Safety Regulation Group

Civil Aviation Authority

CAP 732

Progress Report 2002

Responses to Air Accidents Investigation Branch (AAIB) Safety Recommendations

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Civil Aviation Authority (CAA) and Department of Transport, Local Government and the Regions (DTLR) responses to AAIB Recommendations received up to 31 December 2001, presented to the Secretary of State for Transport

September 2002

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Foreword

In the UK, the role of the Civil Aviation Authority (CAA) is to ensure that UK civil aviation standards are set and achieved in a co-operative and cost-effective manner. The Group must satisfy itself that aircraft are properly designed, manufactured, operated and maintained; that airlines are competent; that flight crews, air traffic controllers and aircraft maintenance engineers are fit and competent; that licensed aerodromes are safe to use and that air traffic services and general aviation activities meet required safety standards.

The Air Accidents Investigation Branch (AAIB), a branch of the Department for Transport, is responsible for the investigation of all civil aircraft accidents and serious incidents (collectively referred to as 'accidents' in this document) occurring in or over the UK.

The two functions, and associated responsibilities, of accident investigation and safety regulation are clearly different and the two organisations are deliberately kept independent of each other. However, the evaluation of the findings of an accident investigation and the determination of the need for, and the initiation of, appropriate action to maintain and enhance safety is an important part of safety regulation, i.e. the responsibility of the CAA. Thus a good working relationship between the two organisations is essential, while in no way jeopardising the independence of the accident investigation.

While day to day liaison is maintained between the CAA and the AAIB in the aftermath of any accident, the formal procedure by which the AAIB identify and convey to the CAA, or other bodies, matters which it believes require action is by means of Safety Recommendations.

Recommendations can be made at any stage as the AAIB investigation progresses. The CAA has in place formal procedures for the receipt and evaluation of such Recommendations and initiation of necessary action. In its evaluation the CAA has to consider all the implications of the Recommendation and any action being proposed; it must also take into account the views of other Regulatory Authorities, e.g. the European Joint Aviation Authorities or any Authority responsible for the initial certification of the aircraft type. The CAA responds to the AAIB as quickly as possible on all Recommendations as they arise, those of an urgent nature being acted upon immediately. In the case of AAIB Formal Investigations for which an Aircraft Accident Report (AAR) is published, all Recommendations made are listed in the final AAR. In such cases, the CAA publishes its Response to the Recommendations on the day the AAR is published.

The CAA Responses to all Recommendations addressed to the CAA are published, initially, by means of a FACTOR (Follow-up Action on Occurrence Report) but will subsequently appear in this annual Progress Report.

Some Recommendations involve long-term investigation or research. In order to determine appropriate action when this is so, the CAA's response will indicate that the status of the Recommendation is 'Open' until all action by the CAA has been completed. This Report contains the current status of earlier Recommendations addressed to the CAA which were listed as 'Open' in the previous Progress Report.

Once CAA action is completed it will be designated 'Closed' in this Report and will not appear in subsequent Reports. However, in some instances this may mean that further action is still necessary but is being progressed by organisations outside the jurisdiction of the CAA, for example, by the Joint Aviation Authorities. In these cases CAA will continue to monitor the progress on these Recommendations as part of its normal regulation activity.

The Report

This is the thirteenth annual Progress Report submitted to the Secretary of State for Transport. It contains all Recommendations addressed to the CAA and received during 2001 together with the CAA's responses.

The Report also contains all Recommendations addressed to the CAA that remained 'Open' in the twelfth annual Progress Report together with a statement of their position as at 31 May 2002 and all 'Open' Recommendations addressed to the DTLR.

The Recommendations addressed to the CAA have been separated into three Parts:

Part 1 Aeroplanes at or above 5700kg Maximum Take-off Weight Authorised (MTWA)

Part 2 All Rotorcraft

Part 3 Aeroplanes below 5700kg MTWA and others, (e.g. Balloons)

NOTE: The definition of Aeroplane and Rotorcraft are as stated in the Air Navigation Order.

Within each Part the accidents are listed by event date but in reverse chronological order. This date order should not be taken as an indication of the date of receipt of the Recommendation by the CAA as some Recommendations are received a significant time after an accident.

Some of the Recommendations made by the AAIB are addressed to organisations other than the CAA. Following a request from the DTLR, responses to Recommendations involving the DTLR appear in Part 4. Recommendations made during 2001, other than those above, are detailed in Part 5.

CAA Responses to AAIB Recommendations 13th Report

1 Introduction

This Report is in response to the Secretary of State for Transport's request to the CAA for Annual Reports on the status and progress of its responses to the Recommendations made to the CAA from the Air Accidents Investigation Branch. This Report covers all of those Recommendations which remained 'Open' from the previous Report and all Recommendations received during 2001.

2 Recommendations - Status Summary

During 2001, a total of 35 Recommendations addressed to the CAA were received compared with 40 for 2000. A Summary of the Acceptance and Current Status of these is as follows:

	Acceptance				**Current Status**	
	Fully	Partially	Fully & Partially	Not Accepted	Open	Closed
PRE 2000	685	83	768	130	11	887
2000	36	4	40	0	4	36
2001	29	5	34	1	9	26
TOTAL	750	92	842	131	24	949

Part 1 AAIB Recommendations relating to aeroplanes at or above 5700kg MTWA

B747-4H6	London Heathrow Airport	15 Jan 2001	Accident

References: Bulletin 10/2001 dated 11 Oct 2001

FACTOR F44/2001 dated 15 Nov 2001

SYNOPSIS

A Boeing 747-400 was scheduled to land at London Heathrow airport (LHR) from a long haul flight at 0530 hrs, and had been allocated parking Stand J2 at Terminal 3.

Prior to the flight's arrival, a driver from the airline's handling agent positioned three tugs and a number of baggage dollies side by side to the right (looking from a parked aircraft's cockpit) of Stand J2 at right angles to the stand centreline. The driver used two white lines painted on the ramp parallel to the stand centreline to judge a safe distance from the centreline at which to park the equipment. After positioning the tugs and dollies, the driver adjourned to his supervisor's van, which was parked elsewhere on the stand, to await the arrival of the aircraft.

The ramp supervisor responsible for parking the aircraft arrived at the stand prior to the aircraft's arrival and carried out a safety check. He noted the tugs and dollies to the right of the stand and a 'high loader ' vehicle to the left rear of the stand within the stand boundary. None of the vehicles was manned. Although he could see no stand markings by which to assess safe clearance, the supervisor judged the tugs and dollies to be far enough to the right of the stand centreline to be clear of the aircraft, but he was concerned at the proximity of the 'high loader'. He requested that the 'high loader' be moved, and switched on the Automatic Positioning and Information System (APIS).

The 'high loader' had not been moved by the time the aircraft arrived at the stand and the supervisor therefore positioned himself to the left of the stand to monitor the clearance between the aircraft and the vehicle. As the aircraft turned into the stand, the supervisor satisfied himself that the left wing tip would clear the 'high loader' and started walking toward the jetty. As he walked he noticed an engineer run to the APIS controls at the front of the stand and operate the emergency stop button.

On arrival at the entrance to the stand the aircraft commander noticed that the APIS was lit and that there was a number of tugs with attached baggage dollies parked on the right of the stand. The commander judged that there was sufficient clearance between the parked ground equipment and the aircraft and continued to follow the APIS guidance.

During the approach to the final parking position the commander felt a 'bump' and immediately brought the aircraft to a halt. The number four engine had collided with one of the tugs and had pushed it into the other tugs causing the first tug to tip on its side and wedge between the ground and the bottom of the engine nacelle. Damage was caused to the number four engine nose cowl, fan cowl, and right reverser sleeve.

A ground engineer had been present on the stand during the incident. The engineer was responsible for chocking the aircraft and connecting ground power once the aircraft had come to a halt. He was standing adjacent to the stand centreline as the aircraft turned on to the stand. As the aircraft straightened from the turn he became aware of the proximity of the tugs to the number four engine and ran to the front of the stand to activate the emergency stop button. Unfortunately he was too late to prevent the collision with the tugs.

RECOMMENDATION 2001-65

The CAA should amend the current guidance in CAP 642 [Airside Safety Management] on the use of emergency stop systems such that the system can be operated quickly in the event of an emergency while aircraft are manoeuvring onto the stand.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation. The guidance in CAP 642 on the use of emergency stop systems will be reviewed by the Airside Safety Management Working Group (ASMWG) at its next regular meeting planned for the end of 2001.

CAA Action

The guidance on the use of emergency stop systems contained in CAP 642 'Airside Safety Management' has been reviewed and will be amended, to reflect this Recommendation, at its next amendment, scheduled for Summer 2002.

RECOMMENDATION 2001-66

The CAA and the Health and Safety Executive should conduct a joint audit of the current airside safety system at LHR to determine its adequacy. This will require an assessment of its implementation and supervision, and the development of a more comprehensive system for the reporting of ground damage to aircraft.

Status - Fully Accepted - Closed

CAA Response

The Civil Aviation Authority (CAA) accepts this Recommendation. Recent discussions reaffirmed the desire and intention to harmonize regulatory activity by the CAA and the Health and Safety Executive (HSE), who intend to carry out ad-hoc audits as and when programmes permit; these will include audits of the airside safety systems at target aerodromes.

CAA Action

The CAA and HSE have conducted a joint audit of the airside safety system at Heathrow. Both parties are content that the reporting of ground damage is now satisfactorily covered and that there have been improvements in the supervision and cleanliness (including the removal of unnecessary ground equipment) of the apron area. The CAA and HSE will continue to work together on this issue.

B757/F15E	5NM West of Daventry	22 Nov 2000	Incident

References: Bulletin 5/2001 dated 10 May 2001

FACTOR F12/2001 dated 15 Jun 2001

SYNOPSIS

The Boeing 757 (B757) was scheduled for a turnaround flight from Birmingham Airport to Paphos, Cyprus. The aircraft departed Birmingham in a southerly direction on a Cowley 1E departure and entered cloud in the climb between 3,000 and 4,000 feet. Not long after becoming airborne the departure controller cancelled the Standard Instrument Departure procedure and placed the aircraft under radar control. At FL60 control was handed from Birmingham Departures to Midland Terminal Control (MTC).

Immediately upon contact with MTC the B757 was cleared to climb to FL90 and shortly thereafter given a radar heading of 140deg. About one minute after initial contact with MTC the B757 was re-cleared to FL100. The controller acknowledged the B757 crew report on reaching FL100 and advised "MILITARY TRAFFIC IN YOUR ELEVEN O'CLOCK POSITION CROSSING LEFT TO RIGHT, ONE THOUSAND FEET ABOVE". The B757 crew acknowledged the advice and although the aircraft remained in cloud, they immediately began a visual search for the traffic, which their Traffic Alert and Collision Avoidance System (TCAS) was indicating one thousand feet above. The cloud proved to be too thick for visual contact with the military traffic, but the crew remained looking out as the TCAS contact passed clear down their right side.

Shortly after the traffic passed clear and, whilst still in cloud, the commander and the first officer suddenly became aware of an aircraft in their left 'half-past ten' position at very close range and at about the same level. The aircraft, which they were immediately able to identify as a twin-tailed fighter and later as an F15, passed rapidly across the B757's nose and disappeared down their right side. The B757 crew heard the noise of the F15's engines and their aircraft encountered its wake turbulence. There was no time for the B757 crew to take avoiding action. Subsequent analysis of radar data indicated that at the closest point of approach the two aircraft were separated by less than the minimum range detectable by the radar which is 0.0625 of a nautical mile. As far as is known, none of the cabin crew or passengers saw the F15, but the cabin crew felt the disturbance as the B757 flew through the F15's wake. The flight deck crew filed an AIRPROX report with ATC and continued to Cyprus.

The two F15s were two-seat E models, and the flight was planned as training for the front seat occupant of the No 2 aircraft. The pilot under training was in current flying practice on the single-seat F15C, but there are several significant differences between the F15C and the F15E, and the F15E instructor pilot was therefore in the rear seat. The plan was to carry out tactical low flying training in Wales followed by weapons delivery practice on one of the air-ground ranges in the Wash before returning to base at Lakenheath for circuit training. The route to Wales was to be flown at medium altitude crossing controlled airspace through the Daventry Radar Corridor and descending to low level once clear of controlled airspace to the west.

The two aircraft took off from Lakenheath approximately 20 seconds apart and took up a 'trail' formation with the No 2 aircraft about two miles behind the leader. In accordance with standard procedures for this type of formation only the lead aircraft

was transmitting a Secondary Surveillance Radar (SSR) code (Squawk). The aircraft climbed through cloud, with the No 2 aircraft maintaining position by use of radar, and levelled at FL100 in VMC. Part of the briefed flight profile included an aircraft systems check for both aircraft to be carried out in VMC. The procedures for the checks involved a change of lead aircraft. The formation No 2 completed his checks and began to close on the lead aircraft to take the lead position, but the formation entered IMC, and the No 2 aircraft aborted the change of lead and dropped back to about a 1.5 mile trail. In the attempt to regain VMC the lead aircraft requested from ATC a climb to FL110.

Not long after the F15s became airborne, ATC control was handed to London Military Radar (in particular the London Joint Area Organisation Central (LJAO) of London Military Radar) by Lakenheath Departure Control. LJAO cleared the F15s to cross the Daventry Radar Corridor at FL100, and the FL15's request to climb to FL110 was made to LJAO shortly after the aircraft entered the Daventry Radar Corridor. The controller's initial response was for the flight to maintain FL100, but she contacted the MTC controller by landline to co-ordinate a climb. The MTC controller agreed the higher level and LJAO later cleared the F15 flight to climb to FL110.

The leader immediately began a climb to FL110, but the No 2 aircraft did not hear the ATC clearance and maintained FL100. The two pilots of the No 2 aircraft later noticed that their radar showed the leader to be above their level, and they began a discussion of the indication. At about this time the front seat occupant was vaguely aware of a 'shadow' flashing rapidly down his right side. Shortly thereafter the LJAO controller asked the flight to confirm that both aircraft were level at FL110, and at this point No 2 climbed rapidly to FL110. Some time later the F15s were advised that the B757 had filed an airborne AIRPROX report, and only then did the front seat occupant of the No 2 aircraft associate the "shadow" with the possible presence of another aircraft. The rear seat occupant saw nothing of the B757.

RECOMMENDATION 2000-71

In order for STCA and TCAS to alert pilots and controllers to the possibility of mid-air collision it is essential that all conflicting aircraft should be transmitting SSR information. Transponding aircraft in formation will trigger unnecessary STCAs due to the proximity of their SSR returns, and specific procedures are needed to overcome this. Since this AIRPROX could have been averted if both aircraft in the formation had been 'squawking', it is recommended that the CAA and NATS should, without delay, implement procedures by which the safety assurance based on the use of SSRS is established for aircraft operating in formation

Status - Fully Accepted - Open

CAA Response

The Civil Aviation Authority (CAA) accepts this Recommendation. Following discussions between the CAA, the Ministry of Defence (MOD) and the National Air Traffic Services Ltd (NATS), new military ATC procedures for formations of military aircraft crossing controlled airspace have been agreed and introduced, subject to the constraints imposed by the limitations inherent in current ground based radar equipment. These procedures will reduce the risk of elements of military formations not being at their assigned levels, and will complement the protection given to all aircraft by ACAS and STCA. Additionally, the MOD and NATS have independently but co-operatively commissioned research to consider whether further enhancement of the protection can be obtained within those constraints to allow all elements of a

formation to be allocated individual SSR codes and hence full protection provided by ACAS/STCA.

NOTE: This Response to Recommendation 2000-71 was returned to the AAIB on 13 February 2001.

CAA Action

It is considered that this Recommendation has considerable commonality with Recommendation 97-45 and, accordingly, they are being addressed jointly. Enhanced civil and military procedures for Formation Flights to cross Controlled Airspace (CAS) have been in place since 15th January 2001. The CAA, MoD and NATS met on 26th April 2002 to discuss a draft revised MATS Part 1 entry, describing procedures for Military Formation Flights in CAS. In addition, the meeting assessed the enhanced procedures from the different perspectives of those present. From evidence to date, the procedures have improved the safety of formation flights crossing CAS, however, the issue of all aircraft in a formation squawking remains unresolved. This, therefore, means that the safety net of ACAS will only be activated against the lead aircraft in the prescribed one-mile box formation; this subject was also discussed at the April meeting. The report on the meeting, containing suggested improvements to the relevant procedures, is expected imminently and it is planned to incorporate the revised MATS Part 1 entry with Amendment 54, scheduled for publication at the end of July 2002.

DC3-R1830-90C	**Coventry Airport**	**11 Nov 2000**	**Incident**

References: Bulletin 4/2001 dated 12 Jun 2001

FACTOR F29/2001 dated 15 Jun 2001

SYNOPSIS

The aircraft was scheduled to drop poppy petals over a war memorial near Coventry during the Remembrance Day weekend. The crew consisted of two pilots and three dispatchers who were to dispense the poppy petals from bags in the rear of the aircraft. The rear crewmembers were wearing parachutes, and on similar flights in previous years some rear crewmembers had parachuted from the aircraft on return to the departure airfield. On this occasion only one of the rear crew was fit and qualified for parachuting.

The weather forecast for Coventry was reported as surface wind 230°/20 to 30 kt and a main cloud base of 1,500 feet with patches of cloud at 600 feet above airfield level. It therefore appeared unlikely that the weather would be suitable for parachuting, and a detailed drop briefing was not included in the pre-departure briefing.

The poppy drop took place uneventfully and on return to Coventry Airport the weather appeared to have improved slightly. The surface wind had reduced to 17 kt and there was no significant cloud below 1,500 feet. A conversation took place between the commander and the parachute qualified rear crewmember during which the commander advised him of the improved conditions. The rear crewmember decided to jump provided that a height of at least 1,500 feet could be achieved and that the aircraft could be flown directly into wind.

On contact with Coventry ATC the flight crew requested to 'come overhead at 1,500 feet and throw one of our passengers out'. The ATC controllers had received no prior notification of a parachute drop, and because of the informal nature of the request they initially regarded it as a joke. The flight crew asked if there were any engines running on the airfield, and on being informed of a taxiing helicopter, they decided to carry out a 'run and break and then come around for another go'.

About a minute later the tower controller advised that the helicopter was landing and '……if you want to carry on with the detail'. The flight crew acknowledged the transmission and the handling pilot began to slow the aircraft towards a target speed of 80 kt and called for one-quarter flaps to be lowered. As the aircraft overflew the airfield the commander gave the pre-arranged drop signal to the rear crew and some seconds later the commander was aware that the parachutist had left the aircraft. The commander could not recall the aircraft's exact indicated air speed (IAS) when the parachutist jumped but remembers that the strong wind was making flight conditions quite turbulent.

The parachutist departed the aircraft facing forward with his right hand to the rear of his right hip on his main pilot parachute and his left arm extended for stability. His exit through the rear door was uneventful but, before he cleared the aircraft completely and initially unknown to himself, he struck part of the aircraft breaking his left arm. His descent immediately became violently unstable and he fought to regain stability before releasing his parachute. With height rapidly reducing, he attempted to release his reserve parachute with his right hand (the reserve parachute had a faster deployment time than the main parachute and in an unstable descent was less likely to become entangled) but he found difficulty in operating the reserve parachute deployment pad. With height now down to an estimated 200 to 300 feet he resorted to deploying the main parachute but the low deployment height and unstable descent made a full deployment impossible and he landed on his back on a hangar roof with the parachute partially deployed. He sustained injuries to his ribs and internal organs during the impact.

From the ground the ATC controllers noticed 'a bundle' falling from the aircraft toward the hangar area with a parachute partially deploying shortly before it disappeared from view. On questioning the flight crew the controllers were advised that a parachutist had indeed left the aircraft but, because the bundle seen leaving the aircraft had appeared small, the controllers continued to believe that they were the victims of a practical joke. Some time later the controllers noticed the fire and rescue crews proceeding toward the hangars but it was not until some twenty minutes later that the controllers became fully aware of the nature of the incident.

RECOMMENDATION 2001-30

It is recommended that the CAA amend the aircraft Certificate of Airworthiness (C of A) for their DC3 aircraft which are cleared to be fitted with spray bar modifications so as to clarify the position regarding the dropping of parachutists with the rear spray bar fitted.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation. The CAA will, by 31st July, amend the aircraft Certificates of Airworthiness (C of A) for those DC3 aircraft which are cleared to be fitted with spray bar modifications so as to clarify that the dropping of parachutists is prohibited with the rear spray bar fitted.

CAA Action

CAA has amended the aircraft Certificates of Airworthiness (C of A) for those DC3 aircraft that are cleared to be fitted with spray bar modifications so as to clarify that the dropping of parachutists is prohibited with the rear spray bar fitted.

ATR72	Bournemouth Airport	10 Oct 2000	Accident

References: Bulletin 9/2001 dated 6 Sep 2001
FACTOR F43/2001 dated 15 Nov 2001

SYNOPSIS

The aircraft was carrying out a flight scheduled to depart from London Gatwick Airport at 1725 hrs and to arrive at Jersey Airport, Channel Islands, at 1835 hrs. The crew of two pilots and two cabin crew members had reported for duty at 1245 hours and operated one uneventful round trip flight to Guernsey, Channel Islands, on the same aircraft before the accident flight.

The aircraft took off at 1739 hrs and climbed up to a cruise level of FL160. Flight conditions were reported to be good with occasional light turbulence. The weather forecast for Jersey indicated a change was expected between 1600 and 1900 hrs from clear weather with strong westerly winds to cloud, rain and strong southerly winds. Prior to descent the First Officer (FO), who was designated as the handling pilot, briefed for a Runway 27 ILS approach at Jersey. On first contact with Jersey Air Traffic Control (ATC) the crew were informed that the runway in use had just been changed to Runway 09. There was some discussion between the pilots regarding the reported surface wind of 170_/30 kt and the flight manual was checked to confirm the crosswind limit of 30 kt for the aircraft. It was decided that the FO would fly the approach with the commander following through on the controls. The FO accordingly gave a briefing on the details of the Runway 09 ILS approach. At 1813 hrs the following weather observation was passed to the crew by Jersey ATC: VISIBILITY 3KM, HEAVY RAIN SHOWERS, BROKEN CLOUD AT 600 FEET, BROKEN CLOUD AT 1,000 FEET AND SURFACE WIND 180_/20 KT.

The aircraft was given radar vectors towards the extended centreline of Runway 09 and cleared to descend to 3,000 feet amsl. The crew could see weather radar returns indicating the possibility of turbulent conditions in the vicinity of the approach. The level of turbulence being experienced by the aircraft increased during the descent and a master caution alert sounded. The "Flight Controls" (FLT CTL) amber caution light and local stick pusher "Fault" light were illuminated. The crew carried out the appropriate drill from the QRH which required the stick pusher system to be switched off. For extended periods during subsequent turbulence the FLT CTL light illuminated and the master caution alert sounded but with no associated local alert light. When at 3,000 feet and heading south towards the approach further turbulence was encountered and the commander decided that it was too severe to continue. The aircraft was climbed back up to 6,000 feet. At 1833 hrs another attempt was made to establish on the approach but again turbulence was too severe. This time the autopilot disconnected on several occasions and the FO advised the commander that the aircraft controls felt unusually heavy and he did not feel competent to be flying

the aircraft in the conditions. The commander took over control of the aircraft, re-engaged the autopilot and at 1837 hrs accepted vectors again towards the approach. This time the aircraft established on the ILS and descended to 1,700 feet amsl but further turbulence was encountered and the approach was discontinued at 1845 hrs. The autopilot remained engaged for the remainder of the flight until just before landing at Bournemouth.

By this time a number of the passengers and one cabin crew member were suffering from airsickness. The cabin crew handed out cold towels in an attempt to alleviate the symptoms. They also advised the FO of the cabin situation. The commander decided the flight would have to be diverted and, after finding that the Guernsey weather was unsuitable, Southampton was preferred. En route to Southampton the crew calculated that sufficient fuel was on board to return to Gatwick and accordingly requested a route change from ATC. A few minutes later they were advised that Gatwick Airport was closed due to an incident and was not expected to re-open for several hours. The flight thus continued towards Southampton until ATC advised the crew that Southampton was busy and there could be a delay for landing. As a result the crew requested a diversion to Bournemouth and were then cleared to proceed there. Some minutes later they were informed that there were now no delays at Southampton and so revised their destination once more. The weather conditions at Southampton where Runway 20 was in use were, surface wind 160_/9 kt, visibility 8km, rain and drizzle with broken cloud at 1,200 feet. An approach briefing for an ILS 20 approach at Southampton was given by the commander who remained the handling pilot. On descending through FL80 the FO switched to the second radio and spoke to his company operations department. They advised him that due to terminal area congestion at Southampton it would be better for the management of the passengers if the aircraft were to go to Bournemouth. The crew discussed this between themselves, decided that they could accommodate the request, and obtained clearance to Bournemouth once again. The FO was off the ATC frequency for 4 minutes while these arrangements were discussed.

En route to Bournemouth the commander gave an approach briefing for the ILS 26 approach there. The briefing was interrupted on 5 occasions by ATC communications with the aircraft and there were a further 6 such communications while the crew were carrying out the approach checklist. The aircraft was however established on the ILS approach at 9 nm with the checks completed. On final approach information regarding windshear below 500 feet reported by a previous landing aircraft was relayed to the crew by Bournemouth Tower ATC. There was moderate rain on the approach and the surface wind, reported one minute before touchdown, was 180_/17 kt. The commander disengaged the autopilot at 230 feet agl. The aircraft landed on the runway in a nose down attitude on the nose landing gear and rebounded into the air. Nose down elevator was applied and held resulting in a series of divergent bounces which ultimately caused the nose landing gear leg to collapse. The aircraft came to rest on the runway and shortly afterwards the commander initiated a passenger evacuation. All the passengers evacuated the aircraft safely and the airport fire services were on the scene promptly.

RECOMMENDATION 2001-70

It is recommended that the CAA should review the in-service performance of the LORAL model F800 recorder. If confirmed to be not satisfactory for accident investigation purposes they should remove it from the approved list of recorders that may be fitted to aircraft.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation. Following a review of the in-service history, the CAA concluded that the performance of the Model F800 recorder is unsatisfactory for accident investigation purposes and, on 29 May 2001, marked the Model F800 as obsolescent in the CAA equipment approval record. This means that the Model F800 recorder is not permitted to be newly fitted to any UK registered aircraft. However, existing equipment may continue in use until such time that the operator chooses to replace it by another model of recorder. This parallels the action taken by the FAA. Action has been taken to bring this decision and its consequences to the attention of operators and other interested parties by means of the publication of a dedicated Appendix to CAA Airworthiness Notice No.12.

A330/A340	**N5828 W01646**	**2 Oct 2000**	**Incident**

References: Bulletin 6/2001 dated 7 Jun 2001

FACTOR F21/2001 dated 15 Jun 2001

SYNOPSIS

The A340 was en route from Istanbul to New York at Flight Level (FL) 360 and the A330 at FL 370 from London to Ottawa. Both aircraft were assigned to North Atlantic (NAT) Track E, cleared to cruise at M0.82. The vertical separation of 1000 feet was in accordance with RVSM (Reduced Vertical Separation Minima) used by approved aircraft within NAT Oceanic Airspace. The A330 was slowly overtaking the A340.

