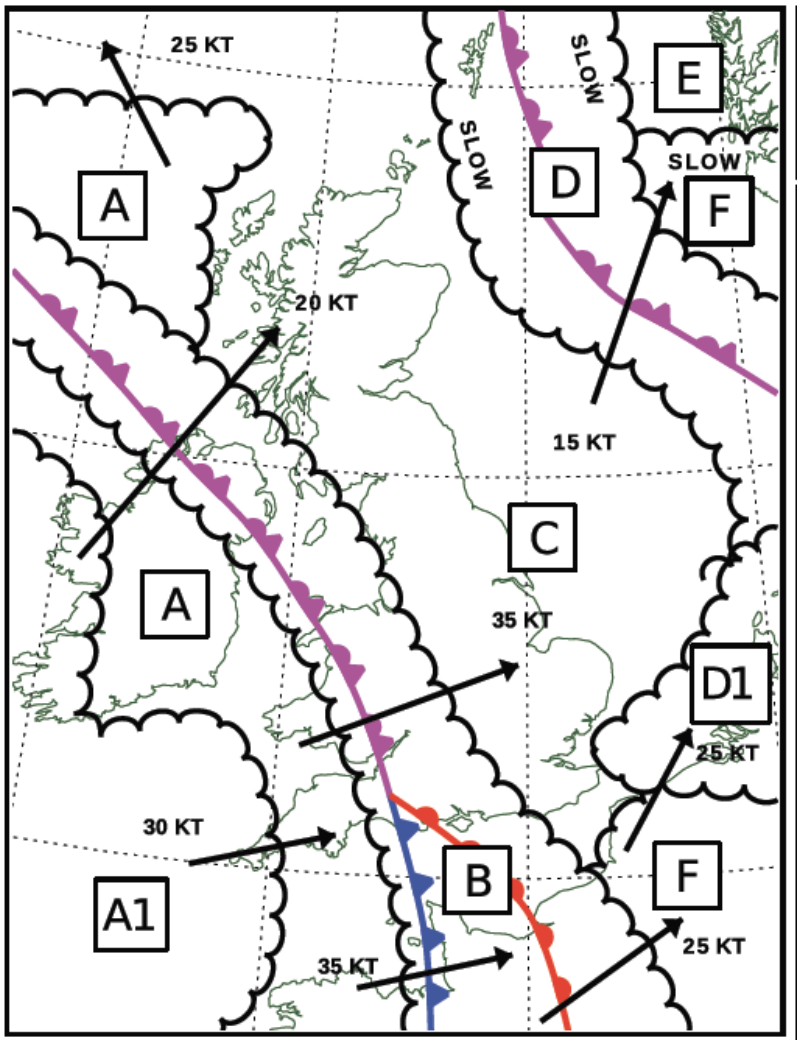
Meteorology

Forecast

The pilot received a briefing pack before the flight which contained METARs and TAFs relevant to the route, and the Met Office F215 and F214 together with other flight planning information. The pack contained the following forecast information for the Isle of Man:

TAF 230500Z 2306/2315 13025G37KT 7000 RA FEW005 SCT008 BKN015
BECMG 2306/2309 24022KT 9999 NSW FEW008 SCT020
TEMPO 2306/2308 4000 +RA BKN005 PROB30
TEMPO 2309/2315 7000 SHRA
BECMG 2309/2312 21018KT

Figure 2 shows the Met Office Form 215 which was included in the briefing pack. The chart shows the occluded front tracking across the Irish Sea. The Isle of Man is in Area B. The forecast suggests there would be isolated heavy rain squalls with visibility reduced to 1,200 m, and occasional moderate turbulence and isolated severe turbulence associated with the cold front and occlusion.



AREA	SURFACE VIS AND WX	CLOUD	0 C
B	20 KM NIL/-RA WDSPR 7 KM RA/-RADZ ISOL (OCNL FRONTS) 3000 M +RA/RADZ ISOL 1200 +RA SQ OCCLUSION AND ... ... COLD FRONT OCNL ∧ (ISOL ⅄ OCCLUSION AND ... .. COLD FRONT) OCNL HILL FG	BKN/OVC AC AS ⅄ ∧ 070 / XXX BKN/OVC CU SC ⅄ ∧ 015-025 / 070 OCNL SCT/BKN ST 007-012 / 015 ... ... (LCA 003-005 WARM FRONT AND ... ... WARM SECTOR)	040-050 N 050-070 S

Figure 2

Extract from the Met Office F215 valid on the 23 November between 0200 hrs and 1100 hrs (front positions valid at 0600 hrs)

Actual Weather

Table 1 shows the actual weather reports that were issued at Isle of Man Airport around the time the pilot experience the turbulence.

By 0729 hrs the wind had changed to 230° at 17 kt.

Figure 3 shows a radar image taken at 0630 hrs. The bright colours indicate significant precipitation along the frontal system.

Time	Wind	Visibility	Weather
0639 hrs	130° at 27 kt	3,000 m	Heavy Rain
0650 hrs	130° at 29 kt	7,000 m	Rain
0657 hrs	130° at 28 kt gusting 38 kt	7,000 m	Light Rain
0700 hrs	130° at 27 kt gusting 38 kt	6,000 m	Rain
0707 hrs	130° at 28 kt	4,000 m	Rain
0710 hrs	130° at 28 kt	4,000 m	Heavy Rain

Table 1

Extracts from the METARs and SPECIs[3] weather reports issued by Isle of Man Airport

Met Office review

The Met Office suggested that one indicator of a very active frontal system is the presence of a significant change in wind direction as the front passes. This windshear can result in severe turbulence being encountered, which is one of the reasons severe turbulence was forecast on the F215. The large directional change forecast and observed between 0600 hrs and 0900 hrs with relatively strong winds indicates there was likely to be severe turbulence.

The radar image (Figure 3) showed the rear edge of the rain band was very near to the Isle of Man at 0630 hrs. It shows some very bright colours in the area, as well as along most of the front, indicating heavier rainfall and a very active frontal system.

A CAA meteorologist advised that the inclusion of 'squalls' on the F215 was unusual and was an indication of the potential for significant turbulence. A squall is defined in CAP 746[4] as:

> *'A strong wind that rises suddenly: that is by at least 16 knots, increasing to 22 knots or more, and sustained for at least one minute, then dying away quickly; distinguished from a gust by its longer duration. A squall is associated with violent convective activity and the passage of active cold fronts. In the*

Footnote

[3] A SPECI is a type of METAR that is issued when there has been a significant change to the weather reported in the most recent METAR.

[4] CAP 746 - 'Meteorological Observations at Aerodromes', section 7.2.26, available at www.caa.co.uk [accessed March 2023].

latter case, typically squalls occur along the line of the front, accompanied by a veer in wind, a sharp fall in temperature, a rise in relative humidity and the appearance of a roll shaped cloud with a horizontal axis.'

