

CANARD PUSHER

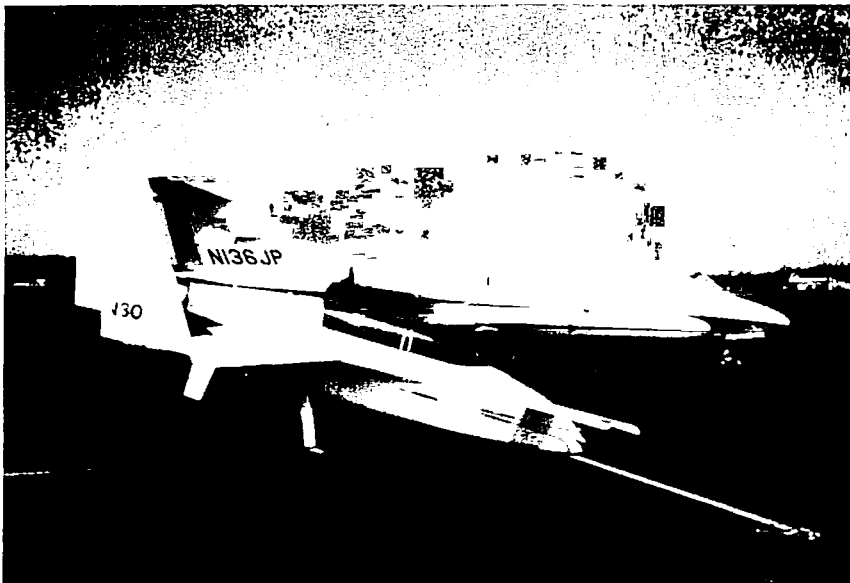
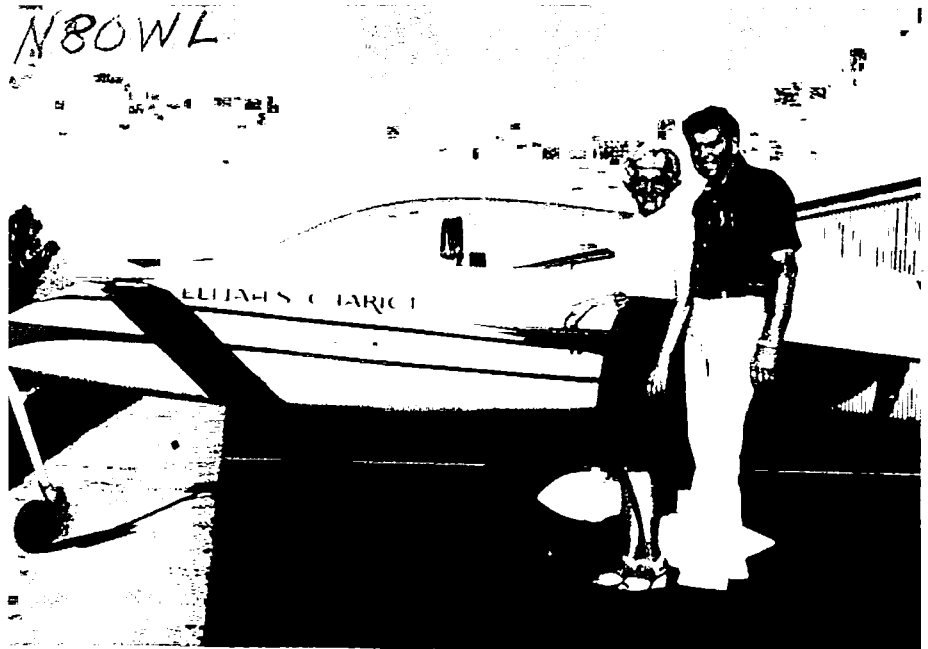
OCTOBER 1998

RUTAN AIRCRAFT FACTORY

VOL.14, ISSUE 4, NO. 94

1000 Hour Club

Wally Loewen first flew VariEze 80WL, also known as "Elijah's Chariot," in 1981. He and his wife Esther enjoyed many hours in the airplane until Wally suffered a heart attack and triple-by-pass four and a half years ago, and like Burt, had his ticket revoked. Fortunately their son Paul is an agriculture pilot and an avid pilot, flying 12 to 18 hours a day. Today 80WL has 1168 hours on the tach. Wally and Esther live in Reedley, CA.



