

COZY NEWSLETTER #33 April, 1991

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We wish to welcome our new Cozy Mark IV subscribers. Subscribing to this newsletter is a requirement for all builders. Cozy builders from #4 on, and Mark IV builders from #33 on. The newsletter is the only practical way we have of communicating with all builders, and we try to keep the subscription price close to printing and mailing costs, so as not to discourage anyone.

We will be handling the Mark IV program the same way as the original Cozy, but with one exception. We will require each builder to sign a license agreement at the time of purchase, and assign a serial number at that time which will also be printed in his plans. This should simplify record keeping for all of us. Although we sometimes get calls from Long EZ builders, we are only obligated to support those who have licensed our design from us.

WHAT WE HAVE BEEN DOING

It seems like a long time ago, but after sending out the last newsletter. we hopped a plane and went up to Minnesota to spend the holidays with our children, grandchildren. and other relatives and friends. Then it was back here and back to work. Isn't retirement wonderful!

In January, Don and Julia Downey, writers for Kit Planes and friends, flew down here from Kingman AZ for a visit and to gather material for an article to be published this spring. Don flew the Mark IV (he is a big person. over 6 ft. tall) and then went up with Julia in their Cessna and Shirley and I in the Mark IV for some aerial photography. Julia flew while Don took the pictures. It was pretty routine (we have done this many times before), except Don had a camera tunnel in the bottom of his airplane and wanted to get some shots of the Mark IV from directly above. It was the first time I had ever flown directly underneath and a little forward of another airplane. They couldn't see us, and I had a hard time seeing and flying off them so it was a little hairy. I told Don that if I happened to get too far ahead and couldn't see him, I would dive and peel off to the left. This actually happened, so it was good that we had made this pre-arrangement. I haven't seen the pictures, but they will probably show my head tilted back at a pretty odd angle. They are an enjoyable couple, and we had a very good visit!

This is also the time of year when we get a lot of visitors and guests-relatives, friends, and builders- and this year was no exception. Everyone thinks that because they are on vacation, we should be also. It was a little difficult to entertain and also get some work done, but we apologized, and kept on. We are happy to report that as of this date, everything for Section I .Manufacturing Manual for the airframe, which consists of 135 pages 11 x 17, and 25 full size drawings 17 x 23, have been released for printing, and the full size drawings, 12,500 copies in all. were just delivered and sitting here waiting to be collated.

We should be ready to start mailing out plans in a week or so. We already have 16 builders who have already start, based on Xerox copies of the first few chapters, and a number more waiting for the complete package. We have been surprised and pleased by the response with very little publicity and no advertising .

One job which took a lot of time and effort and which we really didn't anticipated was the redesign of a lot of the hardware. It is no secret that there have been a lot of suggestions for improvement of the Long EZ (and Cozy) nose gear, but RAF was reluctant to make any changes because they are no longer selling Long EZ plans. We could not modify Long EZ parts, so our only recourse was to design completely new Cozy Mark IV parts, distinctively different from Long EZ parts. So we designed a new nose gear pivot, MKNG-6, new strut brackets, MKNG-3 & MKNG-4, a new shock strut with a stronger spring, MKI..ST, a new swivel assembly with a Bob Davenport shimmy damper, MKNG-15. and a new nose gear fork for a 10 in. dia. tire, MKNG-16, and new bushings MKNG-1, which allow you to tighten the axle without tightening the bearings, and we will be recommending the cast aluminum 4 in. wheel which won't fatigue and break when side loads are applied. The tooling cost will be somewhat in excess of \$3,(XX), but we are so relieved to finally get this resolved, it was almost worth any price. We just received the first castings for approval and they were really neat. These parts are available to Cozy and Long EZ builders if they wish to go to the trouble of retrofitting them. We also redesigned the main gear attach hardware for the Mark IV and Wicks has redesigned

the axles for the heavy duty wheels and brakes. We redesigned the Roncz canard hardware with "offsets" to eliminate the large hole in the side of the fuselage for the torque tube to wobble, and which causes a lot of pilots cold feet in the winter. We have redesigned the rudder pedals for mounting the brake cylinders up-front, and also for very simple adjustment on the passenger side. These parts are also available to Cozy builders.

We still have plenty to do. We have to redesign the canopy (2 in. wider) and the turtle back, arrange for new tooling and proofing, arrange for cowling molds and other prefab parts, complete Section II, prepare an information pack, etc. Then there is the small matter of completing our own proof-of-plans model. We don't have a big organization, just the 2 of us, and we don't move quite as fast as we used to, so we will be busy for quite some time to come.

You Cozy builders need not feel neglected. Being actively involved in design and construction better equips us to support you too.

KANSAS CITY GIG "GRAZIN' IN THE GRASS"

(A NATIONAL CANARD FLY-IN JUNE 14, 15, 16, 1991)

This looks like it will be a good one. It is sponsored by the Central States Association. This fun event will be held at the Johnson County Industrial Airport (IXD). Please write to Terry Yake, 8904 West 116th Terrace, Overland Park, KS 66210 for details. Mark your calendar , this will be a memorable event and is not to be missed!

OSHKOSH 1991

This will be our 19th year at Oshkosh. the last 14 of which we flew and exhibited our own homebuilts, a Varieze, 3-place Cozy, and the Mark IV prototype. We will have our 3-place there this year. The Mark IV will be in Oregon and its new owner in Saudi Arabia a while longer. We were hoping he would bring it to Oshkosh, but he can't seem to leave the middle east.

