

## COZY NEWSLETTER #76 Jan. 2002

**Published quarterly (Jan., April, July, Oct.) by:**

**Co-Z Development Corp.**

**2046 No. 63rd Place**

**Mesa, AZ 85215 Phone/Fax (480) 981-6401**

**Web page [www.cozyaircraft.com](http://www.cozyaircraft.com)**

**Email: [natp@cozyaircraft.com](mailto:natp@cozyaircraft.com)**

**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)**

Following our custom of previous years, we are sending this newsletter out a little early so we can wish you:

# Merry Christmas

And

# Happy New Year

Subscribing to the Cozy Newsletter is a requirement for all builders. We will be giving new Mark IV builders some previous newsletters, including newsletter #73 which has a summary of 2<sup>nd</sup> edition plans corrections, plus a complimentary 1 year subscription, to start them off on the right foot. Our newsletters date back to April, 1983, and older copies which we can no longer supply are available on the Unofficial Cozy Web Page. 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.

Co-Z Development is the only one authorized to sell the plans and construction manuals and provide builder support for the Cozy and Cozy Mark IV 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**

Wicks Aircraft  
410 Pine St.

Aircraft Spruce  
Box 4000

A. Spruce East  
Box 909

Highland IL 62249  
(800)221-9425

Corona, CA 91718  
(909)372-9555

Griffin GA 30224  
(800)831-2949

#### **2) Metal Parts**

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

#### **3) Fiberglass Parts**

Feather Lite  
Box 781  
Boonville CA95415  
(707)895-2718  
(Also propellers)

#### **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

#### **5) Specialties**

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 (561) 664-9239.
- 3) **Switching and breaker panel.** Wayne Lanza (561) 664-9239.
- 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](mailto: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.

### PLANS CORRECTIONS/CLARIFICATION

- 1) Chapter 23, p.9: Change AN3-10A to AN3-4 or 5A.

### BUILDER HINTS

- 1) **Fillers:** Larry Capps checked several fillers and compared them. He said the homemade fillers (either Alphapoxy + micro, or Aeropoxy + micro) weighed in the range of 3.1 to 3.8 lbs/gal, and cost approximately \$16/gal. On the other hand, Superfil weighed 5.0 lb/gal and cost approximately \$40/gal.

- 2) **Cablecraft:** Paul Stowitts says the telephone number for Cablecraft is (253) 475-1080.
- 3) **Cold feet:** Peter Militch says you can buy electrically heated socks from Widder. [www.widder.com](http://www.widder.com) and also [www.motorsports-network.com/ProdTest/electric/widder.htm](http://www.motorsports-network.com/ProdTest/electric/widder.htm)
- 4) **Band saws:** John Epplin says he wasn't satisfied with an off-shore copy of a 14" Delta, so he attended an auction of government industrial tools at the Rock Island Arsenal. He bid on a 16 inch DoAll and bought it for \$600! He said it weighs well over 1,000 lbs and was in very good condition. He said, "Using it is quite an experience when you are used to using a light duty machine, this thing cuts straight and smooth! One inch thick steel is not a problem. 4x4 wood disappears! Keep your eyes open for these things, there are some good deals out there if you look!"

## FOR SALE

- 1) **Cozy Mark IV 4-place aircraft.** 220mph cruise on 10 gph. 150 hrs TT airframe, 150 TT IO-360 Lycoming. First flight 9/8/98. Always hangared. Exceptionally nice Cozy with full instruments: KX155, Collins transponder, ELT, Stereo CD player, Iintercom, Audio flight engine monitor system, Electric trim, electric speed brake, electric retract, 3-blade Performance prop. \$99,900. Tel (480)671-7355 or email [cozy42cz@qwest.net](mailto:cozy42cz@qwest.net) for more info or references
- 2) **0-360 Lycoming.** No mags, flywheel, or carb, but new fuel pump. Purchased from Dan Brown but not run. Sold my project. \$7,000 for engine. Contact Paul at (732) 473-1370.
- 3) **0-320 E2A Lycoming.** 150 hp, 361 hours SMOH, completely documented. All accessories including engine mount. \$9,400. Will crate. Buyer pay shipping from San Juan. Contact Armando Vargas (789) 728-0334.

## WHAT WE HAVE BEEN DOING

When we were at Oshkosh last July, an old friend, Norm Goyer, stopped by to chat, and asked if we would like to come out to Apple Valley, CA for another photo shoot. We had been there in early 1996 for a photo shoot, and Norm subsequently wrote the article, "Getting Cozy" for Sport Pilot, one of the articles we include in our information kit. We agreed, and arranged to do it in connection with a visit to Yermo, to help celebrate Alex and Norma Strong's 50th wedding anniversary. It was the night before (August 24<sup>th</sup>), when Shirley was getting ready, that she broke her ankle. So that squelched that.

Then came September 11<sup>th</sup>, and the grounding of all GA airplanes that were at airports under the "veil".

On October 6<sup>th</sup>, it was 6 weeks since Shirley's break, so the cast came off, and she started to relearn how to walk without crutches or a cane. Then on October 16<sup>th</sup> the "veil" was lifted, so we made a new appointment with Norm and Alex for November 8<sup>th</sup>. The weather was beautiful, we had a good flight, and we met Norm. This time, rather than flying over the desert, we went into the mountains (Big Bear, I think) so the pictures should be nice. Norm said he was doing an article on canards for the March issue of Custom Planes, and we would be included. Alex and Norma came to Apple Valley to meet us in their Cozy III, and we flew to Barstow in a 2-plane formation. Barstow is an ex B-25 base with

nice long runways, 8 miles from their home, and that is Alex's alternate airport when he and Norma leave on long trips with full fuel and luggage. We parked our N 14 CZ at Barstow, Shirley and Norma drove home in the Strong's car, and Alex and I flew there in the Cozy III.

