

THE CANARD PUSHER

No. 48

April 1986

Published quarterly (Jan, Apr, Jly, Oct) by

RUTAN AIRCRAFT FACTORY INC.
Bldg 13, Airport,
Mojave, Ca 93501
(805)824-2645

U.S. & Canadian subscriptions \$14.00
Overseas (Airmail) \$16.00
Back Issues \$ 3.50

If you are building a VariViggen from 1st-Edition plans you must have newsletter 1 through 48. If you are building from 2nd Edition plans you must have newsletters 18 through 48. If you are building a VariEze from 1st Edition plans you must have newsletters from 10 to 48. If you are building a VariEze from 2nd Edition plans you must have newsletters from 16 through 48. If you are building a Long-EZ you must have newsletters from 24 through 48. If you are building a Solitaire, you must have newsletters from 37 through 48. If you are building a Defiant, you must have newsletters 41 through 48.

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

PLEASE NOTE: BUILDER SUPPORT IS ON TUESDAY AND FRIDAY FROM 8:00 am to 5:00 pm ONLY. If you have parts that you would like us to see and or would like to drop in, please make it Tuesdays and Fridays if you can. If you need to come up other than those days, please call so that we can be sure to be here.

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.

RAF ACTIVITY

RAF is open Tuesdays and Fridays only. This also means we are only available to answer phone call questions on Tuesdays and Fridays. Do NOT call for builder support on Mondays, Wednesdays or Thursdays, you will get a recorded message.

We still talk to a lot of builders as well as flyers of RAF airplanes and we do enjoy keeping in touch. If you have any construction problems or flying qualities questions, don't hesitate to drop us a line or give us a call.

If you come up with a good idea, an easier or better way to do something, or you just took a neat trip in your airplane that you would like to share with other flyers, let us know. In order to keep the CP newsletter going and to provide useful information for builders and flyers, please keep those letters coming.

Mike was extremely fortunate a few weeks ago when Dick Rutan offered him a ride in the Voyager! Jeana was not in town, she was back in the Midwest adding a couple of ratings to her pilot's certificate. A test flight had to be flown, and since there was so much to do during a test flight that a co-pilot is a necessity, Dick invited Mike to go along.

Mike reports that it was a tremendous experience and that he is really impressed with the airplane and the team which is now rapidly moving toward the goal of world flight. The date has been set, Sept. 14, 1986 (weather, of course, permitting). It is not too late to help them along. Send a few dollars to: Voyager,

Hangar 77, Airport, Mojave, CA 93501

Look for an article in an upcoming Sport Aviation which details Mike's experience in this incredible flying machine.

SUN-FUN 1986

Unfortunately, due to other commitments, no one from RAF was able to attend this fly-in. However, we have received reports from several builders/flyers who did go.

Once again, there were more composite type airplanes there than any other kind, including approximately twenty EZ types, ten Glasairs, one Q2, one Velocity, etc.

The Sun "60" Race was held again this year over a slightly different course, 67.7 nautical miles (76 statute miles). This race is a flat out race from a standing start with no consideration for fuel flow, miles per gallon or cabin load. This race sorts the fast ones from the slower ones and, generally, is a really fun race. Of course, as in any race held around a closed course, navigation has to be dead accurate or you will not win!

This year the race had a much broader variety of airplanes from Glasairs to Long-EZs to VariEzes to Cozy, to Cassutts to a Velocity and a TC-2.

It is interesting to note that while most of the EZs posted ground speeds very close to their owner's manual speeds, most of the other makes certainly did not. The moral? Don't always believe the performance figures quoted in the color brochures!!

Place	Name	Aircraft	Eng.HP	Time	SpeedMPH
1	Richard Pater	Glasair-RG	180T	21:20.5	213.68
2	Charles Largar	Glasair-RG	180	21:33	211.50
3	Donald Yoakely	Glasair-TD	160	21:44	209.85
4	James Cline	Glasair-TD	160	23:13	196.38
5	Neil Hunter	Long-EZ	160	23:55	193.63
6	Steve Wiggins	Long-EZ	160	23:63	192.98
7	Danny Mayer	Velocity	180	24:22	188.27
8	Paul Mason	VariEze	115	24:33	187.42
9	Steve McCaskie	Long-EZ	125	24:33	187.42
10	Ed Albers	Cassutt	100	24:42	186.73
11	Jack Fehling	VariEze	100	25:32	180.09
12	Nat Puffer	Cozy	115	25:34	179.95
13	Tim Gehers	VariEze	100	25:39	179.66
14	Jim Rutland	Long-EZ	115	25:56	178.40
14	Ken Wheeler	TC-2	100	26:85	169.83
15	Gary Price	VariEze	108	26:85	169.83
17	Robin Yound	Glasair-TD	160	26:86	169.77
18	David Haggard	Long-EZ	115	29:83	152.87
19	Dick Dobson	Glasair-TD	160	34:43	134.44

Sadly, this year there were several accidents associated with getting to or during the flyin. A good friend with probably the high-time Quickie, Doug Swanningson, was killed in his well-known "painted like a waving American flag" Quickie. We will miss Doug, he had almost 1000 hrs. on his rather stock Onan-powered Quickie. A Q-200 and a T-18 were both involved in fatal accidents. Our sympathy goes out to those bereaved. With Oshkosh not too far in the future, it is time to review our piloting skills. Perhaps a ride with an instructor to brush up and point out potential bad habits that tend to creep in! During take-off and landing especially, we must be at 100%. Practice flying a slow approach such as may be forced on you in the Oshkosh pattern. Do it up high and see how your own airplane behaves at low speed. Watch out for getting too slow on short final, a high sink rate can develop very rapidly resulting in a very hard arrival that can easily break a prop or nose gear - or even main gear! Proficiency, knowledge of your limitations and your airplane's limitations can make all the difference. Do yourself and every member of EAA a favor, get a few hours of serious, quality practice (with an instructor?) before you set out for Oshkosh 1986.

GREAT AMERICAN PROPS APPROVED IN AUSTRALIA

Fred Griffith, president of Great American Props reports that after a recent trip to Australia where he visited a number of EZ builders, he has received notification from the Australian equivalent of the FAA that Great American Props are now approved for use on both VariEzes and Long-EZs.

This is good news for Aussie builders. All GAP props for EZs will be carved from certified multi-laminate hard maple blanks. The number of laminations has recently been doubled because Fred now orders 1/16" laminated blanks instead of the 1/8" laminates they have used up 'til now.

