

THE CANARD PUSHER

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

VariViggen (1st Edition), newsletters 1 to 65.
VariViggen (2nd Edition), newsletter 18 to 65.
VariEze (1st Edition), newsletters 10 thru 65.
VariEze (2nd Edition), newsletters 16 thru 65.
Long-EZ, newsletters 24 through 65.
Solitaire, newsletters 37 through 65.
Defiant, newsletters 41 through 65.

A current subscription for future issues is mandatory for builders -- as this is the only formal means to distribute mandatory changes. Reproduction and redistribution of this newsletter is approved and encouraged.

PLEASE NOTE: BUILDER SUPPORT IS ON TUESDAY ONLY FROM 8:00 TO 12:00 AND 1:00 TO 5:00. When you call on Tuesdays for builder assistance, please give your name, serial number, and nature of the problem along with a number where you can be reached, collect, between 3:30 and 5:00. Mike will try to return your call the same day. However, we ask that calls be limited to emergency-type situations and other questions be mailed in. When writing to RAF, send along a stamped, self addressed envelope.

TOUGH SLEDDING AHEAD FOR RAF

In general, I have been very pleased with the business performance of RAF since we discontinued the sale of plans and the licensing of individuals to build aircraft based on RAF design information. RAF made these moves in mid-1985 partially because of severe conflicts with other aircraft development projects at Scaled Composites which were taking all of my time and because of the expanding threat of lawsuits which often occur after an accident, regardless of the cause of the accident.

In 1985, I decided to keep RAF's doors open in spite of the fact that we had lost our primary source of income. The remaining assets of RAF would be used to continue to provide technical and safety support to those licensed individuals still building and flying their RAF designs. In order to provide the best service to those customers who were licensed by RAF, we discontinued the policy of allowing transfer of license and, in effect, promised support only to our direct customers. Those who bought a project or completed aircraft from "Joe Smith" must be supported by "Joe Smith". We would maintain, to the best of our ability, our support of Joe, as our licensee.

In 1985, we believed that we would be able to continue support for 2 to 3 years in this way and thus, not strand any builder who had recently begun his project. Little did we know that 5-1/2 years later RAF would still be alive and well, providing support, continuing newsletters, continuing our talks and booth at Oshkosh, even helping new starts for those licensed in the early 80's and only now laying up the front seat fuselage bulkhead! Our survival has had a lot to do with a few key items:

1. Great support from our family of builders who helped police the cheaters (those who sought RAF support even though working without a RAF license). Understanding from builders when we raised our newsletter price from \$7 to \$14 and cut down on our hours of direct builder support. Support from those who still stop by our Oshkosh booth and load up on goodies.

2. Patience, dedication and sacrifice from people like Mike and Sally Melvill and Joan Richey who hung in there even though it was obvious that the ship was beginning to sink. Their continuing dedication was because they love working with this wonderful group of EAAers who truly enjoy our hobby.

3. The donation to RAF of the income from paid lectures that I gave from '87 to '89 telling the exciting story of Voyager, RAF's most famous design (developed at RAF from 1982 to 1984).

The good news is that RAF still has potential to provide a few years more of support to builders - to maximize their chances of building a safe airplane and operating it safely.

The bad news is that RAF now is plagued by two lawsuits, both of which seem ridiculous, and both of which are proving to be very expensive distractions.

1. RAF contracted with Colin Chapman, the Lotus car founder, in 1982 to develop a proof-of-concept prototype to assess the feasibility of an ultralite-category light plane. The result (RAF model 97 Microlite) completed its contracted initial test program in 1983. The program was shelved by Lotus, primarily due to the death of Mr. Chapman. Rights to the concept were later sold to another English Company, Aviation Composites, which used the design's features as a basis for a different aircraft, the Mercury. The Mercury's development program suffered a number of developmental problems, among them, the failure to obtain an acceptable engine (the Lotus engine was dropped and others were too heavy for the configuration), and the discovery that changes would be necessary to obtain adequate spin recovery characteristics. Aviation Composites then discontinued further development and sued RAF claiming that we should have more thoroughly tested the model 97 in 1983 to find a possible flaw in spin recovery. This case is scheduled for trial in federal court during January '91. Of course there seems to be no basis, however, these exercises have an enormous effect on our time and distract from our ability to concentrate on things more productive and

enjoyable.

2. The latest lawsuit to be brought against RAF concerns the VariEze accident described in CP61 page 9. We did a thorough investigation of that accident and came to the conclusion that the wing attach taper pins, which were home-made, were a poor fit. The bolts that secure these taper pins were too long and all had had a threading die run onto them to increase the length of threads on each bolt! Aircraft bolts are roll threaded and heat treated. Under no circumstances should an aircraft bolt have threads extended or cut using a die! One of these bolts was missing as were the two taper pins. The three remaining bolts had been over-torqued allowing a wing to swing aft. The VariEze was seen to be doing aerobatic maneuvers by at least one eyewitness just prior to crashing. The pilot was found to have alcohol in his bloodstream. In spite of these facts, RAF and the builders estate are being sued by the relatives of the passenger.

It seems unreasonable that these suits are allowed to threaten the viability of RAF and, thus, its ability to continue to provide support to EZ builders/flyers. We, of course, do not plan to accept any settlement offers on these suits since bowing to extortion in order to avoid the hassle only attracts other frivolous suits.

YOU MUST REGISTER YOUR PROJECT.
YOUR LICENSE TO BUILD WILL EXPIRE
1 JANUARY 1991.