A Cozy dinner has been scheduled at Robbins on Friday, 6 PM July 26th. We had a good turnout last year and hope for an even better one this year. Plan to share the good food and fellowship.

Our Cozy forum is scheduled for Sunday, July 28th at 1 PM in tent #8. You always seem to enjoy hearing about the experiences of other builders, so we hope many will be willing to speak up.

FOAMS

The PVC foam stocked by our suppliers was originally imported from Europe but is now made in the US. Over the years it has been supplied in various colors, red, tan, brown, or blue, and recently there has been a change in sheet size. Do not be alarmed if the foam you receive is a different color or size than that stated in the plans. We have also noticed some variation in thickness of the 3/8 in. PVC sheets. If you encounter this. line the sheets up on the outside to avoid a problem in finishing.

The color of urethane foam was changed from gray-green to yellow a few years back. As far as we know, Styrofoam has always been blue, and Clark white. The color of RAES epoxy catalyst is blue, but cures to a green. The RAEF catalyst is nominally red, but there is a large variation in shade. Of course Safe-T-Poxy is brown. The different combinations of foam and epoxy can result in a multi-colored airplane. before painting.

WHEELS

We hope everyone has the word. that they should order the heavy duty CWB199-152 Cleveland wheels and brakes. They have about 65 % more braking power than standard, and are the best thing since sliced bread. We hope everyone also knows that the wheels have to be located 3/16" farther out on the axles for proper functioning of the calipers and also to avoid melting the gear legs. Where a 1/4" spacer was formerly used inboard of the inboard bearing, you must now use 7/16". The extra wide spacer has made the standard 5-3/4" long axles that everyone seems to stock a little marginal in length. Wicks has modified their axles to 6" in length and eliminated the undercut between the bearings. This is a much improved design, and we hope Brock and AS follow suit. In the meantime. we recommend that you buy the new Wicks axles and spacers.

CHECK YOUR TACHOMETER'S ACCURACY

A simple method of checking the tachometer in your aircraft is to run it up at night with fluorescent (or mercury vapor?) light shining on the prop. Since 60 Hz current is universal in the US, and maintained very accurately at 60 Hz, you can check your tach at multiples of 60, such as 600, 1200, 1800, and 2400 RPM (if you can turn up that high on the ground). Just adjust the RPM until the strobe effect stops the prop and check your tachometer. Make sure you take appropriate safety precautions while doing this.

CIRCUIT BREAKERS

CP66 reported favorably on a newly discovered line of small circuit breakers made by Snap Action, Inc. Apparently they have one line which is a direct replacement for ATO and ATC automotive fuses, and another line which is panel mounted, available DC up to 50 volts and 2.5 to 30 amps. We have requested a catalog and will supply more info in our next newsletter.

VORTEX GENERATORS ON CANARDS

Some of you may have seen the funny little things that Quickie builders stick on their canards, called vortex generators, so they can fly in rain. Well, apparently if you stick these same funny things on GU canards they don't have a pitch trim change in rain. According to CP66, Magna Liset of Oakley, Australia has demonstrated this. Essentially, he glued tiny vortex generators (aluminum angles) to the top skin of the canard, 44 of them on each side, at specific angles and positions. Below is the layout which was published by Central States Association.

Instructions: Make 80 (for a Cozy) vortex generators from .02 aluminum as shown. Cut a 1/2" x 2" board one-half the span of your canard. Cut slots alternating 15 deg. from a centerline as shown.

Using this board as a template and a generous amount of contact or silicone cement, glue 40 vortex generators on each side as per drawing.

CHROME & CADMIUM PLATING

Cozy builder Daniel Schaefer wrote to me about chrome and/or cadmium plating of aircraft parts. It seems that he had tabs welded on his rudder pedals for mounting brake cylinders up front and then had them re-plated. He then noticed an article in December 1990 Sport Aviation cautioning about the plating of aircraft parts. It seems that the materials used in aircraft, like 4130 steel, are unusually susceptible to hydrogen or surface embrittlement as a result of the acid bath used in plating, and this can result in failure of the part. The hydrogen embrittlement resulting from the plating process can be avoided by baking immediately after plating. The acceptable processes for plating aircraft parts are covered by industry and military specifications, which an aircraft plating company would be familiar with and follow. The more common shops which just do decorative, non-critical plating on things like car bumpers would not. Brock Mfg. advises that the proper procedure to follow when modifying a part is to first strip the plating, then do the welding, then stress relieve, have the part re-plated according to applicable MIL-specs, and ask for a certification that the parts were baked per spec. Brock Mfg. can do this. A short cut would be to paint the part with aluminum or silver Rust-Oleum.

In the Mark IV plans we have specified that the master brake cylinders be installed in the nose, and the rudder pedals have been redesigned accordingly. The same parts can also be retrofitted in the 3-place Cozy.

ENGINE COOLING -VANCE IS AT IT AGAIN!

