

THE COZY NEWSSETTER #10 JULY 5, 1985

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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, 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, now that I have retired from 3M, you can reach us most of the time at our residence, (612) 776-1145 until the end of August, after which time we will be moving to our new home in Mesa, AZ. We do not have a phone number issued as yet.

After September I, 1985, the following prices will be in effect:

Information kit \$9.00

Newsletter \$5.00/yr.

Plans \$230.00

Orders for plans outside the US will be shipped by surface mail unless additional postage is supplied for airmail, which runs about \$35.00 to most countries.

We are programming our computer to print on the address label, after your name, the last issue of the Co-Z 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.

ABOUT THE PLANS

When you receive your plans, don't neglect to sign and send in your license agreement (Chapter I, Page 4), so we can issue your serial number. Many of you haven't done this yet. Also, don't neglect to mark in the corrections published in the newsletters. In spite of our best efforts, errors do creep in. If you find any we haven't, let us know and we will publish them for everyone's benefit.

Please check your plans when you receive them to determine that there are no missing pages. So far, we know of only one case where this has happened. We don't want anyone leaving one whole page out of construction (the manuals were put together by the printer. We try to check each one out before shipping).

The plans were laid out in the same sequence as the Long EZ plans. You will find, however, that there are some detours. For example, you should not attempt to install the landing gear before the centerspar is installed, and it is much easier to jig-bore the centerspar to the wings before the centerspar is installed in the fuselage, which means that you will have to build the wings before installing the centerspar and gear. Also, it is easier to do the turtleback and canopy before building the strakes, although not absolutely necessary.

Section 1A of the plans was published in January 1985 and mailed to all plans purchasers as of that date. Several were return, because the post office would not forward. If you have not received 1A, perhaps because you have moved, please send us your new address.

If you have 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 even started the project yet. Very often the instructions presume that you have completed preceding chapters and have developed a basic understanding of how things are done, without having to return to square 1 each time.

Thanks to those of you who have commented on the plans being very complete and well done. We have been trying as conscientiously as we can to find the best way to do each step, explain it in detail, avoid poor grammar and misspelled words, and type-set it for easy reading. It helps to know that our

efforts are appreciated.

WHAT WE HAVE BEEN DOING

Well, the great date, June 1, 1985 finally arrived, and I retired from 3M at the young age of 59-1/2. It was with some trepidation, wondering how it would feel to break all of the associations formed after almost 32 years with 3M, and wondering how well we could live on our pension. Contrary to what many may think, our income from Cozy plans sales just barely covers our expenses, but so far it appears we will be in good shape and able to maintain the lifestyle we are accustomed to, which is relatively modest.

We got a great send off from 3M. I really didn't realize how well they thought of me. I was expecting to get badly roasted, because I have the reputation of being somewhat of a tease. But the party was most cordial and heart warming. My going away present was a new set of golf clubs, which I haven't had the time to tryout yet, but maybe down at Mesa--- As for the associations, we extended an invitation to all of our friends to visit us in Mesa, so we hope to be seeing at least some of them this winter, after we move.

The party at work was followed by a champagne party at home. Shirley outdid herself on the food (as usual), and a good time was had by all.

Preceding my retirement, I was getting a little panicky. I had the Cozy wings at home, installing the new high performance rudders, and I repainted the entire wings, but they turned out badly because there was too much air borne dust in the garage with the windows and door open, so I had to sand them all down again and repaint at the airport later (Fortunately, that turned out much better).

During this period, we had open houses every weekend, because our house was for sale, and we had to be gone, and leave everything shipshape. We had a contingent offer early, which we accepted, but we had to get a firm offer for the first party to remove their contingency. That is all settled now and closing and occupancy are scheduled for August 28th (after Oshkosh, fortunately). We will be out of business temporarily during our move, but hope it won't last too long.