Great American Props recently subjected a few of their props to an extremely thorough physical properties test by the engineering department of Cal Poly in San Luis Obispo, CA. These props came through with flying colors. Any builder choosing to use one of these props can rest assured that there is no stronger wood prop available. If you are using one of these props, you can torque the prop bolts to 300 in./lbs., the normal limit for a 3/8-24 aircraft bolt, without crushing the hub at all. If you are using one of the early GAP props using only 5 laminations of birch, you are limited to a maximum of 220 in./lbs. If you exceed this limit, you will crush the hub and then the bolts will be loose. This is also true of any other propmakers product which uses the 5 laminate birch, beech, or maple prop blanks.

EDGES OF AMERICA - A photographic essay of our border towns and their people.

JOHN FAULKNER, VariEze builder and photographer and art teacher will fly his recently completed VariEze around the perimeter of the 48 states taking aerial and ground photographs of people and places along the way. This ambitious trip will begin in June and end in August. John will begin and end his trip in his home town of Wallingford, CT and is planning on visiting Oshkosh during the 1986 convention. This trip will cover some 9500 nautical miles and take him through some 30 states. John plans on shooting about 4000 photographs, all in black and white.

A selected group of these photos will be on display during January 1987 at the PAUL MELLON ARTS CENTER in Wallingford, CT. Good luck with your project, John. Drop by Mojave if you can!

VORTILONS ON EZ'S

We continue to receive glowing reports from EZ flyers who are very pleased with the results of installing the vortilons on both VariEzes and Long-EZs. Don't miss out on these definite improvements. Vortilons are now mandatory on VariEzes and Long-EZs (regardless of which canard you have). Do NOT slit the wing leading edge to install the vortilons. This will weaken the wing, particularly in a VariEze which has a monocoque wing structure. Vortilons should be installed per the CP recommended procedure. Make the vortilons with small flanges as shown in CP 42, page 7 (VariEze) and CP47, page 15 (Long-EZ), finish them in your trim color, and attach them to the leading edges using RTV silicone.

DEFIANT NEWS

N78RA is finally looking like her old self. Cowlings are now white with the appropriate trim. Almost all of the little wiring glitches we had are corrected and all systems but one are working well. Unfortunately the one system not working is the rear prop. This is a Hoffmann constant speed, feathering prop and so far it has defied every effort we have put out to make it work right. The front prop works fine, right to the book, but we cannot get the rear prop to hold RPM.

We have been systematically chasing down every possibility we could think of and several suggested by the prop governor manufacturer, as well as a few from Hoffmann. So far nothing has worked. We were very close to believing that it must be internal in the engine when we received a call from Dr. Frank Yost of Muscle Shoals, AL. He has exactly the same problem, front prop works fine, but rear prop will only hold 2700 RPM for a short period of time before it starts to slowly loose RPM. This is exactly the symptom we have on N78RA! Dr. Yost's engine man, Ray Lett, has done a

transfer gland leak check on his engines as well as two other engines. All are the same. We conducted the same test on both of Burt's engines as well as a third engine similar to the Defiant's engines. All three of these were essentially the same and the same as Dr. Yost's, so we are reasonably certain it is not the engine. It is certainly not the prop governor, we have had three on Burt's rear engine, including one that we had specially built up to have as low an internal leak rate as possible. Nothing so far has made the slightest difference to the rear prop.

It is not unsafe to fly at this point, so we have been doing some flying, although almost all of it has been related to checking the various changes we have made trying to get the rear prop to work. We have managed to measure some performance numbers but none of these show any maximum performance since we cannot get the back prop to allow the engine to turn up. We are currently talking with Hoffmann about the problem, but this is difficult due to time and language differences. We do intend to get this problem worked out but, frankly, it has been an incredibly frustrating effort for all of us who have been involved in the project. Looking at the cost, both in man hours and money, unfortunately we would have to say at this point that it was not worth it.

Burt has not made any decision about approving the constant speed props for the Defiant. At this time, they are not a RAF approved installation. We still believe that, by far, the best bet is the original, simple, fixed pitch wood prop version and would strongly recommend that for all Defiant builders, at least until they are very thoroughly familiar with their own Defiant.

No new Defiants are flying yet that we know of, but Bydrell Mathews of Houston, TX surely would have been flying if it were not for a freak storm that raged across northern Texas smashing the Hull Airport and destroying the hangar where Bydrell had his completed (painted white Imron) wings stored. Both wings suffered damage, one winglet was severely damaged. Bydrell is busily repairing the damage now and should be flying by the time you read this. Good luck, Bydrell. Charles Simms, Defiant builder of Deer Park, TX would like to point out a "gotcha". On page D-37, the main landing gear strut is called out to be 5.75" as a BARE LEG. This dimension is very important and must not be any longer than 5.75" before you layup the 15 plies of torsional glass wraps. Check your gear legs before you do the layup or you may not be able to fit the completed main gear strut into the slot behind bulkhead 144.5. If your BARE MAIN GEAR is wider than 5.75" as called out, sand it down. This will allow you to finish up with the correct 5.9" dimension after the torsional layup is complete.

SOME RECENTLY ACQUIRED PERFORMANCE NUMBERS FOR N78RA

Full throttle, best power mixture.

ALT	RPM	MAP	KIAS (kt)	APPROX TRUE AIRSPEED KNOTS	MPH
8000	2500	23	165	190	218
10,000	2500	21	158	188	216
12,000	2500	19.5	150	185	213
14,000	2500	18	141	179	205

LECTURE TIME! EXCESS WEIGHT/WORKMANSHIP

We have not had a weight lecture in a long time, so please bear with us! We have seen quite a number of airplanes and parts of airplanes recently, and there are a couple of things that are showing up. The good news is that the average workmanship (glass work) is good, much better than it was a few years ago. We still see an occasional example that makes us wince, but generally, the quality of glass layups is very good.

The bad news is that most builders, VariEze and Long-EZ, seem to have lost the incentive to build light airplanes. We see heavier and heavier examples. 700 lbs. VariEzes and 950 to 1000 lb. Long-Ezs!! This is very bad, guys. Perhaps this is in part due to the

tendency to put bigger and bigger engines in these airplanes? Whatever it is, keep in mind it is a snowball, the heavier you build, the more it takes to make it go and the heavier that makes it! There is no way to get ahead taking that route. The solution is to be very conscientious about weight all the time while building. Resist the temptation to add "fru-fru", unnecessary items that just add weight.

We have flown dozens and dozens of examples of both VariEzes and Long-EZs. Without exception, regardless of engine/HP installed, the lightest examples are always the best flying, most fun to fly.

Keep in mind that the prototype VariEze N4EZ weighed 594 lbs. and the prototype Long-EZ weighed 790 lbs. (and this airplane had a 50 lb. center-section spar due to the "plug-in" wings it had when first flown!). There are a number of EZs flying that beat these numbers easily. A 1000 lb. Long-EZ is like flying the prototype all the time with a 200 lb. passenger on board! Regardless of the engine/power installed, it is still more fun to fly the prototype and much, much more economical!

