

# THE CANARD PUSHER

NO 21

JULY 1979

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If you are building a VariViggen from 1st Edition plans you must have newsletter 1 through 21. If you are building a VariViggen from 2nd Edition plans you must have newsletter 18 through 21.

If you are building a VariEze from the 1st Edition plans you must have newsletters 10 through 21. If you are building a VariEze from the 2nd Edition plans you must have newsletter 16 through 21.

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 9:00 to 12:00 and 2:00 to 5:00 on Wednesday through Saturday.

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 fly-ins. Our building will be closed 26 July to 9 August during Oshkosh convention.

When writing to RAF always send a stamped, self-addressed envelope along if you have questions. If you are making an order, its'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 your reply.

**CONGRATULATIONS!** There have been a very large number of first-flights of VariEze's since April, averaging about one every three days. The following list is of VariEzes' first flights that RAF has been notified of since our April Newsletter.

Eric Larson	San Deigo,	Ca
Lou Mason	San Antonio,	Tx
Tom Franken	Great Fall	Mont.
Jim Davis	Falls Church	Va
John Neils	Bozeman	Mont
Bob Ohletz	Thousand Oaks	Ca
Norm Ross	Victoria	Canada
Bob Purdy	Carbondale	Ill
Ray & David Ganzer	El Cajon	Ca
John Wagner	Pontiac	Mi
H.A. Bowman	Anchorage	Ais
Ike Griswald	Phoenix	Az
George Gilman/ Otto Schimmel	Santa Paula	Ca
Harold Heiman	Aurora	Ill
Carlos Amspoker	Marfinis	Ca
Robert Vaughan	Nashville	Tn
Mel Blanchard	Independence	Or
Bob Mudd	Albuquerque	N.M.
Chet Ellingston	Huntington Bc	Ca
Bruce McKinney	Belmont	Ca
Dick Davey	Boise	Id
Riley/Walkton/Beenson	Swickley	Pa
Ben Duarte	Dallas	Tx
Loyd & June Foster	Mt Shasta	Ca
Don Youngs	Palo Alto	Ca
S. Cochran	Swanton	Oh
Jack Day	Reading	Ca
Dan Laurence	Hopwell	Va
Bob Wahrmond	Austin	Tx
Mick Hinton	Kororo via Coffs	Australia

This totals 126 VariEzes that we have heard of that have flown. Now, if we all arrive at Oshkosh Saturday in formation - - - - -!!

**RAF ACTIVITY** Since the Apri newsletter has included builder support, development and test of the LongEZ, and refining our Defiant - V riViggen - VariEze airshow routine. Also, we have run a complete series of workability tests with SAFE-T-POXY, the new epoxy that now allows sensitized people to hand laminate.

**OSHKOSH 79** should be a big year for the canards. We expect that 25 to 50 VariEzes, VariViggen and Quickies will fly in to the EAA convention July 28 to August 5. We will attempt to reserve two rows immediately north of the access road so we can all park together. We plan to organize a daily pilots bull-session at the airplanes. Here's the RAF forum schedule:

VariEze	1 Aug	3pm
VariViggen	3 Aug	3pm
Defiant	2 Aug	1:30 pm
Quickie	31 Jul	3 pm
Design		
College	2 Aug	10:30 am

Tentative schedule for RAF Airshow - (Defiant/VariViggen EZ formation)

Sunday	29 July
Tuesday	31 July
Thursday	2 August
Saturday	4 August

## GOOD NEWS! BREAKTHROUGH IN EPOXY

The new low toxicity epoxy from Applied Plastics, is now approved for release to our raw material suppliers, Wicks and Aircraft Spruce. The epoxy is called SAFE-T-POXY, which is a registered trade name. RAF has done a considerable amount of testing of this material, and have found it to be as good or better in all respects as the RAEF and RAES and you will no longer have to worry about which to use. Safe-T-Poxy does not exotherm, and can therefore be used in both large and small layups with low danger of heat/foam damage.

Response from those builders testing Safe-T-Poxy has been 100% positive, even though the samples were not as easy to work with from a "thickness" standpoint.

We are very pleased with this development, and proud to have been associated with Applied Plastics, in this milestone in epoxy development. Results of one of the test follows:

Attention: Mr. Burt Rutan  
 Subject: SP-10 Epoxy Tests.

The Applied Plastics Co. sent samples of the new, low toxicity, epoxy system for home tests. The results of my test are listed on the attached page. In summary, there were no detectable toxic effects whatsoever.

Thank you for developing this new epoxy system, it is another significant contribution to the aircraft industry.

Sincerely

Paul J. Bryant  
 Prof. of Physics and  
 Lecturer in Medicine.

## SENSITIVITY DATA RECORDED FOR TWO EPOXY SYSTEMS RAE & SP-10

Parts of body effected	Sympto		Duration of effect	
	RAE	SP-10	RAE	SP-10
Back of hands & wrists	dermatitis rash	no effect	48 hrs	none
palate and throat	soreness & reddening	no effect	7 days	none
sinuses and forehead	moderate headache	no effect	8 hrs	none
finger tips	hardened flaking	no effect	10 days	none
forearms	itching	no effect	4 hrs	none

Since the ratio of resin to hardener is different than the previous APCO epoxy, see CP20 for the necessary changes to your balance scale. If you have "Michael's Engineering" ratio pump it will need to be reconfigured before you can use it to ratio Safe-T-Poxy. See the sketch on page 9 for a simple way to do this. We have done this and have good results.

**VARIEZE OPERATOR EXPERIENCE.** We've been criticized by some VariEze flyers that our newsletter covers only builder support and modifications and when covering flyers we discuss only accidents or problems, but not the fun part. With this in mind, the following section summarizes some of the information we have received concerning VariEze "social life".

First, activity from the VariEze Hospitality Club (CP #20, Page 11)

"This is the 1st Annual International VariEze Hospitality Club flyin at Mariposa. The largest assembly of VariEzes since Oshkosh 78. There were ten Ezes flew in plus two builders of nearly complete birds.

Les and Olga Faus	N14533
Ken Forrest	N84ST
Gerald Gardner	N99EZ
Julie and Bill Lerner	N51820
Ed & Joann Hamlin	N777EJ
Ron Kaporman	N16EL
Dan & Mark Lee	N35EZ
John & Wilam Melville	N76WJ
Donald & Bernadette Shupe	N39EZ
Bruce & Bonnie Tiffit	N115EZ

Everyone except three stayed with Bruce's parents, brother, and relatives for one night and had great times telling lies !!!

"Pine Mountain Lake VariEze Hospitality Club fly in over Memorial weekend. Faus, Hamlins, Melvilles, and Shupes rented a house for the weekend, and it was great! The Ezes were parked just off the Pine Mountain runway on the land of Charlie Lynn, builder of the Mini-Mustang. Pine Mountain, with runway access lots and friendly people captured the hearts of the attendees."

"We have planned another informal VariEze flyin to be held October 20-21 at Columbia, Ca. Notices with details are being mailed to all the Eze owners that we have addresses for. We need to give the airport people at Columbia some idea of how many airplanes we expect, so please get in touch with the below listed people for further details if you would like to attend. Hope to see you all at Columbia in October."

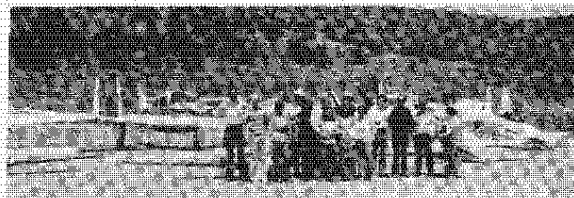
Bruce and Bonnie Tiffit (805) 649-2721  
 Bill and Julie Lerner (714) 462-0904

Hotels: Columbia Inn (209) 532-7357  
 Stagecoach (209) 532-4508  
 City Hotel (209) 532-1479  
 Campground at edge of airport also.

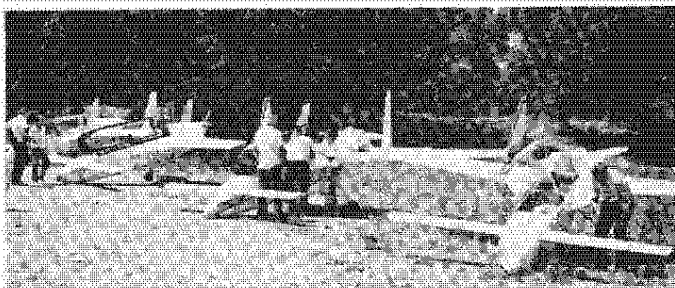
Ray and Nova Cullen recently visited RAF in Mojave in their newly completed and very beautiful VariEze. They did a super job on their EZ and are both concerned about builders who are having difficulty with their projects. They have expressed a sincere desire to assist other EZ builders in their area. Call (503) 842-5440 or write Ray and Nova Cullen, 1116 6th Street, Tillamook, Oregon 97141. Thanks Ray and Nova, this local help is extremely important to builders needing assistance.