A lot of people wonder what they will do when they retire, but I have been as busy or busier since June 1 than before. There were some things I neglected on my airplane which I finally had time to do. In the now 3 years since the Cozy first flew, almost all of our efforts have been devoted to getting out information kits, newsletters and plans, and serving our customers. I finally had the time to fix a nagging problem we have lived with all of this time. My right tank had some pin hole leaks inside the leading edge which communicated with the fuselage, and I didn't like a gasoline odor so I did not use that tank. Also, the drain valve on the left tank leaked, and kept producing an ugly stain on the side of the fuselage. At any rate, I cut away the leading edge of the right strake, and opened up the tank from the top. I re-epoxied the inside of the entire tank, reclosed it, built a new leading edge and refinished the strake.

I discovered that the problem on the left tank drain valve was that I had twisted the aluminum insert when I tightened the drain valve, and the leak was around the insert, not in the valve. So I dug Out

the old insert and made a new, larger one. I glassed the inside of the cavity before installing the insert, set it in flox, and glassed over the outside. There is no way it could twist now. I am now in a good position to advise other builders on how to avoid these problems (see Builder Hints). So far at least it appears all of these problems are behind us and we should now be able to fly for 10 hours non-stop without refueling.

Another little improvement which we will really appreciate, we put small doors on our wheel pants so we could check air pressure without removing 1/2 of the wheel pants. Previously we had to remove 15 screws and 1 bolt every time we wanted to check pressure for each tire. The doors are hinged and only one screw secures each door. This is a big improvement and is highly recommended.

Well, we finally got the Cozy in the air again! It has been a long time! I had forgotten how wonderful an airplane it really is! The new rudders are really great! Of course the Cozy needs very little rudder in flying, but for taxiing and take offs cross wind they are a big improvement. Yesterday we had an estimated 25 K quartering cross wind and they really helped in taxiing, take off, and landing. I have not yet tested the rudders at full deployment in a steep side slip, so I don't know if it is possible to get the airplane to do anything unexpected. We will report further in the next newsletter. But regardless of what we find, all of you should make similar tests on your airplanes during your flight test programs, because all airplanes do not perform identically, due

to builder differences, which leads up to the next subject.

CANARDS

Some time ago I asked Mike Melvill why they were going to such a great expense and significant risk of life to test alternate canard airfoils when the GU worked so well on the Varieze, Long EZ, and Cozy? Mike said it was really just pressure from a few builders; a relatively small number were complaining about a trim change in rain.

I talked to one such builder recently (name withheld). He admitted that he did a very bad job in building his canard on his Long EZ. He said he had a big hump at the spar cap, and a sharp break in the contour after the spar cap. He said he was probably getting flow separation at the sharp change in curvature, and as a result, he had a significant trim change in rain. He had decided to build a new canard when Mike told him that RAF had approved a new airfoil.

The moral to this story is that the large trim change was not because of the GU airfoil, but because it no longer was a GU airfoil. A new airfoil is not a carte blanc license to do poor workmanship. If an airfoil is not rendered accurately, especially on the canard, its performance can be unpredictable.

The plus that we have going for us on the GU airfoil is that there are probably over 1000 flying on Variezes and Long EZs and out of all of these builder permutations, only a very few have seen fit to complain, and their complaints probably could have been satisfied had they rebuilt their canards and more faithfully reproduced the GU airfoil. It is my belief that no new airfoil, no matter how good it is purported to be, could challenge this record of reliability, until a lot more is known about it and until it has been subjected to an equal number of builder "tolerances". The GU airfoil works just

beautifully on our Cozy, and we see no reason to change it. If we were to ask for a new airfoil. we would probably have a slightly different list of requirements than for the Long EZ, because of the wider fuselage. higher front seat loading, etc. The agreement we have with RAF is that they will not knowingly sell plans for a Long EZ canard to a Cozy builder unless we give our prior approval; actually it wouldn't even fit without considerable modification, and the modifications would require extensive testing.

OSHKOSH 85

As we mentioned in newsletter #9, we plan to arrive at Oshkosh early this year and relax a bit before the first big weekend. We plan to camp in Paul's Woods (if there is any space left when we arrive) or else close to it. and reserve some extra space for other Cozy builders-campers.

We have scheduled a forum at 8:45 Sunday, July 28th in forum tent #6. We hope to see as many of you there as can make it.

