

CANARD PUSHER

JANUARY 1998

RUTAN AIRCRAFT FACTORY

VOL.13, ISSUE 1, NO. 91

A Dream of Africa

by
Hans Georg Schmid

Story continued from CP 90

Is there any similarity between a fitting worth two dollars and a terrorist? Answer: Apparently in Luxor there is!

Having landed in Luxor my first priority was to install my ferry tank which had arrived with the help of MAT-Transport, a Zurich-based company which does all kinds of transports worldwide very reliably. The final task shortly before nightfall was to connect the two fuel hoses — but the necessary AN-fitting was missing. I looked everywhere for it but came to the conclusion that it had not been included when the ferry tank had been shipped from Switzerland.

To make matters worse, while I was trying to sort out this problem, I was informed that the Egyptian police suspected me of being a terrorist. It appears I had the same surname as a suspected terrorist, although our first names were different and our dates of birth were four years apart. After the lengthy process of checking and rechecking their records, the police finally convinced themselves that they hadn't captured a terrorist.

While all this was going on, Francesco Manfrin from ZIMEX-Aviation was using his time far more constructively. With his usual efficiency he organized for the missing fitting to be in Luxor by the next evening. As there is no FedEx nor UPS service to Luxor it had to be shipped via internal channels by Swissair to Cairo where an Egypt Air captain brought the package to Luxor. Fitting the part took just five minutes, so at 10:30 PM the aircraft was fueled and ready to go.

see Africa page 4

Up, up and . . . oh no!

by Tonya Rutan

The launch was exhilarating.

It had been a cold, toe-tapping night at the Balloon Fiesta Park in Albuquerque, waiting for the winds to lie low long enough for the precarious inflation of the giant envelopes they called a balloon. Fed by long lines of helium, the balloon bellowed and blanched like a quivering silvery monster rising to its feet for the first time.

"Jiffy pop," a girl standing next to me breathed.

Below on the ground dozens of men ran in all directions, throwing their weight against the strain of ropes, helping, holding, coaxing the 170-foot creature to rise.

It rose, almost yanking them off their feet with a sudden swoon to the south. There was a shout, and then just as suddenly the balloon stood up tall and straight as a soldier saluting the stars.

It towered over us like a shadow on the moon. Not a quaver rippled its silvery seams.

"Awesome," we cooed from the sidelines. "Lovely."

Hours later, just before daybreak, Dick Rutan, our 'round-the-world-brother and Dave Melton, an accomplished balloon pilot, kissed their loved-ones aloha, shook hands with their esteemed flight crew, and climbed into the capsule through the top porthole. As they prepared for launch, well-wishers and media emerged from the darkness and the relative warmth of their vehicles where they had waited for more than 12 hours while crew members worked at a steady pace to prepare the balloon for a 14-day flight.

Barron Hilton, a major sponsor for the expedition, had the honor of releasing the final anchor that held the balloon earthbound. When all was ready he pulled the rope, and with a clang and a mighty jerk the Global Hilton leaped into the air like a headstrong racehorse bursting out of the starting gate.

On the ground we cheered. Friends and strangers, we howled like a clan of coyotes. The balloon sailed up, straight up, luminous and silent, into the night. We watched it until we couldn't see it any longer. Darkness seemed to devour it whole.


We ran for our cars. Daylight was just beginning to break on the horizon. Burt wanted to get to Mission Control at the Hilton Hotel ASAP, where Dick and Ruth Blosser were manning Communications. Little did we know then, as we dialed Mom and Pop Rutan on the cell phone with jubilant news of an awesome launch, that within the hour our hearts would be in our stomachs as Dick quietly radioed in with MAYDAY, MAYDAY, MAYDAY.

For Dick's Incident Report see page 3

BRIEFS

John Denver — We hope to have more answers about the crash that killed folk singer John Denver in the next few weeks when the NTSB issues their official report. RAF will publish that report when we receive it from the NTSB.

FEATHER LITE INC has a new price list. Larry Lombard dropped by Mojave Airport to pick up Mike Melvill's cowling molds in January. Price and availability for the cowling is still pending, but you can call Feather Lite Inc. for more info. *See page 13.*



To report accidents and incidents

Call (805) 824-2645

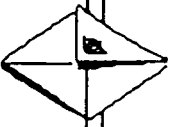

or fax: (805) 824-4174
(805) 824-3880
Attention RAF

Write: Rutan Aircraft Factory
1654 Flightline
Mojave, Ca 93501

RAF HOURS: Rutan Aircraft is officially open every Wednesday. Please call between 10 am - 2 pm (805) 824-2645 and give your name, serial number and nature of the problem. If you are not in an emergency situation, we ask that you write to Mike.

Note — Sometimes you can catch Tonya at RAF Monday thru Friday. She is in and out. Try and try again.

When writing to RAF, send along a stamped, self addressed envelope, if you have builder's questions that need to be answered. Please put your name and address on the back of any photos you send.



The Canard Pusher is published quarterly (January, April, July, October) by Rutan Aircraft Factory, Inc. 1654 Flightline, Mojave, CA 93501
Editor: Mike Melvill
Publisher: Tonya Rutan

U.S. & Canadian subscriptions \$14; Back issues \$3.50
Overseas (Airmail) subscriptions \$16; Back issues \$4

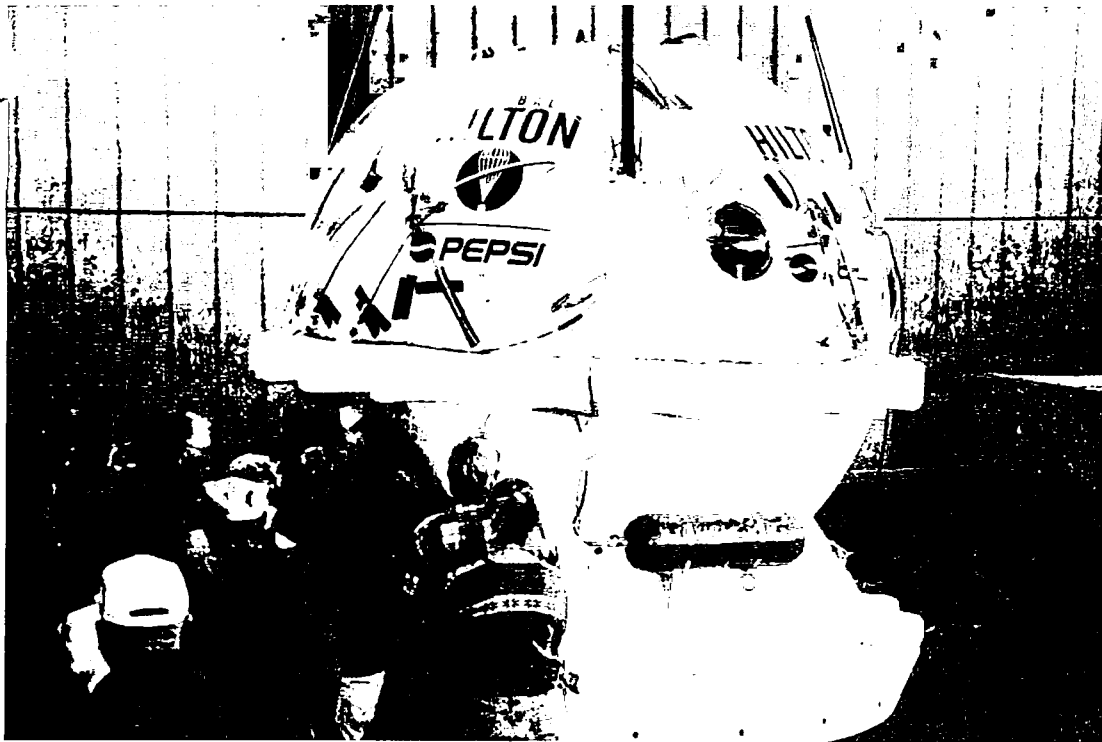
RAF is no longer accepting multi-year subscriptions. Please renew only after your current subscription has expired.

