

CANARD PUSHER

APRIL 1999

RUTAN AIRCRAFT FACTORY

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Proteus ground directed remote autopilot and payload pod tested

by Jeremy Desch
Engineer, Scaled Composites Inc.

On Wednesday, May 5, Proteus flew Flight 21. This flight marked the first opportunity to see Proteus acting in its design mission role — a payload pod was strapped to the belly measuring approximately 21 feet in length and 4 feet in diameter. Despite its rather large size, pilot Mike Melvill reported that the pod's effect on the airplane handling qualities was almost unnoticeable.

The pod was built by Dewey Storm, Keith Storm, Mike Updike, Jeff Smith and Florencio Diaz of Scaled Composites Inc. The pod's plug mold was carved by John Newman, Manny Chavez and Mike Waring.

The pod was built for a variety of potential applications under a NASA contract. Sherwin Beck, who was primarily responsible for getting this contract for Scaled, was here to see the first flight with his pod. Beck flew in the chase aircraft and was quite impressed with Proteus and the tremendous success of the first flight with the pod. Proteus flew again on Thursday, May 6, thanks to the quick turn-around time of the Proteus ground crew, Jon Marion, Jeff Price and Mike Vaughan. This flight lasted approximately 11 hours and it marked the first truly successful flight with the Proteus autopilot and flight management system.

This new system not only allows the airplane to be flown hands-off as with a conventional autopilot, but it also allows for the aircraft to be directionally controlled from the ground station. *For more on the Proteus, see page 7.*



"I've just headed them for home!" Left, Jeremy Desch gave Sally Melvill a lesson on how to fly the Proteus from the ground directed autopilot. It didn't take Sally long to learn how to to steer the aircraft, and hubby Mike, back to the Mojave airport.

BRIEFS

Certified Flight Instructor — “Velvet Arm” Dick Rutan is available for CFI check-outs and aircraft deliveries on a limited basis. He also performs pre-sale and pre-buy inspections which include a formal report at a price of \$600 plus travel costs. Contact Dick at (661) 824-4608 or email RINGDOVE21@aol.com

A Late Flash — Time Magazine will ran a small photo of the Proteus in its March 29th issue. You can contact Time for a back issue, or look it up at your local library.

Also, I've heard that National Geographic is running a photo of the Proteus in the Geographica section of either its April or May issue.

RAF HOURS: Rutan Aircraft is officially open every Wednesday. Please call between 10 am - 2 pm (661) 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.

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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

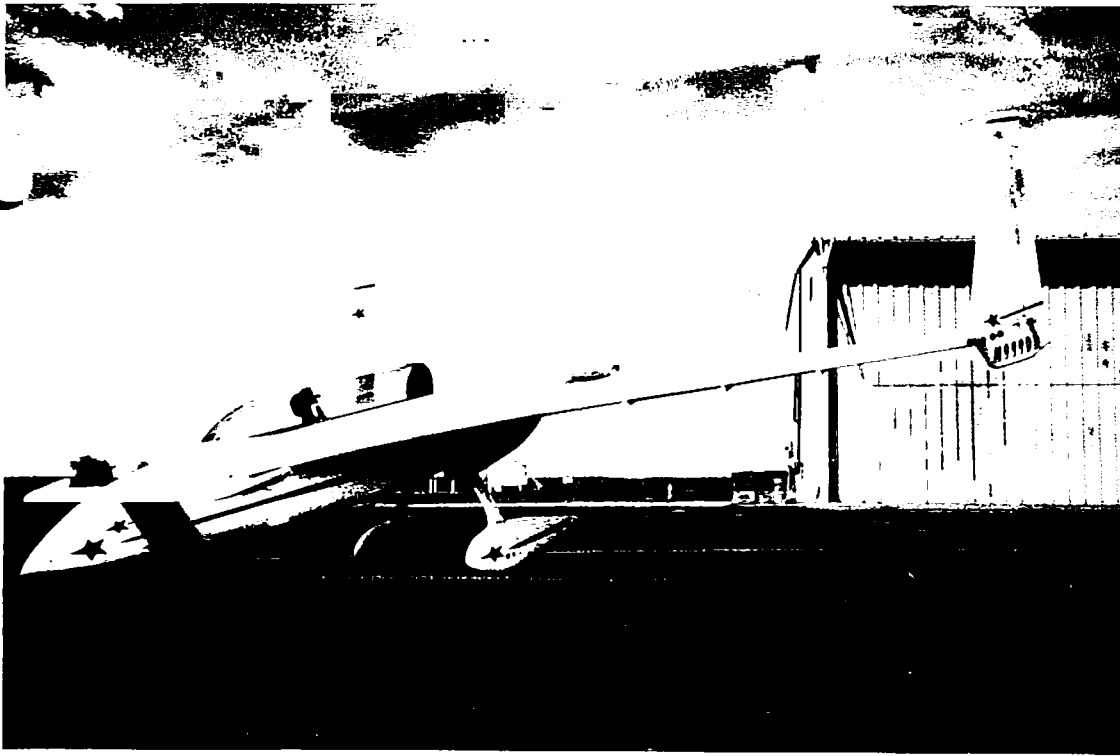
Solitaire

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.

