

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

# COZY NEWSLETTER #37

## April, 1992

### Table Of Contents

- [WHAT WE HAVE BEEN DOING](#)
- [NEW EXHAUST SYSTEM](#)
- [CANOPY STOP](#)
- [INTERIOR PAINTING](#)
- [ACCESSORY WEIGHTS](#)
- [REMANUFACTURED INSTRUMENTS](#)
- [CIRCUIT BREAKERS](#)
- [TIE DOWNS](#)
- [MARK IV CHANGES/CORRECTIONS](#)
- [FOR SALE](#)
- [FIRST FLIGHTS](#)
- [TURBULENCE](#)
- [MAIN GEAR MELT DOWNS \(from CP 70\)](#)
- [THE AERO ELECTRIC CONNECTION \(from CF'70\)](#)
- [DITCHING CANARD AIRCRAFT](#)
- [CAUTION From the Tech Council Newsletter](#)
- [OSHKOSH '92](#)
- [KANSAS CITY FLY IN](#)
- [FALL FESTIVAL OF FLIGHT](#)
- [BOLT TORQUE ON WOODEN PROPS](#)
- [LETTERS FROM BUILDERS](#)

[Newsletter Info.](#)[Subscription Info.](#)[Authorized Suppliers](#)

In Newsletter #35, we advised that we were adding Alexander Aeroplane to our list of authorized suppliers. They are geographically situated to serve the SE, have a good reputation for service, and carry the correct basic materials, although they don't have as extensive a line as Wicks or Aircraft Spruce. We have also added a new supplier for exhaust systems. Cozy builder Dave Mendenhall arranged for a close friend of his who has a muffler shop to make exhaust systems of our new design (see write-up elsewhere).

Brock Mfg. should now have all of the Cozy Mark IV parts in stock and on the shelf. It took longer than expected to complete the first lot of 60 nose gear forks, but we were told the machining is now complete, and they are in assembly as this is being written.

### WHAT WE HAVE BEEN DOING

Since our last newsletter, we have been concentrating on the plans model Mark IV. We haven't been able to devote full time to it, because there have been many interruptions. We are talking about builder

support, answering letters and the telephone, working with suppliers getting new parts made, approved, and into production, entertaining visitors. Cozy builders (like Vance Atkinson), and others who want to meet us and see what the plans model looks like (like Dave Martin, editor of Kitplanes) and also spending a little time with family members (children and grandchildren) who stay with us on their vacations. Sometimes we feel like we are running a hotel and restaurant, but we enjoy it!

Nevertheless, we have made good progress. We are grateful to Cozy builder Doug Hoffman, who came down from Minn., stayed with us for a week and helped, and Cozy builder Gene Davis, who comes down from Globe once a week to help. Since the last newsletter, we received the pre-fab turtleback (we had made our own, shipped it to Feather Lite who used it to make a mold, and then shipped us one that they made) and strake kit that Feather Lite wanted us to use, critique, and approve. The new canopy bubble from Airplane Plastics fit the turtleback well, so we mated the two together, and built the canopy frame. We found that the side windows from the 3 place did not fit well in the Mark IV turtleback. so we made molds and sent them to Airplane Plastics to make special, larger windows for the 4-place.

After completing the canopy, we decided to paint the inside of the fuselage while we could still turn it on its side, and then we mounted the centersection spar and bolted both wings on in preparation for building the strakes. Visitors are impressed when they see the airplane with wings attached sitting inside a 2 car garage, with one wing going through the double doors into my shop, which is alongside the garage. Invariably they ask how we are going to get it out.

The Feather Lite strake kit consisted of two straight, 8 ft. long, airfoil shaped leading edges, ribs and baffles. The builders supply the top and bottom skins, which are essentially flat pieces. We were very pleased that we were able to build two perfectly straight strakes, which joined the wings and centerspar exactly, without requiring much, if any, contour filling. This didn't happen automatically, however. It was the result of carefully checking alignment in every step of construction. We found that the rib shape and baffle dimensions shown in the plans only approximately correct, and that the ribs and baffles had to be trimmed in assembly, using a long straight-edge, for a correct fit.

With strakes complete, we had to make and fit cowlings before removing the wings. This meant installing the engine, and before we could do that, we had to have an engine mount made. Mike Youngblood, who builds the engine mounts at Brock Mfg. said he would give us 2-day service if we faxed him drawings, so we got busy, made up drawings, faxed them on a Thursday morning, and reviewed them with him on the telephone. The following Monday the engine mount arrived!!! The workmanship (welding) was beautiful, and the dimensions were right on the money, so we got a hoist and hoisted our engine out of the box. The mount fit our engine with no interference and ample clearance at the fuel pump and the oil filler neck - the two spots we were concerned might be problems. We called Brock Mfg. and gave our verbal approval.

