

THE CANARD PUSHER

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If you are building a VariViggen from 1st Edition plans you must have newsletter 1 through 36. If you are building from 2nd Edition plans you must have newsletters 18 through 36. If you are building a VariEze from 1st Edition plans you must have newsletters from 10 to 36. If you are building a VariEze from 2nd Edition plans you must have newsletters from 16 through 36. If you are building a Long-EZ you must have newsletters from 24 through 36.

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

The RAF hangar is located on the west end of the flight line at the Mojave Airport, Mojave, Ca. approximately 80 miles north of Los Angeles. You are welcome to come by and see our aircraft or to bring in any parts for our comments. We are normally open from 8:00 to 12:00 and 1:00 to 5:00 on Monday through Friday and 9:00 to 3:00 on Saturday. Closed on Sunday

If you are planning a trip to see us, please call first to assure that someone will be here to assist you, since occasionally we are gone to flyins. When arriving at Mojave by car turn east at the Carl's Jr. restaurant to find the airport.

When writing to RAF send a stamped, self addressed envelope along if you have any questions. If you are placing an order, it's best to keep it separate from a request for an answer to a builder question. Mark the outside of your envelope "builder questions". This will speed up your reply.

Aircraft on Display at RAF

We have on display at RAF two Long-EZs and the Solitaire. We are often asked why the Defiant and the Grizzly are not available for viewing. Two reasons - first is that there simply is not enough space, if we could get Grizzly in the hangar, that would be all that would go in!! Second is that the Grizzly and Defiant were not designed as homebuilts, only as research and development aircraft. Building a research and development aircraft every once in awhile is necessary so that RAF can test and try out new materials and methods that will benefit the next homebuilt.

During 1983, RAF will be closed for three-day weekends on the following dates:

May 30 Memorial Day
July 4 Independence Day
Sept 5 Labor Day
Dec 24 Christmas

RAF ACTIVITY

Since the January newsletter RAF had a trip to the Annual Sun 'n Fun flyin at Lakeland, Florida. The Solitaire was shown with the retractable engine at the Soaring Society of America's convention in Reno, Nevada. The doors were installed on the Solitaire and much work has been done toward preparing the distributors for the Solitaire program. Mike and Sally's Long-EZ made the cover of Technology Illustrated magazine. Builder support and Saturday demos continue as usual.

SUN 'N FUN - 1983

Mike Melvill and Michael Dilley attended the Sun 'n Fun for the last two days of the show. The weather was less than optimal, it rained so much that the afternoon airshow was held only on Wednesday, Friday and Saturday. In spite of the weather 32 EZs flew in during the week, 23 VariEzes and 9 Long-EZs. Unfortunately Irene (Mom) Rutan was unable to attend so we do not have all the pilots names.

An excellent IVHC dinner was held at Christina's Smoke House hosted by the EZ Builders of Florida. There must have been well over 100 people attending. A high light of the evening was Charles Gray presenting a Birthday cake to Charlie Auton for his 80th birthday. Charlie has a student pilots license and has recently completed his own Long-EZ. Charlie flew it into Lakeland. He has about 6 hours in it so far and says it is much easier to fly than the other "spam can" trainers he has flown!

The "Michaels" gave a Solitaire and Long-EZ talk and slide presentation which were both well attended. Walking up and down the rows of EZs and meeting with and talking to the owners was lots of fun as always.

Tim Gehres sponsored the annual EZ race. Three Long-EZs and three VariEzes were entered. Herb Sanders won at a blistering 200 mph speed over the 51 mile course.

For the last two days, the weather cleared the flybys were in full swing allowing the "Sun 'n Fun" to live up to its name.

Reno, Nevada - Soaring Society of America's Convention

Sally and Michael Dilley drove the van towing the Solitaire in a borrowed sailplane trailer up to Reno with Burt and Mike flying up the Sierra Nevada mountains in the Defiant. What a sight - tons of snow.

Solitaire was put on display in the convention hall in the MGM Grand and was well received by the 2500 or so Soaring enthusiasts attending. The electro-hydraulic engine/prop extend/retract system was given a thorough workout with literally dozens and dozens of cycles, demonstrating it for four days.

The SSA convention was a success and we were pleased with the reception given to the Solitaire. Quite a few sailplanes were on display, including a couple of self launching models. Both of these cost in excess of four times the cost of a Solitaire. Burt gave a talk on Solitaire and we were very proud that he received the "Exceptional Achievement Award" from the SSA at the Awards Dinner.

LONG-EZ COMPLETES TESTS AT EDWARDS AIR FORCE BASE, CA

We are pleased to announce that the United States Army has built 2 Long-EZs at Fort Lewis, Washington. One of these Longs has recently completed a comprehensive static load, ground vibration test and flight test program at Edwards Air Force. The Army is studying the Long-EZ with its all composite construction to see if the design can be applied to future Army aircraft. Test pilots, Major Don Underwood and Major Robert Ward both agreed that the handling characteristics of the Long-EZ are very good.

Both Long-EZs will be involved in an evaluation program starting in May of 1983 and lasting approximately 6 months. This is to determine the feasibility of using the latest civilian technology in a military environment.

(Does this mean that we can park our "replicas" with the War Birds at Oshkosh ????)

SOLITAIRE

Solitaire is now complete. The KFM engine folds in and out with two doors closing over the engine when it is folded away. We use an electro/hydraulic pump to raise and lower the engine/prop assembly. We have 10 hours on this configuration with no problems.

Two people can easily put a Solitaire together or take it apart in under 10 minutes. Solitaire should fill a void in the spectrum of aviation, in that the average private pilot can build one for between \$7000 and \$9000, including engine, but not including instruments or avionics. He can then store it on his driveway in a relatively small trailer, thus no hanger or tiedown rent. He can drive it to his local airport, remove it from the trailer, assemble it himself (using a wing stand) or better yet with the help of another person. He can then strap in, switch on the master switch, extend the engine and start the engine using the electric start.

Taxing is an absolute delight. It is done on the two main tires and one wing tip wheel or once you are up to a brisk walking speed, you can raise the wing tip to wings level, and taxi on the mains. The nose wheel is steerable. The rear wheel has a small hydraulic brake. It is easy and lots of fun to taxi. The take off is simple, no mags to check, engine running, full throttle and you are ready. Ailerons keep the wings level, nose wheel steering and rudder keeps Solitaire pointed down the runway. Acceleration is reasonably quick. It will rotate at around 35 to 40 KIAS and lift off shortly thereafter. Climb out is best at 40 to 45 KIAS. Climb RPM is 5800 to 5900 RPM. CHT should not exceed 350° F. The prototype will lift off in 600 to 800 feet. Mojave is at 2800 MSL and density altitude this time of the year runs around 3500 to 4000 feet. Rate of climb is about 400 ft/min initially and this tapers down to 200 ft/min at 9000.

Once you are high enough, throttle back to idle and kill the engine with the ignition switch. The prop will stop if you are below 60 KIAS. Pull out the red knob which actuates the prop centering cam, the prop will windmill gently onto the cam. Flip a switch to retract the engine. It will fold away and the doors will close in about 7 seconds. Now you are in a 32:1 sailplane and even if you have never done so before, you can enjoy the quiet solitude of soaring. If conditions are good, even a neophyte may be able to gain a little altitude.

As you descend back down through 1000 feet above the ground, extend the engine, crank it up and enter the pattern just as you would in your favorite "Wichita Wonder". The spoilerflaps are very powerful and allow excellent glide path control. With experience, full spoilerflap is extended on downwind, opposite the numbers. The nose is pushed over to hold 60 KIAS. This speed is held until you are on short final, then by varying the spoilerflaps, you will be able to touch down at 35 to 40 KIAS and roll to a stop in 300 to 600 feet. Or you can close the spoilerflap and push in the throttle for a touch and go!! Lots of fun, touch and goes are not normally practiced in a sailplane but are easy in the Solitaire and very good practice to enable you to get used to the spoilerflaps. Taxi back to your trailer (no need for a ground crew) and refuel or disassemble and off for home. Solitaire has a fuel capacity of 5 gallons, so you could fly with the engine running for over an hour and a half. This is not the purpose of the Solitaire. The engine is simply a replacement for the tow plane and it gives you the freedom and flexibility to soar where and when you want to, independent of expensive tow planes.

Plans - As with the other homebuilts that RAF has done, RAF will be supplying the plans and builder support. Licensed distributors will handle the kits. Plans for the Solitaire will be available June 1, 1983. The owners manual and engine installation will be available August 1, 1983.