Alex and Norma live in a lovely home with a hangar and shop, all of which Alex built, on a dry lake bed, sorta like Edwards, except much smaller. They have their own runway, sort of, on the dry lake bed. I don't remember whether it is 1500 ft or 2000 ft. As a matter of fact, its kinda hard to tell where the runway starts and where it ends. Anyway, Alex demonstrated his short field landing technique. He comes in low (and I mean low) and slow in a nose-high attitude and chops throttle at the beginning of the landing area. He said he hits brakes hard when he touches down, and then lets up. The dry lake bed consisted of caked mud with cracks in between the cakes, so it wasn't exactly smooth. He continues the roll out off to the side and taxis right into his hangar. What a deal! They own 5 acres, and have converted their lot into a little oasis. We spent a very pleasant rest of the day and evening with them, and all too soon it was morning and time for us to go back.

Incidentally, LtCmdr Randell Livingood, the chaplain on board the Constellation, who is Alex's son-in-law, and who invited Alex and me on the cruise, is building a Cozy Mark IV, with the help of Alex's daughter, Nancy, in Alex's hangar. We got to inspect it while we were there. The fuselage is sitting on its wheels and they had started the canard before Randell got sent to sea. His next assignment will be at the Marine base in Barstow, so he expects to finish his Cozy in a year or two, and then operate off the dry lake bed. He has installed 600 x 6 wheels, so he shouldn't have any problem.

The weather is very moderate now in Arizona, our citrus is starting to ripen, and all the snowbirds are returning, which means heavy traffic and long waits at restaurants. We plan to spend a week over Christmas in Minnesota with our kids and grandkids, and then take some additional time off in January and February.

## FIRST FLIGHTS

We learned of 3 in the last 3 months:

- 1) On 6/26/01 we got a call from **Dan Cruger**, in Mobile AL, advising us that his first flight of N197DL was on 5/2/01. He said he had an oil cooling problem with his IO-360 that he was working on solving.
- 2) We keep bumping into people who are flying their Cozys who have never sent us notice of their first flights, so we never knew they had completed their projects. So it was with **Wendy and Tim Freeze**, who camped with us at Oshkosh. They already had about 60 hours on their airplane, but we hadn't heard from them for over 3 years. That is one reason it is hard for us to know how many Cozys are flying.
- 4) Another builder we haven't heard from for 3 years is **Paul Stowitts**. He has been flying for 6 months and we published a long letter from him that he posted on the net.

## \$100 AWARDS

Both Sport Aviation and Kitplanes are requesting all designers to have their builders send in pictures of their completed projects, with short write-ups, because that is one of the most interesting features for their readers. Kitplanes even

offers the incentive of entering the builders in a drawing for a free hand-held GPS. We have found that these pictures and write ups are more impressive with prospective builders than an equivalent sized picture ad. **That is why we award each builder \$100 for their entry in either or both magazines**, or an Alex Strong pitch trim, which would otherwise sell for **\$175**. We were pleased to see 3 entries so far this year, and have awarded each **\$100** or a Strong pitch trim:

- 1) Malcolm Hart and his Cozy III, Kitplanes December 01.
- 2) Gary Guergen and his Cozy IV, Kitplanes December 01.
- 3) Doug and Patti Pitzer and their Cozy Mark IV, Custom Planes, November 01.

**Thanks guys, and the rest of you,  
Send in your pictures!!!!**

### **\$50 REWARDS**

Our best advertising is enthusiastic builders who invite others to see their projects or take them for a ride in their Cozys. To show our appreciation, we still are sending a check for \$50 if their referrals result in a new Cozy builder.

David Domeier was responsible for yet another new builder, Ron Machisen, in Valley Park MO. He asked that we apply his \$50 to the cost of Ron's plans, which we did.

### **KEN BROCK: 1932 – 2001**

The world has lost a GA icon. Ken Brock perished in a landing accident in his T-18 at El Mirage near his week-end cabin on Oct. 19th. According to his son, Terry, Ken and Marie took off from Corona, CA, where they kept their T-18, and landed on their dirt strip at El Mirage Dry Lake, CA. During the roll-out, the tailwheel fork broke, dug into the ground, and caused the plane to veer to the left side of the runway. Ken was not able to keep it straight by braking. Because their strip was graded, there were banks of dirt on both sides. The aircraft hit one of these on the left side of the runway, popped into the air, and hit a steel pole about 10 feet off the side of the runway. The steel pole, which marks a neighbor's property line, sheered off half the left wing and caused the plane land upside down. Ken is six feet tall, and the impact from hitting the ground upside down caused his neck to break.

Marie Brock sustained a large bump on the right side of her forehead, and her knees were banged up from striking the instrument panel. When the swelling receded from her forehead two days later, her eyes were blackened. According to Terry, they were still black two weeks later.

Ken was very famous. As a kid, he liked to drag race. After a stint in the Army, where he was a Golden Gloves boxer, he rose to manager at Martin-Decker. In 1958 he struck out on his own, started his own machine shop, and made parts for race cars and dragsters, and later, airplanes. He became interested in aviation, learned to fly, designed a gyrocopter, restored a Stinson Voyager, built a Thorpe T-18, and became a well-known airshow performer in his gyrocopter. He survived two months in the Antarctic shooting pictures in his gyrocopter, and getting hit in the head by a spinning rotor.

We first got to know Ken and Marie while building our Varieze in 1976 through using many of his parts in our Varieze

and later in our Cozys. We were impressed with their loyalty (to Burt, and later to us), and would see and greet them at every airshow—Sun n Fun, Oshkosh, and Copperstate. At Copperstate, Ken would park his gyrocopter right next to our display, so we saw a lot of them. They have attended Cozy banquets at various times and places, and were guests at our house a couple of times during Copperstate. We have truly lost a good friend!

Marie Brock and her son Terry will continue to operate Brock Mfg. and supply parts to our builders.