We hauled our prototype cowling molds back from the hangar, dusted them off, polished them up, and made top and bottom cowlings. We anticipated some problems fitting these cowlings to the plans model, because of minor differences in the firewall shape between the prototype and the plans model, but a good fit was obtained with only minor modifications. We will eventually have to ship our cowlings off to Feather Lite, to use as plugs so they can make permanent molds, but for the present, at least, they are staying on the airplane.

The new 4-pipe exhaust system from Dave Mendenhall just arrived a couple of days ago. We installed it immediately to see how much we would have to modify the cowlings. Fortunately only the top

cowlings needed modification, and not very much at that, so we were pleased.

---

## NEW EXHAUST SYSTEM

In the 3-place Cozy, we used the exhaust system designed for the Long EZ by Herb Sanders, the original owner of Sport Flight. We liked this design because it was compact, had slip joints at the cylinders (to prevent cracks at the flanges) and the pipes exited aft. Over time, there were two complaints about this system. The first was that the heat muff was inadequate in cold weather, and the second was that exhausting both cylinders on the same side into the same pipe robbed the engine of power, at least a loss of 100 rpm. A few builders made their own 4-pipe systems, but they didn't have slip joints or heat muffs. We have been under pressure to find a second source for exhaust systems, but didn't want to do it until we had a new design which met all of our requirements, namely:

1. Four individual pipes exiting aft.
2. Slip joints at each of the flanges to avoid stresses and cracks.
3. A heat muff covering both pipes on the right side.
4. Fit inside existing 3 and 4 place Cozy cowlings (and also Long EZs).

After a little bit of trial and error, we did come up with a design which met all of these requirements. The Mark IV has its engine mounted a little higher than on the 3-place, so we just made the uprights a little longer for the 4-place; otherwise the pipes are identical.

About the time we were working out the details of this design, Cozy builder Dave Mendenhall asked if he could be considered as a supplier, since he had a lot of experience welding stainless. We turned him loose on the new design. He started out with much enthusiasm, but ran 'into a lot of bad luck along the way and decided he couldn't handle it along with his regular job. In the process, though, he involved a friend who owned a muffler shop, and this friend, Gary Reed, decided that it would be a good fit with his automobile business.

We have the first set of pipes that Dave and Gary made. and are very pleased with them (see pictures). They fit our 4-place well, and we have asked Gary to make a set for the 3-place to check for fit as well.

The new exhaust system uses over \$250 worth of materials, and takes about 16 hours to build. We asked Gary to price them under \$500. We think this is pretty reasonable since Hal Hunt has priced his pipes at \$450 plus shipping, and his have neither slip joints nor heat muffs.

---

## CANOPY STOP

Cozy builder [Dewey Davis](#) wrote to us about the canopy stop shown in the plans. He said he didn't like it because it didn't allow the canopy to be opened far enough to enter the back seat comfortably, and if

the latch pin released when the airplane shook, like in starting the engine, the canopy could slam shut rather violently. So Dewey eliminated these concerns by installing an automotive gas spring, which he picked up at an auto store. This spring opens the canopy about 55 degrees, and holds it open similarly to hatch backs and hoods on automobiles.

Dewey sent us the part number on the gas spring (Mighty Lift #95002) and the installation details. Shortly thereafter Vance Atkinson dropped us a note saying he had installed the same spring on his canopy and was very pleased. With such impressive recommendations, we rushed down to our local auto store, bought the same gas spring, installed the hardpoints per Dewey's instructions. and installed the spring. When we started to close the canopy we heard such a loud groaning noise and crunch we stopped in our tracks. It sounded as though bulkhead TB1 was about to pull loose from the turtleback. At this point, we got on the phone to Mighty Lift and asked what force this spring was rated at. They said it was rated at 103 lbs!!! I hauled out our bathroom scale and let the canopy rest on it, and it registered only 16 lbs. Obviously this was a case of overkill!

I tried to find out from Mighty Lift if they had a gas spring of the same dimensions with about a third of the force. When they found out this wasn't an automobile application. they refused to provide any information. After much phoning, I finally was referred to a company called Service Plus Distributors (215) 639-7810. The gentleman I talked to, Stewart, said they engineer industrial applications for gas springs, and would be happy to engineer mine. I said all I needed was a gas spring about 15" long with 30 to 40 lbs. of force. They suggested a SPD-5150-40, for \$29. He said the industry standard for ends was sockets, so I would need ball fittings for each end for a nominal additional cost. I asked him to send me a ball stud and a right angle ball bracket.

About the same time, good friend Tom McNeilly suggested that the spring be mounted differently, so it would go over center when the canopy was half open. Then it would hold it open in the open position, and closed in the closed position. Tha wav it would provide an additional degree of safety, should someone neglect to lock the canopy, and the safety latch failed (like happened to Vance). This seemed like a good idea, so I mounted one end of the spring 8.5" up the side of the right headrest. and the other end on the horizontal member of TB1 so it just clears the left headrest. Guess what? It works like a charm. It takes 26 lbs. to lift the canopy from the closed position. Half - way open, the spring takes over and lifts it the rest of the way, and it opens to 64 degrees!!