Task Research has done all of the tooling for the prefabricated glass parts and are the approved distributor for prefab fuselage shells, main wing spars, turtle deck, seat pan and canopy in it's frame. In addition to the above basic kit, Task Research intends to provide as an option prefab bulkheads, fairings, wing tips, engine cover doors and possibly hot wired foam wing cores.

Contact: Task Research Inc.
848 East Santa Maria
Santa Paula, CA 93060
(805)525-4545

Ken Brock Mfg. will have all premachined metal parts including brackets, belcranks, weldments, mounts, hinges, latches etc. Available either as a complete package or as individual parts as needed.

Contact:
Ken Brock Mfg.
11852 Western Ave,
Stanton, CA 90680
(714)898-4366

Aircraft Spruce and Wicks Aircraft will have all of the raw materials, cables, nuts, bolts, washers, foam, glass and epoxy necessary to complete your Solitaire.

Aircraft Spruce
P.O. Box 424,
Fullerton, CA 92632
(714)870-7551

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

PREFAB PARTS FOR SOLITAIRE

The following is from Task Research, the manufacturer of the prefab parts for the Solitaire and Long-EZ.

"Essential Kit": so called because RAF has chosen to not supply drawings or information for these parts to be homebuilt. Fuselage shells are fully formed half shells made in molds with prepregged epoxy glass cloth and Nomex honeycomb core, vacuum bagged and oven cured. Assembly will be easy because the edges are formed with a double joggle like so:



To make it easy to fit and then bond together using clecos or pop rivets and floc and then when cured, taping the joint as specified in the plans. All the molds are taken from one master pattern so all are coordinated with each other for fit. All necessary reference marks are scribed in the molds and transferred to the parts. Final trim and installation are left to the builder. Plywood or solid glass inserts are included and glass to glass edges are formed. It will be necessary to add some reinforcements where they are required in the construction sequence. You will note that each component may be purchased separately and is priced accordingly.

Wing Spars: Wing spars are manufactured in Class A metal molds and have the metal fittings attached. The spar caps are pressure molded in heated molds that assure proper size and density. Shear webs are wet layups and the spar final size and shape is controlled by the mold. Should you ever need a replacement, you can be sure that it will fit as well as the original one.

Frills: We have listed all the parts that you have the information to build yourselves as "Frills". The advantages of getting these parts preformed are (1) time savings; they are ready to trim and install. (2) Weight savings; prepreg epoxy glass parts will weigh about 15% less than the same wet layup parts. Task Research and RAF's intention is to develop components to help you build your Solitaire with the same quality as the finest glass sailplanes and motor gliders.

Pre-impregnated glass fiber with epoxy resin is purchased from Hexcell Corp. and is kept in cold storage 35/40° until used. It is then laid in the mold with the proper core materials and core adhesive, and to the correct lay up schedule, placed under a plastic bag and sealed. A vacuum is pulled to compress the entire sandwich against the mold. Next it goes into the oven for curing at 215° to 250°. The end result is a very strong light weight structure.

Nomex Honeycomb, the same material as is used in many aerospace products is an Aramid Fiber/Phenolic resin product. Task Research Inc. uses it in the Solitaire because it makes a lighter stronger shell than any of the foam cores.

Film adhesives are used between the pre-preg cloth and the Nomex Honeycomb as a bond enhancer to guarantee the highest strength shells. It is a partially cured adhesive film on a throw away carrier film.

Foams - PVC or Clark Urethane is used for bulkheads and other flat or light contoured parts.

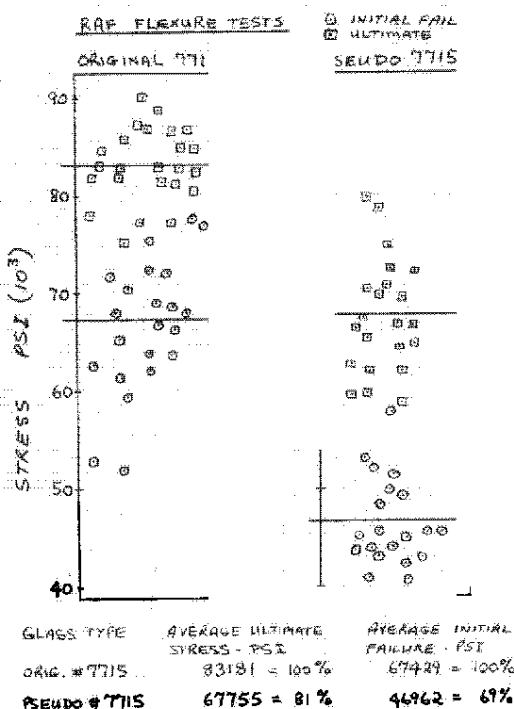
Spar caps are made from S-2 glass roving (strands). Made from the same glass roving as the Long-EZ landing gear. First it is wet out to the proper percentage of resin to glass then packed in heated metal molds for curing. Both pressure and temperature are regulated. The spars consist of completed assembly with core and shear webs. They are jigged and drilled to fit. This allows later replacement if one wing is damaged.

Caution!- Pseudo Fiberglass Cloth

It has recently come to our attention that a cheaper 'version' of our UND #7715 cloth is available from a different major weaver. We obtained a sample of this glass and admit that our first impression was favorable. By just looking at it, it was virtually identical to the original #7715. We cut equal size pieces and weighed them on a gram scale. Weight was identical. We did a few sample layups to check wet out and the ability to layup around a tight radius. Again essentially the same performance. We felt we had something we could recommend.

We then decided to do a simple flexure test of this new cloth comparing it directly with our original UND. The test consisted of 24 coupons of each type. We failed all of them and plotted the results. We faired a line through the 24 points to obtain an average. The result was startling. The new cloth was 19% weaker at ultimate load and 31% weaker at initial failure. See the graph below.

NOTE: The really confusing aspect of this is the fact that the weaver of this cheaper material saw fit to call it by the same part number #7715.



This means that if you were to use this material to build your VariEze or Long-EZ, even though you may have excellent workmanship with optimum resin to glass ratios, you would still have an airplane that could suffer a structural failure at only 81% of the expected load capability. Worse than that, the initial failure point (first noise) would occur at only 67% of the normal expected load. This is not acceptable since it would be impossible to detect initial failure occurring in flight. It could sneak up on you. Do not take this lightly. If you have purchased UND glass from any source other than Wicks Aircraft and Aircraft Spruce, you almost certainly have the wrong glass. Spruce and Wicks have been the only source of the correct UND, due to proprietary rights. If you have built any major structural parts (wings, winglets, centersection or canard) from this glass, you should discard them.

EPOXY REACTIONS

A small percentage of our builders continue to develop allergic reactions to the Safe-T-Poxy. Applied Plastics, the manufacturers of the epoxy continue to try to isolate whatever it is that causes this problem. It is not an easy task. Safe-T-Poxy was recently retested by an independent lab and again came up with an SPI rating of zero, on a scale of 0-10. Applied Plastics has published an excellent brochure covering all aspects of using epoxy, precautions to take and what to do if you react to it. They also evaluated the various types of gloves that are on the market. They have a brochure that very thoroughly covers this subject. It turns out that the only glove that is an absolute 100% barrier is one made of Butyl. Butyl gloves are expensive but Applied Plastics has found a reasonable one that will last a long time with care and still gives good feel. Some people are effected by contact with the material, others by inhaling the fumes. A good quality respirator with charcoal filters will go a long way toward curing the latter problem. Again Applied Plastics have found a very nice disposable charcoal filter which they have in stock.

Write to Applied Plastics and enclose a SASE for the brochures and prices of the Butyl gloves and respirator. See page 7 this CP.

No one at RAF has developed an allergic reaction to either the old RAE epoxy or the Safe-T-Poxy. We are always careful and after every layup we wash our hands and arms very thoroughly using Lava soap. Mike Melvill has been using Vaseline brand "Dermatology Formula Lotion". He uses it morning and evening whether or not he has worked with the epoxy. Mike has been working with the various epoxies RAF has recommended for 9 years and is a firm believer in washing after short layups and even during large layups. Different techniques may be required for different individuals. Cotton liners under vinyl, rubber, latex or butyl gloves are an excellent idea. These absorb the sweat. Do not apply Ply 9 as well as wearing gloves. Ply 9 works quite well by itself, but the barrier it forms, (which is impenetrable by epoxy) can be ruptured while working. If you suspect this has happened or if a glove is torn, stop. Take the time to wash your hands, dry them and reapply Ply 9 or a new pair of gloves.

Take care of yourself while building. A few builders have simply had to give up their projects due to severe reactions. Do not think it won't happen to you. Everyone has a level of tolerance at which their body will cry 'uncle', don't try your luck.