RAF ceased licensing builders in July '85. Our decision to remain open to support builders was based on our desire to not strand those who had been recently licensed. We did not foresee that now, more that 5 years after the last license, new building starts would still be occurring. In order to continue to be able to provide support for those who obtained a license with an honest intention of building, we must now place a limitation on the exercise of your license to build. Of course, it is not reasonable for any contract, especially one in which support is expected, to be good forever. We must, therefore, cancel your license to build a RAF design unless you show that your building project is started by Jan. 1, 1991 and

completed by Jan. 1, 1993.

We think you will agree that RAF has extended free support far beyond that expected of a company departing from the business. Between now and Jan. 1, 1991, RAF will compile a list of active projects with proper licenses to build so we can define those projects who are authorized and who deserve our support. By 1 January '91, you must fill out the form below and mail it to RAF along with proof that your building project is underway - a receipt for purchase of materials will do.

NAME _____ TYPE A/C _____

ADDRESS _____

DATE LICENSE AGREEMENT WAS SIGNED _____

SERIAL NUMBER ASSIGNED _____

DATE CONSTRUCTION STARTED _____

DATE OF FIRST FLIGHT
(OR PLANNED DATE) _____

N-NUMBER _____

THIS SURVEY IS IMPORTANT as it will allow us to determine what projects are being conducted by legitimate, licensed manufacturers and which projects have been dropped. This will allow us to continue to provide quality support to those who deserve it.

Please fill out the form even if your aircraft is flying (no materials purchase receipt required). In this way, we can define our support requirements for the future. If RAF does not receive the form, we will assume your project is dropped, your license expired, and you no longer require support. RAF may assign new serial numbers based on the active list as of 1 Jan. '91.

Our main concern is the safety of those who fly RAF designs and we will continue to disseminate information pertinent to the safe operation of all RAF designs until we run out of resources to provide this support.

We believe RAF has provided the best support in the industry and we will continue to do so for as long as we can. As far as we know, no other homebuilt plans or kit manufacturer has provided any support after they stopped marketing their product. We are proud of our record and are proud of the thousands of builders who have completed their projects and who now fly them safely, efficiently and enjoy the full potential of the various RAF designs. BURT RUTAN

EDITOR'S CALL FOR HELP!

I would like to make a plea to all flyers of Rutan designs to please send me all reports of any failures, breakdowns, wear problems, anything at all that you think may be helpful to other operators of the same aircraft. Please write a clear report on the subject. Include your own ideas as to what caused the problem as well as what you did or would like to do about the problem. I will do my best to publish anything and everything that might concern operators of the RAF designed aircraft.

Examples of what I am looking for are in this very newsletter. The crumbling polyurethane fuel lines on a 10 year old VariEze, and the throttle springs wearing through an aluminum bracket due to vibration. As the fleet of RAF designs gets older and gets more time on it, various pieces on these airplanes are bound to show signs of wear and tear. I would like to accumulate as much of this kind of required maintenance information as possible and publish it in the CP.

Not just wear and tear items, any item that requires your attention is worth jotting down and sending in to RAF. I may not publish every item, but you can be sure that each will be carefully and individually considered. I look forward to hearing from you soon.

OSHKOSH 1990

Burt traveled to Oshkosh this year in his Catbird via Dallas, TX where he had a business call to make. He left a couple of days early from Mojave, had excellent weather and good tailwinds all the way. Sally was unable to attend Oshkosh this year, so Mike flew their Long-EZ, N26MS, with ARES crew chief, Fred Kimmel, in the back seat.

Mike and Fred departed Mojave before dawn on Thursday, July 26th and flew toward Oshkosh using Mike's new King KLN-88 loran. They had excellent weather and good winds. They flew to O'Neill, NB where they stopped for lunch and fuel. They called Mojave to find out how Doug Shane, who was flying the ARES jet, was doing. Doug had just called in and reported that he had a problem and had landed at Wichita, KS.

Mike and Fred took off and flew south to Wichita where they found that Doug had already rounded up some help from local Pratt and Whitney people. There were lots of folks looking at the ARES and discussing what might have caused the problem. Doug had flown from Mojave at 25000 feet to Wichita. The outside air temperature was below zero Celsius. He noticed a drop in engine RPM which slowly degraded until he had only idle power. He shot a simulated flame out approach at Wichita and landed uneventfully, but naturally, was reluctant to take off again. The general consensus was that he had had water in the fuel which had frozen and clogged the fuel filter and this reduced the flow of fuel to the engine. A full power run-up on the ground showed full power was available, so it was decided that it must have been ice in the fuel which must have melted in the heat on the ground at Wichita. Crew chief Fred carefully checked the ARES and declared it fit to fly. Doug blasted off in ARES and Mike and Fred followed as best they could in N26MS. The two airplanes maintained radio contact all the way to Oshkosh. While they were on the ground in Kansas, the weather had degraded and both had to make several 180° turns and, also, were forced to do some considerable scud running to make it to Oshkosh. Doug elected to land at

Iowa City, Iowa to top off his fuel so both arrived at Oshkosh at approximately the same time. The ARES ran flawlessly from Wichita to Oshkosh so the crew assumed that the problem had been correctly diagnosed.

ARES was parked on the new concrete ramp next to the immaculate Confederate Air Force's B24 Liberator and near an F-14 and F-15. The Stealth F-117A was parked nearby. Someone from the crew of ARES was at the airplane to answer questions virtually the entire time the airplane was on display.

