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COZY NEWSLETTER #39

October, 1992

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WHAT WE HAVE BEEN DOING

When the last newsletter was written in July, the Mark IV plans model had just been completed, signed off, and flown for about 10 hours. During those first few hours we were concerned with engine break-in and proper cooling.

It is normal in pusher installations for the cylinders closest to the firewall, #3 and #4, to run hot and the cylinders closest to the propeller, #1 and #2 to run cold. The reason is that the pressure differential is greater across cylinders #1 and #2, with the high velocity air piling up underneath and the propeller pulling the air out the top, so that is where most of the cooling air goes.

Some builders cut outlets in the top of their cowlings above cylinders #3 and #4, to increase the airflow through those cylinders. We wanted to avoid this, so we built a ramp across the inside of the bottom cowling to direct high velocity air toward #3 and #4. Tile ramp was in about 6 in., inclined at 45 deg., and about 7 in. tall.

Interestingly, this reversed the temperatures. #3 and #4 ran cold and #1 and #2 ran hot. It was then just a matter of nibbling away at the baffle until all the CHTs ran at the same temperature (within 4 degrees!). We were very pleased with this result and wanted to pass the information on. We will show the baffling in the Mark IV plans, which should help builders, particularly if they are breaking in newly overhauled

engines.

From the first flight on we noticed a little oil mixed with fuel collecting in the bottom of the cowl. It was strange. No sign of any leaks after returning from a flight, but the next morning there would be a puddle. It seemed to be coming down from the cylinders through the Ellison throttle body (carburetor). Various "experts" said it was probably coming down from the cylinders via the intake valve guides. I didn't believe this explanation, so I removed all the intake pipes from the sump to the cylinders, removed the throttle body, wiped everything clean, and added a few extra quarts of oil in the sump. When I returned a few hours later, there was oil dripping out of the sump. Obviously there was a leak in one of the induction pipes going through the sump. I removed the sump, and sure enough, found a crack in one of the induction pipes. Probably the engine had been dropped or set down too hard on the sump.

We called around and were able to locate a used sump, and had it shipped in next day air. We installed it, went flying, and no more oil leaks!

About this time, Ken Murphy dropped in in the Mark IV prototype. He was back from Saudi on vacation and on his way to Dallas. Seeing 44CZ again was like seeing an old friend, and almost brought tears to my eyes. Ken was putting on a lot of hours and was delighted with his airplane. We were able to take pictures of the only two Mark IVs in the world sitting side-by-side, and did some flying together.

A couple of days later, Vance Atkinson dropped in. He was on his way to California to take part in the cross-county race. He needed to make an emergency repair on his new fuel injection system, which he did at our house, and was on his way the next day.

It was another of those last minute rushes to get the time flown off before Oshkosh. My sister, Lee Parlee (bless her heart) arrived to answer the phone and the mail while we were gone. I was able to give Shirley her first quick ride in the new airplane before we packed up to leave.

The weather in the Midwest was stinko, and we didn't have time to wait, so we detoured around it, flying north to Vernal, Utah where we landed to stretch and refuel. We flew over some mighty beautiful but desolate country.

From there it was on to Rochester MN through Wyoming and the Dakotas. We ran into the edge of the bad weather, rain and low ceilings, but otherwise the weather was good. We used our new Garmin GPS unit and were very impressed. It was picking up 6 satellites all of the time with good signal strength even with the antenna in the nose, and it kept us straight on course. The Nav-Aid wing leveler was also a nice feature, allowing us to fly "hands off" most of the time.

We stopped overnight in Rochester MN with our son and his family, and then it was off to Oshkosh. We always like to arrive at Oshkosh a couple of days early, to stake out a row on the flight line for Cozys, to relax a bit, and to greet our friends as they arrive. There were 15 Cozys at Oshkosh this year, about half repeats and half first timers.

