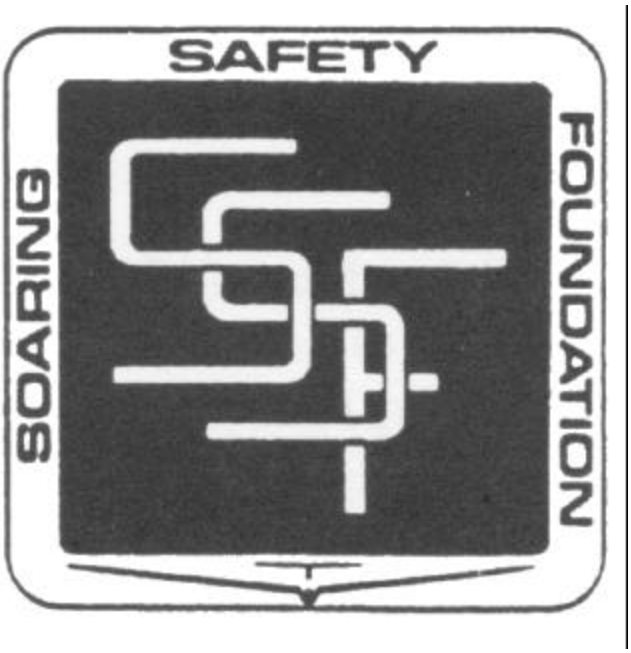

SOARING SAFETY FOUNDATION

1998 SAFETY REPORT

SOARING SAFETY FOUNDATION
ANNUAL SAFETY REPORT
1998

In 1980, the Soaring Society of America (SSA) mandated the Flight Training and Safety Board to conduct a review of soaring safety in the United States and to use the information obtained to develop methods and techniques to promote safety in soaring through pilot education, program development, information dissemination, and participation in areas of general aviation safety pertinent to soaring. A Safety Task Force was formed to collect all available information and to report those findings to the SSA Board of Directors and the soaring community. In 1985, this mandate was assumed by the newly created Soaring Safety Foundation (SSF). The 1998 SSF Safety Report is a product of that mandate.

The compilation and dissemination of accident data have become one of the Soaring Safety Foundation's most important functions. Analysis of this information is crucial because it allows the SSF to identify and evaluate emerging accident trends within the soaring community and to focus accident prevention resources on specific problem areas having a negative impact on the safety of our sport.

Accident data included in this report was obtained from two primary sources: National Transportation Safety Board (NTSB) Accident Reports and the Federal Aviation Administration (FAA) Daily Reporting System. These sources were selected because of the specific reporting requirements of NTSB Part 830 of the Code of Federal Regulations. Although it would be ideal to include all accident and incident reports involving gliders, it becomes extremely difficult to confirm accurate reporting from the various entities involved. Consequently, the SSF elected to take advantage of the standardized reporting requirements of NTSB Part 830 to develop its data base of soaring accident information. This data base is then used to develop accident prevention strategies and to continuously improve training methods to reduce the number of soaring accidents.

The information contained in this report represents data compiled by the SSF and reported in **Soaring** Magazine, **Sailplane Safety** newsletter, Flight Instructor Refresher Clinics, and pilot safety seminars.

The Trustees of the Soaring Safety Foundation sincerely hope that this report and the publication of accident data are beneficial is assisting members of the soaring community in developing a greater awareness of current issues and emerging trends in soaring safety.

Additional copies of this report may be obtained from the Soaring Safety Foundation by request to:

Soaring Safety Foundation
Post Office Box 2100
Hobbs, New Mexico 88241
505-392-1177
74717.237@Compuserve.com

THE SOARING SAFETY FOUNDATION

The Soaring Safety Foundation (SSF) was founded in 1986 for the purpose of promoting soaring safety through pilot education, program development, information dissemination, and participation in areas of general aviation safety pertinent to soaring. The stated goals of the SSF are to reduce the accident rate in soaring and to make soaring as safe as a sport can be.

The scope of the SSF includes all activities of the Soaring Society of America relating to the subjects of flight training and safety. The SSF is responsible for the development and maintenance of the ABC Training Program, appointment of SSA Instructors, review of manuals, development of procedures, accomplishment of specific programs, data compilation and review, and dissemination of information relating to flight training and the promotion of soaring safety.

One of the most important functions of the SSF is the dissemination of safety information to the soaring community. To meet this responsibility, the SSF obtains accident data from the National Transportation Safety Board and the Federal Aviation Administration and distributes that information through various mediums including Sailplane Safety and the SSF Web Page. Information of a time critical nature may be disseminated through the issuance of a *Safety Alert* to inform pilots of potential aircraft or operational safety issues.

Funding for the SSF is obtained through donations from individuals and organizations interested in the promotion of soaring safety. These funds are then used to develop and promote programs such as soaring safety seminars, flight instructor refresher clinics, posters, safety-related articles in *Soaring* Magazine, the SSF Web Page, and the newsletter of the SSF, *Sailplane Safety*.

SOARING SAFETY FOUNDATION TRUSTEES

GENE HAMMOND

TOM KNAUFF

STEVE NORTHCRAFT

BILLY SINGLETON – CHAIRMAN

BERNALD SMITH

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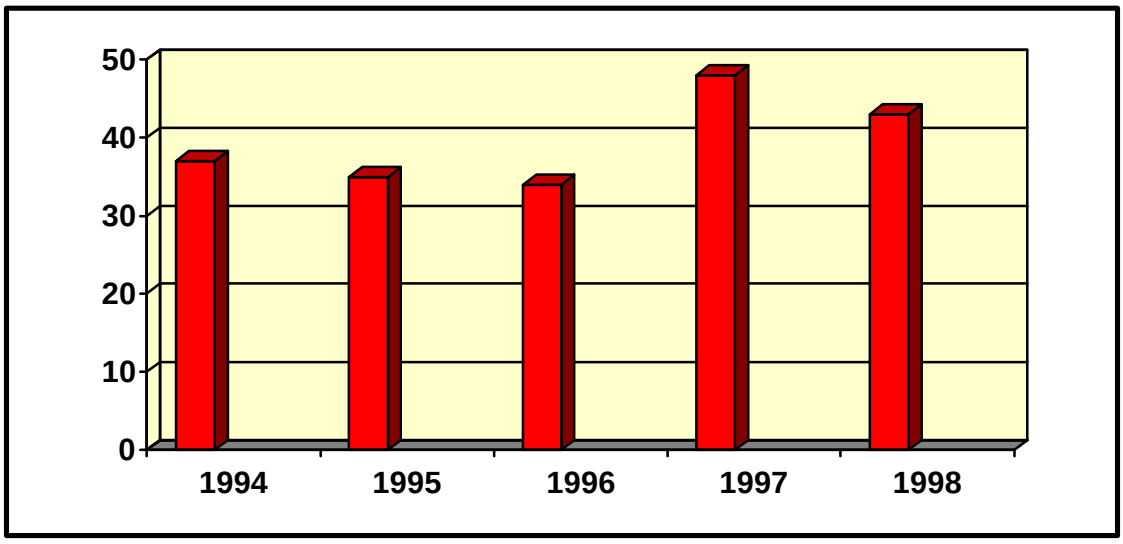
1998 ACCIDENT SUMMARY

NUMBER OF ACCIDENTS

For the twelve month period ending December 31, 1998, 43 glider accidents meeting the reporting requirements of Part 830 of the Code of Federal Regulations were reported to the National Transportation Safety Board. The number of accidents reported during 1998 represents a decrease of 11% from the 48 accidents reported for the previous year. The five-year average for the 1994 – 1998 reporting period is 39.2 accidents per year. This represents an increase from the 36.8 accidents per year average for the previous five-year reporting period.