Vance Atkinson has an insatiable curiosity, boundless energy, and is very innovative. He provides us with a wealth of information. He was the first (perhaps the only) one to fly his Cozy to 23,000 ft. He was the first (we hope the only) one to test his airplane at 1.5" aft of the aft c.g. limit. He was the first one to install a high pressure blower for heat, individual pipes on all cylinders, a Roncz canard with dihedral, and the list goes on. Not all of his experiments are successful. but that does not discourage him. We understand he has become disenchanted with the long nose on his COZY, and is building a shorter one. So far he hasn't said what it will be like. He has moved his oil cooler for the 4th time and is pleased with the new location. He installed it in the space between the firewall and #4 cylinder. He brings in outside air through a NACA scoop built into the fuselage fairing alongside the turtleback and exhausts the air through a duct over the top of #4 cylinder and out the top of the cowl. He has noticed the same thing that we have, namely that using outside air directly through the oil cooler, rather than warmer cowl air gives better oil cooling. He claims a 35 – 45 deg. F improvement over his previous location, under the engine through the aft baffle. His new system is shown below.

Vance combined oil cooling improvements with cylinder cooling improvements. He installed a hinged lip on the main NACA scoop so he could adjust the amount of cooling air coming into the cowl, and special exit ramps over #3 and #4 cylinders. He says that his #3 and #4 CHTs went down 50 deg. and that he can now fly at full throttle without exceeding 300 deg. F CHTs on all cylinders and make rapid descents without worrying about cooling shock. Vance attributes the lower CHTs to a combination of factors. 1) By providing a separate air source for the oil cooler, more air is

available for cylinder cooling. 2) There was very little pressure drop of air going through the cooler. By removing the cooler from the pressure side of the cowling, overall cowl pressure was increased, helping to drive more air through the fins. 3) By building exit ramps over cylinders #3 and #4, it also increased the pressure differential across those cylinders, causing more air to flow. 4) By opening the cowl lip past neutral, Vance can greatly increase air flow, as compared to the neutral position.

COZY WINS FIRST PRIZE AT PARIS AIR SHOW

Daniel Hedricourt writes from France:

Dear Nat and Shirley, Jan. 15, 1991

In the past 2 years I have put a very enjoyable 300 hours on my Cozy. It is really wonderful. We sometimes fly the entire family – do you remember we are now four? Our daughters are growing quickly and soon we will not be able to fly together. I received the news about the availability of plans for the Mark IV with great interest. Perhaps I will have to build a Mark IV so our daughters can continue to fly with us.

Last June we went to the "Paris Air Trophées" air-show at Le Bouget airfield in Paris, and my Cozy was honored with the first prize of \$1,600 and a pocket computer, but the most important was a kiss from Jeanne Yaeger!

Happy New Year! Daniel Hedricourt

SUPPLIERS

John Queener, of Sport Flight has been through some rather trying times, what with a divorce, a move out of his home and shop, tornado damage to his storage building, a new marriage, house hunting, setting up a new shop, etc. During this period he was hard to reach and those of you who may have placed orders with him might be understandably upset. He has assured us that he will continue (or resume) his business and now has most of his problems behind him. He makes exhaust pipes to order and is quoting a delivery time of several weeks. As long as he can keep our builders happy, we won't look for an alternate supplier. John's new address and phone number are:

Sport Flight (John Queener), 208 Zoller St., Brooksville FL 34601, (904) 799-2871 (home)

FOR SALE

1) Low-time 0-320 Lycoming. If you wish more details, call or write Cathi Yarmey , 17023 East Progress Circle North, Aurora, Colorado 80015. Phone (303) 580-1355.

2) Sturba 68 x 62 propeller for an 0-235 powered Cozy, \$150. If interested. call or write Steve Russell, 1073 Winborne. Davis IL 61019. Phone (815) 248-2719.

FIRST FLIGHTS

Sometimes we are the last ones to hear.

- 1) I had a note in my newsletter file that Todd Morgan was ready to fly several months ago, but we do not have a first hand report from him.
- 2) Greg Bastin in East Bentleigh Australia sent us a long letter last October saying he was ready to fly. Our mutual friend, Ross Blanchard, wrote us recently and mentioned that Greg has been flying, but we don't have a first hand report.
- 3) We received this letter from Al Yarmey Feb. 1,1991:

Dear Nat & Shirley, Jan.30,1991

It has been a long time since I have written you. It seems I am always playing catch-up with things (except, I hope, the Cozy). The demands of a growing family of 4 now, our recent move into a new house. and my job flying/managing 2 corporate jets for an "on demand" charter/management company keep me very busy indeed. Until this past weekend. I had not flown my Cozy since last November 18th. Then, Mike Green, Mike Marshall and I flew our Cozys together from Centennial Airport here in Denver. Enclosed are pictures. It was fun to see 2 other Cozy's up close in their real element -flying. Last weekend I flew the Cozy to NM for a few days. There is nothing like seeing the beautiful snow-capped Rocky Mountains and Sangre de Cristos from the perch of a Cozy at 14,500'.

Cozy N923AC finally flew on July 1,1990. This followed 6 years and 5,000+ documented hours of construction. Called "Chandelle II" (after my daughter), my 984 lb. Cozy has a 150 HP 0-320-E2D engine and a Tift prop. Changes I made include: a forward sliding canopy, rear gull-wing doors, electric pitch and roll trim. electric speed brake and nose gear retract, dual wing mounted landing/taxi lights, hidden internal rudder controls, forward brake cylinders with HD brakes, oil cooler mounted on top of the engine under the top cowl "hump". Ellison throttle body injector, temperfoam seats, fixed oxygen system and full IFR panel.

