

[\[Newsletters\]](#)
[\[Cozy MKIV Information\]](#)

[\[Prev\]](#) [\[Next\]](#)

COZY NEWSLETTER #63

October, 1998

Table Of Contents

- [WHAT WE HAVE BEEN DOING](#)
- [SQ \(SPEED QUEEN\) 2000](#)
- [INTERNET](#)
- [ELECTRICAL SYSTEMS](#)
- [BRAKES](#)
- [PARTY](#)
- [\\$\\$\\$\\$\\$\\$\\$\\$ 4 U - \\$100 OR STRONG PITCH TRIM](#)
- [AWARDS](#)
- [FIRST_FLIGHTS](#)
- [READY TO FLY](#)
- [WEIGHTS](#)
- [CABIN HEAT](#)
- [STEP](#)
- [COPPERSTATE_FLY-IN](#)
- [AUSTRALIA ANYONE](#)
- [ENGINES](#)
- [ENGINE FIRES](#)
- [DELAMINATIONS/HARD SHELLING](#)
- [PROP DAMAGE](#)
- [PLANS CORRECTIONS](#)
- [BUILDER HINTS](#)
- [FOR SALE](#)
- [PROJECTS FOR SALE](#)
- [COZY MKIV FOR SALE](#)
- [NEED HELP WITH YOUR PROJECT?](#)
- [LETTERS FROM BUILDERS](#)

[Newsletter Info.](#)

[Subscription Info.](#)

[Authorized Suppliers](#)

Please note that Saber Mfg. has moved to a new location, close to Performance Props.

Note also that Jeff Rogers is now sole owner of Airplane Plastics, and has moved to a new location.

Featherlite is now making the same propellor that Bruce Tift used to make, with Bruce's airfoils and tooling. We previously tested and approved this prop. It is 2-bladed and very reasonably priced. Also, Sensenich is building a prop for us to test. We will be anxious to see how it compares to our Performance prop.

WHAT WE HAVE BEEN DOING

We left on our annual Arlington-Oshkosh trek a couple of days early on July 5th. Lee Parlee flew down from Rockford Illinois to man the office in our absence. July 5th just happened to be the first day of the Monsoon season, that is, the flow of moist air up from Mexico, which can cause some violent storms in the desert, where we live. We got off the ground just ahead of a line of thunderstorms advancing from the south. In northern Arizona and Southern Utah, there was a huge cell that we had to avoid by diverting to the east. We landed at Boise, Idaho to refuel and check weather ahead. The Cascades were socked in with a Marine overcast, so we had to divert to Portland through the Columbia River Gorge, and then fly up the coast under the overcast. Our destination was Port Townsend on the Olympic peninsula, to visit our friends and Cozy builders the Wickstroms, for two days until the show opened at Arlington.

On the 7th we made the short flight across the Sound to Arlington, and parked our plane in the display area. The weather the next few days was bright and sunny, and very enjoyable. The Wolcotts passed thru briefly in their Mark IV on the way to the San Juan islands. Otherwise, no other Cozys showed up. A lot of Cozy builders did, however. On Friday evening, the Westlands held a cook-out, and about 25 builders attended. Eric's Mark IV was all painted and just about ready to move to the airport. All of us admired his work.

The marine overcast layer returned on Saturday and Sunday with marginal VFR weather. We were concerned about getting out, but mid-morning and Sunday we spotted a few holes in the overcast, took off and flew over the top of the overcast over the Cascades and Rockies. We landed at our favorite overnite, the Olive Hotel in Miles City, Montana. The next day it was on to Duluth, Minn. to visit youngest son Duncan and wife, Stephanie. Stephanie works for the local ABC station and had a reporter and camera crew come out to do an interview and films, including take-off and a high speed pass, which they showed on TV that evening (guess there wasn't too much other news that day). We then worked our way down to Rochester, Minn. visiting our other 3 children, spouses, and grandchildren on the way.

On Sunday, July 26th, we flew over to Oshkosh and set up our display at the south entrance to Exhibition Bldg. A. We had made an appointment with Ed Kolano to flight test our Cozy on Tuesday. He has been writing a series of evaluations of various homebuilts for Sport Aviation. We are anxious to see how his evaluation of our Mark IV compares with those he made of the Berkuit and Velocity and other designs. By Tuesday, the air traffic was really viscious. There must have been about 25 airplanes orbiting over Lake Winnebago, from P-51s to Cessnas, all trying to get in line for final on runway 27. That is why we always try to arrive at Oshkosh a few days early, hardly ever agree to fly during the show, and always wait until after the show is over to leave.

Our forum went well on Friday. One of the subjects we discussed was insurance. We had attended a dinner meeting a day earlier hosted by the insurance industry for designers of some of the more popular homebuilts. There we learned some of the considerations insurance companies have in deciding whether to insure various designs, and how they calculate the risk, and therefore the premiums. They like to have a data base of at least 100 airplanes that are all the same. They made a big pitch to us to try to talk builders out of making changes. They calculate risk by the accident rate and the size of the claims. They like to see an accident rate of less than 5 per year per 100 airplanes flying. They said the rate for Cessnas was 1 per 100, and for Cozys was less than .5 per 100. We were very pleased with that. They said that the flight advisor program of the EAA has significantly reduced the accidents during the first 10 hours of flight. They said that the majority of accidents are caused by pilot error, not mechanical

failure. Each of us contribute to the safety record which affects all of us, so thank you for flying safely!

We had about 80 attendees at the Cozy banquet on Friday night. We learned that there would have been a few more if we had just waited a little longer to provide rides. The food and camaraderi were excellent. The speaker briefed us on the progress of the Delta Hawk diesel aircraft engine. It sounded like they will soon be ready for flight tests.

We were not able to get down to the flight line very often to look at the Cozys, which we regret. We counted 8 three place Cozys and 5 Cozy Mark IVs, and we may not have counted them all:

Cozy III

Atkinson

Solinger

Oelmann

Suminski

Reider

Esselstyn

Brown

Denk

Mark IVs

Co-Z Dev.

Beduhn

Koster

Domeier

Elkind

Oshkosh just keeps getting bigger and bigger each year, and many echo the sentiment that it has gotten just too commercial. Apparently Paul Poberezney is even disturbed about what is happening, and has decided to re-activate his Sport Aviation Assoc. which will be more sport aviation oriented. We saw a first at Oshkosh. An above ground swimming pool where you could learn to scuba dive!

