SPECIAL – 28 PAGES ON BOATING

POPULAR MECHANICS MAGAZINE

WRITTEN SO YOU CAN UNDERSTAND IT

MARCH 1958
35 CENTS

Build This 15-Foot Outboard Runabout
—Plans start on page 152

What Owners Say About the EDSEL

8 Pages of Full-Color Paintings by Eric Sloane tell you

HOW TO FORECAST

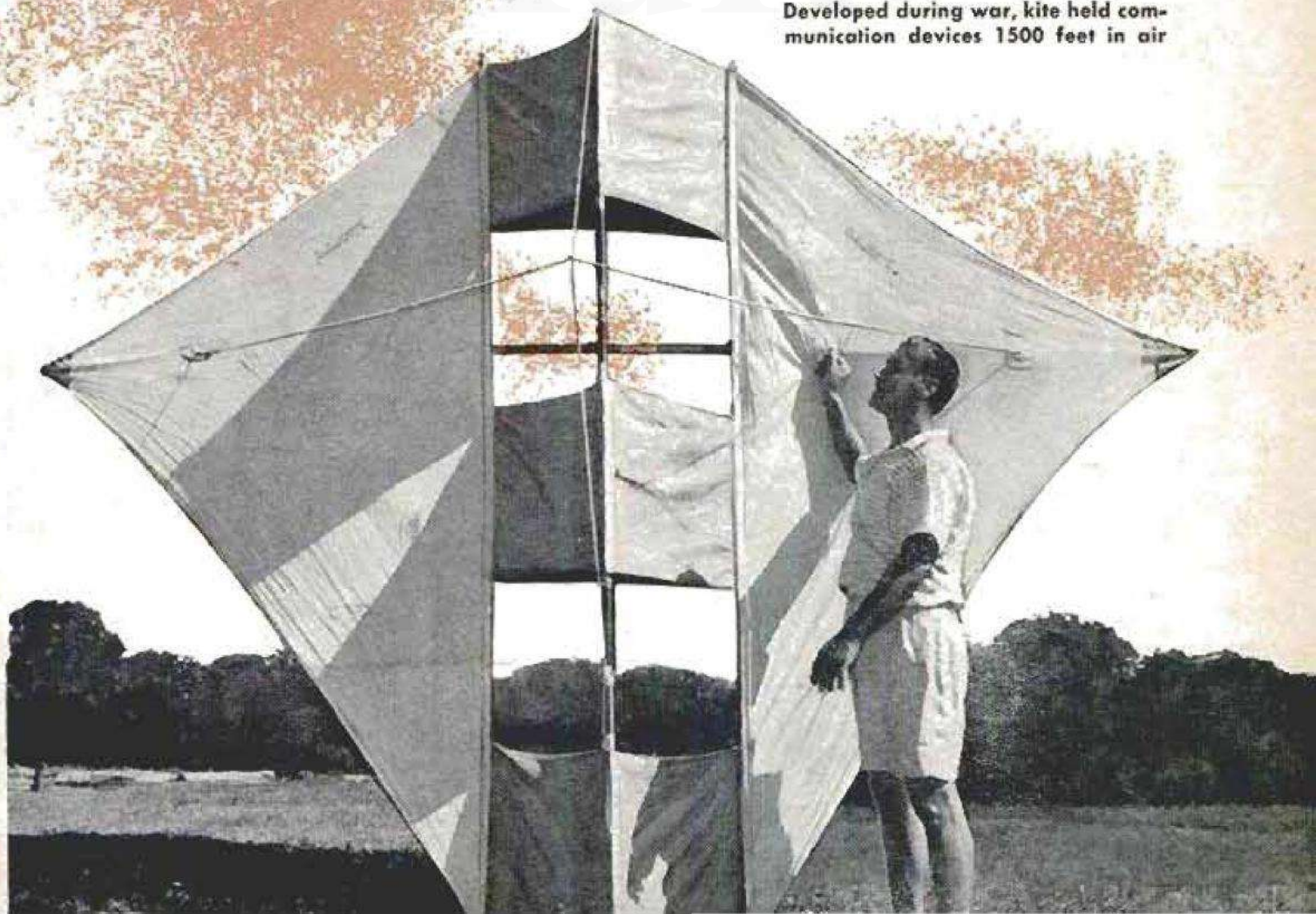
POPULAR MECHANICS
MARCH 1958
WRITTEN SO YOU CAN UNDERSTAND IT
VOL. 109 NO. 3

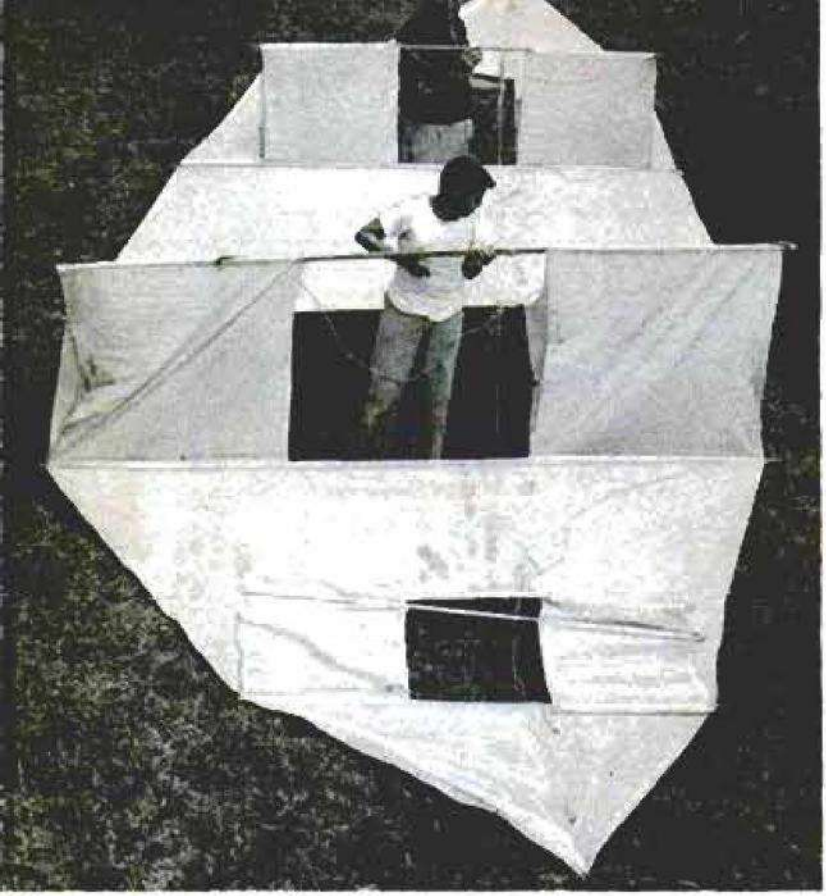
He Flies Kites for Love or Money

By George X. Sand

WHEN Rear Adm. Richard E. Byrd led his Operation Deepfreeze expedition to the Antarctic, the famed explorer knew from experience that very tall low-frequency radio antennas would be required

Developed during war, kite held communication devices 1500 feet in air





Jalbert and son display kite with 18-foot wingspread. The inventor once used it to tow an automobile

to maintain dependable communication with the outside world. The nature of the polar atmosphere was such that it hopelessly attenuated the conventional short-wave signals.

To erect huge, very costly radio masts would require transporting thousands of tons of steel under very unfavorable circumstances. Once up, such towers would be subject to the violent storms that lash this desolate area.

Instead, Byrd decided to use captive balloons to send aloft the long antennas. However, unlike the unsteady "rubber cow" gas bags used during the last war, these balloons would have to remain practically stationary in the polar sky, regardless of the wind. A big order!

Jalbert Knew the Answer

The Jalbert Aerology Laboratory at Boca Raton, Fla., knew the answer to Byrd's problem. The founder of this unique lab, Domina C. Jalbert, 53, is an energetic French Canadian inventor who has delighted himself by flying kites since he was four. He supplied the Deepfreeze expedition with airfoil "kite balloons" of his own origin that are part kite, part balloon, with the best features of each.

"I'd discovered that an ordinary balloon would remain stationary overhead only if there was little or no wind to blow it and its cable away from the vertical plane," explains Jalbert. "In fact, if the wind blew strongly enough it would force the gas bag right down against the ground.