We camped in the woods as usual, again with our friends the [Wilhelmsons](#) from SC and the Vargas from PR. We were also joined by newcomers the Todd Morgans from San Diego and the Jeff Glynnns from Las Vegas. The Glynnns brought their young son along in the back seat.

The now annual Cozy banquet at Robbins was a great success. We reserved for 60 and 69 attended. Rosita Vargas brought along mementos from Puerto Rico, coffee and vacation booklets which she passed out to all attendees.

The forum was also well attended. We always welcome the opportunity to meet our builders, answer their questions, and get their input. We called on Vance to fill us in on the cross-country race. He had built an extra fuselage tank to fly non-stop at full throttle from Palm Springs CA to DuPage Co. Airport IL. There were over 50 entrants, of which only about half finished. They ran into the bad weather in the midwest, and either had to fly through VFR or circle and wait for an IFR clearance. Vance pushed through VFR. He had high hopes of winning prize money, but just missed and placed 4th.

We enjoyed seeing a lot of our old friends and meeting many new ones on the flight line. The Cozy Mark IV was a big hit and the plans we left with Wicks and Alexander disappeared in a hurry. They both said they could have sold a lot more. The Mark IV is the only high-performance 4-place (to our knowledge) which can be built from plans and basic materials, and with a sluggish economy, this is a big plus!

When we were getting ready to leave on Wednesday, we were told that we should stay, if at all possible, because one of our builders was going to receive a major award. We knew right away that this would be Todd Morgan, because his workmanship was immaculate. All aluminum parts (including engine baffles) were polished to a mirror finish, and his Cozy was completely upholstered in white leather. He had been camping with us and was a super person. It turned out that he won Reserve Grand Champion for his Cozy. We hope the EAA took a lot of pictures and that they will be published in Sport Aviation. Not bad a first time builder, wouldn't you say?

On the way back, we stopped off in Minnesota and also Albuquerque to visit. Outside of having to fly through a front in Nebraska and the usual cumulonimbus buildups with lightning and rain at Albuquerque, the weather wasn't too much of a problem.

After returning home and clearing up accumulated mail, we started work on Section II of the Mark IV plans. As of this writing, the chapters on the control system, the trim system, the canopy, and electrical and instrumentation are complete. It will probably take another month to complete the rest and get it ready for printing. We appreciate your patience and confidence! We already have 4 builders who have completed Section 1 and we are sending them advance copies of additional chapters to keep them busy.

CRANKCASE VENTING

In the rush to get to Oshkosh, we didn't have time to install a crankshaft seal retainer, and weren't too concerned because our engine log book said the shop had installed a new seal when they topped it, just before we bought it. Now that we were back, it seemed time to do it. We removed the prop and ring gear, and were horrified to see the seal lying loose around the shaft. There was no way of telling when it had come out. Why, like Uli, hadn't we lost all the oil and froze the engine? Opinions varied. One person said we must have tight bearings. Another said we must not have much blow-by. We tend to think that it was the way we had installed the vent line. We brought it straight down the firewall, out through the cowling lip about 1-1/2 in. into the airstream, with the end sawed off at a 45 deg. angle facing aft. It acted like an aspirator, drawing the vapors out of the crankcase and probably creating a

negative pressure there. This works well in warm weather, but on further thought might be susceptible to freezing shut in cold weather. A better solution, we think, would be to run the vent line from the accessory case (on the 0-360) over the top (to keep it warm), and out the back into the low pressure area forward of the prop. Along the exhaust pipes might even be better. We intend to change ours. We also think it advisable to avoid any possible obstruction or back pressure in the breather line, like from an oil separator. It would be far better to lose a little oil from the breather than to risk losing all the oil through a blown seal!

PRODUCT LIABILITY

Burt Rutan, having just successfully defended himself against the 11th frivolous law suit (A builder had not followed the plans, was flying intoxicated, was doing unauthorized acrobatics, and killed himself and another man's wife, and the husband sued Burt) had some comments to make in his forum at Oshkosh about the legal system in this country.

