

# COZY NEWSLETTER #85 April, 2004

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**Co-Z Development Corp.**

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

**(2-year renewals save us record keeping)**

As of January 1, 2004 Aircraft Spruce purchased the intellectual property (copyrighted plans, Construction Manuals, Owner's Manuals, information kits, etc.) of Co-Z Development and since that date, Aircraft Spruce is the only one authorized to sell Cozy plans and Construction Manuals, info kits, etc., but Co-Z Development will continue to provide builder support for the Cozy airplanes.

The 3<sup>rd</sup> Edition Cozy Mark IV plans were updated with all changes and corrections through newsletter #73. Since then, there have been no changes or corrections of any significance, except for revised canard incidence template drawings 80-3 and 80-4. These revised drawings will be included with each new set of plans, and extra copies may be obtained from Aircraft Spruce by sending them a stamped, addressed envelope.

The Cozy newsletter will continue to be published by Co-Z Development. It contains any plans corrections or changes, builder hints, information and updates about our suppliers, shopping info, first flight reports, and other news of interest to builders. It is the principle means by which we communicate with builders and support their projects.

The latest copy of the newsletter and older copies of the newsletter, which we can no longer supply, are available on the Unofficial Cozy Web Page, <http://www.cozybuilders.org/> and also on a CD available at Aircraft Spruce. We will continue to 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.

## **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 Aircraft Spruce East\* Wicks Aircraft

Box 4000

Corona, CA 91718

(909)372-9555

### **2) Metal Parts**

Brock Mfg. Co.

11852 Western Ave.

Stanton CA 90680

(714)898-4366

### **4) Canopy & Windows 5) Specialties**

Airplane Plastics Co.

9785 Julie Court

Tipp City, OH 45371

(937) 669-2677

Box 909

Griffin GA 30224

(800)831-2949

### **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

410 Pine St.

Highland IL 62249

(800)221-9425

### **8) Prop Hub Exten.**

Saber Mfg.

3601 Nassau Ct.

Granbury TX 76049

(817) 326-6293

### **7) Propellers**

Performance Props

Box 486

Patagonia AZ 85624

(520)394-2059

Sensenich Props

2008 Wood Ct.

Plant City FL33567

(813)752-3711

**\*Note:** Aircraft Spruce East will be moving its distribution warehouse at Griffin to new facilities in Peachtree City, GA on March 18,2004. The new address is:

Aircraft Spruce East,

452 Dividend Drive,

Peachtree City, GA 30269

(770)487-2310

## **OTHER PARTS WE RECOMMEND:**

We can recommend the following items:

- 0) **New and rebuilt Lycoming engines.** Aerosport Power, 2965 Airport Drive, Kamloops, B.C. V2B 7W6 Tel (250) 376-2955, Fax (250) 376-1995.
- 0) **Improved Rudder pedals** for lay-down brake cylinders, adjustable both sides. Dennis Oelmann (319) 277-5996.
- 0) **Electric speed brake actuator kit.** Wayne Lanza (772) 664-8953; [wlanza@bellsouth.net](mailto:wlanza@bellsouth.net)
- 0) **Switching and breaker panel.** Wayne Lanza (772) 664-8953, [www.CompositeDesignInc.com](http://www.CompositeDesignInc.com).
- 0) **Fuel sight gages.** Vance Atkinson (817) 354-8064.
- 0) **Electric nose-lift.** Steve Wright (615) 373-8764.
- 0) **Electric nose-lift, Spring steel safety catch,** and improved **MKNG-6 and NG-6 Pivots** with tapered roller bearings. Jack Wilhelmson (843) 884-5061.
- 0) **Electric pitch trim.** Alex Strong (760) 254-3692.
- 0) **Rebuilt flight instruments.** Howard Francis (not a Cozy builder) (480) 820-0405.
- 0) **T-shirts,** etc. Bill Walsh, [nogofsu@sprintmail.com](mailto:nogofsu@sprintmail.com). (407) 696-0942.
- 0) **Antennas.** RST Jim Weir (530) 272-2203.
- 0) **Teflon & Stainless Hinge Pins Replacement.** Gary Hall (954)979-9494.
- 0) **Nosegear crank ratchets.** Bill Theeringer (805) 964-5453.
- 0) **Embroidered clothing.** With pictures of a Cozy, name, N number, etc. in any color. Trish Vermeylen (609) 693-4819.
- 0) **Featherlite:** Their email address is: [ftthrlite@pacific.net](mailto:ftthrlite@pacific.net) Check there for latest prices.

## PLANS CLARIFICATION

Chapter 14, p.2, Step 3. One sentence is out of order, suggesting that there might be two reinforcing layouts (layout 3). Move the sentence starting with, "Now, apply the local reinforcements (layout 3)....." and insert it AFTER the following sentence, which starts with, "The first ply of BID is laid up....." Sorry if this has caused any confusion. I must have written it in the wee hours of the morning.

## BUILDER HINTS

- 4) **Copying templates.** There was a running dialog on the internet about whether it was possible to buy extra sets of plans, or what was the best way to copy airfoil templates to make sure they were exactly 1:1, and that the paper didn't shrink in one direction or both, and the aerodynamic consequences of a 1 mm divergence of chord or height from the plans. The relative merit of downloading off the internet with a CAD program, or the merits of Xerox, vs laser jet, vs ink jet, vs contact prints vs roll printers, vs blue print machines, etc were all discussed. Finally, out of the ether came the voice of reason, "KISS" Tape the template to a window and, in daylight, place a piece of tracing over it and make an exact copy by tracing with a pencil. Make image copies the same way. But why did it take so long? Think of all the airplanes that were built and have been flying successfully for all these years before there was the internet!
- 5) **Eyeball vents.** Bulient Aliev says that he found the best, lightest and cheapest eyeball vents are from older model Mercedes. You can get them both for about \$10 at a junkyard.
- 6) **Eyeball vents.** Al Wick says he bought 2" plastic ones from Spruce. Since they were too large cosmetically, he installed them differently than specified. He counterbored the fiberglass panel for the flange to fit behind the panel and so that only the eyeball was showing on the front of the panel.
- 7) **M drawings:** We didn't have enough extra M-drawings to offer them to builders, but AS must have in-house copying or printing facilities, so Renee has arranged to supply extra M-drawings for \$49.95 per set, but only to registered Cozy builders. They will be listed as part No. 01-00570.
- 8) **Perfect contours:** Jean-Jacques Claus writes: I found a method to make the final canard contour perfect per plans. I used the checking contour templates for the canard to cut out (hot wire) a block of styrafoam. Then I stuck a large piece of sandpaper to it and used it to give the canard a perfect contour over its entire length. The same thing worked fine for the elevators.
- 9) **Metering pumps.** Russ Fisher says that he caps off the nozzles of his metering pump with little plastic caps which protect the fiber-optic ports on a network device, because he has a million of them, but fat nails could be used instead. If air can't get into the tube, then the hardner or resin can't seep back into the tank. It also prevents the fluid from leaking out of the nozzle into your cabinet and makes your first pump as accurate as your fifth. If you use a nail, be sure to cut it very short so it barely sticks into the tube.
- 10) **Winter flying:** Ken Brimmer says he just got back from a vacation in the warm sun, but he took off in 27 deg F with no heater. He has been flying this way for 11 years. He dresses

in 3 layers, and as he flies south he strips off one layer at a time. This year he used foot warmers that he bought at Walmart. He used them going down and they worked just fine. However, on the way back one got jammed as he was sliding his boot on. It worked fine in the air, but when he landed and pushed on the brakes, his toes went hard against the heat pad. The pad got quite hot. However he was on the ground and able to get his boot off quickly. In the air, it would have been a problem. He says the pads work fine as long as they are not bunched up, and keeps his feet nice and warm.