"On the other hand, to remain aloft and steady, a kite required a fairly strong breeze. Without wind, the kite would dive to earth. So I compromised by putting kitelike fins and rudders on a streamlined balloon. Henceforth, the stronger the wind

Trapped air supports marker which is tossed from a ditched plane or stricken vessel to attract attention

the more the kite-balloon would climb against it. And, of course, with no wind the hydrogen or helium-filled bag would remain up anyway."

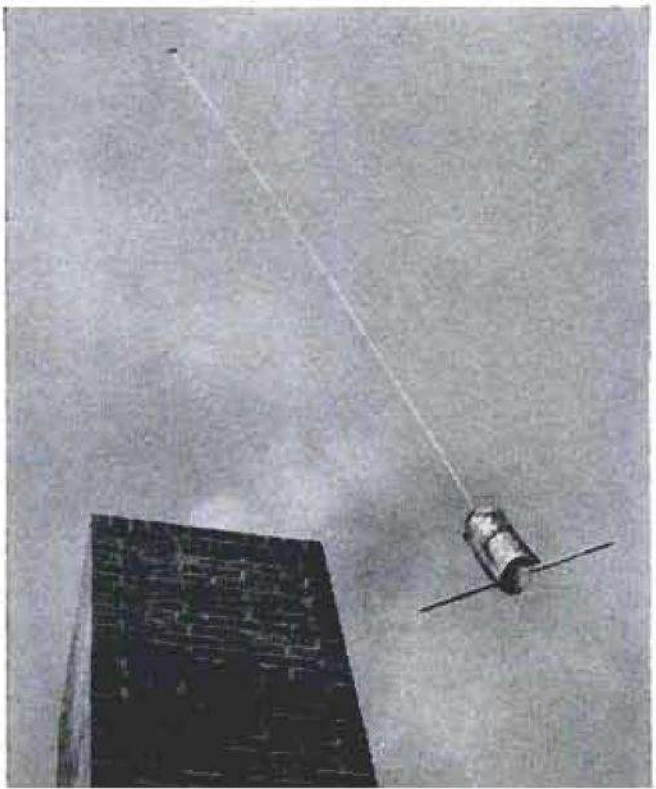
Jalbert's measure of a good captive balloon is its ability to remain almost directly overhead, for days if necessary, with practically no movement. His kite-balloons have solved the problems of surveyors in rough terrain by supporting airborne sighting markers for their transits. When the Rockefeller Foundation found itself wondering how it could suspend mosquito traps above the tallest trees of the Brazilian jungle to make possible a study of malaria conditions, Jalbert's invention provided the means.

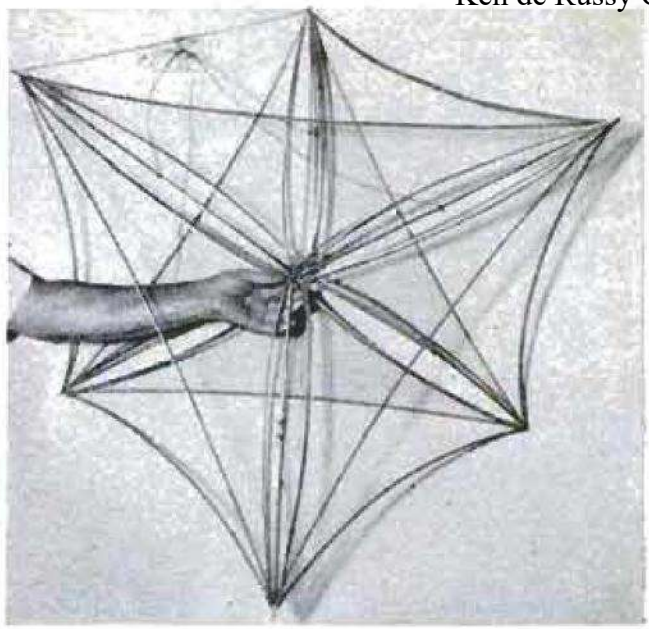
The unusual product has found application from one end of the earth to the other. Byrd used it in the Antarctic; near the North Pole, Norwegian whaling ships put it to work to mark the location of harpooned leviathans, preventing loss of the floating carcasses.

Several years ago the University of Washington wanted to record on film the activities of spawning salmon in the rivers. However, experience warned that the sound of a boat or plane motor, even the splash of a wading cameraman, would disturb the fish and defeat the purpose. You guessed it: one of Jalbert's kite-balloons was weighted down so that it floated silently over the unsuspecting salmon while an automatic camera made the pictures.

