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COZY NEWSLETTER #70

July 2000

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OTHER PARTS WE RECOMMEND:

We can recommend the following items:

1. Improved Rudder pedals for lay-down brake cylinders, adjustable both sides. Dennis Oelmann (319) 234-6109.
2. Water tight fuel caps: Jack Wilhelmson (843)884-5061.
3. Improved MKNG-6 and NG-6 Pivots with tapered roller bearings. Jack Wilhelmson (843) 884-5061.
4. Electric speed brake actuator kit. Wayne Lanza (561) 664-9239.
5. Switching and breaker panel. Wayne Lanza (561) 664-9239.

6. Fuel sight gages. Vance Atkinson (817) 354-8064.
7. Electric nose-lift. Steve Wright (615) 373-8764.
8. Electric pitch trim. Alex Strong (760) 254-3692.
9. Voice annunciated warning system. Richard Lewis (423) 376-1450.
10. Rebuilt flight instruments. Howard Francis (not a Cozy builder) (480) 820-0405.
11. T-shirts, etc. Bill Walsh, nogofsu@sprintmail.com. (407) 696-0942.
12. Antennas. RST Jim Weir (530) 272-2203.

PLANS CORRECTIONS/CLARIFICATION

BUILDER HINTS

1. Oil Spills. Have you ever spilled oil all over your firewall when changing a spin-on oil filter? Well here is a procedure that will avoid all that mess, if you are using one of Bill Bainbridge's 90 degree filter mounts. First, drain all the oil from the sump, and then reinstall the plug in the drain outlet. Then take a center punch and hammer, and punch a couple of holes in the top of the filter, and let stand over night. During the night, all of the oil will drain out of the filter and into the sump. The next morning remove the drain plug and drain it into your bucket. Then you can remove the oil filter, which will be mostly empty of oil. You will need just one or two paper towels to take care of the oil remaining in the low point of the base. The ease of changing filters is well worth the cost of the 90 deg. mount.
2. Canopy frame. Builder Dennis Butler said he was having a problem getting a smooth edge where the fiberglass contacts the canopy, and he asked for ideas. Builder Wayne Hicks said he made a paper pattern of the canopy deck, then laid up the 2 UND on plastic (and later the 2 BID), used the pattern and razor pizza cutter to make a nice, clean cut along the pattern lines. Then he laid the piece nice and neat up against the glass. There were absolutely no problems. No excess flox, no excess resin, no excess glass. Never had to use a dremel! If anything, all he had to do was cut one or two stray strands with a razor blade. He did this for both the outside and inside canopy deck layups, and highly recommends this technique.
3. Canopy frame. Wayne Lanza suggested this: Use 3 plies of 1 inch wide duct tape against the plexiglas, making sure the edges are even. Then carefully sand the exposed plexiglass which you intend to cover with fiberglass. Go to your scrap drawer and pick out some UND with the original selvage edge, wet out, and cut 1 inch wide strips, and layup with selvage edge against the duct tape, butting ends, and 2 plies thick. Then layup 1 ply of BID, cutting its edge to meet the back edge of the UND plies. Finally apply a second layer of BID over the whole mess, cutting its edge close to the duct tape. When cured LEAVE the duct tape in place and start sanding the glass. You will disturb the top layer of duct tape, but shouldn't go all the way through. When finished, and after removing the duct tape, you will have a nice, neat edge.
4. Fuses vs circuit breakers. Both Bob Misterka and Nick Ugolini have seconded Bob Nuckolls' philosophy of using fuses rather than breakers. Bob Misterka says the system was simple to wire, was inexpensive, and has performed well and been trouble free. A blown fuse would be an inconvenience but wouldn't affect the outcome of the flight. Nick says he used a \$15 fuse block, 30 fuses, and one breaker for the alternator. After 725 hrs of flying, no failures. He says since everything in his plane has its own fuse, he could only lose 1 circuit, and could live with that.

