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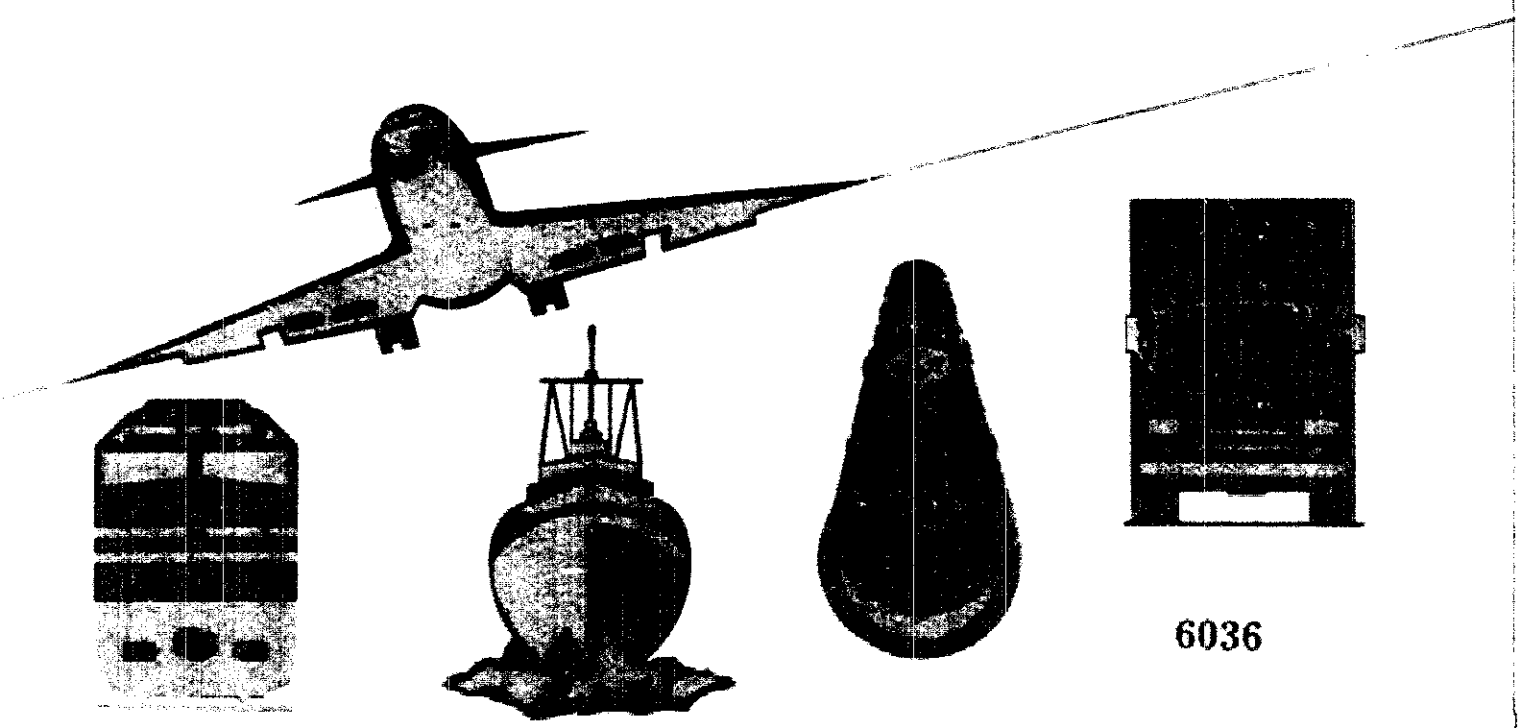
NATIONAL TRANSPORTATION SAFETY BOARD

ANNUAL REVIEW OF AIRCRAFT ACCIDENT DATA

U.S. AIR CARRIER OPERATIONS
CALENDAR YEAR 1989



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16. Abstract

This publication presents the record of aviation accidents involving revenue operations of U.S. Air Carriers including Commuter Air Carriers and On Demand Air Taxis for calendar year 1989.

The report is divided into three major sections according to the federal regulations under which the flight was conducted - 14 CFR 121, 125, 127, Scheduled 14 CFR 135, or Nonscheduled 14 CFR 135. In each section of the report tables are presented to describe the losses and characteristics of 1989 accidents to enable comparison with prior years.

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INTRODUCTION

This report presents a statistical compilation and review of air carrier accidents that occurred in 1989, and involved U.S. registered aircraft conducting operations under Title 14 CFR Parts 121, 125, 127, and 135. Briefly stated, Part 121 applies to air carriers, such as major airlines and cargo haulers, which fly large transport aircraft. Part 125 covers the operation of large, privately owned aircraft not held out for hire. Part 127 regulates the operation of helicopters used as scheduled air carriers. Part 135 applies to commercial air carriers commonly referred to as commuter airlines and air taxis. For a complete definition of operations under each of these Parts, consult the applicable sections of the Code of Federal Regulations.

The report is divided into three major sections: 14 CFR 121, 125, 127 Operations; Scheduled 14 CFR 135 Operations; and Nonscheduled 14 CFR 135 Operations. Each section begins with an overview of accidents and their consequences for 1989 and for the 4 preceding years. Several tables then present accident parameters for 1989 only. Each section concludes with tabulations that present comparative statistics for 1989 and for the 5-year period 1984-88.

Exposure data (flight hours, miles, and departures) used to compute accident rates for operations under Parts 121, 125, and 127 and for scheduled operations under Part 135 were obtained from the Research and Special Programs Administration (RSPA) of the U.S. Department of Transportation (DOT). Flight hours for nonscheduled operations under Part 135 were estimated from data obtained by the Federal Aviation Administration (FAA) in its surveys of general aviation activity. NTSB Form 6120.4 (Appendix F) provides the factual data represented in this report.

In many of the tables presented in this report (such as table 4), the number of accidents in a given category is small; in these tables, even a small change in the number of accidents would result in a significant change in the accident rate. Therefore, the reader should exercise caution in the use of these rates and in comparing numbers and percentages of accidents between two time periods when the number of accidents is small. The reader should avoid placing undue significance on a change that may be due primarily to chance.

14 CFR 121, 125, 127 OPERATIONS

In 1989, there were 28 accidents involving Part 121, 125, 127 operations. The overall accident rate for 1989 was 0.248 per 100,000 hours flown, a slight decrease from the 1988 rate of 0.251. The 1989 rate was also 17.6 percent lower than the overall rate of 0.280 for the period from 1980 - 1988.

There were 11 fatal accidents in this category during 1989 involving 276 fatalities. This is the highest number of fatal accidents in the ten year period reported in Table 14. The most serious of these accidents involved a Boeing 707 in Santa Maria, Portugal (144 fatalities) and a McDonnell Douglas DC-10 in Sioux City, Iowa (111 fatalities).

Table 1 - SUMMARY OF LOSSES
14 CFR 121, 125, 127 OPERATIONS
1985 - 1989

	1985	1986	1987	1988	1989
Accidents					
Fatal	7	3	5	3	11
Involved Serious Injury	8	15	12	16	5
Involved Minor or No Injury	7	6	19	10	12
Total	22	24	36	29	28
Fatalities					
Passenger	486	4	213	255	259
Crew	39	3	17	19	17
Other Persons	1	1	2	11	2
Total	526	8	232	285	278
Aircraft Damage (14 CFR 121, 125, 127)					
Destroyed	9	2	5	3	7
Substantial	8	8	18	12	11
Minor	0	4	4	0	0
None	5	10	12	14	10
Total	22	24	39	29	28

Table 2 - ACCIDENT RATES
14 CFR 121, 125, 127 OPERATIONS

	1985	1986	1987	1988	1989
Aircraft Miles Flown (Thousands)	3,631,017	4,017,626	4,360,521	4,503,426	4,605,083
Aircraft Hours Flown	8,709,894	9,976,104	10,644,856	11,139,519	11,273,908
Departures Flown	6,306,759	7,202,027	7,601,373	7,716,061	7,645,494
Accident Rates *					
Per Million Miles Flown	0.0061	0.0057	0.0080	0.0062	0.0061
Per Hundred Thousand Hours Flown	0.253	0.231	0.329	0.251	0 248
Per Hundred Thousand Departures Flown	0.349	0.319	0.460	0.363	0.366
Fatal Accident Rates *					
Per Million Miles Flown	0.0019	0.0005	0.0009	0.0004	0.0024
Per Hundred Thousand Hours Flown	0.080	0.020	0.038	0.018	0.098
Per Hundred Thousand Departures Flown	0.111	0.028	0.053	0.026	0.144

* The 12/21/88 sabotage involving a Pan Am B747-100, 12/7/87 suicide/sabotage involving a PSA BAe-146e and the 4/2/86 sabotage of a TWA B727-200 are excluded from accident rate computations.

Table 3 - LIST OF ACCIDENTS
14 CFR 121, 125, 127 OPERATIONS
1989

Date	Location	Type of Operation	Air Carrier	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
1/20	Buena Vista, CO	Sch Passenger	Aspen Airways	Convair 580	Substantial	Minor	Loss of power(total) - non-mechanical
1/20	Chicago, IL	Sch Passenger	Piedmont	Boeing 737-201	Substantial	None	Airframe/component/system failure/malfunction
2/08	Santa Maria, Port	Nonsch Passeng	Independent	Boeing 707	Destroyed	Fatal (144)	Not reported
2/09	Salt Lake City, UT	Sch Cargo	Evergreen	McD-Doug DC-9-32F	None	Fatal (1)	Miscellaneous/other
2/19	Puchong, Malaysia	Sch Cargo	Flying Tigers	Boeing 747-200	Destroyed	Fatal (4)	In flight collision with terrain
2/24	Honolulu, HI	Sch Passenger	United	Boeing 747-122	Substantial	Fatal (9)	Airframe/component/system failure/malfunction
3/15	West Lafayette, IN	Nonsch Cargo	Mid Pacific	Nihon YS-11A-600	Destroyed	Fatal (2)	Loss of control - in flight
3/17	Oakland, CA	Sch Passenger	Continental	Boeing 737-300	Substantial	None	Fire
3/18	Saginaw, TX	Sch Cargo	Evergreen	McD-Doug DC-9-33F	Destroyed	Fatal (2)	Airframe/component/system failure/malfunction
4/03	Los Angeles, CA	Sch Passenger	Piedmont	Boeing 767-201	None	Serious	Miscellaneous/other
5/10	San Diego, CA	Sch Passenger	Continental	Airbus A300-B4-203	None	Serious	In flight encounter with weather
5/28	Denver, CO	Sch Passenger	Continental	McD-Doug MD-80	Substantial	Minor	Main gear collapsed
6/16	Jacks Creek, TN	Sch Passenger	Delta	Lockheed L1011-38	None	Serious	In flight encounter with weather
6/26	Atlanta, GA	Sch Passenger	Continental	Boeing 737-291	None	Serious	Propeller blast or jet exhaust/suction
7/12	San Juan, PR	Sch Passenger	American	Airbus A300	None	Fatal (1)	On ground collision with object
7/13	Vandalia, OH	Nonsch Cargo	Rosenbalm	McD-Doug DC-8-63F	Substantial	None	Airframe/component/system failure/malfunction
7/19	Sioux City, IA	Sch Passenger	United	McD-Doug DC-10-10	Destroyed	Fatal (111)	Airframe/component/system failure/malfunction
8/03	Atlanta, GA	Sch Cargo	Zantop Intl	Convair 640	Substantial	None	Hard landing

Table 3 - LIST OF ACCIDENTS (Continued)
14 CFR 121, 125, 127 OPERATIONS
1989

Date	Location	Type of Operation	Air Carrier	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
8/19	Vero Beach, FL	Sch Passenger	US Air	Fokker F-28-4000	None	Serious	In flight encounter with weather
9/12	Chicago, IL	Sch Passenger	American	McD-Doug MD-80	Substantial	Minor	Airframe/component/system failure/malfunction
9/20	Flushing, NY	Sch Passenger	US Air	Boeing 737-400	Destroyed	Fatal (2)	Loss of control - on ground
9/30	Bemidji, MN	Sch Passenger	Mesaba Av.	Fokker F-27	Substantial	None	In flight encounter with weather
10/07	Orlando, FL	Nonsch Passeng	US Air	McD-Doug DC-9-31	None	Fatal (1)	On ground encounter with weather
10/14	Salt Lake City, UT	Sch Passenger	Delta	Boeing 727-232	Destroyed	Minor	Fire/explosion
11/06	Phoenix, AZ	Sch Passenger	America West	Boeing 757-200	None	None	Miscellaneous/other
12/21	Santa Ana, CA	Sch Passenger	American	Boeing 757-223	Substantial	None	In flight collision with terrain
12/27	Miami, FL	Sch Passenger	Eastern	Boeing 727-225B	None	Fatal (1)	Miscellaneous/other
12/30	Tucson, AZ	Sch Passenger	America West	Boeing 737-204	Substantial	Minor	Fire

Table 4 - ACCIDENTS AND RATES BY TYPE OF OPERATION
14 CFR 121, 125, 127 OPERATIONS
1989

	Type of Operation				
	Scheduled				
	Passenger/ Cargo	All Cargo	All	All Non-Scheduled	All
Accidents	20	4	24	4	28
Fatal Accidents	5	3	8	3	11
Aircraft Miles Flown (Thousands)	4,172,399	165,632	4,338,031	267,052	4,605,083
Aircraft Hours Flown	10,126,360	471,562	10,597,922	675,986	11,273,908
Departures Flown	6,935,450	333,644	7,269,094	376,400	7,645,494
Accident Rates					
Per Million Miles Flown	0.0048	0.0241	0.0055	0.0150	0.0061
Per Hundred Thousand Hours Flown	0.190	0.848	0.226	0.592	0.248
Per Hundred Thousand Departures Flown	0.288	1.199	0.330	1.063	0.366
Fatal Accident Rates					
Per Million Miles Flown	0.0012	0.0181	0.0018	0.0112	0.0024
Per Hundred Thousand Hours Flown	0.049	0.636	0.075	0.444	0.098
Per Hundred Thousand Departures Flown	0.072	0.899	0.010	0.797	0.144

Table 5 - PERSONS BY ROLE AND DEGREE OF INJURY
14 CFR 121 125 127 OPERATIONS
1989

	Degree of Injury				
Role of Person	Fatal	Serious	Minor	None	Total
Pilot	5	0	2	21	28
Copilot	4	1	2	21	28
Check pilot	0	0	1	0	1
Flight engineer	2	0	3	4	9
Cabin attendants	5	10	18	77	110
Other crew	1	0	0	0	1
Passenger	259	55	200	1988	2502
Total aboard	276	66	226	2111	2679
Other ground	2	2	3	0	7
Grand total	278	68	229	2111	2686
Percent	10.3	2.5	8.5	78.6	

Table 6 - AIRCRAFT BY DAMAGE AND DEGREE OF INJURY
14 CFR 121 125 127 OPERATIONS
1989

Aircraft damage	Degree of injury				Aircraft	
	None	Minor	Ser	Fatal	No.	Percent
None	1	0	5	4	10	35.7
Substantial	6	4	0	1	11	39.3
Destroyed	0	1	0	6	7	25.0
Aircraft						
Total	7	5	5	11	28	
Percent	25.0	17.9	17.9	39.3		

Table 7 - AIRCRAFT BY FIRST OCCURRENCE AND DEGREE OF INJURY AND BY DAMAGE
14 CFR 121 125 127 OPERATIONS
1989

Type of first occurrence	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
Airframe/component/system failure/malfunction	2	1	0	3	0	0	4	2	6	21.4
Fire/explosion	0	1	0	0	0	0	0	1	1	3.6
Fire	1	1	0	0	0	0	2	0	2	7.1
Main gear collapsed	0	1	0	0	0	0	1	0	1	3.6
Hard landing	1	0	0	0	0	0	1	0	1	3.6
In flight collision with terrain	1	0	0	1	0	0	1	1	2	7.1
In flight encounter with weather	1	0	3	0	3	0	1	0	4	14.3
Loss of control - in flight	0	0	0	1	0	0	0	1	1	3.6
Loss of control - on ground	0	0	0	1	0	0	0	1	1	3.6
On ground collision with object	0	0	0	1	1	0	0	0	1	3.6
On ground encounter with weather	0	0	0	1	1	0	0	0	1	3.6
Loss of power(total) - non-mechanical	0	1	0	0	0	0	1	0	1	3.6
Propeller blast or jet exhaust/ suction	0	0	1	0	1	0	0	0	1	3.6
Miscellaneous/other	1	0	1	2	4	0	0	0	4	14.3
Not reported	0	0	0	1	0	0	0	1	1	3.6
Aircraft										
Number -	7	5	5	11	10	0	11	7	28	
Percent -	25.0	17.9	17.9	39.3	35.7	0.0	39.3	25.0		

Table 8 - AIRCRAFT BY FIRST OCCURRENCE AND BROAD PHASE OF OPERATION
14 CFR 121 125 127 OPERATIONS
1989

Type of first occurrence	Phase of operation									Aircraft	
	Stndg	Taxi	Tkoff	Climb	Cruis	Dscnt	Aprch	Landg	Nrept	No.	Percent
Airframe/component/system failure/malfunction	1	1	1	1	1	1	0	0	0	6	21.4
Fire/explosion	1	0	0	0	0	0	0	0	0	1	3.6
Fire	1	0	0	0	0	1	0	0	0	2	7.1
Main gear collapsed	0	0	0	0	0	0	0	1	0	1	3.6
Hard landing	0	0	0	0	0	0	0	1	0	1	3.6
In flight collision with terrain	0	0	0	0	0	0	1	1	0	2	7.1
In flight encounter with weather	0	0	0	0	1	2	0	1	0	4	14.3
Loss of control - in flight	0	0	0	0	0	0	1	0	0	1	3.6
Loss of control - on ground	0	0	1	0	0	0	0	0	0	1	3.6
On ground collision with object	0	1	0	0	0	0	0	0	0	1	3.6
On ground encounter with weather	0	1	0	0	0	0	0	0	0	1	3.6
Loss of power(total) - non-mechanical	0	0	0	0	1	0	0	0	0	1	3.6
Propeller blast or jet exhaust /suction	1	0	0	0	0	0	0	0	0	1	3.6
Miscellaneous/other	1	1	0	1	1	0	0	0	0	4	14.3
Not reported	0	0	0	0	0	0	0	0	1	1	3.6
Aircraft											
Number -	5	4	2	2	4	4	2	4	1	28	
Percent -	17.9	14.3	7.1	7.1	14.3	14.3	7.1	14.3	3.6		

Table 9 - AIRCRAFT BY PHASE OF OPERATION AND DEGREE OF INJURY AND BY DAMAGE
14 CFR 121 125 127 OPERATIONS
1989

Phase of operation	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
Standing	0	1	0	0	0	0	0	1	1	3.6
Standing - pre-flight	0	0	0	1	0	0	0	1	1	3.6
Standing - starting engine(s)	1	0	0	0	0	0	1	0	1	3.6
Standing - engine(s) operating	0	0	1	0	1	0	0	0	1	3.6
Standing - engine(s) not operating	0	0	1	0	1	0	0	0	1	3.6
Taxi - pushback/tow	1	0	0	2	3	0	0	0	3	10.7
Taxi - from landing	1	0	0	0	0	0	1	0	1	3.6
Takeoff - ground run	0	0	0	1	0	0	0	1	1	3.6
Takeoff - initial climb	1	0	0	0	0	0	1	0	1	3.6
Climb	0	0	0	1	1	0	0	0	1	3.6
Climb - to cruise	0	0	0	1	0	0	1	0	1	3.6
Cruise - normal	0	1	1	2	2	0	1	1	4	14.3
Descent - normal	0	2	2	0	2	0	2	0	4	14.3
Approach	0	0	0	1	0	0	0	1	1	3.6
Approach - VFR pattern - final approach	0	0	0	1	0	0	0	1	1	3.6
Landing - flare/touchdown	3	0	0	0	0	0	3	0	3	10.7
Landing - roll	0	1	0	0	0	0	1	0	1	3.6
Not reported	0	0	0	1	0	0	0	1	1	3.6
Aircraft										
Number -	7	5	5	11	10	0	11	7	28	
Percent -	25.0	17.9	17.9	39.3	35.7	0.0	39.3	25.0		

Table 10 - AIRCRAFT BY CONDITION OF LIGHT AND TYPE OF WEATHER
14 CFR 121 125 127 OPERATIONS
1989

Condition of light	Type of weather: VMC	IMC	Not reptd	Aircraft: No.	Percent
Dawn	1	0	0	1	3.6
Daylight	13	0	1	14	50.0
Night (dark)	9	1	0	10	35.7
Dusk	1	0	1	2	7.1
Not reported	0	1	0	1	3.6
Aircraft					
Number -	24	2	2	28	
Percent -	85.7	7.1	7.1		

Table 11 - AIRCRAFT BY TYPE OF OPERATION AND DEGREE OF INJURY
14 CFR 121, 125, 127 OPERATIONS
1989

Type of Operation	Degree of Injury: None	Minor	Serious	Fatal	Aircraft: No.	Percent
Scheduled Domestic Passenger	5	4	5	2	16	57.1
Scheduled Domestic Cargo	1	0	0	2	3	10.7
Scheduled International Pass.	0	1	0	3	4	14.3
Scheduled International Cargo	0	0	0	1	1	3.6
Nonscheduled Domestic Pass.	0	0	0	1	1	3.6
Nonscheduled Domestic Cargo	1	0	0	1	2	7.1
Nonscheduled International Pass.	0	0	0	1	1	3.6
Aircraft						
Number -	7	5	5	11	28	
Percent -	25.0	17.9	17.9	39.3		

Table 12 - AIRCRAFT BY OCCURRENCE OF FIRE AND DEGREE OF INJURY AND BY DAMAGE
14 CFR 121, 125, 127 OPERATIONS
1989

Aircraft fire	Degree of injury: None	Minor	Ser	Fatal	Aircraft damage: None	Minor	Subs	Dest	Aircraft: No.	Percent
None	6	3	5	5	10	0	8	1	19	67.9
In-flight	0	0	0	1	0	0	1	0	1	3.6
On ground	1	1	0	4	0	0	1	5	6	21.4
In-flight and on ground	0	1	0	0	0	0	1	0	1	3.6
Other	0	0	0	1	0	0	0	1	1	3.6
Aircraft										
Number -	7	5	5	11	10	0	11	7	28	
Percent -	25.0	17.9	17.9	39.3	35.7	.0	39.3	25.0		

Table 13 - BROAD CAUSE/FACTOR ASSIGNMENTS*
14 CFR 121 125 127 OPERATIONS
1989

Cause/Factor	Cited as a Cause		Cited as a Factor		Cited as Either a Cause or a Factor (or Both)	
	Fatal Accidents	All Accidents	Fatal Accidents	All Accidents	Fatal Accidents	All Accidents
Aircraft #	3	7	2	2	5	8
Propulsion System and Controls	1	2	0	1	1	3
Flight Control System	1	0	0	0	1	0
Airframe	1	0	2	0	3	0
Landing Gear	0	3	0	0	0	3
Systems/Equipment/Instruments	1	4	1	1	2	4
Environment #	1	3	1	4	2	6
Weather	0	3	1	2	1	4
Object(trees,wires,etc.)	1	0	0	1	1	1
Terrain/Runway Condition	0	0	1	1	1	1
Personnel #	6	13	5	5	8	14
Pilot	3	6	2	1	3	6
Others (Aboard)	0	2	0	0	0	2
Others (Not Aboard)	3	6	4	4	6	7
Number of Aircraft					11	28
NTSB Determined Probable Cause					9	26

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* Multiple causes and factors may be assigned in an accident

\# This category is composed of the sub-categories indented below it. The number of aircraft cited in a category may be less than or equal to the sum of the sub-category citations.

