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IONAL TRANSPORTATION SAFETY BOARD

ANNUAL REVIEW OF AIRCRAFT ACCIDENT DATA

U.S. GENERAL AVIATION
CALENDAR YEAR 1989

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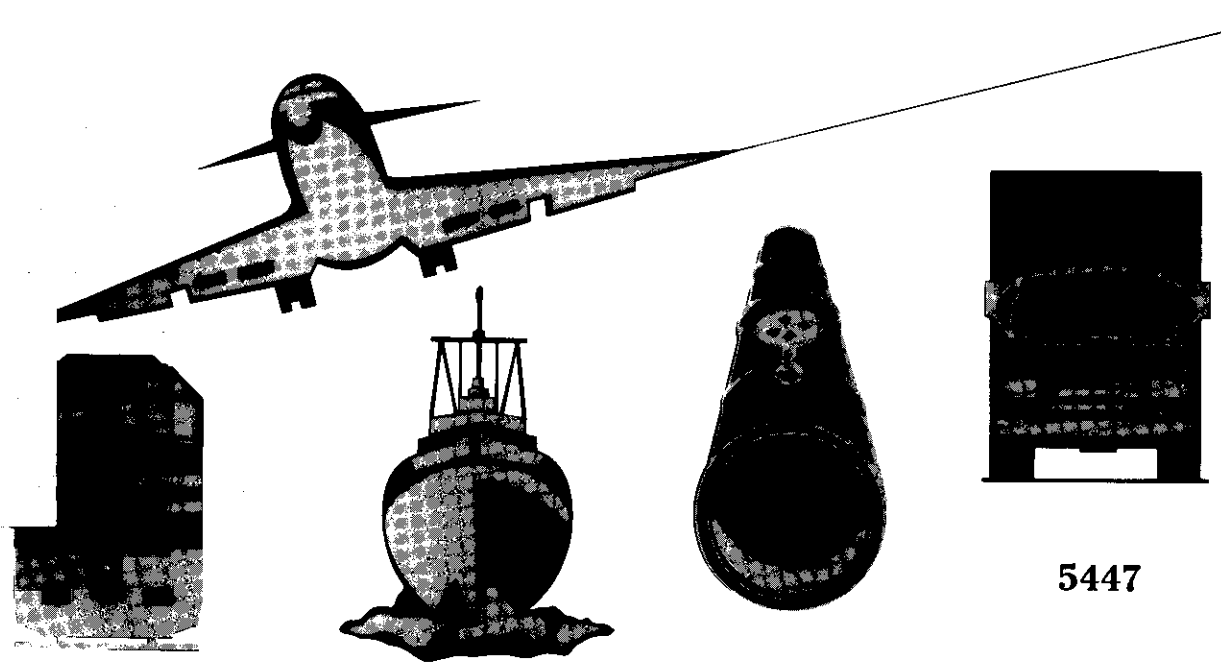

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16. Abstract

This report presents a statistical compilation and review of general aviation accidents which occurred in 1989 in the United States, its territories and possessions, and in international waters. The accidents reported are all those involving U.S. registered aircraft not conducting operations under 14 CFR 121, 14 CFR 125, 14 CFR 127, or 14 CFR 135.

This report is divided into five sections: All Accidents; Fatal Accidents; Serious Injury Accidents; Property Damage Accidents and Midair Collision Accidents. Several tables present accident parameters for 1989 accidents only, and each section includes tabulations which present comparative statistics for 1989 and for the five-year period 1984-1988.

17. Key Words	18. Distribution Statement
General Aviation, Accident, Accident Rates, Rotorcraft, Glider, Personal, Business, Corporate/Executive, Aerial Application, Instructional	

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UNCLASSIFIED	UNCLASSIFIED	86	

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INTRODUCTION

In 1989, a total of 2,242 U.S. registered general aviation aircraft were involved in 2,214 accidents in the United States and its territories.[1] This report presents a statistical compilation and review of those accidents, all involving U.S. registered aircraft not conducting air carrier revenue operations under 14 CFR 121, 14 CFR 125, 14 CFR 127, or 14 CFR 135.

The total number of accidents in 1989 decreased 6.3 percent from 1988. The number of fatal accidents decreased by 6.0 percent from the 1988 total, with a 3.1 percent decrease in the number of fatalities in 1989. The 1989 total accident rate decreased 8.3 percent from the 1988 rate with a decrease of 8.5 percent in the fatal accident rate.

The lowest accident rates (total and fatal) among aircraft types were recorded for turbojet airplanes (0.63 total accidents and 0.14 fatal accidents per 100,000 hours flown). The highest total accident rate was for reciprocating engine powered rotorcraft (16.46 accidents per 100,000 hours flown). Reciprocating engine powered rotorcraft also had the highest fatal rotorcraft accident rate (1.92 fatal accidents per 100,000 hours flown).

Safety Board reports also specify the purpose of the accident flight. The highest accident rates recorded (total and fatal) were for personal/business purposes. During 1989, 68.0 percent of aircraft involved in general aviation accidents and 73.6 percent of aircraft involved in fatal accidents were operating in the personal/business category.

In 1989, 37 percent of the total accidents occurred during the approach or landing. Eighteen percent of fatal accidents occurred during these phases of flight. Takeoff accidents accounted for 21 percent of the year's total and 16 percent of the fatal accidents.

The pilot was cited as causing or contributing to the cause of 90 percent of the fatal general aviation accidents in 1989, while weather conditions were a factor in approximately 34 percent of fatal accidents. The incidence of pilot error and weather was somewhat lower among total accidents - 82 percent and 27 percent respectively. Note that multiple causes and related

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[1] Since a collision between aircraft is counted as one accident for the purposes of this report, and since there were 17 accidents in which two general aviation aircraft collided in the air and 11 on the ground, the number of accidents in 1989 was 2,214.

factors may be cited in any given accident. This fact should be taken into account in any interpretation of the tabulations involving accident causes/factors.

Accident data upon which this review is based have been extracted from the Safety Board's automated Aviation Accident System. Flight hours used for computing accident rates were estimated using data provided by the Federal Aviation Administration.

The review is divided into five sections. The first section presents a wide range of information on all general aviation accidents, including historical comparison data for similar types of aircraft, and aircraft being operated for particular purposes. The four remaining sections contain information on fatal accidents, serious injury accidents, property damage accidents and midair collision accidents, respectively. Tables that list occurrences or phase of operation are based on the first in the accident sequence. Appendix A provides an explanation of terms used in this report. Appendix B contains a tabulation of cause and factor assignments for all 1989 accidents. Appendix C is a copy of NTSB Form 6120.4 (Factual Aviation Accident/Incident Report Form), the source of data upon which this review is based.

During the final stage of report production two events occurred which effect the number of accidents and flight hours: 1) NTSB and FAA agreed to report all U.S. registered aircraft accidents regardless of where they occurred (formerly NTSB excluded accidents on foreign soil); and 2) FAA revised its flight hour estimates from those previously published. These revised statistics were published by the Safey Board in a January 15, 1993 press release. This Annual Review, however, does not reflect the revised accident and flight hour data. The reader may refer to Appendix D, which contains revised data, and compare it with Table 3.

Table 1 - SUMMARY OF LOSSES
ALL OPERATIONS
1985 - 1989

	1985	1986	1987	1988	1989
Accidents					
Fatal	497	473	437	451	424
Involved Serious Injury	306	317	290	294	243
Involved Minor Injury	411	403	357	389	363
Involved No Injury	1523	1385	1392	1229	1184
Total	2737	2578	2476	2363	2214
Fatalities					
Passenger	431	395	343	308	309
Crew	507	481	456	468	448
Other Persons	13	89	15	8	3
Total	951	965	814	784	760
Aircraft Damage*					
Destroyed	796	745	678	670	605
Substantial	1936	1831	1791	1693	1610
Minor	17	17	22	17	14
None	18	18	12	12	13
Total	2767	2611	2503	2392	2242

* Number of General Aviation Aircraft

Table 2 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES ABOARD, AND RATES
BY TYPE OF AIRCRAFT AND BY KIND OF FLYING
ALL OPERATIONS
1989

Type of Aircraft	Accidents	Fatal Accidents	Fatalities Aboard	Accident Rate Per 100,000 Aircraft Hours Flown	
				Total	Fatal
Fixed Wing	1984	390	707	7.07	1.38
Single Recip. Engine	1805	335	581	8.37	1.54
Multiple Recip. Engine	140	41	89	4.25	1.25
Turboprop	33	14	33	1.86	0.79
Turbojet	9	2	4	0.63	0.14
Rotorcraft	185	30	41	10.19	1.65
Recip. Engine(s)	120	14	17	16.46	1.92
Turbine Powered	65	16	24	5.43	1.34
Gliders	23	1	1	N/A	N/A
Balloons	21	3	6	N/A	N/A
Kind of Flying					
Personal	1359	271	498	9.99*	2.05*
Business	146	42	85		
Corporate/Executive	11	4	15	0.29	0.11
Aerial Application	158	24	24	7.81	1.19
Instructional	306	28	43	4.71	0.43
All Aircraft	2214	424	757	7.31	1.39

* The accident rate per 100,000 flying hours is presented for the combination of personal flying and business flying and not for each category separately. The NTSB has previously stated its objections to presenting separate rates until exposure data are available which depict a more credible division of flying hours between the two categories.

Table 3 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
ALL OPERATIONS
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
			Total	Aboard Aircraft In This Category		Total	Fatal
1980	3590	618	1239	1230	36,402,000	9.86	1.69
1981	3500	654	1282	1261	36,803,000	9.51	1.78
1982	3233	591	1187	1171	32,095,000	10.06	1.84
1983	3075	555	1064	1057	31,048,000	9.90	1.79
1984	3011	543	1039	1018	31,510,000	9.55	1.72
1985	2737	497	951	940	30,590,000	8.94	1.62
1986	2578	473	965	876	29,317,000	8.79	1.61
1987	2476	437	814	799	29,208,000	8.47	1.49
1988	2363	451	784	776	29,634,000	7.97	1.52
1989	2214	424	760	757	30,237,000	7.31	1.39

* Suicide and sabotage accidents excluded from rates as follows :
Total - 1980 (1), 1982 (3), 1983 (1), 1984 (3), 1985 (3), 1987 (1), 1988 (1), 1989 (5)
Fatal - 1980 (1), 1984 (2), 1985 (2), 1987 (1), 1989 (4)

Figure 1 - ACCIDENTS PER 100,000 HOURS FLOWN
ALL OPERATIONS

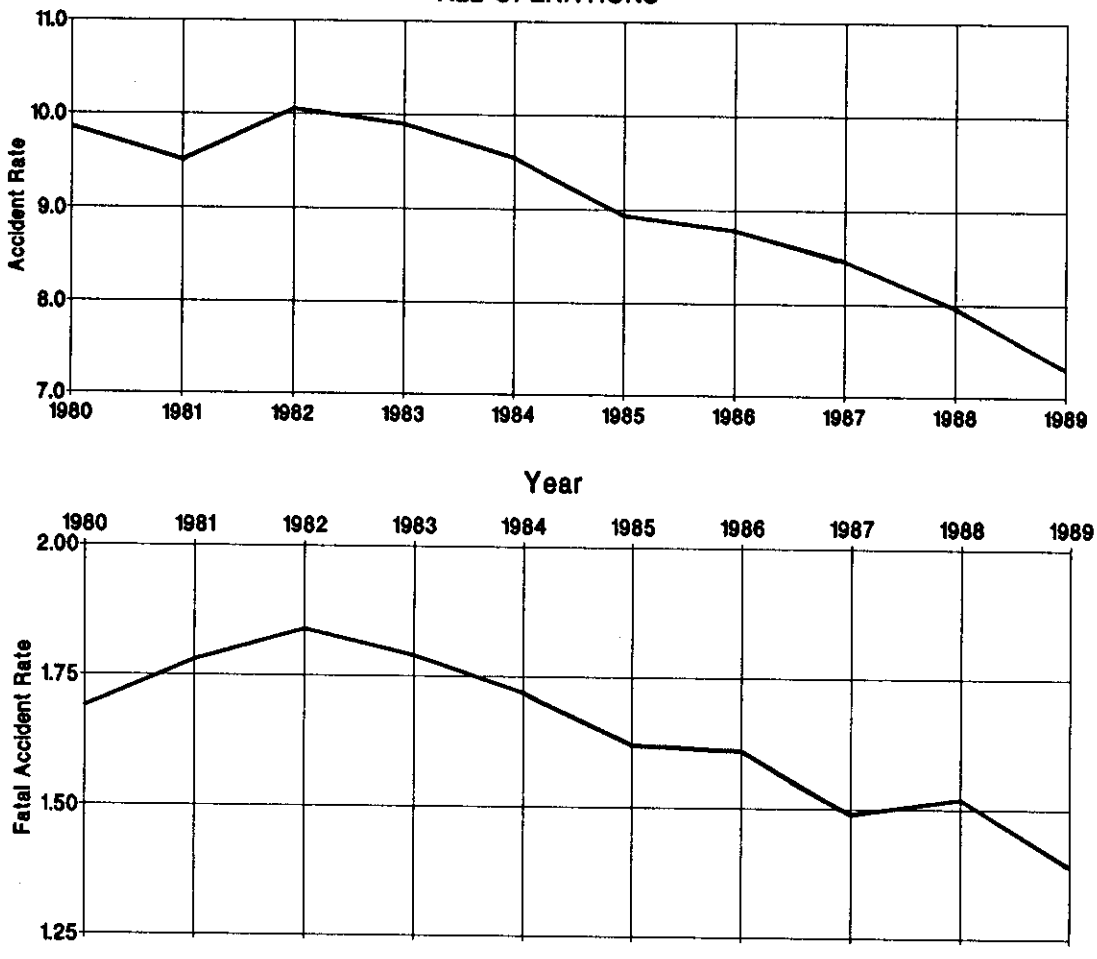


Table 4 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
ALL FIXED WING AIRCRAFT
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
			Total	Aboard Aircraft In This Category		Total	Fatal
1980	3233	569	1168	1162	34,145,000	9.47	1.66
1981	3161	610	1208	1190	34,113,000	9.27	1.79
1982	2885	539	1105	1094	30,077,000	9.59	1.79
1983	2729	503	990	985	28,917,000	9.43	1.74
1984	2695	496	969	950	29,555,000	9.11	1.67
1985	2466	454	892	883	28,471,000	8.65	1.59
1986	2299	426	901	805	27,234,000	8.44	1.56
1987	2232	403	765	749	27,404,000	8.14	1.47
1988	2108	418	744	736	27,067,000	7.78	1.54
1989	1984	390	711	707	28,000,000	7.07	1.38

* Suicide and sabotage accidents excluded from rates as follows :
Total - 1980 (1), 1982 (2), 1983 (1), 1984 (3), 1985 (3), 1987 (1), 1988 (1), 1989 (5)
Fatal - 1980 (1), 1984 (2), 1985 (2), 1987 (1), 1989 (4)

Figure 2 - ACCIDENTS PER 100,000 HOURS FLOWN
ALL FIXED WING AIRCRAFT

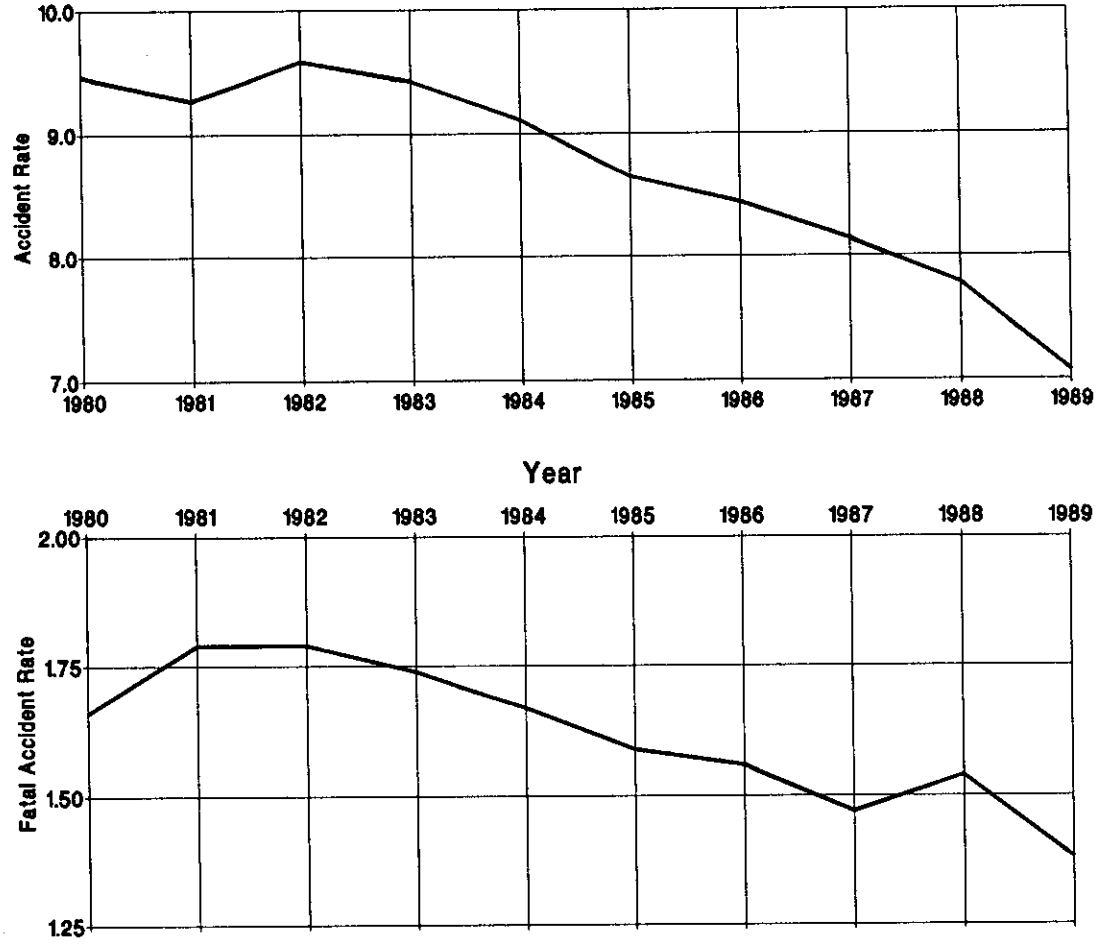


Table 5 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
FIXED WING AIRCRAFT - SINGLE RECIPROCATING ENGINE
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
			Total	Aboard Aircraft In This Category		Total	Fatal
1980	2854	459	876	864	26,876,000	10.62	1.70
1981	2819	496	918	906	26,347,000	10.70	1.88
1982	2547	455	862	846	23,165,000	10.99	1.96
1983	2439	419	779	771	22,152,000	11.01	1.89
1984	2381	405	765	748	22,710,000	10.47	1.77
1985	2178	367	672	662	21,926,000	9.92	1.67
1986	2067	358	713	623	20,935,000	9.87	1.71
1987	2010	345	621	603	21,262,000	9.45	1.62
1988	1931	343	594	589	21,169,000	9.12	1.62
1989	1805	335	587	581	21,514,000	8.37	1.54

* Suicide and sabotage accidents excluded from rates as follows :
Total - 1980 (1), 1982 (1), 1983 (1), 1984 (3), 1985 (2), 1987 (1), 1988 (1), 1989 (4)
Fatal - 1980 (1), 1984 (2), 1985 (1), 1987 (1), 1989 (4)

Figure 3 - ACCIDENTS PER 100,000 HOURS FLOWN
FIXED WING AIRCRAFT - SINGLE RECIPROCATING ENGINE

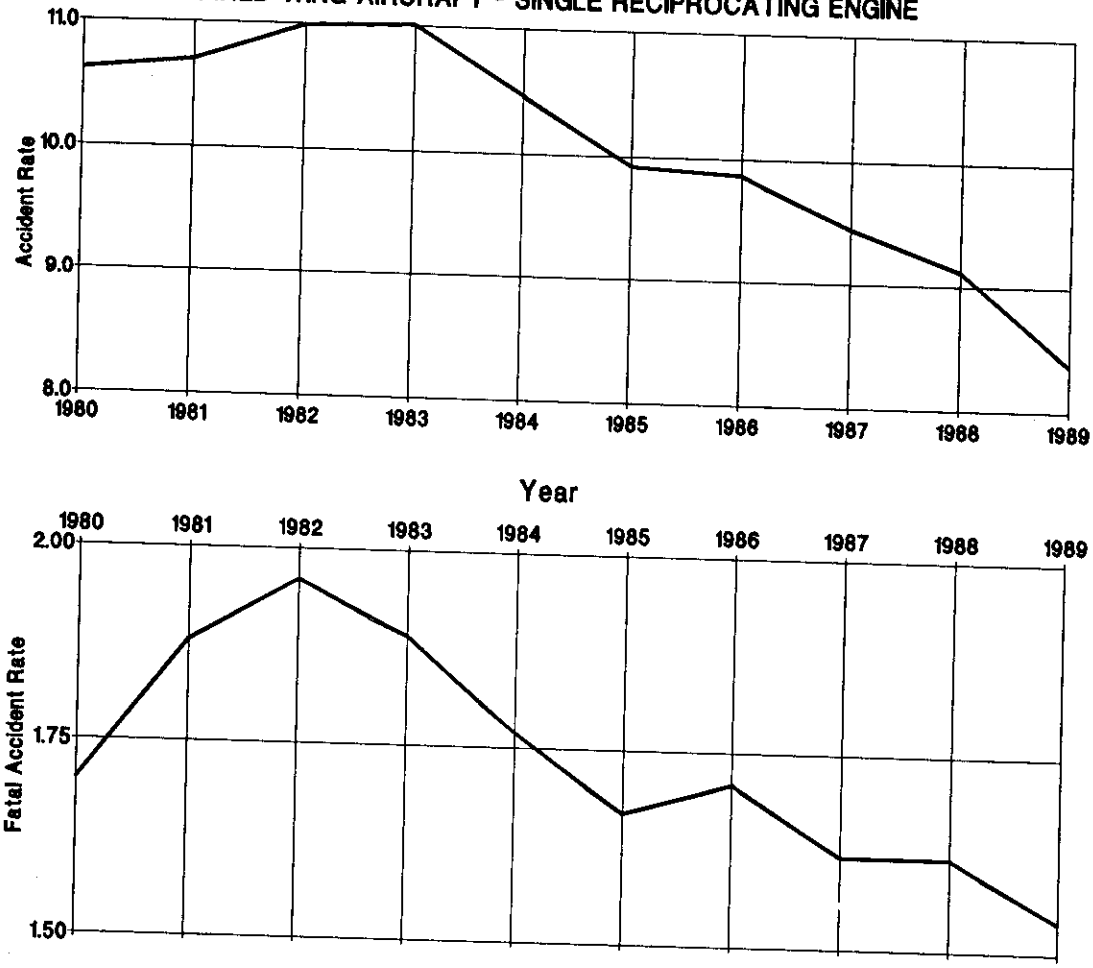
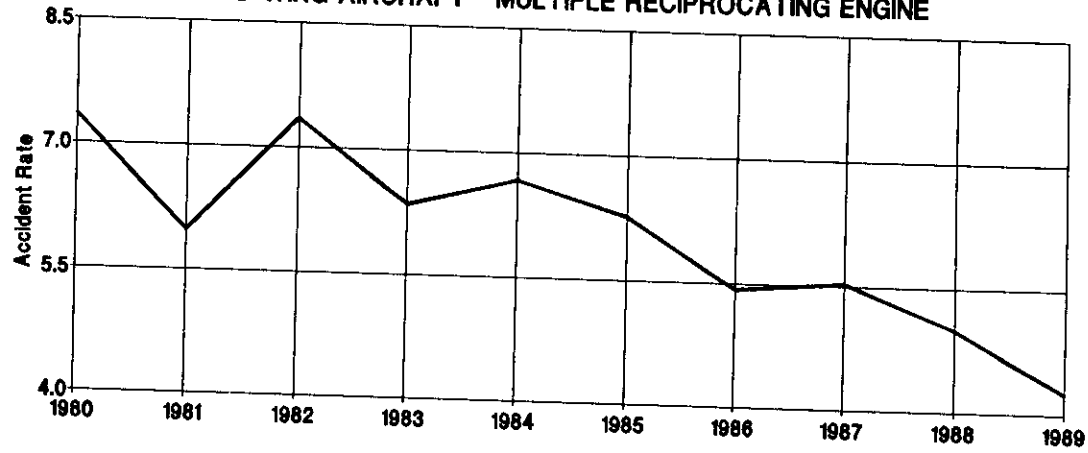