This is so slick we are going to show it in our Mark IV plans, and we think 3-place builders could do the sam thing with the same spring. First locate one end of the spring on the TB1 cross member as close to the left headrest as possible. Then open the canopy 60 degrees or so and see where on the right head rest to fasten the bracket. The hard point on the cross member was made by routing out some of the 3/8" PVC, and then floxing in a 3/8" thick alum. slug (1/4" would also work). After cure, a 1/4" hole was drilled and tapped to 5/16" x 18 for the ball stud. 4 layers of BID reinforcement locally is optional. On the headrest, we routed out some foam and floxed in a 1/4" thick alum. slug and later drilled and tapped for 10-32 screws to mount the ball bracket.

---

## INTERIOR PAINTING

We decided to paint the interior of the fuselage before installing the center section spar, so we could lay the fuselage on its side. The recommended paints are either Zolatone, or Multispec textured paints,

which hide the fiberglass weave. The two paints are similar, except Multispec has smaller flecks or color and costs about 1/2 that of Zolatone (you will need 1 gal.). A primer should be used first, to improve adhesion and provide background color. A conventional spray gun doesn't work well in close quarters. It makes too much overspray and blowback. We applied the primer by brush and then rented equipment for the Multispec. The rental company knew exactly what we needed. It was a Binks 2001 internal mix gun with a #66 fluid nozzle a #200 tip and a remote 2 qt. pressure pot. It worked great! Hardly any overspray or blowback. and no drips no matter how the gun was held. The same equipment, but with different nozzle and tip would probably be excellent for painting the exterior.

## ACCESSORY WEIGHTS

We removed the starter, alternator, and carburetor from the 0-360 we purchased, because we are going to replace them with lighter weight units. Thought you might be interested in the weights:

Original Equipment		Lightweight Replacement
Starter	17.5 lbs.	8.0 lbs.
Alternator	15.5 lbs.	6.0 lbs.
Carburetor	5.0 lbs.	3.0 lbs.
<b>Total</b>	<b>38.0 lbs.</b>	<b>17.0 lbs.</b>

This saving of 21 lbs. in the engine compartment is extremely significant!

## REMANUFACTURED INSTRUMENTS

Through our friend Tom McNeilly we met a neat guy who operates an instrument repair station in his home. He checked out the used electric gyros we purchased at a bargain price through a lead from Vance Atkinson. Anyway, this man has a large inventory of used flight instruments (altimeters, ROC, airspeed, vacuum gyros. etc.) which he remanufactures, i.e. rebuilds them to new specs. His prices are very reasonable. If interested. contact:

Howard Francis  
5631 S. Crows Nest Rd.  
Tempe AZ 85283 (602) 820-0405

## CIRCUIT BREAKERS

Heard on the news today that a blown fuse shut down one of the operations of the space shuttle! Tsk! Tsk! The space shuttle uses fuses?? We are using the new Snap Action MB1 miniature circuit breakers (\$6 ea. at Wicks) and miniature toggle switches (\$1 ea. at our local surplus store). We found that there

was enough room at the top of the panel to locate 14 switches with circuit breakers plus warning lights and a dimming rheostat. This is a very convenient location. The panel will be removeable, and all of the wiring will be very accessible.

---

***Co-Z Dev. will be closed the last wk. of May (Our youngest son is getting married!)***

---

## TIE DOWNS

The recommended location for wing tie downs is through the reinforced area of the wing tips, missing the shear web. Measure forward of the trailing edge and perpendicular to it 12-3/4". Measure inboard of the inside surface of the winglet 13-3/4". Drill a hole there through the wing just large enough to accept a piece of tubing with a 3/16" I.D., and flox the tubing in place. Then purchase a couple of 3/16" eye bolts with steel and rubber wide area washers for the top and bottom of the wing.

When the Cozy is parked nose down and the wings tied down, the nose tie down does not have to be substantial. We have a removeable pitot in the nose, and when we park we remove it and replace it with an eye bolt attached to a 1/8" pipe plug.

---

## MARK IV CHANGES/CORRECTIONS

---

## FOR SALE

1. 1990 Cozy. Lyc 0-32G-E2D 100OTTSN, Airframe 180TT. IFR equipped and rated, Mode C Loran tied into Shaddin miniflow fuel computer, front sliding canopy, gull wing rear doors, removable Ox system, excellent workmanship, always hangared. too many extras to mention. \$50,000 OBO. (303) 680-1355.
2. 1989 Cozy. 120 HTT. Excellent Workmanship. 0-235-L2C, 170 MPH cruise, full vacuum. Mode-C, Apollo 608 Loran. Terra Nav/Com, Heavy duty brakes, wheel pants. Flies Great! (513) 553-4513.
3. Nose gear ratchet. A 'must' for all Cozy builders. \$38. Contact [Dr. Curtis Smith](#). 1846 Sextant Dr., Worden IL 62097 (618) 656-5120.
4. Fuel sight gages. Clear bubble with white background \$30 per set. Contact Vance Atkinson. 360.4 Willomet Ct. Bedford, TX 76021-2431 (817) 354-8064.
5. Wire for hot wire saw. John DiMilia purchased a 250' coil (minimum order) of .041 dia. high



temp., high tensile wire from the manufacturer and would like to sell off the surplus. Contact John DiMilia, 92 Park Ave., West Caldwell, NJ 07006 (201) 228-8966.