Our Cozy's construction began in Salt Lake City in May of 1984 in the master bedroom of our 2 room apartment. It moved with us 2 years later to Denver and after 4 more years of construction it was completed. With the generous help of fellow Cozy builder Ron Lorimor, it made it's trip to Centennial airport in 100 degree plus heat on Thursday, June 28th. After literally round-the-clock preparation, it was signed off on Saturday the 30th and began taxi tests and final preparations.

First flight day, July 1, saw the continuance of very hot temps in Denver. A 2 mile taxi from the north end of the airport to the beginning of runway 35's 10,000 ft. length caused overheating of the engine and a brake dragging on one side stopped the first attempt. The engine was shut down. Again, with Ron and Trish Lorimor's help, we walked the Cozy the 2 miles back to the hanger.

My twin brother Bob had arrived on Saturday to assist in first flight preparations and to document the occasion. Bob had built a beautiful Long that he had flown and thoroughly enjoyed until an engine

problem caused a serious landing accident and near-fatal injuries. His ordeal took the heart out of my project for awhile. It was only after Bob's slow recuperation that limited work resumed on our Cozy. Bob nonetheless continued to help, support and encourage the building. Without his help it never would have been finished. Thanks, Bob! .

After the engine cooled down and adjustments were made to the brakes, the wind picked up a bit and shifted from the south for a more favorable departure on runway 17L. Finally, "Chandelle II" took to the air for a brief 20 minute flight. Cooling was still a problem and a slight right wing heaviness was apparent. After a few orbits over the field an uneventful landing followed. Champagne flowed freely to the relief of the anxious. semi-dehydrated crew.

The next 40 hours were spent correcting problems and getting to know intimately this fine design. A curved, inlet-air diverter vane now guides air up to the oil cooler and cylinders and it has solved the cooling problems. Shimming corrected the wing-heaviness and brake dragging. Overall performance characteristics are excellent. Only the rain-induced pitch changes of the GU canard are still objectionable. A new Roncz canard will be built.

On Friday July 29 with 40.2 hours on the hobbs, the whole family, Cathi, 4 yr. old Chandelle, and 6 weeks old

Johnathan took off and departed for Oshkosh. After an overnight rain delay in Ft. Dodge, IA and an IFR arrival and 45 min. hold at Ripon, we finally arrived in Oshkosh about noon on Saturday. The next 4 days were spent fulfilling the dream of someday having a plane of my own construction on display at the big "O" and enjoying the other Cozy camaraderie. A memorable time it was! The return trip was uneventful except for a hard landing in Denver due to strong crosswinds and limited rudder authority (since corrected).

In October. we took off for an ambitious vacation flight from Denver to Dallas, Ft. Meyers FL, Charleston SC, Pittsfield MA, Wiscasset ME, Michigan and return. The Cozy performed perfectly until our departure from Charleston, SC. when the right gull-wing door's latch mechanism failed, forcing the door open and off the plane. These doors were designed and tested to be removed and flown up to 120 knots for photo work with no adverse effects. However, the 140 knot speed at the time overstressed the open door and caused it to depart. Fortunately, it never touched the prop. An immediate landing was made and then followed an unsuccessful ground search for the door. During the search. an unprepared yours truly became lost in the inhospitable, snake and 'gator infested swamp land of coastal SC when darkness got to me before civilization did. With the help of local authorities, I finally got out OK. minus the door. A temporary door was made with cardboard and duct tape. This was the first time duct tape was used on the Cozy not as a release agent.

The next take off found us with a major oil leak caused by a cracked/broken oil by-pass warning switch assembly on the Oberg oil filter. The switch was replaced with a solid fitting. I would caution others using the Oberg of the weakness of this assembly which has caused problems with other builders too!

On our next take off, a major fuel leak inside the rear seat area occurred when a piece of luggage

inadvertently partially twisted open a Curtis fuel drain valve installed on the bottom of a fuel filter. After that was also sealed off with a solid fitting and our fuel-soaked clothes were washed and cleaned, we finally, departed Charleston for the rest of our vacation.

Shortly after our arrival in Pittsfield. MA, New England was hit with a typical stagnant low pressure system off the coast which caused low IFR weather for the next 5 days. So our travels became ground-bound as the Cozy sat outside. When the weather finally improved, I took off from Pittsfield. MA with my brother Paul in back and my grandfather, Ed Merry , in the right seat for a trip to Wiscasset. ME. My grandfather had owned and flown Luscombes on wheels and floats as well as J-3 cubs, T-crafts, etc. He had also been very interested and Supportive during the Cozy's construction. He couldn't believe how quickly this plane "ate up the miles". It took us 53 minutes to fly a trip that was over 6 hours by car.

While cruising over Portland. ME at 9,500'. I switched fuel tanks and about 2 minutes later the engine sputtered and died. I quickly reversed my actions, turned the boost pump on and checked everything else. After 3 minutes with the prop still windmilling, I set up for a landing on Portland's ample 7,000' runway still some 6,000' below. No problem. Shortly thereafter the power returned to normal and we resumed a climb to altitude and destination. I was glad that I switched tanks over such a suitable emergency runway. It could have been much different if I had switched them just before take off. Lesson re-emphasized. On the ground at Wiscasset I found about 1 quart of water in the right tank. I believe that it accumulated through a leak in the Glassair flush fuel caps I had installed. The seals were tightened to cure the problem. Be careful of planes left out in the rain. Check those fuel caps and sumps. I plan to install an electric water detector in my plane.