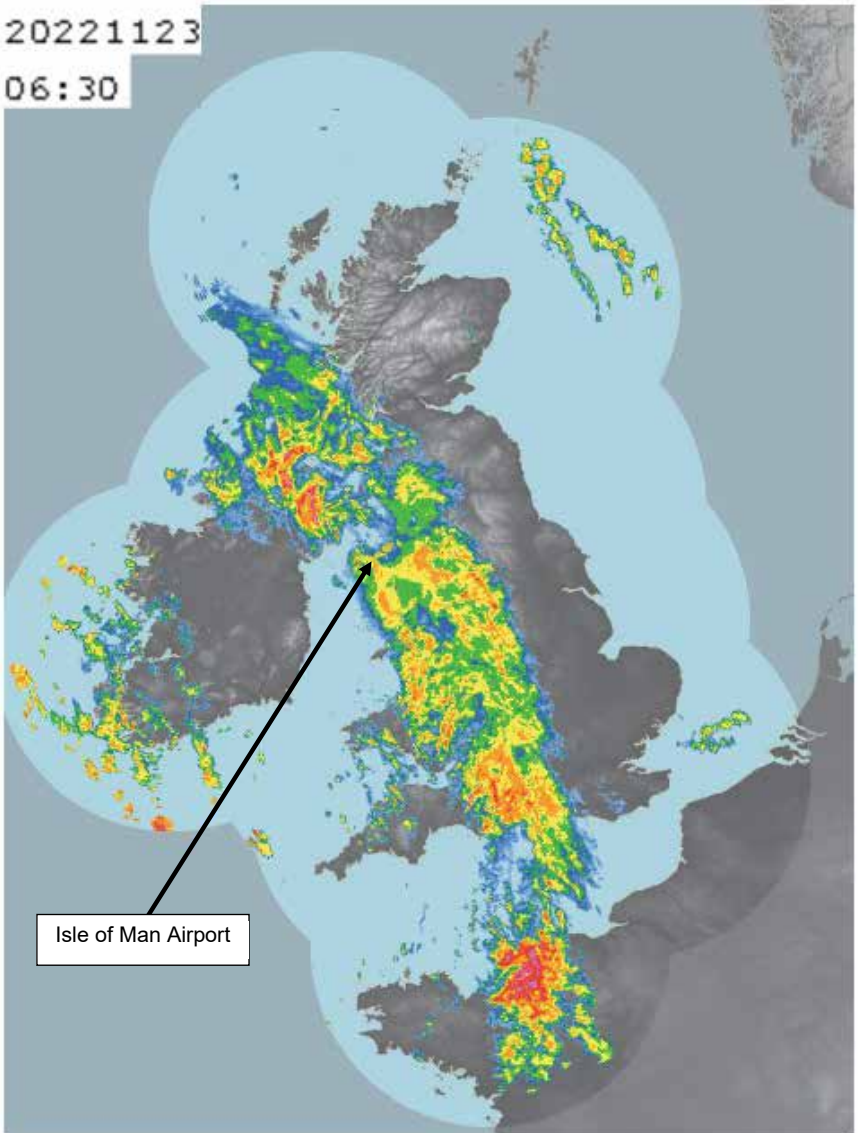


Figure 3

Weather radar image of the UK at 0630 hrs on 23 November 2022

Analysis

The aircraft encountered severe turbulence which resulted in an uncontrolled descent to 1,200 ft amsl before the pilot was able to regain control and climb away. The turbulence was caused by an occluded front passing through the area.

Information available to the pilot forecast isolated severe turbulence associated with the occluded front. However, as forecasts often cover a wide area and significant time band, it is not practical for commercial flights to avoid all areas where there may be severe turbulence.

The aircraft was not fitted with weather radar or windshear detection equipment to warn the pilot of the weather ahead and there were no reports of turbulence from other aircraft. The visibility, cloud base and wind were within the aircraft's landing limits, so did not preclude the pilot starting an approach.

The Met Office reported that the significant change in wind direction and strong winds which were forecast and observed were an indication that there was likely to be significant turbulence associated with the frontal system. A CAA meteorologist stated that the inclusion of squalls on the forecast was also an indication of a very active frontal system.

Pilots can contact the appropriate meteorological office to obtain clarification or amplifications of the forecast to assist their pre-flight planning. The Isle of Man has a dedicated forecast office. The phone numbers are provided in the AIP[5], Part 1, GEN 3.5 Meteorological Service, Paragraph 4.2.5. The AIP states:

> *'When necessary, the personal advice of a forecaster, or other meteorological information, can be obtained from the appropriate forecast office. Forecaster advice or other information for safety related clarification/amplification will only be given on the understanding that full use has already been made of available meteorological briefing material.'*

The pilot reported that the UPRT he had received helped him to successfully fly the aircraft through the turbulence.

Conclusion

The aircraft encountered severe turbulence which resulted in an uncontrolled descent. Isolated severe turbulence was forecast in the area, but this information did not preclude the flight or the start of an approach.

A review of the forecast by a meteorologist after the incident suggested there were some indications of the potential severity of the turbulence.

The AIP contains contact details for meteorological offices that may be able to provide pilots with additional forecast information before flight.

This serious incident demonstrates the benefits of UPRT for pilots.

Footnote

[5] Available at https://nats-uk.ead-it.com/cms-nats/opencms/en/Publications/AIP/ [accessed March 2023].

ACCIDENT

Aircraft Type and Registration:	Robin DR400/140B, G-BDUY	
No & Type of Engines:	1 Lycoming O-320-D2A piston engine	
Year of Manufacture:	1976 (Serial no: 1120)	
Date & Time (UTC):	16 June 2022 at 0850 hrs	
Location:	East Kirkby Aviation Centre, Lincolnshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damaged propeller, nose and left main landing gear and lower fuselage damage	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	52 years	
Commander's Flying Experience:	787 hours (of which 646 were on type) Last 90 days - 12 hours Last 28 days - 11 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further AAIB enquiries	

Synopsis

The aircraft landed outside the designated but unmarked runway area at an unlicensed aerodrome and came to rest on a grassy bank. The airfield layout appeared different to what the pilot expected from the chart he was using. The low circuit height, with no overhead joining procedure, reduced the opportunity for the pilot to orientate himself.

The investigation revealed anomalies in published circuit information which the airfield and relevant chart publishers intend to resolve. The report discusses advice for pilots preparing to operate at unlicensed aerodromes.

History of the flight

G-BDUY had flown in a group of aircraft from Hatton to East Kirkby airfield. The pilot reported that during the final approach he saw a Lancaster aircraft parked on what he thought was Runway 24. He performed a go-around and joined left downwind for Runway 26, at the 500 ft aal circuit height specified on the airfield chart he was using (Figure 1).

The pilot explained that during that approach he was focussed on overflying some trees near his intended landing point. During touchdown he realised the remaining landing distance was too short (Figure 1). Because of more trees straight ahead, he applied maximum braking – rather than performing a go-around – and came to rest on a grassy bank at the edge of the airfield.