Sometimes when optimum conditions prevail, Jalbert will use a straight kite on his projects instead of the kite-balloon. Once the Woods Hole Oceanographic Institute had him make a kite for measuring

Jalbert kite is used to suspend smoke-measuring instrument above chimney in a city's antismog campaign





Collapsible radar reflector is stored aboard lifeboat, flown to pinpoint location of drifting boat

the depth of the Caribbean Sea in the vicinity of the Virgin Islands. "Because the southeast trade winds blew steadily in that area the kite easily held up the depth-recording instruments," he says.

He uses Egyptian cotton for the construction of his kites.

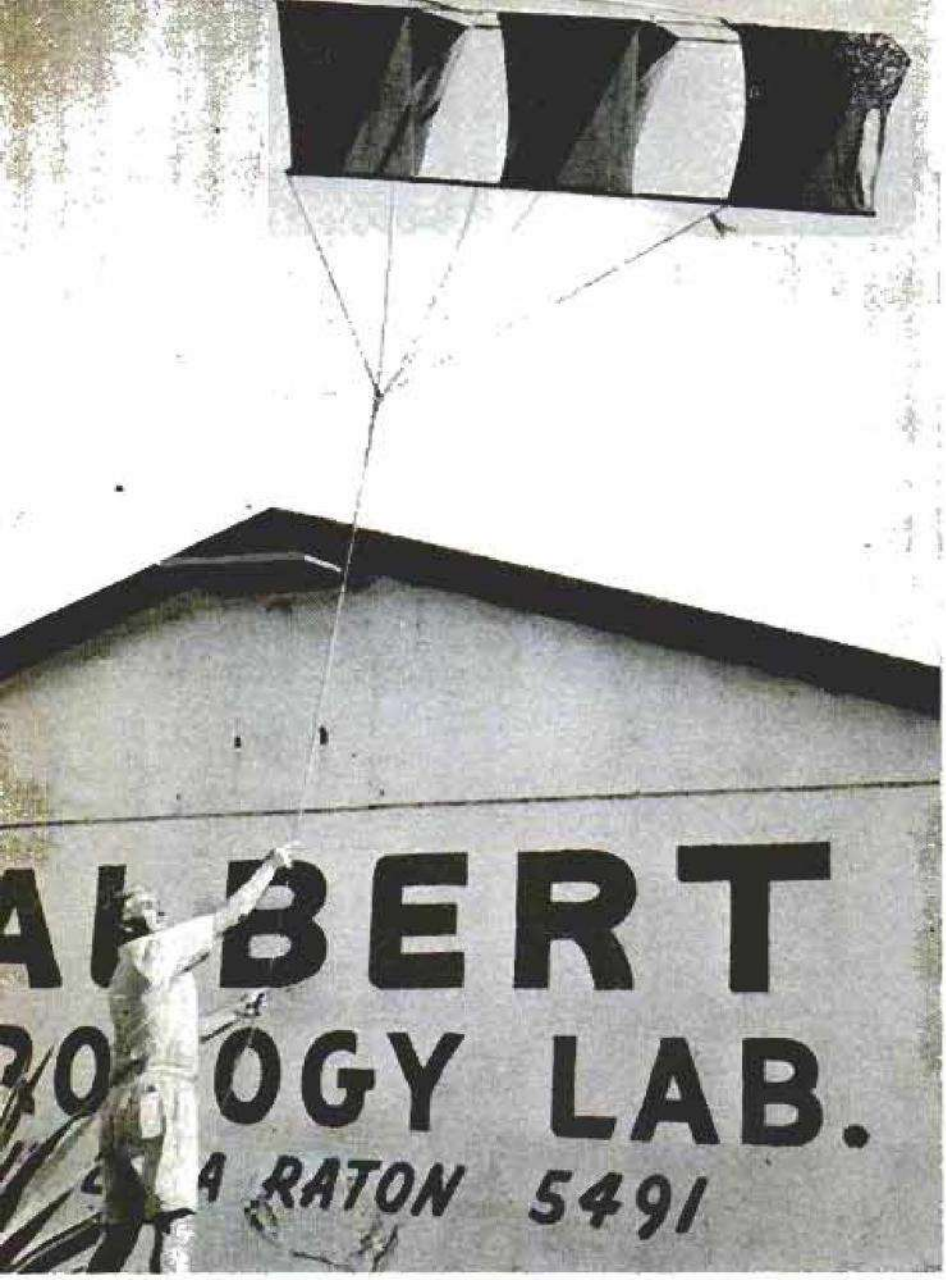
"Speaking of kites, I think I hold the world's surf-casting record — 1500 feet," says the inventor with a chuckle. He'd gone fishing for striped bass at Martha's Vineyard, Mass., but the fish insisted upon remaining far offshore. So Dom rigged up a kite to fly his bait out to the stripers where it was released to fall among them.

