
Birdstrike on takeoff, Boeing 737-204 (ADV) (EI-CJH), Dublin, Ireland, April 19, 2003.

Micro-summary: Birdstrike on takeoff of this Boeing 737 results in a single-engine landing.

Event Date: 2003-04-19 at 1942 UTC

Investigative Body: Air Accident Investigation Unit (AAIU), Ireland

Investigative Body's Web Site: <http://www.aaiu.ie/>

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FINAL REPORT

AAIU Synoptic Report No: 2005-016

AAIU File No: 2003/0023

Published: 29/08/05

In accordance with the provisions of SI 205 of 1997, the Chief Inspector of Air Accidents Kevin Humphreys, decided to investigate this incident, due to the particular circumstances surrounding the event.

Aircraft Type and Registration:	Boeing B737-204 ADV, EI-CJH
No. and Type of Engines:	2 x Pratt & Whitney JD8D-15
Aircraft Serial Number:	22057
Year of Manufacture:	1980
Date and Time (UTC):	19 April 2003 @ 19.42 hrs
Location:	Take-off Runway (RWY) 10 Dublin (EIDW)
Type of Flight:	Scheduled Public Transport
Persons on Board:	Crew - 5 Passengers - 103
Injuries:	Crew - Nil Passengers - Nil
Nature of Damage:	No. 1 (left-hand) engine fan blade damage
Commander's Licence:	Not required
Commander's Details:	Not required
Commander's Flying Experience:	Not required
Information Source:	AAIU Field Investigation

SYNOPSIS

During the rotation for take-off (that is the point at which the nose wheel is lifted off the runway to assume a flying attitude) the aircraft ingested several racing pigeons into its No.1 engine causing serious damage to the engine, which resulted in a return to Dublin Airport on a single engine. The aircraft landed RWY 10 without further incident. The No.1 engine suffered serious bird strike damage. There were no injuries.

NOTIFICATION

This incident was notified to the AAIU by the Air Traffic Control (ATC) Watch Manager at Dublin Airport.

FINAL REPORT

1. FACTUAL INFORMATION

1.1 History of the Flight

The B732 was on a scheduled flight from Dublin to Bristol, UK. It had a flight crew of 2 pilots, 3 cabin crew and a total of 103 passengers. On rotation, the flight crew heard several thuds, which sounded to them like a multiple bird strike. The No.1 engine started banging and the EPR (Engine Pressure Ratio) fluctuated between 1.15 EPR and 2.05 EPR. The flight crew made a PAN call and told ATC that they were climbing straight ahead. At MFRA (Minimum Flap Retraction Altitude), the Captain took control of the aircraft, while the First Officer carried out the Quick Reference Handbook (QRH) Checklist. The aircraft was levelled at 2,500 feet and the flight crew asked to enter the hold at DINIL. ATC instructed the flight crew that this altitude would place them below controlled airspace and therefore offered a visual approach for RWY 10.

The flight crew requested radar vectors and carried out a single engine, instrument landing system (ILS) approach, and landing to RWY 10. The aircraft cleared the runway (12.56 hrs) without further incident and came to a halt on RWY 34. Airport Rescue and Fire Fighting Service (ARFFS) vehicles positioned fore and aft of the aircraft and conducted a visual inspection. An inspection of the No. 1 engine determined that fan blade damage had occurred (**See Appendix A**), however no signs of fire were present. The aircraft then taxied under its own power to Stand 11. A short time later the aircraft was towed to a maintenance hangar at Dublin Airport for engine examination, assessment and repair.

Aer Rianta recovered carcasses of the Racing Pigeons from the active runway and these were identified by the metal rings attached to them. It transpired that 21,000 racing pigeons from the North of Ireland had been released to race from Arklow, back to their lofts in Northern Ireland.

This release had been notified to ATC and the possible presence of racing pigeons was broadcast on the Automatic terminal Information Service (ATIS) at Dublin Airport.

1.2 Damage To Aircraft

The No. 1 engine suffered damage necessitating the replacement of the engine fan assembly.

2. Discussion

2.1 General

Wildlife poses a particular threat to Aircraft Operations. Birds, especially when striking an aircraft, can cause serious damage to the airframe, cockpit window and when ingested into engines, can cause severe damage. In some cases total engine power loss or indeed engine separation has occurred.