Aerodrome information

Chart used by the pilot

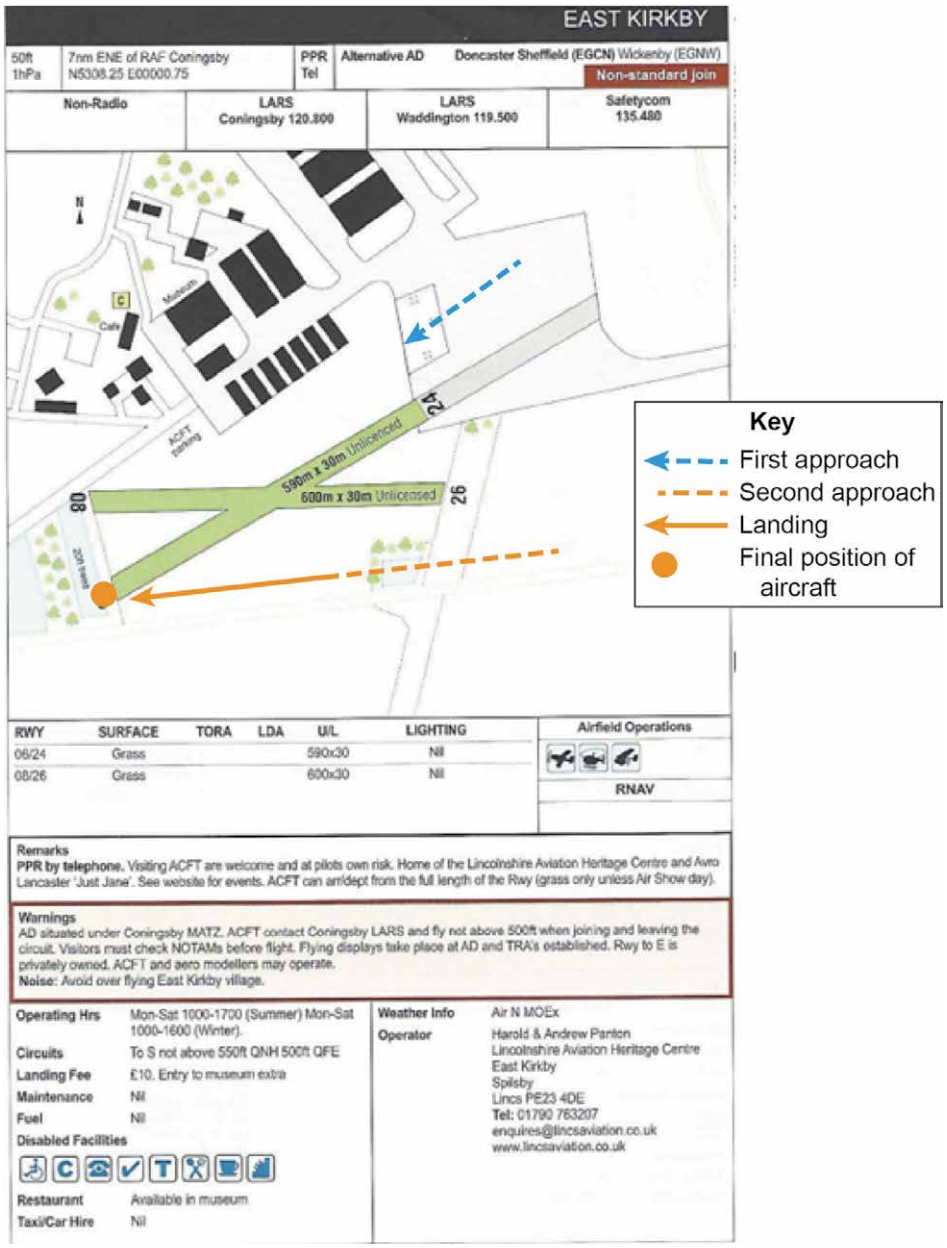


Figure 1

Chart used by pilot annotated with the approaches flown, and the landing[1,2]

Footnote

1 'PPR' on the chart means prior permission is required to land there.
2 Note chart specified circuit height of 500 ft.

Information from the airfield's website

The airfield website stated:

> *'Please look at the airfield plate.*
>
> *There is a wind sock in the Museum compound next to the Control Tower for guidance.*
>
> ***DO NOT OVERFLY THE HOUSE AT THE NORTHERN END OF THE RUNWAY AIRFIELD PROCEDURE***
>
> ***We have two possible grass strips, 24/06 and 26/08. When landing you must use grass only, there should be no use of the concrete areas…***
>
> *Please ring us in advance to check that the runway is clear and available for landing.'*

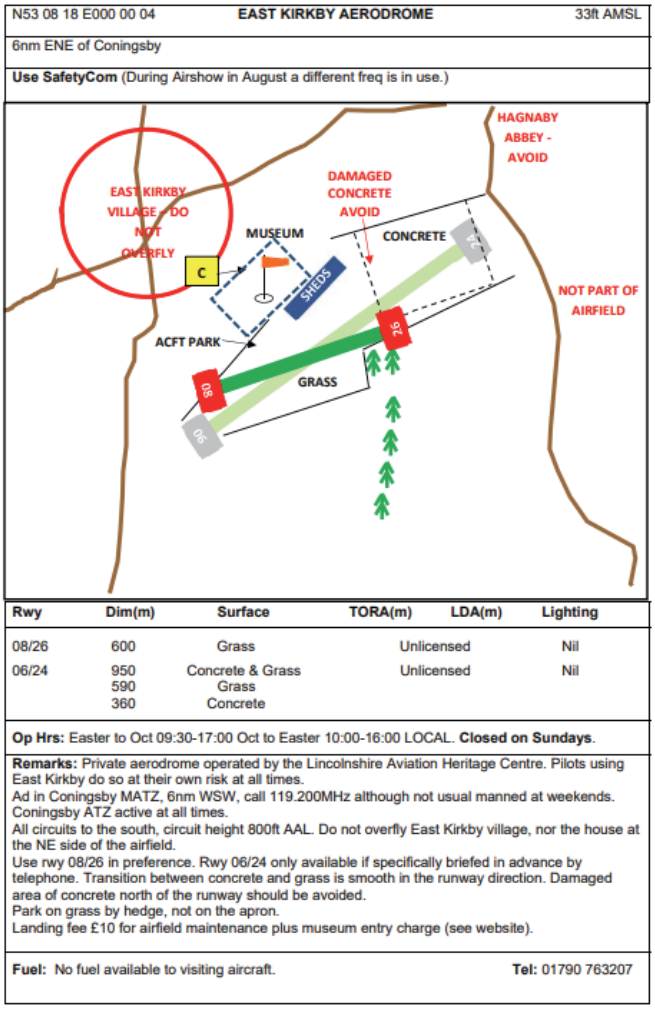


Figure 2

Chart promulgated on the airfield's website[3]

Footnote

[3] Note chart specified circuit height of 800 ft.

Additional information

Arrangements for flying in

While some of the pilots in the group had flown to East Kirkby before, the incident pilot had not. One of the other pilots phoned for prior landing permission on behalf of the whole group.

Airfield features

The pilot reported realising while approaching East Kirby that it looked significantly different to what he was expecting, using his chart. Rather than having marked runways, it was a triangular shaped field of evenly mown grass (Figure 3). The low circuit height with no overhead join made it difficult to identify the runway.

Figure 3

Satellite image of East Kirkby[4]

The pilot reported that after the accident, other pilots who were familiar with East Kirkby said they used satellite imagery and information from a navigation app to help them identify the runways. The app's *'Pilot's Notes'* section and an internet site referred to the absence of runway markings.

Information from the airfield operator

The airfield operator explained that East Kirkby's circuit height sometimes reduces to 500 ft aal when Coningsby military aerodrome traffic zone is active. It said it would contact relevant chart publishers to clarify circuit height information. The publisher of the chart used by the pilot expressed keenness to collaborate on this point.

Footnote

[4] [Accessed 1 February 2023].

