

# COZY NEWSLETTER #30 July, 1990

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Cozy builders will need newsletters #4 - #30, and a current subscription to the Cozy Newsletter. The earlier issues contain most of the design changes and corrections. Other issues contain building hints, builders' letters, safety recommendations, first flight reports, changes in suppliers, and other information helpful to builders. The newsletter is our principle means of builder support and communication. We also answer telephone calls whenever we are here, and personal letters, but please enclose a stamped, self addressed envelope if you desire a reply. If you have news, suggestions, or experiences which you think would be of interest to other builders, write to us and we will publish your letter (if it isn't too long).

## OSHKOSH 1990

We are planning to fly our prototype Cozy, N22CZ, back to Oshkosh this year. It first appeared there in 1982, but has been somewhat neglected ever since we started building the Mark IV in 1986. We plan to arrive a couple of days before the opening on Friday, to avoid the heavy traffic and to try to save space for Cozys to park together, just south of the old main gate to the flight line and the homebuilt headquarters. We probably won't be at the airplane every day, all day, but will plan to be there every day from 1 PM to 2 PM or later to meet builders and answer questions. There is one exception, on Monday, July 30th, when we have a forum scheduled in Tent #3. Please check the schedule, to make sure there are no last-minute changes. Last year, everyone enjoyed hearing the experiences of those already flying, so we will repeat this again this year. I would also like to discuss the process of designing a new aircraft and auto engine conversions.

We were hoping that someone would organize a pilots/builders dinner, but that didn't happen; so we started exploring the idea in January. We found that the restaurants booked large groups a year in advance. The best we could do was a room for 25 at Robbins for 6 PM Saturday, July 28<sup>th</sup>. Their food is excellent, and prices reasonable, and we will order from the menu. We sounded out a few people about whether they thought this was a good idea, and 14 have already asked to be included. We will ask for a \$5/person refundable deposit (see us on the flight line) , and take the first 25. If we have to turn anyone down, we will look for a larger room next year , and try to talk someone else into making the arrangements .

## SUPPLIERS

We have had a number of calls asking why we discontinued Great American (propellers) and Alpha Plastics (materials). We understand that Great American had several key employees leave , whom they couldn't replace , and had to cease operations. Alpha Plastics sold out (for whatever reason we aren't sure) to a company in Alabama. After 3 different owners in 3 different locations, we decided that this particular supplier doesn't fit our definition of an established company with a good track record.

B & T Props (Bruce and Bonnie Tift) decided that California was getting too crowded and that they would prefer to live in Oregon. They are in the process of moving. Their new address after July 15 will be: B&T Props, 75872 Mosby Creek Road, Cottage Grove OR 97424 (503) 942-7068

Bruce says that he has picked up the Great American business on top of his own, and is very busy. Three months is his minimum lead time and he would prefer much more. He reports that his new design carries the twist closer to the hub and appears to be giving superior performance. He also says that the multi-laminate props are losing their appeal, because they are made from poorer quality wood, they are heavier and more expensive, and apparently not as serviceable .

## WHAT WE HAVE BEEN DOING

Even though we are retired, it doesn't seem like we have much free time, between supporting builders (we aren't complaining) , entertaining, church work, and community service. This last quarter we

have entertained a number of house guests, i.e. vacationing relatives and friends, and had a number of Cozy builders stop in, from places like Saudi Arabia, Switzerland, and Austria, as well as the Atkinsons, who stopped in on their way to California in their Cozy. As a corporate pilot, Vance is widely traveled and always looks up the local Cozy builders, where ever he lays over. So he is a good source of information for us.

## KANAB

We attended Shirl Dickey's Kanab "Honk Out" over Memorial Day again this year. Kanab is on the southern border of Utah, and very picturesque. To get there, we fly north to Flagstaff, and then either over or around the Grand Canyon. It is a very beautiful trip. It makes us appreciate our airplane—two years ago, we spent one day climbing down into the canyon and another day climbing out, and we can climb the Same distance in our airplane in just 5 minutes.

The event is competitive racing for canard types, a spot landing contest, and a ribbon cutting contest (a roll of toilet paper unrolling as it falls). We were the only Cozy this year and elected to be spectators rather than competitors. There were about 20 or so airplanes. The townspeople were very hospitable and provided a school bus and driver for our transportation for 3 days. Upon departure, one airplane had a severe right yaw after lift off. His right rudder was stuck fully extended. He flew home that way and was concerned about whether he would have any right brake ( or a locked right brake ) on landing. The landing went okay. On investigation, he found that the rudder cable had jumped the pulley, because he forgot to put in the cable retention cotter pins (NL #29). He had the internal rudder mechanism, rather than the external bell cranks, and thinks that someone might have been bending his rudders to see how they worked (or else the wind did) , and the momentary slackness of the cable caused it to falloff the pulley.