We said hello to Marc Zeitlin at the Bose booth. He demoed the Bose noise cancelling headsets to Shirley and me. Quite impressive!

The weather at Oshkosh was great until the last two days. Oshkosh was socked in, and the whole mid-west was affected by a stationary front and IFR or marginal VFR conditions. It looked like the weather would be bad for another whole week. But on Wednesday, mid-morning, Oshkosh briefly went VFR, so we got out, flew north and then west to South Dakota, under very marginal conditions. We refueled at O'Neil, Kansas, and then stopped at Pueblo overnight. The next morning it was clear all the way home to Mesa AZ. It was also cool at 12,500 ft, but boy, was it warm (over 100F) when we landed.

We sold out of plans and information kits at Oshkosh, and had to get more pass-outs printed twice at Kinkos, and a number of people since have ordered plans because they liked our airplane when they saw it at Oshkosh, so we would have to say that Oshkosh was very successful.

SQ (SPEED QUEEN) 2000

We have received several phone calls from SQ2000 builders. Apparently there are about 37 whose projects are in question now that Glassic went under. They were interested in whether we could help them finish their airplanes. We question the wisdom of trying to finish these airplanes, because we have heard that the factory prototype had never met the rather extravagant claims being made for it, and we doubt whether it had ever been thoroughly flight tested throughout its proposed flight envelope.

One of the principals of this company was Stan Montgomery, who originally taught composite construction for Ron Alexander in his Sport Air Workshop. He left under unexplained circumstances to make pre-fab parts for Shirl Dickey's E-Racer. Shortly thereafter he decided to market a 4-place kit patterned after the Velocity, but using the E-Racer wings and canard, and the Infinity landing gear. He started selling pre-fab kits before he had built and tested one himself. The specifications projected for this airplane were hard to believe. We heard from one of our propellor suppliers that he had supplied several propellers for the factory prototype, but it still could not come close to the projected specs.

It is unfortunate that 37 builders lost their money, but it is also a reminder that if you are going to trust not only your money, but also your life to someone, you should check their background first, to find out where their design came from, whether they thoroughly test their kits before they sell them, how many airplanes they have flying, and what kind of safety record they have.

INTERNET

We took a lap-top computer with us on our sojourn, and were able to plug into a phone line most places to monitor the subjects being discussed on the Cozy builders chat group, and also answer our e-mail. We also got to meet in person for the first time some of the builders who are quite active on the internet. We weren't able to plug in at Oshkosh, so when we got home we had 157 messages. For those of you not on the internet, what typically happens is that someone will raise a subject, like pitot tubes, relief tubes, landing lights, strobe lights, cabin heat, etc., and then for the next few days this topic will be discussed, with many builders volunteering their ideas and opinions. Sometimes I volunteer background information, or explain why something is recommended to be done in a particular way in the plans.

ELECTRICAL SYSTEMS

Following my admission in the last newsletter that we had an electrical failure on the way to Sun & Fun, when the field wire to the alternator failed at the connector, I got an e-mail letter from Chuck Wolcott:

Hi Nat,

Wanted to let you know that I lost my alternator last year just as you reported in the Newsletter. It occurred on the way home. I was only 20 minutes away, so I just continued. At the time I had the plans

hand crank for the nose gear. The problem was exactly the same as you reported. The wire to the field winding broke at the crimp connector. I used the B & C alternator (probably the same as the one you have) but didn't even think others might have this same problem! I just thought, due to my inexperience in this airplane stuff, I didn't provide adequate vibration support for the wire. My fix was similar to yours and now have the wire well supported.

Since that incident, I installed Steve Wright's electric nose lift. Interesting to note...during the installation, I snapped off the 1/4" drive shaft as I was adjusting the stops. I will have to admit that I may have put a small side load on the shaft as I was adjusting the position. I discussed this with Steve, as I am sure you have. He indicated the shaft is designed to "break" before it might cause severe physical damage to the airplane or the operator's hand in the event the operator forgets to disengage the power to the unit (at circuit breaker and switch) during manual operation. I let him know at that time I was not pleased with the relative ease with which the shaft snapped. He convinced me that the shaft should be left as is. Designed to fail under stress for the operators safety. He promptly sent out a replacement shaft at no charge. I did NOT want to fly the unit without the manual override capability.

After your report, I am considering replacing the welded shaft with one that has not been welded. I would appreciate your thoughts on this.

Editor: I replaced mine with a very substantial shaft which I am sure will not break!

BRAKES

Cozy builder Robert Kittler called our attention to the fact that Cleveland has a super high energy wheel and brake kit CWB199-197 which is the same as the super heavy duty kit CWB199-152, except it has metallic brake linings. This increases the kinetic energy limit from 192,000 ft/lbs to 289,000 ft/lbs. It also follows that you can replace the brake pads on the CWB199-152 to metallic to get the higher kinetic energy rating. We discussed the fact that the kinetic energy absorbed by the brakes ends up in the brake discs as heat, and they can get red-hot, if you apply enough brakes. It is therefore important to use no more braking than absolutely necessary, to wrap the gear strut with insulation, to install heat shields between the discs and strut, and to ventilate the top of the wheel pants, to dissipate the heat.

In the maintenance area at Oshkosh we saw a NASA Long EZ that had melted the main gear strut, both sides. It had no heat shields installed and the wheel pants had not been ventilated at the top. No insulation was apparent on the strut. Obviously, the pilot had used very heavy braking. It was being debated whether the gear could be repaired well enough to fly it back to the home base, or whether it would have to be trailered.

Builders have asked about MATCO wheels and brakes. From our own experience and that of others, they are not as high quality as Clevelands nor are they as customer friendly.

A PLANE PARTY

Our good friends, Gene and Carol Davis, hosted a "plane" party Sunday, August 30th, to show off their newly completed Cozy Mark IV, N42CZ, to their friends and to help them celebrate. There must have been 100 guests in attendance, including a number of local builders. Their Cozy is really a work of art, and one of the finest examples we have ever seen. We are sure that they will win awards wherever they show it. We hope that we will have a first flight report from them before this goes to press.

