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# COZY NEWSLETTER #51

## October, 1995

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### WHAT WE HAVE BEEN DOING

As has been our custom in past years, we had Lee Parlee man our office while we went first to Arlington, and then Oshkosh. We left the morning of July 4, pretty much loaded. The weather was beautiful over the Grand Canyon and Rocky mountains to Boise, ID, where we stopped for fuel and to meet with Cozy builder Brent Thompson. After our visit, we took off, planning to fly direct to Everett, WA, over the Cascades. But when we got as far as Yakima, FSS advised that the Cascades were obscured by clouds, and that best way to get to Everett VFR would be to go south to the Columbia River gorge, through the gorge to Portland, and then up the coast under the overcast to Everett. It was a little longer route than we had planned, and by the time we were diverted around an airshow at Tacoma, and were then asked to extend our downwind because of an aircraft making an instrument approach, we landed at Everett with barely the required reserve of fuel remaining.

From Everett we flew across the Sound to Port Townsend, to visit Cozy builders Jim and Sue Wickstrom. The airport was interesting - 2800 ft. long with trees at both ends. We touched down on the numbers and could have turned off half way, but I prefer to coast to the end to save the brakes and tires. We enjoyed our stay, the Wickstroms have a beautiful new home on the side of the hill overlooking the Sound. The next day, it was dead calm at the airport, and we were pretty heavily loaded, but we were able to rotate mid-runway. Back at Everett, we picked up Cozy builder [Eric Westland](#), and flew to

Arlington. We have a lot of builders in the Northwest, and we had a chance to meet many of them, some for the first time. Arlington is more homesie than Sun & Fun, and we always enjoy it. We were staying with the Westlands. Eric is doing very fine work on his Mark IV, and they were very hospitable hosts. We got together for a mini-banquet with the Westlands and the Wickstroms. It took us only about 10 min. to cross the Sound in our Mark IV, but it took the Wickstroms 4 hours by car via the ferry! The weather was pretty good through Saturday, but on Sunday, when we planned to leave, the weather worsened and VFR was not recommended. Twice, when it looked like it was lifting, we tried to get through the pass in the Cascades, and both times we had to turn back. On our last return, we landed in the heaviest down pour I have ever flown in.

Monday seemed a little better. The clouds were right up against the west side of the mountains, but FSS told us it was clear on the other side, so we decided to go over the top. We had to go to 14,500 ft., but when we got there, sure enough, it was clear ahead. So we flew on to Spokane. The Rockies east of Spokane are pretty high, but there is a pass through them called Mullin Pass. Same deal. The mountains were obscured by clouds, and you couldn't get through the pass VFR, so we climbed on top again, and on the east side of the Rockies, it was clear again. So we flew on to our favorite refueling stop, Miles City, MT. Even though it was barely noon, we decided to spend a lazy afternoon. The good people at the airport put our Mark IV in their hangar, and the good people at the Olive Hotel came out to pick us up. We had stayed there before. It is really old-fashioned. Shirley thinks her parents stayed there in the '30s and '40s. They had a huge bowl of grapes and apples on the desk, they gave us a ticket for a free drink, and the special in the restaurant was top sirloin steak for \$9.95!

The next morning a courtesy ride to the airport, and then non-stop to Duluth, MN to visit our youngest son Duncan and his new bride, Stephanie. At the airport, they wanted \$30 for overnight in a hangar, so we elected to park outside. Wouldn't you know, but that night there was a huge thunderstorm. We thought the worst must be over, so we stayed outside. But the next morning the phone rang at 6:00 AM. The FBO said another big thunderstorm with winds 60 to 80 mph was going to hit shortly, so all of a sudden, \$30 didn't seem so bad, so I rushed to the airport, put the Mark IV inside just as the storm hit. The second plane (a 152) they were trying to put in got turned over in the wind. The next morning, while we were still in the hangar, the third thunderstorm hit. We decided it was time to depart Duluth, so as soon as the thunderstorm passed, we left for So. St. Paul, where Shirley's sister lives. We put the Mark IV in a hangar (the rates are better in So. St. Paul), spent a couple of days in New Prague visiting our oldest son, and then gave a reception in Gem Lake at our daughter's home for Duncan and Stephanie. Then it was off to Oshkosh!

The flight over was pretty good, except it is always foggy and hazy over the cranberry bogs in central Wisconsin. We landed on runway 27, approaching over the lake, with a 90 deg. crosswind. After parking our airplane, we were able to locate the camper we had rented, pick up our rental car, and head into town for groceries and dinner at Robbins. I think we ate there every night except one. [Jack and Donna Wilhelmson](#) were supposed to arrive from Charleston, SC, on Monday in their Cozy as well, but they didn't show up. We didn't see them Tuesday either. On Wednesday, a horn tooted outside our camper, and there they were in a rental car. We asked where they parked their Cozy, and Jack said it was in a farmer's yard in Indiana. He said they were flying along under weather, their engine missed once in awhile, and then all of a sudden it stopped cold. They weren't high enough to reach an airport, and didn't want to set down in a cornfield, so Jack picked a narrow country road. There were power lines on one side, so he told Donna to watch out for farm houses on the other side, to avoid wires crossing across the road. Just before touchdown, a white Cadillac turned onto the road coming toward him. He had enough speed to clear the caddy, and he could see the look on the lady's face, but she never

stopped. After he got stopped, he was able to start the engine again. He didn't want to attempt a take-off without knowing what the problem was, so he taxied to a farmers yard, parked the plane, removed the Ellison, rented a car and drove to Oshkosh. We brainstormed the symptoms and tried to define the problem. It sounded like carburetor ice. Jack didn't have carburetor heat hooked up, but if it had been ice, he could have cleared it by cycling the throttle. Because he was low, he didn't have a lot of time to try everything in the book. It could also have been something in the throttle body pressure regulating valve. Or it could have been an ignition problem. He decided to send the Ellison in for overhaul while he was at Oshkosh, and maybe also pick up a new set of mags. Taking off on a country road, you just don't want to take any chances.

Well, Oshkosh went pretty well. Our Cozy forum on Friday was well attended. At Shirley's suggestion, we reviewed a number of subjects from previous newsletters. Flight tests, canard shortening, lower winglets, auto engine conversions, builder design changes, propellers, hub extensions, fuel systems, engine cooling, retractable gear, complaints about custom shops, etc. Builders seemed to appreciate revisiting these subjects and asking questions.

For the first time ever, we did not park our airplane on the flight line. Instead we parked in an outside exhibit space, alongside the new north exhibition building, courtesy of Aircraft Spruce. We were afraid builders wouldn't find us, but quite a few of them did. [Marc Zeitlin](#) arranged for his Internet group to meet at our airplane, I think it was on Saturday. We had quite a free-ranging discussion. Speed and convenience in communications were cited as advantages of Internet. The fact that it might be difficult for a first time builder to decipher between good and bad advice was cited as a disadvantage. But there was no doubt that builders like to talk to other builders, and many could do it at work, so it is a powerful medium.

We didn't get to the flight line but once or twice. But David Orr gave us a list of the Cozys he counted, and he said there were 20! We were surprised at one or two he had on the list. Ken Murphy with our prototype 44CZ was supposed to be in Saudi Arabia. We had a chance to visit our 3-place prototype 22CZ in the EAA Museum. It was displayed in a very prominent spot, and polished like we had never seen it before. It made our hearts warm and brought tears to our eyes.

