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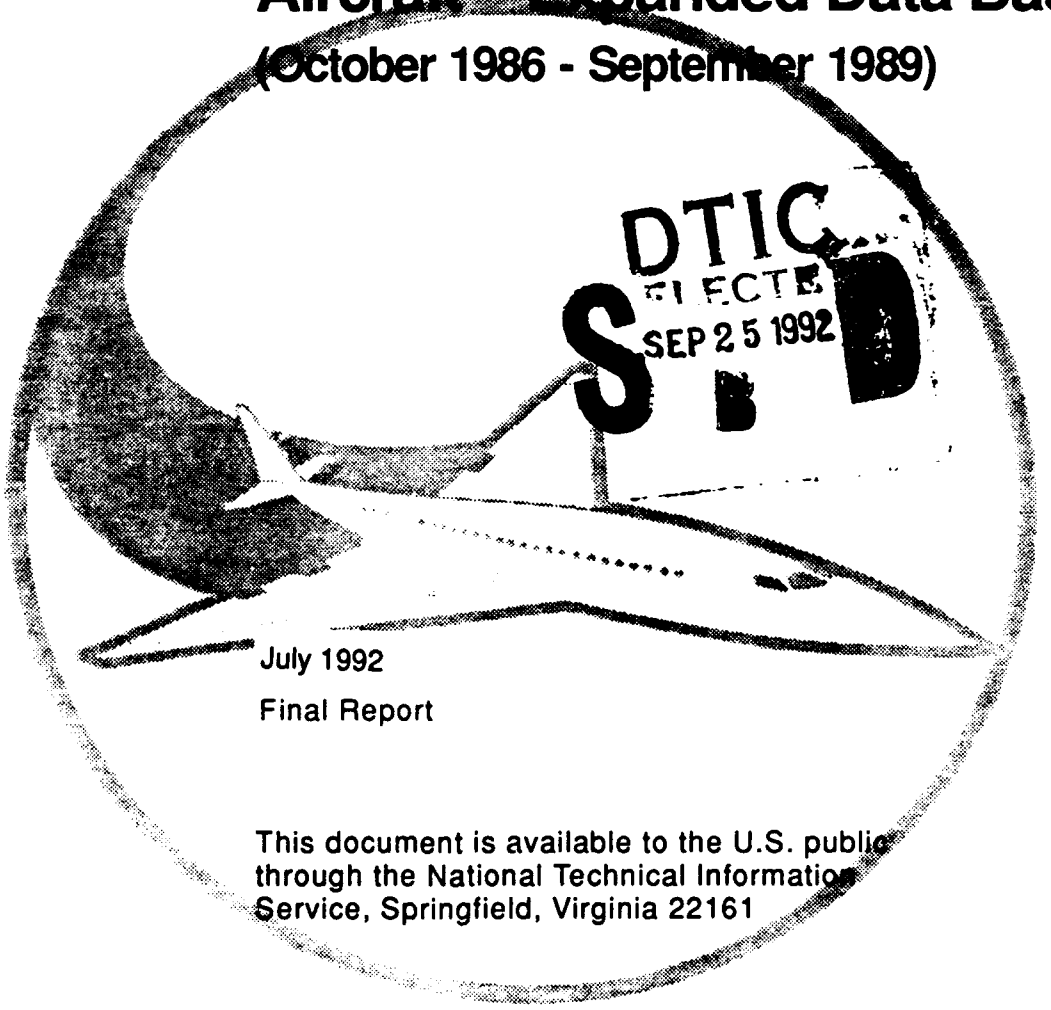
FAA Technical Center
Atlantic City International Airport
N.J. 08405

Engine Bird Ingestion Experience of the Boeing 737 Aircraft - Expanded Data Base (October 1986 - September 1989)



July 1992

Final Report

U.S. Department of Transportation
Federal Aviation Administration

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16. Abstract

DOT/FAA/CT-89/16 covers the period from October 1986 to September 1987
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The Federal Aviation Administration (FAA) Technical Center initiated a study in October 1986 to determine the numbers, weights, and species of birds which are being ingested into medium and large inlet area turbofan engines and to determine what damage, if any, results. Bird ingestion data were collected for the Boeing-737 model aircraft which uses either the Pratt and Whitney JT8D medium inlet area turbofan engine or the CFM International CFM56 large inlet area turbofan engine. This report analyzes the entire 3 years of data collected by the engine manufacturers, the FAA, and the International Civil Aviation Organization (ICAO) during the period from October 1986 through September 1989.

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FOREWORD

This final report provides descriptive and statistical analyses of the data collected over a 3-year period on bird ingestion experiences for the B737 aircraft. The data described in this report were collected under separate Federal Aviation Administration (FAA) contracts with the engine manufacturers, by the FAA, and by the International Civil Aviation Organization (ICAO). This is the second report on the 3-year data collection period. At the time when the first report (number DOT/FAA/CT-90/28) was prepared, the ICAO bird ingestion data were not available for the full 3-year period. This report represents an update of the first report with the ICAO data included in the descriptive and statistical analyses.

The report was prepared by the University of Dayton under Department of Transportation, Federal Aviation Administration Contract DTFA03-88-C-00024. The principal investigator at the University of Dayton was Dr. Peter W. Hovey, and computer support was provided by Mr. Donald A. Skinn. Mr Joseph Wilson was co-author and the technical project monitor for the FAA during the preparation of the report.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF ILLUSTRATIONS (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

EXECUTIVE SUMMARY

An investigation was initiated by the Federal Aviation Administration (FAA) Technical Center in September 1986 to determine the numbers, weights, and species of birds which are ingested into medium and large inlet area turbofan engines during worldwide service operation and to determine what damage, if any, results. This report summarizes the three years of Boeing-737 (B737) data that were collected by the engine manufacturers, the FAA, and the International Civil Aviation Organization (ICAO) as part of a separate data collection.

This report includes the ICAO data in the statistical analysis. The previous report (report number DOT/FAA/CT-90/28 [1]) was based only on the three years of data collected by the engine manufacturers and the FAA because only the first two years of ICAO data were available. Previous reports covered just the first year of data (report number DOT/FAA/CT-89/16 [2]) and the first two years of data (report number DOT/FAA/CT-89/29 [3]).

The main difference between this report and the previous report is that there is a substantial increase in the number of foreign bird ingestion events that were reported. There was no change in the total number of B737 operations so that an increase in reported ingestion events results in an increase in estimated ingestion rates and probabilities for foreign operations. The statistical tests that were performed throughout the report were not significantly affected by the increased data.

Figure E-1 is an overall summary of the data that were collected during the 3 years of this investigation which extended from October 1986 through September 1989. A total of 8.91 million aircraft operations were flown by B737 commercial aircraft during the 3-year period. B737 aircraft equipped with Pratt and Whitney JT8D medium inlet area turbofan engines accounted for 71.8 percent of these flights. The remaining 28.2 percent of the flights were made by B737 aircraft having CFM International CFM56 large inlet area turbofan engines.

During the three years of data collection, birds were ingested by one or both engines during 1,410 aircraft operations which yields a probability of aircraft ingestion of 1.58×10^{-4}. One or more birds were ingested into both engines of the aircraft during 58 of the 1,410 aircraft ingestion events. Thus, a total of 1,468 engine ingestion events were reported during the data collection period. There were 17.82 million engine operations during this period which yields a probability of engine ingestion of 8.24×10^{-5}. A conclusion of these data is that bird ingestion events are rare, but probable events.

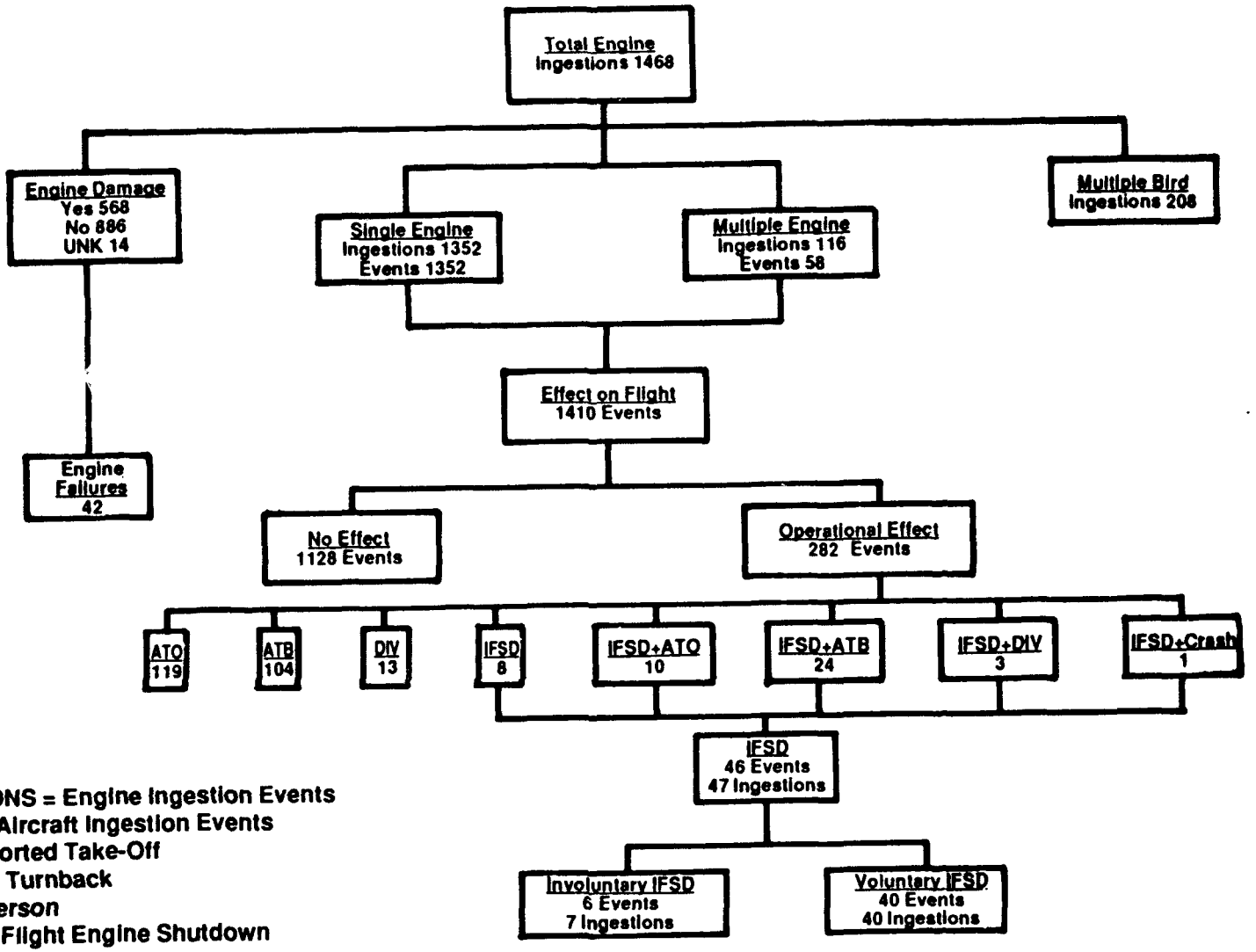
The species of the ingested bird was reliably identified 253 times. The order charadriiformes (shorebirds) was most frequently represented with 99 ingested birds. The majority of ingested birds (238) weighed 40 ounces or less. The bird weight distribution of ingested birds in the United States was different from the distribution in foreign countries. The median bird weight in the United States was 4 ounces higher than abroad; however, the domestic mean bird weight was 1.9 ounces lower than abroad. The bird ingestion rate within the United States was significantly lower than the foreign bird ingestion rate.

The majority of engine ingestion events (1,208 of 1,468) involved a single bird and a single engine on the aircraft. The remaining 260 engine ingestion events involved 144 single engine, multiple bird events, 23 dual engine, single bird aircraft ingestion events (46 engine ingestion events), or 35 dual engine, multiple bird aircraft ingestion events (70 engine ingestion events). Multiple birds were ingested in both engines in 29 of the 35 dual engine, multiple bird aircraft ingestion events which resulted in 208 multiple bird engine ingestion events. There were a total of 58 dual engine aircraft ingestion events which when combined with the 144 single engine, multiple bird engine ingestion events totaled to 202 aircraft ingestion events involving multiple engines and/or multiple birds.

Engine damage occurred in 39 percent of all engine ingestion events, and there were 180 engine ingestions that resulted in engine damage classified as moderately severe or worse. The majority of bird ingestions resulted in little or no engine damage.

The majority (856 of 1054) of aircraft ingestion events, for which the phase of flight was known, occurred within the airport environment during takeoff and landing. The probability of engine damage is greater when the bird ingestion occurs during the takeoff and climb phases of flight than when it occurs during approach and landing. Aircraft airspeed at or above 140 knots also increases the probability of engine damage.

It was determined that 2.9 percent of all engine bird ingestion events resulted in an engine failure. Eight engine failures were caused by birds that weighed less than or equal to 1 pound. Engine failures are also more likely to occur when multiple birds are ingested into an engine.



INGESTIONS = Engine Ingestion Events
Events = Aircraft Ingestion Events
ATO = Aborted Take-Off
ATB = Air Turnback
DIV = Diverson
IFSD = In-Flight Engine Shutdown

Figure E-1. 737 AIRCRAFT ENGINE BIRD INGESTION STUDY DATA SUMMARY (3 YEARS OF DATA, 10/86 TO 9/89)

The following summary shows the most pertinent statistics extracted fr the three years of data for the B737 aircraft:

Median Bird Weight (oz)* Worldwide	10.0
Mode Bird Weight (oz)** Worldwide	40.0
Probability of Ingestion Per Aircraft Operation	
Worldwide	1.58×10^{-4}
United States	0.63×10^{-4}
Foreign	2.70×10^{-4}
Most Commonly Ingested Bird	
United States	Dove/Gull
Foreign	Gull/Lapwing
Engines Experiencing Moderate/Severe Damage	180
Multiple Bird, Engine Ingestion Events	208
Dual Engine Aircraft Ingestion Events	58
Dual Engine, Multiple Bird Aircraft Ingestion Events	35
Single Engine, Multiple Bird Aircraft Ingestion Events	144
Aircraft Ingestion Events By Phase-of-Flight	
Takeoff and Climb Phase-of-Flight	60.7%
Approach and Landing	36.7%
Airports Reporting Bird Ingestions	409
Ratio of Reported Events to Aircraft Operations	
United States	0.63×10^{-4}
Foreign	2.70×10^{-4}

* Divides the weights into two groups with half the weights below the median and half above.

** The weight that has the highest frequency.

SECTION 1
INTRODUCTION

1.1 BACKGROUND.

Contention for airspace between birds and airplanes has created a serious bird/aircraft strike hazard. Past studies [1,2,3,4] have indicated that birdstrikes to engines are statistically rare events. The probability of a birdstrike during any given flight is extremely low; however, when the number of flights is considered, the number of birdstrikes becomes significant.

The windshield and the engines are particularly vulnerable to the birdstrike threat. Although penetration of the windshield by a bird is primarily a concern for military airplanes operating at high speeds in a low-altitude environment, such a penetration has occurred on a civilian airplane resulting in the death of the co-pilot. Ingestion of birds into turbine engines is a safety problem for commercial as well as military airplanes for it can cause significant damage to the engine resulting in degraded engine performance and very possibly failure.

In their studies of bird ingestions on commercial flights, both Hovey [1,2,3] and Frings [4] indicated that nearly all bird ingestion events have occurred in the vicinity of airports during the non-cruise phases of flight. This is understandable because these phases of flight naturally occur closer to the ground where bird concentrations are higher, resulting in a higher probability of birdstrike.

The solutions to the problem of engine damage resulting from bird ingestion are similar to those for windshield birdstrike, e.g., structural design consideration to withstand impact or bird avoidance. Bird avoidance can be facilitated by either of two approaches: (1) keeping airplanes out of airspaces with large bird concentrations, and (2) removing birds from these regions of airspace. The bird avoidance approach can have various degrees of success or failure for commercial air fleets because flight schedules place airplanes in specific areas at specific times and the effectiveness of airport bird control programs (if any) varies from airport to airport and country to country.

Structural design of engines to withstand bird ingestions can be accomplished provided that requirements with respect to bird weights and numbers can be identified. Bird ingestion data for medium/large inlet area turbofan engines and small inlet area turbine engines [5,6] have been collected by several engine manufacturers. Statistical evaluation of bird ingestion data from these data collection efforts and previous bird ingestion studies will be useful in re-evaluating certification test criteria specified in Federal Aviation Administration (FAA) Regulation 14 CFR 33.77. As a result, future turbine engines can be designed to withstand more realistic bird threats.

1.2 OBJECTIVES.

The objective of this report is to determine the relationship of bird weight, number of birds ingested, geographic location, season, time of day,

phase of flight, and engine type to the frequency of bird ingestion events and the extent of engine damage, if any, resulting from the ingested birds. The statistical analysis of reported bird ingestions experienced by commercial B737 aircraft worldwide over a 3-year reporting period is used to summarize the service threat and level of engine damage experienced by these aircraft. The findings of the analysis will be helpful in defining minimum engine design requirements for resistance to damage as a result of bird ingestions. Moreover, this study will provide a comparison between the experiences of a contemporary high bypass ratio turbofan engine (CFM56) and an older low bypass ratio turbofan engine with a smaller inlet (JT8D) exposed to similar aircraft-bird ingestion environments.

This is the second report on the 3-year data collection period. There were three major sources of bird ingestion data for the 3-year period: the engine manufacturers, the FAA, and the ICAO. At the time the first report was prepared, the data from ICAO were not available for the full 3-year period. This report represents an update of the first report with the ICAO data included in the analyses.

1.3 ORGANIZATION OF REPORT.

Section 2 defines, discusses, and differentiates airport operations and aircraft operations. Section 3 identifies the characteristics of bird species that have been ingested and reliably identified. Section 4 describes bird ingestion rates by location, engine type, and phase of flight. Section 5 provides a geographic placement of bird ingestion events throughout the world. Section 6 summarizes engine damage resulting from bird ingestions. Section 7 examines the probabilities of various bird ingestion events. Section 8 summarizes the changes in the second edition and discusses the quality of the data collected in this study by examining the sources of the data and evaluating the consistency of the data from the first year to the third year. Section 9 provides a summary of the results obtained from this data analysis. Section 10 provides literature references. Section 11 is a glossary of terms.

SECTION 2
AIRCRAFT OPERATIONS AND AIRPORT OPERATIONS

Aircraft operations and airport operations data are used to determine bird ingestion rates. Operations data (and their sources) used to generate bird ingestion rates are discussed in this section. Definitions are provided to aid in understanding these data.

An aircraft operation as defined in the glossary is a nonstop flight from one airport (departure airport) to another airport (arrival airport) and consists of seven phases of flight which include: (1) taxi-out, (2) takeoff, (3) climb, (4) cruise, (5) approach, (6) landing, and (7) taxi-in. An airport operation is considered either a departure from or an arrival at an airport. When all scheduled flights are considered, the number of airport operations is twice the number of aircraft operations.

The Official Airline Guide (OAG) is the data source for scheduled airport operations. Counts of airport operations involving B737 airplanes were extracted from OAG magnetic tapes and maintained by airport code. The counts were further categorized by month of year and hour of day so that seasonal and time of day analyses could be performed.

Table 2.1 presents the OAG airport operations counts by seasonal months for the 3-year period. The counts are also broken down by several geographic regions. Table 2.2 presents the same airport operations counts as Table 2.1; however, an adjustment for hemisphere has been made. It should be noted that the number of aircraft operations for each of these categories is one-half the number of airport operations. Frings [4] defines autumn in the Northern Hemisphere and spring in the Southern Hemisphere as the months September, October, and November. The collection period for each year of B737 data was October through the following September. Consistency with Frings is maintained in Table 2.1 and Table 2.2 by grouping operations counts for October and November with the operations counts of the following September.

Table 2.3 presents two cross tabulations of airport operations by month and OAG destination-arrival code. The first tabulation includes all airports at which one or more B737 operations were scheduled during the reporting period. The second tabulation is a subset of the first and includes only those airports at which a bird ingestion event was reported during the 3-year period. The destination-arrival code is taken directly from the OAG tapes and its values are presented as a footnote in Table 2.3.

A tabulation of aircraft operations by engine type and geographic region is required to obtain bird ingestion rates for these parameters. Table 2.4 presents a tabulation of B737 aircraft operations by engine type and geographic region for the reporting period. The OAG operations data identify implicitly the geographic region through the airport code and also identify explicitly whether the airplane is a B737; however, the engine type of the airplane is not reliably identified in the OAG data. The aircraft operations presented in the ALL ENGINES column of Table 2.4 are derived by dividing the airport operations in the TOTAL column of Table 2.1 by 2. The aircraft operations for the CFM56 engine were provided by the engine manufacturer as actual flights flown during the reporting period and are considered reliable.

Similar data were not available for the JT8D engine. The JT8D aircraft operations were therefore derived by subtracting the CFM56 aircraft operations from the total aircraft operations for both engines.

The engine manufacturers provided the FAA with a listing of monthly operations counts for their respective engine types; however, the counts did not agree with the OAG counts. Monthly percentages for each engine type were calculated from the engine manufacturer's data and subsequently applied to the JT8D and CFM56 engine totals in Table 2.4 to estimate monthly aircraft operations for the reporting period. Figure 2.1 is a histogram showing the estimated aircraft operations for each engine type.

TABLE 2.1 SCHEDULED OAG AIRPORT OPERATIONS BY SEASONAL MONTH
(OCTOBER 1986 THROUGH SEPTEMBER 1989)

	SEASONAL MONTHS				
Geographic Location	Mar-May	Jun-Aug	Sep-Nov	Dec-Feb	Total
Contiguous US					
Oct'86-Sep'87	728,180	762,922	685,560	681,306	2,857,968
Oct'87-Sep'88	758,076	775,265	758,049	756,956	3,048,346
Oct'88-Sep'89	815,708	838,195	791,297	777,947	3,223,147
Three Year Total	2,301,964	2,376,382	2,234,906	2,216,209	9,129,461
United States					
Oct'86-Sep'87	771,231	807,492	726,309	722,461	3,027,493
Oct'87-Sep'88	801,058	819,890	800,388	798,613	3,219,949
Oct'88-Sep'89	862,495	889,311	836,328	822,768	3,410,902
Three Year Total	2,434,784	2,516,693	2,363,025	2,343,842	9,658,344
Foreign					
Oct'86-Sep'87	619,425	647,640	604,935	591,679	2,463,679
Oct'87-Sep'88	688,874	722,608	668,398	650,891	2,730,771
Oct'88-Sep'89	747,501	778,335	730,340	712,736	2,968,912
Three Year Total	2,055,800	2,148,583	2,003,673	1,955,306	8,163,362
Northern Hemisphere					
Oct'86-Sep'87	1,235,767	1,296,951	1,181,268	1,166,794	4,880,780
Oct'87-Sep'88	1,314,164	1,357,068	1,295,982	1,277,954	5,245,168
Oct'88-Sep'89	1,413,677	1,456,381	1,370,619	1,344,256	5,584,933
Three Year Total	3,963,608	4,110,400	3,847,869	3,789,004	15,710,881
Southern Hemisphere					
Oct'86-Sep'87	154,889	158,181	149,976	147,346	610,392
Oct'87-Sep'88	175,768	185,430	172,804	171,550	705,552
Oct'88-Sep'89	196,319	211,265	196,049	191,248	794,881
Three Year Total	526,976	554,876	518,829	510,144	2,110,825
Worldwide					
Oct'86-Sep'87	1,390,656	1,455,132	1,331,244	1,314,140	5,491,172
Oct'87-Sep'88	1,489,932	1,542,498	1,468,786	1,449,504	5,950,720
Oct'88-Sep'89	1,609,996	1,667,646	1,566,668	1,535,504	6,379,814
Three Year Total	4,490,584	4,665,276	4,366,698	4,299,148	17,821,706

TABLE 2.2 SCHEDULED OAG AIRPORT OPERATIONS BY SEASON
(OCTOBER 1986 THROUGH SEPTEMBER 1989)

Geographic Location	Spring	Summer	Autumn	Winter	Total
	---------- SEASONS OF THE YEAR ----------				
Contiguous US					
Oct'86-Sep'87	728,180	762,922	685,560	681,306	2,857,968
Oct'87-Sep'88	758,076	775,265	758,049	756,956	3,048,346
Oct'88-Sep'89	815,708	838,195	791,297	777,947	3,223,147
Three Year Total	2,301,964	2,376,382	2,234,906	2,216,209	9,129,461
United States					
Oct'86-Sep'87	771,231	807,492	726,309	722,461	3,027,493
Oct'87-Sep'88	801,058	819,890	800,388	798,613	3,219,949
Oct'88-Sep'89	862,495	889,311	836,328	822,768	3,410,902
Three Year Total	2,434,784	2,516,693	2,363,025	2,343,842	9,658,344
Foreign					
Oct'86-Sep'87	614,512	636,805	609,848	602,514	2,463,679
Oct'87-Sep'88	685,910	708,728	671,362	664,771	2,730,771
Oct'88-Sep'89	747,231	758,318	730,610	732,753	2,968,912
Three Year Total	2,047,653	2,103,851	2,011,820	2,000,038	8,163,362
Northern Hemisphere					
Oct'86-Sep'87	1,235,767	1,296,951	1,181,268	1,166,794	4,880,780
Oct'87-Sep'88	1,314,164	1,357,068	1,295,982	1,277,954	5,245,168
Oct'88-Sep'89	1,413,677	1,456,381	1,370,619	1,344,256	5,584,933
Three Year Total	3,963,608	4,110,400	3,847,869	3,789,004	15,710,881
Southern Hemisphere					
Oct'86-Sep'87	149,976	147,346	154,889	158,181	610,392
Oct'87-Sep'88	172,804	171,550	175,768	185,430	705,552
Oct'88-Sep'89	196,049	191,248	196,319	211,265	794,881
Three Year Total	518,829	510,144	526,976	554,876	2,110,825
Worldwide					
Oct'86-Sep'87	1,385,743	1,444,297	1,336,157	1,324,975	5,491,172
Oct'87-Sep'88	1,486,968	1,528,618	1,471,750	1,463,384	5,950,720
Oct'88-Sep'89	1,609,726	1,647,629	1,566,938	1,555,521	6,379,814
Three Year Total	4,482,437	4,620,544	4,374,845	4,343,880	17,821,706

TABLE 2.3 OAG AIRPORT OPERATIONS BY MONTH (OCTOBER 1986 THROUGH SEPTEMBER 1989)

ALL AIRPORTS WITH SCHEDULED B737 OPERATONS

MONTH	OAG DESTINATION-ARRIVAL CODES** (0)	(1)	(2)	(3)	(4)	(Total)
OCT	641,872	776,446	11,516	212	8,986	1,439,032
NOV	630,484	750,104	11,174	146	9,064	1,400,972
DEC	653,862	786,540	12,090	108	10,228	1,462,828
JAN	661,904	791,504	12,556	174	9,682	1,475,820
FEB	607,282	733,084	11,566	174	8,394	1,360,500
MAR	669,266	805,420	12,456	180	8,934	1,496,256
APR	661,436	783,124	11,738	212	8,130	1,464,640
MAY	693,966	814,452	12,124	264	8,882	1,529,688
JUN	685,538	803,792	13,042	182	9,100	1,511,654
JUL	708,036	831,962	13,700	290	10,008	1,563,996
AUG	720,400	845,508	13,336	350	10,032	1,589,626
SEP	700,354	804,790	12,440	364	8,746	1,483,634
TOTAL	8,034,400	9,526,726	147,738	2,656	110,186	17,821,706

AIRPORTS EXPERIENCING BIRD INGESTIONS DURING REPORTING PERIOD

MONTH	OAG DESTINATION-ARRIVAL CODES** (0)	(1)	(2)	(3)	(4)	(Total)
OCT	409,604	602,384	8,376	212	5,729	1,026,305
NOV	406,442	583,757	7,811	146	5,691	1,003,847
DEC	421,210	611,970	8,349	108	6,348	1,047,985
JAN	426,326	616,496	8,668	174	6,079	1,057,743
FEB	392,519	572,802	7,958	174	5,315	978,768
MAR	432,869	629,646	8,483	180	5,790	1,076,968
APR	427,835	611,822	8,084	212	5,359	1,053,312
MAY	450,877	638,458	8,484	264	5,860	1,103,943
JUN	447,965	629,500	9,118	182	5,997	1,092,762
JUL	459,566	649,333	9,370	290	6,550	1,125,109
AUG	466,043	660,417	9,063	350	6,528	1,142,401
SEP	453,994	627,456	8,646	364	5,842	1,096,302
TOTAL	5,195,250	7,434,041	102,410	2,656	71,088	12,805,445

** =0 Any Carrier. Operation begins and ends out of the US.
=1 Domestic Carrier. Operation begins and ends in the US.
=2 Domestic Carrier. Departure or arrival, but not both, in the US.
=3 Foreign Carrier. Operation begins and ends in the US.
=4 Foreign Carrier. Departure or arrival, but not both, in the US.

TABLE 2.4 SCHEDULED AIRCRAFT OPERATIONS BY ENGINE TYPE

GEOGRAPHIC LOCATION	JT8D	CFM56	ALL ENGINES
United States			
Oct'86 - Sep'87	1,160,091	353,656	1,513,747
Oct'87 - Sep'88	1,082,543	527,431	1,609,974
Oct'88 - Sep'89	1,007,797	697,654	1,705,451
Three Year Total	3,250,431	1,578,741	4,829,172
Foreign			
Oct'86 - Sep'87	1,057,633	174,206	1,231,839
Oct'87 - Sep'88	1,062,971	302,415	1,365,386
Oct'88 - Sep'89	1,025,228	459,228	1,484,456
Three Year Total	3,145,832	935,849	4,081,681
Worldwide			
Oct'86 - Sep'87	2,217,724	527,862	2,745,586
Oct'87 - Sep'88	2,145,514	829,846	2,975,360
Oct'88 - Sep'89	2,033,025	1,156,882	3,189,907
Three Year Total	6,396,263	2,514,590	8,910,853

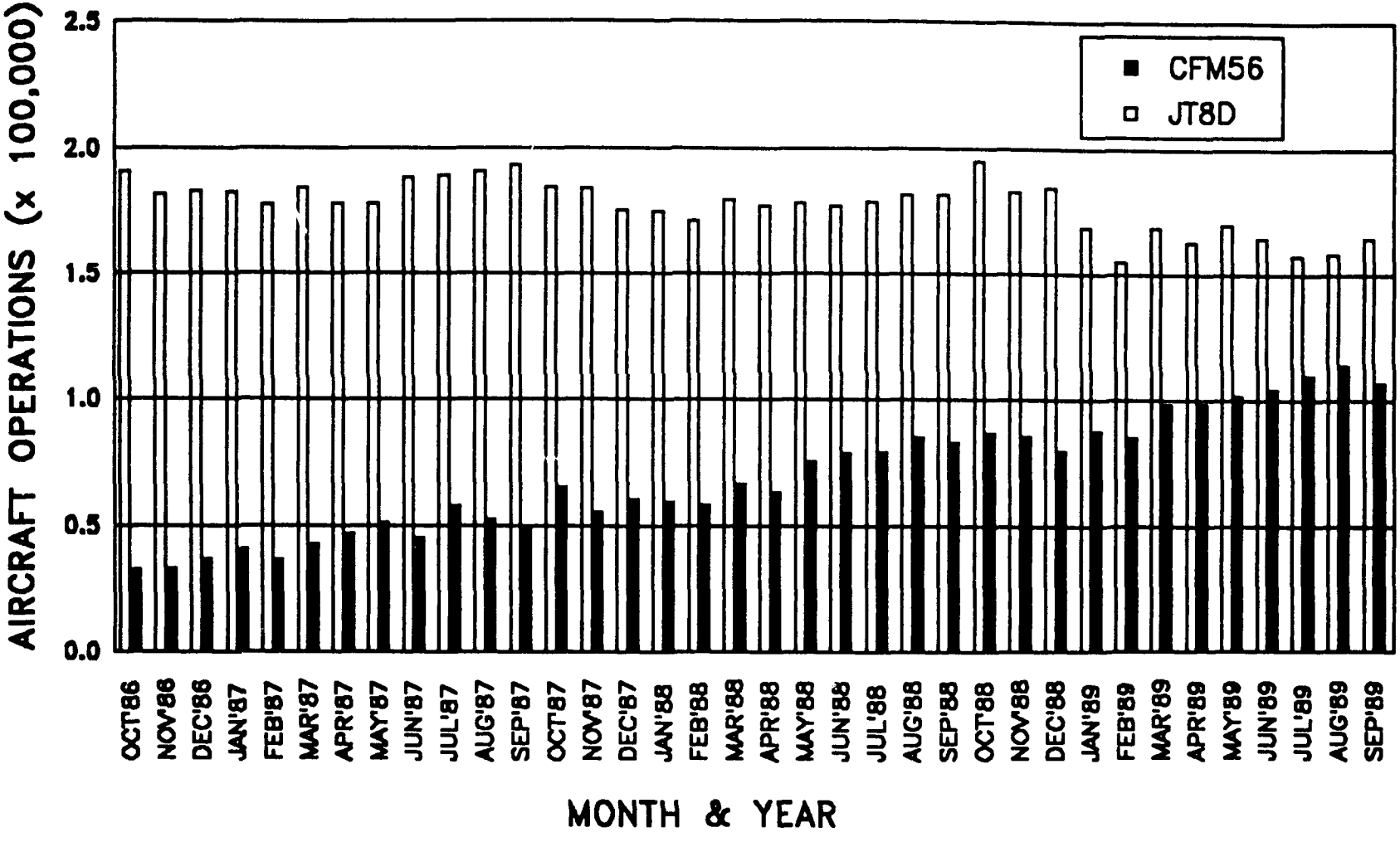


Figure 2.1. Histogram of Monthly Aircraft Operations by Engine Type.

SECTION 3
CHARACTERISTICS OF INGESTED BIRDS

This section provides a description of the birds that were ingested during the data collection period and an analysis of the extent of the bird ingestion threat. The bird related features that are described in this section include species, weight, seasonal trends, time of day trends, and geographic location.

A detailed breakdown of aircraft ingestion events in the United States is presented in Figures 3.1 and 3.2. Figure 3.1 is a contour map of the contiguous United States with the height of the contours being proportional to the number of aircraft ingestion events in each state while Figure 3.2 is a bar chart with the same information plus Alaska and Hawaii. Texas and California have the greatest number of ingestions followed by Hawaii, Florida, Illinois, and New York.

Table 3.1 provides a tally of all the species that were positively identified by an ornithologist during the collection period. The counts in the US, Foreign, and Overall columns of Table 3.1 indicate the number of aircraft ingestion events in which each bird species was ingested. The species are listed by order and family and it is apparent that the gulls, doves and lapwing/plover families of the order charadriiformes (shorebirds) are the most commonly ingested birds worldwide. The order columbiformes (doves/pigeons) appear to be a bird ingestion problem for the United States while the order falconiformes (hawks/vultures) poses a significant threat abroad.

One of the disappointing features of the B737 bird ingestion data base is the low bird identification rate. The bird species was positively identified in only 237 out of 1,410 aircraft ingestion events that were recorded giving a 16.8 percent identification rate. The identification rate for engine ingestion events in which an engine sustained damage (23.4 percent) was almost 74 percent greater than the identification rate for events which caused no engine damage (13.3 percent); which could indicate that the group of identified birds is biased to include more birds in the size and weight ranges that tend to damage engines when ingested. Any conclusions about the population of ingested birds should be viewed with the caution that the sample might be more representative of the population of birds that damage engines than of all birds that are ingested.

The species-related descriptions of ingested birds in this report probably provide a conservative view in that the birds that caused damage are better represented in the sample than birds that did not cause damage. The bird features that influence damage cannot be discerned, however, because of the possible bias in the identifications. That is, the differences between the birds that cause damage and the birds that don't cause damage cannot be readily identified since there is less information about the birds that didn't cause damage.

Table 3.2 is a frequency table of weights for the positively identified birds. The bird weights are derived from the species identification and when possible are adjusted for the age and sex of the ingested bird. The modes in

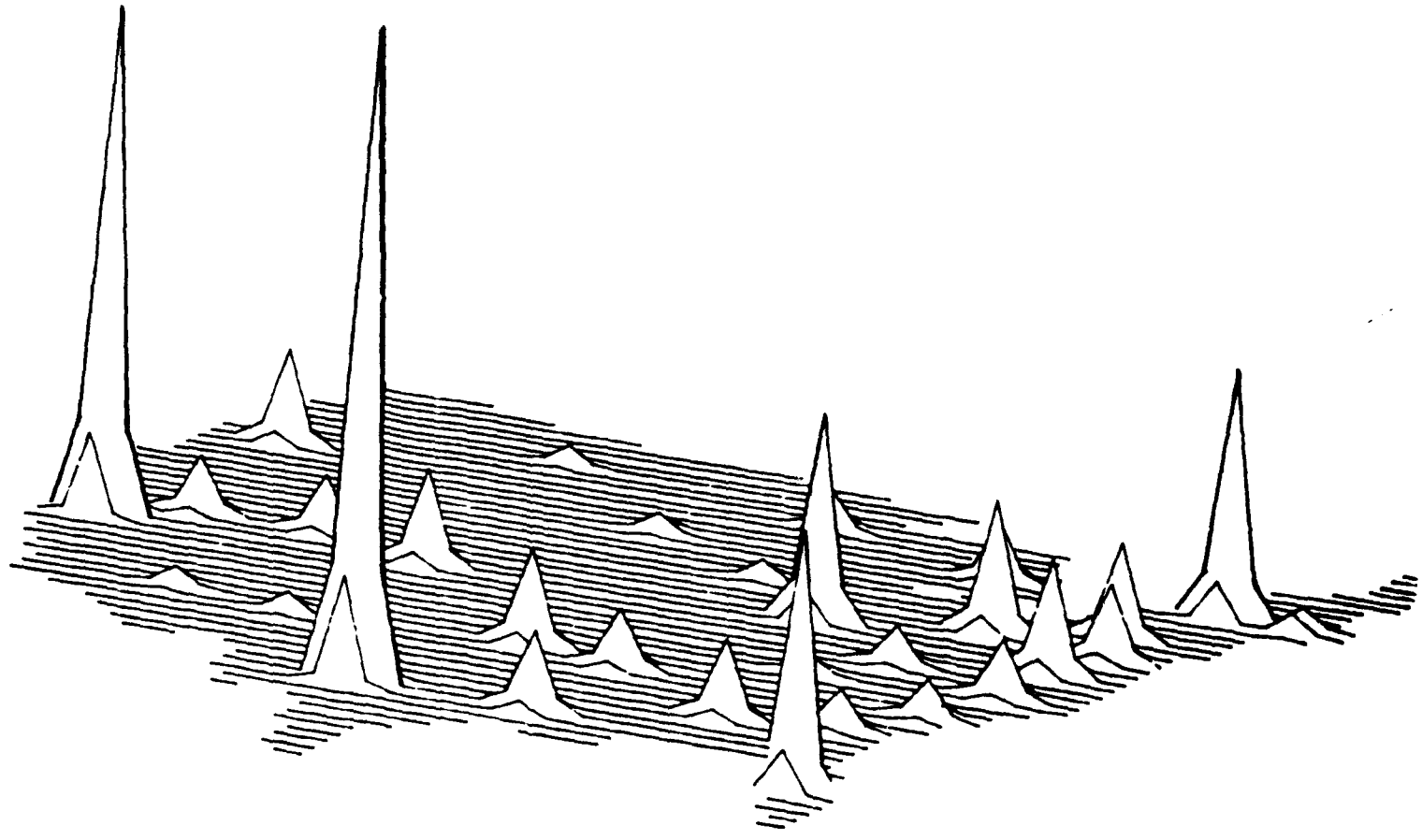


Figure 3.1 Contour Map of Domestic Aircraft Ingestion Events

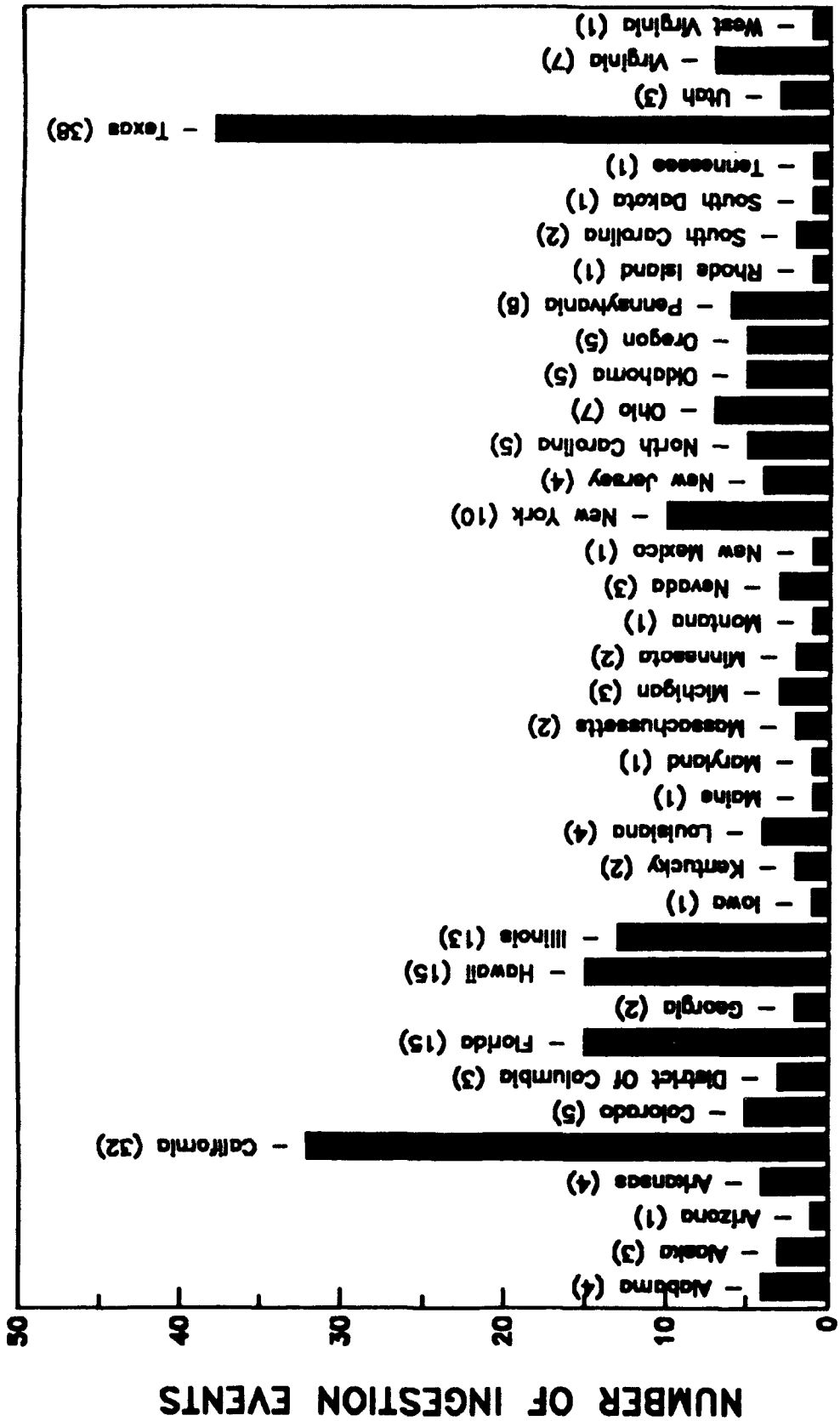


Figure 3.2. Histogram of Bird Ingestion Events by State.

TABLE 3.1 TALLY OF POSITIVELY IDENTIFIED BIRD SPECIES BROKEN DOWN BY US, FOREIGN, AND OVERALL (AIRCRAFT INGESTION EVENTS)

Latin Name	Common Name	Species Code	US	Foreign	Overall
Nycticorax nycticorax	Black-crowned night heron	1I24	1	0	1
Bubulcus ibis	Cattle egret	1I35	1	2	3
Egretta alba	Great egret	1I52	2	0	2
Hagedashia hagedash	Hadada ibis	6I12	0	3	3
Chen caerulescens	Snow goose	2J26	0	2	2
Branta canadensis	Canada goose	2J30	1	0	1
Anas americana	American wigeon	2J71	1	0	1
Anas platyrhynchos	Mallard	2J84	2	0	2
Coragyps atratus	Black vulture	1K4	0	1	1
Pandion haliaetus	Osprey	2K1	1	0	1
Milvus migrans	Black kite	3K28	0	8	8
Gyps bengalensis	Indian white-backed vulture	3K46	0	2	2
Aegypius monachus	Eurasian black vulture	3K55	0	1	1
Circus cyaneus	Northern marsh harrier	3K78	1	0	1
Accipiter nisus	European sparrow-hawk	3K103	0	2	2
Accipiter striatus	Sharp-shinned hawk	3K105	1	0	1
Geraonaetus melanoleucus	Gray eagle-buzzard	3K161	0	1	1
Buteo swainsonii	Swainson's hawk	3K171	1	1	2
Buteo buteo	Common buzzard	3K180	0	2	2
Falco sparverius	American kestrel	5K26	2	0	2
Falco tinnunculus	Eurasian kestrel	5K27	0	10	10
Falco berigora	Brown falcon	5K39	0	1	1
Alectoris rufa	Red-legged partridge	4L41	0	1	1
Alectoris barbara	Barbary partridge	4L42	0	1	1
Francolinus francolinus	Black francolin	4L44	0	1	1
Perdix perdix	Hungarian partridge	4L85	0	3	3
Phasianus colchicus	Ring-necked pheasant	4L161	1	0	1
Porsana carolina	Sora	7M84	1	0	1
Haematopus ostralegus	Common oystercatcher	4N1	0	1	1
Vanellus vanellus	Common lapwing	5N1	0	10	10
Vanellus spinosus	Spur-winged plover	5N4	0	2	2
Vanellus melanopterus	Black-winged plover	5N10	0	1	1
Vanellus coronatus	Crowned lapwing	5N11	0	2	2
Vanellus vanellus	Gray-headed lapwing	5N20	0	2	2
Vanellus miles	Masked plover	5N24	0	2	2
Pluvialis apricaria	Eurasian golden plover	5N25	2	1	3
Charadrius dubius	Little ringed plover	5N31	0	1	1
Charadrius vociferus	Killdeer	5N33	2	2	4
Numenius americanus	Long-billed curlew	6N12	1	0	1
Bartramia longicauda	Upland sandpiper	6N13	1	0	1
Gallinago gallinago	Common snipe	6N47	0	2	2
Burhinus oedicnemus	Eurasian stone-curlew	9N1	0	1	1
Burhinus capensis	Cape dikkop	9N4	0	2	2
Stiltia isabella	Australian courser	10N9	0	1	1
Stercorarius pomarinus	Pomarine jaeger	13N4	1	0	1
Larus delawarensis	Ring-billed gull	14N12	3	0	3
Larus canus	Common gull	14N13	10	3	13
Larus argentatus	Herring gull	14N14	7	11	18

TABLE 3.1 (CONCLUDED) TALLY OF POSITIVELY IDENTIFIED BIRD SPECIES BROKEN DOWN BY US, FOREIGN, AND OVERALL (AIRCRAFT INGESTION EVENTS)

Latin Name	Common Name	Species Code	US	Foreign	Overall
Larus fuscus	Lesser black-backed gull	14N17	0	1	1
Larus marinus	Great black-backed gull	14N21	0	1	1
Larus glaucescens	Glaucous-winged gull	14N22	1	2	3
Larus cirrocephalus	Gray-headed gull	14N29	0	1	1
Larus novaehollandiae	Silver gull	14N32	0	1	1
Larus maculipennis	Brown-hooded gull	14N35	0	3	3
Larus ridibundus	Common black-headed gull	14N36	1	16	17
Larus philadelphia	Bonaparte's gull	14N38	0	1	1
Columba livia	Common rock dove	2P1	8	3	11
Columba guinea	African speckled pigeon	2P4	0	1	1
Pterocles gutturalis	Common wood-pigeon	2P9	0	4	4
Streptopelia turtur	Common turtle dove	2P50	0	1	1
Streptopelia chinensis	Spotted dove	2P65	1	1	2
Geopelia striata	Zebra dove	2P102	1	0	1
Geopelia humeralis	Bar-shouldered dove	2P103	1	0	1
Zenaida macroura	American mourning dove	2P105	6	0	6
Zenaida auriculata	Eared Dove	2P106	0	1	1
Cacatua roseicapilla	Galah	1Q15	0	2	2
Cuculus canorus	Common cuckoo	2R15	0	3	3
Coccyzus americanus	Yellow-billed cuckoo	2R51	1	0	1
Tyto alba	Common barn owl	1S2	0	3	3
Athene noctua	Common little owl	2S100	0	1	1
Speotyto cunicularia	Burrowing owl	2S102	1	2	3
Asio flammeus	Short-eared owl	2S124	0	1	1
Chordeiles minor	Nighthawk	5T5	1	0	1
Chaetura pelagica	Chimney swift	1U33	1	0	1
Apus apus	Common swift	1U55	0	4	4
Aeronautes saxatalis	White-throated swift	1U71	1	0	1
Alauda arvensis	Common skylark	17Z72	0	2	2
Eremophila alpestris	Horned lark	17Z74	4	1	5
Progne subis	Purple martin	18Z12	1	0	1
Delichon urbica	Common house martin	18Z69	0	3	3
Sturnus vulgaris	Common starling	21Z75	4	1	5
Corvus brachyrhynchos	Common crow	22Z85	1	1	2
Corvus corone	Carrion crow	22Z94	0	1	1
Gymnorhina tibicen	Australian bell magpie	23Z7	0	1	1
Catharus ustulatus	Swainson's thrush	41Z246	1	0	1
Turdus merula	Common blackbird	41Z269	0	1	1
Turdus iliacus	Red-winged thrush	41Z281	0	1	1
Turdus philomelos	Common song thrush	41Z282	0	1	1
Turdus migratorius	American robin	41Z314	1	0	1
Icteria virens	Yellow-breasted chat	63Z69	1	0	1
Sturnella neglecta	Western meadowlark	64Z68	2	1	3
Zonotrichia albicollis	White-throated sparrow	68Z218	1	0	1
Passer domesticus	House sparrow	70Z12	0	1	1
			83	154	237

TABLE 3.2 WEIGHT DISTRIBUTION OF INGESTED BIRDS* BY ORIGIN

Weight Range (Oz)	United States			Foreign			Worldwide		
	Multiple Bird Events	Single Bird Events	Total Bird Events	Multiple Bird Events	Single Bird Events	Total Bird Events	Multiple Bird Events	Single Bird Events	Total Bird Events
(0 < x <= 4)	3	30	33	8	17	25	11	47	58
(4 < x <= 8)	0	7	7	13	29	42	13	36	49
(8 < x <= 12)	0	1	1	8	29	37	8	30	38
(12 < x <= 16)	6	19	25	4	13	17	10	32	42
(16 < x <= 20)	1	1	2	2	5	7	3	6	9
(20 < x <= 24)	0	2	2	1	1	2	1	3	4
(24 < x <= 28)	0	2	2	0	5	5	0	7	7
(28 < x <= 32)	0	0	0	0	6	6	0	6	6
(32 < x <= 36)	0	2	2	1	1	2	1	3	4
(36 < x <= 40)	2	8	10	5	6	11	7	14	21
(40 < x <= 44)	0	1	1	0	0	0	0	1	1
(44 < x <= 48)	0	0	0	0	4	4	0	4	4
•									
(52 < x <= 56)	0	2	2	1	0	1	1	2	3
(56 < x <= 60)	0	0	0	0	1	1	0	1	1
•									
(76 < x <= 80)	0	0	0	0	1	1	0	1	1
•									
(84 < x <= 88)	0	0	0	0	2	2	0	2	2
•									
(124 < x <= 128)	1	0	1	0	0	0	1	0	1
•									
(188 < x <= 192)	0	0	0	0	2	2	0	2	2
TOTAL	13	75	88	43	122	165	56	197	253

* Counted by Engine Ingestion Events

Table 3.2 therefore represent the weights of the more commonly identified bird species that were ingested. Figure 3.3 provides the same information in the form of a histogram. Most of the ingested birds (77.5 percent) that were identified in this study weighed less than or equal to 20 ounces; however, 6.7 percent weighed more than 20 ounces and less than or equal to 32 ounces and 15.8 percent of the identified birds weighed more than 2 pounds.

Summary statistics calculated from the raw data for the United States, foreign and worldwide bird weight distributions are presented in Table 3.3. Note that the weight of one ingested bird per event is included in the bird weight distribution for multiple bird engine ingestion events. The mean, median and mode are three different concepts for the typical or average value which measures the central tendency of the distribution. The mean bird weight is the sum of the bird weights for all ingestion events divided by the number of events included in the sum. The median weight divides the weights into two groups with half the weights below the median and half above. The mode of the bird weights is the weight that has the highest frequency in the data set. The median and mode are more relevant measures of the average for the bird ingestion problem. The mean weight would be important if damage were related to the cumulative weight of all birds ingested by a single engine since the mean is based on the total weight of the ingested birds.

A pattern suggestive of a sine function is seen in Figure 3.4 which is a bar chart of monthly bird ingestions for the data collection period. The cyclic pattern in aircraft ingestion events reflects seasonal bird activity. The start of a cyclic pattern is also seen in the ingestion rate data which indicates that the trends are due to the changing bird population and not changes in air traffic activity. Time trends in bird ingestions are further investigated on a seasonal basis in the following paragraphs.

The seasonal bird ingestion rates for the Northern and Southern Hemispheres, the United States and foreign countries and the whole world are presented in the bar chart of Figure 3.5. Here the ingestion rates are not being compared by engine type so the ingestion rate R is simply calculated as:

$$R = Ing \cdot \frac{10000}{Ops} \qquad (3.1)$$

where Ing is the number of ingestions and Ops is the number of aircraft operations in the time period being considered. The rate is expressed as ingestions per 10,000 aircraft operations.

Seasonal trends were investigated using a Chi-squared goodness-of-fit (GOF) analysis. The Chi-squared value for testing the hypothesis that the number of aircraft ingestion events does not vary with the seasons is 170.3. The critical value for testing at the five percent level of significance is 7.81 while the 0.5 percent level is 12.8; therefore, the high value of the test statistic is a very strong indication that ingestions do vary with the seasons.

The winter data were eliminated in an effort to better identify the nature of the differences between the seasons. Testing for the equality of the ingestions for spring, summer and autumn also yields a significant difference with a test statistic of 82.19 and a five percent critical value of

5.99 which is also a very strong indication that ingestions vary between spring, summer, and autumn. Further testing between summer and autumn produces a test statistic of 23.9 which is also much larger than the five percent critical value of 3.84 for comparing two groups. Seasonal ingestion rates rank highest to lowest with summer, autumn, spring, and winter.

The time of day distribution of bird ingestion events is illustrated in Figure 3.6 with time of day reduced to the four basic segments of morning, mid-day, evening and night. There is a noticeable drop in the number of ingestions at night and the Chi-squared test for equality of the four time periods indicates that they are not the same. The Chi-squared test statistic is 104.9 while the 99th percentile of the Chi-squared with three degrees of freedom distribution is 11.34.

There are two likely reasons for a drop in ingestions during the night. Birds are not generally nocturnal so that bird activity is reduced at night. Also, there are fewer flights scheduled at night. A lessened exposure due to fewer flights and fewer birds results in a reduction in the number of ingestions at night.

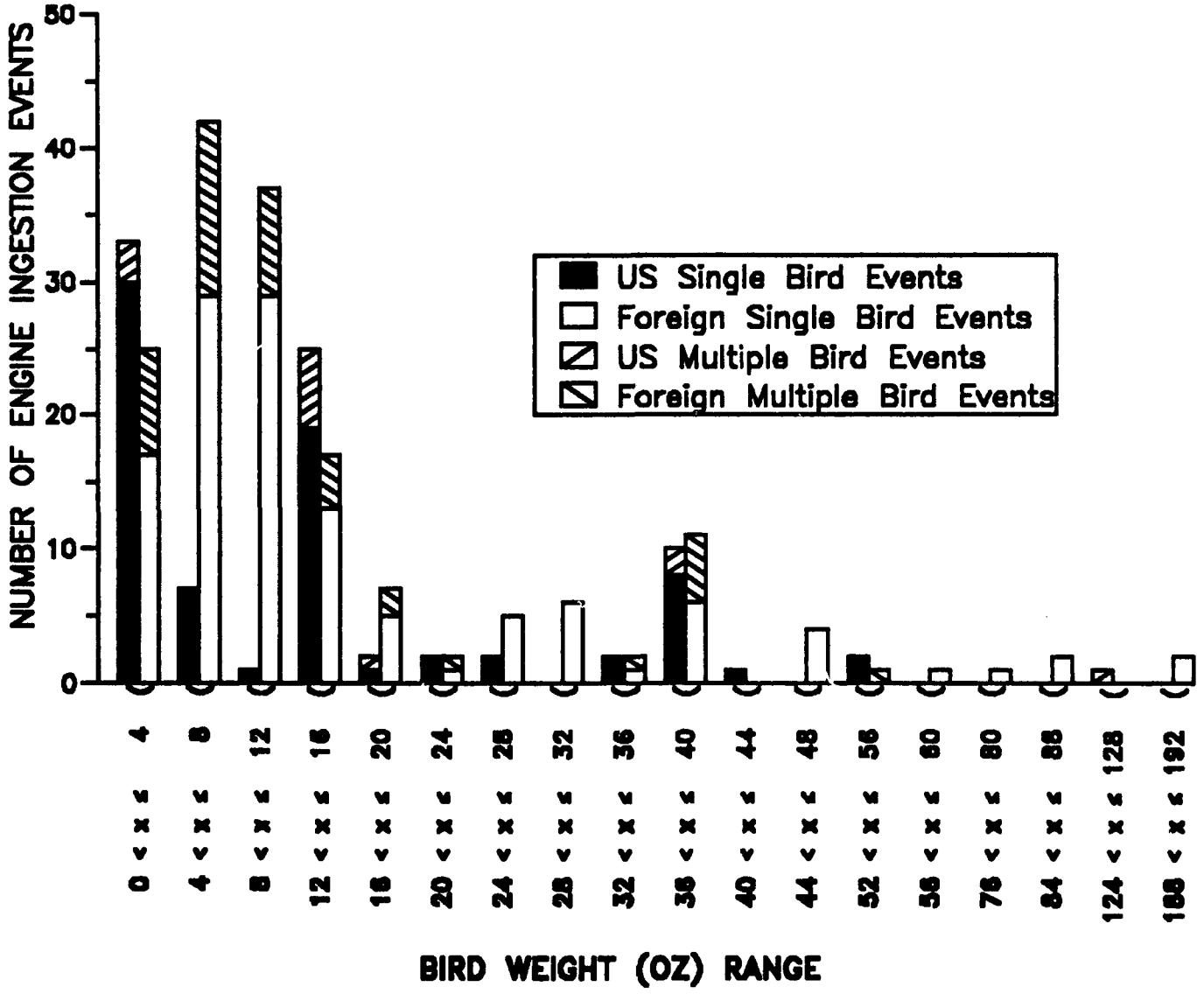


Figure 3.3. Histogram of Number of Birds Ingested by Weight Class.

TABLE 3.3 SUMMARY STATISTICS FOR INGESTED BIRD WEIGHTS

STATISTIC*	United States			Foreign			Worldwide		
	Multiple Bird Events	Single Bird Events	Total Bird Events	Multiple Bird Events	Single Bird Events	Total Bird Events	Multiple Bird Events	Single Bird Events	Total Bird Events
NUMBER OF EVENTS**	13	75	88	43	122	165	56	187	253
MODE(S)	14. 15.	4.	15.	7. 40.	10.	10. 40.	40.	40.	40.
MEDIAN	14.	6.0	14.	8.0	10.0	10.0	10.1	10.0	10.
MEAN (AVERAGE)	24.5	14.4	15.9	13.9	19.2	17.8	16.9	17.4	17.2
STD DEVIATION	33.15	14.54	18.56	13.49	27.79	24.94	20.39	23.71	22.90

* Bird Weights Given in Ounces

** Counted by Engine Ingestion Events

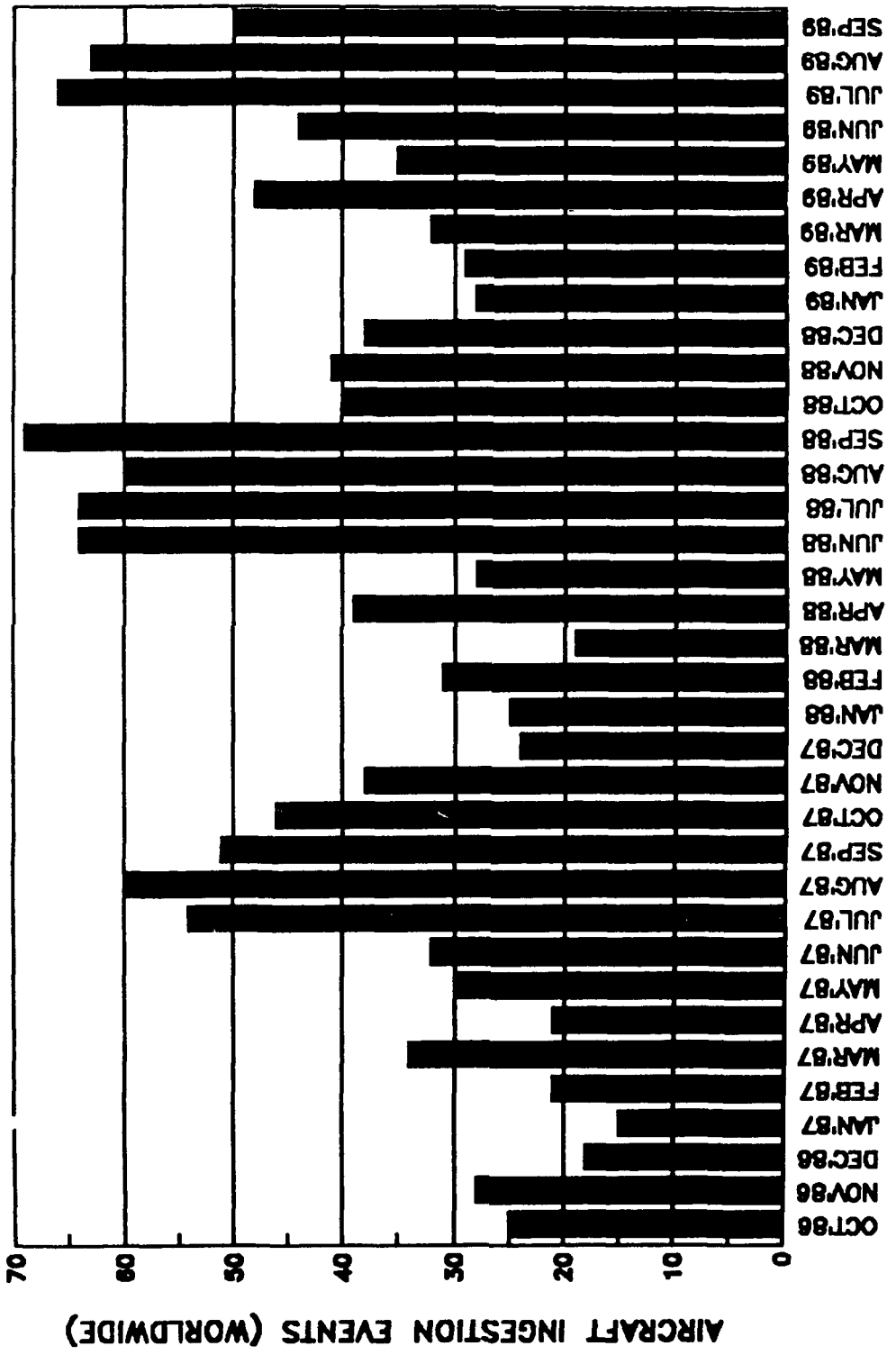


Figure 3.4. Histogram of Monthly Worldwide Aircraft Ingestion Events.

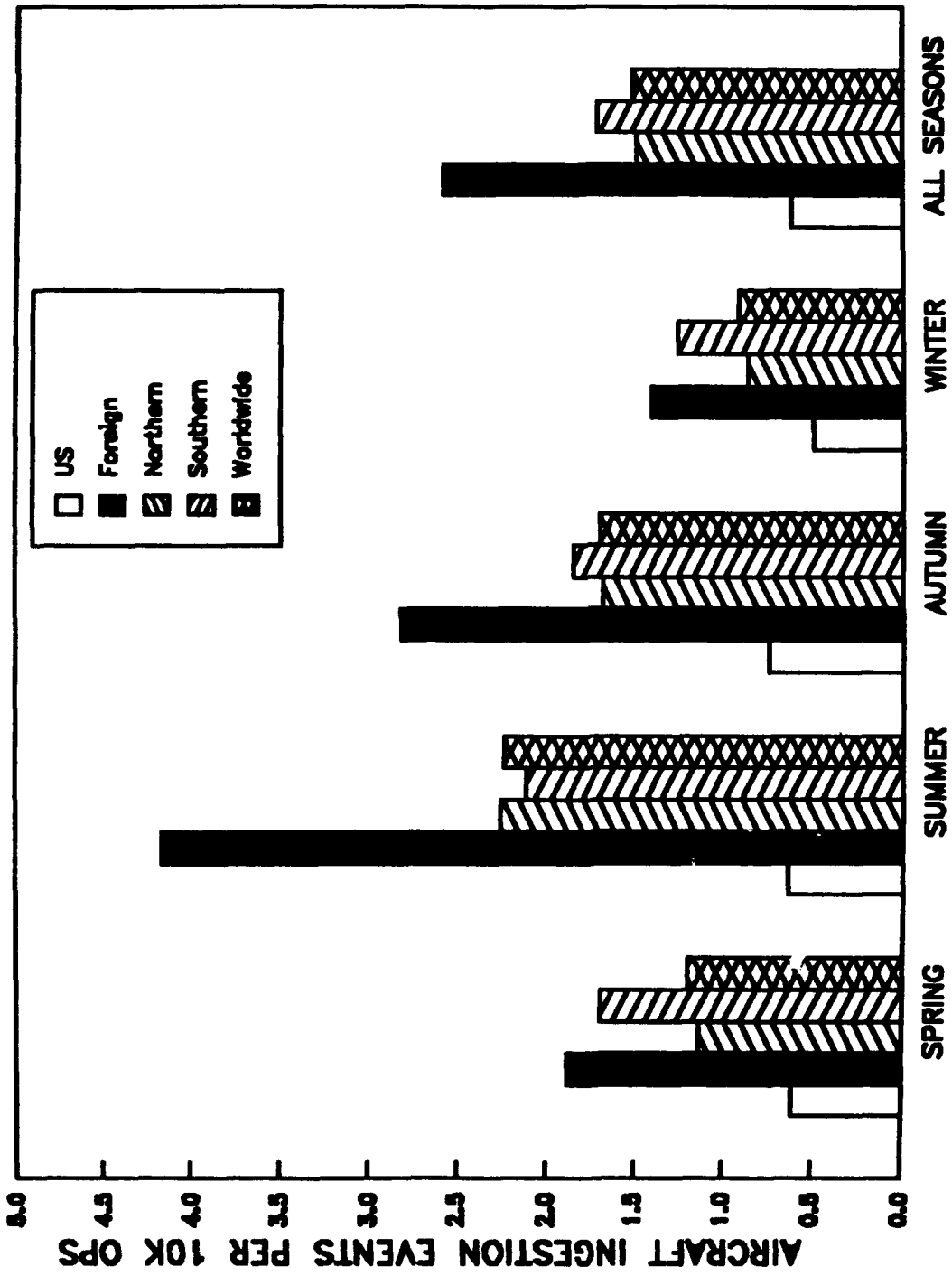


Figure 3.5. Histogram of Seasonal Aircraft Ingestion Rates.

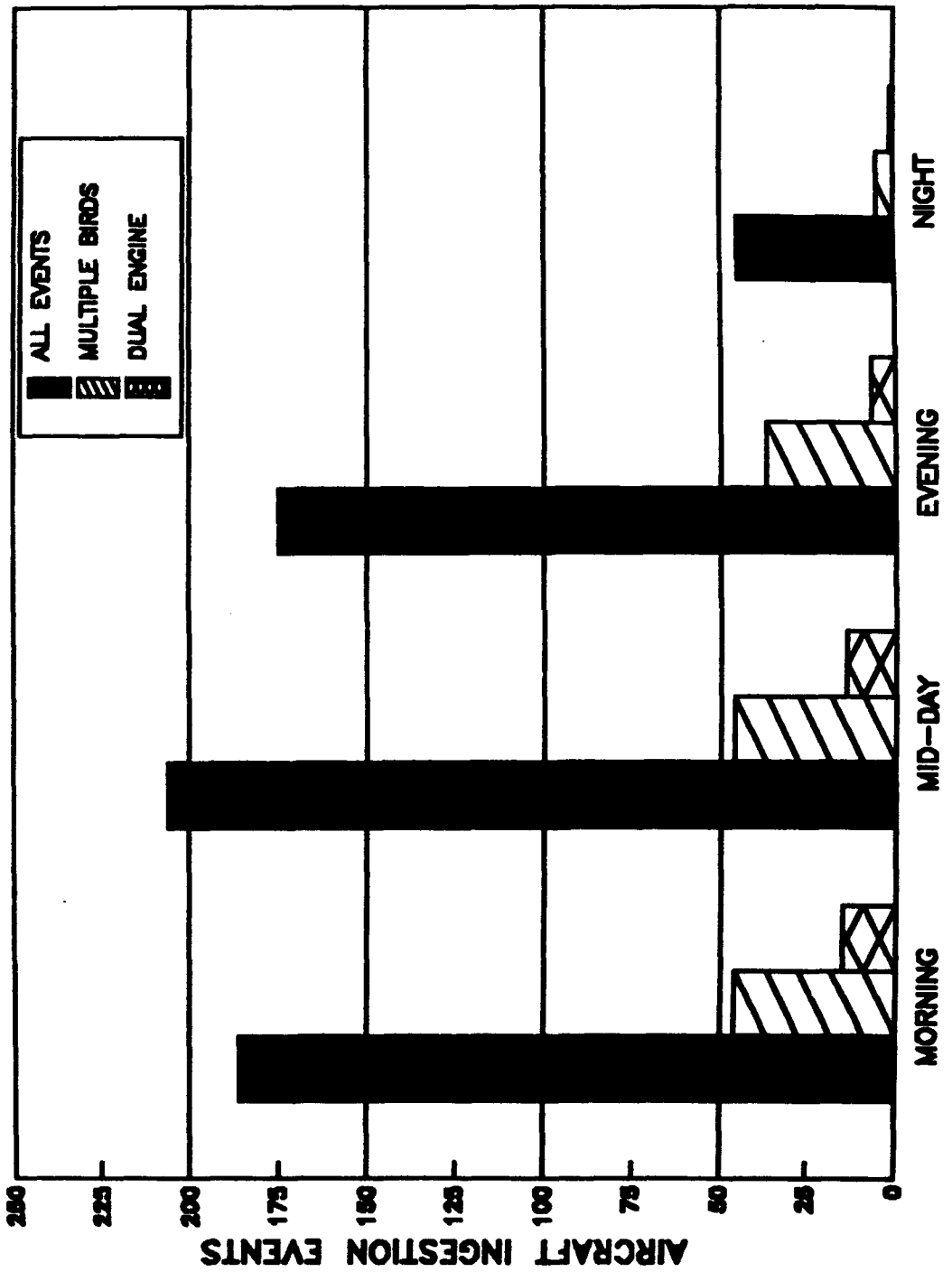


Figure 3.6. Histogram of Aircraft Ingestion Events by Time of Day.

SECTION 4
INGESTION RATES

This section describes the rates at which bird ingestions occurred during the 3-year collection period covered in this report. The Poisson distribution is commonly used to describe how events are randomly scattered in time and the bird ingestion data are shown to agree with the assumptions of a Poisson process. The first part of this section provides the estimates of the basic ingestion rates. The second part describes the Poisson distribution and how it relates to the bird ingestion events. The final parts discuss statistical analyses based on the assumption that bird ingestions follow a Poisson process.

4.1 INGESTION RATE ESTIMATES.

This sub-section provides a general description of ingestion rates broken down by location, engine and phase of flight. The rates are given in terms of ingestions per 10,000 aircraft operations and have been adjusted to the inlet area of the engine to allow size independent comparisons between engines. The inlet area used throughout this report is called the "fat lip area" and was specified by the Boeing Company for each type of engine installation. A more detailed statistical analysis of ingestion rates is covered in the next section using statistical techniques for Poisson processes.

Table 4.1A lists the United States, foreign and worldwide ingestion rates for both the JT8D and the CFM56 engines as well as a composite rate for all 737 aircraft. The inlet area adjustment was done using a 10-square-foot unit area on the basis of the total inlet area of both engines to keep the rates in a reasonable range. The composite rates in each geographical region are weighted means of the inlet area adjusted rates for the individual engines and are determined as follows: the number of ingestions per 10 square feet inlet area for each engine is projected by multiplying the rates by the number of aircraft operations. The composite rates are calculated by dividing the total projected ingestions for both engines by the total aircraft operations for the geographical region. Table 4.1B lists engine ingestion rates based on engine operations and normalized for the engine inlet area. The numbers in parentheses in Tables 4.1A and 4.1B reflect the number of ingestions where geographic location and/or engine type was not known.

The ingestion rates for the CFM56 engine were calculated using reported aircraft operations for specific geographical regions. The ingestion rates for the JT8D engine were calculated using estimated aircraft operations for specific geographical regions. The details of the calculation were presented in Section 3, equation 3.1.

Figure 4.1 shows monthly ingestion rates subdivided by engine type and adjusted for inlet area so that a comparison between engine types can be made. The adjusted monthly ingestion rate (R_{adj}) for an engine type is expressed as ingestions per 10 ft^2 per 10,000 aircraft operations is calculated as:

$$R_{adj} = Ing \cdot \frac{1440}{2\ IA} \cdot \frac{10000}{Ops} \qquad (4.1)$$

TABLE 4.1A

BREAKDOWN OF BIRD INGESTION RATES BY ENGINE AND LOCATION
(BASED ON AIRCRAFT OPERATIONS)

ENGINE TYPE:	JT8D	CFM56	ALL ENGINES
INLET AREA:*	2234 in^2	4606 in^2	N/A
UNITED STATES			
Aircraft Ingestion Events	136	151	304 (17)
OAG Aircraft Operations	3,250,431	1,578,741	4,829,172
Ingestion Rate (Ing/10K Ops)	0.42	0.96	0.63
Normalized Ingestion Rate (Ing/10K Ops/10ft^2)	0.27	0.30	0.28
FOREIGN			
Aircraft Ingestion Events	784	293	1,104 (27)
OAG Aircraft Operations	3,145,832	935,849	4,081,681
Ingestion Rate (Ing/10K Ops)	2.49	3.13	2.70
Normalized Ingestion Rate (Ing/10K Ops/10ft^2)	1.61	0.98	1.46
WORLDWIDE			
Aircraft Ingestion Events	921 (1)	445 (1)	1,410 (46)
OAG Aircraft Operations	6,396,263	2,514,590	8,910,853
Ingestion Rate (Ing/10K Ops)	1.44	1.77	1.58
Normalized Ingestion Rate (Ing/10K Ops/10ft^2)	0.93	0.55	0.82

*Total Area for 2 Engines

TABLE 4.1B

BREAKDOWN OF BIRD INGESTION RATES BY ENGINE AND LOCATION (BASED ON ENGINE OPERATIONS)

ENGINE TYPE:	JT8D	CFM56	ALL ENGINES
INLET AREA:	1117 in^2	2303 in^2	N/A
UNITED STATES			
Engine Ingestion Events	142	157	317 (18)
OAG Engine Operations	6,500,862	3,157,482	9,658,344
Ingestion Rate (Ing/10K Ops)	0.22	0.50	0.33
Normalized Ingestion Rate (Ing/10K Ops/$10ft^2$)	0.28	0.31	0.29
FOREIGN			
Engine Ingestion Events	811	310	1,149 (28)
OAG Engine Operations	6,291,664	1,871,698	8,163,362
Ingestion Rate (Ing/10K Ops)	1.29	1.66	1.41
Normalized Ingestion Rate (Ing/10K Ops/$10ft^2$)	1.66	1.04	1.52
WORLDWIDE			
Engine Ingestion Events	954 (1)	468 (1)	1,468 (48)
OAG Engine Operations	12,792,526	5,029,180	17,821,706
Ingestion Rate (Ing/10K Ops)	0.75	0.93	0.82
Normalized Ingestion Rate (Ing/10K Ops/$10ft^2$)	0.96	0.58	0.85

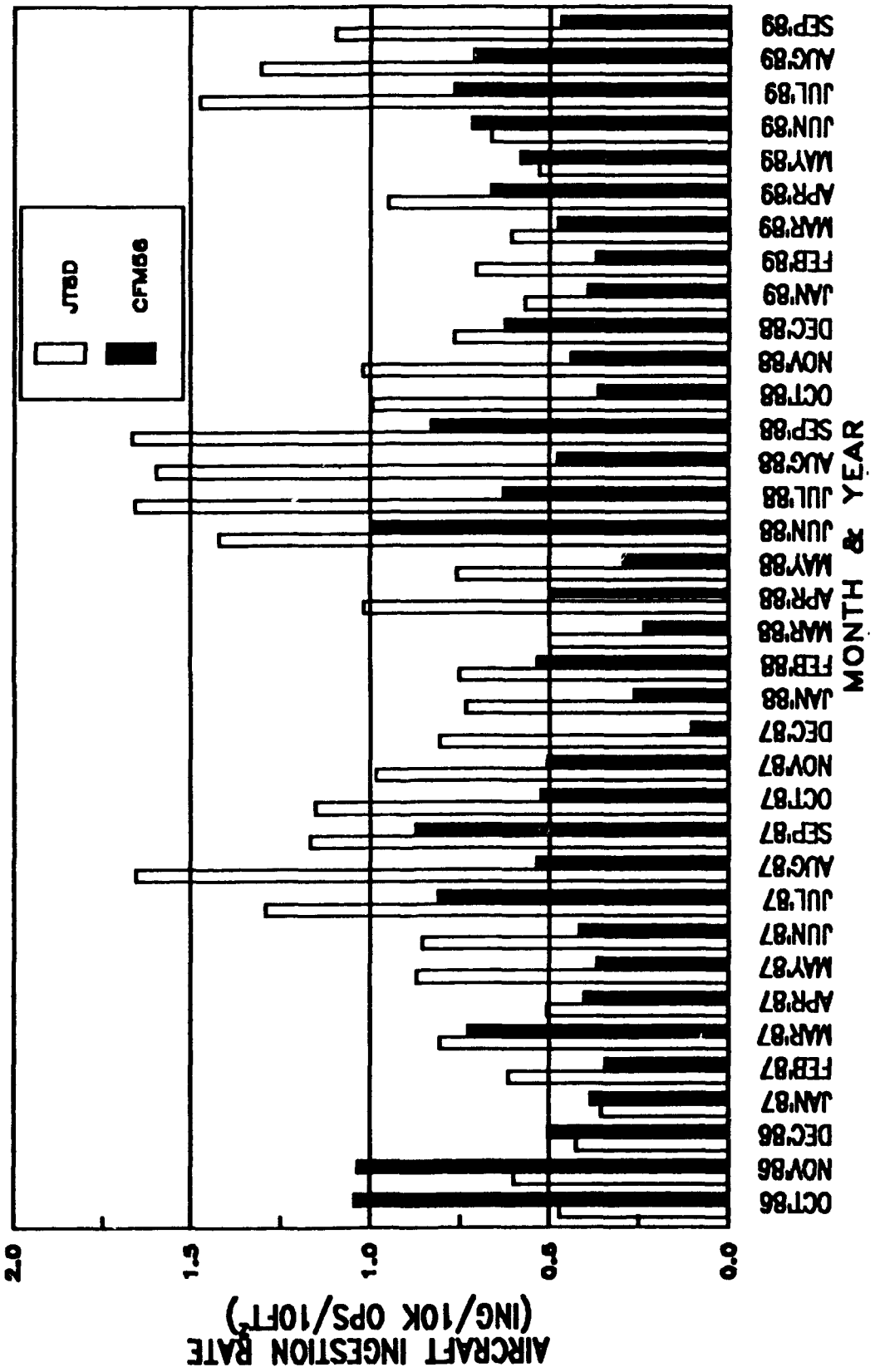


Figure 4.1. Histogram of Monthly Aircraft Ingestion Rates by Engine Type (Normalized for Inlet Area).

where Ing is the number of monthly aircraft ingestion events for an engine type, IA is the inlet area (in^2) of the engine type, and Ops is the number of aircraft operations for the month. Twice the engine area is used because there are two engines on each B737 aircraft. The constant 1440 is the factor for converting square inches to units of 10-square-foot areas.

The phase of flight ingestion rate tabulation is presented in Table 4.2A. The method used to calculate ingestion rate 1 is expressed in Equation 3.1. The area adjustment used for ingestion rate 2 is implemented using Equation 4.1. The highest ingestion rates were in the takeoff and landing phases followed by the climb and approach phases. There were very few ingestions during the taxi and cruise phases of flight. This pattern is typically seen in bird strike and bird ingestion studies and is indicative of the fact that airports are often located in desirable bird environs. Since birds congregate around airports there is a greater chance of striking or ingesting a bird during the phases of flight that take place close to the airports. Also, commercial airline cruise routes are well above the altitude in which birds are usually found. Table 4.2B lists engine ingestion rates as a function of phase of flight. The differences in ingestion rates between Tables 4.2A and 4.2B are due to multiple engine ingestion events.

4.2 THE POISSON PROCESS.

The Poisson process is the simplest type of stochastic process which describes how events are distributed in time. The Poisson process is here taken to govern aircraft ingestion events and the times at which they occur are random. In a Poisson process the events are distributed somewhat evenly in time so that it appears that the times at which the events occurred form a uniform distribution. This section describes some of the properties of Poisson processes that will be useful in describing bird ingestions and in testing hypotheses about bird ingestion rates.

The basis of a Poisson process is a description of the probability distribution of the number of events that occur in a given time interval. The formula for the probability of n events in an interval of length T is:

$$P(X(T)=n) = \frac{e^{-\lambda T}\ (\lambda T)^n}{n!} \qquad (4.2)$$

The parameter λ is the mean rate at which events occur and the mean number of events in the length T time interval is λT. The time scale that will be used in this study is number of aircraft operations. Ingestion rates are typically reported in events per 10,000 aircraft operations which implies the use of aircraft operations as the time scale in a Poisson process.

One derivation of the formula for the Poisson distribution is the limiting distribution of the binomial distribution for large sample sizes. If we assume that the probability of a bird ingestion is the same from flight to flight then the number of ingestions in a large number of flights has a binomial distribution. If the probability of ingestion is p and the number of flights is N then the probability that n ingestions occur in the N flights is:

$$P(X(N)=n) = \binom{N}{n} p^n (1-p)^{(N-n)} \qquad (4.3)$$

TABLE 4.2A INGESTION RATES FOR ENGINE TYPE BY PHASE OF FLIGHT
(BASED ON AIRCRAFT INGESTION EVENTS)

	PRATT-WHITNEY JT8D			CFMI CFM56			ALL ENGINES*		
INLET** AREA	2234 in^2			4606 in^2			---		
AIRCRAFT OPERATIONS	6,396,263			2,514,590			8,910,853		
PHASE OF FLIGHT	AIRCRAFT*** ING. EVENTS	INGEST† RATE 1	INGEST†† RATE 2	AIRCRAFT*** ING. EVENTS	INGEST† RATE 1	INGEST†† RATE 2	AIRCRAFT*** ING. EVENTS	INGEST† RATE 1	INGEST††† RATE 2
Parked	1	.002	.001	0	---	---	1	.001	.001
Taxi	6	.009	.006	4	.016	.005	10	.011	.006
Takeoff	540	.844	.544	189	.752	.235	729	.818	.457
Climb	60	.094	.060	54	.215	.067	114	.128	.062
Cruise	6	.009	.006	12	.048	.015	18	.020	.009
Approach	64	.100	.064	44	.175	.055	108	.121	.062
Landing	243	.380	.245	142	.565	.177	385	.432	.226
Other	1	.002	.001	0	---	---	1	.001	.001
All Phases	921	1.440	.928	445	1.770	.553	1366	1.533	.822

* Includes Only Events Where Engine Type Known

** Total Area of 2 Engines

*** Contains Proprated Apportionment of Events with Unknown Phase of Flight

† Ingestion Events Per 10,000 Operations

†† Ingestion Events Per 10,000 Operations Per 10 ft^2

††† Function of JT8D Rate 2, CFM56 Rate 2, and Corresponding Operations

TABLE 4.2B INGESTION RATES FOR ENGINE TYPE BY PHASE OF FLIGHT
(BASED ON ENGINE INGESTION EVENTS)

	PRATT-WHITNEY JT8D	CFMI CFM56	ALL ENGINES*
INLET AREA	1117 in^2	2303 in^2	---
ENGINE OPERATIONS	12,792,526	5,029,180	17,821,706

PHASE OF FLIGHT	ENGINE ING. EVENTS**	INGEST† RATE 1	INGEST†† RATE 2	ENGINE ING. EVENTS**	INGEST† RATE 1	INGEST†† RATE 2	ENGINE ING. EVENTS**	INGEST† RATE 1	INGEST††† RATE 2
Parked	1	.001	.001	0	---	---	1	.001	.001
Taxi	6	.005	.006	4	.008	.005	10	.006	.006
Takeoff	563	.440	.567	198	.394	.246	761	.427	.477
Climb	64	.050	.064	54	.107	.067	118	.066	.065
Cruise	6	.005	.006	12	.024	.015	18	.010	.009
Approach	65	.051	.066	47	.093	.058	112	.063	.064
Landing	248	.194	.250	153	.304	.190	401	.225	.233
Other	1	.001	.001	0	---	---	1	.001	.001
All Phases	954	.746	.961	468	.931	.582	1422	.798	.854

* Includes Only Events Where Engine Type Known

** Contains Proprated Apportionment of Events with Unknown Phase of Flight

† Ingestion Events Per 10,000 Operations

†† Ingestion Events Per 10,000 Operations Per 10 ft^2

††† Function of JT8D Rate 2, CFM56 Rate 2, and Corresponding Operations

The binomial probabilities in Equation 4.3 can be approximated by a Poisson distribution with mean Np for large values of N. That is, the single flight probability of an ingestion, p, replaces λ in Equation 4.2.

An important question that can be investigated through the Poisson process model of bird ingestions is the influence of inlet area on the ingestion rates. Past studies [7,8] in bird strikes have used the assumption that the probability of a bird strike is proportional to the cross sectional area of the aircraft. Applying the same concept to engines implies that the bird ingestion rate should be proportional to the inlet area of the engine.

The inlet area effect can be incorporated into the Poisson process model by letting the parameter λ represent the ingestion rate per unit area. The probability of n ingestions in N operations for an engine with inlet area A is:

$$P(X(N)=n) = \frac{e^{-\lambda AN}(\lambda AN)^n}{n!} \quad . \qquad (4.4)$$

4.3 VALIDITY OF THE POISSON PROCESS MODEL FOR BIRD INGESTIONS.

The applicability of the Poisson process model can be tested by analyzing the times between ingestions. The interarrival times in a Poisson process are random variables that have independent exponential distributions and the mean time between arrivals is the reciprocal of the ingestion rate. The validity of the Poisson process model can be tested by applying a goodness-of-fit (GOF) test for the exponential distribution to the times between ingestions.

The times between ingestions are measured by the number of days between aircraft ingestion events. Normally the number of aircraft operations between aircraft ingestion events would be used; however it is impossible to measure this directly. The number of days between aircraft ingestion events provides a suitable measure of the time between ingestions since daily aircraft operations are reasonably consistent.

The GOF test for the exponential distribution is a modified Kolmogorov-mirnov (K-S) test comparing the observed cumulative distribution function (CDF) to the predicted exponential CDF based on the sample mean. The K-S test uses the test statistic D defined as the maximum distance between the observed and predicted cumulative distribution functions. A modification to the critical values for the test statistic is required when the predicted CDF is derived from the mean of the sample. The critical values for the modified K-S test were computed by Liliefors [9]. The critical value for a 0.05 level of significance when the sample size, n, is larger than 30 can be approximated by $1.06/\sqrt{n}$.

The modified K-S test was run on six subgroups of the data broken down by engine and location. The six groups were (1) domestic (United States) JT8D, (2) contiguous United States JT8D, (3) foreign JT8D, (4) domestic CFM56, (5) contiguous United States CFM56, and (6) foreign CFM56. Figures 4.2 through 4.7 compare the observed and predicted cumulative distributions for each of the six groups, respectively. In each case there is a very close visual agreement between the observed and predicted CDF's.

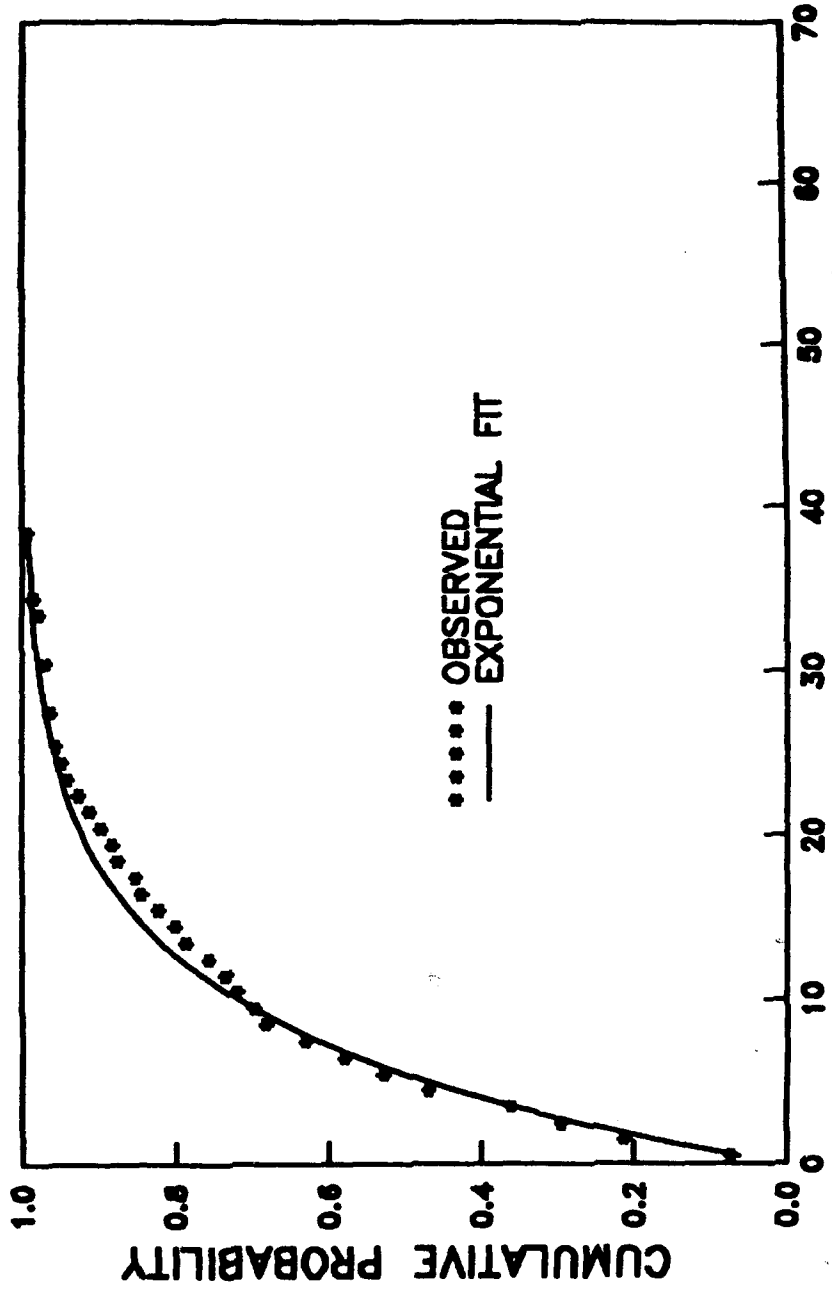


Figure 4.2. Comparison of Observed and Predicted CDFs for United States JT8D Aircraft Ingestion Events.

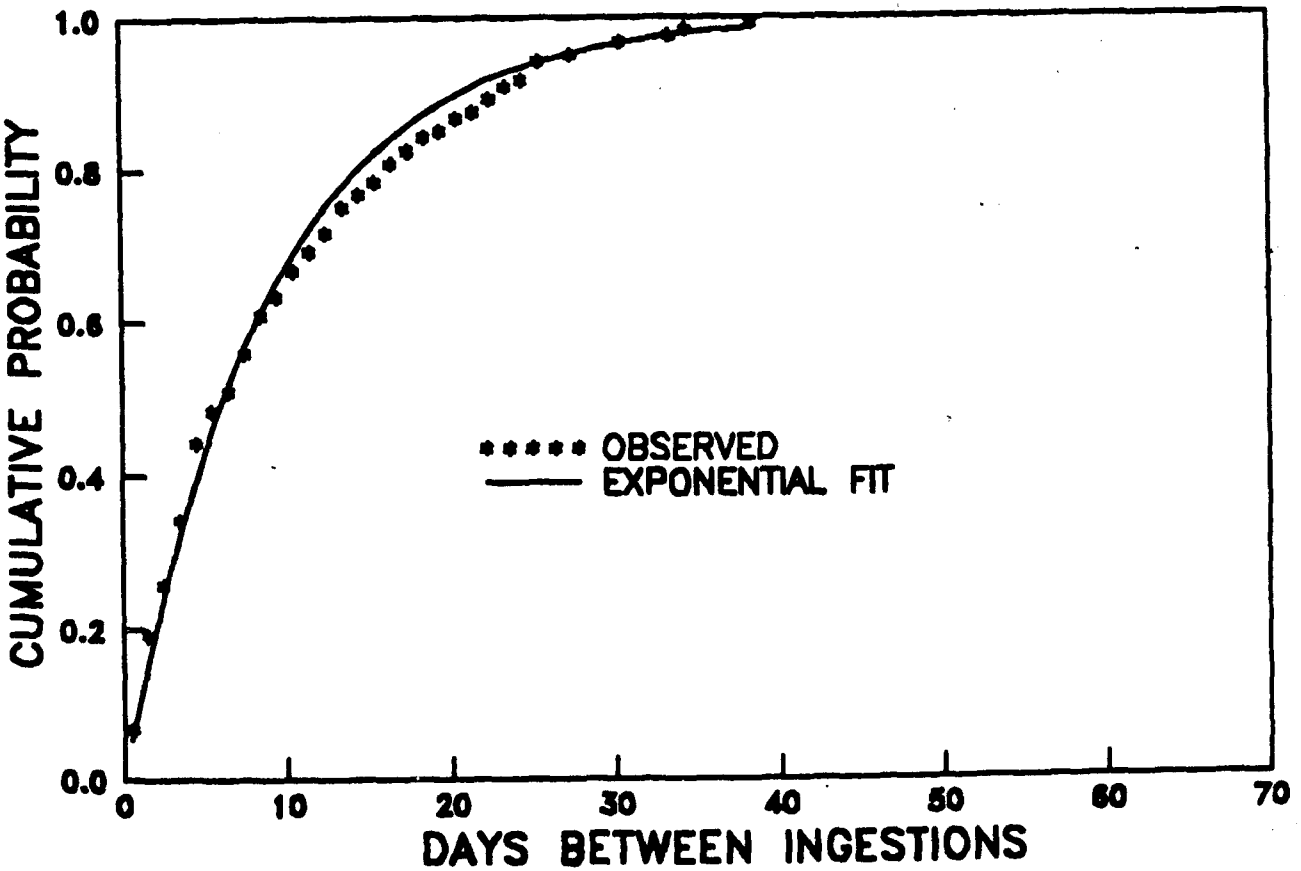


Figure 4.3. Comparison of Observed and Predicted CDFs for Contiguous United States JT8D Aircraft Ingestion Events.

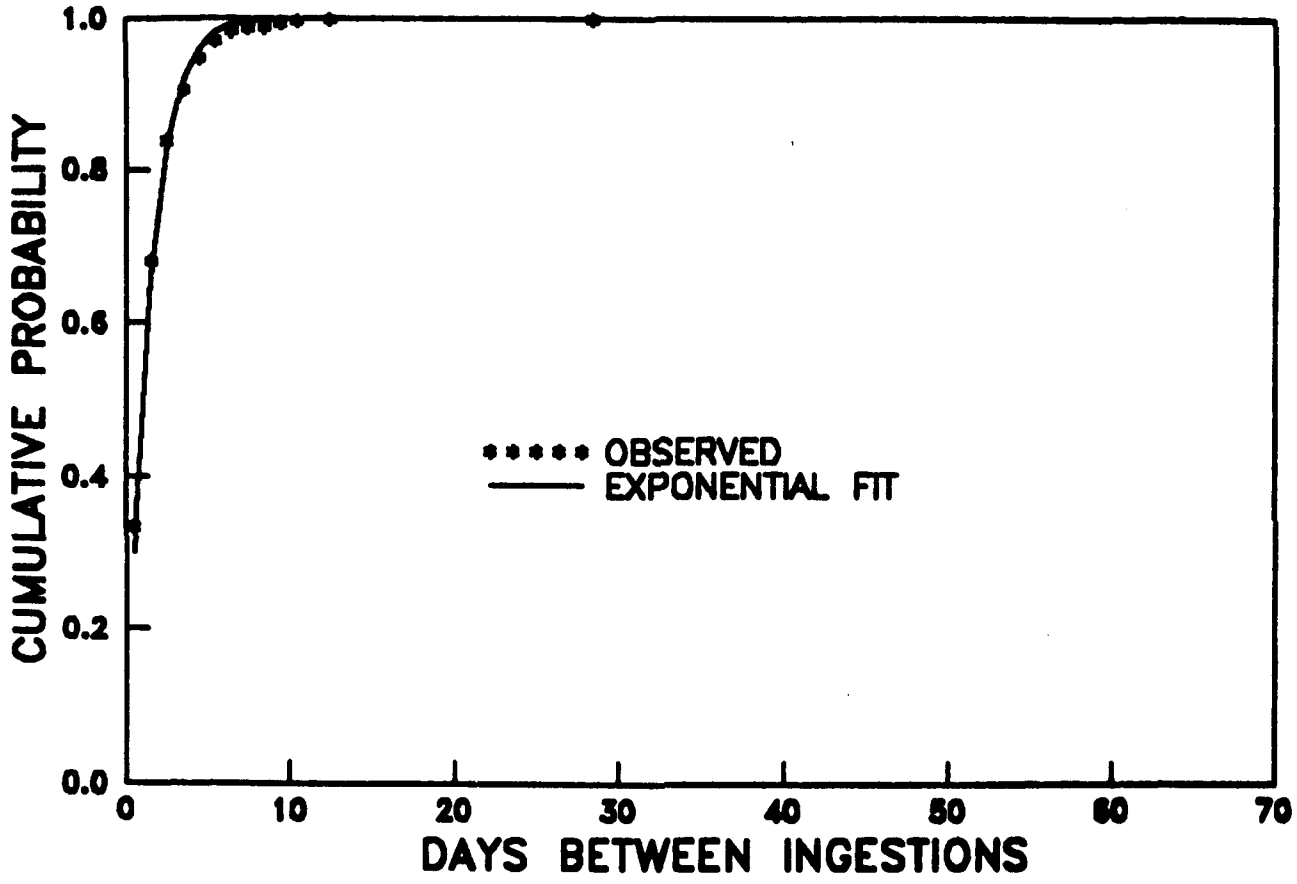


Figure 4.4. Comparison of Observed and Predicted CDFs for Foreign JT8D Aircraft Ingestion Events.