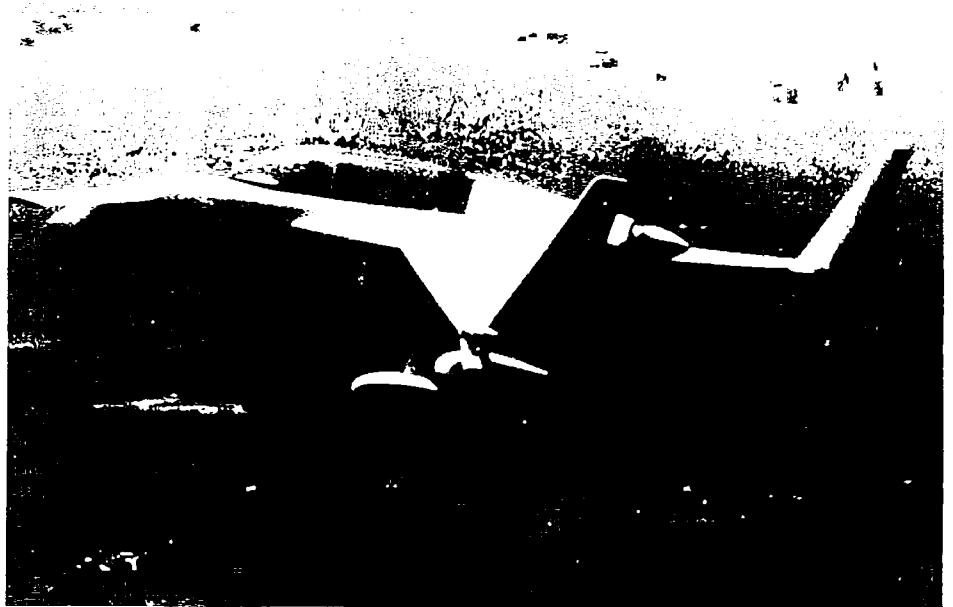


Since its first flight in June 1989, Donald Douglas of Greenley, Colorado has flown Long-EZ N999DD 1200 hours.

In 1997 the airplane won the Jackpot, Nevada Grand Champion award and the Front Range Regional (Longmont) Best Homebuilt Award.

1000 Hour Club

Dear Burt, per your request, enclosed is a picture of my VariEze N115JT, serial #1273, which, as of now, I have flown for 1265 hours. Flights with my wife as passenger include landings in 47 of the lower 48 states, 3 provinces in Canada and 2 landings at Leadville, CO. First flight was September 1983 from oxford, CT. Empty weight is (unfortunately) 690 pounds. The engine is an O200A with alternator. I consider my airplane to be "not as good as some, but better than most." Thanks for a fine design, Very Truly yours, James Townsend.



Accident Report

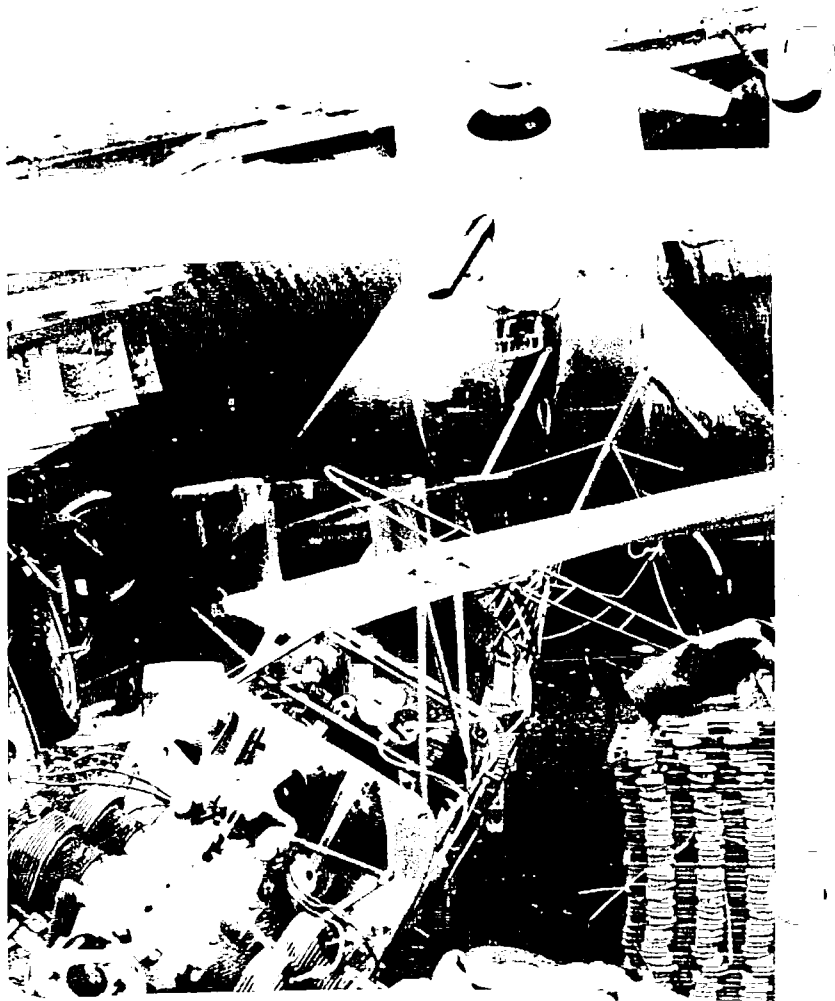
Tornado reaks havoc on airport

John Toelaer lost his Defiant project when a tornado struck Smartt Field in St. Charles County, Missouri last June. The Post-Dispatch reported that 20 of the 36 aircraft housed at Smartt Field were damaged. Many of the planes were owned by members of the Experimental Aircraft Association. According to the St. Charles Post this is the second time the airport has been hit by a natural disaster. Flooding in 1993 shut down the airport for a short period of time.