However, the majority of the clients' letters in the files of Dom's 10,000-square-foot aerology laboratory in Florida deal with the kite-balloon. An Oregon vacation site, located deep in a wooded wilderness, flies a telltale kite-balloon directly overhead. This marker in the sky enables lost tenderfeet to find their way back to camp.

The "sky hooks" are likewise used in everyday life to hold aloft eye-catching signs that promote everything from political campaigns to fund-raising projects, fairs, carnivals and the opening of new business establishments. In Texas, cowboy residents blinked unbelievingly when a huge American flag unfurled itself in the sky above a supermarket. High above the flag rode one of Jalbert's kite-balloons.

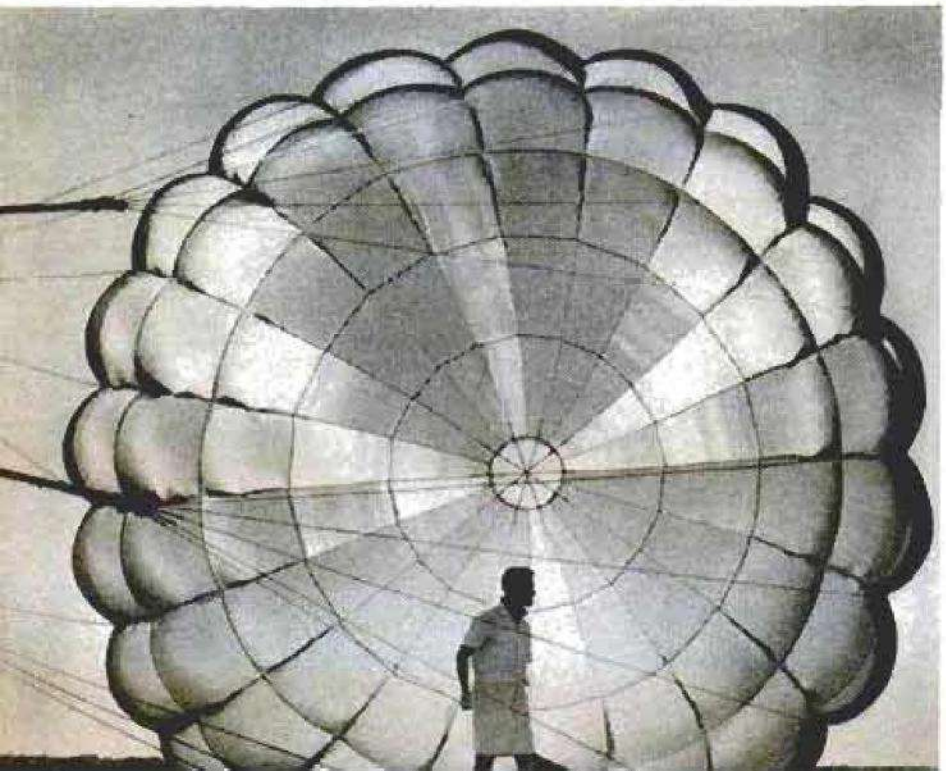
His most important customer is the U. S. Government. He is a member of the Naval Institute and has been cited by the Navy. Among the classified jobs in which he has taken part are guided-missile and earth-satellite projects.

Domina Jalbert was born in St. Michael, in northern Quebec, the 17th child of a very poor family of 21 children.



Kite six feet tall with eight-foot spread was designed to support depth-measuring devices over the surface of the Caribbean

Multicell parachute canopy developed by Jalbert will carry 35 to 40 percent greater load than a conventional parachute



"There was no railroad, no automobiles, nothing," he recalls. "There was very little money to buy clothing, none at all for toys. My mother was constantly remodeling old clothing from one child to fit the next younger.

