

# CANARD PUSHER

APRIL 1996

RUTAN AIRCRAFT FACTORY

VOL.11, ISSUE 2, NO. 84

## Andre' J. Deberdt 1935-1996

We are very sad to report the passing of an outstanding EZ builder/flyer, and our friend, Andre' Deberdt. Andre' was killed when his Long-EZ crashed on the evening of March 14, 1996 in Santiago, Chile. He was repeating a flight he had tried in 1993, when he attempted unsuccessfully, to set a city-to-city speed record from Rio de Janeiro to Santiago.

On that flight he experienced ice in his fuel, and had to turn back. This time he did make it to Santiago, but had to land at Mendoza, Argentina to wait out bad weather in Santiago before completing the flight. According to his daughter Alix, in Sao Paulo, Brazil, we understand that he was asked to fly a demonstration flight at the Santiago airport for the locals. In preparation for this demonstration flight he apparently was trying to work up an aerobatic air show, and eyewitnesses reported watching him practice low-level rolling maneuvers. We are not certain whether he was still practicing or if he was actually flying a demo flight for the local TV people, but on one of his passes he began a roll at very low attitude. Half way through the roll he tried to reverse his roll direction, apparently realizing he was too low. He almost recovered, but caught a wingtip on the ground, resulting in a fatal crash, literally on the runway in Santiago.

Once again we have lost a fellow EZ pilot and a good friend to low level aerobatics. Several years ago we did a study and found that a high percentage of all EZ accidents (at that time) involved, or were directly caused by, unwarranted low-level aerobatics. In the interest of safety we are reprinting info from CP 47, 57 and 65 (see pg 5).

It is difficult to believe Andre' is gone. We had been in almost constant communication concerning a trip to South America that Sally and I have been planning for over a year. He was a tremendous source

see Friend pg 4



## More on wood props

A correctly designed wood prop can operate successfully and safely for many years, provided it is carefully maintained and not abused. It is very important to repair any damage to the finish ASAP. If bare wood is exposed to the elements it will rapidly absorb moisture and engine oil. This will significantly reduce the useful life of the prop.

Metal props are generally more efficient than wood props, mainly because they have thinner blade sections. You cannot simply cut

your wood prop blades to thinner sections and expect them to give prolonged, safe use. They *will not*. If you are into performance

tuning and feel you must thin down your prop blades, you will need to lay-up several plies of glass, or better

yet, carbon and epoxy, from the hub to the tip on each blade.

This is not generally recommended because it takes some design capability as well as skill to produce a balanced, symmetrical prop. This change also

The bottom line is  
**DO NOT FLY**  
with evidence of heat  
distress on your prop!

see Props pg 4

# BRIEFS

## In-cowl exhaust update

Mike's "in cowl" exhaust system is still operating well and is crack-free so far. The gray exhaust "soot" that it deposits on the spinner is more of an aggravation than he thought it would be, requiring the spinner to be cleaned after any flight of an hour or more. However, the smoothness of the engine/prop and the extra performance makes it worthwhile.

## RAF, SCI now on WEB

Rutan Aircraft Factory and Scaled Composites Inc. have taken up residence in cyberspace — you can pass messages by way of their computer mailboxes in America On Line and on the World Wide Web.

RAF's Address: [tsatraf@aol.com](mailto:tsatraf@aol.com)

Scaled Composites Inc.: [go4scaled@aol.com](mailto:go4scaled@aol.com)

<http://www.portal.com/~scaled>

## Aircraft on display

Those passing through the Seattle, Washington area between April and July 7 may want to stop by the Museum of Flight for a visit. The museum has three Rutan-designed aircraft on temporary display at the entrance to the Museum's Great Gallery — a VariEze built by John Foy of Bellevue, WA; the prototype Quickie, developed by Tom Jewett, Gene Sheehan and Burt Rutan; and VariViggen #2, which flew soon after the prototype, built by Mike and Sally Melvill of Tehachapi, CA. The Museum of Flight is located five miles south of Seattle and is fronted by the King County Airport/Boeing Field. Fly on in!

## It's a 10

For a great hangar pin-up check out the centerfold in the May issue of *Air & Space/Smithsonian Magazine*. Photographer Chad Slattery rounded up a flock of canards, military aircraft, store-bought airplanes and a helicopter, parked them in the formation of the numeral number 10 in honor of the magazine's 10th anniversary, and shot the scene while leaning from a Hughes 500 at 1400 feet in the driving rain. This all happened at the Mojave Test Flight Center, naturally.