### **WHO BUILDS COZYS?**

You might be interested to know what countries are represented in the Cozy family. We have almost all states in the US including Hawaii, Canada, Mexico, the Carribean, Venezuela, Brazil, Argentina, Ireland, England, France, Spain, Germany, Italy, Czeckoslovakia, Turkey, Latvia, India, China, Japan, Australia, and New Zealand. And I probably forgot a few.

We have both men and women.

We have young, middle age, and retired people.

We have military and ex-military. Navy carrier pilots, the former leader of the thunderbirds, B-52 and B-1 pilots, commercial airline pilots, corporate pilots, CFIs, IFR pilots and of course VFR pilots.

We can separate these into 3 types:

- 1) Those who build because they want a challenging and worthwhile hobby.
- 2) Those who want to fly a high performance airplane without spending an arm and a leg.
- 3) Both of the above.

### **WEIGHT AND BALANCE**

When you finish your airplane, and before you get it signed off and start your taxi tests, you will have to do a weight and balance. The instructions and a sample calculation are in the owner's manual. The amount of weight in the back seat, the amount of fuel, and the amount of luggage affect the gross weight, but do not have much affect on the c.g. (center of gravity) because they are all within the approved c.g. range. The front seat is another matter, however. It is about 40 inches ahead of the approved c.g. range, so it has a large affect, and you will need to calculate the minimum and maximum weight limits for the front seat. This is very important! Drawing M-13 shows that the front seat is at fuselage station (FS) 60. An average person sitting on 2 inch cushions in the front seat will have a c.g. for his body at FS 59, which is the "arm" we use in the sample calculation. You can actually confirm this when you are doing your weight and balance with you aircraft sitting on scales, if a person of known weight sits in the seat and you record the weight on all three wheels, and then calculate the "arm". A word of caution, however. One builder did this and got an arm of 55.6, because he had 3 inch seat cushions and the person he had sit in the front seat weighed 217 lbs. Someone weighing 217 lbs is bound to be thicker around the middle, and the c.g. of his body will be farther forward even on 2 inch cushions. So a "heavy" person (anyone over 170 lbs.) should have a thinner back cushion (thinner than 2 inches), and he would be more comfortable as well. The other

thing that may have gone wrong, if your airplane is level on the scales when it is empty, and someone climbs in the front seat, the nose gear will flex a bit, and shift the aircraft c.g. forward, which causes an error in this calculation. For good demonstration of this affect, when the airplane is parked nose-down, there is around 90 lbs. on the nose, but when it is lifted up level, the aircraft c.g. is behind the main wheels and it would tip over backwards if not held down.

So if you want to confirm the 59 inch "arm", use a person less than 170 lbs in the front seat, cushions with a back no thicker than 2 inches, and make sure you re-level the longerons after that person gets in, by slipping a spacer under the nosewheel.

## **NOSEGEAR RETRACT**

The mechanical nose gear retract we use in the Cozy Mark IV is the same one Burt Rutan designed for the Varieze and the Long EZ. It was intended to be operated with no load on the gear teeth, that is, it was designed to be retracted or extended in air, either while flying or on the ground. While flying, the air load balances the weight of the gear so that it takes very little force to crank the gear up or down. On the ground, it is necessary to hold the nose up manually while either extending or retracting the gear. When the gear is extended past center, it will support a huge load—well over 400 lbs in the front seat in a not too smooth landing. If the mechanism is moved past center in the other direction, even with no one in the front seat, the result is always the same. You will strip the teeth off the spur gear. Since only one half of the spur gear is used, by reversing it, you can strip it the second time.

With the advent of the electric nose lift, it is advertised that you can extend and retract the gear on the ground, even with two people in the front seat. There are two words of caution, however. The first is that if the nose wheel is not straight when you retract the gear, you can very well end up with a second nosewheel well, displaced on one side from center. The second is that Jack Wilhelmsen has made a stress analysis of the nose gear linkage if the gear is retracted on the ground with 400 lbs in the front seat, and he came up with some rather alarming numbers. He calculated that the bending load on the fork and NG-15 would be 500 Lbs, and the force applied to NG-3 and NG-4 and NG-6 would be 3,000 lbs. If the main gear happens to be just a little aft of the design location, these loads would even be greater. These are tremendous loads to put on the nose gear components and the nose gear structure. Even though the ball screw is rated at 3,000 lbs, the rest of the components were really not designed for these loads. Although there haven't been any structural failures to our knowledge due to the electric lift, it is strongly recommended that you don't attempt to raise or lower the nose on the ground with more than one person in the front seat. Please ignore any claims that the electric lift will raise the nose when the aircraft is fully loaded with people, fuel, and luggage. We have the electric lift now, and I never raise the nose of my Mark IV with more than one person in the front seat, and that one person is substantially less than 200 lbs.

## **FIREWALL COVERING**

In reply to a question about using 18 ga stainless on the firewall, Mike Bowden published the following information: "ACS has a firewall product called "Firewall 2000 Ceramic Blanket" (part number FW2000). It has a foil thin layer of stainless on the barrier side, a foil thin layer of aluminum on the other side with a thick fiberfrax like material between. It is very light compared to 18 ga stainless. It is 0.125" thick x 24" wide. You would have to make seams, but they have a calk available for that. Steve Wright and I tested it with a propane torch for 5 minutes. The flame never penetrated the stainless."

## **ENGINES**

Here is what builder Denny \_\_\_\_\_ wrote:

I spent a bunch of time talking with the engine folks at the Big O. I'll tell you what caught my eye. Superior has an XP380, a Lycoming look alike that is almost ready for production (3 to 4 months was the promise) A 360 bottom and bigger jugs, tuned induction, updraft cooling..TaDaa.., and an extended prop crankshaft. It is designed from the drawing board to run as an O-380 with a carburetor, or as an IO-380 with fuel injection, and it will accept Lyc,s FADEC – your option.

This engine package just begs to be hung on a canard airframe. Do you really, really think this was accidental on Superior's part?