BUILDER HINTS

Elevator trailing edge up travel (nose down command) on the new Roncz 1145MS canard continues to cause some builders' problems. Jiggling the elevators per CP47 which enables the builder to look at the actual travel BEFORE he flox hinges into the canard has certainly helped to avoid getting things permanently assembled with not enough clearance. However, the cause of the problem has not been clearly determined.

Looking closely at several homebuilt examples, we have noticed in almost all cases, a tendency to build the elevators too thick. This extra thickness is always all on top of the elevators and that seems to be why the elevator nose down travel becomes a problem.

Why are elevators being built too thick? One reason might be that the elevator templates in the plans, particularly the holes running the length of each elevator for the torque tubes, may be letting you hot wire cut an undersized hole. The 1" diameter torque tube, when forced into this, perhaps undersized hole, swells the top shape of the elevator.

When you make your elevator hot wire templates, sand halfway through the line, or possibly even a little more than that. When sanding in the area of the 1" diameter hole, sand the line off entirely. The hot wire temperature can also make a big difference, especially on such a small part as an elevator. Too hot of a wire will cut an undersized elevator with an oversized hole, while too cool of a wire will cut an oversized elevator with an undersized hole! Complicated, huh? Anyway, after you have cut your elevator cores, stand them on end atop the full size drawing on page C-1 and compare them. If they are oversize, a little careful sanding can bring them into perfect size. If the 1" diameter torque tubes do not want to go into the elevator cores easily, sand them until they do. After these torque tubes are micro-ed in and cured, carefully sand the excess "ears" of foam off and again check them by standing them up on end on top of the full size elevator drawing. If necessary, sand them until they fit. Elevator shape size is very important, and a little extra time spent now will pay off handsomely when you go to hinge your elevators to the canard.

A leveling device that is very useful is a water level. This consists of a 30-foot long piece of hardware store type plastic or vinyl tubing with 1/2" I.D. Fill the tubing with colored water (food coloring), hold the two ends together and mark the water level at each end. Now, to use the water level to check, for example, the wing tips for relative height, hold or tape one end of the tubing on the reference wingtip with the water level mark on the reference point. Go to the other wingtip and raise and lower the other end of the tubing until the water is at the mark you put on the tube. This works great and does not have any sag in it like a tight string does.

Don't get the tubing too small in I.D. because the capillary action of the water will disturb the accuracy. Don't fill the tubing too full! Allow at least 12" from water level to top of tube. Do not cap the tubing! When you are not using the water level, twist a loop of safety wire around each end and hang them on a wall or door frame to prevent spilling.

Sanding blocks. We all know what a pain it can be to glue sandpaper to a hard block. Contact cement gets lumpy. It is difficult to remove "used up" sandpaper, etc. Well, this is it. The time tested method used by the sailplane wing contouring experts. FEATHERING DISC ADHESIVE, part #51135, number 08044, made by 3M. This is a spray can of glue - accept no substitute. Reportedly, no other product, regardless of their claims, works as well. Follow the instructions on the can to the letter to stick your piece of sandpaper to your block of wood. Now, when the sandpaper is worn out and you need to remove it, use a fingernail to pry up one corner and, using a small (cheap) paint brush, brush a little DuPont fast dry enamel reducer, part #3812S under the sandpaper. Just a few drops will allow the brush to almost miraculously peel the sandpaper off. Again, accept no substitute.

This combination was arrived at after literally years of experimenting and testing. Usually you can reuse the glue for 3 or 4 sheets of sandpaper. If you start to build up too much glue and get lumps, use the 3812S to remove excess glue. This system works really great and can make the contouring, finishing, priming and painting process a lot less frustrating. Try it, you'll like it!

NOSE GEAR MISTREATMENT

We have noticed a growing tendency among EZ owners to set the nose gear at one-half to two-thirds down and then leave the airplane sitting on its 3 wheels. This is asking for a stripped worm gear in the retract mechanism. Take a look at the drawings. It should be obvious that the worm/worm gear never sees the load.

~~With the gear down and locked, the pushrod is in an overcenter position and takes all the load in compression. The worm/worm gear mechanism only takes the weight of the gear driving the retract/extend cycle and that is all it is ever designed to do. It cannot carry the weight of the airplane and will strip instantly if you ever allow it to "see" the weight of the nose plus a pilot. Park it nose down, or tie it down with the nose gear extended.~~

VARIEZE TYGOTHANE FUEL LINES.

Leo Brosche of West Pasco, FL reports that after leaving his VariEze setting in a hangar with fuel in it for a 1-1/2 year period, all of his Tygothane fuel lines deteriorated to the point of total failure with hundreds of small cracks all over them.

We have seen this at least once before and have cautioned VariEze builders to watch for this problem. According to the manufacturers, the Tygothane is essentially not affected by fuel but water will destroy it over an extended period of time. If you still have Tygothane fuel lines in your EZ, check and/or replace them often. Or better yet, plumb the airplane per the Long-EZ, using only standard aircraft fittings and hoses such as the Aeroquip 600 series.

CAUTION

We have noticed a few builders who have connected all four fuel tank vent lines on a Long-EZ to a common manifold then ran a single vent line up through the skin presumably because it "looks nice"?! This is a no-no! This completely defeats the main reason for the multiple fuel tank vents - REDUNDANCY. With a single vent line, one mud wasp can cause you to lose your engine even though you have two tanks full of fuel. Each fuel tank requires at least one independent vent. If you have totally sealed fuel tank caps, you need two separate vent lines per tank. Don't compromise here, this is a flight safety item and could seriously ruin your day, maybe even the rest of your life.

CAUTION

ELEVATOR CONTROL STOP POSITION. This applies to VariEzes as well as Long-Ezs using the original GU canard (Roncz 1145MS not affected). The design philosophy of the EZ canard type airplane calls for the canard airfoil to develop maximum lift coefficient (CLmax) at full aft stick. Thus the elevator trailing edge down (nose up command) stop must be set correctly. On an accurately built GU canard/elevator, this will usually be at approximately 22° (trailing edge down).

Recently, we have heard from a few builders, both VariEze and Long-EZ, who have noticed stall characteristics that were not "per the handbook". In all cases, the cause was the elevator nose up stop set to allow too much elevator travel. If you have noticed any of the following symptoms, check that you have no more than 22° to 22-1/2° trailing edge down travel on your elevator.