Table 14 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
ALL 14 CFR 121 125 127 OPERATIONS
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities - Total	Fatalities - Aboard Aircraft In This Category	Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown - Total	Accident Rate per 100,000* Aircraft Hours Flown - Fatal
1980	19	1	1	0	7,379,581	0.257	0.014
1981	26	4	4	2	7,125,698	0.365	0.056
1982	20	5	235	223	7,040,325	0.270	0.057
1983	24	4	15	14	7,298,799	0.329	0.055
1984	17	1	4	4	8,165,124	0.208	0.012
1985	22	7	526	525	8,709,894	0.253	0.080
1986	24	3	8	7	9,976,104	0.231	0.020
1987	36	5	232	230	10,644,856	0.329	0.038
1988	29	3	285	274	11,139,519	0.251	0.018
1989	28	11	278	276	11,273,908	0.248	0.098

* Suicide and sabotage accidents excluded from rates as follows :
Total - 1982 (1), 1986 (1), 1987 (1), 1988 (1)
Fatal - 1982 (1), 1986 (1), 1987 (1), 1988 (1)

Figure 1 - ACCIDENTS AND FATAL ACCIDENTS
ALL 14 CFR 121, 125, 127 OPERATIONS

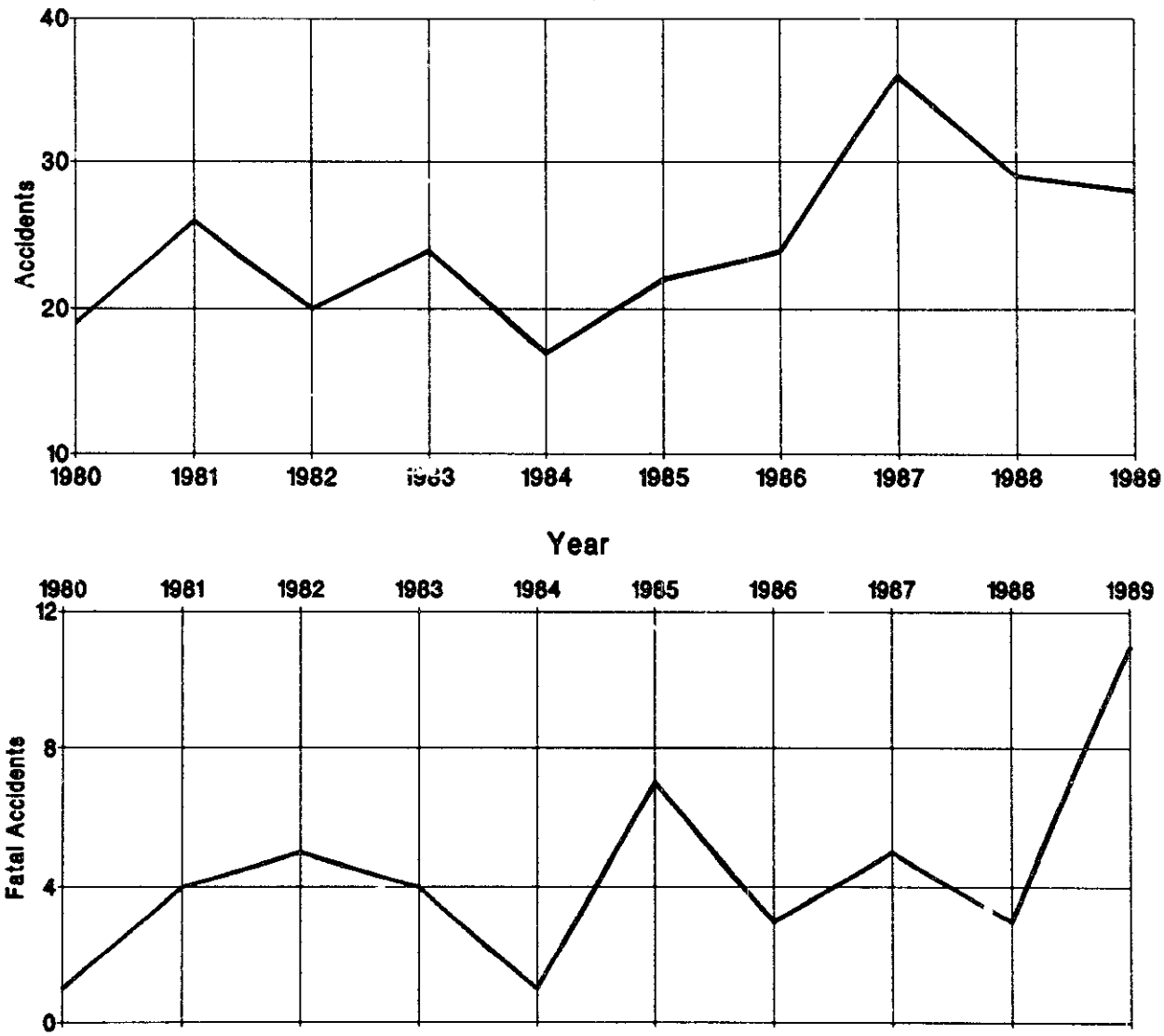


Figure 2 - NUMBER OF FATALITIES
ALL 14 CFR 121, 125, 127 OPERATIONS

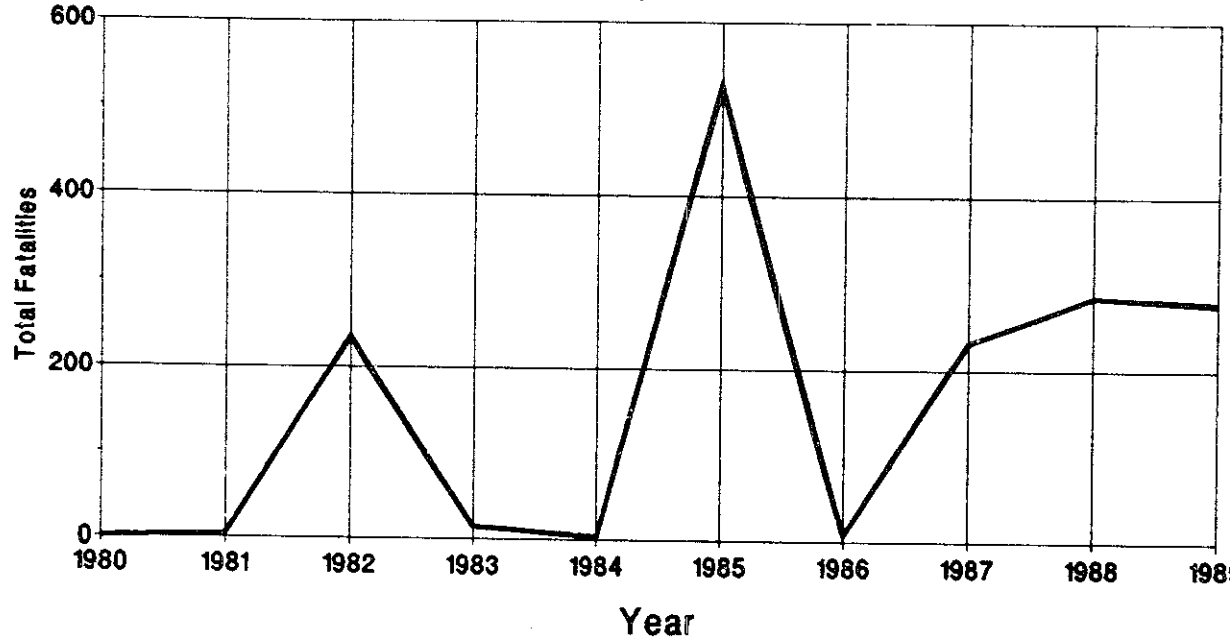


Figure 3 - ACCIDENTS PER 100,000 HOURS FLOWN
ALL 14 CFR 121, 125, 127 OPERATIONS

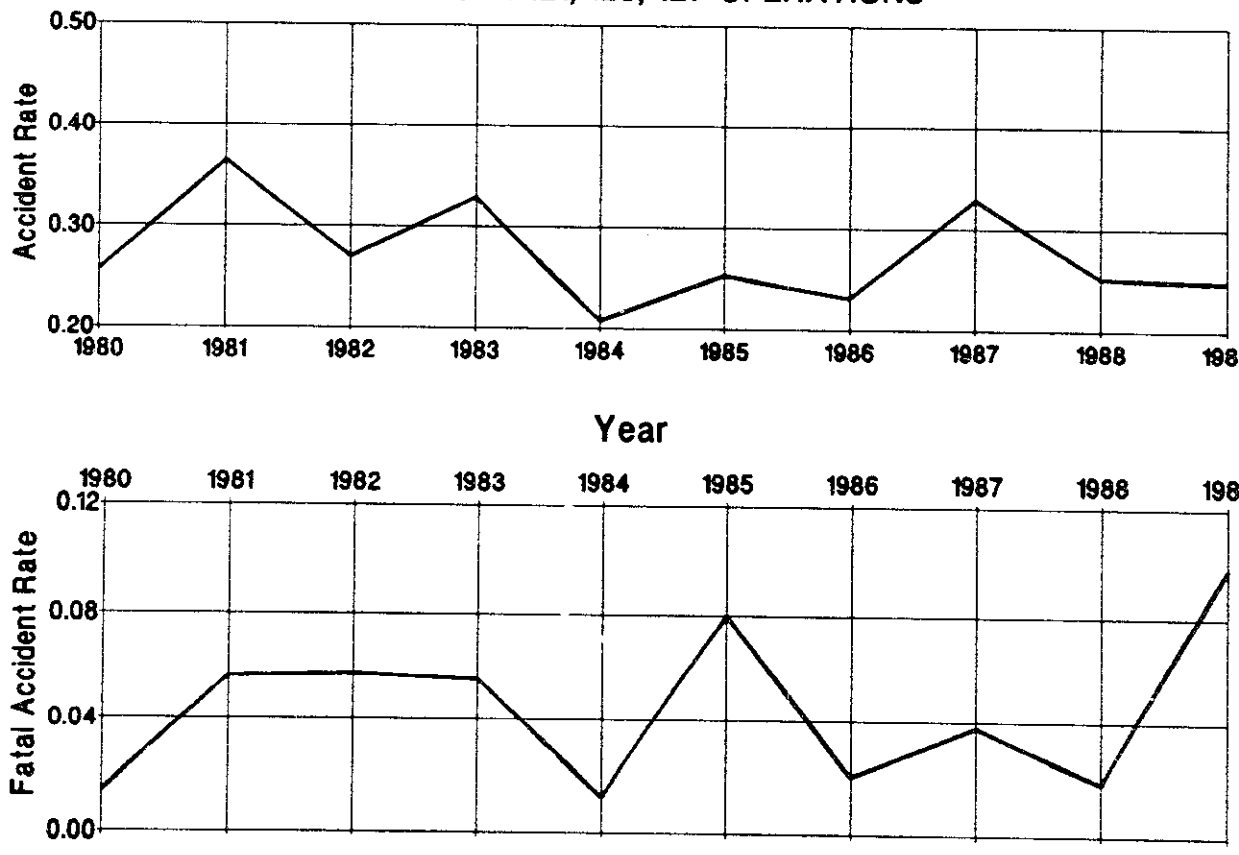


Table 15 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
SCHEDULED 14 CFR 121 125 127 OPERATIONS
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities: Total	Fatalities: Aboard Aircraft In This Category	Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown: Total	Accident Rate per 100,000* Aircraft Hours Flown: Fatal
1980	15	0	0	0	7,069,481	0.212	0.000
1981	25	4	4	2	6,834,140	0.366	0.059
1982	16	4	234	222	6,697,770	0.224	0.045
1983	22	4	15	14	6,914,969	0.318	0.058
1984	13	1	4	4	7,736,037	0.168	0.013
1985	17	4	197	196	8,265,332	0.206	0.048
1986	21	2	5	4	9,495,158	0.211	0.011
1987	32	4	231	229	10,115,653	0.306	0.030
1988	28	3	285	274	10,521,052	0.257	0.019
1989	24	8	131	130	10,597,922	0.226	0.075

* Suicide and sabotage accidents excluded from rates as follows :
Total - 1982 (1), 1986 (1), 1987 (1), 1988 (1)
Fatal - 1982 (1), 1986 (1), 1987 (1), 1988 (1)

Figure 4 - ACCIDENTS AND FATAL ACCIDENTS
SCHEDULED 14 CFR 121, 125, 127 OPERATIONS

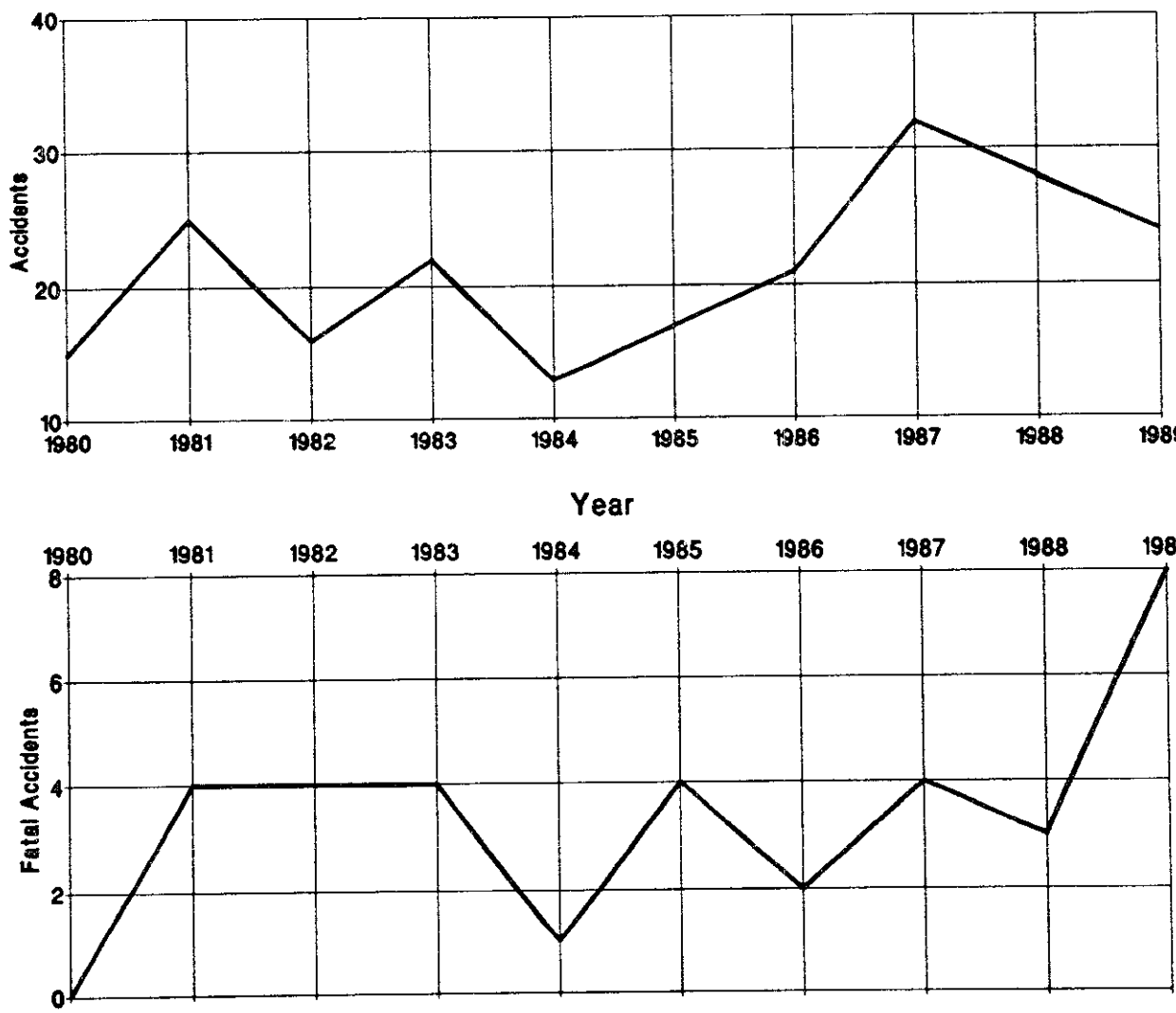


Figure 5 - NUMBER OF FATALITIES
SCHEDULED 14 CFR 121, 125, 127 OPERATIONS

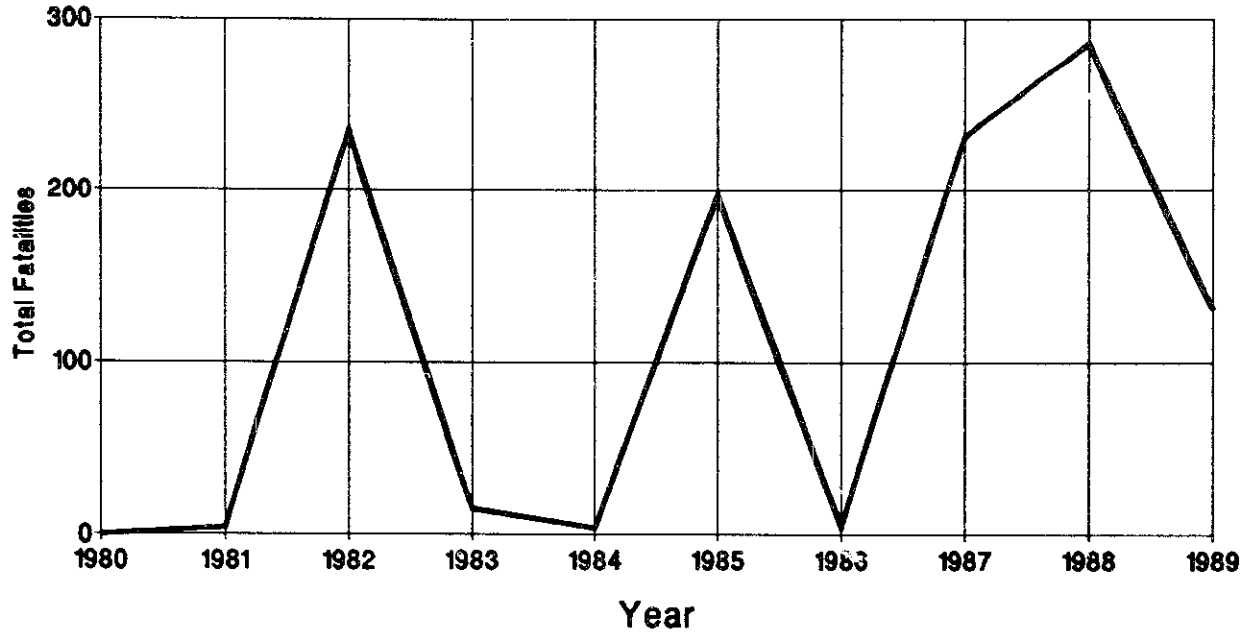


Figure 6 - ACCIDENTS PER 100,000 HOURS FLOWN
SCHEDULED CFR 121, 125, 127 OPERATIONS

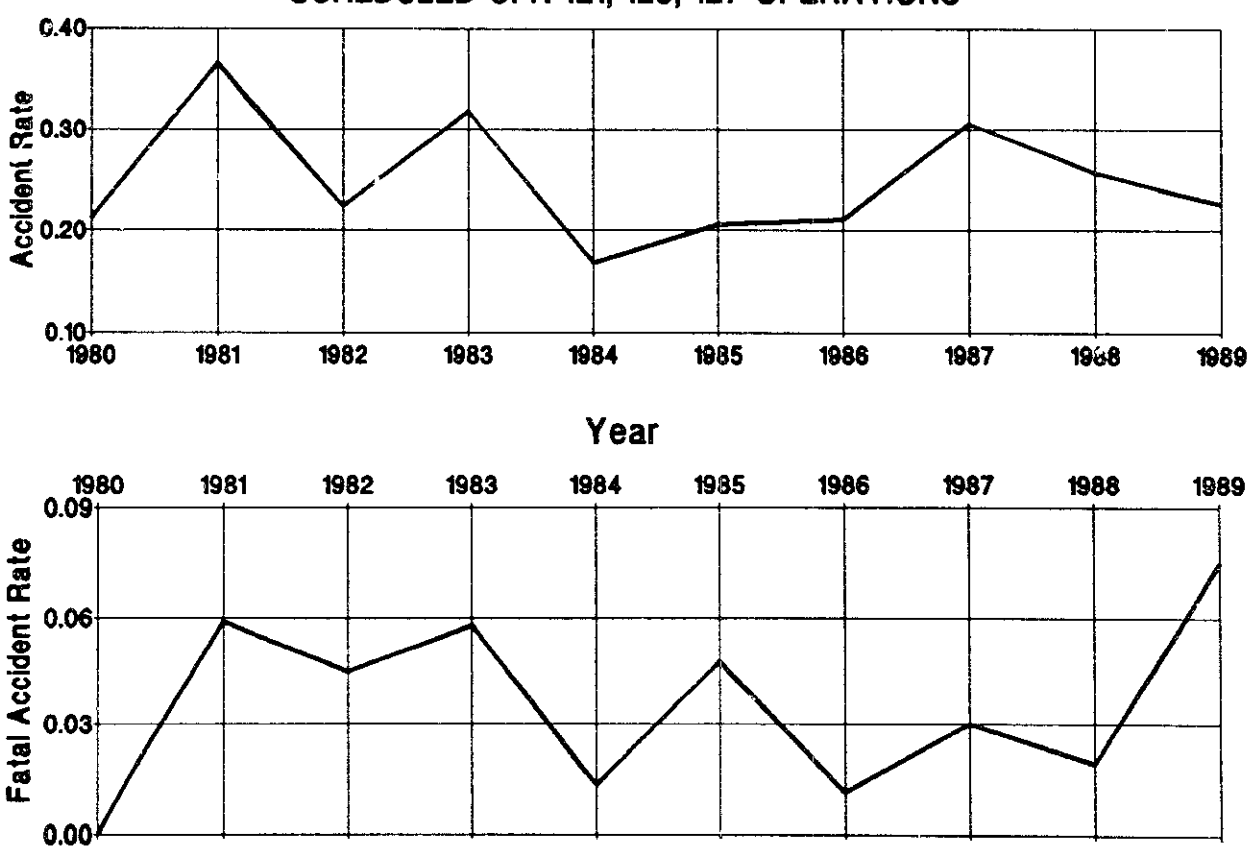


Table 16 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
NONSCHEDULED 14 CFR 121 125 127 OPERATIONS
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities: Total	Fatalities: Aboard Aircraft In This Category	Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown: Total	Accident Rate per 100,000* Aircraft Hours Flown: Fatal
1980	4	1	1	0	310,100	1.290	0.322
1981	1	0	0	0	291,558	0.343	0.000
1982	4	1	1	1	342,555	1.168	0.292
1983	2	0	0	0	383,830	0.521	0.000
1984	4	0	0	0	429,087	0.932	0.000
1985	5	3	329	329	444,562	1.125	0.675
1986	3	1	3	3	480,946	0.624	0.208
1987	4	1	1	1	529,203	0.756	0.189
1988	1	0	0	0	618,467	0.162	0.000
1989	4	3	147	146	675,986	0.592	0.444