Table 6 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
FIXED WING AIRCRAFT - MULTIPLE RECIPROCATING ENGINE
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
			Total	Aboard Aircraft In This Category		Total	Fatal
1980	330	99	262	256	4,491,000	7.35	2.20
1981	289	94	220	218	4,833,000	5.98	1.94
1982	297	78	212	208	4,026,000	7.35	1.94
1983	243	74	193	188	3,828,000	6.35	1.93
1984	257	74	166	164	3,853,000	6.67	1.92
1985	229	68	164	160	3,639,000	6.27	1.84
1986	190	54	122	121	3,498,000	5.43	1.54
1987	187	46	115	109	3,383,000	5.53	1.36
1988	150	62	123	118	3,001,000	5.00	2.07
1989	140	41	90	89	3,273,000	4.25	1.25

* Suicide and sabotage accidents excluded from rates as follows :
Total - 1982 (1), 1985 (1), 1989 (1)
Fatal - 1985 (1)

Figure 4 - ACCIDENTS PER 100,000 HOURS FLOWN
FIXED WING AIRCRAFT - MULTIPLE RECIPROCATING ENGINE



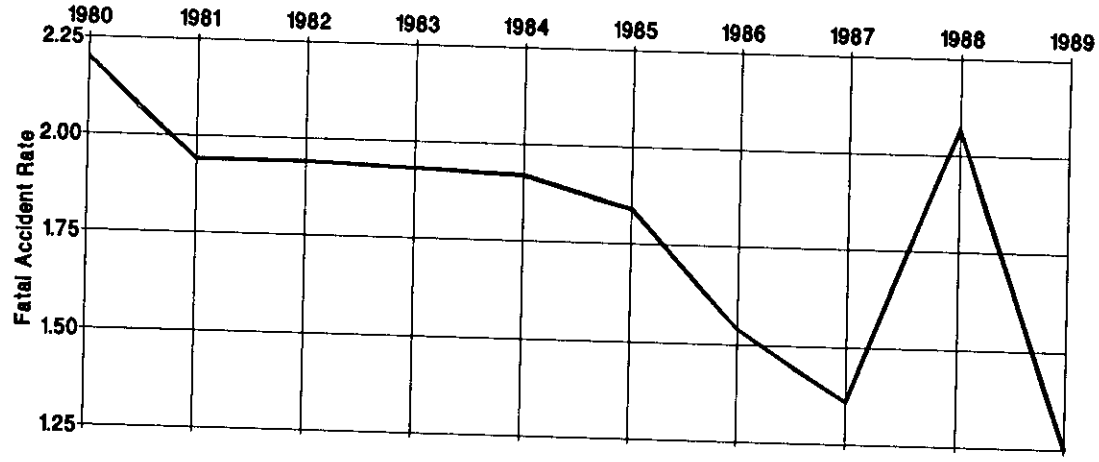


Table 7 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
FIXED WING AIRCRAFT - TURBOPROP
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
			Total	Aboard Aircraft In This Category		Total	Fatal
1980	41	11	38	35	1,524,000	2.69	0.72
1981	49	17	61	48	1,606,000	3.05	1.06
1982	38	9	37	33	1,515,000	2.51	0.59
1983	33	10	20	19	1,460,000	2.26	0.68
1984	46	12	23	23	1,689,000	2.72	0.71
1985	46	17	55	51	1,418,000	3.24	1.20
1986	31	12	57	51	1,345,000	2.30	0.89
1987	31	9	26	25	1,407,000	2.20	0.64
1988	24	10	19	19	1,416,000	1.69	0.71
1989	33	14	36	33	1,774,000	1.86	0.79

Figure 5 - ACCIDENTS PER 100,000 HOURS FLOWN
FIXED WING AIRCRAFT - TURBOPROP

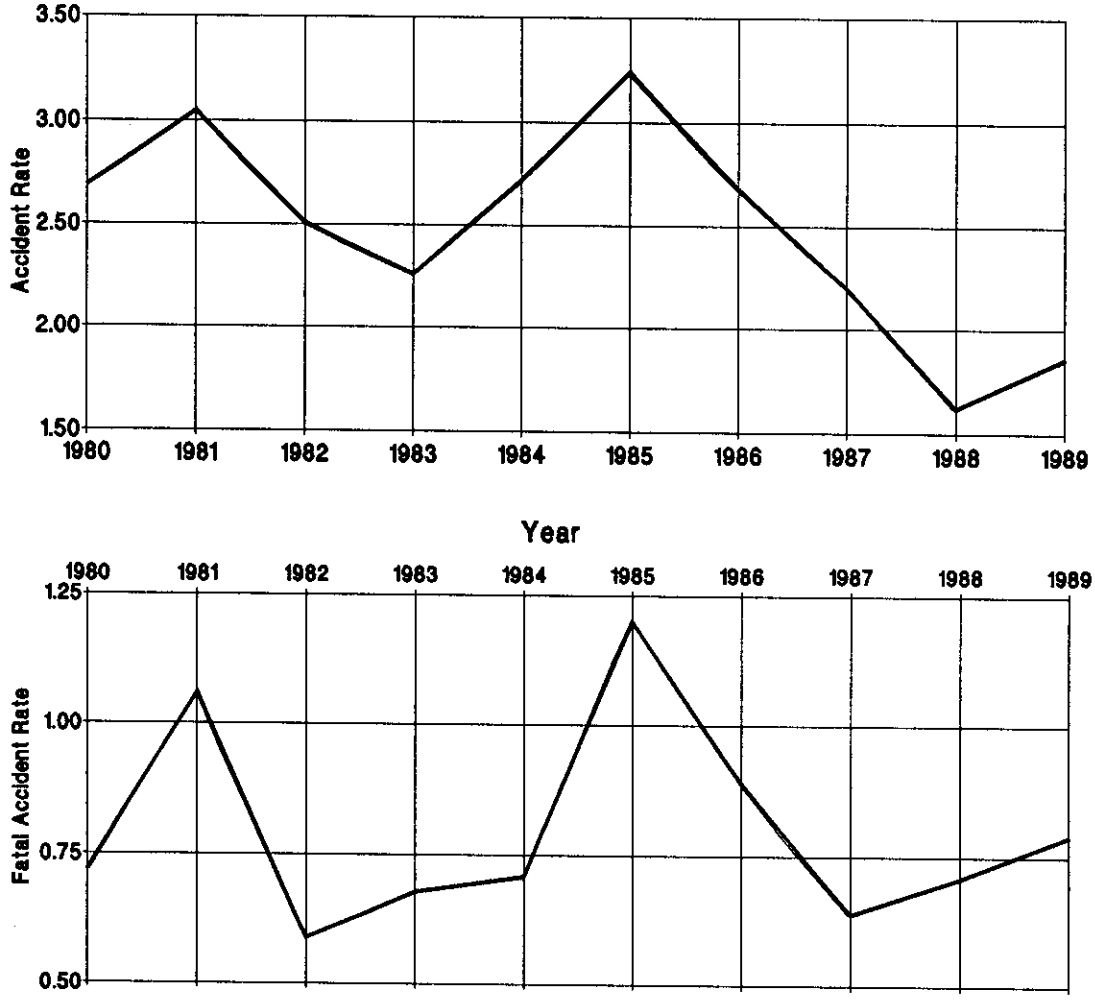


Table 8 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
FIXED WING AIRCRAFT - TURBOJET
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
			Total	Aboard Aircraft In This Category		Total	Fatal
1980	12	3	7	7	1,244,000	0.96	0.24
1981	7	4	17	17	1,318,000	0.53	0.30
1982	10	2	7	7	1,349,000	0.74	0.15
1983	14	4	15	6	1,452,000	0.96	0.28
1984	14	5	15	15	1,303,000	1.07	0.38
1985	16	5	15	10	1,488,000	1.08	0.34
1986	13	3	10	10	1,456,000	0.89	0.21
1987	10	6	12	12	1,352,000	0.74	0.44
1988	7	4	10	10	1,481,000	0.47	0.27
1989	9	2	4	4	1,429,000	0.63	0.14

Figure 6 - ACCIDENTS PER 100,000 HOURS FLOWN
FIXED WING AIRCRAFT - TURBOJET

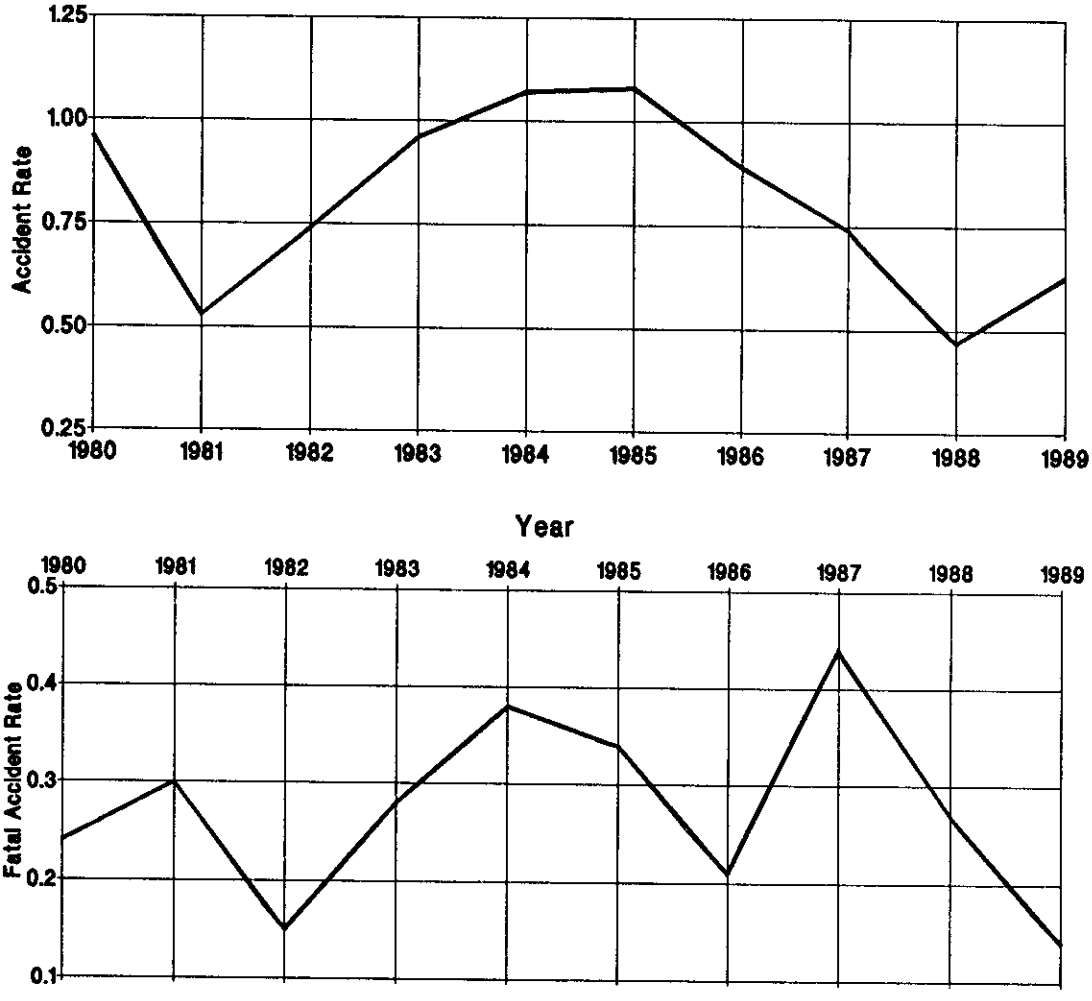
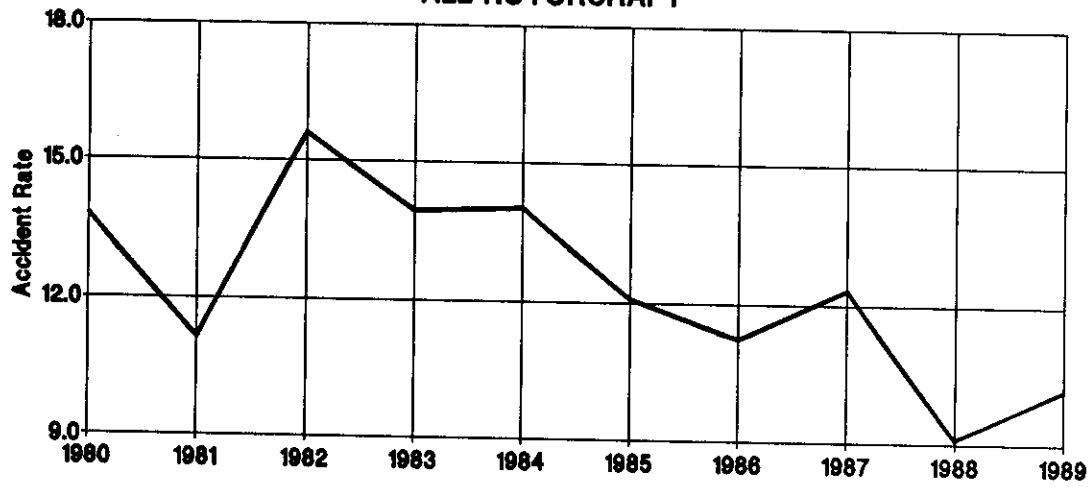


Table 9 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
ALL ROTORCRAFT
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
			Total	Aboard Aircraft In This Category		Total	Fatal
1980	261	40	60	57	1,891,000	13.80	2.12
1981	257	30	55	52	2,303,000	11.16	1.30
1982	255	41	66	62	1,628,000	15.60	2.52
1983	238	37	58	56	1,709,000	13.93	2.17
1984	224	38	61	59	1,599,000	14.01	2.38
1985	206	36	50	47	1,706,000	12.08	2.11
1986	190	39	81	59	1,689,000	11.25	2.31
1987	178	27	42	42	1,388,000	12.82	1.95
1988	178	21	27	27	1,953,000	9.11	1.08
1989	185	30	44	41	1,815,000	10.19	1.65

* Suicide and sabotage accidents excluded from rates as follows :
Total - 1982 (1)
Fatal - None

Figure 7 - ACCIDENTS PER 100,000 HOURS FLOWN ALL ROTORCRAFT



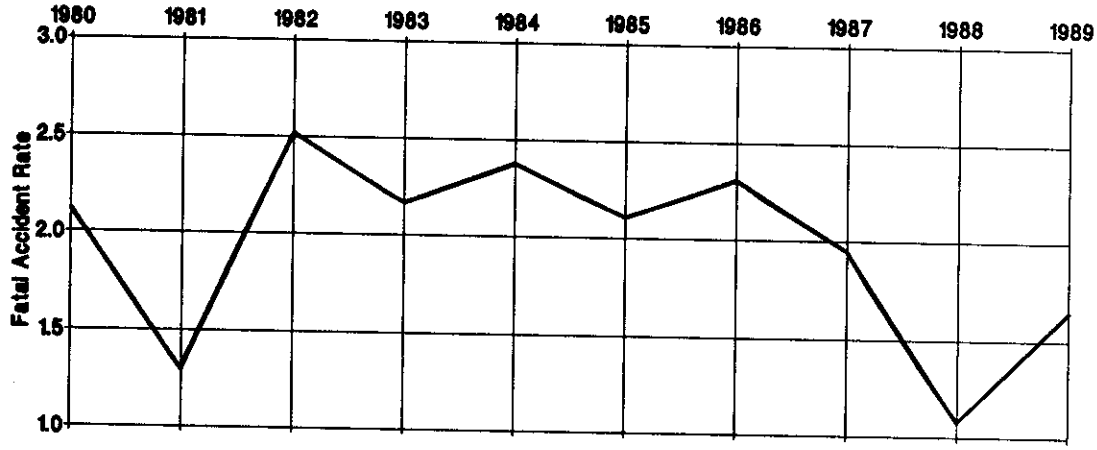


Table 10 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
ROTORCRAFT - RECIPROCATING ENGINE(S)
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
			Total	Aboard Aircraft In This Category		Total	Fatal
1980	181	22	25	24	719,000	25.17	3.06
1981	178	21	32	29	878,000	20.27	2.39
1982	157	20	24	24	570,000	27.37	3.51
1983	143	20	25	25	566,000	25.27	3.53
1984	128	22	29	28	578,000	22.15	3.81
1985	119	12	14	13	557,000	21.36	2.15
1986	118	21	24	22	789,000	14.96	2.66
1987	117	18	25	25	646,000	18.11	2.79
1988	117	17	21	21	569,000	20.56	2.99
1989	120	14	18	17	729,000	16.46	1.92

* Suicide and sabotage accidents excluded from rates as follows :
Total - 1982 (1)
Fatal - None

Figure 8 - ACCIDENTS PER 100,000 HOURS FLOWN
ROTORCRAFT - RECIPROCATING ENGINE(S)

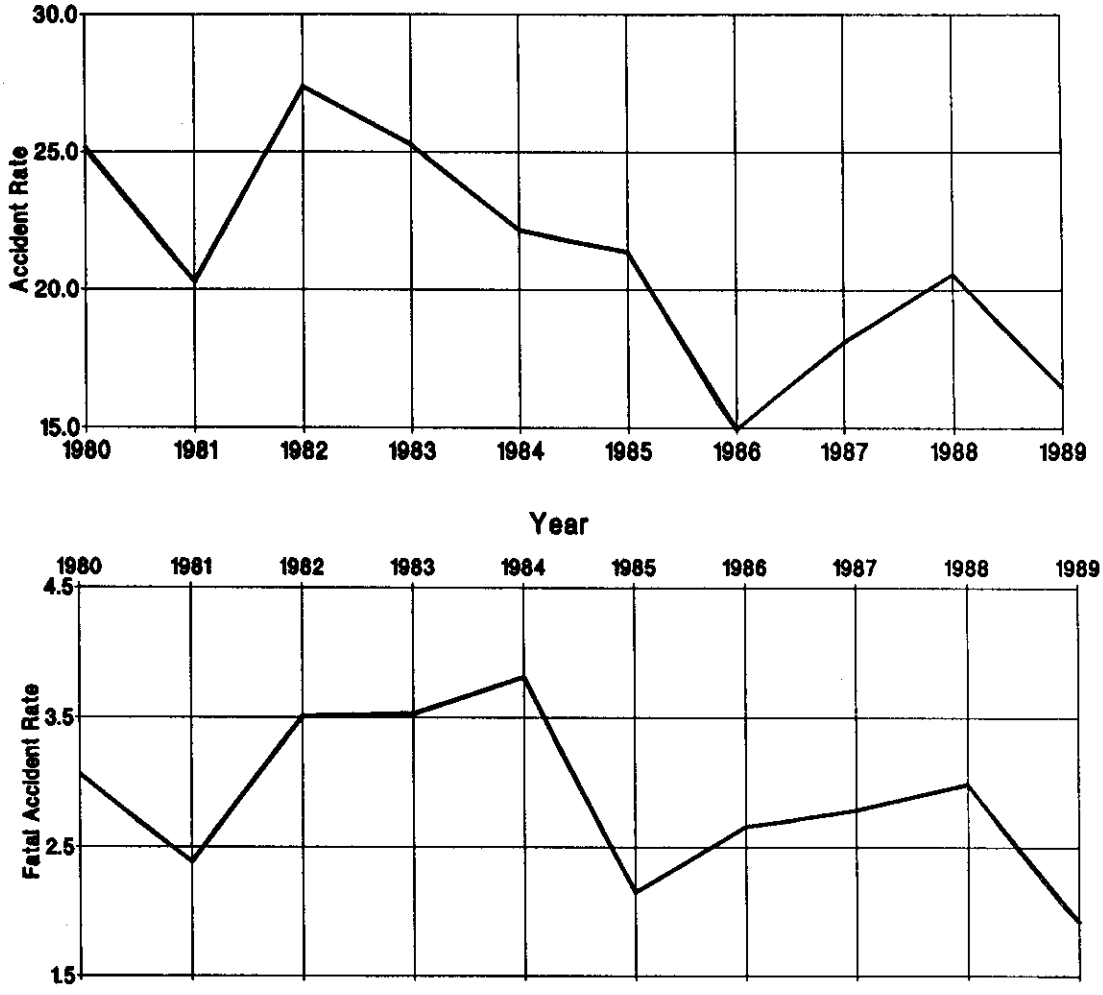


Table 11 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
ROTORCRAFT - TURBINE POWERED
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
			Total	Aboard Aircraft In This Category		Total	Fatal
1980	80	18	35	33	1,172,000	6.83	1.54
1981	79	9	23	23	1,424,000	5.55	0.63
1982	98	21	42	38	1,061,000	9.24	1.98
1983	95	17	33	31	1,143,000	8.31	1.49
1984	96	16	32	31	1,021,000	9.40	1.57
1985	87	24	36	34	1,149,000	7.57	2.09
1986	72	18	57	37	900,000	8.00	2.00
1987	61	9	17	17	741,000	8.23	1.21
1988	61	4	6	6	1,384,000	4.41	0.29
1989	65	16	26	24	1,197,000	5.43	1.34

Figure 9 - ACCIDENTS PER 100,000 HOURS FLOWN
ROTORCRAFT - TURBINE POWERED

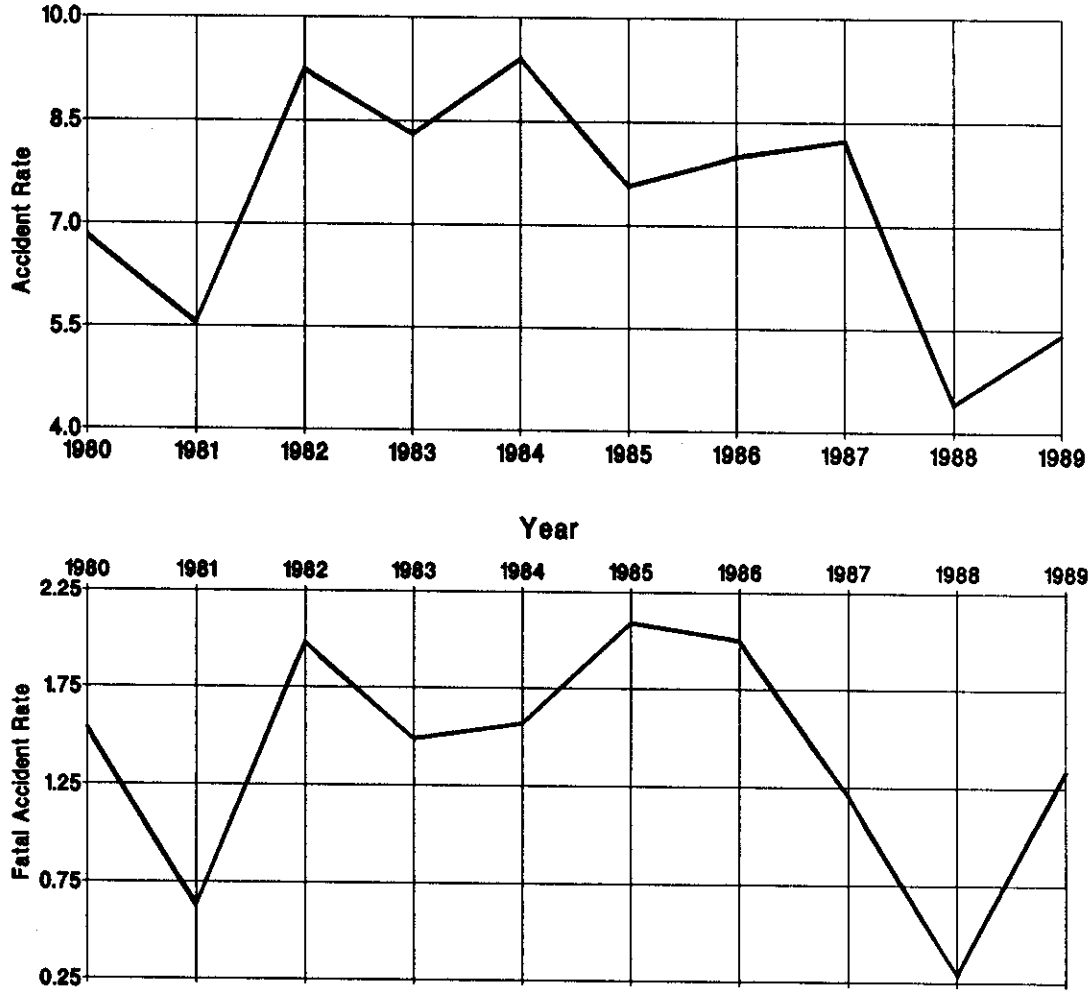


Table 12 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
PERSONAL AND BUSINESS FLYING COMBINED
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
			Total	Aboard Aircraft In This Category		Total	Fatal
1980	2285	450	924	915	19,374,000	11.79	2.32
1981	2220	456	892	883	18,323,000	12.12	2.49
1982	2194	471	979	965	16,584,000	13.23	2.84
1983	2157	450	891	886	15,676,000	13.76	2.87
1984	2153	440	867	862	16,537,000	13.00	2.65
1985	1999	388	754	743	16,302,000	12.25	2.37
1986	1832	386	819	720	15,993,000	11.46	2.41
1987	1761	346	656	652	16,500,000	10.67	2.09
1988	1663	368	662	654	15,773,000	10.54	2.33
1989	1504	312	592	583	15,017,000	9.99	2.05