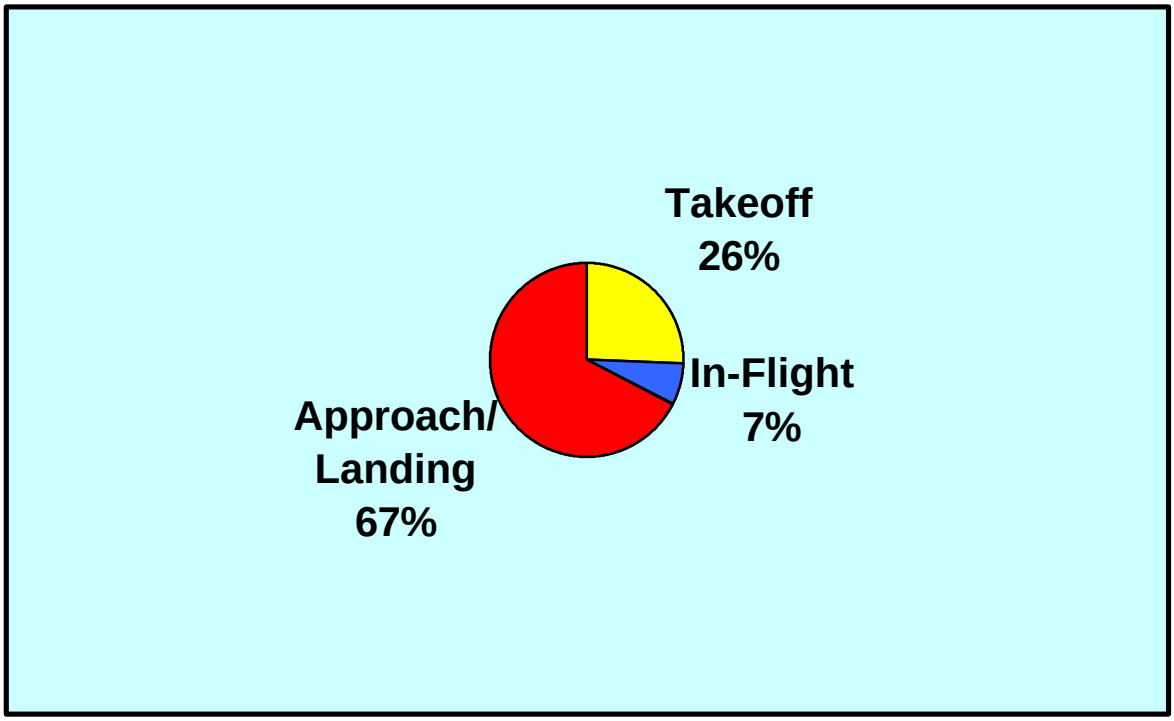
SOARING ACCIDENTS
1994 – 1998

Since 1981, the first year in which the Soaring Society of America mandated the Flight Training and Safety Board to review the safety record of gliding in the United States, the average number of accidents per year has continued an overall decrease. For example, 53 glider accidents were reported in 1981, the first year glider accident data was compiled for comparative purposes. Since that time, the average number of yearly accidents has continued to decrease to the present rate of 40.8 accidents per year.

The number of pilots fatally injured in glider operations also decreased during the 1998 reporting period. Six fatalities were reported during 1998, a slight decrease from the seven pilots fatally

injured during the previous year. Of the six fatalities reported for 1998, five occurred as a result of glider accidents and one pilot was fatally injured during an accident involving a tow aircraft. Pilots sustaining serious injuries in glider accidents was unchanged from 1997, while pilots reporting minor injuries did decrease.

PHASE OF FLIGHT



PHASE OF FLIGHT
1998

The number of accidents occurring during the approach and landing again far surpassed those recorded during any other phase of flight. As was the case during the 1997 reporting period, accidents occurring during the approach and landing were more than double the combined total of accidents occurring during any other flight phase. For the year, takeoff and landing accidents attributed to approximately 93% of the number of accidents reported for the year. This percentage represents an increase from the 83% recorded during the 1997 reporting period.

It should come as no surprise that a majority of accidents occur during takeoff and landing, where the tolerance for error is greatly diminished and opportunities for pilots to overcome errors in judgment and decision-making become increasingly limited. This trend coincides with a 1985 National Transportation Safety Board study initiated to determine the phases of flight in which aircraft accidents are most likely to occur. The study concluded that approximately 60% of all

aircraft accidents occur during the first two minutes or the last four minutes of the average flight, even though these flight phases typically account for less than 16% of actual flight time.

Three accidents were recorded during the In-flight phase. The first involved the pilot of a Discus who reported flying low in a canyon with no thermal activity. The glider impacted a tree, which separated the wings from the fuselage. The pilot reported that the glider then spun into the canyon wall and impacted the ground. The pilot reported that no mechanical malfunction existed with the aircraft prior to the accident. The pilot was not injured. *NTSB LAX98LA234.*

Two pilots were fatally injured when their PZL Bielsko 50-3 impacted terrain while maneuvering two miles from the departure airport. The pilot of another glider, flying approximately four miles from the accident location, reported that his attention was drawn to the accident aircraft by the sun glistening off the wings as the aircraft spun, nose low, approximately three revolutions before impacting the ground. *NTSB LAX98FA235.*

The pilot of a SDZ-59 was seriously injured after the aircraft impacted terrain approximately two miles from the departure airport. The pilot reported that he had been flying for about 15 minutes when the lift began to weaken. At approximately 200 – 300 feet above ground level, the glider entered a spin and impacted a large group of trees, then fell into a clearing. The pilot did not report any mechanical discrepancies with the aircraft prior to the accident. *NTSB LAX98LA293.*