We first met Gene and Carol in the early 90s, when Gene volunteered 1 day a week to help us finish our plans model Mark IV. He subsequently purchased a set of plans. We loaned him our 3-place Cozy N22CZ to fly while he was building. He and Carol flew it to Oshkosh the year we donated it to the museum. We will forever be grateful to them.

\$\$\$\$\$\$\$ 4 U - \$100 OR STRONG PITCH TRIM

EAA members, and readers of Kitplanes magazine love to read about what other builders are building and flying. We have a lot of builders who are flying, but never sent in pictures to any of the magazines. Maybe they didn't think it was worth the effort. So we decided to increase the ante. When we mentioned this to Alex Strong, he suggested we offer builders a free "Strong" electric pitch trim, or, if they have already purchased one, \$100.00, for any pictures and descriptions or articles published in Sport Aviation or Kitplanes Magazines.

Let us know when you submit (so we can watch for it to be published) and let us know what you wish to receive. Submit your pictures and write up to:

[Publicity Addresses](#)

AWARDS

To date, we have sent checks for \$100 or a Strong pitch trim kit to the following for the favorable publicity they have received on their Cozys:

1. Mike Davis, (June '98 Sport Aviation)
2. Mark Beduhn (August & September '98 KitPlanes)
3. Patric Colin (July '98 Sport Aviation)
4. Rueben and Carlos Leon (Article, Sport Aviation)

A short time ago we got a call from Paul Lampasso, in New York. He said that Chris Scida gave him a ride in his Cozy Mark IV, and he was so impressed that he wanted to order a set of plans. Satisfied customers are our best advertising. A check for \$50 is on its way to Chris Scida.

We want to remind you again that we had some very nice plaques made by Cozy builder/artist Lon Cooper to honor those builders who have passed the milestones of 500 hrs. and 1000 hrs. on their Cozys. These are really attractive, and truly a work of art, suitable for mounting on the headrest of your airplane, or in your trophy case, or on the wall of your office. 500 hrs. gets you silver, and 1000 hrs. gold. We would like to award these at Cozy dinners at one of the fly-ins. Let us know ahead of time if you qualify.

FIRST FLIGHTS

The following first flights have been reported to us:

1. Michael Link 6/13/98
2. David Domeier 6/18/98
3. Barjon 8/9/98
4. Brice Daunay (date not known)
5. Gene Davis 9/8/98

Michael Link writes:

Cozy Mark IV, N171ML completed ehr first flight on June 13th under clear skies and light winds. I was able to be the pilot thanks to the generosity of Pat Reina, who spent many hours qualifying me in his Cozy III. Although I had a good number of take-offs and landings, I still managed to do the "pitch bobble" on rotation. This was my first solo in a Cozy and I was surprised by the rate of climb; despite the pilot PIO, the plane did fine and soon we were 5,000 ft. above the airport. After completing the flight trest cards (Flight Advisor Program), I made a great landing. A good landing is any one you can walk away from. A great landing is one where you can immediately reuse the airplane. The intire flight lasted only .6 hr., but I was worn out... and elated.

Some suggestions:

1. Build according to plans. The Cozy is an outstanding aircraft; don't screw it up. Resist the urge to "improve" the design until after you have some hours under your belt. Chances are you will be plased with the unmodified Cozy.
2. Be an active EAA chapter member and sign up for the Flight Advisor Program. It saves on insurance, and the help and advice that you receive from chapter members just might save your bacon.
3. On reflection, getting a test pilot to do your first flight is a good idea. If you are fortunate enough to locate a qualified individual, get the necessary insurance detailes worked out and obtain the approval of the pilot's family, then I would suggest that you not fly the first flight. Someone with less emotional attachment might be the best bet especially if an emergency arises.

No one builds an airplane without the support and help from many people along the way. Space does not allow me to list everyone who contributed their time and effort, but I would like to express my

sincere appreciation to my wife, Margie. I also want to thank you, Nat, for making this all possible.

Michael G. Link
Nashville, TN

David Domeier writes:

6/18/98

Dear Nat,

This morning at 10:30 AM I launched N10CZ from Spirit of St. Louis Airport for the first time. What can I say other than it's a great feeling to fly an airplane built with your own hands. I was thinking as it climbed, this machine really flies and I built it!

I did not raise the nose gear but did get up to about 125 kts at 2500MSL. All engine parameters were normal. The highest CHT was 362F. Control response seemed very normal. I had forgotten how pitch sensitive these airplanes are, so I had a few bobbles after take off. But like always, just relax your grip on the stick, and the airplane stops doing it. It's been about 8 years since I last flew the Long EZ how's that Celine Dion song go, "It's all coming back to me now"

Thanks much for a great design, great builder support, and especially, all the flight test work you performed on this airplane. I feel very confident in it.

Keep building guys, you will love to fly this airplane.

David Domeier
Chesterfield, MO

We have a note in our files that M.A.Barjon, in Lyons, France, first flew his Cozy Mark IV on 8/9/98 and said that it is a "very good aircraft".

Brice Daunay, from St. Johns USVI, showed us a picture of the airplane he built using Mark IV plans and he is now flying. It was highly modified though, and probably not registered as a Cozy.

Gene Davis writes:

9/12/98

Dear Nat,

Well, after six years of building, moving, and numerous interruptions in the life of this builder as well as fighting an allergy to all known types of epoxy, the time arrived for me to request a certification inspection from the FAA. On August 28, 1998, the Temporary Airworthy Certificate was issued on Cozy 42CZ. Following this, to let our neighbors know what the crazy guy was building in his garage, working all kinds of hours, we invited our neighbors and friends to see our proud addition and share in our celebration. About 70 people showed up for the party and christening on the evening of August 30. That night with the help of family and other builders we disassembled the plane removing the wings and canard and prepared it to be trailered to the Globe Airport where I have a hangar. Globe is 60 miles

from where we live and the distance that the Cozy had to travel. On Monday August 31 we loaded the wings on the trailer and took them to Globe, then Tuesday the rest of the plane made the journey. Fortunately all this without incident. I think transporting it by trailer may have been more stressful than the first flight! The rest of that week was spent re-assembling the aircraft and completing taxi tests. Since I have flown very little in the last two years, in preparing for the first flight I took my Bi-Annual Flight Review on Sept.5. On the 8th, Nat took me flying in his 14CZ to get that Cozy feeling once again in preparation for my first flight.