6. Original equipment Delco Remy alternator and starter and Marvel Schebler 4-5 carburetor (yellow tagged) from a Lyc. 0-360 engine. Make offer. (602) 981-6401.
7. New landing brake assembly and canopy for 3-place. Contact Bill Teeters (815) 399-0390.

---

## FIRST FLIGHTS

On Sunday 10/20/91, Charles Morel, Strasbourg, France flew his beautiful Cozy for the first time. Charles started building his Cozy in the spring of 1987. He kept building steadily and said that he was surprised when suddenly there was nothing more to do. His first flight was about 10 min. long, at Colmar-Houssen airport, Elsas, France. Since then he has logged about 8 hours of flying time and over 30 landings.

We know that more of you have made first flights. Please keep us informed!

---

## TURBULENCE

One might think it is not necessary to tie things down in an airplane if you don't expect to fly upside down or do aeratics. You might be in for a surprise. We were told that several years ago a Long EZ pilot encountered such severe turbulence (a mountain wave) that a wrench which was not tied down went right through the canopy. It left a hole the size of a volley ball and did a job on the prop as well.

---

## MAIN GEAR MELT DOWNS (from CP 70)

We continue to hear from at least one builder/flyer each quarter who has had this problem. We have reported on this problem several times in the past CPs and yet it continues to happen. The bad part is that each flyer who we hear from acts like they had never heard of this problem and why weren't we warning people about it? It is quite frustrating for us at RAF because this is a problem that frankly, does not need to happen - should never in fact.

If you have a Long EZ and are using the heavy duty brakes, this is what must be done to fix this potential problem. You must install heat shields between the axle mounting flange and the glass/epoxy main gear strut. This shield is purely a radiant heat shield and, as such, must be large enough to prevent the hot brake disc from "seeing" the gear strut. A fan-shaped, 1/8" thick alum. heat shield that extends up above the brake disc by at least 1/2" works fine. You don't need any more than that. We have seen more gear legs damaged in this way than we care to think about and all of them had exactly the same damage; i.e. the epoxy had been boiled or vaporized out of the glass strut directly opposite the brake disc. The damage was confined to an area the same shape and size as the disc. The damage can, and

does, occur even through fiberfrax insulation. I repeat, this damage is caused by radiating heat from the red hot brake disc and is locally confined to a small section of gear leg directly opposite to and the same shape and size as the disc.

To our knowledge, this damage has only ever occurred when tight fitting wheel pants were installed. Apparently with no wheel pants, the disc gets enough cooling air flowing over it to keep it from getting hot enough to do this kind of damage. So if you have tight fitting wheel pants, expect your brake discs to get very hot and protect the gear with an aluminum shield. In addition to the radiating heat damage, it is possible to generate enough heat inside an unvented wheel pant that this trapped oven-like heat can soften the epoxy and cause the gear strut to bend, usually at the highest point in the wheel pant. To protect against this kind of damage, you must wrap the strut from axle to the top of the inside of the wheel pant with Fiberfrax insulation. held in place with silicone (RTV). We have found wrapping over the Fiberfrax with aluminum tape makes a neat job and helps hold the Fiberfrax firmly in place. This will help the "oven heating" problem (as opposed to red hot radiation), but you must provide a place for this hot air to "chimney" out of the wheel pant. A vent of some kind is needed. This vent should be placed at the highest point in the wheel pant when parked, whether you park 3-point or nose down. This position niav change a little depending on the wheel pant design. The important thing here is that the vent must be high to allow the trapped hot air to flow out and pull cool air in around the fire. These two fixes together will help prevent a softening of the epoxy-type failure.

The NACA scoop-type inlets and outlets we have all seen on wheel pants probably don't have much value because you really need the cooling after you come to a stop. The NACA-type cooling scoops are generally too low to allow good chimney venting when parked.

The single man important thing is not to conduct extensive braking /taxi tests with wheel pants installed. Do all initial taxi tests with no wheel pants. Once the airplane has been flown and signed off, generally you will not find a need to do extensive taxiing/braking. If you do have to check-out a new pilot prior to his first flight in his own EZ, remove your wheel pants before you allow someone to practice for his first flight in your airplane.

If you have to taxi a long way with a strong crosswind, for example, the full length of a 10.000' taxiway on a day with a 90 degree temperature, you will have to ride one brake all the way. Under these circumstances, you might consider removing the affected wheel pant as soon as you park. This small inconvenience is tiny compared to getting stuck in some remote area, miles from home, due to a failed gear leg. And if you are unfortunate enough to fail a main gear leg due to heat, contact Mike Melville at Scaled Composites to borrow his steel splint that was made specifically to ferry a long EZ home with this problem. So far, it has been used on two Long EZs and one Cozy, and it will fit left or right Long EZ main gear legs!

