

COZY NEWSLETTER #84 Jan., 2004

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Subscription rate: \$16.00/2 yrs., \$20.00/2 yrs. OUS

(2-year renewals save us record keeping)

Cozy Mark IV Owners Manuals - \$15

Cozy & Cozy Mark IV decals - \$5 ea. (specify color)

**The Staff at Co-Z Development wishes
you a Happy Holiday Season and a
Prosperous New Year**

The Cozy Mark IV plans are obsolete unless updated by all changes or corrections in the newsletter. First Edition plans holders need newsletters #34 to present. Second Edition plans holders need newsletters #52 to present. Third Edition plans holders need, newsletters #74 to present. The older copies, which we can no longer supply, are available on the Unofficial Cozy Web Page and also on a CD available at Aircraft Spruce. The newsletter is the principle means by which we communicate with builders and support their projects. The newsletter contains plans corrections and changes, builder hints, information and updates about our suppliers, shopping info, first flight reports, and other news of interest to builders. We answer telephone calls whenever we are home and personal letters as well, but please enclose a stamped, self-addressed envelope if you expect a reply. We encourage newsletter input from builders (letters and pictures) which would be of interest to other builders.

“Cozy” and “Cozy Mark IV” are trade names of Co-Z Development and are the names given to airplanes built according to the plans and instructions of Co-Z Development. Just because you buy a set of Cozy or Cozy Mark IV plans, does not mean you have to build your airplane exactly according to plans. It is an experimental airplane and you can, in fact, make whatever changes you desire. But then you have a new, untested design, and shouldn't register or insure your airplane as a Cozy or a Cozy Mark IV.

Starting January 1, 2004 (or soon thereafter) Aircraft Spruce will be the only one authorized to sell plans and construction manuals, but Co-Z Dev will continue to provide builder support for the Cozy airplanes.

AUTHORIZED SUPPLIERS

Authorized suppliers are those suppliers we selected because of their excellent reputation in the industry, whose parts and materials we proofed in our plans model and who agreed to supply the same parts and materials to our builders.

1) Basic Materials

Aircraft Spruce West Box 4000 Corona, CA 91718 (909)372-9555	Aircraft Spruce East Box 909 Griffin GA 30224 (800)831-2949	Wicks Aircraft 410 Pine St. Highland IL 62249 (800)221-9425
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2) Metal Parts

Brock Mfg. Co.
11852 Western Ave.
Stanton CA 90680
(714)898-4366

4) Canopy & Windows

Airplane Plastics Co.
9785 Julie Court
Tipp City, OH 45371
(937) 669-2677

B & C Spec.
PO Box B
Newton KS67114
(316)283-8662

3) Fiberglass Parts

Feather Lite
1327 S State St,Arpt.
Ukiah, CA 95482
(707)462-2939
(707)462-3424

6) Exhaust Systems

Custom Aircraft
14374 Olde Hwy 80
El Cajon CA 92021
(800)561-1901

7) Propellers

Performance Props
Box 486
Patagonia AZ 85624
(520)394-2059

Sensenich Props
2008 Wood Ct.
Plant City FL33567
(813)752-3711

8) Prop Hub Exten.

Saber Mfg.
3601 Nassau Ct.
Granbury TX 76049
(817) 326-6293

OTHER PARTS WE RECOMMEND:

We can recommend the following items:

- 1) Improved **Rudder pedals** for lay-down brake cylinders, adjustable both sides. Dennis Oelmann (319) 277-5996.
- 2) **Electric speed brake actuator kit.** Wayne Lanza (772) 664-8953; wlanza@bellsouth.net
- 3) **Switching and breaker panel.** Wayne Lanza (772) 664-8953, www.CompositeDesignInc.com.
- 4) **Fuel sight gages.** Vance Atkinson (817) 354-8064.
- 5) **Electric nose-lift.** Steve Wright (615) 373-8764.
- 6) **Electric nose-lift, Spring steel safety catch,** and improved **MKNG-6 and NG-6 Pivots** with tapered roller bearings. Jack Wilhelmson (843) 884-5061.
- 7) **Electric pitch trim.** Alex Strong (760) 254-3692.
- 8) **Voice annunciated warning system.** Richard Lewis (423) 376-1450.
- 9) **Rebuilt flight instruments.** Howard Francis (not a Cozy builder) (480) 820-0405.
- 10) **T-shirts,** etc. Bill Walsh, nogofsu@sprintmail.com. (407) 696-0942.
- 11) **Antennas.** RST Jim Weir (530) 272-2203.
- 12) **Teflon & Stainless Hinge Pins Replacement.** Gary Hall (954)979-9494.
- 13) **Nosegear crank ratchets.** Bill Theeringer (805) 964-5453.
- 14) **Embroidered clothing.** With pictures of a Cozy, name, N number, etc. in any color. Trish Vermeylen (609) 693-4819.
- 15) **Featherlite:** Their email address is: fhrlite@pacific.net
Check there for latest prices.