We have arranged with Adalon Designs (Lon Cooper and Michelle Chang). 25506 Crenshaw Blvd.. Torrance CA 90505 (213) 534-2110 for a spectacular trophy for the best Cozy at Oshkosh this year. There are several that we know of

which are almost complete and we sure hope that one or more make it. As of this writing, Ulrich and Linda Wolters are just painting theirs and are finishing up on the engine installation. The trophy will have a gold Cozy on the top and

should be just beautiful.

Adalon Designs has our permission to make scale models of the Cozy which will be solid, high-gloss white. and you can paint on your own trim to match your airplanes. These will be available at Oshkosh. both in our campground and at Custom Tops booth in the Fly Market. where you can also buy Navy Blue windbreakers, T-shirts, golf shirts and caps. Visit there early. because they ran out last year. The Cozy models will be priced at \$30. They are going to make it a limited edition. and each model will have its own serial number. Should be a real collectors item. We have placed our order for serial #1, to correspond to our airplane.

BUILDER HINTS

1) Do do a good job of sealing your gas tanks. A well sealed fiberglass tank can be a real joy. A leaky one, a real pain (take it from someone who learned the hard way). Pinholes are impossible to avoid in fiberglass layups. unless you follow the layup with additional coats of epoxy. Best time to do this is before the layup has completely cured. Use a squeegee to force epoxy into any pinholes. Pay particular attention to corners and joints.

2) Do test your tanks before finishing. Hook the vent line to your altimeter and a source of vacuum, but do not pull more than 1500 ft. of altitude. I don't know how much vacuum is required to collapse a tank. but it is possible, and it will spoil your whole day. There should be no change in pressure over

a 24 hr. period, except as caused by ambient temperature and pressure changes. Keep track of outside temperature and pressure.

3) Do not use any styrafoam (not even for fairings or leading edges) anywhere near the fuel tanks. A pinhole leak will cause the styrafoam to dissolve, leaving a pocket which can collect gasoline.

4) Don't use featherfill. It has a poor bond with epoxy and cause your paint job to delaminate in a year or two. Sterling urethane finishing primer is recommended. It cures fast, so just mix small amounts. It can be brushed or sprayed, and sands beautifully.

5) Do not use spot putty under anything except the final finish. It is lacquer based. and Sterling will lift it.

6) RAE fast. mixed with as many micro balloons as possible is the best way to fill depressions and bring your surfaces up to contour. It doesn't spread very well, so load it on and sand back down to contour. but don't sand into the fiberglass.

7) Bending 3/8 in. PVC is a universal problem. When I re-built my right strake, I made a scribing tool from a block of wood and a hacksaw blade. I made a saw cut in the wood and 5-minuted in the hacksaw blade so it rotruded 1/4 in. I carefully scribed a number of cuts in the PVC where I wanted it to bend, then bent it into the frame and fastened it in the bent shape, and then microed and glassed the scribed surface. That worked better than anything else I have tried to date.

SUPPLIERS

The new supplier for Long EZ and Cozy nose struts and main gear is Larry Lombard, PO Box 781, Boonville, CA 95415, (707) 895-2118. Prices are: Main gear -\$344.00, Nose gear -\$61.70

We have just learned that Ken Brock has supplied some Cozy builders with throttle quadrants where the cable conduit is only 100 in. long, as compared to the 118 in. previosly supplied. 100 in. is too short for the Cozy. We will call this to Ken's attention. Measure yours. If it is too short, return it for replacement.

WEIGHTS

John E. Dahl reports the following weights;

Fuselage (thru Chap. 7) 69 Ibs.

Center section spar 30 Ibs.

Wings (before cutting ailerons) 48 Ibs.

Send in yours and we will publish them.

DESIGN CHANGES/CORRECTIONS

Chap. 1, p.2: Co-Z Development Corp. address will change on 9/1/85 to 2046 N. 63rd PL., Mesa, AZ 85205. Our phone number will also Change, but we don't have the new number yet.

Chap. 3, p.7: Add after 1st para. All templates are shown on the drawings slightly oversize, to allow for normal wire burn during hot-wire cutting. Do not make additional allowance. The elevator templates are critical. Cut away the template line, and make sure your hotwire is not too cold, otherwise your cores will be too large and not fit on the torque tube with the top and bottom surfaces tangent to the tube.