John wrote that he was still too upset to write about the event, but he added several lessons learned:

1. Do get hull insurance
2. Don't assume your airplane is safe just because it is in a hangar.

He estimated that it would take 3 years to rebuild.



Accident Report

Two Long-EZ aircraft took off from Loreto, Mexico on Sunday, March 7 about 11 a.m. Flying in formation, they encountered a severe weather system roughly 150 miles south of San Felipe. They learned from communications with pilots ahead of them that large cumulus clouds in the system extended between 16,000 and 22,000 feet.

The two pilots increased altitude and changed flight path to avoid strong winds, precipitation and icing on the wings. At some point, one pilot radioed he saw a break in the clouds and was descending. He indicated that he could not see the ground, and requested a vector. In his last communication the pilot indicated that he was flying at an altitude of about 7500 feet.

The experienced pilot, who has logged more than 1500 hours of flying time, did not notify area air traffic controllers of mechanical difficulties or that he was attempting an emergency landing prior to his disappearance.

When the pilot failed to appear at Calexico for refueling, the second pilot contacted emergency authorities. An extensive search was launched on land and sea by the U.S. Coast Guard, Mexican Military and civilian friends and family of the lost pilot.

The search ended after wreckage of the Long-EZ was found floating in the Sea of Cortez near San Felipe on Friday, March 12.

This report was contributed to by the Las Vegas Review Journal. and Las Vegas Sun.

In Memory of Gus Sabo



Burt and I had the honor of meeting Gus Sabo, the manager of the North Las Vegas Airport, and his wife Carolyn for dinner in Vegas a handful of years ago. They were full of fun and charm, and Gus told great tales of his adventures. I remember thinking at the time that Gus's love for aviation shone through him like a beacon, a light that I thought must surely enthrall others with the joy of flight.

Glenn Puit of the Las Vegas Review-Journal wrote a series of articles about the search for Gus and his Long-EZ. Nearly 100 people aided in the search and hundreds more attended a memorial for him in Las Vegas last month. I urge you to read the touching tribute paid to Gus by his closest friends and family at the memorial in the Las Vegas Review-Journal on March 20, 1999. You can access Puit's articles on the Review-Journal website [http://www.lvrj.com/lvrj-home/1999/March 20](http://www.lvrj.com/lvrj-home/1999/March%20) or contact the newspaper by phone (702) 383-0211.

Aviation has lost one of its most devoted champions.— Tonya

Jim and Gayle Weir of RST Engineering are spearheading a project that draws homebuilders together via the internet. This is no easy task. After a year of gathering support, filling out paperwork, and producing a website, their efforts have finally been rewarded.

On April 12 Jim and Gayle invited Burt Rutan to their Cyberhangar for a chat with canard enthusiasts via computer. They talked about everything from airframes to power plants, to what will happen when a computer becomes as smart as the human brain.

And there's much more than chat at the Cyberhangar. You will find an events calendar, web news, air swap and more. Cyberhangar offers more than 50 website connections that might otherwise be difficult to find. Make a visit! You won't be sorry. I've printed a letter from the Cyberhangar Webmaster below.

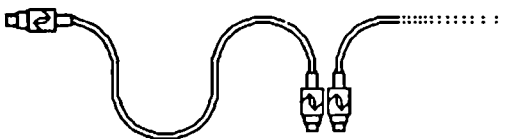
Webmaster. April 20, 1999 — The Cyberhangar is a group of current or prospective EAA* members who got together on the Web in the late summer of 1998. We started mostly through the rec.aviation newsgroups (Usenet). With the help of the EAA staff back in beautiful Oshkosh, WI, our Web based chapter concept was approved by the EAA in January 1999. On April 15, 1999 we officially became EAA Chapter 1248.

We come from all over the world, mostly the US and Canada, but we have no geographic boundaries. We are totally Web based even though a some of us have actually met face to face at one time or another. Currently, we have close to 150 members and are still growing. Our

main ways of getting together are our twice-weekly chats, our forum and our mailing list.

We are currently working on our bylaws and non-profit incorporation. We have a small elected board, but we are still working on defining those roles and responsibilities, too. If you are interested in aviation and the flying, building, restoration, preservation or maintenance of aircraft, you'll probably enjoy hanging out with us.

On the Web



Anyone with a web connection can join
EAA Chapter 1248's Cyberhangar!
<http://www.cyberhangar.org/>

We invite you to explore our Web site, give us your suggestions and if you are not a member, join us by filling out a membership application on the web. •

Parts Message from Brock MFG

Ken Brock MFG has notified us that the steel tubing (1/2" OD x .028 wall) called out in the CP to replace the aluminum aileron control push rods aft of the firewall, in the engine compartment and wing root area, is no longer available.

