

AERONAUTICS

Sailing Like the Birds

Like ducks take to water, Americans are taking to the air in man's earliest successful form of flight—the sailplane. Using no motor, soaring is "putting the fun back in flying."

By ELIZABETH HALL

► FOLLOWING in the wakes of eagles, Americans in wholesale numbers are realizing the dream of centuries—to soar like a bird, using only the natural currents of the air and human skill for flight.

All it takes is a sunny day, a few puffy cumulus clouds to indicate the presence of warm air currents and an automobile or airplane to launch your sailplane. The towline is released, the nose pointed down—the plane dips, glides, climbs and suddenly soars!

Sky sailing with its motorless flight is man's closest approximation to his dream of flying like the birds, being one with the wind and the sky, without the noise of an engine.

In soaring, airplane pilots find a form of relaxation and recreation in which staying in the air depends on their skill and knowledge of the air.

Scientists are interested in sailplanes in order to study yet unsolved mysteries of aerodynamics and as a vital link to studying meteorological phenomena.

Soaring is also an effective training ground for pilots. The National Aeronautics and Space Administration is training astronauts to fly paragliders with triangular-shaped wings as gliders may play an important part in reentry under the Apollo manned lunar flight program.

But soaring's primary popularity is as

a sport. Americans are taking to the air in ever increasing numbers. The ease with which amateurs can quickly learn to fly a sailplane, the excitement of gliding down a ridge or climbing with the birds, and the element of danger lurking if proper skill is not exercised have made man's earliest successful form of flight a popular recreation and a sport in the Space Age of today.

Although a layman may consider gliding and soaring almost the same thing, they are actually different. Gliding means to coast downhill on an inclined plane of air, while soaring is maintaining or gaining altitude in up-currents of air.

History of Soaring

The history of soaring goes back more than 450 years to Leonardo da Vinci who studied the movements of soaring birds as a possible answer to human flight.

Pioneers in the field of soaring were John Montgomery who built a successful glider in 1884, and Otto Lilienthal, whose glider wings resembled those of a bat. Lilienthal jumped from hilltops near Berlin, his arms encased in the wings and his legs hanging down to steer.

The first real soaring flight took place in 1909 when a Frenchman, Jose Weiss, rose 40 feet above his starting point because the air was rising faster than the glider was sinking through it. Orville Wright in 1911

set a new record when he soared for almost ten minutes, using a moveable rudder and wings that twisted to guide his plane.

The beginning of modern soaring technology can be dated from the Versailles Treaty in 1920 when the Germans were forced to abandon powered aircraft. A camp near the top of Mount Wasserkuppe in the Rhone mountain district was started for those interested in gliding.

First True Sailplane

Dr. Wolfgang Klemperer, who launched his plane with a heavy rubber cord like a slingshot, broke the Wright Brothers' record in the world's first true sailplane in the early twenties. "I am unable to describe by words the sublime pleasure one experiences in gliding over hills and valleys, silently, like the eagle," he wrote in 1927. "The ample controllability makes you feel like them, master of the air." Dr. Klemperer holds license number one, the first soaring pilot license issued in the world.

Germany advanced rapidly in glider technology until war preparations stopped further research. The Germans' success with gliders was shown when they used the motorless planes to land troops silently for the battle of Crete and in their well trained air force personnel, who were experienced glider pilots.

Soaring technology today has not changed much since 1932, in the opinion of Clarence D. Cone Jr., a professional aerodynamicist and research associate at the Virginia Institute of Marine Science, who has been interested in soaring, especially the natural soaring of birds for several years. The major progress in soaring technology has been in understanding new developments in meteorological research, instead of in new aerodynamic principles.

In order to understand the principles of soaring, man looks to the birds. The sea birds practice "dynamic" soaring as they fly horizontally in loops above the ocean's waves, taking advantage of the uneven layers of wind to glide down to the slower-moving wind near the waves and then soaring up on higher wind currents.

The soaring of land birds is called "static" soaring because these birds depend on vertical columns of rising air. One source of static soaring is called the ridge current, found when the air is deflected upward over hills and ridges. The early glider pilots who jumped from hilltops and sand dunes depended on these air currents for lift. But, like dynamic soaring over the ocean, this type of flight is limited geographically.

In order to understand the other source of static soaring, Mr. Cone compares the earth's surface on a sunny day to the bottom of a kettle of gently boiling water, with buoyant air masses rising from many points exactly as the vapor bubbles in a teakettle do.

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Dita Aldott

IN THE EAGLE'S WAKE—S. A. Aldott soars above the Texas plains near Odessa, using the natural currents of the air instead of a motor to keep him aloft. His sailplane is a Schweizer 1-23H high-performance, all-metal sailplane, built for competition, record and sport flying, and winner of many world soaring titles.

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These bubbles of air are called thermals, and consist of a mass of warm air slowly rising through the cooler, heavier air.

In order to soar in thermals, a bird circles within the central updraft and will maintain altitude or gain altitude if his sinking speed is less than or equal to the upward speed of the cooler air. A sailplane pilot, in order to travel cross country, must likewise gain his altitude by traveling on these thermals, gliding from one to the other.

Another type of soaring, in which higher altitudes can be reached is wave soaring. Waves are found in the lee of ridges or mountain ranges, where the air reaches higher speeds as it "flows" over the mountains and down causing a wavy current that has lifted sailplanes as high as 45,000 feet.

Despite popular notions, sailplaning is a safe sport as long as normal precautions are taken and any carelessness avoided in the air. A glider can land almost anywhere at a speed of 30 to 40 miles an hour. Cruising speeds between thermals average 70 miles per hour.

A person interested in soaring can obtain a student license when he is 14 years old and a private pilot license when he is 16, allowing him to carry nonpaying passengers. A sailplane pilot earns his commercial license two years later and is then qualified to give instruction and carry paying passengers.

In all cases, a certain number of flights and hours in the air are necessary in addition to passing a written examination.

If a soaring pilot wants his own equipment, he can buy a new sailplane for between \$2,300 and \$8,000. Secondhand ones cost less. Do-it-yourself kits are available for the mechanically minded person who wants to build his own. One inexpensive way to enjoy the art of soaring is to form a partnership with other interested pilots or join a club where equipment is available for everyone.

U.S. Soaring Society

The Soaring Society of America, Box 66701, Los Angeles 66, California, is glad to help new sailplane pilots get started by recommending sailplane manufacturers, soaring clubs and instructors in a certain area. The SSA is the American representative of the Federation Aeronautique Internationale that governs international sporting aviation and conducts the World Soaring Championships.

The first national soaring contest in the United States was held in Elmira, N. Y., in 1930, although soaring had become a popular sport long before that in Europe. Most of the national American meets since that time have also been held in Elmira, on the mountain known as Harris Hill. From early summer through Thanksgiving meets are held at this U.S. soaring capital.

Elmira is also the home of the Schweizer Aircraft Corporation that built the world's first all-metal sailplane. Founded in 1930, it is the leading manufacturer of sailplanes in the U.S., and its soaring school has been in existence for 17 years.

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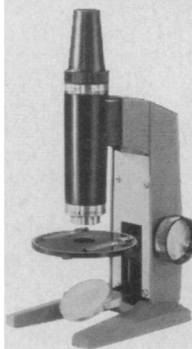
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