The reason that law is the fastest growing profession in the US, and that we have 73% of the world's lawyers for only 10% of the world's population, is that lawyers have passed laws making it very easy and very profitable to sue manufacturers (and doctors and almost everyone else), and they encourage people to do so. Trial lawyers and "Consumer Advocates" (like Ralph Nader) argue that this benefits the consumer by making products better. The large settlements of course benefit the lawyers, but raise the cost of manufactured products to the consumer, and/or cost jobs when manufacturers go bankrupt or move overseas.

A very good example close to all of us is general aviation. The US used to be the world leader in small aircraft production (Piper, Cessna, and Beech). Because of the cost of liability, US small aircraft production has all but stopped, and the cost of new engines is prohibitive. Under present laws, you, as an aircraft builder (manufacturer) will forever be liable for any airplane you build, you may have trouble buying parts or equipment for it because of liability (joint and several), and you will have to pay exorbitant prices for what you can buy (like engines). This not only affects us, but every level of our society, and probably is a major contributor to our economy becoming service oriented rather than manufacturing oriented, and to manufacturing jobs going overseas.

Congress is unwilling to pass legislation to limit product liability, because this would hurt lawyers (which many congressmen are), and the Trial lawyers Association is a very powerful lobby.

Burt asked everyone at the forum to write their congressmen and get their friends to write too, urging them to enact legislation limiting product liability. Do so! It is in your best interest.

WING ATTACH

In Cozy Europe's newsletter #37, it was stated that the German and Swiss authorities were requiring Long EZ and Cozy builders to install a 4th attachment for the wing between the leading edge of the wing and the strake. Burt Rutan was asked about this in his forum at Oshkosh. He adamantly disagreed

with this requirement. He said it defeats the provision for adjusting wing incidence. He said that he knew of no reason why a 4th attachment point would be necessary-that there had been no known failures of the 3 point system, and that adding a 4th point could introduce indeterminate stresses in the structure.

CUSTOM SHOPS

As you know, we have disapproved of custom shops in the past because we have had many complaints and seen some terrible workmanship. We can now make a couple of recommendations. Two of our builders who built excellent Cozys themselves are now building components for other builders. Dennis Oelmann is doing this on a part time basis, and Jeff Russell and his father have set up a shop, started a new business, and are working at it full time. Besides seeing their airplanes, which are show quality, we have seen samples of the work they have done for others, and can recommend them without reservation. The Russells are investing in permanent tooling to make sure their parts are identical and interchangeable.

You can reach Dennis Oelmann at (319)268-0513, and Jeff Russell at (919) 961-2238.

TREATING EPOXY ALLERGY

One of our builders (wish I could remember who) told us at Oshkosh that he developed an allergic reaction to epoxy and his doctor prescribed a skin cream named "Maxiflor", made by Herbert Laboratories. He said that this skin cream cured his rash and it has not returned. We looked up this medication, and it is described as a topical corticosteroid. Our medical dictionary says that corticosteroid skin creams reduce inflammation and suppress allergic reactions. We called our pharmacist, who said Maxiflor requires a prescription, but that there are other corticosteroid creams, probably lower strength, available without a prescription. We would appreciate hearing from anyone else who has used corticosteroid skin creams.

ELECTRONIC IGNITION, FUEL INJECTION AND INFRA RED TACHOMETERS

Vance Akinson has been at it again, evaluating new systems for his Cozy. He wrote a very interesting article in September 1992 Kitplanes magazine on electronic ignition and fuel injection, and a separate unpublished article on the Braal infra red tach.

Vance became interested in electronic ignition because he thought it would require less maintenance than magnetos and have other advantages. He reported that he selected the Rose system which has automatic spark advance, uses automobile plugs, increases the power output of the engine, uses less fuel, and results in a very smooth running engine. He has now replaced both mags with electronic systems. He believes that more builders will install electronic ignition when they learn of the benefits and reliability is proven.