Figure 7 - ACCIDENTS AND FATAL ACCIDENTS
NONSCHEDULED 14 CFR 121, 125, 127 OPERATIONS

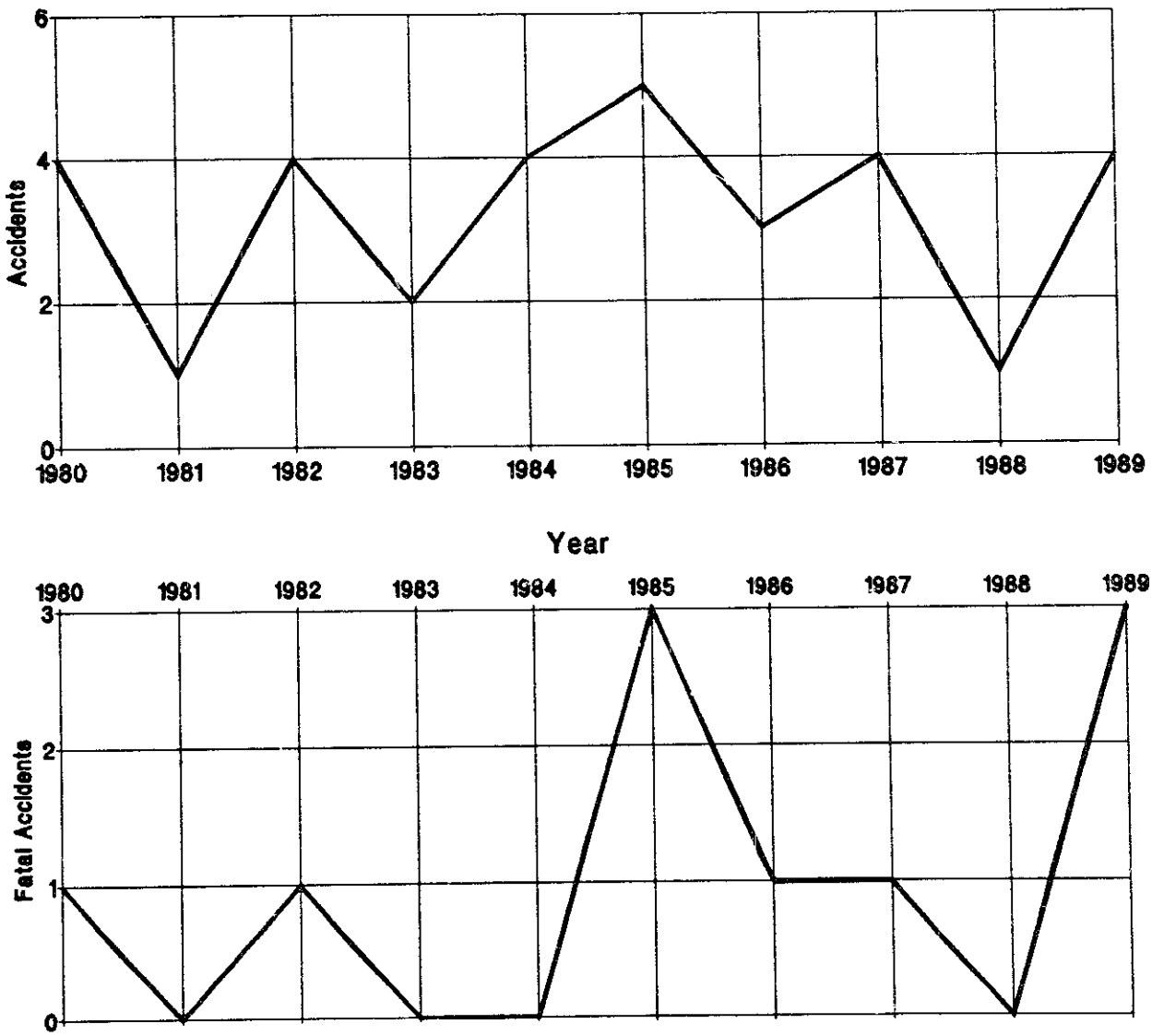


Figure 8 - NUMBER OF FATALITIES
NONSCHEDULED 121, 125, 127 OPERATIONS

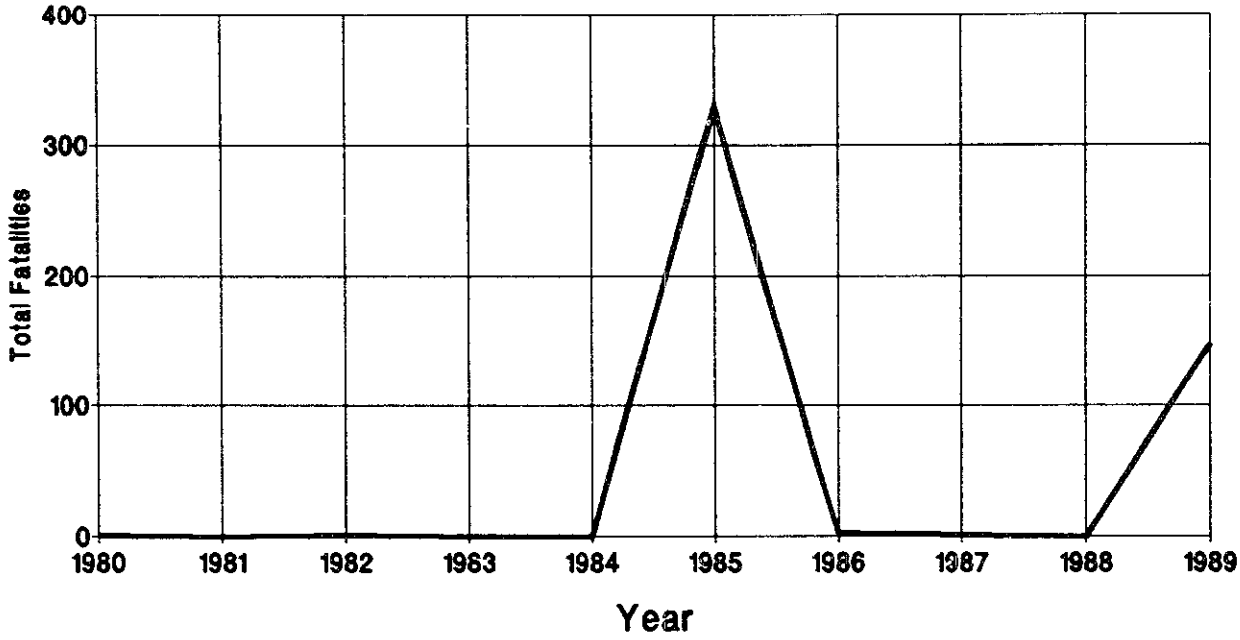
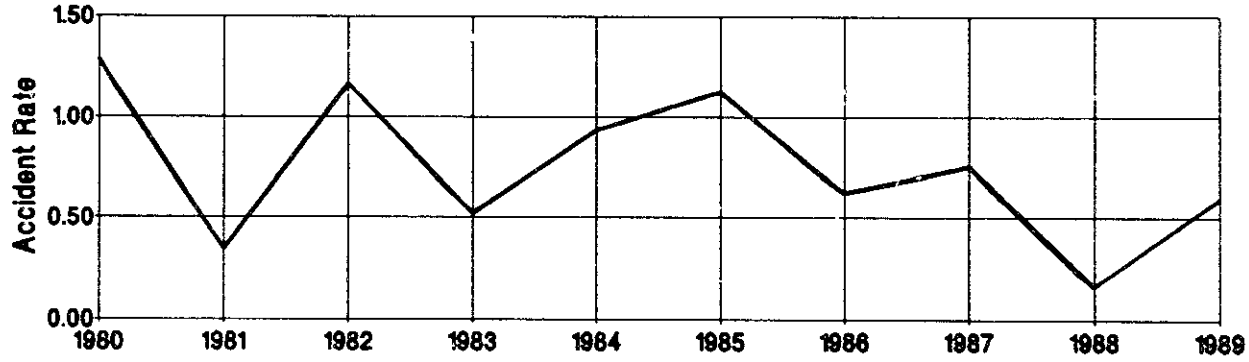


Figure 9 - ACCIDENTS PER 100,000 HOURS FLOWN
NONSCHEDULED 14 CFR 121, 125, 127



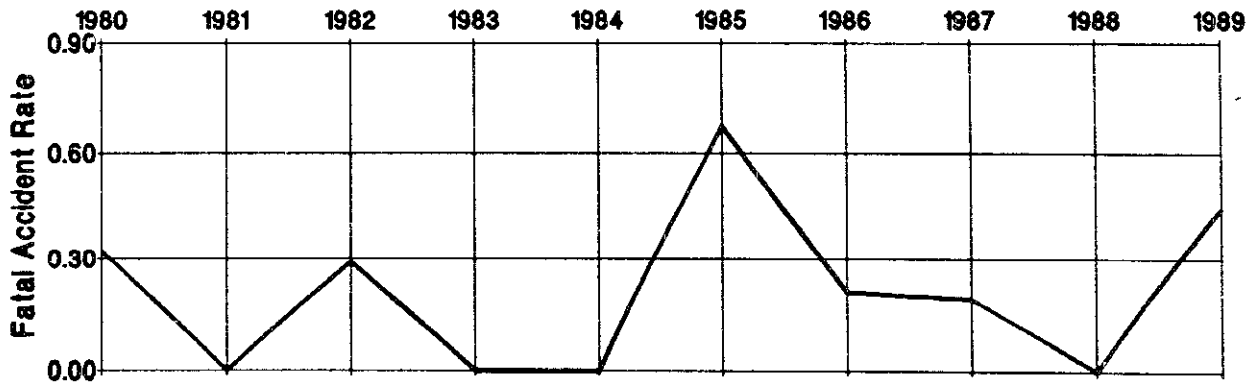


Table 17 - FIRST OCCURRENCES IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
14 CFR 121 125 127 OPERATIONS
1989 AND 1984 - 1988

Type of Occurrence	All Accidents				Fatal Accidents			
	1989		1984 - 1988		1989		1984 - 1988	
	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
In flight encounter with weather	4	14.3	6.6	25.4	0	.0	.2	5.6
Airframe/component/system fail/mal	6	21.4	4.0	15.4	3	27.3	.2	5.6
On ground collision with object	1	3.6	2.8	10.8	1	9.1	.2	5.6
Miscellaneous/other	4	14.3	2.2	8.5	2	18.2	.2	5.6
Not reported	1	3.6	1.6	6.2	1	9.1	.4	11.1
Loss of control - in flight	1	3.6	1.4	5.4	1	9.1	1.2	33.3
In flight collision with object	0	.0	1.0	3.8	0	.0	.2	5.6
Main gear collapsed	1	3.6	.6	2.3	0	.0	.0	.0
In flight collision w/ terrain	2	7.1	.6	2.3	1	9.1	.4	11.1
Loss of engine power(total) - mech failure/malfunction	0	.0	.6	2.3	0	.0	.0	.0
Loss of engine power(partial) - mech failure/malfunction	0	.0	.6	2.3	0	.0	.2	5.6
Loss of engine power(total) - non-mechanical	1	3.6	.6	2.3	0	.0	.2	5.6
Nose gear collapsed	0	.0	.4	1.5	0	.0	.0	.0
Hard landing	1	3.6	.4	1.5	0	.0	.0	.0
Overrun	0	.0	.4	1.5	0	.0	.0	.0
Loss of engine power	0	.0	.4	1.5	0	.0	.0	.0
Altitude deviation,uncontrolled	0	.0	.2	.8	0	.0	.0	.0
Fire/explosion	1	3.6	.2	.8	0	.0	.0	.0
Explosion	0	.0	.2	.8	0	.0	.2	5.6
Loss of control - on ground	1	3.6	.2	.8	1	9.1	.0	.0
Near collision between aircraft	0	.0	.2	.8	0	.0	.0	.0
On ground collision w/ terrain	0	.0	.2	.8	0	.0	.0	.0
On ground encounter with weather	1	3.6	.2	.8	1	9.1	.0	.0
Propeller/rotor contact to person	0	.0	.2	.8	0	.0	.0	.0
Undershoot	0	.0	.2	.8	0	.0	.0	.0
Fire	2	7.1	.0	.0	0	.0	.0	.0
Propeller blast or jet exhaust/suction	1	3.6	.0	.0	0	.0	.0	.0
Total Aircraft	28	100.0	26.0	100.0	11	100.0	3.6	100.0

Table 18 - FIRST PHASES OF OPERATION IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
14 CFR 121 125 127 OPERATIONS
1989 AND 1984 - 1988

	All Accidents				Fatal Accidents			
	1988		1983 - 1987		1988		1983 - 1987	
Phase of Operation	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Cruise	4	14.3	6.0	23.1	2	18.2	.8	22.2
Takeoff	2	7.1	4.8	18.5	1	9.1	1.4	38.9
Landing	4	14.3	3.2	12.3	0	.0	.0	.0
Taxi	4	14.3	2.6	10.0	2	18.2	.2	5.6
Descent	4	14.3	2.6	10.0	0	.0	.2	5.6
Standing	5	17.9	1.8	6.9	1	9.1	.0	.0
Approach	2	7.1	1.8	6.9	2	18.2	.6	16.7
Climb	2	7.1	1.6	6.2	2	18.2	.0	.0
Not reported	1	3.6	1.6	6.2	1	9.1	.4	11.1
Maneuvering	0	.0	.0	.0	0	.0	.0	.0
Other	0	.0	.0	.0	0	.0	.0	.0
Total	28	100.0	26.0	100.0	11	100.0	3.6	100.0

Table 19 - BROAD CAUSE/FACTOR ASSIGNMENTS IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
14 CFR 121 125 127 OPERATIONS
1989 AND 1984 - 1988

	All Accidents				Fatal Accidents			
	1989		1984 - 1988		1989		1984 - 1988	
Broad Cause/Factor	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Pilot	9	32.1	10.8	41.5	3	27.3	2.2	61.1
Other Person (Not Aboard)	13	46.4	9.4	36.2	6	54.5	1.6	44.4
Weather	5	17.9	8.8	33.8	1	9.1	.6	16.7
Other Person (Aboard)	2	7.1	5.8	22.3	0	.0	.2	5.6
Systems/Equipment/ Instruments	6	21.4	4.6	17.7	2	18.2	1.0	27.8
Propulsion System and Controls	4	14.3	2.8	10.8	1	9.1	.4	11.1
Landing Gear	3	10.7	2.6	10.0	0	.0	.0	.0
Light Conditions	0	.0	2.6	10.0	0	.0	.8	22.2
Object (tree,wires,etc)	2	7.1	2.6	10.0	1	9.1	.4	11.1
Airframe	3	10.7	2.2	8.5	3	27.3	.4	11.1
Terrain/Runway Condition	2	7.1	2.0	7.7	0	.0	.0	.0
Flight Control System	1	3.6	.8	3.1	1	9.1	.2	5.6
Airport/Airways Facilities, Aids	0	.0	.6	2.3	0	.0	.0	.0
Total Aircraft	28		26.0		11		3.6	
NTSB Determined Probable Cause	26		23.8		9		2.8	

Scheduled 14 CFR 135 Operations

There were 18 accidents involving scheduled 14 CFR 135 operations in 1989. The average number of accidents per year in this category for the years 1980 through 1988 is 24.5. The accident rate per 100,000 hours flown for 1989 is 0.803, compared with an overall rate of 1.527 for the period 1980 through 1988.

Of the 18 accidents in this category, five accidents were fatal involving a total of 31 fatalities. During the period 1980 through 1988, there were an average of 5.7 fatal accidents and 29.4 fatalities per year in Scheduled 14 CFR 135 operations, with a fatal accident rate of 0.223 accidents per 100,000 hours flown.

One of the accidents reported in this section involved an on-ground collision between two scheduled 14 CFR 135 aircraft. Therefore, this section lists 18 accidents involving 19 aircraft.

Table 20 - SUMMARY OF LOSSES
SCHEDULED 14 CFR 135 OPERATIONS
1985 - 1989

	1985	1986	1987	1988	1989
Accidents					
Fatal	7	2	10	2	5
Involved Serious Injury	4	2	5	2	1
Involved Minor or No Injury	10	11	17	15	12
Total	21	15	32	19	18
Fatalities					
Passenger	28	3	42	17	25
Crew	8	1	15	4	6
Other Persons	1	0	2	0	0
Total	37	4	59	21	31
Aircraft Damage (Scheduled 14 CFR 135)					
Destroyed	9	1	11	3	5
Substantial	12	13	18	15	13
Minor	0	1	2	1	0
None	0	1	1	0	1
Total	21	16	32	19	19

Table 21 - ACCIDENT RATES
SCHEDULED 14 CFR 135 OPERATIONS

	1985	1986	1987	1988	1989
Aircraft Miles Flown (Thousands)	300,817	307,393	350,879	380,237	393,619
Aircraft Hours Flown	1,737,106	1,724,586	1,946,349	2,092,689	2,240,555
Departures Flown	2,561,463	2,798,811	2,809,918	2,909,005	2,818,520
Accident Rates					
Per Million Miles Flown	0.070	0.049	0.091	0.050	0.046
Per Hundred Thousand Hours Flown	1.209	0.870	1.644	0.908	0.803
Per Hundred Thousand Departures Flown	0.820	0.536	1.139	0.653	0.639
Fatal Accident Rates					
Per Million Miles Flown	0.023	0.007	0.028	0.005	0.013
Per Hundred Thousand Hours Flown	0.403	0.116	0.514	0.096	0.223
Per Hundred Thousand Departures Flown	0.273	0.071	0.356	0.069	0.177

Table 22 - LIST OF ACCIDENTS
SCHEDULED 14 CFR 135 OPERATIONS
1989

Date	Location	Type of Operation	Air Carrier	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
1/03	Russian Mission, AK	Passenger	Ryan Air	Cessna 207A	Substantial	None	Loss of power(partial) - non-mech.
1/16	Carolina, PR	Passenger	Vieques Air Link	Britten-Norman BN-2A	Substantial	None	Loss of power(total) - non-mech.
1/17	Los Angeles, CA	Passenger	Skywest Airlines	Fairchild Swearingen SA-227AC	Substantial	Minor	On ground collision with object
1/30	Salt Lake City, UT	Passenger Passenger	Skywest Airlines Skywest Airlines	Fairchild Swearingen SA-227AC Fairchild Swearingen SA-227AC	Substantial Substantial	None None	On ground collision
3/09	Kasigluk, AK	Passenger	Seagull Air Service	Piper PA-32	Substantial	None	On ground collision with terrain
3/31	Syracuse, NY	Pax and Cargo	Brockway Air	Beech 1900C	Substantial	Minor	On ground collision with object
4/19	Pelican, AK	Pax and Cargo	Channel Flying	DeHavilland DHC-2	Destroyed	Fatal (2)	In flight encounter with weather
5/18	Marion, IL	Passenger	Air Midwest	Fairchild Swearingen SA-226TC	Substantial	None	Airframe/component/syst. failure/malf.
7/26	Bullhead City, AZ	Passenger	American Intl	British Aerospace 3201	None	Serious	Miscellaneous/other
7/30	Haines, AK	Passenger	Skagway Air	Piper PA-32-301	Destroyed	Fatal (2)	In flight encounter with weather
8/07	Nome, AK	Pax and Cargo	Ryan Air	Cessna 402	Destroyed	Fatal (1)	In flight encounter with weather
9/01	Boston, MA	Pax and Cargo	Bar Harbor Airline	Beech 1900C	Substantial	None	On ground collision with object
9/06	Los Angeles, CA	Passenger	Skywest Airlines	Fairchild Swearingen SA-227AC	Substantial	None	On ground collision with object
10/10	Philadelphia, PA	Pax and Cargo	Pennsylvania Aviation	Britten-Norman BN-2A-MK3	Substantial	None	On ground collision with object
10/28	Halawa Molokai, HI	Passenger	Aloha Islandair	DeHavilland DHC-6-300	Destroyed	Fatal (20)	In flight encounter with weather
12/11	Kotzebue, AK	Passenger	Baker Aviation	Cessna 402	Substantial	Minor	On ground collision with object
12/15	Staunton, VA	Passenger	US Air Express	British Aerospace 3101	Substantial	None	On ground collision with terrain
12/26	Pasco, WA	Passenger	United Express	British Aerospace 3101	Destroyed	Fatal (6)	In flight encounter with weather

Table 23 - PERSONS BY ROLE AND DEGREE OF INJURY
SCHEDULED 14 CFR 135 OPERATIONS
1989

Role of Person	Degree of Injury: Fatal	Serious	Minor	None	Total
Pilot	4	1	1	13	19
Copilot	2	0	0	10	12
Passenger	25	3	3	100	131
Total aboard	31	4	4	123	162
Other aircraft*	0	0	1	1	2
Other ground	0	0	2	1	3
Grand total	31	4	7	125	167
Percent	18.6	2.4	4.2	74.9	

* Injuries carried opposite Other aircraft are injuries occurring in aircraft that are not part of this tabulation, but which were involved in collisions with aircraft which are a part of this tabulation.

