

SERIOUS BIRD STRIKES TO CIVIL AIRCRAFT 1984 & 1985

John Thorpe - UK Civil Aviation Authority  
Safety Data & Analysis Unit

S U M M A R Y

The paper contains a sample of detailed histories of accidents and more serious incidents (e.g. double engine ingestion, holed airframe, fire, uncontained engine failure) for the years 1984 and 1985. The paper is divided into three groups:

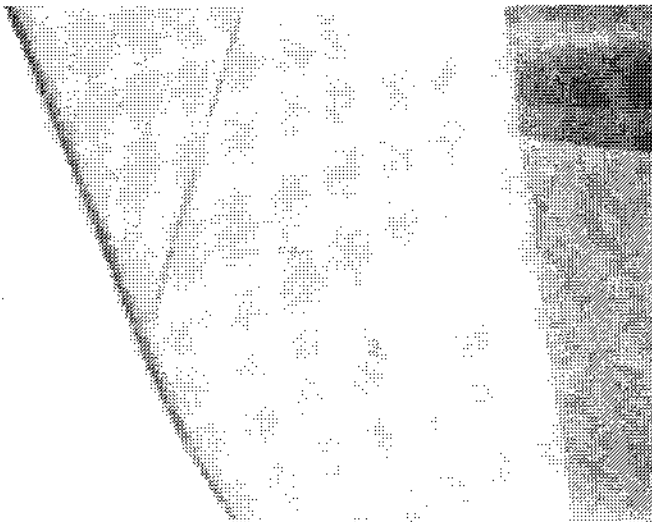

- transport aircraft over 5,700 kg and executive jets
- aeroplanes of 5,700 kg and below
- all helicopters

No attempt has been made to analyse the information although it is apparent that for transport aircraft the critical area is engines (20 out of 36 incidents in the paper) and for light aeroplanes and helicopters the windshield may be the critical area. As far as is known, during this period there have not been any hull losses.

The Author would welcome any new or additional information as it currently relies heavily on UK and ICAO information.

SERIOUS BIRD STRIKES TO CIVIL AIRCRAFT 1984/85

AEROPLANES OVER 5700 KG AND EXECUTIVE JETS

<u>Date</u>	<u>Aircraft</u>	<u>Regn</u>	<u>Operator</u>	<u>Location</u>	<u>Total Aboard</u>	<u>Injury to Occupants</u>
30.01.84*	Concorde	G-BOAD	British Airways	London Heathrow	-	Nil
<p>After gear retraction one of the hydraulic system contents fell to zero. Fuel jettisoned for return. After landing a second hydraulic system contents fell to a low level. Found a bird (believed gull) had impacted the rear of the landing gear bay and had punctured a structural diaphragm damaging hydraulic couplings. This occurred during 15 seconds doors are open for gear retraction. A debris guard has now been added. No part of the other system was damaged. (Source - UK Reporting)</p>						
11.02.84*	B707	G-AXGX	British Airways	Karachi, Pakistan	-	Nil
<p>At 2500 ft accelerating to 250 kts a large bird struck the wing leading edge. An 18" x 12" hole was made. Continued at 250 kt at 16000 ft to Doha. No. 2 generator tripped due to slight cable damage. Bird was vulture, either White-backed or Griffon (weights 5.3 kg or 8 kg). (Source - UK Reporting)</p>						
<div style="display: flex; justify-content: space-around;">   </div>						
18.03.84*	B747	G-BDXJ	British Airways	-	-	Nil
<p>Pre-flight inspection at Nairobi revealed a birdstrike had removed the lower skin from wing mid-flap. Area of damage about 12" x 3". (Source - UK Reporting)</p>						
22.03.84	B737	5N-ANY	Nigerian Airways	Port Harcourt, Nigeria	-	Nil
<p>During the landing roll a landing light was broken and a large hole made in the fuselage. (Source - ICAO IBIS)</p>						
26.03.84*	B747 (JT9D)	-	-	Delhi, India	-	Nil
<p>Descending through 2500 ft bird struck engine 2. Inlet nose cone had large hole and inlet cowling inner skin holed. Slight damage to two fan blades. (Source - Lloyds)</p>						
28.03.84	Aerospace Guppy	F-BPPA	Airbus Industry	Toulouse, France	-	Nil
<p>At about 50 ft and 127 kts a large flock of Black-headed gulls (Larus ridibundus) were struck. After an engine (T34) was shutdown the aircraft returned. The windshield was split, nose dented and engine 1 propeller damaged. (Source - ICAO IBIS)</p>						
19.04.84*	Boeing 747SP (JT9D)	N-	TWA	JFK New York	-	Nil
<p>Birdstrike on landing, shutdown engine. Found nose spinner shattered, tail cone liberated, with damage to nose cowl, fan blades and fan case.</p>						
29.04.84	B737	VT-EAJ	Indian Airlines	Patna, India	-	Nil
<p>While passing 160 ft at 170 kts in the climb a single eagle struck the wing leading edge. The rear side partition wall cracked and the flap hinge was damaged. (Source - ICAO IBIS)</p>						