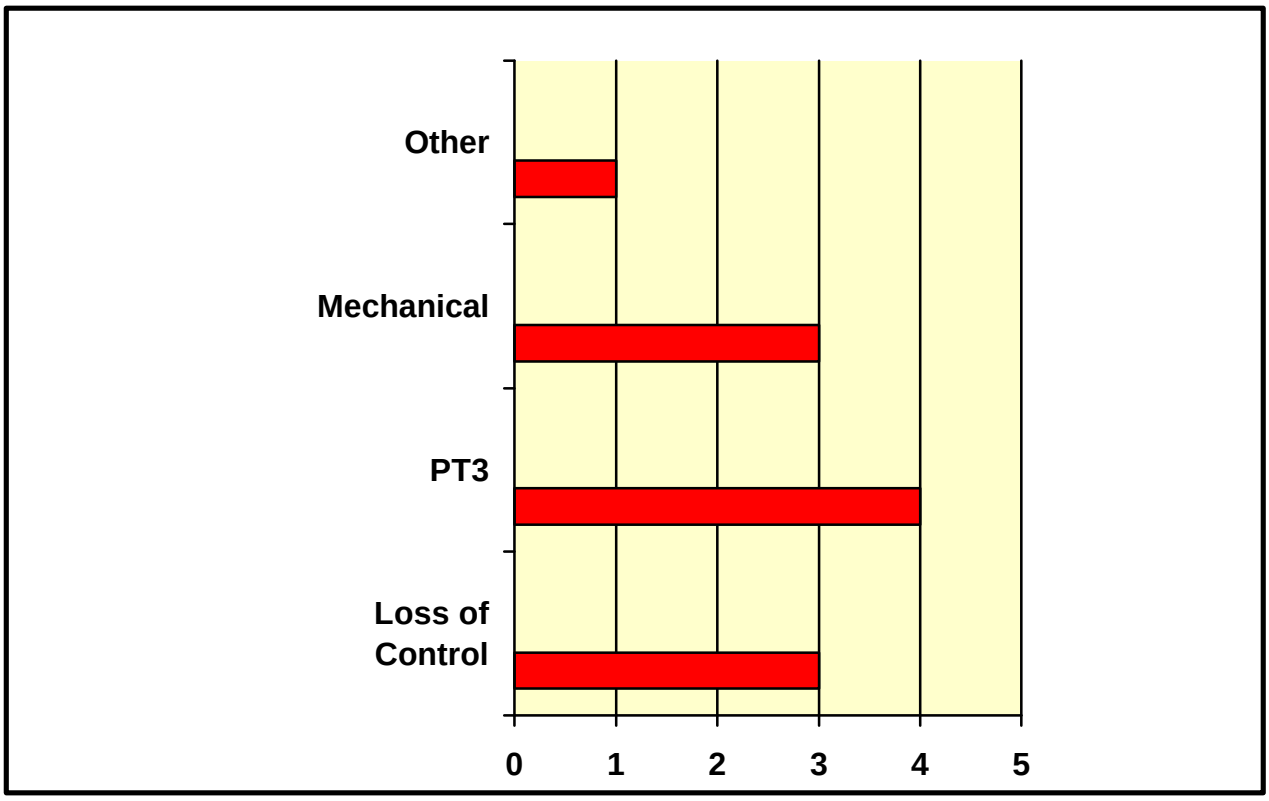
The number of stall / spin related accidents increased during the 1998 reporting period. Surprisingly, stall / spin related accidents were most prevalent during the in-flight phase of operation.

TAKEOFF ACCIDENTS

Premature termination of the tow (PT3) again accounted for the majority of the takeoff accidents that occurred during the 1998 reporting period. The most frequent contributing factor in the PT3 accidents was aircraft canopies opening during the takeoff. This factor contributed to each of the PT3 accidents.

The most serious of this type of accident occurred when the rear canopy of a Grob 103 was observed to open shortly after takeoff. According to a Federal Aviation Safety Inspector who observed the accident, " . . . I saw that the rear canopy had opened and the person in the rear seat extended an arm toward the open canopy. At the same time, the glider pitched up rather steeply and the arm returned inside the glider. With the canopy still open the glider reduced its pitch, but remained high on tow. The effort to close the canopy occurred at least three times with the glider going higher and higher. Toward the end of the runway, the tow plane begin to descend, then pitch up once or twice, then descend and impact the ground. As the tow plane impacted the ground, the glider, which was much higher and still on the tow rope, continued forward and climbing and the tow rope became almost vertical . . [which] separated from the glider and fell into a pile by the tow plane. The glider continued . . . beyond the tow plane . . . rolled left to the inverted position . . . and impacted the ground." *NTSB IAD99FA004B.*

The certificated commercial pilot in the glider received serious injuries while the passenger in the glider was fatally injured. The pilot of the tow aircraft received minor injuries.



TAKEOFF ACCIDENTS
1998

The Soaring Safety Foundation has long stressed the importance of proper use of checklist and the need to minimize distractions to ensure that critical safety of flight items are accomplished prior to takeoff. Additionally, the SSF strongly encourages every pilot to develop and review an emergency plan prior to every takeoff. Finally, but most important, it is critical for pilots to understand that a pilot's most basic responsibility is control of the aircraft. Regardless of the circumstances, FLY THE AIRCRAFT!

Mechanical malfunctions accounted for a significant number of takeoff accidents during the 1998 reporting period. These included an L-13 Blanik that sustained substantial damage during a ground launch. During the initial part of the launch, the ground launch bridle disconnected from one attachment point. The asymmetrical force then pulled the glider to the left, and the left wing struct a parked truck.

A second mechanical related takeoff accidents involved an LS-6. Witnesses reported that the right aileron or a portion of the right wing appeared to be *fluttering* before the glider was released. After releasing from the tow aircraft, the glider went into a right spiral and impacted the ground. The third mechanical related accident involved a Libelle 301H. The glider experienced an aileron malfunction during the tow. The glider released and landed short of the runway. Each of the accidents is currently under investigation by the National Transportation Safety Board.