PROP EXTENSIONS

As described in CP 30, page 5, the 6" prop extension has continued to provide trouble free operations. We have sufficient time on these extensions on two Long-EZs here at RAF to feel confident in recommending the 6" extension as well as the 3" extension.

Note that we have only tested these on Lycoming engines. Due to the smaller crankshaft diameter of the Continental engines and the lack of data, we cannot recommend anything but the thoroughly tested 3" extensions for Continental engines.

The 6" extension does reduce the noise level in the pilots seat by as much as 3 decibels (DBA scale). However it also increases cylinder head and oil temperatures slightly. The worst case is a new or recently overhauled engine, in a new airplane. It is possible that engine temperatures could go out of acceptable limits during the first few hours of operations, especially during ground testing. We have noticed on an engine with hundreds of hours, that if we are forced to run the engines standing still on the ground for extended periods of time, in excess of 30 minutes or so, the cylinder head temperature can climb right to the red line. Using a 3" extension this will not occur.

To summarize: We recommend both the 3" and 6" prop extension for the Lycoming engines, and only the 3" extensions for Continentals. You, the builder must decide which to use in your application.

Unintentional Spin in Homebuilt - Long-EZ N711QA

As you know, our Long-EZs have undergone extensive high angle-of-attack testing at all cgs and configurations and the results have shown them to be immune to stall, departure or spins. Vigorous and sustained combinations of all flight controls were input, by us and by a NASA pilot with the same results. The Owners Manual does caution, though that experience has indicated not all examples fly the same and that the builder should be aware of differences. We have recently heard from a Long-EZ owner who has experienced a spin and his report is published below. It is possible that he was operating aft of the aft limit cg. His impression of the effects of power for recovery are probably due to the oscillatory effects of the incipient spin since it lasted only two and a half turns. Conclusive data on power effects can only be made after a stable (developed) spin rate is achieved (over 2 or 3 turns) and by study of flight test instrumentation-obtained data. See also our LPC #115 on page 6.

Pilot Info: Age 63, 30,000 plus hours, flew Aerocass, Cubs, Monocoupes, Cessnas, Stinsons, Wacos, Fairchilds, Douglas DC 3-4-6-7-8, Boeing 747 etc. Currently own half interest in a Pitts S-1, Long-EZ and a 1927 Monocoupe".

"Conditions - Gross weight 1070, Fuel 84 lbs left tank and 42 lbs. right tank, CG - maximum aft, altitude 3000 ft, SL - 2200 ft above ground, WX - CAVU

While approaching a stalled condition with the nose about 15° up, air speed 62-65 mph, the left wing went down about 60° followed by the nose dropping and the airplane entering a left spin. The nose was at least 60° down. After the spin had started, an attempt to recover was made by using forward stick and opposite rudder. There was no response. Opposite aileron was also used which may have aggravated the situation. The aircraft had a rather rapid rate of rotation - faster than a Citabria type but less than a Pitts S-1. Also there was pressure to the right - being pushed against the right side of the cockpit. With no response from basic control inputs the throttle was "jabbed" which resulted in a momentary slower rotation rate. When the engine idled back, the rotation returned to its original quite rapid rate. The throttle was then opened (1/8 - 1/4) and left there. The spin rate decreased and a recovery was effected. The pull out from the dive did not result in high air speed. The actual speed was not observed; however, the G load was not excessive - less than the bottom side of a loop with the airplane.

The number of rotations was about two and a half and 800 to 1000 feet of altitude lost. After climbing a few thousand feet a half hearted attempt was made to duplicate the situation, but it was unsuccessful.

With the many times that the almost identical flight conditions have been explored that is the only time this condition ever surfaced or gave any indication that it might surface. The airplane has about 180 hours on it and flies and performs beautifully.

Approaches to stalls have been very normal and docile. Usually a wing will drop (30° at the most) followed by the nose dropping, and then wings can be leveled with either rudder or aileron. During this incident no attempt was made to level the airplane until the resulting spin was entered.

That the gyration was a tight spiral does not seem logical for a couple of reasons. From past experience with spins and spirals, had the airplane been spiraling considerable speed would have built up and basic control would have been regained. Also the pull out would have had much more speed.

As to the effect that the engine had on recovery, one wonders whether it was the thrust that aided recovery or the resulting torque, or both.

The only change to the aircraft since the original flight test is the addition of wheel fairings. It would not appear that they would cause appreciable change in flight characteristics particularly at such low air speeds.

Sincerely, Paul Wallace.

Paul reports that he installed 10 lbs of lead in the nose and his Long-EZ now flies at full aft stick per the book.

NOTE: When doing the original envelope expansion on your new Long-EZ, wear a parachute and have at least 7000 feet of altitude. If you find yourself routinely operating at aft CG, ballast to around mid CG. Any aircraft flies better at mid CG, a little lead up in the nose does not hurt a thing.

N26MS - Mike and Sally's Long

With 521 hours on the Hobbs, 26MS is running like a dream and continues to prove what a reliable high speed transportation machine a Long-EZ is. I recently got tired of my combination 12V/24V system which never did work correctly. I cut the front cover over the instrument panel off and rewired the airplane to be a 100% 24 volt electrical system. It was intimidating thinking about how I was going to do this, but once started it was actually quite simple to do. I have also installed Wes Gardner's fuel sight gauges (see CP 35 page 10) and must say I am pleased with the result. Also installed Wes's oil separator breather and it has worked great! No more cleaning cowlings after landing.

A few weeks ago a photographer from "Technology Illustrated" took a bunch of slides of my Long-EZ for the cover of the May edition. He wanted to light up the inside of the cockpit. He handed me a remote controlled flash unit with quite a heavy power pack. Like a dummy, I laid it on my lap, not tied down. In the middle of the photo session, I hit a strong bump, the flash unit sailed off my lap and crashed into the canopy cracking it badly just in front of my head. It cracked almost clear across with a hole a couple of inches square. It scared me but once I slowed down and pulled the cracked pieces back into place, I found it to be no immediate problem and was able to complete the mission.

Sally temporarily repaired it by laying up a huge fiberglass patch both inside and out. A least we could fly until the new canopy came in. Actually went to the IVHC Agua Caliente flyin this way! I talked to Dan Patch and Phil Cornelius, both of whom had been through repairing a broken canopy.

First we cut the plexiglass canopy about 1" above the rail all the way around (son Keith did the work, I supervised!). This removed the broken canopy. We turned the frame over and cut through the fiberglass just inside the edge of the plexiglass lip. This allowed us to peel out the fiberglass piece that fitted the original plexiglass bubble exactly. This thin glass "frame" was carefully layed into the new "bubble" and was used to layout where it should be trimmed in order to fit. While I cut the new bubble, Keith broke out the remaining plexiglass with a vice grip, a hammer and wood chisel and a dremel grinder. The plexiglass does not come out easily. After the frame was cleaned up, the new bubble fitted almost perfectly. We floxed it into the frame and let it cure over night. Next morning, I trimmed and sanded. I microed in all the voids and then layed up two plies of BID over the plexiglass up onto the inside of the frame. I let this gel up for a few hours, then reinstalled the whole canopy/frame onto the airplane. I locked it down and let it cure for two days. This assured that it would fit the fuselage. Later I removed it, cleaned it up and sprayed the charcoal Zoletone inside the canopy frame. I did not have to repaint the outside frame. The new canopy gives me a little more head room (not all canopies are alike!) and the visibility without the fiberglass patch is superb!!

FROM THE BUILDERS

Don Foreman from England (one of the builders of the first VariEze (G-LASS) to fly in the UK) is about ready to fly his Long-EZ (G-RAFT). Don has installed a Continental O-240, 130 hp. by Rollis Royce. His empty weight is 847 lbs with starter and alternator. As of this date (April 14) Don has run his engine and will be at the airport within two weeks for taxi testing and flight testing.

George Allison of South Africa reports the first flight of his Long-EZ (ZS-USS) in January '83. George is a first time builder and completed his Long in good time.

His biggest problem was getting parts from the USA. George installed a Lycoming O-235-C2C and a B & T prop. Congratulations!

Homer "Mac" McClanahan (N3260T) and George Kelley (N3260K) both from Long Beach, California built their Longs together. Their Longs weigh within 1 lb of each other, were both ready to fly at the same time and the latest two Longs to fly. Congratulations Mac and George.

We received the following letter from Long-EZ co-builders, Bob LaBonte and Dick Dorman:

"Dear Folks at RAF,

Just a few words of thanks for the great design you produced in the way of the "Long-EZ". The plans are very well written and quite simple to follow. This is the first plane we have ever built and we are extremely happy with the results.