Our trip back from Maine as breathtaking as we cruised low just off the rock-lined coast between Pemaquid Point and Boothbay Harbor .The breakers were truly impressive as they crashed violently against the coastal rocks below. My brother Paul correctly pointed out how one can only appreciate the Maine's complex waterways from the air. It was a highlight of the trip.

The next day we left Pittsfield for a return to Denver. We circled for about 20 minutes over Niagara Falls - a beautiful sight. After stops in Sturgis, MI and Lincoln, NE we made it home to Denver. We had been fighting 40 knot headwinds all the way. Still the Cozy got us safely from the East coast to the Rockies in one day.

The cross country portion of our flight saw us travel 5,338 statute miles in 33 hours and 5 min. flight time for an average ground speed of 161 MPH. We used 257.3 gal. or 7.8 GPH and 20.1 mpg. The total flying time was 42.9 hours on the hobbs over a 2.5 week period of time using 306 gal at 7.13 GPH. Fuel costs varied from \$1.35 to \$2.55/gal. for an average of \$2.11/gal. Our direct operating costs were less than the cost of "super saver" advance purchase airline tickets just between Denver and New York! Enough said. Now we can go on our own schedule for a fraction of the cost.

Since then I have flown to Wichita, Dallas, and New Mexico. By the end of October, the Cozy had flown 131.2 hours in less than 4 months. With winter here, flying has slowed and work on changes and modifications is underway for future fair-weather flying. Still to do are: build a new Roncz canard, replace the gull wing door, hinge the NACA inlet scoop and install a linear actuator for

cooling control, install a heater blower, add trim color, stereo intercom, etc.

In review, I would advise other Cozy builders to be persistent. It is a great airplane and well worth the investment in time, effort and \$\$\$\$. Visit as many other projects as possible and solicit objective critiques of your own workmanship from experienced builders.

In addition to the credits previously mentioned, I would like to thank Vance Atkinson for his generous help and advice during building and flight preparations for the Cozy. He has done a great deal of furthering understanding and enhancements of this design. Uli Wolters was also helpful during early stages of construction. Most of all, I would like to thank you, Nat, for making this all possible. Your plans, help, support and encouragement have given us a good, safe design. I look forward to many hours of enjoyment flying in the future. See you at Oshkosh!

Sincerely, Alan Yarmey

4) Daniel T. Davis is flying, and writes:

Dear Nat, Jan.29,1991

First flight of N149CZ was on Sept. 15, 1990. I was real nervous about the first flight. Although I have a lot of high performance time, I hadn't flown much in ten years and I had never flown a similar aircraft. For instance, I didn't know the effect of a small or large out of trim condition. I searched for quite a while for a test pilot and when I didn't find one, I finally bit the bullet and decided that I was going to have to do it myself. I decided not to wear a parachute. The idea scared me to death, and besides, I felt the chances of getting out of an out of control plane before it hit the ground were poor, and if I did. with my luck, I'd go through the prop.

I flew a Cessna 172 until I felt comfortable in a plane again. Nat advised that the nearest flying Cozy was in Denver, so I contacted Al Yarmey for some dual. Al was great! He gave me dual in his beautiful Cozy. It flew like a dream. He was very knowledgeable, which really helped. This made all the difference in the world. I felt much more confident then about flying my Cozy.

Still worried about a large out-of-trim condition, I talked to Nat. He said to get up speed, chop the power, then try to lift the nose wheel off. Then continue chopping power at a higher rate of speed until it works. He explained that this would take 95% of the weight off the main gear so that a serious problem should show up right there. I did that several times. It felt fine. We have a pretty long runway here and it looked like I had plenty of room, so I left the power on and lifted it just off the runway. It felt fine. I did this about 5 times. I was ready to fly. The local FBO who had been following the plane's construction. talked me into waiting another day. So the next day I did it about 10 more times. but I still had trouble talking him into letting me fly! The plane felt good, just like Al's, so I went ahead and flew straight out, checked approach speed stability which was fine, then came in for a perfect landing. What an anticlimax! It was a piece of cake! It is such an easy plane to fly, but since nothing looks conventional I guess you have to actually fly it to prove it to yourself. Now of course, it is a high performance plane and things happen real fast, so one should definitely have high performance time before testing one.

I have more than 40 hours on it now. Cruise speed solo appears to be a little better than 205 MPH. where it burns about 9.5 GPH. leaned out. It climbs about 1000 to 1500 FPM, at 5000 ft. (Our airport is 4300 ft.). It has a run-out 0-320 with a Great American 62 x 72 prop. It weighs a little more than 1000 lbs. It is very stable in pitch trim. In calm air it holds altitude very well and it doesn't do badly in turbulence. Oscillations dampen quickly and are minor. It is somewhat stable in roll. Although if the wing dips below about 10 deg., the turn will continue to tighten. It is not dynamically stable in roll. It is very stable in yaw and does not "wallow" around in yaw like some close coupled planes like a Mooney or a Bonanza. One very appealing characteristic is that turns do not require rudder to be coordinated. In other words, rudders need only be used on landing.

I installed a Narco Navcom with glide slope, a Narco Transceiver, and encoding transponder. I got a RST kit for the audio panel which includes a voice activated intercom. The best piece of equipment is the II Morrow 618 Loran with Flybrary and encoder. I put about a 6 ft. antenna in the left winglet and embedded a fine wire ground plane in the left wing. The ground plane is also connected to almost every conductive piece on the plane. The pre-amp is also embedded in the winglet. This was done per early instructions put out by Jim Weir of RST. Although we are in a poor coverage area. it works reasonably well.