BUILDER HINTS

- 1) **Aircraft wire:** David Domeier says for aircraft wire, go to <http://www.terminaltown.com>. He says they sell only new aircraft quality wire and terminals. The price is reasonable and the service excellent.
- 2) **Aircraft wire:** Rick Crapse says for aircraft wire, go to <http://www.skycraftsurplus.com/aircraft.htm>. Mil spec and definitely nice people to deal with.

- 3) **Cushion foam:** Tim Lumppp said that he purchased a twin XL pad from <http://www.foam4u.com/topper1.htm>. and that it was \$70 for the 1-1/2", or about \$3.25 per square foot, compared to \$8 per for temper foam in 1" thickness. He had a good friend bring over some samples of the 3 different densities of temper foam. He said the mattress cover IS NOT as dense as even the softest temper foam. So he plans on using it in some combination with temper foam, and maybe exclusively for the rear seats.
- 4) **Engine break in procedures.** Wayne Hicks says that the break-in procedure for new engines can be found at <http://www.lycoming.textron.com>. and suggests: 1) operate between 65% - 75% power. 2) Don't fly above 8,000ft. alt. 3) Avoid low manifold pressures and rapid changes of engine speed, and 4) Avoid closed throttle descents.
- 5) **Shop heat.** Carl Denk suggests checking with furnace installers for a used house furnace that is being replaced by a more efficient unit. He says these are frequently available for next to free.
- 6) **Covering large gaps:** Keith Spreuer says that a good way to cover large gaps like strake/wing of spar/wing is to take some pour foam, mix it up, and pour a strip onto waxed paper. Let it rise but while still soft, flip it over onto the gap and push it into the gap. After it cures (30 minutes or so), sand it flush with the adjacent surfaces. Then lay up 1 ply bid over the fam and onto both surfaces. After cure, you can cut a nice thin gap. Then separate the pieces and sand the foam down to a fillet. Glass the under side to reinforce. This works real well, even in curved areas.
- 7) **Canopy frame.** A common complaint is that in winter or at high altitudes, shrinkage of the plastic bubble pulls the canopy lip up out of alignment. Al Wick says that to avoid this problem, he made a point of building the canopy frame in cold weather without heat in his garage. His canopy lip does not lift noticeably in front at altitude. No air leaks.

DESIGN CHANGES/CORRECTIONS

- 1) It is recommended that builders drill a 3/16" hole through the side of MKNG-15 (not MKNG-6 as reported in NL #83) and strut and install an AN-3 bolt of the proper length and nut to prevent the MKNG-15A assembly from coming loose from the strut and departing the aircraft in the event of nosewheel It will also help to make the MKNG-15A assembly attachment more secure to dimple the strut and fitting before floxing the fitting in place.

WHAT WE HAVE BEEN DOING

In early October we attended Copperstate Fly-in at Phoenix Regional Airport, a ways south of town and displayed our airplane. We missed Colby Farmer, Kevin Funk, and Gene Davis, who attended last year, but there were a couple of new Cozys there this year besides ours. We met a lot of builders and would-be builders. The weather was good and we had a pretty good time, but frankly, the long drive down and back each day was a little tiring. It was much more fun when it was at Williams-Gateway Airport, only a few miles from our house.

Later in October we flew to Albuquerque to celebrate Shirley and her twin sister, Ramona's 80th birthday. The

weather was great and our Mark IV performed flawlessly. We contacted Lloyd and Erica Gimple, builders/flyers, in Albuquerque in advance, and they invited us for lunch when we arrived. They catered a lunch for us in their hangar with their Cozy at the airport. Their hangar was spotless, and this was a linen tablecloth affair. We sure have nice builders! It would have taken us 8 hours to drive to Albuquerque through the mountains, or probably about 5 hours going commercial, figuring the trip to Sky Harbor, 2 hours wait, a flight the better part of an hour, and then a trip clear across town to our destination. But in our airplane it was only about 1-1/2 hours, and we landed at Double-Eagle, only a couple of miles away for Ramona's house. Nothing beats your own airplane, especially if it is a Cozy!

Had a few prospects and builders stop by to see us, whom we gave rides to. Then Gary Hertzler asked us to try one of his props. Gary is the one who set all kinds of records in his Varieze, and now is making props in his retirement. We installed it on N14CZ, and took him up. It performed very well—2400 static rpm and in climb at 120 Kts. Rate of climb was good at 1,500 fpm with two aboard, and at 8500 ft full throttle cruise we got 2680 rpm. Very Good! It was a 2-blade prop, which of course has a little more vibration than the 3-blade I am used to, but all-in-all, a very good prop, and only half the cost of a 3-blade.

