

WP/3

BIRD STRIKE COMMITTEE EUROPE

Rome, October 1984

BSCE/17 WP 27

SERIOUS BIRD STRIKES TO CIVIL AIRCRAFT 1981 TO 1984

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SUMMARY

The paper contains detailed histories of accidents and serious incidents e.g. double engine ingestions, holed airframe, for the years 1981 to date. An attachment contains a summary of all fatal accidents due to bird strikes between 1912 and 1980. The paper is divided into three groups

- transport aeroplanes over 5700kg (12,500lb) and executive jets
- aeroplanes below 5700kg
- helicopters

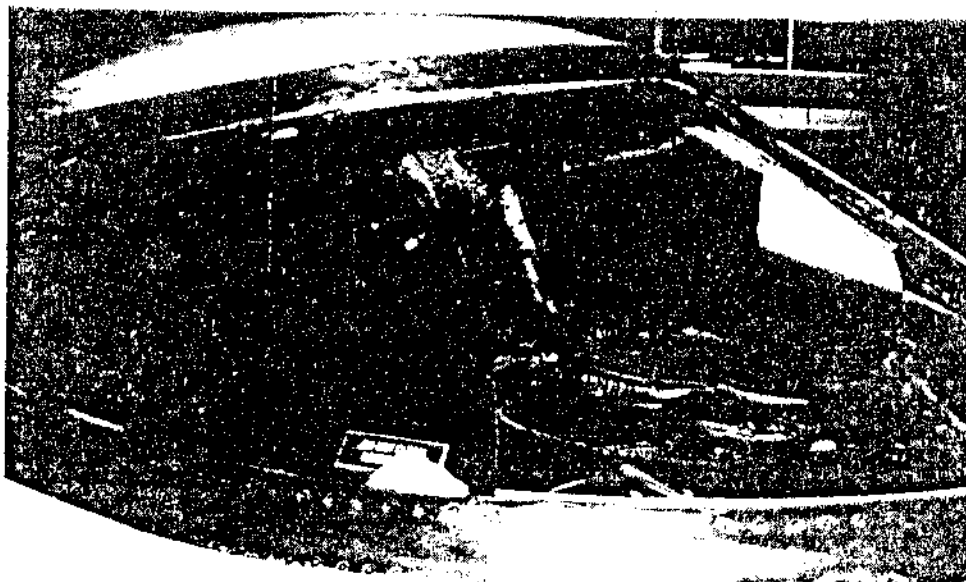
No attempt has been made to analyse the information although it is apparent that for transport aeroplanes the critical area is engines and for light aeroplanes and helicopters the windshield may be critical.

The Author would welcome any new or additional information.

Aeroplanes over 5700kg (12,500lb) together with Executive Jets

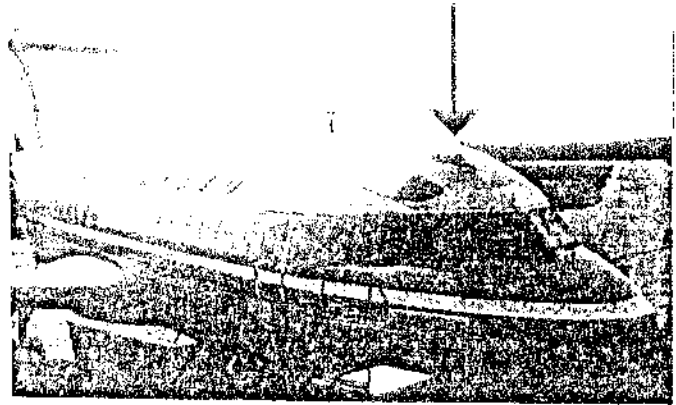
<u>Date</u>	<u>Aircraft</u>	<u>Regn</u>	<u>Operator</u>	<u>Location</u>	<u>Total Aboard</u>	<u>Injury to Occupants</u>
15.2.81	Fokker F28	VH-	-	Derby Australia	-	Nil
<p>During take-off run struck a Nankeen night-heron (Nycticorax caledonicus weight 750gm). Take-off was abandoned after an uncontained failure of engine 1. Compressor case holed by 2 blades, but cowling not penetrated.</p>						
25.2.81	DC10	N-	-	New York JFK	-	Nil
<p>During climb a flock of gulls was ingested in engine 2 &amp; 3. There was medium damage to engine 2 and major damage to engine 3.</p>						
25.3.81	B707(JT3D)	-	-	Kanombe, Rwanda	-	Nil
<p>During landing birds of prey were ingested in engine 1 and 2. Aircraft was immobilized by engine damage.</p>						
29.3.81	B727	N-	-	Nr New York JFK	-	1 Minor
<p>During climb at 3,500ft geese were struck, inner and outer panes of first officers windshield shattered, but bird did not penetrate. First officer received facial cuts from glass fragments. Left wing holed.</p>						
7.4.81	Lear 23	N400PG	Private	Lunken Executive Cincinnati, USA	2	1 Killed 1 Minor