Vance also converted This 0-320 over to fuel injection. He discusses the pros and cons of fuel injection vs the Ellison throttle body. The fuel injector doesn't require carburetor heat and makes it possible to adjust the mixture in each cylinder so all of the EGTs peak at the same time (which should also increase power and efficiency), but can't be leaned quite as far as the Ellison. You are encouraged to read the entire article.

When Vance got rid of his magnetos, he had to select a different type of tachometer, which relied on a signal generator rather than P-leads. He decided on the miniaturized Braal, because of space limitations, and has been well satisfied with it to date.

FIRST FLIGHTS

1. Mark IV Cozy N14CZ on July 3, 1992 (for the record)
2. On 9/1/92 we got a note from Ray Hart, Williamsburg VA, included with his newsletter renewal "N98RH flying great with about 60 hours on it".
3. Jim Krug, Dayton, OH sent this letter:

8/26/92

Dear Nat and Shirley,

Cozy N80CZ (S/N 8) attacked the wild blue on 21 August, 1992. Time logged was a half hour, at 2000 feet, circling its home at Dayton General Airport, south of the birthplace of aviation, Dayton, OH. Finally, after ten years of dreaming of the day, N80CZ left the nest.

Regards,
Jim Krug

BUILDER HINTS

1. The 2 lb./cu.ft. large cell blue styrofoam called for in the plans is called Styrofoam in the Aircraft Spruce catalog, Polystyrene in the Wicks catalog, and extruded Polystyrene in the Alexander catalog. Urethane foam may also be called Polyurethane foam.
2. Gary Buscombe wrote to say that a product called "Pick Apart", made to soften Crazy Glue, also softens cured epoxy.
3. Rosenhan 4" wheels, now made by MATCO, are more expensive and have a different bearing spacing than the Brock and the Gerdes wheels, so the spacer bushings do not fit. When ordering a 4 in. nosewheel from Wicks or Aircraft Spruce, specify Gerdes and do not accept MATCO or Rosenhan.
4. Mark IV builder James Allen was allergic to Safe-T-poxy and switched to RAE. He said Dave Thalimer suggested a simple way to convert his metering pump. He drilled one hole to move the pivot bolt along the operating handle to a point 3.5 in. from the far connecting link. This changed the ratio from 45:100 (for Safe-T-poxy) to 1:4 (for RAE). He says an added advantage is that he can convert it back at any time just by moving the pivot bolt back to the original hole.

5. Extruded piano hinges MS20001-P6, P5, P4, etc. are all identical except for the width of the flange. It is easier just to order and stock the P6, and if the flange is wider than necessary, trim it on your band saw.
6. Ray Goldsmith suggested we advise builders of the correct way to bend aluminum to avoid it cracking. Rule of thumb is that the bend radius should be no less than the thickness of the material, i.e. 1/16 in. thick aluminum can be bent 90 deg. if the radius is 1/16 in. or greater, but always bend aluminum across the grain, not with it, otherwise it still might crack.
7. Lon Cooper says that he has made different shaped tips for his Weller soldering gun out of solid #12 copper wire and uses it as a miniature hot wire saw, and has found it very useful, like when he was building his canard.
8. [Eric Westland](#) sent a number of suggestions:
 1. He made a plywood jig for his bandsaw so he could cut foam at 30 degrees in one pass. He cut a piece of wood at a 15 degree angle to fit in the miter slot of his bandsaw table, which added another 15 deg. when the table was set at 45 deg.
 2. He uses a router to carve 1/8 in. and 1/16 in. relief cuts in the foam. He said it worked exceptionally well in Chap. 9 on the landing brake. He attached the router base to a 36 in. long board and said he made smooth 1/8 in. deep cut in minutes.
 3. He had difficulty stickling the copper foil tape to the bottom of the fuselage until he heated it with a hair dryer and pressed it down with a hard rubber roller.
 4. Make sure the nav antenna misses the area in the bottom of the fuselage that will be cut out later for the nosewheel well.
 5. A light from inside makes carving the outside foam for the fuel sight gauges easy. It also helps to locate holes that have been glassed over.
 6. Alexander Aeroplane sells peel ply 38 in. wide for just over \$2.00/yd. (this is cheaper than it would cost at a fabric store). It is a finer weave than the tape and conforms to curves easily. If you need tape, you can cut it to whatever width needed.

