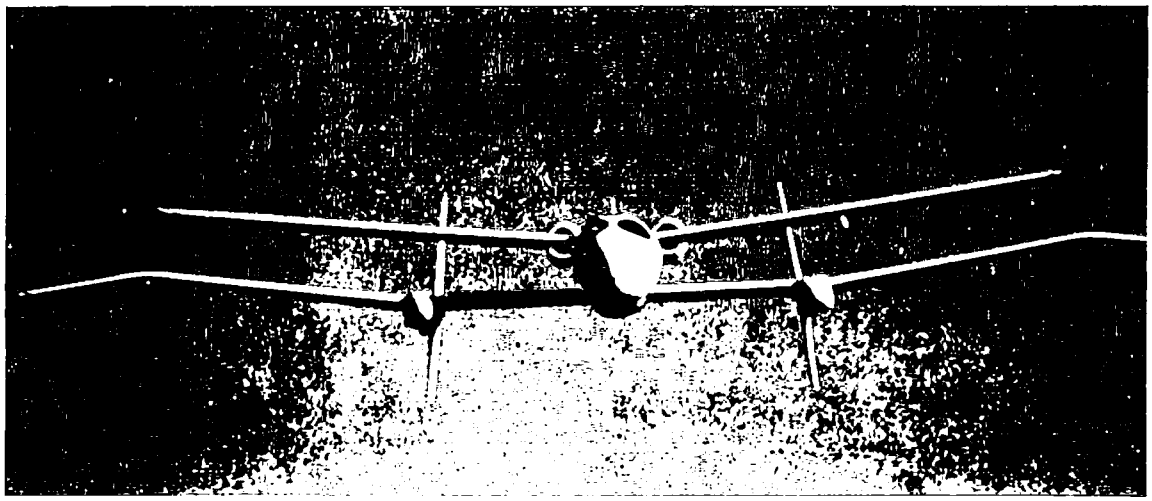
CANARD PUSHER

JANUARY 1999 RUTAN AIRCRAFT FACTORY VOL.15, ISSUE 1, NO. 95

Burt's newest creation, the Proteus, has been called by some publications his strangest design yet. It is a long, slender, lovely thing, more akin to a gigantic dragonfly than a jet aircraft. It does not take-off — it elevates. It does not land — it alights. But poetry aside, Burt never designs without a specific mission in mind. The Proteus was designed as an efficient and inexpensive multipurpose aircraft for long duration high altitude operations. Turbofan-powered and manned, the aircraft is designed to carry a 2000-lb class payload to altitudes above 60,000 feet and remain on station for up to 14 hours.

Named after the Greek sea god who could change his shape, the Proteus centersection is changeable so that it can conform to a wide variety of cargo. While there are hopes it will replace the U-2 in military high-flying spy missions, its primary applications are commercial, such as for a telecommunications relay platform or as an Al Gore ozone-sniffing platform.

The Proteus takes wing in '98



Here's one many of you are sure to like — Burt envisions Proteus as a launch platform for civilian spacecraft. Space tourists could earn their astronaut wings by being launched from the side of the mothership, Proteus, at 30,000 feet. They would zoom to 100 miles above the Earth's surface, play around in micro-gravity for four minutes, and then return to earth for an ocean splashdown. Of course, this includes a 10-day Space Boot Camp at a luxury resort complete with golf and diving facilities for non-flying family members. Cost? $50,000 a seat.

Now, that's something to look forward to.

Scaled Composites announced the maiden flight of its Model 281 Proteus in July 1998. Mike Melvill was Pilot in command for the first flight; assisted by copilot and test engineer Matthew Gionta. All test points were flown as planned, and the airplane exhibited outstanding handling qualities during all tests.

Flight test at altitudes as high as 48,000 feet have continued through 1999, and Mike soon expects to take it to 50,000. He and his copilots are now waiting for the delivery of high-altitude pressure suits.●

For more on the Proteus see page 3

BRIEFS

Air New Zealand — Burt has been invited to speak at the prestigious 50th Anniversary of the Royal Aeronautical Society in Wellington, New Zealand on February 26. Those of you in the Southern hemisphere who won't be able to join Burt at the symposium may be able to hear his voice on local radio, as organizers of the event said that the speaker's speeches will be aired.

Oshkosh Forum Tapes of Burt and John Roncz are available from Buzz Talbot. Buzz has taped the daring duo's forums at Oshkosh since 1995. If you were unable to attend Osh and would like a VHS tape, contact Buzz at Buzz112@aol.com or write to him at 222 Sunshine Drive, Bolingbrook, IL 60490.