FOR SALE

1. Very nice Cozy Mark IV, Oshkosh winner, with very low time IO-360 200hp Lycoming engine. Fully IFR with many extras incl. autopilot. \$92,000. (817) 280-0750 or e-mail: fbibb@home.com.
2. Cozy Mark IV project. Fuselage tub, firewall, canard, and centersection spar complete with electric landing brake. \$3800. Ted Hall (636) 946-5287 or adamted.hall@att.net.
3. Cozy III IFR project. All major components completed. Needs assembly. Excellent glass workmanship. 1/2 price. \$30K invested. If you started today, it would cost over 40K to get to this point. Most parts and instruments to finish Plus Lyc 0-320 E2D with 1000 hours since chrome major (first). Two 760 channel King radios (new in box). Must sell soon. Heart/kidney failure. Asking \$20K. Call Steve (614) 871-0710 or email at: AECCBishop@aol.com.
4. Cozy III project. Almost all major components completed. Needs assembly. Includes Lyc 0-320 engine wind damaged from 172 Cessna, 1498 SMOH (reman). Most everything needed to finish except electrical, instruments, and some engine stuff. John Vance, 4 Laurana Lane, Hadley MA 01035. Tel. (413)549-6491. Best Offer.

COSY EUROPE

In last October's Cosy Europe newsletter, Uli reported that: "Cosy Europe will be closing Dec. 31st 1999. This all came about with the new tax laws. Since our forced landing in 1991, we built a totally new aircraft, the Cosy Classic. Of course, we also had some extremely high court costs to pay, resulting from the forced landing, as well as some setbacks in the marketing of the COSY CLASSIC. When you put all these together, you certainly don't come up with black numbers at the end of the year. Well, this happened to us one too many times, and the tax authorities declared Cosy Europe as a hobby and no longer a business. We were forced to repay all tax refunds for the last 7 years (with a little wheeling and dealing, it was reduced to 4 years), and we have to liquidate the company."

On 1 May 2000 we contacted Uli. He confirmed that they closed down Cosy Europe at the end of the year, but officially on 1 April 2000. He said they are liquidating the company, including selling their airplane, to repay past tax refunds.

Now that Cosy Europe has discontinued operations, we may resume the sale of Cozy 3-place plans, if there is sufficient interest.

STODDARD-HAMILTON

Stoddard-Hamilton, manufacturer of the Glasair and GlaStar, shocked the aviation industry May 8 when it laid off its staff and closed its doors. This 20-year-old company (located in Arlington) was regarded as one of the world's more stable kit-aircraft manufacturers. It is not known how many builders have paid for kits they have not yet received.

This news had special significance for us for a couple of reasons. I was left hanging, like many others, not able to finish my first home-built project, when Jim Bede closed his doors back in the 70s. That is when I decided Burt Rutan had the right idea. Once you buy plans from him, you can build the airplane from readily available materials and use readily available aircraft engines. Burt stopped selling plans in 1985, but there are still people building Variezes, Long Ezs, Defiants, etc.

One of the risks a builder faces when he buys a prefab kit is that he might be left hanging. In addition to the BD5, I can think of the Prescott Pusher, the Wheeler Express, the Speed Queen, and now the Glasair and GlaStar.

I can still remember the year at Oshkosh, and how excited everyone was, when the pre-fab Glasair was first introduced. It just happened to be about the same time the Cozy first appeared.

SUN 'n FUN

When you rent exhibit space at Sun 'n Fun, you must agree to be set up before the show starts, and not leave until it is over. This is the same rule as at Oshkosh. So we always leave Mesa a few days early to allow delays enroute due to bad weather. In the spring of the year, there are always warm and cold fronts parading across the south about every 5 days. Shirley doesn't like to fly in bad weather (I don't blame her) so we try to fly in between fronts, which is what we did again this year. When we get to Florida (or Oshkosh) a few days early, we just get a few days vacation.

And so it was this year, that we were one of the first exhibit planes to arrive and parked in our spot. We rented our car, and picked up the Wilhelmsons when they arrived on Saturday, bought our usual flat of strawberries (Plant City is the Strawberry capitol of the world), and proceeded to our condo, this time between Kissimmee and Orlando.

The Cozy banquet, at the Red Barn Steak House, arranged by Bill Walsh, was attended by 73 Cozy builders and friends. A little short of the 100 that Bill was aiming for, but still the most to date. The food and camaraderie, as always, was great.