Because of the unstable roll condition, I looked for a wing leveler. I got one with autopilot for just a little more than \$1000 from Navaid Devices, Inc., 100 Cherokee Blvd.. Suite 333. Chattanooga. TN 37405. Phone (615) 752-1718. It works very well. I guess it was designed for a Long EZ. You use their turn coordinator which has all the brains and controls for the autopilot/wing leveler. The only extra weight that you add is the servo, about a couple of pounds. It mounts on the center section spar. just next to the firewall. It does a great job following the loran CDI output. Or, you can hook it up to the VOR CDI output. or install a switch for either option. In addition, it is a great wing leveler.

I installed a Micro Monitor from Rocky Mountain Instrument, 202 Fremont, Thermopolis, WY (307) 864-9300. It is a nifty device. It is a little computer which displays outside air temperature, all engine temperatures and pressures, an ammeter which works very well, a good voltmeter, a low battery warning, RPM, manifold pressure, carb venturi temp., oil temp and pressure, fuel pressure, CHT, EGT, has a fuel totalizer, timer, local time, GMT, flight time, Tach time, plus warns for all of these things and three user alarms which you could use for canopy, etc. So far it has worked very well.

I installed four turbine type hair dryer motors in a 2-1/2" piece of PVC. All 4 of them pull just 2 amps. They run on 12 volts if you cut the diodes. They push plenty of air, but the heat muff is not large enough. When you order exhaust pipes, be sure to ask for a larger heat muff.

So far. I haven't had any real big problems. When I put the wheel pants on, the brakes failed. I used the larger brakes and the pants pushed on the caliper, pushing it open. Blisters on the pants solved the problem. I put a big turning vane on the bottom of the cowling. but #3 and #4 CHTs are still running 20 deg. C hotter. This will probably be a problem in the summer, especially after I overhaul the engine.

All in All. the plane is a dream. I have a plane that will fly faster and farther than most \$200,000 production airplanes.

Very Sincerely, Daniel T. Davis

5) Jeff Russell is flying and writes:

Dear Nat and Shirley, Dec.18,1990

Now there are 5 flying in N. Carolina. Cozy N238CZ first flight was 12/14/90. Everything worked as planned. I flew about 35 min. with a smile all the way. My air filter for the carb was too restrictive. giving me only 2200 static RPM. With the filter off, I got 2500 static. Overall, everything just seemed to work better than expected. She flies hands off with no trim adjustments. My thanks to John Ashe and Ken Ashly for a flight in their Cozy months past. to give me some pattern work. It really helped to know what to do. Pattern alt that seems to work best is 400 AGL with speed setting per manual to land on the numbers. All my engine temps are very good. with #3 cylinder being the hottest on my 0-320 H2AD.

I like being able to use full rudder with no brakes on take off, with the toe brake I have. On 12/19/90 my dad and I are getting a ride in a Beech Starship from Winston Salem to Elkin airport where my Cozy is. Beech is trying to sell it by giving demos to corporations who can afford it (\$3.7 million). They were picking up some people at Elkin airport to take to lunch so this was just the perfect chance for us. We are trying to get some news coverage with both airplanes together. Beech thinks this would be great. I will send pictures and let you know how things go.

Thanks again, Jeff Russell, (919) 961-2238

P.S. What do you think about posting in newsletter all builders' names, location, phone numbers, all Cozys flying and location? Builders helping builders helped me the most. My phone number is always welcome to other builders/flyers.

IN MEMORIAL

We are saddened this quarter to report the loss of two close friends:

1) Ken Winter, January 13,1991. Ken was instrumental in influencing us to design a larger version of the Cozy for Aeromet and to build our prototype Mark IV. Ken was involved in a secret project for the military in preparation for Desert Storm. It involved very low level flying through a dust storm over the Yuma desert at night in total darkness. Ken hit the crest of a hill and did not survive.

2) Alan Yarmey, February 13, 1991. Al was one of our first builders, and co-piloted the prototype Cozy in the CAFE 400 in 1983, with Cathi riding in the back as passenger. Al and Cathi brought their two young children to Oshkosh in their recently finished Cozy, which won an award there. The Lear jet Al was flying crashed on approach to the Aspen airport, and he did not survive. His wife, Cathi, asked that we publish this letter:

Dear Friends and Fellow Builders,

As many of you know, on February 13, 1991 my husband, Alan Yarmey was killed in a plane crash in Aspen Colorado. He was flying the company airplane, a Lear 35. Two others died in the accident as well, including Hal Ravensborg, the other pilot. Details of the accident are not known yet as the NTSB and FAA have not finished their investigation. I do however gain comfort in the fact that they died with the reputation of being the "best crew in Denver".

My dream for our Cozy, N923AC, is that I will someday learn to fly her, and that my children, Chandelley (4), and Johnathan (8 months) will again know the serene beauty of her flight. But, as the financial reality of Alan's death becomes more apparent, I don't know if this will be possible, or if I will even be able to keep our ship.

Alan always dreamed of building an airplane. When Cozy plans became available, he obtained them and poured his every minute into them, and I supported all of this. I can not thank all of you enough for all of your support to him, and to me.

Now I ask each of you to please keep building, flying and improving. Never settle for "good enough" when you know there is better .