If you are building a RAF design, you must have the following newsletters:

- VariViggen (1st Ed) CP 1 to current
- VariViggen (2nd Ed) CP 18 to current
- VariEze (1st Ed) CP 10 to current
- VariEze (2nd Ed) CP 16 to current
- Long-EZ CP 24 to current
- Solitaire CP 37 to current
- Defiant CP 41 to current

A current subscription of the Canard Pusher is mandatory for builders, as it is the only formal means to distribute mandatory changes.

Global Hilton Incident Narrative



Friends give Dick Rutan and Dave Melton a send-off party at the Mojave airport as the balloon capsule is prepared for transport to Albuquerque, New Mexico.

From Dick Rutan

The balloon (Global Hilton N298AR) was launched at 0618 on January 9, 1998 from Albuquerque, New Mexico approximately ten miles north of the Albuquerque International Airport (KABQ).

The lift-off and climb to 27,000 feet was as per the normal profile. The average climb rate was 263 feet per minute. We leveled at 27,000 feet for approximately ten minutes when there was a loud whoosh and a mild bounce, and immediately, (and without pilot output), the balloon climbed to 31,000 feet, and leveled off.

A MAYDAY emergency call was made on the Air Traffic Control (ATC) frequency and a descent was initiated by release of helium via the helium release valve.

The decision to bail out was based on the following circumstances: As the Global Hilton just eased into float altitude with the rate of climb no more than 50 feet per minute, and considering Kevin Uliassi's problem with blockage of the pressure relief APEX tubes, the pilots were intensely concerned they would not exceed float altitude at a rapid rate of 27,500 feet. The APEX vent tubes were fully functional, and almost immediately after reaching altitude, the total bottom membrane of the helium gas cell exploded. From the top hatch of the capsule, the pilots could look up into the gas cell, all the way into the helium valve. You could have driven a truck through

the opening. This failure, or explosion, destroyed a large portion of the bottom of the helium cell.

When the balloon climbed the 7000 feet (without pilot output) it is important to note that the failure was not just with the lower portion of the helium gas cell membrane, but radical vertical tears had begun to extend up into the main, basic structure of the envelope itself.

The pilots descended to a lower altitude to de-pressurize the capsule and further evaluate the situation. The crew considered landing in a heavyweight condition, which would have been a challenge under ideal circumstances. But at the time, considering the tons of propane and the liquid oxygen on board, a heavyweight, emergency landing grew increasingly impossible due to the high surface winds that were being reported by the ground crew.

A Roziere gas balloon system without a lower membrane could conceivably be flown for many days. However, during the descent to a lower altitude, there were many pops and creaks in the envelope, and one specifically loud crack that immediately resulted in a rapid rotation of the balloon. Thus, the structural integrity of the envelope was in serious question.

Considering the fact it could have taken a good 24 hours to jettison propane and valve off helium, the validity of that plan was not promising. That rejected plan, coupled with the ever-

Continued on page 4

Africa

A short night and a very long day

I was in bed shortly after 11 pm, but at 1:15 am the next morning my alarm clock awoke me from a deep sleep. However it wasn't until shortly after 4 am that I finally overcame all the bureaucratic hurdles, paid the exorbitant landing fee and was able to push my throttle forward to get my Long-EZ rolling.

It was a memorable take-off in pitch black darkness with some 105 USG (400 l) fuel on board, out over the empty desert heading southeast. There was no choice as to my routing as there was no assured fuel supply before Nairobi.

My itinerary took me over the Red Sea almost to Jeddah/Saudi Arabia, then over Asmara/Eritrea and Addis Ababa/Ethiopia towards Lake Turkana and finally just after sunset I landed at Nairobi-Wilson. It had been a very interesting and impressive flight of 14 hours and 4 minutes and I still had enough fuel on board for a further 3 hours.

During the long flight, it was good for my peace of mind to know that not only did I have a dinghy, a life-vest and a well-stocked emergency package on board, but that I was also wearing the latest invention from Bretling, the BREITLING-Emergency. Naturally I had one ELT as well as an additional radio on board but the knowledge that I had an ELT attached to my wrist at all times was very reassuring.

As an additional back-up the GARMIN-

195 GPS was a great help and allowed me to fly as close as possible to the Sudanese FIR but not inside it. It worked perfectly throughout the whole flight and was a perfect supplement to the KLN-90.

On this leg I noted on several occasions a fuel flow of 5.8 USH/H (22l/h) which would not have been obtainable with standard magnetos as an ignition source. The average fuel consumption between Luxor and Nairobi was finally calculated as 6.27 USG/H (23.75 l/h) thanks to the electronic LASAR ignition system of UNISON-Industries.

Breakfast with the ambassador

The following morning the ferry tank had to be removed from the aircraft and was prepared for shipment to Cape Town. I had my engine checked independently by two aircraft mechanics, who discovered absolutely no problems.

At 7 am the next morning (Sunday, March 23) I met up with the TV-crew who had arrived from Zurich and the Swiss ambassador, Mr. Hans-Peter Erismann with his wife, and we went for breakfast at the Aero Club of East Africa. While the cameraman installed a camera on the left wing of my aircraft I had time to brief the ambassador and Stephan Klapproth on my on-going journey.

What followed was a fantastic flight over the Rift Valley, accompanied by a Long

Ranger with camera crew on board. We then tried to overfly Mount Kilimanjaro but this proved to be impossible due to its cloud cover. The game park of Amboseli rewarded us with superb views of herds of elephants and other game which we were able to admire from close up as they made their way to the next water hole. After this challenging and most memorable flight, the day was concluded with an excellent dinner at the ambassador's residence.

Monday morning, shortly after seven, we took off direction south, crossing the whole of Tanzania towards, and then over, Lake Malawi to land finally at Lilongwe. It was almost possible to feel the coming rainy season. The 9000-ft-high Livingston Mountains proved to be quite a challenge because of the weather conditions, but we completed this flight sector without any major problems. The next flight was over Mozambique whose wide jungle glowed with numerous shades of green, broken only by silvery streams heading east towards the Indian Ocean — an amazing sight. We finally landed at Harare Intl./Zimbabwe, glad that the daunting line of thunderstorms was still south of the city.

Continued on page 5

Balloon flight

increasing surface winds, led to the decision to abandon the balloon, but not until there was an extensive evaluation of the sparsely populated area of eastern New Mexico, the forecast for ever-increasing surface winds, the integral degradation of the balloon envelope itself, and consulting with our ground team. It was them then that the decision was collectively made to bail out.

The pilots helped each other put their parachutes on, inspected each other's chute and practiced pulling the rip cord. The pilots then assisted each other out of the capsule. While standing on the propane tanks, Dick pulled the manual helium valve rope, opening the helium valve and securely tying it off to the capsule to insure descent after the capsule was no longer manned.