The Cozy banquet at Robbins drew an overflow crowd. Extra tables had to be set up, and 117 attended. Rex said that 11 more arrived late, and had to be turned away (they were seated outside our banquet room). The food was excellent - more Swiss steak and chicken than anyone could eat. The speaker, Wm. Groninger, SR 71 Blackbird pilot, was interesting and entertaining, and afterwards, we had a host of door prizes. Many thanks to [Rex and Barbara Pershing](#) for arranging such a fine event!

The weather this year at Oshkosh was very hot and humid - a lot more uncomfortable than Arizona, if you can believe that. One of the displays which interested some of us a lot was the Franklin engine display. Last year, we didn't really take them seriously, but we did this year. An engine made in Poland which had a pretty good reputation in this country, certified by the FAA, 220 hp 6-cyl with a silicone vibration damper, slightly heavier than an 10-360 (to be confirmed), and retailing at \$11,800 new. There would be some installation and c.g. problems to be solved, but still worth a serious look, particularly for those builders who seem determined to load the front seat to the maximum in spite of our recommendations to the contrary. This year at Oshkosh they had a special parking area for all of the aircraft which had received awards in previous years. One of these was Todd Morgan's Cozy. Guess what? Of all these previous award winners, Todd's Cozy was chosen as the **Grand Champion Plans Built** (see the picture in Sept. '95 Sport Aviation). Aren't you pleased it was one of ours? Todd finished

his Cozy in 1991 and now has 627 hrs. on it. He also won the Stan Dzik Memorial Award, which is given to builders who have come up with unique safety features. **CONGRATULATIONS, TODD!** One of the wonderful things about Oshkosh, for us and we think also our builders, is getting to see old friends again, making new friends, and the camaraderie. For us it has been 23 years, and each year seems better!

We didn't have much of an opportunity to look around, so for general news of Oshkosh, you will have to rely on other reporters.

On Wednesday there was a stationary front from Oshkosh to Kansas. We thought we could fly west under it until it was clear, and then head SW. We headed west and about Rochester, MN there were some breaks so we climbed up on top and flew on top for 4 hours or so to Goodland, Kansas, which was just on the edge of a clear area. There we bumped into a couple returning from Oshkosh and headed to Mesa in a Bonanza. Rather than head for Albuquerque, and stop overnight to fly the mountains in the smooth morning air, we decided to try to make it over the Rockies in the afternoon. Boy, was it bumpy! We got over the Mogollon Rim just before the thunderstorms closed in, as they always do this time of year in the afternoon, and landed at Falcon field in the nice 110 deg dry desert air. We were gone about 4-1/2 weeks and covered an estimated 6,000 miles, many of them over mountains and VFR over the top. It is sure comforting to have a reliable airplane with a reliable engine. After returning, we called the [Wilhelmsons](#). Jack had reinstalled the overhauled Ellison and installed new mags, thanked the farmer (who became quite a celebrity with such a strange airplane parked in his front yard), had the local sheriff set up a roadblock (to stop the Cadillacs), took off and proceeded home uneventfully.

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## FAA HOMEBUILT IDENTIFIERS

Because of the growing number of homebuilt designs, the FAA wishes to establish identifiers for the use of the aviation community and air traffic controllers. They have proposed a list of identifiers for the more common designs to the EAA's Ben Owens, and he has asked our approval for **COZ4** to represent both the 3-place Cozy and the Cozy Mark IV. At the suggestion of one of our builders in Salt Lake City who is a controller, he said that he has been using **COZY**, with no problems, so we have asked the FAA to approve this in lieu of the **COZ4**. Until we hear to the contrary, let's all use **COZY**!

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## PUBLICITY

Congratulations, guys! You are doing better! Four builders had Cozys featured in August 1995 Kitplanes magazines "Completions":

1. [Kenneth R. Brimmer](#), Bowie MD
2. Mike Doering, Tipton, CA
3. Michael Marshall, Kansas City, MO
4. Jim Edwards, Prescott AZ

Richard L. Runyon had a picture of his Cozy in October '95 Kitplanes magazine, and Todd Morgan and

[Ken Brimmer](#) had pictures of their Cozys in September '95 Sport Aviation. Nice work, guys! You get a renewal to your newsletters, our compliments!

Our congratulations go to Charles Howell who won the "Best Homebuilt Contest" with his Cozy N100CD at the March Tenn Aircraft Builders Conference. Chuck's first flight was on November 13, 1994.

## Publicity Addresses

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## FIRST FLIGHTS

We know that there have been some first flights since our last newsletter, but haven't received many first hand reports. Here are long awaited reports from [Chuck Wolcott #154](#) and Billy Denis:

June 20, 1995

Hi Nat,

My Cozy Mark IV was completed in a little less than 2-1/2 years. Might have been sooner without time out for earthquake repairs (only about 10 miles from Northridge epicenter). I'm not sure if that qualifies me as a "serious" builder or not?

First flight was November 25, 1994 by Jim Pierce of Bakersfield. It is powered by a 180 hp Lycoming IO-360 and a three blade Catto prop. Maximum average cruise with primer finish in two directions by GPS is 171 kts.

Special thanks to my wife, Darryl, for her continuous encouragement and support of the project. The airplane is everthing I had hoped for. As a low time pilot and first time builder, I am happy to confirm previous reports. Keep building, it really is worth it!

[Chuck Wolcott](#) #154

7/3/95

Dear Nat,

I apologize for not writing sooner on my Cozy's first flight. My Cozy 794WD first flew on 2/9/95 piloted by our dear friend, Dennis Oelman. A month before, I called and asked Dennis if he would test fly the Cozy and he agreed. Dennis came from Iowa and stayed with us for five days. He was glad to warm up in Hawaii for a few days after the 30 deg below weather in Iowa. The day before the flight, we went through everything on the Cozy - weight and balance, ballast and battery in the nose for the first flight box, the whole works.

The morning of the big day, we headed to the airport, pulled it out of the hangar and made some last minute checks. Then Dennis hopped in and taxied to Runway 17. After many years of working on the Cozy, it was a thrill to see it finally lift off. Dennis said it flew just like his and climbed nice with the three - blade performance prop.



Since then I've flown off the restricted hours and have flown to almost every one of the inhabited Hawaiian Islands. It is powered by an O-320-E2D, and with a 3-blade 62 x 72 prop. With 3 people on board, and 20 gals of fuel, climb is 1,000 fpm at sea level. At 6,500', 3 on board, GPS speeds are 145 kts at 2300 rpm, 170 kts at 2500 rpm, and 178 kts at 2700 rpm. This past Sunday, the EAA chapter on Maui held their 4th Annual Fly-In. The president called EAA members on other islands to come over so a group of us, a Pitts, a Long EZ, and the Cozy headed for Maui. We putted along at 135 mph to stay with the Pitts. It was a little bumpy, but that is normal over there. We had a great time! Unfortunately, we had to leave early. That evening I received a call from my buddy, John Totah (Long EZ) saying that Steve Perry brought home my trophy for "Best Hombuilt" airplane. Apparently they announced when we were just leaving the airport. I couldn't believe it, 1st place! Nat, I want to say thank you very much for designing such a beautiful airplane - everyone loves it! You've done much for us builders throughout the years. We appreciate all you've done. Again Mahalo and Aloha from Hawaii. May God's blessing and guidance be with you and Shirley always!