**FLASH!** Peter Kraus flew his VariEze at the Paris Airshow, in an impressively smooth, low level, aerobatic display!

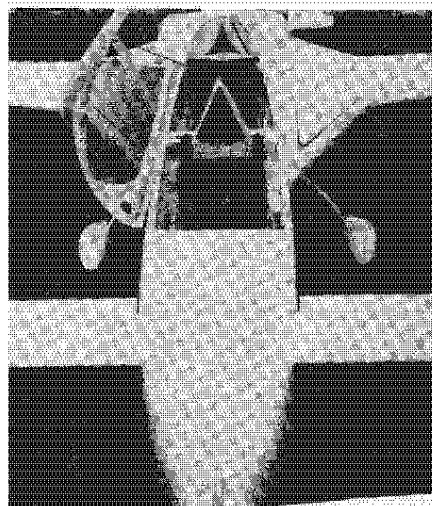
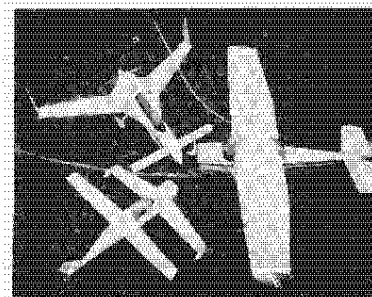
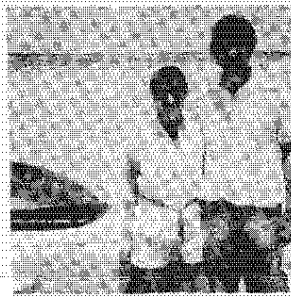
We understand that Johnny Murphy, builder of VariEze N20VE has, together with his brother, built and flown a Quickie. That makes two E-Z builders who have completed and flown a Quickie. We hear that he was just elected Mayor of his hometown, Cape Canaveral, Florida. Congratulations, Johnny !!



MARIPOSA → ← PINE MT. LAKE

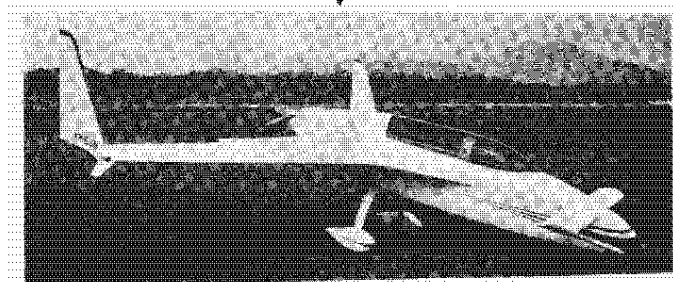


RAY & NOVA Cullen → Lee & Dianne's Trio →



NORM ROSS'S  
 EZ - 1ST IN  
 CANADA.

A. Hinton's EZ →



Lee and Dianne Herron own a unique set of three airplanes - see photo. They were the first homebuilders to fly off restrictions on a VariEze in 1977. They were the first homebuilders to fly a Quickie. Their VariEze cruises at 190 mph on 100 hp. Their Quickie and Cessna both cruise at 125 mph on 19 and 100 hp respectively! Their Quickie's takeoff distance and cruise speeds are better than the Quickie manual performance figures. Lee and Dianne built their Quickie in 111 days and 525 man-hours.

Note: Address any Quickie correspondence to Quickie, not RAF. Quickie, Bld 68 Mojave Airport, Mojave Ca 93501 (805)824-4313

A.Hinton  
RMB 13 Woolgoola Rd  
Kororo Via Coffs Harbour  
N.S.W. Australia

Dear Burt,

I would like to inform you that my VariEze VH-EZH is now flying (fantastic to say the least). It weighed out just under 600 lbs with alternator and limited I.F.R. panel.

Thank you very much for your help, which has allowed me to build this magnificent machine. It flies hands off and I just can't stall it, but will be going back into the work shop soon to install the wing cuffs.

After the necessary flight tests in March of this year, I was able then, accompanied by my wife to do my longest flight in EZH and enter my EZ in the SAAA convention of the year at Bowral N.S.W. I am very proud to say it won the Reserve Grand Champion home built of Australia. This was my first attempt at building so mere words will never express how I felt that day.

Since the air show my phone has rang constantly with enquiries from future builders of the VariEze.

Hope to see you at Oshkosh this year.

Yours faithfully,

Mick Hinton.

The Photo on pg 2 shows Norm Ross' beautiful new VariEze. It weighs 603 lb, yet has full electrical system, I.F.R. panel and leather upholstery - it is the first Canadian EZ to fly.

Some comments from Dr. Jim Wright, Kansas City.

"I have noticed an early tendency on the part of everyone flying 26JW to have the right wing drop momentarily on lift-off, even with the two TWA pilots, and talking with them I believe its related to our tendency to want to keep the stick vertical rather than canted to the left. We all have a lot of stick time and maybe just keep it "in the middle" by habit. When we have thought about that and remembered not to "force" the stick to be vertical the wing does not drop.

I've made a couple of cross country flights, and on one short one, KC to Jefferson City, Mo., I got a ground speed of exactly 200 mph, checked out by time and crossing the departure field at altitude and checking time as I crossed the Jefferson City airport at same altitude. I took one trip KC to Houston Tx., Port Arthur, back to Houston, Fort Worth, and back to KC. Put 14 hours on 26 JW and used 64 gallons. That's 4.57 gals/hr! I cruised at from 8,000 to 11,500 at about 65 to 70% power, but also did a lot of take offs and landing joy riding friends. I used one quart of oil on the trip!

I'm pleased with and proud of 26JW, and thank you for a good design and fine support program. When a VariEze pilot goes into a new airport he is, indeed, a celebrity and all the hard work to get a well built aircraft is worth it. And I suggest to all who are about to buy a prop and want a really good performer at reasonable price that they talk to Ray Hegy."

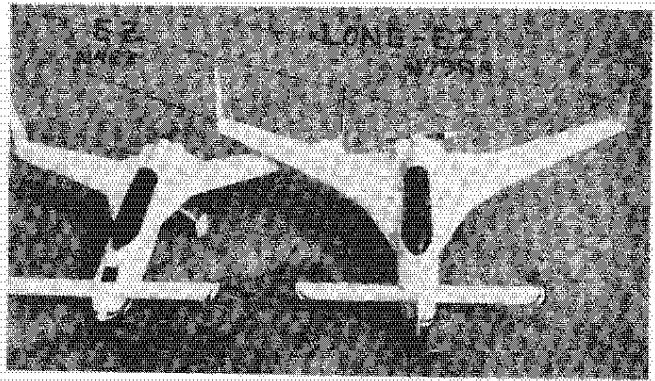
More from Nat Puffer, Minneapolis, who owns one of the cleanest EZ's around. His 85hp Ez is faster than most of the 100 hp ones.

"Don Rosborough, VariEze builder from Philadelphia, stopped in and I took him flying. After letting him fly from the back seat, and doing wing overs, the air was smooth so we opened it up at 4000ft. We hit 175 mph indicated which we calculated was 188 TAS at a density altitude of 5000. That looks like about three mph better than your curve for a C-85, and translates to 195 mph sea level.

There are still a few things I can do yet to squeeze a few more mph out:

- 1) Aileron gap seals
- 2) Seal the large trim gap on my rudder, which I don't use.
- 3) Herb Sanders trailing edge exhaust pipes.

I would like to say some day that I have a 85 hp, 200mph airplane!"



N79RA - LONG-EZ The Long-EZ equipped with Fred Jiran's prefab wings made its first flight on June 13th, 1979, and is in the middle of a rigorous flight test program at this time. We have put 30 plus flight hours on it to date.

The design goal for the Long-EZ is a comfortable, two place, cross country airplane, with long range and the capability of carrying a starter and alternator on the O-200 or O-235 without the penalty of lead ballast in the nose. Of course, having a larger whetted area and being heavier it is not as fast nor as spritely as a standard VariEze. This aircraft was designed for those people who insist on having starter, alternator and full electrical. The Long-EZ has longer range, more wing area and wider fuselage than a VariEze. It sports a nose rudder using conventional rudder pedals and toe brakes.

This is all the information we have to release at this time and we would appreciate it if you builders interested in Long-EZ please wait until our test program is complete. As you know, our policy here at RAF, is that until we are ready to sell anything, we will not encourage anyone's interest, until we have a marketable product.

If The Long-EZ completes a successful test program we will market a Section VII. (Long-EZ addendum). You will be able to use your VariEze plans. The canard, elevators, wings and cowling are the same as a VariEze. Do not assume that the Long-EZ will be available. It's acceptability depends on the success of the remainder of a very thorough test program. If successful, the Long-EZ addendum will be available this winter. Look for an update this October in CP#22.