Bob Woodall has about 1360 hours on VariEze 301RW. He has flown it to Oshkosh 15 times and Sun n' Fun 14 times over the years, but he admits that "Ken Swain has me beat." VariEze 301RW will be 20 years old next July. We hope to see you in Oshkosh in 1999 Bob so we can wish 301RW a happy birthday!

(Left) 301RW shares the tarmac with a visitor at home in Easton, MD.

CAUTION: If you have purchased Dr. Curt Smith's Nose gear ratchet check to see if the lever that selects UP & Down is made of plastic. If it is plastic and not metal, DO NOT FLY until it is replaced or corrected. A plastic lever may break, leaving you in a gear-down, or worse, gear-up position. See Page 3 for more info.

BRIEFS

I apologize to everyone for the delay of Canard Pusher — I fell behind at my RAF duties after Burt suffered a mild heart attack last April, but I am now back on track. The future Canard Pushers will be delivered on time. I thank you for your patience.

The good news is that in the months following his hospitalization, Burt has developed a whole new interest — we call it Extreme Golfing. There are those who would tell you that golf is not *real* exercise, but they have never followed Burt around the course. Most people play 18 holes in a day, but Burt goes around twice, running the entire way. It takes all day to play 36 holes of golf, but if there is a streak of light left from the setting sun you are sure to find Burt hitting a bucket of balls out on the range.

Thanks to golf and a healthy diet, Burt has shed more than 30 pounds and his cholesterol level has dropped from 230 to 189. Again, we thank our friends who mailed us books on how to live a full and fit life. We didn't know it could be this much fun!

Burt has been selected — as PRO PILOT's Aircraft Designer of the Year for 1998. It was an unanimous decision, according to magazine publisher Murray Smith. The award will be presented at the Professional Pilot Magazine's Awards Dinner in March '99 in Alexandria, VA. Congratulations Burt!

1000 Hour Club — We would like to know who out there has 1,000 hours or more on their Rutan canard airplane (Mike and Dick both have 3,000 hours!). Please pass us a note, and if you can, send a photo for the Canard Pusher.

Woofter Mfg has moved — to Arizona and changed its name to Saber Mfg. Here is how to contact Judith Saber and Saber Mfg.:

Saber Mfg.
PO Box 1201-6327C
Patagonia, AZ 85624

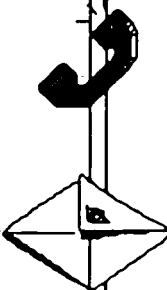
(520) 394-9146

email saber@dakotacom.net

RAF HOURS: Rutan Aircraft is officially open every Wednesday. Please call between 10 am - 2 pm (805) 824-2645 and give your name, serial number and nature of the problem. If you are not in an emergency situation, we ask that you write to Mike.

Note — Sometimes you can catch Tonya at RAF Monday thru Friday. She is in and out. Try and try again.

When writing to RAF, send along a stamped, self addressed envelope, if you have builder's questions that need to be answered. Please put your name and address on the back of any photos you send.



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multi-year subscriptions. Please
renew only after your current
subscription has expired.

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

VariViggen (1st Ed)
CP 1 to current
VariViggen (2nd Ed)
CP 18 to current
VariEze (1st Ed)
CP 10 to current
VariEze (2nd Ed)
CP 16 to current
Long-EZ
CP 24 to current
Solitaire
CP 37 to current
Defiant
CP 41 to current

A current
subscription of the
Canard Pusher is
mandatory for
builders, as it is the
only formal means
to distribute
mandatory changes.

If you have purchased Dr. Curt Smith's Nose gear ratchet check to see if the lever that selects UP & Down is made of plastic. If it is plastic and not metal, DO NOT FLY until it is replaced or corrected. A plastic lever may break, leaving you in a gear-down, or worse, gear-up position.

—CAUTION —
**Inspect your
nose gear ratchet**

Sears and modified per Dr. Smith's instructions. He did not know that the toggle was now poly carbonate and I did not know that his earlier units were metal.

