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# COZY NEWSLETTER #35

## October, 1991

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### WHAT WE HAVE BEEN DOING

Shortly after publishing the last newsletter, we were able to obtain a copy of the August Kitplanes magazine featuring the Mark IV Cozy on the cover and the nice article by Don Downie. We had reprints printed to complete our information kit. After the magazine hit the newstands and our advertising started, interest in the Mark IV has been brisk. We are pleased to report that we now have 80 sets of plans out.

The prototype Mark IV now resides in Oregon, and we are reduced to a single airplane, the 3-place prototype. Ken Murphy returned to the US on vacation from Saudi Arabia in June and stopped here first to pick up the Mark IV. He stayed with us a few days while we did a thorough annual inspection and he refreshed his check out. Then we all flew together (Shirley and I in the 3 place) to Bullhead City to spend an enjoyable day in Laughlin NV, whereupon he continued on by himself to Oregon, to his family and new house. Before returning to Saudi he forayed up into Canada, putting 50 hours on the airplane and having some interesting experiences in the process.

A couple of days after Ken's departure, we got a call from Vance Atkinson, asking if he, Lynn, and Cory could stop here on their way back to Dallas. He was anxious to show us his new paint job and all the

other mods he made, including his new, shorter, and rounded nose. We said, "of course", cause we were anxious to see them. The paint job was spectacular, to say the least (He won 'Best Exterior' at Kansas City), and the nose was very beautiful, almost exactly like what we show in the plans for the Mark IV.

Vance built a ballast tank in the nose which he could fill with water anywhere (except in the desert), relocated his oil cooler (yes, again), installed an anti-collision light, and removed the lower winglets. Vance noticed a change in trim and elevator position after making these changes, which he attributed to changing the shape of the nose, however it could also have been due to removing the lower winglets. This is troubling and something we need to find an answer to before approving this change.

In July we completed the new turtleback and started work on the center section spar. The new canopy (slightly larger than the 3 place and requiring completely new tooling) arrived, was a perfect fit on the turtleback, so we set up all of the parts which were completed to date, except for the wings (which were at the airport), in the driveway, seated Shirley in the fuselage, and took pictures to show at Oshkosh. At Oshkosh, we talked to Jeff Rogers about larger rear windows, and he agreed to make a trial set.

After Oshkosh, the new windows arrived and they were a perfect fit, so we were able to ship the turtleback off to Feather Lite, together with the nose cone plug (made by Mark IV builder Lon Cooper). We are excited about the nose cone. Making a prefab nose cone available to builders will make it much easier for them to shape the nose and provide more consistency between airplanes. Feather Lite is going to mold a relief for a door, plus the door, to make construction of a ballast compartment in the nose very simple.

We took some vacation after Oshkosh to visit our kids, friends, and relatives, and it took another week or so to catch up on mail, so finally near the end of August we got back to work on the plans model. We are grateful to Cozy builder Doug Hoffman, who came down to visit us for 2 weeks in September and to help. The status as of this writing is that the center section spar is complete, wings have been jigged to the center spar, winglets installed, and rudders installed. The canard is complete and fitted to the fuselage, and we have started construction of the nose. The sticks and torque tubes and landing brake actuating mechanism have been installed in the fuselage, as well as the landing light and thigh supports. Arm rests and a couple of other parts have been fabricated and will be sent off to Feather Lite to make molds for pre-fabbing.

We have designed a super 4-pipe exhaust system with slip joints and an extra large heat muff for either cabin or carb heat. It was designed with minimum bends and welds for minimum cost. We are waiting for the first example to be built so we can evaluate it and put it in production.

We are still being held up for lack of parts from Brock, and haven't been able to install either the main or nose gear. Brock says he is making progress and promises that all parts will be complete and in stock soon.

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## OSHKOSH '91

As in years before, my sister, Lee Parlee, came down to Mesa on July 15th to answer the phone, answer the mail, and take care of our Lhasa, Shu Shu, while we went north. We visited for a day, and then left in the 3-place early on the 17th. We straight-lined it, over the Rockies to McCook N-E, where we

stopped to stretch and take on fuel. Then on to So. St. Paul. Total flight time was about 7.5 hours. We hangared with a friend from 3M, Jim Casey, and called Shirley's sister, Janet, to come and pick us up in our '81 Citation, which we keep stashed in her garage. What followed was a round of visits with Janet, daughter Kimberly and family in Gem Lake, son Duncan and fiancée in Burnsville, son Charles and family in New Prague, and son Matthew and family in Rochester, and friends. Then off to Oshkosh on Tues., July 23rd. The 1.5 hr. flight was uneventful. When we arrived, there were few other display airplanes, so we staked out a row for Cozys near the Custom Built headquarters.

Cris Esselstyn, Cozy builder from Pewaukee WI dropped off a bundle of beautifully carved mahogany stakes and rope, and Steve Russell, Cozy builder from Rockford IL brought some street signs "Cozy Lane" to erect. Eventually we were proud to have a II cozys parked at Oshkosh. This was just over 20 % of all the Cozys flying world-wide. All of the Cozys were so nice, it was hard to pick one that was best. Jeff Russell's was awarded Champion Plans Built, and Cris Esselstyn's was awarded Best Workmanship Plans Built. We feel honored to be among such select company.