Our church is helping to sponsor a house for "Habitat For Humanity", and I signed up to work every Saturday. As of this writing, we are shingling the roof. It is a lot of fun, very inspiring, and we are meeting a lot of new friends, including the couple who will occupy the new house. I heartily recommend that you consider signing up for any projects near you.

We are having some computer problems which are very annoying. The darn thing keeps freezing up, and then I have to do an improper shutdown. The problem could be Windows ME, and I may decide to change to XP.

On December 9th, we hosted Jim Irwin and two of his staff for the day. Jim flew them in on his twin Cessna. We went over and explained everything we do in promoting and supporting the Cozy, and made plans for joint operations next year. They seemed dedicated to providing the same service on plans, information kits and owner's manuals as have we.

On December 19th we will leave (commercial) for Minnesota to attend our annual family Christmas get-together. Hopefully this will be printed and in the mail before we leave.

FOR SALE

- 1) **Propeller.** For 0-360 powered Cozy Mark IV. Same as tested on N14CZ (see above). Less than 300 rpm change from static to full throttle cruise at altitude (almost constant speed).

Gary Hertzler (480)097-8167 hertzler@yahoo.com.

BACK NEWSLETTERS

We will ask Marc Zeitlin if he will post the newsletters up to #83 on his web site, and keep current. Aircraft Spruce will also post this and future newsletters on their web site, after it is transferred over to them for updating in January. One of our builders has recorded all of our newsletters from #4 on on a CD, and we will see if they can be made available from Aircraft Spruce.

CANARD VIBRATION (not flutter)

Jean-Patrick Lacote reported that he had canard vibration which he traced to rudder flutter, which he was able to cancel out by applying slight pressure on a rudder pedal. Marc Zeitlin answer that a few months back, he had exactly the same problem. His vibration occurred at about 200 mph, and it was caused by the rudders. He had installed adjustable stops with too much compliance, that is, they weren't "hard" enough. When he installed flox stops on the rudders and linglets that did not let the rudders move at all when the rudder pedals were released, the vibration completely went away. The fact that light pressure on the rudder pedal stops the vibration indicates that it's not the position of the rudder that is the problem, but the fact that the rudder has the ability to move a bit even when at it's stop.

ACCIDENTS

Our purpose in investigating and reporting accidents is try to help other builders fly safely. This quarter we had 2 accidents, fortunately neither fatal:

- 1) Bill Swears, who was stationed in Hawaii in the Coast Guard, purchased a Cozy III from the original builder, had it shipped out there, and flew it in the islands for a couple of years. During that time, he had some engine problems, but topped his engine (an 0-235), installed a couple of new cylinders, and thought he had his problems solved. In anticipation of retirement, he installed a fuselage tank and planned to fly the plane back to the mainland. He took off around 6 pm on November 15th and headed east. At about 9 pm he reported engine problems and sent out a distress message. Apparently he started experiencing the loss of oil, turned around, and lost all oil pressure and was forced down about 100 miles out. He was found and rescued by the Coast Guard about 12:30 am. He was suffering from some injuries and hyperthermia. He was flown to the hospital, and the word is he is recovering nicely.
- 2) Richard Hughes purchased a Cozy III from its second owner. The airplane had a fuel injected 0-360 (after market conversion). Rich had recently installed one new cylinder assembly. On Monday, Dec. 1, he had an engine stoppage on final approach to McArthur airport in Islip, NY, and crash landed in a residential area, apparently glancing off two houses. The Cozy was totally destroyed (picture was published in the paper), but it was reported that he was not critically injured, but hospitalized. Rich called us several days later. He was out of the hospital and back at work. He said that the engine was turning over on final. He was not sure whether it was idling, or just windmilling, but when he needed a burst of power and advanced the throttle, it did not respond.

We are grateful that both of these pilots survived, apparently without serious injury. So what conclusions can we draw from these accidents?

- 1) A Cozy can be successfully ditched in the ocean.
- 2) The Cozy offers protection to the occupant in a crash landing.
- 3) Both of these accidents occurred after recent engine work. One should always break-in a new, or recently overhauled

engine within gliding distance of an airport, and one should always plan one's approach to the airport with enough altitude to glide to the runway in the event of engine stoppage. Come in high and use the landing brake and two rudders to bleed off excess altitude. If the engine stops, you can gain extra distance by retracting the brake and the nosewheel.