After the bail out, the balloon and capsule did descend in a remote area downwind and east of where the pilots landed. On impact, however, the capsule shed many of the tanks (it is believed eleven), and this loss of the ballast allowed the capsule

and balloon to climb back into the sky.

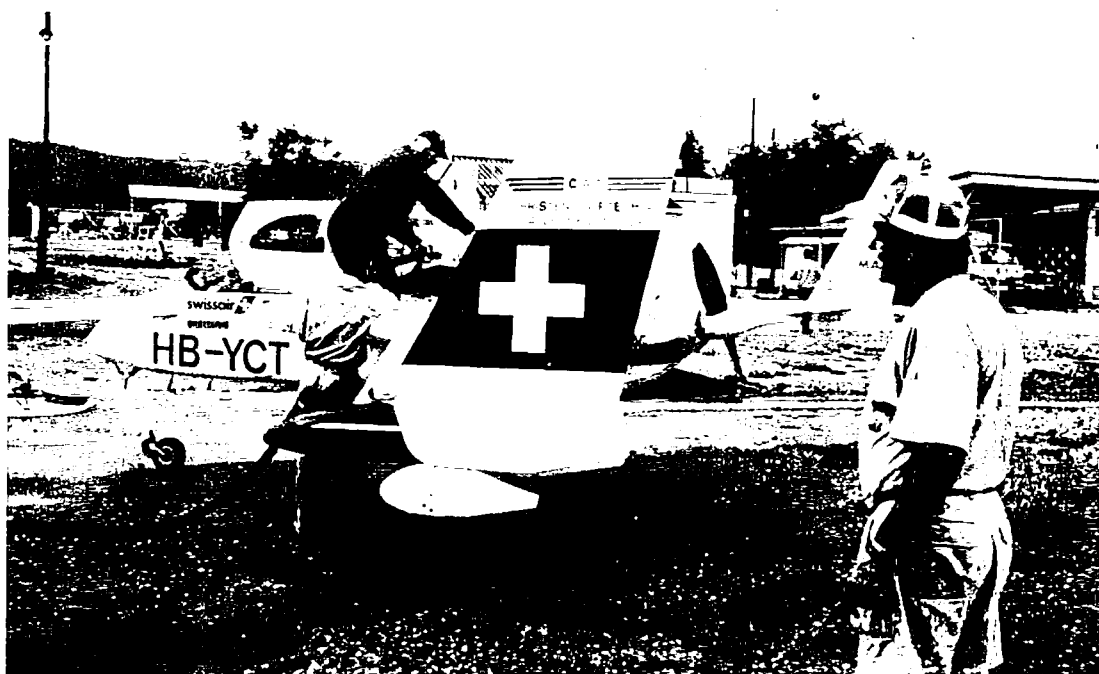
Dick landed in cactus and suffered minor puncture wounds and Dave is in serious, but mendable condition and remains hospitalized at the University of New Mexico Hospital in Albuquerque, New Mexico. ●

Dick and Dave are already making plans for a 1998/1999 winter weather launch attempt at the balloon record. Currently Dick and crew chief Bruce Evans are en route to Switzerland to cheer on the flight of the Breitling Orbiter, which is expected to launch January 28 and then to Marrakesh for the launch of the Virgin Challenger.

Cards and letters for Dave Melton can be sent to Rt 1, Box 370N, Espanola, NM 87532.

IB Schmid fills the ferry tank in Kariba, Zimbabwe.

HG flew his Long-EZ from Switzerland to Cape Town and back in 23 days and 108 flight hours last Spring.



South Africa

TV anchormen often see things somewhat differently

I was looking forward to Tuesday as I had planned an easy leg of only three hours to Johannesburg-Lanseria followed by some urgently needed sleep and relaxation. That's what I had in mind — but unfortunately I didn't anticipate the ideas of my friend from Swiss TV. Southern Africa without the famous Victoria Falls (which I had planned to visit on my return journey anyway), just isn't Africa, and it was specifically the Falls that Stephan wanted to show his viewers. So I was up until midnight replanning the next days flight, and out of bed early the next morning to fly at maximum speed to Vic-Falls which greeted us with a big cloud of water-vapor. From our vantage point it was fantastic to see the mighty Zambezi River cascading down many hundreds of feet. As I had the intention of landing at Lanseria the latest by 6 pm due to the problems of an early sunset and the forecast of thunderstorms, I frequently checked my watch.

Once we had landed I told Stephan my plans regarding departure time from the falls. We then raced up by taxi, at speeds up to 85 mph (140 km/hr) to the Zambezi, where we viewed the falls. Time was now getting short but it was then that Stephan told me he still needed to do another two minutes of shooting, which turned into a further two minutes, and then another two minutes . . .

On the way back to the airport I recalculated my reserves and subsequently accepted a take-off time without bothering to refuel in order to gain time. We had one hour of reserves and plenty of airfields around Johannesburg which I could accept. At long last we were airborne but I was forced to make a 20 minute detour by air traffic control and then I had to fly around

the thunderstorms. On arrival at Lanseria it was dark, rainy and there was a thunderstorm barely two miles to the east of the field.

Cape Town and what an arrival

South Africa gave us a very warm welcome. The tower crew of Lanseria assisted us by advising Kimberly in advance of our wish to film the famous diamond mines. The weather forecast had predicted that the prevailing low overcast cloud and rain showers would be replaced by sunny weather soon after our take-off, but unfortunately we flew some 200 miles (300 km) fighting to maintain VFR-minimas until the sun finally broke through.

However, the rest of the flight made up for everything with Kimberley inviting us to take pictures of its beautiful mines, which are to my knowledge the deepest in the world, from as low as we liked. We showed our gratitude with a low pass abeam the tower. We passed the almost dry Orange-river and crossed the "Great Karoo," a semi-desert with isolated farms and thousands of sheep stretching for long distances southward to the mountainous Cape Province. We flew at low-level from farm to farm with people waving to us and surprised sheep looking up before running off. The landscape and its beautiful colors were overwhelming and reminded me of areas of Arizona and Nevada which I know quite well.

Exactly as planned I called Cape Town tower at 3 pm on Wednesday, March 26, 1997 which responded "HB-YCT, Cape Town Tower — We welcome the Mittelholzer Celebration Flight 1927 to 1997 in South Africa and Cape Town —

Continued on page 6

South Africa

Cleared for left base and two low passes abeam the tower." My next question about the minimum height was answered with "As low as you can go," which I duly complied to.

During the next 15 minutes Cape Town International was closed for other traffic. It followed a hold to allow the camera crews to go out to the runway and then I had to fly three circuits followed by a full stop to be finally guided to a parking position besides a Swissair MD-11 which had just arrived from Johannesburg. The Swiss Consul, Mr. Widrig, a representative of Cape Town, the head of the Olympic committee and representatives of Swissair were all there to welcome us together with four TV-crews and a dozen reporters. This was followed by dinner at the Swiss Club.

The next day my Long-EZ was required for more filming around the Cape (which was quite demanding due to wind and turbulence and the slow speed of the helicopter), followed by a reception at the Swiss Consulate. The day was finally concluded with an excellent dinner to which I had been invited by Mr. and Mrs. Cliff Jacobs who manage the Villa Belmonte, a beautiful hotel in Cape Town.

Flying there was easy

The flight back to Switzerland was much more demanding than the trip to Cape Town, partly due to the additional heavy workload which was imposed by the TV-crew.