Mike flew the ARES on Friday, Saturday and twice on Sunday. Doug flew ARES back to Mojave on Tuesday with Mike and Fred following in N26MS. The two aircraft stopped for fuel and a delicious lunch at Denver's Centennial Airport - a great place to stop, by the way. Excellent food, super service and friendly people. From Centennial to Mojave, the only notable things were the turbulence and the headwinds. Other than that, both aircraft made it to Mojave safely and in time for an important business meeting.

RAF shared their booth this year with Larry Lombard and Michael Dilley of FeatherLite as well as with Mike Clark who had an interesting moving map display. This promises to give control back to the pilot and takes the ground controller out of the loop when it comes to potential mid-air conflict. A much better system than what we have now! Scaled has since provided storage and hangar facilities for Mike Clark's group while they tested and showed his anti-collision system to FAA and the people at Edwards.

Burt gave a number of talks at the various tents. All were well attended and we got to meet and talk to many Viggen, EZ, Defiant and Solitaire builders and flyers at bull sessions as well as at the ARES - and just walking around. According to Burt's mom, Irene, there were 78 RAF designs in attendance at Oshkosh, Not as many as we have had in the past, but still considerably more than any other designers airplanes. This year there were some truly outstanding examples, a fact born out by the convention judges who picked Bob Eckes' Long-EZ (built by George Nopper)

as Grand Champion and Bob Greider's Long-EZ as Reserve Grand Champion. Herb Abrams' beautiful Solitaire won two trophies, the Stan Dzik Award for his very clever engine retraction-extension system (this had to be seen to be believed!), as well as a Lindy trophy for champion homebuilt. Congratulations to all the winners at Oshkosh, and congratulations to all who flew their own creations into the convention. A special congratulations to Ron and Pam Smith for finally completing and flying their beautiful VariViggen to Oshkosh. This really is a pretty example of the breed. David Orr assisted Mom Rutan in her count of all the RAF-types and he came up with the astounding statistic that the sum distance flown to and from the Oshkosh convention by all in their RAF designs was over 144,000 miles!

LANDING LIGHTS AND COCKPIT NIGHT LIGHTING.

Why does the Long-EZ have its landing light where it is? Initially, the prototype Long-EZ had no landing light. It also had no navigation or strobe lights. When Dick Rutan wanted to try for the Closed Course Distance Record in the C1B class, it was obvious that night lighting would be required. Dick and Mike hurriedly designed, built and installed a "fold out" type landing light under the right thigh support which was somewhat similar to the present plans call-out for a Long-EZ.

The light worked quite well, but due to its design, it was difficult to extend and it took up storage space under the thigh support. This led directly to the present landing light design. While there are probably a lot of EZ drivers who have landed their EZ's at night, there are probably a lot more who have not.

There are several requirements for an effective landing light on an EZ. One of the most important is that it have the capability to be correctly pointed for landing and then re-positioned for taxiing. An EZ approaches to land, nose high. The Cessnas and Pipers that many of us learned to fly in, do not. Due to their flaps, they normally approach nose down. This means that a landing light on an

EZ must point down to a much greater degree than the light in a Cessna. Once this angle is determined (by trial and error), it will be immediately obvious that this light is now essentially unusable for taxiing since it points at the ground directly in front of the nose of the aircraft and the pilot can only see forward for about 6 to 8 feet. If this light is adjusted to make taxiing possible, it becomes useless for a landing light. That is why it is adjustable and must be adjustable at least to these two positions.

This pretty well eliminated using the nose mounted landing light that Burt had called out for the VariViggen back in the early '70's. Some VariEze builders did use this type of light but not many used it to actually land at night. Those who use it regularly found they needed to have a two position adjustment, usually a cable driven, difficult-to-design and-build device.

A number of EZ's have the landing/taxi light mounted in the leading edge of the outboard fuel strakes. We rejected this idea very early on because we were concerned about these lights reflecting on the canard, lighting up the canard and blinding, or at least hurting, the pilots night vision. This editor would welcome constructive comments based on actual experience using this type of landing/taxi lights. One definite advantage would be to make it easier to flash a landing light while flying at cruise speed.

Using the Long-EZ plans landing light requires some practice and a couple of little tricks only learned by experience. If you have never used your landing light at night, you are in for a surprise! The first time you turn it on and extend it, it will probably light up the interior of the front cockpit! It will tend to blind you by glaring off the nose gear strut into the little plexiglas window between your legs. Here are a few ideas to help you with these problems.

First of all, you should paint the inside of the nose wheel well flat black. Also, the inside of the trough where the nose gear strut fits while the gear is retracted should be painted flat

black. The aft face and both sides of the nose gear strut itself, including any nose gear doors or covers should be flat black. Make a small cover (a piece of engine baffle rubber works quite well) that can quickly and easily be installed over the plexiglas window through the lower instrument panel. Velcro works really well here. Do not permanently cover this window. For daytime and night flying, this window can save your butt by allowing the pilot to verify that the gear is indeed down. Extend the nose gear, extend the landing light, verify that the gear is down, then install the window cover to completely block any light. With the landing light on, you should get no reflected light through the plexiglas window or through the fiberglass wheel well. If you do, take whatever steps it requires to correct this.

The above evaluation should be conducted on the ground, at night. Before you go flying at night, you should address all of the above suggestions and satisfy yourself that you are comfortable with the landing light's effectiveness. Focus the light to an optimum taxi position and practice taxiing at night. Keep in mind that you will have to depress the light considerably from the optimum taxi position to the optimum approach-to-land position.