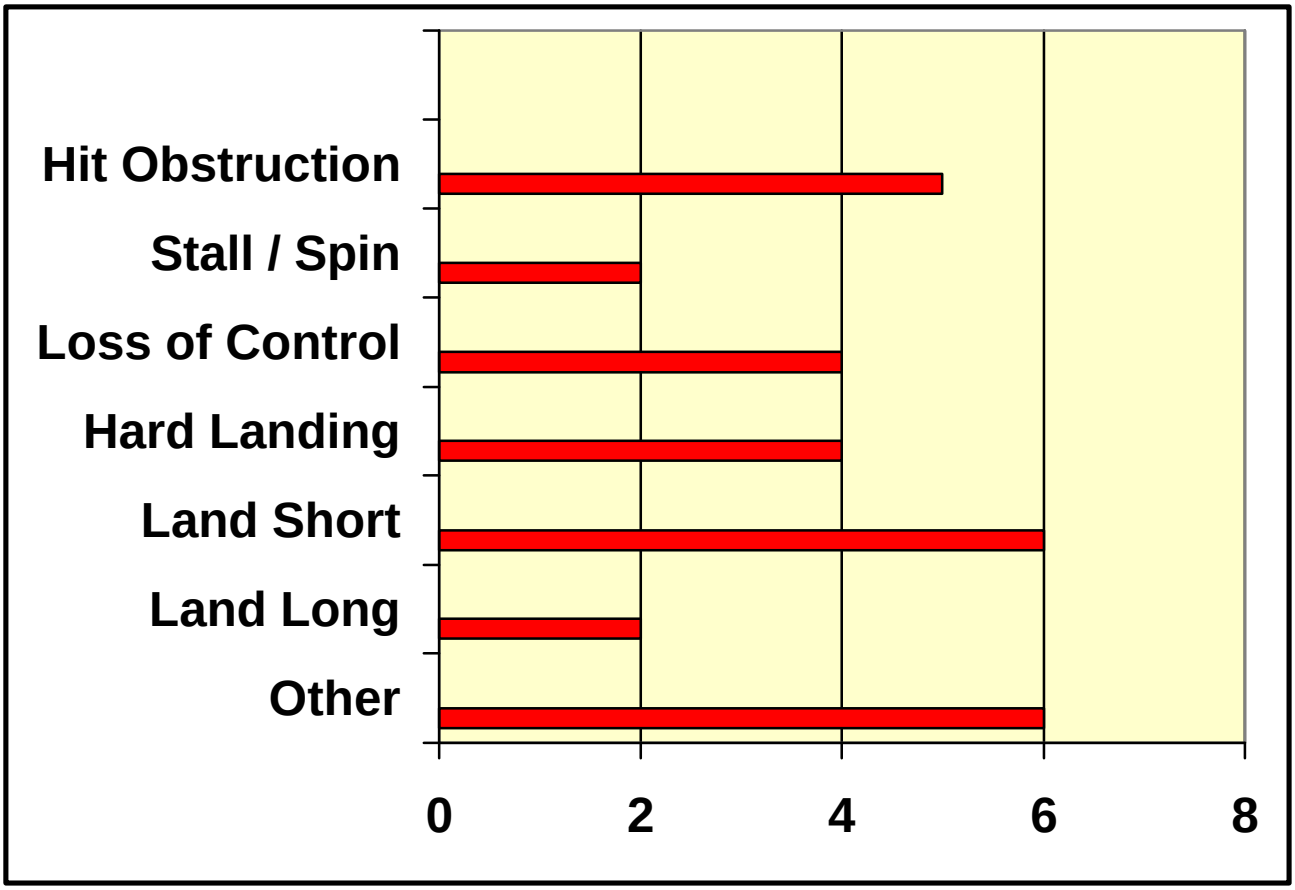
Problems associated with maintaining directional control also contributed to a number of takeoff accidents. In two of the accidents involving loss of directional control, the gliders struck parked vehicles or other obstructions after leaving the runway. A more serious loss of control accident occurred when the pilot of a SGS 1-35 moved out of position to the right during an aerotow. This movement caused the tow plane to yaw hard to the left. After bringing the glider back to the normal tow position, the glider veered to the right again very rapidly. The tow plane yawed hard to the left and the towline broke at an altitude of approximately 700 feet above ground level. As the pilot attempted to return to the airport to land, the glider impacted a ditch that ran between the two runways.
NTSB LAX98LA147

The final takeoff accident occurred during a ground launch by auto tow. According to witnesses, the glider rotated sharply nose-up on takeoff, rolled left, and struck the ground inverted. *NTSB ATL98L090.*

LANDING ACCIDENTS

Accidents occurring during the landing phase of flight again accounted for a majority of injuries to pilots and damaged or destroyed gliders. Gliders being landed short of the intended landing runway or area continues to be the most common causal factor in landing accidents. Many of the reported land short accidents occurred at the completion of local flights at the pilot's home airport.

For the 1998 reporting period, land-short accidents tended to occur at the conclusion of a sequence of events that involved misjudgments of altitude in the landing pattern or the pilot electing not to fly a landing pattern while attempting to stretch a glide to return to the airport.



LANDING ACCIDENTS
1998

The second most common cause of landing accidents during the 1998 reporting period was gliders colliding with obstructions on or near the landing area. Four gliders were substantially damaged and one glider destroyed after colliding with an obstruction during landing. No pilot injuries were reported as a result of this type of accident. A majority of obstruction related accidents occurred on the airport and resulted from the glider hitting taxiway / runway markers or other obstructions in close proximity to the runway.

An accident involving a Cessna 172 and a Blanik L-13 occurred when the two aircraft collided while on final approach to landing. The Cessna was not involved in the glider operations. The collision occurred at approximately 500 feet above ground level on the final approach segment. Both aircraft were transmitting position reports using the local unicom frequency. The pilot of the glider first observed the Cessna after the impact occurred. Both aircraft were able to continue their approach to landing. The Cessna was substantially damaged while the glider sustained only minor damage. Neither pilot was injured. *NTSB MIA99LA051A.*

Two of the reported landing accidents involved aircraft being stalled while on approach to an off-airport landing. A witness to the first accident observed the ASW-19 at a low altitude estimated to

be approximately 200 feet above ground level. The airspeed was described to be extremely slow, and the glider was in a right turn descending. The glider made three to four right 360-degree turns before the nose of the glider was observed to pitch straight down. The pilot of the glider was fatally injured. *NTSB MIA98LA128.*

The pilot of a LET L-23 had been soaring for approximately two hours when he lost sight of the departure airport. He stated that as the glider lost altitude, he continued to reduce the airspeed while looking for a field in which to land. Just prior to touchdown, the glider stalled, struck a tree, and hit the side of a barn. The pilot was seriously injured and the passenger received minor injuries. *NTSB NYC98LA097*.