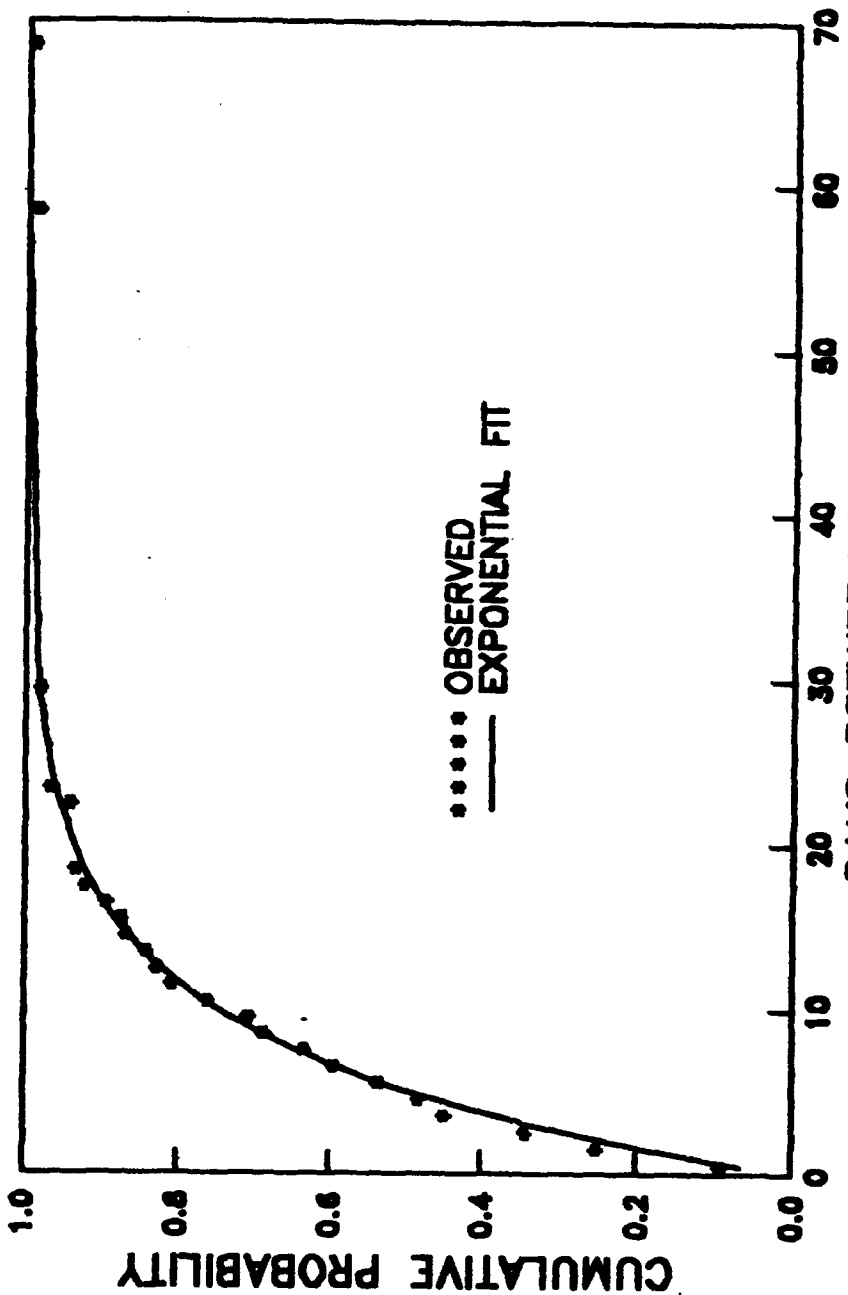


Figure 4.5. Comparison of Observed and Predicted CDFs for United States CFM56 Aircraft Ingestion Events.

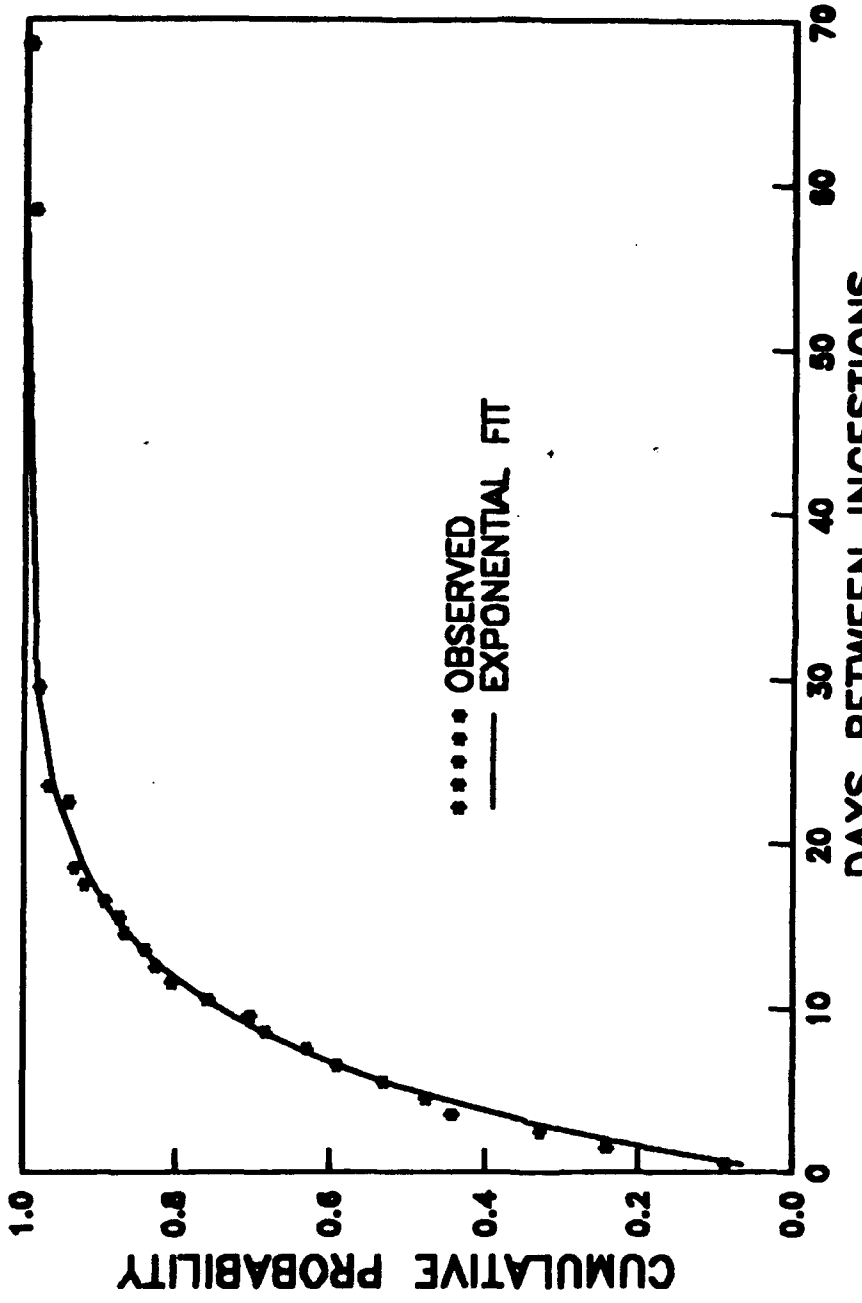


Figure 4.6. Comparison of Observed and Predicted CDFs for Contiguous United States CFM56 Aircraft Ingestion Events.

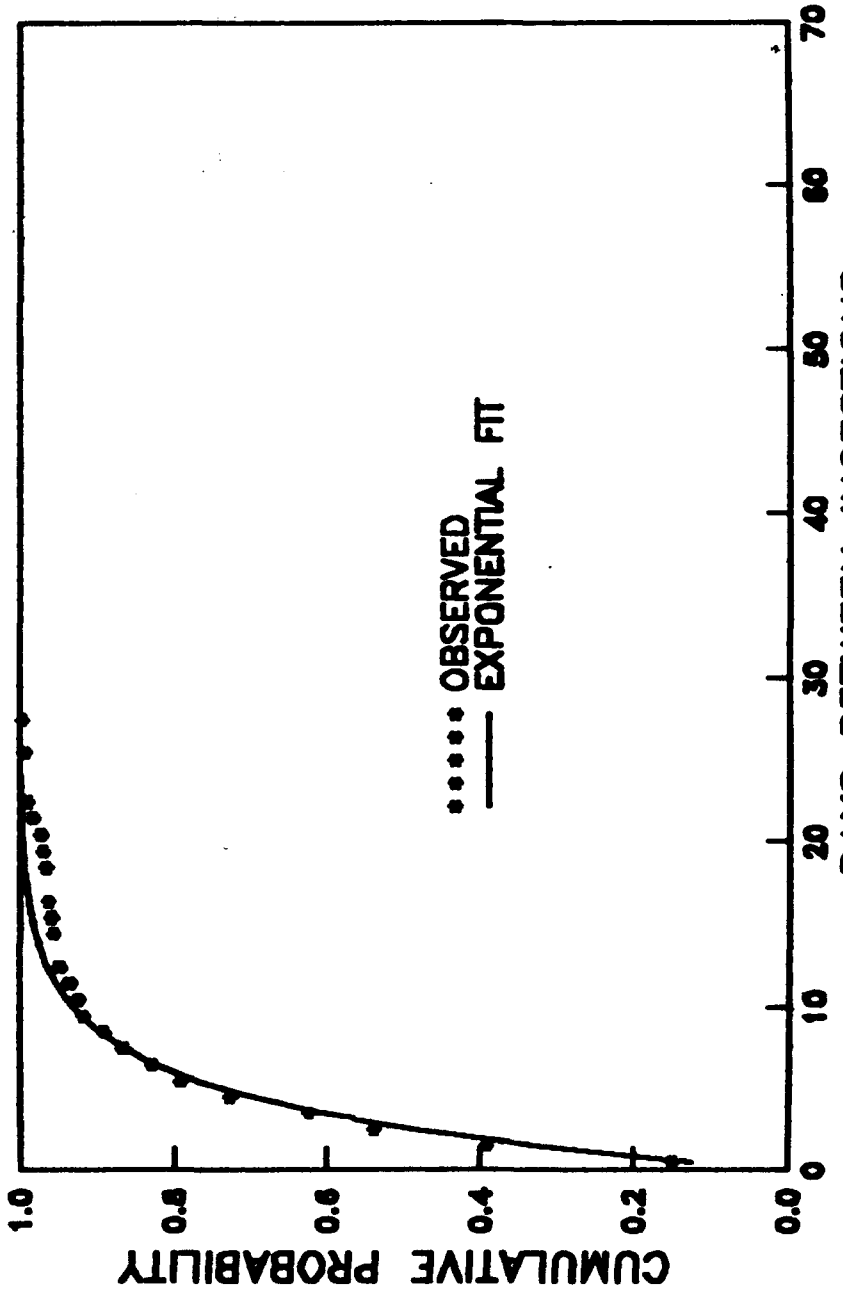


Figure 4.7. Comparison of Observed and Predicted CDFs for Foreign CFM56 Aircraft Ingestion Events.

The visual similarities are verified by the statistical tests which are summarized in Table 4.3. The mean time between ingestion events is given in column one. The sample size given in column two is the count of times between ingestions and is one less than the number of aircraft ingestion events. The critical value for a five percent significance level (D*) is in column three and the test statistic (D) is in column four. The assumption that the times between ingestion events come from an exponential distribution cannot be rejected at the five percent level in five of the six groups. The use of a Poisson process to model bird ingestions is appropriate based on these test results.

The one group that does not pass the exponential goodness of fit test is the foreign CFM56 ingestions. The test statistic for the foreign CFM56 group is nearly equal to the critical value and the maximum deviation occurs at 1.5 days. Since the time between ingestions is recorded to the nearest day, round off error could adversely affect the observed CDF at 1.5 days. Since the other five groups are consistent with the Poisson model, the failed test for the foreign CFM 56 ingestions is not sufficient cause to reject the use of the Poisson model for bird ingestion events.

4.4 INLET AREA EFFECT ON INGESTION RATES.

One property of the Poisson process model described in Section 4.2 is that ingestion rates should be proportional to the inlet area of the engine. The size effect can be investigated in the B737 bird ingestion data by comparing the number of ingestion events of the JT8D with the number of ingestion events of the CFM56. According to Equation 4.4 the total number of ingestion events during the reporting period for a given engine has a Poisson distribution with a mean that is proportional to the number of aircraft operations in the reporting period and to the inlet area of the engine. The number of JT8D ingestion events out of the total number of ingestion events will have a Binomial distribution if the Poisson process model is valid.

The proportion of total ingestion events that occurred in JT8D engines for a particular geographic region should be:

$$P = \frac{OJ*AJ}{OJ*AJ+OC*AC}, \qquad (4.5)$$

where OJ and OC are the numbers of regional aircraft operations for, and AJ and AC are the inlet areas of, the JT8D and CFM56 engines, respectively. The relevant values for Equation 4.5 can be obtained from Table 4.1A giving an expected proportion of JT8D ingestion events of P = 0.50 for United States ingestion events and P = 0.62 for foreign ingestion events. The observed proportion of JT8D events is 0.47 for the United States and 0.73 for foreign ingestion events. The test statistic to compare the observed proportion to the predicted is the standard Z statistic for the binomial distribution given by:

$$Z = (\hat{P} - P) \; / \; \sqrt{(P * (1-P) \; / \; N)}, \qquad (4.6)$$

where $\hat{P}$ is the observed proportion of JT8D engine ingestion events and N is the total number of aircraft ingestion events for the geographic region.

TABLE 4.3

RESULTS OF THE EXPONENTIAL GOF TESTS
TO VERIFY THE POISSON PROCESS

JT8D ENGINE

GEOGRAPHIC AREA	MEAN	SAMPLE SIZE	CRITICAL VALUE D^*	TEST STATISTIC D
United States	7.90	135	.091	.040
Contiguous US	8.97	119	.097	.047
Foreign	1.39	783	.037	.032

CFM56 ENGINE

GEOGRAPHIC AREA	MEAN	SAMPLE SIZE	CRITICAL VALUE D^*	TEST STATISTIC D
United States	7.25	150	.086	.067
Contiguous US	7.34	148	.087	.064
Foreign	3.75	292	.062	.063

The Z statistic defined in Equation 4.6 is used to test the null hypothesis that there is no difference between the two types of engines in ingestion rates for each region after adjusting for area. The test statistics for the two geographic regions are computed by substituting the observed proportions for P and the expected proportions for P in Equation 4.6. The computed Z values are -0.87 for United States ingestion events and 7.310 for foreign ingestion events. The tests show no difference in ingestion rates between engines after adjusting for area for the United States events; however, the test for foreign events is significant at the five percent level of significance indicating that the area adjustment does not fully explain the observed difference in engine ingestion rates for foreign events.

A second school of thought suggests that the relationship between engine size and ingestion rate is described better as a linear function of inlet diameter than as a linear function of inlet area. A similar Z test can be computed by substituting inlet diameter for inlet area in Equation 4.5. The expected proportions of JT8D ingestion events after an adjustment for inlet diameter are P = 0.59 and P = 0.70 for the United States and foreign events, respectively. The test statistics are Z = -3.97 and Z = 1.95 for the United States and foreign events, respectively. The null hypothesis is that there is no difference in ingestion rates after adjusting for inlet diameter and the conclusion of the test is that there is no detectable difference at the five percent level of significance for the foreign events but is different for United States events.

There appears to be an engine size effect on ingestion rates; however, it is not clear whether it is best described by inlet area or diameter. The inlet area provides a good fit for the United States ingestions but not the foreign rates while inlet diameter provides a good fit for foreign rates but not for United States rates. The discrepancy could be due to differences in collection rates between the geographic regions; however, there are no data that could be used to determine whether collection rates varied geographically.

SECTION 5
AIRPORT BIRD INGESTION EXPERIENCE

The objective of the statistics of this section is to identify the frequency and location of bird ingestion events at airports worldwide. An aircraft ingestion event is the simultaneous ingestion of one or more birds by one or more engines of an aircraft. Bird ingestion data were provided by both the engine manufacturers and the ICAO. Airport ingestion rates are expressed in terms of aircraft ingestion events per 10K airport operations.

The OAG tapes indicate that there are 1,143 airports worldwide for which 17,821,706 B737 airport operations were scheduled during the reporting period. Appendix A lists the airport code, airport location, and both the number of scheduled airport operations and number of aircraft ingestion events at these airports for each of the three years in the data collection period. Bird ingestion events were reported at only 345 of these airports. The OAG tapes show that there were 12,805,445 scheduled airport operations at these 345 airports over the 3-year period. There were also bird ingestion events reported by unscheduled B737 flights at 65 additional airports. These 65 airports are included in Appendix A but there are no OAG operations counts for them.

A complete summary of the airports having reported aircraft ingestion events is presented in Table 5.1 as a frequency count of worldwide bird ingestion events by phase of flight. The majority of aircraft ingestion events occur during takeoff or landing. This table suggests that the threat of bird ingestion is posed primarily from birds which live near the airport and/or whose migratory path crosses over or near the airport property.

Figure 5.1 is a bar chart showing reported aircraft ingestion events at domestic airports during the reporting period. There are 91 domestic airports at which bird ingestion events have been reported. The largest number of aircraft ingestion events reported in the United States during the 3-year period was 10 at Dallas, Love (DAL) followed by 9 at both Houston (HOU) and Los Angeles (LAX). Of the 304 aircraft ingestion events reported in the United States, 89 events occurred at an unknown location and they are assigned to the airport code XUS on the bar chart.

Figure 5.2 is a bar chart showing reported aircraft ingestion events at foreign airports during the reporting period. There are 318 foreign airports at which bird ingestions have been reported. The largest number of aircraft ingestion events reported abroad during the period is 21 at Frankfort, Germany (FRA) followed by 14 at Amsterdam, Netherlands (AMS). Of the 1,104 aircraft ingestion events reported outside of the United States, 265 events occurred at an unknown location and they are assigned to the airport code XFO on the bar chart.

Table 5.2 lists all airports worldwide which experienced three or more aircraft ingestion events during the reporting period. The airports are listed in descending order of airport operations. The table includes the number of ingestion events, the number of scheduled OAG airport operations, and the rate of aircraft ingestion events per 10,000 airport operations. Unscheduled B737 operations are not reflected in the operations counts,

whereas ingestion events occurring during either scheduled or unscheduled operations are included in the event counts. Therefore unscheduled B737 operations may account for the apparently higher ingestion rates.

The rates of bird ingestion events per aircraft operation summarized previously in Table 4.1A are twice the rates of bird ingestion events per airport operation. The number of reported foreign bird ingestion events exceeds the number of reported domestic ingestion events by a factor of 3.6; however, the number of foreign airport operations is slightly less than the number of domestic airport operations. The rate of reported bird ingestions per airport operation is 4.3 times higher at foreign airports than at domestic airports. This implies that either (1) there are far less birds in the environment of domestic airports, possibly due to environmental control programs, or (2) foreign airline operators are much more conscientious and cooperative in reporting bird ingestions.

TABLE 5.1

FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
AAE	ANNABA, ALGERIA				1					1
ABCG	COOLANGATTA, AUSTRALIA							2		2
ABQ	ALBUQUERQUE, NM, USA				1					1
ACA	ACAPULCO, MEXICO			1						1
ADD	ADDIS ABABA, ETHIOPIA			1						1
ADL	ADELAIDE, SA, AUSTRALIA			2						2
ADQ	KODIAK, AS, USA							1		1
AEP	BUENOS AIRES - NEWBERY, ARGENTINA							1		1
AES	AALESUND, NORWAY							2		2
AGR	AGRA, INDIA			2				2		4
AJA	AJACCIO, CORSICA, FRANCE			1				1		2
AJU	ARACAJU, BRAZIL			1						1
AKL	AUCKLAND, NEW ZEALAND			3				1		4
ALB	ALBANY, NY, USA			1	1					2
ALC	ALICANTE, SPAIN			1	1		1	1		4
ALG	ALGIERS, ALGERIA						1	1		2
ALY	ALEXANDRIA, ARA REP OF EGYPT							1		1
AMD	AHMEDABAD, INDIA			8				2		10
AMS	AMSTERDAM, NETHERLANDS			9	1		1	8	1	20
AOR	ALOR SETAR, MALAYSIA			1						1
ARD	ALOR, INDONESIA						1			1
ASP	ALICE SPRINGS, N.T., AUSTRALIA				1					1
ATH	ATHENS, GREECE			1						1
ATL	ATLANTA, GA, USA				1					1
ATQ	AMRITSAR, INDIA			1						1
AUS	AUSTIN, TX, USA			2	1					3
AYT	ANTALYA, TURKEY							2		2
BAH	BAHRAIN, BAHRAIN			1						1
BBI	BHUBANESWAR, INDIA			2				1		3
BCN	BARCELONA, SPAIN			1			1			2
BDQ	VADODARA, INDIA			1				1		2
BEG	BELGRADE, YUGOSLAVIA			1	1					3
BFN	BLOEMFONTEIN, SOUTH AFRICA			5	2					7
BFS	BELFAST, N. IRELAND			3				2		5
BGO	BERGEN, NORWAY			1						1
BHI	BAHIA BLANCA, ARGENTINA			2	2					4
BHM	BIRMINGHAM, AL, USA			1	1			1	1	4
BHO	BHOPAL, INDIA						1	1		2
BHX	BIRMINGHAM, ENGLAND (UK)			3				1		4
BHZ	BELO HORIZONTE, BRAZIL			1						1
BJL	BANJUL, GAMBIA			1						1
BJR	BAHAR DAR, ETHIOPIA			1						1
BKK	BANGKOK, THAILAND		1							1
BLR	BANGALORE, INDIA			3				4	1	8
BNA	NASHVILLE, TN, USA						1			1
BNE	BRISBANE, QLD, AUSTRALIA							2		2
BNJ	BONN, FRG				1			2		3
BOD	BORDEAUX, FRANCE			1						1
BOH	BOURNEMOUTH, ENGLAND, UK			1						1
BOM	BOMBAY, INDIA			2			1	2	1	6
BOO	BODO, NORWAY							1		1
BOS	BOSTON, MA, USA			1				1		2
BRE	BREMEN, FED REP OF GERMANY			4	1			1		6
BRS	BRISTOL, ENGLAND (UK)			3				2		5
BRU	BRUSSELS, BELGIUM			7	1		2	2		12

TABLE 5.1 (CONTINUED)

FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
BUD	BUDAPEST, HUNGARY			1						1
BUE	BUENOS AIRES, ARGENTINA			1						1
BWI	BALTIMORE, MD, USA			1						1
CAG	CAGLIARI, ITALY			1						1
CAS	CASABLANCA, MOROCCO			2				1		3
CBR	CANBERRA, A.C.T, AUTSTRALIA						1	2		3
CCR	CONCORD, CA, USA						1			1
CCU	CALCUTTA, INDIA			4				3		7
CDG	PARIS DE GAULLE, FRANCE			4	1		1	6		12
CFU	CORFU, GREECE			1			1			2
CGN	COLOGNE BONN, FRG			1				1		2
CGR	CAMPO GRANDE, BRAZIL			3						3
CHC	CHRISTCHURCH, NEW ZEALAND			5				2	1	8
CID	CEDAR RAPIDS/IOWA CITY, IO, USA			1						1
CJB	COIMBATORE, INDIA			3				1		4
CJU	CHEJU, REP OF KOREA			1						1
CLE	CLEVELAND, OH, USA			3						3
CLT	CHARLOTTE, NC, USA			1			1	1	1	4
CMB	COLOMBO, SRI LANKA			1						1
CMG	CORUMBA, MATO GROSSO, BRAZIL			2						2
CND	CONSTANTO, ROMANIA			1						1
CNS	CAIRNS, QLD, AUSTRALIA							1	1	2
COK	COCHIN, INDIA			2				1		3
COR	CORDOBA, ARGENTINA			1						1
COS	COLORADO SPRINGS, CO, USA			1						1
CPH	COPENHAGEN, DENMARK			4						4
CPT	CAPE TOWN, SOUTH AFRICA			3						3
CRP	CORPUS CHRISTI, TX, USA			1						1
CRW	CHARLESTON, WV, USA			1						1
CTC	CATAMARCA, ARGENTINA						1			1
CTU	CHENGDU, P.R. CHINA		1					1		2
CWB	CURITIBA, PARANA, BRAZIL			1				1		2
CWL	CARDIFF, WALES, UK			2						2
CZL	CONSTANTINE, ALGERIA			1						1
DAB	DAYTONA BEACH, FL, USA			2						2
DAL	LOVE DALLS/FT. WORTH, TX, USA			5	1		2		2	10
DAY	DAYTON, OH, USA			2	2					4
DCA	NATIONAL, WASHINGTON, DC, USA							1		1
DEL	DELHI, INDIA			2	1		4	1		8
DEN	STAPLETON INT'L, DENVER, CO, USA			2	1		1			4
DET	DETROIT CITY, MI, USA							1		1
DFW	DALLAS/FT WORTH, TX, USA			1				1		2
DLH	DULUTH, MN, USA							1		1
DRW	DARWIN, N.T., AUSTRALIA							1		1
DTMB	HABIB BOURGIBA, TUNISIA				1		1			2
DTTA	CARTHAGE, TUNISIA			1						1
DTW	WAYNE CO, DETROIT, MI, USA							1		1
DUB	DUBLIN, REPUBLIC OF IRELAND			1			1	1		3
DUD	DUNEDIN, NEW ZEALAND							1		1
DUR	DURBAN, SOUTH AFRICA			6						6
DUS	DUESSELDORF, FRG			7	2		1	6		16
EAM	NEJRAN, SAUDI ARABIA				1					1
EBCI	CHARLEROI/GOSSELIES, BELGIUM			1						1
EBOS	OOSTENDE, BELGIUM								1	1
EDI	EDINBURGH, SCOTLAND			3				2		5

TABLE 5.1 (CONTINUED)

FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
EDUO	GUTERSLOH, GERMANY							1		1
EGNV	TEES-SIDE, ENGLAND			2						2
EICK	CORK, IRELAND							1		1
EINN	SHANWICK, IRELAND				1					1
ELP	EL PASO, TX, USA			1						1
ELS	EAST LONDON, SOUTH AFRICA			2	1			2		5
EMA	EAST MIDLANDS, ENGLAND			1			1	2		4
ERI	ERIE, PA, USA				1					1
EWR	NEWARK, NEW YORK, NY, USA			2				2		4
EZE	BUENOS AIRES-EZEÍZA ÁRPT, ARGENTINA			1						1
FACT	D.F.MALAN, S. AFRICA			1						1
FAE	FAROE ISLANDS, DENMARK						1			1
FAO	FARO, PORTUGAL			1	1		1	1		4
FAT	FRESNO, CA, USA			1				1		2
FAWH	WINDHOEK, STRIJDOM, NAMIBIA			1						1
FCO	DA VINCI, ROME, ITALY			1				1		2
FLL	FT LAUDERDALE, FL, USA			1						1
FLN	FLORIANOPOLIS, BRAZIL			1						1
FMA	FORMOSA, ARGENTINA			1						1
FMMI	IVATO, MADAGASCAR			1						1
FNC	FUNCHAL - MADEIRA, PORTUGAL			2					1	3
FNT	FLINT, MI, USA			1						1
FRA	FRANKFURT, FRG		1	7	4		4	4	1	21
FSC	FIGARI, FRANCE			1						1
FVCP	PRINCE CHARLES, ZIMBABWE			1						1
GAJ	YAMAGATA, HONSHU, JAPAN								1	1
GAU	GAUHATI, INDIA			2						2
GHB	GOVERNORS HARBOUR, BAHAMAS			1						1
GHU	GUALEGUAYCHU, ARGENTINA			1						1
GIG	RIO DE JANEIRO INT'L, BRAZIL			1				1		2
GLA	GLASGLOW, SCOTLAND	1			1					2
GMTT	BOUKHAUF, MOROCCO							1		1
GOA	GENOA, ITALY			2						2
GOI	GOA, INDIA							2		2
GOT	GOTHENBURG, SWEDEN		1	1				1		3
GRZ	GRAZ, AUSTRIA			1				1		2
GSO	GREENSBORO/HPT/WIN-SALEM, NC, USA							1		1
GSP	GREENVILLE/SPARTANBURG, SC, USA			1						1
GVA	GENEVA, SWITZERLAND						1			1
GWL	GWALIOR, INDIZ			1						1
HAC	HACHIJO, JIMA ISLAND, JAPAN							1		1
HAJ	HANOVER, FED REP OF GERMANY			2				2		4
HAM	HAMBURG, FRG			9		1	1	4		15
HKG	HONG KONG, HONG KONG			1						1
HKNA	JOMO KENYATTA, NAIROBI, KENYA			1						1
HND	TOKYO-HANEDA, JAPAN							1		1
HNM	HANA, MAUI, HA, USA			1						1
HOU	HOUSTON, TX, USA			5	1			3		9
HRL	HARLINGEN, TX, USA							1		1
HYD	HYDERABAD, INDIA			4			1	2	1	8
IAD	DULLES INT'L, WASHINGTON, DC, USA							1	1	2
IAH	HOUSTON INTERCONT, TX, USA			3						3
IBZ	IBIZA, SPAIN			2	1			2		5
INU	NAURU, REP OF NAURU			1						1
ISA	MOUNT ISA, QLD, AUSTRALIA						1	1		2

TABLE 5.1 (CONTINUED)

FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
ISG	ISHIGAKI, JAPAN			5						5
ISP	LONG ISLAND MACARTHUR, NY, USA				1					1
ITO	HILO HAWAII, HA, USA			3						3
IVC	INVERCARGILL, NEW ZEALAND			1						1
IXB	BAGDOGRA, INDIA								1	1
IXC	CHANDIGAR, INDIA							3		3
IXE	MANGALORE, INDIA			1						1
IXJ	JAMMU, INDIA						1	1		2
IXR	RANCHI, INDIA			1				1		2
IXU	AURANGABAD, INDIA			1						1
IXV	ALONG, INDIA							1		1
IXZ	PORT BLAIR ANDAMAN ISLAND, INDIA							1		1
JAI	JAIPUR, INDIA				2			2	1	5
JAX	JACKSONVILLE, FL, USA			1						1
JDH	JODHPUR, INDIA			1			1			2
JNB	JOHANNESBURG, SOUTH AFRICA			4				1		5
JRH	JORMAT, INDIA			1				1	1	3
JRO	KILIMANJARO, TANZANIA			1						1
KCH	KUCHING, SARAWAK, MALAYSIA				1					1
KEF	REYKJAVIK-KEFLAVIK, ICELAND			1				1		2
KGS	KOS, GREECE			1						1
KHH	KAOHSIUNG, TAIWAN							1	1	2
KHI	KARACHI, PAKISTAN			2				1	1	4
KIM	KIMBERLEY, SOUTH AFRICA			2				1		3
KMG	KUNMING, P.R. CHINA			1						1
KOA	KONA, HA, USA			1						1
KOJ	KAGOSHIMA, JAPAN								2	2
KRP	KARUP, DENMARK							1		1
KRT	KHARTOUM, SUDAN			1						1
KST	KOSTI, SUDAN						1			1
KTM	KATHMANDU, NEPAL							1		1
KUL	KUALA LUMPUR, MALAYSIA						1			1
LAS	LAS VEGAS, NV, USA			1						1
LAX	LOS ANGELES, CA, USA		1	6			1	1		9
LBB	LUBBOCK, TX, USA							1		1
LCA	LARNACA, CYPRUS				1			2		3
LDE	LOURDES/TARBES, FRANCE			5				1		6
LEAM	ALMERIA, SPAIN						1			1
LEGE	COSTA BRAVA, SPAIN							1		1
LEMG	MALAGA, SPAIN			1				1		2
LEMH	MENORCA, SPAIN			1						1
LERS	REUS, SPAIN			1			1	1		3
LEX	LEXINGTON, KY, USA			1						1
LFBO	BLAGNAC, FRANCE			3						3
LGA	NEW YORK LA GUARDIA, NY, USA			1				3		4
LGG	LIEGE, BELGIUM							1		1
LGRP	PARADISI, GREECE				1					1
LGRX	ARAXOS, GREECE							1		1
LGSK	SKIATHOS, GREECE			1				1		2
LGW	LONDON-GATWICK, ENGLAND			3	3		2			8
LHE	LAHORE, PAKISTAN			3	1			2	1	7
LHR	LONDON HEATHROW, ENGLAND, (UK)			4			4	1		9
LIH	LIHUE, KAUAI, HA, USA			7				1		8
LIL	LILLE, FRANCE			2						2
LIN	MILAN LINATE, ITALY			3						3

TABLE 5.1 (CONTINUED)

FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
LIPE	BORGO PANICALE, ITALY			1						1
LIPZ	TESSERA, ITALY			1						1
LIS	LISBON, PORTUGAL			1				2		3
LIT	LITTLE ROCK, AK, USA			2	2					4
LJU	LJUBLJANA, YUGOSLAVIA			1						1
LKO	LUCKNOW, INDIA			3				2		5
LLW	LILONGWE, MALAWI			1						1
LNZ	LONZ, AUSTRIA			2				2		4
LOS	LAGOS, NIGERIA			1					1	2
LOWW	WIEN-SCHWEICHAT, OSTERREICH						2	1		3
LPA	GRAN CANARIA, CANARY ISLANDS								1	1
LPL	LIVERPOOL, ENGLAND							1		1
LST	LAUNCESTON, TASMANIA, AUSTRALIA			1	1			1		3
LTBS	MUGLA, TURKEY			2						2
LTN	LONDON-LUTON INT'L, ENGLAND			3				4		7
LXR	LUXOR, ARAB REP OF EGYPT			1						1
LXS	LEMNOS, GREECE			2						2
LYS	LYON, FRANCE			1				1		2
MAA	MADRAS, INDIA			4	1		1	1		7
MAD	MADRID, SPAIN			1	1			1		3
MAF	MIDLAND ODESSA, TX, USA			2				1		3
MAH	MAHON, MENORCA, SPAIN			1						1
MAN	MANCHESTER, ENGLAND (UK)			4			1			5
MCO	ORLANDO-INT'L, FL, USA							1		1
MDP	MINDIPTANA, INDONESIA			1						1
MDQ	MAR DEL PLATA, ARGENTINA			2				1		3
MDT	HARRISBURG-OLMSTEAD ST, PA, USA			1						1
MDW	CHICAGO-MIDWAY, IL, USA			6			1			7
MED	MEDINA, SAUDI ARABIA			1						1
MEL	MELBOURNE, VICTORIA, AUSTRALIA			2	3			1		6
MFR	MEDFOR, OR, USA			1						1
MGA	MANAGUA, NICARAGUA			1						1
MIA	MIAMI, FL, USA							1		1
MIL	MILAN, ITALY			1						1
MLA	MALTA, MEDITERRANEAN SEA							1		1
MLAL	LUQA, MALTA							1		1
MMY	MIYAKO JIMA, JAPAN			6				4		10
MSO	MISSOULA, MT, USA							1		1
MSP	MINNEAPOLIS-ST PAUL, MN, USA			1						1
MSY	NEW ORLEANS, LA, USA			2	1			1		4
MUC	MUNICH, FRG			3	3		2	2		10
MVD	MONTEVIDEO, URUGUAY			1						1
MXP	MILAN-MALPENSA, ITALY			1						1
MYR	MYRTLE BEACH, SC, USA			1						1
NAP	NAPLES, ITALY						1			1
NCE	NICE, FRANCE			2			2	5		9
NCL	NEWCASTLE, ENGLAND							2	1	3
NGO	NAGOYA, JAPAN								1	1
NUE	NUREMBURG, FRG			2	1					3
OAK	OAKLAND, SAN FRANCISCO, CA, USA			1				2		3
OGG	KAHULUI, MAUI, HA, USA			2						2
OIT	OITA, JAPAN							1		1
OKC	OKLAHOMA CITY, OK, USA			1				1		2
OPO	OPORTO, PORTUGAL			1						1
OPRN	CHAKLALA, PAKISTAN			1						1

TABLE 5.1 (CONTINUED)

FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
ORD	CHICAGO-O'HARE, IL, USA			4	1			1		6
ORF	NORFOLK-VA. BEACH, VA, USA			2				3		5
ORY	PARIS - ORLY ARPT, FRANCE			5						5
OSL	OSLO, NORWAY			1				1		2
PAT	PATNA, INDIA			4				3	1	8
PDB	PEDRO BAY, AS, USA			1						1
PDX	PORTLAND, OR, USA			1	1			2		4
PEK	BEIJIN, P. R. CHINA		1					1		2
PEN	PENANG, MALAYSIA			1	1					2
PER	PERTH, WA, AUSTRALIA							1		1
PHL	PHILADELPHIA/WILMINGTON, PA, USA				2			2		4
PHX	PHOENIX, AZ, USA						1			1
PIE	TAMPA-ST. PETERSBURG, FL, USA			5						5
PLZ	PORT ELIZABETH, SOUTH AFRICA			4	1			2		7
PME	PORTSMOUTH, UK			1				1		2
PMI	PALMA MALLORCA ISLAND, SPAIN			3	1			1		5
PMO	PALERMO, ITALY							1		1
PMR	PALMERSTON, NEW ZEALAND			1				2		3
PNA	PAMPLONA, SPAIN				1					1
PSA	PISA, ITALY				1		1			2
PTY	PANAMA CITY, PANAMA			1						1
PUY	PULA, YUGOSLAVIA			1						1
PVD	PROVIDENCE, RI, USA			1						1
PVH	PORTO VELHO, BRAZIL			2						2
PVK	PREVEZA/LEFKAS, GREECE							1		1
PWM	PORTLAND, ME, USA							1		1
QTV	TREVISO, ITALY							1		1
RAP	RAPID CITY, SD, USA			1						1
RBA	RABAT, MOROCCO			2				1		3
REC	RECIFE, BRAZIL			1						1
RES	RESISTENCIA, ARGENTINA						1		1	2
RKPC	CHENJU, KOREA			1						1
RNO	RENO, NV, USA			1	1					2
ROA	ROANOKE, VA, USA			1			1			2
ROC	ROCHESTER, NY, USA			1			1			2
ROK	ROCKHAMPTON, QLD, AUSTRALIA			1						1
RST	ROCHESTER, MN, USA							1		1
RUH	RIYADH, SAUDI ARABIA			1						1
SAB	SABA, NETH. ANTILLES							1		1
SAL	SAN SALVADOR, EL SALVADOR			1						1
SAN	SAN DIEGO, CA, USA				1					1
SAO	SAO PAULO, BRAZIL				1					1
SAT	SAN ANTONIO, TX, USA			2	1				1	4
SAV	SAVANNAH, GA, USA			1						1
SCC	PRUDHOE BAY, DEADHORSE, AS, USA							1		1
SCN	SAARBRUECKEN, FRG						1			1
SDF	LOUISVILLE, KY, USA			1						1
SDJ	SENDAI, JAPAN								1	1
SFN	SANTA FE, ARGENTINA							1		1
SFO	SAN FRANCISCO-OAKLAND, CA, USA			3	2			1	1	7
SHI	SHIMOJISHIMA, JAPAN								1	1
SJC	SAN JOSE, CA, USA			2			1	1		4
SLA	SALTA, ARGENTINA			1						1
SLC	SALT LAKE CITY, UT, USA					1	1	1		3
SLL	SALALAH, OMAN			1						1

TABLE 5.1 (CONTINUED)

FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
SLZ	SAO LUIZ, MARANHAO, BRAZIL			1						1
SMF	SACRAMENTO, CA, USA			1			2			3
SMI	SAMOS ISLAND, GREECE						1			1
SNA	ORANGE COUNTY, CA, USA			1						1
SRQ	SARASOTA/BRADENTON, FL, USA			2						2
STN	LONDON-STANSTED, ENGLAND, UK							1		1
STO	STOCKHOLM, SWEDEN			1						1
STR	STUTTGART, FRG			3	1			3		7
STV	SURAT, INDIA			1						1
SVG	STAVANGER, NORWAY			1				2		3
SVO	MOSCOW-SHEREMETYE, U.S.S.R.			1				1		2
SXR	SRINAGAR, INDIA			2				1		3
SYD	SYDNEY, N.S.W., AUSTRALIA		1	1	1		2	2		7
SYR	SYRACUSE, NY, USA			1						1
SZG	SALZBURG, AUSTRIA							2		2
TBT	TABATINGA, BRAZIL						1			1
TCI	TENERIFE, CANARY IS.							1		1
TFS	TENERIFFE-REINASOFIA, CANARY ISLAND			2	1					3
TGD	TITOGRAD, YUGOSLAVIA							1		1
TIP	TRIPOLI, LIBYA			1						1
TLS	TOULOUSE, FRANCE				2					2
TLV	TEL AVIV-YAFO, ISRAEL			1						1
TNG	TANGIER, MOROCCO			3				1	1	5
TPA	TAMPA/ST PETERSBURG, FL, USA				1		1			2
TRD	TRONDHEIM, NORWAY			1						1
TRN	TURIN, ITALY			1						1
TRV	TRIVANDRUM, INDIA			1				5	1	7
TSF	TREVISO, ITALY			1						1
TSV	TOWNSVILLE, QLD, AUSTRALIA			3				1		4
TTJ	TOTTORI, JAPAN							1	1	2
TUC	TUCUMAN, ARGENTINA		1	1			1			3
TUL	TULSA, OK, USA			3						3
TUN	TUNIS, TUNISIA			1				1		2
TVL	LAKE TAHOE, CA, USA				1					1
TXL	WEST BERLIN, GERMANY			1				1		2
UDR	UDAIPUR, INDIA							1		1
UET	QUETTA, PAKISTAN								1	1
UTN	UPINGTON, SOUTH AFRICA			3						3
VAKJ	KHAJURAHO, INDIA		1	1						2
VCE	VALVERDE, CANARY ISLANDS			4	1		1	1		7
VDM	VIEDMA, ARGENTINA								1	1
VIE	VIENNA, AUSTRIA							2		2
VNS	VARANASI, INDIA			2				4	2	8
VOTR	TIRUCHCHIRAPPALLI, INDIA							1		1
VTZ	VISHAKHAPATNAM, INDIA			1						1
WAW	WARSAW, POLAND							1		1
WBSB	BRUNEI INTL, MALAYSIA			1						1
WDH	WINDHOEK, NAMIBIA			1				2		3
WLG	WELLINGTON, NEW ZEALAND			3				1		4
XFO	UNKNOWN FOREIGN AIRPORT			14	1	8	1	9	226	259
XMN	XIAMEN, P. R. CHINA			2						2
XRY	JEREZ DE LA FRONTERA, SPAIN						1			1
XUS	UNKNOWN USA AIRPORT		1	1		3	1		83	89
YAM	SAULT STE MARIE, ONT., CANADA			1			1			2
YCG	CASTLEGAR, BC, CANADA			1						1

TABLE 5.1 (CONCLUDED)

FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
YHY	HAY RIVER, NWT, CANADA							2		2
YHZ	HALIFAX, NS, CANADA			2						2
YKA	KAMLOOPS, BC, CANADA			1						1
YLW	KELOWNA, BC, CANADA			1			1			2
YMM	FT MCMURRAY, ALTA, CANADA			1						1
YOW	OTTAWA, ONT, CANADA			1				1		2
YQB	QUEBEC, QUE, CANADA			2						2
YQR	REGINA, SASK, CANADA			1						1
YQT	THUNDER BAY, ONT, CANADA			1						1
YSM	FT SMITH, NWT, CANADA			1						1
YUL	MONTREAL, QUEBEC, CANADA			5				2		7
YVO	VAL D'OR, QUE, CANADA			1						1
YVQ	NORMAN WELLS, NWT, CANADA			1						1
YVR	VANCOUVER, BC, CANADA						1	5	1	7
YWG	WINNIPEG, MAN, CANADA			3						3
YXD	EDMONTON-MUNICIPAL, ALBERTA, CANADA			1				1		2
YXJ	FT ST JOHN, BC, CANADA			3						3
YXS	PRINCE GEORGE, BC, CANADA			2				1		3
YYC	CALGARY, ALBERTA, CANADA			4				2		6
YYJ	VICTORIA, BC, CANADA			1				1		2
YYT	ST JOHNS, NFLD, CANADA			1						1
YYZ	TORONTO, ONTARIO, CANADA			2			1			3
YZF	YELLOWKNIFE, NWT, CANADA			1						1
YZP	SANDSPIT, BC, CANADA							1		1
ZRH	ZURICH, SWITZERLAND			1			1	2		4
ZTH	ZAKINTHOS, GREECE						1	1		2
-0-	AIRPORT UNKNOWN			1		2			6	9
	AIRPORTS WITH KNOWN INGESTIONS	1	10	555	85	15	86	301	357	1410

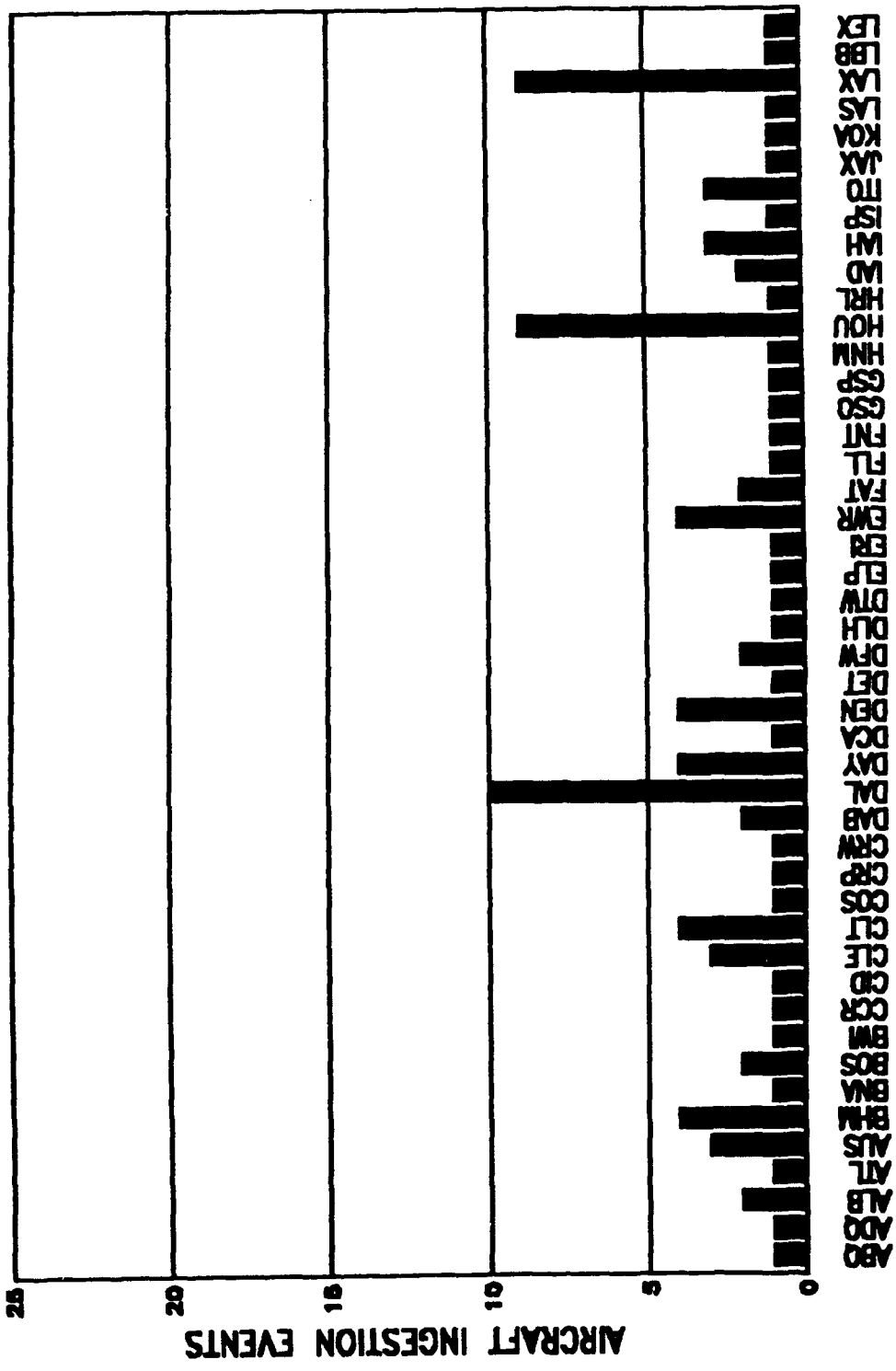


Figure 5.1. Histogram of Aircraft Ingestion Events at Domestic Airports.

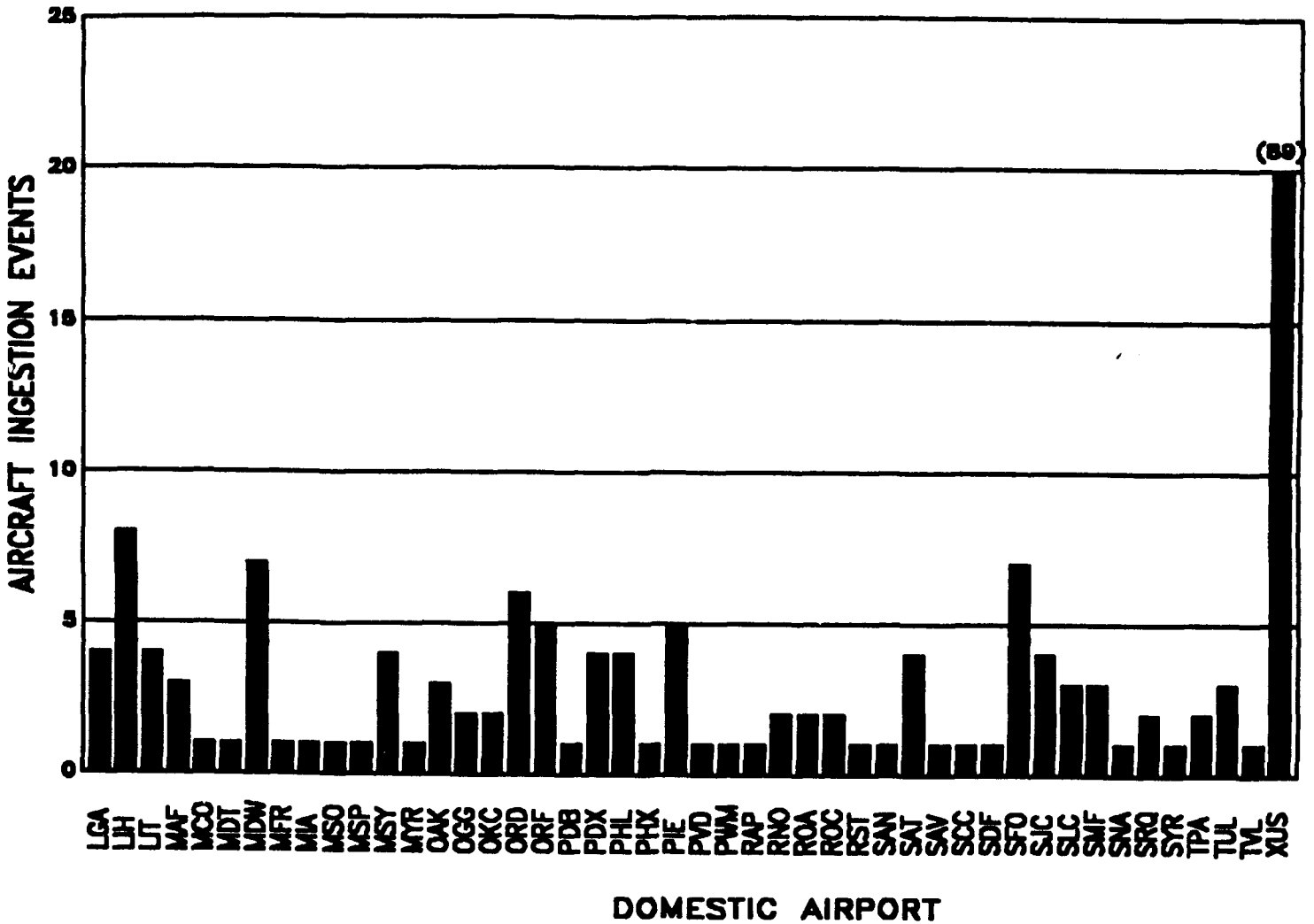


Figure 5.1. Histogram of Aircraft Ingestion Events at Domestic Airports. (Concluded)

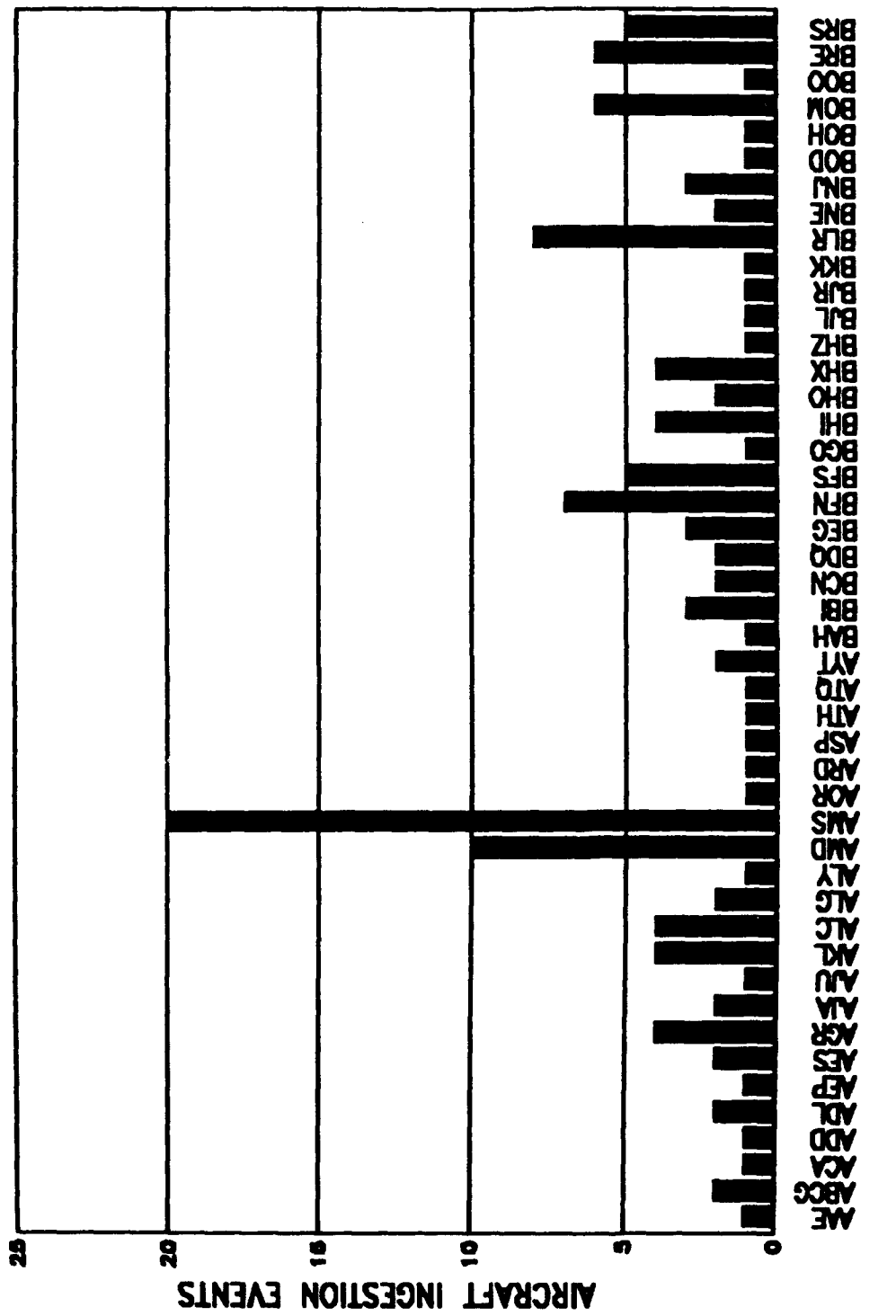


Figure 5.2. Histogram of Aircraft Ingestion Events at Foreign Airports.

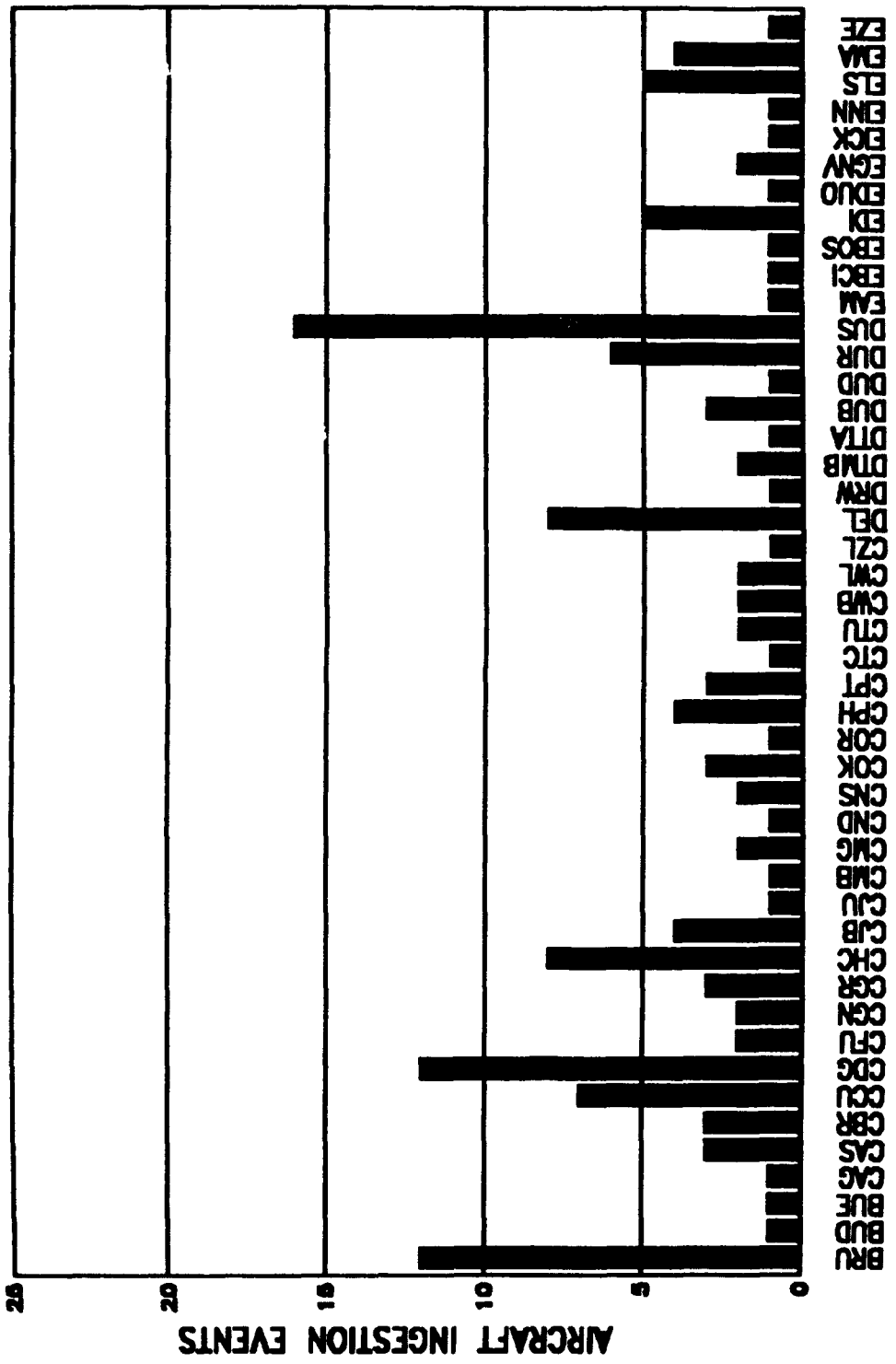


Figure 5.2. Histogram of Aircraft Ingestion Events at Foreign Airports. (Continued)

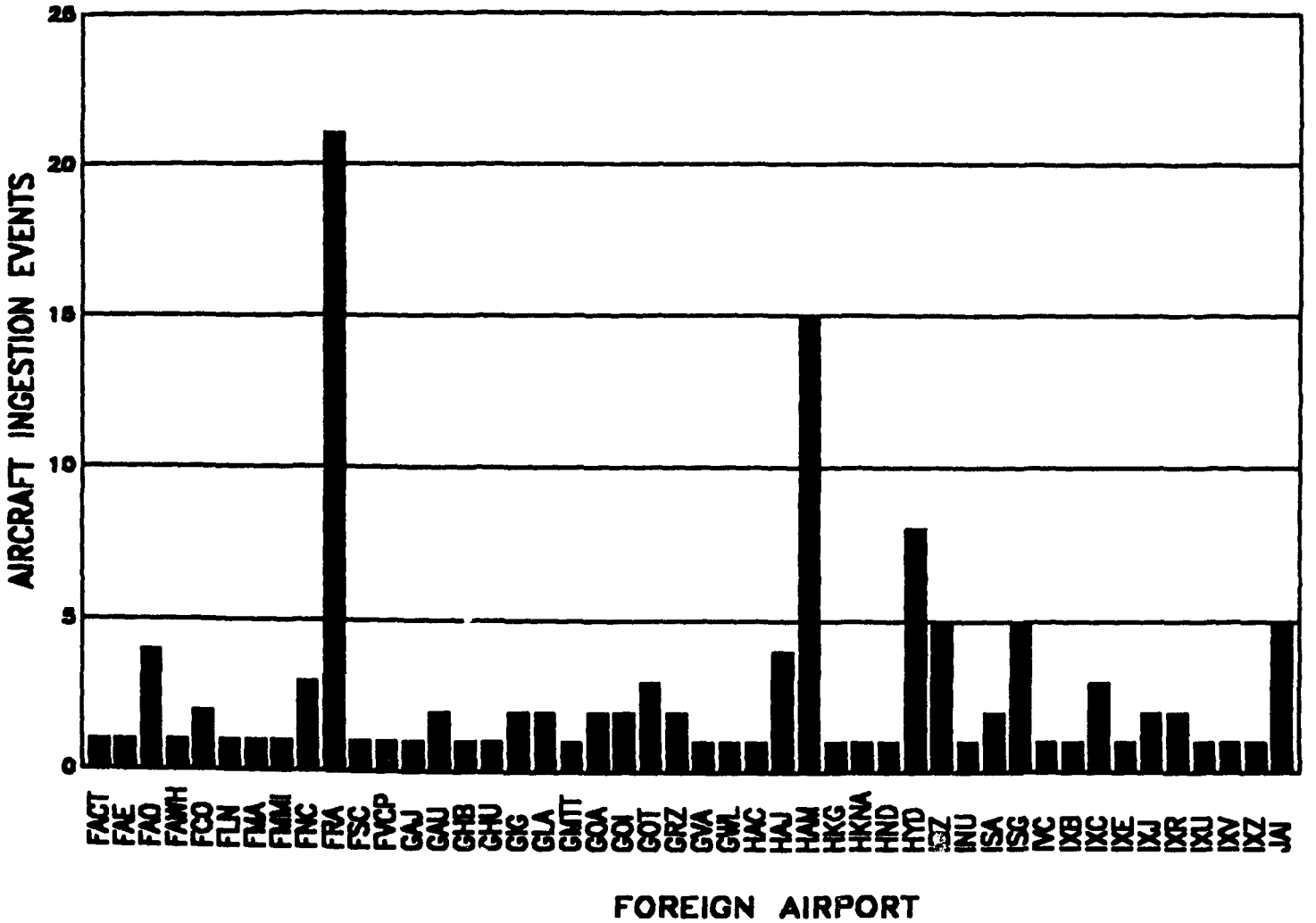


Figure 5.2. Histogram of Aircraft Ingestion Events at Foreign Airports. (Continued)

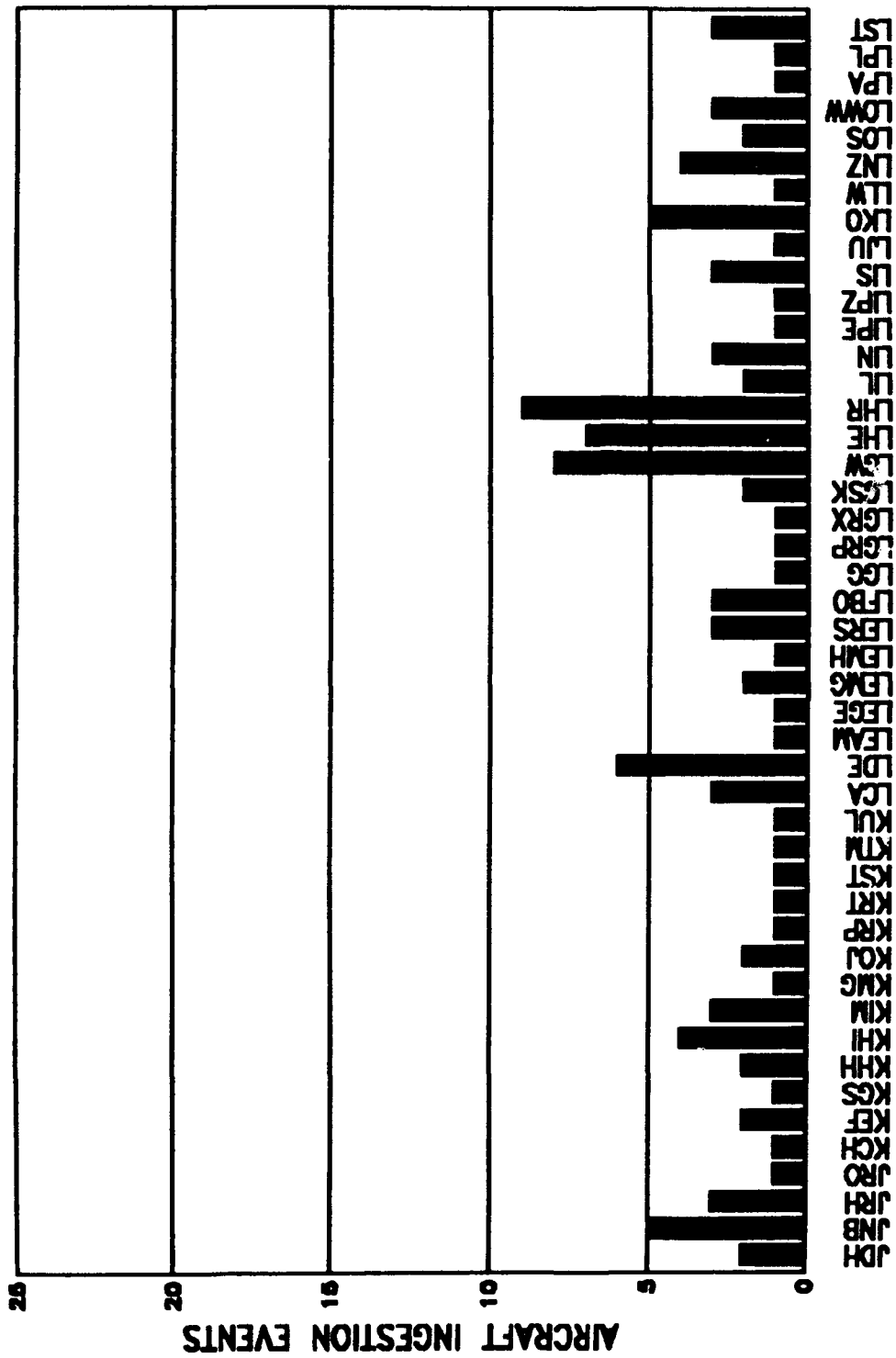


Figure 5.2. Histogram of Aircraft Ingestion Events at Foreign Airports. (Continued)

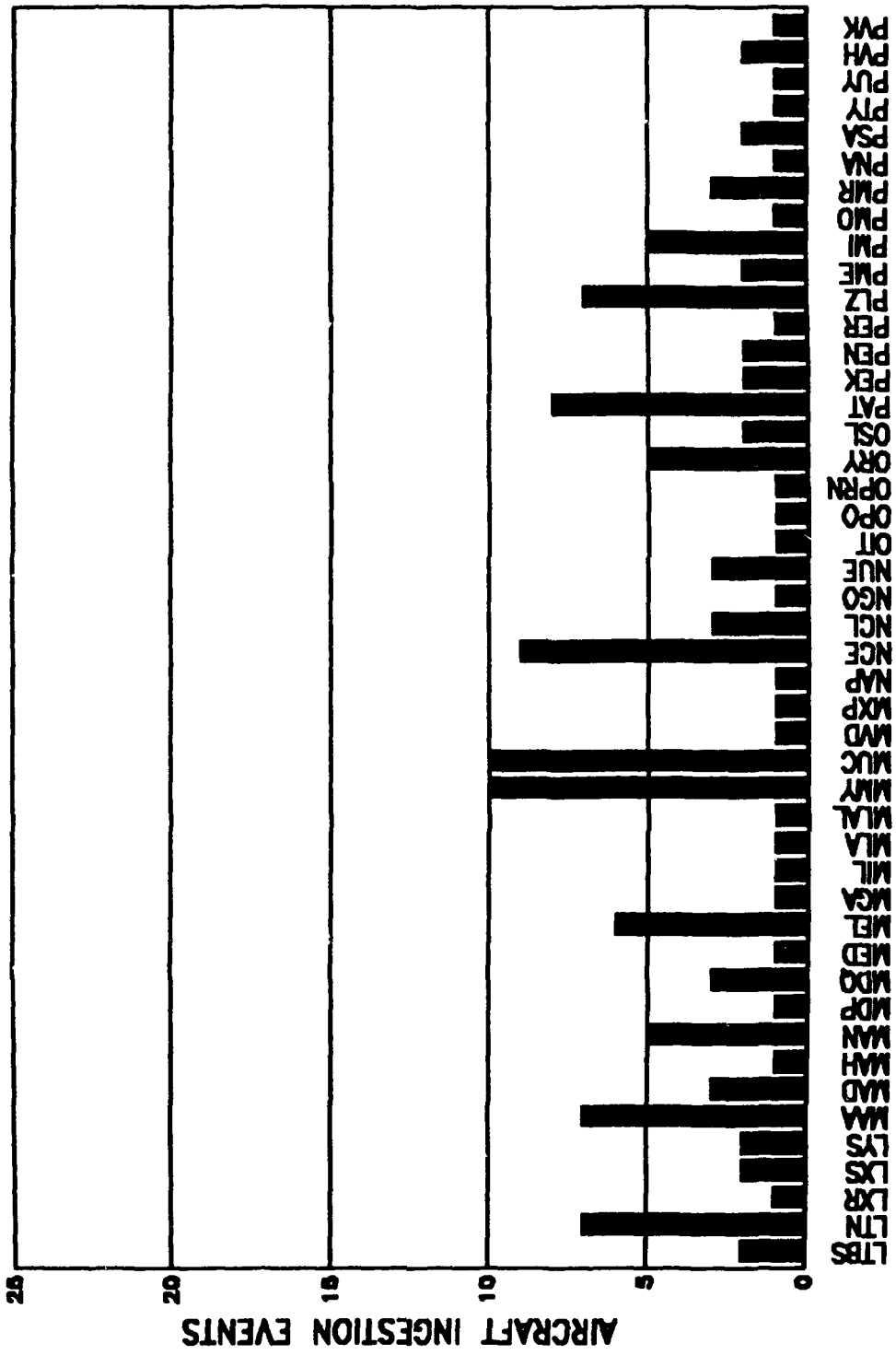


Figure 5.2. Histogram of Aircraft Ingestion Events at Foreign Airports. (Continued)

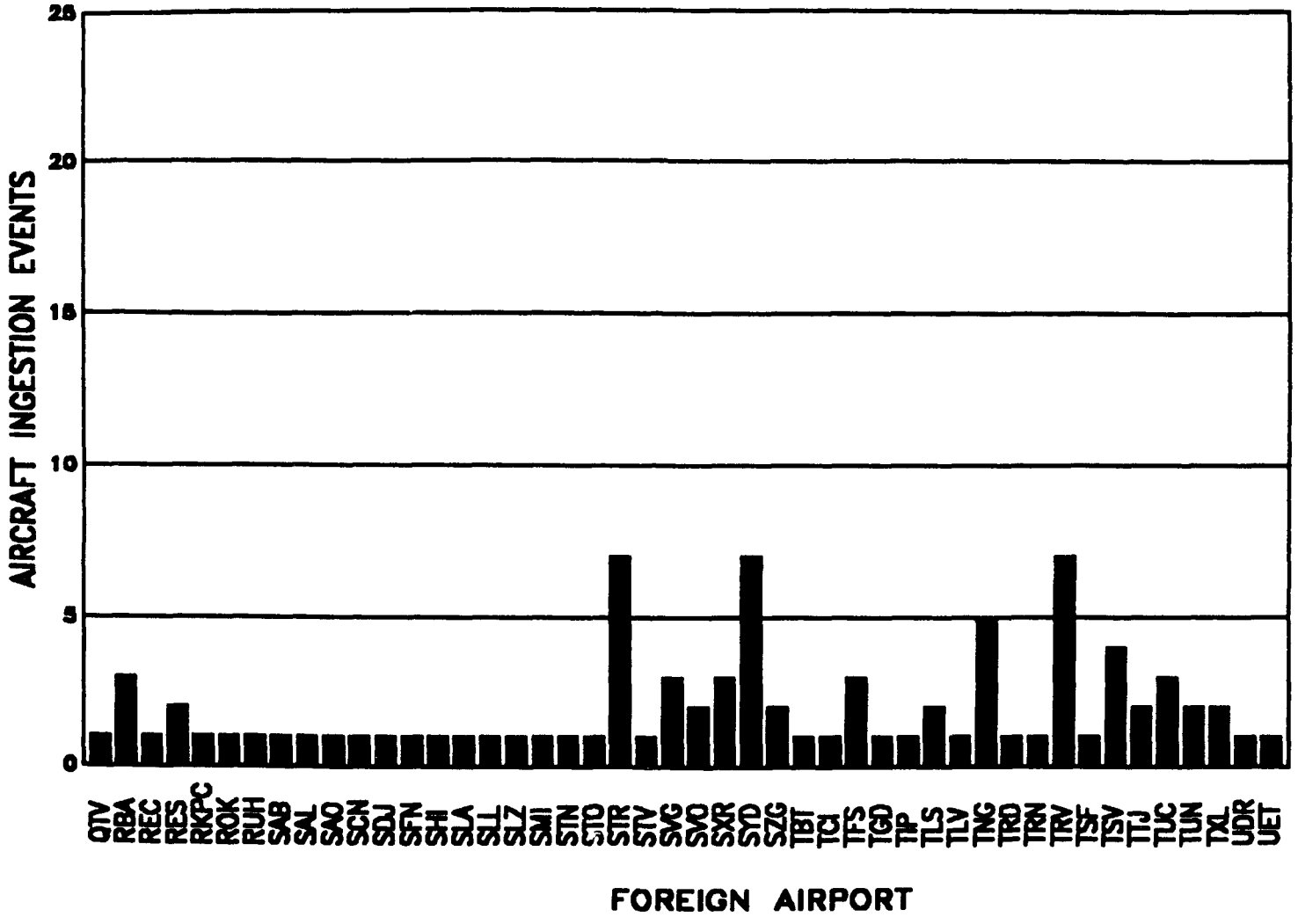


Figure 5.2. Histogram of Aircraft Ingestion Events at Foreign Airports. (Continued)

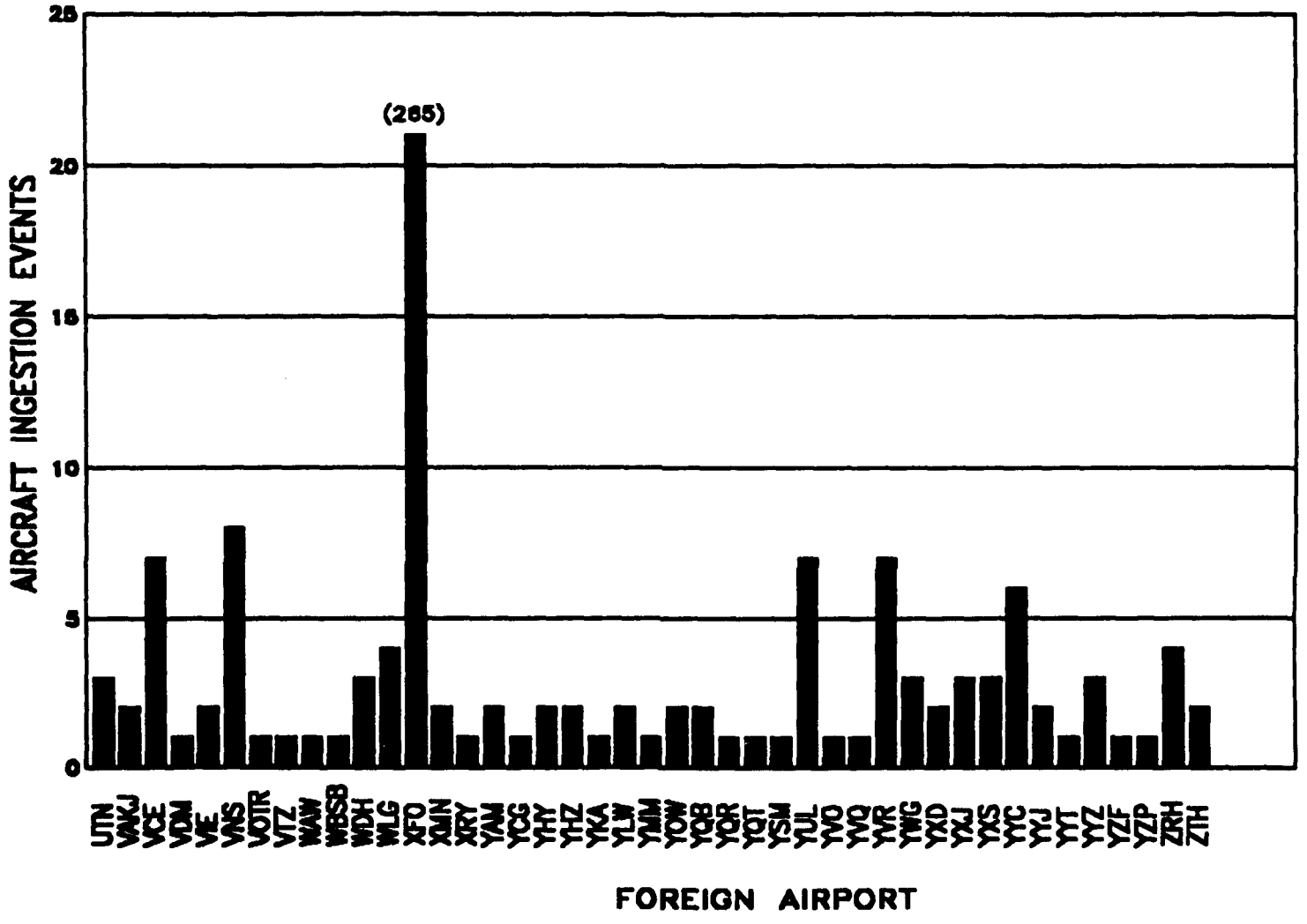


Figure 5.2. Histogram of Aircraft Ingestion Events at Foreign Airports. (Concluded)

TABLE 5.2 AIRPORT BIRD INGESTION RATES

(3 Or More Aircraft Ingestion Events)

Airport Code	Airport Operations	Ingestion Events	Ingestion Rate Events/10K Ops	Airport Location
LAX	355,538	9	0.25	LOS ANGELES, CA, USA
DEN	332,616	4	0.12	STAPLETON INT'L, DENVER, CO, USA
CLT	331,001	4	0.12	CHARLOTTE, NC, USA
SFO	254,777	7	0.27	SAN FRANCISCO-OAKLAND, CA, USA
ORD	249,037	6	0.24	CHICAGO-O'HARE, IL, USA
EWR	247,201	4	0.16	NEWARK, NEW YORK, NY, USA
HOU	239,871	9	0.38	HOUSTON, TX, USA
LHR	238,809	9	0.38	LONDON HEATHROW, ENGLAND, (UK)
DAL	227,610	10	0.44	LOVE DALLS/FT. WORTH, TX, USA
SLC	221,234	3	0.14	SALT LAKE CITY, UT, USA
FRA	172,698	21	1.22	FRANKFURT, FRG
YYZ	136,511	3	0.22	TORONTO, ONTARIO, CANADA
MDW	128,958	7	0.54	CHICAGO-MIDWAY, IL, USA
DAY	128,873	4	0.31	DAYTON, OH, USA
MUC	127,730	10	0.78	MUNICH, FRG
PHL	125,578	4	0.32	PHILADELPHIA/WILMINGTON, PA, USA
IAH	124,385	3	0.24	HOUSTON INTERCONT, TX, USA
CLE	119,819	3	0.25	CLEVELAND, OH, USA
SJC	112,356	4	0.36	SAN JOSE, CA, USA
YVR	109,876	7	0.64	VANCOUVER, BC, CANADA
SAT	101,879	4	0.39	SAN ANTONIO, TX, USA
LGA	100,997	4	0.40	NEW YORK LA GUARDIA, NY, USA
BRU	100,800	12	1.19	BRUSSELS, BELGIUM
AUS	96,991	3	0.31	AUSTIN, TX, USA
DUS	96,533	16	1.66	DUESSELDORF, FRG
YYC	96,280	6	0.62	CALGARY, ALBERTA, CANADA
MSY	91,572	4	0.44	NEW ORLEANS, LA, USA
AMS	89,704	20	2.23	AMSTERDAM, NETHERLANDS
CDG	86,983	12	1.38	PARIS DE GAULLE, FRANCE
TUL	85,274	3	0.35	TULSA, OK, USA
HAM	80,971	15	1.85	HAMBURG, FRG
OAK	77,470	3	0.39	OAKLAND, SAN FRANCISCO, CA, USA
WLG	75,242	4	0.53	WELLINGTON, NEW ZEALAND
DUB	71,650	3	0.42	DUBLIN, REPUBLIC OF IRELAND
SYD	71,211	7	0.98	SYDNEY, N.S.W., AUSTRALIA
AKL	70,344	4	0.57	AUCKLAND, NEW ZEALAND
MEL	69,604	6	0.86	MELBOURNE, VICTORIA, AUSTRALIA
CHC	68,167	8	1.17	CHRISTCHURCH, NEW ZEALAND
LGW	67,116	8	1.19	LONDON-GATWICK, ENGLAND
YUL	65,366	7	1.07	MONTREAL, QUEBEC, CANADA
ORF	64,753	5	0.77	NORFOLK-VA. BEACH, VA, USA
SMF	63,259	3	0.47	SACRAMENTO, CA, USA
STR	59,973	7	1.17	STUTTGART, FRG
PDX	55,447	4	0.72	PORTLAND, OR, USA
SVG	55,045	3	0.55	STAVANGER, NORWAY
LIH	54,320	8	1.47	LIHUE, KAUAI, HA, USA
DEL	50,033	8	1.60	DELHI, INDIA
BOM	48,192	6	1.25	BOMBAY, INDIA
JNB	48,059	5	1.04	JOHANNESBURG, SOUTH AFRICA
MAF	45,147	3	0.66	MIDLAND ODESSA, TX, USA
YWG	44,751	3	0.67	WINNIPEG, MAN, CANADA
ZRH	41,321	4	0.97	ZURICH, SWITZERLAND
CPH	41,237	4	0.97	COPENHAGEN, DENMARK
PLZ	40,727	7	1.72	PORT ELIZABETH, SOUTH AFRICA

TABLE 5.2 (CONTINUED) AIRPORT BIRD INGESTION RATES

(3 Or More Aircraft Ingestion Events)

Airport Code	Airport Operations	Ingestion Events	Ingestion Rate Events/10K Ops	Airport Location
BEG	38,517	3	0.78	BELGRADE, YUGOSLAVIA
LIS	38,228	3	0.78	LISBON, PORTUGAL
CCU	33,422	7	2.09	CALCUTTA, INDIA
ELS	31,567	5	1.58	EAST LONDON, SOUTH AFRICA
LIT	31,026	4	1.29	LITTLE ROCK, AK, USA
CPT	30,773	3	0.97	CAPE TOWN, SOUTH AFRICA
ITO	27,787	3	1.08	HILO HAWAII, HA, USA
HAJ	27,370	4	1.46	HANOVER, FED REP OF GERMANY
BHM	26,708	4	1.50	BIRMINGHAM, AL, USA
LHE	25,548	7	2.74	LAHORE, PAKISTAN
ORY	25,127	5	1.99	PARIS - ORLY ARPT, FRANCE
KHI	25,124	4	1.59	KARACHI, PAKISTAN
DUR	24,288	6	2.47	DURBAN, SOUTH AFRICA
MAA	24,266	7	2.88	MADRAS, INDIA
MAN	24,179	5	2.07	MANCHESTER, ENGLAND (UK)
CGR	23,424	3	1.28	CAMPO GRANDE, BRAZIL
MAD	23,424	3	1.28	MADRID, SPAIN
BLR	23,250	8	3.44	BANGALORE, INDIA
LIN	22,833	3	1.31	MILAN LINATE, ITALY
ISG	20,767	5	2.41	ISHIGAKI, JAPAN
TSV	19,626	4	2.04	TOWNSVILLE, QLD, AUSTRALIA
CBR	17,383	3	1.73	CANBERRA, A.C.T, AUTSTRALIA
AMD	17,076	10	5.86	AHMEDABAD, INDIA
LST	16,128	3	1.86	LAUNCESTON, TASMANIA, AUSTRALIA
BRE	15,785	6	3.80	BREMEN, FED REP OF GERMANY
FNC	14,957	3	2.01	FUNCHAL - MADEIRA, PORTUGAL
NCE	14,532	9	6.19	NICE, FRANCE
COK	14,483	3	2.07	COCHIN, INDIA
BFN	14,158	7	4.94	BLOEMFONTEIN, SOUTH AFRICA
GOT	13,794	3	2.17	GOTHENBURG, SWEDEN
YXS	13,619	3	2.20	PRINCE GEORGE, BC, CANADA
PAT	13,223	8	6.05	PATNA, INDIA
LKO	12,896	5	3.88	LUCKNOW, INDIA
KIM	12,859	3	2.33	KIMBERLEY, SOUTH AFRICA
JAI	12,680	5	3.94	JAIPUR, INDIA
PMI	12,555	5	3.98	PALMA MALLORCA ISLAND, SPAIN
MMY	12,276	10	8.15	MIYAKO JIMA, JAPAN
NUE	11,527	3	2.60	NUREMBURG, FRG
BFS	11,351	5	4.40	BELFAST, N. IRELAND
EDI	10,151	5	4.93	EDINBURGH, SCOTLAND
YXJ	9,691	3	3.10	FT ST JOHN, BC, CANADA
BHX	8,690	4	4.60	BIRMINGHAM, ENGLAND (UK)
MDQ	8,442	3	3.55	MAR DEL PLATA, ARGENTINA
VNS	8,302	8	9.64	VARANASI, INDIA
PMR	8,038	3	3.73	PALMERSTON, NEW ZEALAND
TRV	7,796	7	8.98	TRIVANDRUM, INDIA
TUC	7,106	3	4.22	TUCUMAN, ARGENTINA
BHI	6,974	4	5.74	BAHIA BLANCA, ARGENTINA
SXR	6,850	3	4.38	SRINAGAR, INDIA
TNG	6,639	5	7.53	TANGIER, MOROCCO
HYD	6,582	8	12.15	HYDERABAD, INDIA
BBI	6,254	3	4.80	BHUBANESWAR, INDIA
WDH	5,792	3	5.18	WINDHOEK, NAMIBIA
AGR	5,670	4	7.05	AGRA, INDIA

TABLE 5.2 (CONCLUDED) AIRPORT BIRD INGESTION RATES

(3 Or More Aircraft Ingestion Events)

Airport Code	Airport Operations	Ingestion Events	Ingestion Rate Events/10K Ops	Airport Location
NCL	5,293	3	5.67	NEWCASTLE, ENGLAND
CJB	4,662	4	8.58	COIMBATORE, INDIA
VCE	4,652	7	15.05	VALVERDE, CANARY ISLANDS
IXC	4,350	3	6.90	CHANDIGAR, INDIA
LCA	4,245	3	7.07	LARNACA, CYPRUS
FAO	4,081	4	9.80	FARO, PORTUGAL
ALC	3,014	4	13.27	ALICANTE, SPAIN
TFS	2,617	3	11.46	TENERIFFE-REINASOFIA, CANARY ISLAND
UTN	2,570	3	11.67	UPINGTON, SOUTH AFRICA
JRH	2,156	3	13.91	JORMAT, INDIA
LNZ	2,155	4	18.56	LONZ, AUSTRIA
RBA	1,093	3	(*)	RABAT, MOROCCO
LTN	1,018	7	(*)	LONDON-LUTON INT'L, ENGLAND
EMA	882	4	(*)	EAST MIDLANDS, ENGLAND
PIE	645	5	(*)	TAMPA-ST. PETERSBURG, FL, USA
IBZ	638	5	(*)	IBIZA, SPAIN
BRS	18	5	(*)	BRISTOL, ENGLAND (UK)
CAS	16	3	(*)	CASABLANCA, MOROCCO
LDE	8	6	(*)	LOURDES/TARBES, FRANCE
LOW	0	3	(**)	WIEN-SCHWEICHAT, OSTERREICH
LFB	0	3	(**)	BLAGNAC, FRANCE
LER	0	3	(**)	REUS, SPAIN
BNJ	0	3	(**)	BONN, FRG
	7,332,204	647	0.88 (***)	

(*) High proportion of unscheduled operations prevents calculation of meaningful ingestion rate.
(**) Undefined ingestion rate.
(***) Does not include airports whose rates are flagged with asterisks.

SECTION 6
ENGINE DAMAGE DESCRIPTION

The type of damage incurred by well-defined engine bird ingestion events is useful in refining bird certification test criteria that could lead to improved engine design. In general, three parameters are used to describe engine damage and failure. The first is the type of damage incurred, the second is whether or not the engine failed and the third is a description of the crew action taken during the engine ingestion event. The first part of this section provides descriptions of the types of damage incurred during the study, the relationships between engine damage and bird weight, engine damage and phase of flight, engine damage and aircraft airspeed, engine damage and multiple engine and multiple bird involvement, and the types of crew actions implemented as a result of the bird ingestion. The second part describes the statistical analysis of the relationship between bird weight and the likelihood of damage occurring in an engine ingestion event. The third part of this section provides estimates of the probabilities of a crew action or an engine shutdown. The fourth part describes the engine failures that were due to bird ingestions.

6.1 ENGINE DAMAGE AND CREW ACTION DESCRIPTIONS.

The types of damage that were identified in the data base were grouped into 14 categories which are defined in Table 6.1. Within the 3-year data collection period all 14 of the categories occurred. Tabulations of the occurrences of combinations of damage categories are presented in Table 6.2. The triangular top portion of the table provides tallies of co-occurrences for all pairs of damage categories. The number in the top portion represents the number of engine ingestion events in which both the row damage and the column damage occurred. The events in which more than two types of damage occurred were also included in the tallies of the top portion of Table 6.2. There were 39 events in which three types of damage occurred, 101 events in which two types of damage occurred and 314 events with a single type of damage.

There are insufficient data in the top portion of Table 6.2 to make any strong statements about correlations between types of damage. There is some indication that bent and dented fan blades accompany core damage and broken and shingled fan blades and that leading edge fan blade damage accompanies fan blade shingling; however, these trends cannot be strongly substantiated because of the small amount of data. The observed trends could provide the starting point for further investigations into the damage mechanisms of bird ingestions.

The bottom half of Table 6.2 provides tallies of the number of engine ingestion events in which each damage category was the only type of damage and the total number of events that involved each of the damage categories. Fewer than three bent and dented blades, shingled blades and nacelle and spinner damage seem more likely to occur by themselves than other types of damage. When more than three blades are bent or dented there is a much higher chance that some other type of damage will also occur. As with the trends identified in the top portion of Table 6.2, there is insufficient evidence to strongly substantiate these trends.

TABLE 6.1 DEFINITION OF ENGINE DAMAGE CATEGORIES

DAMAGE CATEGORY	SEVERITY LEVEL	DAMAGE DEFINITION
TRVSFRAC	Severe	Transverse fracture - fan blade broken chordwise (across) and piece liberated (includes secondary hard object damage).
CORE	Severe	Bent/broken compressor blades/vanes, blade/vane clash, blocked/disrupted airflow in low, intermediate, and high pressure compressors.
FLANGE	Severe	Flange separations.
TURBINE	Severe	Turbine damage.
BE/DE>3	Moderate	More than three fan blades bent or dented.
TORN>10	Moderate	More than ten torn fan blades.
BROKEN	Moderate	Broken fan blades, leading edge and/or tip pieces missing, other blades also dented.
SPINNER	Moderate	Dented, broken, or cracked spinner (includes spinner cap).
RELEASED	Moderate	Released (walked) fan blades (blade retention mechanism broken).
TORN<10	Mild	Ten or fewer torn fan blades.
SHINGLED	Mild	Shingled (twisted) fan blades.
NACELLE	Mild	Dents and/or punctures to the engine enclosure (includes cowl).
LEAD_EDG	Mild	Leading edge distortion/curl.
BEN/DEN	Mild	One to three fan blades bent or dented.

TABLE 6.2 TYPES OF DAMAGE CAUSED BY BIRD INGESTIONS

	TRVSFRAC	CORE	FLANGE	TURBINE	BE/DE>3	TORN>10	BROKEN	SPINNER	RELEASED	TORN<10	SHINGLED	NACELLE	LEAD_EDG
CORE	11												
FLANGE	2	0											
TURBINE	0	2	0										
BE/DE>3	3	11	0	2									
TORN>10	2	0	0	0	1								
BROKEN	6	13	0	0	14	0							
SPINNER	0	0	0	0	0	0	0						
RELEASED	3	4	0	0	5	0	0	0					
TORN<10	0	2	0	0	1	0	1	0	0				
SHINGLED	2	3	0	0	19	0	6	0	5	1			
NACELLE	0	0	0	0	0	0	1	0	0	0	0		
LEAD_EDG	0	1	0	0	1	0	5	0	0	2	23	0	
BEN/DEN	6	9	0	0	0	0	16	0	2	0	25	2	6

	TRVSFRAC	CORE	FLANGE	TURBINE	BE/DE>3	TORN>10	BROKEN	SPINNER	RELEASED	TORN<10	SHINGLED	NACELLE	LEAD_EDG	BEN/DEN
ONLY DAMAGE	7	12	0	1	38	0	30	1	0	1	89	5	31	99
TOTAL	29	48	2	3	80	2	70	1	11	6	159	7	64	151

Table 6.3 and 6.4 describe the relationship between the weight of the ingested bird and resulting engine damage. Table 6.3 shows the number of both multiple and single bird engine ingestion events as well as the total number of events with and without reported damage in each specified bird weight range where the bird was positively identified by an ornithologist. Engine damage summaries are shown in Tables 6.4A for all engine ingestion events, 6.4B for single bird events, and 6.4C for multiple bird events. These tables were made by tallying the damage codes from the events shown in Table 6.3 in each specified bird weight range.

Since many of the engine ingestion events have multiple damage categories, the total number of damage categories does not equal the number of engine ingestion events. Tables 6.4A, 6.4B, and 6.4C also show the damage sustained by those engines that were considered to have failed due to the bird ingestion. (See section 6.4 for more information on engine failure.)

The amount of data available is insufficient to draw any correlations between the weight of the ingested bird and the type of damage that occurs. However, Table 6.4A shows that 56 percent of the ingestions (111) in which the bird weighed less than or equal to 24 ounces caused no damage. In comparison only 17 percent of the birds ingested that weighed more than 24 ounces caused no engine damage.

The relationship between engine damage, phase of flight and aircraft airspeed is shown in Tables 6.5 and 6.6. Table 6.5 depicts the relationship between engine damage and phase of flight. Of the 1107 known phase of flight engine ingestion events, 61 percent occurred on takeoff and climb and 37 percent occurred during approach and landing. Forty-five percent of the engine ingestion events that took place during takeoff and climb resulted in engine damage; in comparison, only 24 percent resulted in damage during approach and landing. This suggests a relationship between engine speed (thrust) and bird ingestion engine damage, since engine speed would typically be higher during takeoff and climb than during approach and landing. However, engine speed or power was rarely reported during the study. It should be noted that 35 engine failures occurred during takeoff and climb and only 2 engine failures occurred during approach and landing.

Table 6.6 shows the number of engine ingestion events and the number of damaging engine ingestions known to have occurred below 140 knots airspeed and at or above 140 knots. The table also shows the phase of flight that these damaging engine ingestions occurred in those airspeed ranges. There were 13 percent (41 percent versus 28 percent respectively) more engine ingestions that resulted in engine damage at or above 140 knots airspeed than those that occurred below 140 knots. It is also shown that a significantly greater number of damaging ingestions occurred during takeoff and climb than during approach and landing at both aircraft airspeed ranges.