This editor has logged over 300 hours of night flight, many of those hours in a Long-EZ. The way I use the landing light is as follows: I slow to about 100kts on base and extend the landing light to what I feel is about the correct position. Once established on final, I fine-tune the landing light until I can plainly see the runway numbers illuminated by the landing light. (Mine is a 250 watt light and, as such, easily lights up the approach end of the runway). I continue to slow to reach touchdown speed just above the runway. I use a small amount of power right to touch down and I drive it on, rather than, flare for a "greaser" type landing. This avoids the problem of dropping it in and it also helps keep the landing light focused on the runway and not up in the sky (as it might be with a very nose high, fully flared touchdown). Once the nose wheel is rolling on the ground, I readjust the landing light to clearly

illuminate the runway/taxiway in the 3 point position. So much for the landing light - if you have only a 100 watt light and you do actually fly at night, you should replace the 100 watt with a 250 watt. 14v 250w #4313, 28v 250w #4587.

Now to address the instrument panel lighting. An airplane with a canopy rather than a windshield presents a rather more difficult cockpit lighting problem due to the "fish bowl" affect. This is the result of all the panel light being reflected in the bowl shaped canopy and making it difficult to see outside. In this editor's opinion, the very best form of instrument lighting (to help cut down the fish bowl affect) is internal lighting in each instrument. Unfortunately, this is not available on most aircraft instruments but you should use it where possible such as VOR heads, engine instruments, etc.

The next best lights, I feel, are post lights. The least desirable form of lighting would be a flood light. A good dimmer switch is important, particularly when you are taking off or landing and need to maximize your ability to see outside. Dim the instrument panel lights down as much as possible while still being able to read the critical instruments. With post lights, there should be two to each critical flight instrument - airspeed, attitude, altimeter and rate of climb. These post lights can be turned to focus their small red glow to best illuminate each instrument.

Now, sit in your airplane at night with the canopy closed. You may be surprised to see just how much reflection you have in the canopy. You should obtain a piece of cardboard or fairly stiff paper, painted flat black, and cut it to closely fit into the forward end of the plexiglas canopy at the bottom edge of the plexiglas (where the plexiglas is retained in the canopy frame by fiberglass). You should ideally be able to secure this stiff paper in place with velcro or something similar. While seated in the normal position in the seat with the canopy closed, your eye should see only the aft edge of this cardboard or paper. It must not

restrict your view of the instrument panel or your view outside through the canopy. You should now have zero glare or "fish bowl" affect on the canopy. Cut the aft edge of the flat black cardboard away as much as you can to give you more physical room but not so much that you get the glare on the canopy. This must be done at night with the cockpit lights on. You should experiment, by trial and error, until you get it right.

All this may seem like a lot of trouble to go to but, believe me, if you plan on flying your creation at night, you will be very glad you took the time. Just be sure that this paper glareshield does not restrict your visibility of the instruments or of the outside. It should be soft enough to collapse out of the way in the unfortunate event of an abrupt stop or accident.

One other point. Flying at night can be a beautiful experience. It can also become a terrifying and dangerous experience if anything at all goes wrong. Flying a single engine at night is considered by many to be an unacceptable risk. Away from an airport, an engine or prop failure at night will almost certainly result in an accident and the chances of surviving an off-field landing at night are so small as to be essentially non-existent. This is a decision you, the pilot, must make. The information in this article is to assist you should you decide to fly at night. It is absolutely not intended to encourage you to do so.

PLANS CHANGES/INSPECTIONS

VARIIZE MAN/GND

Polyurethane fuel and vent lines. Mandatory Inspection before next flight - See article on this page.

Throttle/mixture springs. Mandatory inspection next 10 hours - See article on page 13.

Note: The headrest in a VariEze is not a structural roll over protection. See this page.

LONG-EZ MAN/GND

Polyurethane fuel and vent lines. Mandatory Inspection before next flight - See article on this page.

Throttle/mixture springs. Mandatory inspection next 10 hours - See article on page 13.

NO DEFIANT CHANGES

NO SOLITAIRE CHANGES

Please submit any significant plans changes that you may come across as you go through the building process.

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.

HEADREST/ROLL OVER

The FAA has requested that RAF make it clear to all VariEze and Long-EZ builders that the triangular shaped foam and fiberglass headrest on top of the front seat bulkhead is just that, a headrest. It is not a roll over structure. It will not support the loads that would be imposed on it in the event of an accident in which the aircraft might flip upside down. The construction of the headrest triangle is such that it is a lightweight, stiff "box" that makes an excellent storage area for maps, logbooks, etc. and, with a cushion attached to the forward face, it makes for a comfortable place to rest the back of your head when flying. The light weight foam and glass structure can not possibly support any turnover crash loads. As the builder/pilot of a VariEze or Long-EZ, you should be aware of this important information.

VARIIZE POLYURETHANE FUEL LINES

A VariEze builder/flyer recently reported to RAF that while conducting an inspection of his VariEze, he found all of the polyurethane

fuel lines in his VariEze were cracked and when he squeezed these lines in his fingers, they crumbled to pieces. This VariEze is 10 years old and has been flown fairly regularly.

He has removed and replaced every piece of the urethane fuel line. This is a serious matter and for that reason RAF is making it a mandatory requirement to carefully examine every inch of urethane fuel line in all VariEze's. Use a strong light to check for cracks or crazing and squeeze the line at the same time. If the normal resilience is not felt, if the fuel line feels stiff or has any sign of checking, cracking or crazing, it should be removed and discarded. Any fuel lines forward of the firewall could either be soft aluminum tubing, using AN fittings, or as an option, could be new fuel compatible clear polyurethane tubing, or transparent yellow Tygon tubing. McMaster-Carr Supply Co. sells both of these products.