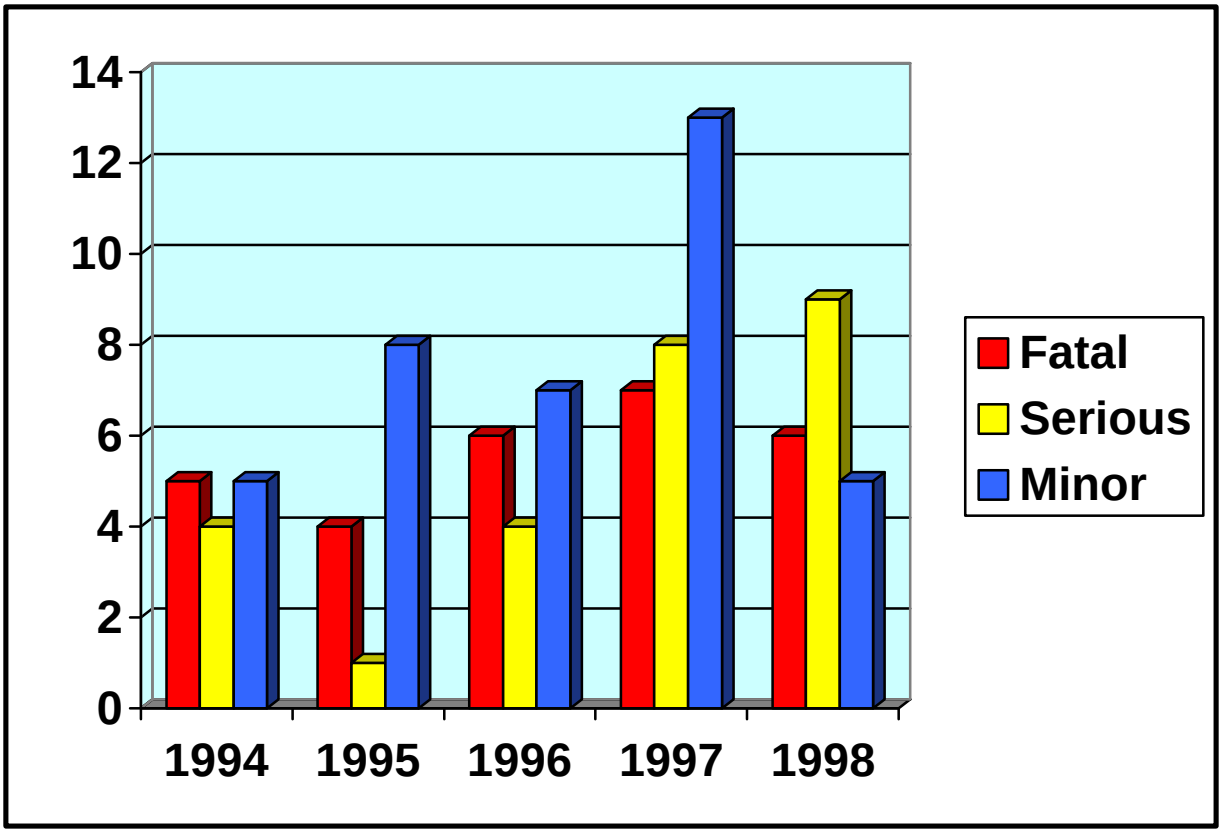
The pilot of a PW-5 was fatally injured when the glider collided with terrain during landing. A witness to the accident observed the glider approaching from the northeast at an altitude of 30-35 feet above ground level. The witness reported that the glider made a sharp left turn, probably to avoid an obstruction. The left wing of the glider hit the ground. The nose of the glider then impacted the ground and the glider slid 15 – 20 feet and came to a stop in an upright position. *NTSB FTW98LA406.*

Preliminary reports indicate that a mechanical malfunction may have been a factor in an accident involving a DG-800. The glider was observed very low on the final approach and appeared to be oscillating. The aircraft impacted the terrain short of the runway in a level attitude. The pilot reported that he had lost aircraft elevator control. Accident investigators reported that the bolt connecting the pushrod to the elevator was found in the fuselage, but the attaching nut could not be located. The aircraft had a total time of approximately four hours. *NTSB LAX98LA209.*

The remaining landing accidents include problems associated with maintaining directional control during landing, hard landings, and over-shoots.

FATALITIES

Six individuals were fatally injured participating in glider operations during the 1998 reporting period. This represents a slight decrease from the seven fatalities reported for the previous year. Four of the individuals fatally injured in accidents in 1998 were piloting a glider. One passenger received fatal injuries as a result of a takeoff accident involving a Grob 103. The final fatality of 1998 occurred when the pilot of a Cessna 182 was fatally injured in an accident while towing a glider.



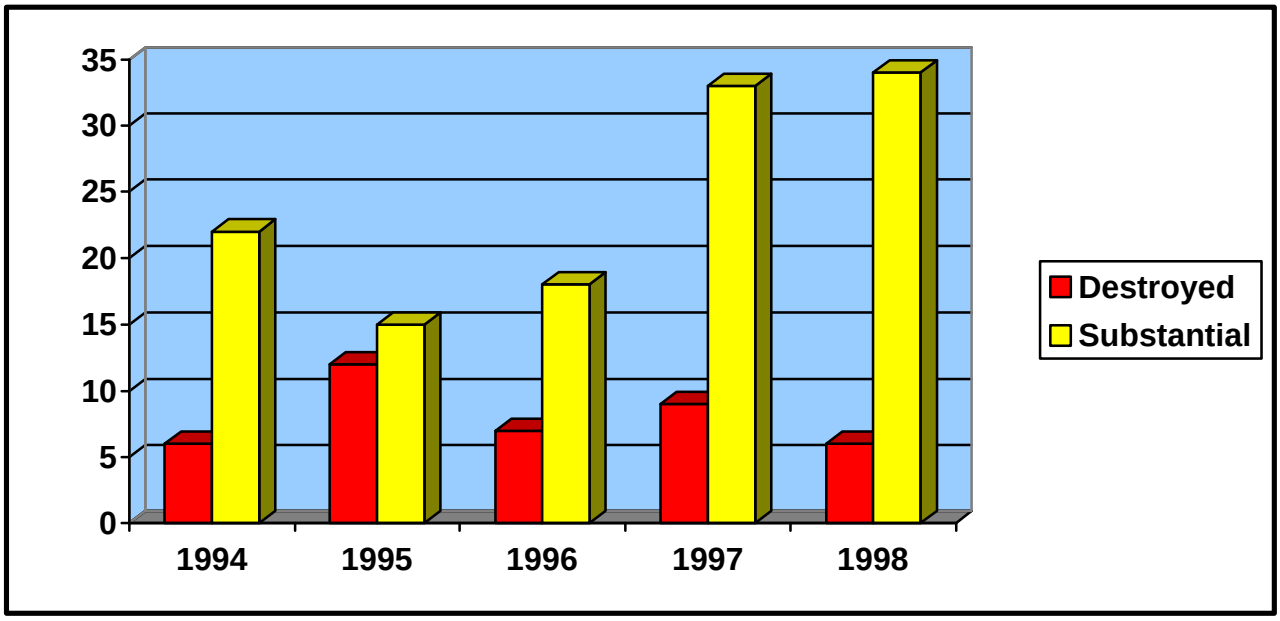
INJURIES TO OCCUPANTS
1994 – 1998

Serious injuries to individuals participating in glider operations increased slightly from the previous reporting period. Minor injuries to individuals involved in accidents did decrease significantly.

For the five-year period 1994 – 1998, 28 fatalities have been recorded. This equates into a five-year average of 5.6 fatalities per year. The is up slightly from the 4.4 fatalities per year from the previous five-year period that ended last year. The current five-year average still represents significant improvement from the yearly average of 10.71 fatalities per year average recorded in 1987.

DAMAGE TO AIRCRAFT

Damage to aircraft reported to the National Transportation Safety Board declined slightly during the 1998 reporting period. Six gliders were reported destroyed and thirty-four gliders received substantial damage as a result of accidents. Additionally, three gliders were reported to have received minor damage during the year. As expected, landing accidents accounted for the majority of aircraft destroyed or substantially damaged.