"I used the leftover rags to make kites to play with. Kites fascinated me. I made all kinds. I even flew them in the rain. What few neighbors we had thought I was crazy."

By the time the boy was 14 his family had moved to Woonsocket, R. I. To help his struggling parents, he quit school at the sixth grade and went to work in the woolen mills. He has had no formal schooling since. Yet this self-taught inventor is often invited to lecture at large universities.

Dom continued to play and experiment with kites at every opportunity. At first puzzled why the same kite would fly perfectly one day, then badly the next, he learned how changing winds, temperatures and other factors could affect the performance of his kites.

He built a kite with an 18-foot wingspread that could tow an automobile. And he stumbled upon the advertising potential of his hobby one day when he flew a political candidate's name above the city for $15. The man was elected—only member of his party to win.

Meanwhile, young Jalbert had become interested in foot racing, no doubt the result of running fast since childhood to launch his kites. He won several dozen trophies as a sprinter, and became national walking champion in the early '30s.

Although friends continued to ridicule him for "playing" with kites, Jalbert kept on stubbornly. By this time he'd learned that a properly rigged kite could be expected to fly almost directly overhead, with very little drag or bow (catenary) in its line. If the bow was permitted the kite would very likely end up in tree tops.

This catenary was not caused by the weight of the line; rather, by the pressure of the wind against the total area of the string, and the effect of gravity. When this combined pressure overcame the dynamic lift of the kite, down everything would come! (If you computed the area of the line by

Square chute of multicell type is more efficient than round one. With several cells ripped, chute still supports load

taking its diameter — including the "fuzz" of the weave—and multiplied this by the length, you nearly always found you had a square area almost equal to that of the kite surface which was trying to lift it.)

"By the time World War II broke in Europe my years of experimenting with kites and small balloons had taught me the art of precision rigging," Dom recalls. "It happened that my hobby represented something for which few people had trained themselves. The U. S. Rubber Company made me chief rigger of their barrage-balloon division."

England was in urgent need of barrage balloons for protection against Nazi dive-bombers. In Dom's home town of Woonsocket floors and wall partitions were hastily ripped from an idle factory building to provide space for building the cumbersome gas bags. They measured 76 feet long, 28 feet high, and each one upon completion would fill most of a three-story wing of the plant.

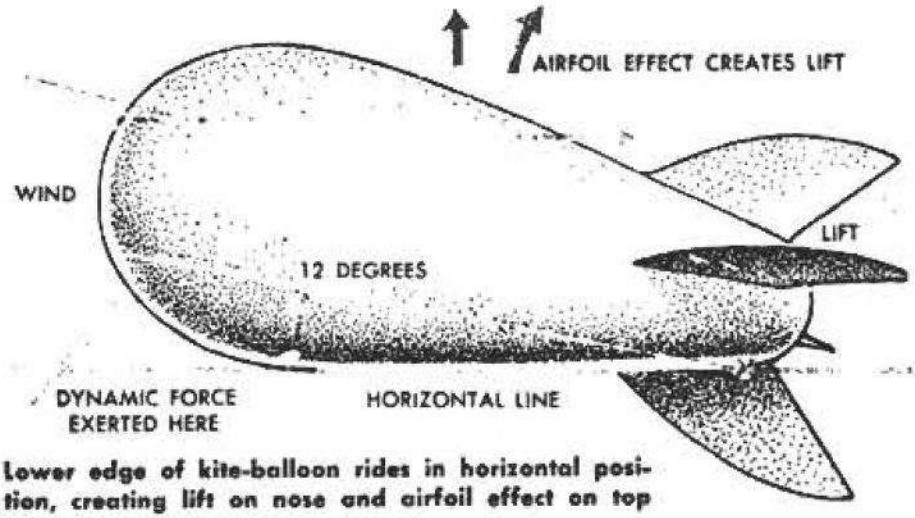
In one 300-foot-long assembly room dozens of girls cut out the more than 100 different patterns that were required, cementing these together on the floor. These employees wore special moccasins to aid the constant battle against dirt. A single piece of grit—should it be overlooked and aggravated later by a violently tossing balloon at several thousand feet—could cut into the cotton fabric like a knife.