After having completed my 50-hour check of the aircraft and having installed the ferry tank, I departed for Winhoek/Namibia. Thereafter Maun and the unforgettable Okavangodelta with its rich wildlife and herds of giraffes and elephants followed, before I reached Kariba. It was in Zimbabwe that the rainy season finally got me.

After a rest day I followed the brown Zambezi at tree-top height on course for the Tete/Mozambique. Below I spotted dozens of hippos as well as crocodiles, but then the rain became too heavy and the visibility dropped dramatically. The forecast had promised visibility of between 5 to 7 kilometers and a sufficient cloud base ... I turned and climbed over a known obstacle-free region IFR to a sage altitude before turning north (over minimum sector altitude and below the lowest level of the closest airway) in order to be out of the frontal system in the shortest time possible. This was the safest course of action.

Overhead Tanzania I flew on to Mombasa/Kenya where I landed shortly before dark. Above the Indian Ocean there were numerous big thunderstorms looming on the horizon, which gave me a spectacular view from the cockpit, but it was at this stage that I had noticed a significant rise in humidity. Locals told me that the so called "Long Rains" — the rainy season — were imminent. Hence my decision to take off first thing next morning with some 400 liters of fuel on board towards Asmara/Eritrea. It would be a long and tiring, but nevertheless fascinating, flight.

The final chapter of HG's adventure will be published in the next Canard Pusher. Meanwhile he is planning yet another long-distance flight over Africa and South America. For inquiries email HG at hgschmid@bluewin.ch or fax +41 56 621 98 42.

RAF CD-ROM Encyclopedia!!

only \$325

- Canard Pusher Newsletters #1 (1974) thru' #83 (1996) with Searchable Format!
- Aircraft plans (except for Defiant), Texts, Brochures, Operators Manuals & Photographs!
- The Moldless Composite Homebuilt Sandwich Aircraft Construction Manual.
- Many Historical & Milestone Articles on the Development of the Composite Aircraft Industry.

Note: This product is intended for entertainment purposes only. It is not a license to build aircraft, nor does it include any of the necessary templates.

Send check or money order to TERF, 11411 Culver, Brighton, MI 48116
(810) 229-2082

**The LINDBERGH DIPLOMA
was presented to
André Joseph DEBERDT**

*(Posthumously) at the 90th Annual Federation Aeronautique Internationale
General Conference in Rio de Janeiro, Brazil on October 23rd, 1997*

This Diploma was created by the FAI in 1983 on a proposal by the FAI General Aviation Commission. It is awarded annually to individuals or organizations that have contributed significantly over a period of not less than ten years to the progress and success of General Aviation in either its sporting or transportation manifestations or in the work of international bodies. Not more than one diploma may be awarded annually.

André J. Deberdt was born in France in October 1934 and lived in Sao Paulo, Brazil since 1954. An electronic engineer in radio and telecommunications, he obtained his private pilot license in 1974 and accumulated some 1600 hours of flight on small airplanes. He had an IFR rating and some basic aerobatic experience.

Co-founder and first president of "ABRA" the Brazilian Air Rally Association, Andre organized and participated in

several rallies in Brazil and abroad. He participated with his own airplane in the 9th World Precision Flying Championship held in Argentina in 1990.

With his experimental Long-EZE, André J. Deberdt crossed the Andes mountains in 1993, reproducing the South Atlantic flight performed by Joao Ribeiro de Barros in his Savoia Marchetti named "Jahu" on 28/4/1927. He flew from Rio de Janeiro, Brazil, to Santiago, Chile, for the 8th World Precision Flying Championship in 1993. He also flew from Sao Paulo, Brazil, to Dakar, Senegal, and back in April 1994 and Sao Paulo, Brazil, to Oshkosh, USA, and back in July 1994.

He finally flew from Sao Paulo, Brazil, around Europe to Denmark for the 10th World Precision Flying Championship and back to Brazil through the USA in 1995, thus establishing 8 FAI World "Speed Over Recognized Course" Records.

Reader Mail



This letter was sent to RAF on the Internet at raf@hughes.net

Dear RAF,

While inspecting the engine area of my Long Ez, I discovered a break in the engine mount. This is a Ken Brock conical mount for an O-235 Lyc. The break was on the smaller diameter down strut, occurring at the teeny weep hole. The tube was cracked clean through, almost as if cut with a hack saw. I never experienced any vibration or any other indication that the mount was broken. After removing the engine and the mount, I discovered that the other down strut was also cracked about 75% around, also at the weep hole. Needless to say I was rather shocked!!!

Those of you with conical engine mounts might want to give this area an extra look. I had heard of cracking mounts, but had always concentrated my inspections around the weld area. Has anyone else had a similar problem?

By the way, Mike Youngblood at Brock MFG. was extremely helpful in getting the mount repaired.

Roger Johnson
N34JR
rjohnson@ctaz.com

Jim Price (Rochester Hills, MI) — Setting a World Altitude Record is an outstanding opportunity to link with and learn from some of the best people in the world! A partial listing includes, Burt Rutan, John Roncz, The University of Michigan Department of Aerospace Engineering, and the Carson City, NV EAA Chapter who were all wonderful to help with this project. My biggest surprise was finding nearly every time I asked for advice or help I was able to get it.

I always knew aviation people were special, but the responses I received were an affirmation of that fact. These folks are truly "World Class People".

My goal focused on setting an altitude record after deciding it would be challenging, yet possible. In my work at General Motors, we are often challenged to do more with less. One of my favorite managers terms this as "leveraging adversity". When I began this quest I didn't realize I would have to best a competitor with sponsorship, contacts and programs far surpassing anything that I had. What a great challenge!

Initial study of FAI rules and records led me to believe I was best suited to go after the Altitude and Altitude in Horizontal Flight for C-1.a weight class (661 to 1102 pounds). A major concern was: could I get my Long-EZ, including myself and all required equipment, to the required take off weight of less than 1102 pounds? In the Long-EZ's eleven years and over 4,000 hours building process, I tried to keep weight to the minimum and still have a comfortable IFR equipped plane. As a testimony of how wonderful this plane is, I have already had it

in all of the Continental United States (including Alaska), all but one of the Provinces of Canada (including the North West Territories) and even to Mexico. All this in just over three years of flying. It's the best thing short of teleportation.