---

## THE AERO ELECTRIC CONNECTION (from CF'70)

The AeroElectric Connection is a book published for people who desire a working understanding of aircraft electrical systems and components. It is produced as a periodical publication of chapters on specific topics. For example, issue #1 covers d.c. electrical fundamentals, batteries, engine driven power sources, voltage regulators and grounding. Issue #2 covers over-voltage protection, low voltage warning systems, wiring, wire terminations and circuit protection. This first a series of simplified wiring



diagrams for composite airplanes with high capacity alternators was published with issue #2. Issue #3 added diagrams for airplanes with and without starters plus versions using small permanent magnet type alternators. A series of do-it-yourself avionics articles and kits are in planning. An entire issue will be devoted to providing a customizable book form wiring diagram for your airplane. Contact The AeroElectric Connection Medicine River Press, 6936 Bainbridge Rd.. Wichita KS 67226- 1008 (316) 685-8617.

---

## DITCHING CANARD AIRCRAFT

We received a detailed report of the Varieze that ditched in the waters off the Montpellier Frejorgues airport in southern France. The full report has already been published verbatim several places, so we will only summarize. The cause was fuel starvation because the pilot neglected to switch from the fuselage tank (which holds only 2-1/2 gal.) to the wing tanks. He was low and slow on final, the prop stopped, and he didn't have enough speed or altitude to get a restart. He elected to ditch in the lagoon rather than to try to stretch his glide to reach land. He lowered the nose gear and touched the water with the mains, which broke off. When the nose gear touched, it did not collapse. Instead, the little door attached to the fork acted like a ski and kept the nose from plunging. The plane came to a stop in about 30 meters, and filled with water and sank up to the armrests. The instrument panel did not go under nor did the magnetos. Neither the builder-pilot, Ernest Magallon, nor his son were injured or even bruised. In addition to the main gear, there was damage to the lower cowl and the wings adjacent to the cowl.

We know that when Bob Beard ditched his Varieze in the water off California, it overturned and he perished. We don't know whether he had lowered the nose gear (or had it up, trying to stretch his glide), and if he had, whether he had the door in front of the wheel as shown in the plans. This might be an argument for following the plans, attaching the door to the wheel rather than installing doors on the bottom of the fuselage, which look nice but probably don't do much for performance.

---

## CAUTION From the Tech Counsel Newsletter

An on site inspection of a Long EZ revealed that the builder had failed to remove the dacron peel ply between buildups of the spar cap. The local Counselor discovered the need to aspect the ends of the wing while doing some peel strength tests on sample lay ups provided by the builder. The parts separated easily. When questioned, the builder was unable to explain why. Since the parts had been cut and trimmed, there was no edge frill to suggest an explanation. The clue to the cause was the texture of the surfaces which revealed a weave pattern too fine to be the 8 oz. glass called for in the plans. The builder thought that the peel ply was a part of the structure.

*Editor's note (Ben Owen): This is not the first occurrence where a fiberglass aircraft has had peel ply left in. Peel ply's primary function is to draw the resin up out of the matrix and to keep the resin "green" so that the next layup will adhere. If the peel ply is left in the structure and the structure built up around it - you just have a useless unit. If you are looking at a composite part to buy, say a wing, and you lift up on the wing tip and you hear it crinkling inside the wing, someone probably left peel ply in the wing. There is no way to correct this and the part must be discarded at this point. Peel ply will cause the*

*structure to separate piece from piece. If you realize upon inspection of an amateur built aircraft that the builder has left peel ply in the structure, either the part has to be torn down to the peel ply, the peel ply removed and the part redone, or the part must be discarded. Due to the nature of most fiberglass structures, this implies that the structure will have to be discarded and it is recommended that it be destroyed at that point. The above occurrence is not the first time that this has happened, I have had several calls here at EAA Headquarters on this very problem.*

---

## **OSHKOSH '92**

We have made arrangements for accommodations (camper in the woods) and transportation (a VW convertible) for Oshkosh '92. We don't know whether we can arrive early to reserve a row for Cozys on the flight line like past years (any volunteers?) cause we may be in a last minute panic to get the Mark IV completed and approved.

The Cozy dinner will be on Friday night, July 31, 6PM at Robbins, like last year. We reserved for 60 people. It will be on a first come, first serve basis. Last year we had an overflow crowd and they set up extra tables. See you there!

The Cozy forum will be Saturday Aug. 1, 1-2:15 PM in tent #3. We wish to encourage builders to participate, so you won't have to listen to us the entire time.