Multiple engine and multiple bird ingestion events present the greatest hazard to aircraft. Table 6.7 shows the number of these event that occurred. Fifty-eight aircraft had bird ingestions into both engines during the same event, and twelve events resulted in damage to both engines. There were also twenty-nine events where multiple birds were ingested into both engines;

TABLE 6.3. TALLY OF POSITIVELY IDENTIFIED BIRD SPECIES BY WEIGHT RANGE AND EVENT TYPE

Weight Range (oz.)	Bird Identifications* Total Bird Events	Single Bird Events	Multiple Bird Events
$0 < x \leq 8$	107	83	24
$8 < x \leq 16$	80	62	18
$16 < x \leq 24$	13	9	4
$24 < x \leq 32$	13	13	0
$32 < x \leq 40$	25	17	8
$x > 40$	15	13	2
Total	253	197	56

*One counted for each engine ingestion event

TABLE 6.4A. 737 AIRCRAFT ENGINE BIRD INGESTION DAMAGE SUMMARY (TOTAL BIRD EVENTS)*

Severity	Damage Category	Bird Weight Range (oz.)					
		(0<x≤8)	(8<x≤16)	(16<x≤ 24)	(24<x≤32)	(32<x≤40)	(x>40)
	None	69	36	6	2	4	3
	Damage Unknown	4	5/1	0	1	0	0
	Other	0	3/1	0	1	6	0
Mild							
	Lead-Edg	3	6	2	1/1	3	0
	Shingled	10	11/2	1	1	6/1	4/1
	Ben/Den	18/1	10/1	3	1	3/1	3
	Torn<3	0	1	0	1	0	1
	Nacelle	1	0	0	2	0	0
Moderate							
	Be/De>3	6	8/3	2/2	0	6/3	5/1
	Torn>3	0	0	0	0	2/2	0
	Broken	7/1	6/2	2/1	5/1	3/2	3/1
	Spinner	0	0	0	0	0	0
	Released	0	4/3	0	0	1	1
Severe							
	Trvs Frac	4/4	8/8	1/1	2/2	3/3	1/1
	Core	3/2	9/7	2/2	2/1	1	5/1
	Flange	0	1/1	0	1/1	0	0
	Turbine	1/1	2/2	0	0	0	0

*Number of occurrences/number of occurrences when engine failed

TABLE 6.4B. 737 AIRCRAFT ENGINE BIRD INGESTION DAMAGE SUMMARY (SINGLE BIRD EVENTS)*

Severity	Damage Category	Bird Weight Range (oz.)					
		(0<x≤8)	(8<x≤16)	(16<x≤ 24)	(24<x≤32)	(32<x≤40)	(x>40)
	None	56	31	3	2	2	3
	Damage Unknown	3	5/1	0	1	0	0
	Other	0	3/1	0	1	4	0
Mild							
	Lead-Edg	2	4	1	1/1	3	0
	Shingled	7	7/1	1	1	3	3/1
	Ben/Den	13	8/1	2	1	2/1	1
	Torn<3	0	1	0	1	0	1
	Nacelle	1	0	0	2	0	0
Moderate							
	Be/De>3	3	3/1	2/2	0	5/2	5/1
	Torn>3	0	0	0	0	2/2	0
	Broken	5	6/2	2/1	5/1	3/2	2/1
	Spinner	0	0	0	0	0	0
	Released	0	1/1	0	0	1	1
Severe							
	Trvs Frac	3/3	4/4	1/1	2/2	3/3	1/1
	Core	3/2	3/2	2/2	2/1	1	4/1
	Flange	0	1/1	0	1/1	0	0
	Turbine	1/1	0	0	0	0	0

*Number of occurrences/number of occurrences when engine failed

TABLE 6.4C. 737 AIRCRAFT ENGINE BIRD INGESTION DAMAGE SUMMARY (MULTIPLE BIRD EVENTS)*

Severity	Damage Category	Bird Weight Range (oz.)					
		(0<x≤8)	(8<x≤16)	(16<x≤ 24)	(24<x≤32)	(32<x≤40)	(x>40)
	None	13	5	3	0	2	0
	Damage Unknown	1	0	0	0	0	0
	Other	0	0	0	0	2	0
Mild							
	Lead-Edg	1	2	1	0	0	0
	Shingled	3	4/1	0	0	3/1	1
	Ben/Den	5/1	2	1	0	1	2
	Torn<3	0	0	0	0	0	0
	Nacelle	0	0	0	0	0	0
Moderate							
	Be/De>3	3	5/2	0	0	1/1	0
	Torn>3	0	0	0	0	0	0
	Broken	2/1	0	0	0	0	1
	Spinner	0	0	0	0	0	0
	Released	0	3/2	0	0	0	0
Severe							
	Trvs Frac	1/1	4/4	0	0	0	0
	Core	0	6/5	0	0	0	1
	Flange	0	0	0	0	0	0
	Turbine	0	2/2	0	0	0	0

*Number of occurrences/number of occurrences when engine failed

TABLE 6.5. PHASE-OF-FLIGHT (POF) ANALYSIS

	Known POF Aircraft Events/ Engine Ingestions (1054/1107)	Known POF Damaging Aircraft Events/ Engine Ingestions (388/406)	Known POF Engine Failure Ingestions (37)
Takeoff and Climb	640/674	289/300	35
Approaching and Landing	387/406	89/96	2

TABLE 6.6. AIRCRAFT AIRSPEED ANALYSIS

Aircraft Airspeed	Known Speed Engine Ingestions (634)	Known Speed Engine Ingestions, Takeoff And Climb (387)	Known Speed Engine Ingestions, Landing And Approach (234)
< 140 Knots	412	215	190
≥ 140 Knots	222	172	44

Aircraft Airspeed	Known Speed Damaging Engine Ingestions (206)	Known Speed Damaging Engine Ingestions, Takeoff And Climb (159)	Known Speed Damaging Engine Ingestions, Landing And Approach (47)
< 140 Knots	116	78	38
≥ 140 Knots	90	81	9

TABLE 6.7. MULTIPLE ENGINE AND MULTIPLE BIRD ANALYSIS

	Aircraft Events/ Engine Ingestions	Damaging Engine Ingestions	Engine Failure Ingestions
Multiple Engine	58/116	38/12*	2
Multiple Bird	179/208	79	9
Single Bird	1237/1260	489	21

*Aircraft events where more than one engine damaged

potentially the most hazardous bird ingestion condition an aircraft can encounter.

Table 6.7 also gives the number of engine ingestion events where more than one bird was ingested into the engine. Of the 208 multiple bird engine ingestions that occurred, 38 percent of the ingestions resulted in some engine damage. In comparison 39 percent of the engines that ingested a single bird resulted in some engine damage. Four percent of the mutiple bird ingestions resulted in engine failures compared to three percent for single bird ingestions.

There were four types of crew action identified in connection with the aircraft ingestion events in the data base. An air turnback was performed in 128 of the events, the takeoff was aborted 129 times, a diversionary maneuver was performed 16 times and in 21 events the crew action was listed as other without specifying the type of action taken. There was no crew action taken in 719 of the aircraft ingestion events for which a crew action entry was recorded, which is nearly 71 percent of the time. (One airplane crashed on takeoff.) The crew action should correspond to the phase of flight in which the event occurred. No change in the flight is usually required when an ingestion occurs during a landing maneuver. The aborted takeoffs and air turnbacks would most likely occur during takeoff and climb phases since there were practically no ingestions during the cruise phase. However, there were three air turnbacks as a result of a bird ingestion during the cruise phase.

6.2 PROBABILITY OF DAMAGE.

One of the key questions that inspired the bird ingestion survey is the issue of what weight bird should be considered for certification test criteria. Two of the main issues in deciding what the certification bird size should be are (1) the likelihood of ingesting a bird of the certification size or larger and (2) the likelihood that damage will result from ingesting a bird of a specified weight. The issue of bird weights is discussed in Sections 3 and 7 while the probability of damage is the topic of this section.

The problem of relating bird weight to the probability of damage (POD) is similar to bio-assay experiments which try to predict the probability of a response as a function of dose size. The key elements of similarity are that the probability of success for a dichotomous (pass/fail) trial is related to a continuous stimulus variable. In bird ingestions the dichotomous trial is whether or not damage occurs and the stimulus variable is the weight of the ingested bird.

Linear logistic analysis is the most commonly used method of analyzing the dosage-response type of data and has been used successfully in relating the probability of transparencies breaking as a function of projectile size in dealing with the problem of propwash blown gravel breaking helicopter windshields [10]. The logistic distribution function is assumed to describe the relationship between the probability of damage and the bird weight in a linear logistic analysis. The logistic distribution function is given by:

$$POD(w) = 1/\{1+\exp[-(\pi/\sqrt{3})(w-\mu)/\sigma]\} \qquad (6.1)$$

where w is the bird weight, μ is the weight with a 50 percent chance of causing damage and σ is a parameter that is related to the steepness of the POD function.

The estimation of the function given in Equation 6.1 has been extensively studied and the methods have been described in the literature [11,12]. The method of maximum likelihood provides the best estimates for the type of data in the bird ingestion study since there are only a few ingestions at each weight. The software for estimating the parameters of Equation 6.1 has been developed and extensively tested at the UDRI [13] and verified by researchers at other institutions.

The types of damage were categorized as mild, moderate or severe by the FAA. Table 6.8 itemizes the types of damage that were included in each of the severity categories. Three distinct analyses were conducted based on the severity ratings. The three analyses estimated the probability of any damage, the probability of at least moderate damage and the probability of severe damage as a function of bias weight. Figures 6.1, 6.2, and 6.3 show the estimated POD functions along with confidence bounds on the POD functions for the three analyses. Note that the figures are based on the weight of one ingested bird per event, not the total weight of all birds ingested in the case of a multiple bird ingestion event.

Figure 6.1 shows the probability of any damage occurring and includes all three severity levels as positive responses. The probability of any damage occurring rises very steeply reaching 50 percent at about 10.0 ounces and the curve levels off at the 90 percent level at about 120 ounces. The relationship between bird weight and the probability of any damage is very strong and results in the confidence bound being close to the mean trend curve.

The probability of moderate damage does not rise quite so steeply and a definitive weight cutoff between birds that cause damage and those that do not cause damage cannot be identified. The probability of moderate damage reaches 50 percent at 66 ounces and remains below 70 percent through the weight range collected in this study. The confidence bound shown in Figure 6.2 is further from the mean trend than the confidence bound in Figure 6.1 because the trend in the probability of moderate damage as a function of bird weight is not as strong as the trend in the probability of any damage.

The probability of severe damage and its confidence bound are plotted in Figure 6.3 as functions of bird weight. The probability of severe damage is much lower than the probabilities of any damage or moderate damage. As a result, the curves are much flatter and rise much more slowly than the curves in Figures 6.1 and 6.2. The probability of severe damage remains below 35 percent through the weight range collected in this study.

The probability of damage analysis is clouded by the poor bird identification rates. The estimated POD functions are likely to be biased toward higher POD values since there was a larger proportion of birds identified when engine damage occurred. The extent of the bias cannot be estimated accurately.

TABLE 6.8 DAMAGE SEVERITY DEFINITIONS

SEVERITY LEVEL	DAMAGE DEFINITION
SEVERE DAMAGE	Damage classified as severe. Achieved when reported damage category is TRVSFRAC, CORE, FLANGE, or TURBINE.
MODERATE DAMAGE	Damage classified as moderate. Achieved when reported damage category is BE/DE>3, TORN>10, BROKEN, SPINNER, or RELEASED **AND** no SEVERE damage has been reported.
MILD DAMAGE	Damage classified as mild. Achieved when reported damage category is LEAD_EDG, BEN/DEN, TORN<10, SHINGLED, or NACELLE **AND** neither SEVERE nor MODERATE damage has been reported.

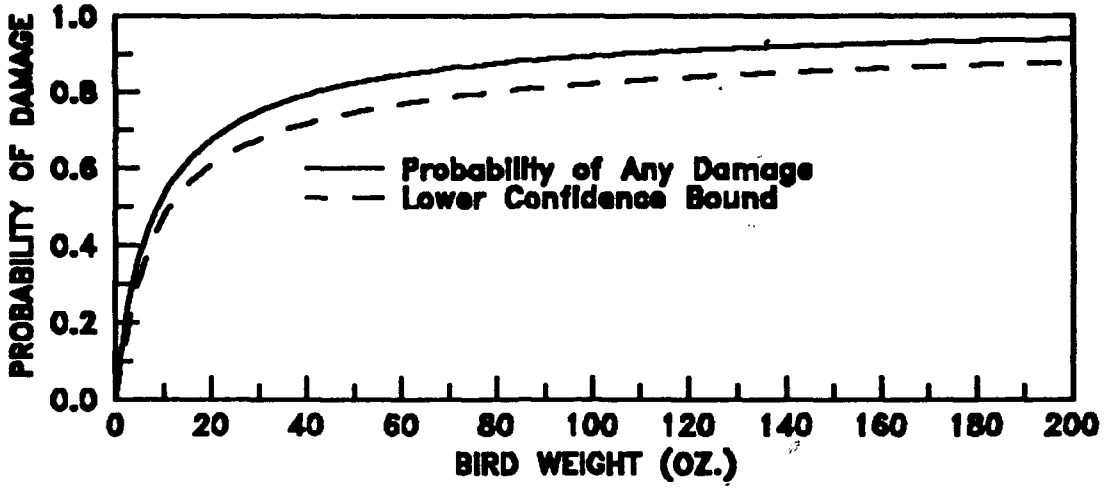


Figure 6.1. Estimated POD Function for Any Damage with the 95 Percent Confidence Bound.

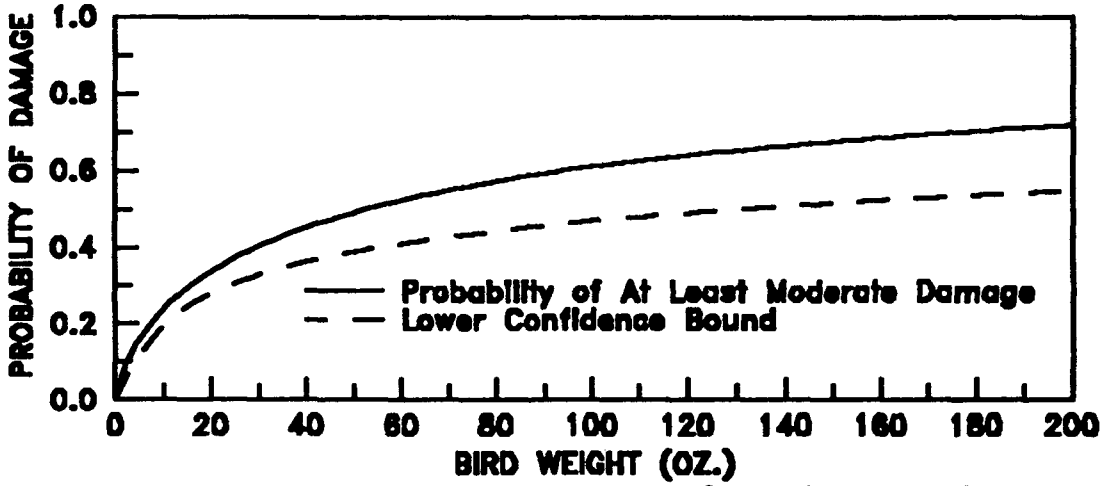


Figure 6.2. Estimated POD Function for Moderate or Worse Damage with the 95 Percent Confidence Bound.

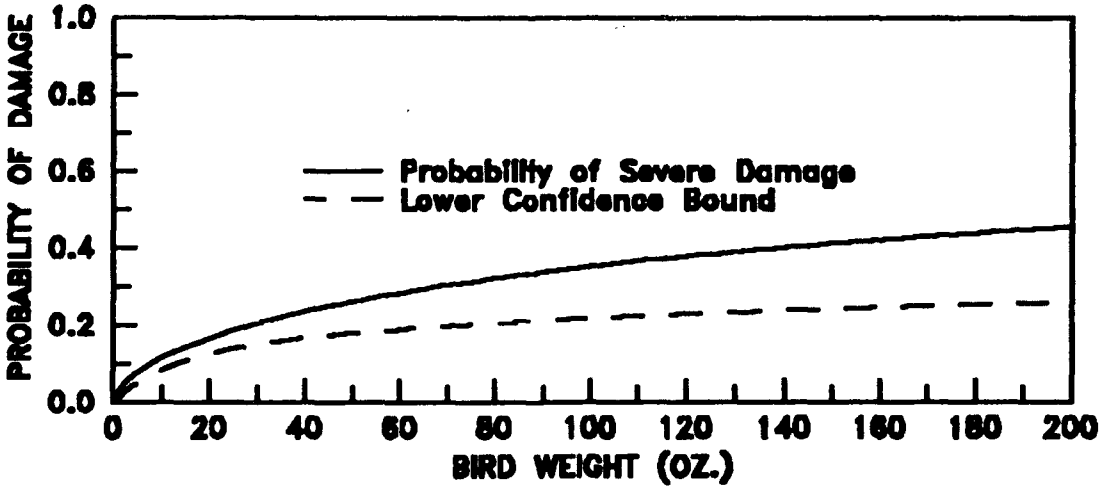


Figure 6.3. Estimated POD Function for Severe Damage with the 95 Percent Confidence Bound.

6.3 CREW ACTION AND ENGINE SHUTDOWN PROBABILITIES.

Two other factors that relate to the severity of engine damage are whether or not a crew action is required and whether or not an engine was shut down as a result of the ingestion. Table 6.9 lists the conditional probabilities that a crew action is required given the severity of damage that the engine incurs. The probability that a crew action is required increases with the severity of engine damage as expected. The third column of Table 6.9 contains the upper 95 percent confidence bound on the conditional probabilities given in column two.

The formulae for the estimates of the conditional probability of a crew action given the engine damage severity are:

$$\hat{P} = \frac{C}{N_s} \tag{6.2}$$

$$P_{CB} = \hat{P} + 1.645\sqrt{\frac{\hat{P}\ (1-\hat{P})}{N_s}} \tag{6.3}$$

In Equations 6.2 and 6.3, $\hat{P}$ is the estimated conditional probability of a crew action, C is the number of aircraft ingestion events in which a crew action was taken and an engine sustained the given severity level, N_s is the number of aircraft ingestion events in which an engine sustained the given severity level and P_{CB} is the upper confidence bound on the conditional probability. The constant 1.645 is derived from the cumulative normal distribution function to give a 95 percent level of confidence.

An in-flight engine shutdown occurred in 46 of the 1,410 aircraft ingestion events; which corresponds to an estimated probability of an in-flight engine shutdown given that an ingestion has occurred of 0.033 with a 95 percent confidence bound of 0.0404. The reason for the shutdown was not known in 25 of the events. An involuntary shutdown occurred seven times. Excessive vibration precipitated the shutdown nine times. The engine was shut down because of incorrect engine pressure ratio three times, incorrect engine parameter readings once, and high exhaust gas temperature twice. Inferences about the causes of in-flight shutdowns cannot be drawn because of the large proportion of shutdowns in which the cause was not identified.

6.4 ENGINE FAILURES.

Engine failures are important areas to consider when analyzing these engine bird ingestion events. For the purpose of this study an engine failure was considered to have occurred when an engine was not able to produce and maintain usable thrust of at least 50 percent for the use by the pilot of the aircraft. A transverse fan blade fracture and an involuntary engine in-flight shutdown were considered to be engine failures in all cases. Otherwise an engineering judgement was made based on the extent of engine damage, effect on flight, phase of flight, and any other factors that may have been provided in the description of the event or investigation summary.

TABLE 6.9

CONDITIONAL PROBABILITY OF CREW ACTION
GIVEN THE ENGINE DAMAGE SEVERITY

ENGINE DAMAGE SEVERITY	PROBABILITY OF CREW ACTION P(CA)	UPPER CONFIDENCE BOUND
NO DAMAGE	.139	.161
ANY DAMAGE	.289	.329
AT LEAST MODERATE DAMAGE	.400	.487
SEVERE DAMAGE	.567	.743

Table 6.10 provides a summary of some of the important data categories for the engine ingestion events that resulted in an engine failure. The conditional probability of an engine failure given that an ingestion has occurred is 0.029 with a lower 95 percent confidence bound of 0.021. The lower confidence bound was calculated using the Z statistic for proportions. The overall engine failure rate for the 737 aircraft due to bird ingestion was 0.005 failures per ten thousand aircraft operations.

Table 6.10 shows that a voluntary or involuntary in-flight shutdown of the engine occurred in 21 of the 42 engine failures. There was also a power loss associated with 89 percent of the engine failures where there was information reported in the power loss category. The most significant cause of engine failures appears to be transverse fan blade fracture which caused 27 of the 42 engine failures.

Reviewing the bird threat data for these engine failures shows that the species of bird was identified and an estimated weight was available in only 28 of the 42 engine failure events. The percentage of identifications is too low to allow statistical inferences about bird weights. The trend for the weights that are available is that the birds ingested in failure events are heavier than the birds ingested in all events. The mean of the weights for the birds that were identified in failure events is 27.5 ounces which is 10.3 ounces heavier than the overall mean. The higher mean for the failure events should be interpreted as a pointer to a possible trend that should be investigated further since the weight identifications are low.

Twenty-one of the engine failures were caused by the ingestion of a single bird and nine were caused by the ingestion of multiple birds. This is a much higher percentage than the fraction of all ingestion events which involved multiple birds. This suggests that engine failure is more likely in cases of multiple bird ingestion. Also, in 7 of the 28 engine failures where the bird weight was known, the bird or birds weighed more than 2 pounds. However, 16 were caused by birds that weighed less than or equal to 1 pound. Comparing this with the number of engine ingestions where the bird weight was known (Table 6.3), shows that 18 percent and 9 percent of the engine ingestion events resulted in engine failures when the bird weighed more than 2 pounds and less than or equal to 1 pound, respectively.

Almost all of the failure events occurred during takeoff (33) with two failures during the climb, one during the approach and one during landing. The phase of flight was unknown in five of the failure events. The engine location was split almost in half with 22 failures occurring in the left engine and 20 in the right.

TABLE 6.10. ENGINE FAILURE SUMMARY BY BIRD WEIGHT

Bird (oz.) Weight	Number of Birds	Damage Code	Phase of Flight	Power Loss	In-Flight Shutdown	Crew Action
1.5	1	A,O	Takeoff	Epr Dec	Vibes	ATB
4.0	--	A,I	---	---	---	--
4.0	--	A,I,K	Takeoff	Compressor	No	ATO
4.0	1	A,I,K	Takeoff	---	No	ATO
7.0	*	A,C,G,I	Takeoff	Compressor	Parameters	ATB
10.0	*	A,H,I,N	Takeoff	Compressor	Voluntary	ATB
10.1	*	A,I,K	Takeoff	Compressor	Vibes	ATB
11.5	6	A,D,K,O	Takeoff	Compressor	Involuntary	Crashed
11.5	8	A,D,K,O	Takeoff	Compressor	Involuntary	Crashed
12.0	1	A,I,M,P	Takeoff	Yes	Involuntary	ATB
14.0	1	A,G,I,K	Takeoff	Compressor	---	ATB
14.0	1	A,C,G,I	Takeoff	---	---	ATO
14.0	3	A,I,K,N	Takeoff	Compressor	Egt	ATB
15.0	1	A,D,H	Takeoff	Compressor	Involuntary	ATB
16.0	1	A,I,K,N	Takeoff	Compressor	Involuntary	ATB
16.0	*	A,I,K	Takeoff	Compressor	No	ATO
22.0	1	A,D,G,K	Takeoff	None	No	ATB
24.0	1	A,D,I,K	Takeoff	Compressor	Voluntary	ATB
28.0	1	A,B,G,K	Takeoff	Spool Down	Involuntary	ATB
28.0	1	A,I,M	Takeoff	---	No	ATO
32.0	1	A,I	Takeoff	Epr Dec	Yes	DIV
38.4	1	A,D,G	Takeoff	---	No	ATO
40.0	1	A,D,F,I	Climb	---	---	ATB

TABLE 6.10. ENGINE FAILURE SUMMARY BY BIRD WEIGHT (Continued)

40.0	2	A,D,H	Takeoff	Compressor	Yes	DIV
40.0	1	A,F,I	Takeoff	Compressor	Vibes	ATB
40.0	1	A,C,G,I	Takeoff	---	---	---
80.0	1	A,H,I	Takeoff	Compressor	Yes	ATB
192.0	1	A,D,G,K	Approach	Yes	Epr	---
---	--	A,C,G,I	---	---	---	None
---	---	A,Q	Climb	Spool Down	Involuntary	ATB
---	---	A,G,K	Takeoff	---	Vibes	ATO
---	1	A,I,K,Q	Takeoff	---	No	ATB
---	---	A,C,I,K	Takeoff	---	No	None
---	1	A,B,G,P	Takeoff	None	No	ATO
---	---	A,I	---	---	---	---
---	1	A,I	Takeoff	Yes	Yes	ATO
---	---	A,I	Takeoff	---	No	---
---	---	A,I	---	---	---	---
---	---	A,C,G,I	Landing	None	No	---
---	---	A,I	---	---	---	---
---	2	A,D	Takeoff	Compressor	No	ATO
---	---	A,D,G,K	Takeoff	Compressor	Yes	ATO

*Means more than one bird ingested but the exact count is unknown.

Note: A description of the columns and column contents can be found in Appendix B.

SECTION 7
PROBABILITY ESTIMATES

This section provides a summary of the probabilities of various bird ingestion events. The probability of an event is a measure of the likelihood that the event will occur. The probabilities in this section are calculated on a per operation basis and present similar information to the ingestion rates. The ingestion rates that were presented in Section 4 were calculated on the basis of 10,000 aircraft operations; however, it was shown in Section 4.2 that the per operation ingestion rate is equal to the probability of ingestion for a single operation. This section provides more details on the probabilities of various categories of bird ingestion events.

Table 7.1 provides the estimated probabilities and 95 percent confidence bounds for the whole B737 fleet for various aircraft ingestion events. The overall likelihood of an aircraft ingestion event in a single operation is slightly more than one in sixty-five hundred; and although the odds of having a bird ingestion on any one operation are very small, there are millions of B737 operations each year so that hundreds of ingestions are expected each year. Most ingestions occur during the takeoff and landing phases so that the probabilities for takeoff and climb and the approach and landing phases are relatively large. Dual engine and multiple bird ingestions are relatively rare (which is reflected in the smaller probabilities for these events).

The inlet area effect on aircraft ingestion probabilities is shown in Table 7.2 which separates the probabilities by location and engine. With the exception of single engine multiple bird ingestion events in the United States, the probabilities for the CFM International CFM56 are always larger than the corresponding probabilities for the Pratt and Whitney JT8D. The larger probabilities for the CFM56 are expected since the inlet area of the CFM56 is nearly twice the inlet area of the JT8D.

The probability of an ingestion that causes moderate or severe engine damage (POI_d) is calculated with respect to engine operations, not aircraft operations. Moderate or severe engine damage occurred in 180 (49 domestic, 130 foreign, 1 unknown) of the 1,468 engine ingestion events reported in the data collection period. The respective worldwide, domestic, and foreign POI_d values for the B737 fleet are 1.01×10^{-5}, $0.[illegible] \times 10^{-5}$, and 1.59×10^{-5}. The respective worldwide, domestic, and foreign 95 percent confidence bounds on the POI_d values are 1.14×10^{-5}, 0.64×10^{-5}, and 1.84×10^{-5}.

The effect of bird weight on the probabilities is estimated in Tables 7.3 and 7.4. The entries in Tables 7.3 and 7.4 were calculated by multiplying the overall probability for each location/engine combination by the relative frequency of each bird weight range. The relative frequencies for bird weight ranges were derived from the weights of positively identified birds and are based on the number of events that involved birds in each weight range, not the total number of birds ingested. The validity of this calculation depends on the randomness of bird identifications, as discussed in Section 3. Table 7.3 provides a breakdown of the probability of ingestion (POI) by location and engine while Table 7.4 combines the two engine types. The calculations in Tables 7.3 and 7.4 were made on both an aircraft operation basis (Tables 7.3A and 7.4A) and an engine operation basis (Tables 7.3B and 7.4B). Tables 7.4A

and 7.4B show that the worldwide probability of ingesting one or more birds as a function of bird weight is 0.210×10^{-5} and 0.102×10^{-5} respectively at the 52-to 56-ounce weight range for the B737 aircraft fleet. Above this weight range the probability of ingestion decreases.

TABLE 7.1 AIRCRAFT OPERATION INGESTION PROBABILITIES

CONDITION	INGESTION EVENTS	PROBABILITY* OF INGESTION	CONFIDENCE* BOUND
All Flights	1,410	15.82	16.53
Takeoff & Climb†	863	9.68	10.24
Approach & Landing†	516	5.79	6.23
Dual Engine / Single Bird Per Engine	23	0.26	0.37
Dual Engine / Multiple Birds	35	0.39	0.52
Multiple Birds / Single Engine	144	1.62	1.86

* Scaled by 10^5

† Contains prorated apportionment of events with unknown phase of flight

TABLE 7.2 AIRCRAFT OPERATION INGESTION PROBABILITIES* BY LOCATION AND ENGINE TYPE
(BASED ON AIRCRAFT INGESTION EVENTS)

	JT8D ENGINE						CFM56 ENGINE					
	UNITED STATES		FOREIGN		WORLDWIDE		UNITED STATES		FOREIGN		WORLDWIDE	
Aircraft Operations:	3,250,832		3,145,832		6,396,263		1,578,741		935,849		2,514,590	
Condition Under Consideration	Ing Evt	Ingestion Prob'lity	Ing Evt	Ingestion Prob'lity	Ing Evt	Ingestion Prob'lity	Ing Evt	Ingestion Prob'lity	Ing Evt	Ingestion Prob'lity	Ing Evt	Ingestion Prob'lity
All Flights	136	4.18	784	24.92	921†	14.40	151	9.56	293	31.31	445†	17.70
Takeoff And Climb Phases	107	3.29	492	15.64	600†	9.38	92	5.83	150	16.03	243†	9.66
Approach And Landing Phases	27	0.83	280	8.90	307	4.80	54	3.42	132	14.10	186	7.40
Dual Engine - Single Bird Events	2	0.06	10	0.32	12	0.19	4	0.25	7	0.75	11	0.44
Multiple Birds - Single Engine Events††	12	0.37	71	2.26	83	1.30	4	0.25	44	4.70	48	1.91
Multiple Birds - Dual Engine Events†††	4	0.12	15	0.48	19	0.30	2	0.13	10	1.07	12	0.48

*Ingestion probabilities scaled by 10^5

†Geographic region unknown for 1 takeoff event

††Engine type unknown for 13 events

†††Engine type unknown for 4 events

TABLE 7.3A

PROBABILITY OF INGESTION* AS A FUNCTION OF BIRD WEIGHT BY LOCATION AND ENGINE TYPE
(BASED ON AIRCRAFT OPERATIONS)

	JT8D ENGINE			CFM56 ENGINE		
	US	FOREIGN	WORLDWIDE	US	FOREIGN	WORLDWIDE
Aircraft Ops:	3,250,431	3,145,832	6,396,263	1,578,741	935,849	2,514,590
Bird Wt Range (Oz.)	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion
(0 < X ≤ 4)	1.778	3.887	3.286	3.454	4.369	4.256
(4 < X ≤ 8)	0.628	6.859	3.479	0.266	6.553	2.240
(8 < X ≤ 12)	---	3.658	1.546	0.266	10.922	3.584
(12 < X ≤ 16)	0.732	2.515	1.739	2.923	3.641	3.584
(16 < X ≤ 20)	0.209	0.686	0.483	---	2.912	0.896
(20 < X ≤ 24)	0.105	0.457	0.290	0.266	---	0.224
(24 < X ≤ 28)	0.105	0.915	0.483	0.266	0.728	0.448
(28 < X ≤ 32)	---	1.372	0.580	---	---	---
(32 < X ≤ 36)	---	---	---	0.531	1.456	0.896
(36 < X ≤ 40)	0.313	2.286	1.256	1.328	---	1.120
(40 < X ≤ 44)	---	---	---	0.266	---	0.224
(44 < X ≤ 48)	---	0.686	0.290	---	0.728	0.224
(52 < X ≤ 56)	0.209	0.229	0.290	---	---	---
(56 < X ≤ 60)	---	0.229	0.097	---	---	---
(76 < X ≤ 80)	---	0.229	0.097	---	---	---
(84 < X ≤ 88)	---	0.457	0.193	---	---	---
(124 < X ≤ 128)	0.105	---	0.097	---	---	---
(188 < X ≤ 192)	---	0.457	0.193	---	---	---
All Weights†	4.184	24.992	14.399	9.565	31.308	17.697

* Probability that either engine will ingest 1 or more birds of a given weight class per aircraft operation. Probabilities have been scaled up by 10^5.

† Cumulative probability of all weight bands. Also probability of ingestion for engine, location combination.

TABLE 7.3B
PROBABILITY OF INGESTION* AS A FUNCTION OF BIRD WEIGHT BY LOCATION AND ENGINE TYPE
(BASED ON ENGINE OPERATIONS)

	JT8D ENGINE			CFM56 ENGINE		
	US	FOREIGN	WORLDWIDE	US	FOREIGN	WORLDWIDE
Engine Ops:	6,500,862	6,291,664	12,792,526	3,157,482	1,871,698	5,029,180
Bird Wt Range (Oz.)	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion
(0 < X ≤ 4)	0.884	2.000	1.652	1.963	2.114	2.299
(4 < X ≤ 8)	0.312	3.556	1.794	0.131	3.172	1.095
(8 < X ≤ 12)	---	2.111	0.897	0.131	6.343	2.080
(12 < X ≤ 16)	0.468	1.222	0.944	1.439	2.114	1.861
(16 < X ≤ 20)	0.104	0.333	0.236	---	1.410	0.438
(20 < X ≤ 24)	0.052	0.222	0.142	0.131	---	0.109
(24 < X ≤ 28)	0.052	0.444	0.236	0.131	0.352	0.219
(28 < X ≤ 32)	---	0.667	0.283	---	---	---
(32 < X ≤ 36)	---	---	---	0.262	0.705	0.438
(36 < X ≤ 40)	0.156	1.222	0.661	0.654	---	0.547
(40 < X ≤ 44)	---	---	---	0.131	---	0.109
(44 < X ≤ 48)	---	0.333	0.142	---	0.352	0.109
(52 < X ≤ 56)	0.104	0.111	0.142	---	---	---
(56 < X ≤ 60)	---	0.111	0.047	---	---	---
(76 < X ≤ 80)	---	0.111	0.047	---	---	---
(84 < X ≤ 88)	---	0.222	0.094	---	---	---
(124 < X ≤ 128)	0.052	---	0.047	---	---	---
(188 < X ≤ 192)	---	0.222	0.094	---	---	---
All Weights†	2.184	12.890	7.457	4.972	16.563	9.306

* Probability that an engine will ingest 1 or more birds of a given weight class per engine operation. Probabilities have been scaled up by 10^5.

† Cumulative probability of all weight bands. Also probability of ingestion for engine, location combination.

TABLE 7.4A

PROBABILITY OF INGESTION* AS A FUNCTION OF BIRD WEIGHT BY LOCATION
(BASED ON AIRCRAFT OPERATIONS)

	BOEING-737 COMMERCIAL FLEET		
	UNITED STATES	FOREIGN	WORLDWIDE
Aircraft Operations:	4,829,172	4,081,681	8,910,853
Bird Weight Range (Ounces)	Probability Of Ingestion	Probability Of Ingestion	Probability Of Ingestion
(0 < X ≤ 4)	2.351	4.215	3.672
(4 < X ≤ 8)	0.531	7.025	3.138
(8 < X ≤ 12)	0.076	5.445	2.136
(12 < X ≤ 16)	1.669	2.810	2.537
(16 < X ≤ 20)	0.152	1.229	0.601
(20 < X ≤ 24)	0.152	0.351	0.267
(24 < X ≤ 28)	0.152	0.878	0.467
(28 < X ≤ 32)	---	1.054	0.401
(32 < X ≤ 36)	0.152	0.351	0.267
(36 < X ≤ 40)	0.758	1.756	1.335
(40 < X ≤ 44)	0.076	---	0.067
(44 < X ≤ 48)	---	0.703	0.267
(52 < X ≤ 56)	0.152	0.176	0.200
(56 < X ≤ 60)	---	0.176	0.067
(76 < X ≤ 80)	---	0.176	0.067
(84 < X ≤ 88)	---	0.351	0.134
(124 < X ≤ 128)	0.076	---	0.067
(188 < X ≤ 192)	---	0.351	0.134
All Weights†	6.295	27.048	15.823

* Probability that either engine will ingest 1 or more birds of a given weight class per aircraft operation. Probabilities have been scaled up by 10^5.

† Cumulative probability of all weight bands in geographic location.

TABLE 7.4B

PROBABILITY OF INGESTION* AS A FUNCTION OF BIRD WEIGHT BY LOCATION
(BASED ON ENGINE OPERATIONS)

	BOEING-737 COMMERCIAL FLEET		
	UNITED STATES	FOREIGN	WORLDWIDE
Engine Operations:	9,658,344	8,163,362	17,821,706
Bird Weight Range (Ounces)	Probability Of Ingestion	Probability Of Ingestion	Probability Of Ingestion
(0 < X ≤ 4)	1.231	2.133	1.888
(4 < X ≤ 8)	0.261	3.583	1.595
(8 < X ≤ 12)	0.037	3.156	1.237
(12 < X ≤ 16)	0.932	1.450	1.367
(16 < X ≤ 20)	0.075	0.597	0.293
(20 < X ≤ 24)	0.075	0.171	0.130
(24 < X ≤ 28)	0.075	0.427	0.228
(28 < X ≤ 32)	---	0.512	0.195
(32 < X ≤ 36)	0.075	0.171	0.130
(36 < X ≤ 40)	0.373	0.938	0.684
(40 < X ≤ 44)	0.038	---	0.033
(44 < X ≤ 48)	---	0.341	0.130
(52 < X ≤ 56)	0.075	0.085	0.098
(56 < X ≤ 60)	---	0.085	0.033
(76 < X ≤ 80)	---	0.085	0.033
(84 < X ≤ 88)	---	0.171	0.065
(124 < X ≤ 128)	0.038	---	0.033
(188 < X ≤ 192)	---	0.171	0.065
All Weights†	3.282	14.075	8.237

* Probability that an engine will ingest 1 or more birds of a given weight class per engine operation. Probabilities have been scaled up by 10^5.

† Cumulative probability of all weight bands in geographic location.

SECTION 8
DATA QUALITY

The interpretations derived from any large set of data are only as good as the data. The use of poor data can lead to invalid and misleading conclusions. The conclusions reached in this report should be interpreted in the context of the sources of the data and the quality of the data. The following paragraphs discuss the sources of data for the 3 years and the quality of the data as measured by the consistency of the data collected in each of the 3 years and by the consistency of the ICAO data with the data collected by the FAA.

8.1 DATA SOURCES.

The main body of data was collected by the manufacturers of the two engines used on B737 aircraft under separate contracts with the FAA. The FAA also collected data from the FAA Voluntary Bird Strike/Incident Report (FAA Form 5200-7) and from reports received from FAA field inspectors (see FAA Action Notice A8300.39). A second source of data used in this report is an ongoing effort by the ICAO to collect aviation bird strike data. A significant number of B737 bird ingestion events were recorded by the ICAO that were not collected through FAA sources. The additional events were included with the FAA data base for the preparation of this second report.

The engine manufacturers, FAA, and ICAO conducted a census rather than a survey, i.e., the goal of both studies was to collect information on every B737 bird ingestion event in the 3-year period. A complete census is nearly impossible to achieve under any circumstances; therefore, estimates involving the total number of ingestions, such as ingestion rates, should be viewed as lower bounds.

8.2 INTERNAL CONSISTENCY.

The data collected over the third year of the program appear to be consistent with the data collected in the first 2 years. Most of the tables, graphs and statistical tests presented in this report for the 3-year period are very similar to the corresponding data presented in earlier reports [1,2] for the data collected in the first 2 years. This section provides statistical verification of the similarities and discusses some of the differences.

The first feature for comparing the 3 years is the total number of aircraft ingestion events collected in each year. Section 4 provided evidence that aircraft ingestion events occur according to a Poisson process so that the proportion of events that were recorded in each year should be equal to the proportion of operations conducted in that year.

The same formulas used in Section 4 can be used here except that the area factor is no longer required since comparisons are made between years for the same engine. The formula for the expected proportion of events in year i becomes:

$$P_i = O_i / (O_1 + O_2 + O_3) \qquad (8.1)$$

where O_i (i=1,3) represents the number of operations for the specific engine and geographic location for year i.

The Chi-squared goodness-of-fit test is used instead of a Z test since there are more than two years. The Chi-squared test statistic provides a measure of the closeness of the observed number of events in each year to the number that would be expected if the collection rates were the same in each year. The expected number of events in year i are given by:

$$E_i = P_i * N \tag{8.2}$$

where N is the total number of events for the 3 years. The test statistic is then given by:

$$\chi^2 = \sum_{i=1}^{3} \frac{(X_i - E_i)^2}{E_i}, \tag{8.3}$$

where X_i is the observed number of events in year i.

The data for performing the test are presented in Table 8.1 and Table 8.2. The number of events and number of operations for each year are broken down by engine type and geographic location in Table 8.1. The calculated χ^2 values for the test are given in Table 8.2 for each engine and location combination. The Chi-squared test detects any type of change among the 3 years and the critical value for a five percent level of significance for a Chi-square with two degrees of freedom is 5.99. The only significant change is in the collection rate for the foreign JT8D data.

The large value of the test statistic for foreign JT8D ingestion rates is caused by a large number of ingestion events reported in the second year.

The change in collection rates for the JT8D could affect the test for size effect that was described in Section 4. In the first year report [1] both area and diameter provided adequate adjustments for the differences in ingestion rates between the two engines. In the 2-year report [2], area provided an adequate adjustment but diameter did not; while in the 3-year report diameter provided an adequate adjustment but area did not. The high second year collection rate would have an impact on the ingestion rate analysis so that investigations into the nature of engine size effects should be considered inconclusive.

Another check on the consistency of the data collection is to compare the birds that were identified in the 3 years. There were too many different species and locations of ingestions to allow comparisons of these features; however, if the species identifications are reduced to bird weights the cumulative weight distributions for the 3 years can be compared.

Table 8.3 provides a table of the cumulative weight distributions for each of the 3 years for birds ingested in the United States and for birds ingested in foreign countries. The data in Table 8.3 are plotted in Figures 8.1 and 8.2 to provide visual comparisons of the three yearly bird weight distributions for United States and foreign ingested birds. The distributions for the United States ingestions are moderately close, and the distributions for the foreign ingestions are very close.

TABLE 8.1

COUNTS FOR UNITED STATES AND FOREIGN
AIRCRAFT EVENTS AND AIRCRAFT OPERATIONS BY YEAR AND ENGINE

	JT8D		CFM56	
	EVENTS	OPERATIONS	EVENTS	OPERATIONS
YEAR 1				
UNITED STATES	40	1,160,091	40	353,656
FOREIGN	238	1,057,633	63	174,206
YEAR 2				
UNITED STATES	49	1,082,543	46	527,431
FOREIGN	314	1,062,971	88	302,415
YEAR 3				
UNITED STATES	47	1,007,797	65	697,654
FOREIGN	232	1,025,228	142	459,228

TABLE 8.2

CHI-SQUARED TEST STATISTICS
FOR COMPARING ANNUAL INGESTION RATES

	UNITED STATES	FOREIGN
JT8D	2.36	13.74
CFM56	1.56	1.81

TABLE 8.3

COMPARISON OF WEIGHT DISTRIBUTIONS BETWEEN BIRDS INGESTED IN THE FIRST, SECOND, AND THIRD YEARS

	CUMULATIVE PROBABILITY					
	UNITED STATES			FOREIGN		
WEIGHT (OZ)	YEAR 1	YEAR 2	YEAR 3	YEAR 1	YEAR 2	YEAR 3
4	26.3	50.0	37.0	28.6	14.3	11.4
8	42.1	61.1	41.3	53.6	39.3	38.6
12	47.4	61.1	41.3	67.9	58.9	61.4
16	63.2	77.7	76.1	82.1	64.3	74.3
20	68.4	77.8	78.3	82.1	71.4	78.6
24	68.4	83.3	80.4	89.3	71.4	78.6
28	68.4	88.9	82.6	89.3	73.2	84.3
32	68.4	88.9	82.6	92.9	78.6	87.1
36	68.4	94.4	84.8	92.9	80.4	88.6
40	84.2	100.0	97.8	96.4	89.3	94.3
44	84.2	100.0	100.0	96.4	89.3	94.3
48	84.2	100.0	100.0	100.0	91.1	97.1
56	94.7	100.0	100.0	100.0	92.9	97.1
60	94.7	100.0	100.0	100.0	94.6	97.1
80	94.7	100.0	100.0	100.0	96.4	97.1
88	94.7	100.0	100.0	100.0	98.2	98.6
128	100.0	100.0	100.0	100.0	98.2	98.6
192	100.0	100.0	100.0	100.0	100.0	100.0

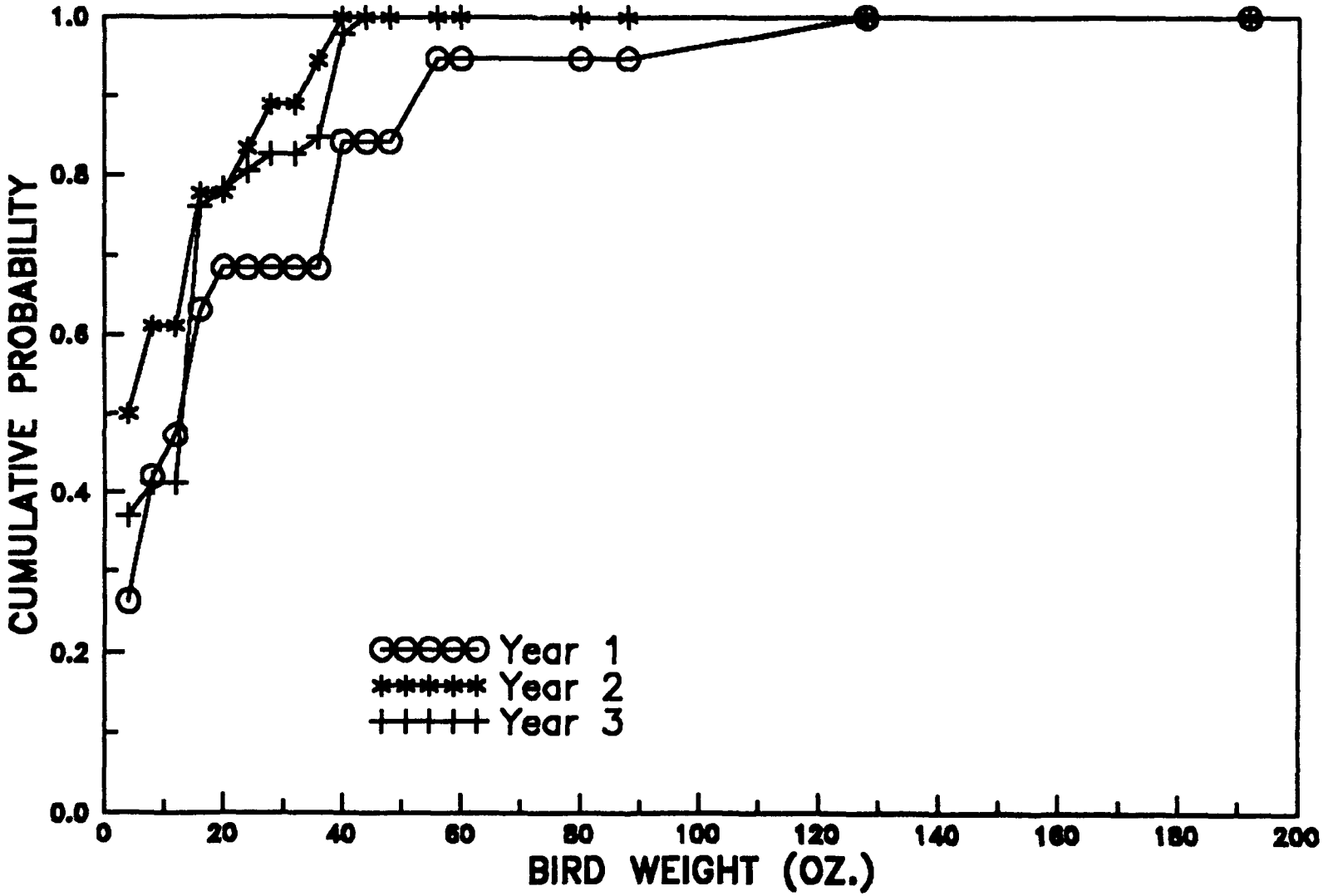


Figure 8.1. Comparison of the United States Bird Weight Distributions for the First, Second, and Third Years.

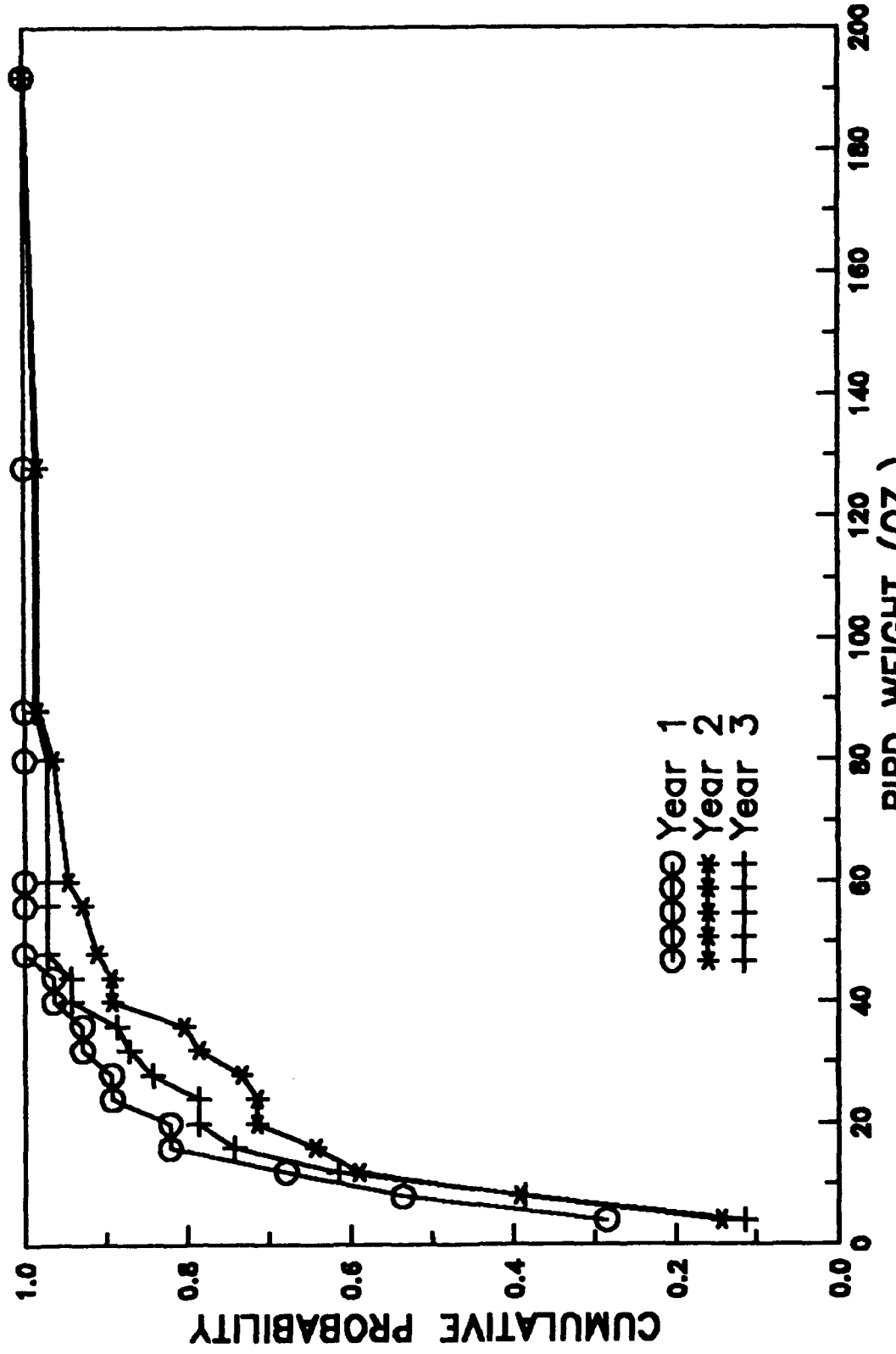


Figure 8.2. Comparison of the Foreign Bird Weight Distributions for the First, Second, and Third Years.

A statistical measure of the closeness of the cumulative distributions plotted in Figures 8.1 and 8.2 is provided by a multi-sample extension of the Kolmogorov-Smirnov D test, described by Kiefer [14]. The D statistic is the maximum vertical distance between two observed cumulative distribution functions while the T statistic described by Kiefer is the maximum vertical scatter among the three observed cumulative distribution functions. The formula for the T statistic is:

$$T = \max_x \sum_{j=1}^{3} n_j \left[S_j(x) - \bar{S}(x) \right]^2, \qquad (8.4)$$

where $\max_x$ indicates the maximum over x, n_j is the sample size in year j, $S_j(x)$ is the observed cumulative distribution function in year j and S(x) is the observed cumulative distribution function for all 3 years combined.

The Kiefer goodness-of-fit test shows very good consistency between the 3 years for the ingested bird weight distribution. The T statistic for the U. S. bird ingestions is 0.82 and for the foreign bird ingestions is 0.63 which are the twenty-seventh and twelfth percentiles of the null distribution of T. Large values of T indicate differences between the three distributions and the observed values given above are in the lower half of the likely range of T. There is no statistical evidence that the bird weight distributions have changed over the 3-year period.

The ICAO data seem to be consistent with the data collected by the FAA. The only substantial change from including the ICAO data is an increase in the estimated ingestion rates and probabilities. This is the result of an additional 392 aircraft ingestion events that were reported by the ICAO. Most of the additional events occurred during foreign operations.

If the ICAO data were inconsistent with the FAA data, some of the statistical tests would have shown different conclusions with the combined set of data. None of the conclusions in the report changed when the ICAO data were combined with the FAA data. Specific values of test statistics are different; however, the conclusions remained the same. The ICAO data seem to support the patterns in B737 bird ingestion events that are evident in the FAA data.

The overall quality of the data used in the report seems to be adequate. There is reasonable consistency from year to year with a slightly higher collection rate in the second year. The two sources of data show good compatibility so that there should be no bias due to different collection procedures. The data used in this report should provide valuable information about the bird ingestion hazard.

SECTION 9
CONCLUSIONS

This section summarizes conclusions based on the 3 years of data for the B737 aircraft.

Bird Descriptions

Gulls, doves, and lapwings are most often ingested.

There is a better species identification rate when the engine is damaged.

The weight of a bird most likely to be ingested outside the United States is significantly heavier than one most likely to ingested within the United States.

Ingestion Rates

Bird ingestion events are seasonal with the highest rates in the summer and the lowest in the winter.

Bird ingestion events are much more likely to occur during daylight than at night.

Bird ingestion events can be modeled as a Poisson process.

Bird ingestion rates are proportional to the inlet size of the engine.

Airport Experiences

The foreign bird ingestion rate is significantly higher than the United States ingestion rate.

Effect of Flight

The probability that a crew action is required increases with the severity of engine damage.

The effects of flight that occur most often are air turnbacks and aborted takeoffs.

The probability of experiencing an involuntary in-flight engine shutdown, given a bird ingestion has occurred, is approximately one-half of one percent.

Engine Damage

Some types of engine damage are correlated with other types of damage.

The majority of engine bird ingestion events result in either minor or no engine damage.

The probability of any damage increases with the weight of the bird ingested.

The probability of engine damage, given a bird ingestion has occurred, is greater when the ingestion occurs during the takeoff and climb phases of flight than those that occur during approach and landing.

The probability of engine damage, given a bird ingestion has occurred, is greater when the aircraft airspeed is greater than or equal to 140 knots than those that occur at less than 140 knots.

Engine failure appears more likely to occur when multiple birds are ingested.

The mean or average weight of the birds that caused engine failures was significantly heavier than the mean weight for all bird ingestion events.

Engine failure is not necessarily associated exclusively with severe engine damage.

Engine failure appears more likely to occur during the takeoff phase of flight.

Engine failure can be caused by a bird ingestion in any bird weight range.

The majority of engine failures are caused by transverse fan blade fractures.

The probability of experiencing an engine failure, given a bird ingestion has occurred, is approximately 3 percent.

Probabilities of Ingestion

Bird ingestions are more likely during the takeoff and landing phases of an aircraft operation.

The worldwide probability of a bird ingestion as a function of bird weight for the B737 fleet remains relatively high up to 56 ounces.

Data Quality

The overall quality of the bird ingestion data collected by the engine manufacturers for the FAA is adequate for a meaningful statistical analysis.

SECTION 10
REFERENCES

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SECTION 11
GLOSSARY

Term	Definition of Term
Aircraft Ingestion Event	Simultaneous ingestion of one or more birds into one or more engines of an aircraft.
Aircraft Operation	A nonstop aircraft flight from one airport to another. (Includes time from taxi-out from departure airport through taxi-in at arrival airport.)
Airport Operation	Takeoff (departure) from an airport or a landing (arrival) at an airport.
Engine Ingestion Event	Process whereby one or more birds pass through the engine inlet during engine operation.
Engine Operation	The participation of each engine of an aircraft in an aircraft operation (e.g., a twin engine aircraft would, ideally, experience two engine operations for each aircraft operation).
Ingested Bird	A bird having experienced the process of engine ingestion event.
Ingestion Rate	The number of aircraft or engine ingestion events per flight event. Flight event refers to aircraft, engine or airport operation. The components of ingestion rate are specified when used in the report. The influence of engine inlet area is not considered.
Normalized Ingestion Rate	Ingestion rate adjusted to a given nominal area. Allows statistical comparison of ingestion rates of engines with different inlet areas.

APPENDIX A

AIRPORTS WITH SCHEDULED BOEING-737 FLIGHTS AND/OR REPORTED BIRD INGESTION EVENTS

This appendix presents information about airports having scheduled Official Airline Guide (OAG) operations or aircraft ingestion events during the 3-year data collection period. The data are taken from a data base developed by the contractor. The data base contents are described below:

COLUMN	DESCRIPTION OF COLUMN CONTENTS
AIRPORT	Airport code. 3-letter ATA code 4-letter ICAO code
APTDEF	Location of airport.
HEMISPHR	Hemisphere in which AIRPORT is located. N - Northern Hemisphere S - Southern Hemisphere
CONUS	Indicates whether AIRPORT is located in the United States. YES - located in contiguous United States (48 states) NO - not located in the contiguous United States, but in the United States (Alaska or Hawaii) FGN - foreign airport
STGFY87	Scheduled OAG airport operations during first year.
ING1	Aircraft ingestion events during first year.
STGFY88	Scheduled OAG airport operations during second year.
ING2	Aircraft ingestion events during second year.
STGFY89	Scheduled OAG airport operations during third year.
ING3	Aircraft ingestion events during third year.
STG737	Scheduled OAG airport operations during 3-year period.
INGS	Aircraft ingestion events during 3-year period.

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
AAE	ANNABA, ALGERIA	N	FGN	2393	0	2237	0	2061	0	6691	0
AAY	AL GHAYDAH, YEMEN	N	FGN	210	0	314	0	162	0	686	0
ABE	ALLENTOWN, PA, USA	N	YES	370	0	1573	0	2490	0	4433	0
ABJ	ABIDJAN, COTE D'IVORE (IVORY COAST)	N	FGN	1620	0	1806	0	1899	0	5325	0
ABQ	ALBUQUERQUE, NM, USA	N	YES	41942	0	43562	0	44079	1	129583	1
ABS	ABU SIMBEL, ARAB REP OF EGYPT	N	FGN	3366	0	5028	0	5496	0	13890	0
ABT	AL BAHA, SAUDI ARABIA	N	FGN	1148	0	642	0	626	0	2416	0
ABV	ABUJA, NIGERIA	N	FGN	1240	0	1178	0	1160	0	3578	0
ABZ	ABERDEEN, SCOTLAND	N	FGN	1519	0	1636	0	2871	0	6026	0
ACA	ACAPULCO, MEXICO	N	FGN	126	0	322	1	120	0	568	1
ACC	ACCRA, GHANA	N	FGN	486	0	0	0	216	0	702	0
ACE	LANZAROTE, CANARY ISLANDS	N	FGN	76	0	688	0	1115	0	1879	0
ACK	NANTUCKET, MA, USA	N	YES	0	0	7	0	9	0	16	0
ACV	EUREKA ARCATA, CA, USA	N	YES	2616	0	739	0	0	0	3355	0
ADB	IZMIR, TURKEY	N	FGN	0	0	236	0	426	0	662	0
ADD	ADDIS ABABA, ETHIOPIA	N	FGN	148	0	1538	1	1585	0	3271	1
ADE	ADEN, YEMEN	N	FGN	1346	0	1022	0	1242	0	3610	0
ADK	ADAK ISLAND, AS, USA	N	NO	0	0	16	0	0	0	16	0
ADL	ADELAIDE, SA, AUSTRALIA	S	FGN	4738	1	5568	0	9550	0	19856	1
ADQ	KODIAK, AS, USA	N	NO	2290	0	2500	0	2700	1	7490	1
ADZ	SAN ANDRES ISLAND, COLOMBIA	N	FGN	526	0	624	0	700	0	1850	0
AEP	BUENOS AIRES - NEWBERY, ARGENTINA	S	FGN	23291	0	22170	1	21296	0	66757	1
AES	AALESUND, NORWAY	N	FGN	8988	0	8364	0	8060	0	25412	0
AGA	AGADOR, MOROCCO	N	FGN	601	0	684	0	1164	0	2449	0
AGP	MALAGA, SPAIN	N	FGN	2434	0	3226	0	3213	0	8873	0
AGR	AGRA, INDIA	N	FGN	1980	1	2074	1	1616	1	5670	3
AGS	AUGUSTA, GA, USA	N	YES	1579	0	1881	0	1270	0	4730	0
AHB	ABHA, SAUDI ARABIA	N	FGN	2026	0	5425	0	5606	0	13057	0
AHU	AL HOCEIMA, MOROCCO	N	FGN	292	0	338	0	346	0	976	0
AJA	AJACCIO, CORSICA, FRANCE	N	FGN	59	1	87	0	177	1	323	2
AJF	JOUF, SAUDI ARABIA	N	FGN	1128	0	1258	0	1280	0	3666	0
AJU	ARACAJU, BRAZIL	S	FGN	1460	0	2592	1	5242	0	9294	1
AKL	AUCKLAND, NEW ZEALAND	S	FGN	16985	2	26503	0	26856	1	70344	3
AKN	KING SALMON, AS, USA	N	NO	1444	0	1832	0	1956	0	5232	0
AKR	AKURE, NIGERIA	N	FGN	238	0	354	0	244	0	836	0
ALB	ALBANY, NY, USA	N	YES	4461	2	6510	0	6964	0	17935	2
ALC	ALICANTE, SPAIN	N	FGN	148	0	1070	1	1796	1	3014	2
ALG	ALGIERS, ALGERIA	N	FGN	14258	1	13443	0	13905	0	41606	1
ALY	ALEXANDRIA, ARA REP OF EGYPT	N	FGN	2104	0	1507	0	2123	0	5734	0
AMA	AMARILLO, TX, USA	N	YES	12811	0	11122	0	10270	0	34203	0
AMD	AHMEDABAD, INDIA	N	FGN	5932	2	6180	4	4964	1	17076	7
AMM	AMMAN, JORDAN	N	FGN	2131	0	1859	0	1684	0	5674	0
AMS	AMSTERDAM, NETHERLANDS	N	FGN	19047	4	29304	4	41353	6	89704	14
ANC	ANCHORAGE, AS, USA	N	NO	18977	0	17295	0	18186	0	54458	0
ANF	ANTOFAGASTA, CHILE	S	FGN	1434	0	1635	0	2356	0	5425	0
ANI	ANIAK, AS, USA	N	NO	460	0	714	0	1108	0	2282	0
ANR	ANTWERP, BELGIUM	N	FGN	540	0	0	0	0	0	540	0
ANU	ANTIGUA, WEST INDIES	N	FGN	18	0	0	0	0	0	18	0
AOR	ALOR SETAR, MALAYSIA	N	FGN	1886	1	1884	0	2154	0	5924	1
APL	NAMPULA, MOZAMBIQUE	S	FGN	1144	0	1156	0	520	0	2820	0
APW	APIA, WESTERN SAMOA	S	FGN	858	0	264	0	158	0	1280	0
AQI	QAISUMAH, SAUDI ARABIA	N	FGN	494	0	552	0	642	0	1688	0
ARD	ALOR, INDONESIA	N	FGN	0	1	0	0	0	0	0	1
ARI	ARICA, CHILE	S	FGN	970	0	1308	0	1452	0	3730	0
ARN	STOCKHOLM ARLANDA, SWEDEN	N	FGN	7556	0	8439	0	10086	0	26081	0
ASM	ASMARA, ETHIOPIA	N	FGN	0	0	769	0	636	0	1405	0
ASP	ALICE SPRINGS, N.T., AUSTRALIA	S	FGN	1816	0	3728	0	5198	1	10742	1
ASU	ASUNCION, PARAGUAY	S	FGN	498	0	234	0	104	0	836	0
ASW	ASWAN, ARAB REP OF EGYPT	N	FGN	4968	0	7042	0	8616	0	20626	0
ATH	ATHENS, GREECE	N	FGN	24758	0	25267	0	31341	1	81366	1
ATL	ATLANTA, GA, USA	N	YES	42143	0	43773	0	47101	1	133017	1
ATM	ALTAMIRA, BRAZIL	S	FGN	416	0	420	0	416	0	1252	0
ATQ	AMRITSAR, INDIA	N	FGN	1846	0	1838	0	1460	0	5144	0
AUA	ARUBA, ARUBA	N	FGN	50	0	9	0	32	0	91	0
AUH	ABU DHABI, U. A. EMIRATES	N	FGN	4023	0	4381	0	4479	0	12883	0
AUS	AUSTIN, TX, USA	N	YES	33326	1	31454	2	32211	0	96991	3
AUX	ARAGUAINA, BRAZIL	S	FGN	244	0	420	0	582	0	1246	0
AVL	ASHEVILLE, NC, USA	N	YES	1298	0	1594	0	2212	0	5104	0
AVP	WILKES-BARRE/SCRANTON, PA, USA	N	YES	114	0	555	0	373	0	1042	0
AWZ	AHWAZ, IRAN	N	FGN	0	0	0	0	724	0	724	0
AXD	ALEXANDROUPOLIS, GREECE	N	FGN	908	0	1028	0	819	0	2755	0
AXT	AKITA, JAPAN	N	FGN	591	0	609	0	538	0	1738	0
AYT	ANTALYA, TURKEY	N	FGN	52	0	62	0	68	0	182	0
AZD	YAZD, IRAN	N	FGN	0	0	522	0	730	0	1252	0
AZO	KALAMAZOO, MI, USA	N	YES	2800	0	2802	0	2857	0	8459	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
AZR	ADRAR, ALGERIA	N	FGN	818	0	718	0	732	0	2268	0
BAH	BAHRAIN, BAHRAIN	N	FGN	11933	1	10623	0	10944	0	33500	1
BAQ	BARRANQUILLA, COLOMBIA	N	FGN	105	0	104	0	104	0	313	0
BBI	BHUBANESWAR, INDIA	N	FGN	2086	1	2160	0	2008	0	6254	1
BCN	BARCELONA, SPAIN	N	FGN	4166	0	4707	0	7749	0	16622	0
BDH	BANDAR LENGEH, IRAN	N	FGN	1460	0	1464	0	832	0	3756	0
BDL	HARTFORD, CN, USA	N	YES	15001	0	14757	0	15366	0	45124	0
BDQ	VADODARA, INDIA	N	FGN	1925	0	1866	1	1888	0	5679	1
BDT	BADO LITE, ZAIRE	N	FGN	208	0	278	0	282	0	768	0
BEG	BELGRADE, YUGOSLAVIA	N	FGN	10759	1	13303	1	14455	1	38517	3
BEL	BELEM, BRAZIL	S	FGN	5505	0	9161	0	12314	0	26980	0
BEN	BENGHAZI, LIBYAN A JAMAHIRIYA	N	FGN	0	0	62	0	444	0	506	0
BET	BETHEL, AS, USA	N	NO	3190	0	3238	0	3158	0	9586	0
BEW	BEIRA, MOZAMBIQUE	S	FGN	1304	0	1112	0	1094	0	3510	0
BFL	BAKESFIELD, CA, USA	N	YES	2742	0	1037	0	0	0	3779	0
BFN	BLOEMFONTEIN, SOUTH AFRICA	S	FGN	3954	0	4710	1	5494	6	14158	7
BFS	BELFAST, N. IRELAND	N	FGN	1570	0	2915	2	6866	0	11351	2
BFX	BAFOUSSAM, CAMEROON	N	FGN	0	0	14	0	0	0	14	0
BGF	BANGUI, CEN. AFRICAN REPUBLIC	N	FGN	272	0	340	0	373	0	985	0
BGI	BARBADOS, BARBADOS	N	FGN	52	0	52	0	52	0	156	0
BGM	BINGHAMTOM, NY, USA	N	YES	0	0	130	0	484	0	614	0
BGO	BERGEN, NORWAY	N	FGN	12038	0	14288	0	15923	0	42249	0
BGR	BANGOR, MA, USA	N	YES	0	0	0	0	204	0	204	0
BGW	BAGHDAD, IRAQ	N	FGN	0	0	31	0	38	0	69	0
BHH	BISHA, SAUDI ARABIA	N	FGN	1740	0	1779	0	1517	0	5036	0
BHI	BAHIA BLANCA, ARGENTINA	S	FGN	2162	0	2412	0	2400	3	6974	3
BHJ	BHUJ, INDIA	N	FGN	730	0	732	0	730	0	2192	0
BHM	BIRMINGHAM, AL, USA	N	YES	6048	2	11193	1	9467	1	26708	4
BHO	BHOPAL, INDIA	N	FGN	1828	0	2462	1	1924	1	6214	2
BHU	BHAVNAGAR, INDIA	N	FGN	730	0	732	0	538	0	2000	0
BHX	BIRMINGHAM, ENGLAND (UK)	N	FGN	2307	1	2630	1	3753	0	8690	2
BHZ	BELO HORIZONTE, BRAZIL	S	FGN	0	0	0	0	0	1	0	1
BIA	BASTIA, CORSICA, FRANCE	N	FGN	234	0	300	0	200	0	734	0
BIL	BILLINGS, MT, USA	N	YES	7285	0	4583	0	3874	0	15742	0
BIO	BILBAO, SPAIN	N	FGN	622	0	628	0	677	0	1927	0
BIQ	BIARRITZ, FRANCE	N	FGN	52	0	52	0	52	0	156	0
BIS	BISMARCK, ND, USA	N	YES	3396	0	3760	0	2746	0	9902	0
BJL	BANJUL, GAMBIA	N	FGN	472	0	420	0	420	1	1312	1
BJM	BUJUMBURA, BURUNDI	S	FGN	245	0	245	0	384	0	874	0
BJR	BAHAR DAR, ETHIOPIA	N	FGN	0	0	572	1	296	0	868	1
BKI	KOTA KINABALU, SABAH, MALAYSIA	N	FGN	8699	0	9134	0	11424	0	29257	0
BKK	BANGKOK, THAILAND	N	FGN	7329	0	7596	0	7058	0	21983	0
BKO	BAMAKO, MALI	N	FGN	50	0	54	0	82	0	186	0
BKY	BUKAVU, ZAIRE	S	FGN	104	0	106	0	72	0	282	0
BLI	BELLINGHAM, WA, USA	N	YES	0	0	2	0	237	0	239	0
BLL	BILLUND, DENMARK	N	FGN	2177	0	2178	0	2393	0	6748	0
BLQ	BOLOGNA, ITALY	N	FGN	310	0	374	0	634	0	1318	0
BLR	BANGALORE, INDIA	N	FGN	5886	3	8160	2	9204	2	23250	7
BME	BROOME, W.A., AUSTRALIA	S	FGN	0	0	0	0	2	0	2	0
BNA	NASHVILLE, TN, USA	N	YES	17920	0	22380	1	21447	0	61747	1
BND	BANDAR ABBAS, IRAN	N	FGN	1460	0	1922	0	1354	0	4736	0
BNE	BRISBANE, QLD, AUSTRALIA	S	FGN	12830	0	15610	2	21839	0	50279	2
BNI	BENIN CITY, NIGERIA	N	FGN	2127	0	1875	0	1666	0	5668	0
BNJ	BONN, FRG	N	FGN	0	0	0	0	0	0	0	0
BOD	BORDEAUX, FRANCE	N	FGN	688	0	790	0	1016	0	2494	0
BOH	BOURNEMOUTH, ENGLAND, UK	N	FGN	0	0	0	0	0	1	0	1
BOI	BOISE, ID, USA	N	YES	5399	0	5655	0	8309	0	19363	0
BOM	BOMBAY, INDIA	N	FGN	16848	2	15854	2	15490	0	48192	4
BOO	BODO, NORWAY	N	FGN	2868	0	3254	0	3286	0	9408	0
BOS	BOSTON, MA, USA	N	YES	30820	0	34903	1	37878	0	103601	1
BRC	SAN CARLOS DE BARILOCHE, ARGENTINA	S	FGN	1663	0	1656	0	1176	0	4495	0
BRE	BREMEN, FED REP OF GERMANY	N	FGN	4526	0	5729	0	5530	2	15785	2
BRS	BRISTOL, ENGLAND (UK)	N	FGN	2	1	0	2	16	0	18	3
BRU	BRUSSELS, BELGIUM	N	FGN	31942	2	32748	4	36110	3	100800	9
BRW	BARROW, AS, USA	N	NO	1897	0	1960	0	1946	0	5803	0
BSB	BRASILIA, BRAZIL	S	FGN	22788	0	30251	0	35278	0	88317	0
BSK	BISKRA, ALGERIA	N	FGN	0	0	0	0	96	0	96	0
BSL	BASEL/MULHOUSE, SWITZERLAND	N	FGN	554	0	538	0	528	0	1620	0
BTM	BUTTE, MT, USA	N	YES	1460	0	1464	0	1454	0	4378	0
BTR	BATON ROUGE, LA, USA	N	YES	2944	0	2065	0	1273	0	6282	0
BTV	BURLINGTON, VT, USA	N	YES	2544	0	2678	0	6126	0	11348	0
BUD	BUDAPEST, HUNGARY	N	FGN	1660	0	1468	1	4764	0	7892	1
BUE	BUENOS AIRES, ARGENTINA	S	FGN	0	0	0	1	0	0	0	1
BUF	BUFFALO, NY, USA	N	YES	17704	0	16940	0	14779	0	49423	0
BUQ	BULAWAYO, ZIMBABWE	S	FGN	1834	0	2870	0	2808	0	7512	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
BUR	BURBANK, CA, USA	N	YES	11187	0	14262	0	20498	0	45947	0
BUX	BUNA, ZAIRE	N	FGN	210	0	208	0	166	0	584	0
BUZ	BUSHEHR, IRAN	N	FGN	88	0	24	0	0	0	112	0
BVB	BOA VISTA, BRAZIL	N	FGN	1314	0	1426	0	1914	0	4654	0
BVH	VITHENA, BRAZIL	S	FGN	0	0	62	0	254	0	316	0
BWI	BALTIMORE, MD, USA	N	YES	54435	1	60614	0	71566	0	186615	1
BWN	BASERI BEGAWAN, BRUNEI DARUSSALAM	N	FGN	2951	0	2782	0	3248	0	8981	0
BXO	BISSAU, GUINEA BISSAU	N	FGN	20	0	80	0	0	0	100	0
BZE	BELIZE CITY, BELIZE	N	FGN	3647	0	4416	0	5541	0	13604	0
BZN	BOZEMAN, MT, USA	N	YES	5200	0	4588	0	5762	0	15550	0
BZR	BEZIERS, FRANCE	N	FGN	0	0	0	0	1	0	1	0
BZV	BRAZZAVILE, PEOP REP OF CONGO	S	FGN	1406	0	1321	0	1180	0	3907	0
CAB	CABINDA, ANGOLA	S	FGN	1042	0	966	0	730	0	2738	0
CAE	COLUMBIA, SC, USA	N	YES	8213	0	8051	0	4297	0	20561	0
CAG	CAGLIARI, ITALY	N	FGN	0	0	0	1	0	0	0	1
CAI	CAIRO, ARAB REP OF EGYPT	N	FGN	8057	0	8970	0	10132	0	27159	0
CAK	AKRON/CANTON, OH, USA	N	YES	2241	0	2582	0	1398	0	6221	0
CAN	GUANGZHOU, P. R. CHINA	N	FGN	13955	0	16177	0	14550	0	44682	0
CAS	CASABLANCA, MOROCCO	N	FGN	0	0	8	1	8	0	16	1
CAY	CAYENNE, FRENCH GUIANA	N	FGN	208	0	367	0	415	0	990	0
CBD	CAR NICOBAR, INDIA	N	FGN	40	0	106	0	104	0	250	0
CBH	BECHAR, ALGERIA	N	FGN	1455	0	1258	0	1274	0	3987	0
CBQ	CALABAR, NIGERIA	N	FGN	1935	0	1783	0	1221	0	4939	0
CBR	CANBERRA, A.C.T, AUTSTRALIA	S	FGN	5600	1	5064	0	6719	0	17383	1
CCJ	CALICUT, INDIA	N	FGN	0	0	174	0	536	0	710	0
CCP	CONCEPCION, CHILE	S	FGN	1184	0	1484	0	1444	0	4112	0
CCR	CONCORD, CA, USA	N	YES	0	0	0	0	37	0	37	0
CCS	CARACAS, VENEZUELA	N	FGN	0	0	52	0	52	0	104	0
CCU	CALCUTTA, INDIA	N	FGN	10798	2	11583	1	11041	0	33422	3
CDG	PARIS DE GAULLE, FRANCE	N	FGN	25514	1	28834	2	32635	0	86983	3
CDV	CORDOVA, AS, USA	N	NO	1514	0	1516	0	1512	0	4542	0
CEO	WACO KUNGO, ANGOLA	S	FGN	10	0	4	0	0	0	14	0
CFU	CORFU, GREECE	N	FGN	746	0	1152	0	1224	0	3122	0
CGB	CUIABA MATO GROSSO, BRAZIL	S	FGN	9184	0	8652	0	8360	0	26196	0
CGH	SAO PAULO-CONGONHAS, BRAZIL	S	FGN	1082	0	2410	0	2600	0	6092	0
CGK	JAKARTA-SOEKARNO, INDONESIA	S	FGN	626	0	630	0	687	0	1943	0
CGN	COLOGNE BONN, FRG	N	FGN	18161	1	19445	0	19597	1	57203	2
CGO	ZHENGZHOU, P. R. CHINA	N	FGN	208	0	394	0	341	0	943	0
CGP	CHITTAGONG, BANGLADESH	N	FGN	0	0	0	0	80	0	80	0
CGQ	CHANGCHUN, P. R. CHINA	N	FGN	62	0	70	0	268	0	400	0
CGR	CAMPO GRANDE, BRAZIL	S	FGN	6770	0	7800	3	8854	0	23424	3
CHA	CHATTANOOGA, TN, USA	N	YES	1618	0	1704	0	984	0	4306	0
CHC	CHRISTCHURCH, NEW ZEALAND	S	FGN	17095	7	24202	0	26870	0	68167	7
CHM	CHIMBOTE, PERU	S	FGN	0	0	0	0	98	0	98	0
CHO	CHARLOTTESVILLE, VA, USA	N	YES	1814	0	808	0	831	0	3453	0
CHQ	CHANIA, CRETE, GREECE	N	FGN	856	0	793	0	1554	0	3203	0
CHS	CHARLESTON, SC, USA	N	YES	7219	0	8528	0	8385	0	24132	0
CID	CEDAR RAPIDS/IOWA CITY, IO, USA	N	YES	3800	0	2995	0	3565	1	10360	1
CIX	CHICLAYO, PERU	S	FGN	286	0	450	0	800	0	1536	0
CJB	COIMBATORE, INDIA	N	FGN	1528	0	1674	2	1460	0	4662	2
CJC	CALAMA, CHILE	S	FGN	626	0	420	0	630	0	1676	0
CJU	CHEJU, REP OF KOREA	N	FGN	0	0	0	0	1708	1	1708	1
CKG	CHONGQING, P. R. CHINA	N	FGN	714	0	787	0	1138	0	2639	0
CKS	CARAJAS, BRAZIL	S	FGN	417	0	417	0	188	0	1022	0
CKY	CONAKRY, GUINEA	N	FGN	550	0	707	0	947	0	2204	0
CLE	CLEVELAND, OH, USA	N	YES	24028	1	40166	1	55625	1	119819	3
CLT	CHARLOTTE, NC, USA	N	YES	95251	2	113302	1	122448	0	331001	3
CMB	COLOMBO, SRI LANKA	N	FGN	3021	0	3078	0	3254	1	9353	1
CMG	CORUMBA, MATO GROSSO, BRAZIL	S	FGN	1460	1	1464	0	1068	0	3992	1
CMH	COLUMBUS, OH, USA	N	YES	8004	0	9329	0	9980	0	27313	0
CMI	CHAMPAIGN, IL, USA	N	YES	2186	0	2195	0	2188	0	6569	0
CMN	MOHAMEDV, CASABLANCA, MOROCCO	N	FGN	4767	0	6241	0	6621	0	17629	0
CND	CONSTANTO, ROMANIA	N	FGN	0	0	0	0	0	0	0	0
CNF	BELO HORIZONTE-CONFINS, BRAZIL	S	FGN	19683	0	19554	0	17047	0	56284	0
CNQ	CORRIENTES, ARGENTINA	S	FGN	1100	0	544	0	312	0	1956	0
CNS	CAIRNS, QLD, AUSTRALIA	S	FGN	4850	1	6049	0	7815	0	18714	1
CNX	CHIANG MAI, THAILAND	N	FGN	728	0	435	0	18	0	1181	0
COK	COCHIN, INDIA	N	FGN	5457	1	4646	2	4380	0	14483	3
COO	COTONOU, BENIN	N	FGN	1120	0	1038	0	838	0	2996	0
COR	CORDOBA, ARGENTINA	S	FGN	6772	0	6194	1	5551	0	18517	1
COS	COLORADO SPRINGS, CO, USA	N	YES	8004	0	8313	1	10804	0	27121	1
CPH	COPENHAGEN, DENMARK	N	FGN	11419	1	14184	0	15634	1	41237	2
CPO	CUPIATO, CHILE	S	FGN	0	0	320	0	632	0	952	0
CPQ	CAMPINAS, BRAZIL	S	FGN	1056	0	1207	0	889	0	3152	0
CPR	CASPER, WY, USA	N	YES	4230	0	2902	0	2170	0	9302	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
CPT	CAPE TOWN, SOUTH AFRICA	S	FGN	8545	1	10490	0	11738	2	30773	3
CPV	CAMPINA GRANDE, BRAZIL	S	FGN	626	0	628	0	624	0	1878	0
CRD	COMODORO RIVADAVIA, ARGENTINA	S	FGN	2553	0	2041	0	1509	0	6103	0
CRP	CORPUS CHRISTI, TX, USA	N	YES	5584	0	5292	0	5290	1	16166	1
CRW	CHARLESTON, WV, USA	N	YES	4478	0	5070	1	2915	0	12463	1
CTA	CATANIA, ITALY	N	FGN	252	0	665	0	838	0	1755	0
CTC	CATAMARCA, ARGENTINA	S	FGN	778	0	782	1	730	0	2290	1
CTG	CARTAGENA, COLOMBIA	N	FGN	105	0	104	0	104	0	313	0
CTS	SAPPORO-CHITOSE, JAPAN	N	FGN	1398	0	2908	0	2784	0	7090	0
CTU	CHENGDU, P.R. CHINA	N	FGN	2138	1	1728	0	2749	1	6615	2
CUN	CANCUM, MEXICO	N	FGN	634	0	1212	0	602	0	2448	0
CUR	CURACAO, NETH ANTILLES	N	FGN	20	0	0	0	0	0	20	0
CUT	CUTRAL-CO, ARGENTINA	S	FGN	0	0	18	0	0	0	18	0
CVG	CINCINNATI, OH, USA	N	YES	14496	0	18777	0	16460	0	49733	0
CVT	COVENTRY, ENG, UK	N	FGN	0	0	0	0	42	0	42	0
CWB	CURITIBA, PARANA, BRAZIL	S	FGN	6532	0	8720	0	10110	2	25362	2
CWL	CARDIFF, WALES, UK	N	FGN	0	0	0	1	0	0	0	1
CXI	CHRISTMAS ISLAND, REP OF KIRIBATI	N	FGN	106	0	104	0	104	0	314	0
CYI	CHIAYI, TAIWAN	N	FGN	730	0	732	0	730	0	2192	0
CZL	CONSTANTINE, ALGERIA	N	FGN	3352	0	3129	0	3101	0	9582	0
CZS	CRUZEIRO DO SUL, ACRE, BRAZIL	S	FGN	344	0	436	0	454	0	1234	0
CZX	CHANGZHOU, P. R. CHINA	N	FGN	208	0	227	0	224	0	659	0
DAB	DAYTONA BEACH, FL, USA	N	YES	3532	1	4032	0	2840	1	10404	2
DAC	DHAKA, BANGLADESH	N	FGN	934	0	734	0	789	0	2457	0
DAL	LOVE DALLS/FT. WORTH, TX, USA	N	YES	75124	4	76295	3	76191	3	227610	10
DAM	DAMASCUS, SYRIA	N	FGN	523	0	883	0	905	0	2311	0
DAR	DAR ES SALAAM, TANZANIA	S	FGN	3407	0	2968	0	2961	0	9336	0
DAY	DAYTON, OH, USA	N	YES	37652	1	43020	2	48201	1	128873	4
DBV	DUBROVNIK, YUGOSLAVIA	N	FGN	1806	0	2366	0	2730	0	6902	0
DCA	NATIONAL, WASHINGTON, DC, USA	N	YES	22108	0	26412	0	30911	1	79431	1
DEC	DECATUR, IL, USA	N	YES	0	0	0	0	0	0	0	0
DEL	DELHI, INDIA	N	FGN	15987	0	16401	3	17645	2	50033	5
DEN	STAPLETON INT'L, DENVER, CO, USA	N	YES	112673	2	113634	2	106309	0	332616	4
DET	DETROIT CITY, MI, USA	N	YES	0	0	2064	0	10902	1	12966	1
DEU	SOMEWHERE OVER GERMANY	N	FGN	0	0	0	1	0	0	0	1
DFW	DALLAS/FT WORTH, TX, USA	N	YES	51130	1	48254	1	53615	0	152999	2
DHA	DHAHRAN, SAUDI ARABIA	N	FGN	7902	0	6474	0	6302	0	20678	0
DIB	DIBRUGARH, INDIA	N	FGN	816	0	864	0	852	0	2532	0
DIE	ANTSIRANANA, MADAGASCAR	S	FGN	610	0	610	0	576	0	1796	0
DIR	DIRE DAWA, ETHIOPIA	N	FGN	38	0	628	0	1100	0	1766	0
DJE	DJERBA, TUNISIA	N	FGN	547	0	267	0	303	0	1117	0
DJG	DJANET, ALGERIA	N	FGN	466	0	532	0	564	0	1562	0
DKR	DAKAR, SENEGAL	N	FGN	467	0	580	0	653	0	1700	0
DLA	DOUALA, REP OF CAMEROON	N	FGN	5262	0	4691	0	4654	0	14607	0
DLC	DALIAN, P. R. CHINA	N	FGN	0	0	44	0	130	0	174	0
DLG	DILLINGHAM, AS, USA	N	NO	1444	0	1622	0	1660	0	4726	0
DLH	DULUTH, MN, USA	N	YES	0	0	0	0	0	1	0	1
DMU	DIMAPUR, INDIA	N	FGN	0	0	0	0	326	0	326	0
DOD	DODOMA, TANZANIA	S	FGN	16	0	0	0	0	0	16	0
DOH	DOHA, QATAR	N	FGN	8859	0	9310	0	9325	0	27494	0
DPS	DENPASAR, INDONESIA	S	FGN	104	0	104	0	106	0	314	0
DRO	DURANGO, CO, USA	N	YES	2233	0	1462	0	1442	0	5137	0
DRW	DARWIN, N.T., AUSTRALIA	S	FGN	1107	0	2092	0	2513	0	5712	0
DSM	DES MOINES, IO, USA	N	YES	7748	0	9329	0	7785	0	24862	0
DTW	WAYNE CO, DETROIT, MI, USA	N	YES	16765	0	24028	0	21130	1	61923	1
DUB	DUBLIN, REPUBLIC OF IRELAND	N	FGN	19308	1	23823	1	28519	1	71650	3
DUD	DUNEDIN, NEW ZEALAND	S	FGN	4145	0	4379	1	5890	0	14414	1
DUR	DURBAN, SOUTH AFRICA	S	FGN	6925	2	7739	2	9624	1	24288	5
DUS	DUESSELDORF, FRG	N	FGN	30119	2	32964	5	33450	6	96533	13
DUT	DUTCH HARBOR, AS, USA	N	NO	828	0	1116	0	1432	0	3376	0
DXB	DUBAI, U. A. EMIRATES	N	FGN	3134	0	2234	0	2719	0	8087	0
EAM	NEJRAN, SAUDI ARABIA	N	FGN	2392	0	2412	0	2552	1	7356	1
EBB	ENTEBBE KAMPALA, UGANDA	N	FGN	39	0	167	0	459	0	665	0
EBD	EL OBEID, SUDAN	N	FGN	632	0	968	0	512	0	2112	0
EBJ	ESBJERG, DENMARK	N	FGN	482	0	284	0	156	0	922	0
EDI	EDINBURGH, SCOTLAND	N	FGN	1040	0	1988	0	7123	1	10151	1
EFL	KEFALONIA, GREECE	N	FGN	780	0	786	0	776	0	2342	0
EJH	WEDJH, SAUDI ARABIA	N	FGN	784	0	736	0	730	0	2250	0
ELF	EL FASHER, SUDAN	N	FGN	0	0	8	0	164	0	172	0
ELG	EL GOLEA, ALGERIA	N	FGN	416	0	416	0	416	0	1248	0
ELM	ELMIRA, NY, USA	N	YES	0	0	260	0	0	0	260	0
ELP	EL PASO, TX, USA	N	YES	38902	0	39117	0	41757	0	119776	0
ELQ	GASSIM, SAUDI ARABIA	N	FGN	4652	0	4072	0	3224	0	11948	0
ELS	EAST LONDON, SOUTH AFRICA	S	FGN	9987	3	11104	0	10476	2	31567	5
ELU	EL OUED, ALGERIA	N	FGN	288	0	312	0	426	0	1026	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	ING5
EMA	EAST MIDLANDS, ENGLAND	N	FGN	291	0	269	0	322	2	882	2
ENU	ENUGU, NIGERIA	N	FGN	3138	0	2980	0	2199	0	8317	0
EQS	ESQUEL, ARGENTINA	S	FGN	1116	0	1066	0	850	0	3032	0
ERI	ERIE, PA, USA	N	YES	1772	0	1618	0	1535	0	4925	0
ESB	ANKARA-ESENBOGA, TURKEY	N	FGN	0	0	695	0	1329	0	2024	0
ESR	EL SALVADOR, CHILE	S	FGN	836	0	772	0	728	0	2336	0
ETH	ELAT, ISRAEL	N	FGN	4	0	14	0	2	0	20	0
EUG	EUGENE, OR, USA	N	YES	3493	0	2908	0	5201	0	11602	0
EUN	LAAYOUNE, MOROCCO	N	FGN	244	0	503	0	317	0	1064	0
EVE	EVENES, NORWAY	N	FGN	1520	0	1874	0	1778	0	5172	0
EVV	EVANSVILLE, IN, USA	N	YES	2468	0	2519	0	1898	0	6885	0
EWR	NEWARK, NEW YORK, NY, USA	N	YES	78323	1	85323	2	83555	1	247201	4
EZE	BUENOS AIRES-EZEIZA ARPT, ARGENTINA	S	FGN	424	1	838	0	1483	0	2745	1
FAE	FAROE ISLANDS, DENMARK	N	FGN	756	0	837	0	752	0	2345	0
FAI	FAIRBANKS, AS, USA	N	NO	3674	0	3816	0	3756	0	11246	0
FAO	FARO, PORTUGAL	N	FGN	1069	0	1712	1	1300	0	4081	1
FAR	FARGO, ND, USA	N	YES	1561	0	383	0	445	0	2389	0
FAT	FRESNO, CA, USA	N	YES	9993	1	6833	1	4983	0	21809	2
FAY	FAYETTEVILLE, NC, USA	N	YES	3260	0	3643	0	2786	0	9689	0
FBM	LUBUMBASHI, ZAIRE	S	FGN	262	0	378	0	444	0	1084	0
FBU	FORNEBU, OSLO, NORWAY	N	FGN	11420	0	29599	0	33347	0	74366	0
FCA	KALISPELL GLACIER NAT'L OK, MT, USA	N	YES	1460	0	1460	0	1067	0	3987	0
FCO	DA VINCI, ROME, ITALY	N	FGN	4538	0	6614	1	8484	1	19636	2
FEZ	FEZ, MOROCCO	N	FGN	146	0	408	0	640	0	1194	0
FIH	KINSHASA, ZAIRE	S	FGN	2324	0	2776	0	2920	0	8020	0
FJR	AL FUJAIRAH, U.A.E.	N	FGN	0	0	208	0	225	0	433	0
FKI	KISANGANI, ZAIRE	N	FGN	1170	0	1596	0	1388	0	4154	0
FLL	FT LAUDERDALE, FL, USA	N	YES	12566	1	12687	0	17037	0	42290	1
FLN	FLORIANOPOLIS, BRAZIL	S	FGN	4180	0	5040	0	3909	0	13129	0
FMA	FORMOSA, ARGENTINA	S	FGN	682	0	696	1	648	0	2026	1
FMI	KALEMIE, ZAIRE	S	FGN	524	0	440	0	414	0	1378	0
FMO	MUENSTER, GERMANY	N	FGN	0	0	0	0	69	0	69	0
FNA	FREETOWN, SIERRA LEONE	N	FGN	112	0	0	0	0	0	112	0
FNC	FUNCHAL - MADEIRA, PORTUGAL	N	FGN	3737	1	4944	0	6276	1	14957	2
FNT	FLINT, MI, USA	N	YES	2186	0	2300	0	2923	1	7409	1
FOC	FUZHOU, P. R. CHINA	N	FGN	534	0	1116	0	1082	0	2732	0
FOE	FORBES, TOPEKA, KA, USA	N	YES	1407	0	62	0	0	0	1469	0
FOR	FORTALEZA, CEARA, BRAZIL	S	FGN	4798	0	6068	0	8582	0	19448	0
FPO	FREEPORT, BAHAMAS	N	FGN	2666	0	5156	0	4876	0	12698	0
FRA	FRANKFURT, FRG	N	FGN	52274	8	56256	2	64168	6	172698	16
FRL	FORLI, ITALY	N	FGN	0	0	0	0	2	0	2	0
FSD	SIOUX FALLS, SD, USA	N	YES	6410	0	2897	0	5603	0	14910	0
FTU	FT DAUPHIN, MADAGASCAR	S	FGN	332	0	328	0	330	0	990	0
FUE	FUERTEVENTURA, CANARY IS.	N	FGN	0	0	216	0	228	0	444	0
FUK	FUKUOKA, JAPAN	N	FGN	730	0	410	0	62	0	1202	0
FWA	FT WAYNE, IN, USA	N	YES	2580	0	2344	0	2444	0	7368	0
GAJ	YAMAGATA, HONSHU, JAPAN	N	FGN	1154	0	1426	1	1330	0	3910	1
GAL	GALENA, AS, USA	N	NO	0	0	270	0	182	0	452	0
GAU	GAUHATI, INDIA	N	FGN	3934	1	5832	0	6143	0	15909	1
GBE	GABORONE, BOTSWANA	S	FGN	527	0	500	0	246	0	1273	0
GCI	GUERNSEY, CHANNEL IS, UK	N	FGN	0	0	0	0	40	0	40	0
GDL	GUADALAJARA, MEXICO	N	FGN	0	0	38	0	92	0	130	0
GEG	SPOKANE, WA, USA	N	YES	8549	0	5588	0	6999	0	21136	0
GEO	GEORGETOWN, GUYANA	N	FGN	0	0	8	0	28	0	36	0
GHA	GHARDAIA, ALGERIA	N	FGN	1014	0	858	0	1032	0	2904	0
GHB	GOVERNORS HARBOUR, BAHAMAS	N	FGN	36	0	0	1	0	0	36	1
GHU	GUALEGUAYCHU, ARGENTINA	S	FGN	0	1	0	0	0	0	0	1
GIB	GIBRALTAR, GIBRALTAR	N	FGN	1788	0	2904	0	3440	0	8132	0
GIG	RIO DE JANEIRO INT'L, BRAZIL	S	FGN	27048	0	33116	1	34612	1	94776	2
GIZ	GIZAN, SAUDI ARABIA	N	FGN	5781	0	6019	0	6070	0	17870	0
GJT	GRAND JUNCTION, CO, USA	N	YES	2416	0	3572	0	2962	0	8950	0
GLA	GLASGLOW, SCOTLAND	N	FGN	687	0	1605	0	5763	0	8055	0
GMA	GEMENA, ZAIRE	N	FGN	312	0	332	0	252	0	896	0
GOA	GENOA, ITALY	N	FGN	292	1	267	0	1064	0	1623	1
GOI	GOA, INDIA	N	FGN	1798	0	1554	0	1982	1	5334	1
GOM	GOMA, ZAIRE	S	FGN	104	0	446	0	554	0	1104	0
GOP	GORAKHPUR, INDIA	N	FGN	486	0	328	0	404	0	1218	0
GOT	GOTHENBURG, SWEDEN	N	FGN	3846	0	4517	2	5431	0	13794	2
GOU	GAROUA, REP OF CAMEROON	N	FGN	1954	0	1822	0	1338	0	5114	0
GOV	GOVE, N.T., AUSTRALIA	S	FGN	314	0	600	0	624	0	1538	0
GRB	GREEN BAY, WI, USA	N	YES	605	0	0	0	0	0	605	0
GRJ	GEORGE, SOUTH AFRICA	S	FGN	2178	0	2262	0	2253	0	6693	0
GRR	GRAND RAPIDS, MI, USA	N	YES	4831	0	3497	0	4465	0	12793	0
GRU	SAO PAULO-GUARULMOS, BRAZIL	S	FGN	41061	0	45163	0	47825	0	134049	0
GRZ	GRAZ, AUSTRIA	N	FGN	619	1	304	0	562	1	1485	2