There are several well documented cases of total aircraft loss resulting in fatalities and on a daily basis bird strikes are reported by aircrew.

FINAL REPORT

To counter this known threat to Aviation Safety, ICAO, the International Civil Aviation Organisation, has published information (**See Appendix B**) supplementary to the Standards and Recommended Practices contained in Annex 14 (Aerodromes) .

This material outlines how to minimise the threat posed by Wildlife to aircraft, in particular birds. Each State is encouraged by ICAO to establish and maintain a National Bird Hazard Committee to co-ordinate the Bird Hazard Prevention effort.

The event in question, however, does not concern naturally occurring bird hazards but rather a man made problem of pigeon racing. This can involve the mass release of up to 40,000 pigeons at a time from large transporters pre-positioned at historic release points.

Following this multiple bird strike on the 9 April 2003, the National Bird Hazard Committee, (chaired and administered by the AAIU) in conjunction with Aer Rianta, arranged a meeting on the 1 May 2003 at Dublin Airport with the following associations. The Irish Homing Union, the Northern Ireland Pigeon Racing Association, the Irish Aviation Authority (IAA) and Aer Rianta Dublin, (now the Dublin Airport Authority).

It was noted that pigeon fanciers, as they are termed, North and South of the border, are bound by the “Official Rules” of the Royal Pigeon Racing Association (RPRA). These Official Rules include a section at the rear entitled “Liberation Points and Airfields 2003” from which liberation of pigeons within an 8-mile radius of named aerodromes is forbidden. Included in this list are Dublin and Cork Airports.

Following a AAIU power point presentation and discussion on the threat that Racing Pigeons pose to aircraft, including a briefing on the 19 April 2003 incident, it was agreed by the various representatives present that liberations would no longer occur on the East Coast, namely Arklow and Wexford, but that they would move liberations inland to Tramore and points Westward. This new policy was to be implemented forthwith in the interests of aviation safety and racing pigeon clubs would be so notified by the Parent Unions. This move of liberations Westward has, in fact, already occurred.

It was pointed out by the Chairman that it should be clearly understood that if these liberation points do still not address the problem of Racing Pigeons crossing airports, particularly Dublin, then more formal, perhaps regulatory methods, may have to be introduced to enforce safe liberation areas and timely formal notification to ATC centres en route.

At this time, the UK Civil Aviation Authority (CAA) advised that there is no UK legislation as such in relation to Racing Pigeons, however, there is an “Agreement” with RPRA, who control about 80% of the clubs, on not releasing birds within 8 miles of listed airfields. The CAA confirmed that they are currently working on a new set of Rules, which will be easy to understand and comply with, which will make notification, formal and verbal, obligatory to ATC centres.

FINAL REPORT

2.2 National Bird Hazard Committee

In accordance with ICAO requirements, the National Bird Hazard Committee in Ireland annually collates the information for their Bird Strike Information System (IBIS). The NBHC is comprised of all civil aircraft and airport operators, the IAA and the Air Corps. The Dublin Airport Authority kindly supplies the services of a Consultant Ornithologist, and organises Wildlife Management Control Courses at State and non-State Airports and Agencies.

The Committee meets twice a year and circulates the minutes of its meetings to interested parties. Attendees include:

Aer Lingus
Cityjet
Connaught International Airport
Cork Airport Authority
Donegal International Airport
Dublin Airport Authority, Dublin Airport
Galway Airport
Irish Aviation Authority (IAA)
Irish Aer Corps
Irish Airline Pilots Association (IALPA)
Kerry Airport
Ryanair, Dublin Airport
Shannon Airport Authority
Sligo Airport
Waterford Regional Airport
Dr. Tom Kelly, Consultant Ornithologist.

The NBHC provided the following statistics to ICAO. In 2003 there were 77 confirmed bird strike reports that occurred at eight airports in Ireland, and 108 in 2004. The average weight per bird is 500 g. Of these strikes, only one involved racing pigeons.

2.3 Bird strike initiatives

In January 2005, the IAA issued "*Guidelines for the release of Racing Pigeons*" in Ireland (See **Appendix C**).