DAMAGE TO AIRCRAFT
1994 – 1998

AUXILIARY-POWERED SAILPLANES

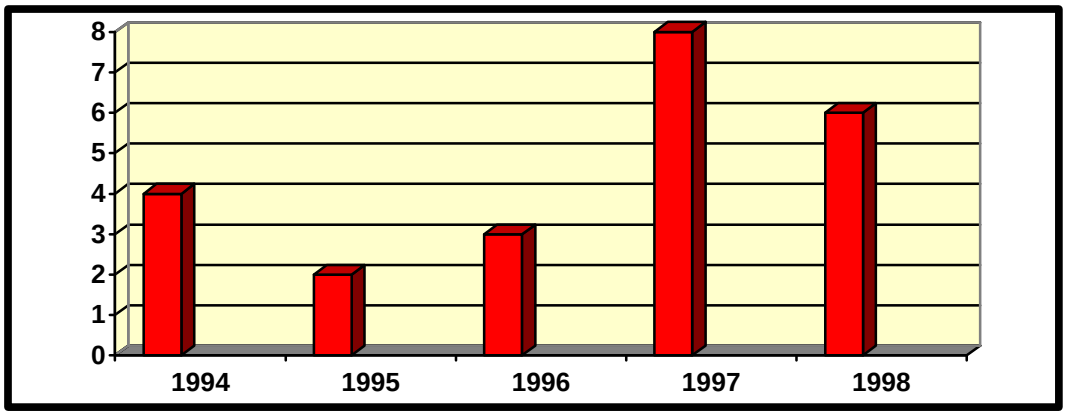
For the twelve month period ending December 31, 1998, six accidents involving auxiliary-powered sailplanes were reported to the National Transportation Safety Board. As a result of these accidents, one pilot was seriously injured and six aircraft were substantially damaged. This represents a decrease from the eight accidents reported for 1997. Furthermore, no fatalities were reported as a result of auxiliary-powered sailplane accidents during the 1998 reporting period. This represents a significant decrease from the two fatalities reported last year.

Preliminary accident reports indicate a number of factors that contributed to the accidents. A Stemme S10V was substantially damaged when it impacted terrain during an off-airport landing. The pilot was unable to bring the motor out of an idling condition. *NTSB CHI98LA171.*

A Taifun 17E was substantially damaged during takeoff when the aircraft collided with trees. The pilot reported that he was unable to maintain directional control as the aircraft drifted to the right of the runway. *NTSB CHI98LA314.*

The pilot of a Strojnik S2A reported that as he flared for landing, the aircraft ballooned. The pilot lowered the nose to regain airspeed and noticed that he was running out of runway. He forced the aircraft onto the runway, substantially damaging the aircraft during the subsequent hard landing. *NTSB MIA99LA015.*

Other accidents involved a Ventus CM that was substantially damaged during landing under unknown circumstances. The pilot of a DG-800 was seriously injured during landing. Preliminary reports indicate that a mechanical malfunction may have been a factor in the accident (See narrative on page 7).



AUXILIARY-POWERED SAILPLANE ACCIDENTS
1994 – 1998

ACCIDENTS BY SSA REGION

A comparison of the geographic locations of accidents in relation to SSA Regions tends to reflect the geographic distribution of the SSA membership. In general, those regions having the greatest populations of SSA members and soaring activity tend to record the highest numbers of accidents.

SSA REGIONS

Region 1 — Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont.

Region 2 — New Jersey, New York (south of 42nd parallel), Pennsylvania (east of 78th meridian).

Region 3 — New York (north of 42nd parallel), Pennsylvania (west of 78th meridian).

Region 4 — Delaware, District of Columbia, Maryland, Virginia, West Virginia.

Region 5 — Alabama, Florida, Georgia, Mississippi, North & South Carolina, Tennessee, Puerto Rico, The Virgin Islands.

Region 6 Indiana, Kentucky, Michigan, Ohio.

Region 7 Illinois, Iowa, Minnesota, Missouri (east of 92nd meridian), North & South Dakota, Wisconsin.

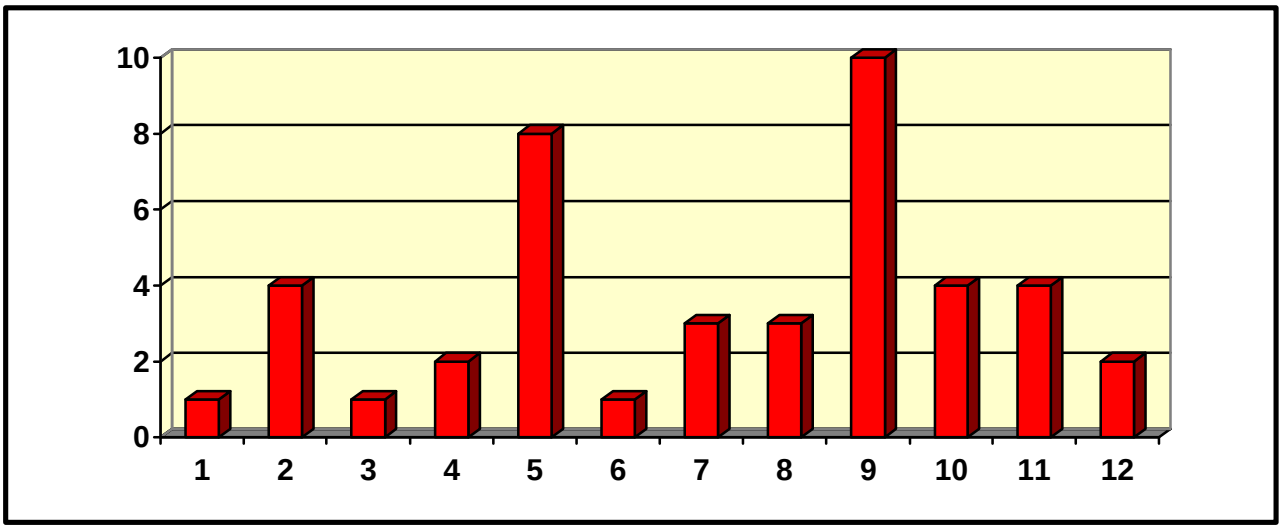
Region 8 Alaska, Idaho, Montana, Oregon, Washington.

Region 9 Arizona, Colorado, New Mexico, Utah, Wyoming.

Region 10 Arkansas, Kansas, Louisiana, Missouri (west of 92nd meridian), Nebraska, Oklahoma, Texas.

Region 11 California (north of 36th parallel), Guam, Hawaii, Nevada.

Region 12 California (south of 36th parallel).



ACCIDENTS BY SSA REGION
1998

ACCIDENTS INVOLVING TOW AIRCRAFT

During 1998, three accidents involving tow aircraft occurred during the takeoff phase of flight. As a result of these accidents, one pilot was fatally injured and two pilots received minor injuries. Additionally, two tow aircraft were substantially damaged and a third was destroyed.