1) Perform a 1-'g', wings level, straight ahead stall with sufficient power to maintain level flight. Slowly pull the control stick back to full aft stick. This should result in a nose high attitude with a "pitch bucking" that can vary from hardly noticeable to quite vigorous, perhaps "one buck" per second, with a deck angle change of several degrees per "buck". This is normal and will vary depending on the cg. If, however, you notice a strong stall break (canard stalls) and the nose comes down through the horizon until you are in a stable shallow dive, even though you are still holding full aft stick, the speed may build up to over 100 KIAS before the EZ begins to climb again. This very long period pitch "bucking" can be as long as 30 seconds per cycle and is indicative of too much elevator trailing edge down travel. You can verify this by releasing back pressure on the stick during the nose down phase of the cycle and gently raising the elevator trailing edge perhaps 1/8" at a time.

This should allow the canard to develop more lift and pitch the nose up. Try to determine by experimenting with elevator position, where CLmax is, then set your elevator stop at that position.

2) Another classic symptom may be noticed during a take off. At full aft stick, it may take a longer take-off roll to lift off than it does at, say, slightly forward with the stick. If you have ever noticed this, it should be corrected. Under certain circumstances, this could become a serious problem. A Long-EZ builder/flyer in Alaska, attempting to take off on a rather short runway, discovered that he was rapidly approaching the end of the runway and, even though he was holding the stick all the way back, was not rotating. Realizing he was not going to make it, he backed off from the full aft stick stop and, to his surprise, the airplane literally jumped into the air! Again, his trailing edge down elevator stop was set for too much travel. This same scenario has also been reported to us by a San Diego VariEze pilot.

What causes this? If the elevator stop is set so that at full aft stick your canard can develop its maximum possible lift, this will result in the lowest possible rotation speed for take-off and a good, clean canard stall (limiting the main wing angle of attack) or classic "per the book" stall at full aft stick in flight. If, however, you have set your elevator stop for too much travel (perhaps you thought you could lower your rotation speed?!!) what happens is that you are now on the "back side" of the lift curve, lift is less than maximum, and the elevator is creating lots of drag. The result may be running off the end of the runway. Keep in mind that this condition could be aggravated even further if it were raining.

CAUTION

Low Fuel Pressure on Cont. 0-200 Powered Long-EZ's. The mechanical fuel pump on a Continental engine is prone to being heated by hot cylinder air. This can reduce fuel pressure to near zero, particularly at altitudes above about 8000'. The fix is to build a cooling shroud from 3 plys of BID, to fit around the fuel pump with about 3/8" clearance all around. A 1" diameter blast tube, ducting cold, high-pressure air to this BID shroud will correct this problem.

FOR SALE

Two (2) Lycoming O-235-C2C engines with logs. Both "runout". These engines were running when they were removed from the Voyager. Yes, these are the two engines RAF installed on the Voyager for its initial flight testing. \$2500.00 each. FOB Bldg 13, Airport Mojave, CA 93501. Contact Mike or Joan 805-824-2645.

VariEze Continental O-200. Flight Research stainless exhaust system with mufflers and carb heat muff. Cost-\$350.00, never used. Sacrifice for \$150.00. Contact: Phil at 818-352-0326.

Wes Gardner is still selling his excellent, reusable foam air filters. Wes has some other neat "EZ" items. A retrofitable fuel sight gauge, for those with poor translucency in their gauges. An oil separator system for the Continental O-200 and the Lycoming O-235 that is guaranteed to remove all traces of breather oil mess on your cowling.

Contact Wes for more information:
Wes Gardner
1310 Garden Street
Redland, CA 92373
(714)-792-1555

RAF RECOMMENDED PROP MANUFACTURES

The following are manufactures of props that have been "tried and tested" by RAF and are considered your best buys.

B and T Propellers
Bruce Tiff
3850 Sherrrod Road
Mariposa, CA 95338
(209)742-6743

Teds Custom Props
9917 Airport Way
Snohomish, WA 98920
(206)-568-6792

Great American Props
1180 Pike Lane #5
Oceano, CA 93445
(805)-481-9054

INTERNATIONAL VARIEZE and COMPOSITE HOSPITALITY CLUB

IVCHC was founded in 1979 by Donald and Bernadette Shupe of California to encourage and promote hospitality, travel, and support for builders and pilots of VariEze and Other Composite aircraft.

A Quarterly newsletter is published that contains letters from members on safety, first flight reports, builders hints, and information on past and future club flyins.

A list of members is published yearly with quarterly updates. These lists are provided to all members but they are CONFIDENTIAL and are NOT to be duplicated, posted, or shared for any reason with nonmembers.

Members are expected to provide emergency assistance, shelter and comfort to other members according to their ability to do so. Courtesy demands as much prior notice as possible of an impending visit be provided the host by visiting dignitaries. The major complaint we get from members is that they are not visited enough. Members who are still building especially treasure visits from flying members who can provide lots of talk, examples, and occasional rides.

Club members have frequent lapses of sanity and take on the task of hosting a flyin. They have complete freedom to do this when and where they please. All we ask is that they take credit for their accomplishment and simply send us the notice for the flyin and a report after the event (and perhaps recruit a few new members).

IVCHC hosts a Fantastic banquet at Oshkosh each year with an average of 240 attendees. The "Real" George Scott, IVCHC 1984 recipient of the Ed Hamlin Memorial Trophy, has been the Organizer and Chair of Ceremony for the Banquet for several years. A few well established and successful flyins are ones like the Dickey's Jackpot Flyin and Air Race and the Brookridge Airpark Fly & Drive In by Buzz Talbot et al.

IVCHC members support other members by lending, replacing, and repairing parts and extending aid and comfort to any member who has become stranded in their vicinity. Members who have been helped are only expected to replace whatever they have borrowed and cover any expenses of the helping members.

When people visit you, they are expected to cover all their own expenses including food and transportation. It should not cost you to be a host. The most common hosting task is to pick people up at the airport, provide a bed overnight or two, sometimes a meal or two, and then take them back to the airport so they may continue their journey. (We recommend that everyone gets a credit card call number)

It is very comforting to know that no matter where you are in the world, if something should go wrong or you need a place to stay there will be a member within a few hundred miles. Help is never far away if you keep an IVCHC Membership list with you while you travel.

If IVCHC sounds like an organization that may fit your needs and interests, please join us by filling out the attached form and sent it with a check for \$14.00 domestic (U.S.A. & CANADA) or \$17.00 OVERSEAS, and mail to:

SHUPE/IVCHC
2531 College Lane
La Verne, CA 91750

IVCHC NEWS

The International VariEze Hospitality Club is now called "INTERNATIONAL VARIEZE and COMPOSITE HOSPITALITY CLUB" -- to include members who are building LongEZ, Defiant, Cozy, Quickie, Lanceair, Glasair, etc.

The IVCHC had just published its NEWSLETTER #28, and is now into its 8th year! To celebrate this very special occasion, the IVCHC founders--Donald & Bernadette Shupe--would like to invite you to join their CLUB ACTIVITIES this year.