The aircraft was in a climbing turn at about 4000ft when the aircraft struck a Common Loon (Gavia immer weight 3.7kg). The bird penetrated the right windscreen and killed the co-pilot. Windscreen debris damaged No 2 engine which had to be shutdown. The pilot's arm was badly cut but a safe landing was made using the emergency brake chute and with no flaps. The weather was good, the flight being at 11.35 local time. The pilot did not see the bird. The Lear 23 is of an age such that the windscreen was not required to withstand a bird of even 4lbs.



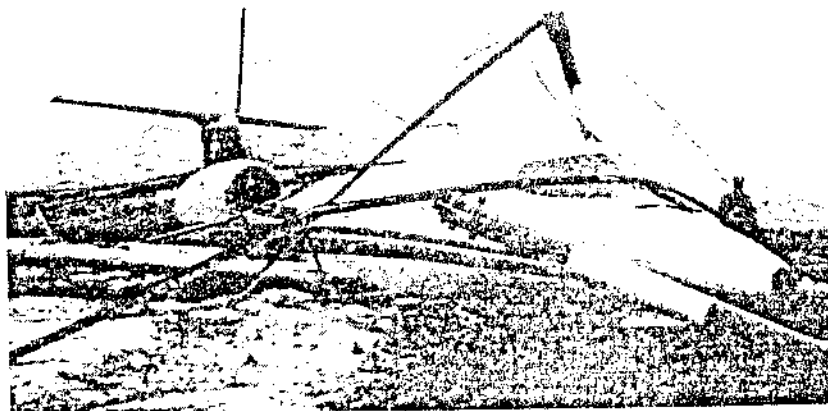
18.4.81	NAMC YS11A	N173RV	Scud Pak	Sand Point, Alaska	39	Nil
<p>The aircraft was on short finals when a gull struck the windshield centre post, the remains seriously reducing the pilots vision. The pilot misjudged distance and altitude, the main gear impacted an embankment on the approach, both main gear wheels were knocked off and the aircraft came to rest 1500ft beyond the threshold. The damage was substantial.</p>						
6.5.81	A300B	F-BGEB	Air France	Paris Orly	-	Nil
<p>During the take-off roll at 110kts struck flock of wood pigeons (Columba palumbus weight 460gm). Birds ingested in both engines damaging four fan blades on each one. Take-off abandoned and stopped on the runway. Birds also struck wings, landing gear, fuselage and empennage.</p>						
24.5.81	B737	-	-	Johor Bahru, Malaysia	-	Nil
<p>Both engines were damaged during the take-off run.</p>						