Regulatory information

The Civil Aviation Publication (CAP 793) *'Safe operating practices at unlicensed aerodromes'*[5] stated:

> *'It is essential to mark any obstacles, potholes and bad ground. Runway markers and runway numbers will help line up for both take-off and landing…*
>
> *The usable parts of hard runways (if all of the hard area cannot be used) and of grass runways may be edged with white rectangular paint markings or marker boards…*
>
> *While operations are not confined to marked, paved or unpaved runways, the limits of the usable area may be marked in a similar way…*
>
> *Operators may also wish to notify their aerodrome for publication in one of the general aviation guides…'*

Additional guidance

An article on *'Safety factors when landing on unlicensed airfields… abridged from GASCO'*[6,7] stated:

> *'Unlicensed aerodromes and private strips… require special consideration.*
>
> *…the criteria of your aviation authority for the licensing of an aerodrome… are unlikely to have been applied to the strip. Since in almost all cases Prior Permission is Required (PPR), your phone call should also include discussion of any difficulties, obstructions, noise sensitive areas to be avoided and the useable length of the strip…*
>
> *Tell the operator of the strip what experience you have, which strips you have used recently, and what aeroplane you intend using. He has probably seen pilots with similar aeroplanes flying into and out of the strip and you can benefit from local knowledge…*
>
> *Carefully examine from the ground, air or maps the approaches to the strip and the go-around area, with particular reference to any runway slope, obstructions or hills within 5 km, windshear or turbulence from nearby woods… buildings and other considerations...*
>
> *Consider having a familiarisation flight to and from the strip with a pilot who knows the strip and is both current on your aeroplane and operations into grass strips…*
>
> *If your approach is bad, make an early decision to go-around. It is often useful to plan to make a go-around from your first approach…'*

Footnote

[5] CAP 793 Safe Operating Practices at Unlicensed Aerodromes (caa.co.uk) [accessed 1 February 2023].
[6] Safety factors when landing on unlicensed airfields (pilotfriend.com) [accessed 6 February 2023].
[7] Original GASCO publication was not retrieved.

Analysis

Unlicensed aerodromes

There were significant differences between the airfield chart, promulgated on the airfield's website, and the chart used by the pilot. The latter specified a lower circuit height and did not refer to the special telephone briefing required for landing on Runway 24. Neither chart would necessarily conform to satellite imagery of the airfield or information provided in a navigation app, particularly regarding the absence of runway markings.

Unlicensed aerodromes are not required to mark their runways, nor publish airfield charts. While the airfield operator in this case intended to resolve the anomalies identified on published charts, the accident highlights the importance of pilots researching airfields using all available resources, especially if they cannot perform an overhead join or familiarisation visit beforehand. Important details of a particular aerodrome might include the location of obstacles, circuit procedures, preferred runways, and proximate airspace.

Where there is no overhead join, it may be appropriate for pilots to make an initial approach and go-around to orientate themselves at an unfamiliar airfield; a go-around may also be flown if an approach does not go as expected.

PPR

Aside from their administrative purpose, telephone calls for landing permission at an aerodrome present an opportunity to gain local advice. One pilot telephoning on behalf of a group does not preclude others in the group calling individually, for example to discuss their experience.

Conclusion

The accident occurred because the aircraft landed outside the designated grass runway at an unlicensed aerodrome. The low circuit height and an airfield layout that the pilot had not expected contributed to his misidentifying the landing surface.

The airfield and a chart publisher intend to resolve anomalies on relevant charts.

AAIB Record-Only Investigations

This section provides details of accidents and incidents which were not subject to a Field or full Correspondence Investigation.

They are wholly, or largely, based on information provided by the aircraft commander at the time of reporting and in some cases additional information from other sources.

The accuracy of the information provided cannot be assured.

Record-only UAS investigations reviewed: February - March 2023

18 Jan 2023 **eBeeX SenseFly** Hayling Island, Hampshire

After the UA was hand launched, it climbed to 20 m when there appeared to be a loss of power. The UA struck a wall outside of the planned flying area. The cause for the loss of power was not established.

26 Jan 2023 **Flylogix** Scatsta Airport, Shetland

After touchdown, the UA left the runway, struck a runway light, and the landing gear collapsed.

31 Jan 2023 **DJI Inspire 2** Near Slough, Buckinghamshire

Whilst landing the UA in a field, the pilot did not arrest the rate of descent in time to prevent a hard touchdown which caused damage to the UA's gimbal, camera and baseplate.

7 Feb 2023 **DJI Inspire 2** Cantley Park, Doncaster

During a practice qualification flight, the remote pilot misjudged the flightpath of the UA and it collided with a tree.

10 Feb 2023 **DJI Ai2 S** Crosby Beach, Merseyside

The UA was manoeuvring and collided with a structure on a beach. The UA could not be recovered.

16 Feb 2023 **Swoop Aero Kookaburra III** Near Predannack Airfield, Cornwall

Whilst flying out over the coast some airspeed sensors flagged an issue on the command unit and the remote pilot triggered a return to base. On returning the UA deviated from its predicted flight path, and the UA automatically carried out an emergency landing based on its predicted speed and flight path. The UA subsequently landed in the sea and was not recovered.

20 Feb 2023 **Unknown** White Waltham Airfield, Maidenhead

Control of the UA was lost following a loss of power, and it fell to the ground.

28 Feb 2023 **Mavic 2 Enterprise Advanced** Preston, Lancashire

After the UA lifted off, the remote pilot was unable to control the UA and it struck a building; a GPS issue was suspected.

Record-only UAS investigations reviewed: February - March 2023 cont

4 Mar 2023 **MA Model Aircraft** Croxley Common Moor, Hertfordshire

Soon after takeoff the model aircraft failed to respond to control inputs. The failsafe did not work and the aircraft disappeared from view. Despite a search the pilot was unable to locate the aircraft.

7 Mar 2023 **DJI Phantom 4** Near Buxton, Derbyshire

Following a loss of GPS in-flight, the pilot commanded a Return to Home but the UA flew away and was not recovered.

31 Mar 2023 **DJI M30T** Coleshill, Warwickshire

The UA was being operated on a training flight in a closed off area with no residential properties and no structures nearby. Three birds flew out of trees directly towards the UA and struck it, causing it to drop to the ground.

Miscellaneous

This section contains Addenda, Corrections and a list of the ten most recent Aircraft Accident ('Formal') Reports published by the AAIB.

The complete reports can be downloaded from the AAIB website (www.aaib.gov.uk).

AIRCRAFT SERIOUS INCIDENT REPORT CORRECTION

Aircraft Type and Registration:	Airbus A321-211, G-POWN
Date & Time (UTC):	26 February 2020 at 0009 hrs
Location:	London Gatwick Airport, UK
Information Source:	AAIB Field Investigation

In February 2023, it was noted that Figures 19 and 21 in the report were incorrect in that they were identical to Figures 18 and 20 respectively. The correct versions of Figures 19 and 21 are shown below.

While making this correction, the opportunity was also taken to update Figure 9; change the titles of Figures 21 and 22 to make them clearer; and correct a typographical error in Section 1.6.7.7.

Commencing with the typographical error in Section 1.6.7.7, the other corrections will follow on subsequent pages.

Page 23: Section 1.6.7.7 (penultimate sentence)

New text:

> It has a specific gravity of 1,040 kg / m^3 and is available in 5 or 20 kg polythene containers.

Original text:

> It has a specific gravity of 1.04 kg / m^3 and is available in 5 or 20 kg polythene containers.

The online version of this report was corrected on 11 May 2023 and can be read on the AAIB website at: https://www.gov.uk/aaib-reports/aircraft-accident-report-aar-1-slash-2021-airbus-a321-211-g-pown-26-february-2020 [accessed April 2023].

Details of the correction were published in the May 2023 AAIB Bulletin.