PROSSER STATE'S DAYS
MEMORIAL DAY WEEKEND FLYIN

For more details contact Sue Husa
1821 Wright Ave., Richland WA 99352
(509) 943-3693

JACKPOT, NEVADA, FLYIN AND AIR RACE
July 4, 5, 6, 1986

Cactus Ptes Resort 1-800-821-1103
(about \$37.50 per night, double occupancy)
For more details contact Shirl Dickey
1646 Allegheny Drive, Murray UT 84123
(801) 258-3360

EZ AUTUMN ADVENTURE

COLUMBUS DAY WEEK- END, OCTOBER 10-13, 1986
ROUGH RIVER DAM STATE RESORT

Falls of Rough, Kentucky
(lodging \$32.00 or \$40.00, depending.....)
For more details contact Buzz Talbot
222 Sunshine Drive, Bolingbrook IL 60439
(302) 759-1124

MEXICO ADVENTURE
NOVEMBER 1986

For more details contact David Kolstad
9955 Babbitt Ave., Northridge CA 91325
(213) 860-1418

*****YOU ARE ALSO INVITED TO JOIN THE IVCHC*****

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.

<u>Category</u>	<u>Definition</u>
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.
MEU	Minor error or omission.

VARIEZE In CP47, pg. 6, we recommended separate, independent fuel tank vents for the VariEze. This is a mandatory plans change and is designed to offer redundancy should one vent become clogged by a mud wasp as was reported in CP47.

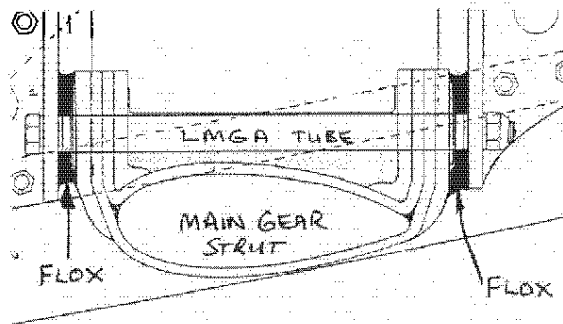
A mandatory inspection of your nylon brake lines is required before next flight. If these brake lines have been directly exposed to radiating heat from the brake discs, or to sunlight (UV), they must be replaced.

LONG-EZ

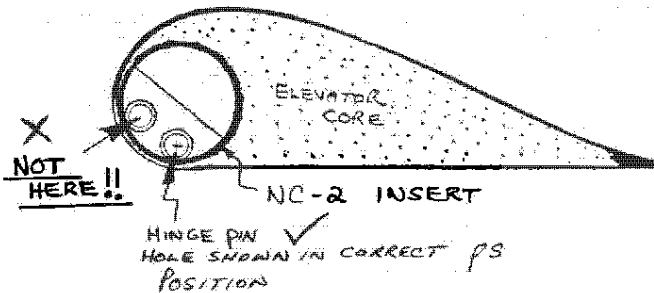
LPC #127 A mandatory inspection of your nylon brake lines is required before next flight. If these brake lines have been directly exposed to radiating heat from the brake discs, or to sunlight (UV) they must be replaced.

LPC #128 Main gear attach. Inspect with a mirror and a flashlight to determine if the gear attach tabs have slid aft on the LMGA steel tube. We have received two reports of this from Long-EZ flyers. This is not a structural problem, but may cause the nylon brake lines to be pinched between the trailing edge of the main gear strut and the fuselage side where the gear comes out of the fuselage.

If you find any evidence of movement in this area, please let us know. Pry the gear forward to its proper position on the LMGA tube then fill the gap between the aft attach tab and the aft aluminum extrusion on each side with flox. Allow to cure for 24 hours before flying.



LPC #129 Long-EZ Roncz 1145MS Canard Plans. The NC-2 elevator hinge inserts must be installed correctly as shown in the full size cross section drawing, page C1. The hinge pin hole should be aft as shown.

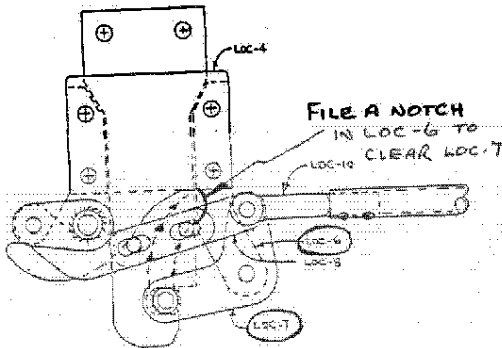


SOLITAIRE

SPC #60 Solitaire section 1, page A-22. The cable arrangement for the operation of the spoil flaps is reversed. The wrong cable is shown connected to the SSF-3 spoil flap actuator.

DEFIANT

DPC #38 Section 1, page D-51. Canopy latch. A small notch should be filed in part #LOC-6 to allow part #LOC-7 to swing up far enough to let part #LOC-2 slip into the receptacle assembly. Without this small notch, the #LOC-2 tab will not clear #LOC-7.



VARIEZE/ROSENHANN AXLES

Good news! Clyde Hamilton, VariEze builder/flyer has decided to go ahead on his own and have several sets of these axles manufactured. They are machined out of steel and the flange is welded on. The weld is done by a certified aircraft welder.

Contact: Clyde Hamilton
6362 Glenknoll Drive
Yorba Linda, CA 92686
(714)-970-7231

CAUTION

Very recently while reading copies of the various EZ support newsletters that are currently being produced all over the US, we came across a couple of bad suggestions. One of these is of great concern, a suggestion to use WD-40 Silicone lubricant to lube and cool the counterbore tool while drilling the wing attach holes in the wings and centersection of a Long-EZ. NO WAY, NO HOW, NOT FOR ANY REASON must you use WD-40 or ANY similar silicone type lubricant to help you drill these holes. Plain water is as much as you can do. Getting silicone lubricant onto any glass surface will absolutely guarantee that you will never be able to get anything to stick to that area again. Epoxy will not stick, nor will primer or paint. In short, you have a major problem on your hands. The wing attach bushings

must be glued into these holes securely with floc. WD-40 will not allow you to get a bond in this area. This is a very foolish and dangerous suggestion - do not even think about doing it.

The other suggestion which was printed in the EAA Designee newsletter, was to use a salt shaker to sprinkle micro balloons onto an uncured layup for future contouring. We do not like this idea for two reasons: It makes it impossible to inspect the layup after it cures, which is unacceptable and in order for the dry micro balloons to wet out they must be leaching epoxy out of your layup.