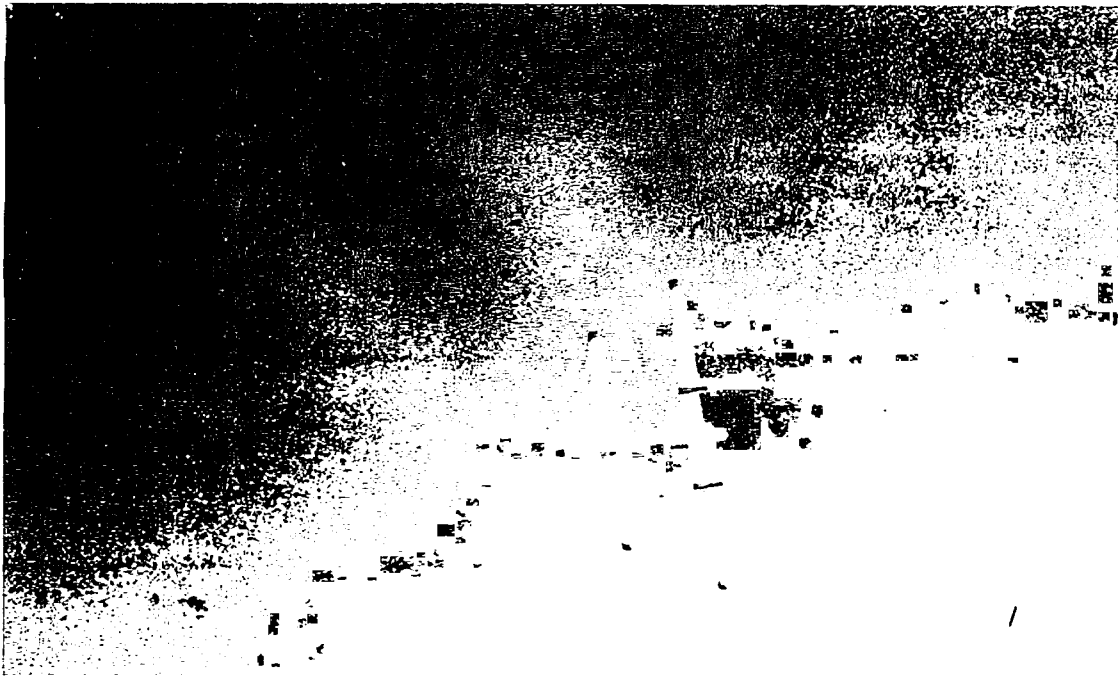
This means that the CS-50 steel inserts that were machined to fit inside 1/2" OD x .028 wall steel tubing will be made to fit inside 1/2" OD x .035 wall steel tubing from now on.

If you purchased CS-50 inserts that were machined to fit the .028 wall tubing, you can turn them down on a lathe yourself, or you can send them to Brock who will do it for you for a small fee.

Some builders have noted that the canard lift tabs for the Roncz 1145MS canard have the 3 holes pre-drilled at #3 drill size (.213) instead of the 1/4" diameter that is called out in the drawings. This is because the #3 tools were already in place, and also because you should drill these three holes out to fit as closely as possible to the AN-4 bolts that fit through these holes. You should have a nice tight fit on these bolts.

We suggest drilling them out with a letter "D" drill, not a 1/4" drill. This will give you the best fit.

See page 13 for the phone # and address of Brock Mfg.



Proteus to attend Paris Air Show

Mojave, California — Scaled Composites Inc. announced that its Proteus aircraft will attend the 1999 Paris Air Show in June. Scaled has been working with several companies interested in integrating their payloads on the Proteus in future tests, and is actively soliciting appropriate payloads to be displayed on the Proteus while in Paris.

Near-term goals for Proteus include flight tests in support of the NASA ERAST program; continued envelope expansion and performance testing; autopilot integration; support of Angel Technologies' telecommunications flight tests (www.broadband.com); and deployment to and participation in the Paris Air Show.

Meanwhile Proteus climbed to 50,500 feet on its sixteenth flight in February. This flight marked the first to include a payload. The HyperSpectral Sciences, Inc. (www.hyperspectral.com) ARTIS payload was operated during the entire flight, gathering visual and near infrared photos of the surface of the desert area.

With Scaled's Michael Melvill (pilot) and Jeremy Desch (flight test engineer) aboard, the Proteus departed Mojave Airport at 10:33 a.m. local time. During its 4-hour sortie, many tests were accomplished, including evaluation of increased cabin pressurization, speed and Mach number envelope expansion (to .50 Mach at 50,000 ft), engine handling checks (the Williams/Rolls FJ44-2 engines performed flawlessly), and payload operation.

A Diary by Hans Georg Schmid

Shortly after completion of the Mittelholzer commemorative flight to South Africa and back (<http://www.airnews.com/HGSchmid/Maininfo.nhtml>) I started, in early summer 1997, to develop ideas about a flight to South America. Richard Schilliger, retired Swissair B-747 captain and renowned aviation historian, and Gunther Pluschow, who 70 years ago started to open up the way for modern aviation from Europe to Latin America, helped me to find out about Aéropostale.