Both aircraft were in clear air and the A330 was slightly to the right of the A340 and almost abeam it when the A340's wings were seen to flex. At about the same time the A330 crew felt a bump, which was described as similar to entering a mountain wave. 5 or 10 seconds later a further bump caused the A330 to lose 200 feet of altitude. Immediately thereafter the aircraft received a TCAS "climb climb" alert and the A340 was seen to be 2 - 300 feet to the left in a nose up attitude and climbing swiftly. The A340 passed through the A330's level before the commander had time to react to the TCAS alert. The commander estimated that the A340 reached a level of FL381.

The A340 commander had been expecting a turbulence encounter about N59 W020 and when the aircraft entered light turbulence took the appropriate actions. Shortly before the Airprox moderate turbulence was experienced and outside air temperature changes were noted. Suddenly the aircraft began to climb and the autopilot disengaged as the aircraft exceeded the speed limit of M0.86. The airspeed dropped and the commander took manual control because neither autopilot would engage. The commander estimated the lateral separation at the time of the Airprox to be one mile.

After the Airprox the A330 altered course to the right to allow the A340 to descend back to FL360. There were no injuries on either aircraft and the Airprox and the turbulence were both reported to Shanwick OACC.

RECOMMENDATION 2000-67

It is recommended that the CAA take forward a recommendation to the appropriate international bodies to review overtaking procedures in RVSM airspace.

Status - Fully Accepted - Closed

CAA Response

This Recommendation is accepted by the CAA.

The CAA brought this Safety Recommendation to the attention of the ICAO (North Atlantic Operations and Airworthiness Sub-Group of the North Atlantic Systems Planning Group. The final report of the sub-group has yet to be issued, however, the recommendation was well received and will be passed on for further consideration by the main Group.

CAA Action

The North Atlantic Systems Planning Group (NATSPG) met in June 2001. One of the conclusions from that group was as follows: "That the Implementation Management Group develop, on behalf of the NAT SPG, lateral offset procedures that would mitigate the impact on risk of the increasing lateral overlap probability that would be applicable in NAT RVSM airspace." In addition, it is understood that another ICAO group, called the Separation and Airspace Safety Panel (SASP), discussed lateral offsets in relation to procedural airspace at their November 2001 meeting.

RECOMMENDATION 2000-68

It is recommended that the CAA take forward a recommendation to the appropriate international bodies that they reconsider the need for commanders to inform ATC of all lateral offset manoeuvres of less than 2nm in Oceanic airspace, irrespective of the reason for the manoeuvre.

Status - Fully Accepted - Closed

CAA Response

This Recommendation is accepted by the CAA.

The CAA brought this Safety Recommendation to the attention of the ICAO (North Atlantic) Operations and Airworthiness Sub-Group of the North Atlantic Systems Planning Group. The final report of the sub-group has yet to be issued, however, the recommendation was well received and will be passed on for further consideration by the main Group.

CAA Action

The North Atlantic Systems Planning Group (NATSPG) met in June 2001. One of the conclusions from that group was as follows: "That the Implementation Management Group develop, on behalf of the NAT SPG, lateral offset procedures that would mitigate the impact on risk of the increasing lateral overlap probability that would be applicable in NAT RVSM airspace." In addition, it is understood that another ICAO group, called the Separation and Airspace Safety Panel (SASP), discussed lateral offsets in relation to procedural airspace at their November 2001 meeting.

RECOMMENDATION 2000-69

It is recommended that the CAA bring this incident to the attention of the Eurocontrol RVSM Safety Assurance Section as soon as practicable so that its impact on the safety case may be properly considered.

Status - Fully Accepted - Closed

CAA Response

This Recommendation is accepted by the CAA.

The CAA brought this incident, and Safety Recommendation 2000-69, to the attention of the EUROCONTROL RVSM Project Manager and the EUROCONTROL Safety, Quality and Standardisation Department. The matter was also raised by CAA in full session of the Eurocontrol Safety Regulation Commission (SRC) meeting in February 2001.

The EUROCONTROL RVSM Project commissioned an independent Research Report to provide analysis of wake vortices as part of the overall assurance of the continued safety of flight within the European RVSM environment.

As a consequence of the Research Report and CAA intervention under this safety recommendation, the EUROCONTROL RVSM Project will be establishing a number of measures to determine the incidence and operational effect of wake vortex events and to introduce an awareness of these effects into pilot and ATC briefing/training schemes.

When assessing the final RVSM Safety Case, pursuant to the EUROCONTROL Provisional Council RVSM go/delay decision, the EUROCONTROL SRC task force will closely consider the safety arguments and claims presented by the EUROCONTROL RVSM Project in respect of wake vortex.

CAA Action

EUROCONTROL took this incident into account and put in place a number of specific actions to address the matter in their Risk and Safety Assessment processes. The results of those actions were to be incorporated into the Pre-Implementation Safety Case made for RVSM within European Civil Aviation Conference (ECAC) airspace. The Safety Case, together with supporting arguments and evidence, was presented by the RVSM Project team to a specialist RVSM Task Force established by the SRC. In their assessment of the Safety Case, the SRC Task Force made specific consideration of the issues raised in the AAIB report on this incident. The Task Force concluded that the Safety Case addressed the issues raised. RVSM was successfully introduced into ECAC airspace on the 24 January 2002.

RECOMMENDATION 2000-70

It is recommended that the CAA take forward a recommendation to the appropriate international bodies to consider standardising lateral track offset procedures which are independent of wind direction.

Status - Fully Accepted - Closed

CAA Response

This Recommendation is accepted by the CAA.

This Safety Recommendation was raised by the CAA at the ICAO (North Atlantic) Operations and Airworthiness Sub-Group of the North Atlantic Systems Planning

Group. It was concluded that, due to the scope of the objective, it should be considered by a body with wider remit and, accordingly, the CAA elected to approach the Review of the General Concept of Separation Panel (RGCSP).

The CAA are preparing a formal working paper, based on this Safety Recommendation, to be addressed at the next meeting of the RGCSP for the consideration of the RGCSP - Working Group A - Horizontal Separation.

CAA Action

The formal paper referred to was not raised at the RGCSP because the Panel's future was uncertain and, indeed, it has since folded to re-appear in a different entity as the SASP - Separation and Airspace Safety Panel. The SASP is developing offset procedures for global application and, at a meeting of Working Group A of the SASP, in November 2001, there was a presentation on a Strategic Lateral Offset Trial in the West Atlantic Route System area, effective from 1 November 2001 for a period of one year. This trial standardises lateral track offsets to the right, independent of wind direction. The CAA hopes to be represented at the next meeting of SASP, scheduled for October 2002, and will actively encourage the principle of standard offsets, independent of wind direction.

DC10-30F	**Near Shannon Airport**	**1 Oct 2000**	**Incident**

References: Bulletin 9/2001 dated 6 Sep 2001

FACTOR F42/2001 dated 15 Nov 2001

SYNOPSIS

The aircraft suffered a bird strike shortly after take off from Shannon, Ireland, which caused severe damage to the No. 1 (left) engine and caused some large nacelle components to separate from the engine. These parts struck and damaged the left inboard aileron and flap before falling to the ground. The aircraft diverted to London Heathrow for inspection and repair. Whilst ATC written procedures specify that aircraft in emergency should preferably not be routed over densely populated areas, the commander of the aircraft was not advised of this procedure and the approach to London Heathrow Airport from the east took his aircraft over densely populated urban areas.

Three Safety Recommendations were made as a result of this investigation, pertaining to the method of attachment of the aft centre body on the CF6-50 engine and air traffic control procedures for aircraft in emergency situations.

RECOMMENDATION 2001-35

The CAA should include in the provisions, relating to handling Aircraft Emergencies in MATS Part 1, instructions for controllers to inform the pilot of an aircraft in emergency if it is known that an intended route takes the aircraft over densely populated areas.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation. The relevant section of the Manual of Air Traffic Services Part 1 will be amended by the inclusion of new text stating that, when the most expeditious routeing is not required, suggestions of alternative runways or aerodromes, which avoid the need for flight over densely populated areas, shall be passed to the pilot, together with the rationale for such action, and his intentions requested. The revised text will be distributed with Amendment 52, scheduled for publication in December 2001.

CAA Action

The revised text was distributed with the Manual of Air Traffic Services Part 1 Amendment 52, issued in December 2001.

B747	Over Arabian Sea	5 Sep 2000	Incident

References: Bulletin 11/2000

FACTOR F1/2001 dated 1 Feb 2001

SYNOPSIS

(From AAIB Report)

In the climb after departure from Karachi, the two lower combustion section fairings from within the bypass duct of the nr 3 engine detached and collided with the outboard trailing edge flap inboard flap track fairing (canoe fairing), the high speed aileron, the trailing edge flaps and flap actuating mechanism. In addition to the impact damage within the bypass duct and to these primary and secondary flight control surfaces an actuating rod to the outboard aft flap was bent and a cam track supporting the sequence carriage for the outboard fore flap was dislodged. The detached fairings (p/ns LK70363 and LK70365) were not recovered and consequently it cannot be determined whether there was a mechanical failure in either of them or in their attachment hooks or latches.

RECOMMENDATION 2000-48

It is recommended that the Civil Aviation Authority and Rolls-Royce Limited review the history of occurrences of the loss of combustion section fairings from RB211 engines and re-assess the effectiveness of the current (post SB RB211-72-4647) design in preventing mal-assembly, with a view to design and/or procedural changes to minimise the chances of future mal-assembly.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation.

The CAA, in conjunction with Rolls-Royce, will by 30 June 2001, review the history of occurrences of the loss of combustion section fairings from RB211 engines and re-assess the effectiveness of the current (post SB RB211-72-4647) design in

preventing mal-assembly in order to determine whether design or procedural changes, to minimise the chances of future mal-assembly, are appropriate.

CAA Action

A review of occurrences of the loss of combustion section fairings from RB211 engines has concluded that a design change is appropriate. A design modification is being prepared by Rolls-Royce and is scheduled to be available by August 2002. Meanwhile, Rolls-Royce has issued a training video to all operators highlighting the appropriate maintenance procedures for installation of the current fairing configuration.

Concorde	**Paris CDG**	**25 Jul 2000**	**Accident**

References: BEA dated 28 Jan 2002

FACTOR F14/2001

SYNOPSIS

During the take-off run the front right tyre of the left main landing gear was destroyed between V1 and VR, very probably because it ran over a piece of metal.

The destruction of the tyre has caused damage, either directly or indirectly, to the aircraft structure and systems, leading to the crash less than one minute and thirty seconds after the destruction of the tyre.

The damage sequence and the links between the various events are not yet fully established, nevertheless, the following events occurred:

- one or more punctures of at least one fuel tank with a major fuel leak,
- ignition of the leaking fuel and an intense fire which lasted for the duration of the flight, the fire appeared within a few seconds of the destruction of the tyre,
- the loss of thrust on one and then two engines.

The crew had no means to make them aware of the nature of the fire nor to take action to contain it.

Moreover, the in-service experience shows that tyre damage during taxi, take-off or landing is not an unlikely event on Concorde and that it may actually lead to damage to the structure and to systems. However, this has never led to a fuel fed fire.

The accident that occurred on 25 July 2000, has thus shown that the destruction of a tyre - a simple event which cannot be asserted not to re-occur - has had catastrophic consequences in a very short timescale without the crew being able to recover from this situation.

Consequently, without prejudice to additional elements that may arise during the course of the investigation, the BEA and the AAIB have made one Safety Recommendation to the Direction General de l'Aviation Civile of France and the Civil Aviation Authority of the United Kingdom.

RECOMMENDATION 2000-43

The certificates of airworthiness of Concorde be suspended until appropriate measures have been taken to ensure a satisfactory level of safety as far as the tyre destruction based risk is concerned.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The CAA suspended the certificates of airworthiness of the British-registered Concorde fleet on 15 August 2000. The CAA has also required the joint manufacturers to recommend an action plan including appropriate measures which will ensure a satisfactory level of safety of Concorde as far as risks associated with tyre failures are concerned.

CAA Action

The CAA has reviewed a package of measures proposed by the manufacturers which is intended to ensure a satisfactory level of safety as far as risks associated with tyre failures are concerned, and has concluded that they are acceptable.

On 5th September 2001, CAA issued Emergency Airworthiness Directive (EAD) 001-09-2001 which specifies these measures. The suspension of the certificates of airworthiness for the British-registered Concorde aircraft was lifted following issue of this EAD.

Fokker F27 Mark 50	**Coventry Airport**	**1 Jul 2000**	**Accident**

References: Bulletin 4/2001 dated 5 Apr 2001
FACTOR F27/2001 dated 2 May 2001

SYNOPSIS

The aircraft was returning to Coventry with 400 kg of ballast after a night mail flight to Belfast. The ILS approach was flown slightly steep and 15 kt above target speed and the aircraft landed 300 metres beyond the aim point at Vref plus 19 kt. The commander inadvertently failed to select propellers to ground fine pitch and the excessive speed prevented the aircraft weight from transferring to the mainwheels. As a result the braking effectiveness was poor and the aircraft departed the runway at approximately 60 kt, impacting the airfield perimeter fence and coming to rest with the nosewheel collapsed half way across a public road.

The investigation determined that the following causal factors contributed to the accident:

1 The landing was continued even though the airspeed was above the calculated threshold speed and touchdown was beyond the normal point.

2 Ground fine pitch was not selected at the normal place in the landing roll, although the commander thought that he had done so.

3 The AFM Volume 1 target threshold speed (Vthr) exceeded the certified threshold speed (Vat) by 8 kt.

4 The flaps were not raised after touchdown which was not in accordance with the instruction contained in the Aircraft Flight Manual Volume 2.

RECOMMENDATION 2000-53

The CAA should require the manufacturer (Fokker Services BV) to correct the F27 Aircraft Flight Manual (AFM) Volume 1 speeds in accordance with the certified data in AFM Volume 2.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation.

The CAA has initiated an action with the manufacturer (Fokker Services BV) to correct the F27 Aircraft Flight Manual (AFM) Volume 1 speeds in accordance with the certified data in AFM Volume 2.

It is intended that this is accomplished by 30 September 2001

CAA Action

The manufacturer has agreed to address the discrepancies between the take-off speeds contained in Volume 1 and the certified data contained in Volume 2 of the F27 AFM. The CAA continues to press the manufacturer both for a solution to the discrepancies in the landing speeds, and for a timescale for the amendment of Volume 1 of the AFM.

RECOMMENDATION 2000-54

The CAA should require the manufacturer (Fokker Services BV) to clarify the procedure for the retraction of flaps after landing and amend the relevant volume of the F27 AFM accordingly.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The CAA has initiated an action with the manufacturer (Fokker Services BV) to clarify the procedure for the retraction of flaps after landing, and amend the relevant volume of the F27 AFM accordingly.

It is intended that this is accomplished by 30 September 2001.

CAA Action

The manufacturer has agreed to clarify the procedures in the AFM for the retraction of flaps after landing, and is preparing a Manufacturer's Change Notification (MCNO) to accomplish these changes.

B747/A321	London Heathrow Airport	28 Apr 2000	Incident

References: AIR 1/2001 dated 12 Jun 2001

FACTOR F11/2001 dated 12 Jun 2001

SYNOPSIS

This serious incident occurred at London Heathrow Airport when Runway 09 Right (09R) was being used for take-off and Runway 09 Left (09L) was being used for landing. At the time, the ATC controller with responsibility for Runway 09R was a mentor who was supervising a trainee. There was also a local procedure whereby aircraft could land on Runway 09R if traffic conditions allowed. A number of aircraft had been given conditional line-up clearance for Runway 09R and an arriving aircraft (Speedbird Six) was approaching for a landing on Runway 09R.

With one aircraft (Midland One November Zulu) still on the runway for take-off, 'Speedbird Six' was instructed to go-around at a late stage of its approach. During this procedure, the aircraft performing the go-around descended to 118 feet radar altitude above the runway; the aircraft on the runway for departure had a tail fin height of 38 feet 7 inches.

The investigation revealed the following causal factors:

1 The ATC mentor allowed the situation to develop to the point where 'Speedbird Six' could not be safely integrated with the departure of 'Midland One November Zulu'.

2 When this became apparent, the initial actions of the mentor, on taking control of the RTF, were inappropriate.

RECOMMENDATION 2001-42

The Civil Aviation Authority should issue instructions requiring United Kingdom Registered aircraft to use strobe lights, if fitted, when on an active runway in the UK.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation. The CAA will issue instructions requiring United Kingdom registered aircraft to use strobe lights, if fitted, when on an active runway in the UK. Target date: 31 August 2001.

CAA Action

The CAA published Flight Operations Department Communication (FODCOM) 14/ 2001, dated 24 August 2001. This FODCOM contained instructions that operators should review their operating procedures and amend their Operations Manual as necessary to include instructions that, if fitted, strobe lights should be used when on an active runway prior to take-off or after landing.

RECOMMENDATION 2001-43

The Civil Aviation Authority should ensure that Air Traffic Control providers include an adequate allocation of time for formal briefing and debriefing of student controllers undergoing operational training.

Status - Partially Accepted - Closed

CAA Response

The CAA partially accepts this Recommendation. UK based OJTI courses are approved by the CAA. These courses contain elements specifically targeting briefing and de-briefing of trainees. It is the individual OJTIs' responsibility to determine the extent of briefing and debriefing applicable to a student on a day-to-day basis. The CAA will undertake to remind ATS Providers of this responsibility.

CAA Action

ATS Information Notice (ATSIN) No. 2 - Conduct of On the Job Training Instruction - was issued on 22 October 2001.

RECOMMENDATION 2001-44

The Civil Aviation Authority should ensure that Air Traffic Control units use formal systems for the selection and monitoring of On-the-Job Air Traffic Control Training Instructors.

Status - Partially Accepted - Closed

CAA Response

The CAA partially accepts this Recommendation. Although the CAA cannot by responsible for the selection of potential On-the-Job Training Instructors (OJTIs), which is the function of the service provider, the CAA approved OJTI training course provides assurance of a potential OJTI's skills and suitability. The CAA ensures that service providers have in place procedures to assess the ongoing competence of OJTIs.

CAA Action

Having reviewed the issues raised in this Recommendation, the CAA concludes that they are adequately addressed by the measures referred to in the CAA Response above, nevertheless, as part of their regulatory oversight, the CAA will ensure that service providers continue to have effective procedures in place to assess the ongoing competence of OJTIs.

Shorts SD3-60, Tornado F3	**26.5nm North Newcastle Airport**	**20 Mar 2000**	**Incident**

References: Bulletin 2/2001 dated 20 Feb 2001

FACTOR F20/2001 dated 10 Apr 2001

SYNOPSIS

A Shorts SD3-60 aircraft, G-OLAH, was operating a scheduled service from Aberdeen to Newcastle. The direct track between the two aerodrome control zones followed by the aircraft lay within Class G airspace. At the same time a formation of three RAF Tornado F3 aircraft were engaged in a Tactical Leadership Training medium scale night exercise planned by the Air Warfare Centre and notified to civilian operators by NOTAM. As the SD3-60 descended to FL50 into Newcastle, under a Radar Advisory Service (RAS), one of the Tornados was manoeuvring at high speed and passed closely in front of the SD3-60 at the same level. The Newcastle radar controller, who observed the military traffic on his radar, provided the SD3-60 pilot with avoiding headings, which were followed. Despite this, and because the Tornado was manoeuvring, both aircraft conflicted, with the closest point of approach estimated to be some 300 feet horizontally and 100 feet vertically. The Tornado navigator detected the confliction on his radar moments before and warned his pilot of the danger. Neither he nor the pilot saw the aircraft until it had passed behind them and too late to take any avoiding action. The pilot of the SD3-60 did not see the Tornado until it passed in front of his aircraft.

RECOMMENDATION 2000-57

The CAA, in conjunction with the Director of Airspace Policy, should, by means of risk assessment, quantify the risk of mid-air collisions occurring between scheduled public transport services, which operate wholly or partially outside controlled airspace, and other users of Class F and G airspace.

Status - Partially Accepted - Closed

CAA Response

The CAA partially accepts this Recommendation.

It is not possible to gather the statistical data required to conduct the quantitative risk assessment called for by this Recommendation. Therefore, the Directorate of Airspace Policy conducted an immediate safety assessment of operations by scheduled public transport services in Class F and G airspace throughout the UK. The study confirmed that there had been a concentration of incidents in the vicinity of Newcastle Airport and that provided a Radar Advisory Service or Radar Information Service is used, the target levels of safety are met. However, this and a number of other incidents indicate that not all military traffic is availing itself of such air traffic services. Consequently, the CAA is continuing to work closely, as a matter of urgency, with the MOD and Newcastle Airport, on a wide range of initiatives aimed at reducing conflicts of this nature in the future. This work is expected to be complete by October 2001, after which the subject will continue to be reviewed as part on the ongoing safety assurance process. Details of this remedial action will be published in the next edition of the CAA's Progress Report on responses to Air Accidents Investigation Branch Safety Recommendations.

CAA Action

A variety of initiatives aimed at reducing conflicts between scheduled public transport services and military aircraft have been introduced between May 2001 and October 2001. Use of a serviceable transponder is now mandatory for military flights within the UKLFS, and military pilots engaged in low-flying activities have been directed to make an information call to Newcastle Airport when operating close to the Newcastle CTR boundary and when transiting the Hexham Gap. During large-scale military

exercises in the area, an airspace buffer is put in place around the Newcastle CTR for UKLFS participants. A Military Liaison Officer is deployed to Newcastle Airport ATC during such exercise periods. The Liaison Officer has full details of exercise activities and acts as a point of contact for any unusual occurrences or incidents. The situation in the Newcastle area remains under constant review, with Newcastle Airport providing CAA and MOD with monthly reports on any issues of concern. MOD subsequently investigates any suspected breaches of airspace, military regulations or UKLFS procedures arising from these reports and takes appropriate remedial action. The MOD and Newcastle Airport, in conjunction with the CAA, continue to meet at 6 monthly intervals to promote the safe and efficient use of airspace in the region.

RECOMMENDATION 2000-58

The CAA, in conjunction with the Director of Airspace Policy, should assess whether there is adequate provision of regulated airspace for scheduled air transport operations to and from regional airports that are not directly linked by airways or advisory routes.

Status - Partially Accepted - Open

CAA Response

The CAA partially accepts this Recommendation.

The safety assessment referred to in the response to Recommendation 2000-57 indicates that target levels of safety are met where Radar Advisory and Radar Information Services are utilised. However, a further consideration of the adequacy of the airspace in the Newcastle area will be conducted following discussions with MOD. It is expected that this further work will be concluded by April 2002.

CAA Action

Following discussions with the MOD, the CAA has recently reviewed the adequacy of the airspace in the Newcastle area. The CAA noted the steps that had been taken by MOD to address the issues surrounding airspace in the vicinity of Newcastle Airport and supported Joint Future Airspace Design Team proposals for additional Controlled Airspace in the area. The CAA concluded that, whilst there was clearly still a level of risk associated with the current airspace arrangements, all reasonable steps had been taken to mitigate the risk of encounters between civil air transport aircraft and military aircraft to an acceptable level in the short and medium term. Notwithstanding this, the situation needs to be carefully monitored. Additionally, commencing with data from 2001, the CAA will undertake an annual review of all AAIB/UKAB reports for incidents involving commercial aircraft operating in Class G airspace within the UK FIR. The 2001 review should be completed by 30 June 2002.

Fokker F27-600	**1nm past Guernsey Airport**	**12 Jan 1999**	**Accident**

References: AAR 2/2000 dated 4 Apr 2000

FACTOR F9/2000 dated 4 Apr 2000

SYNOPSIS

(From AAIB Report)

The accident occurred when control of the cargo aircraft, carrying three tonnes of newspapers, was lost during the final stages of an approach to Guernsey Airport. Moments after the wing flaps were lowered to their fully down position, the nose of the aircraft rose and the crew were unable to prevent it rising further. The nose continued to rise until the aircraft's pitch attitude was near vertical. Although the crew applied nose down pitch trim and high engine power, the aircraft lost flying speed, stalled and entered an incipient spin. It descended in a shallow nose down pitch attitude with little forward speed and crashed at the rear of a private house, striking the house with its port wing. Both the house and the aircraft caught fire. The two pilots were killed but the sole occupant of the house escaped without physical injury.

The AAIB investigation identified the following causal factors:

a) The aircraft was operated outside the load and balance limitations.

b) Loading distribution errors went undetected because the load sheet signatories did not reconcile the cargo distribution in the aircraft with the load and balance sheet.

c) The crew received insufficient formal training in load management.

RECOMMENDATION 99-65

It is recommended that the CAA require operators to reassess the relevant equipment and engine fit on all UK registered aircraft subject to the requirements of the Air Navigation Order, Schedule 4, Scale P and require that, where now practicable, those aircraft are modified to enable the recording of pitch attitude, roll attitude and engine thrust.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation.

A Letter to Operators (LTO) will be sent to owners of affected aircraft which will request them to re-assess the Flight Data Recorder installation in their aircraft against the requirements of the Air Navigation (No 2) Order 1995, Schedule 4, Scale P. In addition, the owners of the aircraft will be asked to provide confirmation to the CAA of the status of the Flight Data Recorder System on their aircraft concerning the recording or non-recording of pitch attitude, roll attitude and engine thrust parameters. The CAA will assess these responses and require that where now practicable, those aircraft are modified to enable the recording of pitch attitude, roll attitude and engine thrust.

The LTO will be despatched by 31 March 2000.

CAA Action

The process of assessing operators' responses to the CAA's Letter to Operators (LTO) has now been completed. Following review of those responses further questions have been raised with some manufacturers of Flight Data Recorders regarding the capabilities of their equipment and some operators have been requested to re-consider the installations in their aeroplanes.

HS748-Series 2B	London Stansted Airport	30 Mar 1998	Accident

References: AAR 3/2001 dated 7 Dec 2001

FACTOR F45/2001 dated 7 Dec 2001

SYNOPSIS

(From AAIB Report)

The aircraft was scheduled to depart from London (Stansted) Airport at 2230 hours with a one hour flight to Leeds Bradford Airport. A baggage problem delayed the flight and the aircraft eventually taxied at 2323 hours, to holding point 'HP' for Runway 23. Takeoff clearance was given at 2329 hours. The First Officer was the handling pilot and the takeoff was to be made with full dry power; the water methanol system was selected to standby.

(The following sequence of events was established from the flight recorders). The aircraft was cleared to takeoff and the First Officer called for full dry power. As engine power stabilised, the First Officer called that the warning 'lights were out and the emergency panel was clear'. As the aircraft accelerated, the Commander announced 'sixty knots' and relinquished steering control to the First Officer who acknowledged and confirmed, 'full dry we have, just slightly low on the right'. No significant variation in engine rpm between the two engines could be detected from the Flight Data Recorder (FDR) recording. The aircraft accelerated through 80 kt and, for a period of two seconds, the sound of the nosewheel running over the runway centreline lighting was recorded on the area microphone channel of the Cockpit Voice Recorder (CVR). At an airspeed of 111 kt the Commander called 'vee one, rotate', the First Officer moved the control column rearwards and the aircraft became airborne.

Less than five seconds after the 'rotate' call, at an airspeed of 115 kt and a height of between 30 feet and 100 feet agl, the sound of a sharp report followed by an engine run-down was recorded on the CVR. The aircraft yawed 11deg to the right of the runway heading. As the crew asked each other what the noise had been, loud shouting could be heard from the passenger cabin. The First Officer said, as he corrected the yaw, 'something's gone' and the Commander then stated that he had taken control of the aircraft. Within eight seconds of the event the First Officer stated that an engine had stopped. Simultaneously, the senior cabin attendant, using the Public Address (PA) system, told the passengers to sit down and then advised the flight deck crew via the interphone that the right engine was on fire. Engine power was reduced and the aircraft yawed 14.5deg to the left of runway heading. Four seconds later, the sound of the engine fire warning bell was recorded. Without using the PA system, the senior cabin attendant told the passengers to 'stay in your seats and make sure your seatbelts are all fastened'.