---

## **KANSAS CITY FLY IN**

Terry Schubert (Central States Assoc.) wrote to us to encourage you to attend the Second National Gathering of Canard Aircraft, June 5, 6, 7, 1992 at the Johnson Co. Industrial Airport, Olathe, KS. Last year this event brought nearly 70 EZ/Cozy types from all corners of the nation, and over 180 builders, flyers, friends & family members together for social events, races, seminars and prizes. It is non-commercial and held on a big, lightly used, controlled airport right in the middle of the country. There's no better way or place to meet other expert and exchange information. Hope to see you there whether you come by bus, train, or homebuilt. The goal is 100 plastic pushers. Make sure you are one of them! For further information contact Terry Yake, 8904 W 116th Terr., Overland Park. KS 66210-1963 (913) 451-8904.

---

## **FALL FESTIVAL OF FLIGHT**

Sept. 26 & 27, 1992. New Castle County Airport, Wilmington, Delaware. For info pack contact EAA Eastern Coast Fly In Corp. (301) 942-3309.

---

## **BOLT TORQUE ON WOODEN PROPS**

**Bolt Dia.****Torque**

3/8 "	200+/- 25 in.lbs.
7/16 "	250+/- 25 in.lbs.
1/2 "	350+/- 25 in.lbs.

Note: The values may vary depending upon the number of laminations. To bring a wooden prop into track, it is permissible to go to the high end of the propellor torque on one side to adjust its track.

---

## LETTERS FROM BUILDERS

3/25/92

Dear Nat & Shirley

Just a note to update you on the flight testing of our Cozy N3EP since you reported our first flight on April 20, 1992 in Cozy Newsletter #34.

The 40 hour test period was completed some time ago and now my wife Pearlie and I are ready for a few tnp.

N3EP weighed in at 990-lbs. The engine is a rebuilt Lyc 0-320 E2A, 150 hp. The propellor is a B&T 62 x 75.

I found the Cozy to be a very fast, high performance airplane. All controls are smooth with elevators and ailerons normal and satisfactory. Durtng several speed runs at 3000' MSL and 2700 RPM, N3EP indicated 160 Kts. The stall turned out be a non-event with no wing rock or tendency to fall off on one wing. It's a delight to fly.

Thanks, Nat, for a very fine airplane.

Regards,  
Ed & Pearlie Moulden

Dear Nat & Shirley,

Some news from France. I'm still enjoying the Cozy. Nearly 500 hours without any problem. It's really a wonderful plane! We moved to Ugnan, a little village near Beziers and we'll expect to move again to Montpellier next summer because of my job.

Happy new year,  
Daniel Hedricourt

2/25/92

Dear Nat,

As I reported earlier, I have been overhauling the engine of my Cozy for the past 3 months. It is an O-320 E2D and was purchased as a run-out with 2500 hours TT. I put 170 hours on it since the first flight, and it performed well, but oil consumption was high, and a major was inevitable. The last time I flew, the CHT went to 525 F on climbout, so I throttled way back and nursed it home. I tore it down and found that the #2 exhaust valve was stretched. Otherwise, the engine looked far better than I had expected, considering the TT and the fact that it had never been topped.

I sent the cyls to ECI for Cerichrome remanufacture and fitting of 160 hp pistons. I also sent the crank, cam, lifter bodies, case, etc. for overhaul. They line-bored the case. All other parts were polished and returned yellow tagged to standard tolerances. It took 6 weeks to get everything back. I then took all the moving mass to an automotive shop that builds racing engines and had them dynamically balance everything to within 1/4 gram. With the help of a friend and Lycoming manuals, we reassembled it over a two week period. A new oil pump, hydraulic lifters, and scads of small parts were also installed. I ended up spending around \$5500 for parts, labor and shipping. A ridiculous figure, considering what that will buy in the automotive market.

I was fortunate in that my friend Rick Cahill's Cozy was not quite finished, so he loaned me his 62x74 prop to use to break in my engine. I had planned to fly the Cozy to the Dominican Republic as a participant in the Dominican 500 early in Feb, so I needed to get some time on the engine. After about 12 hours, the temps and oil consumption had started to stabilize, so I left on the trip. It was a week long fly in to the D.R. in celebration of the quincentennial of Columbus's discovery of the new world. We flew to Ft. Pierce, FL, and then off across the pond! I had never done any flying over water and do not have either a VOR receiver or an ADF, so I installed a Sony GPS receiver. It was a good thing too, as the Loran could not navigate past Grand Bahama Is. We landed for fuel at Great Euma Is. The next stop was at Providenciales. It was getting dark, so we spent the night and departed early the next morning for Santiago, D.R. It is about 200 nm to the island and when we got there, it was solid IFR. The clouds build around the 10,000' range on the south side and unpredictably will cover the entire country. We diverted to Grand Turk Is. in the Turks and Caicos. about 180 nm north and spent two wonderful days goofing off and snorkling. Grand Turk is a trip back to the 19th century. There is very little to do there, but the beaches are beautiful, the pace is slow, and the people are very friendly. We finally flew into Santiago where we met the rest of the group. We ferried the Cozy to San Isidro AFB where the aircraft were stored, and then spent three days in Santo Domingo. We were treated like royalty. The Dominican people had received much advance warning as to the fly in, and as we moved along on our tour busses, they were lined up along the streets cheering and welcoming us to their beautiful country. There were three other homebuilts on the trip, 2 Defiants, and a Glasair RG. It was a great trip, that would not have been possible for me without the Cozy. It was a hit everywhere we landed. The tower controller at Grand Turk had us do a fly-by so he could get some photos.