21.6.81	5717	G-BMHC	Air Europe	May, Italy	-	Nil
<p>During the take-off run a flock of birds was seen to land on the runway about 100 yds ahead of the aircraft. The birds pigeons (Columba sp) took off just before the aircraft reached them at about 11.5 km (V1 125). Several impacts were felt so the take-off was successfully abandoned with reverse thrust and brakes. Later some fusible plugs blew. There was birdstrike damage to the nacelles, noticeable steering cables and to both engines. Six LP compressor blades were damaged in No 1 engine and 5 in No 2 engine. Both engines were changed.</p>						
4.7.81	581	F-UTTC	Air Iber	Ajaccio Corsica	-	Nil
<p>During the climb at 1200ft 750ft the outer windshield was shattered after a violent bird impact.</p>						
6.7.81	1007	DL124	World Airways	Garwick UK	-	Nil
<p>On take-off engine 3 and smoke were seen from engine 3 and the aircraft returned with the engine shutdown. The runway was inspected and 50 or more pieces of engine were found, together with some bird remains. The bird remains were identified as either Feral or Wood pigeon (Columba sp of weight 150 g (3oz)). The engine was seriously damaged with holed casing.</p>						
20.7.81	515	-	-	Thessalonika, Greece	-	Nil
<p>Aircraft was abandoned after striking pigeons (Phasianus colchicus weight 1.2 kg) on take-off. There was severe damage to engines 2 and 3. Repair cost was 145,000 US dollars.</p>						
8.8.81	1701	G-BCAF	British Airways	Larnaca Cyprus	347	Nil
<p>Aircraft was with a load bang of 90 kts. so the take-off was abandoned. Evidence of birdstrike in engine 1 and 3. Ground run revealed power loss on engine 3. Aircraft landed safely.</p>						
15.8.81	51	ET 85Y	Ethiopian Airlines	Jinba	-	-
<p>Aircraft suffered a birdstrike causing wing leading edge skin damage and five broken or cracked ribs.</p>						
29.8.81	5776	-	-	Wellington NZ	-	Nil
<p>During take-off struck flock of gulls. Uncontained failure on engine 1. Aircraft diverted to Auckland.</p>						
19.9.81	508	SE-ROO	Hiqorlyg	Huse Garskoldsvik Sweden	-	Nil
<p>While flying at 6000ft and slightly above 300 kts the aircraft struck an Osprey (Pandion haliaetus weight 1.5 kg). The bird penetrated the skin above the windshield damaging frames, doors etc and entered the flight deck causing considerable mess.</p>						



12.9.81	8747	-	-	Delhi, India	-	Nil
<p>During approach struck vultures (Cathartidae). Engine 2 suffered uncontained failure holing No 1 fuel tank as a result of flying debris.</p>						
24.9.81	8737	-	-	Nagaya, Japan	-	Nil
<p>Abandoned take-off after gulls were ingested in both engines. Blade damage was found in both engines.</p>						
16.10.81	A1008	F-	Air Inter	Paris, Orly	-	Nil
<p>During approach at 150ft and 130kts struck a flock of Stock Doves (Columba Genus weight 350gm). Birds ingested in both engines.</p>						
19.10.81	808-10	-	-	Makurdi, Nigeria	-	Nil
<p>Engines 1, 2 and 4 ingested birds when the aircraft struck a flock during the take-off run. Landing gear and 1 engine also struck. Two engines repaired at base, once changed.</p>						