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
GSO	GREENSBORO/HPT/WIN-SALEM, NC, USA	N	YES	18586	0	14989	0	15677	0	49252	0
GSP	GREENVILLE/SPARTANBURG, SC, USA	N	YES	1508	0	2324	0	2292	1	6124	1
GTF	GREAT FALLS, MT, USA	N	YES	4356	0	3398	0	2992	0	10746	0
GUA	GUATELMALA CITY, GUATEMALA	N	FGN	1667	0	2848	0	3522	0	8037	0
GUM	GUAM, GUAM	N	FGN	289	0	366	0	145	0	800	0
GVA	GENEVA, SWITZERLAND	N	FGN	10594	0	10520	1	11863	0	32977	1
GWL	GWALIOR, INDIZ	N	FGN	1460	0	1422	1	1460	0	4342	1
GWT	GALWAY, IRELAND	N	FGN	130	0	136	0	8	0	274	0
GXF	SEIYUN, YEMEN	N	FGN	26	0	0	0	0	0	26	0
GXG	NEGAGE, ANGOLA	S	FGN	382	0	314	0	0	0	696	0
GYE	GUAYAQUIL,ECUADOR	S	FGN	1609	0	0	0	0	0	1609	0
GYN	GOIANIA, BRAZIL	S	FGN	7891	0	8638	0	10582	0	27111	0
HAC	HACHIJO, JIMA ISLAND, JAPAN	N	FGN	834	1	1396	0	842	0	3072	1
HAH	MORONI-HAHAYA, COMOROS	S	FGN	266	0	343	0	222	0	831	0
HAJ	HANOVER, FED REP OF GERMANY	N	FGN	8844	0	9804	1	8722	0	27370	1
HAK	HAIKOU, P. R. CHINA	N	FGN	770	0	1508	0	1270	0	3548	0
HAM	HAMBURG, FRG	N	FGN	25535	2	27695	3	27741	4	80971	9
HAN	HANOI, SOC REP OF VIETNAM	N	FGN	152	0	158	0	242	0	552	0
HAS	HAIL, SAUDI ARABIA	N	FGN	3642	0	2720	0	2568	0	8930	0
HBA	HOBART, TASMANIA, AUSTRALIA	S	FGN	3785	0	4822	0	5322	0	13929	0
HBT	HAFR ALBAPIN, SAUDI ARABIA	N	FGN	140	0	228	0	208	0	576	0
HDN	STEAMBOAT SPRINGS, CO, USA	N	YES	0	0	0	0	88	0	88	0
HDY	HAT YAI, THAILAND	N	FGN	3094	0	2434	0	2706	0	8234	0
HEL	HELSINKI, FINLAND	N	FGN	2797	0	3382	0	4373	0	10552	0
HER	HERAKLION, GREECE	N	FGN	1780	0	2406	0	2312	0	6498	0
HGH	HANGZHOU, P. R. CHINA	N	FGN	1390	0	1619	0	1610	0	4619	0
HIR	HONIARA, GUADALCANAL, SOLOMON IS.	S	FGN	436	0	648	0	672	0	1756	0
HJR	HIROSHIMA, JAPAN	N	FGN	1460	0	1464	0	1460	0	4384	0
HKD	HAKODATE, JAPAN	N	FGN	1030	0	566	0	416	0	2012	0
HKG	HONG KONG, HONG KONG	N	FGN	2792	0	6018	0	7074	0	15884	0
HKT	PHUKET, THAILAND	N	FGN	1932	0	2110	0	2290	0	6332	0
HLN	HELENA, MT, USA	N	YES	2046	0	2188	0	1800	0	6034	0
HLZ	HAMILTON, NEW ZEALAND	S	FGN	627	0	727	0	1151	0	2505	0
HME	HASSI MESSAOUD, ALGERIA	N	FGN	256	0	118	0	268	0	642	0
HND	TOKYO-HANEDA, JAPAN	N	FGN	14398	0	12095	0	9997	1	36490	1
HNL	HONOLULU, OAHU, HA, USA	N	NO	51139	0	51563	0	58525	0	161227	0
HNM	HANA, MAUI, HA, USA	N	NO	0	0	0	0	0	1	0	1
HOD	HODEIDAH, YEMEN	N	FGN	86	0	0	0	0	0	86	0
HOF	HOFUF, SAUDI ARABIA	N	FGN	992	0	960	0	854	0	2806	0
HOR	HORTA FAIAL ISLAND, PORTUGAL	N	FGN	92	0	144	0	188	0	424	0
HOU	HOUSTON, TX, USA	N	YES	71429	3	81688	4	86754	2	239871	9
HPN	WHITE PLAINS, NY, USA	N	YES	2159	0	2049	0	1990	0	6198	0
HRB	HARBIN, MANCHURIA, P. R. CHINA	N	FGN	210	0	147	0	204	0	561	0
HRE	HARARE, ZIMBABWE	S	FGN	3314	0	5238	0	5347	0	13899	0
HRG	HORGHADA, ARAB REP OF EGYPT	N	FGN	760	0	732	0	1024	0	2516	0
HRL	HARLINGEN, TX, USA	N	YES	7446	1	7653	0	7583	0	22682	1
HSV	HUNTSVILLE/DECATUR, AL, USA	N	YES	1817	0	1972	0	3316	0	7105	0
HTI	HAMILTON ISLAND, QLD, AUSTRALIA	S	FGN	1351	0	1648	0	1748	0	4747	0
HTS	HUNTINGTON, WV, USA	N	YES	1152	0	1174	0	538	0	2864	0
HUN	HUALIEN, TAIWAN	N	FGN	6508	0	7264	0	8030	0	21802	0
HYD	HYDERABAD, INDIA	N	FGN	2103	1	2214	5	2265	1	6582	7
IAD	DULLES INT'L, WASHINGTON, DC, USA	N	YES	84839	1	52922	1	50660	0	188421	2
IAH	HOUSTON INTERCONT, TX, USA	N	YES	35485	0	46187	1	42713	0	124385	1
IAM	IN AMENAS, ALGERIA	N	FGN	408	0	420	0	506	0	1334	0
IBA	IBADAN, NIGERIA	N	FGN	1382	0	706	0	484	0	2572	0
IBZ	IBIZA, SPAIN	N	FGN	124	1	220	0	294	1	638	2
ICT	WICHITA, KA, USA	N	YES	10698	0	6225	0	6858	0	23781	0
IDA	IDAHO FALLS, ID, USA	N	YES	2190	0	2756	0	2714	0	7660	0
IDR	INDORE, INDIA	N	FGN	1460	0	1426	0	1460	0	4346	0
IEV	KIEV, USSR	N	FGN	0	0	32	0	8	0	40	0
IFN	ISFAHAN, IRAN	N	FGN	2256	0	2874	0	2728	0	7858	0
IGL	IZMIR-CIGLI, TURKEY	N	FGN	26	0	22	0	0	0	48	0
IGR	IGUAZU, ARGENTINA	S	FGN	986	0	784	0	522	0	2292	0
IGU	IGUASSU FALLS, BRAZIL	S	FGN	1776	0	2764	0	3510	0	8050	0
ILG	PHILADELPHIA-WILMINGTON, PA, USA	N	YES	440	0	0	0	0	0	440	0
ILM	WILMINGTON, NC, USA	N	YES	6254	0	5363	0	4298	0	15915	0
ILR	ILORIN, NIGERIA	N	FGN	1568	0	1884	0	737	0	4189	0
IMF	IMPHAL, INDIA	N	FGN	1460	0	1464	0	1460	0	4384	0
IMP	IMPERATRIZ, BRAZIL	S	FGN	1186	0	1464	0	1456	0	4106	0
IND	INDIANAPOLIS, IN, USA	N	YES	12290	0	19730	0	25796	0	57816	0
INI	NIS, YUGOSLAVIA	N	FGN	57	0	0	0	106	0	163	0
INU	NAURU, REP OF NAURU	S	FGN	889	0	906	1	430	0	2225	1
INZ	IN SALAH, ALGERIA	N	FGN	586	0	504	0	606	0	1696	0
IOA	IOANNINA, GREECE	N	FGN	1354	0	1200	0	1200	0	3754	0
IOS	ILHEUS, BRAZIL	S	FGN	2920	0	2928	0	2954	0	8802	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
IQQ	IQUIQUE, CHILE	S	FGN	1460	0	1674	0	1868	0	5002	0
IQT	IQUTOS, PERU	S	FGN	210	0	304	0	844	0	1358	0
IRJ	LA RIOJA, ARGENTINA	S	FGN	860	0	768	0	736	0	2364	0
IRP	ISIRO, ZAIRE	N	FGN	104	0	156	0	210	0	470	0
ISA	MOUNT ISA, QLD, AUSTRALIA	S	FGN	546	0	1262	1	1660	0	3468	1
ISB	ISLAMABAD RAWALPINDI, PAKISTAN	N	FGN	3663	0	4673	0	4868	0	13204	0
ISG	ISHIGAKI, JAPAN	N	FGN	6936	1	7473	4	6358	0	20767	5
ISO	KINSTON, NC, USA	N	YES	2024	0	1464	0	495	0	3983	0
ISP	LONG ISLAND MACARTHUR, NY, USA	N	YES	5816	0	3036	0	3539	1	12391	1
IST	ISTANBUL, TURKEY	N	FGN	2551	0	2343	0	3213	0	8107	0
ITH	ITHICA, NY, USA	N	YES	182	0	2	0	151	0	335	0
ITO	HILO HAWAII, HA, USA	N	NO	8568	1	9273	2	9946	0	27787	3
IUE	NIUE ISLAND, NIUE	S	FGN	127	0	72	0	26	0	225	0
IVC	INVERCARGILL, NEW ZEALAND	S	FGN	2069	0	2076	1	2096	0	6241	1
IXA	AGARTALA, INDIA	N	FGN	1976	0	2720	0	2593	0	7289	0
IXB	BAGDOGRA, INDIA	N	FGN	2366	1	2196	0	2190	0	6752	1
IXC	CHANDIGAR, INDIA	N	FGN	1460	0	1464	1	1426	1	4350	2
IXD	ALLAHABAD, INDIA	N	FGN	392	0	500	0	1042	0	1934	0
IXE	MANGALORE, INDIA	N	FGN	2370	0	2168	1	1878	0	6416	1
IXJ	JAMMU, INDIA	N	FGN	1650	0	1576	1	1546	1	4772	2
IXL	LEH, INDIA	N	FGN	574	0	916	0	938	0	2428	0
IXM	MADURAI, INDIA	N	FGN	1200	0	1142	0	1344	0	3686	0
IXR	RANCHI, INDIA	N	FGN	1460	0	1464	1	1460	0	4384	1
IXS	SILOHAR, INDIA	N	FGN	1748	0	1832	0	1772	0	5352	0
IXU	AURANGABAD, INDIA	N	FGN	1820	0	1464	1	1460	0	4744	1
IXV	ALONG, INDIA	N	FGN	0	0	0	1	0	0	0	1
IXZ	PORT BLAIR ANDAMAN ISLAND, INDIA	N	FGN	706	0	928	0	994	0	2628	0
JAC	JACKSON, WY, USA	N	YES	2325	0	2179	0	2342	0	6846	0
JAI	JAIPUR, INDIA	N	FGN	4068	2	4876	2	3736	0	12680	4
JAN	JACKSON, MS, USA	N	YES	3392	0	3085	0	2959	0	9436	0
JAX	JACKSONVILLE, FL, USA	N	YES	10211	0	13077	0	15242	1	38530	1
JDH	JODHPUR, INDIA	N	FGN	2920	0	2928	0	2816	1	8664	1
JDO	JUAZEIRO DO NORTE CEARAH, BRAZIL	S	FGN	626	0	628	0	624	0	1878	0
JED	JEDDAH, SAUDI ARABIA	N	FGN	19745	0	20292	0	19897	0	59934	0
JER	JERSEY CHANNEL ISLANDS, UK	N	FGN	1263	0	1112	0	3011	0	5386	0
JFK	KENNEDY, NEW YORK, NY, USA	N	YES	13217	0	8785	0	8874	0	30876	0
JGA	JAMNAGAR, INDIA	N	FGN	730	0	732	0	730	0	2192	0
JHB	JOHOR BAHRU, MALAYSIA	N	FGN	4018	0	4164	0	4690	0	12872	0
JIB	DJIBOUTI, DJIBOUTI	N	FGN	508	0	686	0	868	0	2062	0
JKH	CHIOS, GREECE	N	FGN	1858	0	1720	0	1768	0	5346	0
JNB	JOHANNESBURG, SOUTH AFRICA	S	FGN	13746	2	15620	0	18693	1	48059	3
JNU	JUNEAU, AS, USA	N	NO	2255	0	2684	0	2686	0	7625	0
JOI	JOINVILLE, BRAZIL	S	FGN	626	0	628	0	624	0	1878	0
JOS	JOS, NIGERIA	N	FGN	2596	0	2022	0	1643	0	6261	0
JPA	JOAO PESSOA, BRAZIL	S	FGN	1460	0	1832	0	4074	0	7366	0
JRH	JORMAT, INDIA	N	FGN	694	2	732	0	730	0	2156	2
JRO	KILIMANJARO, TANZANIA	S	FGN	1667	0	1568	0	1405	0	4640	0
JSI	SKIATHOS, GREECE	N	FGN	412	0	342	0	448	0	1202	0
JTR	SANTORINI, THIRA ISLAND, GREECE	N	FGN	1126	0	884	0	1480	0	3490	0
JUB	JUBA, SUDAN	N	FGN	38	0	0	0	0	0	38	0
JUJ	JUJUY, ARGENTINA	S	FGN	600	0	226	0	26	0	852	0
KAD	KADUNA, NIGERIA	N	FGN	3896	0	3639	0	2650	0	10185	0
KAN	KANO, NIGERIA	N	FGN	700	0	708	0	765	0	2173	0
KBL	KABUL, AFGHANISTAN	N	FGN	208	0	208	0	78	0	494	0
KBR	KOTA BHARU, MALAYSIA	N	FGN	3024	0	3034	0	3091	0	9149	0
KCH	KUCHING, SARAWAK, MALAYSIA	N	FGN	5337	1	5482	0	6265	0	17084	1
KCZ	KOCHI, JAPAN	N	FGN	1522	0	816	0	170	0	2508	0
KDU	SKARDU, PAKISTAN	N	FGN	190	0	688	0	730	0	1608	0
KEF	REYKJAVIK-KEFLAVIK, ICELAND	N	FGN	561	0	936	0	992	1	2489	1
KER	KERMAN, IRAN	N	FGN	532	0	52	0	0	0	584	0
KGA	KANANGA, ZAIRE	S	FGN	420	0	366	0	490	0	1276	0
KGL	KIGALI, RWANDA	S	FGN	22	0	22	0	208	0	252	0
KGS	KOS, GREECE	N	FGN	550	1	566	0	894	0	2010	1
KHH	KAOHSIUNG, TAIWAN	N	FGN	14596	2	18764	0	20170	0	53530	2
KHI	KARACHI, PAKISTAN	N	FGN	7384	2	9030	0	8710	1	25124	3
KHN	NANCHANG KIANGSI, P. R. CHINA	N	FGN	228	0	190	0	52	0	470	0
KIJ	NIIGATA, JAPAN	N	FGN	2190	0	2224	0	2162	0	6576	0
KIM	KIMBERLEY, SOUTH AFRICA	S	FGN	3888	0	4182	0	4789	3	12859	3
KIN	KINGSTON, JAMAICA	N	FGN	338	0	88	0	208	0	634	0
KKC	KHON KAEN, THAILAND	N	FGN	2264	0	1942	0	1668	0	5874	0
KLX	KALAMATA, GREECE	N	FGN	782	0	742	0	730	0	2254	0
KMG	KUNMING, P.R. CHINA	N	FGN	2448	1	2577	0	3683	0	8708	1
KMI	MIYAZAKI, JAPAN	N	FGN	4686	0	3536	0	3474	0	11696	0
KMJ	KUMAMOTO, JAPAN	N	FGN	0	0	74	0	42	0	116	0
KMP	KEETMANSHOOP, NAMIBIA	S	FGN	174	0	0	0	0	0	174	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	ING5
KMQ	KOMATSU, JAPAN	N	FGN	730	0	828	0	702	0	2260	0
KMX	KHAMIS MUSHAIT, SAUDI ARABIA	N	FGN	0	0	0	0	322	0	322	0
KND	KINDU, ZAIRE	S	FGN	480	0	622	0	522	0	1624	0
KNN	KANKAN, GUINEA	N	FGN	0	0	100	0	92	0	192	0
KNU	KANPUR, INDIA	N	FGN	1372	0	1578	0	1068	0	4018	0
KOA	KONA, HA, USA	N	NO	11308	0	11047	1	13819	0	36174	1
KOJ	KAGOSHIMA, JAPAN	N	FGN	843	0	1913	2	1095	0	3851	2
KRN	KIRUNA, SWEDEN	N	FGN	0	0	18	0	0	0	18	0
KRP	KARUP, DENMARK	N	FGN	0	0	0	0	72	0	72	0
KRS	KRISTIANSAND, NORWAY	N	FGN	7646	0	7990	0	7912	0	23548	0
KRT	KHARTOUM, SUDAN	N	FGN	1921	0	2623	1	1945	0	6489	1
KSA	KOSRAE, CAROLINE ISLANDS	N	FGN	10	0	132	0	104	0	246	0
KSD	KARLSTAD, SWEDEN	N	FGN	0	0	0	0	52	0	52	0
KSH	BAKHTARAN, IRAN	N	FGN	0	0	0	0	144	0	144	0
KSM	ST MARY'S, AS, USA	N	NO	420	0	562	0	722	0	1704	0
KST	KOSTI, SUDAN	N	FGN	0	1	0	0	0	0	0	1
KSU	KRISTIANSUND, NORWAY	N	FGN	2128	0	2024	0	2106	0	6258	0
KTM	KATHMANDU, NEPAL	N	FGN	2240	0	2200	1	2195	0	6635	1
KTN	KETCHIKAN, AS, USA	N	NO	1460	0	1464	0	1460	0	4384	0
KUA	KUANTAN, MALAYSIA	N	FGN	426	0	420	0	676	0	1522	0
KUH	KUSHIRO, JAPAN	N	FGN	1336	0	926	0	552	0	2814	0
KUL	KUALA LUMPUR, MALAYSIA	N	FGN	21147	1	22237	0	24379	0	67763	1
KVA	KAVALA, GREECE	N	FGN	1242	0	1160	0	1202	0	3604	0
KWE	GUIYANG, P. R. CHINA	N	FGN	684	0	660	0	834	0	2178	0
KWI	KUWAIT, KUWAIT	N	FGN	3659	0	2728	0	2536	0	8923	0
KWJ	KWANGJU, REP OF KOREA	N	FGN	0	0	0	0	668	0	668	0
KWL	GUILIN, P. R. CHINA	N	FGN	3855	0	4671	0	3365	0	11891	0
LAD	LUANDA, ANGOLA	S	FGN	5680	0	5112	0	3986	0	14778	0
LAN	LANSING, MI, USA	N	YES	1120	0	1646	0	1764	0	4530	0
LAS	LAS VEGAS, NV, USA	N	YES	82033	0	89149	1	96139	0	267321	1
LAX	LOS ANGELES, CA, USA	N	YES	113329	0	123390	2	118819	4	355538	6
LBB	LUBBOCK, TX, USA	N	YES	13600	0	16396	0	16240	0	46236	0
LBU	LABUAN SABAH, MALAYSIA	N	FGN	2398	0	2406	0	2709	0	7513	0
LBV	LIBREVILLE, GABON	N	FGN	1553	0	1955	0	1983	0	5491	0
LCA	LARNACA, CYPRUS	N	FGN	1352	0	1277	0	1616	1	4245	1
LCE	LA CEIBA, HONDURAS	N	FGN	380	0	570	0	1210	0	2160	0
LDB	LONDRINA, BRAZIL	S	FGN	0	0	440	0	1185	0	1625	0
LDE	LOURDES/TARBES, FRANCE	N	FGN	8	1	0	1	0	1	8	3
LDI	LINDI, TANZANIA	S	FGN	10	0	0	0	0	0	10	0
LED	LENINGRAD, U.S.S.R.	N	FGN	198	0	163	0	239	0	600	0
LEI	ALMERIA, SPAIN	N	FGN	100	0	104	0	130	0	334	0
LEJ	LEIPZIG, GDR	N	FGN	16	0	28	0	46	0	90	0
LEX	LEXINGTON, KY, USA	N	YES	3916	1	4165	0	3573	0	11654	1
LFT	LAFAYETTE, LA, USA	N	YES	0	0	0	0	302	0	302	0
LFW	LOME, TOGO	N	FGN	985	0	812	0	929	0	2726	0
LGA	NEW YORK LA GUARDIA, NY, USA	N	YES	32068	1	32703	1	36226	1	100997	3
LGB	LONG BEACH, CA, USA	N	YES	1299	0	3321	0	7605	0	12225	0
LGG	LIEGE, BELGIUM	N	FGN	0	0	0	0	0	1	0	1
LGK	LANGKAWI, MALAYSIA	N	FGN	0	0	206	0	448	0	654	0
LGW	LONDON-GATWICK, ENGLAND	N	FGN	13117	0	17634	1	36365	2	67116	3
LHE	LAHORE, PAKISTAN	N	FGN	7188	1	9191	2	9169	0	25548	3
LHR	LONDON HEATHROW, ENGLAND, (UK)	N	FGN	69405	2	75934	1	93470	2	238809	5
LHW	LANZHOU, P. R. CHINA	N	FGN	0	0	83	0	21	0	104	0
LIH	LIHUE, KAUAI, HA, USA	N	NO	17365	2	17708	3	19247	3	54320	8
LIL	LILLE, FRANCE	N	FGN	214	0	292	0	367	0	873	0
LIM	LIMA, PERU	S	FGN	1460	0	2157	0	2318	0	5935	0
LIN	MILAN LINATE, ITALY	N	FGN	7588	1	7604	1	7641	0	22833	2
LIS	LISBON, PORTUGAL	N	FGN	10558	0	13190	0	14480	0	38228	0
LIT	LITTLE ROCK, AK, USA	N	YES	10791	1	10853	1	9382	1	31026	3
LJA	LODJA, ZAIRE	S	FGN	106	0	104	0	74	0	284	0
LJU	LJUBLJANA, YUGOSLAVIA	N	FGN	1741	0	1704	1	1615	0	5060	1
LKO	LUCKNOW, INDIA	N	FGN	4396	1	4264	1	4236	2	12896	4
LLA	LULEA, SWEDEN	N	FGN	0	0	8	0	0	0	8	0
LLW	LILONGWE, MALAWI	S	FGN	752	1	786	0	823	0	2361	1
LMT	KLAMATH FALLS, OR, USA	N	YES	1218	0	62	0	0	0	1280	0
LNK	LINCOLN, NB, USA	N	YES	5816	0	5847	0	4201	0	15864	0
LNZ	LONZ, AUSTRIA	N	FGN	768	1	704	0	683	0	2155	1
LOS	LAGOS, NIGERIA	N	FGN	16716	1	14969	1	11299	0	42984	2
LPA	GRAN CANARIA, CANARY ISLANDS	N	FGN	293	0	1439	0	2682	1	4414	1
LPB	LA PAZ, BOLIVIA	S	FGN	136	0	264	0	312	0	712	0
LPL	LIVERPOOL, ENGLAND	N	FGN	30	0	42	0	134	0	206	0
LRH	LA ROCHELLE, FRANCE	N	FGN	0	0	8	0	4	0	12	0
LST	LAUNCESTON, TASMANIA, AUSTRALIA	S	FGN	4721	1	5684	0	5723	2	16128	3
LTN	LONDON-LUTON INT'L, ENGLAND	N	FGN	192	0	270	0	556	1	1018	1
LUN	LUSAKA, ZAMBIA	S	FGN	2302	0	1961	0	2183	0	6446	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	ING5
LUO	LUENA, ANGOLA	S	FGN	434	0	472	0	556	0	1462	0
LUQ	SAN LUIS, ARGENTINA	S	FGN	196	0	0	0	0	0	196	0
LUT	LAURA STATION, AUSTRALIA	S	FGN	0	0	0	0	0	0	0	0
LUX	LUXEMBOURG, LUXEMBOURG	N	FGN	2615	0	3500	0	3753	0	9868	0
LXR	LUXOR, ARAB REP OF EGYPT	N	FGN	2161	0	2143	1	2995	0	7299	1
LXS	LEMNOS, GREECE	N	FGN	1040	0	996	0	1060	1	3096	1
LYH	LYNCHBURG, VA, USA	N	YES	1824	0	2306	0	1754	0	5884	0
LYP	FAISALABAD, PAKISTAN	N	FGN	790	0	1326	0	1324	0	3440	0
LYR	LONGYEARBYEN, NORWAY	N	FGN	14	0	223	0	255	0	492	0
LYS	LYON, FRANCE	N	FGN	5223	0	5439	0	5714	0	16376	0
MAA	MADRAS, INDIA	N	FGN	7714	0	8485	3	8067	1	24266	4
MAB	MARABA, BRAZIL	S	FGN	470	0	628	0	782	0	1880	0
MAD	MADRID, SPAIN	N	FGN	6813	1	7477	0	9134	0	23424	1
MAF	MIDLAND ODESSA, TX, USA	N	YES	16021	1	14942	0	14184	2	45147	3
MAH	MAHON, MENORCA, SPAIN	N	FGN	84	0	174	0	310	1	568	1
MAJ	MAJURO, MARSHALL ISLAND	N	FGN	92	0	132	0	104	0	328	0
MAL	MANGOLE, INDONESIA	N	FGN	0	0	0	0	0	0	0	0
MAN	MANCHESTER, ENGLAND (UK)	N	FGN	5780	3	7490	1	10909	0	24179	4
MAO	MANAUS, BRAZIL	S	FGN	6627	0	7820	0	9619	0	24066	0
MBA	MOMBASA, KENYA	S	FGN	0	0	0	0	21	0	21	0
MBJ	MONTEGO BAY, JAMAICA	N	FGN	218	0	0	0	0	0	218	0
MBS	SAGINAW, MI, USA	N	YES	794	0	272	0	2169	0	3235	0
MBX	MARIBOR, YUGOSLAVIA	N	FGN	0	0	0	0	40	0	40	0
MCG	MCGRATH, AS, USA	N	NO	0	0	0	0	204	0	204	0
MCI	KANSIS CITY, MO, USA	N	YES	26453	0	29842	0	50786	0	107081	0
MCO	ORLANDO-INT'L, FL, USA	N	YES	23551	1	28187	0	25069	0	76807	1
MCP	MACAPA, AMAPA, BRAZIL	N	FGN	1888	0	2337	0	2295	0	6520	0
MCT	MUSCAT, OMAN	N	FGN	4409	0	5241	0	5174	0	14824	0
MCY	MAROOCHYDORE, QLD, AUSTRALIA	S	FGN	104	0	136	0	10	0	250	0
MCZ	MACEIO, ALAGOAS, BRAZIL	S	FGN	978	0	1646	0	4088	0	6712	0
MDE	MEDELLIN, COLOMBIA	N	FGN	312	0	312	0	314	0	938	0
MDI	MAKURDI, NIGERIA	N	FGN	730	0	695	0	375	0	1800	0
MDK	MBANDAKA, ZAIRE	N	FGN	416	0	522	0	526	0	1464	0
MDP	MINDIPTANA, INDONESIA	-0-	FGN	0	0	0	0	0	1	0	1
MDQ	MAR DEL PLATA, ARGENTINA	S	FGN	2964	0	2816	2	2662	1	8442	3
MDT	HARRISBURG-OLMSTEAD ST, PA, USA	N	YES	3784	1	3265	0	2805	0	9854	1
MDW	CHICAGO-MIDWAY, IL, USA	N	YES	33077	2	46544	2	49337	1	128958	5
MDZ	MENDOZA, ARGENTINA	S	FGN	1578	0	1106	0	886	0	3570	0
MED	MEDINA, SAUDI ARABIA	N	FGN	4698	0	5236	0	4896	1	14830	1
MEG	MALANGE, ANGOLA	S	FGN	740	0	758	0	696	0	2194	0
MEL	MELBOURNE, VICTORIA, AUSTRALIA	S	FGN	17124	1	21097	3	31383	0	69604	4
MEM	MEMPHIS, TN, USA	N	YES	8599	0	7534	0	7035	0	23168	0
MES	MEDAN, INDONESIA	N	FGN	730	0	732	0	714	0	2176	0
MEX	MEXICO CITY, MEXICO	N	FGN	4170	0	5281	0	5092	0	14543	0
MFE	MC ALLEN, TX, USA	N	YES	288	0	1148	0	1052	0	2488	0
MFR	MEDFOR, OR, USA	N	YES	3529	0	2228	1	1784	0	7541	1
MFU	MFUWE, ZAMBIA	S	FGN	34	0	60	0	30	0	124	0
MGA	MANAGUA, NICARAGUA	N	FGN	3212	0	2689	0	1762	1	7663	1
MGM	MONTGOMERY, AL, USA	N	YES	148	0	896	0	1681	0	2725	0
MGQ	MOGADISHU, SOMALIA	N	FGN	94	0	46	0	50	0	190	0
MHD	MASHAD, IRAN	N	FGN	516	0	0	0	0	0	516	0
MHT	MANCHESTER, NH, USA	N	YES	0	0	1106	0	2733	0	3839	0
MIA	MIAMI, FL, USA	N	YES	28033	0	34912	1	29373	0	92318	1
MID	MERIDA, MEXICO	N	FGN	0	0	244	0	170	0	414	0
MIL	MILAN, ITALY	N	FGN	0	1	0	0	0	0	0	1
MIR	MONASTIR, TUNISIA	N	FGN	488	0	336	0	567	0	1391	0
MIU	MAIDUGURI, NIGERIA	N	FGN	887	0	1042	0	636	0	2565	0
MJM	MBUJI-MAYI, ZAIRE	S	FGN	364	0	510	0	618	0	1492	0
MJN	MAJUNGA, MADAGASCAR	S	FGN	402	0	336	0	298	0	1036	0
MJT	MYTILENE, GREECE	N	FGN	2852	0	2634	0	2820	0	8306	0
MKE	MILWAUKEE, WI, USA	N	YES	1056	0	3124	0	4861	0	9041	0
MKY	MALACCA, MALAYSIA	S	FGN	2109	0	2272	0	1316	0	5697	0
MLA	MALTA, MEDITERRANEAN SEA	N	FGN	2882	0	4492	0	5117	1	12491	1
MLB	MELBOURNE, FL, USA	N	YES	958	0	1474	0	1034	0	3466	0
MLE	MALE, MALDIVES	N	FGN	356	0	464	0	454	0	1274	0
MLH	MULHOUSE/BASEL, FRANCE	N	FGN	1	0	4	0	21	0	26	0
MLI	MOLINE, IL, USA	N	YES	1947	0	2284	0	2941	0	7172	0
MLU	MONROE, LA, USA	N	YES	3670	0	3712	0	2852	0	10234	0
MLW	MONROVIA, LIBERIA	N	FGN	0	0	0	0	124	0	124	0
MMY	MIYAKO JIMA, JAPAN	N	FGN	3606	5	4836	5	3834	0	12276	10
MNL	MANILA, PHILIPPINES	N	FGN	1232	0	1211	0	1321	0	3764	0
MOB	MOBILE AL/PASCAGOULA, MS, USA	N	YES	3013	0	2274	0	330	0	5617	0
MOC	MONTES CLAROS, BRAZIL	S	FGN	416	0	420	0	416	0	1252	0
MOL	MOLDE, NORWAY	N	FGN	2129	0	2263	0	2366	0	6758	0
MOQ	MORONDAVA, MADAGASCAR	S	FGN	112	0	204	0	150	0	466	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	ING5
MOT	MINOT, ND, USA	N	YES	737	0	964	0	648	0	2349	0
MPL	MONTPELLIER, FRANCE	N	FGN	52	0	52	0	52	0	156	0
MPM	MAPUTO, MOZAMBIQUE	S	FGN	2248	0	2289	0	1480	0	6017	0
MRS	MARSEILLE, FRANCE	N	FGN	3381	0	3805	0	4186	0	11372	0
MRU	MAURITIUS, MAURITIUS	S	FGN	321	0	437	0	446	0	1204	0
MRY	MONTEREY, CA, USA	N	YES	3559	0	1923	0	1844	0	7326	0
MSN	MADISON, WI, USA	N	YES	1695	0	1489	0	2132	0	5316	0
MSO	MISSOULA, MT, USA	N	YES	3537	1	3427	0	3307	0	10271	1
MSP	MINNEAPOLIS-ST PAUL, MN, USA	N	YES	8120	1	11799	0	16476	0	36395	1
MSR	MUENSTER, FRG	N	FGN	4	0	0	0	0	0	4	0
MSY	NEW ORLEANS, LA, USA	N	YES	25950	0	32656	1	32966	3	91572	4
MSZ	NAMIBE, ANGOLA	S	FGN	228	0	262	0	138	0	628	0
MTS	MANZINI, SWAZILAND	S	FGN	96	0	192	0	154	0	442	0
MTY	MONTERREY, MEXICO	N	FGN	0	0	62	0	48	0	110	0
MUC	MUNICH, FRG	N	FGN	36435	4	44305	1	46990	1	127730	6
MUX	MULTAN, PAKISTAN	N	FGN	2488	0	2344	0	2303	0	7135	0
MUZ	MUSOMA, TANZANIA	S	FGN	8	0	0	0	0	0	8	0
MVB	FRANCEVILLE, GABON	N	FGN	1	0	5	0	3	0	9	0
MVD	MONTEVIDEO, URUGUAY	S	FGN	4977	0	5351	0	5226	0	15554	0
MVR	MAROUA, REP OF CAMEROON	N	FGN	1190	0	1052	0	933	0	3175	0
MWZ	MWANZA, TANZANIA	S	FGN	79	0	530	0	785	0	1394	0
MXP	MILAN-MALPENSA, ITALY	N	FGN	4	0	21	1	26	0	51	1
MXZ	MEIXIAN, P. R. CHINA	N	FGN	0	0	328	0	420	0	748	0
MYJ	MATSUYAMA, SHIKIKU, JAPAN	N	FGN	290	0	862	0	762	0	1914	0
MYR	MYRTLE BEACH, SC, USA	N	YES	4864	0	5504	0	6440	1	16808	1
MYW	MTWARA, TANZANIA	S	FGN	370	0	312	0	290	0	972	0
MYY	MIRI, SARAWAK, MALAYSIA	N	FGN	3024	0	3244	0	3730	0	9998	0
MZG	MAKUNG, TAIWAN	N	FGN	8877	0	10980	0	10180	0	30037	0
MZM	METZ, FRANCE	N	FGN	0	0	0	0	21	0	21	0
MZT	MAZATLAN, MEXICO	N	FGN	976	0	554	0	628	0	2158	0
NAG	NAGPUR, INDIA	N	FGN	2756	0	2440	0	1970	0	7166	0
NAK	NAKHON RATCHASIMA, THAILAND	N	FGN	0	0	0	0	82	0	82	0
NAN	NADI, FIJI	S	FGN	1373	0	1413	0	1724	0	4510	0
NAP	NAPLES, ITALY	N	FGN	739	0	584	0	662	0	1985	0
NAS	NASSAU, BAHAMAS	N	FGN	7440	0	9851	0	10501	0	27792	0
NAT	NATAL, BRAZIL	S	FGN	4380	0	4976	0	5422	0	14778	0
NBO	NAIROBI, KENYA	S	FGN	1051	0	1087	0	1344	0	3482	0
NCE	NICE, FRANCE	N	FGN	3675	1	5258	0	5599	0	14532	1
NCL	NEWCASTLE, ENGLAND	N	FGN	1825	0	1589	1	1879	0	5293	1
NDD	SUMBE, ANGOLA	S	FGN	10	0	0	0	0	0	10	0
NDJ	N'DJAMENA, CHAD	N	FGN	18	0	0	0	20	0	38	0
NGE	N'GAOUNDERE, REP OF CAMEROON	N	FGN	1006	0	902	0	870	0	2778	0
NGO	NAGOYA, JAPAN	N	FGN	5577	0	6995	1	6550	0	19122	1
NIM	NIAMEY, NIGER	N	FGN	62	0	0	0	0	0	62	0
NKC	NOUAKCHOTT, MAURITANIA	N	FGN	110	0	82	0	66	0	258	0
NKG	NANJING, P. R. CHINA	N	FGN	2476	0	2744	0	3005	0	8225	0
NLA	NDOLA, ZAMBIA	S	FGN	701	0	508	0	730	0	1939	0
NLK	NORFOLK ISLAND, PACIFIC OCEAN	S	FGN	420	0	581	0	628	0	1629	0
NNG	NANNING, P. R. CHINA	N	FGN	1157	0	1042	0	480	0	2679	0
NOS	NOSSIBE, MADAGASCAR	S	FGN	508	0	614	0	700	0	1822	0
NOU	NOUMEA, NEW CALEDONIA	S	FGN	219	0	209	0	949	0	1377	0
NOV	HUAMBO, ANGOLA	S	FGN	520	0	630	0	1254	0	2404	0
NPE	NAPIER, NEW ZEALAND	S	FGN	0	0	0	0	80	0	80	0
NQN	NEUQUEN, ARGENTINA	S	FGN	1876	0	1838	0	1598	0	5312	0
NRT	TOKYO-NARITA, JAPAN	N	FGN	0	0	640	0	730	0	1370	0
NUE	NUREMBURG, FRG	N	FGN	3516	1	4068	1	3943	1	11527	3
NVT	NAVEGANTES, BRAZIL	S	FGN	2608	0	2556	0	2500	0	7664	0
OAJ	JACKSONVILLE, NC, USA	N	YES	2428	0	1892	0	1588	0	5908	0
OAK	OAKLAND, SAN FRANCISCO, CA, USA	N	YES	27453	3	25240	0	24777	0	77470	3
ODE	ODENSE, DENMARK	N	FGN	567	0	496	0	503	0	1566	0
OGG	KAHULUI, MAUI, HA, USA	N	NO	27942	1	27757	1	29505	0	85204	2
OGN	YONAGUNI-JIMA, JAPAN	N	FGN	0	0	30	0	0	0	30	0
OGX	OUARGLA, ALGERIA	N	FGN	836	0	552	0	841	0	2229	0
OHD	OHRID, YUGOSLAVIA	N	FGN	292	0	523	0	452	0	1267	0
OIT	OITA, JAPAN	N	FGN	854	0	818	0	1472	1	3144	1
OKA	OKINAWA, RYUKYU IS, JAPAN	N	FGN	11818	0	13972	0	13660	0	39450	0
OKC	OKLAHOMA CITY, OK, USA	N	YES	25165	0	27072	1	26161	1	78398	2
OKJ	OKAJAMA, JAPAN	N	FGN	0	0	923	0	1444	0	2367	0
OLB	OLBIA, ITALY	N	FGN	40	0	42	0	92	0	174	0
OMA	OMAHA, NB, USA	N	YES	10800	0	10871	0	13689	0	35360	0
OME	NOME, AS, USA	N	NO	2272	0	2232	0	2269	0	6773	0
OMO	MOSTAR, YUGOSLAVIA	N	FGN	0	0	0	0	178	0	178	0
ONT	ONTARIO, CA, USA	N	YES	33033	0	34539	0	35608	0	103180	0
OOL	GOLD COAST, QLD, AUSTRALIA	S	FGN	2812	0	3663	0	5208	0	11683	0
OPO	OPORTO, PORTUGAL	N	FGN	3349	1	3331	0	5553	0	12233	1

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	ING5
ORD	CHICAGO-O'HARE, IL, USA	N	YES	59542	2	79401	3	110094	1	249037	6
ORF	NORFOLK-VA. BEACH, VA, USA	N	YES	24618	2	20845	0	19290	3	64753	5
ORH	WORCESTER, MA, USA	N	YES	719	0	2976	0	1966	0	5661	0
ORK	CORK, IRELAND	N	FGN	2942	0	3322	0	4963	0	11227	0
ORN	ORAN, ALGERIA	N	FGN	4524	0	4495	0	4450	0	13469	0
ORY	PARIS - ORLY ARPT, FRANCE	N	FGN	6940	1	8806	1	9381	2	25127	4
OSA	OSAKA, JAPAN	N	FGN	1792	0	1262	0	1246	0	4300	0
OSD	OSTERSUND, SWEDEN	N	FGN	0	0	0	0	6	0	6	0
OSL	OSLO, NORWAY	N	FGN	14168	0	0	0	0	0	14168	0
OSM	MOSUL, IRAQ	N	FGN	312	0	314	0	314	0	940	0
OTP	BUCHAREST-OTOPENI, ROMANIA	N	FGN	487	0	405	0	481	0	1373	0
OTZ	KOTZEBUE, AS, USA	N	NO	2082	0	2050	0	2082	0	6214	0
OUA	OUAGADOUGOU, BURKINA FASO	N	FGN	14	0	0	0	0	0	14	0
OUD	OUJDA, MOROCCO	N	FGN	402	0	386	0	361	0	1149	0
OUE	OUESSO, PEOP REP OF CONGO	N	FGN	258	0	260	0	222	0	740	0
OZZ	OUARAZATE, MOROCCO	N	FGN	161	0	395	0	385	0	941	0
PAP	PORT AU PRINCE, HAITI	N	FGN	0	0	88	0	208	0	296	0
PAT	PATNA, INDIA	N	FGN	4973	2	4408	3	3842	0	13223	5
PBI	WEST PALM BEACH, FL, USA	N	YES	10310	0	9469	0	9081	0	28860	0
PBM	PARAMARIBO, REP OF SURINAME	N	FGN	104	0	106	0	104	0	314	0
PCL	PUCALLPA, PERU	S	FGN	586	0	110	0	182	0	878	0
PDB	PEDRO BAY, AS, USA	N	NO	0	0	0	0	0	1	0	1
PDL	PONTA DELGADA, PORTUGAL (AZORES)	N	FGN	886	0	933	0	451	0	2270	0
PDP	PUNTA DEL ESTE, URUGUAY	S	FGN	2332	0	1676	0	1863	0	5871	0
PDX	PORTLAND, OR, USA	N	YES	18968	3	17604	0	18875	1	55447	4
PEK	BEIJIN, P. R. CHINA	N	FGN	9169	2	9152	0	8951	0	27272	2
PEM	PUERTO MALDONADO, PERU	S	FGN	0	0	92	0	64	0	156	0
PEN	PENANG, MALAYSIA	N	FGN	9062	2	9591	0	10330	0	28983	2
PER	PERTH, WA, AUSTRALIA	S	FGN	1178	0	1503	0	3664	0	6345	0
PEW	PESHAWAR, PAKISTAN	N	FGN	418	0	440	0	578	0	1436	0
PHC	PORT HARCOURT, NIGERIA	N	FGN	208	0	707	0	821	0	1736	0
PHE	PORT HEDLAND, WA, AUSTRALIA	S	FGN	130	0	0	0	0	0	130	0
PHL	PHILADELPHIA/WILMINGTON, PA, USA	N	YES	34184	0	45759	2	45635	2	125578	4
PHS	PHITSANULOK, THAILAND	N	FGN	1460	0	1464	0	818	0	3742	0
PHX	PHOENIX, AZ, USA	N	YES	163588	0	177325	0	199769	1	540682	1
PIA	PEORIA, IL, USA	N	YES	389	0	603	0	993	0	1985	0
PIE	TAMPA-ST. PETERSBURG, FL, USA	N	YES	302	3	0	0	343	1	645	4
PIK	GLASGOW-PRESTWICK, SCOTLAND	N	FGN	52	0	104	0	97	0	253	0
PIT	PITTSBURGH, PA, USA	N	YES	69413	0	80005	0	65047	0	214465	0
PIU	PIURA, PERU	S	FGN	1068	0	62	0	338	0	1468	0
PLZ	PORT ELIZABETH, SOUTH AFRICA	S	FGN	12531	1	14399	2	13797	3	40727	6
PMA	PEMBA ISLAND, TANZANIA	S	FGN	8	0	0	0	0	0	8	0
PMC	PUERTO MONTT, CHILE	S	FGN	1400	0	1565	0	1861	0	4826	0
PME	PORTSMOUTH, UK	N	FGN	0	0	0	2	0	0	0	2
PMI	PALMA MALLORCA ISLAND, SPAIN	N	FGN	2449	0	3158	0	6948	1	12555	1
PMO	PALERMO, ITALY	N	FGN	0	0	46	0	246	0	292	0
PMR	PALMERSTON, NEW ZEALAND	S	FGN	2592	2	2752	0	2694	0	8038	2
PNA	PAMPLONA, SPAIN	N	FGN	0	0	0	0	0	1	0	1
PNQ	POONA, INDIA	N	FGN	842	0	1554	0	1968	0	4364	0
PNR	POINTE NOIRE, PEOP REP OF CONGO	S	FGN	1265	0	912	0	640	0	2817	0
PNS	PENSACOLA, FL, USA	N	YES	2180	0	1824	0	1328	0	5332	0
PNZ	PETROLINA, BRAZIL	S	FGN	720	0	732	0	732	0	2184	0
POA	PORTO ALEGRE, BRAZIL	S	FGN	8156	0	7765	0	5217	0	21138	0
POG	PORT GENTIL, GABON	S	FGN	18	0	139	0	263	0	420	0
POL	PEMBA, MOZAMBIQUE	S	FGN	260	0	262	0	150	0	672	0
POS	PORT OF SPAIN, TRINIDAD/TOBAGO	N	FGN	52	0	52	0	52	0	156	0
PPG	PAGO PAGO, SAMOA	S	FGN	434	0	147	0	26	0	607	0
PPP	PROSERPINE, QLD, AUSTRALIA	S	FGN	437	0	521	0	257	0	1215	0
PPT	PAPEETE, SOCIETY IS, FR POLYNESIA	S	FGN	0	0	0	0	51	0	51	0
PRG	PRAGUE, CZECHOSLOVAKIA	N	FGN	1231	0	1148	0	1510	0	3889	0
PSA	PISA, ITALY	N	FGN	1082	0	1026	1	458	0	2566	1
PSC	PASCO, WA, USA	N	YES	864	0	2035	0	2565	0	5464	0
PSG	PETERSBURG, AS, USA	N	NO	1460	0	1464	0	1460	0	4384	0
PSI	PASNI, PAKISTAN	N	FGN	208	0	208	0	210	0	626	0
PSP	PALM SPRINGS, CA, USA	N	YES	3083	0	3434	0	3653	0	10170	0
PSS	POSADAG, ARGENTINA	S	FGN	938	0	928	0	810	0	2676	0
PTY	PANAMA CITY, PANAMA	N	FGN	2683	0	2922	1	3258	0	8863	1
PUB	PUEBLO, CO, USA	N	YES	2569	0	2395	0	2190	0	7154	0
PUQ	PUNTA ARENAS, CHILE	S	FGN	760	0	782	0	827	0	2369	0
PUS	PUSAN, REP OF KOREA	N	FGN	0	0	0	0	1704	0	1704	0
PUY	PULA, YUGOSLAVIA	N	FGN	76	0	286	0	400	1	762	1
PVD	PROVIDENCE, RI, USA	N	YES	5358	0	7982	0	10925	1	24265	1
PVH	PORTO VELHO, BRAZIL	S	FGN	4700	0	4786	1	4888	1	14374	2
PVK	PREVEZA/LEFKAS, GREECE	N	FGN	0	0	0	0	0	0	0	0
PVR	PUERTO VALLARTA, MEXICO	N	FGN	880	0	888	0	540	0	2308	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	ING5
PWM	PORTLAND, ME, USA	N	YES	2450	0	3650	0	6679	0	12779	0
PXO	PORTO SANTO, PORTUGAL (MADEIRA)	N	FGN	58	0	78	0	102	0	238	0
PZO	PUERTO ORDAZ, VENEZUELA	N	FGN	0	0	0	0	74	0	74	0
PZU	PORT SUDAN, SUDAN	N	FGN	925	0	1517	0	1344	0	3786	0
QTV	TREVISO, ITALY	N	FGN	0	0	0	1	0	0	0	1
RAE	ARAR, SAUDI ARABIA	N	FGN	1662	0	1576	0	1728	0	4966	0
RAH	RAFHA, SAUDI ARABIA	N	FGN	166	0	210	0	240	0	616	0
RAJ	RAJKOT, INDIA	N	FGN	730	0	732	0	692	0	2154	0
RAK	MARRAKECH, MOROCCO	N	FGN	529	0	777	0	1086	0	2392	0
RAP	RAPID CITY, SD, USA	N	YES	4703	1	2847	0	3554	0	11104	1
RAR	RAROTONGA, COOK ISLAND, S. PACIFIC	S	FGN	152	0	63	0	0	0	215	0
RAS	RASHT, IRAN	N	FGN	540	0	40	0	0	0	580	0
RBA	RABAT, MOROCCO	N	FGN	0	0	562	0	531	0	1093	0
RBR	RIO BRANCO, BRAZIL	S	FGN	3614	0	3146	0	3146	0	9906	0
RCU	RIO CUARTO, ARGENTINA	S	FGN	552	0	0	0	0	0	552	0
RDD	REDDING, CA, USA	N	YES	3151	0	737	0	0	0	3888	0
RDU	RALEIGH-DURHAM, NC, USA	N	YES	23607	0	20624	0	16416	0	60647	0
REC	RECIFE, BRAZIL	S	FGN	8974	0	11088	1	15588	0	35650	1
REL	TRELEW, ARGENTINA	S	FGN	2448	0	1928	0	1984	0	6360	0
RES	RESISTENCIA, ARGENTINA	S	FGN	730	0	556	2	752	0	2038	2
RGA	RIO GRANDE, ARGENTINA	S	FGN	1628	0	1278	0	1253	0	4159	0
RGL	RIO GALLEGOS, ARGENTINA	S	FGN	3170	0	2492	0	1838	0	7500	0
RGN	RANGOON, BURMA	N	FGN	0	0	0	0	44	0	44	0
RHO	RHODES, GREECE	N	FGN	728	0	1132	0	2254	0	4114	0
RIC	RICHMOND, VA, USA	N	YES	8252	0	9847	0	9821	0	27920	0
RIJ	RIOJA, PERU	S	FGN	338	0	600	0	192	0	1130	0
RIY	RIYAN, YEMEN	N	FGN	560	0	322	0	242	0	1124	0
RJK	RIJEKA, YUGOSLAVIA	N	FGN	76	0	370	0	378	0	824	0
RKT	RAS AL KHAIMAH, U. A. EMIRATES	N	FGN	236	0	237	0	238	0	711	0
RNN	RONNE, DENMARK	N	FGN	298	0	242	0	272	0	812	0
RNO	RENO, NV, USA	N	YES	25150	1	20535	1	20236	0	65921	2
ROA	ROANOKE, VA, USA	N	YES	3910	1	4468	0	4283	0	12661	1
ROB	MONROVIA ROBERTS, LIBERIA	N	FGN	320	0	210	0	296	0	826	0
ROC	ROCHESTER, NY, USA	N	YES	13533	0	13078	1	17916	1	44527	2
ROK	ROCKHAMPTON, QLD, AUSTRALIA	S	FGN	3570	0	3750	0	2933	0	10253	0
ROR	KOROR, PALAU ISLAND, PACIFIC OCEAN	N	FGN	132	0	39	0	0	0	171	0
ROS	ROSARIO, ARGENTINA	S	FGN	1704	0	1478	0	900	0	4082	0
ROT	ROTORUA, NEW ZEALAND	S	FGN	0	0	292	0	482	0	774	0
RPR	RAIPUR, INDIA	N	FGN	1460	0	830	0	738	0	3028	0
RRS	ROROS, NORWAY	N	FGN	782	0	792	0	790	0	2364	0
RSW	FORT MYERS REGIONAL, FL, USA	N	YES	2486	0	7120	0	6729	0	16335	0
RTB	ROATAN, HONDURAS	N	FGN	0	0	188	0	1482	0	1670	0
RUH	RIYADH, SAUDI ARABIA	N	FGN	21799	0	21703	1	22246	0	65748	1
RUN	REUNION ISLAND, INDIAN OCEAN	S	FGN	436	0	410	0	304	0	1150	0
SAB	SABA, NETH. ANTILLES	N	FGN	0	0	0	1	0	0	0	1
SAH	SANAA, YEMEN	N	FGN	1580	0	1379	0	1291	0	4250	0
SAL	SAN SALVADOR, EL SALVADOR	N	FGN	6574	0	7271	0	8073	1	21918	1
SAN	SAN DIEGO, CA, USA	N	YES	36109	0	46848	1	55661	0	138618	1
SAO	SAO PAULO, BRAZIL	S	FGN	0	0	0	1	0	0	0	1
SAP	SAN PEDRO, SULA, HONDURAS	N	FGN	3411	0	4099	0	3944	0	11454	0
SAT	SAN ANTONIO, TX, USA	N	YES	31907	2	36421	1	33551	1	101879	4
SAV	SAVANNAH, GA, USA	N	YES	5077	0	4364	0	6639	1	16080	1
SBA	SANTA BARBARA, CA, USA	N	YES	2895	0	3035	0	3666	0	9596	0
SBN	SOUTH BEND, IN, USA	N	YES	1496	0	1708	0	2294	0	5498	0
SCC	PRUDHOE BAY, DEADHORSE, AS, USA	N	NO	3834	1	3908	0	3878	0	11620	1
SCK	STOCKTON,CA, USA	N	YES	787	0	0	0	0	0	787	0
SCL	SANTIAGO, CHILE	S	FGN	3733	0	5184	0	5928	0	14845	0
SCN	SAARBRUECKEN, FRG	N	FGN	0	0	0	1	8	0	8	1
SCQ	SANTIAGO DE COMPOSTELA, SPAIN	N	FGN	0	0	0	0	348	0	348	0
SDA	BAGHDAD-SADDAM, IRAQ	N	FGN	2599	0	1451	0	1406	0	5456	0
SDD	LUBANGO, ANGOLA	S	FGN	862	0	784	0	694	0	2340	0
SDE	SANTIAGO DEL ESTERO, ARGENTINA	S	FGN	910	0	732	0	690	0	2332	0
SDF	LOUISVILLE, KY, USA	N	YES	11936	1	11837	0	9752	0	33525	1
SDJ	SENDAI, JAPAN	N	FGN	2796	0	3276	1	3527	0	9599	1
SDK	SANDAKAN, SABAH, MALAYSIA	N	FGN	2190	0	2196	0	4340	0	8726	0
SDQ	SANTO DOMINGO, DOMINICAN REP	N	FGN	0	0	124	0	208	0	332	0
SEA	SEATTLE/TACOMA, WA, USA	N	YES	27059	0	29147	0	26176	0	82382	0
SEL	SEOUL, REP OF KOREA	N	FGN	0	0	0	0	2376	0	2376	0
SEZ	MAHE IS. SEYCHELLES IS.	S	FGN	0	0	93	0	57	0	150	0
SFA	SFAX, TUNISIA	N	FGN	186	0	194	0	188	0	568	0
SFN	SANTA FE, ARGENTINA	S	FGN	624	0	784	0	686	1	2094	1
SFO	SAN FRANCISCO-OAKLAND, CA, USA	N	YES	82408	2	78067	4	94302	1	254777	7
SFT	SKELLEFTEA, SWEDEN	N	FGN	0	0	0	0	2	0	2	0
SGF	SPRINGFIELD, MO, USA	N	YES	3704	0	2335	0	2381	0	8420	0
SGN	HO CHI MINH, SOC REP OF VIETNAM	N	FGN	0	0	0	0	88	0	88	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
SHA	SHANGHAI, P. R. CHINA	N	FGN	1678	0	2060	0	2291	0	6029	0
SHE	SHENYANG, P. R. CHINA	N	FGN	208	0	400	0	444	0	1052	0
SHI	SHIMOJISHIMA, JAPAN	N	FGN	0	0	0	1	0	0	0	1
SHJ	SHARJAH, U. A. EMIRATES	N	FGN	2588	0	2845	0	2934	0	8367	0
SHV	SHREVEPORT, LA, USA	N	YES	3098	0	3472	0	2510	0	9080	0
SHW	SHARURAH, SAUDI ARABIA	N	FGN	730	0	730	0	732	0	2192	0
SIA	XI AN, P. R. CHINA	N	FGN	848	0	991	0	1265	0	3104	0
SID	SAL, CAPE VERDE ISLAND	N	FGN	10	0	40	0	0	0	50	0
SIN	SINGAPORE, SINGAPORE	N	FGN	6631	0	6354	0	6479	0	19464	0
SIT	SITKA, AS, USA	N	NO	778	0	782	0	778	0	2338	0
SJC	SAN JOSE, CA, USA	N	YES	37310	2	37278	0	37768	2	112356	4
SJD	LOS CABOS, MEXICO	N	FGN	0	0	38	0	0	0	38	0
SJJ	SARAJEVO, YUGOSLAVIA	N	FGN	174	0	356	0	564	0	1094	0
SJO	SAN JOSE, COST RICA	N	FGN	3317	0	3409	0	3128	0	9854	0
SJU	SAN JUAN, PUERTO RICO	N	FGN	0	0	60	0	0	0	60	0
SKG	THESSALONIKI, GREECE	N	FGN	1987	0	1721	0	2473	0	6181	0
SKO	SOKOTO, NIGERIA	N	FGN	1182	0	732	0	598	0	2512	0
SKP	SKOPJE, YUGOSLAVIA	N	FGN	210	0	710	0	722	0	1642	0
SKS	SKRYDSTRUP, DENMARK	N	FGN	45	0	0	0	0	0	45	0
SKZ	SUKKUR, PAKISTAN	N	FGN	566	0	720	0	870	0	2156	0
SLA	SALTA, ARGENTINA	S	FGN	1934	0	1947	1	1622	0	5503	1
SLC	SALT LAKE CITY, UT, USA	N	YES	77961	1	72870	0	70403	2	221234	3
SLL	SALALAH, OMAN	N	FGN	882	0	964	0	1010	1	2856	1
SLZ	SAO LUIZ, MARANHAO, BRAZIL	S	FGN	3629	0	4701	1	7507	0	15837	1
SMF	SACRAMENTO, CA, USA	N	YES	18876	0	24452	1	19931	1	63259	2
SMI	SAMOS ISLAND, GREECE	N	FGN	1678	0	1608	0	1774	0	5060	0
SNA	ORANGE COUNTY, CA, USA	N	YES	24680	1	22489	0	23389	0	70558	1
SNN	SHANNON, IRELAND	N	FGN	1999	0	2715	0	3658	0	8372	0
SNO	SAKON NAKHON, THAILAND	N	FGN	566	0	282	0	0	0	848	0
SOF	SOFIA, BULGARIA	N	FGN	671	0	547	0	462	0	1680	0
SPC	SANTA CRUZ LA PALMA, CANARY IS.	N	FGN	0	0	1272	0	1186	0	2458	0
SPP	MENONGUE, ANGOLA	S	FGN	224	0	208	0	346	0	778	0
SPU	SPLIT, YUGOSLAVIA	N	FGN	1592	0	2213	0	1915	0	5720	0
SRQ	SARASOTA/BRADENTON, FL, USA	N	YES	657	0	994	1	2481	1	4132	2
SSA	SALVADOR, BRAZIL	S	FGN	9230	0	11330	0	16768	0	37328	0
SSG	MALABO, EQUATORIAL GUINEA	N	FGN	126	0	206	0	96	0	428	0
STL	ST LOUIS, MO, USA	N	YES	20660	0	25797	0	30162	0	76619	0
STM	SANTAREM, BRAZIL	S	FGN	3318	0	3913	0	4380	0	11611	0
STN	LONDON-STANSTED, ENGLAND, UK	N	FGN	0	0	874	0	1745	1	2619	1
STR	STUTTGART, FRG	N	FGN	18747	1	19270	4	21956	2	59973	7
STT	ST THOMAS, VIRGIN ISLANDS	N	FGN	748	0	732	0	730	0	2210	0
STV	SURAT, INDIA	N	FGN	0	1	0	0	0	0	0	1
STX	ST CROIX, VIRGIN ISLANDS	N	FGN	730	0	732	0	730	0	2192	0
SUB	SURABAYA, INDONESIA	S	FGN	0	0	0	0	80	0	80	0
SUV	SUVA, FIJI	S	FGN	650	0	582	0	565	0	1797	0
SUX	SIOUX CITY, IO, USA	N	YES	1536	0	2844	0	2127	0	6507	0
SVB	SAMBAVA, MADAGASCAR	S	FGN	274	0	220	0	294	0	788	0
SVG	STAVANGER, NORWAY	N	FGN	16946	0	18466	0	19633	1	55045	1
SVO	MOSCOW-SHEREMETYE, U.S.S.R.	N	FGN	864	0	962	0	1320	0	3146	0
SVP	KUITO, ANGOLA	S	FGN	422	0	392	0	316	0	1130	0
SVQ	SEVILLE, SPAIN	N	FGN	0	0	804	0	2074	0	2878	0
SWA	SHANTON, P. R. CHINA	N	FGN	0	0	507	0	1166	0	1673	0
SXB	STRASBOURG, FRANCE	N	FGN	76	0	4	0	86	0	166	0
SXF	BERLIN, GDR	N	FGN	86	0	202	0	470	0	758	0
SXR	SRINAGAR, INDIA	N	FGN	2123	1	2035	1	2692	0	6850	2
SYA	SHEMYA IS., AS, USA	N	NO	0	0	16	0	0	0	16	0
SYD	SYDNEY, N.S.W., AUSTRALIA	S	FGN	16325	2	21343	0	33543	2	71211	4
SYR	SYRACUSE, NY, USA	N	YES	10961	0	18007	1	25961	0	54929	1
SYZ	SHIRAZ, IRAN	N	FGN	3868	0	3768	0	3554	0	11190	0
SZG	SALZBURG, AUSTRIA	N	FGN	648	0	653	0	650	0	1951	0
TAI	TAIZ, YEMEN	N	FGN	820	0	872	0	690	0	2382	0
TAO	QINGDAO, P.R. CHINA	N	FGN	0	0	0	0	157	0	157	0
TBO	TABORA, TANZANIA	S	FGN	36	0	0	0	0	0	36	0
TBP	TUMBES, PERU	S	FGN	404	0	576	0	338	0	1318	0
TBT	TABATINGA, BRAZIL	S	FGN	764	0	852	0	836	0	2452	0
TBU	TONGATAPU, TONGA ISLAND, PACIFIC	S	FGN	667	0	323	0	316	0	1306	0
TBZ	TABRIZ, IRAN	N	FGN	214	0	0	0	0	0	214	0
TCI	TENERIFE, CANARY IS.	N	FGN	0	0	0	0	0	1	0	1
TEE	TBESSA, ALGERIA	N	FGN	652	0	628	0	624	0	1904	0
TER	TERCEIRA, PORTUGAL (AZORES)	N	FGN	87	0	260	0	253	0	600	0
TET	TETE, MOZAMBIQUE	S	FGN	364	0	364	0	158	0	886	0
TEZ	TEZPUR, INDIA	N	FGN	728	0	732	0	730	0	2190	0
TFF	TEFE, BRAZIL	S	FGN	246	0	208	0	264	0	718	0
TFN	TENERIFE, SPAIN	N	FGN	0	0	1842	0	1640	0	3482	0
TFS	TENERIFFE-REINASOFIA, CANARY ISLAND	N	FGN	244	1	874	1	1499	1	2617	3

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
TGD	TITOGRAD, YUGOSLAVIA	N	FGN	616	1	754	0	1002	0	2372	1
TGG	KUALA, TERENGGANU, MALAYSIA	N	FGN	438	0	418	0	640	0	1496	0
TGT	TANGA, TANZANIA	S	FGN	26	0	0	0	0	0	26	0
TGU	TEGUCIGALPA, HONDURAS	N	FGN	3746	0	4286	0	4645	0	12677	0
THE	TERESINA, PIAUI, BRAZIL	S	FGN	2920	0	3972	0	5418	0	12310	0
THR	TEHRAN, IRAN	N	FGN	4370	0	3536	0	4434	0	12340	0
TIA	TIRANA, ALBANIA	N	FGN	104	0	104	0	208	0	416	0
TIF	TAIF, SAUDI ARABIA	N	FGN	1484	0	926	0	888	C	3298	0
TIN	TINDOUF, ALGERIA	N	FGN	1006	0	962	0	966	0	2934	0
TIP	TRIPOLI, LIBYA	N	FGN	287	0	626	0	453	0	1366	0
TIV	TIVAT, YUGOSLAVIA	N	FGN	188	0	364	0	227	0	779	0
TKQ	KIGOMA, TANZANIA	S	FGN	18	0	0	0	0	C	18	0
TLE	TULEAR, MADAGASCAR	S	FGN	490	0	528	0	348	0	1366	0
TLH	TALLAHASSEE, FL, USA	N	YES	0	0	1376	0	1711	0	3087	0
TLM	TILIMSEN, ALGERIA	N	FGN	1046	0	831	0	517	0	2394	0
TLS	TOULOUSE, FRANCE	N	FGN	1152	0	1107	0	1306	0	3565	0
TLV	TEL AVIV-YAFO, ISRAEL	N	FGN	2334	1	1608	0	2173	0	6115	1
TMM	TAMATAVE, MADAGASCAR	S	FGN	150	0	14	0	60	0	224	0
TMR	TAMANRASSET, ALGERIA	N	FGN	1228	0	1058	0	1136	0	3422	0
TMS	SAO TOME ISLAND, SAO TOME ISLAND	N	FGN	124	0	144	0	104	0	372	0
TNG	TANGIER, MOROCCO	N	FGN	2117	3	2241	0	2281	1	6639	4
TNN	TAINAN, TAIWAN	N	FGN	3324	0	3452	0	3444	0	10220	0
TNR	ANTANANARIVO, MADAGASCAR	S	FGN	1953	0	1801	0	1659	0	5413	0
TOE	TOZEUR, TUNISIA	N	FGN	86	0	18	0	4	0	108	0
TOL	TOLEDO, OH, USA	N	YES	1724	0	1192	0	545	0	3461	0
TOS	TROMSO, NORWAY	N	FGN	2080	0	2518	0	2557	0	7155	0
TOY	TOYAMA, JAPAN	N	FGN	1522	0	446	0	48	0	2016	0
TPA	TAMPA/ST PETERSBURG, FL, USA	N	YES	19425	0	19630	0	24615	1	63670	1
TPE	TAIPEI, TAIWAN	N	FGN	0	0	34	0	366	0	400	0
TPP	TARAPOTO, PERU	S	FGN	656	0	486	0	964	0	2106	0
TRD	TRONDHEIM, NORWAY	N	FGN	11039	0	13061	0	14345	0	38445	0
TRI	TRI-CITY AIRPORT, TN, USA	N	YES	2166	0	2926	0	2413	0	7505	0
TRN	TURIN, ITALY	N	FGN	932	0	1798	1	2048	0	4778	1
TRU	TRUJILLO, PERU	S	FGN	28	0	28	0	450	0	506	0
TRV	TRIVANDRUM, INDIA	N	FGN	2374	3	2708	1	2714	0	7796	4
TRW	TARAWA, REP OF KIRIBATI	N	FGN	106	0	104	0	52	0	262	0
TRZ	TIRUCHIRAPALLY, INDIA	N	FGN	2318	0	2094	0	2052	0	6464	0
TSA	TAIPEI-SUNG SHAN, TAIWAN	N	FGN	22439	0	26214	0	28454	0	77107	0
TSF	TREVISO, ITALY	N	FGN	0	0	0	0	110	0	110	0
TSN	TIANJIN, P. R. CHINA	N	FGN	954	0	1421	0	1550	0	3925	0
TSV	TOWNSVILLE, QLD, AUSTRALIA	S	FGN	6252	1	6051	0	7323	1	19626	2
TTJ	TOTTORI, JAPAN	N	FGN	1460	0	1464	1	1460	1	4384	2
TTT	TAITUNG, TAIWAN	N	FGN	1488	0	1802	0	1880	0	5170	0
TUC	TUCUMAN, ARGENTINA	S	FGN	2409	0	2433	2	2264	1	7106	3
TUI	TURAIF, SAUDI ARABIA	N	FGN	0	0	0	0	38	0	38	0
TUL	TULSA, OK, USA	N	YES	30215	0	29642	3	25417	0	85274	3
TUN	TUNIS, TUNISIA	N	FGN	5129	1	3906	1	4307	0	13342	2
TUR	TUCURUI, BRAZIL	S	FGN	419	0	417	0	187	0	1023	0
TUS	TUCSON, AZ, USA	N	YES	14844	0	14048	0	19849	0	48741	0
TUU	TABUK, SAUDI ARABIA	N	FGN	4152	0	3910	0	3222	0	11284	0
TVL	LAKE TAHOE, CA, USA	N	YES	2274	1	1985	0	1982	0	6241	1
TWU	TAWAU, SABAH, MALAYSIA	N	FGN	2920	0	2928	0	4256	0	10104	0
TXL	WEST BERLIN, GERMANY	N	FGN	17484	1	18958	0	28902	0	65344	1
TYL	TALARA, PERU	S	FGN	12	0	700	0	338	0	1050	0
TYN	TAIYUAN, P. R. CHINA	N	FGN	104	0	122	0	182	0	408	0
TYS	KNOXVILLE, TN, USA	N	YES	4917	0	5269	0	5066	0	15252	0
UAQ	SAN JUAN, ARGENTINA	S	FGN	546	0	706	0	614	0	1866	0
UBA	UBERABA, BRAZIL	S	FGN	1186	0	1464	0	1460	0	4110	0
UBJ	UBE, JAPAN	N	FGN	2496	0	1411	0	1247	0	5154	0
UBP	UBON PATCHATHANI, THAILAND	N	FGN	730	0	732	0	394	0	1856	0
UDI	UBERLANDIA, BRAZIL	S	FGN	1186	0	1464	0	1460	0	4110	0
UDR	UDAIPUR, INDIA	N	FGN	1460	0	2126	0	1866	i	5452	1
UEL	QUELIMANE, MOZAMBIQUE	S	FGN	418	0	420	0	208	0	1046	0
UET	QUETTA, PAKISTAN	N	FGN	832	1	1566	0	1652	0	4050	1
UIO	QUITO, ECUADOR	S	FGN	1609	0	0	0	0	0	1609	0
UNK	UNALAKLEET, AS, USA	N	NO	4	0	270	0	658	0	932	0
URT	SURAT THANI, THAILAND	N	FGN	798	0	1272	0	1202	0	3272	0
URY	GURAYAT, SAUDI ARABIA	N	FGN	740	0	942	0	866	0	2548	0
USH	USHUAIA, ARGENTINA	S	FGN	1804	0	1544	0	1532	0	4880	0
UTH	UDON, THANI, THAILAND	N	FGN	738	0	732	0	314	0	1784	0
UTN	UPINGTON, SOUTH AFRICA	S	FGN	882	0	856	0	832	1	2570	1
UTP	UTAPAO, THAILAND	N	FGN	0	0	184	0	356	0	540	0
UVL	NEW VALLEY, ARAB REP OF EGYPT	N	FGN	315	0	312	0	312	0	939	0
VBY	VISBY, SWEDEN	N	FGN	0	0	0	0	2	0	2	0
VCE	VALVERDE, CANARY ISLANDS	N	FGN	1729	0	1335	0	1588	1	4652	1

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	ING5
VCP	SAO PAULO - VIRACOPOS, BRAZIL	S	FGN	104	0	56	0	0	0	160	0
VDM	VIEDMA, ARGENTINA	S	FGN	416	1	460	0	540	0	1416	1
VFA	VICTORIA FALL, ZIMBABWE	S	FGN	610	0	1292	0	1232	0	3134	0
VHC	SAURIMO, ANGOLA	S	FGN	252	0	234	0	384	0	870	0
VIE	VIENNA, AUSTRIA	N	FGN	5820	0	6195	0	7904	2	19919	2
VIL	DAKHLA, MOROCCO	N	FGN	8	0	58	0	78	0	144	0
VIX	VITORIA, ESPIRITO SANTO, BRAZIL	S	FGN	2878	0	3794	0	4160	0	10832	0
VLC	VALENCIA, SPAIN	N	FGN	206	0	342	0	1296	0	1844	0
VLG	VILLA GESELL, ARGENTINA	S	FGN	154	0	148	0	104	0	406	0
VLI	PORT VILA, VANUATU	S	FGN	251	0	560	0	934	0	1745	0
VNC	VENICE, ITALY	N	FGN	0	0	0	0	0	1	0	1
VNS	VARANASI, INDIA	N	FGN	3150	4	2686	3	2466	1	8302	8
VRN	VERONA, ITALY	N	FGN	0	0	3	0	8	0	11	0
VTE	VIENTIANE, LAOS	N	FGN	0	0	52	0	142	0	194	0
VTZ	VISHAKHAPATNAM, INDIA	N	FGN	1722	0	1774	0	1902	0	5398	0
VVI	SANTA CRUZ, VIRU VIRU, BOLIVIA	S	FGN	104	0	208	0	466	0	778	0
VXC	LICHINGA, MOZAMBIQUE	S	FGN	312	0	318	0	110	0	740	0
WAW	WARSAW, POLAND	N	FGN	1027	0	755	0	1162	0	2944	0
WDH	WINDHOEK, NAMIBIA	S	FGN	1862	1	1988	0	1942	1	5792	2
WKJ	WAKKANAI, JAPAN	N	FGN	0	0	550	0	562	0	1112	0
WLG	WELLINGTON, NEW ZEALAND	S	FGN	17828	2	28370	1	29044	1	75242	4
WLS	WALLIS IS, WALLIS & FUTUNA IS	S	FGN	0	0	0	0	180	0	180	0
WRG	WRANGELL, AS, USA	N	NO	1460	0	1464	0	1460	0	4384	0
WUH	WUHAN, P. R. CHINA	N	FGN	2002	0	2073	0	1307	0	5382	0
XMN	XIAMEN, P. R. CHINA	N	FGN	2254	0	3433	1	4474	1	10161	2
XRY	JEREZ DE LA FRONTERA, SPAIN	N	FGN	0	1	0	0	0	0	0	1
YAK	YAKUTAT, AS, USA	N	NO	1460	0	1464	0	1460	0	4384	0
YAM	SAULT STE MARIE, ONT., CANADA	N	FGN	3540	1	3286	1	1338	0	8164	2
YAO	YAOUNDE, REP OF CAMEROON	N	FGN	4147	0	3353	0	3493	0	10993	0
YBC	BAIE COMEAU, QUEBEC, CANADA	N	FGN	276	0	106	0	252	0	634	0
YBG	SAGUENAY, QUE, CANADA	N	FGN	520	0	264	0	244	0	1028	0
YBR	BRANDON, MAN, CANADA	N	FGN	1252	0	948	0	224	0	2424	0
YCB	CAMBRIDGE BAY, NWT, CANADA	N	FGN	239	0	296	0	338	0	873	0
YCG	CASTLEGAR, BC, CANADA	N	FGN	626	0	364	0	0	0	990	0
YCH	CHATHAM, NB, CANADA	N	FGN	626	0	550	0	56	0	1232	0
YCL	CHARLO, NB, CANADA	N	FGN	626	0	550	0	56	0	1232	0
YDF	DEER LAKE, NFLD, CANADA	N	FGN	2855	0	2432	0	2131	0	7418	0
YDQ	DAWSON CREEK, BC, CANADA	N	FGN	626	0	310	0	0	0	936	0
YEG	EDMONTON, ALTA, CANADA	N	FGN	11693	0	10938	0	10359	0	32990	0
YEV	INUVIK, NWT, CANADA	N	FGN	745	0	912	0	1232	0	2889	0
YFB	IQALIUT, NWT, CANADA	N	FGN	1769	0	1576	0	1714	0	5059	0
YFC	FREDERICTON, NB, CANADA	N	FGN	1342	0	1054	0	1120	0	3516	0
YFO	FLIN FLON, MAN, CANADA	N	FGN	420	0	374	0	406	0	1200	0
YFS	FT SIMPSON, NWT, CANADA	N	FGN	0	0	0	0	42	0	42	0
YGJ	YONAGO, JAPAN	N	FGN	2190	0	2008	0	2180	0	6378	0
YGL	LA GRANDE, QUE, CANADA	N	FGN	1044	0	1092	0	1050	0	3186	0
YGW	KUUJJUARAPIK, QUE, CANADA	N	FGN	522	0	524	0	520	0	1566	0
YGX	GILLAM, MAN, CANADA	N	FGN	832	0	848	0	844	0	2524	0
YHD	DRYDEN, ONT, CANADA	N	FGN	2699	0	1520	0	0	0	4219	0
YHY	HAY RIVER, NWT, CANADA	N	FGN	1252	0	1256	1	1252	1	3760	2
YHZ	HALIFAX, NS, CANADA	N	FGN	14221	0	14832	0	14257	2	43310	2
YJT	STEPHENVILLE, NFLD, CANADA	N	FGN	144	0	0	0	0	0	144	0
YKA	KAMLOOPS, BC, CANADA	N	FGN	2650	0	2804	1	1498	0	6952	1
YLW	KELOWNA, BC, CANADA	N	FGN	8790	0	7473	2	5321	0	21584	2
YMM	FT MCMURRAY, ALTA, CANADA	N	FGN	1148	0	1152	1	1144	0	3444	1
YMS	YURIMAGUAS, PERU	S	FGN	210	0	264	0	96	0	570	0
YMX	MONTREAL MIRABEL, QUE, CANADA	N	FGN	569	0	138	0	1	0	708	0
YNB	YANBU, SAUDI ARABIA	N	FGN	2513	0	2511	0	2533	0	7557	0
YNG	YOUNGSTOWN, OH, USA	N	YES	330	0	0	0	0	0	330	0
YOL	YOLA, NIGERIA	N	FGN	1279	0	1261	0	792	0	3332	0
YOW	OTTAWA, ONT, CANADA	N	FGN	10695	0	15822	0	15489	1	42006	1
YPR	PRINCE RUPERT, BC, CANADA	N	FGN	1436	0	1412	0	1548	0	4396	0
YQB	QUEBEC, QUE, CANADA	N	FGN	1356	0	1003	1	1309	1	3668	2
YQD	THE PAS, MAN, CANADA	N	FGN	630	0	628	0	624	0	1882	0
YQG	WINDSOR, ONT, CANADA	N	FGN	2351	0	1093	0	14	0	3458	0
YQH	WATSON LAKE, YT, CANADA	N	FGN	335	0	184	0	0	0	519	0
YQM	MONCTON, NB, CANADA	N	FGN	0	0	557	0	525	0	1082	0
YQR	REGINA, SASK, CANADA	N	FGN	3925	0	4110	1	5168	0	13203	1
YQT	THUNDER BAY, ONT, CANADA	N	FGN	6659	0	5058	1	3257	0	14974	1
YQU	GRANDE PRAIRIE, ALBA, CANADA	N	FGN	1568	0	912	0	0	0	2480	0
YQX	GANDER, NFLD, CANADA	N	FGN	748	0	675	0	62	0	1485	0
YQY	SYDNEY, NS, CANADA	N	FGN	1846	0	1464	0	1342	0	4652	0
YQZ	QUESNEL, BC, CANADA	N	FGN	442	0	304	0	0	0	746	0
YRB	RESOLUTE, NT, CANADA	N	FGN	417	0	418	0	416	0	1251	0
YRT	RANKIN INLET, NWT, CANADA	N	FGN	0	0	0	0	328	0	328	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
YSB	SUDBURY, ONT, CANADA	N	FGN	1092	0	0	0	0	0	1092	0
YSJ	SAINT JOHN, NB, CANADA	N	FGN	1358	0	1464	0	1319	0	4141	0
YSM	FT SMITH, NWT, CANADA	N	FGN	1252	0	1256	0	1252	0	3760	0
YSR	NANISIVIK NWT, CANADA	N	FGN	208	0	210	0	246	0	664	0
YTH	THOMPSON, MAN, CANADA	N	FGN	1006	0	1008	0	1016	0	3030	0
YUL	MONTREAL, QUEBEC, CANADA	N	FGN	19081	1	23752	2	22533	4	65366	7
YUM	YUMA, AZ, USA	N	YES	31	0	408	0	0	0	439	0
YUX	HALL BEACH, NWT, CANADA	N	FGN	210	0	210	0	208	0	628	0
YUY	ROUYN-NORANDA, QUEBEC, CANADA	N	FGN	0	0	0	0	48	0	48	0
YVO	VAL D'OR, QUE, CANADA	N	FGN	1887	0	1204	0	1299	1	4390	1
YVP	FT CHIMO, QUE, CANADA	N	FGN	1178	0	1036	0	1408	0	3622	0
YVQ	NORMAN WELLS, NWT, CANADA	N	FGN	1133	0	1618	0	1588	1	4339	1
YVR	VANCOUVER, BC, CANADA	N	FGN	38426	0	38128	3	33322	3	109876	6
YWG	WINNIPEG, MAN, CANADA	N	FGN	13898	0	16176	2	14677	1	44751	3
YWK	WABUSH, NFLD, CANADA	N	FGN	964	0	976	0	1050	0	2990	0
YWL	WILLIAMS LAKE, BC, CANADA	N	FGN	442	0	304	0	0	0	746	0
YXC	CRANBROOK, BC, CANADA	N	FGN	2712	0	2800	0	1714	0	7226	0
YXD	EDMONTON-MUNICIPAL, ALBERTA, CANADA	N	FGN	10271	1	11878	0	11943	1	34092	2
YXE	SASKATOON, SASK, CANADA	N	FGN	3934	0	4688	0	5216	0	13838	0
YXJ	FT ST JOHN, BC, CANADA	N	FGN	3958	1	3491	1	2242	0	9691	2
YXS	PRINCE GEORGE, BC, CANADA	N	FGN	5052	1	4592	0	3975	1	13619	2
YXT	TERRACE, BC, CANADA	N	FGN	1790	0	1412	0	1594	0	4796	0
YXU	LONDON, ONT, CANADA	N	FGN	422	0	992	0	341	0	1755	0
YXY	WHITEHORSE, YT, CANADA	N	FGN	1479	0	1382	0	1552	0	4413	0
YYC	CALGARY, ALBERTA, CANADA	N	FGN	33327	1	33794	0	29159	4	96280	5
YYD	SMITHERS, BC, CANADA	N	FGN	904	0	1274	0	1306	0	3484	0
YYE	FT NELSON, BC, CANADA	N	FGN	962	0	548	0	0	0	1510	0
YYF	PENTICTON, BC, CANADA	N	FGN	2964	0	1643	0	0	0	4607	0
YYG	CHARLOTTETOWN, PEI, CANADA	N	FGN	1699	0	1403	0	852	0	3954	0
YYJ	VICTORIA, BC, CANADA	N	FGN	871	0	1265	1	690	1	2826	2
YYL	LYNN LAKE, MAN, CANADA	N	FGN	32	0	32	0	0	0	64	0
YYQ	CHURCHILL, MAN, CANADA	N	FGN	412	0	424	0	422	0	1258	0
YYR	GOOSE BAY, NFLD, CANADA	N	FGN	1733	0	1721	0	1898	0	5352	0
YYT	ST JOHNS, NFLD, CANADA	N	FGN	4331	0	4782	1	4680	0	13793	1
YYY	MONT JOLI, QUE, CANADA	N	FGN	276	0	106	0	242	0	624	0
YYZ	TORONTO, ONTARIO, CANADA	N	FGN	44100	1	49334	1	43077	1	136511	3
YZF	YELLOWKNIFE, NWT, CANADA	N	FGN	3253	0	3578	0	5142	1	11973	1
YZP	SANDSPIT, BC, CANADA	N	FGN	774	0	1282	0	1260	1	3316	1
YZT	PORT HARDY, BC, CANADA	N	FGN	708	0	0	0	0	0	708	0
YZV	SETP-ILES, QUE, CANADA	N	FGN	603	0	612	0	640	0	1855	0
ZAD	ZADAR, YUGOSLAVIA	N	FGN	52	0	109	0	164	0	325	0
ZAG	ZAGREB, YUGOSLAVIA	N	FGN	6743	0	8422	0	9322	0	24487	0
ZAH	ZAHEDAN, IRAN	N	FGN	88	0	210	0	160	0	458	0
ZCO	TEMUCO,CHILE	S	FGN	0	0	558	0	834	0	1392	0
ZHA	ZHANGJIANG, P. R. CHINA	N	FGN	416	0	579	0	723	0	1718	0
ZIH	IXTAPA/ZIHUATANEJO, MEXICO	N	FGN	44	0	146	0	482	0	672	0
ZNZ	ZANZIBAR, TANZANIA	S	FGN	1098	0	412	0	210	0	1720	0
ZRH	ZURICH, SWITZERLAND	N	FGN	12226	3	13751	0	15344	0	41321	3
ZTH	ZAKINTHOS, GREECE	N	FGN	676	1	718	0	748	1	2142	2
ZUM	CHURCHILL FALLS, NFLD, CANADA	N	FGN	216	0	210	0	192	0	618	0

APPENDIX B

CONTENTS OF FAA BIRD INGESTION DATA BASE
BOEING 737 AIRCRAFT OCTOBER 1986 - SEPTEMBER 1989

This appendix presents the contents of the Boeing 737 bird ingestion data base maintained by the FAA. The appendix presents actual data extracted from the FAA data base which contains bird ingestion data supplied by the engine manufacturers, FAA, and ICAO. The data base contents are described below:

COLUMN	DESCRIPTION OF COLUMN CONTENTS
EDATE	Date (mm/dd/yyyy) of ingestion event.
EVT#	FAA bird ingestion event sequence number reflecting order in which events were entered into the FAA bird ingestion data base.
ENG_POS	Engine position of engine ingesting bird. Since each engine ingestion event has a unique record in the data base, duplicate event numbers indicate multiple engine ingestion events. This column provides record uniqueness in such cases. 1 - left engine of 737 airplane 2 - right engine of 737 airplane
MFG_NO.	Manufacturer's event number. The prefix values 87, 88, and 89 imply ICAO events reported in years 1987, 1988, and 1989 respectively. The value 0 implies events reported from FAA sources.
ETIME	Local time of bird ingestion.
SIGN_EVT	Significant event factors. AIRWRTHY - engine related airworthiness effects INV POS LOSS - involuntary power loss MULT B[illegible]DS - multiple birds in one engine MULT EN[illegible] - multiple engine ingestion (1 bird in each engine) MULT ENG [illegible]IRDS - multiple engine ingestion and one or both engines sustained multiple bird ingestion TRVS FRAC - transverse fan blade fracture OTHER - other significant factor, may be reported in REMARKS NONE - no significant factor noted
AIRCRAFT	737 aircraft type.
POF	Phase of flight during which bird ingestion occurred. (TAXI;TAKEOFF;CLIMB;CRUISE;APPROACH;LANDING;UNKNOWN)
ALTITUDE	Altitude (ft. AGL) at time of bird ingestion.
SPEED	Air speed (kn) at time of bird ingestion.
FL_RULES	Flight rules in effect at time of bird ingestion. IFR - instrument flight rules VFR - visual flight rules UNK - unknown

LT_CONDS — Light conditions at time of bird ingestion.
(DARK;LIGHT;DAWN;DUSK;etc.)

WEATHER — Weather conditions at time of bird ingestion.

CREW_AC — Crew action taken in response to bird ingestion.
ATO - aborted takeoff
ATB - air turnback
DIV - diversion
UNK - unknown
NONE - no crew action taken
N/A - not applicable
OTHER - some action taken, may be specified in narrative remarks

CREW_AL — Indicates whether crew alerted to presence of birds at time of bird ingestion.
(YES;NO;UNKNOWN)

BIRD_SEE — Indicates whether ingested bird(s) seen prior to ingestion
NO - not seen
YES - seen
SEVERAL - two to ten birds observed
FLOCK - more than ten birds observed

BIRD_NAM — Common bird name. Trailing asterisk (*) implies bird not positively identified as such.

BIRD_SPE — Species of positively identified bird. Alphanumeric identification code which conforms to Edward's† convention.

#_BIRDS — Number of birds ingested. An asterisk (*) implies more than one bird; however, the exact count is unknown.

WT_OZ_1 — Weight (oz.) of first ingested bird.

CTY_PRS — Scheduled city pairs of aircraft operation.
(from code:to code) 3-letter city airport code. Reference AIRPORT column in Appendix A.

AIRPORT — Airport at which bird ingestion event occurred.
3- or 4-letter airport code. See AIRPORT column in Appendix A.

LOCALE — Nearest town, state, country, etc.

US_INCID — Indicates whether bird ingestion occurred within US boundaries.
(YES;NO)

ENGINE — Engine model.
(CFM56;JT8D)

DASH — Engine dash number.

† Edwards, E.P., "A Coded List of Birds of the Worlds," IBSN:911882-04-9, 1974

DMG_CODE Letter codes summarizing engine damage resulting from the bird ingestion. This column does not exist in the actual FAA data base, but was developed by the contractor to compress 17 YES/NO damage fields into a single column. A letter code appears for damage columns whose values are YES. In the explanation of damage codes below, a number in parentheses indicates the damage severity code which is further explained in the SEVERITY column. The data base column name is given in the explanation of the damage code.

- A(4) - ENG_DAM; engine damaged due to bird ingestion
- B(3) - LEAD_EDG; leading edge distortion/curl, minor fan blades
- C(3) - BEN/DEN; one to three fan blades bent or dented
- D(2) - BE/DE>3; more than three fan blades bent or dented
- E(3) - TORN<10; one to ten fan blades torn
- F(2) - TORN>10; more than ten fan blades torn
- G(2) - BROKEN; broken fan blade(s), leading edge and/or tip pieces missing; other blades also dented
- H(3) - SHINGLED; shingled (twisted) fan blades
- I(1) - TRVSFRAC; transverse fracture - a fan blade broken chordwise (across) and the piece liberated (includes secondary hard object damage)
- J(2) - SPINNER; dented, broken, or cracked spinner (includes spinner cap)
- K(1) - CORE; bent/broken compressor blades/vanes, blade/vane clash, blocked/disrupted airflow in low, intermediate, and high pressure compressors
- L(3) - NACELLE; dents and/or punctures to the engine enclosure (includes cowl)
- M(1) - FLANGE; flange separations
- N(2) - RELEASED; released (walked) fan blades (blade retention mechanism broken)
- O(1) - TURBINE; turbine damage
- P - OTHER; any damage not previously listed
- Q - UNKNOWN;

SEVERITY Numeric code indicating the severity of engine damage resulting from the bird ingestion. This column was developed by the contractor after analyzing reported damage in the data base. The lower the severity code, the more severe the damage. The severity rating of a flight is determined as the lowest severity rating attained by any of the damage categories. Corresponding severity ratings for each damage category were presented in the DMG_CODE discussion above.

- 1 - most severe damage (damage is known)
- 2 - moderately severe damage (damage is known)
- 3 - least severe damage (damage is known)
- 4 - damage indicated, but not specified
- 9 - no damage reported

POW_LOSS Degree of power loss as a result of bird ingestion

- NONE - no power loss
- EPR DEC - engine pressure ratio decrease
- SPOOL DOWN - engine spooled down
- N1 CHANGE - N1 rotor change
- N2 CHANGE - N2 rotor change

COMPRESSOR - compressor surge/stall
UNKNOWN - unknown whether power loss occurred

MAX_VIBE Maximum vibration reported as a dimensionless unit.

THROTTLE Voluntary throttle change by crew in response to bird ingestion.
ADVANCE - voluntary throttle advance
RETARD - voluntary throttle retard
IDLE - voluntary throttle retard to idle
CUTOFF voluntary throttle retard to cutoff
NONE - no voluntary throttle change

IFSD Indicates whether in-flight shutdown occurred in response to bird ingestion.
NO - no shutdown
VIBES - shutdown due to vibrations
STAL/SURG - shutdown due to compressor stall/surge
HI EGT - shutdown due to high exhaust gas temperature
EPR - shutdown due to incorrect engine pressure ratio
INVLNTRY - involuntary engine shutdown
PARAMTRS - shutdown due to incorrect engine parameters
OTHER - other reasons, may be listed in remarks
UNKNOWN - unknown cause for shutdown

REMARKS Narrative description providing additional information concerning some aspect of the ingestion.