The aircraft was in the air for a total period of 27 seconds before the noise of touchdown was recorded. The Commander called for brakes, to which the First Officer replied 'coming on'. The First Officer then suggested that he 'fire' the right engine fire bottle but the Commander asked him to call the fire brigade, which he then did continuously. The Flight Fine Pitch Stops (FFPS) warning horn activated 5 seconds after touchdown, 4 seconds before the aircraft ran off the end of the runway at 62 kt. The warning sounded for the remainder of the audio recording.

After the aircraft left the runway, the CVR cockpit area microphone picked up the noises of the aircraft rolling over uneven ground, the point at which the perimeter track was crossed and the final collapse of the nose landing gear. Recording on both the FDR and CVR terminated due to the removal of electrical power 7.1 seconds after the aircraft departed the paved surface. When the aircraft came to a halt, the First Officer left his seat immediately to assist with the evacuation of the aircraft. The Commander carried out a limited shutdown. He then satisfied himself that the cabin was clear before leaving the aircraft. All passengers and crew evacuated the aircraft without serious injury.

RECOMMENDATION 2001-08

It is recommended that the CAA require modification of the PA/Interphone system on HS748 aircraft at the rear cabin attendant position to render the handset and its controls accessible to an attendant strapped into the aft cabin crew seat.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The requirement for the installation of a Public Address system stems from an operational requirement (ANO/JAR-OPS). CAA Specification No.15, dated 27 January 1989, provides the installation requirements for such systems and in particular paragraph 4.2 covers cabin crew accessibility provisions that fully meet the intent of this recommendation.

Following the accident, G-OJEM has been permanently removed from the Register. Those HS748 aeroplanes which remain on the Register are configured as freighters which would not require the carriage of cabin crew. Any passenger aircraft coming onto the UK register will be required to meet CAA Specification No 15. On this basis the CAA has concluded that no further regulatory action is needed at this time.

RECOMMENDATION 2001-09

It is recommended that the manufacturer revise and the CAA approve an amendment to the HS748 Flight Manual to emphasise the importance of LP fuel cock closure as a priority action in the event of an engine bay fire. The CAA should consider whether similar measures are necessary for other aircraft types.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

With respect to any action to revise the HS748 Flight Manual, the CAA awaits a submission from the manufacturer.

A review of approved Flight Manuals for other large aeroplane types indicates that each includes shutting off the LP fuel supply as an action early in the engine fire/ severe damage emergency procedure, as is the case for the HS748. The CAA concludes that closure of the LP fuel cock is already adequately emphasised in relevant Flight Manuals and that no regulatory action is necessary for other aircraft types.

CAA Action

The manufacturer has completed a review of the HS748 Flight Manual drills and has concluded that as the third vital action in the Engine Fire Emergency Procedure is to close the LP cock, the intent of this Recommendation is already satisfied and that accordingly there is no need for amendment. The CAA concurs with this view.

A review of approved Flight Manuals for other large aeroplane types indicates that each includes shutting off the LP fuel supply as an action early in the engine fire/ severe damage emergency procedure. The CAA therefore concludes that closure of the LP fuel cock is already adequately emphasised.

RECOMMENDATION 2001-11

It is recommended that the CAA require the HS748 to be provided with an easily deployable and effective means of descent from both fuselage rear doors in an emergency evacuation situation with any landing gear configuration.

Status - Not Accepted - Closed

CAA Response

The CAA does not accept this Recommendation.

The CAA has reviewed the escape systems fitted to the HS748. There are no HS 748s now in passenger configuration in the UK. Several types of aeroplane are in freighter configuration with various escape provisions such as ropes, rope ladders and canvas chutes. Although some of these aeroplanes can be operated with persons other than aircrew on board, for example when transporting livestock, the overall considerations of the likely time of implementation, the nature of the aircraft affected (for example the modest sill heights in normal attitude), cost, and the expected further reduction of the affected fleet over future years it is not considered that the limited benefits justify regulatory action.

RECOMMENDATION 2001-12

It is recommended that the CAA review the escape systems fitted to other UK public transport aircraft certificated to an earlier standard and require similar action where doubts exist as to their effectiveness.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The CAA has reviewed the escape systems fitted to other UK public transport aircraft certificated to an earlier standard. One type, the Viscount, is no longer in operation in the UK. There are no HS748s now in passenger configuration. Several types of aeroplane are in freighter configuration with various escape provisions such as ropes, rope ladders and canvas chutes. Although some of these aeroplanes can be operated with persons other than aircrew on board, for example when transporting livestock, the overall considerations of the likely time of implementation, the nature of the aircraft affected (for example the modest sill heights in normal attitude), cost, and the expected further reduction of the affected fleet over future years it is not considered that the limited benefits justify regulatory action.

RECOMMENDATION 2001-13

It is recommended that the manufacturer and the CAA reassess the crashworthiness of the aircraft electrical system in the event of nose landing gear overload failure and take measures aimed at ensuring that safety-critical services remain operable in such a case. These services should include LP fuel cocks and engine bay fire extinguishers.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation.

By a letter dated 23 November 2001, the CAA have requested the manufacturer to reassess the crashworthiness of the HS748 electrical system in the event of nose landing gear overload failure and to investigate the feasibility of measures aimed at ensuring that safety-critical services remain operable in such a case. The CAA have set a target date of September 2002 to complete this reassessment.

CAA Action

The manufacturer has completed a reassessment of the crashworthiness of the HS748 electrical system. The conclusion drawn is that it would be possible to design and introduce a modification which would reduce the vulnerability of the earthing provisions to disruption in the event of nose wheel collapse. The CAA concurs with this conclusion and has requested the manufacturer to develop such a modification.

RECOMMENDATION 2001-14

It is recommended that the CAA require the aircraft manufacturer to consider measures aimed at ensuring that the LP fuel heater assembly in the HS748 engine bay can tolerate the displacements likely to result from a major failure of the engine rotating assembly without releasing fuel.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

By a letter dated 23 November 2001, the CAA have requested the manufacturer to consider measures aimed at ensuring that the LP fuel heater assembly in the HS748 engine bay can tolerate the displacement likely to result from a major failure of the engine rotating assembly without releasing fuel.

CAA Action

In response to the CAA's request the manufacturer has considered measures aimed at ensuring that the LP Fuel Heater assembly in the HS748 engine bay can tolerate the displacement likely to result from a major failure of the engine rotating assembly without releasing fuel. From their review they have concluded that no practical degree of additional flexibility could be provided in the fuel heater installation which would allow it to tolerate the displacement likely to result from a major failure of the engine rotating assembly without releasing fuel. They also concluded that the same design has been demonstrated to be adequate during many millions of hours of Dart engine installations operations over the last fifty years.

The CAA concurs with the manufacturer's conclusions.

RECOMMENDATION 2001-15

It is recommended that the CAA review, in the light of advances in communication technology, its response to and reconsider Safety Recommendation 4.14, Aircraft Accident Report 8/88.

Status - Fully Accepted - Open

CAA Response

The Civil Aviation Authority accepts this Recommendation. Civil Aviation Publication (CAP) 168 (Licensing of Aerodromes), Chapter 8, Paragraph 20 already calls for an effective communication system. The objective should be to provide communications equipment in all areas where discernible benefits can be achieved. The current guidance addresses specific areas related to communication fitted to vehicles, portable equipment, emergency frequencies (121.6), Local Authority Fire Service(s), person to person and effective-range-of-communication equipment.

In order to address the Recommendation (No 2001-15) and ensure that there are no residual vulnerabilities, the CAA will review the advances in technology, assess the current guidance and survey the major UK Airport Fire Services to ensure the above objective can be achieved. In order to be proactive the CAA, through its regulatory oversight of licensed aerodromes, is currently assessing interoperability of emergency services involved in the saving of life at an aircraft accident. Communications form a significant element of this proactive measure. Work will commence on this process immediately, with an expected completion date of not later than 31 May 2002.

CAA Action

A questionnaire has been circulated to Industry and the Airport Fire Officers Association and the issue will be progressed further once the extent of the perceived problem is known. In the meantime, Aerodrome Inspectors are reviewing and promoting the topic at units during audits.

RECOMMENDATION 2001-18

It is recommended that the CAA review and revise as necessary the requirements for the recording of maintenance actions with the aim of ensuring that information essential to the further operation and maintenance of the aircraft is readily available.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The CAA will review and revise as necessary the requirements for the recording of maintenance actions with the aim of ensuring that information essential to the further operation and maintenance of the aircraft is readily available. Target date: 31 March 2002.

CAA Action

The CAA has reviewed the requirements for the recording and retention of maintenance actions and concluded that the requirements are adequate. Airworthiness Notice 12, Appendix 61 has been published to clarify the requirements and remind aircraft operators and maintenance organisations of their responsibilities.

RECOMMENDATION 2001-19

It is recommended that the CAA require the engine manufacturer to designate repair schemes in such a way that the standard that has been used on any particular occasion is readily apparent.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The CAA has required the engine manufacturer to review and amend where necessary the procedures controlling the designation of repair schemes to ensure that the standard used on any particular occasion is readily apparent.

RECOMMENDATION 2001-20

It is recommended that the engine manufacturer and the CAA reassess the susceptibility of the three-stage Dart turbine to HCF failure and ensure that effective action aimed at preventing recurrence has been taken.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The CAA assessed the problem with the engine manufacturer and issued Airworthiness Directive 007-02-2001 on 22 February 2001. The directive is aimed at preventing recurrence of failure of the three-stage Dart turbine disc owing to HCF by ensuring effective damping is present on the disc diaphragm. The CAA revised this Airworthiness Directive on 1 July 2001 in response to additional data. This revision instructed considerable reductions to the compliance period.

RECOMMENDATION 2001-21

It is recommended that the CAA and the engine manufacturer consider the need for further improvement to their systems intended to ensure effective action to prevent recurrence following potentially catastrophic in-service failures of UK type-certificated equipment used on public transport aircraft.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The CAA has reviewed its system for ensuring the effectiveness of actions taken to prevent recurrence of potentially catastrophic failures of UK type-certificated equipment on public transport aircraft. The CAA has concluded that the performance of its current systems has been sufficient to contain catastrophic failures of UK type certificated equipment to an extremely low rate. Given its commitment to refining these systems where possible and necessary to ensure that this remains the case, the CAA concludes that it has met the intent of this Recommendation.

RECOMMENDATION 2001-22

It is recommended that the CAA review the adequacy of their current procedures to ensure that aircraft being entered into the UK Register have DFDR installations that satisfy the requirements of applicable performance specifications.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation.

The CAA will review the adequacy of its current procedures to ensure that aircraft being entered into the UK Register have DFDR installations that satisfy the requirements of applicable performance specifications. Target date: 31 March 2002.

CAA Action

The CAA working group completed the draft Civil Aviation Publication (CAP) giving 'best practice' information on the handling of Flight Data Recorder issues. This CAP will cover all aspects from Type Certification to Certificate of Airworthiness issues and ongoing system serviceability assessment. The draft CAP was completed in March 2002 and it will now undergo industry consultation and publication at the earliest opportunity.

RECOMMENDATION 2001-23

It is recommended that the CAA provide adequate guidance material on the subject DFDR installations to all personnel responsible for the surveying and regulation of such installations.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation.

The CAA will review the existing internal guidance material on DFDR installations as promulgated in September 2000. If, in the light of the review, changes are made to the material then it will be reissued to all personnel responsible for the surveying and regulation of such installations. Target date: 31 March 2002.

CAA Action

The CAA working group completed the draft Civil Aviation Publication (CAP) giving 'best practice' information on the handling of Flight Data Recorder issues. This CAP will cover all aspects from Type Certification to Certificate of Airworthiness issues and ongoing system serviceability assessment. The draft CAP was completed in March 2002 and it will now undergo industry consultation and publication at the earliest opportunity.

RECOMMENDATION 2001-24

It is recommended that the CAA, in conjunction with operators, review the DFDR installation of aircraft on the UK Register which are fitted with the type PV1584 DFDR to determine compliance with the applicable minimum performance standards.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation.

The CAA, in conjunction with operators, will review the DFDR installation of aircraft on the UK register which are fitted with the type PV1584 DFDR to determine compliance with the applicable minimum performance standards. Target date: 31 March 2002.

CAA Action

Letter to Operators (LTO) number 2017 has been sent to identify operators of aircraft utilising Flight Data Recorders under ANO scale P. The feedback from the LTO was analysed, compliance with the applicable minimum performance standards determined, and the results used during the preparation of the 'best practice' draft CAP which was completed in March 2002. The draft CAP will now undergo industry consultation and publication at the earliest opportunity.

RECOMMENDATION 2001-25

It is recommended that the CAA should require that, during a mandatory DFDR installation calibration, a range of expected data values should be stipulated for every point of a transducer's travel that is tested. These range values should be stated in either the calibration test procedure or the appropriate test results sheet.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation.

The CAA will require that, during a mandatory DFDR installation calibration, a range of expected data values must be stipulated for every point of a transducer's travel that is tested. These range values must be stated in either the calibration test procedure or the appropriate test results sheet. Target date: 31 March 2002.

CAA Action

The CAA working group completed the draft Civil Aviation Publication (CAP) giving 'best practice' information on the handling of Flight Data Recorder issues. This CAP will cover all aspects from Type Certification to Certificate of Airworthiness issues and ongoing system serviceability assessment. The draft CAP was completed in March 2002 and it will now undergo industry consultation and publication at the earliest opportunity.

RECOMMENDATION 2001-26

It is recommended that the CAA should require that, during a mandatory readout of a DFDR, a section of the readout data should be examined to determine that all parameters have been recorded in accordance with the repetition rate specified in the data frame layout and conversion document pertinent to the DFDR installation being assessed.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation.

The CAA will require that, during a mandatory readout of a DFDR, a section of the read out data must be examined to determine that all parameters have been recorded in accordance with the repetition rate specified in the data frame layout and conversion document pertinent to the DFDR installation being assessed. Target date: 31 March 2002.

CAA Action

The CAA working group completed the draft Civil Aviation Publication (CAP) giving 'best practice' information on the handling of Flight Data Recorder issues. This CAP will cover all aspects from Type Certification to Certificate of Airworthiness issues and ongoing system serviceability assessment. The draft CAP was completed in March 2002 and it will now undergo industry consultation and publication at the earliest opportunity.

HS748 Series 2A	**Liverpool Airport**	**9 Feb 1998**	**Accident**

References: Bulletin 7/99 dated 10 Dec 1999

FACTOR F23/99 dated 1 Dec 1999

SYNOPSIS

The left wheel of the nose landing gear detached on take off. This was not apparent to the crew until after they had landed and taxied to the stand. Examination revealed extensive fretting and hammering type damage to the components, including thread damage sufficient to allow the axle nut to detach from the axle. The evidence indicated that this had resulted from the use of an incorrect procedure for tightening the axle nut. Similar failures attributed to this cause had previously occurred to HS748 aircraft on a number of occasions and the Nose Landing Gear manufacturer had issued two Service Letters, the first some time before 1982, informing operators of the correct procedure and warning of the consequences of failing to follow it. Damage to G-BPDA's axle nut and bearing adjustment nut was indicative of attempts to rotate them without using the specified tools. A Nose Landing Gear manufacturer's Service Bulletin in 1990 had recommended a special check of the axle assembly for correct adjustment and axle nut integrity but this had not been mandated by the CAA and had not been carried out on G-BPDA.

A number of features of the maintenance background, including an attempt five flights prior to the accident to adjust and tighten the axle assembly without the correct tools and without the work having been entered in the maintenance records, suggested a maintenance standard unlikely to achieve a satisfactory level of airworthiness.

RECOMMENDATION 99-25

The CAA define limits for the scope of line and base maintenance operations and take measures aimed at ensuring that operators and maintainers are fully aware of these limits.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation.

The CAA submitted proposals to the Joint Aviation Authorities (JAA) on 2 October 1998 to amend the definitions provided by the Joint Aviation Requirements for Approved Maintenance Organisations (JAR-145). The proposals, if adopted by the JAA, are intended to clearly define the scope together with associated limitations of both line and base maintenance, in order that operators and maintainers are fully aware of these limits. The CAA will continue to monitor the progress of these proposals, and if not adopted before February 2000 by the JAA, will further review our position.

CAA Action

The CAA has given consideration to this matter and decided that industry should be reminded of the requirements and of its responsibilities. Airworthiness Notice 14(3) will be revised during 2002 at the earliest opportunity and will contain this information.

B767-322ER	**London Heathrow**	**9 Jan 1998**	**Accident**

References: AAR 5/2000 dated 2 Nov 2000

FACTOR F21/2000 dated 2 Nov 2000

SYNOPSIS

Whilst in cruising flight near Paris during an ETOPS flight from Zurich to Washington, DC, abnormal warnings appeared on the flight deck instrumentation and circuit breakers began tripping. The commander, in consultation with the operator's maintenance control centre at London Heathrow Airport, decided to divert and land at Heathrow. The aircraft subsequently landed safely, but during the landing ground roll the right thrust reverser failed to deploy fully and smoke appeared at the forward end of the passenger cabin. As a result, the commander ordered an evacuation when the aircraft was on the taxiway, adjacent to the landing runway. During the evacuation, the right off-wing escape slide failed to deploy and several minor injuries occurred.

A confusion in communication between the aircraft and various Air Traffic Control units resulted in the Heathrow Airport Tower controller being unaware that the aircraft was landing with technical problems until the evacuation was announced, whereupon the emergency services were alerted.

The investigation identified the following causal factors:

1 The tripping of multiple circuit breakers had been caused by the occurrence of electrical arcing and associated thermal damage to a wiring loom adjacent to the aft/upper inboard corner of the forward galley chiller unit within the Electronic and Equipment (E&E) bay, with resultant thermal damage to an adjacent loom and smoke generation.

2 Prior damage to the wiring loom insulation adjacent the aft/upper corner of the chiller unit had occurred due to contact with such units during associated removal and installation; this chiller unit had been replaced on the day before the accident.

3 Aluminium alloy swarf was present within the E&E bay prior to the accident and had probably assisted the onset of arcing between adjacent damaged wires in the loom.

4 Incorrect installation of the chiller unit, with its heat exchanger exhaust fitted with a blanking plate, would have caused warm exhaust air to discharge from an alternative upper vent which was capable of blowing any aluminium swarf around the wiring looms.

5 The crew were unaware of the potentially serious arcing fire in the E&E bay during the flight due to failure of the bay smoke warning system to activate on the flight deck, because the density of smoke emitted by the arcing wiring in the bay was not apparently sufficient to be detected by the only smoke sensor, which was located in the card and rack cooling system exhaust duct.

6 The jamming of a severely worn latch, associated with the right off-wing slide compartment, prevented that escape slide from operating during the evacuation; such latches exhibited vibration induced wear on other aircraft.

RECOMMENDATION 99-50

It is recommended that manufacturers such as Boeing and Airworthiness Authorities such as the FAA should investigate the feasibility of installing smoke and/or heat detectors within remote areas of high wiring and equipment density, such as the E&E bays of transport aircraft, with associated flight deck warnings to alert crews to electrical overheat/fire situations within such areas at the earliest possible stage, so that appropriate and timely operational decisions can be taken.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The CAA will, by 30 June 2001, complete an investigation into the feasibility of installing smoke or heat detectors within remote areas of high wiring and equipment density, such as E&E bays of transport aircraft, with associated flight deck warnings to alert crews to electrical overheat/fire situations within such areas at the earliest possible stage, so that appropriate and timely operational decisions can be taken.

CAA Action

BAE Systems, as one of the manufacturers, and the CAA as one of the Airworthiness Authorities alluded to in this Recommendation have conducted a joint study into the feasibility of providing the features suggested by this Recommendation in the range of aeroplanes produced by that manufacturer. This study concluded that, in the context of current requirements, adequate detection and warning of smoke/heat is being provided.

However, study of this Recommendation and others of similar nature promulgated by other investigatory bodies following recent accidents/incidents has indicated that it may be appropriate for the need for more extensive requirements to be considered on an international basis and the CAA has therefore made formal proposals to ICAO for the introduction of design requirements in Annex 8 which will satisfy the intent of this Recommendation.

RECOMMENDATION 99-51

It is recommended that manufacturers such as Boeing and Airworthiness Authorities such as the FAA should require that all operators and maintenance organisations should ensure that before maintenance activities take place which are likely to generate conductive debris, wiring looms and electrical equipment in the working area are provided with temporary protection against associated contamination, and that at the end of the maintenance activity such areas are specifically inspected to be free from such contamination.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation.

The CAA represents the JAA on the Ageing Transport Systems Rulemaking Advisory Committee and its various working groups. Amongst a number of recommendations that are likely to emerge from the Committee early in 2001 is a recommendation that will ensure "best practice" is always adopted when work is accomplished adjacent to wiring. Another recommendation is expected to state how the analytical process that examines in depth the maintenance requirements that will be applied to a particular aircraft type should be enhanced to focus attention on wiring inspections with regard to general condition and contamination. These recommendations will be commended to the JAA for implementation across the JAA Member States in a harmonised fashion. Target date for transmission of the Committee's recommendations to JAA is 31 August 2001.

CAA Action

The Ageing Transport Systems Rulemaking Advisory Committee (ATSRAC) has forwarded to the FAA recommendations for improvements to maintenance practices, enhancement of maintenance programmes and additions to training and awareness for maintenance personnel. The FAA is expected to issue a Notice of Proposed Rule Making (NPRM) in January 2003. The JAA are expected to issue similar material shortly after the FAA. The CAA will take appropriate action at that time.

B747-100	**London LHR**	**6 Dec 1997**	**Incident**

References: Bulletin 9/99 dated 30 Sep 1999

FACTOR F22/99 dated 10 Dec 1999

SYNOPSIS

The incident occurred when the Nr2 engine ingested a bird about 75 feet agl after the aircraft had taken off from R/W27R. The Nr2 engine suffered severe damage to the fan with rapid detachment of the complete intake assembly, reverser shrouds, jet pipe and exhaust cone. The engine was shut down and, after fuel jettison, the aircraft returned to Heathrow where it landed without further incident using full reverse on both outboard engines after touchdown. Feathers found in the No. 2 engine were sent to the Bird Strike Avoidance Unit at the Central Science Laboratory where they were identified as having come from a grey heron. During the investigation, data was

obtained from a previous series of observations at Heathrow by the Bird Strike Avoidance Team which indicated that there is a particular and increasing problem of large water bird species in those areas near the main runway ends. In particular, the population of Canada Geese has apparently been growing at an average rate of about 8% per year since 1953, resulting in a UK population of over 60,000 geese in 1991 and, if this rate of increase has been sustained, approximately 110,000 geese currently. As a result of the findings arising from this investigation, Safety Recommendations Nos. 98-58 and 98-59 are addressed to Heathrow Airport Limited and the CAA with the aim of improved management of the large bird population around Heathrow and other major UK airports, in addition to the assessment of improved warning systems for transiting large birds/formations at major airports. Safety Recommendation No 98-60 has been made to the aircraft manufacturer to review the previous reduction in the number of associated intake attachment bolts on Pratt and Whitney JT9 turbofan engines. Safety Recommendation No. 98-61 is addressed to the FAA and JAA concerning amendment of current engine certification requirements to require that large nacelle components remain attached to damaged engines. Safety Recommendation of 99-18 is addressed to the CAA that it should expand the remit of its current sponsored study by the Central Science Laboratory Birdstrike Avoidance Team.

RECOMMENDATION 98-59

In order to reduce the risk of multiple large birdstrike encounters, involving bird formations over-flying London Heathrow Airport conflicting with departing or arriving public transport aircraft, Heathrow Airport Limited should seek maximum co-operation with the relevant local authority bodies and associated land owners to expedite effective management of the associated large bird habitat and population around Heathrow Airport. Similar co-operative initiatives should be actively promoted by the CAA around other affected major airports in the UK.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation.

The CAA will continue to promote co-operative initiatives where it can, and within its legal remit. A facilitation role by the Department of the Environment, Transport and the Regions in this area would greatly assist aerodrome licensees and the Authority is actively pursuing the Department's assistance in this matter.

CAA Action

The Aerodrome Standards Department has been promoting all areas of bird hazard control in both on and off-aerodrome situations and a great deal of progress has been made on the netting of landfill sites. Due to delays with the transfer of Safeguarding, a proposed amendment to CAP680, "Aerodrome Bird Control" which details the Safeguarding procedures to be adopted by aerodromes, has also been delayed. The amendment is now scheduled for publication in Summer 2002 and, once that is achieved, the Aerodrome Standards Department will consider its work on this Recommendation complete. The recent AAIB Safety Recommendation 2001-32 seeks to have DTLR take the lead in this area, which is something the CAA has been keen to establish, as their power of regulation is very limited outside the aerodrome boundary. The Department looks forward to the new working relationship with the DLTR in addressing bird hazard problems.

RECOMMENDATION 99-18

The CAA should expand the remit of its sponsored current study by the Central Science Laboratory Birdstrike Avoidance Team of the habitat, population and transit flight behaviour of flocking large bird species around Heathrow Airport to include the formulation of recommendations on the best means of managing and reducing the associated hazard of multiple birdstrike encounters involving departing or arriving public transport aircraft.

Status - Fully Accepted - Open

CAA Response

The Authority accepts this Recommendation.

The CAA will use its bird hazard consultant to work with the Central Science Laboratory (CSL) during its current study to revisit the bird hazard control methods, in particular for the area outside aerodrome boundaries.

CAA Action

The Aerodrome Standards Department has been promoting action to reduce the population of Canada Geese in the Heathrow area and the continued monitoring of the effectiveness of bird hazard control is an ongoing part of the Department's work as part of its regulatory oversight. The CSL has continued to monitor the Canada Geese population at Heathrow and this work has revealed a disturbing fact in the pattern of movement of the birds. Canada Geese travel much greater distances than was first thought and they change feeding and roosting sites much more often than was previously believed. This means that the problem is widespread and that simply removing birds in the vicinity of Heathrow will not solve the problem, as they would be quickly replaced by birds from farther afield. Currently it is not possible to estimate when this work will have progressed to the extent that a final report, containing recommendations on how the problem can best be tackled, could be produced.

Airbus A340-311	**London Heathrow Airport**	**5 Nov 1997**	**Accident**

References: AAR 4/2000 dated 3 Aug 2000
FACTOR F15/2000 dated 3 Aug 2000

SYNOPSIS

The accident occurred when the aircraft, which had a landing gear problem on its first approach to Heathrow Airport, carried out an emergency landing on Runway 27L with the left main landing gear only partially extended. The flight crew responded to the in-flight emergency with commendable judgement and conducted a skilful landing, with the Airport Emergency Services in full and effective attendance. The evacuation was completed with minor injuries to 5 passengers and 2 crew members.

Examination of the left main landing gear found that the gear had been jammed by the No 6 wheel brake torque rod which had disconnected from its brake pack assembly and had become trapped in the keel beam structure. The associated torque

rod pin was subsequently found beyond the end of Runway 24L at Los Angeles International Airport, the departure airport.

The investigation identified the following causal factors:

1 Full deployment of the left main landing gear was prevented by the unrestrained end of the No 6 brake torque rod having become trapped in the keel beam structure within the gear bay, jamming the landing gear in a partially deployed position.