The following was emailed to us from the new maker of Dr. Curt Smith's Nose Gear Ratchet, Bill Theeringer, in response to our request for a status report. Two failures of the nose gear ratchet have been recently reported to Mike.

Tonya;

Thanks for the note regarding the ratchet failures. Mike (Melvill) is right. There have been several failures of these units out of the 28 units sold. This is a very serious condition which warranted an investigation to determine the cause of the failures and recommend a course of action.

Background:

Beginning October 1, 1997 I started making the nose gear ratchet mechanisms for Dr. Curt Smith. He was no longer able to supply them to the homebuilders market. I made them as specified by him using his drawings. The first shipments began December 27, 1997. There have been two reported failures that I am aware of. One sustained damage to the plane because of a nose gear up landing. Both failures were reported to me. I supplied information to one on how to replace the broken part which was accomplished successfully. Between the time of Dr. Smith's last batch of ratchets and my first run, and unknown to either Dr. Smith or myself, Sears modified their quarter inch ratchet drive part number M44812 from which the nose gear ratchet is made. The toggle was changed from metal to black poly carbonate. The ratchet drives are made in the USA and are stamped "U.S.A. -VL- 44812". These newer units were purchased from

Failure Investigation:

Both failures were identical and occurred within the same time frame, usually within the first week or so of installation. Each failure consisted of the physical breaking off of the black poly carbonate handle (toggle) that selects the up or down operation of the nose gear crank. In both instances virtually no pressure was used to cause the breakage. In one case it was just touched and fell off while moving the just completed plane to the airport. An examination of a failed toggle showed the material to be crazed and brittle, crumbling with the slightest pressure. A check of the remaining units in stock revealed none that exhibited this condition. All were taken apart and inspected for any anomalies. None were found.

Duplication:

In an effort to duplicate the fail condition the toggle was subjected to high temperatures, greases, solvents, epoxies and four months of ultraviolet radiation. The toggle held up well in all environments except solvents. Exposure to lacquer thinner or acetone degraded the material so that it broke with moderate finger pressure. Exposure involved getting the surface wet for several seconds. During the assembly process the toggle is held in place with a small dab of loctite 242 thread locker. Exposure to this material had no obvious effect on the toggle when exposed for several months. There was, however, an instance when I assembled a couple of units and had mislaid the loctite bottle. Instead I used some gap filling "Hot Stuff" super glue that I use in the assembly of the electric cabin heaters. Testing toggles with this material resulted in crazing after about 2 or 3 days and weakened the material substantially after a week.

See Nose Gear Ratchet page 4

Parts Message from Brock MFG

Ken Brock MFG has notified us that the steel tubing (1/2" OD x .028 wall) called out in the CP to replace the aluminum aileron control push rods aft of the firewall, in the engine compartment and wing root area, is no longer available.

This means that the CS-50 steel inserts that were machined to fit inside 1/2" OD x .028 wall steel tubing will be made to fit inside 1/2" OD x .035 wall steel tubing from now on.

If you purchased CS-50 uisots that were machined to fit the .028 wall tubing, you can turn them down on a lathe yourself, or you can send them to Brock who will do it for you for a small fee.

Some builders have noted that the canard lift tabs for the Roncz 1145MS canard have the 3 holes pre-drilled at #3 drill size (.213) instead of the 1/4" diameter that is called out in the drawings. This is because the #3 tools were already in place, and also because you should drill these three holes out to fit as closely as possible to the AN-4 bolts that fit through these holes. You should have a nice tight fit on these bolts.

We suggest drilling them out with a letter "D" drill, not a 1/4" drill. This will give you the best fit.

See page 13 for the phone # and address of Brock Mfg.

Nose Gear Ratchet

Recommendations:

There have been 2 failures of the ratchet toggles reported to me. Both occurred shortly after installation. I have been able to duplicate the fail using a process that was used by me one time. The last unit to fail was delivered in July of 1998. There have been no failures since. I would recommend:

- 1) A one time check of the integrity of the toggle by forcing it in either direction with the thumb as hard as possible. (Finger only!)
- 2) When raising or lowering the gear first turn the crank further in the direction that it is locked. This will unload the pressure on the pall and make switching the toggle easier on your finger.
- 3) Keep solvents AWAY from your airplane. Be aware that Zolatone primer contains lacquer thinner. If you have the see through fuel gauges this primer can crack them, as well as the ratchet toggle.