Intl. airport together with the historic Mittelholzer propeller in a ceremony attended by the premier of the Cape Province just a few months ago. As Bruce Tiff had tragically been killed in an accident, the manufacturer of my propeller was gone as well.

The second solution was to try to bring the noise level down to or below the Swiss limit, which is the most stringent worldwide. Six months, many hours of construction, trial and error and some US\$7,000 later, I was accepted for a new noise test. This time I was, by a narrow margin, inside the tolerance and I was very happy, but the setback in planning and preparation for my flight was

SOUTH ATLANTIC FLIGHT 1998

Apparently it wasn't enough . . .

Before starting to make any plans I had to know whether I would be allowed the necessary time off work in November and December of 1998. I went to see the chief pilot MD-11 Capt. Christian Stuessi to whom I explained my plans. SWISSAIR then was very cooperative and unbureaucratic in granting some fixed vacation and unpaid leave for the time necessary, while, at the same time, a shortage of pilots was in the making.

As I wanted to land at high elevation airports such as LA Paz/Bolivia, I installed a Muhlbauer variable pitch propeller on my Long-EZ. This proved to be much more of a challenge than anticipated. Although the Swiss Federal Office for Civil Aviation believed the aircraft to be quieter than with the former fixed pitch propeller, the noise measurements proved otherwise.

The sound level was 1.7 dB above the limit (which is measurable but not audible) and Anton Weber of the Federal Office for Civil Aviation did not even reply when I asked for an exception because of the known difficulties of bringing down the noise in a pusher aircraft. After lengthy discussions, he agreed to let me do the proposed South America Commemoration Flight if I could not meet the noise limit but, after my return, the aircraft would be grounded.

I was in a very difficult position and had two choices: I could go back to the old configuration with the B&T fixed pitch propeller which meant reversing the conversion to the variable pitch propeller. A considerable amount of work would have been lost, a lot of money as well.

But this was not the solution as it was impossible to get my old propeller back: it had been put on permanent display in the arrival hall of Cape Town

severe.

The unconditional insistence by Anton Weber cost me almost my plane when the cowling started to burn in early ground trials and it might have been a coincidence that one of the exhaust pipes broke while flying almost fourteen hours over the South Atlantic . . . The construction as in the original design had worked flawlessly before without any problems for over 500 hours.

My next problem came with flight testing, where cylinder head as well as oil temperatures turned out to be too high because of the different and larger exhaust construction. With the old exhaust system, both stayed in the green range even on warm days. As I planned to operate in the tropics, it was imperative to bring those temperatures down. This again took many weeks, a lot of trial and error, but with the help of knowledgeable friends I finally managed to solve those problems as well. The whole process in the meantime had cost me at least ten months, time which I now definitely lacked for preparation.

RAISING THE FUNDS

There were so many positive contacts since I started the project that this in itself made my endeavor worthwhile even before it took off. People helped to look for sponsors (**Martin Mayer** and **Rolf H. Zuercher**), **Mike Fraser** and **Martin Mayer** provided a translation of my documentation into English and French; **Robert Schubiger**, **Heinz Thut** and **Arnold Kretz** helped technically and my son **Alexander** constructed the homepage of the flight

(<http://fly.to/sat98>).

Sponsoring, a thorny path! I knew from the outset that it would be very difficult to finance the whole trip on the shoulders of my family. For many months they had already enjoyed very little of my time and had agreed to the substantial outlays I already had with my South Africa flight as well as with the conversion of my aircraft to a variable pitch propeller. These outlays had been added to by the expenditure due to the strict Swiss noise regulations.

First a German PR company from Frankfurt offered its help to find sponsors and TV coverage for a hefty fee. The propositions sounded almost too good to be true — but they weren't. Three lost months later I received a letter where I was told, due to a larger contract, they were unable to honor their promises and they wished me luck. . .

I started to mail my own documentation to companies I felt might be interested. The answers I obtained — if any — were sometimes a little strange. For example one of the largest Swiss banks which also owns other banks and an insurance company dealing in aircraft coverage proclaims in its regulations to actively sponsor many different activities but to explicitly exclude aviation. Others told me that my budget was too low for them to consider and again others wrote that sponsoring my flight was exactly in their line of advertising, but as someone else was involved in the South Africa flight they were very sorry. . .

On the other hand I received many encouraging letters which I really enjoyed even when sponsoring could not be granted. The best was a message by a secretary who apologized that her company would not be part of the action. She then wrote how excited she was by my commemorative flight and that she wished me every success.

A number of TV stations in Switzerland, Europe and the US were contacted and I received interesting replies but nothing firm in writing. A lot of hot air was produced and I was promised coverage in big magazines. Regular interviews by radio stations were proposed while en route and I had promises here and there. If everything promised had materialized I would, in the meantime, be a rich man with coverage of the flight (almost) everywhere.

Hot air, however, cools down and vanishes. Nevertheless I was able to secure the help of many friends and some sponsors who really helped to make the flight possible:

Beat Schaer, Manager Operations of **SWISSAIR**, offered some paid time off in recognition of the publicity I was able to generate during the South Africa flight. **Bernard Eggen**, Manager Sponsoring and Event Marketing was not able to offer funds but sponsored tickets for participating TV crews. **UNISON INDUSTRIES** installed their newest version of the **LASAR** electronic ignition

system in my aircraft and sent a cheque.