We camped, as usual, in Paul's Woods. Cozy builder Armando Vargas, from Puerto Rico, wife and son had the popup alongside of us, and Cozy builders Steve Russell, and Jim Turk and friend tented alongside, as well as Varieze builder and long time friend Bob Woodall and family. Cars are hard to rent in Oshkosh, so we bought a used one for \$ 100 down, but returned it after a week and forfeited our down payment.

Our banquet on Friday night was a smashing success. A year ago we reserved for 25, and 29 attended. This year we reserved for 50, and 59 attended. Next year we reserved for 60; hope that's enough!.

The forum on Sunday was well attended. We brought everyone up to date on Cozy news. Vance filled people in on all of his mods, and Jacque Genest and Merle Musson talked about their different approaches on auto engine installations. Canadian Cozy builder Walter Gamble presented us with a framed letter from Canadian Worthiness Director A. J. Alexander saying that the Cozy Mark IV aircraft meets Canadian requirements and may be built and licensed in Canada. provided that it is built totally in conformity with the designer's plans and instructions, using only specified materials. Cozy builder [Ron McGrath](#) then showed everyone sections of a counterfeit canard he had purchased from a custom shop which had been represented to be a Cozy canard.

We didn't do much shopping, but did pick up a used oil cooler for \$75. There was a lot going on at Oshkosh, which we will leave up to the aviation magazines to report.

We put a gravity door in the top of our cowl to cool the accessory case after engine shut down so we don't cook the mags, but neglected to cover it during the day and a half rain. When we were ready to leave on Wednesday morning, the engine wouldn't fire and we exhausted the battery. We called maintenance and they said they knew what was wrong. They gave us a heat gun to hold on the mags to dry them out, and sure enough, we started with no further problem. We crossed a front on the way back to Minn., but it was nothing more than a change in the cloud pattern. However, that same front got stuck in an east west direction across the midwest and a week later it was blocking our path when we wanted to fly south. When it finally looked like we could get through VFR, we headed south. The weather got really bad in Nebraska. We were scud running about 500 above ground and called ahead to Grand Island. They said they were IFR and we couldn't land, so we detoured to Kearney, about 40 miles to the west. Quite suddenly we broke out into clear sky and bright sunshine. Never saw anything like it before.

After refueling, we headed for Albuquerque NM, to visit Shirley's other sister. As we approached the mountains in mid afternoon, the build-ups were spectacular, and we had to dodge rain showers and lightning strikes. We landed at Double Eagle and got picked up. After an enjoyable evening, we departed for Mesa in the morning. The local traffic at Double Eagle was departing down wind, to avoid taxiing a mile to the other end of the runway. Against my better judgement, I followed suit. Down wind and over gross at 6000 ft elevation with only 118 hp made for an interesting take off, to say the least. The rest of the trip was uneventful, and another Oshkosh was history!.

## BEWARE!

Canada requires that experimental aircraft be built exactly according to plans using only specified materials. The FAA in the US allows a little more freedom, but requires that you list in the log book any deviation from plans. What is not allowed is to say that something was built according to plans when it was not.

In a previous newsletter, we commented that it was virtually impossible in looking at a finished part to tell if it was built correctly. Now, thanks to Cozy builder [Ron McGrath](#), we have a good (bad?) example.

Ron ordered a complete Cozy canard, including elevators, from Quality Aircraft Components (now Fitzgerald Composites). When it arrived, it was about 15 lbs. overweight (a complete canard should weigh about 29 lbs.) and the elevators did not operate freely, so he decided not to use it. When we learned about this, we couldn't imagine how a canard could be that much overweight. 15 lbs. is about equal to 2 extra gallons of epoxy! So we asked Ron if he would be willing to section it so we could see what it was like inside. He did and brought he sections to Oshkosh to show us, show at our forum, show Burt, and show Ben Owen. Everyone was shocked. We couldn't believe what we saw.

There was no resemblance between it and a Cozy canard. There was no core of structural, polystyrene foam. It appeared that a spar had been built in or around some kind of form and then assembled between skins in a jig. There was such a poor fit between the spar and the skins that a very thick layer of resin or flox had to be used to fill the void, and even then there were voids between the spar cap and the skins. It appeared that the canard was hollow when assembled and then pour foam was poured in from the ends, except not all of the hollow areas got filled. The outside contour was so bad that about 1/4 in. of micro was used to fill the leading edge. The resin did not appear to be either of the approved epoxies. The hinges were not set in high density foam per plans, and the lift tabs were not backed up with foam and micro on both sides of the shear web. A nav antenna had been installed, but the coax was run right alongside one of the copper foil dipoles, so it is doubtful that it would have functioned very well, if at all.

We have notified Mr. Fitzgerald that he is not authorized to advertise Cozy parts, and that he should recall any parts he has represented to be Cozy parts which were not built strict accordance with the plans using approved materials in accordance with specified quality control criteria.

If any of you have purchased parts (particularly canards) represented to be Cozy parts from this source, or know of any builder who has, we urge you to contact us. The best way to put a stop to this type of thing is to patronize only reputable suppliers, and expose those who are not. Your cooperation will be appreciated!.