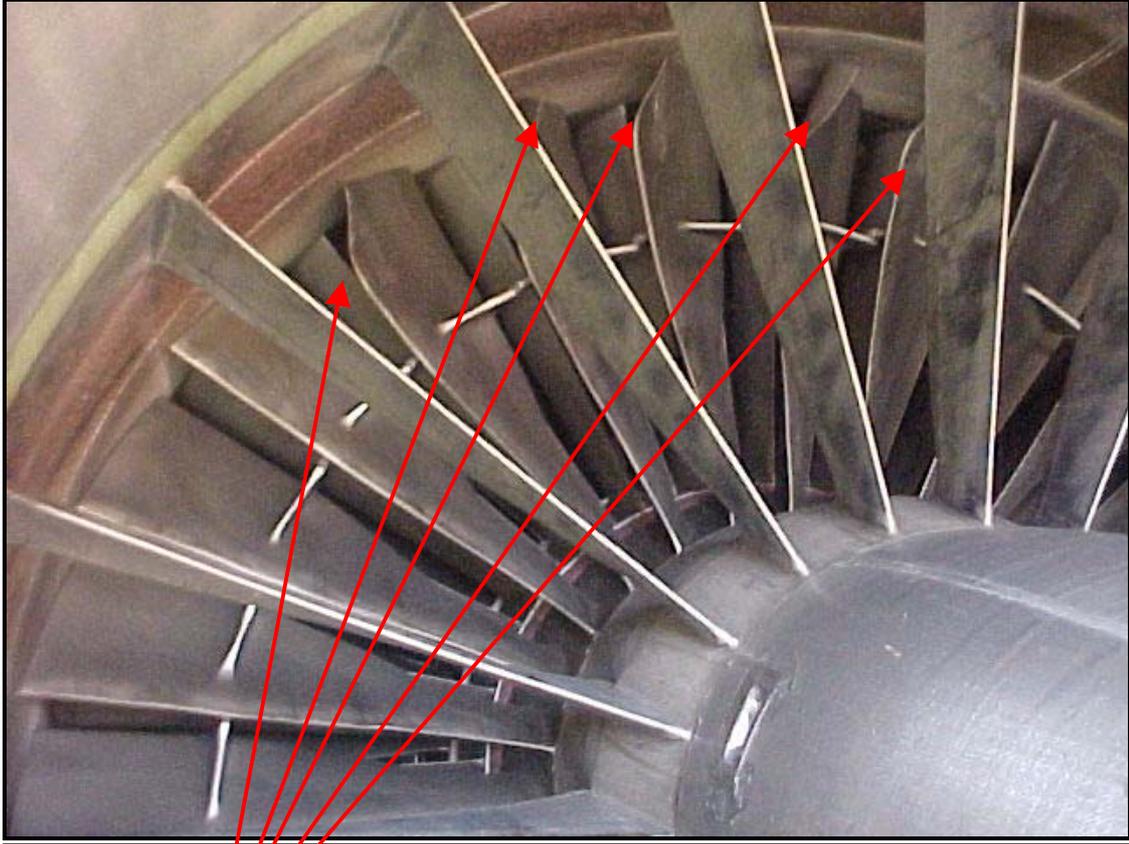
The NBHC has organised, with the kind permission of the Minister of Defence and the Dublin Airport Authority, for the routes taken by large pigeon liberations to be tracked by a military helicopter. The consultant Ornithologist member of the NBHC will report on these studies at the end of the 2005 pigeon racing season.

3. General

All aircraft Aviation Agencies and Aerodrome Operators are encouraged to recognise the continuing threat to Aviation Safety posed by Wildlife, and in particular birds, and to continue to support the bird hazard prevention policies laid down by ICAO.

FINAL REPORT

Appendix A



Fan blade assembly damage

FINAL REPORT

Appendix B

Extract Annex 14 (Aerodromes)

9.4 Bird hazard reduction

9.4.1 The bird strike hazard on, or in the vicinity of, an aerodrome shall be assessed through:

- a) The establishment of a national procedure for recording and reporting bird strikes to aircraft; and
- b) The collection of information from aircraft operators, airport personnel, etc on the presence of birds on or around the aerodrome constituting a potential hazard to aircraft operations.

