HISTORY OF GLIDING & SOARING

MEDIA BACKGROUND

Media Guide to the
History of Gliding & Soaring
By
United States
Soaring Teams

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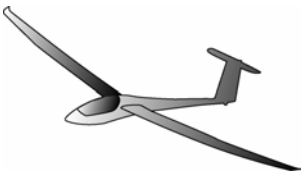
Media Background - History of the Sport of Gliding and Soaring

Modern aviation is a tribute to humanities ability to dream. Early pioneers first dreamed of flight and then put intelligence and perseverance to work to see these dreams become reality. The jets we take for granted today use technology that dates back to the beginnings of aviation history when these daring inventors made the first glides down hills in wood and fabric covered craft of every description.



Modern sailplanes are sleek, strong and fast but it has not always been this way

Gliding Started It All

The sleek high performance sailplanes of today have a heritage that dates back to man's first attempts at flight. History tends to move from the simple to the complex and aviation follows this premise elegantly. With no understanding of aerodynamics, few adequate materials and no available engines avations enthusiasts had to be content with using crude gliders that used the force of gravity and a slope to become airborne. These flights were short and often ended in a less than elegant arrival but it was flying none the less.

Development of Motorless Flight

At first all flight was gliding flight as the internal combustion engine had not been invented when visionaries the likes of Leonardo da Vinci drew his first impressions of what a flying machine might have looked like in 1490. The dream of human flight continued to capture the imagination of many but it was not until 1799 when Sir George Cayley, a baronet in Yorkshire England, conceived a craft with stationary wings to provide lift and "flappers" to provide thrust. It also has a movable tail to provide control.

Through the 1800's several aviation pioneers emerged in different countries around the world all perusing glider designs with varying degrees of success. Chief among these were Otto Lilienthal in Berlin, Germany, Lawrence Hargrave in Sydney, Australia, Percy Pilcher in the United Kingdom, John J. Montgomery at Wheeler Hill near San Diego, Octave Chanute and his team in Gary, Indiana in the USA., just to name a few.

By the early 1900's the famed Wright Brothers were experimenting with gliders and gliding flight in the hills of Kitty Hawk, North Carolina. The Wrights developed a series of gliders while experimenting with aerodynamics which was crucial to developing a workable control system. Many historians and most importantly the Wrights themselves pointed out that their game plan was to learn flight control and become pilots specifically by soaring whereas all the other experimenters rushed to add power without refining flight control. By 1903 Orville and Wilbur Wright had achieved powered flight of just over a minute by putting an engine on their best glider design.

At this point the development of aviation had been all about developing more and more advanced gliders and perfecting the ability to control them in flight. Now aviation branched off with powered flight becoming increasingly dominant from the successful 1903 first sustained, controlled, powered flight of the Wright Brothers.

By 1906 the sport of gliding was progressing rapidly. An American glider meet was sponsored by the Aero Club of America on Long Island, NY. By 1911 Orville Wright had set a world duration record of flying his motorless craft for 9:45 minutes.

By 1920 the sport of soaring was coming into its own. Glider design was spurred on by developments in Germany were the World War I treaty of Versailles banned flying power aircraft.

New forms of lift were discovered that made it possible to gain altitude and travel distances using these previously unknown atmospheric resources. In 1921 Dr. Wolfgang Klemperer broke the Wright Brothers 1911 soaring duration record with a flight of 13 minutes using ridge lift. In 1928 Austrian Robert Kronfeld proved that thermal lift could be used by a sailplane to gain altitude by making a short out and return flight. In 1929 the National Glider Association was founded in Detroit, Michigan and by 1930 the first USA National Glider Contest was held in Elmira, New York. In 1937 the first World Championships were held at the Wasserkuppe in Germany.

By the 1950 soaring was developing rapidly with the first American, Dr. Paul MacCready, Jr. taking part in a World Soaring Championships held in Sweden. Subsequently Dr. MacCready went on to become the first American to win a World Soaring Championships in 1956 in France.

The period of the 1960's and 80's found soaring growing rapidly with the Soaring Society of America growing from 1,000 members to over 16,000. During this period there was a revival in hang gliders and ultralight aircraft as new materials and a better understanding of low speed aerodynamics made new designs possible.