Table 24 - AIRCRAFT BY DAMAGE AND DEGREE OF INJURY
SCHEDULED 14 CFR 135 OPERATIONS
1989

Aircraft damage	Degree of injury: None	Minor	Ser	Fatal	Aircraft: No.	Percent
None	0	0	1	0	1	5.3
Substantial	10	3	0	0	13	68.4
Destroyed	0	0	0	5	5	26.3
Aircraft						
Number -	10	3	1	5	19	
Percent -	52.6	15.8	5.3	26.3		

Table 25 - AIRCRAFT BY FIRST OCCURRENCE AND DEGREE OF INJURY AND BY DAMAGE
SCHEDULED 14 CFR 135 OPERATIONS
1989

Type of first occurrence	Degree of injury: None	Minor	Ser	Fatal	Aircraft damage: None	Minor	Subs	Dest	Aircraft: No.	Percent
Airframe/component/system failure/malfunction	1	0	0	0	0	0	1	0	1	5.3
In flight encounter w/weather	0	0	0	5	0	0	0	5	5	26.3
On ground collision w/obj.	5	3	0	0	0	0	8	0	8	42.1
On ground collision w/ter.	2	0	0	0	0	0	2	0	2	10.5
Loss of power(total) - non-mechanical	1	0	0	0	0	0	1	0	1	5.3
Loss of power(partial) - non-mechanical	1	0	0	0	0	0	1	0	1	5.3
Miscellaneous/other	0	0	1	0	1	0	0	0	1	5.3
Aircraft										
Number -	10	3	1	5	1	0	13	5	19	
Percent -	52.6	15.8	5.3	26.3	5.3	.0	68.4	26.3		

Table 26 - AIRCRAFT BY FIRST OCCURRENCE AND BROAD PHASE OF OPERATION
SCHEDULED 14 CFR 135 OPERATIONS
1989

Type of first occurrence	Phase of operation								Aircraft	
	Stndg	Taxi	Tkcff	Cruis	Dscnt	Aprch	Landg	Manvr	No.	Percent
Airframe/component/system failure/malfunction	0	0	0	0	0	0	1	0	1	5.3
In flight encounter with weather	0	0	0	3	0	1	0	1	5	26.3
On ground collision with object	2	6	0	0	0	0	0	0	8	42.1
On ground collision with terrain	0	1	1	0	0	0	0	0	2	10.5
Loss of power(total) - non-mechanical	0	0	0	0	1	0	0	0	1	5.3
Loss of power(partial) - non-mechanical	0	0	0	0	0	1	0	0	1	5.3
Miscellaneous/other	1	0	0	0	0	0	0	0	1	5.3
Aircraft										
Number	3	7	1	3	1	2	1	1	19	
Percent	15.8	36.8	5.3	15.8	5.3	10.5	5.3	5.3		

Table 27 - AIRCRAFT BY PHASE OF OPERATION AND DEGREE OF INJURY AND BY DAMAGE
SCHEDULED 14 CFR 135 OPERATIONS
1989

Phase of operation	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
Standing - engine(s) operating	2	0	0	0	0	0	2	0	2	10.5
Standing - engine(s) not operating	0	0	1	0	1	0	0	0	1	5.3
Taxi - to takeoff	2	0	0	0	0	0	2	0	2	10.5
Taxi - from landing	2	3	0	0	0	0	5	0	5	26.3
Takeoff - ground run	1	0	0	0	0	0	1	0	1	5.3
Cruise	0	0	0	3	0	0	0	3	3	15.8
Descent - normal	1	0	0	0	0	0	1	0	1	5.3
Approach	0	0	0	1	0	0	0	1	1	5.3
Approach - VFR pattern - downwind	1	0	0	0	0	0	1	0	1	5.3
Landing - roll	1	0	0	0	0	0	1	0	1	5.3
Maneuvering	0	0	0	1	0	0	0	1	1	5.3
Aircraft										
Number -	10	3	1	5	1	0	13	5	19	
Percent -	52.6	15.8	5.3	26.3	5.3	.0	68.4	26.3		

Table 28 - AIRCRAFT BY CONDITION OF LIGHT AND TYPE OF WEATHER
SCHEDULED 14 CFR 135 OPERATIONS
1989

Condition of light	Type of weather		Aircraft	
	VMC	IMC	No.	Percent
Daylight	4	6	10	52.6
Night (dark)	3	2	5	26.3
Night (bright)	2	0	2	10.5
Dusk	2	0	2	10.5
Aircraft				
Number -	11	8	19	
Percent -	57.9	42.1		

Table 29 - AIRCRAFT BY TYPE OF OPERATION AND DEGREE OF INJURY
SCHEDULED 14 CFR 135 OPERATIONS
1989

Type of Operation	Degree of Injury				Aircraft	
	None	Minor	Serious	Fatal	No.	Percent
Scheduled Domestic Passenger	8	2	1	3	14	73.7
Scheduled Domestic Pass/Cargo	2	1	0	2	5	26.3
Aircraft						
Number -	10	3	1	5	19	
Percent -	52.6	15.8	5.3	26.3		

Table 30 - AIRCRAFT BY PROXIMITY TO AIRPORT AND FLIGHT PLAN
SCHEDULED 14 CFR 135 OPERATIONS
1989

Accident location	Flight plan			Aircraft	
	VFR	IFR	Cmpny VFR	No.	Percent
Off airport/airstrip	3	0	3	6	31.6
On Airport	2	9	1	12	63.2
On Airstrip	0	0	1	1	5.3
Aircraft					
Number -	5	9	5	19	
Percent -	26.3	47.4	26.3		

Table 31 - AIRCRAFT BY OCCURRENCE OF FIRE AND DEGREE OF INJURY AND BY DAMAGE
SCHEDULED 14 CFR 135 OPERATIONS
1989

	Degree of injury				Aircraft damage				Aircraft	
Aircraft fire	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
None	10	3	1	1	1	0	13	1	15	78.9
On ground	0	0	0	4	0	0	0	4	4	21.1
Aircraft										
Number -	10	3	1	5	1	0	13	5	19	
Percent -	52.6	15.8	5.3	26.3	5.3	.0	68.4	26.3		

Table 32 - AIRCRAFT BY TYPE OF AIRCRAFT AND DEGREE OF INJURY AND BY DAMAGE
SCHEDULED 14 CFR 135 OPERATIONS
1989

	Degree of injury				Aircraft damage				Aircraft	
Type of aircraft	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
Fixed Wing Single Recip. Engine	2	0	0	2	0	0	2	2	4	21.1
Fixed Wing Multiple Recip. Engine	2	1	0	1	0	0	3	1	4	21.1
Fixed Wing Turboprop	6	2	1	2	1	0	8	2	11	57.9
Aircraft										
Number -	10	3	1	5	1	0	13	5	19	
Percent -	52.6	15.8	5.3	26.3	5.3	.0	68.4	26.3		

Table 33 - BROAD CAUSE/FACTOR ASSIGNMENTS*
SCHEDULED 14 CFR 135 OPERATIONS
1989

Cause/Factor	Cited as a Cause		Cited as a Factor		Cited as Either a Cause or a Factor (or Both)	
	Fatal Accidents	All Accidents	Fatal Accidents	All Accidents	Fatal Accidents	All Accidents
Aircraft #	0	2	1	0	1	2
Propulsion System and Controls	0	1	0	0	0	1
Flight Control System	0	0	1	0	1	0
Airframe	0	0	1	0	1	0
Landing Gear	0	0	0	0	0	0
Systems/Equipment/Instruments	0	1	0	0	0	1
Environment #	0	0	5	7	5	7
Weather	0	0	5	3	5	3
Light Conditions	0	0	1	5	1	5
Object(trees,wires,etc.)	0	0	0	2	0	2
Airport/Airways Facilities,Aids	0	0	0	1	0	1
Terrain/Runway Condition	0	0	4	2	4	2
Personnel #	5	13	2	10	5	14
Pilot	5	6	0	4	5	7
Others (Aboard)	0	1	0	0	0	1
Others (Not Aboard)	0	6	2	8	2	11
Number of Aircraft					5	19
NTSB Determined Probable Cause					5	19

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* Multiple causes and factors may be assigned in an accident

\# This category is composed of the sub-categories indented below it. The number of aircraft cited in a category may be less than or equal to the sum of the sub-category citations.

Table 34 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
SCHEDULED 14 CFR 135 OPERATIONS
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities: Total	Fatalities: Aboard Aircraft In This Category	Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown: Total	Accident Rate per 100,000* Aircraft Hours Flown: Fatal
1980	38	8	37	37	1,175,588	3.232	0.681
1981	31	9	34	32	1,240,764	2.498	0.725
1982	26	5	14	14	1,299,748	2.000	0.385
1983	17	2	11	10	1,510,908	1.125	0.132
1984	22	7	48	46	1,745,762	1.260	0.401
1985	21	7	37	36	1,737,106	1.209	0.403
1986	15	2	4	4	1,724,586	0.870	0.116
1987	32	10	59	57	1,946,349	1.644	0.514
1988	19	2	21	21	2,092,689	0.908	0.096
1989	18	5	31	31	2,240,555	0.803	0.223

Figure 10 - ACCIDENTS AND FATAL ACCIDENTS
SCHEDULED 14 CFR 135 OPERATIONS

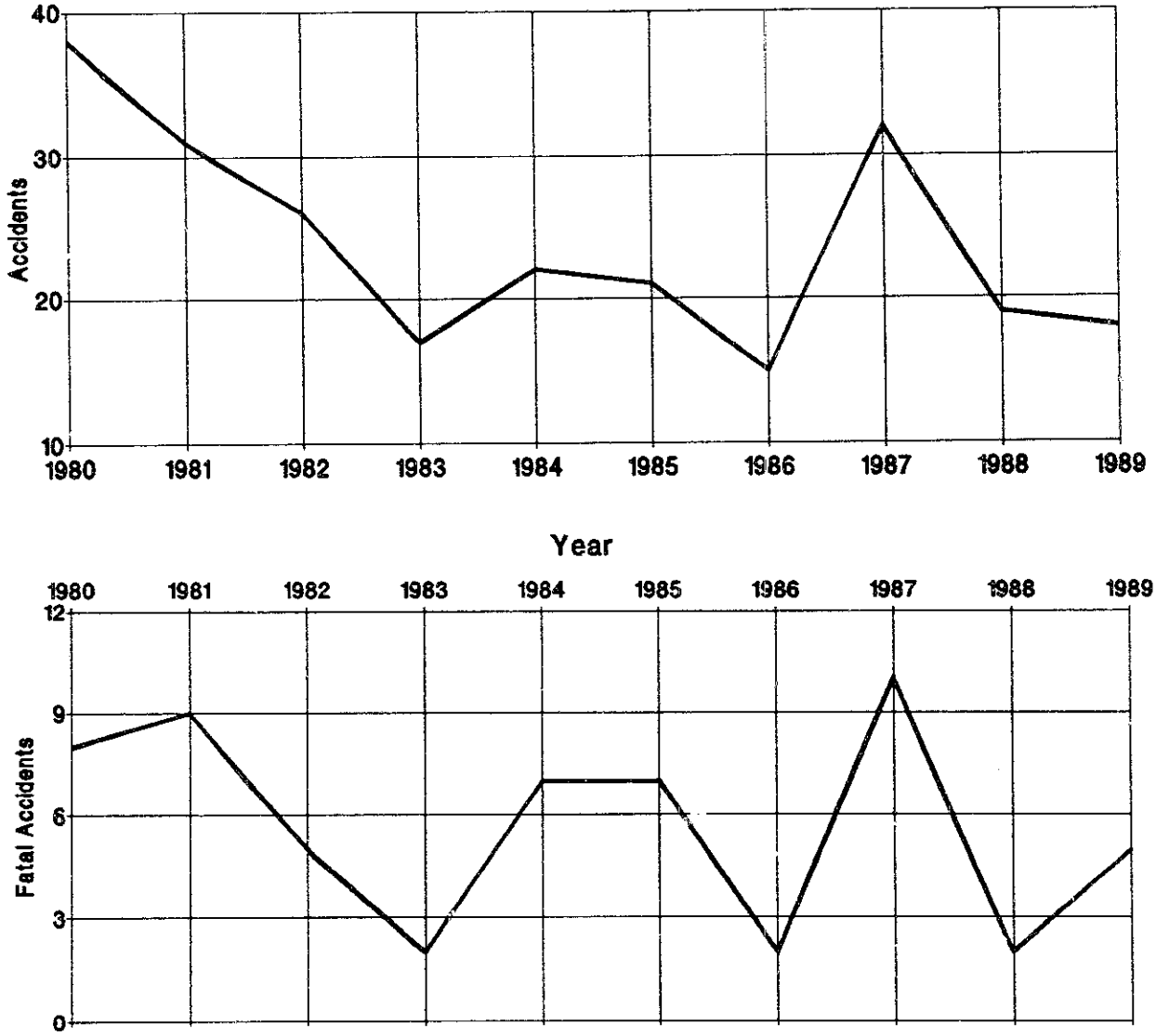


Figure 11 - NUMBER OF FATALITIES
SCHEDULED 14 CFR 135 OPERATIONS

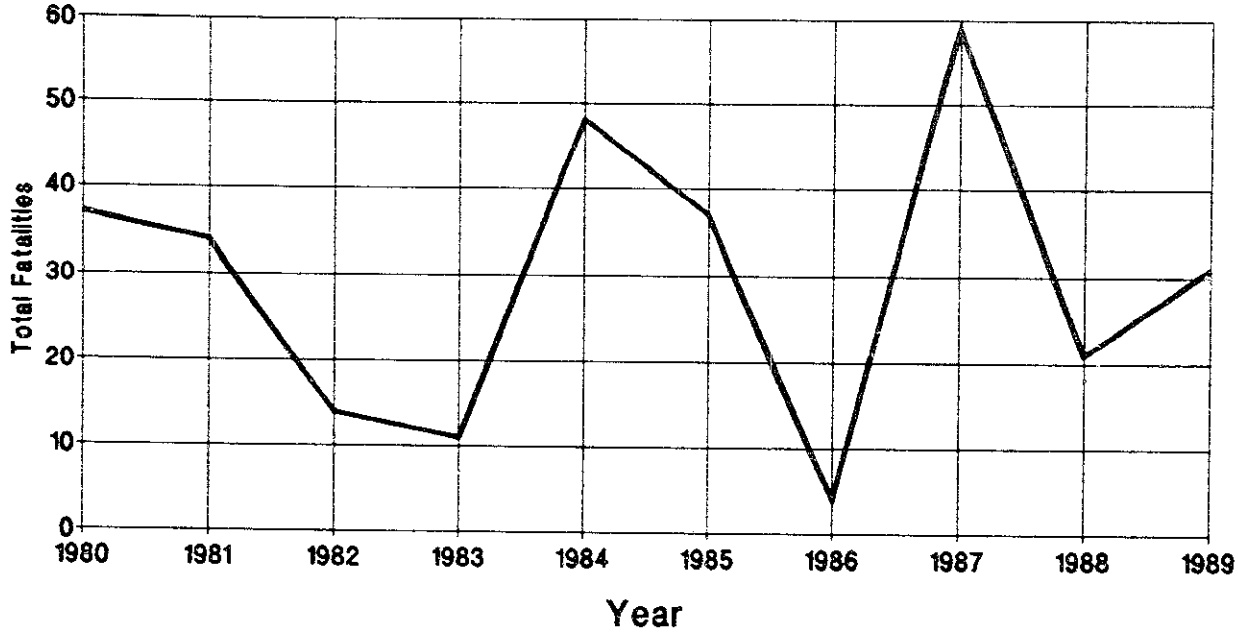
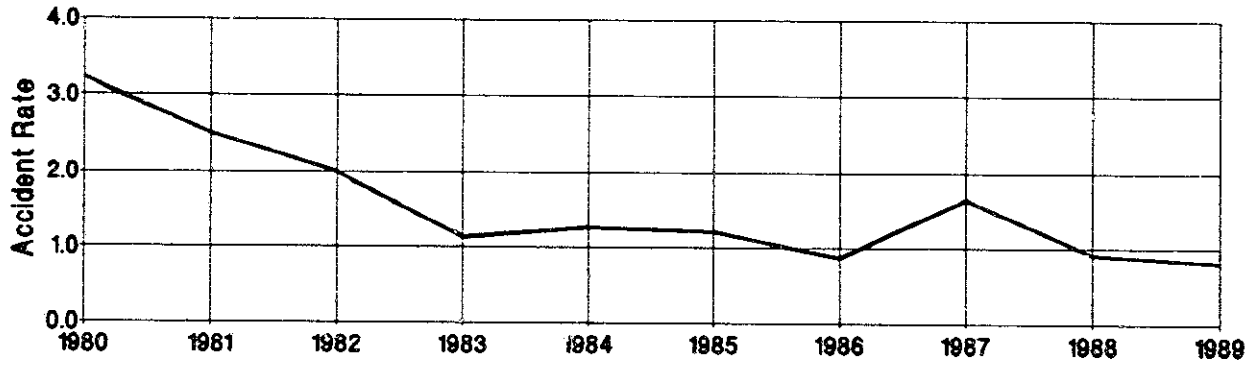


Figure 12 - ACCIDENT RATE PER 100,000 HOURS FLOWN
SCHEDULED 14 CFR 135 OPERATIONS



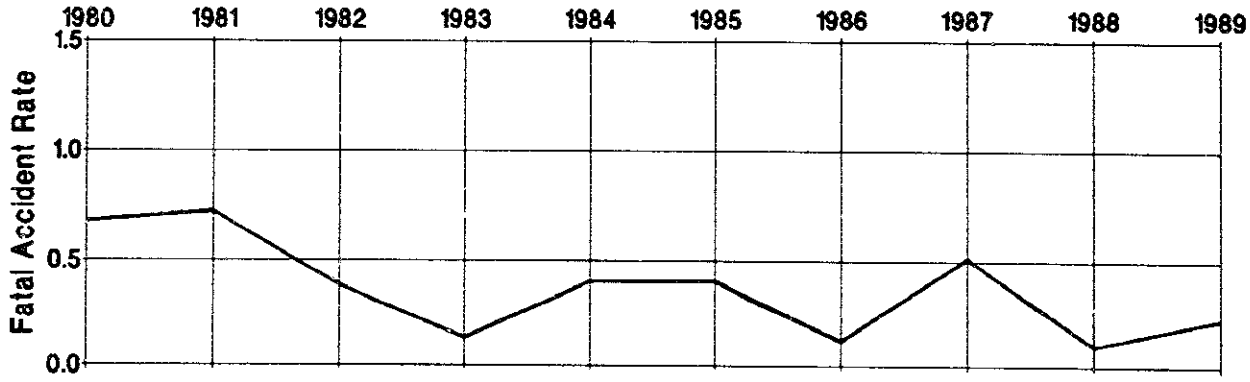


Table 35 - FIRST OCCURRENCES IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
SCHEDULED 14 CFR 135 OPERATIONS
1989 AND 1984 - 1988

	All Accidents				Fatal Accidents			
	1989		1984 - 1988		1989		1984 - 1988	
Type of Occurrence	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Airframe/component/system fail/malf	1	5.3	3.2	14.5	0	.0	.8	14.3
Loss of engine power(total) - non-mechanical	1	5.3	2.0	9.1	0	.0	.6	10.7
Loss of control - in flight	0	.0	1.8	8.2	0	.0	1.0	17.9
In flight encounter with weather	5	26.3	1.6	7.3	5	100.0	.6	10.7
In flight collision w/terrain	0	.0	1.4	6.4	0	.0	.6	10.7
Loss of control - on ground	0	.0	1.4	6.4	0	.0	.0	.0
On ground collision with object	8	42.1	1.4	6.4	0	.0	.2	3.6
In flight collision with object	0	.0	1.0	4.5	0	.0	.4	7.1
Loss of engine power(partial) - non-mechanical	1	5.3	1.0	4.5	0	.0	.2	3.6
Hard landing	0	.0	.8	3.6	0	.0	.0	.0
Midair collision	0	.0	.8	3.6	0	.0	.4	7.1
Complete gear collapsed	0	.0	.6	2.7	0	.0	.0	.0
Loss of engine power	0	.0	.6	2.7	0	.0	.4	7.1
Gear collapsed	0	.0	.4	1.8	0	.0	.0	.0
Main gear collapsed	0	.0	.4	1.8	0	.0	.0	.0
Loss of engine power(total) - mech failure/malfunction	0	.0	.4	1.8	0	.0	.0	.0
Loss of engine power(partial) - mech failure/malfunction	0	.0	.4	1.8	0	.0	.2	3.6
Undershoot	0	.0	.4	1.8	0	.0	.0	.0
Vortex turbulence encountered	0	.0	.4	1.8	0	.0	.0	.0
Miscellaneous/other	1	5.3	.4	1.8	0	.0	.0	.0
Not reported	0	.0	.2	.9	0	.0	.2	3.6
Dragged wing, rotor, pod, or float	0	.0	.2	.9	0	.0	.0	.0
Explosion	0	.0	.2	.9	0	.0	.0	.0
Nose gear collapsed	0	.0	.2	.9	0	.0	.0	.0
Gear not extended	0	.0	.2	.9	0	.0	.0	.0
Overrun	0	.0	.2	.9	0	.0	.0	.0
Propeller/rotor contact to person	0	.0	.2	.9	0	.0	.0	.0
Undetermined	0	.0	.2	.9	0	.0	.0	.0
On ground collision w/terrain	2	10.5	.0	.0	0	.0	.0	.0
Total	19	100.0	22.0	100.0	5	100.0	5.6	100.0