The Cozy performed flawlessly on the trip (3200 nm total). There were many times the GPS showed a ground track over 200 Kts. For a while at 11,500' we had a GT of 230 Kts. Not bad for something you built yourself in your garage! I have an Ellison TBI to install, and a Performance Props 3 bladed prop on order. I am anxious to get these things done, as I feel that then my airplane will have developed it's full potential. Thanks again Nat for a wonderful airplane!

Fly Safely,  
[Ron Kidd](#)

3/2/92

Dear Nat,

I came across a computer bulletin board that you might want to mention in your newsletter. It is run by the FAA to promote the rapid exchange of safety items throughout the small community. There is a bulletin board area to discuss questions or building hints, and a database of service reports to share information on equipment failure, etc. This database is used primarily by homebuilders. I found that browsing through the bulletin board and the service reports to be very enlightening and educational. This bulletin board is open to the public, and any activity on it is anonymous. The number is (800) 426-3814. Even the phone call is free.

I have begun construction on my Cozy Mark IV Serial No. 117, and am halfway through Chapter 4. David Haggard of Wichita was kind enough to give me a ride and let me fly his 1991 Sun & Fun reserve grand champion Long EZ. It was quite inspirational: the Mark IV can only be better.

Regards,  
Mason Ranee

1/27/92

Dear Nat,

Your efforts are greatly appreciated. I am about to complete Chapter 6. I'll send pictures when I get to the "garage flyable" stage.

I have a few things to pass on to other builders.

1) I tried four unsuccessful times to bend the fuel valve mounting bracket into the position shown in Fig. 17, Chap.6 without getting cracks. 2024 alununum is strong, but is prone to crack when bent to such a sharp radius. If cracked, this bracket could fail and make it difficult to switch tanks in flight. I would recommend 3/16" radius instead of the 1/16" radius shown.

2) Instead of using wedges to hold the 0.25" longeron strips together as shown in Fig. 2, Chap. 5, wrap strong twine back and forth across the jigs around the ends from one longeron to the other. This "corset" arrangement worked well for me.

3) Don't use weights to hold down the wood pieces LWX and LNW shown in Fig. 14, Chap. 5 or the Clark foam in Fig. 17 if the fuselage side is not supported underneath. The slight sag in each side will cause over a 1/4" gap to occur when you get to Chap. 6 and start assembling the pieces you worked so diligently on in Chap. 4.

4) It would be helpful if builders would share part weights as they progress. I believe my layups are high quality and light, but I would hate to get to the end of the project and find out it's 100 pounds overweight (ugh).

Considering I only work on the Mark IV in the evenings and sporadically on weekends, the project is progressing much faster than I thought it would. Thanks for a great set of plans!

Yours truly,  
[Jim White](#)

2/19/92

Dear Nat,

I want to share with you an experience I've had recently that you may wish to pass along to other Cozy builders. On a recent flight in my Cozy N41CZ the engine began running very rough when I reduced the throttle to near idle to practice slow flight. Opening the throttle smoothed out the engine but the RPMs were way down and I could only get about 2300 RPM max. CHT on #2 cylinder was down to only about 100 deg. so it seemed a good bet it wasn't firing. I also noted that the electrical system was no longer charging. I headed back to the airport and made a normal landing. I pulled the plugs in #2 and noted they were both covered with oil sludge and that there were several tablespoons of oil in the bottom of the cylinder. This cylinder had been fouling plugs ever since I started flying my Cozy 4 years ago. I've just had an overhaul done. The problem was a badly worn exhaust valve guide which allowed oil to be sucked into the cylinder at low throttle settings. Much to my shock the real lesson here was much more serious than the cylinder!

Remember I mentioned that the electrical system had stopped charging? Well, upon removing the cowling I discovered that the pulley, washer and nut from the Mitsubishi alternator were missing and the belt was chewed up!!! Fortunately, I found the pulley halves and washer in the bottom of the cowling and the nut was found balanced on top of the #3 cylinder!!! All the parts were there and no prop damage. When originally installing, it seemed too difficult to safety this nut so it was a regular item that I checked. I believe the rough running of the engine due to the fouled plugs caused unusual pulses to be transmitted to the alternator which backed off the nut. I have since drilled the nut and shaft in a drill press and added a cotter pin. I was very, very lucky! The large pieces that came off could easily have gone out the back and chewed up my prop or worse! The lesson here is that safety wiring or pinning is essential. Anything that can come off will come off! Hope to see you at Oshkosh this year!

Sincerely,  
 Jack Grandman

2/10/92

Dear Nat,

I trust this finds you and Shirley doing well. If you remember, I visited you along with my wife and children before we moved from Williams AFB last April. You were kind enough to show us your Cozy Mark IV prototype and proof of plans in the works.