The weight penalty for the extra 20 cubes is minimal, just the weight of the bigger jug and piston. The incremental increase in takeoff torque is greater than the change from 360 to 380 might suggest, and after you leap into the air on takeoff there is no rule that says you can't pull back on the throttle a smidgen and run it like a 320 for fuel economy (he claims that part throttle BSFC is excellent). A tad more weight on the backend is not such a bad thing anyway, and they redid the accessories so that you can tuck it into the firewall nice and snug.

Sixteen grand and change out the door for the plane Jane model. Another twenty four hundred gets you and accessory package for the O-380 version. My choice would be the Ellison throttle body, mechanical fuel pump, electronic ignition on one side and a non impulse mag on the other side. To make this engine combo fail, you would need to either run out of fuel, or start flying missionaries in Peru. What's not to like?

## **CRANKCASE BREATHER**

This subject continues to come up, and problems with the breather continue to be the most common cause of people ruining their engines and having forced landings. We know of 3 Cozy pilots who have had forced landings for this reason.

Vance Atkinson recently called our attention to an FAA bulletin to Cessna 300 and 400-series twin owners, warning them about the possibility of their crankcase breathers icing over in flight, causing crankcase pressure to build up, blowing out the front crankcase oil seal, and resulting in the loss of all engine oil.

In all internal combustion engines there is some blow-by of combustion gases past the rings. If not relieved, these gases will build up pressure in the crankcase. One of the products of combustion is water vapor. When these combustion gases are

vented from the crankcase, they carry some oil mist with them, along with the water vapor. It is possible to buy and install an "oil separator" in the breather line, but we believe this is a mistake for two reasons. The first is, one of our builders (David Domeier), measured the liquid which was collected in his oil separator, and if I remember correctly, it was about 90% water. You should not return water to your crankcase. The second reason, about which we have strong feelings, you should not have anything in the breather line between the crankcase and the outside air, period. We have consistently recommended that you cut off the breather line at a 45 degree angle to the passing air, so that it actually pulls the gases from the crankcase. If you live in a climate that is cold in the winter (brrrrr!), you should also have a whistle slot in you breather line inside the cowling and close to where it exits the crankcase, so it will provide an alternate route for the gas to escape, should the regular outlet freeze over.

We recommend against the breather line going back into the carburetor, because you should get rid of the water vapor and not put it back in the engine. It is hazardous to vent the gases into the exhaust stream (for the possibility of blowing up your engine), unless you install a back-pressure valve, but that is an additional risk, because they have been known to plug up. So we remain convinced the best way is to pipe it to atmosphere the shortest way, and the little oil that might collect on your cowling is a good indication that everything is working right. This is advice from someone whose oil seal came loose, and he didn't lose a drop of oil because his vent was installed as just described.

## **HARD SHELLING**

Hard shelling is a procedure (not recommended) of covering foam with micro, letting it cure, and sanding the surface prior to covering it with fiberglass.

Paul Kuntz, a Boeing engineer presently stationed in England, did some experiments which he reported on the internet 09/01/01. His conclusions were:

"After doing some two-layer uni layups over the hard-shelled sample surfaces, I attempted to peel the layups from the foam to see how well they had bonded to the hard shell. I found that where the hard shell was merely filling the usual roughness in the foam surface, the glass remained bonded to the hard shell and what failed was the foam beneath. That is, I was breaking the foam itself when I stripped the glass.....The bad news was that everywhere the hard shell had filled in a void, even as small as one-eighth inch in diameter and perhaps one-sixteenth inch deep, and everywhere the hard shell had been used to create even a very thin filler layer on top of the foam, the glass skin popped right off the hard shell as clean as a whistle.....Scary!...

My advice has been, and continues to be, stick to the plans."

## **LETTERS FROM BUILDERS (some from the net)**

Dear Nat,

10/4/01

I just received your newsletter today and while I always look forward to seeing what's new, it was a special surprise to see the article about your recent cruise on the USS Constellation. The aircraft photographs that you included brought back many

memories from my Navy days. I have about 1,000 hours and 100 traps in the C-2A Greyhound flying throughout the Mediterranean in support of the Sixth Fleet. The COD could carry up to 28 passengers or 10,000 pounds of cargo. I once landed on the ship with a Fiat sports car strapped down inside. We drove it off onto the flight deck much to the surprise of everyone on the carrier, except the Captain. The car was the prize for a Navy Relief fund raising raffle and was carried back to the United States on the ship. It was great for morale at the end of a difficult cruise and raised some much needed relief funds.

My next tour was as an instructor in the E-2C Hawkeye that you have pictured. I did a lot of instrument and carrier landing instruction during the four years that I was stationed in Norfolk, VA. People often ask how the plane flies with the big rotating radar dome on top. Surprisingly, it is aerodynamically neutral and you don't even know that it is there.

I arrived at Oshkosh this year, the second-to-last day of the show due to enroute weather delays. Since AirVenture was all but over, I camped with my Cozy III, in the empty show plane area.

The next morning I heard the unforgettable sound of those Allison T-56, 4,800 hp turboprop engines that are used on these planes and was surprised to see an E-2 taxiing to the runway. I got my camera ready and got a nice shot of the E-2 taking off as it passed over my Cozy. My old plane and my new plane both in the same photo.

Thanks for sharing your adventure and for your continuing support of the Cozy. Hope that Shirley's ankle is on the mend without complications.

Richard Reitz  
Houston, TX

Fighter Pilots,

11/10/01

The St. Louis class B veil was down for about 5 weeks and I really missed flying the Cozy. I did blast off one day with tower concurrence just to shoot a few landings and no one asked boo, so I got away with it, however a week later too many guys began asking questions of the local FSS and the tower tightened it up so I did not try it again.

The veil is up now but flying is different. Maybe it is the realization that this privilege can slip away and how precious it is. We have taken many things for granted in this country for too long. All that has changed. There is a nuke power plant about 40 miles west and it is a great land mark for navigation. Now it is a greater land mark in that we must steer clear of it or risk getting shot down.