Any fuel or vent lines aft of the firewall should be stainless steel tubing or firesleeved aircraft-grade fuel line, such as Stratoflex stainless braiding over teflon tubing with stainless end fittings. Under no circumstances should there be any urethane or rubber hose in the engine compartment and all fuel hoses in his area should be protected by installing fire sleeve.

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 to be expected that there would be more EZ accidents. According to this report, there have been 71 accidents during this time period and, of these, 24 of them were fatal accidents (or 33.8%). Thirty-three of these accidents were caused by mechanical failures of one kind or another while 38 were caused by pilot error.

The pilot error accidents are to be expected. Even factory built, certificated airplane accidents are mostly caused by pilot error. The unsettling thing is the very high rate of accidents caused by mechanical failures. In certificated aircraft (factory built), mechanical failures account for only 1.6% of all accidents. In homebuilt aircraft (not just EZ's, 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 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 the landing 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.

As always, the only reason we publish information of this nature is in the hope that

it may help prevent more accidents.

SHOPPING

VARIIZE INDEX TO THE CANARD PUSHER

Bill Greer, a VariEze builder who became frustrated with looking for information in the newsletter, decided to do the research and compile an index specifically for the VariEze references in the *Canard Pusher* from CP10 through CP64! He has now completed the project and sent a sample of it to us at RAF to evaluate. It must have been quite a task. There are over 1100 listings in more than 50 pages. There is also an optional floppy disc for those who have personal computers.

For any VariEze builder, this is a must. Bill sells it a couple of different ways. You can buy just the printed book for \$20.00 or you can get the book plus a 5-1/4" IBM compatible floppy disc with a delimited ASCII listing of the data base (or optional PFS professional file data file). Specify which you would want, for \$24.00. Bill tells us he plans on updating the index once a year which would make this a valuable reference source for anyone building a VariEze.

Bill has listed all of the plans changes printed in all the CP's as well as all suggestions, problems, etc. that Bill, as a builder/pilot, thought might be of interest to a fellow builder. If you would like to order a copy for yourself.

Contact: Bill Greer
222 McLennan Dr.
Fayetteville, NY 13066
315-637-3795

If you have oil leaks in the area of the rocker covers on your engine, Mike Melvill strongly recommends the use of silicone rubber, reusable gaskets manufactured by the Real Gasket Corp. Mike first tested these gaskets a number of years ago on his VariViggen. They completely eliminated all rocker cover oil leaks. Since that time, these gaskets have been installed on Mike's Long-EZ and Burt's

Defiant with the same excellent results, namely zero oil leaks. This is one product that really works. Be certain to follow the installation directions exactly to obtain the best results.

Contact: Doug Price
Real Gasket Corp.
PO Box 1366
Laurel, MS 39441-1366
1-800-635-REAL
1-601-649-0702

PROPS FOR EZS AND DEFIANTS

RAF recommends the following prop manufacturers:

Ted Hendrickson	Bruce Tift
PO Box 834	B & T Props
Concrete, WA 98237	75875 Mosby Creek Rd
208-853-8947	Cottage Grove, OR 9742
	503-942-7068

NOSE GEAR "RATCHET" CRANK

Dr. Curtis Smith of Wooster, OH has developed a neat little method of assuring that the nose gear on a VariEze or a Long-EZ remains securely locked in both the gear-up and the gear-down position. This editor has already recommended this nose gear crank ratchet in CP ? last year. That recommendation was based on a description and photo of the mechanism.

Recently we had the opportunity to help install one of Curtis Smith's little gadgets and to see just exactly what it was, how it worked and how difficult it was to install. The installation went quite quickly and was not difficult. The only problems we experienced were that the existing Brock-supplied crank handle shaft was not a perfect fit in the inside diameter of the case-hardened gear and it was a tough job drilling through the hardened gear in order to install the required, and supplied, "split" pin. It took about an hour to complete the installation. The idea is to use a 1/4" ratchet wrench drive to lock the crank handle in the gear-up and the gear-down position. To crank it in the opposite direction, the pilot

must position the little ratchet lever as required. It looks good and it works so well you wonder why you did not think of it! It is a marvelously simple idea and is a must for all EZ drivers. It virtually eliminates the concern of having the nose gear retract while taxiing or landing on a rough surface. It also ensures that the nose gear does not vibrate down in flight. This editor recommends Curtis Smith's clever idea without reservation.

Contact: Dr. Curtis Smith
5114 Canaan Center Rd.
Wooster, OH 44691

Enclose a check or \$34.95 which includes shipping. Due to the machining and heat treatment required, allow 6 to 8 weeks for delivery.

LORAN INTERFERENCE PROBLEMS?

