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COZY NEWSLETTER #57

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OBSOLETE PLANS

This is a reminder that your plans are obsolete, unless you are current in your newsletter subscription and have made *all of the corrections* to your plans which have been published in the newsletter. We are doing the best we can to provide builders with the support we think is necessary for them to build good airplanes and fly safely, but we do need to have you stay on our mailing list.

WHAT WE HAVE BEEN DOING

We were able to get the January newsletter (#56) in the mail before the Christmas holidays, so we could spend Christmas with our children and grandchildren in Minnesota. After our return, Shirley's friend from British Columbia arrived, and we were able to go on a 1 week vacation with friends in St. Martin, and then a 1 week vacation with other friends at Cabo San Lucas, at the end of the Baja Peninsula. I was persuaded to go deep sea fishing, and ended up catching a 145 lb. Marlin. I can attest to the fact that Cabo's reputation for great fishing is true!

After getting our winter vacations behind us, I got to work installing Steve Wright's (originally Tom Ellis') electric nose lift. It didn't seem to be quite as easy an installation as Steve described, and more than once I had to ask myself if it was really worth it, because we never had any problems lifting the nose off the ground and cranking the gear down manually. I persevered, however, had to make a couple of changes which I passed on to Steve, and finally got it working. To date we have made several flights with other builders as passengers, and it seems to work very well. We even put it to the test by lifting the nose with a 225 lb. passenger sitting in the right seat, and it didn't seem to complain. I haven't demonstrated it with Shirley yet, but my guess is that she will like it. She has arthritis, and sometimes had a little trouble climbing in without a little boost. My unqualified recommendation will be withheld until after we return from Sun 'n Fun.

I also took the opportunity to install Alex Strong's electric pitch trim. It was easy to install and seems to be well designed. It has more authority than the spring pitch trim, so it seems to cover a wider range of c. g.s. My only reservation to date is that I have experienced a little binding, which we think is due to the pivot being too tight, and is easily correctable. Our trip to Florida should give it a good workout.

Coy builder Don Ponciroli visited us from CT, and I took him for a ride. He seemed to like both of these mods.

EXPERIMENTAL AIRCRAFT ASSOCIATION

The EAA has been a major positive influence in general aviation since the 50s, especially for those of us who wish to build and fly experimental aircraft. We joined the EAA in 1973 when we started building our first airplane, and have been active supporters ever since. As a matter of fact, we haven't missed an Oshkosh in 24 years, and have been exhibiting airplanes there that we have built ever since 1978. We encourage all of our builders to join both the national organization and also a local chapter. Exhibiting an airplane at Oshkosh is a must for all builders.

The EAA has had a Technical Counselor organization for many years. These are experienced builders who have volunteered to help first-time builders by visiting their projects, critiquing their work and offering suggestions where appropriate. The Avemco Insurance Co. acknowledges the value of this program by offering a 10% reduction in insurance premiums if a builder has logged at least 3 official visits by a Tech Counselor. Avemco also offers another 10% reduction if the builder is an active member of a local EAA chapter. A more recent EAA program is the Flight Advisor. This is an experienced builder/pilot who is qualified by the EAA to assist a new builder in preparing for his first flight. Most homebuilt accidents occur during the first few hours of flight, and most insurance companies are reluctant to provide coverage during this period. This can pose a problem because some states will not

allow you to make your first flight until you have insurance coverage. If a builder avails himself of the services of a Flight Advisor, Avemco will provide insurance coverage during the first 10 hours of flight.

VANCE ATKINSON

Most of you have either met Vance or heard his name mentioned many times. He has been a good friend of ours and a frequent visitor for many years, and a wonderful supporter of the Cozy design and its builders. Vance is a corporate pilot with many thousands of hours in Lear Jets. He is also an experienced builder, having first built a Varieze, and then he became one of our first Cozy builders. He won at least one award at Oshkosh, was the first builder to log over 1,000 hours on a Cozy, and the designer of the award we now present to 500 and 1,000 hour pilots. Vance is very creative and innovative. He has originated and evaluated many design changes. What we like about his approach is that he is very meticulous and cautious. He first builds according to plans. Then he will make one change, and thoroughly evaluate it and record the data before deciding whether the change was an improvement, or not. He then shares his evaluations with others. He holds a number of firsts. He was the first to design fuel sight gages, which he sells. He was the first to evaluate the Roncz canard airfoil on a Cozy. He was the first to install electric trim, a fuel flow meter, and an electric nose lift, and after-market fuel injection, and a redesigned oil sump, and electronic ignition, and an adjustable NACA scoop for engine cooling, and different locations for the oil cooler, and a special spinner cone, and the list goes on and on. Vance's credentials are impeccable!

On many of his corporate trips, he will look up Cozy builders in the area, visit them, and share his expertise. He has checked out a number of builders in his Cozy. He is both a Tech Counselor and a Flight Advisor. He has no other interest but to help builders.

We have asked Vance if he could participate in the Cozy program in a more official capacity. His work schedule is demanding, and he is away from home a lot. He has offered to start by writing a column for the newsletter. We are proud to have him on our team!

VANCE'S COLUMN

Dear Builders,

For those of you that don't know me, my name is Vance Atkinson. The rest of you guys can skip the next couple paragraphs. I have built and flown a Varieze in 1980 and a COZY 3 serial #18 since January 1987.

We were number 5 to fly and promptly had an engine failure at 40 hours (exhaust valve failed) and I was able to put down at a nearby Navy base. YES, the COZY did look snarfy sitting next to all those P-

14 Tomcats. Fortunately the base XO (executive commander in civilian lingo) was building an RV and was sympathetic to our plight. I was outa' there in 3 days, and grateful that I didn't have to truck it out. To continue, the COZY specs are: Empty wt. 1052 lbs. (weighed Nov. 96) up from the original wt of 978 lbs in Jan 87, TT 1078 hrs with a modified Lyc E2A-320 for power and being screwed through the air with a 2-blade Great American 64x76 prop. The fastest recorded speed for our machine was at the 1992 Sun 'n Fun race where we took 1st place at a speed of 214 mph from a standing start. In 1988 I climbed to 23,000' coming back to Texas from Tucson AZ. It would have gone higher, but I stopped there for lack of tailwinds. This was done with absolutely no preparation other than 02 aboard. My wife Lynn goes with me on about 80% of all flights and we cruise around 174 kts true at 2600 rpm looking at 7.5 gph on the flowmeter. The plane has the best speed/fuel combo at around 9 to 12,000'. Oh yes, for me, I have 16,000+ hrs., 6 type ratings and fly for AMR/Bombardier in the executive division. I am an EAA Flight Advisor and became a Tech Counselor this year. As Nat has explained, you will get a pretty good discount from your insurance company with a few measly visits from a Tech or Flt Advisor. Besides, Ya gonna be a lot safer and smarter talking with someone who's been there.