2 The torque pin which had connected No 6 brake torque rod to that wheel brake assembly had disengaged during landing gear retraction after take off from Los Angeles, allowing the unrestrained rod to pivot freely about the retained end.

3 The torque pin and its retaining assembly had been subject to higher axial and torsional loads than predicted during aircraft braking in service. These loads were the result of elastic deformation of the wheel axle, brake and torque rod, and due to assembly without the correct axial clearance as a result of prior undetected displacement of the associated bushes. The precise mode of failure of the retaining assembly bolt, nut and cotter pin could not be ascertained in the absence of these parts.

4 This design of wheel brake assembly had satisfactorily passed the related certification wheel brake structural torque test to the requirements of TSO C26c paragraph 4.2(b). However the latter contained no requirement to use a representative axle or other means to reproduce the axle deflections which occur during aircraft braking in service, and did not require post-torque test strip assessment of brake assemblies for resultant evidence of overstressing deformation which did not produce component failure.

RECOMMENDATION 2000-33

The CAA, FAA and JAA should review the requirements for public transport aircraft cabin door simulators used for crew training to require that they accurately simulate any non-linear characteristics of the associated aircraft doors and to require that full instruction is given to cabin crews regarding the door operating characteristics to be expected when operating the doors in an emergency.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The CAA will, through the JAA, review the requirements for public transport aircraft cabin door simulators used for crew training to require that they accurately simulate any non-linear characteristics of the associated aircraft doors and to require that full instruction is given to cabin crews regarding the door operating characteristics of the associated aircraft doors and to require that full instruction is given to cabin crews regarding the door operating characteristics to be expected when operating the doors in an emergency. Target date: 31 December 2000.

CAA Action

The CAA published Flight Operations Department Communication 5/2001, dated 23 May 2001, on the subject of Crew Training for Exit Operation in accordance with the Recommendation. The Joint Aviation Authorities published Temporary Guidance Leaflet (JAR-OPS) No 31, dated 1 February 2002, covering the same subject.

Boeing 737-200; Ilyushin 76 & Two SU30	**10nm East of Compton VOR**	**16 Jul 1997**	**Incident**

References: Bulletin 12/97 dated 9 Dec 1997

FACTOR F7/98 dated 9 Apr 1998

SYNOPSIS

(Adapted from AAIB Report)

The Military IL76 tanker aircraft (callsign WS78807), in formation with two SU30 fighters, inbound to RAF Fairford for the Royal International Air Tattoo 1997, was routed through controlled airspace as General Air Traffic (GAT). It had flight planned as Operational Air Traffic (OAT), in accordance with procedures agreed for military traffic inbound to RAF Fairford.

Due to the poor English of the military crew involved and a lack of understanding of the intended flight path of the formation by some of the ATC staff involved, the military formation was directed into the London TMA and given a GAT routing.

The formation was cleared by ATC to descend to FL160 as it transited the London Terminal Manoeuvring Area (LTMA), inbound to the Compton VOR (CPT) from the east. Instead of indicating level at FL160, the ATC controller noticed that the IL76's height readout (Mode 'C') was indicating 200 feet below its assigned level, at FL158. The Boeing 737, en-route from Glasgow to London Gatwick, was level at FL150, at an Indicated Air Speed (IAS) of 300 kt and approximately 7nm north-east of the formation, as the IL76's height readout reduced further to indicate FL156 (600 feet above that of the Boeing 737). The Boeing 737 was given 'avoiding action' by ATC and instructed to turn left onto a heading of 090deg. The Boeing 737 passed 0.5nm north of the formation in a steeper than normal left turn. Its position at the time was 3.5nm north of Reading (10nm east of the Compton VOR). The weather at the time was good with light turbulence and unlimited visibility above 8/8ths cloud cover.

COMMENT

This incident was also reported as an Airprox (P).

RECOMMENDATION 97-45

The Air Traffic Services Standards Department (ATSSD) of the CAA Safety Regulation Group (SRG) should conduct a review of the Manual of Air Traffic (MATS) Part 1 provisions for the conduct of military formation flights as GAT (civil traffic) in controlled airspace.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation. The Air Traffic Services Standards Department is conducting a review of the requirements for military formation flights operating as General Air Traffic (GAT) within controlled airspace to determine the provisions required to be made in the Manual of Air Traffic Services (MATS) Part 1 for such operations. Amendments will be made to the appropriate document following the review, which is expected to be completed by June 1998.

CAA Action

It is considered that this Recommendation has considerable commonality with Recommendation 2000-71 and, accordingly, they are being addressed jointly. Enhanced civil and military procedures for Formation Flights to cross Controlled Airspace (CAS) have been in place since 15 January 2001. The CAA, MoD and NATS met on 26 April 2002 to discuss a draft revised MATS Part 1 entry, describing procedures for Military Formation Flights in CAS. In addition, the meeting assessed the enhanced procedures from the different perspectives of those present. From evidence to date, the procedures have improved the safety of formation flights crossing CAS, however, the issue of all aircraft in a formation squawking remains unresolved. This, therefore, means that the safety net of ACAS will only be activated against the lead aircraft in the prescribed one-mile box formation; this subject was also discussed at the April meeting. The report on the meeting, containing suggested improvements to the relevant procedures, is expected imminently and it is planned to incorporate the revised MATS Part 1 entry with Amendment 54, scheduled for publication at the end of July 2002.

RECOMMENDATION 97-47

NATS should ensure that the maximum possible amount of any supplementary flight plan information is shown in the remarks field of the flight progress strip or any other flight plan display media.

Status - Fully Accepted - Closed

CAA Response

NATS accepts this Recommendation. NATS are presently exploring the feasibility of providing as much supplementary flight plan information as possible to controllers.

CAA Action

NATS Action

A full review of the contents of flight progress strip remarks fields has taken place. The review was carried out with the assistance of staff from the London, Scottish and Manchester Area Control Centres and the London Terminal Control Centre in order to ascertain whether it would be feasible to increase the data displayed in the remarks field.

The review concluded that, while in some cases it would be technically feasible to increase the data displayed in the remarks field, this would create additional problems which would far outweigh the benefits achieved. Accordingly, it is considered that the optimum solution is to reinforce the standard method of indicating that a flight is a formation, by recording the number of aircraft ahead of the aircraft type in the appropriate field. In the case of the Airprox which gave rise to this Recommendation, this procedure was not followed. It is proposed that control and Flight Plan Reception Service (FPRS) staff are reminded of the need to use the appropriate NAS computer field to clearly indicate if a flight comprises of more than one aircraft. An FPRS Supplementary Instruction has been issued, detailing the required action, and the FPRS Manual will be updated at the next issue.

Boeing B747-300/ Gulfstream IV	14nm East of Lambourne VOR	3 Jul 1997	Incident

References: AIR 4/98 dated 17 Sep 1998

FACTOR F18/98 dated 17 Sep 1998

SYNOPSIS

(From AAIB Report)

A loss of separation occurred between a Boeing 747-300 (B747) and a Gulfstream IV (G IV) in the London Terminal Control Area, which is Class A controlled airspace. The B747 was en route from Kansai, Japan, to London (Heathrow) Airport; the G IV was en route from Olbia, in Sardinia, to London (Luton) Airport.

The B747 began its descent after entering the UK Upper Information Region (UIR) from Holland and was controlled through the Clacton Sector for arrival at London Heathrow. It was cleared initially to Flight Level (FL) 150, and later to FL110, whilst routing direct to the Lambourne VOR and maintaining 290 kt. On making contact with Heathrow Intermediate North Director the B747 was cleared to descend to FL90, to leave Lambourne on a heading of 270deg, and to reduce speed 'now' to 210 kt.

The G IV entered the UK FIR from France and was controlled through the Lydd Sector for arrival at Luton via the Detling VOR. When the G IV crew contacted the Lambourne controller it was level at FL130 and was permitted to maintain high speed whilst given a radar heading of 340deg, it was subsequently cleared to FL120.

As the G IV reached FL120 the pilot reported that his Traffic Alerting and Collision Avoidance System (TCAS) was indicating traffic in his one o'clock position. The controller initially thought that there was 1,000 feet vertical separation between the two aircraft and declared this, but he then gave the G IV avoiding action, after the pilot reported that the traffic was 300 feet below him, to turn to the left which took it out of the path of the B747.

At the same time B747 crew complied with the first of two TCAS Resolution Advisory (RA) messages. The first instruction was to climb followed by a subsequent instruction to descend. Subsequent analysis of the recorded radar data showed the closest proximity of the two aircraft was 0.83 nautical miles (nm) horizontally with vertical separation of 100 feet; the next element of the recorded radar data indicates that the vertical separation had then increased to 200 feet with the horizontal separation reducing to 0.66nm.

The following causal factors were identified:

1 The B747, having left FL120 then stopped descending some 300 feet below this level whilst reducing speed from 290 kts to 210 kts. FL120 was assigned to the G IV by the bandboxed Terminal Control North East Departures/Lambourne controller before the proper vertical separation had been established after its direct routing towards Luton had brought it into lateral conflict with the B747.

2 The North East Departures/Lambourne controller did not apply the procedure given in MATS Part 1 regarding level assessment of SSR Mode C (height information) when giving clearance to the G IV to FL120. The controller should have waited for the B747 to have had a readout of at least FL116 (400 feet below the vacated level)

before clearing the G IV to descent. The controller then did not monitor the Mode C readout of the B747 to ensure that it was 'continuing in the anticipated direction'.

3 Despite reporting to the Heathrow Intermediate North controller that the aircraft had vacated FL120, the B747 did not descend at the minimum rate mandated for the UK and detailed in the UK Air Pilot (500 ft/min). If it was not possible to comply with this requirement, the crew were required to inform the controller but did not do so.

4 The Heathrow Intermediate North controller, unaware that the aircraft speed was 290 kt, called for a combined speed and level change which resulted in the B747 having a minimal rate of descent while its speed reduced.

5 The B747 crew did not report their speed control, which had been imposed by Clacton SC, to the Lambourne Sector, thereby allowing the controllers to assume a standard speed of 250 kt.

6 Since the TCAS manoeuvre was not fully co-ordinated by both aircrafts' TCAS, one of which was not selected to TA/RA, the B747's initial RA reduced the separation distance.

RECOMMENDATION 98-39

NATS should ensure that the development and introduction of an effective MTCA system is given a high priority.

Status - Fully Accepted - Closed

CAA Response

NATS accepts this Recommendation. NATS has already commenced work in this area in preparation for providing an MTCA at its Swanwick Centre.

CAA Action

NATS Action

NATS recognises the importance of MTCA and, as such, it is a central part of plans to introduce new and updated controller support tools. It is planned to introduce a MTCA in conjunction with the midlife upgrade to the Swanwick system circa 2008. The resolution of this recommendation is embedded in NATS plans for the Swanwick centre and, accordingly, they now consider the recommendation closed.

Fokker F27-500	**Jersey**	**6 May 1997**	**Accident**

References: Bulletin 12/97 dated 9 Dec 1997

FACTOR F2/98 dated 11 Mar 1998

SYNOPSIS

(From AAIB Report)

The aircraft was operating on a scheduled freight service carrying newspapers from Bournemouth to Jersey. The commander, a training captain working part time for the

company, was training a new first officer on his first line-training sector. The flight, which was delayed due to poor weather and strong cross winds at Jersey, departed nearly three hours behind schedule at 0638 hrs with the first officer as the handling pilot. He flew for most of the sector but the commander briefed that he would probably take control for the landing. The aircraft was radar vectored for an ILS approach to Runway 27 at Jersey where the weather had moderated to give a surface wind of 330deg/24 to 34 kt with a visibility of 30km and a cloud base of 1,600 feet. The first officer continued to fly the aircraft as it descended on the glide path with the commander taking control 4 seconds before touchdown. The aircraft landed heavily nose wheel first distorting the nose wheel assembly rearwards into the aircraft structure. The aircraft bounced, and after a second heavy impact, the main landing gear retracted allowing the fuselage to contact the runway. The aircraft slid several hundred metres along the runway before departing the paved surface coming to rest on the grass close to the airfield boundary. There was no fire and the crew vacated the aircraft without injury.

RECOMMENDATION 97-68

The CAA should require that an aircraft operator maintains, for each recorder installation type, a data frame layout document which contains details of all parameters recorded, the layout of the recorded data and the algorithms required to convert that data to engineering units. The layout of the document should be of a format standard to be stipulated by the CAA.

Status - Partially Accepted - Open

CAA Response

The CAA partially accepts this Recommendation. The Civil Aviation Authority Specification 10A, which covers the installation of flight data recorders into aircraft, already requires a reference document to be prepared that provides details of the conversion data and logic required for the translation of the data held in memory to parameters expressed in engineering units. The CAA's earlier version of Specification 10 allows the record to be kept as an analogue trace, digital transcription or original record. These Specifications are provided as a means by which operators can meet the requirements of the Air Navigation Order. In addition, the implementation of Joint Aviation Requirement JAR-OPS 1.160 has required JAR-OPS operators to keep a document which presents the information necessary to retrieve and convert the stored data into engineering units. The CAA is, however, aware that the accident investigators of various states are collaborating to define and standardise documents for the data frame layout and conversion of flight recorder data to engineering units. The CAA will, therefore, await the outcome of this work with the intention of promulgating recommendations for a standardised document.

CAA Action

To date the CAA is not aware of any progress being made by EUROCAE Working Group 50 on this subject. The CAA has therefore formed a working group to draft a Civil Aviation Publication (CAP) giving 'best practice' information on the handling of Flight Data Recorder issues. This CAP covers all aspects from Type Certification to Certificate of Airworthiness issues and ongoing system serviceability assessment. The draft CAP was completed in March 2002 and will now undergo industry consultation and publication at the earliest opportunity.

RECOMMENDATION 97-70

The CAA should require that an organisation conducting scheduled mandatory readouts from a digital flight data recorder has procedures in place to ensure that all information, within a data frame layout document, is correctly interpreted, used for a scheduled mandatory readout of the relevant recording installation and that any assessment is conducted only on data that has been converted to engineering units. Furthermore, any report issued by the organisation shall reference, both by document number and issue status, the data frame layout document against which the readout was performed.

Status - Partially Accepted - Open

CAA Response

The CAA partially accepts this Recommendation. Whilst understanding the rationale for this Safety Recommendation the CAA foresees practical difficulties if organisations were constrained to convert to engineering units and to interpret a complete data recording against a data frame. Consequently, the CAA proposes to consult industry on this matter to determine the value of such a requirement.

The CAA does, however, accept that reports on FDR readouts should reference, both by document number and issue status, the applicable data frame document used. The CAA will therefore advise all organisations who undertake FDR readouts that the associated reports are to contain this information. Target date: 31 December 1998.

CAA Action

The CAA working group completed the draft Civil Aviation Publication (CAP) giving 'best practice' information on the handling of Flight Data Recorder issues. This CAP will cover all aspects from Type Certification to Certificate of Airworthiness issues and ongoing system serviceability assessment. The draft CAP was completed in March 2002 and will now undergo industry consultation and publication at the earliest opportunity.

HS748	Liverpool Airport	16 Aug 1996	Accident

References: AAR 1/99 dated 4 Feb 1999

FACTOR F1/99 dated 4 Feb 1999

SYNOPSIS

(From AAIB Report)

The accident occurred when take-off rotation of the aircraft was prevented by an elevator control circuit jam. The take-off was rejected after reaching V1, and wheelbraking and selection of propeller ground fine pitch failed to stop the aircraft on the runway. During the overrun the aircraft collided with camera equipment mounted on a building, locally damaging the right wing.

A number of potentially serious deficiencies in the flight controls gust lock system were found, although the system passed checks intended to verify its integrity. An undemanded re-locking of the system could not be reproduced during testing, but this

could not fully simulate the accident circumstances. It was concluded that the accident was probably caused by a re-engagement of the elevator gust lock induced by the carrying out of a Full and Free controls check at the start of the take-off run.

Despite a series of modifications to the flight controls gust lock system by the manufacturer, particularly following a major fatal overrun accident which occurred at Sumburgh Airport on 31 July 1979, this accident at Liverpool Airport and other possible gust lock related incidents demonstrated that associated unlocking of the flight controls on HS748 aircraft before flight is still not sufficiently reliable.

The investigation identified the following causal factors:

1 Flight control gust lock system deficiencies which probably caused the elevator lock to re-engage on completion of the crew's Full and Free check of the flight controls before the take-off.

2 Lack of any indication of a jammed elevator condition until the first officer attempted to pull the control column back at aircraft rotation speed, Vr.

3 Lack of sufficient remaining runway distance to stop the aircraft on the runway following the rejected take-off at some 8 kt above V1 decision speed with the elevator jammed fully down.

4 Inadequacies in maintenance information and implementation that led to failure to correctly maintain a gust lock system the design of which is inherently sensitive to deficiencies.

5 Lack of fully effective modification action, following the fatal overrun accident to HS748, G-BEKF, at Sumburgh Airport on 31 July 1979 (AIB Report 1/81), to address the inherent design sensitivity of the flight controls gust lock system.

RECOMMENDATION 97-50

The CAA should require for UK registered HS748 aircraft the development and fitment of a system to continuously monitor the position of each of the three gust lock rollers and to provide an associated flight deck indication of a potentially unsafe condition.

Status - Partially Accepted - Open

CAA Response

The CAA partially accepts this Recommendation.

The CAA intends to review with the aeroplane manufacturer the practicality and benefits of developing and fitting a system which would monitor continuously the position of each of the three gust lock rollers and provide an associated flight deck indication of a potentially unsafe condition, in order to determine whether such a system should be required. It is intended to complete this review by 31 July 1999.

CAA Action

The original modification to monitor all three gust lock positions at speeds approaching V1 failed its installation validation for reasons associated with design complexity. As a result, a simplified modification of higher integrity with less susceptibility to spurious warnings is now entering its installation validation phase. This modification introduces a baulk actuator restriction on the elevator system, and system changes that ensure that the rudder and aileron gust locks are fully off. A review of service experience and system failure analysis has confirmed the elevator system as the critical and most susceptible element of the gust lock system to

uncommanded re-engagements. It is considered this is the most practicable solution to meet the intent of the Recommendation. As with the original modification attempt there are important flight safety considerations and the CAA need to be satisfied that the modification now proposed has acceptable system integrity and freedom from spurious warnings before it can be approved.

Boeing 737-236	**Manchester Airport**	**22 Aug 1985**	**Accident**

References: AAR 8/88 dated 15 Dec 1988

FACTOR F5/89 dated 13 Mar 1989

SYNOPSIS

At 0612 hrs on 22 August 1985 G-BGJL, carrying 131 passengers and 6 crew on a charter flight to Corfu, began its take-off from runway 24 at Manchester with the co-pilot handling. About thirty six seconds later, as the airspeed passed 125 kts, the left engine suffered an uncontained failure, which punctured a wing fuel tank access panel. Fuel leaking from the wing ignited and burnt as a large plume of fire trailing directly behind the engine. The crew heard a 'thud', and believing that they had suffered a tyre-burst or bird-strike, abandoned the take-off immediately, intending to clear the runway to the right. They had no indication of fire until 9 seconds later, when the left engine fire warning occurred. After an exchange with Air Traffic Control, during which the fire was confirmed, the commander warned his crew of an evacuation from the right side of the aircraft, by making a broadcast over the cabin address system, and brought the aircraft to a halt in the entrance to link Delta. As the aircraft turned off, a wind of 7 kts from 250 deg carried the fire onto and around the rear fuselage. After the aircraft stopped the hull was penetrated rapidly and smoke, possibly with some flame transients entered the cabin through the aft right door which was opened shortly before the aircraft came to a halt. Subsequently fire developed within the cabin. Despite the prompt attendance of the airport fire service, the aircraft was destroyed and 55 persons on board lost their lives. The cause of the accident was an uncontained failure of the left engine, initiated by a failure of the No 9 combustor can which had been the subject of a repair. A section of the combustor can, which was ejected forcibly from the engine, struck and fractured an underwing fuel tank access panel. The fire which resulted developed catastrophically, primarily because of adverse orientation of the parked aircraft relative to the wind, even though the wind was light. Major contributory factors were the vulnerability of the wing tank access panels to impact, a lack of any effective provision for fighting major fires inside the aircraft cabin, the vulnerability of the aircraft hull to external fire and the extremely toxic nature of the emissions from the burning interior materials. The major cause of the fatalities was rapid incapacitation due to the inhalation of the dense toxic/irritant smoke atmosphere within the cabin, aggravated by evacuation delays caused by a door malfunction and restricted access to the exits.

RECOMMENDATION 4.20

The balance of effort in aircraft fire research should be restored by increased effort directed towards fire hardening of the hull, the limitation of fire transmission through

the structure and the prevention of structural collapse in critical areas. Short term measures should be devised for application to existing types but, in the long term, fire criteria should form a part of international airworthiness requirements.

Status - Fully Accepted - Closed

CAA Response

The CAA, whilst agreeing the case for considering fire hardening of the structure, has some reservations on the proposed change in the balance of research work. The CAA is aware of current FAA research studies, addressing both the ability of existing aircraft fuselage skins to resist penetration in a ground fire condition and the behaviour of fires within remote aircraft compartments, i.e. hidden fires. When results of this research become available, and have been reviewed, the CAA will determine what, if any, new requirements are necessary. It should be noted that the capability of water sprays, in limiting fire transmission through the structure, will be included in such a review.

CAA Action

The CAA has now completed its research into fire hardening of aircraft fuselages. It has been shown that changes to the thermal acoustic insulation liner material combined with specific installation methods can inhibit the transmission of fire through the structure and thus increase evacuation time for passengers in the cabin.

The FAA are to issue a final rule later this year to require thermal acoustic insulation liners to comply with new flammability and burnthrough requirements, which includes criteria from the CAA research. The JAA will issue a Notice of Proposed Amendment to the Joint Aviation Requirements (JAR) to introduce similar requirements into JAR-25. Research is therefore complete and fire criteria are to become part of the international airworthiness requirements.

Part 2 AAIB Recommendations relating to all rotorcraft

Agusta Bell 206B Jetranger	Near Caernarfon, North Wales	25 Nov 1997	Accident

References: Bulletin 6/99 dated 10 Jun 1999

FACTOR F19/99 dated 9 Aug 1999

SYNOPSIS

The aircraft was on a mountain flying training detail in North Wales when the fuel tank bladder suffered an abrupt deflagration, damaging the airframe. There was no Cumulo-Nimbus activity but the aircraft was flying in light turbulence. The crew landed the aircraft safely.

Subsequent inspection showed that the fuel bladder had split in three places, close to the two fuel hoses and the aft boost pump. Evidence of combustion sooting and localised heating of the bladder were also found. The supply fuel hose had no electrical bonding to the airframe and there had been abrasion between the two hoses within the fuel bladder due to the absence of a 'P' clip. This appeared to be the source of the flame front.

The aft boost pump was lacking its 'umbrella' check valve and tests showed that this produced a fountain of fuel in the area of the two hoses.

The most probable source of ignition was a build-up of static electricity between the hoses. It is probable that combustion was limited because of the low temperature of the fuel.

RECOMMENDATION 99-02

It is recommended that the RAI and the FAA institute an inspection within the Agusta and Bell 206 fleets to ensure that any Parker Airborne Division 'cartridge/canister' boost pumps are properly equipped with umbrella check valves and the CAA takes such measures as are necessary to ensure inspection of the UK fleet.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The actions taken by the RAI and FAA to institute an inspection within the Agusta and Bell 206 fleets to ensure that Parker Airborne Division cartridge/canister boost pumps are properly equipped with umbrella check valves will be monitored by the CAA. The CAA's future position will be determined when the actions taken by the RAI and FAA are made known.

CAA Action

CAA Additional Airworthiness Directive 001-02-2002 applicable to the Bell 206 was published in February 2002.

AS355 Twin Squirrel	Nr Liverpool	6 Jan 1993	Accident

References: Bulletin 5/93

FACTOR F26/93 dated 3 Dec 1993

SYNOPSIS

Major parts of the right engine bay door detached in flight and struck main and tail rotor blades, causing severance of the tail rotor drive train. The pilot managed to land the helicopter without further major damage but the evidence showed that control during the landing was marginal. The door latches were not recovered but there is no known history of latch failure and it is possible that the door had not been latched following a pre-flight inspection. The aircraft had been modified to add latch safety flaps, intended to attract attention to an undone latch on an engine bay or main gearbox bay door. Previous cases have shown that airflow loads can hinge open an unlatched door and that there are few signs to the pilot that this has occurred. A mandatory door restraint system had been fitted to prevent a door from opening far enough to contact a main rotor blade, but this would restrain an open engine bay door in the engine exhaust efflux. The evidence suggested that buffeting and overheating had caused parts of the door from G-BOOV to separate. This was the 8th reported case in around 12 years of engine or main gearbox doors of UK registered Squirrel helicopters having opened in flight and there were 7 reported cases of in-flight detachment of engine and transmission bay doors from other types of UK registered helicopters.

RECOMMENDATION 93-37

Require for UK registered AS350 and AS355 helicopters, the fitment of a system to provide unmistakable cockpit indication to the pilot of improperly latched engine or MGB bay doors.

Status - Partially Accepted - Closed

CAA Response

The CAA rejects this Recommendation as written in that it dictates a specific design solution which may not in airworthiness terms be the optimum answer to the problem. However the intent of the Recommendation is accepted in that improved indication of improperly latched engine or MGB bay doors is necessary. To this end the manufacturer in co-operation with the type certification authority (DGAC France) is currently examining ways and means of achieving such an improvement and plan to have the design of a suitable indication system certificated towards the end of 1993. When such a system is available DGAC France will be consulted on the need for airworthiness directive action.

CAA Action

Airworthiness Directives 002-10-2001 and 003-10-2001 were issued in October 2001, for the AS350 and AS355 respectively. Compliance with these Airworthiness Directives is required by June 2002. These Airworthiness Directives require the installation of either a cockpit warning system to indicate an improperly latched engine and/or gearbox cowl or a secondary latching mechanism which prevents a cowling opening in flight. Either of these modifications is considered to satisfy the intent of this recommendation.

Part 3 AAIB Recommendations relating to aeroplanes below 5700kg MTWA and others, (e.g. balloons)

Partenavia P68C	Gratwich, near Uttoxeter	3 Jun 2001	Accident

References: Bulletin 5/2002 dated 9 May 2002

FACTOR F8/2002 dated 16 May 2002

SYNOPSIS

(From AAIB Report)

The five occupants left Guernsey on 24 May and flew direct to Vannes in Normandy. The pilot routinely cruised at power settings of 2,350 RPM and 32 inches Manifold Pressure giving a speed of 140 KIAS. The flight to Vannes would have taken some 44 minutes in still air and records recovered from the aircraft indicated that it lasted 50 minutes. The aircraft was parked at Vannes for a few days on level ground. No fuel was uplifted before leaving Vannes and the aircraft departed on 31 May to fly to Meaux on the eastern outskirts of Paris. The records indicate that this 254 nm flight lasted 2 hours 5 minutes.

The aircraft was parked on level ground at Meaux for a few days. On the morning of 3 June, the day of the accident, the owner taxied the aircraft to the aero club's fuel pumps at Meaux to have the fuel tanks replenished. She believes she may have dipped the tanks before refuelling began but she could not remember the resultant quantities. Whilst the aircraft was being refuelled, the pilot left its vicinity and went into the club premises to file her flight plan, check the weather and pay the fuel and airport charges. The fuel receipt was completed for 157 litres of 100LL AVGAS.

