

THE CANARD PUSHER

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If you are building a VariViggen from 1st Edition plans you must have newsletter 1 through 31. If you are building from 2nd Edition plans you must have newsletters 18 through 31. If you are building a VariEze from 1st Edition plans you must have newsletters from 10 to 31. If you are building a VariEze from 2nd Edition plans you must have newsletter from 16 through 31. If you are building a Long-EZ you must have newsletters from 24 through 31.

A current subscription for future issues is mandatory for builders, as this 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 4:00 on Saturday.
Closed 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.

Saturday Demos.

Saturdays from 10:00 am to about 2:00 pm have been very busy with from 30 to 100 visitors showing up at the shop. Generally we have the VariViggen, the VariEze and two Long-EZs on display. We have been showing the construction video tape plus a very entertaining tape of RAF planes flying formation. We then generally have a "bull session" answering any builder or pilot questions and wind up with flying one or all of the airplanes, at around 1:00 pm.

RAF ACTIVITY

Since CP 30 has involved: completion of our Model 73 jet flight test program, fabrication of our self-launching sailplane prototype, completion and rollout of our new STOL research aircraft, hosting our annual workshop and providing homebuilder support.

RAF MODEL 77 SAILPLANE IS NAMED

Our entry in the SSA contest for a self-launching sailplane now has a name - SOLITAIRE. The Solitaire is a single-place sailplane with the intended capability to self launch, with a fixed engine and a retractable propeller. Its tandem-wing configuration allows the pilot to sit at the cg, eliminating the cg shift due to pilot weight that is common with standard sailplanes. The Solitaire has a 12.5 meter wingspan. If flight tests planned to begin next month are successful, the Solitaire will be offered for homebuilder construction. It will be marketed similarly to the Long-EZ, not as a complete kit. This results in considerable cost savings to the builder for materials. Also, the builder has the option of building or buying the prefab components. Further information on Solitaire will be released after it is flying, but in the mean time, please don't ask - we're very busy with the completion and test program.

For Sale at RAF

We do have the main and nose gears in stock. The main gear is shipped Greyhound bus, freight collect.
Main Gear \$309.00
Nose Gear 55.55

Canopies for pickup at RAF are taking about 2 to 3 weeks to arrive. We are not really keeping these in stock as we do have a storage problem. If you wish to pick up here at RAF, we will order for you and let you know when it comes in.

Bronze or Smoke \$249.00
Green 229.00
Clear 199.00

The new RAF patch (see photo) introduced at Oshkosh '81 is available from us. The large patch is \$2.50 and the small patches are \$1.50 each. The small patches are available for VariViggen, VariEze and Long-EZ.

The Long-EZ, VariEze and VariViggen silver belt buckles come in both mens and ladies sizes and also brushed finish or shiny. They are hand made in silver, from New Mexico.
\$25.00 each.

Video Tapes - Building the Rutan Composites.

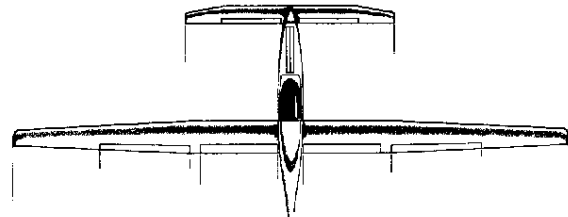
This tape shows you the "how to" with composites. It is a great help for first timers as well as experienced builders. When ordering your tape, please specify whether it is VHS or Beta II
\$59.95 plus \$4 for postage.

Go-a-Long-EZ is a tape that covers the checkout, weight and balance of your aircraft, how to conduct the taxi tests and first flight.
\$49.95 plus \$4 for postage.

Orders for the Construction tape from overseas customers should be sent directly to the address below. Ferde will convert the VHS or Beta to the PAL system for you. At present he is only doing the construction tape.
Ferde Grofe Films,
702 Washington St.,
Suite 168,
Marina Del Rey, Ca 90291

RAF BUILDER SUPPORT

It has become necessary to further clarify Rutan Aircraft's position in relation to the homebuilder and the support we give. Rutan Aircraft can only offer the assistance that helps them interpret the plans when they desire to build their aircraft like the prototype we have tested. We cannot assist in the design and construction of modifications. We cannot comment on the advisability of modifications. Many of the developments we design and test do not work as predicted. Thus, without testing your idea we cannot reliably predict its success. A similar situation exists for substitutions of materials. We will not be able to advise you on any material we have not tested ourselves.



LONG-EZ ACCEPTED

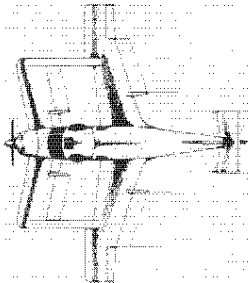
For amateur construction in Canada. Thanks to much hard work by the EAA Canada, in particular Edward Slack, the Long-EZ is now accepted by the Canadian DOT for amateur construction. Maximum take off weight allowed is 1325 lbs.

LONG-EZ FIRST FLIGHTS

The following is a list of all the Long-EZs flying that we know of. If you know of someone who has a Long-EZ flying, please send us his or her name, address, N-number and date of first flight.

Burt Rutan	CA	N79RA	June 1979
Johnny Murphy	FL	N21VE	June 1980
Mike Melvill	CA	N26MS	Dec 1980
Dick Rutan	CA	N169SH	Apr 1981
Richard Sparkman	FL	N506EZ	June 1981
Dan McElroy	WA	N80DZ	July 1981
Neil Hunter	FL	N141NH	Oct 1981
Ray Olsen	MN	N42DR	Oct 1981
Jerry Gruber	IN	N40IEZ	Nov 1981
Harris Howard	TX	N25HC	Dec 1981
Robert Hansen	CA	N71Z	Jan 1982
Joe Enrico	Ca		Jan 1982

Many more Long-EZs are close to completion. By the time Oshkosh comes around, Long-EZs may even be close to VariEzes in number on the flight line!!



RAF MODEL 72, GRIZZLY ROLLOUT

The Rollout - On January 14th, 1982, at the Mojave California Airport, Rutan Aircraft Factory Inc. rolled out their latest prototype, the RAF Model 72 Grizzly. The new aircraft is a proof-of-concept prototype to be used to evaluate the feasibility of achieving STOL and amphibious capability with a canard/tandem-wing configuration.

Amphibious Floats - The aircraft will initially be tested in its bush configuration with four low-pressure tires on the main gear for soft or unprepared fields. It will later be fitted with a new type of amphibious float system to allow it to operate from either water or hard-surfaced runways. The goal of the new float system is to allow operation from land to lake and back without the requirement to raise or lower wheels or to operate a water rudder. Schedule for testing the amphibious system will depend on the success of the flight test program with the bush configuration.

The Grizzly Details - The Grizzly is a four-place with a large baggage area. Power is the IO360-B, an injected 180 bhp 4 cylinder Lycoming. The prop is a constant-speed two-blade Hartzell. The sliding canopy has bulging side windows, allowing straight-down visibility for the pilots. Fuel is carried in the wing interconnects, keeping fuel away from the cabin while providing the torsional bracing required for the forward-swept wings. The four Fowler flaps average over 50 percent chord, adding over 45 square feet of wing area when deployed. The Grizzly airfoil and wing systems are the first to be developed by a new RAF aerodynamic design computer program which handles the complex interactions of tandem wings and high-lift devices. The structure is all composite, using fiberglass and carbon fiber facings/reinforcements with rigid foam sandwich cores. The Grizzly airframe is a test bed for evaluating and comparing several structural configurations. For example, the right wing is a hollow, sandwich-skin configuration and the left wing is the full-core construction technique pioneered on the VariEze. It's interesting to note that not only did the full core wing require far fewer man hours to build, it is also lighter and stiffer than the hollow wing.

To enhance the go-anywhere, land-anywhere capability of the Grizzly, its cabin converts to sleep two, for camping. Folding the rear seat forward results in a level, 78 inch long bed.

The Grizzly Purpose - The Model 72 prototype is not intended for a specific market. RAF plans no certification/production of this model and it is considered too large for the homebuilt market. The purpose is research, to study canard aerodynamics in the STOL category. Our previous canard aircraft have not been designed for short-field operation. Thus, many have concluded that tandem-wing aircraft may not be suited for STOL performance. We do not have the definitive answers to this subject, but hope to gather the necessary data during the Model 72 test program to considerably expand our technology base. We expect the knowledge gained by testing this proof-of-concept aircraft will be invaluable for future developments.