- 4) Jack Wilhelmson advises that with fuel injection, if the idle is set too low and the engine stops with the boost pump running, the engine will flood and will be very difficult to restart quickly.
- 5) If you are ever asked to extend downwind because of traffic, you should do so at pattern altitude (or climb) with power on and make sure you can still glide to the runway, or go around, if that option is acceptable to the tower.

FIRST FLIGHTS

We have had 2 this quarter:

- 1) Bill Kastenholz
- 2) Bob Allen

Bill Kastenholz writes on 11/4/03:

This morning about 8:30am EST, I flew the first flight of my Cozy MKIV N9WK. It flew successfully with the anticipated higher CHTs because of new cylinders. I had to hold the stick back and was unable to trim out the back pressure. I will adjust the canard incidence before flying again. The Ellison also needs the idle power setting to be adjusted. I should have checked this out better before flying, but there is a lot of pressure to not run the engine too much before cylinder break-in. After the flight, turning around the runway, I pulled the throttle all the way back, and the engine stopped.

After take-off I climbed to 2700 ft and recorded engine data. I was happy with it, but not with the pitch problem. So I decided to land. I entered a high long downwind and decided to check out the low speed realm before landing. I throttled back to about 1600 rpm and pulled back a bit more and reduced to 70 kts with no bob yet. I decided this was good enough to land, and proceeded downwind and ran my normal landing checklist, called my position, and set up to land. I controlled the speed pretty good on final but struggled with the pitch on landing. It turned out to be a pretty soft landing.

I had flown 1.4 hours with Carl Denk last Wednesday, which allowed me to handle the pitch problem and be comfortable with flying the Cozy. Thank you Carl! Terry Schubert worked as my flight advisor and gave me great ideas to keep safe. I bounced a lot of ideas off Terry over the last couple of weeks, and he gave good sound advice. Thank you Terry! Tim Lumpp, fellow Cozy builder, has helped push me through these last 3 months of preparations. Tim drives over 50 miles from his house to my hangar more than once per week over these last months. Thank you Tim! Joe Berki, Limo-EZ builder, has helped me with many long lay-ups, and advice, and moral support for these 7-1/2 years. Joe is always willing to help, truly representative of all of the EAA people I have met. Thank you Joe! Robin, my wife, has always supported the airplane building, because she sees the value in the building experience. Besides helping with some layups, moving wings, and parts around the house, buying my Catto prop, buying a pair of headsets, she is excited about using the Cozy to travel! Thank you Robin! There are many more including of course, Nat Puffer, and all of the fellow builders on the internet, local friends, chapter

members, etc. Suffice it to say, we don't build alone!

Bill Kastenholz

Oberlin, OH

Bob Allen's Cozy Mark IV G-BYLZ was the first to fly in the UK, and was flown by test pilot John Brownlow and reported on by him October 2, 2003. Exerpts from his report to the "PFA" (Popular Flying Association) follow:

COZY MARK IV APPROVED IN U.K.

"The test programme revealed that the aircraft handled almost exactly in line with the flying qualities described in the Owner's Manual, and other reports dealing with the Cozy IV. The most accurate, comprehensive, and best-written of these reports was, in my view, the one issued by the CAFÉ Foundation. The test programme went very well and you will see from my report that I recommend the issue of a permit to fly."

"**Introduction.** Cozy IV G-BYLZ was the first four-seat Cozy type to be built and flown in the UK, and was constructed from plans. The aircraft was beautifully built and finished, and was equipped with comprehensive flight and engine information displays. The engine was a Lycoming 0-360 engine driving a three-bladed fixed pitch wooden propeller manufactured by Performance Propellers. The aim of the flight test programme was to provide an independent evaluation the the Cozy IV at a maximum all up weight of 1800 lbs as a two-seater. The PFA JAR/VLA flight test schedule was used as a basis for the programme, but particular emphasis placed on exploring the low speed behaviour close to and at the point where the canard reached its minimum flying speed. It should be noted that the Cozy IV has been designed to be 'stall-resistant' and that therefore it should not be possible, in normally accepted mishandling situations, to stall the main wing. Stall warning by artificial means, or aerodynamic buffet, should not therefore be required, provided control can be maintained at the lowest practicable IAS, and recovery from unusually low speed conditions can be made by use of the controls in the natural sense and without excessive height loss.

"In the US, the Cozy IV can be flown as a four-seater at a maximum all up weight of 2050 lbs for take off and 1900 lbs for landing, but with significant qualifications bearing on the operation of the aircraft at these weights. These qualifications are listed in the Owner's Manual.

"The approach taken to the flight test programme was to validate the handling and other relevant information contained in the Cozy IV Owner's Manual, and those flight test reports available commercially which were considered relevant."