Correct version of Figure 19:

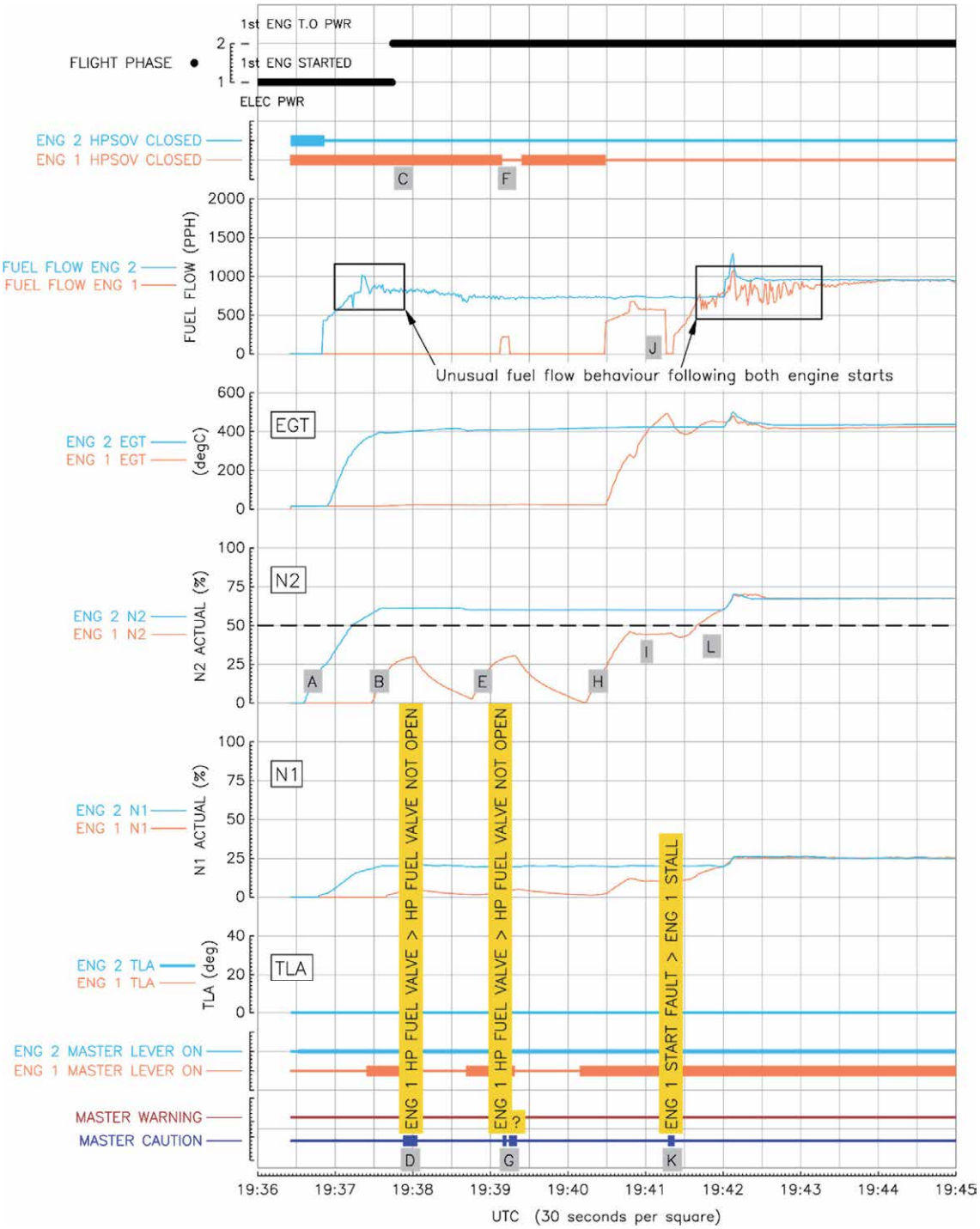


Figure 19

Krakow to Gatwick flight engine starts

Original version of Figure 19:

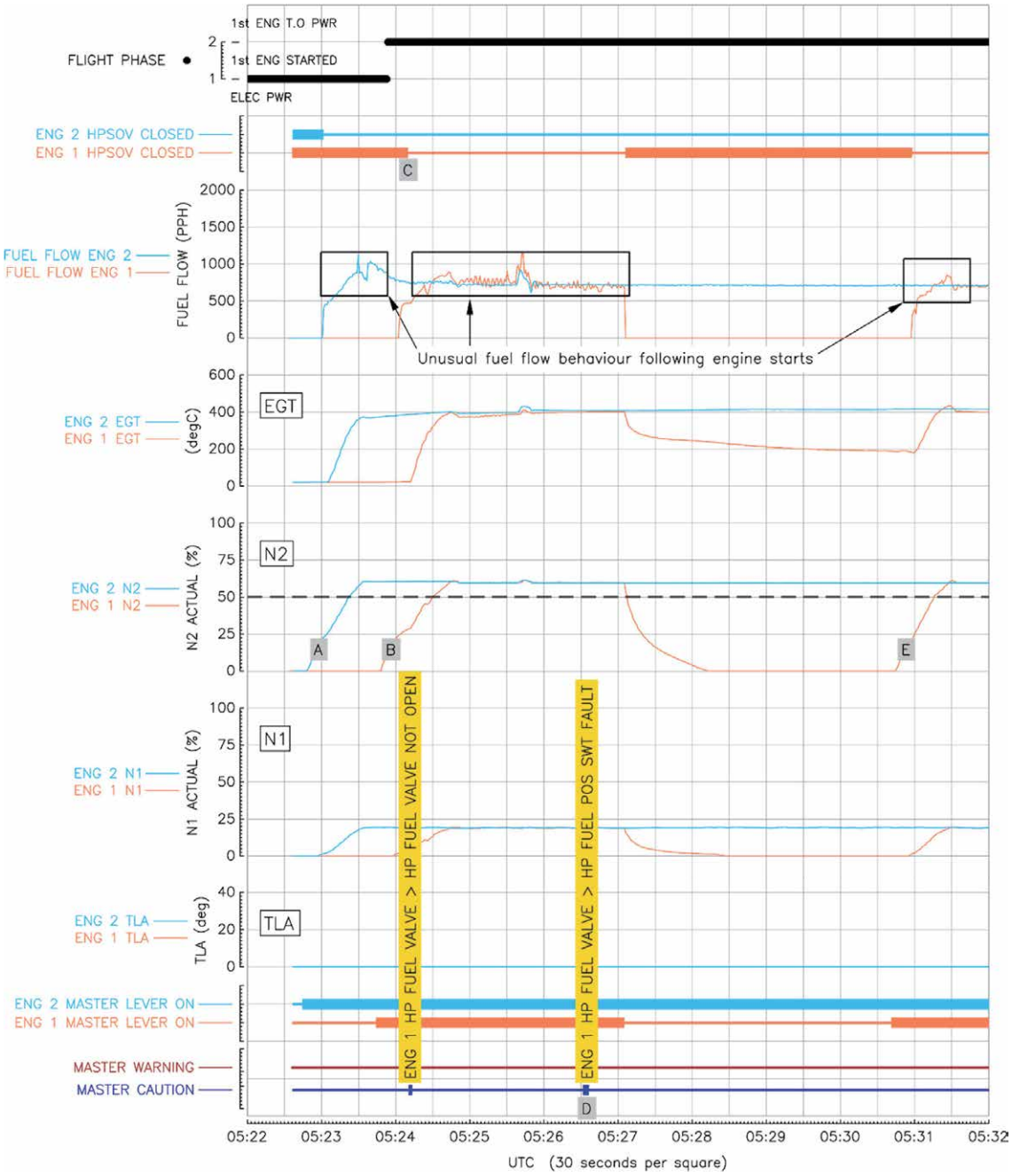


Figure 19

Krakow to Gatwick flight engine starts

Correct version of Figure 21:

This also includes the new title for this figure.