## The good ol' days

An article in the May issue of *Sport Aviation* tells the story of the VariEze and its debut at Oshkosh over twenty years ago. It's a great story, written with personal insight by journalist Jack Cox. He should know, he was there!

**RAF HOURS:** Rutan Aircraft is officially open Tuesdays only. Please call between 9 am - 2 pm 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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\$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

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# Answering the epoxy question

It seems several laminating materials have gone the way of the buffalo, disappearing from market shelves only to reappear briefly in small quantities before dying out for good.

It has put some homebuilders in a tailspin, stranding them with partly built aircraft and a possible compatibility problem. While the good news is that new products are on the horizon, the bad news is that homebuilders will have to decide what tradeoffs they are willing to accept.

RAF reported in CP 77 that its sister company Scaled Composites (SCI) would no longer use Safe-t-Poxy as it was found to contain MDA (a known carcinogen) and styrenes (highly allergenic). "We buy resin in 55 gallon drums, sometimes 10 drums at a time," explained Mike Melvill, "and we have 100 employees now. We don't



If any composite building chapter member has questions about these epoxy systems or general composites question, they can contact Gordon Bowen directly at (801) 394-5537.

want to subject our employees to even the threat of MDA contamination." The same goes for homebuilders, he continued. "They have to know, even if it's the smallest part of a million, that Safe-t-Poxy contains a known carcinogen."

In addition, Hexcel sold its Resins Group business, which included Safe-t-Poxy, to another company. The new owners decided not to continue the resin line, and Safe-t-Poxy suddenly became a thing of the past.

Unfortunately alternate epoxies recommended by RAF in CP 77 have since been discontinued. SCI scrambled to find a MDA-free replacement and now uses a laminating system called Pro-Set distributed by Gougeon Brothers Inc. located in Bay City, MI.

To add to the confusion, a "near-exact replacement" for Safe-t-Poxy is now on the market according to a recent letter from Gordon Bowen, former Product Manager at Hexcel. "We've now introduced via Aircraft Spruce of LA, GA and Diversified Materials of San Diego the near exact

replacements for 'Safe-t-Poxy' systems, 'E-Z Poxyl,' writes Bowen. "The chemistry and technology remains as close as possible without violation of any rights retained by Hexcel. The mix ratio is the same, the long pot life and storage stability remain the same, the excellent fabric wetting and adhesion remain the same. The most important aspect of

*See Epoxy page 4*

**"With sights set on impossible..."**

## READY TO BUY YOUR DREAM AIRPLANE?

For a friendly financing program designed with the General Aviation pilot in mind, call Mojave Desert Bank at 805-824-2200 or toll free at 800-446-0557 (CA & AZ only).

Dick Rutan, Voyager Pilot, is a founding director of the Mojave Desert Bank and the special advisor for aircraft inspections and aviation loans.

Fast, friendly and efficient service. Financing and refinancing available - even on FAA registered experimental aircraft!

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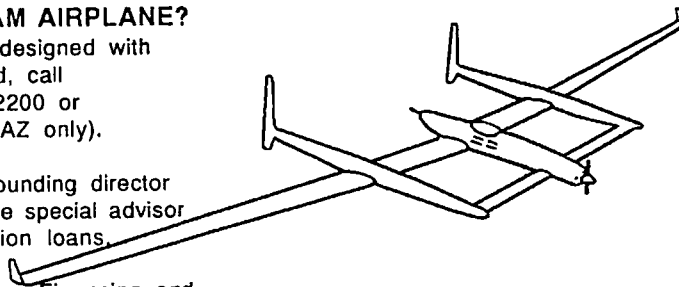
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## Props

makes it difficult to have an urethane "rain proof" leading edge.

Props on pusher-type aircraft really have to work hard. They are running in the wake of the wing, fuselage and landing gear, which makes for a turbulent flow field (especially when compared to a tractor or "puller" installation). The exhaust plumes also create problems for these props, due to high speed jets of hot air flowing through the prop disc, which can actually scorch or burn the wood if the prop is not "clocked" correctly.

Since the last newsletter, we have actually seen three different installations where one or more of the blades were damaged by hot exhaust gasses. The varnish was burned away, and in two of these installations the wood was blackened and scorched. It is critically important that you clock a two-blade pusher prop at the one o'clock/seven o'clock position when cylinder #1 is at top dead center on a Lycoming engine.

If you have a three-blade propeller, inspect it carefully for any sign of scorching and rotate it one bolt hole either way if it does show evidence of heat distress, and try it again. The best way to ensure that your prop is not being damaged by hot exhaust gasses (particularly if you have an "in cowl" exhaust system that ends close to the prop disc) is to install a pair of stick-on irreversible temperature indicators (about a buck apiece). These should be placed on the prop blades, centered in the area where where the exhaust plumes pass though the prop.