* Suicide and sabotage accidents excluded from rates as follows :
Total - 1980 (1), 1984 (3), 1985 (2), 1987 (1), 1989 (4)
Fatal - 1980 (1), 1984 (2), 1985 (1), 1987 (1), 1989 (4)

Figure 10 - ACCIDENTS PER 100,000 HOURS FLOWN
PERSONAL AND BUSINESS FLYING COMBINED

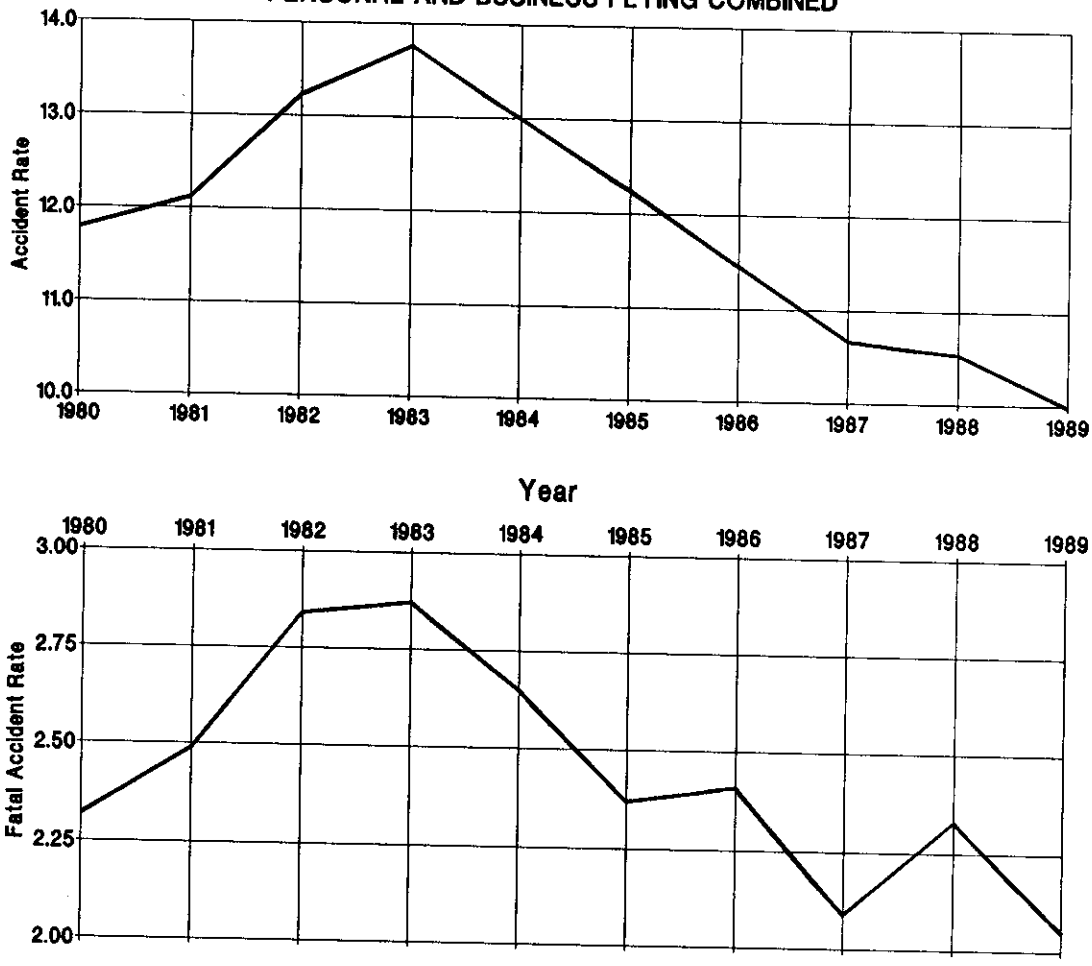


Table 13 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
CORPORATE/EXECUTIVE FLYING
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
			Total	Aboard Aircraft In This Category		Total	Fatal
1980	96	21	66	63	5,351,000	1.79	0.39
1981	84	30	99	99	6,209,000	1.35	0.48
1982	39	6	21	20	4,998,000	0.78	0.12
1983	39	6	23	23	5,253,000	0.74	0.11
1984	25	4	8	8	4,788,000	0.52	0.08
1985	37	13	37	32	4,189,000	0.88	0.31
1986	20	3	11	11	3,781,000	0.53	0.08
1987	19	4	10	7	3,403,000	0.56	0.12
1988	10	2	3	3	3,748,000	0.27	0.05
1989	11	4	15	15	3,739,000	0.29	0.11

Figure 11 - ACCIDENTS PER 100,000 HOURS FLOWN CORPORATE/EXECUTIVE FLYING

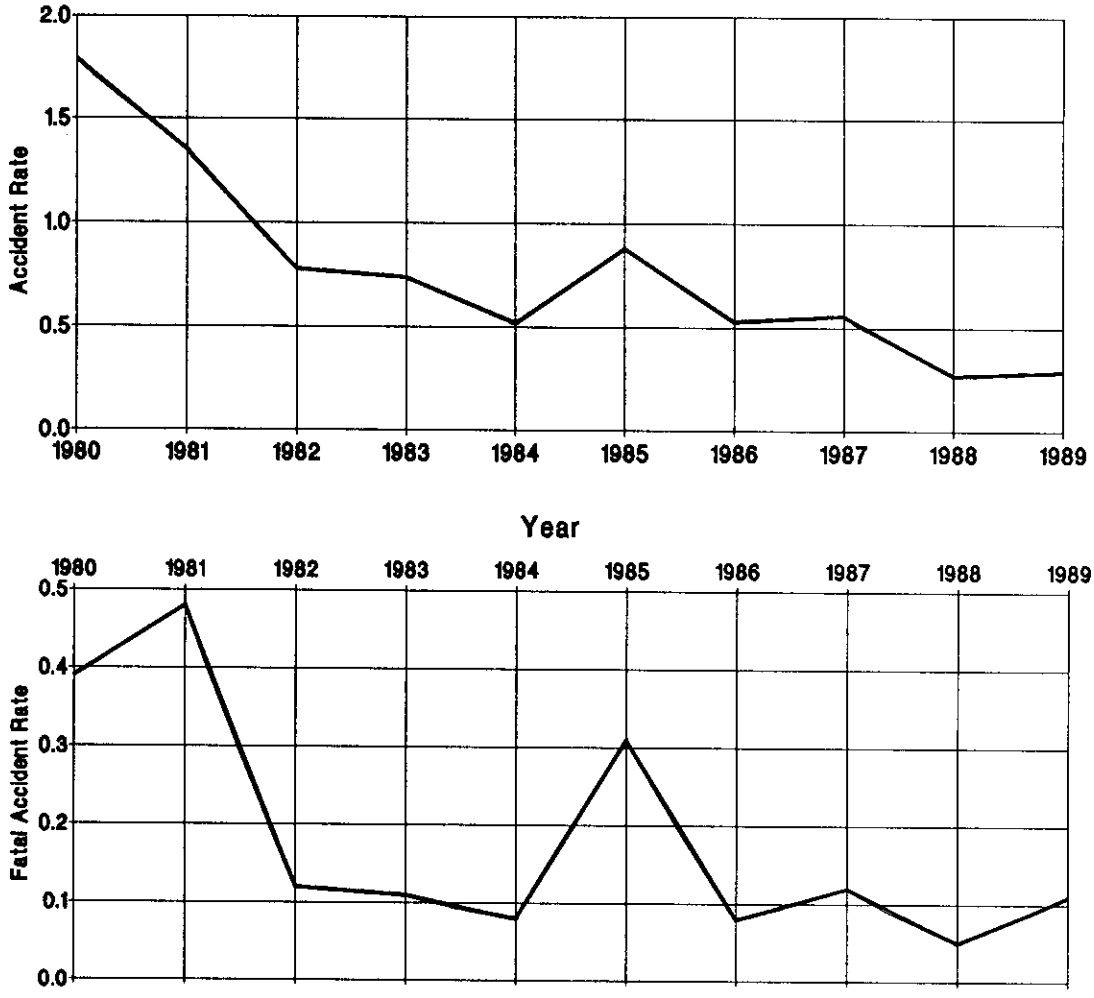
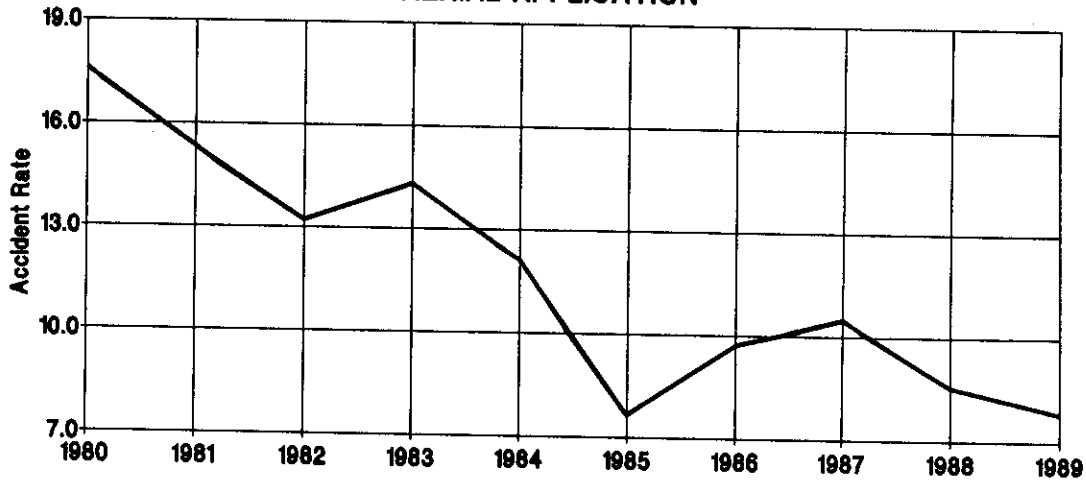


Table 14 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
AERIAL APPLICATION FLYING
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
			Total	Aboard Aircraft In This Category		Total	Fatal
1980	363	25	32	28	2,063,000	17.60	1.21
1981	378	30	36	34	2,466,000	15.33	1.22
1982	272	17	18	15	2,058,000	13.22	0.83
1983	254	15	15	15	1,774,000	14.32	0.85
1984	245	20	21	20	2,022,000	12.12	0.99
1985	167	9	9	9	2,181,000	7.66	0.41
1986	193	19	22	20	1,985,000	9.72	0.96
1987	175	11	11	10	1,666,000	10.50	0.66
1988	170	12	13	13	1,989,000	8.55	0.60
1989	158	24	25	24	2,023,000	7.81	1.19

Figure 12 - ACCIDENTS PER 100,000 HOURS FLOWN
AERIAL APPLICATION



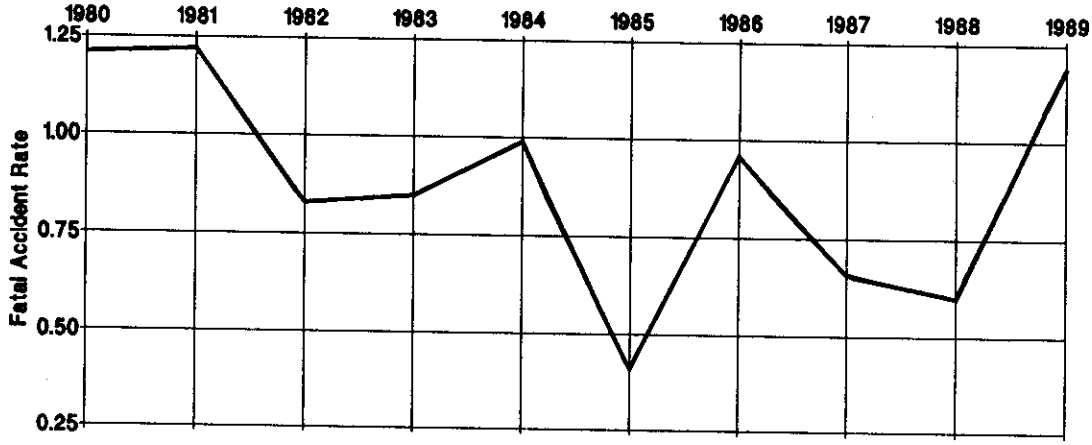


Table 15 - ACCIDENTS, FATAL ACCIDENTS, FATALITIES, AND RATES
INSTRUCTIONAL FLYING
1980 - 1989

Year	Accidents	Fatal Accidents	Fatalities		Hours Flown	Accident Rate per 100,000* Aircraft Hours Flown	
			Total	Aboard Aircraft In This Category		Total	Fatal
1980	461	41	73	70	7,315,000	6.30	0.56
1981	428	40	70	63	7,104,000	6.02	0.56
1982	411	22	38	36	4,939,000	8.30	0.45
1983	379	26	41	40	5,820,000	6.51	0.45
1984	353	25	54	37	5,694,000	6.20	0.44
1985	314	27	52	40	5,322,000	5.90	0.51
1986	315	23	41	37	4,677,000	6.74	0.49
1987	340	31	68	57	4,904,000	6.93	0.63
1988	335	31	48	46	5,309,000	6.29	0.58
1989	306	28	50	43	6,500,000	4.71	0.43

* Suicide and sabotage accidents excluded from rates as follows :
Total - 1982 (1), 1988 (1)
Fatal - None

Figure 13 - ACCIDENTS PER 100,000 HOURS FLOWN INSTRUCTIONAL

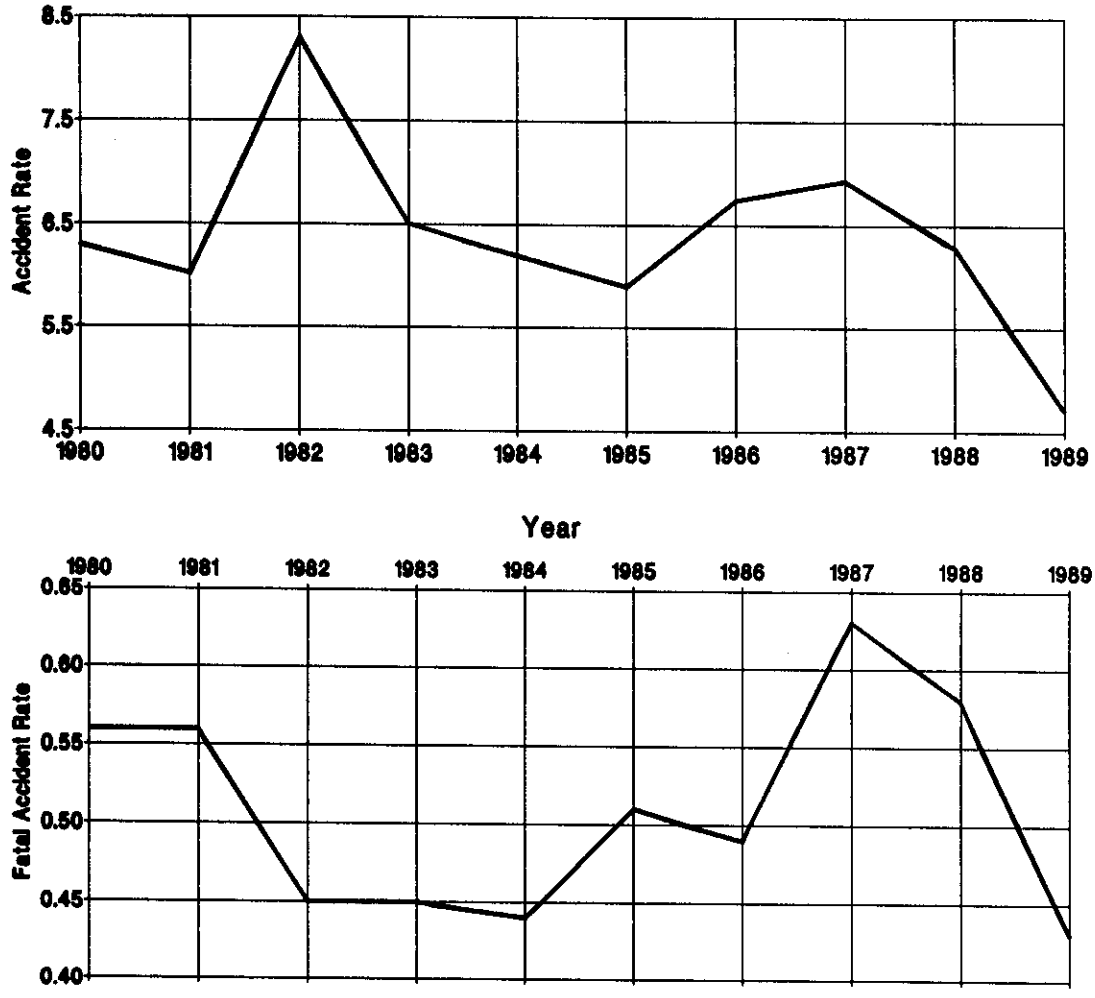


Table 16 - ACCIDENTS, FATAL ACCIDENTS AND FATALITIES
GLIDERS
1980 - 1989

Year	Accidents*	Fatal Accidents*	Fatalities	
			Total	Aboard Aircraft In This Category
1980	62	7	7	7
1981	59	12	13	13
1982	51	6	6	5
1983	71	11	11	11
1984	55	10	10	9
1985	43	5	6	6
1986	68	9	10	10
1987	36	4	4	4
1988	44	12	13	13
1989	23	1	1	1

Table 17 - ACCIDENTS, FATAL ACCIDENTS AND FATALITIES
BALLOONS
1980 - 1989

Year	Accidents*	Fatal Accidents*	Fatalities	
			Total	Aboard Aircraft In This Category
1980	34	2	4	4
1981	23	2	6	6
1982	29	2	7	7
1983	29	2	3	3
1984	33	0	0	0
1985	24	1	1	1
1986	23	1	2	2
1987	27	3	3	3
1988	25	0	0	0
1989	21	3	6	6

Table 18 - ACCIDENTS, FATAL ACCIDENTS AND FATALITIES
PERSONAL FLYING
1980 - 1989

Year	Accidents*	Fatal Accidents*	Fatalities	
			Total	Aboard Aircraft In This Category
1980	2040	389	808	799
1981	1958	383	749	738
1982	1906	398	826	809
1983	1884	398	777	772
1984	1906	365	714	707
1985	1741	325	636	629
1986	1638	328	682	589
1987	1583	301	562	560
1988	1495	320	576	568
1989	1359	271	506	498

* The yearly accident counts include suicide and sabotage accidents as follows :
Total - 1980 (1), 1984 (3), 1985 (2), 1987 (1), 1989 (4)
Fatal - 1980 (1), 1984 (2), 1985 (1), 1987 (1), 1989 (4)

Table 19 - ACCIDENTS, FATAL ACCIDENTS AND FATALITIES
BUSINESS FLYING
1980 - 1989

Year	Accidents*	Fatal Accidents*	Fatalities	
			Total	Aboard Aircraft In This Category
1980	246	62	126	116
1981	264	74	145	145
1982	292	74	157	156
1983	276	52	114	114
1984	249	76	155	155
1985	259	63	118	114
1986	194	58	137	131
1987	180	46	98	92
1988	169	48	86	86
1989	146	42	90	85

Table 20 - MOST PREVALENT FIRST OCCURRENCES
ALL ACCIDENTS
1989 AND 1984 - 1988

Type of Occurrence	1989		1984 - 1988	
	No.	Percent	Mean	Percent
Loss of control - in flight	303	13.5	363.6	13.6
Loss of engine power(total) - non-mechanical	287	12.8	307.0	11.5
Loss of control - on ground	222	9.9	297.6	11.2
In flight collision with object	191	8.5	204.4	7.7
In flight encounter with weather	161	7.2	173.2	6.5
Loss of engine power	122	5.4	158.2	5.9
In flight collision with terrain/water	106	4.7	145.8	5.5
Airframe/component/system failure/malfunction	106	4.7	140.8	5.3
Hard landing	113	5.0	131.2	4.9
Loss of engine power(total) - mech failure/malf	112	5.0	124.4	4.7
Overrun	56	2.5	76.6	2.9
On ground collision with object	57	2.5	72.2	2.7
Loss of engine power(partial) - mech failure/malf	64	2.9	66.4	2.5
Loss of engine power(partial) - non-mechanical	41	1.8	58.2	2.2
Midair collision	35	1.6	44.8	1.7
Undershoot	28	1.2	39.2	1.5
On ground collision with terrain/water	38	1.7	38.2	1.4
Miscellaneous/other	34	1.5	31.4	1.2
Nose over	26	1.2	28.2	1.1
(All other types)	139	6.2	163.0	6.1
Number of Aircraft	2242	100.0	2664.2	100.0

Table 21 - MOST PREVALENT FIRST PHASES OF OPERATION
ALL ACCIDENTS
1989 AND 1984 - 1988

	1989		1984 - 1988	
Phase of Operation	No.	Percent	Mean	Percent
Landing	533	23.8	661.8	24.8
Takeoff	475	21.2	543.8	20.4
Cruise	417	18.6	444.4	16.7
Maneuvering	303	13.5	372.0	14.0
Approach	289	12.9	341.2	12.8
Climb	53	2.4	83.6	3.1
Descent	53	2.4	82.4	3.1
Taxi	58	2.6	69.0	2.6
Standing	35	1.6	34.4	1.3
Other	25	1.1	31.0	1.2
Not reported	1	0.0	0.6	0.0
Number of Aircraft	2242	100.0	2664.2	100.0

Table 22 - BROAD CAUSE/FACTOR ASSIGNMENTS
ALL ACCIDENTS
1989 AND 1984 - 1988

	1989		1984 - 1988	
Broad Cause/Factor	No.	Percent	Mean	Percent
Pilot	1832	81.7	2263.4	85.0
Terrain/Runway Condition	611	27.3	740.8	27.8
Weather	612	27.3	668.8	25.1
Propulsion System and Controls	542	24.2	598.0	22.4
Object (tree, wires, etc)	418	18.6	486.8	18.3
Other Person (Not Aboard)	214	9.5	236.0	8.9
Light Conditions	173	7.7	199.6	7.5
Landing Gear	78	3.5	145.0	5.4
Systems/Equipment/Instruments	100	4.5	127.8	4.8
Airframe	36	1.6	62.0	2.3
Flight Control System	30	1.3	45.0	1.7
Airport/Airways Facilities, Aids	23	1.0	27.8	1.0
Other Person (Aboard)	16	0.7	16.8	0.6
Number of Aircraft	2242		2664.2	

Table 23 - PERSONS BY ROLE AND DEGREE OF INJURY
ALL ACCIDENTS
1989

Role of Person	Degree of Injury				
	Fatal	Serious	Minor	None	Total
Pilot	406	209	361	1265	2241
Copilot	16	7	8	27	58
Dual student	11	8	14	104	137
Check pilot	4	1	4	10	19
Flight engineer	0	0	0	1	1
Cabin attendants	0	0	0	1	1
Other crew	11	4	5	20	40
Passenger	309	151	261	846	1567
Total aboard	757	380	653	2274	4064
Other aircraft*	1	1	5	3	10
Other ground	2	3	9	4	18
Grand total	760	384	667	2281	4092
Percent	18.6	9.4	16.3	55.7	

* 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 24 - PERSONS ABOARD BY KIND OF FLYING AND DEGREE OF INJURY
ALL ACCIDENTS
1989

Kind of Flying	Degree of Injury				
	Fatal	Serious	Minor	None	Total
Personal	498	236	439	1478	2651
Business	85	27	50	129	291
Corporate/Executive	15	2	2	23	42
Aerial application	24	21	33	84	162
Instructional	43	33	53	359	488
Other	92	61	76	201	430
Total	757	380	653	2274	4064
Percent	18.6	9.4	16.1	56.0	

Table 25 - PERSONS ABOARD BY TYPE OF AIRCRAFT AND DEGREE OF INJURY
ALL ACCIDENTS
1989

Type of Aircraft	Degree of Injury				
	Fatal	Serious	Minor	None	Total
All Fixed Wing	707	308	560	2059	3634
Fixed Wing Single Recip.Engine	581	290	526	1825	3222
Fixed Wing Multi Recip. Engine	89	12	28	175	304
Fixed Wing Turboprop	33	6	5	33	77
Fixed Wing Turbojet	4	0	1	26	31
All Rotorcraft	41	50	60	173	324
Rotorcraft, Reciprocating Engine	17	28	40	103	188
Rotorcraft, Turbine Engine	24	22	20	70	136
All Gliders	1	7	5	15	28
All Balloons	6	15	28	24	73
Other	2	0	0	3	5
Total	757	380	653	2274	4064
Percent	18.6	9.4	16.1	56.0	