Two weeks ago (Dec.) I was privileged to fly Nat's MK4. Lots of people have asked me how does it compare to the 3- place? Up until now I didn't have a clue. I have flown the Berkut, Varieze, Long EZ, Defiant, and Velocity, but not the 4-place. Over Nat's objections, I insisted on sitting on the left side. The first thing I noticed is the rudder pedals on the left side were non-adjustable (at least not easily so). I'm 6'1" and Nat must be 4' 1" (just kidding) but he's significantly shorter than I am. Scrunching down to my minimum height, I managed to work the brake pedals with my knees jammed into the instrument panel. This made for a somewhat wobbly taxi path but manageable with the canopy open. Take-off was made with jabs at the pedals to track straight. Nat's 4 doesn't have dual adjustable rudders, only the right side. Nat reasoned he'd do all the demo flying from the left anyway, so why putt'em in there? Pressing on, we got the engine started (the carbureted 6-cylinder Franklin) and let it warm up (it was around 50 degrees out). I might remind you guys out there with the Lycoming 4-cylinders that a test I did last year involving oil flow to the rockers showed NO oil to any rockers for 4 minutes and 50 seconds! This is typical for Lvcoming! After start-up, we proceeded to taxi to the main runway without any hesitation, stumble or roughness on the engines part. Pilot technique, however, could have used some help as my knees continued to rub new holes in the instrument panel. Nat and I have the same heavy duty brake discs and pucks but his brake system "feels" better than mine! Even though both our systems are up front in the nose and mine has fewer parts, the 4-place just has a better feel. As we taxied out, I noticed that the MK4's engine instruments were harder to read than mine were. The liquid crystal digital displays were very small and not very bright (similar to my digital Braal Tach, which happens to be right in front of my fat face in my COZY). Head and hip room were noticeably improved and the visibility was the same as in my ship. Magnificent! (Why would anyone want to cover the top of the canopy?) The engine produced a lower rumble (as expected) and the prop noise seemed the same. Actual noise was different than mine but we run with Bose headsets and the advance on my ignition is around 40 degrees, putting the engine in the very smooth and quiet category. During the run-up I noticed a large and surprising mag drop (Nat said this was normal on the Franklin). I have been running electronic ignition now for 5 years and total electronic ignition for 4 years and the typical drop is 20 to 50 rpm. It's amazing to me what you take for granted. Unfortunately Nat had filled the tanks to the brim and I would guess we weighed around 1840 lbs. Not exactly the conditions one would want for a snappy test flight. Never the less, we accelerated better than my machine would under those circumstances. Lift off achieved about 1200 fpm climb. Not bad for all that weight. The first thing I noticed was Nat's ailerons were a LOT smoother than mine. And, seemed to be more responsive. I'd recommend putting in steel bearings on the control rods instead of the phenolic cut outs called for. With almost 1100 hours on mine they are now worn out! Elevator action was the same. We climbed up to 5000' and did some slow flight and approach to stalls. The nose bobbed around 68 kts and pretty much felt like mine. The control

stick angle was more straight up and down and consequently when sitting on the left side the pilot would hit his knuckles on the side of the fuselage when turning hard left. Nat is aware of this and is going to change the angle inboard significantly. Noise level in flight was hard to judge. Our 3-place is significantly quieter but only because of the noise canceling feature of the headsets. Radio operation and audio quality was standard. Vibration of the 6 cylinder was quite different than our COZY 3, it seemed to be lower and deeper at cruise (at around 160 kts indicated). I didn't try an all-out speed run for very long but I'm pretty sure the MK4 with this engine/prop combo will dust our 3 off fairly easily. It seemed to pull the weight we were at with no problem. The 3 place would be struggling with the 160 hp. One item I was very disappointed in was Nat's lack of a fuel flow meter. This handy little gizmo will tell you more about power output (in combination with the airspeed did) than any other indicator. I would have liked to have compared the fuel flows of the two aircraft at given speeds. I do know that our 3-place flying side by side with another COZY 4 with a 200 hp Lyc shows the flows to be about 2 gal per hour less in the COZY 3. Same loads in both aircraft of course, and the TAS around 174 kts.

With 50 gal of fuel on board, and the two of us, I did some slow flight. I got the usual nodding as we approached minimum speed. A typical non-event for canard aircraft. As we picked up speed for normal cruise we headed back to Falcon Field for the landing. For you pilots who haven't flown one of these types of planes, the secret to good landings is airspeed control. No control, no landing! Just kidding, but pretty close analogy. On our 3-place, I use 100 kts downwind and 90 kts base and 80 kts final which I bleed down to 70 kts on short final and then touchdown at 63 kts at medium weights. I decided to use the same speeds with the 4-place and it worked out beautifully. The 3 and 4 place land identically. After landing, as we rolled to the hangar, Nat told me he was planning to put the electrical nose gear retract in his plane. I have had the prototype unit in my COZY for two years now and with the exception of a welded joint breaking, there have been no problems. Nat will give you a report on his retrofit. As for mine (identical to the 4-place) I discovered several areas of attention. For you builders who are considering this option, this is how it went.

Through the years we have gone from a 600 lb Varieze to a 1200 lb COZY (and beyond 1200 lbs for the Velocity and AeroCanard) These airplanes are quite nose heavy when loaded with fun and baggage. If you put a scale under the nose bumper you will be surprised to find weights in excess of 100 lbs. This weight can go as high as 200 lbs depending on where the snubber is and how much fuel and baggage you have aboard. My particular machine with 50 gallons of fuel on board weighs 142 lbs on the snubber, with 6 gallons it weighs 120 lbs. 4 years ago I threw my back out in Denver and it took a month to recoup. After that, I thought about how I could avoid more lifting pain. Its not that you can't lift 150 lbs, its the angle that gets you! Some of the guys on the West Coast were using an electric lift, but it was relatively heavy and expensive and didn't lend itself very eze to re-installation. Besides, it had this big ugly 6" foot sticking out in the middle of the nose gear strut which looked really weird. About the time I was trying to figure out what to do and where to do it, Tom Ellis (COZY 4 builder) was also doing the same. He had come up with the compressed spring arrangement that would fit on the end of the actuator I was going to use. I then tried to come up with a simple ratchet mechanism to crank down the gear in case of electrical failure. I did, but it was a lot of work and would not lend itself very well to the average builder fabricating it. This was not easy and Steve Wright in Nashville has persuaded the factory to modify the actuators with the attachment already to go in a special shipment to him. You can buy the entire kit from Steve or the parts you need to install this system. One thing I highly recommend, is the heavy duty strap (HDNG3 & HDNG4) that Steve sells for attachment of the spring to the fiberglass strut. His new one is made of thicker steel and is welded. This particular piece takes a terrible punishment landing, taking off and taxiing. I have replaced mine twice and have bent bolts and elongated holes in my continued abuse of this particular part. Don't think for a moment that this is indigenous to the Cozy, as the Long EZs have had this problem for many years. This part just needs to

be heavier. The foot problem was solved by positioning it farther down the strut and reducing it to 1-1/2" high. This worked out quite well as it looks like an exotic high freq. antenna when the gear is folded up. The next problem was where to locate the up and down lock switches. These guys are usually the cause of most gear problems as they also entail using relays for high current loads. The uplock switch was no problem, but the down lock switch took some time to come up with a workable option. I told Steve this and he came up with a nifty solution by welding a tab on the actuator itself and attaching the switch to it. I found a few areas of concern and passed these on to Steve and the result is, I consider his unit quite superior to mine and you can buy it as a kit or parts. A good deal!