ROTORWAY RW-100/VARIEZE UPDATE We still have not begun any formal RW-100/VariEze compatibility testing. We have recieved no information from Rotorway that the developmental deficiencies we consider necessary to begin testing (stated in CP #20) have been corrected. Again, we must caution our builders that until the deficiencies have been corrected and an acceptable testing of reliability and performance has been established, we will be unable to ascertain the acceptability of the RW-100 or any other alternate engine for the VariEze.

IMPROVEMENTS/CHANGES - MANDATORY?

Modifications, improvements, and changes in our newsletters have not been specifically tagged as to their mandatory nature. These recommendations have, instead, been verbalized in the description accompanying the change.

We at RAF, of course, can not 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. We are therefore listing past and future changes in several categories.

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.

Note that changes correcting plans errors are not listed. Only those that could be interpreted as flight safety items are listed. Read all your newsletters, this is not a complete list.

Be sure you check the following list against the current status of your aircraft.

VARI VIGGEN

Category	CP# & Page	Change
DES	1-2 + 21-8	Trim tabs on Viggen elevators
DES	2-2	Reflex Thd double advance
MAN-10HR	2-2	Remove upper O-ring
DES	3-6	Modify fork
MAN-GRD	4-4	3/32 cable
MAN-GRD	4-4	Stiffen SA5
MAN-GRD	6-8	Emergency gear extension
MAN-GRD	9-7	Fuel plumbing
MAN-GRD	12-11	Reflex for first flight
DES	14-12	Shorten FP-3
MAN-10HR	15-11 & 16-11	Cowl screen - see construction manual part II
MAN-GRD	17-6	Canopy safety catch
DES	16-10	Worm drive main gear - MAN for new aircraft construction
MAN-25HR	21-7	Skin reinforcement

VARI EZE

Category	CP# & Page	Change
MAN-GRD	10-6	Fuel tank drains
MAN-GRD	11-5	3-tank fuel system
MAN-GRD	11-7	UND wrap on C/S spar
OBS	11-A1	Spoilers - obsoleted in CP12
MAN-GRD	12-9	1.7" dim on tab
MAN-GRD	12-18	Replace elevons with ailerons, remove spoilers (see CP13-2)
MAN-GRD	14 -6	All-glass maingear tabs
MAN-GRD	14-6	Shorten Canard - New cg ranges (if cg requires)
MAN-GRD	14-8	Drill hole in inlet hoze
MAN-GRD	15-2	25-hour interval on fuel filter inspection.
MAN-GRD	15-2	First flights only - strip <u>all</u> unnecessary weight out before first flight
MAN-GRD	16-4	Contour canard within 0.006
MAN-25HR	16-5	NG25 or new-design NG15A (CP 18 pg 4)
MAN-25HR	16-6	Inserts in brake Nylaflo w fittings
MAN-GRD	16-9	Safety cables on short stacks see also CP18
MAN-GRD	17-5	Wide-chord elevator. DES or OPT if you are already proficient in flying your narrow-chord EZ. MAN for new aircraft
MAN-GRD	17-6	Canopy safety catch
MAN-GRD	17-4	Replace valve if stiff
MAN-25HR	18-5	Gascolator and fire resistant fuel lines.
MAN-25HR	19-3	Worm-drive nosegear, MAN-GRD for new construction
MAN-25HR	19-2	Wing cuffs. Also, limit cg as shown until cuffs are installed
MAN-GRD	19-4	Rebuild elevators if more than .3 lb required to meet balance angle. Additional weight <u>must</u> go at tip balance area.
MAN	20-3	UND Beef on main gear. MAN for new construction, and on operational aircraft <u>if</u> gear creep is experienced.
MAN-GRD	20-4	1/4" rod ends in pitch system.



SALLY, SHUTTING DOWN AFTER HER FIRST SOLO FLIGHT IN VIGGEN N27MS MIKE, READY FOR A KISS!

VARIIZE PLANS CHANGES

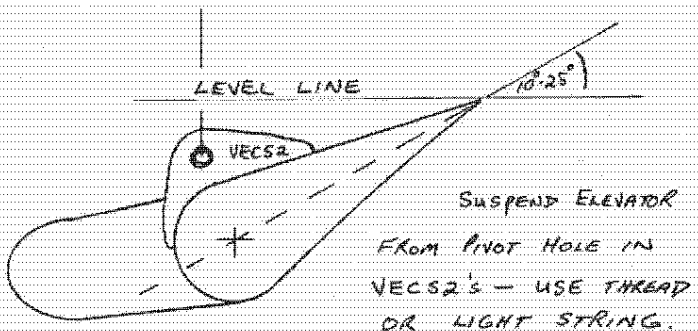
- Section IV pg 30      delect "light grease on nosegear guides" and change to "light grease on worm and wormgear".
- Section IV pg 37      add " before first flight, clean and flush all screens, both carb and gascolator. Remove and clean out carb float bowl and finger strainer.
- Claraffaction to C.P. #19 pg 7.      When retrofitting the crankdown nose gear system,  
Discard:      Reuse:  
NG 13      NG 9  
NG 11      NG 10 (cut down)  
NG 12      NG 14
- Section IIC pg 36      Fuel system shown is obsolete Follow page 7,10,11, & 17
- Section IIC pg 27      Material for throttle and mixture controls is .062 2024T3 aluminum ALSO, see pg 7.
- Section I      Construction Order. Build fuselage first and canard and elevators last.

The reason for this change is simply that the canard and elevators is the most important and critical part as far as accuracy is concerned, on the whole airplane. Rather than learning to use the materials while building such important parts, we want you to learn to handle the foam and fiberglass-epoxy while building such simple parts, as fuselage bulkheads, seat backs and fuselage sides. Then work your way into assembling the fuselage and making the bottom. Follow the plans from here, and finally last of all, build the canard and then the elevators. By this time you will be thoroughly proficient and should be able to make excellent parts.

ELEVATOR BALANCE (continued) Here we go again!

It may seem that we harp on about the elevator shape and balance, but the fact remains that the single most important parts of the airplane are the elevators. Recently, since CP20, we have had yet another builder who experienced elevator flutter. It occurred at 120-130 mph and produced such a violent shaking, that he was certain the airplane was going to come apart. It turned out that he had extended his elevator's trailing edge and found he had to add weight. Unfortunately he added considerable weight only to the inboard, and none to the outboard counter weight. This is a NO NO!! It is critical that any extra weight added to balance the elevators to 10° - 20° nose down (up to a maximum of .3 lb) be equally divided between the inboard and out board. Keep your elevators light! In his case, these elevators weighed around 5 lb a piece, which is totally unacceptable. If yours are over 3.9 (lb) or 3.6(rt) balanced, strip them to bare tubes and start over.

While we are on the subject of balance I want to clarify the method of measuring the 10° - 20° nose down angle. A few builders have been using the flat bottom of the elevator, which is wrong.



INITIAL FLIGHT TEST

As new VariEzes emerge from their concealed assorted construction sites and start taking to the air for the first time, the great majority of the pilots report no problems, "the aircraft flew great, just like the book". However, a few are still having control problems during initial flights. When we investigate the problems we often find a pilot who is neither current, proficient, familiar enough with the VariEze owners manual, or does not understand that a VariEze does not fly like a Cessna 150 or some other sluggish trainer. The VariEze is high performance, responsive aircraft with differences. It has a side stick and the pilot should keep his forearm on the arm rest and use his wrist to control pitch. Also, the rudders can both be inadvertently deployed at the same time and the pilot should be careful not to do this in flight. Jim Davis got a little tense and unknowingly pushed both rudders simultaneously giving him yaw-roll problems. (see his story below) Another pilot reported very poor climb and he said he almost hit a small hill on his first take off. I was concerned until I found out he was holding 130 mph, thats 38 mph above best climb speed, no wonder the climb rate was low. The nose and canard attitude gave him the impression he was climbing when he wasn't. I flew first flights on two new VariEzes here at Mojave. Both aircraft flew normally, but both pilots had problems when they first flew on their own. One pilot rounded out high, got real slow on landing and hit the winglets on "crunch-down". The other pilot had pitch control problems (PIO) and damaged the nose gear. He was trying to fly with his whole arm instead of just the wrist.

Lets discuss the three common areas that seem to give a few people problems.

1. The non-standard rudder pedals. Beware not to push both at the same time in flight. One will usually be out more than the other producing unwanted yaw. The VariEze rudders are very effective and the yaw generated couples easily to roll. Infact the roll rate will almost double with rudder added to aileron control. Adjust the pedals so your foot does not press the pedals naturally.