\* Were in BSCE 17 (Rome) WP 27

08.05.84 L1011 D-AERP LTU Palma, Majorca - Nil

A precautionary landing was made with one engine shutdown after gulls were struck at 140 kts during the take off run. Engine 1 seized, engine 2 had cowling damage, engine 3 was also struck. (Source - ICAO IBIS)

07.06.84 B737 C-GOPW Air Canada Edmonton, Canada - Nil

At about 160 kts during the take off a flock of Herring gulls (*Larus argentatus*) were struck. The radome engine 2, light and windshield were damaged. The aircraft returned. (Source - ICAO IBIS)

22.06.84 DC10 TU-TAN Air Afrique Paris CDG - Nil

Fuel was jettisoned and a precautionary landing made after Herring gulls (*Larus argentatus*) struck engines 2 and 3. Four fan blades were damaged on engine 2 and 34 on engine 3. (Source - ICAO IBIS)

01.08.84 A310 G-BKWU British Caledonian Yundum, Gambia - Nil

During the take off run two birds struck the nose, one of which was in the area of the Captain's pitot. No 1 flight augmentation computer (i.e. speeds, pitch trim and yaw damper) were lost. (Source - UK Reporting System)

08.08.84 B737 G-DGDP Monarch Corfu, Greece - Nil

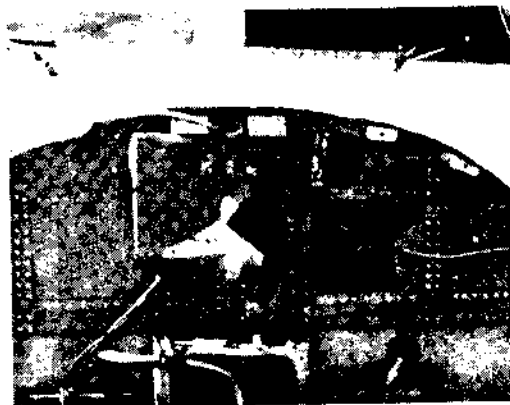
At 142 kts on rotation the air/ground sense line on the RH landing gear was damaged by birds. (Source - UK Reporting System)

19.08.84 B747 (JT9D) N221GF Swissair Zurich, Switzerland - Nil

Take off was abandoned at 154 kts after pigeons were ingested in engines 2 and 3. (Source - ICAO IBIS)

19.09.84 B737 ZS-SBP SAA Nr Kimberley, South Africa 40 Nil

While climbing through 7,000 ft at 280 kts the aircraft struck a Great Blue Heron (*Ardea herodias*) weight 2.7 kg. The bird penetrated the cockpit forward bulkhead on the Captains side knocking out the altimeters. The pressurisation system went from automatic to standby but maintained pressure. There were no injuries but the Captain was covered in blood and aircraft pieces. Noise hampered cockpit communication and the smell was so bad the crew used oxygen. The co-pilot had sighted a pair of birds slightly above the aircraft, but the bird folded its wings and struck the aircraft. (Source - Lloyds and FSE)