## FIRST FLIGHTS

We keep hearing about Cozys that are almost ready to fly, but have had only two confirmed reports this quarter. The first was from Ken Ashley, in Pineville NC, Ser. #270. We hope to have more details in a subsequent newsletter.

The second was a report from Mike Green, in Colorado Springs, CO. Mike called to report that Cozy N566MG, which he spent 3 years, 5 months building, had its first flight on June 17th. Mike flies King Airs, Citations, Helios and Lears, but he still did his taxi testing in the Cozy. With a 11,500 ft runway, he was able to go quite a ways with the canard flying, but the mains on the runway. The airport is at 6,200 ft. and he figured the density altitude was about 9,500 for his first flight. He said everything went very well, except for his oil temperature. He attributed this to not having made a big enough cut out in his cowl for the air exiting the cooler, and also not using large enough lines from the engine to the cooler. He is going to make these changes and give us another report.

## OTHER NEWS

Vance Atkinson has been making more changes. His daughter was not comfortable in the back seat so he moved the thigh support forward 6 in. and shaped and extended it similar to the front seat. This

change made it a lot more comfortable for her. He also made some other mods which he is still in the process of evaluating. When Vance flies with 3 adults, luggage for 2 weeks, and full fuel, he said his gross is around 1800 lbs. He said the difference in his performance between a light and heavy gross is quite dramatic. At 1800 lbs., he requires about 3000 ft. to rotate and his ROC is only 600 fpm.

While it is some comfort to know that an experienced pilot can exceed the limitations in the owner's manual with apparent safety, it is not recommended!

Merle Musson has installed a Blanton auto engine conversion in his Cozy. The engine is a V-6, steel block Mercury of 3.8 liter displacement and 8:1 compression, giving about 180 hp at 4200 rpm. He said the installation cost him about \$7,000, including a used engine. The engine plus accessories were about 120 lbs. heavier than his O-235, but after the modifications and relocating things for c.g. considerations, his airplane was 200 lbs. heavier. He is pleased with the take-off and climb performance, and gained some top speed. He has no cooling problem in the air, but tends to overheat on the ground. He plans to be at Oshkosh 90.

Mike Marshall is now flying with his variable pitch MT prop. He said it was more difficult to install than he expected, because of some unanticipated problems. Mike flies from an airport of 7,400 ft elevation at density altitudes of 10,000 ft. The MT prop, he says, allows him to turn up to 2700 rpm for takeoff, and down to 2100 rpm in cruise, which he likes because of quieter engine operation and better fuel economy. He said the increased power for takeoff didn't really shorten his takeoff distance, however, because he also installed a Roncz canard at the same time, and it requires a higher rotation speed. He reports that the new canard allows him to fly slower, but at a higher angle of attack, which isn't necessarily desirable for landing.

## AIRCRAFT WEIGHT

We ran across an interesting article by Art Bianconi, Technical Counselor. Although it pertains to Long EZs, we thought you might be interested because of similarities. Art compiled the data from the flight line at EAA Oshkosh '87. The average Long EZ, he calculated, weighs 876.4 lbs. empty and has a 132 hp engine. It is equipped with both a starter and alternator. With pilot and 5 hrs fuel, it weighs 1,279 lbs. and has an active power loading of 9.69 lbs./hp. He observed that with a 180 lb pilot (no passenger) and 5 hrs fuel, many of the heavier aircraft are close to or above maximum gross weight.

The lightest Long, N40EB, belonged to John Benjamin at 752 lbs. with a 118 hp engine. The heaviest Long weighed 1,000 lbs. empty with a 200 hp engine. Art claims that two airplanes the same size, same plan form, and same drag values, but one weighs 1000 lbs. with a 200 hp engine and the other weighs 500 lbs. with a 100 hp engine, the lighter airplane will roll faster, turn quicker, land slower, stop sooner, and has more utility while subjecting the airframe to only 1/4 the stress.

This may be true, Art, but the trend seems to be toward heavier airplanes with bigger engines.

## MORE ON OIL

The April 1990 AOPA magazine says that Mobil AV-1 is the only oil Continental approves for use in the Voyager engine. Gary Collins says, in EAA Chapter 174's newsletter, that after having several episodes of stuck exhaust valves in his Cessna's C-145 engine, he decided to change to a synthetic oil. He selected AV-1 because of its compatibility with all petroleum-based oils. Since his C-145 had no oil filter, Continental suggested a 100 hr change interval.