Deutsche Flugsicherung with their **ADVANCED AIS MUNICH** organized all my overflight permits and helped financially as well. **AXA AIRCRAFT INSURANCE** agreed to sponsor the flight financially while **CHRISTEN-AIRTECH** of Grenchen (who, by the way, were the first to help me!) offered the Garmin 195 GPS, which was a tremendous help, and performed the installation of the short wave radio which was no easy task. **LIONS AIR** provided flight watch for the whole trip 24 hours a day which was often very difficult and demanding. **METEOSWISS** was on standby to give free weather briefings and send weather charts by fax whenever needed during the whole flight.

Without the help of all these sponsors and friends the flight would have been impossible.

To prepare such a long flight

To cross the Atlantic, to fly from winter to summer, to be over water for extended times and to circumnavigate a whole continent, the preparation is extensive as events can turn very difficult very quickly.

Aircraft: The Long-EZ, with the capacity of the standard tanks (198 I/52 USG), has a range of about 1000 NM or 1800 km, depending on weight, altitude flown and speed. To cross the South Atlantic from Dakar to Recife (3300 km/1800 NM) I had to carry an auxiliary tank which boosted my capacity to 404 I/106 USG. Now my range went up to 4000 km/2150 NM, but only if I was able to fly at the right altitude which was on average around 9000 ft/3000 m at a slightly reduced speed and with a very lean mixture. Thanks to the speedy and unbureaucratic help of **Philippe Voisard** of the Swiss Federal Office of Civil Aviation, the installation of the auxiliary tank for this flight and the overweight operation on the very long legs was approved without delay. This was only possible because all the necessary test flights and the paperwork had already been approved a year before for the flight to Cape Town. The initial approval of the proposed long range operation was given by **Ryan Hunninghaus** of the Swiss FOCA. Thanks as well.

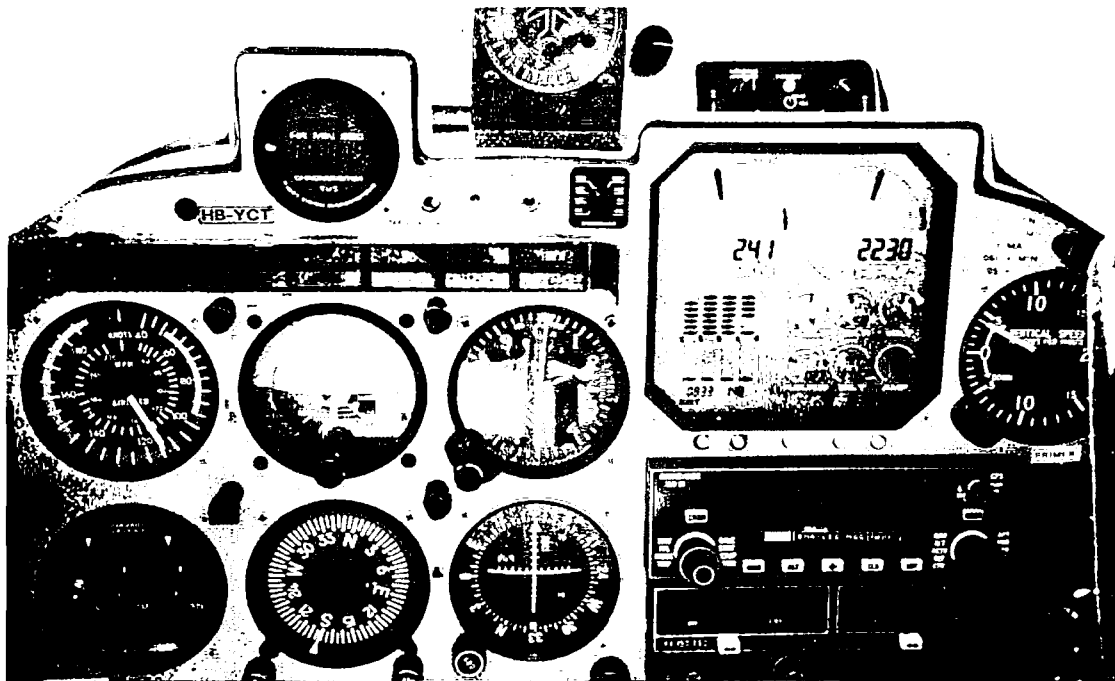
Then there was the problem of a short wave radio which is a necessity for the South Atlantic crossing. **Roger Christen** of **CHRISTEN-AIRTECH** discovered a solution for the antenna installation and the wiring which actually worked, something quite a number of Long-EZ pilots found almost impossible to accomplish. He also found a solution for mounting the second GPS,

the Garmin 195 behind the stick. This as well was no easy task as the cockpit was very cramped already.

Baggage : Baggage had to be kept at the absolute minimum. I carried everything in so-called "Tokyo bags" which are lightweight, soft and very durable. In the aircraft the bags and all the rest were carried in two underwing pods and a specially manufactured pod on top of the auxiliary tank. I had to carry clothes for about six days as I planned to have laundry done after five days. I also had to make provisions to be able to survive sub-zero temperatures, to remain fit in the tropics and to be able to look at least somewhat decent with dark trousers, a tie and some sort of jacket (suede) when invited to official receptions.

signal to ground stations which relay the message to NOAA. As the signal is coded it is known which aircraft is in need of help and with the new technology the position can be pinpointed to within 2 NM worldwide. Additionally I had the Breitling-Emergency on my wrist which was a third ELT with short range capability.