If you have already done a good job on the layup, which you obviously should have done, if you are following the instructions in the plans, you are then causing what might have been an excellent layup with the correct epoxy to glass ratio to become a starved, dry layup, which you would never be able to check.

Be very careful about getting away from the basic plans and instructions. These methods have been developed and tested over a number of years and hundreds of airplanes. Fooling around with the structural integrity of your EZ could result in a serious accident.

DYNAMIC PROP BALANCING ACT

A few weeks ago, Jim Fackler brought a Chadwick balancer up to Mojave to check the balance on the props of the Voyager. While he was here, Bruce Evans persuaded him to check the balance on his own VariEze prop and one thing led to another and before poor Jim knew what had happened, he had a flock of VariEzes, Long-EZs and a Defiant waiting in line!

Jim told us that he really did not do this kind of thing for a living. Basically what he does is sell the Chadwick/Helmuth balancing equipment, but said he would be willing to help out the EZ flyers who may be interested in getting this done. He does it on his own time and an appointment would have to be made with him. Jim charges around \$100.00 and what you get is a very accurate tachometer check (he uses a strobe) plus, he checks the track of the prop, that is, while it is running the two blades are running in the same plane. If not, he can tell you how far out they are. Then he mounts an accelerometer to the engine and has you run the engine at several different RPMs. His equipment prints out a graph which shows all the vibration characteristics of your engine/prop/spinner combination. Then you shut it down, while he calculates how much out of balance your particular prop maybe. He will mount a washer or two on an AN4 bolt through the starter ring gear and have you run it again. That is usually all it takes. With a particularly badly out of balance airplane, he may require one more engine run.

There were six of us who had their airplanes checked by Jim a few weeks ago. All of us were very pleased with the results. Noticably smoother across the board. We did notice however, that after four or five flights in the airplane that the advantage that we had gained seemed to go away. Bruce and Mike noticed this and decided to remove the bolt and washers Jim had added. One flight without the added balanced weight was enough to convince them that it really had made a significant difference and that it was worth the time and the money.

Even if the difference is not all that noticable to the pilot, you can see on the "before and after" graph printouts that Jim will provide to you, that the vibration peak of the prop is reduced considerably. This must mean less stress on the whole engine/airframe over the long term - see photos for details.

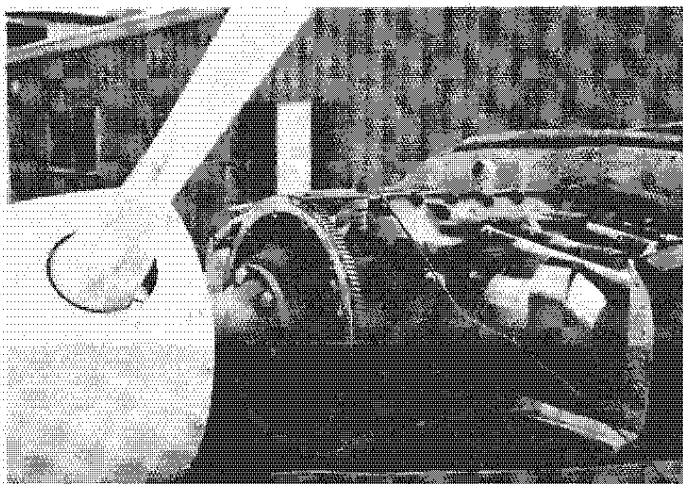
If you would like to get your engine/prop dynamically balanced, a couple of things you can do to help you get the most out of it, is to carefully balance your prop (statically) and check the track when you mount it on the airplane. Keep in mind that Jim will balance the prop even if it is way out of balance. Once this is done, you will have to leave the prop "out of balance" or you will have to have it done again. Give Jim a call after work in the evenings at his home - (818)-285 2064.



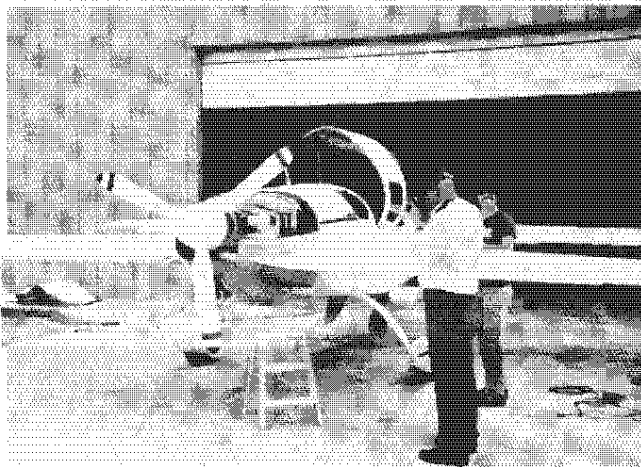
Jim Fackler checking out his Chadwick/Helmuth prop balancing equipment



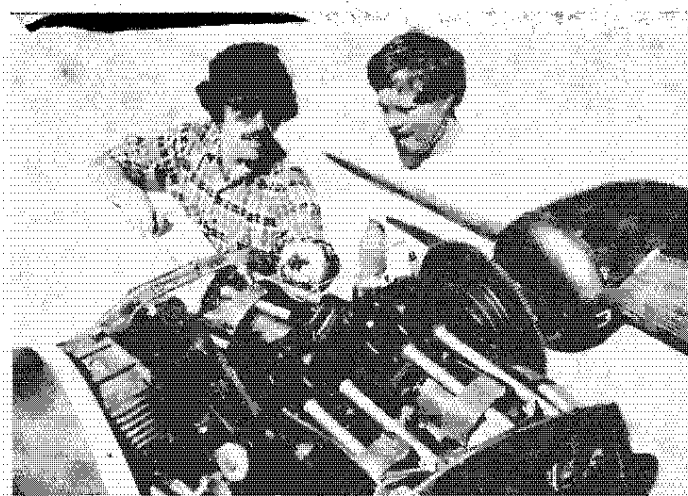
The Chadwick/Helmuth spectrum analyzer in action, printing out a graph showing 'g' peaks and valleys.



Accelerometer mounted on Burt's Defiant, rear engine.



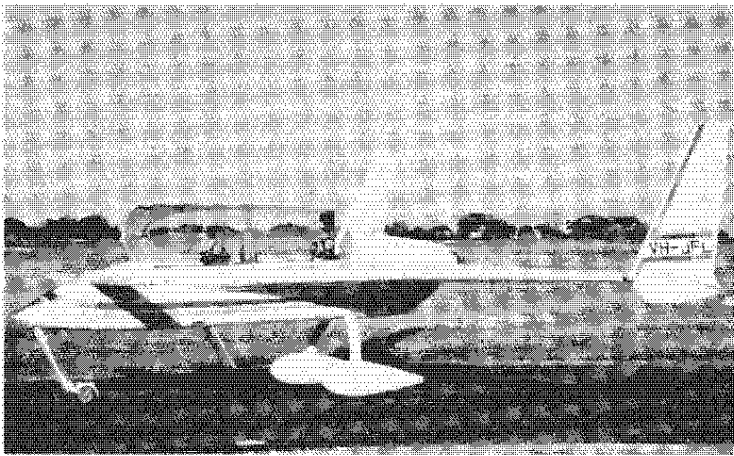
N78RA, Defiant during wiring for the dynamic prop balancing run.