- 0) **Winter flying:** Eric Westland says that a couple of year ago he bought a "Winterseat", which is essentially a 12v heated seat cover. He never tried it until recently when it was cloudy and cold (28 deg F). He already had on long underwear and insulated coveralls. He was very toasty during his one-hour flight, in fact too toasty. It didn't have a thermostat, so he is planning to install one. It didn't help much with his feet, but only draws 4 amps and weighs almost nothing. It only cost \$25. See [www.12vautotech.com/winterseat.html](http://www.12vautotech.com/winterseat.html).
- 0) **MGS cost:** Dan Tomlinson reminds everyone that MGS is priced based on 1 gallon of resin and .45 gallon of hardner, resulting in almost 1.5 gallons of epoxy. He says it wets out so well that it goes farther than Aeropoxy, making the effective cost about the same.
- 0) **Data plates.** Brian DeFord says he took his to a local trophy shop and they engraved it for him. He says it didn't cost much and looks great.

## TRANSITION OF SALES TO SPRUCE

The transition of our copyrights and sales to Aircraft Spruce seems to have gone quite smoothly. We have received some very positive reports.

On December 9<sup>th</sup>, Jim Irwin flew here in his twin Cessna with two members of his staff, Renee Gelinas and Don Arrington, to spend the day with us. Renee will be the main contact for builders at Aircraft Spruce. We went over and explained everything we do in promoting and supporting the Cozy, and made plans for joint operations. They seemed dedicated to providing the same service on plans, information kits and owner's manuals as have we. Then on December 30<sup>th</sup>, Don's brother, who was on his way to LA, stopped here with a U-Haul trailer to pick up all of our inventory of plans, information kits, Owner's Manuals, reprints, and all of our originals.

Our web site must have been very effective. We posted that we were having a Christmas promotion, which included a gift certificate with each set of plans, and we set a new record for the number of plans ordered in a single month. After the end of the month, everyone seemed to know that Aircraft Spruce had taken over the sales, because they started receiving the orders, not we.

There were some minor difficulties when the Cozy web page was turned over to Spruce, and moved to their server. I had been using the email address: [natp@cozyaircraft.com](mailto:natp@cozyaircraft.com), but this required the forwarding of my email from their server to mine, and some emails fell through the cracks, so I decided to use only my other email address: [cozy@extremezone.com](mailto:cozy@extremezone.com), which goes directly to my server and me. Please take note and don't use my old address.

There seemed to be a little concern about whether we would still be publishing the newsletter and providing builder support, but we reassured those who were concerned, and they seemed to be satisfied. We will still be here most of the time and we will still be making the rounds of air-shows. We may take a little more vacation time, however.

## **WHAT WE HAVE BEEN DOING**

It has actually seemed a little less hectic and stressful, now that AS has taken over sales. We decided to cancel our merchant account (for credit cards), because the monthly cost was prohibitive for only newsletter renewal, and then we decided to take our regular two-week vacation by cruising through the Panama Canal. Of course we always knew that there was a canal there, but never quite visualized the deep cut through the continental divide, the damming and flooding of a river to make a huge artificial lake, and the lock system for raising ships about 60 ft and then lowering them again. The locks are 110 ft wide, and most ships nowadays are about 106 ft. wide, but it looks like the clearance is only inches. The food was great, and we made some very nice new friends, which we may have persuaded to come to Oshkosh.

## **SUN N FUN**

Sun n Fun this year will be from April 13-19. Since they changed to starting during the week, it is now a little more difficult to get accommodations. We will be staying in Orlando and driving every day. We will, of course, be displaying our airplane (the Lord willing) at the same location (AC-2) with a tent so builders can stop by for a little shade. We hope to see as many builders as possible.

Bill Walsh, who has in the past arranged the Cozy dinner at the Red Barn, will not be able to attend this year, and there have been some complaints about the accommodations and cuisine at the Red Barn, so builder Keith Lukat, who lives in Tampa and will be working at S n F all week as a volunteer, has also volunteered to arrange for a hot-dog (bratwurst?) roast with other menu items and refreshments (including beer) at Sun n Fun for \$5 per head, some evening, yet to be determined. He has arranged this in the past at his church for Oktoberfest. Please contact him at (727)460-8888 or [klukat@hotmail.com](mailto:klukat@hotmail.com) if you can attend so he will have some idea how much food to arrange. He writes:

All, 3/6/04

I was thinking about Friday the 16<sup>th</sup> as the night for the cookout. Saturday night is the night airshow, and I figured that some people might want to depart on Sunday.

We did an Oktoberfest at church last year with brats, hotdogs, sauerkraut, potato salad, beer and softdrinks and just about broke even at around \$5.00 a person. If there is an excess in funds, or left over food, maybe we can donate it to some worthwhile cause at SNF.

I would like everyone who is planning to attend to let me know what night works best for them. Also, I'd like to get a headcount for food purchasing purposes. Keith

## **OSHKOSH**

Oshkosh this year is from July 28 to August 2<sup>nd</sup>. We will be exhibiting in our usual spot, just outside the south entrance

to exhibit hangar A, which is also just outside the AS booth. We haven't heard from Daryl Lueck and his lovely wife yet, about the Cozy dinner, but we are sure they are making the necessary arrangements for either Friday or Saturday evening. This has been one of the Oshkosh highlights in the past, as I am sure it will be this year. In addition to the fantastic buffet at Robbins, the Luecks have always arranged for door prizes, and last year MGS supplied wine for us at all the tables. This is a good way to meet other builders, and we hope it will be on the top of your Oshkosh agenda.

Some of the old timers and others as well may be getting a little tired of my corny jokes and listening to me talk, so we invited Marc Zeitlin to be the featured speaker, and he has accepted, except he asked for it to be scheduled on Thursday, rather than Friday, so he has 3 days to get home (he must have a slow airplane). We will be there to listen to any complaints—there are always a few. Again, we hope to see as many builders as possible.

## **BACK NEWSLETTERS**

We have asked Marc Zeitlin if he will keep current in posting the newsletters on his web site, and he agreed. Aircraft Spruce is also planning to post newsletters on its web site as well, so it will no longer be necessary for builders to have a current subscription with us, and we may not always be able to supply extra copies of future newsletters. One of our builders has recorded all of our newsletters from #4 on on a CD, and they are available from Aircraft Spruce for \$20.

## **ACCIDENTS**

Our purpose in investigating and reporting accidents is to try to help other builders fly safely. Jean-Patrick Lacote wrote me privately about an accident he had, and I asked his permission to share it with other builders, because he supplied some valuable information. He agreed:

Dear Nat, 3/3/04

On Thursday, 5<sup>th</sup> of February 2004, I flew with a friend from Paris to La Baule (Atlantic coast, runway 29, about 82 ft. wide x 3,000 ft. long). There was no tower information, so I did the normal pattern. There was a 90 degree crosswind from the left, estimated at 10-15 kts.

During a short final, just after pulling the landing brake, a gust of wind pushed me out of the axis of the runway and I overcorrected to the left. With more experience, I should have pushed the throttle, and gone around, instead of wanting to land at all cost the first time.

I touched the runway on the very left side, and my left wheel was on gravel. I could not correct my trajectory with my right brake, and after about 300 ft. I went off the runway to the left. For about 100 ft, the nose wheel was banging a lot, then, the Cozy went down on the nose (I have Steve Wright's electric nose lift). I skidded about 200 ft further on the field when the right canard tip dug into the ground. I plowed a groove about 20 inches deep, and the the Cozy flipped over and rested on its back.

While upside down, still held by the harness, I switched off the engine, which was still running, and switched off the battery. The plexiglass was broken (so I did not have to use my special hammer). My friend enlarged the hole and we were

able to crawl out of a 14" opening. Help came about 5 minutes after we were out.

