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COZY NEWSLETTER #58
July, 1997

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OUR TRIP TO SUN 'n FUN '97

Sun 'n Fun is quite a long trip for us and the weather along the Gulf coast is aways marginal in the springtime, so we usually plan to leave up to a week in advance, whenever we can take advantage of a weather "window". This year, Sun 'n Fun was early, and we had a houseful of guests (relatives, daughter, and grandchildren). The Wednesday before Sun 'n Fun, after taking our daughter and grandchildren to the airport, we called Flight Service. They told us that there would be very bad weather along the Gulf coast for the rest of the week and weekend, and Qur only hope of getting there in time would be to leave right away, and fly through it before it became worse. I told Shirley she had 1 hour to pack, and we were off the ground at 2:30 PM. Flying south toward Tucson, we encountered a heavy cloud layer which we thought we could fly over, but the clouds continued to get higher. At 15,000' we encountered icing, and still couldn't dear the tops, so we fumed around and decided to fly under. We flew around the mountains to Lordsberg, Demming, El Paso, and reached Ft. Stockton, TX, at dusk. The next morning Flight Service said the weather ahead of us was not only IFR, but there were violent embedded thunderstorms along the front, so we decided to wait. In the meantime, 6 other airplanes, all headed for Sun 'n Fun, arrived at Ft. Stockton. They had all tried to get through to Austin, TX, but had to turn around. We waited, and waited. By Saturday, FSS told us the weather would be VFR as far as

Baton Rouge by mid-afternoon. In the meantime, Cozy builders Ken Francis and Frank Bibbee called us to say they would be leaving from Dallas Saturday morning and would meet us at Baton Rouge. We arrived at Baton Rouge about 2:30 PM just as they were leaving. Rather than landing to refuel, we joined up with them to fly with them through the bad weather. Frank is an American Airlines Captain, so we had confidence in his judgement that he could lead us through. We only had 13 gal. of fuel left, so we advised him we would have to stop along the way to refuel. He led us along the beach from New Orleans on. Ceiling about 1000' and visibility sometimes obscured by scud clouds, rain showers and lightning. We landed in the rain at Gulf Shores for fuel. We took off in formation right behind Ken Francis. Ken rotated at a lower speed than we usually do, but we rotated as well. When we were about 10' in the air, we got caught in his wake and got bounced back onto the runway and then up in the air again. This put our landing gear to a more severe test than we had ever imagined, but it didn't faze it. We then continued on for a couple hundred miles in formation through the bad weather along the beach, and then across the Gulf to Cross City before we were through the front and back into good weather. It became dark before we reached Lakeland, so we made night landings. The EAA area was closed, so we had to park at the terminal until morning. They wanted to charge us for parking there, which we considered to be an insult, and refused. The next morning (Sunday) we taxied across the airport, and pushed our airplane in to our exhibit area. We appreciated the fact that David Higgins also parked his Mark IV in our exhibit area before we arrived, which he agreed to do ahead of time in case we couldn't get there. Steve Wright and Wayne Lanza were very generous and helpful in supplying us with a gazebo (to shade us from the sun), and table and chairs, which we would not have been able to pack in our airplane. Our Cozy builders are some of the finest people we have ever met. We stayed in a condo with Jack and Donna Wilhelmson, and Ken and Shirley Francis, and later, Al and Nance Aldinger and Vance and Lynn Atkinson. Al Aldinger flys pipeline and powerline inspections in a Cessna for a living, has accumulated 33,000 hours, and is delighted with his Cozy. He is TALL, at least 6'4", and mounted his canopy higher, as we suggest for tall pilots, and has more than enough headroom. We counted 13 Cozys and Mark IVs altogether at Sun 'n Fun.

Our banquet on Sunday at the Red Barn, arranged by Cozy builder Bill Walsh, was very successful. Around 60 builders and friends attended. We heard later that a few more never made it because they had been given wrong directions and couldn't find the Red Barn. We are sorry!

We had another parry on Monday night, arranged by US Aviator, which we helped to sponsor. The food was great and the entertainment was the "Lost Patrol" Dixieland jazz band, the most talented band we have ever heard. This was the third year we have attended a party arranged by US Aviator with this talented band entertaining us, and if you ever have the opportunity, make sure you hear them. At 10:30 PM, when they were scheduled to leave, we wouldn't let them go, and they had to continue to play encores until 11:00 PM.

A big attraction at Sun 'n Fun was a Cozy built in Venezuela, with twin Suzuki 100hp engines mounted in the cowling driving counter-rotating propellers. The installation was a mechanical engineering marvel. The builders had flown it 1300 miles from Venezuela, across the Gulf, with a fuel stop in the Dominican Republic, in 10 hours. They were interviewed by Jack Cox for Sport Aviation, and Dave Martin, for Kitplanes. There should be articles in both magazines in a couple of months.

Attendance this year was down a little, probably because of the bad weather across the country, and also the bad weather in Florida. We stayed on a few days after the fly-in, hoping to enjoy some good weather, but it continued to be bad. There was no break in the weather, and when we headed home, we again had to fly through a front. We couldn't reach Ft. Stockton, TX, as planned, so we diverted to

Pecos. We were greatly impressed with the hospitality extended to us at Pecos. We got a discount on fuel, we were supplied with a courtesy car for free, and they put our airplane up in a hangar overnight. We very much recommend a stop at Pecos.

All in all, the weather on this trip was the worst we have experienced in 19 years attending airshows all around the country. We hope it will be better next year.

The 1st of May we were honored with a visit by Cozy Mark IV builder Mark Beduhn. He is almost completed with his Cozy, so he popped in to get a familiarization ride in ours. Besides taking him for a ride, we showed him around Mesa a bit and had a good time swapping stories.

