

# THE COZY NEWSLETTER #12 • January 1986

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It is mandatory for all Cozy builders to subscribe to this newsletter, as this is the only formal system we have for communicating plans changes and/or corrections, builder hints, changes in suppliers, and other information of interest to builders and prospective builders. Issues prior to No. 4 are not necessary, in that they were only reports on the progress of plans, and extra copies are no longer available. Starting with issue No. 4, the newsletter contains important builder information. We will try to keep the subscription price low, so cost won't be a problem.

When writing to Co-Z with questions, please send along a stamped, self-addressed envelope. Please leave space after each question, so we can fill in the answers (without having to rewrite the question) and return on your original.

If you call, you can reach us most of the time on (602) 981-6401. This is both our office and our residence phone. If we are not able to answer, leave a message and we will return your call at the first opportunity.

The following prices are in effect:

Information kit	\$9.00
Newsletter	5.00/yr
Plans	230.00

The Owners Manual should be available in two months, and will be priced at \$15.00.

Orders for plans from overseas will be shipped by surface mail unless additional postage is supplied for airmail, which costs about \$35.00 to most countries (the plans weigh 6.5 lbs.).

Our computer prints on the address label, after your name, the last issue of the newsletter you will receive without renewing your subscription. Ignore the number at the top of the label; it is the file number where your address is stored in the computer.

### ABOUT THE PLANS

When you receive your plans, sign and return your license agreement (Chapter 1, Page 4), so we can issue your serial number. Also, don't neglect to mark in the corrections published in the newsletters. In spite of our best efforts, some errors did creep in. If you find any we haven't, let us know and we will publish the correction.

Please check your plans when you receive them to determine that there are no missing pages. It isn't possible for us to double check each set of plans—we don't want anyone to leave out a whole page during construction.

If you have any questions, please make sure that they aren't already answered in the plans, or newsletters. Don't expect to understand everything perfectly on the first reading, particularly if you have just received your plans, and haven't started building yet. The instructions assume you have completed the previous chapters and are gaining experience as you go along, and that it isn't necessary to return to square one each time.

Thank you for your compliments on the plans. We did try to do a good job.

### WHAT WE HAVE BEEN DOING

We have now been in our new Mesa location for four months and are becoming very attached to Arizona. The weather is almost always beautiful (the sunsets are gorgeous) and the winter temperatures so far seem to average around 70° in mid-day—a very far cry from the frigid temperatures and ice and snow that we endured in Minnesota for so many years. It is quite a nice change! True, we haven't spent a summer here yet, but September had temperatures over 100° and it wasn't all that uncomfortable, even working outside, perhaps because of the low humidities which definitely help to cool the bod. We intend to fly north (like the rest of the birds) at least part of the

summer to visit our children and grandchildren, make the annual pilgrimage to Oshkosh, and perhaps take a 2 week vacation. We will warn you ahead of time that we may be hard to reach for all of July and a part of August.

We are gradually getting settled and organized. Moving is a chore, as most of you know, and moving a business besides is more of a chore. We have to stock a lot of printed materials, i.e. plans, newsletters, information kits, records, etc., which requires a lot of storage space in both our office and garage. We have converted one of our 3 bedrooms into the Co-Z corporate office and one of our builders, Jerry Rauton, who is also a cabinet maker, made counter tops, drawers and cabinets for our new office. I still don't have a shop, nor does Shirley have the art studio I promised her, but we have negotiations underway for an 800+ sq. ft. addition, which should fill those needs. After having my garage in St. Paul filled with airplane projects for 10 years, I decided to start out on the right foot down here.

Some people are surprised that we operate out of our home. We have observed, though, that the failure rate of airplane businesses is quite high, and since there isn't much profit in selling only plans, we intend to keep our overhead low and be a survivor.

In mid-October, we went to the Eloy fly-in to show the COZY, conduct a seminar, and renew old acquaintances. In the seminar, we talked about the advantages of the canard configuration, the advantages of composite construction, and made a strong pitch for quality workmanship—much the same as at Oshkosh. Quality is a matter of doing it right the first time, according to plans. Good quality is much cheaper than poor quality, because you only have to do the job once, and when you are finished, you have something valuable (and reliable).

The next weekend Uli and Linda Wolter flew over from Texas in their Cozy for a several-day visit. By prearrangement they called us on our hand-held transceiver when they were still 35 miles out so we could watch for them. They flew over our house, and it was a beautiful sight! The weather was still warm enough for swimming, so we relaxed the rest of the day around our new pool. That evening we hosted all of the builders in the area and their wives, including the Lorimors from Tucson and the Banhagels from California with a patio barbeque. The next day we flew up to Sedona with the Wolters in a two-Cozy formation. Sedona was quite impressive! Not only very beautiful scenery, but the airport is perched atop a small mesa, about 1000 ft. above the town, with a sheer drop off all around—sorta reminded me of landing on aircraft carriers 40 years ago!