The report went on to describe in several pages all the tests made in taxiing, take-off, climb, rate of roll, trim, lateral, directional, and longitudinal stability, low speed flight at mid and aft c.g., and landing. The the following conclusions and recommendations were made:

"**Conclusions.** The flying qualities of Cozy IV G-BYLZ closely matched those described in the Owner's Manual, and in the thorough test report by the CAFÉ Foundation. Two low speed characteristics not identified in these, or other documents studied were:

- 1) At all c.g.s tested, other than 101.975, with the stick on the back stop at around 60 KIAS with the air brake not deployed, the Cozy IV remained stable in pitch at low IAS

after bobbing had taken place at 62-63 KIAS (*At 101.975 c.g. there was no bobbing, just a 3 degree drop of the nose.*).

- 2) With the airbrake deployed, **at all cgs tested, including 101.975**, the pitch attitude remained stable (1-2 deg lower than with air brake in) and the wings stayed level at 60-64 KIAS with the stick on the back stop. At **no** low IAS, with the wings level or in turning flight, did bobbing or canard 'stall' occur with the air brake deployed.

"These two characteristics provide substantial safety features since the air brake would normally be deployed on the approach and during landing.

Recommendations.

- 1) Issue of a permit to fly for Cozy IV G-BYLZ as a two-seater is recommended with the Owner's manual specified c.g. range of 97.5 to 102 in. and at a maximum all up weight of 1800 lbs.
- 2) It is further recommended that clearance to fly as a four-seater, up to a maximum all up weight of 1800 lbs, be authorized as soon as practicable.
- 3) The Owner's Manual specifies that for take off only a maximum all up weight of 2050 lbs may be used, with a maximum landing weight of 1900 lbs under certain conditions. It is further recommended that this extension of operational capability be authorized as soon as possible, subject to engineering integrity considerations, and flight test results being satisfactory."

John Brownlow
Test Pilot

After receiving this report, the PFA issued Bob Allen a Permit to Fly, a Certificate of Validity, and a PFA Operating Limitations.

The significance of these events is that no other 4-place homebuilt has been approved in the UK, but the Cozy IV is well on its way to becoming the first.

ENGINES

As reported previously, we were given a special OEM price from superior for their XP-360 (a clone of the Lycoming). One of our builders checked the price of the same engine at Aero Sport Power, in B.C. (250-376-2955), and found their price including customs and shipping was a few dollars less than Superior's special OEM price.

We read in GA News that the new large-bore, water-cooled, 200+hp, direct-drive Honda engine will be sold by Continental. Makes you wonder what happened to their diesel project.

BALLAST COMPARTMENT

The reason we have provided a ballast compartment in the nose of the Mark IV, is that the Mark IV was designed to carry two average sized adults in the front seat, and since the front seat is 40 inches ahead of the optimum c.g., the c.g. with only one average sized adult in the front seat would be too far aft, and risk an unrecoverable main wing stall.

When the aircraft is completed and ready to fly, you will do a weight and balance procedure to determine both the minimum and maximum weight in the front seat to be within the approved c.g. range. In my own case, I weigh just under 160 lbs, and the minimum weight in the front seat of my airplane calculates to be

220 lbs. So if I wish to fly solo, I would be 60 lbs short of the minimum weight in the front seat to be in the approved c.g. range, aft limit being 102.0. With a ballast compartment in the nose, which is 2-1/2 times as far forward of the optimum c.g. (100) as the front seat, I only need to add 24 lbs of lead in the ballast compartment to make up for the 60 lbs missing in the front seat. But, to make sure I am on the safe side, I put in 30 lbs.

For most builders, the only time you will be flying solo without a passenger is during the first 40 hours. After that you can carry passengers and someone is always wanting a ride. If not your wife (or significant other), a friend, or if you have no friends, you can always pick up an airport "bum". Some builders think this is a big problem. Supposing they fly solo somewhere and pick up a passenger? Very simple! Just move the ballast to the back seat, where it will have no effect on the c.g. But what about the penalty on the useful load by carrying ballast in the back seat? Are you kidding me? You are worried about 30 more lbs in the back seat when this airplane has a useful load of 1000 lbs? Or some people say, what if you forget to remove the ballast? Actually that really happened to me a couple of years ago (the only time in over 20 years). I took up a fairly heavy passenger and forgot to remove the ballast. My airplane didn't want to rotate at 80 kts, but it did when I hit 90 kts. Then I remembered. Jeeze, I forgot to remove the ballast. I was probably at the equivalent of 450 lbs in the front seat. But as soon as I picked up a little more speed, I was able to trim for hands-off flight. Of course, I came in a little faster than usual for landing.