A Cessna 182 was substantially damaged when it collided with terrain following an attempted takeoff with a glider in tow. The pilot of the tow aircraft attempted to tow a glider out of a field following an off-airport landing. After determining that a successful takeoff could be made, the pilot of the glider and the tow pilot reviewed the aborted takeoff procedure and agreed to use a shorter towline. After becoming airborne, the glider pilot stated that he felt the tow aircraft was not going to get airborne. He released the glider from tow and landed straight ahead. The tow pilot reported that he was about to rotate when the glider released. He stated that he experienced a large pitch up of the airplane's nose, and reacted by applying strong down force to the yoke. The airplane came to rest in a vertical nose down attitude at the bottom of a ravine. *NTSB IAD98LA031.*

A second Cessna 182 received substantial damage on impact with terrain during a glider tow on initial climb out. The pilot of the tow aircraft was fatally injured. The glider pilot reported that the tow rope had been released when the tow plane began experiencing engine trouble. Samples of fuel taken by accident investigators after the accident indicated the presence of water in the aircraft fuel system. A total of approximately 30 ounces of water was drained from the aircraft wreckage, 4 ½ ounces of which were taken from the carburetor bowl. *NTSB CHI99FA029.*

The third accident involving a tow aircraft occurred when the canopy of the glider being towed opened inadvertently during takeoff. The glider was observed to make erratic pitch changes during the initial tow. The tow plane began to descend, then pitch up once or twice, then descend and impact the ground. The pilot of the tow aircraft received minor injuries. The aircraft was destroyed (See page 3). *NTSB IAD99FA004B.*

FLIGHT TRAINING AND SAFETY REPORT

Many landing accidents are the result of improperly flown landing patterns. Pilots who are too low often fly too close to the landing area while on the down wind leg. This leaves little room for a proper base leg, so the pilot performs a low altitude, low speed, button hook pattern.

Flight instructors can help by insisting on the discipline of proper landing pattern height, and proper spacing. Most pilots know to increase the landing pattern airspeed in windy conditions, however pattern altitude also needs to be adjusted higher in windy, gusty conditions.

Takeoff accidents are particularly frustrating as launch emergency situations are predictable. Pilots must assume an emergency can and will occur and have a specific plan of action for each phase of the launch. Flight instructors need to emphasize launch emergencies during flight reviews, club check rides and flight training.

Adding the letter "E" to the pre-takeoff checklist is a helpful reminder to concentrate on the emergency plan of action. Teaching the wing runner to remind the pilot of the possiblity of a launch emergency ("Are you ready for an emergency?") and to be observant of dive brakes left open, canopy unlatched, tail dolly left on, positive control check accomplished, will help reduce these accidents.

The tow pilot also needs special training to be alert for signs of potential trouble. Is the glider pilot being hurried? Are conditions too gusty, is there fuel in the towplane? Is the takeoff area clear of people and other obstructions? Has the tow pilot added the letter "E" to the pre-takeoff checklist and is prepared for an emergency? Towplanes need good rear view mirrors that are located close to the tow pilot. Radios are highly recommended.

Flight instructors play an important safety role during everyday glider operations. They need to supervise flying activities and serve as critics to any operation that is potentially unsafe. Other pilots and people involved with the flying activity also need to be trained to be alert to any safety issues during the daily activity.

In an effort to help flight instructors present complete required flight training, the Soaring Safety Foundation has recently adopted a flight training syllabus which is published in the new SSAI Handbook as well as the SSF web page. This checklist can be used to help ensure full compliance with federal regulations.

The FAA is making an effort to include judgment training in flight training as well as flight testing. The SSF encourages all flight instructors to make a special effort to include judgment training scenarios in their lesson plans.

INTERNATIONAL SAFETY AND OPERATIONS

In August of 1998 the Soaring Safety Foundation participated in the biennial meeting of the OSTIV Training and Safety Panel, held in Alleberg, Sweden.

The Swedish delegate and Chairman of the TSP reviewed two separate but integrated programs adapted from earlier efforts by Ole Didricksen, former chief instructor in Denmark. These programs resulted in a reduction of 50% in accidents in Sweden over the last 3 years.

1. A select cadre of instructors toured Sweden conducting mandatory pilot seminars at each club and flying operation.

2. Other instructors toured each site and performed surveys of the operation. These surveys covering all phases of the glider operation were then discussed with the operators (club officers and chief instructors) with "suggestions" on how to improve the safety factor. The operation was reviewed later for compliance. The goal of both programs was no injuries, no damage, and no uncontrolled situations of unsafe flying or airspace intrusions.

Obviously, the size of the United States and the method of teaching flying (as much by commercial operations as by clubs) makes it virtually impossible to perform such sweeping oversight. Since 1985, the SSF has attempted through the written word (SOARING magazine, SAILPLANE SAFETY, and other articles) as well as CFIG clinics and pilot seminars at the SSA conventions to have a positive effect accidents and incidents with moderate success.

In 1999, the SSF will attempt to make available, upon request, Pilot Seminars at sites chosen by local clubs, chapters, and commercial operators. Additionally, any glider operation may request a site survey be conducted, with confidence the results will only be available to the operator and the SSF.

Other areas discussed during the Alleberg meetings (which included flying four fiberglas two-place gliders) emergency training (cable and rope breaks, other towing problems,) stall, spin, and recovery training, reduced or "negative g" symptoms, use of GPS, and maintaining a constant visual scan.

Examining the accident reports from the different countries showed about 40% of the accidents occurred during the landing phase and 14% during winch operations. In the U.S., about 60% occur during approach and landing and 20% during take-off. While Great Britain reported a history of spins for the last 7 years being responsible for 2.6% of the accidents, **31% resulted in fatalities and 19% in serious injuries!** Stall/spins reported as being causal in the U.S. are about 19.5% of the total, with 43% resulting in fatalities. This emphasizes the importance of continuing emphasis on stall recognition and some degree of spin training.

The necessity to keep a sharp lookout for other aircraft was obvious from several reports of mid-air collisions resulting in fatalities. Britain reported 2 during competitions, both with fatal results. (See U.S. information elsewhere in this report.)

While the U.S. reported 7 fatalities in 1997, Austria reported 12, Belgium 3, Germany 13 in pure gliders and 10 in motorgliders , Netherlands 4, and Britain 2. Through August, 1998, the U.S. had two while Britain had 7 in the first 3 months of the year!

A more humorous report was one aerobatic pilot that fell out of the glider while upside down because he forgot to fasten his seat belts.

From all the 1997 submitted reports, 8% of the accidents were related to stall/spin, 8% to mid-air collisions, 8% to mechanical problems (ailerons not connected, seat back not properly latched, etc.), and 3% to winch launches. For comparison, the U.S. reported 8% related to stall/spin, no reported mid-airs, 15% structural and mechanical, and 18% aerotow (PT3) problems.

While the European countries have problems with winch launches because of the large percentage performed when compared to aerotow, PT3 accidents in the U.S. account for 29% of the total! Approach and landing is about 40% in Britain while 62% in the U.S.!!!

Obvious areas for EVERY pilot to focus on are take off (have an emergency plan) and landing (proper pattern, wind awareness, and maintaining control of the glider throughout the approach, touchdown, and landing roll.)

1998 NON-FLIGHT INSURANCE LOSSES

From information supplied to the Soaring Safety Foundation, we take note of non-flight claims (losses) in the SSA Insurance Program for 1998. These losses have been categorized to define the areas in which they occur. This data enables the SSF to focus efforts to address the safety factors involved, which could concomitantly reduce losses.