After leaving Nat at Falcon Field in Mesa, I picked up my wife, Carol and we drove to the Globe Airport hoping the weather would hold and this would be THE DAY. At 10:30AM on 9/8/98, after one final inspection, I taxied to the runway. As I pushed the throttle fully open, I was surprised at how quickly I was airborne and climbing at 1500 fpm. I stayed within the pattern to test the controls, and the plane flew flawlessly! WoW, what a great feeling, after all that hard work! I encourage everyone to keep building: it is so worth the effort when you feel that beautiful bird take off the first time.

Flight tests are going well and I have discovered that I have no allergy to cured and pointed epoxy! Thanks, Nat, for designing such a great airplane and all the fantastic support over the years.

Gene Davis
Gold Canyon, AZ

READY TO FLY

1. Jim Wickstrom, Mesa AZ
2. Eric Westland, Mulkiteo WA
3. Thomas Waters, Clapton, AL; he writes:

8/26/98

Nat;

Got my airworthiness certificate Sunday afternoon, did my high speed taxiing Tuesday afternoon, and trying to find a canard ride before I take it around the patch. Though I had better send a peicure with one of my neighbors. My finish is a little rough, but she wants to fly. I have a O-290 with starter, full panel ,ad auto pilot with GPS.

Thomas Waters
Clapton, AL

WEIGHTS

It is very important to keep the weight of your aircraft as light as possible. Burt Rutan used to say to throw something up in the air, and if it came down, it was too heavy to put in your airplane. Perhaps we should caution builders more often. It is sad but true that many builders put too many things in their

airplanes which aren't necessary, and will never know the joy of flying a light airplane.

This is also true of the human body. According to the National Institute of Health, 55 percent of Americans are overweight or obese. We are scared sometimes when we see how heavy some of the builders of our airplane are. According to NIH, if you have a body mass index of 19 to 25, you are healthy. A BMI of 25 to 30 is considered to be overweight, and a BMI of 30 or more is considered obese. BMI is calculated by multiplying your weight in pounds by 704.5, and dividing that by your height in inches squared. This same formula applies to both men and women. We have to tell people, more often than we would like, that they are too heavy to fly in our airplane.

CABIN HEAT

Although we now live in Arizona, we did live in Minnesota for 30 years, and flew both a Varieze and a Cozy III there, knew the importance of cabin heat, and tried to design a system for the Mark IV (and retroactive to the III) that would provide adequate cabin heat for those less fortunate who live up north or even Canada and Alaska.

We decided that one good heat muff would be better than two inadequate ones, and that it should be on the starboard side of the engine, where the pipes were the longest, and it should collect the heat from two, rather than just one pipe. The solution we came up with was to weld (we later changed that to clamp) on a muff to the pipe from #4 cylinder, and then wrap a shroud around both #2 and #4 pipes to collect the heat from both pipes. It seemed logical that we could use a single heat muff for both cabin and carburetor heat, because the latter would only be used occasionally, and not during cruise at below freezing temperatures.

We found that there was enough pressure inside the cowling to push the hot air forward without using a blower. We ran a heat duct straight down the center of the fuselage and extended it forward around the wheel well so the hot air comes out around our feet. In the coldest temperatures we have tested, we can get more heat than is comfortable, so we have never used cabin heat more than intermittantly. If you are worried about the possibility of carbon monoxide, you can get a CO indicator to hang on the instrument panel. We have found that we can direct a little fresh outside air in our faces, while directing hot air at our feet. We believe that this is the simplest way to provide cabin heat.

Doug Koster, who flies a Mark IV in the Chicago area, said he sealed the canard joints at the fuselage with silicone, and made a silicone seal around the inspection door, and this eliminated most of the draft and made a big improvement in keeping his feet warm. We plan to try this.

STEP

When we designed the Cozy III, we tried to use as many Long EZ parts as possible, to avoid buying new tooling. The step was a Long EZ part that we used. When we designed the Mark IV, we had to redesign many of the Long EZ parts we used on the 3-place, but we did not redesign the step. Several builders have complained that the curvature of the step is not identical to the curvature of the fuselage. This is true.

There are at least two solutions.

1. You can buy the step before hand, and when you install the reinforcing block of wood, shape it to fit the step, or
 2. You can bend the step to conform to the radius of the corner of the fuselage. Even though the step is heat treated, the amount of bending required to conform is quite small and should not present a problem.
-

COPPERSTATE FLY-IN

Copperstate Fly-in will be in Mesa, AZ October 8-11 at Williams Gateway Airport, which is about 10 miles from our home. We have extra beds, and can accommodate couples on a first come basis. We had a Cozy banquet at Anzio's Landing, at Falcon Field, which was well attended, and we will probably do the same thing again this year.

AUSTRALIA, ANYONE?

Not all of you are aware that almost every year, our Australian friends hire a 747 and arrange the "Australian Express" to fly to Oshkosh en mass. At our Cozy dinner, Allan Aaron, Cozy builder living in Sydney, suggested getting together a group of Cozy builders/flyers to fly to Australia (commercial) next May, rent airplanes, and make a 2 week tour of Australia. Seems only fair! The plan would be to fly north along the coast to the Great Barrier Reef (maybe Darwin?), and then inland to the outback (no pun intended) visiting Alice Springs and Ayres Rock on the way back to Sydney. Allan and his wife, Shereen (she's in the travel business) would make all the arrangements, making sure everyone got the biggest bang for the buck. Allan estimates round trip to Australia from \$600 to \$1000, lodging approx. \$60/night, and 172 Cessnas about \$70/hr including fuel (all in US dollars). Allan would like to know how many of you might be interested. His e-mail address is:

<mailto:allana@interconnect.com.au>

His snail mail address is:

PO Box 403

Vaucluse NSW 2030
Australia.

We (Co-Z Dev.) would appreciate being copied so we can be a clearing house.

ENGINES

We still get still get questions about auto conversions. At the present time, the Leon brothers are the only ones flying with auto engines that we know of. We will be pleased to publish a report on Suburus, when anyone can supply us with actual experience in a Mark IV.

We asked the Leons for an up-to-date report, and they answered:

"For those interested in our twin auto conversion, we are sorry we could not make it to Oshkosh this year. At the moment our Cozy is down for modifications in the engine package.