Bill Theeringer N29EZ
Composite Aircraft Accessories
PO Box 21645, Santa Barbara, CA 93121
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Inverted Flight in a Canard Aircraft

We thought you'd be interested in the following article. However, the aerobatics described **ARE NOT** intended or approved for the operation of the EZ aircraft. RAF has never encountered an inverted deep stall.

By Tom Staggs, Long-EZ N13YV

Over the past few weeks, there was a string of messages about whether or not our canard aircraft are capable of sustained inverted flight. I found the messages that assured us such a maneuver would be "impossible" to be rather humorous: as an air show performer, one of the maneuvers in my routine is to fly my Long-EZ down the showline inverted.

Having said this, it's time for my "don't try this at home disclaimer". I'm sharing my thoughts and observations here because I feel that the better we understand our aircraft, the safer we can be. As I explain below, I have gotten myself into a nasty position because of inverted flight.

If any of you have questions, I'd be glad to answer them to the best of my ability. If any of you aerodynamacist types out there have better explanations for the phenomena I describe below, please do so.

As many contributors to this news group pointed out, an airfoil couldn't care less about "up" and "down"; airfoils only care about the relative wind. In the case of the Long-EZ I fly, I have the GU25 airfoil on the canard (the original design), and the modified Eppler 1230 on the main wing. They're both flat-bottomed, which implies very poor negative angle of attack characteristics.

With a flat-bottom airfoil the maximum coefficient of lift is substantially less than what it is for positive angles of attack. In other words, the maximum G's generated in inverted flight would be less than what they are for conventional, right-side-up flight. Flat-bottomed airfoils can sustain inverted flight; a good example are modified Super Cubs that do just fine inverted.

In the POH for the Long-EZ, the performance envelope shows G limitations of +5, and -2. I don't

know whether the negative-G capability was ever proven in flight test, but I would suppose, knowing Burt's thoroughness, it most likely was. I know that my experience in a stock O-235 Long-EZ showed that these parameters were achievable, both at positive and negative G, up through 160 KIAS.

The inverted characteristics of my Long are quite reasonable, although they require a fair amount of forward stick force with a very steep force gradient.

Coordinated turns are possible and actually easier to attain inverted than upright (I believe this might

stem from the fact that my knees are braced during inverted flight, allowing for greater precision applying rudder inputs).

When I make an inverted pass, I always start it with at least 5 degrees nose above the horizon, and I never let the nose fall below the horizon. Just before I roll back upright, I push to about 20 degrees nose up before commencing my roll. I should also point out that I have a 4-point hooker harness, as well as second independent lap belt for redundancy.

Now for the bad news: although the EZ should exhibit tame stall characteristics inverted (mine does), it is also significantly easier to enter a deep stall. I have twice encountered this phenomena, but have been able to recover from it by rocking the wings with the rudders, my guess is that they are not blanked when inverted like they are in an upright deep stall. In both cases, my CG was within the 103" limitation although towards the aft

I'm sharing my thoughts and observations here because I feel that the better we understand our aircraft, the safer we can be. As I explain below, I have gotten myself into a nasty position because of inverted flight.

SEE Inverted Flight page 6

Airplane Plastics Company Has New Owners

From the Airplane Plastics Newsletter

Jeff Rogers has been with The Airplane Plastics Co. since the beginning approximately 20 years ago. Fifteen years ago the company became a small division of a large skylight company, Fox Lite Inc. January 1, 1998, Fox Lite Inc. agreed to sell the assets of The Airplane Plastics Co. to Jeff Rogers and his wife Becky. A new company was then formed titled J&B Rogers, Inc. DBA Airplane Plastics.

Very little will change with the new company except for the customer service. Becky will be running the office which will give Jeff the time he needs to make the best canopies and windshields possible. Customer service will be top priority to the new company.

Employees that joined the company formerly from Fox Lite Inc. are Chuck James, tooling specialist, and Jim Hill, canopy technician. Chuck had eleven years with Fox Lite, Inc. with seven of those years working for Jeff. Jim had fifteen years with Fox Lite, Inc. This gives the total years experience for the new team an impressive 46 years in the plastics fabricating business.