19.10.81	A300B	F-	Air France	Tunis	-	Nil
Struck flock of birds at 150 kts during take-off run. Both Engines, Fuselage and wing struck. Three fan blades were damaged.						
23.3.82	B747 (JT9D-7)	VT-EFJ	Air India	Jeddah, Saudi Arabia	-	-
During the approach the aircraft passed through a flock of birds causing the pilot to shutdown No 1 engine and bring No 2 back to idle. After touchdown No 2 was shutdown due to vibration. Both engine nose domes and all fan blades were damaged. There were holes in the nose cowl of No 2 engine and the tail cone was missing.						
19.6.82	DC8-63	-	-	Yesilkoy, Turkey	-	Nil
Gulls ingested in engines 3 and 4 during landing run. Both engines changed.						
11.7.82	B747 (JT9D)	G-AWNA	British Airways	Melbourne, Australia	91	Nil
At about 75ft on take-off the aircraft struck a flock of birds, loud bang from engine 3 which ran down and was shutdown with high JPT. Engine 4 vibration warning came on so was throttled to idle. Made immediate return, engine 4 shutdown after landing. Birds were racing pigeons (Columba livia, wt 250 gm) released 100 miles away and returning to Melbourne. Believed 3-4 birds in engine 3 and 2-3 in No 4. The aircraft was at a very light weight. Both engines changed.						
1.9.82	B737	G-BGDE	British Airways	Turin, Italy	-	Nil
During the take-off 07.20 hrs the aircraft passed through a flock of gulls at 50ft. Engine 2 indicated a vibration warning. Air traffic reported flames from No 2 engine. This was shutdown and the aircraft returned. Engine 2 was changed as it was severely damaged.						
12.9.82	B707	G-BFEO	Tradewinds	Khartoum, Sudan	-	Nil
At 400ft on take-off the aircraft struck a large stork (Ciconiidae up to 3 kg). The left-hand windscreen was obscured by blood. The aircraft returned where it was found the radome had been severely holed, with large radial crack. The ILS glideslope aerial was broken.						
13.9.82	B747CF	-	-	Luxemburg	-	Nil
During the take-off engine 4 ingested birds resulting in fan and nose cowling damage after it had been pierced by part of a fan blade. The aircraft returned.						
3.11.82	DC10	-	-	Entebbe, Uganda	-	Nil
During the climb the aircraft encountered between 11 and 100 herons (Ardea sp, up to 1.8 kg), which were ingested in engines 1 and 3. Engine 1 was shutdown.						
4.12.82	B747(CF6-50)	PH-BGN	KLM	Amsterdam, Netherlands	132	Nil
During the take-off run at 14.00 hrs GMT on runway 19L at about 1/3 of the runway at 135 kts the aircraft struck a flock of 100 Lapwings (Vanellus vanellus, weight 250 gm) suffering multiple engine damage. The take-off was abandoned stopping with 800 metres left. The passengers disembarked via stairs at the end of the runway. Engine 1 beyond economic repair and changed, engine 2 had nine fan blades and some fan exit vanes changed, engine 3 had little damage and engine 4 had one fan blade changed. Wing trailing edge flaps also damaged. About 75 dead birds were found on the runway. Bird patrols were in continuous use.						
6.12.82	Lear 35	NB-VFO	Private	Paris LBG	-	1 Serious
At about 8.30 local the aircraft abandoned take-off after V1 as a result of striking a flock of black headed gulls (Larus ridibundus). The aircraft failed to stop and over-ran striking the ILS installation, seriously injuring the co-pilot. The aircraft was destroyed. The engines were not in fact damaged and there was one birdstrike on the wing.						



12.10.68 ... the ... a flock of ... which were ... after ... there was no damage

12.10.68 ... Nil

... struck ... runway at ... lost ... partially lost through ... flaps left down, the aircraft ... 500 to 1000 dead birds were found. ... Wing defuser boots damaged ... conditioning system. Nose gear taxi ... was knocked off its pulley. Crew ... with so little degradation of performance

12.10.68 ... 7 Minor

... 105 kts. An immed ... engine 2. Overweight landing by 44 ton ... minor injuries to seven people. ... engine 1 fa ... ATC reported engine

