

CANARD PUSHER

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RUTAN AIRCRAFT FACTORY

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ROCKET MEN

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November 12, 2001

by Glenn Gaslin

MOJAVE, Calif. — Two hours before launch, the biggest problem seems to be with the VCR. It won't record right, or something silly like that, but that's OK. Far, far worse things could be going wrong in the hours before a tiny, homebuilt airplane is set to fly a mile straight up into the air using two small honest-to-God, send-a-man-to-the-moon, fire-out-the-back-rockets on a Thursday morning in the middle of the desert.

An engineer, the chief engineer, in fact, the guy who designed the thing, a man named Dan DeLong, climbs into the cockpit and fiddles with the VCR, a tiny camera and a television set. He wears a red bicycle helmet.

Cold air and a high-pitched hissing surround the plane — dubbed the EZ Rocket, it's the only airplane now flying on rocket power — inside a garage-like hangar at the Mojave Airport, about 100 miles from Los Angeles and just as far from outer space. While DeLong figures out how to videotape the instrument panel during flight, two mechanics named Johnny and Mike feed liquid oxygen, cooled to -298 F, into a large tank resting in the passenger seat. The air throughout the hangar feels cold and fresh, flushed with pure oxygen. A 5-foot tube on the plane's underside has been filled with isopropyl alcohol, which is what you might use to clean a wound, and which, when mixed with liquid oxygen and flame, can send you straight into space. This is the stuff that makes a rocket go. This and the eclectic band of people orbiting the EZ Rocket on the morning of what's supposed to be its second full-engine launch. They're a passionate pit crew of engineers, mechanics, test pilots, dreamers and dotcom dropouts, the heart of a young company called XCOR Aerospace, which may be the future of technology start-ups, space travel and the human race as we know it.

Or quite possibly not.

continued on page 4



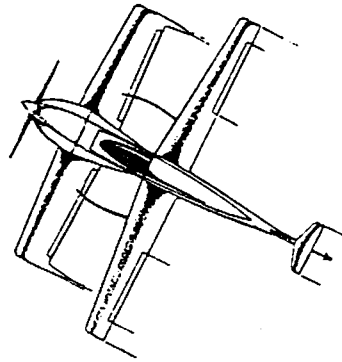
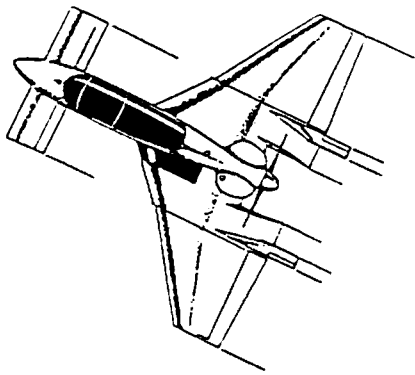
CLEAR! — Test Pilot Dick Rutan gives the EZ-Rocket engine a lookover after November 12 rollout flight

Mandatory Ground ELEVATORS

If your elevators are not in compliance with the report on page 7

GROUND YOUR AIRCRAFT

Do not fly it again until you have fabricated new elevators
with the correct shape, size and balance



NEEDED!!

Derelict and/or non-flying RAF airplanes for Camelot Golf Course

Most people aren't aware of it, but during the few moments when Burt is not designing, building and test-flying experimental aircraft he and I are working to save our local golf course from drying up and blowing away in the wind.

Last July we were devastated to learn that Mojave's great local golf course, built in 1970, was going to close. Burt and I, along with the helping hands of our Mojave community volunteers, launched an effort to save it. We were successful and have been celebrating (and playing a lot of golf) ever since.

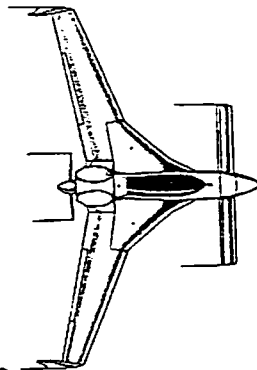
However, there is much more work to be done. The course needs to turn a profit to stay alive. The new operator of the course, Gary Delano, wants to add an aviation theme to Camelot by highlighting the RAF-designed aircraft. Thus we are helping to turn the course into an aviator/golfer's dream. The plan is to name each of the fairways after one of the Rutan aircraft — Boomerang, Defiant, LongEZ, VariEze, Quickie, Grizzly, Solitaire, VariViggen and Voyager. Camelot's first hole is a dogleg left, the shape of (you guessed it) the Boomerang's wing. The second is a Long-Easy par 5; the very difficult third is a Grizzly 465-yard par 4, and so on . . .

We are seeking derelict, and/or non-flying airplanes to decorate the course. The airplanes need only the basic structure. We will paint them and mount them for display adjacent to the tees of each hole. Please let us know if you have or know of any aircraft we can get donated to the course.

Thanks, Burt & Tonya

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REMEMBERING KEN BROCK

1932-2001

by Mike Melvill

Ken Brock died in a tragic landing accident at his private dirt strip on the western edge of El Mirage dry lake in Southern California. He was unique. There will not be another quite like him. He will be sorely missed.

Ken was the epitome of what EAA is all about. He was a superb pilot, and had more flight time in various gyrocopters than anyone. He made the first coast to coast flight in a gyrocopter, from Long Beach to Kitty Hawk. Ken demo'd his fantastic gyrocopter at virtually every Oshkosh air show.