Medical: Dr. Severin Muff of the Swissair Medical Service provided me with a list of medication for the trip as well as with the necessary prescriptions. His advice was as usual very comprehensive and most welcome. I had to anticipate everything from tropical diseases to a common cold, as well as to have provisions in case of an accident.



My instrument panel (on the right partly covered a Garmin-195)

Emergency equipment: A very good dinghy and a life jacket were a must for the long over-water legs. Additionally I had two emergency packages, one of them at all times in my flight suit, about 10 liters of water in plastic bottles and food for five days. I also carried three ELTs. There was the Pointer Emergency Locator Transmitter which would go on automatically in a crash or if manually switched on. The main beacon was an EPIRB which operated on 406 MHz as well as on 121.5 MHz.

The EPIRB is able to transmit distress signals worldwide to orbiting satellites. The satellites relay the

My scenario was to be able to survive at least two days in case of an accident where I was able to reach my first aid kit and to help myself. There the problem was to find pain-relief drugs which would really help even in case of a broken bone and which would not pose problems with customs and local regulations. For instance, morphine-based products were out of the question.

Navigation: I tried to acquire VFR and IFR maps for the whole flight. For en route navigation in Africa and South America I used ONC 1:1'100'000 maps a

well as Swissair and Jeppesen IRF charts. Additionally I had Jeppesen approach charts for all destinations and most alternate airports on board. Together this was very bulky and heavy. In hindsight the entire trip would have been possible with the information I had in my two King and Garmin GPS — entirely paper less — however it would have been illegal to do so.

The combination of the King KLN-90 and the Garmin 195 GPS proved to be ideal. Both had their advantages: the KLN-90 was coupled to the autopilot and provided a wealth of information which was easily accessible while the Garmin had a moving map which was detailed down to a range of 5 NM and could be scaled up to 3000 MN.

Tools and spare parts: This was a very difficult task! If you take spare parts you probably end up with having those which you do not need. Tools are by nature heavy and sometimes bulky. I tried my best to assemble a meaningful list with experience and the help of some friends.

General preparation: To know where to go and what to avoid needs extensive study. With the experience of my Africa trip I prepared a computer-generated list which provided a daily form which contained all relevant data in a condensed but still readable format. This proved to be extremely valuable as I always had all important information handy, be it to fill out a flight plan, to find a local hotel or to know the actual time of sunset.

There was much more. Due to the very narrow cockpit I had to wear a military flight suit which has a lot of pockets in all the right places. I ordered a navy blue coast guard summer flight suit at a specialized wholesaler in the US. I wanted to avoid the common green air force suit so as not to get into difficulties in South America. The winter variety was just too warm for the tropics. I finally ended up with a green winter flight suit as blue was not available for several months and by mistake a winter suit was sent. Fortunately I did not encounter the anticipated problems at airports but it was really warm in the tropics . . .

Then I had to get some visas and a large number of overflight permits. The most difficult to obtain was the one for Columbia. I was really grateful to have the friendly and efficient help of the AAIS in Munich (aais@munich.t-online.de) which I recommend for their service as well as the moderate rates they charge.

Last, but not least, I had to change money (US\$ in cash only, which is accepted everywhere. Important was to have only new bank notes and

lots of small denominations as nobody has change). I looked for insurance, bought some travelers cheques as a last resort and, in case everything went wrong, an open one-way ticket home.

Then I needed a small computer to communicate (Toshiba Libretto) as well as two cameras: a normal one and an electronic one (Fuji film MX-700, which is excellent).

Finally I was ready, although still tired from my rotation to Tokyo and somewhat exhausted from the final preparations. Because of the lost time battling the noise problem I was forced to complete the really important things in much too much of a hurry. I had started my preparations very early to avoid exactly this. On such a long trip even the smallest details have to be done right as a correction on the way is normally very difficult to achieve and an omission of something important may turn out to be dangerous.

*TO BE CONTINUED IN THE NEXT
CANARD PUSHER*

For Sale

Hartzell cons/spd two blade prop with governor.

Part # HC-C2YK-BLF/FL 7666 D-2X and the governor.

Its a pusher that came off my IO-360 F1A6 and has a flight tested 106 hrs since new.

Asking \$6,000 for both.

Contact Dick Rutan
RINGDOVE21@aol.com
or

(661) 824-4608

This is not a RAF recommended Prop

New! Aircraft Inspection Light Snook Light

06 LU-15

Same as LU-10 only 15"

5 LU-10 Flexible 10 inch neck with bulb and protective covt. Approximately 3/16" in diameter, retains shape when bent.

10 SC-PH

Suction cup screws into base of power handle

M-PH

Magnet screws in base of power handle.

11 SC-LU Suction cup snaps onto flexible neck, holds light in position

16 M-LU Magnet in protective cover, replaces protective cover over bulb on flexible necks. Holds light in position or can pick up metallic objects.

07 LU-36

Same as LU-10 only 36" long.