Table 36 - FIRST PHASES OF OPERATION IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
SCHEDULED 14 CFR 135 OPERATIONS
1989 AND 1984 - 1988

	All Accidents				Fatal Accidents			
	1989		1984 - 1988		1989		1984 - 1988	
Phase of Operation	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Approach	2	10.5	5.8	26.4	1	20.0	2.6	46.4
Landing	1	5.3	4.4	20.0	0	.0	.0	.0
Takeoff	1	5.3	3.0	13.6	0	.0	1.2	21.4
Taxi	7	36.8	2.8	12.7	0	.0	.2	3.6
Climb	0	.0	1.4	6.4	0	.0	.6	10.7
Cruise	3	15.8	1.4	6.4	3	60.0	.2	3.6
Descent	1	5.3	1.2	5.5	0	.0	.0	.0
Standing	3	15.8	.6	2.7	0	.0	.0	.0
Maneuvering	1	5.3	.6	2.7	1	20.0	.4	7.1
Other	0	.0	.6	2.7	0	.0	.2	3.6
Not Reported	0	.0	.2	.9	0	.0	.2	3.6
Total Aircraft	19	100.0	22.0	100.0	5	100.0	5.6	100.0

Table 37 - BROAD CAUSE/FACTOR ASSIGNMENTS IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
SCHEDULED 14 CFR 135 OPERATIONS
1989 AND 1984 - 1988

	All Accidents				Fatal Accidents			
	1989		1984 - 1988		1989		1984 - 1988	
Broad Cause/Factor	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Pilot	12	63.2	16.8	76.4	5	100.0	4.4	78.6
Other Person (Not Aboard)	13	68.4	8.0	36.4	2	40.0	2.8	50.0
Weather	8	42.1	5.8	26.4	5	100.0	1.8	32.1
Terrain/Runway Condition	6	31.6	5.2	23.6	4	80.0	1.2	21.4
Propulsion System and Controls	1	5.3	4.8	21.8	0	.0	1.4	25.0
Systems/Equipment/ Instruments	1	5.3	4.2	19.1	0	.0	1.4	25.0
Object (tree,wires,etc)	2	10.5	3.0	13.6	0	.0	.6	10.7
Light Conditions	6	31.6	2.6	11.8	1	20.0	.8	14.3
Landing Gear	0	.0	2.4	10.9	0	.0	.0	.0
Airframe	1	5.3	1.4	6.4	1	20.0	.4	7.1
Airport/Airways Facilities, Aids	1	5.3	1.0	4.5	0	.0	.4	7.1
Flight Control System	1	5.3	0.6	2.7	1	20.0	.6	10.7
Other Person (Aboard)	1	5.3	.2	.9	0	.0	.2	3.6
Total Aircraft	19		22.0		5		5.6	
NTSB Determined Probable Cause	19		21.6		5		5.4	

Nonscheduled 14 CFR 135 Operations

There were 111 accidents invovling nonscheduled 14 CFR 135 aircraft in 1989. Twenty-five of them were fatal, involving a total of 83 fatalities. The average number of accidents per year in this category for the years 1980 through 1988 is 135.1.

The average accident rate for the period 1980 - 1988 was 4.82 accidents per 100,000 hours flown. The 1989 rate of 3.68 is 23.9 percent below this average. The 1989 fatal accident rate of 0.83, the second lowest in the decade of the eighties, is 27.8 percent below the nine year average of 1.15.

One of the accidents reported in this section involved an on-ground collision between two nonscheduled 14 CFR 135 aircraft. Therefore, this section lists 111 accidents involving 112 aircraft.

Table 38 - SUMMARY OF LOSSES
NONSCHEDULED 14 CFR 135 OPERATIONS
1985 - 1989

	1985	1986	1987	1988	1989
Accidents					
Fatal	35	31	30	28	25
Involved Serious Injury	13	13	9	15	13
Involved Minor or No Injury	106	73	58	58	73
Total	154	117	97	101	111
Fatalities					
Passenger	39	26	31	22	46
Crew	36	35	32	33	35
Other Persons	1	4	2	4	2
Total	76	65	65	59	83
Aircraft Damage (Nonscheduled 14 CFR 135)					
Destroyed	50	38	34	37	32
Substantial	104	77	62	62	80
Minor	2	1	4	1	0
None	1	2	0	1	0
Total	157	118	100	101	112

Table 39 - ACCIDENT RATES
NONSCHEDULED 14 CFR 135 OPERATIONS

	1985	1986	1987	1988	1989
Aircraft Hours Flown	2,570,000	2,690,000	2,657,000	2,632,000	3,020,000
Accident Rates *					
All Accidents	5.99	4.35	3.65	3.84	3.68
Fatal Accidents	1.36	1.15	1.13	1.06	0.83

*Per Hundred Thousand Hours Flown

Table 40 - LIST OF ACCIDENTS
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
1/05	Aspen, CO	Cargo	Cessna 208B	Destroyed	Serious	In flight encounter with weather
1/10	Juneau, AK	Passenger	Cessna 185F	Substantial	None	Nose over
1/11	Madison, NC	Cargo	Cessna 208B	Destroyed	Serious	In flight collision with object
1/12	Bell Mountain, AK	Passenger	Hughes 500-D	Substantial	None	In flight collision with terrain
1/15	Ketchikan, AK	Passenger	DeHavilland DHC-3	Destroyed	Fatal (2)	In flight encounter with weather
1/15	Port Lions, AK	Pax and Cargo	Piper PA-32-300	Substantial	None	Hard landing
1/17	Page, AZ	Cargo	Cessna T207A	Substantial	None	In flight collision with object
1/17	Fort Myers, FL	Cargo	Piper PA-32-300	Substantial	Minor	Loss of power(total) - mech failure/malfunction
1/23	Kalskag, AK	Passenger	Cessna 207	Substantial	None	Loss of control - on ground
1/27	Durango, CO	Cargo	Cessna P210N	Substantial	None	In flight collision with terrain
2/04	Hyannis, MA	Pax and Cargo	Cessna 402B	Substantial	None	Miscellaneous/other
2/09	Fairbanks, AK	Cargo	Cessna U206G	Destroyed	Fatal (1)	Loss of power(total) - mech failure/malfunction
2/09	Cleveland, OH	Cargo	Cessna 310Q	Destroyed	Fatal (1)	In flight collision with terrain
2/10	Fairbanks, AK	Cargo	DeHavilland DHC-3	Substantial	None	In flight collision with terrain
2/13	Tyler, TX	Passenger	MBB BK-117-A1	Destroyed	Fatal (3)	In flight encounter with weather
2/15	Binghamton, NY	Cargo	Falcon Fan Jet	Substantial	Serious	Overrun
2/17	Spokane, WA	Cargo	Mitsubishi MU-2B-35J	Substantial	None	On ground collision with object
2/19	Corona, CA	Passenger	Cessna 402B	Destroyed	Fatal (10)	In flight encounter with weather
3/01	Isla Verde, PR	Cargo	McD-Doug DC-3	Substantial	Minor	Loss of power
3/02	Norfolk, NE	Passenger	Cessna 310Q	Substantial	None	Loss of control - in flight
3/03	Anchorage, AK	Cargo	CESSNA U-206G	Substantial	None	Loss of control - on ground

Table 40 - LIST OF ACCIDENTS (Continued)
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	[illegible]	First Occurrence
3/06	Puntilla Lake, AK	Pax and Cargo	Cessna A-185-F	Substantial	Minor	Altitude deviation,uncontrolled
3/06	Johnstown, PA	Cargo	Beech TC-45J	Substantial	None	Nose gear collapsed
3/09	Covington, KY	Cargo	Beech BE-18	Destroyed	Fatal (1)	Loss of control - in flight
3/20	Kershaw, SC	Cargo	Piper PA-32-260	Substantial	Minor	Loss of power(total) - mech failure/malfunction
3/22	Jacksonville, FL	Cargo	Piper Aerostar	Destroyed	Fatal (1)	In flight collision with object
3/24	Lake Arthur, LA	Passenger	Cessna A185F	Substantial	None	On ground collision with object
3/30	Vallejo, CA	Cargo	Hughes 369D	Substantial	None	Loss of power(total) - mech failure/malfunction
3/31	Syracuse, NY	Cargo	Mitsubishi MU-2B-35	Substantial	Minor	On ground collision with object
4/05	Park City, UT	Passenger	Bell 206B-III	Substantial	None	In flight encounter with weather
4/05	Cheyenne, WY	Cargo	Piper PA-34-220T	Substantial	None	Hard landing
4/06	Utica, NY	Cargo	Piper Aerostar	Substantial	None	Airframe/component/system failure/malfunction
4/13	Siler City, NC	Cargo	Grumman AA-5B	Substantial	None	Loss of power(total) - mech failure/malfunction
4/14	Santa Ana, CA	Cargo	Sikorsky S-58ET	Substantial	Minor	Main gear collapsed
4/26	Jacksonville, FL	Cargo	Swearingen SA-226-AT	Substantial	None	Gear not retracted
4/26	Mt. Zion, IL	Cargo	Cessna 208A	Substantial	Minor	In flight encounter with weather
4/28	Walkers Cay, OF	Cargo	Britten Norman BN-2A	Substantial	None	Not reported
5/06	Girdwood, AK	Passenger	Bell 412	Destroyed	Minor	Airframe/component/system failure/malfunction
5/07	W Cameron Blk, GM	Pax and Cargo	MBB BO-105S	Destroyed	Fatal (1)	Loss of control - in flight
5/10	Tatitlke, AK	Pax and Cargo	Cessna C-402	Substantial	None	Loss of control - on ground
5/20	Waialae Falls, HI	Passenger	Aerospatiale AS350D	Substantial	Minor	Loss of power(partial) - mech failure/malfunction
5/23	Green Island, AK	Passenger	Cessna 180	Substantial	Serious	Nose over

Table 40 - LIST OF ACCIDENTS (Continued)
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
5/29	Kahiltna Glac, AK	Passenger	Cessna 185F	Substantial	None	Loss of control - in flight
5/30	Lewiston, ID	Passenger	Bell 206B III	Substantial	None	Loss of power(partial) - non-mechanical
5/31	Toksook Bay, AK	Passenger	Cessna 185F	Substantial	None	Gear not retracted
5/31	Tuba City, AZ	Passenger	Beech E-90	Substantial	None	On ground collision with object
6/01	Big Timber, MT	Passenger	Bell 206L-3	Destroyed	Fatal (4)	Loss of control - in flight
6/07	Skagway, AK	Passenger	Piper PA-32-300	Substantial	None	Altitude deviation,uncontrolled
6/10	Moab, UT	Passenger	Cessna 182	Substantial	None	Loss of power(total) - non-mechanical
6/11	Waipio Valley, HI	Passenger	Beech H18	Destroyed	Fatal (11)	In flight collision with terrain
6/14	Las Vegas, NV	Passenger	Cessna TU206G	Substantial	None	Loss of control - on ground
6/15	Puntilla Lake, AK	Pax and Cargo	Aerospatiale AS350B	Destroyed	Fatal (1)	In flight encounter with weather
6/16	Eek, AK	Passenger	Piper PA-32-300	Substantial	None	Main gear collapsed
6/23	Tuntutuliak, AK	Passenger	Piper PA-32-300	Substantial	None	Loss of power(total) - mech failure/malfunction
6/26	Cleveland, TX	Cargo	Piper PA-601B	Substantial	Minor	Loss of power
7/06	Queens Cannery, AK	Passenger	Piper PA-32	Substantial	None	Undershoot
7/10	44 NW Fairbanks, AK	Cargo	Cessna 207	Substantial	None	Loss of power(total) - non-mechanical
7/11	Galveston, TX	Pax and Cargo	Bell 206L-1	Destroyed	Fatal (2)	Midair collision
7/12	Fort Myers, FL	Cargo	Cessna 208B	Substantial	None	Hard landing
7/13	Kodiak, AK	Passenger	DeHavilland DHC-2	Substantial	Serious	In flight collision with terrain
7/14	Salt Lake City, UT	Cargo	Piper PA-34-200T	Substantial	None	Overrun
7/15	Quinhagak, AK	Passenger	Piper PA-32-300	Destroyed	None	Loss of power(total) - mech failure/malfunction
7/18	Des Moines, IA	Cargo	Learjet 35	Substantial	Minor	Loss of control - on ground

Table 40 - LIST OF ACCIDENTS (Continued)
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
7/19	Glen Burnie, MD	Cargo	Beech E18S	Destroyed	Fatal (2)	Fire
7/27	Nappanee, IN	Cargo	Piper PA-32R-300	Substantial	None	Loss of power(partial) - mech failure/malfunction
8/06	Boulder City, NV	Passenger	Bell 206B	Substantial	None	Loss of control - in flight
8/08	Georgetown, CO	Passenger	Bell 206B	Substantial	Serious	Loss of control - in flight
8/11	Tanana, AK	Passenger	Cessna 207-A	Substantial	Serious	In flight collision with terrain
8/15	Greenwood, MS	Cargo	Beech 18	Substantial	None	In flight collision with terrain
8/19	Volcano, HI	Pax and Cargo	Aerospatiale AS350D	Destroyed	Serious	Loss of power(total) - mech failure/malfunction
8/19	Oak Grove, LA	Pax and Cargo	Bell 206B	Substantial	None	Hard landing
8/21	Carson City, NV	Passenger	Aerospatiale AS350D	Substantial	Serious	Loss of power(total) - mech failure/malfunction
8/21	Gold Beach, OR	Passenger	Beech C90	Destroyed	Fatal (3)	Loss of control - in flight
8/27	Blanchard, ID	Passenger	Aerospatiale AS350D	Destroyed	Fatal (4)	Airframe/component/system failure/malfunction
8/28	Lynchburg, VA	Passenger	Piper PA-31-350	Destroyed	Fatal (5)	In flight collision with object
8/30	Talkeetna, AK	Cargo	Piper PA-18	Substantial	None	Nose over
9/01	Sparrevohn, AK	Cargo	Cessna 172H	Substantial	None	On ground collision with object
9/08	Petersburg, AK	Passenger	Hughes 369D	Substantial	None	In flight collision with object
9/08	Monument Valley, UT	Passenger	Piper PA-31-350	Substantial	None	In flight encounter with weather
9/11	Bentonville, AR	Cargo	Piper PA-32-300	Destroyed	Fatal (2)	Loss of power(total) - mech failure/malfunction
9/15	Ontario, CA	Cargo	Piper PA-31-350	Destroyed	Fatal (1)	Airframe/component/system failure/malfunction
9/16	Molongo, OF	Passenger	Bell 206L-1	Substantial	None	In flight collision with object
9/20	Zenia, CA	Passenger	Cessna 182	Substantial	None	On ground collision with object
9/20	Hyannis, NE	Passenger	Cessna 172N	Substantial	Serious	In flight collision with terrain

Table 40 - LIST OF ACCIDENTS (Continued)
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
9/21	Littlefork, MN	Cargo	Beech 80	Substantial	None	Airframe/component/system failure/malfunction
9/25	Redoubt Bay, AK	Pax and Cargo	Cessna 180	Substantial	None	Overrun
9/25	Tucson, AZ	Cargo	Cessna 177RG	Substantial	None	Loss of power(partial) - non-mechanical
9/27	Grand Canyon, AZ	Passenger	DeHavilland DHC-6-300	Destroyed	Fatal (10)	Loss of control - in flight
10/01	King Salmon, AK	Passenger	Cessna 208	Substantial	None	In flight collision with terrain
10/04	Nevis Island, OF	Passenger	Piper PA-23-250	Substantial	Minor	Not reported
10/05	Hoonah, AK	Passenger	Piper PA-32-300	Substantial	Serious	Loss of control - on ground
10/10	Grand Canyon, AZ	Passenger	Cessna T207A	Destroyed	Serious	Loss of power
10/10	High Island 474, GM	Passenger	Bell 206B-III	Substantial	Minor	Roll over
10/10	Lacey Township, NJ	Pax and Cargo	Agusta A109A-MKII	Destroyed	Fatal (5)	Airframe/component/system failure/malfunction
10/10	Philadelphia, PA	Cargo	Beech 58	Substantial	None	On ground collision with object
10/19	Dodgeville, WI	Cargo	Cessna 207	Substantial	None	Overrun
10/20	San Andros, OF	Pax and Cargo	Beech G18S	Substantial	None	Not reported
10/24	San Antonio, TX	Cargo	Beech 58	Substantial	None	Fire/explosion
10/25	Ontario, CA	Cargo Cargo	Piper PA-31-350 Beech C-99	Substantial Substantial	None None	On ground collision
10/29	Little Rock, AR	Pax and Cargo	Cessna 402B	Substantial	Fatal (1)	Fire
11/01	Fort Myers, FL	Pax and Cargo	Piper Aerostar 601P	Destroyed	Fatal (1)	In flight collision with terrain
11/02	Apopka, FL	Cargo	Piper Aerostar 600	Destroyed	Fatal (2)	In flight collision with terrain
11/02	Saint Paul, MN	Passenger	Bell 206L-3	Substantial	None	Loss of power(total) - non-mechanical
11/07	Quinhagak, AK	Passenger	Cessna 207	Substantial	None	Airframe/component/system failure/malfunction

Table 40 - LIST OF ACCIDENTS (Continued)
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
11/13	Atlanta, GA	Cargo	Learjet 24	Substantial	None	On ground collision with object
11/14	Morrisville, NC	Cargo	Piper PA-32R-300	Destroyed	Minor	Loss of power(total) - non-mechanical
11/25	Eek, AK	Passenger	Piper PA-32-260	Substantial	None	Loss of control - in flight
11/28	Block Island, RI	Passenger	Britten Norman BN-2	Destroyed	Fatal (8)	In flight collision with terrain
12/22	Beluga, AK	Passenger	Piper PA-31	Destroyed	Fatal (1)	In flight collision with object
12/23	Brevig Mission, AK	Cargo	Beech 18	Substantial	None	Loss of power
12/27	S. Marsh Isl 7, GM	Passenger	Bell 206L-1	Destroyed	Serious	Loss of control - in flight

Table 41 - PERSONS BY ROLE AND DEGREE OF INJURY
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Role of Person	Degree of Injury: Fatal	Serious	Minor	None	Total
Pilot	24	11	12	65	112
Copilot	4	1	2	2	9
Cabin attendants	1	0	0	0	1
Other crew	6	0	0	1	7
Passenger	46	19	35	112	212
Total aboard	81	31	49	180	341
Other aircraft*	1	0	4	6	11
Other ground	1	0	5	1	7
Grand total	83	31	58	187	359
Percent	23.1	8.6	16.2	52.1	

* Injuries carried opposite Other aircraft are injuries occurring in aircraft that are not part of this tabulation, but which were involved in collisions with aircraft which are a part of this tabulation.