There was quite a discussion on the internet about how to avoid having to move ballast. A couple builders suggested a water tank in the nose. But can you get water at every airport? And what about winter? Supposing it froze? Another suggested a fuel tank in the nose, which hopefully you would never need the fuel. But what if you hit something head-on?

Vance Atkinson wrote that to avoid using lead ballast, he put a rounded nose on his 3-place so that he could build in a tank in the nose to hold either water or fuel, and if fuel, a complicated transfer system to either fill the nose tank from the main tanks, or to transfer the fuel from the nose to the main tanks. He says, "I have used this tank twice in 17 years, and 1500 hours of flying. Thus, it aint worth it.*keep it simple and use the lead.* I put in at least 100 hours doing all the crap for this system and it still didn't turn out, or work the way I envisioned it."

Once I was asked to fly in the "parade" at one of the airshows. I said I would have to carry a passenger because of w & b. They told me no passengers were allowed, so I had to decline. Then I spotted a pile of rocks alongside one of the hangers. I loaded rocks into the ballast compartment, and then signed up for the "parade". Another builder suggested putting together 30 lbs of tools, and carrying those in the nose when flying solo or in the back seat when carrying a passenger. Not a bad idea! How smart these builders are!

STORAGE OF EPOXY RESIN SYSTEMS

Gary Hunter is our epoxy resin expert. On 12/09/99 he wrote: When the general population speaks of "epoxy resins" they tend to generically refer to both the resin and the hardener. In my world, when we refer to both the resin and hardener, it is called a "resin system". HOWEVER, the resin and hardener are two separate things and from a storage or shelf life perspective need to be

addressed separately. So, what is the shelf life for resins and curing systems?

- Some formulators state one year – it sells more resin.
- Properly formulated resins will keep forever if stored properly. Tightly sealed containers at 70 +/- 15 deg. F.
- Most curing agents will keep forever if stored properly. Tightly sealed containers at 70 +/- 15 deg. F. Direct sunlight will cause darkening – brown.
- Exception – EZPoxy 83,84, and 87 may increase in viscosity if storage temperatures are too high.
- Refrigeration WILL enhance shelf life.
- Do not use epoxy or hardener in a crystallized state. Warming them to 120 F for a brief period of time will de-crystallize or reconstitute the hardener and resin to a useable state again.

WHAT WOULD I DO AGAIN?

Neal Johnson says:

8/8/03

This is my second canard. Here's what I am doing differently. After the first one, you learn that there are better ways and methods of doing things. The Mark IV is the direct descendant of the Long EZ which I have vast experience with:

- 1) **Accuracy.** This is the key to speed (airspeed). Not a big factor you say? Bull. Once you build and fly, you are not likely to bring the project home and do those little things you discover afterward that would improve performance. Try flying in a group of canards and watch the others leave you behind. You will wish that you had incorporated some of the trim and speed mods that were available, but which you didn't want to take the extra time to incorporate.
- 2) **Foam cores.** Sand foam cores to perfection and fill dings and dents before you skin. Then go back and shape and sand some more. Foam sands 10 times easier than micro. Get rid of those joint ridges and contour your shapes before you apply glass.
- 3) **Other ideas.** Pay close attention to ideas and methods discovered by others. The internet did not exist when I built my first airplane. You don't realize what a blessing this email group and the web pages created by people like Marc, Rick, Wayne and others are till you try to build one without this asset. The problem is having to use your own judgment to determine whether someone else's idea is better, worse, or just too risky. I struggled for 3 weeks trying to decide whether or not to hard-shell or use triax on my wings. When in doubt, and if you are not completely convinced, stick with the plans. That's what I did with these two matters. And when in doubt, ask Nat. When I confronted him with the triax question, he explained the differences in detail. Triax comes in 45 degree orientation while the plans call for 30 degrees, not to mention the weight penalty. If you bought your plans from him, that's part of the security you paid for. You're likely to get the most conservative answer, but use this in YOUR decision making process. We all want to live long and prosper. Ask yourself if the risk associated with any deviation from the plans is worth the possible penalties, apparent or not.
- 4) **Something marginal?** Trust your judgment when you see something in the plans that seems marginal or subject to improvement. An example would be the routing of the fuel line from the sump through the fuselage sides secured only by flox and a ply of BID. Through others I discovered a better way. I am now mounting 1/4" aluminum plates in the area of

the sump and fitting an MS20822-4-4D elbow fitting into a drilled and tapped NPT thread in the aluminum plate before I skin the fuselage exterior. This gives you better strength in case the tubing receives pressure with very little weight penalty. Use the same method described in Chapter 21, relating to the strake drains.