## Friend

of information on flying homebuilt airplanes in Central and South America. He was a very special person, and will be sorely missed.

Andre' is probably best known here in the US for flying his Long-EZ to Oshkosh from Sao Paulo, Brazil two years in a row. What many people may not remember is that in April last year, he flew his airplane from Natal, Brazil to Dakar, Senegal in West Africa and back, via the Cape Verde Islands, crossing the Atlantic twice, to commemorate the 60th anniversary of a fellow countryman, who accomplished this feat *before* Charles Lindbergh did! Naturally he became a major celebrity in Brazil, appearing on many TV talk shows

## Epoxy

Safe-t-Poxy technology is the fact that this chemistry is the only chemistry to have a 20 year track record/pedigree, in existing homebuilt's critical structural parts and gas tanks, without known failure."

According to Bowen the resin and hardener can be ordered in small packages from Spruce and DMC. The slow hardener is EZ-87 and the fast is EZ-83, the resin is EZ-10. It is compatible with Safe-t-Poxy materials the homebuilder may still have on hand from previous purchases of Epolite (these epoxy systems were known at Hexcel as Epolite 2183, 2184 and 2187 hardeners and Epolite 2410 resin), depending on how 'old' the previous material may be but needs to be checked by the builder. The chemistry is compatible, he says.

"Because I've been involved with the EAA since 1974, coordinated the Composites Workshop at Oshkosh several years, given tent forums on composites and resins, built a lot of my Cozy IV using Safe-t-Poxy and had been the Product Manager at Hexcel for these systems for 7 years, I decided not to let the Safe-t-Poxy type technology die at the hands of corporate lawyers and non-homebuilder business managers," Bowen explained in his April 96 letter.

RAF can't comment on whether or not you should use E-Z Poxo, which more than likely contains MDA. It's up to you to ascertain how much MDA is contained in E-Z Poxo, if any, and what the risks are. We suggest you discuss the subject with Gordon Bowen at (801) 394-5537.

If you decide to use E-Z Poxo, we would recommend that you use EZ-10 and EZ-84. But remember, it is up to you! Check it out! ●

Since RAF no longer has the resources to conduct testing on "new" or different products like this, we would appreciate feedback from those of you who do use it.

I currently have a pair of temperature indicators on my prop. They have a 150 degree - 175 degree - 200 degree - 225 degree temperature range, and with more than 50 hours of flying, the lowest temperature (150 degrees F) has yet to trigger. I have ordered more of these with a lower temperature range and will comment on the outcome in the next CP.

**The bottom line is  
DO NOT FLY  
with evidence of  
heat distress on  
your prop!**

and in many newspaper articles. Then, in July he flew to Natal once more, and this time flew non-stop to Tenerife in the Canary Islands, an almost 18-hour flight over the open Atlantic Ocean. From Tenerife, he flew to France, Belgium and Denmark. He then crossed the North Atlantic, his fourth Atlantic crossing in 1995, via Iceland to Canada, and then on to Oshkosh '95.

Andre' was an excellent pilot and a brilliant navigator. He was also a great ambassador for Sport Aviation, and was actively preparing for an -around-the-world flight in 1997.

Fly high Andre', until we meet again.

# Accident data for homebuilt "EZ" type aircraft

RAF recently received a summary of all reported accidents during the period from 1983 to 1989 for various selected homebuilt aircraft. This document was put out by the NTSB and is indeed a very sobering document.

Since there are more EZ's flying than any other type of homebuilt, it was expected that there would be more EZ accidents during this time period. According to this report there have been 71 accidents during this time period. Of these, 24 of them were fatal accidents (33.8%). Mechanical failures of one kind or another caused 33 accidents, while 38 were caused by pilot error.

Pilot error accidents are to be expected. Even factory built, certificated aircraft accidents are mostly caused by pilot error. The unsettling thing is the very high rate of accidents caused by mechanical failures. In certificated (factory built) aircraft mechanical failures account for only 1.6% of all accidents. In homebuilt aircraft (not only EZs, but all homebuilts) mechanical failures account for 19% of the accidents. With the EZ-type aircraft, 47% of all reported accidents from 1983 to 1989 were caused by mechanical failures.

While it will always be difficult to control the pilot error-type accidents in any type aircraft, as responsible builders of homebuilt aircraft, we need to be more aware of the things that can cause mechanical failures and possibly lead to accidents.