Several U.S. Soaring pilots captured the title of World Soaring Champion including Doug Jacobs in 1985. As the sport enters 2000 there is a growing sophistication of instrumentation with global positioning technology, electronic glide computers and new composite materials combined highly refined aerodynamics creating high performance sailplanes. New pilot techniques, refined sailplanes and better training have made the sport of soaring a compelling and safe endeavor.

The Development of Soaring Flight

The discovery of the three main sources of lift freed gliders to become soaring machines and the sport of soaring was off and running.

Ridge Lift – Wind blows up a slope producing lift

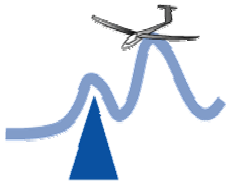
Ridge lift occurs when the wind is deflected upwards along the face of a windward slope. Sailplanes use the upward movement of the air by flying close to the slope and can stay aloft for hours and travel hundreds of miles utilizing slope lift. Ridge lift was the first to be discovered in the 1890 but perfected between 1920 and 1928. At that time, this meteorological phenomenon was discussed extensively by engineers and scientists. It is believed that Chanute's team was the first to utilize the updrafts from the wind, coming from Lake Michigan along the sand dunes along the southern lake shore.

Thermal Lift – Raising columns of warm air

Thermals are raising columns of warm air that allow sailplanes to gain altitude by turning in tight circles to keep the sailplane inside the column of raising air. Thermals are the most common form of lift. Thermal lift was first used by Robert Kronfeld in the late 1920s in Germany, followed closely by Wolf Hirth a few months later. Thermal soaring became widely known between of 1928 to 1935.

Thermals are frequently toped by cumulus clouds although they can occur when the sky is completely blue. The first "blue" thermal was flown by Wolf Hirth during the first US National Glider Meet, flying from Elmira to Appalachian, NY.

Wave lift occurs when winds blow over a mountain range the air takes on the characteristics of water in a stream forming a wave behind the mountain range. Unlike water the wave can develop many times higher than the top of the mountains allowing sailplanes to reach altitudes of over 40,000 feet. Wave lift was discovered by Wolf Hirth and one of his students in 1933 in Germany and became well known between the years of 1935 and 1941. The phenomenon was researched extensively in several parts of the world, culminating in the Sierra Wave and Jet Stream Projects over the Owens Valley in eastern California in the early/mid 1950s. Vic Saudek was Project Supervisor for both of these research projects.



Wave Lift – Stable air flowing over a mountain

By the late 1900's aviation has become common place with jet travel becoming providing critical to the world economy. Soaring had grown into a diverse and interesting sport. Modern high performance sailplanes are made from composite materials and take advantage of highly refined aerodynamics and control systems . Soaring pilots use sophisticated instrumentation including global positioning technology and electronic glide computers to go further, faster and higher than ever before.

Brief History of Gliding and Soaring

This brief history of gliding and soaring covers the most important aspects of the development of the sport and is not a full rendition of history. See the resources at the end of this background for a more on the history of flight.

1490	Leonardo da Vinci drew his first impressions of what a flying machine might have looked like based on the wing of a bat.
1799	Sir George Cayley, a baronet in Yorkshire, England, conceives a craft with fixed wings to provide lift and "flappers" to provide thrust. It also has a movable tail to provide control.
1809	Sir George Cayley builds a man-sized version of his glider with a wing surface of 300 feet. An assistant makes a few tentative hops in the air, holding onto the fuselage.
1884	Gliding flight by John J. Montgomery at Wheeler Hill near San Diego, California, USA
1891-1896	Gliding and possibly some soaring flight by Otto Lilienthal in Berlin, Germany
1896-1897	Gliding and soaring ("quartering" as early pioneers called ridge soaring") flight by Octave Chanute and his team in Miller Beach, Gary, Indiana, USA
1902-1903	Wright Brothers learn control by flying in ground effect from the shallow dunes amidst wind and sand at Kitty Hawk North Carolina, USA
1903	Octave Chanute reports *"that these glides provide the most original and most enticing of sports… Some of our dauntless automobile sportsmen will happen to make themselves similar machines and seek out somewhere a favorable spot for competing in these glides."*