He said he cleaned all the exhaust valve guides and changed to AV-1. His oil consumption went from 1 qt/12 hrs to 1 qt/14 hrs right away, and gradually improved to 1 qt/25 hrs.

At his first oil change (106 hrs) , he said the screen was very dirty, but an analysis of the particles showed no problems, but he plans to clean the screen every 25 hrs in the future. He said his engine had run 700 hrs using non-detergent oil, and was very dirty. He selected AV-1 because it is not supposed to attack and break varnish loose, as some synthetic oils do.

He said many small oil seeps and leaks dried, cold starts are much easier, and oil pressure comes up as quick in winter as in summer. He believes he is getting more power and better fuel economy. He says at 100 hr change intervals, the cost is comparable with conventional oils.

Mobil makes all these claims, but it is nice to hear them from an independent source.

### ALTIMETER ADJUSTMENT

Your altimeter should read field elevation when atmospheric pressure is set at the reading given by the tower or FSS. If it does not, it needs adjusting. This is easy to do without taking it to an instrument shop, if you follow these steps: First, place the needle on the correct altitude. Then remove the screw adjacent to the adjustment knob. Under the screw you will see a brass bar with a hole in it. With a pick, hold the bar away from the adjustment knob. Now, you can adjust the atmospheric pressure to the correct reading without changing the altitude reading. When both the altitude and pressure readings are correct, move the brass bar back in place and replace the screw. Now, your altimeter should read correctly either on the ground or in the air.

### OXYGEN

Since the Cozy has a long range and high service ceiling, it is practical and many times desirable to fly at altitudes where oxygen is required. The best location to mount an oxygen bottle is behind the front seat back, high enough to reach the shutoff valve and regulator through TB-1. The nose cannulas (rather than masks) with flowmeters waste less oxygen and are worth the extra cost.

### FIRE EXTINGUISHERS

Fires on the ground are possible. You could have a fueling fire if you do not ground correctly (NL#22) , a wheel pant fire, if brake fluid leaks onto a hot disc, or a cowl fire if an exhaust pipe fails during ground run-up. Everyone should carry a halon fire extinguisher in his airplane. A very convenient and accessible location is on the shoulder support, between the seat cushion and head rest. The simplest way to mount it there is with Vel Cro.

## CABIN HEAT

We haven't ventured up north in winter, nor until recently, haven't flown much over 13,500 ft., so we haven't had a problem with cabin heat. But Vance Atkinson did (see NL#23) , and more recently, Dennis Oelmann. He wrote to us about his experience flying to Sun and Fun from Iowa in April. You will find his letter elsewhere in this NL.

## LORAN C

The FAA has stated that the mid-continent loran C gap will be closed in two stages, beginning in the Southwest in December, 1990, except for the Las Cruces, NM station. The northern quadrant of the gap will be closed and the Las Cruces station will be up and running by April of 1991. At that point all of the "lower 48" will have loran coverage.

CP 63 reported a builder/flyer who had installed a Northstar loran following all the installation hints recommended, but still had a low signal to noise ratio. A friend suggested the problem might be caused because he had run all of his power wires down the right side of the fuselage, and the main ground down the left side, which created an electrical field, and the antenna was mounted in the center of that field. So he re-routed the ground down the right side of the fuselage, and his SNR's went up to where they should be, i.e. high 80 to 90 percent. Mike suggests wrapping the power wire around the ground at a spacing of two wraps per foot to cancel out any field caused by parallel wires.

Mike reported that his loran suddenly developed a case of low SNRs after having installed a new alternator. After extensive trouble shooting , he found a broken connection in his filter capacitor, and also bad diodes in his new alternator. He discovered the latter by turning the alternator off in flight, and his SNRs jumped up to where they had been previously.

## ELECTRICAL SWITCHES

In CP 63, Long EZ builder/pilot Dick Kreidel reported smelling smoke in flight, turning off all electrical, and making an immediate landing. Upon examining his electrical system, he found the rocker switch (a standard Cessna Part) in his nav light circuit had overheated and melted. It appeared that one of the spade connectors had oxidized enough over time to create a high resistance, and, because of the 7 amp draw, heated the lug and internal parts enough to melt the plastic housing. His conclusion was that it would be safer to use switches with screw connections.