We felt sad when the time arrived for Uli and Linda to leave for Texas. Ed Moulden and I accompanied them a ways in our Cozy and I was able to get some air-to-air shots of N52CZ, which we had printed and are enclosed. The plans-built Cozy looks pretty nice, wouldn't you agree?

The following weekend Shirley and I flew to the Blythe CA fly-in, which was only about one hour away (at 180 mph). It was a pleasant trip and the first time we were in Calif. with the Cozy, although it was there in 1984 for the CAFE 400. At Blythe we bumped into old friends Don and Julie Downie. They filled us in on the latest news in the world of aviation, as well as the long article Don wrote about the Cozy for *Kitplanes*, which is now on the newsstands. If you don't have a copy, rush out and get one. You will recognize the Feb. issue because the Cozy is on the cover.

We had a steady stream of visitors in November and December—Cozy builders, and people interested in building a Cozy. One of these was Ken Murphy (and his lovely family) from Saudi Arabia, and Jim Turk (and his lovely family) from Barranquilla, Columbia, who, we learned, is now in the process of moving to Mesa, and we influenced him into buying a house just down the street from us. Someday we should quite a fleet of Cozys in this area!

Our initial printing of 300 sets of Section I ran out about a month ago, and we had them reprinted. This was about the same time Burt Rutan announced he was canceling our license to use Long EZ technology in the Cozy. We hung in there and he finally conceded that he couldn't break our agreement without our approval, and since we wouldn't give our approval, the license agreement stands.

OWNERS MANUAL

We had every intention of having the Owners Manual printed by now; I started work on it in November. But when I got into the detailed performance data, I suddenly realized that we are not getting as much performance as we could because we didn't have the optimum propeller. By this I mean we were not developing enough rpm static or full throttle cruise, and therefore not using the 118 hp that should be available. We have been flying a 62 x 62 Great American prop for the last 2 years, so I called them up and asked whether I should reduce the pitch or the diameter. They said reducing the pitch would be better and agreed to send me a 60 x 62, which arrived several days later. I told my friends, "you haven't seen anything yet, wait 'til you see what I can do with this!" To my horror I lost 100 rpm with the new prop, it took me 1-1/2 minutes longer to climb to 8,000 ft., and I lost 6 mph in fast cruise. Great American said they goofed, and sent me a different airfoil. They would correct the mistake, but it would take 4 weeks to carve a new prop. Being an impatient person, I took matters in my own hand and sawed 1" off each tip of my 62 x 62. I am still waiting for the prop I want, but the data so far is quite thought provoking:

Prop	Pitch	Diameter	Static RPM	Time to 8000' @ 100 mph	8000' RPM	Full Throttle TAS [mph]
1.	62	62	2400	9min.10sec.	2700	185
2.	60	62	2300	10min.30sec.	2600	179
3.	62	60	2500	8min. 5sec.	2800	190

The data is quite convincing that it is important in both climb and top speed to have a propeller which is correctly matched to the engine. An engine, of course, will only develop the rated horsepower at the rated rpm. Horsepower drops off quite rapidly with rpm. We plan to continue propeller evaluation, and get cracking on the Owners Manual.

ENGINES

About the time I was gathering this data, and fretting over the fact that some builders seem determined to put in heavy O-320s in their Cozys, Mike Quigley, formerly of Task Research, popped

in. Mike is quite a knowledgeable fellow and we got into some deep discussions. He asked me why I didn't demonstrate what you could do by souping up an O-235? He pointed out that with a simple top overhaul, I could bump the horsepower from 118 to 125, and if I really got fancy, there were several specialty engine shops that could do even more. So I called up High Performance Aircraft Engines in Mena, AR and they explained to me that run of the mill aircraft engines are really pretty bad, and that by balancing, blueprinting, re-porting, installing gap-less rings, and balancing air flows, they could take an O-235 up to 137 hp without putting any more stress on the engine, and without adding any more weight to the airplane, and it would run smooth as silk. With the same propeller, I could expect at least 170 more rpm. Referring to the previous data, can you imagine what that would do to rate of climb and top speed?

Now, we were quite pleased with the performance of our Cozy before I started fooling with propellers or contemplating engine work. But it seems to us that for those builders who aren't satisfied with the performance of the prototype, there just has to be a better alternative than to install all that extra weight.