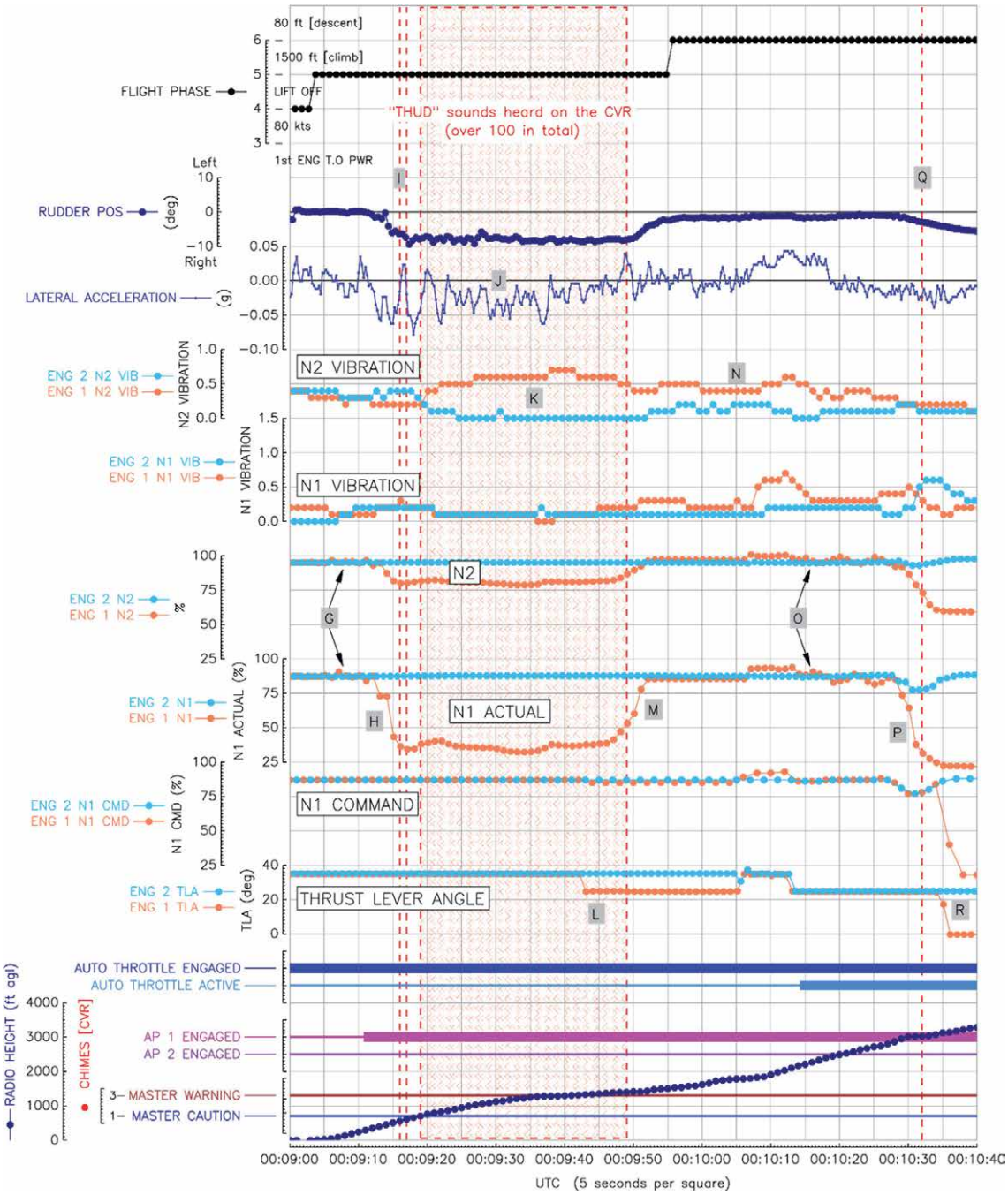


Figure 21

Overview of flight data from the incident (plot 1 of 2)

Original version of Figure 21:

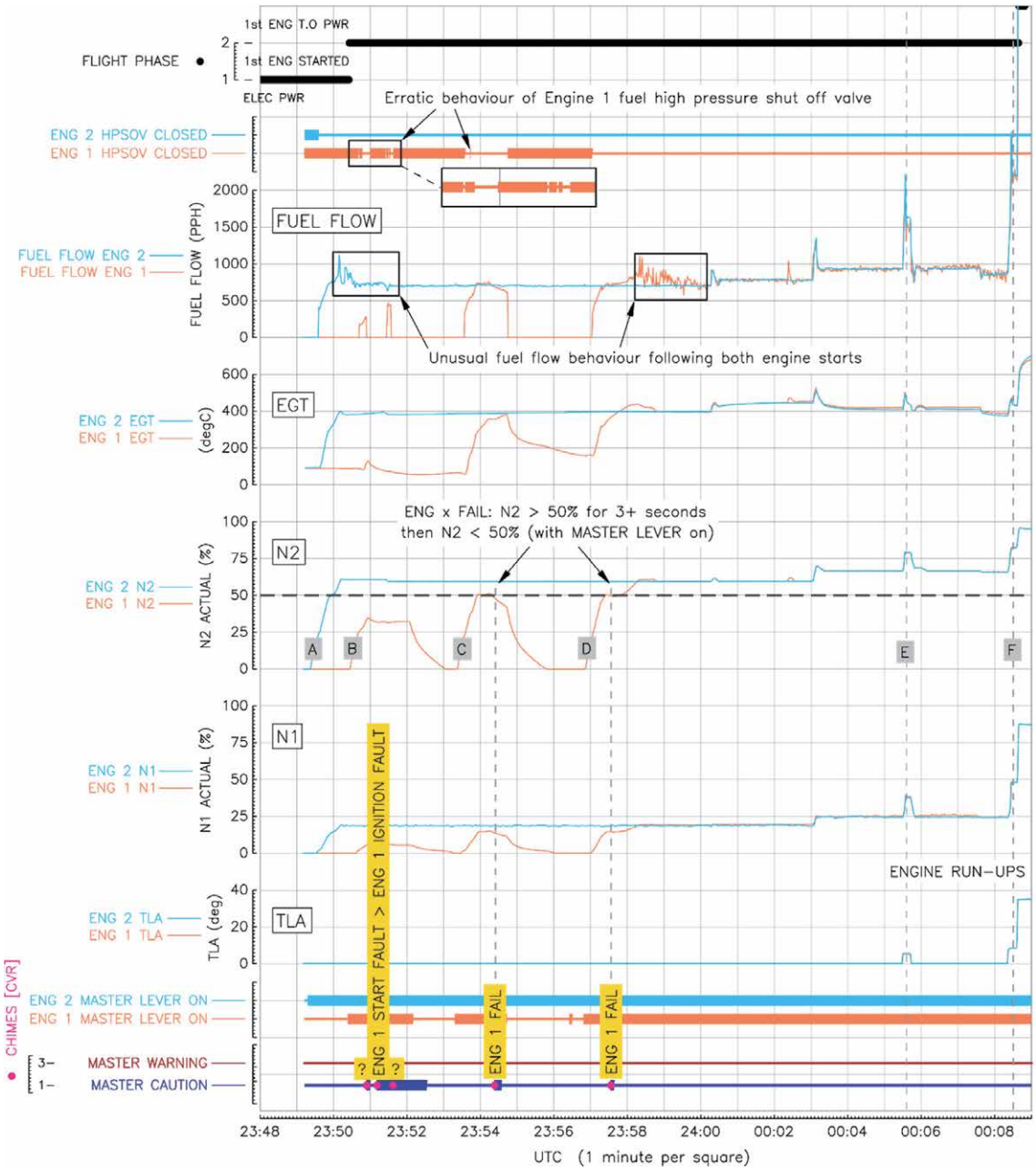


Figure 21

Overview of incident flight data (plot 1 of 2)