Not on Public Display - The Model 72 prototype should be visible undergoing extensive testing at Mojave and at other required sites. However, it is not on public display at the RAF facility since it is housed at a remote hangar. Grizzly has not been and will not be our highest priority - we will continue to concentrate on our homebuilt programs, the Model 61 Long-EZ and our new self-launching sailplane, the Model 77, Solitaire.

OSHKOSH 1982 - Those of you who will be making the pilgrimage to Oshkosh this year should note that the Hospitality Club banquet will be held at the Anchor Inn on Sunday August 1st 1982, not on Wednesday as it has been in the past. The annual banquet is limited to Hospitality Club members or to those actively flying a VariEze or Long-EZ. For information on the Hospitality Club write Don and Bernadette Shupe, 2531 College Lane, Laverne, Ca 91750

Camping at Oshkosh - Those EZ pilots flying in and wishing to camp can reserve a camping trailer (sleeps 4 to 6) which will be parked in Paul's Woods the week prior to the flyin. The cost is \$150 per trailer, payable at least one month before August 1st, plus cost of registration and camping fee. There are only 8 trailers available, and reservations are on a first come, first served basis. Contact:

Nat Puffer,
2182 North Payne Ave,
St. Paul, MN 55117

Irene "Mom" Rutan, official historian for the VariEze Hospitality Club, requests that all VariEze and Long-EZ pilots send her a photo and information on their airplane as soon as possible after first flight.

Send to Irene Rutan
8526 Calmada,
Whittier, Ca 90605

VARIEZE/LONG-EZ CLUBS

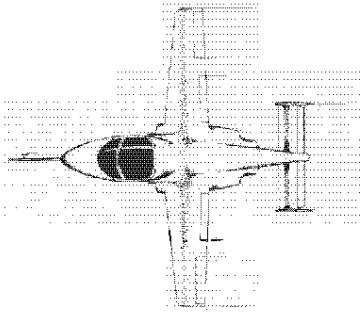
Jerry Gruber, who recently flew his beautiful Long-EZ, has offered builder assistance to anyone in his area. Contact Jerry at 401 Aspin Dr.
Elkhart,
Indiana 46514

John Steichen of Downers Grove, Illinois would like to hear from builders/flyers who would be interested in some form of Great Lakes or midwest hospitality activities. John is willing to organize a winter or spring flyin/drive in. Contact

John Steichen (N27EZ)
Brookeridge Air Park,
960 86th Street,
Downers Grove, Illinois 60516

SAFE-T-POXY - REACTIONS, ALLERGIES

It has come to our notice that quite a number of builders seem to be suffering from some form of reaction to the Safe-T-Poxy. We are very interested to know the present scope of this problem, since initial results in 1978 showed that reactions were very rare. If you have had any kind of reaction to the Safe-T-Poxy, please send us a report with a brief description of the reaction, and how long you had been working with the material before you noticed the reaction, whether or not you were using any form of protection, gloves, Ply 9, respirator, etc. We will correlate this information and work closely with the manufacturer to see if a change has occurred or if improvement is indicated. We will report on our findings in a future C.P.



FOAM PREPARATION

Although we have had this correction in at least two previous newsletters, some builders are still not using micro slurry. ALL foam should be slurried. Disregard ANY and ALL statements in the Long-EZ plans that say not to use slurry. By slurrying the foam, you will be able to do a better quality, lighter layup, in less time.

Slurry fills the broken cells on the foam surface. After spreading slurry on, wipe off excess with the squeegee so that only a thin film is uniformly spread over the entire part. The construction video tape is a good reference for good slurry technique. If in doubt, send RAF a sample of your work for our comment (include a SASE, of course).

If you have already made some of your parts without slurry, it is not necessary to remake them, provided you have met the dryness criteria. If they are very wet, or too heavy, you might consider doing them again, however lack of slurrying is not cause for structural disqualification.

PARKING YOUR EZ

It does not seem possible, but there are still VariEze and Long-EZ builders out there who apparently are not aware of the fact that this configuration of aircraft will fall over on its tail if it is left unattended while the nose gear is extended. The pilot is required in the front seat to balance the airplane to the correct cg. Should the pilot climb out and let go of the airplane, it will fall over on its tail, and this can result in a broken prop or at least damaged winglets. This condition is unavoidable. The main gear position is a direct function of rotation speed. Ballasting the nose to overcome this will result in unacceptably long take-off rolls, and a very difficult airplane to handle on the ground. This is the main reason that the nose gear retracts. This allows you to park the airplane nose down, which is a very stable way to park and avoids the requirement for a wheel chock when untied in winds up to 35 knots.

BUILDER-INITIATED CHANGES

This is an item that needs to be put into perspective, since we often answer questions and often observe activity that we consider questionable. First, we do recognize that you are the manufacturer of your aircraft and that if you do not agree with us on specific details you have every right to modify, redesign, substitute etc., on your aircraft and to then take the risks of trying something new and untested. We do recommend only that which we have tested, since it is the only configuration we know is adequate and, by our own experience we can report on and support.

Any builder (at least U.S. builder) has the freedom to build his own aircraft exactly as he sees fit. Changes he makes will be opening up new areas not substantiated by test. We have no argument with this. However, if he makes recommendations to other builders on a change that he likes, but has not verified by test he should realize that he may be liable for loss or injury caused by that change.

If, for example, you recommend a larger engine or a substitute of an inferior foam core to someone else, without fully qualifying and testing the many design changes that may be required, you must remember that those builders are now counting on you to be right and that your responsibility is then extended beyond your own risk with your own airplane.

MODEL 73 TEST PROGRAM COMPLETED - The RAF Model 73 is a scaled flight demonstrator of Fairchild Republic's proposal for the Air Force's Next Generation Trainer (NGT) program. In early 1981 Fairchild Republic contracted Ames Industrial Corp. (builder of the RAF Model 35, AD-1 skew-wing jet) to build the scaled flight demonstrator. Fairchild supplied accurate lofts of the external shape of their NGT design. Ames hired RAF to design the structure and systems and to conduct the flight test program. The scaled demonstrator is 62% of the size of the full scale aircraft.

The design and prototype construction effort took eight months. The aircraft was shipped to RAF in early September 1981. Within eight weeks RAF accomplished all the following tasks: flew four qualitative flights, coordinated the installation of a telemetered instrumentation system, flew 14 stability and control flights, developed and tested a spin recovery parachute, measured and ballasted the three-axis moments of inertia, developed a fuel transfer system for cg control, designed and incorporated several modifications, reduced, analyzed and presented all flight test data, wrote the qualitative flying qualities results, conclusions and recommendations, prepared a 220-page test report and an oral/video tape/slide presentation of the results. Working on a tight schedule, the final report and presentation was presented to Fairchild seven days after the last test flight. The use of the manned, scaled flight demonstrator produced higher quality data than other methods, particularly for areas such as spin susceptibility and departure recovery. The scaled flight demonstrator was built within a schedule and cost framework that compared to conventional static-only wind-tunnel programs. However, the added benefits of dynamic stability data and pilot qualitative information resulted in considerable improvement in the value of the findings. The structure of the Model 73 is the moldless composite sandwich method, using oriented uni-directional carbon fiber or fiberglass for facings and spar caps and rigid closed-cell foams for core.

NEW COMPANY, SCALED, INC. TO DO RESEARCH PROJECTS

Since the successful completion of the Fairchild 62% NGT program in November '81 there has been a great deal of interest in RAF's capability to design, develop, fabricate and flight test new aircraft concepts at low cost and short schedule. Because of this interest, Herb Iversen, General Manager of Ames, the company that built the NASA AD-1 and the Model 73, is forming a new company to deal exclusively with this new type of business. Burt will do the design work and the flight testing for the new company. No changes are planned for RAF. RAF plans to continue to support builders of RAF-designed homebuilts and to develop new designs for homebuilders.

The new company will be called SCALED, Inc. The SCALED is, in fact, an acronym for "Scaled Composites: the Advance Link to Efficient Development". Pat Storch spent several late nights and the better part of a carafe of white wine to come up with that name!

SCALED will be based on Mojave Airport next door to RAF. The new facility will conduct the entire program of contracting, design, fabrication, testing and reporting. Proposed customers for SCALED include any agency requiring aerodynamic, systems or structural research data early in the development cycle. To date, proposals include next-generation general aviation designs, commuter airliners and military applications.