Collapsible rubber boats were also manufactured in this U. S. Rubber Company plant. And Dom invented a collapsible kite to be stored inside a small cylinder aboard rubber boats, to serve as a rescue signal for drifting sailors and airmen.

"The Air-Sea Rescue Service wanted other things developed," he remembers. "I was transferred to the Dewey and Almy Chemical Company at Cambridge, Mass. There I worked with kite-balloons in various scientific fields, traveling extensively throughout the country. I made kites for the Massachusetts Institute of Technology and for the Signal Corps."

After the war Dom decided to go into business for himself. There was a growing demand for stable balloons that could lift substantial loads. And with Neoprene and new coated fabrics available, the possibilities appeared good. He recalls with a smile the photographer who came to him with the request for "a kite for making aerial pictures." When the inventor promptly hooked four 12-foot-tall kites in tandem and invited the cameraman to "climb aboard" a makeshift bosun's chair, the lensman paled. He hurriedly explained it was only his camera he'd intended to fly. Dom's 12-year-old daughter obliged, instead, by going nonchalantly aloft in her father's husky rig to take the pictures.

Today the Aerology Laboratory provides standard models of airfoil kite-balloons



Lower edge of kite-balloon rides in horizontal position, creating lift on nose and airfoil effect on top

that meet most of the requirements of customers. Other types are available on order. The standard jobs vary in length from 16 to 30 feet, in diameters from 7½ to 12 feet, and will lift gross weights from 22 to 122 pounds, depending upon whether helium or hydrogen is used.

Jalbert is convinced that kite-balloons would be put to much greater use today had not much of his work been of a secret nature for the government.

"As a result, when you say 'balloon' today the public immediately visualizes the clumsy, old-fashioned barrage type," he says. "This is like comparing a modern car with a Model T!"

He explains the general operation of his own streamlined units thus: "The belly or bottom rides in the horizontal position. From the diameter of the nose to that of the tail you have a 12-degree 'angle of attack.' The wind shifts slightly below the nose and creates a lift, going over the top of an airfoil that provides a vacuum and lifts the balloon straight up."

Fortunately, the operators of an Ohio radio broadcasting station do not share the general public apathy concerning balloons. When a tornado hurled their steel tower to earth they phoned Jalbert to rush a kite-balloon by air. They got it next day and resumed broadcasting with a temporary antenna.

"To their surprise, they discovered they had a 50 percent greater coverage," says Jalbert. "There apparently was less grounding effect caused by the wire that replaced the tower."

In 1950 Domina Jalbert used one of his "sky anchors" to demonstrate a technique which has since revolutionized air-pollution studies. Assisted by engineers at the Columbus, Ohio, Battelle Memorial Institute, he sent aloft instruments to gather samples of gases and solid particles which pollute the air. These were collected in bottles and piped down a small rubber tube to the ground by a vacuum process. In addition, battery-powered instruments simultaneously recorded the velocity and direction of the wind, humidity, air temperature and other weather factors.

Dom demonstrated how the kite-balloon could be used to suspend the recording gadgets in the center of gases being emitted from a factory smokestack, or fly them high above the city. Such scientific sleuthing served a double purpose: the guilty factory operators were usually happy to cooperate by trapping the sulphur and other smog-causing waste products at the source, since to do so would represent a substantial saving for them, while helping to cleanse the city's air.

In much the same manner Dom has assisted medical researchers in making pollen counts. And his kite-balloons have been planted in the path of tornadoes to record storm turbulence and other data. More recently, the tough gas-filled kites have felt the concussion of atomic blasts in the desert.

When a customer comes to Dom he is asked three questions: (1) How high above sea level the kite will be expected to fly; (2) how much weight must be carried; (3) the duration of the flight, and under what conditions.

The energetic inventor does not limit his experimenting to kites and balloons. He flies his own plane and is a consultant for the Advisory Committee on Weather Control, a group authorized by Congress to evaluate public and private experiments in "cloud seeding." In an experiment not long ago over the Jalbert Aerology Laboratory in Florida meteorologists released plumes of silver-iodide "smoke" from propane and oxygen-fed generators. Bright yellow balloons were simultaneously released with the vapor so that 16-mm. "time lapse" cameras could track the minute particles as upper air currents carried them into cloud banks to set up the desired reaction.