Billy & Bronwyn Denis Jr.

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## ACCIDENTS/INCIDENTS

The purpose in investigating and reporting accidents is to try to determine the cause; if there is something wrong with the design, to correct it, or if it was pilot error, to make suggestions as to how other builders might avoid a similar occurrence. One of our 3-place Cozy builders had an accident which destroyed his airplane, but fortunately, he and his passenger were not injured. We appreciate his candid report, which follows:

7/18/95

To: Cozy builders,

I'm happy to report that I'm writing this with a healthy body. My passenger and I survived a harrowing experience in large part to the toughness and sound design of the composite Cozy construction. My Cozy 3-place didn't fair nearly as well. It happened Friday, June 23, around noon at Oceanside airport. My neighbor and I were headed off to Loretto Baja for a fishing trip. After the trouble I've had in the past with sticking exhaust valves, speculated to be aggravated by Mexican fuel, I topped off the tanks here. That way I would have to buy less down there. So with full tanks, fishing gear, and a robust passenger, I was at maximum gross weight and a c.g. in the forward range of the envelope. I had flown many times at this weight and c.g., so I was confident that it was safe. Oceanside airport is 3061 feet long. I did a complete pre-flight and filed IFR since Oceanside had its typical June fog bank hugging the coast. The run up was fine and I pulled to the very end of the runway, trimmed for 80 Kts and forward c.g. and got the usual 2350 rpm full static prior to brake release. My Cozy accelerated a little slower than usual, but pretty much as expected for that weight. At the normal rotation speed I pulled back on the stick, but it made no attempt to lift off. I let it down and tried again, but still no lift off. I estimated that I had ample runway remaining to stop, so I decided to abort. I pulled the throttle and applied the brakes, but it barely slowed at all. The poor little standard sized brakes fighting the full weight had almost immediately overheated and faded. By this time the end of the runway was approaching very rapidly and it was clear we would not come close to stopping. I pulled the mixture to cut off to completely stop the engine and to minimize the possibility of fire. The fence at the end of the

runway was made out of 4x4 uprights with 2x4 cross beams and a lattice facing. On either side was chain link. I really had no choice but to go straight thru it, across a narrow road and into a field. Just on the other side of the road there was a dirt berm about 30" high. This is the perfect height to remove the nose and main gear in one fell swoop. The airplane then slid on its belly for another 50 ft. I hit the fence very squarely with the uprights equally spaced on each side. One hit each side of the canard and caused separation along the shear web just outboard of the attach point on each side. The next set of uprights struck at about the joint of the strake and the wing, just missing the fuel tanks. Another set hit out near the wing tips. The wings each separated at the shear web just outboard of the strake. The left wing must have been cut on the bottom by the remains of an upright, as the lower spar cap in the wing was severed. The propellor was barely damaged since it was stopped and mostly sheltered by the fuselage. The fuselage was unbreached except at the very nose. The fuel tanks remained entirely intact and didn't leak a drop. I turned off the fuel valve and switches and checked on my passenger. He was unharmed except for a scratch on his knee from the instrument panel. I had a very small cut on my ear from the head set. The canopy did not even crack although it did have white marks on it from the fence material. The fuselage is repairable. The canopy could be polished up and reused. The main gear looks good except it is missing the attach tabs. Close examination of the right gear leg show diagonal crazing of the paint, indicating high stress levels in the torsion uni wrap. Interestingly, the left gear leg, which is the side that some years ago we had melted and was repaired, showed no signs of damage.

### Keith Spreuer

*Editor. There were a number of factors contributing to this accident, and much to be learned:*

1. **Stopping distance:** Most people don't realize it, but it takes much more distance to stop after aborting a take-off than it takes just to land.

First of all, rotation speed at take-off is 10 kts. higher than landing speed, because for take-off, the canard is at zero angle of attack, so it needs a greater speed to generate enough lift to raise the nose. So if you abort a take-off, ***you will be going much faster than if you had just landed.***

Secondly, in landing, you are generating a lot more drag with the landing brake out and a high angle of attack, and holding the nose wheel off as long as possible. If you abort a take-off, you ***do not have the benefit of this aerodynamic drag.***

Thirdly, the gross weight is always higher for take-off than it is for landing. If you have fueled up before take-off, it is in expectation, of flying some distance before landing. If you abort a take-off, you will be heavier than if you had used up most of your fuel, you will have more inertia, and ***it will take longer and farther to stop.***

And lastly, at 80 kts you are traveling 136 ft./sec. It is not unreasonable to assume that it would have taken Keith 8 seconds to try to rotate twice. In that span of time, Keith would have used up an additional 1,000 ft. of runway just trying to rotate. We consider ***5,000 ft. to be barely adequate*** for high speed taxi testing, even when lightly loaded, that is, to accelerate to rotation speed, raise the nose, and then brake to a stop. This was in effect what Keith attempted to do, and he was not lightly loaded. He was at least ***2,000 ft. short on runway length.***

**Lesson to be learned:** You will have a problem aborting a take - off on a runway less than 5,000 ft. at sea level, even if lightly loaded.

2. **History of a Problem rotating:** When Keith's Cozy first flew, he told us he had a problem in rotating. On the ground on all three wheels, his airplane sat at a *negative* angle of incidence, and the battery had also been mounted in the nose. We recommended that the battery be moved to the location at the firewall, as shown in the plans, and that the main gear be shortened so the airplane would sit from 0 to 1-1/2 degrees *positive when fully loaded*. He moved the battery, but instead of shortening the main gear, he elected to put smaller tires on the mains (which probably doesn't help braking). He subsequently reported that he *still had a problem rotating*.

We did not know what else might have caused a rotation problem until after the accident, when Keith sent us the data he used to calculate the c.g. position. *He was using 113.6" as the empty c.g. location*. As near as we can determine, it is physically impossible for a Cozy weighing 949 lbs. with a 4-cylinder Lycoming engine to have an empty c.g. that far aft. Furthermore, an airplane with an aft c.g. sure wouldn't have a problem rotating. The Owner's Manual shows that the empty c.g. should be approximately 110.5". The c.g. he was using was 3.1" farther aft than it should have been. We can only attribute this to a *mistake in the initial weight and balance*. The consequence of using the wrong empty c.g., and one that is too far aft, is that Keith would have unknowingly put too much weight in the front seat, and his loaded c.g. would have been much farther forward than he realized. This is a very logical explanation for problems in rotating (at the time of the accident, he had a very heavy front seat passenger).

**Lesson to be learned:** If your initial weighing and calculation of empty c.g. differs much from the example in the Owners Manual, do it over again and have someone else check it. Also, the more forward the c.g., the higher will be the rotation and minimum flying speed.

3. **Previous brake problems.** Some time after installing smaller tires, Keith's father aborted a take-off at Gallup, NM (a high altitude airport) Whether it was caused by the brakes dragging during the initial acceleration, or too much braking trying to stop, or both, the discs got so hot (probably red hot) it *melted* the left landing gear leg. This was with the "standard" brakes. He had to remove the damaged portion of the main gear leg, make (or borrow) a splint to reattach the axle and wheel, and then fly the Cozy home to make permanent repairs. Dragging brakes can be caused by insufficient clearance between the calipers and the gear leg.

**Lesson to be learned:** Make sure your brakes are properly installed and work properly.

4. **Fading brakes.** Keith said his brakes "faded". This can be caused by worn out brake linings.