"For awhile we had been having problems with resonant vibrations in the engines. We were flying safely, but we kept having broken brackets, bolts, and excessive wear. This was due to a design error we made at the beginning by bolting both engines rigidly together and to the center axis. This causes vibration to be passed from one engine to the other with disastrous consequences.

"The work we are doing now includes building in rubber brackets to attach the engines together. We built a spindle housing for the bearings and held this with rubber separators. This will assure alignment of the bearings, and independence of the center axis in relation to the engines. We took the opportunity to increase the reduction from 2:1 to 2.25:1, expecting to get a maximum of 5,000 rpm (the engines can go up to 6200 rpm) with the propellers going at 2200 rpm. Also we are installing a hydraulic belt tensioner to be able to remove belt tension in case of an engine failure. This will insure engine disconnection from the propeller and deduce drag.

"Please don't think we want to give up or go back to a Lycoming. Our main hobby is perfecting our engine package rather than flying. But I want to say that anyone considering an auto engine conversion must know that it takes a lot of time and expense to achieve something near a Lycoming. It is very interesting but I assure you it is not cheaper or more reliable. If doing the conversion is your main hobby then fine, but if you want to fly soon and reliably, then it is better to choose a Lycoming. We built our Cozy 100 percent according to plans in 2 years and, apart from correcting the canard incidence (when we checked it, it wasn't correct) the airframe has performed flawlessly in the 120 hours we have flown to date. We estimate that it will take 2 to 3 years in total just to perfect the engine installation."

Good luck & regards,
Carlos and Ruben Leon

Cozy builder Mike Skoriya called to say that testing is done on the first diesel engine delivered to Lycoming 6 months ago, and they are waiting for the next one with mods scheduled in 4 to 6 weeks.

They expect to have their engine in production in the year 2000.

Mike says that Continental is just now receiving parts for their first prototype diesel.

A prototype Renault diesel engine is already flying: see Jean-Jacques Claus' letter under [LETTERS](#).

At our dinner at Oshkosh we learned that the Delta Hawk diesel is nearly ready for testing on a Velocity.

And of course the Zoche diesel was at Oshkosh again this year, but still not ready for production.

ENGINE FIRES

An engine fire is probably the most dreaded emergency one can have in an airplane. It is probably safer to have one in a pusher than in a tractor, as long as one knows it is occurring. Fortunately, an engine fire is quite a rare occurrence, but it can happen. The most likely cause of an engine fire is a leak in a fuel line. We have had two massive fuel leaks. Both were on the ground before starting the engine. The first was from a deteriorated synthetic rubber line, which suddenly started to leak like a sieve. This caused us to change to Teflon, with a stainless braid. The second was a fuel line fitting I neglected to tighten after having done some work on the engine which required removal of a fuel line. Both were discovered during my routine preflight, during which I turn the fuel selector on, turn the boost pump on, prime the engine, and then pull the prop through 3 blades with the boost pump running. One advantage of having a NACA scoop on the bottom of the cowling is that if you have a fuel leak, it will run out and you will see it.

So how do you know if you have an engine fire in flight? We suspect that you would smell it, because the pressure inside the cowling is greater than in the cabin, and there are bound to be leaks in the firewall, or in the cabin heat valve, even if it is closed. But some other clue would provide additional assurance. After considering all the possibilities, we decided to mount a thermocouple in the cooling air after it passes through the cylinder fins. We asked for two additional readings on our engine monitor, one for inlet air, and one for exit air, and have a limit set on the latter thermocouple reading so that a red light appears if this temperature exceeds the limit we have set.

So what do you do if you have an engine fire? The first thing one should do is shut off the fuel selector to stop the supply of fuel to the engine compartment, and at the same time look for a place to land.

How fire-proof is the engine compartment? There is no way to protect everything in the engine compartment from a continuous, fuel-fed fire. The most critical things in the engine compartment are the flight controls you need to make an emergency landing, most obviously the pushrods for the ailerons. They were originally thin-wall aluminum in the Long EZ, but were subsequently changed to thin-wall steel. The emphasis should be that if a fire should occur, shut off the fuel immediately and get the airplane on the ground the quickest way possible. We don't know if the fire would extinguish itself if you shut off the fuel, but it certainly would be a lot less intense.

DELAMINATIONS/HARD SHELLING

We have quoted the phrase, "Learn from the mistakes of others. You may not live long enough to make them all yourself".

A few years back, famous designer/race-pilot Steve Wittman (after whom the airport at Oshkosh was named) was killed with his wife while returning home from his winter home in Florida. We believe it was determined that the skin on one wing delaminated because he had not followed the manufacturer's instructions in covering it.

More recently one of our builders posted on the internet: "One of our builders/fliers heard a loud pop while flying around 13,500 ft in route back to Texas from Oshkosh". He later noticed a bubble on the top of the left canard airfoil, just forward of the spar, and concluded it was due to the pressure differential at that altitude. He said that to eliminate future occurrences, they drilled small holes into all surfaces they thought might be air tight.

We responded that we had never heard of this problem occurring on any Varieze, Long EZ, or Cozy, built according to plans, with possibly one exception. If you wipe fiberglass with wet solvent before filling the pinholes, the solvent can weep through the pinholes and dissolve the styrafoam underneath. The void created fills with air, and when the surface later becomes air-tight, a bubble can form. I also asked if this could have been due to "hard shelling", which doesn't result in as strong a bond as a wet layup over a wet micro filled foam surface, as recommended in the plans. For those of you who aren't familiar with the term, hard-shelling is the bad practice of covering the styrafoam with micro, letting it cure, sanding it and then applying a fiberglass layup over the top. This does not result in as strong a bond.

The builder replied that the airplane in question was a Velocity, and the builder had used the "hard shelling" technique.

Builders should be aware that this delamination may not have been a case of air underneath, and the pressure differential at 13,500 ft. An airfoil has a large negative pressure over the top at any altitude. This negative pressure is known as "lift". If you do not have the best possible bond between the fiberglass and the underlying foam, this lifting force can delaminate the skin on your flying surfaces. Hard-shelling IS NOT RECOMMENDED!

You should know that in the past I have complained to Ron Alexander about some of the techniques being recommended in his composite Sport Air workshops. This is one example.

PROP DAMAGE WITH A PUSHER

There has been some discussion on the internet about the likelihood of prop damage with a pusher due to debris thrown up by the wheels.