## HOLIDAYS

Over the Christmas holidays we had relatives visiting us from up north, and they were impressed with our new home, the beautiful scenery, and the wonderful weather. I had asked Shirley what she wanted for Christmas, and she said she wanted me to get the landscaping done. This involved hauling in fill, grading, planting palm trees and cacti and fruit trees, installing an underground bubbler system, building more walls, laying down plastic, and spreading crushed rock. I contracted for most of the work, but wasn't satisfied with the way the job was progressing, so I dismissed the contractor and finished it myself. That is the reason this newsletter is late and I am behind in other things as well. Accept my apologies. It is important, however, to keep my wife happy. Hope you all had a very joyous Christmas and will have a prosperous New Year!

## OTHER BUILDERS

The three other builders we know about who are almost done have been delayed for various reasons. Jack Wilhelmson has had to do a lot of overseas traveling, and Merle Musson and Al Yarmey both had moves. Merle reports that he is done but has been waiting for over a month now for his final FAA inspection. Merle is a former Varieze builder and knows how nice it is to have a light airplane. His Cozy, ready to fly, weighs in at 870 lbs. with starter! The plans say that a basic VFR Cozy without starter should weigh 850 lbs. We estimate that a starter, ring gear, and wiring add about 25 lbs., so Merle has beat the design weight by 5 lbs. Congratulations, Merle! You should have a very nice performing Cozy and have demonstrated it can be done.

We now have builders in most of the 50 states including Hawaii and Alaska, and the following foreign countries:

Australia	France	Netherlands	Sweden
Belgium	Holland	Norway	Switzerland
Canada	India	Saudi Arabia	Virgin Is.

Denmark  
England

Italy  
Japan

Scotland  
So. Africa

Uli and Linda Wolter have agreed to be our representative in Europe, after they return to Germany in June of this year, and provide builder support. We would like to visit as many of our European builders as we can the following year, if possible.

## HOMEBUILDER MODIFICATIONS AND FUEL

Having been builders ourselves, we know that there are some builders with a mindset which can't be changed. About all we can do is give the reasons why we don't approve of certain modifications and practices.

1. Heavier engines. The Cozy was designed for the O-235 engine. We were quite pleased with its original performance even though we know now that we were not utilizing all of the power available because we had not optimized the propeller. We hope to demonstrate what can be done by optimizing the propeller and then engine potential without adding weight. Weight is the enemy of performance. It is particularly detrimental in operating at high altitudes and/or short runways. Weight increases takeoff distance and rotation speed, and reduces rate of climb. Weight increases landing speed, landing distance, and is harder on the brakes. Weight decreases the chance of survival in a forced landing in rough terrain. The engine mounting system in the Cozy was not designed for engines heavier than the O-235. Use of a heavy engine, aircraft alternator, and starter will risk fatigue failure of the mounting system over a period of time.
2. Extending the nose. This mod serves no useful purpose and it is undesirable and maybe even dangerous because it adds weight and area 100 inches ahead of the c.g. It is destabilizing in yaw and in pitch. At full rudder the extended nose will contribute an additional turning moment which could be enough to cause one wing to stall (in a sideslip). This effect was demonstrated in a Varieze and resulted in a violent snap roll. At full aft stick and aft c.g., the extended nose could contribute enough additional lift to raise the nose high enough to stall the main wing. This condition was demonstrated in a Long EZ. The resultant deep-stall was almost impossible to recover from because there wasn't enough forward speed and elevator power to get the nose down again. Extending the nose will require that you further limit rudder travel and further restrict aft c.g. to have the same margin of safety designed into the plans model. You should placard your airplane and logbook accordingly.
3. Changing the canard airfoil. We believe that the GU airfoil in the plans is a better canard airfoil for the Cozy than the "new" R1145MS which is offered as an option for the Long EZ, but not approved for the Varieze. The R1145MS is a more powerful airfoil than the GU, which means that it is capable of lifting the nose higher and the main wings to a higher angle of attack than the GU. This reduces the safety margin which was designed into the plans Cozy to prevent main wing stall. This effect would be compounded on the Cozy, because of the wider fuselage and would require reducing the c.g. range, which would be undesirable. RAF states that with the new canard the approach and landing speed in rain should be increased by 10K, suggesting that there is a loss of lift in rain at slow speeds. Since rain is usually accompanied by poor visibility and wet runways, this is not desirable either.
4. Auto fuels. We are fully aware that the EAA has been promoting the use of auto fuels, and has