## DEEP STALLS

The July '91 issue of Sport Aviation (and also Nov.'91 Kitplanes) contains a very fascinating article on the investigation of the deep stall characteristics of the Velocity 4-place canard aircraft. In 1988 and 1989, there were 3 reported instances where 3 different Velocities 'locked in' a deep stall condition from which the pilots were unable to recover. The aircraft descended almost vertically, but in a flat attitude, at an unusually slow rate of descent, variously reported as 1200 fpm or 15 to 20 mph. Per [Burt Rutan](#), this is several times slower than theory would predict. Two of the aircraft splashed down in water, and one on land. One pilot was uninjured, and the other two received "minor" injuries.

The article describes the ingenious test program Danny Maher conducted on the ground to determine what it took to stall a Velocity, what happened when it stalled, and what airfoil modifications were most effective in preventing stalls. He was then able to confirm his findings in flight test, with a very clever way of avoiding a recurrence.

Following publication of the July article we were asked to comment on how this related to the 3 and 4 place Cozy. We think this is a very important subject which we should discuss:

1. First of all, even though the Velocity and the Cozy, particularly the Mark IV, appear to be similar, there are some important differences, most notably in the canard, which is the key to stall resistance. The 3-place Cozy uses the GU airfoil, and the Mark IV the R1145MS airfoil, both of which are used on the Long EZ. The Velocity uses a different airfoil with considerably more area (about 50 % more) than either of the Cozys.
2. It has been demonstrated that the original Velocity could be made to enter a deep stall while being operated within its approved c.g. range. We have not been able to demonstrate this with either the 3-place or Mark IV. The 3-place Cozy was tested 1/2 in. aft of its approved c.g. range and the plans model 1-1/2 in. aft of its approved c.g. range without entering a stall. Admittedly, we haven't tried to force a stall at these extreme c.g.'s by pumping the stick, however.
3. We think the Cozy (and other canard aircraft as well) could be forced into a deep stall if the c.g. were moved far enough aft of the aft c.g. limit and the attitude aggravated by pumping the stick. We see no justification for trying to demonstrate this, however, if the approved c.g. range appears to be safe from stalls, because deep stalls do not appear to be recoverable (except by very skillful test pilots) unless a mechanism is installed to change the c.g. in flight. What happens is that the excessive drag of the stalled wing causes the loss of all forward movement, rendering the controls ineffective, so the aircraft simply mushes.

Apparently, even full power is not enough to overcome the drag of the stalled wing and reestablish enough forward motion to make the controls effective.

4. It should be emphasized that deviation from the plans and/or builder modifications could reduce the stall resistance of the Cozy. It is mandatory that vortilons be installed on the main wing to prevent airflow separation at high angles of attack. Extending and/or changing the shape of the



nose can affect pitch stability. Canard airfoil shape, incidence and span affect pitch stability, and should not be changed. Even increasing the size of the fuel tanks can be dangerous by allowing too great a shift in c.g. with pitch. You should not fly your airplane without having made an accurate weight and balance evaluation, and without knowing exactly where the c.g. is. You cannot assume that your acceptable c.g. range is the same as our prototype due to individual variances in homebuilt aircraft. You must confirm the acceptable c.g. range of your aircraft by stall tests at least 10,000 ft. above ground while wearing a parachute. If you see any hint of an unusual or uncommanded pitch up, or any hesitation in nose down control power when at full aft stick, go to full power and full forward stick immediately and recover! If your aircraft hangs in a high sink condition, rock it out with ailerons and rudder using maximum available engine power. Ballast your aircraft to a more forward c.g. and retest. If you do not want to take the risk of doing this stall test program, do, at least, limit your flying to mid or forward c. g.

5. Notwithstanding the fact that we have not been able to stall a Cozy at the aft c.g. limit and beyond, we still advocate using ballast during solo operation to place the c.g. near mid range. The main reason is to avoid a large difference in trim and flying qualities between solo and duo operation, although it also greatly increases the margin of safety as regards stall resistance. It goes without saying that at any c.g. we don't recommend flying approaches at minimum speed and full aft stick, and aggravating attitude by pumping the stick.
6. We would be remiss if we did not point out the advantage that canard aircraft have over conventional aircraft, as regards stall behavior:
  1. It is said that 25% of general aviation fatalities are due to stall/spin accidents. To our knowledge none of these can be attributed to canard type aircraft.
  2. Most (all?) conventional aircraft will stall at full aft stick while being operated within their approved c.g. range. With rudder and/or aileron input, they will spin. Canard aircraft are designed to be stall proof (or at least stall resistant) at full aft stick within the approved c. g. range.
  3. When a conventional aircraft stalls, the nose drops and speed builds up rapidly, and the aircraft often spins. This is most likely to occur during approach to landing (or during take off) when there isn't sufficient altitude to recover, and is usually fatal to the occupants. If a canard aircraft could be made to stall, it would descend in a flat attitude at a sink rate not likely to be fatal.

On balance, we believe that canard aircraft are much safer than conventional aircraft for the reasons detailed above.

Danny Maher should be commended for the very innovative test program he conducted and the information he published which greatly increases the knowledge and understanding of the stall behavior of canard aircraft. If you have any further questions on this subject, please contact us.