Are there any CFIs for experimental aircraft in the audience? We'd like to advertise your services in the Canard Pusher. Let us know — email raf@hughes.net, or call (805) 824-2645, fax (805) 824-3880.

1000 Hour Club — We would like to know who out there has 1,000 hours or more on their Rutan canard airplane (Mike and Dick both have 3,000 hours!). Please pass us a note, and if you can, send a photo for the Canard Pusher. We will be awarding a lovely lithograph poster based on a Stan Stokes painting in the future to each and every one of you!

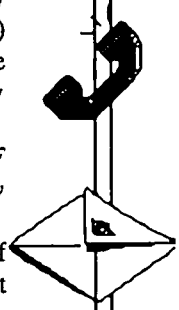
Woofter Mfg has moved — to Arizona and changed its name to Saber Mfg. Here is how to contact Judith Saber and Saber Mfg.:

Saber Mfg.
PO Box 1201-6327C
Patagonia, AZ 85624

(520) 394-9146

email saber@dakotacom.net

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.



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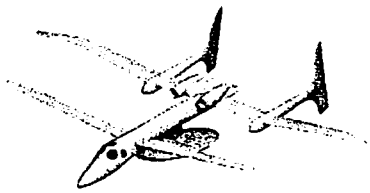
Overseas (Airmail) subscriptions
$16; Back issues $4

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.

Baseline Configuration



Telecommunications

Atmospheric Research

PROTEUS TECHNICAL SHEET

Proteus is a multipurpose manned aircraft for long duration high altitude operations. This specification addresses each of the following 4 mission configurations.

Missions:

1. Telecommunications
2. Atmospheric Research
3. Reconnaissance/Surveillance/Commercial Imaging
4. Space Launch

Mission Independent Specifications:

General:

T/W at sea level = 0.77 at landing weight (0.37 @ 12,500 lb. weight)
W/S at sea level = 12.1 lb/ft^2 at landing weight (26.1 @ 12,500 lb. weight)
All composite airframe
Tandem wing configuration with extendable wing tips
10 psi cabin differential pressure (8,000 ft. cabin at 60,000 ft. altitude)
2 Williams/Rolls Royce FJ44-2 turbofans – 2,300 lb thrust per engine
Single pilot (FAR 23 - civil)
Manual flight control system

Dimensions:

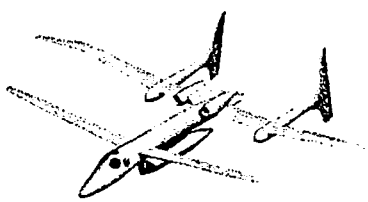
Aft wing span	77.6 ft. (91.8 ft. with 85 in. tip extensions)
Aft wing area	300.5 ft^2
Canard span	54.7 ft. (64.7 ft. with 60 in. tip extensions)
Canard area	178.7 ft^2
Total wing area	479.2 ft^2
Length	56.3 ft.
Height	17.6 ft.
Maximum cabin diameter	5.1 ft.
Cabin length	9 ft.

Weights:

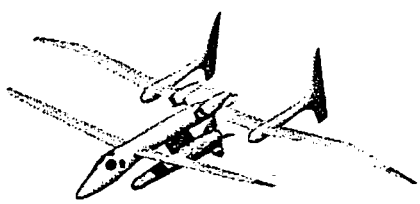
Standard empty weight	5,860 lb.
Fuel weight	5,900 b.
Minimum landing weight	6,200 (no payload)
Maximum landing weight	11,000 lb.
Gross weight	12,500 lb. FAR 23 (15,800 lb. Military)

Performance:

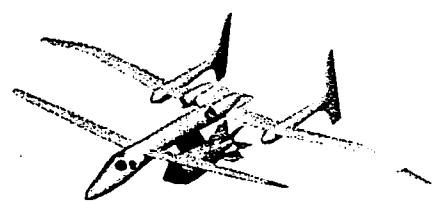
Maximum SL rate of climb	6,000 ft./min. at 8,000 lb. (3,400 ft./min. at 12,500 lb.)
Best range speed	190 ktas at 20,000 ft. (280 ktas at 40,000 ft.)
Takeoff roll	730 ft. at 8,000 lb. (1,420 ft. at 12,500 lb.)