Table 42 - AIRCRAFT BY DAMAGE AND DEGREE OF INJURY
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Aircraft damage	Degree of injury: None	Minor	Ser	Fatal	Aircraft: No.	Percent
None	0	0	0	0	0	.0
Minor	0	0	0	0	0	.0
Substantial	59	12	8	1	80	71.4
Destroyed	1	2	5	24	32	28.6
Aircraft						
Number -	60	14	13	25	112	
Percent -	53.6	12.5	11.6	22.3		

Table 43 - AIRCRAFT BY FIRST OCCURRENCE AND DEGREE OF INJURY AND BY DAMAGE
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Type of first occurrence	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
Altitude deviation,uncontrolled	1	1	0	0	0	0	2	0	2	1.8
Airframe/component/system failure/malfunction	3	1	0	3	0	0	3	4	7	6.3
Fire/explosion	1	0	0	0	0	0	1	0	1	.9
Fire	0	0	0	2	0	0	1	1	2	1.8
Main gear collapsed	1	1	0	0	0	0	2	0	2	1.8
Nose gear collapsed	1	0	0	0	0	0	1	0	1	.9
Gear not extended	1	0	0	0	0	0	1	0	1	.9
Hard landing	4	0	0	0	0	0	4	0	4	3.6
In flight collision with object	3	0	1	3	0	0	3	4	7	6.3
In flight collision with terrain	5	0	3	5	0	0	8	5	13	11.6
In flight encounter with weather	2	1	1	4	0	0	3	5	8	7.1
Loss of control - in flight	4	0	2	5	0	0	5	6	11	9.8
Loss of control - on ground	4	1	1	0	0	0	6	0	6	5.4
Midair collision	0	0	0	1	0	0	0	1	1	.9
Nose over	2	0	1	0	0	0	3	0	3	2.7
On ground collision with object	8	1	0	0	0	0	9	0	9	8.0
Overrun	3	0	1	0	0	0	4	0	4	3.6
Loss of power	1	2	1	0	0	0	3	1	4	3.6
Loss of power(total) - mech failure/malfunction	4	2	2	2	0	0	6	4	10	8.9
Loss of power(partial) - mech failure/malfunction	1	1	0	0	0	0	2	0	2	1.8
Loss of power(total) - non-mechanical	3	1	0	0	0	0	3	1	4	3.6
Loss of power(partial) - non-mechanical	2	0	0	0	0	0	2	0	2	1.8
Roll over	0	1	0	0	0	0	1	0	1	.9
Undershoot	1	0	0	0	0	0	1	0	1	.9
Miscellaneous/other	2	0	0	0	0	0	2	0	2	1.8
Not reported	2	1	0	0	0	0	3	0	3	2.7
Other	1	0	0	0	0	0	1	0	1	.9
Aircraft										
Number -	60	14	13	25	0	0	80	32	112	
Percent -	53.6	12.5	11.6	22.3	.0	.0	71.4	28.6		

Table 44 - AIRCRAFT BY FIRST OCCURRENCE AND BROAD PHASE OF OPERATION
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Type of first occurrence	Phase of operation										Aircraft	
	Stndg	Taxi	Tkoff	Climb	Cruis	Dscnt	Aprch	Landg	Manvr	Other	No.	Percent
Altitude deviation, uncontrolled	0	0	1	0	0	0	0	0	1	0	2	1.8
Airframe/component/system failure/malfunction	0	0	1	0	5	0	0	1	0	0	7	6.3
Fire/explosion	0	0	1	0	0	0	0	0	0	0	1	.9
Fire	0	0	1	1	0	0	0	0	0	0	2	1.8
Main gear collapsed	0	1	0	0	0	0	0	1	0	0	2	1.8
Nose gear collapsed	0	0	0	0	0	0	0	1	0	0	1	1.8
Gear not extended	0	0	0	0	0	0	0	1	0	0	1	1.8
Hard landing	0	0	0	0	0	0	0	4	0	0	4	3.6
In flight collision w/object	0	0	2	0	0	0	3	0	2	0	7	6.3
In flight collision w/terrain	0	0	2	0	0	2	2	1	4	2	13	11.6
In flight encounter w/weather	0	0	1	0	3	1	3	0	0	0	8	7.1
Loss of control - in flight	0	0	3	0	1	0	3	1	2	1	11	9.8
Loss of control - on ground	0	1	0	0	0	0	0	5	0	0	6	5.4
Midair collision	0	0	0	1	0	0	0	0	0	0	1	1.8
Nose over	0	0	0	0	0	0	0	3	0	0	3	2.7
On ground collision w/object	0	4	1	0	0	0	0	4	0	0	9	8.0
Overrun	0	0	1	0	0	0	0	2	0	1	4	3.6
Loss of power	0	0	0	0	2	0	2	0	0	0	4	3.6
Loss of power(total) - mech failure/malfunction	0	0	0	2	6	1	1	0	0	0	10	8.9
Loss of power(partial) - mech failure/malfunction	0	0	1	0	0	0	0	0	1	0	2	1.8
Loss of power(total) - non-mechanical	0	0	0	0	2	0	2	0	0	0	4	3.6
Loss of power(partial) - non-mechanical	0	0	0	0	1	0	1	0	0	0	2	1.8
Roll over	0	0	1	0	0	0	0	0	0	0	1	.9
Undershoot	0	0	0	0	0	0	0	1	0	0	1	.9
Miscellaneous/other	2	0	0	0	0	0	0	0	0	0	2	1.8
Not reported	0	0	0	0	0	0	0	1	0	3	4	3.6
Aircraft												
Number -	2	6	16	4	20	4	17	26	10	7	112	
Percent -	1.8	5.4	14.3	3.6	17.9	3.6	15.2	23.2	8.9	6.3		

Table 45 - AIRCRAFT BY PHASE OF OPERATION AND DEGREE OF INJURY AND BY DAMAGE
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Phase of operation	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
Standing	1	0	0	0	0	0	1	0	1	.9
Standing - engine(s) operating	1	0	0	0	0	0	1	0	1	.9
Taxi	1	0	0	0	0	0	1	0	1	.9
Taxi - to takeoff	0	2	0	0	0	0	2	0	2	1.8
Taxi - from landing	3	0	0	0	0	0	3	0	3	2.7
Takeoff	3	1	0	1	0	0	4	1	5	4.5
Takeoff - ground run	3	0	0	0	0	0	3	0	3	2.7
Takeoff - initial climb	4	1	0	3	0	0	5	3	8	7.1
Climb	0	1	0	0	0	0	1	0	1	.9
Climb - to cruise	1	0	0	2	0	0	2	1	3	2.7
Cruise	2	0	0	4	0	0	2	4	6	5.4
Cruise - normal	6	3	2	3	0	0	8	6	14	12.5
Descent	0	0	1	1	0	0	1	1	2	1.8
Descent - normal	0	0	1	1	0	0	0	2	2	1.8
Approach	0	0	0	2	0	0	0	2	2	1.8
Approach - VFR pattern - base turn	0	1	0	0	0	0	1	0	1	.9
Approach - VFR pattern - final approach	4	0	0	1	0	0	4	1	5	4.5
Approach - go-around (VFR)	1	0	1	0	0	0	1	1	2	1.8
Approach - IAF to FAF/outer marker (IFR)	0	1	0	1	0	0	0	2	2	1.8
Approach - FAF/outer marker to threshold (IFR)	0	1	1	2	0	0	1	3	4	3.6
Approach - missed approach (IFR)	0	0	1	0	0	0	0	1	1	.9
Landing	5	0	0	0	0	0	5	0	5	4.5
Landing - flare/touchdown	7	0	1	0	0	0	8	0	8	7.1
Landing - roll	10	1	2	0	0	0	13	0	13	11.6
Maneuvering	3	1	3	2	0	0	7	2	9	8.0
Hover	1	0	0	0	0	0	1	0	1	.9
Other	4	1	0	2	0	0	5	2	7	6.3
Aircraft										
Number -	60	14	13	25	0	0	80	32	112	
Percent -	53.6	12.5	11.6	22.3	.0	.0	71.4	28.6		

Table 46 - AIRCRAFT BY CONDITION OF LIGHT AND TYPE OF WEATHER
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Condition of light	Type of weather: VMC	IMC	Not reptd	Aircraft: No.	Percent
Dawn	3	3	0	6	5.4
Daylight	63	10	1	74	66.1
Night (dark)	16	12	0	28	25.0
Night (bright)	3	0	0	3	2.7
Not Reported	1	0	0	1	.9
Aircraft					
Number -	86	25	1	112	
Percent -	76.8	22.3	.9		

Table 47 - AIRCRAFT BY TYPE OF OPERATION AND DEGREE OF INJURY
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Type of Operation	Degree of Injury: None	Minor	Serious	Fatal	Aircraft: No.	Percent
Domestic Passenger	25	3	9	11	48	42.9
Domestic Cargo	27	8	3	8	46	41.1
Domestic Pass/Cargo	5	1	1	6	13	11.6
International Passenger	1	1	0	0	2	1.8
Internatioanl Cargo	1	1	0	0	2	1.8
International Pass/Cargo	1	0	0	0	1	.9
Aircraft						
Number -	60	14	13	25	112	
Percent -	53.6	12.5	11.6	22.3		

Table 48 - AIRCRAFT BY PROXIMITY TO AIRPORT AND FLIGHT PLAN
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Accident location	Flight plan: None	VFR	IFR	Cmpny VFR	Aircraft: No.	Percent
Off airport/airstrip	11	7	14	31	63	56.3
On airport	3	6	17	13	39	34.8
On airstrip	1	1	1	3	6	5.4
Other	0	3	0	1	4	3.6
Aircraft						
Number -	15	17	32	48	112	
Percent -	13.4	15.2	28.6	42.9		

Table 49 - AIRCRAFT BY OCCURRENCE OF FIRE AND DEGREE OF INJURY AND BY DAMAGE
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Aircraft fire	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
None	53	12	11	12	0	0	72	16	88	78.6
In-flight	1	1	0	1	0	0	2	1	3	2.7
On ground	4	1	2	10	0	0	4	13	17	15.2
In-flight and on ground	0	0	0	1	0	0	0	1	1	.9
Other	2	0	0	1	0	0	2	1	3	2.7
Aircraft										
Number -	60	14	13	25	0	0	80	32	112	
Percent -	53.6	12.5	11.6	22.3	.0	.0	71.4	28.6		

Table 50 - AIRCRAFT BY TYPE OF AIRCRAFT AND DEGREE OF INJURY AND BY DAMAGE
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Type of aircraft	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
All Fixed Wing *	51	10	9	18	0	0	66	22	88	78.6
Fixed Wing Single Recip. Eng.	28	4	6	3	0	0	35	6	41	36.6
Fixed Wing Multiple Recip. Eng.	15	3	0	11	0	0	19	10	29	25.9
Fixed Wing Turboprop	7	2	2	4	0	0	9	6	15	13.4
Fixed Wing Turbojet	1	1	1	0	0	0	3	0	3	2.7
All Rotorcraft *	9	4	4	7	0	0	14	10	24	21.4
Rotorcraft, Turbine Engine	9	4	4	7	0	0	14	10	24	21.4
Aircraft										
Number -	60	14	13	25	0	0	80	32	112	
Percent -	53.6	12.5	11.6	22.3	.0	.0	71.4	28.6		

* Not included in column totals

Table 51 - BROAD CAUSE/FACTOR ASSIGNMENTS*
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

Cause/Factor	Cited as a Cause		Cited as a Factor		Cited as Either a Cause or a Factor (or Both)	
	Fatal Accidents	All Accidents	Fatal Accidents	All Accidents	Fatal Accidents	All Accidents
Aircraft #	9	25	2	6	9	31
Propulsion System and Controls	5	13	1	1	5	14
Flight Control System	2	2	0	1	2	3
Airframe	2	2	1	1	2	3
Landing Gear	0	3	0	0	0	3
Systems/Equipment/Instruments	1	5	0	2	1	7
Environment #	0	4	13	61	13	62
Weather	0	4	8	31	8	34
Light Conditions	0	0	4	11	4	11
Object(trees,wires,etc.)	0	1	4	14	4	15
Airport/Airways Facilities,Aids	0	0	0	1	0	1
Terrain/Runway Condition	0	0	4	37	4	37
Personnel #	17	69	8	27	19	70
Pilot	16	60	6	22	17	60
Others (Aboard)	0	0	0	0	0	0
Others (Not Aboard)	2	13	4	6	6	16
Number of Aircraft					25	112
NTSB Determined Probable Cause					25	108

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* Multiple causes and factors may be assigned in an accident

\# This category is composed of sub-categories indented below it. The number of aircraft cited in a category may be less than or equal to the sum of the sub-category citations.

Table 52 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
NONSCHEDULED 14 CFR 135 OPERATIONS
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities: Total	Fatalities: Aboard Aircraft In This Category	Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown: Total	Accident Rate per 100,000* Aircraft Hours Flown: Fatal
1980	171	46	105	101	3,617,724	4.73	1.27
1981	157	40	94	92	2,895,827	5.42	1.38
1982	132	31	72	72	3,008,000	4.39	1.03
1983	141	27	62	57	2,378,000	5.93	1.14
1984	146	23	52	52	2,843,000	5.14	0.81
1985	154	35	76	75	2,570,000	5.99	1.36
1986	117	31	65	61	2,690,000	4.35	1.15
1987	97	30	65	63	2,657,000	3.65	1.13
1988	101	28	59	55	2,632,000	3.84	1.06
1989	111	25	83	81	3,020,000	3.68	0.83

Figure 13 - ACCIDENTS AND FATAL ACCIDENTS
NONSCHEDULED 14 CFR 135 OPERATIONS

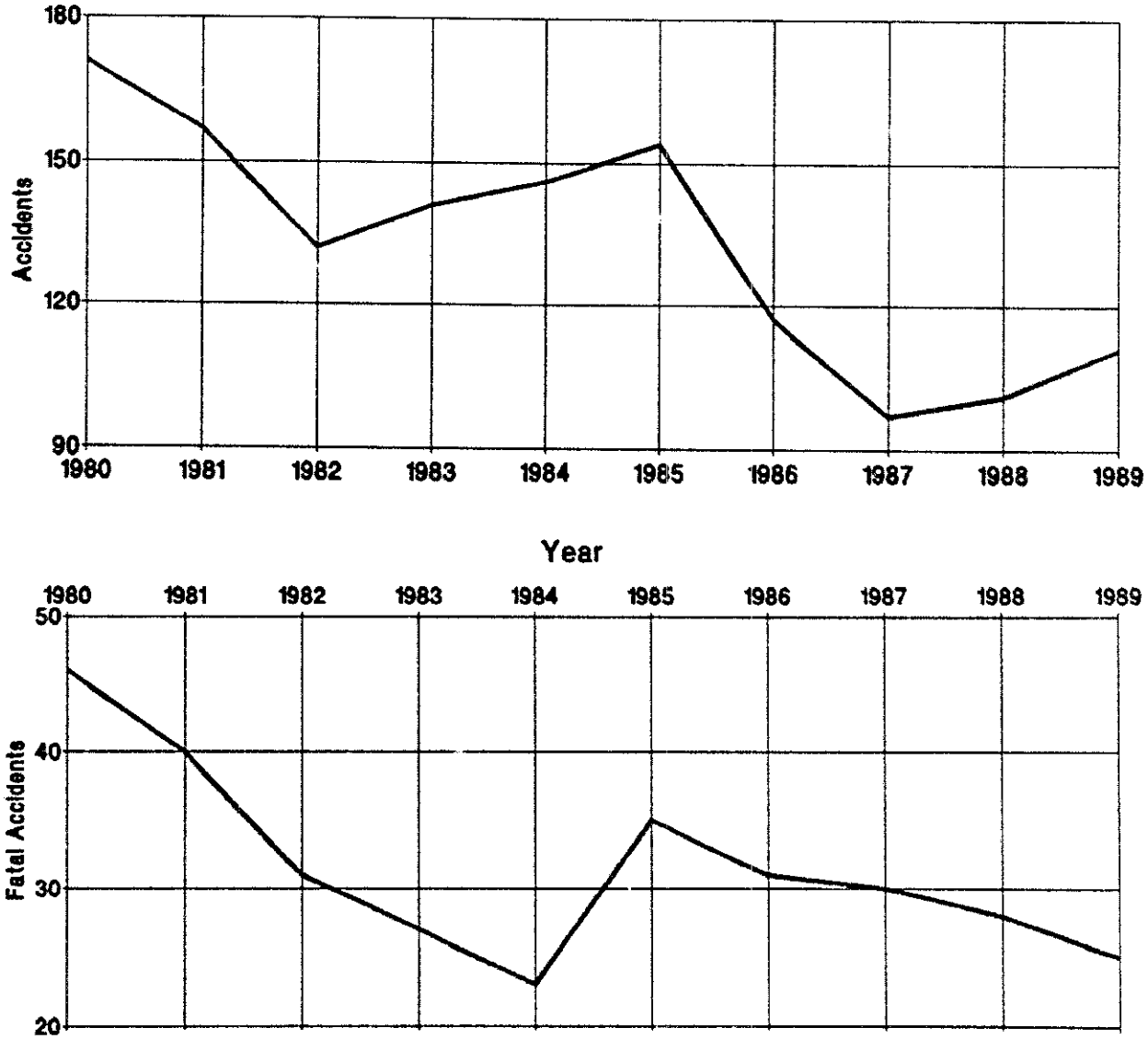

Figure 14 - NUMBER OF FATALITIES
NONSCHEDULED 14 CFR 135 OPERATIONS

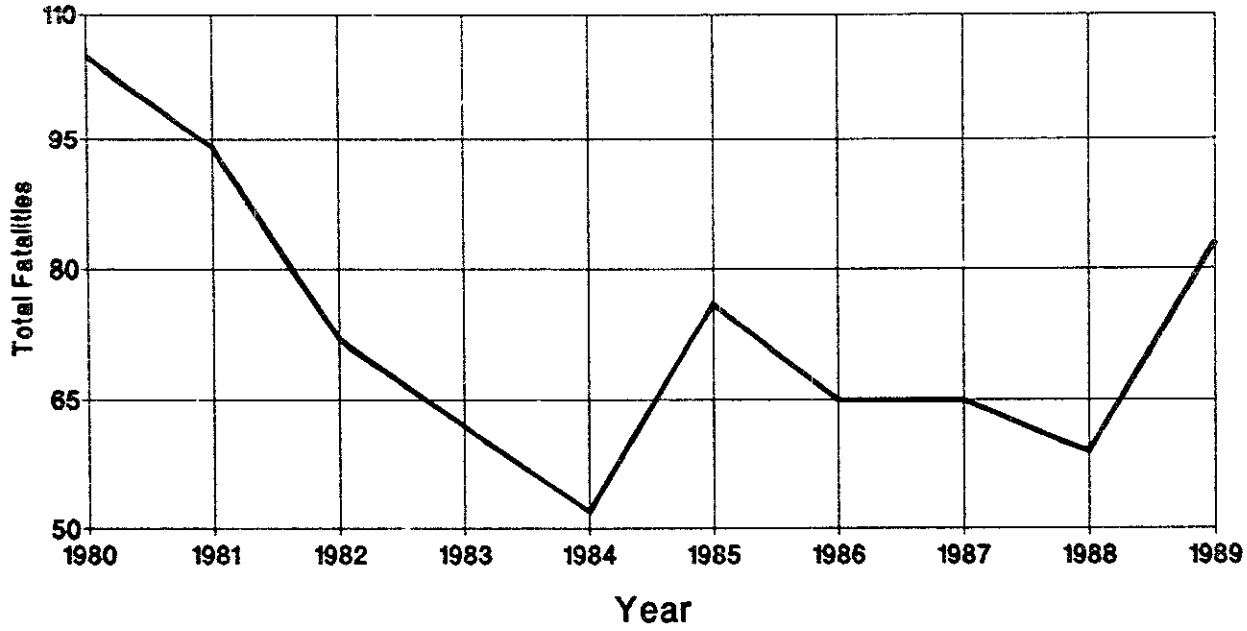

Figure 15 - ACCIDENT RATE PER 100,000 HOURS FLOWN
NONSCHEDULED 14 CFR 135 OPERATIONS

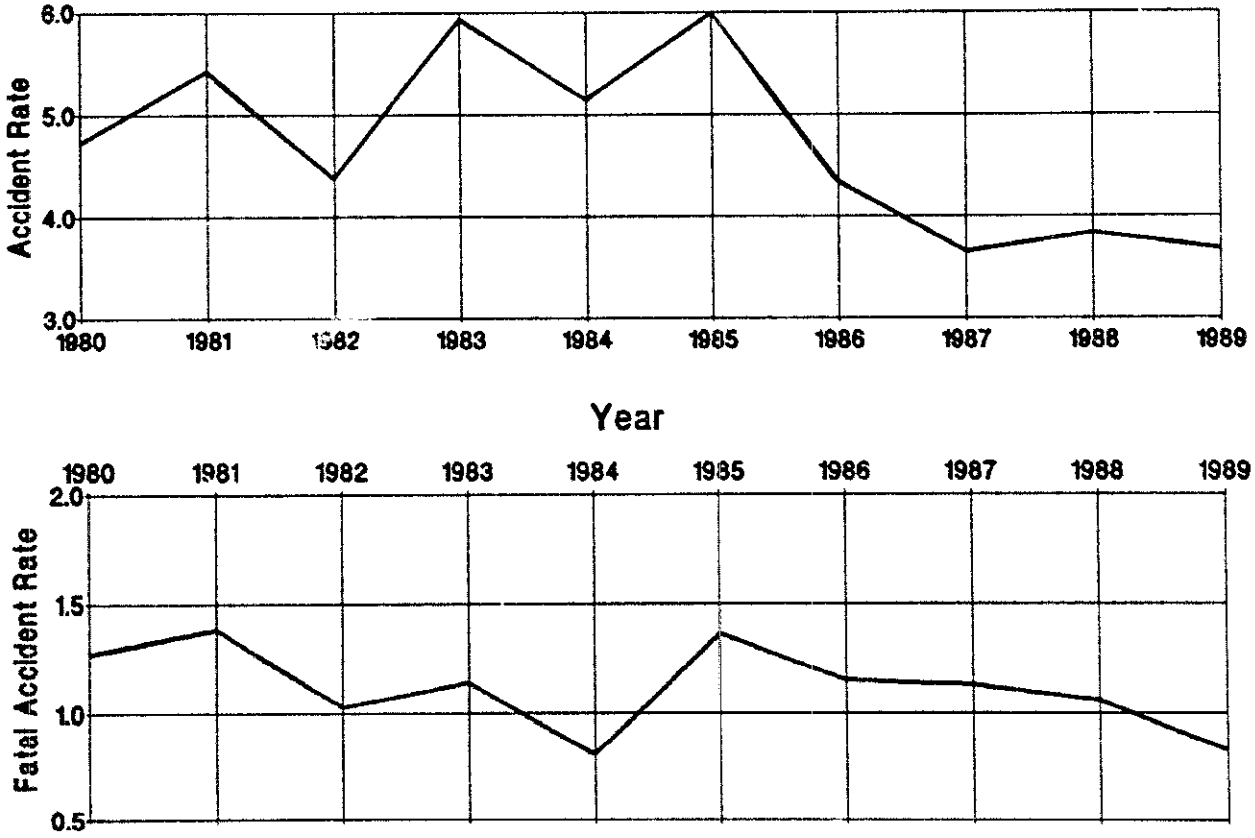

Table 53 - FIRST OCCURRENCES IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
NONSCHEDULED 14 CFR 135 OPERATIONS
1989 AND 1984 - 1988

	All Accidents				Fatal Accidents			
	1989		1984 - 1988		1989		1984 - 1988	
Type of occurrence	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Loss of control - in flight	11	9.8	14.2	11.4	5	20.0	6.8	23.0
Loss of control - on ground	6	5.4	10.8	8.7	0	.0	.4	1.4
In flight encounter with weather	8	7.1	10.4	8.3	4	16.0	4.8	16.2
Loss of engine power(total) - non-mechanical	4	3.6	10.0	8.0	0	.0	.8	2.7
Airframe/component/system failure/malfunction	7	6.3	9.6	7.7	3	12.0	2.2	7.4
In flight collision with object	7	6.3	9.6	7.7	3	12.0	2.6	8.8
In flight collision w/terrain	13	11.6	9.4	7.5	5	20.0	4.6	15.5
Loss of engine power(total) - mech failure/malfunction	10	8.9	7.8	6.3	2	8.0	1.0	3.4
On ground collision with object	9	8.0	6.6	5.3	0	.0	.6	2.0
Loss of engine power(partial) - mech failure/malfunction	2	1.8	4.0	3.2	0	.0	1.0	3.4
Overrun	4	3.6	3.6	2.9	0	.0	.0	.0
Loss of engine power	4	3.6	3.6	2.9	0	.0	1.2	4.1
Main gear collapsed	2	1.8	3.0	2.4	0	.0	.0	.0
On ground collision w/terrain	0	.0	2.8	2.2	0	.0	.0	.0
Fire	2	1.8	2.4	1.9	2	8.0	.4	1.4
Undershoot	1	.9	2.0	1.6	0	.0	.2	.7
Loss of engine power(partial) - non-mechanical	2	1.8	1.8	1.4	0	.0	.0	.0
Midair collision	1	.9	1.6	1.3	1	4.0	.8	2.7
Hard landing	4	3.6	1.4	1.1	0	.0	.0	.0
Miscellaneous/other	2	1.8	1.2	1.0	0	.0	.2	.7
Nose gear collapsed	1	.9	1.0	.8	0	.0	.0	.0
Abrupt maneuver	0	.0	.8	.6	0	.0	.6	2.0
Explosion	0	.0	.8	.6	0	.0	.2	.7
Propeller/rotor contact to person	0	.0	.8	.6	0	.0	.0	.0
Not reported	3	2.7	.6	.5	0	.0	.0	.0
Altitude deviation,uncontrolled	2	1.8	.6	.5	0	.0	.2	.7
Gear not extended	1	.9	.6	.5	0	.0	.0	.0
Nose over	3	2.7	.6	.5	0	.0	.0	.0
Roll over	1	.9	.6	.5	0	.0	.2	.7
Fire/explosion	1	.9	.4	.3	0	.0	.0	.0
On ground encounter with weather	0	.0	.4	.3	0	.0	.0	.0
Undetermined	0	.0	.4	.3	0	.0	.4	1.4
Missing aircraft	0	.0	.4	.3	0	.0	.4	1.4
Dragged wing, rotor, pod, or float	0	.0	.2	.2	0	.0	.0	.0
Forced landing	0	.0	.2	.2	0	.0	.0	.0
Gear collapsed	0	.0	.2	.2	0	.0	.0	.0
Other gear collapsed	0	.0	.2	.2	0	.0	.0	.0
Gear not retracted	1	.9	.0	.0	0	.0	.0	.0
Total	112	100.0	124.6	100.0	25	100.0	29.6	100.0