CHINO

May 9th, we flew to California to attend the fly-in at Chino. The Chino fly-in is sponsored by Aircraft Spruce, so we like to attend. We have learned that the LA basin is usually smogged in in the moming, so we planned to fly in there on Friday afternoon. Even though the visibility is usually very poor, after you fly over the pass (Banning?) from Palm Springs, if you set your GPS on Chino (CNO), and keep the needle centered, it brings you right in on runway 26. After arriving, we called the Cozy Cadwells, and they came over to pick us up. They live in Corona, a short distance from Chino, and had generously offered (insisted?) that we stay with them. Gai has his Cozy based at Chino, and now has 700 hours on it. We also got to renew our friendship with the Coopers. Lon, if you remember, is a very talented builder who, with the help of his wife Michelle, made our trophies, Cozy models, and now our awards. At the awards banquet, Burt Rutan was the featured speaker, and after his speech, we awarded Gai one of our 500 hour awards in recognition of his 700 hours on his Coy. We enjoyed the fly-in, seeing the Coopers again, staying with the Cadwells, and all the new prospective builders we met.

Right after resuming from Chino, we downed our Coy to make our engine change.

ENGINES

Our evaluation of the Franklin engine has been completed. We had it installed in our Coy Mark IV for exactly 1 year. During that time we made trips from Mesa to Arlington, WA; from there to St. Paul, MN; from there to Oshkosh, WI, and from there back to Mesa. Then we made a trip to Page, AZ and return. Then to Copper State (a very short hop). Then to Kissimmee, FL, and to Lakeland, FL, and then back to Mesa, AZ. After that, from Mesa, AZ to Chino, CA and return. For these trips, and quite a few local hops, we put on 69.3 hours. During this time, the Franklin operated flawlessly. In the beginning, we had some cooling problems. We determined that there wasn't enough clearance over the aft cylinders, and the exit air was being restricted. We re-contoured the top cowling and this problem was solved. The Franklin is a very smooth running engine. Installing it is a little more complicated than the Lycoming. It didn't appear to have much, if any more power for takeoff, but 75% power cruise was 10

mph faster (230 mph) due to the higher rated rpm (2800) for the Franklin. We calculated it to be approx. 90 lbs. heavier installed than the Lycoming, but we need to confirm this when we make a new weight and balance with the Lycoming. We had to carry about 17 lbs. of lead in the nose for Shirley and me (front seat weight about 290 lbs.). Our conclusion is that it is an acceptable alternative to the Lycoming, for those builders who plan to carry more weight in the front seat than we. Our 1st choice is still the Lycoming 0-360. We plan to make Franklin engine mounts and cowlings available from our suppliers, and draw up plans and instructions for baffling and installation.

We decided not to evaluate the IVO prop on the Franklin (Duane Swing of Velocity reports that it works very well on the Franklin), because we wanted to get the Lycoming reinstalled, checked out, and broken in so we could fly it to Arlington and Oshkosh.

When we removed our Lycoming a year ago, it had 1800 hours since new. It was still running well, but was 32 years old, so we decided to go for a major overhaul. The cost of a major overhaul is determined by whether you will accept parts which are still within service limits, or whether you want everything restored to new specifications. We opted for new specs, so we purchased new, Mellenium cylinders, pistons, rings, valves and springs (by Superior), had the crank reground to remove some slight pitting it had acquired over 32 years, had it polished on the inside to comply with the latest AD, had the accessory case and crankcase remachined, and the latter rebored, the camshaft replaced with the newer style, etc. It cost more than we expected ($11,000), but we ended up with the same as a brand new engine. Reinstalling it was more work than just putting the same engine back in, because we had to undo a number of changes we made to install the Franlclin. Also, we used B & C's new, 90 deg. spin-on oil filter mounting, which meant that there was no longer room at the top of the firewall for the cooler, so we relocated it in the bottom cowling, behind the strake. It made a nice, clean installation, and works very well there. We also used Featherlite's carburetor air filter heat box kit, which mounts on the throttle body and picks up ram air from the scoop - a really excellent kit at a very reasonable price. Break-in has gone well so far.

CYLINDER HEAD TEMPERATURES

New and just overhauled engines run hot until the rings seat, so control of cylinder head temperature and oil temperature is critical during the break-in period. You really should measure cylinder head temperature on all cylinders, because temperatures can vary widely, particularly during break-in. It is also very important to realize that the temperature is dependent upon where it is measured, and the limits have to be adjusted accordingly. Lycoming says that the absolute maximum cylinder head temperature is 500 deg. F. Disregard this! Lycoming and engine shops say that for maximum engine life, the maximum should be 400 deg. F or less - but this must be qualified. These limits assume that the temperature is being measured by a probe installed in the bottom of the cylinder, and the engine has down-draft cooling. With down-draft cooling, the bottom of the cylinder is the hottest. However, with updraft cooling, like we have, and which we consider to be superior, because the cooling is aided by convection, the bottom of the cylinder is the coolest part of the cylinder. So we need to know how much the temperature varies from the bottom to the top, and adjust the limits accordingly. According to measurements made by RAF, the difference can be as low as 40 deg. F. in climb with a rich mixture, or as high as 70 deg. F in cruise with a lean mixture. So if you are measuring with probes installed in the

bottom of the cylinders and have up-draft cooling, the temperatures should be no greater than 360 deg. F with full rich and 330 deg. F or so in lean cruise, for maximum engine life.