08 EX-36 Extension cord 36 long used between power handle and headlamp or flexible neck.

14 POUCH to hold power handle and accessories.

01 Kit -1 Consists of items 4,5,8,14.

02 Kit-2 Consists of items 4,5,8,9,14.

03 Kit-3 Consists of items 4 through 14.

12 SGC Safety glass clip, attaches to side panel of safety glasses to hold headlamp.

13 SB Spare bulb for headlamp.

04 PH CNC machined anodized aircraft grade aluminum power handle with RCA connector plug on top and turn switch on base. Base tapped for accessories.

09 HL Headlamp 6" low profile flexible shaft with high intensity bulb and detachable clip for clipping to cap or collar.

Ideal for repair and maintenance of Aircraft, Auto, Trucks, Boats, Motorcycles, Computers, Office Equipment, Cooling & Heating and much more.

LU light bends and retains shape for access to hard to get at areas.

MLU Magnet attaches to end of LU light to retrieve dropped items.

Magnet or Suction cup holds light in desired location.

Headlamp clips on hat or collar.

Powered by 2 "AA" batteries, minimal drain on batteries.

SNOOK LIGHT

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- 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.

TERF has a new phone number! (734) 477-8029
Check out the TERF website at <http://www.terf.com/rutan.htm>

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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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.

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Feather Lite Inc.

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

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
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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)	

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We've negotiated a 40% discount with Viking Freight.

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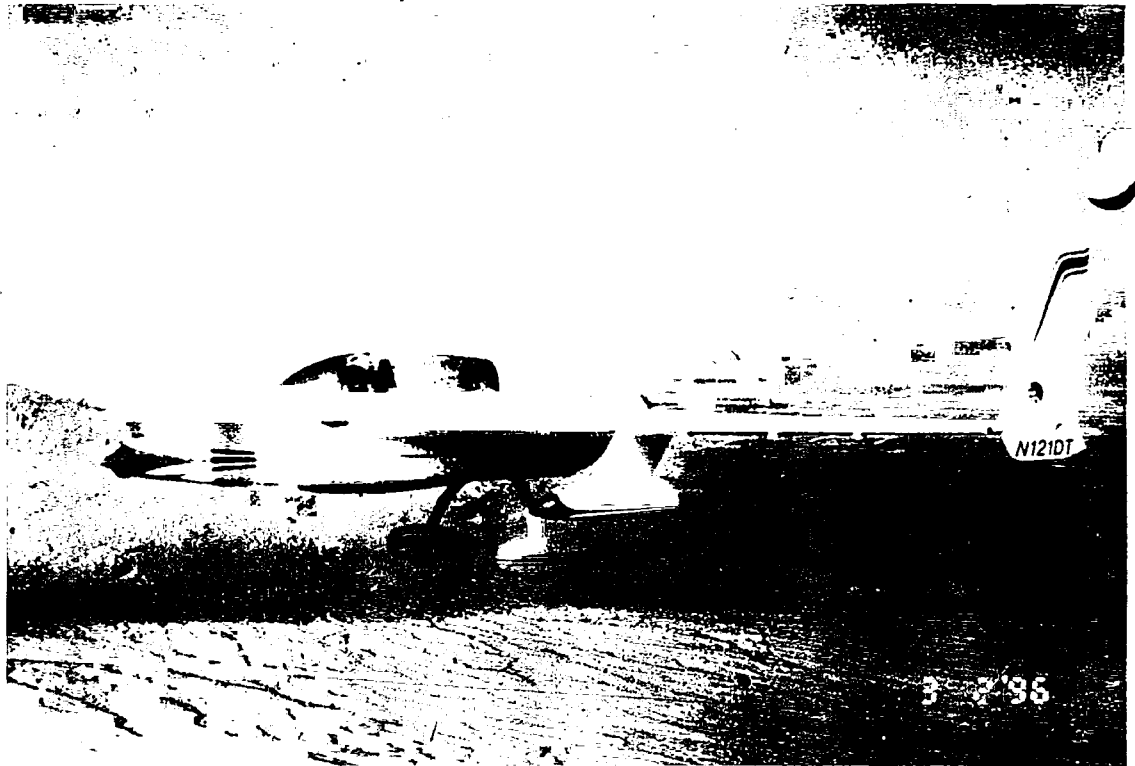
Please allow 30 days for delivery, we will expedite when possible.

We will discuss questions regarding our products by phone or mail.

*Items must be shipped by truck.

This Long-EZ (the Sundancer) was built and is piloted by Dave Timms. It first flew in December of 1988 after eight and a half years of construction. It now has 1084 hours on the Hobbs meter.

On December 5, 1991, Dave and the Sundancer set a world record for ALTITUDE IN HORIZONTAL FLIGHT for Class C-1A, having reached an altitude of 30,40 ft. Jim Price now holds record at 34,926 ft, also in a Long-EZ.



Dave hangs the Sundancer at Camarillo Airport in California. He has made a couple of trips to Oshkosh, the East Coast and Alaska. The aircraft weights in at 903 lbs (including 6 qts of oil). It has a Lycoming 0320, 160 HP with a Catto prop that pushes him to 221 mph TAS at 8000 ft DA, while turning 2820 rpm (while not carrying baggage pods).

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