I hope to see you at Oshkosh this year. and I hope that if you ever pass through Denver that you will call me. I still feel part of our "Cozy Family" and would like to hear from you.

Sincerely, Cathi Yarmey, 17023 E. Progress Cir. N.,
Aurora, CO 80015

Editor: A fund has been established for the childrens' education. Alan Yarmey Mem. Fund, PO Box 461991, Aurora. CO 80046

LETTERS FROM BUILDERS

Dear Nat and Shirley Dec.23.1990

Still slowly progressing on Cozy #8. When the temperature drops below 50 F in the garage, I don't last too long out there. It's ready for the avionics, prime and paint. Thought you might like to see some pictures. The alternator came from a 78 Honda friend removed after he converted to a 100 amp system for AC. The alternator fan has since been removed. The starter is from a Honda Prelude, for about a 10 lb. saving. So far I checked the starter for engagement with a jumper from the car. I added the picture of the fuel sending unit I've installed on both sides. The sight gage I made from clear plastic tubing with a ball float. It's covered with duct tape until the cockpit gets painted. I have a R/L switch on the panel and two LEDs of 5/8" high numerals.

I waited too long to get this letter off; so after the fact, a Merry Christmas to you both and an enjoyable New Year.

Very truly yours, Jim Krug, Dayton, OH

Dear Nat, Jan.2,1991

Just been reading the Jan. '91 AOPA Pilot, and the "road test" of the F33 Bonanza-a long admired airplane. Having

purchased Mark IV plans. I though I bad better examine how well I spent my money.

The lead line in Twombly's article is "Best value in general aviation...{because of) its combination of payload, performance and price " .How much does the latest Bonanza outperform the Cozy Mark IV?

Pricewise its a real loser. The 1990 F33A listed for \$156.000, and it will be higher in 1991. Even with a new 0-360, and King IFR avionics, I don't think I could spend \$55K for a finished Mark IV.

Twombly says, "The F33A is a solid, full-fuel and 3 adults airplane" .What a disappointment. I thought that when Beech built an airplane with seats they expected bottoms in them. The MkIV does better: 4 adults at 170 lbs plus 300 lbs. of fuel gives a 1,000 mile range. Full fuel in the F33A goes only 760 nm, and it uses 50% more fuel than the Cozy. We'll save money at every pump.

Fast? Twombly says "The 285 hp IO-520 with 3-blade prop yielded 1200 fpm but no view over the nose. Level at 8,500' and 75% power yielded, 173 kts true on 14.4 gph". The MkIV specs say 1500 fpm and 170 kts at 8-10 gph. Impressive!

The "big" Bonanza is 42" wide-same as the MkIV.

Sincerely, Joe Lane

Dear Nat, 12/12/90

Recently I painted my Cozy with Zolatone. I thought the information I discovered would be valuable to all Cozy builders, in view of the special, expensive equipment CP63 said was needed. I visited a local body shop that had recently painted a boat with Zolatone. By adjusting his mix gun properly, he had successfully sprayed Zolatone with excellent results.

So I purchased a Devillbiss S6A570 gun for \$105, which is an excellent unit for regular paints. The body shop showed me how to adjust the gun, the fluid feed, and the spray pattern for Zolatone. I mixed the paint, filled my first pot, tried it on a piece of plywood, and the results were excellent. I proceeded to spray the entire cockpit and it turned out beautifully. Hope this info is useful to builders out there facing the Zolatone dilemma.

Sincerely, Dave Petrosino, Homer, Alaska

Dear Nat, Dec.7, 1991

We certainly enjoyed visiting with you and Shirley at Oshkosh. Your hospitality and efforts for Cozy builders/flyers is appreciated.

I would like to recommend the Navaid autopilot to Cozy flyers. The price seems to be reasonable, they are helpful folks, and installation can be completed in under 4 hrs. This autopilot will not do everything, but it is a very useful tool on cross countries, VFR or IFR. The Cozy becomes very stable in pitch once roll control is provided. Very little altitude adjustment is necessary with the autopilot engaged. There is also significant stabilization in turbulence, resulting in a smoother ride. And it is much easier to read maps, check fuel gauges, etc. with the autopilot on. It is fairly poor at tracking, however, I do have it coupled to VOR & Loran. It would be interesting to compare it to Ken Francis' S- Tech. I recently had an opportunity to take off in formation with Ken Francis in Ft. Worth and with Al Yarmey in Denver. I can report that the MT prop provides significantly greater acceleration and climb compared to otherwise similar airplanes. The prop is flawless after 120 hours.

I still have a warm (410 deg.) #3 cylinder inspite of building a cooling air outlet. My next step will be to build a cooling vane.

Mike Marshall

Dear Nat, Nov. 10, 1990

I am enclosing a color brochure from Sherwin Williams on their Multispec Fine Fleck paint. I repainted my cockpit again, didn't like Zolatone, and tried this. This stuff is great!. It has smaller speckles and covers just as well as Zolatone, and cost is the same. But you can get it at any large Sherwin Williams Paint Store. I had a lot of good comments on it at Rough River. Also I won Reserve Grand Champion at the Sterling, Whiteside EAA fly in at Rock Falls, IL on Sept. 15 and received a very nice plaque.

I am getting my new shop ready. Let me know if you need anything built.