Bodily injuries: none (only small cuts from plexiglass). The fuselage concept is very good, as to protect the pilot and passenger, in fact with the 4 point harness, we are sitting in a cocoon!! The headrests did their job in preventing the crushing of the turtle back.

Damages: The canard bottom right longeron (spar cap?) was shattered at the fuselage about B.L.20. Both wings were delaminated at the winglets (the winglets did plow the ground for 3 feet at least). The 8 ply VID layup #4 was torn out from the right winglet. The left winglet rotated about 60 degrees. Both longerons (sparcaps?) of both wings were intact. The turtleback bulhead TB-1 is broken between the headrests (top and bottom). NG-30 was broken between F-5 and F-22. F-22 middle vertical part was broken top and bottom, caused by the electric motor of the nose lift to move and put the Cozy on its nose. The canopy plexiglass is broken and so are the 2 front widows and the 3 blades of the propeller. The fuselage, strakes, cowlings, engine, main landing gear, and front gear are all OK.

I am already working on the repairs. I have to redo both wings + canard. I will keep the ailerons and elevators, which are OK. I have already cut both wing cores FC1 to FC5 + winglets. I am in contact with Brock, AS, Airplane Plastics, Performance Props, and Featherlite. I am waiting for warm weather.

That was an unusual experience. I had no time to get scared. Notwithstanding the beating taken, the Cozy is a safe airplane. The repairs are manageable and I expect to take off (and land again) in 6 months time. Meanwhile, I will have to improve my piloting skill, particularly in crosswind landings. Regards,

Jean-Patrick

*Editor: We are very sorry for Jean-Patrick's accident, but thankful he was not hurt, and appreciate his sharing his experience with us. Incidentally, we know of a friend (a former Cozy builder) who had an off-field landing in his RV, tipped over, and had to build an entirely new fuselage and tail section. Luckily, he was not hurt either.*

## **ENGINE BREAK IN**

To a question by Don Herstein, John Epplin writes:

As an old retired A&P, most experience with turbine equipment, though. I also purchased an engine from Aerosport. Great people up there!!! They ran mine about 3 hours according to the test report. Last hour was at full power, a few notes of CHT along the way. The head temp dropped somewhere along this run, don't recall the exact time or degrees. This is the indication that the rings have seated quite well.

My engine was delivered about 2 years before my first run, stored in garage that was kept heated to a min of 45 deg. F. The garage is quite dry all year, no sweating concrete, etc.

If they ran yours 5 hours, you will have to try hard to hurt it. Either it is correct or never will be, am quite sure the former is the case. We treated mine basically with no mercy, taxi tests several times down full length of 10,000 ft. runway. More ground run than I really wanted but just to make sure. First flight was full throttle take off but reduced power to keep

speed down around 120 kts. For first flight, which was over an hour.

Bottom line, I used less than a quart in the first 15 hours, then changed, flew for over 30 hours before next change, did not add any but it was down at least a quart. So far, so good.

John Epplin  
Orion, IL

## **TRANSPONDERS**

Tim Hedstrom wrote:

3/4/04

Carl, to clarify some things. Being a controller, I speak from experience. "Radar contact" is the phrase told to pilots when we have confirmed that the blip on the scope is indeed you. Radar contact has nothing to do with transponders. Some controllers forget that, but that is beside the point.

ATC has two radar systems. Primary radar is the raw radar energy return depicted on the scope with a small dot. The size of the dot changes with the size of your plane. Too small a change to really notice. Secondary radar is not technically a radar, as it does not deal with reflected radiowave energy. This is where your transponder comes into play. The secondary radar sends out a signal to your transponder asking for a reply. Your transponder picks up on this reply and then sends back a signal. The signal includes your pressure altitude, transponder code (squawk), and if you have the ID button depressed, your "ident." Our equipment measures the time it takes for your reply, which in turn shows how far from the radar you are, and it measures the degrees of sweep that your signal is picked up. The degrees of sweep is greater than the primary radar's, so you get a bigger blip on the scope which is easier to see.

Now, another system comes into play. ARTS. If I remember right, it stands for Automated Radar Tracking System. I may be wrong, forgive me for my bad memory. ARTS displays your "tag" which includes your aircraft ID, altitude, speed, and some other things that may or may not be included in your tag, all depending on the controller and facility configurations. ARTS follows your transponder "blip" with your data tag. If we loose your transponder, we see your tag flash and CST under your call sign which means "coast." Your primary blip still is on our scope or you will hear, "radar contact lost." We can manually move your tag if we have to, but it is a major pain in the butt. That's why many controllers will ask you to recycle your transponder, which sometimes helps. If your antenna is the cause of the coasting, it won't matter if you recycle.

Now that if have explained the basics, I can get to some quirks. Out west in the Rockies, some facilities do not use primary radar. This will be depicted on the ATIS broadcast if they do not have it. I know that Denver is one. Makes sense because you don't want to be looking at the raw radar return from the mountains. At those facilities you will hear, "radar contact lost" if your transponder "sucks" or goes into coast.

As an experimental pilot, you should make a mental note of where the radar site is when you hear a controller ask you to recycle your transponder or tells you that he lost your transponder, or part of it like your mode C. If it always happens when the radar is at a particular place relative to your plane, you might be able to fix the problem. Like Nat has said before, he always looses it when the radar is behind him, so he

makes a few turns and the controller “sees” him again and he just turns back. I suspect that his engine is blocking the signal, but I can’t say that for sure since I don’t know where his antenna is located. I plan to put mine inside the NACA scoop so that it will not be blocked by any metal next to it. That seems to be a good place as the small antenna couldn’t affect the amount of air entering the scoop to make a difference, yet would provide the most use.

I hope this clears up how the systems work and why you hear some things. If you don’t understand this, tour your local ATC facility and ask questions. You can even ask them to show you all the things I just talked about. I see pilots on a daily basis. The sad part is that the worst transponders are usually on the newest planes. Cirrus especially has “lucky” transponders along with most experimentals. Most experimentals coast either coming to the radar or going away. In fact it is so common that I don’t ask an experimental to recycle until I have seen him pass the radar antenna and it still doesn’t work.

Last thing. If you have a transponder, turn it on! You don’t have to have your mode C on, but just turning it on will make you stand out so much better on the scope. It is very hard to see primary returns, and that’s all you are if your transponder is off. If you squawk VFR (1200) ATC will see a “V” over your primary return. If you turn on your mode C, we will see: V – 035. The “V” means VFR (1200), and the 035 is your altitude in hundred feet. This example would be a VFR target at 3500 feet. The difference for us is when we call traffic. Knowing your altitude will tell the other planes where to look, up or down. A bright “V” is much easier to see than a dot. Just compare here: V . See the dot? That is what you look like with your transponder off.

Tim Hedstrom  
Florence, SC

On 3/5/04, Tim writes,

Earlier someone stated that to turn on your mode C, you have to have the transponder checked in the last 24 months. That is incorrect. To use your transponder at all, mode C or not, you must have your transponder checked within the last 24 months.

There is good reason for this. For example, if your transponder is not set correctly, ATC will get what is called “ring around.” Ring around is really bad and distracting. Basically, ring around is what it sounds like. There will be hundreds of false “targets” all at the same distance from the radar antenna, but at every angle the antenna goes through, producing a near solid circle from the airplane. This usually happens most when the plane is near the antenna, but can happen at farther distances.

I cannot imagine that the newer transponders would be poor in design, since transponders are not a new technology. I would suspect that if the transponder was poor they would show up on their 24 month checkup and be recalled.

