BE PREPARED®
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News, tips, and useful information about Scouting and the outdoors

Vol. 4, No. 6

HIGH FLYING EDITION

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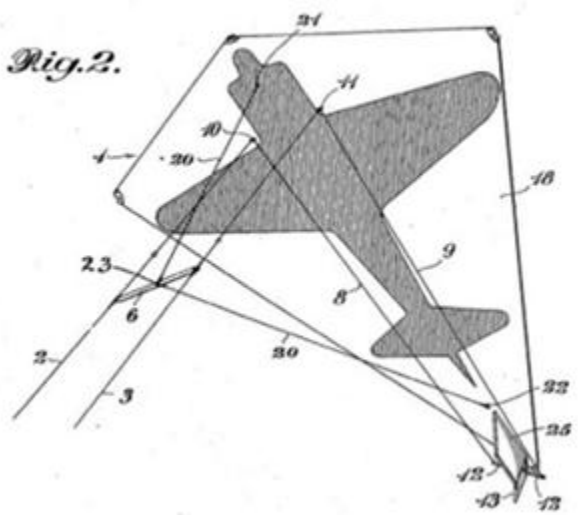


The strong, steady breezes of summer are perfect for flying kites. Building and launching them is a skill that can be as much fun today as it was long ago. Kite construction is also one of many terrific ways that Scouts can explore STEM - *Science, Technology, Engineering, and Mathematics*.

Photo by John R. Fulton Jr.

Cub Scouts and their leaders launch an eagle-shaped kite in Chicago

KITES

"It is a pleasant sensation to sit in the first spring sunshine and feel the steady pull of a good kite upon the string," wrote Daniel Carter Beard, one of Scouting's founders. "The pleasure is, however, greatly enhanced by the knowledge that the object skimming so bird-like and beautifully through the

air is a kite of your own manufacture."

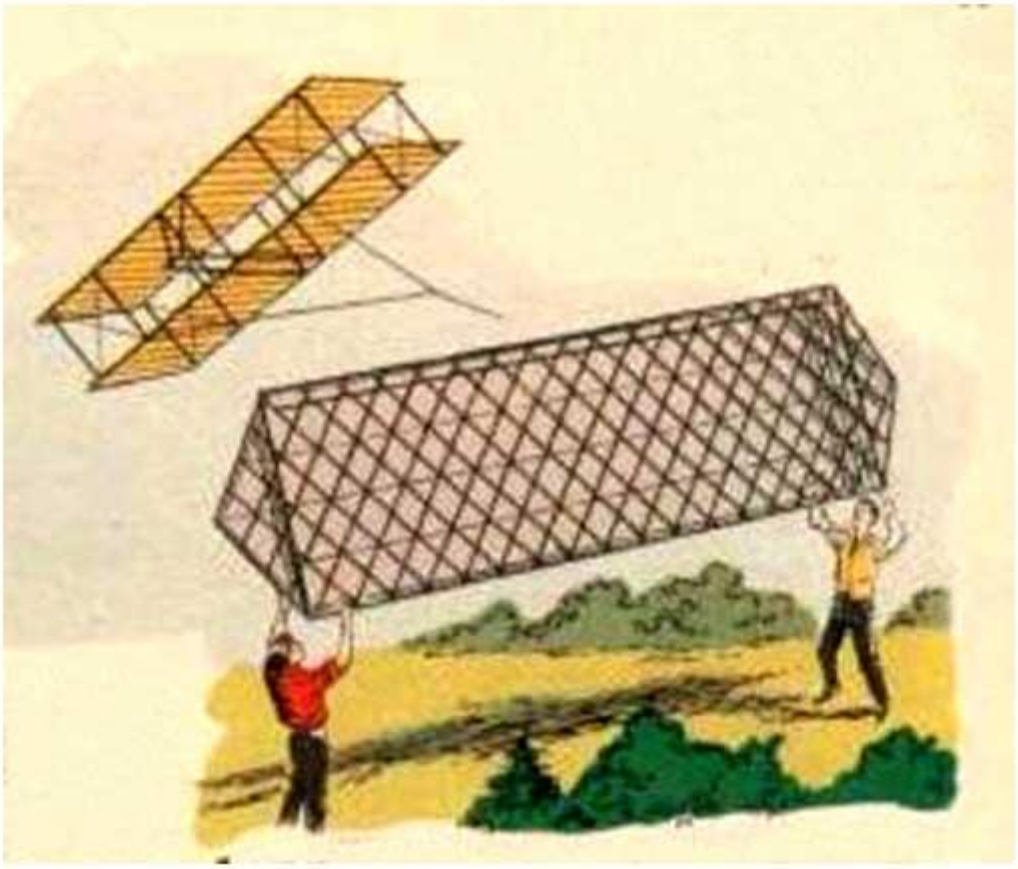
In The American Boy's Handy Book, Mr. Beard included plans for dozens of kites that readers could build on their own.