New version of Figure 9:

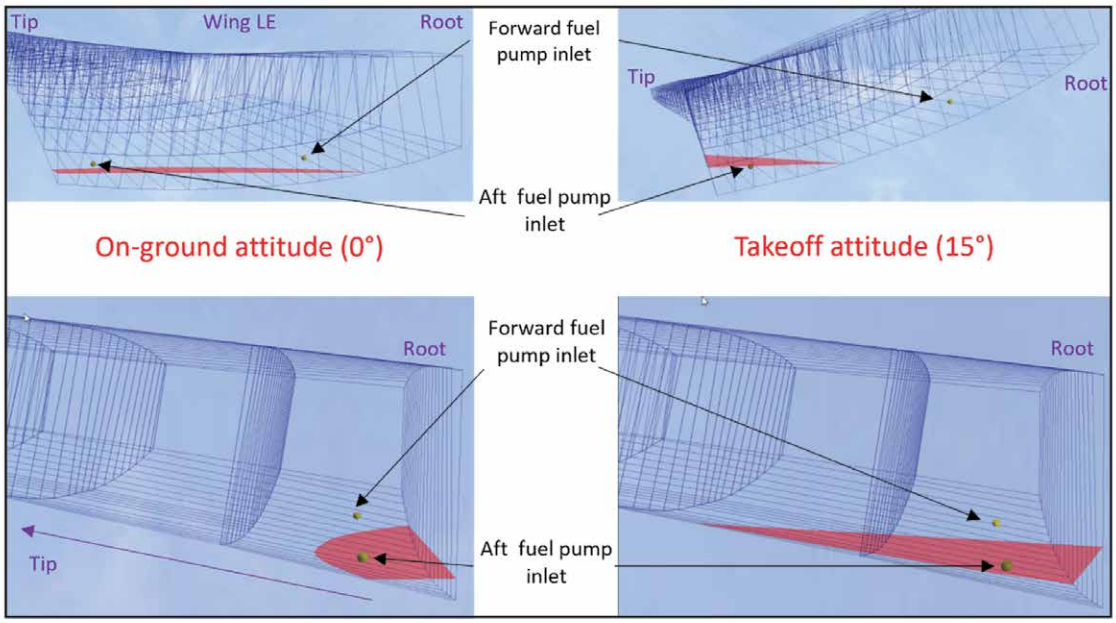


Figure 9

View of the left wing fuel tank at the root showing the fuel pump inlet positions in relation to approximately 30 kg of Kathon (shown in red)
(images courtesy of Airbus)

Original version of Figure 9:

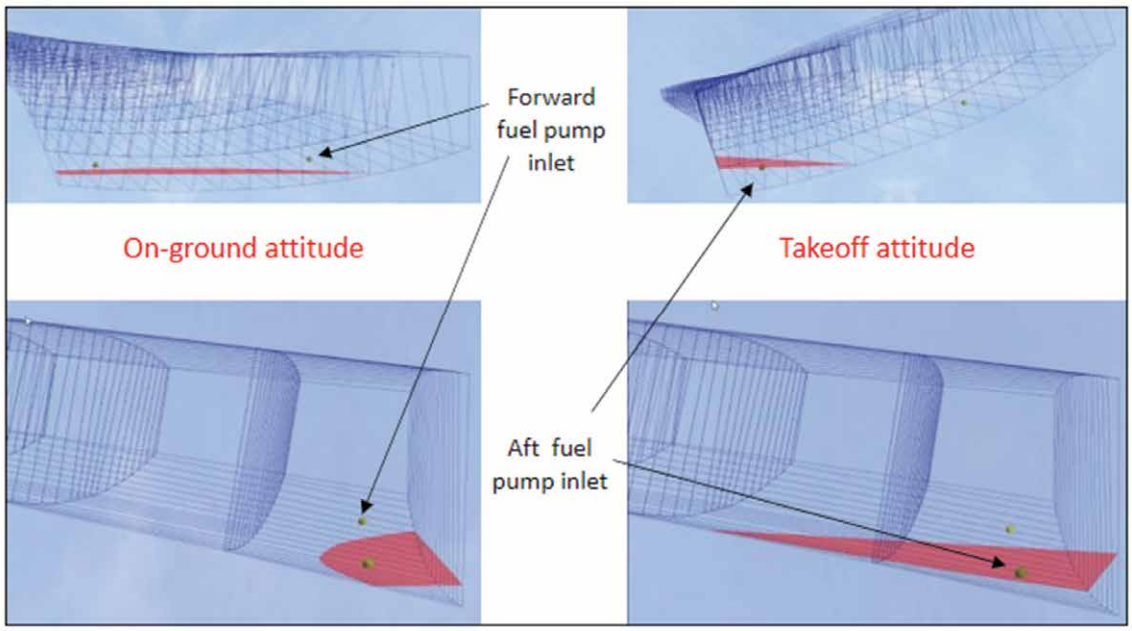


Figure 9

View of the left wing fuel tank at the root with the fuel pump inlet positions in relation to approximately 30 kg of Kathon.
Left – on-ground (0°). Right – takeoff (15°)
(images courtesy Airbus)

New title to Figure 22:

Figure 22 remains the same, however the title has been amended.