The company will have a new address and phone number. Airplane Plastics is moving into a brand new building which will also help increase productivity. The move will be complete by September 1998. Production should only be slowed down for approximately one month during the move.

Airplane Plastics

New address

9785 Julie Court, Tipp City, OH 45371

New Phone Numbers

Phone (937) 669-2677

Fax (937) 669-2777

Inverted Flight

portion of the range (102.1" with an O-235, 103.0 with an O-320) and I was at very low airspeed "floating" over the top of the loop in mist or light rain. In the O-235 case, my engine was not producing power, but with the O-320, I was at full throttle.

Both times, I was applying more forward stick to hold my nose up, then applied even more forward stick. The nose seemed to hang above the horizon as I suddenly felt my shoulders dig into my straps. The stick then seemed to go lifeless in my hand; I could cycle the pitch with no apparent effect, nor did the ailerons seem to be capable of rolling the plane. In the first incident, I noticed my airspeed was still on the peg after approximately 2-3 seconds of "falling". In the second incident, I saw about 40 kts of airspeed and about -3,000 fpm on the VSI after a similar period

of time.

In both cases, application of full rudder resulted in a simultaneous yaw and wing rock. After one or two more applications (too scared to remember exactly how many times I cycled the rudders), the plane sliced nose-low while rolling upright. As the nose fell through, airspeed picked up and I was able to fly away.

Lesson learned: Avoid large control inputs at negative G in an EZ, realize that moisture can impact the aerodynamic characteristics of the airfoils, and be ready to use the rudders to recover. Better yet, just don't fly inverted in EZ's.

By the way, I eliminate the inverted pass portion of my air show routine when there's any kind of visible moisture. •

Accident Report

On November 2, 1998, approximately 1630 central standard time, a Long-EZ homebuilt experimental airplane, N21EE, owned and operated by the pilot and four other people, was destroyed during a forced landing following a complete loss of engine power near Alvin, Texas. The private pilot received serious injuries and his passenger sustained fatal injuries. Visual meteorological conditions prevailed and a flight plan was not filed for the Title 14 CFR Part 91 personal flight.

The local flight originated at approximately 1600 from Clover Airport near Houston, Texas. During personal interviews, conducted by the investigator-in-charge (IIC), local authorities reported that during the rescue operations, "the pilot stated that the engine had quit." Witnesses approximately one mile from the accident site reported hearing a "sudden shut off of engine noise" as they observed the airplane. When the airplane did not return to the Clover Airport, pilots at the airport initiated the search and rescue.

The airplane was located at 0900 the following morning. Examination of the accident site by the IIC revealed that the

fuselage, with the engine intact, came to rest inverted against the up-slope of the water dike. The initial impact point was an International farm combine utilized for harvesting rice. An imprint of the letter "N" was found on the tread of the left main landing gear tire. The wreckage distribution path extended on a measured magnetic heading of 064 degrees for a distance of 86 feet from the combine to the dike. Numerous pieces of fiberglass from the forward canard and left wing were found on the combine. The right main landing gear and gear struts were also found on the combine. Both wings were separated from the fuselage. The left wing was found 27 feet from the combine, and the outboard portion of the right wing was found 43 feet from the combine. The nose gear, front canard, emergency locator transmitter, and the inboard portion of the right wing were separated from the fuselage and found along the edge of the drainage ditch which runs along the base of the dike.●



**To report
accidents
and incidents**

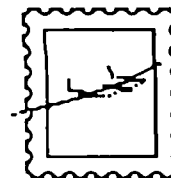
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Fax RAF
(805) 824-4174
(805) 824-3880

Write RAF
1654 Flightline
Mojave, Ca 93501

Email RAF
raf@hughes.net

Can Voyager be licked? Airplane's Postage Stamp One Letter Away



Neither rain, nor snow nor repeated rejections from the Citizen's Stamp Advisory Committee has stopped Kelly Hall's drive to put the Voyager back into the air — the airmail, that is.

Kelly Hall (from Dick Rutan's office) has been trying to persuade the Citizen's Stamp Advisory Committee (CSAC) to produce a Voyager Stamp since 1989.