Now, some builders install thermocouples under the spark plugs, because they are less expensive than probes. These builders must make a further adjustment. RAF determined that thermocouples under the plugs read approximately 40 deg. higher than a probe installed adjacent to the plug. It would seem then that if you installed thermocouples under the plugs on the coolest side of the cylinder, they would read approximately the same as probes installed on the hottest side of the cylinder. So for up-draft cooling, the best place to install thermocouples under the plugs for the least correction would be at the bottom of the cylinders. Conversely, if you install thermocouples under the top plugs and have up-draft cooling, you will be reading a temperature that is about 40 deg. F too hot, so you can adjust your 400 deg. limit to 440 deg. We hope that you understand this and correctly set your temperature limits.

The good news is that up-draft cooling, using a NACA scoop as shown in our plans, provides really excellent cooling in addition to providing ram air into the carburetor. Don't let anyone talk you into the so-called arm pit scoops. They are the pits! You must baffle the engine meticulously, as shown in the plans, to make sure that no air can get through the cowling, or out, except by passing through the fins. The NACA scoop shown in the plans, 3" x 15", provides plenty of air for cooling the cylinders, for cooling the oil, and for the carburetor. It provides two additional benefits - in a climb, it provides additional cooling air, and on the ground while taxiing or while parked after engine shutdown, natural convection gives additional cooling. With our up-draft cooling, our engines do not overheat in taxiing or waiting for takeoff, like those with down- draft cooling.

It is typical that the cylinders closest to the firewall, and for the Lycoming those are cylinders #3 & #4, win run the hottest, unless you install baffles in the bottom of the bottom cowling to deflect more air up to cylinders #3 & #4, as shown in the plans. It is suggested that you install these baffles a little taller than necessary to start with, and shorten them a bit at a time until an CHTs are equal, or have no more than a 20 degree spread. You will find that the temperature distribution is dependent upon airspeed, so we suggest that you balance your CHTs for full throttle (at altitude) and lean cruise, which is the most critical condition. To give you an idea what to shoot for, after 2 hours of break in, with probes in the bottom, up-draft cooling, 8,000 ft., 2660 rpm, leaned to best power, our CHTs are 347, 327, 337, & 337 deg. F and in a downward trend, and oil temp was 173 deg. F. At lower power settings, or rich mixtures, the temperatures will be lower, but the variation will be greater. We have also noted that the landing brake seriously disrupts cylinder cooling, so you should not have power on very long with the landing brake down. Putting it differently, if you make long, power-on approaches, don't put the landing brake down until you "have the runway made".

If you have any questions about the above, please call us.

ELECTRIC NOSE LIFT AND TRIM

As we reported in our last newsletter, we installed Steve Wright's electric nose lift and Alex Strong's electric trim to evaluate them for builders. We have put about 25 hours or so flight time on since then and both have performed flawlessly. Shirley has arthritis and gets a real kick out of climbing in when

parked on the nose, and pushing a button and getting liked up. When we are ready to park, she stays in until after we let the nose down. I haven't had to lift the nose for the last 25 hours. I never thought it was a big deal, but the electric lift is a luxury and impresses others. It added about 10 lbs. at F22, but we are light and can afford it.

The electric trim works well. The binding we reported earlier was solved by loosening the pivot. The electric trim has more authority than the trim shown in the plans, which means it can cover a greater range of front seat loads and speeds. The plans trim system had a handle which indicated the trim setting at all times. With electric trim there is no indication in the cockpit, however, you only really need to know the trim setting when you are on the ground before takeoff, and an you have to do is look at the elevator position. In the air, you don't really care about the setting, because you use trim as required to take pressure off the stick.

The bottom line, folks, is that both of these are nice additional touches for sophisticates who don't mind a little additional weight.

VANCE'S COLUMN

Dear Builders,

Another Sun 'n Fun has gone by, and our group suffered no battle damage! Our trio of 3 Cozys was joined by a 4th (DL Davis) at Lakeland and we flew down to Key West for several days. We also had a Long EZ running with us taking pictures. As far as the flying goes, we had good weather down and back to the Keys, but encountered some rain both ways to Lakeland from Dallas and back. The highlight of the flight was a 5 ship formation flight over the town and then down the runway with a 8-G pull-up at the end of the runway into a single file downwind and landing. Ground personnel said it looked awesome!! I believe we did a righteous job and the tower said "come back next year!!!"

Because of the rain there Is some paint missing off the leading edge of one wing and the prop is slightly eroded (even after reducing RPM to 2200). Oh well, I guess that's the price we pay for going faster than the speed of stink!

Of the 5 planes, 3 of us have electric elevator trim systems. I don't want to imply that everybody has electric trim, but quite a few high performance homebuilts either have built them in or are upgrading to them. Reason being more people are putting in bigger engines and thus are increasing top end speed and or total weight. That translates into more stick back pressure for landing and more forward stick pressure for high speed cruise. The stock trim systems were not designed for this wide of an envelope. My original trim system did not even use any springs! I used an 1/8" steel rod about a foot long with a T handle on the end to push and pull a paddle-like spring board made out of uni and bid that was bolted to the elevator torque tube. This arrangement worked pretty darn good except for the fact I kept wearing out the twist-lock mechanism and wound up replacing the unit every year or so. After a couple of years went by I thought more and more about hooking up an electric motor to the elevator torque tube. Finally I found a small electric motor and gearbox that I thought was perfect, I thought. I had to machine a spiral groove in an aluminum drum for the cable to wrap around that went up to the elevator torque tube.

This was system 2. It lasted about two years and was unreliable enough that I was already thinking about system 3.