Reconnaissance/Surveillance



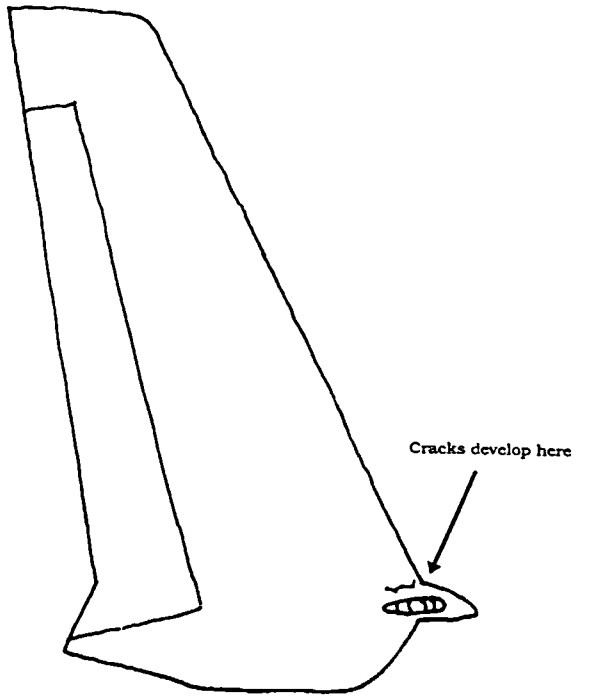
Micro-Satellite Launch



Space Tourism

Crack Anomalies

From David Orr — Eric Cobb reports that on two high time sets of wings, Cozy and Long-EZ, that there were cracks on the the outboard leading edge of the winglet near the strobe location. The winglet top could be moved more than he expected and if he moved the top of the winglet the cracks on each airplane opened and closed. He sanded down to the attachment 7 layers of wing to winglet to see if any structural joint was also involved and concluded it was only the skin to skin attach on the forward part of the winglet. He drilled three one-eight holes, about two inches apart above the cracks and injected micro with a large glue syringe and next day the winglet/wing attachment was as rigid as new. He did the same prophylactically on the other wing too.



I've never heard of this with any EZ airplane before. Eric, last I recall, was over 1600 hours of air time, the Cozy III had lots of time too, over 800 hours four years ago, and is being used for transportation to work every week. Both had been bounced a few times in heavy turbulence.

From Mike Melvill — The Wing/ Winglet structural attachment is very strong, but is somewhat flexible. Forward of the structural joint (2 plies bid plus 7 plies UND) there is essentially no structure other than what the homebuilder has elected to do to install his wingtip strobe /nav light. There may be as little as one ply of bid on some of the homebuilt Long-EZs (which is perfectly fine). However, after 800-plus flight hours and who know how many bending cycles on this very light (maybe one ply) layup, it might fracture, and show as a crack in the paint as David Orr and Eric Cobb have described. I have never seen an example of this crack, but do no believe it to be a safety of flight problem.

Normally any crack in the paint should be inspected and repaired. This inspection should consist of carefully removing the paint around the crack until you have exposed the glass structure (sand off all micro to bare glass). If this glass shows a white fracture mark where the crack was, this **MUST be repaired** before the next flight.

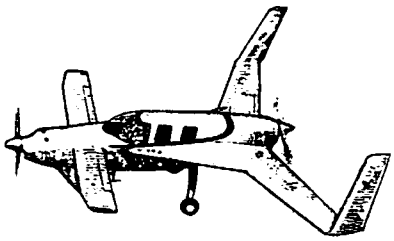
The repair should consist of sanding to bare glass all around the crack, to allow for the same number of plies as was there originally, to be laid up with a 1" per ply drop off.

The area David and Eric are talking about requires only a 1-ply repair, approx 1" all around the crack.

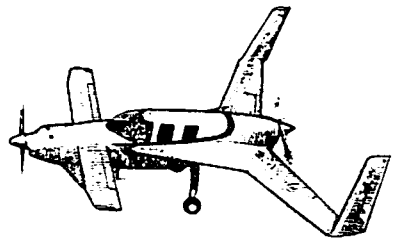
Would you all, particularly you high timers, check for these cracks and report back to RAF? What has been your experience with cracks?