Some of the mechanical reasons pointed out in the NTSB report are as follows: mud wasp plugged fuel tank vent; contamination in float bowl; Teflon tape in float bowl; propeller failure/loss; water in fuel; drain not installed in lowest point; carb ice/carb

*As always, we publish information of this nature in the hope that it may help prevent more accidents.*

As reported in CP 47, seven of the eleven Long-EZ accidents occurred during low altitude buzzing or aerobatic maneuvers. Because many individuals, including those who may purchase one of these aircraft or may ride in one as a passenger, may not be aware of the risks involved we included a plans change in newsletter 57 requiring placarding the aircraft and the owner's manual with the following announcement:

## WARNING!

STATISTICS INDICATE THAT AMATEUR BUILT AIRCRAFT ARE MORE LIKELY TO HAVE AN ACCIDENT, INCLUDING A FATAL ACCIDENT, THAN FAA CERTIFICATED, MANUFACTURED TYPES. WHILE STRICT ADHERENCE TO OPERATING PROCEDURES CAN REDUCE THIS RISK, THE HAZARDS ARE SIGNIFICANT PARTICULARLY DURING INITIAL FLIGHT TESTING OR WHEN OPERATED IN A NON-CONSERVATIVE MANNER.

heat inadequate; throttle spring failure; canopy not latched; grip came off control stick; crankcase breather kinked (blew all oil overboard), in-flight fire; improper wing incidence; landing gear improperly installed (attach tab); excessive connecting rod bearing wear.

You will note that only one of the above was an actual mechanical failure of the engine. All of the rest were simply caused by mistakes made by the builder and, essentially, all could have been eliminated by a careful, systematic approach to the important tasks of building and flying your own aircraft.

The only pilot oriented reasons called out by the NTSB report were: careless hand propping; lack of training (familiarity with type); fuel mismanagement; and failing to extend land gear.

From our own investigations of EZ-type accidents we know that low flying, buzz jobs and low-level aerobatics account for an abnormal number of accidents.

*Reprinted from CP 57*

As we have discussed previously in the Canard Pusher and as has been reported by Aviation

Consumer magazine, the experimental homebuilt airplanes have an accident record that is worse than that experienced with certificated, factory-built aircraft. This is due to a number of factors. There are more chances for non-conformality to occur, thus each airplane built is actually a new, experimental, research, high-risk article.

This new research aircraft is often tested by pilots who have very little time in type and who often do not follow careful flight safety procedures in their testing. Also, because these aircraft are more fun to fly and have higher performance, many accidents are the result of improper aerobatics or other high-risk flying. ●