During the show, we showed our Mark IV to a lot of prospective builders, met a lot of builders we hadn't met before (including John Slade), and renewed many acquaintances. We met Brian Bishop, former leader of the Thunderbirds, who had recently purchased Chuck Wolcott's Cozy Mark IV. He agreed to speak at the Cozy Banquet at Oshkosh, and we will be anxious to hear how the Cozy compares to the F-16. We counted 12 Cozys at Sun n Fun, but they weren't all there at the same time. Ron Wilson won the Grand Champion award with his Cosy Classic. He sure did a beautiful job, and was beside himself with the honor. His canopy was hinged in the front, ala Uli, but only for the front seat. He made a gull wing door for the back seat. His locking method on the canopy was very ingenious. He had made his own cowling, and was having difficulty with cylinderhead temperatures. He realized it was because he didn't allow enough clearance over the rear cylinders for the cooling air to escape, and was going to install blisters after returning home. Sure was pretty!

Weather during the show was good, except for Friday, which was a

complete bust, because it rained almost all day.

With special permission, we left just before the air show on Saturday, and got as far as Panama City, where we had to set down and wait for IFR to change to VFR. Then we continued on to Baton Rouge for the night. The next day, we made it the rest of the way home. When we were in the Houston airspace, center asked us what we were flying, because we "were really smoking". I said "a Cozy Mark IV". The controller asked, "Did you build it?" I said, "I not only built it, but I designed it!" He said, "Are you Nat Puffer?" I told him I was, and then I said that if he knew whom I was, I'd better be careful not to do anything wrong. He said, "We have a bunch of RVs here, and we always take care of our own!". Nothing like a little repartee with traffic control to make the trip more interesting!

NYLAFLOW BRAKE LINES

You need to be aware that exposure to ultra violet light (from the sun) over time will damage Nylaflo tubing and make it brittle. This was demonstrated to me very vividly a few years ago. Someone gave a Varieze fuselage tub to my friend Tom McNeilly. It had been sitting outside in the sun, probably for years. Nylaflo tubing brakelines had already been run through the tub. Where the tubing exited the firewall and was exposed to sunlight, we could snap the tubing like potato chips. Where it was hidden from the sunlight inside the tub, it was still tough and flexible and couldn't be broken.

In the plans Chapter 9, page 8, we say to wrap the Nylaflo brake lines, where they exit the strut and connect to the calipers, with fiberfrax and aluminum tape to protect them from heat from the brake discs. This also protects them from exposure to UV, and wheel pants provide additional protection. The only other place they might be exposed is under the instrument panel, if your airplane is parked outside with the canopy open, oriented so the sun can shine on them, as we do every year at airshows, but this hasn't caused us any problems so far.

Dick Rutan had a problem with Nylaflo brake lines in his Long EZ several years ago, and replaced the lines with 1/8" stainless. We have had no problems in 22 years. Cozy builder Ken Brimmer reported that he talked to Bob Woodall who still has his original Nylaflo brake lines in his Varieze, which he built 21 years ago, and which was parked outside for 6 of those years, and has had no problems with his brake lines. So if you protect your lines from UV, you shouldn't have any problems.

BRAKES

When doing our annual this spring, I decided it might be time to do some maintenance on the brakes. After all, they were still the original brake pads, since the first flight of our plans model in 1992, and we had accumulated over 512 flying hours and somewhere between 500 and 1,000 takeoffs and landings. We try not to be hard on brakes, preferring to let the airplane slow down by itself (because of aerodynamic drag and rolling friction) after touchdown, and only use brakes as necessary to turn off at a taxiway. But it is not as though we don't use brakes. We do fly fairly heavy, have been in and out of 3000 ft. runways, airports over 6,000 ft elevation, landed (and taken off) with pretty strong crosswinds, and even downwind, and have to taxi quite a long way from our hangar (at Falcon) to the runway. So it was a pleasant surprise to discover that the pads weren't even worn down to the rivets. Nevertheless, I

replaced the pads and followed Cleveland's break-in procedure. New pads don't have much braking power until you "condition" them. This consists of taxiing about 1500 ft or so at 1700 rpm with enough pressure on the pedals to keep you at only about a walking speed. This heats them up enough to glaze the surface, and after cooling down again, are ready for use. Normal useage keeps them "conditioned".