Next newsletter I'll talk about electric trim, its advantages, disadvantages and how my particular unit came about and other units on the market. Most systems in my plane would be considered non-essential options by aircraft designers and therefore, add weight and complexity. Something a builder needs to consider before installing such a unit.

Tailwinds, Vance

***Editor:** The nose of Vance's airplane is much heavier than most - I couldn't even lift it off the ground. The reason is that he mounted his main gear 1" farther aft than shown on the plans. The nose of our Mark IV weighs between 85 and 95 lbs, depending on fuel, and was not a strain for my 71 yr old back. Also, on the 3-place Cozy, we used the same NG3 & 4 as the Long EZ, and they were easy to bend. So for the Mark IV, we made the MKNG3 & 4 twice as thick as the original NG3 & 4, but Steve's new ones (HDNG3 & HDNG4) are even thicker.*

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The Copyright and Patent laws were enacted in this country (and most other countries) to encourage creativity. Creative people are encouraged to publish their work, whether a musical composition, a book, a computer program, an aircraft design, or whatever, by granting them exclusive rights to commercialize their work. We spent a number of years and a lot of money developing our Cozy designs, and they are the most valuable things we own, so we copyrighted them, which gave us the exclusive right to commercialize them. We charge \$500 for Cozy Mark IV plans and require the purchasers to sign license agreements in which they agree to build only one airplane from these plans. Part of the \$500 covers the cost of printing the plans. The remaining portion is a royalty payment for use of our copyrighted design and trademarks, Cozy and Cozy Mark IV. Our Cozy designs were derived from the Long EZ design, which was also copyrighted. We were granted a special license from the Rutan Aircraft Factory to use its copyrighted Long EZ plans and technology in our designs and have kept this license agreement in effect all of these years by paying royalties to RAF on our gross receipts, so part of the \$500 you pay for plans goes to RAF.

Violation of the copyright laws is a federal offense, and if the violation is willful, the offender can be liable for additional damages, including the reimbursement of attorney's fees. If persuasion is not sufficient, enforcement of the law requires the copyright owner to file a complaint in Federal Court. Several years ago we discovered that someone was copying our plans and advertising them for sale. We were able to persuade this person to stop without taking legal action and to refund the monies he had

received from the several people who had purchased plans from him. Please be advised that our copyrighted design cannot be used legally for any other purpose than to build one airplane, unless a special license agreement has been obtained from us and maintained in force by paying royalties.

STALLS AND OTHER CONSIDERATIONS

Stall spin accidents with conventional aircraft are said to contribute about 25% of the fatalities in general aviation. They usually occur near the ground, where there isn't sufficient altitude to recover (it usually takes 1,500' of altitude or more to recover), and the airplane crashes nose-first. They are caused by a loss of flying speed, due to a power failure on takeoff and failure to dump the nose fast enough, or trying to stretch out a glide preparatory to landing, or just pulling too many g's at low speed in a banked turn, as a turn onto final. But they can occur at higher altitudes with an aft c.g., where the aircraft can enter into an unrecoverable flat spin. Stall spin accidents in conventional aircraft are usually fatal.

One of the many advantages claimed for the canard design is its resistance to stall, if operated within its approved c.g. envelope. By resistance to stall, we are talking about the main wing, not the canard. A canard aircraft has two lifting surfaces; i.e., the canard, which provides about 20% of the lift, and doubles as the horizontal stabilizer, and the main wing, which provides the remaining 80% of the lift. It is very complicated to design a canard aircraft which behaves properly. The designer must select appropriate airfoils for both the canard and main wing, the correct spans, the correct angles of incidence, and the correct wing loading (which relates to the approved c.g. range) to make sure that the maximum angle of attack for the canard is less than the angle of attack at which the main wing will stall. The original airfoil for the canard was the GU (Glasgow University). At its maximum angle of attack, it did not stall, but just reached its maximum coefficient of lift, and would go no higher. It tended to just sit there, or else just bob a little. But it caused a trim change in rain, so builders clamored for a different canard. The Roncz airfoil was developed subsequently by John Roncz and Mike Melvill (of RAF) to overcome this objection. It has no trim change in rain, has a higher lift coefficient than the GU (which means the span must be shorter), and it is the airfoil used in the Cozy Mark IV. At its maximum angle of attack with an aft c.g., it will actually stall. The result is that the nose of the Mark IV will drop down to or slightly below the horizon before the airflow reattaches and it resumes providing lift. Since 80% of the weight of the aircraft is supported by the main wing, the aircraft does not fall out of the sky, but just picks up speed without losing much, if any altitude.

In the early days of the Varieze and Long EZ, a main wing stall was an unheard of event. A main wing stall first received publicity in the case of the Velocity. There were at least 3 occurrences, in fairly rapid succession. In each of these cases, the main wing stalled, airspeed dropped to zero (at least on the airspeed indicator), all controls were ineffective, the aircraft became locked into the stall, and the aircraft pancaked to the ground. Two splashed into the water, and the pilots were not seriously injured (if at all). The third hit land, and the pilot sustained serious, but not fatal injuries. These main wing stalls apparently occurred with airplanes which were not built exactly according to plans, or with c.g.'s which were too far aft. (I hope this is an accurate statement). To the credit of Velocity, a series of "trailer" tests were conducted on the ground, where the aircraft was pulled along the ground on a trailer at different angles of attack, and the forces measured. It was determined that the main wing could indeed be made to stall at aft c.g.'s, and redesign of the main wing was immediately undertaken. A temporary fix was to

restrict the aft c.g. limit and install wing cuffs (droop leading edges).

At or about the same time, Mike Melvill was testing the new Roncz canard airfoil on his Long EZ, starting out with extra span (like we did on the plans model Mark IV). But Mike did not have a means to move the e.g. 6 to 8 inches forward while in flight. The main wing stalled, and the stall became locked in. Mike is a very experienced test pilot, and he was able to rock his Long EZ from side to side until it finally fell off on one side. We think he said he started out above 10,000' and just barely recovered before hitting the ground. We talked to him right after it happened. He was shaken. He preceded to trim the span on his Roncz canard until he could no longer stall the main wing. Only then did he approve the Roncz canard for Long EZ builders. The next deep stall we remember was with Dave Ronneberg's Long EZ. It was reported to be heavy in the tail, but Dave was a large (and experienced) pilot. He loaned his Long EZ to a friend, who loaned it to a friend, who was very light and low time. This pilot entered into a Ribbon cutting contest at a competition fly-in at Kanab. This is where someone tosses a roll of toilet paper out of an airplane at 10,000', and another pilot sees how many times he can cut it before it falls thru 8,000'. This involves low speed, high turns. In other words, yanking the airplane around. The Long EZ became locked into a deep stall, from which the pilot was unable to recover, and pancaked into the ground. The pilot survived, but was injured. The accident was captured on video. At this point, RAF undertook a series Of "truck EZ" tests, on the ground. RAF determined that at some aft c.g., the main wing of the Long EZ could Be made to stall, but the stall would not be locked in. Extrapolating the data, they concluded that at a farther aft e.g. (probably well aft of the limit) the stall would be difficult to recover.