Jim Fackler (left) and Bruce Evans discussing the best location on the wires to the accelerometer shown just aft of the starter ring gear.



Sam Kreidel watches Jim as he checks prop tip runout with his strobe on Sam's beautiful Long-EZ.



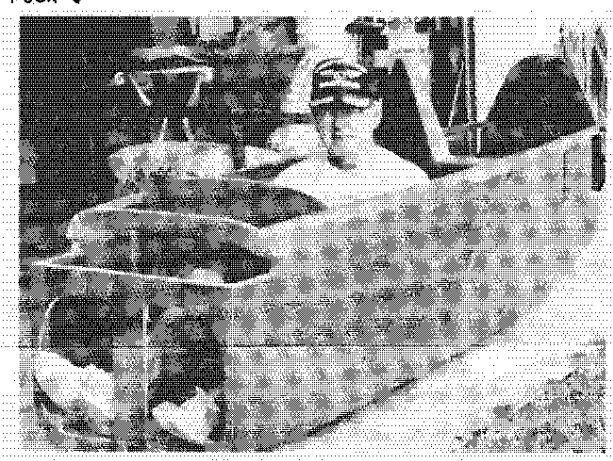
Aub Liebig taxis out for take off in his recently completed Long-EZ at Waikerie Aerodrome in Australia.



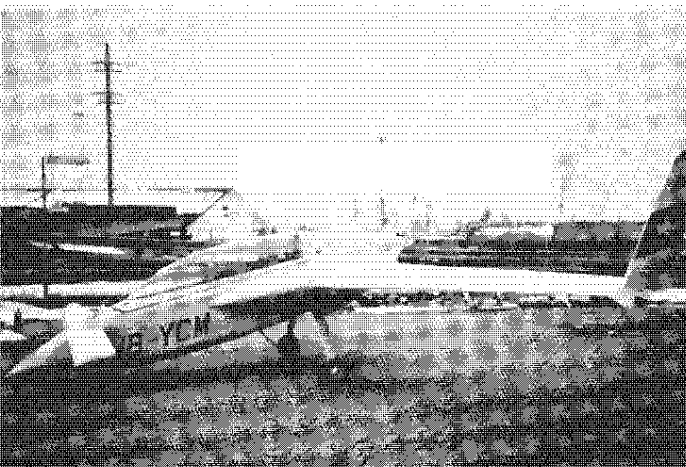
Peter Van Rensberg of Pretoria, Republic of South Africa, built this Long-EZ shown in his yard just prior to going to the airport. Peter reports that she flies beautifully, "stable as rock".



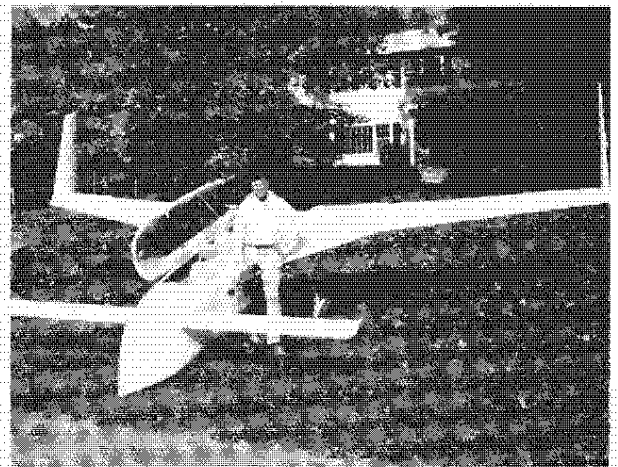
Graham Singleton and friend Joan preparing for a flight in Graham's Long-EZ in England.



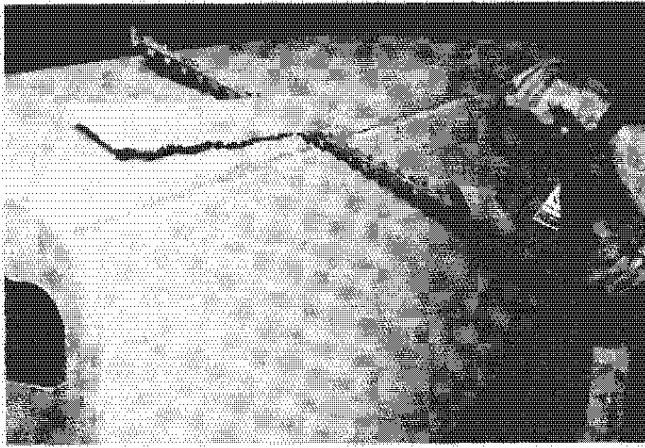
Robert Hughes of Pembroke Pines, Florida getting a little stick time!



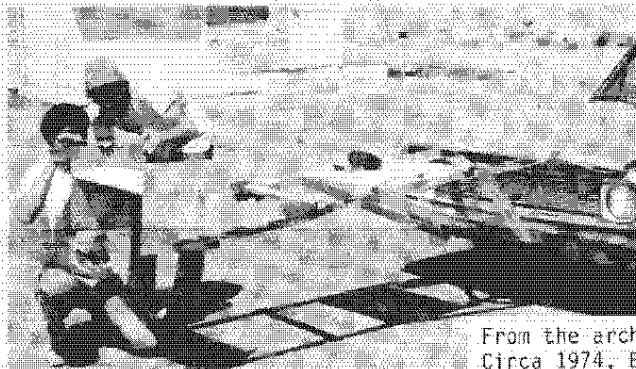
Fry Vanlentino's unusual VariEze just prior to going to the airport. Bumps on the cowl are due to Switzerland's strict minimum noise requirements.