12.10.68 ... Nil

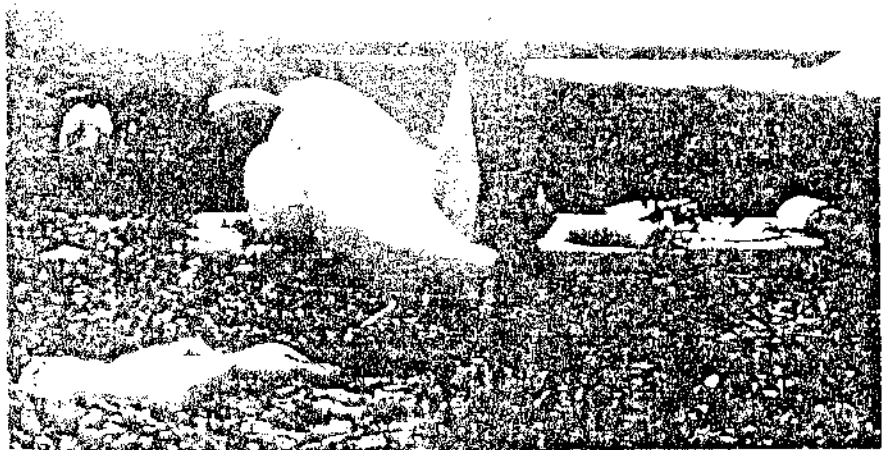
... which were ingested ... The aircraft was ... at least one bird had entered

12.10.68 ... Nil

... and this ... from landi ... system

12.10.68 ... Nil

... around 100 starlings. ... between ... feet struts ... the aircraft tumbled into the air, ... pilots rapidly exited via ... for only 10 seconds



12.10.68 ... Nil

... ingested in engines 1 and 2. ... engine 2 exited the front engine cowling ... overheated during reverse thrust ... across the runway, probably on

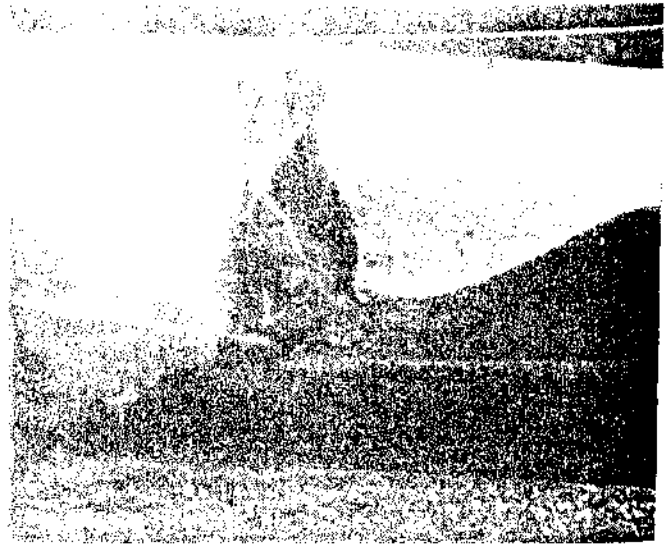
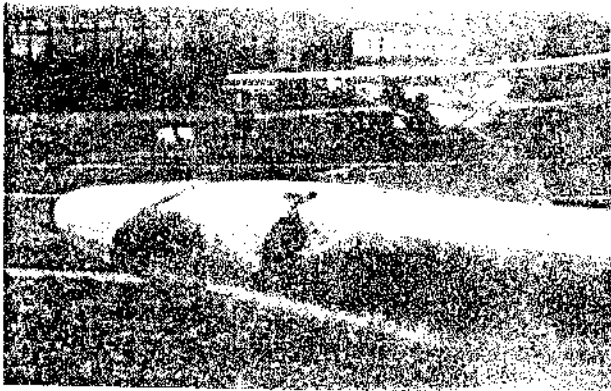
12.10.68 ... Nil

... right hand engine failed and ... aircraft made immediate return.

18.3.84	B747	G-BDXJ	British Airways	-	-	Nil
Pre-flight inspection at Nairobi revealed lower skin missing from wing mid-flap. Area of damage about 12" x 3".						
19.4.84	Boeing 747SP (JT90)	N-	TWA	JFK New York	-	Nil
Birdstrike on landing, shutdown engine. Found nose spinner shattered, tail cone liberated, with damage to nose cowl, fan blades and fan case.						