**Lesson to be learned:** Make sure your brakes are maintained in proper condition.

5. **Design changes.** Keith did not upgrade to "Super Heavy Duty" brakes when they became available in 1986 and were recommended in Newsletters #14 and #17.

**Lesson to be learned:** Install the brake assembly recommended by the designer.

6. **Gross weight limitations.** The Owner's Manual states the maximum gross weight for the 3-place is 1,500 lbs. It says this weight can be exceeded for take-off only (not for landing) by 100 lbs. only under certain special conditions. When we asked Keith what his gross weight was at the time of the accident, he was equivocal. He supplied us with two figures, a low "official" value



and a high "hypothetical" value. He did not want us to publish them. The low value exceeded the maximum weight for special conditions. The high value was substantially higher.

**Lesson to be learned:** Do not ignore the gross weight limits, particularly on short runways.

7. **Full fuel.** Keith had filled up with fuel in preparation for a flight into Mexico, which put him *over maximum gross weight*. He could have taken off with minimum fuel and well under the maximum gross weight from the short runway at Oceanside, and legally flown to the first port of entry, which was Tijuana, 44 nautical miles away, to clear customs and to fill up with fuel. Tijuana has an 8,000 ft. runway. He wouldn't have had any problem rotating on an 8,000 ft. runway, even if more than 200 lbs. over gross. If he preferred not to fuel up in Mexico, he could have fueled up at San Diego Int. (9,400 ft.) or Brown Field (7,900 ft.). When we flew to Port Townsend (2,800 ft. runway), we were fairly heavily loaded, so we took off (no problem) with minimum fuel, flew across the Sound (10 minutes) and fueled up at Everett (9,010 ft.). Vance Atkinson says that when he goes to Rough River (2,800 ft. runway) he takes off with only 10 gals. fuel and flies to a larger airport to fuel up. This is merely good flight planning.

**Lesson to be learned:** Never put in more fuel than required to fly to the next stop, plus a reasonable reserve. If runway length is marginal, fly to another airport with a longer runway to refuel.

8. **Runway length for take-off.** The graphs in the owners manual are only a guide. The length required varies with density altitude, gross weight, c.g. position (weight in the front seat), angle of incidence of the airplane when loaded, amount of toe-in, and rigging of the airplane, and other things, like dragging brakes. Every airplane is different. Each builder should determine the distance he requires in his airplane to rotate at various gross weights and e.g. locations during the 40 hour test period.

**Lesson to be learned:** Take-offs with forward c.g.s or over gross, or both, require much longer distances.

9. **Emergency procedures:** If you must take off on a runway too short to brake to a stop after reaching rotation speed, lighten your load as much as possible (go somewhere else to fuel up), make sure you know the capability of your airplane, and make sure your engine is developing full power before you release the brakes. Remind yourself that every Cozy has an emergency brake, and the pilot should not hesitate to use it if he aborts a take-off or lands long and is running out of runway. That is to retract the nose gear (But do this before you run out of runway, not after). It takes one turn of the crank to put the linkage past center, and the nose gear *retracts automatically*. The worst that can happen is that you will lose the puck, and wear through the fiberglass under the nose, and you might strip the spur gear in the retract mechanism, but we will guarantee that you will stop mighty fast. We know. We did this accidentally once in our 3- place. We didn't even strip any gear teeth. We were away from home and were able to fly home to repair the bottom of the nose. Rehearse this in your mind as an emergency procedure. If you do it before running out of runway, it could save your airplane and perhaps even your life. In our judgement, in an emergency panic stop, it would be better to dump the nose than to risk melting the main landing gear, or run off the runway into a ditch or through a fence.

**Lesson to be learned:** In an emergency panic stop, you can stop in a hurry by retracting the nose

gear. You should also shut off the engine at the beginning of a panic stop, because even at idle, the engine and prop are generating thrust.

**In summary:** This accident did not just happen, it was caused by *a combination of pilot errors, i.e. poor decisions and mistakes*. A take-off was attempted with *full fuel* and *over gross* with *bad brakes* on a runway that was *too short* in an airplane that had a *history of being difficult to rotate*, probably because of *too much weight in the front seat* due to a *mistake in the initial weighing* and empty c.g. calculation. The builder *had not installed the more powerful brakes* recommended by the designer 9 years earlier. He did *not shut off his engine* the moment he decided to abort, and he *did not take advantage of* the one *emergency procedure* which could have enabled him to stop before running out of runway and to save his airplane. There is an old adage which says, "If one thing goes wrong, correct it at your first opportunity. If two things go wrong, land immediately. If three things go wrong, *you are probably going to buy the farm*". Keith was preparing to take off with more than 3 things wrong. He was very lucky he and his passenger were not both killed.

Are we being too hard on Keith? Actually, there was a Long EZ accident under very similar circumstances at Prescott AZ the first week of August. The pilot was killed and the passenger severely injured. We are talking about people's lives, folks! Vance Atkinson (EAA Safety Advisor, with an Airline Transport Rating, 16,000 total hours and 1,000 hours in his Cozy) reminds us, "the pilot in command is ultimately responsible for the condition of his aircraft and its performance". He says, "the FAA is very interested in our little homebuilts and the accidents we are involved in". ***This is the 3rd major Cozy accident in over a year, all due to pilot error. All were preventable!*** Vance says that, "this reflects on all of us, and if we don't get the trend down, the FAA will do it for us, and we won't like their methods". Also, accidents (even if pilot error) make insurance rates go up. We hope this critical review will help others to avoid a similar occurrence, and that is our purpose in presenting it here.

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## BRAKES

At the time the Long EZ and Cozy 3-place were designed, the only brakes available for homebuilders from distributors were the standard Cleveland 199-102 brakes. These had only 3/16" thick discs and were rated at 117,500 ft.-lbs. energy absorbing capacity. These are still being used on many high-performance homebuilts. Also, in the original Long EZ and Cozy designs, the master brake cylinders were installed on the firewall and actuated by cables connected to the rudder pedals. Cable stretch made the brakes feel soft. The combination of "standard" brakes and master cylinders on the firewall made braking only marginally acceptable.

When it was learned in July of 1986 that Cleveland also made a more powerful wheel and brake assembly, the "super heavy duty" 199-152, rated at 192,000 ft.-lbs. energy absorbing capacity, and ***certified for use for gross weights up to 2200 lbs.*** we asked our suppliers to stock these wheel and brake kits, and conversion kits. These assemblies had 3/8" thick discs and more powerful pistons and brake pads. They required an extra spacer on the axle to keep the same spacing between the disc and the strut. ***We recommended that 3-place builders switch to the newer heavy duty 199-152s in newsletters #14 and #17*** (If builders don't follow our advice, there is not much we can do about it.), and that is the wheel and brake assembly specified for the Cozy Mark IV. We also recommended that builders install the master cylinders in the nose connected directly to the rudder pedals, as shown in the newsletter and in the Mark - IV plans. This is the set up we have in our plans model which we consider to be quite

satisfactory.