N31542 flew for the first time on Sunday, September 15, '82 while we were conducting our second day of high speed taxi tests. That first flight lasted for 45 minutes and flew hands-off well within the trim range. Our ship has an O-235-C turning a Ted Hendrikson 62 x 66 prop and has an empty equipped weight of 824 lbs. The performance is close to specs with no wheel fairings. We completed the project in 23 months.

We wish to thank all the people at RAF who have been so helpful on the phone and at the airshows whenever we needed assistance. Your builder support program is unquestionably one of the keys to the success of the EZ program.

Sincerely, Bob LaBonte and Dick Dorman"

CAFE 400

This year's efficiency race promises to be just as exciting as ever. If you have never entered, you should. It is quite a challenge and most rewarding.

The event consists of an approximately 400 statute mile closed course flight competition for propeller driven aircraft weighing less than 6500 lbs.

Awards will be given to the aircraft with the highest score according to the CAFE formula which is:
Speed X miles per gallon X payload.

The race will be held at Santa Rosa Air Center, Santa Rosa, California on June 24 and 25, 1983. An entry fee of \$50.00 is required for each aircraft.

Contact: Brien Seeley MD
CAFE 400
4370 Raymonde Way
Santa Rosa, CA 95404
(707)526-3925

INTERNATIONAL VARIEZE HOSPITALITY CLUB FLY-INS

1. Brookridge Air Park, IL.April 23, 1983
Contact - Buzz Talbot - (312)985-5254
- John Steichen (312)985-6671
2. Jackpot, NvJuly 4th weekend
Shirl Dickey, 1646 Allegheny Drive, Murray, UT 84107, is organizing a IVHC flyin at Jackpot, NV. A motel is close by and is \$36.75 per night per couple. Camping is available 100 ft from the airport. On Sunday, Shirl would like to have an EZ race from Jackpot to Wells and back, 118 statute miles. There will be 4 classes based on horsepower. Ribbon cutting and spot landing contest on Saturday and possibly a golf and tennis tournament depending on the interest. There are 3 casinos within walking distance of the motels and airport. Shirl is planning a banquet on Sunday evening - prime rib for \$10.50 per person. Please contact Shirl if you are interested, especially if you would like to enter the race. Contact - Shirl Dickey - (810)268-3360
3. Wallowa Lake, ORJuly 16 & 17 1983
Contact - Ray & Nova Cullen - (503)963-2202
4. Ruth, CASept 2,3 & 4, 1983
Contact - Barbara Wilson - (916)726-7456

The IVHC is dedicated to promoting hospitality, travel and support for EZ pilots and builders. If you would like to join, please send \$6.00 domestic or \$8.00 overseas to - IVHC, 2531 College Lane, La Verne, CA 91750

Dr. Paul Adrien (Long-EZ N46AA) is interested in developing IVHC activities in New England. He invites all EZ builders and flyers to the Concord, New Hampshire airshow on Saturday June 25th '83 for a "get-acquainted" flyin - drive in. For more information contact:

Paul Adrien,
18 Hearthstone Rd,
Pelham, NH 03076
(603)635-3061
(617)682-5656

Please reply by June 18, 1983 if your plan on attending.

2nd Annual EZ fly/drive Picnic

Date: 23rd April, Saturday, Noon to 5 pm.
Place: Brookridge Airpark (private airport)
southwest of Chicago in Downers Grove.

Contact: John Steichen
960 86th Street,
Downers Grove, IL
(312)985-6671

Last year 30 people attended including several EZs from out of state.

EZ CLUBS

Dayton area (Ohio) VariEze and Long-EZ builders have formed a Hospitality and Co-op support organization called "DUCK". This stands for "Dayton United Canard Klub". Local area builders should contact:

Michael Zimmerman,
7313 Dabel Ct
Dayton, OH 45459
(513)435-0882

"DUCK" will be organizing a flyin in connection with the Dayton Air Fair in July 1983 and will hold monthly meetings.

Long-EZ Squadron #1.

This is a club for Long-EZ builders only.

Contact:
Long-EZ Squadron #1
Chino Airport,
7000 Merrill Ave,
Chino, CA 91710

Long-EZ Squadron #2

A second Long-EZ builder/flyer club is starting up at Santa Monica airport with aims similar to those of Squadron #1. A builder's support club to provide assistance by builders to builders. Those who have Rutan registration numbers are welcome to join. The club plans to develop assistance committees, a newsletter and lectures. If interested, please contact:

Long-EZ Squadron #2
3021 Airport Ave.
Santa Monica, CA 90405
(213)398-5652
(213)454-9877

EZ Builders of Florida

This club was run by Charlie Gray, now organized by Jim Carlin. For more information, contact:

Jim Carlin
5359 Lantana Road,
Lake North, FL 33463
(305)964-3805

Claude Beaudet, a French Long-EZ builder would like to contact other French builders. Please contact:

Beaudet J Claude,
33 Boulevard de Charonne
75011 Paris,
France.

The Educational Resources and Planetarium in Lumberton North Carolina has asked us to announce that they will show, upon request the Rutan video tapes. That is the Construction tape, Flying is VariEze, Defiant and First Flight tape. For more information, contact:
James Hooks at (919)739-3302

PLANS CHANGES.

We at RAF, of course, cannot enforce a mandatory change, as FAA can on a type-certified aircraft. The regulations allowing amateur-built experimental aircraft recognize that the homebuilder is the aircraft manufacturer and, that the aircraft does not need to conform to certification requirements. This allows experimentation by the homebuilder, giving him the freedom to develop new ideas. FAA achieves their goal of providing adequate public safety by restricting the homebuilder to unpopulated areas and to solo flight until his aircraft is proven safe.

It is the homebuilder's responsibility to maintain, inspect and modify his aircraft as he desires. However, we at RAF feel that part of our job is to provide information to the homebuilder in the form of recommendations that, in our opinion, are required for him to achieve a satisfactory level of flight safety.

Category	Definition
MAN-GRD	Mandatory, ground the aircraft Do not fly until the change has been accomplished.
MAN-XXHR	Mandatory, accomplish the change at next convenient maintenance interval or within XX flight hours whichever comes first.
DES	Desired - strongly recommended but not requiring grounding of the aircraft.
OPT	Optional - does not effect flight safety.
OBS	Obsoleted by a later change.
MEO	Minor error or omission.

LONG-EZ PLANS CHANGES

LPC #111 MEO	Section I, page 16-4. Universal joint CS120, should be MS20271-810, not AN271-810
LPC #112 MEO	Section I, page 9-1, top right - "refer to Chapter 8" should read "refer to Chapter 14"
LPC #113 MEO	Long-EZ Owners Manual, page 32, aileron mass balance - it reads "level to 10° nose down", should read per Section I page 19-9 bottom left - "The aileron must hang between the angle that makes the bottom surface level and the angle that makes the top surface level after painting".
LPC #114 MEO	Section I, page 32-3, gear and canopy warning wiring diagram. For clarification add the correct call outs for each connection to each switch, ie, C (common), NO (normally open), NC (normally closed). See sketch pg. 9
LPC #115 MAN-GND	Long-EZ Owners Manual, page 20, bottom of the page add - "Builder experience has indicated that it may be possible to spin a Long-EZ when at or aft of the aft CG limit. Analysis indicates that the spin mode or recovery would not be effected by power. Recovery should be forward stick, rudder against rotation and ailerons neutral or with the spin rotation".

BUILDER HINTS

L/E (Long-EZ) V/E (VariEze)
V/E & L/E Straight edges for hotwire cutting foam blocks to the correct planform. Buy an aluminum 36" yard stick from any hardware store. Drill a #30 hole (or to fit your nails) at each inch in the center of the yard stick. Cut it into two 18" lengths and you have the very best pair of hot wire cutting straight edges.

V/E & L/E Fuel tank vents icing over - none of us should fly into icing conditions. However, if it should happen to you inadvertently, it is possible to have your fuel tank vents clogged by impact or rime ice. This could cause your engine to quit! The remedy is to drill a #50 hole on the aft side of the vent tube per sketch.



L/E Accessory case machining for fuel pumps/oil coolers. Vance Atkinson went to Hancock Industries, 2551 Willow Street, Long Beach, CA (213)424-3795. This is a small father/son shop. They do good work at reasonable prices.

V/E & L/E John Sheffles (Long-EZ N682S) reports that he recently was able to get his engine checked for vibration on a helicopter balancer. At 2000 RPM his Long-EZ had a reading of '3', about average for a light plane. By adding a nut and bolt of the correct weight at the proper location on the starter ring gear, this reading was reduced to 0.5! John reports a noticeably smoother and quieter airplane.