There was a fatal crash of a Berkut during an airshow in California. A very experienced air show pilot was demonstrating high speed, high-g, steep 360 degree turns low to the ground. The aircraft flipped and went in. It did not have lower winglets of the type used on the Long EZ and Cozy. We do not know what was finally determined to be the cause.

When we designed the 3-place Cozy, we knew that widening the fuselage would be destabilizing in pitch. The fuselage is a lifting body, and the higher the angle of attack, the more lift it produces, so it would add to the lift of the canard. We did not know how much canard span to use. We consulted with several well known aerodynamicists, including Burt Rutan, Len Niemi, and NASA. None could predict how much the canard should be shortened (as compared to the Long EZ). So we shortened the canard by 8 inches, that is, 4 inches less airfoil extending outboard of the fuselage on each side, and increased the incidence on the canard by 0.8 degree as compared to the Long EZ. The reason for increasing the incidence was to cause the canard to stall sooner, to offset the extra lift of the fuselage. This turned out to be the correct decision, and we did not have any deep stall incidences with the 3-place Cozy, with one possible exception.

The details are a little sketchy, but Chris Esselstyn, a high- time Cozy pilot told us that on one trip when he was flying solo, with presumeably an aft e.g. (he didn't say how far and we don't know), he was making an accelerated climb with full power through clouds with icing conditions, and he was trying to zoom up to the top at minimum airspeed. He picked up a load of ice on the canard and the main wing, which certainly would have affected the airfoil, and probably moved his c.g. farther aft. He felt the main wing sink and thought it might be stalling, so he dumped the nose without reducing power, let down underneath the clouds to warmer air, let the ice melt, and then climbed back through while maintaining higher airspeed.

Because of this stall background, we decided that we should conduct a thorough aft c.g. flight test

program on our plans model Cozy Mark IV before any builders had completed their projects. We hired one of the most renowned test pilots, Jim Patton, equipped our Mark IV with a 135 lb. moving weight which could move the c.g. in flight about 8 inches and well beyond the fore and an c.g. limits, we obtained a parachute, and did a very thorough weight and balance with a half a load of fuel, pilot and parachute in the airplane, and every position of the translating weight. We started the tests with a canard span greater than we had on the prototype, with the same amount of airfoil outboard of the fuselage as the Long EZ, but with 0.8 deg. more incidence than the Long EZ, and without lower winglets. To our great surprise and horror, we could stall the main wing, but were always able to fly out of it, except on one occasion, when, at my suggestion, Jim moved the c.g. way past the aft limit, and then tried a high-g, steeply banked turn. The Mark IV flipped and went out of control. Jim lost 3,500' (he started at about 12,000') before he was able to regain control. We installed wing cuffs, with no improvement, so we grounded the airplane and Jim returned to his home in Florida. We then installed lower winglets, and then tested the Mark IV ourselves. We learned that the lower winglets extended the useable c.g. range by 0.5 inches, and eliminated the wing-rock at aft c.g.'s prior to stall and any tendency to flip, but we could still get a main wing stall within the c.g. range we wanted. So then we preceded to shorten the canard span. After shortening the span 2 inches on each side, we could not get the main wing to stall within the desired c.g. range. We asked Jim Patton to return and confirm our findings. He did, but insisted that we trim the canard 1 more inch on each side as an additional safety factors for builders, which we did. After these mods, we were not able to stall the main wing even 1.2 inches aft of our aft c. g. limit. We were also able to rotate for take off and flare for landing with the 135 lb. weight all the way forward, which represented a c.g. of more than 400 lbs. in the front seat. We should mention that we never tried to zoom the airplane with full power until it stalled, and then cut power. We considered this to be a recipe for disaster. What we did was to establish level flight with power, gradually reduce the power and pull back on the stick until the aircraft reached an angle of attack of about 14 degrees and minimum airspeed of 60 knots at forward c.g., and 50 knots at aft c.g. Before the modifications, if we held it nose high at aft c.g. and 50 knots for any length of time, there would be a pitch-up (caused by the main wing dropping), and the airspeed would head toward zero, which indicated to us that the main wing was starting to stall. We would release back stick pressure, the nose would drop, and the airspeed would pick up again without losing any significant altitude. Once Jim let the airspeed drop all the way to zero but recovered without having to move the weight forward. There was probably still enough forward speed, even though the airspeed indicator indicated zero, for the elevators to be effective in dropping the nose. We thought at the time that this indicated the nose would drop by itself and the airplane would not get "locked in" to a stall. Of course, as we said before, after the modifications, we were not able to get a main wing stall with the c.g. as far aft as 103.2, which is 1.2 inches aft of the limit we have set for our builders. All of these tests were duly recorded on video by a camera mounted in the cockpit which recorded all of the flight instruments, the angle of attack, and the horizon. We were quite pleased that we had solved an unexpected problem, and quite sure we had an airplane which would not stall, if built according to plans and operated within the approved c.g. limits.

Jim Patton submitted a technical article for publication in Sport Aviation about these tests, and we have received many compliments on our flight testing, which we were told was more thorough than for any other design. We were the only ones to ever have documented the function of lower winglets. Of course, we now know that if a 4-place canard airplane is not built according to Cozy Mark IV plans, and not operated within the approved c.g. range, the main wing can stall, and if recovery is not effected quickly enough, the stall will become locked in with disastrous results for the pilot and aircraft.

One of the results of our flight test program was the realization that canard span involves more than the amount of area of the canard. The main wing does not fly in undisturbed air. It flies in the down-wash of the canard. There is a corresponding up-wash outboard of the canard tips. Reducing the canard span by

a very small amount had a huge affect on the lift generated by the main wing. We do not know whether this was due to a stronger vortex off the canard tip, or just more of the main wing exposed up-wash air. We were impressed that rather minor changes in a canard design can have huge, unexpected results.

Now, we have been criticized by some for repeatedly saying that first-time builders should not make design changes unless they wish to become a test pilot of an untested design. Few realize what that entails, what experience it would require, and what preparations and precautions would have to be employed. And most would not go to the trouble to take the necessary precautions. We believe the recent stall accident can underscore the point we are trying to make.