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
10/01/86	1	1	1		NONE	300	UNKNOWN						NONE		
10/02/86	2	2	2	16:20:00	NONE	300	CLIMB	700		IFR		OVERCAST	DIV		
10/02/86	3	2	3		NONE	300	TAXI	0							
10/04/86	235	2	50		NONE	200	UNKNOWN								
10/05/86	4	1	4		NONE	300	TAKEOFF	100	160	VFR		CLEAR	ATB	NO	YES
10/08/86	5	2	5		NONE	300	TAXI	0		VFR	LIGHT	CLEAR	NONE		
10/10/86	233	2	55		NONE	200	UNKNOWN						NONE		
10/10/86	234	2	1037		NONE	200	TAKEOFF						ATB		
10/13/86	6	1	6	8:00:00	MULT ENG	300	TAKEOFF		146	VFR	DAWN	SCATTERED	ATB		FLOCK
10/13/86	6	2	7	8:00:00	MULT ENG	300	TAKEOFF		146	VFR	DAWN	SCATTERED	ATB		FLOCK
10/14/86	232	2	55		NONE	200	LANDING	0	125						
10/16/86	7	1	9		MULT ENG-BIRDS	300	APPROACH					CLEAR	NONE		FLOCK
10/16/86	7	2	8		MULT ENG-BIRDS	300	APPROACH					CLEAR	NONE		FLOCK
10/19/86	230	1	55		NONE	200	LANDING	0	90						
10/19/86	231	1	27		NONE	200	TAKEOFF								
10/20/86	228	1	50		NONE	200	UNKNOWN								
10/20/86	229	1	55		NONE	200	TAKEOFF	0					ATO		
10/21/86	226	2	55		NONE	200	TAKEOFF								
10/21/86	227	1	55		NONE	200	TAKEOFF		145				ATB		
10/23/86	62	1	21		MULT BIRDS	200	TAKEOFF						NONE		
10/25/86	236	2	70		NONE	200	UNKNOWN								
10/26/86	8	1	10		MULT ENG	300	TAKEOFF			VFR			DIV		
10/26/86	8	2	11		MULT ENG	300	TAKEOFF			VFR			DIV		
10/28/86	9	1	2		MULT ENG-BIRDS	200	APPROACH								SEVERAL
10/28/86	9	2	2		MULT ENG-BIRDS	200	APPROACH								SEVERAL
10/28/86	10	1	12		NONE	300	UNKNOWN						NONE		
10/29/86	11	1	13		NONE	300	TAKEOFF	0	130	VFR	DAY	PARTLY CLOUD	ATB	YES	FLOCK
10/29/86	12	1	14		NONE	300	CLIMB		90				NONE		SEVERAL
10/30/86	225	1	55		NONE	200	LANDING	0	20						
11/01/86	13	1	1		NONE	200	UNKNOWN								NO
11/02/86	423	2	0		NONE	200	TAKEOFF						ATB		
11/03/86	14	1	15		NONE	300	UNKNOWN	0					NONE		
11/04/86	15	1	16		NONE	300	TAKEOFF	0	<100	VFR		OVERCAST	NONE	NO	NO
11/04/86	73	2	55		NONE	200	TAKEOFF	0	145						
11/04/86	161	1	70		NONE	200	UNKNOWN								
11/07/86	16	2	15		NONE	200	UNKNOWN								
11/07/86	74	1	55		NONE	200	LANDING	0	125						
11/09/86	17	1	17		NONE	300	UNKNOWN						NONE		
11/09/86	18	2	18		NONE	300	APPROACH						NONE		
11/10/86	19	2	19		NONE	300	UNKNOWN						NONE		
11/10/86	20	1	6	21:13:00	NONE	200	TAKEOFF	100		VFR	DARK	CLEAR	NONE	YES	
11/14/86	75	1	55		NONE	200	TAKEOFF	0	145				ATB		
11/14/86	76	1	55		NONE	200	TAKEOFF	0					ATO		
11/15/86	21	1	3	18:30:00	MULT ENG-BIRDS	200	TAKEOFF				DARK		NONE	NO	NO
11/15/86	21	2	3	18:30:00	MULT ENG-BIRDS	200	TAKEOFF				DARK		NONE	NO	NO
11/15/86	22	2	20		NONE	300	UNKNOWN						NONE		
11/15/86	23	2	21		NONE	300	LANDING						NONE		
11/18/86	24	2	22		NONE	300	TAKEOFF						ATB		
11/20/86	25	1	4	15:51:00	NONE	200	TAKEOFF	0	120	VFR	LIGHT	CLEAR	NONE	NO	YES
11/22/86	26	1	7	23:08:00	NONE	200	APPROACH	500			DARK	CLEAR	NONE		SEVERAL
11/23/86	27	1	23		MULT ENG	300	UNKNOWN						NONE		
11/23/86	27	2	24		MULT ENG	300	UNKNOWN						NONE		
11/23/86	28	1	25	13:00:00	NONE	300	TAKEOFF				LIGHT	CLEAR	NONE		
11/24/86	300	1	130		MULT ENG	200	UNKNOWN								
11/24/86	300	2	130		MULT ENG	200	UNKNOWN								
11/26/86	29	1	5	15:50:00	NONE	200	TAKEOFF	0		VFR	LIGHT	CLEAR	OTHER	NO	NO
11/26/86	30	2	8	19:30:00	NONE	200	TAKEOFF	0			DARK		NONE		YES
11/27/86	31	1	26		NONE	300	LANDING						NONE		
11/27/86	424	1	0		NONE	200	LANDING								
11/29/86	77	1	55		NONE	200	LANDING								
12/02/86	72	1	1069		NONE	200	UNKNOWN								
12/03/86	32	1	14	7:14:00	MULT BIRDS	200	UNKNOWN								
12/08/86	34	1	28	16:00:00	NONE	300	APPROACH					OVERCAST	NONE		FLOCK
12/12/86	35	2	25	19:00:00	NONE	300	CLIMB	500	180	VFR	DARK	CLEAR	NONE		
12/13/86	36	1	30		MULT BIRDS	300	CLIMB	500		IFR		RAIN	ATB		
12/13/86	79	2	50		MULT BIRDS	200	UNKNOWN								
12/14/86	37	2	31	15:30:00	NONE	300	CLIMB	1000	190	IFR	DAY	OVERCAST	ATB	NO	FLOCK
12/14/86	57	2	16		NONE	200	TAKEOFF	0	100				ATB		

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
10/01/86	1	1						BEG	BELGRADE, YUGOSLAVIA	NO	CFM56	3
10/02/86	2	2						TVL	LAKE TAHOE, CA	YES	CFM56	3
10/02/86	3	2						CTU	CHENGOU, CHINA	NO	CFM56	3
10/04/86	235	2			1			XFO	CHINA	NO	JT8D	
10/05/86	4	1	GULL*		1			MDT	HARRISBURG, PA	YES	CFM56	3
10/08/86	5	2						PEK	BEIJING, CHINA	NO	CFM56	3
10/10/86	233	2			1		-BOM	XFO	INDIA	NO	JT8D	9A
10/10/86	234	2					MAN-CDG	MAN	MANCHESTER, ENGLAND	NO	JT8D	15
10/13/86	6	1	GRAY-HEADED LAPWING	5N20	1	9,6		KMG	KUNMING, CHINA	NO	CFM56	3
10/13/86	6	2	GRAY-HEADED LAPWING	5N20		9.		KMG	KUNMING, CHINA	NO	CFM56	3
10/14/86	232	2			1		-BOM	BOM	BOMBAY, INDIA	NO	JT8D	
10/16/86	7	1	STARLING	21Z75	1	3.		DAL	DALLAS/FT WORTH, TEX-LOVE	YES	CFM56	3
10/16/86	7	2	STARLING	21Z75	3	3.		DAL	DALLAS/FT WORTH, TEX-LOVE	YES	CFM56	3
10/19/86	230	1			1		-TRV	TRV	TRIVANDRUM, INDIA	NO	JT8D	9A
10/19/86	231	1					ELS-	ELS	EAST LONDON, SOUTH AFRICA	NO	JT8D	17
10/20/86	228	1			1			XFO	CHINA	NO	JT8D	
10/20/86	229	1			1		CCU-	CCU	CALCUTTA, INDIA	NO	JT8D	
10/21/86	226	2			1			XFO		NO	JT8D	17
10/21/86	227	1			1		GAU-	GAU	GAUHATI, INDIA	NO	JT8D	17A
10/23/86	62	1			*			GHU	GUALEQUAYCHU, CHINA	NO	JT8D	17A
10/25/86	236	2			1			XFO		NO	JT8D	
10/26/86	8	1						SNA	ORANGE COUNTY, CA	YES	CFM56	3
10/26/86	8	2						SNA	ORANGE COUNTY, CA	YES	CFM56	3
10/28/86	9	1	ROCK DOVE	2P1	*	14.	PIT-ROA	ROA	ROANOAK, VA	YES	JT8D	15
10/28/86	9	2	ROCK DOVE	2P1	1	14.	PIT-ROA	ROA	ROANOAK, VA	YES	JT8D	15
10/28/86	10	1						DAL	DALLAS/FT WORTH, TEX-LOVE	YES	CFM56	3
10/29/86	11	1	ROBIN OR PIGEON*					CLT	CHARLOTTE, NC	YES	CFM56	3
10/29/86	12	1	BLACK-HEADED GULL	14N36	1	9,7		BHM	BIRMINGHAM, ALA	YES	CFM56	3
10/30/86	225	1			1	4.	GAU-	XFO	INDIA	NO	JT8D	
11/01/86	13	1	NIGHTHAWK	5T5	1	2.		XUS		YES	JT8D	15
11/02/86	423	2						MDW	MIDWAY AIRPORT	YES	JT8D	15
11/03/86	14	1						KHI	KARACHI, PAKISTAN	NO	CFM56	3
11/04/86	15	1			1			ALB	ALBANY, NY	YES	CFM56	3
11/04/86	73	2			1			HYD	HYDERABAO, INDIA	NO	JT8D	
11/04/86	161	1			1			XFO		NO	JT8D	
11/07/86	16	2					-CHC	XFO	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	15
11/07/86	74	1			1			SXR	SRINAGAR, INDIA	NO	JT8D	17A
11/09/86	17	1						SAT	SAN ANTONIO, TEX	YES	CFM56	3
11/09/86	18	2						DEN	DENVER, COL	YES	CFM56	3
11/10/86	19	2					CLT-DCA	CLT	CHARLOTTE, NC	YES	CFM56	3
11/10/86	20	1			1		PEN-KUL	PEN	PENANG, MAY	NO	JT8D	15A
11/14/86	75	1			1			BLR	BANGALORE, INDIA	NO	JT8D	
11/14/86	76	1			1			BBI	BHUBANESWAR, INDIA	NO	JT8D	
11/15/86	21	1	ROCK DOVE	2P1	2	14.	ORD-CLT	ORD	CHICAGO, IL	YES	JT8D	15
11/15/86	21	2	ROCK DOVE	2P1	1	14.	ORD-CLT	ORD	CHICAGO, IL	YES	JT8D	15
11/15/86	22	2						CNS	CAIRNS, QLD. AUSTRALIA	NO	CFM56	3
11/15/86	23	2	GRAY-HEADED LAPWING	5N20		7.7		AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
11/18/86	24	2						DFW	DALLAS/FT WORTH, TEX	YES	CFM56	3
11/20/86	25	1			1		LIH-HNL	LIH	LIHUE, KAUAI, HAWAII	YES	JT8D	9A
11/22/86	26	1			1		KUL-ARD	ARD	KEDAH, MALAYSIA	NO	JT8D	15
11/23/86	27	1						LHE	LAHORE, PAKISTAN	NO	CFM56	3
11/23/86	27	2						LHE	LAHORE, PAKISTAN	NO	CFM56	3
11/23/86	28	1						HOU	HOUSTON, TEX	YES	CFM56	3
11/24/86	300	1					-WLG	XFO	WELLINGTON, NEW ZEALAND	NO	JT8D	
11/24/86	300	2					-WLG	XFO	WELLINGTON, NEW ZEALAND	NO	JT8D	
11/26/86	29	1	BLACK WINGED PLOVER	5N10	1	6.	LLW-BLZ	LLW	LILONGWE, MALAWI	NO	JT8D	17A
11/26/86	30	2	RING BILLED GULL	14N12	1	16.	LGA-CLE	LGA	NEW YORK, NY	YES	JT8D	7
11/27/86	31	1						PDX	PORTLAND, ORE	YES	CFM56	3
11/27/86	424	1						PDX	PORTLAND, ORE	YES	JT8D	
11/29/86	77	1			1			BLR	BANGALORE, INDIA	NO	JT8D	
12/02/86	72	1			1	2.	-CHC	XFO	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	15
12/03/86	32	1			2			VDM	ARGENTINA	NO	JT8D	
12/08/86	34	1						DAL	DALLAS/FT WORTH, TEX-LOVE	YES	CFM56	3
12/12/86	35	2						TFS	TENERIFE	NO	CFM56	3
12/13/86	36	1			*			AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
12/13/86	79	2			*			XFO		NO	JT8D	
12/14/86	37	2	HERRING GULL	14N14	1	40.		SFO	SAN FRANCISCO/OAKLAND, CA	YES	CFM56	3
12/14/86	57	2						CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	15

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
10/01/86	1	1	A,B	3	NONE	2.0	NONE	NO	
10/02/86	2	2	A,B	3		4.0	NONE	NO	
10/02/86	3	2	A,B	3			NONE	NO	
10/04/86	235	2	A,G	2					
10/05/86	4	1	A,H	3	NONE		NONE	NO	AM EVENT, MEDIUM BIRD
10/08/86	5	2		9	NONE		NONE	NO	
10/10/86	233	2	A,H	3					
10/10/86	234	2	A,C	3					CCOC PS4 CRACK
10/13/86	6	1	A,B,E	3		5.0	IDLE	NO	
10/13/86	6	2		9	NONE		NONE	NO	
10/14/86	232	2		9					THUD REPORTED
10/16/86	7	1		9	NONE		NONE	NO	
10/16/86	7	2		9	NONE		NONE	NO	
10/19/86	230	1		9					
10/19/86	231	1		9					
10/20/86	228	1		9					
10/20/86	229	1	A,C	3					
10/21/86	226	2	A,C,G	2					
10/21/86	227	1	A,C	3		YES			VIBRATION, THUD, SMELL
10/23/86	62	1	A,B	3			NONE	NO	7 FAN BLADES REQUIRED LE TIP REPAIR
10/25/86	236	2	A,C	3					3 FAN BLADES BENT
10/26/86	8	1		9	NONE		NONE	NO	
10/26/86	8	2	A,H	3	NONE	3.0	NONE	NO	
10/28/86	9	1		9	NONE		NONE	NO	
10/28/86	9	2		9	NONE		NONE	NO	TURBINE FAILED ON 11/10/86
10/28/86	10	1		9	NONE		NONE	NO	
10/29/86	11	1	A,C,H	3	NONE	5.0	IDLE	NO	
10/29/86	12	1		9	NONE		NONE	NO	
10/30/86	225	1		9					
11/01/86	13	1		9	NONE		NONE	NO	
11/02/86	423	2		9					
11/03/86	14	1	A,H	3	NONE	3.8	NONE	NO	
11/04/86	15	1	A,B,H	3	NONE		NONE	NO	
11/04/86	73	2		9				NO	
11/04/86	161	1	A,C	3				NO	
11/07/86	16	2		9	NONE		NONE	NO	
11/07/86	74	1		9				NO	
11/09/86	17	1		9	NONE		NONE	NO	
11/09/86	18	2		9	NONE		NONE	NO	
11/10/86	19	2		9	NONE	4.0	NONF	NO	
11/10/86	20	1	A,C	3	NONE		NONE	NO	
11/14/86	75	1		9				NO	
11/14/86	76	1		9				NO	
11/15/86	21	1	A,C	3	NONE		NONE	NO	
11/15/86	21	2	A,G	3	NONE		NONE	NO	
11/15/86	22	2	A,C,H	3	NONE		NONE	NO	
11/15/86	23	2		9	NONE		NONE	NO	
11/18/86	24	2	A,H	3	NONE	5.0	IDLE	NO	
11/20/86	25	1	A,B,C	3	NONE		NONE	NO	SMALL BIRD
11/22/86	26	1	A,D,H	2	NONE		NONE	NO	
11/23/86	27	1	A	4	NONE		NONE	NO	
11/23/86	27	2	A	4	NONE		NONE	NO	
11/23/86	28	1	A,B,H	3	NONE	HIGH	NONE	NO	
11/24/86	300	1		9					ODOR
11/24/86	300	2		9					ODOR
11/26/86	29	1	A,D,G	2	NONE		NONE	NO	ODOR IN CABIN
11/26/86	30	2	A,C,G	2	COMPRESSOR		NONE	NO	
11/27/86	31	1		9	NONE		NONE	NO	
11/27/86	424	1		9					
11/29/86	77	1		9				NO	
12/02/86	72	1		9	NONE		NONE	NO	
12/03/86	32	1	A,G	2				NO	
12/08/86	34	1		9	NONE		NONE	NO	
12/12/86	35	2	A,H	3	NONE	2.0	NONE	NO	
12/13/86	36	1	A,B	3	NONE	OFFSC	IDLE	VIBES	
12/13/86	79	2		9				NO	
12/14/86	37	2	A,B,H	3	NONE		NONE	NO	
12/14/86	57	2		9	COMPRESSOR	NONE	NONE	NO	ODOR

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
12/14/86	80	2	1074		NONE	200	UNKNOWN								
12/14/86	457	2	0		NONE	300	CLIMB	1000	210	IFR	DAY	OVERCAST		NO	NO
12/15/86	81		55		NONE	200	TAKEOFF	0	145						
12/17/86	38	2	9		NONE	200	LANDING	200					ATB	NO	YES
12/17/86	162	2	46		NONE	200	UNKNOWN								
12/19/86	82	2	55		NONE	200	LANDING	0	90						
12/20/86	58	1	17		NONE	200	TAKEOFF	0	130				ATB		
12/24/86	237	2	79		NONE	200	TAKEOFF								
12/26/86	42	2	10	8:30:00	TRVS FRAC	200	CLIMB	500	150			BELOW CLOUDS	ATB		YES
12/31/86	39	1	32	11:39:00	MULT ENG	300	LANDING				LIGHT	CLEAR	NONE		
12/31/86	39	2	33	11:39:00	MULT ENG	300	LANDING				LIGHT	CLEAR	NONE		
01/02/87	43	2	11		NONE	200	TAKEOFF	0	50				ATO		
01/02/87	301	1	120		NONE	200	LANDING	0	115						
01/04/87	302		120		NONE	200	TAKEOFF	0	130						
01/07/87	44	1	871001		MULT BIRDS	300	LANDING						NONE		
01/08/87	83	1	55		NONE	200	LANDING	0							
01/09/87	84	2	55		NONE	200	UNKNOWN								
01/09/87	238	1	110		NONE	200	TAKEOFF	0	130			SCATTERED			
01/09/87	303		130		NONE	200	UNKNOWN								
01/09/87	304	1	130		NONE	200	UNKNOWN								
01/10/87	45	1	871002		MULT BIRDS	300	LANDING						NONE		SEVERAL
01/16/87	40	1	12		NONE	200	TAKEOFF			VFR			ATB		NO
01/17/87	46	1	871003		NONE	300	TAKEOFF	0	-V1			ICY	DIV		
01/19/87	41	2	13	17:30:00	MULT BIRDS	200	CLIMB	200	150	VFR	DUSK	SCATTERED	ATB	NO	FLOCK
01/28/87	47	1	871004		MULT ENG	300	LANDING						NONE		FLOCK
01/28/87	47	2	871005		MULT ENG	300	LANDING						NONE		FLOCK
01/31/87	614	2	87	12:58:00	NONE	300	LANDING	0	110			CLEAR	NONE	NO	FLOCK
02/06/87	356	2	160		NONE	200	LANDING								
02/06/87	623	1	87	10:40:00	MULT BIRDS	300	TAKEOFF	0					NONE		
02/08/87	240	2	40		NONE	200	UNKNOWN								
02/10/87	305	1	130		NONE	200	TAKEOFF								
02/10/87	428	1	0		NONE	200	TAKEOFF	0	140	VFR	DAY	PARTLY CLOUD	ATB	YES	NO
02/10/87	429	1	0		NONE	200	TAKEOFF						ATB		
02/10/87	458	1	0		MULT ENG	200	TAKEOFF	0	140	VFR	DAY	PARTLY CLOUD		YES	FLOCK
02/10/87	458	2	0		MULT ENG	200	TAKEOFF	0	140	VFR	DAY	PARTLY CLOUD		YES	FLOCK
02/10/87	655	2	87	18:41:00	NONE	200	CLIMB	350				CLOUDY	ATB	NO	
02/11/87	85	2	55		NONE	200	UNKNOWN								
02/13/87	430		0	12:52:00	NONE	300	TAKEOFF	0	140						SEVERAL
02/13/87	589	2	87	17:45:00	NONE	300	LANDING						NONE		
02/14/87	357	1	1327		NONE	200	UNKNOWN								
02/17/87	59	1	18	10:30:00	NONE	200	TAKEOFF	35	150	VFR	DAY	CLEAR	ATB	NO	ONE
02/19/87	60	1	19	16:00:00	NONE	200	TAKEOFF	0					ATO		
02/21/87	663	1	87		NONE	200	TAKEOFF	0							
02/22/87	690	1	87	12:12:00	MULT ENG-BIRDS	200	TAKEOFF	0	150			CLOUDY	NONE	NO	
02/22/87	690	2	87	12:12:00	MULT ENG-BIRDS	200	TAKEOFF	0	150			CLOUDY	NONE	NO	
02/23/87	61	2	20	10:30:00	NONE	200	CLIMB	15000	350	VFR	DAY	CLEAR	NONE	NO	NO
02/25/87	241	1	100	11:55:00	NONE	200	TAKEOFF	0	145			SCATTERED			YES
02/27/87	49	1	871006		NONE	300	CLIMB			VFR		CLEAR	NONE		
02/27/87	242	2	100	6:10:00	NONE	200	LANDING	0	100			RAIN		NO	SEVERAL
02/28/87	86	2	35	7:30:00	NONE	200	TAKEOFF	0				CLOUDY	ATB		
03/02/87	306	2	130		NONE	200	UNKNOWN								
03/02/87	667	2	87	16:20:00	NONE	200	UNKNOWN					CLEAR	NONE		
03/03/87	460		0		NONE		TAKEOFF	0	120	VFR	NIGHT	CLEAR		NO	NO
03/07/87	590	1	87	6:35:00	MULT BIRDS	300	LANDING					CLEAR	NONE	NO	FLOCK
03/10/87	50	1	871007		NONE	300	LANDING					OVERCAST	NONE		
03/11/87	358	1	180		NONE	200	LANDING	100	124						NO
03/12/87	359	2	160		NONE	200	UNKNOWN								
03/12/87	595	1	87	7:09:00	MULT BIRDS	300	TAKEOFF					CLOUDY	NONE	YES	SEVERAL
03/13/87	63	2	22	15:20:00	NONE	200	TAKEOFF	50	125	VFR	DAY	CLEAR	NONE	NO	SEVERAL
03/16/87	87	2	55		NONE	200	UNKNOWN								
03/16/87	647	1	87	21:00:00	NONE	200	LANDING	0				CLOUDY	NONE	NO	
03/17/87	64	1	23	7:45:00	NONE	200	TAKEOFF	400		VFR		CLEAR	NONE		NO
03/18/87	88	2	55		NONE	200	UNKNOWN								
03/19/87	51	1	871008		NONE	300	APPROACH						NONE		
03/21/87	52	1	871009	13:50:00	NONE	300	LANDING						NONE		
03/21/87	53	1	871010	19:00:00	NONE	300	TAKEOFF	1200	150	IFR		CLEAR	ATB		
03/21/87	65	1	24	15:00:00	NONE	200	TAKEOFF	0	150			CLEAR	ATB		NO
03/21/87	89	1	55		NONE	200	UNKNOWN								

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
12/14/86	80	2						CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	15
12/14/86	457	2	GULL*		1			SFO	SAN FRANCISCO, CA	YES	CFM56	3
12/15/86	81				1			MAD	MADRID, SPAIN	NO	JT8D	
12/17/86	38	2	MALLARD	2J84	1	40.		MSO	MISSOULA, MT	YES	JT8D	
12/17/86	162	2			1			XFO		NO	JT8D	
12/19/86	82	2			1			TRV	TRIVANDRUM, INDIA	NO	JT8D	9A
12/20/86	58	1			1			CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	15
12/24/86	237	2						XFO	BRAZIL	NO	JT8D	17A
12/26/86	42	2	HERRING GULL	14N14	1	40.	ORD-MSY	ORD	CHICAGO, IL	YES	JT8D	7
12/31/86	39	1						HOU	HOUSTON, TEX	YES	CFM56	3
12/31/86	39	2						HOU	HOUSTON, TEX	YES	CFM56	3
01/02/87	43	2			1		FAT-BFL	FAT	FRESNO, CA	YES	JT8D	17
01/02/87	301	1					OKA-MMY	MMY	MIYAKO JIMA, JAPAN	NO	JT8D	
01/04/87	302						MMY-OKA	MMY	MIYAKO JIMA, JAPAN	NO	JT8D	
01/07/87	44	1			2			MEL	MELBOURNE, AUSTRALIA	NO	CFM56	3
01/08/87	83	1			1	4.		JAI	JAIPUR, INDIA	NO	JT8D	
01/09/87	84	2			1			VNS	VARANASI, INDIA	NO	JT8D	
01/09/87	238	1			1			MAN	MANCHESTER, ENGLAND	NO	JT8D	
01/09/87	303						-AKL	XFO	AUCKLAND, NEW ZEALAND	NO	JT8D	
01/09/87	304	1					-CHC	XFO	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
01/10/87	45	1	CROW*		*			LST	LAUNCESTON, TASMANIA	NO	CFM56	3
01/16/87	40	1	HORNED LARK	17Z74	1	1.5	OAK-NR	OAK	SAN FRANCISCO, CA-OAKLAND	YES	JT8D	17
01/17/87	46	1						MUC	MUNICH, GERMANY	NO	CFM56	3
01/19/87	41	2	CANADIAN GOOSE	2J30	2	128.	RNO-DEN	RNO	RENO, NEV	YES	JT8D	17
01/28/87	47	1	GULL*					TGD	TITOGRAD, YUGOSLAVIA	NO	CFM56	3
01/28/87	47	2	GULL*					TGD	TITOGRAD, YUGOSLAVIA	NO	CFM56	3
01/31/87	614	2	GULL*		1			LCA	LARNACA, CYPRUS	NO	CFM56	3
02/06/87	356	2						XFO	SOUTH AFRICA	NO	JT8D	17
02/06/87	623	1			*			FRA	FRANKFURT, GERMANY	NO	CFM56	3
02/08/87	240	2						XFO		NO	JT8D	15
02/10/87	305	1						AKL	AUCKLAND, NEW ZEALAND	NO	JT8D	
02/10/87	428	1						SJC	SAN JOSE, CA	YES	JT8D	9
02/10/87	429	1						SJC	SAN JOSE, CA	YES	JT8D	9
02/10/87	458	1	GULL*					MDW	MIDWAY, ILL	YES	JT8D	15
02/10/87	458	2	GULL*					MDW	MIDWAY, ILL	YES	JT8D	15
02/10/87	655	2						EINN	SHANWICK, IRELAND	NO	JT8D	
02/11/87	85	2			1			TRV	TRIVANDRUM, INDIA	NO	JT8D	
02/13/87	430		GULL*					HAM	HAMBURG, GERMANY	NO	CFM56	3
02/13/87	589	2	HAWK*		1			CBR	CANBERRA, AUSTRALIA	NO	CFM56	3
02/14/87	357	1						XFO	ARGENTINA	NO	JT8D	9A
02/17/87	59	1	GOLDEN PLOVER	5N25	1	6.	OGG-HNL	OGG	KAHULUI, MAUI, HAWAII	YES	JT8D	9A
02/19/87	60	1			1		DUR-PLZ	DUR	DURBAN, SOUTH AFRICA	NO	JT8D	17A
02/21/87	663	1	KITE*		1			OPRN	CHAKLALA, PAKISTAN	NO	JT8D	
02/22/87	690	1	KITE*		*			PIE	CLEARWATER, FL	YES	JT8D	
02/22/87	690	2	KITE*		*			PIE	CLEARWATER, FL	YES	JT8D	
02/23/87	61	2	GLAUCOUS WINGED GULL	14N22	1	56.	PDX-RNO	PDX	PORTLAND, ORE	YES	JT8D	7
02/25/87	241	1			1			MUC	MUNICH, GERMANY	NO	JT8D	
02/27/87	49	1						ALB	ALBANY, NY	YES	CFM56	3
02/27/87	242	2			1			STR	STUTTGART, GERMANY	NO	JT8D	15
02/28/87	86	2	BLACK-BACKED GULL	14N21	1	31.		CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	15
03/02/87	306	2					-CHC	XFO	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
03/02/87	667	2	GULL*		1			FNC	FUNCHAL, MADEIRA, PORTUGAL	NO	JT8D	
03/03/87	460				1			PIE	ST PETERSBURG, FL	YES		
03/07/87	590	1	TRUE SPARROW*		*			ABCG	COOLANGATTA, AUSTRALIA	NO	CFM56	3
03/10/87	50	1	SHORE (HORNED) LARK	17Z74		1.5		PEK	BEIJING, CHINA	NO	CFM56	3
03/11/87	358	1					DEN-OAK	OAK	SAN FRANCISCO, CA-OAKLAND	YES	JT8D	
03/12/87	359	2						XFO		NO	JT8D	17A
03/12/87	595	1	HAWK*		*			TSV	TOWNSVILLE, AUSTRALIA	NO	CFM56	3
03/13/87	63	2			1		LIH-HNL	LIH	LIHUE, KAUAI, HAWAII	YES	JT8D	9A
03/16/87	87	2			1			IXB	BAGDOGRA, INDIA	NO	JT8D	
03/16/87	647	1						BDQ	VADODARA, INDIA	NO	JT8D	
03/17/87	64	1	BLACK-HEADED GULL	14N36	1	10.	BAH-DHA	BAH	BAHRAIN, BAHRAIN	NO	JT8D	15
03/18/87	88	2			1			JAI	JAIPUR, INDIA	NO	JT8D	
03/19/87	51	1						SYD	SIDNEY, NSW, AUSTRALIA	NO	CFM56	3
03/21/87	52	1						ZRH	ZURICH, SWITZERLAND	NO	CFM56	3
03/21/87	53	1	DUCK OR GOOSE*					MSP	MINN./ST. PAUL, MINN	YES	CFM56	3
03/21/87	65	1	GULL*				PIE-YYZ	PIE	ST. PETERSBURG, FL	YES	JT8D	9A
03/21/87	89	1			1			PAT	PATNA, INDIA	NO	JT8D	17

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
12/14/86	80	2		9				NO	
12/14/86	457	2	A,D	2					PM EVENT
12/15/86	81			9				NO	
12/17/86	38	2	A,D,H	2	NONE			NO	ATB DUE TO WEATHER
12/17/86	162	2	A,C	3				NO	
12/19/86	82	2		9				NO	
12/20/86	58	1	A,C	3	NONE		NONE	NO	
12/24/86	237	2	A,C	3				YES	
12/26/86	42	2	A,D,F,I	1		HIGH			#1 CMPT FIRE
12/31/86	39	1		9	NONE		NONE	NO	
12/31/86	39	2	A,H	3	NONE	HIGH	NONE	NO	
01/02/87	43	2		9	COMPRESSOR			NO	
01/02/87	301	1		9					
01/04/87	302			9					
01/07/87	44	1		9	NONE	NONE	NONE	NO	
01/08/87	83	1		9				NO	
01/09/87	84	2		9				NO	
01/09/87	238	1		9					
01/09/87	303			9					ODOR
01/09/87	304	1		6					
01/10/87	45	1	A,B	5	NONE		NONE	NO	CSD OIL COOLER BLOCKED
01/16/87	40	1	A,O	1	EPR DEC		CUTOFF	VIBES	
01/17/87	46	1	A,C	3	NONE		NONE	NO	1 FBLD WITH CRACK,1/2 OF WIDTH AT 2/3 HT
01/19/87	41	2	A,C,G,H	2	NONE		NONE	NO	
01/28/87	47	1		9	NONE		NONE	NO	
01/28/87	47	2	A,H	3	NONE		NONE	NO	
01/31/87	614	2		9					MEDIUM BIRD
02/06/87	356	2	A,C	3					
02/06/87	623	1		9					
02/08/87	240	2	A,C	3					ENGINE REMOVED FOR FAN ASSEMBLY OVERHAUL
02/10/87	305	1		9					ODOR
02/10/87	428	1	A,K	1					COMPRESSOR SECTION BLADE DAMAGE
02/10/87	429	1		9					LOUD BANG HEARD
02/10/87	458	1	A	4					PM EVENT
02/10/87	458	2	A	4					PM EVENT, EXTENSIVE INLET DAMAGE
02/10/87	655	5		9					
02/11/87	85	2		9				NO	
02/13/87	430			9					
02/13/87	589	2	A,Q	4					MEDIUM BIRD, MINOR DAMAGE
02/14/87	357	1	A,C	3					
02/17/87	59	1	A,C,H	3	NONE		NONE	NO	SMALL BIRD
02/19/87	60	1		9	NONE		NONE	NO	
02/21/87	663	1	A,Q	4					4 FAN BLADES DAMAGED
02/22/87	690	1		9					LARGE BIRD
02/22/87	690	2		9					LARGE BIRD
02/23/87	61	2	A,D,G	2	NONE	NONE	NONE	NO	10 MIN OUT AFTER TAKEOFF
02/25/87	241	1		9					
02/27/87	49	1	A,H	3	NONE	4.9	NONE	NO	
02/27/87	242	2		9				NO	LARGE BIRD
02/28/87	86	2	A,G	2				NO	
03/02/87	306	2		9					
03/02/87	667	2		9					MEDIUM BIRD
03/03/87	460			9					PM EVENT
03/07/87	590	1		9					SMALL BIRD
03/10/87	50	1		9	NONE		NONE	NO	
03/11/87	358	1		9					
03/12/87	359	2	A,C	3					
03/12/87	595	1		9					LARGE BIRD
03/13/87	63	2		9	NONE		NONE	NO	MEDIUM BIRD
03/16/87	87	2	A,H	3				NO	
03/16/87	647	1		9					SMALL BIRD
03/17/87	64	1	A,D,H	2	NONE		NONE	NO	
03/18/87	88	2		9				NO	
03/19/87	51	1		9	NONE		NONE	NO	
03/21/87	52	1	A,H	3	NONE		NONE	NO	
03/21/87	53	1	A,H	3	NONE	4.0	IDLE	NO	
03/21/87	65	1	A,G	2	COMPRESSOR			NO	
03/21/87	89	1	A,H	3				NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
03/21/87	90	2	50		MULT BIRDS	200	UNKNOWN								
03/23/87	54	1	871011		NONE	300	UNKNOWN						NONE		
03/25/87	307	2	120		NONE	200	TAKEOFF	0	120						
03/26/87	66	1	26	18:35:00	INV POW LOSS	200	TAKEOFF	0	139			RAIN	ATB		YES
03/26/87	67	1	25		NONE	200	LANDING	0	80			CLEAR			NO
03/26/87	627	1	87	20:17:00	MULT ENG-BIRDS	200	CLIMB	700	160			CLEAR	ATB	NO	
03/26/87	627	2	87	20:17:00	MULT ENG-BIRDS	200	CLIMB	700	160			CLEAR	ATB	NO	
03/27/87	91	2	50		NONE	200	UNKNOWN								
03/27/87	664	2	87	7:08:00	NONE	200	CLIMB	6000				CLOUDY	ATB		ONE
03/28/87	55	2	871012		NONE	300	TAKEOFF	1000		VFR		CLEAR	NONE		
03/29/87	92	2	36		NONE	200	TAKEOFF	0	145				ATB		
03/29/87	243	2	100	12:47:00	NONE	200	LANDING	0	114			SCATTERED		NO	ONE
03/29/87	360	2	170	10:47:00	NONE	200	LANDING	0	114						
03/30/87	56	1	871013		NONE	300	TAKEOFF						ATB		
03/30/87	308	2	130		NONE	200	UNKNOWN								
03/31/87	425	2	0		NONE	200	TAKEOFF						ATO		
03/31/87	684	1	87	9:30:00	NONE	300	TAKEOFF	0				CLOUDY	NONE		
04/01/87	68	2	27	14:10:00	MULT BIRDS	200	TAKEOFF	0	90			CLEAR	ATO		FLOCK
04/03/87	244	2	100	9:00:00	NONE	200	TAXI	0	40			SCATTERED	NONE	NO	SEVERAL
04/03/87	309		130		NONE	200	TAKEOFF								
04/05/87	245	2	110	23:59:00	NONE	200	CLIMB	10	140			SCATTERED		NO	YES
04/06/87	657		87		MULT BIRDS	200	TAKEOFF	0	140			CLEAR	OTHER	NO	SEVERAL
04/07/87	93	2	55		NONE	200	LANDING	0	90						
04/07/87	361		140		NONE	200	UNKNOWN								
04/08/87	665	2	87	13:00:00	NONE	200	LANDING	200	140		OVERCAST		NONE		SEVERAL
04/09/87	106	1	872001	19:40:00	NONE	300	TAKEOFF	0	-V1			CLEAR	DIV		
04/11/87	107	1	872002	22:30:00	NONE	300	CLIMB	600	160	IFR	DARK	CLEAR	NONE		
04/12/87	246	2	100		MULT BIRDS	200	APPROACH	100	140			SCATTERED		YES	SEVERAL
04/12/87	596	1	87	10:50:00	NONE	300	TAKEOFF						NONE		
04/14/87	108	1	872003		NONE	300	UNKNOWN						NONE		
04/14/87	681	2	87	11:15:00	NONE	UNK	TAKEOFF	200	175			CLEAR	NONE		ONE
04/17/87	109	2	872004		NONE	300	UNKNOWN								
04/21/87	70	1	29		TRVS FRAC	200	TAKEOFF	0	130				ATB		
04/22/87	247		110	8:03:00	NONE	200	CLIMB		210			CLEAR		NO	NO
04/23/87	248	2	110	10:38:00	NONE	200	TAKEOFF	0	110			CLEAR		NO	YES
04/26/87	310	2	130		NONE	200	UNKNOWN								
04/26/87	311	2	130		NONE	200	TAKEOFF								
04/26/87	660	1	87	20:05:00	MULT BIRDS	300	LANDING	0					NONE		
05/01/87	312	1	130		NONE	200	UNKNOWN								
05/01/87	362		160		NONE	200	UNKNOWN								
05/03/87	69	2	28		NONE	200	TAKEOFF	0	150				ATB		
05/04/87	110	1	872005	18:38:00	NONE	300	TAKEOFF		+V1						
05/06/87	591	1	87	20:00:00	MULT BIRDS	300	LANDING	0					NONE		
05/08/87	592	1	87	20:38:00	NONE	300	LANDING				CLOUDY	RAIN	NONE		
05/10/87	94	1	55		NONE	200	UNKNOWN								
05/10/87	111	2	872006	22:00:00	NONE	300	TAKEOFF					RAIN			
05/10/87	622	2	87		NONE	200	UNKNOWN					CLEAR	NONE		
05/10/87	687	1	87	15:30:00	NONE	200	APPROACH		136			CLOUDY	NONE		ONE
05/12/87	95	1	55		NONE	200	UNKNOWN								
05/12/87	363	1	1330		NONE	200	UNKNOWN								
05/16/87	364	2	1329		NONE	200	UNKNOWN								
05/17/87	313	2	130		NONE	200	LANDING								
05/18/87	249	1	110	13:40:00	MULT BIRDS	200	APPROACH	300	140			SCATTERED		NO	YES
05/20/87	250	2	110	8:17:00	MULT BIRDS	200	TAKEOFF	0	100			CLEAR			SEVERAL
05/22/87	96	1	55		NONE	200	UNKNOWN								
05/22/87	97	1	55		NONE	200	TAKEOFF	0	85				ATO		
05/22/87	98	1	50		NONE	200	UNKNOWN								
05/24/87	99	1	33	7:35:00	TRVS FRAC	200	TAKEOFF	0	140	VFR			ATB		YES
05/24/87	251	2	110	6:30:00	NONE	200	LANDING	0	90			OVERCAST	NONE	NO	
05/25/87	164	2	51	8:53:00	NONE	200	TAKEOFF	15		VFR		CLEAR			ONE
05/26/87	252	1	110	16:00:00	NONE	200	APPROACH	300				CLEAR		NO	YES
05/27/87	314	2	130		NONE	200	UNKNOWN								
05/28/87	100	2	50		NONE	200	UNKNOWN								
05/28/87	165	1	52	20:30:00	NONE	200	APPROACH	300	150	VFR		SCATTERED			YES
05/29/87	112	2	872007		NONE	300	UNKNOWN								
05/30/87	253	2	100	10:50:00	NONE	200	APPROACH	82	140			CLEAR		NO	YES
05/31/87	113	2	872008	14:55:00	NONE	300	TAKEOFF	0	110		BRIGHT	CLEAR	NONE		
05/31/87	254	1	100	17:06:00	NONE	200	APPROACH	150	135					YES	SEVERAL

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
03/21/87	90	2			*			XFO		NO	JT8D	
03/23/87	54	1						UET	QUETTA, PAKISTAN	NO	CFM56	3
03/25/87	307	2					MMY-OKA	MMY	MIYAKO JIMA, JAPAN	NO	JT8D	
03/26/87	66	1	SPOTTED THICK-KNEE	9N4	1	15.	JNB-DUR	JNB	JOHANNESBURG, SOUTH AFRICA	NO	JT8D	17A
03/26/87	67	1			1		JNB-WDH	WDH	NAMIBIA, S.W. AFRICA	NO	JT8D	17A
03/26/87	627	1			*			BNJ	BONN, GERMANY	NO	JT8D	
03/26/87	627	2			*			BNJ	BONN, GERMANY	NO	JT8D	
03/27/87	91	2			1			XFO		NO	JT8D	
03/27/87	664	2			1			LHE	LAHORE, PAKISTAN	NO	JT8D	
03/28/87	55	2					FLL-PHL	FLL	FT.LAUDERDALE/HOLLYWOOD,FL	YES	CFM56	3
03/29/87	92	2			1			AKL	AUCKLAND, NEW ZEALAND	NO	JT8D	15
03/29/87	243	2			1			XFO	GERMANY	NO	JT8D	
03/29/87	360	2						NCE	NICE, FRANCE	NO	JT8D	15
03/30/87	56	1						DEN	DENVER, COL	YES	CFM56	3
03/30/87	308	2					-AKL	XFO	AUCKLAND, NEW ZEALAND	NO	JT8D	
03/31/87	425	2						XUS		YES	JT8D	
03/31/87	684	1			1			LHR	LONDON-HEATHROW, ENGLAND	NO	CFM56	3
04/01/87	68	2	SWALLOW*		*		PLZ-LON	PLZ	PORT ELIZABETH, S. AFRICA	NO	JT8D	17A
04/03/87	244	2	COMMON BLACKBIRD	41Z269	1	2.8		FRA	FRANKFURT, GERMANY	NO	JT8D	
04/03/87	309							CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
04/05/87	245	2						KCH	KUCHING, MALAYSIA	NO	JT8D	
04/06/87	657				*			HKNA	JOMO KENYATTA, KENYA	NO	JT8D	
04/07/87	93	2			1			CCU	CALCUTTA, INDIA	NO	JT8D	17
04/07/87	361							XFO	ZAIRE	NO	JT8D	15
04/08/87	665	2			1			FAO	FARO, PORTUGAL	NO	JT8D	
04/09/87	106	1						CPH	COPENHAGEN, DENMARK	NO	CFM56	3
04/11/87	107	1					SYD-MEL	SYD	SYDNEY, NSW, AUSTRALIA	NO	CFM56	3
04/12/87	246	2			2			ZTH	ZAKINTHOS, GREECE	NO	JT8D	
04/12/87	596	1			1			TSV	TOWNSVILLE, AUSTRALIA	NO	CFM56	3
04/14/87	108	1						FRA	FRANKFURT, GERMANY	NO	CFM56	3
04/14/87	681	2	HOUSE SPARROW	70Z12	1	1.		BHX	BIRMINGHAM, ENGLAND	NO	UNK	
04/17/87	109	2	AMERICAN KESTREL	5K26		4.		DAL	DALLAS/FT.WORTH,TEX-LOVE	YES	CFM56	3
04/21/87	70	1	ROCK DOVE	2P1	1	14.		XFO		NO	JT8D	17A
04/22/87	247				1			PEN	PENANG, MALAYSIA	NO	JT8D	
04/23/87	248	2			1			MAN	MANCHESTER, ENGLAND	NO	JT8D	
04/26/87	310	2					-CHC	XFO	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
04/26/87	311	2					WLG-DUD	WLG	WELLINGTON, NEW ZEALAND	NO	JT8D	
04/26/87	660	1			*			AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
05/01/87	312	1					-AKL	XFO	AUCKLAND, NEW ZEALAND	NO	JT8D	
05/01/87	362							XFO	NIGERIA	NO	JT8D	15A
05/03/87	69	2					PIE-YYZ	PIE	ST. PETERSBURG, FL	YES	JT8D	9A
05/04/87	110	1					SAT-HOU	SAT	SAN ANTONIO, TEX	YES	CFM56	3
05/06/87	591	1	AUSTRALIAN COURSER	10N9	*	2.5		DRW	DARWIN, AUSTRALIA	NO	CFM56	3
05/08/87	592	1	GULL*					SYD	SYDNEY, AUSTRALIA	NO	CFM56	3
05/10/87	94	1			1			JRH	JORHAT, INDIA	NO	JT8D	
05/10/87	111	2					LIT-HOU	LIT	LITTLE ROCK, ARK	YES	CFM56	3
05/10/87	622	2			1				FRANCE	NO	JT8D	
05/10/87	687	1						EMA	EAST MIDLANDS, ENGLAND	NO	JT8D	
05/12/87	95	1			1			BOM	BOMBAY, INDIA	NO	JT8D	
05/12/87	363	1			1			XFO	ENGLAND	NO	JT8D	15A
05/16/87	364	2						XFO		NO	JT8D	15
05/17/87	313	2						CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
05/18/87	249	1			2			LHR	LONDON, ENGLAND-HEATHROW	NO	JT8D	15
05/20/87	250	2			2			AOR	ALOR SETAR, MALAYSIA	NO	JT8D	
05/22/87	96	1			1			BLR	BANGALORE, INDIA	NO	JT8D	
05/22/87	97	1			1			VNS	VARANASI, INDIA	NO	JT8D	
05/22/87	98	1			1			XFO		NO	JT8D	
05/24/87	99	1	CATTLE EGRET	1135	1	16.		LOS	LAGOS, NIGERIA	NO	JT8D	15
05/24/87	251	2	HADADA IBIS	6112	1	48.		ELS	EAST LONDON, SOUTH AFRICA	NO	JT8D	
05/25/87	164	2	SPARROW*		1	3.		CGN	COLOGNE/BONN, GERMANY	NO	JT8D	15
05/26/87	252	1						KUL	KUALA LUMPUR, MALAYSIA	NO	JT8D	
05/27/87	314	2					-CHC	XFO	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
05/28/87	100	2			1			XFO		NO	JT8D	
05/28/87	165	1	SWALLOW*		1	3.	-FRA	FRA	FRANKFURT, GERMANY	NO	JT8D	15
05/29/87	112	2						AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
05/30/87	253	2			1			ALG	ALGIERS, ALGERIA	NO	JT8D	15
05/31/87	113	2						TNG	TANGER, MOROCCO	NO	CFM56	3
05/31/87	254	1			1			DUB	DUBLIN, IRELAND	NO	JT8D	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
03/21/87	90	2		9				NO	
03/23/87	54	1	A,D,E	2	NONE		NONE	NO	
03/25/87	307	2		9					
03/26/87	66	1	A,D,H	2	COMPRESSOR	HIGH	CUTOFF	INVOLUNTARY	RPM ROLLED BACK BELOW IDLE THEN SHUTDOWN
03/26/87	67	1	A,C	3	NONE		NONE	NO	
03/26/87	627	1	A,Q	4					MEDIUM BIRD, MINOR DAMAGE
03/26/87	627	2	A,Q	4					MEDIUM BIRD, MINOR DAMAGE
03/27/87	91	2		9				NO	
03/27/87	664	2		9					SMALL BIRD
03/28/87	55	2	A,D	2	NONE		NONE	NO	
03/29/87	92	2	A,D,H	2				NO	
03/29/87	243	2		9				NO	
03/29/87	360	2		9				NO	
03/30/87	56	1	A,H	3	NONE		NONE	NO	
03/30/87	308	2		9					
03/31/87	425	2		9					
03/31/87	684	1		9					SMALL BIRD
04/01/87	68	2		9	COMPRESSOR		IDLE	NO	
04/03/87	244	2		9				NO	
04/03/87	309			9					
04/05/87	245	2		9					
04/06/87	657			9					MEDIUM BIRD
04/07/87	93	2		9				NO	
04/07/87	361		A,C	3					
04/08/87	665	2		9					SMALL BIRD
04/09/87	106	1	A,H	3	NONE	3.9		NO	
04/11/87	107	1	A,C	3	NONE			NO	
04/12/87	246	2		9				NO	
04/12/87	596	1		9					
04/14/87	108	1		9	NONE			NO	
04/14/87	681	2		9					SMALL BIRD
04/17/87	109	2		9	NONE			NO	
04/21/87	70	1	A,G,I,K	1	COMPRESSOR				
04/22/87	247		A,C	3				NO	
04/23/87	248	2		9					SMALL BIRD
04/26/87	310	2		9					
04/26/87	311	2		9					ODOR
04/26/87	660	1		9					SMALL BIRD
05/01/87	312	1		9					
05/01/87	362		A,G	2					
05/03/87	69	2		9	COMPRESSOR		NONE	NO	
05/04/87	110	1		9	NONE			NO	
05/06/87	591	1		9					SMALL BIRD
05/08/87	592	1		9					MEDIUM BIRD
05/10/87	94	1	A,H	3				NO	
05/10/87	111	2		9	NONE			NO	
05/10/87	622	2		9					MEDIUM BIRD
05/10/87	687	1		9					
05/12/87	95	1		9				NO	
05/12/87	363	1	A,C	3					3 FAN BLADES DAMAGED
05/16/87	364	2	A,C	3					
05/17/87	313	2		9					LARGE BIRD
05/18/87	249	1		9					
05/20/87	250	2		9					
05/22/87	96	1	A,H	3				NO	
05/22/87	97	1		9	COMPRESSOR			NO	POWER LOSS
05/22/87	98	1		9				NO	
05/24/87	99	1	A,I,K,N	1	COMPRESSOR			INVOLUNTARY	COMPLETE FRAC OF #2 BEARING RET BOLTS
05/24/87	251	2		9				NO	
05/25/87	164	2		9	NONE			NO	
05/26/87	252	1		9					MEDIUM BIRD
05/27/87	314	2		9					
05/28/87	100	2	A,H	3				NO	
05/28/87	165	1		9	NONE			NO	
05/29/87	112	2		9	NONE			NO	EVENT OCCURED DURING GO-ROUND
05/30/87	253	2		9					SMALL BIRD
05/31/87	113	2	A,D	2	NONE	3.8		NO	
05/31/87	254	1		9				NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT		AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
06/02/87	71	1	30	16:05:00	NONE		200	TAKEOFF	0		VFR		CLEAR	ATO	NO	YES
06/03/87	315	1	120		NONE		200	LANDING	50	120						
06/04/87	114	1	872009	14:45:00	NONE		300	TAKEOFF		+V1				NONE		
06/05/87	115	2	872010		NONE		300	LANDING					CLEAR			
06/05/87	694	2	87	10:00:00	NONE		200	LANDING	0	80			CLOUDY	NONE	NO	SEVERAL
06/08/87	116	1	872011		NONE		300	CRUISE								
06/08/87	662	1	87	7:48:00	MULT	BIRDS	200	LANDING	150	125			CLOUDY	NONE	YES	SEVERAL
06/09/87	255	1	100	20:20:00	NONE		200	TAKEOFF	0	120			SCATTERED	ATO		SEVERAL
06/10/87	101	1	31	16:10:00	NONE		200	LANDING	0	120	VFR					YES
06/10/87	608	1	87	10:40:00	NONE		200	LANDING	12	120			CLEAR	NONE	NO	ONE
06/12/87	677	2	87	1:25:00	NONE		UNK	TAXI	0	12			CLOUDY	NONE	NO	SEVERAL
06/13/87	117	1	872012		NONE		300	TAKEOFF		+V1			CLEAR	ATB		
06/13/87	256	1	110	4:03:00	MULT	ENG	200	TAKEOFF	0				SCATTERED			YES
06/13/87	256	2	110	4:03:00	MULT	ENG	200	TAKEOFF	0				SCATTERED			YES
06/13/87	365		170		NONE		200	TAKEOFF	0	130						
06/14/87	316	1	120		NONE		200	UNKNOWN								
06/15/87	257	2	110	16:45:00	NONE		200	TAKEOFF	0	130			CLEAR		NO	YES
06/17/87	118	2	872013		NONE		300	UNKNOWN								
06/17/87	317	2	120		NONE		200	UNKNOWN								
06/19/87	119	1	872014	9:09:00	NONE		300	LANDING	50	140	VFR	DAY	PARTLY CLOUD	NONE	NO	FLOCK
06/19/87	609	2	87	9:12:00	NONE		200	TAKEOFF	0	110			CLEAR	NONE	NO	SEVERAL
06/22/87	166	1	53	15:45:00	NONE		200	CLIMB	500		VFR		SCATTERED			YES
06/22/87	258	1	100		NONE		200	APPROACH		114			CLOUDY	NONE	NO	ONE
06/23/87	674	1	87	18:35:00	MULT	BIRDS	200	TAKEOFF	0	140			CLEAR			FLOCK
06/24/87	676	2	87	4:40:00	NONE		200	CLIMB	3000	230			CLOUDY	NONE		
06/24/87	682	1	87	10:07:00	NONE		200	CLIMB	500	170			OVERCAST	NONE		ONE
06/25/87	102	2	34	12:56:00	NONE		200	LANDING	0	90	VFR		CLEAR		NO	ONE
06/27/87	103		32		NONE		200	UNKNOWN								
06/27/87	259	1	110	10:07:00	NONE		200	LANDING	0	110			SCATTERED			YES
06/27/87	318	2	130	15:18:00	MULT	BIRDS	200	TAKEOFF	0	110			RAIN	ATB	NO	SEVERAL
06/28/87	671	2	87		NONE		200	LANDING	0					OTHER	NO	
06/29/87	427	1	0		NONE		200	CLIMB						ATB		
06/30/87	628	2	87	7:50:00	NONE		200	LANDING	50	135			CLEAR	NONE		ONE
07/01/87	629	2	87	17:38:00	NONE		300	TAKEOFF	10	135			CLEAR		NO	SEVERAL
07/02/87	260	1	80	14:15:00	NONE		200	APPROACH	80	120			SCATTERED		NO	YES
07/02/87	366		170		NONE		200	UNKNOWN								
07/02/87	431		0		NONE		300	UNKNOWN								
07/03/87	319	1	120		NONE		200	TAKEOFF						ATB		
07/04/87	261	2	80	15:15:00	NONE		200	LANDING					SCATTERED		NO	
07/05/87	133	2	873001	8:25:00	NONE		300	TAKEOFF		+V1			CLEAR	NONE		
07/06/87	134	2	873002		NONE		300	UNKNOWN								
07/07/87	104	2	50		NONE		200	UNKNOWN								
07/07/87	1064	1	1667		NONE		200	TAKEOFF	0	0				ATO		
07/09/87	135	2	873003	0:42:00	NONE		300	LANDING				NIGHT		NONE		
07/11/87	262	1	100	12:20:00	NONE		200	CLIMB	3000	170			SCATTERED		NO	YES
07/13/87	105	1	37		NONE		200	UNKNOWN								
07/13/87	171	2	58		NONE		200	UNKNOWN								NO
07/13/87	692	1	87		NONE		200	UNKNOWN								
07/13/87	1061	2	1664		NONE		200	LANDING	0					NONE		
07/13/87	1062	1	1665		NONE		200	UNKNOWN						NONE		
07/14/87	136	2	873004		NONE		300	UNKNOWN								
07/14/87	137	2	873005		NONE		300	APPROACH	7000	137	VFR	DAY	CLEAR		NO	NO
07/14/87	138	1	873006		NONE		300	TAKEOFF		+V1				NONE		
07/15/87	263	1	110	9:35:00	NONE		200	TAKEOFF	0				CLEAR		NO	NO
07/15/87	1063	1	1666		NONE		200	UNKNOWN						NONE		
07/16/87	320	1	130		NONE		200	UNKNOWN								
07/17/87	367		170		NONE		200	CLIMB	1000	155						
07/17/87	432		0	18:39:00	NONE		300	APPROACH	300	130						ONE
07/17/87	632	2	87	7:35:00	NONE		200	TAKEOFF	0	90			CLOUDY	ATO	NO	ONE
07/19/87	139	2	873007		NONE		300	UNKNOWN								
07/19/87	264	2	100	20:26:00	MULT	BIRDS	100	TAKEOFF	0				SCATTERED		NO	SEVERAL
07/19/87	685	1	87	16:54:00	NONE		200	TAKEOFF	0	130			OVERCAST	NONE		
07/21/87	140	2	873008	7:00:00	NONE		300	TAKEOFF		+V1		DAWN	CLEAR	NONE		
07/21/87	265	2	100	15:20:00	NONE		200	APPROACH	100	125			CLEAR		NO	YES
07/21/87	426	2	0		NONE		200	TAKEOFF						ATO		
07/21/87	615	2	87	15:20:00	NONE		UNK	LANDING	100	125			CLEAR	NONE	NO	ONE
07/23/87	122	2	44	19:00:00	NONE		200	TAKEOFF	0	110	VFR					NO
07/24/87	606	2	87	18:20:00	MULT	BIRDS	200	TAKEOFF	0	100			CLOUDY	NONE	YES	SEVERAL

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
06/02/87	71	1	GULL*		1		ORF-CVG	ORF	NORFOLK, VA	YES	JT8D	15A
06/03/87	315	1					ISG-MMY	MMY	MIYAKO JIMA, JAPAN	NO	JT8D	
06/04/87	114	1					KGS-GEN	KGS	KOS, GREECE	NO	CFM56	3
06/05/87	115	2	CROW*					GRZ	GRAZ, AUSTRIA	NO	CFM56	3
06/05/87	694	2	VULTURE*					TRV	TRIVANDRUM, INDIA	NO	JT8D	
06/08/87	116	1						SLC	SALT LAKE CITY, UT	YES	CFM56	3
06/08/87	662	1	GULL*		*			CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
06/09/87	255	1	BLACK KITE	3K28	1	20.8		LDE	LOURDES, FRANCE	NO	JT8D	
06/10/87	101	1			1		YYC-YXD	YXD	EDMONTON, ALTA-MUN.,CANADA	NO	JT8D	9A
06/10/87	608	1			1			YOW	OTTAWA, CANADA	NO	JT8D	
06/12/87	677	2			1			BKK	BANGKOK, THAILAND	NO	UNK	
06/13/87	117	1						LNZ	LINZ, AUSTRIA	NO	CFM56	3
06/13/87	256	1						LIN	MILAN, ITALY	NO	JT8D	
06/13/87	256	2						LIN	MILAN, ITALY	NO	JT8D	
06/13/87	365							MIL	MILAN, ITALY	NO	JT8D	15
06/14/87	316	1					ISG-OKA	XFO	JAPAN	NO	JT8D	
06/15/87	257	2			1			ELS	EAST LONDON, SOUTH AFRICA	NO	JT8D	
06/17/87	118	2						IAD	WASHINGTON, DC-DULLES	YES	CFM56	3
06/17/87	317	2					OKA-MMY	XFO	JAPAN	NO	JT8D	
06/19/87	119	1	GULL*					HRL	HARLINGEN, TEX	YES	CFM56	3
06/19/87	609	2	SWALLOW*		1			YXS	PRINCE GEORGE, CANADA	NO	JT8D	
06/22/87	166	1	SWALLOW*		1	3.		FRA	FRANKFURT, GERMANY	NO	JT8D	15
06/22/87	258	1	COMMON SWIFT	1U55	1	2.		CDG	PARIS, FRANCE-DEGAULLE	NO	JT8D	
06/23/87	674	1	GULL*		*			LERS	REUS, SPAIN	NO	JT8D	
06/24/87	676	2						PMI	PALMA MALLORCA, SPAIN	NO	JT8D	
06/24/87	682	1						GLA	GLASGOW, SCOTLAND	NO	JT8D	
06/25/87	102	2	NORTHERN MARSH HARRIER	3K78	1	18.	LAS-OAK	OAK	SAN FRANSICO,CA-OAKLAND	YES	JT8D	9A
06/27/87	103		FERAL PIGEON*		1	14.		KHH	KAOHSIUNG, TAIWAN	NO	JT8D	17A
06/27/87	259	1			1			TUN	TUNIS, TUNISIA	NO	JT8D	
06/27/87	318	2	SPUR-WINGED PLOVER	5N4	*	5.4		CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
06/28/87	671	2			1			MAD	MADRID, SPAIN	NO	JT8D	
06/29/87	427	1	RED TAI*					DAY	DAYTON, O	YES	JT8D	
06/30/87	628	2			1			TXL	W. BERLIN, GERMANY	NO	JT8D	
07/01/87	629	2	GULL*		1			LGSK	SKIATHOS, GREECE	NO	CFM56	3
07/02/87	260	1						LHR	LONDON, ENGLAND-HEATHROW	NO	JT8D	15
07/02/87	366						-HAJ	XFO	HANOVER, GERMANY	NO	JT8D	15
07/02/87	431							TNG	TANGER, MOROCCO	NO	CFM56	3
07/03/87	319	1						EZE	BUENOS AIRES, ARGENTINA	NO	JT8D	
07/04/87	261	2						FRA	FRANKFURT, GERMANY	NO	JT8D	15
07/05/87	133	2			1		SDF-CLT	SDF	LOUISVILLE, KY	YES	CFM56	3
07/06/87	134	2			1		-IAD	XUS	WASHINGTON, DC-DULLES	YES	CFM56	3
07/07/87	104	2			1			XFO		NO	JT8D	
07/07/87	1064	1			1			AMD	AHMEDABAD, INDIA	NO	JT8D	9A
07/09/87	135	2					ORY-AJA	AJA	AJACCIO, CORSICA, FRANCE	NO	CFM56	3
07/11/87	262	1			1			BRU	BRUSSELS, BELGIUM	NO	JT8D	
07/13/87	105	1					AGR-VNS	VNS	VARANASI, INDIA	NO	JT8D	17
07/13/87	171	2					-LAX	XUS	LOS ANGELES, CA	YES	JT8D	
07/13/87	692	1	PARTRIDGE*		1					NO	JT8D	
07/13/87	1061	2			1		HJR-VNS	VNS	VARANASI, INDIA	NO	JT8D	17A
07/13/87	1062	1			1		DEL-JAI	XFO	INDIA	NO	JT8D	17
07/14/87	136	2			1		-KHI	XFO	KARACHI, PAKISTAN	NO	CFM56	3
07/14/87	137	2			1		-TVL	XUS	LAKE TAHOE, CA	YES	CFM56	3
07/14/87	138	1			1		TLV-MUC	TLV	TELAVIA-YAFO, ISRAEL	NO	CFM56	3
07/15/87	263	1			1			DUR	DURBAN, SOUTH AFRICA	NO	JT8D	
07/15/87	1063	1			1			XFO	INDIA	NO	JT8D	17
07/16/87	320	1					-CHC	XFO	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
07/17/87	367							NUE	NUREMBURG, GERMANY	NO	JT8D	15
07/17/87	432							MUC	MUNICH, GERMANY	NO	CFM56	3
07/17/87	632	2	KITE*		1			AMD	AHMEDABAD, INDIA	NO	JT8D	
07/19/87	139	2			1		-MUC	XFO	MUNICH, GERMANY	NO	CFM56	3
07/19/87	264	2	BLACK KITE	3K28	2	20.8		LFBO	BLAGNAC, FRANCE (LFBO)	NO	JT8D	
07/19/87	685	1						LTN	LONDON-LUTON, ENGLAND	NO	JT8D	
07/21/87	140	2			1		DAB-CLT	DAB	DAYTONA BEACH, FL	YES	CFM56	3
07/21/87	265	2			1			KST	KOSTI, SUDAN	NO	JT8D	
07/21/87	426	2						EWR	NEW YORK, NY-NEWARK	YES	JT8D	9A
07/21/87	615	2			1			KRP	KASTRUP, DENMARK	NO	UNK	
07/23/87	122	2			1		MMY-OKA	MMY	MIYAKO JIMA, JAPAN	NO	JT8D	17
07/24/87	606	2	KILLDEER	5N33	*	3.		YCG	CASTLEGAR, CANADA	NO	JT8D	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
06/02/87	71	1	A,D	2				NO	
06/03/87	315	1		9					
06/04/87	114	1		9	NONE			NO	
06/05/87	115	2	A,H	3	NONE			NO	
06/05/87	694	2	A,Q	4					SUBSTANTIAL DAMAGE
06/08/87	116	1	A,B	3	NONE			NO	2 F BLDS BLENDED
06/08/87	662	1		9					MEDIUM BIRD
06/09/87	255	1		9					
06/10/87	101	1		9	COMPRESSOR			NO	SURGED ON GROUND
06/10/87	608	1		9					SMALL BIRD
06/12/87	677	2		9					
06/13/87	117	1	A,H	3	NONE	5.0	RETARD	NO	
06/13/87	256	1		9					
06/13/87	256	2		9					
06/13/87	365			9					
06/14/87	316	1	A,C	3					
06/15/87	257	2		9				NO	MEDIUM BIRD
06/17/87	118	2		9	NONE			NO	
06/17/87	317	2		9					
06/19/87	119	1		9	NONE			NO	
06/19/87	609	2		9					SMALL BIRD
06/22/87	166	1		9	NONE			NO	
06/22/87	258	1		9				NO	
06/23/87	674	1	A,Q	4					SUBSTANTIAL DAMAGE, ENGINE CHANGED
06/24/87	676	2		9					
06/24/87	682	1		9					
06/25/87	102	2	A,C,H	3	NONE		RETARD	NO	
06/27/87	103		A,G	2				NO	
06/27/87	259	1		9					
06/27/87	318	2	A,C	3					
06/28/87	671	2		9					
06/29/87	427	1		9					LARGE BIRD
06/30/87	628	2		9					SMALL BIRD
07/01/87	629	2		9					LARGE BIRD
07/02/87	260	1		9				NO	MEDIUM BIRD
07/02/87	366			9					
07/02/87	431			9					
07/03/87	319	1		9					
07/04/87	261	2		9				NO	
07/05/87	133	2	A,C	3	NONE	4.9		NO	
07/06/87	134	2	A	4	NONE			NO	REPLACED 1 PAIR OF F BLDS
07/07/87	104	2		9				NO	
07/07/87	1064	1		9				NO	
07/09/87	135	2		9	NONE			NO	
07/11/87	262	1		9				NO	
07/13/87	105	1	A,G	2				NO	AIRCRAFT GROUNDED DUE TO FOD
07/13/87	171	2	A,C,N	2	NONE			NO	FOUND DURING GROUND INSPECTION
07/13/87	692	1		9					MEDIUM BIRD
07/13/87	1061	2	A,D,N	2				NO	8 FBLDS REPLACED, BLD TANG BROKEN
07/13/87	1062	1		9				NO	FOUND ON GRD INSPEC
07/14/87	136	2	A	4	NONE			NO	FOUND ON GRD INSPEC, 1 F BLD DAMAGED
07/14/87	137	2		9	NONE			NO	FOUND ON GRD INSPECTION, SMALL BIRD
07/14/87	138	1		9	NONE			NO	
07/15/87	263	1		9					
07/15/87	1063	1		9				NO	FOUND ON GRD INSPEC
07/16/87	320	1		9					
07/17/87	367			9					
07/17/87	432		A	4					
07/17/87	632	2		9					MEDIUM BIRD
07/19/87	139	2		9	NONE			NO	FOUND DURING GROUND INSPECTION
07/19/87	264	2		9				NO	
07/19/87	685	1		9					
07/21/87	140	2	A,D	2	NONE	3.2		NO	
07/21/87	265	2		9					
07/21/87	426	2	A	4	YES				FAN BLADE DAMAGE
07/21/87	615	2		9					MEDIUM BIRD
07/23/87	122	2	A,C,H,N	2				NO	
07/24/87	606	2		9					SMALL BIRD

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT		AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
07/25/87	605	1	87	11:40:00	NONE		200	TAKEOFF	0	50			CLEAR	ATO	NO	FLOCK
07/26/87	123	1	41	18:37:00	NONE		200	TAKEOFF	0	150						FLOCK
07/26/87	124	2	43	9:00:00	NONE		200	TAKEOFF	100	150	VFR			ATB		
07/26/87	141	2	873009		NONE		300	LANDING	0	80						
07/26/87	266	1	93	20:37:00	NONE		200	TAKEOFF		140			CLEAR		NO	YES
07/26/87	612	2	87	9:00:00	NONE		200	CRUISE						ATB		
07/27/87	321	1	0		NONE		200	TAKEOFF		130				ATO		
07/27/87	635	1	87	13:20:00	NONE		200	TAKEOFF	20	140			CLOUDY	NONE	YES	ONE
07/27/87	1065	1	1668		NONE		200	UNKNOWN						NONE		
07/29/87	126	1	42	17:45:00	NONE		200	TAKEOFF	0	70						YES
07/29/87	142	1	873010		NONE		300	TAKEOFF								
07/29/87	368	2	160		NONE		200	UNKNOWN								
07/29/87	619	2	87	19:30:00	NONE		200	LANDING	0			OVERCAST	RAIN	NONE	NO	SEVERAL
07/30/87	127	1	45	4:55:00	NONE		200	TAKEOFF	0	130	VFR		CLEAR	ATO		
07/30/87	322		120		NONE		200	TAKEOFF	0	100						
07/30/87	658	2	87	14:16:00	MULT	BIRDS	200	LANDING	10	135			CLOUDY	NONE		SEVERAL
07/31/87	143	1	873011		NONE		300	LANDING						NONE		
07/31/87	144	1	873012	9:55:00	MULT	BIRDS	300	TAKEOFF	500	+V1	VFR	BRIGHT	OVERCAST	ATB		NO
07/31/87	624	1	87	16:24:00	NONE		200	LANDING	0	128			OVERCAST	NONE		ONE
08/01/87	600	2	87	7:01:00	NONE		200	LANDING	0	100			CLEAR	NONE	NO	SEVERAL
08/03/87	128	1	38		NONE		200	UNKNOWN								
08/03/87	129	2	39		NONE		200	TAKEOFF	0	90	VFR	DAY	PARTLY CLOUD	ATO	NO	YES
08/03/87	205	2	90		NONE		200	UNKNOWN								
08/03/87	267	2	80	9:22:00	MULT	BIRDS	200	LANDING	0				BELOW CLOUDS			SEVERAL
08/03/87	369		170		NONE		200	APPROACH	1000	140						
08/04/87	206	1	90		NONE		200	TAKEOFF						ATO		
08/04/87	323	2	130		NONE		200	TAKEOFF								
08/05/87	145	1	873013		NONE		300	LANDING				DUSK	OVERCAST	NONE		
08/05/87	146	1	873014		MULT	ENG	300	LANDING						NONE		
08/05/87	146	2	873015		MULT	ENG	300	LANDING						NONE		
08/05/87	207	1	90		NONE		200	UNKNOWN								
08/05/87	370		170		NONE		200	TAKEOFF	0	130						
08/05/87	643	1	87		NONE		200	LANDING	0	123				NONE		
08/06/87	147	1	873016		NONE		300	UNKNOWN								
08/06/87	626	2	87	18:10:00	NONE		200	LANDING	0	20			CLOUDY	NONE		FLOCK
08/07/87	649	1	87	8:15:00	NONE		200	TAKEOFF	0	130		OVERCAST	RAIN	NONE	NO	ONE
08/07/87	1067	1	1670		NONE		200	UNKNOWN								
08/07/87	1068	1	1671		NONE		200	UNKNOWN						NONE		
08/08/87	1066	2	1669	9:54:00	NONE		200	TAKEOFF		140			CLOUDY	ATB		
08/12/87	597	2	87	14:10:00	NONE		300	TAKEOFF	0	130			OVERCAST	ATO	NO	ONE
08/12/87	693	2	87		NONE		200							NONE		
08/13/87	208	2	90		NONE		200	UNKNOWN								
08/14/87	645	2	87	10:00:00	NONE		200	LANDING	0	100			CLEAR	NONE	NO	SEVERAL
08/15/87	433		0	9:00:00	NONE		300	LANDING	20	135						ONE
08/15/87	659	2	87	17:50:00	NONE		200	LANDING	0	100			CLEAR	NONE		ONE
08/17/87	130	2	48	15:30:00	NONE		200	LANDING								NO
08/17/87	148	2	873017		NONE		300	UNKNOWN								
08/18/87	625	2	87	7:38:00	MULT	BIRDS	UNK	LANDING	0	100		OVERCAST	RAIN	OTHER	NO	FLOCK
08/18/87	679	1	87	6:18:00	NONE		200	TAKEOFF	0	150			CLEAR	NONE		SEVERAL
08/19/87	131	1	47		MULT	BIRDS	200	LANDING	0		VFR					YES
08/19/87	1069	1	1672	15:17:00	NONE		200	TAKEOFF	0	85			CLOUDY	ATO		
08/20/87	209	1	90		NONE		200	UNKNOWN								
08/22/87	324	1	120		NONE		200	UNKNOWN								
08/22/87	371	1	190		NONE		200	UNKNOWN								
08/22/87	372	1	190		NONE		200	UNKNOWN								
08/22/87	633	2	87	8:15:00	NONE		200	TAKEOFF	0	60				ATO	NO	ONE
08/22/87	650	1	87	13:05:00	NONE		200	APPROACH	1500	170			CLEAR	NONE	NO	SEVERAL
08/22/87	1070	2	1673		NONE		200	TAKEOFF	0	60				ATO		
08/22/87	1071	1	1674		NONE		200	APPROACH						NONE		YES
08/23/87	373	2	190		NONE		200	TAKEOFF								
08/23/87	680	1	87	12:00:00	MULT	BIRDS	200	LANDING	0	100			CLEAR	NONE	NO	FLOCK
08/25/87	210	2	90		NONE		200	UNKNOWN								
08/26/87	188	1	75	8:23:00	TRVS	FRAC	200	LANDING	0		VFR		SCATTERED			YES
08/26/87	374		170		NONE		200	TAKEOFF	0	140						
08/26/87	451		0		NONE		200	TAKEOFF	0	+V1		NIGHT	CLEAR	ATO	NO	NO
08/27/87	666	1	87	6:20:00	MULT	BIRDS	200	TAKEOFF	0	135			CLEAR	NONE		SEVERAL
08/27/87	689	1	87	20:00:00	NONE		200	UNKNOWN						NONE		
08/28/87	325	1	0		NONE		200	TAKEOFF						ATO		

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DA$N
07/25/87	605	1	GULL*		1			YYC	CALGARY, ALTA, CANADA	NO	JT8D	
07/26/87	123	1					GOA-LGW	GOA	GENOVA, ITALY	NO	JT8D	15A
07/26/87	124	2	GLAUCOUS-WINGED GULL	14N22		40.	YYZ-YQG	YYZ	TORONTO, ONT., CANADA	NO	JT8D	9A
07/26/87	141	2			1		-DUS	DUS	DUSSELDORF, GERMANY	NO	CFM56	3
07/26/87	266	1			1			XFO	ITALY	NO	JT8D	
07/26/87	612	2			1				NPEARSON INTL, CANADA	NO	JT8D	
07/27/87	321	1						XFO		NO	JT8D	
07/27/87	635	1						ATQ	AMRITSAR, INDIA	NO	JT8D	
07/27/87	1065	1			1			XFO	INDIA	NO	JT8D	9A
07/29/87	126	1	SPOTTED DOVE	2P65	1	6.	ITO-HNL	ITO	HILO, HAWAII	YES	JT8D	9A
07/29/87	142	1			1		AMS-	AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
07/29/87	368	2						XUS		YES	JT8D	7
07/29/87	619	2	HAWK*		1			LDE	LOURDES, FRANCE	NO	JT8D	
07/30/87	127	1					TXL-BRE	TXL	BERLIN, WEST GERMANY	NO	JT8D	15A
07/30/87	322						ISG-OKA	ISG	ISHIGAKI, JAPAN	NO	JT8D	
07/30/87	658	2	PIGEON*		*			MLAL	LUQA, MALTA	NO	JT8D	
07/31/87	143	1			1		HRL-HOU	HOU	HOUSTON, TEX	YES	CFM56	3
07/31/87	144	1	GALAH	1Q15	2	11.5		ADL	ADELAIDE, S. AUSTRALIA	NO	CFM56	3
07/31/87	624	1			1			EDUO	GUTERSLOH, GERMANY	NO	JT8D	
08/01/87	600	2			1			SZG	SALZBURG, AUSTRIA	NO	JT8D	
08/03/87	128	1			1			XFO	JOHANNESBURG, SOUTH AFRICA	NO	JT8D	
08/03/87	129	2			1		RAP-FSD	RAP	RAPID CITY, S. DAK	YES	JT8D	9
08/03/87	205	2					-YYZ	XFO	TORONTO, ONT., CANADA	NO	JT8D	
08/03/87	267	2	GULL*		*	10.	MUC-ZRH	ZRH	ZURICH, SWITZERLAND	NO	JT8D	15
08/03/87	369							XRY	JEREZ DELA FRONTERA, SPAIN	NO	JT8D	15
08/04/87	206	1					YAM-YYZ	YAM	SAULT STE. MARIE, CANADA	NO	JT8D	9A
08/04/87	323	2					WLG-DUD	WLG	WELLINGTON, NEW ZEALAND	NO	JT8D	
08/05/87	145	1	GULL*				-BRS	BRS	BRISTOL, ENGLAND	NO	CFM56	3
08/05/87	146	1			1		-IBZ	IBZ	IBIZA, SPAIN	NO	CFM56	3
08/05/87	146	2			1		-IBZ	IBZ	IBIZA, SPAIN	NO	CFM56	3
08/05/87	207	1					-YVR	XFO	VANCOUVER, B.C., CANADA	NO	JT8D	
08/05/87	370							FRA	FRANKFURT, GERMANY	NO	JT8D	15
08/05/87	643	1	KITE*					PAT	PATNA, INDIA	NO	JT8D	
08/06/87	147	1					-AMS	XFO	AMSTERDAM, NETHERLANDS	NO	CFM56	3
08/06/87	626	2	LAPWING*		1			MUC	MUNICH, GERMANY	NO	JT8D	
08/07/87	649	1			1			VTZ	VISAKHAPATNAM, INDIA	NO	JT8D	
08/07/87	1067	1					MAA-VTZ	XFO	INDIA	NO	JT8D	9A
08/07/87	1068	1			1		JAI-BOM	XFO	INDIA	NO	JT8D	17
08/08/87	1066	2					LKO-DEL	LKO	LUCKNOW, INDIA	NO	JT8D	17A
08/12/87	597	2			1			LNZ	LONZ, AUSTRIA	NO	CFM56	3
08/12/87	693	2			1					NO	JT8D	
08/13/87	208	2					-YYZ	XFO	TORONTO, ONT., CANADA	NO	JT8D	
08/14/87	645	2			1			IXR	RANCHI, INDIA	NO	JT8D	
08/15/87	433		FALCON*					TNG	TANGIER, MOROCCO	NO	CFM56	3
08/15/87	659	2	HAWK*		1			GMTT	BOUKHALF, MOROCCO	NO	JT8D	
08/17/87	130	2					YVR-YYC	YYC	CALGARY, ALTA , CANADA	NO	JT8D	17A
08/17/87	148	2					-SNA	XUS	ORANGE COUNTY, CA	YES	CFM56	3
08/18/87	625	2	GULL*		*			HAM	HAMBURG, GERMANY	NO	UNK	
08/18/87	679	1						LTBS	MUGLA, TURKEY	NO	JT8D	
08/19/87	131	1	KILLDEER AND STARLING	5N33	*	3.	YXJ-YXS	YXS	PRINCE GEORGE,B.C., CANADA	NO	JT8D	15
08/19/87	1069	1			1		JRH-GAO	JRH	JORHAT, INDIA	NO	JT8D	17
08/20/87	209	1					-YLW	XFO	KELOWNA, B.C., CANADA	NO	JT8D	
08/22/87	324	1					ISG-OKA	XFO	JAPAN	NO	JT8D	
08/22/87	371	1					-BRU	XFO	BRUSSELS, BELGIUM	NO	JT8D	
08/22/87	372	1	GULL*				-FOR	XFO	FORTALEZA, CEARA, BRAZIL	NO	JT8D	
08/22/87	633	2						AMD	AHMEDABAD, INDIA	NO	JT8D	
08/22/87	650	1	VULTURE*		1			DEL	DELHI, INDIA	NO	JT8D	
08/22/87	1070	2			1		AMD-DEL	AMD	AHMEDABAD, INDIA	NO	JT8D	9A
08/22/87	1071	1			1			XFO	INDIA	NO	JT8D	9A
08/23/87	373	2						STV	SURAT, INDIA	NO	JT8D	
08/23/87	680	1	COMMON LAPWING	5N1	*	7.7		SVO	MOSCOW-SHEREMETYE, USSR	NO	JT8D	
08/25/87	210	2					-YEG	XFO	EDMONTON, ALTA., CANADA	NO	JT8D	
08/26/87	188	1					TYO-HAC	HAC	HACHIJO, JAPAN	NO	JT8D	9A
08/26/87	374							HAM	HAMBURG, GERMANY	NO	JT8D	15
08/26/87	451							LEX	LEXINGTON, KY	YES	JT8D	
08/27/87	666	1			*			FAO	FARO, PORTUGAL	NO	JT8D	
08/27/87	689	1						NCL	NEW CASTLE, ENGLAND	NO	JT8D	
08/28/87	325	1						OPO	PORTO, PORTUGAL	NO	JT8D	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
07/25/87	605	1		9					MEDIUM BIRD
07/26/87	123	1		9	EPR DEC			NO	STRONG ODOR IN CABIN
07/26/87	124	2	A,B,G,H	2	COMPRESSOR	YES		YES	METAL IN TAILPIPE
07/26/87	141	2		9	NONE			NO	
07/26/87	266	1		9					
07/26/87	612	2		9					
07/27/87	321	1	A,G,H	2					EPR SYMPTOM
07/27/87	635	1	A,H,Q	3					SMALL BIRD, SUBSTANTIAL DAMAGE
07/27/87	1065	1		9				NO	
07/29/87	126	1		9				NO	STRONG ODOR IN CABIN
07/29/87	142	1		9	NONE			NO	
07/29/87	368	2	A,C	3					
07/29/87	619	2		9					LARGE BIRD
07/30/87	127	1	A,C,G,K	1	EPR DEC		CUTOFF	EPR	FAN CHANGE,ENG SHUTDOWN ON TAXI,COMP DAM
07/30/87	322			9					
07/30/87	658	2		9					MEDIUM BIRD
07/31/87	143	1		9	NONE			NO	STRONG ODOR IN CABIN
07/31/87	144	1	A,B,D,H	2			RETARD	NO	
07/31/87	624	1		9					MEDIUM BIRD
08/01/87	600	2		9					SMALL BIRD
08/03/87	128	1		9					
08/03/87	129	2		9	COMPRESSOR				#2 ENGINE STALLED AT 80 KTS, PM EVENT
08/03/87	205	2		9					
08/03/87	267	2		9				NO	
08/03/87	369			9					
08/04/87	206	1		9					TIRE FAILURE
08/04/87	323	2	A,C	3					
08/05/87	145	1	A,H	3	NONE	3.5		NO	EVENT OCCURRED IN PM
08/05/87	146	1	A,H	3	NONE	2.2		NO	
08/05/87	146	2	A,H	3	NONE			NO	
08/05/87	207	1		9					
08/05/87	370			9					
08/05/87	643	1		9					MEDIUM BIRD
08/06/87	147	1	A	4	NONE			NO	FOUND ON GRD INSPEC,4FAN BLADES REPLACED
08/06/87	626	2		9					MEDIUM BIRD
08/07/87	649	1		9					SMALL BIRD
08/07/87	1067	1	A,H	3				NO	FOUND ON GRD INSPEC
08/07/87	1068	1		9				NO	
08/08/87	1066	2	A	4	COMPRESSOR			NO	UNK POWER LOSS, 6 F BLDS UNKNOWN DAMAGE
08/12/87	597	2		9					MEDIUM BIRD
08/12/87	693	2	A,Q	4					
08/13/87	208	2		9					
08/14/87	645	2		9					SMALL BIRD
08/15/87	433			9					
08/15/87	659	2	A,Q	4					
08/17/87	130	2	A,H	3				NO	
08/17/87	148	2	A,C,H	3	NONE	HIGH		NO	
08/18/87	625	2		9					MEDIUM BIRD
08/18/87	679	1		9					
08/19/87	131	1		9				NO	MOMENTARY EGT INC OF 70 DEG.C,2-4 BIRDS
08/19/87	1069	1		9				NO	
08/20/87	209	1		9					
08/22/87	324	1		9					
08/22/87	371	1		9					
08/22/87	372	1		9					
08/22/87	633	2		9					MEDIUM BIRD
08/22/87	650	1		9					LARGE BIRD
08/22/87	1070	2		9				NO	
08/22/87	1071	1		9				NO	
08/23/87	373	2		9					
08/23/87	680	1		9					MEDIUM BIRD
08/25/87	210	2		9					
08/26/87	188	1	A,C,G,I	1	NONE			NO	1,1st STAGE F BLADES WERE FRAC, 2nd DAM
08/26/87	374			9					
08/26/87	451			9					PM EVENT, LOUD ENGINE NOISE
08/27/87	666	1		9					
08/27/87	689	1		9					
08/28/87	325	1		9					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
08/28/87	607	1	87	20:00:00	NONE	200	TAKEOFF	0							
08/29/87	211	2	90	16:15:00	MULT BIRDS	200	TAKEOFF	0	130			RAIN		NO	SEVERAL
08/29/87	268	1	80		MULT BIRDS	200	TAKEOFF	0				BELOW CLOUDS			YES
08/29/87	326	2	130		NONE	200	TAKEOFF								
08/29/87	598	1	87	14:10:00	MULT BIRDS	UNK	LANDING	0	115			OVERCAST	OTHER	NO	SEVERAL
08/29/87	620	1	87	18:00:00	NONE	200	TAKEOFF	0				CLEAR	NONE	NO	SEVERAL
08/30/87	1072	2	1675		NONE	200	TAKEOFF	0	80				ATO		YES
08/31/87	149	2	873018		NONE	300	UNKNOWN								
08/31/87	150	1	873019		NONE	300	LANDING								
08/31/87	151	2	873020		NONE	300	UNKNOWN								
08/31/87	269	1	80	8:06:00	NONE	200	TAKEOFF	0		VFR					ONE
08/31/87	669	1	87	15:23:00	NONE	200	TAKEOFF	0	120			CLEAR	ATO	NO	
09/01/87	327	1	0		NONE	200	TAKEOFF		100						FLOCK
09/01/87	603	1	87	22:15:00	NONE	UNK	UNKNOWN	0	100			CLEAR	NONE	NO	
09/01/87	604	1	87	11:05:00	NONE	200	TAKEOFF	0	140			CLEAR	NONE	NO	ONE
09/02/87	328	1	0		NONE	200	LANDING								
09/03/87	375	1	0	6:57:00	NONE	200	TAKEOFF	15	155			CLOUDY	NONE		ONE
09/04/87	593	2	87	9:00:00	NONE	300	TAKEOFF	0	140			CLOUDY	NONE		ONE
09/04/87	672	1	87	19:55:00	MULT ENG	200	TAKEOFF	0	100			CLEAR	NONE		
09/04/87	672	2	87	19:55:00	MULT ENG	200	TAKEOFF	0	100			CLEAR	NONE		
09/04/87	696	1	87		MULT ENG-BIRDS	200	TAKEOFF	0	90			CLEAR	NONE	NO	FLOCK
09/04/87	696	2	87		MULT ENG-BIRDS	200	TAKEOFF	0	90			CLEAR	NONE	NO	FLOCK
09/05/87	618	1	87	10:39:00	NONE	300	LANDING	0	100			CLEAR	NONE	NO	SEVERAL
09/06/87	132	2	49	10:15:00	NONE	200	LANDING	0		VFR		CLEAR			ONE
09/06/87	152	1	873021		NONE	300	UNKNOWN								
09/06/87	599	2	87	11:20:00	NONE	300	LANDING	0	80		OVERCAST	RAIN	NONE	NO	SEVERAL
09/07/87	329	1	130		NONE	200	LANDING								
09/08/87	449	2	0		NONE	200	LANDING	35	130	VFR	DAY	CLEAR		NO	FLOCK
09/08/87	1073	1	1676		NONE	200	UNKNOWN						NONE		
09/09/87	330	2	0		NONE	200	TAKEOFF		140				ATB	NO	
09/10/87	153	1	873022		NONE	300	UNKNOWN								
09/10/87	434		0	6:25:00	NONE	300	TAKEOFF	0	100						
09/12/87	212	2	90		NONE	200	UNKNOWN								
09/12/87	270	1	80	17:40:00	NONE	200	LANDING	0	110			BELOW CLOUDS		NO	YES
09/13/87	154	1	873023		NONE	300	TAKEOFF		+V1				NONE		
09/14/87	172	2	59		NONE	200	UNKNOWN								
09/15/87	155	2	873024	9:06:00	NONE	300	TAKEOFF	0	140	IFR	BRIGHT	CLEAR	ATB	NO	ONE
09/15/87	376	1	180		NONE	200	LANDING						NONE		
09/16/87	156	1	873025	13:33:00	NONE	300	CLIMB			VFR	BRIGHT	CLEAR	NONE		
09/16/87	377		160		NONE	200	UNKNOWN								
09/16/87	1074	1	1677	7:55:00	MULT BIRDS	200	TAKEOFF	0	100			CLOUDY	ATO		SEVERAL
09/17/87	157	1	873026		NONE	300	TAKEOFF		+V1				NONE		
09/17/87	271	1	1168	18:45:00	NONE	200	TAKEOFF	20	150					NO	FLOCK
09/17/87	331	2	0		NONE	200	LANDING		40						
09/18/87	158	1	873027		NONE	300	APPROACH								ONE
09/18/87	167	1	54	16:50:00	NONE	200	TAKEOFF	20	150	VFR			ATB		NO
09/18/87	379	2	160		NONE	200	UNKNOWN								
09/18/87	1075	1	1678	6:30:00	NONE	200	LANDING	0	60			CLEAR	NONE	NO	SEVERAL
09/20/87	332	1	0		NONE	200	TAKEOFF		140				ATO		
09/21/87	621	1	87	9:55:00	NONE	UNK	TAKEOFF	0	140			CLEAR	NONE		FLOCK
09/21/87	673	2	87	13:40:00	NONE	200	TAKEOFF	0	140			CLOUDY	NONE		SEVERAL
09/22/87	159	2	873028	0:43:00	NONE	300	UNKNOWN			VFR	DARK	CLEAR	NONE		
09/22/87	169	1	56	9:57:00	NONE	200	TAKEOFF	0		VFR		OVERCAST	ATO		NO
09/22/87	272	1	110		NONE	200	TAKEOFF								
09/22/87	668	1	87	10:57:00	NONE	200	TAKEOFF	0	150			CLEAR	NONE	NO	
09/22/87	1076	2	1679		NONE	200	UNKNOWN						NONE		
09/23/87	160	1	873029	19:20:00	NONE	300	UNKNOWN			VFR	DARK	CLEAR	NONE		
09/23/87	450	2	0		NONE	200	TAKEOFF		80	VFR	DAY	PARTLY CLOUD	ATO	NO	NO
09/24/87	380	1	150		NONE	200	UNKNOWN								
09/24/87	1077	2	1680		NONE	200	UNKNOWN						NONE		
09/25/87	333	1	120		NONE	200	UNKNOWN								
09/27/87	334	1	130		NONE	200	UNKNOWN								
09/28/87	170	1	57	17:23:00	NONE	200	TAKEOFF			VFR					NO
09/29/87	173	2	60		NONE	200	UNKNOWN								NO
09/30/87	204	1	873030		NONE	300	LANDING						NONE		ONE
10/01/87	189	1	874001		NONE	300	CRUISE					CLEAR	NONE		
10/01/87	213	2	90	19:36:00	NONE	200	TAKEOFF	10	145			CLOUDY	ATB	NO	
10/01/87	613	1	87	19:35:00	NONE	200	CRUISE						ATB		

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
08/28/87	607	1	COMMON SNIPE	6N47		4.		YXJ	FT ST JOHN, CANADA	NO	JT8D	
08/29/87	211	2	COMMON SNIPE	6N47	*	4.4		YXJ	FT. ST. JOHN, B.C., CANADA	NO	JT8D	
08/29/87	268	1	SWALLOW*		2	3.	FRA-LNZ	FRA	FRANKFURT, GERMANY	NO	JT8D	15
08/29/87	326	2					PMR-AKL	PMR	PALMERSTON, NEW ZEALAND	NO	JT8D	
08/29/87	598	1	SWALLOW*		*			LNZ	LONZ, AUSTRIA	NO	UNK	
08/29/87	620	1	EURASIAN KESTREL	5K27	1	7.		LDE	LOURDES, FRANCE	NO	JT8D	
08/30/87	1072	2			1		COK-TRV	COK	COCHIN, INDIA	NO	JT8D	17
08/31/87	149	2					-IAH	XUS	HOUSTON, TEX	YES	CFM56	3
08/31/87	150	1					-KHI	KHI	KARACHI, PAKISTAN	NO	CFM56	3
08/31/87	151	2					-PHX	XUS	PHOENIX, ARIZ	YES	CFM56	3
08/31/87	269	1	GULL*		1		DUS-ZRH	DUS	DUSSELDORF, GERMANY	NO	JT8D	15
08/31/87	669	1			1			FAWH	J.G.STRIJDOM, S. AFRICA	NO	JT8D	
09/01/87	327	1	PIGEON*					FNC	FUNCHAL, PORTUGAL	NO	JT8D	
09/01/87	603	1			1			EBOS	OOSTENDE, BELGIUM	NO	UNK	
09/01/87	604	1			1			WBSB	BRUNEI INTL, MALAYSIA	NO	JT8D	15
09/02/87	328	1			1		MZG-KHH	KHH	KAOHSIUNG, TAIWAN	NO	JT8D	
09/03/87	375	1	COMMON GULL	14N13		15.2		XFO	ENGLAND	NO	JT8D	9A
09/04/87	593	2						MEL	MELBOURNE, AUSTRALIA	NO	CFM56	3
09/04/87	672	1						IBZ	IBIZA, SPAIN	NO	JT8D	
09/04/87	672	2						IBZ	IBIZA, SPAIN	NO	JT8D	
09/04/87	696	1			*			YSM	FT SMITH, CANADA	NO	JT8D	
09/04/87	696	2			*			YSM	FT SMITH, CANADA	NO	JT8D	
09/05/87	618	1			1			NCE	NICE, FRANCE	NO	CFM56	3
09/06/87	132	2	OSPREY	2K1	1	56.	IAD-MCO	MCO	ORLANDO, FL	YES	JT8D	7
09/06/87	152	1					-DUS	XFO	DUSSELDORF, GERMANY	NO	CFM56	3
09/06/87	599	2	GULL*		1			LNZ	LONZ, AUSTRIA	NO	CFM56	3
09/07/87	329	1						PMR	PALMERSTON, NEW ZEALAND	NO	JT8D	
09/08/87	449	2	GULL*					ORF	NORFOLK, VA	YES	JT8D	15
09/08/87	1073	1			1		-BOM	XFO	INDIA	NO	JT8D	9A
09/09/87	330	2	EURASIAN KESTREL	5K27	1	7.2		ORY	PARIS-ORLY, FRANCE	NO	JT8D	
09/10/87	153	1					-MUC	XFO	MUNICH, GERMANY	NO	CFM56	3
09/10/87	434		BUZZARD OR FALCON*					FRA	FRANKFURT, GERMANY	NO	CFM56	3
09/12/87	212	2					-YYC	XFO	CALGARY, ALTA., CANADA	NO	JT8D	
09/12/87	270	1	HAWK*		1		BEG-MUC	MUC	MUNICH, GERMANY	NO	JT8D	15
09/13/87	154	1					YUL-SDF	YUL	MONTREAL QUE, CANADA	NO	CFM56	3
09/14/87	172	2			1		PLZ-JNB	XFO	SOUTH AFRICA	NO	JT8D	17A
09/15/87	155	2	SHARP-SHINNED HAWK	3K105	1	6.		MAF	MIDLAND/ODESSA, TEX	YES	CFM56	3
09/15/87	376	1					ORD-BHM	BHM	BIRMINGHAM, ALA	YES	JT8D	7
09/16/87	156	1	YELLOW-BILLED CUCKOO	2R51	1	2.	AUS-DAL	AUS	AUSTIN, TEX	YES	CFM56	3
09/16/87	377							XFO		NO	JT8D	9A
09/16/87	1074	1	KITE*		*			PAT	PATNA, INDIA	NO	JT8D	17
09/17/87	157	1					ZRH-AMS	ZRH	ZURICH, SWITZERLAND	NO	CFM56	3
09/17/87	271	1	DOVE*				BHX-FRA	BHX	BIRMINGHAM, ENGLAND	NO	JT8D	15
09/17/87	331	2	GULL*					SCC	PRUDHOE BAY, ALASKA	YES	JT8D	
09/18/87	158	1	MASKED PLOVER	5N24	1	11.8	-CBR	CBR	CANBERRA,A.C.T., AUSTRALIA	NO	CFM56	3
09/18/87	167	1	SPARROW*		1	4.	JNB-PLZ	JNB	JOHANNESBURG, SOUTH AFRICA	NO	JT8D	17A
09/18/87	379	2						XUS		YES	JT8D	15A
09/18/87	1075	1			1		DEL-AGR	AGR	AGRA, INDIA	NO	JT8D	17
09/20/87	332	1						BRU	BRUSSELS, BELGIUM	NO	JT8D	
09/21/87	621	1			1			LDE	LOURDES, FRANCE	NO	UNK	
09/21/87	673	2	SWIFT*		1			IBZ	IBIZA, SPAIN	NO	JT8D	
09/22/87	159	2			1		TUL-STL	XUS	ST. LOUIS, MO	YES	CFM56	3
09/22/87	169	1	DOVE*		1	14.	CPT-PLZ	CPT	CAPE TOWN, SOUTH AFRICA	NO	JT8D	9
09/22/87	272	1	VULTURE*		1			CMG	CORUMBA, BRAZIL	NO	JT8D	
09/22/87	668	1	DOVE*		1			FACT	D.F.MALAN, S. AFRICA	NO	JT8D	
09/22/87	1076	2			1		-PAT	XFO	INDIA	NO	JT8D	17
09/23/87	160	1					AUS-HOU	XUS	HOUSTON, TEX	YES	CFM56	3
09/23/87	450	2	DOVE*		1			BWI	BALTIMORE, MD	YES	JT8D	
09/24/87	380	1						XFO		NO	JT8D	
09/24/87	1077	2					-BOM	XFO	INDIA	NO	JT8D	9A
09/25/87	333	1					ISG-OKA	XFO	JAPAN	NO	JT8D	
09/27/87	334	1					-AKL	XFO	AUCKLAND, NEW ZEALAND	NO	JT8D	
09/28/87	170	1					CLE-IAD	CLE	CLEVELAND, O	YES	JT8D	7
09/29/87	173	2			1		-DEN	XUS	DENVER, COL	YES	JT8D	
09/30/87	204	1			1		-TSV	TSV	TOWNSVILLE, AUSTRALIA	NO	CFM56	3
10/01/87	189	1					MIA-LAX	XUS		YES	CFM56	3
10/01/87	213	2						YYZ	TORONTO, ONT., CANADA	NO	JT8D	
10/01/87	613	1			1				NPEARSON INTL, CANADA	NO	JT8D	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
08/28/87	607	1	A,Q	4					SMALL BIRD, MINOR DAMAGE
08/29/87	211	2	A,C	3					
08/29/87	268	1		9		YES		NO	SYMPTOM - VIBRATION
08/29/87	326	2		9					
08/29/87	598	1		9					SMALL BIRD
08/29/87	620	1		9					MEDIUM BIRD
08/30/87	1072	2	A,C	3		YES		NO	3 F BLDS BENT, DROP IN EPR
08/31/87	149	2		9	NONE			NO	FOUND DURING GROUND INSPECTION
08/31/87	150	1	A	4	NONE	<2		NO	3 FAN BLADES DAMAGED
08/31/87	151	2	A	4	NONE			NO	1 FAN BLADE DAMAGED
08/31/87	269	1		9	COMPRESSOR			NO	
08/31/87	669	1		9					MEDIUM BIRD
09/01/87	327	1		9					
09/01/87	603	1		9					MEDIUM BIRD
09/01/87	604	1		9					SMALL BIRD
09/02/87	328	1	A,H	3					3 FAN BLADES SHINGLED
09/03/87	375	1	A,C	3					
09/04/87	593	2		9					MEDIUM BIRD
09/04/87	672	1		9					SMALL BIRD
09/04/87	672	2		9					SMALL BIRD
09/04/87	696	1		9					SMALL BIRD
09/04/87	696	2		9					SMALL BIRD
09/05/87	618	1		9					SMALL BIRD
09/06/87	132	2	A,K	1				NO	LPC DAMAGED
09/06/87	152	1		9	NONE			NO	FOUND DURING GROUND INSPECTION
09/06/87	599	2		9					LARGE BIRD
09/07/87	329	1		9					
09/08/87	449	2		9					AM EVENT
09/08/87	1073	1		9				NO	
09/09/87	330	2		9	COMPRESSOR				ODOR
09/10/87	153	1		9	NONE			NO	FOUND DURING GROUND INSPRCTION
09/10/87	434			9					
09/12/87	212	2		9					
09/12/87	270	1		9				NO	MEDIUM BIRD
09/13/87	154	1	A,H	3	NONE	2		NO	4 FAN MID ACOUSTICAL PANELS REPLACED
09/14/87	172	2	A,C	3					
09/15/87	155	2	A,B,H	3	NONE			NO	
09/15/87	376	1	A,C	3				NO	
09/16/87	156	1		9	NONE			NO	
09/16/87	377		A,C	3					
09/16/87	1074	1	A,G	2				NO	
09/17/87	157	1		9	NONE			NO	
09/17/87	271	1	A,C	3	NONE			NO	
09/17/87	331	2		9					
09/18/87	158	1		9	NONE			NO	
09/18/87	167	1		9	COMPRESSOR			NO	
09/18/87	379	2	A,G	2					
09/18/87	1075	1		9				NO	
09/20/87	332	1		9	COMPRESSOR				
09/21/87	621	1		9					MEDIUM BIRD
09/21/87	673	2		9					SMALL BIRD
09/22/87	159	2		9	NONE			NO	FOUND DURING GRD INSPEC, ODOR IN CABIN
09/22/87	169	1	A,C	3					
09/22/87	272	1	A,C,L	3					IGV AND COWL DAMAGE,1 FAN BLADE DAMAGED
09/22/87	668	1		9					SMALL BIRD
09/22/87	1076	2	A,H	3				NO	1 F BLD SHINGLED
09/23/87	160	1	A,B	3	NONE			NO	FOUND DURING GROUND INSPECTION
09/23/87	450	2		9					AM EVENT
09/24/87	380		A,G	2					
09/24/87	1077	2	A,D	2				NO	7 F BLDS BENT
09/25/87	333	1		9					
09/27/87	334	1	A,C	3					
09/28/87	170	1	A	4	NONE			NO	
09/29/87	173	2		9	NONE			NO	FOUND DURING GROUND INSPECTION
09/30/87	204	1		9	NONE			NO	ODOR IN CABIN
10/01/87	189	1	A,B,H	3	NONE	2.5		NO	PILOT HEARD ""LOUD ENGINE NOISE""
10/01/87	213	2		9					
10/01/87	613	1		9					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
10/02/87	335	1	120		NONE	200	UNKNOWN								
10/04/87	630	1	87	8:55:00	NONE	200	TAKEOFF	10	140			CLEAR	NONE	NO	ONE
10/04/87	686	2	87	19:10:00	NONE	UNK	TAKEOFF	75				CLOUDY	NONE		
10/05/87	336		120		NONE	200	TAKEOFF	140	130						
10/05/87	381	1	180		NONE	200	LANDING		100						NO
10/06/87	190	2	874002		NONE	300	CLIMB								
10/06/87	337	1	120		NONE	200	TAKEOFF	0	110						
10/06/87	338	1	120		NONE	200	UNKNOWN								
10/07/87	654	1	87	11:43:00	NONE	200	LANDING	0				CLOUDY	NONE	NO	
10/08/87	382	2	190		TRVS FRAC	200	UNKNOWN								
10/08/87	1078	1	1681		MULT ENG	200	UNKNOWN						NONE		
10/08/87	1078	2	1681		MULT ENG	200	UNKNOWN						NONE		
10/10/87	383	2	160	10:30:00	NONE	200	TAKEOFF	0	115				ATO		YES
10/10/87	448		0		NONE		UNKNOWN								
10/11/87	384		170		NONE	200	TAKEOFF	250	170						
10/11/87	601	1	87		NONE	300	APPROACH	100	140			CLEAR	NONE	NO	
10/11/87	616	1	87	16:11:00	NONE	100	TAKEOFF	0					ATB	NO	ONE
10/11/87	683	2	87	9:30:00	NONE	200	PARKED	0				CLEAR	NONE		
10/11/87	1079	2	1079	8:08:00	NONE	200	TAKEOFF	0				CLEAR	NONE		SEVERAL
10/11/87	1080	2	1683		NONE	200	UNKNOWN						NONE		
10/13/87	1081	2	1684	12:00:00	NONE	200	TAKEOFF	0	60				ATO		ONE
10/14/87	191	2	874003		NONE	300	CRUISE						NONE		
10/14/87	214	1	90		NONE	200	UNKNOWN								
10/15/87	385	2	160		NONE	200	UNKNOWN								
10/16/87	192	1	874004		NONE	300	APPROACH						NONE		
10/17/87	386		170		NONE	200	CRUISE	4000	190		DARK				
10/19/87	193	1	874005	15:00:00	NONE	300	LANDING					BELOW CLOUDS	NONE		
10/19/87	661	1	87	20:15:00	MULT BIRDS	300	LANDING	0					NONE		
10/20/87	387	1	160		NONE	200	UNKNOWN								
10/21/87	388		180		NONE	200	TAKEOFF	0		VFR				NO	FLOCK
10/23/87	194	2	874006		NONE	300	UNKNOWN								
10/24/87	168	2	70		NONE	200	UNKNOWN								
10/24/87	195	1	874007	14:36:00	NONE	300	LANDING	0	100						
10/25/87	339	2	0		NONE	200	TAKEOFF						ATO		
10/26/87	176	2	70		NONE	200	UNKNOWN								
10/28/87	182	2	70		NONE	200	UNKNOWN								
10/28/87	187	2	74		TRVS FRAC	200	UNKNOWN								
10/28/87	435		0		NONE	300	UNKNOWN								ONE
10/29/87	389		170		NONE	200	CRUISE	4500	210		DARK				
10/29/87	594	1	87	7:00:00	NONE	300	TAKEOFF	0	130			CLOUDY	NONE		ONE
10/29/87	1082	2	1685		NONE	200	TAKEOFF	0	140			CLEAR	NONE		ONE
10/30/87	273	1	110		NONE	200	TAKEOFF	0					ATO		
10/31/87	174	1	61	14:02:00	NONE	200	TAKEOFF	0	80	VFR	DAY	CLEAR	ATO	NO	FLOCK
10/31/87	675	2	87	18:13:00	NONE	200	LANDING	200	125			CLOUDY	NONE		SEVERAL
11/02/87	196	1	874008	7:00:00	MULT ENG	300	APPROACH	200	135	IFR	DAWN	LOW CLOUDS	NONE		
11/02/87	196	2	874009	7:00:00	MULT ENG	300	APPROACH	200	135	IFR	DAWN	LOW CLOUDS	NONE		
11/03/87	340	2	130		NONE	200	TAKEOFF	0	115				ATO		
11/04/87	422	1	0		MULT BIRDS	200	TAKEOFF		100				ATO		FLOCK
11/05/87	390	2	1375	19:50:00	MULT BIRDS	200	TAKEOFF	0	130		DARK	BELOW CLOUDS	NONE		FLOCK
11/05/87	728	1	215		NONE	200	CLIMB	5000	250	VFR					
11/06/87	183	2	70		NONE	200	UNKNOWN								
11/07/87	184	2	70		NONE	200	UNKNOWN								
11/08/87	177	2	64	22:15:00		200	LANDING	275		VFR			NONE	YES	ONE
11/08/87	652	2	87	20:10:00	NONE	200	UNKNOWN		120			CLEAR	NONE	NO	ONE
11/08/87	1083	1	1686	8:10:00	NONE	200	TAKEOFF	0	128			CLEAR	NONE	NO	
11/09/87	611	2	87	22:22:00	MULT BIRDS	200	LANDING	250	130			CLEAR		YES	SEVERAL
11/09/87	1084	2	1687		NONE	200	UNKNOWN						NONE		
11/10/87	185	2	70		NONE	200	UNKNOWN								
11/10/87	198	1	874010	14:45:00	NONE	300	TAKEOFF	0	90	VFR	BRIGHT	CLEAR	ATO	NO	YES
11/10/87	452	2	0		NONE		LANDING	0							
11/11/87	341	1	130		NONE	200	UNKNOWN								
11/11/87	617	2	87		NONE	100	TAKEOFF	0					OTHER	NO	
11/12/87	175	1	62	13:50:00	MULT BIRDS	200	TAKEOFF	0	75	VFR		CLEAR	ATO		SEVERAL
11/14/87	199	2	874011	12:40:00	NONE	300	TAKEOFF	0	150	VFR	BRIGHT	CLEAR	DIV		
11/14/87	436		0	9:52:00	NONE	300	CLIMB								
11/14/87	729	2	182		NONE	200	UNKNOWN								
11/15/87	200	1	874012		NONE	300	CLIMB						NONE		
11/15/87	274	2	40		NONE	200	UNKNOWN								