1903	Orville Wright's first powered flight of just over 1:00 min was achieved by adding a motor their "Flyer" design. This 1902 glider design becomes the basis for their "Flying Machine" patent.
1906	American glider meet sponsored by the Aero Club of America on Long Island, NY. This event was a gathering of about 10-12 members of the club, sharing to fly three biplane gliders.
1911	Intercollegiate meets were held in many areas of our globe, here in the United States, in Europe, but also in Australia. The sport started to find its supporters.
1911	First world soaring duration record: 9:45 min by Orville Wright, Kitty Hawk NC. Accomplished using ridge lift created by the sand dunes near Kitty Hawk, North Carolina, USA.
1920	Soaring becomes organized sport at Wasserkuppe, Germany as the World War I Versailles treaty outlaws flying power aircraft in Germany.
1920-1930	**Phase 1 – Discovery**: Sources of life and soaring flight discovered, better glider designs, pilot training and USA Glider clubs proliferate with air-minded youth.
1921	Dr. Wolfgang Klemperer breaks the Wright Brothers 1911 soaring record with a 13 minute flight in Germany. Both flights used ridge lift.
1928	Austrian Robert Kronfeld proved that thermal lift could be used by a sailplane to gain altitude by making a short out and return flight.
1929	National Glider Association founded in Detroit, MI
1930–1950	**Phase 2 – Development**: Aero towing becomes popular, sailplanes develop better performance, the three forms of lift are becoming well known, and soaring distances reach over 300 miles.
1930	First USA National Glider Contest, Elmira NY, 1930. All pre-WWII (up to 1941) Nationals were held at Elmira.
1932	Soaring Society of America incorporated in May, 1932: "To provide an official body with the authority to conduct a contest (the 3rd Nat'l Contest), it was deemed advisable to organize an association."
1933	Wave lift was discovered by Wolf Hirth and one of his students in 1933 in Germany.
1931	World Duration Record in a single place sailplane, THE "NIGHTHAWK," in the USA ~ 22 HOURS, flown by Lt WILLIAM Cocke near Honolulu, Hawaii in December, 1931.
1937	Heini Dittmar wins the first recognized World Soaring Championships flying the Sao Paulo at the Wasserkuppe in Germany. Wave flights to high altitudes are accomplished.

1939	US Distance Record flown in the USA was 263 miles, flown by Woody Brown in Jun 1939 with a flight from Wichita Falls, TX to Wichita KS. The World Distance Record was 465 miles flown by Ms. Klepikova in July 1939 in the USSR. US Altitude Record in a single place sailplane reached 17,265 ft by Bob Stanley in July 1939.
1950	First American competes in World Soaring Championships Paul MacCready, Jr flying to second place in Orebro, Sweden flying a Weihe sailplane.
1952	World Soaring Championships in Madrid, Spain: Paul MacCready, Jr, flies to 6th place, flying a Schweizer 1-23, Paul A. Schweizer to 18th place, Dick Johnson to 24th place, and Stan Smith to 31rd place.
1956	First American, Paul MacCready, Jr, wins World Soaring Championships in Saint Yan, France.
1958	The standard class was introduced at World Soaring Championships
1960–1980	**Phase 3 - Expansion:** Soaring Society of America goes from 1,000 to 16,000 members and from 1 to 5 National soaring competitions.
1957	The prototype of the first composite sailplane PHOENIX had its first flight in 1957 in Germany.
1968	American Andrew J. "AJ" Smith wins World Soaring Championships in Leszno, Poland
1970	American George Moffat, Jr. wins World Soaring Championships in Marfa Texas.
1974	American George Moffat. Jr wins World Soaring Championships in Waikerie, Australia
1978	The 15-meter class was introduced at World Soaring Championships
1980-2002	**Phase 4 – Refinement**: Growing sophistication of instrumentation with global positioning technology, electronic glide computers and new composite materials combined highly refined aerodynamics create high performance sailplanes. New pilot techniques and the development of better training. Expansion in the number of FAI competitive classes to eight.
1985	American Doug Jacobs wins World Soaring Championships in Rieti, Italy.
1997	The World Class was introduced at World Soaring Championships
1999	The Junior class was introduced at World Soring Championships.
2001	No less than three new classes were introduced at World Soaring Championships including the 18-Meter, Club and Feminine classes.