Tim Hedstrom

## PARACHUTES

Keith Spreur asked on the internet for a consensus on whether it was necessary to wear a parachute for the first flight. I volunteered that there would be no problem with the airplane, if built according to plans, but there might be a problem with the

engine, particularly auto conversions. But you should always remain in the pattern on the first flight, and stay within gliding distance of the runway, in case of engine failure. Also, at pattern altitude, there would not be sufficient time for the chute to open anyway, and besides, I don’t know of anyone who ever did or ever wanted to get out of a Cozy in the air (a pretty good testimony to the construction and flyability of the Cozy). Others had similar advice.

A reply from J.E. Patterson was particularly poignant:

Fellow Builders, 3/5/04

I have given this subject much thought in the past, as it is often been included in our Home Town Airport “Hangar Talk”. Here are my conclusions:

**ALWAYS PLAN AHEAD FOR AN EMERGENCY LANDING.**

1) Your very first flight, could be no more than getting the tires off the ground.

**ALWAYS PLAN AHEAD FOR AN EMERGENCY LANDING**

2) Your second flight could be, get her up and put her back down.

**ALWAYS PLAN AHEAD FOR AN EMERGENCY LANDING.**

3) Your third should be to go around the pattern once, staying in the pattern or at least close to the field.

**ALWAYS PLAN AHEAD FOR AN EMERGENCY LANDING.**

You get the idea: You keep “Pushing the Envelope” out a little farther each time, listening to your engine, feeling the vibrations, so you will get a sense of “How she feels”. **FLY** the plane to its intended landing spot, even if you have to change the landing spot. All of the “Old wise pilots” I have spoken to, say don’t think you will need a chute, on yourself or on the plane.

Once Chuck Yeager was asked, “How have you survived so many plane crashes?” His reply was, “I have never considered any of my landings to be crashes, I always flew the plane to the intended landing zone.”

## COST OF FLYING A COZY MKIV

Marc Zeitlin reported (see LETTERS) his hourly costs for his first full year of flying. By including some non-direct costs like AOPA membership, magazines etc, and some one-time costs like conditional inspection, preheater, and a top overhaul, he came up with the alarming cost, based on 71.9 hrs, of \$88/hr. This is probably very frightening to other builders. However, if we consider only his tie-down cost (he does not have a hangar), insurance, fuel, and registration, these costs amounted to \$37/hr.

Usually, when figuring operating costs of an airplane or a car, depreciation is a significant cost that should be included. For example, on a new car, it could easily lose 25% of its value the first year. So lets assume you built a Cozy Mark IV for \$40,000 (I know that some builders will spend more), but after 10 years you can still sell it for \$80,000. The **NEGATIVE** depreciation would be \$4,000 per year, and if, as in Marc’s case, you flew 71.9 hrs/yr, that would come to a credit of \$55/hr. In other words, your flying would not only be free, but after 10 years, you would be ahead.

Now I know some of you won’t buy this scenario. However, you can make your hourly costs turn out any way you want them to, just by the figures you decide to include. I will say, however, that if you are reasonably careful in the money you spend building (and flying) a Cozy Mark IV, your flying costs should be very low

and might even be free if you make enough money when you sell, down the road. It is more likely that you could do this with a Cozy MKIV than with some other kit airplane or a factory built.

## EPOXY RESIN COLOR

Epoxy resin should be clear and should be colorless or be a slight yellow and can vary between batches. If it is hazy, this is probably due to crystallization, and should not be used until it is heated and becomes clear again. The catalyst or hardner can be clear (like it is with MGS) or colored (like it is with RAE or Aeropoxy). If it is colored, it is because a dye has been added, usually to identify whether it is fast or slow hardner. The color is not critical, so the manufacturer uses dyes which are lower cost because the color did not exactly match the desired color. These dyes do not have any affect on the properties of the cured epoxy system, so do not be concerned if the color of the hardner varies from batch to batch.

## LETTERS TO/FROM BUILDERS

To Cozy Builders,

1/07/04

During the past few days since we took over the Cozy program from Nat Puffer, we made many changes to the websites, phone numbers, fax numbers, e-mail addresses, etc. to provide builders with current contact information. We brought in some new people and we have been working closely with Nat to insure a smooth transition so that we can continue to provide the great support that builders have received over the years from Co-Z Development.

Nat prepared the other suppliers for this change, and when we announced plans to acquire the Cozy rights from Nat months ago, I stated that the authorized suppliers of parts and materials would remain the same, and that is exactly what we will do. Material kits for the Cozy remain available from Aircraft Spruce and Wicks Aircraft.

We appreciate the many letters and e-mails of support we have received regarding our carrying on the Cozy program, and you have my pledge that we will do our very best to provide plans, info packs, owner's manuals, etc in the same efficient manner that Co-Z Development did in the past.

Best wishes to all Cozy builders for a Happy New Year in 2004, and please let us know anytime if Aircraft Spruce can be of service.

Best regards,  
Jim Irwin, Pres.  
Aircraft Spruce

1/06/04

Dear Nat,

Thanks Nat for your reply (about continuing the newsletter) and glad to hear you're still hanging in there. I am just really glad to hear that in one form or another the newsletter will continue at least for the time being. I enjoy having the hard copy in hand and look forward to getting it each quarter. I even saw my name in it a few months back. I fully intend to keep my subscription current with you as long as you choose to put it out. In the event you do ever decide to fully retire, perhaps some of the group members would be willing to continue on with it in your absence. I would certainly be willing to do anything I could to help continue this wonderful asset. Thanks again for hanging with us.

Denny Mortenson  
Sioux City, IA

1/11/04

Dear Nat and Shirley,

Please renew my newsletter. Once again, thanks a lot for a great design. The closer I get to the finish line, the more I love this bird. Cozy MK IV #0220 is not a "boat" anymore. I am done up till chapter 20 (not firewall yet), so now I'm working on attaching my winglets to my wings. Then the only big fiberglass task that is left is to build the strakes (and finishing the bird). The only (and tiny) problem is the size of the bird (yes, size does matter). Both our cars are now living outdoors year round. The Cozy takes up all the space in our two car garage. One half is my working area (working table) and in the other half, the bird resides (I am probably privileged because I have room for both).

I can't wait to finish the project. Every time I rent a plane here in The Netherlands, we are talking \$168 per hour for a C-172, that is old (and slow). I wish you both a merry X-mas and a happy 2004. Best regards,

LTC Mike Schroeder  
Royal Danish Air Force

Builders,

1/10/04

We've had discussions in the past regarding the cost/hr. of flying a COZY MKIV. I've just finished my first full year of flying my plane, and here's what I come up with after flying 71.9 hours in 2003:

Tiedown: .....\$612

Insurance: .....\$714

Fuel .....\$1,180

Other: .....\$1,100 (Oil, foreign tiedowns, magazines, AOPA, EAA, contional inspection, etc.)

Preheater:..... \$405

Top Overhaul \$2,193

Total:..... \$6,369

So, that works out to \$88/hr. If I assume that I won't need a new preheater or Top Overhaul every year, it drops to \$52/hr.

This, of course is just one data point.

Marc Zeitlin  
Acton, MA

Builders,

1/18/04

So Friday afternoon after my daughters marriage, we're standing outside helping the photographer earn some easy money when what to my complete surprise should fly DIRECTLY over my head at low level? A Cozy! I could hardly believe it! My wife accused me of setting it up. This was about 1300 hours over the East Bay (Oakland Hills), roughly north east bound. This is gotta be some kind of omen! I've seen fly-bys at funerals but never a wedding! Whoever it was, thanks!

