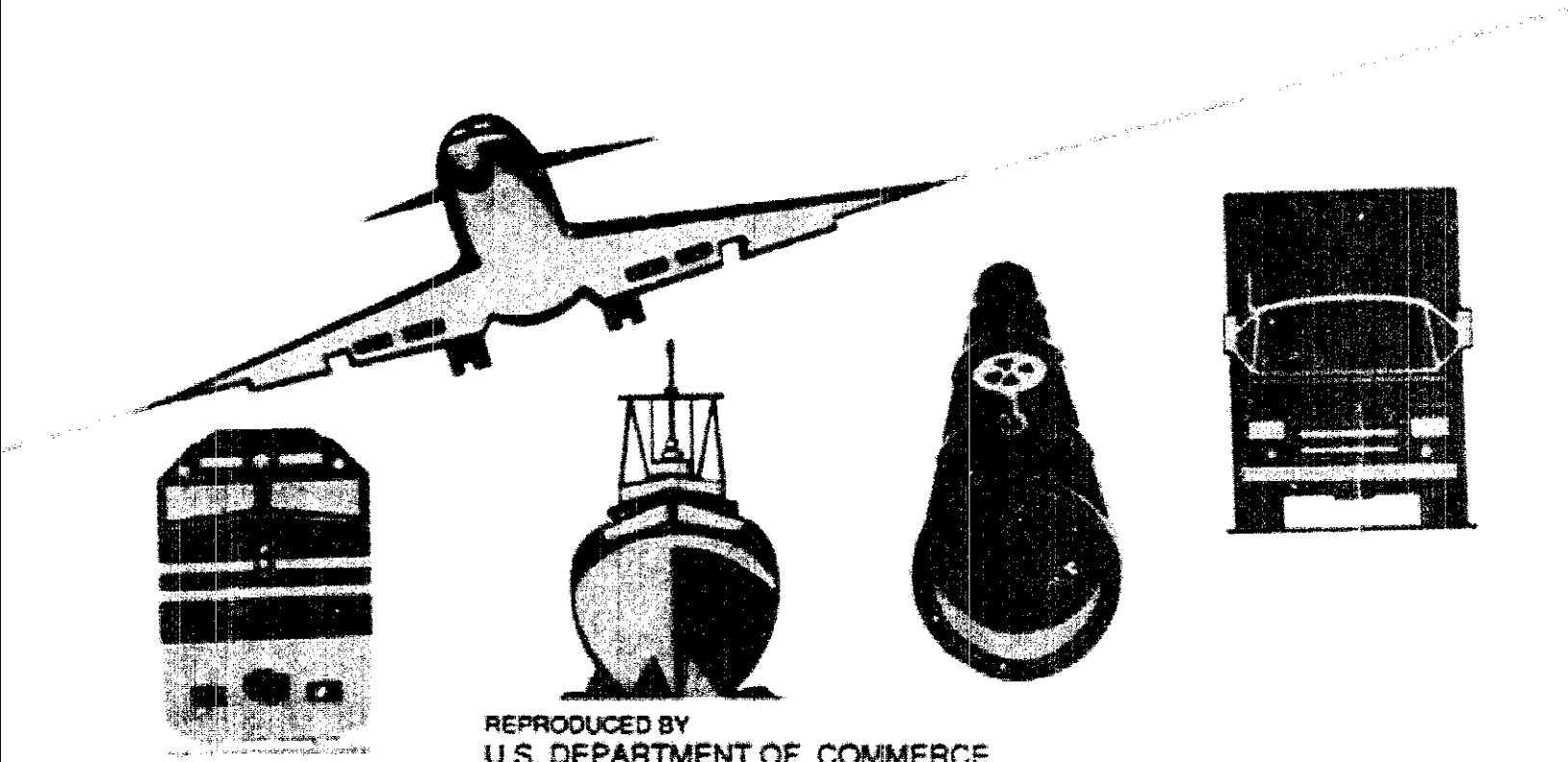
NTSB/ARC-90/01

NATIONAL TRANSPORTATION SAFETY BOARD

ANNUAL REVIEW OF AIRCRAFT ACCIDENT DATA

U.S. AIR CARRIER OPERATIONS CALENDAR YEAR 1987



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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 1987.

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 1987 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 1987. The accidents reported are all those involving U.S. registered aircraft conducting operations under Title 14 CFR Parts 121, 125, 127, and 135.

Briefly stated, Part 121 applies to large commercial air carriers such as major airlines and cargo haulers. 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.

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.

This 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 1987 and for the 4 preceding years. Several tables then present accident parameters for 1987 only. Each section concludes with tabulations that present comparative statistics for 1987 and for the 5-year period 1982-86.

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.

There were 36 accidents in Part 121, 125, and 127 operations in 1987, the highest number in the eleven year period reported in Table 14. The overall accident rate for 1987 was 0.332 per 100,000 hours flown, a 43.1 percent increase over the 1986 rate of 0.232. The 1987 rate was also 9.21 percent higher than the overall rate of 0.304 for the period from 1977 through 1986.

There were five fatal accidents in this category during 1987, in which 232 fatalities resulted. The most serious of these accidents involved a McDonnell Douglas DC-9 in Romulus, Michigan (156 fatalities); and a British Aerospace BAe-146-200 in San Luis Obispo, California (43 fatalilties) the result of a criminal act.

Table 1 - SUMMARY OF LOSSES
14 CFR 121, 125, 127 OPERATIONS
1983 - 1987

	1983	1984	1985	1986	1987
Accidents					
Fatal	4	1	7	3	5
Involved Serious Injury	11	10	8	15	12
Involved Minor or No Injury	9	6	7	6	19
Total	24	17	22	24	36
Fatalities					
Passenger	8	1	486	0	212
Crew	6	3	39	7	17
Other Persons	1	0	1	1	3
Total	15	4	526	8	232
Aircraft Damaged (14 CFR 121, 125, 127)					
Destroyed	2	2	9	2	5
Substantial	13	8	8	8	17
Minor	3	2	0	4	4
None	6	5	5	10	12
Total	24	17	22	24	38

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

	1983	1984	1985	1986	1987
Aircraft Miles Flown (Thousands)	3,069,318	3,428,063	3,631,017	4,053,726	4,334,532
Aircraft Hours Flown	7,298,799	8,165,124	8,709,894	9,918,189	10,534,200
Departures Flown	5,444,374	5,898,852	6,306,759	7,247,400	7,503,968
Accident Rates *					
Per Million Miles Flown	0.0078	0.0050	0.0061	0.0057	0.0081
Per Hundred Thousand Hours Flown	0.329	0.208	0.253	0.232	0.332
Per Hundred Thousand Departures Flown	0.441	0.288	0.349	0.317	0.466
Fatal Accident Rates *					
Per Million Miles Flown	0.0013	0.0003	0.0019	0.0005	0.0009
Per Hundred Thousand Hours Flown	0.055	0.012	0.080	0.020	0.038
Per Hundred Thousand Departures Flown	0.073	0.017	0.111	0.028	0.053

* The 12/7/87 suicide/sabotage involving a PSA BAe-146 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
1987

Date	Location	Type of Operation	Air Carrier	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
2/11	Detroit, MI	Sch Pax + Cargo	United	Boeing 747-122	None	Serious	Miscellaneous/other
2/14	Durango, MX	Nonsch. Pax	Ports of Call	Boeing 707	None	Fatal (1)	Not reported
2/25	Los Angeles, CA	Sch Passenger	Continental	Boeing 727-224	None	None	In flight collision with object
2/27	Fresno, CA	Sch Passenger	Pacific SW	BAE 146-200A	Substantial	None	Loss of power(total) - mech failure/malfunction
3/10	Burlington, VT	Sch Passenger	Us Air	Boeing 727	Substantial	None	On ground collision with object
3/13	Calgary, CO	Sch Passenger	Western	Boeing 727	Substantial	None	Not reported
3/16	Midland, TX	Sch Passenger	Southwest	Boeing 737-300	None	Serious	In flight encounter with weather
3/24	Dallas, TX	Sch Passenger	Metro Flight	Convair CV-580	Substantial	None	On ground encounter with weather
3/25	Chicago, IL	Sch Pax + Cargo	American	McD-Doug DC-10-10	None	Serious	Airframe/component/system failure/malfunction
3/29	Indianapolis, IN	Sch Pax + Cargo	Eastern	Airbus A300B4-203	None	Serious	In flight encounter with weather
4/01	Miami, FL	Sch Pax + Cargo	Piedmont	Boeing 727-295	None	Serious	Miscellaneous/other
4/10	Honolulu, HI	Sch Passenger	Mid Pacific	Nihon YS-11A	None	Serious	Airframe/component/system failure/malfunction
4/13	Kansas City, MO	Sch Cargo	Buffalo	Boeing 707-351C	Destroyed	Fatal (4)	In flight collision with terrain
4/30	Oklahoma City, OK	Sch Cargo	Buffalo	Boeing 707-323C	Substantial	Minor	On ground collision with object
5/03	Ft. Lauderdale, FL	Nonsch Cargo	Florida Leas.	McD-Doug DC-6A	Substantial	None	Airframe/component/system failure/malfunction
6/22	Los Angeles, CA	Sch Pax + Cargo	America West	Boeing 737-277	Substantial	None	On ground collision with object
6/22	Dayton, OH	Sch Passenger	Southern Air	Lockheed L-382-30	Substantial	None	Nose gear collapsed
7/28	Laredo, TX	Nonsch Cargo	Ferreteria	McD-Doug DC-3A	Substantial	None	Loss of power

Table 3 - LIST OF ACCIDENTS (Continued)
14 CFR 121, 125, 127 OPERATIONS
1987

Date	Location	Type of Operation	Air Carrier	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
8/16	Romulus, MI	Sch Passenger	Northwest	McD-Doug DC-9-82	Destroyed	Fatal (156)	In flight collision with object
8/20	Newburgh, NY	Sch Cargo Sch Cargo	Rosenbalm Airborne Ex.	McD-Doug DC-8-63 McD-Doug DC-9-31	Substantial Substantial	None None	On ground collision
8/25	Atlanta, GA	Sch Passenger	Delta	Lockheed L-1011	Substantial	None	Hard landing
9/15	Tulsa, OK	Sch Passenger	Eastern	Boeing 727	Substantial	None	In flight encounter with weather
9/17	Pittsburgh, PA	Sch Passenger	Usair	Boeing 727-200	None	Serious	In flight encounter with weather
9/18	Philadelphia, PA	Sch Pax + Cargo	Usair	Boeing 737	None	Serious	In flight encounter with weather
9/28	Bermuda	Sch Pax + Cargo	Eastern	Lockheed L-1011	Minor	Serious	In flight encounter with weather
10/04	Los Angeles, CA	Sch Pax + Cargo	Piedmont	Boeing 767-201	Substantial	None	In flight collision with terrain
10/28	Bartlesville, OK	Nonsch Cargo	SMB Stage	Convair 640(3400)	Destroyed	Minor	Loss of power(total) - non-mechanical
11/10	Raleigh, NC	Sch Passenger	Delta	Boeing 737-232	None	Serious	In flight encounter with weather
11/11	Atlantic Ocean	Sch Passenger	Pan American	Airbus A310	Minor	Serious	In flight encounter with weather
11/15	Denver, CO	Sch Passenger	Continental	McD-Doug. DC-9-14	Destroyed	Fatal (28)	Loss of control - initial climb
11/25	Los Angeles, CA	Sch Passenger	Usair	Boeing 737-387	None	Serious	Miscellaneous/other
12/05	Deptford, NJ	Sch Pax + Cargo	Usair	Boeing 737-2B7	Substantial	None	Airframe/component/system failure/malfunction
12/07	San Luis Obispo, CA	Sch Pax + Cargo	Pacific SW	BAe 146-200	Destroyed	Fatal (43)	Suicide/sabotage
12/15	Kansas City, MO	Sch Pax + Cargo	Eastern	Boeing 727-225A	Minor	None	On ground collision with object
12/26	San Juan, PR	Sch Passenger Sch Passenger	American American	Boeing 727-200 Boeing 727-223	Substantial Minor	None None	On ground collision
12/27	Pensacola, FL	Sch Passenger	Eastern	McD-Doug DC-9-31	Substantial	Minor	Hard landing

Table 4 - ACCIDENTS AND RATES BY TYPE OF OPERATION *
14 CFR 121, 125, 127 OPERATIONS
1987

	Type of Operation				
	Scheduled				
	Passenger/ Cargo	All Cargo	All	All Non-Scheduled	All
Accidents	28	4	32	4	36
Fatal Accidents	3	1	4	1	5
Aircraft Miles Flown (Thousands)	3,980,630	123,112	4,103,742	230,790	4,334,532
Aircraft Hours Flown	n/a	n/a	10,015,784	518,416	10,534,200
Departures Flown	n/a	n/a	7,199,402	304,566	7,503,968
Accident Rates					
Per Million Miles Flown	0.0068	0.0325	0.0076	0.0173	0.0081
Per Hundred Thousand Hours Flown	n/a	n/a	0.310	0.772	0.332
Per Hundred Thousand Departures Flown	n/a	n/a	0.431	1.313	0.466
Fatal Accident Rates					
Per Million Miles Flown	0.0005	0.0081	0.0007	0.0043	0.0009
Per Hundred Thousand Hours Flown	n/a	n/a	0.030	0.193	0.038
Per Hundred Thousand Departures Flown	n/a	n/a	0.042	0.328	0.053

* The 12/7/87 suicide/sabotage involving a PSA BAe-146 is excluded from accident rate computations.

Table 5 - PERSONS BY ROLE AND DEGREE OF INJURY **
14 CFR 121 125 127 OPERATION
1987

	Degree of Injury				
Role of Person	Fatal	Serious	Minor	None	Total
Pilot	4	0	1	31	36
Copilot	4	0	1	31	36
Check pilot	0	0	0	1	1
Flight engineer	1	0	0	20	21
Cabin attendants	8	5	9	96	118
Other crew	0	1	1	3	5
Passenger	212	39	121	2412	2784
Total aboard	229	45	133	2594	3001
Other aircraft*	0	0	0	4	4
Other ground	3	1	5	0	8
Grand total	232	46	138	2598	3013
Percent	7.7	1.5	4.6	86.2	

* 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.

** Two foreign accidents (February 14 in Durango, MX and March 13, in Calgary, CD) are not included in Injury Table.

Table 6 - AIRCRAFT BY DAMAGE AND DEGREE OF INJURY
14 CFR 121 125 127 OPERATIONS
1987

Aircraft damage	Degree of injury: None	Minor	Ser	Fatal	Aircraft: No.	Percent
None	1	0	10	1	12	31.6
Minor	2	0	2	0	4	10.5
Substantial	15	2	0	0	17	44.7
Destroyed	0	1	0	4	5	13.2
Aircraft						
Number -	18	3	12	5	38	
Percent -	47.4	7.9	31.6	13.2		

Table 7 - AIRCRAFT BY FIRST OCCURRENCE AND DEGREE OF INJURY AND BY DAMAGE
14 CFR 121 125 127 OPERATIONS
1987

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	2	0	2	0	2	0	2	0	4	10.5
Nose gear collapsed	1	0	0	0	0	0	1	0	1	2.6
Hard landing	1	1	0	0	0	0	2	0	2	5.3
In flight collision with object	2	0	0	1	1	0	1	1	3	7.9
In flight collisionn with terrain	1	0	0	1	0	0	1	1	2	5.3
In flight encounter with weather	1	0	7	0	5	2	1	0	8	21.1
Loss of control - in flight	0	0	0	2	0	0	0	2	2	5.3
On ground collision with object	6	1	0	0	0	2	5	0	7	18.4
On ground encounter with weather	1	0	0	0	0	0	1	0	1	2.6
Loss of power	1	0	0	0	0	0	1	0	1	2.6
Loss of power(total) - mech failure/malfunction	1	0	0	0	0	0	1	0	1	2.6
Loss of power(total) - non-mechanical	0	1	0	0	0	0	0	1	1	2.6
Miscellaneous/other	0	0	3	0	3	0	0	0	3	7.9
Not reported	1	0	0	1	1	0	1	0	2	5.3
Aircraft										
Number -	18	3	12	5	12	4	17	5	38	
Percent -	47.4	7.9	31.6	13.2	31.6	10.5	44.7	13.2		

Table 8 - AIRCRAFT BY FIRST OCCURRENCE AND BROAD PHASE OF OPERATION
14 CFR 121 125 127
1987

Type of first occurrence	Phase of operation									Aircraft	
	Stndg	Taxi	Tkoff	Climb	Cruis	Dscnt	Aprch	Landg	Nrept	No.	Percent
Airframe/component/system failure/malfunction	0	0	2	1	0	0	0	1	0	4	10.5
Nose gear collapsed	0	0	0	0	0	0	0	1	0	1	2.6
Hard landing	0	0	0	0	0	0	0	2	0	2	5.3
In flight collision with object	0	0	2	0	0	0	0	1	0	3	7.9
In flight collision with terrain	0	0	0	0	0	0	1	1	0	2	5.3
In flight encounter with weather	0	0	0	0	5	2	0	1	0	8	21.1
Loss of control - in flight	0	0	1	0	1	0	0	0	0	2	5.3
On ground collision with object	2	4	1	0	0	0	0	0	0	7	18.4
On ground encounter with weather	0	0	1	0	0	0	0	0	0	1	2.6
Loss of power	0	0	1	0	0	0	0	0	0	1	2.6
Loss of power(total) - mech failure/malfunction	0	0	0	0	1	0	0	0	0	1	2.6
Loss of power(total) - non-mechanical	0	0	0	0	1	0	0	0	0	1	2.6
Miscellaneous/other	2	0	0	1	0	0	0	0	0	3	7.9
Not reported	0	0	0	0	0	0	0	0	2	2	5.3
Aircraft											
Number -	4	4	8	2	8	2	1	7	2	38	
Percent -	10.5	10.5	21.1	5.3	21.1	5.3	2.6	18.4	5.3		

Table 9 - AIRCRAFT BY PHASE OF OPERATION AND DEGREE OF INJURY AND BY DAMAGE
14 CFR 121 125 127 OPERATIONS
1987

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	2.6
Standing - engine(s) operating	1	0	0	0	0	1	0	0	1	2.6
Standing - engine(s) not operating	0	0	2	0	2	0	0	0	2	5.3
Taxi	0	1	0	0	0	0	1	0	1	2.6
Taxi - pushback/tow	1	0	0	0	0	0	1	0	1	2.6
Taxi - to takeoff	1	0	0	0	0	0	1	0	1	2.6
Taxi - from landing	1	0	0	0	0	0	1	0	1	2.6
Takeoff - ground run	2	0	1	0	1	1	1	0	3	7.9
Takeoff - initial climb	2	0	1	2	2	0	1	2	5	13.2
Climb - to cruise	1	0	1	0	1	0	1	0	2	5.3
Cruise - normal	1	1	4	1	2	2	1	2	7	18.4
Cruise - holding(IFR)	0	0	1	0	1	0	0	0	1	2.6
Descent - normal	0	0	2	0	2	0	0	0	2	5.3
Approach - FAF/outer marker to threshold (IFR)	0	0	0	1	0	0	0	1	1	2.6
Landing - flare/touchdown	4	1	0	0	0	0	5	0	5	13.2
Landing - roll	2	0	0	0	0	0	2	0	2	5.3
Not reported	1	0	0	1	1	0	1	0	2	5.3
Aircraft										
Number -	18	3	12	5	12	4	17	5	38	
Percent -	47.4	7.9	31.6	13.2	31.6	10.5	44.7	13.2		

Table 10 - AIRCRAFT BY CONDITION OF LIGHT AND TYPE OF WEATHER
14 CFR 121 125 127 OPERATIONS
1987

Condition of light	Type of weather: VMC	IMC	Not reptd	Aircraft: No.	Percent
Dawn	0	2	0	2	5.3
Daylight	17	1	0	18	47.4
Night (dark)	7	4	0	11	28.9
Night (bright)	3	0	0	3	7.9
Dusk	2	0	0	2	5.3
Not reported	0	0	2	2	5.3
Aircraft					
Number -	29	7	2	38	
Percent -	76.3	18.4	5.3		

Table 11 - AIRCRAFT BY TYPE OF OPERATION AND DEGREE OF INJURY
14 CFR 121, 125, 127 OPERATIONS
1987

Type of Operation	Degree of Injury: None	Minor	Serious	Fatal	Aircraft: No.	Percent
Scheduled Domestic Passenger	9	1	4	2	16	42.1
Scheduled Domestic Cargo	2	1	0	1	4	10.5
Scheduled Domestic Pass/Cargo	3	0	5	1	9	23.7
Scheduled International Pass.	1	0	2	0	3	7.9
Scheduled International Pass/Cargo	1	0	1	0	2	5.3
Nonscheduled Domestic Cargo	0	1	0	0	1	2.6
Nonscheduled International Pass.	0	0	0	1	1	2.6
Nonscheduled International Cargo	2	0	0	0	2	5.3
Aircraft						
Number -	18	3	12	5	38	
Percent -	47.4	7.9	31.6	13.2		

Table 12 - AIRCRAFT BY OCCURRENCE OF FIRE AND DEGREE OF INJURY AND BY DAMAGE
14 CFR 121, 125, 127 OPERATIONS
1987

Aircraft fire	Degree of injury: None	Minor	Ser	Fatal	Aircraft damage: None	Minor	Subs	Dest	Aircraft: No.	Percent
None	16	3	12	0	11	4	15	1	31	81.6
On ground	1	0	0	4	0	0	1	4	5	13.2
Other	1	0	0	1	1	0	1	0	2	5.3
Aircraft										
Number -	18	3	12	5	12	4	17	5	38	
Percent -	47.4	7.9	31.6	13.2	31.6	10.5	44.7	13.2		

Table 13 - BROAD CAUSE/FACTOR ASSIGNMENTS*
14 CFR 121 125 127 OPERATIONS
1987

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	10	2	6	2	14
Propulsion System and Controls	0	3	0	1	0	4
Landing Gear	0	2	0	1	0	3
Systems/Equipment/Instruments	0	5	2	5	2	9
Environment #	0	4	0	15	0	17
Weather	0	4	0	7	0	11
Light Conditions	0	0	0	5	0	5
Object(trees,wires,etc.)	0	0	0	4	0	4
Terrain/Runway Condition	0	0	0	2	0	2
Personnel #	4	28	2	19	4	32
Pilot	3	13	1	10	3	15
Others (Aboard)	1	8	0	1	1	9
Others (Not Aboard)	0	7	2	13	2	16
Number of Aircraft					5	38
NTSB Determined Probable Cause					4	36

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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
1977 - 1987

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
1977	24	5	655	398	6,039,707	0.397	0.083
1978	22	5	160	150	6,234,628	0.353	0.080
1979	29	5	354	351	6,878,911	0.422	0.073
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	9,918,189	0.232	0.020
1987	36	5	232	229	10,534,200	0.332	0.038

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

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

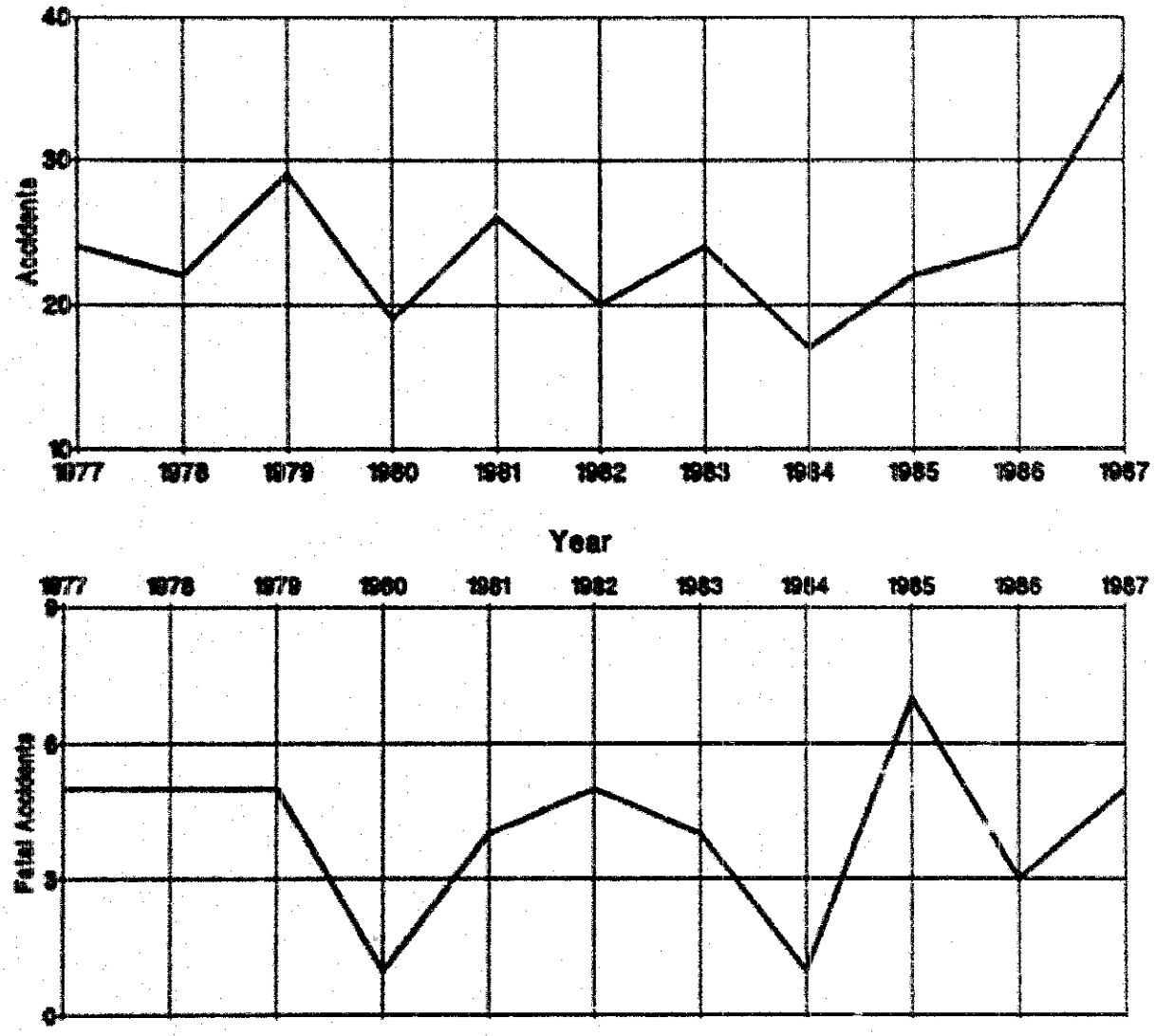


Figure 2 - NUMBER OF FATALITIES
ALL 14 CFR 121, 125, 127 OPERATIONS

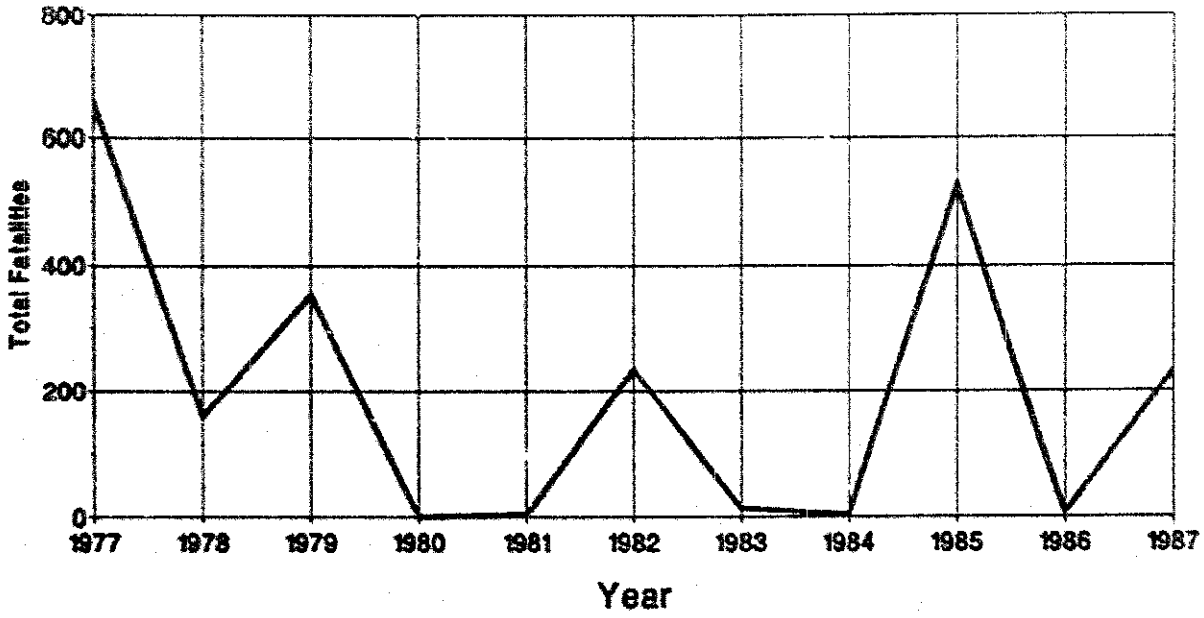


Figure 3 - ACCIDENTS PER 100,000 HOURS FLOWN
ALL 14 CFR 121, 125, 127 OPERATIONS

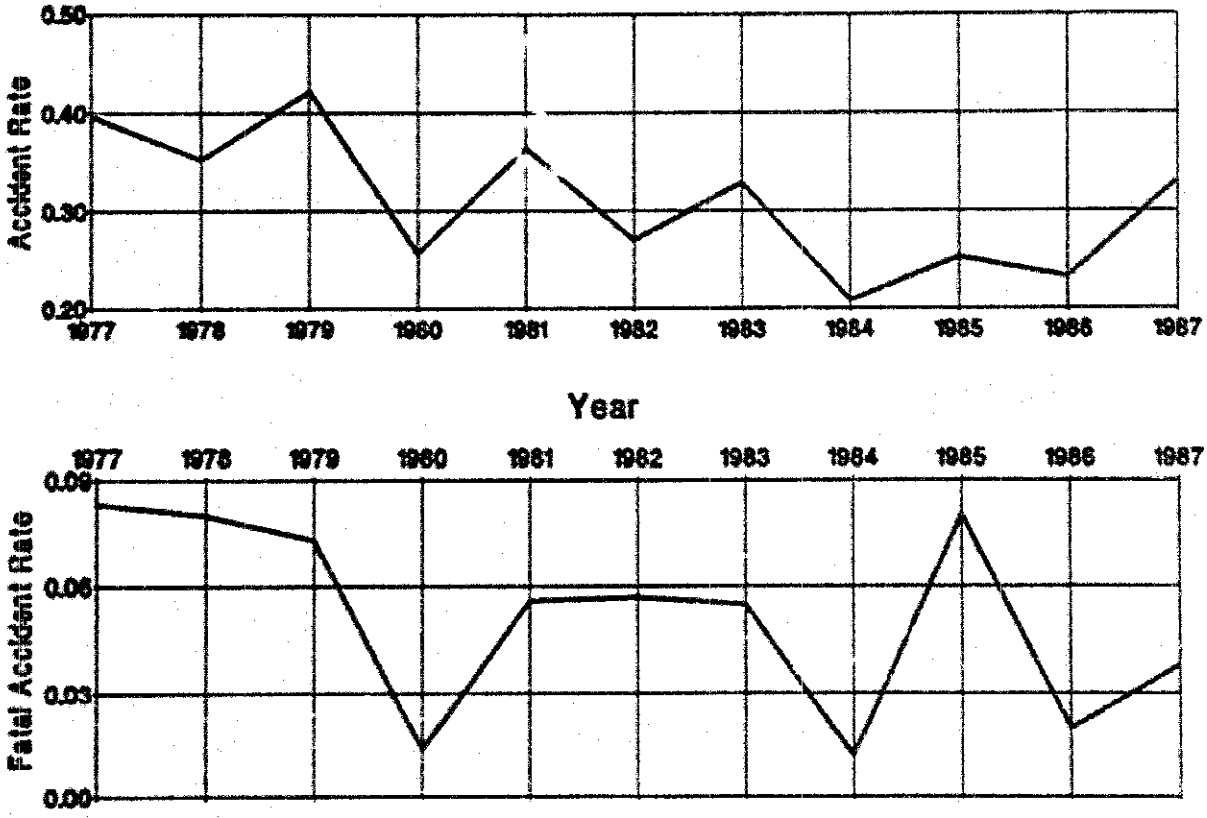


Table 15 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
SCHEDULED 14 CFR 121 125 127 OPERATIONS
1977 - 1987

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
1977	19	3	78	69	5,798,873	0.328	0.052
1978	20	5	160	150	6,031,743	0.332	0.083
1979	23	4	351	348	6,713,094	0.343	0.060
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	9,444,636	0.212	0.011
1987	32	4	231	229	10,015,784	0.310	0.030

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

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

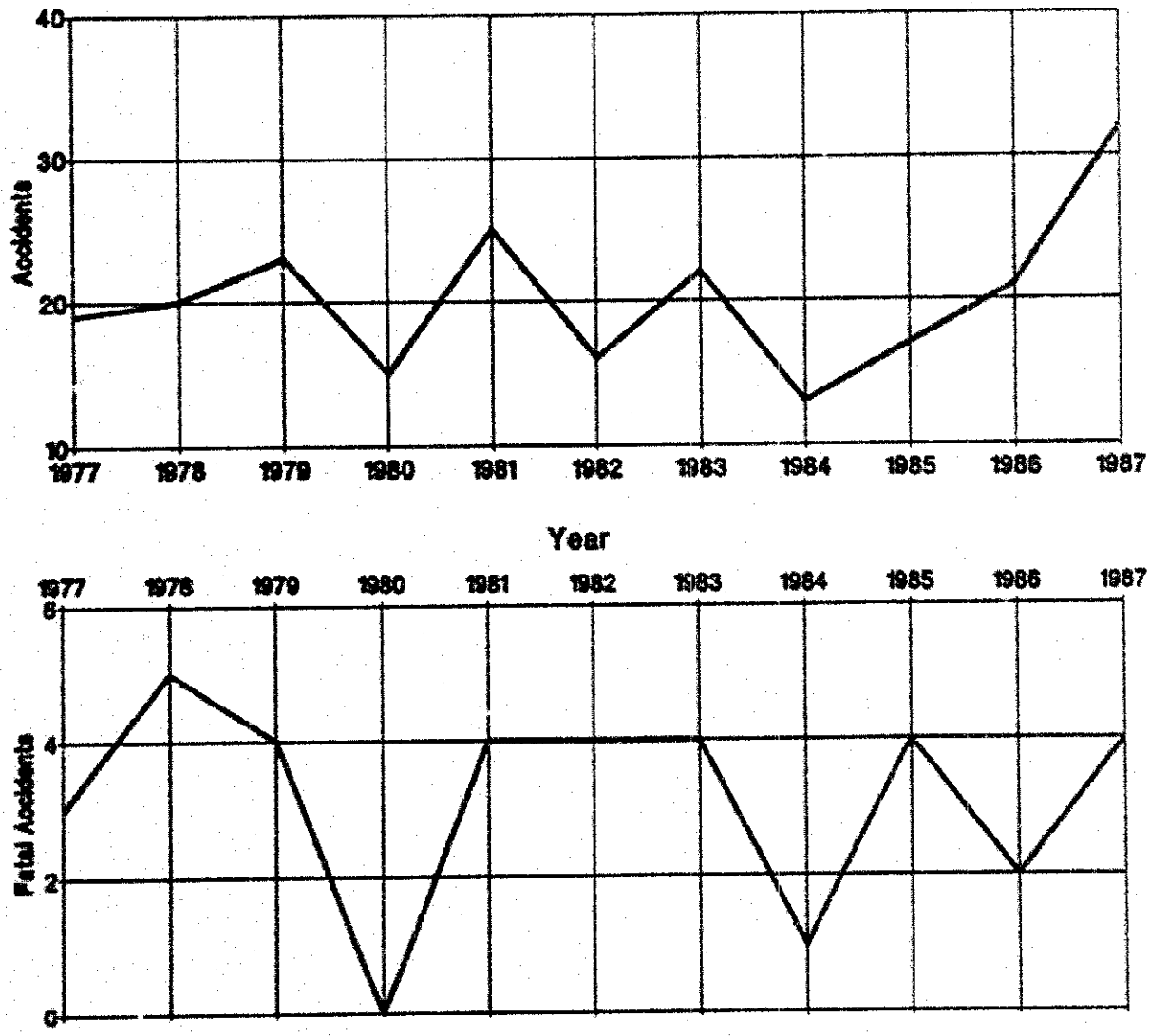


Figure 5 - NUMBER OF FATALITIES
SCHEDULED 14 CFR 121, 125, 127 OPERATIONS

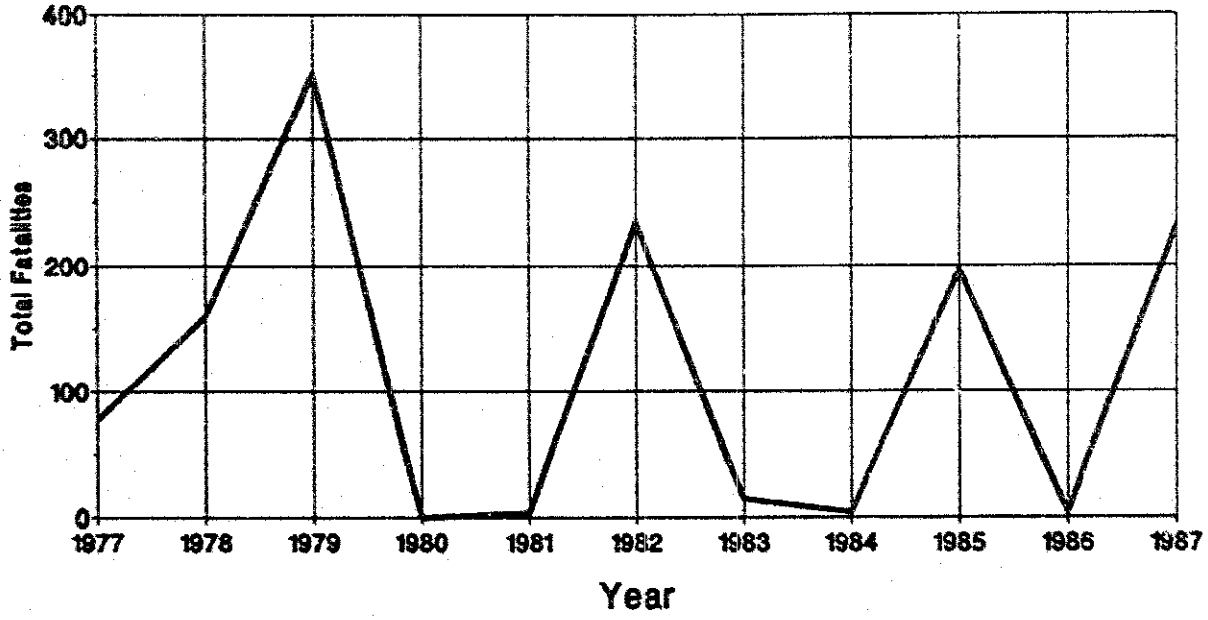


Figure 6 - ACCIDENTS PER 100,000 HOURS FLOWN
SCHEDULED CFR 121, 125, 127 OPERATIONS

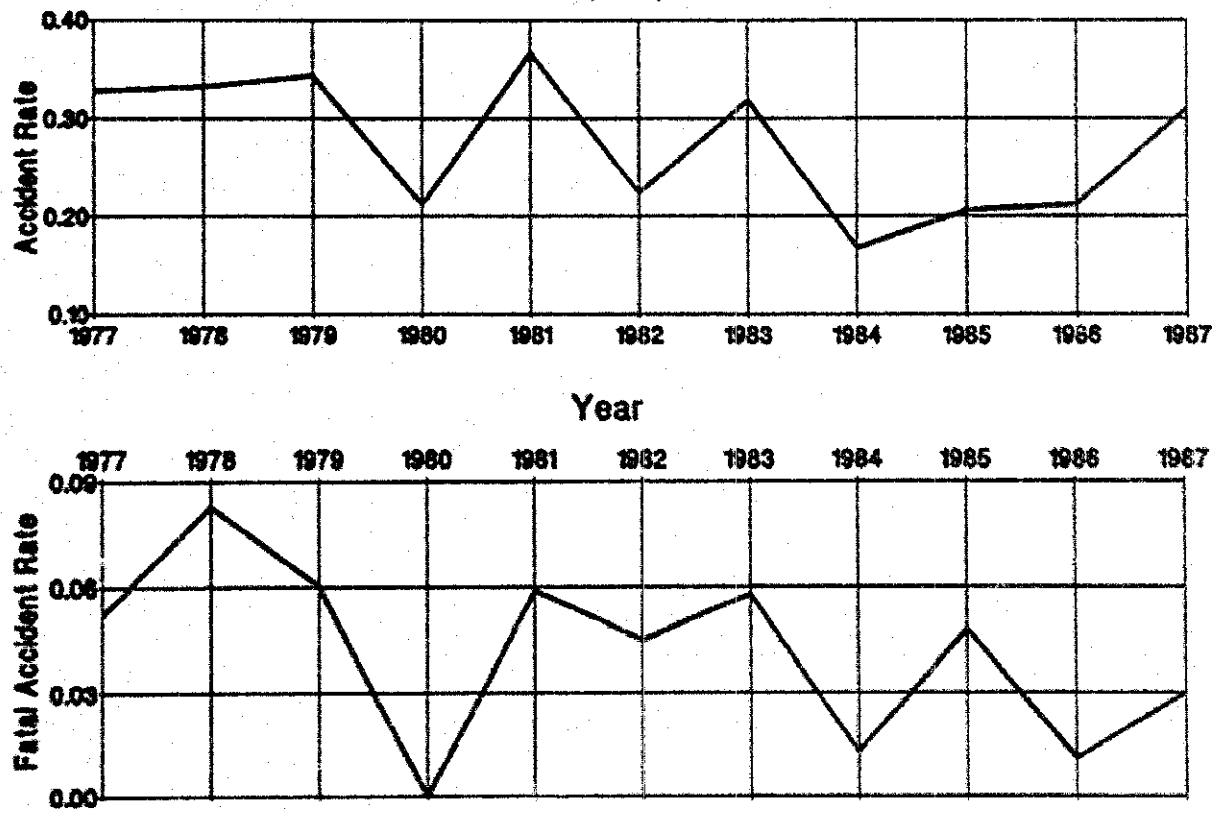


Table 16 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
NONSCHEDULED 14 CFR 121 125 127 OPERATIONS
1977 - 1987

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
1977	5	2	577	329	240,834	2.076	0.830
1978	2	0	0	0	202,883	0.986	0.000
1979	6	1	3	3	165,817	3.618	0.603
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	473,553	0.634	0.211
1987	4	1	1	1	518,416	0.772	0.193

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

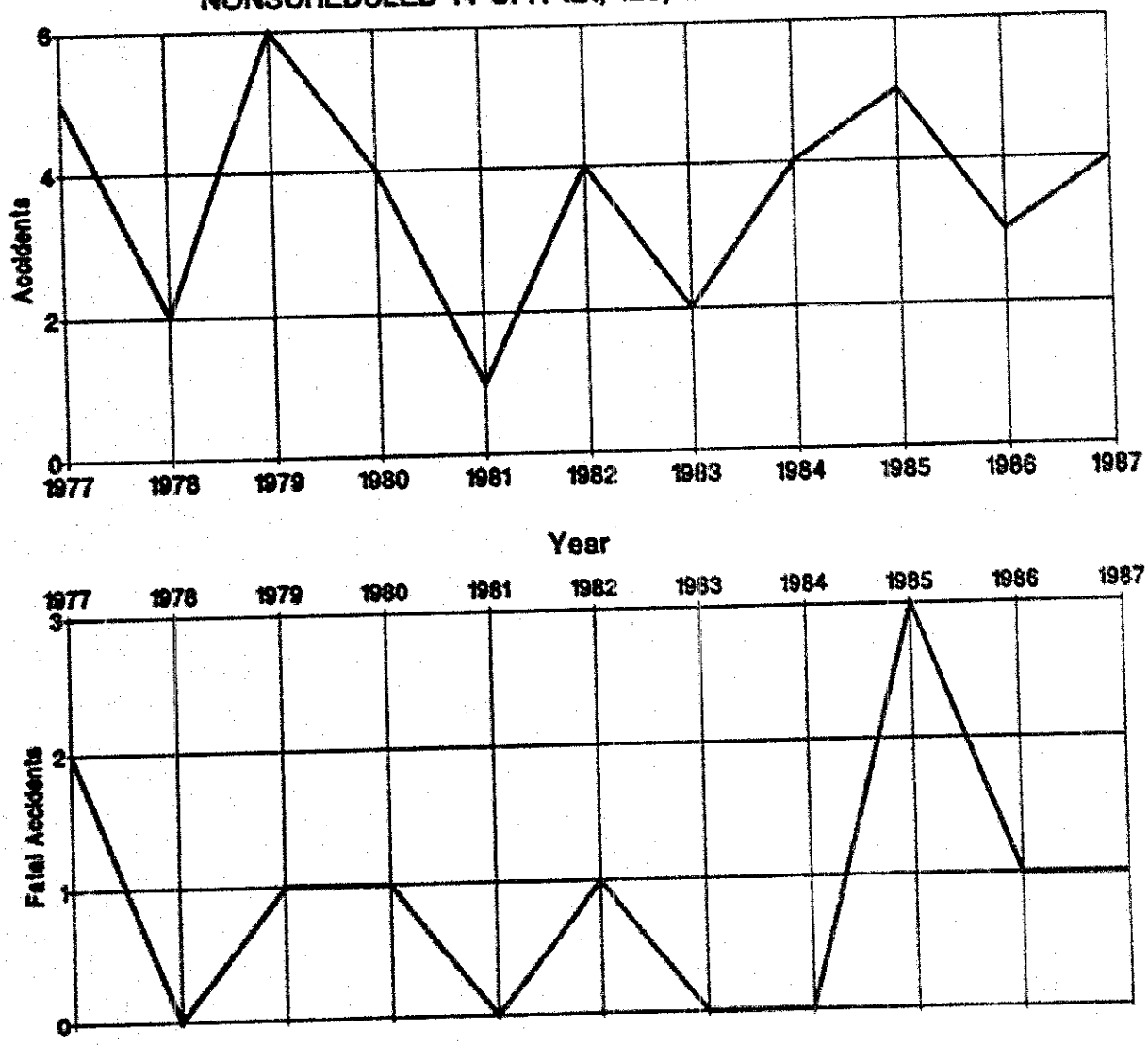


Figure 8 - NUMBER OF FATALITIES
NONSCHEDULED 121, 125, 127 OPERATIONS

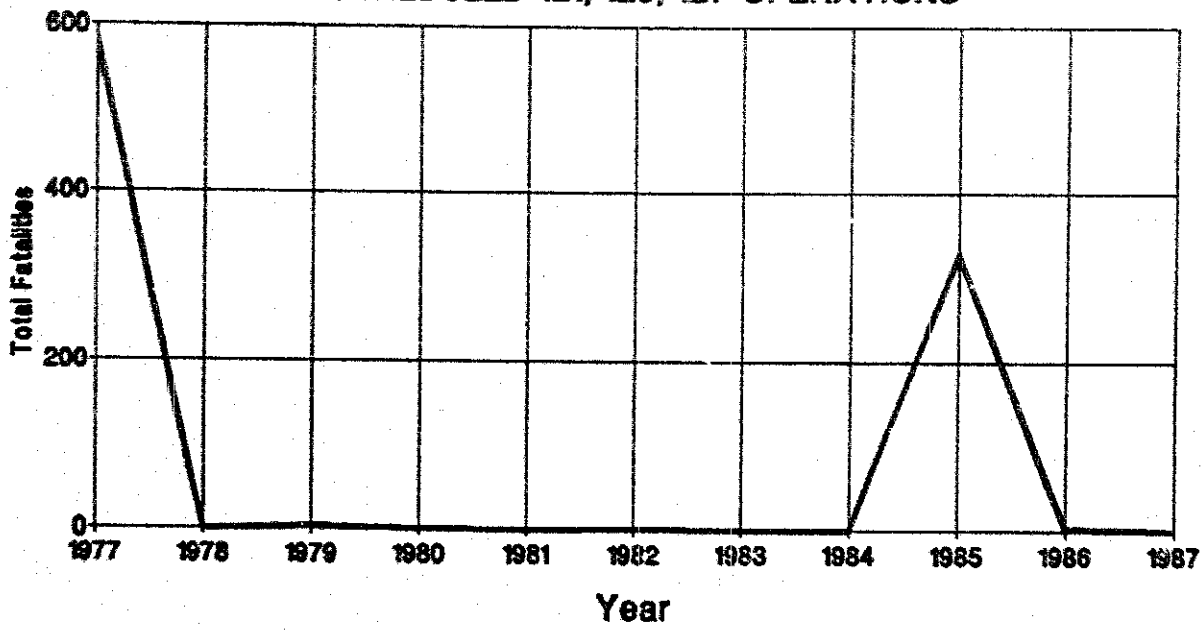
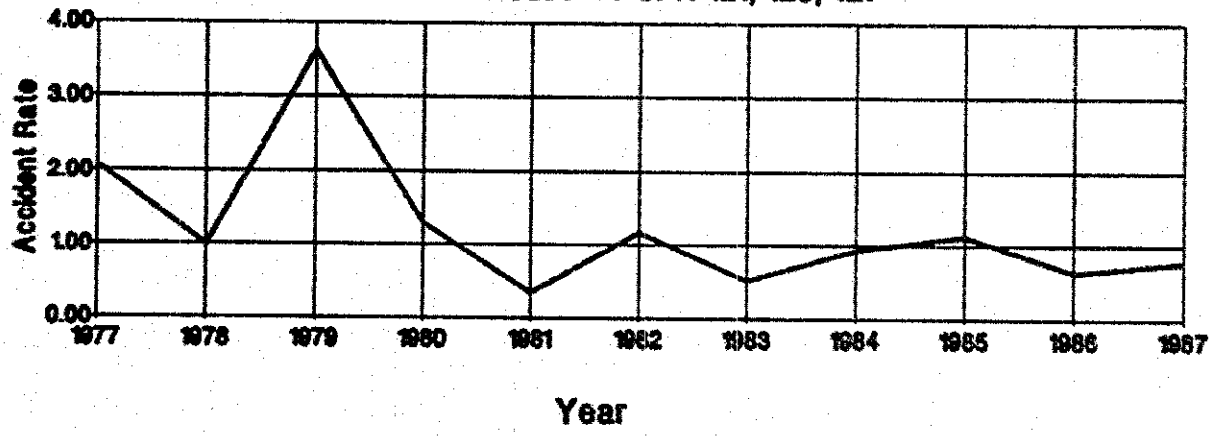


Figure 9 - ACCIDENTS PER 100,000 HOURS FLOWN
NONSCHEDULED 14 CFR 121, 125, 127



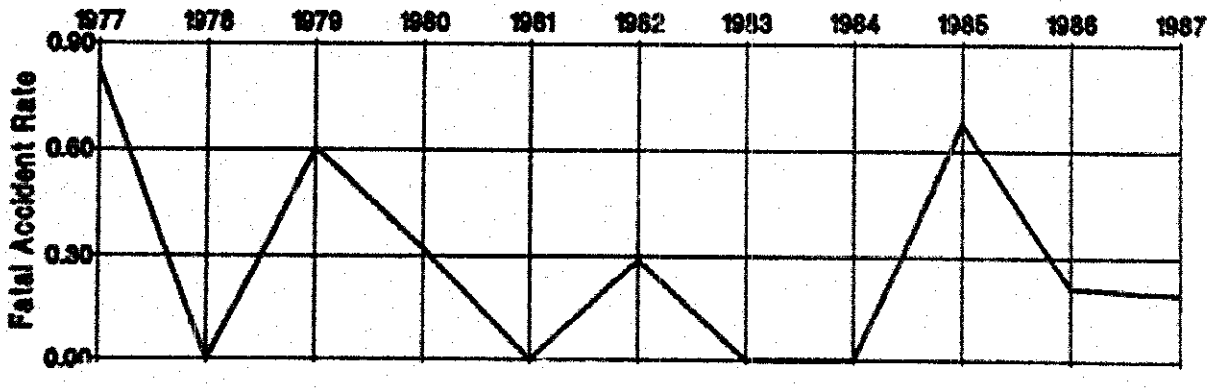


Table 17 - FIRST OCCURRENCES IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
14 CFR 121 125 127 OPERATIONS
1987 AND 1982 - 1986

	All Accidents				Fatal Accidents			
	1987		1982 - 1986		1987		1982 - 1986	
Type of Occurrence	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
In flight encounter with weather	8	21.1	5.6	26.7	0	0.0	.2	5.6
Airframe/component/system fail/mal	4	10.5	3.2	15.2	0	.0	.2	5.6
Miscellaneous/other	3	7.9	1.2	5.7	0	.0	.2	5.6
Loss of control - in flight	1	2.6	1.0	4.8	2	40.0	.8	22.2
Not reported	2	5.3	.8	3.8	1	20.0	.2	5.6
Main gear collapsed	0	.0	.8	3.8	0	.0	.0	.0
In flight collision with object	3	7.9	.8	3.8	1	20.0	.2	5.6
In flight collision w/ terrain	2	5.3	.8	3.8	1	20.0	.4	11.1
Overrun	0	.0	.8	3.8	0	.0	.2	5.6
Nose gear collapsed	1	2.6	.6	2.9	0	.0	.0	.0
On ground collision with object	8	21.1	.6	2.9	0	.0	.4	11.1
Loss of engine power(partial) - mech failure/malfunction	0	.0	.6	2.9	0	.0	.2	5.6
Loss of engine power(total) - non-mechanical	1	2.6	.6	2.9	0	.0	.2	5.6
Undershoot	0	.0	.6	2.9	0	.0	.0	.0
Abrupt maneuver	0	.0	.4	1.9	0	.0	.0	.0
Loss of control - on ground	0	.0	.4	1.9	0	.0	.0	.0
On ground collision w/ terrain	0	.0	.4	1.9	0	.0	.2	5.6
Loss of engine power(total) - mech failure/malfunction	1	2.6	.4	1.9	0	.0	.0	.0
Decompression	0	.0	.2	1.0	0	.0	.2	5.6
Explosion	0	.0	.2	1.0	0	.0	.0	.0
Near collision between aircraft	0	.0	.2	1.0	0	.0	.0	.0
Loss of engine power	1	2.6	.2	1.0	0	.0	.0	.0
Loss of engine power(partial) - non-mechanical	0	.0	.2	1.0	0	.0	.0	.0
Propeller blast or jet exhaust/suction	0	.0	.2	1.0	0	.0	.0	.0
Propeller/rotor contact to person	0	.0	.2	1.0	0	.0	.0	.0
Altitude deviation,uncontrolled	0	.0	.0	.0	0	.0	.0	.0
Cargo shift	0	.0	.0	.0	0	.0	.0	.0
Ditching	0	.0	.0	.0	0	.0	.0	.0
Dragged wing, rotor, pod, or float	0	.0	.0	.0	0	.0	.0	.0
Fire/explosion	0	.0	.0	.0	0	.0	.0	.0
Fire	0	.0	.0	.0	0	.0	.0	.0
Forced landing	0	.0	.0	.0	0	.0	.0	.0
Gear collapsed	0	.0	.0	.0	0	.0	.0	.0
Tail gear collapsed	0	.0	.0	.0	0	.0	.0	.0
Complete gear collapsed	0	.0	.0	.0	0	.0	.0	.0
Other gear collapsed	0	.0	.0	.0	0	.0	.0	.0
Gear not extended	0	.0	.0	.0	0	.0	.0	.0
Gear not retracted	0	.0	.0	.0	0	.0	.0	.0
Hard landing	2	5.3	.0	.0	0	.0	.0	.0
Hazardous materials leak/spill	0	.0	.0	.0	0	.0	.0	.0
Midair collision	0	.0	.0	.0	0	.0	.0	.0
Nose down	0	.0	.0	.0	0	.0	.0	.0
Nose over	0	.0	.0	.0	0	.0	.0	.0
On ground encounter with weather	1	2.6	.0	.0	0	.0	.0	.0
Engine tearaway	0	.0	.0	.0	0	.0	.0	.0
Roll over	0	.0	.0	.0	0	.0	.0	.0
Undetermined	0	.0	.0	.0	0	.0	.0	.0
Vortex turbulence encountered	0	.0	.0	.0	0	.0	.0	.0
Missing aircraft	0	.0	.0	.0	0	.0	.0	.0
Total Aircraft	38	100.0	21.0	100.0	5	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
1987 AND 1982 - 1986

	All Accidents				Fatal Accidents			
	1987		1982 - 1986		1987		1982 - 1986	
Phase of Operation	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Takeoff	8	21.1	4.2	20.0	2	4.0	1.6	44.4
Cruise	8	21.1	3.6	17.1	1	20.0	.2	5.6
Approach	1	2.6	3.0	14.3	1	20.0	.4	11.1
Landing	7	18.4	2.4	11.4	0	.0	.4	11.1
Climb	2	5.3	2.2	10.5	0	.0	.4	11.1
Descent	2	5.3	2.0	9.5	0	.0	.2	5.6
Taxi	4	10.5	1.4	6.7	0	.0	.2	5.6
Standing	4	10.5	1.2	5.7	0	.0	.0	.0
Not reported	2	5.3	.8	3.8	1	20.0	.2	5.6
Other	0	.0	.2	1.0	0	.0	.0	.0
Total Aircraft	38	100.0	21.0	100.0	5	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
1987 AND 1982 - 1986

	All Accidents				Fatal Accidents			
	1987		1982 - 1986		1987		1982 - 1986	
Broad Cause/Factor	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Pilot	15	41.7	10.2	51.5	3	75.0	2.4	75.0
Weather	11	30.6	9.4	47.5	0	.0	1.6	50.0
Other Person (Not Aboard)	16	44.4	6.8	34.3	2	50.0	1.8	56.3
Other Person (Aboard)	9	25.0	3.6	18.2	1	25.0	.2	6.3
Systems/Equipment/ Instruments	9	25.0	3.0	15.2	2	50.0	1.0	31.3
Light Conditions	5	13.9	3.0	15.2	0	.0	1.0	31.3
Landing Gear	3	8.3	2.6	13.1	0	.0	.0	.0
Propulsion System and Controls	4	11.1	2.4	12.1	0	.0	.4	12.5
Object (tree,wires,etc)	4	11.1	2.2	11.1	0	.0	.8	25.0
Terrain/Runway Condition	2	5.6	2.2	11.1	0	.0	.4	12.5
Airframe	0	.0	2.0	10.1	0	.0	.4	12.5
Flight Control System	0	.0	.6	3.0	0	.0	.2	6.3
Total Aircraft	38		21.0		5		3.6	
NTSB Determined Probable Cause	36		19.8		4		3.2	

Scheduled 14 CFR 135 Operations

There were 32 accidents involving scheduled 14 CFR 135 operations in 1987. The average number of accidents per year in this category for the years 1977 through 1986 is 32.7. The accident rate per 100,000 hours flown for 1987 is 1.644, compared with an overall rate of 2.327 for the period 1977 through 1986.

Of the 32 accidents in this category, ten accidents were fatal, involving a total of fifty-nine fatalities. During the period 1977 through 1986, there were an average of 7.8 fatal accidents and 33.1 fatalities per year in Scheduled 14 CFR 135 operations, with a fatal accident rate of 0.514 accidents per 100,000 hours flown.

It should be noted that in 1987 there were three midair collision accidents involving scheduled 14 CFR 135 and operations. During the previous ten years, there had been only three midair collisions in this category.

Table 20 - SUMMARY OF LOSSES
SCHEDULED 14 CFR 135 OPERATIONS
1983 - 1987

	1983	1984	1985	1986	1987
Accidents					
Fatal	2	7	7	2	10
Involved Serious Injury	6	4	4	2	5
Involved Minor or No Injury	9	11	10	11	17
Total	17	22	21	15	32
Fatalities					
Passenger	9	38	28	3	42
Crew	1	8	8	1	15
Other Persons	1	2	1	0	2
Total	11	48	37	4	59
Aircraft Damaged (Scheduled 14 CFR 135)					
Destroyed	6	7	9	1	11
Substantial	9	15	12	13	18
Minor	2	0	0	1	2
None	0	0	0	1	1
Total	17	22	21	16	32

Table 21 - ACCIDENT RATES
SCHEDULED 14 CFR 135 OPERATIONS

	1983	1984	1985	1986	1987
Aircraft Miles Flown (Thousands)	253,572	291,460	300,817	308,147	388,350
Aircraft Hours Flown	1,510,908	1,745,762	1,737,106	1,723,034	2,159,199
Departures Flown	2,328,430	2,676,590	2,561,463	2,707,593	3,149,778
Accident Rates					
Per Million Miles Flown	0.0670	0.0755	0.0698	0.0487	0.0824
Per Hundred Thousand Hours Flown	1.125	1.260	1.209	0.871	1.482
Per Hundred Thousand Departures Flown	0.730	0.822	0.820	0.554	1.016
Fatal Accident Rates					
Per Million Miles Flown	0.0079	0.0240	0.0232	0.0062	0.0257
Per Hundred Thousand Hours Flown	0.132	0.401	0.403	0.116	0.463
Per Hundred Thousand Departures Flown	0.086	0.262	0.273	0.074	0.317

Table 22 - LIST OF ACCIDENTS
SCHEDULED 14 CFR 135 OPERATIONS
1987

Date	Location	Type of Operation	Air Carrier	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
1/10	Yuma, AZ	Sch Passenger	Sky West Airlines	Swearingen SA227-AC	Substantial	None	Main gear collapsed
1/15	Kearns, UT	Sch Passenger	Sky West Airlines	Swearingen SA226-TC	Destroyed	Fatal (10)	Midair collision
1/20	Westerly, RI	Pax and Cargo	New England Airlines	Piper PA-32-260	Minor	None	Midair collision
2/05	Florence, SC	Passenger	Atlantis Leasing, Inc.	Swearingen SA226-TC	Substantial	None	In flight collision with terrain
2/11	Oneonta, NY	Passenger	Catskill Airways, Inc.	Beech 99	Substantial	None	Undershoot
3/04	Miami, FL	Passenger	Air South Airlines	Piper PA-34-200	Substantial	None	Vortex turbulence encountered
3/04	Romulus, MI	Passenger	Fisher Brothers Inc.	Casa C-212-CC	Destroyed	Fatal (9)	Loss of control - in flight
3/05	Norfolk, NE	Passenger	Mid Continent Airlines	Embraer EMB-110	Substantial	None	In flight collision with object
3/18	Missoula, MT	Passenger	Big Sky Airlines	Swearingen SA226TC	Substantial	None	On ground collision with object
4/01	Anchorage, AK	Passenger	Wilbur's Flight	Cessna 402	Substantial	Fatal (2)	Loss of power(total) - non-mechanical
4/06	Boston, MA	Passenger	Business Express	Beech 1900	Substantial	Serious	On ground collision with object
4/06	Columbia, MO	Pax and Cargo	Resort Air, Inc.	Fairchild SA-227	Substantial	None	Undetermined
4/12	Hyannis, MA	Passenger	Provincetown Boston Air	Cessna 402C	Destroyed	Minor	Loss of power(partial) mech fail./malf.
5/08	Mayaguez, PR	Passenger	Executive Air Charter	Casa C-212-CC	Destroyed	Fatal (2)	Loss of control - in flight
5/28	Kenner, LA	Passenger	Air New Orleans	BAE 3101	Destroyed	Serious	Loss of power(partial) - non-mech.
6/29	Grand Canyon, AZ	Passenger	Grand Canyon Airlines	DeHavilland DHC-6-300	Substantial	None	On ground collision with object
8/04	Palmdale, CA	Passenger	Resort Commuter Inc.	DeHavilland DHC-6	Substantial	None	Midair collision
8/08	Crooked Creek, AK	Pax and Cargo	Hermans Air Inc.	Cessna 207	Destroyed	Fatal (1)	Loss of control - in flight
9/28	Freeport, BH	Passenger	Caribbean Express	Embraer EMB 110-P-2	Minor	Fatal (1)	Not reported

Table 22 - LIST OF ACCIDENTS (Continued)
SCHEDULED 14 CFR 135 OPERATIONS
1987

Date	Location	Type of Operation	Air Carrier	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
9/30	San Juan, PR	Passenger	Executive Air Charter	Casa 212-200	None	Serious	Propeller/rotor contact
11/18	Atmautluak, AK	Passenger	Ryan Air	Cessna 208	Substantial	None	Airframe/component/syst. failure/malf.
11/20	Honolulu, HI	Passenger	Airtour Acquisition	Piper PA-31-350	Substantial	Minor	Loss of power(total) - non-mech.
11/23	Homer, AK	Pax and Cargo	Ryan Air Service, Inc.	Beech 1900C	Destroyed	Fatal (18)	Loss of control - in flight
12/06	Atmautluak, AK	Passenger	Ryan Air Service, Inc.	Cessna 207A	Substantial	None	Hard landing
12/07	Metlakatla, AK	Passenger	Temsco Helicopters	DeHavilland DHC-2	Substantial	Minor	Loss of control - in flight
12/09	Anchorage, AK	Passenger	Wilbur's Inc.	Cessna 402B	Substantial	Minor	Vortex turbulence encountered
12/14	Joplin, MO	Passenger	Express Airlines, Inc.	BAE-3101	Destroyed	Serious	Loss of control - in flight
12/17	Chantilly, VA	Passenger	Avair Incorporated	Swearingen SA-226	Substantial	Serious	Loss of power(total) - non-mech.
12/19	Bethel, AK	Pax and Cargo	Hermens Air	Cessna 208	Substantial	Minor	Nose gear collapsed
12/22	Chadron, NE	Pax and Cargo	G.P. Express	Cessna 402C	Destroyed	Fatal (2)	In flight collision with object
12/23	Kenai, AK	Passenger	South Central Air, Inc.	Piper PA-31-350	Destroyed	Fatal (6)	Loss of power(part.) mech fail/malf.
12/23	Maunaloa, HI	Passenger	Panorama Air Tours	Piper PA-31-350	Destroyed	Fatal (8)	Loss of power

Table 23 - ACCIDENTS AND RATES BY TYPE OF OPERATION
SCHEDULED 14 CFR 135 OPERATIONS
1987

	Type of Operation		
	Passenger/ Cargo	All Cargo	All*
Accidents	32	0	32
Fatal Accidents	10	0	10
Aircraft Miles Flown (Thousands)	350,089	38,261	388,350
Aircraft Hours Flown	1,946,260	212,939	2,159,199
Departures Flown	2,847,786	301,592	3,149,778
Accident Rates			
Per Million Miles Flown	0.0914	0.0	0.0824
Per Hundred Thousand Hours Flown	1.644	0.0	1.482
Per Hundred Thousand Departures Flown	1.124	0.0	1.016
Fatal Accident Rates			
Per Million Miles Flown	0.0286	0.0	0.0257
Per Hundred Thousand Hours Flown	0.514	0.0	0.463
Per Hundred Thousand Departures Flown	0.351	0.0	0.317

* Since 1982, all commuter airline cargo and mail carrying operations were classified the same as on-demand operations, for which there is no requirement to report activity. Therefore, there are no exposure data and rates cannot be calculated for all cargo operations. Exposure data for "All Operations" are estimated by NTSB from RSPA-reported (passenger/cargo) exposure data using the proportion of the totals which had historically been reported for such operations:

$$\text{All Operations Miles} = \frac{\text{Passenger-Cargo Hours}}{0.915}$$

$$\text{All Operations Hours} = \frac{\text{Passenger-Cargo Hours}}{0.914}$$

$$\text{All Operations Departures} = \frac{\text{Passenger-Cargo Departures}}{0.943}$$

Table 24 - PERSONS BY ROLE AND DEGREE OF INJURY
SCHEDULED 14 CFR 135 OPERATIONS
1987

Role of Person	Degree of Injury: Fatal	Serious	Minor	None	Total
Pilot	10	1	4	17	32
Copilot	5	0	2	10	17
Cabin attendants	0	0	1	0	1
Passenger	42	17	30	106	195
Total aboard	57	18	37	133	245
Other aircraft*	2	0	2	5	9
Other ground	0	2	5	0	7
Grand total	59	20	44	138	261
Percent	22.6	7.7	16.9	52.9	

* 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 25 - AIRCRAFT BY DAMAGE AND DEGREE OF INJURY
SCHEDULED 14 CFR 135 OPERATIONS
1987

Aircraft damage	Degree of injury: None	Minor	Ser	Fatal	Aircraft: No.	Percent
None	0	0	1	0	1	3.1
Minor	1	0	0	1	2	6.3
Substantial	11	4	2	1	18	56.3
Destroyed	0	1	2	8	11	34.4
Aircraft						
Number -	12	5	5	10	32	
Percent -	37.5	15.6	15.6	31.3		

Table 26 - AIRCRAFT BY FIRST OCCURRENCE AND DEGREE OF INJURY AND BY DAMAGE
SCHEDULED 14 CFR 135 OPERATIONS
1987

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	1	0	0	0	0	0	1	0	1	3.1
Main gear collapsed	1	0	0	0	0	0	1	0	1	3.1
Nose gear collapsed	0	1	0	0	0	0	1	0	1	3.1
Hard landing	1	0	0	0	0	0	1	0	1	3.1
In flight collision with obj.	1	0	0	1	0	0	1	1	2	6.3
In flight collision with ter.	1	0	0	0	0	0	1	0	1	3.1
Loss of control - in flight	0	1	1	4	0	0	1	5	6	18.8
Midair collision	2	0	0	1	0	1	1	1	3	9.4
On ground collision with obj.	2	0	1	0	0	0	3	0	3	9.4
Loss of power	0	0	0	1	0	0	0	1	1	3.1
Loss of power(partial) - mech failure/malfunction	0	1	0	1	0	0	0	2	2	6.3
Loss of power(total) - non-mechanical	0	1	1	1	0	0	3	0	3	9.4
Loss of power(partial) - non-mechanical	0	0	1	0	0	0	0	1	1	3.1
Propeller/rotor contact	0	0	1	0	1	0	0	0	1	3.1
Undershoot	1	0	0	0	0	0	1	0	1	3.1
Undetermined	1	0	0	0	0	0	1	0	1	3.1
Vortex turbulence encountered	1	1	0	0	0	0	2	0	2	6.3
Not reported	0	0	0	1	0	1	0	0	1	3.1
Aircraft										
Number -	12	5	5	10	1	2	18	11	32	
Percent -	37.5	15.6	15.6	31.3	3.1	6.3	56.3	34.4		

Table 27 - AIRCRAFT BY FIRST OCCURRENCE AND BROAD PHASE OF OPERATION
SCHEDULED 14 CFR 135 OPERATIONS
1987

Type of first occurrence	Phase of operation												Aircraft	
	Stndg	Taxi	Tkoff	Climb	Cruis	Dscnt	Aprch	Landg	Manvr	Unk	Nrept	Other	No.	Percent
Airframe/component/system failure/malfunction	0	0	0	0	0	0	0	1	0	0	0	0	1	3.1
Main gear collapsed	0	0	0	0	0	0	0	1	0	0	0	0	1	3.1
Nose gear collapsed	0	0	0	0	0	0	0	0	0	0	0	1	1	3.1
Hard landing	0	0	0	0	0	0	0	1	0	0	0	0	1	3.1
In flight collision w/obj.	0	0	0	0	0	1	1	0	0	0	0	0	2	6.3
In flight collision w/ter.	0	0	0	0	0	0	0	1	0	0	0	0	1	3.1
Loss of control - in flight	0	0	0	0	0	1	4	0	1	0	0	0	6	18.8
Midair collision	0	0	0	1	0	1	0	0	1	0	0	0	3	9.4
On ground collision w/obj.	1	2	0	0	0	0	0	0	0	0	0	0	3	9.4
Loss of power	0	0	0	0	1	0	0	0	0	0	0	0	1	3.1
Loss of power(partial) - mech fail/malf.	0	0	2	0	0	0	0	0	0	0	0	0	2	6.3
Loss of power(total) - non-mechanical	0	0	0	0	0	1	2	0	0	0	0	0	3	9.4
Loss of power(partial) - non-mechanical	0	0	1	0	0	0	0	0	0	0	0	0	1	3.1
Propeller/rotor contact	1	0	0	0	0	0	0	0	0	0	0	0	1	3.1
Undershoot	0	0	0	0	0	0	0	1	0	0	0	0	1	3.1
Undetermined	0	0	0	0	0	0	0	0	0	1	0	0	1	3.1
Vortex turb. encountered	0	0	0	0	0	0	1	1	0	0	0	0	2	6.3
Not reported	0	0	0	0	0	0	0	0	0	0	1	0	1	3.1
Aircraft														
Number -	2	2	3	1	1	4	8	6	2	1	1	1	32	
Percent -	6.3	6.3	9.4	3.1	3.1	12.5	25.0	18.8	6.3	3.1	3.1	3.1		

Table 28 - AIRCRAFT BY PHASE OF OPERATION AND DEGREE OF INJURY
SCHEDULED 14 CFR 135 OPERATIONS
1987

Phase of operation	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
Standing - engine(s) operating	1	0	1	0	1	0	1	0	2	6.3
Taxi - to takeoff	1	0	1	0	0	0	2	0	2	6.3
Takeoff - initial climb	0	1	1	1	0	0	0	3	3	9.4
Climb - to cruise	1	0	0	0	0	1	0	0	1	3.1
Cruise - normal	0	0	0	1	0	0	0	1	1	3.1
Descent - normal	2	2	0	0	0	0	4	0	4	12.5
Approach	0	0	0	1	0	0	0	1	1	3.1
Approach - VFR pattern - base turn	0	0	0	1	0	0	1	0	1	3.1
Approach - VFR pattern - final approach	0	1	0	2	0	0	1	2	3	9.4
Approach - FAF/outer marker to threshold (IFR)	0	0	2	1	0	0	1	2	3	9.4
Landing - flare/touchdown	4	0	0	0	0	0	4	0	4	12.5
Landing - roll	2	0	0	0	0	0	2	0	2	6.3
Maneuvering	0	0	0	2	0	0	0	2	2	6.3
Unknown	1	0	0	0	0	0	1	0	1	3.1
Not reported	0	0	0	1	0	1	0	0	1	3.1
Other	0	1	0	0	0	0	1	0	1	3.1
Aircraft										
Number -	12	5	5	10	1	2	18	11	32	
Percent -	37.5	15.6	15.6	31.3	3.1	6.3	56.3	34.4		

Table 29 - AIRCRAFT BY CONDITION OF LIGHT AND TYPE OF WEATHER
SCHEDULED 14 CFR 135 OPERATIONS
1987

Condition of light	Type of weather		Aircraft	
	VMC	IMC	No.	Percent
Dawn	1	0	1	3.1
Daylight	14	2	16	50.0
Night (dark)	9	2	11	34.4
Dusk	2	0	2	6.3
Not reported	2	0	2	6.3
Aircraft				
Number -	28	4	32	
Percent -	87.5	12.5		

Table 30 - AIRCRAFT BY TYPE OF OPERATION AND DEGREE OF INJURY
SCHEDULED 14 CFR 135 OPERATIONS
1987

Type of Operation	Degree of Injury				Aircraft	
	None	Minor	Serious	Fatal	No.	Percent
Scheduled Domestic Passenger	10	4	4	6	24	75.0
Scheduled Domestic Pass/Cargo	2	1	0	3	6	18.8
Scheduled International Pass.	0	0	1	1	2	6.3
Aircraft						
Number -	12	5	5	10	32	
Percent -	37.5	15.6	15.6	31.3		

Table 31 - AIRCRAFT BY PROXIMITY TO AIRPORT AND FLIGHT PLAN
SCHEDULED 14 CFR 135 OPERATIONS
1987

Accident location	Flight plan						Aircraft	
	None	VFR	IFR	VFR/ IFR	Cmpny VFR	Other	No.	Percent
Off airport/airstrip	1	5	5	0	3	0	14	43.8
On airport	1	4	7	1	2	1	16	50.0
Other	0	0	1	0	0	1	2	6.3
Aircraft								
Number -	2	9	13	1	5	2	32	
Percent -	6.3	28.1	40.6	3.1	15.6	6.3		

Table 32 - AIRCRAFT BY OCCURRENCE OF FIRE AND DEGREE OF INJURY AND BY DAMAGE
SCHEDULED 14 CFR 135 OPERATIONS
1987

Aircraft fire	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
None	11	5	5	5	1	1	17	7	26	81.3
On ground	1	0	0	4	0	0	1	4	5	15.6
Not reported	0	0	0	1	0	1	0	0	1	3.1
Aircraft										
Number -	12	5	5	10	1	2	18	11	32	
Percent -	37.5	15.6	15.6	31.3	3.1	6.3	56.3	34.4		

Table 33 - AIRCRAFT BY TYPE OF AIRCRAFT AND DEGREE OF INJURY AND BY DAMAGE
SCHEDULED 14 CFR 135 OPERATIONS
1987

Type of aircraft	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
Fixed Wing Single Recip. Engine	2	1	0	1	0	1	2	1	4	12.5
Fixed Wing Multiple Recip. Engine	1	3	0	4	0	0	4	4	8	25.0
Fixed Wing Turboprop	9	1	5	5	1	1	12	6	20	62.5
Aircraft										
Number -	12	5	5	10	1	2	18	11	32	
Percent -	37.5	15.6	15.6	31.3	3.1	6.3	56.3	34.4		

Table 34 - BROAD CAUSE/FACTOR ASSIGNMENTS*
SCHEDULED 14 CFR 135 OPERATIONS
1987

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	5	2	8	4	11
Propulsion System and Controls	3	5	1	3	3	6
Airframe	0	0	0	2	0	2
Landing Gear	0	0	0	1	0	1
Systems/Equipment/Instruments	0	0	2	3	2	3
Environment #	0	1	4	16	4	16
Weather	0	0	2	5	2	5
Light Conditions	0	0	2	6	2	6
Object(trees,wires,etc.)	0	1	1	4	1	5
Terrain/Runway Condition	0	0	2	8	2	8
Personnel #	9	28	6	15	9	28
Pilot	7	23	5	13	8	24
Others (Not Aboard)	2	8	4	5	5	12
Number of Aircraft					10	32
NTSB Determined Probable Cause					9	31

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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 35 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
SCHEDULED 14 CFR 135 OPERATIONS
1977 - 1987

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
1977	44	9	32	32	1,150,250	3.825	0.782
1978	61	14	48	48	1,302,136	4.685	1.075
1979	52	15	66	66	1,169,921	4.445	1.282
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	1,723,034	0.871	0.116
1987	32	10	59	57	2,159,199	1.482	0.463

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

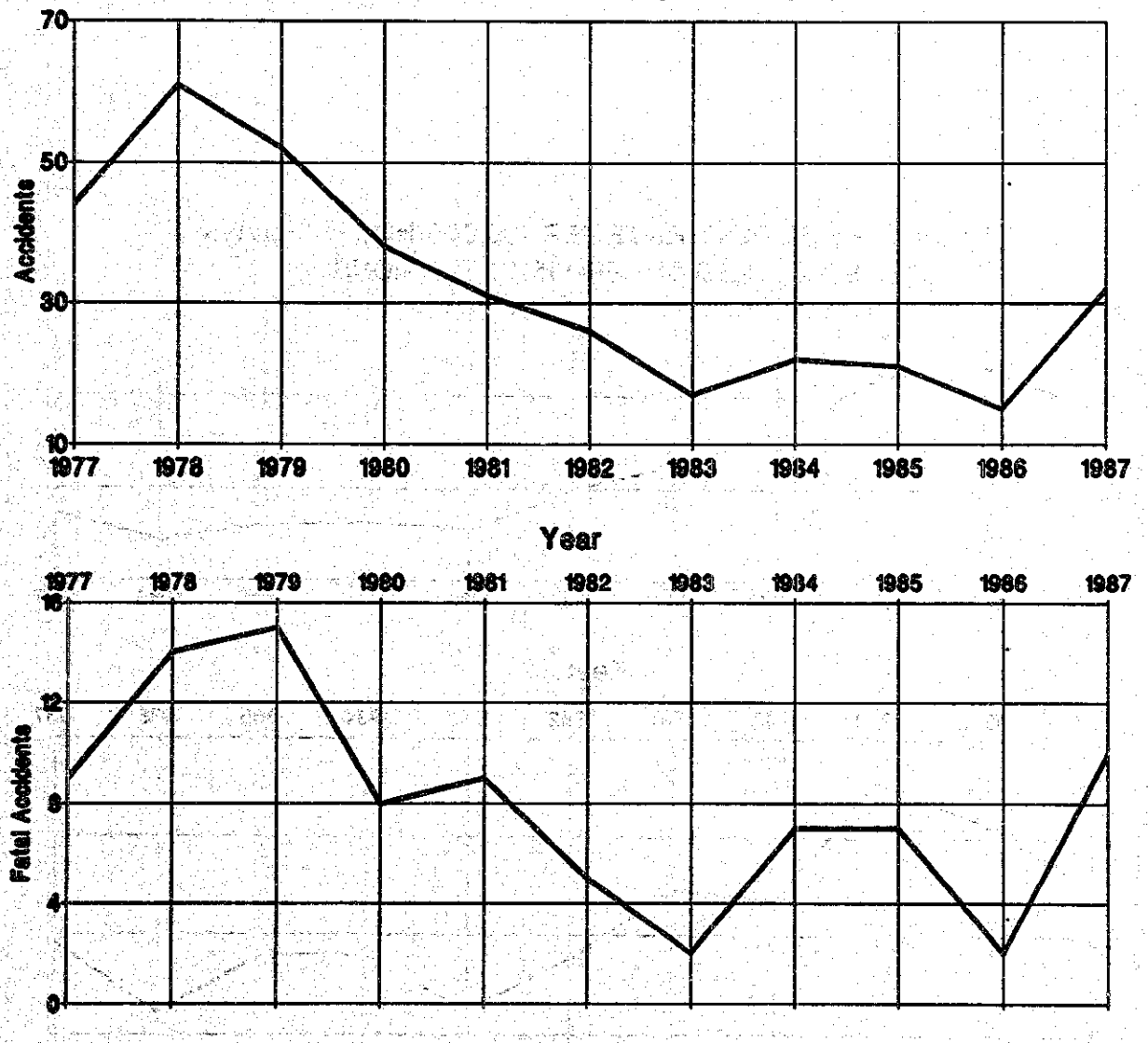

Figure 11 - NUMBER OF FATALITIES
SCHEDULED 14 CFR 135 OPERATIONS

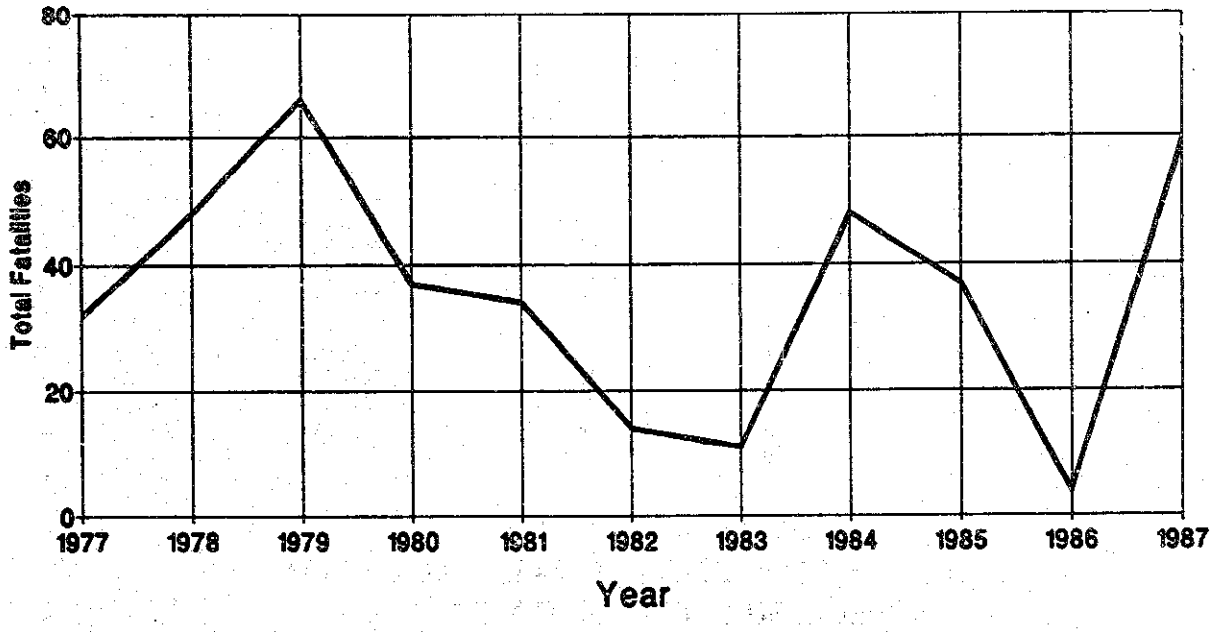

Figure 12 - ACCIDENT RATE PER 100,000 HOURS FLOWN
SCHEDULED 14 CFR 135 OPERATIONS

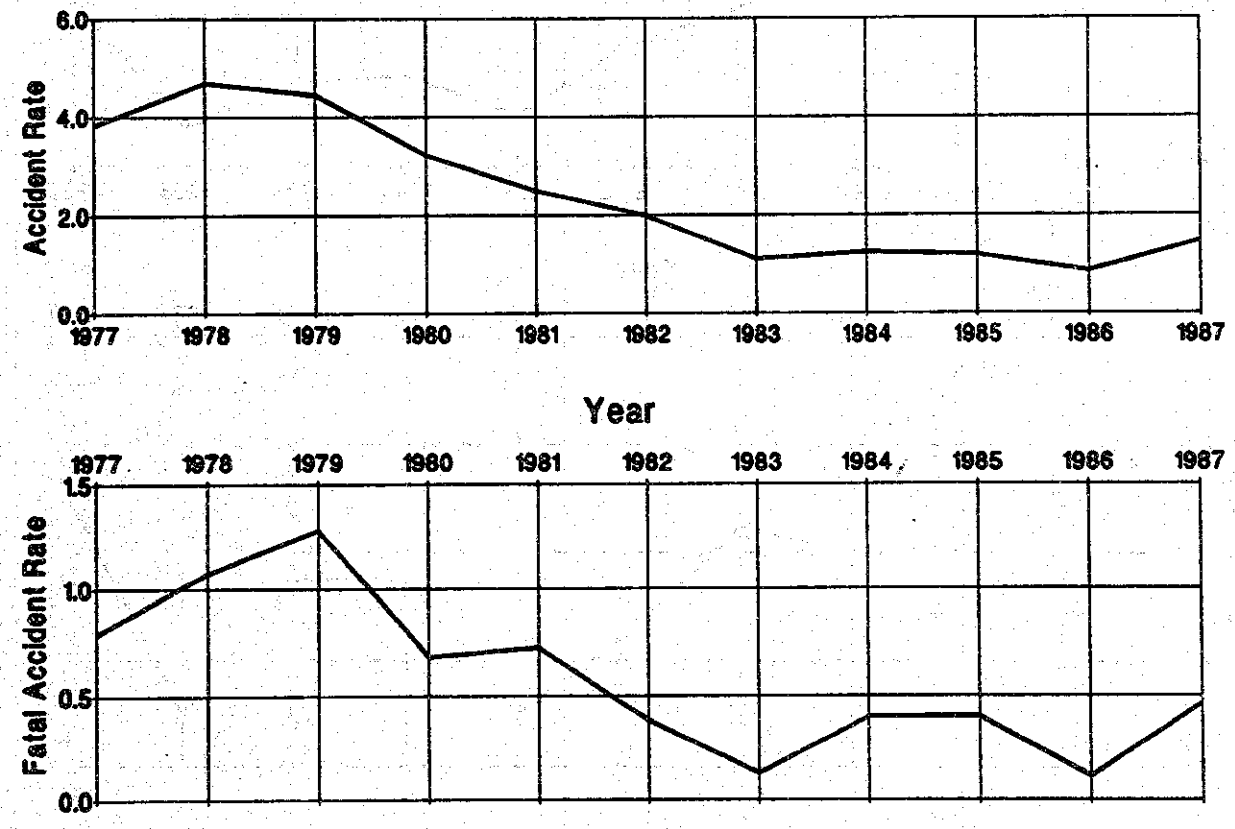

Table 36 - FIRST OCCURRENCES IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
SCHEDULED 14 CFR 135 OPERATIONS
1987 AND 1982 - 1986

	All Accidents				Fatal Accidents			
	1987		1982 - 1986		1987		1982 - 1986	
Type of Occurrence	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Airframe/component/system fail/malf	1	3.1	3.8	18.6	0	.0	1.0	21.7
In flight encounter with weather	0	.0	2.4	11.8	0	.0	1.0	21.7
Loss of engine power(total) - non-mechanical	3	9.4	2.2	10.8	1	10.0	.4	8.7
In flight collision with terrain	1	3.1	1.6	7.8	0	.0	.8	17.4
Loss of control - on ground	0	.0	1.6	7.8	0	.0	.0	.0
On ground collision with object	3	9.4	1.2	5.9	0	.0	.2	4.3
Loss of control - in flight	6	18.8	.8	3.9	4	40.0	.0	.0
Fire	0	.0	.6	2.9	0	.0	.2	4.3
Loss of engine power	1	3.1	.6	2.9	1	10.0	.2	4.3
Loss of engine power(total) - mech failure/malfunction	0	.0	.6	2.9	0	.0	.0	.0
Loss of engine power(partial) - non-mechanical	1	3.1	.6	2.9	0	.0	.2	4.3
Propeller/rotor contact to person	1	3.1	.6	2.9	0	.0	.2	4.3
Gear collapsed	0	.0	.4	2.0	0	.0	.0	.0
Complete gear collapsed	0	.0	.4	2.0	0	.0	.0	.0
Hard landing	1	3.1	.4	2.0	0	.0	.0	.0
In flight collision with object	2	6.3	.4	2.0	1	10.0	.2	4.3
Midair collision	3	9.4	.4	2.0	1	10.0	.2	4.3
Miscellaneous/other	0	.0	.4	2.0	0	.0	.0	.0
Fire/explosion	0	.0	.2	1.0	0	.0	.0	.0
Main gear collapsed	1	3.1	.2	1.0	0	.0	.0	.0
Nose gear collapsed	1	3.1	.2	1.0	0	.0	.0	.0
On ground collision with terrain	0	.0	.2	1.0	0	.0	.0	.0
Overrun	0	.0	.2	1.0	0	.0	.0	.0
Loss of engine power(partial) - mech failure/malfunction	2	6.3	.2	1.0	1	10.0	.0	.0
Undershoot	1	3.1	.2	1.0	0	.0	.0	.0
Not reported	1	3.1	.0	.0	1	10.0	.0	.0
Abrupt maneuver	0	.0	.0	.0	0	.0	.0	.0
Altitude deviation,uncontrolled	0	.0	.0	.0	0	.0	.0	.0
Cargo shift	0	.0	.0	.0	0	.0	.0	.0
Decompression	0	.0	.0	.0	0	.0	.0	.0
Ditching	0	.0	.0	.0	0	.0	.0	.0
Dragged wing, rotor, pod, or float	0	.0	.0	.0	0	.0	.0	.0
Explosion	0	.0	.0	.0	0	.0	.0	.0
Forced landing	0	.0	.0	.0	0	.0	.0	.0
Tail gear collapsed	0	.0	.0	.0	0	.0	.0	.0
Other gear collapsed	0	.0	.0	.0	0	.0	.0	.0
Gear not extended	0	.0	.0	.0	0	.0	.0	.0
Gear not retracted	0	.0	.0	.0	0	.0	.0	.0
Hazardous materials leak/spill	0	.0	.0	.0	0	.0	.0	.0
Near collision between aircraft	0	.0	.0	.0	0	.0	.0	.0
Nose down	0	.0	.0	.0	0	.0	.0	.0
Nose over	0	.0	.0	.0	0	.0	.0	.0
On ground encounter with weather	0	.0	.0	.0	0	.0	.0	.0
Engine tearaway	0	.0	.0	.0	0	.0	.0	.0
Propeller blast or jet exhaust	0	.0	.0	.0	0	.0	.0	.0
Roll over	0	.0	.0	.0	0	.0	.0	.0
Undetermined	1	3.1	.0	.0	0	.0	.0	.0
Vortex turbulence encountered	2	6.3	.0	.0	0	.0	.0	.0
Missing aircraft	0	.0	.0	.0	0	.0	.0	.0
Total Aircraft	32	100.0	20.4	100.0	10	100.0	4.6	100.0

Table 37 - FIRST PHASES OF OPERATION IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
SCHEDULED 14 CFR 135 OPERATIONS
1987 AND 1982 - 1986

	All Accidents				Fatal Accidents			
	1987		1982 - 1986		1987		1982 - 1986	
Phase of Operation	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Approach	8	25.0	5.6	27.5	5	50.0	1.6	34.8
Takeoff	3	9.4	3.8	18.6	1	10.0	.8	17.4
Landing	6	18.8	3.0	14.7	0	.0	.0	.0
Taxi	2	6.3	2.2	10.8	0	.0	.2	4.3
Cruise	1	3.1	2.2	10.8	1	10.0	.6	13.0
Climb	1	3.1	1.4	6.9	0	.0	.6	13.0
Standing	2	6.3	1.0	4.9	0	.0	.2	4.3
Descent	4	12.5	.6	2.9	0	.0	.2	4.3
Other	1	3.1	.4	2.0	0	.0	.2	4.3
Maneuvering	2	6.3	.2	1.0	2	20.0	.2	4.3
Not Reported	2	3.1	.0	.0	1	10.0	.0	.0
Total Aircraft	32	100.0	20.4	100.0	10	100.0	4.6	100.0

Table 38 - BROAD CAUSE/FACTOR ASSIGNMENTS IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
SCHEDULED 14 CFR 135 OPERATIONS
1987 AND 1982 - 1986

	All Accidents				Fatal Accidents			
	1987		1982 - 1986		1987		1982 - 1986	
Broad Cause/Factor	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Pilot	24	77.4	13.4	66.3	8	88.9	3.4	73.9
Other Person (Not Aboard)	12	38.7	6.8	33.7	5	55.5	2.4	52.2
Weather	5	16.1	5.6	27.7	2	22.2	2.2	47.8
Propulsion System and Controls	6	19.4	4.6	22.8	3	33.3	.8	17.4
Terrain/Runway Condition	8	25.8	4.2	20.8	2	22.2	1.4	30.4
Systems/Equipment/ Instruments	3	9.7	4.0	19.8	2	22.2	1.2	26.1
Landing Gear	1	3.2	3.2	15.8	0	.0	.0	.0
Object (tree,wires,etc)	5	16.1	2.2	10.9	1	11.1	.4	8.7
Light Conditions	6	19.4	2.0	9.9	2	22.2	1.0	21.7
Airframe	2	6.5	1.8	8.9	0	.0	.6	13.0
Flight Control System	0	.0	1.4	6.9	0	.0	.8	17.4
Other Person (Aboard)	0	.0	.4	2.0	0	.0	.4	8.7
Total Aircraft	32		20.4		10		4.6	
NTSB Determined Probable Cause	31		20.2		9		4.6	

Nonscheduled 14 CFR 135 Operations

During 1987 there were 98 accidents involving nonscheduled 14 CFR 135 aircraft. This is the fewest accidents in any year in this report and represents a decrease of 35 percent from the average of 153.1 accidents per year in this category during the period 1977 through 1986. The 1987 accident rate is also the lowest among the 11 years covered in this review.

There were 30 fatal accidents in this category which were responsible for 65 fatalities in 1987. This is a substantial improvement from the averages of 34.8 fatal accidents and 87.6 fatalities per year between 1977 and 1986. The fatal accident rate of 1.04 fatal accidents per 100,000 hours flown is essentially equal to the overall rate of 1.10 during that ten year period.

Three of the accidents reported in this section involved an on-ground collision between two nonscheduled 14 CFR 135 aircraft. Therefore, this section lists 98 accidents involving 101 aircraft.

Table 39 - SUMMARY OF LOSSES
NONSCHEDULED 14 CFR 135 OPERATIONS
1983 - 1987

	1983	1984	1985	1986	1987
Accidents					
Fatal	27	23	35	31	30
Involved Serious Injury	12	19	12	13	9
Involved Minor or No Injury	102	104	105	72	59
Total	141	146	152	116	98
Fatalities					
Passenger	27	22	39	26	31
Crew	30	30	36	35	32
Other Persons	5	0	1	4	2
Total	62	52	76	65	65
Aircraft Damaged (Nonscheduled 14 CFR 135)					
Destroyed	33	40	50	38	34
Substantial	106	104	102	76	62
Minor	2	1	2	1	5
None	2	2	1	2	0
Total	143	147	147	117	101

Table 40 - ACCIDENT RATES
NONSCHEDULED 14 CFR 135 OPERATIONS

	1983	1984	1985	1986	1987
Aircraft Hours Flown	2,574,883	3,079,007	2,782,696	2,913,358	2,877,002
Accident Rates *					
All Accidents	5.48	4.74	5.46	3.98	3.41
Fatal Accidents	1.05	0.75	1.26	1.06	1.04

*Per Hundred Thousand Hours Flown

Table 41 - LIST OF ACCIDENTS
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
1/05	Albuqerque, NM	Cargo	Cessna T210M	Destroyed	Fatal (1)	In flight encounter with weather
1/07	Miles City, MT	Passenger	Aero Commander 690A	Substantial	Serious	Abrupt maneuver
1/08	Shoal Cove, AK	Passenger	DeHavilland DHC-2	Substantial	None	On ground collision with terrain
1/08	Pollockville, NC	Passenger	Bell 206L-1	Destroyed	Fatal (4)	Fire
1/14	Kenai, AK	Pax and Cargo	Cessna 207A	Destroyed	Fatal (1)	In flight encounter with weather
1/15	Brownsville, TX	Pax and Cargo	Beech 65-80	Substantial	None	Loss of power(total) - non-mechanical
1/16	Cima, CA	Cargo	Cessna 208	Destroyed	Fatal (1)	Altitude deviation,uncontrolled
1/24	Spokane, WA	Passenger	Cessna 182RII	Substantial	None	In flight encounter with weather
1/28	Las Vegas, NV	Mail Only	Cessna 402B	Substantial	None	Loss of power(total) - non-mechanical
1/29	Bedford Park, IL	Cargo	Cessna 210N	Destroyed	Fatal (1)	Airframe/component/system failure/malfunction
2/05	Matagorda 665, GM	Passenger	Bell 206L-1	Substantial	Fatal (2)	Loss of power
2/14	Tyonek, AK	Passenger	Piper PA-34	Substantial	None	On ground collision with object
2/18	Quincy, IL	Cargo	Westwind E18S	Destroyed	Fatal (2)	Loss of power
2/20	Flagstaff, AZ	Passenger	Cessna 441	Destroyed	Fatal (2)	Airframe/component/system failure/malfunction
2/25	Los Angeles, CA	Passenger	Cessna 310R	Substantial	None	In flight collision with object
2/26	Englewood, CO	Passenger	Gates Learjet 35A	Substantial	None	Loss of control - on ground
3/12	Basalt, CO	Cargo	Rockwell 680FL	Destroyed	Serious	In flight encounter with weather
3/13	Chinle, AZ	Passenger	Cessna 414A	Substantial	Minor	In flight collision with object
3/17	Walla Walla, WA	Cargo	Cessna 402A	Substantial	None	Hard landing
3/18	Missoula, MT	Cargo	Piper PA-31-350	Minor	None	On ground collision with object
3/19	Lopez Island, WA	Passenger	Cessna 172	Substantial	None	Loss of power(total) - non-mechanical

Table 41 - LIST OF ACCIDENTS (Continued)
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
3/20	Lawrence, MA	Mail Only	Piper PA-31T	Destroyed	Minor	In flight collision with terrain
3/29	Kona, HI	Passenger	Bell 206B	Destroyed	Fatal (1)	Loss of power
4/12	Burnett Inlet, AK	Cargo	Cessna 185	Substantial	None	On ground collision with terrain
4/15	Laupahoehoe, HI	Passenger	Bell 206B	Destroyed	Fatal (1)	Loss of control - in flight
4/20	Manchester, NH	Passenger	Dornier DO-228-201	Substantial	None	Airframe/component/system failure/malfunction
4/23	Wilmington, NC	Cargo	Swearingen SA-226TC	Destroyed	Fatal (2)	Loss of power(partial) - mech failure/malfunction
4/28	Portland, ME	Cargo	Piper PA-23-250	Destroyed	Serious	In flight encounter with weather
5/07	Nightmute, AK	Cargo	Piper PA-31-350	Destroyed	Fatal (1)	In flight encounter with weather
5/13	Sayre, PA	Passenger	Piper PA-32-300	Destroyed	Fatal (2)	Fire
5/30	Cooperstown, NY	Passenger	Piper PA-31-350	Substantial	None	Loss of power
6/05	Atlanta, GA	Cargo Cargo	Cessna 208B Beech 58	Substantial Substantial	None None	On ground collision
6/05	Choteau, MT	Passenger	Bell 206L-1	Destroyed	Fatal (4)	Loss of control - in flight
6/09	Birmingham, AL	Passenger	Piper PA-34-200	Minor	None	Gear not extended
6/19	Alexander River, AK	Passenger	DeHavilland DHC-2	Substantial	None	On ground collision with terrain
6/21	Bridgeport, CA	Passenger	Rockwell 690	Destroyed	Fatal (2)	Loss of control - in flight
6/24	Hilliard, FL	Cargo	Rockwell 690A	Destroyed	Fatal (2)	Abrupt maneuver
6/25	Tanneraville, NY	Cargo	Piper PA-32R-300	Destroyed	Fatal (2)	In flight collision with terrain
6/26	Boston, MA	Cargo	Piper PA-34-200T	Destroyed	Fatal (1)	Loss of control - in flight
7/02	Benson, AZ	Passenger	Bell 206L-3	Substantial	Serious	In flight collision with object

Table 41 - LIST OF ACCIDENTS (Continued)
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
7/04	Venice, LA	Cargo	Aerospatiale AS355FL	Destroyed	Fatal (1)	Airframe/component/system failure/malfunction
7/09	McCall, ID	Passenger	Cessna T-207	Substantial	None	Loss of power(total) - mech failure/malfunction
7/13	Mason City, IA	Cargo	Aero Commander 500-B	Destroyed	Serious	Loss of control - in flight
7/13	Columbus, OH	Cargo	Smith Aerostar 600	Substantial	None	On ground collision with terrain
7/16	Jackson, MS	Pax and Cargo	Israel Commander 1121	Substantial	None	Airframe/component/system failure/malfunction
7/20	Chicago, IL	Cargo	Cessna 402B	Destroyed	Fatal (1)	Airframe/component/system failure/malfunction
7/28	Cuba, NM	Passenger	Cessna 414	Substantial	None	On ground collision with object
8/07	Georgetown, TX	Pax and Cargo	Cessna 206G	Substantial	None	Loss of power(total) - mech failure/malfunction
8/09	Milwaukee, WI	Passenger	Beech B90	Substantial	None	Airframe/component/system failure/malfunction
8/10	Eugene Island, GM	Pax and Cargo	Bell 206L-1	Destroyed	Minor	In flight collision with object
8/12	Ketchikan, AK	Passenger	Cessna 185E	Substantial	Fatal (2)	Midair collision
8/12	Mexia, TX	Cargo	Piper PA-32R	Substantial	None	Fire
8/12	Pledger, TX	Passenger	Bell 206B	Substantial	None	Airframe/component/system failure/malfunction
9/23	Kailua-Kona, HI	Passenger	Bell 206B	Substantial	Minor	In flight collision with terrain
9/01	Lanai, HI	Cargo	GAF Nomad 24A	Substantial	None	Loss of power(total) - non-mechanical
9/02	St. Thomas, VI	Passenger	Aero Commander 680FL	Substantial	None	Airframe/component/system failure/malfunction
9/02	Appleton, WI	Passenger	Aero Commander 690	Substantial	None	Airframe/component/system failure/malfunction
9/04	Bulverde, TX	Cargo	Cessna 208	Substantial	Minor	Airframe/component/system failure/malfunction
9/07	Atlanta, GA	Passenger	BAE 3101	Substantial	Minor	On ground collision with object
9/09	Williamsport, PA	Cargo	Cessna 310N	Substantial	None	Fire/explosion

Table 41 - LIST OF ACCIDENTS (Continued)
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
9/10	Columbus, OH	Cargo	Jetcruiser 800	Substantial	None	On ground collision
		Cargo	Piper PA-60-600	Minor	None	
9/11	Atlanta, GA	Cargo	Cessna 402C	Minor	Serious	Miscellaneous/other
9/14	Wichita Falls, TX	Pax and Cargo	Cessna 401A	Substantial	None	Explosion
9/15	Tampa, FL	Passenger	Beech 200	Substantial	None	On ground collision with object
9/17	Tok Lakes, AK	Pax and Cargo	Cessna 207	Substantial	None	In flight collision with object
9/19	100Mi S.Eng Slw, AK	Passenger	Cessna 206G	Substantial	None	Loss of power(total) - mech failure/malfunction
9/21	Malloy, ID	Passenger	Cessna T210L	Destroyed	Fatal (3)	Loss of control - in flight
9/22	Hillsdale, MI	Cargo	Piper PA-32R-300	Destroyed	Serious	Loss of power(partial) - mech failure/malfunction
9/25	Miami, FL	Cargo	Beech B185	Destroyed	Fatal (2)	Loss of control - in flight
9/25	Kansas City, MO	Pax and Cargo	Aero Commander 500B	Substantial	None	Gear not extended
9/30	Ames, IA	Passenger	Cessna 401	Substantial	None	Fire
10/08	Memphis, TN	Cargo	Hamilton MA-1	Substantial	Fatal (1)	Loss of control - in flight
10/14	Tin City, AK	Passenger	Cessna 207A	Substantial	Minor	Loss of control - on ground
10/18	Nantucket, MA	Passenger	Cessna 402B	Substantial	None	Undershoot
10/20	Jacksonville, FL	Cargo	Cessna 210M	Destroyed	Serious	Loss of power(total) - non-mechanical
10/21	Karluk, AK	Pax and Cargo	Cessna A185	Substantial	None	In flight collision with terrain
10/21	Beverly, MA	Passenger	Piper PA-31-310	Substantial	None	Loss o. power
10/21	Salt Lake City, UT	Cargo	Beech C45G	Substantial	None	Loss of control - on ground
10/23	Avalon, CA	Mail Only	Cessna 402B	Substantial	None	Loss of control - on ground

Table 41 - LIST OF ACCIDENTS (Continued)
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
10/23	Fairfield, CA	Cargo	Cessna 208A	Destroyed	Fatal (1)	In flight encounter with weather
10/23	Oshtemo Townshp, MI	Cargo	Smith Aerostar 600	Destroyed	Fatal (1)	Loss of power(total) - mech failure/malfunction
10/26	Borrego Springs, CA	Passenger	Douglas 369D	Substantial	None	Loss of power(total) - mech failure/malfunction
10/27	Larsen Bay, AK	Pax and Cargo	Piper PA32	Substantial	None	Undershoot
10/28	Iliamna, AK	Pax and Cargo	Piper PA-32-301	Substantial	Minor	Loss of power(total) - mech failure/malfunction
11/03	Orlando, FL	Passenger	Lear Jet 35A	Substantial	None	In flight encounter with weather
11/04	Bellingham, WA	Passenger	Cessna 310N	Destroyed	Fatal (4)	In flight collision with object
11/06	New Bedford, MA	Passenger	Cessna U206F	Substantial	None	Loss of control - in flight
11/09	Tallahassee, FL	Cargo	Cessna T-210N	Substantial	None	Airframe/component/system failure/malfunction
11/11	West Palm Beach, FL	Cargo	Piper PA-31-310	Substantial	None	In flight encounter with weather
11/20	San Juan, PR	Passenger	North American 500	Substantial	None	Gear not extended
11/30	Funter Bay, AK	Passenger	Cessna 206	Substantial	None	In flight encounter with weather
12/03	Mansfield, OH	Cargo	Piper PA-60-600	Destroyed	Serious	Loss of power(total) - mech failure/malfunction
12/09	Natchez, MS	Cargo	Beech E-18S	Substantial	None	Midair collision
12/10	Ambler, AK	Cargo	Cessna 207A	Substantial	Fatal (1)	In flight encounter with weather
12/10	Silverdale, WA	Passenger	Cessna TU206G	Substantial	None	Loss of control - on ground
12/18	Wedron, IL	Cargo	Beech 58	Destroyed	Fatal (1)	Loss of power(total) - non-mechanical
12/21	Los Angeles, CA	Cargo Cargo	Piper PA-32R-300 Beech E18S	Substantial Minor	None None	On ground collision
12/21	Eugene Island, GM	Passenger	Aerospatiale SA-330J	Destroyed	Fatal (15)	In flight collision with object

Table 42 - PERSONS BY ROLE AND DEGREE OF INJURY
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

Role of Person	Degree of Injury: Fatal	Serious	Minor	None	Total
Pilot	26	10	7	58	101
Copilot	3	0	1	9	13
Other crew	3	0	0	2	5
Passenger	31	9	16	123	179
Total aboard	63	19	24	192	298
Other aircraft*	2	0	0	101	103
Other ground	0	0	2	0	2
Grand total	65	19	26	293	403
Percent	16.1	4.7	6.5	72.7	

* 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 43 - AIRCRAFT BY DAMAGE AND DEGREE OF INJURY
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

Aircraft damage	Degree of injury: None	Minor	Ser	Fatal	Aircraft: No.	Percent
Minor	4	0	1	0	5	5.0
Substantial	50	6	2	4	62	61.4
Destroyed	0	2	6	26	34	33.7
Aircraft						
Number -	54	8	9	30	101	
Percent -	53.5	7.9	8.9	29.7		

Table 44 - AIRCRAFT BY FIRST OCCURRENCE AND DEGREE OF INJURY AND BY DAMAGE
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

Type of first occurrence	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
Abrupt maneuver	0	0	1	1	0	0	1	1	2	2.0
Altitude deviation,uncontrolled	0	0	0	1	0	0	0	1	1	1.0
Airframe/component/system failure/malfunction	7	1	0	4	0	0	8	4	12	11.9
Fire/explosion	1	0	0	0	0	0	1	0	1	1.0
Fire	2	0	0	2	0	0	2	2	4	4.0
Explosion	1	0	0	0	0	0	1	0	1	1.0
Gear not extended	3	0	0	0	0	1	2	0	3	3.0
Hard landing	1	0	0	0	0	0	1	0	1	1.0
In flight collision with object	2	2	1	2	0	0	4	3	7	6.9
In flight collision with terrain	1	2	0	1	0	0	2	2	4	4.0
In flight encounter with weather	4	0	2	5	0	0	5	6	11	10.9
Loss of control - in flight	1	0	1	7	0	0	2	7	9	8.9
Loss of control - on ground	4	1	0	0	0	0	5	0	5	5.0
Midair collision	1	0	0	1	0	0	2	0	2	2.0
On ground collision with object	10	1	0	0	0	3	8	0	11	10.9
On ground collision with terrain	4	0	0	0	0	0	4	0	4	4.0
Loss of power	2	0	0	3	0	0	3	2	5	5.0
Loss of power(total) - mech failure/malfunction	4	1	1	1	0	0	5	2	7	6.9
Loss of power(partial) - mech failure/malfunction	0	0	1	1	0	0	0	2	2	2.0
Loss of power(total) - non-mechanical	4	0	1	1	0	0	4	2	6	5.9
Undershoot	2	0	0	0	0	0	2	0	2	2.0
Miscellaneous/other	0	0	1	0	0	1	0	0	1	1.0
Aircraft										
Number -	54	8	9	30	0	5	62	34	101	
Percent -	53.5	7.9	8.9	29.7	.0	5.0	61.4	33.7		

Table 45 - AIRCRAFT BY FIRST OCCURRENCE BROAD PHASE OF OPERATION
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

Type of first occurrence	Phase of operation									Aircraft	
	Stndg	Taxi	Tkoff	Climb	Cruis	Dscnt	Aprch	Landg	Manvr	No.	Percent
Abrupt maneuver	0	0	0	1	0	0	1	0	0	2	2.0
Altitude deviation,uncontrolled	0	0	0	0	1	0	0	0	0	1	1.0
Airframe/component/system failure/malfunction	0	0	3	1	4	1	2	1	0	12	11.9
Fire/explosion	1	0	0	0	0	0	0	0	0	1	1.0
Fire	0	0	1	1	2	0	0	0	0	4	4.0
Explosion	0	1	0	0	0	0	0	0	0	1	1.0
Gear not extended	0	0	0	0	0	0	0	3	0	3	3.0
Hard landing	0	0	0	0	0	0	0	1	0	1	1.0
In flight collision with object	0	0	3	0	0	0	0	2	2	7	6.9
In flight collision with terrain	0	0	1	0	1	0	1	0	1	4	4.0
In flight encounter with weather	0	0	1	1	5	0	3	0	1	11	10.9
Loss of control - in flight	0	0	3	1	0	0	2	0	3	9	8.9
Loss of control - on ground	0	0	2	0	0	0	0	3	0	5	5.0
Midair collision	0	0	1	0	1	0	0	0	0	2	2.0
On ground collision with object	2	7	1	0	0	0	0	1	0	11	10.9
On ground collision with terrain	0	2	1	0	0	0	0	1	0	4	4.0
Loss of power	0	0	1	0	3	0	1	0	0	5	5.0
Loss of power(total) - mech failure/malfunction	0	0	0	1	5	0	0	0	1	7	6.9
Loss of power(partial) - mech failure/malfunction	0	0	1	0	1	0	0	0	0	2	2.0
Loss of power(total) - non-mechanical	0	0	1	0	3	0	2	0	0	6	5.9
Undershoot	0	0	0	0	0	0	1	1	0	2	2.0
Miscellaneous/other	0	0	0	1	0	0	0	0	0	1	1.0
Aircraft											
Number -	3	10	20	7	26	1	13	13	8	101	
Percent -	3.0	9.9	19.8	6.9	25.7	1.0	12.9	12.9	7.9		

Table 46 - AIRCRAFT BY PHASE OF OPERATION AND DEGREE OF INJURY AND BY DAMAGE
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

Phase of operation	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
Standing - starting engine(s)	1	0	0	0	0	0	1	0	1	1.0
Standing - engine(s) operating	2	0	0	0	0	0	2	0	2	2.0
Taxi - to takeoff	4	0	0	0	0	2	2	0	4	4.0
Taxi - from landing	5	1	0	0	0	1	5	0	6	5.9
Takeoff	0	0	0	1	0	0	1	0	1	1.0
Takeoff - ground run	5	1	0	0	0	0	6	0	6	5.9
Takeoff - initial climb	6	1	1	5	0	0	6	7	13	12.9
Climb	0	0	0	2	0	0	0	2	2	2.0
Climb - to cruise	2	0	1	2	0	1	2	2	5	5.0
Cruise	3	0	1	3	0	0	5	2	7	6.9
Cruise - normal	7	2	1	9	0	0	9	10	19	18.8
Descent - normal	1	0	0	0	0	0	1	0	1	1.0
Approach	2	0	1	1	0	0	2	2	4	4.0
Approach - VFR pattern - base to final	1	0	0	1	0	0	1	1	2	2.0
Approach - VFR pattern - final approach	2	0	0	0	0	0	2	0	2	2.0
Approach - FAF/outer marker to threshold (IFR)	1	1	1	1	0	0	2	2	4	4.0
Approach - missed approach (IFR)	0	0	1	0	0	0	0	1	1	1.0
Landing	1	1	0	1	0	1	1	1	3	3.0
Landing - flare/touchdown	6	0	0	0	0	0	6	0	6	5.9
Landing - roll	4	0	0	0	0	0	4	0	4	4.0
Maneuvering	1	1	2	2	0	0	3	3	6	5.9
Maneuvering - turn to reverse direction	0	0	0	1	0	0	1	0	1	1.0
Hover	0	0	0	1	0	0	0	1	1	1.0
Aircraft										
Number -	54	8	9	30	0	5	62	34	101	
Percent -	53.5	7.9	8.9	29.7	.0	5.0	61.4	33.7		

Table 47 - AIRCRAFT BY CONDITION OF LIGHT AND TYPE OF WEATHER
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

Condition of light	Type of weather: VMC	IMC	Not reptd	Aircraft: No.	Percent
Dawn	3	0	0	3	3.0
Daylight	45	10	0	55	54.5
Night (dark)	21	9	1	31	30.7
Night (bright)	8	0	0	8	7.9
Dusk	3	1	0	4	4.0
Aircraft					
Number -	80	20	1	101	
Percent -	79.2	19.8	1.0		

Table 48 - AIRCRAFT BY TYPE OF OPERATION AND DEGREE OF INJURY
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

Type of Operation	Degree of Injury: None	Minor	Serious	Fatal	Aircraft: No.	Percent
Domestic Passenger	26	4	2	11	43	42.6
Domestic Cargo	17	1	7	17	42	41.6
Domestic Pass/Cargo	7	2	0	1	10	9.9
Domestic Mail	2	1	0	0	3	3.0
International Passenger	1	0	0	1	2	2.0
International Cargo	1	0	0	0	1	1.0
Aircraft						
Number -	54	8	9	30	101	
Percent -	53.5	8.0	9.0	29.7		

Table 49 - AIRCRAFT BY PROXIMITY TO AIRPORT AND FLIGHT PLAN
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

Accident location	Flight plan: None	VFR	IFR	Cmpny VFR	Aircraft: No.	Percent
Off airport/airstrip	19	7	21	15	62	61.4
On airport	6	5	22	2	35	34.7
On airstrip	0	2	1	1	4	4.0
Aircraft						
Number -	25	14	44	18	101	
Percent -	24.8	13.9	43.6	17.8		

Table 50 - AIRCRAFT BY OCCURRENCE OF FIRE AND DEGREE OF INJURY AND BY DAMAGE
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

	Degree of injury				Aircraft damage				Aircraft	
Aircraft fire	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
None	50	7	7	14	0	5	58	15	78	77.2
In-flight	3	0	0	0	0	0	3	0	3	3.0
On ground	1	1	2	14	0	0	1	17	18	17.8
In-flight and on ground	0	0	0	2	0	0	0	2	2	2.0
Aircraft										
Number -	54	8	9	30	0	5	62	34	101	
Percent -	53.5	7.9	8.9	29.7	.0	5.0	61.4	33.7		

Table 51 - AIRCRAFT BY TYPE OF AIRCRAFT AND DEGREE OF INJURY AND BY DAMAGE
NONSCHEDULED 14 CFR 135 OPERATIONS
1986

	Degree of injury				Aircraft damage				Aircraft	
Type of aircraft	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
All fixed wing *	52	6	8	23	0	5	57	27	89	88.1
Fixed Wing Single Recip. Eng.	17	2	2	8	0	0	21	8	29	28.7
Fixed Wing Multiple Recip. Eng.	25	1	5	7	0	5	22	11	38	37.6
Fixed Wing Turboprop	7	3	1	8	0	0	11	8	19	18.8
Fixed Wing Turbojet	3	0	0	0	0	0	3	0	3	3.0
All Rotorcraft *	2	2	1	7	0	0	5	7	12	11.9
Rotorcraft, Turbine Engine	2	2	1	7	0	0	5	7	12	11.9
Aircraft										
Number -	54	8	9	30	0	5	62	34	101	
Percent -	53.5	7.9	8.9	29.7	.0	5.0	61.4	33.7		

* Not included in column totals

Table 52 - BROAD CAUSE/FACTOR ASSIGNMENTS*
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

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 #	7	35	5	12	11	41
Propulsion System and Controls	4	22	2	3	6	24
Airframe	0	4	2	5	2	9
Landing Gear	0	3	0	1	0	4
Systems/Equipment/Instruments	2	6	2	5	4	11
Environment #	2	6	23	61	24	66
Weather	2	3	13	29	14	31
Light Conditions	0	0	12	29	12	29
Object(trees,wires,etc.)	0	2	5	16	5	18
Terrain/Runway Condition	0	1	10	24	10	25
Personnel #	26	82	17	41	28	91
Pilot	23	72	17	33	27	81
Others (Aboard)	0	0	0	0	0	0
Others (Not Aboard)	5	16	6	16	11	28
Number of Aircraft					30	101
NTSB Determined Probable Cause					30	101

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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 53 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
NONSCHEDULED 14 CFR 135 OPERATIONS
1977 - 1987

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
1977	156	31	118	115	3,304,220	4.78	0.94
1978	198	54	155	152	3,545,753	5.58	1.52
1979	160	30	77	73	3,684,321	4.34	0.81
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	3,256,763	4.05	0.95
1983	141	27	62	57	2,574,883	5.48	1.05
1984	146	23	52	52	3,079,007	4.74	0.75
1985	152	35	76	75	2,782,696	5.46	1.26
1986	116	31	65	61	2,913,358	3.98	1.06
1987	98	30	65	63	2,877,002	3.41	1.04

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

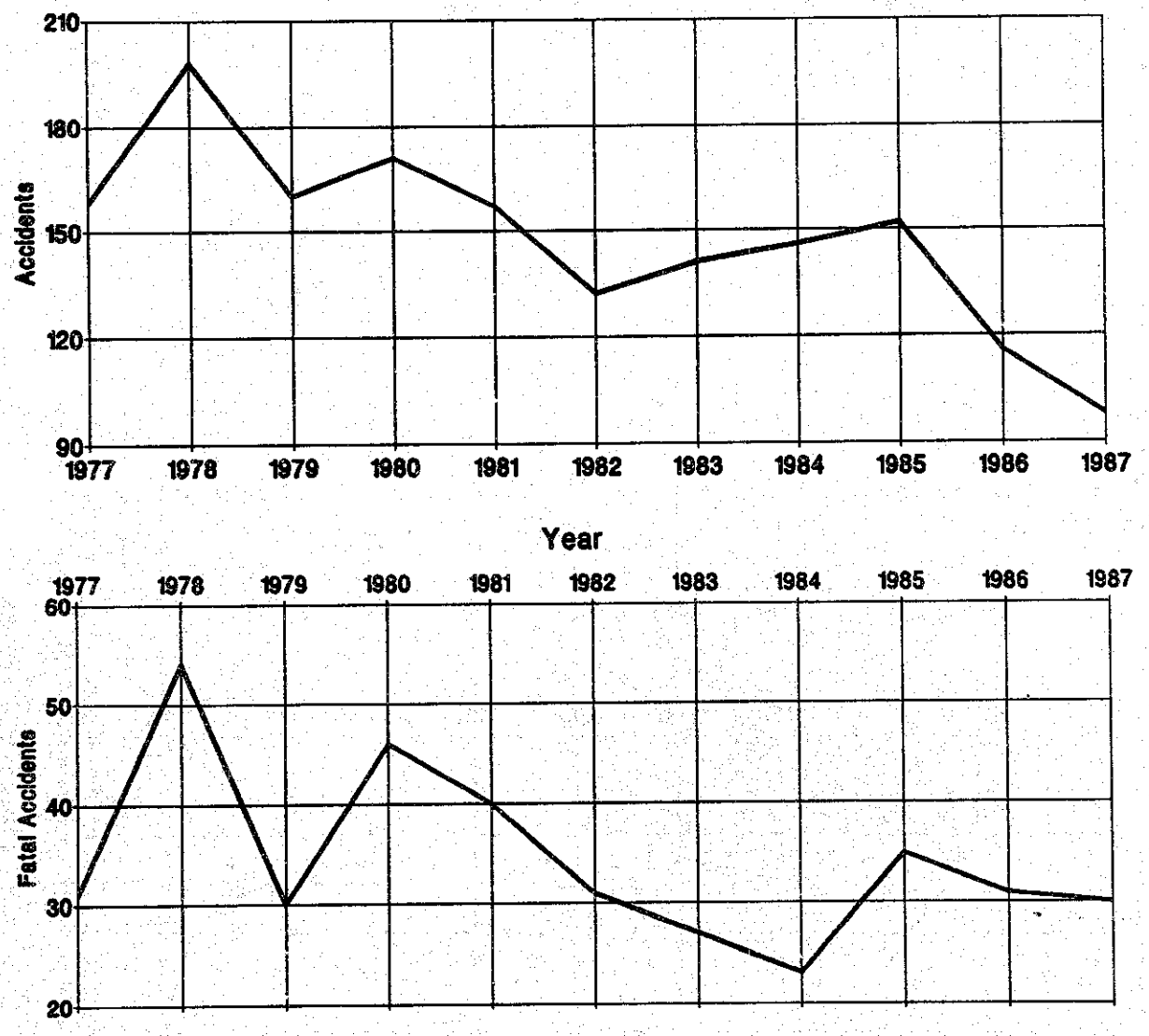

Figure 14 - NUMBER OF FATALITIES
NONSCHEDULED 14 CFR 135 OPERATIONS

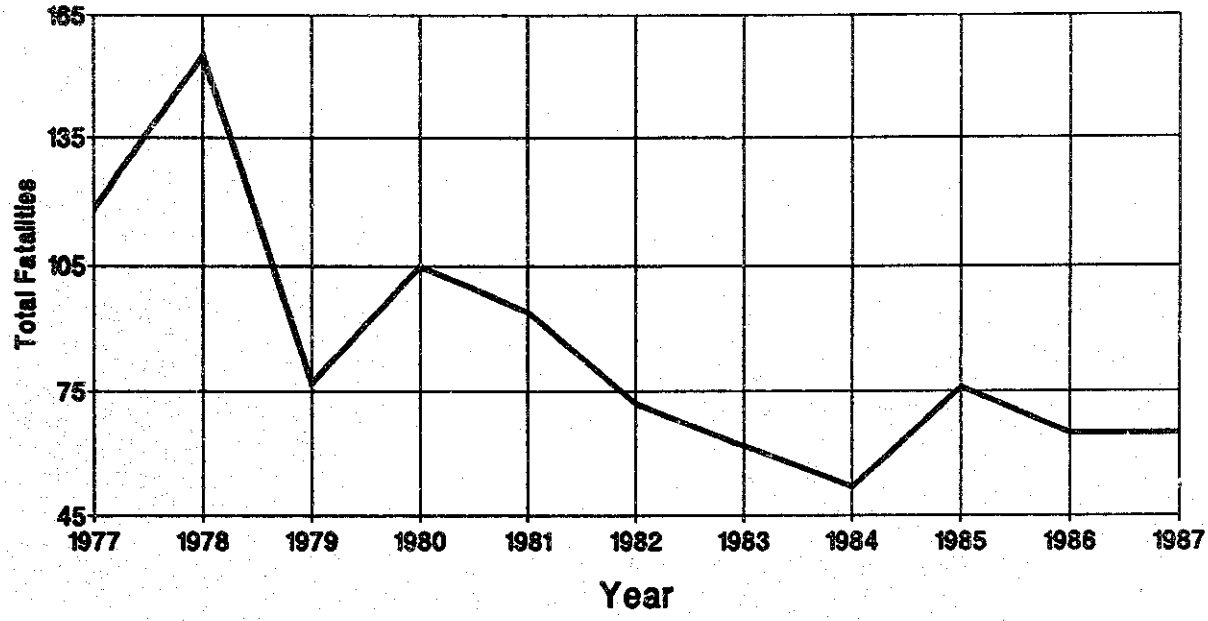

Figure 15 - ACCIDENT RATE PER 100,000 HOURS FLOWN
NONSCHEDULED 14 CFR 135 OPERATIONS

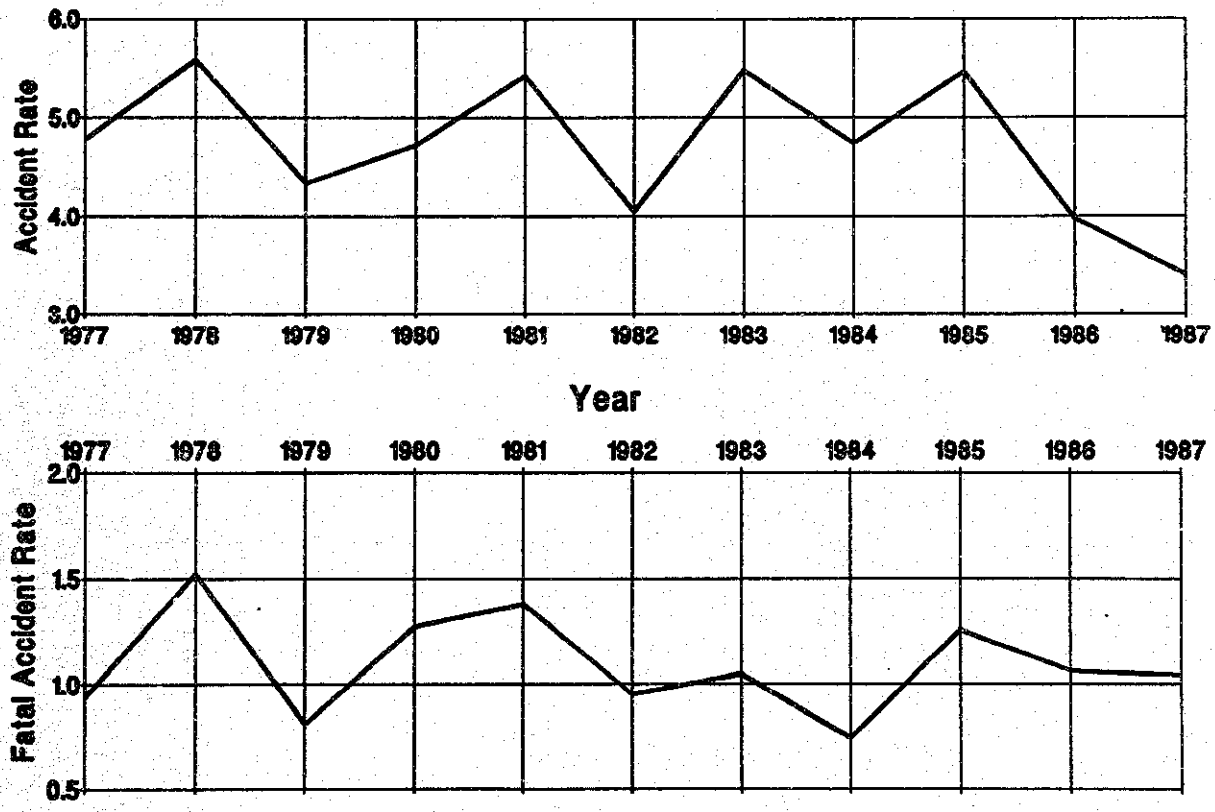

Table 54 - FIRST OCCURRENCES IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
NONSCHEDULED 14 CFR 135 OPERATIONS
1987 AND 1982 - 1986

	All Accidents				Fatal Accidents			
	1987		1982 - 1986		1987		1982 - 1986	
Type of Occurrence	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Abrupt maneuver	2	2.0	.4	.3	1	3.3	.4	1.3
Altitude deviation,uncontrolled	1	1.0	.4	.3	1	3.3	.2	.7
Airframe/component/system fail/malf	12	11.9	10.8	7.8	4	13.3	1.2	4.0
Dragged wing, rotor, pod, or float	0	.0	.2	.1	0	.0	.0	.0
Fire/explosion	1	1.0	.2	.1	0	.0	.0	.0
Fire	4	4.0	2.0	1.4	2	6.7	.0	.0
Explosion	1	1.0	.6	.4	0	.0	.2	.7
Forced landing	0	.0	.2	.1	0	.0	.0	.0
Gear collapsed	0	.0	.8	.6	0	.0	.0	.0
Main gear collapsed	0	.0	3.8	2.7	0	.0	.0	.0
Nose gear collapsed	0	.0	.8	.6	0	.0	.0	.0
Tail gear collapsed	0	.0	.2	.1	0	.0	.0	.0
Other gear collapsed	0	.0	.2	.1	0	.0	.0	.0
Gear not extended	3	3.0	.0	.0	0	.0	.0	.0
Hard landing	1	1.0	1.2	.9	0	.0	.0	.0
In flight collision with object	7	6.9	10.4	7.5	2	6.7	2.4	8.1
In flight collision with terrain	4	4.0	12.4	8.9	1	3.3	5.4	18.1
In flight encounter with weather	11	10.9	13.0	9.3	5	16.7	6.4	21.5
Loss of control - in flight	9	8.9	15.4	11.1	7	23.3	5.8	19.5
Loss of control - on ground	5	5.0	11.2	8.0	0	.0	.4	1.3
Midair collision	2	2.0	1.6	1.1	1	3.3	1.0	3.4
Nose over	0	.0	1.4	1.0	0	.0	.0	.0
On ground collision with object	11	10.9	7.2	5.2	0	.0	.6	2.0
On ground collision with terrain	4	4.0	3.2	2.3	0	.0	.2	.7
On ground encounter with weather	0	.0	.6	.4	0	.0	.0	.0
Overrun	0	.0	3.8	2.7	0	.0	.0	.0
Loss of engine power	5	5.0	4.4	3.2	3	10.0	.8	2.7
Loss of engine power(total) - mechanical failure/malfunction	7	6.9	8.8	6.3	1	3.3	1.0	3.4
Loss of engine power(partial) - mechanical failure/malfunction	2	2.0	4.6	3.3	1	3.3	.8	2.7
Loss of engine power(total) - non-mechanical	6	5.9	9.6	6.9	1	3.3	.6	2.0
Loss of engine power(partial) - non-mechanical	0	.0	2.0	1.4	0	.0	.0	.0
Propeller/rotor contact to person	0	.0	1.6	1.1	0	.0	.6	2.0
Roll over	0	.0	.6	.4	0	.0	.2	.7
Undershoot	2	2.0	3.0	2.2	0	.0	.4	1.3
Undetermined	0	.0	.4	.3	0	.0	.4	1.3
Missing aircraft	0	.0	.6	.4	0	.0	.6	2.0
Miscellaneous/other	1	1.0	1.6	1.1	0	.0	.2	.7
Total Aircraft	101	100.0	139.2	100.0	30	100.0	29.8	100.0

Table 55 - FIRST PHASES OF OPERATION IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
NONSCHEDULED 14 CFR 135 OPERATIONS
1987 AND 1982 - 1986

	All Accidents				Fatal Accidents			
	1987		1982 - 1986		1987		1982 - 1986	
Phase of Operation	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Takeoff	20	19.8	29.2	21.0	6	20.0	4.0	13.4
Landing	13	12.9	29.2	21.0	1	3.3	1.0	3.4
Cruise	26	25.7	28.0	20.1	12	40.0	6.8	22.8
Approach	13	12.9	17.8	12.8	3	10.0	7.4	24.8
Maneuvering	8	7.9	9.6	6.9	4	13.3	3.0	10.1
Taxi	10	9.9	6.6	4.7	0	.0	.0	.0
Climb	7	6.9	5.6	4.0	4	13.3	1.8	6.0
Descent	1	1.0	5.4	3.9	0	.0	2.4	8.1
Standing	3	3.0	4.6	3.3	0	.0	1.4	4.7
Other	0	.0	3.2	2.3	0	.0	2.0	6.7
Total Aircraft	101	100.0	139.2	100.0	30	100.0	29.8	100.0

Table 56 - BROAD CAUSE/FACTOR ASSIGNMENTS IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
NONSCHEDULED 14 CFR 135 OPERATIONS
1987 AND 1982 - 1986

	All Accidents				Fatal Accidents			
	1987		1982 - 1986		1987		1982 - 1986	
Broad Cause/Factor	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Pilot	81	80.2	103.4	74.3	27	90.0	24.0	80.5
Weather	31	30.7	46.0	33.0	14	46.7	13.4	45.0
Terrain/Runway Condition	25	24.8	45.0	32.3	10	33.3	9.6	32.2
Propulsion System and Control	24	23.8	30.0	21.6	6	20.0	3.4	11.4
Object (tree,wires,etc)	18	17.8	24.4	17.5	5	16.7	4.8	16.1
Light Conditions	29	28.7	23.6	17.0	12	40.0	7.8	26.2
Other Person (Not Aboard)	28	27.7	21.2	15.2	11	36.7	5.2	17.4
Landing Gear	4	4.0	17.6	12.6	0	.0	.6	2.0
Systems/Equipment/ Instruments	11	10.9	11.6	8.3	4	13.3	3.0	10.1
Airframe	9	8.9	6.2	4.5	2	6.7	1.8	6.0
Flight Control System	0	.0	2.2	1.6	0	.0	1.0	3.4
Other Person (Aboard)	0	.0	1.4	1.0	0	.0	.8	2.7
Airport/Airways Facilities, Aids	0	.0	.4	.3	0	.0	.0	.0
Total Aircraft	101		139.2		30		29.8	
NTSB Determined Probable Cause	101		139.2		30		29.8	

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APPENDIX A
MIDAIR COLLISION ACCIDENTS
U.S. AIR CARRIER OPERATIONS
1977 - 1987

Year	Accidents Total	Accidents Fatal	Total Fatalities	Number of Accidents by Segments of Aviation Involved: 121 and GA	S135 and S135	S135 and GA	N135 and N135	N135 and GA
1977	1	1	3	0	0	0	0	1
1978	1	1	144	1	0	0	0	0
1979	4	2	8	0	1	0	0	3
1980	3	3	3	0	0	0	1	2
1981	4	3	20	0	0	1	1	2
1982	3	1	3	0	0	1	1	1
1983	1	1	4	0	0	0	0	1
1984	1	1	17	0	0	1	0	0
1985	2	1	1	0	0	0	2	0
1986	0	0	0	0	0	0	0	0
1987	5	2	12	0	0	3	0	2
	25	16	215	1	1	6	5	12

NOTE: 121 = 14 CFR 121, 125 or 127 Operation
S135 = Scheduled 14 CFR 135 Operation
N135 = Nonscheduled 14 CFR 135 Operation
GA = General Aviation

APPENDIX B -- EXPLANATORY NOTES

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 particular phase of the flight or operation will be that phase of flight in which the first occurrence or circumstance occurred. In the event that there was more than one occurrence in one operational phase, the same phase is recorded for each of these occurrences.

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
1987

	Cause or Factor	Cause
AIRCRAFT		
1 engine	2	2
Air cond/heating/pressurization	1	0
Aircraft performance,takeoff capability	1	1
All engines	1	1
Auxiliary power unit	1	0
Electrical system	1	0
Engine installation,mounting bolt	1	1
Fire warning system,powerplant	1	1
Fluid,fuel	1	1
Fluid,oil	2	1
Ground proximity warning system	1	0
Landing gear,main gear	1	0
Landing gear,nose gear	2	2
Lubricating system	1	1
Misc eqpt/furnishings,seat belt	1	1
Misc eqpt/furnishings,slides	2	1
Turbine assembly,shaft bearing	1	1
Warning system(other)	1	0
ENVIRONMENT		
Aircraft moving on ground	1	0
Aircraft parked	1	0
Airport facility	1	0
Crosswind	1	0
Dark night	3	0
Dawn	2	0
Fog	2	0
Gusts	1	0
Obscuration	2	0
Rain	1	0
Terrain condition	2	0
Thunderstorm	1	0
Thunderstorm,outflow	1	0
Turbulence	3	0
Turbulence in clouds	1	1
Turbulence,clear air	3	3
Unfavorable wind	1	0
Vehicle	1	0
Windshear	1	0
FLIGHT CREW		
ATC clearance	1	0
Aircraft weight and balance	1	1
Airspeed	1	0
Airspeed(Vs)	1	1
Checklist	1	1
Clearance	1	1
Crew/group coordination	1	1
Decision height	1	1
Directional control	1	1
Emergency procedure	2	1
Flare	3	3
Flight and navigation instruments	1	0
Fuel tank selector position	1	1
Gear extension	1	1
Hazardous weather advisory	1	1
IFR procedure	1	1
Ice/frost removal from aircraft	1	1
In-flight planning/decision	2	1
Instructions,written/verbal	1	1
Lack of total experience in type of aircraft	2	0

CAUSE/FACTOR TABLE
14 CFR 121 125 127 OPERATIONS
1987

	Cause or Factor	Cause
FLIGHTCREW (continued)		
Lowering of flaps	1	1
Lowering of slats	1	1
Missed approach	1	1
Over confidence in aircraft's ability	1	0
Over confidence in personal ability	1	0
Preflight planning/preparation	1	1
Procedures/directives	2	2
Proper alignment	1	1
Proper assistance	1	0
Proper descent rate	2	2
Radio communications	1	0
Remedial action	1	1
Rotation	1	1
Stall/mush	1	1
Supervision	1	1
Unsafe/hazardous condition warning	1	1
Visual lookout	2	1
Wind information	2	2
OTHER PERSON		
ATC clearance	2	1
Acft/equip, inadequate control shape/size	1	0
Airplane handling	1	1
All available runway	1	0
Brakes(emergency)	2	1
Brakes(normal)	2	2
Checklist	1	0
Clearance	1	1
Control interference	1	1
Control tower service	3	1
Crew/group coordination	4	2
Diverted attention	1	0
Emergency equipment	2	2
Emotional reaction	1	1
Equipment, other	2	2
Hydraulic system	1	0
Identification of aircraft visually	2	1
In-flight planning/decision	1	1
Inadequate surveillance of operation	2	0
Instructions,written/verbal	1	0
Insufficient stds/rqmts - Airman	1	0
Insufficient stds/rqmts - Operation/operator	1	0
Judgement	1	1
Maintenance	3	1
Maintenance,service bulletins	1	0
Monitoring	2	1
Navigation computer	1	0
Operation with known deficiencies in equipment	1	0
Passenger briefing	2	2
Physical impairment	1	0
Preflight planning/preparation	1	1
Procedure inadequate	1	0
Procedures/directives	1	1
Proper assistance	2	1
Sabotage	1	1
Seat belt	1	1
Seat belt sign	1	1
Security	1	0
Supervision	1	1
Unsafe/hazardous condition warning	2	2
Visual lookout	1	0
Visual/aural perception	1	0

APPENDIX D

DETAILED CAUSE/FACTOR ASSIGNMENTS
SCHEDULED 14 CFR 135 OPERATIOS

CAUSE/FACTOR TABLE
SCHEDULED 14 CFR 135 OPERATIONS
1987

	Cause or Factor	Cause
AIRCRAFT		
1 engine	2	0
Engine assembly,camshaft	1	0
Engine assembly,cylinder	1	1
Fluid,fuel	2	2
Fuel system	1	0
Fuel system,fuel control	1	1
Induction air control,intake manifold	1	0
Landing gear,main gear	1	0
Landing gear,nose gear	1	0
Propeller governor control,bellcrank	1	1
Propeller governor control,linkage	1	0
Propeller system/accessories	1	1
Stall warning system	1	0
Wing	1	0
Wing,skin	1	0
FACILITY		
Radar,approach/departure	1	0
ENVIRONMENT		
Bird(s)	1	1
Dark night	4	0
Dusk	2	0
Fence	1	0
Fog	2	0
Gusts	1	0
High wind	1	0
Icing conditions	1	0
Low ceiling	1	0
Snow	1	0
Tailwind	1	0
Terrain condition	8	0
Tree(s)	1	0
Vehicle	2	0
FLIGHT CREW		
Aircraft control	1	1
Aircraft preflight	1	1
Aircraft weight and balance	1	0
Airspeed	3	2
Airspeed(Vmc)	2	2
All available runway	2	1
Altitude	2	2
Anti-ice/de-ice system	1	1
Checklist	2	2
Clearance	1	1
Compensation for wind conditions	1	1
Complacency	1	0
Crew/group coordination	2	1
Directional control	2	1
Distance	1	1
Diverted attention	1	0
Emergency procedure	3	2
Fatigue(flight and ground schedule)	1	0
Flare	2	2
Fuel consumption calculations	1	1
Gear extension	1	1
Go-around	1	1
Habit interference	1	0
IFR procedure	1	1
Ice/frost removal from aircraft	1	0

CAUSE/FACTOR TABLE
SCHEDULED 14 CFR 135 OPERATIONS
1987

	Cause or Factor	Cause
FLIGHT CREW(continued)		
In-flight planning/decision	3	2
Inadequate initial training	1	1
Inattentive	1	0
Judgement	1	1
Lack of recent instrument time	1	0
Lack of total experience in type of aircraft	1	0
Planned approach	1	1
Powerplant controls	2	1
Preflight planning/preparation	3	2
Procedures/directives	1	1
Proper alignment	1	1
Proper altitude	1	1
Proper descent rate	1	0
Recovery from bounced landing	2	1
Spatial disorientation	1	0
Stall	1	1
Stall/spin	1	1
Supervision	1	1
Throttle/power control	1	1
Trim setting	1	0
VFR flight into IMC	1	1
Visual lookout	3	3
Wheels up landing	1	1
OTHER PERSON		
ATC clearance	1	0
Became lost/disoriented	1	1
Clearance	2	2
Equipment, other	1	1
Identification of aircraft on radar	1	0
Inadequate certification/approval - Aircraft	1	0
Inadequate certification/approval - Airman	1	1
Inadequate surveillance of operation	1	0
Inadequate training	1	0
Judgement	1	1
Maintenance,100 hour inspection	1	0
Maintenance,adjustment	2	1
Procedures/directives	1	1
Unsafe/hazardous condition warning	1	0
Visual lookout	5	5

APPENDIX E

DETAILED CAUSE/FACTOR ASSIGNMENTS
NONSCHEDULED 14 CFR 135 OPERATIONS

CAUSE/FACTOR TABLE
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

	Cause or Factor	Cause
AIRCRAFT		
Air cond/heating/pressurization,turbocompressor	1	1
Aircraft performance	1	1
Aircraft performance,landing capability	1	1
Aircraft performance,yawing maneuvers	1	1
Cooling system,cowling	1	1
Door,exterior crew	1	1
Door,passenger	1	1
Electrical system	2	1
Electrical system,electric wiring	1	1
Eng assembly,crankshaft counterweights/vib damper	1	1
Engine assembly,bearing	1	1
Engine assembly,camshaft	1	1
Engine assembly,cylinder	2	2
Engine assembly,other	2	2
Engine instruments,fuel quantity gage	2	0
Exhaust system	1	1
Exhaust system,clamp	1	1
Exhaust system,stack	1	1
Exhaust system,turbocharger	1	1
Flight compartment lights	1	0
Fluid,fuel	6	6
Fluid,hydraulic	1	1
Fluid,oil	5	5
Fuel system	1	1
Fuel system,line	1	1
Fuel system,pump	1	0
Fuel system,strainer	1	1
Fuselage,cabin	1	0
Fuselage,crew compartment	2	0
Fuselage,seat	1	1
Hydraulic system,bypass valve	1	1
Hydraulic system,line	1	1
Hydraulic system,relief valve	1	1
Ignition system,ignition harness	1	1
Induction air control,linkage	1	1
Instrument lights	1	0
Landing gear	1	0
Landing gear,emergency extension assembly	1	1
Landing gear,gear locking mechanism	1	1
Landing gear,normal retraction/extension assembly	1	1
Landing gear,tire	1	1
Lubricating system	2	2
Lubricating system,oil pressure pump	1	1
Lubricating system,oil scavenge pump	1	1
Misc rotorcraft,emergency floatation gear	1	0
Propeller system/accessories,blade	1	1
Rotor drive system,engine to transmission drive	1	1
Rotor drive system,isolation link	1	1
Rotor system,rotor vibration absorber	1	1
Turbine assembly,guide vane retention	1	0
Turbine assembly,shaft bearing	1	1
Turbine assembly,turbine wheel	1	0
Turboshaft engine	1	0
Turboshaft engine,gas generator	1	0
Window,flight compartment window/windshield	1	0
Wing	2	1
FACILITY		
Airport facilities,obstruction marking	1	0
Airport facilities,runway edge lights	1	0
Airport facilities,runway/landing area condition	2	0

CAUSE/FACTOR TABLE
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

	Cause or Factor	Cause
ENVIRONMENT		
Animal(s)	2	2
Below approach minimums	1	0
Bright night	3	0
Building(nonresidential)	2	0
Clouds	1	0
Crosswind	2	0
Dark night	17	0
Downdraft	1	0
Dusk	2	0
Fence	2	0
Fog	8	1
Gusts	3	0
High density altitude	2	0
High wind	3	0
Ice fog	1	0
Icing conditions	2	0
Low ceiling	7	1
Night	7	0
Obscuration	5	1
Rain	5	0
Residence	1	0
Sign	1	0
Snow	7	0
Tailwind	4	0
Terrain condition	25	1
Tree(s)	9	0
Turbulence	2	1
Turbulence in clouds	1	0
Unfavorable wind	2	0
Vehicle	1	0
Whiteout	2	0
Windshear	1	0
Wire,transmission	2	0
FLIGHT CREW		
Aerobatics	1	1
Aircraft preflight	3	1
Aircraft weight and balance	2	1
Airplane handling	3	3
Airspeed	2	1
Airspeed(Vmc)	2	2
Airspeed(Vs)	2	2
All available runway	1	1
Altitude	5	4
Autopilot	1	1
Autorotation	1	1
Became lost/disoriented	1	1
Brakes(normal)	1	1
Checklist	3	3
Clearance	7	7
Collective	1	1
Company-induced pressure	2	0
Compensation for wind conditions	3	2
Descent	2	1
Design stress limits of aircraft	1	1
Directional control	5	5
Distance	1	0
Diverted attention	5	1
Documentation	1	0
Emergency procedure	2	2
Equipment, other	1	0

CAUSE/FACTOR TABLE
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

	Cause or Factor	Cause
FLIGHT CREW(continued)		
Fatigue(circadian rhythm)	1	0
Fatigue(flight and ground schedule)	1	0
Fatigue(lack of sleep)	2	1
Flare	3	3
Flight controls	1	1
Flight into known adverse weather	4	4
Fuel consumption calculations	3	3
Fuel supply	2	2
Fuel tank selector position	1	1
Gear extension	2	2
Go-around	2	2
Ground loop/swerve	1	1
IFR procedure	1	1
Improper use of procedure	1	0
In-flight planning/decision	15	13
Instructions,written/verbal	1	1
Judgement	2	0
Lack of familiarity with geographic area	2	0
Lack of total experience	2	0
Lack of total experience in type of aircraft	3	0
Lack of total experience in type operation	1	0
Level off	1	1
Low pass	1	0
Lowering of flaps	1	0
Minimum descent altitude	1	1
Operation with known deficiencies in equipment	3	0
Over confidence in personal ability	4	2
Planned approach	2	2
Planning-decision	3	1
Precautionary landing	1	1
Preflight planning/preparation	7	5
Pressure	1	1
Pressure induced by others	1	0
Procedures/directives	5	3
Propeller feathering	1	1
Proper alignment	2	2
Proper altitude	5	5
Proper climb rate	1	1
Proper glidepath	1	0
Proper touchdown point	1	1
Pull-up	2	0
Refueling	2	2
Rotor rpm	2	2
Self-induced pressure	1	0
Spatial disorientation	4	3
Spiral	1	1
Stall	2	1
Stall/mush	2	1
Throttle/power control	2	2
Unsafe/hazardous condition warning	1	1
Unsuitable terrain	5	4
VFR flight into IMC	4	4
VFR procedures	1	0
Visual lookout	12	9
Visual/aural perception	1	1
Weather evaluation	3	3
Weather radar	1	0
Wheels down landing in water	1	1
Wheels up landing	1	0
Wind information	1	0
Wrong runway	1	1

CAUSE/FACTOR TABLE
NONSCHEDULED 14 CFR 135 OPERATIONS
1987

	Cause or Factor	Cause
OTHER PERSON		
ATC clearance	1	1
Acft/equip, inadequate aircraft manuals	1	0
Aircraft/equipment, inadequate design	1	0
Airport snow removal	1	1
Brakes(normal)	1	1
Checklist	1	0
Clearance	2	2
Company-induced pressure	2	1
Control tower service	1	1
Crew/group coordination	1	1
Diverted attention	2	0
Identification of aircraft visually	1	0
In-flight planning/decision	1	1
Inadequate initial training	2	0
Inadequate substantiation process	1	0
Inadequate surveillance of operation	1	0
Insufficient stds/rqmts - Operation/operator	1	0
Maintenance	2	2
Maintenance,100 hour inspection	1	0
Maintenance,annual inspection	1	0
Maintenance,inspection of aircraft	3	1
Maintenance,installation	2	2
Maintenance,major repair	3	3
Procedure inadequate	2	0
Procedures/directives	2	1
Supervision	1	0
Unsafe/hazardous condition	1	1
Visual lookout	5	5
Visual/aural perception	1	0

APPENDIX F

N.T.S.B. FORM 6120.4

National Transportation Safety Board

FACTUAL REPORT
AVIATION

1 NTSB Accident/Incident Number

2
1 ☐ Accident
2 ☐ Incident

3 Investigation
1 ☐ NTSB
2 ☐ FAA Delegated

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

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

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

66 Hazardous Material Spill/Factor
1 ☐ Yes
2 ☐ No
A Other

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 Specify
_____
B Other

112 Medical wavier
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/LCRAN/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

*U.S.G.P.O:1991-281-626:20034