When the refuelling operator had finished filling the left wing tank he moved towards the right wing but received instructions from a member of the pilot's family that there was no need to refuel the right wing tank. A different member of the family stated, soon after the accident, that this was because the right fuel tank gauge was indicating 2/3 full. Shortly afterwards the pilot returned to the aircraft. She did not dip the tanks after refuelling. On leaving Meaux the pilot recalled that the right tank gauge indicated "almost full" whilst the left tank gauge indicated "a bit less". Her intentions were to fly from Meaux to the airstrip near Liverpool where three persons would disembark and she would then return to Henstridge. There were no refuelling facilities at the Liverpool landing strip and she planned to complete both legs without refuelling. She did so on the basis that the aircraft's endurance on full tanks was about 6 hours and she planned to be airborne for less than this. (The still air flight time was later calculated to be 41/4 hours and the prevailing winds were westerly).

The aircraft departed Meaux at 1020 hrs and was flown uneventfully and in VMC conditions towards Liverpool via Compiegne, Abbeville, Lydd, Clacton and Cambridge. The autopilot was disengaged throughout the flight and the pilot could not recall using abnormal amounts of rudder or roll control (the aircraft had no aileron trim). Specifically, she was not aware of any marked imbalance in roll or any abnormal fuel gauge readings.

At 1246 hrs when the aircraft was at 3,500 feet altitude and south of Leicester the pilot contacted East Midlands Approach and requested a Flight Information Service en-route to the Lichfield NDB. At 1312 hrs she transmitted a Mayday message on the East Midlands frequency stating that she had "lost" the right engine. The controller responded with information that the nearest airfield was Tatenhill in her six o'clock at about 10 miles range. The pilot turned to the right and took-up a south-westerly track

towards Tatenhill. About one minute later, when asked to confirm her altitude, the pilot reported "I HAVE NO ENGINES NOW" followed by "TO DO A FORCED LANDING PAPA VICTOR, OH NO ITS GOING AGAIN". The controller continued providing vectors to Tatenhill whilst his assistant briefed Tatenhill's radio operator and West Drayton's Distress and Diversion cell on the developing situation. At 1315:40 hrs, when the aircraft was 10 miles north-west of Tatenhill at 2,800 feet altitude, the pilot reported "NO ENGINES … WE'LL HAVE TO FIND A FIELD". The last recorded RTF message from the pilot at 1316:50 hrs was "I HAVE A HI… HILL ERM A FIELD ON A".

The pilot was heavily sedated in hospital for some time after the accident and she could remember little of the final stages of the glide approach. The aircraft passed low beside a farmhouse and crash–landed in a field of soft earth with a significant up-slope in the landing direction.

RECOMMENDATION 2001-73

It is recommended that the CAA, in conjunction with the Registro Aeronautico Italiano (RAI) and Vulcanair, take early action to warn pilots of Partenavia P68 aircraft of the possibility of inadvertent fuel transfer and engine supply problems arising from a lack of correct synchronisation between cockpit fuel selectors and fuel selector values; and take early action to require in service inspection of these fuel selector circuits to ensure correct operation.

Status - Partially Accepted - Closed

CAA Response

The CAA partially accepts this Recommendation.

The Partenavia Maintenance Manual contains the maintenance task "Check fuel selector valves and receivers for condition and operation" to be accomplished at 100 hour intervals.

Partenavia have also issued a Service Bulletin No. 52 and Service Instruction No. 13 to replace the fuel selector valve control cable stop tube. The Service Bulletin and Instruction are "To avoid wrong operation of fuel selector control system".

The CAA considers that adequate information is available in existing publications to require inspections of the fuel selector circuits.

The CAA will bring this matter to the attention of UK owners/operators of Partenavia P68 aircraft, including details of the scheduled maintenance task and the Service Instruction. Target date: January 2002.

CAA Action

The CAA has brought this matter to the attention of UK owners/operators of Partenavia P68 aircraft. GASIL 6/2001 published in December 2001 contained an article on the subject for General Aviation operators, and the two AOC operators of this type of aircraft were informed individually by letter.

RECOMMENDATION 2001-74

It is recommended that Vulcanair, in conjunction with the RAI and the CAA, conducts an early review of the operation and airworthiness of the fuel valve selector system on all Partenavia P68 models, with a view to corrective actions to prevent inadvertent

mis-positioning of fuel selector valves and resultant inadvertent fuel transfer and engine supply problems.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The CAA is ready to support Vulcanair and ENAC (formerly RAI) in a review of the operation and airworthiness of the fuel valve selector system on all Partenavia P68 models. CAA has already conducted a review of the airworthiness of UK registered Partenavia P68 aircraft and has concluded that there is adequate service information concerning the fuel selector system available to operators. The results of this review have been passed to Vulcanair.

Cessna 182S	Leicester Airport	12 May 2001	Accident

References: Bulletin 3/2002 dated 7 Mar 2002

FACTOR F5/2002 dated 18 Mar 2002

SYNOPSIS

The aircraft occupants were a married couple who had owned a share in a Cessna 182 for 11 years that was kept in a hangar at Leicester Airport. In 1998 their shared 1966 model Cessna 182J was damaged during a storm at La Rochelle Airport and, together with the owner of another share, they purchased G-BYEG as a replacement. This aircraft was one year old when they purchased it and was equipped with a factory fitted avionics suite that included an autopilot.

Unless they were flying with an instructor, the two pilots invariably flew together and they alternated the role of handling pilot in the left seat. Together they had flown 72 hours in G-BYEG. The aircraft had last flown on 2 May when the co-owner had returned from Guernsey. The co-owner stated that there were no aircraft defects apparent during his flight to Leicester. He refuelled the aircraft to full tanks on 5 May and parked it in its hangar where it remained until the day of the accident.

On the morning of 12 May, an anticyclone dominated weather conditions over central England. At Leicester Airport the sky was clear, the QNH was 1022 mb and the surface wind was from the north-east. The runway in use was tarmac surfaced Runway 04 which is 490 metres long.

Shortly after 0800 hrs the two pilots arrived at their aircraft and loaded their baggage in preparation for the first leg of their 'flying holiday' which was to Copenhagen. They extracted the aircraft from the hangar and were seen inspecting its exterior in preparation for flight. A minor issue of fuel dripping from the engine bay was soon resolved and they had a brief conversation with friends, who were to take-off before them in their own aircraft, regarding the in-flight rendezvous and radio procedures. The pilot of G-BYEG for this flight occupied the left-hand seat and his wife acted as co-pilot in the right hand seat. She made all the radio calls before take-off. Engine start-up and taxi were apparently normal and at the holding point, the co-pilot transmitted that power checks had been completed and stated that the aircraft was ready for departure. The radio operator responded with the measured wind

conditions which were 040° at 5 to 10 kt. The aircraft then lined-up and began its take-off roll. None of the witnesses noticed the position of the wing flaps but the pilots habitually used 10° flap for take-off. The aircraft was seen to accelerate normally with a healthy sound from the engine and it became airborne after about 200 metres of ground roll. Initially, until about 100 feet agl the take-off appeared normal but then the aircraft adopted an ever increasing nose-high attitude which culminated in a gentle left roll at about 300 feet agl before the aircraft's nose dropped sharply. It seemed to the aero club witnesses that the aircraft had stalled in a markedly nose-up attitude. After what appeared to be an attempted stall recovery at about 100 feet agl, it dived into the ground whilst rolling left with the engine still running. Both occupants received fatal injuries on impact; neither made any radio transmission after the start of the take-off roll.

RECOMMENDATION 2001-55

The Civil Aviation Authority should take early measures to inform all owners and operators of aircraft on the UK register which may have a Bendix/King KAP 140 two axis autopilot of the dangers associated with inadvertent autopilot engagement in altitude hold before take-off.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation. The CAA has sent letters to Owners/ Operators (LTOs 2235 and 2236) of Cessna 172R, 172S, 182S and Piper PA28-181 aircraft, informing them of the dangers of inadvertent autopilot engagement in altitude hold mode before take-off. The LTOs were dispatched by first class mail on 28 June 2001.

Piper PA34-220T	One mile east of Shoreham Apt	2 Apr 2001	Accident

References: Bulletin 9/2001 dated 6 Sep 2001

FACTOR F41/2001 dated 15 Nov 2001

SYNOPSIS

The pilot planned a return flight from Shoreham, West Sussex to Sheffield City Airport, Yorkshire, departing from Shoreham at 1000 hrs and returning at about 1500 hrs after 2 to 3 hours on the ground in Sheffield. The route was planned from Shoreham via Woodley non-directional beacon and Netherthorpe airfield to Sheffield and returning from Sheffield direct to Woodley and thence to Shoreham. The outbound leg was planned at 2,000 feet and the return leg at 3,500 feet. The forecast weather for the route was fine. A weak cold front located in the Irish Sea was forecast to move eastwards during the day, but conditions at Shoreham and Sheffield were expected to remain fine until late afternoon. The wind at the selected cruise levels was generally south to south westerly at 20 to 35 kt with the stronger winds to the north.

The pilot arrived at Shoreham in good time and the Chief Pilot of the aircraft operating company authorised the flight. To avoid the requirement to uplift fuel at Sheffield, the pilot planned to carry sufficient fuel for the return flight. The pilot completed the technical log and indicated that he planned to uplift 30 US gallons of fuel (15 US gallons in each wing tank) giving a total fuel on board of 60 US gallons. After completing his walk around check, which included a check of the fuel drains, the pilot started the aircraft and taxied to the refuelling pumps. The refueller recalled that the pilot initially mentioned that he needed 15 gallons but that he quickly realised that the fuel pumps delivered in litres, and he used his circular slide rule to calculate the required quantity in litres. Having completed the calculation, the pilot asked the refueller to put 45 litres (12 US gallons) of fuel in each wing. After refuelling the pilot noted that the fuel gauges indicated full on the left and three quarters full on the right.

The flight to Sheffield was uneventful with an airborne time of 1 hour 2 minutes and a block time (start of taxi at Shoreham to end of taxi at destination) of 1 hour and 5 minutes. On departure from Sheffield the pilot completed a further walk-round check and again checked the fuel drains. The flight departed from Sheffield on the return journey at 1242 hrs, after about 2 hrs and 40 minutes on the ground. On the return flight, Shoreham ATC cleared the aircraft for an overhead join at 2,000 feet for Runway 21. As the aircraft passed through the Shoreham overhead, the pilot began a shallow left turn and started to carry out the Pre-Landing checks. As he did so he noted that the fuel gauges indicated half full for the left wing tanks and a quarter full for the right tanks. As part of the checks, the pilot advanced the propeller control levers toward the FULLY FINE position, and immediately the aircraft yawed and rolled rapidly to the left and the pilot noticed that the left engine manifold pressure had reduced to 15 inches. The pilot instinctively returned the left propeller control lever to the cruise position and the left engine seemed to recover power. The pilot informed Shoreham ATC of the problem with the left engine and was cleared for a wide left-hand circuit for Runway 21. Shortly thereafter the pilot placed both propeller control levers back in the FULLY FINE position and almost immediately the left engine failed completely. The pilot attempted to restart the left engine using the normal electric starter but nothing happened and, during the course of the restart attempt, the right engine also failed. As the aircraft began a glide descent the pilot made a further attempt to restart the left engine with the left engine fuel lever to CROSSFEED but again without success. The pilot informed ATC of the total loss of power and was cleared to land on grass Runway 25 which was the nearest runway. By this stage the aircraft had descended to about 900 feet with both propellers windmilling and the landing gear and flap retracted. The pilot returned the fuel selector controls to NORMAL and attempted a further restart on the right engine but still without success. In the limited time available the pilot was unable to refer to the emergency checklist during the restart attempts and he cannot recall whether he selected the AUX fuel pump to HI in accordance with the checklist. Now at about 400 feet and pointing directly at the airfield, the pilot realised that he would be unable to glide to the runway and he began looking for a suitable place to land. Noticing a narrow strip of grass between a railway line and the end of several rows of houses the pilot aimed for this area and lowered the landing gear. As he approached the grass area the pilot flared the aircraft but the left wing struck the roof of a house and the right wing and tailplane struck an adjacent tree. The roof collapsed absorbing much of the aircraft's forward speed and the aircraft yawed left and slid into the rear garden of the house largely intact. The pilot suffered head injuries but was able to exit the aircraft unassisted. He later returned to the cockpit to switch off the aircraft electrical systems.

Both the pilot and a firemen who reached the scene a matter of minutes after the impact, recalled seeing fuel seeping from damage to the right wing, but none of the

eyewitnesses were able to recall seeing or smelling fuel in the area of the severely damaged left wing. The elapsed time from the pilot reporting problems with the left engine to ground impact was about 1 minute 15 seconds and the pilot reported that both engines had suffered power loss about 35 seconds after reporting the initial problem with the left engine. The total flight time from Sheffield was one hour and 11 minutes.

RECOMMENDATION 2001-67

The difficulties of establishing the exact amount of fuel on board on this and other similar types presents a flight safety hazard to both private and public transport category operations. The investigation of this accident revealed significant discrepancies in the recording of fuel states for some of the previous fourteen flights. It is therefore recommended that the CAA should ensure that operators of twin engine light aircraft (all types similar to the PA 34) in the Transport Category (Passenger) have an effective back up procedure, in addition to the aircraft fuel gauges, by which the fuel remaining in tanks after flight may be established and recorded.

Status - Partially Accepted - Closed

CAA Response

The CAA partially accepts this Recommendation. The CAA accepts the Recommendation for public transport operations but can only partially accept the Recommendation for non-public transport operations as it is unable to ensure compliance on this type of operation, being able only to issue advice and guidance.

For twin engine light aircraft, similar to the PA 34, that are certificated in the Transport Category (Passenger) and operated by Air Operators' Certificate Holders, the CAA will publish information in a Flight Operations Communication (FODCOM); this publication will require operators to establish an effective back up procedure, in addition to the aircraft fuel gauges, by which the fuel remaining in tanks after flight may be established and recorded. This procedure will be required to be contained in the Operations Manual.

For aircraft not operated by Air Operators' Certificate Holders, the CAA has published guidance in the General Aviation Safety Information Leaflet (GASIL) Issue 5 of 2001. Owners and operators are reminded of the unreliability of many light aircraft fuel gauges, and advised of the necessity for regular re-fuelling to a level which can be visually checked and technical log records amended accordingly.

CAA Action

The CAA published Flight Operations Department Communication (FODCOM) 2/2002 on 18 January 2002. This FODCOM drew the attention of Public Transport Operators of twin engine light aeroplanes to the fact that they should establish an effective back-up procedure, in addition to the aeroplane fuel gauges, by which the fuel remaining in the tanks after flight may be established and recorded, and that this procedure should be detailed in their Operations Manual.

Mainair Blade 582	Near Enson, Staffs	13 Jan 2001	Accident

References: Bulletin 6/2001 dated 7 Jun 2001

FACTOR F34/2001 dated 15 Aug 2001

SYNOPSIS

The pilot had arrived at his home microlight airstrip at Ince for some local flying in this aircraft, G-MZCN. At the airfield, three other pilots were preparing their aircraft for a return flight to Sittles Farm near Lichfield to enable one of them to deliver an aircraft. The pilot of G-MZCN asked if he could accompany them in his aircraft and this was agreed. The total distance was about 75 miles. At an estimated airspeed of 60 MPH and with a headwind component, the outbound flight was expected to take approximately 1 hour 30 minutes. The pilot of G-MZCN was heard to comment that he could use one tank of fuel on the outbound flight and the other for the return flight. Then, sometime prior to departure, he invited an acquaintance to come along as his passenger in the rear seat; this passenger was also a qualified PPL (M) holder. Of the four aircraft involved in the flight, two were 3-axis microlight aircraft and two, including G-MZCN, were flexwing microlight aircraft. The other three aircraft had RTF but there was no facility on G-MZCN for radio communication between aircraft or intercom between the two personnel on board.

The pilot of G-MZCN rigged his aircraft and the passenger supported the 'wing' while the pilot attached the 'trike' unit to it. The passenger had flown with the pilot once before and considered him a steady and conscientious individual in whom he had full confidence. He saw the pilot topping up the rear fuel tank; he confirmed that this tank was full of fuel but was not aware of how much fuel was in the underseat tank. The pilot accomplished the engine start and pre-departure checks and the take-off, following the other three aircraft, was normal.

Take-off was at approximately 1250 hrs and the early part of the flight was uneventful with the four aircraft remaining in visual contact, albeit widely spread. However, after they had left the Low Level Route, the pilot of one of the 3-axis microlight aircraft noticed that his fuel pressure gauge was giving erratic indications and he decided to land at Ashcroft airstrip as a precaution; after informing the other radio equipped aircraft, the pilot returned to Ashcroft.

The other three aircraft continued their flight and the passenger of G-MZCN retained intermittent visual contact with the other flexwing aircraft. Then, north of Stafford (some 15 miles short of destination), the passenger was aware of a engine power reduction in G-MZCN and that the pilot was reaching back with his right hand towards the position of the fuel selector level. There did not seem to be any improvement to the engine power level and the pilot brought his hand back to the control bar. Almost immediately, the pilot banked to the left and the passenger assumed that he had made a decision to carry out a forced landing. The passenger was not looking at the aircraft instruments and estimated the aircraft to be banked approximately 40deg and with a high rate of descent. Looking ahead, he could see a field in which he assumed the pilot was intending to land. At the far boundary of the field, the passenger saw a fence and he felt that the landing was going to be "heavy". The pilot levelled the wings just before ground contact and the landing was hard. The passenger's next recollection was being underneath the aircraft, unable to move and aware of leaking fuel. However, after a short period, two men arrived at the scene and the passenger

was able to crawl clear when the aircraft was raised. He then helped the other men to lift the 'trike' and released the pilot from his harness. Once clear of the aircraft, the passenger put the pilot in the 'recovery position' but could not detect any signs of life.

The pilot of the other flexwing aircraft did not see G-MZCN make a forced landing. However, he confirmed that the two aircraft were flying at a similar height of approximately 1,000 feet agl and at 60 MPH; he did not consider the weather conditions to be particularly cold. The pilot estimated that the headwind component at their height was about 17 kt. He had changed his fuel tank selection after approximately 1 hour 45 minutes flying time, which occurred close to Stafford. When he realised that G-MZCN was not still with him, the pilot retraced his route for a short time but was unable to locate him. He landed at his intended destination at approximately 1450 hrs.

RECOMMENDATION 2001-52

It is recommended that the Civil Aviation Authority require manufacturers of UK registered microlight aircraft to provide upper body restraint to the rear seats of aircraft where forward movement of a passenger could cause injury to the pilot.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation. The CAA will, by 31 December 2001, ensure that manufacturers of UK registered microlight aircraft provide upper body restraint to the rear seats of aircraft where forward movement of a passenger could cause injury to the pilot.

CAA Action

Prior to 31 December 2001 the CAA issued 5 Mandatory Permit Directives which required all affected UK registered microlights to be fitted with an upper body restraint by 30 April 2002 at the latest.

RECOMMENDATION 2001-53

It is recommended that the Civil Aviation Authority, as the issuing Authority of the Permit to Fly for microlights in the UK, should review the requirements applicable to the design of fuel systems of the type fitted to the Mainair Blade 582 with the intention of ensuring that, at all times when in flight, information concerning the fuel state is presented to the pilot in an easily assimilated manner and that the operation of a fuel selector, due to its location, does not detract from safe conduct of the flight.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation. The CAA, will by 31 December 2001, complete a review of the relevant airworthiness requirements for design of fuel systems for microlight aeroplanes with particular regard to the presentation of the fuel state to the pilot and the operation of a fuel selector.

CAA Action

The CAA has reviewed the requirements applicable to the design of fuel systems of the type fitted to the Mainair Blade 582, and has concluded that there is scope for improvements, either to the requirements or by the provision of guidance material.

The CAA has recently set up a BCAR Section S working group with industry, the PFA and the BMAA, with the intention to develop improvements for this code. This issue has been added to the agenda for this group.

Cessna C152	Near Mullach An Rathain Peak	13 Dec 2000	Accident

References: Bulletin 7/2001 dated 5 Jul 2001

FACTOR F38/2001 dated 16 Oct 2001

SYNOPSIS

The pilot and a business colleague planned to fly from Inverness to Benbecula for a business meeting. The aircraft took off at 0856 and departed to the west of the airfield. At approx 1130 a representative of the company, due to host the pilot in Benbecula, telephoned the pilot's place of work to advise them that the aircraft had not arrived and to confirm that the intention to visit remained. At 1430 the aircraft had still not arrived and the company representative in Benbecula again called the pilot's place of work. By 1500 the Rescue Co-ordination Centre at RAF Kinloss had been informed and overdue action commenced. A request for information on local radio resulted in a large number of reported sightings or 'hearings', but no further evidence of the aircraft's progress could be gained. There were no further radio calls from the aircraft to ATC units and examination of radar recordings showed no trace of the aircraft. In the following days a large scale land and air search was conducted over the Scottish Highlands but without success and after four days the search was scaled down. On 23 February 2001 a hill walker discovered an aircraft wheel and a liferaft in a gully on the southern side of the Liathach Mountains near Torridon, Wester Ross. A subsequent search by the Torridon Mountain Rescue Team (MRT) found the wreckage of G-BHPX, together with the bodies of its occupants, at approx 2700 feet amsl roughly 1km ESE of the Mullach an Rathain peak in the Liathach Mountains. The search and rescue effort began at 1500, just over 4 hours after the aircraft's ETA at Benbecula and not long before sunset. If the pilot had filed a VFR flight plan in accordance with the advice in the UK AIP, overdue action would have started 30 minutes after the scheduled ETA and it is possible that the wreckage might have been found earlier. The lack of an ELT further hampered the search and rescue effort. Whilst this accident was not survivable, the search and rescue effort for G-BHPX contrasts sharply with a similar accident to a Cessna 172 that crashed in the Cairngorms on 25 January 2001. The Cessna 172 was fitted with an EPIRB transmitting on 121.5 MHz and 243.0 MHz and, although the survivors were unaware of the EPIRB's existence, the emergency signal was received by SARSAT and alerted rescue aircraft were able to locate the wreckage by homing on the EPIRB signal. The survivors were rescued within three and a half hours of crashing.

RECOMMENDATION 2001-51

The CAA should advise pilots flying in the private category whose intended route takes them over sparsely populated areas or in areas where search and rescue might be difficult that their aircraft should either be fitted with an approved EPIRB or they should carry an approved PLB that can be automatically activated on impact or manually activated by survivors.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation. Advice already given in the UK AIP (Aeronautical Information Publication) at GEN 3.6.6, paragraph 2.4, will be reinforced with an article to be published in the next issue of the General Aviation Safety Information Leaflet (GASIL) to be published in October 2001.

CAA Action

Advice already given in the UK Aeronautical Information Publication (AIP) at GEN 3.6.6, paragraph 2.4 was reinforced with an article published in the General Aviation Safety Information Leaflet (GASIL) published in October 2001.

Piper PA31-350	Mersey Estuary W Liverpool A/P	14 Jun 2000	Accident

References: Bulletin 1/2001 dated 11 Jan 2001

FACTOR F13/2001 dated 6 Mar 2001

SYNOPSIS

The aircraft, operated by an Air Operator's Certificate holder, was engaged on an air ambulance operation from Ronaldsway in the Isle of Man to Liverpool. Having flown under VFR on a direct track to the Seaforth dock area of Liverpool the pilot flew by visual reference along the northern coast of the Mersey Estuary to carry out a visual approach to Runway 09 at Liverpool. During the turn on to the final approach, when approximately 0.8 nm from the threshold and 0.38 nm south of the extended centreline, the aircraft flew into the sea.

The investigation concluded that the pilot lost control of the aircraft at a late stage of the approach due either to disorientation, distraction, incapacitation, or a combination of these conditions.

RECOMMENDATION 2000-50

The transfer of patients by Air Ambulance under Intensive Care Transport (ICT) or Air Taxi Transport (ATT), where payment is made, falls within the category of public transport. The Air Navigation Order makes no provisions for discriminating between types of passengers on public transport flights. Furthermore, such flights are operated in accordance with the terms of an Air Operator's Certificate, the holder of which has demonstrated competence to undertake flights for the purpose of public transport in accordance with all applicable regulations.

The Air Navigation Order states the minimum crew required for public transport flights. Whilst the majority of public transport flights require an operating crew of two pilots, the aircraft involved in this accident was legally only required to have a single pilot. In the light of this accident, in which the pilot was either disorientated, distracted or incapacitated (or a combination of all three), the presence of a co-pilot could have averted the accident.

It is therefore recommended that the CAA, in conjunction with the JAA, review the circumstances in which the carriage of a second pilot is required for public transport flights.

Status - Fully Accepted - Closed

CAA Response

The Civil Aviation Authority (CAA) accepts this recommendation.

In conjunction with the Joint Aviation Authorities (JAA), the CAA will review the circumstances in which a second pilot is required for public transport flights. Target Date: July 2002

CAA Action

The Joint Aviation Authorities Study Group that deals with flight crew matters reviewed the minimum crew requirement for Commercial Air Transport flights at their meeting in March 2002. The Study Group considered the existing JAR-OPS regulations in light of the number of recorded incidents of pilot incapacitation reported in the UK since 1976. After deliberation the Group decided that the number of serious incapacitations did not warrant an amendment to the existing JAR-OPS requirements and consequently did not recommend any changes.

BN2B-26 Islander	**Overhead Largs, Ayrshire**	**18 Mar 2000**	**Incident**

References: Bulletin 6/2001 dated 7 Jun 2001

FACTOR F32/2001 dated 15 Aug 2001

SYNOPSIS

(From AAIB Report)

The aircraft had taken off from Glasgow on a flight to Campbeltown and had levelled at 3,000 feet. About one minute later, the pilot heard a noise which he described as sounding like hailstones striking the windscreen. However, there was no hail and about one second later the right engine ran down. The right propeller continued to windmill until the pilot successfully completed feathering action. He then transmitted a 'Mayday' call to Prestwick Approach, who offered him the option of returning to Glasgow or a diversion to Prestwick. The pilot decided to return to Glasgow since the weather conditions there were better. The pilot elected not to increase power on the left engine and accepted a gradual descent back to Glasgow where the aircraft later landed without further incident, with the Airfield Fire Service in attendance.

RECOMMENDATION 2001-28

In order that maintenance records may be of enhanced use to post incident and accident investigations, it is recommended that the CAA promote amendment of JAR 145.55 to increase the minimum period for the retention of maintenance records from two to five years.

Status - Partially Accepted - Closed

CAA Response

The CAA partially accepts this Recommendation. Whilst it is accepted that JAR 145.55 requires that maintenance records be kept for a minimum of two years, the operator of an aircraft is bound by the more stringent requirements of the Air Navigation Order 2000, Article 17 or JAR OPS 1.920. In this respect, the requirement is that operators keep log books/maintenance records until 24 or 12 months after the aeroplanes has been permanently withdrawn from service. The CAA thus considers that current requirements adequately address the subject of maintenance record retention.

Further, to promulgate to industry its responsibility in respect of document retention, the CAA will issue an appendix to Airworthiness Notice 12. This appendix will be included in the October 2001 revision of Airworthiness Notices.

CAA Action

Appendix 61 to Airworthiness Notice 12 was published in October 2001 to clarify the requirements and remind aircraft operators and maintenance organisations of their responsibilities.