We have never had any problem braking, and I thought that our experience was a pretty good testimony for the Cleveland Super Heavy Duty CWB199-152s that we recommend in the plans, and was proud to report it to the Cozy_builders chat group on the net. I wasn't prepared for the rancor that a few builders (who haven't flown yet) and some non-builders have toward Cleveland wheels and brakes.

We specify Cleveland wheels and brakes for use on the Cozy because they are approved by the FAA for factory-built airplanes, they have an excellent reputation, and they seem to be the industry standard. The accepted method for sizing them is to calculate the kinetic energy to be absorbed using the formula $K.E. = V \times W / 2g$, where: V = stall speed (or in the case of the Cozy, minimum flying speed) in ft./sec. and W = gross weight in lbs., and g is the acceleration of gravity (This formula has a built-in safety factor because it doesn't take into account any wind, aerodynamic drag, or rolling friction which assists the brakes). Using 60 kts as the worst case minimum flying speed, and 2050 lbs as the worst case gross weight, we get 331,492 ft.-lbs. for two wheels or 165,746 ft.-lbs. per wheel. If you check Wicks catalog, you will see that this is well within the capacity of the 500x5 Super Heavy Duty CWB199-152 kit, which will absorb up to 192,000 ft.-lbs. of kinetic energy. These are the wheels and brakes recommended in the plans, and which we used on our prototype and plans model. As far as we know, they have been used by all the Cozys currently flying, with no complaints.

It was argued by one of the builders on the internet that if you use 70 kts as the touch-down speed, the theoretical kinetic energy becomes 225,598 ft.-lbs., which would make it appear that the Super Heavy Duty brakes aren't adequate. This is very misleading for a number of reasons. For one, you never land at the same gross weight you took off (because of fuel consumed), so the gross weight for landing is always less a couple of hundred pounds less than the maximum for take off. Secondly, you don't (or shouldn't) touch down with the brakes on. For another, airspeed is the same as ground speed only when there is no wind. Also, there are other forces at work which absorb kinetic energy, such as wind resistance (aerodynamic drag) which increases as the square of velocity, and then there is the energy absorbed to start the wheels rotating at touchdown, and then there is of course rolling friction. All of these factors, which can be appreciable, reduce the amount of energy which the brakes need to absorb. So using 60 kts as the worst case is in fact a valid and safe assumption.

So what about an aborted takeoff? Well, if you are doing high-speed taxi tests, you shouldn't be anywhere close to maximum gross weight (you shouldn't have full tanks and passengers, right?), and rotation speed would be less because you wouldn't have a forward c.g. You shouldn't have wheel pants installed, so overheating your brakes isn't likely.

What about later on, if you plan to take off at maximum gross? First of all, the Owners Manual says that this is very uncommon, and should not be attempted at high density altitudes, or in cross-winds, or until you are experienced. If all of these conditions are met, if there is reason to abort, you will know it before you reach rotation speed. It is suggested that you use 60 kts. as your go, no go decision point. If anything isn't right at 60 kts, abort! If you are above 60 kts and decide to abort, shut off the engine, and if your brakes fade as you slow down, because of overheating, you can always retract your nosewheel if necessary to avoid running over the end of the runway.

We are not suggesting that you can't install more powerful brakes, if it gives you peace of mind to have more stopping power, Cleveland supplies a more powerful 500x5 kit, the Super High Energy CWB199-197 for jet airplanes which will absorb 289,000 ft.-lbs. of kinetic energy, which is 74% more than the calculated maximum requirement for the Mark IV. These use the same wheels and brake discs as the 152s, but have metallic pads that are bonded (not riveted) on and pistons which are heat-insulated for higher temperatures. They are retrofittable to the 152s. Basically, they allow you to transfer more energy to the discs in the form of heat (the discs get hotter).