He also encouraged boys to be bold in trying out new ideas, giving the example of two boys building a kite-powered wagon and riding it on a windy beach. "By being able to steer the kite to right or left," Mr. Beard reported, "they were enabled to follow the line of the shore."

Kites and Scouting began crossing paths through Baden Baden-Powell, the younger brother of Robert Baden-Powell, founder of the world Scouting movement. Long before there were airplanes, Baden Baden-Powell became an expert in using balloons and kites for collecting military intelligence. In an 1894 experiment, he was lifted into the sky by a kite 36 feet tall.

Baden Baden-Powell aloft

In America, kites were vital to the development of flight. Orville and Wilber Wright used large kites to test the wing shapes they eventually incorporated into their 1903 Flier, the first successful manned, engine-driven airplane.



Wright brothers kite research

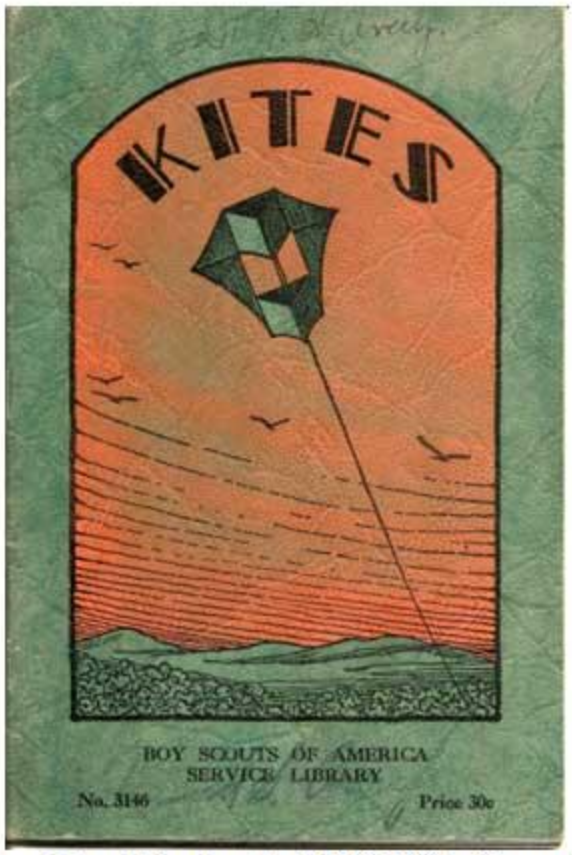
As children, the Wright brothers had been introduced to flying contraptions when they were given a toy called The Bat. Powered by a rubber band, a propeller on top lifted The Bat high into the air.

Wright Bat Kit

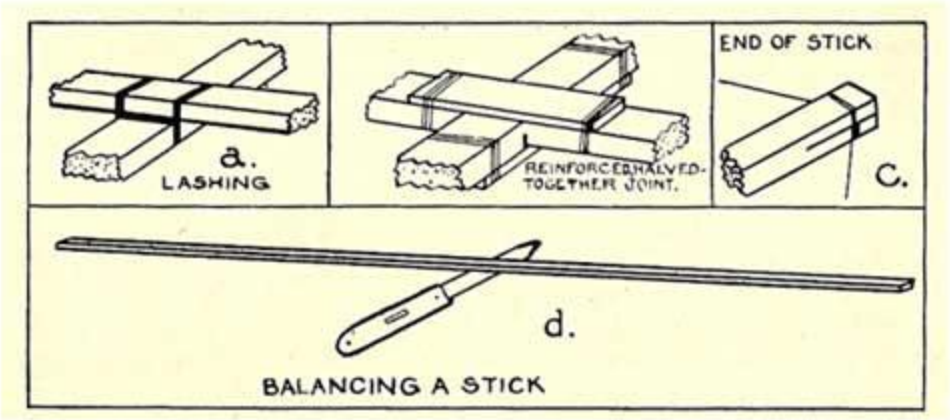
You can experiment with the Wright Bat Kit, too. It's available at www.scoutstuff.org.