The main drawback in any of these electric trim systems is it costs lots of money! So what else is new in aviation? I had been using a nifty light-weight ball and screw actuator in my electric cowl inlet lip for 5 years now with absolutely no problem (and plenty of abuse). I paid $100 for it way back when. Now they are $250, still light weight and reliable but expensive! I bit the bullet and sent for one. While waiting, I gathered up some aluminum tubing, some bushings and a couple of springs and came up with a miniature shock absorber that was going to be put in place between the actuator and the elevator. This little tube with two internal pre-loaded springs would be the heart of the unit. The uniqueness of the EZ's and thus the COZY's, is the light control forces and feel of the controls. Break-out, control loading, rate of change of force all affect what your ittybitty soft pink whoopees feel. I went through several sets of springs before I settled on the ones that give me that just right feeling. The whole unit is rather small but long. It weighs less than 2 lbs., is less than two feet in length, and snuggles up against the side of the fuselage out of the way of everything. Couldn't of planned it better if I was an engineer, and it only took 4 years! In defense of the $250 actuator, it is light, powerfull, freewheels at both ends of travel (important for a primary control actuator), can be overridden easily, and it looks like an aircraft part ..... but still expensive! This last unit (system 3) has been on my aircraft for 4 years now with no glitches or breaking down. It has never malfunctioned and always performs as commanded. I would recommend it highly if you want to go electric.

There are other people who make trim kits also. They are as follows:

1. Alex Strong (COZY builder/flier) has a nice kit he sells for $175. It uses the same shock absorber that I came up with, but his actuator is derived from a Black and Decker electric screwdriver with various torque settings. If you would like to look at it on the net, type in www. canard.com, scroll down and you will see his ad. Click on it and you're in business! He also has brochures available. His slow-mail address is PO Box 1316, Yermo, CA 92398. His voice mail is (619) 254-3692.
2. Ken Miller (Long EZ flier) has another nice kit for around $175, but it uses a fiberglass springboard (similar to my first one) and a different electric actuator. He lives in NY where he has a shop that specializes in EZ type aircraft. His address is 105 Kraus Rd., Mattituck, Long Island NY 11952. (602) 474-7097.
3. If you want a simple set of plans I will send you a set free if you send a self-addressed, stamped, envelope to me, Vance Atkinson, 3604 Willomet Ct., Bedford, TX 76021. These plans are what I used to build my system with. It's a one page drawing with some dimensions and a list of materials.

Vance Atkinson N43CZ
vaatk@flash.net

FIRST FLIGHTS

Please report your first flights to us. It is an important accomplishment for you which we would like you

to share with others. The following were reported since the last newsletter.

1. Carlos and Rueben Leon first flew their twin-engine Cozy Mark IV in Venezuela on 212197.
2. Brian Heinitz, Citrus Heights, CA, first flew his 3-place Cozy on 3/20/97.
3. John Maita, Ft. Lauderdale, FL, first flew his Cosy Classic on 3/22/97.
4. Chris Scida, Rocky Point, NY, first flew his Mark IV on 413197.
5. Larry Sligar, Myrtle Creek, OR, first flew his Mark IV onS14197.
6. David Machin, Chatham, Kent, England, first flew his 3-place Coy on 5/14/97.

Some of these were reported by telephone. We received the following letters:

2/3/97
Dear Nat and Shirley,

We are very happy to inform you that our Cozy Mark IV, serial # 0308 made its first flight on 2/2/97. On this Sunday, my brother and I woke up really early in the morning on a beautiful Valencia day, put on our parachutes and took off to test our new plane. The takeoff was uneventful. After rotation, we adjusted for 100 kts and had a climb rate of about 700 fpm. We leveled off at 10,500 feet, a height at which we felt comfortable in case something went wrong with the engines.

We built our Cozy MKIV totally to specifications but wanted to test an idea we had with automotive engines. As you might already know, we made it a twin by installing two Suzuki 1600 cc, four cylinder, in-line engines. Each has about 100 hp and each drives a 3-blade warp drive pusher propeller on the same axis (coaxial). One propeller is right behind the other and they rotate in opposite directions (counter-rotating). Both engines fit inside the cowling which is very similar to the original Cozy cowlings. Our airplane's empty weight is 1250 lbs. and has an empty e.g. of 113 inches. We installed two batteries in the nose to help with c.g. position.

We very much appreciate all the help we have received from you and are enclosing a check for our newsletter renewal.

Carlos & Ruben Leon
Caracas, Venezuela

5/12/97
Dear Nat and Shirley,

Enclosed are pictures of my Cozy MK IV. Five and one half years ago I purchased #0074 MK IV plans from you. Two businesses and three moves later, I have finally completed N136LS.

I want to take this time to thank you both for the continual support you rendered while I built my bird. I marvel at the accuracy of the plans and the ease in which they are understood. Your contribution to the aircraft world is greatly appreciated. I flew my Cozy for the first time on 5/4/97. Everything went very well. The CHT and oil temps were both too high (due to my deviation from your tried and proven plans). I now have them both under control. The Cozy flew flawlessly - it is so maneuverable and fast. It flys straight and level hands off. Empty weight came in at 1055 lbs. Thanks again for a wonderful airplane, Nat.

Larry Sligar
Myrtle Creek, OR

Chris Scida told us on the phone that his first flight was 4/3/97, that it took him just 2 years and 3 months of building time, that he didn't do any taxi testing, and that he climbs at 2000 fpm. At 7,000 ft. he does 155 kts *(**Editor:** after his engine is broken in, and he is able to lean it out, he should get much faster speeds)*.

Vance Atkinson writes:
6/5/97
Dear Nat,

I just finished flying Chris Scida's neat Coy Mark IV in NY. It has just over 40 hours total time. The total weight is about 1140 lbs. It is powered by an 0-360 with a Performance 3-blade prop. It runs very smoothly. The whole airplane is very smooth. He installed regular bearings throughout the control system. The interior is all leather and the exterior is ice-white with an up-scale stripe down the side - very nice looking! This Cozy is a great performer with its 0-timed engine.