Mike recently installed a King KLN-88 loran in his Long-EZ, N26MS. At around the same time, he installed a new alternator because the old one stopped alternating! The replacement was identical in appearance but apparently something was different because the King did not work as well as his previous Northstar. After much testing and checking around, he was advised to install a Hisonic RFI-70 in-line noise filter. He obtained one through Pacific Air Radio in Van Nuys and installed it close to the alternator by cutting the main power wire from the alternator to the buss (battery) and running this wire through the Hisonic RFI-70 filter. The signal-to-noise ratios jumped up by a factor of 2! He is very happy with his King loran and recommends the Hisonic filter. They are expensive at around \$100.00 ea. but are very effective. Dick Rutan has one installed in his Long-EZ with the same excellent results. Dick, in fact, was the person who advised Mike to try the RFI-70

Contact: San Val
7456 Valjean Ave.
Van Nuys, CA
818-786-8274

or

Pacific Air Radio
16143 Waterman Dr.
Van Nuys, CA 91406
818-786-8800

RAF RECOMMENDED SUPPLIERS

Aircraft Spruce PO Box 424 Fullerton CA 92632 714-870-7551	Wicks Aircraft 410 Pine Street Highland, IL 62249 518-654-7447
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FeatherLite PO Box 781 Boonville, CA 95415 707-895-2718	Brock Mfg. 11852 Western Ave. Stanton, CA 90680 714-898-4366
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WANTED

Complete or partial Whelen strobe set-up for Long-EZ: 2 ea. A600-PG/PR
1 ea. A413A, HDA, SF
1 ea. HD-60 installation kit.

Contact: Frank Nowak
Searle Road
Huntington, MA 01050
413-667-5595

FOR SALE

Many builders have had difficulty locating the correct springs called out to be installed in the rudder cables when installing the flush rudder belhorn modification. The springs called out in the plans are available from Century Spring Corp. but this company has a \$25.00 minimum charge! Fortunately, John York, a Long-EZ builder who experienced the same problem, has informed us that he has a supply of these springs and is willing to keep them in stock for a year or two. He will sell the springs for \$1.50 each plus \$1.00 shipping. So send John a check or money order for \$4.00 and he will send you a pair of springs!

Contact: John York
230 Coachmans Way
O'Fallon, MO 63366
314-281-5851

Thanks for your generosity, John. We realize this is essentially a non-profit operation but it is a much needed service.

Crankshaft for Lycoming 0-235-L2C. 1000 hrs. total time. Magnafluxed. Mains polished to .003" under. Pins are within standard service limits. Cad plated and baked flange with service tag.

Dry vacuum pump, Airborne model 211CC.
Best offers to: Bernard Hayes
4305-D Westchester Dr. NE
Cedar Rapids, IA 52402
319-378-1331

New Stratoflex brake lines (stainless braided over teflon) 2 at 106" long each with dash 3 ends per Mike Melvill in the CP. Ordered from Aircraft Spruce, never installed, new cost - \$235.00, sell for \$200.00.

14 volt geared Prestolite starter - \$190.00.
14 volt, 60 amp Chrysler alternator - \$150.00.
Two prs. Sigtronics headsets plus a SPA-400 Sigtronics intercom - \$500.00.

Contact: Hal Hunt
818-989-5534

Pair Cleveland 500-5 wheels, brakes and discs. Excellent condition - \$200.00

Pair Cleveland 500-5 Wheels, brakes, discs, axles, axle nuts, tires & tubes, complete. Excellent condition - \$350.00.

Oil pressure gage, Westach, no leads or sender - \$25.00.

Mechanical tach - \$30.00.

CHT gage, no lead or sender - \$25.00.

Fuel pump, Facet, 12 volt - \$25.00.

Fuel pump, Bendix, 12 volt - \$25.00.

2 ea, VariEze or Long-EZ carb heat selector boxes - \$50.00 ea.

2 Cessna 172 dry air cleaners - \$5.00 ea.

2 Rosenhan master brake cylinders with reservoirs - \$20.00 ea.

Pair Rosenhan brake assemblies - \$100.00.

Assorted circuit breakers:

Pullable	Non-pullable	
1 35 amp	1 35 amp	
1 25 "	2 10 "	
2 10 "	5 5 "	
3 7 "	1 3 "	
4 5 "	2 2 "	\$2.50 ea.
4 Assorted auto compasses -		\$5.00 ea.
1 Cleveland master cylinder -		\$30.00.
1 complete, new Whelen strobe assembly model #A413A HDA DF 14 14 volt four outlet -		\$175.00.

Contact: The Cutlers
PO Box 1058
Dublin, PA 18917
215-257-0817

61x66 B&T prop SAE 1 Hub - \$250.00

62x66 Hendrickson Prop SAE 1 Hub - \$250.00

6" Rotodyne Prop Extension SAE 1 to SAE 1 - \$275.00

Sport Flight Exhaust System - \$200.00

Contact: Pete Simmons
219 Pendleton Hill Rd.
North Stonington, CT 06359
203-535-2040

LETTERS

"Dear RAF,

Just thought I would drop you a note concerning a problem that I experienced in my VariEze on the way back from Oshkosh that might be of significance to other Ez's. Fortunately, the only harm done was a few minutes of inconvenience instead of what could have been a serious problem. I made a normal landing at Douglas, WY after a 4.5 hour flight from Duluth, MN. After rolling clear of the active runway, I found that advancing the throttle resulted in only a 100 rpm increase over my normal engine idle speed. Surprise! I had just successfully completed my first forced landing without even knowing it!

A check under the cowl revealed that one of the two throttle springs (the one with the most mechanical advantage, naturally) had cut its way through the aluminum bracket attached to

a vacuum pump stud on my Cont. 0-200. The second throttle spring was within a whisker (a few thousands) of also cutting through the bracket. Wear at the other end, on the thicker (also aluminum) throttle bracket was quite evident but well short of failure. A check of all other engine related springs showed essentially no wear, so it is pretty obvious that my particular combination of throttle springs was resonating under the influence of the engine vibration, greatly accelerating the wear rate on these brackets. Total time on the installation was just over 800 hours. About 25 hours prior to the failure, I had switched back to a prop that I hadn't used for several years. If anything, this propeller runs smoother than the one that it replace, so I doubt that the "new" prop was a major factor. I would like to think that this problem developed after my last annual inspection (at 730 hrs.), but must admit that it looks like I missed seeing it despite the detailed check list that I use that explicitly includes all the engine controls and cables. I always go over the engine with a clean rag and (I thought) a sharp eye at every oil change looking for trouble, but didn't catch it at 765 hrs. either.