been pooh-poohing any possible problems associated with their use. The fact is that aviation fuels are more expensive than auto fuels because they contain more expensive ingredients and are more closely controlled. Auto fuels, especially lead-free, can contain much higher concentrations of unsaturated aromatics, like toluene and xylene, which are very powerful solvents. In aviation fuels, more expensive alkanes are used, and the aromatics limited to very low levels, by agreement. In auto fuels, it is permissible to add anything which will burn, so you really don't know what you are putting in your tanks. We have had first hand experience—we had a power failure on takeoff in our Varieze due to sludge which accumulated in the carburetor after using auto fuel for one year. We did some research, and found the above to be true. This was further substantiated just recently by one of our customers whose job it is to blend auto fuels for a well-known major refinery. He said he would NEVER put auto fuel in his airplane.

There you have it. If you choose to ignore our recommendations, at least you know what problems you might encounter.

## HIGH PERFORMANCE RUDDERS

We have had the high performance rudders on our prototype for 6 months now and are well-pleased with their performance. They are more powerful than the rudders shown in the plans, and reduce braking in cross wind taxiing and takeoff. If you install them, make sure that you test them in extreme side slips at high altitude before using side slips on approach to landing. The high performance rudders require relocating the com antenna forward of the rudder hinge line. They may be retrofitted or installed originally—the plans cover both situations. The rudders are a RAF design, and plans are available from them (Bldg. 13, Mojave Airport, Mojave, CA 93501) for \$18.50 (plus 6% sales tax for CA residents).

## BUILDER HINTS

1. The plans show both headrests mounted on the shoulder support. The right headrest must, if it also serves as a support when the canopy is open; however the left headrest could just as easily be attached to canopy bulkhead TB-1. If so, it would swing out of the way when the canopy is opened, and greatly facilitate access to the rear seat. Don't know why we didn't think of this before. If you make this mod, you may use TB-1 for the rear face of the headrest, but you should widen the sides of the headrest to eliminate the gap which would otherwise exist between the headrest and TB-1.
2. As mentioned in NL #11, the turtleback flange is not intended to line up exactly with the top longeron, so don't try to force it to do so. The advantage to building the turtleback yourself is that you can install the bulkheads while it is in the jig, which will guarantee the correct shape, and it isn't hard to build.
3. Dean Morgan suggests that milk cartons filled with sand and taped shut make excellent weights.
4. The retractable step we have in our prototype was made by providing a detent in the left side of the fuselage underneath the lower longeron in lieu of the step reinforcement shown in Chap. 7, Fig. 7, Section AA. The 1/4" birch plywood insert shown in Chap. 8, p. 3, Fig. 13, which

reinforces the seatbelt attach area was lengthened to about 6". Steel bushings cut from 4130 tubing 1/2" O.D. x .120 wall were installed vertically 4.75" apart in the 1/4" plywood insert and the .26 I.D. was drilled through. The step was made from AN4 bolts (length to suit) with the heads imbedded in the rung. The rung is fiberglass, thick enough so it won't bend, and shaped to fit in the detent and match the curvature of the fuselage. The step is retracted from inside by pulling up on a safety wire threaded through safetying holes in the threaded end of the bolts, and secured in the up position with Velcro to the armrest. To avoid binding, build the step and secure it in position before floxing in the bushings.

5. Do not cut up your large size A drawings, because you may need to refer to them later. It can be quite confusing sorting thru scraps of paper looking for something referred to on a drawing. Better way is to trace templates onto another sheet of paper, and save the original drawing intact.
6. The canard and elevators should have exactly the same airfoil shape at every point in the span. Before cutting any foam, put all of the templates together and make sure they are the same. Remove any variations due to printing or tracing, except for the canard spar cap troughs, which must be different because the spar caps are tapered.

## DESIGN CHANGES

- Chap.2,p.2 and Chap.2, p.5; add (2) MS2071-B10 universals required for ailerons in Chapter 19.
- Chap.19 after Step 6 and Step 8; add a small UND layup 2" wide x 4" long across the notch in the wing (See diagram below). This will avoid a possible future paint crack and unnecessary concern about the integrity of the structure.  
(Top and Bottom)
- Chap.19 after Step 6 and Step 8; add one layer of UND 12" long between the spar cap and the ailerons (not over the ailerons) with fibers parallel to the spar cap. This will add stiffness to the wing at the point the skin might delaminate if you run into something with your wing tip.  
(Top and Bottom)

## PUBLICITY

1. Feb. 1986 ***Kitplanes***, now on the newsstands, has an excellent series of articles on the Cozy, written by Don Downie, in which he interviewed a number of Cozy builders. A must reading for all builders and prospective builders.
2. Feb. 1986 ***Sport Aviation*** will have a nice article by Uli and Linda Wolter about the first plans-built Cozy to fly.
3. ***Homebuilt*** magazine will have an article in one of the next few months. It is being printed now.