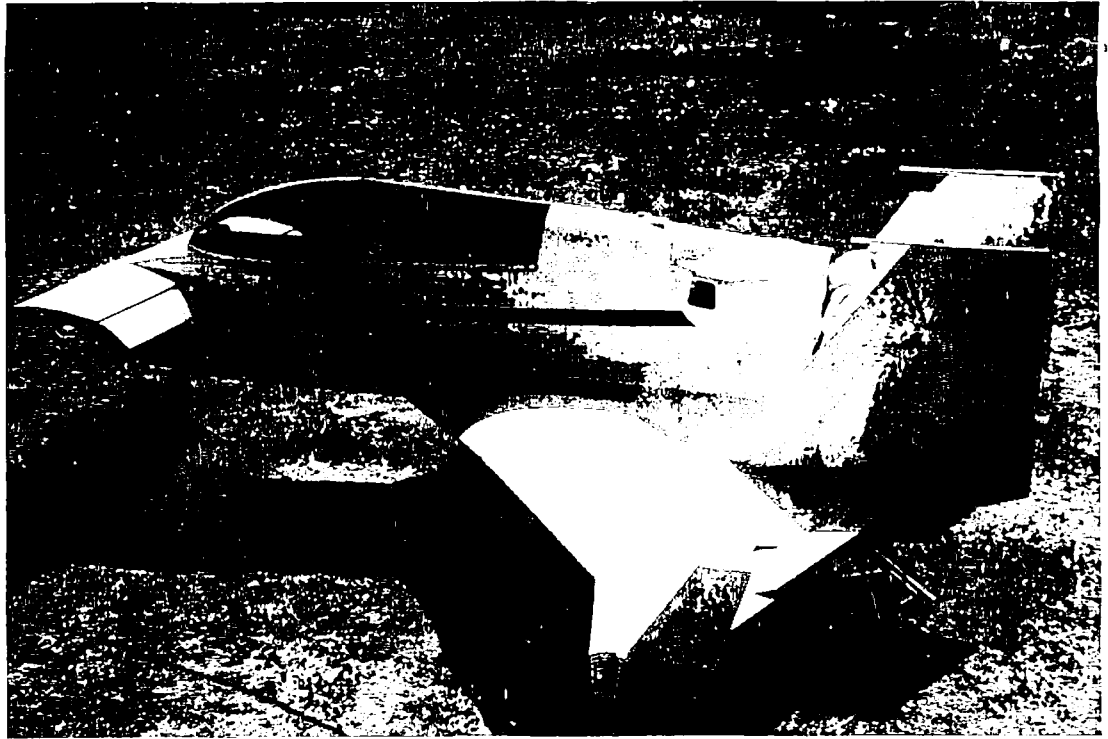
## To report accidents and incidents

Write: Rutan Aircraft Factory  
1654 Flightline  
Mojave, Ca 93501

or Fax: (805) 824-4174  
Attention RAF

(Right) Prize-winning VariViggen N212RS, owned and built by Ron & Pam Smith of Anderson, IN.

N212RS was built in 1989; wingspan 23.7 ft; Empty weight 1004 lbs; Gross weight 1700 lbs; cruise 150 mph; landing speed 70 mph.



## The Canard Connection —

*Newsletters can bring canard enthusiasts together in more ways than one. While RAF does not take part in the contents of the following newsletters, RAF encourages pilots and builders to “keep in touch” in the continuing effort to keep on flying safe.*

**USA — *The Central States Newsletter*** not only presents an ultra informative news forum for experimental aircraft, but offers a connection between a host of pilots living coast-to-coast. Articles cover products, ideas, tips and flying experiences that help modify, build, maintain and fly the canard airplane, whether it is an Eze, Cozy or E-Racer. Each quarterly issue is packed with up-coming fly-ins, as members of the Central States Association — by far the largest group of associated canard pilots in the U.S. — fly together as well. A membership in Central States Association is well worth the \$20 cost. Contact Terry Schubert, 9283 Lindbergh Blvd. Olmsted Falls, OH 44138-2407

**USA — *The Canard I*** — Builders and enthusiasts of Burt Rutan’s very first homebuilt, the VariViggen, now have a “connection” directed at their special interest. The Viggen Owners and Pilots Association (VOPA) recently founded by Viggen owners Ron and Pam Smith, will help builders keep in touch through their newsletter, the *Canard I*. You don’t have to own the rare Viggen to be a VOPA member, you just have to love them. Subscriptions cost \$10 year, Canada or Foreign \$15. Contact Ron and Pam Smith, 2128 Tartan Road, Anderson, Indiana, 46012. Phone: 317/643-9451.

**United Kingdom — *Canard EZ News*** is for builders and pilots of the EZ family, the VariEze, Long-EZ and Cozy (and similar back-to-front flying machines) in Europe. “The aim is to improve contacts between pilots, facilitating self-help with spares, safety matter. We are not attempting to replicate the function of the Canard Pusher, but to exchange the addresses of UK aficionados with information about our activities” writes *Canard EZ News* Editor Nick Rushby. A recent newsletter (November #15) included information on vortex generators; thermal protection, a report on Lenckite AV Blend; a copy of RAF’s recent Mandatory Changes (Thank You for spreading the word Nick) and several pages of ads from pusher pilots. *Canard EZ News*, 209 Junction Road, Burgess Hill, West Sussex RH15 ONX, UK.

**Norway — *The Bulletin*** is published three or four times a year by EAA Chapter 573 in Norway. Write to: EAA Chapter 573, Hennembratan 22, 3408 Tranby Norway. •

## ***Fly-In with friends***

### **R.A.C.E. Kanab Honk-Out May 25-27, 1996 Kanab, Utah**

Races begin immediately after the Pilot's meeting at 7 am on Sunday the 26th. The established race course and race procedures will be used. The 1995 High Points Awards Banquet and presentation will be held on Saturday night, May 25. Honk-Out Awards Banquet will be held Sunday night.. Shirl Dickey will have a bus tour to some interesting place arranged for Saturday afternoon so plan to arrive early if you want to participate.

*Contact Aikins Lodge for R.A.C.E. reservations at (801) 644-2625  
Please reserve early!*

### **"Grazing in the Grass" Canard Fly-In, June 21-23 Clarence Page Municipal Airport (F29), Oklahoma City, Oklahoma**

This is the Sixth National Gathering for Canard Type Airplanes held in Oklahoma.