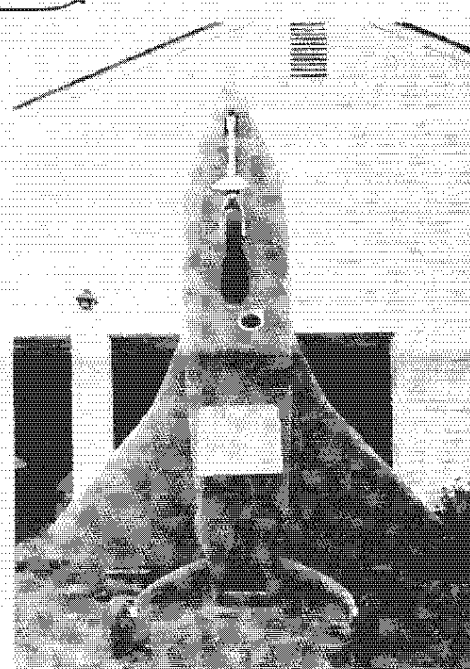
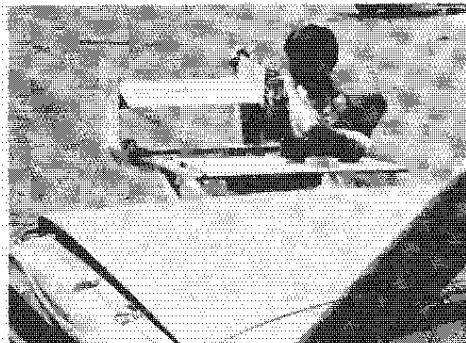
Marcus Borom from Schenectady, New York shows off his Long-EZ in his front yard.



RAF recieved the following pictures from "Captain Val". Captain Val is building his own composite design. The story goes that he was wondering how to trim and shape the fuselage when his wife asked him when he was going to trim the hedges. He went to the garage and found the hedge trimmer and says "the light came on". As you can see he made short work of trimming the fuselage!!! Captain Val got so carried away trimming foam, he had trouble finding his epoxy pump!!



From the archives! Circa 1974, Burt and helper Gary Morris rigging an early VariEze airfoil on the old Dodge powered wind tunnel, which Burt used to gather full scale airfoil data for his prototype VariViggen, N27VV, the proof of concept VariEze, N7EZ, and the prototype VariEze, N4EZ.



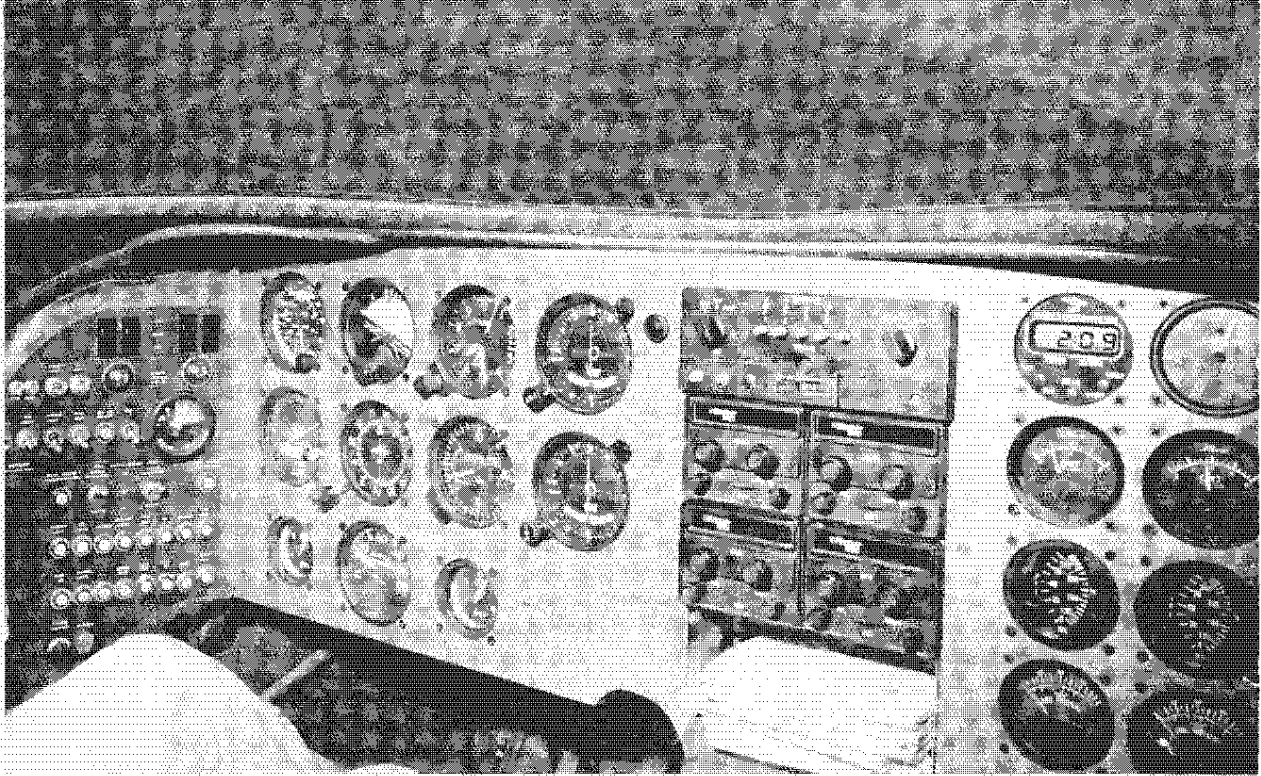
Marcus Borom positioned his Long-EZ almost vertically in order to prime and paint it! A neat idea, we did something very similar when painting the prototype Long-EZ, N79RA.

SUPPORT THE CANARD PUSHER!

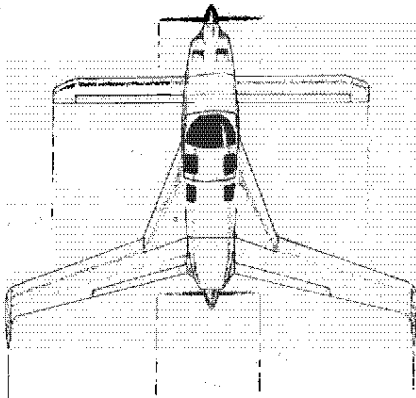
If you enjoy the Canard Pusher, and would like to see it continue in its present form, we need you help! Please send in photos of your projects, or your flying airplanes. We need builder hints, better or easier ways to do things, suggestions, corrections to the plans etc.

We enjoy putting out the CP, it really has become a way of life, almost an institution here at RAF but lately we have recieved very little feed back from builder/flyers. We need you support and you may be able to save another buider from making the same mistake you did or even prevent a possible accident. If you have information that maybe helpful to other EZ builders and/or flyers or if you have had an interesting or unusual experience in your EZ, send it in. This is really what the CP is made up of, the builders and flyers input.

An excellent view of Fred Keller's Deffiant instrument panel. This photo was taken by Don Downie while he and Fred were flying over the mountains west of Mojave.



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



first class mail

TO:

April '86

The line which appears above your name lets you know through which Canard Pusher you are paid. If your label says **LAST ISSUE CP 48**, then this is your last issue, and you need to renew.

CP 48