9.4.2 **Recommendation.** – *Bird Strike reports should be collected and forwarded to ICAO for inclusion in the ICAO Bird Strike Information System (IBIS) database.*

Note.- The IBIS is designed to collect and disseminate information on bird strikes to aircraft. Information on the system is included in the Manual on the ICAO Bird Strike Information System (IBIS).

9.4.3. When a bird strike hazard is identified at an aerodrome, the appropriate authority shall take action to decrease the number of birds constituting a potential hazard to aircraft operations by adopting measures for discouraging their presence on, or in the vicinity of, an aerodrome.

Note.- Guidance on effective measures for establishing whether or not birds, on or near an aerodrome, constitute a potential hazard to aircraft operations, and on methods for discouraging their presence, is given in the Airport Services Manual, Part 3.

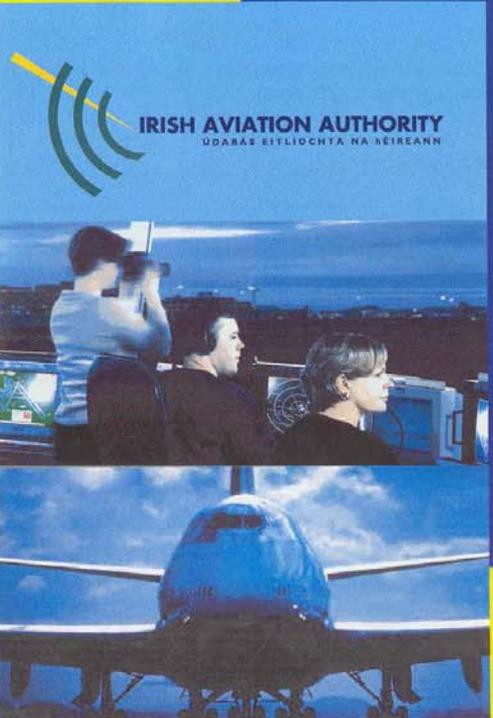
9.4.4 The appropriate authority shall take action to eliminate or to prevent the establishment of garbage disposal dumps or any such other source attracting bird activity on, or in the vicinity of, an aerodrome unless an appropriate aeronautical study indicates that they are unlikely to create conditions conducive to a bird hazard problem.

Note.- Due consideration needs to be given to airport operators' concerns related to land developments close to the airport boundary that may attract birds/wildlife.

Additional material is contained in supplements to Annex 14 including land use in the vicinity of Airfields.

FINAL REPORT

Appendix C



IRISH AVIATION AUTHORITY
UDARAS EITLÍOCHTA NA hÉIREANN

Guidelines for the release of Racing Pigeons

Issued by the Safety Regulation Division of the Irish Aviation Authority
www.iaa.ie

Introduction

The Irish Aviation Authority have issued the following guidelines for the release of racing pigeons for the purpose of ensuring the safety of aircraft and the passengers and crew traveling therein. These are available to all Racing Pigeon Clubs and all owners of racing pigeons on request.

Why are racing pigeons a hazard for aircraft?

Racing pigeons are a predictable hazard to both civil and military aviation. There are four main reasons why they are hazardous to aircraft. Firstly they are heavy birds – weighing at least 450g i.e. almost half a kilo.



Secondly they fly in flocks, which, in the case of pigeon races may involve 30,000 birds. Flocks cause multiple bird strikes i.e. where several or many birds strike an aircraft. This in turn increases the risk of a bird or birds entering a jet engine. Modern commercial jet transporters (e.g. Boeing 737, 767, 777, A321 and A330) have 2 very large diameter engine intakes, so the risk of birds entering both engines increases when a flock strikes the aircraft.

Thirdly, racing pigeons travel at speeds of up to 70 mph, which means that there may be insufficient time for pilots and or birds to take evasive action thus increasing the risk of collision.

Fourthly, racing pigeons fly at low altitudes of the order of 300ft and therefore if a collision occurs it happens as the aircraft is at a critical phase of flight having either just taken off or when it is about to land.

In addition, racing pigeons do not usually respond to conventional bird control measures at airports and as they are wild animals, their behaviour is predictable only to a limited extent.

Military aircraft have been lost due to bird strikes with racing pigeons and, in 2003, an executive jet crashed (and all on board were killed) near Milan (Linate) airport following a collision

with racing pigeons. There are numerous cases of serious damage to aircraft at Dublin Airport caused by strikes with racing pigeons.