Being an old ex military pilot, I get the itch to be involved in the action but know that won't happen. So we go out and play war games. I and 2 other guys briefed a mission this week that involved joining up and flying formation for a while. What a sight---a Cozy, a RV4, and a Starlet. We were Whiskey Flight of 3. The tower gave permission for a fly by and right break. It was about as much fun as can be had these grim days. I've also patrolled the Missouri River west checking for Taliban and al-Qaeda subs (never can tell about those sneaky rats) but haven't seen any yet. The Cozy is a good patrol machine as it cruises along very well on 5 gph and will turn on a dime to check things out.

Haven't had any mechanical problems lately to report. My machine now has about 315 hours and is about as reliable as an airplane can be. I put air in the tires every six weeks or so and keep it in fuel and oil and all is well. I sucked some water into the DG coming out of OSH in the rain this year and it corroded up quick

like in several days. My friendly gyro OH shop said it was too far gone and sent it back. I took it apart, freed it up with some WD40 and got it running again. It isn't IFR certified anymore but it still holds a good VFR heading. In the process I also took an old (20 yrs) vacuum regulator apart to see why it quit working. It too needed some WD40 to free up the baffle spring arrangement that seats a valve that regulates the pressure. It too works again. Amazing how long some of this stuff lasts and what can be done in time of war to keep things working.

More patrolling tomorrow as this great mid west weather continues.

David Domeier  
St. Louis, MO

Mike Joyce wrote:

11/23/01

As a newbie still considering this design, I am wondering if anyone would care to comment on pilot adaptation to "left hand stick, right hand throttle?" I know this is not an issue for new pilots, but I have the bulk of my hours in aircraft that I flew with my left hand full of throttles and my right hand on the stick (T-38s, B-1B). Would any of you consider designing the panel layout for a right seat PIC configuration?

Mike Joyce

Jim Sower replies:

11/25/01

I flew a lot of Navy stuff too. That said, I'm looking forward to a left stick, console throttle. That way I'll be able to write while flying (I'm right handed). All of the spam cans I ever were in had a yoke and right hand (center) engine controls, so during critical phases (TO and landing) I was flying with my left hand. I got through that OK as I recall. Just a theory...

Jim Sower  
Catskill NY

Dear Nat,

11/01/01

As you know, I have two twins and to attend two newborn is very hard work. For this reason I almost stopped building, was able to make only short jobs, but now the twins are 19 months old and work is normalized, so I have again free time to work on my Cozy.

I noted something important. The more I work on my Cozy, the more the work is gratifying. The more I am distant, the more I have not the will to build the Cozy. Therefore, it's a psychological problem.

I met Martino Bonicelli at last meeting of CAP (Italian EAA) and Martino told me that he met you at OSH, and you spoke with him for a long time about his building of his Cozy and also of my Cozy. In the future when the twins are grown, I will come to the EAA convention at OSH to meet you.

Oreste Muccilli  
Bojano, Italy

Cozy Builders,

11/16/01

I just returned from a short business trip to Europe, and I deviated a bit sideways and was lucky enough to meet Mr. Oreste Muccilli in Boiano Campo Basso (Italy). He was very kind enough to take his time to take me to his house to meet his family and showed me his project in his garage, he was busy with his new innovation, and also his Cozy project was progressing. I envy his talent very much and I think he has a golden hand was my impression upon seeing his work. I can't wait till his Cozy is ready for takeoff in the near future, and I want to be sitting next to him when that time arrives. I have put some of his images and of a magnificent ride on one of the ultra light planes P-92 which is owned by the association he belongs to in the area. If you like to

see them, go to [www3.ocn.ne.jp/~kawanoko/](http://www3.ocn.ne.jp/~kawanoko/) hit the address and for those who do not have Japanese font in your PC it will look a bit funny but on the left hand there is the English version so please go there. Hope you like it. I would like to thank Mr. Oreste Muccilli and his family which gave me lots of happiness. So long and happy building and flying, from Japan

Etsuo Fuwa  
Karuizawa Japan

Neil Clayton Wrote:

10/26/01

Is anyone using Velocity style exhaust pipes where they drop vertically out of the bottom of the cowl vs heading aft to impinge on the prop blades? Does releasing the hot gasses this far upstream reduce the problem of reduced prop efficiency? Is there sufficient turbulent mixing between the exhaust gas and the free stream so that the prop blade sees undisturbed flow, and develops full power:

Oviedo, FL

Burrall Sanders wrote:

10/27/01

My VE flew the first 100 hours with a four pipe straight down system that I built. Then I installed a stainless 4 pipe out the cowl with the cooling air stream. I saw a bigger performance improvement with this mod than any other thing I have done, including wheel pants. You do have to put up with soot on the prop.

Burrall Sanders  
Falcon, CO

Nat Puffer Wrote:

10/26/01

Having the exhaust exit straight down causes a lot of drag—that is the way commercial airliners slow down after they land and that is the way vertical takeoff and land airplanes raise or lower themselves. I have heard it said that exhausting straight down is like having a 36 inch pole extending straight down from each pipe. On the other hand, exhausting straight back gives you additional propulsion. Cozys and Long Ezs have been doing this for 20 years. Complaints about the affect on props are largely unfounded.

A builder wrote: Covering a layup with plastic did not seem to work well. I could not get all of the wrinkles out.

Bob Bittner replied:

10/22/01

Admitting that I'm a fairly new builder myself, I can't say I have years of experience. But, in what I have done, I can't see wanting to cover large layups with plain plastic. If you want the part light, you want to hit it with a hair dryer, and get rid of all the excess resin. How are you going to do that through plastic? If you want a nice surface finish, use the large, cheap peel ply. The excess resin weeps through that, and you remove it with the squeegee. Then, you can still get the nice finish, no air bubbles, and a lightweight part. No offense intended, but you might just as well follow the plans, to get started.