Modern Soaring

Advances in technology and a better understanding of nature's atmospheric forces has made soaring a safe and enjoyable activity for estimated 150,000 glider pilots worldwide with a majority of these in Europe where the sport has national attention in many countries.

In the United States there are over 180 soaring clubs in the country with a club located near almost every large city in the country. Soaring clubs have between 20 and 200+ members and offer inexpensive access to the sport. Clubs normally own several gliders and towplanes for use by their members, offer rides and instruction often at very reasonable cost. Clubs provide a relaxed way to enjoy gliding for the nearly 40,000 licensed glider pilots in the United States. Over 5,000 sailplanes are registered nationally.

There are over 80 commercial soaring operations in the United States offering rides, flight training and rental services.

While there are many ways to enjoy soaring from a lazy summer afternoon of relaxing club flying around the home field to more energetic cross country flying, it is competitive soaring that provides the ultimate test of pilot grit and skill. Competitive soaring is organized by this countries national soaring organization, the Soaring Society of America (SSA). There are regional and national contests held each year with top pilots flying several events each season.

Selected Current World Soaring Records

World soaring records are a good measure of how far the sport of soaring has come from its modest beginnings. (Valid 08/2004)

- Free Distance (1350 miles) 2174 km Pilot: Klaus Ohlmann, Germany. Place Argentina
- Out and Return Distance (1395 miles) 2245 km Pilot: Klaus Ohlmann, Germany. Place Argentina
- Longest Flight (1869 miles) 3009 km Pilot: Klaus Ohlmann, Germany. Place Argentina
- Speed over (62.14 mi) 100km Course (154.78 mph) 249.09 kph Pilot: Horacio Miranda Argentina. Place: Argentina
- Speed over (621.4 miles) 1000km course (105.46 mph) 169.72kmh Pilot: Helmut Fischer, Germany. Place: South Africa
- Absolute Altitude : (49,011 feet) 14 938 m, Pilot: Robert R. Harris, USA Place: USA

Acknowledgements

While this document was pulled together from many sources, the hard work and dedication of Simine Short has made this document possible. Thanks to John H. Campbell as well.

Aviation & Soaring History Web Sites

www.first-to-fly.com/
The Wright Brothers online museum which includes a very detailed history of aviation.

http://invention.psychology.msstate.edu/air_main.shtml
A very worthwhile site when interested in the history and the invention of the airplane.

www.aviation-history.com/
Interesting online aviation history site

www.soaringmuseum.org/
National Soaring Museum in the USA

www.soaringmuseum.org/hallfame.htm
US Soaring Hall of Fame - Persons who achieve in a noteworthy manner in soaring or who have made significant contributions to the sport of soaring.

http://soaringmuseum.org/landmark.htm
National Landmarks of Soaring - Sponsored by the National Soaring Museum, an affiliate of the Soaring Society of America.

Soaring Related Background Web Sites

www.ssa.org
Soaring Society of America (SSA) home page. The SSA is the national organization responsible for soaring in the United States. Lots of good information on the sport and the organization here.

www.ssa.org/UsTeam/
US Soaring Teams. Organized and funded as part of the SSA the US Soaring Teams Web site features team members, pilot's biographies and much more about the US Soaring Teams.

www.ssa.org/usteam/press
The one stop media press room on soaring brought to you by U.S. soaring teams.

http://acro.harvard.edu./ssa/
This site has a host of soaring related information including the turnpoint exchange, flight recordings from contests and all the details of US team selection.

http://www.soarmn.com/soaring_links/index.htm
The excellent soaring link page by Paul Remde who has collected a huge variety of soaring related links. A must visit and four stars.

http://www.miskin.demon.co.uk/index.htm
This site gives a very good step by step idea and many references about learning to fly sailplanes.

http://www.webring.org/hub?ring=soaring&id=64&next5
This is a soaring web ring that allows you to randomly browse many of the best soaring related web sites

http://www.glidingmagazine.com
This site is an online magazine sponsored by the Soaring Society of America.

http://www.fai.org/
Fédération Aéronautique Internationale (FAI), the world's air sports federation, was founded in 1905. It is a non-governmental and non-profit making international organization with the basic aim of furthering aeronautical and astronautical activities worldwide. Ever growing, FAI is now an organization of some 90 member countries.

http://www.fai.org/Gliding/
The International Gliding Commission (IGC) of the FAI is the Air Sports Commission which is responsible for all air sports activities involving gliders and motor gliders with the exception of glider aerobatics.