Social events, seminars & prizes will abound. Each year this fly-in has drawn canards from both coasts and offered great technical seminars.

Contact Pete Peterson for more information  
4429 NW 48th, Oklahoma City, OK, 73112  
(405) 946-5003.



## **Jackpot!! July 5 - 7 Jackpot, Nevada**

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**RESERVE EARLY!**

### **Oshkosh '96 August 1 - August 7 Oshkosh, WI**

Call (414) 426-4800 for Convention information  
(414) 235-3007 for housing information  
EAA  
PO Box 3086  
Oshkosh, WI 54903-3086

### **Mesquite Sprints August 31 - September 2 Mesquite, Nevada**

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## **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 607, Plainfield, NJ 07061-2318  
Please allow 2-3 weeks for delivery, Sorry, no COD's.  
For more information 6:00-10:00pm EST, Mon.-Fri.  
908-757-9573 908-755-9639 FAX

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

## NOSE GEAR RATCHET

Dr. Curtis Smith's nose gear crank ratchet is available for \$40.00 which includes postage and packaging. No need to call, just send check or money order. This little device should be considered a "must" by all Long-EZ and VariEze builder/flyers. Once you have flown with it you will wonder how you ever did without it.

Curtis Smith, 1846 Sextant Dr.  
Worden, IL 62097

Note new phone # 618-656-8209

## 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

## F-16 DEEP STALL INCIDENT VIDEO

Gives a pilot's-eye view of a deep stall which almost doesn't recover. Includes a letter describing what the important learning points are from the video, especially as they apply to EZ pilots who are unfamiliar with deep stall, as well as a transcript of the audio portion (for clarity). Price - \$13.00.

Contact: Charlie Precourt  
7015 Little Redwood Dr.  
Pasadena, TX 77505-4433



## NOSE WHEEL SHIMMY DAMPER PLANS

Because of rising costs Bob Davenport tells us he will no longer sell the nosewheel shimmy damper kit.

However, all production information, drawings, and installation procedure were published in the April 1995 Vol. 38 edition of the Central States Newsletter.

Contact: Central States Newsletter  
9283 Lindbergh Blvd  
Olmsted Falls, OH 44138-2407

## RAF Recommended Suppliers

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

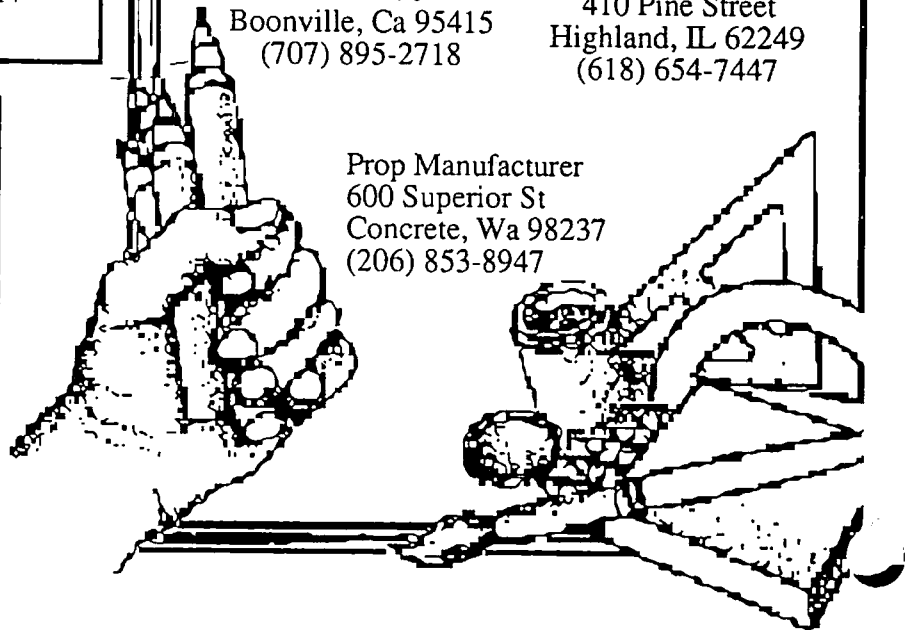
Aircraft Spruce  
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Stanton, Ca 90680  
(714) 898-4366

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

Wicks Aircraft  
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Highland, IL 62249  
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Prop Manufacturer  
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(206) 853-8947





## **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, Advanced Aircraft Electronics, PO Box 4111, Florissant, MO 63032  
800-758-8632