Bob Bittner  
Rochester, MN

A builder wrote:

10/21/01

Eleven hours after laying up the front side of F28 and F22, the epoxy is stuck in the chewing gum stage. I am using MGS and was using the slow hardener because of the long layup for the F22 reinforcements. The temperature in the garage was 76-78 degrees during the layups.

Peter Militch replied:

10/22/01

I use MGS 285, but I get the same slow cure you report when I use just the slow hardener. Typically, even when warm, I won't try sanding back a trimmed edge for at least two days – it just feathers and clogs the sandpaper. What I normally do, if I want a slow cure, is mix just a little fast hardener with the slow. Since I use a balance

as shown in the plans for mixing epoxy, I can vary the hardener proportions on a cup by cup basis. Even a small amount of fast hardener will get the cure down to a day or so, but it won't generally have much effect on the working time. So, for a job that is going to take a while to layup, I might use a 90/10 slow/fast hardener mix. For a quicker job, I might use 50/50. Using just straight fast hardener can be exciting. If you aren't laying it down quickly and stirring the contents of the cup a lot, it's easy to end up with an exotherm.

Peter Militch  
Laurel, MD

Builders, 10/20/01

Today I mounted the plane's main gear legs, took the ancient trestle away from beneath it and it stood on it's 3 legs for the first time! Margie and I pushed it forward for about 3 feet and back again the spread of the gear legs. Does that qualify as a first taxi test?

Can't put into words how it feels to see it looking like a plane, standing free on it's own wheels! We both just stood and stared at it with out talking, trying to imagine what's to come next.

Neil Clayton  
Oviedo, FL

Nat and All, 10/09/01

I am having a problem with aileron balance. The elevators were so overbalanced that I did not expect to have a problem here. I made both of them with the same material and technique. There was no way that they were going to balance with the .3 lb of lead added. Last evening I attacked one with 80 grit and took it down to about 20% glass showing. It now just meets the balance criteria with no added weight. The plans indicate I can sand into the first layer of glass which brings up a question. How do I know when I must quit? As of now, I don't think I have removed much glass, next to none.

Looking at what happened, my guess is that I used too much of the smooth-Prime (the heavy stuff) on these. I wanted to get the leading edge, the really not visible, looking finished. I applied several coats of primer, sanding several times which resulted in a pretty thick film on the whole surface. As a first time builder, I am not in a position to give much advice, but I will caution those that have not been there before to pay close attention to finishing the ailerons. There is still primer in the low spots that should have been better prepared with micro. I was surprised that removing the finish produced such a moment. Keep it thin and light!!! Get it perfect with dry micro before priming. Do not do as I did and expect to use the primer as a little fill to get to that super flat block sanded finish.

I finish painted the ailerons as well as most of the small parts first. The elevators were first. They were so bad I lightly sanded them and recoated them. Expected problems, but they turned out OK. The ailerons were not as good as could be but I decided not to repaint them. Now I will get to do it anyway.

John Epplin  
Orion, IL

Paul Stowitts wrote that he would be cautious about using peel ply. He said his understanding is that peel ply adds weight (more resin) and resin is heavier than the micro that would otherwise be used to fill the weave.

Paul and All, 10/10/01

When I made the speed brake door, I carefully measured everything that went into one side. Glass, epoxy, and peel-ply. I

wanted to get a good handle on the glass-epoxy ratio I was getting as well as the effects of the peel ply. After cure I again weighed the peel-ply and the scrap that was trimmed off. I had made the lay-up as good as I could get it, no dry spots and no excess resin before applying the peel ply. I added a little resin with the peel ply to make sure it was wet out. When I removed the peel ply it weighed more than the original cloth plus the added resin, thus indicating that it in fact did remove a little resin from the lay up. I don't remember the numbers, but at least it was positive, although not much. I don't think it would make much difference in the overall project, but at least it will not hurt. The plus side is it leaves a good surface for subsequent bonding and eliminates a lot of sanding before the contour operation.

John Epplin  
Orion, IL

Jim Hocut wrote: 10/10/01

I don't believe there is any evidence that vacuum bagging will increase either strength or stiffness of any structure. My experiments sure didn't support that contention. I agree that it will decrease weight, which is good. However, you'll have to be super careful that the vacuum bagging process doesn't induce any twist or other shape deformations into your control surfaces, or cause any other unforeseen headache. I vacuum bagged my first set of elevators. They were very light and absolutely beautiful. Just one small problem—large amounts of epoxy had been forced into the torque tube and torque tube inserts. No way to install the hinge pin. My second set of elevators were built per plans, by being stingy with epoxy and using a hair drier to help with wetting out the cloth. They were perfectly acceptable and balanced with no problem.

Over the time that I've been building, I've migrated from the school of thought that I'm going to reinvent the wheel and build a bird that's better than originally designed, to the realization that I want to get finished and that most of my attempted "improvements" have only had the net effect of slowing progress.

Jim Hocut  
Powder Springs GA

Mark Logan wrote: 10/01/01

How do we get around not having pitot heat for IFR rated canards?

Vance Atkinson wrote: 10/02/01

A heated pitot tube is not required for IFR flight. I have flown my Cozy for 15 years and not had more than 3 airspeed indicator reductions due to ice or visible moisture. While on final approach, the airspeed system came back as the ice melted. However, you will be able to fly the plane without airspeed indication, as the canard elevator, RPM, and wind noise give good indications of your speeds.

For folks who fly IFR and get some ice, the airspeed icing over is the least of your problems. Other things are accumulating ice also. It won't take much to make your bird sullen and sluggish, if you stay in icing conditions for long. You will not be able to see out the front of the canopy as about 80% of it will be opaque. The stick and trim will be almost at their aft limit, airspeed will decay about 40%, and added to this, you will be at reduced RPM due to prop erosion at the higher RPM settings. When it comes time to land, you will be sideslipping, trying to see the ground (using the tiny clear space just above the canopy rails) enough to flare.