Vance Atkinson

PUBLICITY

We haven't noticed any Cozy pictures in Sport Aviation or Kitplanes recently. If we have missed anyone, please let us know.

ARLINGTON '97

Last year, Eric and Vicki Westland hosted a very wonderful party for Cozy builder! in their home. Eric writes:

6/1/97
Dear Nat and Shirley,

This year's Arlington fly-in will take place from Wednesday, July 9th to Sunday, July 13th. Like last year, we would like to host the Coy dinner at our home on Friday, July 11th after the airshow, at 5 PM or so. The Seattle area has plenty of restaurants, but banquet dinners are expensive and your time visiting is limited. Besides, having it at our home will allow us to show off our original water color by Shirley Puffer! This year, we would like to ask for $5 per person *(**Editor:** Why not also include a nice, big tip.~)*. For this, we will provide all the good food you can eat along with soft drinks. We would ask

folks to bring their own beer/wine. We have a large yard and children are welcome.

Knowing how many people are coming is key to keeping the cost low and making sure we have plenty of food for everyone, so we would like people to RSVP to us as soon as they know they are coming. They may call us at (425) 513-0941. We don't need any money in advance, we just need to know how many are coming. We are looking forward to seeing you again!

The Westlands

We plan to attend both Arlington and Oshkosh again this year, with a stop off in Minnesota in between. This is an important year for us, not only because it will be our 25th year at Oshkosh, but because we will be celebrating our N,b>50th WEDDING ANNIVERSARY! We will be celebrating with our kids and grandkids during our stop off in Minnesota.

OSHKOSH '97

At Oshkosh, we will again be exhibiting our Cozy Mark IV in the exhibit area at the south entrance to the North Exhibition Building, just outside of the Aircraft Spruce location. We have also scheduled a Cozy Builders Forum for Friday, August 1, 1:00 PM in Tent #3. We would like to meet as many builders as possibly, should have more news to report then, and will be happy to field any questions. As has become the custom, there will again be a Cozy banquet at Oshkosh, which is always well attended. Cozy builder Daryl Lueck, in Franklin WI (414) 570-0365 has generously agreed to take over arrangements from the Pershings, who did it for many years. Daryl advises that it will again be at the Ramada Inn, along Hwy 41, north of 9th, and 1 exit north of the airport, on Friday, August 1, at 6:00 PM. It will be "all you can eat, buffet style", and cost, including tax, gratuity and incidental expenses, will be $13.00. There will be a cash bar. Daryl has tentative agreement from air-show performer Patty Wagstaff, to be our guest speaker (ladies take note!). Better plan to leave before the end of the airshow, to avoid the horrendous traffic jams. Those who can provide rides should offer them to those needing rides either on the Cozy flight line, or at our exhibit south of the North Exhibition building.

ELT ANTENNAS

Joe Heagerty recendy wrote to us asking our opinion on an article written by Jim Weir, of RST, describing how you could build an ELT (emergency locating transmitter) antenna into the fuselage wall of a composite aircraft. I have great admiration for Jim Weir, and swear by his antennas, which I have used in 5 composite airplanes now, but I was a lithe shocked by this one. First of all, the ELT and its antenna is the one piece of equipment that you want to survive a crash, even if there is nothing left of the airplane. Secondly, I have, and would recommend to all builders, a PORTABLE ELT with a whip antenna which is small enough to fit in my pocket while I walk out for help, should I ever be unfortunate enough to have an emergency landing off airport. The ELT antenna is the only one that I

would recommend you not build in to your airplane.

NEED HELP WITH YOUR PROJECT?

We discourage builders from seeking help from custom shops because there is no way of knowing whether components are built in exact confooce with plans, and we have seen some glaring examples of parts not built according to plans which were actually unairworthy (not safe). We do know of builders whom we trust who have made parts for others. To name a few, Vance Atkinson, Dennis Oelmann, Steve Russell (not to be confused with Jeff Russell), and Robin DuBois. Here are a couple of new ones:

8/30/97
Dear Nat,

Arrived in the Reno Area on the 17th. Had a nice visit with Brian Scott and got to see my Cozy N456DP again at Deer Valley Airport, and very much enjoyed my visit with you and Shirley. It was nice meeting you both after these many years. I Would like to reiterate my interest in assisting anyone in building either a Cozy III or Mark IV. Anyone interested should know my preference would be to assist only with the airframe construction and engine installation. With my assistance, the aforementioned could be completed in as little as 6-8 months. My experience with composite aircraft dates back to 1979, when I began construction on my first Long EZ. Another Long EZ airframe was subsequently constructed and then a Cozy III. I also assisted with final stages of a Lancair 360. I have references for anyone that may be interested. Logistics with respect to how and where construction will take place would be worked out on an individual basis. So if anyone is short on time but long on money and serious about owning a Cozy III or Mark IV, write or call me at PO Box 3285, Sparks, NV 89432. Tel (916) 546-7018. Thanks a bunch Nat. You both take good care. Perhaps I'll see you at Copper State.