Chap. 11, p.1, Step 1, Add after 1st para. After cutting first core, trial fit Against torque tube. If top and bottom surfaces are not tangent to torque tube (with minimal sanding) either your templates are too large (see note above) or your hot wire is too cold, or both. Correct before continuing.

Chap. 11,p.1, Step 2. Elevator contour is critical. Before glassing elevator, check foam contour using contour template on page A-2. If contour is not correct, sand or recut as appropriate.

Chap. 11,p.1, Fig.2. Change 59 to 57in.

Chap. 9,p.5, Add after para. 3. The AN-22A bolts should be long enough for wheel pant brackets to be added later on without replacing bolts. If not, use next longer bolt. Insert one or more extra washers under nuts until brackets are installed.

Chap.16, p.2 The template for CS 109 is incorrect. Substitute the one shown below. Change View D-D, Chap.16,p.4 to correspond.

Chap.16, p.2 CZSA The 1.0 in. dimension is correct, but the drawing is out of scale.

Chap.21, p.3, Step 2, para,4. Change 1" x 1" x 1/8" to 1" x 1" x 1/4". Add: Dimple top and bottom with a 1/8" drill for better bonding. Glass inside of cavity in foam for insert with 2 plies of BID so insert cannot twist. Wax threads in insert to prevent epoxy from sticking, but clean top and bottom surfaces. Install insert in cavity and surround with floc. If you accidentally cut all of the way through the foam, back up lay up with masking tape. After cure, carefully remove BID under tapped hole with exacto knife.

Chap.21, p.3, Fig.5. Revise sketch to show above change.

LORAN

A friend of mine (Judge King) made a very simple, retroactive Loran antenna installation in his Long EZ, which he reports works excellently. His write up follows:

"The stories I had heard about problems of installing Lorans in plastic airplanes almost discouraged

me from attempting a retrofit for my Long. There were the ongoing antenna problems and the problem of where to put the unit. Claims of no panel space are a myth if one plans well in advance.

"I decided to plan a Loran installation because the price was right compared to the new equipment that depends on VOR signals. I ignored all of the stories about Lorans and electrical interference and did nothing special during my installation to eliminate problems discussed in many articles related to strobe lights, alternators, etc.

"The antenna is a straight piece of RG58 coax cable 4 ft. long and installed in the winglet on the left side of the airplane. The top 24 in. of the cable is stripped of its outer insulation and braided shield. The lower 24 in. portion of the cable plugs into the preamp. Putting this in the winglet during construction would be a snap. It is also a snap in a retrofit. Steps to follow:

1. Remove the position-strobe light assembly exposing the hole in the wing for running wires. If your Long was built by plans this hole is forward and below the upper winglet.
2. Using a .25" x 4 ft. drill bit (the kind that burglar alarm installers use) drill a channel through this hole from the inside into the upper winglet, staying as close to the leading edge of the winglet as possible. (My channel wandered and the drill bit came out the top of the winglet about half way aft. It is important to note that this hole is being drilled through a structural attachment point so one small hole is enough. The antenna coax was pulled through from the top.
3. Placing the preamp. Since the preamp has to be attached at the end of the antenna, a cavity was carved in the same space behind the strobe light assembly to accommodate the preamp. (There is only styrafoam in this area, thus an easy carving job.) The distance from the preamp to the Loran is less than 25 ft. of cable routed through the wing and center section spar and fuselage. I didn't have to fish the cable because I installed a radio antenna in the left winglet during construction which I never used, so I used the RG 58 coax that was already there. With my antenna installed I turned to the problem of where do I put the unit. I got rid of my ARC radio and VOR head, lowered my transponder by 1", and was able to fit my 3.1 in. ARNAV at the top of the stack of my TXN960 (720 channel radio with loc. and glideslope and VOR head all in one unit) and transponder.

"The ARNAV unit is higher than some other units, but I was determined to make it fit because it has some features that others are lacking. I don't have to ask flight service for winds aloft anymore and I was aware that ARNAV was in the process of developing a new safety feature which I just ordered for my R-21. Enroute to a distant waypoint I can punch in 911 and get immediate indication of bearing and distance to the nearest six airports.

"Flying the VORs was great when that was all I had, but I consider my R-21 ARNAV the best thing since sliced bread."