22.09.84 B737 G-AXNA Britannia Manchester, UK Nil

The aircraft struck a flock of Black-headed gulls, there was a bang and the aircraft yawed. Take off was abandoned at V1 of 143 kts. Full reverse was used, runway was wet. The gear fusible plugs blew and brakes seized. Feathers in both engines, but no damage. (Source - UK Reporting)

29.09.84 A300B F-BUAE Air Inter Marseilles, France - Nil

At 130 kts a large flock of Herring gulls were struck. The take off was abandoned. The wing leading edge was holed, and six fan blades were damaged in both engines 1 and 2. (Source - ICAO IBIS System)

07.10.84 B737 VT-EHE Indian Airlines Calcutta, India - Nil

During the approach a large vulture pierced the top of the windshield. The cockpit was covered in broken glass and remains. (Source - ICAO IBIS)

23.10.84	B737	G-BGDK	British Airways	Berlin Tegel	98	Nil
Just after rotation birds were struck. All engine indications were normal. Damage found on arrival to engine 1 fan blades (one bent, two shingled) and shingled blades on engine 2. Flaps also dented. (Source - UK Reporting System)						
24.10.84	B727	C-GAAG	-	Nr Winnipeg, Canada	-	Nil
While climbing through 1600 ft at 190 kts a flock of geese damaged the radome, engine 3, wing, tail, lights and penetrated the airframe. Engine 3 was shutdown and windshield vision was obscured. (Source - ICAO IBIS)						
01.11.84	Short SD330	N-	-	Peoria, USA	-	Nil
On the approach the right hand side window was shattered and parts of bird and window struck the first officer. He was able to perform his duties, but was bruised. The aircraft RH inboard exhaust stack was also damaged. (Source - FAA)						
06.11.84	B737	HR-SHA	Sahsa	Lasham, UK	7	Nil
The aircraft had been undergoing maintenance at the unlicensed aerodrome. A vehicle was used to check that the runway was clear of birds. At rotation the captain saw a large flock of lapwings in the aircraft's flight path, but hoped to fly over them. Loud bangs were heard and both engines appeared to lose power. A passenger saw 2 birds enter No 2 engine, severe vibration ensued and the Captain reduced power at 2000 ft, as engine 2 EPR etc was low. About 7 minutes after take off the engine intake cowling detached and fell in a field. The engine was shutdown, and a single engine landing made at Hurn. 18 dead lapwings were found on the runway. No 2 engine compressor was badly damaged, vibration causing cowling detachment. No 1 engine was undamaged. (Source - UK AB Bulletin)						
30.11.84	B737	G-AZNZ	Britannia	Ibiza, Spain	-	Nil
At 200 ft and 162 kts on a night take off the radome was holed by a birdstrike. The radar worked normally during the flight. (Source - UK Reporting System)						
06.12.84	N262	F-BPNS	DGAC	St Yan, France	-	Nil
While climbing through 150 ft at 110 kts a flock of rooks ( <i>Corvus frugilegus</i> ) struck the windshield, nose propellers, wing and tail. The wing leading edge was holed. (Source - ICAO IBIS)						
27.12.84	B747	G-AWNL	British Airways	Over North London	172	Nil
While climbing through 4000 ft at 260 kts a loud bang was heard. The steward reported that cabin window 3L was cracked and blood and remains had splattered two first class passengers. The aircraft was de-pressurised, 10,000 kg of fuel jettisoned and the aircraft returned. The birds were identified as Lapwings ( <i>Venellus vanellus</i> ), flying at night. Seven birds struck the aircraft, a large dent being left in the tail plane leading edge. The impact on the window forced the outer pane against the inner pane which cracked and broke against the window retaining clips. (Source - UK Reporting)						
11.01.85	B737	G-BGDO	British Airways	Aberdeen, UK	120	Nil
During the approach at about 200 ft and 130 kts the aircraft passed through a flock of Lapwings which rose from fields near the airport. Both engines, radome, windscreen, wings and fuselage were struck. Four fan blades were shingled in engine 1 and one blade shingled in engine 2. (Source - UK Reporting System)						
28.01.85	B737	G-BGDE	British Airways	Cork, Ireland	-	Nil
Gulls ingested in both engines at 120 kts on take off. Smell from air conditioning. Flight continued on one system. Radome, wing and landing gear struck. Engine 1 had shingled fan blades, engine change. (Source - UK Reporting System)						
17.02.85	B737	G-BFVA	Britannia	Malaga, Spain	-	Nil
On landing, the aircraft struck a partridge damaging the air/ground sensor on the RH main gear leg. This caused the air conditioning and electrical system to malfunction. The aircraft was ferried to base. (Source - UK Reporting)						
16.04.85	B737	-	Far Eastern Transport	Taipei, Taiwan	93	Nil
The aircraft skidded off the runway during take off after a bird struck the right hand engine. (Source - Lloyds)						