Sincerely,
Dave Petrosino

6/9/97
Dear Nat & Shirley,

This is an update on our Cozy Mark IV project #0026. As you know I have had delays with the major one becoming allergic to all the epoxys, RAE, Safety, 2427, and now EZ-Poxy. However I do like the way that the EZ-Poxy works out. Of course, as you know, we also sold our home in Globe, built a new one at Gold Canyon, and moved twice including moving our Mark IV, and sold our business. I waited tll after contouring the wings to the strakes before attaching the winglets, which is my last major epoxy project. I am fortunate to have found an individual, Craig Hamm, who is offering "builder assistance". He has extensive experience with composite aircraft and has spent 4 years building Glassairs in a factory authorized facility, and completed a Lancair, EDI (Wheeler Express) and Europa aircraft as well as Ezs. He has proven to be a meticulous craftsman and very knowlegeable. With Craig's help, the winglets are now attached and we are finishing up with the rudders and starting to fill and contour the wings. While the airplane was upside down and contouring the wings to the strakes, I completed the final paint on the bottom half. This was an exciting moment to see a part of the project complete! It is

strange that the painting process does not seem to bother my allergies, so that should not slow me down. I am shooting for September for first flight if all goes as planned. We are very excited to feel on the downhill portion of this long project and to begin to think of flying again! Craig has provided invaluable assistance and without going on about it, I would certainly recommend him to anyone who is considering getting some help to move their project along with in-shop help or to avoid epoxy exposure. His telephone voice mail is (602) 209-5879. I would be happy to talk to anyone with questions and I can be reached at (602) 671-7355

Nat, you and Shirley have provided such excellent support as well as encouragement from the very beginning of this project. Carol and I have felt grateful that we chose the Cozy Mark IV for many reasons but particularly because of the builder support that you provide. See you in the air in September!!

Sincerely,
Gene Davis

ACCIDENTS/INCIDENTS

We have always stated that the purpose in investigating accidents and reporting our findings is to help other builders to avoid a similar occurance. Sometimes it is painful to the builder involved, to review in detail what went wrong; however, we feel justified when other builders confide in us that our accident analyses have prevented them from having a similar accident.

EXPERIMENTAL AIRCRAFT ASSOCIATION

The EAA has been a major positive influence in general aviation since the 50s, especially for those of us who wish to build and fly experimental aircraft. We joined the EAA in 1973 when we started building our first airplane, and have been active supporters ever since. As a matter of fact, we haven't missed an Oshkosh in 24 years, and have been exhibiting airplanes there that we have built ever since 1978. We encourage all of our builders to join both the national organization and also a local chapter. Exhibiting an airplane at Oshkosh is a must for all builders.

The EAA has had a Technical Counselor organization for many years. These are experienced builders who have volunteered to help first-time builders by visiting their projects, critiquing their work and offering suggestions where appropriate. The Avemco Insurance Co. acknowleges the value of this program by offering a 10% reduction in insurance premiums if a builder has logged at least 3 official visits by a Tech Counselor. Avemco also offers another 10% reduction if the builder is an active member of a local EAA chapter. A more recent EAA program is the Flight Advisor. This is an experienced builder/pilot who is qualified by the EAA to assist a new builder in preparing for his first flight. Most homebuilt accidents occur during the first few hours of flight, and most insurance

companies are reluctant to provide coverage during this period. This can pose a problem because some states will not allow you to make your first flight until you have insurance coverage. If a builder avails himself of the services of a Flight Advisor, Avemco will provide insurance coverage during the first 10 hours of flight.

FOR SALE

1. Cozy builder, Bill Walsh, has arranged a source of tee shirts (sweatshirts available on request) which come in various colors but only adult sizes. They have a detailed picture of the Cozy or Cozy Mk IV. The Cozy name is printed above. Bill is also working on other Cozy items, such jackets, caps, pins, and cups. The shirts are available at $9.95 plus $1.50 shipping and handling. Orders for 2 or more are sent 2-day priority Make checks out to Linda Walsh, PO Box 160884, Altamonte Springs FL 32716. (407) 695-3543.
2. Wayne Lanza makes a number of very nice goodies for the 3 and 4-place Cozys. He has an electric speed brake actuator kit with all the parts needed for installation, with instructions for $275. His latest creation is a switching and breaker panel for the Mark IV. It is similar, but not identical to the one we had made for our plans model. It is located at the top of the panel, which is the best location for appearance and access to the electrical system. Wayne is using the highest quality DC switches (They are hard to locate) and circuit breakers, and pre-wires the panels, making the rest of the electrical system installation very EZ. Cost is $425. We really appreciate Wayne's contribution, and heartily recommend his products to you. Contact him at: 9425 Honeysuckle Dr., Sebastian, FL 32976 (561)664-9239.
3. We believe that the 4-pipe stainless steel exhaust system we designed and is being manufactured by Custom Aircraft Parts (see Authorized Suppliers.) is far superior to anything else available or advertised for the 3 and 4 place Cozy (or Long EZ, or any other pusher, for that matter). Cost is $500, which includes shipping and handling.
4. New, improved fuel sight gauges. Clear bubble with white background. S35 per set. Vance Atkinson, 3604 Willomet Ct., Bedford, TX 76021-2431 (817) 354-8064.
5. Dr. Curtis Smith's nosegear ratchet (which we recommend) is now priced at S40. Dr. Smith's new address is 1846 Sextant Drive, Warden, IL 62907-9631 (618) 656-8209.
6. Steve Wright is making electric nose-lifts for the Cozy III and Cozy Mark IV aircraft. It has been up dated with improvements suggested by Vance Atkinson and by ourselves as a result of our recent installation. It will raise the nose with full fuel and baggage and at least one person sitting in the front seat. Check with Steve on (615) 373-8764 for most recent pricing.
7. Cozy builder Alex Strong is making a neat electric trim system for $175 which we are currently evaluating. You can reach Alex on (619) 254-3692.
8. B & C, in addition to their light weight starters, alternators and linear regulators, has just introduced a neat right-angle spin-on oil filter adaptor for Lycoming engines. We ordered one ourselves for our Lycoming, and it looks like a work of art. Contact Bill Bainbridge on (316) 283-8662.
9. Our authorized supplier, Featherlite, whose parts we have tested and approved, has many pre-fab parts available for the Mark IV. We printed the list of parts and prices in the last newsletter. Featherlite has also taken over the manufacture of propellers from Bruce Tift's estate. The B & T propellers were good propellers, with a urethane leading edge, and we are pleased to see that

they are available again.