2. Pitch over-controlling. The novice pilot will expect the VariEze to handle like the C-150, or what ever, he last flew. The experienced pilot knows that J-3 cubs and Bonanzas handle different and will make the transition easily. Spend enough time on the runway just above rotation speed but below lift-off speed and practice controlling pitch so you can put and hold the desired/selected pitch proficiently. Hold the forearm on the arm rest and control pitch with the wrist only. Do not over-rotate! The highest rotation you should see during this or the later flights is the canard up to, but never above the horizon. Better yet, keep it always at least 2 degrees below the horizon.

3. Nose high, Slow touch down speeds. To avoid this be sure that during take off and landing to not rotate the nose above the horizon. On take off rotate the nose/canard to just below the horizon. Hold it there and wait for lift off. On landing, fly final and touch down while you can still easily see over the nose. If you cannot see the runway, go around and use more speed next time. You will find that using this technique you will be a little above the minimum touch down speeds. This is okay to be a little fast for your first few landings. Runway length notwithstanding a hot landing in a VariEze is no problem and is much better than a slow, wing rocking, blind "arrival".

The following is from Jim Davis' about his first flight experience:

"On first flight, I experienced unusual roll on climb out and level flight. This occurred unexpectedly, both right and left at a random rate. First landing was exceedingly hard and resulted in damage to the main gear, wings, etc. I believe this was due entirely to pressing on the rudder bars inadvertently. I had flown back seat of another VariEze and experienced the unusual sensitivity of the controls. However, this didn't carry over well to the rudders which I had been tromping on for brakes during two hours of high speed taxiing. Rudder cable length was short, cut to insure solid brakes with toes down. Seat cushions, adjusted to other Rutan criteria definitely accentuated the problem. I didn't

realize the unusual roll induced in swept wings by rudder action. Suggestion: Make sure your rudder cables are long enough to keep foot pressure off rudder bars without any effort. Make every effort to ride the backseat of another VariEze before first flight in yours. Fly dual in a Thorpe T-18 or other small plane with very sensitive controls and speed on final of 80 mph. There is really no substitute for this experience - and keep your feet off your rudder bars unless you want yaw and plenty of roll."

Jim Davis, Falls Church, Va

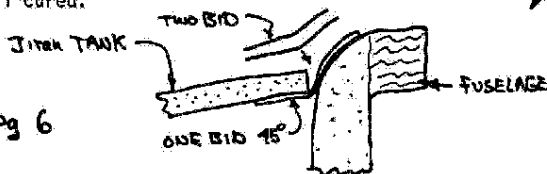
Another area we need to emphasize is weight. During the initial flight testing "KEEP IT LIGHT." Our philosophy is "if it isn't needed for first flight don't put it in". Give your aircraft every chance of successfully completing the test phase. If you keep the weight out of the tail (gen/alt/starter/pump etc) you don't have to ballast the nose as much to get the cg into the "first flight box". Remember the aft cg limit might not be the same for your aircraft as it is on N4EZ due to builder differences. Be careful, work toward the aft cg limit gradually.

Another question is "why wear a parachute during flight test?" Will I hit the prop or the canopy or should I slow up and roll inverted - - - ? Remember your aircraft may not fly like N4EZ or a builder error could cause destructive flutter or a loose fuel line could cause a fire, or many other things. In any of these cases the parachute is the only means of survival. As for how to bail out - - - you open the canopy unfasten the belt and jump over the side. Don't worry about the prop, you will fall away from the aircraft long before you get blown back into the prop. You need 250+kt before prop contact should be a factor. Remember if you find yourself in a situation where staying with a stricken aircraft means death and the parachute is a chance to live, I think I would take that chance no matter what the odds were. It sure is comforting to have a chute on your back to get home with in the remote chance the aircraft came apart. As a two time member of the Caterpillar Club, I recommend parachutes enthusiastically. (Above comments by Dick Rutan)

**ACCIDENT** Fuel contamination: Steve Stuff had an engine failure just after take off and damaged his VariEze running off the end of the runway. The failure was due to debris in the carb float bowl blocking the main fuel jet. Therefore, we are changing Section IV to clean the screens and the float bowl after the engine/taxi runs but just prior to first flight. Note that Section IV already requires a 25 hour inspection and cleaning of the gascolator.

Did you know: that a Boeing 727 can run over you (midair) and not ever see you? Reference Aviation Week report on the San Diego midair—they found that when the airline crew is in their usual sitting position (slightly down or back from the recommended position) it is possible to run into you and never see you, even if they are looking, because the windshield wipers will obscure you from their view. "You all be careful now."

**BUILDERS HINTS** Bob Lokey, of Universal City, Texas, recommends the following method of repairing a bad gouge in blue foam. Use a 1 7/8" dia hole saw with the guide drill bit removed, and turn it by hand centered over the damage until about 1/2" deep. Remove the center 'plug' with a chisel. Now use a 2" dia hole saw with guide drill bit removed, and cut a plug from some scrap foam. Paint a little slurry on the bottom of the 2" plug, and "screw" it into the hole made by the 1 7/8" dia hole saw, until it firmly bottoms out. Use a hard sanding block to sand it down flush. Bob says it works beautifully. Don't neglect to use slurry to glue the plug in, though, a plug, just forced in dry is not structurally acceptable. If you need to hot wire through the plugged area, leave out the slurry until after hot wiring is complete, then slurry and nail the piece in place until cured.



CP21 Pg 6

Several builders have purchased the CD1145 worm gear from Boston, and have received a webbed cast gear with lightning holes in the web. This gear can be used if you follow this procedure: Remove all grease, and sand blast or sand with 60 grit, the webbed area. Lay the gear down on some saran wrap on a flat surface. Now mix up some flox and trowel it into the lightening holes making sure to get good squeeze out, and thoroughly fill all voids. Trowel off excess, level with the gear and allow to harden.



Now drill and countersink 4 #12 holes for AN509 bolts and bolt to NG steel weldment. This system works great, we have it on N4EZ with no problems. Vigen builders can use the same method in the worm-wormgear main gear system as it uses the same Boston gear.

**FEATHERFILL** some builders have not read their newsletters and are still experiencing problems with feather fill. This newsletter bulletin supercedes all previous instructions including Section V on Finishing. Before attempting to apply featherfill - surface must be dry, dull and clean! A "fog" or "tack" coat (very light coat) of featherfill should be sprayed or brushed on and allowed to "tack" up for 10 - 20 minutes. Now mix up a batch of featherfill (must be thoroughly mixed using a paddle or wire in a drill press) and mix 25% -50% micro balloons by volume into the featherfill. Use a 2" brush, and brush it all over the part you are working on. Allow this to cure thoroughly, then dry sand using new 100 grit and a spline. As soon as you see glass high spots quit!

Again brush on featherfill - micro balloons in any remaining low places, allow to cure and sand with 100 grit and spline. Generally these two applications as described above will be sufficient for all but the worst surface, three applications at the most. You should use 1 1/2 gallons at the most on a VariEze.

Some people have had problems with their Rosenhan brake discs. Mr. Rosenhan is selling an excellent replacement disc direct from him for \$10 each.

Note that the styrofoam referred to in the plans as blue foam is not as blue as it once was, in fact some builders have reported receiving almost white foam. This is ok, just be sure it is styrofoam, which it will be if you purchase it from one of our designated suppliers Wicks or Aircraft Spruce.

The speckled paint finish as seen inside Fred Keller's cockpit at Oshkosh last year, is "Zoletone" which is available from most paint supplies, one of which is Paramount Paints, Westminster, Ca

Joe Deady reports that he has been using a pair of ski goggles when sanding or grinding with excellent results. The soft foam seal is designed to keep out fine particles like snow and conforms to your face, even with a dust mask on, and it stays completely fog free.

**Installing Jiran Fuel Tanks.** The fuel tank bottoms are pretty straight forward, but don't forget to remove the peel ply!! Then paint a generous coat of pure epoxy all over the inner surface of the tank. Do this with the tanks at the same temperature as the shop. (Don't bring them into a cool construction environment, after they have been stored in a hot shed, or visa-versa).

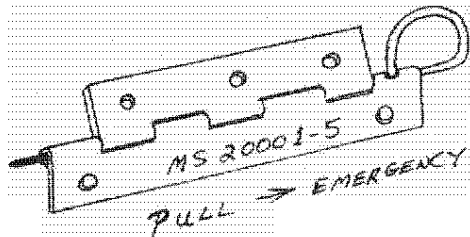
When you get ready to put the Jiran fuel tank tops in place, do not build a small "ledge" along the fuselage as shown for the home built tanks. Cut a 3" wide strip of BID at 45° and lay it up on the edge of the tank top, lapping onto the tank 1 1/2". Be careful not to wet the 1 1/2" overhanging half of the BID tape. Allow this to cure for three hours, then install the tank top with flox and tapes, and wet out the BID tape onto the fuselage as shown. After this cures, trowel dry micro into any gap between the tank and fuselage and apply two BID tapes over this joint lapping equally onto the tank and fuselage.