Sally and I first met Ken and Marie in 1978. We were invited to attend a Thanksgiving dinner at the El Mirage dry lake. We flew over in our VariViggen, landed on the dry lake, and enjoyed the tremendous hospitality of this amazing couple. We were lucky enough to be invited back many times to the "lakeside" cottage. We also enjoyed their fabulous company Christmas parties at the shop in Stanton.

We both vividly remember going thru' the "Ken Brock gyrocopter training school." Eating lake dust behind Ken's big station wagon in the two-place gyro glider with Ken taking us through the basics! Then finally actually flying solo in his original gyrocopter, N2305. What a thrill, tearing across the dry lake, Ken driving along side in the station wagon yelling instructions. Trying to get the rotor RPM up to it's operating range (not so easy for a beginner!) Then finally, up and away. Some gentle turns, some high speed low-level flight, then a landing so slow you rolled only 25 yards! A fabulous, never to be forgotten experience thanks to Ken.

Ken was the best gyro flight instructor ever, quiet, patient and great at imparting his knowledge about this unique little sport plane.

In the good old days at Oshkosh, when the RAF booth was directly adjacent to Ken and Marie's booth, we would spend the whole week of Oshkosh chatting and sharing jokes. We rapidly got to know the Brocks, and to understand their passion for the rotary wing crowd, and for EAA.

They not only attended Oshkosh every year, but also Sun 'n Fun and the PRA fly-in in Illinois. Over the years, Ken must have trained many hundreds of gyrocopter pilots. He will be sorely missed by all who fly, and especially by his wonderful family. Our hearts go out to Marie, daughter Kim and son Terry.

A bit of good news: Marie told me that with Terry's help, she intends to keep Ken Brock Manufacturing going for the foreseeable future, great news for all EZ fans.

by Burt Rutan

As all of you no doubt know by now, we lost Ken in October. He died doing what he enjoys most — flying his homebuilt T-18 with his wife Marie to their hide-away cabin near El Mirage dry lake.

The accident was not extreme — just a "simple" loss of directional control on landing when something broke at the tailwheel. Fortunately, Marie escaped the ground-loop and flip with minor injuries.

I met Ken and Marie at Oshkosh in 1972 soon after he had flown his KB-2 gyrocopter cross-country from Los Angeles to Kittyhawk. Ken and Marie's love for homebuilts and their high quality, efficient machine shop was a perfect fit to provide the machined parts our VariViggen builders needed starting in 1974. Ken and Marie expanded their shop to offer metal stamping and have since provided all sorts of machined and welded parts for many homebuilt kits.

Throughout the '70s and '80s we would make the annual trip to El Mirage for Ken and Marie's Thanksgiving dinner at the dry lake. We would mix the thrill of flying his gyroplanes with the enjoyments of true friends and excellent potluck turkey-day food. It was an informal event, right down to the wine list (prominently displayed, reading "Red or White").

We do miss the good ole days where the big event of the weekend was tearing up the skies with our homebuilts — and we do miss Ken.

God Bless Marie and her family. Our memories of the fun will last forever.

Rocket Men continued

If flight-operations wiz Buzz Lange, who describes his job here as pushing buttons and fixing the plumbing, is to be believed, it's one way or the other. "Everything in rockets is extreme," he says, pointing at this ordinary, tiny airplane, much of it now covered in ice. "It's extremely hot or extremely cold, and there's no middle ground."

For the four founders who've spent two years turning a plans-built Long EZ hobby plane into a rocket-powered mission statement, this hot-cold dichotomy is a more serious problem than the buggy VCR. Rockets, space travel and aerospace in general have always been big-budget, government-style endeavors, and no privately funded civilians have ever sent somebody into space and brought them back. If XCOR is to survive, however, if founders DeLong and Loretta "Aleta" Jackson, Dough Jones and Jeff Greason are to do this, they have to make rocket science safe and predictable. In other words, mainstream and boring. An everyday thing.

Putting a scrappy rocket plane into the air is an act of such brand-name American optimism that you'd expect it to be trumpeted by talk of Big Ideas at the roll-out, scheduled for today, an aerospace custom of presenting a new flying machine to investors, the press and the world.

The fact that weathered aviation legend Dick Rutan, 63, has been hired to pilot the thing only reinforces the company's self-styled, pragmatic maverick image.

All of this takes place at an airport surrounded by hundreds of grounded commercial aircraft, United and Continental and the like, just parked on sand, some in need of repair, some waiting for their second career in another county, some simply not needed these days, with fewer and fewer people willing to take to the sky.

The national mood, however, doesn't affect those working at Mojave Airport, which has become a sort of office park for dreamers, a haven for those who want to build and zip around in untested,

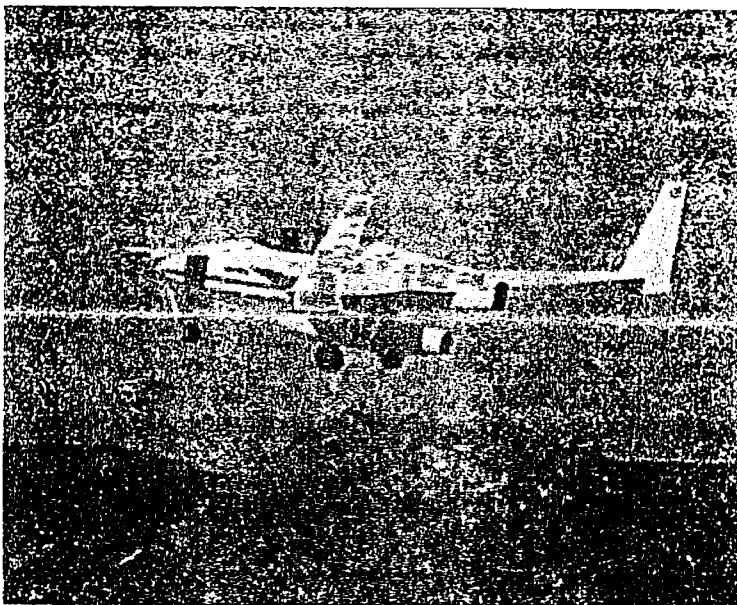
seemingly hare-brained aircraft. It's where XCOR founders — and most of the half a dozen people they've hired in the past two years — met, at the now-defunct Rotary Rocket Co., which planned to send a 63-foot-tall, thumb-like, rocket-powered object into orbit, and then bring it back down using a giant propeller.