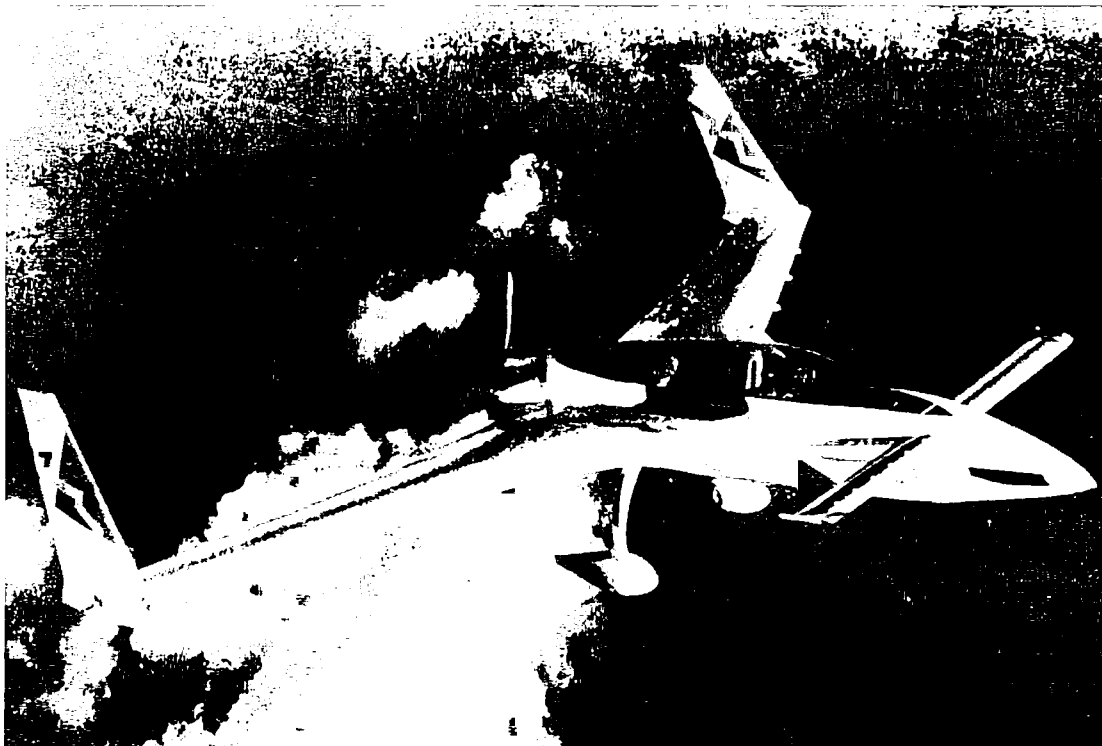
When complete (July 1994), its empty weight was 907 pounds, in the bottom 10 percentile of O-320 EZ. I still needed a lower empty weight so I began removing and weighing all non-essential items. I was able to get my airplane's empty weight down to 842 pounds. Nothing was overlooked; even the engine lifting eye was removed. I was sure this weight removal would permit me to make the C-1.a weight class. Weight removal brought about creative repositioning of equipment to keep the CG where I wanted it.

While working on airframe empty weight, I looked at myself and thought that I should kill some fat cells and shed some weight. I set a goal to loose 25 pounds and I was able to remove 30 with a self imposed exercise program and diet. After doing this weight review, I conducted a test flight to determine what my service ceiling would be. Examination of the rate of climb data to flight level 280 showed I could advance the existing record.

During the weight reduction process, I looked into what special equipment would be needed for the flight. Jeff Rose of ELECTROAIR offered a great enhancement for his dual Electronic Ignition system I had in my Long-EZ. The modification allowed me to exceed normal spark

Continued on page 9

Price EZ achieves 6.6 mile Altitude Record



Altitude Record

advance using a control inside the cockpit. The system worked wonderfully and allowed me to advance the spark timing much further than the normal system allowed. All I had to do was to switch over to a manual mode at about FL 180, advance timing until I saw an RPM drop, then retard timing slightly from that point. This was done much like the setting of fuel mixture. It operated like the early cars used to do with their manual spark controls!

Another weight reducing piece of special equipment was Bill Bainbridge's ultra light weight alternator. The 8 amp unit weighs just 3.7 pounds and mounts on the vacuum pump pad. Bill's alternator allowed removal of my heavier 40 AMP alternator yet provided plenty of power for my electronic ignition, transponder/encoder, hand held radio and GPS.

I knew this activity can be dangerous, so after inquires, I linked up with The Air Force Department of Aerospace Physiology, at Brooks AFB. Lt. Col. Sam Holoiviak saw my level of commitment and offered to help me prepare for the record attempt. Sam was outstanding to work with and helped me better understand what a hostile environment that I would be going into. Sam had a special way of getting my attention with statements like "This is essential for your survival! (Can I make this any clearer?)".

The two largest Physiologic areas of concern were: Decompression Sickness (DCS) i.e. the bends and loss of oxygen supply. Per his suggestion, I found an Air Force base near my record setting location with an altitude chamber to treat me in case I got the bends. He also suggested doing what U-2 & SR-71 drivers do, pre-breathing 100% oxygen for at least one hour to get as much nitrogen out of my system as possible. To assure proper oxygen delivery, I purchased a special Air Force style pressure oxygen regulator. Because of low ambient pressure at the altitudes that I went to, oxygen is not be absorbed normally into the blood stream. It must be forced in using a pressure system and special oxygen mask.

Obviously this oxygen system was an essential tool. I also had a emergency back-up supply of pressurized oxygen in case the regulator failed. The back-up oxygen system was one of the very few extras to go on the flight with me.

Lancair IV and Questair drivers need to be aware of some of the data Sam shared with me. Unpressurized flying above 21,000 feet will have a high DCS risk. Major variables are: Altitude, Exposure Time, Breathing Gas, Pre-breathing, and Exercise. At 28,000 feet 50% of the tested subjects had DCS symptoms within 24 minutes. I took & highly recommend the Air Force Physiology course offered through the FAA. It covers this information and other important physiological flight concerns.

During this preparation period, I flew to Minden, NV, to initiate local contacts. This trip with Jim Conners in a Prop Jet Bonanza was especially delightful. Jim knows the area very well and suggested I do my flight in Minden. Tony Sabino of Soar Minden, a local sailplane FBO, offered to help with some of the special flight equipment like the recording barometer and oxygen mask. Tony also steered me to local National Weather Office weather expert, Doug Armstrong, ATC personnel controlling this area.

While in NV, I reviewed safety concerns which included selection of numerous emergency landing sites. These were selected because weather can change rapidly in this region and I wanted several options in case I got trapped on top of a cloud deck. One of the primary reasons I chose Minden was it is one of the few areas one can go up this high VFR in the special airspace called a wave window. I hoped I would be able to link to a mountain wave to assist my climb, unfortunately the wave I had hoped for never materialized in my two attempts.

After a review of the flight program status, an idea occurred to me. I decided to inquire at the University of Michigan Aerospace Engineering Department to see if they would conduct a critique of my progress to date. I hoped they could offer suggestions for improvements. Dr. Kauffman kindly scheduled a meeting for me. Four professors and 14 students were in attendance. They

I knew this activity can be dangerous, so after inquires, I linked up with the Air Force Department of Aerospace Physiology at Brooks AFB.

also found this record setting attempt to be an excellent opportunity to work a challenging development program.

After a group review of the Army's Long-EZ flight test report, Professor Bill Ribbens noted the Long-EZ's minimum power speed was below the stall speed. Dr. Ribbens suggested a wind tunnel test to see if vortex generators, (VGs), could lower the wing's stall speed and allow the Long-EZ to fly closer to the minimum power speed.

My timing was extremely lucky as a senior wind tunnel class was about to begin the next semester. Professor Dahm forwarded my test proposal to his students to see if any of them would be interested in taking on this project.

I was again fortunate as one of the student teams was interested in taking on a study of effects of vortex generator effects. Our team started by building a Π span Roncz Canard airfoil and a half scale main wing section. We had a few exceptional events. Most memorable was when I told the students epoxy would cure faster at 100 degrees than at room temperature. One of them decided if a little heat was good, a lot more heat would be better yet!

Oh well, our first airfoils had the foam cores melted. Rebuilding both airfoils would have caused us to be too far behind our targeted time line so we chose to just make another canard and not test the main wing airfoil.