In his last newsletter, Uli reported on the engine failure and emergency landing he and Linda had in Sweden on June 13th. They had taken off from Stockholm, were about 7 minutes out and 4 minutes over a lake when the oil pressure dropped from 80 to 0 psi. Uli thought (hoped) that it was a gage malfunction, but turned back to the airport and informed Stockholm radar. Because of bad weather, they were at 700 ft. The engine froze about 4 minutes later, still about 4 km from the airport. Uli set it down in the only possible place, a field of tall grass, barely making it over a barbed wire fence. The nose wheel fork broke loose from the strut after touchdown (the machine screws pulled through the back-up plate) and there was rather extensive damage to the nose and nose gear parts ahead of F-22, but Uli and Linda were not hurt.

Uli said that when he climbed out he could see that oil was dripping from the bottom cowl and prop, and it was obvious that he had blown the neoprene crankshaft seal. He said that Vance Atkinson had given him a metal retainer which bolts over the main seal, but he had never installed it. He also indicated that he had had a top overhaul recently and wasn't sure that the mechanic installed the seal correctly.

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## CRANKSHAFT OIL SEALS

After learning of Uli's misfortune, I called Lycoming to ask whether they recommended the installation of a retainer ring over the crankshaft seal. They said that many years ago, some narrow deck engines were manufactured with retainer rings, but since switching to wide deck engines this practice was discontinued. In these engines, the seals are glued in place in a recess in the casing, and a retainer ring is not needed. Their service bulletin 1324 proscribes the correct installation of the seal and the glue which should be used. This notwithstanding, Lycoming offers a retainer ring kit for those who desire the additional insurance its installation would offer.

We then went on to discuss what might cause a seal to blow out even though it was installed correctly. They said that the pressure inside the crankcase could be measured by drilling a hole in the oil filler tube and connecting an airspeed indicator. The normal pressure with the engine running at rated rpm should be between 45 and 60 mph. Higher pressure could blow the seal. There could be a number of causes of higher pressure. Excessive blow by the rings is one, but if compression is normal, this should not be a factor. Other causes could be obstructions in the vent line like ice formation, or a plugged oil separator. Less obvious might be venting to high pressure air inside the cowl or the vent line facing into the relative wind. High pressure air inside the cowl is almost equivalent to the forward speed of the aircraft, and could approach 200 mph. Obviously if the vent line were faced forward, the effect would be the same. This is scary! A homebuilder could accidentally vent the crankcase incorrectly and cause an engine failure! Thinking these considerations over, I would be inclined to trash my oil separator, run the vent along (not through) the exhaust pipe, to prevent ice formation, and face it aft. This might cause a little more oil consumption, but if it saved an experience like Uli's, it would be well worth it. Your comments are invited !.

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## DITCHING

Whether it is possible to ditch a fixed gear canard type aircraft in water without it tipping over has long been a subject of speculation. No one has ever done it and no one has ever been willing to try. In talking to Uli, he mentioned that a Varieze had been ditched in the ocean off the coast of France and the pilot was uninjured. It had remained upright, floated with water up to the armrests, and was towed ashore. We asked Uli to obtain more details because this was a subject of wide interest.

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## **SOUTH AMERICAN CONNECTION**

At Oshkosh, Cozy builder and long-time friend Firmino Campos asked us if he could be our representative in Brazil. Firmino works for IBM and travels to the US frequently. He is multi-lingual, active in the EAA, knows most of the builders in Brazil, has helped many of them, and has almost completed his own Cozy. He is very personable, eminently qualified, we are pleased that he would like to represent us, and we accepted his offer. If you have need, you can contact him:

Firmino Campos  
R. Santa Ernestina #570  
Campinas S.P. 13095, Brazil.

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## **NEW SUPPLIER**

At Oshkosh, we were approached by Mr. Ron Alexander who asked if we would approve Alexander Aeroplane as a Cozy distributor. We have investigated the materials they supply and checked on their reputation. They are a Hexcel distributor and carry the specified glass cloths and epoxy resins, and they stock all of the specified foams and most of the required hardware, though their line is not as complete as Wicks or Aircraft Spruce. They have been in business for quite some time and, as near as we can determine, have an excellent reputation.

A number of our builders have dealt with them and have been complimentary. They are well situated geographically to serve our builders in the Southeast without infringing too badly on the areas served by our other suppliers, so we have given our approval and are adding them to our list:

Alexander Aeroplane  
PO Box 909  
Griffin GA 30224-0909  
(800) 831-2949

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## **FAILED LANDING GEARS**

According to RAF, Long EZs are continuing to experience landing gear failure due to overheating brakes, so Cozy builders should be warned as well.