We would remind you, however, that kinetic energy doesn't just disappear, it is absorbed by the brake discs as BTUs. So the more kinetic energy you transfer from the airplane to the brake discs, the hotter the discs get. The discs can only get rid of this energy, now in the form of heat, by radiation or convection to something else. If you have no wheel pants, it is easier for the brake discs to cool down without affecting something else. However, if you have wheel pants and housed in the same wheel pants as the discs are the landing gear struts and the tires, and the brake assembly including hydraulic lines, piston O-rings, etc., and if you have more powerful brakes, it would behoove you to use them judiciously, to avoid cooking gear struts, tires, hydraulic lines and O-rings. We know of at least one airplane which burned up and was totally destroyed because of a brake fire. It can happen, you know. Sometimes design "improvements" lead to unexpected consequences. We want to make sure everyone understands, putting in more powerful brakes, which generate more heat, makes it more likely (not less likely) that you could melt your landing gear and/or have a brake fire, so be careful!

We have not heard any complaints about the plans recommended Cleveland Super Heavy Duty brakes from any of the approximately 350 Cozys that are already flying with them, so we see no reason for a design change.

LIGHTNING STRIKES

When builders ask us about the possibility of getting struck by lightning in a Cozy, we have been saying that sailplanes operate near thunderstorms routinely, and we have never heard of one getting struck. Well, we can't say that anymore. April 17, 1999 a Schleicher ASK 21 two-seat glider in England was struck by lightning while operating in the vicinity of an advancing bad weather cloud line with heavy rainfall under it. Large sections of the airframe disintegrated. Fortunately, the pilot and passenger were wearing parachutes, departed the sailplane and did not suffer injury. Since manufacture in 1985, this sailplane had accumulated over 4,000 hours during some 28,000 flights, and this was the first time it was struck.

We sometimes encounter thunderstorm activity in the southwest in the afternoon when returning from Oshkosh. As a matter of principal, we avoid thunderstorms by as wide a margin as possible, and suggest that you do likewise.

EXHAUST PIPES

The original 3-place Cozy had 2 into 1 exhaust pipes each side. This was a simple system, but it sacrificed some engine power. So for the Mark IV, we designed a 4-pipe exhaust system which got a

little more power out of the engine (100 more rpm). It was designed with a welded-on heat muff on the #4 pipe, positioned so that a sheet-metal shroud could be wrapped around pipes #2 and #4 to extract heat from both pipes for carburetor/cabin heat.

In newsletter #61 (2 years ago), we reported that Carl Denk experienced cracking of the exhaust pipe on the right side from #4 cylinder where the heat muff is welded on. It cracked once, he repaired it, and it cracked again. He had about 500 hours on the pipes. He diagnosed the cause as the differential expansion and contraction of the exhaust pipe compared to the heat muff, which doesn't get as hot, and this differential exerts a tremendous force which will eventually crack the weld or the pipe. When we reported this, we listed 2 potential dangers: 1) A crack in the exhaust pipe could allow carbon monoxide to escape into the heat muff, and 2) If the crack is allowed to propagate, a piece of pipe could come loose and go through the prop.

We discussed the problem with Clinton Anderson, at Custom Aircraft Parts, and we decided to change the design. As of April 1998, #4 pipe has been supplied with a clamped on, rather than welded on muff. We advised all builders with welded-on muffs to inspect their exhaust systems frequently and rework or replace #4 pipe at their first opportunity. We announced that we were replacing our #4 pipe with a new pipe with a clamped on muff immediately.

Well, our worst fears were realized. While we were still at Sun 'n Fun, Dave Domeier called us and told us that he had an emergency landing in Alabama on the way home from Sun 'n Fun. He was cruising along happily at about 10,000 ft., when all of a sudden his airplane began to shake violently. The canard was just a blur. He instinctively shut down the engine, and the shaking stopped. He declared an emergency, got a steer to the nearest airport, and set it down on the runway. When he deplaned, he noticed that #4 exhaust pipe was missing, and #3 blade on his 3-blade Performance prop was also missing. The #4 pipe had broken off at the aft heat muff weld and gone through the prop, taking one blade with it. He tied down his airplane, rented a car, drove home, and ordered a new #4 pipe and new Performance prop.