Leave a message at (805) 824-2645; Fax (805) 824-4174; or email raf@hughes.net

Defiant Nose Gear Update



by Fred Mahan
Long-EZ N86LE
Defiant project #137



I now have a nose gear that swings up and down, propelled by my right arm and Retract Arm NG-1. Of course, the pivots are still raw fiberglass and long 1/4" drill bits, but the clearances are good. Because of Defiant builder John Rippengal's admonitions about clearances inside the box with the revised 0.7" nose gear trail measurement, I raised the top as much as I could, about 1/2", and tipped the top front of the nose gear box forward about 3/8". I now just have clearance at the front, top edge of the nose gear box for the fixed pivots of Retract Pivot NG-2. With the gear up, the tire has about 1/4" clearance at the front and the top of the box. Thanks, John!

Of course, no changes are without consequences. I had to sand a groove into the top of the box at the bend to get clearance for NG-1 and Long Tie Rod NG-5 to assure over-the-center action and full metal-to-metal contact between NG-1 and NG-2 (yes, I have the "New" NG-2 with no rod ends). Not a big deal.

The other consequence is that clearance disappeared for Lock Latch NG-7, and I'll have to slot the top of the box for clearance and do some minor glass work there, too. Not having the luxury of adjustable rod ends in my setup, I was uncomfortable with the assumption that I could measure out the nose gear pivot and the NG-2 pivot, and that the parts would fit properly between them. So, I left the "ears" on top of the gear box undrilled, and located and drilled the nose gear pivot holes.

Next, with fuselage leveled, I stuck a 7/16" rod through the Mooney nose gear retract pivot and, using a shimmed level for reference, blocked it to the floor of the hanger with + 1/2 degree caster. Then, I cut the hole in the floor of the airplane ahead of the gear box per plans. I made up some temporary bushings for the "big" end of NG-2 so that they accommodated a 1/4 inch bolt or rod. I put NG-2 on NG-1 with the 5/16" bolt, stuck NG-1 down through the hole, and bolted it to the nose gear attachment eye.

Inside, I flipped up the large, to-be-fixed pivot of NG-2, placed the pivot as close to the plans location as I could, and there's where my pivot points were to be. I cut a 1/4" rod to fit inside my temporary bushings. When installed in NG-2, the rod could be pushed to one side or the other against the inside of the "ears" on the top of the box.

I slipped in a 1/4" i.d. large area washer between the NG-2 body and one of the nose box "ears", pushed over the 1/4" rod to locate the washer, then hot glued the washer to the inside of the "ear". I then repeated the process on the other "ear". The 1/4" rod has to be long enough that you can push it into the washers from its other end with an X-acto knife point, but short enough that you can get it out from between the washers when you are finished.

After you slip the NG-2 pivot and 1/4" rod assembly out from between the ears and hot-glued washers, you use the 1/4" hole in the washer to locate drilling a 1/4" hole, with a small angle drill, through one of the ears from the inside to the outside. You have to use your eyeball and keep the axis of the drill aligned as well as you can with the other 1/4" washer. Once your first hole is drilled, you can use a long 1/4" drill through your new hole to drill through the other 1/4" washer and "ear".

If I had attempted to locate the pivots through the ear just by measuring, the nose gear and NG-2 pivots, in retrospect, would have been too far apart and I would have has negative nose wheel castor and/or I couldn't have gotten NG-1 over center to lock the gear up. Now, on to making my temporary bushings permanent. •

Ellison explains advantage of TBI

The following letter was written in answer to a customer question and then forwarded to RAF from Ben Ellison, President of Ellison Fluid Systems, Inc. He thought you might find it of interest.

Dear Steve,

Your friend is correct in that the TBI will seldom deliver as uniform fuel distribution as a constant flow fuel injection system. It will however, when installed properly, deliver adequate fuel distribution, which together with other advantages can make an owner happy that he made the TBI choice.

The combustion process is more efficient burning a mixture of finely atomized fuel and fuel vapor, compared to one in which the fuel resides in rather large droplets of relatively high entropy, as is the case with constant flow fuel injection. Generally, the onset of lean misfire occurs at a lower fuel flow when operating with a TBI than with the competition. Hot starts in the middle of summer are a non-event with a TBI while frequently a challenge with fuel injection and at overhaul time the TBI will run only $350 to $450. Other advantages like lower initial cost, simplicity, dependability, low versus high-pressure fuel are adequately hyped on our web page.

I have an O-320 powered Long EZ equipped with an EFS-4 TBI which you and/or your partner would be welcome to fly if you come to Seattle. It has an accurate fuel flow gauging system as well as four cylinder EGT and CHT, so you could see what you would be getting with a TBI.