After this accident, but before we had the opportunity to investigate, we spent much time and thought trying to think of all of the possible factors which could have contributed to a deep stall. Of course, a c. g. that was too far aft, the wrong angles of incidence on the canard and main wing, and vortilons removed from the main wing were suspected factors. Incidentally, vortilons on the main wing are mandatory, because they were determined by Burt Rutan to reduce the possibility of a main wing stall by interrupting spanwise airflow at high angles of attack, and therefore increasing the lift on the main wing and preventing premature stall. Of course, lower winglets are important, as well as the proper canard span. Also, any change in dimensions or shape of the fuselage could also be a factor, such as a wider fuselage in the front or back, or a longer fuselage, because the fuselage is a lifting body. Even things like a retractable landing gear, particularly one with a lot of drag when extended, would cause a pitch-down moment when extended (just what you don't need for landing), and a pitch-up moment when retracted (just what you don't need on climb out). You might think we are stretching, but it was a real education for us to be able to measure the affect of very small changes on main wing stall resistance, and unless one tests all of these things before and after in a flying airplane, they should be suspect. A properly designed canard aircraft can be a wonderful thing, but it sure doesn't take much of a change to screw it up. The average builder/pilot is just not qualified to professionally test changes to a canard design, particularly if he doesn't have a reference point, like knowing how it should fly if built according to plans. This is why we published in the last newsletter where the point of neutral stability should be (it should be well aft of the aft c.g. limit, and any c.g. forward of that should have positive stability in pitch, that is, if you take your hand off the stick, the airplane should return to the attitude at which it was trimmed), and also pointed out the importance of checking the position of the elevators at various forward c.g.'s and speeds. The purpose was to allow builders to determine that their airplanes were properly rigged before opening up the flight envelope into the aft c.g. region. It is not just enough to fly your airplane around for the first 40 hours. You should use this test period to thoroughly test your airplane throughout any set of conditions you will ever operate it in the future. And if you have made **ANY DESIGN CHANGES** involving structure or shape, the performance specifications we have determined and published in our Owners Manual **DO NOT APPLY**. We hope this helps to explain why we are unwilling to approve design changes if we have not thoroughly flight tested them ourselves. If you are considering any design changes, please consult with us first.

We think the Cozy builders forum on internet is a good idea for Cozy builders and wannabe builders to share their building and flying experiences with other builders, but it is a **BAD** place to seek advice on design changes or changes in building technique from other first-time builders. Those are questions which should be directed to the designer. Just a small deviation from recommended building technique is said to have caused the crash and death of a famous designer/builder/pilot Steve Wittman and his wife.

We would also urge builders, when they do their weight and balance, to obtain the assistance of an EAA Flight Advisor, or an EAA Technical Counselor, or some other experienced builder, to help with the

weighing and measurements, and to double check the c.g. calculations. The accurate determination of c. g. is very important. Errors in weighing and calculating are all too common, and can sometimes be contributing factors to accidents.

ENGINES & PROPS

Cozy builders Ed Nielander and Lee Merlo and I attended the large, annual auction of airplanes and aircraft parts at Falcon Field Feb. 21 - 23. We were interested in whether we could pick up any engines for builders. There were some run-out O-235s and O-320s which went pretty cheap. There was a new O-360 without cylinders, pistons and accessories which went for \$5,500, and a new O-360 with all accessories which went for \$15,500. We stopped bidding on both of these when it looked like the price was going to go too high.

Duane Swing of Velocity aircraft passed along some interesting information to us on their work with the Franklin engine. They noticed the same thing we did, namely that with a fixed pitch propeller, the Franklin doesn't give any more static rpm than the 180 hp Lycoming. So they installed an Ivo cockpit-adjustable propeller on their Franklin engine, and he said it makes a world of difference in take-off and climb performance. By setting the prop at low pitch, they could generate the full rated power of the Franklin. We were aware that Ivo was designing for higher horsepower, but this is the first information we have received on a 200 hp pusher installation. Ivo encourages its installation on the Franklin, because it is very smooth running, and also the O-360 Lycoming, with a slight reservation, but thinks the 200 hp IO-360 is a little too harsh. The Ivo prop, priced at \$1900, is much less expensive than the MT and Hoffman constant speed props, and competitive in price with the 3-blade, fixed pitch Performance prop. If the Ivo prop proves to be reliable, it could be combined with the 160 hp O-320 Lycoming to make an excellent power package for the Cozy Mark IV. Tim Merrill has an O-320 Lycoming and Hoffman prop on his Cozy Mark IV, and even though his airplane is on the heavy side, gets better take-off and climb performance than we do with an O-360 and fixed pitch prop. O-320 Lycomings are more readily available than the O-360, and the prices are lower. We are excited about this possibility and have placed an order for an Ivo prop to evaluate on our Franklin.

PUBLICITY

We haven't noticed any Cozy pictures in Sport Aviation or Kitplanes recently. If we have missed anyone, please let us know.

FIRST FLIGHTS

We received two reports of first flights since our last newsletter.

Dear Nat,

This report is rather late, but I have been very busy. After ten years of work, Cozy #263 finally flew on 6/11/96. Empty weight is 1087 lbs. with c.g. of 110.5, minimum front seat weight is 230 lbs. and maximum is 360 lbs. I made the following changes to the original plans:

1. Used Lyc O-360-A3A engine, with a 3-blade 63x78 Performance prop.
2. Engine mount 1.75" shorter puts engine as close to firewall as possible. A modified Cessna 152 mount worked great.
3. I used steel angle engine mount extrusions.
4. I increased plies of spar caps and shear web of centersection spar by 15% for greater strength due to heavier engine.
5. I moved front seatback and instrument panel 1" forward.
6. I increased length of NG50 and NG1-L strut for greater nose gear extension. I now have a good positive angle of incidence with gear down.
7. I used the R1145 canard according to Long EZ plans, span 144" and increased incidence 1 deg. I could not get main wing to stall.
8. I added a bubble to bottom cowl to accommodate conventional type carb heat box with separate air inlet.
9. I increased the canopy height; I'm 6' 2" tall.

I'm very pleased with the performance and handling qualities of the aircraft. I have about 75 hours on the aircraft now.

Sincerely,
Al Aldinger
Lancaster TX

Dear Nat, 1/12/97

It is my privilege to inform you that my Cozy Mark IV #173 is flying. I cut the first piece of foam on 10/15/92 and flew 1/12/97. The empty weight came in at 1063 lbs. with a Lyc. O-320, Ellison TBI, & Performance 68 x 68 prop.

The last few times I have driven to the airport I weighed the odds of flying but refused to commit till all the conditions were in my favor. A lot of the resident pilots were beginning to wonder why I hadn't already flown.