Other Soaring and U.S. Team Media Background Available

This is your guide to understanding the history of soaring. Whether you are seeking a local club angle, dramatic contest coverage, a technology story, human interest, the history angle or international championship coverage, soaring has something for you. The sport is diverse, colorful and pulls together many potential story ideas for print editors and video professionals alike. This information is brought to you by U.S. Soaring teams without copyright for use by the media in coverage of the sport or U.S. soaring teams. See the U.S. Team Press Room for more background on the exciting sport of soaring. www.ssa.org\usteam\ust_press.htm

These resources are available for your use on the United States Soaring Team Press Room which includes press releases, media clippings, background, fact sheets, press images, web links and a championship calendar. See www.ssa.org/usteam/ust_press

United States Soaring Team Press Room

This is your one stop online media resource developed to help you craft a factual and newsworthy story on the exciting sport of soaring and United States Soaring Teams. This media resource is brought to you by the Soaring Society of America and United States Soaring Teams. Some of the resources available in the U.S. Soaring Team Press Room are:

- Soaring Society of America
- Sport of Soaring
- Sailplanes & Gliders
- Competitive Soaring
- Clipping Archive
- Press Releases
- U.S. Soaring Teams
- History of the Sport
- Glossary of Terminology
- Calendar of Events

Soaring History Terminology

Bank	To tip or roll around the longitudinal axis of the glider. To bank to turn the glider.
Class	A category of competitive glider established based on wing span, performance or pilot characteristics. World Soaring Championships are flown by class.
Convection	The up and down movement of the atmosphere normally related to thermal action.
Crews	Support personnel who assist the pilot on take off and landing and retrieve the pilot if they land off field. Typically a friend or family member.
Cumulus	A could type whose origin is upward moving air. Typically these clouds look like fluffy cotton balls in the sky.
Drag	The force opposing the forward motion of the glider (wind resistance when you stick your hand out the car window).
FAA	Federal Aviation Administration is the governing body of civil aviation in the U.S.
FAI	Federation Aeronautique Internationale is the world governing body of aeronautical contests and records.
Flight Computer	Sophisticated computer that takes measurements of distance and performance to show the pilot the distance and speed they can glide to reach a point.
Flight Recording	An electronic file that is a recording of the altitude and position of competitors while in flight. Normally generated by a secure recording GPS. Also called a Flight Trace.
Glide Ratio	The ratio of forward to downward motion. Forty five feet forward to one foot down to is called a glider ratio of 45:1
GPS	Global Positioning System. Used by competitors in conjunction with a flight computer and a secure recorder to navigate and make a record of the day's flight.
IGC	The International Gliding Commission (IGC) is the Air Sports Commission which is responsible for all air sports activities involving gliders and motor gliders with the exception of glider aerobatics.
Nationals	An event sanctioned by the Soaring Society of America for a single class of glider. Establishes the US national champion for that class and is used to select the U.S. Soaring Team.
Ridge Lift	Ridge lift occurs when the wind is deflected upwards along the face of a windward slope.
Sailplane	A motor less craft that can climb using atmospheric forces alone. Referred to interchangeably as a glider.
Sink	Descending air currents
Soaring	To fly without power from and engine without loss of altitude.
SSA	Soaring Society of America – The national organization responsible for soaring in the United States.
Thermaling	Turning in tight circles to keep the sailplane inside the column of raising air.
Thermals	Raising columns of warm air that allow sailplanes to gain altitude
Variometer	Sensitive rate of climb indicator that allows competitors to climb efficiently in thermals.
Wave Lift	Wave lift occurs when winds blow over a mountain range the air takes on the characteristics of water in a stream forming a wave behind the mountain range
WGC	World Gliding Championships are international events with the best sailplane pilots from around the world coming together to determine a champion of champions.