Tim Andres  
Cottonwood, CA

Builders,

1/05/04

I have to take a short break from working on my Cozy right now to build a garden shed in the yard to hold everything non-Cozy. This Saturday, I was up on a ladder hammering and heard a high pitched sound. I thought, "man, that would sure be cool if that was a canard". So I looked up and couldn't see anything. I just hear it. Then, sure enough, here comes a canard! It was a beautiful warm sunny day about 74 degrees. I live in San Diego area with a lot of air traffic, so spam cans are always flying overhead. I always look up, and I get used to how slow they cross the sky. So when I focussed on the canard, of course I watched it intently, and was amazed at how **fast** it moved across the sky! I didn't even have much time to enjoy! To you flyers, big deal, but to us builders who rarely see canards, this was GREAT!

Jay Hegemann  
Escondido, CA

Builders,

1/06/04

I had a similar experience. I knew a canard was flying in to my local airport at 12:00, and I was sure to be there. I watched the skies for about 20 minutes, when I spotted a most graceful form in the sky. I realized that this was the first time I'd actually seen a Cozy flying. I got so excited I bounded over to the nearest available airport bum and asked, "how about that one?!" The reply from this senior fellow was simply "experimental" (preceded by an unrecognizable grunt sound). Others were clearly in awe and were affixed to the craft in a trance-like state.

The aircraft landed, I got in, and was graciously treated to an amazing ride by the Mr. Marc Zeitlin. Had a wonderful experience feeling the plane out, and watching Marc do his stuff, ending in a greaser landing. I have to say that things got kicked up a gear or two after that sunny Saturday, and I am now aggressively building a detached hangar ("er, 'garage' Honey") to build in.

Bridgewater, NJ

Hey guys,

3/3/04

I posted a notice on the internet about an airshow at the Florence SC airport May 1<sup>st</sup> and 2<sup>nd</sup>. I have heard from Nick Ugolini, Art Armani, and Jack Wilhelmson. They will all be there. Does anyone else want to join the fun?

Since there won't be a big dinner at Sun n Fun (just a hot-dog roast), I can work something out. There are plenty of wonderful places to eat around here that can put up with a big group. Art and Nick have requested that their planes be roped off to keep people from messing with them. I can do the same for anyone else who wants to come. The weather will be great as it usually is in May, and the show will be spectacular!

If you know of anyone else who may want to come, the offer is for anyone with a unique looking airplane. Forward them my email and have them contact me to make sure everything is set up for them. Please email me if you want to attend. Remember, if you display your airplane, I can get you free tickets to the show.

Tim Hedstrom, Air Traffic Controller at Florence SC

<http://www.cardomain.com/memberpage/441691>.

Builders,

3/4/4

In response to Tim Hedstrom's question, I have had three tech inspections. The inspectors there were two each time, drove from Hartford to Ledyard (about 150 miles round trip). I gave them refreshments the first two times. The last time they flew into Groton and I picked them up, fed them a good home cooked Italian meal, and sent each of them home with an unopened bottle of homemade Italian wine. The results of the last inspection was the same as the first two. They told me that I had raised the bar considerably in regards to hospitality. My advice is to do what seems in good taste. I think that tipping them would be in poor, or at best questionable, taste.

Don Ponciroli

Ledyard, CT

Editor:

*Don makes very good Italian wine.*

Builders,

2/13/04

The Cozy wing airfoil is a modified Eppler 1230. The modification is a slight straightening of the reflexed underside of the trailing edge. This I am sure is for ease of manufacture and structural stiffness of the trailing edge. The modification is a common one on reflexed airfoils. Even some of the NASA series airfoils have modified versions that beef up the trailing edges, as I am sure the guys who built the actual wings complained loudly about the very thin sections on the trailing edges.

If you do some analysis on this airfoil or any others, what you will find is that small modifications of the shape do not generally have strong influences on the performance of the airfoil. For example, Harry Riblett caused a great stir at NASA when he criticized their series of 64,65,66 airfoils, because of their stall characteristics. He basically said they were idiots for not increasing the leading edge radius. NASA went back and studied the affects of this. NASA found that Harry was right to some extent, increasing the nose radius noticeably and significantly increased the stall AOA and softened the stall curve, and for wings at low Reynolds numbers this affect is even stronger. Score one for Harry.

The other consequence of Harry's modification to the nose was a significant increase in drag at cruise AOA's. So, you don't choose airfoils blindly, and ~~don't pay~~ ~~attention~~ attention to Reynolds numbers when you choose them.

So, if you want to stress out over getting the perfect shape to your airfoil, go ahead and stress out. The reason these planes can be built by thousands of untrained imprecise builders is because the minor variations caused by them have almost no measurable affect on the airfoil performance. Now, if you want to do something that will have an affect, worry about the surface finish on the first half of the wing chord, the laminar portion. Smooth is good.

Todd Parker

Hollister, CA

Builders,

2/11/04

I learned to fly in the mountains, so I've never really known anything different. All of the discussions about cloud turbulence seems over played to me. Clouds have turbulence whether over flat land or mountains. Mountains on the other hand can have severe wind related updrafts and down drafts. If you have your mountain flying courses then you know to expect significant lift on the upwind side and similarly sinkers of equal or greater magnitude on the leeward side. The sinkers on the back side are generally much more turbulent as well. These can place your heart well into your throat the first time you experience one. Rules of thumb:

- 4) Don't fly into a canyon unless you can see the horizon behind it.
- 5) When cresting a ridge, approach it at a shallow angle with as much altitude as you can. This will allow you to easily divert to the upwind side if the sinker is a strong one.
- 6) If there is a cloud covering the top of the mountain, expect turbulence and sinkers on the leeward side. If it is a lenticular cloud, get the heck out of there.
- 7) Remember your density altitude performance. You most likely will not be able to muscle your way out of a bad situation. Just don't get into it in the first place.
- 8) When flying in a canyon, stay to one side or the other, so if things go wrong, you have space to turn. If the canyon ahead is to narrow to turn in, better get higher or find another way.

An acquaintance of mine landed his Mooney at 1,000 ft. in a snow field when he forgot to follow these rules. When I was a teenage airport bum in Utah, we would say, "You can tell it's Spring when the hills are covered with California pilots".

Todd Parker

Hollistar, CA

Hi Cozy Fliers,

2/12/04

Having flown in a number of hazardous locations all over the world (Germany, Vietnam, Alaska, Colorado, Utah, New Mexico, to name a few....there're a lot more), I have followed the discussion on Mountain Flying with interest. All who have responded have valid points based on their study, experience and training.

Todd Parker mentioned the "California pilots covering the Utah mountains in the spring". We in New Mexico have had similar experiences with FLAT LANDERS from various locations, forgetting about density altitude and mountains (we watch for them around Angel Fire).

All I wish to do is remind that a study of the subject combined with some experience and training is extremely beneficial to longevity. Carl Denk talked of the value of the mountain flying course he attended, and the use of a go-no-go gage to assist in decision making (at Farmington, NM airport for example) at high density airports. All are useful tools.

I would highly recommend the study of the "Mountain Flying Bible", by Sparky Imeson. This book is used to teach mountain flying here in New Mexico. If you have a vast amount of experience, then only a review of the book might be in order. This book is beneficial even if you never go into the mountains.

We, as aircraft owners, owe it to ourselves to establish our own FLIGHT MINIMUMS which, while being consistent with the airplane envelope, also recognizes our personal ability as a pilot. Mine are always higher (allowing a greater degree of safety) than FAA authorized minimums.

Lloyd A Gimple

Albuquerque, NM

Builders,

2/11/04

Although I've my whole life on the relatively flat East Coast, I already feel like I know a lot of the "Mountain flying" stuff. Here's why.

When I was 17, I took glider lessons for 3 weeks at a flying camp at the Fraconia airstrip in Franconia, NH, nestled at the base of Cannon Mountain and the White Mountains of NH. Now, these aren't the 14K ft peaks of the rockies, but the fastest wind ever recorded on the face of the earth was recorded on the top of Mt. Washington, at 6K ft, and the rules of thumb that Todd mentioned were drilled into us every day, along with lessons on how the wind works in ridge lift, wave lift, and the dreaded "rotors". We used to cruise up and down the ridge, 100 ft over the trees, and heaven help us if we crossed over the ridge to the downwind side—we weren't getting back.