SCALED INC. NEEDS HELP

SCALED Inc. who will be involved in designing, building and testing proof-of-concept demonstrator aircraft similar to those RAF and AMES have collaborated on in the past are looking for charter members for their new staff. We're currently looking for some shop help, a computer fanatic, a flight test instrumentation technician and a French-speaking secretary/receptionist (word processing experience helpful). Also needed turbo-jet, turbo-fan engineer/manager. Needs to have 10 years experience with turbo jet/APU, overhaul/repair.

If you are more concerned with interesting, challenging work than in civilization and culture, you might consider a move to our Mojave Desert to get in on some real stimulating projects. Send resume to:

Herb Iversen
c/o Rutan Aircraft Factory Inc.
Bldg 13, Airport,
Mojave, Ca 93501

BUILDER HINTS

We have recently tried an excellent substitute for featherfill. This product is a two part polyurethane primer filler and is manufactured by Sterling Laquer Mfg. Co. 3150 Brannon Ave., St. Louis, MO 63139 (314)776-4450. Contact the above for a local distributor in your area. Sterling primer filler (part # U-1761 and U-1762 and U-1014 thinner) is a high solids primer with excellent sanding and film thickness building properties. We have used it with up to 20% by volume mixed with micro balloons and were still able to spray it. It can also be brushed on. The good news is that it cures very rapidly, 45 minutes to 1 hour and sands nicely to contour. It also adheres very well. The bad news is the price. This is an expensive material, the price seems to vary considerably depending on where you are located.

When applying Spraylat to your canopy for protection, be sure to get a good thick coat, preferably 2 or even 3 coats. This will make it much easier to remove. Also, if you spill epoxy on the Spraylat, wipe it up with a paper towel before it cures. If it cures, it will not damage the plexiglass, but it does make it very difficult to remove the Spraylat locally.

A 3M part #7770 Clean 'n Strip brush, mounted on your drill really does a super job of carving the R45 dark blue foam. As an example the bottom can be carved and ready to glass in only 45 minutes. Thanks to Don Jehlik for this one.

When knife trimming, hold a strong light under the glass overhanging to more clearly show where the edge of the foam is.

Long-EZ Clarification -

Section I, page 19-8, layup #5 is one ply of UND per leg of the "V" layup. (2 plies over the shearweb face).

Caution - damage from brake heat.

Do not conduct your taxi tests, high speed taxi and first flights with wheel pants installed. You will be using far more brake during this period than is normal. See Long-EZ Owners Manual, page 41, under low speed taxi.

If you do have wheel pants installed, it is possible to generate enough heat buildup to soften the main gear strut and cause it to sag/fail.

Long-Ez and VariEze - Glue a piece of fiberfrax on to the outboard face of the main gear strut to protect the strut from local heat radiating from the brake disc.

If your control sticks have any lateral slop, try substituting AN174-20 close tolerance bolts for the AN4-20 pivot bolts in the control handles.

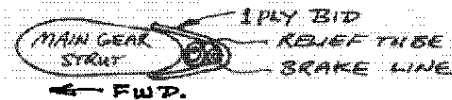
Balancing Long-EZ ailerons. Several builders have reported having a problem in this area. If you are having difficulty with this, double check your hinge pivot is exactly correct, in most cases this has been the problem. When building your wings, keep the aileron as light (almost dry) as possible. Install the balance weight in the correct relationship to the hinge. Some builders are getting the weight too close to the hinge. See Section I, page 19-14 for full size sections.

When you install your wheels, spin them and check the disc for runout/wobble. It should run true, within .010" If not true it can force the brake caliper piston back inside the caliper, and then you may have to pump the brakes once or twice before you get a solid brake.

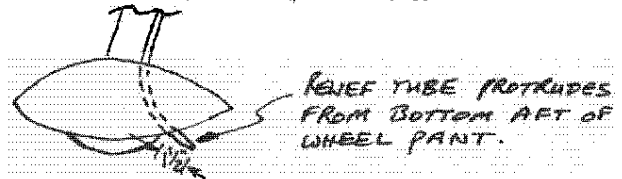
If you are experiencing gear "walk" or shudder as you roll out to take off or land, particularly as you brake to slow down, you should balance your wheels and tires. An out of balance condition that may not be noticeable on a factory built, may be objectionable on a VariEze or Long-EZ due to the relatively flexible gear strut.

Many builders have enquired about the relief tubes that are installed in N26MS and in the prototype N79RA. Here is a brief description of how we did it.

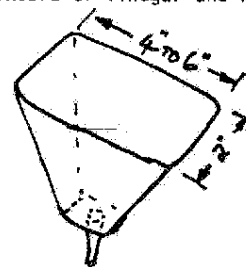
We used 5/16" ID x 3/8" OD plastic line from the local hardware store. We left it about 2 ft long in each seat and ran it down the length of the fuselage through the aft seat bulkhead to the trailing edge of the gear. Then it was run down the trailing edge of the gear and left long enough at the bottom of the gear to protrude out of the wheel pants. The brake line was run down aft of the relief tubes on the trailing edge of the gear, to help fair in the gear strut.



After you install your wheel pants, drill a 3/8" hole in the aft bottom of the wheel pant and run the relief tubes out about 1 1/2" through this hole.



We coil up the excess 24" or so and stow the coil in the front seat on the left side behind the static port line, and in the back seat, under the right console. To use the relief tubes, uncoil them and plug a rectangular plastic funnel into the end of the tube. The funnel is kept in a zip lock bag in the center section spar. To keep it and the relief tube clean and fresh, rinse out with a mixture of vinegar and water.



RECTANGULAR PLASTIC FUNNEL

We had always had a small oil slick on the cowl from the breather on our Long-EZ, not enough to notice any oil loss on the dip stick, but enough to be unsightly and aggravating. We cured this by running the breather line forward and up to the top of the forward engine baffle, looping it around and back down and aft to the normal breather exit shown in Section III. This necessitates using about 4 feet of 3/4" ID x 1" OD hardware store vinyl tubing. This is tied to the forward baffle brace and the engine lift point. To assure that this tube would not kink and pinch closed, we installed a 5/8" OD screen door spring, stretched out til the coils are 1/2" apart, inside the vinyl tube. This works like a separator, and even after a long flight, we have a clean cowl.

Caution - When flexing the top of your VariEze fuel strakes into place, be careful that excess squeeze out of floc does not drip down onto the screen, drip through and fall onto the open end of fuel pick up tube.

Caution - Exhaust system modifications, particularly those causing large bumps on the lower cowl (like cross-over or muffler-under-engine) can result in a performance loss as great as 15 mph due to aerodynamic drag, caused by airflow separation aft of the cowl modification.

Caution - Nose gear crank systems on both VariEze and Long-EZ, must have the two NG14 heavy wall aluminum tubes installed. These parts may not have been included in your nose gear actuator assembly from Brock.

Caution - Nat Puffer would like to share a problem that he has run into. He bought an engine mount and a cross over exhaust system from a supplier (not one of RAF's designated suppliers) and has had problems. The supplier has refused to make good or to refund. Nat is a member of the VariEze Hospitality club, and anyone interested in the exact nature of his problems should contact Nat Puffer.

Caution - Oil pressure line should have an orifice fitting at the engine end. We have not been able to find a source of these fittings, but we have made up an acceptable substitute by making a small plug for the pipe thread end and drilling a #60 hole in it, installing it in the AN fitting and staking it into place.

Warning: Possible fatigue or installation failure of aluminum fittings in engine plumbing. We have had failure reports of aluminum fittings that support hoses or transducers on the vibrating parts of engines. This is a very serious concern, requiring us to recommend a grounding change that replaces certain fittings with equivalent steel parts. Refer to the plans-changes section of this newsletter for the new fittings. Do not fail to install the new steel parts, a failure can be fatal.

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.

VariEze and Long-EZ

Owners Manual Under engine failure, add "CAUTION, in weather conditions where carb ice is likely, descents should be made with as high a power setting as possible in order to keep the maximum available carb heat. Descent at idle power will allow carb heater (exhaust system) to cool down such that inadequate heat will be available should the carb ice up. This is particularly true when using any of the Continental engines.

VariEze Plans Changes

Owners Manual Under annually or each 100 hours, add -
Page 39 Jack aircraft up so that both main wheels are clear of the ground, and check for attachment wear by moving each wheel fore and aft - there should be no apparent excessive movement. If wear is present either bush the aluminum extrusions or drill out to 5/16" for AN5 bolts.