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
10/02/87	335	1					ISG-OKA	XFO	JAPAN	NO	JT8D	
10/04/87	630	1			1			HKG	HONG KONG, HONG KONG	NO	JT8D	
10/04/87	686	2	LAPWING*		1			EGNV	TEES-SIDE, ENGLAND	NO	UNK	
10/05/87	336						MMY-OKA	MMY	MIYAKO JIMA, JAPAN	NO	JT8D	
10/05/87	381	1			1		DCA-IAD	IAD	WASHINGTON,DC-DULLES	YES	JT8D	
10/06/87	190	2					PSA-	PSA	PISA, ITALY	NO	CFM56	3
10/06/87	337	1					ISG-OKA	ISG	ISHIGAKI, JAPAN	NO	JT8D	
10/06/87	338	1					MMY-OKA	XFO	JAPAN	NO	JT8D	
10/07/87	654	1	GULL*		1			EICK	CORK, IRELAND	NO	JT8D	
10/08/87	382	2						XFO		NO	JT8D	
10/08/87	1078	1			1		-BOM	XFO	INDIA	NO	JT8D	9A
10/08/87	1078	2			1		-BOM	XFO	INDIA	NO	JT8D	9A
10/10/87	383	2	BUZZARD*				STR-HAD	STR	STUTTGART, GERMANY	NO	JT8D	15
10/10/87	448							BHM	BIRMINGHAM, ALA	YES		
10/11/87	384							FCO	ROME-DA VINCI, ITALY	NO	JT8D	15
10/11/87	601	1			1			LOWW	WIEN-SCHWECHAT, AUSTRIA	NO	CFM56	3
10/11/87	616	1	COMMON BUZZARD	3K180	1	32.		LFBO	BLAGNAC, FRANCE	NO	JT8D	
10/11/87	683	2						GLA	GLASGOW, SCOTLAND	NO	JT8D	
10/11/87	1079	2			1		AMD-BLR	AMD	AHMEDABAD, INDIA	NO	JT8D	17
10/11/87	1080	2			1		-AMD	XFO	INDIA	NO	JT8D	17A
10/13/87	1081	2	SPARROW*		1			BDQ	VADODARA, INDIA	NO	JT8D	17
10/14/87	191	2					-BEG	XFO	BELGRADE, YUGOSLAVIA	NO	CFM56	3
10/14/87	214	1					-YUL	XFO	MONTREAL, QUE., CANADA	NO	JT8D	
10/15/87	385	2						XFO	MALAYSIA	NO	JT8D	15
10/16/87	192	1	COMMON GULL	14N13	1	14.	BRS-FAO	FAO	FARO, PORTUGAL	NO	CFM56	3
10/17/87	386							XFO		NO	JT8D	15
10/19/87	193	1					-NCL	NCL	NEWCASTLE, ENGLAND	NO	CFM56	3
10/19/87	661	1			*			AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
10/20/87	387	1						XUS		YES	JT8D	9A
10/21/87	388		SPARROW*				SFO-SBA	SFO	SAN FRANCISCO/OAKLAND, CA	YES	JT8D	
10/23/87	194	2					-PEK	XFO	BEIJING, CHINA	NO	CFM56	3
10/24/87	168	2			1			XFO		NO	JT8D	
10/24/87	195	1			1		-MIA	MIA	MIAMI, FL	YES	CFM56	3
10/25/87	339	2						AUS	AUSTIN, TEX	YES	JT8D	
10/26/87	176	2			1			XFO		NO	JT8D	
10/28/87	182	2			1			XFO		NO	JT8D	
10/28/87	187	2						XFO		NO	JT8D	17
10/28/87	435							XFO	GERMANY	NO	CFM56	3
10/29/87	389							XFO		NO	JT8D	15
10/29/87	594	1	AUSTRALIAN BELL MAGPIE	2327	1	11.		ROK	ROCKHAMPTON, AUSTRALIA	NO	CFM56	3
10/29/87	1082	2	VULTURE*		1		MAA-BLR	MAA	MADRAS, INDIA	NO	JT8D	9A
10/30/87	273	1			1			CGR	CAMPO GRANDE, BRAZIL	NO	JT8D	
10/31/87	174	1	GULL*				MFR-SFO	MFR	MEDFORD, OR	YES	JT8D	7
10/31/87	675	2	LITTLE OWL	2S100	1	5.8		LERS	REUS, SPAIN	NO	JT8D	
11/02/87	196	1	BLACK HEADED GULL	14N36		9.7	-MAN	MAN	MANCHESTER, ENGLAND	NO	CFM56	3
11/02/87	196	2	BLACK HEADED GULL	14N36		9.7	-MAN	MAN	MANCHESTER, ENGLAND	NO	CFM56	3
11/03/87	340	2						IVC	INVERCARGILL, NEW ZEALAND	NO	JT8D	
11/04/87	422	1			*			LAX	LOS ANGELES, CA	YES	JT8D	15
11/05/87	390	2	GULL*		2		AMS-FRA	AMS	AMSTERDAM, NETHERLANDS	NO	JT8D	15
11/05/87	728	1					FRA-MUC	FRA	FRANKFURT, GERMANY	NO	JT8D	15
11/06/87	183	2			1			XFO		NO	JT8D	
11/07/87	184	2			1			XFO		NO	JT8D	
11/08/87	177	2	SNOW GOOSE	2J26	1	88.	YYZ-YVR	YVR	VANCOUVER, B.C., CANADA	NO	JT8D	17A
11/08/87	652	2						HYD	HYDERABAD, INDIA	NO	JT8D	
11/08/87	1083	1	KITE*		1			IXE	INDIA	NO	JT8D	17
11/09/87	611	2	GOOSE*		*			YVR	VANCOUVER, CANADA	NO	JT8D	
11/09/87	1084	2					AMD-BLR	XFO	INDIA	NO	JT8D	17
11/10/87	185	2			1			XFO		NO	JT8D	
11/10/87	198	1	GREAT EGRET	1152	1	38.4	IAH-	IAH	HOUSTON, TEX	YES	CFM56	3
11/10/87	452	2			1			SFO	SAN FRANCISCO/OAKLAND, CA	YES		
11/11/87	341	1					-WLG	XFO	WELLINGTON, NEW ZEALAND	NO	JT8D	
11/11/87	617	2	COMMON SKYLARK	17Z72	1	1.5		LFBO	BLAGNAC, FRANCE	NO	JT8D	
11/12/87	175	1	PIGEON*		2			ADD	ADDIS ABABA, ETHIOPIA	NO	JT8D	17A
11/14/87	199	2					BHX-PMI	BHX	BIRMINGHAM, ENGLAND	NO	CFM56	3
11/14/87	436							MUC	MUNICH, GERMANY	NO	CFM56	3
11/14/87	729	2						XFO	BRUSSELS, BELGIUM	NO	JT8D	17A
11/15/87	200	1					DUS-	DUS	DUSSELDORF, GERMANY	NO	CFM56	3
11/15/87	274	2						XFO		NO	JT8D	15

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
10/02/87	335	1		9					
10/04/87	630	1		9					SMALL BIRD
10/04/87	686	2		9					MEDIUM BIRD
10/05/87	336			9					
10/05/87	381	1		9					SMALL BIRD
10/06/87	190	2	A,B,H	3	NONE			NO	
10/06/87	337	1		9					
10/06/87	338	1		9					
10/07/87	654	1		9					LARGE BIRD
10/08/87	382	2	A,I	1		HIGH			
10/08/87	1078	1		9				NO	FOUND ON GRD INSPEC
10/08/87	1078	2		9				NO	FOUND ON GRD INSPEC
10/10/87	383	2	A,D,G	2	NONE			NO	ENG REMOVED, FAN AND DOWNSTREAM DAMAGE
10/10/87	448		A,B	3					FOUND DURING GROUND INSPECTION
10/11/87	384			9					
10/11/87	601	1		9					SMALL BIRD
10/11/87	616	1		9					LARGE BIRD
10/11/87	683	2		9					
10/11/87	1079	2	A,B	3				NO	3 F BLDS MINOR LE DAMAGE
10/11/87	1080	2	A,B	3				NO	1 F BLD MINOR LE DAMAGE
10/13/87	1081	2		9				NO	
10/14/87	191	2	A,B	3	NONE			NO	TIP CORNER LE BENT ON 5 FAN BLADES
10/14/87	214	1		9					
10/15/87	385	2	A,C	3					
10/16/87	192	1		9	NONE			NO	
10/17/87	386			9					NIGHT EVENT
10/19/87	193	1	A,H	3	NONE			NO	
10/19/87	661	1	A,Q	4					3 FAN BLADES DAMAGED
10/20/87	387	1	A,C	3					
10/21/87	388			9					
10/23/87	194	2	A,B,H	3	NONE			NO	FOUND DURING GROUND INSPECTION
10/24/87	168	2	A,C	3					1 FAN BLADE BENT
10/24/87	195	1		9	NONE			NO	
10/25/87	339	2		9	COMPRESSOR				
10/26/87	176	2	A,C	3					
10/28/87	182	2	A,C	3					
10/28/87	187	2	A,I	1					2, 1st STAGE F BLADES WERE FRAC, 2nd DAM
10/28/87	435			9					
10/29/87	389			9					NIGHT EVENT
10/29/87	594	1		9					MEDIUM BIRD
10/29/87	1082	2		9				NO	
10/30/87	273	1		9					SMALL BIRD
10/31/87	174	1	A,D,G,K	1	COMPRESSOR			YES	HPC+LPC DAMAGE, 1 COMP BLADE TRVS FRAC
10/31/87	675	2		9					
11/02/87	196	1	A,H	3	NONE	NONE		NO	
11/02/87	196	2		9	NONE			NO	
11/03/87	340	2	A,H	3					
11/04/87	422	1		9					
11/05/87	390	2		9	NONE			NO	
11/05/87	728	1	A,H	3				NO	
11/06/87	183	2	A,C	3					
11/07/87	184	2	A,C	3					
11/08/87	177	2	A,D,H,N	2					
11/08/87	652	2		9					SMALL BIRD
11/08/87	1083	1		9				NO	
11/09/87	611	2	A,Q	4				YES	MINOR DAMAGE, LARGE BIRD
11/09/87	1084	2		9				NO	FOUND ON GRD INSPEC
11/10/87	185	2	A,B,C	3					
11/10/87	198	1	A,D,G	2				NO	TIP PCE BRK (3.5X2.5IN), ACOU LINER TORN
11/10/87	452	2		9					
11/11/87	341	1		9					
11/11/87	617	2		9					SMALL BIRD
11/12/87	175	1	A,D	2	COMPRESSOR		IDLE	NO	SURGES CONTINUES AT IDLE, HIGH EGT
11/14/87	199	2	A,H	3	NONE			NO	ODOR IN CABIN,EVIDENCE OF DEBRIS IN CORE
11/14/87	436		A	4					
11/14/87	729	2	A,E,K	1					IMPACT DAMAGE IN LOW + HIGH COMPRESSOR
11/15/87	200	1	A,H	3	NONE	5.0		NO	
11/15/87	274	2		9					FOUND DURING GROUND INSPECTION

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
11/16/87	437		0	14:45:00	NONE	300	CRUISE								
11/18/87	391		170		NONE	200	UNKNOWN				DARK				
11/20/87	695	1	87	18:00:00	NONE	200	TAKEOFF	0	120			CLOUDY	NONE	NO	
11/22/87	1085	1	1688	19:25:00	NONE	200	TAKEOFF	0	100			CLEAR	ATO	NO	ONE
11/23/87	201	1	874013	17:00:00	NONE	300	TAKEOFF		+V1		DUSK		ATB		YES
11/23/87	215	1	90		NONE	200	UNKNOWN								
11/23/87	275		110		NONE	200	TAKEOFF								
11/23/87	421	1	0		MULT ENG	300	TAKEOFF						ATB		
11/23/87	421	2	0		MULT ENG	300	TAKEOFF						ATB		
11/24/87	392	2	1377	7:55:00	NONE	200	CLIMB	1000	160				NONE		SEVERAL
11/24/87	646	2	87	14:30:00	NONE	200	TAKEOFF	10	138			CLEAR	ATB	NO	SEVERAL
11/25/87	202	2	874014		NONE	300	TAKEOFF		+V1						
11/25/87	393		180	21:50:00	NONE	200	TAKEOFF	0	135	VFR		CLEAR	ATO		
11/26/87	342	2	0		NONE	200	TAKEOFF								
11/26/87	453	1	0		MULT ENG-BIRDS	200	TAKEOFF	0	120	VFR	DAY	PARTLY CLOUD		NO	FLOCK
11/26/87	453	2	0		MULT ENG-BIRDS	200	TAKEOFF	0	120	VFR	DAY	PARTLY CLOUD		NO	FLOCK
11/26/87	656	1	87	11:05:00	MULT BIRDS	200	TAKEOFF	0	142			RAIN	NONE		SEVERAL
12/01/87	1087	2	1690	19:32:00	NONE	200	TAKEOFF	0	90			CLEAR	ATO	NO	ONE
12/02/87	179	2	66	20:00:00	NONE	200	TAKEOFF	0		VFR					NO
12/02/87	343	2	120		NONE	200	UNKNOWN								
12/02/87	639	2	87	16:37:00	NONE	200	TAKEOFF	0	130			CLEAR	NONE	NO	ONE
12/03/87	216	1	90	9:13:00	NONE	200	TAKEOFF	0					ATB		
12/04/87	344	2	0		NONE	200	TAKEOFF	0	123						
12/04/87	688	1	87	12:05:00	MULT BIRDS	300	APPROACH						NONE		
12/06/87	217	2	84		MULT BIRDS	200	TAKEOFF								FLOCK
12/06/87	276	2	80		NONE	200	TAKEOFF								
12/08/87	277	2	110		NONE	200	TAKEOFF	0					ATO		
12/08/87	651	1	87		NONE	200	UNKNOWN					CLEAR	NONE	NO	
12/11/87	180	1	67	7:20:00	MULT BIRDS	200	LANDING	0	100	VFR	TWILIGHT				FLOCK
12/12/87	394	2	150		NONE	200	UNKNOWN								
12/13/87	731	2	240		NONE	200	UNKNOWN								
12/15/87	203	1	874015		NONE	300	LANDING						NONE		FLOCK
12/15/87	678	1	87		NONE	200	TAKEOFF	0					ATB		
12/15/87	732	1	1235		NONE	200	TAKEOFF	210					ATB		
12/17/87	181		68	15:00:00	MULT BIRDS	200	TAKEOFF								NO
12/20/87	278	1	69		NONE	200	LANDING	50	110	VFR	DAY	PARTLY CLOUD			YES
12/23/87	219	2	90		NONE	200	UNKNOWN								
12/24/87	1086	2	1689		NONE	200	TAKEOFF	0					ATO		
12/27/87	641	2	87	8:22:00	NONE	200	TAKEOFF	0	70			CLOUDY	ATO	NO	ONE
12/28/87	670	1	87	16:35:00	NONE	200	LANDING	0	110			CLEAR	NONE	NO	
12/29/87	186	2	73		NONE	200	UNKNOWN								
01/03/88	733	2	260		NONE	200	UNKNOWN								
01/03/88	1088	1	1691	8:49:00	NONE	200	TAKEOFF	0	100				ATO	NO	SEVERAL
01/03/88	1234	1	88		NONE	100	APPROACH						NONE	NO	
01/04/88	535	1	1424		NONE	200	TAKEOFF								
01/04/88	1297	1	88		NONE	200	APPROACH	1000	130			CLEAR	NONE	NO	SEVERAL
01/05/88	1089	2	1692		NONE	200	TAKEOFF	0					ATO		
01/07/88	279	2	71	23:15:00	NONE	200	TAKEOFF	0	60				ATO		NO
01/07/88	395		140		NONE	200	UNKNOWN								
01/11/88	283	2	881001		NONE	300	CLIMB						NONE		
01/14/88	734	2	220		NONE	200	UNKNOWN								
01/15/88	220	1	77		NONE	200	UNKNOWN								
01/17/88	1090	2	1693	10:58:00	NONE	200	TAKEOFF	0	100			CLEAR	ATO	NO	ONE
01/19/88	221	1	90		NONE	200	UNKNOWN								
01/19/88	1091	2	1694	18:40:00	NONE	200	TAKEOFF	0	140			CLEAR	ATO	NO	ONE
01/20/88	1092	2	1695	18:50:00	NONE	200	LANDING	200	125				NONE	NO	ONE
01/20/88	1225	1	88	10:15:00	MULT ENG-BIRDS	300	LANDING	200	130			RAIN	NONE		SEVERAL
01/20/88	1225	2	88	10:15:00	MULT ENG-BIRDS	300	LANDING	200	130			RAIN	NONE		SEVERAL
01/21/88	735	1	220		NONE	200	TAKEOFF	0	140				ATO		
01/22/88	736	2	220		NONE	200	UNKNOWN								
01/25/88	222	2	78		NONE	200	LANDING			VFR					
01/25/88	284	2	881002		NONE	300	UNKNOWN						NONE		
01/25/88	285	1	881003		NONE	300	TAKEOFF		+V1				NONE		
01/27/88	1272	1	88	9:57:00	NONE	200	TAKEOFF	0	150			CLOUDY	ATB	NO	SEVERAL
01/27/88	1292	2	88		MULT BIRDS	200	APPROACH	600	130			CLEAR	NONE	NO	FLOCK
01/28/88	223	1	91	12:05:00	NONE	200	TAKEOFF	0		VFR					YES
01/30/88	286	2	881004		NONE	300	UNKNOWN						NONE		
02/01/88	396	2	1312		NONE	200	LANDING								

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
11/16/87	437							HAM	HAMBURG, GERMANY	NO	CFM56	3
11/18/87	391						-HAM	XFO	HAMBURG, GERMNAY	NO	JT8D	15
11/20/87	695	1			1			FVCP	PRINCE CHARLES, ZIMBABWE	NO	JT8D	
11/22/87	1085	1			1			BOM	BOMBAY, INDIA	NO	JT8D	9A
11/23/87	201	1					DAY-	DAY	DAYTON, O	YES	CFM56	3
11/23/87	215	1					-YOW	XFO	OTTAWA, ONT., CANADA	NO	JT8D	
11/23/87	275				1		SLZ-BEL	SLZ	SAO LUIZ, BRAZIL	NO	JT8D	
11/23/87	421	1						DAY	DAYTON, O	YES	CFM56	3
11/23/87	421	2						DAY	DAYTON, O	YES	CFM56	3
11/24/87	392	2	GULL*				DUS-STR	DUS	DUESSELDORF, GERMANY	NO	JT8D	15
11/24/87	646	2	KITE*					SXR	SRINAGAR, INDIA	NO	JT8D	
11/25/87	202	2	BLACK KITE	3K28		27.5	-KHI	XFO	KARACHI, PAKISTAN	NO	CFM56	3
11/25/87	393				1		SFO-RNO	SFO	SAN FRANCISCO/OAKLAND, CA	YES	JT8D	17
11/26/87	342	2						ISG	ISHIGAKI, JAPAN	NO	JT8D	
11/26/87	453	1	DOVE*		1			LIH	LIHUE, KAUAI, HAWAII	YES	JT8D	9A
11/26/87	453	2	DOVE*		2			LIH	LIHUE, KAUAI, HAWAII	YES	JT8D	9A
11/26/87	656	1	GULL*		*			LIPE	BORGO PANIGALE, ITALY	NO	JT8D	
12/01/87	1087	2			1		BOM-AMD	BOM	BOMBAY, INDIA	NO	JT8D	9A
12/02/87	179	2	GOLDEN PLOVER	5N25	1	6.	KOA-HNL	KOA	KONA, HAWAII	YES	JT8D	9A
12/02/87	343	2					OKA-MMY	XFO	JAPAN	NO	JT8D	
12/02/87	639	2						GAU	GAUHATI, INDIA	NO	JT8D	
12/03/87	216	1			1			YQB	QUEBEC, QUE., CANADA	NO	JT8D	
12/04/87	344	2					ISG-OKA	ISG	ISHIGAKI, JAPAN	NO	JT8D	
12/04/87	688	1			*			LHR	LONDON-HEATHROW, ENGLAND	NO	CFM56	3
12/06/87	217	2			*		ACA-YWG	ACA	ACAPULCO, MEXICO	NO	JT8D	17A
12/06/87	276	2						XFO		NO	JT8D	17A
12/08/87	277	2			1			AJU	ARACAJU, BRAZIL	NO	JT8D	7
12/08/87	651	1							CHANDIGARH-DELHI, INDIA	NO	JT8D	
12/11/87	180	1	HUNGARIAN PARTRIDGE	4L85	3	8.	TXL-HAJ	HAJ	HANOVER, GERMANY	NO	JT8D	15A
12/12/87	394	2						XFO		NO	JT8D	
12/13/87	731	2						XFO		NO	JT8D	17
12/15/87	203	1	GULL*				-DUB	DUB	DUBLIN, IRELAND	NO	CFM56	3
12/15/87	678	1			1			DTTA	CARTHAGE, TUNISIA	NO	JT8D	
12/15/87	732	1						ORY	PARIS-ORLY, FRANCE	NO	JT8D	
12/17/87	181		COMMON LAPWING	5N1	2	6.		XFO	LASHAM, ENGLAND	NO	JT8D	17
12/20/87	278	1	OWL*		1		BOS-CLT	CLT	CHALOTTE, NC	YES	JT8D	15
12/23/87	219	2					-YYC	XFO	CALGARY, ALTA., CANADA	NO	JT8D	
12/24/87	1086	2					SXR-IXJ	SXR	SRINAGAR, INDIA	NO	JT8D	17
12/27/87	641	2						MAA	MADRAS, INDIA	NO	JT8D	
12/28/87	670	1	IBISE*		1			JNB	JAN SMUTS, S. AFRICA	NO	JT8D	
12/29/87	186	2						LOS	LAGOS, NIGERIA	NO	JT8D	15
01/03/88	733	2						XFO	TAIWAN	NO	JT8D	7A
01/03/88	1088	1	VULTURE*		1			CJB	COIMBATORE, INDIA	NO	JT8D	9A
01/03/88	1234	1	BLACK-HEADED GULL	14N36	1	10.		NCE	NICE, FRANCE	NO	JT8D	
01/04/88	535	1			1			MDQ	MAR DEL PLATA, ARGENTINA	NO	JT8D	9
01/04/88	1297	1	GULL*		1			SMI	SAMOS, GREECE	NO	JT8D	
01/05/88	1089	2						COK	COCHIN, INDIA	NO	JT8D	17
01/07/88	279	2	GULL*		1		DUR-PLZ	DUR	DURBAN, S. AFRICA	NO	JT8D	9
01/07/88	395						-KIN	XFO	KINGSTON, JAMAICA	NO	JT8D	15
01/11/88	283	2	BROWN FALCON	5K39	1	18.5		MEL	MELBOURNE, AUSTRALIA	NO	CFM56	3
01/14/88	734	2					-MDQ	XFO	MAR DEL PLATA, ARGENTINA	NO	JT8D	9
01/15/88	220	1					-TRV	XFO	TRIVANDRUM, INDIA	NO	JT8D	17A
01/17/88	1090	2					BLR-TRV	BLR	BANGALORE, INDIA	NO	JT8D	15
01/19/88	221	1					-YYC	XFO	CALGARY, ALTA., CANADA	NO	JT8D	
01/19/88	1091	2			1			HYD	HYDERABAD, INDIA	NO	JT8D	17A
01/20/88	1092	2	KITE*		1		-BOM	XFO	INDIA	NO	JT8D	9A
01/20/88	1225	1			*			CNS	CAIRNS, AUSTRALIA	NO	CFM56	3
01/20/88	1225	2			*			CNS	CAIRNS, AUSTRALIA	NO	CFM56	3
01/21/88	735	1						SLA	SALTA, ARGENTINA	NO	JT8D	9
01/22/88	736	2			1		-AEP	XFO	BUENOS AIRES, ARGENTINA	NO	JT8D	9
01/25/88	222	2			1		TAN-CAS	CAS	CASABLANCA, MOROCCO	NO	JT8D	
01/25/88	284	2					-AMS	XFO	AMSTERDAM, NETHERLANDS	NO	CFM56	3
01/25/88	285	1	GOLDEN PLOVER	5N25		7.	GHB-LWG	GHB	GOVERNORS HARBOUR, BAHAMAS	NO	CFM56	3
01/27/88	1272	1	GULL*		1			LTN	LUTON, ENGLAND	NO	JT8D	
01/27/88	1292	2	GULL*		*			SMF	SACRAMENTO, CA	YES	JT8D	
01/28/88	223	1	BAR-SHOULDERED DOVE	2P103	1	2.	LIH-HNL	LIH	LIHUE, KAUAI, HAWAII	YES	JT8D	9A
01/30/88	286	2					-ONT	XUS	ONTARIO, CA	YES	CFM56	3
02/01/88	396	2						GOT	GOTHENBURG, SWEDEN	NO	JT8D	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
11/16/87	437		A	4					
11/18/87	391			9					NIGHT EVENT
11/20/87	695	1		9					SMALL BIRD
11/22/87	1085	1		9				NO	
11/23/87	201	1	A,B	3	NONE	INC.		NO	
11/23/87	215	1	A,C	3					
11/23/87	275			9					CABIN ODOR
11/23/87	421	1	A,D	2					REPLACED FOUR PAIRS OF FAN BLADES
11/23/87	421	2		9					
11/24/87	392	2		9	NONE			NO	
11/24/87	646	2		9					SMALL BIRD
11/25/87	202	2	A	4	NONE	4.5		NO	3 STAGE 1 BOOSTER VANES SHEARED OFF
11/25/87	393			9				NO	
11/26/87	342	2	A,C	3					
11/26/87	453	1		9					PM EVENT
11/26/87	453	2		9					PM EVENT
11/26/87	656	1	A,Q	4					MEDIUM BIRD, MINOR DAMAGE
12/01/87	1087	2	A,G,K	1		HIGH		VIBES	BLD PIECES THRU CORE, OIL PRESS DROPPING
12/02/87	179	2	A,C	3	NONE			NO	FOUND ON GROUND INSPEC DUE TO ENG ODOR
12/02/87	343	2		9					
12/02/87	639	2		9					SMALL BIRD
12/03/87	216	1	A,C	3					
12/04/87	344	2		9					
12/04/87	688	1		9					
12/06/87	217	2	A,D	2	COMPRESSOR			NO	EPR SYMPTOM, CABIN ODOR, SMALL BIRDS
12/06/87	276	2	A,C	3					
12/08/87	277	2		9					
12/08/87	651	1	A,Q	4		HIGH			SUBSTANTIAL FAN BLADE DAMAGE
12/11/87	180	1	A,D,H	2	NONE			NO	
12/12/87	394	2	A,C	3					
12/13/87	731	2	A,G	2					ENGINE REMOVED
12/15/87	203	1		9	NONE	NONE		NO	
12/15/87	678	1	A,Q	4					6 FAN BLADES DAMAGED, ENGINE REMOVED
12/15/87	732	1	A,G	2	COMPRESSOR	HIGH		VIBES	
12/17/87	181		A,C	3	COMPRESSOR				
12/20/87	278	1	A,G	2					ENGINE REMOVED
12/23/87	219	2		9					
12/24/87	1086	2		9				NO	
12/27/87	641	2		9					MEDIUM BIRD
12/28/87	670	1		9					LARGE BIRD
12/29/87	186	2	A,C	3					
01/03/88	733	2	A,D	2					4 FAN BLADES BLENDED ON WING
01/03/88	1088	1	A,K	1				NO	FAN CHANGED, COMP BLDS BENT
01/03/88	1234	1		9					
01/04/88	535	1		9					DECREASE OF .05 IN EPR AND A DROP IN RPM
01/04/88	1297	1		9					
01/05/88	1089	2		9				NO	
01/07/88	279	2		9					
01/07/88	395		A,G	2					
01/11/88	283	2		9	NONE			NO	
01/14/88	734	2	A,C	3					
01/15/88	220	1	A,C	3					ENGINE REMOVED
01/17/88	1090	2		9				NO	
01/19/88	221	1		9					
01/19/88	1091	2		9				NO	
01/20/88	1092	2		9				NO	
01/20/88	1225	1		9					
01/20/88	1225	2		9					
01/21/88	735	1		9	NONE			NO	
01/22/88	736	2		9					
01/25/88	222	2	A,C	3					2 FAN BLADE SETS REPLACED
01/25/88	284	2		9	NONE			NO	FOUND DURING GROUND INSPECTION
01/25/88	285	1	A,C,H	3	NONE	3.0		NO	3 MATCHED PAIRS OF FAN BLADES REPLACED
01/27/88	1272	1	A,Q	4					4 F BLDS UNK DAMAGE
01/27/88	1292	2		9					
01/28/88	223	1	A,C	3					INGESTION CAUSED ENGINE ""HUM""
01/30/88	286	2		9	NONE			NO	FOUND DURING GROUND INSPECTION
02/01/88	396	2		9					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
02/04/88	1264	1	88	19:40:00	NONE	300	LANDING					OVERCAST	NONE		
02/05/88	737	1	260		NONE	200	UNKNOWN								
02/05/88	1253	2	88	7:18:00	NONE		LANDING	0	125			OVERCAST	NONE	NO	ONE
02/06/88	287	1	881005	16:35:00	MULT BIRDS	300	CLIMB	500	160	VFR	DUSK	CLEAR	NONE		FLOCK
02/06/88	738	1	260		NONE	200	UNKNOWN								
02/06/88	739	1	260		NONE	200	UNKNOWN								
02/07/88	289	2	881007		NONE	300	LANDING	0					NONE		SEVERAL
02/08/88	290	1	881008	8:30:00	NONE	300	CRUISE						NONE		
02/08/88	740	2	260		NONE	200	UNKNOWN								
02/09/88	288	1	881006		NONE	300	UNKNOWN						NONE		
02/10/88	291	2	881009	22:00:00	INV POW LOSS	300	TAKEOFF	100	128		DARK	RAIN	ATB	NO	NO
02/11/88	292	1	881010		NONE	300	UNKNOWN						NONE		
02/11/88	397	1	1306		NONE	200	LANDING								
02/15/88	280	1	72	18:15:00	NONE	200	TAKEOFF	250	145	VFR			DIV		YES
02/15/88	398	2	1331		NONE	200	UNKNOWN								
02/15/88	1093	2	1696	12:20:00	NONE	200	APPROACH	4000	210			CLOUDY	NONE	NO	SEVERAL
02/15/88	1223	1	88		NONE	100	TAKEOFF	0					NONE	NO	
02/16/88	1094	1	1697	12:30:00	NONE	200	TAKEOFF	0	146			CLEAR	NONE	NO	
02/18/88	399	1	1311		NONE	200	UNKNOWN								
02/18/88	1095	2	1698	6:55:00	NONE	200	LANDING	0	80			OVERCAST	NONE	NO	SEVERAL
02/19/88	281	2	76		NONE	200	UNKNOWN								
02/19/88	293	1	881011	7:10:00	NONE	300	TAKEOFF	0	60	VFR		CLEAR	NONE	YES	ONE
02/20/88	741	1	220		NONE	200	TAXI	0	10						
02/21/88	1096	1	1699	5:55:00	NONE	200	TAKEOFF	0				FOG	ATO	NO	
02/24/88	294	1	881012	14:40:00	NONE	300	LANDING	0	125			CLOUDY	NONE		ONE
02/24/88	742	1	220		NONE	200	UNKNOWN								
02/26/88	400	1	1309		NONE	200	UNKNOWN								
02/27/88	295	1	881013		NONE	300	CRUISE								
02/27/88	743	2	220		NONE	200	LANDING	200	140				NONE		
02/28/88	401	1	160		NONE	200	UNKNOWN								
03/02/88	1097	1	1700	14:45:00	NONE	200	LANDING	0	65				NONE	NO	ONE
03/07/88	402	1	180		NONE	200	LANDING	100	150						
03/07/88	1304	1	88		NONE	200	APPROACH						NONE		
03/10/88	744	1	196	17:30:00	NONE	200	TAKEOFF	0	100			OVERCAST	NONE	NO	ONE
03/11/88	282	2	81		NONE	200	TAKEOFF								
03/13/88	296	2	881014		NONE	300	LANDING					CLEAR	NONE		
03/13/88	1228	2	88	10:35:00	NONE	200	TAKEOFF	0	110			CLEAR	ATO		SEVERAL
03/14/88	297	2	881015		NONE	300	UNKNOWN						NONE		
03/18/88	745	2	220		NONE	200	APPROACH	500	160						
03/18/88	1284	1	88	11:05:00	NONE	300	LANDING		100			CLEAR	OTHER		ONE
03/20/88	298	1	881016	11:10:00	NONE	300	APPROACH	1150	120			CLOUDY	NONE		ONE
03/21/88	746	1	198	10:40:00	NONE	200	APPROACH		140			OVERCAST	NONE	NO	NO
03/22/88	1098	2	1701	19:37:00	NONE	200	LANDING	0	130				NONE	NO	ONE
03/22/88	1270	1	88	17:55:00	MULT ENG-BIRDS	200	TAKEOFF	50	145			CLEAR	NONE	NO	
03/22/88	1270	2	88	17:55:00	MULT ENG-BIRDS	200	TAKEOFF	50	145			CLEAR	NONE	NO	
03/24/88	299	2	881017	18:40:00	NONE	300	CLIMB	300			OVERCAST	CLOUDY	ATB		
03/25/88	403	1	1308		NONE	200	UNKNOWN								
03/29/88	1249	1	88	11:30:00	MULT ENG-BIRDS	200	CLIMB	700	170			CLEAR	OTHER		FLOCK
03/29/88	1249	2	88	11:30:00	MULT ENG-BIRDS	200	CLIMB	700	170			CLEAR	OTHER		FLOCK
03/29/88	1259	1	88	20:02:00	MULT BIRDS	200	TAKEOFF	0	130			CLEAR	NONE	NO	
03/30/88	1099	2	1702	8:53:00	MULT BIRDS	200	LANDING	0	110			CLOUDY	NONE	NO	FLOCK
04/01/88	404	1	99		NONE	200	TAKEOFF								
04/02/88	346	2	82		NONE	200	TAKEOFF								
04/02/88	405	1	102	3:10:00	NONE	200	TAKEOFF		90	VFR	NIGHT	PARTLY CLOUD		NO	NO
04/03/88	462	1	882001		NONE	300	UNKNOWN								
04/03/88	747	1	220		NONE	200	TAKEOFF	0					ATO		
04/04/88	461	2	882002	6:10:00	NONE	300	TAKEOFF	50	145		DAWN	CLEAR	ATB		
04/06/88	406		140		NONE	200	UNKNOWN								
04/06/88	407	2	180		NONE	200	LANDING								
04/07/88	748	1	166		NONE	200	TAKEOFF								
04/08/88	408	1	95		NONE	200	UNKNOWN						ATO		
04/09/88	463	1	882003	6:10:00	NONE	300	UNKNOWN						NONE		
04/09/88	464	2	882004		NONE	300	UNKNOWN						NONE		
04/10/88	489	2	200		NONE	200	UNKNOWN								
04/12/88	347	2	83		NONE	200	TAKEOFF	350	170	VFR	NIGHT	CLEAR		NO	NO
04/12/88	409	2	1307		NONE	200	UNKNOWN								
04/13/88	411	2	1826		NONE	200	TAKEOFF								
04/13/88	465	1	882005		NONE	300	TAKEOFF		+V1						

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
02/04/88	1264	1	GULL*					SYD	SYDNEY, AUSTRALIA	NO	CFM56	3
02/05/88	737	1						XFO	TAIWAN	NO	JT8D	7A
02/05/88	1253	2						HAJ	HANOVER, GERMANY	NO		
02/06/88	287	1			*		ALC-MAN	ALC	ALICANTE, SPAIN	NO	CFM56	3
02/06/88	738	1						XFO	TAIWAN	NO	JT8D	9A
02/06/88	739	1						XFO	TAIWAN	NO	JT8D	7A
02/07/88	289	2	KITE*		1			LHE	LAHORE, PAKISTAN	NO	CFM56	3
02/08/88	290	1	LONG BILLED CURLEW	6N12	1	27.	SJC-SAN	XUS	CA	YES	CFM56	3
02/08/88	740	2						XFO	TAIWAN	NO	JT8D	7A
02/09/88	288	1					-PHX	XUS	PHOENIX, ARIZONA	YES	CFM56	3
02/10/88	291	2	BARN OWL	1S2	1	12.		GIG	RIO DE JANEIRO, BRAZIL	NO	CFM56	3
02/11/88	292	1									CFM56	3
02/11/88	397	1						DUD	DUNEDIN, NEW ZEALAND	NO	JT8D	
02/15/88	280	1			1		SRQ-TPA	SRQ	SARASOTA/BRADENTON, FL	YES	JT8D	7
02/15/88	398	2						XFO	ENGLAND	NO	JT8D	7
02/15/88	1093	2					GWL-BHO	BHO	BHOPAL, INDIA	NO	JT8D	9A
02/15/88	1223	1	BARN OWL	1S2	1	11.25		BRU	BRUSSELS, BELGIUM	NO	JT8D	
02/16/88	1094	1					IXR-PAT	IXR	RANCHI, INDIA	NO	JT8D	9A
02/18/88	399	1						XFO		NO	JT8D	
02/18/88	1095	2	KITE*		1			HYD	HYDERABAD, INDIA	NO	JT8D	17
02/19/88	281	2					SFO-LAX	SFO	SAN FRANSICO/OAKLAND, CA	YES	JT8D	7
02/19/88	293	1	SPARROW*				DAL-HOU	DAL	DALLAS/FT. WORTH, TEX-LOVE	YES	CFM56	3
02/20/88	741	1	PODAGER NACUNDA*					TUC	TUCUMAN, ARGENTINA	NO	JT8D	9A
02/21/88	1096	1						DEL	DELHI, INDIA	NO	JT8D	9A
02/24/88	294	1	HAWK*		1		-BNE	BNE	BRISBANE, AUSTRALIA	NO	CFM56	3
02/24/88	742	1			1			XFO		NO	JT8D	9
02/26/88	400	1					-CHC	XFO	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
02/27/88	295	1	GULL*				-LPA	XFO	GRANCANARIA, CANARY ISLANDS	NO	CFM56	3
02/27/88	743	2	MILVAGO CHIMANGO*					AEP	BUENOS AIRES, ARGENTINA	NO	JT8D	9A
02/28/88	401	1						XFO		NO	JT8D	17A
03/02/88	1097	1			1			VNS	VARANASI, INDIA	NO	JT8D	17
03/07/88	402	1						EWR	NEW YORK, NY-NEWARK	YES	JT8D	
03/07/88	1304	1	AMERICAN BLACK VULTURE	1K4	1	60.		TBT	TABATINGA, BRASIL	NO	JT8D	
03/10/88	744	1			1		STR-HAJ	STR	STUTTGART, GERMANY	NO	JT8D	15
03/11/88	282	2			1		ITO-HNL	ITO	HILO, HAWAII	YES	JT8D	9A
03/13/88	296	2						LGA	NEW YORK-LA GUARDIA	YES	CFM56	3
03/13/88	1228	2			1			MVD	CARRASCO, URUGUAY	NO	JT8D	
03/14/88	297	2					-GSO	XUS	SALEM, NC	YES	CFM56	3
03/18/88	745	2			1			CTC	CATAMARCA, ARGENTINA	NO	JT8D	9
03/18/88	1284	1			1			ISA	MT. ISA, AUSTRALIA	NO	CFM56	3
03/20/88	298	1			1		-ISA	ISA	MOUNT ISA, AUSTRALIA	NO	CFM56	3
03/21/88	746	1			1		FRA-GVA	GVA	GENEVA, SWITZERLAND	NO	JT8D	15
03/22/88	1098	2			1			BLR	BANGALORE, INDIA	NO	JT8D	9A
03/22/88	1270	1	SWALLOW*		*			DUR	DURBAN, S. AFRICA	NO	JT8D	
03/22/88	1270	2	SWALLOW*		*			DUR	DURBAN, S. AFRICA	NO	JT8D	
03/24/88	299	2						MSY	NEW ORLEANS, LOUISIANA	YES	CFM56	3
03/25/88	403	1					-CHC	XFO	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
03/29/88	1249	1			*			DTMB	HABIB BOURGIBA, TUNISIA	NO	JT8D	
03/29/88	1249	2			*			DTMB	HABIB BOURGIBA, TUNISIA	NO	JT8D	
03/29/88	1259	1			*			JNB	JOHANNESBURG, S. AFRICA	NO	JT8D	
03/30/88	1099	2			*		IXM-MAA	MAA	MADRAS, INDIA	NO	JT8D	17
04/01/88	404	1					ITO-HNL	ITO	HILO, HAWAII	YES	JT8D	9A
04/02/88	346	2					YYJ-YYC	YYJ	CALGARY, ALTA., CANADA	NO	JT8D	
04/02/88	405	1	PLOVER*		1	5.	LIH-HNL	LIH	LIHUE, KAUAI, HAWAII	YES	JT8D	9A
04/03/88	462	1					-YVR	XFO	VANCOUVER, CANADA	NO	CFM56	3
04/03/88	747	1						TUC	TUCUMAN, ARGENTINA	NO	JT8D	9
04/04/88	461	2	BLACKCROWNED NIGHT HERON	1124	1	22.		SMF	SACRAMENTO, CA	YES	CFM56	3
04/06/88	406						-KIN	XFO	KINGSTON, JAMAICA	NO	JT8D	15
04/06/88	407	2					DEN-OKC	OKC	OKLAHOMA CITY, OKLA	YES	JT8D	
04/07/88	748	1			1		INU-NOU	INU	NAURU, REP OF NAURA	NO	JT8D	17
04/08/88	408	1	KITE*			32.		XFO	NIGERIA	NO	JT8D	15
04/09/88	463	1					ATH-BEG	XFO	GREECE-YUGOSLAVIA	NO	CFM56	3
04/09/88	464	2					-PEK	XFO	BEIJING, CHINA	NO	CFM56	3
04/10/88	489	2						KOJ	KAGOSHIMA, JAPAN	NO	JT8D	9A
04/12/88	347	2	PLOVER*		1	14.	OGG-HNL	OGG	KAHULUI, MAUI, HAWAII	YES	JT8D	9A
04/12/88	409	2					-CHC	XFO	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
04/13/88	411	2						FMA	FORMOSA, ARGENTINA	NO	JT8D	9A
04/13/88	465	1						HAM	HAMBURG, GERMANY	NO	CFM56	3

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
02/04/88	1264	1		9					
02/05/88	737	1	A,D	2					4 FAN BLADES CHANGED
02/05/88	1253	2		9					
02/06/88	287	1	A,C,H	3				NO	3 MATCHED PAIRS OF FAN BLADES REPLACED
02/06/88	738	1	A,D	2					7 BLADES BLENDED ON WING
02/06/88	739	1	A,D	2					9 FAN BLADES CHANGED
02/07/88	289	2		9	NONE	SOME		NO	FLUCTUATING VIBRATION INDICATION
02/08/88	290	1	A,L	3	NONE			NO	
02/08/88	740	2	A,D	2					4 FAN BLADES BLENDED ON WING
02/09/88	288	1		9	NONE			NO	
02/10/88	291	2	A,I,M,P	1	YES	HIGH		INVOLUNTARY	HEAVYDAMAGED ACOUSTIC PANELS,LOW OILPRES
02/11/88	292	1		9	NONE			NO	FOUND DURING GROUND INSPECTION
02/11/88	397	1		9					
02/15/88	280	1		9	COMPRESSOR			NO	LARGE BIRD
02/15/88	398	2	A,C	3					
02/15/88	1093	2	A	4				NO	
02/15/88	1223	1		9					
02/16/88	1094	1	A	4				NO	3 F BLDS UNK DAMAGE
02/18/88	399	1		9					ODOR
02/18/88	1095	2		9				NO	
02/19/88	281	2	A,C,K	1				NO	LPC+HPC DAMAGE, FOUND ON GROUND INSPEC.
02/19/88	293	1		9	NONE			NO	ODOR IN COCPIT
02/20/88	741	1		9				NO	
02/21/88	1096	1		9	COMPRESSOR			NO	
02/24/88	294	1		9	NONE			NO	
02/24/88	742	1	A,H	3		SOME			
02/26/88	400	1		9					
02/27/88	295	1	A,B,E,H	3		5		NO	AM EVENT
02/27/88	743	2		9				NO	
02/28/88	401	1	A,H	3					
03/02/88	1097	1		9				NO	
03/07/88	402	1		9					
03/07/88	1304	1		9					
03/10/88	744	1		9					
03/11/88	282	2		9					SMELL
03/13/88	296	2	A,L	3	NONE			NO	
03/13/88	1228	2		9					
03/14/88	297	2		9	NONE			NO	FOUND DURING GROUND INSPECTION
03/18/88	745	2		9					
03/18/88	1284	1		9					
03/20/88	298	1		9	NONE			NO	
03/21/88	746	1		9				NO	
03/22/88	1098	2	A,G	2				NO	8 F BLDS DAMAGED
03/22/88	1270	1		9					
03/22/88	1270	2		9					
03/24/88	299	2	A,D	2			CUTOFF	YES	IFSD+POW LOSS NOT DUE TO BIRD INGESTION
03/25/88	403	1		9					
03/29/88	1249	1		9					
03/29/88	1249	2		9					
03/29/88	1259	1		9					
03/30/88	1099	2		9				NO	
04/01/88	404	1	A,C	3					
04/02/88	346	2		9	COMPRESSOR				
04/02/88	405	1		9					ODOR
04/03/88	462	1	A,D	2				NO	6 SETS OF FAN BLADES CHANGED
04/03/88	747	1		9				NO	
04/04/88	461	2	A,D,G,K	1	NONE	HIGH	RETARD	NO	TIP PIECE BROKEN (5X2.5IN), COWL PUNCS
04/06/88	406		A,G	2					
04/06/88	407	2		9					
04/07/88	748	1		9					
04/08/88	408	1	A,D,G,K	1					HEAVY DAMAGE, HPC DAMAGE
04/09/88	463	1	A,H	3	NONE			NO	FOUND DURING GROUND INSPECTION
04/09/88	464	2		9	NONE			NO	FOUND DURING GROUND INSPECTION
04/10/88	489	2		9					
04/12/88	347	2		9					ODOR, MEDIUM BIRD
04/12/88	409	2		9					
04/13/88	411	2	A	4					ODOR AND NOISE, ENG CHANGED
04/13/88	465	1		9	NONE			NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
04/14/88	410	2	1305		NONE	200	UNKNOWN								
04/16/88	1215	1	88		NONE	200	TAKEOFF	0	150			CLOUDY	NONE		ONE
04/16/88	1265	2	88	14:30:00	NONE	300	TAXI	0	10			CLOUDY	NONE		SEVERAL
04/18/88	1247	2	88	18:30:00	NONE	300	TAKEOFF	0	128			CLEAR	NONE	NO	SEVERAL
04/19/88	466	1	882006	4:40:00	NONE	300	TAKEOFF		+V1		BRIGHT	CLEAR	ATO		
04/20/88	1289	2	88	15:20:00	MULT BIRDS	300	LANDING	75	135			CLOUDY	NONE		SEVERAL
04/21/88	490	1	200		NONE	200	UNKNOWN								
04/22/88	749	2	220		NONE	200	LANDING								
04/24/88	348	2	1293		NONE	200	CLIMB	7000	180						
04/25/88	412	1	180		NONE	200	TAXI	0							
04/26/88	349	1	1257		NONE	200	UNKNOWN								
04/26/88	413	2	180		NONE	200	CLIMB	0	125						
04/26/88	1246	1	88	6:50:00	NONE	100	TAKEOFF	0	119			CLEAR	NONE		
04/27/88	350	1	1294		NONE	200	TAKEOFF						ATB		
04/27/88	351	1	1295		NONE	200	TAKEOFF								
04/27/88	467	1	882007		NONE	300	TAKEOFF		+V1				NONE		
04/28/88	352	1	91		NONE	200	UNKNOWN								
04/28/88	1319	1	88	23:10:00	MULT BIRDS	200	APPROACH	1000	142			CLOUDY	NONE	NO	SEVERAL
04/29/88	414	1	180		NONE	200	LANDING								
04/29/88	1100	1	1703	22:38:00	NONE	200	LANDING	30	126			CLEAR	NONE	NO	ONE
04/29/88	1303	1	88	7:54:00	NONE		LANDING	50	130			CLEAR	NONE	NO	ONE
04/30/88	1293	1	88	21:28:00	NONE	100	LANDING	20	135			CLEAR	OTHER	NO	ONE
05/01/88	353	2	92		NONE	200	TAKEOFF								
05/01/88	750	1	230	19:22:00	MULT BIRDS	200	LANDING	0	90						
05/02/88	354	2	86	20:00:00	TRVS FRAC	200	TAKEOFF	0	115			CLOUDY	DIV	NO	SEVERAL
05/04/88	415	2	103		NONE	200	LANDING	0	90						
05/05/88	468	2	882008	14:30:00	NONE	300	CLIMB			VFR	BRIGHT	CLEAR	NONE		
05/06/88	469	2	882009		NONE	300	UNKNOWN						NONE		
05/10/88	1212	1	88		MULT ENG	100	TAKEOFF	0					NONE	NO	
05/10/88	1212	2	88		MULT ENG	100	TAKEOFF	0					NONE	NO	
05/11/88	416	2	160		NONE	200	UNKNOWN								
05/11/88	470	1	882010	8:46:00	NONE	300	TAKEOFF	0	92			OVERCAST	NONE	NO	SEVERAL
05/11/88	471	1	882011	6:30:00	NONE	300	CLIMB				DAWN	CLEAR			
05/11/88	1251	2	88	11:05:00	NONE	200	APPROACH					CLOUDY	NONE		ONE
05/15/88	417	1	94		NONE	200	TAKEOFF								
05/15/88	1220	1	88		NONE	200	APPROACH	500	140			CLEAR	NONE		SEVERAL
05/17/88	355	1	93		NONE	200	UNKNOWN								
05/19/88	472	1	882012		NONE	300	CLIMB				CLOUDY	RAIN			
05/20/88	456		0		NONE	200	TAKEOFF		130	VFR	DAY	CLEAR		NO	NO
05/20/88	751	2	202		NONE	200	LANDING	0	80	VFR		CLEAR	NONE	NO	ONE
05/21/88	473	1	882013	15:14:00	NONE	300	LANDING	0	110	VFR	DAY	PARTLY CLOUD	NONE	YES	ONE
05/21/88	1256	2	88		NONE	100	LANDING	0					NONE	NO	
05/22/88	418	2	97		TRVS FRAC	200	TAKEOFF								
05/22/88	1288	1	88	9:00:00	MULT BIRDS	200	LANDING	0	110			CLEAR	NONE	NO	SEVERAL
05/22/88	1314	2	88		NONE	100	APPROACH						OTHER	NO	
05/23/88	419	1	96		NONE	200	CLIMB	400	140				ATB		
05/23/88	438	2	112		TRVS FRAC	200	TAKEOFF	0	70				ATO		
05/24/88	1306	2	88	15:25:00	MULT BIRDS	200	TAKEOFF	0	110			CLEAR	NONE		SEVERAL
05/25/88	474	1	882014	9:45:00	MULT BIRDS	300	LANDING	0	125	VFR	BRIGHT	CLEAR	NONE		FLOCK
05/27/88	1101	1	1704	8:30:00	NONE	200	LANDING	0	120			CLEAR	NONE	NO	SEVERAL
05/29/88	1260	1	88	7:10:00	MULT BIRDS	200	TAKEOFF	0	140			OVERCAST	ATO	NO	SEVERAL
06/01/88	475	2	882015	14:18:00	MULT BIRDS	300	LANDING	0	130			CLOUDY	NONE		SEVERAL
06/02/88	533	2	210		NONE	300	LANDING	100	150						
06/02/88	1227	2	88	12:10:00	MULT BIRDS	200	APPROACH	500	140			CLEAR	NONE		SEVERAL
06/04/88	577	2	0		NONE	200	APPROACH	5	128	VFR	DAY	CLEAR		NO	YES
06/06/88	752	2	220		NONE	200	TAKEOFF	0					ATO		NO
06/06/88	753	2	240		NONE	200	UNKNOWN								
06/07/88	754	2	203	15:50:00	NONE	200	TAKEOFF	0	140			OVERCAST	NONE	NO	NO
06/08/88	439	1	107		NONE	200	TAKEOFF	0					ATB		
06/08/88	476	1	882016	11:42:00	NONE	300	LANDING				BRIGHT	CLEAR			
06/08/88	492	2	143		NONE	200	UNKNOWN								
06/09/88	1221	1	88	11:10:00	MULT BIRDS	200	LANDING	0	120			RAIN	NONE		SEVERAL
06/09/88	1308	2	88	13:30:00	NONE	200	TAKEOFF	0	95			CLOUDY	ATO	NO	ONE
06/10/88	420	1	98		NONE	200	TAKEOFF								
06/10/88	1261	2	88	13:25:00	MULT BIRDS	200	TAKEOFF	0	70			CLEAR	NONE		FLOCK
06/11/88	576	2	882029		NONE	300	UNKNOWN						NONE		NO
06/11/88	1102	2	1705	9:05:00	NONE	200	APPROACH	500	120			CLEAR	NONE	NO	ONE
06/11/88	1273	2	88	14:42:00	NONE	200	TAKEOFF	50	150			CLEAR	NONE		SEVERAL

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
04/14/88	410	2					-WLG	XFO	WELLINGTON, NEW ZEALAND	NO	JT8D	
04/16/88	1215	1			1			ALC	ALICANTE, SPAIN	NO	JT8D	
04/16/88	1265	2	PIGEON*		1			SYD	SYDNEY, AUSTRALIA	NO	CFM56	
04/18/88	1247	2	WOOD PIGEON		1			EBCI	GOSSELIES, BEGIUM	NO	CFM56	3
04/19/88	466	1						REC	RECIFE, BRAZIL	NO	CFM56	3
04/20/88	1289	2			*			PER	PERTH, AUSTRALIA	NO	CFM56	3
04/21/88	490	1						SHI	SHIMOJISHIMA, JAPAN	NO	JT8D	17
04/22/88	749	2			1			MDQ	MAR DEL PLATA, ARGENTINA	NO	JT8D	9
04/24/88	348	2						HOU	HOUSTON, TEX	YES	JT8D	9A
04/25/88	412	1					IAD-MSY	XUS	WASHINGTON, DC - LA	YES	JT8D	
04/26/88	349	1						XUS		YES	JT8D	17A
04/26/88	413	2					LIT-OKC	LIT	LITTLE ROCK, ARK	YES	JT8D	
04/26/88	1246	1			1			LGW	LONDON, ENGLAND	NO	JT8D	
04/27/88	350	1						DAL	DALLAS/FT WORTH, TEX-LOVE	YES	JT8D	9A
04/27/88	351	1						TUL	TULSA, OKLA	YES	JT8D	9A
04/27/88	467	1					DEN-BUR	DEN	DENVER, COL	YES	CFM56	3
04/28/88	352	1					HOU-	XUS	HOUSTON, TEX	YES	JT8D	9A
04/28/88	1319	1			*			MAA	MADRAS, INDIA	NO	JT8D	
04/29/88	414	1					ORD-SAB	SAB	SABA, NETH, ANTILLES	NO	JT8D	
04/29/88	1100	1			1			DEL	DELHI, INDIA	NO	JT8D	15
04/29/88	1303	1	HOODED CROW*		1			SVG	STAVANGER, NORWAY	NO		
04/30/88	1293	1	HERRING GULL	14N14	1	40.		RBA	RABAT, MOROCCO	NO	JT8D	
05/01/88	353	2					CGR-GRU	CGR	CAMPO GRANDE, BRAZIL	NO	JT8D	
05/01/88	750	1	PLOVER*		2		OKA-MMY	MMY	MIYAKO JIMA, JAPAN	NO	JT8D	17
05/02/88	354	2	BLACK KITE	3K28	1	32.	LDE-CRL	LDE	LOURDES/TARBES, FRANCE	NO	JT8D	15
05/04/88	415	2						WLG	WELLINGTON, NEW ZEALAND	NO	JT8D	
05/05/88	468	2	ROCK DOVE	2P1		14.	DAL-HOU	DAL	DALLAS/FT WORTH, TEX-LOVE	YES	CFM56	3
05/06/88	469	2	SWAINSON'S THRUSH	412246	1	1.	-HOU	XUS	HOUSTON, TEX	YES	CFM56	3
05/10/88	1212	1			1			CZL	CONSTANTINE, ALGERIA	NO	JT8D	
05/10/88	1212	2			1			CZL	CONSTANTINE, ALGERIA	NO	JT8D	
05/11/88	416	2						XUS		YES	JT8D	15A
05/11/88	470	1			1			AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
05/11/88	471	1					SAT-DAL	SAT	SAN ANTONIO, TEX	YES	CFM56	3
05/11/88	1251	2	COMMON SWIFT	1U55	1	2.		HAM	HANBURG, GERMANY	NO	JT8D	
05/15/88	417	1	SWIFT*			1.		AUS	AUSTIN, TEX	YES	JT8D	
05/15/88	1220	1	SWALLOW*		1			BCN	BARCELONA, SPAIN	NO	JT8D	
05/17/88	355	1					EWR-IAD	XUS	NY-WASHINGTON, DC	YES	JT8D	7B
05/19/88	472	1						SAO	SAO PAULO, BRAZIL	NO	CFM56	3
05/20/88	456		GULL*		1			MDW	MIDWAY, ILL	YES	JT8D	17
05/20/88	751	2			1		MUC-CDG	CDG	PARIS-DE GAULLE, FRANCE	NO	JT8D	15
05/21/88	473	1	SWAINSON'S HAWK	3K171	1	36.	DAL-HOU	HOU	HOUSTON, TEX	YES	CFM56	3
05/21/88	1256	2			1			ALG	ALGIERS, ALGERIA	NO	JT8D	
05/22/88	418	2	HERRING GULL	14N14	1	40.	TUN-BRU	TUN	TUNIS, TUNISIA	NO	JT8D	15
05/22/88	1288	1	KITE*		*			PMI	PATNA, INDIA	NO	JT8D	
05/22/88	1314	2			1			ZRH	ZURICH, SWITZERLAND	NO	JT8D	
05/23/88	419	1			1			DEN	DENVER, COL	YES	JT8D	17
05/23/88	438	2	COMMON ROCK DOVE	2P1	1	14.		LXR	LUXOR, EGYPT	NO	JT8D	17
05/24/88	1306	2	PIGEON*		*			LIPZ	TESSERA, ITALY	NO	JT8D	
05/25/88	474	1	COMMON TURTLE DOVE	2P50	*	7.	EMA-QTV	QTV	TREVISO, ITALY	NO	CFM56	3
05/27/88	1101	1			1			HYD	HYDERABAD, INDIA	NO	JT8D	17A
05/29/88	1260	1	GLAUCOUS WINGED GULL	14N22	*	56.		KEF	KEFLAVIK, ICELAND	NO	JT8D	
06/01/88	475	2	PIGEON*		*			FRA	FRANKFURT, GERMANY	NO	CFM56	3
06/02/88	533	2			1		CVG-ORD	ORD	CHICAGO, ILL-OHARE	YES	CFM56	3
06/02/88	1227	2			*			NAP	NAPLES, ITALY	NO	JT8D	
06/04/88	577	2	HAWK*		1			ROC	ROCHESTER,NY	YES	JT8D	15A
06/06/88	752	2	NIGHTJAR*					COR	CORDOBA, ARGENTINA	NO	JT8D	9
06/06/88	753	2						XFO		NO	JT8D	17
06/07/88	754	2			1		DUS-NUE	DUS	DUESSELDORF, GERMANY	NO	JT8D	15
06/08/88	439	1			1		YWG-YOW	YWG	WINNIPEG, CANADA	NO	JT8D	17
06/08/88	476	1						FAT	FRESNO, CA	YES	CFM56	3
06/08/88	492	2						XUS		YES	JT8D	9A
06/09/88	1221	1	SKYLARK	17Z72	*	1.		BHX	BIRMINGHAM, ENGLAND	NO	JT8D	
06/09/88	1308	2	CURLEW*		1			TRD	TRONDHEIM, NORWAY	NO	JT8D	
06/10/88	420	1	WESTERN MEADOWLARK	64Z68	1	4.	YQR-YWG	YQR	REGINA, SASK., CANADA	NO	JT8D	9A
06/10/88	1261	2			*			CFU	CORFU, GREECE	NO	JT8D	
06/11/88	576	2					-OAK	XUS	CA	YES	CFM56	3
06/11/88	1102	2			1			HYD	HYDERABAD, INDIA	NO	JT8D	9A
06/11/88	1273	2			1			LTN	LUTON, ENGLAND	NO	JT8D	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
04/14/88	410	2		9					
04/16/88	1215	1		9					
04/16/88	1265	2		9					
04/18/88	1247	2		9					
04/19/88	466	1	A,D	2	NONE			NO	AM EVENT, REPLACED 2 FAN BLADES
04/20/88	1289	2		9					
04/21/88	490	1		9					
04/22/88	749	2		9					
04/24/88	348	2		9					ODOR
04/25/88	412	1		9					
04/26/88	349	1	A,C	3					
04/26/88	413	2		9					
04/26/88	1246	1		9					
04/27/88	350	1		9					ODOR
04/27/88	351	1		9					ODOR
04/27/88	467	1		9	NONE			NO	
04/28/88	352	1		9					ODOR
04/28/88	1319	1		9					
04/29/88	414	1		9					
04/29/88	1100	1	A	4				NO	3 F BLDS UNKNOWN DAMAGE
04/29/88	1303	1		9					
04/30/88	1293	1	A,Q	4					
05/01/88	353	2		9					ODOR
05/01/88	750	1		9					
05/02/88	354	2	A,I	1	EPR DEC	HIGH		YES	EGT INCREASED TO FULL SCALE
05/04/88	415	2		9					
05/05/88	468	2	A,B,H	3	NONE			NO	
05/06/88	469	2		9	NONE			NO	FOUND DURING GROUND INSPECTION
05/10/88	1212	1		9					
05/10/88	1212	2		9					
05/11/88	416	2	A,C	3					
05/11/88	470	1		9	NONE			NO	
05/11/88	471	1	A,B,H	3	NONE	3.5		NO	
05/11/88	1251	2		9					
05/15/88	417	1		9					ODOR
05/15/88	1220	1	A,Q	4					
05/17/88	355	1	A,G	2					
05/19/88	472	1	A,H	3	NONE	2.9		NO	PM EVENT, CHANGED 1 FAN BLADE
05/20/88	456			9					AM EVENT
05/20/88	751	2		9	NONE			NO	
05/21/88	473	1		9	NONE			NO	
05/21/88	1256	2		9					
05/22/88	418	2	A,C,G,I	1		HIGH			TRVS FRAC 1 INCH FROM TIP
05/22/88	1288	1		9					
05/22/88	1314	2		9					
05/23/88	419	1		9					ODOR, SMALL BIRD
05/23/88	438	2	A,C,G,I	1					HPT METALIZATION
05/24/88	1306	2		9					
05/25/88	474	1	A,D,H	2	NONE	2.5		NO	FAN ABRADABLE SLIGHTLY DAMAGED
05/27/88	1101	1		9				NO	
05/29/88	1260	1	A,C,K	1					2 BENT F BLDS, 1 COMP BLD DAMAGED
06/01/88	475	2		9	NONE			NO	
06/02/88	533	2		9					
06/02/88	1227	2		9					
06/04/88	577	2	A,H	3					AM EVENT, MEDIUM BIRD, 1 BLADE SHINGLED
06/06/88	752	2	A	4				VOLUNTARY	
06/06/88	753	2	A,G	2					
06/07/88	754	2		9	NONE			NO	
06/08/88	439	1		9					ODOR
06/08/88	476	1		9	NONE			NO	
06/08/88	492	2		9					
06/09/88	1221	1		9					
06/09/88	1308	2	A,Q	4					UNK DAMAGE TO F BLDS
06/10/88	420	1	A,C	3		HIGH			ODOR, HUM, 3 FAN BLADES DAMAGED
06/10/88	1261	2		9					
06/11/88	576	2	A	4	NONE			NO	ENGINE REMOVED FOR HIGH EGT
06/11/88	1102	2		9				NO	
06/11/88	1273	2		9					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
06/12/88	477	2	882017		NONE	300	UNKNOWN								
06/12/88	1219	1	88	20:30:00	MULT BIRDS	100	CLIMB	500	155			CLEAR	NONE	NO	SEVERAL
06/12/88	1274	1	88	7:02:00	NONE	300	LANDING	0	125			CLEAR	NONE		ONE
06/13/88	478	2	882018	6:12:00	MULT BIRDS	300	TAKEOFF	0	115			CLOUDY			
06/13/88	755	1	260		NONE	200	UNKNOWN								
06/13/88	1281	2	88		NONE	300	CLIMB						NONE		
06/14/88	440	2	104		NONE	200	TAKEOFF								
06/14/88	479	1	882019		NONE	300	UNKNOWN						NONE		
06/14/88	480	2	882020		NONE	300	LANDING								
06/14/88	756	1	230	18:15:00	NONE	200	LANDING	0	70						
06/14/88	1254	1	88	19:31:00	NONE	300	TAKEOFF	0	120			CLEAR	NONE	NO	ONE
06/15/88	481	1	882021		NONE	300	TAKEOFF		+V1						
06/15/88	757	1	220		NONE	200	OTHER	0	10						
06/16/88	441		111		NONE	200	UNKNOWN								
06/16/88	584	2	0		NONE	200	TAKEOFF						ATB		
06/16/88	1217	2	88	21:05:00	MULT BIRDS	300	LANDING	0	90			CLEAR	NONE	NO	SEVERAL
06/18/88	442	2	105		MULT BIRDS	200	TAKEOFF						ATB		
06/18/88	443	2	106		NONE	200	TAKEOFF	0	140						
06/18/88	758	1	181		NONE	200	UNKNOWN								
06/18/88	1282	1	88	20:28:00	NONE	200	TAKEOFF	0	140			CLOUDY	NONE		ONE
06/19/88	759	2	260		NONE	200	UNKNOWN								
06/20/88	444	1	108		NONE	200	TAKEOFF	0					ATO		
06/20/88	482	1	882022		NONE	300	LANDING						NONE		
06/20/88	483	2	882023		MULT BIRDS	300	TAKEOFF		+V1				NONE		
06/20/88	1302	1	88	7:20:00	MULT BIRDS	200	LANDING	0	115			CLEAR	NONE	NO	FLOCK
06/21/88	445	1	113		NONE	200	UNKNOWN								
06/22/88	484	2	882024		NONE	300	UNKNOWN						NONE		
06/22/88	760	2	230		NONE	200	UNKNOWN								
06/23/88	1222	2	88	19:30:00	MULT BIRDS	200	LANDING	10	130			OVERCAST	NONE	NO	SEVERAL
06/24/88	446	2	109		NONE	200	TAKEOFF	0	110				ATO		
06/25/88	587	1	0		NONE	300	LANDING	0	70	VFR	EVENING				YES
06/25/88	1103	1	1706	8:30:00	NONE	200	LANDING	0	70			CLEAR	NONE	NO	ONE
06/26/88	485	1	882025	11:00:00	NONE	300	TAKEOFF		+V1				ATB		
06/26/88	486	1	882026		NONE	300	UNKNOWN								
06/26/88	1268	2	88	6:15:00	MULT BIRDS	300	LANDING						NONE		FLOCK
06/27/88	493	2	200		NONE	200	UNKNOWN								
06/27/88	761	1	230		NONE	200	UNKNOWN								
06/27/88	1262	1	88	20:10:00	NONE	300	APPROACH	600	135			CLOUDY	NONE		SEVERAL
06/28/88	487	1	882027	11:12:00	NONE	300	APPROACH	4000	210			CLOUDY	NONE	NO	
06/28/88	488	2	882028	11:00:00	NONE	300	UNKNOWN						NONE		
06/28/88	494	2	200		NONE	200	UNKNOWN								
06/28/88	762	2	204	7:13:00	NONE	200	TAKEOFF	0	110	VFR		CLEAR	NONE	NO	ONE
06/29/88	1104	1	1707		NONE	200	UNKNOWN						NONE		
06/29/88	1267	2	88	8:00:00	NONE	300	TAKEOFF	50	145			CLEAR	NONE	NO	ONE
06/29/88	1285	1	88	17:02:00	MULT BIRDS	300	CLIMB		150			CLOUDY	ATB	NO	SEVERAL
06/30/88	1105	1	1708		MULT ENG	200	UNKNOWN						NONE		
06/30/88	1105	2	1708		MULT ENG	200	UNKNOWN						NONE		
06/30/88	1106	2	1709		NONE	200	LANDING	0					NONE		YES
07/01/88	497	2	115	20:00:00	NONE	200	TAKEOFF	10	140			OVERCAST	ATB	NO	ONE
07/01/88	536	1	883001	8:44:00	MULT BIRDS	300	LANDING	20	135			CLOUDY	NONE	NO	SEVERAL
07/01/88	1107	2	1710	7:30:00	NONE	200	CLIMB						NONE	YES	
07/01/88	1108	2	1711		NONE	200	UNKNOWN						NONE		
07/01/88	1280	1	88	4:40:00	NONE	200	TAKEOFF					CLOUDY	NONE		
07/02/88	763	1	230		NONE	200	UNKNOWN								
07/02/88	1109	1	1712	9:10:00	NONE	200	TAKEOFF	0	100			CLOUDY	ATO	NO	FLOCK
07/03/88	578	1	0		NONE	300	LANDING	30	140	VFR	DAY	OVERCAST		NO	YES
07/05/88	764	2	260		NONE	200	UNKNOWN								
07/05/88	1291	1	88	9:39:00	MULT BIRDS	300	LANDING	0	120			CLEAR	NONE	NO	FLOCK
07/07/88	447	2	1360		NONE	200	LANDING								
07/07/88	1110	2	1713	15:50:00	NONE	200	LANDING	0	60			CLOUDY	NONE	NO	SEVERAL
07/07/88	1286	1	88	19:45:00	NONE	200	TAKEOFF	20	160			CLEAR	NONE		FLOCK
07/08/88	765	1	208	18:43:00	NONE	200	TAKEOFF	50	160			CLOUDY	NONE	NO	SEVERAL
07/09/88	495	2	117		NONE	200	UNKNOWN								
07/11/88	1233	1	88	6:20:00	MULT BIRDS	300	LANDING	50	130			RAIN	NONE		SEVERAL
07/12/88	496		200		NONE	200	UNKNOWN								
07/12/88	1111	1	1714		NONE	200	UNKNOWN						NONE		
07/14/88	766	2	230		NONE	200	UNKNOWN								
07/15/88	498	1	114		NONE	200	TAKEOFF								

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
06/12/88	477	2						XUS		YES	CFM56	3
06/12/88	1219	1			*			MAD	MADRID, SPAIN	NO	JT8D	
06/12/88	1274	1			1			LTN	LUTON, ENGLAND	NO	CFM56	3
06/13/88	478	2	GULL*		*		BRS-CWL	BRS	BRISTOL, ENGLAND	NO	CFM56	3
06/13/88	755	1						XFO	TAIWAN	NO	JT8D	7A
06/13/88	1281	2	SILVER GULL	14N32		12.		MEL	MELBOURNE, AUSTRALIA	NO	CFM56	3
06/14/88	440	2					YUL-YOW	YUL	MONTREAL, CANADA	NO	JT8D	17
06/14/88	479	1					-FRA	XFO	FRANKFURT, GERMANY	NO	CFM56	3
06/14/88	480	2	HAWK*					BNE	BRISBANE, AUSTRALIA	NO	CFM56	3
06/14/88	756	1			1		OKA-MMY	MMY	MIYAKO JIMA, JAPAN	NO	JT8D	17
06/14/88	1254	1						LHR	LONDON, ENGLAND	NO	CFM56	3
06/15/88	481	1					EWR-ORD	EWR	NEW YORK, NY-NEWARK	YES	CFM56	3
06/15/88	757	1			1			RES	RESISTENCIA, ARGENTINA	NO	JT8D	9
06/16/88	441		GULL*				-GIG	XFO	RIO DE JANEIRO, BRAZIL	NO	JT8D	
06/16/88	584	2						PTY	PANAMA CITY, PANAMA	NO	JT8D	9
06/16/88	1217	2			*			LGRX	ARAXOS, GREECE	NO	CFM56	3
06/18/88	442	2	BONAPARTE'S GULL	14N38	*	7.	YKA-YVR	YKA	KAMLOOPS, CANADA	NO	JT8D	9A
06/18/88	443	2	HERRING GULL	14N14	1	40.	YYT-YHZ	YYT	ST. JOHNS, CANADA	NO	JT8D	9A
06/18/88	758	1						XFO	BELGIUM	NO	JT8D	15
06/18/88	1282	1			1			LEMH	MENORCA, SPAIN	NO	JT8D	
06/19/88	759	2						XFO	TAIWAN	NO	JT8D	7A
06/20/88	444	1					RUH-AHB	RUH	RIYADH, SAUDI ARABIA	NO	JT8D	
06/20/88	482	1	PIGEON*		1		PMI-PME	PME	PORTSMOUTH, ENGLAND	NO	CFM56	3
06/20/88	483	2	PIGEON*		*		PME-PMI	PME	PORTSMOUTH, ENGLAND	NO	CFM56	3
06/20/88	1302	1	GULL*		*			LGSK	SKIATHOS, GREECE	NO	JT8D	
06/21/88	445	1					-OKC	XUS	OKLAHOMA CITY, OKLA	YES	JT8D	
06/22/88	484	2	CATTLE EGRET	1I35	1	16.		XUS		YES	CFM56	3
06/22/88	760	2					ISG-OKA	XFO	JAPAN	NO	JT8D	17
06/23/88	1222	2	GULL*		*			BOO	BODO, NORWAY	NO	JT8D	
06/24/88	446	2					YQT-YAM	YQT	THUNDER BAY, ONT., CANADA	NO	JT8D	9A
06/25/88	587	1					BLE-BOS	BOS	BOSTON, MASS	YES	CFM56	3
06/25/88	1103	1	KITE*				IXC-IXJ	IXJ	JAMMU, INDIA	NO	JT8D	17A
06/26/88	485	1					MXP-FUE	MXP	MILAN-MALPENSA, ITALY	NO	CFM56	3
06/26/88	486	1					-BRE	XFO	BREMEN, GERMANY	NO	CFM56	3
06/26/88	1268	2	KITE*		*			LHE	LAHORE, PAKISTAN	NO	CFM56	
06/27/88	493	2						NGO	NAGOYA, JAPAN	NO	JT8D	17
06/27/88	761	1					OKA-MMY	XFO	JAPAN	NO	JT8D	17
06/27/88	1262	1			1			CFU	CORFU, GREECE	NO	CFM56	3
06/28/88	487	1	COMMON LAPWING	5N1	1	7.75	STR-SCN	SCN	SAARBRUECKEN, GERMANY	NO	CFM56	3
06/28/88	488	2					CTU-SHA	XFO	CHINA	NO	CFM56	3
06/28/88	494	2						GAJ	YAMAGATA, HONSHU, JAPAN	NO	JT8D	17
06/28/88	762	2	SPARROW*		1	2.	NUE-HAM	NUE	NUREMBERG, GERMANY	NO	JT8D	15
06/29/88	1104	1					JDH-JAI	XFO	INDIA	NO	JT8D	9A
06/29/88	1267	2	SWALLOW*					LIN	MILAN, ITALY	NO	CFM56	3
06/29/88	1285	1			*			MUC	MUNICH, GERMANY	NO	CFM56	3
06/30/88	1105	1					DEL-JAI	XFO	INDIA	NO	JT8D	9A
06/30/88	1105	2					DEL-JAI	XFO	INDIA	NO	JT8D	9A
06/30/88	1106	2	VULTURE*		1			KTM	KATHMANDU, NEPAL	NO	JT8D	17A
07/01/88	497	2	GULL*		1		DUS-VIE	DUS	DUESSELDORF, GERMANY	NO	JT8D	
07/01/88	536	1	HERRING GULL	14N14	*	36.	BRU-CDG	CDG	PARIS-DE GAULLE, FRANCE	NO	CFM56	3
07/01/88	1107	2						JAI	JAIPUR, INDIA	NO	JT8D	9A
07/01/88	1108	2						XFO	INDIA	NO	JT8D	17
07/01/88	1280	1	OWL*					MAN	MANCHESTER, ENGLAND	NO	JT8D	
07/02/88	763	1					OKA-MMY	XFO	JAPAN	NO	JT8D	17
07/02/88	1109	1	PARTRIDGE*		1			CJB	COIMBATORE, INDIA	NO	JT8D	17
07/03/88	578	1	PIGEON*		1			DFW	DALLAS/FT. WORTH, TEX	YES	CFM56	3
07/05/88	764	2						XHC	TAIWAN	NO	JT8D	9A
07/05/88	1291	1	SWALLOW*		*			PVK	PREVEZA, GREECE	NO	CFM56	3
07/07/88	447	2					YHZ-YUL	YUL	MONTREAL, CANADA	NO	JT8D	17
07/07/88	1110	2	KITE*		1		LKO-PAT	PAT	PATNA, INDIA	NO	JT8D	17A
07/07/88	1286	1						LTBS	MULGA, TURKEY	NO	JT8D	
07/08/88	765	1	SWALLOW*		1	3.	TRN-FRA	TRN	TURIN, ITALY	NO	JT8D	15
07/09/88	495	2					-BNA	XUS	NASHVILLE, TENN	YES	JT8D	9A
07/11/88	1233	1			*			ABCG	COOLANGATTA, AUSTRALIA	NO	CFM56	3
07/12/88	496							TTJ	TOTTORI, JAPAN	NO	JT8D	17
07/12/88	1111	1					-BOM	XFO	INDIA	NO	JT8D	9A
07/14/88	766	2					ISG-OAK	XFO	JAPAN	NO	JT8D	17
07/15/88	498	1					YLW-YVR	YLW	KELOWNA, CANADA	NO	JT8D	9A

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
06/12/88	477	2		9	NONE			NO	FOUND DURING GROUND INSPECTION
06/12/88	1219	1		9					
06/12/88	1274	1		9					
06/13/88	478	2	A,B	3	NONE			NO	
06/13/88	755	1	A,C	3					1 FAN BLADE BLENDED ON WING
06/13/88	1281	2		9					
06/14/88	440	2		9					SYMPTOM-EGT
06/14/88	479	1	A,C	3	NONE			NO	FOUND DURING GROUND INSPECTION
06/14/88	480	2		9	NONE			NO	
06/14/88	756	1		9					
06/14/88	1254	1		9					
06/15/88	481	1	A,C	3	NONE			NO	
06/15/88	757	1		9					
06/16/88	[illegible]1			9					
06/16/88	[illegible]4	2	A,K	1					2 1ST STG COMPRESSOR BLADES DAMAGED
06/16/88	[illegible]17	2		9					
06/18/88	442	2	A,C,G,I	1	COMPRESSOR	HIGH		PARAMETERS	METAL IN TAILPIPE, SYMPTOM-EGT, 2 BLADES
06/18/88	443	2	A,D,N	2					4 FAN BLADES DAMAGED, ODOR
06/18/88	758	1	A,G	2					
06/18/88	1282	1	A,K,Q	1	COMPRESSOR			VOLUNTARY	F BLDS, 2ND + 6TH STG COMP UNK DAMAGE
06/19/88	759	2	A,D	2					5 FAN BLADES BLENDED ON WING
06/20/88	444	1		9	COMPRESSOR				
06/20/88	482	1	A,H	3	NONE			NO	
06/20/88	483	2	A,H	3	NONE	SOME		NO	M/S SHROUD DISTORTED, CSD COOLER CLOGGED
06/20/88	1302	1		9					
06/21/88	445	1		9					ODOR
06/22/88	484	2	A	4	NONE			NO	FOUND DURING GROUND INSPECTION
06/22/88	760	2		9					
06/23/88	1222	2	A,D	2					BENT F BLDS # UNK
06/24/88	446	2	A,C	3	COMPRESSOR				
06/25/88	587	1		9					ODOR IN CABIN
06/25/88	1103	1		9				NO	
06/26/88	485	1	A,B	3	NONE	2.6		NO	REPLACED 5 PAIR OF FAN BLADES
06/26/88	486	1	A	4	NONE			NO	REPLACED 3 PAIR OF FAN BLADES
06/26/88	1268	2		9					
06/27/88	493	2		9					
06/27/88	761	1		9					
06/27/88	1262	1		9					
06/28/88	487	1	A,H	3	NONE			NO	ENGINE NOISE
06/28/88	488	2	A,K	1	NONE			NO	FOUND DURING GROUND INSPECTION, UER
06/28/88	494	2		9					
06/28/88	762	2		9	NONE			NO	
06/29/88	1104	1		9				NO	FOUND ON GRD INSPEC
06/29/88	1267	2		9					
06/29/88	1285	1	A,C	3					
06/30/88	1105	1		9				NO	FOUND ON GRD INSPEC
06/30/88	1105	2		9				NO	FOUND ON GRD INSPEC
06/30/88	1106	2	A,H	3				NO	4 F BLDS SHINGLED
07/01/88	497	2	A,D,K,N	1		HIGH			2 BLDS BROKEN TANGS, SEVERE COMP BLD DAM
07/01/88	536	1	A,H	3		3.0		NO	REPLACED 6 PAIR OF FAN BLADES
07/01/88	1107	2	A	4				NO	2 F BLDS UNK DAMAGE
07/01/88	1108	2	A,C,G,K	1				NO	FBLDS DAMAGED, 7TH+8TH STG BLD DAMAGE
07/01/88	1280	1		9					
07/02/88	763	1		9					
07/02/88	1109	1		9				NO	
07/03/88	578	1		9					MEDIUM BIRD
07/05/88	764	2	A,D	2					4 FAN BLADES BLENDED ON WING
07/05/88	1291	1		9					
07/07/88	447	2		9					
07/07/88	1110	2	A,H	3				NO	2 F BLDS SHINGLED
07/07/88	1286	1		9					
07/08/88	765	1		9				NO	
07/09/88	495	2		9					ODOR
07/11/88	1233	1		9					
07/12/88	496			9					
07/12/88	1111	1	A,H	3				NO	FOUND ON GRD INSPEC
07/14/88	766	2		9					
07/15/88	498	1		9					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
07/15/88	499	2	118		NONE	200	UNKNOWN			VFR		CLEAR			NO
07/15/88	537	1	883002		NONE	300	TAKEOFF		+V1				NONE		FLOCK
07/15/88	767	1	209	19:48:00	NONE	200	LANDING	0	120			OVERCAST	NONE	NO	ONE
07/15/88	1112	1	1715		NONE	200	TAKEOFF	0	80				ATO		
07/15/88	1252	2	88	11:50:00	NONE	200	LANDING	0	100			OVERCAST	NONE		ONE
07/16/88	538	2	883003		NONE	300	LANDING	0				CLOUDY	NONE		NO
07/16/88	768	2	260		NONE	200	UNKNOWN								
07/16/88	1245	2	88	9:40:00	MULT BIRDS	200	LANDING	30	125			CLEAR	NONE	NO	SEVERAL
07/16/88	1310	1	88	20:15:00	NONE	200	LANDING	0	120			CLEAR	NONE	NO	ONE
07/18/88	500	2	122		NONE	200	LANDING	50	120	VFR	DAY	CLEAR		NO	YES
07/18/88	501	2	138	15:45:00	NONE	200	TAKEOFF	0							
07/19/88	502	1	139	19:30:00	NONE	200	TAKEOFF								
07/19/88	503	2	200		NONE	200	UNKNOWN								
07/19/88	1317	1	88	5:04:00	NONE	200	TAKEOFF	0	120			CLEAR	NONE	NO	ONE
07/19/88	1320	2	0		NONE	200	TAKEOFF						ATB		
07/20/88	539	2	883004		NONE	300	CLIMB						NONE		NO
07/20/88	540	1	883005	11:25:00	NONE	300	LANDING	100			BRIGHT	CLEAR	NONE		SEVERAL
07/20/88	1307	1	88		NONE	100	TAKEOFF						NONE	NO	
07/21/88	504	1	200		NONE	200	UNKNOWN								
07/21/88	588		0		NONE	300	UNKNOWN								
07/23/88	505	1	119		NONE	200	APPROACH								
07/23/88	541	1	883006		NONE	300	CLIMB						NONE		NO
07/23/88	542	1	883007		NONE	300	UNKNOWN						NONE		NO
07/23/88	769	1	260		NONE	200	UNKNOWN								
07/23/88	1229	2	88	6:00:00	NONE	100	TAKEOFF	0					NONE		
07/24/88	543	2	883008	8:15:00	NONE	300	TAKEOFF	0	80			RAIN	NONE	NO	SEVERAL
07/25/88	506	2	132		INV POW LOSS	200	TAKEOFF						ATB		
07/25/88	1224	2	88	7:02:00	MULT BIRDS	200	TAKEOFF	0	120			CLOUDY	ATO	NO	SEVERAL
07/26/88	507	2	123	22:10:00	INV POW LOSS	200	TAKEOFF	70	140			CLEAR	ATB	NO	NO
07/26/88	544	1	883009		NONE	300	TAKEOFF		+V1				ATB		
07/26/88	545	2	883010	15:20:00	MULT BIRDS	300	TAKEOFF	0	140			CLEAR	ATO		SEVERAL
07/26/88	1243	1	88	21:00:00	NONE	200	CLIMB	3500	250			CLEAR	NONE		
07/26/88	1275	2	88	17:40:00	NONE	200	LANDING	10	130			CLEAR	NONE		SEVERAL
07/27/88	508	2	133		NONE	200	TAKEOFF	0	100						
07/27/88	586	1	0		NONE	200	APPROACH	1500	180	VFR		CLEAR		NO	NO
07/27/88	1309	1	88	11:21:00	NONE	200	APPROACH	800	170			CLOUDY	NONE	NO	ONE
07/28/88	509	1	121		NONE	200	UNKNOWN								
07/28/88	1235	2	88		MULT BIRDS	100	TAKEOFF	0	100				ATO	NO	
07/28/88	1266	1	88	8:17:00	NONE		LANDING	0	40			CLEAR	NONE	NO	SEVERAL
07/29/88	546	2	883011	15:00:00	NONE	300	APPROACH					CLOUDY	NONE		ONE
07/30/88	510	1	141		NONE	200	LANDING								
07/30/88	511	2	142		NONE	200	LANDING								
07/30/88	1315	2	88		NONE		APPROACH						NONE	NO	
07/31/88	1312	1	88	13:00:00	NONE	300	LANDING	50	140			CLEAR	NONE	NO	SEVERAL
08/01/88	1113	1	1716	14:00:00	NONE	200	LANDING	0	90				NONE		
08/01/88	1269	1	88	1:55:00	NONE	200	TAKEOFF	0	145			CLEAR	NONE		
08/05/88	547	1	883012		NONE	300	APPROACH						NONE		NO
08/05/88	548	1	883013		NONE	300	UNKNOWN						NONE		NO
08/05/88	1114	2	1717	17:55:00	NONE	200	LANDING	5	130			OVERCAST	NONE	NO	ONE
08/05/88	1188	2	1603		NONE	200	UNKNOWN						NONE		
08/07/88	512	1	116		NONE	200	TAKEOFF	0				CLEAR			NO
08/07/88	513	2	151		NONE	200	TAKEOFF								
08/07/88	770	1	211	9:46:00	NONE	200	TAKEOFF	0	110	VFR		CLEAR	DIV	NO	ONE
08/07/88	1006	2	1718		NONE	200	UNKNOWN						NONE		
08/07/88	1248	1	88	16:03:00	NONE	200	TAKEOFF	225	136			CLEAR	NONE	NO	
08/09/88	514	2	124		NONE	200	TAKEOFF								
08/09/88	830	2	230		NONE	200	UNKNOWN								
08/09/88	1213	1	88	14:48:00	MULT BIRDS	300	TAKEOFF					CLOUDY	NONE		
08/09/88	1214	1	88	9:48:00	NONE		LANDING	0	122			RAIN	NONE		SEVERAL
08/09/88	1250	1	88		MULT BIRDS	100	TAKEOFF	0	130			CLEAR	OTHER	NO	SEVERAL
08/10/88	515	1	125		NONE	200	TAKEOFF								
08/10/88	1007	1	1719		NONE	200	LANDING	0	50			OVERCAST	NONE	NO	SEVERAL
08/11/88	516	1	126		NONE	200	UNKNOWN								
08/12/88	517	1	127		NONE	200	UNKNOWN								
08/12/88	518	2	134		NONE	200	TAKEOFF						ATB		
08/13/88	585	2	0	7:13:00	NONE	200	TAKEOFF	0	120	VFR	DAY	PARTLY CLOUD	ATB	NO	ONE
08/13/88	771	1	193	8:30:00	NONE	200	TAKEOFF	0	123	VFR		CLEAR	NONE	NO	
08/13/88	772	2	230		NONE	200	TAKEOFF	0	125						

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
07/15/88	499	2			1		BRR-ANC	XFO	SCOTLAND-ALASKA	NO	JT8D	17A
07/15/88	537	1			1			LJU	LJUBLJANA, YUGOSLAVIA	NO	CFM56	3
07/15/88	767	1	EURASIAN KESTREL	5K27	1	8.	MAD-STR	STR	STUTTGART, GERMANY	NO	JT8D	15
07/15/88	1112	1					GWL-BHO	GWL	GWALIOR, INDIA	NO	JT8D	17
07/15/88	1252	2	HAWK*		1			HAM	HAMBURG, GERMANY	NO	JT8D	
07/16/88	538	2	BLACK-HEADED GULL	14N36	1	8.8		BRU	BRUSSELS, BELGIUM	NO	CFM56	3
07/16/88	768	2						XFO	TAIWAN	NO	JT8D	7A
07/16/88	1245	2	PIGEON*		*			OSL	OSLO, NORWAY	NO	JT8D	
07/16/88	1310	1	GULL*					AES	AALESUND, NORWAY	NO	JT8D	
07/18/88	500	2	BLACK BIRD*		1	40.		PHL	PHILADELPHIA, PA	YES	JT8D	15
07/18/88	501	2	EURASIAN KESTREL	5K27	1	8.	BRU-LHR	BRU	BRUSSELS, BELGIUM	NO	JT8D	15A
07/19/88	502	1					CAG-BRU	CAG	CAGLIARI, ITALY	NO	JT8D	15
07/19/88	503	2						SDJ	SENDAI, JAPAN	NO	JT8D	9A
07/19/88	1317	1	EUROPEAN SPARROW HAWK	3K103	1	6.7		BRU	BRUSSELS, BELGIUM	NO	JT8D	
07/19/88	1320	2						TUL	TULSA, OK	YES	JT8D	
07/20/88	539	2			1			BEG	BELGRADE, YUGOSLAVIA	NO	CFM56	3
07/20/88	540	1	CARRION CROW	22Z94	1	19.	CDG-AMS	AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
07/20/88	1307	1			1				UNKNOWN	NO	JT8D	
07/21/88	504	1						KOJ	KOGOSHIMA, JAPAN	NO	JT8D	9A
07/21/88	588						-DEN	XUS	COL	YES	CFM56	3
07/23/88	505	1					YVR-YLW	YLW	KELOWNA, CANADA	NO	JT8D	9A
07/23/88	541	1			1			SAN	SAN DIEGO, CA	YES	CFM56	3
07/23/88	542	1	CHIMNEY SWIFT	1U33	1	1.		XUS		YES	CFM56	3
07/23/88	769	1						XFO	TAIWAN	NO	JT8D	7A
07/23/88	1229	2			1			CDG	PARIS, FRANCE	NO	JT8D	
07/24/88	543	2	GULL*		1		BRU-CDG	BRU	BRUSSELS, BELGIUM	NO	CFM56	3
07/25/88	506	2	GREY EAGLE-BUZZARD	3K161	1	80.		PVH	PORTO VELHO, BRAZIL	NO	JT8D	7
07/25/88	1224	2			*			BRU	BRUSSELS, BELGIUM	NO	JT8D	
07/26/88	507	2			1		PLZ-JNB	PLZ	PORT ELIZABETH, S. AFRICA	NO	JT8D	9
07/26/88	544	1			1			LHE	LAHORE, PAKISTAN	NO	CFM56	3
07/26/88	545	2	CROW*		*			CWL	CARDIFF, WALES	NO	CFM56	3
07/26/88	1243	1			1			FAO	FARO, PORTUGAL	NO	JT8D	
07/26/88	1275	2			1			LTN	LUTON, ENGLAND	NO	JT8D	
07/27/88	508	2			1		CGR-GRU	CGR	CAMPO GRANDE, BRAZIL	NO	JT8D	7
07/27/88	586	1						BNA	NASHVILLE, TENN	YES	JT8D	
07/27/88	1309	1			1			FAE	FAROE ISLANDS, DENMARK	NO	JT8D	
07/28/88	509	1	BURROWING OWL	2S102	1	5.		YVR	VANCOUVER, CANADA	NO	JT8D	17A
07/28/88	1235	2	HERRING GULL	14N14	*	40.		NCE	NICE, FRANCE	NO	JT8D	
07/28/88	1266	1	HAWK*		1			BNJ	BONN, GERMANY	NO		
07/29/88	546	2	COMMON SWIFT	1U55	1	2.		AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
07/30/88	510	1	GULL*		1		YSM-YHY	YHY	HAY RIVER, CANADA	NO	JT8D	9A
07/30/88	511	2						YVR	VANCOUVER, CANADA	NO	JT8D	9A
07/30/88	1315	2						FRA	FRANKFURT, GERMANY	NO		
07/31/88	1312	1	SPARROW*		1			LOWW	WIEN-SCHWECHAT, OSTERREICH	NO	CFM56	3
08/01/88	1113	1					DEL-AGR	AGR	AGRA, INDIA	NO	JT8D	17
08/01/88	1269	1	BARN OWL	1S2	1	11.25		LIS	LISBON, PORTUGAL	NO	JT8D	
08/05/88	547	1						BRU	BRUSSELS, BELGIUM	NO	CFM56	3
08/05/88	548	1			1		-NCE	XFO	FRANCE	NO	CFM56	3
08/05/88	1114	2			1			COK	COCHIN, INDIA	NO	JT8D	17
08/05/88	1188	2						XFO	ARGENTINA	NO	JT8D	9A
08/07/88	512	1	GULL*		1	4.	DUR-PLZ	DUR	DURBAN, S. AFRICA	NO	JT8D	17A
08/07/88	513	2			1		YXJ-YXY	YXJ	FT. ST. JOHN, CANADA	NO	JT8D	9A
08/07/88	770	1	BUZZARD*		1	32.	DUS-LIN	DUS	DUESSELDORF, GERMANY	NO	JT8D	15
08/07/88	1006	2					-AGR	XFO	AGRA, INDIA	NO	JT8D	17
08/07/88	1248	1			1			PLZ	PORT ELIZABETH, S AFRICA	NO	JT8D	
08/09/88	514	2			1		YWG-YVR	YWG	WINNEPEG, CANADA	NO	JT8D	17A
08/09/88	830	2						XFO	JAPAN	NO	JT8D	17
08/09/88	1213	1	HOUSE MARTIN	18Z69	*	0.5		BFS	BELFAST, N. IRELAND	NO	CFM56	3
08/09/88	1214	1			1			BFS	BELFAST, N. IRELAND	NO		
08/09/88	1230	1			*			CDG	PARIS, FRANCE	NO	JT8D	
08/10/88	515	1					YMM-YXD	YMM	FORT MCMURRAY, CANADA	NO	JT8D	9A
08/10/88	1007	1	VULTURE*					IXC	CHANDIGARH, INDIA	NO	JT8D	17A
08/11/88	516	1					YQR-YWG	XFO	CANADA	NO	JT8D	9A
08/12/88	517	1	LITTLE RINGED PLOVER	5N31	1	1.		XFO	CHINA	NO	JT8D	17A
08/12/88	518	2	MOURNING DOVE	2P105	1	4.		HOU	HOUSTON, TEX	YES	JT8D	9A
08/13/88	585	2			1		SYR-IAD	SYR	SYRACUSE, NY	YES	JT8D	
08/13/88	771	1			1		BFN-KIM	BFN	BLOENFONTEIN, S. AFRICA	NO	JT8D	17A
08/13/88	772	2			1			MMY	MIYAKO JIMA, JAPAN	NO	JT8D	17