28.07.85 B747 (CF6) - - - - Nil

Unknown bird species ingested by engine 2 during take off, which was abandoned. All fan blades badly damaged, N1 sensor struck by large piece of fan blade which exited through fan cowl. Exhaust centrebody departed. Trailing edge flaps damaged by piece of blade. (Source - Engine Manufacturer)

29.07.85 B747 (RB211) - Air New Zealand Christchurch, New Zealand 370 Nil

At rotation on take off for Melbourne birds were ingested in two engines. They were shut down shortly afterwards, the aircraft climbed on three engines, before a second engine was throttled back. Fuel was jettisoned prior to landing. Two engines were removed, one having fan blade and duct damage. (Source - Aviation Week)

09.08.85 Cessna 0Y-CEV Falck Air Dusseldorf, Germany - Nil

The aircraft ingested a flock of Lapwings in both engines at about 150 ft on take off. One fan blade was damaged. (Source - Danish Reporting System)

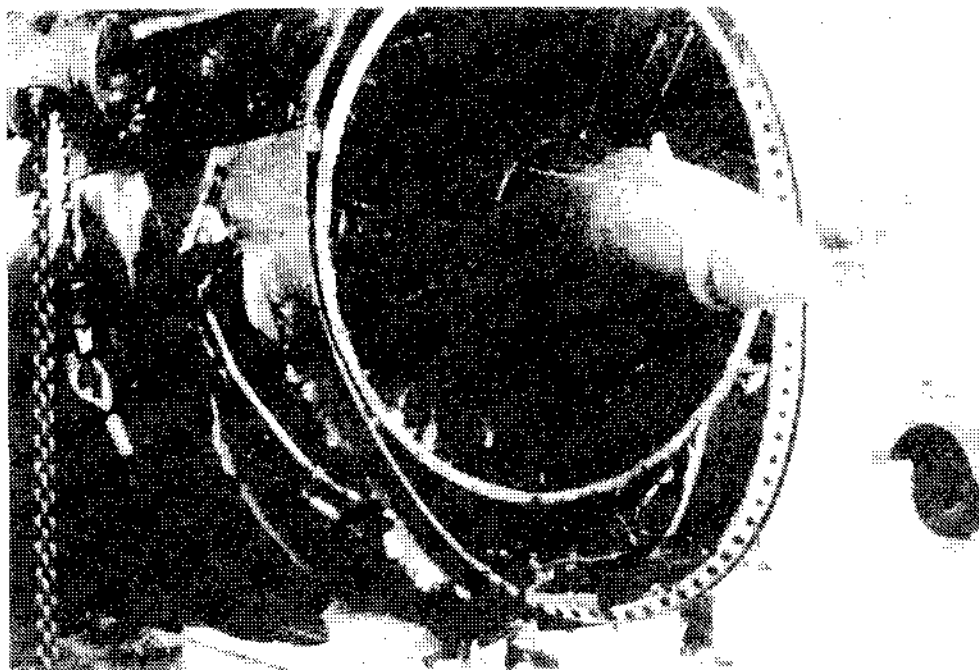
04.09.85 DC10-30 - - Rio de Janeiro, Brazil - Nil

Engine 3 ingested a large bird on take off, severe vibration caused shutdown. Fuel was jettisoned before landing. A hot brake fire was extinguished on landing. Heavy fan damage with four broken blades, and minor aircraft damage. Inlet cowl and both fan cowl doors separated and were on the runway. Bird may be Heron (3-4 kg) which feed near airport runway departure area. (Source - Engine Manufacturer)