The following lessons suggest themselves to me:

1. Very careful attention to the condition of all engine related controls, as you have pointed out numerous times (e.g., CP61 pg. 7), is critical. A careful inspection of the engine, controls and exhaust system at every oil change could save your plane and/or life.
2. Ideally, the throttle and mixture controls should not require springs to open the throttle or enrich the mixture. This is difficult to accomplish with the Continental 0-200 using a single cable system because of the force required to overcome and positively actuate the accelerator pump.
3. Regardless of whether item 2 can be accomplished, springs are needed as a fail safe backup in case something else breaks (like the cable or outer cable clamp).
4. I believed that either spring alone was strong enough to actuate the throttle arm.

With fuel in the carb, this wasn't the case. Instead of having a backup spring in case one failed, I actually doubled my chances of experiencing a throttle linkage failure by having two interdependent flight critical items. Obviously, other EZ builder/pilots need to inspect their particular installations to assure themselves that their controls will function reliably with any single spring failed. In my particular case, even if a single spring had been sufficient to open the throttle, only a few more hours of operation would have passed before the second spring also cut through the bracket.

5. Hindsight engineering makes is pretty clear that my brackets were plenty strong enough to carry the spring loads, but were not designed to withstand (or prevent) high rates of wear.

6. Finally, as my flight instructor told me long ago, "Don't count on being able to add power to make the runway."

To close on a more positive note, I love N862DP. So far it has made eight trips from San Diego to Duluth in nine years, with two side trips to Oshkosh, plus many other places all over the West. Last year I made it from here to Duluth with one stop in Rawlins, WY, and one-day trips over this 1500 nm route are the rule rather than the exception. Three years ago my daughter made the trip back with me when she was not yet five years old. I have and regularly use the Aerox system-it's great! Living in San Diego, I get lots of chances to climb out or land through our coastal stratus. So far, I have accumulated over 25 hours of actual IFR in N862DP. My plane does experience a definite pitch down trim in or near precipitation that requires significant retrimming.

This Spring I really enjoyed attending the EZ fly-in at Kanab, UT and Burt's birthday fly-in at Kern Valley (plus Oshkosh, of course). Enclosed is a picture of a flight of Southern Calif. EZ's returning from Kern Valley fly-in. Sorry I missed you at Oshkosh.

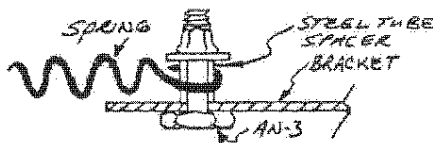
With best regards, Don Patch"

THROTTLE AND MIXTURE CONTROL SPRINGS

Referring to Don Patch's letter above, we agree with Don's comments and we really appreciate his bringing this to our attention so that we can bring it to all the EZ builder/flyer's attention. As we have said many times, having perfect control of your engine is just as critically important as having perfect control of your elevators, your ailerons and your rudders. Anything less is almost certain to cause an accident which could result in the loss of the aircraft and possible the loss of life.

The bracket that Don refers to is a 1/16" thick aluminum bracket which he had mounted on his vacuum pump pad. He had drilled several 1/16" diameter holes through this bracket in order to "hook" the two springs through the bracket. Over the 800 or so hours of operation, the vibration had caused these springs to slowly "saw" their way toward the edge of the bracket. One of the springs had, in fact, "sawed" through almost 3/16" of the bracket until it broke through the edge. The other spring was almost at this point.

While this method of attaching a spring works OK (indeed, it was the same method used on Burt's prototype, N4EZ), it is prone to this kind of vibration induced failure. A preferred method is to install an AN-3 bolt through the aluminum bracket with a short spacer. The spring should be installed so that the loop of spring is supported by the spacer. See sketch .



We have used this method successfully on several installations, some of which have been in operation for many years, with no failures.

The throttle and mixture both should be set up and adjusted so that they will work with no springs installed. The springs should be installed so that they pull the throttle to full power and the mixture to full rich in case of a

cable failure.

These springs, cables and all engine controls should be carefully examined and checked for correct and full operation each time you remove your cowling, whether it be for an oil change or for whatever reason, or every 25 hours.

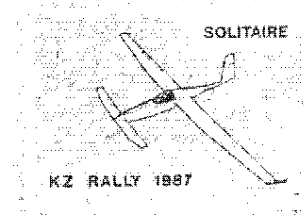
If you have these springs installed in a similar manner to what Don Patch had, you should check to see that you do not have the same failure, or close to failure, that he had - before next flight.