A recent FAA newsletter cautioned against using AC switches in DC circuits. In an AC circuit, the current changes direction 120 times a second, and most of the time there is no current flowing at all. But in DC circuits, the current flows continuously. A DC switch must be designed to withstand the arcing which occurs everytime the circuit is opened or closed. A switch rated for 10 amps at 125 volts can only carry 0.3 amps DC at the same voltage. For this reason, a DC-rated switch will cost about 3 times as much as an AC-rated switch of the same current capacity, and is well worth it!

## FAA ENFORCEMENT POLICY

We understand that congress extended this policy for another 3 months, and the FAA has been making spot checks at big and small airports of landing pilots, demanding to see licenses, log books, and current charts, and checking to see whether all instruments are working. If they find anything wrong, they have the authority to suspend your license and levy a fine up to \$1,000. Not something to take lightly!

## FOR SALE

1. Silicone rubber valve cover gaskets which don't leak oil and can be re-used are available from the Real Gasket Corp., P.O. Box 1366, Laurel, MS 39441-1366, tel. (601) 649-0702.
2. Instrument panels and engraving. Aero Engravers, 173 Durley Ave., Camarillo, CA 93010, tel (805) 484-4647. They offer complete instrument panel service, including fabrication.
3. Fuel Sight Gauges. The fiberglass tank windows, if not made correctly, can be less than clear, and hard to read. A popular solution is to mount external gauges in front of the tank window. Vance Atkinson has taken over manufacture of the gauges formerly supplied by John Van Ostrom. The gauge has a white base, and a blister window made of crystal clear and unbreakable lexan, and is very attractive. Cost is \$30/set US, and \$36/set OUS. Contact: Vance Atkinson, 3604 Willomet, Bedford TX 76021, tel. (817) 354-8064
4. 0-320 Dynafocal mount by Weldtech. \$200 EGT (4 probe) E-4 Electronics Int. \$250 CHT (4 probe) C-4 Electronics Int. \$250 Voltmeter (0-60 amps) & shunt. \$100 Nosewheel (Brock). \$35 Oil filter kit--remote mount (Mel Hinson) \$150

Bryan Giesler, 6213 W. 6th Ave., Kennewich, WA 99336 tel (509) 735-7957

## LETTERS

We misplaced the following letter and apologize for not publishing it sooner.

Dear Nat, March 29, 1989

Just a note to let you know of the activities of Cozy 84CZ during the first nine months of flying.

We have enjoyed a little over 90 hrs of good flying, including short trips to Phoenix, the bay area, and Santa Barbara. Our good friend Morgan Dean of Burbank is also flying, as you know, and we have had several rendezvous with him to compare performance and techniques. He has a superior bird with low friction controls, easy lift-off, and good high speed. His Cozy is about 5 kts faster in nearly identical configuration.

Our earlier flying was plagued by difficult rotation and lack of elevator control for landing at forward c.g. By comparison with other Cozy information, it seemed apparent that our bird had a minimum speed (full elevator) approx. 10 kts higher than standard. At c.g. 97.5 and 80 kts, no control margin was available for landing. As a result, we have limited our forward c.g. to 98.5, and moved the battery from the nose to the center spar.

Our investigation and analysis eliminated any discrepancy with the canard contour or incidence .The contour was the same as Morgan's, and the elevator either trails or is slightly T.E. up at high speed. We believe the problem stems from an out of contour leading edge of the strakes. We had a very bad time building the top surface of the strakes and ended up with a substantial contour error caused by a flattening of the top surface between bulkheads. We think this has the effect of reducing the angle of attack of this section, and moving the aerodynamic center of lift aft approximately 1 to 1.5 inches. With this in mind, we reasoned that we should be able to tolerate a more aft c.g., and made a careful flight evaluation, Moving the c.g. aft in 1/4 in. increments.

The results seemed to fit our theory, in that we are very stable at 103.5 in. , and the elevator angles and minimum speed are now comparable to Cozy data at standard c.g.. Normal stall characteristics are observed. By the way, Morgan Dean used prefab strakes with excellent contour and has excellent elevator control at forward c.g. of 97.5 in. This problem of strake contour might be experienced by other builders and result in similar problem.

We have found that the transponder antenna buried in the right wing, with its extremely long co-ax degraded our transponder performance. We are still using this antenna, but it required a non-standard adjustment to get the reply frequency, as installed, within limits. The bench test was right on, but installed in the, airplane, the reply frequency was down 4 Mhz. We would recommend an antenna with a much shorter lead, and a small blade or spike on the forward fuselage bottom.

We are considering a trip to Oshkosh this year and will be looking for information for first timers.

Sorry to hear that you will not put out plans for the Mark IV. However, we certainly understand your reasons. Like all your other builders, we are grateful for all the work you've put into the Cozy, its fantastic!