First of all, the main wheels are outside of the propeller arc, so the only question is the nosewheel. You can taxi with the landing brake down, but we don't think that is necessary. If you taxi slowly (as you should), it is very unlikely that the nosewheel will throw up any debris.

What is more likely is that pilots will use too many rpms in taxiing and ride the brakes. In this case the propeller will actually suck up debris off the ground. I have to remind myself continually when taxiing to throttle back to 800 rpm or less and get off the brakes.

In 20 years of flying pushers, and landing on many different runways, and taxiing over a fair amount of debris, only once did I pick up an AN3 bolt which left its impression on my prop. That was when I used a burst of throttle on a dirty taxiway at Chino. I should have known better. I filled the dent with 5-min flox. Outside of hurting my pride, it didn't hurt my prop.

[PLANS CORRECTIONS/CLARIFICATION](#)

BUILDER HINTS

1. The MK100 studs which secure the main landing gear strut between the landing gear bulkheads are available from Wicks and Aircraft Spruce. They are close tolerance AN studs with rolled threads which are specially made for this application. It is intended that the studs be a close fit in the bushings to allow next to zero fore and aft play in the landing gear. The rolled threads prevent stress cracking which can occur with cut threads. And the plating prevents corrosion. Even though these studs may seem expensive, they are about one half the cost of AN bolts of the same diameter and length.
2. Masking tape has a natural rubber adhesive and is designed to be used in painting where it is removed as soon as the paint dries. If left in place for longer periods of time, the adhesive will cure and it will be very difficult to remove. When removing masking tape, it should be pulled back 180 degrees from itself. If you pull it away at 90 degrees, you might also remove the paint. If you need a tape that you can leave in place for a longer period of time, look for one with a vinyl adhesive.
3. If you have Steve Wright's electric nose gear, the last thing you do before parking the airplane is to lower the nose. Almost everyone sooner or later forgets to turn off the master switch, and the following morning the battery is dead. Charles Danila suggests leaving the strobe switch on permanently. No one would walk away from his airplane with the strobe flashing.
4. It has been called to our attention that there are a few inconsistencies in our full size drawings, and we have been criticized for this. For example: 1) On M-8, on the waterline scale at the right side, some of the 2" intervals are off by about the thickness of one line. 2) On the same drawing,

the horizontal match line is not exactly perpendicular to the centerline, and 3) on M-17, template A is not exactly identical to template B, by the difference of one line width in one or two areas (they should be averaged). Most builders either didn't notice these inconsistencies or didn't think they were important enough to comment on (they aren't). We admit that we are not perfect, but we have tried to the best of our ability to produce a good set of plans and good instructions for building a good airplane, and if we do discover any error of real significance in the plans, we make a mandatory correction or design change.

FOR SALE

1. IO-360 200hp. Zero since major. New factory cylinders. Rebuilt to factory new limits. \$12,500 plus crating and freight from Dallas TX. P16pen@gte.net
 2. Rebuilt aircraft instruments, much less expensive than new, guaranteed. Contact: Howard Francis, 5613 S. Crows Nest Rd., Tempe, AZ 85283 (602) 820-0405.
 3. Cozy builder, Bill Walsh, makes tee shirts and sweatshirts in various colors and adult sizes. They have a picture of the Cozy Mark IV on the front and back. He may have other items, such as jackets, caps, and pins. Contact him at PO Box 160884, Altamonte Springs FL 32716. Tel (407) 695-3543.
 4. Cozy builder Wayne Lanza supplies an electric speed brake actuator kit with all the parts needed for installation, with instructions for \$275. He now has a switching and breaker panel for the Mark IV. It is similar, but not identical to the one we had made for our plans model. He is using the highest quality DC switches and circuit breakers, and pre-wires the panels, making the rest of the electrical system installation very EZ. Cost is \$425. We heartily recommend his products. Contact him at: 9425 Honeysuckle Dr., Sebastian, FL 32976 (561) 664-9239.
 5. Vance Atkinson supplies fuel sight gauges. They are a clear bubble with a white background. \$35 per set. Contact him at 3604 Willomet Ct., Bedford, TX 76021-2431 (817) 354-8064.
 6. Steve Wright is making electric nose-lifts for the Cozy 3 and 4 aircraft. It will raise the nose with full fuel and baggage and at least one person sitting in the front seat. We have installed one and like it. Contact him on (615) 373-8764 or (615) 373-9707 for pricing.
 7. Alex Strong is making a neat electric pitch trim system. Cost is \$175. We have installed one and like it. Contact him at (619) 254-3692.
 8. Featherlite (see "[Authorized Suppliers](#)") makes many pre-fab parts for the Cozy 3 and 4, including pre-cut wing and canard cores. We have used all of their parts and can vouch for the quality. They have also taken over the manufacture of propellers from Bruce Tift's estate. These were good propellers, with a urethane leading edge, and we are pleased to see that they are available again.
 9. Plans nose gear retract mechanism complete. New. Never used. \$260. (215)637-4034.
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PROJECTS FOR SALE (2)

8/24/98

Dear Nat,

Could you put a note in your next newsletter to put my Cozy IV for sale? I started building about 8 years ago. It has been stalled now for about 5 years. I started a little part-time engineering company to make enough money to finish the plane and the company has taken off (no pun intended) and I no longer have time to build.

I have done everything EXACTLY to plans. To date, the fuselage tub is done, main gear is done and attached, canard and elevators are done and attached, centersection spar is half done. Nose is started. I guess I'm about 30% done.

All work has been meticulous. For example, my canard profile is PERFECT. The only filling required is to fill the glass weave. No buildup is required to have the proper airfoil. I've worked on it for about 2 ½ years. I'm slow but I'm careful. I have photos that I can email anywhere. I don't want to bother them with you now as they take a while to download.

I have \$10,500 in receipts for material purchased. I bought the entire foam, fiberglass, wood, and metal kit from AS&S. There are still a few items to buy yet. The airframe should cost about 13K and I'm at 10.5K.

I'd like to get some pittance for my labor but I guess I'll be lucky if I can recover material costs so 10,500 OBO would be the starting point.