The only real reason to put rockets on an aircraft these days, explains Greason, XCOR president, is to go into space. Jet engines can't do it. Propellers can't do it. And once you're 50 miles or so in the air, or what's called suborbital space, there's business to be done: low-gravity experiments, satellite missions, military research and — here's the sexy stuff — tourism. Sending humans up to see stars that don't twinkle, any time of day, on visits much like California millionaire Dennis Tito's paid leisure trip to the International Space Station last year. "I would never have talked about tourism in public," says Greason, "until Dennis Tito flew."

At XCOR, this shiny, gee-whiz future is couched in small-business pragmatism and dotcom-influenced caution. There is a mantra, spoken all day around the little, hot-and-cold rocket plane: "build a little, test a lot, get more funding." This is what DeLong tells me. This is what Jackson tells me. This is what company newcomer Rich Pournelle, a San Francisco e-commerce guy who moved to Mojave last year to learn the space business, says over and over again. "Everything," says DeLong, "is incremental."

They've all seen how this works. Before Rotary Rocket, DeLong, the chief engineer, worked on the Space Station for Boeing. Greason managed big ideas for microchip maker Intel and now says this new company, like any successful tech start-up, needs to take one leap at a time, each one making money, each spurring new investors, new directions.

First, in this case, build a rocket that you can turn on and off, that you can launch five times in a day. It doesn't have to go into space; it just has to be reliable, boring. This, he says, is the point of the



Continued on page 5

Rocket Men continued

EZ Rocket, which they won't fly any faster or higher than a regular LongEZ.

Then, in the next few years, the plan is to design and build a supersonic rocket plane, something that breaches the sound barrier and the atmosphere, goes suborbital, something no private plane has done. The U.S. government has already drafted permits for this kind of vehicle — companies like XCOR have been promising them for years — and Greason wants to be the first to apply for one.

Next? Nobody talks too much about what's next, but they'll say that any small private aerospace company wants to build a space plane, a reusable, reliable vehicle that will shuttle people and cargo

into outer space, to orbiting hotels, to the moon. This is similar to what Rotary Rocket tried to build right off the pad, and that is where it went wrong, says Greason.

The company burned through \$35 million and never got into space, he says, which is why these survivors are building, first, a tiny rocket plane that goes only a dull 225 mph, and plan to work up from there. They've spent less than a half-

million dollars so far, private investments from traditional high-tech and venture capital sources.

"We're trying to get away from that starry-eyed image," he says. "The first time you hear about us, a pilot gets into it and flies it. It's a real thing."

Along the way, the company's willing to flip burgers. They've got a government contract to build clean-burning propulsion systems for satellites. They've publicly offered to build anyone who wants one a working, flying replica of the X-1, the orange, sausage-like rocket plane in which Chuck Yeager broke the sound barrier in 1947. (Got \$5 million? You want one?)

Despite all this, um, everyday pragmatism, there's something deeper driving this crew, a reason why people move to the desert and stand around cold hangars all morning. Jackson talks about the passions that brought her out here. She wants to retire on the moon, she says. She and the others want to see safe travel and exploration as

something more important than war.

They want to see, with their own eyes, things like orbiting hotels and moon bases and humans on Mars — things that did not seem so far-fetched when men went to the moon in machines less sophisticated than a buggy VCR. She says she hasn't been this excited about working since the mid-'60s, since her days with the Gemini project, where she fitted clocks into the capsules, a job she got because she has tiny hands.

"Dammit, we're dreaming. This offers a hopeful future, if we can get out of Earth's gravity and into space permanently," she says. "The rest of the universe is out there, and it's only 100 miles away."

"The only way we're going to get there is to get there ourselves," adds Jackson, suggesting that the future of space travel is, today, in tiny hands.

"But we don't talk about it too much," says Jackson, suddenly stopping herself, focusing again on the plane, the runway, today's launch, "because we're testing a 400-pound engine on a Long EZ."

The test pilot shows up and begins circling the EZ Rocket, sizing up his ride. Dick Rutan is as famous in Mojave as a man can be. He flew fighter jets in Vietnam. He's been stranded at the North Pole. He piloted the first aircraft to fly around the world nonstop, without refueling, something called the

Voyager, which, like the Long EZ, was built by a company owned by his brother, Burt Rutan. He then tried, and failed, to circle the Earth in a balloon.

Now he's ready to sit in a rocket-powered plane, hit two little red switches labeled RUN1 and RUN2 and fly straight into the air until he runs out of fuel. He then plans to glide into what he calls a "dead-stick landing pattern" and coast back onto the runway. He did it a few weeks ago, the first time the EZ Rocket left the runway and went 6,200 feet in the air in 93 seconds.