SCOUTING'S KITE MAN

In 1931, the Boy Scouts of America published a manual entitled Kites. It gave the basics for building kites, and encouraged Scouts to use their ingenuity to develop their own designs and flying techniques.



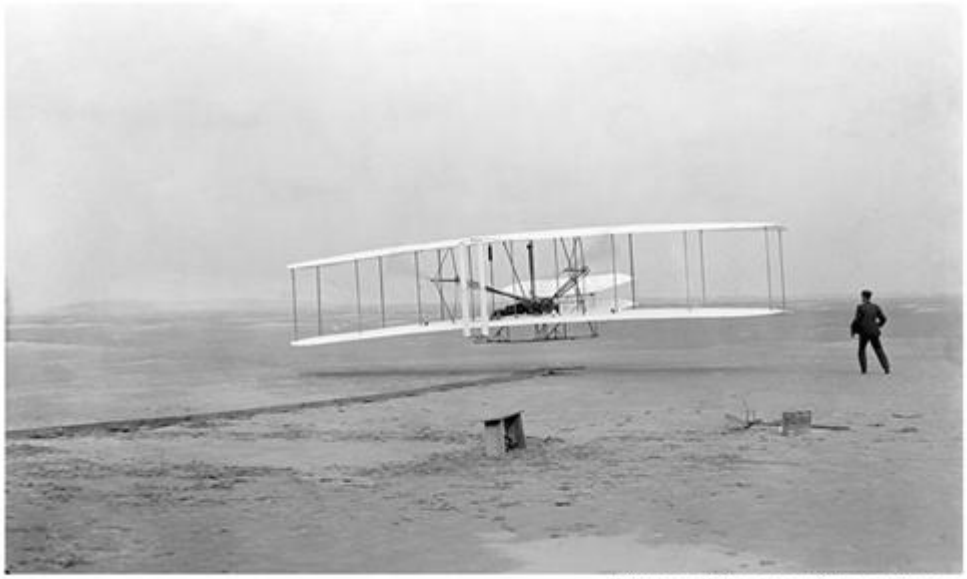
***Kites* - Paul Garber's 1931 BSA Pamphlet**



***Kites* applied Scouting skills to kite construction**

The author of *Kites* was Paul Garber, born in 1899 before there were airplanes. At age five he was given a kite, and it fascinated him. A few years later he saw Orville Wright pilot the first aircraft the U.S. Army would fly, and he knew he wanted a life on high. He enlisted in the Army to become a pilot, and after World War I worked with the Air Mail Service.

In 1920, Mr. Garber began what would be a 68-year career with the Smithsonian Institute. He was a driving force in building the Smithsonian's collection of aircraft, including the Wright Brothers' *Flier*.



Library of Congress photo archives

The Wright brothers *Flier* on its historic first flight in1903

Mr. Garber also acquired *The Spirit of St. Louis* for the Smithsonian. That was the plane Charles Lindbergh piloted on the first solo, non-stop flight across the Atlantic Ocean. Today you can see those planes and many more at the National Air and Space Museum in Washington, DC.