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
07/15/88	499	2		9					FOUND DURING GROUND INSPECTION
07/15/88	537	1		9	NONE			NO	AM EVENT
07/15/88	767	1		9				NO	
07/15/88	1112	1		9				NO	
07/15/88	1252	2		9					
07/16/88	538	2		9	NONE			NO	
07/16/88	768	2	A,D	2					12 FAN BLADES REPLACED
07/16/88	1245	2		9					
07/16/88	1310	1		9					
07/18/88	500	2	A,D	2		HIGH			INVESTIGATED, AM EVENT
07/18/88	501	2	A,C	2					
07/19/88	502	1	A,C,G	2		HIGH		NO	CREW NOTED NOISE AND VIBES AT TO
07/19/88	503	2		9					
07/19/88	1317	1		9					
07/19/88	1320	2	A,H	3				NO	
07/20/88	539	2		9	N1 DECREASE			NO	MOMENTARY 10% DEC. IN FAN SPEED
07/20/88	540	1	A,B	3	NONE				4 F BLADES HAD LE TIP CURL
07/20/88	1307	1		9					
07/21/88	504	1		9					
07/21/88	588			9					FOUND ON GRD INSPECTION, BLOOD ON COWL
07/23/88	505	1		9					
07/23/88	541	1	A,H	3	NONE	3.0		NO	3 F BLADES SHINGLED, 1 BLADE REPLACED
07/23/88	542	1		9	NONE			NO	FOUND DURING LTR CHECK
07/23/88	769	1	A,D	2					5 FAN BLADES BLENDED ON WING
07/23/88	1229	2	A,Q	4					1 F BLD UNK DAM
07/24/88	543	2	A,H	3	NONE	3.0		NO	REPLACED 3 PAIR OF FAN BLADES
07/25/88	506	2	A,H,I,K	1	COMPRESSOR			YES	1 F BLADE FRACTURED BELOW MSS
07/25/88	1224	2		9					
07/26/88	507	2		9	COMPRESSOR	HIGH		YES	MOMENTARY THRUST LOSS FOR APPROX. 10 SEC
07/26/88	544	1	A,H	3	NONE	5.0		NO	
07/26/88	545	2	A,B,H	3	NONE	NONE		NO	
07/26/88	1243	1		9					
07/26/88	1275	2		9					
07/27/88	508	2		9					ODOR IN CABIN, SMALL BIRD
07/27/88	586	1		9					SMALL BIRD
07/27/88	1309	1		9					
07/28/88	509	1	A,C,H,K	1					HPC DAMAGED AND REMOVED
07/28/88	1235	2	A,Q	4					4 F BLDS UNK DAM
07/28/88	1266	1		9					
07/29/88	546	2	A	4	NONE			NO	BSI FOUND HPC STG6 BLD WITH A NICK
07/30/88	510	1		9					
07/30/88	511	2		9					SMALL BIRD
07/30/88	1315	2		9					
07/31/88	1312	1		9					
08/01/88	1113	1		9				NO	
08/01/88	1269	1	A,Q	4					
08/05/88	547	1	A,H	3	NONE	2.0		NO	6 FAN BLADES REPLACED
08/05/88	548	1		9	NONE				
08/05/88	1114	2		9				NO	ODOR
08/05/88	1188	2	A	4				NO	4 F BLDS UNK DAMAGE
08/07/88	512	1		9					
08/07/88	513	2		9					
08/07/88	770	1		9				NO	MOMENTARY SMALL DROP IN EPR
08/07/88	1006	2	A,H	3				NO	2 F BLDS SHINGLED
08/07/88	1248	1		9					
08/09/88	514	2		9					ODOR IN CABIN, SMALL BIRD
08/09/88	830	2		9					
08/09/88	1213	1		9					
08/09/88	1214	1		9					
08/09/88	1230	1		9					
08/10/88	515	1		9					
08/10/88	1007	1	A,H	3				NO	4 F BLDS SHINGLED
08/11/88	516	1		9					FOUND DURING GROUND INSPECTION
08/12/88	517	1		9					FOUND DURING GROUND INSPECTION
08/12/88	518	2		9					
08/13/88	585	2		9					
08/13/88	771	1		9					SMALL BIRD
08/13/88	772	2		9					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
08/13/88	1008	2	1720	19:14:00	NONE	200	LANDING						NONE		
08/14/88	549	1	883014		NONE	300	UNKNOWN						NONE		NO
08/14/88	773	1	212	18:27:00	NONE	200	LANDING	0	110	VFR		CLEAR	NONE	NO	ONE
08/15/88	519	1	128		NONE	200	UNKNOWN								
08/15/88	520	1	129		NONE	200	UNKNOWN								
08/15/88	550	2	883015	21:45:00	MULT BIRDS	300	UNKNOWN						NONE		
08/15/88	581	2	0		NONE	200	CRUISE						ATB		
08/15/88	774	2	260		NONE	200	UNKNOWN								
08/15/88	1009	1	1721		NONE	200	UNKNOWN						NONE		
08/16/88	521	2	154		NONE	200	TAKEOFF	50	150				ATB		
08/16/88	551	2	883016	15:45:00	MULT BIRDS	300	TAKEOFF	0	145		BRIGHT	CLOUDY	ATB		FLOCK
08/17/88	552	2	883017		NONE	300	UNKNOWN						NONE		NO
08/18/88	553	1	883018		NONE	300	UNKNOWN						NONE		NO
08/18/88	1298	2	88		NONE	100	TAKEOFF	0	140			CLEAR	ATB	YES	ONE
08/19/88	522	1	135		NONE	200	TAKEOFF	0					ATO		
08/19/88	554	1	883019		NONE	300	CLIMB						NONE		NO
08/19/88	1010	2	1722	15:14:00	NONE	200	TAKEOFF	10	150			RAIN	ATO	NO	ONE
08/19/88	1011	1	1723		NONE	200	LANDING						NONE		
08/20/88	1287	1	88	20:26:00	NONE	200	TAKEOFF	0	150			CLOUDY	NONE		SEVERAL
08/20/88	1294	2	88	9:20:00	NONE	100	TAKEOFF	0	120			CLEAR	ATO	YES	ONE
08/21/88	555	1	883020	8:52:00	NONE	300	TAKEOFF		+V1				ATB		NO
08/21/88	1012	2	1724		NONE	200	CLIMB	500					ATB		
08/21/88	1257	2	88	12:30:00	NONE		LANDING	150	138			CLEAR	NONE		ONE
08/22/88	1295	1	88	9:20:00	NONE	100	TAKEOFF	0	120			FOG	NONE	NO	ONE
08/23/88	523	1	131	6:18:00	MULT ENG	200	TAKEOFF	0	100			CLOUDY	ATO	NO	SEVERAL
08/23/88	523	2	131	6:18:00	MULT ENG	200	TAKEOFF	0	100			CLOUDY	ATO	NO	SEVERAL
08/24/88	1187	2	1595	8:50:00	NONE	200	APPROACH						NONE	NO	
08/26/88	524	1	136		MULT BIRDS	200	TAKEOFF	0	135	VFR				NO	SEVERAL
08/26/88	556	1	883022		MULT ENG	300	TAKEOFF	0	+V1				NONE		NO
08/26/88	556	2	883021		MULT ENG	300	TAKEOFF	0	+V1				NONE		NO
08/28/88	775	2	230		NONE	200	UNKNOWN								
08/28/88	1013	2	1725		NONE	200	TAKEOFF	0					ATO		
08/29/88	557	1	883024	8:43:00	MULT ENG-BIRDS	300	TAKEOFF	20	145	IFR	LIGHT	CLEAR	ATB	NO	FLOCK
08/29/88	557	2	883023	8:43:00	MULT ENG-BIRDS	300	TAKEOFF	20	145	IFR	LIGHT	CLEAR	ATB	NO	FLOCK
08/29/88	1014	2	1726		NONE	200	UNKNOWN						NONE		
08/29/88	1313	1	88	14:56:00	NONE	100	APPROACH	1000	140				NONE	NO	SEVERAL
08/30/88	525	1	152		NONE	200	UNKNOWN								
08/30/88	558	1	883025	14:30:00	NONE	300	UNKNOWN				BRIGHT	CLEAR	NONE	NO	NO
08/31/88	776	1	260		NONE	200	UNKNOWN								
09/01/88	1186	2	1639		NONE	200	UNKNOWN						NONE		
09/01/88	1255	1	88	7:12:00	MULT ENG-BIRDS	200	TAKEOFF	0	60			RAIN	ATO	NO	FLOCK
09/01/88	1255	2	88	7:12:00	MULT ENG-BIRDS	200	TAKEOFF	0	60			RAIN	ATO	NO	FLOCK
09/01/88	1277	1	88	14:50:00	MULT ENG-BIRDS	100	TAKEOFF	0	135			CLEAR	ATO	NO	FLOCK
09/01/88	1277	2	88	14:50:00	MULT ENG-BIRDS	100	TAKEOFF	0	135			CLEAR	ATO	NO	FLOCK
09/02/88	559	1	883026	13:00:00	NONE	300	UNKNOWN						NONE		NO
09/03/88	560	2	883027		NONE	300	UNKNOWN						NONE		NO
09/03/88	583	1	0		NONE	300	UNKNOWN			IFR		RAIN	NONE	NO	NO
09/04/88	526	2	153		NONE	200	APPROACH								
09/04/88	561	1	883028		NONE	300	UNKNOWN						NONE		NO
09/04/88	1015	2	1727	7:16:00	NONE	200	TAKEOFF	0	60			CLEAR	ATO	NO	ONE
09/05/88	562	1	883029		NONE	300	TAKEOFF		+V1				ATB	NO	NO
09/05/88	1017	1	1729		NONE	200	UNKNOWN						NONE		
09/05/88	1311	1	88	13:59:00	MULT ENG-BIRDS	200	LANDING	0	125			CLOUDY	NONE	YES	FLOCK
09/05/88	1311	2	88	13:59:00	MULT ENG-BIRDS	200	LANDING	0	125			CLOUDY	NONE	YES	FLOCK
09/06/88	563	2	883030		NONE	300	TAKEOFF		+V1				NONE		NO
09/07/88	777	2	230		NONE	200	TAKEOFF	0							
09/07/88	1226	1	88	9:40:00	NONE	300	LANDING					CLEAR	NONE		
09/08/88	564	2	883031	11:00:00	MULT BIRDS	300	LANDING	0	130			OVERCAST	NONE		NO
09/08/88	1018	1	1730		TRVS FRAC	200	TAKEOFF	0	132			OVERCAST	ATB	NO	ONE
09/08/88	1263	1	88		NONE	200	TAKEOFF	0	130			CLEAR	ATB	NO	ONE
09/09/88	527	1	148	8:39:00	NONE	200	LANDING	0	131			CLEAR		NO	NO
09/10/88	528	1	144		NONE	200	TAKEOFF								
09/10/88	565	1	883032		NONE	300	UNKNOWN						NONE		NO
09/11/88	1241	1	88	15:45:00	NONE	200	TAKEOFF	0	125			RAIN	NONE		ONE
09/12/88	778	2	187	13:40:00	INV POW LOSS	200	APPROACH	2500	245			CLEAR		YES	SEVERAL
09/12/88	1019	1	1731		NONE	200	LANDING	0					NONE		
09/12/88	1207	2	0		INV POW LOSS	300	CLIMB	800					ATB		
09/14/88	779	2	230		NONE	200	UNKNOWN								FLOCK

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
08/13/88	1008	2					HJR-VNS	VNS	VARANASI, INDIA	NO	JT8D	17
08/14/88	549	1			1		-FRA	XFO	GERMANY	NO	CFM56	3
08/14/88	773	1	BUZZARD*		1	32.	DUS-STR	STR	STUTTGART, GERMANY	NO	JT8D	15
08/15/88	519	1					YYZ-YXD	XFO	CANADA	NO	JT8D	9A
08/15/88	520	1	KILLDEER	5N33	1	3.	OMA-PHX	XUS	NEB-ARIZ	YES	JT8D	15
08/15/88	550	2			*		-STL	XUS	ST LOUIS, MO	YES	CFM56	3
08/15/88	581	2					DAY-SDF	XUS	OHIO	YES	JT8D	
08/15/88	774	2						XFO	TAIWAN	NO	JT8D	9A
08/15/88	1009	1					-BOM	XFO	BOMBAY, INDIA	NO	JT8D	9A
08/16/88	521	2						CLE		YES	JT8D	7B
08/16/88	551	2			*			MEL	MELBOURNE, AUSTRALIA	NO	CFM56	3
08/17/88	552	2					-CLT	XUS	NC	YES	CFM56	3
08/18/88	553	1			1		LHR-	XFO	LONDON, ENGLAND	NO	CFM56	3
08/18/88	1298	2			1			LYS	LYON, FRANCE	NO	JT8D	
08/19/88	522	1	UPLAND SANDPIPER	6N13	1	6.		HOU	HOUSTON, TEX	YES	JT8D	9A
08/19/88	554	1						LGW	LONDON-GATWICK, ENGLAND	NO	CFM56	3
08/19/88	1010	2			1		CCU-BBI	CCU	CALCUTTA, INDIA	NO	JT8D	17
08/19/88	1011	1					DEL-PAT	PAT	PATNA, INDIA	NO	JT8D	17
08/20/88	1287	1						PMI	PALMA MALLORCA, SPAIN	NO	JT8D	
08/20/88	1294	2	KITE*		1			RBA	RABAT, MOROCCO	NO	JT8D	
08/21/88	555	1	AMERICAN KESTREL	5K26	1	3.5		TUL	TULSA, OKLA	YES	CFM56	3
08/21/88	1012	2						XFO	BARODA, INDIA	NO	JT8D	17
08/21/88	1257	2	EURASIAN KESTREL	5K27	1	7.		IBZ	IBIZA, SPAIN	NO		
08/22/88	1295	1	EURASIAN KESTREL	5K27	1	8.		RBA	RABAT, MOROCCO	NO	JT8D	
08/23/88	523	1	BLACK HEADED GULL	14N36	1	10.	HAM-CGN	HAM	HAMBURG, GERMANY	NO	JT8D	15
08/23/88	523	2	BLACK HEADED GULL	14N36	1	10.	HAM-CGN	HAM	HAMBURG, GERMANY	NO	JT8D	15
08/24/88	1187	2			1			RES	RESISTENCIA, ARGENTINA	NO	JT8D	9A
08/26/88	524	1	SPARROW*		3		COS-YHY	COS	COLORADO SPRINGS, COL	YES	JT8D	15
08/26/88	556	1					TFS-SPC	TFS	TENERIFE, CANARY ISLANDS	NO	CFM56	3
08/26/88	556	2					TFS-SPC	TFS	TENERRIFE, CANARY ISLANDS	NO	CFM56	3
08/28/88	775	2					OKA-ISG	XFO	JAPAN	NO	JT8D	17
08/28/88	1013	2					AMD-BDQ	AMD	AHMEDABAD, INDIA	NO	JT8D	17A
08/29/88	557	1	COMMON STARLING	21Z75	2	3.		ORD	CHICAGO, ILL-OHARE	YES	CFM56	3
08/29/88	557	2	COMMON STARLING	21Z75	1	3.		ORD	CHICAGO, ILL-OHARE	YES	CFM56	3
08/29/88	1014	2					ATQ-SXR	XFO	INDIA	NO	JT8D	9A
08/29/88	1313	1	SWALLOW*		1			LOWW	WIEN-SCHWECHAT, OSTERREICH	NO	JT8D	
08/30/88	525	1					YYC-YXD	XFO	CANADA	NO	JT8D	9A
08/30/88	558	1			1		PIT-BDL	XUS	PA-MA	YES	CFM56	3
08/31/88	776	1						XFO	TAIWAN	NO	JT8D	7A
09/01/88	1186	2	BARBARY PARTRIDGE	4L42	1	20.		XFO	INDONESIA	NO	JT8D	9A
09/01/88	1255	1			*			LHR	LONDON, ENGLAND	NO	JT8D	
09/01/88	1255	2			*			LHR	LONDON, ENGLAND	NO	JT8D	
09/01/88	1277	1	COMMON STARLING	21Z75	*	2.5		CND	CONSTANTA, ROMANIA	NO	JT8D	
09/01/88	1277	2	COMMON STARLING	21Z75	*	2.5		CND	CONSTANTA, ROMANIA	NO	JT8D	
09/02/88	559	1			1		HRL-HOU	XUS	TEX	YES	CFM56	3
09/03/88	560	2			1		-BEG	XFO	BELGRADE, YUGOSLAVIA	NO	CFM56	3
09/03/88	583	1					-CLE	XUS	OHIO	YES	CFM56	3
09/04/88	526	2					YYZ-YAM	YAM	SAULT ST MARIE, CANADA	NO	JT8D	9A
09/04/88	561	1					-PIT	XUS	PA	YES	CFM56	3
09/04/88	1015	2	KITE*		1			AMD	AHMADABAD, INDIA	NO	JT8D	15
09/05/88	562	1						ORD	CHICAGO, ILL-OHARE	YES	CFM56	3
09/05/88	1017	1					IXV-UDR	XFO	INDIA	NO	JT8D	17
09/05/88	1311	1			*			AES	AALESUND, NORWAY	NO	JT8D	
09/05/88	1311	2			*			AES	AALESUND, NORWAY	NO	JT8D	
09/06/88	563	2						RNO	RENO, NEV	YES	CFM56	3
09/07/88	777	2					MMY-OKA	MMY	MIYAKO JIMA, JAPAN	NO	JT8D	17
09/07/88	1226	1						CBR	CANBERRA, AUSTRALIA	NO	CFM56	3
09/08/88	564	2	GULL*		*			BFS	BELFAST, N. IRELAND	NO	CFM56	3
09/08/88	1018	1			1		PAT-LKO	PAT	PATNA, INDIA	NO	JT8D	17A
09/08/88	1263	1						JRO	KILIMANJARO, TANZANIA	NO	JT8D	
09/09/88	527	1	HADADA IBIS	6I12	1	48.	CPT-PLZ	PLZ	PORT ELIZABETH, S. AFRICA	NO	JT8D	17A
09/10/88	528	1			1			XMN	XIAMEN, CHINA	NO	JT8D	17A
09/10/88	565	1					-LGW	XFO	ENGLAND	NO	CFM56	3
09/11/88	1241	1	COMMON GULL	14N13		15.		EDI	EDINBURGH, SCOTLAND	NO	JT8D	
09/12/88	778	2	WHITE VULTURE	3K46	1	192.		DEL	DEHLI, INDIA	NO	JT8D	17A
09/12/88	1019	1			1			TRV	TRIVANDRUM, INDIA	NO	JT8D	17
09/12/88	1207	2						PHL	PHILA, PA	YES	CFM56	3
09/14/88	779	2					MMY-OKA	XFO	JAPAN	NO	JT8D	17

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
08/13/88	1008	2	A,C,G	2				NO	2 F BLDS DAMAGED
08/14/88	549	1		9	NONE			NO	FOUND DURING GROUND INSPECTION
08/14/88	773	1		9				NO	
08/15/88	519	1		9					ODOR IN COCKPIT
08/15/88	520	1	A,C,G	2					FOUND DURING GROUND INSPECTION
08/15/88	550	2	A,D,I	1	NONE			NO	8 F BLDS REPLACED, 1 WITH .5 IN CRACK
08/15/88	581	2		9				NO	
08/15/88	774	2	A,C	3					
08/15/88	1009	1		9				NO	
08/16/88	521	2		9	COMPRESSOR			YES	5% EPR LOSS
08/16/88	551	2	A,B,H	3	NONE	5.0	IDLE	NO	6 FAN BLADES REPLACED
08/17/88	552	2	A,D	2	NONE			NO	4 FAN BLDS REPLACED, FOUND ON GRD INSPEC
08/18/88	553	1		9	NONE			NO	
08/18/88	1298	2		9					
08/19/88	522	1		9					
08/19/88	554	1		9	NONE			NO	MOMENTARY INCREASE IN EGT
08/19/88	1010	2	A	4	COMPRESSOR			NO	6 F BLDS UNK DAMAGE
08/19/88	1011	1		9				NO	
08/20/88	1287	1		9					
08/20/88	1294	2	A,Q	4					ENG CHANGED
08/21/88	555	1		9	NONE			NO	ODOR IN COCPIT
08/21/88	1012	2		9				NO	
08/21/88	1257	2		9					
08/22/88	1295	1	A,Q	4					
08/23/88	523	1	A,C	3					
08/23/88	523	2		9					
08/24/88	1187	2		9	NONE			NO	ODOR
08/26/88	524	1		9					
08/26/88	556	1	A,D	2	NONE			NO	SOME ABRADABLE MISSING
08/26/88	556	2		9	NONE			NO	
08/28/88	775	2		9					
08/28/88	1013	2		9				NO	
08/29/88	557	1	A,B,H	3	NONE	SMALL	RETARD	NO	REPLACED 5 PAIRS OF FAN BLADES
08/29/88	557	2		9	NONE	SMALL		NO	27 BIRDS CLEARED FROM RUNWAY
08/29/88	1014	2		9				NO	FOUND ON GRD INSPEC
08/29/88	1313	1		9					
08/30/88	525	1	A,B	3					1 F BLADE 1/4 INCH TIP CURL, GRD INSPEC
08/30/88	558	1		9	NONE			NO	INGESTED PIECE OF TIRE,ALSO FOUND BIRD
08/31/88	776	1	A,C	3					3 FAN BLADES BLENDED ON WING
09/01/88	1186	2	A,G	2				NO	
09/01/88	1255	1		9					
09/01/88	1255	2		9					
09/01/88	1277	1		9					
09/01/88	1277	2		9					150 BIRDS KILLED ON RUNWAY
09/02/88	559	1		9	NONE			NO	
09/03/88	560	2		9	NONE			NO	
09/03/88	583	1	A	4					
09/04/88	526	2		9					
09/04/88	561	1		9	NONE			NO	
09/04/88	1015	2		9				NO	
09/05/88	562	1	A	4	NONE			NO	REPLACED 4 PAIRS OF FAN BLADES
09/05/88	1017	1		9				NO	FOUND ON GRD INSPEC
09/05/88	1311	1		9					
09/05/88	1311	2		9					
09/06/88	563	2		9	NONE			NO	
09/07/88	777	2		9					
09/07/88	1226	1		9					
09/08/88	564	2	A,H	3	NONE			NO	
09/08/88	1018	1	A,I,K	1				NO	LPC + HPC DAMAGE
09/08/88	1263	1	A,Q	4					MANY F BLDS UNK DAMAGE
09/09/88	527	1	A,D,H	2				NO	
09/10/88	528	1	A,C	3				NO	
09/10/88	565	1		9	NONE			NO	
09/11/88	1241	1	A,Q	4					ENG CHANGED
09/12/88	778	2	A,D,G,K	1	YES	HIGH		EPR	PARAMETER DECAY, 1 1ST GVANE DISLODGED
09/12/88	1019	1		9				NO	
09/12/88	1207	2	A	4	SPOOL DOWN			INVOLUNTARY	EGT OVER TEMP LIGHT CAME ON, LOUD BANG
09/14/88	779	2		9					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
09/14/88	1016	2	1728		NONE	200	TAKEOFF	0					ATO		
09/14/88	1020	1	1732		NONE	200	UNKNOWN						NONE		
09/15/88	529	1	149	9:45:00	MULT ENG-BIRDS	200	TAKEOFF	0	155	VFR	LIGHT	CLEAR	CRASHED	YES	FLOCK
09/15/88	529	2	149	9:45:00	MULT ENG-BIRDS	200	TAKEOFF	0	155	VFR	LIGHT	CLEAR	CRASHED	YES	FLOCK
09/15/88	566	1	883033	18:50:00	MULT BIRDS	300	TAKEOFF	25	150			OVERCAST	ATB		FLOCK
09/15/88	1021	1	1733	13:55:00	MULT BIRDS	200	TAKEOFF	0	122			CLOUDY	NONE	NO	SEVERAL
09/16/88	567	1	883034		NONE	300	CRUISE						NONE		NO
09/16/88	1022	1	1734	8:45:00	NONE	200	TAKEOFF	0	120			CLOUDY	NONE	NO	SEVERAL
09/17/88	579	1	0	13:00:00	NONE	200	TAKEOFF						ATB		ONE
09/17/88	780	2	188	8:17:00	NONE	200	CLIMB	1600	160			CLOUDY	ATB	NO	
09/18/88	568	1	883035		NONE	300	LANDING						NONE		NO
09/18/88	1023	1	1735	8:15:00	NONE	200	TAKEOFF	0	80			CLOUDY	ATO	NO	
09/19/88	781	1	216	13:14:00	MULT ENG-BIRDS	200	TAKEOFF	30	160	VFR		CLEAR	NONE	NO	FLOCK
09/19/88	781	2	216	13:14:00	MULT ENG-BIRDS	200	TAKEOFF	30	160	VFR		CLEAR	NONE	NO	FLOCK
09/20/88	530	1	145		NONE	200	UNKNOWN								
09/20/88	569	1	883036		NONE	300	UNKNOWN						NONE		NO
09/20/88	782	1	217	1:25:00	NONE	200	TAXI	0	10			OVERCAST	NONE	NO	ONE
09/20/88	783	2	218	8:05:00	NONE	200	TAKEOFF	0	135	VFR		CLEAR	NONE	NO	ONE
09/20/88	784	2	230	16:24:00	NONE	200	TAKEOFF	0	80						
09/20/88	1024	1	1736		NONE	200	TAKEOFF	0	71				ATO		YES
09/20/88	1025	1	1737		NONE	200	UNKNOWN						NONE		
09/20/88	1026	1	1738		NONE	200	UNKNOWN						NONE		
09/21/88	570	1	883037		MULT ENG	300	TAKEOFF	0	VR				ATB		FLOCK
09/21/88	570	2	883038		MULT ENG	300	TAKEOFF	0	VR				ATB		FLOCK
09/23/88	531	2	146		NONE	200	UNKNOWN								NO
09/23/88	785	2	230		NONE	200	UNKNOWN								FLOCK
09/23/88	1210	1	88	14:06:00	MULT BIRDS	300	TAKEOFF					CLOUDY	ATB		
09/24/88	571	2	883039		NONE	300	UNKNOWN						NONE		NO
09/24/88	580	1	0		NONE	200	TAKEOFF						ATB		
09/25/88	572	1	883040		NONE	300	TAKEOFF		+V1				NONE		NO
09/25/88	1027	2	1739		NONE	200	LANDING	0					NONE		YES
09/25/88	1185	2	1535		NONE	200	TAKEOFF	0	140				NONE		
09/25/88	1218	1	88	14:20:00	NONE	200	TAKEOFF	0	80			CLEAR	ATO	NO	ONE
09/26/88	532	1	147	9:30:00	MULT BIRDS	200	TAKEOFF	100	150			BELOW CLOUDS	DIV		FLOCK
09/26/88	573	1	883041		NONE	300	CLIMB						ATB		NO
09/26/88	786	2	155	12:23:00	NONE	200	UNKNOWN					RAIN			
09/27/88	574	1	883042	16:30:00	NONE	300	UNKNOWN				BRIGHT	CLEAR	NONE		NO
09/27/88	787	1	158		NONE	200	UNKNOWN						NONE		
09/27/88	1028	2	1740		NONE	200	LANDING						NONE		
09/28/88	788	2	159	12:45:00	MULT BIRDS	200	TAKEOFF	0	100				ATO		
09/28/88	1029	2	1741	7:27:00	NONE	200	LANDING	0	127				NONE		
09/28/88	1250	2	88	9:10:00	NONE	300	APPROACH	600	139			CLOUDY	NONE	NO	ONE
09/28/88	1271	1	88	9:30:00	NONE	200	TAKEOFF	0	145			OVERCAST	DIV		FLOCK
09/29/88	789	2	240		TRVS FRAC	200	TAKEOFF	0	140						
09/29/88	1231	2	88	17:19:00	NONE	100	TAKEOFF	0	140			CLEAR	NONE	NO	ONE
09/30/88	575	2	883043		NONE	300	UNKNOWN						NONE		NO
10/01/88	697	1	884001		NONE	300	UNKNOWN						NONE	NO	NO
10/02/88	698	2	884002		NONE	300	APPROACH						NONE	NO	NO
10/02/88	790	1	161		MULT ENG-BIRDS	200	UNKNOWN								
10/02/88	790	2	161		MULT ENG-BIRDS	200	UNKNOWN								
10/02/88	791	1	194		NONE	200	TAKEOFF						NONE		
10/02/88	831	1	247	10:47:00	NONE	200	TAKEOFF	0	130			OVERCAST	NONE	NO	ONE
10/03/88	699	2	884003		NONE	300	UNKNOWN						NONE	NO	NO
10/04/88	1030	1	1742	7:55:00	NONE	200	APPROACH	6500	250			CLOUDY	NONE	NO	
10/04/88	1244	2	88	10:06:00	NONE	200	TAKEOFF	10	130			OVERCAST	ATB	NO	ONE
10/05/88	1031	1	1743	20:52:00	NONE	200	LANDING					CLEAR	NONE		
10/06/88	832	2	248	8:35:00	MULT BIRDS	200	LANDING	10	140			OVERCAST	NONE	NO	FLOCK
10/07/88	1032	1	1744		NONE	200	LANDING	0	70				NONE		
10/08/88	1033	1	1745		NONE	200	TAKEOFF	0	VR				ATB		
10/08/88	1034	1	1746		NONE	200	LANDING	0					NONE		
10/08/88	1035	1	1747		MULT ENG	200	LANDING						NONE		
10/08/88	1035	2	1747		MULT ENG	200	LANDING						NONE		
10/08/88	1211	1	88	7:05:00	NONE	200	TAKEOFF	5	130			CLEAR	ATB	NO	ONE
10/10/88	792	2	165		NONE	200	UNKNOWN								
10/12/88	793	2	163		NONE	200	APPROACH								YES
10/12/88	1290	2	88		MULT BIRDS	100	LANDING	0	130			CLOUDY	NONE	YES	FLOCK
10/13/88	700	2	884004		NONE	300	UNKNOWN						NONE	NO	NO
10/14/88	1276	1	88	10:25:00	NONE	200	LANDING	100	120			FOG	NONE		

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
09/14/88	1016	2						AMD	AHMEDABAD, INDIA	NO	JT8D	17
09/14/88	1020	1					-NAG	XFO	INDIA	NO	JT8D	17A
09/15/88	529	1	SPECKLED PIGEON	2P4	8	11.5	BJR-ASM	BJR	BAHAR DAR, ETHIOPIA	NO	JT8D	17A
09/15/88	529	2	SPECKLED PIGEON	2P4	6	11.5	BJR-ASM	BJR	BAHAR DAR, ETHIOPIA	NO	JT8D	17A
09/15/88	566	1	LAPWING*		*			BFS	BELFAST, N. IRELAND	NO	CFM56	3
09/15/88	1021	1			2		VNS-HJR	VNS	VARANASI, INDIA	NO	JT8D	17
09/16/88	567	1			1		ZAG-ZRH	XFO	YUGOSLAVIA-SWITZERLAND	NO	CFM56	3
09/16/88	1022	1			1		HYD-HYD	HYD	HYDERABAD, INDIA	NO	JT8D	9A
09/17/88	579	1						MDW	CHICAGO, ILL-MIDWAY	YES	JT8D	15
09/17/88	780	2			1		MAA-TRZ	MAA	MADURAI, INDIA	NO	JT8D	17A
09/18/88	568	1	WOOD PIGEON	2P9	1	16.4		LHR	LONDON-HEATHROW, ENGLAND	NO	CFM56	3
09/18/88	1023	1	KITE*		1			IXU	AURANGABAD, INDIA	NO	JT8D	9A
09/19/88	781	1			*		BUD-MUC	BUD	BUDAPEST, HUNGARY	NO	JT8D	15
09/19/88	781	2			*		BUD-MUC	BUD	BUDAPEST, HUNGARY	NO	JT8D	15
09/20/88	530	1					YQT-YYC	XFO	CANADA	NO	JT8D	9A
09/20/88	569	1	BARRED DOVE	2P102	1	2.		XUS		YES	CFM56	3
09/20/88	782	1	GULL*		1	10.		GOT	GOTHENBURG, SWEDEN	NO	JT8D	15
09/20/88	783	2	GULL*		1	10.	LIN-DUS	LIN	MILAN, ITALY	NO	JT8D	15
09/20/88	784	2	SWALLOW*		1		ISG-MMY	ISG	ISHIGAKI, JAPAN	NO	JT8D	17
09/20/88	1024	1			1		LKO-BOM	LKO	LUCKNOW, INDIA	NO	JT8D	9A
09/20/88	1025	1						XFO	INDIA	NO	JT8D	15
09/20/88	1026	1					VNS-LKO	XFO	INDIA	NO	JT8D	17
09/21/88	570	1			1			LAS	LAS VEGAS, NEV	YES	CFM56	3
09/21/88	570	2			1			LAS	LAS VEGAS, NEV	YES	CFM56	3
09/23/88	531	2						XFO	CANADA	NO	JT8D	9A
09/23/88	785	2					OKA-MMY	XFO	JAPAN	NO	JT8D	17
09/23/88	1210	1	GALAH	1Q15	*	11.5		ADL	ADELAIDE, AUSTRALIA	NO	CFM56	3
09/24/88	571	2			1		STL-HOU	XUS	MO-TEX	YES	CFM56	3
09/24/88	580	1						CRW	CHARLESTON, W. VA	YES	JT8D	9A
09/25/88	572	1	ROCK DOVE	2P1		14.		LAX	LOS ANGELES, CA	YES	CFM56	3
09/25/88	1027	2			1			XFO	INDIA	NO	JT8D	9A
09/25/88	1185	2					KRT-PZU	KRT	KHARTOUM, SUDAN	NO	JT8D	17
09/25/88	1218	1						BLR	BANGALORE, INDIA	NO	JT8D	
09/26/88	532	1	HERRING GULL	14N14	2	40.	BRS-TCI	BRS	BRISTOL, ENGLAND	NO	JT8D	15
09/26/88	573	1	PARROT*		1			MEL	MELBOURNE, AUSTRALIA	NO	CFM56	3
09/26/88	786	2	SPARROW*			2.	HND-YGJ	XFO	JAPAN	NO	JT8D	17
09/27/88	574	1					-DAL	XUS	TEX	YES	CFM56	3
09/27/88	787	1	MOURNING DOVE	2P105		4.	-PHX	XUS	PHOENIX, AZ	YES	JT8D	9A
09/27/88	1028	2					JDH-JAI	JAI	JAIPUR, INDIA	NO	JT8D	9A
09/28/88	788	2			*			BUE	BUENOS AIRES, ARGENTINA	NO	JT8D	9A
09/28/88	1029	2					BOM-IXV	IXV	ALONG, INDIA	NO	JT8D	17
09/28/88	1250	2						DTMB	HABIB BOURGIBA, TUNISIA	NO	CFM56	3
09/28/88	1271	1	BLACK-BACKED GULL	14N17		29.		BRS	BRISTOL, ENGLAND	NO	JT8D	
09/29/88	789	2						XFO	SUDAN	NO	JT8D	17
09/29/88	1231	2	EURASIAN KESTREL	5K27	1	7.		CDG	PARIS, FRANCE	NO	JT8D	
09/30/88	575	2			1			XUS		YES	CFM56	3
10/01/88	697	1			1		-FRA	XFO	FRANKFURT, GERMANY	NO	CFM56	3
10/02/88	698	2			1			FRA	FRANKFURT, GERMANY	NO	CFM56	3
10/02/88	790	1			*			XFO	CANADA	NO	JT8D	9A
10/02/88	790	2			*			XFO	CANADA	NO	JT8D	9A
10/02/88	791	1					YQB-YUL	YQB	QUEBEC, CANADA	NO	JT8D	9
10/02/88	831	1			1		STR-FRA	STR	STUTTGART, GERMANY	NO	JT8D	15
10/03/88	699	2			1		-PIT	XUS	PITTSBURGH, PA	YES	CFM56	3
10/04/88	1030	1			1		IXC-IXJ	IXJ	JAMMU, INDIA	NO	JT8D	17
10/04/88	1244	2	GULL*		1			BGO	BERGEN, NORWAY	NO	JT8D	
10/05/88	1031	1						LKO	LUCKNOW, INDIA	NO	JT8D	17
10/06/88	832	2			2			VIE	VIENNA, AUSTRIA	NO	JT8D	15
10/07/88	1032	1					HJR-VNS	VNS	VARANASI, INDIA	NO	JT8D	17
10/08/88	1033	1			1			AGR	AGRA, INDIA	NO	JT8D	17
10/08/88	1034	1					DEL-LKO	LKO	LUCKNOW, INDIA	NO	JT8D	17
10/08/88	1035	1						XFO	INDIA	NO	JT8D	9A
10/08/88	1035	2						XFO	INDIA	NO	JT8D	9A
10/08/88	1211	1	EAGLE*					AGR	AGRA, INDIA	NO	JT8D	
10/10/88	792	2	MOURNING DOVE	2P105		4.	-DAL	XUS	DALLAS, TX	YES	JT8D	9A
10/12/88	793	2			1		YLW-YVR	YVR	VANCOUVER, CANADA	NO	JT8D	9A
10/12/88	1290	2			*			PWM	PORTLAND, ME	YES	JT8D	
10/13/88	700	2	WHITE-THROATED SWIFT	1U71	1	1.5	-PHX	XUS	PHOENIX, AZ	YES	CFM56	3
10/14/88	1276	1			1			LTN	LUTON, ENGLAND	NO	JT8D	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
09/14/88	1016	2		9				NO	
09/14/88	1020	1		9				NO	
09/15/88	529	1	A,D,K,O	1	COMPRESSOR		ADVANCED	INVOLUNTARY	CONTINUOUS SURGING, ERRATIC EPR
09/15/88	529	2	A,D,K,O	1	COMPRESSOR		ADVANCED	INVOLUNTARY	CONTINUOUS SURGING, ERRATIC EPR
09/15/88	566	1	A,H	3	NONE	5.0	IDLE	NO	ODOR IN CABIN
09/15/88	1021	1	A	4				NO	1ST F BLDS UNK DAMAGE
09/16/88	567	1	A,D	2	NONE			NO	8 PAIRS OF FAN BLADES REPLACED
09/16/88	1022	1		9				NO	ODOR
09/17/88	579	1	A,C	3				NO	DAMAGE TO C2 FAN BLADES, REPLACED C2 ASS
09/17/88	780	2	A,D,G,K	1		SOME	IDLE		FAN AND COMP BLDS DAMAGED, ODOR
09/18/88	568	1		9	NONE	2.8		NO	
09/18/88	1023	1	A,G	2				NO	1STG F BLDS DAMAGED
09/19/88	781	1		9	NONE			NO	SMALL BIRDS
09/19/88	781	2		9	NONE			NO	SMALL BIRDS
09/20/88	530	1		9					FOUND DURING GROUND INSPECTION
09/20/88	569	1		9	NONE	1.9		NO	
09/20/88	782	1		9	NONE			NO	
09/20/88	783	2		9	NONE			NO	
09/20/88	784	2		9					
09/20/88	1024	1		9				NO	
09/20/88	1025	1		9				NO	FOUND ON GRD INSPEC
09/20/88	1026	1		9				NO	FOUND ON GRD INSPEC
09/21/88	570	1		9	NONE			NO	
09/21/88	570	2	A,H	3	NONE			NO	
09/23/88	531	2		9					FOUND ON GRD INSPEC
09/23/88	785	2		9					
09/23/88	1210	1	A,K	1					UNK DAMAGE TO COMPRESSOR BLDS
09/24/88	571	2	A,K	1	NONE			NO	1 STG 4 HPC BLADE DAMAGED
09/24/88	580	1		9				NO	
09/25/88	572	1	A	4	NONE			NO	14 PAIRS OF FAN BLADES REPLACED
09/25/88	1027	2		9				NO	
09/25/88	1185	2	A,G	2	NONE			NO	3 F BLDS DAMAGED
09/25/88	1218	1		9					
09/26/88	532	1	A,D,H	2	COMPRESSOR		CUTOFF	YES	POWER LOSS, EPR SYMPTOM, EGT FAIL CODE
09/26/88	573	1	A,H	5		5.0	RETARD	NO	12 FAN BLADES SHINGLED
09/26/88	786	2		9					
09/27/88	574	1	A,B	3	NONE			NO	15 FAN BLADES DAMAGED, LE NICKS
09/27/88	787	1		9				NO	
09/27/88	1028	2		9				NO	
09/28/88	788	2	A,G	2				NO	ENGINE REMOVED
09/28/88	1029	2		9				NO	
09/28/88	1250	2		9					
09/28/88	1271	1	A,Q	4					UNK # OF F BLDS DAMAGED, DAM UNK
09/29/88	789	2	A,I	1				NO	
09/29/88	1231	2		9					
09/30/88	575	2	A,C,K	1	NONE			NO	HPC BLADES BEYOND MM LIMITS
10/01/88	697	1		9	NONE			NO	FOUND DURING GROUND INSPECTION
10/02/88	698	2	A,H	3	NONE	4.0		NO	3 FAN BLADES DAMAGED
10/02/88	790	1		9					FOUND ON GRD INSPEC
10/02/88	790	2		9					FOUND ON GRD INSPEC
10/02/88	791	1	A,G,K	1				NO	FAN RUB STRIP GOUGED, 1+2 STG F BLDS REP
10/02/88	831	1		9	NONE			NO	
10/03/88	699	2	A,H	3	NONE			NO	FOUND ON GRD INSPEC.,3 F BLDS SHINGLED
10/04/88	1030	1	A,H	3		YES		NO	1 F BLD SHINGLED
10/04/88	1244	2		9					
10/05/88	1031	1		9				NO	
10/06/88	832	2		9	NONE			NO	
10/07/88	1032	1		9				NO	
10/08/88	1033	1		9				NO	
10/08/88	1034	1		9				NO	
10/08/88	1035	1		9				NO	
10/08/88	1035	2		9				NO	
10/08/88	1211	1		9					
10/10/88	792	2		9					
10/12/88	793	2		9					
10/12/88	1290	2	A,Q	4					
10/13/88	700	2		9	NONE			NO	FOUND ON GRD INSPEC.
10/14/88	1276	1		9					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
10/15/88	1036	1	1748	16:57:00	NONE	200	LANDING	0	120			CLOUDY	NONE	NO	SEVERAL
10/17/88	701	2	884005		NONE	300	TAKEOFF						NONE	NO	NO
10/18/88	1240	2	88		NONE	300	APPROACH					CLOUDY	NONE	NO	
10/19/88	794	2	164		NONE	200	LANDING								
10/20/88	1183	2	1828	14:40:00	NONE	200	APPROACH					CLOUDY	NONE	NO	
10/20/88	1184	2	1612	7:50:00	MULT BIRDS	200	LANDING	0				CLOUDY	NONE	NO	SEVERAL
10/21/88	795	1	167	21:00:00	NONE	200	TAKEOFF	25	120			RAIN	NONE	NO	YES
10/22/88	1037	1	1749	20:25:00	NONE	200	LANDING	0	80			CLEAR	NONE	NO	SEVERAL
10/23/88	833	1	237	19:27:00	MULT BIRDS	200	TAKEOFF	0	80			CLEAR	ATO	YES	SEVERAL
10/23/88	1182	1	1538		NONE	200	UNKNOWN						NONE		
10/24/88	798	1	250	15:45:00	NONE	200	LANDING	0	100			BROKEN			
10/24/88	1209	2	0		NONE	200	UNKNOWN						NONE		
10/26/88	702	2	884006	8:00:00	NONE	300	TAKEOFF	0	130			OVERCAST	NONE	NO	NO
10/26/88	703	1	884007		NONE	300	UNKNOWN						NONE	NO	NO
10/26/88	704	2	884008	9:00:00	NONE	300	TAKEOFF	0	VR				NONE	NO	NO
10/26/88	1216	2	88	12:53:00	MULT BIRDS	300	LANDING	200	130			OVERCAST	NONE	NO	FLOCK
10/28/88	799	1	250	10:30:00	NONE	200	LANDING	0	110			BROKEN			
10/28/88	1038	2	1750	9:10:00	NONE	200	LANDING	0	130			CLOUDY	NONE	NO	ONE
10/29/88	1236	1	88	9:19:00	NONE	200	TAKEOFF	200	160			CLEAR	NONE		FLOCK
10/31/88	800	2	169	21:35:00	NONE	200	CLIMB	500	150			CLEAR	ATB	NO	YES
11/02/88	801	2	176	7:50:00	MULT BIRDS	200	TAKEOFF	0	146			OVERCAST	DIV		SEVERAL
11/03/88	705	2	884009	20:00:00	NONE	300	TAKEOFF	200	140				NONE	NO	NO
11/03/88	1039	1	1751		NONE	200	TAKEOFF	50	130				NONE		
11/04/88	802	1	260		NONE	200	UNKNOWN								
11/05/88	803	1	171	6:30:00	NONE	200	TAKEOFF	5					ATB		
11/07/88	706	1	884010	7:40:00	INV POW LOSS	300	TAKEOFF	0	150	VFR		CLOUDY	ATO	YES	ONE
11/07/88	707	2	884011		NONE	300	TAKEOFF	0	+V1				ATB	NO	NO
11/07/88	804	2	172	9:15:00	MULT BIRDS	200	TAKEOFF	15	133			CLOUDY	ATB	NO	SEVERAL
11/07/88	834	1	270		NONE	200	TAKEOFF								
11/09/88	805	1	174	17:30:00	NONE	200	TAKEOFF								ONE
11/09/88	806	1	173	13:30:00	AIRWRTHY	200	CLIMB	2000		VFR		CLEAR	ATB	NO	NO
11/09/88	1305	1	88	14:03:00	MULT ENG-BIRDS	200	TAKEOFF	0	137			OVERCAST	NONE		
11/09/88	1305	2	88	14:03:00	MULT ENG-BIRDS	200	TAKEOFF	0	137			OVERCAST	NONE		
11/10/88	1258	1	88	21:55:00	NONE	200	CLIMB		125			CLEAR	NONE	NO	ONE
11/12/88	807	1	179		NONE	200	TAKEOFF								
11/13/88	835	2	270		NONE	200	CLIMB								
11/14/88	708	1	884012	18:45:00	NONE	300	APPROACH					CLOUDY	NONE	NO	NO
11/14/88	1237	1	88	13:44:00	MULT BIRDS	200	LANDING	5	135			CLOUDY	NONE	NO	FLOCK
11/14/88	1278	1	88	6:00:00	NONE	200	TAKEOFF	0	140			CLEAR	NONE	NO	
11/15/88	1238	1	88	16:15:00	NONE	300	APPROACH						NONE		
11/16/88	808	1	175	11:00:00	NONE	200	UNKNOWN								NO
11/16/88	1296	2	88	7:31:00	NONE	300	LANDING	50	120			RAIN	NONE	NO	FLOCK
11/17/88	809	2	178		NONE	200	UNKNOWN								
11/17/88	1040	1	1752		NONE	200	LANDING						NONE		
11/17/88	1279	1	88	13:49:00	NONE	200	TAKEOFF	0				CLOUDY	NONE		ONE
11/18/88	836		112		NONE	200	UNKNOWN								
11/18/88	837	2	249	7:43:00	MULT BIRDS	200	LANDING	0	130			FOG	NONE	NO	FLOCK
11/19/88	810	1	177	17:00:00	INV POW LOSS	200	TAKEOFF	200					ATB		FLOCK
11/19/88	1041	1	1753		NONE	200	LANDING	0	VT				NONE		
11/19/88	1300	2	88	16:20:00	MULT BIRDS	300	LANDING	0	130			OVERCAST	NONE	NO	FLOCK
11/20/88	838	2	252	18:45:00	NONE	200	TAKEOFF	0	80			CLOUDY	ATO	NO	ONE
11/21/88	709	1	884013		NONE	300	LANDING						NONE	NO	NO
11/22/88	710	2	884014		NONE	300	UNKNOWN						NONE	NO	NO
11/23/88	711	2	884015		MULT BIRDS	300	TAKEOFF						NONE	NO	
11/23/88	811	1	185		INV POW LOSS	200	TAKEOFF	0					ATO		YES
11/24/88	712	1	884016		MULT BIRDS	300	CRUISE	4000					NONE	NO	FLOCK
11/24/88	1042	1	1754		NONE	200	TAKEOFF	0					ATO		
11/24/88	1205	2	0		NONE	200	UNKNOWN						NONE		
11/26/88	812	1	191	21:40:00	NONE	200	LANDING	0	120			RAIN	NONE	NO	NO
11/27/88	813	2	189	8:47:00	NONE	200	LANDING	0	128			BELOW CLOUDS	OTHER	NO	NO
11/29/88	839	1	251	11:35:00	NONE	200	LANDING					RAIN	NONE	NO	ONE
11/30/88	713	2	884017		NONE	300	UNKNOWN					RAIN	NONE	NO	NO
12/01/88	814	1	186	7:45:00	MULT BIRDS	200	TAKEOFF	50	160	IFR		RAIN	ATB	NO	FLOCK
12/04/88	714	1	884018	9:00:00	MULT BIRDS	300	CLIMB		123			CLOUDY	ATB	NO	SEVERAL
12/05/88	815	1	224		NONE	200	TAKEOFF	0					ATO		
12/05/88	840	2	270		NONE	200	UNKNOWN						NONE		
12/05/88	841	2	162	20:25:00	NONE	200	LANDING	200	130			CLEAR	NONE		
12/05/88	1318	1	88	9:41:00	NONE	200	TAKEOFF	0	140			CLOUDY	ATB	NO	SEVERAL

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
10/15/88	1036	1			1		IDR-BHO	BHO	BHOPAL, INDIA	NO	JT8D	9A
10/17/88	701	2	COMMON SONG THRUST	412282	1	2.6		ORY	PARIS-ORLY FRANCE	NO	CFM56	3
10/18/88	1240	2						CLT	CHARLOTTE, NC	YES	CFM56	3
10/19/88	794	2	SNOW GOOSE	2J26	1	86.	YZF-YHY	YHY	HAY RIVER, CANADA	NO	JT8D	9A
10/20/88	1183	2						TUC	TUCUMAN, ARGENTINA	NO	JT8D	9A
10/20/88	1184	2			*			SFN	SANTA FE, ARGENTINA	NO	JT8D	9A
10/21/88	795	1	GULL*		1	20.	DUR-SBP	DUR	DURBAN, S. AFRICA	NO	JT8D	9
10/22/88	1037	1			1		DEL-AMD	AMD	AHMEDABAD, INDIA	NO	JT8D	9A
10/23/88	833	1	STONE CURLEW	9N1	*	16.	SLL-MCT	SLL	SALALAH, OMAN	NO	JT8D	15
10/23/88	1182	1	HORNED LARK	17Z74		1.5		XUS	TX	YES	JT8D	9A
10/24/88	798	1			1			XFO	JAPAN	NO	JT8D	17
10/24/88	1209	2						XUS		YES	JT8D	15
10/26/88	702	2			1		CWB-GRU	CWB	CURITIBA, BRAZIL	NO	CFM56	3
10/26/88	703	1			1		-DFW	XUS	DALLAS/FT WORTH, TX	YES	CFM56	3
10/26/88	704	2			1		OKC-SLC	OKC	OKLAHOMA CITY, OK	YES	CFM56	3
10/26/88	1216	2	SPARROW*		*			AYT	ANTALYA, TURKEY	NO	CFM56	3
10/28/88	799	1			1			XFO	JAPAN	NO	JT8D	17
10/28/88	1038	2	KITE*		1		MAA-BLR	BLR	BANGALORE, INDIA	NO	JT8D	9A
10/29/88	1236	1	GULL*					NCE	NICE, FRANCE	NO	JT8D	
10/31/88	800	2					PNA-DEL	PNA	PATNA, INDIA	NO	JT8D	17
11/02/88	801	2	BLACK PARTRIDGE	4L44	*	14.	EMA-ACE	EMA	EAST MIDLANDS, ENGLAND	NO	JT8D	15
11/03/88	705	2			1			PVH	PORTO VELHO, BRAZIL	NO	CFM56	3
11/03/88	1039	1						HYD	HYDERABAD, INDIA	NO	JT8D	9A
11/04/88	802	1						XFO	TAIWAN	NO	JT8D	9A
11/05/88	803	1						BHM	BIRMINGHAM, AL	YES	JT8D	7
11/07/88	706	1	HAWK*		1			MAF	MIDLAND/ODESSA, TX	YES	CFM56	3
11/07/88	707	2	COMMON LAPWING	5N1	1	7.6		AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
11/07/88	804	2	BROWN-HOODED GULL	14N35	*	10.1	MDQ-BUE	MDQ	MAR DEL PLATA, ARGENTINA	NO	JT8D	9A
11/07/88	834	1						MDP	MINDIPTANA, INDONESIA	NO	JT8D	9
11/09/88	805	1			1		SRQ-TPA	SRQ	SARASOTA, FL	YES	JT8D	7B
11/09/88	806	1	BLACK KITE	3K28	1	28.	BFN-JNB	BFN	BLOEMFONTEIN, S. AFRICA	NO	JT8D	17A
11/09/88	1305	1	LAPWING*		*			EGNV	TEES-SIDE, ENGLAND	NO	JT8D	
11/09/88	1305	2	LAPWING*		*			EGNV	TEES-SIDE, ENGLAND	NO	JT8D	
11/10/88	1258	1						JAI	JAIPUR, INDIA	NO	JT8D	
11/12/88	807	1					YOW-YYZ	YOW	OTTAWA, CANADA	NO	JT8D	9A
11/13/88	835	2						BHI	BAHIA BLANCA, ARGENTINA	NO	JT8D	9A
11/14/88	708	1			1		-LGW	LGW	LONDON-GATWICK, ENGLAND	NO	CFM56	3
11/14/88	1237	1	PIGEON*		*			NCE	NICE, FRANCE	NO	JT8D	
11/14/88	1278	1						MAA	MADRAS, INDIA	NO	JT8D	
11/15/88	1238	1						NCE	NICE, FRANCE	NO	CFM56	3
11/16/88	808	1					MCI-DEN	XUS	MO-CO	YES	JT8D	17
11/16/88	1296	2	GULL*		1			SZG	SALZBURG, AUSTRIA	NO	CFM56	3
11/17/88	809	2					DAY-ORD	XUS	OH-IL	YES	JT8D	7B
11/17/88	1040	1					MAA-BLR	BLR	BANGALORE, INDIA	NO	JT8D	17
11/17/88	1279	1			1			LEMG	MALAGA, SPAIN	NO	JT8D	
11/18/88	836										JT8D	15
11/18/88	837	2	GULL*		*		CGN-HAM	HAM	HAMBURG, GERMANY	NO	JT8D	15
11/19/88	810	1	AMERICAN WIGEON	2J71	1	28.	PDX-SFO	PDX	PORTLAND, OR	YES	JT8D	7
11/19/88	1041	1					IXV-UDR	UDR	UDAIPUR, INDIA	NO	JT8D	9A
11/19/88	1300	2			*			AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
11/20/88	838	2	GULL*		1			GRZ	GRAZ, AUSTRIA	NO	JT8D	15
11/21/88	709	1	BURROWING OWL	2S102	1	5.3		CWB	CURITIBA, BRAZIL	NO	CFM56	3
11/22/88	710	2			1			XFO		NO	CFM56	3
11/23/88	711	2	STARLING*		*			PIE	TAMPA/ST PETERSBURG, FL	YES	CFM56	3
11/23/88	811	1			1		BHZ-MIN	BHZ	BELO HORIZONTE, BRAZIL	NO	JT8D	17A
11/24/88	712	1	STARLING*		*		-LHR	XFO	LONDON-HEATHROW, ENGLAND	NO	CFM56	3
11/24/88	1042	1					CMB-TRZ	CMB	COLOMBO, SRI LANKA	NO	JT8D	17
11/24/88	1205	2						XUS		YES	JT8D	
11/26/88	812	1	OWL*		1		CPT-PLZ	PLZ	PORT ELIZABETH, S. AFRICA	NO	JT8D	17A
11/27/88	813	2	HADADA IBIS	6I12	1	48.	DUR-ELS	ELS	EAST LONDON, S. AFRICA	NO	JT8D	17A
11/29/88	839	1			1			MLA	MALTA, MEDITERRANEAN SEA	NO	JT8D	15
11/30/88	713	2	BLACK-HEADED GULL	14N36	1	9.7	AMS-ENS	XFO	NETHERLANDS	NO	CFM56	3
12/01/88	814	1	BLACK-HEADED GULL	14N36	*	10.		BRU	BRUSSELS, BELGIUM	NO	JT8D	15A
12/04/88	714	1	PLOVER*		*			LST	LAUNCESTON, AUSTRALIA	NO	CFM56	3
12/05/88	815	1	GULL*					BHI	BAHIA BLANCA, ARGENTINA	NO	JT8D	15A
12/05/88	840	2						XFO	ARGENTINA	NO	JT8D	9A
12/05/88	841	2	GULL*			10.		HND	TOKYO-HANEDA, JAPAN	NO	JT8D	
12/05/88	1318	1	BROWN-HOODED GULL	14N35	1	10.1		BHI	BAHIA BLANCA, ARGENTINA	NO	JT8D	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
10/15/88	1036	1		9				NO	
10/17/88	701	2		9	NONE			NO	
10/18/88	1240	2	A,Q	4					
10/19/88	794	2		9					
10/20/88	1183	2	A,C	3				NO	1 F BLD BENT
10/20/88	1184	2		9	NONE			NO	
10/21/88	795	1	A,D	2				NO	1 STG FAN ASSEMBLY CHANGED
10/22/88	1037	1		9				NO	
10/23/88	833	1	A,I,K	1	COMPRESSOR	HIGH		NO	10 OTHER FBLDS SEVERE DAM, DAM THRU COMP
10/23/88	1182	1		9	NONE			NO	FOUND ON GRD INSPEC
10/24/88	798	1		9					
10/24/88	1209	2	A,D	2					BENT F BLDS, REPLACED FAN ASSEMBLY
10/26/88	702	2	A,H	3	NONE			NO	5 F BLDS SHINGLED
10/26/88	703	1		9	NONE			NO	
10/26/88	704	2	A,D	2	NONE			NO	'LOUD VIBRATING SOUND' FROM ENGINE
10/26/88	1216	2		9					
10/28/88	799	1		9					
10/28/88	1038	2		9				NO	
10/29/88	1236	1		9					
10/31/88	800	2	A,D,G	2				VOLUNTARY	ENGINE CHANGE, 1STG F BLDS REPLACED
11/02/88	801	2	A,D,H,N	2	COMPRESSOR		IDLE	YES	ENG REMOVED, ENG SURGED TWICE ON POW RED
11/03/88	705	2	A,C	3	NONE			NO	
11/03/88	1039	1		9				NO	
11/04/88	802	1	A,C	3					1 F BLD CHANGED
11/05/88	803	1		9	COMPRESSOR				LOUD BANG AT LIFTOFF
11/07/88	706	1	A,D,H	2				NO	3 FAN OGV'S DAMAGED
11/07/88	707	2	A,D,H	2	NONE			NO	7 F BLDS WITH TRAILING EDGE TIP CURL
11/07/88	804	2	A,I,K	1	COMPRESSOR	HIGH		VIBES	SEVERE GAS PATH DAMAGE
11/07/88	834	1		9					
11/09/88	805	1		9				NO	
11/09/88	806	1	A,E,G,K	1	COMPRESSOR			NO	AC SWUNG TO LEFT, DAMAGE THRU GAS PATH
11/09/88	1305	1		9					
11/09/88	1305	2		9					
11/10/88	1258	1	A,Q	4					
11/12/88	807	1		9					ODOR IN CABIN
11/13/88	835	2	A,C,K	1	NONE			NO	SMALL DAM IN 13TH STG COMP
11/14/88	708	1		9	NONE			NO	
11/14/88	1237	1		9					
11/14/88	1278	1		9					
11/15/88	1238	1		9					
11/16/88	808	1	A,G	2				NO	FOUND ON GRD INSPEC, C1+C2 DAMAGE
11/16/88	1296	2		9					
11/17/88	809	2	A,D	2					FOUND ON GRDINSPEC,C1 DISK+BLDS REPLACED
11/17/88	1040	1		9				NO	
11/17/88	1279	1		9					
11/18/88	836		A,H,K,N	1					LPC DAMAGE
11/18/88	837	2		9	NONE			NO	
11/19/88	810	1	A,B,G,K	1	SPOOL DOWN			INVOLUNTARY	3X5IN LE PIECE LIBERATED
11/19/88	1041	1		9				NO	
11/19/88	1300	2		9					
11/20/88	838	2		9	NONE			NO	
11/21/88	709	1		9	NONE			NO	
11/22/88	710	2		9	NONE			NO	FOUND ON SHOP INSPEC. FOR OTHER REASON
11/23/88	711	2	A,B,C	3	NONE	1.3		NO	
11/23/88	811	1	A,I	1	YES	HIGH		YES	TRVS FRAC .75IN ABOVE MIDSPAN SHROUD
11/24/88	712	1		9	NONE			NO	N1 ENG CORE INLET PARTIALLY BLOCKED
11/24/88	1042	1		9				NO	
11/24/88	1205	2	A,D	2				NO	CHANGED FAN DUE TO BENT BLDS # UNK
11/26/88	812	1	A,C	3				NO	
11/27/88	813	2	A,D	2				NO	FAN CHANGE, ING WHILE IN REVERSE THRUST
11/29/88	839	1		9	NONE			NO	
11/30/88	713	2		9	NONE			NO	FOUND ON GRD INSPEC
12/01/88	814	1	A,H,I,N	1	COMPRESSOR	HIGH	CUTOFF	VOLUNTARY	ONE F BLD TRVS FRAC, 100% LOSS OF THRUST
12/04/88	714	1	A,C,H	3		HIGH		VIBE	ACOUSTIC LINING AT REAR OF FBLDS MISSING
12/05/88	815	1	A,D	2				YES	EPR SYMPTOM
12/05/88	840	2	A,D	2	NONE			NO	4 F BLDS BENT
12/05/88	841	2		9				NO	
12/05/88	1318	1	A,Q	4					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
12/07/88	715	2	884019	11:00:00	NONE	300	TAKEOFF	0	VR		BRIGHT	CLEAR	ATB	NO	ONE
12/07/88	716	1	884020		MULT ENG-BIRDS	300	APPROACH						NONE	NO	FLOCK
12/07/88	716	2	884021		MULT ENG-BIRDS	300	APPROACH						NONE	NO	FLOCK
12/07/88	1239	1	88	16:46:00	MULT ENG-BIRDS	300	LANDING	0	100			OVERCAST	NONE	NO	FLOCK
12/07/88	1239	2	88	16:46:00	MULT ENG-BIRDS	300	LANDING	0	100			OVERCAST	NONE	NO	FLOCK
12/10/88	1283	1	88		NONE	100	TAKEOFF	0					NONE	NO	
12/11/88	717	1	884022	8:36:00	NONE	300	TAKEOFF	0	130			CLOUDY	NONE	NO	FLOCK
12/11/88	718	2	884023		NONE	300	UNKNOWN							NO	NO
12/11/88	842	1	270	9:20:00	MULT ENG	200	CLIMB					CLEAR	NONE	NO	YES
12/11/88	842	2	270	9:20:00	MULT ENG	200	CLIMB					CLEAR	NONE	NO	YES
12/12/88	843	2	197	18:15:00	MULT BIRDS	200	LANDING	50	125			BELOW CLOUDS	NONE		
12/13/88	816	2	192	10:22:00	MULT BIRDS	200	TAKEOFF	50				RAIN	ATB		FLOCK
12/13/88	1043	2	1755		NONE	200	UNKNOWN						NONE		
12/14/88	817	1	228		NONE	200	UNKNOWN						NONE		
12/14/88	1242	1	88		MULT BIRDS	200	TAKEOFF	0	125			CLEAR	NONE	NO	FLOCK
12/15/88	719	2	884024	16:40:00	NONE	300	TAKEOFF	0	130	IFR	DARK	RAIN	NONE	NO	ONE
12/18/88	818	2	195	15:00:00	MULT BIRDS	200	LANDING	70				RAIN			FLOCK
12/19/88	720	2	884025	7:45:00	NONE	300	CLIMB	1500		VFR		CLEAR	NONE	NO	SEVERAL
12/19/88	819	1	223	17:47:00	NONE	200	TAKEOFF	0	133			RAIN	ATO	YES	ONE
12/20/88	820	2	232	10:30:00	NONE	200	CLIMB					CLEAR	NONE		NO
12/20/88	844	2	236	12:20:00	NONE	200	LANDING	100	130			CLEAR	NONE		
12/20/88	1301	1	88	15:15:00	MULT ENG-BIRDS	300	LANDING	10	120			OVERCAST	NONE		FLOCK
12/20/88	1301	2	88	15:15:00	MULT ENG-BIRDS	300	LANDING	10	120			OVERCAST	NONE		FLOCK
12/21/88	821	1	231	7:00:00	MULT ENG-BIRDS	200	TAKEOFF	20	145			CLEAR	NONE		FLOCK
12/21/88	821	2	231	7:00:00	MULT ENG-BIRDS	200	TAKEOFF	20	145			CLEAR	NONE		FLOCK
12/21/88	822	2	227		NONE	200	UNKNOWN						NONE		
12/22/88	721	1	884026	8:00:00	NONE	300	LANDING	0					NONE	NO	ONE
12/22/88	1232	2	88	16:25:00	MULT BIRDS	100	LANDING	30	124			OVERCAST	NONE	YES	FLOCK
12/23/88	797	1	168		NONE	200	UNKNOWN								
12/25/88	722	2	884027	8:45:00	NONE	300	LANDING	0		VFR	BRIGHT	CLEAR	NONE	NO	ONE
12/25/88	723	1	884028		NONE	300	TAKEOFF		+V1				NONE	NO	FLOCK
12/25/88	823	2	225		NONE	200	UNKNOWN								
12/28/88	724	2	884029		NONE	300	UNKNOWN						NONE	NO	NO
12/30/88	725	1	884030	17:36:00	NONE	300	TAKEOFF	0	140			OVERCAST	ATB	NO	ONE
12/31/88	726	2	884031		MULT BIRDS	300	APPROACH	3600	210			OVERCAST	NONE	YES	FLOCK
12/31/88	727	1	884032		NONE	300	TAKEOFF	0	VR				ATB	NO	NO
12/31/88	824	1	229	8:34:00	NONE	200	TAKEOFF	0	145			CLEAR	NONE		NO
01/01/89	1359	1	89	10:15:00	NONE	100	LANDING	5	130			CLEAR	OTHER	NO	ONE
01/03/89	825	2	226		NONE	200	UNKNOWN								
01/06/89	826	2	201		NONE	200	LANDING								
01/08/89	827	1	233	19:38:00	NONE	200	TAKEOFF	0	60			CLEAR	ATO	NO	
01/11/89	863	1	891001	12:45:00	MULT ENG-BIRDS	300	TAKEOFF	0	VR	VFR		OVERCAST,DRY	DIV		FLOCK
01/11/89	863	2	891002	12:45:00	MULT ENG-BIRDS	300	TAKEOFF	0	VR	VFR		OVERCAST,DRY	DIV		FLOCK
01/11/89	1349	2	89	10:30:00	NONE	100	LANDING	100	120			OVERCAST	OTHER	NO	SEVERAL
01/12/89	1350	1	89	18:20:00	MULT BIRDS	100	LANDING	0	125		OVERCAST	RAIN	OTHER		FLOCK
01/13/89	864	2	891003	12:30:00	NONE	300	APPROACH	0					NONE		SEVERAL
01/14/89	1424	1	89	19:13:00	NONE	200	LANDING	0	120			SOME CLOUDS	NONE	NO	
01/16/89	865	1	891004		NONE	300	UNKNOWN						NONE	NO	
01/17/89	1342	2	89		NONE		APPROACH						NONE	NO	
01/19/89	828	2	234		MULT BIRDS	200	TAKEOFF						ATB		YES
01/19/89	829	2	219		NONE	200	TAKEOFF	0	50				ATO		YES
01/19/89	1203	1	0		NONE	300	TAKEOFF	100	140	IFR	DAY	FOG	NONE	NO	
01/20/89	866	2	891005		NONE	300	LANDING	0					NONE		YES
01/20/89	1333	1	89		NONE	100	CLIMB	1000					OTHER	NO	
01/22/89	845	2	245	16:00:00	NONE	200	UNKNOWN					CLEAR			NO
01/23/89	1044	2	1756		NONE	200	TAKEOFF	0					ATO		
01/23/89	1045	1	1757	10:30:00	NONE	200	LANDING		100			CLEAR	NONE	YES	YES
01/23/89	1410	2	89		NONE		LANDING	0			OVERCAST	RAIN	NONE		SEVERAL
01/26/89	1334	1	89	10:00:00	NONE	100	CLIMB	1000	160		OVERCAST	FOG	ATB	NO	
01/27/89	846	1	238	19:20:00	NONE	200	LANDING	0	100		OVERCAST	CLOUDY	NONE	NO	NO
01/27/89	867	2	891006		NONE	300	UNKNOWN						NONE		
01/27/89	868	2	891007		NONE	300	UNKNOWN								
01/29/89	869	2	891008		NONE	300	TAXI	0	0				NONE		ONE
01/29/89	870	2	891009		MULT BIRDS	300	TAKEOFF	0	-V1				ATO		SEVERAL
01/29/89	1204	2	0		NONE	300	TAKEOFF	0	130	VFR	DAY	CLEAR	NONE	NO	SEVERAL
01/30/89	871	2	891010		NONE	300	LANDING	0					NONE		
02/01/89	1411	2	89		NONE	300	TAKEOFF					CLEAR	NONE	NO	ONE
02/05/89	847	1	249	17:37:00	MULT BIRDS	200	TAKEOFF	50	140			SOME CLOUDS	NONE	NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
12/07/88	715	2			1			GSP	GREENVILLE, SC	YES	CFM56	3
12/07/88	716	1			1			FRA	FRANKFURT, GERMANY	NO	CFM56	3
12/07/88	716	2			*			FRA	FRANKFURT, GERMANY	NO	CFM56	3
12/07/88	1239	1			*			DUS	DUSSELDORF, GERMANY	NO	CFM56	3
12/07/88	1239	2			*			DUS	DUSSELDORF, GERMANY	NO	CFM56	3
12/10/88	1283	1			1			BOD	BORDEAUX, FRANCE	NO	JT8D	
12/11/88	717	1	GULL*		1		DUS-TFS	DUS	DUSSELDORF, GERMANY	NO	CFM56	3
12/11/88	718	2	COMMON LAPWING	5N1	1	7.7	-AMS	XFO	AMSTERDAM, NETHERLANDS	NO	CFM56	3
12/11/88	842	1	BROWN-HOODED GULL	14N35		10.1		BHI	BAHIA BLANCA, ARGENTINA	NO	JT8D	9A
12/11/88	842	2	BROWN-HOODED GULL	14N35		10.1		BHI	BAHIA BLANCA, ARGENTINA	NO	JT8D	9
12/12/88	843	2	DUCK*		*	32.		TTJ	TOTTORI, JAPAN	NO	JT8D	
12/13/88	816	2	COMMON OYSTERCATCHER	4N1	*	8.		AKL	AUKLAND, NEW ZEALAND	NO	JT8D	15A
12/13/88	1043	2					-GOI	XFO	INDIA	NO	JT8D	17
12/14/88	817	1						XFO	ARGENTINA	NO	JT8D	9A
12/14/88	1242	1	DIPPER*		*			ELP	EL PASO, TX	YES	JT8D	
12/15/88	719	2			1		AMS-FCO	AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
12/18/88	818	2	HERRING GULL	14N14	2	40.	ANC-ADQ	ADQ	KODIAK, ALASKA	YES	JT8D	17A
12/19/88	720	2	HERRING GULL	14N14	1	40.	ISP-PIT	ISP	LONG ISLAND, NY	YES	CFM56	3
12/19/88	819	1	PARTRIDGE*		1		SLA-BUE	SAL	SALTA, ARGENTINA	NO	JT8D	9A
12/20/88	820	2			1		BFN-KIM	BFN	BLOEMFONTEIN, S. AFRICA	NO	JT8D	17A
12/20/88	844	2	GULL*		1			OIT	OITA, JAPAN	NO	JT8D	
12/20/88	1301	1	LAPWING*		*			AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
12/20/88	1301	2	LAPWING*		*			AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
12/21/88	821	1	KIEWIET*		*		BFN-JNB	BFN	BLOEMFONTEIN, S. AFRICA	NO	JT8D	17A
12/21/88	821	2	KIEWIET*		*		BFN-JNB	BFN	BLOEMFONTEIN, S. AFRICA	NO	JT8D	17A
12/21/88	822	2	WOOD PIGEON	2P9		18.		XFO	ALGERIA	NO	JT8D	17A
12/22/88	721	1	RING-BILLED GULL	14N12	1	16.	ALB-PHL	PHL	PHILA, PA	YES	CFM56	3
12/22/88	1232	2	BLACK-HEADED GULL	14N36	*	10.		CDG	PARIS, FRANCE	NO	JT8D	
12/23/88	797	1	HORNED LARK	17Z74	1	5.	-HOU	XUS	HOUSTON, TX	YES	JT8D	
12/25/88	722	2	GULL*		1		LAX-SJC	SJC	SAN JOSE, CA	YES	CFM56	3
12/25/88	723	1			1		SAT-DAL	SAT	SAN ANTONIO, TX	YES	CFM56	3
12/25/88	823	2					PEK-	XFO	CHINA	NO	JT8D	17A
12/28/88	724	2			1		-PHX	XUS	PHOENIX, AZ	YES	CFM56	3
12/30/88	725	1			1			DAL	DALLAS/FT WORTH, TX	YES	CFM56	3
12/31/88	726	2			*			SMF	SACRAMENTO, CA	YES	CFM56	3
12/31/88	727	1			1			DAL	DALLAS/FT WORTH, TX	YES	CFM56	3
12/31/88	824	1	DOVE*			10.	CPT-JNB	CPT	CAPE TOWN, S. AFRICA	NO	JT8D	17A
01/01/89	1359	1	BLACK-HEADED GULL	14N36	1	10.		NCE	NICE, FRANCE	NO	JT8D	
01/03/89	825	2					YYC-YXD	XFO	CANADA	NO	JT8D	9A
01/06/89	826	2	EARED DOVE	2P106	1	6.	MDQ-	XFO	ARGENTINA	NO	JT8D	15A
01/08/89	827	1			1		BFN-JNB	BFN	BLOEMFONTEIN, S. AFRICA	NO	JT8D	17A
01/11/89	863	1	STARLING*		*		LST-MEL	LST	LAUNCESTON, AUSTRALIA	NO	CFM56	3
01/11/89	863	2	STARLING*		*		LST-MEL	LST	LAUNCESTON, AUSTRALIA	NO	CFM56	3
01/11/89	1349	2			1			CDG	CHARLES DE GAULLE, FRANCE	NO	JT8D	
01/12/89	1350	1	COMMON LAPWING	5N1	*	7.7		CDG	PARIS-DE GAULLE, FRANCE	NO	JT8D	
01/13/89	864	2			1		DTW-MDW	MDW	CHICAGO, IL-MIDWAY	YES	CFM56	3
01/14/89	1424	1	SPUR-WINGED PLOVER	5N4		5.4		PMR	PALMERSTON, NEW ZEALAND	NO	JT8D	
01/16/89	865	1			1		-LGW	XFO	LONDON-GATWICK, ENGLAND	NO	CFM56	3
01/17/89	1342	2	COMMON GULL	14N13	1	15.		CCR	CONCORD, CA	YES		
01/19/89	828	2	PIGEON*		2	14.	LAX-YVR	LAX	LOS ANGELES, CA	YES	JT8D	17
01/19/89	829	2					HNM-HNL	HNM	HANA, HAWAII	YES	JT8D	9A
01/19/89	1203	1	SPARROW*		1			CRP	CORPUS CHRISTI, TX	YES	CFM56	3
01/20/89	866	2			1		-FRA	FRA	FRANKFURT, GERMANY	NO	CFM56	3
01/20/89	1333	1			1			TLS	TOULOUSE, FRANCE	NO	JT8D	
01/22/89	845	2					ADQ-ANC	XUS	ALASKA	YES	JT8D	17A
01/23/89	1044	2			1		JDH-UDR	JDH	JODHPUR, INDIA	NO	JT8D	9A
01/23/89	1045	1			1			VOTR	TIRUCHCHIRAPPALLI, INDIA	NO	JT8D	9A
01/23/89	1410	2	HERRING GULL	14N14		40.		LAX	LOS ANGELES, CA	YES		
01/26/89	1334	1	COMMON LAPWING	5N1	1	8.		TLS	TOULOUSE, FRANCE	NO	JT8D	
01/27/89	846	1	KIEWIET*		1		UTN-KIM	KIM	KIMBERLEY, S. AFRICA	NO	JT8D	9
01/27/89	867	2			1		-GRU	XFO	SAO PAULO, BRAZIL	NO	CFM56	3
01/27/89	868	2			1		-GIG	XFO	RIO DE JANEIRO, BRAZIL	NO	CFM56	3
01/29/89	869	2			1			LAX	LOS ANGELES, CA	YES	CFM56	3
01/29/89	870	2	BLACK-HEADED GULL	14N36	*	9.7		PMI	PALMA, MALLORCA IS, SPAIN	NO	CFM56	3
01/29/89	1204	2						LIH	LIHUE, KAUAI, HAWAII	YES	CFM56	3
01/30/89	871	2			1		HNL-LIH	LIH	LIHUE, KAUAI, HAWAII	YES	CFM56	3
02/01/89	1411	2	HERRING GULL	14N14	1	40.		LAX	LOS ANGELES, CA	YES	CFM56	3
02/05/89	847	1	COMMON LAPWING	5N1	*	7.7	DUS-CPH	DUS	DUSSELDORF, GERMANY	NO	JT8D	15

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
12/07/88	715	2	A,C	3		HIGH		VIBES	1 F BLD BENT AT TIP
12/07/88	716	1		9	NONE			NO	
12/07/88	716	2		9	NONE			NO	
12/07/88	1239	1	A,Q	4					
12/07/88	1239	2	A,Q	4					
12/10/88	1283	1	A,K,Q	1					18 F BLDS + 8 COMP BLDS UNK DAMAGE
12/11/88	717	1	A,H	3	NONE	4.0		NO	4 F BLDS MARKED DUE TO SHINGLING
12/11/88	718	2		9	NONE			NO	FOUND ON GRD INSPEC.
12/11/88	842	1	A,C	3	NONE			NO	
12/11/88	842	2	A,C	3	NONE			NO	
12/12/88	843	2		9					
12/13/88	816	2		9					
12/13/88	1043	2		9		YES		NO	
12/14/88	817	1	A,H	3	NONE			NO	
12/14/88	1242	1		9					
12/15/88	719	2		9	NONE			NO	
12/18/88	818	2	A,C	3				NO	
12/19/88	720	2		9	NONE			NO	ODOR IN CABIN
12/19/88	819	1	A,C,H	3					2 FBLDS SHINGLED, OTHER BLDS LIGHT DENTS
12/20/88	820	2		9	NONE			NO	
12/20/88	844	2	A,H	3				NO	
12/20/88	1301	1	A,Q	4					
12/20/88	1301	2	A,Q	4					
12/21/88	821	1		9	NONE			NO	
12/21/88	821	2		9	NONE			NO	
12/21/88	822	2	A,C	3				NO	SEVERE DAMAGE ON C12 BLDS AND C11 STATOR
12/22/88	721	1		9	NONE			NO	
12/22/88	1232	2		9					
12/23/88	797	1		9					FOUND ON GRD INSPEC
12/25/88	722	2		9	NONE			NO	
12/25/88	723	1		9	NONE			NO	ATO/STALL ON 12/27,CORE DAM,UNK CAUSE
12/25/88	823	2	A,C,H	3					ENGINE REMOVED, 3 F BLDS REPLACED
12/28/88	724	2	A	4	NONE			NO	FOUND ON GRD INSPEC
12/30/88	725	1	A,C,H	3	NONE		IDLE	NO	ENG NOISE CHANGED AT ROTATION
12/31/88	726	2	A,J	2	NONE			NO	SPINNER BATTERED
12/31/88	727	1	A	4	NONE		IDLE	NO	ENG NOISE CHANGED AT ROTATION
12/31/88	824	1		9	SLIGHT			NO	EPR SYMPTOM, SLIGHT MONENTARY POW LOSS
01/01/89	1359	1		9					
01/03/89	825	2	A,C,K	1	NONE			NO	FOUND ON GRD INSPEC,2 F BLDS MINOR BENDS
01/06/89	826	2	A,C	3		SOME			
01/08/89	827	1		9	YES				
01/11/89	863	1	A,B,H	3				NO	
01/11/89	863	2	A,B,H	3		4.0	RETARD	NO	PILOT REDUCED POWER TO REDUCE VIBS
01/11/89	1349	2	A,Q	4					
01/12/89	1350	1		9					
01/13/89	864	2		9	NONE			NO	
01/14/89	1424	1		9					
01/16/89	865	1		9	NONE			NO	FOUND ON GRD INSPEC
01/17/89	1342	2		9					
01/19/89	828	2	A,C,H	3	COMPRESSOR	HIGH		NO	AC YAWED, NOTICEABLE CHANGE IN ENG PARAM
01/19/89	829	2		9	COMPRESSOR				
01/19/89	1203	1	A,C	3					PM EVENT
01/20/89	866	2		9	NONE			NO	
01/20/89	1333	1		9					
01/22/89	845	2		9	NONE			NO	FOUND ON GRD INSPEC
01/23/89	1044	2		9				NO	
01/23/89	1045	1		9				NO	
01/23/89	1410	2	A,Q	4					
01/26/89	1334	1		9					
01/27/89	846	1		9	NONE			NO	
01/27/89	867	2	A,H	3	NONE			NO	FOUND ON GRD INSPEC, 2 F BLDS CHANGED
01/27/89	868	2	A,H	3	NONE			NO	FOUND ON GRD INSPEC
01/29/89	869	2		9	NONE	IDLE		NO	
01/29/89	870	2	A,D	2	NONE			NO	
01/29/89	1204	2	A,H	3		3.5			AM EVENT
01/30/89	871	2		9	NONE	2.0		NO	
02/01/89	1411	2	A,Q	4					
02/05/89	847	1	A,D	2	NONE			NO	ODOR, 5 F BLDS BENT

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
02/05/89	1046	1	1758	20:25:00	NONE	200	TAKEOFF	0	80			CLEAR	ATO	NO	SEVERAL
02/05/89	1435	1	89	9:14:00	MULT BIRDS	300	LANDING	10	135			SOME CLOUDS	NONE	NO	FLOCK
02/06/89	848	1	239		NONE	200	TAKEOFF	0	70	VFR	DAY	PARTLY CLOUD	NONE	NO	SEVERAL
02/06/89	1351	1	89	9:20:00	MULT ENG	100	CLIMB	500	150		OVERCAST	FOG	ATB	NO	ONE
02/06/89	1351	2	89	9:20:00	MULT ENG	100	CLIMB	500	150		OVERCAST	FOG	ATB	NO	ONE
02/07/89	850	2	241	20:20:00	NONE	200	TAKEOFF	0	140				NONE	NO	NO
02/08/89	872	2	891011		MULT BIRDS	300	APPROACH						NONE		SEVERAL
02/08/89	1208	2	0		NONE	200	TAKEOFF						ATB		
02/10/89	1047	2	1759		NONE	200	UNKNOWN						NONE		
02/11/89	849	1	243	14:32:00	NONE	200	CLIMB	20	130			CLEAR	NONE	NO	NO
02/11/89	1194	1	0		MULT BIRDS		LANDING	200	145		DAY	CLEAR	NONE	NO	FLOCK
02/12/89	851	1	242		NONE	200	UNKNOWN						NONE		NO
02/13/89	1417	1	89	9:12:00	MULT ENG-BIRDS	100	TAKEOFF	200	160			CLEAR	ATB	NO	FLOCK
02/13/89	1417	2	89	9:12:00	MULT ENG-BIRDS	100	TAKEOFF	200	160			CLEAR	ATB	NO	FLOCK
02/14/89	873	2	891012	9:59:00	NONE	300	TAKEOFF				OVERCAST	RAIN	NONE		
02/14/89	1388	1	89		MULT ENG-BIRDS		TAKEOFF	0	130			SOME CLOUDS	NONE	NO	SEVERAL
02/14/89	1388	2	89		MULT ENG-BIRDS		TAKEOFF	0	130			SOME CLOUDS	NONE	NO	SEVERAL
02/15/89	852	2	245	10:44:00	MULT BIRDS	200	TAKEOFF	0	130			CLEAR	NONE	NO	FLOCK
02/15/89	874	1	891013		NONE	300	UNKNOWN						NONE		
02/16/89	853	1	244		MULT BIRDS	200	TAKEOFF						NONE		
02/20/89	875	2	891014		NONE	300	LANDING	0					NONE		YES
02/20/89	1193	1	0		NONE	200	TAKEOFF	200	145	VFR	DAY	RAIN	NONE	NO	FLOCK
02/21/89	876	2	891015		NONE	300	UNKNOWN						NONE		
02/22/89	854	1	246	23:27:00	NONE	200	TAKEOFF	5	140			CLEAR	ATB	NO	
02/22/89	877	1	891016		NONE	300	TAKEOFF	0	120				ATB		SEVERAL
02/24/89	1191	2	0		NONE	200	CLIMB	3500	220		NIGHT	CLEAR	NONE	NO	FLOCK
02/24/89	1192		0		NONE	300	LANDING	0	125	VFR		PARTLY CLOUD	NONE	YES	ONE
02/26/89	855	1	247	20:00:00	NONE	200	TAKEOFF	50	140			CLEAR	NONE	NO	YES
02/27/89	878	1	891017		NONE	300	UNKNOWN						NONE		
02/28/89	1201	1	0		MULT BIRDS	200	TAKEOFF	4	160	VFR	DAY	CLEAR	NONE	YES	FLOCK
03/01/89	1446	2	89		NONE	300	TAKEOFF						NONE	NO	
03/02/89	856	2	248	6:57:00	NONE	200	TAKEOFF	0	80				NONE		YES
03/02/89	879	1	891018		NONE	300	UNKNOWN						NONE		
03/02/89	1048	1	1760		NONE	200	UNKNOWN						NONE		YES
03/02/89	1329	1	89	18:35:00	NONE	200	LANDING	0						NO	
03/03/89	857	2	156		TRVS FRAC	200	UNKNOWN								
03/03/89	880	1	891019		NONE	300	UNKNOWN						NONE		
03/03/89	1202	1	0		NONE	300	LANDING	10	120	VFR	DAY	CLEAR	NONE	NO	ONE
03/05/89	881	1	891020		NONE	300	UNKNOWN						NONE	NO	
03/05/89	936		1625		NONE	200	TAKEOFF						NONE		NO
03/06/89	1316		101389		NONE	300	UNKNOWN								
03/08/89	937	1	1803		NONE	200	TAKEOFF			IFR			NONE		NO
03/09/89	1049	1	1761		NONE	200	UNKNOWN						NONE		YES
03/10/89	938	1	1623	6:40:00	NONE	200	TAKEOFF	10	140	IFR		CLEAR	ATB	NO	YES
03/12/89	858	1	157		NONE	200	TAKEOFF	0					ATO		YES
03/14/89	882	1	89	13:53:00	MULT ENG-BIRDS	300	LANDING	0				SOME CLOUDS	NONE	NO	FLOCK
03/14/89	882	2	891021	13:53:00	MULT ENG-BIRDS	300	LANDING	0				SOME CLOUDS	NONE	NO	FLOCK
03/15/89	939	1	1624		NONE	200	UNKNOWN						NONE		NO
03/15/89	1366	2	89	7:27:00	NONE	300	TAKEOFF	20	150			SOME CLOUDS	NONE		ONE
03/16/89	940	2	1622		NONE	200	TAKEOFF			VFR	DAY	CLEAR	NONE	NO	ONE
03/17/89	1399	2	89		NONE		LANDING	0				SOME CLOUDS	NONE	NO	ONE
03/18/89	859	2	253	13:45:00	NONE	200	TAKEOFF	0	110			CLEAR	ATO	NO	ONE
03/18/89	861	1	254	17:10:00	MULT BIRDS	200	TAKEOFF	0	70			CLEAR	ATO		FLOCK
03/19/89	883	2	891022		NONE	400	LANDING				NIGHT	PARTLY CLOUD	NONE	NO	ONE
03/20/89	884	1	891023		NONE	300	APPROACH	3000		VFR	NIGHT	CLEAR	NONE	NO	ONE
03/23/89	860	1	252		TRVS FRAC	200	UNKNOWN								
03/23/89	941		1626		NONE	200	UNKNOWN						NONE		NO
03/24/89	885	1	891024		NONE	300	UNKNOWN						NONE	NO	
03/24/89	886	1	891025		NONE	300	UNKNOWN						NONE		
03/28/89	887	1	891026		NONE	300	UNKNOWN						NONE		
03/28/89	1338	1	89	9:55:00	NONE	300	TAKEOFF	0	125			CLEAR		NO	
03/31/89	888	1	891027	8:00:00	NONE	300	TAKEOFF	0	10		BRIGHT		NONE		YES
03/31/89	942	2	1627		NONE	200	UNKNOWN						NONE		
04/01/89	889	1	892001	12:25:00	NONE	300	LANDING	0	110			OVERCAST	NONE		
04/01/89	1050	1	1762		NONE	200	UNKNOWN						NONE		
04/02/89	1051	1	1763		NONE	200	LANDING	50	124			CLEAR	NONE	NO	ONE
04/02/89	1199	2	0	9:15:00	NONE	300	LANDING	0		VFR	DAY	CLEAR	NONE	NO	SEVERAL
04/03/89	890	1	892002		NONE	300	UNKNOWN		200	VFR	DAY	CLEAR	NONE	NO	ONE

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
02/05/89	1046	1			1			MAA	MADRAS, INDIA	NO	JT8D	9A
02/05/89	1435	1			*			AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
02/06/89	848	1	DOVE*		1	10.	LIH-MAU	LIH	LIHUE, KAUAI, HAWAII	YES	JT8D	9A
02/06/89	1351	1	COMMON LAPWING	5N1	1	7.7		CDG	PARIS-DE GAULLE, FRANCE	NO	JT8D	
02/06/89	1351	2	COMMON LAPWING	5N1	1	7.7		CDG	PARIS-DE GAULLE, FRANCE	NO	JT8D	
02/07/89	850	2			1		WDH-JNB	WDH	WINDHOEK, NAMIBIA	NO	JT8D	17A
02/08/89	872	2			*			LAX	LOS ANGELES, CA	YES	CFM56	3
02/08/89	1208	2						MYR	MYRTLE BEACH, SC	YES	JT8D	15
02/10/89	1047	2			1		HYD-HYD	XFO	INDIA	NO	JT8D	17A
02/11/89	849	1	FALCON*		1	32.	PLZ-ELS	PLZ	PORT ELIZABETH, S. AFRICA	NO	JT8D	17A
02/11/89	1194	1	MALLARD	2J84	2	38.		ORF	NORFOLK, VA	YES		
02/12/89	851	1					-LAX	XUS	CA	YES	JT8D	7
02/13/89	1417	1	COMMON LAPWING	5N1	*	7.7		CAS	CASABLANCA, MOROCCO	NO	JT8D	
02/13/89	1417	2	COMMON LAPWING	5N1	*	7.7		CAS	CASABLANCA, MOROCCO	NO	JT8D	
02/14/89	873	2			1		HAM-FRA	HAM	HAMBURG, GERMANY	NO	CFM56	3
02/14/89	1388	1	COMMON GULL	14N13	*	15.		IAH	HOUSTON, TX	YES		
02/14/89	1388	2	COMMON GULL	14N13	*	15.		IAH	HOUSTON, TX	YES		
02/15/89	852	2	SWALLOW*		*	3.	KIM-CPT	KIM	KIMBERLEY, S. AFRICA	NO	JT8D	17A
02/15/89	874	1			1			LPA	GRAN CANARIA, CANARY ISL	NO	CFM56	3
02/16/89	853	1			*		YHZ-YYT	YHZ	HALIFAX, CANADA	NO	JT8D	9A
02/20/89	875	2			1			TCI	TENERIFE, CANARY ISL	NO	CFM56	3
02/20/89	1193	1	SWALLOW*		1			LAX	LOS ANGELES, CA	YES	JT8D	9
02/21/89	876	2			1		-PHX	XFO	PHOENIX, AZ	NO	CFM56	3
02/22/89	854	1	KIEWIET*		1		CPT-JNB	CPT	CAPE TOWN, S. AFRICA	NO	JT8D	17A
02/22/89	877	1	GULL*		1		BEG-MOW	BEG	BELGRADE, YUGOSLAVIA	NO	CFM56	3
02/24/89	1191	2	GULL*					PHL	PHILA, PA	YES	JT8D	15
02/24/89	1192		HAWK*		1			MSY	NEW ORLEANS, LA	YES	CFM56	3
02/26/89	855	1	KIEWIET*		1		BFN-KIM	BFN	BLOEMFONTEIN, S. AFRICA	NO	JT8D	9
02/27/89	878	1			1		-TFS	XFO	TENERIFE, CANARY ISL	NO	CFM56	3
02/28/89	1201	1	COMMON CROW	22Z85	*	16.8		MSY	KENNER, LA	YES	JT8D	
03/01/89	1446	2						TIP	TRIPOLI, LIBYA	NO	CFM56	3
03/02/89	856	2	SPUR-WINGED PLOVER	5N24	1	12.	WLG-AKL	WLG	WELLINGTON, NEW ZEALAND	NO	JT8D	7B
03/02/89	879	1			1		TGD-BEG	XFO	YUGOSLAVIA	NO	CFM56	3
03/02/89	1048	1					-TRV	XFO	INDIA	NO	JT8D	17
03/02/89	1329	1						AKL	AUCKLAND, NEW ZEALAND	NO	JT8D	
03/03/89	857	2	MOURNING DOVE	2P105		4.		XUS	TX	YES	JT8D	15
03/03/89	880	1			1		-PHX	XUS	PHOENIX, AZ	YES	CFM56	3
03/03/89	1202	1	WESTERN MEADOW LARK	64Z68	1	4.		MAF	MIDLAND, TX	YES	CFM56	3
03/05/89	881	1			1		-DAL	XUS	DALLAS/FT WORTH, TX	YES	CFM56	3
03/05/89	936		PURPLE MARTIN	18Z12	1	2.		LIT	LITTLE ROCK, AR	YES	JT8D	9A
03/06/89	1316		GREY-HEADED GULL	14N29		7.6		XFO		NO	CFM56	3
03/08/89	937	1					HAM-MUC	HAM	HAMBURG, GERMANY	NO	JT8D	15
03/09/89	1049	1					HJR-VNS	XFO	INDIA	NO	JT8D	9A
03/10/89	938	1	BLACK KITE	3K28	1	28.	HAJ-MUC	HAJ	HANOVER, GERMANY	NO	JT8D	15
03/12/89	858	1	SPOTTED DOVE	2P65	1	6.	XMN-GHO	XMN	XIAMEN, CHINA	NO	JT8D	17A
03/14/89	882	1	STARLING*		*			NCL	NEWCASTLE, ENGLAND	NO	CFM56	3
03/14/89	882	2	STARLING*		*			NCL	NEWCASTLE, ENGLAND	NO	CFM56	3
03/15/89	939	1					-HOU	XUS	HOUSTON, TX	YES	JT8D	9A
03/15/89	1366	2	BLACK-HEADED GULL	14N36	1	10.		EDI	EDINBURGH, SCOTLAND	NO	CFM56	3
03/16/89	940	2	WHITE THROATED SPARROW	68Z218	1	1.		MDW	CHICAGO, IL	YES	JT8D	9A
03/17/89	1399	2	COMMON GULL	14N13	1	15.		LGA	LA GUARDIA, NY NY	YES		
03/18/89	859	2	SECRETARY*		1		KIM-JNB	KIM	KIMBERLEY, S. AFRICA	NO	JT8D	17A
03/18/89	861	1	SPOTTED THICK-KNEE	9N4	*	20.	UTN-JNB	UTN	UPINGTON, S. AFRICA	NO	JT8D	17A
03/19/89	883	2	GULL*		1		CLT-LGA	LGA	LA GUARDIA, NY	YES	CFM56	3
03/20/89	884	1	COMMON GULL	14N13	1	15.		SJC	SAN JOSE, CA	YES	CFM56	3
03/23/89	860	1						XFO	INDIA	NO	JT8D	17A
03/23/89	941						PHC-	XFO	PORT HARCOURT, NIGERIA	NO	JT8D	15
03/24/89	885	1			1		-SEA	XUS	SEATTLE/TACOMA, WA	YES	CFM56	3
03/24/89	886	1			1		-BEG	XFO	BELGRADE, YUGOSLAVIA	NO	CFM56	3
03/28/89	887	1			1		-PHX	XUS	PHOENIX, AZ	YES	CFM56	3
03/28/89	1338	1			1			BRE	BREMEN, GERMANY	NO	CFM56	3
03/31/89	888	1			1		CJU-KWJ	CJU	CHEJU, KOREA	NO	CFM56	3
03/31/89	942	2					MCI-MDW	XUS	MO - IL	YES	JT8D	9A
04/01/89	889	1	GULL*		1			EMA	EAST MIDLANDS, ENGLAND	NO	CFM56	3
04/01/89	1050	1					COK-GOI	XFO	INDIA	NO	JT8D	17
04/02/89	1051	1			1		IXJ-IXC	IXC	CHANDIGARH, INDIA	NO	JT8D	17
04/02/89	1199	2	GULL*					DCA	WASHINGTON, DC	YES	CFM56	3
04/03/89	890	1	COMMON ROCK DOVE	2P1	1	14.	-DAL	XUS	DALLAS, TX	YES	CFM56	3