"I'm pretty much a hero pilot, so they came and asked me to fly their airplane," he tells me, with a dead-serious demeanor. "There isn't a better pilot around." Rutan pulls up the sleeve of a full-body green flight suit and strokes his arm. "See this right here? This is the velvet arm. It is without

Alcohol keeps flowing from under the plane into the rockets at the rear, and then pools on the ground, igniting into a fountain and then a lake of fire.

Rutan jumps out of the cockpit, but the others run toward the burning fuel. Mike and Johnny hit the flames with extinguishers, and fire trucks scream down the runway.

Continued on page 6

Rocket Men continued

equal in the universe."

Rutan gives the plane another look. He bends down to examine the tires.

"Did you check the pressure in these?"

No, says Lange, not yet.

"Well, you need to do that."

The rockets are tiny, silvery tubes the size of soda cans. They're wrapped in Kevlar tubes and attached to a dense box of valves and pipes on the back of the fairly common Long EZ, which is a very cheap basis for experimental rocket craft and is now outfitted with one-of-a-kind parts and a few more from the hardware store: the spark plug from a weed whacker, the ignition switch from a moped, gauges from race cars.

The small rockets were designed from "clean paper," as DeLong likes to say, after developing four generations of engines in two years. They have fired rocket engines 2,000 times out here in Mojave without one of them exploding. "We've had every kind of failure you can think of, but we design them so that they don't fall apart," he says. "But in big aerospace, rockets are considered dangerous until the day they ask a pilot to sit on top of it."

While the team waits for the runway to clear, for a student at the nearby test pilot school to take off in a Swedish-built Draken jet fighter, Rutan and DeLong talk about safety, contingency plans, that sort of thing. Rutan is saying, "If there's a fire, I bail out."

"Can you at least," pleads DeLong, "try to put it out first?"

A roar smothers the airport as the Draken finally takes off. A big yellow pickup tows the EZ Rocket to the runway, across a living museum of aviation baking in the sun: Half a dozen A4 fighter jets are being turned into pilot-less drones for military target practice. A giant hangar bearing the Rotary Rocket logo looms over the airfield, too big to be put to use by anything that isn't on its way to outer space. Another roar and an F-100, the first supersonic U.S. jet fighter, lifts off over the heads of XCOR, gathered now at the end of the runway. Rutan, who flew F-100s in Vietnam, throws his fists in the air and yells, "Let's go, baby, let's go, baby, let's go, baby."

Everybody wears a hat beneath the desert sun. DeLong, as usual, is quiet, obviously thinking. Johnny and Mike keep funneling liquid oxygen into a tank in the passenger seat until the very last minute--the stuff evaporates almost as quickly as

you can pump it.

Rutan tells stories about jumping out of doomed jets, until the safety huddle, when he gets serious and tells DeLong and Lange: "If you see something, tell me what's wrong instead of telling me what to do."

The tanks are topped off, the runway's cleared of all hangers-on, and Rutan gets into the EZ Rocket. To test the rockets, he fires one and then the other, flipping little red switches and the entire airport submits to a loud rushing sound. This does not, however, stop after a few seconds, when Rutan turns off the little red switches. So he pulls the emergency-stop handle, meant to cut off the engines, and the sounds continue. Something is wrong.

Alcohol keeps flowing from under the plane into the rockets at the rear, and then pools on the ground, igniting into a fountain and then a lake of fire. Rutan jumps out of the cockpit, but the others run toward the burning fuel. Mike and Johnny hit the flames with extinguishers, and fire trucks scream down the runway. Five minutes later, the trucks drive away, the moment over, the flight scrapped. The airport is as quiet as it's been all day.

So on the morning of the EZ Rocket's second full-engine flight, something goes wrong. Not terribly wrong, just wrong. The plane is towed back to the hangar and appears unscathed, as if just washed, and the chief engineer is only a little miffed, mostly because a reporter was there.

"You've seen a pretty big setback," DeLong tells me with a shrug. He's seen setbacks. Everyone here used to work on the thumb-like rocket that was supposed to go straight into orbit and then ran out of cash.

This crew, in the next few days, finds and fixes the problem, and the flight is rescheduled for the following Friday, when it takes off as planned, at 11:30 a.m., proving itself ready for the public roll-out. But on the day of this scrapped flight, the crew returns to work, and the crazy hot-and-cold dream will have to wait. "First," says DeLong the rocket scientist, in a moment of everyday, middle-of-the-road, regular-guy normality, "we're gonna get some lunch." ●

For more about the XCOR Aerospace EZ-Rocket go to www.xcor.com

Mandatory Ground ELEVATORS

**If your elevators are not in compliance with this report
GROUND YOUR AIRCRAFT
Do not fly it again until you have fabricated new elevators
with the correct shape, size and balance**

A Southern California Varieze crashed near Palm Springs, killing both occupants. The NTSB accident investigation, while no where near complete yet, has determined that the canard came off the aircraft in flight. The aircraft crashed more than one mile from where the canard was found.

The physical damage to the canard itself suggests that the right elevator fluttered, resulting in the nearly complete destruction of the right side of the canard and elevator. The forces generated by divergent flutter tore the canard mounting hard points at the top of the F-22 bulkhead completely out of the fuselage. What remained of the canard then departed the aircraft. With no means of controlling pitch, the aircraft nosed over and crashed.