Vance Atkinson  
Bedford, TX

Nick Ugolini writes: 10/03/01

In the last 1400 hours of flying my Long, I have only (unintentionally) encountered icing four or five times. When it was a build up of snow, I climbed quickly, and when icing, it required me to lose altitude. Let me tell you, when you see ice forming on the canard (or main wings), you get out of there FAST or you WILL GO DOWN. Knowing the airspeed is the least of your concerns! LOTS of power is helpful to overcome the loss of lift. A heated pitot tube makes no difference in the actions you take.

BTW, I have a heated pitot tube, and in most of those cases, I forgot to turn it on...If I had turned it on it would have made no difference in my actions. What did cause me major problems was my rudders freezing up from a small amount of moisture (from rain) which entered the rudder cable tubes. Put a small amount of RTV on the rudder cable entry points to seal the tube up.

Nick Ugolini  
Charleston, SC

Howard Calk writes: 10/04/01

On my way to Rough River this year, I had an encounter with ice. I accumulated about 1/2" to 3/4" of ice on the leading edges of the flying surfaces (those that I could see). The ice accumulated fast, most of it before I realized it was happening. As the ice accumulated only on the leading edges, I did not have a major pitch change. However, the plane was certainly not performing efficiently.

The ice was not a problem until I descended and it started to shed. The ice went through the prop, ruining my prop, my day, and my weekend at Rough River. The plane is OK, the prop is not, but that is another story.

Even though I do not have a heated pitot, I did not notice a problem with the airspeed. Point is...a heated pitot is not that critical for an icing encounter at altitude. Nick is right, you eventually will descend (hopefully to warmer air).

Howard Calk

Glenn Schools writes: 10/04/01

For what it is worth, the only aircraft I have ever been in that had a heated pitot tube also had de-icing on its wings and props (C130). A heated pitot tube in my opinion will only encourage folks to be flying light aircraft in situations they shouldn't.

Glenn Schools  
Ft. Worth, TX

Nat, 11/29/01

Went to St. Louis over Thanksgiving. Had called in an order to Wicks with all materials for Chaps 4-8. Brought them back therefore saving the shipping. They told me that actually paid for my trip...got to like that.

Cleaned the epoxy pump and did the 6-ply layup and the confidence layup. Both turned out great and I enjoyed doing them. By the way, the 6-ply layup weighed 11 ounces!!! I was very pleased.

Working on the seat back and bulkheads. I am a Cozy builder officially now after several years. Thanks again for letting me visit, and getting me started again. I visited David Domeier while in St. Louis and saw his bird, and while at my corporate HQ for a meeting, I went to Sonoma to see Michael Antares' project. Both the visits, plus yours, really got me going. Oh, and I lost ten pounds. If I keep that up, I'll be a twig by the time I am ready to fly the Cozy. So look out world, Todd's Cozy is underway!! PS: Switched to MGS 285, and love the fact that it doesn't stink!!!

Todd Miller  
Lincoln, VA

Builders, 11/30/01

Had my first flight experience in a Cozy two weeks ago. Chris Esselstyn (N423CZ) was kind enough to give Laura and me a fun flight in his III out of UES (Waukesha WI). Once airborne, I heard some fidgeting from the back seat, then Laura saying, "That VSI can't be right. MY GOD, it is! 1000fpm at 90 kts?!?" On reaching straight and level at 4000 ft, Chris demonstrated stall characteristics, then turned to me and offered the controls. I won't bore you with details of the flight, but I was at a loss for words as the Cozy and I got acquainted. What a sweet aircraft!

Let me say that again, and offer it as a personal mantra when things are going slowly. What a sweet aircraft!!

Gene Traas  
Milwaukee, WI

Nat, 10/25/01

I am just now getting around to sending you the pictures I promised. I have been steadily building MkIV #837 since Dec. 1999. I am currently on Chap. 10 canard and 13 nose.

I can't say enough about the fun I'm having building this plane. So far, the few obstacles I have encountered have worked themselves out. What doesn't make sense today, will tomorrow. Many, many thanks, Nat.

David W Burkes  
Columbus, MS

Nat, 11/22/01

Thank you for your note. In retrospect, I wish I had pointed out that much of the reason I chose the Cozy over the other options was the many comments from successful builders praising the plans, yourself, and the finished result.

Dan Davidson  
San Diego, CA

Hi Nat, 10/04/01

I know how you feel about your design, The Cozy is an outstanding design. The build it yourself plans allow for an individual to build the aircraft at the speed that his skills and budget allow. But some builders will try to make changes from the original design. I have plans for the Cozy III which called for the 0-235, but the engine now is the 0-320. The design was robust enough to handle the bigger engine, but you now have a heavier airplane. I work for Lockheed in Ft Worth and the evolution that the F-16 has taken has increased the aircraft weight by 2/3rds the original. Sure the F-16C will drop bombs more accurately than another in its class, but the F-16A will out dogfight anything in the world including the F-16C. People may bash you for some of your comments about adding different baubles and things to their Cozy, but I appreciate your guidance in such matters and I know where you come from. When we were having trouble (crashes) with the GE engine we upgraded to for more power, the press did not call the aircraft a General Electric F-16, they called it a Lockheed F-16. Your name will always be tied to the Cozy and in some cases if someone doesn't put it together correctly or flies it in a way they shouldn't, people will think of you. Sometimes you have to be cruel to be kind.

Glenn Schools  
Ft Worth, TX

Marc Zeitlin writes: 10/18/01

I took yesterday off from work to head to the Massachusetts Dept. of Revenue office to either pay owed taxes on the aircraft

parts I bought mail order, or to prove to them I paid taxes on the parts I bought. This is necessary to get a MA sticker (\$62.50) that allows me to base my aircraft in MA. No problem, right?