Table 26 - AIRCRAFT BY STATE AND KIND OF FLYING
ALL ACCIDENTS
1989

State	Kind of Flying						Aircraft	
	Personal	Business	Corp/ Exec.	Instruct.	Aer. App.	Other	No.	Percent
Alabama	16	2	0	5	8	3	34	1.5
Alaska	108	18	0	2	0	18	146	6.5
Arizona	41	3	0	14	6	8	72	3.2
Arkansas	18	2	0	2	21	1	44	2.0
California	171	14	0	50	20	21	276	12.3
Colorado	46	3	1	11	3	8	72	3.2
Connecticut	15	1	0	2	0	0	18	0.8
Delaware	1	0	0	2	0	1	4	0.2
Florida	82	7	1	34	7	27	158	7.0
Georgia	23	5	0	3	6	7	44	2.0
Hawaii	5	1	0	1	1	3	11	0.5
Idaho	14	1	0	0	3	1	19	0.8
Illinois	36	4	0	14	1	5	60	2.7
Indiana	22	5	1	8	1	5	42	1.9
Iowa	13	3	0	2	0	4	22	1.0
Kansas	11	0	0	0	4	0	15	0.7
Kentucky	5	0	1	1	0	1	8	0.4
Louisiana	9	4	0	4	13	7	37	1.7
Maine	12	1	0	0	0	3	16	0.7
Maryland	22	0	0	2	2	4	30	1.3
Massachusetts	19	0	0	3	0	1	23	1.0
Michigan	46	3	0	12	2	4	67	3.0
Minnesota	31	1	0	7	3	5	47	2.1
Mississippi	16	4	0	3	9	2	34	1.5
Missouri	27	3	0	8	4	4	46	2.1
Montana	16	1	0	1	6	1	25	1.1
Nebraska	12	2	0	1	4	1	20	0.9
Nevada	25	1	0	4	0	3	33	1.5
New Hampshire	4	0	0	1	0	1	6	0.3
New Jersey	17	3	1	3	0	6	30	1.3
New Mexico	26	1	0	3	1	3	34	1.5
New York	42	3	2	4	0	8	59	2.6
North Carolina	30	6	0	5	0	5	46	2.1
North Dakota	3	0	0	6	2	1	12	0.5
Ohio	45	6	0	11	0	9	71	3.2
Oklahoma	24	3	0	6	3	2	38	1.7
Oregon	26	1	0	6	2	7	42	1.9
Pennsylvania	29	3	2	6	0	4	44	2.0
Puerto Rico	3	1	0	1	0	0	5	0.2
Rhode Island	3	0	0	0	0	0	3	0.1
South Carolina	16	1	0	2	1	6	26	1.2
South Dakota	4	0	0	0	1	0	5	0.2
Tennessee	16	1	0	7	1	0	25	1.1
Texas	84	15	1	19	13	9	141	6.3
Utah	20	2	0	4	1	4	31	1.4
Vermont	3	0	0	2	0	1	6	0.3
Virginia	16	2	1	9	0	6	34	1.5
Washington	42	3	0	10	6	9	70	3.1
West Virginia	8	2	1	0	0	2	13	0.6
Wisconsin	33	3	0	6	3	10	55	2.5
Wyoming	10	1	0	0	0	1	12	0.5
Gulf of Mexico	0	0	0	0	0	3	3	0.1
Pacific Ocean	0	0	0	0	0	2	2	0.1
Atlantic Ocean	1	0	0	0	0	1	2	0.1
Unknown	3	0	0	0	0	1	4	0.2
Aircraft Number -	1370	146	12	307	158	249	2242	
Percent -	61.1	6.5	0.5	13.7	7.0	11.1		

Table 27 - AIRCRAFT BY FIRST OCCURRENCE AND TYPE OF AIRCRAFT
ALL ACCIDENTS
1989

Type of First Occurrence	Type of Aircraft: All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Glid ers	Ball oons	Other	Aircraft No.	Aircraft Pct.
Abrupt maneuver	7	7	0	0	0	2	0	2	0	0	0	9	0.4
Altitude deviation,uncontrolled	4	3	1	0	0	0	0	0	0	0	0	4	0.2
Airframe/component/system fail./ malfunction	75	56	15	3	1	27	15	12	2	2	0	106	4.7
Dragged wing, rotor, pod, or float	9	9	0	0	0	3	3	0	1	0	0	13	0.6
Fire	16	10	5	1	0	0	0	0	0	0	0	16	0.7
Forced landing	3	3	0	0	0	0	0	0	0	0	0	3	0.1
Gear collapsed	10	4	5	1	0	0	0	0	0	0	0	10	0.4
Main gear collapsed	25	20	5	0	0	0	0	0	0	0	0	25	1.1
Nose gear collapsed	7	6	1	0	0	0	0	0	0	0	0	7	0.3
Complete gear collapsed	2	0	2	0	0	0	0	0	0	0	0	2	0.1
Gear not extended	15	8	6	0	1	0	0	0	0	0	0	15	0.7
Hard landing	98	89	8	0	1	10	8	2	2	2	1	113	5.0
In flight collision with object	147	137	1	7	2	30	18	12	3	11	0	191	8.5
In flight collision with terrain	90	84	5	1	0	15	12	3	1	0	0	106	4.7
In flight encounter with weather	151	133	15	3	0	3	1	2	3	4	0	161	7.2
Loss of control - in flight	269	252	11	6	0	28	23	5	6	0	0	303	13.5
Loss of control - on ground	215	203	6	5	1	7	6	1	0	0	0	222	9.9
Midair collision	31	28	2	1	0	2	0	2	0	2	0	35	1.6
Nose down	2	2	0	0	0	0	0	0	0	0	0	2	0.1
Nose over	26	26	0	0	0	0	0	0	0	0	0	26	1.2
On ground collision with object	51	48	3	0	0	5	3	2	1	0	0	57	2.5
On ground collision with terrain	37	35	2	0	0	1	0	1	0	0	0	38	1.7
On ground encounter with weather	13	12	0	1	0	0	0	0	0	0	0	13	0.6
Overrun	55	51	3	0	1	0	0	0	1	0	0	56	2.5
Loss of power	110	104	5	0	1	11	5	6	0	0	1	122	5.4
Loss of power(total) - mech failure/malfunction	100	93	5	1	1	11	6	5	0	0	1	112	5.0
Loss of power(partial) - mech failure/malfunction	59	54	5	0	0	5	2	3	0	0	0	64	2.9
Loss of power(total) - non-mechanical	271	252	17	2	0	15	11	4	0	0	1	287	12.8
Loss of power(partial) - non-mechanical	36	32	4	0	0	5	3	2	0	0	0	41	1.8
Propeller blast or jet exhaust/ suction	1	1	0	0	0	0	0	0	0	0	0	1	0.0
Propeller/rotor contact	4	3	0	1	0	1	1	0	0	0	0	5	0.2
Roll over	0	0	0	0	0	2	1	1	0	0	0	2	0.1
Undershoot	27	22	5	0	0	0	0	0	1	0	0	28	1.2
Undetermined	1	1	0	0	0	0	0	0	0	0	0	1	0.0
Vortex turbulence encountered	5	5	0	0	0	0	0	0	0	0	0	5	0.2
Missing aircraft	5	5	0	0	0	0	0	0	0	0	0	5	0.2
Miscellaneous/other	28	25	3	0	0	3	2	1	2	1	0	34	1.5
Other	2	2	0	0	0	0	0	0	0	0	0	2	0.1
Aircraft													
Number -	2007	1825	140	33	9	186	120	66	23	22	4	2242	
Percent -	89.5	81.4	6.2	1.5	0.4	8.3	5.4	2.9	1.0	1.0	0.2		

Table 28 - AIRCRAFT BY FIRST OCCURRENCE AND KIND OF FLYING
ALL ACCIDENTS
1989

Type of First Occurrence	Kind of Flying: Personal	Business	Corp/Exec.	Inst ruct.	Aer. App.	Other	Aircraft: No.	Aircraft: Percent
Abrupt maneuver	7	1	0	0	0	1	9	0.4
Altitude deviation,uncontrolled	2	0	0	0	0	2	4	0.2
Airframe/component/system failure/malfunction	51	6	1	10	14	24	106	4.7
Dragged wing, rotor, pod, or float	6	0	0	4	1	2	13	0.6
Fire	10	2	1	0	1	2	16	0.7
Forced landing	2	0	0	1	0	0	3	0.1
Gear collapsed	3	2	0	4	0	1	10	0.4
Main gear collapsed	18	2	0	2	2	1	25	1.1
Nose gear collapsed	6	1	0	0	0	0	7	0.3
Complete gear collapsed	1	1	0	0	0	0	2	0.1
Gear not extended	8	3	0	2	0	2	15	0.7
Hard landing	62	4	1	41	0	5	113	5.0
In flight collision with object	99	9	1	20	37	25	191	8.5
In flight collision with terrain	66	9	0	10	12	9	106	4.7
In flight encounter with weather	113	21	1	8	1	17	161	7.2
Loss of control - in flight	191	19	0	31	15	47	303	13.5
Loss of control - on ground	133	8	2	56	10	13	222	9.9
Midair collision	21	3	0	8	0	3	35	1.6
Nose down	2	0	0	0	0	0	2	0.1
Nose over	16	1	0	4	2	3	26	1.2
On ground collision with object	46	1	2	4	0	4	57	2.5
On ground collision with terrain	28	3	0	1	3	3	38	1.7
On ground encounter with weather	9	1	0	1	2	0	13	0.6
Overrun	37	6	0	9	0	4	56	2.5
Loss of power	74	7	1	13	11	16	122	5.4
Loss of power(total) - mech failure/malfunction	69	9	0	6	14	14	112	5.0
Loss of power(partial) - mech failure/malfunction	38	3	0	4	10	9	64	2.9
Loss of power(total) - non-mechanical	176	17	1	45	21	27	287	12.8
Loss of power(partial) - non-mechanical	26	1	1	7	1	5	41	1.8
Propeller blast or jet exhaust/suction	1	0	0	0	0	0	1	0.0
Propeller/rotor contact	3	1	0	0	1	0	5	0.2
Roll over	1	0	0	0	0	1	2	0.1
Undershoot	16	3	0	6	0	3	28	1.2
Undetermined	1	0	0	0	0	0	1	0.0
Vortex turbulence encountered	2	0	0	3	0	0	5	0.2
Missing aircraft	4	0	0	0	0	1	5	0.2
Miscellaneous/other	22	2	0	6	0	4	34	1.5
Other	0	0	0	1	0	1	2	0.1
Aircraft								
Number -	1370	146	12	307	158	249	2242	
Percent -	61.1	6.5	0.5	13.7	7.0	11.1		

Table 29 - AIRCRAFT BY FIRST PHASE OF OPERATION AND TYPE OF AIRCRAFT
ALL ACCIDENTS
1989

Phase of Operation	Type of Aircraft											Aircraft	
	All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Glid ers	Ball oons	Other	No.	Pct.
Standing	1	1	0	0	0	0	0	0	0	0	0	1	0.0
Standing - starting engine(s)	13	13	0	0	0	0	0	0	0	0	0	13	0.6
Standing - engine(s) operating	14	14	0	0	0	4	4	0	0	0	0	18	0.8
Standing - engine(s) not operating	1	0	1	0	0	0	0	0	0	0	0	1	0.0
Standing - idling rotors	0	0	0	0	0	2	0	2	0	0	0	2	0.1
Taxi	5	5	0	0	0	0	0	0	0	0	0	5	0.2
Taxi - to takeoff	22	20	2	0	0	0	0	0	0	0	0	22	1.0
Taxi - from landing	27	23	3	1	0	0	0	0	0	0	0	27	1.2
Taxi - aerial	0	0	0	0	0	4	4	0	0	0	0	4	0.2
Takeoff	28	25	1	1	1	8	5	3	0	0	0	36	1.6
Takeoff - ground run	80	70	7	3	0	2	2	0	2	0	0	84	3.7
Takeoff - initial climb	306	281	21	4	0	18	12	6	4	1	0	329	14.7
Climb	18	14	2	2	0	3	1	2	0	2	1	24	1.1
Climb - to cruise	27	24	3	0	0	2	1	1	0	0	0	29	1.3
Cruise	160	149	8	3	0	23	12	11	0	1	1	185	8.3
Cruise - normal	212	187	22	2	1	15	12	3	2	1	0	230	10.3
Cruise - holding(IFR)	1	1	0	0	0	1	0	1	0	0	0	2	0.1
Descent	15	14	1	0	0	1	1	0	0	1	0	17	0.8
Descent - normal	26	25	1	0	0	2	1	1	0	2	0	30	1.3
Descent - emergency	2	2	0	0	0	0	0	0	1	0	0	3	0.1
Descent - uncontrolled	3	3	0	0	0	0	0	0	0	0	0	3	0.1
Approach	55	47	7	1	0	4	1	3	0	1	0	60	2.7
Approach - VFR pattern - downwind	16	15	1	0	0	1	1	0	2	0	0	19	0.8
Approach - VFR pattern - base turn	8	8	0	0	0	0	0	0	0	0	0	8	0.4
Approach - VFR pattern - base to final	21	19	0	2	0	0	0	0	2	0	0	23	1.0
Approach - VFR pattern - final approach	109	99	9	1	0	5	2	3	4	3	0	121	5.4
Approach - go-around (VFR)	38	36	1	1	0	1	1	0	0	0	0	39	1.7
Approach - IAF to FAF/ outer marker (IFR)	8	4	2	2	0	0	0	0	0	0	0	8	0.4
Approach - FAF/outer marker to threshold (IFR)	9	6	2	0	1	0	0	0	0	0	0	9	0.4
Approach - circling(IFR)	1	0	1	0	0	0	0	0	0	0	0	1	0.0
Approach - missed approach (IFR)	1	1	0	0	0	0	0	0	0	0	0	1	0.0
Landing	44	37	7	0	0	4	3	1	0	5	0	53	2.4
Landing - flare/touchdown	172	157	12	1	2	13	9	4	2	3	1	191	8.5
Landing - roll	251	229	15	5	2	0	0	0	1	0	0	252	11.2
Maneuvering	153	145	7	1	0	24	15	9	2	0	1	180	8.0
Maneuvering - aerial application	64	60	1	3	0	14	9	5	0	0	0	78	3.5
Maneuvering - turn to reverse direction	9	9	0	0	0	6	5	1	0	0	0	15	0.7
Maneuvering - turn to landing area (emergency)	1	1	0	0	0	0	0	0	1	0	0	2	0.1
Hover	0	0	0	0	0	28	18	10	0	0	0	28	1.2
Other	66	62	2	0	2	1	1	0	0	2	0	69	3.1
Unknown	19	18	1	0	0	0	0	0	0	0	0	19	0.8
Not reported	1	1	0	0	0	0	0	0	0	0	0	1	0.0
Aircraft Number -	2007	1825	140	33	9	186	120	66	23	22	4	2242	
Percent -	89.5	81.4	6.2	1.5	0.4	8.3	5.4	2.9	1.0	1.0	0.2		

Table 30 - AIRCRAFT BY FIRST PHASE OF OPERATION AND KIND OF FLYING
ALL ACCIDENTS
1989

Phase of Operation	Kind of Flying						Aircraft	
	Personal	Business	Corp/ Exec.	Instruct.	Aer. App.	Other	No.	Percent
Standing	1	0	0	0	0	0	1	0.0
Standing - starting engine(s)	12	0	0	0	1	0	13	0.6
Standing - engine(s) operating	13	2	0	2	0	1	18	0.8
Standing - engine(s) not operating	0	0	0	0	0	1	1	0.0
Standing - idling rotors	0	0	1	0	0	1	2	0.1
Taxi	5	0	0	0	0	0	5	0.2
Taxi - to takeoff	18	1	0	1	0	2	22	1.0
Taxi - from landing	17	3	1	2	1	3	27	1.2
Taxi - aerial	0	0	0	2	0	2	4	0.2
Takeoff	19	1	0	8	5	3	36	1.6
Takeoff - ground run	51	3	1	15	11	3	84	3.7
Takeoff - initial climb	230	18	1	30	18	32	329	14.7
Climb	15	1	1	1	2	4	24	1.1
Climb - to cruise	22	3	0	1	0	3	29	1.3
Cruise	106	14	1	19	12	33	185	8.3
Cruise - normal	160	28	1	16	2	23	230	10.3
Cruise - holding(IFR)	1	0	0	0	0	1	2	0.1
Descent	7	5	0	2	0	3	17	0.8
Descent - normal	20	3	1	4	0	2	30	1.3
Descent - emergency	2	0	0	1	0	0	3	0.1
Descent - uncontrolled	2	0	0	0	1	0	3	0.1
Approach	34	7	0	10	2	7	60	2.7
Approach - VFR pattern - downwind	13	2	0	3	0	1	19	0.8
Approach - VFR pattern - base turn	6	0	0	0	0	2	8	0.4
Approach - VFR pattern - base to final	13	2	1	2	0	5	23	1.0
Approach - VFR pattern - final approach	78	6	0	24	0	13	121	5.4
Approach - go-around (VFR)	23	0	0	12	1	3	39	1.7
Approach - IAF to FAF/outer marker (IFR)	7	1	0	0	0	0	8	0.4
Approach - FAF/outer marker to threshold (IFR)	4	5	0	0	0	0	9	0.4
Approach - circling(IFR)	0	1	0	0	0	0	1	0.0
Approach - missed approach (IFR)	1	0	0	0	0	0	1	0.0
Landing	34	3	0	12	0	4	53	2.4
Landing - flare/touchdown	114	12	2	51	0	12	191	8.5
Landing - roll	158	14	1	48	15	16	252	11.2
Maneuvering	105	6	0	21	4	44	180	8.0
Maneuvering - aerial application	2	0	0	0	74	2	78	3.5
Maneuvering - turn to reverse direction	2	1	0	0	8	4	15	0.7
Maneuvering - turn to landing area	2	0	0	0	0	0	2	0.1
Hover	5	2	0	7	1	13	28	1.2
Other	51	1	0	13	0	4	69	3.1
Unknown	17	0	0	0	0	2	19	0.8
Not reported	0	1	0	0	0	0	1	0.0
Aircraft								
Number -	1370	146	12	307	158	249	2242	
Percent -	61.1	6.5	0.5	13.7	7.0	11.1		

Table 31 - AIRCRAFT BY BROAD CAUSE/FACTOR AND TYPE OF AIRCRAFT
ALL ACCIDENTS
1989

Broad Cause:	Type of Aircraft											Aircraft	
	All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Glid ers	Ball oons	Other	No.	Pct.
Aircraft	578	517	49	8	4	58	31	27	3	4	2	645	28.8
Propulsion System and Controls	455	421	27	4	3	47	26	21	0	3	2	507	22.6
Flight Control System	18	14	4	0	0	4	1	3	2	0	0	24	1.1
Airframe	20	18	1	1	0	2	2	0	1	0	0	23	1.0
Landing Gear	62	45	14	2	1	1	1	0	0	0	0	63	2.8
Systems/Equipment/Instruments	47	40	6	1	0	5	1	4	0	2	0	54	2.4
Environment	61	55	4	1	1	6	3	3	2	0	1	70	3.1
Weather	20	18	2	0	0	2	2	0	2	0	0	24	1.1
Object (trees, wires, etc.)	21	20	0	1	0	2	0	2	0	0	1	24	1.1
Airport/Airways Facilities, Aids	3	3	0	0	0	0	0	0	0	0	0	3	0.1
Terrain/Runway Condition	21	18	2	0	1	2	1	1	0	0	0	23	1.0
Personnel	1702	1553	115	27	7	153	99	54	19	21	3	1898	84.7
Pilot	1616	1477	107	25	7	131	91	40	19	20	3	1789	79.8
Others (Aboard)	8	8	0	0	0	2	2	0	0	2	0	12	0.5
Others (Not Aboard)	134	115	16	3	0	22	6	16	2	2	0	160	7.1
Broad Factor:													
Aircraft	130	99	26	5	0	17	10	7	0	4	0	151	6.7
Propulsion System and Controls	51	41	9	1	0	11	7	4	0	1	0	63	2.8
Flight Control System	6	4	2	0	0	1	0	1	0	0	0	7	0.3
Airframe	16	15	1	0	0	0	0	0	0	0	0	16	0.7
Landing Gear	15	11	3	1	0	2	2	0	0	0	0	17	0.8
Systems/Equipment/Instruments	44	28	13	3	0	4	1	3	0	3	0	51	2.3
Environment	1179	1097	60	18	4	89	56	33	9	15	2	1294	57.7
Weather	546	507	26	11	2	28	19	9	5	10	0	589	26.3
Light Conditions	159	138	17	3	1	14	7	7	0	0	0	173	7.7
Object (trees, wires, etc.)	342	314	21	7	0	40	26	14	2	8	2	394	17.6
Airport/Airways Facilities, Aids	18	15	2	1	0	2	0	2	0	0	0	20	0.9
Terrain/Runway Condition	553	523	20	8	2	34	20	14	4	1	1	593	26.4
Personnel	646	575	57	8	6	48	24	24	11	4	2	711	31.7
Pilot	612	546	53	8	5	42	24	18	10	4	2	670	29.9
Others (Aboard)	4	4	0	0	0	0	0	0	0	0	0	4	0.2
Others (Not Aboard)	62	53	7	1	1	10	1	9	1	2	0	75	3.3
Either Broad Cause or Factor:													
Aircraft	652	575	63	10	4	67	37	30	3	7	2	731	32.6
Propulsion System and Controls	484	442	34	5	3	52	30	22	0	4	2	542	24.2
Flight Control System	23	18	5	0	0	5	1	4	2	0	0	30	1.3
Airframe	33	30	2	1	0	2	2	0	1	0	0	36	1.6
Landing Gear	75	55	16	3	1	3	3	0	0	0	0	78	3.5
Systems/Equipment/Instruments	88	67	18	3	0	9	2	7	0	4	0	101	4.5
Environment	1220	1135	63	18	4	91	56	35	11	15	3	1340	59.8
Weather	565	524	28	11	2	30	21	9	7	10	0	612	27.3
Light Conditions	159	138	17	3	1	14	7	7	0	0	0	173	7.7
Object (trees, wires, etc.)	363	334	21	8	0	42	26	16	2	8	3	418	18.6
Airport/Airways Facilities, Aids	21	18	2	1	0	2	0	2	0	0	0	23	1.0
Terrain/Runway Condition	570	538	22	8	2	35	20	15	4	1	1	611	27.3
Personnel	1749	1593	120	28	8	157	100	57	19	21	3	1949	86.9
Pilot	1654	1512	109	26	7	136	92	44	19	20	3	1832	81.7
Others (Aboard)	12	12	0	0	0	2	2	0	0	2	0	16	0.7
Others (Not Aboard)	178	151	22	4	1	29	7	22	3	4	0	214	9.5
Aircraft													
Number -	2007	1825	140	33	9	186	120	66	23	22	4	2242	
Percent -	89.5	81.4	6.2	1.5	0.4	8.3	5.4	2.9	1.0	1.0	0.2		