Fuel Cap Retention. Geoff Danes from Australia, reports a lost fuel cap experience, with a cap secured to the cross wire by a short length of brass bath tub plug chain. Contrary to our previous fears of the cap flailing and damaging the top surface of the strake, very little damage occurred. Thus we are recommending that all fuel caps be attached to the cross wire with a length of brass "hardware store" chain as shown. Keep this chain as short as practical.

MAN/GRD 25 hours VariEze oil pressure line - if you have substandard fittings and hose on your system, change it to that shown on page 8 of this newsletter.

MAN-GRD 25 Hour At each end of the flex line from the gascolator to carburetor (see page 4 of this newsletter). Remove the following aluminum fittings:
 AN822-6D 1
 AN816-6D 1
 Install the following steel substitute fittings:
 AN822-6 1
 AN816-6 1

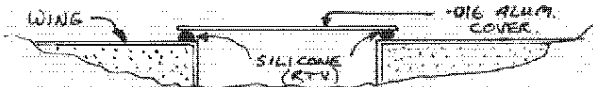
Long-EZ Plans Changes.

LPC #88 MEO Section I pg 19-16. Part # CS127 is made from .032 2024T3 aluminum.

LPC #89 MEO Section I pg 9-3. Sketch on lower left of page shows brake line run between the gear strut and brake disc. This is incorrect. The brake line must run around the inboard face of the gear strut. This puts the strut between the brake disc and the brake line.

LPC#90 MEO Section I pg 20-4. Step 6, says see Section III, this should read, see page 22-3.

LPC #91 MEO Section I, Chapter 19. Covers for the access holes, three each side, for wing attachment can be fabricated out of .016 aluminum sheet, painted to match your airplane. To install, stick over the hole using a small bead of RTV (silicone, clear silicone rubber sealant by Dow Corning is best). The covers should be taped or weighted into position and left to cure for at least 24 hours. They are water-tight and keep rain out of the attach area. If your need to remove them later, a razor blade will easily cut them loose.



LPC #92 MEO Section IIL, Oops! We neglected to cover installation of the ram inlet scoop. This prefab part should be installed onto the bottom cowl, permanently. It is floxed into place, and has a flush "pop" rivet approximately every 2" around the flange. After cure, one ply of BID is layed up inside lapping 1" onto the cowl and the ram inlet.

LPC #93 MEO Section IIL, page 36, bottom left. AN823-4D should be AN816-4, also aeroquip 496-4 should be aeroquip 491-4

LPC #94 MAN-GRD 25 HOUR Remove the following aluminum fittings:
 AN822-6-2D 2
 AN816-6D 2
 AN823-6D 1
 AN912-1D 1
 AN823-4D 1

Install the following steel substitute fittings.
 AN822-6-2 2
 AN816-6 2
 AN823-4 1
 AN823-6 1
 AN912.1 1
 Refer to the adjacent circled items from Section IIL pg 36 to identify effected parts. Make the appropriate changes to Section IIL, pages 18, 13 and 37.

ACCIDENTS AND INCIDENTS

The CR Newsletter reports accidents and discusses their conditions and causes, for information purposes for all operators. We have always investigated accidents in the interest of determining information that we can disseminate to you to prevent recurrence. It should be recognized in our discussion of accident conditions or causes that generally this information is preliminary since it is published before the availability of the FAA accident report.

Long-Ez - runway and visibility.

A Long-EZ crashed on takeoff from a small Minnesota airport. Conditions were clear, it was dark (about 1 hour before sunrise), the runway was hard surfaced, but covered with ice and snow, some large lumps of ice up to 4" thick. The runway was 2000 ft. long and ended near the edge of a lake. The aircraft was in excellent condition with approximately 60 hours total time, with 5 hours flown the previous day. It had been hangared and had no frost on the wings, however an eye witness reported that the canopy was frosted over on the inside such that he was unable to see the pilot just before take off. The pilot commented that it was no problem because his experience was that the canopy would clear as soon as he had some speed. It appeared from wheel tracks in the snow that he had a very extended takeoff roll, in fact rolled virtually the full length of the runway. He struck several hard lumps of packed snow/ice with nose and main wheels, which probably slowed him down. When he lifted off he did not climb enough and flew into the tops of some small trees off the end of the runway. The left canard and left elevator were torn off at this point, which caused the airplane to roll left. The left wing then struck the ground and was broken off at BL57. The airplane rolled inverted and crashed into a frozen swamp on the edge of the lake. It then slid over a small embankment and broke through the ice coming to rest in four feet of water. The fuselage remained essentially intact, however the pilot was killed instantly.

The cause of this accident appears to be a combination of several things. 1) Takeoff attempt on an uncleared runway with snow and lumps of ice. 2) Frosted canopy probably restricting visibility. 3) Total darkness with lake at end of runway resulting in "black hole" visibility effect at lift off, causing disorientation. As is often the case in accidents, one problem could probably be handled by an experienced pilot, but a combination of the right conditions can be enough to result in disaster.

Composite Structure Fire - There were no instances of fire on any VariEze type structure in over 200,000 flight hours of operation - until last fall. Here's the report from Ron Walter:

"I pulled in front of my hangar, shut down the engine and put the plane on its nose. Looking back I noticed flames coming out the back and proceeded to get an extinguisher to control the flame. This was to no avail and resulted in completely destroying the plane within approximately 12 (more) minutes"

A fellow VariEze builder arrived on the scene after the entire engine area and cowl were involved and he offered the following, cautioning that some is conjecture.

"At runup area engine did not sound normal. After several tries at runup he taxied back to hangar parking. Time of run was about seven minutes. On shutting down the engine with the idle cut off he noted smoke from engine compartment. He retracted the nose gear, got a small fire extinguisher and emptied it into the fire. By that time however the fire was out of control"

"Fire definitely was well along in the engine compartment when aircraft was shut down. It might have been arrested if fuel valve had been closed when smoke was detected and fuel burned through engine. Initial cause was stuck float in carburetor which kept feeding fuel to point of overflow (conjecture)"

"The aircraft was headed west and wind was from 240 degrees about 3-5 knots. This fact inhibited the fire somewhat but I was surprised at the slow propagation of the fire, about 2 to 3 inches per minute forward on both wings. The heat softened the upper wing strake to the

point that when the gas in the tanks ignited there was only a large "poof" - no contained explosion or any shattering. Even at this point neither the outer wing spars nor the center section box, showed deformation. Obviously they were getting soft but no sag. Within the next minute the fuel from the tanks intensified the fire to where everything melted down and completed burning forward to the front cockpit. At this point the main gear softened and gave up. Fire trucks arrived and put out remaining fire.

Findings: Carburetor completely melted down to point of distortion - recognizable, but that's about all. Fire wall took a lot of heat before allowing fire to progress forward. Fuselage tank failed through sight gauge first. I could not tell whether the fuel feed line from the tank to the shut off valve had softened and burned feeding the fire. Engine mount distorted but intact. Top of wing tanks burned but bottom remained intact until almost complete collapse of main gear."

Ron also shared with us a poem written after the fire by his wife.

"You were the diversion he needed in times of stress.
You were solace to him when he was not at his best.
When the world was too much for him to cope
He turned to you, and you gave him hope,
In the wee small hours when sleep wouldn't come
You were there - always something to be done.
You and he saw the world from a different view
When you soared together to the distant blue.
You're gone now - no more obsession.
Only memories left - the only possession.
You were the joy and the pride of his life,
I can't fill the void. I'm only his wife"

VARIVIGGEN NEWS

Bertil Fornen, from Stockholm, Sweden sent in a few photos of his Vigggen project and it really is going to be something. Bertil has installed a full IFR panel, has a neat electric reflex, and has completed the installation of the main gear retract system, which is the same as that on N27MS. His nose gear retract mechanism uses a slick little motor driving the gear up and down through a toothed belt. Looks like an excellent idea - let us know how this works out, Bertil.

George Craig called on us here at RAF last week and showed me some photos of his excellent Vigggen, which is coming along well. George finally got his main gear operating and is very satisfied with it. George had problems getting the correct springs to help pull up the gear and tells me that anyone wanting a set of springs to do this job should order them from: Stock Springs Co., (415)828-0373
Talk to Truman Allen. You will need 8 springs (4 on each side), .062 wire dia., 302 type stainless, 1/2" OD x 11 5/8" free length. George paid about \$35 for all 8 and reports that they work great.