There is still another 500 x 5 Cleveland wheel and brake assembly which can be ordered through our suppliers (not shown in their catalogs), it is the "high energy absorbing," 199-197, which is rated at 289,000 ft.-lbs. and has metallic brake pads rather than organic. A word of caution, however. The more powerful your brakes and the harder you use them, the more energy will be converted into heat in the discs, and the greater the possibility that heat trapped inside the wheel pants will damage (melt) the main landing gear strut. This has happened to some Long EZ pilots and 2 Cozy pilots that we know of, even though they had only the *standard* brakes. This is the reason we recommend that you wrap the gear leg (inside the wheel pants) with fiberfrax insulation covered with aluminum foil, install a metal heat shield between the disc and the gear leg, and *vent* your wheel pants so the heat will not be trapped inside the wheel pant, and also use brakes no more than necessary.

Calculations a couple of builders made for the amount of kinetic energy which must be absorbed to stop in airline after landing, based on gross weight are a *useless and misleading academic exercise*, because they assume that airplanes are going to land full of fuel at gross weight, and that brakes are the only force acting on the airplane. It's a good example of making the wrong assumptions and getting the wrong answer ("*garbage in, garbage out*"). Actually, you should never be landing full of fuel and at or over gross weight, and brakes are intended to be used only after taking full advantage of all other forces first. The space shuttle, which can afford the most expensive brakes in the world, uses aerodynamic braking (a nose - high attitude) and a drag chute first, before brakes. The Air Force uses flaps, aerodynamic braking, and drag chutes first. The Navy uses flaps, aerodynamic braking, and arresting wires first. Commercial airliners use flaps, aerodynamic braking, and thrust reversers first. *None of these land full of fuel at maximum gross weight.* As a matter of fact, if a commercial airliner is forced to make an unscheduled landing, it usually dumps most of the fuel first. The Cozy uses the normal parasite and induced drag of the airplane, aerodynamic braking by holding the nose tip as long as possible, a landing brake which creates drag, and the rudders, which were designed so that both rudders had to be deployed before the brakes were actuated, the friction due to toe-in and regular rolling friction, and the fact that you are usually landing into some wind, and you should not come to a dead stop anyway before turning off the runway. After touchdown, we normally hold the nosewheel off the ground (aerodynamic braking) as long as possible, leave the landing brake extended, deploy both rudders, and let our airplane coast, to save on tires and brakes. If there is any amount of wind at all, You can slow down enough to turn off the runway without using hardly any brakes. When the tower says to turn off on the next taxiway, we usually ignore it. Ken Murphy, who has our prototype and earns his living flying 737s, was in the habit of stopping airplanes (737s) as quickly as possible, after touchdown. He soon learned that if you are paying the maintenance costs yourself, it can be pretty expensive replacing tires and brakes, so now he lets the wind slow his Cozy down the same as we do.

To put the matter of brakes in the proper perspective, when Keith decided to abort his take-off, it was the equivalent of trying to land full of fuel and over gross weight (not allowed), at least 10 knots faster than normal touch-down speed (80 + kts vs 70 kts), without the benefit of aerodynamic braking (nose high) or landing brake (belly board), on *less than the last 1/3rd of a 3,000 ft. runway* (he might have had as little as 500' left). *Nobody in their right mind would attempt this.* Better brakes would not have saved him. He would have to have had a drag chute, or thrust reversers, or an arresting wire, or retracted his nose gear to stop before running out of runway. On Internet, someone suggested that MATCO wheels and brakes might be better than Clevelands. MATCO took over the Rosenhan line. We had them on our Vari-Eze. They were very poor quality. The discs were wavy, which made the main wheels shimmy, and we had to have them reground. Later, one of the discs cracked (it was cast iron) and we narrowly averted a locked wheel, and the cylinders failed several times (no brakes). Cleveland had a

reputation for much better design and quality. We have only used Clevelands since 1981. We recommend only what we know works.

In summary, we have found the Cleveland "Super Heavy Duty Brakes" to be more than adequate for the Mark IV, even on short runways. If you operate your Mark IV as recommended, they should be more than adequate for you too.

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## MORE ON BRAKES

Vance Atkinson writes:

9/19/95

Dear Nat,

After Keith's accident in California, I decided to look into my soft brakes. After all, it wouldn't look too swift if I ran off the runway after lambasting Keith for his stunt.

When I first started flying the Cozy, I used to change the brake pads every annual. They were cheap and I got a lot of peace of mind. However, things change and the price went from \$8 a change to \$30. So now I examine the brake discs and pads and replace only when necessary. Usually 2 to 2-1/2 years between changes.

A couple of years ago I noticed I was having to push the pedal in further to get the same stopping power results. Examination of the brake pads and system showed nothing amiss, including at least 50% brake pad left. A year later I was changing pads even though they didn't warrant it. This would get me back some of the pedal I lost. In short time I was back to pushing my foot through the floor again and only 10% wear on the pads. Pumping did help some. So I reasoned I must have air in the system! More purging. Brakes were a little better but still not right.

Finally, after putting in new brake pads, bleeding the system for the umpteenth time and still getting sagging brakes, I jerked out the master brake cylinders. What a glorious feeling when you tear something apart to find all manners of crud and corroding parts. YES! We hit the jackpot! There was a nice deposit of water in one cylinder, a goodly supply of mud or dirt (that's what it looked like) in both and a fair amount of crud evenly distributed between both. It cost me 5 bucks for new O-rings (4 each cylinder), about 2 hours of disassembly, cleaning, honing and reassemble, and 30 min. to re-pump up the system with DOT 5 silicon based fluid.

VIOLA, you guessed it, they work as brand new now. Amazing what a little preventive maintenance can do. As far as when to overhaul your cylinders time-wise, I don't know. Based on mine, I'd say around the 600 hour mark or 5 to 6 years. These units are very simple and take no time to overhaul. The 5606 fluid or the DOT 5 fluid does have an affinity for moisture so I suspect that our planes parked nose down, in the rain, will grab some water when your nose fills from normal leaks. If you are not getting braking like you should, check'em, it could make a difference!

Vance

*Editor. Vance has the acrobatic brake cylinders, which mount almost horizontally near the floor. Most of our airplanes take on a little water when parked nose down in the rain. Drilling a couple of holes at the low point in the nose allows any water to drain out before enough accumulates to submerge horizontally mounted brake cylinders.*

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## FLIGHTS INTO MEXICO

We were surprised to learn that Keith was planning to fly into Mexico without stopping at the first port of entry, Tijuana, to clear customs. Several years ago, some friends of ours flew their Cozys down to Puerto Vallarta, Mexico, without clearing customs at the first port of entry, and were fined \$500. We checked with the Mexican Consulate in Phoenix, who told us it was permissible for private aircraft to overfly the "first" port of entry and clear customs at some other international airport. The EAA checked with the Mexican Embassy and Mexican Military Attache and were told that private aircraft **MUST** land at the first approved port of entry to clear customs, so it appears that the Mexicans themselves don't agree on the rules.

Unfortunately, there are military "Comandantes" at these international airports, and when the Comandantes has guards with sub-machine guns sitting outside the terminal guarding airplanes, you have to accept his interpretation of the rules; the Mexican Consulate in Phoenix wouldn't be much help. The way to avoid any risk of being fined (or shot) is to land at the "first" port of entry, clear Mexican customs, and then continue on. This, by the way, is the rule when entering the U.S. as well, i.e., you **MUST** stop at the first port of entry. Shouldn't we offer Mexico the same courtesy?