RANS S6-ESD	**Monewden, Suffolk**	**6 Oct 1999**	**Accident**

References: Bulletin 1/2001 dated 11 Jan 2001

FACTOR F24/2001 dated 2 May 2001

SYNOPSIS

(From AAIB Report)

The aircraft was climbing out normally when one of the pistons seized and the engine stopped. The engine seizure was the result of a number of flights having been carried out with inadequate engine cooling. This inadequate cooling was the result of a badly worn fan-belt, which in turn was the result of a period of operation with corroded pulley surfaces.

The descriptions of the aircraft's behaviour after the engine stopped suggest that the speed decayed, possibly as the pilot attempted to clear the ploughed area and hedge. The right turn may have been a consequence of this, rather than a deliberate turn back towards the airfield. The aircraft wing then stalled and it had entered the initial phase of autorotation when it hit the ground.

The pilot's harness failed and he died from a serious head injury, which would almost certainly not have occurred had the seat belt not failed. As he had no other life

threatening injuries, it is also possible that a helmet would have saved his life. The seat harness failed as a result of a hard object, probably a belt buckle or part of the pilot's clothing, cutting into the stitching of the webbing where the tongue was attached.

RECOMMENDATION 2000-61

It is recommended that when surveying aircraft or approving the installation of safety restraint harnesses, the CAA and PFA surveyors/inspectors should check the connections between the harness webbing and the metal components (release boxes, tongues and adjusters), where the latter are capable of being positioned against the occupant's body, to determine the safe orientation of reversed overlapped and stitched sections of webbing.

Status - Partially Accepted - Closed

CAA Response

The CAA partially accepts this Recommendation.

The exact nature of the seat belt failure is not known. A hypothesis has been proposed, based upon the most probable cause. A search of the MOR database has failed to identify any similar incidents. The CAA, therefore, concludes that the probability of a recurrence is extremely unlikely. A recurrence, however unlikely, could nevertheless result in serious injury or death.

The CAA considers the most appropriate action is to bring this potential failure to the attention of CAA Surveyors, the Popular Flying Association, the British Microlight Aircraft Association and maintenance organisations with a view to sampling this item as part of aircraft surveys/inspections. The results from this work would be monitored with a view to improving standards where practical.

The information will be promulgated in an appendix to Airworthiness Notice 12, due revision in October 2001. The appendix would give details of the potential failure and advise (in the absence of OEM instructions) a best practice which can be adopted. The best practice would be based upon the AAIB recommended action and the supplementary information which has been supplied to the CAA's queries.

CAA Action

Appendix 62 to Airworthiness Notice 12 was published in October 2001. This appendix gives details of the seatbelt failure and based on the AAIB recommended action advised a 'best practice' to be adopted.

Cessna 208B Caravan	**Sumburgh Airport**	**6 Sep 1999**	**Accident**

References: Bulletin 5/2000 dated 9 May 2000
FACTOR F11/2000 dated 7 Jul 2000

SYNOPSIS

(From AAIB Report)

On a flight from Aberdeen, the crew diverted to Kirkwall because of poor weather at their intended destination of Sumburgh. With a report of improved weather, the crew flew to Sumburgh and made an approach to runway 27. They reported that they broke cloud at approximately 500 feet agl but were high and fast. The aircraft touched down at least half way along the runway, with a high speed and bounced. Following the second touchdown, both pilots applied full foot braking but were not aware of any retardation. The commander took control and applied full power to try and avoid concrete blocks which he knew were off the end of the runway; the aircraft stopped on these concrete blocks. There was little evidence of any effective decision making from the commander during the approach and landing and no co-ordination between the crew. Additionally, the weather conditions were such that it was doubtful if the flight should have been initiated under company rules.

RECOMMENDATION 2000-21

The CAA review the content of Article 32A of the Air Navigation Order and clarify it.

Status - Fully Accepted - Closed

CAA Response

The Authority accepts this Recommendation.

The Authority will review the content of Article 32A of the Air Navigation Order and clarify its intent, as necessary. Target date: April 2001.

CAA Action

The CAA has consulted industry in respect of a proposal to amend the Air Navigation Order to clarify the intent of Article 32A (now Article 37). A Letter of Intent was sent to industry on 2 May 2001. The Air Navigation Order Article 37 was amended with effect from 1 April 2002.

Cessna C404 Titan	Near Glasgow Airport	3 Sep 1999	Accident

References: AAR2/2001 dated 31 Jul 2001

FACTOR F35/2001 dated 31 Jul 2001

SYNOPSIS

(From AAIB Report)

The aircraft had been chartered to transport an airline crew of nine persons from Glasgow to Aberdeen. The aircraft was crewed by two pilots and its weight was close to the maximum permitted for take-off. ATC clearance for an IFR departure was obtained before the aircraft taxied from the business aviation apron for take-off from Runway 23, which has a take-off run available of 2,658 metres. According to survivors, the take-off proceeded normally until shortly after the aircraft became airborne when they heard a thud or bang. The aircraft was seen by external witnesses at low height in a wings level attitude that later developed into a right bank and a gentle descent. Witnesses reported hearing engine spluttering and saw at least one propeller rotating slowly. There was a brief 'emergency' radio transmission from

the commander and the aircraft was seen in a steep right turn. It then entered a dive. A witness saw the wings being levelled just before the aircraft struck the ground on a northerly track and caught fire. Three survivors were helped from the wreckage by a nearby worker before flames engulfed the cabin.

RECOMMENDATION 2001-38

The CAA should take forward to the JAA a proposal to re-examine the criteria for the carriage of flight recorders by multi piston engine aircaft, which have in force a certificate of airworthiness in the Transport Category (Passenger) and are certified to carry more than 9 passengers with a view to requiring all aircraft, whether piston or turbine powered, to carry at least a Cockpit Voice Recorder.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation. The CAA wrote to the Chairman of the Joint Aviation Authorities Flight Recorder Study Group on 9 July 2001 requesting that the criteria for the carriage of flight recorders be re-examined in line with this Recommendation.

RECOMMENDATION 2001-40

The increased statistical risk in operating FAR/JAR Part 23 aircraft, in comparison with the larger FAR/JAR Part 25 "Transport Airplanes", is a strong incentive to incorporate at least some of upgraded seat requirements into the existing light aircraft fleet, particularly for those types in continuing production. For example, dynamic testing has shown the advantages of the fitting of upper torso restraints. Similarly, it is possible for seat attachment fittings to be strengthened without imposing a requirement that the FAR/JAR 23.562 injury criteria be demonstrated.

It is therefore recommended the CAA should undertake a study to identify those elements of the current JAR 23 seat standards which may be used for retrofit into existing aeroplanes whose maximum certified take-off mass is less than 5,700kg and, separately, for those designs in continuing production which are not covered by the current JAR 23 standards. These elements should then be applied at least to those that are operated in the Transport Category (Passenger).

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation. In the context of the factual information contained in Section 1 of the report, the CAA will undertake a study to identify any relevant parts of current JAR-23 seat standards that could effectively be applied retrospectively to aircraft. The study will separately focus on "in-service" aircraft and those "in continuing production" at weights under 5700kg operated in the Transport Category.

On completion of the study, by March 2002, consideration will be given to proposing amendments to the JAA operational requirements.

CAA Action

From the study completed in March 2002 the CAA is satisfied that only one element is worthy of further investigation. This investigation is underway to examine the

feasibility of retrospective application of upper torso restraint beyond that required in the ANO Schedule 4 Section 5 Scale B (i) (f).

Jet Provost TMK4	Woolaston, Gloucestershire	1 Aug 1999	Accident

References: Bulletin 6/2000 dated 15 Jun 2000

FACTOR F16/2000 dated 11 Aug 2000

SYNOPSIS

The aircraft was being operated on a series of pleasure flights over the course of a weekend from Gloucester Staverton Airport. Three different pilots flew the aircraft on these trips taking passengers who were members of a local flying club. Payment was made by each passenger as part contribution to the costs of the flight.

The pilot for the 'accident' flight had flown three such flights on the Saturday and this was his first flight on the Sunday. The aircraft took off and climbed away from the airfield heading south-west. Radar contact was lost at the point where the aircraft crossed the Severn Estuary. The aircraft was seen, from the bank of the River Severn, to be flying along the middle of the river at a height described as being about 50 feet. Several other people described seeing the aircraft flying 'very low' along the river. Before reaching the Severn Road Bridge the aircraft entered a climbing turn to the right, the turn taking the aircraft over the west bank and rising ground. On completion of the turn the aircraft headed north-east and descended again towards the river. The aircraft passed close by a house and the occupants, who were in the garden, continued to watch the aircraft and saw it fly up the river for a short time before turning sharply to the left, descending close to the ground.

A number of witnesses saw the aircraft carrying out its final turn and described seeing it in a steep bank to the left whilst at a low level. During the turn the nose of the aircraft was seen to drop and the aircraft descended towards the ground. There were no witnesses to the actual impact but people close by reported that there was an immediate fire. Ejection seats were fitted but no attempt was made to use them.

RECOMMENDATION 2000-13

The CAA should consider amending the guidelines given to operators in CAP 632 to require a minimum operating height to be specified in the Organisational Control Manual when passengers are carried.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The CAA will consider amending the guidelines given to operators in CAP 632 to require a minimum operating height to be specified in the Organisational Control Manual when passengers are carried. Target date: 31 December 2000.

CAA Action

The CAA has amended the guidelines, given to operators of ex-military aircraft in CAP 632, for a minimum operating height to be specified in the Organisational Control Manual for all flights and particularly when passengers are carried. The amended version of CAP 632 has been published and is also available on the CAA website: www.caa.co.uk/publications.

RECOMMENDATION 2000-14

The CAA should consider amending the guidelines given to operators in CAP 632 to require a minimum level of experience specified in the Organisational Control Manual before a pilot is authorised to carry passengers.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The CAA will consider amending the guidelines given to operators in CAP 632 to require a minimum level of experience to be specified in the Organisational Control Manual before a pilot is authorised to carry passengers. Target date: 31 December 2000.

CAA Action

The CAA has amended the guidelines, given to operators of ex-military aircraft in CAP 632, for a minimum level of experience to be specified in the Organisational Control Manual before a pilot is authorised to carry passengers. The amended version of CAP 632 has been published and is also available on the CAA website: www.caa.co.uk/publications.

Tornado GRI & Cessna 152	**Mattersey, Nottinghamshire**	**21 Jan 1999**	**Accident**

References: AAR 3/2000 dated 20 Apr 2000

FACTOR F8/2000 dated 20 Apr 2000

SYNOPSIS

(From AAIB Report)

The investigation was conducted under the provisions of the Air Navigation (Investigation of Air Accidents involving Civil and Military Aircraft or Installations) Regulations 1986. A Tornado Combined Safety Investigation (TCSI) was also convened under air force regulations and conducted its own separate investigation.

The Cessna 152, which was based at Gamston Airfield, Nottinghamshire, was conducting a local flight and was most probably engaged in aerial photography. The Tornado GRI, based at RAF Cottesmore, was on a routine training flight that included low level flying. The weather was excellent at the time of the accident with good visibility, no cloud and a light westerly wind.

The mid air collision occurred over open ground at a height of 655 feet agl some 300 metres from the western edge of the village of Mattersey, Nottinghamshire. The Cessna pilot, his passenger and both Tornado pilots were killed in the collision. After the collision the Cessna broke up in the air. The Tornado continued on its track but descended into the ground 13 seconds later. The collision initiated the ejection sequence for the front seat of the Tornado and the pilot was ejected from the aircraft but command ejection of the rear seat did not take place. The aircraft disintegrated on ground impact with the rear seat pilot still in his seat.

Eyewitness evidence indicates that before the collision the Cessna had been in a prolonged left-hand manoeuvre when it collided with the Tornado which was flying at low level on a north-easterly heading.

The following causal factors were identified:

a) None of the pilots saw each other's aircraft in time to take effective avoiding action.

b) The Cessna pilot, whilst probably taking aerial photographs, conducted his flight at a height known to be vulnerable to an encounter with a military fast jet.

c) By not using the Civil Aircraft Notification Procedure or informing any ATC agency of his location and intentions, the Cessna pilot degraded the potential of other traffic to locate and avoid him.

d) When conducting operational checks, head down, whilst at low level, the front seat pilot of the Tornado did not detect the Cessna. The rear seat pilot had a limited field of view ahead of his aircraft and would have been unable to detect other aircraft in the forward sector.

e) The principle of 'see and avoid' was suspended during a period in which none of the pilots was able to conduct an effective lookout.

f) Technology based aids designed to enhance visual detection, such as strobe detectors and Collision Warning Systems, which had been recommended in the light of previous mid air collisions, had not been introduced into service.

RECOMMENDATION 99-37

The CAA should review the status of its strobe detector programme against the background of other technologies that might assist pilots in preventing collisions in the air.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation.

The strobe detector has proved to be technically feasible and moderately effective in flight trials and the CAA will continue to promote and keep an open mind on other technologies, but commercial production and installation costs may inhibit the attractiveness of the device to GA pilots.

CAA Action

The CAA continues to investigate other technologies and further trials of a self-contained transponder for general aviation will take place during 2002. If the proof of concept of such a transponder is successful, it will be for industry to decide whether to take it forward to commercial production.

Hawker Hunter F MK4	Dunsfold Airfield	5 Jun 1998	Accident

References: Bulletin 10/99 dated 7 Oct 1999

FACTOR F27/99 dated 14 Dec 1999

SYNOPSIS

The accident occurred when the aircraft crashed whilst attempting to conduct a rapid emergency landing on R/W25 after suffering an inflight engine failure and fire during a practice air display. The pilot did not eject and was fatally injured. Subsequent investigation found that the Avon Mk122 turbojet engine had suffered a massive uncontained turbine failure which had caused the HP and LP turbine blades to penetrate the jet pipe and rear fuselage, initiating the in-flight fire. After a detailed investigation in conjunction with the engine and fuel system manufacturers, it was concluded that the turbine failure had occurred due to gross overfuelling which was probably induced by momentary selection of the HP fuel pump isolate switch (HPPIS) to ISOLATE without the required closure of the throttle before such selection. It was further considered that this HPPIS selection may have been made in response to a compressor problem induced by malfunction of the Bleed Valve Control Unit which performed inconsistently during testing and was found, on strip inspection, to contain a small piece of sealant and fine debris or dirt contamination of its airway. This engine had previously experienced 'compressor rumbling' on 8 June 1997, the cause of which was not identified at that time.

RECOMMENDATION 99-28

In view of the increasing number of ex-RAF high performance jet aircraft on the Civil Register which are equipped with ejection seats, it is recommended that the CAA consider publishing appropriate operational guidance information on the correct and timely use of such ejection seat systems during emergency situations for pilots who fly such aircraft and whose previous flying training and experience has been on aircraft not so equipped.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation.

The CAA has issued written operational guidance to all civil operators of ex-military aircraft, including the timely use of ejection seat systems, in February 1999 following the loss of a Jet Provost in December 1998. A poster campaign to reinforce the message is planned.

A seminar for operators of ex-military aircraft was held at Duxford on 7 December 1999. The timely use of ejection systems was one of the major topics covered. There was a most positive response to the guidance.

CAP 632, "The Arrangements for the Operation of Ex-Military Aircraft on the UK Register with a Permit to Fly", is being reviewed and will be reissued in 2000. Advice on the use of ejection systems included in the new edition.

CAA Action

The CAA has amended the guidelines, given to operators of ex-military aircraft in CAP 632, for advice on the correct and timely use of ejection seats. The amended version of CAP 632 has been published and is also available on the CAA website: www.caa.co.uk/publications.

Piper PA28R-200 Cherokee-Arrow II	**Skiddaw**	**13 Feb 1992**	**Accident**

References: Bulletin 6/92

FACTOR F292

SYNOPSIS

Pilot had recently completed training for Night Rating, but this had not yet been issued. Training for IMC Rating completed 2 months earlier. Pilot was on first solo flight for significant period, due to recently lifted medical restrictions. Inadequate flight planning made for long cross country flight, during which Instrument Meteorological Conditions were forecast. Freezing level was below minimum safe altitude, and aircraft was not approved or equipped for operations in icing conditions. Darkness occurred during flight, due to later than planned departure time. Whilst over mountainous terrain, on encountering turbulence and cloud formations, pilot elected to descend below minimum safety altitude in strong wind conditions. Aircraft approached high ground on lee side, in an area where downdraughts would be expected, and aircraft impacted high ground close to summit of 3055 feet AMSL.

RECOMMENDATION 92-32

The CAA consider ways of enhancing the training content of the IMC Rating, to bring it closer to the ICAO minimum standard for IFR operations. This should include the incorporation of a full navigation flight test, with increased emphasis on the use of radio aids for en route navigation, and including a descent to minimum safe altitude and diversion due to (simulated) adverse weather conditions.

Status - Fully Accepted - Closed

CAA Response

The CAA accepts this Recommendation which will be covered in a review of the future of the IMC Rating conducted in the context of the introduction from 1993 of European harmonised flight crew licensing requirements.

CAA Action

Following the introduction of the European harmonised flight crew licensing requirements in the UK, in July 1999, it was decided to conduct a review of the future content of the UK IMC Rating, co-ordinated by the General Aviation Steering Group (GASG). The minutes of the GASG meeting held on 12 June 2001, indicate that the review found the basis of the IMC rating to be sound and that it remained a beneficial rating contributing significantly to safety in the general aviation environment. Possible

"changes to the rating with respect to training and validity" remain an issue for future consideration by the industry and SRG but the GASG agenda item has been closed.

Piper PA28-181	Stanmore	18 Apr 1991	Accident

References: Bulletin 9/91

SYNOPSIS

A/C ran out of fuel and crashed following pan call. Subst damage. Pilot subsequently died from his injuries. Alcohol involved. On the morning of the accident the pilot completed a flight from Panshanger to Cambridge, which had appeared to be normal in all respects. After an absence of about two hours he returned to Cambridge Airport and booked out for Panshanger. During subsequent RTF exchanges between the A/C and Cambridge Tower the pilot appeared confused and had difficulty in understanding instructions. While taxiing the A/C turned in the wrong direction and passed behind a large A/C, which was carrying out full power engine checks, before taking off without clearance. During the ensuing two hour flight the A/C was observed flying erratically at varying heights within the Stansted zone, causing the police to be alerted. The pilot subsequently called Panshanger stating he was turning finals but five minutes later he transmitted a pan call just before the A/C crashed into trees on Stanmore Common. The pilot, who subsequently died of his injuries, was found to be in possession of a partly empty half-bottle of vodka with its cap loose. Although the accident occurred when the A/C ran out of fuel, it is considered that the most likely primary causal factor was excessive alcohol consumption. It was also concluded that the pilot was probably not wearing a seat belt. CAA Closure: ANO Article 52 to be amended.

RECOMMENDATION 01

The CAA initiate action to amend the Air Navigation Order Article 52, such that when a person is involved in an accident or incident or is suspected of an offence under the Article, the person may be required to submit to appropriate tests and provide samples.

Status - Fully Accepted - Open

CAA Response

The CAA accepts this Recommendation and action is in hand to amend the ANO. However the Civil Aviation Act has to be amended before the ANO. This may take some time and is a matter for the DTp.

CAA Action

The amendment to the Air Navigation Order which will allow drug and alcohol testing of persons involved in accidents or incidents has still not occurred because the Civil Aviation Act has not yet been amended in Parliament. This remains in the hands of the DTLR.

Part 4 AAIB Recommendations involving the DTLR

B767-322ER	London Heathrow Airport	1 Sep 1998	Incident

References: AAIB Bulletin No: 4/2001 dated 5 April 2001
FACTOR F26/2001 dated 2 May 2001

RECOMMENDATION 2001–32

In order to reduce the risk of multiple large bird strike encounters, involving bird formations over-flying London Heathrow Airport conflicting with departing or arriving public transport aircraft, the Department of the Environment, Transport and the Regions (DETR) should organise and lead a working group of representatives of relevant local authority bodies, private land owners and Heathrow Airport Limited (HAL) to expedite effective management of the associated large bird habitat and population around Heathrow Airport. Similar co-operative initiatives should be actively promoted by the DETR and the CAA around other affected major airports in the UK.

Response

This recommendation is accepted by DTLR. DTLR has established and chairs a working group looking at the bird strike hazard at Heathrow, which also includes representatives from the CAA, HAL, the Environment Agency, English Nature, County and Local Councils and other land owning and representative bodies. The terms of reference of the working group include the identification of options for the control of existing bird populations posing a hazard to operations at Heathrow and the encouragement of effective habitat control measures to reduce the risk of bird strikes, having due regard to conservation and bio-diversity. It is anticipated that any recommendations or guidance arising out of the work of this group will form the basis of action at other aerodromes where a bird strike risk has been identified. This recommendation complements the existing recommendation (98–59) aimed at HAL and the CAA.

RECOMMENDATION 2001–34

In order that the aviation safety of public transport flights is not adversely affected by an increased potential for bird strikes, the Department of the Environment, Transport and the Regions (DETR) should review the implementation of the EC Bird Directive in the UK to ensure that, where the designation of any SSSIs and/or SPAs are being considered in the general region of major airports, the affected airport authorities and the CAA must be consulted for their assessment of the potential effects of increased habitat protection upon the incidence and frequency of bird strikes on such aircraft.

Response

This recommendation is accepted. The Department for the Environment, Food and Rural Affairs (DEFRA) has circulated a list of UK licensed aerodromes to English Nature, the Government's statutory nature conservation advisors for England, who have added the names to their consultation lists. The views of the CAA will also be sought as part of the consultations carried out by DEFRA and other Government Departments on these issues. Details of the licensed aerodromes have also been forwarded to the Scottish Executive, the National Assembly for Wales and the Northern Ireland Executive to consider taking similar action with their respective country conservation agencies.

Part 5 AAIB Recommendations made to other non-CAA bodies

Boeing B737	London Heathrow Airport	9 Aug 2001	Incident

References: Bulletin 12/2001 dated 6 Dec 2001

FACTOR F3/2002 dated 18 Mar 2002

SYNOPSIS

(From AAIB Report)

The aircraft had just parked on Stand C14 at London Heathrow Airport when the crew felt an impact on the forward right side of the aircraft. Investigation revealed that a baggage tug towing a number of baggage trolleys had struck the right side of the aircraft fuselage just ahead of the forward cargo door. Closer examination showed that the front offside roof of the tug driver's cabin had punctured the aircraft skin. The tug was being driven in a mainly south easterly direction when the collision occurred and the driver stated that he had been blinded by the sun during his approach to the aircraft.

Damage to aircraft caused by ground handling vehicles is not only costly to repair but in the worst case, if the damage goes undetected, it is potentially dangerous. Modern technology permits the fitting of proximity sensors to vehicles, and the following recommendation is made to the Airport Operators Association:

RECOMMENDATION 2001-78

It is recommended that the Airport Operators Association should examine the feasibility and cost effectiveness of fitting proximity sensors to ground handling vehicles that are routinely required to operate close to aircraft.

Status - Not CAA - Closed

Response

Awaiting response.

Piper PA28R-200	Off NW Guernsey	3 Jul 2001	Accident

References: Bulletin 2/2002 dated 7 Feb 2002

FACTOR F2/2002 dated 18 Mar 2002

SYNOPSIS

(From AAIB Report)

Having flown, without incident, from Guernsey two days previously, the owner pilot had intended to make a direct return flight from Liverpool to Guernsey on Saturday 21 July. Before departure he had uplifted 55 litres of Avgas. Take-off was at 0915 UTC and the planned flight time was 2 hours. When overhead Exeter, the pilot checked

the Guernsey weather via the broadcast and, due to reports of fog at Guernsey, he decided to divert to Exeter and continue his journey the next day.

After start-up for the continued flight the following day, a very severe drop on the right magneto, reported as being nearly a dead cut, was experienced during the pre-departure run-up check. Engineering assistance was sought and the engineer spent over 2 hours checking the plugs, leads and magneto alignment and changed the capacitor in the right magneto as the points appeared to be slightly white. Following this work, extensive run-up checks indicated that the fault had been rectified and the pilot decided to continue the journey.

After take-off the pilot climbed at full throttle and levelled at 3,000 ft. After flying down the coast to Berry Head he headed out to sea; but about 5 miles off-shore the engine started to feel 'lumpy'. The pilot advised Air Traffic Control that he was returning to Exeter and maintained his cruising height during the return. When about 5 miles short of the airfield the engine began to run extremely roughly, although he was able to maintain height. The airfield initiated full Emergency procedures when the pilot reported a deterioration of the engine condition, but the aircraft was landed without further incident. Before shutting down, the pilot conducted further engine power runs, experiencing severe drops on both magnetos, and elected to abandon the journey that day and address the problem on the Monday.

The following morning, the pilot taxied the aircraft over to the maintenance hangar and noted that, although the drop on the left magneto appeared to have gone, that of the right magneto was still as bad as ever. The plugs were inspected again and cleaned and the leads rechecked, without improving the magneto drops, so the points and capacitor were then changed, also to no effect. The magneto was then removed for a bench check and following adjustments, which appeared to result in the production of good sparks, was refitted on the engine. During the subsequent run-up checks, however, it was found that the magneto drop was just as severe as previously and consequently, the pilot purchased and had fitted a new, replacement right magneto. Following this, run-up checks indicated that the problem had been eliminated as no undue drops were observed on either magneto during power checks.

The pilot decided to continue his journey and after taking off, he climbed, at full power to 3,000 feet before levelling into the cruise. About 10 minutes after leaving Berry Head for the flight over the sea, the pilot and front seat passenger noticed a slight vibration which persisted for about 2 to 3 minutes. No abnormal indications were observed and, after the vibration had ceased, the flight proceeded normally.

About 12 miles from Guernsey, just after the pilot had started to descend, the engine began to run very roughly, with extreme speed fluctuations and a loss of power. The pilot attempted to restore engine power using the mixture control, power lever, switching on the fuel pump and changing the fuel tank selected, none of which was consistently effective. During the descent, the pilot informed Air Traffic Control of his situation and instructed the passengers to put on their life jackets, which they did when the aircraft was estimated to be at about 500 ft; he did not put his own life jacket on as he was concentrating on flying the aircraft.

As the aircraft approached the water, the door was unlatched and the landing gear override up lever pulled up to prevent the automatic deployment of the landing gear. This latter task was then taken over by the front passenger to enable the pilot to handle the aircraft more easily. The aircraft was ditched, wheels up, flapless and with the stall warning sounding, onto a mild swell and remained level and upright when it came to rest. The deceleration at touchdown caused both front seat occupants, who were wearing lap and diagonal harnesses, to strike their faces on objects ahead of

them; the pilot struck his eyebrow on the coaming and the passenger, who was leaning forward to hold the landing gear lever, struck her chin on the control column. All three occupants left the cabin and stood on the wing whilst the pilot extracted and inflated the 4 man dinghy. The two passengers entered the dinghy whilst the pilot retrieved further articles from the aircraft before joining them. Shortly after this the aircraft tipped on its nose and sank slowly. Two flares were fired and after 25 minutes a fishing boat and rescue craft launched as a result of emergency actions initiated by ATC arrived at the scene.

The aircraft has not been recovered and, therefore, an examination to try to establish the cause of the loss of engine power has not been possible.

RECOMMENDATION 2001-94

The General Aviation Safety Council should draw up, and maintain, a dossier of information on the commercially available life jackets which exhibit the desired characteristics, as described in Safety Sense Leaflet 21A. This information should be available for dissemination, on request, and the CAA should publicise this service in Safety Sense Leaflet 21A.

Status - Not CAA - Open

Response

The CAA accepts its part of the Recommendation.