Arthur Schwartz reports that his Vigggen is running like a dream and he now has 123 hours on the tach. Arthur is planning on installing the worm gear main gear system soon, up til now he has been flying with the main gear down and nose gear retracted. The cable system is just too unreliable. Reference CP 26, page 9, when Arthur's Vigggen had the right main collapse while taxiing. There is a lesson here, to my knowledge there has not been a single Vigggen that has had a satisfactory main gear using cables or chains. Every one to date has had one or more failures. The worm drive system as used on N27MS has been 100% successful so far, and it is now the standard recommended system.

I have not had a written report from Len Dobson, but he called a few weeks ago with the heart breaking news that he had collapsed the gear on his ship. Briefly, he landed on a narrow runway, with a strong cross wind, and drifted off into soft sand or mud, this tore off the nose gear and folded up one or both mains. Damage to the airframe is fairly extensive, but Len is unharmed (physically). He plans on rebuilding and will keep us posted.

FROM THE BUILDERS

Dear Burt, Dick, Mike and Sally,
We can't thank all of you enough for your generous support and help in our flight test of our Long-EZ N7LZ. We (son Dean, wife Joan and I) worked on this project for slightly under one year and we couldn't be more pleased with the resulting product. The Long is fully equipped with R-NAV and transponder for easy cross-country cruising; and, with Burt's unique design, it performs like no other two place aircraft for this purpose. It weighed in at 874 lbs. without wheel pants or spinner and apparently is the 12th Long-EZ to fly. Mike's gracious offering to fly the first flight was more than we could expect, but he went further and checked out Dean. Since I'm only a student pilot, Dick who is a CFI, checked me out. Burt personally inspected the craft and pronounced that it would fly straight and true and it did!

The required 25 hours of test flying was completed within 5 days, so we were on our way home only a week after we arrived. The only problem encountered was a need to correct a slight cusp on the aft edge of the elevators and rebalancing them. Performance matched or slightly exceeded the owners manual values.
Thanks again,
Bob, Joan, and Dean Hansen.

Dear Burt,
VariEze N774 lifted off at Tehachapi airport on November 12, 1981. The duration of the flight was for 35 minutes and everything went well. I had two rides previously in VariEzes, one with Bruce Tiff and another with Richard Clark, so the feel and performance was about what I expected.

At completion it weighed in at 638 lb. It has a C-85 without starter, standard instrumentation and a B & T prop. At 7000 ft. 2650 rpm it indicated 152 mph. It flies straight and level, hands off and stalls at 65 mph with no tendency to drop a wing.

From the moment I saw N4EZ about four years ago I wanted to build this airplane and to say that I am pleased and proud of this little bird is an understatement. The highest tribute that I can pay to your expertise and builder backup is to say that after 46 years of active flying, 37.5 with TWA, it was one of the highlights of my career to fly my own personally constructed aircraft.

I want to thank you, Mike Melville and your entire crew for their patient help and encouragement which allowed me to enjoy this experience.

Sincerely,
Bob Cummings,
Tehachapi, Ca

EZ Autumn Escapade - by Bruce and Bonnie Tiff.

Flying U.S.A. during the autumn season is truly spectacular, as we discovered for ourselves on our recent almost 7000 mile trip across our glorious country. Fantastic, beautiful, breath-taking, magnificent, etc... etc..., were the only words we "almost native" Californians could find to describe the awesome spectral of the colorful trees, shrubs, flowers and scenery as we visited the various states on our journey to and through New England. Someone up there was really looking after us as far as the weather was concerned because we found ourselves in crisp, clear, sunshiny blue skies almost all of the trip; only a few days of scud-running out of the three weeks we were gallivanting around the country.

Not only were we delighted with the beauty of these United States at this particular time of the year, but of the marvelous assortment of friends, new and old (not age-wise of course), that we met along the way. We almost wore out our Hospitality Club list from using it

so much. It was easy calling on the members that we had met previously at various flyins since we felt we knew them already, but it was a little more difficult to call up "strangers". However, what we found very quickly was that none of us that have these super flying machines, or are in the process of building them, are strangers. We were welcomed in each and every instance like long-lost friends or relatives. There is a tremendous, warm bond between the people with these airplanes, and we thoroughly enjoyed our stay with each and every one of the Hospitality Club members and also our B & T customers that we visited. It was great for us to have the opportunity to get acquainted with all these interesting people, and they seemed to enjoy the chance to swap EZ stories, get building hints, chat about the flyins, etc. Of course, back-seat checkout rides were a must for all the would be EZ pilots and it was such fun to see the reaction from the fellas and gals who have never had the thrill of flying in a EZ before. They were so excited and enthusiastic about the wonderful flying characteristics of the EZ. It's especially fun to get this reaction from the high-time pilots who have flown lots and lots of different kinds of aircraft over a period of many years. They are as impressed as the brand new pilot. It's really rewarding for us to share this experience.

Our journey took us up to Salt Lake City, Ut; over the wilds of Wyoming (where we had the opportunity to check out how service roads compare with runways - however, that is another looong story that we will share some other time); into the Plain states and a stop in Lincoln. Nb; up into Minneapolis/St.Paul. Mn; around Lake Michigan to Lansing; over across Canada and Niagra Falls to Utica, NY; down to Hyannis, MA and Cape Cod Bay where we had our only "crash" for the trip - Bonnie falling off her bicycle on Nantucket Island; up to Camden ME; (missed our visit to Vermont since weather was reporting two inches of snow - burrrr); down the southern route and stop in Bruce's hometown of Allentown, Pa; on down into Illinois, Missouri, Oklahoma and into Texas, New Mexico, Arizona and back again to California, with a stop at Mojave to relate our adventures to the RAF crowd. We arrived home with six rolls of slides and an enormous collection of memories to hold us for at least another year (well, maybe six months). We have found that these EZ adventures are becoming habit forming and eagerly look forward to planning and experiencing the next one. Our sincere thanks to Shiri and Diana Dickey, Jo and Cariye Reinmuth, Nat and Shirley Puffer, Buzz and Ann Weatherly, John and Fran Kevern, Gary Price, Joe and Fran MacDonald, and Harris and Cleta Sue Howard for their warm, friendly hospitality. As Harris and Cleta would say "Y'all come visit us sometime".

NOTE FROM B AND T PROPS.

Bruce recently retooled his prop drilling jigs and asked us to inform anyone with a B & T prop, shipped prior to January 1, 1982, if you are checking balance, to use only the 2 1/4" dia. hole, do not use the 3/4" through hole, since it may not be concentric. Props shipped after the above date, you can use either the 2 1/4" dia. hole, or the 3/4" dia. hole or both to balance the prop.

Please don't hesitate to contact Bruce or Bonnie if you have any questions at all concerning your prop.
805-649-2721

SHOPPING

Task Research - Fuel/baggage strakes are in stock for immediate shipment. Special on the next 25 orders only. Ribs and baffles will be included with strakes for \$884.

John Frilling, who sells a set of plans to make a light weight alternator, as reported in CP 26 page 11, has recently moved. Johns's new address is:
 John Frilling,
 743 Annoreno Road,
 Addison, IL 60101

Find that elusive CP article! Index for Canard Pushers #16 through #29 now available. \$3.00 per set, 10 pages.
 Bob Coon,
 26 Cloverdale Street,
 Pittsfield, MA 01201

For Sale: VariEze prefab parts.
 Brian Roach,
 1238 West Street,
 Woodland, CA 95695 916-622-2912

For Sale: VariEze original main and nose gear struts and other prefab parts.
 Grover Smith,
 509 Valley Vista Drive,
 Benton, Ark 72015

For Sale or Trade: Original VariEze nose and main gear-needs Long-EZ gear.
 Gail Jergensen,
 2725 Comanche Drive,
 Salt Lake City, UT 84108 801-583-2725

Wanted: Prefab wing/fuel strakes for VariEze
 Tom Tyner,
 P.O.Box 11625,
 Houston, TX 77293 Home 713-358-6816
 Work 713-695-9262

For Sale: Original VariEze exhaust systems, these need a slight modification - for Cont. 0-200 limited quantity - \$50 a set.
 Ken Brock Mfg.
 11852 Western Ave,
 Stanton, CA 90680 714-898-4366

For Sale: C-85-12 tapered shaft, 1350 hours total time on case. OSMOH logs and related documents. \$2600 firm (plus shipping)
 Steve Franseen
 1245 S. Tennyson
 Denver, CO 80219 303-922-6081 (evenings)

For Sale: 0-200 Cont. 0-SMOH, \$2200 cash. Less oil tank and magnetos.