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## MARK IV CHANGES/CORRECTIONS

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## WARNING: ACROBATICS NOT PERMITTED

We wish to remind you that Cozy Mark- IV is classified in the normal category, which is non-acrobatic. For the purpose of this discussion, acrobatic flight means an intentional maneuver involving an abrupt change in an aircraft's attitude, or an abnormal attitude, or an abnormal acceleration, or any high-g maneuver not necessary for normal flight. The reason for this classification is that primary mission of the Cozy Mark IV is a family-type, high-performance, cross-country airplane. It will not do any stall maneuvers, we don't think it will fly upside down, and it builds up speed very fast if the nose is pointed down. The Cozy Mark IV ***has not been tested in acrobatics***, nor do we have any intention to, because it would set a bad example. This would be a good time to remind builders not to exceed the maneuvering speed, 140 mph IAS, in turbulent air, and not to exceed the never exceed speed, 220 mph IAS, ever (see Owner's Manual, p. 24)! You could be in danger of exceeding these speeds if you engage in low-level buzzing or dive through a hole in the clouds!

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## LOWER WINGLETS

In our aft c.g. flight tests, which we reported in our newsletter and also in Sport Aviation and Kitplanes magazines, we found that lower winglets were necessary to provide lateral stability at aft c.g.s and high angles of attack. Without lower winglets and before shortening the canard span, and at aft c.g., Jim Patton was able to stall the main wing in a banked turn, and the airplane flipped over and considerable altitude was lost before he was able to effect recovery. After installing lower winglets, and before shortening the canard, he was still able to stall the main wing, but the aircraft did not roll and lose altitude. After installing lower winglets and shortening the canard, the main wing could not be made to stall within the approved c.g. range. We noted that the *Berkut* crashed during an acrobatic demonstration at the Santa Paula Airport Saturday, 8/12/95. The report we heard stated that it was being flown at *aft c.g.* and exhibited *lateral instability* during a high-g (high angle of attack) 360 degree banked turn. *It flipped over and went in, killing the pilot. It did not have lower winglets!*

We also noted that Jeff Russell's Aerocanard did not have lower winglets as exhibited at Oshkosh. Beware of anyone who says that lower winglets are not necessary (it is difficult to prove a negative), but has not conducted the exhaustive aft c.g. flight testing that we did. They are living dangerously and setting a bad example for builders! We hope they (or their builders) do not suffer the same fate as the pilot of the *Berkut*! Another old adage: "One who ignores history is destined to repeat it!" *Lower winglets are mandatory on all Cozys!*

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## LYCOMING ENGINES

Superior advises that they have let contracts for crankshafts and crankcases for the 0-360 Lycoming. They expect the first parts to be delivered in November, and installed in a test cell in January. If things go well, they hope to have FAA certification in late summer '96 and be in production in late fall. There would still be some parts (like connecting rods) which they could not supply new, but would have to be obtained on the used market. They aren't willing to commit to prices yet.

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## ALTERNATE ENGINES

**Auto conversions:** We have tried to save our builders unnecessary expense and unfortunate experiences by explaining why we think auto engine conversions are not an acceptable choice for the Cozy. This notwithstanding, a few builders must learn the hard way. Merle Musson lost a lot of money when he installed a Blanton Ford V6 and then tried to sell his Cozy with this auto engine. More recently, we understand that Larry Olson, after spending a lot of money trying to make a Mazda 13B work, is now trying to sell the Mazda and is looking for a Lycoming. We know of another horror story involving a Buick V8. We understand that one or more builders are now thinking they can make a Subaru work. We think they will be wasting their money, but we wish them luck!

**Franklin 6A 350 C1:** We think the most promising alternate engine for the Mark IV might be the Franklin 6A-350 engine, particularly for builders who intend to load up the front seat, because the Franklin is somewhat heavier than the Lycoming. The Franklin is 6 cylinder and rated at 220 hp at 2800

rpm. It has a long history and good reputation in airplanes, and because it is 6 cylinder with a vibration dampener, it runs very smoothly. It is being imported for \$11,800 new, without accessories, i.e. no mags, starter, alternator, fuel pump, carburetor, or oil filter. It looks like satisfactory accessories either are or will become available. We are hoping to evaluate a Franklin in our plans model. A word of caution, however. Quite a bit of engineering development will be required, involving a new engine mount, a new cowling, new baffling, etc. We will have to determine whether weight and balance is acceptable, and then of course comes flight testing and a determination of reliability. This will take time. We will keep you advised of developments.

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## **ELECTRIC NOSE LIFTS**

Bill Oertel, in Palmdale CA (909) 734-7569 sells a ready made electric nose lift for around \$1000 to \$1200. It is capable of lifting the nose of the Cozy with at least one, and maybe also two people in the front seat. Vance Atkinson (817) 354-8064 has designed and installed in his Cozy an alternate electric nose lift which is a little more compact and lighter, and less expensive to install. He said it added about 8 lbs. to the nose of his airplane. He has a 6-page set of drawings and instructions, which lists the source and cost of the parts and materials required. If interested, contact Vance for more information. But remember, every extra pound you add to your airplane reduces performance. We recommend that you build your airplane according to plans first, and then decide how much performance you are willing to sacrifice.

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## **CAUTION - RETRACTABLE GEAR**

Infinity Aerospace is advertising a retractable gear for the Cozy 3-place and Mark IV. This company has not purchased plans from us, nor have they built a Cozy and installed the gear and flight tested it throughout the approved flight envelope, much less the higher speeds they claim can be obtained. They do not have our approval. We are concerned that mounting the gear on the centersection spar, and cutting through the bottom of the strake will weaken the structural support of the wings and could lead to an in-flight catastrophic failure. We think it is unethical to promote a design change for someone else's design which has not been flight tested for the claims made in the advertised application. Be forewarned! It is your life! Not everyone in this business is ethical.

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## **COPPER STATE FLY-IN**

The Copper State Fly-In is scheduled this year for October 12th to the 15th at Williams Gateway Airport in Mesa, only about 10 miles away from our home. Formerly Williams AFB, this airport has better runway and ramp facilities than any other major fly-in. We hope it will rival Arlington and Sun'n Fun. We plan to have our airplane and a booth there, and will also have a forum. We already have most of the space in our home spoken for, but might have room for one more couple. If we can get enough Cozy builders to attend, we might even arrange a banquet. How about letting us know if you plan to attend?