10. Coy Mark IV project #323, completed through Chapter 10, with additional materials and parts, $11,000. Highest quality workmanship. Contact Ron Newsom at (602) 963-2628. The aircraft is located at 13732 E. Ivanhoe St., Gilbert AZ 85296. E-mail address is slkeagle@swlink.net

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LETTERS FROM BUILDERS

3/16/97
Dear Nat,

As of today, I have surpassed 20 hours of flight time on my new Cozy Mark IV. I have tested up to 210 mph without a trace of flutter. As a matter of fact, the faster I push it, the more stable it becomes. I am continually amazed at how docile this airplane is.

We have all heard of how hot the EZ series of planes is. People who do not have the facts straight think that they use too much runway during takeoff and landings. This simply is not true! I can easily break ground in 1200 feet and peg my 2000 fpm VSI. Anyone who hasn't purchased their instruments yet might consider a 3000 fpm VSI so he won't run the risk of bending the needle! On the other end of the scale, you have the option of pulling the throttle back, trim and putt putt around the patch at Cessna speeds (but who wants to?). I typically cruise around at 150 to 165 knots without breathing too hard. If you read between the lines on this letter, you will read, "I'm having a ball shaking out this bird!".

For all the serious builders out there in Cozy Land, prep on, you're going to be surprised at how well your Cozy creation flies. For the guys who can't seem to get it in gearÄif you only knew what you were missing, you might be able to find an hour a day and one of your weekend days. I am helping another builder now; I will let him reveal himself when he is ready; and we are progressing nicely. His Cozy will be nicer than mine, but those are the breaks. If I can help motivate you, feel free to contact me at (502) 259-5928 between 6-9pm CST,or on weekends if you can catch me on the ground.

Best regards,
Mike Davis
Leitchfield, KY

4/16/97
Dear Nat and Shirley,

Just wanted to drop you a line to thank you for your wonderful hospitality at Sun 'n Fun. We certainly did enjoy our first fly-in with the Cozy and I'm ready to attend another one. We hated leaving earlier than we'd originally planned, but we weren't looking forward to fighting rains all the way back to Texas like we did on the way to Florida. We stopped at Gulfport on the way home and had a fun night at the slot machines. As usual, we left a contribution at the casino.

We had a good flight back to Texas. Al was a little concerned about the engme, but we had no problems on the way home and it seemed to be running fine. We made it home in a little less than 6 flying hours.

Got home in time to mow the lawn before the rains hit here!

Looks like we will miss Arlington by a couple of days. We'll be heading back to Dallas'lrom Seattle on the 6th of July. Once we get back to Dallas we'll probably take a day of rest and then head up to Minnesota in the Cozy. I know this year our trip to Minnesota will be a lot less traumatic for me than last year's trip. I'm now a "seasoned" Cozy traveler. Ha! Ha! We'll also miss Oshkosh since we'll be heading back to Texas around the 18th of July. Next year we'll just have to plan our vacation a little better.

Al plans to spend this weekend installing Steve Wright's electric nose-lift. He's been playing with it on the kitchen table off end on all week.

Once again, thanks for taking us under your wing at Sun 'n Fun. Although I enjoyed a night of camping under the wing of the Coy, it was nice to take a REAL shower and eat decent food. Hope to see you in the near future, and if not, we'll see you at Sun 'n Fun again next year! Warm regards,

Nance & Al Aldinger
Lancaster, TX

5/21/97
Aloha, Nat!

My family and I hope you are well. Last year, during my renewal, I just knew that I would be done working on the downstairs addition to our house by this time. But thanks to county regulations and a heavy work-load, I am still dreaming of building Cozy #327. Every day, I pass by my plans on one of my filing cabinets in my office, and give a sigh. Hopefully, we will be finishing the downstairs soon so my son and I can start production of what we REALLY want to be working on. I do want to thank you for such a great airplane design. I have never heard of any design flaws of the Coy that make the airplane unsafe. I think that pilot error is the #1 problem when people flying Cozy planes have troubles. Take care, and God bless.

Gary Lyons,
Kamuela, HI

1/31/97
Dear Nat,

I really did not expect a response to my letter, but thanks for taking the time to address my comments. I did not mean to discourage individuals from using the Franklin engine. In the helicopter application, the engine is in a vertical position which allows all the oil to settle in the accessory gear box, which is not known for its ability to hold oil. Although in the horizontal position the oil is not pooling in the gear box, and that is a good thing. I hope I cleared this up. Every engine out there has its quarks and I could talk about all of them, but I am not writing a newsletter.

I totally agree with your advice to first build the aircraft to the plans design. Then if a builder feels the need to modify the aurcraft he should realize that the first test flight is exactly that, a "test". This is a test the individual could be 100% prepared for and still fail due to controllability. Like the person who

discovered the deep stall and could not recover. I am no different than anyone else, I learn by mistakes. I just try to learn by someone else's. No one is perfect. Be careful of modifications, if you find something that sounds good to install on you aircraft and no one else has it, ask why? It's your life that is at stake! How about that soap box action. I'll get off now.