Doug Klever,
 2820 Prince Road,
 Crescent City, CA 95531 Home 707-464-9829
 Work 707-464-2656

For Sale: 8 Lycoming O-235-L2C engines. Zero time per specs for Long-EZ. With Lycoming warranty. \$6695 outright, freight paid inside the USA.
 Memphis Aircraft Power Service,
 P.O.Box 38304
 Germantown, TN 38138 901-754-0214

HOT WIRE SET UP - The homebuilt hot wire set up that was described in CP 29, page 8, works fine, but many have had problems locating the parts. Vince Golden has kindly agreed to provide the transformers for those who can not locate them locally. Contact Vince at:
 Mike Quinn Electronics,
 Bldg. 727 Langley Street,
 Oakland Airport,
 Ca 94614
 (415)569-1539

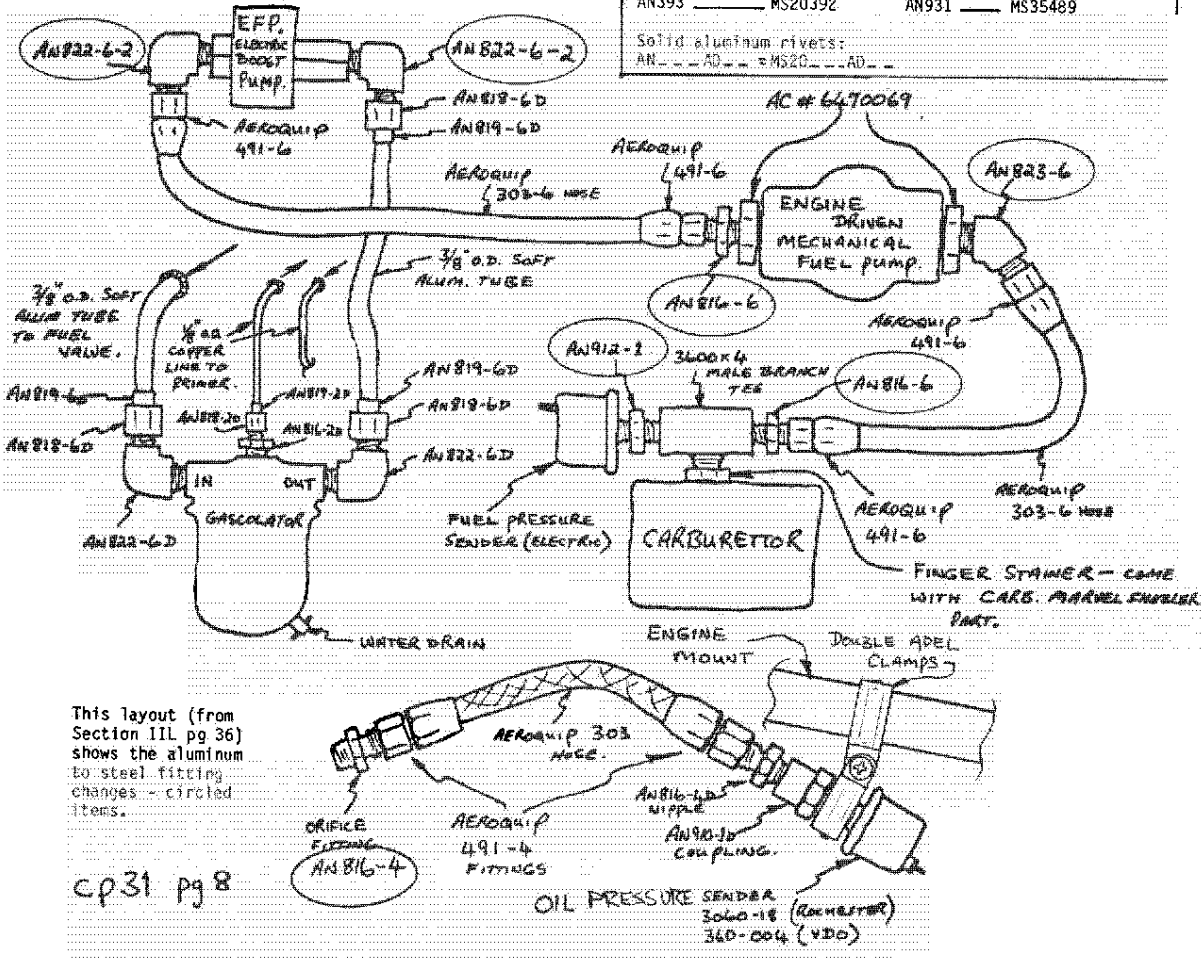
Vince will send you the transformers and modification parts by UPS for \$7.50 plus \$3.50 shipping.

Rusty Foster has developed a very nice space saver console that fits on the right side above the stick. This prefab panel will fit into a VariEze or Long-EZ. See photos. This looks like an excellent idea, is light weight, and a practical method of getting more room on your instrument panel for avionics/instruments.
 Contact: Rusty Foster,
 P.O.Box 4273,
 Ventura,
 Ca 93004

Due to some confusion over AN versus MS hardware, we have compiled a conversion chart which should help clarify things. Our thanks to Bud Meyer of Wicks Aircraft for assistance in getting this chart together.

AN509	MS24694	AN819	MS20819
AN364	MS20364	AN822	MS20822
AN365	MS20365	AN823	MS20823
K1000	MS21097	AN500	MS35265
AN380	MS24665	AN936	MS35333
AN393	MS20392	AN931	MS35489

Solid aluminum rivets:
 AN -- AD -- MS20 -- AD --



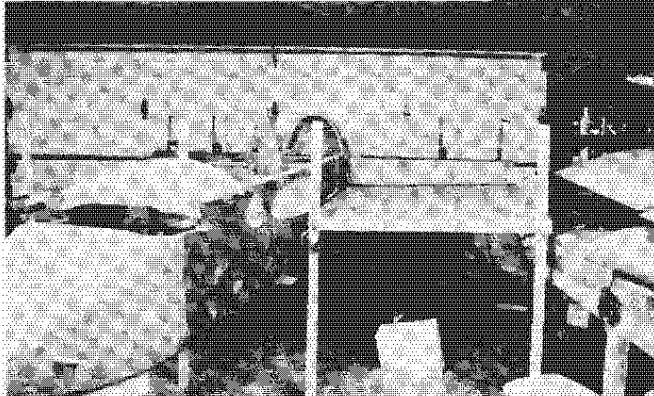
This layout (from Section III pg 36) shows the aluminum to steel fitting changes - circled items.

cp31 pg 8

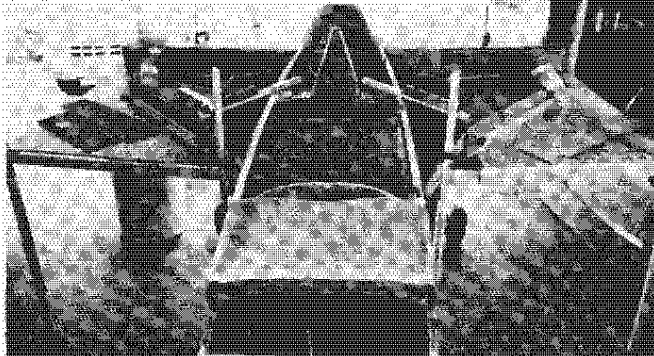
A Chino Valley area Long-EZ club for beginners, those in the middle and those finished. Let's get together and share some of our ideas and helpful hints. For more information please contact:
 Kim Prout, 3801 Carlos Court, Chino, Ca 91710
 (714)628-1403
 or Paul Prout - (714)621-0060
 Everyone welcome.

Our thanks to Gerry Grueber for sending in these nice photos showing the fuel/baggage strake construction.

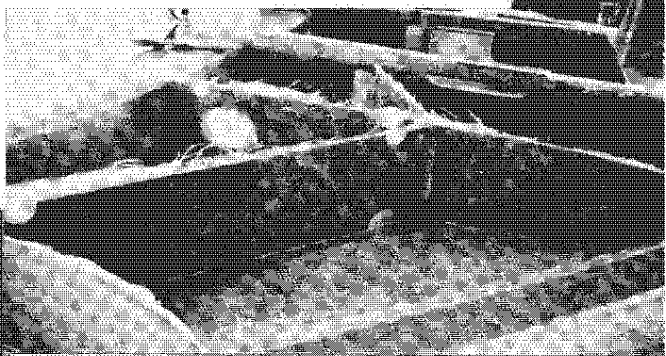
Jig "tables" in place ready to build bottoms of fuel/baggage strakes on a Long-EZ.