Conditions in the Banning Pass near Palm Springs at the time of the accident were reported as strong wind shears with lots of dust devils. The Banning pass is notorious for turbulence, and it is likely that these pilots encountered sharp edged gusts, which may have excited this extremely heavy, incorrectly balanced elevator causing it to flutter. In this case the flutter was severe and divergent destroying the right side of the canard and tearing the canard from the fuselage.

We have repeatedly cautioned builders/flyers of both the Varieze and the Long-EZ about how critically important the elevators are. The elevators on all the EZ's are the single most important parts on these aircraft. Your very best workmanship and attention to detail is required when working on your elevators and associated parts.

The weight of each elevator, including the lead mass balance weights, must not be more than 3.5 lbs on the left side, and 3.25 lbs on the right side. These weights are prior to applying paint. The lead blocks as supplied by Brock are all that should be necessary to balance these elevators to

within the spec as called out in Section 1 of the plans. Re-check the balance after painting, and note that the absolute maximum allowable weights are 3.9 lbs, left and 3.6 lbs right, after painting and accepting them as ready to fly. The maximum permissible additional lead to balance the elevators is 0.3 lbs per elevator, and ALL of this additional lead must be added to the outboard mass balance. Do not add any additional lead to the inboard ends of the elevators.

The shape of each elevator is also very important. They should be flat on the underside, and slightly concave on the upper surface. The chord length should be 4.6 inches, with a maximum tolerance of plus or minus 0.2 inches. These features can affect pitch control forces and your ability to trim the airplane. Your elevators must closely match the full scale drawing in Section 1 of the plans.

If your elevators do not meet the above criterion, strip all of the foam and glass from the aluminum torque tubes, and start over. The importance of near perfect elevators cannot be overstressed. Poorly made elevators CAN KILL YOU!!

Reprinted from CP 21, July 1979

It may seem that we harp on about elevator shape and balance, but the fact remains that the single most important parts of the airplane are the elevators. Recently, since CP 20, we have had yet another builder who experienced flutter. It occurred at 120 to 130 mph and produced such a violent shaking that he was certain the airplane was going to come apart. It turned out that he had extended his elevator's trailing edge and found he had to add weight. Unfortunately he added considerable weight only to the inboard and none to the outboard mass balance. This is a NO NO!

Continued on Page 8

ELEVATOR Inspection continued

It is critical that any extra weight added to balance the elevators to 10° - 20° nose down (up to a maximum of 0.3 lbs) be equally divided between the inboard and outboard. Keep your elevators light! In his case these elevators weighed around 5 lbs apiece, which is totally unacceptable. If yours are over 3.9 lb left, or 3.6 lb right balanced, strip them to bare tubes and start over.

Reprinted from CP 57, October 1988

MAN GND: Conduct an inspection or provide certification that the elevator quality regarding correctness of laminate schedule, orientation of plies, number of plies and workmanship relative to the weight of the layup and straightness of the primary surface is correct. This should include inspection or verification that additional filler materials have not been added to increase the elevators weight and thus change its natural frequency of oscillation. If you have purchased structure from someone else and cannot otherwise verify the structural quality and conformance, conduct a dissection of the elevator skins to assure the proper structure, or better yet, discard the elevators and build new ones you know are in conformance with the tested and approved configuration. Any variance in weight, stiffness or shape should be suspected of being dangerous and

not allowing you to rely on the testing that was conducted to verify freedom from flutter.

The weight limits shown are absolute maximums. A properly fabricated, accurate foam core with a properly squeegee'd minimum resin laminate will result in weights well below the limits shown in CP 21, PG 5. (and in Section 1 of the plans) In order to provide more margin for variables in this extremely important area, we are now recommending that any elevators that require additional mass balancing beyond those weights shown for the basic configuration be discarded and new elevators be fabricated. If you are unable to build elevators that can be balanced by the basic balance weights, both inboard and outboard, you are possibly unable to produce adequately safe flying components. Do not compromise by using up your margin of safety by merely increasing balance weight. This increases the weight of the elevator and lowers the frequency of oscillation. Above all, be certain that your elevators meet the balance-hanging angle of 12 to 20 degrees nose down after painting. If there's any doubt that they are absolutely perfect, discard them and start over. It is possible, with proper tube orientation, to retain the aluminum tubing when building new elevators.

Continued on page 9

The weight of each elevator, including the lead mass balance weights, must not be more than 3.5 lbs on the left side, and 3.25 lbs on the right side. These weights are prior to applying paint.

The lead blocks as supplied by Brock are all that should be necessary to balance these elevators to within the spec as called out in Section 1 of the plans.