Any FBO with a helicopter rotor balancer should be able to do this, or stop by Great Falls airport, in Montana. "Rocky Mountain Air" can do the job for a reasonable price. All it takes is a couple of hours - sounds like a great suggestion John, thanks.

V/E & L/E Phil Cornelius turned in this neat method of tracing a fuel tank leak. This assumes you have the fuel cap holes cut and have a small enough leak not to be detectable using soapy water. Push an amonia soaked rag into the tank and seal the caps. (Phil bondo'd an aluminum cover over the hole). Then soak a rag in Phenolphthalein (C₂₀ H₁₄ O₄) and hold it against the outside of the tank moving it around until you see a purple spot. This purple spot is your pinhole leak! Pop off the aluminum cap covers, remove the amonia rag and vacuum the vapors out of the tank. Wipe down the outside of the strake with soap and water.

You should be able to scrounge a small baby food jars worth of C₂₀ H₁₄ O₄ from your local high school or college chemistry teacher. If its in powder form, use alcohol to dissolve it into solution.
CAUTION - phenolphthalein is hazardous if it comes in contact with your bare skin. Use only with rubber gloves.

V/E & L/E Gear up warning systems. It has come to our attention that several builders have installed the gear position micro switch so that it is contacted with the gear in the up position. This is totally unacceptable and is cause to ground your EZ until the switch is mounted such that the gear is down and fully locked when it contacts the switch. This is very important. You will have no warning if the arm has backed off from its safe over-center position.

SHOPPING

Available at RAF are the following items:

The Long-EZ lithograph, shown on the back of CP33. The price is \$10.00.

T-Shirts are in stock. The "Laughter Silvered Wings" comes in two colors, blue or cream, \$8.00 each. "I fly a nose dragger" is white with a cartoon EZ, these are \$7.00.

Both T-shirts come in Ladies small, medium and large. Mens are small, medium, large and extra large. Childrens are small (2-4), medium (6-8) and large (10-12).

Belt Buckles with either VariEze or Long-EZ in either brush or shiny finish. \$25.00. These are made from German silver and hand made.

Posters - two kinds. Two ship Long-EZ are 11 x 17 at \$2.00 each. Three ship Defiant, VariViggen and VariEze 17 x 22 at \$2.75 each. Please add \$1.00 for postage.

Long-EZ three view drawings are available for \$10.00

Solitaire three view drawing - \$5.00 each

VariViggen Radio Control Plans - \$4.75

The "Complete Guide to Rutan Homebuilt Aircraft" by Don and Julia Downie is available from RAF at \$9.95.

The RAF patch - large \$2.50, small name patches- \$1.50

Video Tapes. The Construction tape and Go-a-Long-EZ (first flight and weight and balance) are \$59.95 each or \$99.95 when bought together. Please add \$4.00 for postage and don't forget to specify Beta or VHS.

Remember Californians to add 6% sales tax!!

Aircraft Spruce has the following new items available:

Electric cockpit heaters, same as Mike has in Long-EZ, N26MS, see CP 35.

12V 14 Amp manifolded batteries Yuasha #YB14LAZ as called out in CP 35.

B & D Tachometers, expensive but the best you can get, 2 1/4" electric accurate, reliable, same as in Mike's Long-EZ N26MS.

Pizza Cutters, for cutting fiberglass, excellent. But must be used against a resilient material.

Wicks Aircraft Supply has a slightly different version of the throw over canopy stay. Made by a Long-EZ builder, Jim Duprey, these are complete and ready to bolt on.

Applied Plastics of El Segundo, California, (213)322-8050 has a supply of an excellent disposable charcoal filter respirators. Also pure Butyl gloves, a bit expensive but if you are having problems with epoxy reactions, this is your way out. Butyl is the only 100% barrier to all of the chemical components in Safe-T-Poxy.

Ken Brock Mfg. has just completed a run of throw over canopy stays per the drawings in CP 30 and has them in stock.

NOTE !!

Task Research reports that 23 sets of the 340 x 5 (small) wheel pants were delivered to Aircraft Spruce and Wicks with the left wheel pant incorrect. Contact Task direct for replacement. (805)525-4545

Lycoming O-235-L2C still in the crate - \$5700
Contact: Erwin Oertli
6186 West 10050 North
American Fork, UT 84003
(801)756-2864

Rusty Foster's Space Saver Panel

We recently got the opportunity to examine Rusty's latest Space Saver Panel Kit. It is excellent. The instruction booklet is very well layed out, clear, concise and also contains a lot of useful hints and ideas. We have seen several of these panels installed in both VariEzes and Long-EZs and they not only look great but they allow more efficient use of the instrument panel space.

Contact: Foster's Modular Design Co.,
P.O.Box 4941,
Ventura, CA 93004
(805)642-6308

Byron McKean's popular compuflight seen on more and more VariEzes and Long-EZs is available as a basic integral unit or as a remote mounted unit. Until July 1, 1983 prices will remain as follows:

Basic Compuflight. \$229.95
Remote Compuflight. 259.95

After July 1, 1983 prices will be as follows:

Basic Compuflight. 249.95
Remote Compuflight. 279.95

Write to Byron for an order form:

McKean Systems Inc.
Route 1 Box 429-B
McQueeney, TX 78123
(512)557-6575

Retrofitable fuel sight gauges, PVC and 3/16" thick glass. Not only gives you a crystal clear view of your fuel, but also damps out the sloshing, making it easy and accurate to read fuel levels. Engine breather oil separator for both Continental and Lycoming.

Contact: Wes Gardner
1310 Garden Street,
Redlands, CA 92373
(714)792-1565

FOR SALE

Continental prop by Ray Hegy 58 x 67

Contact: Gerald Gieszler,
Box 6073,
Great Falls, MT 59406
(406)761-6383

Lycoming O-235-C2C, 640 hours since new, logs, carb, mags and fuel pump. Partially disassembled for a top overhaul (valves and jugs done and ready for assembly) \$2695 includes crating.

Contact: Danny Schultz
P.O.Box 823
Arcadia, FL 33821
(813)494-3118

Lycoming O-235-C1 zero hours since major, ready for Long-EZ, includes fuel pump, Slick mags and Brock mount.

Contact: Gordon Jones
4257 Findley Way
Livermore, CA
(415)447-1549

Continental O-200 total time 840 hours. Since major - 271 hours. Complete with Slick mags, Sanders Exhaust and prop extension. \$3,990

Also an original VariEze main gear, complete with axles, brakes wheels and tires . . . \$495.00

Contact: Bruce Muirhead
458 Handicap Ave,
Pagosa Springs, CO 81147

VariEze original main gear strut, plus numerous assorted EZ parts. Also a factory new, in the crate Lycoming O-235-C2C.

Contact: Bruce Tiff
8746 Ventura Ave
Ventura, CA 93001
(805)649-2721

VARIVIGGEN NEWS

Three more builders sent in their names to be added to the "Viggen Club" list. This brings the total to 32. A new update will be sent to all those on the list every news letter. The "Viggen Club" seems to be working quite well. Several builders have been writing back and forth and sending me copies. I am glad to see the Club working for the builder's benefit.

Wayne Wilkins reports that Peter Lawrence, who bought Wally Warner's Viggen, has completed the job of rebuilding and is flying. Congratulations Peter. Charles Cowan reports that his Viggen is flying well and he is enjoying his immensely. Charles has a Lycoming O-360 180 HP and has found as I did on N27MS that his 70 x 70 prop was too much. He has cut 1" off each end and now at 75% power over a measured 20 mile course he averages 142.7 knots (163mph). This is roughly the same performance I get out of N27MS.

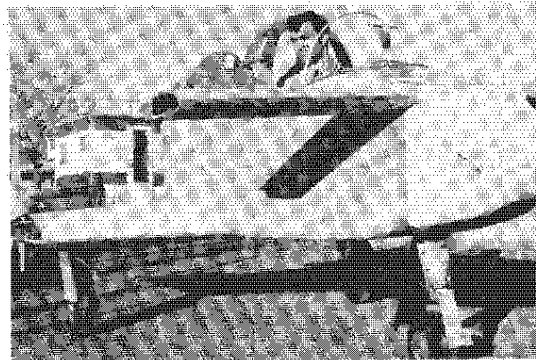
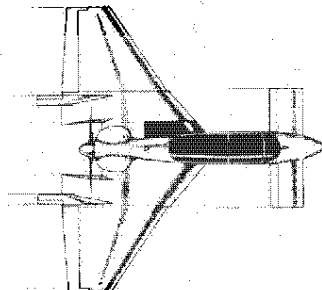
Terry Galbreath reports that he has been transferred to Thule, Greenland for 12 months which means putting his Viggen project in storage for that time. Terry has been making progress, bottom is skinned and painted through primer. Gear is in and operating. Terry asked about rain trim change in a Viggen. Burt reports that his Viggen had no perceptible trim change even in very heavy rain. N27MS is exactly the same, no measurable trim change in light, moderate or even a cloud burst! Any other Viggen flyers care to comment?