Photo by Robert Birkby

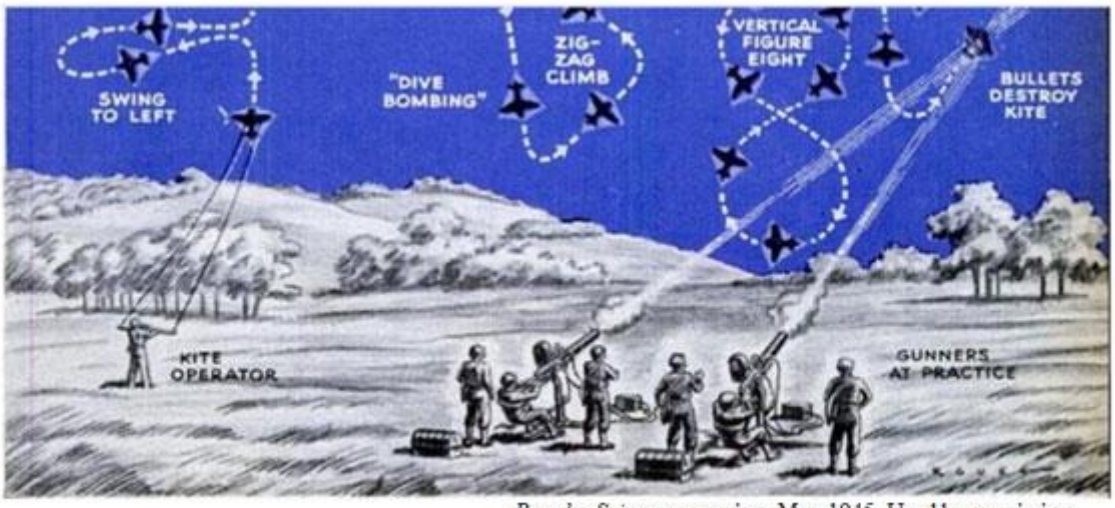
***The Spirit of St. Louis*, on display at the National Air and Space Museum**

Paul Garber never lost his fascination with kites or his eagerness to try new ideas. During World War II, he developed a special kite used for target practice by gunners stationed on land and on ships.

National Air and Space Museum photograph

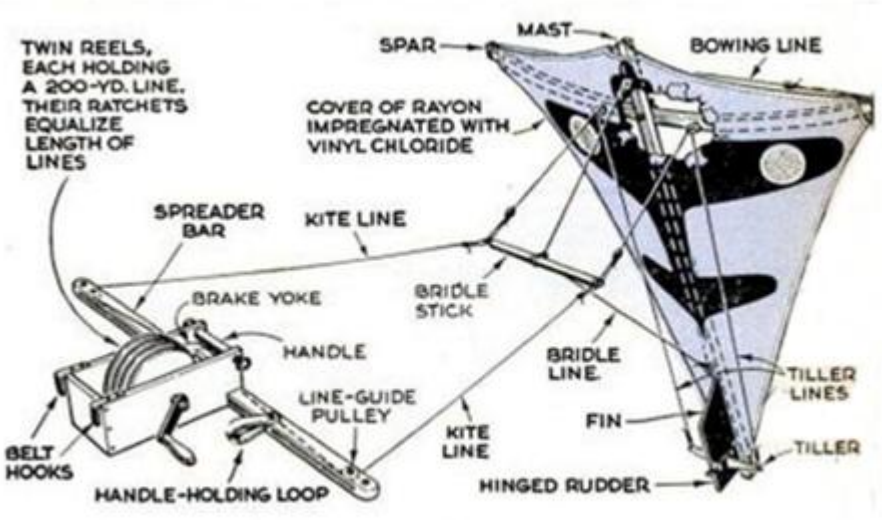
Navy Commander Paul Garber and his target kite

The secret to the kite's performance was a hinged rudder. An operator used two lines to steer the kite through complicated flight patterns.



Popular Science magazine, May 1945. Used by permission.

Target kites in action



Popular Science magazine, May 1945. Used by permission.

Controls of the Garber Target Kite

From the childhood joy of kites through his writings for the Boy Scouts and decades with the Smithsonian Institute, Paul Gartner learned all he could about flight, then used that knowledge to follow his dreams.

AVIATION MERIT BADGE - ONE OF THE FIRST

"Built a box kite that will fly." That was a requirement for the Aviation merit badge in 1911 at the dawn of the Boy Scouts of America. The embroidered badge showed the most advanced airplane of the time - a single-engine biplane constructed mostly of wood and cloth.