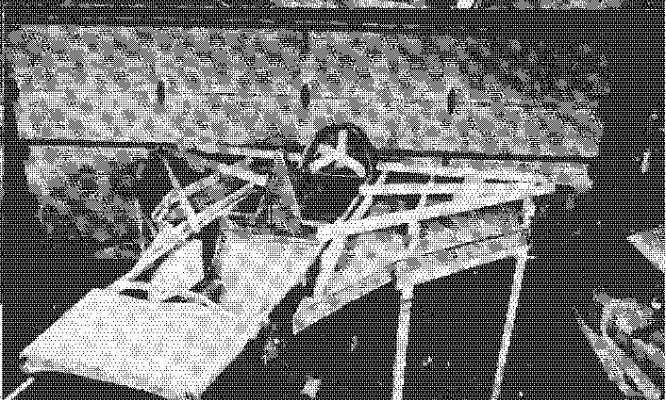
Fuel/baggage strakes with bottoms layed up and ribs micro'd into place. Be sure to do almost "wet" layups inside your tanks to eliminate the chance of leaks later on.



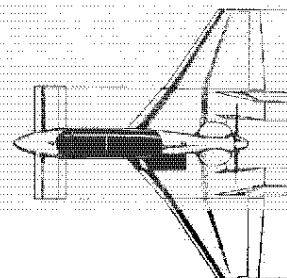
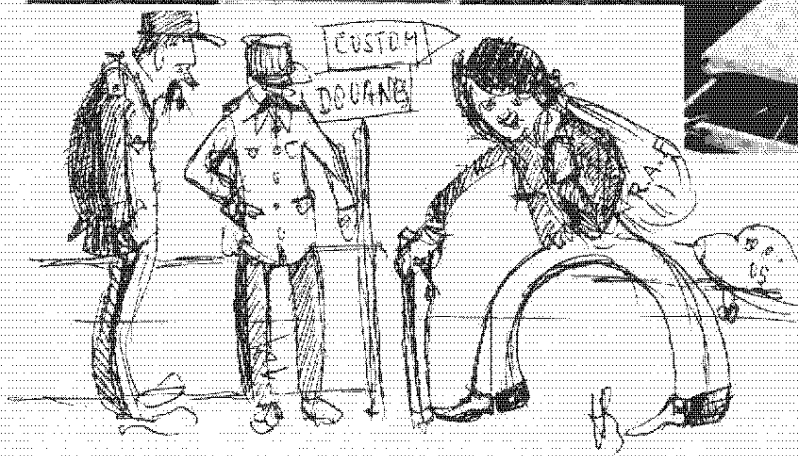
Ribs, layed up, will be knife trimmed later. The knothced out openings should be painted with pure epoxy. No need to do a glass layup on the edges of any of these holes.



View of the inside of the top of the fuel/baggage strake. Note that this foam part is supported by a lumber frame bondg'd to the outside.

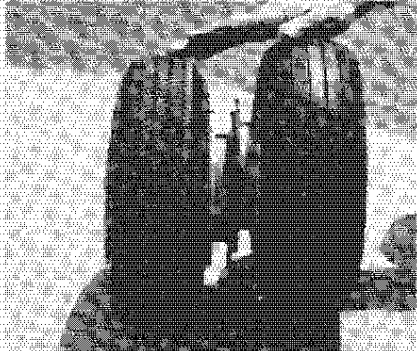


Fuel/baggage strakes floxed into place for cure.

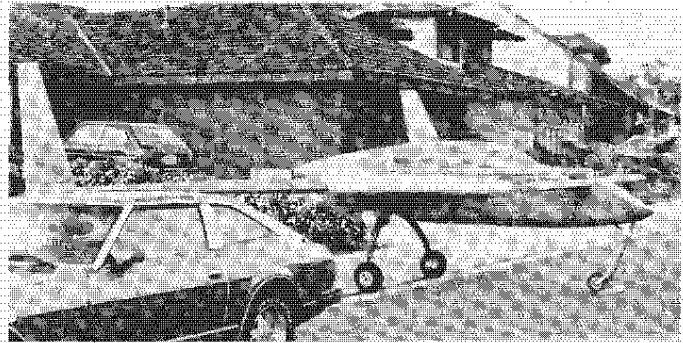


Size comparison 3.40 x 5 - 4 ply and the new 11 x 4.00 x 5 - 6ply. The new 11 x 4.00 x 5-6ply has shown excellent durability in service. We strongly recommend it or the 500-5 for the heavier Long-EZ. Also, it is the best VariEze tire size.

OK, which way to a runway! Roger Johnson's Long nearly complete.



These are the new RAF jacket patches - the general logo on the top and small Long-EZ on the bottom. We also have VariViggen and VariEze bottom patches. See page 1 for prices.



First-released photo of our Model 77 Solitaire self-launching sailplane. The fuselage shells were lofted and plotted on our Apple II micro computer with lines optimized for the thermaling design point. The engine is in the nose, with the prop extending out of the forward fuselage.

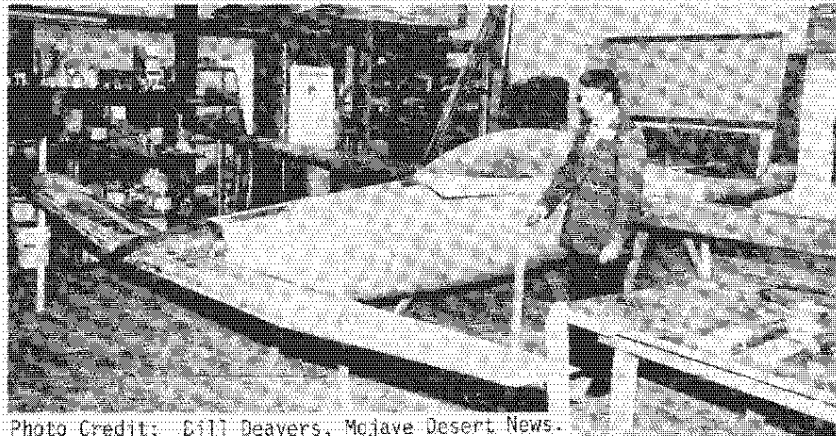
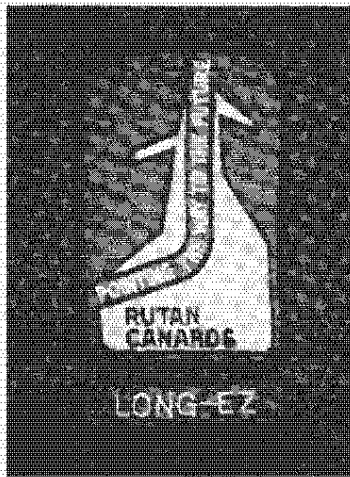
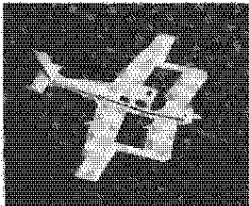


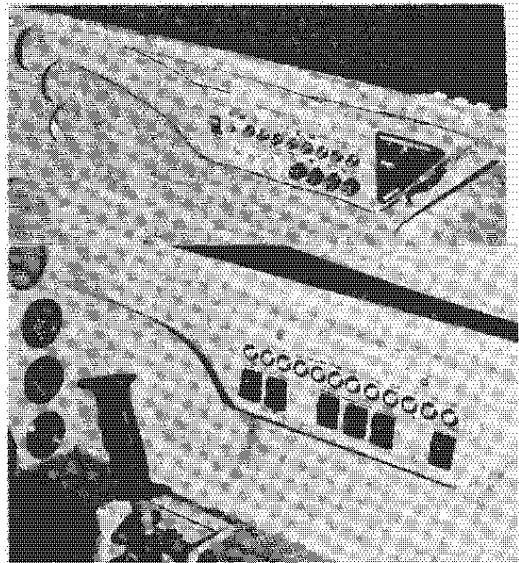
Photo Credit: Bill Deavers, Mojave Desert News.

Grizzly, Model 77, on her first flight, with Mike Melvill at the controls. Polaroid photo by Pat Storch snapped just before this newsletter went to press. The Grizz matched the stability predictions and has exceeded performance estimations.