When making your main landing gear attachment tabs, in Section I chapter 18, you are told to layup your pads on a 'piece of paper', do NOT use waxed paper in this application, as it is possible for the epoxy to pick up wax, and then to have in effect a wax barrier between the tabs and the gear leg.

**Gaution** Do not ever hand prop a VariEze (or any airplane) that does not have at least one functioning impulse mag. An impulse mag allows the plugs to fire at or slightly after top dead center, without an impulse mag it will fire up to 25° before top dead center, which can lead to broken thumbs at the very least. If you only have one impulse mag, be sure you select only that one until the engine is running.

**Safety Hint.** This suggestion comes from Lee Herron. "It has been pointed out by the F.A.A. Eastern Region E.M.D.O. that the canopies of the bubble-type found on VariEze, Quickie, KR-2 etc., are impossible to break or open with the bear hands in an emergency and not all emergency personnel know to freeze the lucite canopy with CO<sub>2</sub> before it will break. Therefore, an emergency canopy opening system is desirable.

An acceptable answer was found when using MS20001 type hinge, the hinge pin is replaced with 1/8" stainless music wire that has a one inch finger loop at the front end. A 1/8" hole is then drilled into the base side of the hinge and the wire loop end snaps into this hold and locks the pin in place until pulled to release the canopy in an emergency. To finish the job, use 3/8" red "stick-on" letters along the hinge "PULL EMERGENCY". Simple and safe.



Noel Bramich, first VariEze to fly in Australia, had tremendous overheating problems on a Rolls Royce O-200. He finally traced it to too small of a main jet. EZ builders - take note!!

**Junking of non perfect parts.** We have recieved many calls lately from builders who have a poorly built part, too heavy, dry layup, etc. Also builders who are determined to use epoxy that has expired (Lambert). Try to put yourself in the position of a manufacturer of a certified airplane. If any parts don't meet quality control specs, or if any material is over shelf life, it is thrown out and not used. You are building an aircraft that you will trust your life to, do not use substandard parts, or expired shelf life materials. In the case of expired epoxy, use it to build a boat, remember you can swim a whole lot better than you can fly.

#### VARIIZE SHOPPING.

Props for the VariEze are available from the following vendors. We have evaluated sample props from these suppliers and have found workmanship and performance to be excellent.

Ted's Custom Props  
Ted Hendrickson  
9917 Airport Way,  
Snohomish, Wa 98290  
(206) 568-6792

Bill Cassidy  
4652 Montview Blvd.,  
Denver, Co 80207  
(303)322-3423

B & T Props.  
5746 Ventura Ave.,  
Ventura,  
Ca 93001  
(805) 649-2721

Ray Hegy  
Marfa,  
Texas 79843  
(915) 729-4249

**CAUTION!** When mounting Cont. O-200 engine, do not omit the 1.5" long hose # AN 844-8-6 from each mounting bolt. See Section IIA page 13.

#### FOR SALE

Cowley VariEze canopy (bronze) brand new, still in the box. \$175.00 F.O.B. Santa Paula, Ca  
Call Bill - (805) 985-6565

Ted's Prop for Cont. A80 (58 x 52)  
Prop Extension for Cont. A65-0.200  
Call Chris Doostmard  
(714) 673-9625  
(714) 640-6879

Stan Cooper reports excellent results to an ad in Trad-a-plane for an engine for his VariEze. He bought a Cont. C85 for \$1300 with 430 hours on it and heartily recommends going this route.

**NOTE!!** H.C.Communications reports that they will Not be able to fill antenna orders placed after September 1.

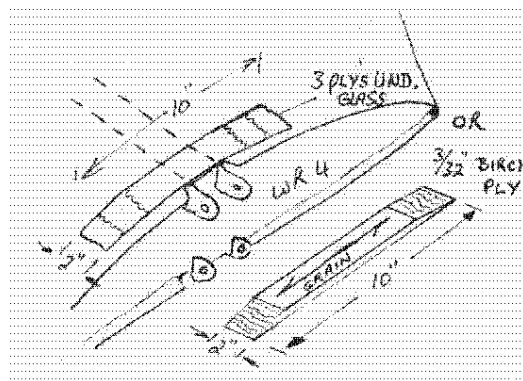
#### VARIVIGGEN NEWS

I have heard from quite a few Viggen builders since Cp20, and it seems that we will have several new Viggens flying during the summer. We only have one report of a first flight this time and that is John Poehner of Flushing Michigan. He reports excellent flying qualities and is very happy with everything but his main gear system. Congratulations John.

N27MS has flown regularly and on June 19, Sally solo'd our Viggen for the first time. She has flown it regularly from the front seat but I have never had the guts to get out and let her go solo! I finally could not put it off any longer and she went out and made three perfect landings. Sally's total flying time is 120 hours, mostly in C-150's and with a little Grumman Tiger time. The only problem is now our Viggen will not always be available for me to fly !! Congratulations Sally.

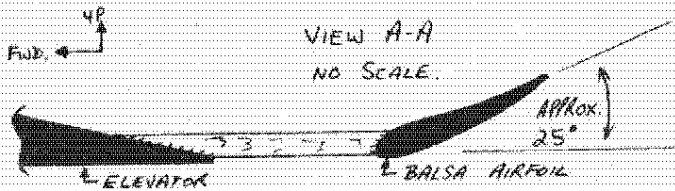
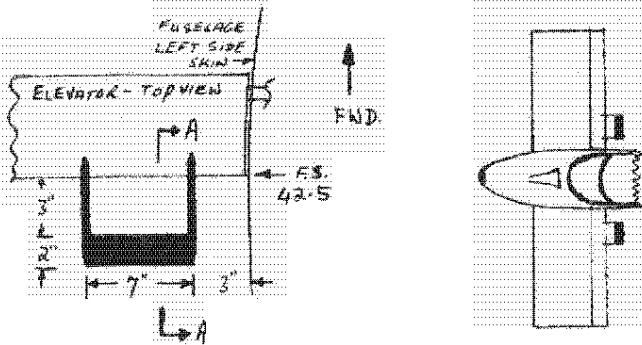
N27MS now has 298 hours total time, and for the first time we have had a minor failure. During a routine preflight I noticed a small crack in the skin under the wing attach fittings on the aft side and parallel to spar E. (see sketch) This crack was caused by torsional loads on the outboard wings, when large abrupt aileron deflection was used, i.e. abrupt rolling maneuvers.

There are two ways to prevent this: 1) on a new aircraft, before applying dacron, use three plies of UND (unidirectional) glass, layed up parallel to the butt-line over the skin crossing the ends of spar E. This should be done top and bottom on both left and right wings. On an already completed aircraft, the finish including the dacron must be removed down to bare wood. 2) The same repair may be made using a strip of 3/32" birch plywood tapered all around. Grain must be parallel to the buttline.



I carried out this repair on N27MS using 3 ply's of UND glass. The first ply was 2" wide 10" long, the second ply was 2" wide 8" long, and the third ply was 2" wide 6" long. The airplane has 15 hours on it since the repair in really turbulent air with no further sign of a problem.

An omission was made in the second edition of the VariViggen plans. The high speed fixed trim tabs, which are discussed in the technical report are not shown. They should be installed on each elevator to improve trim characteristics (speed stability). Each tab consists of a balsa wood airfoil epoxied to two booms (1/4" hardwood dowels, or fiberglass arrow shaft stock) which are epoxied into 1/4" slots notched into the trailing edge of each elevator. The booms increase



the tabs effectiveness at high speed and prevent the the tabs from reducing maximum elevator lift. This allows the bungee trim system to function normally.

VIGGEN SHOPPING

I've had several reports that the rubber shocks for the main gear are readily available through Genuine Auto Parts or NAPA. Doan #31-2014 NAPA #602-1015 made by Balkap

Aircraft Spruce and Specialty report that they can now offer all raw materials and purchase parts required for the VariViggen main gear retract system used on N27MS.

Those of you using the worm-wormgear main gear retract system, see page 6 of this newsletter for the correct method of using the CD1145 Boston worm gear.