Aviation merit badge - 1911

Aviation merit badge - 2012

Today's Aviation merit badge features a sleek airliner streaking across the sky. The change in images represents a hundred years of people developing the skills and vision to design, build, and fly aircraft, from the first propeller-driven biplanes to the latest supersonic jets.

BUILD YOUR OWN AIRCRAFT

Want to construct an aircraft of your own? A good place to start is with a Wood Kit from www.scoutstuff.org. Choose a helicopter, biplane, Spirit of St. Louis, SR-71 Blackbird, or a Space Shuttle, or build them all. Check the online catalogue to see the BSA's entire Wood Kit fleet.

Biplane Wood Kit

Space Shuttle Wood Kit

ASTRONAUTS AT PHILMONT

While training for lunar missions, the astronauts of America's Apollo Space Program traveled to Philmont Scout Ranch in 1964 for an intense three-day study of geology. Scientists at the National Aeronautics and Space Administration (NASA) realized that areas of the BSA national high adventure base offered important geologic similarities to landscape formations the astronauts might encounter on the Moon.

Photo by Robert Birkby

Philmont landscape at the center of the astronauts' activities

The astronauts were all expert pilots. For that, mastering mathematics had been important. They were also preparing themselves for space exploration by studying many other areas of science, technology, and engineering. Of the 20 Apollo astronauts, 18 had learned skills and values as Scouts. Five had reached the rank of Life, and four were Eagles.

NASA photograph

Apollo Astronauts in the Philmont Dining Hall – June, 1964

From left to right: Pete Conrad (Cub Scout), Buzz Aldrin (Tenderfoot), Dick Gordon (Life), Ted Freeman (First Class), Charlie Bassett (Life), Walt Cunningham, Neil Armstrong (Eagle), Donn Eisele (Eagle), Rusty Schweikhart (First Class), Jim Lovell (Eagle), Mike Collins, Elliot See (Eagle), Gene Cernan (Second Class), Ed White (Second Class), Roger Chaffee (Eagle), Gordon Cooper (Life), C.C. Williams (Life), Bill Anders (Life), Dave Scott (Life), Al Bean (First Class).

Make it a priority to get to Philmont sometime, or any of the BSA's other high adventure bases and terrific council camps. As the Apollo astronauts discovered, there's plenty to learn, and you'll find great adventures all around.

You can look the part, too, by pulling on a Scout jacket like the ones the astronauts wore while they were at Philmont. The traditional red jacket is perfect for school, around town, and evenings in camp. When you do reach to Philmont, you've earned the right to stitch the black bull patch on your jacket's left shoulder. Learn more at www.scoutstuff.org.

Washable Wool Jac-Shirt

STEM/NOVA

***S**cience, **T**echnology, **E**ngineering, **M**athematics* - put them all together and you've got STEM, shorthand for important subjects of study in high demand today and in the future.

Ever designed and lashed together a signal tower? That's STEM in action. Figured out food quantities and stove fuel needs for your patrol's backpacking trek? That's STEM, too. From Architecture to Weather, many merit badges rely heavily on STEM. So does map and compass navigation. Look around and you'll find Scouts everywhere putting STEM skills to use.

Photo by Robert Birkby

The STEM of signal tower construction

To encourage Scouts and reward them for sinking their teeth even deeper into science, technology, engineering, and mathematics, the BSA is rolling out an exciting new program called STEM/NOVA. You'll be hearing a lot in the months to come about ways to use STEM in BSA activities and to challenge yourself and others to learn even more. STEM/NOVA awards will further inspire Cub Scouts, Boy Scouts, and Venturers to achieve at the highest levels.

STEM/NOVA emblem and award

For the latest on STEM/NOVA, check out www.scouting.org/stem

From a Cub Scout flying a kite to an astronaut Eagle Scout setting foot on the Moon, STEM skills open doorways to incredible possibilities. Let Scouting and STEM/NOVA help you fly as high as you can, too, and challenge you to discover remarkable interests, hobbies, and perhaps even a career.

Photo by Robert Birkby

(This edition of the *Be Prepared Newsletter* was developed and written by Robert Birkby, author of the current editions of the *Boy Scout Handbook* and *Fieldbook* and of *Scout Stuff*, the new book about the National Scouting Museum.)