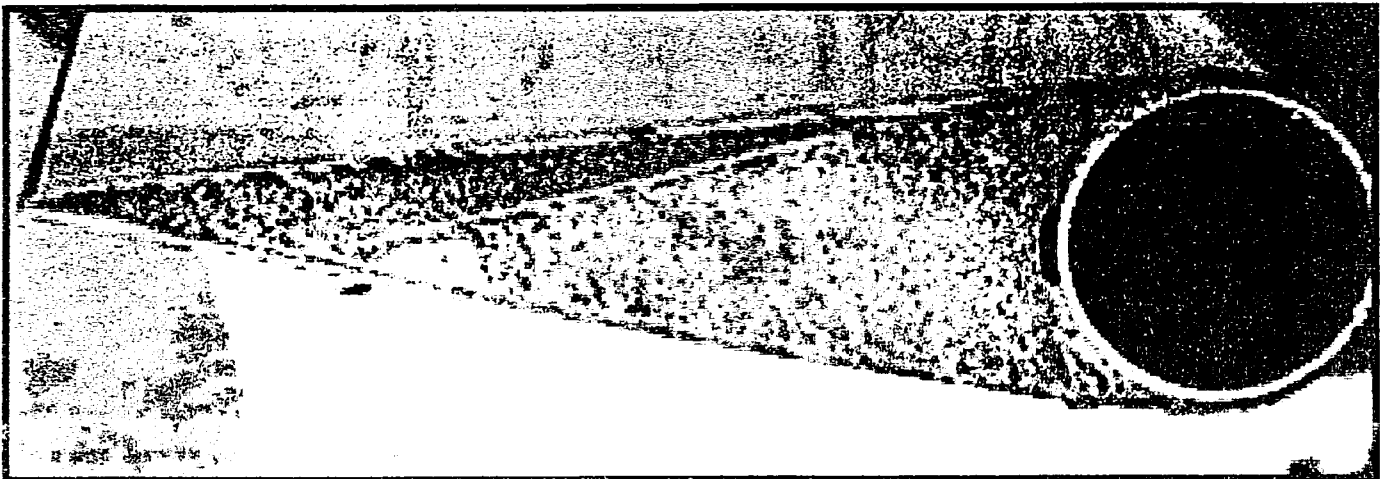
Re-check the balance after painting, and note that the absolute maximum allowable weights are 3.9 lbs, left and 3.6 lbs right, after painting and accepting them as ready to fly.

The following inspection is required before next flight. While it is true that RAF cannot issue an AD, we are requesting, in the strongest possible way, that all owners of Varieze and Long-EZ aircraft comply with this inspection before you fly again.

If you built your own elevators, and you are positive that you built them exactly to the plans and that they balanced within the tolerance using only the basic Brock supplied lead weights, you may disregard this inspection requirement.

MANGND: If your elevators are not in compliance with the statements above---remove them and rebuild them to the correct specification before next flight.

If you own an older Varieze, built with the original short chord elevator that has been modified to the "new" longer chord, in other words, an elevator within an elevator, (see photo).



Ground your aircraft; do not fly it again until you have fabricated new elevators with the correct shape, size and balance.

If you have purchased an EZ, one you did not build yourself, you have no reliable way of knowing how the elevator was constructed. Before you fly this aircraft you should remove the elevators from the canard and weigh them individually, and check the balance per Section 1 of the plans. If they are out of the weight or balance limits, or if they required additional inboard lead weight to balance, you should discard them and build new elevators.

If there is another aircraft out there somewhere that is built like the one recently involved in an accident, it will probably kill someone. Please help us to locate it and save a life.

This Mandatory Ground has been posted on the RAF website

at www.rutanaircraft.com

26TH JULY 2001

The purpose of the flight was to complete the Permit to Fly test flight for the Popular Flying Association of the United Kingdom. The first attempt on the 14th of July was abandoned because of a strong burning smell in the cockpit shortly after take-off. Inspection of the engine did not reveal a cause, so the smell was assumed to be caused by excess brake fluid spilled when the right brake was bled before the flight. The second flight on the same day was continued after the same smell was noticed for a few seconds after take-off, but then cleared.

The whole test flight schedule was completed except the high speed run to VNE. This was because the oil temperature and pressure was erratic and it was considered unwise to operate the engine at full power. The owners were advised to replace the oil temperature and pressure probes and gauges in matched pairs to rule out any indication problems. This resulted in normal oil temperature and pressure indications.

The third flight on the 26th July (after an extension was issued by the PFA) was to complete the VNE run. The engine started reluctantly and was rough running for a minute or so after start. The pre-flight engine power check was normal with all indications normal.

Take-off was normal with a hint of the burning smell for a few seconds after take-off. The climb to 1500' at full throttle was normal and all engine indications normal. The oil pressure was noted at 65psi and the oil temperature at 210f as the nose was lowered to accelerate to 190kts.

At 1000' and 170kts the engine lost power and shuddered. The speed was converted into altitude and a turn back to the airfield made while a MAYDAY call was made to Shoreham (EGKA). Carb heat was applied. The fuel selector was switched from right to left (which were both almost full). The mags were switched L/R/BOTH. Nothing gave any hope of the engine restarting, so Shoreham was advised that a ditching would be made in the area of Shoreham Harbour.

The canopy safety catch was released, straps were already tight. The nose wheel was not extended because of the ratchet modification requiring both hands to release the ratchet and extend the nose wheel. It was considered more important to "fly the plane."

The aircraft would only slow to 60kts and then descended at 300'/min. This was noted on the "stall" test and the aircraft would not porpoise as with my own

DITCHING OF LONG-EZ G-BLZM *By Tim Bailey*

Varieze. This made the ditching less than ideal, but the sea was calm and the wind only 160/4. The beach was very busy with swimmers and an inflatable pleasure craft was heading west about 200 yards off the coast. My planned ditching position was to be far enough out to avoid the swimmers and close enough to the pleasure craft in order to get assistance.

On impact with the water, the main landing gear separated and was found floating 25 yards behind the aircraft. The nose did not appear to pitch down at that moment, but there must have been some effect.

Deceleration was very rapid and water rushed into the cockpit. When the aircraft had come to rest, the nose and the instrument panel bulkhead had detached and were floating away from the rest of the aircraft, which was intact and floating.

The canopy opened normally and escape onto the wing was easy.

The pleasure boat arrived very quickly and the aircraft was towed 150 yards to the beach.