When the General Aviation Safety Council advises that the dossier of information has been compiled, the CAA will amend Safety Sense Leaflet 21A 'Ditching' to include contact details for obtaining the information on commercially available life jackets which exhibit the desired characteristics. The General Aviation Safety Sense leaflets are available on the CAA website and it is anticipated that this amendment will be promulgated in Autumn 2002.

Cessna 310R	**Bournemouth Airport**	**6 Jun 2001**	**Accident**

References: Bulletin 12/2001 dated 6 Dec 2001
FACTOR F4/2002 dated 18 Mar 2002

SYNOPSIS

(From AAIB Report)

Whilst taxiing from the A3 hold at Bournemouth International Airport (BIA) and backtracking the runway for take off for a routine cargo flight to Guernsey, the pilot felt what he described as a tyre deflation. He radioed the tower, who sent someone to investigate the problem. After what the pilot described as a thorough look, the observer confirmed that all appeared to be normal. The pilot therefore assumed that the sensation he had felt must have been caused by the aircraft running over a runway centreline marker. He carried out a 240° turn to line up on Runway 08 and then took off without noticing anything unusual.

Once a positive rate of climb was established, the pilot selected the landing gear up. It was at this point that the first indication of a problem occurred, when the red "in transit" light would not go out to confirm that the landing gear was up and locked. The pilot then selected the landing gear down, but obtained green lights for only the nose and port main landing gears. The pilot cycled the landing gear up and down several times in an attempt to get the starboard main landing gear to lock down but this proved unsuccessful.

The pilot rejoined the BIA holding pattern to prepare for an emergency landing. He remained airborne for approximately 1 hour, during which time he carried out 2 flypasts of the control tower for a visual inspection. The tower reported that the starboard main wheel was at 90° to the fore/aft direction and that the starboard main landing gear was not locked down.

The pilot elected to carry out an emergency landing on Runway 26 as this was the longest available runway and the approach would place the sun behind him. The approach was made with the landing gear selected down and the flaps and lights selected up to minimise the damage and reduce any adverse effects these might have had on the landing roll/slide. Once over the threshold, with no chance of undershooting, the pilot shut down the starboard engine. The port engine was shut down immediately after touchdown. After touchdown, the starboard wing dropped and hit the runway as the starboard main landing gear collapsed. The pilot initially kept the aircraft straight using the left brake and then decided to swerve onto the grass, where the aircraft came to a stop. The pilot evacuated the aircraft unharmed.

RECOMMENDATION 2001-71

The aircraft manufacturer should as soon as possible issue an All Operators Letter, or similar, to all Cessna 310 operators to inspect the main landing gear torque link assemblies on their aircraft to ensure that they have been assembled with the correct washers.

Status - Not CAA - Closed

Response

Awaiting response.

RECOMMENDATION 2001-72

The aircraft manufacturer should amend the Cessna 310 IPC and Maintenance Manual to clearly identify the locations of the part number 5045018-1 washers to reduce the possibility of incorrect assembly of the torque links.

Status - Not CAA - Closed

Response

Awaiting response.

Cessna 182S	Leicester Airport	12 May 2001	Accident

References: Bulletin 3/2002 dated 7 Mar 2002

FACTOR F5/2002 dated 18 Mar 2002

SYNOPSIS

The aircraft occupants were a married couple who had owned a share in a Cessna 182 for 11 years that was kept in a hangar at Leicester Airport. In 1998 their shared 1966 model Cessna 182J was damaged during a storm at La Rochelle Airport and, together with the owner of another share, they purchased G-BYEG as a replacement. This aircraft was one year old when they purchased it and was equipped with a factory fitted avionics suite that included an autopilot.

Unless they were flying with an instructor, the two pilots invariably flew together and they alternated the role of handling pilot in the left seat. Together they had flown 72 hours in G-BYEG. The aircraft had last flown on 2 May when the co-owner had returned from Guernsey. The co-owner stated that there were no aircraft defects apparent during his flight to Leicester. He refuelled the aircraft to full tanks on 5 May and parked it in its hangar where it remained until the day of the accident.

On the morning of 12 May, an anticyclone dominated weather conditions over central England. At Leicester Airport the sky was clear, the QNH was 1022 mb and the surface wind was from the north-east. The runway in use was tarmac surfaced Runway 04 which is 490 metres long.

Shortly after 0800 hrs the two pilots arrived at their aircraft and loaded their baggage in preparation for the first leg of their 'flying holiday' which was to Copenhagen. They extracted the aircraft from the hangar and were seen inspecting its exterior in preparation for flight. A minor issue of fuel dripping from the engine bay was soon resolved and they had a brief conversation with friends, who were to take-off before them in their own aircraft, regarding the in-flight rendezvous and radio procedures. The pilot of G-BYEG for this flight occupied the left-hand seat and his wife acted as co-pilot in the right hand seat. She made all the radio calls before take-off. Engine start-up and taxi were apparently normal and at the holding point, the co-pilot transmitted that power checks had been completed and stated that the aircraft was ready for departure. The radio operator responded with the measured wind conditions which were 040° at 5 to 10 kt. The aircraft then lined-up and began its take-off roll. None of the witnesses noticed the position of the wing flaps but the pilots habitually used 10° flap for take-off. The aircraft was seen to accelerate normally with a healthy sound from the engine and it became airborne after about 200 metres of ground roll. Initially, until about 100 feet agl the take-off appeared normal but then the aircraft adopted an ever increasing nose-high attitude which culminated in a gentle left roll at about 300 feet agl before the aircraft's nose dropped sharply. It seemed to the aero club witnesses that the aircraft had stalled in a markedly nose-up attitude. After what appeared to be an attempted stall recovery at about 100 feet agl, it dived into the ground whilst rolling left with the engine still running. Both occupants received fatal injuries on impact; neither made any radio transmission after the start of the take-off roll.

RECOMMENDATION 2001-56

The Cessna Aircraft Company should review the layout and content of its BEFORE TAKEOFF checklists to minimise the dangers associated with inadvertent autopilot engagement in altitude hold mode before take-off.

Status - Not CAA - Closed

Response

Awaiting response.

RECOMMENDATION 2001-57

The Cessna Aircraft Company should review the integration of the Bendix/King KAP 140 autopilot into its aircraft products, preferably to provide a facility that prevents or suitably warns of undemanded or unexpected electrical activation of the elevator trim motor before take-off. Respositioning the autopilot control/display unit to a position less susceptible to inadvertent engagement could additionally be considered.

Status - Not CAA - Closed

Response

Awaiting response.

RECOMMENDATION 2001-58

The US Federal Aviation Authority, as the type certification authority, should ensure that effective action is taken to address the dangers associated with inadvertent engagement of the Bendix/King KAP140 autopilot in altitude hold mode before take-off.

Status - Not CAA - Closed

Response

Awaiting response.

Avid MK4 Speedwing	**Full Sutton Airfield, Pocklington**	**11 May 2001**	**Accident**

References: Bulletin 3/2002 dated 7 Mar 2002

FACTOR F6/2002 dated 18 Mar 2002

SYNOPSIS

The pilot and his passenger boarded the aircraft at Full Sutton for a local flight at about 1300 hrs. This was only the second time the pilot had taken off from Runway 04. A Piper light aircraft departed ahead of G-BUSZ. The pilot of G-BUSZ stated that he did not taxi into position until the Piper was airborne and so the time difference between their take-offs would have been about one minute. According to the pilot, the aircraft

took off quite normally but when it was between 125 and 150 feet above the airfield, it failed to respond to either stick or rudder input. The pilot remembered checking the engine RPM, airspeed and vertical speed. The engine RPM gauge was still indicating 6,200 and the airspeed indicator was reading 68 mph but the vertical speed indicator showed a zero rate of climb. He recalled warning his passenger that they had a serious problem but remembered nothing more until he regained consciousness days later.

The passenger stated that all was normal until just after take-off when the pilot asked him to pass a map. The passenger removed the map from the door pocket, placed it on his lap and then located Full Sutton on the map. Next he looked up and saw the aircraft bank to the left. Shortly afterwards the pilot began moving the stick from left to right and vice versa quite aggressively. The passenger's overall impression was of a loss of speed.

The aircraft crashed into the rough ground, about 50 metres beyond the end of the strip, still within the airfield boundary. It struck the ground in a steep nose-down attitude with its right wingtip and nose, coming to rest inverted, having shattered the propeller and crushed the forward fuselage and cockpit. Both occupants suffered multiple serious injuries. The pilot was in hospital for about 25 days and his passenger was hospitalised for 9 days.

RECOMMENDATION 2001-95

In view of the potential for serious damage to the pitch control linkage within Avid Speedwing aircraft that lack an elevator travel stop in the elevator trailing edge downwards direction, on 29 November 2001 the AAIB wrote to the Popular Flying Association recommending that the Association should:

a) Identify a modification that introduces an effective and durable pitch control stop in the elevator trailing edge downwards direction.

b) Classify the modification as a Mandatory Permit Directive.

Status - Not CAA - Closed

Response

Awaiting response.

RANS4	Old Aerodrome, Davidstow Moor	14 Feb 2001	Accident

References: Bulletin 7/2001 dated 5 Jul 2001

FACTOR F37/2001 dated 17 Sep 2001

SYNOPSIS

On 13 January 2001 the pilot bought the accident aircraft, a Rans S4, G-MWLY. The previous owner, who had owned the aircraft for 21 months during which time he had flown some 15 hours in it, delivered the aircraft on a trailer with the wings and tail plane surfaces folded for transit. It was intended that the previous owner would help the new owner to rig the aircraft, but strong winds on that day prevented them from

doing so. The previous owner reported that he had not experienced any difficulties with the aircraft and one minor technical defect with the ignition system had been rectified.

On the day before the accident the pilot asked the club owner to recommend a suitable pilot who could check that he had correctly assembled and rigged the aircraft and to carry out a short test flight. This was arranged and the inspection pilot met the aircraft owner and inspected G-MWLY, which he considered to be properly assembled. He also noticed that the fuel tank was full. Although he himself was not experienced on tailwheel aircraft, the inspection pilot was happy to undertake the flight. The visibility was excellent with clear skies and the surface wind estimated as easterly less than 5 kt.

The inspection pilot strapped himself in the cockpit and, following a lengthy taxi across the bumpy grass, lined up on Runway 12. He increased power carefully to full power and, as the tailwheel left the runway, he was surprised by a swing to the left which he estimated as 15°, but he was able to contain and correct this once airborne. Soon after leaving the runway he was aware that the control column was forward of the central position and a positive force was required to prevent the control column moving aft. By reducing power he was able to level off and the forward force on the column could be reduced. The inspection pilot carried out a number of turns in the vicinity of the airfield and then made two approaches to Runway 12 with a go-around each time to establish the feel of the aircraft. Apart from some difficulties with his harness, which restricted his movement due to being incorrectly fastened, he considered the aircraft to be airworthy. At no time during the flight did he detect any control restriction. He noted during his flight that conditions were smooth with no turbulence and the Air Speed Indicator (ASI) was working. He taxied the aircraft back to the area of the club and informed the owner that the aircraft had passed his ground and flight inspection.

The inspection pilot was aware that the owner was to undertake his first flight in G-MWLY and had understood him to be an experienced pilot of tailwheel configured microlight aircraft. The aft control bias was not mentioned to the owner.

The owner pilot was strapped into the aircraft by the inspection pilot and a friend. He sat on a cushion, which comprised a nylon document holder about the size of a brief case. They took care not to make the same mistake when fastening the safety harness as had been made earlier. The pilot had taxied the aircraft before but as stated previously had not flown it. The owner pilot taxied out to Runway 12 and the group of people who had strapped him in walked around the club buildings to the rear, which took them out of sight of the runway.

The aircraft was seen to line up on Runway 12 with engine power increasing. It accelerated along the runway and became airborne, maintaining the runway direction and with the wings level. At a height of about 70 feet the right wing dropped to about 30° but was immediately corrected to wings level. Shortly afterwards the right wing again dropped by about the same amount and was corrected to wings level. Almost immediately and, at a height of approximately 150 feet, the right wing dropped to about 45°. This was corrected but roll in the opposite direction continued with the left wing dropping and the aircraft entering a spiral dive to the left before striking the ground.

The only person to witness the accident was a telecommunications engineer working on an aerial mast some 500 meters from the departing aircraft. He had watched the earlier flight with interest, which had appeared quite normal. He did not watch the aircraft throughout the taxi phase and could not recall hearing any power checks prior to take-off but as soon as the engine note increased for take-off he watched the

aircraft continuously until it struck the ground. Whilst the witness recalled the aircraft turning through approximately 360° he could not remember what attitude it was in when it struck the ground. He was clear that the engine note had not changed during the take-off and could be heard all the way to the sound of the impact.

The group of people who were behind the club buildings heard the sound of the impact and the propeller splintering. They immediately went by vehicle to the accident site and called the emergency services. They removed a number of pins holding wing struts in order to release the pilot from the wreckage and paramedics who attended the scene attempted rendering medical assistance but the pilot's injuries sustained in the crash had proved fatal.

RECOMMENDATION 2001-48

The Popular Flying Association should ensure that all UK registered Rans S4 Coyote aircraft are modified in a manner that, in the event of a maladjustment, slippage or failure of the seat hang straps, the seat will be prevented from collapsing onto the aileron torque tube, thus avoiding the possibility of a control restriction.

Status - Not CAA - Closed

Response

Awaiting response.

B747-4H6	London Heathrow Airport	15 Jan 2001	Accident

References: Bulletin 10/2001 dated 11 Oct 2001
FACTOR F44/2001 dated 15 Nov 2001

SYNOPSIS

A Boeing 747-400 was scheduled to land at London Heathrow Airport (LHR) from a long haul flight at 0530 hrs, and had been allocated parking Stand J2 at Terminal 3.

Prior to the flight's arrival, a driver from the airline's handling agent positioned three tugs and a number of baggage dollies side by side to the right (looking from a parked aircraft's cockpit) of Stand J2 at right angles to the stand centreline. The driver used two white lines painted on the ramp parallel to the stand centreline to judge a safe distance from the centreline at which to park the equipment. After positioning the tugs and dollies, the driver adjourned to his supervisor's van, which was parked elsewhere on the stand, to await the arrival of the aircraft.

The ramp supervisor responsible for parking the aircraft arrived at the stand prior to the aircraft's arrival and carried out a safety check. He noted the tugs and dollies to the right of the stand and a 'high loader ' vehicle to the left rear of the stand within the stand boundary. None of the vehicles was manned. Although he could see no stand markings by which to assess safe clearance, the supervisor judged the tugs and dollies to be far enough to the right of the stand centreline to be clear of the aircraft, but he was concerned at the proximity of the 'high loader'. He requested that the 'high loader' be moved, and switched on the Automatic Positioning and Information System (APIS).

The 'high loader' had not been moved by the time the aircraft arrived at the stand and the supervisor therefore positioned himself to the left of the stand to monitor the clearance between the aircraft and the vehicle. As the aircraft turned into the stand, the supervisor satisfied himself that the left wing tip would clear the 'high loader' and started walking toward the jetty. As he walked he noticed an engineer run to the APIS controls at the front of the stand and operate the emergency stop button.

On arrival at the entrance to the stand the aircraft commander noticed that the APIS was lit and that there was a number of tugs with attached baggage dollies parked on the right of the stand. The commander judged that there was sufficient clearance between the parked ground equipment and the aircraft and continued to follow the APIS guidance.

During the approach to the final parking position the commander felt a 'bump' and immediately brought the aircraft to a halt. The number four engine had collided with one of the tugs and had pushed it into the other tugs causing the first tug to tip on its side and wedge between the ground and the bottom of the engine nacelle. Damage was caused to the number four engine nose cowl, fan cowl, and right reverser sleeve.

A ground engineer had been present on the stand during the incident. The engineer was responsible for chocking the aircraft and connecting ground power once the aircraft had come to a halt. He was standing adjacent to the stand centreline as the aircraft turned on to the stand. As the aircraft straightened from the turn he became aware of the proximity of the tugs to the number four engine and ran to the front of the stand to activate the emergency stop button. Unfortunately he was too late to prevent the collision with the tugs.

RECOMMENDATION 2001-63

Heathrow Airport Limited should standardise wing span markings at the airport and review the use of such markings on multi-choice aprons. Further, the Operational Safety Instruction providing information on stand markings should be amended to reflect accurately the markings in use.

Status - Not CAA - Closed

Response

Awaiting response.

RECOMMENDATION 2001-64

Heathrow Airport Limited should amplify the current information available in the Aeronautical Information Publication to clarify the use of multi-choice aprons at the airport.

Status - Not CAA - Closed

Response

Awaiting response.

Piper PA28R-200B	Compton Abbas Airfield	30 Dec 2000	Accident

References: Bulletin 8/2001 dated 9 Aug 2001
FACTOR F40/2001 dated 16 Oct 2001

SYNOPSIS

Following an uneventful flight from Blackbushe to Compton Abbas Airfield, a pre-flight inspection of the aircraft was carried out by the pilot before the subsequent departure. This included checking of the engine oil contents, which were found satisfactory. The aircraft then departed normally but some 5 minutes later, when it had climbed to some 2,500 feet amsl, the propeller rpm suddenly increased. The pilot retarded the propeller pitch control lever, but this had no effect. He then noted that the engine oil pressure gauge was indicating zero, although the oil pressure had been normal when he had checked the gauge during the climb. The pilot immediately turned the aircraft back towards Compton Abbas and reduced the engine power to 20 inches of manifold pressure, since he realised that the engine was likely to seize at any moment. Snow on the ground made obstacle identification and field conditions difficult to assess, and so he decided to attempt to land on the airfield since he considered that he had sufficient height available at that stage. However the engine then suddenly seized, causing the aircraft to land 'short' from where it carried on across a road before being brought to an abrupt halt by a low bank within a hedge, which formed the western perimeter of the airfield. This impact caused substantial damage to the underside of the aircraft and probably contributed to the severity of the occupants' injuries.

RECOMMENDATION 2001-59

In order to further reduce the likelihood of fitment of incorrect quick release drain valves to the oil sumps of engines on Piper PA-28R series aircraft, with the attendant risk of contact by retracting noselegs and the sudden release of all engine oil contents, it is recommended that New Piper Aircraft Corporation review the Maintenance Manuals for PA-28R series aircraft with regard to the installation of quick drain valves and make amendments where required to give adequate warnings, for all applicable model types, of the consequences of fitting an incorrect valve.

Status - Not CAA - Closed

Response

Awaiting response.

B747-236	London Heathrow Airport	12 Dec 2000	Incident

References: Bulletin 5/2002 dated 9 May 2002

FACTOR F7/2002 dated 16 May 2002

SYNOPSIS

The flight departed from Boston USA and was inbound to London Heathrow Airport (LHR). The 1800 hrs Terminal Aerodrome Forecast (TAF) for LHR, obtained en-route by the crew, indicated that surface winds could increase to a value in excess of the aircraft crosswind limitation at the expected time of arrival. The crew reviewed the available alternates and decided that London Stansted Airport would be the most suitable in the event of LHR being unavailable.

At 1917 hrs the aircraft was required to hold in the London area awaiting an approach. The crew asked London Area and Terminal Control Centre (LATCC) whether Runway 23 would be available in view of the wind conditions. They were advised that it was but would entail a 20 minute delay for the flight. In light of this information, together with the fact that the surface wind remained within limits for Runway 27R and that an ILS approach would be preferred the commander elected to continue for an approach for Runway 27R, the landing runway scheduled for use until 2359 hrs.

The First Officer (FO) flew the approach with the autopilot engaged. At about 1,000 feet agl the Flight Engineer (FE) advised the others of the Inertial Navigation System (INS) derived wind; 206°/45 kt with a drift of 16.1°. ATC advised another aircraft ahead on the approach that severe turbulence could be expected around the area of the hangars on short final. A question was raised amongst the incident crew as to why the airport was using this runway in these conditions as from their own previous experience Runway 27L would be preferable. At 700 feet agl with visual contact established the commander took control, in accordance with company standard operating procedures, and then disengaged the autopilot. Flap 25 with a VREF speed of 135 kt was used for landing. The FE read out a drift angle of 12° at touchdown. The touchdown was made at 150 kt on a heading 8° left of the runway QDM of 273°M, smoothly and close to the centreline. Autospeedbrake deployed normally. After touchdown the aircraft initially tracked towards the left of the runway despite the commander's attempts to maintain the centreline by the use of full right rudder. The left wing of the aircraft lifted to give a right roll attitude of 4° and then returned to level. The FO delayed the selection of reverse thrust until he was confident that the aircraft was under control. The aircraft tracked back towards the runway centreline and thrust reversers were then deployed at a speed of 110 kt. The centreline was regained and the aircraft began to track slightly to the right. An input of 70% left rudder was used for a short time to counter this and the aircraft swung rapidly to the left. Reverse thrust was cancelled and the commander attempted to use the steering tiller to regain control but felt the nosewheel scrubbing across the runway surface. The left wing briefly lifted again. Full right rudder was reapplied but the aircraft continued tracking to the left and came off the paved area into a grass triangle between two taxiways.

The aircraft came to rest on the grass and the flight crew assessed the possible damage. The commander consulted with the attending Heathrow Fire Service and decided that it was not necessary to carry out a passenger evacuation of the aircraft and completed a normal shutdown. The emergency services confirmed that there

was no apparent damage to the aircraft. There was some delay before steps could be attached and passengers disembarked because of the difficult ground and wind conditions.

RECOMMENDATION 2002-07

It was recommended to Heathrow Airport Limited and to Heathrow Air Traffic Control that Runway 27 Left should be the nominated landing runway from the commencement of the promulgation of Runway 23 (three hours prior to start of Runway 23 operations). This will serve to minimise the use of Runway 27 Right during periods of strong south-westerly winds.

Status - Not CAA - Closed

Response

Awaiting response.

B757/F15E	5NM West of Daventry	22 Nov 2000	Incident

References: Bulletin 5/2001 dated 10 May 2001
FACTOR F12/2001 dated 15 Jun 2001

SYNOPSIS

The Boeing 757 (B757) was scheduled for a turnaround flight from Birmingham Airport to Paphos, Cyprus. The aircraft departed Birmingham in a southerly direction on a Cowley 1E departure and entered cloud in the climb between 3,000 and 4,000 feet. Not long after becoming airborne the departure controller cancelled the Standard Instrument Departure procedure and placed the aircraft under radar control. At FL60 control was handed from Birmingham Departures to Midland Terminal Control (MTC).

Immediately upon contact with MTC the B757 was cleared to climb to FL90 and shortly thereafter given a radar heading of 140deg. About one minute after initial contact with MTC the B757 was re-cleared to FL100. The controller acknowledged the B757 crew report on reaching FL100 and advised "MILITARY TRAFFIC IN YOUR ELEVEN O'CLOCK POSITION CROSSING LEFT TO RIGHT, ONE THOUSAND FEET ABOVE". The B757 crew acknowledged the advice and although the aircraft remained in cloud, they immediately began a visual search for the traffic, which their Traffic Alert and Collision Avoidance System (TCAS) was indicating one thousand feet above. The cloud proved to be too thick for visual contact with the military traffic, but the crew remained looking out as the TCAS contact passed clear down their right side.

Shortly after the traffic passed clear and, whilst still in cloud, the commander and the first officer suddenly became aware of an aircraft in their left 'half-past ten' position at very close range and at about the same level. The aircraft, which they were immediately able to identify as a twin-tailed fighter and later as an F15, passed rapidly across the B757's nose and disappeared down their right side. The B757 crew heard the noise of the F15's engines and their aircraft encountered its wake turbulence.

There was no time for the B757 crew to take avoiding action. Subsequent analysis of radar data indicated that at the closest point of approach the two aircraft were separated by less than the minimum range detectable by the radar which is 0.0625 of a nautical mile. As far as is known, none of the cabin crew or passengers saw the F15, but the cabin crew felt the disturbance as the B757 flew through the F15's wake. The flight deck crew filed an AIRPROX report with ATC and continued to Cyprus.

The two F15s were two-seat E models, and the flight was planned as training for the front seat occupant of the No 2 aircraft. The pilot under training was in current flying practice on the single-seat F15C, but there are several significant differences between the F15C and the F15E, and the F15E instructor pilot was therefore in the rear seat. The plan was to carry out tactical low flying training in Wales followed by weapons delivery practice on one of the air-ground ranges in the Wash before returning to base at Lakenheath for circuit training. The route to Wales was to be flown at medium altitude crossing controlled airspace through the Daventry Radar Corridor and descending to low level once clear of controlled airspace to the west.

The two aircraft took off from Lakenheath approximately 20 seconds apart and took up a 'trail' formation with the No 2 aircraft about two miles behind the leader. In accordance with standard procedures for this type of formation only the lead aircraft was transmitting a Secondary Surveillance Radar (SSR) code (Squawk). The aircraft climbed through cloud, with the No 2 aircraft maintaining position by use of radar, and levelled at FL100 in VMC. Part of the briefed flight profile included an aircraft systems check for both aircraft to the carried out in VMC. The procedures for the checks involved a change of lead aircraft. The formation No 2 completed his checks and began to close on the lead aircraft to take the lead position, but the formation entered IMC, and the No 2 aircraft aborted the change of lead and dropped back to about a 1.5 mile trail. In the attempt to regain VMC the lead aircraft requested from ATC a climb to FL110.

Not long after the F15s became airborne, ATC control was handed to London Military Radar (in particular the London Joint Area Organisation Central (LJAO) of London Military Radar) by Lakenheath Departure Control. LJAO cleared the F15s to cross the Daventry Radar Corridor at FL100, and the FL15's request to climb to FL110 was made to LJAO shortly after the aircraft entered the Daventry Radar Corridor. The controller's initial response was for the flight to maintain FL100, but she contacted the MTC controller by landline to co-ordinate a climb. The MTC controller agreed the higher level and LJAO later cleared the F15 flight to climb to FL110.

The leader immediately began a climb to FL110, but the No 2 aircraft did not hear the ATC clearance and maintained FL100. The two pilots of the No 2 aircraft later noticed that their radar showed the leader to be above their level, and they began a discussion of the indication. At about this time the front seat occupant was vaguely aware of a 'shadow' flashing rapidly down his right side. Shortly thereafter the LJAO controller asked the flight to confirm that both aircraft were level at FL110, and at this point No 2 climbed rapidly to FL110. Some time later the F15s were advised that the B757 had filed an airborne AIRPROX report, and only then did the front seat occupant of the No 2 aircraft associate the "shadow" with the possible presence of another aircraft. The rear seat occupant saw nothing of the B757.

RECOMMENDATION 2001-31

The Ministry of Defence should extend the applicability of its recently revised RT procedures for formation operations to include Class F and G airspace.

Status - Not CAA - Closed

Response

Awaiting response.

Fokker F28-0100	Approaching CDG Airport	3 Nov 2000	Incident

References: Bulletin 8/2001 dated 9 Aug 2001
FACTOR F17/2001 dated 16 Oct 2001

SYNOPSIS

The aircraft was on the fifth rotation of the day flying between Newcastle (NCL) and Paris, Charles de Gaulle (CDG). The flight crew had flown the previous two sectors from NCL to CDG, returning to NCL and these had been uneventful. The First Officer (FO) was undergoing line training and was the handling pilot for the sector from NCL to CDG. The weather on departure was surface wind calm, visibility 40 km cloud few at 2,000 feet, few CB 3,000 feet, temperature +5°C, dew point +3°C and QNH 991 mb. The aircraft flew only briefly through the lower layer of cloud and did not enter the areas of CB. There were no visible signs of icing and no ice warning was activated.