Aeroplanes of 5700 kg and Below

<u>Date</u>	<u>Aircraft</u>	<u>Regn</u>	<u>Location</u>	<u>Total Aboard</u>	<u>Injury</u>	<u>Damage</u>
25.4.81	C182	C-FTKQ	Near Cooking Lake Alberta, Canada	-	Minor	Substantial
Aircraft struck a duck (Anas sp) which jammed in carburettor intake causing loss of power. Aircraft forced landed into trees.						
19.7.81	C152	G-BIDM	Near Lerwick, UK	1	Minor	-
While descending through 1000 ft at about 90 kts the aircraft struck a gull breaking the windscreen. The pilot suffered a cut nose.						
6.8.81	Cessna 402	SY-ATU	Near Musiars, Kenya	1	1 killed	Destroyed
Suffered birdstrike with a Ruppell's Griffon (Gyps rueppellii weight 7.5 kg) which penetrated the windscreen killing the pilot instantly. The pilot, the sole occupant was killed and the aircraft destroyed.						
1.11.81	Cullair A9	VH-	Batchelor Australia	1	Minor	Destroyed
While towing a glider a black kite (Milvus migrans) became lodged between the strut and the top surface of the left wing causing loss of aileron control. The aircraft was forced into a turn, descending into woodland where it struck trees. The aircraft was destroyed by impact and fire.						
1.11.82	Microlight	G-	Nr Bolton, England	-	Nil	-
A flock of gulls were encountered and the engine exhaust was knocked off (falling near a house and going 3" deep into the frozen ground). The pilot glided to a safe landing.						
2.2.82	Beech 200	EI-	Nr Nairobi, Kenya	-	-	Substantial
While on final approach the pilot attempted to avoid a large flock of birds, but shortly afterwards the pilot felt a large thump at the back end of the aircraft and it pitched up. After recovering a normal landing was made. The bird, a Marabou Stork (Leptoptilos Crumeniferus weight up to 7 kg) struck the fin leading edge, crushing the whole fin leading edge back to the front spar. The fin attachment was not damaged.						
10.2.82	C404		Maya Maya, Congo	-	1 minor	-
During approach the aircraft struck bats (Chiroptera) smashing the windscreen and slightly injuring the pilots face.						
1.4.82	Cessna 172	F-	Sarre Union, France	-	Nil	-
Just before touchdown the pilot noticed two buzzards (Buteo sp) on the beginning of the runway so the pilot overshot and made a circuit. On his second approach both birds were in the air and the pilot took evasive action to miss one of them. The aircraft landed too fast, bounced and the landing gear and propeller were damaged. The bird damaged the left-hand wing leading edge.						
30.7.82	Piper PA23	G-AYWF	Amsterdam, Netherlands		Nil	-
While making a night landing a thump was felt as the aircraft descended through 150ft. A Grey heron (Ardea cinerea, weight 1.8kg) had damaged struck the wing leading edge damaging ribs, stringers and holing the skin.						



26.2.82 Paper 1871  
 An angle of 10 degrees was observed between the two pieces of wood. The wood was found in the area of the wreckage.

9.9.82 Paper 1872  
 A piece of wood was found in the area of the wreckage. The wood was found in the area of the wreckage.



31.10.82 Paper 1873  
 The 10 degree angle was observed between the two pieces of wood. The wood was found in the area of the wreckage.

18.11.82 Paper 1874  
 A large piece of wood was found in the area of the wreckage. The wood was found in the area of the wreckage.

6.5.83 Paper 1875  
 A piece of wood was found in the area of the wreckage. The wood was found in the area of the wreckage.

24.5.83 Paper 1876  
 A piece of wood was found in the area of the wreckage. The wood was found in the area of the wreckage.

24.11.83 Paper 1877  
 A piece of wood was found in the area of the wreckage. The wood was found in the area of the wreckage.