MARK IV CHANGES/CORRECTIONS

FOR SALE

1. Fuel sight gages. Clear bubble with white background. \$30 per set. Contact Vance Atkinson, 3604 Willomet Ct., Bedford, TX 76021-2431 (817) 354-8064.
2. Plans for the 3-place Cozy. My son wants to help me build, but is suggesting we work on the Mark IV instead of the 3-place. Glen Wiser, (805) 871-7254.
3. Cozy project #523, complete thru Chap. 7 with materials thru Chap. 8. All news letters, plans updated, tools, epoxy pump and extra items. Lost job, no income, must sell. \$750. Quality workmanship. Bill Petty (713) 920-1944.
4. Internal rudder belhorn plans and detailed instructions \$8.00. Contact Jeff Russell (919) 961-2238.
5. '91 Cozy 70 TT, 0-320 B2D 1250 SMOH. KXI55 w/glideslope, KT76A. Stereo sound system with AM/FM. IFR equipped. Excellent workmanship and beautifully finished. \$49,500. Dave Petrosino (619)495-1763 or (919)747-0285.
6. The following classified ad appeared in Sport Acrobatics: "New & used parachutes. Great prices.

Lifetime Warrantee!"

LETTERS FROM BUILDERS

8/21/92

Dear Nat,

Per our conversation, please find a picture of the nose of my MK IV which has since been finished. As it sits now, the main wings, canard and center spar are finished.

As you may know, Dennis Oelmann did the wings, canard and the center spar for me. The local EAA chapter has been a lot of help, so the progress has moved quite fast.

Anything you can send would help Nat, since the prefab turtle back and strakes are coming next week. Thanks for a great set of plans.

Sincerely,
[Mike Pinnock](#)

9/10/92

Dear Nat,

I have completed all of Section 1 (Mark IV) except Chapter 21. Please send additional chapters.

The plans you have provided are a pleasure to work from. It is very rewarding to be able to work from the plans and make everything fit right the first time. I am holding tolerances of 1/32" and everything fits great!

Sincerely,
Larry Sligar

9/15/92

Dear Nat,

I have moved from Alaska to a temporary home in San Diego. Since arriving though I've been unemployed, and although I'm scraping by, the time will come, unless a job appears on the horizon, that my Cozy will have to be sold. Since I've been here, I've had to leave it parked on the tarmac, since I can't afford a hangar. I hate leaving it outside. I have bad dreams about it, so after much heart-wrenching thought, I have decided to sell it to someone who can afford it and give it the home it deserves. If this gets to you in time for the newsletter, please advertise it for sale.

Sincerely,
David Petrosino

2006 Whinchat

San Diego 92123
(619)495-1763

Editor: Can any of our San Diego builders come to Dave's rescue?

8/31/92

Dear Nat,

Congratulations on completing another Cozy! Sometimes I think I will grow wings before I get one finished, however, the last newsletter inspired me towards another work marathon!

Progress on my Mk IV #111 continues along at a slow, but enjoyable pace. I have finished meat of Chap. 8 and completed the landing brake in Chap. 9. The enclosed picture shows my progress to date along with my son Paul. The 4th seat will be taken by DEC. with son #2. All together, I have recorded 367 hours and so far it has really gone together well. The effort and thought you have put into your plans is appreciated! Mark IV builder Jim White has been a big help as well.

Lastly, thank you for always being there when the phone rings. I have only called 2 or 3 times. It is only when I am really unsure that I call at all. Believe me when I tell you that I could talk Cozy all day.