She started with a handful of letters from friends and family. When *that* didn't work, Kelly turned to the extended Voyager and canard family for help. Thousands of requests poured into Kelly's office, which she

Citizen's Stamp Advisory Committee
United States Postal Service
475 L'Enfant Plaza, SW
Washington DC 20260-2435

has forwarded to the committee, and she says she is certain thousands more have reached CSAC on their own.

After ten years it now seems we are getting some deliverance. Kelly received news last year that the Voyager Stamp is under consideration by CSAC for "the nomination of First Flights or Manned Flights."

If you would like to give the CSAC your 33-cents worth, address your letter or postcard to the CSAC with your request for a Voyager Postage Stamp.

As Kelly says, "we may be just a letter or two away from convincing CSAC that the Voyager is worth a stamp!"

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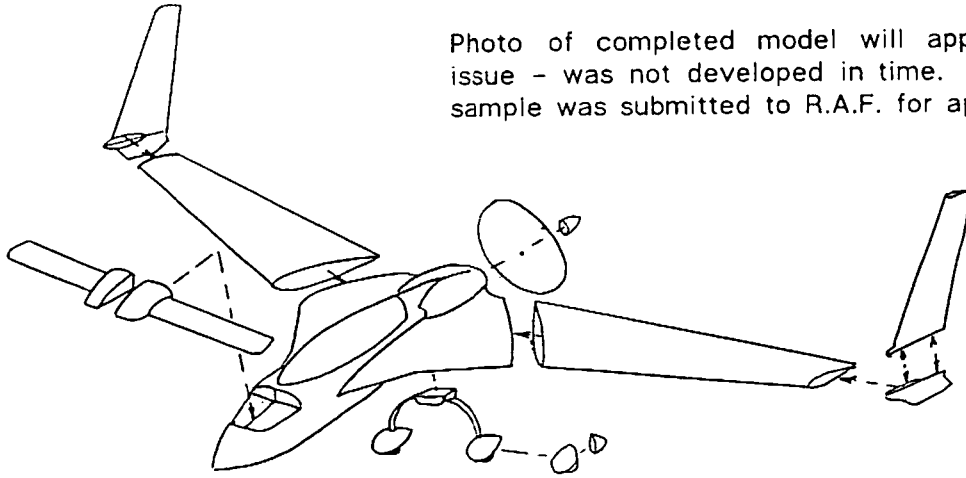


Photo of completed model will appear next issue - was not developed in time. Model kit sample was submitted to R.A.F. for approval.



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Fly-In with Friends

March 4 - March 7, 1999
Deep Baja Save the Males Fly-In

by David Orr

Honey-dos got your goat? Tired of "800 and 2" on the local ATIS? Now you too can Save the Males! A flight into nice weather at the Eastern corner of the tip of BAJA.

We will be flying down on March 4, 1999 (Thursday) and flying back on March 7 (Sunday). You can certainly stay later or come earlier, you are putting the deposit on your card, after all.

For those newcomers, let me introduce you to this friendly yet-to-be discovered world class resort. It has a gentle surf on two sides with tropical climate between 70 and 100 degrees F., and clear sky in that time of the year. It is said to be the location of the northern-most coral beds in the world.

We will be staying at a lovely small, secluded hotel within walking distance of the airport, and no towns within 20 miles. You must call to make reservations to either 1-800-426-BAJA. Mention Señor OERTEL's name to get the best price.

The place has absolutely no day and night activities except fishing, walking on the beach, reading a novel, drinking, snorkeling, a swimming pool, scrawny horseback riding and other things I don't particularly credit (after all, I just do this for the flying).

The "we" I mention includes eminent tour director Bill "Duck" and "Twinkle" Oertel (Chino), probably leading Stet "Turtle" Elliott (NM); Stan "Pumbaa" Susman (SNA); Bruce "The Kids" Elkind (Hawthorn); Bob "Jaba" the Hutter (SMO); Harry "Yellow" Bawcom (AZ); Gary "Dragstrip" Spencer (near Death Valley); mister talky, David "Beagle" Orr (SNA); and some guy in a backward's airplane called Roy "Trigger" Something. I can count at least 2 kids and 5 wives in there somewhere, probably lots more. It is fun for both wives or kids, even both.