I understand that you called with an inquiry about our amphibian project. It is a twin engine flying boat configuration, which we are developing under another corporation. Powered by two Lycoming IO-540 engines, its gross weight is 6000 lbs. It will carry six passengers, have a 48 ft wing span and be made of glass / foam composite. We are building the prototype from hard tooling so that if it proves to be a successful design and there is enough popular interest, it could be made available as a kit.The aircraft looks very much like the Grumman Widgeon and in keeping with the tradition of naming seaplanes after water critters, our amphibian is called Gweduck.

Ellison Fluid Systems, Inc
Ben Ellison, President

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 uisots 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.

Accident Report

National Transportation Safety Board
Public Meeting of January 26, 1999

Aircraft Accident involving John Denver
In Flight Collision with Terrain/Water
October 12, 1997
Pacific Ocean near Pacific Grove, CA
LAX-98-FA008

EXECUTIVE SUMMARY

On October 12, 1997, about 1728 Pacific daylight time, an experimental category, amateur built Adrian Davis Long-EZ airplane, N555JD, crashed into the Pacific Ocean near Pacific Grove, California. Air traffic control communications indicated that the airplane had departed from the Monterey Peninsula Airport's runway 28L about 1712, and the pilot performed three touch-and-go landings and departed to the west moments before the accident. Witness reported that they heard engine popping and a reduction in engine noise before the accident. The pilot made no distress calls. The pilot was killed, and the airplane was destroyed.

PROBABLE CAUSE

The National Transportation Safety Board determines the probable cause of this accident was the pilot's diversion of attention from the operation of the airplane and his inadvertent application of right rudder that resulted in the loss of airplane control while attempting to manipulate the fuel selector handle. Also, the Board determines that the pilot's inadequate preflight planning and preparations, specifically his failure to refuel the airplane, was causal. The Board determines that the builder's decision to locate the unmarked fuel selector handle in a hard-to-access position, unmarked fuel quantity sight gauges, inadequate transition training by the pilot, and his lack of total experience in this type of airplane were factors in this accident.

SAFETY RECOMMENDATIONS

As a result of its investigation of this accident, the National Transportation Safety Board makes safety recommendations as follows:

to the Federal Aviation Administration:

1. Amend FAA Order 8130.2C to specify that, before the issuance of special airworthiness certificates, experimental, amateur-built airplanes should be inspected for needed placards and markings on cockpit instruments and for the appropriate placement and operation of essential system controls to ensure that they provide clear marking, easy access, and ease of operation.

2. Amend FAA Order 8130.2C to specify that inspection limitations be issued with special airworthiness certificates for amateur-built airplanes requiring that the annual condition inspection include an inspection for needed placards and markings on cockpit instruments and the appropriate operation of essential controls to ensure that they provide clear marking, easy access, and ease of operation.

3. Establish, in conjunction with the Experimental Aircraft Association and the Aviation Insurance Association, a cooperative program that strongly encourages pilots transitioning to unusual or unfamiliar experimental amateur-built category airplanes to undergo formalized, type-specific transition training similar to that provided to pilots of some advanced, experimental, amateur-built airplanes.

to the Aviation Insurance Association:

4. Establish, in conjunction with the Federal Aviation Administration and the Experimental Aircraft Association, a cooperative program that strongly encourage pilots transitioning to unusual or unfamiliar experimental amateur-built category airplanes to undergo formalized, type-specific transition training similar to that provided to pilots of some advanced, experimental, amateur-built airplanes.

to the Experimental Aircraft Association:

5. Establish, in conjunction with the Federal Aviation Administration and the Aviation Insurance Association, a cooperative program that strongly encourage pilots transitioning to unusual or unfamiliar experimental amateur-built category airplanes to undergo formalized, type-specific transition training similar to that provided to pilots of some advanced, experimental, amateur-built airplanes. •

To report accidents and incidents

Call RAF (805) 824-2645

Fax RAF (805) 824-4174
(805) 824-3880

Write RAF 1654 Flightline
Mojave, Ca 93501

Email RAF raf@hughes.net

LONG-EZ DESK MODEL KITS

Easy to build solid urethane plastic kit. Finished model has an 11 inch wingspan. Complete with prop disc, display stand, foam stand pad, aluminum riser & illustrated instructions. When finished, you'll own a professional-looking model worth many times the purchase price.* Only $39.95/ea.