With the advent of heavy duty brakes, it is possible to stop much more quickly with a lot more energy absorbed by the brake discs, and they can become red hot. Since they are close to the gear strut, the epoxy can soften and cause the strut to bend. Normal operation of taxiing and landing with wheel pants on should not cause a problem if your wheel pants are vented at the top to allow cooling air to circulate, if your brakes don't drag, and if you aren't unduly hard on them. Here are some rules to help you avoid melting your fiberglass gear legs:

1. High speed taxi tests should be done with the wheel pants removed, and time should be allowed between runs for the brakes to cool.
2. Be easy on your brakes. You don't have to turn off at the first taxiway, even if the tower asks you. You will save brake pads, tires, and gear legs. The heck with the tower!.
3. Make sure your wheel pants are vented at the top.
4. If you have installed the heavy duty brakes, make sure you have installed the extra 3/16 in. spacer. You would be amazed at the difference that 3/16 in. makes in the amount of heat radiated.
5. Wrap your gear legs with 1/8 in. Fiberfrax insulation, covered by reflective aluminum tape.
6. RAF recommends, as an added precaution, to a 1/8 in. thick aluminum reflector plate between the axle and gear leg, extending 1 in. higher than the brake disc and a little wider than the gear leg. Actually, 0.016 in. thick stainless might be even more effective (we haven't tried this yet), because it is a poorer conductor of heat and a better reflector of radiation.

## OVERVOLTAGE PROTECTION

According to the Canard Pusher, it is possible to have a "catastrophic over voltage event" if you do not have overvoltage protection in your aircraft charging system. We are not quite sure what this means, but it sounds scary. They say that Bill Bainbridge's high-tech linear voltage regulator (which we are using) has instantaneous overvoltage protection built in. Contact Bill at (316) 283-8662.

## LORAN VS GPS

Just about the time that Loran mid-continent gap where we live, GPS (global positioning) is beginning to look even more viable. We don't have first hand experience, but are told that GPS does not suffer from the problems that afflict Loran, such as ground planes, electrical noise, interference in rain (just when you need it), and local signal coverage. Cozy builder/flyer Dr. Mike Marshall has installed a Pro Nav 100 unit and swears by it. He says it cost him \$ 1 800 and now he can send it in to the factory and for \$495 have a data base installed that covers the entire world!. Pro Nav was bought out by Garmin, and the latter has split the line into Marine and Aviation. You can still buy the Pro Nav 100 and have the data base installed. For a little more, you can buy the aviation unit 100 AVD with the data base

installed, a tray for panel mounting, and blade antenna. Garmin requires the 100 AVD to be dealer installed, but homebuilders are exempted. If interested, contact Dan Johnson at Gulf Coast (813) 879-9714.

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## AUTO PILOTS

Dr. Mike Marshall also has a Navaid wing leveler, which he had slaved to his Loran and probably now to his Pro Nav to follow the CDI. He says that now that he can take his hand off the stick, his Cozy holds pitch and altitude, so he has an inexpensive (relatively) auto-pilot.

We do not fly IFR (I am embarrassed to say), so I am considering installing a Navaid in lieu of a turn and bank indicator and a gyro horizon. I hate to run a vacuum line the length of the fuselage, and vacuum pumps have a high failure rate. My logic is that if I ever got caught in IFR conditions and had to let down through a cloud, I could rely on the wing leveler to hold the wings level and control descent with airspeed, ROC and altimeter. Are there any high time IFR pilots out there who would like to comment?

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## PUBLICITY

Aviation magazines are hungry for anything of interest to print, especially from builders.

Sport Aviation has a section "What our members are building" and Kitplanes has "Completions, Builders share their successes with our readers". All you have to do is send in a good color photo (and negative) and a short dissertation. If you are even more ambitious, they would love to have manuscripts with pictures. Most are willing to pay for printable articles. We have more than our share of lovely airplanes and interesting experiences, and we (you) shouldn't be afraid to let the world know. If the weather is bad and you can't fly, think about sending in something to a magazine.

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## INDUCTION SYSTEMS

The induction system shown in the 3-place Cozy plans, i.e. air filter on the firewall and a Brock carb heat valve, is the same system designed for the Varieze and Long EZ. You only have to look at it to know that it offers a lot of resistance to the air entering the carburetor, and robs the engine of horsepower. Ellison (manufacturer of the throttle body claims the 0-235 loses 8 horsepower and larger engines even more. A better system is to mount the air filter immediately below the carburetor in a housing (like on automobiles) with the inlet facing forward into the airstream and a flapper valve for alternate heated air coming into the top or side. RAF reports that Hal Hunt (818) 989-5534 makes such a unit for sale, but we haven't seen it yet. Cozy builders Jack Wilhelmson, Jim Krug, and Exian Heinitz have all designed and built their own. We intend to evaluate various designs and select the one we consider best for the Mark IV and retrofitting on the 3-place.

## BUILDER HINTS

1. We always mix a little flox with 5-min. epoxy to prevent it from running and make a little stronger joint.
2. We get double duty out of our 8 oz. mixing cups by using the bottom (up side down) to mix 5-min. epoxy.
3. After you are into your project a ways, there is no need to throw away left over micro or epoxy. Have the surface of the fuselage, wings, or canard sanded dull and vacuumed, and spread left over micro (or epoxy converted to micro) on the low spots. This will save epoxy and time later on during finishing. Always mix the micro as thick as you can work with it, because it will be lighter and sand much easier.
4. Series 8 Protective Barrier Cream is excellent for hand protection, and Lava soap removes epoxy from your hands the best. It is our experience that latex gloves do not protect your hands, and in some cases actually contribute to an allergic reaction.
5. Postpone installing the centersection spar and building the strakes until you have completed as much work inside the fuselage as possible. It is much easier to work inside the fuselage with it sitting on its side on saw horses. You can install the centersection spar temporarily with bondo to install the main gear (3-place builders), and then remove both to continue work inside the fuselage.