There aren't many rooms, so the longer you wait, the more likely you need to rent a home on

the beach next to the hotel; gorgeous home I might say, but who knows the cost!

New guys might do well to tag along with an old experienced pilot. You can keep them awake was we pass the high Sierras of Baja at 10,000 feet, fly over the crystal coves of the islands and skeleton shores while Beagle reads serially from the Baja book about every dirt strip and paved runway from Tijuana to the tip (just in case you are one of those people who like your back seater to think about engine failures), and Pumbaa simulates forced landings all over the place.

Now, did I say that there will be a reservation waiting for you to decide later? No, you gotsta make the reservation right now, yourself! The Male you save may be YOU, and it won't hurt if the other half relaxes while you are being saved.

For DETAILED SAVE THE MALES information such as Airport, Accommodations and Over the Border Flight Rules call or fax David Orr at (949) 248-5725.

1999 R.A.C.E. Schedule

Shirl Dickey, E-Racer and King Racer have a new address and telephone: PO Box 828, Aquila, AZ 85320
520-685-3126

email: mreracer@primenet.com

Airport: Eagle Roost Airpark,
Aquila Airport, 75 NW of
Phoenix

Spin-On Oil Filter Adapter for Lycomings

B & C Specialty Products' latest product is the neatest idea I have seen in a long time. It is a 90-degree, spin-on oil filter adapter for Lycoming engines. It is beautifully made by CNC milling out of a solid aluminum billet and bolts onto the accessory case in place of your oil screen housing or AC spin on filter adaptor. It fits perfectly, does not interfere with the magnetos, the vacuum pump or even the mechanical tachometer drive. It also has plenty of clearance on your engine mount and firewall, important considerations when you operate an EZ!

I installed one on N26MS and now have a full flow, spin on champion oil filter, with no high pressure hoses to a remote mounted filter which could leak. It comes with everything you need to install it: a new gasket, new aluminum washer for the vernatherm, and new copper washer for the oil temperature sensor. They even send a small container of the proper sealant for the gaskets. Of course it comes with new Lycoming bolts to mount it.

It is fairly expensive at \$395 but is available to EZ flyers until the end of 1996 for \$350. I am extremely pleased with mine and I heartily recommend it for anyone running a Lycoming engine on an EZ. A fuel flow spin-on filter allows 50 hours between oil changes and prolongs the life of your engine.

Give B&C a call at (316) 283-8662 or fax (316) 283-8000. You'll be glad you did! *Mike*

RAF Recommended Suppliers

These suppliers are still the only authorized RAF dealers for all your various aircraft materials and components.

Brock Mfg.
11852 Western Ave
Stanton, Ca 90680
(714) 898-4366

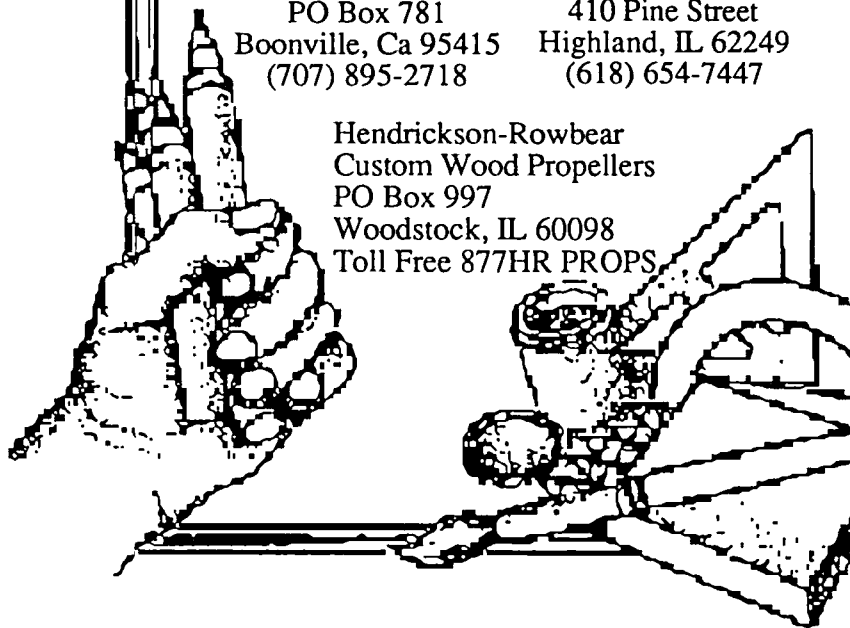
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VariEze builder/flyer Bill Butters has started a company to develop a full range of buried antennas. These are normally supplied with a BNC connector built into the actual antenna, but can be supplied without connectors to include enough length of co-ax cable to facilitate easy installation with minimum weight and bulk.