Table 54 - FIRST PHASES OF OPERATION IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
NONSCHEDULED 14 CFR 135 OPERATIONS
1989 AND 1984 - 1988

	All Accidents				Fatal Accidents			
	1989		1984 - 1988		1989		1984 - 1988	
Phase of operation	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Takeoff	18	16.1	26.6	21.3	4	16.0	4.4	14.9
Cruise	20	17.9	24.4	19.6	7	28.0	7.2	24.3
Landing	27	24.1	23.4	18.8	1	4.0	1.2	4.1
Approach	17	15.2	16.4	13.2	6	24.0	6.4	21.6
Maneuvering	10	8.9	9.6	7.7	2	8.0	4.4	14.9
Climb	4	3.6	6.4	5.1	2	8.0	2.2	7.4
Taxi	6	5.4	6.0	4.8	0	.0	.0	.0
Descent	4	3.6	4.8	3.9	2	8.0	1.8	6.1
Standing	2	1.8	3.8	3.0	0	.0	.6	2.0
Other	4	3.6	3.2	2.6	1	4.0	1.4	4.7
Total Aircraft	112	100.0	124.6	100.0	25	100.0	29.6	100.0

Table 55 - BROAD CAUSE/FACTOR ASSIGNMENTS IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
NONSCHEDULED 14 CFR 135 OPERATIONS
1989 AND 1984 - 1988

	All Accidents				Fatal Accidents			
	1989		1984 - 1988		1989		1984 - 1988	
Broad Cause/Factor	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Pilot	77	68.8	96.0	77.0	17	68.0	25.4	85.8
Weather	42	37.5	37.2	29.9	8	32.0	13.2	44.6
Terrain/Runway Condition	41	36.6	37.0	29.7	4	16.0	9.0	30.4
Propulsion System and Controls	19	17.0	28.4	22.8	5	20.0	4.4	14.9
Other Person (Not Aboard)	22	19.6	21.4	17.2	6	24.0	7.8	26.4
Light Conditions	15	13.4	21.2	17.0	4	16.0	8.6	29.1
Object (tree,wires,etc)	19	17.0	19.4	15.6	4	16.0	5.4	18.2
Landing Gear	3	2.7	12.0	9.6	0	.0	.4	1.4
Systems/Equipment/ Instruments	8	7.1	10.2	8.2	1	4.0	3.2	10.8
Airframe	5	4.5	6.0	4.8	2	8.0	1.8	6.1
Flight Control System	5	4.5	2.6	2.1	2	8.0	1.4	4.7
Airport/Airways Facilities, Aids	1	.9	2.2	1.8	0	.0	.4	1.4
Other Person (Aboard)	0	.0	.2	.2	0	.0	.0	.0
Total Aircraft	112		124.6		25		29.6	
NTSB Determined Probable Cause	108		123.6		25		29.6	

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ CARL W. VOGT
Chairman

/s/ SUSAN M. COUGHLIN
Vice Chairman

/s/ JOHN K. LAUBER
Member

/s/ JOHN HAMMERSCHMIDT
Member

/s/ CHRISTOPHER A. HART
Member

APPENDIX A
MIDAIR COLLISION ACCIDENTS
U.S. AIR CARRIER OPERATIONS
1980 - 1989

Year	Accidents Total	Accidents Fatal	Total Fatalities	Number of Accidents by Segements of Aviation Involved: S135 and GA	N135 and N135	N135 and GA
1980	3	3	3	0	1	2
1981	4	3	20	1	1	2
1982	3	1	3	1	1	1
1983	1	1	4	0	0	1
1984	1	1	17	1	0	0
1985	2	1	1	0	2	0
1986	0	0	0	0	0	0
1987	5	2	12	3	0	2
1988	2	1	4	0	0	2
1989	1	1	2	0	0	1
	22	14	66	6	5	11

NOTE: S135 = Scheduled 14 CFR 135 Operation
N135 = Nonscheduled 14 CFR 135 Operation
GA = General Aviation

APPENDIX A
MIDAIR COLLISION ACCIDENTS
U.S. AIR CARRIER OPERATIONS
1980 - 1989

Year	Accidents Total	Accidents Fatal	Total Fatalities	Number of Accidents by Segements of Aviation Involved: S135 and GA	N135 and N135	N135 and GA
1980	3	3	3	0	1	2
1981	4	3	20	1	1	2
1982	3	1	3	1	1	1
1983	1	1	4	0	0	1
1984	1	1	17	1	0	0
1985	2	1	1	0	2	0
1986	0	0	0	0	0	0
1987	5	2	12	3	0	2
1988	2	1	4	0	0	2
1989	1	1	2	0	0	1
	22	14	66	6	5	11

NOTE: S135 = Scheduled 14 CFR 135 Operation
N135 = Nonscheduled 14 CFR 135 Operation
GA = General Aviation

AIRCRAFT ACCIDENT: The accidents included herein are the occurrences incident to flight in which, "as a result of the operation of an aircraft, any person (occupant or nonoccupant) receives fatal or serious injury or any aircraft receives substantial damage." The definition of substantial damage is:

(1) Substantial damage means damage or failure which adversely affects the structural strength, performance, or flight characteristics of the aircraft, and would normally require major repair or replacement of the affected component.

(2) Engine failure, damage limited to an engine, bent fairings or cowling, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered "substantial damage."

AIRCRAFT-MILES: The distance flown by aircraft in terms of great circle airport-to-airport distances measured in statute miles.

CAUSES AND RELATED FACTORS In determining probable cause(s) of an accident, all facts, conditions, and circumstances are considered. The objective is to ascertain those cause and effect relationships in the accident sequence about which something can be done to prevent recurrence of the type of accident under consideration. Accordingly, for statistical purposes, where there are two or more causes of an accident, each is recorded and no attempt is made to establish a primary cause. Therefore, in the cause and related factor table, the figures shown in the columns dealing with cause will exceed the total number of accidents. The term "factor" is used, in general, to denote those elements of an accident that further explain or supplement the probable cause(s); this provides a means for collecting essential items of information that could not be readily categorized elsewhere in the system.

COLLISION BETWEEN AIRCRAFT Collisions between aircraft are so classified only when both aircraft are occupied. This includes collisions wherein both aircraft are airborne (midair); one is airborne, the other on the ground; and both are on the ground. A collision with a parked, unoccupied aircraft is classified under the broad category of collision with objects.

FATAL INJURY: Any injury which results in death within 30 days of the accident.

INJURY INDEX: Injury index refers to the highest degree of personal injury sustained as a result of the accident.

NONSCHEDULED SERVICE: Revenue flights that are not operated in regular scheduled service, such as charter flights, and all nonrevenue flights incident to such flights.

PASSENGER-MILES: One passenger transported 1 mile. Passenger miles are computed by the summation of the products of the aircraft-miles flown on each inter-airport flight multiplied by the number of passengers carried on the flight.

PERSONNEL (NON-PILOT): As defined for the Broad Cause/Factor tables may include any of the following personnel:

Rules, Regulations, Standards Personnel
Maintenance, Servicing, Inspection Personnel
Weather Service Personnel
Airport Management
Production-Design Personnel
Ground Signalman
Passenger
Driver of Vehicle
Flight Engineer
Radio Operator
Other Flight Personnel
Flight Instructor on Ground
Operational Supervisor Personnel
Air Traffic Control Personnel
Airways Facilities Personnel
Pilot of Another Aircraft
Ground Crewman
Spectator
Third Pilot
Navigator
Flight Attendant
Dispatching Personnel

PHASE OF OPERATION: The phase of flight in which the first occurrence happened.

REVENUE PASSENGER: A person receiving air transportation from an air carrier for which remuneration is received by the air carrier. Air carrier employees and others receiving air transportation for which a token service charge is levied are considered nonrevenue passengers.

REVENUE PLANE-MILES: The total plane-miles flown in revenue service.

ROTORCRAFT (BROAD CAUSE/FACTOR) When any part, assembly, or system which is unique to rotorcraft is cited as a cause or factor, then "Rotorcraft" is considered a broad cause or factor in that accident.

SERIOUS INJURY: Any injury which 1) requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received; 2) results in a fracture of any bone (Except simple fractures of fingers, toes, or nose); 3) involves lacerations which cause severe hemorrhages, nerve, muscle, or tendon damage; 4) involves injury to any internal organ; or 5) involves second-or third-degree burns, or any burns affecting more than 5 percent of body surface.

TYPE OF OCCURRENCE: "Occurrences" is the highest level of an accident classification mechanism known as the Sequence of Events. This concept was introduced in 1982 accident investigations to describe the circumstances in an accident. To describe an accident, up to five occurrences may be used. Typically each occurrence is further defined by one or more "findings" which, when presented chronologically, depict the accident scenario from beginning to end in considerable detail. The findings are developed by NTSB analysts from a menu of words and phrases, and are the most detailed means of classifying an accident. The findings are also the vehicle used to describe the probable cause of, and related factors in an accident. The example below illustrates the relationship between occurrences and findings.

Occurrence #1 LOSS OF POWER (PARTIAL) - MECHANICAL FAILURE/MALFUNCTION
Phase of Operation TAKEOFF - GROUND RUN

Finding(s)

1. COMPRESSOR ASSEMBLY - FATIGUE
2. COMPRESSOR ASSEMBLY - FAILURE, TOTAL
3. MATERIAL DEFECT (INADEQUATE QUALITY CONTROL) - MANUFACTURER

TYPES OF WEATHER CONDITIONS The types of weather conditions (VMC/IMC) are determined in accordance with the prescribed minima in Part 91 of the Federal Aviation Regulations. These minima pertain to the ceiling and visibility, in conjunction with the type of airspace, at the accident site. Type of weather conditions is based on surface weather as determined from officially recognized sources. Weather conditions encountered in flight are not necessarily representative of the flight plan classifications VFR/IFR as carried under Type of Weather Conditions.

APPENDIX C

DETAILED CAUSE/FACTOR ASSIGNMENTS
14 CFR 121 125 127 OPERATIONS

CAUSE/FACTOR TABLE
14 CFR 121 125 127 OPERATIONS
1989

	Cause or Factor	Cause
AIRCRAFT		
Air cond/heating/pressurization	1	1
Auxiliary power unit	1	1
Compressor assembly,forward fan	1	1
Door,cargo	2	1
Door,inspection	1	0
Electrical system,electric wiring	1	1
Engine installation,mounting bolt	1	1
Fluid,hydraulic	1	1
Fuselage,cabin	1	0
Horizontal stabilizer surface	1	1
Hydraulic system	1	1
Hydraulic system,line	1	1
Hydraulic system,shutoff valve	1	0
Landing gear,emergency brake system	1	1
Landing gear,gear locking mechanism	1	1
Landing gear,main gear	1	1
Landing gear,normal brake system	2	2
Lubricating system	1	0
Oxygen system,passenger	1	1
Thrust reverser,accumulator	1	1
FACILITY		
Aircraft manuals,procedure information	1	0
ENVIRONMENT		
Aircraft parked	1	0
Downdraft	1	1
Icing conditions	1	0
Lightning strike	1	1
Terrain condition	2	0
Turbulence	2	1
Turbulence,clear air	2	1
FLIGHT CREW		
Aborted landing	1	1
Aborted takeoff	1	1
Airspeed	1	0
Altitude	1	0
Anti-ice/de-ice system	1	0
Checklist	1	1
Compensation for wind conditions	1	1
Crew/group coordination	1	0
Design stress limits of aircraft	1	1
Directional control	1	1
Emergency procedure	1	1
Equipment, other	1	1
Flare	2	2
Fuel supply	1	1
In-flight planning/decision	2	2
Incapacitation(anoxia/hypoxia)	1	1
Oxygen system	1	1
Powerplant controls	1	1
Procedures/directives	1	1
Proper descent rate	1	1
Remedial action	2	2
Touchdown	1	1
Trim setting	1	1

CAUSE/FACTOR TABLE
14 CFR 121 125 127 OPERATIONS
1988

	Cause or Factor	Cause
OTHER PERSON		
Acft/equip, inadequate standard/requirement	1	0
Aircraft/equipment inadequate	1	0
Aircraft/equipment, inadequate design	1	0
Airplane handling	1	1
Inadequate surveillance of operation	1	0
Insufficient stds/rqmts - Aircraft	2	0
Lack of total experience in type operation	1	0
Maintenance	1	0
Maintenance,inspection of aircraft	3	1
Maintenance,installation	1	1
Maintenance,overhaul	1	1
Maintenance,overhaul,major	1	1
Maintenance,replacement	1	1
Maintenance,service bulletins	1	0
Material defect	1	0
Material defect(inadequate quality control)	1	1
Over confidence in personal ability	1	0
Procedures/directives	4	3
Seat belt	2	2
Supervision	1	1
Weather evaluation	1	1

APPENDIX D

DETAILED CAUSE/FACTOR ASSIGNMENTS
SCHEDULED 14 CFR 135 OPERATIOS

CAUSE/FACTOR TABLE
SCHEDULED 14 CFR 135 OPERATIONS
1989

	Cause or Factor	Cause
AIRCRAFT		
Fluid,fuel	1	1
Horizontal stabilizer surface	1	0
Powerplant	1	1
Wing	1	0
FACILITY		
Airport facilities,runway edge lights	1	0
ENVIRONMENT		
Aircraft moving on ground	1	0
Clouds	1	0
Dark night	4	0
Drizzle	2	0
Dusk	1	0
Fog	5	0
Icing conditions	1	0
Low ceiling	4	0
Night	1	0
Obscuration	1	0
Rain	3	0
Snow	1	0
Terrain condition	6	0
Unfavorable wind	1	0
Vehicle	1	0
FLIGHT CREW		
Aircraft preflight	1	1
Airplane handling	1	1
Complacency	1	0
Crew/group coordination	1	0
Directional control	1	1
IFR procedure	1	1
In-flight planning/decision	5	4
Procedures/directives	1	1
Proper alignment	1	1
Remedial action	1	0
Stall	1	1
Supervision	1	1
VFR flight into IMC	4	4
Visual lookout	2	2
Visual/aural perception	1	0
OTHER PERSON		
ARTCC service	1	0
Acft/equip inadequate, visual restriction	1	0
Aircraft/equipment, inadequate design	1	0
Airplane handling	1	1
Airport operations	1	1
Airport snow removal	1	0
Clearance	1	1
Complacency	1	1
Diverted attention	1	0
Improper initial training	1	0
Inadequate surveillance of operation	1	0
Inadequate training	1	0
Judgement	1	1
Maintenance,modification	1	0

CAUSE/FACTOR TABLE
SCHEDULED 14 CFR 135 OPERATIONS
1989

	Cause or Factor	Cause
OTHER PERSON (continued)		
Physical impairment(alcohol)	1	1
Refueling	1	0
Supervision	1	0
Taxispeed	1	1
Traffic advisory	1	0
Visual lookout	4	3

APPENDIX E

DETAILED CAUSE/FACTOR ASSIGNMENTS
NONSCHEDULED 14 CFR 135 OPERATIONS

CAUSE/FACTOR TABLE
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

	Cause or Factor	Cause
AIRCRAFT		
Aircraft performance,climb capability	1	1
Aircraft performance,hydroplaning condition	1	0
Electrical system	2	2
Eng assembly,crankshaft counterweights/vib damper	1	1
Engine assembly,connecting rod	1	1
Engine assembly,connecting rod bolt	1	1
Engine assembly,crankshaft	3	3
Engine assembly,cylinder	1	0
Exterior lights	1	1
Flight control surfaces/attachments	1	1
Flight control,flap attachment	1	0
Flight control,rudder	1	1
Fluid,fuel	4	4
Fluid,oil	2	2
Fuel system	1	1
Fuel system,PC line	1	1
Fuel system,fuel control	1	1
Fuel system,nozzle	1	1
Fuel system,tank	1	1
Fuselage,crew compartment	2	2
Hydraulic system	1	1
Landing gear,main gear strut	1	1
Landing gear,main gear strut scissors	1	1
Landing gear,normal retraction/extension assembly	1	1
Landing light	1	0
Lubricating system,oil hose	1	1
Lubricating system,oil seal	1	1
Misc eqpt/furnishings,parachute/drag chute	1	0
Miscellaneous	1	1
Powerplant	2	2
Propeller system/accessories	1	0
Propeller system/accessories,hub	1	1
Rotor system,main rotor blade	1	1
Rotor system,main rotor blade spar	1	1
Rotorcraft flight control,cyclic control	1	1
Rotorcraft flight control,swashplate assembly	1	1
Turboshaft engine,gas generator turbine	1	1
Turboshaft engine,gas generator turbine shaft	1	1
Wing	3	2
FACILITY		
Airport facilities,aeronautical light beacon(obst)	1	0
Airport facilities,runway/landing area condition	6	0
ENVIRONMENT		
Aircraft moving on ground	2	0
Aircraft parked	1	0
Animal(s)	1	0
Bird(s)	1	0
Clouds	1	0
Crosswind	6	1
Dark night	14	0
Dawn	1	0
Downdraft	6	0
Drizzle	2	0
Fence	2	0
Fog	11	1
Gusts	6	1
High density altitude	3	0
High wind	2	0

CAUSE/FACTOR TABLE
NONSCHEDULED 14 CFR 135 OPERATIONS
1989

	Cause or Factor	Cause
ENVIRONMENT (continued)		
Icing conditions	1	0
Low ceiling	9	0
Obscuration	2	0
Other	1	1
Rain	6	0
Runway light	2	0
Snow	8	0
Tailwind	4	1
Terrain condition	39	0
Thunderstorm	1	0
Tree(s)	7	0
Turbulence	3	0
Turbulence in clouds	1	0
Turbulence(thunderstorms)	1	0
Unfavorable wind	3	0
Vehicle	2	0
Whiteout	1	0
Windshear	2	0
Wire,transmission	2	0
FLIGHT CREW		
Aborted takeoff	1	1
Aircraft control	3	3
Aircraft preflight	2	2
Aircraft weight and balance	5	3
Airspeed	5	3
Airspeed(Vlof)	1	1
Airspeed(Vso)	1	1
Altitude	4	4
Autorotation	1	0
Brakes(normal)	2	1
Checklist	1	1
Clearance	5	5
Compensation for wind conditions	3	2
Complacency	1	0
Decision height	2	2
Descent	1	1
Directional control	7	6
Distance	2	2
Emergency procedure	3	3
Flare	5	5
Flight into known adverse weather	4	2
Fuel consumption calculations	1	0
Fuel supply	3	2
Gear extension	1	1
Go-around	2	2
Hazardous weather advisory	1	1
IFR procedure	5	5
Ice/frost removal from aircraft	2	2
In-flight planning/decision	7	7
Lack of familiarity with geographic area	2	0
Lack of total experience in type of aircraft	2	0
Landing gear	1	1
Lowering of flaps	1	1
Maneuver	2	1
Minimum descent altitude	1	1
Missed approach	2	0
Operation with known deficiencies in equipment	1	0
Over confidence in personal ability	1	0

CAUSE/FACTOR TABLE
NONSCHEDULED 14 CFR 135 OPERATIONS
1988

	Cause or Factor	Cause
FLIGHTCREW (continued)		
Parking brakes	1	1
Planning-decision	7	7
Powerplant controls	1	1
Preflight planning/preparation	7	6
Procedures/directives	2	2
Propeller feathering	1	1
Proper alignment	6	5
Proper altitude	4	3
Proper assistance	1	1
Proper climb rate	1	1
Proper glidepath	1	1
Psychological condition	1	0
Recovery from bounced landing	2	2
Refueling	1	1
Remedial action	2	1
Reversers	1	0
Rotor rpm	1	1
Self-induced pressure	2	0
Spatial disorientation	1	1
Stall	1	1
Stall/mush	1	1
Taxispeed	1	1
Trim setting	1	1
Unsuitable terrain	1	1
VFR flight into IMC	5	4
Visual lookout	5	5
Visual/aural detection	1	0
Visual/aural perception	5	1
Weather evaluation	3	3
Wheels down landing in water	1	1
Wheels up landing	2	2
OTHER PERSON		
Aircraft weight and balance	1	0
Airport operations	1	1
Brakes(normal)	1	1
Communications/information/ATC	1	0
Company-induced pressure	1	1
Condition(s)/step(s) insufficiently defined	1	0
Condition(s)/step(s) not listed	1	0
Flt with inadqt enroute/destn facilities	1	0
Hazardous weather advisory	1	1
Inadequate initial training	2	0
Inadequate surveillance of operation	1	0
Inadequate training(emergency procedure(s))	1	0
Insufficient stds/rqmts - Airman	1	0
Maintenance	1	1
Maintenance,100 hour inspection	1	1
Maintenance,adjustment	1	1
Maintenance,compliance with AD	1	1
Maintenance,inspection of aircraft	1	0
Maintenance,installation	2	1
Maintenance,overhaul,major	1	1
Maintenance,service bulletins	2	0
Material defect	1	1
Material defect(inadequate quality control)	1	1
Traffic advisory	1	0
Unsuitable terrain	1	1
Visual lookout	2	2

APPENDIX F

N.T.S.B. FORM 6120.4

National Transportation Safety Board

FACTUAL REPORT AVIATION

1 NTSB Accident/Incident Number	2	3 Investigation
	1 ☐ Accident 2 ☐ Incident	1 ☐ NTSB 2 ☐ FAA Delegated

4 Aircraft Registration Number	5 Flight Number	For collision between aircraft enter reg. no. and flt. no. for other aircraft	6 Aircraft Registration Number	7 Flight Number
	_____ A Other			_____ A Other

8 Nearest City/Place	9 State	10 Zip Code *(First 5 numbers only)*	11 Accident Site Elevation
			_____ Feet MSL

12 Date of Accident *(Nos. for M. D. Y.)*	13 Day of Week *(First 2 letters)*	14 Local Time *(24 hour clock)*	15 Time Zone

16 Narrative Statement of Facts, Conditions and Circumstances Pertinent to the Accident/Incident

Additional Persons Participating in this Accident/Incident Investigation *(Name, address, affiliation. Continue on page 2 if necessary)*

Investigated By:

17 Date *(Nos. for M. D. Y.)*	18 Agency	19 Name/Signature

NTSB Form 6120.4 (Rev. 1-84)

Page 1

National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB Accident/Incident Number

16 Narrative Statement of Facts, Conditions and Circumstances Pertinent to the Accident/Incident *(continued)*

Attach additional pages as necessary (Page 2a, 2b, 2c, etc.)