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
02/05/89	1046	1		9				NO	
02/05/89	1435	1		9					
02/06/89	848	1	A,C	3					ODOR, 2 ADJACENT BLDS BENT, AM EVENT
02/06/89	1351	1		9					
02/06/89	1351	2	A,Q	4					
02/07/89	850	2		9	NONE			NO	ODOR
02/08/89	872	2	A,H	3	NONE			NO	
02/08/89	1208	2	A	4		HIGH		VIBES	ENG CHANGE
02/10/89	1047	2		9				NO	FOUND ON GRD INSPEC
02/11/89	849	1		9	NONE			NO	
02/11/89	1194	1		9					PM EVENT
02/12/89	851	1	A	4	NONE			NO	FOUND ON GRD INSPEC, ENG CHANGED
02/13/89	1417	1	A,Q	4					
02/13/89	1417	2		9					
02/14/89	873	2		9	NONE			NO	ODOR IN CABIN
02/14/89	1388	1		9					
02/14/89	1388	2		9					
02/15/89	852	2		9	NONE			NO	ODOR
02/15/89	874	1	A,H	3	NONE	3.5		NO	
02/16/89	853	1	A,C	3	NONE			NO	
02/20/89	875	2		9	NONE			NO	
02/20/89	1193	1	A,C	3	NONE			NO	AM EVENT, ODOR
02/21/89	876	2	A,B	3	NONE			NO	FOUND ON GRD INSPEC,1F BLD LE DISTORTED
02/22/89	854	1		9	COMPRESSOR			NO	AC YAWED
02/22/89	877	1	A,H	3	NONE	4.0		NO	ODOR, 4 F BLDS SHINGLED, 2 REPLACED
02/24/89	1191	2		9					PM EVENT
02/24/89	1192		A,H	3					
02/26/89	855	1		9	NONE			NO	
02/27/89	878	1		9	NONE			NO	FOUND ON GRD INSPEC
02/28/89	1201	1		9					PM EVENT
03/01/89	1446	2		9					
03/02/89	856	2	A,G,K	1	NONE			NO	ODOR
03/02/89	879	1	A,B	3	NONE			NO	FOUND ON GRD INSPEC, 1F BLD LE DISTORTED
03/02/89	1048	1		9	NONE			NO	FOUND ON GRD INSPEC
03/02/89	1329	1	A,Q	4					
03/03/89	857	2	A,I	1					
03/03/89	880	1		9	NONE			NO	FOUND ON GRD INSPEC
03/03/89	1202	1		9	NONE			NO	ODOR, PM EVENT
03/05/89	881	1		9	NONE			NO	
03/05/89	936			9	COMPRESSOR			NO	ODOR
03/06/89	1316			9					
03/08/89	937	1		9				NO	
03/09/89	1049	1		9				NO	
03/10/89	938	1	A,G	2	NONE			NO	ODOR
03/12/89	858	1	A,D,G	2		HIGH			3 F BLDS BROKEN, 1 LARGE BIRD
03/14/89	882	1		9					
03/14/89	882	2		9	NONE			NO	
03/15/89	939	1		9	NONE			NO	
03/15/89	1366	2		9					
03/16/89	940	2		9	NONE			NO	AM EVENT
03/17/89	1399	2	A,Q	4					
03/18/89	859	2		9	COMPRESSOR			VOLUNTARY	
03/18/89	861	1	A,B,C	3					3 F BLDS DAMAGED
03/19/89	883	2	A,C,H	3	NONE			NO	PM EVENT
03/20/89	884	1		9	NONE			NO	ODOR
03/23/89	860	1	A,I	1					
03/23/89	941		A	4				NO	FOUND ON GRD INSPEC
03/24/89	885	1	A,C	3	NONE			NO	1 BENT F BLD
03/24/89	886	1		9	NONE			NO	FOUND ON GRD INSPEC
03/28/89	887	1		9	NONE			NO	FOUND ON GRD INSPEC
03/28/89	1338	1		9					
03/31/89	888	1	A,B	3	NONE			NO	2 F BLDS WITH LE DENTS
03/31/89	942	2		9	NONE			NO	
04/01/89	889	1		9	NONE			NO	
04/01/89	1050	1		9				NO	
04/02/89	1051	1		9				NO	
04/02/89	1199	2		9					
04/03/89	890	1		9	NONE			NO	AM EVENT

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
04/04/89	891	1	892003		NONE	300	TAKEOFF	0					NONE		
04/04/89	1448	2	89		NONE	100	TAKEOFF						NONE	NO	
04/06/89	1413	1	89		NONE		LANDING					CLEAR	NONE	NO	
04/07/89	892	2	892004		NONE	300	TAKEOFF						NONE		YES
04/07/89	1339	1	89		NONE	300	TAKEOFF					CLEAR	NONE	NO	
04/07/89	1427	1	89	19:10:00	NONE	200	TAKEOFF	0	70			CLEAR	ATO	NO	SEVERAL
04/08/89	893	2	892005		NONE	300	UNKNOWN						NONE		
04/08/89	894	1	892006		NONE	300	TAKEOFF	0					NONE		
04/08/89	895	1	892007	20:40:00	NONE	300	APPROACH	1500	180		OVERCAST	RAIN	NONE	NO	ONE
04/09/89	896	2	892008		NONE	300	UNKNOWN						NONE		
04/10/89	862	2	251		NONE	200	TAKEOFF						NONE		NO
04/11/89	897	2	892009		NONE	400	LANDING	0					NONE		
04/13/89	898	2	892010		NONE	300	CLIMB						NONE		
04/14/89	1181		1651		NONE	200	UNKNOWN						NONE		
04/14/89	1387	2	89		NONE		LANDING	80	250			CLEAR	NONE	NO	
04/15/89	899	2	892011	20:06:00	NONE	300	TAKEOFF	0	135			CLEAR	NONE	NO	SEVERAL
04/16/89	900	2	892012	16:00:00	NONE	300	TAKEOFF	0			CLEAR	DRY	NONE		
04/16/89	943	2	1631		MULT	BIRDS	200	UNKNOWN					NONE		NO
04/16/89	944	1	1630		NONE	200	UNKNOWN						NONE		NO
04/16/89	1373	2	89	18:42:00	NONE	200	TAKEOFF	0	102			SOME CLOUDS	ATO	NO	ONE
04/16/89	1428	1	89	19:31:00	NONE	200	TAKEOFF	0	90			CLEAR	ATO	NO	SEVERAL
04/19/89	901	1	892013		NONE	300	TAKEOFF	0					NONE		
04/19/89	946	1	1640	17:49:00	NONE	200	APPROACH	1000	155			CLEAR	NONE	NO	ONE
04/20/89	947	2	1638	20:00:00	NONE	200	CLIMB	530	150				ATB		NO
04/21/89	948	2	1632	11:30:00	NONE	200	LANDING						NONE		FLOCK
04/21/89	949	2	1648		NONE	200	UNKNOWN						NONE		
04/21/89	1052	1	1764	7:30:00	NONE	200	LANDING		100			CLEAR	NONE	NO	SEVERAL
04/23/89	950	1	1633		NONE	200	TAKEOFF						NONE		
04/23/89	951	1	1634		NONE	200	UNKNOWN						NONE		NO
04/23/89	1430	2	89		NONE	100	LANDING	0					OTHER	NO	
04/25/89	902	1	892014	15:45:00	NONE	300	TAKEOFF	0	80		BRIGHT		ATO		YES
04/25/89	1365	1	89	16:30:00	NONE	200	LANDING	0	100			SOME CLOUDS	NONE		ONE
04/25/89	1449	1	89		NONE	100	TAKEOFF						NONE	NO	
04/26/89	903	2	892015		NONE	300	UNKNOWN						NONE		
04/27/89	952	2	1635		NONE	200	TAKEOFF						ATB		
04/27/89	953	2	1636	9:45:00	MULT	BIRDS	200	TAKEOFF	100			CLEAR	ATB		FLOCK
04/28/89	904	2	892016		NONE	300	UNKNOWN						NONE		
04/28/89	905	1	892017		NONE	300	UNKNOWN						NONE		
04/29/89	906	1	892018		NONE	300	UNKNOWN						NONE		
04/30/89	907	2	892019		NONE	300	UNKNOWN						NONE		
04/30/89	954	1	1637	19:31:00	MULT	BIRDS	200	TAKEOFF				CLEAR	NONE		SEVERAL
04/30/89	1200	1	0		NONE		CLIMB	2700	190	VFR	NIGHT	BELOW CLOUDS	NONE	NO	ONE
04/30/89	1343	1	89	18:35:00	NONE	200	LANDING	0	135			CLEAR	NONE		
05/01/89	1330	1	89	14:16:00	NONE	300	TAKEOFF	0	100			CLEAR	NONE	NO	ONE
05/06/89	1053	1	1765	15:45:00	NONE	200	TAKEOFF	0	120			CLEAR	ATO	NO	YES
05/07/89	908	1	892020	18:00:00	MULT	BIRDS	300	LANDING	0			LIGHT CLOUDY	NONE		
05/07/89	955	1	1647		NONE	200	TAKEOFF	150					NONE		NO
05/08/89	909	1	892021		NONE	400	APPROACH		250				NONE		
05/08/89	910	1	892022		NONE	300	LANDING	0					NONE		NO
05/08/89	956	2	1641		NONE	200	UNKNOWN						NONE		
05/10/89	911	1	892023		NONE	300	UNKNOWN						NONE		NO
05/12/89	912	1	892024		NONE	400	UNKNOWN						NONE		NO
05/12/89	1381	1	89		NONE	300	TAKEOFF	200	145			OVERCAST	NONE	NO	ONE
05/13/89	1374	2	89	17:00:00	NONE	300	TAKEOFF	0	110			SOME CLOUDS	NONE	NO	SEVERAL
05/13/89	1431	1	89	8:45:00	NONE	200	APPROACH	300	140			RAIN	NONE		SEVERAL
05/14/89	913	1	892025		NONE	300	TAKEOFF	0	60		BRIGHT	CLEAR	ATO		NO
05/15/89	1321	1	89		NONE	300	CLIMB	3000	250			SOME CLOUDS	NONE	NO	ONE
05/16/89	957	1	1642		NONE	200	LANDING	0					NONE		SEVERAL
05/17/89	1054	2	1766		NONE	200	UNKNOWN						NONE		YES
05/17/89	1340	1	89	18:34:00	MULT	BIRDS		TAKEOFF	0	100		SOME CLOUDS	NONE	NO	FLOCK
05/18/89	914	1	892026		NONE	300	TAKEOFF						ATO		
05/19/89	1419	2	89	4:10:00	MULT	BIRDS	300	CLIMB	1000	170		CLEAR	NONE	NO	SEVERAL
05/20/89	915	1	892027		NONE	300	UNKNOWN						NONE		
05/20/89	958	1	1662		NONE	200	UNKNOWN						NONE		
05/20/89	1055	2	1767		NONE	200	UNKNOWN						NONE		
05/20/89	1386	1	89	16:35:00	NONE	200	APPROACH	2500	190			CLEAR	NONE		ONE
05/24/89	1367	1	89	8:20:00	NONE	300	LANDING	0	110				NONE		ONE
05/25/89	916	1	892028		NONE	400	LANDING						NONE		

A SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
04/04/89	891	1			1		KHI-LHE	KHI	KARACHI, PAKISTAN	NO	CFM56	3
04/04/89	1448	2	RED-WINGED THRUSH	41Z281	1	2.4		XFO	UNKNOWN	NO	JT8D	
04/06/89	1413	1	COMMON STARLING	21Z75	1	2.8		LBB	LUBBOCK, TX	YES		
04/07/89	892	2					FNC-BRU	FNC	FUNCHAL, PORTUGAL	NO	CFM56	3
04/07/89	1339	1			1			BRE	BREMEN, GERMANY	NO	CFM56	3
04/07/89	1427	1	COURSER*					UTN	UPINGTON, S. AFRICA	NO	JT8D	
04/08/89	893	2			1		-DAL	XUS	DALLAS/FT.WORTH, TX	YES	CFM56	3
04/08/89	894	1			1			FRA	FRANKFURT, GERMANY	NO	CFM56	3
04/08/89	895	1			1			DUS	DUSSELDORF, GERMANY	NO	CFM56	3
04/09/89	896	2	HUNGARIAN PARTRIDGE	4L85	1	14.1	-ATH	XFO	ATHENS, GREECE	NO	CFM56	3
04/10/89	862	2			1		ORF-ORD	ORF	NORFOLK, VA	YES	JT8D	7
04/11/89	897	2			1			STN	LONDON-STANSTED, ENGLAND	NO	CFM56	3
04/13/89	898	2			1		FRA-HAM	FRA	FRANKFURT, GERMANY	NO	CFM56	3
04/14/89	1181							XFO	AFRICA	NO	JT8D	15
04/14/89	1387	2	GOOSE*		1			GSO	GREENSBORO, NC	YES		
04/15/89	899	2			1		AMS-LHR	AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
04/16/89	900	2			1		AMS-LHR	AMS	AMSTERDAM	NO	CFM56	3
04/16/89	943	2	HERRING GULL	14N14	*	40.	YHZ-YUL	XFO	CANADA	NO	JT8D	9A
04/16/89	944	1	KILLDEER	5N33		3.	-MAF	XUS	MIDLAND/ODESSA, TX	YES	JT8D	9A
04/16/89	1373	2	PIGEON*		1			OSL	OSLO, NORWAY	NO	JT8D	
04/16/89	1428	1	LAPWING*					UTN	UPINGTON, S. AFRICA	NO	JT8D	
04/19/89	901	1			1		SFO-LGB	SFO	SAN FRANCISCO, CA	YES	CFM56	3
04/19/89	946	1	INDIAN WHITE VULTURE	3K46	1	192.	DBL-DEL	DEL	DELHI, INDIA	NO	JT8D	17
04/20/89	947	2	CROWNED PLOVER	5N11	1	6.	ELS-DUR	ELS	EAST LONDON, S. AFRICA	NO	JT8D	17A
04/21/89	948	2	AMERICAN ROBIN	41Z314	1	3.	SJC-SLC	SLC	SALT LAKE CITY, UT	YES	JT8D	
04/21/89	949	2						XFO		NO	JT8D	17
04/21/89	1052	1	KITE*				BLR-CJB	CJB	COIMBATORE, INDIA	NO	JT8D	9A
04/23/89	950	1	CUCKOO	2R15	1	4.	MED-JED	MED	MEDINA, SAUDI ARABIA	NO	JT8D	15
04/23/89	951	1	HORNED LARK	17Z74	1	2.	DAL-	XUS	TX	YES	JT8D	9A
04/23/89	1430	2			1			PMO	PALERMO, ITALY	NO	JT8D	
04/25/89	902	1	KITE HAWK*		1			TSV	TOWNSVILLE, AUSTRALIA	NO	CFM56	3
04/25/89	1365	1	SHORT-EARED OWL	2S124	1	13.		EMA	EAST MIDLANDS, ENGLAND	NO	JT8D	
04/25/89	1449	1	WARBLER*		1			XFO	UNKNOWN	NO	JT8D	
04/26/89	903	2	COMMON ROCK DOVE	2P1	1	14.	-DAL	XUS	DALLAS, TX	YES	CFM56	3
04/27/89	952	2	GULL*		1	16.	CID-DEN	CID	CEDAR RAPIDS, IA	YES	JT8D	
04/27/89	953	2	ROCK DOVE	2P1	3	14.	ORD-LNK	ORD	CHICAGO, IL	YES	JT8D	7B
04/28/89	904	2			1		-EWR	XUS	NEWARK, NJ	YES	CFM56	3
04/28/89	905	1			1		-PHX	XUS	PHOENIX, AZ	YES	CFM56	3
04/29/89	906	1			1		-BEG	XFO	BELGRADE, YUGOSLAVIA	NO	CFM56	3
04/30/89	907	2			1		-SPL	XFO	AMSTERDAM	NO	CFM56	3
04/30/89	954	1	COMMON STARLING	21Z75	*	2.8	SAV-IAD	SAV	SAVANNAH, GA	YES	JT8D	7B
04/30/89	1200	1	COMMON GULL	14N13	1	15.		ATL	ATLANTA, GA	YES		
04/30/89	1343	1						CCU	CALCUTTA, INDIA	NO	JT8D	
05/01/89	1330	1			1			BCN	BARCELONA, SPAIN	NO	CFM56	3
05/06/89	1053	1						DEL	DELHI, INDIA	NO	JT8D	17
05/07/89	908	1			2			CTU	CHENGDU, CHINA	NO	CFM56	3
05/07/89	955	1	SWAINSON'S HAWK	3K171	1	32.	MGA-SJO	MGA	MANAGUA, NICARAGUA	NO	JT8D	9A
05/08/89	909	1			1			BRU	BRUSSELS, BELGIUM	NO	CFM56	3
05/08/89	910	1	RING-NECKED PHEASANT	4L161	1	44.		DET	DETROIT, MI	YES	CFM56	3
05/08/89	956	2			1		-YHZ	XFO	CANADA	NO	JT8D	9A
05/10/89	911	1	SORA	7M84	1	3.	SUX-PHX	XUS	IOWA - ARIZONA	YES	CFM56	3
05/12/89	912	1			1		-LGW	XFO	LONDON-GATWICK, ENGLAND	NO	CFM56	3
05/12/89	1381	1	SPARROW*		1			BOS	BOSTON, MA	YES	CFM56	3
05/13/89	1374	2			1			FRA	FRANKFURT, GERMANY	NO	CFM56	3
05/13/89	1431	1			1			LERS	REUS, SPAIN	NO	JT8D	
05/14/89	913	1	ROCK DOVE*		1	14.	AJA-ORY	AJA	AJACCIO, FRANCE	NO	CFM56	3
05/15/89	1321	1	HERRING GULL	14N14	1	40.		LIT	LITTLEROCK, AK	YES	CFM56	3
05/16/89	957	1	GULL*				LHR-FCO	FCO	ROME-DA VINCI, ITALY	NO	JT8D	15A
05/17/89	1054	2					IXU-UDR	XFO	INDIA	NO	JT8D	9A
05/17/89	1340	1	PIGEON*		*			BRE	BREMEN, GERMANY	NO		
05/18/89	914	1	ROCK DOVE*		1	14.		TFS	TENERIFE, CANARY ISLANDS	NO	CFM56	3
05/19/89	1419	2	STARLING*		*			MUC	MUNICH, GERMANY	NO	CFM56	3
05/20/89	915	1			1		-FRA	XFO	FRANKFURT, GERMANY	NO	CFM56	3
05/20/89	958	1	SWIFT	1U55		2.	IST-LHR	XFO	TURKEY - ENGLAND	NO	JT8D	15A
05/20/89	1055	2					-HYD	XFO	INDIA	NO	JT8D	15
05/20/89	1386	1						LHR	LONDON-HEATHROW, ENGLAND	NO	JT8D	
05/24/89	1367	1	LAPWING*		1			EDI	EDINBURGH, SCOTLAND	NO	CFM56	3
05/25/89	916	1			1			KEF	REYKJAVIK, ICELAND	NO	CFM56	3

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
04/04/89	891	1		9	NONE	2.5		NO	
04/04/89	1448	2		9					
04/06/89	1413	1		9					
04/07/89	892	2	A,B	3	NONE			NO	2 F BLDS WITH SERVICEABLE LE TIP CURL
04/07/89	1339	1	A,Q	4					
04/07/89	1427	1	A,Q	4					
04/08/89	893	2		9	NONE			NO	FOUND ON GRD INSPEC
04/08/89	894	1		9	NONE			NO	
04/08/89	895	1		9	NONE			NO	STAINS ON 3 F BLDS AND IGV'S
04/09/89	896	2	A,B	3	NONE			NO	1 F BLD WITH LE TIP CURL
04/10/89	862	2	A,G	2	COMPRESSOR			NO	2 IN. CHIP OUT OF FAN BLADE
04/11/89	897	2	A	4	NONE			NO	1 F BLD DAMAGED, DAMAGE UNKNOWN
04/13/89	898	2	A,B	3	NONE			NO	OIL COOLER CLOGGED, 3 F BLDS LE DAMAGE
04/14/89	1181		A,C	3					
04/14/89	1387	2		9					
04/15/89	899	2	A,H	3	NONE			NO	
04/16/89	900	2		9	NONE			NO	
04/16/89	943	2	A,H	3	NONE			NO	FOUND ON GRD INSPEC, 2 F BLDS SHINGLED
04/16/89	944	1	A,C,G,H	2	NONE			NO	
04/16/89	1373	2		9					
04/16/89	1428	1		9					
04/19/89	901	1		9	NONE			NO	
04/19/89	946	1	A,C	3				EGT	
04/20/89	947	2		9	NONE			NO	
04/21/89	948	2	A,B,C,G	2	NONE			NO	1 F BLD HAD 1X.75 IN PIECE BROKEN OFF
04/21/89	949	2	A,C	3	NONE			NO	
04/21/89	1052	1		9				NO	
04/23/89	950	1		9	NONE			NO	
04/23/89	951	1		9	NONE			NO	
04/23/89	1430	2		9					
04/25/89	902	1	A,B,G	2	NONE	2.8		NO	ACOUSTIC PANEL DAM, 6 BLDS 1X1.5IN MISS
04/25/89	1365	1		9					
04/25/89	1449	1		9					
04/26/89	903	2		9	NONE			NO	FOUND ON GRD INSPEC
04/27/89	952	2		9	COMPRESSOR			NO	AC YAWED
04/27/89	953	2	A,I,K,N	1	COMPRESSOR	HIGH		EGT	2 BLDS TRVSFRAC, 2 BLDS BROKEN RET TANGS
04/28/89	904	2		9	NONE			NO	FOUND ON GRD INSPEC
04/28/89	905	1		9	NONE			NO	FOUND ON GRD INSPEC
04/29/89	906	1		9	NONE			NO	FOUND ON GRD INSPEC
04/30/89	907	2		9	NONE			NO	FOUND ON GRD INSPEC
04/30/89	954	1	A,G	2	NONE	YES		NO	
04/30/89	1200	1		9					PM EVENT
04/30/89	1343	1	A,Q	4					
05/01/89	1330	1		9					
05/06/89	1053	1	A,D,G	2				NO	4 FBLDS DAM, METAL IN BEARING CHIP DECTS
05/07/89	908	1	A,B	3	NONE			NO	3-1ST STG BOOSTER VANES DISENGAGED
05/07/89	955	1	A,C,G,L	2	NONE			NO	ODOR, 3 F BLDS DAMAGED
05/08/89	909	1		9	NONE			NO	
05/08/89	910	1	A,E	3	NONE	NONE		NO	8 F BLDS REPLACED, ODOR
05/08/89	956	2		9	NONE			NO	FOUND ON GRD INSPEC
05/10/89	911	1		9	NONE			NO	
05/12/89	912	1		9	NONE			NO	FOUND ON GRD INSPEC
05/12/89	1381	1	A,Q	4					
05/13/89	1374	2	A,Q	4					
05/13/89	1431	1		9					
05/14/89	913	1	A,H	3	NONE	3.0	RETARD	NO	1 PAIR F BLDS SHINGLED AND REPLACED
05/15/89	1321	1	A,Q	4					
05/16/89	957	1	A,C	3	NONE			NO	ODOR, ENG SHUTDOWN ON TAXI IN
05/17/89	1054	2		9				NO	
05/17/89	1340	1		9					
05/18/89	914	1	A	4	NONE			NO	4 F BLDS DAMAGED, DAMAGE UNKNOWN
05/19/89	1419	2		9					
05/20/89	915	1		9	NONE			NO	FOUND ON GRD INSPEC
05/20/89	958	1		9	NONE			NO	
05/20/89	1055	2		9				NO	
05/20/89	1386	1		9					
05/24/89	1367	1		9					
05/25/89	916	1		9	NONE			NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
05/25/89	959	1	1643	19:45:00	NONE	200	CLIMB	4000	120				NONE		ONE
05/25/89	960	1	1644		NONE	200	TAKEOFF	200	150	VFR	DAY	CLEAR	NONE	YES	
05/25/89	1361	1	89	8:00:00	NONE	200	LANDING	0	135			SOME CLOUDS	NONE	NO	ONE
05/26/89	917	2	892029		NONE	300	UNKNOWN						NONE		
05/27/89	918	2	892030	14:15:00	NONE	400	APPROACH	3500	210			SOME CLOUDS	NONE	NO	SEVERAL
05/28/89	1347	1	89		NONE	300	TAKEOFF	0					DIV		
05/31/89	919	1	892031	19:01:00	MULT ENG	400	TAKEOFF	0	140		DUSK	RAIN	ATB		FLOCK
05/31/89	919	2	892032	19:01:00	MULT ENG	400	TAKEOFF	0	140		DUSK	RAIN	ATB		FLOCK
05/31/89	1056	2	1768		NONE	200	UNKNOWN						NONE		
05/31/89	1354	1	89	7:37:00	NONE		TAKEOFF	0	160			SOME CLOUDS	NONE	NO	ONE
05/31/89	1403	1	89	21:20:00	NONE	200	CLIMB	2000	165			CLEAR	NONE		
06/01/89	1197	1	0		NONE	400	CLIMB	3000	240	VFR	NIGHT	CLEAR	NONE	NO	NO
06/02/89	920	1	892033		NONE	300	CLIMB						NONE		
06/02/89	921	2	892034		NONE	300	UNKNOWN						NONE		
06/02/89	922	1	892035		NONE	300	APPROACH						NONE		
06/03/89	923	1	892036	4:20:00	NONE	300	TAKEOFF	0	90		OVERCAST	RAIN	NONE		NO
06/03/89	1450	1	89		NONE		TAKEOFF						NONE	NO	
06/04/89	1196	1	0		NONE	300	APPROACH	420	115	VFR	DAY	OVERCAST	NONE	NO	ONE
06/05/89	924	1	892037	12:26:00	NONE	300	TAKEOFF	0	134			LIGHT RAIN	ATB		SEVERAL
06/07/89	925	2	892038	12:50:00	NONE	400	TAKEOFF	0	135		LIGHT	LIGHT RAIN	ATB		ONE
06/08/89	926	2	892039		NONE	400	UNKNOWN						NONE		
06/09/89	1420	2	89	20:09:00	NONE		APPROACH	2500	180			SOME CLOUDS	NONE	NO	ONE
06/10/89	927	1	892040		NONE	300	UNKNOWN						NONE		
06/10/89	1360	1	89	9:40:00	MULT BIRDS	300	LANDING	40	140			OVERCAST	NONE	NO	FLOCK
06/11/89	1337	2	89	12:03:00	NONE		TAKEOFF	0	120			CLEAR	ATO	YES	SEVERAL
06/12/89	961	1	1649	16:48:00	MULT BIRDS	200	TAKEOFF	0	90			CLEAR	ATO	NO	FLOCK
06/12/89	1406	2	89	7:11:00	NONE	200	TAKEOFF	0	110			SOME CLOUDS	ATO	YES	SEVERAL
06/13/89	962	1	962	21:05:00	TRVS FRAC	200	TAKEOFF	50	145	IFR	DAY	OVERCAST	ATB	YES	ONE
06/13/89	1057	1	1769		NONE	200	UNKNOWN						NONE		YES
06/13/89	1058	1	1770		NONE	200	UNKNOWN						NONE		NO
06/14/89	390	2	89	7:43:00	NONE	200	TAKEOFF	0					ATO	NO	ONE
06/15/89	928	1	892041		NONE	300	CRUISE						NONE		NO
06/16/89	929	2	892042		NONE	400	UNKNOWN						NONE		
06/18/89	1377	1	89	10:35:00	MULT BIRDS	300	TAKEOFF	0	100			CLEAR	NONE		SEVERAL
06/18/89	1418	2	89	12:00:00	NONE	100	TAKEOFF	0	165				NONE	NO	SEVERAL
06/19/89	930	2	892043		MULT BIRDS	300	TAKEOFF	0					NONE		FLOCK
06/19/89	963	1	1650		NONE	200	TAKEOFF	0	137				ATO		
06/19/89	1362	1	89	10:56:00	NONE	200	APPROACH	500	140				NONE		
06/20/89	964	2	1651		NONE	200	UNKNOWN						NONE		
06/20/89	1059	1	1771	10:50:00	NONE	200	LANDING		110			OVERCAST	NONE	NO	ONE
06/21/89	931	1	892044		NONE	300	UNKNOWN						NONE		
06/21/89	1322	1	89	6:50:00	NONE	200	LANDING	0	120			SOME CLOUDS	NONE	NO	SEVERAL
06/21/89	1325	1	89	8:47:00	NONE	300	LANDING	0	110			CLEAR	NONE	NO	SEVERAL
06/22/89	965	1	1652	18:10:00	NONE	200	TAKEOFF	0	110			CLEAR	ATO	NO	SEVERAL
06/22/89	1195	1	0	17:45:00	NONE	200	TAKEOFF		V2	VFR	NIGHT	CLEAR	ATO	NO	ONE
06/23/89	932	2	892045		NONE	400	CLIMB						NONE		
06/24/89	933	1	892046	19:30:00	NONE	300	LANDING	0					NONE	NO	SEVERAL
06/24/89	966	1	1653	5:50:00	TRVS FRAC	200	TAKEOFF	0	135			CLEAR	ATO		ONE
06/24/89	1378	1	89	6:05:00	MULT ENG-BIRDS	300	TAKEOFF					SOME CLOUDS	NONE		
06/24/89	1378	2	89	6:05:00	MULT ENG-BIRDS	300	TAKEOFF					SOME CLOUDS	NONE		
06/25/89	934	2	892047	16:25:00	NONE	300	TAKEOFF		130			OVERCAST	ATO		ONE
06/26/89	935	1	892048	12:30:00	NONE	300	CLIMB	300	180			SOME CLOUDS	ATB		ONE
06/27/89	1324	1	89	19:30:00	MULT BIRDS	300	LANDING	100	133			CLEAR	NONE	NO	FLOCK
06/28/89	967	2	1654	6:30:00	NONE	200	TAKEOFF	0	110			CLEAR	ATO	NO	
06/28/89	968	1	1655		NONE	200	TAKEOFF						NONE		
06/29/89	1368	2	89	10:36:00	NONE	300	LANDING	0	97			SOME CLOUDS	NONE		SEVERAL
07/02/89	1415	1	89	6:18:00	MULT ENG-BIRDS	200	LANDING	10	135			CLEAR	NONE		SEVERAL
07/02/89	1415	2	89	6:18:00	MULT ENG-BIRDS	200	LANDING	10	135			CLEAR	NONE		SEVERAL
07/03/89	1060	2	1772		NONE	200	LANDING	0	80			SOME CLOUDS	NONE	NO	ONE
07/04/89	1115	1	892001	22:55:00	NONE	300	CLIMB			VFR	DARK	CLEAR	NONE		
07/06/89	969	2	1656		NONE	200	TAKEOFF						NONE		
07/06/89	1394	2	89	3:24:00	NONE	200	TAKEOFF					CLEAR	ATO	NO	ONE
07/07/89	1116	2	892002		NONE	300	UNKNOWN						NONE		
07/08/89	970	2	1794		NONE	200	UNKNOWN						NONE		
07/08/89	1422	2	89	13:43:00	NONE	100	TAKEOFF	0				SOME CLOUDS	ATB	NO	
07/09/89	1117	2	892003		NONE	300	TAKEOFF					CLEAR	NONE	NO	
07/09/89	1344	2	89	17:20:00	NONE	200	LANDING	0	80			SOME CLOUDS	NONE	NO	ONE
07/10/89	971	1	1778		TRVS FRAC	200	TAKEOFF		120				ATO		

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
05/25/89	959	1	KESTREL	5K27	1	8.	EAM-JED	EAM	NEJRAN, SAUDI ARABIA	NO	JT8D	15
05/25/89	960	1	ROCK DOVE	2P1	1	14.		DAL	DALLAS/FT. WORTH, TX	YES	JT8D	9A
05/25/89	1361	1						GOI	GOA, INDIA	NO	JT8D	
05/26/89	917	2			1		-IAH	XUS	HOUSTON, TX	YES	CFM56	3
05/27/89	918	2			1			ALC	ALICANTE, SPAIN	NO	CFM56	3
05/28/89	1347	1						CWL	CARDIFF-WALES, ENGLAND	NO	CFM56	3
05/31/89	919	1	BLACK-HEADED GULL	14N36	1	9.7		VCE	VENICE, ITALY	NO	CFM56	3
05/31/89	919	2	BLACK-HEADED GULL	14N36	1	9.7		VCE	VENICE, ITALY	NO	CFM56	3
05/31/89	1056	2					MAA-BLR	XFO	INDIA	NO	JT8D	17A
05/31/89	1354	1			1			RKPC	CHENJU, KOREA	NO		
05/31/89	1403	1			1			LCA	LARNACA, CYPRUS	NO	JT8D	
06/01/89	1197	1	SPARROW*		1			TPA	TAMPA, FL	YES	CFM56	3
06/02/89	920	1			1			FRA	FRANKFURT, GERMANY	NO	CFM56	3
06/02/89	921	2			1		-FRA	XFO	FRANKFURT, GERMANY	NO	CFM56	3
06/02/89	922	1			1			SYD	SYDNEY, AUSTRALIA	NO	CFM56	3
06/03/89	923	1	BLACK-HEADED GULL	14N36	1	9.7	CPH-ARN	CPH	COPENHAGEN, DENMARK	NO	CFM56	3
06/03/89	1450	1						XFO	UNKNOWN	NO		
06/04/89	1196	1	COMMON GULL	14N13	1	15.	SAN-SLC	SLC	SALT LAKE CITY, UT	YES	CFM56	3
06/05/89	924	1	ROCK DOVE*		1	14.	LHR-GLA	LHR	LONDON-HEATHROW, ENGLAND	NO	CFM56	3
06/07/89	925	2			1			EDI	EDINBURGH, SCOTLAND	NO	CFM56	3
06/08/89	926	2			1		-SEL	XFO	SEOUL, S. KOREA	NO	CFM56	3
06/09/89	1420	2	SWALLOW*		1			MUC	MUNICH, GERMANY	NO		
06/10/89	927	1			1		-IAH	XUS	HOUSTON, TX	YES	CFM56	3
06/10/89	1360	1	HOUSE MARTIN	18Z69	*	0.6		NCE	NICE, FRANCE	NO	CFM56	3
06/11/89	1337	2	HAWK*		1			TNG	TANGIER, MOOROCCO	NO		
06/12/89	961	1	CROWNED LAPWING	5N11	*	6.	PLZ-DUR	PLZ	PORT ELIZABETH, S. AFRICA	NO	JT8D	17A
06/12/89	1406	2	GULL*		1			LXS	LEMNOS, GREECE	NO	JT8D	
06/13/89	962	1	POMARINE JAEGER	13N4	1	24.	PDB-FAI	PDB	PEDRO BAY, ALASKA	YES	JT8D	17A
06/13/89	1057	1					-BOM	XFO	INDIA	NO	JT8D	17
06/13/89	1058	1					-SXR	XFO	INDIA	NO	JT8D	17A
06/14/89	1390	2	KITE*		1			FMMI	IVATO, MADAGASCAR	NO	JT8D	
06/15/89	928	1			1		LHR-CPH	XFO	ENGLAND - DENMARK	NO	CFM56	3
06/16/89	929	2			1		-HAJ	XFO	HANOVER, GERMANY	NO	CFM56	3
06/18/89	1377	1	COMMON CROW	22Z85	*	16.8		LGW	LONDON-GATWICK, ENGLAND	NO	CFM56	3
06/18/89	1418	2						CAS	CASABLANCA, MOROCCO	NO	JT8D	
06/19/89	930	2	GULL*		2	15.	PUY-ZAG	PUY	PULA, YUGOSLAVIA	NO	CFM56	3
06/19/89	963	1			1		HOU-ORD	HOU	HOUSTON, TX	YES	JT8D	7B
06/19/89	1362	1						DEL	DELHI, INDIA	NO	JT8D	
06/20/89	964	2			1		-JED	XFO	JEDDAH, SAUDI ARABIA	NO	JT8D	15
06/20/89	1059	1					COK-TRV	TRV	TRIVANDRUM, INDIA	NO	JT8D	17
06/21/89	931	1			1		-SYD	XFO	SYDNEY, AUSTRALIA	NO	CFM56	3
06/21/89	1322	1	CROW*		1			AMD	AHMEDABAD, INDIA	NO	JT8D	
06/21/89	1325	1			1			ALC	ALICANTE, SPAIN	NO	CFM56	3
06/22/89	965	1	GULL*				MAH-MAN	MAH	MAHON, MENORCA, SPAIN	NO	JT8D	15
06/22/89	1195	1	COMMON GULL	14N13	1	15.		DAB	DAYTONA BEACH, FL	YES	JT8D	9
06/23/89	932	2	HERRING GULL	14N14	1	35.9	IBZ-PMI	IBZ	IBIZA, SPAIN	NO	CFM56	3
06/24/89	933	1	PIGEON*		1			LCA	LARNACA, CYPRUS	NO	CFM56	3
06/24/89	966	1	BLACK KITE	3K28	1	28.		LDE	TARBES, FRANCE	NO	JT8D	7B
06/24/89	1378	1			*			LGW	LONDON-GATWICK, ENGLAND	NO	CFM56	3
06/24/89	1378	2			*			LGW	LONDON-GATWICK, ENGLAND	NO	CFM56	3
06/25/89	934	2	GULL*		1			SVG	STAVANGER, NORWAY	NO	CFM56	3
06/26/89	935	1	COMMON WOOD PIGEON	2P9	1	16.	LGW-FNC	LGW	LONDON-GATWICK, ENGLAND	NO	CFM56	3
06/27/89	1324	1			*			ALY	ALEXANDRIA, EGYPT	NO	CFM56	3
06/28/89	967	2	KIEWIET*		1		BFN-KIM	BFN	BLOEMFONTEIN, S. AFRICA	NO	JT8D	17A
06/28/89	968	1					YHZ-YYZ	YHZ	HALIFAX, CANADA	NO	JT8D	9A
06/29/89	1368	2	CROW*		1			EDI	EDINBURGH, SCOTLAND	NO	CFM56	3
07/02/89	1415	1	HERRING GULL	14N14	*	40.		BRS	BRISTOL, ENGLAND	NO	JT8D	
07/02/89	1415	2	HERRING GULL	14N14	*	40.		BRS	BRISTOL, ENGLAND	NO	JT8D	
07/03/89	1060	2	KITE*		1		DEL-GOI	GOI	GOA, INDIA	NO	JT8D	9A
07/04/89	1115	1			1		BRE-FRA	BRE	BREMEN, GERMANY	NO	CFM56	3
07/06/89	969	2			1		YYC-YXD	YYC	CALGARY, CANADA	NO	JT8D	9A
07/06/89	1394	2						CPH	COPENHAGEN, DENMARK	NO	JT8D	
07/07/89	1116	2			1		-MSY	XFO	MONTEREY, MEXICO	NO	CFM56	3
07/08/89	970	2	BURROWING OWL	2S102		5.	DAL-	XUS	DALLAS, TX	YES	JT8D	9A
07/08/89	1422	2			1			ORY	PARIS-ORLY, FRANCE	NO	JT8D	
07/09/89	1117	2	COMMON GULL	14N13	1	15.	ROA-CLT	ROA	ROANOKE, VA	YES	CFM56	3
07/09/89	1344	2	VULTURE*		1			CCU	CALCUTTA, INDIA	NO	JT8D	
07/10/89	971	1	MOURNING DOVE	2P105		4.		MSY	NEW ORLEANS, LA	YES	JT8D	9A

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
05/25/89	959	1	A,C	3	YES			NO	3 BLDS BENT, IMMEDIATE EPR+3%N1 RECOVERY
05/25/89	960	1	A,C	3		YES		YES	ODOR, AM EVENT
05/25/89	1361	1		9					
05/26/89	917	2		9	NONE			NO	FOUND ON GRD INSPEC
05/27/89	918	2	A,H	3	NONE	5.0		NO	3 F BLDS MIDSPAN SHROUD DAMAGE
05/28/89	1347	1	A,H	3		SOME		NO	
05/31/89	919	1	A,C,H	3	SOME	3.0		NO	AIRCRAFT SPEED DROPPED, 2 BENT F BLDS
05/31/89	919	2	A,D,H	2	SOME	1.5		NO	AIRCRAFT SPEED DROPPED, 5 F BLDS BENT
05/31/89	1056	2	A,D,G,H	2				NO	5 F BLDS DAMAGED
05/31/89	1354	1		9					
05/31/89	1403	1		9					
06/01/89	1197	1	A	4					3 F BLDS UNK DAMAGE, PM EVENT
06/02/89	920	1	A,H	3	NONE	3.8		NO	ENGINE NOISE, 2 PAIR OF F BLDS REPLACED
06/02/89	921	2		9	NONE			NO	CABIN ODOR, CONFIRMED ON GRD INSPEC
06/02/89	922	1		9	NONE			NO	
06/03/89	923	1	A,H	3	NONE	2.5	RETARD	NO	3 F BLDS SHINGLED
06/03/89	1450	1		9					
06/04/89	1196	1		9					AM EVENT
06/05/89	924	1	A,C,H	3	NONE			NO	4 PAIR F BLDS REPLACED
06/07/89	925	2	A,C,H	3	NONE	1.8		NO	2 BENT F BLDS, 2 SHINGLED F BLDS
06/08/89	926	2	A,C,H	3	NONE	2.0		NO	ACOUSTIC PANEL DAMAGE, 3 F BLDS DAMAGED
06/09/89	1420	2		9					
06/10/89	927	1	A,C,H	3	NONE	NONE		NO	3 F BLDS DAMAGED, FOUND ON GRD INSPEC
06/10/89	1360	1		9					
06/11/89	1337	2	A,Q	4					
06/12/89	961	1	A,C	3				NO	2 F BLDS BENT
06/12/89	1406	2		9					
06/13/89	962	1	A,D,I,K	1	COMPRESSOR	HIGH	IDLE	VOLUNTARY	4 SURGES RETARD TO IDLE THEN VOL IFSD
06/13/89	1057	1		9				NO	
06/13/89	1058	1		9				NO	FOUND ON GRD INSPEC
06/14/89	1390	2		9					
06/15/89	928	1	A,D,H	2	NONE			NO	ACOUSTIC PANEL DAMAGE, 5 F BLDS DAMAGED
06/16/89	929	2	A,B	3	NONE			NO	2 F BLDS HEAVY TIP CURL
06/18/89	1377	1		9					
06/18/89	1418	2		9					
06/19/89	930	2	A,D,G,H	2	NONE	SOME	RETARD	NO	1 F BLD TIP CORNER MISSING, 25F BLDS DAM
06/19/89	963	1	A	4	COMPRESSOR				
06/19/89	1362	1		9					
06/20/89	964	2	A,H	3				NO	
06/20/89	1059	1		9				NO	
06/21/89	931	1		9	NONE			NO	FOUND ON GRD INSPEC
06/21/89	1322	1		9					
06/21/89	1325	1		9					
06/22/89	965	1	A	4	COMPRESSOR			NO	SEVERE F BLD DAM, AC YAWED
06/22/89	1195	1	A	4					
06/23/89	932	2	A,B	3	NONE	3.5		NO	2 F BLDS REPLACED DUE TO LE
06/24/89	933	1		9	NONE	2.2		NO	
06/24/89	966	1	A,I,M,P	1		YES	RETARD	NO	FAN CASE SEPARATED AND MOVED FORWARD
06/24/89	1378	1		9					
06/24/89	1378	2		9					
06/25/89	934	2	A,C,H	3	NONE	4.0		NO	SEVERAL F BLDS DAMAGED
06/26/89	935	1	A,B,H	3	NONE	3.5	IDLE	NO	9 F BLDS DAMAGED
06/27/89	1324	1		9					
06/28/89	967	2		9				NO	
06/28/89	968	1		9	NONE			NO	ODOR
06/29/89	1368	2		9					
07/02/89	1415	1		9					
07/02/89	1415	2	A,Q	4					
07/03/89	1060	2		9				NO	
07/04/89	1115	1		9	NONE			NO	
07/06/89	969	2		9	NONE			NO	
07/06/89	1394	2	A,Q	4					
07/07/89	1116	2		9	NONE			NO	FOUND ON GRD INSPEC
07/08/89	970	2	A,C	3				NO	
07/08/89	1422	2		9					
07/09/89	1117	2	A,G	2	NONE	SOME		NO	9 F BLDS DAM, 1 BLD TIP PIECE BROKEN OFF
07/09/89	1344	2		9					
07/10/89	971	1	A,I,K	1	COMPRESSOR			NO	ENG OIL LIGHT CAME ON

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
07/10/89	1118	2	892004		NONE	300	CLIMB						NONE		
07/11/89	972	2	1657		NONE	200	APPROACH						NONE		
07/11/89	1119	1	892005		NONE	300	LANDING	0					NONE		
07/12/89	973	2	1658		NONE	200	TAKEOFF	0					ATO		
07/12/89	974	1	1659		NONE	200	LANDING	0					NONE		
07/12/89	975	2	1780		NONE	200	UNKNOWN						NONE		NO
07/13/89	976	1	1660		NONE	200	TAKEOFF	0					ATO		
07/13/89	977	2	1661		NONE	200	LANDING						NONE		
07/15/89	978	2	1783	19:20:00	NONE	200	CLIMB						NONE		
07/15/89	1400	1	89	8:45:00	NONE	300	TAKEOFF	0					OTHER		ONE
07/16/89	1180	1	1820	15:05:00	TRVS FRAC	200	LANDING	50	131			RAIN	NONE		
07/17/89	979	2	1785	18:40:00	NONE	200	LANDING		130			CLEAR	NONE		SEVERAL
07/17/89	980	2	1784		NONE	200	UNKNOWN						NONE		
07/17/39	1440	1	89		NONE		APPROACH					SOME CLOUDS	NONE	NO	
07/18/89	995	2	1786	21:35:00	TRVS FRAC	200	TAKEOFF		137				ATO		NO
07/18/89	1120	2	892006		NONE	400	UNKNOWN						NONE		
07/18/89	1121	1	892007	18:00:00	NONE	300	TAKEOFF						DIV		
07/18/89	1122	1	892008		NONE	400	LANDING	0		VFR		CLEAR	NONE		ONE
07/18/89	1371	2	89		NONE	300	TAKEOFF	0					NONE	NO	
07/18/89	1451	2	89		NONE	200	TAKEOFF	0	135			SOME CLOUDS	ATB		SEVERAL
07/19/89	1335	2	89	15:40:00	NONE	200	APPROACH	600	135			CLEAR	NONE	NO	ONE
07/19/89	1382	1	89	6:33:00	NONE	300	TAKEOFF	0	120			CLEAR	NONE	NO	SEVERAL
07/20/89	981	2	1787		MULT BIRDS	200	LANDING						NONE		
07/20/89	1436	2	89		MULT BIRDS	300	TAKEOFF	0	135				NONE		SEVERAL
07/21/89	1123	1	892009		NONE	300	UNKNOWN						NONE		
07/22/89	1352	2	89	11:15:00	NONE	100	LANDING	200					OTHER	NO	
07/22/89	1356	1	89	8:25:00	NONE	200	TAKEOFF	0	135			OVERCAST	NONE	NO	
07/22/89	1401	1	89	7:00:00	NONE	300	TAKEOFF	0					NONE		
07/22/89	1434	1	89		NONE	200	APPROACH	1000	140			CLEAR	NONE		
07/23/89	1391	1	89	7:20:00	NONE	200	LANDING	0	90			SOME CLOUDS	NONE	NO	ONE
07/24/89	1124	1	892010		NONE	300	UNKNOWN						NONE		
07/25/89	982	1	1789	14:30:00	NONE	200	UNKNOWN						NONE		
07/26/89	983	2	1788		NONE	200	TAKEOFF						NONE		
07/26/89	1125	1	892011		NONE	300	UNKNOWN						NONE		
07/27/89	1126	2	892012		NONE	300	LANDING	0					NONE		
07/27/89	1127	1	892013	9:57:00	MULT ENG-BIRDS	300	LANDING		110			SOME CLOUDS	NONE	NO	SEVERAL
07/27/89	1127	2	89	9:57:00	MULT ENG-BIRDS	300	LANDING		110			SOME CLOUDS	NONE	NO	SEVERAL
07/27/89	1421	2	89	14:00:00	NONE	300	LANDING	0					NONE		
07/27/89	1425	1	89		NONE	200	CLIMB	400	175			CLEAR	NONE		SEVERAL
07/28/89	984	2	1791	12:00:00	NONE	200	UNKNOWN						NONE		
07/28/89	985	1	1790	18:00:00	TRVS FRAC	200	TAKEOFF	20					ATB		YES
07/28/89	1128	2	892014		NONE	300	CRUISE						NONE		
07/28/89	1129	2	892015		NONE	300	UNKNOWN						NONE		
07/28/89	1189	1	1461	8:17:00	NONE	200	LANDING	0				CLEAR	NONE		
07/28/89	1441	1	89	12:00:00	MULT ENG-BIRDS	200	TAKEOFF	0	132			SOME CLOUDS	NONE		FLOCK
07/28/89	1441	2	89	12:00:00	MULT ENG-BIRDS	200	TAKEOFF	0	132			SOME CLOUDS	NONE		FLOCK
07/29/89	1130	1	892016		NONE	400	LANDING	0	80				NONE		
07/29/89	1370		89		MULT BIRDS		CLIMB	500	185			CLEAR	NONE		SEVERAL
07/29/89	1432	2	89		NONE		LANDING	0	140			CLEAR	NONE	NO	ONE
07/30/89	986	1	1792		NONE	200	LANDING	0	100				NONE		
07/30/89	1131	1	892017		NONE	300	APPROACH					CLEAR	NONE		
07/30/89	1132	1	892018		NONE	300	TAKEOFF	0	140	VFR	DAY	CLEAR	NONE	NO	ONE
07/30/89	1404	2	89	12:40:00	NONE	100	TAKEOFF	0	110		OVERCAST	RAIN	ATO	NO	ONE
07/31/89	1133	1	892019		NONE	300	UNKNOWN						NONE		
07/31/89	1134	2	892020		NONE	300	CLIMB						NONE		
07/31/89	1341	1	89	8:20:00	NONE	300	TAKEOFF	0	100				NONE	NO	ONE
07/31/89	1353	2	89	15:59:00	NONE	100	TAKEOFF	0					ATO	NO	
08/01/89	1135	1	892021		NONE	400	UNKNOWN						NONE		
08/01/89	1426	1	89	12:50:00	NONE	200	TAKEOFF	35	140			OVERCAST	NONE	NO	1
08/01/89	1442	1	89	10:30:00	MULT ENG-BIRDS		APPROACH					CLEAR	NONE	YES	FLOCK
08/01/89	1442	2	89	10:30:00	MULT ENG-BIRDS		APPROACH					CLEAR	NONE	YES	FLOCK
08/02/89	1136	1	892022		NONE	300	TAKEOFF	0	+V1				NONE		
08/02/89	1190	1	0		NONE	200	CLIMB						NONE		
08/02/89	1198	1	0		MULT BIRDS	200	TAKEOFF	100	140	VFR	DAY	CLEAR	NONE	NO	SEVERAL
08/02/89	1206		0		NONE	200	UNKNOWN						NONE		
08/02/89	1429	1	89	9:05:00	MULT ENG-BIRDS	200	LANDING	0	60			SOME CLOUDS	OTHER	NO	SEVERAL
08/02/89	1429	2	89	9:05:00	MULT ENG-BIRDS	200	LANDING	0	60			SOME CLOUDS	OTHER	NO	SEVERAL
08/03/89	987	2	1793		NONE	200	LANDING	0	110				NONE		YES

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
07/10/89	1118	2			1			ABQ	ALBUQUERQUE, NM	YES	CFM56	3
07/11/89	972	2			1		YOW-YYZ	YYZ	TORONTO, CANADA	NO	JT8D	17
07/11/89	1119	1			1			BRU	BRUSSELS, BELGIUM	NO	CFM56	3
07/12/89	973	2						DUB	DUBLIN, IRELAND	NO	JT8D	9
07/12/89	974	1					YPR-YZP	YZP	SANDSPIT, CANADA	NO	JT8D	9A
07/12/89	975	2					-DHA	XFO	DHAHRAN, SAUDI ARABIA	NO	JT8D	17
07/13/89	976	1	HERRING GULL	14N14	1	40.	YZF-YYC	YZF	YELLOWKNIFE, CANADA	NO	JT8D	9A
07/13/89	977	2			1		YES-YVR	YVR	VANCOUVER, CANADA	NO	JT8D	17A
07/15/89	978	2			1			DEL	DELHI, INDIA	NO	JT8D	17A
07/15/89	1400	1			1			LHE	LAHORE, PAKISTAN	NO	CFM56	3
07/16/89	1180	1						JRH	JORHAT, INDIA	NO	JT8D	17
07/17/89	979	2	BLACK KITE	3K28	1	28.	LHR-LYS	LYS	LYON, FRANCE	NO	JT8D	15A
07/17/89	980	2	WESTERN MEADOWLARK	64Z68		4.		XUS		YES	JT8D	9A
07/17/89	1440	1	SPARROW*		1			TPA	TAMPA, FL	YES		
07/18/89	995	2	COMMON CUCKOO	2R15	1	4.	LXS-ATH	LXS	LEMNOS, GREECE	NO	JT8D	9A
07/18/89	1120	2			1		-PUS	XFO	PUSAN, KOREA	NO	CFM56	3
07/18/89	1121	1			1		BOH-FAO	BOH	BOURNOUTH, ENGLAND	NO	CFM56	3
07/18/89	1122	1			1			DUS	DUSSELDORF, GERMANY	NO	CFM56	3
07/18/89	1371	2			1			FSC	FIGARI, FRANCE	NO	CFM56	3
07/18/89	1451	2			1			PAT	PATNA, INDIA	NO	JT8D	
07/19/89	1335	2						BOM	BOMBAY, INDIA	NO	JT8D	
07/19/89	1382	1			1			HAM	HAMBURG, GERMANY	NO	CFM56	3
07/20/89	981	2	SANDPIPERS*		*		YEG-YVR	YVR	VANCOUVER, CANADA	NO	JT8D	9A
07/20/89	1436	2			*			AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
07/21/89	1123	1			1		-IND	XUS	INDIANAPOLIS, IN	YES	CFM56	3
07/22/89	1352	2			1			CDG	PARIS-DE GAULLE, FRANCE	NO	JT8D	
07/22/89	1356	1	VULTURE*					CJB	COIMBATORE, INDIA	NO	JT8D	
07/22/89	1401	1						LHE	LAHORE, PAKISTAN	NO	CFM56	3
07/22/89	1434	1						PSA	PISA, ITALY	NO	JT8D	
07/23/89	1391	1	DOVE*					WDH	J.G.STRIJDOM, S. AFRICA	NO	JT8D	
07/24/89	1124	1	COMMON EGRET	1I52	1	36.	-DAL	XUS	DALLAS, TX	YES	CFM56	3
07/25/89	982	1					IAD-TPA	XUS	DC - FL	YES	JT8D	7
07/26/89	983	2					YXS-YVR	YXS	PRINCE GEORGE, CANADA	NO	JT8D	9A
07/26/89	1125	1			1		-DAL	XUS	DALLAS, TX	YES	CFM56	3
07/27/89	1126	2			1			LGG	LIEGE, BELGIUM	NO	CFM56	3
07/27/89	1127	1			*			ZTH	ZAKINTHOS, GREECE	NO	CFM56	3
07/27/89	1127	2			*			ZTH	ZAKINTHOS, GREECE	NO	CFM56	3
07/27/89	1421	2						WAW	WARSAW, POLAND	NO	CFM56	3
07/27/89	1425	1						LGRP	PARADISI, GREECE	NO	JT8D	
07/28/89	984	2	CUCKOO	2R15		4.	RUH-HBT	XFO	SAUDI ARABIA	NO	JT8D	15
07/28/89	985	1	HERRING GULL	14N14	1	40.	YUL-YOW	YUL	MONTREAL, CANADA	NO	JT8D	9A
07/28/89	1128	2			1		-SPL	XFO	AMSTERDAM	NO	CFM56	3
07/28/89	1129	2			1		-PMI	XFO	PALMA MALLORCA, SPAIN	NO	CFM56	3
07/28/89	1189	1			1		BNN-CGN	CGN	COLOGNE/BONN, GERMANY	NO	JT8D	15
07/28/89	1441	1	SWALLOW*		*			VCE	VENICE, ITALY	NO	JT8D	
07/28/89	1441	2	SWALLOW*		*			VCE	VENICE, ITALY	NO	JT8D	
07/29/89	1130	1	PARTRIDGE*		1			BRE	BREMEN, GERMANY	NO	CFM56	3
07/29/89	1370		SPARROW*		*			ERI	ERIE, PA	YES		
07/29/89	1432	2	HAWK		1			RST	ROCHESTER, MN	YES		
07/30/89	986	1	GULL*				YEV-YYC	YYC	CALGARY, CANADA	NO	JT8D	9A
07/30/89	1131	1			1			PHX	PHOENIX, AZ	YES	CFM56	3
07/30/89	1132	1	HAWK*		1		ROC-PHL	ROC	ROCHESTER, NY	YES	CFM56	3
07/30/89	1404	2	BLACK-HEADED GULL	14N36	1	10.		LIL	LILLE, FRANCE	NO	JT8D	
07/31/89	1133	1			1		-LHR	XFO	LONDON-HEATHROW, ENGLAND	NO	CFM56	3
07/31/89	1134	2			1		ASP-ADL	ASP	ALICE SPRINGS, AUSTRAILIA	NO	CFM56	3
07/31/89	1341	1	GULL*		1			BRE	BREMEN, GERMANY	NO	CFM56	3
07/31/89	1353	2	EURASIAN KESTREL	5K27	1	8.		CDG	PARIS-DE GAULLE, FRANCE	NO	JT8D	
08/01/89	1135	1			1		-SEL	XFO	SEOUL, KOREA	NO	CFM56	3
08/01/89	1426	1			1			PAT	PATNA, INDIA	NO	JT8D	
08/01/89	1442	1	SWALLOW*		*			VCE	VENICE, ITALY	NO		
08/01/89	1442	2	SWALLOW*		*			VCE	VENICE, ITALY	NO		
08/02/89	1136	1			1		SYD-BNE	SYD	SYDNEY, AUSTRALIA	NO	CFM56	3
08/02/89	1190	1	GULL*					DAY	DAYTON, OH	YES	JT8D	9
08/02/89	1198	1	COMMON GULL	14N13	*	15.		FNT	FLINT, MI	YES	JT8D	
08/02/89	1206							XUS	CHICAGO, IL	YES	JT8D	
08/02/89	1429	1			*			IXZ	PORT BLAIR, INDIA	NO	JT8D	
08/02/89	1429	2			*			IXZ	PORT BLAIR, INDIA	NO	JT8D	
08/03/89	987	2	COMMON BUZZARD	3K180		32.	TXL-DUS	DUS	DUSSELDORF, GERMANY	NO	JT8D	15A

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
07/10/89	1118	2	A,C	3	NONE	3.0		NO	3 F BLDS BENT
07/11/89	972	2		9	NONE			NO	
07/11/89	1119	1	A,H	3	NONE			NO	4 SHINGLED F BLDS
07/12/89	973	2	A,G	2				NO	EXTENSIVE ENG DAM, GOUGING OF F BLDS
07/12/89	974	1		9	NONE			NO	
07/12/89	975	2	A	4	NONE			NO	FOUND ON GRD INSPEC
07/13/89	976	1	A,D,K	1				NO	2ND+6TH STG BLADES NICKED
07/13/89	977	2		9	NONE			NO	
07/15/89	978	2		9				NO	
07/15/89	1400	1	A,Q	4					7 FAN BLADES DAMAGED
07/16/89	1180	1	A,C,G,I	1					BROKEN PIECE OF F BLD FOUND IN EXIT CASE
07/17/89	979	2	A,H	3	NONE			NO	3 SHINGLED F BLDS, FOUND ON GRD INSPEC
07/17/89	980	2		9				NO	ODOR
07/17/89	1440	1	A,Q	4					
07/18/89	995	2	A,I,K	1				NO	EXTENSIVE GUIDE VANE DAM, 2 BLDS TRVSFRA
07/18/89	1120	2	A,B,H	3	NONE			NO	FOUND ON GRD INSPEC, 4 F BLDS DAMAGED
07/18/89	1121	1	A,H	3		HIGH	RETARD	NO	2 F BLDS SHINGLED
07/18/89	1122	1		9		NONE	RETARD	NO	ODOR
07/18/89	1371	2		9					
07/18/89	1451	2	A,Q	4					
07/19/89	1335	2		9					
07/19/89	1382	1	A,Q	4					
07/20/89	981	2		9	NONE			NO	55 DEAD BIRDS ON RUNWAY
07/20/89	1436	2		9					
07/21/89	1123	1		9	NONE			NO	FOUND ON GRD INSPEC
07/22/89	1352	2		9					
07/22/89	1356	1		9					
07/22/89	1401	1	A,Q	4					5 FAN BLADES DAMAGED
07/22/89	1434	1		9					
07/23/89	1391	1		9					
07/24/89	1124	1	A,C	3	NONE			NO	FOUND GRD INSPEC, SEVERAL DENTED F BLDS
07/25/89	982	1	A,C	3				YES	NICKS ON F BLDS
07/26/89	983	2		9	NONE			NO	MOMENTARY SHIFT IN ENG PARAMETERS
07/26/89	1125	1		9	NONE			NO	FOUND ON GRD INSPEC
07/27/89	1126	2		9	NONE	NONE		NO	
07/27/89	1127	1		9	NONE			NO	
07/27/89	1127	2		9					
07/27/89	1421	2		9					
07/27/89	1425	1		9					
07/28/89	984	2	A,L	3				NO	DENT AND LOOSE RIVETS IN NACELLE LIP
07/28/89	985	1	A,F,I	1	COMPRESSOR	YES		VIBES	EMERGENCY DECLARED
07/28/89	1128	2	A,H	3	NONE	3.5		NO	4 F BLDS SHINGLED
07/28/89	1129	2	A,B,H	3	NONE			NO	FOUND ON GRD INSPEC, 6 F BLDS DAMAGED
07/28/89	1189	1		9	NONE			NO	
07/28/89	1441	1		9					
07/28/89	1441	2		9					
07/29/89	1130	1		9	NONE			NO	ODOR
07/29/89	1370		A,Q	4					
07/29/89	1432	2		9					
07/30/89	986	1		9	NONE			NO	
07/30/89	1131	1	A,H	3	NONE			NO	3 F BLDS SHINGLED
07/30/89	1132	1		9	NONE	NONE		NO	ODOR, AM EVENT
07/30/89	1404	2		9					
07/31/89	1133	1		9	NONE			NO	ODOR, FOUND ON GRD INSPEC
07/31/89	1134	2	A,B,H	3	NONE			NO	3 F BLDS DAMAGED
07/31/89	1341	1		9					
07/31/89	1353	2		9					
08/01/89	1135	1	A,B	3	NONE			NO	1 F BLD LEADING EDGE DENT
08/01/89	1426	1		9					
08/01/89	1442	1		9					
08/01/89	1442	2		9					
08/02/89	1136	1	A,K	1	NONE			NO	AFT STGS OF HPC HAD IMPACT DAMAGE
08/02/89	1190	1	A,D,H	2	NONE			NO	ODOR, REPLACED 1ST STG FAN ASSEMBLY
08/02/89	1198	1	A,C	3					PM EVENT, 1 BENT F BLD
08/02/89	1206			9					
08/02/89	1429	1		9					
08/02/89	1429	2		9					
08/03/89	987	2		9	NONE			NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
08/03/89	1443	2	89	8:25:00	NONE		LANDING	100	225			CLEAR	NONE	NO	ONE
08/05/89	1137	1	892023		NONE	300	TAKEOFF	0	110				ATO		
08/06/89	988	1	1663		NONE	200	TAKEOFF		110				ATO		
08/06/89	1348	2	89	20:00:00	NONE	200	LANDING	0	80			CLEAR	NONE	NO	ONE
08/06/89	1383	1	89	20:33:00	NONE	200	LANDING	0	100			CLEAR	NONE	NO	SEVERAL
08/06/89	1444	2	89	12:31:00	MULT BIRDS	200	CLIMB		140			OVERCAST	NONE	YES	FLOCK
08/07/89	989	2	1779		TRVS FRAC	200	TAKEOFF						NONE		
08/09/89	1138	2	892024		NONE	300	CLIMB						DIV		
08/09/89	1345	1	89	5:40:00	NONE	200	TAKEOFF	0	70			SOME CLOUDS	ATO	NO	ONE
08/10/89	990	2	1781		MULT BIRDS	200	LANDING						NONE		FLOCK
08/10/89	1139	2	892025	6:32:00	MULT BIRDS	300	TAKEOFF	0	90			OVERCAST	NONE	NO	FLOCK
08/10/89	1140	1	892026	11:00:00	NONE	300	TAKEOFF	0	+V1		BRIGHT	CLEAR	NONE		
08/10/89	1141	1	892027		NONE	300	LANDING	20					NONE		
08/10/89	1409	2	89	20:55:00	NONE	200	LANDING	30				RAIN	NONE		ONE
08/11/89	1142	2	892028	11:15:00	NONE	300	TAKEOFF	0	+V1			RAIN	NONE		FLOCK
08/12/89	1143	1	892029		NONE	300	TAKEOFF	0	+V1				NONE		
08/12/89	1392	1	89	20:00:00	NONE	200	APPROACH	1000	150				NONE		
08/13/89	991	1	1782		NONE	200	TAKEOFF	0	140				ATO		
08/13/89	1144	2	892030		NONE	300	UNKNOWN						NONE		
08/14/89	1145	1	892031		NONE	300	UNKNOWN						NONE		
08/14/89	1146	1	892032		NONE	300	TAKEOFF	0	-V1				NONE		
08/14/89	1385	1	89	19:35:00	NONE		TAKEOFF	0	100			CLEAR	ATO	NO	ONE
08/15/89	992	2	1795		NONE	200	TAKEOFF						NONE		
08/15/89	1147	1	892033		NONE	300	LANDING	0		VFR	BRIGHT	CLEAR	NONE		YES
08/15/89	1148	1	892034		NONE	300	LANDING	0					NONE		
08/15/89	1402	1	89	8:51:00	NONE		TAKEOFF	0	150		OVERCAST	FOG	NONE	NO	SEVERAL
08/16/89	1396	1	89	20:20:00	NONE	200	TAXI	0	5			OVERCAST	NONE	NO	SEVERAL
08/18/89	1149	2	892035		NONE	300	UNKNOWN						NONE		
08/18/89	1150	1	892036		NONE	300	UNKNOWN						NONE		
08/18/89	1369	1	89		NONE	100	CLIMB						NONE	NO	
08/19/89	1151	2	892037		NONE	300	LANDING	0					NONE		
08/19/89	1327	2	89	17:08:00	MULT BIRDS	300	LANDING	0	120			CLEAR	NONE		FLOCK
08/19/89	1375	1	89	18:55:00	NONE	300	TAKEOFF	0	10			CLEAR	NONE	NO	ONE
08/20/89	993	2	1796		NONE	200	UNKNOWN						NONE		
08/20/89	1405	1	89	11:30:00	NONE	100	TAKEOFF	50	150			CLEAR	ATB	NO	ONE
08/23/89	1393	1	89	10:55:00	NONE	300	TAKEOFF	0					ATO		
08/23/89	1397	1	89	19:45:00	NONE	200	TAKEOFF	0	80			CLEAR	NONE		
08/24/89	1358	1	89		MULT ENG-BIRDS	300	LANDING	0	115			CLEAR	NONE	NO	SEVERAL
08/24/89	1358	2	89		MULT ENG-BIRDS	300	LANDING	0	115			CLEAR	NONE	NO	SEVERAL
08/25/89	994	1	1797		NONE	200	LANDING						NONE		
08/26/89	996	2	1798		NONE	200	UNKNOWN						NONE		
08/26/89	1438	2	89	17:58:00	MULT BIRDS	200	TAKEOFF	0	120			SOME CLOUDS	NONE		SEVERAL
08/26/89	1445	2	89	12:40:00	MULT BIRDS	200	TAKEOFF	25	150			SOME CLOUDS	NONE		FLOCK
08/27/89	997	2	1799		NONE	200	UNKNOWN						NONE		
08/27/89	1363	1	89	6:12:00	NONE	200	TAKEOFF	0	145			CLEAR	NONE	NO	
08/28/89	1152	1	892038		NONE	300	UNKNOWN						NONE		
08/28/89	1326	2	89	20:16:00	NONE		APPROACH					CLEAR	NONE		
08/29/89	1153	2	892039	15:36:00	NONE	300	LANDING	100		VFR	BRIGHT	CLEAR	NONE		
08/29/89	1154	2	892040		NONE	300	TAKEOFF	0	+V1				NONE		
08/29/89	1155	1	892041		NONE	300	UNKNOWN						NONE		
08/29/89	1179	2	1811		NONE	200	UNKNOWN						NONE		
08/29/89	1379	2	89	14:55:00	NONE	200	APPROACH					SOME CLOUDS	NONE		
08/30/89	998	2	1800		NONE	200	UNKNOWN						NONE		
08/30/89	1433	1	89	13:00:00	NONE	200	TAKEOFF	50	160			SOME CLOUDS	NONE		SEVERAL
08/31/89	1156	2	892042		NONE	300	UNKNOWN						NONE		
09/01/89	1157	1	892043		NONE	400	UNKNOWN						NONE		
09/01/89	1389	2	89		NONE		TAKEOFF	0	100			CLEAR	NONE	NO	ONE
09/01/89	1395	2	89	11:57:00	NONE		TAKEOFF	0	140			OVERCAST	NONE	NO	
09/01/89	1439	1	89		NONE	100	LANDING	0					NONE	NO	
09/03/89	1159	2	892045		NONE	300	TAKEOFF	0	+V1				ATB		
09/03/89	1355	1	89		MULT BIRDS		TAKEOFF	20	150			CLEAR	NONE	YES	SEVERAL
09/04/89	1160	2	892046		NONE	300	UNKNOWN						NONE		
09/04/89	1407	2	89	17:26:00	NONE	200	LANDING	10	132			CLEAR	NONE		SEVERAL
09/05/89	999	1	1804	17:30:00	MULT ENG	200	TAKEOFF						DIV		
09/05/89	999	2	1804	17:30:00	MULT ENG	200	TAKEOFF						DIV		
09/05/89	1000	2	1801		NONE	200	TAKEOFF						ATB		
09/05/89	1416	1	89	17:22:00	MULT BIRDS	200	LANDING	0	100			CLEAR	NONE		FLOCK
09/06/89	1001	2	1802		NONE	200	TAKEOFF						NONE		

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
08/03/89	1443	2	SWALLOW*					VCE	VENICE, ITALY	NO		
08/05/89	1137	1			1			ORY	PARIS-ORLY, FRANCE	NO	CFM56	3
08/06/89	988	1			1		YUL-YVR	YUL	MONTREAL, CANADA	NO	JT8D	17
08/06/89	1348	2						IXC	CHANDIGARH, INDIA	NO	JT8D	
08/06/89	1383	1	BUZZARD*		1			HAM	HAMBURG, GERMANY	NO	JT8D	
08/06/89	1444	2	SWALLOW*		*			VCE	VENICE, ITALY	NO	JT8D	
08/07/89	989	2					BJL-DKR	BJL	BANJUL, GAMBIA	NO	JT8D	15
08/09/89	1138	2			1			STR	STUTTGART, GERMANY	NO	CFM56	3
08/09/89	1345	1						CCU	CALCUTTA, INDIA	NO	JT8D	
08/10/89	990	2	SWALLOW*		*		YVR-YYJ	YYJ	VICTORIA, CANADA	NO	JT8D	9A
08/10/89	1139	2	GULL*		*			HAM	HAMBURG, GERMANY	NO	CFM56	3
08/10/89	1140	1	GULL*		1			AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
08/10/89	1141	1	RING-BILLED GULL	14N12	1	16.		DTW	DETROIT, MI	YES	CFM56	3
08/10/89	1409	2	BLACK-HEADED GULL	14N36	1	10.		LPL	LIVERPOOL, ENGLAND	NO	JT8D	
08/11/89	1142	2	EURASIAN KESTREL	5K27	1	7.2	VCE-LHR	VCE	VENICE, ITALY	NO	CFM56	3
08/12/89	1143	1			1			MUC	MUNICH, GERMANY	NO	CFM56	3
08/12/89	1392	1						JDH	JODHPUR, INDIA	NO	JT8D	
08/13/89	991	1	ROCK DOVE	2P1		11.	TNG-BCN	TNG	TANGIER, MOROCCO	NO	JT8D	15
08/13/89	1144	2			1		-DAL	XUS	DALLAS, TX	YES	CFM56	3
08/14/89	1145	1			1		-AMS	XFO	AMSTERDAM, NETHERLANDS	NO	CFM56	3
08/14/89	1146	1			1			ATH	ATHENS, GREECE	NO	CFM56	3
08/14/89	1385	1			1			HAJ	HANOVER, GERMANY	NO		
08/15/89	992	2					YVQ-YZF	YVQ	NORMAN WELLS, CANADA	NO	JT8D	9A
08/15/89	1147	1	BLACK-HEADED GULL	14N36	1	10.		VIE	VIENNA, AUSTRIA	NO	CFM56	3
08/15/89	1148	1			1			ORF	NORFOLK, VA	YES	CFM56	3
08/15/89	1402	1			1			GOT	GOTHENBURG, SWEDEN	NO		
08/16/89	1396	1			1			VAKJ	KHAJURAHO, INDIA	NO	JT8D	
08/18/89	1149	2			1		DEN-PHX	XUS	CO - AZ	YES	CFM56	3
08/18/89	1150	1	MOURNING DOVE	2P105	1	4.	-DAL	XUS	DALLAS, TX	YES	CFM56	3
08/18/89	1369	1			1			AAE	ANNABA, ALGERIA	NO	JT8D	
08/19/89	1151	2			1			DLH	DULUTH, MN	YES	CFM56	3
08/19/89	1327	2	SWALLOW*		*			AYT	ANTALYA, TURKEY	NO	CFM56	3
08/19/89	1375	1			1			FRA	FRANKFURT, GERMANY	NO	CFM56	3
08/20/89	993	2					YUL-MCQ	XFO	CANADA	NO	JT8D	9A
08/20/89	1405	1	COMMON WOOD PIGEON	2P9	1	16.		LIL	LILLE, FRANCE	NO	JT8D	
08/23/89	1393	1						KHI	KARACHI, PAKISTAN	NO	CFM56	3
08/23/89	1397	1						VAKJ	KHAJURAHO, INDIA	NO	JT8D	
08/24/89	1358	1	QUAIL*		*			LEGE	COSTA BRAVA, SPAIN	NO	CFM56	3
08/24/89	1358	2	QUAIL*		*			LEGE	COSTA BRAVA, SPAIN	NO	CFM56	3
08/25/89	994	1	GULL*				YYZ-YUL	YUL	MONTREAL, CANADA	NO	JT8D	9A
08/26/89	996	2					YYC-YWG	XFO	CANADA	NO	JT8D	9A
08/26/89	1438	2	HAWK*		*			SVO	SHEREMETYEVO, SOVIET UNION	NO	JT8D	
08/26/89	1445	2	SWALLOW*		*			VCE	VENICE, ITALY	NO	JT8D	
08/27/89	997	2					DAB-YMX	XFO	CANADA	NO	JT8D	9A
08/27/89	1363	1						DUS	DUESSELDORF, GERMANY	NO	JT8D	
08/28/89	1152	1			1		-ORD	XUS	CHICAGO, IL	YES	CFM56	3
08/28/89	1326	2						LEAM	ALMERIA, SPAIN	NO		
08/29/89	1153	2			1			DUS	DUSSELDORF, GERMANY	NO	CFM56	3
08/29/89	1154	2			1		CLE-SFO	CLE	CLEVLAND, OH	YES	CFM56	3
08/29/89	1155	1	RED-LEGGED PARTRIDGE	4L41	1	15.9	-AMS	XFO	AMSTERDAM, NETHERLANDS	NO	CFM56	3
08/29/89	1179	2					-OKA	XFO	JAPAN	NO	JT8D	17
08/29/89	1379	2	SPARROW*		1			LGW	LONDON-GATWICK, ENGLAND	NO	JT8D	
08/30/89	998	2			1			XFO	CANADA	NO	JT8D	17
08/30/89	1433	1	HOUSE MARTIN	18269	1	0.6		TSF	TREVISO, ITALY	NO	JT8D	
08/31/89	1156	2			1		-AMS	XFO	AMSTRDAM, NETHERLANDS	NO	CFM56	3
09/01/89	1157	1			1		-DUB	XFO	DUBLIN, IRELAND	NO	CFM56	3
09/01/89	1389	2	SPARROW*		1			IAH	HOUSTON, TX	YES		
09/01/89	1395	2			1			CPH	COPENHAGEN, DENMARK	NO		
09/01/89	1439	1			1			SVG	STAVANGER, NORWAY	NO	JT8D	
09/03/89	1159	2			1			PVD	PROVIDENCE, RI	YES	CFM56	3
09/03/89	1355	1			*			MDW	CHICAGO, IL	YES		
09/04/89	1160	2	YELLOW-BREASTED CHAT	63269	1	1.	-DAL	XUS	DALLAS, TX	YES	CFM56	3
09/04/89	1407	2			1			LIS	LISBON, PORTUGAL	NO	JT8D	
09/05/89	999	1					HOU-ORD	HOU	HOUSTON, TX	YES	JT8D	7B
09/05/89	999	2					HOU-ORD	HOU	HOUSTON, TX	YES	JT8D	7B
09/05/89	1000	2						XFO	NIGERIA	NO	JT8D	15
09/05/89	1416	1	DUCK*		*			LEMG	MALAGA, SPAIN	NO	JT8D	
09/06/89	1001	2					YYC-YWG	YYC	CALGARY, CANADA	NO	JT8D	9A

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
08/03/89	1443	2		9					
08/05/89	1137	1	A,C	3	NONE			NO	3 F BLDS BENT
08/06/89	988	1		9	COMPRESSOR			NO	ENG RECOVERED IMMEDIATELY FROM STALL
08/06/89	1348	2		9					
08/06/89	1383	1		9					
08/06/89	1444	2		9					
08/07/89	989	2	A,C,I,K	1		YES		NO	3 FBLDS BENT, 4 FBLD TIPS WERE CUT OFF
08/09/89	1138	2	A,B,G	2				NO	11 F BLDS DAMAGED, 13 F OGV'S LE NICKS
08/09/89	1345	1		9					
08/10/89	990	2		9	NONE			NO	
08/10/89	1139	2	A,K	1	NONE			NO	MINOR HPC BLADE IMPACT DAMAGE
08/10/89	1140	1		9	NONE			NO	
08/10/89	1141	1		9	NONE			NO	ODOR
08/10/89	1409	2		9					
08/11/89	1142	2		9	NONE			NO	MULT AC STRIKES
08/12/89	1143	1		9	NONE			NO	
08/12/89	1392	1	A,Q	4					
08/13/89	991	1		9				EPR	
08/13/89	1144	2	A,H	3	NONE			NO	1 F BLD SHINGLED
08/14/89	1145	1	A,B,C	3	NONE			NO	1 F BLD TWISTED WITH IS DEFORMATION
08/14/89	1146	1	A,D	2	NONE			NO	SEVERAL F BLDS BENT
08/14/89	1385	1		9					
08/15/89	992	2		9				NO	
08/15/89	1147	1		9	NONE			NO	ODOR, MULT AC STRIKES
08/15/89	1148	1		9	NONE			NO	
08/15/89	1402	1		9					
08/16/89	1396	1		9					
08/18/89	1149	2	A,B,H	3	NONE			NO	FOUND ON GRD INSPEC, 2 F BLDS SHINGLED
08/18/89	1150	1		9	NONE			NO	ODOR
08/18/89	1369	1	A,Q	4					
08/19/89	1151	2		9	NONE			NO	
08/19/89	1327	2		9					
08/19/89	1375	1		9					
08/20/89	993	2		9	NONE			NO	FOUND ON GRD INSPEC
08/20/89	1405	1	A,Q	4					
08/23/89	1393	1	A,Q	4					6 FAN BLADES DAMAGED
08/23/89	1397	1		9					
08/24/89	1358	1	A,Q	4					CONSIDERABLE FAN DAMAGE, DEBRIS IN CORE
08/24/89	1358	2		9					
08/25/89	994	1		9				NO	
08/26/89	996	2		9	NONE			NO	FOUND ON GRD INSPEC
08/26/89	1438	2		9					
08/26/89	1445	2		9					
08/27/89	997	2	A,C	3	NONE			NO	2 F BLDS BENT, FOUND ON GRD INSPEC
08/27/89	1363	1	A,Q	4					
08/28/89	1152	1	A,C,H	3	NONE			NO	2 F BLDS SHINGLED, 1 F BLD TIP BENT .5IN
08/28/89	1326	2		9					
08/29/89	1153	2	A,L	3	NONE			NO	
08/29/89	1154	2	A,H	3	NONE	3.9		NO	VIBES INCREASED THEN RETURNED TO NORMAL
08/29/89	1155	1		9	NONE			NO	
08/29/89	1179	2	A,D	2					1 STG F BLD ASSEMBLY CHANGED
08/29/89	1379	2		9					
08/30/89	998	2		9	NONE			NO	FOUND ON GRD INSPEC
08/30/89	1433	1		9					
08/31/89	1156	2		9	NONE			NO	FOUND ON GRD INSPEC
09/01/89	1157	1	A,C,H	3	NONE			NO	FOUND ON GRD INSPEC, 2 F BLDS DAMAGED
09/01/89	1389	2		9					
09/01/89	1395	2		9					
09/01/89	1439	1		9					
09/03/89	1159	2	A,D,K	1				NO	ENG REM, 11 HPC BLDS IMPACT DAMAGE
09/03/89	1355	1		9					
09/04/89	1160	2		9	NONE			NO	ODOR, FOUND ON GRD INSPEC
09/04/89	1407	2		9					
09/05/89	999	1		9	NONE			NO	
09/05/89	999	2		9	NONE			NO	
09/05/89	1000	2	A	4				NO	FAN CHANGED
09/05/89	1416	1		9					
09/06/89	1001	2	A,L	3	NONE			NO	ODOR, NACELLE DAMAGE, 6 RIVETS SHEERED

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
09/06/89	1161	2	892047		NONE	300	UNKNOWN						NONE		
09/06/89	1372	1	89	8:50:00	NONE	200	TAKEOFF	0	80				NONE		
09/07/89	1357	1	89	18:55:00	NONE	200	TAKEOFF	0	95				NONE		
09/08/89	1002	2	1805		NONE	200	TAKEOFF	0	105				ATO		YES
09/09/89	1162	1	892048		NONE	300	UNKNOWN						NONE		
09/09/89	1384	2	89	18:14:00	MULT BIRDS		TAKEOFF	0	120			CLEAR	NONE	NO	SEVERAL
09/10/89	1336	1	89	9:45:00	NONE	200	LANDING	0	80				NONE	NO	
09/10/89	1437	1	89	15:23:00	MULT ENG-BIRDS	200	TAKEOFF	10	135			SOME CLOUDS	OTHER		FLOCK
09/10/89	1437	2	89	15:23:00	MULT ENG-BIRDS	200	TAKEOFF	10	135			SOME CLOUDS	OTHER		FLOCK
09/11/89	1003	2	1806	6:05:00	NONE	200	TAKEOFF	0	140			CLEAR	ATO	NO	NO
09/11/89	1331	2	89	9:15:00	MULT BIRDS	200	TAKEOFF	0	132			SOME CLOUDS	NONE	NO	SEVERAL
09/11/89	1408	1	89	18:25:00	MULT BIRDS	200	LANDING	250	137			CLEAR	NONE		FLOCK
09/12/89	1004	1	1807		NONE	200	TAKEOFF						NONE		
09/12/89	1414	2	89	21:55:00	NONE	200	TAKEOFF	0	126			CLEAR	NONE	NO	ONE
09/13/89	1163	1	892049		NONE	300	UNKNOWN						NONE		
09/13/89	1328	1	89	10:35:00	MULT BIRDS		TAKEOFF	0				CLEAR	ATO	NO	SEVERAL
09/13/89	1412	2	89		NONE		TAKEOFF	100	160			CLEAR	NONE	NO	SEVERAL
09/14/89	1005	1	1808		NONE	200	TAKEOFF	0	80				ATO		
09/14/89	1398	2	89	15:20:00	NONE	200	LANDING	0	90			SOME CLOUDS	NONE	NO	ONE
09/16/89	1447	2	89	15:27:00	NONE	200	TAKEOFF	35	120			CLEAR	NONE	YES	SEVERAL
09/17/89	1323	1	89	10:35:00	NONE	200	TAKEOFF	0	140			CLEAR	ATB		SEVERAL
09/19/89	1364	1	89	15:36:00	NONE	300	LANDING	50	140			OVERCAST	NONE	NO	SEVERAL
09/20/89	1164	2	892050	12:00:00	NONE	300	LANDING	0	130	VFR	BRIGHT	CLEAR	NONE	NO	ONE
09/21/89	1165	1	892051		NONE	300	UNKNOWN						NONE		
09/21/89	1178	1	1813		NONE	200	UNKNOWN						NONE		
09/21/89	1346	1	89	17:00:00	NONE	200	TAKEOFF	0	100			OVERCAST	NONE	NO	ONE
09/22/89	1158	1	892044	17:12:00	NONE	300	LANDING	150	135				NONE	YES	YES
09/22/89	1376	1	89		NONE	300	LANDING	0				CLEAR	NONE	NO	ONE
09/23/89	1166	2	892052		NONE	300	LANDING		134			CLEAR	NONE	YES	ONE
09/23/89	1167	2	892053		NONE	300	UNKNOWN						NONE		
09/24/89	1168	1	892054		NONE	400	UNKNOWN						NONE		
09/25/89	1332	1	89	6:34:00	NONE	200	LANDING	0	90			SOME CLOUDS	NONE	NO	ONE
09/26/89	1169	1	89	8:10:00	MULT ENG-BIRDS	300	LANDING	0	130			CLEAR	NONE		SEVERAL
09/26/89	1169	2	892055	8:10:00	MULT ENG-BIRDS	300	LANDING	0	130			CLEAR	NONE		SEVERAL
09/27/89	1380	1	89	9:45:00	NONE	200	CLIMB	1800	200			OVERCAST	NONE		ONE
09/28/89	1423	2	89	19:27:00	NONE	200	TAKEOFF	0	40			OVERCAST	ATO		ONE
09/29/89	1170	1	892056	20:06:00	NONE	300	TAKEOFF		150			CLEAR	ATB	NO	ONE
09/29/89	1176	1	1812		NONE	200	TAKEOFF						NONE		YES
09/29/89	1177	1	1607		NONE	200	TAKEOFF						ATB		
09/30/89	1175	2	1809		AIRWRTHY	200	TAKEOFF						NONE		NO

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
09/06/89	1161	2			1		-CTU	XFO	CHENGDU, CHINA	NO	CFM56	3
09/06/89	1372	1	CATTLE EGRET	1135		16.		FLN	FLORIANÓPOLIS, BRAZIL	NO	JT8D	
09/07/89	1357	1						CMG	CORUMBA, BRAZIL	NO	JT8D	
09/08/89	1002	2	GULL*		1		YWG-YVR	YWG	WINNIPEG, CANADA	NO	JT8D	9A
09/09/89	1162	1			1		-SFO	XUS	SAN FRANCISCO, CA	YES	CFM56	3
09/09/89	1384	2	LAPWING*		*			HAM	HAMBURG, GERMANY	NO		
09/10/89	1336	1	KITE*		1			BOM	BOMBAY, INDIA	NO	JT8D	
09/10/89	1437	1	GULL*		*			GOA	GENOA, ITALY	NO	JT8D	
09/10/89	1437	2	GULL*		*			GOA	GENOA, ITALY	NO	JT8D	
09/11/89	1003	2	GULL*		1		JNB-PLZ	JNB	JOHANNESBURG, S. AFRICA	NO	JT8D	9A
09/11/89	1331	2	KITE*		*			BBI	BHUBANESHWAR, INDIA	NO	JT8D	
09/11/89	1408	1			*			LIS	LISBON, PORTUGAL	NO	JT8D	
09/12/89	1004	1					YYC-LAX	YYC	CALAGARY, CANADA	NO	JT8D	17
09/12/89	1414	2						LKO	LUCKNOW, INDIA	NO	JT8D	
09/13/89	1163	1			1		-AMS	XFO	AMSTERDAM, NETHERLANDS	NO	CFM56	3
09/13/89	1328	1	GULL*		*			STO	STOCKHOLM, SWEDEN	NO		
09/13/89	1412	2						LAX	LOS ANGELES, CA	YES		
09/14/89	1005	1	HAWK*		1		YXD-YZF	YXD	EDMONTON, CANADA	NO	JT8D	9A
09/14/89	1398	2	EUROPEAN SPARROW HAWK	3K103	1	6.7		BNJ	BONN, GERMANY	NO	JT8D	
09/16/89	1447	2	HAWK*		1			TRV	TRIVANDRUM, INDIA	NO	JT8D	
09/17/89	1323	1						BFS	BELFAST, N. IRELAND	NO	JT8D	
09/19/89	1364	1	GULL*		1			DUS	DUESSELDORF, GERMANY	NO	CFM56	3
09/20/89	1164	2	GULL*		1			AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
09/21/89	1165	1			1		-LTN	XFO	LUTON, ENGLAND	NO	CFM56	3
09/21/89	1178	1					YWG-YVR	XFO	CANADA	NO	JT8D	9A
09/21/89	1346	1			1			CCU	CALCUTTA, INDIA	NO	JT8D	
09/22/89	1158	1	BLACK VULTURE	3K55	1	48.		GIG	RIO DE JANEIRO, BRAZIL	NO	CFM56	3
09/22/89	1376	1						FRA	FRANKFURT, GERMANY	NO	CFM56	3
09/23/89	1166	2	COMMON GULL	14N13	1	15.		EWR	NEWARK, NJ	YES	CFM56	3
09/23/89	1167	2			1			XFO	GERMANY	NO	CFM56	3
09/24/89	1168	1			1		-LGW	XFO	LONDON, ENGLAND	NO	CFM56	3
09/25/89	1332	1			1			BBI	BHUBANESHWAR, INDIA	NO	JT8D	
09/26/89	1169	1	HUNGARIAN PARTRIDGE	4L85	*	14.1		LTN	LUTON, ENGLAND	NO	CFM56	3
09/26/89	1169	2	HUNGARIAN PARTRIDGE	4L85	2	14.1		LTN	LUTON, ENGLAND	NO	CFM56	3
09/27/89	1380	1			1			LGW	LONDON-GATWICK, ENGLAND	NO	JT8D	
09/28/89	1423	2			1			PMI	PALMA MALLORCA, SPAIN	NO	JT8D	
09/29/89	1170	1			1			NUE	NURENBERG, GERMANY	NO	CFM56	3
09/29/89	1176	1			1		YVO-YUL	YVO	VAL D'OR, CANADA	NO	JT8D	
09/29/89	1177	1					JAX-IAD	JAX	JACKSONVILLE, FL	YES	JT8D	7
09/30/89	1175	2					YUL-YYZ	YUL	MONTREAL, CANADA	NO	JT8D	9A

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
09/06/89	1161	2	A,B	3	NONE			NO	1FBLD LE SLIGHT BEND, FOUND ON GRD INSPE
09/06/89	1372	1		9					
09/07/89	1357	1		9					
09/08/89	1002	2	A,H	3	COMPRESSOR			NO	
09/09/89	1162	1	A	4	NONE			NO	FOUND ON GRD INSPEC, 2 F BLDS UNK DAMAGE
09/09/89	1384	2		9					
09/10/89	1336	1		9					
09/10/89	1437	1	A,Q	4					
09/10/89	1437	2	A,Q	4					
09/11/89	1003	2		9				NO	
09/11/89	1331	2	A,Q	4					
09/11/89	1408	1		9					
09/12/89	1004	1		9				NO	ODOR
09/12/89	1414	2		9					
09/13/89	1163	1	A,B	3	NONE			NO	FOUND ON GRD INSPEC, 2 F BLDS LE DISTORT
09/13/89	1328	1		9				YES	
09/13/89	1412	2	A,Q	4				YES	
09/14/89	1005	1		9	COMPRESSOR			VOLUNTARY	3 COMP STALLS
09/14/89	1398	2		9					
09/16/89	1447	2		9					
09/17/89	1323	1	A,Q	4					
09/19/89	1364	1		9					
09/20/89	1164	2		9	NONE			NO	ODOR
09/21/89	1165	1	A,H	3	NONE			NO	3 ACOUST C PANELS CRACKED, 3 FBLDS SHING
09/21/89	1178	1		9	NONE			NO	FOUND ON GRD INSPEC
09/21/89	1346	1		9					
09/22/89	1158	1	A,K	1	NONE	NONE		NO	ENG REM AFT FLT TO GRU, HPC DAM ALL STGS
09/22/89	1376	1		9					
09/23/89	1166	2		9	NONE			NO	
09/23/89	1167	2		9	NONE			NO	FOUND ON GRD INSPEC
09/24/89	1168	1		9	NONE			NO	FOUND ON GRD INSPEC
09/25/89	1332	1		9					
09/26/89	1169	1		9					
09/26/89	1169	2	A,B,H	3				NO	8 F BLDS SHINGLED+7 FBLDS LE DISTORTION
09/27/89	1380	1		9					
09/28/89	1423	2		9					
09/29/89	1170	1	A,B	3				YES	11 F BLDS LE DISTORTION
09/29/89	1176	1		9	NONE			NO	
09/29/89	1177	1		9					
09/30/89	1175	2		9	COMPRESSOR			NO	EXPERIENCED A BANG AND AC 'YAWED'

APPENDIX C
STATISTICAL HYPOTHESIS TESTING

Statistical analyses are based on an underlying probabilistic model of the processes that give rise to the data. For example, to provide the basis for comparing the weights of ingested birds in the United States and overseas it is necessary to hypothesize an underlying random distribution of bird weights. Statistical analyses are somewhat more sophisticated than descriptive data analyses and more care is required to ensure that the methods are appropriate for the data.

Statistical analysis is basically formalized inductive reasoning. Hypotheses about bird ingestion hazards are evaluated for consistency with the data that have been collected. Statistical analysis provides the rules for quantifying the level of consistency forming the basis for objective unbiased decisions. The process is known formally as statistical hypothesis testing and a brief outline of the procedure is presented here.

The basis of a statistical hypothesis test is the hypothesis; which is a formal statement about a relationship in the data. In comparing the weight distributions of United States ingestions versus foreign ingestions, one hypothesis is that there is no difference in the sizes of the birds ingested here versus those ingested overseas. If the data are found to be consistent with the hypothesis it is accepted; otherwise the hypothesis is rejected.

The rules for deciding whether to accept or reject the hypothesis are based on the possible errors that could be made. A type I error refers to the situation in which the hypothesis is true; however we reject the hypothesis. Alternatively when we accept the hypothesis when it is not true we commit a type II error.

The goal of the statistician is to minimize the likelihood of both types of errors. Unfortunately the likelihood of a type I error is reciprocally linked to the likelihood of a type II error so that lowering the likelihood of a type I error will increase the likelihood of a type II error. Since only one error can be fully controlled it has become standard practice to control the likelihood of a Type I error; which is called the significance level of the test. The test hypothesis is chosen so that it should be accepted unless there is strong evidence that it is not true and the test is constructed to minimize the likelihood of a type II error for the given significance level over a broad range of alternatives.

The mechanics of conducting a statistical hypothesis test are implemented by calculating a test statistic. The test statistic is a function of the data that is related to the test hypothesis. It is usually constructed so that small values are consistent with the null hypothesis and large values are consistent with the alternative hypothesis. The cutoff for accepting or rejecting the null hypothesis is called the critical value and is a function of the desired significance level.

Another aspect in evaluating the efficiency of a statistical test is its ability to detect when the test hypothesis is false. This ability is called the power of the test and is defined to be the probability of rejecting the test hypothesis when it is false. Generally there are many alternatives to

the test hypothesis so that the power of the test is a function of the specific alternate hypothesis.

A variation on the statistical hypothesis test is the calculation of a confidence interval for a parameter such as the overall probability of ingestion (POI). Since there is no specific hypothesis about the POI, a confidence interval is used to describe the range of probabilities that are consistent with the data. The confidence level associated with a confidence interval corresponds to one minus the significance level of a hypothesis test and is a measure of the likelihood that the true value of the parameter (in this case the POI) is contained in the interval.

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