

# LONG ISLAND SOARING ASSOCIATION

**Brookhaven Calabro Airport**

**Shirley, New York**

## THE SPORT OF SOARING

Learning to glide is a team effort. To get into the air you need a minimum of three people--- tow pilot, instructor, and yourself. The youngest age for flying solo is 14. You can take lessons at any age.

### How long will it take me to solo?

How long it will take to learn to fly is somewhat under your own control. The more frequently you fly the quicker you get it all together. On an average it may take you a minimum of 25 flights or as much as 50 flights to solo. If you already have an airplane rating, it may take you 10 to 20 flights to solo.

If you try to take at least one lesson per week you can expect to take about 6 months to one year to complete your training. Two lessons per week is about optimum. If you fly less than once a week it will generally cause you to need more hours to complete your training.

Once you are about to solo, you will need a student pilot certificate ( This can be obtained at the local FAA office). This is only valid when endorsed by an instructor and must be revalidated every 90 days for continued solo flight.

Tows are usually to 3,000 feet and a flight will last an average of 20 minutes. Some flights may be as long as one hour, depending on the weather conditions.

### Should I learn to fly gliders first or airplanes?

There are many different opinions on this subject, depending on who you speak to. The Airforce Academy in Colorado trains all their pilots in gliders first before they learn to fly Jets. Why? Glider flying is pure flying---- there is a minimum of distraction in learning complex airplane systems, electronic navigation and coping with busy airspace. Glider flying requires refined techniques. If you are sloppy on the controls, you will not stay up, while someone who is more proficient and skillful will. Glider flying teaches you the basics of aircraft control and precision flying on tow, turns and landings. This skill can easily be carried with you when or if you choose to fly power planes.

### What happens after I solo?

“Solo” means flying with no one else in the plane. Once you solo, you may want to progress and become a licensed private glider pilot,( you must be at least 16 years of age) which allows you to share the joy of soaring with friends and is one of our requirements to flying some of our more advanced equipment. The FAA requires 10 hours of flight time, including 20 glider flights and 2 hours of solo time, before taking the flight test, which must be preceded by successfully completing the written test for Private Pilot Glider. \*\*(Please refer to the FAR’s for more detail or ask an instructor).

The level of achievement is an individual affair. Some pilots are content merely to glide in the vicinity of

the airport; others wish to reach certain heights and distances to attain badges or fly cross country in competitions. The choice is yours and no pressure is put on members to exceed their own expectations.

At this point you are at a stage to start thinking about teaching the next generation of pilots yourself, or maybe concentrate on progressing to even longer cross country flights such as 100 km triangles. Ultimately some pilots attain Diamond badges or record flights.

To give you an indication of some of our achievements from L.I.S.A., the longest distance flown was 1000 Km, our best height gain is 35,600 feet in Colorado using a soaring technique called wave flying, and in good thermal conditions many flights over five hours have been flown on Long Island. The Long Island record for duration is 8.5 hours. Will you be the next pilot to break this record from 1964? Finally, many aviation careers have started in our club.

There is a lot to learn, but the whole process is quite enjoyable. We hope this gives you a feel for the sport of soaring.

**Visit us on the Web:** <http://www.LongIslandSoaring.com>

Other sites:

<http://www.ssa.org>

<http://www.soaringmuseum.org>

## **Introduction to Soaring**

Learning to glide is a team effort. To get into the air you need a minimum of five people:

Tow pilot, Instructor, Wing Runner, forward signal person and yourself.

### **How old do I need to be in order to learn to fly gliders?**

The youngest age to fly solo is **14** and there is no upper age limit as long as you have no known medical defect that make you unable to pilot a glider. So you can begin your lessons as early as 11, although optimally 12- 13 is better. No Medical is required.

### **How long will it take me to solo?**

How long it will take to learn to fly is somewhat under your own control. The more frequently you fly the quicker you get it all together. On average, it may take you a minimum of 25 flights or as much as 50 flights to solo.

### **When can I take up my friends for a ride?**

You will need to obtain a private glider rating provided that you have certain minimum flights and have passed the private written exam. You must also be at least **16** years old.

Learning to soar is a series of steps and plateaus. How high on that ladder you wish to climb is up to you. Some pilots are content to soar around the airport. Others find exhilaration and satisfaction in cross-country flight and ultimately in competing with other pilots. Learning while flying is fun; a fine balance of determination, flexibility, and practice is necessary to gain the proficiency you will need to get the most out of your sailplane and your flight.

### Launching methods

There are basically 3 launching methods available to pilots:

#### 1. **Aero tow**

Aero tow launches are the most widely used method of getting a glider airborne in the U.S. today. Although it is the most expensive method it is the most efficient method. The sailplane is pulled aloft by a 200-foot nylon or polypropylene rope secured by a special hook to the tow plane. The sailplane pilot can release the tow rope at any altitude desired. In the unlikely event of a sailplane release mechanism malfunction, the tow plane pilot can release the tow line.

#### 2. **Winch Launching**

This is the second most popular method. This may be the least expensive method, although not all airports can accommodate this method. A Winch operation requires a skilled winch operator. Winch launches can achieve altitudes of 500-2000 feet before release, depending on the length of the winch line and the wind strength.



***Double Barrel Winch***



***Winch Launched Glider***

#### 3. **Auto Launching**

Auto launches are sometimes used. A 1000-foot rope connects the sailplane to a special hook on the towing automobile. When the signal is given, the tow vehicle drives down the launch runway and the glider pilot flies the glider up to an altitude of 800 feet or so, then releases the tow line which falls gently to the earth. Auto and winch launches are less expensive than aero tows; however, to conduct them safely, they do require a several member crew.