It is recommended therefore that the actions set out overleaf concerning the release of racing pigeons and related matters are adhered to.

The following photographs show the damage which bird strikes have caused to aircraft.

Example 1



Example 2



FINAL REPORT

What is being done to reduce this hazard?

Airports are required by the International Civil Aviation Organisation (ICAO) to manage the bird hazard. The most effective means of doing so is to manage the environment in the vicinity of an airport so that it does not attract birds. Typically airports object to planning applications for landfill sites close to the airport, adopt a long grass policy and ensure that areas of standing water within the airfield are eliminated. Many other measures are taken on a daily basis to manage the hazard such as playing audio tapes of distress calls, driving along the runway firing shots from a Verrey pistol and suspending aircraft movements if bird activity warrants such action.

A register of all bird strikes is maintained by the State and annual statistics are reported to ICAO. All bird strikes are investigated in order to determine the species of bird involved and the circumstance of the incident. This work is done so that action can be taken to prevent a similar incident occurring at some future date.

Action required by Racing Pigeon Clubs and Pigeon Owners to minimise this hazard.

- a A calendar of planned races should be supplied to the Irish Aviation Authority and to all airport authorities listed overleaf prior to the start of the racing season.
- b A list, with accompanying telephone numbers and email addresses, if available, of reliable and available contact persons from the pigeon clubs, updated where necessary, should be sent to the Irish Aviation Authority and to the airport authorities with the racing calendar.
- c In the event that the date of a scheduled race is changed a nominated person should complete a "Notification of Mass Liberation of Racing Pigeons" form, see overleaf, at least 10 days before a planned liberation and return to:

Aerodrome and Airspace Standards Department

Irish Aviation Authority

Aviation House

Hawkins Street Tel: 01 603 8655

Dublin 2 Fax: 01 677 4460

Cont. ⇨

- d It is recommended that releases involving large numbers of birds should be avoided within 50km of the east coast of Ireland so as to prevent large numbers of birds crossing the approaches to Dublin Airport.

However, liberations of birds may be undertaken

- i south of the Dublin Mountains where the intended route of the birds is to the south
 - ii north of Lusk where the intended route is to the north
- e If liberating large numbers of birds within 10 km of an airport, please phone the relevant airport 1 hour in advance with the precise liberation time (telephone numbers overleaf).
 - f If there are any changes to the times of the race programme then a nominated person should contact each relevant airport as early as possible where the anticipated route of the birds is likely to bring them close to the airport.
 - g A nominated person should contact the relevant ATC Station Manager when birds have been released; see contact numbers for airports and ATC Centres overleaf.

Summary

Racing pigeons are a significant hazard for the safety of aircraft. In order to reduce the risk of a bird strike it is essential that these guidelines are complied with and that communication is established and maintained with the relevant airports.



These guidelines should not be taken as a guarantee that an accident due to a bird strike with racing pigeons will not occur. They are merely the minimum safety standards that should be followed in order to try to prevent such an occurrence

Notification of Mass Liberation of Racing Pigeons

(Please tear off and return form to the Irish Aviation Authority Fax: 01 6774460)

Liberation Point: _____

Date & Time of Liberation: _____

Estimated Number of Birds in the Liberation: _____

Contact Name: _____

Contact Address: _____

Contact Telephone No.: _____

Contact Telephone No. on Race Day: _____

Signature: _____

Date: _____

Contact Numbers Airports and ATC Centres

The contact numbers for relevant airport Air Traffic Control Services are as follows:

Dublin Apt: 01 8445962	Donegal Apt: 074 9548604
Shannon Apt: 061 472284	Galway Apt: 091 770730
Cork Apt: 021 4329668	Sligo Apt: 071 9168461
Kerry Apt: 066 9764794	Waterford Apt: 051 875589
Knock Apt: 094 9367055	

The contact numbers for Aer Rianta airports are as follows:

Dublin – Airside Duty Manager:	Tel: 01 814 4724
	Mobile: 087 289 2222
Shannon – Duty Manager:	Tel: 061 712312
	Mobile: 087 8885023
Cork – Duty Manager:	Tel: 021 4329659
	Mobile: 087 4194332