No one wants their aircraft design associated with accidents. Especially at the hands of an individual who is making unauthorized changes with no regard to the designer who carries the full responsibility of the design. These people impact everyone else after an accident through high insurance, etc.. I seemed to have climbed back on the soap box, sorry. I am an airworthiness inspector in the Honolulu FSDO. I will write more at a later date.

Sincerely,
Darcy D. Reed
Kaneohe, HI

3/26/97
Hi Nat and Shirley,

I enjoyed the latest newsletter like I have enjoyed all of the previous ones. Please sign me up for 2 more years. You may not remember me since you meet so many people, but we met at Sun 'n Fun last year and I've called several times. I appreciate the friendly service on the phone, especially no voice mail system.

Today I flexed the MKMGA tubes into the landing gear tabs. I'm very happy with the positioning of the strut. The plumb bob fell perfectly from the leading edges of the strut. The holes drilled out with some patient work but sliding the studs in the holes was always a challenge because the fit is very tight.

I try to work every day and more on my weekends. I still tell people I am 4 years from flying and they look at me like I am nuts. Here are a couple of pictures of my work/working. I used some copper tape (stained glass type) for measuring the inside curve dimension of the strut. I use a paint and insecticide mask and multiple gloves to work with the RAE epoxy. Notice Tim Merrill's pictures on the wall for motivation. Actually, N14CZ is behind me and also to the left of Tim's plane. In the 3rd picture you can see one of the clamps I use to hold the fuselage to the rotissiere. I couldn't see drilling holes in my work and the clamps work great. I promised another builder to give him my rotissiere stands after Chapter 9. They won't be needed for the canard sections and can't be used after the nose is attached. I'll miss being able to simply ton the tub to any angle to work.

My wife is an enthusiastic backer and helps sporadically. She loves to travel and also to fly. I've met many great people since starting my Cozy and I'm sure I will meet many more in the future years of building and flying. Thanks for the great plans.

Sincerely,
Bill Kastenholz
Oberlin, OH

4/12/97
Dear Nat,

I developed an alergy to Epolite 2427, so I stopped working on my project for that reason and others (work keeps interfering) My shop is too small, just 10' x 15', and my wife dislikes the mess in the garage. But it will be finished! Using barrier cream and gloves took care of one problem and next week I plan to buy a home building site next to a small airport just north of San Antonio. I really appreciate your work and dedication to the Cozy.

Yours truly,
Lowell Robinson
Bulverde, TX

4/16/97
Dear Nat,

With my renewal I've included a drawing of my clamp block that works well in, holding the lower longeron in place, fewer curfs and nails. I used a radial arm saw to cut mine, but any circular saw will do, table or hand held.

Thank you for letting me take pictures of you Cozy at Sun 'n Fun. It is a beauty. I hope mine turns out nearly as well. Hope you had a good trip back home.

John Frey
Sebring, FL

4/30/97
Dear Nat and Shirley,

I have a good reason to write to you. I think it is important that you occasionally stress in the newsletter, that builders should not make any structural or aerodynamic changes to the Mark IV (or other plans built a/c) as you did in the latest newsletter. In the building process, the builder starts to feel "comfortable" (it is not that difficult to put it together after all because of your very high quality plans). However, that does not make a builder an engineer in aerodynamics or an aircraft designer. Just because you have a private license or work within the Air Force and fly planes, it does not make you a qualified test pilot. These jobs require a long education, and it is not enough that you just built a plans built aircraft.

If a builder gets some fancy idea of how to make the Mark IV "look better" or "perform better" by changing only some "few minor unimportant things", he should FORGET ALL ABOUT IT. because he will end with an untested and unproven design that eventually could lead to a fatal accident. As we saw when Jim Patton tested the Mark IV, even small and "not very important" changes make a lot of difference in performance, aerodynamic handling, etc. Leave the changes and testing to the people that have the proper background!

Finally a short update from Denmark. We are now 3 Cozy Mark IV builders here in Denmark, so the "support" group is increasing. I have almost all the parts and materials for #220. Just recently, I received the canopy from Airplane Plastics. They really know how to pack things. You could not see that the box had travelled across the Atlantic Ocean.

Best Regards,

Major Michael Schroeder
Jaegerspris, Denmark 58 9

5/10/97
Dear Nat,

Please note my new address. I am slowly making progress on 0321CZ. At this point I have the wings, canard, center spar, fuselage (minus the nose gear) about complete. Its exciting to be close to having my Cozy begin to take form. Right now everyone thinks I'm building a boat. Keep the newsletters coming. They are extremely valuable.

Martin Kansky
Knoxville, TN

5/29/97
Dear Nat and Shirley,

I have finally made the decision to build a Cozy Mark IV. I would like you to know that I have been reluctant to start construction on any homebuilt because of my concerns over whether any particular company will be there for me until I finish. Only from you have I seen the level of support and dedication to your customers (and their safety, even when they didn't seem to care about that themselves) that would make me comfortable enough to commit to a design. The fact that your design is fast, inexpensive, efficient, and sleek is just a wonderful bonus!

You should know, if you don't already, just how thrilled people are with your design. The really astounding thing I found in searching through the various sites on the internet that Cozy builders have established, and talking to my local EAA people, was that not ONE single person had anything bad to say about you or your business. I hardly know of ANY businesses that can say that. A remarkable accomplishment that probably reflects your character. If you ever stop in Baton Rouge, give me a call. I would like to meet you both and buy you dinner.

Well, enough of the platitudes (though I do mean them), and on to the business at hand. Enclosed is my check and please send me plans. Again, thanks for designing a wonderful airplane. And more thanks for supporting it in the best way possible. I look forward to the day I can send you a picture of my "flying" Cozy. What a way to get where you're going!

Sincerely,
Thomas Hamilton
Baton Rouge, LA

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