Non-flight is defined as *any glider activity not directly involving a phase of flight.* Non-flight losses include taxiing, towing by trailer, moving the glider by hand or towing by car / tractor from one spot to another, regardless of whether the movement is in preparation for flight. Additionally, non-flight losses include ground damage to gliders due to weather (hail, etc.) while the aircraft is on the ground, theft / vandalism, or wind damage to canopies or aircraft structures regardless of whether is aircraft is tied down or not. Non-flight losses do not include the takeoff or landing roll.

Over the past seven years, non-flight claims have averaged 41% of the total amount of insurance claims. It is a significant amount of dollar loss each year, comprising 18% of the 1998 dollar loss.

No improvement has been realized in reducing the incidence of non-flight losses. During 1998, very heavy non-flight losses were recorded (52% of the claims from 50% of the states with claims) in states east of the Mississippi River, including Mississippi, Tennessee, Kentucky, Illinois, and Wisconsin.

The most troubling aspect of non-flight losses is that damage due to carelessness during ground operations can result in gliders remaining out of service for long periods of time as required repairs are made.

Note: The word *state* in the following comments includes the District of Columbia, but not any United States Territories.

Figures given below are only for a one-year period. It is important to understand the accurate trends require several years of accumulated data and analysis to draw meaningful conclusions.

The 1998 Reporting Period

- A state with 40% of the glider / motorglider fleet had only 7% of the non-flight losses.

- A state with 2% of the fleet had 12% of the non-flight losses.

- Ten of the states with a very high ratio (over 50%) of gliders / mototgliders to SSA members, representing 16% of the fleet, had no non-flight losses.

- Thirty-one states, representing 36% of the fleet, had no non-flight losses.

- The state that had the worse non-flight loss record during the 1997 reporting period had no 1998 non-flight losses.

The following categories of non-flight losses represent the most common types of occurrences. The use of the term *Minor* is relative and used in relation to the total amount of dollar loss incurred over a period of one year.

Claim Occurrence	Number of Claims
Assembly / Disassembly	Minor
Towing by Trailer	Significant
Canopy	Major
Vandalism	Minor
Ground Handling	Very Major
Towplane	Significant
Motorglider	Minor
Wind Damage	Major
Hail Damage	No Claims
Damage by Ground Vehicle	Minor

APPENDIX A

NTSB PART 830

The responsibility for investigation of aircraft accidents in the United States was mandated by Congress to the National Transportation Safety Board (NTSB) through The Department of Transportation Act of 1966. This act tasked the NTSB with determining the probable cause of all civil aviation accidents in the United States.

From 1991 - 94, the general aviation community alone accounted for approximately 1,800 aircraft accidents per year. Due to this high level of investigative workload and limited available resources, the NTSB often delegates to the Federal Aviation Administration (FAA) the authority to investigate accidents involving aircraft weighing less than 12,500 pounds maximum certified gross weight. Consequently, many glider accidents meeting the NTSB reporting criteria are investigated by representatives of the FAA.

All aircraft accidents involving injury to passengers or crewmembers or substantial damage to the aircraft must be reported to the NTSB.

The terms used in this report to define injury to occupants and damage to aircraft are included in NTSB Part 830 of the Code of Federal Regulations.

Definitions

Aircraft - a device that is used or intended to be used for flight in the air.

Operator - Any person who causes or authorizes the operation of an aircraft.

Aircraft Accident - An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or, in which the aircraft receives substantial damage.

Fatal Injury - Any injury which results in death within 30 days of the accident.

Serious Injury - Any injury which:

(1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received;

(2) Results in the fracture of any bone except simple fractures of fingers, toes, or nose;

(3) Causes severe hemorrhages, nerve, muscle, or tendon damage;

(4) Involves any internal organ; or

(5) Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.

Minor Injury - Injury not meeting the definition of fatal or serious injury.

Substantial Damage - Damage or 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. Engine failure or damage limited to an engine if only one engine fails or is damaged, bent fairings or cowling, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered Asubstantial damage≅ for the purpose of this part.

Destroyed - Damage to an aircraft which makes it impractical to repair and return it to an airworthy condition. This definition includes those aircraft which could have been repaired, but were not repaired for economic reasons.

Minor Damage - Damage to an aircraft that does not meet the definition of Substantial or Destroyed.

APPENDIX B

PHASE Of OPERATION

Ground Movement - Repositioning of the glider while on the ground. To meet the definition of an accident, occupants must be onboard the glider and movement must be conducted immediately preceeding or subsequent to a flight operation that demonstrates the intention of flight. Includes taxi operations of auxiliary-powered sailplanes.

Takeoff - Begins at initiation of the launch operation, including aero-tow, ground launch, and self-launch, and is concluded at the point the glider reaches the VFR traffic pattern altitude. For ground launch operations, the takeoff phase continues until release of the towline.

Assisted Climb - Begins at the conclusion of the takeoff phase or point at which an auxiliary-powered sailplane or a sailplane using an aero-tow launch climbs above traffic pattern altitude. This phase of operation is not included in ground launch operations.

In-flight - Begins at the point of release of the towline for all launch types and concludes at the point of entry into the traffic pattern or landing approach pattern for an off-airport landing.

Approach/Landing - Begins at the point of entry into the traffic or landing approach pattern and concludes as the glider is brought to a stop at the completion of the ground roll.

APPENDIX C
ACCIDENT CATEGORY DEFINITIONS

Hit Obstruction - Accident occurring during a ground or flight phase as a result of the glider colliding with a fixed object. This classification does not include bird strikes or ground / in-flight collisions with other aircraft.

Ground Collision - Collision of two or more aircraft while being repositioned or taxied while on the ground.

Loss of Directional Control- Accident which occurs as a result of a loss of directional control of the glider during takeoff or landing operations while the glider is on the ground.

Premature Termination of the Tow (PT3) - Any event, pilot, mechanical, or otherwise induced, which results in a premature termination of the launch process. This classification includes ground, aero-tow, and self-launch.

Mechanical - An event that involves a failure of any mechanical component of the glider. This classification includes accidents that result from faulty maintenance or a failure to properly install or inspect primary flight controls. Inflight structural failures caused by fatigue of structural components or pilot induced overstress of the airframe are included in this classification category.

Loss of Aircraft Control - An accident which occurs as a result of the loss of control of the glider for any reason during takeoff, assisted climb, in-flight, or approach / landing. This classification includes failure to maintain proper tow position during assisted climb.

Mid-air Collision - A collision of two or more aircraft which occurs during the takeoff, assisted climb, in-flight, or approach / landing phase of flight. This classification includes collisions involving gliders and other categories of aircraft (airplane, rotorcraft, etc.).

Land Short - Any accident which occurs as a result of the glider being landed short of the physical boundaries of the intended runway or landing area. This classification includes off-airport landing operations.

Land Long - Any accident which occurs as a result of the glider being landed beyond the physical boundaries of the intended runway or landing area. This classification includes off-airport landing operations.

Stall / Spin - Any accident which results from the inadvertent stall and/or spin of the glider during takeoff, assisted climb, in-flight, or approach / landing phases of flight.

Hard Landing - Any accident caused by a hard landing during the approach / landing phase of flight.

Other – Any accident caused by factors not defined within the previous categories.