Frank Stites reports his Viggen is nearing completion and he hopes to fly this summer. All composite parts are complete and painted white. Canopy is done and he is working on the cowling screen. Frank was over to look at Ken Guskott's Viggen which is complete through finish paint. Only the seats remain to be done. Jack Rosen is cutting foam cores and most of the non-composite parts are done.

N27MS has been doing quite a lot of flying lately and now has 601 hours on the Hobbs. This makes her the high-time Viggen. Burt's went into the EAA Museum with 600 hours. A close friend, Bruce Tiff of B and T Propellers from Ventura, California has been putting some time on my Viggen. I lent the Viggen to Bruce after he lost his beautiful VariEze in an unfortunate accident (see CP 35). Bruce has over 600 hours of VariEze time and had no trouble at all transitioning into the Viggen. He bases the Viggen at Santa Paula, a 2500 foot strip in Southern California and has no problem in operating routinely out of this strip. Perhaps Bruce would write us a report of his impressions of the Viggen as compared to his EZ? How about it Bruce? His wife, Bonnie tells me she loves it, it feels so solid and besides, with full dual controls, she can fly from the back seat!

I was at a flyin at Aqua Caliente a few weeks ago when I heard a familiar engine noise. It was a Viggen descending into the pattern. Bruce made by far the shortest landing of the day. It looked like a miniature Shuttle on short final. It gave me a strange feeling to see my Viggen fly into an airport without Sally or me in it!

Bruce has refinished my prop and installed his urethane "rain proof" leading edges. This type of leading edge on a wooden prop should be considered mandatory if you expect to get any sort of utility out of your airplane.



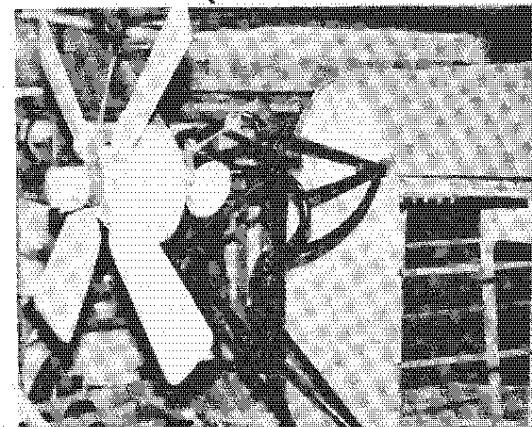
Wow! This one will take you back! Burt getting a little stick time in the original prototype Viggen circa 1972. This is one that started the "Canard Revolution".

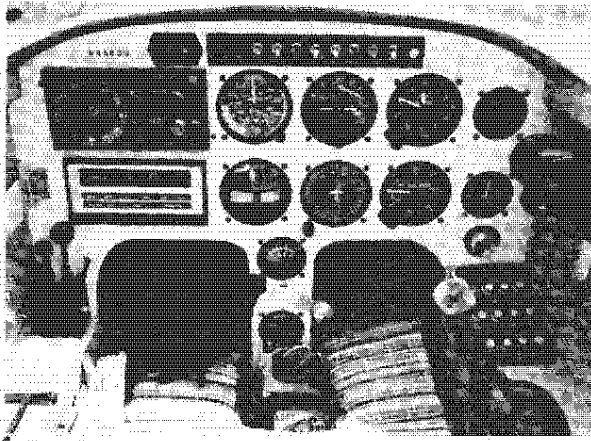


Wayne Wilkins' Viggen - a different approach to the canopy. Pretty snazzy seats Wayne.

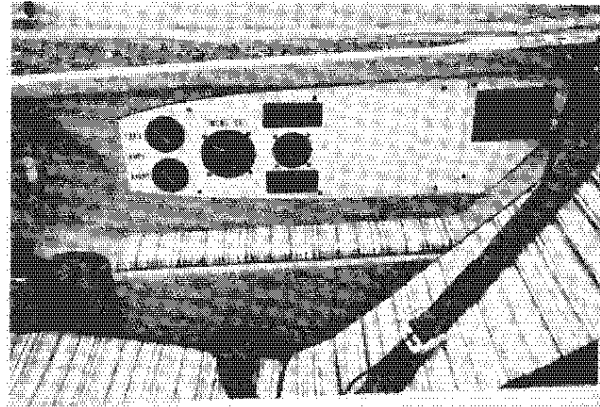


Walter Hudson's Viggen with dynafocal mount. Walter asks: "Do you think I should go to a 42" fan?"

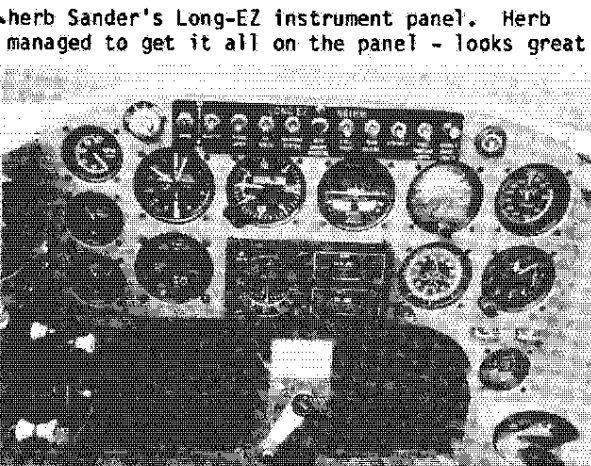




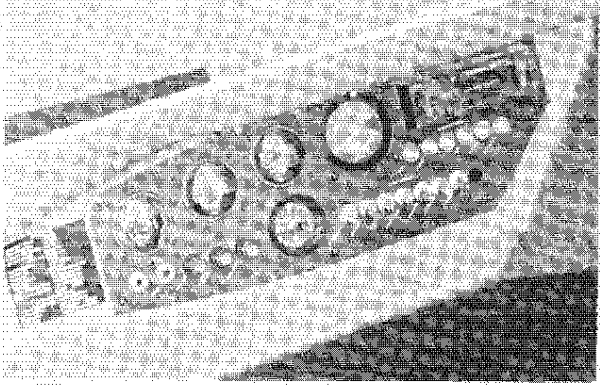
The "Real" George Scott's beautiful Long-EZ instrument panel. Note - engine instruments and intercom mounted in the right forward baggage area.



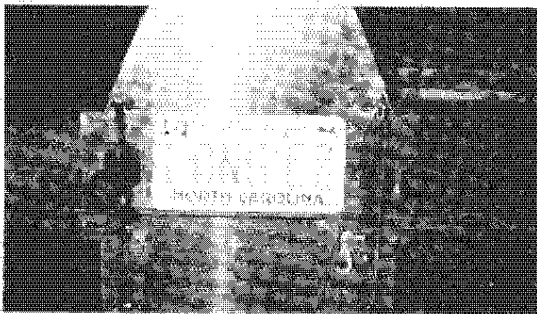
Dr. Robert Forest's "side" panel. Engine instruments, circuit breakers, switches and even his stereo tape deck fit nicely, freeing up the instrument panel for flight



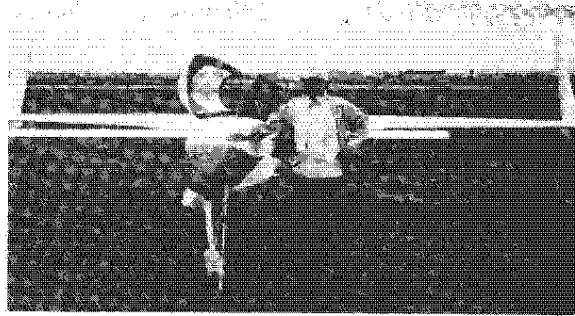
Herb Sander's Long-EZ instrument panel. Herb managed to get it all on the panel - looks great



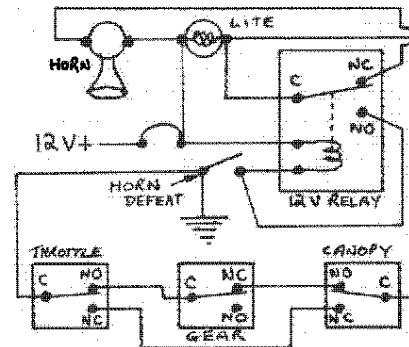
Bijan Neshat has this auto license plate.