## BUILDER HINTS

1. Sometimes we make a mistake and send two newsletters to the same builder. Sometimes newsletters are returned to us because the builder moves without leaving a forwarding address, or it expires. Sometimes newsletters are returned to us because the address is mangled by the Post Office. If you don't receive your newsletter, or get more than one, please let us know.
2. Some builders have had difficulty making the fuel valve bracket shown in Chapter 6, p.4, Fig. 17, because the aluminum cracks when they bend it. The rule of thumb when bending aluminum is that the bend radius must be greater than the thickness of the sheet. To make these bends you will need to bend the aluminum around a block of wood (hardwood preferred) with the edge radiused to 1/16" or more, and the included angle of 80 deg. or less, because the aluminum always springs back at least 10 degrees.
3. Avemco, in cooperation with the EAA, has developed an insurance plan for builders. If you use the EAA Technical Counselor Program, you can earn a 10% discount on insurance of your project while it is under construction. If you use the EAA Flight Advisor Program to prepare you for your first flight, you will be covered for your first flights, including the first 10 hours and the first 10 takeoffs and landings. If you join and participate in your local EAA Chapter, you will qualify for an additional 10% discount on premiums. They also have a disappearing deductible feature in the event you suffer a major loss, meaning you have full hull, liability and medical coverage.
4. A builder writes, "Canopy plexiglas can be cut very EZ with a fiber reinforced cutoff wheel available as a Dremel accessory. We are not talking about the thin and fragile carborundum wheels. The ones we found come in a 3-pack, and are similar to cutoff wheels sold for drills or right angle grinders, only smaller. On the Dremel they breeze through plexiglas without a hint of binding. Run them at high speed for best results.
5. He also writes, "The FAA recently published a new circular, AC 90-89A, entitled AMATEUR-BUILT AIRCRAFT AND ULTRALIGHT FLIGHT TESTING HANDBOOK. Besides being full of good info, it is also a "good read". There is a chapter devoted to testing canard aircraft. Order from US Dept. of Transportation, Section, M-45-03, Washington DC 20590"
6. Al Wick suggests:
  1. Taking advantage of the 10% discount offered by Aircraft Spruce or Wicks on large orders or orders at Oshkosh.
  2. Using Hershey chocolate syrup pumps to dispense epoxy in conjunction with the balance.
  3. Getting more mileage from brushes by wrapping them in Saran and tossing them in the freezer.
  4. Machining your own stainless landing gear bushings???

5. Using a laptop computer and software in lieu of panel instruments???? Far out????

7. [Jim White](#) has made some improvements to the acrobatic brake cylinder installation we described in newsletter #47. If interested, contact him at (503) 690-7533.

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## LETTERS FROM BUILDERS

8/18/95

Dear Nat & Shirley

Thank you for letting me "try on" your Mark IV for size at Oshkosh. At six feet tall and 200 lbs., I felt comfortable in the left seat. Now that I know I will fit, my next step is to visit with anyone building for flying in my area. I would appreciate knowing of anyone within 150 miles of Milwaukee, WI.

Dr. Jay Hellmann  
Germantown, WI

7/31/95

Nat,

I have just removed the fuselage from the jig used to assemble the sides to the bulkheads. Although I spent a lot of time 'setting up', it was well worth it when I took one last set of 4 leveling measurements just before I removed it from the jig and all bubbles were perfectly centered.

[John Fritz](#)  
Roswell GA

6/24/95

Hi Nat,

I am taking over Terry Latino's Cozy III project #172. Terry did a fantastic job and I plan on finishing the great job he has done. I have built a Verieze so I know what still has to be done on this Cozy. It will be great having my bride (of 10 years)/navigator sitting next to me instead of behind me. Fly safe and EZE (now COZY!!!)

Chuck Charles  
Inverness FL

8/7/95

Nat & Shirley,

We met you at Oshkosh with our two small children and made the final decision to go ahead with building a Mark IV. I am an Air Force B-52 pilot and a material engineer, and the Cozy seems to be a plane well-suited to my needs and desires of how an airplane should be built and what it should fly like.

Enclosed is my check and rush us our set of plans, since we are really looking forward to getting started. It was very pleasant meeting you and we look forward to dealing with you closely on the project in the years to come!

Shannon Kruse  
Minot AFB ND

5/6/95

Dear Nat & Shirley,

We have already built a Varieze here in Venezuela and it's flying beautifully. We began building our Cozy MK IV in August last year. We are really enjoying this one because we see many improvements on structure and design.

To this date we have the fuselage on wheels with wings and winglets attached as well as strakes. Also we have done the canard, turtle deck with windows without canopy. We are working hard on the rest. We expect to install a Continental IO-360 (spare from our Cessna) and expect to be flying by the end of this year. You'll be the first to know. Thanks very much for all the help we have received from you.

Ruben Leon  
Caracas, Venezuela

7/4/95

Dear Nat,

Enclosed is a check for the Owner's Manual. not quite ready for it but thought I'd get it now.

The project is going great. Will miss Oshkosh this year - sold the Varieze and have no airplane now. I'm installing avionics and engine/cowl. At this point *just under 10-1/2 months since I began*. The plans are great and allow me to go fast.

Frank Bibbee  
Bedford TX

6/20/95

Dear Nat & Shirley,

Tom McNeilly's suggestion (newsletter #50) for solving the problem of sufficient elevator travel when mating it to the canard - what a wonderfully simple and logical idea!

Its a funny thing, but I have been held up with this mating procedure by various things like returning the offsets to Brock for some additional machining. I continued work on the seats, armrests and nosewheel assembly. Then in the mail this morning came newsletter #50. I now realize what the holdup on the canard was all about. I was just waiting for these McNeilly modified "L" templates. Many thanks, Tom!

Keep up the good work on your piloting, Shirley. Best wishes to you both!



Bob & Angela Allen  
West Sussex, England

8/7/95

Hi Nat & Shirley,

I really enjoyed visiting with you at Oshkosh and seeing N14CZ again. I hope that you had a safe and enjoyable flight home. I am now starting Chapter 9 and have ordered the materials from Wicks at Oshkosh for the 10% savings. My newsletter #49 disappeared and would like to get a replacement, please. I was also wondering about the engine in a box that Superior was working on. I will watch for a reply in the next newsletter.

[John Williams](#)

Heaton ND

6/13/95

Dear Nat,

Please renew my newsletter, I really get great pleasure from the newsletter. In #49 I noted Bud Davis's Mark IV upside down in a hangar in Auburn AL. It would really whet my taste buds to go down to see his progress. Could you send me his phone number so I could ask permission? Maybe my wife has enough flower beds and we can now get underway.

Thank you for all your time and effort testing the Mark IV's main wing stall resistance. It gives me great confidence in a trustworthy stable design. I feel that there is no other aircraft available that provides so much for so little. Thanks again for your years of continued involvement,

Harold Knapp Jr.  
Birmingham AL

7/19/95

Dear Nat,

Another year! There is truth to the old cliché, "Time flies when you're having fun". Building the Mark IV has been a real joy. It has been 2-1/2 years since I started, and am now past the "boat" stage. The fuselage is on gear, the turtleback and canopy are installed, and the seats, armrests, flight controls, etc., are in place in the interior. It is now time for the strakes. While I'm sure it is possible to have completed in the time I have spent, I work at a pace and quality standard that I find comfortable. ENJOYMENT - isn't that what it's all about?

As I progress through the chapters, I gain greater appreciation for the huge investment in time and energy that you have spent, and continue to spend, on the builder's behalf. From the quality of the plans, to the flight test program to your availability on the phone, we know your care. THANKS!

Oops, I almost forgot to renew my subscription to the newsletter. By the way, getting a newsletter written, compiled, printed, and mailed is another large chunk of time that you invest - and we appreciate. I almost forgot to thank your wife, Shirley (could this mean I am getting old?). Any

commitment as large as you have made requires an understand and supportive wife. Thank you both!

We live less than 5 min. from Nashville's airport (BNA), so if you are ever in the area, we would be honored to have you as guests. Until we next meet, I wish you good health and good flying.

Michael Link  
Nashville TN

6/20/95

Dear Nat & Shirley,

I was up in Columbus OM at an Alexander Aeroplane workshop (highly recommended!). We met in a T hangar at Bolton Field and I had told the class that I was building a Cozy IV. Part way through the class one guy said, "Hey, isn't that a Cozy?" Sure enough, there was a Cozy being rolled out behind me. I immediately ditched the class and headed over to check it out. I was surprised to find that the owner was [Ron Kidd](#), a Cozy pilot I have traded messages with on the Internet! He has a beautiful Cozy and was good enough to offer me my first Cozy ride (OK, I begged)!