*The aero tow – a primary means of towing.*

### Why learn to Soar?

Once you get a license to operate a sailplane, you have a license to leave the earth, climb in rising air currents and travel hundreds of miles. You will be incapable of bringing any of your worldly troubles with you in the sailplane - they just won't fit aboard. In order to make such a flight, your mind is consumed flying as efficiently as possible, just as the eagle continually adjusts his circle as he climbs into the upper air, so must you. Constant attention is required to climb, once you're up high, you're busy with the next segment of your route; deciding where your next lift will be coming from as you glide, traveling 10 to 15 miles further for each extra 2,000 feet of the precious altitude you've gained. Unlike a license to fly power planes, **a license to fly gliders is a license to do something that is different each and every time you climb aboard. It is safe, it is fun, and it is challenging.**

### What methods are used in Soaring? (Lift Sources)

There are basically 5 methods of soaring. I will cover the popular 4.

It's easy for a slender sailplane to stay aloft without an engine, since it is aerodynamically designed to glide efficiently through the air. Gravity slowly draws it toward the earth's surface. Generally, a 3,000 foot aero tow will produce a 15-20 minute flight, when no rising air currents are found to lengthen the duration of the flight.

The pilot in the sailplane can achieve a longer flight if the air mass surrounding the sailplane is rising at a faster rate than the sailplane is gliding downward. When this happens, the real thrill of climbing without an engine begins! There are a number of lift

sources; the most commonly experienced are thermals, ridge, wave and on Long Island- Shear Line.

## 1. Thermalling – What is a thermal?

The earth, when heated by the sun, warms the air next to it, causing it to expand and rise just like steam coming from a boiling kettle on the stove. Bubbles of warm, rising air form into columns known as *thermals*. Some terrain absorbs heat from the sun more rapidly than the surrounding earth. Dark plowed fields asphalt parking lots and rocky terrain absorbs the sun's heat quickly and provides excellent sources of lift. In some areas of the United States, sailplane pilots have ridden in thermals up to altitudes of over 30,000 feet. Thermal lift can be found year-round since the ground-heated air will rise as long as it is warmer than the surrounding air.

What can you achieve? Altitude gain, distances (Cross Country), duration flying.

Pilots circle upward in the rising air of the thermal, then head towards their destination, losing altitude gradually over the areas where there is no lift. When another thermal is located, they circle up to a higher altitude, and again head out on their way. You may experience several gliders thermalling together in the same column of rising air. In fact, you've probably often seen large birds circling over the fields without flapping their wings. They are thermal soaring just like the sailplanes, and frequently the two will share a thermal.

As you can see, wind is not all necessary for sailplanes to remain aloft. **Solar energy** is what is used! The wind can blow the thermals apart thus making it harder for the glider pilot to achieve their goals. But if the wind were to stop, the glider will keep on flying during a thermal flight, since **the wind does not help keep the ship aloft**. What can and does reduce thermal lift is the disappearance of the sun behind the clouds.

**There's nothing quite like the exhilaration of bumping into a strong source of thermal lift and circling gracefully up to cloud base! It is a feeling of freedom to soar as the hawks do.** It is also a real sense of accomplishment to seemingly defy gravity and stay up for hours in a graceful aircraft that has no need for an engine. The Duration record on Long Island is 9 hours, The world record is 72 hours- No Engine!

## 2. Ridge Soaring – How does that work?

**Now, the wind is a vital component of ridge soaring.** When the wind blows against a mountain, hill, cliff, or ridge line, the air flow is reflected upward and- depending on the strength of the wind it can rise hundreds of feet above the top of the ridge. Sailplanes can fly back and forth for hours along this narrow band of rising air on the windward or upwind side of the ridge. Flights of over 1,000 miles have been made utilizing the ridge lift along mountain chains.

What can you achieve? Primarily distances (Cross Country) and duration flying.

### 3. Wave Flying – What causes Wave?

Wave flying is especially exciting to many glider pilots. This meteorological phenomenon occurs when strong winds (over 25 mph) blow perpendicular to a mountain or ridge. The wind flows over the top of the obstruction and down the opposite side, where it bounces off a layer of stable air near the ground and is deflected upward many thousands of feet to stable air where it bounces downward again. This wave action can occur many times in succession and is very similar to what you see when water flows over a submerged log in a stream. Mountains and hills are primarily instrumental in the forming of waves.

Because waves which occur on the leeward (downwind) side of the mountain are generated by strong winds, the areas of sink and lift are more extreme. Sailplanes can rise at 2,000 feet per minute or more in the rising air on the windward side of mountain waves. Pilots learn to guide their ships to remain in this lift area and can achieve heights of many miles. Hundreds of pilots have flown their sailplanes to altitudes of greater than 35,000 feet, the normal cruising altitude of a jetliner! Fall, winter and spring generally provide the best conditions for high altitude wave flying.

Federal Aviation Regulations require the pilot to use an oxygen system on any flight higher than 12,500 feet above sea level for more than 30 minutes. Short courses in the physical effects of high altitude flight are available from the FAA, and high-altitude chamber rides for glider pilots can often be arranged at military airfields.

What can you achieve? Primarily Altitude gains and duration flying.



***Lenticular Cloud***



Flight along wave - Photo by Karl Hanzel

### 4. Shear Line Lift – Unique to the east and west coast

Air over land gets hot from the sun. The air rises. Other air must replace the rising air. Ocean air is drawn from the ocean to the land. This is a sea breeze. This is also called the

marine air. Where this cooler marine air meets the warmer valley air this line is called a shear line. A shear line is a generalized term for when two air different air masses contact each other with motion relative to one another. This motion might be with one sliding past the other or where one converges against the other. This is commonly called a “**Convergence**”. This convergence provides abundant thermals for good soaring conditions.