Since our visit, I have completed my B-IB Aircraft Commander course and settled into our new home in Rapid City. I enjoy flying the B-IB bomber and, although it's a kick to fly a \$230 million dollar aircraft, I'm looking forward to building my Cozy Mark IV from your plans. My wife is as excited, if not more so, as I am to work on this project.

I would like to know if there have been any incidences of unrecoverable stalls with your design as has been experienced in the Velocity design (*Editor: None*). If there have been none, do you anticipate the possibility of an occurrence of an unrecoverable stall (*Editor: - Very improbable if operated within the approved cg. range*). Thank you again for your time last April and now.



Sincerely,  
Ken Baker, C.W.

1/20/92  
Dear Nat,

Just a short note to keep in touch. I am planning to visit Oshkosh for the first time this summer (in a spam can).

I just completed the fuselage sides and attached the longerons. Finally I have a "big" piece to show for all my work. As a dentist who wears latex gloves all day, I find the powder or the latex itself can become irritating, and I agree with you, to skip the gloves. I have been using generous quantities of ply #9 gel and paper towels.

Our local EAA chapter will help one of our members. Charlie Gray, with the Sun & Fun races this year. Conspicuously absent from last year's race were Cozys. If 3 aircraft of one type (Cozy) enter, a separate category will be created. All homebuilts race against the clock, not each other. For more information, contact Charlie Gray (407) 466-4660. Continued good luck with the plans and construction.

Sincerely,  
S. Blank, D.D.S.

2/18/92  
Dear Nat,

I am getting ready to put the bottom on my Cozy. I haven't made as much progress over the last month due to the arrival of child #3 (BOY #I!) on July 31. and a heavy project schedule at work. I'm the manager of a group developing network software for the largest ATM system in New England. In banking, having a job is the best Christmas present there is, so I'm not complaining!

I'm including some photos taken this summer when we assembled the sides. The main landing gear extrusions were cut on a band saw and hand sanded. Lightening holes were drilled out at a friend's hangar. He's also given me some back seat time in his Long EZ. I'm getting construction help and flying time at the same place! This was my first experience working in metal and I give credit to anybody out there building an entire airplane out of the stuff. Still I hope to push on and get the fuselage glassed in time for a Mall Show one of my chapters puts on each year. I'm President of one and a member in two others so it keeps me busy.

I have also included a snapshot of my car with it's custom plate (COZY). How's that for advertising? Reaction on the highway is mixed. Some people just give strange looks. but fellow EAAers with the gold wings in their windows always smile and give a thumbs-ups!

The reason you don't hear much from me is definitely a reflection on the quality of the plans and the abundance of Long EZ builders here. The best of building is the friends you make along the way!

Regards,

Dave Barthelme

1/24/92

Dear Nat,

Thank you for taking the time to send information on the nose gear modifications. Since I have already installed the gear, I may only use the new fork. Brock Mfg. says they are still working on the fork assembly.

Work is progressing surely but slowly on Cozy #221. I had an "open house" meeting at the request of our local chapter. Everyone was suitably impressed and are looking forward to see the Cozy airborne. Thanks again, Nat, for your design and assistance.

Yours sincerely,  
Brian McKiemari

3/21/92

Dear Nat,

Thanks for the Mark IV (serial #120) plans. I guess I should have written sooner, but I have been having too much fun pouring over them. I am really pleased with the quality of the plans. I have read them through once, and am just now starting on my second read.

I made contact with local EAA chapter 388. I believe that I am the first Mark IV builder in the group, but fortunately for me there are several Varieze and Long EZ builders and fliers in the group. The past president of the chapter has been flying his Long EZ for about 3 years now, and works for the company I do. We have been meeting at lunch to schmooz, and I have been learning a lot from him.

Starting April 13, I have a 6 weeks sabbatical from work, during which I plan to get my shop ready to work on my airplane. Again, thanks for the great plans, and thanks for what looks like a great design. I am already having fun.

Best regards,  
Wesley R. Witte

2/25/92

Dear Nat,

Cozy #267 has over 200 hours on it now and is flying great! After all these hours I still get excited each time I fly.

Thanks!  
John Ashe

2/11/92

Dear Nat,

Enclosed is a check for renewal of the newsletter. It is very well done but I would be more than happy to increase the subscription rate if you would be able to include more construction pictures. Thanks again for your plans.

Tom Ellis

Dear Nat,

Happy New Year! Am happy to report that both my Cozy and John Kroboth's are beginning to look like airplanes, and not boats as everyone thought we were building. Much progress has been made, as the only major structures left to finish are the canopies and strakes. The rest is ready for fill or is being sanded. I figure that we're about 90% complete with only 50% left to finish. I don't expect to make Sun & Fun, but both of us should be at Oshkosh. If so, and if joined by Tom Gross, there will be three Cozys there from the same town!!

Thanks,  
[Wayne Lanza](#)

---

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

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