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## MARK IV CHANGES/CORRECTIONS

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## FOR SALE

1. Cozy hangar plans, \$80, and info kit, \$5. (see letter following); Dear Nat,  
Good to see you again at Oshkosh. Just wanted you to know that I received the plans built champion award at Oshkosh for my Cozy. My company (CADDIT CO.) that I started last april decided to offer plans to builders who wished to build economical hangars for their airplanes. I built my hangar by CAD drawings, taking the side and top profile of the Cozy and building around it. The smaller the hangar. the cheaper the cost. My hangar works out great for me. The 3-place Cozy, Long EZ or Varieze will fit in this hangar (18' x 28'), as will other small homebuilts. A slightly larger version is available for the Mark IV. I have an info pack for \$5 for people that are interested, with a full bill of materials so they can price it out. My hangar cost me about \$1250 without doors. I will sell these plans for \$80. Please put this in your newsletter. Thanks again,

Jeff Russell

Rt. 2, Box 453-C  
Yadkinville NC 27055  
(919) 961-5631

2. Professionally made seat cushions, headrests and arm pads for the Cozy, grey, black and white, \$100.00. Contact Dennis Oelman (319) 268-0513.

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## FIRST FLIGHTS

First flights this quarter or previous but unreported:

1. PP-ZTX built by Jayme Ruy Textor, Sao Sepe, RS Brazil. First flight June 6,1990, now has over 150 hrs.
2. N30LY built by Bruce Olson, FL first flew 6/21/91.
3. N456 DP built by Dave Petrosino, Alaska, first flew 6/22/91.
4. N\_\_\_ built by Cris Esselstyn, WI first flew 7/10/91.
5. N76PT built by Pat Young, NM first flew 9/2/91.

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## LETTERS TO NAT

8/9/91

Dear Nat,

It's long overdue, but here it goes - 6 years finally paid off. June 10th came and with it, a trip to the airport. Serial #9, with my wife Debbie in the truck leading and my friend John in his car trailing, started a caravan to the airport. It was a 9 mile trip thru town at 20 mph and as I discovered, a trial by ordeal that went smooth as glass. The trip brought many a wide eyed stare, but no problems. One individual sapped a couple shots I am enclosing. With a little knuckle bustin and considerable sweat, the Cozy was soon assembled and ready. So, on June 21 at 7 AM with 2 friends and my wife and son in attendance, I taxied out to rwy 32. End of runway, after a lengthy runup check, left me with a lump in my throat and sweaty hands.

As electricity coursed thru my nervous system, I throttled up and down the runway I went.

The nose elevated to the horizon and a gentle lift off followed. Climb out was quick and as I tumbled downwind anticipating a low level pass for the camera, I noted oil temp pegged, so I throttled back, did 2-360s for spacing, and set up for landing. Approach thru touch down was without excitement. Touch down was a squeaker and then taxi back- all in all a real non-event, very stable and calming on the nerves.

Its a beautiful ship that flys as advertised. Oil temp climbed out of sight because I didn't think I'd need an oil cooler. So much for thinking.

I tried to stay true to the plans, tho I did make some mods of my own. My ship tipped the scales at 914 lbs., has an 0235 C1B, with a light weight starter and alternator, a basic panel with a Val 670. I have internally mounted levers. My brake cylinders are in the nose. I installed windows in the bottom of the strakes for look down visibility.

I don't have a lot of hours built up yet due to adjustment for oil temp. I now have 6 hrs in 7 flights. When opened up for short bursts, I have indicated 162 mph. Visibility is fantastic and it feels very stable. All in all, to say I'm excited would be an under statement. Thank you for your effort and support- it has been outstanding.

Thank you,  
Bruce Olson

6/22/91  
Dear Nat,

This is to report that on 6/22/91, Cozy N456DP, the first "Alaskan" Cozy, lifted off from her home base in Homer. The first flight was approx 1/2 hr and began vrith quick acceleration to lift off speed of 80 mph. Climb out was at 120 mph, leveled out at 2000 ft., and cruised around gear down at 140 mph at about 1900 rpm. She flies hands off, straight as an arrow with no adverse behavior in roll, pitch, or yaw. Ball stayed centered in 30 deg. bank tums with no rudder. Cht stabilized at 380 deg on #4, and will check the others as testing progresses.

Oil temp climbed to 180 deg and stopped there. My first landing approach was at 120, throttie idle (these airplanes don't want to slow down) deployed speed brake and airspeed dropped to 100, then 90 and I continued my approach at 90, over the numbers at 80, and made an uneventful landing. I look forward to many more hours in my Cozy. Its a great flying machine!

Later - I forgot to give you my empty weight (958 lbs incl. oil) and engine (0-320 E2D). The machine is great and I'm having a blast. I've got 4 hrs on her now and have had airspeed to 200 mph indicated at 2600 rpm, level flight. No wheel pants or spinner. She's pretty quick.

This 20 mile by 60 mile flight test area is going to get awfully small by the end of 40 hrs. but I plan on putting the time to good use checking out all aspects of performance and endurance. I had hoped to make Oshkosh, but I would have to hurry things too much. There's always next year. Had I not had to wait nearly 2 months to get the airplane painted, I would have been able to make it. Hope you and Shirley enjoy the show and have a safe trip. I'll be thinking of all of you.