Thanks again,
[Eric Westland](#)

8/25/92

Dear Nat,

It was a pleasure meeting you at Oshkosh 92 and so many other Cozy builders. This was my first experience at Oshkosh and frankly was overwhelmed. To make a short story even shorter, I stumbled onto an airshow in Merced CA, saw this sleek looking thing called a Cozy which belonged to Todd Morgan and fell in love with it. But Todd Morgan said it wasn't for sale. I spent the next 3 days calling all over the US and within 3 mere days was the proud owner of Cozy N566MG built by Mike Green of Colorado Springs, signed, sealed, delivered and a whopping 45 minute check-out.

I become mere impressed each time I fly the Cozy and look forward to my two boys becoming proficient in it. I can't say enough for the economics of the Cozy as most of my fomer experience is owning and flying 310 Cessnas. I think it cost me less to take the Cozy to Oshkosh and back than it did to run around the pattern a couple of times in the 310. I appreciate the time you've spent in the development of a superb airplane and in the promotion of affordable flying.

Thanks,
Marvin L. Schuh

8/9/92

Dear Nat and Shirley,

We enjoyed the Cozy dinner at Robbins. Good food, good company, and good Cozy conversation. For the benefit of Cozy builders who didn't attend, we volunteered to type up a list of Cozy builders who

attended the dinner and mail each person a copy. Perhaps there are others who would like to be included on this list so they can correspond with fellow Cozy builders or visit when traveling. We will include additional names and addresses if we are sent: name, address, phone number, which Cozy you are building or flying, would you be interested in a Cozy builder/flyer visiting you, and include \$1.00 to cover copying and postage. I'll wait until the October Cozy newsletter is out before I send this list to include any additional names/addresses/phone numbers.

We took our first really long trip in our Cozy in July. Having had no experience in mountain flying (Iowa elevations average around 800 msl) we decided to fly to Oregon to visit an uncle. We experienced a major storm system in Nebraska (flight service said we could get through it by 11:00 a.m., but didn't say which day! We ended up flying around it (100 miles south to Salina, KS) dodging thunder storms in eastern Colorado, experienced what density altitude can do on take-off, and know what "moderate turbulence" is. We have an O-235 engine and were carrying about 30 gallons of fuel most of the time along with our luggage, so we were pretty heavy, but other than a take-off at Boulder airport (4,000' rwy at 5,500' elev. and 75 degrees) where we used up all the runway (know what it must feel like to fly off an aircraft carrier!), we had an enjoyable trip. We flew interstates most of the time and never encountered elevations where we had to fly over 10,550'. A cozy 31 hrs. round trip from Waterloo, IA to Kelso, WA in our Cozy. We had radio problems on the way home and have been so busy since we got home, we haven't found the problem.

We have had problems with our Loran and think some of the "position errors" were due to static electricity. The trim on our N611CZ are automotive decals and we have been told that static electricity builds up on these. We put metal static bleeders on the winglets and this seems to have helped. We found that weather and magnetic variations affected the loran in some areas.

Sincerely,
[Rex Pershing](#)

8/4/92
 Dear Nat,

Thank you for promptly sending me the Mark IV plans. I now have plenty of reading to do even though my better half thinks I read too much about airplanes as it is. Although a bit ambitious, this will be my first aircraft project. But if you're going to be a bear, be a grizzly. I do have some experience with fiberglass and I am a Mechanical Engineer, so I believe I may have some background. I am currently seeking a workshop; you see, I live on a boat (38 ft. sailing sloop) which has no garage or workshop. Ever have a builder in this situation before? Currently I have a subscription to your newsletter, the CSA newsletter, Sport Aviation, EAA Chapter newsletter, the CP Digest, and the DBGN. If I screw up, it should not be for lack of information. We do have several plastic plane builders in my Chapter and some fairly good technical counselors. But now that I have the plans in hand it is time to begin to fulfill my dream and BUILD THIS THING. I'll try to keep you up to date on the progress of the "Floating Mark IV".

Doug Harris

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