This aircraft had only flown 220 hours since 1986 and was well known for being hangar bound during the flying season. The engine had just been zero-lifed and the aircraft sold to a group who had employed a reputable engineer to make the aircraft airworthy.

Initial attempts to start the engine failed and the engineer who overhauled the engine was required to rectify the problem. Once started, the engine ran well once warmed-up, but often hesitated at 1500 RPM when the throttle was opened, but not on the day of the flight.

The weather conditions were excellent... 160/4 +26c 1019 clear sky and low humidity, so carb icing seems unlikely. The prop was still rotating slowly on impact, one blade snapped off at the hub and was floating near the aircraft, the other was still attached but split lengthways several times.

The concerns about the oil system had been satisfied, so the cause of the engine failure is likely to be fuel, air or ignition related. A previous report of a collapsed air duct on another Long EZ springs to mind, but that will have been destroyed on impact. The Air Accident Investigation Branch does not wish to have the engine stripped down, so the cause will probably remain a mystery.

The pilot was Tim Bailey, a Varieze owner with 450 hours on type and a total of over 13,000 hours. His left ankle and his left thumb were badly swollen and his right leg was gashed.

The aircraft has been written off. ●

Accident Report

On July 20, 2001 at 1901 hours Pacific daylight time, VERIEZE, N25063, collided with terrain near Palm Springs, California. The private pilot was operating the borrowed airplane under the provisions of 14 CFR Part 91. The pilot and one passenger sustained fatal injuries; the airplane was destroyed. The personal cross-country flight departed Chino, California, about 1830, en route to Palm Springs. Visual meteorological conditions prevailed, and no flight plan had been filed. The Federal Aviation Administration accident coordinator examined the accident site. The wreckage covered an area about 200 feet wide and out to a distance of 400 feet from the initial point of impact. The airplane was highly fragmented and the debris field encompassed a wind turbine and its stanchion. The canard was not in the main debris field and not recovered with the main wreckage. A Deputy Sheriff stated he found the canard about 1/2 mile from the main wreckage on a follow-up search several days after the accident. The initial point of impact was at 34 degrees 54.646 minutes north latitude and 116 degrees 34.893 minutes west longitude.

OPEN CANOPY

Wally Loewen, Reedley, CA — Shortly after flying off the restricted time we had a fly-in here at Reedley, taking a pilot friend for a high speed pass over the runway. Diving down with partial throttle as I leveled out, I reached to add full throttle, accidentally hit the canopy release, and the canopy popped open, at about 200 mph. Made a gradual pull up, slowed down pulled the canopy mostly closed and made a pattern and landed. No abnormal handling. Flew good. FLY THE PLANE. The bolt head that the hood latch catches on was too short, put in longer bolt. It had slipped over the bolt. OK since. That was 20 years ago, still flying.
Wally Loewen <http://www.psnw.com/~wgl/>

Report
Accidents & Incidents to
RAF at

1654 Flightline, Mojave, CA 93501
ph. (661) 824-2645
fax. (661) 824-3880
email. raf@antelecom.net

UPDATE

Bill Allen's welded-steel tube roll over structure

The rollbar I made for my Long-EZ, G-WILY, was the pattern used to make a batch and send them out to those who expressed an interest. I had a run of 6 kits and 6 fully assembled units made, after some struggles with manufacturers who didn't want to know once they discovered that the word "aviation" was associated with it.

The price for these is \$320 complete, and \$240 assembled. It's amazing how the price of a few tubes escalates, but when you look at the time it takes to measure up for and make jigs, I can see why no-one gets rich doing this.

My EZ was made in 1984, with input from that stalwart of the San Diego Squadron, Al Coha. We incorporated the "wider canopy" mod that had permeated the Ez's of San Diego at that time. Accordingly, I now enjoy 21.25" of shoulder room at the canopy rails. (Curiously enough, French builders were also doing this wider canopy mod at the time, so the initial ones sent to Europe fitted fine)

It also allows the rollbar hoop a straight shot down from the top of the headrest to the longerons.

However, the standard canopy is narrower, being about 17" at the base, at the pilot's position. This prevents the rollbar having a straight shot down to the longerons, as the canopy rail is in the way.

So I am now having another assembly made up for the guys who have the narrower canopy, and will be sending this out when I have fitted it to another Ez I have access to. It will be the same price, and I will contact the "rollbar group" by email when it's done.

My website, www.ezrollbars.com will be done when the bars are done, so if anyone wants to have a look in a month or so it should be ready. There are currently some pictures of my installation on www.longeze.com on the preparation/rollbar section if anyone wants a preview. Anyone who wants to contact me before then can do so on bill@allenworld.com .

RAF Merchandise Order Form

Owners Manuals

Long-EZ (\$12) ___ VariEze (\$8) ___

Solitaire (\$8) ___ Defiant (\$15) ___

PLANS

_____ Building Moldless
Composites Manual \$16.00

_____ Viggen RC Model Plans
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_____ Speed brake plans
\$14.00

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\$42.50

_____ Flush belhorns plans
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Foreign checks — Please ensure your check or money order is routed through a bank with an USA address. Traveler checks and post office money orders are OKAY
International orders — please add \$5 postage except for Newsletter Orders



New *COLOR* litho poster based on painting by aviation artist Stan Stokes.