Well, as it turns out (and I was supposed to know this) whenever you purchase stuff from out of state and don't pay sales tax on it, MA requires that you pay an equivalent MA sales tax on the stuff. Since I've been buying parts since 1995, I dragged about 7 gazillion receipts down to the office to wave in their faces. As it turned out, I had to itemize each receipt onto a form, one form for each year from 1995 to 2001, and totalize them. For each year I owed tax, interest on unpaid tax, plus penalties. I sat in the office doing this form filling for about 3 hours, and had two MA DOR employees checking everything I did.

This, clearly, was a major pain in the keister, but I made it fun for myself by playing with the calculator in my Palm Pilot. I've spent about \$48K in mail orders, between Wicks, ACS, AeroSport Power, Varga, etc., and that should have worked out to \$2,400 in back taxes to MA. With interest and penalties, I ended up paying \$3,200.

My recommendation is to know your state's rules on sales taxes, pay whatever you owe as early as possible, and keep all your receipts. The other option, of course, would be to lie to the Revenuers, but in the words of our illustrious ex-president Richard Milhouse Nixon, "But that would be wrong".

Marc Zeitlin  
Acton, MA

Keith Scull wrote, 10/19/01

I have waited for a long time to find something you pay tax on that we don't. Looks like it's aircraft! And we lost that war on tax, as I recall, had something to do with tea!

Keith Scull  
Bettswick, UK

Don Bowen wrote: 10/18/01

Forty-five states and DC impose a tax on in-state sales of tangible personal property and selected services. Every state that imposes a sales tax imposes a complementary use tax within the state if the owner did not pay the sales tax when the goods were purchased. The use tax acts as a backstop to a sales tax to discourage residents from purchasing products in other states with lower sales tax rates.

Don Bowen  
Tucson, AZ

Vance Atkinson writes: 10/19/01

I should say to all of you that 15 years ago two other builders and I made our first flights—two Cozys and a Long. Several months later all three of us received letters from the Texas state tax board, inquiring about the value of the "aircraft". Apparently, experimentals are not listed with stated values like regular aircraft are. At least here in Texas.

SOOOO the 3 of us got together and stated that the aircraft were constructed in a garage, and were built for educational and experimental purposes, (boy THAT'S a true statement) and had salvage value only. We then went on to write in what we deemed to be "salvage value", and sent it off to the tax board. None of us heard anything more, and it's been 15 years!

Vance Atkinson  
Bedford, TX

Gus Spreng writes: 10/19/01

The tax issue is inevitable as soon as you register. It is not any different in Florida. The worst you can do is register it out of state. However, you might have purchased only very few materials,

perhaps some even in your state. Your plane might have been constructed from leftovers, junk parts, etc. Your engine naturally comes from the boneyard, very cheap, and you have overhauled it yourself. Have a little bit of everything, nicely listed up. Sure you all understand. Happy Landings.

Gus Spreng  
Daytona Beach FL

## **THE NIGHT BEFORE CHRISTMAS**

T'was the night before Christmas and out on the ramp,  
Not an airplane was stirring, not even a Champ.  
The aircraft were fastened to tiedowns with care,  
In the hope that come morning, they all would be there.

The fuel trucks were nestled, all snug in their spots,  
While peak gusts from two-zero reached 39 knots.  
And I at the fuel desk, now finally caught up,  
Had just settled comfortably down on my butt.

When over the radio, there arose such a clatter,  
I turned up the scanner to see what was the matter.  
A voice clearly heard over static and snow,  
Asked for clearance to land at the airport below.

He barked out his transmission so lively and quick,  
I could have sworn that the call sign he used was "St. Nick".  
Away to the window I flew like a flash,  
Sure that it was only Horizon's late Dash.

Then he called his position, and there could be no denial,  
"This is St. Nicholas One and I'm turning on final".  
When what to my wondering eyes should appear,  
A Rutan sleigh, and eight Rotax reindeer.

He flew the approach on glideslopes he came,  
As he passed all fixes, he called them by name:  
"Now Ringo! Now Tolga! Now Trini and Bacun!  
On Comet! On Cupid!" What pills was he takin'?

Those last couple of fixes left controllers confused,  
And they called down to the office to give me the news.  
The message they left was both urgent and dour:  
"When Santa lands, could he please call the tower?"

you will receive until after you renew your subscription.  
He landed like silk, with the sled runners sparking.  
Then I heard "Exit at Charlie," and "Taxi to parking."  
So up to the offices the couriers they flew,  
With loud airplane noise, and St. Nicholas, too.

He stepped out of the sleigh, but before he could talk,  
I had run out to him with my best set of chocks.  
He was dressed all in fur, which was covered with frost,  
And his beard was all blackened from reindeer exhaust.

His breath smelled like peppermint, gone slightly stale.  
He smoked on a pipe, (but he didn't inhale).  
He had a broad face and his armpits were smelly,  
And his boots were as black as a cropduster's belly.

He was chubby and plump, a right jolly old fool,  
And he kindly informed me that he needed some fuel.  
A wink of his eye and a twist of his toes,  
Led me to know he was desperate to powder his nose.

I spoke not a word, but went straight to my work,  
And I filled up the sleigh, but I spilled like a jerk.  
He came out of the restroom with a sigh of relief,  
And then picked up a phone for a flight service brief.

And I thought, as he silently scribed in his log,  
That with Rudolph, he could land in eighth-mile fog.  
Next, he completed his preflight, from the front to the rear,  
Then he put on his headset and I heard him yell "Clear!"

And laying a finger on his push-to-talk,  
He called up the tower for his clearance and squawk.  
"Straight out on two-zero," the tower called forth,  
"And watch for a Cessna straight in from the North."

But I heard him exclaim, 'ere he climbed in the night,  
"Happy Christmas to all, I have traffic in sight."

-----by Phllis Moses (c/o Ken Brimmer)

## **Co-Z Development Corp.**

**2046 N. 63rd Place  
Mesa, Arizona 85215**

**TO:**

## **NEWSLETTER #76**

The number appearing after your  
name on the address label is the last newsletter