When building outboard wing tanks in S.P. or composite standard wings, use 9mm thick 6lb/ft<sup>3</sup> pvc (red) foam instead of urethane. Scrounge some from your buddy who is building a VariEze, or buy it from Wicks or Aircraft Spruce and Specialty

# Birth Certificate

Announcing the Birth of

**VARIEZE N7TLF**  
SER. #1268

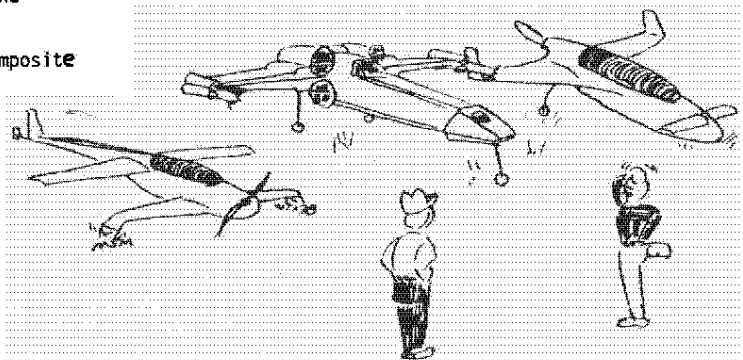
To

**LOYCE & JUNE FOSTER**  
Parents

**6-7-79**      **1 PM**  
Date              Time

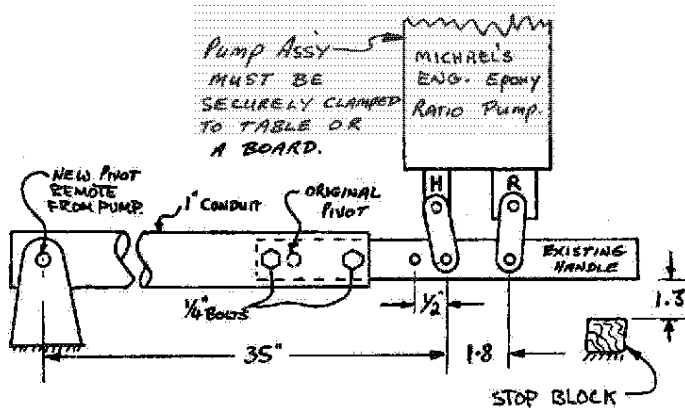
**663#**      **174"**  
Weight              Length

**LYC 0-235**

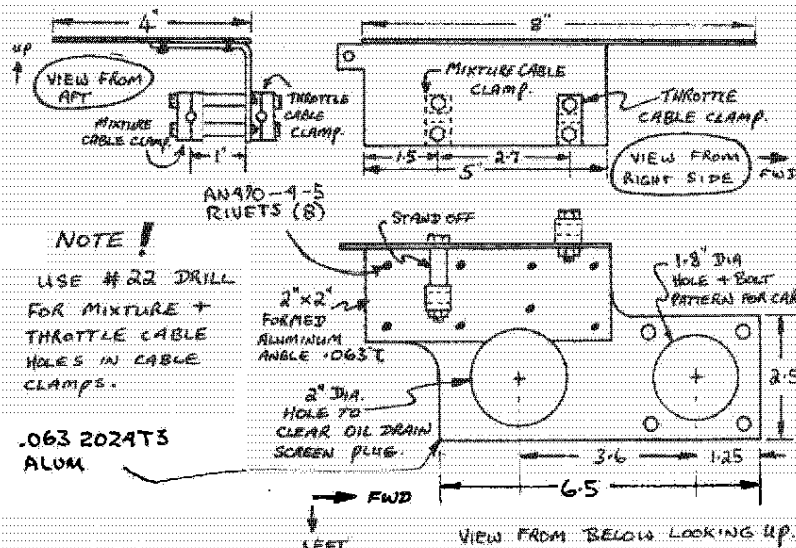




**EPOXY PUMP MOD** Modification to Michael's Engineering epoxy ratio pump, to dispense 100 parts resin to 44 parts hardener for use with the new Safe-T-Poxy. See sketch and note that the linkage pivot on the hardener piston is moved 1/2" closer to the linkage pivot on the resin piston. The original pivot is removed and extended to a position 35 inches away by bolting a length of 1" conduit to the existing handle. It is important that the entire pump assembly and the new pivot point be securely clamped or fastened to a common board or table such that there is no movement between the two. This gives nearly equal travel of both pump cylinders. Now mount a small wood block under the handle so that you limit the amount of 'stroke' on the pistons, such that they do not bind or tend to come out of their respective cylinders.



**LYCOMING THROTTLE/MIXTURE SUPPORT** The Long-EZ was our first experience at installing an O-235 Lycoming, since the Section IIC was developed by AirSport. We found the throttle/mixture support in Section IIC (pg 27) to be too flexible and almost impossible to build. We redesigned it, as shown. It now is a "gasket" between the carb and engine and requires two normal gaskets (either side) when installing the carb. The small tab on the aft end should be bolted to a .063 x .6 aluminum strap. The strap is bolted to an oil pan bolt. Apply additional damping by bonding the support to the oil pan with silicone rubber sealant. The large hole in the support provides clearance for the oil drain. When rigging the throttle and mixture controls be sure the cable clamps are positioned to aim the cable directly at the actuated arm, with as little flexing as possible. The controls must work without the return springs. Check this before installing the springs. The springs provide better snub and eliminate slack. The throttle and mixture springs return to full open and full rich, should a cable fail. The throttle return spring can be attached to the firewall.



**NOTE!**

USE #22 DRILL FOR MIXTURE + THROTTLE CABLE HOLES IN CABLE CLAMPS.

.063 2024T5 ALUM.

**WING AND CANARD AIRLOADS** Canard Pusher No. 10 presented spanwise airloads data for the VariEze. These data are obsolete due to two changes; 1) shortened canard (142 inch) and 2) farther aft cg limit increases wing load. The data listed below is for the wing and canard at limit load factor of 5-g. Also the simultaneous 4000 in-lb winglet bending moment is applied at the wing tip. All data are for 1050 lb gross weight and worst-case cg positions. When doing any static load testing be sure to position the weights centered about the 1/4 chord position (chordwise distribution).

Y IN	LOAD/IN	SHEAR LB	MOMENT IN-LB	BUTT LINE
95.95	8.489	37	4191	127.95
90.9	8.865	82	4608	122.9
85.85	9.394	129	5263	117.85
80.8	9.775	178	6167	112.8
75.75	10.261	230	7332	107.75
70.7	10.755	285	8772	102.7
65.65	11.253	341	10499	97.65
60.6	11.753	401	12525	92.6
55.55	12.254	463	14864	87.55
50.5	12.756	527	17529	82.5
45.45	13.258	594	20531	77.45
40.4	13.76	664	23885	72.4
35.35	14.261	736	27682	67.35
30.3	14.763	810	31696	62.3
25.25	15.265	887	36179	57.25
20.2	15.767	967	41864	52.2
15.15	16.269	1049	46364	47.15
10.1	16.771	1134	52091	42.1
5.05	17.273	1221	58259	37.05
0	17.775	1311	64881	32

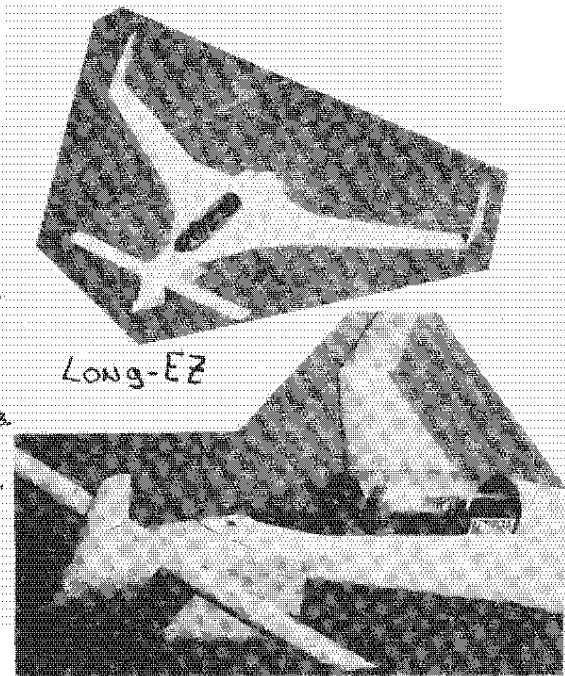
WING

WING FITTING

Y IN	LOAD/IN	SHEAR LB	MOMENT IN-LB
63.65	11.978	40	134
60.3	11.978	89	403
56.95	11.978	120	806
53.6	11.978	160	1344
50.25	11.978	200	2016
46.9	11.978	240	2822
43.55	11.978	280	3763
40.2	11.978	321	4839
36.85	11.978	363	6048
33.5	11.978	401	7393
30.15	11.978	441	8871
26.8	11.978	481	10484
23.45	11.978	521	12232
20.1	11.978	561	14113
16.75	11.978	601	16138
13.4	11.978	642	18298
10.05	11.978	682	20596
6.7	11.978	722	22985