80 years young, Charlie Auton built and flies this Long-EZ. Alright Charlie!!!



Henry Schultz of Glengowan, Australia getting some stick time. Workmanship look great.



GEAR & CANOPY WARNING ON PAGE 22-3, SECTION I, LONG-EZ.

SOLITAIRE —

A

Self-Launching Sailplane

THE PROBLEM

For a long time soaring has been an exclusive sport requiring a special license and training. Soaring in a glider of enough performance to allow the average pilot to feel the true thrill of 'engineless' flight has been expensive enough to severely limit the number of people who enter the sport. The current interest in ultralight and light sport aircraft has reached an all-time high.

THE CHALLENGE

The Soaring Society of America recognized the problem. Other segments of homebuilt aircraft were experiencing great interest and activity on the part of designers and the general public. The sailplane market was not getting its share of the attention. To correct this, the SSA issued a challenge in the form of a contest. Develop a self-launching sailplane capable of take off and the ability to climb to altitude without the use of a tow plane. The new design could be flown without the special license required of a sailplane pilot, just a private pilot's license. The aircraft must be easy to fly, as well as quick and easy to build. Strict rules were set up and an actual structural test of the finished aircraft was required. The Solitaire was designed around these goals and achieved these and more.

THE WINNER

At the flyoff held in Tehachapi, California, on September 6, 1982, the judges studied the entries, flew the SOLITAIRE and unanimously declared it the winner.

WHAT

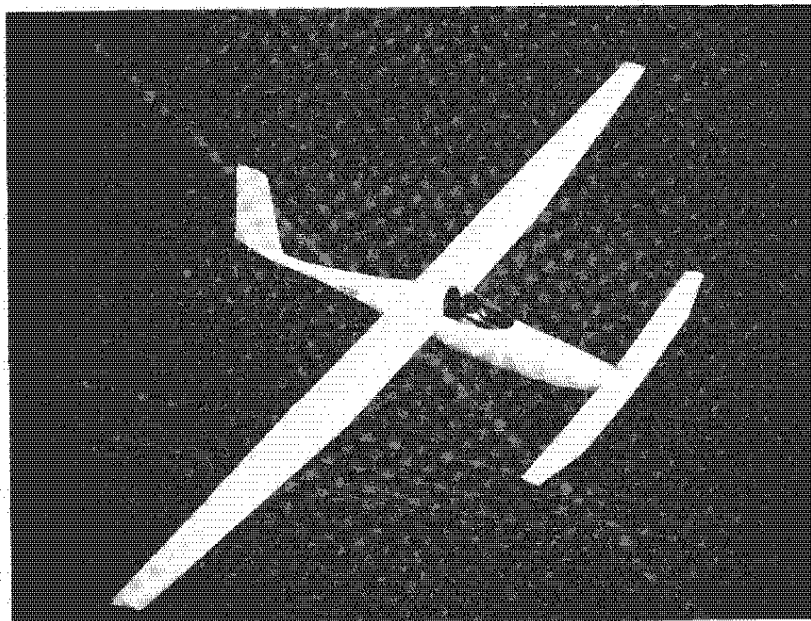
The SOLITAIRE is a single-place self-launching sailplane that is fitted with an engine package that folds into the nose of the aircraft after it pulls the SOLITAIRE to soaring altitude. With the engine folded, it has a L/D of 32 to 1 giving it true soaring capability. The engine can be deployed and restarted in flight using its electric starter. The canard concept results in high resistance to inadvertent stalls and spins. Its 'spoilflap' descent control system has been acclaimed as "excellent" by all evaluators, providing crisp, variable glide path control without trim upsets. Unlike conventional sailplanes the pilot sits within the allowable cg range.

HOW

The SOLITAIRE uses the proven materials and methods pioneered by Burt Rutan and used in the VariEze and Long-EZ, two of the most successful aircraft ever designed for the homebuilder. The wings are special uni-directional fiberglass cloth and epoxy resin. They are built using the moldless composite technique developed in the VariEze and consist of prefabricated 'S' glass spars and a solid foam wing core. The fuselage comes as two prefabricated halves. The bulkheads are available prefab and the wooden fixtures and templates will be available premanufactured. The canopy comes installed in the frame and the turtle deck is available prefabricated. All of the metal parts and complete landing gear components are available premachined. The pre-molded parts are of aerospace quality. Construction consists of prepreg fiberglass skins with a honeycomb core and an adhesive film to bond them together. These parts are then vacuum bagged and cured in an oven. In short, this aircraft will have more prefabricated parts than any previous design from Rutan Aircraft Factory. Of the available prefabricated parts, the builder can buy all or as few parts as he wishes. We estimate that an average builder, purchasing all the available parts could build the aircraft in 400 hours at a cost of between \$7000 and \$9000. When the quality of the parts and the ease of building is considered the value of the SOLITAIRE becomes apparent.

SUPPORT

Rutan Aircraft Factory support has been a key factor in the history of success with homebuilt aircraft. When you buy plans, you become one of a family of builders. Rutan Aircraft prides itself on its builder support program. We will answer questions either by phone or in writing. Builders are also welcome to bring parts to Mojave for inspections and advice. The quarterly newsletter is mandatory when you are building, as it provides continuing builder hints, ideas and plan updates.



ALL RAW MATERIALS.

Near Los Angeles.
AIRCRAFT SPRUCE
201 W. Truslow, Box 424,
Fullerton, CA 92632
(619) 870-7551
Catalog \$4

Near St. Louis.
WICKS AIRCRAFT
410 Pine Street,
Highland, IL 62249
(618) 654-7447
Catalog \$3

ALL PREFAB MACHINE PARTS.

KEN BROCK MANUFACTURING
11852 Western Ave., Stanton, CA 90680
(714) 898-4366
Catalog \$3

PREFAB FUSELAGE, CANOPY, TURTLE DECK, WING SPARS, SEAT PAN.

TASK RESEARCH
848 East Santa Maria, Santa Paula, CA 93060
(805) 525-4545

SPECIFICATIONS

SOLITAIRE - RAF Model 77-6

Empty Weight	380 lbs.	Fuel	5 gal. premixed @ 40:1
Gross Weight	620 lbs.	L/D	32/1 at 50 knots
Total Wing Area	102.44 ft. ²	Min. Sink	150 ft./min @ 40 knots (approx.)
Span	41.75 ft.	Descent Control	Spoilflaps usable to V _{NE}
Wing Loading	6.05 lbs./ft. ²	Min. Flying Speed	32 knots
Engine	KFM 107E	V _{NE}	115 knots
BHP	23 at 6000 RPM	CG	unaffected by pilot weight

SOLITAIRE DOCUMENTATION

Canard Pusher Newsletter published quarterly.

One year's subscription \$ 6.75
Section I - Manufacturing Manual \$225.00

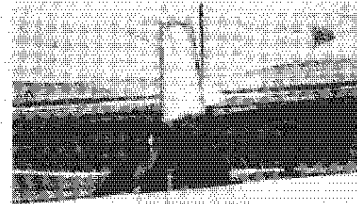
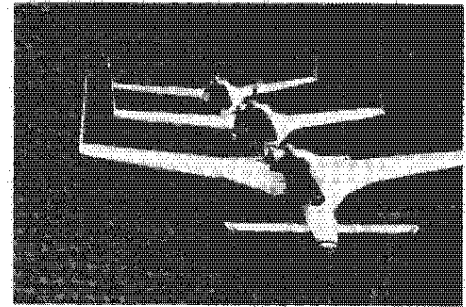
This is the complete education and construction manual for building the entire SOLITAIRE except for the engine installation. This manual consists of a spiral bound book 11" x 17" together with a set of 23" x 33" drawings, which include all necessary full-size templates, jigs and cross sections.

Rutan
Aircraft
Factory, Inc.

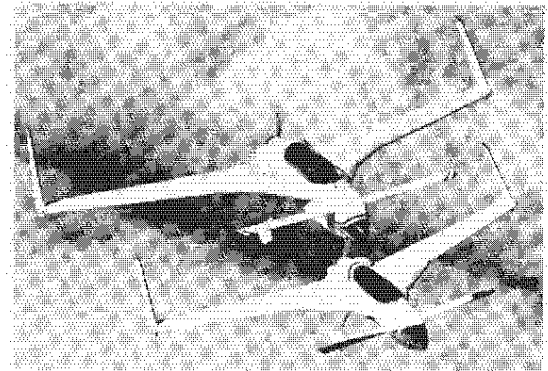
BUILDING 13, MOJAVE AIRPORT
MOJAVE, CALIFORNIA 93501
TELEPHONE (805) 824-2645

Brief Long-EZ specifications/performance.
 Engine — Lycoming O-235 108 hp.