## *Feather Lite*

### LONG-EZ PARTS PRICE LIST

Main gear strut	\$349.00	
Nose gear strut	\$58.00	
Engine cowls, pr. (glass)	\$329.00	
Engine cowls, pr. (Kevlar)	\$480.00	
Cowl inlet	\$48.00	
Wheel pants (3.5x5)	\$150.00	
Wheel pants (500x5)	\$180.00	
Above item in Kevlar	\$215.00	
NG 30 cover	\$21.00	
Pre-cut canard cores	\$160.00	
Pre-cut wing & winglets		\$1199.00
Leading edge fuel strakes w/bulkheads		\$524.00
Strut cover SC	\$19.50	
Nose wheel cover NB	\$19.50	
Sump blister	\$19.50	
NACA inlet	\$47.00	
3" extended nose gear	\$70.00	

Feather Lite, Inc. is proud to announce another product to re-introduce to EZ builders: The original Space Saver Panel by the late Rusty Foster. This is a bare fiberglass panel with a molded recess for builder installation of an aluminum flat stock electrical panel. \$40.00

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

## *For Sale*

2 Cleveland Chrome Brake Discs  
Unused, (164-117)  
500x5, Varieze, etc. \$170

Davenport nose wheel shimmy dampner,  
unused \$185

(707) 785-2947 Alan McPherson

## *For Sale*



One Long-EZ engine mount for  
0-235, 0-320 or 0-360

Flight tested on Dick's Long-EZ N169SH —  
\$210.00

(805) 824-4608 Dick Rutan

## *For Sale*

New Hendrickson Prop  
862 L-66 for L2-35 engine SAE-2  
\$475

Contact Jack (206) 432-5075

## **Lycoming engine for sale**

Lycoming 0-235 C2 — 115 HP  
TT 190 hours — Performance Prop  
One electronic ignition

I am open for price and will take the best offer. This engine was rebuilt in Pocatello, at Idaho School of Aviation by Mr. John Bakken. Any replies would greatly be appreciated.

Martti Riekkinen  
67-49A 192nd Street  
Fresh Meadows, NY 11365  
(718) 454-2524 Phone  
(718) 454-8027 Fax

# Plans Changes

*Do not fly until you comply with the following plans change.*

**MANDATORY GROUND** for All DEFIANTS until compliance with the following plans changes:

## Defiant nose gear failure

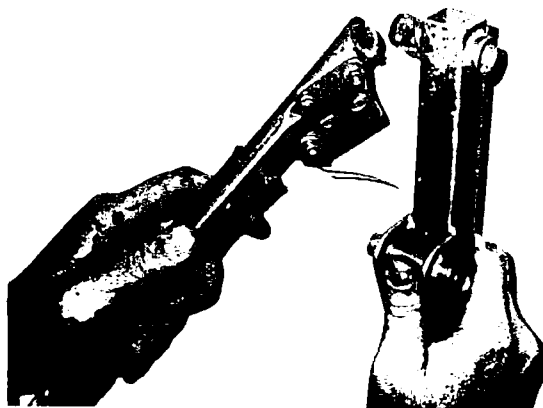
The nose gear on a Defiant collapsed on touchdown causing minimal damage to the front lower cowling and breaking two blades of a 3-blade prop. The pilot did a good job of keeping the airplane on the centerline (using main wheel brakes for steering). The pilot shut down the front engine by turning off the fuel valve. There was no fire, and no injuries.

### Nose gear post mortem

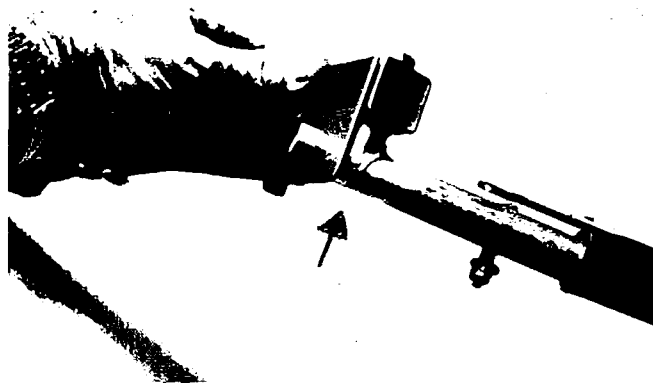
The nose gear failed to lock down on this particular aircraft because the NG-1 Retraction/extension lever broke close to a weld in the 3/4-inch x .049 4130 steel tube handle. (see photos). This failure was due to a torsional overload caused by excessive bending forces having been applied to the retract handle (NG-1).