In fact, anything that involves the controlling of air, gas or liquid will fire Jalbert's inventive imagination. Many airplanes and vessels have disappeared without a trace during recent years in the tropic oceans that wash the Florida shores. Thinking about one disaster, Jalbert found himself designing a self-inflating sea marker which can be tossed out by a ditching plane

(Continued to page 248)

He Flies Kites for Love or Money

(Continued from page 86)

or boat crew and be seen for miles by searchers.

The bright-yellow cloth cylinder (nylon coated with rubber) stands eight feet high and is 3½ feet in diameter. Weighted at the open end, it traps air inside upon contact with the water's surface, then floats away gracefully before the breeze.

Markers Could Bring Help

"In an emergency, or even should a vessel or airplane sight a floating hazard to navigation, such a marker could bring the Coast Guard quickly to the scene," Dom says. "All that the radio message to the searchers need tell would be the latitude and longitude where the marker was thrown over, the speed and direction of the surface wind. It will remain afloat for a month or more."

Circus performers and high divers place their lives in his hands when they ask him to design rubber tanks and other special equipment. He numbers among his clients Sol Solomon, acrobatic diver who has employed a Jalbert collapsible water tank made of nylon with Neoprene "welds." Only 15 feet in diameter and 7 feet deep, the tank safely stopped the daredevil aerialist's dive from 120 feet.

While the author was interviewing the inventor, a pair of California yachtsmen dropped in to inquire if Jalbert would design an ocean-racing sail which the wind could not rip. They'd already lost several sails made of three and four-ounce material.

Designs Lightweight Sail

After studying their plans Dom startled the sportsmen by declaring he would build them a sail from one-ounce material that would have the strength of ordinary seven-ounce fabric. "What's more, if it rips you won't have to pay for it," he concluded.

Jalbert's latest invention deals with such wind-pressured cloth and promises to become one of his most important contributions. It is a "multicell" parachute, made of rip-stop nylon, and he has designed it in both circular and square form. These chutes are the first of their kind and are patented.

"They consist of many small chutes put together to form one big chute," he explains. "For the same weight in an ordinary parachute, this will carry 35 to 40 percent more load. And it will be about 40 percent safer, too. It will not rip, and it costs from 15 to 18 percent less to build than the conventional chute."

(Continued to page 250)

The new canopy will not "Roman candle" (split from skirt to apex, thereby spilling out its air). In fact, when the enthusiastic inventor had nationally known jumper Lew Sanborn first test the two multicell creations, the two men purposely ripped out several cells.

Sanborn jumped at 6000 feet and purposely fell free for 2000 feet before yanking the rip cord. Instead of permitting air to rush to the top of the canopy, as does the ordinary chute, the multicell design traps air at the skirt edge first, after which the rest of the area is filled.

Jalbert Explains Square Chute

Jalbert explains the justification for the square chute in this manner: "If you put two circles side by side, with their rims together, the area where they touch will be very small. However, if you put two squares side by side, the drag coefficient of this combination is about one third more than the first. Hence, two square chutes will be as effective as three round chutes and you have thereby saved the cost of one extra chute, one extra rigging and one extra packing."

Dom Jalbert regards it a shame that today's kids "cannot buy a low-cost kite which will fly at a high angle above the horizon, with little catenary in the line to send it crashing into the trees."

To this day he is kidded for flying kites, and he shakes his head over this attitude of the average adult. "They wouldn't make fun of me if I spent my money on expensive rods and reels and traveled hundreds of miles in the hope of catching a fish," he observes, eyes twinkling. "Yet I could have every bit as exciting a battle simply by staying home and flying an inexpensive kite at the end of a fishing line from my backyard. At least, I would be sure of having something hooked!" ★ ★ ★

Solid-Boron Propellant Boosts Rocket Efficiency

More efficient rockets are promised by development of a solid boron-carbon-hydrogen compound as a rocket fuel. Rockets using the new fuel will have less weight and be less complicated because they will not have to carry fuel-transfer pumps. The boron fuel also will permit air-breathing engines to operate at higher altitudes than would be possible with conventional fuels.

¶Cows in the University of Wyoming dairy herd carry magnets in their stomachs as part of a study of "hardware disease," an ailment found in cattle that swallow wire, nails and other bits of metal.