Ron is a big guy and I am an FAA pilot +30 lbs myself. Ron had widened the fuselage 2" but we were still snug. We used about 3500' of runway before we leaped into the air. He got it trimmed out and turned it over to me. WOW! What an airplane! This thing is ROCK STABLE! I first tried some gentle turns and found myself gaining altitude as I was using too much back pressure. Control forces were light and well coordinated. We were zooming along about 160 mph and it felt like I was driving a car. Ron said that many people said it was like riding on rails. Later in the flight, I blurted out the same comment. It was very quiet too. This is a GREAT airplane!

We flew to another airport, landed and got some fuel. With so much weight in the front seat (us) Ron touched down about 110. We flew back to Bolton where Ron kindly gave another builder a ride.

Much thanks to Ron for giving me my first actual Cozy flight after building for three years. I would encourage all Cozy pilots to pro-actively invite Cozy builders for a ride. It really helps the motivation and helps avoid builder burn-out. I'm more anxious than ever to get back to building the Cozy.

In the recent Cozy newsletter, you had a good article on builder changes. After my discussions with you and other Cozy builders, I have decided to go back to the NACA scoop and the per-plans fuel system. Having had the experience of making the NACA scoop (then filling it in) I should do a better job on the second one. Congratulations again on developing such a great airplane!

[Sid & Mari Lloyd](#)  
Houston, TX

8/10/95

Mr. Puffer,

Please find enclosed a check for the plans. I have researched the kitplane market for 8 months and decided the Cozy to be the best aircraft for my needs. I have had excellent remarks on this aircraft, and look forward to start building as soon as possible. I am a first time builder, with no previous experience

in composites.

Brad Ballew  
Birmingham AL

6/20/95

Dear Nat & Shirley,

Now that I'm feeling better, I just started again on the Cozy. I can finish up several chapters a week. There are many things almost done.

Thank you for a great job on clear instructions! I won't get to Oshkosh this year, but maybe fly it next year and bring Blanche with me. We really enjoy all the magazine articles on the Mark IV-Sport Av., Kitplanes, Private Pilot, etc. The one in Sport Aviation 4/94 on flight tests was the best of all. Nat, you are a great guy, doing a fabulous job. Good luck and God Bless!

Steve Overly,  
Grove City OH

8/31/95

Dear Nat,

I apologize for slipping off your mailing list. As a favor, I would like to get in touch with builders in my area. Please publish my phone number, (214) 414-3667. I live in Garland TX, just north of Dallas. I know there are a number of Cozy builders in the area, and would like to get in touch with them. I am an A&P, a pilot, and I've spent 3 years at Superior Air Parts inspecting engine parts, and a year as the lead technician in the hose shop. I feel I could possibly lend a hand (and build experience).

I am trying to attend Sun 'n Fun '96. I will only have two days to spend there, and would like to make the most of it. Which days to you recommend? ***Editor. Saturday, and either Friday or Sunday.*** I would like to talk to many builders and take a look at their airplanes. Thanks for everything.

**Todd Carrico**

Garland TX

9/17/95

Dear Nat,

I had my Cozy nearly completed but a job relocation and a move to a 200 acre farm caused me to put my project on hold. Before I knew it, 8 years had passed! I have the airframe finished, controls rigged, and engine installation complete. I need to install instruments and finish the exterior. A lot to do yet, but nothing compared to what is done. I have rebuilt a spam can in the time off the Cozy and got an instrument rating. When I started back on the Cozy, I just couldn't believe I didn't just finish it, I was so close. There are a few benefits now - the avionics are going to be much simpler, just a single nav/com with glide slope, marker beacon and audio panel, transponder and ADF. A handheld com and GPS should make a fully capable IFR plane. Thanks for designing such a wonderful plane!

Tim Freeze  
Fishersville VA

6/22/95

Dear Nat & Shirley,

My prosthesis for flight, Cozy FPFMP, is still really enjoyable to use. Recently Marie and I attended "Montpellier Composites '95. 27 canards appeared from Switzerland, Britain, Germany and France. In France, I am the only one with the 0-235 C2A engine, in a Cozy. Some Longs had this engine too. I confirm that with a low pitch prop and not over 1500 lbs gross, it is a very good flying platform. Like Shirley, Marie hates bad weather. However she prefers flying in the Cozy rather than the 172; visibility, turbulence, seat position, and even noise. I don't fly fast: 120 kts/2300 rpm. and 20 L of gas an hour. Calculations are easy, noise is light, sipping is light, and the engine is happy too. I use a handheld GPS, and it is quite sufficient. As for CHTS, I am now in the 300 deg F range after paying attention to leaks around the alternator, starter, and baffling. At climb, max is 400 F. My oil temp when climbing can reach 240 F, but as soon as I level out, it goes back to 170-180 deg F, depending on outside temps. I am thinking of using #8 hoses instead of #6 to the oil cooler (**Editor - YES!!**).

I met Klaus Xavier in Montpellier. He said the vents in my wheel pants generates a lot of drag and suggested I close them. (**Editor. NO!**) I closed them, and there was no change. He also said that the pitch trim change with the GU canard was caused by insufficient gap between the elevator and canard. Your opinion? (**Editor. This is news to me!**) I am still happy with the 76 VGs (to eliminate the pitch trim change) on my GU canard.

I have no problems with the "ram" air induction system mounted directly on the carb and using the air filter from the 2CV Citroen car. Please find a photo enclosed. The principle is exactly the same found on the J3 50 years ago. If all goes well, we plan to go to Sun 'n Fun '96 - but not with FPFMP! Aeronautically yours and friendly regards to you two.

Marc Pichot  
France

6/6/95

Dear Nat & Shirley,

I just wanted to say once more thanks for your hospitality at Lakeland. We had a wonderful time at the show and seeing all our good friends in aviation.

We were very touched by the spontaneous ovation we received at the Cozy banquet by all the folks present. So much so that I wanted to say something in appreciation, and just could not say anything! I would like you to mention it in the newsletter that we **really** felt that token of friendship!

After Sun 'n Fun we went to visit friends and family in Orlando and Melbourne. There I tried to get in contact with Cozy builder Tom Gross (N144CA) without luck. Later on I found out that he was at Cozy lane at Sun 'n Fun for a day and we missed each other. Same thing with Terry Schubert! On our way back we went to Miami again and stayed with my daughter until Monday enjoying all four grandchildren!

Unfortunately, Rosita got sick with all that exposure to people with colds, and the high pollen count of southern Florida. After we came back she landed in the hospital with a bad case of athsmatic bronquitis.

I am back at the shop, working on the right wing, installing antennas and rudder cable conduit before skinning the top. I had trouble glassing the interior of the wing attach bolt access holes, because I had widened the recess where the ratchet touches the sides, to allow more "play" on tightening the nuts. When Rosita looked at the shape of the hole, she made a comment (deleted) which gave me an idea for keeping the glass in place while curing. I inflated a **condom** and pressed it down into the hole with weights, until the layup cured. It came out perfect, not a single air bubble! If you recommend the system (not patented), use the thick rubber", anti-aids, **unribbed**. I call the method: **SAFE LAYUP!** Photos enclosed.

Cordially  
Armando & Rosita  
San Juan, Puerto Rico

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