We discussed the situation. Dave remembered the write up about the cracks that Carl experienced in #4 pipe, but was misled by the fact that it had happened only after several hundred hours. Also, when I replaced my #4 pipe after several hundred hours, it was still okay. In further discussion, it developed that Dave had not anchored his pipes firmly where they went through the aft baffle; i.e., he had cut 2 inch holes in the baffle for 1.75 inch pipes. For some reason, there is an OWT (old wives tale) that you should allow space around the pipes where they pass through the baffle for cooling. Not so!

In Canard Pusher #83 Mike Melvill showed a picture of a new exhaust system he was evaluating. The pipes were firmly anchored with flanged saddles where they passed through the aft baffles. He said he hated to remove his old 4-pipe exhaust system, which had performed flawlessly for 1,320 hours!

The baffle drawings we show on M-32 and M-33 have 1.75 inch holes where the pipes pass through. They aren't dimensioned, but they are full scale patterns. There is a note saying to reinforce that area with .032" aluminum. We have found that that wears too fast, and we have reinforced that area with .125" (1/8") aluminum. We also recommend installing either a hose clamp, or several wraps of heavy safety wire around pipes #1 & #3, and #2 & #4 ahead of the aft baffle to hold them tight together and prevent relative movement between pipes and between pipes and baffle.

We are making it a MANDATORY DESIGN CHANGE to replace the #4 pipe having a welded muff

with a #4 pipe having a clamped muff, and to anchor each pair of pipes together and to the baffle with no clearance around them.

Because of the severe vibration he experienced, David Domeier has thoroughly checked his crankshaft flange and other parts Lycoming recommends for a sudden engine stoppage, and thoroughly checked his canard, and found no damage. He installed his new pipe, anchored the pipes firmly to the aft baffle, installed his new prop, and flew home uneventfully. We are grateful he and his airplane survived so well, and that he has passed his findings on to all of us so that we might be saved a similar experience.

GPS ACCURACY

The federal government was imposing varying and instantaneous amounts of errors in the GPS positioning system as used by general aviation which were intended to prevent hostile governments or terrorists from using it to pinpoint targets. This was called Selective Availability (SA). This was turned off by the Clinton Administration 5/2/00. Neil Clayton advised that the effect of turning off SA was shown on: <http://www.igeb.gov/sa/diagram.shtml>. It appears that errors as great as 60 meters horizontally and 160 vertically have been reduced to about 4 meters or less.

LEANING THE MIXTURE

Eric Westland asked the question, "What is the best way to lean when you have fuel injection?" and one of our builders provided the answer. It was a discussion by John Deakin, on <http://www.avweb.com/articles/pelperch/pelp0018.html>, about the considerations in leaning engines. It turns out that engines really run better and it is better for them to run lean of peak, but the problem is that rarely do all of the cylinders peak at the same time. When you lean to "roughness", it doesn't mean that one cylinder is missing, just that the power from that cylinder falls off as the mixture gets leaner and the cylinder runs cooler. What also happens is that the other cylinders might be in various stages of approaching peak temperature, and running too hot. Lycoming says that for best engine life, you should not let the hottest part of the cylinder exceed 400 deg. F, and there is a good reason for it. Above 400 deg., the strength of aluminum falls off quite abruptly, and other bad things start to happen. Further complicating matters is that when we measure CHTs with probes, or even spark plug thermocouples, at the underside of the cylinder, we are not measuring the hottest part of the cylinder. Another complicating problem is that if you also have electronic ignition, and one or more of the cylinders is operating at peak CHT (because you have leaned to roughness), you might not only have a temperature problem, but also at peak CHT the flame front travels the fastest, and if you have advanced the ignition, the peak pressure point may occur when the piston is at or close to top dead center. This puts additional stresses on the bearings. So how do you sort all this out? Well, with fuel injection, you can size the nozzles so that all cylinders peak about the same time, and then run all cylinders on the lean side of peak, which is really the best of all worlds for the engine. But if you do not have fuel injection (we don't), then you can straddle the peak CHTs; i.e. our #1 peaks first and then the temperature starts to come down as the others are still going up. #3 peaks next, so we lean until #1 CHT going down and #3 CHT going up are the same. Clear as mud, huh? Hint: #2 and #4 CHTs are lower than #3, on the rich side of peak.