During normal nose gear retraction or extension on a plans built Defiant, there are very minor bending forces applied to the NG-1 gear handle. However, during the initial flying by a new builder/pilot, it is possible that large bending forces may be imposed on NG-1, especially if the new Defiant pilot manages to get his nose gear "in limbo" halfway between up and locked and down & locked. Once a pilot learns the required knack of the proper "flip of the wrist" action, that easily retracts or extends the nose gear, this type of failure should never occur.

Since we have had one failure now, and since probably all NG-1 gear mechanisms are the same as the one involved in this incident, RAF is recommending that all Defiants be grounded pending repair and/or reinforcement of the NG-1 weldment (see photos).



Failed retraction/extension lever



Crack close to weld on tube handle



Since RAF is no longer active in the development of homebuilts, we are not likely to discover many new errors or omissions in the plans. For this reason, we need your help. Please submit any significant plans changes that you may discover as you go through the building process.

The recommended reinforcement should be done as follows: a nine-inch (9") long 4130N steel tube 5/8-inch OD x .065 wall should be driven inside the existing 3/4-inch x .049 steel tube as shown. You will have to drill or grind (dremmel) a 5/8-inch diameter hole in the weldment as shown.

The 5/8-inch x.065 tube should be welded in place in three places: at the 5/8-inch diameter hole through which it was installed, and at two points, one on the top and the other on the bottom of the 3/4-inch x .049 tube in the form of rosette welds.

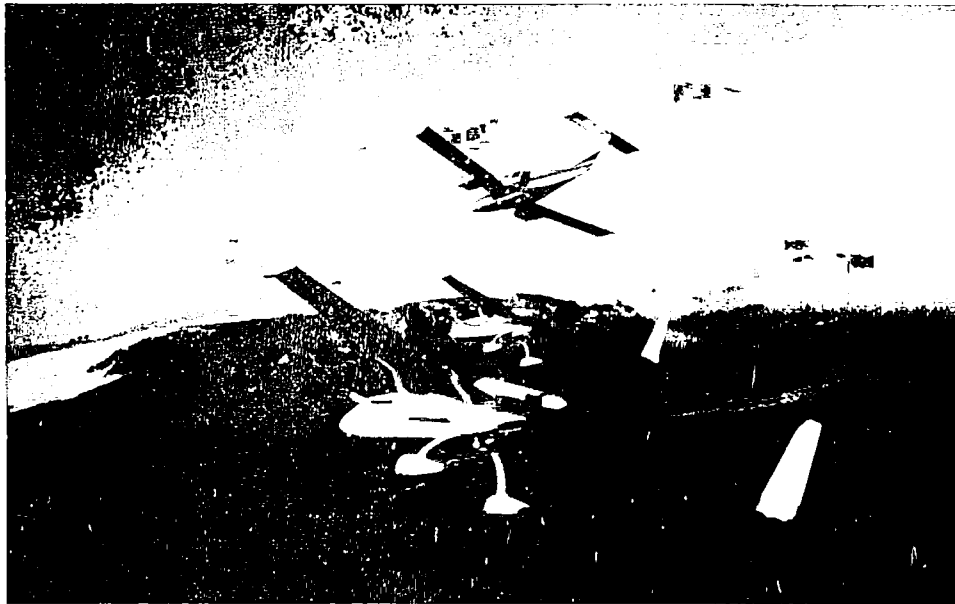
Cut out a plate approximately 1.8 x 2.4 x .065 (4130N steel). Drill a 5/8-inch DIA hole, such that this plate fits approximately as shown in the photos. The 5/8-inch diameter hole will have to be ovalized somewhat to slip over the end of the 5/8 x .065 tube, due to the 69-degree angle between the gear handle tube and the 1" x 1" square tube. (See Defiant plans, page D-41).

Weld this plate to the 1" x 1" square tube on 3 sides, and weld around the 5/8 x .065 round tube as shown.

If you TIG weld this reinforcement, be sure to normalize the affected area. Bead blast, or wire brush the area and apply a coat of Zina Chomate to prevent corrosion.



Plate welded to tubes



Mike Melvill, Doug Shane & Dick Rutan flew a mission for the movies earlier this year over Mojave and Tehachapi. The finished product is expected to air on The Learning Channel in Fall. Look for "Understanding Flight," produced by Cronkite Ward Company. Oh, and where was was Burt during all this? He flew chase for the camera crew.

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**ALL DEFIANTS GROUNDED UNTIL COMPLIANCE WITH  
 ENCLOSED PLANS CHANGES    See page 10-11**

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 CP 84

If your label says LAST ISSUE CP 84, this is your last issue and you need to renew.