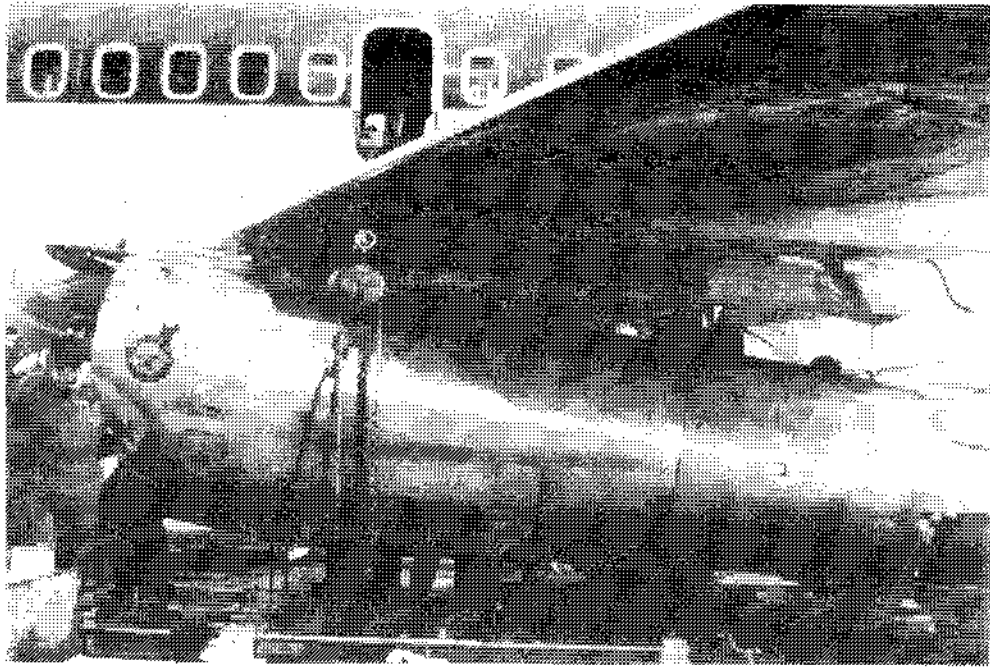
07.12.85 B737 EI-ASA Aer Lingus Dublin, Ireland - Nil

At 50 ft after take off a flock of gulls were struck, No 1 engine surged and the throttle lever slammed rearwards by itself passed the detent and unlocked the thrust reverser. The engine was shutdown, and a single engine landing made.

Ground inspection revealed No 1 engine nose cowling was missing, eight first stage fan blades were liberated and the inlet case and both front and rear fan containment cases had major penetrations. Two of the three engine mount bolts were fractured and the engine was only attached by the front left cone bolt and flexible hydraulic lines at the rear of the engine. Bird remains were found in the fan discharge duct, LH main gear well and outboard trailing edge flaps of the RH wing. Three bird carcasses were found on the runway.



Birds were Black-headed gulls (which weighed 275 gm to 350 gm) only one bird entered the engine striking No 20 fan blade 2" from its root; it broke off initiating the engine failure. Debris exited at the 8 o'clock position and broke the outer pane of a window as well as entering No 2 engine causing blade and stator damage. The airline stated the cost was \$1.25 million. (Source - Engine Manufacturer and Operator)



16.12.85	B737	G-BGDP	British Airways	Malta	-	Nil
During landing flare air/ground sensor cable was damaged by flock of doves. (Source - UK Reporting System)						
30.12.85	B737	ZS-SB0	SAA	East London, South Africa	-	Nil
The aircraft returned after a Blue crane (Anthropoides Paradisea) weight 3.5 kg was ingested in engine 1. Majority of fan blades were broken or liberated and several bolts were broken at 'B' flange. The oil tank was detached from its mount. (Source - Engine Manufacturer and Lloyds)						