Sincerely, Bill & Keith Spreur

Dear Nat, May 18, 1990

In April, I took a weeks vacation and my family and I flew to Florida for Sun & Fun. We also fulfilled a promise I had made to my 4 yr old daughter that I would take her to Disney land when I finished my Cozy. We had a great time and made a lot of new friends, while also seeing some old ones. I had the opportunity to be interviewed by a reporter for channel 6 news in Orlando. I gave him a ride while he filmed from the rear seat. I called him later after we returned from the trip, and he said it turned out great and was sending me a copy. It did turn out very nice.

Our trip was very interesting and I learned a few things about my airplane. We flew most of the way IFR. I learned that the Cozy doesn't handle ice very well. While on an instrument approach into Evansville IN , I noticed picking up a trace of ice on the canopy and leading edges, but it really didn't handle any differently. We fueled up and punched through a cloud layer 2200 ft thick, which is when I really noticed the ice I encountered again. The Cozy came through OK, but I noticed the back pressure required for climb was much greater and climb rate decreased by at least 25%. After we climbed out on top, the ice soon dissipated and we had a normal flight except for MY COLD FEET!



Short flights in the winter hadn't bothered me before, but sitting for a couple of hours, the cold really goes to the toes. When I returned home, I removed the left exhaust pipe (a 4-pipe system) and made a much larger heat muff. I put a 2-1/2 stainless muff completely around the old muff, after cutting 1/4 in slots in the old one, to increase the heat transfer surface and make the air travel farther. I insulated the hoses, and mounted a squirrel cage blower from a 74 Mazda behind the back seat. I ran a 1-1/2 in duct under the left armrest and finally got the air to blow on my feet. When I tested the system, I got heat all right; so much it melted the Bakelite fan impeller. I had to get an aluminum impeller out of a 66 Ford pickup, and now it works great! My feet actually sweat!

Please remind builders NOT to mount an oil pressure sender ( or fuel pressure sender) on the engine , no matter what the manufacturers instructions say. ALWAYS mount them on the firewall or engine mount, and connect to the engine with flexible aeroquip hose.

Regards , Dennis Oelmann

Dear Nat & Shirley, April 3, 1990

Just a short note to bring you up to speed. My yellow bird is still down and well be lucky to make Jackpot. It received damage in early January when a windstorm took our hangar door for a ride. Before the door took wing, it managed to damage the left wing, rudder, and aileron, tore up the prop, bent the spinner and cowling, punched a hole in the top of the right fuel tank, and some minor damage to the right wing. The weather has now warmed up to where I can work on it. Since I have the fuselage in the garage, I'm doing a number of up-upgrades that I had planned to do some time in the future. The items I listed for sale have 90 hrs on them, except the oil filter is new.

Sincerely, Bryan Giesler

Dear Nat, April 30, 1990

The FAA awarded N90CZ to my aircraft, but I might reserve a different number to include my initials, especially if I don't finish by the end of 1990.

As my Cozy stands now, I'm half way through the canopy chapter. Once that is done, the strakes, winglets, covers, engine, and electrical will be left. For the first time, people have stopped talking about my "boat". I am very pleased with the project thus far.

Before I glassed the top side of the canopy frame, I mounted the canard and carved the foam transition piece, sanding it with a 2 ft. long block to get a true, Smooth curve from front to back. I then glassed the whole thing, reducing the plies to just 2 over the canard. At knife trim, I cut the canard separate from the canopy. After full cure I trimmed everything and glassed the exposed foam on the canard. In a few days, when I glass the canopy lips, I will also glass lips on the canard. I believe this method will give my Cozy good contours.

For electrical conduit, instead of sprinkler pipe, I made a 2-ply glass conduit. I put a coat of wax on

the outside of a sprinkler pipe for release. Whenever I have same of sizes of scrap cloth, I lay up a 2 ply tube about 2 ft. long. later, I will connect the pieces with BID tapes and install them under the armrests. This may be more work, but I feel better about saving a few ounces.

By the way, I'm building the flush rudder mod.

May 1990 Kitplanes had an article and instructions for an accessory cooling door that opens and closes automatically, with the aid of a VW cooling fan thermostat.

The benefit of my job (Jetstream Capt. with United Express) is that I can bid a full month of reserve and hope I don't get called in to work. I'll be doing this every other month until the Cozy is flying. I just set the phone in the garage and work away. I will probably end up with at least 20 full days each month to work on my airplane. My goal is to finish before year-end. First fly-in, Sun & Fun 91, and then Oshkosh non-stop from Sacramento.

God Bless, Brian Heinitz

## GALLERY