Regards,  
Dave Petrosino

9/9/91  
Dear Nat,

Well, after 6 years, 9,000 road miles, numerous storage lockers, N76PT is certified and flying. She



weighed in at 828 lbs (strobes, 22 lb battery, radios, and all) certified on 8/30/91, broke ground on 9/2/91 at Double Eagle airport, Albuquerque, under the golden hue of a classic N Mexico sunset. Airborne about 20 min with good stability and trimmed for level flight it actually flew level. Uneventful touchdown and back to the hangar party. The standard brakes are practically non-existent. I am strongly against the Weldtech toe brakes. So its back to work!

Regards,  
Pat Young

Dear Nat and Shirley,

Am busy setting up shop, making jigs, templates and room for Cozy MKIV #20. Due to limited space, the centersection spar, wings and canard will have to be assembled first and placed in storage before the fuselage is constructed. At the rate I'm going, this project should keep me out of bars for 5 or 6 years. I obtained a set of Canard Pushers from 9 thru 54 recently and am striving to complete the set. If anyone could help or would like a copy of these issues, I would be pleased to supply them at cost. It is very informative to study the history of these designs.

Cordially,  
Paul Tremblay  
(208) 526-6119

8/13/91  
Dear Nat,

It seems like just yesterday when I started my Cozy, But it has really been 14 of the most pleasurable months of my life. I have just completed Chap. 12 and constructed a straight R1145MS canard with Roncz tips. I would like to share a builder hint with other first time builders. When you are cutting glass for a layup, cut it on your cutting table and without moving it, roll the glass onto a mailing tube. Then just roll it out onto your layup. The fiber orientation stays perfect, and it also helps if you are short handed.

again,

Richard Bienvenu

6/29/91  
Dear Nat,

Here's the rundown on the 1st annual canard fly-in in KC on June 14-16. Those of you who didn't go really missed a fun event. Friday started out with lots of wind and sunshine.

Also lots of ramp talk as many friends made rearquaintences as we stood around and told of where we've been and what we've been doing. Friday evening was spent porking out on a massive seafood buffet at the Holiday Inn.

Saturday morning a fun race was held. A course 72 nm long was mapped out and we each took our turn

with a race against the clock. Time started in front of the tower and ended with a high speed pass past the same point after flying the course. My Cozy 261DM turned in the fastest time of 190.6 mph. A Long EZ and Varieze were 2nd and 3rd. I raced mine to see how it compared with other EZ types. Considering the rolling start and only 150 hp, I was satisfied with the result. There were 5 Cozys there. Vance, who just finished a beautiful new paint job, won the "Best Exterior". "Congrats, Vance"! Wait and Helen Suminski, Ken Francis, Jerry Lynch, and I. I won the best interior. Saturday afternoon also included some really interesting seminars on formation flying. Then, the weather took a turn for the worse and some of us headed for hangars while others prayed it wouldn't hail. Sunday morning brought many skies and headwinds for the northerners and tailwinds for the Southerners. An enjoyable weekend was had by all.

Dennis Oelman

Dear Nat and Shirley,

Thanks again Nat for your help and advice with my right wing repair. I am the one who had a misalignment in the jigs and had to sand off part of the shear web in order to realign the aboard section and do a repair layup. Everything worked out just fine, and I feel any weight increase, if any, will be insignificant, and the part is stronger than before. I would like to know if any Cozy or Long EZ is flying with and 10 320-BIA engine with the stock fuel injector system complete. Firewall clearance is very minimal and this will be a large problem.

Good luck on the Mark IV. See you at Oshkosh.

Bob Banville

4/16/91

Dear Nat and Shirley,

Just a note to let you know my progress and to renew my subscription.

After about 1200 hours in 20 months the fuselage is complete except glassing the nose, wings and winglets complete, center spar complete, canard complete, most of the controls made, some installed, and I hope to be finished in 8 to 10 months if all goes well. We are looking for an O-235 engine, if you hear of one for sale.

Thanks for a good set of plans and all the support. Good luck on the Mark IV!

Charles Nunnelee

3/31/91

Dear Nat and Shirley,

We have had a very busy year Planning a new home for which I plan to be the contractor.

Once the ground dries out, we plan to start digging. Our new home will be very close to an 2000 ft grass airstrip; that's a little short for the Cozy. Because of the construction of our new home and our daughters graduation from UNI the end of July, we probably will not make it to Oshkosh this summer.

We flew to Atlanta, FA and Chadron NE last fall. 611CZ performed admirably with one two hour stretch averaging 5.0 gph. We frequently fly to another city for dinner or breakfast. We hope the Mark IV progresses well and wish you and Shirlev the best.

Sincerely,

[Rex Pershing](#)

Dear Nat, 7/12/91

Cozy #300 has 125 hours on it now. It is an incredible airplane. This is the first thing that has surpassed my expectations, except for my family!. I am working a lot of hours and traveling a lot so I won't be able to attend Oshkosh again this year. Thanks for a great airplane!