Ken Grakauskas
1801 Airway Dr
Sanford MI 48657
Grakau@wolv.tds.net

9/16/98
Dear Nat;

I regret that I am forced to sell my Cozy Mark IV project by circumstances beyond my control. The fuselage tub is complete and main gear strut installed, except for axles and wheels. Canard is complete with elevators, except not installed on fuselage. Centersection spar 99% complete. Good workmanship throughout. \$7,000 OBO. Craig Pomaville, (810) 978-0410 W, (810) 677-4811 H.

COZY MKIV FOR SALE

Cozy Mark IV beautifully built, 70 TT. Flies like a dream. O-360n Lycoming, Ellison throttle body, electronic ignition and 3-blade Performance prop. ICS plus nav/com, Apollo 618 Loran, Navaid auto pilot, Terra encoding transponder/mode C, Rocky Mtn engine monitor and intercom. Well proven and tested. 200 mph cruise. \$89,500. Contact Larry Sligar (541) 863-3222.

NEED HELP WITH YOUR PROJECT?

Occasionally we hear from builders (even non-builders) who offer their help to Cozy Mark IV builders. Before recommending them, we need assurance that they are good craftsmen, follow the plans and don't take shortcuts (like using tri-ax cloth) or follow bad practice (like hard-shelling). We published a list of those we can recommend in Newsletter 59, p.6. One such builder that Gene Davis recommended was Craig Hamm, who helped Gene (see Gene's letter NL59-6). We have seen Gene's Cozy Mark IV, and it was a work of art. Craig has recently written to us from Montrose, CO., where he is now working for Scaled Composites. He is their lead technician. He has time available, his own shop, and wishes to offer his skills in making components for Mark IV builders. His credentials (too long to publish here) are most impressive. His address is 5750 5600 Rd., Olate, CO 81425 and phone is (970) 323-0767. We recommend him.

LETTERS FROM BUILDERS

8/3/98

Hi Canard Aviators;

Reflections-Oshkosh 1998. A few highlights:

1. Finally met Carl Denk.
2. The weather was great, at least through Saturday.
3. My 1900+ hour Lycoming did not miss a beat (total aircraft time is 44 hours).
4. Many guys coming by the Canard rows were very kind – said my airplane looked great while parked among some truly fine machines (finish work not my forte).
5. Nat and Shirley were great hosts to a mini happy hour on Tuesday evening.
6. Burt Rutan was in his usual outrageous form on Friday... the guru is very much alive and well after his heart attack..it's always a riot to hear him speak.
7. The arrival of the "Oshkosh Express" (747-400) from the South Pacific was neat..spoke with some of the passengers staying at the dorms...3 of them are Cozy guys and came by my airplane.
8. The Delta Hawk engine is VERY interesting. The Zoche engine is VERY interesting.
9. Met Jeff Rose (Electroaire) and Lance Turk (Vision Micro)..great guys.
10. The \$6 breakfast and \$8 dinner at the dorm is a very good deal.
11. The Cozy forum and dinner were informative and fun.
12. The trip from OSH to STL took 2hrs 21min...last year I drove it in 8 hrs 30 min. yuk!

And a few low lights:

1. The traffic approaching OSH on Tuesday afternoon outside Ripon was like a WWI fighter clash while everyone was holding...every man for himself...they need another approach corridor for airplanes that can not maintain 90 knots...I had to pass 2 guys inside Fisk who were doing about

60 knots.

2. Some of the beer at the dorm watering hole was a little old...the popcorn was definitely old. \$5 hamburger on the field is not a good deal...healthwise or wealthwise.
3. The airshows were TOO long...people were bored by 5pm.
4. The port-a-potties were TOO far from the flight line.

Will I go again? Sure – I loved it. There's so much airplane stuff...I was there 4 days and did not see it all...

Dave Domeier
St. Louis, MO

8/26/98
Dear Nat,

I received my plans and they are really great! I must tell you I spent 8 months reviewing all kits, plans and vendors and decided you had the best of all worlds! I took a systematic approach to verify all the items on my "must have" list were validated. I DID NOT let price be the major factor as I wanted to get the BEST product available. I was fascinated by the canard design and wanted to see how it came about and what the safety record of this design was. I reviewed all available material on this design (Varieze, etc..) and was pleased with its record.

I then set out to review kits. I reviewed the Kitplanes listing of kits in the December 1997 issue and called all vendors and got their info kits, videos, or visited their web sites (this was a small price to pay). I reviewed all of the canard kits (as I narrowed it down to the canard style) and found some issues. The main ones were turnover of companies, bankruptcy, short time in business. For most builders who take years to build a plane, this was not what I wanted.

I next reviewed the plans area. Since I wanted a 4-seater and a canard style, I reviewed your info on the web and talked to many people who were building or flying the Cozy Mark IV. After reviewing the criteria, I finally decided to purchase the Rutan video and practice kit from Wicks to see if I really wanted to do this process. I was sold---this was fun (as a former auto tech, sprint car mechanic and welder how could I not like it) and I would now have a real project to complete and enjoy.

I do currently own a Warrior and will still be flying while I'm building. I have no real time table as the process will be just as much fun as will flying my "new" airplane. I hope other people considering building a plane take the time to evaluate ALL aspects of this process as it is not a simple decision. I consulted my wife (since I have to live with her and make her happy as well) and my children (I have 3) to make sure this is a project we all will enjoy.

A big part of this decision was not to forget to join the EAA, your local EAA chapter and participate with the internet news groups as this will be an invaluable aid to all builders of aircraft (not just canards or Cozys). Again, thanks to you and your wife (very pleasant to talk to) for excellent plans and a very "conservative" approach to aircraft construction.

Donald Hamm
Carrollton, TX

8/24/98

Dear Nat,

I just received last week a work of art! A Lycoming O-360 A1A rebuilt by Aero Sport Power in Kamloops B.C., Canada. All looks very good, new crank, all cylinder assemblies, etc. Should be good for as long as I need it. It was not cheap but the price looked good compared to Lycoming list price. If anyone wants one, they have a long lead time. I ordered in late January, however I did tell them that we were not in a hurry and would not mind them getting someone else out the door as long as they did not forget us. Worked out well on both sides.