CANOPIES

We considered one of the outstanding features of Rutan Variezes and Long Ezs was the full bubble canopy and the excellent visibility it provided (sorta like fighter planes). When we designed the Cozy, it didn't seem practical to have a bubble over the back as well as the front seats (and it wouldn't give us as good roll-over protection), so we opted for a bubble over just the front seat. When the Velocity came out several years later, we couldn't understand why they used a "windshield" instead of a bubble. It is sorta like painting over the top half of your glasses. Many prospects who went for a ride in the Cozy after riding in a Velocity, were impressed by how much better the visibility was. In fact, Brian Bishop, former leader of the Thunderbirds, said we could quote him, that "the Cozy was the next best thing to flying an F16". Good visibility is actually a safety consideration!

After we advertised that we had better visibility than the Velocity, they must have seen the light (pun intended), because they changed, and now have almost a full bubble, like the Cozy. We can't understand why anyone would want a windshield rather than a bubble. Now hear this! Cozys have bubble canopies! We don't like airplanes with windshields. We have not approved covering the bubble for the Cozy. It is not approved! So don't get sweet-talked into it. If you are worried about the sun, wear a baseball cap, or get one of those self-sticking pieces of grey transparent plastic you can move around, or paint the top of your glasses, but keep the bubble! Your airplane will look better and be safer (If it doesn't look like a Cozy, it probably isn't a Cozy!)

ARLINGTON

Arlington Northwest EAA Fly-In, July 5-10 is a very nice fly-in (when the weather cooperates). We are going to try to make it. Check out the web page for Arlington 2000 at <http://www.nweaa.org/nweaa/default.html> Eric Westland says: "Vicky and I would once again like to host a dinner for Cozy owners, builders and fans on Friday, July 7th around 5:30 PM at our home. We would appreciate a donation to help cover expenses, \$5/ea or so, and we'll take care of the rest. All ages welcome. RSVP would be great to help us plan for food. (425) 513-0942 or ericw@surf.free.com."

OSHKOSH

The EAA AirVenture Oshkosh is July 26 to August 1 this year. A Cozy dinner on Friday, July 28, at the Ramada has again been arranged by Kim and Daryl Lueck. Social hour 6 to 7, dinner at 7:00PM. They are hoping for a large turn out like last year and would love to get reservations via email dlueck@execpc.com. They would like to have an indication of how many are coming. Last year it got hot and there was an unusually large turnout. If they reserve for 100 and only 70 show up, they still have to pay for 100. If they reserve for 70 and 100 show up, there might not be enough food. They will be gathering door prizes. The guest speaker will be Brian Bishop, former leader of the Thunderbirds, and now a Mark IV owner/pilot. Meet for transportation at the Cozy exhibit, Exhibit Bldg A. Then there is a homebuilders picnic on Saturday. We have a forum scheduled for 1:00pm Friday, but check the schedule. Let us know if there is any particular subject you would like to have us discuss. Nick Ugolini has agreed to talk about the procedure he has perfected for making 3-blade composite propellers. We

would like to know what other subjects you would like to have discussed. If you need a place to stay (motels are always booked) you might try a service that books rooms in residences: 1-800-477-2920.

Alan Shackleton, on the EAA board, has promised that AirVenture 2000 will be "Canard Friendly" and hopes many canards will attend. The canard parking area will be in the same location (away from the crowds) on the southwest corner of the P-1 taxiway and Knapp St. (vicinity of the old fly-market.) The area is being expanded. The drill will be the same, let the marshallers know by holding up a card to let them know where you want to park. Those without a card will be marshalled to the canard area. Those who want to park in the regular flightline area (along 18-36) must show a card, signifying that area. He recommends that everyone have a card handy to show their preference for parking.

GOLDEN WEST

The Golden West EAA Regional Fly-In, September 8-10, has been moved from Merced to Sacramento. We will try to attend.

COPPERSTATE

The Copperstate EAA Regional Fly-In October 12-15 will again be held at Williams Gateway Airport, Mesa. It is about 10 miles away from our house. There was some question about whether it would be in Mesa again this year, but we just received word that it would. That is great, because we would like to have a barbeque at our house again, and we always enjoy having builders stay with us.