Table 32 - AIRCRAFT BY BROAD CAUSE/FACTOR AND KIND OF FLYING
ALL ACCIDENTS
1989

Broad Cause:	Kind of Flying						Aircraft	
	Personal	Business	Corp/ Exec.	Instruct.	Aer. App.	Other	No.	Pct.
Aircraft	393	42	3	63	59	85	645	28.8
Propulsion System and Controls	310	30	2	52	50	63	507	22.6
Flight Control System	14	1	0	1	0	8	24	1.1
Airframe	13	3	1	2	2	2	23	1.0
Landing Gear	38	8	0	6	6	5	63	2.8
Systems/Equipment/Instruments	30	4	0	6	4	10	54	2.4
Environment	46	3	1	7	6	7	70	3.1
Weather	16	2	0	2	3	1	24	1.1
Object (trees, wires, etc.)	14	0	0	5	2	3	24	1.1
Airport/Airways Facilities, Aids	2	0	0	0	0	1	3	0.1
Terrain/Runway Condition	16	1	1	0	2	3	23	1.0
Personnel	1167	128	11	281	104	207	1898	84.7
Pilot	1113	119	10	267	99	181	1789	79.8
Others (Aboard)	6	1	0	3	0	2	12	0.5
Others (Not Aboard)	82	15	1	23	7	32	160	7.1
Broad Factor:								
Aircraft	82	20	0	19	9	21	151	6.7
Propulsion System and Controls	39	4	0	7	5	8	63	2.8
Flight Control System	3	1	0	1	0	2	7	0.3
Airframe	10	4	0	0	1	1	16	0.7
Landing Gear	8	2	0	5	2	0	17	0.8
Systems/Equipment/Instruments	26	9	0	5	1	10	51	2.3
Environment	810	92	8	160	95	129	1294	57.7
Weather	387	48	4	77	19	54	589	26.3
Light Conditions	117	21	2	5	9	19	173	7.7
Object (trees, wires, etc.)	239	21	5	43	37	49	394	17.6
Airport/Airways Facilities, Aids	12	3	2	2	0	1	20	0.9
Terrain/Runway Condition	363	42	3	82	53	50	593	26.4
Personnel	419	55	7	132	21	77	711	31.7
Pilot	397	52	4	125	21	71	670	29.9
Others (Aboard)	4	0	0	0	0	0	4	0.2
Others (Not Aboard)	35	5	4	18	0	13	75	3.3
Either Broad Cause or Factor:								
Aircraft	436	55	3	76	64	97	731	32.6
Propulsion System and Controls	330	31	2	58	53	68	542	24.2
Flight Control System	16	2	0	2	0	10	30	1.3
Airframe	20	7	1	2	3	3	36	1.6
Landing Gear	45	10	0	10	8	5	78	3.5
Systems/Equipment/Instruments	55	12	0	10	5	19	101	4.5
Environment	840	95	8	164	99	134	1340	59.8
Weather	402	50	4	79	22	55	612	27.3
Light Conditions	117	21	2	5	9	19	173	7.7
Object (trees, wires, etc.)	253	21	5	48	39	52	418	18.6
Airport/Airways Facilities, Aids	14	3	2	2	0	2	23	1.0
Terrain/Runway Condition	375	43	4	82	55	52	611	27.3
Personnel	1197	131	12	285	109	215	1949	86.9
Pilot	1140	121	10	269	104	188	1832	81.7
Others (Aboard)	10	1	0	3	0	2	16	0.7
Others (Not Aboard)	107	20	4	36	7	40	214	9.5
Aircraft								
Number -	1370	146	12	307	158	249	2242	
Percent -	61.1	6.5	0.5	13.7	7.0	11.1		

Table 33 - AIRCRAFT BY KIND OF FLYING AND TYPE OF AIRCRAFT
ALL ACCIDENTS
1989

Kind of Flying	Type of Aircraft: All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Glid ers	Ball oons	Other	Aircraft No.	Aircraft Pct.
Personal	1297	1219	69	7	2	36	32	4	21	12	4	1370	61.1
Business	130	100	27	2	1	14	8	6	0	2	0	146	6.5
Corporate/Executive	8	0	4	3	1	4	0	4	0	0	0	12	0.5
Instructional	269	250	17	2	0	35	30	5	2	1	0	307	13.7
Aerial Application	128	116	0	12	0	30	25	5	0	0	0	158	7.0
Other	175	140	23	7	5	67	25	42	0	7	0	249	11.1
Aircraft													
Number -	2007	1825	140	33	9	186	120	66	23	22	4	2242	
Percent -	89.5	81.4	6.2	1.5	0.4	8.3	5.4	2.9	1.0	1.0	0.2		

Table 34 - PILOTS BY TOTAL TIME AND TIME IN TYPE
ALL ACCIDENTS
1989

Total time (hours)	Time in type (hours): 0-49	50-99	100-499	500-999	1000-4999	5000-9999	10000 or more	Not reptd	Pilots No.	Pilots Percent
0 - 49	121	0	0	0	0	0	0	10	131	5.8
50 - 99	74	52	0	0	0	0	0	10	136	6.1
100 - 499	200	101	208	0	0	0	0	89	598	26.7
500 - 999	76	34	145	54	0	0	0	29	338	15.1
1000 - 4999	96	50	169	96	137	0	0	89	637	28.4
5000 - 9999	22	11	44	21	73	7	0	26	204	9.1
10000 or more	14	6	23	15	50	16	6	27	157	7.0
Not reported	1	2	3	1	1	1	0	32	41	1.8
Pilots										
Number -	604	256	592	187	261	24	6	312	2242	
Percent -	26.9	11.4	26.4	8.3	11.6	1.1	0.3	13.9		

Table 35 - PILOTS BY AGE AND KIND OF FLYING
ALL ACCIDENTS
1989

Pilot age	Kind of Flying: Personal	Business	Corp/ Exec.	Instruct.	Aer. App.	Other	Pilots: No.	Pilots: Percent
15 - 19	20	0	0	10	2	3	35	1.6
20 - 24	73	5	0	47	2	13	140	6.3
25 - 29	95	5	1	52	20	27	200	9.0
30 - 34	120	14	2	46	21	29	232	10.3
35 - 39	166	20	2	34	25	35	282	12.6
40 - 44	205	21	2	40	25	47	340	15.2
45 - 49	177	27	3	28	25	28	288	12.8
50 - 54	153	20	0	18	13	26	230	10.3
55 - 59	126	20	1	10	17	12	186	8.3
60 - 64	110	9	1	13	4	12	149	6.6
65 - 69	80	4	0	6	3	5	98	4.4
70 or older	30	1	0	1	1	2	35	1.6
Not reported	15	0	0	2	0	10	27	1.2
Pilots								
Number -	1370	146	12	307	158	249	2242	
Percent -	61.1	6.5	0.5	13.7	7.0	11.1		

Table 36 - MOST PREVALENT FIRST OCCURRENCES
FATAL ACCIDENTS
1989 AND 1984 - 1988

Type of Occurrence	1989: No.	1989: Percent	1984 - 1988: Mean	1984 - 1988: Percent
Loss of control - in flight	122	28.0	126.2	25.7
In flight encounter with weather	82	18.8	98.6	20.1
In flight collision with object	57	13.1	56.0	11.4
In flight collision with terrain/water	39	8.9	53.6	10.9
Airframe/component/system failure/malfunction	26	6.0	25.0	5.1
Midair collision	23	5.3	24.2	4.9
Loss of engine power(total) - non-mechanical	28	6.4	23.8	4.8
Loss of engine power	15	3.4	14.6	3.0
Loss of engine power(total) - mech failure/malf	8	1.8	12.0	2.4
Abrupt maneuver	3	0.7	9.8	2.0
Loss of engine power(partial) - mech failure/malf	7	1.6	6.8	1.4
Loss of engine power(partial) - non-mechanical	4	0.9	6.6	1.3
Missing aircraft	5	1.1	6.6	1.3
Miscellaneous/other	3	0.7	6.2	1.3
(All other types)	14	3.2	21.6	4.4
Number of Aircraft	436	100.0	491.6	100.0

Table 37 - MOST PREVALENT FIRST PHASES OF OPERATION
FATAL ACCIDENTS
1989 AND 1984 - 1988

	1989		1984 - 1988	
Phase of Operation	No.	Percent	Mean	Percent
Maneuvering	112	25.7	140.6	28.6
Cruise	116	26.6	115.0	23.4
Takeoff	69	15.8	73.8	15.0
Approach	68	15.6	71.4	14.5
Climb	24	5.5	28.4	5.8
Other	21	4.8	23.2	4.7
Descent	15	3.4	22.4	4.6
Landing	7	1.6	11.0	2.2
Standing	2	0.5	3.2	0.7
Taxi	1	0.2	2.2	0.4
Not reported	1	0.2	0.4	0.1
Number of Aircraft	436	100.0	491.6	100.0

Table 38 - BROAD CAUSE/FACTOR ASSIGNMENTS
FATAL ACCIDENTS
1989 AND 1984 - 1988

	1989		1984 - 1988	
Broad Cause/Factor	No.	Percent	Mean	Percent
Pilot	394	90.4	447.2	91.0
Weather	146	33.5	177.8	36.2
Terrain/Runway Condition	74	17.0	92.0	18.7
Light Conditions	61	14.0	86.0	17.5
Object (tree, wires, etc)	63	14.4	83.4	17.0
Propulsion System and Controls	51	11.7	62.2	12.7
Other Person (Not Aboard)	57	13.1	49.4	10.0
Airframe	17	3.9	23.8	4.8
Systems/Equipment/Instruments	20	4.6	22.4	4.6
Flight Control System	10	2.3	13.6	2.8
Airport/Airways Facilities, Aids	4	0.9	5.4	1.1
Other Person (Aboard)	2	0.5	4.8	1.0
Landing Gear	0	0.0	2.2	0.4
Number of Aircraft	436		491.6	

Table 39 - AIRCRAFT BY FIRST OCCURRENCE AND TYPE OF AIRCRAFT
FATAL ACCIDENTS
1989

Type of First Occurrence	Type of Aircraft: All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Glid ers	Ball oons	Other	Aircraft No.	Aircraft Pct.
Abrupt maneuver	3	3	0	0	0	0	0	0	0	0	0	3	0.7
Airframe/component/system fail./ malfunction	21	16	4	1	0	4	1	3	0	1	0	26	6.0
Fire	3	1	1	1	0	0	0	0	0	0	0	3	0.7
Hard landing	2	2	0	0	0	0	0	0	0	0	0	2	0.5
In flight collision with object	43	36	1	4	2	12	6	6	0	2	0	57	13.1
In flight collision with terrain	34	29	5	0	0	5	3	2	0	0	0	39	8.9
In flight encounter with weather	81	69	11	1	0	1	0	1	0	0	0	82	18.8
Loss of control - in flight	119	106	8	5	0	2	1	1	1	0	0	122	28.0
Loss of control - on ground	1	1	0	0	0	0	0	0	0	0	0	1	0.2
Midair collision	21	19	1	1	0	2	0	2	0	0	0	23	5.3
On ground collision with object	0	0	0	0	0	1	1	0	0	0	0	1	0.2
On ground collision with terrain	1	1	0	0	0	0	0	0	0	0	0	1	0.2
Loss of power	14	12	2	0	0	0	0	0	0	0	1	15	3.4
Loss of power(total) - mech failure/malfunction	7	5	2	0	0	1	1	0	0	0	0	8	1.8
Loss of power(partial) - mech failure/malfunction	7	6	1	0	0	0	0	0	0	0	0	7	1.6
Loss of power(total) - non-mechanical	26	22	4	0	0	1	1	0	0	0	1	28	6.4
Loss of power(partial) - non-mechanical	4	4	0	0	0	0	0	0	0	0	0	4	0.9
Propeller/rotor contact	2	1	0	1	0	0	0	0	0	0	0	2	0.5
Undershoot	1	1	0	0	0	0	0	0	0	0	0	1	0.2
Undetermined	1	1	0	0	0	0	0	0	0	0	0	1	0.2
Vortex turbulence encountered	1	1	0	0	0	0	0	0	0	0	0	1	0.2
Missing aircraft	5	5	0	0	0	0	0	0	0	0	0	5	1.1
Miscellaneous/other	2	1	1	0	0	1	0	1	0	0	0	3	0.7
Other	1	1	0	0	0	0	0	0	0	0	0	1	0.2
Aircraft -													
Total -	400	343	41	14	2	30	14	16	1	3	2	436	
Percent -	91.7	78.7	9.4	3.2	0.5	6.9	3.2	3.7	0.2	0.7	0.5		

Table 40 - AIRCRAFT BY FIRST OCCURRENCE AND KIND OF FLYING
FATAL ACCIDENTS
1989

Type of First Occurrence	Kind of Flying						Aircraft	
	Personal	Business	Corp/ Exec.	Instruct.	Aer. App.	Other	No.	Percent
Abrupt maneuver	3	0	0	0	0	0	3	0.7
Airframe/component/system failure/malfunction	17	1	0	2	0	6	26	6.0
Fire	1	1	1	0	0	0	3	0.7
Hard landing	2	0	0	0	0	0	2	0.5
In flight collision with object	23	6	1	2	14	11	57	13.1
In flight collision with terrain	24	5	0	3	1	6	39	8.9
In flight encounter with weather	60	11	0	3	0	8	82	18.8
Loss of control - in flight	84	8	0	7	6	17	122	28.0
Loss of control - on ground	0	0	0	1	0	0	1	0.2
Midair collision	12	3	0	5	0	3	23	5.3
On ground collision with object	0	1	0	0	0	0	1	0.2
On ground collision with terrain	0	0	0	0	1	0	1	0.2
Loss of power	11	0	1	1	0	2	15	3.4
Loss of power(total) - mech failure/malfunction	6	1	0	1	0	0	8	1.8
Loss of power(partial) - mech failure/malfunction	4	1	0	0	0	2	7	1.6
Loss of power(total) - non-mechanical	17	2	1	3	1	4	28	6.4
Loss of power(partial) - non-mechanical	3	0	0	1	0	0	4	0.9
Propeller/rotor contact	1	0	0	0	1	0	2	0.5
Undershoot	1	0	0	0	0	0	1	0.2
Undetermined	1	0	0	0	0	0	1	0.2
Vortex turbulence encountered	1	0	0	0	0	0	1	0.2
Missing aircraft	4	0	0	0	0	1	5	1.1
Miscellaneous/other	0	2	0	0	0	1	3	0.7
Other	0	0	0	0	0	1	1	0.2
Aircraft								
Number -	275	42	4	29	24	62	436	
Percent -	63.1	9.6	0.9	6.7	5.5	14.2		

Table 41 - AIRCRAFT BY FIRST PHASE OF OPERATION AND TYPE OF AIRCRAFT
FATAL ACCIDENTS
1989

Phase of Operation	Type of Aircraft											Aircraft	
	All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Glid ers	Ball oons	Other	No.	Pct.
Standing - engine(s) operating	1	1	0	0	0	1	1	0	0	0	0	2	0.5
Taxi - from landing	1	0	0	1	0	0	0	0	0	0	0	1	0.2
Takeoff	4	3	0	0	1	0	0	0	0	0	0	4	0.9
Takeoff - ground run	2	2	0	0	0	0	0	0	0	0	0	2	0.5
Takeoff - initial climb	61	48	10	3	0	2	0	2	0	0	0	63	14.4
Climb	9	6	1	2	0	0	0	0	0	2	1	12	2.8
Climb - to cruise	11	9	2	0	0	1	0	1	0	0	0	12	2.8
Cruise	48	43	4	1	0	7	2	5	0	0	0	55	12.6
Cruise - normal	60	49	10	1	0	1	1	0	0	0	0	61	14.0
Descent	9	8	1	0	0	0	0	0	0	0	0	9	2.1
Descent - normal	5	5	0	0	0	0	0	0	0	0	0	5	1.1
Descent - uncontrolled	1	1	0	0	0	0	0	0	0	0	0	1	0.2
Approach	15	11	3	1	0	1	0	1	0	1	0	17	3.9
Approach - VFR pattern - downwind	6	5	1	0	0	0	0	0	0	0	0	6	1.4
Approach - VFR pattern - base turn	3	3	0	0	0	0	0	0	0	0	0	3	0.7
Approach - VFR pattern - base to final	10	9	0	1	0	0	0	0	0	0	0	10	2.3
Approach - VFR pattern - final approach	14	13	0	1	0	1	0	1	0	0	0	15	3.4
Approach - go-around (VFR)	4	4	0	0	0	0	0	0	0	0	0	4	0.9
Approach - IAF to FAF/outer marker (IFR)	8	4	2	2	0	0	0	0	0	0	0	8	1.8
Approach - FAF/outer marker to threshold (IFR)	4	3	0	0	1	0	0	0	0	0	0	4	0.9
Approach - missed approach (IFR)	1	1	0	0	0	0	0	0	0	0	0	1	0.2
Landing	2	2	0	0	0	0	0	0	0	0	0	2	0.5
Landing - flare/touchdown	3	3	0	0	0	0	0	0	0	0	0	3	0.7
Landing - roll	2	2	0	0	0	0	0	0	0	0	0	2	0.5
Maneuvering	69	65	4	0	0	10	7	3	1	0	1	81	18.6
Maneuvering - aerial application	18	16	1	1	0	3	2	1	0	0	0	21	4.8
Maneuvering - turn to reverse direction	7	7	0	0	0	2	1	1	0	0	0	9	2.1
Hover	0	0	0	0	0	1	0	1	0	0	0	1	0.2
Other	4	3	1	0	0	0	0	0	0	0	0	4	0.9
Unknown	17	16	1	0	0	0	0	0	0	0	0	17	3.9
Not reported	1	1	0	0	0	0	0	0	0	0	0	1	0.2
Aircraft Number -	400	343	41	14	2	30	14	16	1	3	2	436	
Percent -	91.7	78.7	9.4	3.2	0.5	6.9	3.2	3.7	0.2	0.7	0.5		

Table 42 - AIRCRAFT BY FIRST PHASE OF OPERATION AND KIND OF FLYING
FATAL ACCIDENTS
1989

Phase of Operation	Kind of Flying						Aircraft	
	Personal	Business	Corp/ Exec.	Instruct.	Aer. App.	Other	No.	Percent
Standing - engine(s) operating	1	1	0	0	0	0	2	0.5
Taxi - from landing	0	0	0	0	1	0	1	0.2
Takeoff	2	0	0	1	0	1	4	0.9
Takeoff - ground run	2	0	0	0	0	0	2	0.5
Takeoff - initial climb	44	10	1	6	0	2	63	14.4
Climb	8	0	1	1	0	2	12	2.8
Climb - to cruise	8	2	0	0	0	2	12	2.8
Cruise	30	6	1	5	0	13	55	12.6
Cruise - normal	44	11	0	0	0	6	61	14.0
Descent	5	2	0	0	0	2	9	2.1
Descent - normal	4	0	0	0	0	1	5	1.1
Descent - uncontrolled	1	0	0	0	0	0	1	0.2
Approach	12	1	0	1	0	3	17	3.9
Approach - VFR pattern - downwind	4	1	0	1	0	0	6	1.4
Approach - VFR pattern - base turn	2	0	0	0	0	1	3	0.7
Approach - VFR pattern - base to final	7	0	1	0	0	2	10	2.3
Approach - VFR pattern - final approach	12	0	0	2	0	1	15	3.4
Approach - go-around (VFR)	4	0	0	0	0	0	4	0.9
Approach - IAF to FAF/outer marker (IFR)	7	1	0	0	0	0	8	1.8
Approach - FAF/outer marker to threshold (IFR)	2	2	0	0	0	0	4	0.9
Approach - missed approach (IFR)	1	0	0	0	0	0	1	0.2
Landing	2	0	0	0	0	0	2	0.5
Landing - flare/touchdown	2	0	0	0	0	1	3	0.7
Landing - roll	0	0	0	1	1	0	2	0.5
Maneuvering	50	3	0	11	1	16	81	18.6
Maneuvering - aerial application	1	0	0	0	19	1	21	4.8
Maneuvering - turn to reverse direction	2	1	0	0	2	4	9	2.1
Hover	0	0	0	0	0	1	1	0.2
Other	3	0	0	0	0	1	4	0.9
Unknown	15	0	0	0	0	2	17	3.9
Not reported	0	1	0	0	0	0	1	0.2
Aircraft								
Number -	275	42	4	29	24	62	436	
Percent -	63.1	9.6	0.9	6.7	5.5	14.2		

Table 43 - AIRCRAFT BY BROAD CAUSE/FACTOR AND TYPE OF AIRCRAFT
FATAL ACCIDENTS
1989

Broad Cause:	Type of Aircraft: All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Glid ers	Ball oons	Other	Aircraft No.	Aircraft Pct.
Aircraft	66	53	11	2	0	4	1	3	0	2	1	73	16.7
Propulsion System and Controls	41	35	6	0	0	2	1	1	0	1	1	45	10.3
Flight Control System	7	5	2	0	0	1	0	1	0	0	0	8	1.8
Airframe	13	11	1	1	0	0	0	0	0	0	0	13	3.0
Systems/Equipment/Instruments	8	5	2	1	0	2	0	2	0	1	0	11	2.5
Environment	3	3	0	0	0	4	3	1	0	0	0	7	1.6
Weather	1	1	0	0	0	2	2	0	0	0	0	3	0.7
Object (trees, wires, etc.)	2	2	0	0	0	1	0	1	0	0	0	3	0.7
Terrain/Runway Condition	1	1	0	0	0	1	1	0	0	0	0	2	0.5
Personnel	377	322	39	14	2	28	13	15	1	3	2	411	94.3
Pilot	360	308	37	13	2	25	12	13	1	3	2	391	89.7
Others (Not Aboard)	43	35	7	1	0	4	1	3	0	0	0	47	10.8
Broad Factor:													
Aircraft	21	14	6	1	0	4	2	2	0	1	0	26	6.0
Propulsion System and Controls	6	4	2	0	0	1	1	0	0	0	0	7	1.6
Flight Control System	2	1	1	0	0	1	0	1	0	0	0	3	0.7
Airframe	5	5	0	0	0	0	0	0	0	0	0	5	1.1
Systems/Equipment/Instruments	9	5	3	1	0	2	1	1	0	1	0	12	2.8
Environment	200	171	22	6	1	18	9	9	0	0	1	219	50.2
Weather	139	118	16	5	0	4	2	2	0	0	0	143	32.8
Light Conditions	57	48	6	2	1	4	2	2	0	0	0	61	14.0
Object (trees, wires, etc.)	49	42	4	3	0	10	5	5	0	0	1	60	13.8
Airport/Airways Facilities, Aids	4	2	1	1	0	0	0	0	0	0	0	4	0.9
Terrain/Runway Condition	67	58	8	1	0	6	5	1	0	0	0	73	16.7
Personnel	192	164	25	2	1	12	5	7	0	2	1	207	47.5
Pilot	186	159	24	2	1	11	5	6	0	2	1	200	45.9
Others (Aboard)	2	2	0	0	0	0	0	0	0	0	0	2	0.5
Others (Not Aboard)	14	13	1	0	0	3	1	2	0	1	0	18	4.1
Either Broad Cause or Factor:													
Aircraft	81	65	14	2	0	8	3	5	0	2	1	92	21.1
Propulsion System and Controls	46	38	8	0	0	3	2	1	0	1	1	51	11.7
Flight Control System	8	6	2	0	0	2	0	2	0	0	0	10	2.3
Airframe	17	15	1	1	0	0	0	0	0	0	0	17	3.9
Systems/Equipment/Instruments	15	10	4	1	0	4	1	3	0	1	0	20	4.6
Environment	203	174	22	6	1	18	9	9	0	0	1	222	50.9
Weather	140	119	16	5	0	6	4	2	0	0	0	146	33.5
Light Conditions	57	48	6	2	1	4	2	2	0	0	0	61	14.0
Object (trees, wires, etc.)	51	44	4	3	0	11	5	6	0	0	1	63	14.4
Airport/Airways Facilities, Aids	4	2	1	1	0	0	0	0	0	0	0	4	0.9
Terrain/Runway Condition	68	59	8	1	0	6	5	1	0	0	0	74	17.0
Personnel	382	326	40	14	2	28	13	15	1	3	2	416	95.4
Pilot	363	311	37	13	2	25	12	13	1	3	2	394	90.4
Others (Aboard)	2	2	0	0	0	0	0	0	0	0	0	2	0.5
Others (Not Aboard)	50	41	8	1	0	6	2	4	0	1	0	57	13.1
Aircraft Number -	400	343	41	14	2	30	14	16	1	3	2	436	
Percent -	91.7	78.7	9.4	3.2	0.5	6.9	3.2	3.7	0.2	0.7	0.5		