John Epplin
Orion, IL

***Editor:** This is the company that was displaying at Oshkosh '97 Lycoming O-360s rebuilt to new specs with all light-weight accessories and no trade in for \$14,000. Several Cozy builders placed orders with them. Their phone # is (250)376-2955.*

8/27/98

Cozy Builders

Wow, I gotta say some good stuff about Wicks (everyone says bad stuff about other places, I guess it would be fair to say good stuff once in a while).

I ordered a bunch of fittings to make a removable pitot system with other misc. stuff this morning. I ordered a bunch of fittings that were all 4D suffix. There was a coupler that I ordered, an AN910-4D, assuming it was the same thing.

About 20 minutes after I called the order, the SAME person who took my order called me back. I accidentally hung up on her, and she still called me back a second time! She assumed the parts I ordered were to fit together, but this coupling was obviously the wrong size so she wanted to be sure the size I ordered was what I wanted. Then she told me the AN910-1D was the correct size. So she offered to change the order, and I would get the right part. Great service, reasonable prices, and quality parts. What more could you ask for?

Tom Brusehaver
Bloomington, MN

6/18/98

Dear Nat,

I cannot believe that I have over 500 hours on my Cozy III. I have flown it from Maryland to northern Canada, down to the Grand Turk islands, and then as far west as the Grand Canyon. But it got a little fat over the years and I found that I was only climbing at 400 fpm at 10,000 ft. This would be great for a GA plane but not for one of ours. So, as we discussed at S&F, I went out and got an O-320 B2B which I am rebuilding. I bought an engine that had been lying around a parts dealers storage shed for years for \$1500. It had no logs, but when I broke it open it had very little rust or wear. The crank flange was bent too badly so I had to get a reconditioned crank.

Your builders who are in the market for an engine should know that the crank is the most expensive part of the engine. New ones cost over \$4000. They should not get an "experimental" crank as they are not up to our needs. Sure we are pushing a wooden prop, but with the prop extensions we are using, you would get a severe gyroscopic wobble with only a little deformation of the crank and/or flange.

I have just gotten all the parts back yellow tagged, so I will soon start to rebuild the engine. I have a very experienced AI who is looking over my shoulder (yes, there are under-qualified AI's). Rebuilding the engine is almost as much fun as building the plane. Will let you know if I run into anything unique.

Did some interesting air flow work with oil on the wings and VGs. If you would like me to write something up, let me know.

I am looking for a used prop for the 0-320, climb or cruise, it does not matter. After I use it this summer and fall I plan to use the wooden prop as a core for a composite lay up this winter. I want a light but stronger prop than I have been flying with. Say hello to Shirley from Janie and me.

Ken Brimmer
Bowie, MD

6/15/98
Dear Nat,

We had an awful storm here last night. I took a phone call at 10 PM and learned that our airport was hit hard. The fact that the Cozy Mark IV is much less susceptible to high wind probably saved it. The FBO hanger just 150 feet away from my tie down was destroyed. This is not an exaggeration. My Cozy barely even shifted in its spot. I was told that a couple of months ago there were gusting winds at the same airport. The Cessnas were slamming their tails on the ramp and the Cozy ignored the wind. Long live the canards!

Note that my Cozy made the June, Sport Aviation magazine. I'll send a picture to Kitplanes after I repaint. Unfortunately I experimented with System III. It didn't take long for me to realize this product is not what it was claimed to be, hence the new paint job. We hope to make Oshkosh again this year.

Mike Davis
Leitchfield, KY

Hi all,

Last year a builder asked me if I could obtain some information about the new RENAULT aircraft engine. I called and faxed RENAULT with no reply, but last month the following was published in a French aviation magazine:

"New Morane-Renault motor. March 3, 1998, a prototype of the 200 HP Morane Renault engine, installed on a TB20 Trinidad, did its first flight. So far, 8 prototypes of this diesel engine have been constructed. They underwent more than 300 hours of tests to date. This first flight lasted 50 minutes.

In Europe, jet-A fuel is 3 times less expensive than AV0GAS, so the European market is really waiting

diesel engines.

Jean-Jacques CLAUS
France

9/9/98
Nat and Shirley,

Don't know why I feel compelled to tell you this, but THANKS! Although I'm only finishing up Chapter 6, this plane is so much fun to build! My sole goal this past Labor Day weekend was to glass the fuselage bottom and put it on the fuselage. We finished floxing on Monday night, set the bottom in place and weighted it down (I did run out of steam and didn't attempt the 2-BID taping. I did scrape and fillet the squeezed-out flox). Like a kid at Christmas, I sprang out of bed Tuesday morning to check things out. Gorgeous! I just stood there staring at the thing. My neighbor now accuses me of using too much marvel time. Marvel time is the time spent admiring one's own work. I was so pleased I took Tuesday night off and watched Mark McGwyer's baseball game.

The plane's been a pure joy so far to work on, and as I've told you before, it relieves a lot of life's stresses. I look forward to getting home every day to work on the plane. We're building a \$1-million Space Shuttle payload here at SpaceTec with lots of neat hardware (It's a next-generation digital signal processor that increases the quality and clarity of air-to-ground voice communication. It'll fly on STS-93 in January 1999). But all I can think about is, "Hey, that gadget would work well in my Cozy!"

Wayne Hicks
Hampton, VA

9/10/98
Hello Nat,

I have been enjoying the heck out of the Cozy III. Thanks once again for creating this bird. Outside air temps are starting to drop, today only 91, hope for 65 Saturday morning. I can't wait to try the plane out at these temps.

Ken Reiter
Dallas, TX

9/11/98
Dear Nat,

I'm the Cozy III builder in Stockholm, Sweden. We talked on the phone about the engine mount. I used the original Brock mount for an 0-320-E2D, and wanted to be absolutely sure it was safe. After the call (but not because of anything you said), I ordered a professional structural analysis from a company called LUTAB. They do jobs for the SAAB aircraft industry. The company is owned by a professor at the technical university here in Stockholm. I was delighted when they found out that I had a good safety margin. The critical area is the lower, righthand side. The safety factor for the mount (they also looked at bolts, etc) in this place is at least 1.25 better than required by FAR23.

By the way, I appreciate your contributions to the unofficial mailing list (internet) very much. They are always on the dot. Not everything on the list is sound thinking, so it's needed.

Jan Erik Synnerman
Stockholm, Sweden

[\[Prev\]](#)[\[Next\]](#)

[\[Newsletters\]](#)
[\[Cozy MKIV Information\]](#)