- 5) **Peel Ply.** Peel ply everything. Buy rolls of white Dacron or nylon cloth from Wal Mart that closely resemble the rolls of peel ply you get from Wicks or Spruce. It helps tremendously with the finishing process, the looks of the project, and even the ultimate strength of the structure. Remember, when you sand a glass part in order to achieve a mechanical bond, you are certain to cut into the glass fibers, thereby weakening the strength of the glass structure. But be careful not to load on the epoxy in wetting out the peel ply. There is a weight penalty to be paid.
- 6) **Slow down.** Every one feels the drive to complete the project so that you can enjoy the thrill of flying it as soon as possible. DO NOT apply epoxy until you are 100 percent satisfied with the shape and integrity of your part. Once it dries, there are only less satisfactory methods available for quality control. If there is any part whatsoever that you had any doubt about during the construction process, you will spend time thinking about it during take off or somewhere around 10,000 ft cruise. I guarantee it. Buy yourself some peace of mind and confidence. These airplanes are extremely safe. Only you can change that.
- 7) **Pride.** Build something that looks good and flies well. You will be proud of it.
Neal Johnson
Lafayette, LA

LETTERS FROM BUILDERS (some from the net)

Builders, 10/23/03

I bought Jack Wilhelmson's noselift a couple months ago. Last night I got everything wired up including the printed circuit board that automatically extends the gear at a pre-set airspeed (90 kts). I hooked it up to my new battery. No smoke filled my shop—a good sign! I then flipped the down switch and bzzzzzzzzz, down she went and stopped when it hit the microswitch. When you retract the gear, after about 20 seconds, down she goes whether you like it or not. It might be a pain during flight under 90 kts when you don't intend to land, since you can't KEEP the switch on defeat, but if you could do that, you might forget to turn it back on and scratch your paint when you land. I wasn't sure about the auto extension unit at first. A lot more wires, and I didn't know the operation of it. But after getting to know it, I don't see how I could have the "inevitable gear up landing". I think I'll keep it, Jack! Good job!

Jay Hegemann

Note: Jack advises that for parking nose down, wire the retract ahead of the master switch, and the auto extension behind it. Then you can retract the gear with the master switch off, and it will not automatically extend.

Builders, 10/20/03

I am having problems keeping my oil temperatures under control, even now after the outside temps have cooled down somewhat. I have a Positech cooler and the air passages between the rows are much narrower than on a standard S-W cooler. I'm wondering if the air flow through the cooler is significantly restricted by these narrow passages? Does anyone have experience

with these coolers – good or bad – I had heard that Positech redesigned their aircraft coolers (after I'd bought mine!) and wondered if this was to increase the airflow through them. Any advice on Positech or other coolers would be welcome.

Will Chorley

Builders, 10/20/03

I initially had a Positech cooler with much the same issues. Terry Schubert also found it difficult to adequately cool with the Positech cooler. Aero Classic makes a direct bolt in replacement. Terry experienced a 30 plus degree drop in oil temps. He published his findings in CSA. I made the same change on my Cozy 4 and experienced a drop of 35 degrees. No cooling issues since.

Robert Kittler

Canton, MI

Dear Nat, 10/22/03

Thank you for forwarding my email request to Cozy builders. Within 2 hours a builder in NJ responded, and another owner of a flying Cozy Mark IV offered to fly down from Massachusetts to show his to me. This just reinforces my perception that EAA'ers, and builders in particular, are a special breed.

Doug Vogel

Dear Nat, 10,21,03

I want to thank you very much for giving me a ride along with a memory good for a lifetime. My expectations were met and then some. The most significant part of the experience for me was realizing that building the plane exactly to plans will have it fly just perfectly. Some of the modifications that get thrown around no doubt do nothing more than contribute to delaying one's first flight.

Jon Matcho

Bridgewater NJ

Dear Nat and Shirley, 11/10/03

Enclosed is a picture of Cozy N15CZ just completed, after 19 years of part time work, and awaiting airworthiness inspection. Finished weight is 1040 lbs. Power is Lyc. 0-320D3G (160 hp). Duel batteries for duel electronic ignition, Ellison throttle body, Performance prop, Steve Wright's nose lift, A. Strong's pitch trim. I hope to make it to Oshkosh and other shows next year. First flight info to come. Thanks for a great plane!

Charles Danila

Philadelphia, PA

Dear Nat, 12/8/03

I have been gathering information about the Cozy MK IV for quite some time now, and I am enjoying listening to the discussions on the Cozy_Builders mailing list. I think I really made up my mind now and although I can't start building any time soon due to the lack of a garage, I can't resist your Xmas offer and would like to order a set of plans so that I still get them from you. Please charge my credit card.