Table 44 - AIRCRAFT BY BROAD CAUSE/FACTOR AND KIND OF FLYING
FATAL ACCIDENTS
1989

Broad Cause:	Kind of Flying						Aircraft	
	Personal	Business	Corp/ Exec.	Instruct.	Aer. App.	Other	No.	Pct.
Aircraft	48	5	2	5	0	13	73	16.7
Propulsion System and Controls	33	2	1	4	0	5	45	10.3
Flight Control System	5	1	0	0	0	2	8	1.8
Airframe	8	1	1	1	0	2	13	3.0
Systems/Equipment/Instruments	4	1	0	0	0	6	11	2.5
Environment	3	0	0	0	2	2	7	1.6
Weather	2	0	0	0	1	0	3	0.7
Object (trees, wires, etc.)	0	0	0	0	1	2	3	0.7
Terrain/Runway Condition	1	0	0	0	1	0	2	0.5
Personnel	259	41	4	28	23	56	411	94.3
Pilot	249	38	4	26	22	52	391	89.7
Others (Not Aboard)	23	7	0	8	0	9	47	10.8
Broad Factor:								
Aircraft	15	5	0	2	0	4	26	6.0
Propulsion System and Controls	4	1	0	2	0	0	7	1.6
Flight Control System	2	1	0	0	0	0	3	0.7
Airframe	4	1	0	0	0	0	5	1.1
Systems/Equipment/Instruments	6	2	0	0	0	4	12	2.8
Environment	145	22	1	11	12	28	219	50.2
Weather	101	20	1	7	1	13	143	32.8
Light Conditions	44	5	1	1	2	8	61	14.0
Object (trees, wires, etc.)	36	3	1	1	8	11	60	13.8
Airport/Airways Facilities, Aids	3	1	0	0	0	0	4	0.9
Terrain/Runway Condition	48	8	0	4	3	10	73	16.7
Personnel	134	23	2	17	3	28	207	47.5
Pilot	130	22	2	16	3	27	200	45.9
Others (Aboard)	2	0	0	0	0	0	2	0.5
Others (Not Aboard)	8	1	0	4	0	5	18	4.1
Either Broad Cause or Factor:								
Aircraft	59	9	2	6	0	16	92	21.1
Propulsion System and Controls	37	3	1	5	0	5	51	11.7
Flight Control System	6	2	0	0	0	2	10	2.3
Airframe	11	2	1	1	0	2	17	3.9
Systems/Equipment/Instruments	9	2	0	0	0	9	20	4.6
Environment	146	22	1	11	13	29	222	50.9
Weather	103	20	1	7	2	13	146	33.5
Light Conditions	44	5	1	1	2	8	61	14.0
Object (trees, wires, etc.)	36	3	1	1	9	13	63	14.4
Airport/Airways Facilities, Aids	3	1	0	0	0	0	4	0.9
Terrain/Runway Condition	48	8	0	4	4	10	74	17.0
Personnel	263	41	4	28	23	57	416	95.4
Pilot	251	38	4	26	22	53	394	90.4
Others (Aboard)	2	0	0	0	0	0	2	0.5
Others (Not Aboard)	28	8	0	9	0	12	57	13.1
Aircraft								
Number -	275	42	4	29	24	62	436	
Percent -	63.1	9.6	0.9	6.7	5.5	14.2		

Table 45 - AIRCRAFT BY KIND OF FLYING AND TYPE OF AIRCRAFT
FATAL ACCIDENTS
1989

Kind of Flying	Type of Aircraft: All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Glid ers	Ball oons	Other	Aicraft No.	Aicraft Pct.
Personal	263	235	23	5	0	8	6	2	1	1	2	275	63.1
Business	38	24	12	1	1	4	2	2	0	0	0	42	9.6
Corporate/Executive	4	0	2	2	0	0	0	0	0	0	0	4	0.9
Instructional	28	25	2	1	0	1	1	0	0	0	0	29	6.7
Aerial Application	20	18	0	2	0	4	3	1	0	0	0	24	5.5
Other	47	41	2	3	1	13	2	11	0	2	0	62	14.2
Aircraft Number -	400	343	41	14	2	30	14	16	1	3	2	436	
Percent	91.7	78.7	9.4	3.2	0.5	6.9	3.2	3.7	0.2	0.7	0.5		

Table 46 - PILOTS BY TOTAL TIME AND TIME IN TYPE
FATAL ACCIDENTS
1989

Total time (hours)	Time in type (hours): 0-49	50-99	100-499	500-999	1000-4999	5000-9999	10000 or more	Not reptd	Pilots No.	Pilots Percent
0 - 49	16	0	0	0	0	0	0	4	20	4.6
50 - 99	18	6	0	0	0	0	0	2	26	6.0
100 - 499	29	8	32	0	0	0	0	39	108	24.8
500 - 999	10	5	30	5	0	0	0	13	63	14.4
1000 - 4999	15	12	31	17	21	0	0	42	138	31.7
5000 - 9999	3	1	7	5	8	0	0	12	36	8.3
10000 or more	3	0	3	1	7	1	1	18	34	7.8
Not reported	1	0	0	0	0	0	0	10	11	2.5
Pilots Number -	95	32	103	28	36	1	1	140	436	
Percent -	21.8	7.3	23.6	6.4	8.3	0.2	0.2	32.1		

Table 47 - PILOTS BY AGE AND KIND OF FLYING
FATAL ACCIDENTS
1989

Pilot age	Kind of Flying: Per sonal	Busi ness	Corp/ Exec.	Inst ruct.	Aer. App.	Other	Pilots No.	Pilots Percent
15 - 19	4	0	0	0	0	0	4	0.9
20 - 24	11	1	0	4	0	5	21	4.8
25 - 29	13	2	1	3	1	7	27	6.2
30 - 34	22	4	1	6	3	10	46	10.5
35 - 39	22	5	0	4	6	8	45	10.3
40 - 44	35	5	0	4	3	9	56	12.8
45 - 49	41	6	1	1	4	8	61	14.0
50 - 54	31	6	0	3	4	6	50	11.5
55 - 59	28	7	0	2	1	4	42	9.6
60 - 64	34	4	1	1	1	3	44	10.1
65 - 69	21	1	0	1	1	1	25	5.7
70 or older	13	1	0	0	0	1	15	3.4
Pilots Number -	275	42	4	29	24	62	436	
Percent -	63.1	9.6	0.9	6.6	5.5	14.2		

Table 48 - AIRCRAFT BY FIRST OCCURRENCE AND TYPE OF AIRCRAFT
SERIOUS INJURY ACCIDENTS
1989

Type of First Occurrence	Type of Aircraft: All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Glid ers	Ball oons	Other	Aircraft No.	Aircraft Pct.
Abrupt maneuver	1	1	0	0	0	1	0	1	0	0	0	2	0.8
Altitude deviation,uncontrolled	1	1	0	0	0	0	0	0	0	0	0	1	0.4
Airframe/component/system failure/ malfunction	13	11	2	0	0	4	1	3	0	0	0	17	7.0
Fire	1	1	0	0	0	0	0	0	0	0	0	1	0.4
Hard landing	4	4	0	0	0	2	2	0	1	2	0	9	3.7
In flight collision with object	24	24	0	0	0	6	3	3	0	5	0	35	14.3
In flight collision with terrain	9	9	0	0	0	1	1	0	1	0	0	11	4.5
In flight encounter with weather	20	19	0	1	0	1	0	1	0	4	0	25	10.2
Loss of control - in flight	31	31	0	0	0	4	4	0	4	0	0	39	16.0
Loss of control - on ground	7	7	0	0	0	4	4	0	0	0	0	11	4.5
Midair collision	2	2	0	0	0	0	0	0	0	0	0	2	0.8
Nose over	1	1	0	0	0	0	0	0	0	0	0	1	0.4
On ground collision with object	2	2	0	0	0	0	0	0	0	0	0	2	0.8
On ground collision with terrain	1	1	0	0	0	0	0	0	0	0	0	1	0.4
Overrun	1	1	0	0	0	0	0	0	0	0	0	1	0.4
Loss of power	14	14	0	0	0	1	0	1	0	0	0	15	6.1
Loss of power(total) - mech failure/malfunction	13	13	0	0	0	5	4	1	0	0	0	18	7.4
Loss of power(partial) - mech failure/malfunction	9	7	2	0	0	0	0	0	0	0	0	9	3.7
Loss of power(total) - non-mechanical	26	24	0	2	0	2	1	1	0	0	0	28	11.5
Loss of power(partial) - non-mechanical	3	3	0	0	0	2	2	0	0	0	0	5	2.0
Propeller/rotor contact	2	2	0	0	0	1	1	0	0	0	0	3	1.2
Undershoot	2	2	0	0	0	0	0	0	0	0	0	2	0.8
Vortex turbulence encountered	1	1	0	0	0	0	0	0	0	0	0	1	0.4
Miscellaneous/other	4	4	0	0	0	0	0	0	0	1	0	5	2.0
Aircraft													
Number -	192	185	4	3	0	34	23	11	6	12	0	244	
Percent -	78.7	75.8	1.6	1.2	.0	13.9	9.4	4.5	2.5	4.9	.0		

Table 49 - AIRCRAFT BY FIRST OCCURRENCE AND KIND OF FLYING
SERIOUS INJURY ACCIDENTS
1989

Type of First Occurrence	Kind of Flying						Aircraft	
	Personal	Business	Corp/Exec.	Instruct.	Aer. App.	Other	No.	Percent
Abrupt maneuver	1	0	0	0	0	1	2	0.8
Altitude deviation,uncontrolled	0	0	0	0	0	1	1	0.4
Airframe/component/system failure/malfunction	6	1	0	3	3	4	17	7.0
Fire	1	0	0	0	0	0	1	0.4
Hard landing	4	1	0	2	0	2	9	3.7
In flight collision with object	20	1	0	2	7	5	35	14.3
In flight collision with terrain	6	1	0	1	2	1	11	4.5
In flight encounter with weather	17	5	1	0	0	2	25	10.2
Loss of control - in flight	27	2	0	1	2	7	39	16.0
Loss of control - on ground	4	0	0	3	1	3	11	4.5
Midair collision	1	0	0	1	0	0	2	0.8
Nose over	1	0	0	0	0	0	1	0.4
On ground collision with object	2	0	0	0	0	0	2	0.8
On ground collision with terrain	0	0	0	0	1	0	1	0.4
Overrun	1	0	0	0	0	0	1	0.4
Loss of power	11	1	0	0	1	2	15	6.1
Loss of power(total) - mech failure/malfunction	9	3	0	2	3	1	18	7.4
Loss of power(partial) - mech failure/malfunction	8	1	0	0	0	0	9	3.7
Loss of power(total) - non-mechanical	16	2	0	4	0	6	28	11.5
Loss of power(partial) - non-mechanical	4	0	0	1	0	0	5	2.0
Propeller/rotor contact	2	1	0	0	0	0	3	1.2
Undershoot	2	0	0	0	0	0	2	0.8
Vortex turbulence encountered	0	0	0	1	0	0	1	0.4
Miscellaneous/other	3	0	0	1	0	1	5	2.0
Aircraft								
Number -	146	19	1	22	20	36	244	
Percent -	59.8	7.8	0.4	9.0	8.2	14.8		

Table 50 - AIRCRAFT BY FIRST PHASE OF OPERATION AND TYPE OF AIRCRAFT
SERIOUS INJURY ACCIDENTS
1989

Phase of Operation	Type of Aircraft											Aircraft	
	All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Glid ers	Ball oons	Other	No.	Pct.
Standing - engine(s) operating	4	4	0	0	0	3	3	0	0	0	0	7	2.9
Taxi - aerial	0	0	0	0	0	1	1	0	0	0	0	1	0.4
Takeoff	3	3	0	0	0	0	0	0	0	0	0	3	1.2
Takeoff - ground run	1	1	0	0	0	1	1	0	0	0	0	2	0.8
Takeoff - initial climb	51	48	2	1	0	8	4	4	1	0	0	60	24.6
Climb	2	1	1	0	0	0	0	0	0	0	0	2	0.8
Climb - to cruise	2	2	0	0	0	0	0	0	0	0	0	2	0.8
Cruise	17	16	0	1	0	4	2	2	0	0	0	21	8.6
Cruise - normal	17	17	0	0	0	3	2	1	0	1	0	21	8.6
Descent	1	1	0	0	0	0	0	0	0	1	0	2	0.8
Descent - normal	2	2	0	0	0	0	0	0	0	1	0	3	1.2
Approach	7	7	0	0	0	0	0	0	0	0	0	7	2.9
Approach - VFR pattern - downwind	2	2	0	0	0	0	0	0	1	0	0	3	1.2
Approach - VFR pattern - base turn	1	1	0	0	0	0	0	0	0	0	0	1	0.4
Approach - VFR pattern - base to final	5	4	0	1	0	0	0	0	2	0	0	7	2.9
Approach - VFR pattern - final approach	16	15	1	0	0	1	1	0	1	2	0	20	8.2
Approach - go-around (VFR)	5	5	0	0	0	0	0	0	0	0	0	5	2.0
Approach - FAF/outer marker to threshold (IFR)	1	1	0	0	0	0	0	0	0	0	0	1	0.4
Landing	2	2	0	0	0	0	0	0	0	4	0	6	2.5
Landing - flare/touchdown	8	8	0	0	0	1	1	0	1	3	0	13	5.3
Landing - roll	7	7	0	0	0	0	0	0	0	0	0	7	2.9
Maneuvering	23	23	0	0	0	4	3	1	0	0	0	27	11.1
Maneuvering - aerial application	7	7	0	0	0	3	3	0	0	0	0	10	4.1
Maneuvering - turn to reverse direction	2	2	0	0	0	1	1	0	0	0	0	3	1.2
Hover	0	0	0	0	0	4	1	3	0	0	0	4	1.6
Other	6	6	0	0	0	0	0	0	0	0	0	6	2.5
Aircraft													
Number -	192	185	4	3	0	34	23	11	6	12	0	244	
Percent -	78.7	75.8	1.6	1.2	.0	13.9	9.4	4.5	2.5	4.9	.0		

Table 51 - AIRCRAFT BY FIRST PHASE OF OPERATION AND KIND OF FLYING
SERIOUS INJURY ACCIDENTS
1989

Phase of Operation	Kind of Flying						Aircraft	
	Personal	Business	Corp/ Exec.	Inst ruct.	Aer. App.	Other	No.	Percent
Standing - engine(s) operating	4	1	0	1	0	1	7	2.9
Taxi - aerial	0	0	0	1	0	0	1	0.4
Takeoff	2	0	0	1	0	0	3	1.2
Takeoff - ground run	1	0	0	0	1	0	2	0.8
Takeoff - initial climb	40	3	0	3	1	13	60	24.6
Climb	2	0	0	0	0	0	2	0.8
Climb - to cruise	2	0	0	0	0	0	2	0.8
Cruise	12	2	0	2	2	3	21	8.6
Cruise - normal	12	5	1	3	0	0	21	8.6
Descent	1	1	0	0	0	0	2	0.8
Descent - normal	2	1	0	0	0	0	3	1.2
Approach	2	2	0	2	0	1	7	2.9
Approach - VFR pattern - downwind	3	0	0	0	0	0	3	1.2
Approach - VFR pattern - base turn	1	0	0	0	0	0	1	0.4
Approach - VFR pattern - base to final	3	2	0	0	0	2	7	2.9
Approach - VFR pattern - final approach	16	1	0	2	0	1	20	8.2
Approach - go-around (VFR)	4	0	0	1	0	0	5	2.0
Approach - FAF/outer marker to threshold (IFR)	1	0	0	0	0	0	1	0.4
Landing	2	1	0	2	0	1	6	2.5
Landing - flare/touchdown	9	0	0	1	0	3	13	5.3
Landing - roll	4	0	0	1	1	1	7	2.9
Maneuvering	18	0	0	1	1	7	27	11.1
Maneuvering - aerial application	0	0	0	0	10	0	10	4.1
Maneuvering - turn to reverse direction	0	0	0	0	3	0	3	1.2
Hover	0	0	0	0	1	3	4	1.6
Other	5	0	0	1	0	0	6	2.5
Aircraft								
Number -	146	19	1	22	20	36	244	
Percent -	59.8	7.8	0.4	9.0	8.2	14.8		

Table 52 - AIRCRAFT BY KIND OF FLYING AND TYPE OF AIRCRAFT
SERIOUS INJURY ACCIDENTS
1989

Kind of Flying	Type of Aircraft: All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Glid ers	Ball oons	Other	Aircraft No.	Aircraft Pct.
Personal	131	126	3	2	0	4	4	0	6	5	0	146	59.8
Business	12	12	0	0	0	5	4	1	0	2	0	19	7.8
Corporate/Executive	0	0	0	0	0	1	0	1	0	0	0	1	0.4
Instructional	17	17	0	0	0	4	4	0	0	1	0	22	9.0
Aerial Application	13	13	0	0	0	7	7	0	0	0	0	20	8.2
Other	19	17	1	1	0	13	4	9	0	4	0	36	14.8
Aircraft													
Number -	192	185	4	3	0	34	23	11	6	12	0	244	
Percent -	78.7	75.8	1.6	1.2	.0	13.9	9.4	4.5	2.5	4.9	.0		

Table 53 - PILOTS BY TOTAL TIME AND TIME IN TYPE
SERIOUS INJURY ACCIDENTS
1989

Total time (hours)	Time in type (hours): 0-49	50-99	100-499	500-999	1000-4999	5000-9999	10000 or more	Not reptd	Pilots: No.	Pilots: Percent
0 - 49	2	0	0	0	0	0	0	1	3	1.2
50 - 99	7	6	0	0	0	0	0	3	16	6.6
100 - 499	22	11	21	0	0	0	0	13	67	27.5
500 - 999	13	1	18	6	0	0	0	7	45	18.4
1000 - 4999	13	2	21	8	10	0	0	10	64	26.2
5000 - 9999	4	0	5	2	7	1	0	2	21	8.6
10000 or more	3	0	4	1	9	3	1	3	24	9.8
Not reported	0	0	0	0	1	0	0	3	4	1.6
Pilots										
Number -	64	20	69	17	27	4	1	42	244	
Percent -	26.2	8.2	28.3	7.0	11.1	1.6	0.4	17.2		

Table 54 - PILOTS BY AGE AND KIND OF FLYING
SERIOUS INJURY ACCIDENTS
1989

Pilot age	Kind of Flying						Pilots	
	Personal	Business	Corp/ Exec.	Instruct.	Aer. App.	Other	No.	Percent
15 - 19	2	0	0	0	0	1	3	1.2
20 - 24	14	1	0	2	1	0	18	7.4
25 - 29	8	0	0	5	4	2	19	7.8
30 - 34	13	3	0	1	0	6	23	9.4
35 - 39	16	2	1	3	3	4	29	11.9
40 - 44	17	2	0	2	4	10	35	14.3
45 - 49	16	5	0	3	4	6	34	14.0
50 - 54	16	3	0	3	1	2	25	10.2
55 - 59	15	1	0	1	3	2	22	9.0
60 - 64	11	2	0	1	0	2	16	6.5
65 - 69	11	0	0	1	0	0	12	5.0
70 or older	4	0	0	0	0	1	5	2.0
Not reported	3	0	0	0	0	0	3	1.2
Pilots								
Number -	146	19	1	22	20	36	244	
Percent -	59.8	7.8	0.4	9.0	8.2	14.7		

Table 55 - AIRCRAFT BY FIRST OCCURRENCE AND TYPE OF AIRCRAFT
PROPERTY DAMAGE ACCIDENTS
1989

Type of First Occurrence	Type of Aircraft											Aircraft	
	All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Glid ers	Ball oons	Other	No.	Pct.
Abrupt maneuver	3	3	0	0	0	1	0	1	0	0	0	4	0.3
Altitude deviation,uncontrolled	3	2	1	0	0	0	0	0	0	0	0	3	0.2
Airframe/component/system fail./ malfunction	41	29	9	2	1	19	13	6	2	1	0	63	4.0
Dragged wing, rotor, pod, or float	9	9	0	0	0	3	3	0	1	0	0	13	0.8
Fire	12	8	4	0	0	0	0	0	0	0	0	12	0.8
Forced landing	3	3	0	0	0	0	0	0	0	0	0	3	0.2
Gear collapsed	10	4	5	1	0	0	0	0	0	0	0	10	0.6
Main gear collapsed	25	20	5	0	0	0	0	0	0	0	0	25	1.6
Nose gear collapsed	7	6	1	0	0	0	0	0	0	0	0	7	0.4
Complete gear collapsed	2	0	2	0	0	0	0	0	0	0	0	2	0.1
Gear not extended	15	8	6	0	1	0	0	0	0	0	0	15	1.0
Hard landing	92	83	8	0	1	8	6	2	1	0	1	102	6.5
In flight collision with object	80	77	0	3	0	12	9	3	3	4	0	99	6.3
In flight collision with terrain	47	46	0	1	0	9	8	1	0	0	0	56	3.6
In flight encounter with weather	50	45	4	1	0	1	1	0	3	0	0	54	3.5
Loss of control - in flight	119	115	3	1	0	22	18	4	1	0	0	142	9.1
Loss of control - on ground	207	195	6	5	1	3	2	1	0	0	0	210	13.4
Midair collision	8	7	1	0	0	0	0	0	0	2	0	10	0.6
Nose down	2	2	0	0	0	0	0	0	0	0	0	2	0.1
Nose over	25	25	0	0	0	0	0	0	0	0	0	25	1.6
On ground collision with object	49	46	3	0	0	4	2	2	1	0	0	54	3.5
On ground collision with terrain	35	33	2	0	0	1	0	1	0	0	0	36	2.3
On ground encounter with weather	13	12	0	1	0	0	0	0	0	0	0	13	0.8
Overrun	54	50	3	0	1	0	0	0	1	0	0	55	3.5
Loss of power	82	78	3	0	1	10	5	5	0	0	0	92	5.9
Loss of power(total) - mech failure/malfunction	80	75	3	1	1	5	1	4	0	0	1	86	5.5
Loss of power(partial) - mech failure/malfunction	43	41	2	0	0	5	2	3	0	0	0	48	3.1
Loss of power(total) - non-mechanical	219	206	13	0	0	12	9	3	0	0	0	231	14.8
Loss of power(partial) - non-mechanical	29	25	4	0	0	3	1	2	0	0	0	32	2.0
Propeller blast or jet exhaust/ suction	1	1	0	0	0	0	0	0	0	0	0	1	0.1
Roll over	0	0	0	0	0	2	1	1	0	0	0	2	0.1
Undershoot	24	19	5	0	0	0	0	0	1	0	0	25	1.6
Vortex turbulence encountered	3	3	0	0	0	0	0	0	0	0	0	3	0.2
Miscellaneous/other	22	20	2	0	0	2	2	0	2	0	0	26	1.7
Other	1	1	0	0	0	0	0	0	0	0	0	1	0.1
Aircraft													
Number -	1415	1297	95	16	7	122	83	39	16	7	2	1562	
Percent -	90.6	83.0	6.1	1.0	0.4	7.8	5.3	2.5	1.0	0.4	0.1		

Table 56 - AIRCRAFT BY FIRST OCCURRENCE AND KIND OF FLYING
PROPERTY DAMAGE ACCIDENTS
1989

Type of First Occurrence	Kind of Flying						Aircraft	
	Personal	Business	Corp/ Exec.	Instruct.	Aer. App.	Other	No.	Percent
Abrupt maneuver	3	1	0	0	0	0	4	0.3
Altitude deviation,uncontrolled	2	0	0	0	0	1	3	0.2
Airframe/component/system failure/malfunction	28	4	1	5	11	14	63	4.0
Dragged wing, rotor, pod, or float	6	0	0	4	1	2	13	0.8
Fire	8	1	0	0	1	2	12	0.8
Forced landing	2	0	0	1	0	0	3	0.2
Gear collapsed	3	2	0	4	0	1	10	0.6
Main gear collapsed	18	2	0	2	2	1	25	1.6
Nose gear collapsed	6	1	0	0	0	0	7	0.4
Complete gear collapsed	1	1	0	0	0	0	2	0.1
Gear not extended	8	3	0	2	0	2	15	1.0
Hard landing	56	3	1	39	0	3	102	6.5
In flight collision with object	56	2	0	16	16	9	99	6.3
In flight collision with terrain	36	3	0	6	9	2	56	3.6
In flight encounter with weather	36	5	0	5	1	7	54	3.5
Loss of control - in flight	80	9	0	23	7	23	142	9.1
Loss of control - on ground	129	8	2	52	9	10	210	13.4
Midair collision	8	0	0	2	0	0	10	0.6
Nose down	2	0	0	0	0	0	2	0.1
Nose over	15	1	0	4	2	3	25	1.6
On ground collision with object	44	0	2	4	0	4	54	3.5
On ground collision with terrain	28	3	0	1	1	3	36	2.3
On ground encounter with weather	9	1	0	1	2	0	13	0.8
Overrun	36	6	0	9	0	4	55	3.5
Loss of power	52	6	0	12	10	12	92	5.9
Loss of power(total) - mech failure/malfunction	54	5	0	3	11	13	86	5.5
Loss of power(partial) - mech failure/malfunction	26	1	0	4	10	7	48	3.1
Loss of power(total) - non-mechanical	143	13	0	38	20	17	231	14.8
Loss of power(partial) - non-mechanical	19	1	1	5	1	5	32	2.0
Propeller blast or jet exhaust/suction	1	0	0	0	0	0	1	0.1
Roll over	1	0	0	0	0	1	2	0.1
Undershoot	13	3	0	6	0	3	25	1.6
Vortex turbulence encountered	1	0	0	2	0	0	3	0.2
Miscellaneous/other	19	0	0	5	0	2	26	1.7
Other	0	0	0	1	0	0	1	0.1
Aircraft								
Number -	949	85	7	256	114	151	1562	
Percent -	60.8	5.4	0.4	16.4	7.3	9.7		