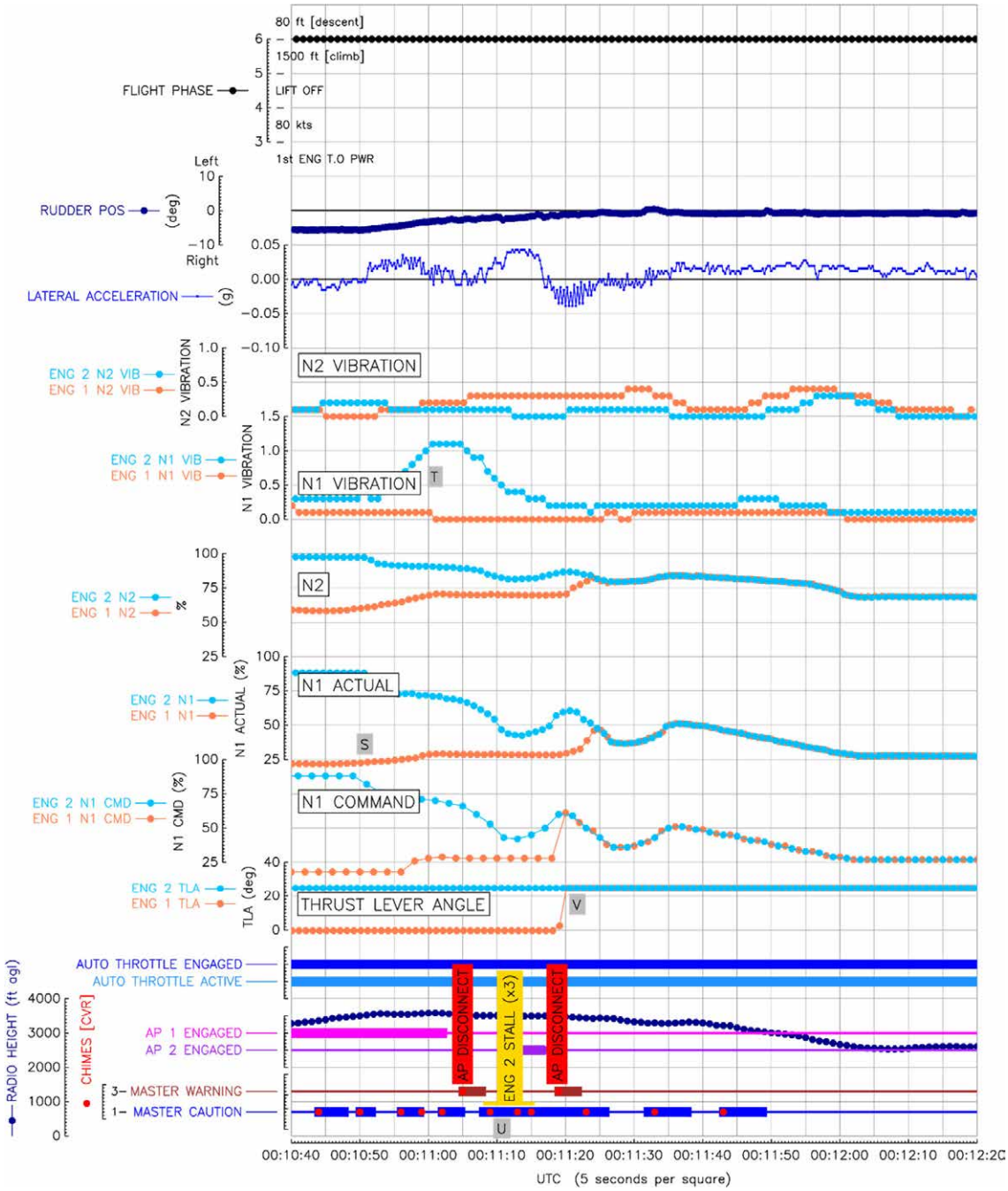


Figure 22

Overview of flight data from the incident (plot 2 of 2)

Original title to Figure 22:

The original title to Figure 22 read:

Overview of incident flight data (plot 2 of 2)

TEN MOST RECENTLY PUBLISHED FORMAL REPORTS ISSUED BY THE AIR ACCIDENTS INVESTIGATION BRANCH

1/2015 Airbus A319-131, G-EUOE
London Heathrow Airport
on 24 May 2013.
Published July 2015.

2/2015 Boeing B787-8, ET-AOP
London Heathrow Airport
on 12 July 2013.
Published August 2015.

3/2015 Eurocopter (Deutschland)
EC135 T2+, G-SPAO
Glasgow City Centre, Scotland
on 29 November 2013.
Published October 2015.

1/2016 AS332 L2 Super Puma, G-WNSB
on approach to Sumburgh Airport
on 23 August 2013.
Published March 2016.

2/2016 Saab 2000, G-LGNO
approximately 7 nm east of
Sumburgh Airport, Shetland
on 15 December 2014.
Published September 2016.

1/2017 Hawker Hunter T7, G-BXFI
near Shoreham Airport
on 22 August 2015.
Published March 2017.

1/2018 Sikorsky S-92A, G-WNSR
West Franklin wellhead platform,
North Sea
on 28 December 2016.
Published March 2018.

2/2018 Boeing 737-86J, C-FWGH
Belfast International Airport
on 21 July 2017.
Published November 2018.

1/2020 Piper PA-46-310P Malibu, N264DB
22 nm north-north-west of Guernsey
on 21 January 2019.
Published March 2020.

1/2021 Airbus A321-211, G-POWN
London Gatwick Airport
on 26 February 2020.
Published May 2021.

Unabridged versions of all AAIB Formal Reports, published back to and including 1971, are available in full on the AAIB Website

http://www.aaib.gov.uk

GLOSSARY OF ABBREVIATIONS

aal	above airfield level
ACAS	Airborne Collision Avoidance System
ACARS	Automatic Communications And Reporting System
ADF	Automatic Direction Finding equipment
AFIS(O)	Aerodrome Flight Information Service (Officer)
agl	above ground level
AIC	Aeronautical Information Circular
amsl	above mean sea level
AOM	Aerodrome Operating Minima
APU	Auxiliary Power Unit
ASI	airspeed indicator
ATC(C)(O)	Air Traffic Control (Centre)(Officer)
ATIS	Automatic Terminal Information Service
ATPL	Airline Transport Pilot's Licence
BMAA	British Microlight Aircraft Association
BGA	British Gliding Association
BBAC	British Balloon and Airship Club
BHPA	British Hang Gliding & Paragliding Association
CAA	Civil Aviation Authority
CAVOK	Ceiling And Visibility OK (for VFR flight)
CAS	calibrated airspeed
cc	cubic centimetres
CG	Centre of Gravity
cm	centimetre(s)
CPL	Commercial Pilot's Licence
°C,F,M,T	Celsius, Fahrenheit, magnetic, true
CVR	Cockpit Voice Recorder
DME	Distance Measuring Equipment
EAS	equivalent airspeed
EASA	European Union Aviation Safety Agency
ECAM	Electronic Centralised Aircraft Monitoring
EGPWS	Enhanced GPWS
EGT	Exhaust Gas Temperature
EICAS	Engine Indication and Crew Alerting System
EPR	Engine Pressure Ratio
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
FAA	Federal Aviation Administration (USA)
FDR	Flight Data Recorder
FIR	Flight Information Region
FL	Flight Level
ft	feet
ft/min	feet per minute
g	acceleration due to Earth's gravity
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GPWS	Ground Proximity Warning System
hrs	hours (clock time as in 1200 hrs)
HP	high pressure
hPa	hectopascal (equivalent unit to mb)
IAS	indicated airspeed
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IP	Intermediate Pressure
IR	Instrument Rating
ISA	International Standard Atmosphere
kg	kilogram(s)
KCAS	knots calibrated airspeed
KIAS	knots indicated airspeed
KTAS	knots true airspeed
km	kilometre(s)
kt	knot(s)
lb	pound(s)
LP	low pressure
LAA	Light Aircraft Association
LDA	Landing Distance Available
LPC	Licence Proficiency Check
m	metre(s)
mb	millibar(s)
MDA	Minimum Descent Altitude
METAR	a timed aerodrome meteorological report
min	minutes
mm	millimetre(s)
mph	miles per hour
MTWA	Maximum Total Weight Authorised
N	Newtons
N_R	Main rotor rotation speed (rotorcraft)
N_g	Gas generator rotation speed (rotorcraft)
N_1	engine fan or LP compressor speed
NDB	Non-Directional radio Beacon
nm	nautical mile(s)
NOTAM	Notice to Airmen
OAT	Outside Air Temperature
OPC	Operator Proficiency Check
PAPI	Precision Approach Path Indicator
PF	Pilot Flying
PIC	Pilot in Command
PM	Pilot Monitoring
POH	Pilot's Operating Handbook
PPL	Private Pilot's Licence
psi	pounds per square inch
QFE	altimeter pressure setting to indicate height above aerodrome
QNH	altimeter pressure setting to indicate elevation amsl
RA	Resolution Advisory
RFFS	Rescue and Fire Fighting Service
rpm	revolutions per minute
RTF	radiotelephony
RVR	Runway Visual Range
SAR	Search and Rescue
SB	Service Bulletin
SSR	Secondary Surveillance Radar
TA	Traffic Advisory
TAF	Terminal Aerodrome Forecast
TAS	true airspeed
TAWS	Terrain Awareness and Warning System
TCAS	Traffic Collision Avoidance System
TODA	Takeoff Distance Available
UA	Unmanned Aircraft
UAS	Unmanned Aircraft System
USG	US gallons
UTC	Co-ordinated Universal Time (GMT)
V	Volt(s)
V_1	Takeoff decision speed
V_2	Takeoff safety speed
V_R	Rotation speed
V_{REF}	Reference airspeed (approach)
V_{NE}	Never Exceed airspeed
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
VOR	VHF Omnidirectional radio Range

AAIB
Air Accidents Investigation Branch