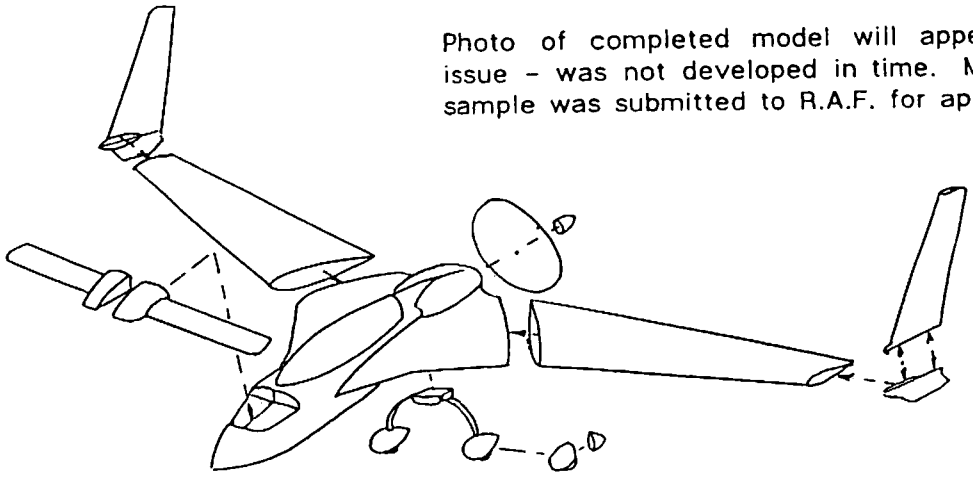
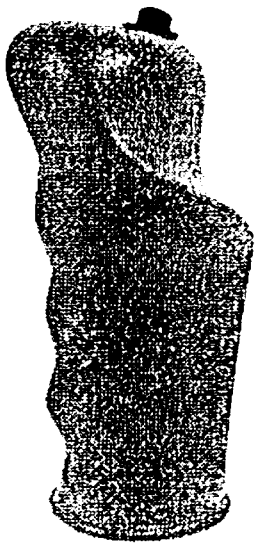


Photo of completed model will appear next issue - was not developed in time. Model kit sample was submitted to R.A.F. for approval.



*Assembled & painted (white) model, ready to display $150.00

AERO-K AG-R right hand fighter-style control stick grip with MS (Mil Spec) push to talk switch. Very popular with Long-EZ & Vari-EZ builders. Designed for maximum side-stick wrist comfort and agility.

Each $34.95 (Save $5.00)
Pair $64.95 (Save $15.00)

Please specify tube size: 3/4" 7/8" 1" 1-1/8"

AERO-K AVIATION PRODUCTS CO.
REDLANDS MUNICIPAL AIRPORT (L12)
1717 SESSUMS DRIVE
REDLANDS, CALIFORNIA 92374

[ ] Send me_____Long-EZ model kits @ $39.95/ea.**
[ ] Send me_____Assembled/painted Long-EZ model @ $150.00**
[ ] Send me_____AG-R grip w/ptt, size:_____@ $34.95/ea.**
[ ] Send me_____AG-R grip set (2) w/ptt, size:_____@ $64.95**

** Add $4.00 S&H any order. Do not send cash!

Name:_____Street:_____

City:_____State:_____Zip:_____

Introducing Mr. & Mrs. Richard Rutan

Dick Rutan and Kris Cremer were married at a romantic get-away resort near Lake Tahoe during the Christmas holidays. The rascals kept their elopement a secret from even their closest family and friends for nearly a month while they made arrangements for a surprise celebration. The happy news was announced January 23 at a reception in Lancaster, California.

Burt's Heroes —

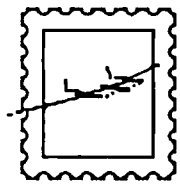
Twenty-three-years-old and still wet-behind-the-ears, Burt Rutan crossed paths with the charismac Wernher von Braun at a 1965 awards banquet where they shared honors. Today Burt cannot remember what the award was for, but remains impressed by his only meeting with the great rocket scientist.

Last October Burt and I got a chance to spent several days with the scientists who immigrated to the states from Germany in the '40's with Wernher von Braun. They were responsible for the design of Germany's V-series of rocket engines, and our Redstone and Saturn rockets.

Now in their '80's, they were as eager to meet with Burt as he was to meet them. They still speak of Mr. von Braun with great affection, describing him as a man of great humor, who was as casual with his genius as he was generous with his ideas. We were treated to a tour of the NASA research facilities in Huntsville, and Burt gave a talk at an evening dinner. It was great fun.