NOTICES

David Scott, Indianapolis (317) 894-2422 has an 0-235-L2C which he reports has been rebuilt to std. specs and for which he is asking \$5000.

LETTERS FROM BUILDERS

Dear Mr. Puffer, June 1, 1985

Enclosed is a check for \$8.00. Please send the information kit on your fantastic plane, the Cozy. I've seen it featured in Downie's book on Rutan aircraft and in your ad in "Kitplanes" magazine. The Cozy looks like just the plane I've been looking for a practical canard.

Thank you for your attention.

Sincerely,

Allen J. Rice

Boca Raton, FL

Dear Nat: April 11, 1985

Enclosed is a check for two hundred and fifteen dollars for the Cozy plans and one year subscription to the newsletter. As an aviation enthusiast, A&P, CFII, and aircraft engineer, I have been impressed with the Cozy design. The Cozy with its good performance, side by side seating and low cost seems to be the ideal aircraft for us. My wife and I look forward to the many enjoyable hours working together on this aircraft and some day the many trips flying to visit family and friends. Understanding the tremendous effort which you and Shirley have expended on the Cozy design and making it available, I would like to congratulate and thank you both for a job well done. I trust that in the future my wife, Skye and I will have the opportunity to meet you. Our best wishes in your future endeavors.

Sincerely yours,

John Becker

San Antonio, TX

May 30. 1985

Dear Mr. Puffer, May 30. 1985

Robert Barton and I would first like to thank you for the opportunity to build what we believe to be the best homebuilt project available and having just finished the roll-over structure, we are very confident that we can complete the project within one year. Enclosed is our copy of the license agreement and \$5.00 for the newsletter.

Very truly yours,

Chris Mendrop

Grand Junction, CO

Dear Nat, May 11, 1985

Please find enclosed the signed copy of your license agreement. I hope it is in order. I am very pleased to inform you that Section IA, which you posted on 20 Jan. has finally arrived (30 May) so I'd better start ordering materials soon if I want to get started this year! I would like to also say what an excellent and interesting set of plans you have produced and I hope that I can eventually give you the ultimate praise by building a Cozy from them.

Yours sincerely,

D. G. Denton

Goteborg, Sweden

Dear Nat, April 26, 1985

Your #9 newsletter just arrived and I do not want to miss a single issue. A copy of the mailing label is enclosed for your easy reference. I plan to see you at Oshkosh and attend your Sunday seminar and buy my set of Cozy plans there. One of my first stops will be Irene at TOPS for my jacket, cap and sport shirt ordered today. That was a great idea. Thanks. I suspect Cozy builders MAY become one of the tightest knit groups in EAA. Here in Columbus I will be working with both Nicholson and Buckley on our Cozy projects. I believe they have both already ordered their plans. On my return trip from Oshkosh (with my new truck equipped for long distance trips) I'm going by way of St. Louis to see the Cards play and stop at Wicks for a load of foam/glass etc., for me and pick up a friend's D'fly canopy. My new Cozy workshop is equipped with air compressor etc., as outlined by Rutan as the "Cadillac shop." For 6 months I have been studying a friend's Long EZ plans especially chap. 3 training. I am hot to get started! You are doing a great job and are performing VERY responsibly toward those who purchase your plans. I especially appreciate your attention to spelling, grammar, and syntax in the Newsletters. Apparently this is going to be true of the plans.

Sincerely yours,

S.Omar Overly

Grove City, OH

Dear Mr. Puffer, April 25, 1985

I am a pilot in the Canadian Armed Forces flying CH-147 "Chinook" helicopters. While in pilot training I purchased a set of Long EZ plans, however I never started construction of the aircraft. This was the result of several limitations of the design (tandem seating, limited panel and baggage space, etc.) all of which your modification of it has eliminated. From all accounts I have read, your design appears to be the aircraft of my dreams! Enclosed please find a money order for \$215 US to cover the cost of the Cozy plans and a one year subscription to the Cozy newsletter. I plan to begin work late this summer and hope my limited construction skills will do your fine design justice. Once again, thank you for the Cozy design.

Yours truly,

Tom Bak

Edmonton, Alberta