The temperature was in the single digits today so I removed the lower cowling and preheated the engine for a couple of hours. I used the time to go over the plane in preparation to, at least, do some more taxi testing. After six runs down the runway raising the nose each time, I began to seriously consider flying. It just felt like it was time. The engine was running great, the wind was favorable and the bright sunshine made the frigid day bearable. To top it off there was a nice little rainbow on the horizon. The FBO called my Long EZ builder and ground support David. He managed to round up a video camera for

the occasion. I made one more pass down the runway at 60 mph and liked the nose for a final sight picture. Lining up on 23 and bringing the power up I hesitated releasing the brakes to savor the moment. N141MD accelerated and promptly lifted to twenty feet. I don't have the exact distance from release to lift off, but it was amazingly short. David later told me that I was off well before the Piper that preceded me. While in ground effect, I did the customary pitch up, down and then remembered to get my heavy hand off the stick and use the fingertips. She settled down to a healthy rate of climb and behaved nicely thereafter. I climbed out and turned to stay in close. The little Lycoming O-320 seemed to be providing ample power and I soon leveled out and reduced throttle, holding the speed down to 40 mph. Staying in gliding range, I checked out the controls and climbed on up to 5280 MSL. The field elevation here is 740. The one mile altitude mark was unplanned but I thought it was a landmark altitude for the occasion. After a practice landing sequence at altitude, I verified that it would behave with the belly brake down, idle power and 70 mph. My practice approach to the runway was acceptable so I went back up to pattern altitude and made another pass at it anticipating a go-around. When I brought her back around to final and set up the landing, I was pleased with the approach so decided it was worth at least a kiss on the runway. To my amazement the first landing was as perfect as I could have asked for. I could have turned off at the first intersection, but the ground crew and video camera were at mid field so I just let her roll out and turned off at the 2200 foot intersection. Only those of us who have built and flown our planes can truly understand the satisfaction I was savoring at that moment!

Now the work begins. The nose up pitch trim needs a bit more authority. There evidently was some melted ice in the right rudder cable path because it froze again and required left rudder to compensate. The elevator was in perfect trail while cruising around the patch. I was granted a quite large practice area; thanks to the DAR. It might be worth mentioning that the DAR went over the Cozy thoroughly. Prior to today I had logged 600 hrs in 2024T3 airplanes and a couple of hours in the back seat of Sam Chamber's Long EZ. The Cozy is much smoother and stable than any factory plane I have strapped on. My successful first flight is proof again that the Cozy is a great design. I feel like I am getting my money's worth having built this airplane.

Regards,
Mike Davis
Leitchfield KY

EPOXY RESINS

A number of builders have caned us and reported that they have been using Epolite 2427 epoxy without experiencing any peel strength problems. It is a mystery why others have, but we think it was a good precautionary move to take 2427 off the approved list (see the last newsletter for approved epoxies).

Our international builders have discovered that Wicks and Aircraft Spruce will not (can not?) ship epoxy resins by air, and surface shipments can take several months. Uli Walter, of Cosy Europe, in Germany has approved several epoxies which are manufactured in Europe. He can be reached on Tel: (49) 8233-60594 or Fax: (49) 8233 20150.

SUN 'n FUN

Sun 'n Fun is scheduled this year at Lakeland FL from April 5th to the 11th. We have reserved a display area for our Cozy Mark IV across the taxi-way from the FAA building again this year and welcome all builders and wannabe builders to stop in to see us. We can pass on any late-breaking news. We will be flying the Franklin there and hope the weather cooperates, because it is a long trip for us.

Cozy builder Bill Walsh has again arranged for a Cozy banquet at the Red Barn at 6:30 PM Sunday April 6th. They have fantastic steaks! Bill would appreciate you're calling him on (407) 695-3543 if you plan to attend, so he can arrange for a private room. He will have COZY hats and shirts, for those who wish to buy the same. Also, he would like to have other Cozy suppliers like Wayne Lanza, bring his panel, electric actuator, and other products, Alex Strong his pitch trim, Steve Wright his electric nose lift, Curtis Smith his ratchet, etc. Anyone who needs a ride should stop by our display during the airshow. We will need to leave before the airshow is over to avoid the huge traffic jam.

Bill would also like to have the names of any and all Cozy builders who have won awards at any airshows or fly-ins. He is going to have shirts made with the names of all award winners.

CANARD AIRCRAFT GATHERING

The 7th national Gathering for Canard Type Airplanes will be held June 13-15 at Butler Memorial (BUM), Butler MO. Social, & flying events, races, & contests. Contact Tom Jordan, 401 Havana, Butler MO 64730, (816) 679-3328.

ARLINGTON & OSHKOSH '97

We plan to attend both Arlington and Oshkosh again this year, with a stop off in Minnesota in between. This is an important year for us, not only because it will be our 25th year at Oshkosh, but because we will be celebrating our 50th WEDDING ANNIVERSARY! We will be celebrating with our kids and grandkids during our stop off in Minnesota.

At Oshkosh, we will again be exhibiting our Cozy Mark IV in the exhibit area at the south entrance to the North Exhibition Building, just outside of the Aircraft Spruce location. We have also scheduled a Cozy Builders Forum for Friday, August 1, 1:00 PM in Tent #3. We would like to meet as many builders as possible, should have more news to report then, and will be happy to field any questions.

There will also be a Cozy banquet at Oshkosh, which is always well attended. More news on this in our next newsletter.

MARK IV CHANGES/CORRECTIONS

COZY BUILDERS HOSPITALITY LIST

Barbara Pershing publishes a Cozy Builders Hospitality List. This is a list of Cozy people who are willing to extend their hospitality to other traveling Cozy people. The list is not to be used for commercial purposes. If you wish be on this list and to receive the most recent edition, please send any special comments and \$2.00 (to cover printing and mailing costs) to Barbara Pershing, 8134 Buckridge Rd., Cedar Falls, IA 50613.

FOR SALE

1. Cozy builder, Bill Walsh, has arranged a source of tee shirts (sweatshirts available on request) which come in various colors but only adult sizes. They have a detailed 'picture of the Cozy or Cozy Mk IV. The Cozy name is printed above. Bill is also working on other Cozy items, such jackets, caps, pins, and cups. The shirts are available at \$9.95 plus \$1.50 shipping and handling. Orders for 2 or more are sent 2-day priority Make checks out to Linda Walsh, PO Box 160884, Altamonte Springs FL 32716. (407) 695-3543.
2. Wayne Lanza makes a number of very nice goodies for the 3 and 4-place Cozys. He has an electric speed brake actuator kit with all the parts needed for installation, with instructions for \$275. His latest creation is a switching and breaker panel for the Mark IV. It is similar, but not identical to the one we had made for our plans model. It is located at the top of the panel, which is the best location for appearance and access to the electrical system. Wayne is using the highest quality DC switches (They are hard to locate) and circuit breakers, and pre-wires the panels, making the rest of the electrical system installation very EZ. Cost is \$425. We really appreciate Wayne's contribution, and heartily recommend his products to you. Contact him at: 9425 Honeysuckle Dr., Sebastian, FL 32976 (561)664-9239.
3. We believe that the 4-pipe stainless steel exhaust system we designed and is being manufactured by Custom Aircraft Parts (see Authorized Suppliers.) is far superior to anything else available or advertised for the 3 and 4 place Cozy (or Long EZ, or any other pusher, for that matter). Cost is \$500, which includes shipping and handling.
4. New, improved fuel sight gauges. Clear bubble with white background. \$35 per set. Vance Atkinson, 3604 Willomet Ct., Bedford, TX 76021-2431 (817) 354-8064.
5. Dr. Curtis Smith's nose gear ratchet (which we recommend) is now priced at \$40. Dr. Smith's

new address is 1846 Sextant Drive, Warden, IL 62907-9631 (618) 656-8209.