(left) Konrad Dannenberg gives Burt a private tour of the Space and Rocket Center in Huntsville, AL

Can Voyager be licked? Airplane's Postage Stamp One Letter Away



Neither rain, nor snow nor repeated rejections from the Citizen's Stamp Advisory Committee has stopped Kelly Hall's drive to put the Voyager back into the air — the airmail, that is.

Kelly Hall (from Dick Rutan's office) has been trying to persuade the Citizen's Stamp Advisory Committee (CSAC) to produce a Voyager Stamp since 1989.

She started with a handful of letters from friends and familiy. When *that* didn't work, Kelly turned to the extended Voyager and canard family for help. Thousands of requests poured into Kelly's office, which she has forwarded to the committee, and she says she is certain thousands more have reached CSAC on their own.

Citizen's Stamp Advisory Committee
United States Postal Service
475 L'Enfant Plaza, SW
Washington DC 20260-2435

After ten years it now seems we are getting some deliverance. Kelly received news last year that the Voyager Stamp is under consideration by CSAC for "the nomination of First Flights or Manned Flights."

If you would like to give the CSAC your 33-cents worth, address your letter or postcard to the CSAC with your request for a Voyager Postage Stamp.

As Kelly says, "we may be just a letter or two away from convincing CSAC that the Voyager is worth a stamp!"

Fly-In with Friends

March 4 - March 7, 1999
Deep Baja Save the Males Fly-In

Honey-dos got your goat? Tired of "800 and 2" on the local ATIS? Now you too can Save the Males! A flight into nice weather at the Eastern corner of the tip of BAJA.

We will be flying down on March 4, 1999 (Thursday) and flying back on March 7 (Sunday). You can certainly stay later or come earlier, you are putting the deposit on your card, after all.

We will be staying at a lovely small , secluded hotel within walking distance of the airport, and no towns within 20 miles. You must call to make reservations to either 1-800-426-BAJA. Mention Señor OERTEL's name to get the best price.

Now, did I say that there will be a reservation waiting for you to decide later? No, you gotsta make the reservation right now, youself! The Male you save may be YOU, and it won't hurt if the other half relaxes while you are being saved.

For DETAILED SAVE THE MALES information such as Airport, Accommendations and Over the Border Flight Rules call or fax David Orr at (949) 248-5725.

Fly Australia '99

Allan Aaron of the Land of Oz has extended an open invitation to all for a "fly-yourself" trip through Australia with he and his family in 1999.

Currently Allan is conducting a fact-finding mission to find out who is interested, when they want to go, what route they should take and how much it will cost.

He has settled on two possible months for the 12-16 day adventure — May and August.

You can read a detailed description of the plan, including important stuff such as how to get licensed in Australia (a piece of cake, he says) and a day-by-day route guide, in the January issue of the CSA Newsletter.

Or contact Allan Aaron:
ph 61 2 9388 8198 (home)
mob. 61 412 404 787
fax 61 2 9337 2118
PO Box 403
Vaucluse NSW 2030
Australia
email aaaron@tvp.com.au

1999 R.A.C.E. address change

Shirl Dickey, E-Racer and King Racer have a new address and telephone: PO Box 828, Aquila, AZ 85320
520-685-3126

email: mreracer@primenet.com

Airport: Eagle Roost Airpark, Aquila Airport, 75 NW of Phoenix

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.