24.11.83 Paper 1878  
 A piece of wood was found in the area of the wreckage. The wood was found in the area of the wreckage.

24.11.83 Paper 1879  
 A piece of wood was found in the area of the wreckage. The wood was found in the area of the wreckage.

7.4.84 G-AMCPE Oxford, UK - Nil Minor  
 A stack of papers rose from runway as aircraft rotated at 100 kts. Multiple strikes, both engines and birds sticking out of vents. Right hand propeller control seized and engine feathered down. Returned Found right hand engine cowling cracked.

1.6.84 G-BIEM Stornoway UK - Nil Minor  
 At 1100 95 kts one of three great black backed gulls (*Larus marinus*) struck the wing leading to the formation of an 18" x 10" hole, and structural damage.

Helicopters

1.3.81 CF- Wanderer State Canada 4 Four Killed Destroyed  
 The helicopter went missing on a low altitude sheep count and was not found till Jun 8. When found at least one raven (*Corvus corax*, weight 1.2 kg) had struck the plexiglass front windscreen and probably entered the cockpit area. The helicopter crashed as a result, killing all 4 on board.

3.1.81 G- Redhill, UK - - Minor  
 While on the hover the rotor was damaged when a crow (*Corvus sp* weight 550 gm) flew into it.

11.82 G-BAUM 3 miles from Kelso Scotland - - Minor  
 While climbing at 600 ft at 90 kts the pilot felt a slight yaw and simultaneous severe vibration. He shut down the engine and made an autorotative landing in a field. The tail rotor had been struck by a bird (leaving three small feathers) bending the leading edge of a blade out of alignment, and resulting in tail rotor drive shaft damage.

24.1.82 F-GAME Marseilles, France - Minor -  
 While flying at 200 ft and 100 kts the aircraft struck a gull smashing the window in the door causing minor injury to the passengers.

15.4.82 G- New Seaton, UK - - Minor  
 At 2000 ft, 125 kts a gull was seen to pass over the rotor, no impact was heard or felt. On landing the stabilizer "fibreglass" fan skin was found to be cracked and had to be renewed.

15.7.82 G-FIOG Mt Montelimar, France - Nil Minor  
 While enroute at 145 kts, 2000 ft the aircraft struck an eagle, holing the radome and jamming the rear scanner.

16.7.82 F- France - Minor -  
 While flying at 1500ft and 230 kts a martin (*Riparia* weight 14 gm) penetrated the windshield injuring the pilot.

20.7.82 F- Lyon Satolas, France - Nil -  
 While approaching to land at 500 ft and 6 kts the windshield was penetrated by a starling (*Sturna vulgaris* weight 60 gm).

19.82 H- Detroit, U.S.A. - Minor -  
 A Mallard Duck weighing 5lbs broke the windscreen knocking the pilot unconscious and breaking his nose. The helicopter was on autopilot (fitted at pilot's request) and the pilot came to at 700 ft and 110 kts over Detroit.

19.82 F-BYOS Montpellier, France - 1 Minor -  
 Approaching the aircraft at 150 ft and 85 kts the helicopter collided with a gull weighing 1.2 kg and 4 ft wingspan. The windscreen was shattered, the remains striking the pilot, who retained control and landed safely, in spite of cuts on his hands.

11.83 G- Sandakan, Borneo - Nil Minor  
 Large bird of prey attacked the helicopter, the pilot managed to dodge the birds first attempt but when the pilot looked up the eagle was again diving with wings folded. At the last second the bird must have realised there was something odd about its "prey", as it spread its wings and attempted to torn away. The wing smashed the nose bubble and the body holed the honeycombe belly structure. Bird was Brambling Kite (*Haliastur indus*, weight 570 gm).