I think that my Cozy, when flying solo, has the performance to minimize the problems in mountain flying, either by going WAY over the top, or because 800 fpm climb rate is substantially better than a C-172's 200 fpm climb rate at similar altitudes. I won't be complacent—don't take me wrong, but it IS a higher performance aircraft (that's why we built them, right? ☺)

Marc Zeitlin

Acton, MA

Builders,

2/11/04

I haven't had any experience in mountain flying per se, but last year I did the California to Oshkosh trip in my Avid 2 place speedwing (ha! 150 mph cruise speed). In doing so, I flew east across northern Nevada, Utah, Wyoming, etc, and west across New Mexico, Arizona and Nevada. Middle of summer and some pretty high density altitude airports. I only have a few hundred flying hours and this was the first time I've ever had to cross such high terrain. I took O2 just in case. It became pretty apparent to

me that I had to depart really early (first light) and quit flying by 11 am to avoid severe convection that was really uncomfortable (if not dangerous in the little Avid). However, I completed the trip very successfully and had a great time. I'm convinced that with good flight planning, local advice, constant weather briefings, flight following and a safe and conservative attitude, flying cross country, including mountain flying can be safe and lots of fun. The Avid would max out at 11-12,000 so I didn't have the luxury of much spare altitude on some legs. I'm really looking forward to having the Cozy flying one day—but I'm a little worried it will be a "vintage" airplane by the time I've finished it. Allan Aaron

Palo Alto, CA

Builders,

*We (Shirley and I) fly over the mountains in our Mark IV all the time. We always leave early in the morning. On the northern route, when we return (from Pueblo), we go through La Vita pass (9,500 ft) but never fly after noon or 1pm, because of the cumulo nimbus build ups in the afternoon over the Mogollon Rim. On the southern route (from El Paso) we don't have to worry about buildups, so we can fly late in the day, but the head winds and turbulence really beat us up. We always fly high, with plenty of clearance over the mountains, and NEVER in canyons. Nat*

To All,

2/11/04

I fly out west and across the pass between Albuquerque and Phoenix every two years to see my wife's sister. The pass (it is on the chart) is one of the most beautiful flights I have ever made. If I recall, I flew at about 11,000 between the peaks, always early in the morning before the heat thermals start to activate. You will go from 11-12,000 ft down to 1500 ft on the Phoenix side very quickly, so be ready to blow some ear wax. You will probably be landing at Falcon Field, which is right at the foot of the mountains.

My wife's sister has since moved just to the south of Phoenix and the last time I had to fly over the top of the mountain range in order to fly direct. It seems that there was a storm down in Baja that was pushing a head wind of 120 mph against my plane. I have never had such a head wind in my life. We were flying so slow we could watch the moss grow on the tops of the mountains. Interesting!

Ken Brimmer

Bowie, MD

Builders,

2/7/04

I used to keep my epoxy pump on top of my water heater. This worked fine to keep it warm. One day I noticed that the resin was going down too fast. The next day the resin was all gone. But I could not see any leakage. Then I noticed a slight amount of resin at the bottom of the hot water tank. You can probably guess "the rest of the story". I had to replace the hot water tank because the insulation in it was saturated with epoxy resin. Jack Wilhelmson

Charleston, SC

Builders,

2/7/04

I had to replace my hardener container early on after it cracked thru the hole. I was lucky and caught it early. I was in a pinch, so into the kitchen I went. My wife never missed the Tupperware container I stole from her! That is, not until I asked her to help with a layup one day. It has worked fine, and lasted longer than the original. I just drilled the hole in the bottom away from any ridges so I had a nice flat surface to seal. Tim Andres

Cottonwood

CA



Dear Nat,

2/7/04

It will be good to get back (to the US). Once I am back in Seattle, I can finish my Cozy without the constraints of having to ship it back with my household goods. I was contemplating going ahead with the strakes and then renting a separate shipping container to get it home, but now I don't have to worry about it.

I'll be retiring in two years, so my wife and I bought a lot at Lake Norman Air Park, about 25 miles north of Charlotte, NC. I've been looking for some time for an airport community with a hard-surface runway, and this one has a combination of location, climate and airport community that appealed to us. See [www.lakenormanairpark.org/](http://www.lakenormanairpark.org/) Hope I can complete the Cozy during our two years in Seattle before I retire. Once settled at Lake Norman, I plan to keep occupied with building and flying airplanes as long as I'm physically able.

Paul Kuntz  
Lancashire, UK

Dear Nat,

3/2/04

I ordered my Cozy Mark IV plans just before Christmas and I was amazed at the quick turnaround. I received them right after Christmas. I had anticipated I would be fortunate if I got them by January 1. WOW, what response, thank you.

I was building a Long EZ and while I loved the design and performance, something bothered me about it. The end of November, it struck me that it was the tandem seating. I have never been a fan of that, but I was stuck on the Long EZ. I started looking at other designs, including the RV, but I just really wanted a canard airplane. I decided to send for the information package for the Cozy Mark IV and another side-byside canard design. You sent the Cozy info right away, but I never heard from the other designer. Anyway, after reading all of the info in the Cozy info pack, I just knew this was the plane for me.

I have been reading the plans and past newsletters. Initially, I thought I would just scan the newsletters so I could get the plans updated for changes. I found the newsletters to be extremely interesting and have been reading everything in them. I feel like I just joined a fraternity or a family! All the great things said about you and Shirley as well as the plane have convinced me that there is no other plane for me.

I am waiting for my first batch of materials so I can get started on the bulkheads. There is no doubt that I will be purchasing parts and materials from the recommended suppliers. Someday, I hope to get a ride in the Cozy so I can experience what other builders have said about it and better know what I am working towards.

I look forward to meeting you and other Cozy builders at Oshkosh.

Gary Wold  
Onalaska, WI

Dear Nat,

3/2/04

This picture of my Cozy III, going out through an 8 ft garage door, speaks for itself. I did work for 4 years in a single car garage. It's unbelievable what the determination to pursue your dream makes you achieve.

Thank you again, Nat, to have put this dream in my life. I have now 160 hours on it, with 66 last summer. I kept an average of 169 mph for over 11,000 miles.

I am encountering some reception problems when taking off from my home airport near Montreal. I have com antennas in my winglets using the RST design (copper foil and torroids). When taking off to the east, I can't receive the Control Center, but I can receive other planes in contact with them. On the other hand,

when taking off to the north, I have no problem whatsoever. The Control Center hears me and I hear them.

Gaetan Roy  
Montreal, Canada

Dear Gaetan,

3/2/04

Jim Wier explains that the band width for transmission and reception of a di-pole antenna is a function of the width of the antenna. When we use copper tape 1/2" wide, but only 5 mils thick, we get excellent band width in every direction except when the station is directly in line with the edge of the tape. In that case, if the length of the tape isn't exactly correct for the frequency used by your Control Center, you wouldn't be able to hear them. I suggest that the next time this happens, make a slight turn and see if that doesn't correct the problem. I have never encountered this problem myself, nor has anyone else ever described it to me, because it is extremely rare. Regards,

Nat

Builders,

2/28/04

I created a spreadsheet specifically to do weight & balance for the Cozy. It has a lot of functionality, and John Slade suggested I make it available on the web pages (he seems to like it). So, if you are interested, check <http://www.cozybuilders.org/docs/> It also gives an updated 5" x 7" version of my checklists, including a new IFR instrument checklist.