## FLY-INS

We are going to try to make as many fly-ins in 1996 as possible. Sun and Fun is on our list as well as Oshkosh. Hope to see as many of you as possible!



## SUPPLIERS

We have approved the following suppliers:

1. Construction materials
  - Wicks Aircraft • 410 Pine St. • Highland, IL 62249 • (628) 654-7447
  - Aircraft Spruce • Box 424 • Fullerton, CA 92632 • (800) 824-1930
  - Alpha Plastics • PO Box 157 • West, TX 76691 • (817) 826-3639
2. Metal Parts
  - Brock Mfg. • 11852 Western Ave. • Stanton, CA 90680 • (714) 898-4366
3. Canopy and Windows
  - Airplane Factory • 7111 Brandtvista Ave. • Dayton, OH 45424 • (517) 849-6533
4. Cowling & Turtleback
  - Quality Aircraft Components • 16223 93rd St. • Bristol, WI 53106 • (414) 857-7419
5. Main gear & Nose strut
  - Larry Lombard • PO Box 781 • Boonville, CA 95415 • (707) 595-2718
6. Propellers
  - B & T Props • 3850 Sherrod Rd. • Mariposa, CA 95338 • (209) 742-6743
  - Great American • 1180 Pike Ln.#5 • Oceano, CA 93445 • (805) 481-9054
7. Exhaust Systems
  - Sport Flight • 22267 Powell Rd. • Brooksville, FL. 33512 • (904) 796-1874

Please note the new phone number for the Airplane Factory. Larry Lombard has been able to reduce the price of the main gear to \$324 and the nose gear strut to \$55.

There are a number of custom fabricating shops who advertise that they will build any or all components for the Cozy. One has advertised that he would even modify the design (i.e. lengthen the nose). We have advised this shop that it should remove this from its advertising and not make any changes that are not authorized by us. The problem for us in recommending any of these shops is that we have no way of knowing and monitoring the quality of workmanship. One, in particular, in Friedens, PA has repeatedly told us that they emphasize quality work, but we have no way of verifying this. We would appreciate any feedback you may be able to provide us about suppliers and custom shops. We can act as a clearing house, and perhaps help out if there is a problem. Drop us a note with your comments, either good or bad. The best recommendation is a list of satisfied customers.

We also occasionally hear from someone who offers to build a Cozy for someone else (most recently a man in Alaska). Although these people could be excellent builders, we have no way of knowing. We have suggested that they advertise in *Trade-a-Plane* or *Sport Aviation*. If you are considering having someone else make components, we suggest that you visit their shop and view the facilities and workmanship first hand.

## FOR SALE

1. Ayton Co. manufactures an adjustable NACA scoop for cabin ventilation which they sell for

\$24.00 plus 6% sales tax for CA residents. Their address: Ayton Co., 4061 Via Pavion, Palo Verdes Estates, CA 90271 (213) 375-9269.

2. Lycoming O-235 L2C 2200TT (1st runout) \$2100.00 Contact Randy Ferrian, 4705 Magnolia Ln., Plymouth MN 55442 (612) 559-2000
3. a. Airspeed indicator, dual scale (K & mph) \$35.00  
b. Circuit breaker switches, new \$12.00 ea.  
c. Solid walnut stick grips w/mic buttons \$50/pr.  
d. Al. cartridge fuel filter w/ball check b-pass \$24.50

Vance Atkinson, 3604 Willomet Ct., Bedford TX 76021(817) 354-8064

## LETTERS

(We only had room for one this month)

January 1, 1986

Dear Nat,

Just a short note (in English! My friend and I will make the effort, If It's not too bad!!) to let you know we received the Cozy plans and are very pleased. We intend to build our workshop (an old cellar without electricity and heating we completely arranged for the Cozy) and the work bench is also at the end. We received all materials of construction: glass, epoxy, micro, flox, foams,...and finished the 3 education pieces, and are now going to start building.

We'll certainly send you photos of our Cozy in its different steps of construction.

Thanks for your help and your plane!

Sincerely

Rol Regis & Arnie Francis

Seichamps, FRANCE

P.S. We wish you a happy new year with a lot of little Cozys!

*This newsletter transcribed to HTML by [Gene Traas](#).*