Table 57 - AIRCRAFT BY FIRST PHASE OF OPERATION AND TYPE OF AIRCRAFT
PROPERTY DAMAGE ACCIDENTS
1989

Phase of Operation	Type of Aircraft											Aircraft	
	All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Glid ers	Ball oons	Other	No.	Pct.
Standing	1	1	0	0	0	0	0	0	0	0	0	1	0.1
Standing - starting engine(s)	13	13	0	0	0	0	0	0	0	0	0	13	0.8
Standing - engine(s) operating	9	9	0	0	0	0	0	0	0	0	0	9	0.6
Standing - engine(s) not operating	1	0	1	0	0	0	0	0	0	0	0	1	0.1
Standing - idling rotors	0	0	0	0	0	2	0	2	0	0	0	2	0.1
Taxi	5	5	0	0	0	0	0	0	0	0	0	5	0.3
Taxi - to takeoff	22	20	2	0	0	0	0	0	0	0	0	22	1.4
Taxi - from landing	26	23	3	0	0	0	0	0	0	0	0	26	1.7
Taxi - aerial	0	0	0	0	0	3	3	0	0	0	0	3	0.2
Takeoff	21	19	1	1	0	8	5	3	0	0	0	29	1.9
Takeoff - ground run	77	67	7	3	0	1	1	0	2	0	0	80	5.1
Takeoff - initial climb	194	185	9	0	0	8	8	0	3	1	0	206	13.2
Climb	7	7	0	0	0	3	1	2	0	0	0	10	0.6
Climb - to cruise	14	13	1	0	0	1	1	0	0	0	0	15	1.0
Cruise	95	90	4	1	0	12	8	4	0	1	1	109	7.0
Cruise - normal	135	121	12	1	1	11	9	2	2	0	0	148	9.5
Cruise - holding(IFR)	1	1	0	0	0	1	0	1	0	0	0	2	0.1
Descent	5	5	0	0	0	1	1	0	0	0	0	6	0.4
Descent - normal	19	18	1	0	0	2	1	1	0	1	0	22	1.4
Descent - emergency	2	2	0	0	0	0	0	0	1	0	0	3	0.2
Descent - uncontrolled	2	2	0	0	0	0	0	0	0	0	0	2	0.1
Approach	33	29	4	0	0	3	1	2	0	0	0	36	2.3
Approach - VFR pattern - downwind	8	8	0	0	0	1	1	0	1	0	0	10	0.6
Approach - VFR pattern - base turn	4	4	0	0	0	0	0	0	0	0	0	4	0.3
Approach - VFR pattern - base to final	6	6	0	0	0	0	0	0	0	0	0	6	0.4
Approach - VFR pattern - final approach	79	71	8	0	0	3	1	2	3	1	0	86	5.5
Approach - go-around (VFR)	29	27	1	1	0	1	1	0	0	0	0	30	1.9
Approach - FAF/outer marker to threshold (IFR)	4	2	2	0	0	0	0	0	0	0	0	4	0.3
Approach - circling(IFR)	1	0	1	0	0	0	0	0	0	0	0	1	0.1
Landing	40	33	7	0	0	4	3	1	0	1	0	45	2.9
Landing - flare/touchdown	161	146	12	1	2	12	8	4	1	0	1	175	11.2
Landing - roll	242	220	15	5	2	0	0	0	1	0	0	243	15.6
Maneuvering	61	57	3	1	0	10	5	5	1	0	0	72	4.6
Maneuvering - aerial application	39	37	0	2	0	8	4	4	0	0	0	47	3.0
Maneuvering - turn to reverse direction	0	0	0	0	0	3	3	0	0	0	0	3	0.2
Maneuvering - turn to landing area (emergency)	1	1	0	0	0	0	0	0	1	0	0	2	0.1
Hover	0	0	0	0	0	23	17	6	0	0	0	23	1.5
Unknown	2	2	0	0	0	0	0	0	0	0	0	2	0.1
Other	56	53	1	0	2	1	1	0	0	2	0	59	3.8
Aircraft Number -	1415	1297	95	16	7	122	83	39	16	7	2	1562	
Percent -	90.6	83.0	6.1	1.0	0.4	7.8	5.3	2.5	1.0	0.4	0.1		

Table 58 - AIRCRAFT BY FIRST PHASE OF OPERATION AND KIND OF FLYING
PROPERTY DAMAGE ACCIDENTS
1989

Phase of Operation	Kind of Flying						Aircraft	
	Personal	Business	Corp/ Exec.	Inst ruct.	Aer. App.	Other	No.	Percent
Standing	1	0	0	0	0	0	1	0.1
Standing - starting engine(s)	12	0	0	0	1	0	13	0.8
Standing - engine(s) operating	8	0	0	1	0	0	9	0.6
Standing - engine(s) not operating	0	0	0	0	0	1	1	0.1
Standing - idling rotors	0	0	1	0	0	1	2	0.1
Taxi	5	0	0	0	0	0	5	0.3
Taxi - to takeoff	18	1	0	1	0	2	22	1.4
Taxi - from landing	17	3	1	2	0	3	26	1.7
Taxi - aerial	0	0	0	1	0	2	3	0.2
Takeoff	15	1	0	6	5	2	29	1.9
Takeoff - ground run	48	3	1	15	10	3	80	5.1
Takeoff - initial climb	146	5	0	21	17	17	206	13.2
Climb	5	1	0	0	2	2	10	0.6
Climb - to cruise	12	1	0	1	0	1	15	1.0
Cruise	64	6	0	12	10	17	109	7.0
Cruise - normal	104	12	0	13	2	17	148	9.5
Cruise - holding(IFR)	1	0	0	0	0	1	2	0.1
Descent	1	2	0	2	0	1	6	0.4
Descent - normal	14	2	1	4	0	1	22	1.4
Descent - emergency	2	0	0	1	0	0	3	0.2
Descent - uncontrolled	1	0	0	0	1	0	2	0.1
Approach	20	4	0	7	2	3	36	2.3
Approach - VFR pattern - downwind	6	1	0	2	0	1	10	0.6
Approach - VFR pattern - base turn	3	0	0	0	0	1	4	0.3
Approach - VFR pattern - base to final	3	0	0	2	0	1	6	0.4
Approach - VFR pattern - final approach	50	5	0	20	0	11	86	5.5
Approach - go-around (VFR)	15	0	0	11	1	3	30	1.9
Approach - FAF/outer marker to threshold (IFR)	1	3	0	0	0	0	4	0.3
Approach - circling(IFR)	0	1	0	0	0	0	1	0.1
Landing	30	2	0	10	0	3	45	2.9
Landing - flare/touchdown	103	12	2	50	0	8	175	11.2
Landing - roll	154	14	1	46	13	15	243	15.6
Maneuvering	37	3	0	9	2	21	72	4.6
Maneuvering - aerial application	1	0	0	0	45	1	47	3.0
Maneuvering - turn to reverse direction	0	0	0	0	3	0	3	0.2
Maneuvering - turn to landing area (emergency)	2	0	0	0	0	0	2	0.1
Hover	5	2	0	7	0	9	23	1.5
Unknown	2	0	0	0	0	0	2	0.1
Other	43	1	0	12	0	3	59	3.7
Aircraft								
Number -	949	85	7	256	114	151	1562	
Percent -	60.8	5.4	0.4	16.4	7.3	9.7		

Table 59 - AIRCRAFT BY KIND OF FLYING AND TYPE OF AIRCRAFT
PROPERTY DAMAGE ACCIDENTS
1989

Kind of Flying	Type of Aircraft: All Fixed Wing	Fixed Wing Singl Recip Engin	Fixed Wing Multi Recip Engin	Fixed Wing Turbo prop	Fixed Wing Turbo Jet	All Rotor craft	Rotor craft Recip Engin	Rotor craft Turb Engin	Gliders	Balloons	Other	Aircraft No.	Aircraft Pct.
Personal	903	858	43	0	2	24	22	2	14	6	2	949	60.8
Business	80	64	15	1	0	5	2	3	0	0	0	85	5.4
Corporate/Executive	4	0	2	1	1	3	0	3	0	0	0	7	0.4
Instructional	224	208	15	1	0	30	25	5	2	0	0	256	16.4
Aerial Application	95	85	0	10	0	19	15	4	0	0	0	114	7.3
Other	109	82	20	3	4	41	19	22	0	1	0	151	9.7
Aircraft													
Number -	1415	1297	95	16	7	122	83	39	16	7	2	1562	
Percent -	90.6	83.0	6.1	1.0	0.4	7.8	5.3	2.5	1.0	0.4	0.1		

Table 60 - PILOTS BY TOTAL TIME AND TIME IN TYPE
PROPERTY DAMAGE ACCIDENTS
1989

Total time (hours)	Time in type (hours): 0-49	50-99	100-499	500-999	1000-4999	5000-9999	10000 or more	Not reptd	Pilots No.	Pilots Percent
0 - 49	103	0	0	0	0	0	0	5	108	6.9
50 - 99	49	40	0	0	0	0	0	5	94	6.0
100 - 499	149	82	155	0	0	0	0	37	423	27.1
500 - 999	53	28	97	43	0	0	0	9	230	14.7
1000 - 4999	68	36	117	71	106	0	0	37	435	27.8
5000 - 9999	15	10	32	14	58	6	0	12	147	9.4
10000 or more	8	6	16	13	34	12	4	6	99	6.3
Not reported	0	2	3	1	0	1	0	19	26	1.7
Pilots										
Number -	445	204	420	142	198	19	4	130	1562	
Percent -	28.5	13.1	26.9	9.1	12.7	1.2	0.3	8.3		

Table 61 - PILOTS BY AGE AND KIND OF FLYING
PROPERTY DAMAGE ACCIDENTS
1989

Pilot age	Kind of Flying						Pilots	
	Personal	Business	Corp/ Exec.	Instruct.	Aer. App.	Other	No.	Percent
15 - 19	14	0	0	10	2	2	28	1.8
20 - 24	48	3	0	41	1	8	101	6.5
25 - 29	74	3	0	44	15	18	154	9.9
30 - 34	85	7	1	39	18	13	163	10.4
35 - 39	128	13	1	27	16	23	208	13.3
40 - 44	153	14	2	34	18	28	249	15.9
45 - 49	120	16	2	24	17	14	193	12.3
50 - 54	106	11	0	12	8	18	155	9.9
55 - 59	83	12	1	7	13	6	122	7.8
60 - 64	65	3	0	11	3	7	89	5.7
65 - 69	48	3	0	4	2	4	61	3.9
70 or older	13	0	0	1	1	0	15	1.0
Not reported	12	0	0	2	0	10	24	1.5
Pilots								
Number -	949	85	7	256	114	151	1562	
Percent -	60.7	5.4	0.4	16.4	7.3	9.7		

Table 62 - SUMMARY OF LOSSES
MIDAIR COLLISION ACCIDENTS
(One or Both Aircraft General Aviation)
1985 - 1989

	1985	1986	1987	1988	1989
Accidents					
Fatal	13	17	13	9	12
Involved Serious Injury	1	4	1	2	1
Involved Minor Injury	0	3	1	2	2
Involved No Injury	9	5	10	6	3
Total	23	29	25	19	18
Fatalities					
Passenger	14	29	8	2	13
Crew	19	28	23	12	27
Other Persons	2	79	13	2	1
Total	35	136	44	16	41
Aircraft Damaged*					
Destroyed	18	26	20	15	22
Substantial	20	24	16	15	9
Minor	3	5	6	5	3
None	1	1	1	1	1
Total	42	56	43	36	35

* Number of General Aviation Aircraft

Table 63 - ACCIDENTS BY TYPES OF OPERATIONS
MIDAIR COLLISION ACCIDENTS
1980 - 1989

Year	Accidents Total	Accidents Fatal	Total Fatalities	Number of Accidents Involving A General Aviation Aircraft AND 121	S135	N135	GA	US Mil	Forgn	Not Reg
1980	24	19	57	0	0	2	21	1	0	0
1981	29	12	45	0	1	2	25	1	0	0
1982	28	17	56	0	1	1	25	0	1	0
1983	12	7	22	0	0	1	10	0	1	0
1984	25	14	47	0	1	0	24	0	0	0
1985	23	13	35	0	0	0	19	2	1	1
1986	29	17	136	0	0	0	27	1	1	0
1987	25	13	44	0	3	2	18	2	0	0
1988	19	9	16	0	0	2	17	0	0	0
1989	18	12	41	0	0	1	17	0	0	0
	232	133	499	0	6	11	203	7	4	1

NOTE: 121 = 14 CFR 121, 125 or 127 Operation
S135 = Scheduled 14 CFR 135 Operation
N135 = Nonscheduled 14 CFR 135 Operation
GA = General Aviation Operation
US Mil = United States Military Operation
Forgn = Foreign Registered Aircraft Operation
Not Reg = Operation by Unregistered Aircraft

Table 64 - ACCIDENTS BY WEATHER AND VISIBILITY
MIDAIR COLLISION ACCIDENTS
1989

Weather Conditions	Accidents No.	Accidents Percent
Visual Meteorological Conditions (VMC)	18	100.0
Instrument Meteorological Conditions (IMC)	0	0
Total	18	100.0
Visibility		
Greater than, Equal to 5 Miles, Less Than 10 Miles	2	11.1
Greater than, Equal to 10 Miles, Less than 20 Miles	8	44.4
Greater than, Equal to 20 Miles	8	44.4
Total	18	100.0

Table 65 - ACCIDENTS BY PHASES OF OPERATION
MIDAIR COLLISION ACCIDENTS
1989

Phases of Operation		Accidents*	
Aircraft 1	Aircraft 2	No.	Percent
Takeoff - Initial Climb	Takeoff - Intial Climb	1	5.5
Total (Either or Both Aircraft in Takeoff Phase)		1	5.5
Climb	Cruise	1	5.5
Climb to Cruise	Approach	1	5.5
Climb to Cruise	Maneuvering	1	5.5
Climb to Cruise	Cruise	1	5.5
Total (Either or Both Aircraft in Climb Phase)		4	22.0
Cruise	Maneuvering	2	11.1
Cruise - Normal	Unknown	1	5.5
Cruise	Climb	1	5.5
Cruise	Climb to Cruise	1	5.5
Cruise - Normal	Cruise - Normal	3	16.7
Total (Either or Both Aircraft in Cruise Phase)		8	44.3
Descent	Approach - VFR Pattern - Downwind	1	5.5
Total (Either or Both Aircraft in Descent Phase)		1	5.5
Approach	Climb to Cruise	1	5.5
Approach - VFR Pattern - Downwind	Descent	1	5.5
Approach - VFR Pattern - Final Approach	Approach - VFR Pattern - Final Approach	2	11.1
Total (Either or Both Aircraft in Approach Phase)		4	22.1
Landing - Flare/Touchdown	Landing - Flare/Touchdown	1	5.5
Total (Either or Both Aircraft in Landing Phase)		1	5.5
Maneuvering	Maneuvering	3	16.7
Maneuvering	Climb to Cruise	1	5.5
Maneuvering	Cruise	1	5.5
Total (Either or Both Aircraft in Maneuvering Phase)		5	27.7
Total Number of Midair Accidents		18	

* Midair collision accidents in this table are grouped according to the Phase of Operation of ONE of the involved aircraft. Column totals do not equal the total number of accidents since collisions between aircraft with different phases of operation are listed in both groupings.*

Table 66 - ACCIDENTS BY TYPE OF FLIGHT PLANS FILED
MIDAIR COLLISION ACCIDENTS
1989

Types of Flight Plan Filed	Accidents* No.	Percent
None and None	14	77.8
None and IFR	3	16.7
Total (Either or Both Aircraft with No Flight Plan Filed)	17	94.5
Company (VFR) and Company (VFR)	1	5.5
Total (Either or Both Aircraft with Company (VFR) Flight Plan Filed)	1	5.5
IFR and None	1	5.5
Total (Either or Both Aircraft with IFR Flight Plan Filed)	1	5.5
Total Number of Midair Accidents	18	

* Midair collision accidents in this table are grouped according to the Type of Flight Plan filed by ONE of the involved aircraft. Column totals do not equal the total number of accidents since collisions between aircraft with different types of flight plans are listed in both groups.

Table 67 - ACCIDENTS BY TYPES OF AIRCRAFT
MIDAIR COLLISION ACCIDENTS
1989

Type(s) of Aircraft	Accidents* No.	Percent
Fixed Wing Single Reciprocating Engine and Fixed Wing Single Reciprocating Engine	12	66.7
Fixed Wing Single Reciprocating Engine and Fixed Wing Multiple Reciprocating Engine	2	11.1
Fixed Wing Single Reciprocating Engine and Fixed Wing Turboprop	1	5.5
Fixed Wing Single Reciprocating Engine and Rotorcraft, Turbine Engine	1	5.5
Total Fixed Wing (Either or Both Aircraft)	16	88.8
Rotorcraft, Turbine Engine and Fixed Wing Single Reciprocating Engine	1	5.5
Rotorcraft, Turbine Engine and Rotorcraft, Turbine Engine	1	5.5
Total Rotorcraft (Either or Both Aircraft)	2	11.0
Balloon and Balloon	1	5.5
Total Balloons (Either or Both Aircraft)	1	5.5
Total Number of Midair Accidents	18	

* Midair collision accidents in this table are grouped according to the Type of Aircraft of ONE of the involved aircraft. Column totals do not equal the total number of accidents since collisions between different types of aircraft are listed in both groupings.

Table 68 - ACCIDENTS BY KINDS OF FLYING
MIDAIR COLLISION ACCIDENTS
1989

Kind(s) of Flying	Accidents*	
	No.	Percent
Personal and Personal	7	38.9
Personal and Business	1	5.5
Personal and Instruction	4	22.2
Personal and Other	2	11.1
Total (Personal Flying by Either or Both Aircraft)	14	77.7
Business and Personal	1	5.5
Business and Instruction	1	5.5
Business and Other	1	5.5
Total (Business Flying By Either or Both Aircraft)	3	16.5
Instruction and Instruction	1	5.5
Instruction and Personal	4	22.2
Instruction and Business	1	5.5
Instruction and Other	1	5.5
Total (Instructional Flying by Either or Both Aircraft)	7	38.7
Other and Personal	2	11.1
Other and Business	1	5.5
Other and Instruction	1	5.5
Total (Other Kind of Flying by Either or Both Aircraft)	4	22.1
Total Number of Midair Accidents	18	

* Midair collision accidents in this table are grouped according to the Kind of Flying of ONE of the involved aircraft. Column totals do not equal the total number of accidents since collisions between aircraft with different Kinds of Flying are listed in both groupings.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

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APPENDIX A -- EXPLANATORY NOTES

AIRCRAFT ACCIDENT: The accidents included in this report 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 Board's definition of substantial damage as stated in 49 CFR 830.2 is:

(1) Except as provided in subparagraph (2) of this paragraph, substantial damage means damage or structural failure which adversely affects the structural strength, performance, or flight characteristics of the aircraft, and which 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 of 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".

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 two or more causes exist in 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.

KIND OF FLYING: The purpose for which the aircraft was being operated at the time of the accident. In this report, accident statistics are presented for five kinds of flying which are defined as follows:

Personal - Flying by individuals in their own or rented aircraft for pleasure, or personal transportation not in furtherance of their occupation or company business. This category includes practice flying (for the purpose of increasing or maintaining proficiency) not performed under supervision of an accredited instructor, and not part of an approved flight training program.

Business - The use of aircraft by pilots (not receiving direct salary or compensation for piloting) in connection with their occupation or in the furtherance of a private business.

Corporate/Executive - The use of aircraft owned or leased, and operated by a corporate or business firm for the transportation of personnel or cargo in furtherance of the corporation's or firm's business, and which are flown by professional pilots receiving a direct salary or compensation for piloting.

Aerial Application - The operation of aircraft for the purpose of dispensing any substance for plant nourishment, soil treatment, propagation of plant life, pest control, or fire control, including flying to and from the application site.

Instructional - Flying accomplished in supervised training under the direction of an accredited instructor.

PHASE OF OPERATION: The phase of the flight or operation is the particular phase of flight in which

the first occurrence or circumstance occurred. In the event that there was more than one occurrence in one operational phase, the same phase is recorded for each of those occurrences.

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. (49 CFR 830.2)

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	IN FLIGHT COLLISION WITH TERRAIN
Phase of Operation	LANDING - FLARE/TOUCHDOWN

Finding(s)

1. WHEELS UP LANDING - INADVERTENT - PILOT IN COMMAND
2. IMPROPER USE OF PROCEDURE, DIVERTED ATTENTION - PILOT IN COMMAND

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 classifications VMC/IMC as carried under Type of Weather Conditions.

APPENDIX B

CAUSE/FACTOR ASSIGNMENTS

CAUSE / FACTOR TABLE
ALL ACCIDENTS - 1989

	Cause or Factor	Cause
Aircraft		
Accessory drive assy,drive gear	3	3
Aerial application equipment	1	1
Air cond/heating/pressurization	1	0
Aircraft performance,climb capability	3	2
Aircraft performance,engine out capability	2	1
Aircraft performance,helicopter hover performance	1	1
Aircraft performance,hydroplaning condition	2	0
Aircraft performance,takeoff capability	1	0
All engines	1	0
Annunciator panel lights	1	0
Anti-ice/de-ice system,carburetor de-ice	1	1
Anti-ice/de-ice system,pitot anti-ice	1	1
Autopilot/flight director	2	0
Balloon equipment,basket	1	0
Balloon equipment,envelope	1	1
Balloon equipment,heater system	1	1
Bleed air system,lines	1	1
Carburetor heat control	2	1
Comm/nav equipment,glide slope receiver	1	0
Compressor assembly	1	1
Compressor assembly,blade	2	2
Compressor assembly,casting	1	1
Compressor assembly,impeller	1	1
Compressor assembly,rotor disc	1	1
Compressor assembly,stator vane	1	1
Cooling system,baffle	1	1
Cooling system,cowling	1	1
Door,passenger	3	0
Electrical system	8	2
Electrical system,alternator	2	1
Electrical system,battery	1	0
Electrical system,circuit breaker	4	2
Electrical system,electric motor	1	1
Electrical system,electric wiring	5	5
Electrical system,fuse	1	1
Electrical system,voltage regulator	1	0
Eng assembly,crankshaft counterweights/vib damper	1	1
Engine accessories,engine starter	1	0
Engine assembly	6	4
Engine assembly,bearing	8	7
Engine assembly,blower/impeller	8	7
Engine assembly,camshaft	2	2
Engine assembly,connecting rod	12	10
Engine assembly,connecting rod bolt	1	0
Engine assembly,crankcase	2	2
Engine assembly,crankshaft	11	10
Engine assembly,cylinder	17	16
Engine assembly,mount	4	3
Engine assembly,other	3	3
Engine assembly,piston	8	7
Engine assembly,push rod	1	1
Engine assembly,ring	1	0
Engine assembly,rocker arm/tappet	3	3
Engine assembly,timing gear	1	1
Engine assembly,valve,exhaust	19	19
Engine assembly,valve,intake	4	2
Engine compartment	4	4
Engine instruments,fuel quantity gage	15	1
Engine instruments,tachometer	1	0
Exhaust system,clamp	1	1
Exhaust system,gasket	1	1

	Cause or Factor	Cause
Aircraft (continued)		
Exhaust system,manifold	2	1
Exhaust system,muffler	3	3
Exhaust system,stack	3	3
Exhaust system,turbocharger	3	2
External load sling/harness	2	1
Flashlight	1	1
Flight control surfaces/attachments	2	2
Flight control system	1	1
Flight control,aileron	1	1
Flight control,aileron attachment	1	1
Flight control,aileron surface	1	0
Flight control,elevator	1	0
Flight control,elevator surface	1	1
Flight control,flap	1	0
Flight control,rudder	1	1
Flight control,ruddervator	2	2
Flight control,speed brake	1	1
Flight/nav instruments	1	1
Flight/nav instruments,airspeed indicator	1	0
Flight/nav instruments,altimeter,radio	1	0
Flight/nav instruments,directional gyro	1	0
Flight/nav instruments,fluxgate compass	1	0
Flight/nav instruments,weather radar system	1	0
Flt control syst, aileron control cable/rod	1	0
Flt control syst, rudder	2	1
Flt control syst, rudder control cable/rod	2	2
Flt control syst, stabilator control cable/rod	1	0
Flt control syst,aileron control	1	1
Flt control syst, elevator control	3	2
Flt control syst,elevator tab control(trim)	1	1
Flt control syst,rudder control	1	1
Flt control syst,stabilator control	1	1
Flt control syst,wing flap control	1	1
Fluid	1	1
Fluid,fuel	257	245
Fluid,fuel grade	3	0
Fluid,hydraulic	3	2
Fluid,oil	27	24
Fuel injection control/system	1	1
Fuel system	20	18
Fuel system,cap	3	3
Fuel system,carburetor	43	41
Fuel system,carburetor float	4	4
Fuel system,electric boost pump	2	2
Fuel system,filter	1	1
Fuel system,fuel control	1	1
Fuel system,fuel flow divider/distributor	1	1
Fuel system,fuel quantity float/sensor	4	1
Fuel system,fuel shutoff	1	1
Fuel system,line	14	13
Fuel system,line fitting	1	1
Fuel system,pump	5	3
Fuel system,ram air/induction air	2	2
Fuel system,screen	1	1
Fuel system,selector valve	1	1
Fuel system,strainer	4	4
Fuel system,tank	5	5
Fuel system,vent	6	5
Fuselage	3	3
Fuselage,cabin	1	1
Fuselage,crew compartment	2	1