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

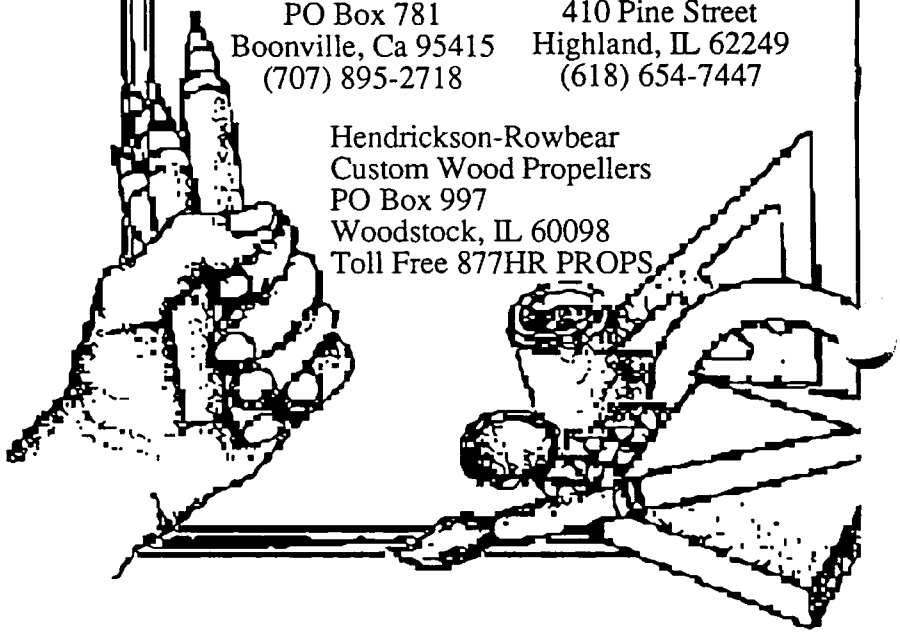
Aircraft Spruce West
PO Box 4000
Corona, Ca 91718-9961
(909) 372-9555
Fax (909) 372-0555

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

Hendrickson-Rowbear
Custom Wood Propellers
PO Box 997
Woodstock, IL 60098
Toll Free 877HR PROPS

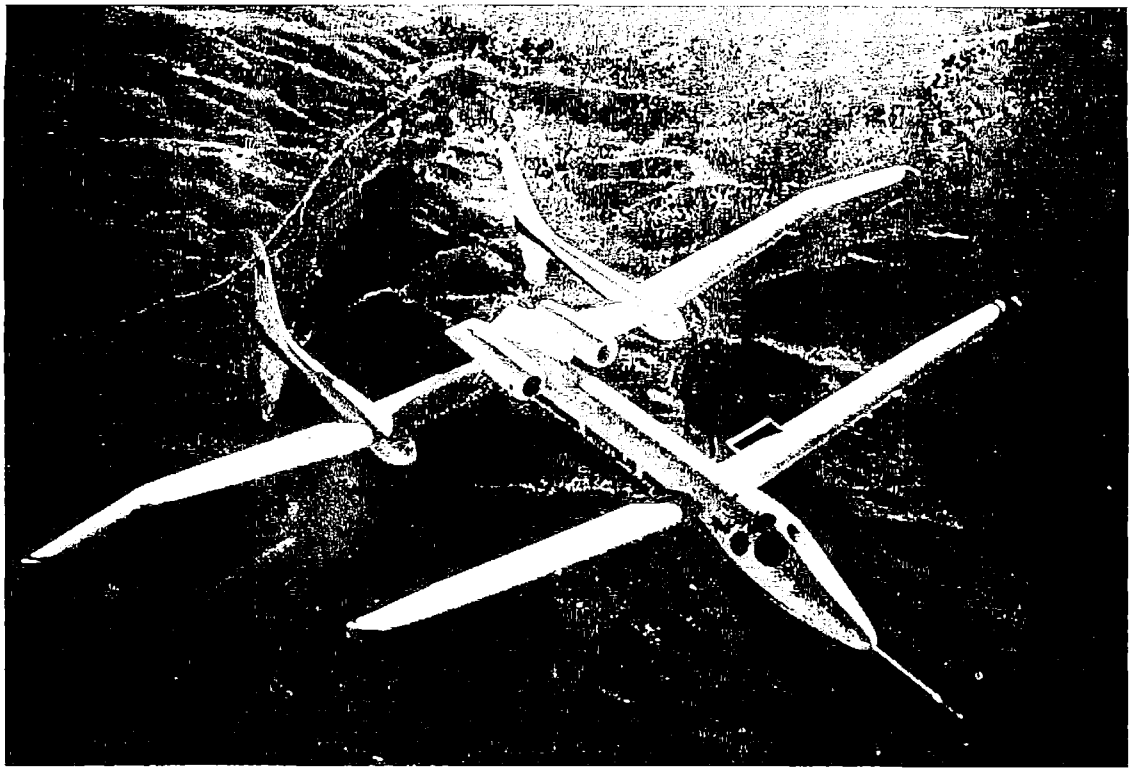


FLUSH, INTERNALLY MOUNTED ANTENNAS

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



The pressure In On — Test Pilots at Scaled Composites Inc. are waiting for delivery of high-altitude pressure suits for the next phase of the Proteus test program.
Proteus photos by James A. Sugar

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