6. Steve Wright is making electric nose-lifts for the Cozy III and Cozy Mark IV aircraft. It has been up dated with improvements suggested by Vance Atkinson and by ourselves as a result of our recent installation. It will raise the nose with full fuel and baggage and at least one person sitting in the front seat. Check with Steve on (615) 373-8764 for most recent pricing.
7. Cozy builder Alex Strong is making a neat electric trim system for \$175 which we are currently evaluating. You can reach Alex on (619) 254-3692.
8. B & C, in addition to their light weight starters, alternators and linear regulators, has just introduced a neat right- angle spin-on oil filter adaptor for Lycoming engines. We ordered one ourselves for our Lycoming, and it looks like a work of art. Contact Bill Bainbridge on (316) 283-8662.
9. Our authorized supplier, whose parts we have tested and approved, has the following Mark IV parts available:

Main landing gear (S-glass)	\$574
Nose gear strut (S-glass)	68
Top and bottom cowlings set	420
Wheel pants set	210
Turtleback	364
Fast-build wing & winglet cores	1199
Fast-build canard core	200
Nose wheel cover	34
Nose strut cover	23
Sump blisters ea.	24
NG30 cover	23
Nose cone with ballast door	75
Strake leading edges, right & left	420
Strake bulkheads, right & left	199
Arm rest kit, front & rear	225
Rear keel & landing brake covers	54
Small parts kit (save \$27 over individual prices)	380
Carb heat and air box kit	165
Baggage pod set (2)	395
Rubber nose bumper	10
Propellors with urethane leading edge	650

LETTERS FROM BUILDERS

Dear Nat,

I've started entering markups in the plans and the owners manual, and I must say, these Mark IV plans are the best I've seen anywhere. Looks like anyone who can read, and follow directions just can't go wrong. I've noticed a couple of items that haven't been mentioned in the newsletters...(see "Corrections"). Thinking ahead, and noticing Vance Atkinson's fuel gage assembly, I stared wondering if anyone has used the old Navy boiler water gage idea, of diagonal stripes behind the tube. With water, at least, the stripes get bent the other way below the fluid level, making it easy to see the level at a glance. I haven't tried this out yet with the lawnmower gas, but the thought won't go away that I've seen this same technique in airplanes; maybe the flight engineer station on the PBY? Just rumination. After I do a trial run, I'll report if it appears worthwhile.

I understand your reasons for wanting to put your Lycoming back in, but I sure did like the Franklin in a Stinson 108-3.

Samuel Walker
Coronado CA

Dear Nat, 3/7/97

Thanks for your quick reply to my plea for help. I was frustrated in not being able to get the cloth to lay in the joggle formed for the landing gear cover. You were right, of course. I sanded the sharp edges back further and the problem was solved. We did the fuselage bottom layup last weekend and it turned out fine.

I've also built a rotisserie based on a photo from another builder in the newsletter. That is a real timesaver in flipping the fuselage from one side to another. Thanks again for your timely help.

J.T. McLean
Baton Rouge LA

1/6/97
Dear Nat & Shirley,

HAPPY NEW YEAR FOR ALL COZY PEOPLE!

Guess what? I collided with what I supposed to be a sea gull in flight last September, 1500' over Mimizan Beach. Sully I saw something whitish on the right root of my canard followed by a noise like "WLLOOOOFF", nothing more. I was scared to death, but tried to check instruments and controls as the engine was still purring like a cat, and FMP flying as usual. I thought: Back to the airport anyway, a 10 mitt flight. It was sufficient to see the oil temp climbing gently to 200 deg F when I usually read 180 deg or slightly less. After a normal landing at LFCZ, the oil reached 230 deg F when I quit the engine.

I checked the canard root. Blood on it, nothing more. Then I checked the NACA scoop of the oil cooler (a la Vance Atkinson) The lip was broken about 1" with a mix of blood and debris embedded in it. We removed the upper cowling to check the cooler and hose. I removed a wisp of feathers and about 1" of the end of one wing of the bird. The oil cooler was not damaged. I checked the prop and found on one blade two areas without paint as large as a finger nail, and blood. The fiberglass protection was not damaged.

I felt very lucky. In a few day FMP was airworthy again. My conclusion is, beware of the birds, and don't fly where and when you know there are a lot of them. Colliding with one of them could be more serious than what I had.

I remember when I was with the French Airforce colliding with a bird in a C47 over Quimper, French Brittany at 10,000' at night. Big noise at collision time. We landed right away at Lorient Navy base and discovered a gull entirely embedded in the leading edge of the right Wing, near the landing lights. One more info, Nat. I used to fly FMP with a 6" prop extension and a ACS prop cone, same as the one you had on N22CZ. After reading CSA news, I made a little one. With the smaller cone, I can check the safety wires, save .9 kg of weight, and my engine (O-235 with conical mount) runs smoother (less vibration noticed at the tip of the canard, or with my teeth when my mouth is slightly open, which is a very good sensor!). It isn't so pretty, but may be more efficient during take off, who knows?

Marc Pichot,
Mimizan France

Dear Nat,

Please send me an owners manual. I'm the type of person that really likes to read ahead. I studied the plans for about 4 months before buying my first Fiberglas and resin. I hope to put the fuselage bottom on this weekend. One part really amazes me about the assembly process. When built with care, all of the parts actually fit!

My project is moving along only slightly slower than I anticipated. Its more a function of the time I have to dedicate than anything else. The plans and design are of the highest caliber. I hope to be flying within two years. Thanks for a great design!

John Stagl
Pittsburg, CA

12/3/96
Dear Nat,

After at least 20 years of indecision during which time I have followed your developments through the press, magazines and EAA, I finally am making the committment to build a plane. I actually purchased plans for the original Cozy from Byron Dees (#19) in 1990, but never did anything with them. They still sit in the box he sent them in. The concept of a 4 seater is much more appealing. I look forward to the challenge of this project and hope I finish it before I'm too old to fly. I took the Composites Workshop in Hampton, NH this summer. In my class of eleven, five said that they planned to build Cozys!

Alexander Hadden
Woodstock, VT

12/1/96
Dear Nat,

Ten years, and still building 3-place Coy #281. I expect to be finished in about another two years. I have

just finished section I and am about to begin the firewall chapter. I have built just about everything myself, with almost no prefab parts-which brings me to the cowling. How many plies, and what is the recommended lay-up schedule? I do not have an altimeter yet, and so for leak checking the fuel tanks, I made a home-built manometer. 17" of water (actually, I used grape juice) to about 1500' altitude. Total cost for materials was less than \$2.00. And yes, neither tank leaked.