Continued on page 10

Altitude Record

I gave Charles White (the President of MICRO AeroDynamics Inc.) a call and he provided me information about a normal VG installation and materials for testing. I asked one of the test development experts at GM to look at my project and he determined a simplified testing method, to obtain the optimum placement of the VGs on my airfoil, with a minimum number of tests. We decided to test three variables 1. large & small VGs. 2. Fore/aft placement of VGs (what % of chord) 3. How many VGs to install.

By running four tests we determined low speed lift could be significantly improved using VGs. The best tested placement of the VGs was at 20% of chord. The VGs' size didn't much matter in lift but smaller ones provided less drag. VG pairs installed more closely together (every 4 inches) gave us the best lifting results. Students, Brian Wear, Eric Roth and Eric Wang were all great to work with. It was a dream come true to do wind tunnel testing with such a prestigious group.

I spoke with the NAA several times to obtain all requirements for the flight. It took me much longer than I imagined it would to get information on several issues. One example was: when the NAA told me I needed certified scales to weigh the plane prior to my flight, I inquired who was the proper authority to certify them. The NAA person that I spoke with didn't know. After a month of asking around it dawned on me to stop at a truck scale on the freeway. The officer was very helpful and I found certification is done by the Department of Agriculture.

Other questions remained, would an extra horse power producer like nitrous oxide be legal? The rules state auxiliary power is not allowed. Because of this I decided to not pursue nitrous injection during my development process. I personally would prefer to see nitrous not allowed because it is such a radical horsepower enhancement. Once it is approved to be used for competition it seems like everyone will have to adopt it's use in order to be competitive.

A lot of people have inquired how much this process of record setting costs. It cost

\$39 to get your FAI sporting license, sanction fees for a record are \$350 for the first record and \$275 for additional ones. Then to register a successful record it costs \$400 for the first and \$325 for the second. The Observer gets \$275 a day plus expenses, like their airline ticket, hotel, rental car, food, etc. I was lucky to get an observer who truly enjoyed doing this activity and he would only accept a bit of gas money for his plane. Also, it takes a long time to go through the steps of having a record certified. After I returned home from my flight, Dr. Ribbens spent a couple of days going over my data using the FAI formulas to come up with the altitudes that I had

While at 31,000 feet I decided to change fuel tanks and found the fuel valve was frozen stuck.

attained. My record flight took about eight months to be certified by the NAA and then the FAI. Needless to say, one needs a lot of patience to go through this process.

By this time things were pretty well in order so I flew to Minden where friends helped me prepare my Long-EZ for our flight. Stan Gorman came in from Tucson and Dave Jones flew his Long-EZ in from Susanville, Ca. To help out, Jeff Rose even dropped in to make sure his ignition was working out OK for me. Dave Timms was even kind enough to bring over his specially made propeller while which he used for his World Record. At the time he loaned me his propeller he was still the official World Record Holder! My first test flight was to evaluate Dave's propeller for this flight. I think that it would have been ideal at altitude but I could overpower it at lower altitudes.

Trying to minimize consumables, fuel and oxygen, I decided to use a flight profile that would get me up high quickly. By reducing climb time the total amount of airframe drag overcome during the flight is reduced, therefore less fuel would be used. The bottom line is I

used a propeller of the same pitch and diameter I use normally. That gives me a great climb up to FL 300. After that the prop is over pitched and RPMs gradually fall off all the way to 2100, which is well below the engine's power band.

The next flight test's purpose was to validate the effect of Vortex Generators. I did this up high while wearing a parachute. The main wing was tufted to assure that the canard would stall, as required, before the main wing. I entered into this test very carefully as it could be catastrophic if the main wing stalled and the plane went into a flat stall. The yarn tufts clearly indicated the canard was stalling before the main wing. It was fascinating to see airfoil sections behind

vortex generators wouldn't stall but the area between them would. On April 9, 1996, we had everything ready to go and I decided to go for an official record attempt. Mr. Tom Gribben, my official observer assigned by the NAA came down from Reno. He

checked things out and we were ready to go. Tom was a delight to work with and was very helpful in assuring that I complied with all the rules. I had a great run to 31,400 feet with good climb rate, even at that altitude, but I went down to the minimum fuel to meet the required FAA fuel reserves at landing so I aborted the run.

I did have one wake up call. While at 31,000 feet I decided to change fuel tanks and found the fuel valve was frozen stuck. It wasn't a big problem as I had enough fuel on that tank to make it to the ground, but it was quite an exercise in such a cramped cockpit. As expected, the canopy frosted on the inside such that one couldn't see out.

Using a turn coordinator, airspeed and hand held GPS inside a frosted opaque canopy is quite a work out. Because of this, I was even more thankful I was in a canard design, because of it's docile stall characteristics. Everything worked very well and after computing and plotting the rate of climb every 1000' all the way up, I was sure I could do a lot better on a future run with just a bit more fuel. I knew of a few items I could remove to reduce weight enough which would compensate for the additional fuel that

Continued on page 11

Altitude Record

wanted for my next flight. With this testing done I found my scheduled vacation and good weather used up. I headed home on a commercial flight leaving the Long-EZ there prepared and ready to go.

I stayed in contact with Doug Armstrong, the weather expert, trying to find a good weather window in which to come out and accomplish my goal. On May 3rd, I got a call that things looked good and I flew to Reno the next day.

When I got out to Reno, John Grubb & his wife, Edie, took me under their wing and with the help of Dave Jones we quickly got everything ready to go. The winds weren't as good as I had hoped for, but I had no time to wait around so I decided to give it a go anyway. On May 5, 1996 we were ready to launch. We even went so far as to push the Long-EZ out to the runway to save fuel. Dave taped the entire front of the canopy down and John gave me one of his famous hand prop starts and off I went.

Later I looked at a tape of my launch and it was incredible to see the rate of sustained climb. I certainly enjoyed hearing upon my first contact with controllers, "cleared to Flight Level 360"! There was a bit of mountain wave action north of my ATC authorized flight area, but I couldn't talk the controllers into letting me go over in that area. I had hoped by running a transponder the controllers would allow me more latitude in flight area that I wanted to use. Unfortunately, it didn't work that way. I hope this doesn't sound negative, for I truly appreciate having this special area to fly in and realize that while the wave window is "hot" it requires special action on the airtraffic controllers part.

This time I leaned the engine more judiciously to conserve fuel, the timing advance was working great and everything was going super until... At about flight level 310 I got a POP out of the airframe. On a pucker factor of one to ten, this hit a thirteen! By barometer recorder later showed that I leveled for four minutes while I evaluated what was going on. All flight controls and the powerplant were operating normally. I guess you'd have to be there to truly appreciate the scene. With the canopy frosted over I couldn't see if the wings were still on and it was already extremely cold at about -57 degrees Fahrenheit. The culprit noise was caused by a very minor delamination of the canopy to it's frame. The delamination was caused by the different material expansion/contraction rates between the canopy and the canopy frame which causes the canopy to twist. Being

as the canopy is right next to your ear I'm sure that this sound seemed louder than it would have if it had been further away. The canopy is bonded to it's frame in a way that it couldn't come off so after a careful evaluation of all systems I decided to go on.

As my climb progressed, stall and cruise speed slowly got closer and closer together and the plane feels like it is on a "bubble". Any control inputs make the plane feel like it would slide off the edge of the top of the bubble it seems to be perched on. Believe me; you won't need a cup of coffee to get yourself going when you do a flight like this!