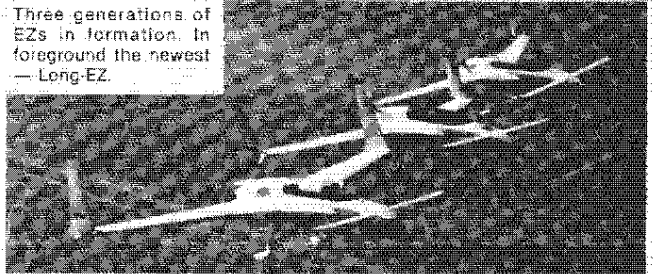
Span	26.1 ft.	Takeoff solo/gross	800/950 ft
Area	94.8 sq. ft.	Climb solo/gross	1750/1250 fpm
Empty Basic	750 lb.	Cruise 75% 8000 ft.	186 mph
Empty Equipped	800 lb.	Cruise 40% 12000 ft.	146 mph
Solo Weight	1000 lb.	Top Speed — Sea Level	193 mph
Gross Weight	1425 lb.	Max range* 75% (solo/2 place)	1380/1150 mi
Max. Fuel	52 gal.	Max range* 40% (solo/2 place)	2070/1690 mi
Cabin L/W/H	100/23/37"	Ceiling (solo/gross)	27000/22000 ft
		Landing distance (solo/gross)	450/680 ft
		*40 minute reserve	



This amount of baggage fits nicely in the Long-EZ baggage area. Baggage is accessible in-flight.



Three generations of EZs in formation. In foreground the newest — Long-EZ.



LONG-EZ DOCUMENTATION

SECTION I — MANUFACTURING MANUAL —

This is the complete education manual for composite materials and methods, also, the complete plans and construction manual for the entire Long-EZ except engine installation and landing-brake. The manual consists of a 180-page, bound 11" x 17" book plus 14 larger full size drawings. It includes many photos, over 800 drawings and illustrations, and over 65,000 words. The builder is led step-by-step through the entire construction of the airplane, including electrical system, fuel system and finishing procedures. The manual identifies sources for all materials and all prefabricated components. A video tape is available covering all aspects of building the moldless fiberglass/foam sandwich construction. The tape covers the latest methods used to obtain the optimum weight, strongest fiberglass layups. This presentation will help both the first-time and experienced builder attain quality aircraft workmanship.

SECTION II — ENGINE INSTALLATION —

This is a set of drawings and construction for the complete engine installation, including mount, baffles, instrumentation, electricals, fuel, exhaust and induction systems, carb heat box and muff, cowling installation, prop and spinner.

OWNERS MANUAL —

This is the required operations handbook and checklists, including normal and emergency operation, detailed flying qualities and performance charts, maintenance, maiden flight procedure, and pilot checkout, etc.

A video tape is also available which covers the weight and balance procedures, taxiing tests and first flight.

LANDING BRAKE —

Complete full size drawings for the landing brake device. This is the large drag plate that extends from the bottom of the fuselage for landing approach.

The following are RAF-authorized distributors of Long-EZ materials and components. Contact the distributors at the addresses below for their catalogues and description of items.

ALL RAW MATERIALS AND PREFAB FIBERGLASS PARTS

Near Los Angeles
AIRCRAFT SPRUCE
 201 W. Truslow, Box 424
 Fullerton, CA 92632
 (714) 870-7551
 Catalog \$4

Near St. Louis
WICKS AIRCRAFT
 401 Pine Street
 Highland, IL 62249
 (618) 654-7447
 Catalog \$3

Prefab machine parts such as, control system parts and welded parts, fuel caps, engine mount, rudder pedals and exhaust systems.

KEN BROCK MANUFACTURING

11852 Western Avenue
 Stanton, CA 90680
 (714) 898-4366
 Catalog \$3

Main and nose gear, fuel strakes, fuselage bulkheads.

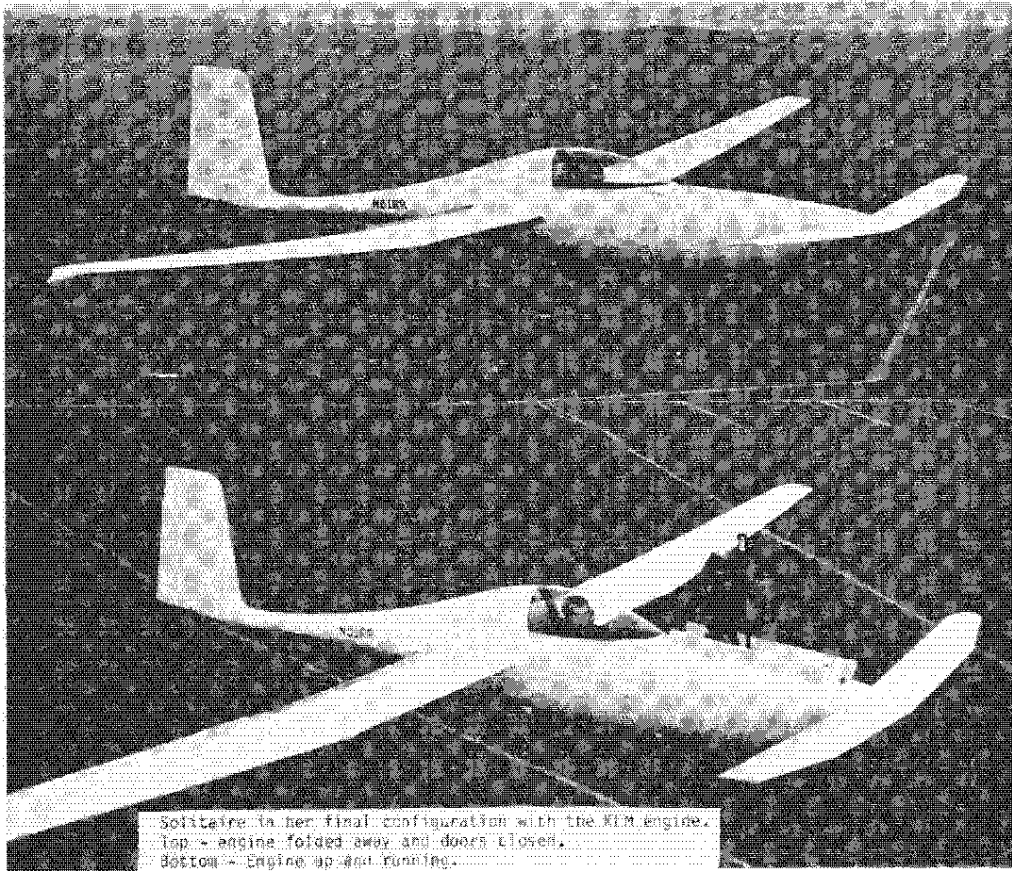
TASK RESEARCH INC.
 848 East Santa Maria
 Santa Paula, CA 93060
 (805) 525-4545

Canopies are available from **RUTAN AIRCRAFT**.

Check items desired.	Price, includes first class mail to U.S. & Canada	Overseas Airmail — U.S. Funds
<input type="checkbox"/> Rutan Aircraft Information Package — complete data and photos of all Rutan designs.	\$ 8.00	\$ 9.00
<input type="checkbox"/> "Canard Pusher" newsletter Published quarterly. One year subscription. Approx. 10,000 words per issue.	6.75	8.75
<input type="checkbox"/> Long-EZ plans, Section I	198.50	212.50
<input type="checkbox"/> Section III Lycoming	21.50	23.50
<input type="checkbox"/> Long-EZ Owners Manual	9.00	10.50
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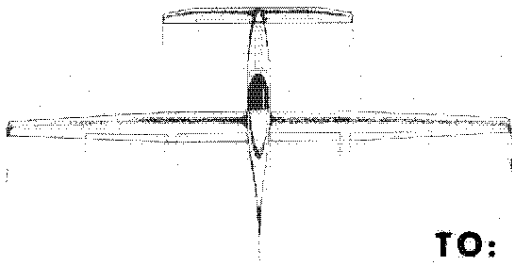
Rutan Aircraft Factory

BUILDING 13, MOJAVE AIRPORT
 MOJAVE, CALIFORNIA 93501
 TELEPHONE (805) 824-2645



Solitaire in her final configuration with the K18 engine.
 Top - engine folded away and doors closed.
 Bottom - Engine up and running.

**Rutan Aircraft Factory
 Building 13, Mojave Airport
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April '83

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