Dennis Buder
Houston TX

12/27/96
Dear Nat,

I really enjoy the newsletter, have thoroughly enjoyed the building experience and hadn't realized a year had passed since I ordered plans. I just completed chapter 7 and can now climb inside the fuselage with my 4 year old daughter and pretend to fly planes. Thanks for your continued support.

Rob Atencio
New Bern, NC

Dear Nat,

Hope this letter finds you both healthy and in good spirits. Work on Cozy MK IV #295 is in its 22nd month and I'm following your plans to the letter. As a mechanical engineer, I see no need to change anything in the plans. But I am guilty of adding an electric nose lift. The electric landing brake I don't feel too bad about. Neither one changes the design per se. I'm finishing up the canopy and it doesn't look like a boat anymore. The canopy chapter went well, but it was a little sketchy when it came to installing the foam seal. Another builder suggested leaving a small gap for the seal, wishing that he had done so. I left a few layers of duct tape on the longerons for this gap. Was this a good idea? (**Editor: Yes!**)

I ordered an O-360 from Dan Brown back in March of 1996. I have yet to receive the engine. Dan is having a difficult time procuring a narrow deck crankcase for the engine. He says that parts are getting scarce and prices for what is left out there are skyrocketing. Could you put a note in your newsletter asking our members for help locating an O-360 narrow deck crankcase?

I've gone through many different epoxies and I like Hexcel's 2427 very much. Builders are complaining about its peel strength, but I've noticed that peel strength is proportional to the amount of resin in the layup. My layups are light where it doesn't really matter, but are heavy where parts butt and join together. I will change as requested, but I'm not sure which epoxy to use for the strakes/fuel tanks. Should I go with EZ Pox? (**Editor: Either EZ Pox or the RAF system are olfy**).

John Vermeylen
Lanoka Harbor NJ

3/7/97
Dear Nat & Shirley,

Thought I'd bring you up to date on my progress. Last Saturday I mated the second wing to the spar and

drilled it. It was quite a sight to see the full wing span for the first time. I'll be installing the bushings this weekend so the spar will be ready to go into the fuselage.

The fuselage is progressing nicely. I've taken advantage of the cooler months to fill and sand the bottom as much as I can. I did the same with the canard and the wings. The nose was a good challenge and it came out great.

I have the turtleback and the windows so that's my next step. I expect to have everything completed forward of the firewall except for the canopy this year. I'm also hoping to get the engine mounted and start with the cowling. Hope things are going well. Take care.

Paul Stowitts
Baldwin Park CA

12/13/96
Dear Mr. Puffer

I look forward to more information on the fine airplane you've developed. Special thanks to Marc Zeitlin for his internet web page. I've learned so much about the Cozy Mark IV just from this source alone.

I've been researching what 4-place would best suit the needs of my family and feel very strongly, the MKIV is it. With all the new designs hitting the market, yours still seems to be the best performing, least expensive, and most importantly, proven model out there. Thanks to Burt Rutan's design philosophy and your development, you've produced an everyman's winner! Keep up the good work!

Joseph Magdaleno
Stanton, CA

2/28/97
Dear Builders,

I went to Arizona to visit Nat Puffer to see, first hand, what the Franklin engine installation looked like. It looks big compared to the pristine installation of the O-360 Lycoming. The Franklin engine sits a little bit higher in relation to where the Lycoming was positioned but Nat put larger blisters on the top of the cowl that made it look very good. The lines are clean. We went flying. I was impressed by the engines' performance. It was about 60 deg ambient, the performance was crisp, the engine is indeed a smooth running machine. We were tooling around over Lake Roosevelt at about 6,000' doing 160 mph on about 60% power. This was my first Cozy flight so I am not able to make a comparison to a Lycoming. However, I was impressed with the flight, the aircraft in general and the warm hospitality of the host.

I have been retired for a month now and have been making real progress since 2/1/97, but now I really can't wait to get my bird in the air. I felt as though I were sitting in the nose cone of a missile, perfect visibility and power to spare. It was an exhilarating experience, I highly recommend it. So I had better get back to building.

Don Ponciroli

Ledyard, CT

12/25/96

Nat & Shirley

We hope you are both well. We are all doing well concentrating all our energy into finishing the airplane. Nadine got her pilot's license back in April and we both try to fly at least once a month to keep current.

The plane is moving along nicely, never as fast as we would like. We moved it out to a hangar at the local airport last June. We've finished up most of the fuselage and canard and have started on the wings. If all goes well we should have it in the air sometime in 1997. We've started buying the instruments and are now searching for an engine (if any of you know of a Lyc O-360 for sale).

Marc Parmelee
Novato, CA

5/22/96

Dear Rex & Barbara,

Please send this on for the newsletter. We are an American family living in Holland, where all the flowers are. We would like to be included on your list of Cozy builders.

My husband Keith is finally able to realize his dream of building an airplane after 20 years of dreaming. He retired from the Air Force after 20 years 3-1/2 years ago. Of course now we are sent overseas with a civilian company.

Keith received his Coy Mark IV plans in October of '95 & he was like a little kid on his first Christmas morning. He kept touching the plans to see if they were real. Now the problem was having a garage to build it. Holland homes are very small so we had to move for the garage. We now have a big American style home with a huge garage (a rarity). Since we've moved he's been cleaning it out every weekend to "get ready". We had a house warming party a few weeks ago and when all the guys and a few women heard he was building an airplane in the garage, they all ran out to the garage. Only the airplane is still in boxes waiting to be unveiled. They all stood around the 2 huge boxes and talked about airplanes. What fun to watch Keith be so thrilled. For a man who was working 16 hour days, he's now home to play in the garage. I couldn't get him home, but the plane will. It's okay with me, I know where he is!! Maybe one day he can fly it out of here.

We would like to extend an invitation to any Cozy builder who would like to see Europe to come our way. Free Room & Board. Amsterdam is 10 minutes away & Paris is only 5 hours by car. Might as well see Europe while the "hotel" is free. Fly yourself or however you get here, anyone is welcome. Of course, you do have to talk COZY in the garage. Take care & hope to see you soon!

Keith & Kelly Barr
Kerkhoflaan 110, 1161 JE Zwanenburg
The Netherlands, 011-31-204974952
Dear Mr. & Mrs. Puffer

Thank you Mrs. Puffer for taking the time to talk to me on the phone about your husband's fantastic aircraft design. I saw one of your designs on a TV show cad "First Flights" with Neil Armstrong and it has inspired me to learn how to fly, so I could be able to fly a COZY. I've already had two ultralight lessons. Someday I hope I can achieve my goal to fly a COZY. Until then, thank you for opening up a new experience to my life.

Sincerely,
William C. Brown

Editor: It's letters like this that mad it all seem worthwhile.

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