CANARD

LIFT TABS



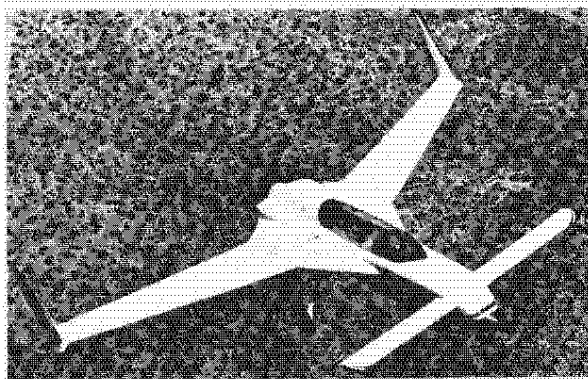
# VariEze

TODAY'S HOMEBUILT WITH TOMORROW'S TECHNOLOGY

**THE AIRPLANE.** The VariEze is a small, high-performance homebuilt sportplane. It can be built from raw materials costing approximately \$3500 (less engine) in about 1200 man-hours or from prefab parts and materials, costing approximately \$5000 in about 800 man-hours (about eight months spare time work). Its structure is a sandwich of high-strength fiberglass, using low-density, rigid foam as core material. The structure is fabricated directly over the shaped core, thus expensive tools and molds are not required. Composite-sandwich structure offers the following advantages over conventional wood or metal: less construction time requiring less skills, improved corrosion resistance, improved contour stability, better surface durability, dramatic reduction in hardware and number of parts, easier to inspect, and repair. The VariEze uses the small four cylinder Continental. The Lycoming O-235 without starter or alternator can also be used. The airplane has exceptional climb and cruise performance. It can carry two people 700 miles at 185 mph on less than 22 gallons of fuel. Frontseat passengers up to 6'4" and 220 lb and backseat passengers up to 6'2" and 220 lb. can be accommodated plus a modest amount of baggage in a suitcase. The airplane does not have full dual controls, but does have a backseat control stick. Due to its small size (only 67-sq. ft. wing area) it is not the airplane for installing extra equipment for IFR, night flying, etc. It can handle a simple electrical system with a single NAV COM and gyro instrument. These can even be powered with a solar panel, thus eliminating the heavy alternator. The VariEze is recommended for day-VFR operation only. Due to its relatively high landing speed (70 mph) and small tires, it is acceptable only for smooth, hard-surface runways. Its stability and overall flying qualities are superb. Once trimmed, it will hold attitude and level flight "hands-off" even in turbulence. Trim changes due to power, gear retraction, or landing brake are all very small. Its unique aerodynamic design allows it to be flown with full aft-stick, at less than 50 knots, without a stall departure or loss of control, and without altitude loss. The VariEze uses the latest aerodynamic features: NASA winglets, both wings cruise at best L/D, basic arrangement provides stall safety, stiff structure provides accurate contour maintenance, basic system's design eliminates or combines complex control systems, which saves weight, cost and building time while increasing reliability and lowering maintenance.

**THE TEST PROGRAM.** The VariEze test program was probably the most extensive and successful ever conducted on a homebuilt. It included basic flight tests for flying qualities, performance and systems, spin and dive test to FAR part 23 requirements, static load tests and landing gear drop tests exceeding part 23 criteria, environmental/thermal tests on structural materials/components, manufacturing methods testing, and many others.

**THE HOMEBUILDER SUPPORT.** The manufacturing manual is a literal education in using the materials and is a detailed step-by-step guide to construction using an illustrated format not common in aircraft plans. The Rutan newsletter, "The Canard Pusher", published since mid 1974, updates plans, provides building hints, etc. Complete owners manual provides all necessary information for safe initial testing and for normal and emergency operations.



VARIEZE DOCUMENTATION is available in six sections.

**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 VariEze except engine installation. The manual consists of a 153-page, bound 11" x 17" book plus nine larger full size drawings. It includes 168 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. The manual identifies sources for all materials and all prefabricated components. NASA approved.

**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 IIA - Continental A65, C85, C90, O-200**  
**SECTION IIC - Lycoming O-235 - No accessories.**

**SECTION III - ELECTRICAL** - This is an optional (not required) set of drawings and installation instructions for electrical system.

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

**SECTION V - FINISHING THE COMPOSITE AIRCRAFT** - applies not only to a VariEze, but to other epoxy/composite aircraft. Includes filling/contouring/priming/UV barrier/ color and trim.

**SECTION VI - LANDING BRAKE** - Complete full size drawings for an optional drag device. The brake dramatically increases the airplane's glide angle and deceleration in the flare. Without the brake the airplane is limited to runways at least 2400-ft long. With it, runways down to 1800-ft long can be used with appropriate pilot proficiency.

**SPECS AND PERFORMANCE WITH 100-HP CONTINENTAL, FIXED-PITCH PROP @ GROSS WEIGHT**

Take Off	900 ft	Range @ Max Cruise	700 mi
Climb	1600 fpm	Range @ Econ Cruise	850 mi
Max Cruise	195 mph	Landing Speed	70 mph
Econ Cruise	165 mph	Landing Distance	900 ft
Empty Weight	570 lb	Wing Span/Area	22.2' / 53.6'²
Gross Weight	1050 lb	Canard Span/Area	12.5' / 13'²

**SPECS AND PERFORMANCE WITH 75-HP CONTINENTAL**

Take Off	1200 ft	Econ Cruise	145 mph
Climb	900 fpm	Empty Weight	550 lb
Max Cruise	172 mph	Gross Weight	950 lb

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

ALL RAW MATERIALS.

<b>AIRCRAFT SPRUCE &amp; SPECIALTY CO</b> 201 W. Truslow Ave. Bx 424, Fullerton, Ca 92632 (714)870-7551 Catalog \$3	<b>WICKS AIRCRAFT SUPPLY</b> 410 Pine, Highland, Tl 62249 (618)654-7447 Catalog \$2
---	---

**KEN BROCK MANUFACTURING**, 11852 Western Ave. Stanton, Ca 90680 (714)898-4366: Prefabricated components - wing attach assembly, nosegear machined parts, control system components, fuel caps, engine mount, rudder pedals. Catalog costs \$2.

**FRED JIRAN GLIDER REPAIR**, 6 Mojave Airport, Mojave Ca 93501, (805)824-4558: Prefabricated components, cowling, fuel tanks, wheel pants, maingear & nosegear struts, strut cover & nosegear box: Send 9" x 12" SASE with 4-oz postage for brochure

**THE AIRPLANE FACTORY**, 7111A Brandt Vista, Dayton, Oh 45424 (513)845-9872 or 233-7754 - Canopy. Send SASE

**H.C. COMMUNICATIONS**, Box 2047, Canoga Park, Ca 91306 (213)882-0422. Custom COM & NAV VHF antennae.

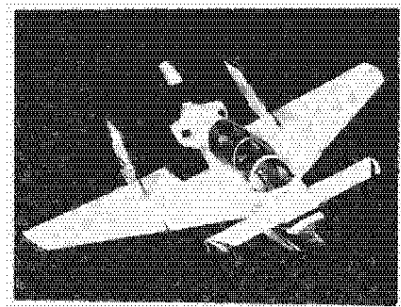
Check items desired	Price, including first-class mail U.S. and Canada	Air Mail Overseas*
VariEze info kit includes current issue of "Canard Pusher" newsletter	\$5.00	\$6.00
"Canard Pusher" newsletter published quarterly. One-year subscription	\$4.75	\$6.50
<input type="radio"/> Section I	\$139.00	\$153.00
<input type="radio"/> Section IIA	\$ 19.00	\$ 21.00
<input type="radio"/> Section IIC	\$ 21.50	\$ 23.50
<input type="radio"/> Section III	\$ 8.00	\$ 9.50
<input type="radio"/> Section IV	\$ 8.00	\$ 9.50
<input type="radio"/> Section V	\$ 7.00	\$ 8.00
<input type="radio"/> Section VI	\$ 10.00	\$ 11.00
<input type="radio"/> 3" tri-colored jacket patch	\$ 1.95	\$ 1.95
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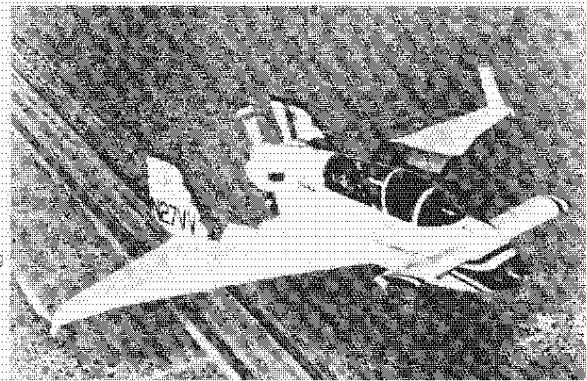
BUILDING 13, MOJAVE AIRPORT  
P. O. BOX 656, MOJAVE, CA 93501  
TELEPHONE (805) 824-2645

CPZI Agro

# VARIVIGGEN



Standard VariViggen  
Special-Wing VariViggen



Performance with 150-hp, fixed-pitch prop, gross weight.	Take Off	850 ft
	Climb	800 fpm
	Cruise	150 mph
	Full Aft Stick	49 mph
Standard VariViggen Landing		500 ft

Performance with 150-hp. Special Performance Wing	Climb	1000fpm
	Cruise	158mph

Specifications Standard VariViggen	Canard Span/Area	8ft/18.3ft <sup>2</sup>
	Wing Span/Area	19ft/119ft <sup>2</sup>
	Empty Weight	950 lb
	Gross Weight	1700 lb

Specifications Special Performance Wing	Wing Span Area	23.7ft/125ft <sup>2</sup>
	Gross Weight	1700 lb

### PROVEN DESIGN

Complete flight test program completed; 600 hours on prototype with very little maintenance. Won the Stan Dzik trophy for design contribution, Oshkosh '72.