PROPELLERS

We basically look for several things in a propeller.

1. Fastest cruise at full throttle and 8,500 ft. altitude, without exceeding 2700 rated rpm. This would compare the efficiency of all props at the same power setting.
2. Maximum static rpm to develop as much horsepower for takeoff as possible. We consider a spread of 300 rpm between static and full throttle rpm to be ideal. Less would even be better.
3. Smoothness. A propeller should be balanced both statically and dynamically. Static is a function of weight and weight distribution. Dynamic requires that all blades have the same airfoil at the same stations. Generally, a 3-bladed propeller is smoother than a 2-bladed, but more expensive.

We have evaluated both the Sensenich 2-blade and the Catto 3-blade. Both were good props at reasonable prices. But both were shy of 2700 rpm at full throttle and altitude, so static was lower than desired as well. We relayed this information back to the manufacturers so they could fine tune them with either less blade area or pitch, which ever they thought would be best, and we'll test them again.

David Domeier has tested a 66 x 76 two-blade, bicambered Felix prop. He liked it very much, and

described it as a "climb" prop. Static was 2400 rpm, acceleration was good, climb was good, and full throttle at 8,500" resulted in 2830 rpm and 179 kts TAS. His performance 3-blade at the same altitude turned 2700 rpm and produced 173+ kts TAS. He said the cost, with the bicamber feature was \$835, including shipping.

EXTENSIONS

From time to time we have heard claims about better cooling, less noise, and higher speed by increasing the length of the prop extension from 6 inches to 8 inches. We mostly discounted this, but decided to try one anyway to see if it resulted in less soot on our 3-bladed prop. So we ordered up one from our favorite supplier, Judy Sabor, and installed it. There does seem to be less soot. Haven't particularly noticed any other change, except it definitely makes it easier to remove and reinstall cowlings, so we like it.

FIRST FLIGHTS

We are aware of 5 first flights in the last 3 months:

1) Don Rothrock writes on 3/30/00:

N320FR made her first flight at Ft. Pierce airport on 3/29/00. It had been parked outside AeroCad's hangar for about 2 weeks with me chasing down last minute items. My prop is a Sensenich 67x85, and it vibrated (fluttered) during runups to over 2000 rpm, and I couldn't get more than 2050 static. So I sent it back to Sensenich, and they removed most of the fiberglass from the tips, rebalanced it and returned it to me in 3 days. Now it turns to 2350 static with no vibration. Jeff made the first flight. He told the tower that he would make a high speed taxi, and if all went well, he would rotate. That's what he did. It appeared very steady as it made a climb toward the east. Jeff reported CHTs, EGTs, oil pres and temp, and airspeed. The CHTs reached 425 deg but cooled down to mid 300s in level flight. He made a nice landing and taxied back to the hangar. I was very excited.

I started building on 1/17/97, but soon developed a severe reaction to epoxy. I had to use every possible protection, and found that by limiting my exposure to epoxy, I was just able to tolerate it. With that in mind, I decided to purchase as many pre-fab parts as possible. The people at Sensenich are great to deal with and very interested in seeing happy customers. My IO-320 was built by Don George Engines in Orlando, another company that stands behind their product. One of the nice things about building this airplane is the type of people we come in contact with. Almost everyone is wanting to help; from the vendors to the individuals. Nat, there is no way I could have gotten this far without you designing & developing an almost fool proof airplane that even someone like me could build. I must also thank Jeff & Greg Russell for their never-ending support.

Don Rothrock
Pt. St. Lucie, FL

2) David L Jones writes on 6/6/00:

What a thrill! My first flight went well with no real problems. The aircraft has a tendency to roll right, but I was able to trim it to neutral. Had a half ball to the right, still need to do some adjustments on wing incidence. All in all, it flew nicely once trimmed. With an O-235 Lycoming the CHTs were 325 to 350 and the oil temp was 200-220 (Nat, do you think this is too high?). I will give you more details later. Thanks.

David L. Jones
Reno, TX

3) EAA Chapter 35 newsletter reported:

Farr Out! On 2/27/00 an extraordinary event took place. Jon Farr flew his Cozy MKIV N244CZ on its maiden flight. After years of hard work, