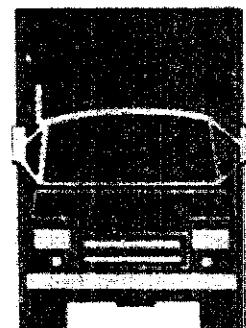
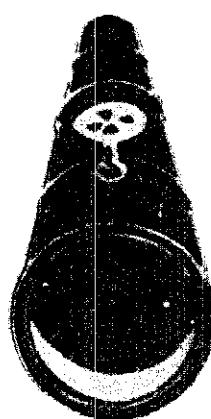
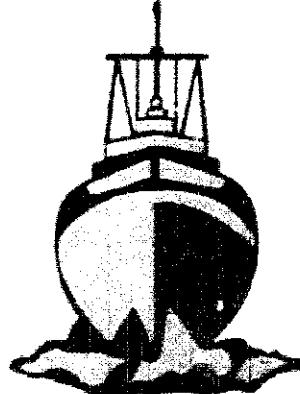


NATIONAL TRANSPORTATION SAFETY BOARD

ANNUAL REVIEW OF AIRCRAFT ACCIDENT DATA

U.S. AIR CARRIER OPERATIONS
CALENDAR YEAR 1990



6162

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16. Abstract	<p>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 1990.</p> <p>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 1990 accidents to enable comparison with prior years.</p>		
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INTRODUCTION

This report presents a statistical compilation and review of air carrier accidents that occurred in 1990, and involved U.S. registered aircraft conducting operations under Title 14 CFR Parts 121, 125, 127, and 135. Briefly stated, Part 121 applies to air carriers, such as major airlines and cargo haulers, that fly large transport aircraft. Part 125 covers the operation of large, privately owned aircraft not held out for hire. Part 127 regulates the operation of helicopters used as scheduled air carriers. Part 135 applies to commercial air carriers commonly referred to as commuter airlines and air taxis. For a complete definition of operations under each of these Parts, consult the applicable sections of the Code of Federal Regulations.

The report is divided into three major sections: 14 CFR 121, 125, 127 Operations; Scheduled 14 CFR 135 Operations; and Nonscheduled 14 CFR 135 Operations. Each section begins with an overview of accidents and their consequences for 1990 and for the four preceding years. Several tables then present accident parameters for 1990 only. Each section concludes with tabulations that present comparative statistics for 1990 and for the 5-year period 1985-1989.

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

In many of the tables presented in this report (such as table 4), the number of accidents in a given category is small; in these tables, even a small change in the number of accidents would result in a significant change in the accident rate. Therefore, the reader should exercise caution in the use of these rates and in comparing numbers and percentages of accidents between two time periods when the number of accidents is small.

14 CFR 121, 125, 127 OPERATIONS

There were 24 accidents in Part 121, 125, 127 operations in 1990. The overall accident rate for 1990 was 0.198 accidents per 100,000 hours flown, a 20.2 percent decrease from the 1989 rate of 0.248. The 1990 rate was 28.6 percent lower than the overall rate of 0.278 for the period from 1981 through 1989.

There were six fatal accidents in this category during 1990. During the period 1981 through 1989 there were an average of five fatal accidents per year. The six fatal accidents in 1990 were responsible for a total of thirty-seven fatalities.

The most serious of these fatal accidents involved a McDonnell Douglas DC-6 in Guatemala City (25 fatalities) and a ground collision between a Boeing 727 and a McDonnell Douglas DC-9 in Romulus, Michigan (8 fatalities).

Table 1 - SUMMARY OF LOSSES
14 CFR 121, 125, 127 OPERATIONS
1986 - 1990

	1986	1987	1988	1989	1990
Accidents					
Fatal	3	5	3	11	6
Involved Serious Injury	15	12	16	5	11
Involved Minor or No Injury	6	19	10	12	7
	----	----	----	----	----
Total	24	36	29	28	24
Fatalities					
Passenger	4	213	255	259	8
Crew	3	17	19	17	4
Other Persons	1	2	11	2	25
	----	----	----	----	----
Total	8	232	285	278	37
Aircraft Damage (14 CFR 121, 125, 127)					
Destroyed	2	5	3	7	3
Substantial	8	18	12	11	8
Minor	4	4	0	0	4
None	10	12	14	10	10
	----	----	----	----	----
Total	24	39	29	28	25

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

	1986	1987	1988	1989	1990
Aircraft Miles Flown (Thousands)	4,017,626	4,360,521	4,503,426	4,605,083	4,954,326
Aircraft Hours Flown	9,976,104	10,644,856	11,139,519	11,273,908	12,149,487
Departures Flown	7,202,027	7,601,373	7,716,061	7,645,494	8,127,133

Accident Rates *

Per Million Miles Flown	0.0057	0.0080	0.0062	0.0061	0.0482
Per Hundred Thousand Hours Flown	0.231	0.329	0.251	0.248	0.198
Per Hundred Thousand Departures Flown	0.319	0.460	0.363	0.366	0.295

Fatal Accident Rates *

Per Million Miles Flown	0.0005	0.0009	0.0004	0.0024	0.0012
Per Hundred Thousand Hours Flown	0.020	0.038	0.018	0.098	0.049
Per Hundred Thousand Departures Flown	0.028	0.053	0.026	0.144	0.074

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

Table 3 - LIST OF ACCIDENTS
 14 CFR 121, 125, 127 OPERATIONS
 1990

Date	Location	Type of Operation	Air Carrier	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
1/02	Baltimore, MD	Sch Passenger	American	McD-Doug DC-10	None	Serious	Airframe/component/system failure/malfunction
1/16	New York, NY	Sch Passenger	United	Boeing 757-222	Substantial	None	On ground collision with terrain
1/18	Atlanta, GA	Sch Passenger	Eastern	Boeing 727	Substantial	Fatal (1)	On ground collision with object
1/20	San Juan, PR	Sch Passenger	American	McD-Doug DC-10-10	None	Serious	In flight encounter with weather
1/31	Indianapolis, IN	Sch Cargo	Federal Exp.	Boeing 727	Minor	Fatal (1)	On ground collision with object
3/13	Phoenix, AZ	Sch Passenger	Alaska	Boeing 727-227	Minor	Fatal (1)	On ground collision with object
3/16	Santa Ana, CA	Sch Passenger	America West	Boeing 737-300	Substantial	None	On ground collision with terrain
4/18	Los Angeles, CA	Sch Cargo	Federal Exp.	McD-Doug DC-10-10	Substantial	None	On ground collision with terrain
5/05	Guatemala City	Sch Cargo	Aerial Trans.	McD-Doug DC-6	Destroyed	Fatal (25)	Loss of power
5/11	Washington, DC	Sch Passenger	United	Boeing B-737	None	Serious	In flight encounter with weather
6/02	Unalakleet, AK	Sch Pax/Cargo	Markair	Boeing 737-2X6C	Destroyed	Serious	In flight collision with terrain
6/16	Jamaica, NY	Sch Pax/Cargo	US Air	Fokker Fk-28-10	Substantial	None	On ground collision with object
6/21	Charleston, SC	Sch Passenger	US Air	Boeing 727-281	None	Serious	Airframe/component/system failure/malfunction

Table 3 - LIST OF ACCIDENTS (Continued)
 14 CFR 121, 125, 127 OPERATIONS
 1990

Date	Location	Type of Operation	Air Carrier	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
7/14	Caribbean Sea	Nonsch Cargo	TPI Intl	Lockheed L-188A	Substantial	None	Airframe/component/system failure/malfunction
7/18	Fort Myers, FL	Sch Passenger	American	Boeing 727-223	None	Serious	In flight encounter with weather
7/22	Kinston, NC	Sch Passenger	US Air	Boeing 737-222	Substantial	Minor	Airframe/component/system failure/malfunction
7/27	Bharu, Malaysia	Nonsch Passeng	World Airways	McD-Doug DC-10-30	None	Serious	Propeller blast or jet exhaust/suction
8/03	Coeur D'Alene, ID	Sch Passenger	United	McD-Doug DC-10-10	None	Serious	Miscellaneous/other
8/09	Corpus Christi, TX	Sch Passenger	NNB Lone Star	Boeing B737-300	None	Serious	In flight encounter with weather
8/12	Paris, France	Sch Passenger	Pan Am	Airbus A-310	None	Serious	Airframe/component/system failure/malfunction
9/28	Detroit, MI	Sch Pax/Cargo	Northwest	Boeing 727-251	Minor	Serious	Fire/explosion
10/03	Cape Canaveral, FL	Sch Passenger	Eastern	McD-Doug DC-9-31	None	Fatal (1)	In flight encounter with weather
10/29	Columbus, OH	Sch Pax/Cargo	US Air	McD-Doug DC-9-31	Minor	None	On ground collision with object
12/03	Ronulus, MI	Sch Passenger	Northwest	McD-Doug DC-9-14	Destroyed	Fatal (8)	On ground collision
		Sch Passenger	Northwest	Boeing 727-251	Substantial	None	

Table 4 - ACCIDENTS AND RATES BY TYPE OF OPERATION
 14 CFR 121, 125, 127 OPERATIONS
 1990

	Type of Operation				
	Scheduled				
	Passenger/ Cargo	All Cargo	All	All Non- Scheduled	All
Accidents	19	3	22	2	24
Fatal Accidents	4	2	6	0	6
Aircraft Miles Flown (Thousands)	4,509,748	186,652	4,696,400	257,928	4,954,328
Aircraft Hours Flown	10,989,612	535,114	11,524,726	624,761	12,149,487
Departures Flown	7,462,755	370,732	7,833,487	293,646	8,127,133
Accident Rates					
Per Million Miles Flown	0.0042	0.0161	0.0047	0.0078	0.0048
Per Hundred Thousand Hours Flown	0.173	0.561	0.191	0.320	0.198
Per Hundred Thousand Departures Flown	0.255	0.809	0.261	0.681	0.295
Fatal Accident Rates					
Per Million Miles Flown	0.0009	0.0107	0.0013	0.	0.0012
Per Hundred Thousand Hours Flown	0.036	0.374	0.052	0.	0.049
Per Hundred Thousand Departures Flown	0.054	0.539	0.077	0.	0.074

Table 5 - PERSONS BY ROLE AND DEGREE OF INJURY
 14 CFR 121 125 127 OPERATIONS
 1990

Role of Person	Degree of Injury				Total
	Fatal	Serious	Minor	None	
Pilot	1	0	2	22	25
Copilot	1	0	2	22	25
Check pilot	0	0	0	2	2
Flight engineer	1	0	0	11	12
Cabin attendants	1	4	2	58	65
Other crew	0	0	0	7	7
Passenger	8	23	100	1997	2128
Total aboard	12	27	106	2119	2264
Other aircraft*	1	1	0	77	79
Other ground	24	1	3	0	28
Grand total	37	29	109	2196	2371
Percent	1.6	1.2	4.6	92.6	

* 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 6 - AIRCRAFT BY DAMAGE AND DEGREE OF INJURY
 14 CFR 121 125 127 OPERATIONS
 1990

Aircraft damage	Degree of injury				Aircraft	
	None	Minor	Ser	Fatal	No.	Percent
None	0	0	9	1	10	40.0
Minor	1	0	1	2	4	16.0
Substantial	6	1	0	1	8	32.0
Destroyed	0	0	1	2	3	12.0
Aircraft						
Total	7	1	11	6	25	
Percent	28.0	4.0	44.0	24.0		

Table 7 - AIRCRAFT BY FIRST OCCURRENCE AND DEGREE OF INJURY AND BY DAMAGE
 14 CFR 121 125 127 OPERATIONS
 1990

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	1	3	0	3	0	2	0	5	20.0
Fire/explosion	0	0	1	0	0	1	0	0	1	4.0
In flight collision with terrain	0	0	1	0	0	0	0	1	1	4.0
In flight encounter with weather	0	0	4	1	5	0	0	0	5	20.0
On ground collision with object	3	0	0	4	0	3	3	1	7	28.0
On ground collision with terrain	3	0	0	0	0	0	3	0	3	12.0
Loss of power	0	0	0	1	0	0	0	1	1	4.0
Propeller blast or jet exhaust/suction	0	0	1	0	1	0	0	0	1	4.0
Miscellaneous/other	0	0	1	0	1	0	0	0	1	4.0
Aircraft										
Number	-	7	1	11	6	10	4	8	3	25
Percent	-	28.0	4.0	44.0	24.0	40.0	16.0	32.0	12.0	

Table 8 - AIRCRAFT BY FIRST OCCURRENCE AND BROAD PHASE OF OPERATION
 14 CFR 121 125 127 OPERATIONS
 1990

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	1	1	1	1	0	0	1	5	20.0
Fire/explosion	0	1	0	0	0	0	0	0	0	1	4.0
In flight collision with terrain	0	0	0	0	0	0	1	0	0	1	4.0
In flight encounter with weather	0	0	0	2	3	0	0	0	0	5	20.0
On ground collision with object	2	2	2	0	0	0	0	1	0	7	28.0
On ground collision with terrain	0	0	2	0	0	0	0	1	0	3	12.0
Loss of power	0	0	1	0	0	0	0	0	0	1	4.0
Propeller blast or jet exhaust /suction	0	1	0	0	0	0	0	0	0	1	4.0
Miscellaneous/other	0	0	0	0	1	0	0	0	0	1	4.0
Aircraft											
Number -	2	4	6	1	4	4	1	2	1		25
Percent -	8.0	16.0	24.0	4.0	4.0	4.0	4.0	8.0	4.0		

Table 9 - AIRCRAFT BY PHASE OF OPERATION AND DEGREE OF INJURY AND BY DAMAGE
 14 CFR 121 125 127 OPERATIONS
 1990

Phase of operation	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Deat	No.	Percent
Standing	0	0	0	1	0	1	0	0	1	4.0
Standing - engine(s) operating	1	0	0	0	0	0	1	0	1	4.0
Taxi - to takeoff	1	0	0	1	0	1	0	1	2	8.0
Taxi - from landing	0	0	2	0	1	1	0	0	2	8.0
Takeoff - ground run	3	0	1	1	1	1	3	0	5	20.0
Takeoff - initial climb	0	0	0	1	0	0	0	1	1	4.0
Climb - to cruise	1	0	0	0	0	0	1	0	1	4.0
Cruise	0	0	1	0	1	0	0	0	1	4.0
Cruise - normal	0	0	2	1	3	0	0	0	3	12.0
Descent - normal	0	0	4	0	4	0	0	0	4	16.0
Approach - IAF to FAF/ - outer marker (IFR)	0	0	1	0	0	0	0	1	1	4.0
Landing - flare/touchdown	1	0	0	0	0	0	1	0	1	4.0
Landing - roll	0	0	0	1	0	0	1	0	1	4.0
Not reported	0	1	0	0	0	0	1	0	1	4.0
Aircraft										
Number -	7	1	11	6	10	4	8	3		25
Percent -	28.0	4.0	44.0	24.0	40.0	16.0	32.0	12.0		

Table 10 - AIRCRAFT BY CONDITION OF LIGHT AND TYPE OF WEATHER
 14 CFR 121, 125, 127 OPERATIONS
 1990

Condition of light	Type of weather			Aircraft	
	VMC	IMC	Not reptd	No.	Percent
Daylight	9	4	0	13	52.0
Night (dark)	7	0	0	7	28.0
Night (bright)	2	0	0	2	8.0
Not reported	2	0	1	3	12.0
Aircraft					
Number -	20	4	1	25	
Percent -	80.0	16.0	4.0		

Table 11 - AIRCRAFT BY TYPE OF OPERATION AND DEGREE OF INJURY
 14 CFR 121, 125, 127 OPERATIONS
 1990

Type of Operation	Degree of Injury				Aircraft	
	None	Minor	Serious	Fatal	No.	Percent
Scheduled Domestic Passenger	3	1	7	4	15	60.0
Scheduled Domestic Cargo	1	0	0	1	2	8.0
Scheduled Domestic Pax/Cargo	2	0	1	0	3	12.0
Scheduled International Pass.	0	0	1	0	1	4.0
Scheduled International Cargo	0	0	0	1	1	4.0
Scheduled International Pax/Cargo	0	0	1	0	1	4.0
Nonscheduled International Pass.	0	0	1	0	1	4.0
Nonscheduled International Cargo	1	0	0	0	1	4.0
Aircraft						
Number -	7	1	11	6	25	
Percent -	28.0	4.0	44.0	24.0		

Table 12 - AIRCRAFT BY OCCURRENCE OF FIRE AND DEGREE OF INJURY AND BY DAMAGE
 14 CFR 121, 125, 127 OPERATIONS
 1990

Aircraft fire	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
None	7	1	8	4	8	3	8	1	20	20.0
On ground	0	0	1	1	0	1	0	1	2	8.0
Other	0	0	2	1	2	0	0	1	3	12.0
Aircraft										
Number -	7	1	11	6	10	4	8	3	25	
Percent -	28.0	4.0	44.0	24.0	40.0	16.0	32.0	12.0		

Table 13 - BROAD CAUSE/FACTOR ASSIGNMENTS*
 14 CFR 121 125 127 OPERATIONS
 1990

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	3	0	2	0	4
Propulsion System and Controls	0	2	0	0	0	2
Landing Gear	0	1	0	0	0	1
Systems/Equipment/Instruments	0	1	0	2	0	2
Environment #	1	4	3	4	3	7
Weather	0	3	3	4	3	7
Object(trees,wires,etc.)	1	1	0	0	1	1
Light Conditions	0	0	1	1	1	1
Airport/Airways Facilities,Aids	0	0	1	2	1	2
Personnel #	4	16	3	8	5	17
Pilot	2	9	1	3	3	10
Others (Aboard)	1	4	0	0	1	4
Others (Not Aboard)	2	5	2	5	3	7
Number of Aircraft					6	25
NTSB Determined Probable Cause					5	22

* 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
 1981 - 1990

Year	Fatalities			Accident Rate per 100,000* Aircraft Hours Flown		
	Accidents	Fatal Accidents	Total	Aboard Aircraft	Hours Flown	Total
				In This Category		
1981	26	4	4	2	7,125,698	0.365
1982	20	5	235	223	7,040,325	0.270
1983	24	4	15	14	7,298,799	0.329
1984	17	1	4	4	8,165,124	0.208
1985	22	7	526	525	8,709,894	0.153
1986	24	3	8	7	9,976,104	0.231
1987	36	5	232	230	10,644,856	0.329
1988	29	3	285	274	11,139,519	0.251
1989	28	11	278	276	11,273,908	0.246
1990	24	6	37	12	12,149,487	0.198

* Suicide and sabotage accidents excluded from rates as follows :

Total - 1982 (1), 1986 (1), 1987 (1), 1988 (1)

Fatal - 1982 (1), 1986 (1), 1987 (1), 1988 (1)

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

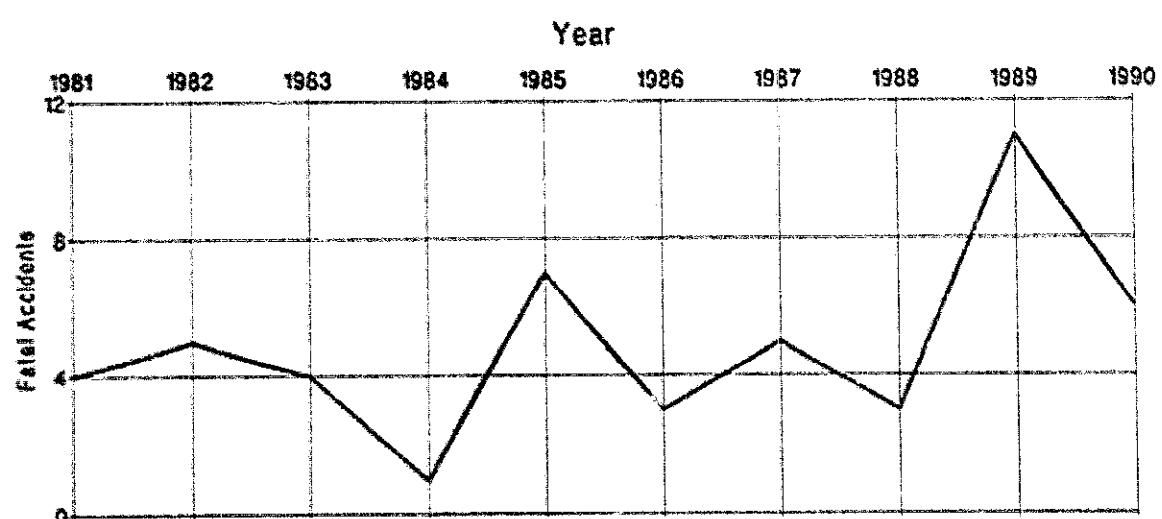
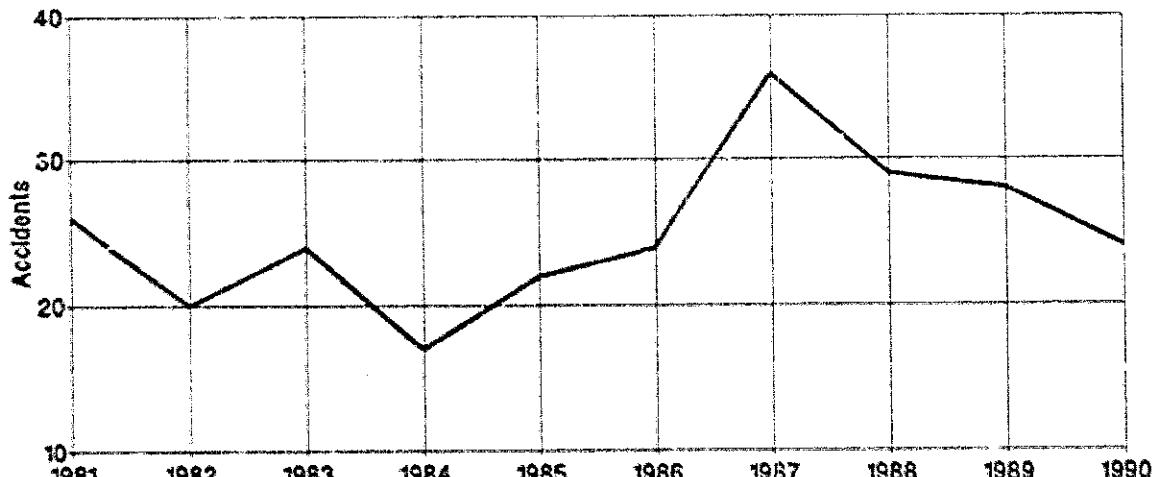


Figure 2 - NUMBER OF FATALITIES
ALL 14 CFR 121, 125, 127 OPERATIONS

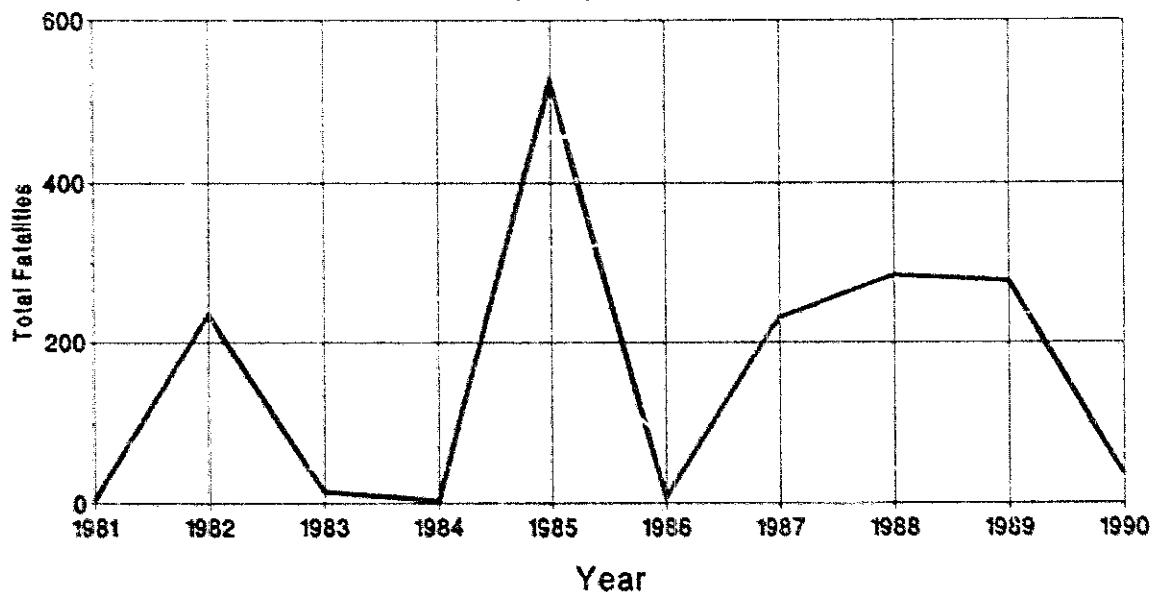


Figure 3 - ACCIDENTS PER 100,000 HOURS FLOWN
ALL 14 CFR 121, 125, 127 OPERATIONS

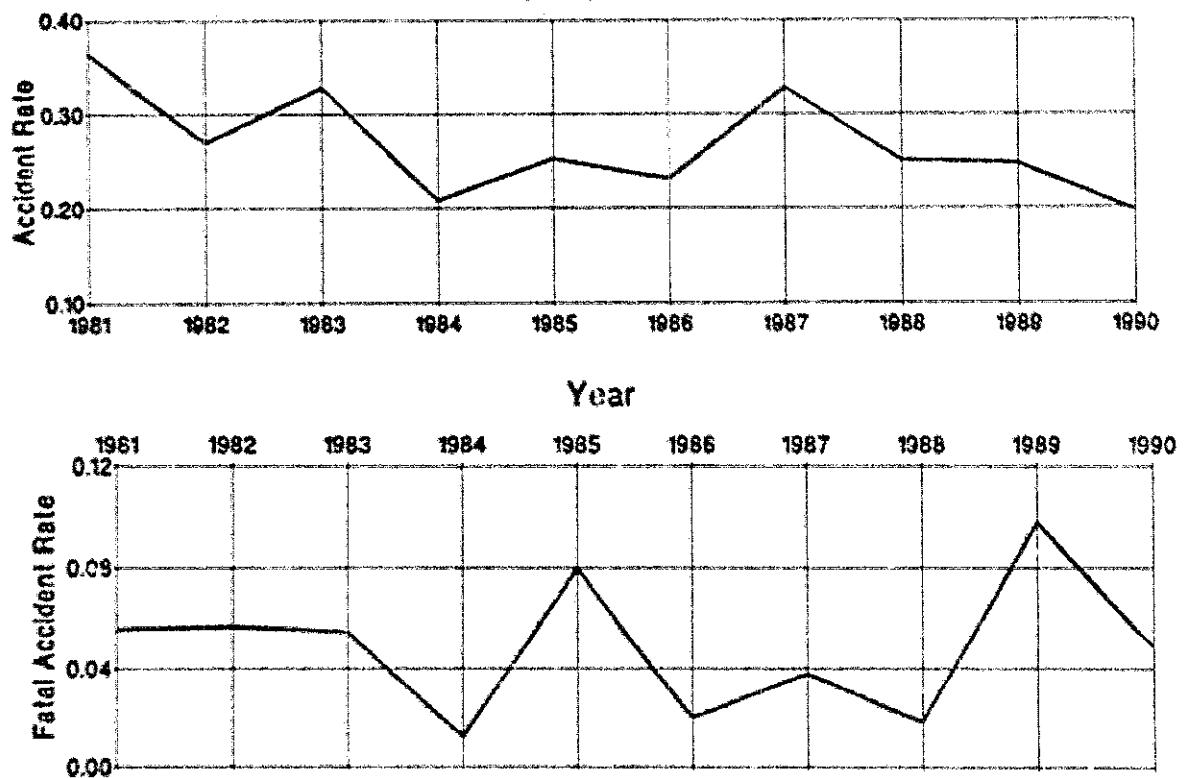


Table 15 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
 SCHEDULED 14 CFR 121 125 127 OPERATIONS
 1981 - 1990

Year	Fatalities			Accident Rate per 100,000* Aircraft Hours Flown		
	Accidents	Fatal Accidents	Total	Aboard Aircraft	Hours Flown	Total
				In This Category		
1981	25	4	4	2	6,834,140	0.366
1982	16	4	234	222	6,697,770	0.224
1983	22	4	15	14	6,914,969	0.318
1984	13	1	4	4	7,736,037	0.168
1985	17	4	197	196	8,265,332	0.206
1986	21	2	5	4	9,495,158	0.211
1987	32	4	231	229	10,115,653	0.306
1988	28	3	285	274	10,521,052	0.257
1989	24	8	131	130	10,597,922	0.226
1990	22	6	37	12	11,524,726	0.191

* Suicide and sabotage accidents excluded from rates as follows :

Total - 1982 (1), 1986 (1), 1987 (1), 1988 (1)
 Fatal - 1982 (1), 1986 (1), 1987 (1), 1988 (1)

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

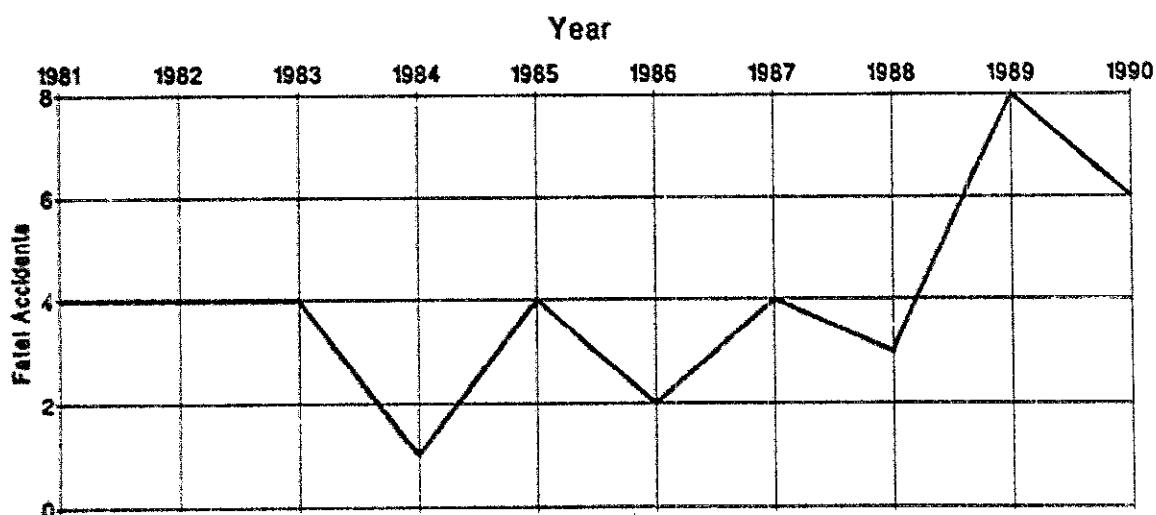
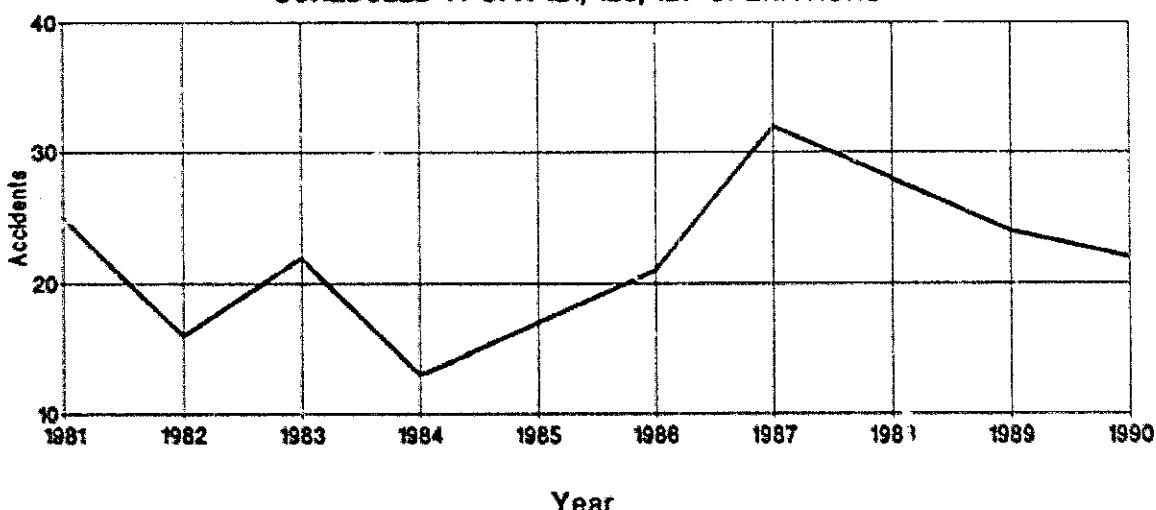


Figure 5 - NUMBER OF FATALITIES
SCHEDULED 14 CFR 121, 125, 127 OPERATIONS

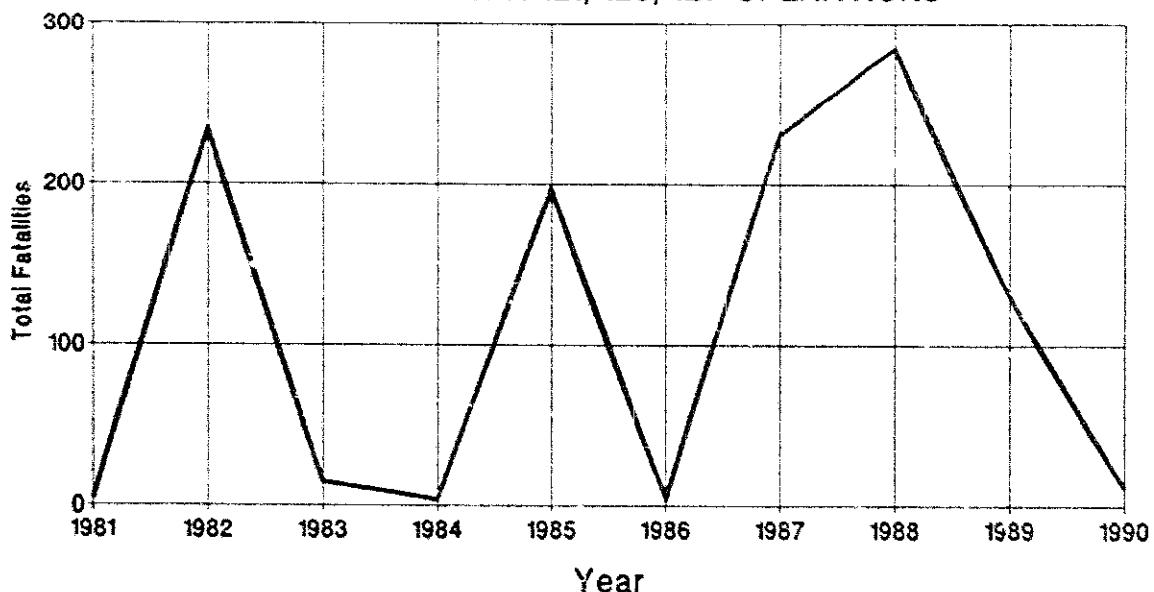


Figure 6 - ACCIDENTS PER 100,000 HOURS FLOWN
SCHEDULED CFR 121, 125, 127 OPERATIONS

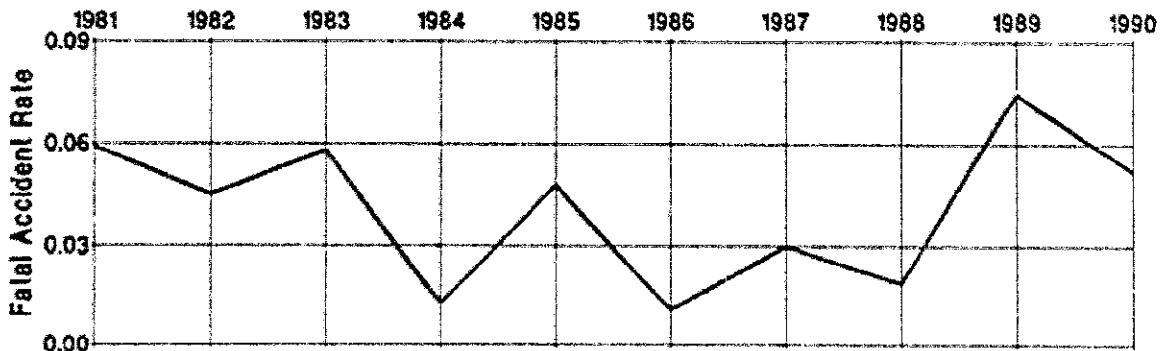
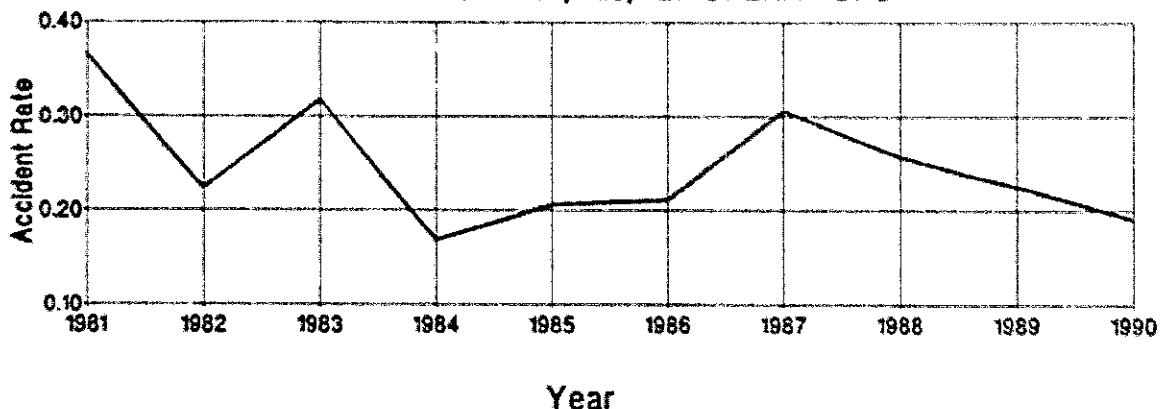
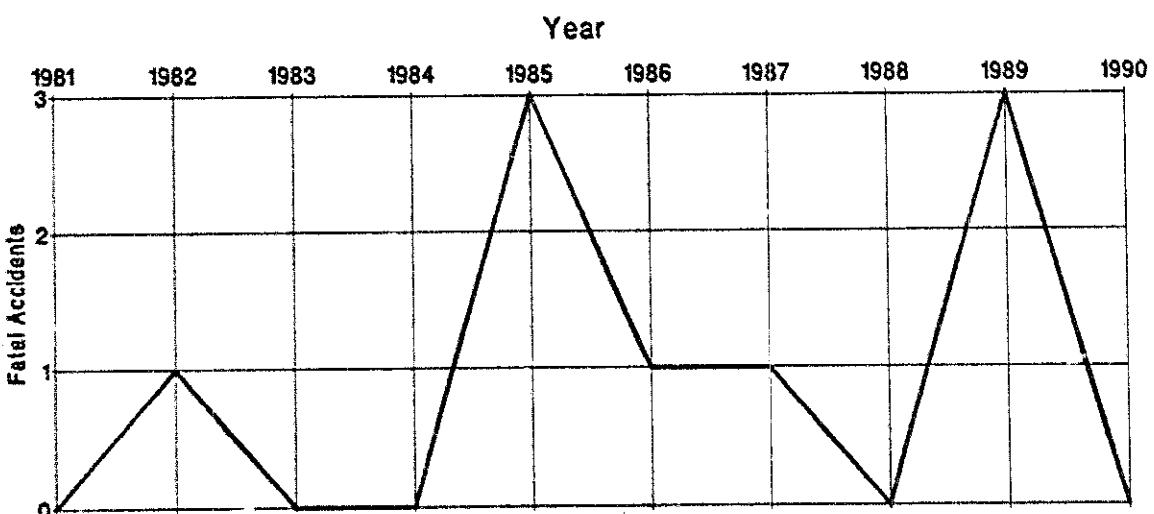
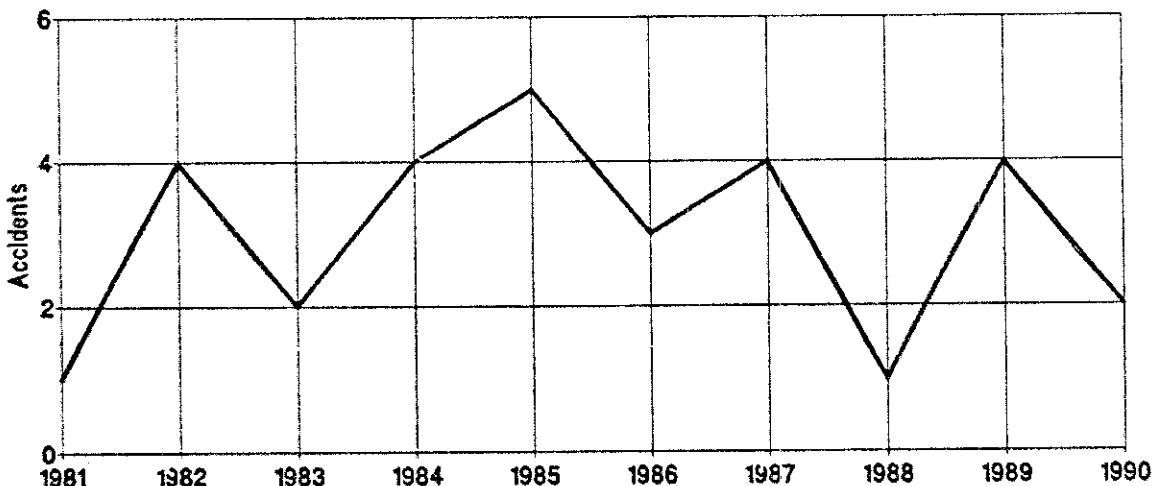


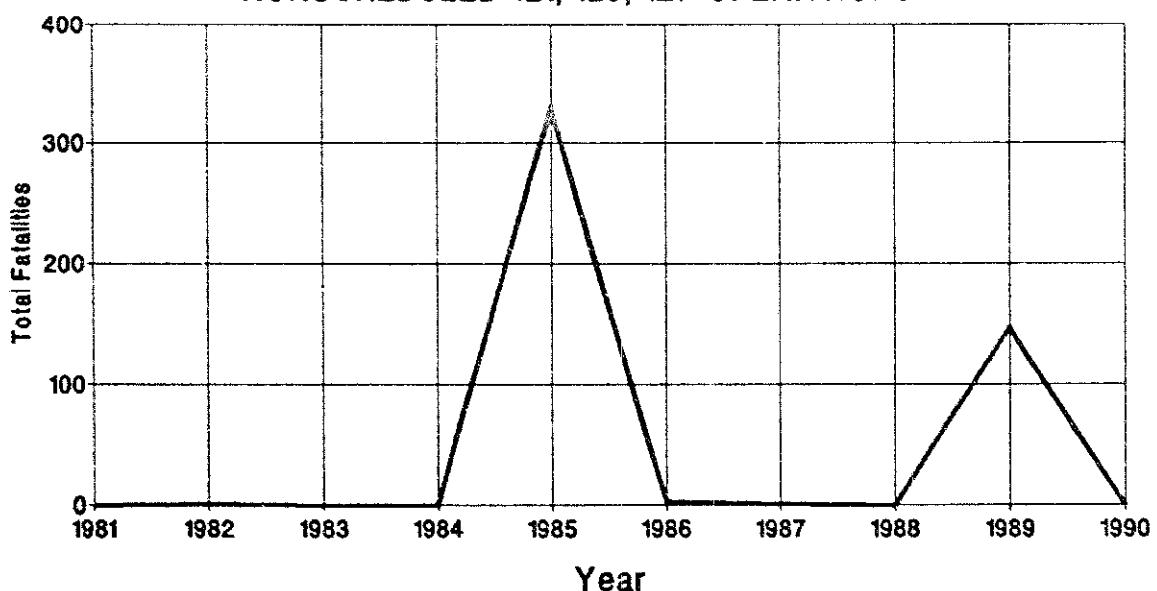
Table 16 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
 NONSCHEDULED 14 CFR 121 125 127 OPERATIONS
 1981 - 1990

Year	Accidents	Fatal Accidents	Total	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
				Aboard Aircraft In This Category	Total		Total	Fatal
1981	1	0	0	0	0	291,558	0.343	0.000
1982	4	1	1	1	1	342,555	1.168	0.292
1983	2	0	0	0	0	383,830	0.521	0.000
1984	4	0	0	0	0	429,087	0.932	0.000
1985	5	3	329	329	329	444,562	1.125	0.675
1986	3	1	3	3	3	480,946	0.624	0.208
1987	4	1	1	1	1	529,203	0.756	0.189
1988	1	0	0	0	0	618,467	0.162	0.000
1989	4	3	147	146	146	675,986	0.592	0.444
1990	2	0	0	0	0	624,761	0.320	0.000

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



**Figure 8 - NUMBER OF FATALITIES
NON SCHEDULED 121, 125, 127 OPERATIONS**



**Figure 9 - ACCIDENTS PER 100,000 HOURS FLOWN
NON SCHEDULED 14 CFR 121, 125, 127**

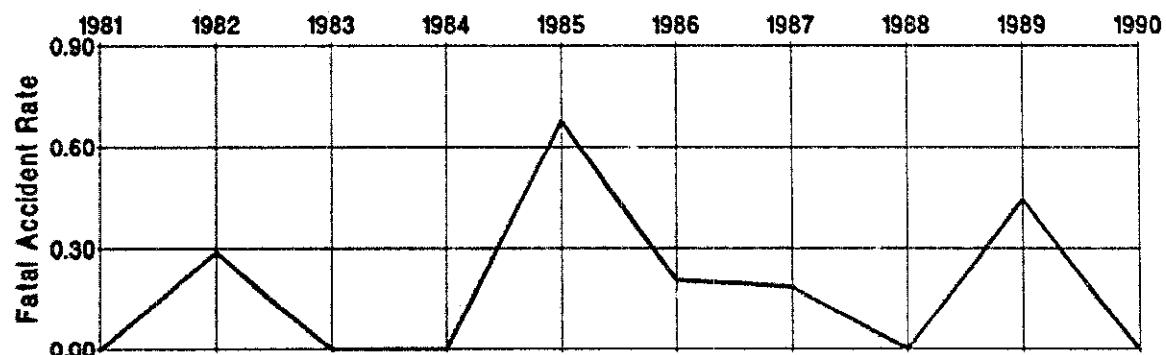
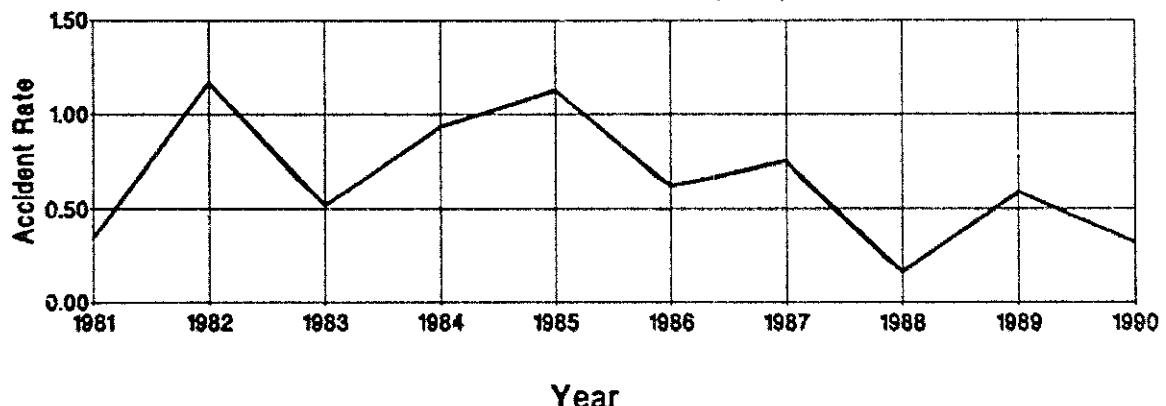


Table 17 - FIRST OCCURRENCES IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
 14 CFR 121 125 127 OPERATIONS
 1990 AND 1985 - 1989

Type of Occurrence	All Accidents				Fatal Accidents			
	1990		1985 - 1989		1990		1985 - 1989	
	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
In flight encounter with weather	5	20.0	6.0	21.3	1	16.7	.2	13.6
Airframe/component/system fail/mal	5	20.0	4.8	17.0	0	.0	.8	14.3
On ground collision with object	7	28.0	3.0	10.6	4	66.7	.4	7.1
Miscellaneous/other	1	4.0	3.0	10.6	0	.0	.6	10.7
Not reported	0	.0	1.6	5.7	0	.0	.6	10.7
Loss of control - in flight	0	.0	1.4	5.0	0	.0	1.2	21.4
In flight collision w/terrain	1	4.0	1.0	3.5	0	.0	.6	10.7
In flight collision with object	0	.0	.8	2.8	0	.0	.2	3.6
Hard landing	0	.0	.6	2.1	0	.0	.0	.0
Loss of engine power(total) - mech failure/malfunction	0	.0	.6	2.1	0	.0	.0	.0
Loss of engine power(partial) - mech failure/malfunction	0	.0	.6	2.1	0	.0	.2	3.6
Loss of engine power(total) - non-mechanical	0	.0	.6	2.1	0	.0	.2	3.6
Fire/explosion	1	4.0	.4	1.4	0	.0	.0	.0
Fire	0	.0	.4	1.4	0	.0	.0	.0
Main gear collapsed	0	.0	.4	1.4	0	.0	.0	.0
Loss of control - on ground	0	.0	.4	1.4	0	.0	.2	3.6
On ground encounter with weather	0	.0	.4	1.4	0	.0	.2	3.6
OVERRUN	0	.0	.4	1.4	0	.0	.0	.0
Altitude deviation, uncontrolled	0	.0	.2	.7	0	.0	.0	.0
Explosion	0	.0	.2	.7	0	.0	.2	3.6
Nose gear collapsed	0	.0	.2	.7	0	.0	.0	.0
Near collision between aircraft	0	.0	.2	.7	0	.0	.0	.0
On ground collision w/terrain	3	12.0	.2	.7	0	.0	.0	.0
Loss of engine power	1	4.0	.2	.7	1	16.7	.0	.0
Propeller blast or jet exhaust	1	4.0	.2	.7	0	.0	.0	.0
Propeller/rotor contact to person	0	.0	.2	.7	0	.0	.0	.0
Undershoot	0	.0	.2	.7	0	.0	.0	.0
Total	25	100.0	28.2	100.0	6	100.0	5.6	100.0

Table 18 - FIRST PHASES OF OPERATION IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
 14 CFR 121 125 127 OPERATIONS
 1990 AND 1985 - 1989

Phase of Operation	All Accidents				Fatal Accidents			
	1990		1985 - 1989		1990		1985 - 1989	
	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Cruise	4	16.0	5.6	19.9	1	16.7	1.0	17.9
Takeoff	7	28.0	4.6	16.3	2	33.3	1.6	28.6
Landing	2	8.0	3.8	13.5	1	16.7	.0	.0
Taxi	4	16.0	3.0	10.6	1	16.7	0.6	10.7
Descent	4	16.0	3.0	10.6	0	.0	.2	3.6
Standing	2	8.0	2.8	9.9	1	16.7	0.2	3.6
Approach	1	4.0	1.8	6.4	0	.0	1.0	17.9
Climb	1	4.0	2.0	7.1	0	.0	0.4	7.1
Not reported	0	.0	1.6	5.7	0	.0	.6	10.7
Maneuvering	0	.0	.0	.0	0	.0	.0	.0
Other	0	.0	.0	.0	0	.0	.0	.0
Total	25	100.0	28.2	100.0	6	100.0	5.6	100.0

Table 19 - BROAD CAUSE/FACTOR ASSIGNMENTS IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
 14 CFR 121 125 127 OPERATIONS
 1990 AND 1985 - 1989

Broad Cause/Factor	All Accidents				Fatal Accidents			
	1990		1985 - 1989		1990		1985 - 1989	
	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Pilot	10	40.0	10.8	38.3	3	50.0	2.6	46.4
Other Person (Not Aboard)	7	28.0	11.6	41.1	3	50.0	2.8	50.0
Weather	7	28.0	8.4	29.8	3	50.0	.8	14.3
Other Person (Aboard)	4	16.0	5.8	20.6	1	16.7	.2	3.6
Systems/Equipment/ Instruments	2	8.0	4.8	17.0	0	.0	1.2	21.4
Propulsion System and Controls	2	8.0	3.4	12.1	0	.0	.6	10.7
Landing Gear	1	4.0	2.2	7.8	0	.0	.0	.0
Light Conditions	1	4.0	2.4	8.5	1	16.7	.6	10.7
Object (tree,wires,etc)	1	4.0	2.8	9.9	1	16.7	.6	10.7
Airframe	0	.0	2.6	9.2	0	.0	1.0	17.9
Terrain/Runway Condition	0	.0	2.0	7.1	0	.0	.2	3.6
Flight Control System	0	.0	1.0	3.5	0	.0	.4	7.1
Airport/Airways Facilities, Aids	2	8.0	.4	1.4	1	16.7	.0	.0
Total Aircraft	25	100.0	28.2	100.0	6	100.0	5.6	100.0
NTSB Determined Probable Cause	22		25.8		5		4.4	

Scheduled 14 CFR 135 Operations

There were 16 accidents involving scheduled 14 CFR 135 operations in 1990. The average number of accidents per year in this category for the years 1981 through 1989 is 22.3. The accident rate per 100,00 hours flown for 1990 is 0.685, compared with an overall rate of 1.294 for the period 1981 through 1989. This accident rate is the lowest of any year presented in this review.

Of the 16 accidents in this category, four accidents were fatal involving a total of 7 fatalities. During the period 1981 through 1989, there were an average of 5.4 fatal accidents and 28.8 fatalities per year in Scheduled 14 CFR 135 operations, with a fatal accident rate of 0.171 accidents per 100,000 hours flown.

Table 20 - SUMMARY OF LOSSES
SCHEDULED 14 CFR 135 OPERATIONS
1986 - 1990

	1986	1987	1988	1989	1990
Accidents					
Fatal	2	10	2	5	4
Involved Serious Injury	2	5	2	1	2
Involved Minor or No Injury	11	17	15	12	10
Total	15	32	19	18	16
Fatalities					
Passenger	3	42	17	25	3
Crew	1	15	4	6	2
Other Persons	0	2	0	0	2
Total	4	59	21	31	7
Aircraft Damage (Scheduled 14 CFR 135)					
Destroyed	1	11	3	5	3
Substantial	13	8	15	13	12
Minor	1	2	1	0	1
None	1	1	0	1	0
Total	16	32	19	19	16

Table 21 - ACCIDENT RATES
SCHEDULED 14 CFR 135 OPERATIONS

	1986	1987	1988	1989	1990
Aircraft Miles Flown (Thousands)	307,393	350,879	380,237	393,619	450,067
Aircraft Hours Flown	1,724,586	1,946,349	2,092,689	2,240,555	2,336,952
Departures Flown	2,798,811	2,909,005	2,809,918	2,818,520	3,159,763
Accident Rates					
Per Million Miles Flown	0.049	0.091	0.050	0.046	0.036
Per Hundred Thousand Hours Flown	0.870	1.644	0.908	0.803	0.685
Per Hundred Thousand Departures Flown	0.536	1.139	0.653	0.639	0.506
Fatal Accident Rates					
Per Million Miles Flown	0.007	0.028	0.005	0.013	0.009
Per Hundred Thousand Hours Flown	0.116	0.514	0.096	0.223	0.171
Per Hundred Thousand Departures Flown	0.071	0.356	0.069	0.177	0.127

Table 22 - LIST OF ACCIDENTS
SCHEDULED 14 CFR 135 OPERATIONS
1990

Date	Location	Type of Operation	Air Carrier	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
1/15	Elko, NV	Passenger	Skywest Airlines	Swearingen SA-227AC	Substantial	Serious	In flight collision with terrain
1/24	Morrisville, NC	Passenger	AMR Corporation	Swearingen SA-226TC	Substantial	None	Gear not extended
1/30	Coeur D'Alene, ID	Passenger	Empire Airlines	Swearingen SA-226TC	Substantial	None	In flight encounter with weather
2/7	Takotna, AK	Passenger	Markair Express	Cessna 207	Substantial	None	Overrun
3/29	Chevak, AK	Pax and Cargo	ERA Aviation	DeHavilland DHC-6	Substantial	None	Hard landing
4/09	Gadsden, AL	Passenger	Atlantic Southeast	Embraer EMB-120	Substantial	Fatal (2)	Midair collision
4/16	Ft. Lauderdale, FL	Passenger	Comair	Embraer EMB-110	Substantial	None	On ground collision with object
5/24	Uganik Bay, AK	Pax and Cargo	Markair Express	Cessna 185	Substantial	None	Loss of control - inflight
5/25	Blue Bell, PA	Pax and Cargo	Pennsylvania Aviation	Britten-Norman BN2A-2F	Substantial	Minor	In flight collision with object
6/17	Grand Canyon, AZ	Passenger	Air Nevada Airlines	Cessna T207A	Substantial	None	On ground collision with object
7/27	Ruidoso, NM	Passenger	Mesa Airlines	Cessna 208A	Substantial	None	Loss of power (total) - mech fail/malf.
9/03	Kaltag, AK	Passenger	Frontier Flying Serv.	Piper PA-31-325	Destroyed	Fatal (3)	Loss of power
10/01	St. Louis, MO	Pax and Cargo	Air Midwest	British Aerospace 3201	Minor	Serious	Propeller/rotor contact
11/20	Albion, ID	Cargo	Regional Express	Piper PA-34-200T	Destroyed	Fatal (1)	In flight encounter with weather
12/21	False Pass, AK	Pax and Cargo	Markair Express	Cessna 208	Destroyed	Fatal (1)	In flight collision with terrain
12/31	Kaliapell, MT	Pax and Cargo	Horizon Airlines	Swearingen SA-227	Substantial	None	Loss of control - on ground

Table 23 - PERSONS BY ROLE AND DEGREE OF INJURY
SCHEDULED 14 CFR 135 OPERATIONS
1990

Role of Person	Degree of Injury				Total
	Fatal	Serious	Minor	None	
Pilot	2	2	0	12	16
Copilot	0	1	0	8	9
Cabin attendants	0	0	0	1	1
Passenger	3	7	10	91	111
Total aboard	5	10	10	112	137
Other aircraft*	2	0	1	0	3
Other ground	0	1	0	0	1
Grand total	7	11	11	112	141
Percent	5.0	7.8	7.8	79.4	

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

Table 24 - AIRCRAFT BY DAMAGE AND DEGREE OF INJURY
SCHEDULED 14 CFR 135 OPERATIONS
1990

Aircraft damage	Degree of injury				Aircraft	
	None	Minor	Ser	Fatal	No.	Percent
Minor	0	0	1	0	1	6.3
Substantial	9	1	1	1	12	75.0
Destroyed	0	0	0	3	3	18.8
Aircraft						
Number -	9	1	2	4	16	
Percent -	56.3	6.3	12.5	25.0		

Table 25 - AIRCRAFT BY FIRST OCCURRENCE AND DEGREE OF INJURY AND BY DAMAGE
SCHEDULED 14 CFR 135 OPERATIONS
1990

Type of first occurrence	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
Gear not extended	1	0	0	0	0	0	1	0	1	6.3
Hard landing	1	0	0	0	0	0	1	0	1	6.3
In flight collision w/obj.	0	1	0	0	0	0	1	0	1	6.3
In flight collision w/ter.	0	0	1	1	0	0	1	1	2	12.5
In flight encounter w/wx.	1	0	0	1	0	0	1	1	2	12.5
Loss of control - in flight	1	0	0	0	0	0	1	0	1	6.3
Loss of control - on ground	1	0	0	0	0	0	1	0	1	6.3
Midair collision	0	0	0	1	0	0	1	0	1	6.3
On ground collision w/obj.	2	0	0	0	0	0	2	0	2	12.5
Overrun	1	0	0	0	0	0	1	0	1	6.3
Loss of power	0	0	0	1	0	0	0	1	1	6.3
Loss of power(total) - mech failure/malfunction	1	0	0	0	0	0	1	0	1	6.3
Propeller/rotor contact	0	0	1	0	0	1	0	0	1	6.3
Aircraft										
Number -	9	1	2	4	0	1	12	3	16	
Percent -	56.3	6.3	12.5	25.0	.0	6.3	75.0	18.8		

Table 26 - AIRCRAFT BY FIRST OCCURANCE AND BROAD PHASE OF OPERATION
SCHEDULED 14 CFR AND 135 OPERATIONS
1990

Type of first occurrence	Phase of operation								Aircraft	
	Standg	Taxi	Tkoff	Cruis	Dscnt	Aprch	Lndg	Manvr	No.	Percent
Gear not extended	0	0	0	0	0	0	1	0	1	6.3
Hard landing	0	0	0	0	0	0	1	0	1	6.3
In flight collision with object	0	0	0	0	0	1	0	0	1	6.3
In flight collision with terrain	0	0	0	0	0	1	0	1	2	12.5
In flight encounter with weather	0	0	0	1	0	0	1	0	2	12.5
Loss of control - in flight	0	0	1	0	0	0	0	0	1	6.3
Loss of control - on ground	0	0	0	0	0	0	1	0	1	6.3
Midair collision	0	0	0	1	0	0	0	0	1	6.3
On ground collision with object	0	2	0	0	0	0	0	0	2	12.5
OVERRUN	0	0	0	0	0	0	1	0	1	6.3
Loss of power	0	0	0	1	0	0	0	0	2	6.3
Loss of power(total) - mech failure/malfunction	0	0	0	0	1	0	0	0	2	6.3
Propeller/motor contact	1	0	0	0	0	0	0	0	1	6.3
Aircraft										
Number	-	1	2	1	3	1	2	5	1	16
Percent	-	6.3	12.5	6.3	18.8	16.3	12.5	31.3	6.3	

Table 27 - AIRCRAFT BY PHASE OF OPERATION AND DEGREE OF INJURY AND BY DAMAGE
SCHEDULED 14 CFR 135 OPERATIONS
1990

Phase of operation	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
Standing	0	0	1	0	0	1	0	0	1	6.3
Taxi - to takeoff	2	0	0	0	0	0	2	0	2	12.5
Takeoff - initial climb	1	0	0	0	0	0	1	0	1	6.3
Cruise	0	0	0	2	0	0	1	1	2	12.5
Cruise - normal	0	0	0	1	0	0	0	1	2	6.3
Descent - normal	1	0	0	0	0	0	1	0	1	6.3
Approach - VFR pattern	0	1	0	0	0	0	1	0	1	6.3
final approach										
Approach - IAF to FAF/outer marker (IFR)	0	0	1	0	0	0	1	0	1	6.3
Landing	1	0	0	0	0	0	1	0	1	6.3
Landing - flare/touchdown	2	0	0	0	0	0	2	0	2	12.5
Landing - roll	2	0	0	0	0	0	2	0	2	12.5
Maneuvering	0	0	0	1	0	0	0	1	1	6.3
Aircraft										
Number	-	9	1	2	4	0	1	12	3	16
Percent	-	56.3	6.3	12.5	25.0	0	6.3	75.0	18.8	

Table 28 - AIRCRAFT BY CONDITION OF LIGHT AND TYPE OF WEATHER
SCHEDULED 14 CFR 135 OPERATIONS
1990

Condition of light	Type of weather			Aircraft	
	VMC	IMC	Not reptd	No.	Percent
Daylight	8	4	1	13	81.3
Night (dark)	0	1	0	1	6.3
Dusk	2	0	0	2	12.5
Aircraft					
Number -	10	5	1	16	
Percent -	62.5	31.3	6.3		

Table 29 - AIRCRAFT BY TYPE OF OPERATION AND DEGREE OF INJURY
SCHEDULED 14 CFR 135 OPERATIONS
1990

Type of Operation	Degree of Injury				Aircraft	
	None	Minor	Serious	Fatal	No.	Percent
Scheduled Domestic Passenger	6	0	1	2	9	56.3
Scheduled Domestic Cargo	0	0	0	1	1	6.3
Scheduled Domestic Pass/Cargo	3	1	1	1	6	37.5
Aircraft						
Number -	9	1	2	4	16	
Percent -	56.3	6.3	12.5	25.0		

Table 30 - AIRCRAFT BY PROXIMITY TO AIRPORT AND FLIGHT PLAN
SCHEDULED 14 CFR 135 OPERATIONS
1990

Accident location	Flight Plan				Aircraft	
	None	VFR	IFR	Cmpny VFR	No.	Percent
Off airport/airstrip	1	1	3	3	8	50.0
On Airport	0	0	5	2	7	43.8
On Airstrip	0	1	0	0	1	6.3
Aircraft						
Number -	1	2	8	5	16	
Percent -	6.3	12.5	50.0	31.3		

Table 31 - AIRCRAFT BY OCCURRENCE OF FIRE AND DEGREE OF INJURY AND BY DAMAGE
SCHEDULED 14 CFR 135 OPERATIONS
1990

Aircraft fire	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
None	9	1	2	3	0	1	12	2	15	93.8
On ground	0	0	0	1	0	0	0	1	1	6.3
Aircraft										
Number -	9	1	2	4	0	1	12	3	16	
Percent -	56.3	6.3	12.5	25.0	.0	6.3	75.0	18.8		

Table 32 - AIRCRAFT BY TYPE OF AIRCRAFT AND DEGREE OF INJURY AND BY DAMAGE
SCHEDULED 14 CFR 135 OPERATIONS
1990

Type of aircraft	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
Fixed Wing Single Recip. Engine	3	0	0	0	0	0	3	0	3	18.8
Fixed Wing Multiple Recip. Engine	0	1	0	2	0	0	1	2	3	18.8
Fixed Wing Turboprop	5	0	2	1	0	1	6	1	8	50.0
Fixed Wing Turbohaft	1	0	0	1	0	0	2	0	2	12.5
Aircraft										
Number -	9	1	2	4	0	1	12	3	16	
Percent -	56.3	6.3	12.5	25.0	.0	6.3	75.0	18.8		

Table 33 - BROAD CAUSE/FACTOR ASSIGNMENTS*
 SCHEDULED 14 CFR 135 OPERATIONS
 1990

Cause/Factor	Cited as a Cause		Cited as a Factor		Cited as Either a Cause or a Factor (or Both)	
	Fatal Accidents	All Accidents	Fatal Accidents	All Accidents	Fatal Accidents	All Accidents
Aircraft #	0	2	0	1	0	3
Propulsion System and Controls	0	1	0	0	0	1
Landing Gear	0	1	0	1	0	2
Environment #	0	2	4	13	4	13
Weather	0	1	3	7	3	7
Light Conditions	0	0	1	3	1	3
Object(trees,wires,etc.)	0	1	0	0	0	1
Airport/Airways Facilities,Aids	0	0	0	1	0	1
Terrain/Runway Condition	0	0	1	6	1	6
Personnel #	4	13	2	7	4	14
Pilot	4	11	1	3	4	11
Others (Not Aboard)	1	4	1	4	1	5
Number of Aircraft					4	16
NTSB Determined Probable Cause					4	16

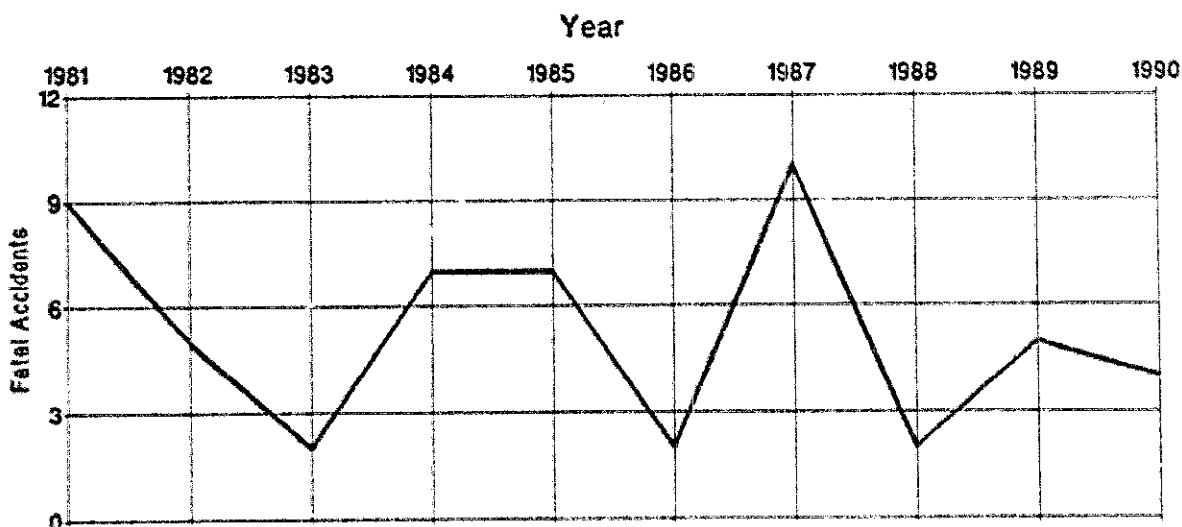
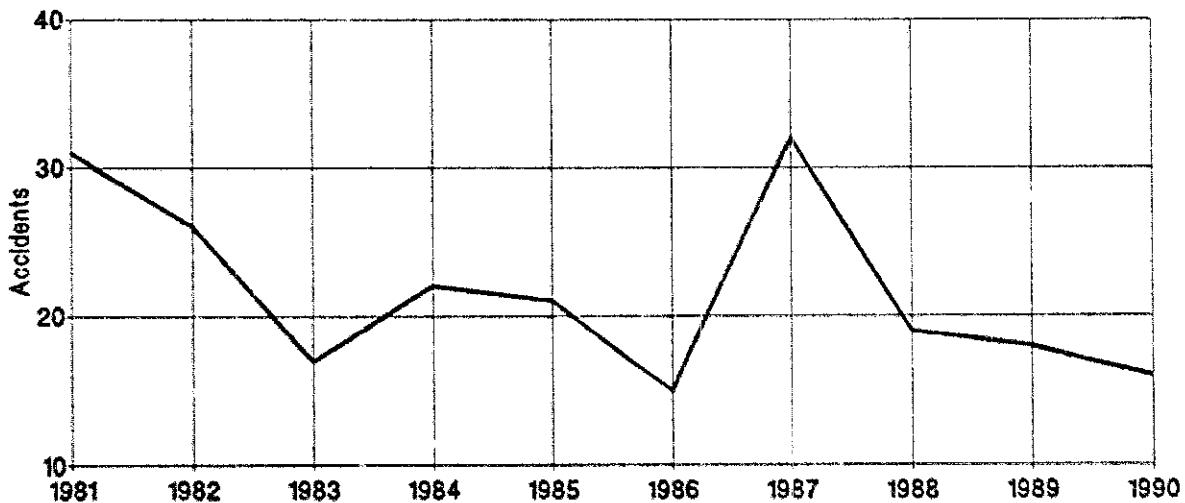
* Multiple causes and factors may be assigned in an accident

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

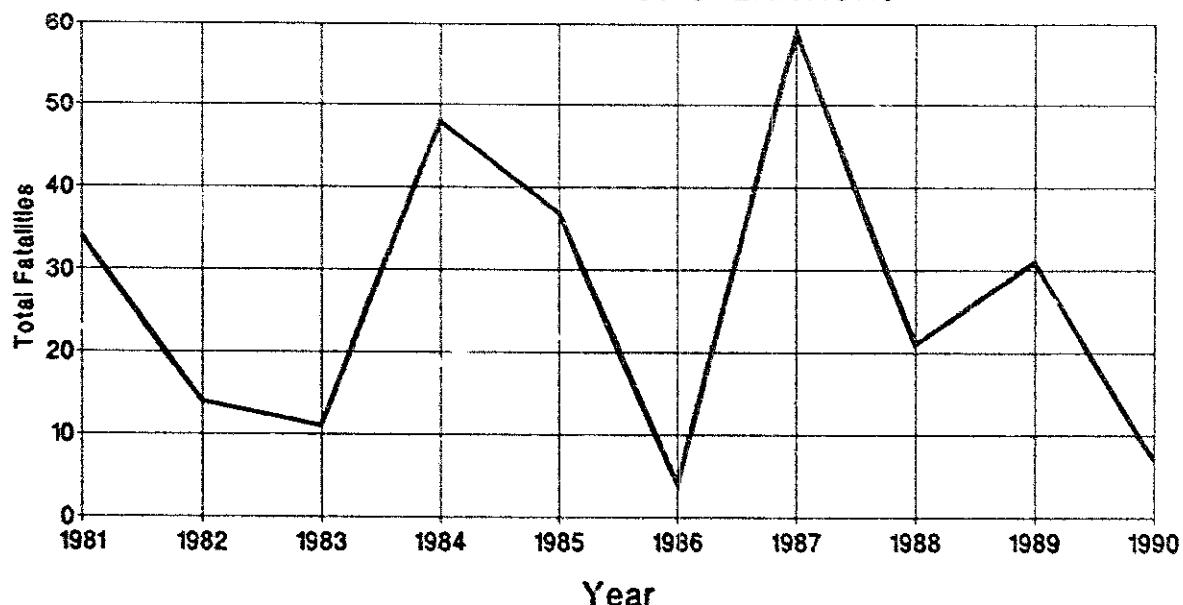
Table 34 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
SCHEDULED 14 CFR 135 OPERATIONS
1981 - 1990

Year	Accidents	Fatal Accidents	Fatalities		Accident Rate per 100,000* Aircraft Hours Flown		
			Total	Aboard Aircraft In This Category	Hours Flown	Total	Fatal
1981	31	1	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	1,510,906	1.125	0.132
1984	22	7	48	46	1,745,762	1.260	0.401
1985	21	7	37	36	1,737,106	1.209	0.403
1986	15	2	4	4	1,724,586	0.870	0.116
1987	32	10	59	57	1,946,349	1.644	0.514
1988	19	2	21	21	2,092,689	0.908	0.096
1989	18	5	31	31	2,240,555	0.803	0.223
1990	16	4	7	5	2,336,952	0.685	0.171

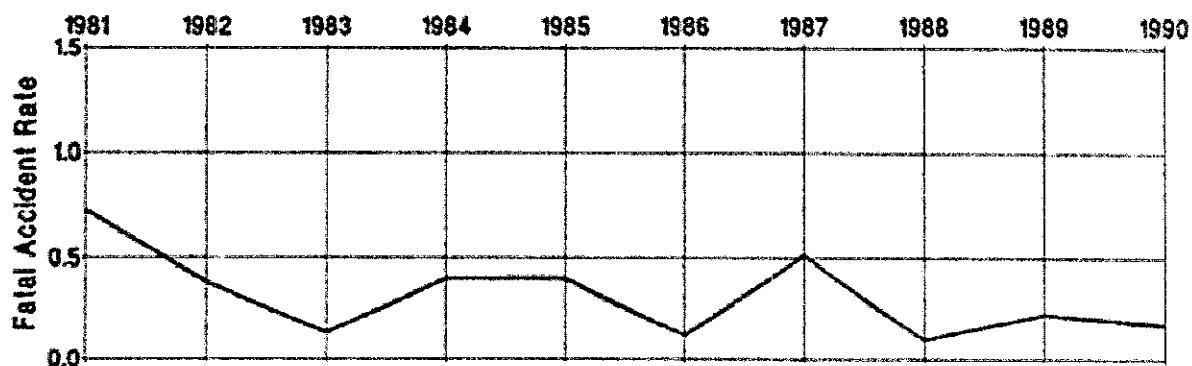
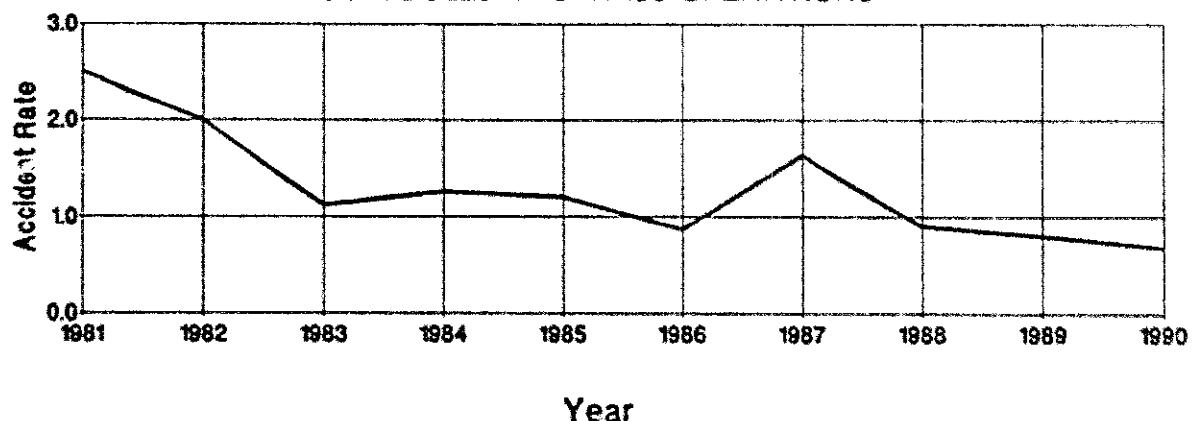
Figure 10 - ACCIDENTS AND FATAL ACCIDENTS
SCHEDULED 14 CFR 135 OPERATIONS



**Figure 11 - NUMBER OF FATALITIES
SCHEDULED 14 CFR 135 OPERATIONS**



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



Tab 3 35 - FIRST OCCURRENCES IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
 SCHEDULED 14 CFR 135 OPERATIONS
 1990 AND 1985 - 1989

Type of Occurrence	All Accidents				Fatal Accidents			
	1990		1985 - 1989		1990		1985 - 1989	
	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
On ground collision with object	2	12.5	2.8	13.1	0	.0	.2	3.8
Airframe/component/system fail/malf	0	.0	2.6	12.1	0	.0	.4	7.7
In flight encounter with weather	2	12.5	2.4	11.2	1	25.0	1.4	26.9
Loss of control - in flight	1	6.3	1.6	7.5	0	.0	1.0	19.2
Loss of engine power(total) - non-mechanical	0	.0	1.4	6.5	0	.0	.4	7.7
In flight collision w/terrain	2	12.5	1.2	5.6	1	25.0	.4	7.7
Loss of control - on ground	1	6.3	1.2	5.6	0	.0	.0	.0
In flight collision with object	1	6.3	1.0	4.7	0	.0	.4	7.7
Loss of engine power(partial) - non-mechanical	0	.0	.8	3.7	0	.0	.0	.0
Complete gear collapsed	0	.0	.6	2.8	0	.0	.0	.0
Hard landing	1	6.3	.6	2.8	0	.0	.0	.0
Midair collision	1	6.3	.6	2.8	1	25.0	.2	3.8
Miscellaneous/other	0	.0	.6	2.8	0	.0	.0	.0
On ground collision w/terrain	0	.0	.4	1.9	0	.0	.0	.0
Loss of engine power	1	6.3	.4	1.9	1	25.0	.4	7.7
Loss of engine power(total) - mech failure/malfunction	1	6.3	.4	1.9	0	.0	.0	.0
Loss of engine power(partial) - mech failure/malfunction	0	.0	.4	1.9	0	.0	.2	3.8
Undershoot	0	.0	.4	1.9	0	.0	.0	.0
Vortex turbulence encountered	0	.0	.4	1.9	0	.0	.0	.0
Not reported	0	.0	.2	0.9	0	.0	.2	3.8
Dragged wing, rotor, pod, or float	0	.0	.2	0.9	0	.0	.0	.0
Explosion	0	.0	.2	0.9	0	.0	.0	.0
Main gear collapsed			.2	0.9	0	.0	.0	.0
Nose gear collapsed			.2	0.9	0	.0	.0	.0
Gear not extended	1	6.3	.2	0.9	0	.0	.0	.0
Propeller/rotor contact to person	1	6.3	.2	0.9	0	.0	.0	.0
Undetermined	0	.0	.2	0.9	0	.0	.0	.0
Overrun	1	6.3	.0	0.0	0	.0	.0	.0
Total	16	100.0	21.4	100.0	4	100.0	5.2	100.0

Table 36 - FIRST PHASES OF OPERATION IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
 SCHEDULED 14 CFR 135 OPERATIONS
 1990 AND 1985 - 1989

Phase of operation	All Accidents				Fatal Accidents			
	1990	Percent	Mean	Percent	1990	Percent	Mean	Percent
Approach	2	12.5	4.8	22.4	0	.0	2.2	42.3
Landing	5	31.3	3.6	16.8	0	.0	.0	.0
Takeoff	1	6.3	2.6	12.1	0	.0	.8	15.4
Taxi	2	12.5	3.4	15.9	0	.0	.2	3.8
Climb	0	.0	.8	3.7	0	.0	.2	3.8
Cruise	3	18.8	2.0	9.3	3	75.0	.8	15.4
Descent	1	6.3	1.4	6.5	0	.0	.0	.0
Standing	1	6.3	1.2	5.6	0	.0	.0	.0
Maneuvering	1	6.3	.8	3.7	1	25.0	.6	11.5
Other	0	.0	.6	2.8	0	.0	.2	3.8
Not Reported	0	.0	.2	.9	0	.0	.2	3.8
Total Aircraft	16	100.0	21.4	100.0	4	100.0	5.2	100.0

Table 37 - BROAD CAUSE/FACTOR ASSIGNMENTS IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
 SCHEDULED 14 CFR 135 OPERATIONS
 1990 AND 1985 - 1989

Broad Cause/Factor	All Accidents				Fatal Accidents			
	1990	Percent	Mean	Percent	1990	Percent	Mean	Percent
Pilot	11	68.8	16.6	77.6	4	100.0	4.6	88.5
Other Person (Not Aboard)	5	31.3	9.6	44.9	1	25.0	2.6	50.0
Weather	7	43.8	6.2	29.0	3	75.0	2.4	46.2
Terrain/Runway Condition	6	37.5	5.4	25.2	1	25.0	1.8	34.6
Propulsion System and Controls	1	6.3	3.8	17.8	0	.0	1.0	19.2
Systems/Equipment/ Instruments	0	.0	3.4	15.9	0	.0	1.2	23.1
Object (tree,wires,etc)	1	6.3	3.0	14.0	0	.0	.4	7.7
Light Conditions	3	18.8	3.4	15.9	1	25.0	.8	15.4
Landing Gear	2	12.5	1.6	7.5	0	.0	.0	.0
Airframe	0	.0	1.6	7.5	0	.0	.6	11.5
Airport/Airways Facilities, Aids	1	6.3	1.0	4.7	0	.0	.4	7.7
Flight Control System	0	.0	.4	1.9	0	.0	.4	7.7
Other Person (Aboard)	0	.0	.4	1.9	0	.0	.2	3.8
Total Aircraft	16	100.0	21.4	100.0	4	100.0	5.2	100.0
NTSB Determined Probable Cause	16		21.0		5		5.0	

Nonscheduled 14 CFR 135 Operations

During 1990 there were 106 accidents involving nonscheduled 14 CFR 135 aircraft. This represents a decrease of 17.4 percent from the average of 128.4 accidents per year in this category during the period 1981 through 1989. The average accident rate for the period 1981 - 1989 was 4.71 accidents per 100,000 hours flown. The 1990 rate of 4.73 is slightly higher than the nine year average.

There were 28 fatal accidents in this category which were responsible for 50 fatalities in 1990. During the period 1981 through 1989, there were an average of 30 fatal accidents and 69.7 fatalities per year. The overall rate for 1990 was 1.25 fatal accident per 100,000 hours flown.

Two of the accidents reported in this section involved an on-ground and midair collision between two non-scheduled 14 CFR 135 aircraft. Therefore, this section lists 106 accidents involving 108 aircraft.

Table 38 - SUMMARY OF LOSSES
NONSCHEDULED 14 CFR 135 OPERATIONS
1986 - 1990

	1986	1987	1988	1989	1990
Accidents	---	---	---	---	---
Fatal	31	30	28	25	28
Involved Serious Injury	13	9	15	13	14
Involved Minor or No Injury	73	58	58	73	64
Total	117	97	101	111	106
Fatalities	---	---	---	---	---
Passenger	39	26	31	22	20
Crew	36	35	32	33	28
Other Persons	1	4	2	4	2
Total	76	65	65	59	50
Aircraft Damage	---	---	---	---	---
(Nonscheduled 14 CFR 135)	---	---	---	---	---
Destroyed	50	38	34	37	38
Substantial	104	77	62	62	68
Minor	2	1	4	1	1
None	1	2	0	1	1
Total	157	118	100	101	108

Table 39 - ACCIDENT RATES
NONSCHEDULED 14 CFR 135 OPERATIONS

	1986	1987	1988	1989	1990
Aircraft Hours Flown	2,690,000	2,657,000	2,632,000	3,020,000	2,241,000
Accident Rates *	---	---	---	---	---
All Accidents	4.35	3.65	3.84	3.68	4.73
Fatal Accidents	1.15	1.13	1.06	0.83	1.25

*Per Hundred Thousand Hours Flown

Table 40 - LIST OF ACCIDENTS
NONSCHEDULED 14 CFR 135 OPERATIONS
1990

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
1/12	Nondalton, AK	Passenger	Cessna 207A	Substantial	None	On ground collision with terrain
1/12	Ocala, FL	Cargo	Cessna 210M	Substantial	None	Loss of power (partial) - mech failure/malfunction
1/15	Anchorage, AK	Cargo	Beech E18F	Substantial	None	Loss of control - in flight
1/16	Appleton, WI	Cargo	Cessna 402B	Destroyed	Fatal (1)	In flight collision with terrain
1/16	Mosinee, WI	Cargo	Cessna 402A	Destroyed	Serious	In flight collision with object
1/17	Leadville, CO	Cargo	Cessna 208A	Destroyed	Fatal (1)	In flight collision with terrain
1/21	Palos Verdes, CA	Passenger	Bellanca 14-19-2	Destroyed	None	Loss of power
1/23	Nashville, TN	Cargo	Mitsubishi MU-2B-20	Substantial	None	Gear not extended
1/25	Oak Creek, WI	Cargo	Beech E18S	Substantial	None	In flight encounter with weather
1/29	Schuyler Falls, NY	Cargo	Cessna 208B	Destroyed	Fatal (1)	Loss of control - in flight
1/29	Williston, VT	Cargo	Cessna 208B	Destroyed	Fatal (2)	Loss of control - in flight
2/04	Winthrop, WA	Passenger	Bell 206B	Substantial	None	Loss of control - on ground
2/05	Baker, OR	Cargo	Cessna 402B	Destroyed	Fatal (1)	In flight encounter with weather
2/09	Teterboro, NJ	Cargo	Mitsubishi MU-2B-35	Substantial	None	On ground collision
2/09	Rapid City, SD	Passenger	Mitsubishi MU-2B-35	Substantial	Fatal (1)	Loss of power (total) - mech failure/malfunction
2/15	Wheeling, IL	Cargo	Cessna T310R	Substantial	None	Loss of control - on ground
2/17	Cold Bay, AK	Cargo	Piper PA-31-350	Destroyed	Fatal (1)	In flight encounter with weather
2/21	Hungry Horse, MT	Cargo	Cessna T207	Destroyed	Minor	Loss of power (total) - mech failure/malfunction
2/21	Carrollton, TX	Cargo	Beech S35	Substantial	Minor	Loss of power (total) - non-mechanical
2/26	Sarasota, FL	Cargo	Cessna 210-M	Destroyed	Serious	Loss of power (total) - mech failure/malfunction

Table 40 - LIST OF ACCIDENTS (Continued)
NON SCHEDULED 14 CFR 135 OPERATIONS
1990

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
2/27	Denver, CO	Cargo	Cessna 208A	Destroyed	Fatal (1)	In flight encounter with weather
3/06	Benton, AL	Passenger	MMB BO-105S	Substantial	None	In flight collision with object
3/06	Lanai, HI	Cargo	Cessna 208B	Substantial	None	Loss of power (total) - non-mechanical
3/06	Alamogordo, NM	Cargo	Cessna 402B	Substantial	None	Airframe/component/system failure/malfunction
3/08	Miami, FL	Pax and Cargo	Aerospatiale 350D	Destroyed	Fatal (2)	Loss of power (total) - mech failure/malfunction
3/15	Lake Butler, FL	Cargo	Piper Aerostar 601	Destroyed	Minor	Loss of power (total) - mech failure/malfunction
3/15	Anderson, SC	Passenger	Learjet 24	Substantial	Serious	Airframe/component/system failure/malfunction
3/16	Almautlak, AK	Cargo	Piper PA-32-301	Destroyed	Fatal (1)	Loss of control - in flight
4/01	Boulder, CO	Passenger	Cessna 421-C	Destroyed	Fatal (2)	Loss of control - in flight
4/01	Saipan, PO	Passenger	Aerospatiale AS350B	Destroyed	None	Airframe/component/system failure/malfunction
4/12	Yuba City, CA	Passenger	Beech F33A	Substantial	None	On ground collision with object
4/13	Grand Canyon, AZ	Passenger	Cessna T207	Destroyed	Serious	Loss of power (total) - non-mechanical
4/14	Drift River, AK	Passenger	Bell 206B	Substantial	None	Loss of control - on ground
4/16	Deadhorse, AK	Cargo	Piper PA-31-350	Substantial	None	Airframe/component/system failure/malfunction
4/17	E. Island Blk15, GM	Pax and Cargo	Bell 206L1	None	Serious	Loss of power (total) - mech failure/malfunction
4/20	Dallas, TX	Cargo	Beech 58	Destroyed	Fatal (1)	Loss of power (total) - non-mechanical
4/21	Williamsport, AK	Passenger	Bell 206B3	Substantial	None	Loss of power (total) - mech failure/malfunction
4/22	Prnc Frederick, MD	Passenger	Robinson R22	Substantial	Minor	Loss of control - on ground
4/27	Tulsa, OK	Cargo	Piper PA-32-260	Destroyed	Minor	Loss of power (total) - mech failure/malfunction
5/04	Glennallen, AK	Passenger	Piper PA-18	Substantial	Serious	In flight collision with terrain
5/04	Wilmington, NC	Cargo	Nomad N-24A	Destroyed	Fatal (2)	In flight collision with object

Table 40 - LIST OF ACCIDENTS (Continued)
NON SCHEDULED 14 CFR 135 OPERATIONS
1990

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
5/08	Kaplan, LA	Passenger	Bell 206BIII	Substantial	None	Roll over
5/29	Chatham, AK	Passenger	DeHavilland DHC-2	Substantial	Minor	Loss of power
5/29	Ketchikan, AK	Pax and Cargo	DeHavilland DHC-2	Substantial	None	On ground collision with object
6/01	Las Cruces, NM	Passenger	Hughes 369HS	Substantial	Serious	Loss of power
6/05	Marble Canyon, AZ	Passenger	Cessna T210L	Substantial	Serious	Overrun
6/06	Fresno, CA	Cargo	Cessna 208A	Destroyed	Serious	Loss of power (total) - mech failure/malfunction
6/07	Toledo, OH	Passenger	Cessna 207	Substantial	None	In flight collision with object
6/09	Bethel, AK	Cargo	Piper PA-32	Substantial	Fatal (1)	Loss of power (total) - non-mechanical
6/15	Challis, ID	Cargo	Cessna TU206G	Destroyed	Fatal (2)	In flight collision with object
6/17	Taku, AK	Passenger	Cessna 206U	Minor	None	Midair collision
6/23	Kako Mine Strip, AK	Cargo	Cessna 206G	Substantial	None	Loss of control - on ground
6/25	Aialak Bay, AK	Passenger	Shorts SH-7	Substantial	Destroyed	Fatal (5)
6/26	Panama City, FL	Passenger	Cessna 207A	Destroyed	Fatal (2)	In flight collision with terrain
6/27	Caribou Lake, AK	Pax and Cargo	Piper PA-31	Substantial	None	Loss of power (partial) - non-mechanical
6/30	Beaver Village, AK	Pax and Cargo	DeHavilland DHC-2	Substantial	Minor	Loss of power (total) - mech failure/malfunction
6/30	Glacier, WA	Passenger	DeHavilland DHC-3	Substantial	Minor	Loss of power (partial) - mech failure/malfunction
7/02	King Salmon, AK	Passenger	Aerospatiale AS350B	Substantial	Fatal (1)	Propeller/rotor contact
7/02	Ashford, WA	Passenger	Cessna 185	Substantial	None	Loss of power (total) - mech failure/malfunction
7/10	Teterboro, NJ	Pax and Cargo	Cessna T210L	Destroyed	Fatal (5)	In flight collision with terrain
7/12	Pinon, AZ	Passenger	Bell 206B3	Substantial	None	Loss of power (total) - mech failure/malfunction
7/14	Farwell, AK	Pax and Cargo	Cessna T210N	Destroyed	Fatal (3)	In flight collision with object
			Bell 206L1	Substantial	Serious	Loss of power (total) - mech failure/malfunction

Table 40 - LIST OF ACCIDENTS (Continued)
NON SCHEDULED 14 CFR 135 OPERATIONS
1990

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
7/18	Goodnews Bay, AK	Passenger	Bell 206B	Substantial	None	Roll over
7/23	Plymouth, MI	Cargo	Piper PA-60-600	Destroyed	Fatal (3)	Midair collision
7/24	Sarasota, FL	Passenger	Bell 206B	Substantial	Minor	Loss of control - in flight
7/25	Quincy, CA	Passenger	Bell 206B	Substantial	None	Loss of power (total) - non-mechanical
7/27	Holy Cross, AK	Passenger	Cessna 206G	Substantial	None	Loss of power
8/02	Tucson, AZ	Cargo	Cessna 180	Substantial	None	Propeller blast or jet exhaust/suction
8/02	Chicopee, MA	Pax and Cargo	Beech 58P	Substantial	None	Loss of power (total) - non-mechanical
8/03	Falls Creek, AK	Passenger	Piper PA-18	Substantial	None	Loss of control - in flight
8/05	Tetlin, AK	Passenger	Cessna 207	Substantial	Serious	Loss of control - on ground
8/07	Athens, OH	Passenger	Bell 206	Substantial	Minor	In flight collision with object
8/08	Talkeetna, AK	Pax and Cargo	Cessna 165	Substantial	None	Airframe/component/system failure/malfunction
8/08	Arctic Village, AK	Pax and Cargo	Helio HE-3/H-295	Substantial	None	Loss of power
8/09	Greenwood, SC	Cargo	Beech E185	Destroyed	Fatal (1)	Loss of power (total) - mech failure/malfunction
8/12	Wrangell, AK	Passenger	Cessna A185F	Destroyed	Fatal (1)	Loss of control - in flight
8/17	Juneau, AK	Passenger	Aerospatiale AS350B	Substantial	None	Loss of power (total) - mech failure/malfunction
8/19	Meeteetse, WY	Passenger	Aerospatiale SA316B	Destroyed	Serious	Loss of control - in flight
8/27	Elkhorn, WI	Passenger	Bell 206B	Destroyed	Fatal (5)	In flight collision with terrain
8/31	Alagnak River, AK	Passenger	DeHavilland DHC-2	Substantial	None	On ground collision with terrain
9/05	Weatherford, TX	Cargo	Beech C55	Substantial	None	Loss of power (total) - non-mechanical
9/07	Deering, AK	Cargo	Beech H-18S	Substantial	None	Loss of control - on ground
9/11	Monroe, MI	Pax and Cargo	Piper PA-601P	Substantial	None	Airframe/component/system failure/malfunction
9/12	Port O'Connor, TX	Passenger	Bell B206L1	Destroyed	Fatal (1)	In flight collision with terrain

Table 40 - LIST OF ACCIDENTS (Continued)
NONSCHEDULED 14 CFR 135 OPERATIONS
1990

Date	Location	Type of Operation	Aircraft Type	Aircraft Damage	Degree of Injury	First Occurrence
9/17	Upper Colleen, AK	Passenger	Cessna 185	Substantial	None	Main gear collapsed
9/21	Flagstaff, AZ	Cargo	Piper PA-31-350	Destroyed	Fatal (1)	In flight encounter with weather
9/22	Coal Creek, AK	Pax and Cargo	piper PA-18-150	substantial	None	Overrun
9/22	King Salmon, AK	Cargo	DeHavilland DHC-3	Substantial	None	Overrun
9/24	Twin Falls, ID	Mail Only	Beech C-45H	Substantial	Minor	Loss of control - on ground
10/02	Seattle, WA	Passenger	Beech 58	Substantial	None	Nose gear collapsed
10/04	Kensington, AK	Passenger	Hughes 500D	Substantial	serious	Roll over
10/05	Minneapolis, MN	Cargo	Beech E-18	Substantial	None	Loss of control - on ground
10/05	Rolling Fork, MS	Passenger	Piper PA-28-181	Substantial	None	On ground collision with terrain
10/06	Koyuktoklik, AK	Cargo	Cessna 185B	Substantial	None	Loss of control - on ground
10/29	Colbusus, OH	Cargo	Cessna 310	Substantial	None	On ground collision with object
11/08	Pocatello, ID	Cargo	Cessna 402B	Substantial	None	In flight encounter with weather
11/12	Pittsburgh, PA	Cargo	Cessna 404	Substantial	None	Nose gear collapsed
11/20	Clovis, NM	Cargo	Cessna T210L	Destroyed	serious	In flight collision with terrain
11/27	Grand Island, NE	Cargo	Cessna 401	Substantial	None	Hard landing
12/03	Vernal, UT	Passenger	Aerospatiale SA316B	Destroyed	Minor	Airframe/component/system failure/ malfunction
12/11	Kongikank, AK	Cargo	Piper PA-32	substantial	None	Loss of control - in flight
12/17	Anacortes, WA	Passenger	Cessna 182-E	Substantial	None	Loss of control - on ground
12/18	Thompson, UT	Cargo	Cessna 182H	Destroyed	Fatal (1)	In flight collision with terrain
12/18	Evanston, WY	Cargo	Piper PA-31-350	destroyed	Fatal (1)	In flight collision with terrain
12/26	Richland, VA	Passenger	Cessna 402	substantial	None	Loss of control - on ground
12/28	Rock Sound, BH	Passenger	Piper PA-31-350	destroyed	Minor	Not reported

Table 41 - PERSONS BY ROLE AND DEGREE OF INJURY
 NONSCHEDULED 14 CFR 135 OPERATIONS
 1990

Role of Person	Degree of Injury				Total
	Fatal	Serious	Minor	None	
Pilot	26	12	8	62	108
Copilot	2	0	1	5	8
Other crew	0	1	0	4	5
Passenger	20	22	23	91	156
Total aboard	48	35	32	162	277
Other aircraft*	2	0	0	0	2
Other ground	0	1	1	0	2
Grand total	50	36	33	162	281
Percent	17.8	12.8	11.7	57.7	

* 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 42 - AIRCRAFT BY DAMAGE AND DEGREE OF INJURY
 NONSCHEDULED 14 CFR 135 OPERATIONS
 1990

Aircraft damage	Degree of injury				Aircraft	
	None	Minor	Ser	Fatal	No.	Percent
None	0	0	1	0	1	.9
Minor	1	0	0	0	1	.9
Substantial	51	7	7	3	68	63.0
Destroyed	2	5	6	25	38	35.2
Aircraft						
Number -	54	12	14	28	108	
Percent -	50.0	11.1	13.0	25.9		

Table 43 - AIRCRAFT BY FIRST OCCURRENCE AND DEGREE OF INJURY AND BY DAMAGE
 NONSCHEDULED 14 CFR 135 OPERATIONS
 1990

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	5	1	1	0	0	0	5	2	7	6.5
Main gear collapsed	1	0	0	0	0	0	1	0	1	.9
Nose gear collapsed	2	0	0	0	0	0	2	0	2	1.9
Gear not extended	1	0	0	0	0	0	1	0	1	.9
Hard landing	1	0	0	0	0	0	1	0	1	.9
In flight collision with object	2	1	1	3	0	0	3	4	7	6.5
In flight collision with terrain	0	0	2	8	0	0	1	9	10	9.3
In flight encounter with weather	2	0	0	4	0	0	2	4	6	5.6
Loss of control - in flight	3	1	1	5	0	0	4	6	10	9.3
Loss of control - on ground	9	2	1	0	0	0	12	0	12	11.1
Midaire collision	2	0	0	1	0	1	1	1	3	2.6
On ground collision with object	5	0	0	0	0	0	5	0	5	4.6
On ground collision with terrain	3	0	0	0	0	0	3	0	3	2.8
Overrun	2	0	1	0	0	0	2	0	3	2.6
Loss of power	3	1	1	0	0	0	4	1	5	4.6
Loss of power(total) - mech failure/malfunction	5	3	4	3	1	0	7	7	15	13.9
Loss of power(partial) - mech failure/malfunction	1	1	0	0	0	0	2	0	2	1.9
Loss of power(total) - non-mechanical	4	1	1	2	0	0	6	2	8	7.4
Loss of power(partial) - non-mechanical	0	0	0	1	0	0	0	1	1	.9
Propeller blast or jet exhaust/suction	1	0	0	0	0	0	1	0	1	.9
Propeller/rotor contact	0	0	0	1	0	0	1	0	1	.9
Roll over	2	0	1	0	0	0	3	0	3	2.8
Not reported	0	1	0	0	0	0	0	1	1	.9
Aircraft										
Number -	54	12	14	28	1	1	68	38	108	
Percent -	50.0	11.1	13.0	25.9	.9	.9	63.0	35.2		

Table 44 - AIRCRAFT BY FIRST OCCURRENCE AND BROAD PHASE OF OPERATION
 NONSCHEDULED 14 CFR 135 OPERATIONS
 1990

Type of first occurrence	Phase of operation										Aircraft	
	Stndg	Taxi	Tkoff	Climb	Cruis	Dscnt	Aprch	Lndg	Manvr	Other	No.	Percent
Airframe/component/system failure/malfunction	0	0	2	0	2	1	0	2	0	0	7	6.5
Main gear collapsed	0	0	0	0	0	0	0	1	0	0	1	0.9
Nose gear collapsed	0	0	0	0	0	0	0	2	0	0	2	1.9
Gear not extended	0	0	0	0	0	0	0	1	0	0	1	0.9
Hard landing	0	0	0	0	0	0	0	1	0	0	1	0.9
In flight collision w/object	0	0	2	0	1	0	2	0	1	1	7	6.5
In flight collision w/terrain	0	0	1	1	2	2	3	0	1	0	10	9.3
In flight encounter w/weather	0	0	0	0	4	0	2	0	0	0	6	5.6
Loss of control - in flight	0	0	4	0	3	0	1	0	2	0	10	9.3
Loss of control - on ground	1	0	2	0	0	0	0	9	0	0	12	11.1
Midaire collision	0	0	0	0	3	0	0	0	0	0	3	2.8
On ground collision w/object	1	3	0	0	0	0	0	0	0	0	5	4.6
On ground collision w/terrain	0	0	1	0	0	0	0	1	0	0	3	2.8
Overrun	0	0	2	0	0	0	0	1	0	0	3	2.8
Loss of power	0	0	1	1	2	1	0	0	0	0	5	4.6
Loss of power(total) - mech failure/malfunction	0	0	4	3	4	0	3	0	1	0	15	13.9
Loss of power(partial) - mech failure/malfunction	0	0	0	0	1	1	0	0	0	0	2	1.9
Loss of power(total) - non-mechanical	0	0	3	0	3	1	1	0	0	0	8	7.4
Loss of power(partial) - non-mechanical	0	0	1	0	0	0	0	0	0	0	1	0.9
Propeller blast or jet exhaust	0	1	0	0	0	0	0	0	0	0	1	0.9
Propeller/rotor contact	1	0	0	0	0	0	0	0	0	0	1	0.9
Roll over	0	0	3	0	0	0	0	0	0	0	3	2.8
Not reported	0	0	0	0	0	0	0	0	0	1	1	0.9
Aircraft												
Number -	3	4	26	5	25	6	12	18	5	4	108	
Perc... -	2.8	3.7	24.1	4.6	23.1	5.6	11.1	16.7	4.6	3.7		

Table 45 - AIRCRAFT BY PHASE OF OPERATION AND DEGREE OF INJURY AND BY DAMAGE
 NONSCHEDULED 14 CFR 135 OPERATIONS
 1990

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	0	1	0	0	2	0	2	1.9
Standing - idling rotors	0	1	0	0	0	0	1	0	1	0.9
Taxi - to takeoff	2	0	0	0	0	0	2	0	2	1.9
Taxi - from landing	2	0	0	0	0	0	2	0	2	1.9
Takeoff	2	0	1	0	0	0	3	0	3	2.8
Takeoff - ground run	3	1	0	0	0	0	4	0	4	3.7
Takeoff - initial climb	9	0	2	8	0	0	12	7	19	17.6
Climb	2	0	0	1	0	0	2	1	3	2.8
Climb - to cruise	0	1	1	0	0	0	1	1	2	1.9
Cruise	3	2	3	3	1	0	5	5	11	10.2
Cruise - normal	7	3	0	4	0	1	6	7	14	13.0
Descent	0	2	0	2	0	0	1	3	4	3.7
Descent - normal	2	0	0	0	0	0	2	0	2	1.9
Approach	1	0	0	2	0	0	1	2	3	2.8
Approach - VFR pattern - final approach	1	0	1	0	0	0	2	0	2	1.9
Approach - go-around (VFR)	0	0	1	0	0	0	0	1	1	0.9
Approach - FAF/outer marker to threshold (IFR)	0	1	2	2	0	0	0	5	5	4.6
Approach - circling(IFR)	0	0	0	1	0	0	0	1	1	0.9
Landing	1	0	0	0	0	0	1	0	1	0.9
Landing - flare/touchdown	5	0	0	0	0	0	5	0	5	4.6
Landing - roll	10	0	2	0	0	0	12	0	12	11.1
Maneuvering	0	0	1	1	0	0	1	1	2	1.9
Maneuvering - turn to reverse direction	0	0	0	2	0	0	0	2	2	1.9
Hover	1	0	0	0	0	0	1	0	1	0.9
Not reported	0	1	0	0	0	0	0	1	1	0.9
Other	2	0	0	1	0	0	2	1	3	2.8
Aircraft										
Number -	54	12	14	28	1	1	68	38	108	
Percent -	50.0	11.1	13.0	25.9	.9	.9	63.0	35.2		

Table 46 - AIRCRAFT BY CONDITION OF LIGHT AND TYPE OF WEATHER
NONSCHEDEDLED 14 CFR 135 OPERATIONS
1990

Condition of light	Type of weather			Aircraft	
	VMC	IMC	Not reptd	No.	Percent
Dawn	3	2	1	6	5.6
Daylight	70	6	2	78	72.2
Night (dark)	14	7	1	22	20.4
Night (bright)	1	0	0	1	.9
Not Reported	1	0	0	1	.9
Aircraft					
Number -	89	15	4	108	
Percent -	82.4	13.9	3.7		

Table 47 - AIRCRAFT BY TYPE OF OPERATION AND DEGREE OF INJURY
NONSCHEDEDLED 14 CFR 135 OPERATIONS
1990

Type of Operation	Degree of Injury				Aircraft	
	None	Minor	Serious	Fatal	No.	Percent
Domestic Passenger	24	5	8	9	46	42.6
Domestic Cargo	21	4	4	17	46	42.6
Domestic Pass/Cargo	8	1	2	0	11	10.2
Domestic Mail Contact Only	0	1	0	0	1	.9
International Passenger	0	1	0	1	2	1.9
International Cargo	1	0	0	0	1	1.9
International Pass/Cargo	0	0	0	1	1	1.9
Aircraft						
Number -	54	12	14	28	108	
Percent -	50.0	11.1	13.0	25.9		

Table 48 - AIRCRAFT BY PROXIMITY TO AIRPORT AND FLIGHT PLAN
NONSCHEDEDLED 14 CFR 135 OPERATIONS
1990

Accident location	Flight plan					Aircraft	
	None	VFR	IFR	VFR/ IFR	Cmpny VFR	No.	Percent
Off airport/airstrip	20	12	21	0	20	73	67.6
On airport	2	10	9	1	4	26	24.1
On airstrip	1	1	2	0	4	8	7.4
Other	0	1	0	0	0	1	.9
Aircraft							
Number -	23	24	32	1	28	108	
Percent -	21.3	22.2	29.6	0.9	25.9		

Table 49 - AIRCRAFT BY OCCURRENCE OF FIRE AND DEGREE OF INJURY AND BY DAMAGE
 NONSCHEDULED 14 CFR 135 OPERATIONS
 1990

Aircraft fire	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
None	52	11	10	14	1	1	63	22	87	80.6
In-flight	1	0	1	0	0	0	2	0	2	1.9
On ground	0	0	3	14	0	0	2	15	17	15.7
Other	1	1	0	0	0	0	1	1	2	1.9
Aircraft										
Number	-	54	12	14	28	1	1	68	38	108
Percent	-	50.0	11.1	13.0	25.9	.9	.9	63.0	35.2	

Table 50 - AIRCRAFT BY TYPE OF AIRCRAFT AND DEGREE OF INJURY AND BY DAMAGE
 NONSCHEDULED 14 CFR 135 OPERATIONS
 1990

Type of aircraft	Degree of injury				Aircraft damage				Aircraft	
	None	Minor	Ser	Fatal	None	Minor	Subs	Dest	No.	Percent
All Fixed Wing *	44	8	9	24	0	1	52	32	85	78.7
Fixed Wing Single Recip. Eng.	23	5	6	8	0	1	28	13	42	38.9
Fixed Wing Multiple Recip. Eng.	15	3	1	10	0	0	16	13	29	26.9
Fixed Wing Turboprop	6	0	1	6	0	0	7	6	13	12.0
Fixed Wing Turbojet	0	0	1	0	0	0	1	0	1	.9
All Rotorcraft *	10	4	5	4	1	0	16	6	23	21.3
Rotorcraft, Recip. Engine	0	1	0	0	0	0	1	0	1	.9
Rotorcraft, Turbine Engine	10	3	5	4	1	0	15	6	22	20.4
Aircraft										
Number	-	54	12	14	28	1	1	68	38	108
Percent	-	.0	11.1	13.0	25.9	.9	.9	63.0	35.2	

* Not included in column totals

Table 51 - BROAD CAUSE/FACTOR ASSIGNMENTS*
 NONSCHEDULED 14 CFR 135 OPERATIONS
 1990

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 #	4	36		2	8		6	41	
Propulsion System and Controls	3	25		2	7		5	29	
Airframe	1	3		0	1		1	4	
Landing Gear	0	7		0	1		0	8	
Systems/Equipment/ Instruments	0	4		0	0		0	4	
Environment #	1	2		19	51		19	52	
Weather	1	1		16	30		16	30	
Light Conditions	0	0		5	7		5	7	
Object (trees, wires, etc.)	0	1		3	6		3	7	
Airport/Airways Facilities, Aids	0	0		0	1		0	1	
Terrain/Runway Condition	0	0		6	27		6	27	
Personnel #	26	79		11	28		26	84	
Pilot	24	69		10	24		24	73	
Others (Aboard)	2	2		0	0		2	2	
Others (Not Aboard)	1	13		2	6		3	13	
Number of Aircraft							28	108	
NTSB Determined Probable Cause							28	107	

* Multiple causes and factors may be assigned in an accident

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

Table 52 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
 NONSCHEDULED 14 CFR 135 OPERATIONS
 1981 - 1990

Year	Accidents	Fatal Accidents	Fatalities		Accident Rate per 100,000* Aircraft Hours Flown		
			Total	Aboard Aircraft In This Category	Hours Flown	Total	Fatal
			-----	-----	-----	-----	-----
1981	157	40	94	92	2,895,827	5.42	1.38
1982	132	31	72	72	3,008,000	4.39	1.03
1983	141	27	62	57	2,378,000	5.93	1.14
1984	146	23	52	52	2,843,000	5.14	0.81
1985	154	35	76	75	2,570,000	5.99	1.36
1986	117	31	65	61	2,690,000	4.35	1.15
1987	97	30	65	63	2,657,000	3.65	1.13
1988	101	28	59	55	2,632,000	3.84	1.06
1989	111	25	83	81	3,020,000	3.68	0.83
1990	106	28	50	48	2,241,000	4.73	1.25

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

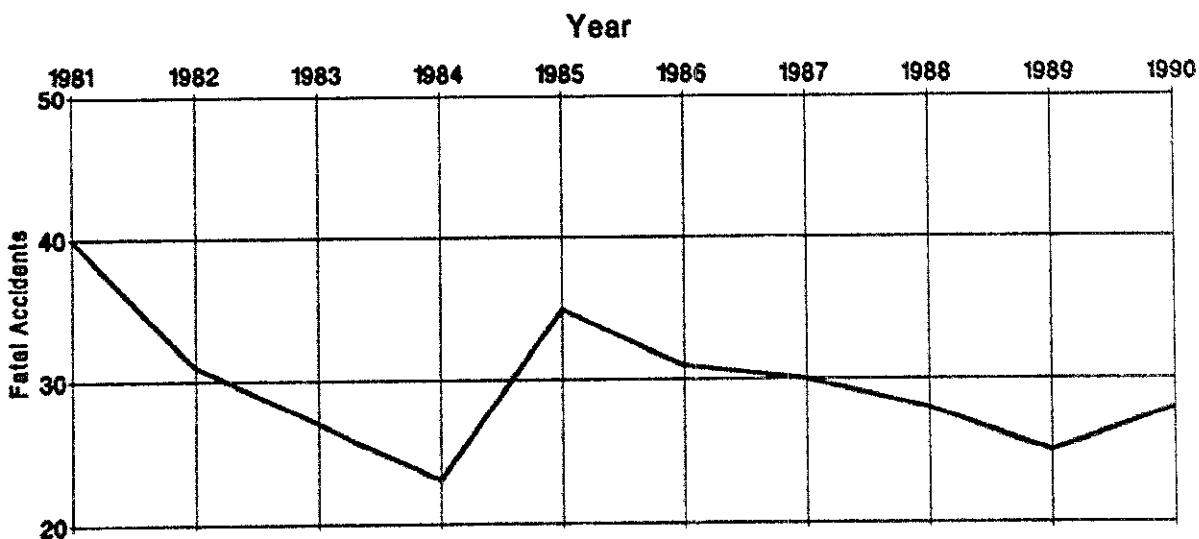
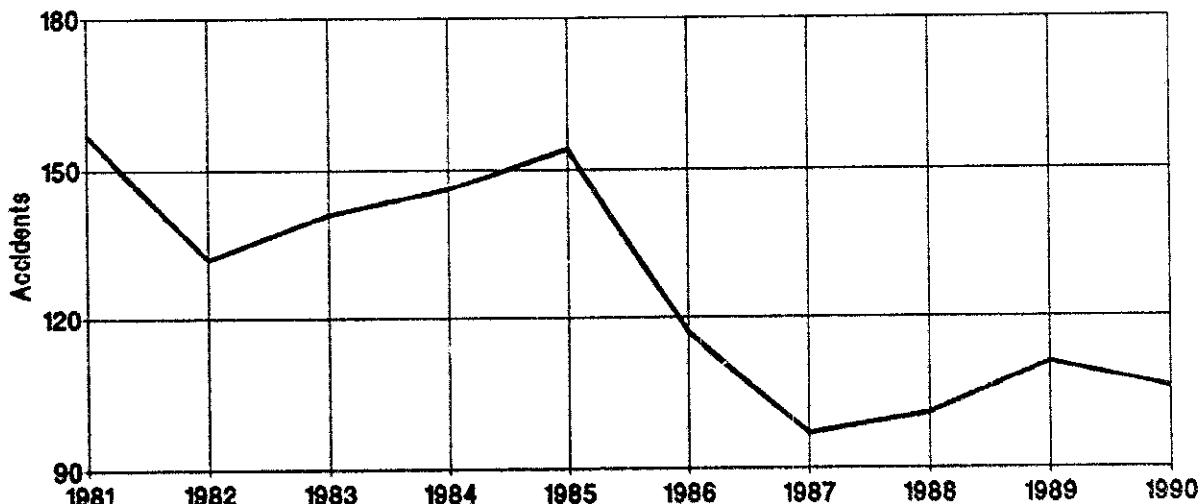


Figure 14 - NUMBER OF FATALITIES
NONSCHEDED 14 CFR 135 OPERATIONS

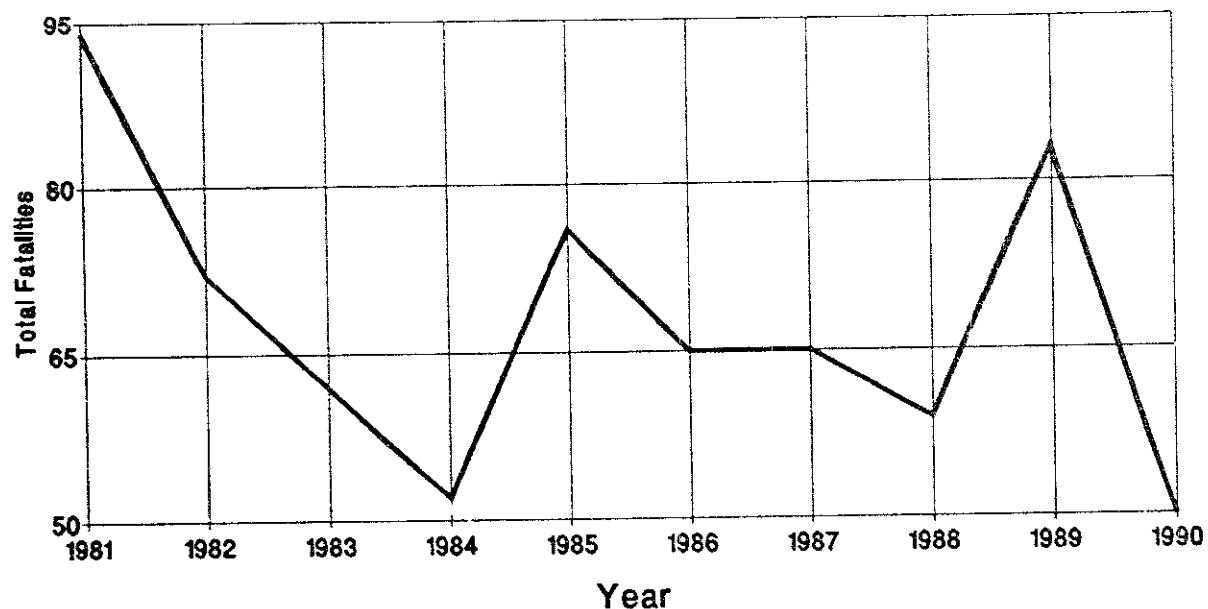


Figure 15 - ACCIDENT RATE PER 100,000 HOURS FLOWN
NONSCHEDED 14 CFR 135 OPERATIONS

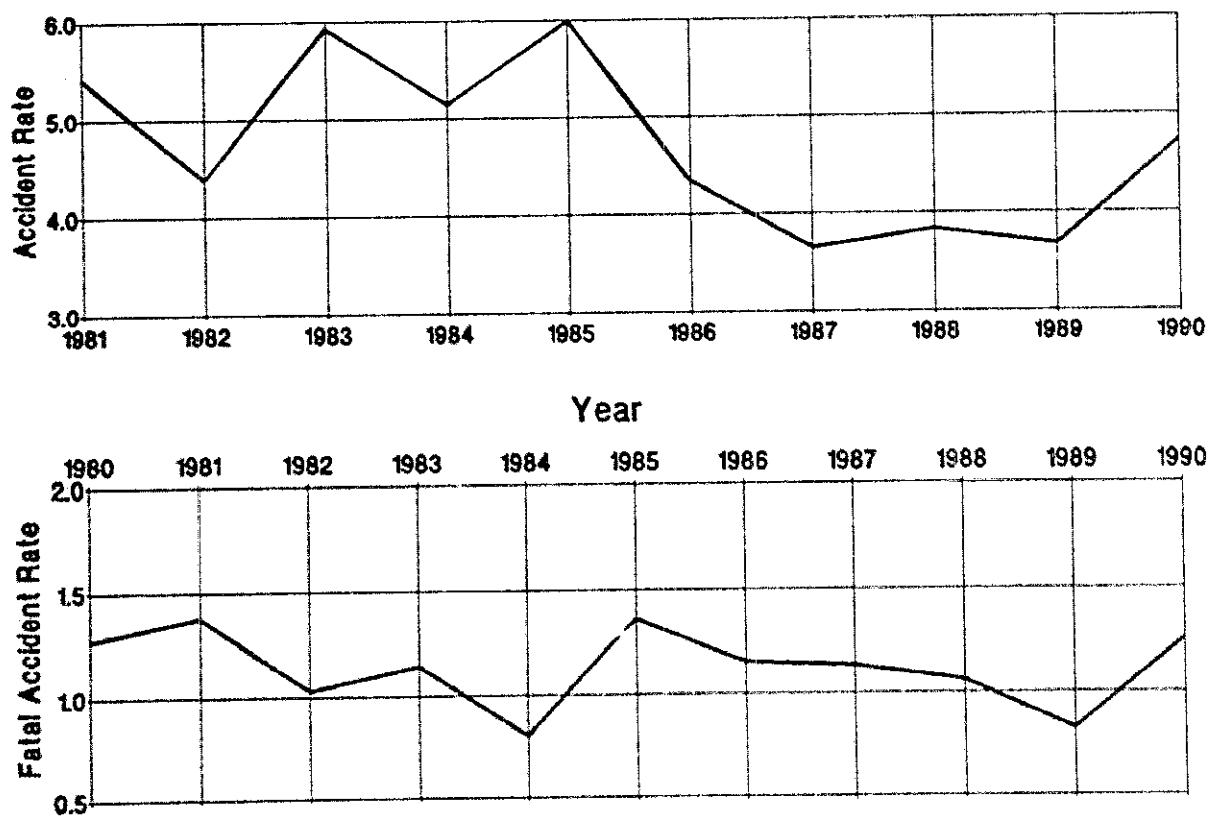


Table 53 - FIRST OCCURRENCES IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
 NONSCHEDULED 14 CFR 135 OPERATIONS
 1990 AND 1985 - 1989

Type of Occurrence	All Accidents				Fatal Accidents			
	1990		1985 - 1989		1990		1985 - 1989	
	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Loss of control - in flight	10	9.3	12.6	10.7	5	17.9	6.8	22.7
Loss of control - on ground	12	11.1	10.8	9.2	0	.0	.2	.7
In flight collision w/terrain	10	9.3	10.6	9.0	8	28.6	5.2	17.3
In flight encounter with weather	6	5.6	10.0	8.5	4	14.3	4.6	15.3
Airframe/component/system failure/malfunction	7	6.5	9.0	7.7	0	.0	2.6	8.7
In flight collision with object	7	6.5	8.4	7.1	3	10.7	2.6	8.7
Loss of engine power(total) - mech failure/malfunction	15	13.9	7.4	6.3	3	10.7	1.2	4.0
Loss of engine power(total) - non-mechanical	8	7.4	6.6	5.6	2	7.1	.6	2.0
On ground collision with object	5	4.6	6.0	5.1	0	.0	.6	2.0
Loss of engine power	5	4.6	3.8	3.2	0	.0	1.2	4.0
Loss of engine power(partial) - mech failure/malfunction	2	1.9	3.6	3.1	0	.0	.8	2.7
Overrun	3	2.8	3.4	2.9	0	.0	.0	.0
On ground collision w/terrain	3	2.8	2.6	2.2	0	.0	.0	.0
Main gear collapsed	1	.9	2.2	1.9	0	.0	.0	.0
Fire	0	.0	2.0	1.7	0	.0	.8	2.7
Hard landing	1	.9	2.0	1.7	0	.0	.0	.0
Midair collision	3	2.8	1.8	1.5	1	3.6	1.0	3.3
Undershoot	0	.0	1.8	1.5	0	.0	.2	.7
Loss of engine power(partial) - non-mechanical	1	.9	1.6	1.4	1	3.6	.0	.0
Not reported	1	.9	1.2	1.0	0	.0	.0	.0
Nose over	0	.0	1.2	1.0	0	.0	.0	.0
Miscellaneous/other	0	.0	1.2	1.0	0	.0	.0	.0
Altitude deviation, uncontrolled	0	.0	1.0	.9	0	.0	.2	.7
Abrupt maneuver	0	.0	.8	.7	0	.0	.6	2.0
Explosion	0	.0	.8	.7	0	.0	.2	.7
Nose gear collapsed	2	1.9	.8	.7	0	.0	.0	.0
Gear not extended	1	.9	.8	.7	0	.0	.0	.0
Fire/explosion	0	.0	.6	.5	0	.0	.0	.0
Roll over	3	2.8	.6	.5	0	.0	.0	.0
On ground encounter with weather	0	.0	.4	.3	0	.0	.0	.0
Propeller/rotor contact to person	1	.9	.4	.3	1	3.6	.0	.0
Undetermined	0	.0	.4	.3	0	.0	.4	1.3
Dragged wing, rotor, pod, or float	0	.0	.2	.2	0	.0	.0	.0
Forced landing	0	.0	.2	.2	0	.0	.0	.0
Gear collapsed	0	.0	.2	.2	0	.0	.0	.0
Other gear collapsed	0	.0	.2	.2	0	.0	.0	.0
Gear not retracted	0	.0	.2	.2	0	.0	.0	.0
Missing aircraft	0	.0	.2	.2	0	.0	.2	.0
Propeller blast or jet exhaust	1	.9	.0	.0	0	.0	.0	.0
Total	108	100.0	117.6	100.0	28	100.0	30.0	100.0

Table 54 - FIRST PHASES OF OPERATION IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
 NONSCHEDULED 14 CFR 135 OPERATIONS
 1990 AND 1985 - 1989

Phase of operation	All Accidents				Fatal Accidents			
	1990		1985 - 1989		1990		1985 - 1989	
	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Takeoff	28	25.9	23.4	19.9	8	28.6	4.4	14.7
Cruise	25	23.1	23.0	19.6	7	25.0	7.4	24.7
Landing	19	17.6	23.2	19.7	1	3.6	1.2	4.0
Approach	12	11.1	17.0	14.5	5	17.9	7.2	24.0
Maneuvering	5	4.6	9.8	8.3	3	10.7	4.2	14.0
Climb	5	4.6	6.0	5.1	1	3.6	2.6	8.7
Taxi	4	3.7	6.0	5.1	0	.0	.0	.0
Descent	6	5.6	4.0	3.4	2	7.1	1.8	6.0
Standing	3	2.8	2.6	2.2	1	3.6	.4	1.3
Other	1	0.9	2.6	2.2	0	.0	.8	2.7
Total Aircraft	108	100.0	117.6	100.0	28	100.0	30.0	100.0

Table 55 - BROAD CAUSE/FACTOR ASSIGNMENTS IN ALL ACCIDENTS AND IN FATAL ACCIDENTS
 NONSCHEDULED 14 CFR 135 OPERATIONS
 1990 AND 1985 - 1989

Broad Cause/Factor	All Accidents				Fatal Accidents			
	1990		1985 - 1989		1990		1985 - 1989	
	No.	Percent	Mean	Percent	No.	Percent	Mean	Percent
Pilot	73	67.6	90.8	77.2	24	85.7	25.6	85.3
Weather	30	27.8	39.8	33.8	16	57.1	13.6	45.3
Terrain/Runway Condition	27	25.0	37.4	31.8	6	21.4	8.8	29.3
Propulsion System and Controls	29	26.9	24.2	20.6	5	17.9	4.8	16.0
Other Person (Not Aboard)	18	16.7	19.4	16.5	3	10.7	8.2	27.3
Light Conditions	7	6.5	21.0	17.9	5	17.9	8.8	29.3
Object (tree,wires,etc)	7	6.5	18.4	15.6	3	10.7	5.4	18.0
Landing Gear	8	7.4	8.4	7.1	0	.0	.2	.7
Systems/Equipment/ Instruments	4	3.7	10.0	8.5	0	.0	2.8	9.3
Airframe	4	3.7	5.4	4.6	1	3.6	1.8	6.0
Flight Control System	0	.0	2.8	2.4	0	.0	1.2	4.0
Airport/Airways Facilities, Aids	1	.9	2.0	1.7	0	.0	.4	1.3
Other Person (Aboard)	2	1.9	.2	.2	2	7.1	.0	.0
Total Aircraft	108	100.0	117.6	100.0	28	100.0	30.0	100.0
NTSB Determined Probable Cause	107		115.8		28		30.0	

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ CARL W. VOGT
Chairman

/s/ SUSAN M. COUGHLIN
Vice Chairman

/s/ JOHN K. LAUBER
Member

/s/ JOHN HAMMERSCHMIDT
Member

/s/ CHRISTOPHER A. HART
Member

APPENDIX A
MIDAIR COLLISION ACCIDENTS
U.S. AIR CARRIER OPERATIONS
1981 - 1990

Year	Accidents			Number of Accidents by Segements of Aviation Involved		
	Total	Fatal	Total Fatalities	S135 and GA	N135 and N135	N135 and GA
1981	4	3	20	1	1	2
1982	3	1	3	1	1	1
1983	1	1	4	0	0	1
1984	1	1	17	1	0	0
1985	2	1	1	0	2	0
1986	0	0	0	0	0	0
1987	5	2	12	3	0	2
1988	2	1	4	0	0	1
1989	1	1	2	0	1	1
1990	3	2	5	1	1	1
	---	---	---	---	---	---
	22	13	68	7	5	10

NOTE: 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 phase of flight in which the first occurrence happened.

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

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

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

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

TYPE OF OCCURRENCE: "Occurrences" is the highest level of an accident classification mechanism known as the Sequence of Events. This concept was introduced in 1982 accident investigations to describe the circumstances in an accident. To describe an accident, up to five occurrences may be used. Typically each occurrence is further defined by one or more "findings" which, when presented chronologically, depict the accident scenario from beginning to end in considerable detail.

The findings are developed by NTSB analysts from a menu of words and phrases, and are the most detailed means of classifying an accident. The findings are also the vehicle used to describe the probable cause of, and related factors in an accident. The example below illustrates the relationship between occurrences and findings.

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

Finding(s)

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

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

APPENDIX C
DETAILED CAUSE/FACTOR ASSIGNMENTS
14 CFR 121 125 127 OPERATIONS

CAUSE/FACTOR TABLE
14 CFR 121 125 127 OPERATIONS
1990

	Cause or Factor	Cause
	-----	-----
AIRCRAFT		
Air cond/heating/pressurization	1	1
Fire warning system,powerplant	1	0
Fuel system,pump	1	1
Landing gear,nose gear	1	1
Propeller system/accessories	1	1
Reduction gear assy	1	1
FACILITY		
Airport facilities,runway marking	2	0
Airport facilities,taxiway marking	2	0
ENVIRONMENT		
Dark night	1	0
Fog	2	0
Other person	1	1
Rain	1	0
Turbulence	1	1
Turbulence(thunderstorms)	1	0
Turbulence,clear air	2	2
FLIGHT CREW		
APU	1	1
Aborted takeoff	1	0
Airspeed	1	1
Airspeed(Vr)	1	0
Airspeed(Vref)	1	1
Crew/group coordination	3	2
Descent	1	0
Evacuation	1	0
Flight manuals	1	1
IFR procedure	1	1
Identification of aircraft visually	1	1
In-flight planning/decision	1	0
Maneuver	2	1
Miscellaneous	1	0
Monitoring	1	1
Procedures/directives	2	2
Rotation	1	0
Supervision	1	0
Visual lookout	1	0
Visual/aural perception	2	0
OTHER PERSON		
Clearance	1	1
Control tower service	3	0
Crew/group coordination	1	1
Emergency equipment	1	1
Equipment, other	1	1
IFR separation standards	1	1
Inadequate surveillance of operation	1	0
Inadequate training	2	0
Maintenance,adjustment	2	0
Maintenance,modification	2	1
Miscellaneous	1	1
Passenger briefing	1	1
Procedure inadequate	1	0
Procedures/directives	2	1
Self-induced pressure	1	0

APPENDIX D

DETAILED CAUSE/FACTOR ASSIGNMENTS
SCHEDULED 14 CFR 135 OPERATIONS

CAUSE/FACTOR TABLE
SCHEDULED 14 CFR 135 OPERATIONS
1990

	Cause or Factor	Cause
	-----	-----
AIRCRAFT		
Landing gear, main gear	1	0
Landing gear, normal retraction/extension assembly	1	1
Turboshaft engine, free (power) turbine	1	1
Turboshaft engine, gas generator turbine	1	1
FACILITY		
Airport facilities, runway safety area	1	0
Airport facilities, runway/landing area condition	2	0
ENVIRONMENT		
Clouds	1	0
Dark night	1	0
Downdraft	1	0
Dusk	1	0
Fog	1	0
Gusts	1	0
Hail	1	0
High wind	1	0
Icing conditions	1	0
Low ceiling	3	0
Mountain wave	1	0
Obscurcation	1	0
Rain	1	0
Snow	2	0
Sunflare	1	0
Terrain condition	6	0
Turbulence in clouds	1	0
Vehicle	1	1
Whiteout	1	1
FLIGHT CREW		
Aircraft control	2	2
Airspeed	1	0
Altitude	1	1
Anxiety/apprehension	1	0
Clearance	1	1
Compensation for wind conditions	1	1
Design stress limits of aircraft	1	1
Directional control	1	1
Diverted attention	2	1
Flare	1	1
Go-around	2	0
IFR procedure	1	1
In-flight planning/decision	1	1
Monitoring	1	1
Planning-decision	1	1
Proper touchdown point	1	0
Self-induced pressure	1	0
Visual lookout	3	3
OTHER PERSON		
Airport snow removal	1	0
Lack of total experience in type operation	1	0
Maintenance, adjustment	1	1
Other airport/runway maintenance	1	0
Procedure inadequate	1	1
Reason for occurrence undetermined	1	0
Visual lookout	3	2
Visual/aural perception	2	1

APPENDIX E

DETAILED CAUSE/FACTOR ASSIGNMENTS
NON SCHEDULED 14 CFR 135 OPERATIONS

CAUSE/FACTOR TABLE
NONSCHEDULED 14 CFR 135 OPERATIONS
1990

	Cause or Factor	Cause
	-----	-----
AIRCRAFT		
Accessory drive assy,drive gear	1	1
All engines	1	1
Bleed air system,lines	1	1
Compressor assembly	1	1
Door,cargo	1	1
Engine assembly	1	0
Engine assembly,connecting rod	2	2
Engine assembly,crankshaft	1	1
Engine assembly,cylinder	1	1
Engine assembly,rocker arm/tappet	1	1
Engine assembly,valve,intake	1	0
Exhaust system,gasket	1	1
Exhaust system,turbocharger	2	2
Flight compartment lights	1	1
Fluid,fuel	5	4
Fluid,fuel grade	1	1
Fluid,oil	2	1
Fuel injection control/system	1	1
Fuel system	1	0
Fuel system,carburetor	1	1
Fuel system,line	1	0
Fuselage	1	1
Fuselage,crew compartment	1	1
Ignition system,magneto	1	1
Ignition system,magneto grounding lead (p-lead)	1	1
Landing gear,main gear	1	1
Landing gear,main gear spring	1	1
Landing gear,main gear strut scissors	2	2
Landing gear,normal retraction/extension assembly	3	3
Landing gear,nose gear assembly	1	0
Landing gear,skid assembly	1	1
Lubricating system,oil filler cap	2	2
Oxygen system	1	1
Rotor system	1	1
Rotor system,main rotor hub damper	2	2
Rotor system,main rotor hub stop(static/dynamic)	1	0
Turbine assembly,turbine blade	1	1
Turbine assembly,turbine wheel	2	2
Turboshaft engine,free (power) turbine	1	1
Turboshaft engine,free turbine governor	1	1
Turboshaft engine,free turbine shaft	1	1
Wing	1	1
FACILITY		
Airport facilities,runway marking	1	0
Airport facilities,runway/landing area condition	2	0
ENVIRONMENT		
Animal(s)	1	1
Below approach minimums	1	0
Carburetor icing conditions	1	0
Clouds	2	0
Crosswind	3	0
Dark night	6	0
Dawn	1	0
Drizzle	1	0
Fence	1	0
Fog	4	0
Gusts	3	0
Haze/smoke	1	0
High density altitude	4	0
High wind	1	0
Icing conditions	5	0

CAUSE/FACTOR TABLE
NONSCHEDULED 14 CFR 135 OPERATIONS
1990

	Cause or Factor	Cause
Environment (continued)		
Low ceiling	6	0
Obscuration	3	0
Rain	4	0
Snow	6	0
Tailwind	3	0
Terrain condition	27	0
Thunderstorm	1	0
Tree(s)	3	0
Turbulence	2	0
Unfavorable wind	1	0
Vehicle	1	0
Wall/barricade	2	0
Whiteout	1	0
Windshear	1	1
Wire, static	1	0
Wire, transmission	1	0
FLIGHT CREW		
Abort	1	1
Aborted takeoff	2	2
Aircraft control	9	8
Aircraft preflight	2	2
Aircraft unattended/engine(s) running	1	1
Airspeed	9	9
Airspeed(Vmc)	2	2
Altitude	3	3
Clearance	4	4
Compensation for wind conditions	3	3
Decision height	1	1
Descent	6	5
Directional control	6	5
Distance	3	3
Diverted attention	1	1
Emergency equipment	1	1
Emergency procedure	1	1
Fatigue	1	0
Flare	1	1
Flight into known adverse weather	4	2
Flight manuals	1	1
Fuel boost pump selector position	1	1
Fuel consumption calculations	1	0
Fuel tank selector position	3	3
Go-around	2	2
IFR procedure	1	0
Ice/frost removal from aircraft	2	3
In-flight planning/decision	4	0
Lack of familiarity with aircraft	1	0
Lack of recent experience in type of aircraft	1	0
Lack of total experience in type operation	1	0
Lift-off	2	1
Lowering of flaps	1	1
Maneuver	4	4
Minimum descent altitude	1	1
Missed approach	1	1
Over confidence in aircraft's ability	1	0
Planned approach	1	0
Planning-decision	5	4
Preflight planning/preparation	4	4
Procedures/directives	2	1
Proper altitude	5	5
Proper climb rate	1	1
Proper descent rate	1	0
Proper glidepath	1	1
Proper touchdown point	3	2

CAUSE/FACTOR TABLE
NONSCHEDULED 14 CFR 135 OPERATIONS
1990

	Cause or Factor	Cause
	-----	-----
FLIGHT CREW (continued)		
Radar assistance to VFR aircraft	1	0
Raising of flaps	1	0
Reason for occurrence undetermined	1	1
Recovery from bounced landing	1	0
Remedial action	2	0
Rotorcraft flight controls	1	1
Spatial disorientation	1	1
Stall	2	2
Stall/mush	2	2
Throttle/power control	1	1
Unsuitable terrain	6	4
VFR flight into IMC	4	4
Visual lookout	7	5
Visual/aural perception	1	0
Weather evaluation	1	0
Wrong propeller feathered	1	1
OTHER PERSON		
Aircraft/equipment, inadequate design	1	1
Control interference	1	1
Distance	1	1
Identification of aircraft visually	1	1
Inadequate initial training	1	0
Inadequate surveillance of operation	1	0
Inadequate training	1	0
Maintenance	1	1
Maintenance, adjustment	2	2
Maintenance, inspection of aircraft	1	1
Maintenance, installation	1	1
Maintenance, overhaul	2	2
Maintenance, replacement	1	1
Maintenance, service bulletins	1	0
Procedures/directives	1	1
Psychological condition	1	0
Radar assistance to VFR aircraft	1	0
Refueling	1	1
Safety advisory	1	0
Supervision	1	1
Updating of recorded weather information	1	0
Visual lookout	2	2
Visual separation	2	2

APPENDIX F

N.T.S.B. FORM 6120.4

National Transportation Safety Board

FACTUAL REPORT
AVIATION

1 NTSB Accident/Incident Number

2	3 Investigation
1 <input type="checkbox"/> Accident	1 <input type="checkbox"/> NTSB
2 <input type="checkbox"/> Incident	2 <input type="checkbox"/> 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

National Transportation Safety Board

NTSB Accident/Incident Number

**FACTUAL REPORT
AVIATION**

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

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

FACTUAL REPORT AVIATION

Airport/Approach/Landing Information24 Not applicable (Go to block 39)

25 Airport Name A Other	26 Airport Identifier A Other	27 Accident Location 1 <input type="checkbox"/> Off airport/airstrip 2 <input type="checkbox"/> On airport 3 <input type="checkbox"/> On airstrip A Other	28 Distance From Airport Center (Nearest SM) A Other	29 Direction From Airport ____ °mag A Other
--------------------------------	--------------------------------------	---	--	---

30 VFR Approach/Landing (Multiple entry) 1 <input type="checkbox"/> None 2 <input type="checkbox"/> Traffic pattern 3 <input type="checkbox"/> Straight-in 4 <input type="checkbox"/> Valley/terrain following 5 <input type="checkbox"/> Go around 6 <input type="checkbox"/> Touch and go 7 <input type="checkbox"/> Full stop 8 <input type="checkbox"/> Stop and go 9 <input type="checkbox"/> Simulated forced landing 10 <input type="checkbox"/> Forced landing 11 <input type="checkbox"/> Precautionary landing A Other	31 Type Instrument Approach Flown (Multiple entry) 1 <input type="checkbox"/> None 2 <input type="checkbox"/> ADF/NDB 3 <input type="checkbox"/> SDF 4 <input type="checkbox"/> VOR/TVOR 5 <input type="checkbox"/> VOR/DME 6 <input type="checkbox"/> TACAN 7 <input type="checkbox"/> ILS-complete 8 <input type="checkbox"/> ILS-localizer 9 <input type="checkbox"/> ILS-backcourse 10 <input type="checkbox"/> RNAV 11 <input type="checkbox"/> MLS 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 <input type="checkbox"/> Macadam 2 <input type="checkbox"/> Asphalt 3 <input type="checkbox"/> Concrete 4 <input type="checkbox"/> Gravel 5 <input type="checkbox"/> Dirt 6 <input type="checkbox"/> Grass/turf 7 <input type="checkbox"/> Snow 8 <input type="checkbox"/> Ice 9 <input type="checkbox"/> Water 10 <input type="checkbox"/> Metal/wood A Other	37 Runway/Landing Surface Condition 1 <input type="checkbox"/> Dry 2 <input type="checkbox"/> Wet 3 <input type="checkbox"/> Ice covered 4 <input type="checkbox"/> Snow—dry 5 <input type="checkbox"/> Snow—wet 6 <input type="checkbox"/> Snow—crusted 7 <input type="checkbox"/> Snow—compacted 8 <input type="checkbox"/> Vegetation 9 <input type="checkbox"/> Water—calm 10 <input type="checkbox"/> Water—choppy	11 <input type="checkbox"/> Water—glossy 12 <input type="checkbox"/> Rubber deposits 13 <input type="checkbox"/> Soft 14 <input type="checkbox"/> Rough 15 <input type="checkbox"/> Slush covered 16 <input type="checkbox"/> Holes A Other
---	---	---

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

Aircraft Information

38 Aircraft Manufacturer	40 Aircraft Model/Series	41 Serial No. A Other	42 Certificated Maximum Gross Weight A Other
--------------------------	--------------------------	------------------------------	---

43 Type of Aircraft 1 <input type="checkbox"/> Airplane 2 <input type="checkbox"/> Helicopter 3 <input type="checkbox"/> Glider 4 <input type="checkbox"/> Balloon	5 <input type="checkbox"/> Blimp/dirigible 6 <input type="checkbox"/> Ultralight 7 <input type="checkbox"/> Gyroplane A Specify _____	44 Type Airworthiness Certificate (Multiple entry) Standard 1 <input type="checkbox"/> Normal 2 <input type="checkbox"/> Utility 3 <input type="checkbox"/> Acrobatic 4 <input type="checkbox"/> Transport Special 5 <input type="checkbox"/> Restricted 6 <input type="checkbox"/> Limited 7 <input type="checkbox"/> Provisional 8 <input type="checkbox"/> Special flight 9 <input type="checkbox"/> Experimental A Other	45 Home Built 1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No A Other
--	---	--	---

National Transportation Safety Board
**FACTUAL REPORT
AVIATION**

Aircraft Information (continued)**46 Landing Gear (Multiple entry)**

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

48 No. of Seats**49 Stall Warning System****50 IFR Equipped****51 Icing Certification/Equipped****52 Engine Type**

Installed

1 Yes2 No

A Other

1 Yes2 No

A Other

(Multiple entry)

1 Certified2 Not Certified3 Equipped4 Not Equipped

A Other

1 2 3 4 5 6

Reciprocating—carburetor

Reciprocating—fuel injected

Turbo prop

Turbo jet

Turbo fan

Turbo shaft A Other

If not
Engine
powered,
go to
block 59**53 Engine Manufacturer****54 Engine Model and Series****55 Engine Rated Power****56 Number of Engines**

A _____ Horsepower

B _____ Lbs. Thrust

C Other

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 Program1 Annual2 Manufacturer's inspection program3 Other approved inspection program (AAIP)4 Continuous airworthiness

A Other

60 Type of Last Inspection1 Annual2 100 hour3 AAIP4 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 Information1 Tach2 Flight3 Hobbs4 Logbooks Records5 Estimate6 Pilot/Operator Report

A Other

**65 Hazardous Materials
on Aircraft**1 No

A (Type) _____

B Other

**Emergency Locator
Transmitter (ELT)**

1

2

A

Other

Yes

No

A Other

67 Installed

68 Required

69 Operated

70 Aided in location
of accident site**66 Hazardous Material Spill/Factor**1 Yes2 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 Address1 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

- | | |
|-----------------------------------|---|
| <input type="checkbox"/> 1 Owner | <input type="checkbox"/> 4 Borrower |
| <input type="checkbox"/> 2 Lessee | <input type="checkbox"/> 5 Unauthorized |
| <input type="checkbox"/> 3 Renter | <input type="checkbox"/> A Other |

78 Pilot Status of This Aircraft

- | | |
|-----------------------------------|---|
| <input type="checkbox"/> 1 Owner | <input type="checkbox"/> 4 Borrower |
| <input type="checkbox"/> 2 Lessee | <input type="checkbox"/> 5 Unauthorized |
| <input type="checkbox"/> 3 Renter | <input type="checkbox"/> 6 Employee |
| | <input type="checkbox"/> A Other |

Type of Certificate(s) Held

79 None (Go to block 83)

80 Air Carrier Operating Certificate (Check all applicable)

- | | |
|--|---|
| <input type="checkbox"/> 1 Flag carrier/domestic (121) | <input type="checkbox"/> 4 Large helicopter (127) |
| <input type="checkbox"/> 2 Supplemental | <input type="checkbox"/> 5 Commuter air carrier |
| <input type="checkbox"/> 3 All cargo (418) | <input type="checkbox"/> 6 On-demand air taxi |

81 Operating Certificate

- | | |
|--------------------------|-------------------|
| <input type="checkbox"/> | Other operator of |
| | large aircraft |

82 Operator Certificate

- | | |
|----------------------------|---|
| <input type="checkbox"/> 1 | Rotorcraft—external load operator (133) |
| <input type="checkbox"/> 2 | Agricultural aircraft (137) |

Regulation Flight Conducted Under

83 Regulation Flight Conducted Under

- | | | | |
|---|---------------------------------------|---------------------------------------|---|
| <input type="checkbox"/> 1 14 CFR 91 (only) | <input type="checkbox"/> 4 14 CFR 105 | <input type="checkbox"/> 7 14 CFR 127 | <input type="checkbox"/> 10 14 CFR 137 |
| <input type="checkbox"/> 2 14 CFR 91D | <input type="checkbox"/> 5 14 CFR 121 | <input type="checkbox"/> 8 14 CFR 133 | <input type="checkbox"/> 11 14 CFR 129 (Foreign flag) |
| <input type="checkbox"/> 3 14 CFR 103 | <input type="checkbox"/> 6 14 CFR 125 | <input type="checkbox"/> 9 14 CFR 135 | <input type="checkbox"/> 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

<input type="checkbox"/> 1 Scheduled	<input type="checkbox"/> 84b
<input type="checkbox"/> 2 Non-scheduled	<input type="checkbox"/> 1 Domestic

84b

<input type="checkbox"/> 1 Domestic
<input type="checkbox"/> 2 International

84c

<input type="checkbox"/> 1 Passenger	<input type="checkbox"/> 3 Passenger/cargo
<input type="checkbox"/> 2 Cargo	<input type="checkbox"/> 4 Mail contract ONLY

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

86

<input type="checkbox"/> 1 Personal	<input type="checkbox"/> 4 Executive/corporate	<input type="checkbox"/> 7 Other work use	<input type="checkbox"/> 10 Positioning
<input type="checkbox"/> 2 Business	<input type="checkbox"/> 5 Aerial application	<input type="checkbox"/> 8 Public use	
<input type="checkbox"/> 3 Instructional (Including air carrier training)	<input type="checkbox"/> 6 Aerial observation	<input type="checkbox"/> 9 Ferry	<input type="checkbox"/> A Specify _____

84d

<input type="checkbox"/> 1 Domestic
<input type="checkbox"/> 2 International

84e

<input type="checkbox"/> 1 Passenger	<input type="checkbox"/> 3 Passenger/cargo
<input type="checkbox"/> 2 Cargo	<input type="checkbox"/> 4 Mail contract ONLY

First Pilot Information

87 Name (Last, First, Initial)

88 Pilot Certificate No.

89 Street Address

A Other

A Other

A Other

90 City

91 State

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

93 Age

Yrs.

A Other

94 Sex

- | |
|-----------------------------------|
| <input type="checkbox"/> 1 Male |
| <input type="checkbox"/> 2 Female |

95 Seat Occupied

<input type="checkbox"/> 1 Left	<input type="checkbox"/> 96 Principal Profession
<input type="checkbox"/> 2 Right	<input type="checkbox"/> 1 Pilot—civilian
<input type="checkbox"/> 3 Center	<input type="checkbox"/> 2 Pilot—military
<input type="checkbox"/> 4 Front	<input type="checkbox"/> 3 Other—military
<input type="checkbox"/> 5 Rear	<input type="checkbox"/> 4 Aircraft mechanic
<input type="checkbox"/> A Other	<input type="checkbox"/> 5 Business
	<input type="checkbox"/> 6 Lawyer

<input type="checkbox"/> 7 Doctor/dentist	<input type="checkbox"/> 13 Farmer/rancher
<input type="checkbox"/> 8 Police	<input type="checkbox"/> 14 Retired
<input type="checkbox"/> 9 Student	
<input type="checkbox"/> 10 Clergy	
<input type="checkbox"/> 11 Teacher	
<input type="checkbox"/> 12 Engineer	

97 Certificate(s) (Multiple entry)

- | | |
|--|--|
| <input type="checkbox"/> 1 Student | <input type="checkbox"/> 6 Flight Engineer |
| <input type="checkbox"/> 2 Private | <input type="checkbox"/> 7 Military |
| <input type="checkbox"/> 3 Commercial | <input type="checkbox"/> 8 None |
| <input type="checkbox"/> 4 Airline Transport | <input type="checkbox"/> 9 Foreign |
| <input type="checkbox"/> 5 Flight Instructor | <input type="checkbox"/> A Other |

National Transportation Safety Board

FACTUAL REPORT AVIATION

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

98 Ratings—Airplane	99 Rotorcraft/Glider/LTA	100 Instrument Rating	101 Instructor Rating(s)								
1 None	1 None	1 <input type="checkbox"/> None	1 <input type="checkbox"/> None								
2 Single engine land	2 Helicopter	2 <input type="checkbox"/> Airplane	2 <input type="checkbox"/> Airplane SE								
3 Multiengine land	3 Gyroplane	3 <input type="checkbox"/> Helicopter	3 <input type="checkbox"/> Airplane ME								
4 Single engine sea	4 Airship		4 <input type="checkbox"/> Helicopter								
5 Multiengine sea	5 Free balloon		5 <input type="checkbox"/> Gyroplane								
	6 Glide:		6 <input type="checkbox"/> Glider								
			7 <input type="checkbox"/> Instrument plane								
			8 <input type="checkbox"/> 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 <input type="checkbox"/> None 2 <input type="checkbox"/> Class 1 3 <input type="checkbox"/> Class 2 4 <input type="checkbox"/> Class 3 A Other _____	109 Medical Certificate Validity 1 <input type="checkbox"/> Valid medical—no waivers/limitations 2 <input type="checkbox"/> Valid medical—with waivers/limitations 3 <input type="checkbox"/> Non valid medical for this flight 4 <input type="checkbox"/> Expired 5 <input type="checkbox"/> No medical certificate A Other _____								
110 Date of Last Medical (Add for M, D, X) _____ A Other _____		111 Medical limitation 1 <input type="checkbox"/> None 2 <input type="checkbox"/> Vision A Other _____ B Other _____									
		112 Medical waiver 1 <input type="checkbox"/> None 2 <input type="checkbox"/> Vision 3 <input type="checkbox"/> Hearing A Specify _____ B Other _____									
		113 Statement of Demonstrated Ability 1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> 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											
115 Source of Pilot Flight Time (Multiple entry) 1 <input type="checkbox"/> Pilot log 2 <input type="checkbox"/> Company 3 <input type="checkbox"/> FAA 4 <input type="checkbox"/> Pilot/Operator Report 5 <input type="checkbox"/> Investigator's Estimate 6 <input type="checkbox"/> Relative 7 <input type="checkbox"/> Other Person A Other _____											
Flight Time A-A-C		B This Make A Model	C Airplane Single Engine	D Airplane Multiengine	E Night	F Instrument Actual	G 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 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No A Other		138 Shoulder Harness Available 1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No A Other							
139 Shoulder Harness Used 1 Yes 2 No A Other		140 Autopsy Performed (This pilot) 1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No A Other		141 Toxicology Performed (This pilot) 1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No A Other							

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Pilot Information (continued)

142 Person at Controls	1 <input type="checkbox"/> Pilot in command	4 <input type="checkbox"/> Non-pilot	143 Simulated Instrument Flight	1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	144 Vision Restricting Device Used	1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	145 Second Pilot
2 <input type="checkbox"/> Second pilot	5 <input type="checkbox"/> No one	A Other	A Other	A Other	A Other	A Other	A Other	A Other	1 <input type="checkbox"/> Yes (Complete second pilot supplement)
3 <input type="checkbox"/> Both pilots									2 <input type="checkbox"/> No

Flight Itinerary Information

155 Last Departure Point (Multiple entry)	1 <input type="checkbox"/> Same as accident/incident location or A Airport Identifier _____ B City/Place _____ C State _____ D Other _____	157 Destination (Multiple entry)	1 <input type="checkbox"/> Same as accident/incident location or 2 <input type="checkbox"/> Local flight A Airport Identifier _____ B City/Place _____ C State _____ D Other _____	158 Flight Plan Filed (Multiple entry)
156 Time of Departure	A Time _____ C Other _____ B Time Zone _____	1 <input type="checkbox"/> None	2 <input type="checkbox"/> Visual Flight Rules (VFR)	
		3 <input type="checkbox"/> Instrument Flight Rules (IFR)	4 <input type="checkbox"/> VFR/IFR	
		5 <input type="checkbox"/> Company (VFR)	6 <input type="checkbox"/> Military (VFR)	
		A Other		

159 Type of Clearance	1 <input type="checkbox"/> None	6 <input type="checkbox"/> VFR on top	1 <input type="checkbox"/> Uncontrolled	8 <input type="checkbox"/> Stage II TRSA	15 <input type="checkbox"/> Warning area
2 <input type="checkbox"/> VFR	7 <input type="checkbox"/> Cruise	2 <input type="checkbox"/> Controlled	9 <input type="checkbox"/> Stage III TRSA	16 <input type="checkbox"/> FAR 93	(Special air traffic areas)
3 <input type="checkbox"/> Special VFR	8 <input type="checkbox"/> Traffic Advisory	3 <input type="checkbox"/> Airport traffic area	10 <input type="checkbox"/> Prohibited area		
4 <input type="checkbox"/> IFR	9 <input type="checkbox"/> VFR Flight Following	4 <input type="checkbox"/> Control zone	11 <input type="checkbox"/> Restricted area	A Other	
5 <input type="checkbox"/> Special IFR	A Other	5 <input type="checkbox"/> Airport advisory area	12 <input type="checkbox"/> Military Operating Area (MOA)		
		6 <input type="checkbox"/> Positive control area	13 <input type="checkbox"/> Student Jet Training Area		
		7 <input type="checkbox"/> Terminal control area	14 <input type="checkbox"/> Demo Area		

161 Control Area	1 <input type="checkbox"/> None	162 Route	1 <input type="checkbox"/> None	7 <input type="checkbox"/> VR route (military)	163 Last Two Way Communications Established
2 <input type="checkbox"/> Victor airway	2 <input type="checkbox"/> Standard instrument departure	2 <input type="checkbox"/> Standard instrument arrival	8 <input type="checkbox"/> IR route (military)	9 <input type="checkbox"/> SR route (military)	1 <input type="checkbox"/> None
3 <input type="checkbox"/> Jet airway	4 <input type="checkbox"/> RNAV/OMEGA/LCRAN/INS	5 <input type="checkbox"/> Direct	10 <input type="checkbox"/> Refueling route (military)	A Other	2 <input type="checkbox"/> Yes
4 <input type="checkbox"/> Control airway	6 <input type="checkbox"/> Profile Descent				A Facility Identifier
5 <input type="checkbox"/> Colored airway					B Other
A Other					

Aircraft Loading Information

164 Fuel on Board at Takeoff (Multiple entry)	1 <input type="checkbox"/> Estimated	165 Fuel Types (Multiple entry)	1 <input type="checkbox"/> 80/87	5 <input type="checkbox"/> Kerosene	9 <input type="checkbox"/> Mixture
2 <input type="checkbox"/> Verified	A Gallons or B Pounds	2 <input type="checkbox"/> 100 low lead	6 <input type="checkbox"/> JP 3, 4, 5, 6	10 <input type="checkbox"/> Automotive	
C Other		3 <input type="checkbox"/> 100/130	7 <input type="checkbox"/> Jet A	11 <input type="checkbox"/> Anti-icing additive added (if known)	
		4 <input type="checkbox"/> 115/145	8 <input type="checkbox"/> Jet B	A Other	

166 Aircraft Weight at Takeoff (Multiple entry)	1 <input type="checkbox"/> At or below max cert. gross takeoff weight	167 Aircraft CG at Takeoff (Multiple entry)	1 <input type="checkbox"/> Within limits	5 <input type="checkbox"/> Estimated
2 <input type="checkbox"/> Above max certified gross takeoff weight	2 <input type="checkbox"/> Exceeded fwd limit	2 <input type="checkbox"/> Exceeded aft limit	6 <input type="checkbox"/> Verified	A Other
3 <input type="checkbox"/> Estimated	3 <input type="checkbox"/> Exceeded lateral limit			
4 <input type="checkbox"/> Verified	A Other			

168 Aircraft Weight at Accident (Multiple entry)	1 <input type="checkbox"/> Same as takeoff	169 Aircraft CG at Accident (Multiple entry)	1 <input type="checkbox"/> Same as takeoff	6 <input type="checkbox"/> Estimated
2 <input type="checkbox"/> At or below max cert. gross takeoff weight	2 <input type="checkbox"/> Within limits	2 <input type="checkbox"/> Exceeded fwd limit	7 <input type="checkbox"/> Verified	A Other
3 <input type="checkbox"/> Above max certified gross takeoff weight	3 <input type="checkbox"/> Exceeded aft limit	4 <input type="checkbox"/> Exceeded lateral limit		
4 <input type="checkbox"/> Estimated	5 <input type="checkbox"/> Exceeded lateral limit			
5 <input type="checkbox"/> Verified				
A Other				

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Aircraft Loading Information (continued)**170 Load Description (Multiple entry)**

<input type="checkbox"/> None	<input type="checkbox"/> Cargo	<input type="checkbox"/> Towing banner	<input type="checkbox"/> Parachutists	<input type="checkbox"/> Chemical	<input type="checkbox"/> Illegal cargo
<input type="checkbox"/> Passengers	<input type="checkbox"/> Towing glider	<input type="checkbox"/> Other external	<input type="checkbox"/> Water	<input type="checkbox"/> Livestock	<input type="checkbox"/> A Other

Weather Information**180 Source of Weather Briefing (Multiple entry)**

<input type="checkbox"/> No record of briefing (Go to block 183)	<input type="checkbox"/> Company
<input type="checkbox"/> National Weather Service (NWS)	<input type="checkbox"/> Commercial weather service
<input type="checkbox"/> Flight Service Station	<input type="checkbox"/> TV/radio weather
<input type="checkbox"/> PATWAS (Pilot Automated Tel. WX Answering Svc)	<input type="checkbox"/> Military
<input type="checkbox"/> VRS (Voice Response System)	<input type="checkbox"/> A Other

181 Method of Briefing (Multiple entry)

<input type="checkbox"/> In person
<input type="checkbox"/> Teletype
<input type="checkbox"/> Telephone
<input type="checkbox"/> Aircraft radio
<input type="checkbox"/> TV radio
<input type="checkbox"/> A Other

182 Completeness of Weather briefing

<input type="checkbox"/> Weather not pertinent
<input type="checkbox"/> Full
<input type="checkbox"/> Partial—limited by pilot
<input type="checkbox"/> Partial—limited by briefer/forecaster
<input type="checkbox"/> A Other

183 Investigator's Source of Weather Information

<input type="checkbox"/> Pilot (Go to block 185)
<input type="checkbox"/> Witness (Go to block 185)
<input type="checkbox"/> 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

<input type="checkbox"/> Visual Meteorological Conditions (VMC)
<input type="checkbox"/> Instrument Meteorological Conditions (IMC)
<input type="checkbox"/> A Other

185 Conditions of Light

<input type="checkbox"/> Dawn
<input type="checkbox"/> Daylight
<input type="checkbox"/> Night (Dark)
<input type="checkbox"/> Night (Bright)
<input type="checkbox"/> Dusk
<input type="checkbox"/> A Other

187 Sky/Lowest/Cloud Condition

<input type="checkbox"/> Clear
<input type="checkbox"/> Scattered
<input type="checkbox"/> Thin broken
<input type="checkbox"/> Thin overcast
<input type="checkbox"/> Partial obscuration
<input type="checkbox"/> A _____ Feet AGL
<input type="checkbox"/> B Other

188 Lowest Ceiling

<input type="checkbox"/> None
<input type="checkbox"/> Broken
<input type="checkbox"/> Overcast
<input type="checkbox"/> Obscured
<input type="checkbox"/> A _____ Feet AGL
<input type="checkbox"/> B Other

189 Visibility (decimals)

A _____ SM	190 Temperature _____ F
B RVR _____ Feet	A Other
C RVV _____ SM	191 Dew Point _____ F
D Other	A Other

192 Wind (From)

<input type="checkbox"/> Variable
A _____ Magnetic
B Other

193 Wind Speed

<input type="checkbox"/> Calm
<input type="checkbox"/> Light and Variable
A _____ Kts.
B Other

194 Gusts

<input type="checkbox"/> None
A _____ Kts.
B Other

195 Altimeter Setting

A Other	" Hg
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197 Restrictions to Visibility

<input type="checkbox"/> None
<input type="checkbox"/> Haze (H)
<input type="checkbox"/> Dust (D)
<input type="checkbox"/> Smoke (K)
<input type="checkbox"/> Fog (F)
<input type="checkbox"/> Ice fog (If)
<input type="checkbox"/> Ground fog (GF)
<input type="checkbox"/> Blowing spray (BY)
<input type="checkbox"/> Blowing dust (BD)
<input type="checkbox"/> Blowing snow (BS)
<input type="checkbox"/> Blowing sand (BN)
<input type="checkbox"/> A Other

198 Type of Precipitation

<input type="checkbox"/> None (Go to block 200)	<input type="checkbox"/> 10 Snow pellets (SP)
<input type="checkbox"/> Rain (R)	<input type="checkbox"/> 11 Snow grains (SG)
<input type="checkbox"/> Snow (S)	<input type="checkbox"/> 12 Freezing drizzle (ZL)
<input type="checkbox"/> Hail (A)	<input type="checkbox"/> 13 Ice crystals (IC)
<input type="checkbox"/> Rain showers (RW)	<input type="checkbox"/> 14 Ice pellet shower (IPW)
<input type="checkbox"/> Freezing rain (ZR)	<input type="checkbox"/> A Other
<input type="checkbox"/> Snow shower (SW)	
<input type="checkbox"/> Drizzle (L)	
<input type="checkbox"/> Ice pellets (IP)	

199 Intensity of Precipitation

<input type="checkbox"/> 1 Light
<input type="checkbox"/> 2 Moderate
<input type="checkbox"/> 3 Heavy
<input type="checkbox"/> A Other

FACTUAL REPORT AVIATION

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					

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 Detect Report Submitted	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No
236 Bogus Part	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No