ALBATROSS

Fatal Accidents and Destroyed Aircraft

Date	Species	Location	Remarks	Notes
4.6.67	Red-tailed Tropicbird	USA	Overhaul engine, aircraft destroyed	1 dead
13.7.67	Wren	USA	Overhaul engine, aircraft destroyed	1 dead
19.11.67	Wren	USA	Overhaul engine, aircraft destroyed	1 dead
19.7.68	Red-tailed Tropicbird	USA	Overhaul engine, aircraft destroyed	1 dead
12.7.69	Wren	USA	Overhaul engine, aircraft destroyed	1 dead
16.8.71	Wren	USA	Overhaul engine, aircraft destroyed	1 dead
11.10.73	Wren	USA	Overhaul engine, aircraft destroyed	1 dead
11.4.75	Red-tailed Tropicbird	USA	Overhaul engine, aircraft destroyed	1 dead
12.11.77	Wren	USA	Overhaul engine, aircraft destroyed	1 dead
20.11.78	Wren	USA	Overhaul engine, aircraft destroyed	1 dead
8.2.78	Wren	USA	Overhaul engine, aircraft destroyed	1 dead
10.11.78	Wren	USA	Overhaul engine, aircraft destroyed	1 dead
4.4.78	Wren	USA	Overhaul engine, aircraft destroyed	1 dead
25.7.78	Wren	USA	Overhaul engine, aircraft destroyed	1 dead

\* Common (Larus delawarensis) weight 100 gm, Red-tailed Tropicbird (Phaethon rubricauda) weight 100 gm  
 \* Great Black-backed (Larus delawarensis) weight 100 gm, Red-tailed Tropicbird (Phaethon rubricauda) weight 100 gm  
 \* Herring (Larus argentatus) weight 100 gm

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	<u>Aircraft</u>	<u>Location</u>	<u>Occupants</u>	<u>Deaths</u>	<u>Other</u>
4.12	Wright Flyer	Long Beach, Calif, USA	1	1	Destroyed
	Struck gull while flying along the beach. Controls jammed and aircraft crashed drowning pilot.				
					
7.29	Arado	Madras, India	2	2	Destroyed
	Shortly after take-off struck large bird, aircraft crashed.				
8.55	Cessna	Aberdare Mtns, Kenya	1	1	Destroyed
	En-route struck vulture, pilot attempted to avoid but bird hit wing tip jamming ailerons.				
8.59	-	Serengeti, Tanganyika	1	1	Destroyed
	Struck a Griffon vulture ( <i>Gyps fulvus</i> , 5.4 kg) and crashed.				
9.03	Beech 35	Bakersfield, Calif USA	1	1	Destroyed
	Common loon ( <i>Gavia immer</i> wt 3.7 kg) which removed right-hand tailplane.				
9.04	Turbulent	Nr Belfast UK	1	1	Destroyed
	Spun in from low altitude after striking or avoiding gull. Dead gull found 60 yards away and avian blood on windscreen of open single seater aircraft.				
9.71	Cessna 180	British Columbia, Canada	3	2	Destroyed
	En-route struck a Bald eagle ( <i>Haliaeetus leucocephalus</i> wt 5 kg).				
9.72	Mitsubishi MU2	Atlantic City, USA	3	3	Destroyed
	While in climb struck flock of geese, windshield destroyed incapacitating one or both pilots. Uncontrolled descent into the sea.				
9.76	Saab MFJ15	Nr Awassa, Ethiopia	2	2	Destroyed
	Climbing through 200 ft struck Vulture. Aircraft went out of control and crashed vertically.				
9.77	Aero Commander 690	Chicago, USA	4	4	Destroyed
	Gull ingested in one engine, emergency procedures improperly executed and aircraft spun into the water.				
10.79	Swearingen Merlin	Palo Alto, Calif, USA	-	2 killed 1 serious	Destroyed
	During approach a flock of gulls clogged an engine intake (engine not damaged). Pilot attempted overshoot but lost control crashing inverted into parking area destroying or damaging 7 other aircraft.				

al Accidents to Helicopters