National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB Accident/Incident Number

Airport/Approach/Landing Information

24 [ ] Not applicable *(Go to block 39)*

25 Airport Name
A Other

26 Airport Identifier

27 Accident Location
1 [ ] Off airport/airstrip
2 [ ] On airport
3 [ ] On airstrip
A Other

28 Distance From Airport Center *(Nearest SM)*
SM
A Other

29 Direction From Airport
mag
A Other

30 VFR Approach/Landing *(Multiple entry)*
1 [ ] None
2 [ ] Traffic pattern
3 [ ] Straight-in
4 [ ] Valley/terrain following
5 [ ] Go around
6 [ ] Touch and go
7 [ ] Full stop
8 [ ] Stop and go
9 [ ] Simulated forced landing
10 [ ] Forced landing
11 [ ] Precautionary landing
A Other

31 Type Instrument Approach Flown *(Multiple entry)*
1 [ ] None
2 [ ] ADF/NDB
3 [ ] SDF
4 [ ] VOR/TVOR
5 [ ] VOR/DME
6 [ ] TACAN
7 [ ] ILS-complete
8 [ ] ILS-localizer
9 [ ] ILS-backcourse
10 [ ] RNAV
11 [ ] MLS
12 [ ] LDA
13 [ ] ASR
14 [ ] PAR
15 [ ] Sidestep
16 [ ] Visual
17 [ ] Contact
18 [ ] Circling
19 [ ] Practice
A Other

32 Runway Used Identifier
A Other

33 Runway Length
Feet
A Other

34 Runway Width
Feet
A Other

35 Airport Elevation
Ft. MSL
A Other

36 Runway/Landing Surface
1 [ ] Macadam
2 [ ] Asphalt
3 [ ] Concrete
4 [ ] Gravel
5 [ ] Dirt
6 [ ] Grass/turf
7 [ ] Snow
8 [ ] Ice
9 [ ] Water
10 [ ] Metal/wood
A Other

37 Runway/Landing Surface Condition
1 [ ] Dry
2 [ ] Wet
3 [ ] Ice covered
4 [ ] Snow—dry
5 [ ] Snow—wet
6 [ ] Snow—crusted
7 [ ] Snow—compacted
8 [ ] Vegetation
9 [ ] Water—calm
10 [ ] Water—choppy
11 [ ] Water—glassy
12 [ ] Rubber deposits
13 [ ] Soft
14 [ ] Rough
15 [ ] Slush covered
16 [ ] Holes
A Other

If accident occurred during approach, departure or on airport, see instructions for completing Supplement Q.

Aircraft Information

39 Aircraft Manufacturer

40 Aircraft Model/Series

41 Serial No.
A Other

42 Certificated Maximum Gross Weight
A Other

43 Type of Aircraft
1 [ ] Airplane
2 [ ] Helicopter
3 [ ] Glider
4 [ ] Balloon
5 [ ] Blimp/dirigible
6 [ ] Ultralight
7 [ ] Gyroplane
A Specify

44 Type Airworthiness Certificate *(Multiple entry)*
Standard
1 [ ] Normal
2 [ ] Utility
3 [ ] Acrobatic
4 [ ] Transport
Special
5 [ ] Restricted
6 [ ] Limited
7 [ ] Provisional
8 [ ] Special flight
9 [ ] Experimental
A Other

45 Home Built
1 [ ] Yes
2 [ ] No
A Other

National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB Accident/Incident Number

Aircraft Information *(continued)*

46 Landing Gear *(Multiple entry)*

1 Tricycle—fixed
2 Tricycle—retractable
3 Tailwheel—all fixed
4 Tailwheel—all retractable
5 Tailwheel—retractable mains
6 Amphibian
7 Hull
8 Float
9 Emerg. float
10 Ski
11 Ski/wheel
12 Skid
13 High Skid
A Other

48 No. of Seats
A Other

49 Stall Warning System Installed
1 Yes
2 No
A Other

50 IFR Equipped
1 Yes
2 No
A Other

51 Icing Certification/Equipped *(Multiple entry)*
1 Certified
2 Not Certified
3 Equipped
4 Not Equipped
A Other

52 Engine Type
1 Reciprocating—carburetor
2 Reciprocating—fuel injected
3 Turbo prop
4 Turbo jet
5 Turbo fan
6 Turbo shaft
A Other

If not Engine powered go to block 59

53 Engine Manufacturer

54 Engine Model and Series

55 Engine Rated Power
A ..... Horsepower
B ..... Lbs Thrust
C Other

56 Number of Engines
A Other

If 3 or more engines enter times in Supp. C

Engine Time (Hours)	A Total Time	B Time Since Inspection	C Time Since Major Overhaul	D Other
57 Engine No. 1				
58 Engine No. 2				

59 Type Maintenance Program
1 Annual
2 Manufacturer's Inspection Program
3 Other approved inspection program (AAIP)
4 Continuous airworthiness
A Other

60 Type of Last Inspection
1 Annual
2 100 hour
3 AAIP
4 Continuous airworthiness
A Other

61 Date Last Inspection Performed *(Nos. for M. D. Y.)*
A Other

62 Time Since Inspection
..... Hours
A Other

63 Airframe Total Time
..... Hours
A Other

64 Source of Maintenance Information
1 Tach
2 Flight
3 Hobbs
4 Logbooks/Records
5 Estimate
6 Pilot/Operator Report
A Other

65 Hazardous Materials on Aircraft
1 No
A *(Type)*
B Other

66 Hazardous Material Spill Factor
1 Yes
2 No
A Other

Emergency Locator Transmitter (ELT)	1 Yes	2 No	A Other
67 Installed			
68 Required			
69 Operated			
70 Aided in location of accident site			

Owner/Operator Information

71 Registered Aircraft Owner
Name

72 Address

73 Operator of Aircraft 1 Same as registered owner
A Name
B dba
C Other

74 Address 1 Same as registered owner
A
B Other

75 Operator Certificate No.
A Other

76 Operator Designator Code

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB Accident/Incident Number

Owner/Operator Information *(continued)*

77 Operator Status of This Aircraft
1 Owner
2 Lessee
3 Renter
4 Borrower
5 Unauthorized
A Other

78 Pilot Status of This Aircraft
1 Owner
2 Lessee
3 Renter
4 Borrower
5 Unauthorized
6 Employee
A Other

Type of Certificate(s) Held

79 None *(Go to block 83)*

80 Air Carrier Operating Certificate *(Check all applicable)*
1 Flag carrier/domestic (121)
2 Supplemental
3 All cargo (418)
4 Large helicopter (127)
5 Commuter air carrier
6 On-demand air taxi

81 Operating Certificate
Other operator of large aircraft

82 Operator Certificate
1 Rotorcraft—external load operator (133)
2 Agricultural aircraft (137)

Regulation Flight Conducted Under

83 Regulation Flight Conducted Under
1 14 CFR 91 *(only)*
2 14 CFR 91D
3 14 CFR 103
4 14 CFR 105
5 14 CFR 121
6 14 CFR 125
7 14 CFR 127
8 14 CFR 133
9 14 CFR 135
10 14 CFR 137
11 14 CFR 129 *(Foreign flag)*
A Specify

Type of Flight Operation Conducted

*(Complete 84a, b, c **ONLY** if flight was a revenue operation conducted under 121, 125, 127, 129, 135)*

84a
1 Scheduled
2 Non-scheduled

84b
1 Domestic
2 International

84c
1 Passenger
2 Cargo
3 Passenger/cargo
4 Mail contract ONLY

*(Complete 86 **ONLY** if 84a, b, c is not applicable)*

86
1 Personal
2 Business
3 Instructional *(including air carrier training)*
4 Executive/corporate
5 Aerial application
6 Aerial observation
7 Other work use
8 Public use
9 Ferry
10 Positioning
A Specify

First Pilot Information

87 Name *(Last, First, Initial)*
A Other

88 Pilot Certificate No.
A Other

89 Street Address
A Other

90 City
A Other

91 State

92 Date of Birth *(Nos. for M, D, Y)*
A Other

93 Age
Yrs
A Other

94 Sex
1 Male
2 Female

95 Seat Occupied
1 Left
2 Right
3 Center
4 Front
5 Rear
A Other

96 Principal Profession
1 Pilot—civilian
2 Pilot—military
3 Other—military
4 Aircraft mechanic
5 Business
6 Lawyer
7 Doctor/dentist
8 Police
9 Student
10 Clergy
11 Teacher
12 Engineer
13 Farmer/rancher
14 Retired
A Other

97 Certificate(s) *(Multiple entry)*
1 Student
2 Private
3 Commercial
4 Airline Transport
5 Flight Instructor
6 Flight Engineer
7 Military
8 None
9 Foreign
A Other

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB Accident Incident Number

First Pilot Information *(continued)* *(Multiple entry - blocks 98-102)*

98 Ratings—Airplane
1 None
2 Single engine land
3 Multiengine land
4 Single engine sea
5 Multiengine sea

99 Rotorcraft/Glider/LTA
1 None
2 Helicopter
3 Gyroplane
4 Airship
5 Free balloon
6 Glider

100 Instrument Rating
1 None
2 Airplane
3 Helicopter

101 Instructor Rating(s)
1 None
2 Airplane SE
3 Airplane ME
4 Helicopter
5 Gyroplane
6 Glider
7 Instrument plane
8 Instrument helicopter

102 Ground Instructor
1 None
2 Basic
3 Advanced
4 Instrument

103 Type Rating Endorsement This Aircraft
1 Yes
2 No *(Go to block 105)*
A Other

104 Months Since Check/Endorsement This Aircraft
Months
A Other

105 Biennial Flight Review *(Or equivalent)*
1 Yes
2 No
A Other

106 Months Since Last BFR
Months
A Other

107 BFR *(or equivalent)* **Aircraft Make/Model**
A Make
B Model
C Other

108 Medical Certificate
1 None
2 Class 1
3 Class 2
4 Class 3
A Other

109 Medical Certificate Validity
1 Valid medical—no waivers/limitations
2 Valid medical—with waivers/limitations
3 Non valid medical for this flight
4 Expired
5 No medical certificate
A Other

110 Date of Last Medical *(Nos. for M D Y)*
A Other

111 Medical limitation
1 None
2 Vision
A Hearing
B Other

112 Medical waiver
1 None
2 Vision
3 Hearing
A Specify
B Other

113 Statement of Demonstrated Ability
1 Yes
2 No
A Other

114 Correcting Lenses *(Multiple entry)*
1 Not required
2 Required to be in possession
3 Required, not in possession
4 Required to be worn
5 Required, not worn
6 Worn at time of accident
A Other

115 Source of Pilot Flight Time *(Multiple entry)*
1 Pilot log
2 Company
3 FAA
4 Pilot/Operator Report
5 Investigator's Estimate
6 Relative
7 Other Person
A Other

Flight Time	A All A/C	B This Make & Model	C Airplane Single Engine	D Airplane Multiengine	E Night	F Instrument Actual	G Instrument Simulated	H Rotorcraft	I Glider	J Lighter Than Air	K Other
125 Total Time											
126 Pilot in Command (PIC)											
127 Instructor											
128 This Make/Model											
129 Last 90 Days											
130 Last 30 Days											
131 Last 24 Hours											

132 Landings—Last 90 Days All Aircraft
Day
A Other

133 Landings—Last 90 Days All Aircraft
Night
A Other

134 Landings—Last 90 Days This Make/Model
Day
A Other

135 Landings—Last 90 Days This Make/Model
Night
A Other

136 Seatbelt Available
1 Yes
2 No
A Other

137 Seatbelt Used
1 Yes
2 No
A Other

138 Shoulder Harness Available
1 Yes
2 No
A Other

139 Shoulder Harness Used
1 Yes
2 No
A Other

140 Autopsy Performed *(This pilot)*
1 Yes
2 No
A Other

141 Toxicology Performed *(This pilot)*
1 Yes
2 No
A Other

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB Accident/Incident Number

Pilot Information (continued)

142 Person at Controls
1 Pilot in command
2 Second pilot
3 Both pilots
4 Non-pilot
5 No one
A Other

143 Simulated Instrument Flight
1 Yes
2 No
A Other

144 Vision Restricting Device Used
1 Yes
2 No
A Other

145 Second Pilot
1 Yes *(Complete second pilot supplement)*
2 No

Flight Itinerary Information

155 Last Departure Point *(Multiple entry)*
1 Same as accident/incident location or
A Airport identifier _____
B City/Place _____
C State
D Other

156 Time of Departure
A Time _____
B Time Zone _____
C Other

157 Destination *(Multiple entry)*
1 Same as accident/incident location or
2 Local flight
A Airport identifier _____
B City/Place _____
C State _____
D Other

158 Flight Plan Filed *(Multiple entry)*
1 None
2 Visual Flight Rules (VFR)
3 Instrument Flight Rules (IFR)
4 VFR/IFR
5 Company (VFR)
6 Military (VFR)
A Other

159 Type of Clearance
1 None
2 VFR
3 Special VFR
4 IFR
5 Special IFR
6 VFR on top
7 Cruise
8 Traffic Advisory
9 VFR Flight Following
A Other

160 Airspace
1 Uncontrolled
2 Controlled
3 Airport traffic area
4 Control zone
5 Airport advisory area
6 Positive control area
7 Terminal control area
8 Stage II TRSA
9 Stage III TRSA
10 Prohibited area
11 Restricted area
12 Military Operating Area (MOA)
13 Student Jet Training Area
14 Demo Area
15 Warning area
16 FAR 93 (Special air traffic areas)
A Other

161 Control Area
1 None
2 Victor airway
3 Jet airway
4 Control airway
5 Colored airway
A Other

162 Route
1 None
2 Standard instrument departure
3 Standard terminal arrival
4 RNAV/OMEGA/LORAN INS
5 Direct
6 Profile Descent
7 VR route (military)
8 IR route (military)
9 SR route (military)
10 Refueling route (military)
A Other

163 Last Two Way Communications Established
1 None
2 Yes
A Facility Identifier _____
B Other

Aircraft Loading Information

164 Fuel on Board at Takeoff *(Multiple entry)*
1 Estimated
2 Verified
A Gallons or
B Pounds
C Other

165 Fuel Types *(Multiple entry)*
1 80/87
2 100 low lead
3 100/130
4 115/145
5 Kerosene
6 JP 3, 4, 5, 6
7 Jet A
8 Jet B
9 Mixture
10 Automotive
11 Anti-ice additive added *(if known)*
A Other

166 Aircraft Weight at Takeoff *(Multiple entry)*
1 At or below max cert gross takeoff weight
2 Above max certified gross takeoff weight
3 Estimated
4 Verified
A Other

167 Aircraft CG at Takeoff *(Multiple entry)*
1 Within limits
2 Exceeded fwd limit
3 Exceeded aft limit
4 Exceeded lateral limit
5 Estimated
6 Verified
A Other

168 Aircraft Weight at Accident *(Multiple entry)*
1 Same as takeoff
2 At or below max cert gross takeoff weight
3 Above max certified gross takeoff weight
4 Estimated
5 Verified
A Other

169 Aircraft CG at Accident *(Multiple entry)*
1 Same as takeoff
2 Within limits
3 Exceeded fwd limit
4 Exceeded aft limit
5 Exceeded lateral limit
6 Estimated
7 Verified
A Other

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB Accident/Incident Number

Aircraft Loading Information *(continued)*

170 Load Description *(Multiple entry)*

1 None
2 Passengers
3 Cargo
4 Towing glider
5 Towing banner
6 Other external
7 Parachutists
8 Water
9 Chemical
10 Livestock
11 Illegal cargo
A Other

Weather Information

180 Source of Weather Briefing *(Multiple entry)*

1 No record of briefing *(Go to block 183)*
2 National Weather Service (NWS)
3 Flight Service Station
4 PATWAS (Pilot Automated Tel WX Answering Svc)
5 VRS (Voice Response System)
6 Company
7 Commercial weather service
8 TV radio weather
9 Military
A Other

181 Method of Briefing *(Multiple entry)*

1 In person
2 Teletype
3 Telephone
4 Aircraft radio
5 TV radio
A Other

182 Completeness of Weather briefing

1 Weather not pertinent
2 Full
3 Partial—limited by pilot
4 Partial—limited by briefer forecaster
A Other

183 Investigator's Source of Weather Information

1 Pilot *(Go to block 185)*
2 Witness *(Go to block 185)*
3 Weather observation facility

184 Weather Observation Facility

A Identifier
B Time of observation zone
C Elevation feet MSL
D Distance from accident site NM
E Direction from accident site magnetic

185 Basic Weather Conditions at Accident Site

1 Visual Meteorological Conditions (VMC)
2 Instrument Meteorological Conditions (IMC)
A Other

186 Conditions of Light

1 Dawn
2 Daylight
3 Night (Dark)
4 Night (Bright)
5 Dusk
A Other

187 Sky/Lowest/Cloud Condition

1 Clear
2 Scattered
3 Thin broken
4 Thin overcast
5 Partial obscuration
A Feet AGL
B Other

188 Lowest Ceiling

1 None
2 Broken
3 Overcast
4 Obscured
A Feet AGL
B Other

189 Visibility *(decimals)*

A SM
B RVR Feet
C RVV SM
D Other

190 Temperature

F
A Other

191 Dew Point

F
A Other

192 Wind (From)

1 Variable
A Magnetic
B Other

193 Wind Speed

1 Calm
2 Light and Variable
A Kts
B Other

194 Gusts

1 None
A Kts
B Other

195 Altimeter Setting

"Hg
A Other

196 Density Altitude

Feet
A Other

197 Restrictions to Visibility

1 None
2 Haze (H)
3 Dust (D)
4 Smoke (K)
5 Fog (F)
6 Ice fog (IF)
7 Ground fog (GF)
8 Blowing spray (BY)
9 Blowing dust (BD)
10 Blowing snow (BS)
11 Blowing sand (BN)
A Other

198 Type of Precipitation

1 None *(Go to block 200)*
2 Rain (R)
3 Snow (S)
4 Hail (A)
5 Rain showers (RW)
6 Freezing rain (ZR)
7 Snow shower (SW)
8 Drizzle (L)
9 Ice pellets (IP)
10 Snow pellets (SP)
11 Snow grains (SG)
12 Freezing drizzle (ZL)
13 Ice crystals (IC)
14 Ice pellet shower (IPW)
A Other

199 Intensity of Precipitation

1 Light
2 Moderate
3 Heavy
A Other

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB Accident/Incident Number

Accident Information

200 Aircraft Damage
1 None
2 Minor
3 Substantial
4 Destroyed

201 Aircraft Fire
1 None
2 In-flight
3 On ground
A Other

202 Explosion
1 None
2 In-flight
3 On ground
A Other

203 Damage to Property
1 None
2 Residence
3 Residential area
4 Commercial bldg
5 Vehicle(s)
6 Airport facility
7 Trees
8 Crops
9 Fence
10 Wires poles
11 Other property

204 Injury Index (Most critical injury)
1 None 2 Minor 3 Serious 4 Fatal

Injury Summary (Enter only one digit per block)	A Fatal	B Serious	C Minor	D None	E Total
205 First Pilot					
206 Co-pilot					
207 Dual Student					
208 Check Pilot					
209 Flight Engineer					
210 Cabin Attendants					
211 Other Crew					
212 Passengers					
213 TOTAL ABOARD					
214 Other Aircraft					
215 Other Ground					
216 GRAND TOTAL					

217 Classification
1 U.S. Registered Aircraft on U.S. Soil Territories and Possessions, or International Waters
2 U.S. Registered Aircraft on Foreign Soil
3 U.S. Registered Aircraft operated by a Foreign Operator
4 Foreign Registered Aircraft on U.S. Soil Territories or Possessions
5 Military Aircraft
6 Aircraft not Registered

Part Failure/Incorrect Part

220 Part Failure/Malfunction (Multiple entry)
1 None
2 Part component #1
3 Part component #2
4 Part component #3
A Other

221 Incorrect Part (Multiple entry)
1 None
2 Part component #1
3 Part component #2
4 Part component #3
A Other

	A Part/Component #1	B Part/Component #2	C Part/Component #3
222 Part Name			
223 ATA Code			
224 Manufacturer			
225 Mfg. Part #			
226 Mfg. Model #			
227 Serial #			
228 Part Condition			
229 Total Time			
230 TSO			
231 TSI			
232 Cycles Total			
233 Cycles Since Overhaul			
234 Cycles Since Inspection			
235 Service Difficulty Report or Malfunction/Defect Report Submitted	1 Yes 2 No	1 Yes 2 No	1 Yes 2 No
236 Bogus Part	1 Yes 2 No	1 Yes 2 No	1 Yes 2 No

END FILMED

DATE:
11-17-93

NTIS