Also, thanks to Larry Capps, we now have the latest and greatest "Plans Corrections" collated by chapter available on the web at: <http://www.cozybuilders.org/newsletters/>

Marc Zeitlin  
Acton, MA

Builders,

3/7/04

So new England managed to squeeze one beautiful day in between a bunch of ugly ones. It was mid-40s, with scattered clouds and 75 - 100 mile visibility today. I took the opportunity (after insuring last week that the White Mountains of NH hadn't moved anywhere) to check on the relative locations of both Connecticut and Maine. I flew from Fitchburg, MA down to Windham (a 20 minute flight) to pick up Chad Robinson (mailing list member and new Cozy MKIV builder, working on Chapter 4, IIRC).

Chad not only has never flown in a Cozy before, but he'd never seen one, nor had he ever flown in a small aircraft before. Talk about building on faith, eh? After moving the ballast to the back seat and letting Chad take a few pictures, we loaded up and took off, heading northeast back through MA, across the coast of NH, and up into Maine, to Sanford. Along the way I let Chad fly, although he'd never flown anything other than a PC based simulator. He noted that the Long EZ model in X-plane doesn't match the Cozy MKIV very well. The pitch sensitivity is off. Considering that he'd never flown before, he had very little problem staying on course and altitude.

So we were heading up to Sanford to visit a prospective Cozy builder named Antony Parchment (and his brother). Antony is a pilot, now renting, who's looking to build something. He'd already gotten a ride in a Lancair Legacy, and was interested in the Cozy as well. We had some breakfast in the nice restaurant on the field, and then loaded the four of us into the plane. Fully loaded, we were at about 2120 lbs. (my gross weight is 2150 lbs.) with about 380 lbs in the front seat. We were just about in the middle of the CG range. We headed out on a sightseeing cruise up to Sebago Lake, and even at that weight were seeing about 1000

fpm climb rates. We could easily see the bulk of Mt. Washington, about 75 miles away in northern NH. It was still in the same place.

I let Antony fly the plane, and he also had no major problem keeping us on course and on altitude. I throttled back and Antony flew the plane down to stall buck at about 82 mph (at that high weight). He was very impressed with the flying qualities of the plane, especially at stall speeds. After 15 minutes he was saying that he loved the plane, and it was much nicer than the Legacy :-). The second landing at SFM was probably my best one ever in the Cozy. I didn't even feel the wheels touch the runway. Every once in a while you get lucky, I guess.

After landing at SFM and dropping Antony and his brother off, Chad and I headed back to IJD, on autopilot with Frank Zappa playing on the stereo. An easy flight; we saw no planes the whole way back. I dropped Chad off, put all the ballast back in the nose, and headed back to FIT. It was time to call it a day, so that's what I called it.

We now have one more VERY motivated builder, and one guy who's probably going to be buying plans soon. I want my royalty check ☺.

Marc Zeitlin  
Acton, MA

Builders, 3/7/04

I'd like to publicly thank Marc for his time and patience in visiting me, answering all of my questions, and giving me what amounted to three rides in his Cozy. I had a blast, Marc, I owe you one.

So, yes, now I'm a very dedicated builder. We had a fun romp on a glorious New England day, and I got to compare flight simulator haze with the real thing for the first time. It sure was an education in turbulence! I really appreciate the opportunity to get my hand on the stick and I actually found the Cozy much easier to fly in practice than a number of other planes in a simulator. This ride really convinced me that I'm building the right thing.

As Marc says, unfortunately the Long EZ model really isn't very accurate. It flies, well, like a fast Cessna. The visuals are great, but it leaves one wanting compared to the real thing. It's the little things. For instance, it rotates at about the right speed, but once you rotate, the Cozy leaps off the ground, and the Long EZ simulator rotates more slowly. It's the little things.

I found the space in the Cozy interesting. This was a big concern for me because I expect that I'll be doing mainly family flying with my wife and kids, rather than solo. Space and convenience are important. I'm about 5'11.5" and had no problem with hitting my head, although I kept tapping the right ear on the Lightspeed "Helmet of Thor" headset on the side of the canopy.

It would be nice to raise the bottom edge of the instrument panel slightly to make way for my knees. However, what nobody tells you is that you have MORE leg room than you do in a car or commercial jet, once you get your feet past the rudder pedals. I could extend mine fully and I imagine that even a taller pilot could do so if he was careful about placement of things in the nose. I also have problems with my sciatic nerve in just about every car I've been in (gives me leg pains when the seat presses on it), but never had a twinge in the Cozy. I'd have an easier time spending 4 hours in a Cozy than in a car.

In the back, you have less legroom but more room everywhere else. I don't know what the complaints are about two adults not being comfortable back there, and there's actually more headroom/shoulder room, especially if you only use 1" cushions. Antony's brother and I made out just fine.

I also noticed that, once aloft, you tend to forget how close everything is. The Cozy is really remarkable.

So, I got about a hundred questions answered and I've already thought of a thousand more, but there's no time like the present. Landing gear hard points, here I come! Thanks again, Marc.

Chad Robinson  
Stafford Springs CT

Builders, 2/4/04

I bought my 8" extension from Saber a couple of years ago. They were really helpful since I needed a special arrangement to match my 6 inch flanged Ross RSRU to a 7 inch flange for my prop. It was all done by phone and delivered to me at Oshkosh, which made it simple for me living in Canada. You couldn't ask for better service and the quality was excellent. Phillip Johnson

Builders, 1/4/04

Many experience an allergic reaction from the hardener component of epoxy resin, which contains amines and will pass through latex gloves. One of the simplest ways to protect against this type of reaction is by rinsing off with white vinegar, which changes the chemical structure of epoxy resin to a water soluble compound, followed by a washing with soap and water.

Two other prime sources for reactions could come from the powder found in latex gloves (corn starch) and in the use of latex gloves themselves.

Larry Capps  
Naperville, IL

Builders, 1/5/04

Butyl vinyl gloves, such as the ones I use, come in sizes (like shoes) that fit quite well. You measure the distance around your palm, between thumb and knuckles, in inches. That's your glove size. Get just the right size, and wearing gloves (with cotton lines) during layups is no big deal. They're also usable many times, simply by wiping the epoxy into paper towels thoroughly when cleaning up after a layup. I've used the same pair for many dozens of layups, without any gloves over them. I also use an orange hand cleaner w/pumice (gloves on) to clean up.

Bob Bittner  
Rochester, MN

Builders, 1/5/04

I had the exact same problem (allergy) very early on in the build process, probably Chapter 5. I found that using latex gloves did nothing to stop the allergic reaction, and thought I might have to give up building altogether. I went out and bought a respirator and started wearing butyl rubber gloves under the latex gloves. The reaction completely went away. Since that time, I have stopped using the respirator with no adverse affects. If you wear butyl gloves under latex, you might find that the allergy problem is solved. As a data point, I never tried Ply 9, and can't comment on it's protection.

Dave Greenwood  
Southington CT

Builders, 12/28/03

My wife (Suzanne) got me the Fein Multimaster as a Christmas gift. All I can say is WOW!. I know this tool has been brought up in the not so distant past on the internet, but I just had to rave about it. It cuts through many layers of glass, flox, whatever like "Butta" (I live in Jersey). Say good bye to the Roto zip. This one came with a bunch of sanding pads and the HSS semi circular saw blade. Should be considered a required tool!! I know, I know, preaching to the choir, right?

John Di Stefano  
Cranfield, NJ

Dear Nat and Shirley, 12/23/03

My new plane project is moving along. All glass work completed. The engine has been mounted with all the accessories and plumbed. The baffling is complete and the bird is upside down for finishing. I have completed the cowlings and have the finishing on the bottom side. I hope to have it painted and ready for instruments and electrical by September. I hope all is well with you two. Thanks for the great Cozy design. I still think it is the best one going.