CAUSE / FACTOR TABLE
ALL ACCIDENTS - 1989

	Cause or Factor	Cause
Aircraft (continued)		
Fuselage,longeron	1	1
Fuselage,seat	1	1
Glider launch/tow equipment	1	1
Horizontal stabilizer surface	1	0
Hydraulic system	2	1
Hydraulic system,line	2	2
Hydraulic system,pump	2	0
Hydraulic system,reservoir	2	1
Ignition system	2	2
Ignition system,igniter	1	1
Ignition system,ignition coil	1	1
Ignition system,ignition lead	1	1
Ignition system,magneto	10	9
Ignition system,spark plug	6	4
Induction air control,alternate air door	1	1
Induction air control/system	4	3
Instrument lights	2	1
Landing gear	3	2
Landing gear,axle	1	1
Landing gear,emergency extension assembly	3	3
Landing gear,float assembly	2	1
Landing gear,gear indicating system	1	1
Landing gear,gear locking mechanism	8	7
Landing gear,main gear	6	5
Landing gear,main gear attachment	3	3
Landing gear,main gear spring	2	2
Landing gear,main gear strut	4	3
Landing gear,main gear strut scissors	1	1
Landing gear,normal brake system	13	11
Landing gear,normal retraction/extension assembly	9	6
Landing gear,nose gear	6	4
Landing gear,nose gear assembly	5	5
Landing gear,nose gear strut	1	1
Landing gear,ski assembly	1	1
Landing gear,skid assembly	2	1
Landing gear,steering system	3	3
Landing gear,tailwheel	2	1
Landing gear,tailwheel assembly	3	3
Landing gear,tire	4	2
Landing gear,wheel	2	2
Landing light	1	0
Lubricating system	2	1
Lubricating system,oil cooler	2	2
Lubricating system,oil filler cap	2	2
Lubricating system,oil filter/screen	1	1
Lubricating system,oil line	4	4
Lubricating system,oil port/passage, internal	2	2
Lubricating system,oil pressure pump	2	1
Lubricating system,oil quickdrain/drain plug	3	2
Lubricating system,oil seal	1	1
Lubricating system,oil tank	1	1
Misc eqpt/furnishings	2	1
Misc eqpt/furnishings,shoulder harness	2	0
Misc rotorcraft,tail boom	1	1
Miscellaneous	1	1
Mixture control	2	1
Mixture control,bellcrank	1	1
Mixture control,cable	3	3
Pick-up equipment	1	1
Pitot/static system	1	0
Powerplant	17	15

	Cause or Factor	Cause
Aircraft (continued)		
Propeller governor control	2	2
Propeller system/accessories	4	4
Propeller system/accessories,blade	5	4
Propeller system/accessories,counterweight	1	1
Propeller system/accessories,hub	1	1
Propeller system/accessories,hydraulic pitch ctl	1	1
Propeller system/accessories,prop blade retention	1	1
Propeller system/accessories,reversing system	1	1
Reduction gear assy,accessory drive shaft	1	1
Rotor drive system	5	5
Rotor drive system,clutch assembly	1	1
Rotor drive system,engine to transmission drive	2	2
Rotor drive system,freewheeling sprag unit	1	1
Rotor drive system,freewheeling unit(other)	1	0
Rotor drive system,intermediate gear box(42 deg)	1	1
Rotor drive system,main rotor mast(drive shaft)	1	1
Rotor drive system,tail rotor drive shaft	3	2
Rotor drive system,tail rotor drive shaft coupling	1	1
Rotor drive system,tail rotor gear box(90 deg)	1	1
Rotor system	3	3
Rotor system,stabilizing bar	1	1
Rotor system,tail rotor blade	1	1
Rotor system,tail rotor hub	1	1
Rotor system,tail rotor hub pitch change beam	1	1
Rotorcraft flight control system,cyclic trim	1	0
Rotorcraft flight control,cyclic control	1	1
Rotorcraft flight control,pitch change horn	1	1
Rotorcraft flight control,swashplate assembly	1	1
Rotorcraft flight control,tail rotor control	1	1
Sign towing equipment	1	1
Stall warning system	2	0
Throttle/power lever	2	1
Throttle/power lever,bellcrank	1	1
Throttle/power lever,cable	8	7
Throttle/power lever,linkage	5	4
Thrust reverser	1	1
Thrust reverser,actuator	1	1
Turbine assembly,shaft bearing	1	1
Turbine assembly,turbine blade	2	2
Turbine assembly,turbine wheel	1	1
Turboshaft engine	1	0
Turboshaft engine,free turbine governor	1	0
Turboshaft engine,gas generator turbine shaft	1	1
Vertical stabilizer surface	1	1
Window,cabin	1	0
Window,canopy	2	1
Window,flight compartment window/windshield	5	1
Wing	11	6
Wing,bracing strut	4	4
Wing,spar	3	3
Wing,wing attachment bolt	1	1
Wing,wing attachment fitting	3	2
Wing,wingtip	1	1
Facility		
Airport facilities	4	0
Airport facilities,heliport	2	0
Airport facilities,obstruction marking	1	1
Airport facilities,ramp facilities	1	0
Airport facilities,runway edge lights	8	0
Airport facilities,runway safety area	1	1

CAUSE / FACTOR TABLE
ALL ACCIDENTS - 1989

	Cause or Factor	Cause
Facility (continued)		
Airport facilities,runway/landing area condition	53	2
Airport facilities,taxiway condition	1	1
Airport facilities,taxiway lighting	1	0
Airport facilities,wind direction indicator	2	0
Charts	1	0
Radar,MSAW	1	0
Radar,conflict alert	2	0
Environment		
Aircraft moving on ground	7	0
Aircraft parked	27	1
Airport facility	10	2
Animal(s)	4	3
Approach light/navaid	4	0
Below approach minimums	5	0
Bird(s)	5	4
Bridge/overpass	2	0
Bright night	2	0
Building(nonresidential)	8	1
Carburetor icing conditions	47	5
Clouds	33	0
Crosswind	133	2
Dark night	114	0
Dawn	4	0
Downdraft	38	3
Drizzle	17	0
Dusk	23	0
Fence	46	0
Fence post	6	0
Fog	84	0
Gusts	127	4
Guy wire	4	0
Haze/smoke	10	0
High density altitude	65	0
High terrain	2	0
High wind	40	4
Ice fog	1	0
Icing conditions	18	1
Lightning	3	0
Loose objects	1	0
Low ceiling	112	0
Mountain wave	5	1
Night	14	0
No thermal lift	1	0
Obscuration	28	0
Other	12	3
Other person	2	0
Pole	16	0
Rain	48	0
Residence	4	0
Runway light	12	2
Sign	5	0
Snow	20	0
Snow covered	1	0
Submerged object	1	1
Sunglare	17	0
Tailwind	67	1
Temperature extremes	6	0
Terrain condition	584	21
Thunderstorm	20	1

CAUSE / FACTOR TABLE
ALL ACCIDENTS - 1989

	Cause or Factor	Cause
Environment (continued)		
Thunderstorm,level III	1	0
Thunderstorm,outflow	2	0
Tower,marked	2	0
Tower,unmarked	1	1
Tree(s)	172	4
Turbulence	31	2
Turbulence in clouds	3	1
Turbulence(thunderstorms)	6	0
Turbulence,clear air	2	0
Unfavorable wind	63	6
Updraft	2	0
Utility pole	6	0
Utility pole(marked)	2	0
Vehicle	21	0
Wall/barricade	4	1
Whiteout	5	0
Windshear	11	2
Wire,static	11	0
Wire,transmission	61	2
Wire,transmission(marked)	1	0
Flight Crew		
Abort	8	8
Aborted landing	12	9
Aborted takeoff	25	21
Adequate rotor rpm	1	1
Aerobatics	7	5
Aileron	2	1
Air/ground communications	1	0
Aircraft control	120	117
Aircraft preflight	89	80
Aircraft service	1	1
Aircraft unattended/engine(s) running	1	1
Aircraft weight and balance	22	5
Aircraft/equipment inadequate	1	0
Airplane handling	22	20
Airspeed	208	195
Airspeed(V2 min)	1	1
Airspeed(Va)	2	1
Airspeed(Vlof)	4	3
Airspeed(Vmc)	3	3
Airspeed(Vr)	1	1
Airspeed(Vref)	3	3
Airspeed(Vs)	22	22
Airspeed(Vso)	7	7
Airspeed(Vyse)	1	1
All available runway	6	1
Altitude	94	69
Anxiety/apprenhension	5	1
Autopilot	2	0
Autorotation	7	4
Became lost/disoriented	19	12
Brakes(normal)	19	14
Buzzing	7	7
Carburetor heat	52	48
Checklist	10	5
Clearance	90	90
Climb	17	16
Collective	3	2
Communications	2	1
Communications equipment	1	1

	Cause or Factor	Cause
Flight Crew(continued)		
Communications/information/ATC	1	0
Compensation for wind conditions	128	117
Complacency	2	1
Control interference	3	3
Crew/group coordination	4	3
Cyclic	4	4
Decision height	1	1
Descent	10	9
Design tress limits of aircraft	16	15
Directional control	190	179
Distance	41	37
Diverted attention	40	24
Documentation	1	0
Elevator	4	2
Elevator trim	5	3
Emergency procedure	41	27
Emotional reaction	1	0
Equipment, other	1	1
Excessive workload (task overload)	1	0
External load equipment	3	2
Fatigue	7	2
Fatigue(flight and ground schedule)	2	0
Fatigue(lack of sleep)	2	0
Flare	107	90
Flight controls	20	18
Flight into known adverse weather	50	39
Flight manuals	1	0
Flight to alternate destination	10	8
Fuel boost pump selector position	4	3
Fuel consumption calculations	41	38
Fuel supply	76	73
Fuel system	4	3
Fuel tank selector position	41	39
Gear down and locked	4	4
Gear extension	12	10
Gear retraction	11	9
Glider tow release	3	3
Go-around	65	48
Ground loop/swerve	62	55
Habit interference	4	1
Hazardous weather advisory	3	2
IFR procedure	17	17
Ice/frost removal from aircraft	3	3
Improper initial training	1	0
In flight briefing service	2	1
In flight weather advisories	2	1
In-flight planning/decision	144	129
Inadequate initial training	3	1
Inadequate recurrent training	1	1
Inadequate training	5	1
Inadequate training(emergency procedure(s))	1	0
Inadequate transition/upgrade training	2	0
Inattentive	8	3
Incapacitation	3	3
Incapacitation(heart attack)	1	1
Incapacitation(hypoglycemia/diet)	1	1
Information insufficient	1	0
Information unavailable	1	1
Instructions,written/verbal	2	2
Interpersonal relations	3	0
Judgement	33	29

	Cause or Factor	Cause
Flight Crew(continued)		
Lack of familiarity with aircraft	24	3
Lack of familiarity with geographic area	7	0
Lack of recent experience	13	0
Lack of recent experience in type of aircraft	8	1
Lack of recent experience in type operation	6	0
Lack of recent instrument time	6	0
Lack of recent total experience	6	1
Lack of total experience	79	4
Lack of total experience in type of aircraft	59	2
Lack of total experience in type operation	23	3
Lack of total instrument time	28	1
Landed at wrong airport	2	2
Level off	12	10
Lift-off	19	15
Load jettison	10	5
Low pass	11	2
Lowering of flaps	8	3
Maintenance	6	5
Maintenance,adjustment	1	0
Maintenance,annual inspection	1	1
Maintenance,design change	1	1
Maintenance,inspection of aircraft	6	5
Maintenance,installation	8	8
Maintenance,major alteration	1	1
Maintenance,major repair	1	0
Maintenance,modification	3	2
Maintenance,rebuild/remanufacture	1	1
Maintenance,replacement	2	2
Maintenance,service bulletins	1	0
Maintenance,service of aircraft	2	2
Maneuver	23	15
Material defect(inadequate quality control)	1	0
Minimum descent altitude	9	9
Miscellaneous equipment	1	0
Missed approach	5	3
Mixture	12	12
Monitoring	4	1
NOTAMs	5	2
Navigation receiver	1	0
Nosewheel steering	1	1
Operation with known deficiencies in equipment	27	17
Ostentatious display	7	0
Other psychological condition	3	0
Over confidence in aircraft's ability	12	2
Over confidence in personal ability	38	5
Panic	1	0
Passenger briefing	2	1
Performance data	11	9
Physical impairment	1	0
Physical impairment(alcohol)	9	9
Physical impairment(anoxia/hypoxia)	1	1
Physical impairment(drugs)	8	3
Physical impairment(other toxic)	2	2
Physical impairment(visual deficiency)	2	0
Physiological condition	1	1
Planned approach	23	14
Planning-decision	97	94
Power on landing	2	0
Powerplant controls	5	3
Precautionary landing	8	2
Preflight briefing service	12	3

	Cause or Factor	Cause
Flight Crew(continued)		
Preflight planning/preparation	119	89
Pressure induced by others	1	0
Procedures/directives	25	18
Propeller feathering	3	2
Proper alignment	51	45
Proper altitude	62	60
Proper assistance	5	3
Proper climb rate	13	12
Proper descent rate	13	9
Proper glidepath	13	11
Proper touchdown point	55	35
Psychological condition	2	1
Pull-up	6	5
Qualification	4	1
Radio communications	6	0
Raising of flaps	19	15
Reason for occurrence undetermined	1	1
Recovery from bounced landing	68	58
Refueling	23	22
Relinquishing of control	6	6
Remedial action	57	44
Rotation	4	4
Rotor rpm	11	10
Rotorcraft flight controls	7	7
Rudder	4	4
Running takeoff	1	0
Self-induced pressure	15	3
Spatial disorientation	47	42
Spiral	3	3
Spoiler extension	1	1
Stall	113	111
Stall/mush	31	31
Stall/spin	41	41
Starting procedure	5	5
Suicide	4	4
Supervision	63	59
Tail rotor	2	2
Taxispeed	4	4
Throttle/power control	13	10
Tie down	8	6
Touch-and-go	4	1
Touchdown	12	10
Traffic advisory	2	0
Trim setting	1	0
Unsafe/hazardous condition	1	1
Unsafe/hazardous condition warning	1	1
Unsuitable terrain	71	63
Updating of recorded weather information	2	1
VFR flight into IMC	81	76
VFR procedures	2	1
Vertical takeoff	1	1
Visual lookout	106	96
Visual/aural detection	3	1
Visual/aural perception	35	2
Wake turbulence	5	4
Weather evaluation	25	15
Weather forecast	3	2
Weather observation	1	1
Weather service	1	0
Wheels down landing in water	1	1
Wheels up landing	7	6
Wind information	16	10
Wrong propeller feathered	1	1
Wrong runway	36	24

CAUSE / FACTOR TABLE
ALL ACCIDENTS - 1989

	Cause or Factor	Cause
Other Person		
Acft/equip, inadequate cockpit/workplace	1	0
Acft/equip, inadequate control location	1	1
Aerobatics	1	1
Aircraft control	3	3
Aircraft/equipment, inadequate design	2	0
Airport snow removal	3	0
Airspeed	1	0
Anxiety/apprenhension	1	1
Checklist	1	1
Clearance	10	10
Climb	1	1
Communications	1	1
Company-induced pressure	2	1
Control interference	3	2
Control tower service	4	3
Crew/group coordination	6	5
Directional control	1	1
Distance	1	1
Emergency equipment	1	1
Evacuation	1	1
Excessive workload (task overload)	2	0
Flare	2	2
Flight manuals	2	0
Fuel supply	1	1
Fuel system	1	1
Gear retraction	1	1
Glider tow release	2	2
Identification of aircraft visually	2	0
Improper initial training	3	0
Improper training	1	1
Inadequate certification/approval	1	1
Inadequate certification/approval - Aircraft	1	0
Inadequate certification/approval - Airman	1	0
Inadequate initial training	1	0
Inadequate procedure - surveillance of operation	2	2
Inadequate substantiation process	1	0
Inadequate surveillance of operation	4	1
Inadequate training	1	0
Inadequate training(emergency procedure(s))	1	0
Inadequate transition/upgrade training	2	0
Incapacitation(heart attack)	1	1
Information	5	0
Information insufficient	3	0
Instructions,written/verbal	3	2
Insufficient standards/requirements	2	0
Insufficient stds/rqmts - Manufacturer	1	0
Insufficient stds/rqmts - Operation/operator	2	0
Judgement	1	1
Lack of familiarity with aircraft	1	0
Lack of recent experience	1	0
Lack of total experience	1	0
Lack of total experience in type of aircraft	1	0
Lack of total experience in type operation	3	0
Landing gear	1	1
Lift-off	1	1
Maintenance	15	10
Maintenance,100 hour inspection	2	1
Maintenance,adjustment	8	8
Maintenance,alignment	1	1
Maintenance,annual inspection	13	12
Maintenance,balancing	1	0

CAUSE / FACTOR TABLE
ALL ACCIDENTS - 1989

	Cause or Factor	Cause
Other Person (continued)		
Maintenance, calibration	2	1
Maintenance, compliance with AD	1	1
Maintenance, inspection of aircraft	22	17
Maintenance, installation	32	31
Maintenance, lubrication	1	1
Maintenance, major alteration	1	1
Maintenance, major repair	2	1
Mainte		

APPENDIX C

N.T.S.B. FORM 6120.4

National Transportation Safety Board

FACTUAL REPORT AVIATION

1 NTSB Accident/Incident Number

2 1 ☐ Accident 2 ☐ Incident

3 Investigation 1 ☐ NTSB 2 ☐ FAA Delegated

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

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

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

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

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

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

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National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB Accident/Incident Number

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

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

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB Accident/Incident Number

24 ☐ **Not applicable** *(Go to block 39)*

25 Airport Name
A Other

26 Airport Identifier

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

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

29 Direction From Airport
_____ °mag
A Other

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

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

32 Runway Used Identifier
A Other

33 Runway Length
_____ Feet
A Other

34 Runway Width
_____ Feet
A Other

35 Airport Elevation
_____ Ft. MSL
A Other

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

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

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

39 Aircraft Manufacturer

40 Aircraft Model/Series

41 Serial No.
A Other

42 Certificated Maximum Gross Weight
A Other

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

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

45 Home Built
1 ☐ Yes
2 ☐ No
A Other

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National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB Accident/Incident Number

Aircraft Information (continued)

46 Landing Gear *(Multiple entry)*

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

48 No. of Seats
_____
A Other

49 Stall Warning System Installed
1 ☐ Yes
2 ☐ No
A Other

50 IFR Equipped
1 ☐ Yes
2 ☐ No
A Other

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

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

If not Engine powered, go to block 59

53 Engine Manufacturer

54 Engine Model and Series

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

56 Number of Engines
_____
A Other

If 3 or more engines enter times in Supp. C

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

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

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

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

62 Time Since Inspection
_____ Hours
A Other

63 Airframe Total Time
_____ Hours
A Other

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

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

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

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

Owner/Operator Information

71 Registered Aircraft Owner
Name

72 Address

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

74 Address 1 ☐ Same as registered owner
A _____
_____
B Other

75 Operator Certificate No.
_____
A Other

76 Operator Designator Code

National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB Accident/Incident Number

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

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

Type of Certificate(s) Held

79 None ☐ *(Go to block 83)*

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

81 Operating Certificate
☐ Other operator of large aircraft

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

Regulation Flight Conducted Under

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

Type of Flight Operation Conducted

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

84a
1 ☐ Scheduled
2 ☐ Non-scheduled

84b
1 ☐ Domestic
2 ☐ International

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

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

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

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

88 Pilot Certificate No.
A Other

89 Street Address
A Other

90 City
A Other

91 State

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

93 Age
_____ Yrs.
A Other

94 Sex
1 ☐ Male
2 ☐ Female

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

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

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

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB Accident/Incident Number

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

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

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

100 Instrument Rating
1 ☐ None
2 ☐ Airplane
3 ☐ Helicopter

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

102 Ground Instructor
1 ☐ None
2 ☐ Basic
3 ☐ Advanced
4 ☐ Instrument

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

104 Months Since Check/Endorsement This Aircraft
_____ Months
A Other

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

106 Months Since Last BFR
_____ Months
A Other

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

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

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

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

111 Medical limitation
1 ☐ None
2 ☐ Vision
A Specify _____
B Other

112 Medical wavier
1 ☐ None
2 ☐ Vision
3 ☐ Hearing
A Specify _____
B Other

113 Statement of Demonstrated Ability
1 ☐ Yes
2 ☐ No
A Other

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

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

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

132 Landings—Last 90 Days All Aircraft
_____ Day
A Other

133 Landings—Last 90 Days All Aircraft
_____ Night
A Other

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

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

136 Seatbelt Available
1 ☐ Yes
2 ☐ No
A Other

137 Seatbelt Used
1 ☐ Yes
2 ☐ No
A Other

138 Shoulder Harness Available
1 ☐ Yes
2 ☐ No
A Other

139 Shoulder Harness Used
1 ☐ Yes
2 ☐ No
A Other

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

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

National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB Accident/Incident Number

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

143 Simulated Instrument Flight
1 ☐ Yes
2 ☐ No
A Other

144 Vision Restricting Device Used
1 ☐ Yes
2 ☐ No
A Other

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB Accident/Incident Number

170 Load Description *(Multiple entry)*

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

180 Source of Weather Briefing *(Multiple entry)*

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

181 Method of Briefing *(Multiple entry)*

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

182 Completeness of Weather briefing

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

183 Investigator's Source of Weather Information

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

184 Weather Observation Facility

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

185 Basic Weather Conditions at Accident Site

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

186 Conditions of Light

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

187 Sky/Lowest/Cloud Condition

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

188 Lowest Ceiling

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

189 Visibility *(decimals)*

A _____ SM
B RVR _____ Feet
C RVV _____ SM
D Other

190 Temperature

_____ ° F
A Other

191 Dew Point

_____ ° F
A Other

192 Wind (From)

1 ☐ Variable
A _____ ° Magnetic
B Other

193 Wind Speed

1 ☐ Calm
2 ☐ Light and Variable
A _____ Kts.
B Other

194 Gusts

1 ☐ None
A _____ Kts.
B Other

195 Altimeter Setting

_____ " Hg
A Other

196 Density Altitude

_____ Feet
A Other

197 Restrictions to Visibility

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

198 Type of Precipitation

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

199 Intensity of Precipitation

1 ☐ Light
2 ☐ Moderate
3 ☐ Heavy
A Other

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB Accident/Incident Number

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					
218 GRAND TOTAL					

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

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

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

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

APPENDIX D

REVISED ACCIDENTS/FLIGHT HOURS

During the final stage of report production two events occurred that effect the number of accidents and flight hours: 1) NTSB and FAA agreed to report all U.S. registered aircraft accidents regardless of where they occurred (formerly NTSB excluded accidents on foreign soil); and 2) FAA revised its flight hour estimates from those previously published. This table contains revised data for all general aviation accidents and corresponds to Table 3 of this Annual Review which contains unrevised data.

R E V I S E D

ACCIDENTS, FATALITIES, AND RATES
U.S. GENERAL AVIATION
1980 - 1989

	Accidents		Fatalities			Accident Rates@ Per 100,000 Aircraft Hours	
Year	Total	Fatal	Total	Aboard	Aircraft Hours Flown#	Total	Fatal
1980	3605	630	1264	1255	36,402,000	9.90	1.73
1981	3512	665	1314	1293	36,803,000	9.94	1.81
1982	3233	591	1187	1170	29,640,000	10.90	1.99
1983	3077	556	1069	1062	28,673,000	10.73	1.94
1984	3016	545	1042	1021	29,099,000	10.35	1.87
1985	2738	498	955	944	28,322,000	9.66	1.75
1986	2582	474	967	878	27,073,000	9.54	1.75
1987	2494	447	838	823	26,972,000	9.24	1.65
1988	2386	460	800	792	27,446,000	8.69	1.68
1989	2233	432	768	765	27,920,000	7.98	1.53

\# Source of estimate: FAA. Hours flown for the years 1982 through 1991 have been revised to reflect the results of FAA's General Aviation Activity and Avionics Non-respondent Survey.

@ Suicide and sabotage accidents excluded from rates as follows:
Total - 1980 (1), 1982 (3), 1983 (1), 1984 (3), 1985 (3), 1987 (1), 1988 (1), 1989 (5)
Fatal - 1980 (1), 1984 (2), 1985 (2), 1987 (1), 1989 (4)