I just would like to take the occasion and say thank you for the big joy you are providing with your wonderful creation as well as the time and passion you are sacrificing to the community! I am really looking forward to becoming a member of the gang! Thanks a lot again and all the best!!

PS: In case you are keeping builder statistics, please list me as an Austrian builder, although I am living and working in France. I guess there are not so many Austrian builders, if any ☺.

Aron Lentsch

Alfortville, France

Builders, 10/26/03

I took a business trip to Los Angeles last Friday and Saturday. I met Clark Canedy and his brother at a restaurant where we had dinner. The meal was as much fun as the steak dinner at the Red Barn. After dinner, Clark drove me out to his hanger where we looked over his great looking Cozy. I didn't have to spring for a hotel because I crashed at Clark's house.

Cozy builders are indeed the salt of the earth! Todd Silver
Ft. Lauderdale, FL

Nick Ugolini writes to Paul Kraska, 10/30/03

Flying in IFR, IMHO is no big deal if you keep up your experience and training. I always fly on an IFR flight plan (on business). I received my IFR license in my Long EZ with the instructor in the back. I even received my FAA flight test in the Long.

With 1700 hours and 120 IFR flight hours (All in the Long),I can tell you, the plane is not the limiting factor it is the pilot. In the rain and clouds the plane flies fine (lots of trimming), just pay attention.

As far as icing, I have had frozen rudders, 1" of rime ice on the main wing, ice on the prop, frozen pitot tubes, and ice on the canard. Yes, it was stupid to get in the situations, and that's why I am somewhat reluctant to fly in the winter in any condition which may lead to icing anymore. You need to be extra careful.

Will the plane fly with ice, yes within certain parameters. If you know what to do, you can get out of this condition, but you have to know what to do and do it quickly.

I personally think the Long EZ is a great plane for IFR if you have an autopilot to lighten the work load (especially when you lose your vacuum pump or the engine decides to self destruct in the clouds...Been there). The plane is fairly stable and handles approaches well.

WARNING. My experience is not a recommendation that you should fly in IFR conditions. Your pucker factor and or IFR result will vary depending on your own piloting experience and skill.

Nick Ugolini
Charleston SC

Builders, 10/30/03

I used to fly my Cozy III with the GU canard routinely in IFR. It had a trim shift when entering or leaving a cloud but it was not that big of a problem. I had no auto pilot or wing leveler. I highly recommend a second comm radio. I flew into icing once or twice. One was while climbing out of Van Nuys to 10,000 ft. I got ice at about 4,000 ft and it built up a thin layer over the canard. Yes there was a trim shift but it flew just fine and continued the climb. It evaporated once above the clouds. Ice should not be flown into intentionally in any GA aircraft not equipped with anti-ice systems. However, with my limited experience, the Cozy is not worse and perhaps better than most. If you still have ice build-up when landing, test your minimum flight speed and make sure you keep the approach speed high enough to still be able to flare.

Keith Spreuer
Los Angeles, CA

Dear Mr. Puffer, 10/12/03

Although I have had my Cozy plans since quite some time, I am still at the beginning of chapter 4 As you can see from my new address, I moved to the eastern part of Switzerland, where I started my own practice. I am living 10 minutes from a nice airfield (LSZE). Unfortunately the runway is only 495m long. Since I am not a very experienced pilot, I decided to improve my piloting

skills first. I had the opportunity to become a partner in a MCR-01 project, which we finished last year.

The work on this "fast-build" kit made me appreciate the quality of the Cozy Mark IV construction manuals and the support available from you, the designer, and the cozy_builders on the internet. Please charge a newsletter renewal, owner's manual and 2 decals to my credit card.

Thank you for making these plans available and best regards.
Christoph Steiner
Mels, Switzerland

Builders, 11/09/03

When I had my plane inspected and signed off by the Feds, they required I apply to each of the conditions I wanted. There were 4 of them: Day VFR, Night VFR, IFR and Limited Aerobatics. I dug out the Feds book on "**Airworthiness Certificates of Aircraft and Related Products**" and lo and behold speaketh the Feds, section 8130.2E paragraph 8, page 128, "*After completing of phase 1 flight testing, unless appropriately equipped for night flight and/or instruments, flight in accordance with 91.205, the aircraft is to be operated under VFR only.*" Soo you don't have to ask anymore, just apply. However, if you guys still want to loop and roll legally, you WILL have to apply for that on your application. Vance Atkinson

Bedford, TX

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Charles Danila's completed Cozy Mark IV.
Doesn't it look beautiful!

The Gimples invited us to a linen tablecloth, French wine luncheon in their hangar in Albuquerque.
Lloyd on the left, Erika behind the camera.

Bob Allen's beautiful Cozy Mark IV, the first certified in UK