### STALL/SPIN SAFETY

The VariViggen's safe flying qualities have been the subject of technical presentations for EASA, SAE, AOPA, AND AIAA. It will not stall or "mush in" like the common delta. At full aft stick (43kts) it will still climb 500 fpm roll over 50 degrees per second without rudder co-ordination, and make buffet-free turns. The prototype received the Omni Aviation safety trophy at Oshkosh '73 and the outstanding new design award at Oshkosh '74.

### EXCELLENT UTILITY

Comfortable tandem cockpits, three-suitcase baggage area, and an adequate cruise speed provide unusual utility for a homebuilt airplane. Its unusual design turns routine travel into "fun trips". Gas service and other airport services have been better too! Take it home; it's road-towable with outer panels removed.

### UNCOMPLICATED CONSTRUCTION.

The basic structure requires few special tools and can be built in a simple jig. The few parts that have double-curvature are available in fiberglass, ready to install. All machined parts are also available, as well as other prefab parts.

### EASY TO FLY

Despite its unique appearance, the VariViggen has no unusual or pilot-demanding flight characteristics. It is easier to handle than conventional aircraft, particularly in gusty crosswind conditions.

### THE FOLLOWING DISTRIBUTORS MARKET VARIVIGGEN PARTS.

AIRCRAFT SPRUCE & SPECIALTY CO., 201 W. Trustlow Box 424, Fullerton, Ca 92632 (714)870-7551  
VariViggen spruce kit, plywood kit, hardware, al aluminum and fiberglass. Catalog cost \$3.

KEN BROCK MFG., 11852 Western Ave., Stanton, Ca 90680. (714)898-4366.  
VariViggen prefabricated components: all machined parts. Catalog costs \$2.

THE AIRPLANE FACTORY, 1711-A Brandvista Ave., Dayton, Ohio 45424. (513)845-9872  
VariViggen plexiglass canopy

BILL CAMPBELL Box 253 Phelan, Ca 92371  
VariViggen brackets and fittings.

MONNETT EXPERIMENTAL AIRCRAFT INC., 955 Grace St Elgin, Ill 60120 (312)741-2223  
VariViggen molded fiberglass parts.

GOUGH BROTHERS, 706 Martin, Bay City, Mi 48707  
VariViggen 105/206 epoxy and 403 fibers for wood construction.

GEORGE EVANS 4102 Twining, Riverside, Ca 92509  
VariViggen welded nose and main landing gear. 1-1/4" sq. steel tube.

JESSE WRIGHT (VariViggen builder)  
7221 S. Colorado Ct. Littleton, Co 80122 (303)771-5140  
VariViggen prefab wood parts. Send 50¢ for list.

### VARIVIGGEN TECHNICAL REPORT - Complete tech report

describing the VariViggen two-place sportplane. Includes specifications, pilot report, dimensions, 3-view, stability and performance flight test data, construction cost, description of car-top wind tunnel, 8" x 10" glossy photo and current issue of newsletter. Price - \$10.00 first class mail, \$11.50 Air Mail overseas.

### VARIVIGGEN OWNERS MANUAL - Complete operational handbook

including normal and emergency procedures, loading, operational record keeping. This manual is a must for those close to first flight. Price - \$6.00 first class mail, \$7.50 Air mail overseas.

### "CANARD PUSHER" SUBSCRIPTION - A newsletter designed

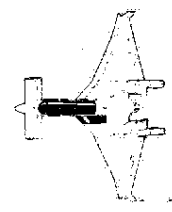
with the builder in mind. Emphasis on distributing to all builders as many ideas, improvements, building tips, photographs, and flight reports as possible. Details mandatory, desirable, and optional changes to plans and to owners manual. A newsletter subscription and back issues starting with CP#19 are mandatory for those with VariViggen's under construction. Identifies new material sources as they become known. Published quarterly. Price - \$4.75 per year first class mail. \$6.50 per year air mail overseas. Back issues, \$1.00 ea.

### VARIVIGGEN PLANS - SECOND EDITION. This is an updated,

revised set of very complete drawings and construction manual consisting of a bound 11" x 17" book, containing many photographs, hints and instructions based on actual builders experience over the past several years. It covers the entire airplane, including the engine installation fuel system, and not only covers the original standard wing in both aluminum and foam an fiberglass composite, but it also includes the composite S.P. wing, ailerons, and rudders. The manual identifies sources for all required materials and all available prefabricated parts and components. Price - \$165.00 first class mail, \$177.00 Airmail overseas.

### VARIVIGGEN R/C MODEL PLANS - Complete construction plans

for the 18" - size radio controlled model airplane built and flown to evaluate VariViggen spin characteristics. Designed for 4-channel proportional radio equipment and engine in the .35 to .65 cu inch size. 555-sq wing area. All balsa or foam/balsa construction. A maneuverable flying model with outstanding roll rate. Also shown are modifications required for a control-line model (70-ft lines, .19 to .45-cu inch engines) Price - \$475 first class mail, \$5.50 air mail overseas.



**Rutan  
Aircraft  
Factory**

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

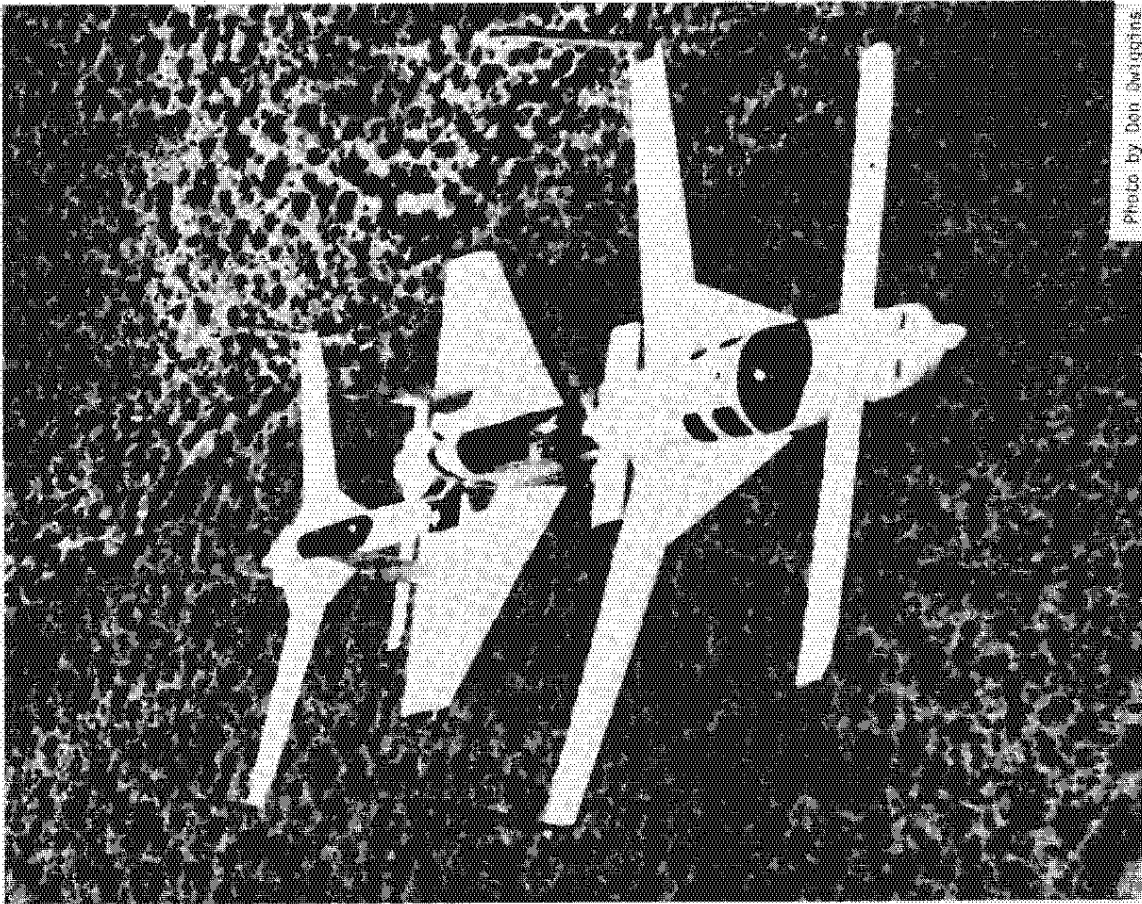


Photo by Don Wittgins

**Rutan Aircraft Factory  
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Mojave, CA 93501**

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**21**

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