The airtraffic controller that I was talking to was having a difficult time understanding me as I didn't have a microphone



inside my oxygen mask. I thought that by pulling my mask off my chin and having the microphone in that area that it would work OK (it had in previous flights). So much for that theory. As my encoder blanks at 28,000 feet so the controller was asking me quite often what my altitude was. With the workload I had, this was quite awkward for me. I even had my mask come unsealed because of pulling it up, such that it was causing a one of my lenses in my glasses to have condensation on it. The lesson I learned was that next time I will go up with a microphone in my oxygen mask.

When I approached my perceived maximum, I leveled off to video tape the altimeter, airspeed indicator and a clock. That documentation proved airspeed was maintained during the horizontal portion of the flight attempt. An electronic barometer recorder collected the altitude every ten seconds.

Continued on page 12

Altitude Record

After flying the required period of time(90 seconds level for the altitude in horizontal), I decided I had enough fun for one day, and extended the nose wheel to increase drag and pointed the nose downward.

The altitudes I attained were 35,027 feet for altitude and 34,926 for Altitude in Horizontal Flight; enough for the two World Records for which I had hoped! I landed with seven gallons of fuel, which was more than required. Data evaluation of my climb rate just prior to my leveling for the altitude in horizontal portion of the flight, showed I was still climbing. The plotted rate of climb data, indicates I could have gained approximately another thousand feet.

A few interesting statistics about the flight were: temperature got to -61degrees Fahrenheit, it took one hour and ten minutes to climb and another twenty five minutes to descend, my spark advance got up to nearly 50 degrees. I do not know the manifold pressure reading at altitude as I didn't have that or any extra gauges. It was gratifying to see that both the April 9 and May 5 flights had the same climb profile to each altitude within a few seconds of one another. I knew a layer

of long Johns with down jacket and pants would allow me to get cold and I did, but not to an unbearable or unsafe state.

What is next? The altitude I reached was greater than the existing C-1.b Altitude in Horizontal Flight record. This heavier class starts at 1102 pounds. All it would require is another gallon of gas and I would be up in that weight class.

In order to get a bit higher (2,273 feet) and capture the C-1.b Altitude Record, I believe I will need to come up with some more tricks. I am looking into nitrous oxide to boost the horsepower. I also plan to look into obtaining sponsorship to defray some of the expenses. The project was truly a grand opportunity for me. It took a year and a half to prepare for this record, and it was marvelous to have all the assistance that I had. My sincerest THANK YOU! to all of you who were involved, many of which were not acknowledged in this article. Be Well & Fly Safely!

Jim Price email HiLong@aol.com

EAA Young Eagles Program Benefits from Check Manufacturer

EAA AVIATION CENTER, OSHKOSH, WI — The Experimental Aircraft Association's Young Eagles Program, which introduces young people to the world of flight, will again receive support from aviation enthusiasts who purchase bank checks from Identity Check Printer of Park Ridge, IL. For the fourth straight year, the check manufacturer is contributing part of every check purchase to Young Eagles.

The checks offered are of special interest to aviation enthusiasts. Both sets contain award winning aircraft photos by EAA's photo staff. The "OSHKOSH ASSORTMENT" features home built, antiques and classics. The new '97 assortment contains the Lancair 320, Piper Super Cruiser, Great Lakes, Waco ATO, RV-3, PT 6-F, Spirit of St. Louis and the Voyager. The "WARBIRD ASSORTMENT" for '97 features the Grumman Goose and the L-19, plus two Triplanes from World War I, two Bombers and three Fighters from World War II and the Harrier Jump Jet from the current inventory.

For each order received through March 31, 1998, Identity Check Printers will contribute three dollars to the Young Eagles Program. Those funds help maintain the program, which has provided 300,000 young people with a free demonstration flight since July 1992.



EAA BANK CHECK ASSORTMENT

CHARLES & MARY PILOT
1234 Main Street
Anytown, U.S.A. 00000
Phone: 000-0000

6000
19 _____ 123-234567

PAY TO THE ORDER OF _____ \$ _____ DOLLARS

FIRST NATIONAL BANK OF ANYTOWN, U.S.A.

MEMO _____

⑆ 2244668899 1133557799 ⑆ 6000 VOID SAMPLE

For a pilot, Christmas comes in late July — it's called "OSHKOSH". You can have that "Oshkosh Spirit" all year with these exquisite bank checks featuring award winning aviation photography from EAA Oshkosh

EAA Oshkosh Ass't— New from '97 Grand Champions: Lancair 320 Piper Super Cruiser Waco ATO Great Lakes 2T1A J RV-3 Cunningham Hall PT6 F — plus the Spirit of St. Louis and Voyager.

EAA Warbird Ass't— New from '97 Grand Champions: Grumman Goose G621-A in a water landing and Aerona L-3 — plus the Harrier, Triplanes of WWI and from WWII the TBM-3E Avenger (think of Lt. George Bush) Corsair P-51 B-17 and Fifi the world's last flying B-29

STARTING NO. _____ (If not specified, we will start checks at 1001.)

SINGLE CHECKS 200 — \$12.95 400 — \$23.95
OR
DUPLICATES 150 — \$14.95 300 — \$26.95

ENTER AMOUNT FOR CHECKS	
SHIPPING & HANDLING	\$1.50
<input type="checkbox"/> EAA CHECKBOOK COVER, ADD \$5.00	
<input type="checkbox"/> Script Lettering, Add \$2.00	
<input type="checkbox"/> In-Plant RUSH & 1ST CLASS MAIL, ADD \$6.50	
<input type="checkbox"/> In-Plant RUSH & UPS 2ND DAY AIR, ADD \$8.75	
9MB030	TOTAL

NAME _____

Daytime phone number: _____

For your protection on checks will be shipped to the printed address unless we are instructed otherwise (USA Delivery ONLY)

One part deposit slips and check register are included in each order

IDENTITY CHECK PRINTERS
BOX 818, PARK RIDGE, IL 60068 **24HR VOICE MAIL 773-992-0890**

Spin-On Oil Filter Adapter for Lycoming

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.

Brock Mfg.
11852 Western Ave
Stanton, Ca 90680
(714) 898-4366

Aircraft Spruce West
PO Box 4000
Corona, Ca 91718-9961
(909) 372-9555
Fax (909) 372-0555

Aircraft Spruce East
PO Box 909
Griffin, GA 30224
(770) 228-3901
(800) 831-2949

Feather Lite
PO Box 781
Boonville, Ca 95415
(707) 895-2718

Wicks Aircraft
410 Pine Street
Highland, IL 62249
(618) 654-7447

Prop Manufacturer
600 Superior St
Concrete, Wa 98237
(206) 853-8947

MOLDED VORTEX GENERATORS

These pre-molded generators are specially engineered for aircraft application. Available in white, they can also be custom molded in quantity to match specific paint colors for aircraft manufacturers and OEM suppliers. After installation, the sail appears to be molded an integral part, rather than an "add-on". The final result not only looks better, it performs better than typical hand-made aluminum fences. Molded vortex generators adhere better, do not corrode, require no painting and are easy to install: one Long-EZ canard can be equipped with a full span of generators in less than 90 minutes.

A kit containing fifty generators is available for a price of \$25.00 plus \$2.00 shipping and handling per kit. Two kits are sufficient to equip the full span of a typical canard (i.e. Long-EZ, Dragon-Fly, et al) or both ailerons on either canard or conventional planforms. Documentation is included. Please send check or money order to:

CCI, PO Box 415, Quakertown, NJ 08868-0415
Please allow 2-3 weeks for delivery, Sorry, no COD's.