Call Bill Butters 800-758-8632 Advanced Aircraft Electronics, PO Box 4111, Florissant, MO 63032

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Main Landing Gear Strut	\$379.00
Nose gear strut	\$64.00
Engine Cowl Glass Top & Bottom Set	\$369.00
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Wheel pants (3.5x5 set)	\$170.00
Wheel pants (500x5)	\$195.00
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Bulkheads Left & Right	\$199.00
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Nose wheel cover NB	\$23.00
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Nose Bumper Rubber	\$10.00
NACA inlet	\$55.00 (requires cowl modification)
Propellers, with rain leading edge (call for quote)	

Contact Michael Dilley or Larry Lombard
(both former RAF employees
and EZ builders and flyers)
Feather Lite, Inc., PO Box 781
Boonville, CA 95415
707-895-2718

A check or money order is required to process orders.
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Nose Gear Ratchets

I have agreed, effective October 1, to take on the job of producing the nose gear ratchets that have been supplied by Dr. Curtis Smith. The job kind of overwhelmed him, and I am hoping that it does not do the same to us! I have orders for around 25 outstanding right now and am tooling up to do an initial run of 100. Price has, of course, gone up. The cost of materials and labor always does. I will be offering the units built exactly to his original specifications. I can't improve on a perfect design! I will, however, be offering the units in two finishes. The standard unit, part number 44807, and a chrome finished version, part number 44812. These are also the Sears part numbers for the two finishes of the 1/4 inch ratchet drives. Each ratchet includes installation hardware and instructions. Prices are as follows:

44807 Ratchet	\$49.95
44812 Chrome finish ratchet	59.95
Shipping & Handling	5.00

See our award winning Long-EZ at
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Projected shipping times are 5 to 7 working days after ARO. There is, as with all our products, a 30-day money back guarantee provided the unit is undamaged. Sorry, no COD orders. Prepaid personal check is preferred. Your check is held until 30 days after shipment to you. Visa and Master Card are also accepted. Please add \$3.00.

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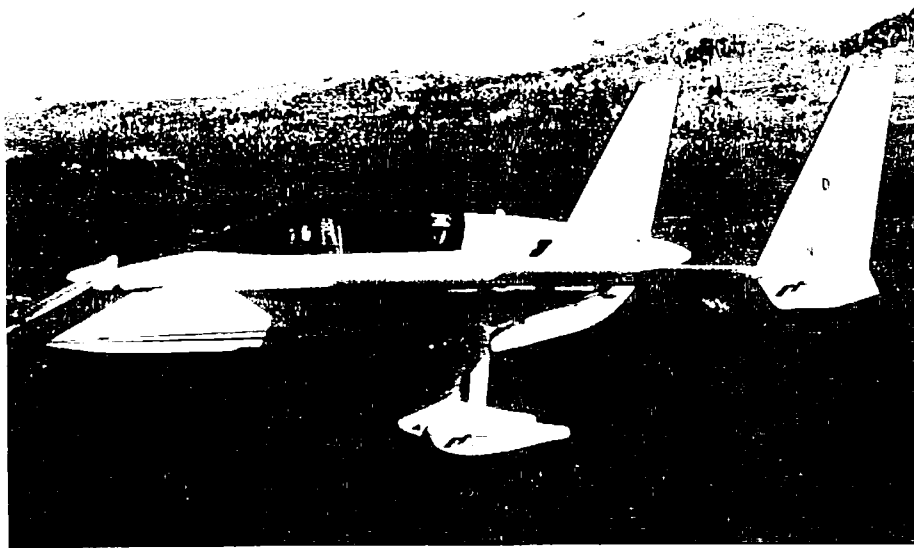
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October 98
CP 94

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