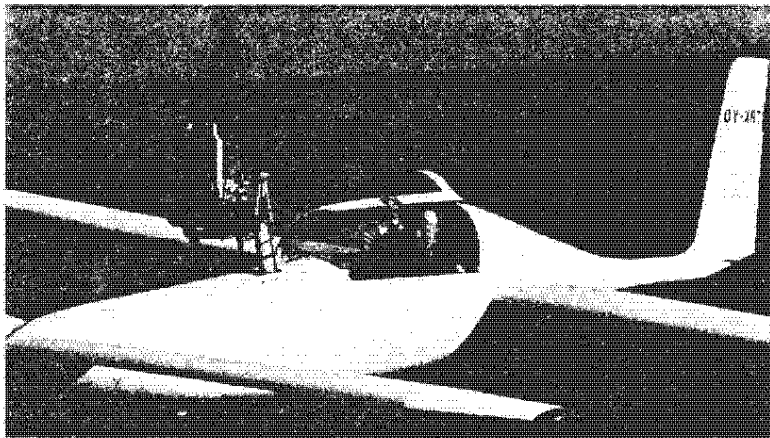
SOLITAIRE NEWS

SOLITAIRE OY-83X11 (FOR FIRST FLIGHT ONLY, OYXRT)

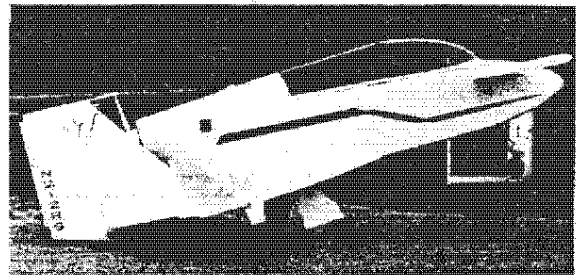
Kjeld Pedersen and Ole Ploug have completed the first Solitaire in Denmark. In fact, it is the first experimental glider ever to be registered in Denmark. We met with Mr. Pedersen at Oshkosh 1990 and he showed us a number of photographs of this beautiful Solitaire. We were surprised to learn that he and his partner, Ole Ploug, had been working with Herb Abrams, an Ohio Solitaire builder and designer of the Stan Dzik Award-winning engine installation in his own exquisite Solitaire. Kjeld also had the identical engine installation in his Solitaire. Kjeld made his first flight at a Denmark military installation using the Herb Abrams designed engine installation. This was on 7 July, 1990, only a couple of weeks after Herb made his first flight. Based on the photos we saw at Oshkosh, the attention to detail on Kjeld and Ole's Solitaire is impressive.

The KZ Rally in Denmark honored Kjeld and Ole by producing a commemorative stamp with their Solitaire depicted on the stamp Congratulations, Kjeld and Ole, we look forward to a more complete flight test report in the near future.





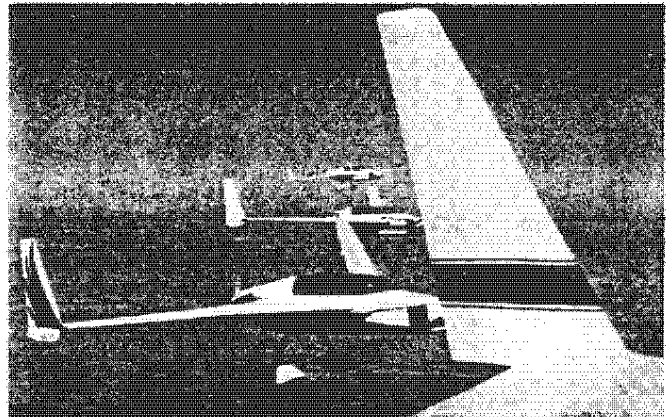
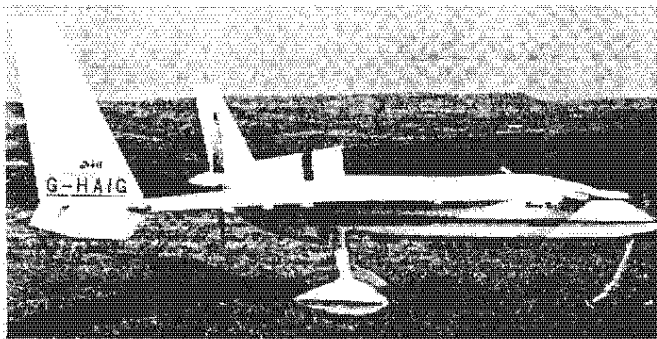
Kjeld Pedersen after his first flight in OY-XRT, a beautiful Solitaire Kjelid and his partner, Ole Ploug, built in Denmark.



Ron Smith recently completed this beautiful example of a VariViggen. He flew it to Oshkosh 1990 where Burt got to try it on for size.

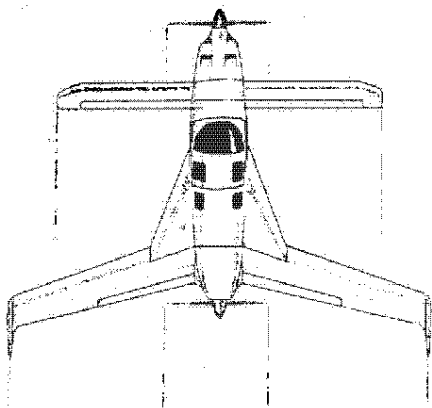
Return to San Diego from Kern Valley, Burt's birthday party. Photo by Mike Romanowski taken from Don Patch's VariEze, N862DP, over Mojave.

Philip Neil Haigh's brand new Long-EZ recently flew in England. You have to see the incredible attention to detail in this plane to believe it.



**Rutan Aircraft Factory
Building 13, Mojave Airport
Mojave, CA 93501**

first class mail



TO:

October '90

The line which appears above your name lets you know through which Canard Pusher you are paid. If your label says **LAST ISSUE CP 65** then this is your last issue, and you need to renew.

CP 65