The transit to Paris was made in cloudless conditions with clear skies during the descent and on arrival in CDG. The arrival was via the reporting point Merue and the aircraft was cleared to descend to FL110 maintaining 280 kt. Autopilot 2 (AP2) was engaged and the aircraft was being navigated by the Flight Management System (FMS). The FO was using the vertical speed mode to adjust the flight path of the aircraft to arrive at the assigned level at Merue. The aircraft levelled at FL110 and turned onto the 100° radial for the VOR 'CRL'. At this point the aircraft began to gently oscillate in pitch and this increased with the aircraft gradually descending. The nose down pitch increased and the commander instructed the FO to de-select the autopilot, which he did and heard the 'cavalry charge' audio warning, which he cancelled. Taking manual control the FO found he had only approximately 2 cm of fore and aft control column movement, which rapidly reduced to having no movement at all in pitch control. The commander took control and confirmed the column had jammed and only by exerting a large aft force was he able to free the column to a limited extent and raise the nose of the aircraft, which was climbed back through FL110. ATC called the aircraft to question the level excursions and were advised of the control difficulties. Both pilots had to maintain an increasing forward pressure on the control column and, given the deteriorating situation, the commander transmitted a Mayday distress call. At about this time autopilot 1 (AP1) was selected although subsequently neither pilot could recall making the selection or noticing the information on their display screen. ATC acknowledged the distress call and instructed the crew to 'turn right heading 120° and descend 3,000 feet 1002'

The aircraft now began to gently pitch up and the crew, in an effort to prevent this pitch up, pushed the control column forward. It is possible that a further speed selection reducing to 230 kt was made and the forward pressure needed on the control column took both pilots to hold it in the almost fully forward position. The commander instructed the cabin crew to move all the passengers to fill up the seats from the front to assist in pitching the aircraft down, and to prepare for an emergency landing. This was accomplished promptly and in an orderly manner. With the control column still nearly fully forward and the air speed at 232 kt the commander lowered the first stage of flap (8°). It now became possible to reduce the forward pressure on the control column and the commander, having at various points throughout the

incident tried to operate the electric trim with what appeared to be little effect, moved the manual trim wheel to try and trim the aircraft more nose down. The commander decided to land on Runway 27 Right, which was the nearest runway. He carried out a radar vectored ILS approach and made a normal landing at 1948 hrs with Flap 42. Reverse thrust was used to slow the aircraft. After landing the control column electric trim switch was operated it functioned normally

RECOMMENDATION 2001-02

Fokker Services BV should issue an All Operators Letter, or similar, drawing attention to the possibility of ice accretion on the elevator servo capstan in cold humid conditions. Operators should be advised to comply with Fokker Service Bulletin, SB 100-22-039 (or the relevant superseding SB) at the earliest practicable opportunity. This introduces a revised capstan groove with less possibility of jamming. Pending the availability of parts, operators should also be advised to take action in accordance with Service Letter No 134, which calls for greasing of the elevator servo cables at intervals of 250 flying hours.

Status - Not CAA - Closed

Response

Awaiting response.

RECOMMENDATION 2001-03

In order to reduce the potential for elevator control restriction due to ice accretion on the elevator servo capstans of Fokker F100 aircraft, the Dutch Civil Aviation Authority confer mandatory status on Fokker Service Bulletin SB F100-22-039 (or the relevant superseding Service Bulletin), that introduces a revised capstan groove.

Status - Not CAA - Closed

Response

Awaiting response.

ATR72	Bournemouth Airport	10 Oct 2000	Accident

References: Bulletin 9/2001 dated 6 Sep 2001

FACTOR F43/2001 dated 15 Nov 2001

SYNOPSIS

The aircraft was carrying out a flight scheduled to depart from London Gatwick Airport at 1725 hrs and to arrive at Jersey Airport, Channel Islands, at 1835 hrs. The crew of two pilots and two cabin crew members had reported for duty at 1245 hours and operated one uneventful round trip flight to Guernsey, Channel Islands, on the same aircraft before the accident flight.

The aircraft took off at 1739 hrs and climbed up to a cruise level of FL160. Flight conditions were reported to be good with occasional light turbulence. The weather

forecast for Jersey indicated a change was expected between 1600 and 1900 hrs from clear weather with strong westerly winds to cloud, rain and strong southerly winds. Prior to descent the First Officer (FO), who was designated as the handling pilot, briefed for a Runway 27 ILS approach at Jersey. On first contact with Jersey Air Traffic Control (ATC) the crew were informed that the runway in use had just been changed to Runway 09. There was some discussion between the pilots regarding the reported surface wind of 170_/30 kt and the flight manual was checked to confirm the crosswind limit of 30 kt for the aircraft. It was decided that the FO would fly the approach with the commander following through on the controls. The FO accordingly gave a briefing on the details of the Runway 09 ILS approach. At 1813 hrs the following weather observation was passed to the crew by Jersey ATC: VISIBILITY 3KM, HEAVY RAIN SHOWERS, BROKEN CLOUD AT 600 FEET, BROKEN CLOUD AT 1,000 FEET AND SURFACE WIND 180_/20 KT.

The aircraft was given radar vectors towards the extended centreline of Runway 09 and cleared to descend to 3,000 feet amsl. The crew could see weather radar returns indicating the possibility of turbulent conditions in the vicinity of the approach. The level of turbulence being experienced by the aircraft increased during the descent and a master caution alert sounded. The "Flight Controls" (FLT CTL) amber caution light and local stick pusher "Fault" light were illuminated. The crew carried out the appropriate drill from the QRH which required the stick pusher system to be switched off. For extended periods during subsequent turbulence the FLT CTL light illuminated and the master caution alert sounded but with no associated local alert light. When at 3,000 feet and heading south towards the approach further turbulence was encountered and the commander decided that it was too severe to continue. The aircraft was climbed back up to 6,000 feet. At 1833 hrs another attempt was made to establish on the approach but again turbulence was too severe. This time the autopilot disconnected on several occasions and the FO advised the commander that the aircraft controls felt unusually heavy and he did not feel competent to be flying the aircraft in the conditions. The commander took over control of the aircraft, re-engaged the autopilot and at 1837 hrs accepted vectors again towards the approach. This time the aircraft established on the ILS and descended to 1,700 feet amsl but further turbulence was encountered and the approach was discontinued at 1845 hrs. The autopilot remained engaged for the remainder of the flight until just before landing at Bournemouth.

By this time a number of the passengers and one cabin crew member were suffering from airsickness. The cabin crew handed out cold towels in an attempt to alleviate the symptoms. They also advised the FO of the cabin situation. The commander decided the flight would have to be diverted and, after finding that the Guernsey weather was unsuitable, Southampton was preferred. En route to Southampton the crew calculated that sufficient fuel was on board to return to Gatwick and accordingly requested a route change from ATC. A few minutes later they were advised that Gatwick Airport was closed due to an incident and was not expected to re-open for several hours. The flight thus continued towards Southampton until ATC advised the crew that Southampton was busy and there could be a delay for landing. As a result the crew requested a diversion to Bournemouth and were then cleared to proceed there. Some minutes later they were informed that there were now no delays at Southampton and so revised their destination once more. The weather conditions at Southampton where Runway 20 was in use were, surface wind 160_/9 kt, visibility 8 km, rain and drizzle with broken cloud at 1,200 feet. An approach briefing for an ILS 20 approach at Southampton was given by the commander who remained the handling pilot. On descending through FL80 the FO switched to the second radio and spoke to his company operations department. They advised him that due to terminal area congestion at Southampton it would be better for the management of the

passengers if the aircraft were to go to Bournemouth. The crew discussed this between themselves, decided that they could accommodate the request, and obtained clearance to Bournemouth once again. The FO was off the ATC frequency for 4 minutes while these arrangements were discussed.

En route to Bournemouth the commander gave an approach briefing for the ILS 26 approach there. The briefing was interrupted on 5 occasions by ATC communications with the aircraft and there were a further 6 such communications while the crew were carrying out the approach checklist. The aircraft was however established on the ILS approach at 9 nm with the checks completed. On final approach information regarding windshear below 500 feet reported by a previous landing aircraft was relayed to the crew by Bournemouth Tower ATC. There was moderate rain on the approach and the surface wind, reported one minute before touchdown, was 180_/ 17 kt. The commander disengaged the autopilot at 230 feet agl. The aircraft landed on the runway in a nose down attitude on the nose landing gear and rebounded into the air. Nose down elevator was applied and held resulting in a series of divergent bounces which ultimately caused the nose landing gear leg to collapse. The aircraft came to rest on the runway and shortly afterwards the commander initiated a passenger evacuation. All the passengers evacuated the aircraft safely and the airport fire services were on the scene promptly.

RECOMMENDATION 2001-68

It is recommended that the operator review the training procedures and instructions given to crew members in the securing of cargo nets and baggage to ensure that crew are adequately trained in their use.

Status - Not CAA - Closed

Response

This Recommendation is not addressed to the CAA. However, the Flight Operations Inspectorate of the CAA has liased with the operator and ensured that the training procedures and instructions given to crew members in the securing of cargo nets and baggage to ensure that crew are adequately trained in their use have been reviewed. In addition the Ground Handling Manual has been amended and a Cabin Crew General notice issued to inform all crew members of the revision. The Flight Operations Inspectorate will promulgate the lessons from this accident to UK industry by way of a Flight Operations Department Communication.

RECOMMENDATION 2001-69

It is recommended that ATR supply information to operators of ATR72 aircraft, fitted with the stall warning and identification modification for UK certification, to advise crews of the possibility of the 'FLT CTL' caution being triggered by turbulence. (This situation may also be applicable to some ATR42 aircraft.)

Status - Not CAA - Closed

Response

Awaiting response.

DC10-30F	Near Shannon Airport	1 Oct 2000	Incident

References: Bulletin 9/2001 dated 6 Sep 2001

FACTOR F42/2001 dated 15 Nov 2001

SYNOPSIS

The aircraft suffered a bird strike shortly after take off from Shannon, Ireland, which caused severe damage to the No. 1 (left) engine and caused some large nacelle components to separate from the engine. These parts struck and damaged the left inboard aileron and flap before falling to the ground. The aircraft diverted to London Heathrow for inspection and repair. Whilst ATC written procedures specify that aircraft in emergency should preferably not be routed over densely populated areas, the commander of the aircraft was not advised of this procedure and the approach to London Heathrow Airport from the east took his aircraft over densely populated urban areas.

Three Safety Recommendations were made as a result of this investigation, pertaining to the method of attachment of the aft centre body on the CF6-50 engine and air traffic control procedures for aircraft in emergency situations.

RECOMMENDATION 2001-36

To prevent further cases of aft centre body and core cowl separation from CF6-50 engines following a bird strike, the engine manufacturer should take appropriate actions to ensure that there is no possibility of confusion in future as to the correct type of bolt to be used when installing the aft centre body.

Status - Not CAA - Closed

Response

Awaiting response.

RECOMMENDATION 2001-50

To ensure the integrity of the forward-to-aft centre body joints on the CF6-50 engine, the FAA should require that inspections be carried out of the aft centre body attachment bolts on all affected CF6-50 engines as soon as possible, to ensure that the correct type of bolts have been used, based on whether the joint is an 8-bolt or 16-bolt configuration.

Status - Not CAA - Closed

Response

Awaiting response.

A321	London Heathrow Airport	21 Jun 2000	Accident

References: Bulletin 5/2001 dated 10 May 2001

FACTOR F33/2001 dated 15 Jul 2001

SYNOPSIS

(From AAIB Report)

The aircraft was operating a scheduled service flight from Dublin Airport, Ireland, to London Heathrow Airport. The crew had operated one round trip earlier in the morning, this flight was thus their third sector of the day. The 1050 hrs ATIS report received by them was as follows: Surface wind 210deg/16 kt, visibility 40 km, scattered cloud at 3,000 and 4,500 feet, temperature 17degC, dewpoint 9degC, QNH 1009. The ATIS also included information regarding windshear on the approach to Runway 27R, of plus or minus 10 kts at 400 feet agl. The last reported surface wind, 20 seconds before the aircraft landed, was 220deg/18 kt.

The aircraft received radar vectors to an ILS approach on Runway 27R with the first officer (FO) as the pilot flying (PF). When established on the ILS approach, and in visual contact with the runway, he disconnected the autothrottle and the autopilot. The remainder of the approach was flown manually with reference to managed speed and using the flight director. From 300 feet agl until landing the aircraft became destabilised in pitch. At around 200 feet agl the rate of descent reduced significantly and the aircraft began to deviate above the ILS glideslope. The FO attempted to correct and in so doing a rate of descent of 800 to 900 feet per minute developed. He them started to apply aft sidestick at a height of 60 feet agl and continued the input until touchdown but the rate of descent was not fully arrested and the aircraft landed firmly.

The main wheels contacted the runway and then the aircraft rebounded into the air with both wheels lifting off again. Ground spoilers deployed at the initial touchdown and the pitch attitude continued to increase. The aft fuselage made contact with the runway at the same time as the second mainwheel touchdown occurred. The remainder of the landing was carried out uneventfully with the crew being unaware of the tailstrike until advised by ATC on vacating the runway. The cabin crew also reported to the commander that there had been an unusual noise at touchdown.

RECOMMENDATION 2001-46

It is recommended that Airbus Industrie should reissue the Operator's Manual Bulletin dealing with the subject of tailstrikes. This should include further guidance regarding flight path destabilisation with increased rates of descent and abnormally low pitch attitudes at a late stage of the approach. It should also re-emphasise the need to use the takeover pushbutton to achieve effective intervention.

Status - Not CAA - Closed

Response

This Recommendation is not addressed to the CAA. However, the CAA will monitor the work undertaken by Airbus Industrie and will respond to any subsequent training issues.

BAe RJ85	Departure from London City	14 Mar 2000	Incident

References: Bulletin 8/2001 dated 8 Aug 2001

FACTOR F39/2001 dated 17 Sep 2001

SYNOPSIS

The aircraft was on a scheduled flight from London City Airport to Brussels. Weather conditions at London City Airport were dry, with surface winds of 320deg/13 kts and visibility in excess of 10km.

Take off was from Runway 28 with a right hand turn and climb to 3,000 feet in accordance with the Standard Instrument Departure procedure. The take off and initial climb were normal. During the continued climb to 3,000feet, accelerating to 250 kt, a vibration was sensed by the flight crew for a period of about two seconds. The vibration recurred after a few seconds, accompanied by a No 3 engine vibration warning ("ENG VIBS #3") and an engine fire warning bell and caption ("ENG FIRE #3"). Cabin crew and passengers reported seeing flames from the No 3 engine. The flight crew performed the engine fire drill discharging both fire bottles, which extinguished the fire. A 'MAYDAY' was declared with a request for an immediate return to London City Airport, this being the most expedient option available. An ILS approach was flown to Runway 28 and an uneventful landing was completed on three engines. The flight crew chose not to order an emergency evacuation as the fire had been extinguished. The fire services confirmed that the fire was out and the passengers were disembarked by airstairs.

RECOMMENDATION 2001-61

The engine manufacturer should take the necessary actions to ensure that the modified oil pump currently undergoing trials is installed on all affected engines as soon as possible, to preclude the possibility of an oil fire from a No 2 bearing failure occurring.

Status - Not CAA - Closed

Response

Awaiting response.

RECOMMENDATION 2001-62

The engine manufacturer should take the necessary actions to ensure that welded assembly No 2 bearing scavenge tubes are installed on all affected engines in an expeditious manner, so as to preclude the possibility of an oil fire from a No 2 bearing failure spreading to the engines nacelle and hazarding the aircraft.

Status - Not CAA - Closed

Response

Awaiting response.

ATR42-300	Teesside Airport	5 Feb 2000	Incident

References: Bulletin 6/2001 dated 7 Jun 2001

FACTOR F31/2001 dated 15 Jul 2001

SYNOPSIS

(From AAIB Report)

The aircraft was on a scheduled passenger flight from Teesside Airport to Paris. Following take-off from Runway 23 at Teesside at 0719 hrs, the cruising altitude of 19,000 feet was reached around 20 minutes later, with all flight deck indications remaining normal. At this point the flight deck crew was informed by the cabin crew member that a passenger had reported a panel missing from the No 1 engine. The cabin crew member also noted that she had heard a noise during take-off, which she had attributed to movement of baggage in the aft compartment.

The flight deck crew could see from the flight deck that part of the No 1 engine outboard cowl door was broken off and decided to return to Teesside. They informed ATC of a slight technical problem and were radar vectored back to the airport, limiting the airspeed to 180kt to minimise the possibility of additional damage. The crew declined to declare an emergency but ATC placed the airport emergency services at local standby. During final approach the crew spotted a panel on runway 23, near its threshold. The aircraft overflew the panel and landed without further incident. A cowl door and a number of pieces of smaller debris were found on the runway near to the point at which G-ORFH had started its take-off run. No other aircraft had operated from the runway between the time of G-ORFH's take-off and landing.

In addition to the new Safety Recommendation, the AAIB restated Recommendation 2000-30, made in respect of an A320 (G-VCED, Bulletin 7/2000).

It is recommended that the JAA and the FAA consider a requirement for future aircraft certification for a system to provide flight deck warning of all unlatched access panels or doors that could hazard the aircraft if left unfastened.

Response to this Recommendation is still awaited.

RECOMMENDATION 2001-29

It is recommended that the operator review its procedures and working practices aimed at ensuring that all aircraft access doors are correctly latched before flight.

Status - Not CAA - Closed

Response

Awaiting response.

BAe146-300	En Route Aberdeen to Amsterdam	4 Oct 1999	Incident

References: Bulletin 7/2001 dated 5 Jul 2001

FACTOR F36/2001 dated 17 Sep 2001

SYNOPSIS

The aircraft had been parked for several hours overnight on stands 4/5 at Aberdeen Airport, under cloudy skies with light rain showers and a surface temperature no lower than +7deg C, ready for an early morning scheduled departure for Amsterdam, The automatic terminal information system (ATIS) timed at 0520 hrs, gave Runway 34 in use, surface wind 320deg/14 kt, visibility 15km with few clouds at 1,200 feet, few cumulonimbus (CB) at 1,800 feet, scattered at 2,300 feet with a temperature of +7degC, a dewpoint of +5deg C and a QNH of 1009mb. The aircraft taxied from its stand at 0523 hrs. The crew completed the normal checks prior to departure and carried out a 'full and free' controls check prior to their take off at 0533 hrs.

An aircraft Technical Log entry referred to an autopilot fault known to be apparent on autopilot engagement, but the autopilot had not been rendered unserviceable. The commander, who was the pilot flying (PF) initially flew the aircraft manually. However, during the climb at approximately FL100 to FL110 the commander decided to engage the autopilot to assess whether it would operate normally. On engagement of the autopilot, the aircraft pitched markedly nose down and rolled to the left. He therefore disengaged the autopilot immediately and continued the climb. As the aircraft continued its climb towards FL250, the commander reported that the ailerons had become stiffer to operate and eventually 'locked solid'. The first officer tried his controls but they were also similarly affected. The aircraft was levelled at FL270 and because it had been climbing in a wings level attitude, the commander decided not to apply excessive force to overcome the aileron jam, as would have been the case if he had adhered to the 'AILERON JAM OR UNCOMMANDED ROLL' drill; the aircraft was therefore manoeuvred laterally using aileron trim. The commander reasoned that to overcome any restriction could induce a sudden and violent rate of roll which might become difficult to control. Lateral control of the aircraft using the aileron trim alone appeared satisfactory and after getting used to the different roll response, the commander was able to maintain the desired heading.

The crew suspected that water from overnight rain had entered the control runs and frozen. The aircraft was overweight for a landing at Edinburgh or Newcastle, and gusty crosswinds and thunderstorms were forecast at their planned destination. The crew therefore declared a PAN and requested a diversion to Stansted where the weather was better. The commander subsequently requested a descent to 5,000 feet, the height of the freezing level, in the hope that the aileron controls would become free. The restriction however remained as the aircraft approached this level. The commander then operated the manual aileron disconnect handle, expecting the jam to clear but this had no effect. However, as the aircraft descended further to 2,500 feet, the ailerons gradually became free and, after a slow speed handling check carried out at 3,000 feet with the landing gear down and 24deg of flap selected, the crew made an uneventful landing at Stansted from a long straight-in-approach,

RECOMMENDATION 2001-27

It is recommended that BAE Systems (formerly British Aerospace) review those entries relating to the aileron disconnect systems in all sections of the Avro RJ and BAe146 Manufacturer's Operating Manuals (MOMs) with a view to clarifying the systems operation and associated procedures.

Status - Not CAA - Closed

Response

Awaiting response.

HS748-Series 2B	London Stansted Airport	30 Mar 1998	Accident

References: AAR 3/2001 dated 7 Dec 2001
FACTOR F45/2001 dated 7 Dec 2001

SYNOPSIS

(From AAIB Report)

The aircraft was scheduled to depart from London (Stansted) Airport at 2230 hours with a one hour flight to Leeds Bradford Airport. A baggage problem delayed the flight and the aircraft eventually taxied at 2323 hours, to holding point 'HP' for Runway 23. Takeoff clearance was given at 2329 hours. The First Officer was the handling pilot and the takeoff was to be made with full dry power; the water methanol system was selected to standby.

(The following sequence of events was established from the flight recorders). The aircraft was cleared to takeoff and the First Officer called for full dry power. As engine power stabilised, the First Officer called that the warning 'lights were out and the emergency panel was clear'. As the aircraft accelerated, the Commander announced 'sixty knots' and relinquished steering control to the First Officer who acknowledged and confirmed, 'full dry we have, just slightly low on the right'. No significant variation in engine rpm between the two engines could be detected from the Flight Data Recorder (FDR) recording. The aircraft accelerated through 80 kt and, for a period of two seconds, the sound of the nosewheel running over the runway centreline lighting was recorded on the area microphone channel of the Cockpit Voice Recorder (CVR). At an airspeed of 111 kt the Commander called 'vee one, rotate', the First Officer moved the control column rearwards and the aircraft became airborne.

Less than five seconds after the 'rotate' call, at an airspeed of 115 kt and a height of between 30ft and 100ft agl, the sound of a sharp report followed by an engine run-down was recorded on the CVR. The aircraft yawed 11deg to the right of the runway heading. As the crew asked each other what the noise had been, loud shouting could be heard from the passenger cabin. The First Officer said, as he corrected the yaw, 'something's gone' and the Commander then stated that he had taken control of the aircraft. Within eight seconds of the event the First Officer stated that an engine had stopped. Simultaneously, the senior cabin attendant, using the Public Address (PA) system, told the passengers to sit down and then advised the flight deck crew via the interphone that the right engine was on fire. Engine power was reduced and the

aircraft yawed 14.5deg to the left of runway heading. Four seconds later, the sound of the engine fire warning bell was recorded. Without using the PA system, the senior cabin attendant told the passengers to 'stay in your seats and make sure your seatbelts are all fastened'.

The aircraft was in the air for a total period of 27 seconds before the noise of touchdown was recorded. The Commander called for brakes, to which the First Officer replied 'coming on'. The First Officer then suggested that he 'fire' the right engine fire bottle but the Commander asked him to call the fire brigade, which he then did continuously. The Flight Fine Pitch Stops (FFPS) warning horn activated 5 seconds after touchdown, 4 seconds before the aircraft ran off the end of the runway at 62 kt. The warning sounded for the remainder of the audio recording.

After the aircraft left the runway, the CVR cockpit area microphone picked up the noises of the aircraft rolling over uneven ground, the point at which the perimeter track was crossed and the final collapse of the nose landing gear. Recording on both the FDR and CVR terminated due to the removal of electrical power 7.1 seconds after the aircraft departed the paved surface. When the aircraft came to a halt, the First Officer left his seat immediately to assist with the evacuation of the aircraft. The Commander carried out a limited shutdown. He then satisfied himself that the cabin was clear before leaving the aircraft. All passengers and crew evacuated the aircraft without serious injury.

RECOMMENDATION 2001-10

It is recommended that the operator ensures that the colour coding of the anchorages for the HS748 emergency escape slides are readily interpretable and are consistent with the descriptions in the aircraft operating and maintenance manuals.

Status - Not CAA - Closed

Response

Awaiting response.

RECOMMENDATION 2001-16

It is recommended that the engine manufacturer undertake further research with the aim of determining the causes of in-service deviation from the installation setting of Dart engine fuel burner flow and developing means of preventing variation beyond acceptable limits.

Status - Not CAA - Closed

Response

Awaiting response.

RECOMMENDATION 2001-17

It is recommended that the engine manufacturer include a requirement in the Engine Overhaul Manual for an as-received burner flow check for the Dart engine at all maintenance shop visits. The Manual should also include requirements for any turbine disc action necessitated by the flow check results that fully reflect the latest knowledge on the possible effects of burner flow deviation on the discs.

Status - Not CAA - Closed

Response

Awaiting response.

Airbus A340-311	London Heathrow Airport	5 Nov 1997	Accident

References: AAR 4/2000 dated 3 Aug 2000

FACTOR F15/2000 dated 3 Aug 2000

SYNOPSIS

The accident occurred when the aircraft, which had a landing gear problem on its first approach to Heathrow Airport, carried out an emergency landing on Runway 27L with the left main landing gear only partially extended. The flight crew responded to the in-flight emergency with commendable judgement and conducted a skilful landing, with the Airport Emergency Services in full and effective attendance. The evacuation was completed with minor injuries to 5 passengers and 2 crew members.

Examination of the left main landing gear found that the gear had been jammed by the No 6 wheel brake torque rod which had disconnected from its brake pack assembly and had become trapped in the keel beam structure. The associated torque rod pin was subsequently found beyond the end of Runway 24L at Los Angeles International Airport, the departure airport.

The investigation identified the following causal factors:

1 Full deployment of the left main landing gear was prevented by the unrestrained end of the No 6 brake torque rod having become trapped in the keel beam structure within the gear bay, jamming the landing gear in a partially deployed position.

2 The torque pin which had connected No 6 brake torque rod to that wheel brake assembly had disengaged during landing gear retraction after take off from Los Angeles, allowing the unrestrained rod to pivot freely about the retained end.

3 The torque pin and its retaining assembly had been subject to higher axial and torsional loads than predicted during aircraft braking in service. These loads were the result of elastic deformation of the wheel axle, brake and torque rod, and due to assembly without the correct axial clearance as a result of prior undetected displacement of the associated bushes. The precise mode of failure of the retaining assembly bolt, nut and cotter pin could not be ascertained in the absence of these parts.

4 This design of wheel brake assembly had satisfactorily passed the related certification wheel brake structural torque test to the requirements of TSO C26c paragraph 4.2(b). However the latter contained no requirement to use a representative axle or other means to reproduce the axle deflections which occur during aircraft braking in service, and did not require post-torque test strip assessment of brake assemblies for resultant evidence of overstressing deformation which did not produce component failure.

RECOMMENDATION 2000-37

The JAA should extend the existing JAA-Ops 1.700 requirement, for aircraft above 5700kg and certificated after April 1998 to have a 2 hour duration CVR recording capability, to include a requirement to retrofit the same weight category of aircraft certificated on, or before, April 1998 with similar recording duration CVRs.

Status - Not CAA - Closed

Response

Awaiting response.

However, the CAA will ensure that the contents of the Recommendation are brought to the attention of the appropriate JAA Committee. Target date: 30 September 2000.

Action

The CAA brought the contents of the Recommendation to the attention of the Flight Recorder Study Group (FRSG) of the JAA at their meeting in January 2001. Representatives of both the CAA and the UK AAIB are members of this Study group. The FRSG deferred discussion of the subject which has been placed on the agenda for the meeting scheduled to be held in October 2002.

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