Regards, Dennis Oelmann

Dear Nat and Shirley, Dec. 17, 1990

Received our Newsletter #32 today and it prompted me to write. I wanted to write before but thought it better to wait until accumulating more hours on our Cozy so I could speak with more authority, seniority, or just plain experience.

Our Cozy #177 has been flying for 22 months now and we have accumulated over 350 hours to date. We have flown from our home base in Michigan to Maine, Oregon, Florida and dozens of places in between. Our last trip was to Maine (750 miles as the crow flies) and we made it from ground to ground in just over 4 hours. We averaged over 180 mph and used a total of 22 gals of gas.

When Helen and I decided to build an airplane, we set our criteria on something that would fly long

distances economically. We weren't interested in just flying around the patch when the weather permitted. Instead, we wanted to build a plane of futuristic design rather than end up with a brand new antique.

Building an airplane is a huge commitment in both time and money. We were very fortunate that we chose the Cozy because it is everything that it is supposed to be and a whole lot more. And best of all, the time and effort spent building was all well worth it! There are many attractive fast build kits on the market, however if you want the same things we wanted, then you just have to bite the bullet and build a Cozy.

I would strongly recommend to anyone who has been building for a number of years to stick with it and not get discouraged. There just isn't any easy short cuts to building a Cozy and, there just isn't anything like flying a " Cozy " either.

Our plane is named "Cloud Nine" and little did we realize at the time we named it that we truly would be on cloud nine. On many occasions while flying far above the weather I've turned to Helen and said, "Great Little Plane, Isn't It?"

Sincerely, Walt & Helen Suminski, 15640 Dice Rd.,
Hemlock, MI 48626, (517) 642-8689

Dear Nat, Jan. 2, 1991

Thank you for replying to my request for information so quickly. I am very much interested in your new Mark IV and want to be on your Newsletter list. I am anxiously awaiting the availability of plans.

I have long been a fan of the Rutan LongEZ and your Cozy, and had felt like I had missed out on an opportunity to build either of these because of schooling and money. I'm glad, as I'm sure others must be, that you have undertaken to introduce a new airplane on the market, that is currently flooded with expensive kits. I've recently had a patient of mine who had built a Long EZ and gave both my wife and I rides. It was such a pleasure to fly (from the back seat) that I knew my desire to build and own a canard design of "Rutan Origin " was still very much alive, since I had first seen Long EZ 79RA in Tullahoma, TN in 1980. It was just so much more enjoyable than the Pipers and Cessnas I have been enduring for the last 10 years.

Thanks again, Marv Royster

Dear Nat, 12/5/9

I have 95 hrs. TT on N509MS now. If I were building again, I would glass in wiring for a dome light in the turtleback. This is my Loran antenna installation. Mount preamp under left armrest. Loop bare copper wire in turtleback. Be sure and ground preamp and Loran Case. Use a voltage regulator friendly to Loran, filter alternator. The air scoops in upper fairings are working out great. No problem at all with oil or CHTs. We have hot summers here.

Bill Owen, 8 Robin Dr., Starkville, MS 39759

Dear Nat, 11/26/90

During the 4-day Thanksgiving weekend I got started building my Cozy Mark IV .I finished the front seat bulkhead and F-22 & F-28. This was my first experience with fiberglass composite construction, but I feel confident in the process after the first layup. The Rutan video is a great supplement to your education section.

Before starting the project I insulated & sheetrocked my two car garage and installed a 100,000 BTU/hr. natural gas heater. The winters get quite cold here in Santa Fe. The 4' x 12' workbench I built has really come in handy. I would recommend this size for anyone who has the room. I ran into a discrepancy in the BOM for Chap. 4. The BOM calls out 3 sheets of .2" Clark foam while the layout correctly shows 4 sheets are required. You might want to mention this in the newsletters so other Mark IV builders will not order too little of this material (Editor: Thank you, the BOM has been corrected).

Sincerely, Steve Willhoite

Dear Nat, Jan. 4, 1991

Hi! I've enclosed some snap shots of when I had the gear melt down. As you can see, I used 1/16" steel plates on each side of the gear, applied with wet flox. The gear seems to be as strong or stronger than before. I have about 40 hours and approx. 40-50 landings since the repair and everything seems to be fine. I thought this information may be of value to someone with a similar problem.

Sincerely, John Ashe

Dear Nat & Shirley, Feb. 14,1991

It was nice to talk on the phone the other day. Hopefully I can get a layover in PHX one of these days. I sure would like to see you folks, your new house, shop, studio, and of course the new four place Cozy!

Shirley, my wife Martha would love to meet you. She is a wonderful support with our Cozy project, in fact my Valentine's day present was an altimeter (one of my Christmas presents was an airspeed indicator). Hope you like the photos. Since then the strakes are glassed, the controls are in, the ailerons built, the winglets built and ready to glass on, and the instrument panel layout is planned.

Fly safe, Dave Chapman

Dear Nat, Jan.15,1991

As of today, I have 1463 man-hours of construction time invested and will probably hold the record

for maximum hours to complete a Cozy. Read also, maximum hours of fun. My project was started June, 1988.

I'm in the last chapter of Section I and getting ready to install the top skin on the strakes. This was the only chapter that gave me trouble so far. After calling you last November, I ended up making both R-23 ribs 23.9" long instead of 23" long per plans in order to make the L.E. come out at F.S.73.3. The bottom and top skins also had to be modified slightly to fit.

Thanks again for a great set of plans!

Sincerely, Will Sladaritz

GALLERY