Chris and Cass Esselstyn

Waukesha, WI

3/7/04

Dear Builders,

I may have one of the most challenging environments to work in. I have a small 10' x 16' shop. It is insulated well, so it's very comfortable during cold Wisconsin winters, but it is small. I hang lots of stuff from the ceiling, including a small table saw, wing jigs (the first thing I did was make jigs and templates) and a lot of other stuff. With shelves, tools, and a dust collector, working around my fuselage is tight. I have 1 small work table that I lower from the ceiling when needed, and 2 other tables that I store under the porch. I made tracks of 1 x 6 and 2 x 4 lumber with rubber wheels to roll them under with. I use plastic pails to store micro and floc, a "warm" box to keep my epoxy, and I have a cup dispenser for easy access to cups. One of the most important things I use is a glass-cutting station that swings down from the ceiling and opens up to reveal a cutting table, two rolls of glass, a yardstick and scissors. Since it closes and folds up and out of the way, there's little chance for dust contamination, which can be bad in a shop where you are sanding and grinding glass and foam. I can supply jpeg photos if you like.

I know that eventually I'll have to move to a more spacious venue for assembly, but for now, I'm doing all right.

Bob Forester

Manitowoc, WI

2/23/04

Builders,

I'm the guy that started in his studio apartment. I was a young single man then, and now I'm officially a married senior citizen☺. By the way, to gain more space, you can store completed components outside if they are well wrapped and sheltered from the elements. The beauty of composites is that they don't corrode.

It's a different ball game when you install the center section spar. Then you need a minimum 20 x 20 garage and space in front to flip the plane occasionally, or install the wings for fitting, etc. A hangar will do nicely.

Get going. You have to start somewhere. It's never too late to have a happy childhood☺.

Bulent Alieve

Ft. Lauderdale, FL

2/27/04

Builders,

Thanks, everybody, for your informative discussion on shop size – very helpful to me.

I am interested in powering my homebuilt with a liquid-cooled auto engine, and I have done a fair amount of research on the web over the past five or six years on this subject, enough to be sold on the idea. I've looked at some of the "firewall forward" options (Eggenfelner, etc.), and I just can't stomach the idea of spending \$20K+ on anything like that. I'm familiar with the basic discussions about PSRUs, cooling, etc., but what I feel I really need to get better read up on is the fundamentals of working with 4-stroke engines. Does anybody have a good place to start? I'm not afraid to break stuff (like the house that I'm remodeling), but I'd like to be introduced to a resource that doesn't assume that I

have a background in auto mechanics or an A and P. Any advice you all would have would be very welcome. Thanks! Matt Putz

Builders,

2/27/04

OH,NOOOOOO. Here we go again (auto engine conversions)! This ain't golf – or remodeling a house. This is hangin' your butt, with everything attached, way high in the air, sometimes over hostile territory. I've refrained from getting involved in these discussions before, but my \$.02, with 35 years of flying – the past 20 in EZ types, is to use an aircraft engine as a starting point. You can then hang fuel injection, electronic ignition, etc on it to "improve"it.

If you want to use an auto engine, build something that can land nice and slow, power-off. A Cozy is not the ticket here. I recently had an engine failure in a J3 - yes, a Continental – over pretty hostile territory. Put it in a little bean field pretty as you please. If I had been in my Cozy, I wouldn't be writing this.

Those of us near the far end of the experience continuum need to speak out on this topic. The Cozy is a wonderful airplane, but a lousy test bed for auto engine conversions. If we really want to promote the safe operation of these marvelous machines, we need to say simply, "DON'T DO IT!" Having said that, my conscience is clear.

Curt Smith

Worden, IL

2/28/04

Builders,

What excellent advice. I have done a conversion. I also agree the Cozy is NOT the best test bed for any risky engine conversion. Any auto conversion WILL include initial higher risk. This isn't because the engines are less reliable, the opposite is likely true. It's because there are more "custom" items you are doing. It's those little details that can bite you. The answers to these questions are better known for Lycomings, not as well understood for others.

Portland, OR

2/27/04

Builders,

I bought a rotary cutter from Walmart yesterday and used it last night. All I can say is WOW what a difference. It is made by Fiskars, and I was able to find a less expensive model (\$15 vs \$20) that uses the same blade as the expensive one, but just has a less fancy handle.

I hope people stop calling these things pizza cutters because they are definitely way sharper (as evidenced by the sizable cut on my hand: and would not work at all on pizza since the blade is much smaller. I would consider this tool to be a "must have" for doing fiberglass work.

Rui Lopes

Airdrie AL Canada

12/18/03

Dear Builders,

I have read all the comments about finishing and it becomes apparent that my own experience over the past 18 years is not unique. Getting a show plane finish that will stay on and be durable on a composite airplane is not done by the inexperienced or unskilled. This fact includes me. I have had at least two failures. I don't want to agree or disagree with anyone's methods, but I will contribute the following points:

- 4) The structural surface must be prepared by peel plying or sanding (and preferably both) such that no glossy epoxy surface remains. I peel ply everything and sand as well. A stainless wire brush can be used to get down in the glass weave after sanding, if still needed.

- 5) Contour the surfaces with micro (all epoxy products are OK, but West system is easier to sand). This process should be carried much further than is normally done. Most builders use very course sanding paper on the micro and they don't try to finish it's surface. I sand the micro with finer and finer paper until I can begin to feel the irregularities with my fingers, and see them with a low angle light. I then fill with thin coats of micro again. And begin the process over. This process can use all the suggested methods such as guide coats, etc. When this process is finished, the surface should be ready for primer and final paint without any further need (at least in your own mind) for further filling of imperfections or low places.
- 6) Filling pin holes. The surfaces should be blasted with high pressure air to open the pin holes. A very thin wet coat of primer (Smooth Prime is what I use, but other epoxy or urethane primers will work) should be applied. The trick here is to get the primer to go down into the pin holes. With Smooth Prime, I spray it on and then roll it with a roller. This coat of primer should be sanded off with 220 paper until the raw micro is exposed and only the pinholes are filled with the primer. If the pin holes open up again, do it over. This method uses very little Smooth Prime.
- 7) Final primer. I don't use Smooth Prime. It is hard to sand and has a rubbery texture. I use a urethane sanding primer made by Dupont, but there are others on the market. The usual prime sand and prime sand is now used to get the surface you are satisfied with. At this point, I think that many others have covered the subject very well.
- 8) Final paint. You need some experience with a spray gun to do this job. I have seen even experienced car painters do poor work on airplanes because of the over spray and overhead requirements not present in auto painting.

Jack Wilhelmson,  
Charleston, SC  
3/5/04

Builders,

The plans for the Cozy are among the best plans for anything I've encountered. Yet, it's very easy to make mistakes. My career has been focused on finding ways to reduce oversights. There are a number of effective ways to control this common problem. I'd like to offer these suggestions, which are some of the best:

- 4) Read ahead 1 or 2 pages. This gives you perspective and compensates for instruction sequence oversights.
- 5) Review pictures. Our comprehension and retention greatly improve by using the graphic half of our brains.
- 6) When you have TOTALLY completed a sentence in the instructions, use a highlighter to line it out.
- 4) Add a small postit not to pages that are not completely lined out. This reminds you to go back and complete the instructions. The postits may fall off, so periodically go back thru the plans looking for pages that are not totally highlighted.
- 5) Measure twice, cut once. Use different methods of measuring on critical items.

MMMMM  
MM

Al Wick  
Portland, OR

When I die, I want to die like my grandfather, who died peacefully in his sleep. Not screaming like all the passengers in his car.....Will Rogers

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We can't solve problems by using the same kind of thinking we used when we created them.....Albert Einstein