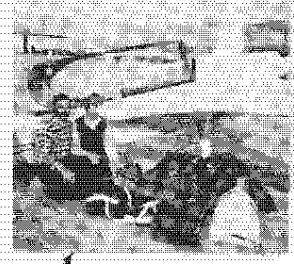
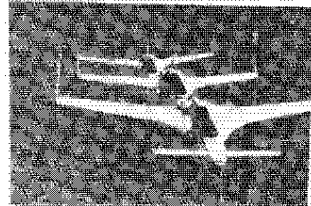
Rusty Foster's space saver side panel for Long-EZ. See page 8.



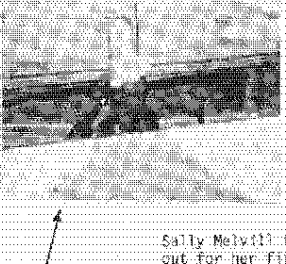
This photo clearly shows the 7 to 8 degree camber of the Long's gear with a light load.



Brief Long-Ez specifications/Performance			
Engine Lycoming O-235 108 hp.			
Span	26.3ft	takeoff (solo/gross)	550/830 ft
Area	94.1sq.ft.	Climb (solo/gross)	1750/1350 fpm
Empty Basic	710 lb.	Cruise 75% 8000 ft	183 mph
Empty Equipped	750 lb.	Cruise 40% 12000 ft	144 mph
Solo Weight	960 lb.	Max range * 75% (solo/2 place)	1370/965 mi
Gross Weight	1325 lb	Max range * 40% (solo/2 place)	2010/1430 mi
Max Fuel	52 gal.	Ceiling (solo/gross)	27000/22000 ft
Cabin L/W/H	100/23/37 in.	Landing dist. (solo/gross)	450/680 ft.
*40-minute reserve			



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



Sally Melvill taxiing out for her first Long-EZ solo flight



Long-EZ parked nose-down with two VariEzes



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.

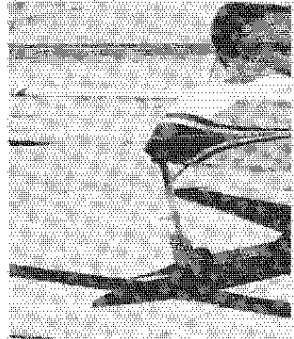
SECTION II - ENGINE INSTALLATION - This is a set of drawings and construction manual for the complete engine installation including mount, baffles, instrumentation, electricals, fuel, exhaust and induction systems, carb heat box and muff, cowling installation, prop and spinner.

SECTION IIC - Lycoming O-235

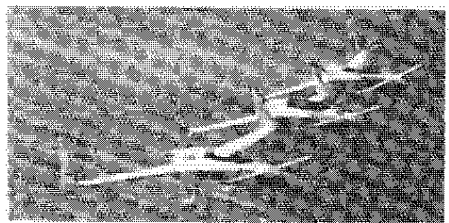
OWNERS MANUAL - This is the required operations handbook and checklists, including normal and emergency operation, detailed flying qualities and performance charts, maintenance, maiden flight procedure, and pilot checkout, etc.

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

The nose gear retracts for parking and in flight



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



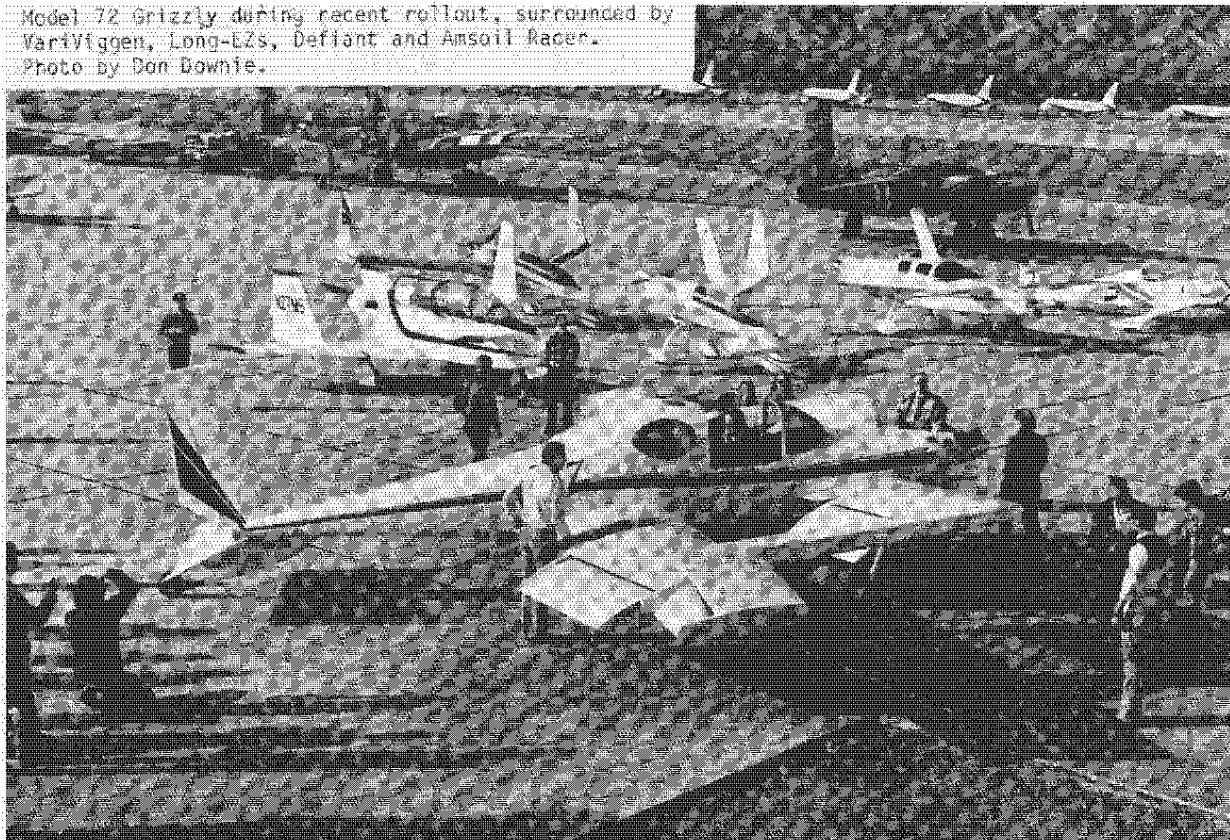
Rutan Aircraft Factory Inc.
 BUILDING 13, MOJAVE AIRPORT
 MOJAVE, CALIFORNIA 93501
 TELEPHONE (805) 824-2645

Check items desired	Price, includes first class mail to U.S. & Canada	Overseas, Airmail - U.S. Funds onl.
<input type="radio"/> Rutan Aircraft Information Package-complete data and photos of all Rutan Aircraft designs.	\$ 5.00	\$ 6.00
<input type="radio"/> "Canard Pusher" newsletter. Published quarterly. One year subscription, Approx 10,000 words per issue.	6.75	8.75
<input type="radio"/> Long-EZ plans. Section I	198.50	212.50
<input type="radio"/> Section IIC Lycoming	21.50	23.50
<input type="radio"/> Long-EZ Owners Manual	9.00	10.50
<input type="radio"/> Long-EZ Landing Brake	10.00	11.00
6% tax, if Calif. order Newsletter not taxable.		
TOTAL		

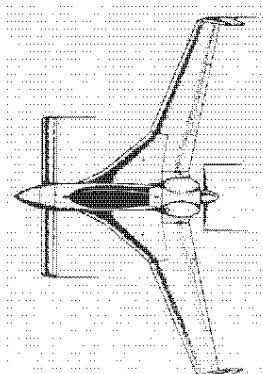
THE FOLLOWING ARE RAF-AUTHORIZED DISTRIBUTORS OF LONG-EZ MATERIALS AND COMPONENTS. CONTACT THE DISTRIBUTORS AT THE ADDRESSES SHOWN FOR THEIR CATALOGUES AND DESCRIPTION OF ITEMS.

ALL RAW MATERIALS & COWLINGS	
Near Los Angeles:	Near St. Louis:
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KEN BROCK MANUFACTURING, 11852 Western Ave., Stanton Ca. 90680 (714) 898-4366: Control system parts and all machined or welded parts, fuel caps, engine mount, rudder pedals and exhaust system. Catalog #3	
PLEXIGLASS CANOPY BUBBLE, NOSE & MAIN GEAR STRUT RUTAN AIRCRAFT FACTORY INC. BUILDING 13 airport Mojave Calif 93501	

Model 72 Grizzly during recent rollout, surrounded by VariViggen, Long-EZs, Defiant and Ansoil Racer.
Photo by Don Downie.



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



first class mail

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