POSTERS

_____ New litho poster based on painting by aviation artist Stan Stokes. Beautiful quality 17x22 poster depicts family of RAF projects, including Voyager \$18

_____ Long-EZ "Cut Away" drawing (see CP 33) 23x33, depicting a "see-through" Long EZ drawn in black ink. You can see fuselage, engine, gear and wing innards. There are close-up drawings with explanations of the nose wheel retraction system; rudder and brake system; aileron control circuit and airbrake operation. It is printed on brown creme paper. \$15

_____ 11x17 Jim Sugar night poster . This unique sunset scene of Voyager, Solitaire, VariViggen and Long-EZ was shot by National Geographic photographer Jim Sugar \$12

_____ 11 x17 Defiant on water \$8

_____ 17x22 Canard 3-ship VariViggen, VariEze and Defiant fly in harmony \$12

_____ 8x10 color photos (choose LongEZ, Defiant, Solitaire) \$3

Spin-On Oil Filter Adapter for Lycomings

B & C Specialty Products' latest product is the neatest idea I have seen in a long time. It is a 90-degree, spin-on oil filter adapter for Lycoming engines. It is beautifully made by CNC milling out of a solid aluminum billet and bolts onto the accessory case in place of your oil screen housing or AC spin on filter adaptor. It fits perfectly, does not interfere with the magnetos, the vacuum pump or even the mechanical tachometer drive. It also has plenty of clearance on your engine mount and firewall, important considerations when you operate an EZ!

I installed one on N26MS and now have a full flow, spin on champion oil filter, with no high pressure hoses to a remote mounted filter which could leak. It comes with everything you need to install it: a new gasket, new aluminum washer for the vernatherm, and new copper washer for the oil temperature sensor. They even send a small container of the proper sealant for the gaskets. Of course it comes with new Lycoming bolts to mount it.

It is fairly expensive at \$395 but is available to EZ flyers until the end of 1996 for \$350. I am extremely pleased with mine and I heartily recommend it for anyone running a Lycoming engine on an EZ. A fuel flow spin-on filter allows 50 hours between oil changes and prolongs the life of your engine.

Give B&C a call at (316) 283-8662 or fax (316) 283-8000. You'll be glad you did! *Mike*

RAF Recommended Suppliers

These suppliers are still the only authorized RAF dealers for all your various aircraft materials and components.

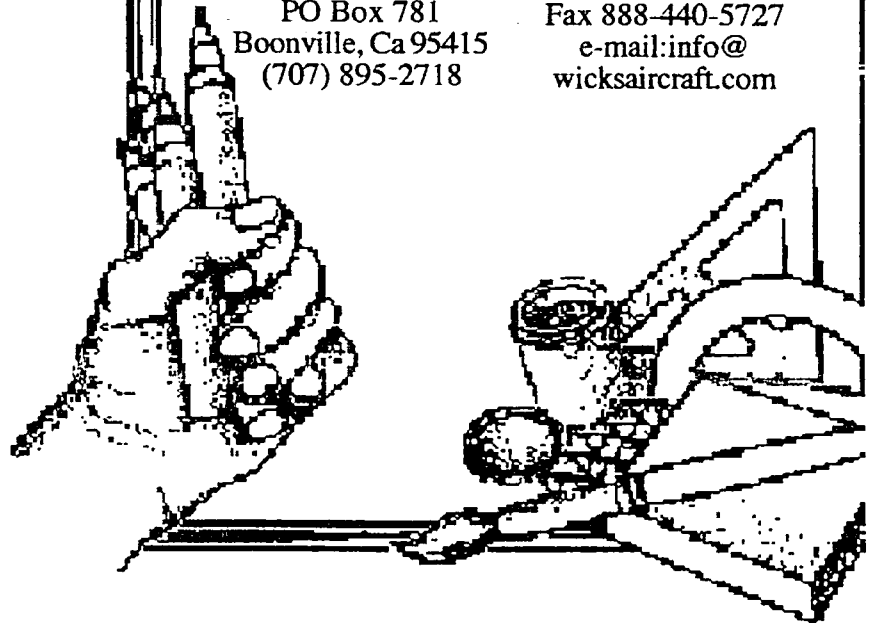
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VariEze builder/flyer Bill Butters has started a company to develop a full range of buried antennas. These are normally supplied with a BNC connector built into the actual antenna, but can be supplied without connectors to include enough length of co-ax cable to facilitate easy installation with minimum weight and bulk.

Call Bill Butters 800-758-8632 Advanced Aircraft Electronics, PO Box 4111, Florissant, MO 63032

Feather Lite Inc.

LONG-EZ PARTS PRICE LIST

Main Landing Gear Strut	\$379.00
Nose gear strut	\$64.00
Engine Cowl Glass Top & Bottom Set	\$369.00
Engine Cowl Kevlar Top & Bottom Set	\$499.00
Cowl inlet	\$ 60.00
Wheel pants (3.5x5 set)	\$170.00
Wheel pants (500x5)	\$195.00
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500x5 Set original style only	\$230.00
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*Pre-cut Foam Cores Wing & Winglets	\$1180.00
Leading Edge Fuel Strakes	\$420.00
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Strut cover SC	\$23.00
Nose wheel cover NB	\$23.00
Sump blister SB	\$23.00
Carb. Air Box Kit	\$165.00
Baggage Pod Set	\$395.00
Nose Bumper Rubber	\$10.00
NACA inlet	\$55.00 (requires cowl modification)
Propellers, with rain leading edge (call for quote)	

Contact Michael Dilley or Larry Lombard
(both former RAF employees
and EZ builders and flyers)
Feather Lite, Inc., PO Box 781
Boonville, CA 95415
707-895-2718

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