Dave Mendenhall

Dear Nat,

I'm having a lot of fun building my Cozy and have met some really good people in the process. Besides myself, there are three other active Cozy builders that I know of in the Tampa Bay area. All have been very helpfull in providing hints in construction techniques. Recently David Wilson and I flew to the East Coast of Florida to visit Tom Gross of Melbourne. Tom gave us a ride in his beautiful Cozy and I have to say that it was everything I expected and then some!!! The handling and control pressures were just what you would want them to be. The 'stall' was unbelievable (I'm used to flying "Spam cans" that feel like the wings are going to rip off when you stall them). The tracking on the ground was excellent, and with a cruise of 200 mph, that would make the Bahamas only two hours away from my home in Seminole!! I can't wait till I hit the lottery so I can devote full time toward the construction of my Cozy. Thanks for your support and excellent plans.

Keith Lukat

Dear Nat,

Progress on Cozy #115 continues slowly. I have completed the fuselage through Chap. 9, with the center spar, nose, nose gear, and firewall installed. The turtleback has been floxed in place and the canopy w/hinges installed. Hope to complete it by October. During the summer, my son and I plan to build and install the canard and elevators.

Although I have been working on "That Thing", as my wife calls it, for almost 6 years, I am looking towards a mid-1993 first flight. I plan to equip our Cozy with Rocky Mountain Instruments "Micro-Encoder" and "Micro-Monitor" instruments and Narco avionics with Flybuddy Loran C.

In closing, thanks for designing this aircraft. It has given me "years" of enjoyment.

Jim Buckalew

Dear Nat,

Please send me the info pack for the Cozy Mark IV. I have a good friend Tom Gross who built a Cozy

which I have flown. He has approx. 100 hours on it now and a few long trips. Tom only has good things to say about your design and what a fine plane the Cozy is.

Thanks,  
Wayne Bunch

8/2/91

Dear Nat and Shirley,

I enjoyed talking with both of you at Oshkosh. I really enjoyed the forum- scary findings in the "custom canard". As you have advised in the past, "BUYERS BEWARE"!!

I am forwarding to you information concerning the free Lycoming reciprocating engine school I told you about. The course is open to anyone interested in learning more about Lycoming engines. I attended the course in Feb. 1990 and found it to be extremely valuable. The instructor, Don Stahl, was excellent. I strongly recommend the course to everybody from AIs to the homebuilder. Everyone will learn something. The plant tour is worth the trip in itself. In addition, I am sending you several pages from Lycoming's SSP-289 Certified Engines book which lists the 4 cylinder engines by model number and gives the differences in each engine. This booklet is available to homebuilders from Lycoming.

Happy flying,  
Steven D. Sharp

7/15/91

Dear Nat,

A note from your wandering builder - I have been on assignment for almost a year and have been out of touch with the experimental builders, specifically Cozy. Hopefully my assignments will be mostly USA from now on. Enclosed are some photos of N306AN. It is now in the final stages of painting, only the fuselage to be done and the last major item is the selection of a propellor. I thought you might like this picture of Norma trying out the left seat.

Thank you very much.

Sincerely yours,  
Alex R.Strong

6/12/91

Dear Nat,

Cozy #171 is progressing well. This week it will be heading out to the airport. I got a really good deal on a 43' x 33' hangar I will be sharing with a friend who is restoring a Globe Swift. I need more room than I have here at home. I will be doing the cowling, baffling, engine plumbing and wiring next. Then I will finish the fairings and armrests and prepare the interior for Zolotone and the outside for painting. I figure I'll make Oshkosh '92. Enclosed is information on the Ellison. The Central States newsletter included an interesting idea on a simpler, lighter, more efficient design for carburetor intake air. I have modified the design slightly and sent it to Ellison for input. They say that the stock Van/Long/Cozy

intake design can rob an O-235 of 8 hp!.

I have installed a Fram HPG-1 fuel filter on the firewall. It has AN threads for aircraft installation. Cost is about \$55. It meets the requirement of the 70 micron filter called for in the Ellison installation manual.

Can't make Oshkosh this year but will be there in '92.

Brian Heinitz

8/16/91

Dear Nat

I mailed you a small box of Gougeon's 410 Microlight filler. I was told a Cozy builder near Bay City was using it plus several guys with the company on their A/C composites. It costs \$150 for 3 lbs (2 cu. ft.), and appears to be coming quite popular. It is easy to mix and sand as claimed. This is in comparison to microballoons I used to build up over the spars. The mix butters on easily and can be worked down to a smooth required height. There appears to be far less pin holes than the balloons produce. I have covered all the glass surfaces with Microlight and sanded them down. This should be lighter than loading the weave with a fill and sand product before priming.

I'm venting the 3 and 4 cylinders thru the cowling. To vent the accessory section, I created a small 2 x 3 inch hinged door in the baffle above the accessory case. It hangs open with the nose down and closes with the nose wheel extended.

I had to make a different air filter design because my carburetor is a MA-4 SPA, about an inch deeper than a MA-3. I have included a sketch with rough dimensions. The design uses an auto filter of minimum depth and radius to clear the carb drain and accelerator pump sump. It is a WIX 46023, Dana Mfg. I should get the added benefit of ram air pressure and a relocation of the electric fuel pump to the right side of the firewall below tank level.

Jim Krug

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