Note: These vortex generators are not TSO'd for use on type-certificated aircraft.

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
Wheel Pants Kevlar	
500x5 Set original style only	\$230.00
NG 30 cover	\$23.00
Pre-cut Foam Cores Canard	\$180.00
*Pre-cut Foam Cores Wing & Winglets	\$1180.00
Leading Edge Fuel Strakes	\$420.00
Bulkheads Left & Right	\$199.00
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

A check or money order is required to process orders.
Orders are filled by postmark date.
California residents add 7 1/4% sales tax.
All Truck orders shipped freight collect.
We've negotiated a 40% discount with Viking Freight.
Please include a telephone number, a mailing and a street address.
Please allow 30 days for delivery, we will expedite when possible.
We will discuss questions regarding our products by phone or mail.

*Items must be shipped by truck.

FLUSH, INTERNALLY MOUNTED ANTENNAS

A complete line of antennas, specifically designed for, and flight tested on, composite aircraft. The antennas are tuned for maximum performance and in general those who have used them so far report reception is doubled over standard external antennas.

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



Canopys

Airplane Plastics

8300K Dayton Rd, Fairborn, OH 45324

(937) 864-5607

TITANIUM ACCESSORIES AVAILABLE!

Custom anodized to any of 15 different colors, shades of copper, purples, blues, greens, yellow/gold, even rainbow effect. Rudder and aileron gustlocks - \$20.00-30.00.

GU canard full span vortex generators with layout template - \$170.00. These are very exciting! Rudder horn CS-301L&R replacements, \$25/pair. Shipping inc.

**Ti Specialties, PO Box 1052
Grover Beach, CA 93483-1052
805-489-8155**



STARTER FOR 0-200 CONTINENTALS

B&C Specialty has introduced a beautifully made, 12 volt starter specifically designed to be installed into the accessory housing on a Continental 0-200 engine, or on an 0-240.

This starter has been thoroughly tested at Teledyne Continental (more than 5000 start cycles without a single problem!).

Bill Bainbridge has these starters available for immediate delivery and they can be had STC'd or for homebuilts.

Contact: B&C Specialty Products, Inc.
123 East 4th Street, Newton, KS 67114
316-283-8662

Nose Gear Ratchets

I have agreed, effective October 1, to take on the job of producing the nose gear ratchets that have been supplied by Dr. Curtis Smith. The job kind of overwhelmed him, and I am hoping that it does not do the same to us! I have orders for around 25 outstanding right now and am tooling up to do an initial run of 100. Price has, of course, gone up. The cost of materials and labor always does. I will be offering the units built exactly to his original specifications. I can't improve on a perfect design! I will, however, be offering the units in two finishes. The standard unit, part number 44807, and a chrome finished version, part number 44812. These are also the Sears part numbers for the two finishes of the 1/4 inch ratchet drives. Each ratchet includes installation hardware and instructions. Prices are as follows:

44807 Ratchet	\$49.95
44812 Chrome finish ratchet	59.95
Shipping & Handling	5.00

See our award winning Long-EZ at
<http://www.flash.net/~infaero/acgear.gif>

Projected shipping times are 5 to 7 working days after ARO. There is, as with all our products, a 30-day money back guarantee provided the unit is undamaged. Sorry, no COD orders. Prepaid personal check is preferred. Your check is held until 30 days after shipment to you. Visa and Master Card are also accepted. Please add \$3.00.

Bill Theeringer, N29EZ
Composite Aircraft Accessories
PO Box 21645
Santa Barbara, CA 93121
(805) 964-5453

email _ composite_aircraft_accessories_@CompuServe.com

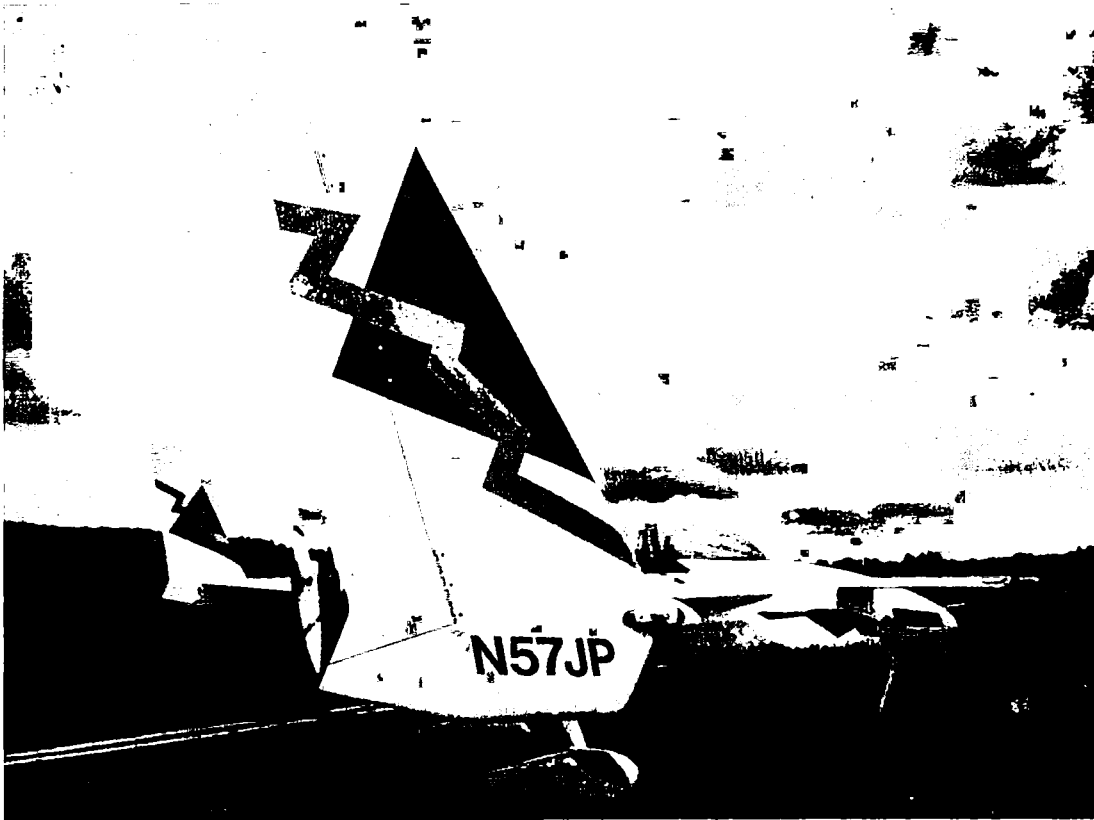


Photo by S. Rhodda

Jim Price set a new altitude record in his Long-EZ last May over Minden NV.

Jim spent 11 years — about 4,000 hours — building N57JP.

Story begins on page 8.

RUTAN AIRCRAFT FACTORY
 1654 Flight Line
 Mojave, CA 93501

Bulk Rate
 U.S. Postage
PAID
 Permit No. 75
 Mojave, CA
 93501

Inside

A Dream of Africa	Pg 1
Balloon incident report	Pg 3
Engine Mount Warning	Pg 7
Price EZ sets altitude record	Pg 8

87* LAST CP IS 99
 SCHUBERT, TERRY *
 9283 LINDBERG
 OLMSTED FALLS OH
 44138

January 98
 CP 91

If your label says LAST ISSUE CP 91, this is your last issue and you need to renew.