AEROPLANES OF 5700 KG AND BELOW

<u>Date</u>	<u>Aircraft</u>	<u>Regn</u>	<u>Location</u>	<u>Total Aboard</u>	<u>Injury to Occupants</u>
07.04.84*	Cessna 421	G-JTIE	Oxford, UK	-	Nil
Flock of pigeons rose from runway as aircraft rotated at 100 kts. Multiple strikes, both engines had birds sticking out of vents. Right hand propeller control seized and engine sounded rough. Returned. Found right hand engine cowling cracked. (Source - UK Reporting)					
23.03.84*	Turbo Thrush	-	Cayman Islands	1	Nil
Garrett engine flamed out after birds were ingested resulting in a night forced landing. The landing gear was badly damaged. (Source - CAA AD)					
01.06.84*	DHC6	G-BIEM	Stornoway UK	-	Nil
At 500 ft, 95 kts one of three Great-black-backed gulls (Larus marinus) struck the wing leading edge causing an 18" x 10" hole, and structural damage. (Source - UK Reporting)					
01.06.84	Beech 90	TF-DCA	Isafjordur, Iceland	-	Nil
Just prior to touch down at about 90 kts, a bird struck the wing flaps, breaking the flap spar. (Source - ICAO IBIS)					
17.07.84	MU2	TF-JMC	Akureyri, Iceland	-	Nil
During the landing roll one Black-headed gull was ingested in engine 2 (a TPE 331). The engine flamed out and caught fire. The aircraft was out of service for 10 days. (Source - ICAO IBIS)					
26.07.84	Robin 2+2	-	Nr Quiberam, France	-	Nil
While flying at 1200 ft at 120 kts the windshield was broken by an unknown bird. A precautionary landing was made. (Source - ICAO IBIS)					
11.09.84	EMB110	Bandeirante	Hamilton, New Zealand	-	Nil
AT 50 ft just before landing, the windshield was damaged by a single duck. (Source - ICAO IBIS)					
15.10.84	Piper PA31 Navajo	-	200 miles N Saskatoon, Canada	-	Nil
While cruising at 2000 ft at 180 kts a number of geese (between 2 and 10) were struck. The RH windshield was shattered leaving a 6" x 12" hole. There was extensive damage to the cockpit ceiling area. (Source - ICAO IBIS)					
03.07.85	Cessna F152	G-BKGW	Sywell, UK	1	Nil
The aircraft was being flown by a student pilot. He was returning to Sywell on completion of a qualifying cross country flight. The pilot executed two go arounds due to the presence of a flock of birds on the landing runway 03. Following advice from air traffic control that the birds would move out of the way of his landing run the pilot began a third and final approach. The pilot states that immediately prior to touch down the aircraft was struck by birds on the windscreen, wing and strut. He also states that he was distracted as the flock of birds rose around him causing him to land his aircraft heavily. It bounced some 10 to 15 feet and landed heavily again on the nosewheel which collapsed, permitting the propeller to strike the ground.					
The birds were identified as rooks and some remains were found near to where the aircraft came to rest. Bird scaring devices, in the form of explosive charges connected to slow burning rope fuses, were in operation at the airfield. (Source - UK AIB Bulletin)					
16.10.85	Cessna 150	G-BCKU	Perth, UK	1	Nil
A Greylag goose (Anser anser) 3.3 kg struck the pitot tube tearing the wing skin. The incident was at 600 ft and 70 kts. (Source - UK Reporting)					



\* Were in BSCE 17 (Rome) WP 27

HELICOPTERS

<u>Date</u>	<u>Helicopter</u>	<u>Regn</u>	<u>Operator</u>	<u>Location</u>	<u>Total Aboard</u>	<u>Injury to Occupants</u>
30.04.84	AS350	F-ODGE	-	New Caledonia	-	Nil
	While flying at 120 kts at 600 ft the fuselage was holed by an unknown bird. A precautionary landing was made. (Source - ICAO IBIS)					
10.06.84	Bell 206	SE-HPL	-	En Route	-	Nil
	While flying at 500 ft at 100 kts between Svartso and Lovstad a bird penetrated the lower front windshield. (Source - ICA IBIS)					
06.11.84	Bell 206	G-BBMM	CB Helicopters	Nr Leavesden, UK	-	Nil
	In cruise at 600 ft and 100 kts a Mallard was seen just in front of the helicopter. It shattered the windscreen and struck the pilot's chest. (Source - UK Reporting)					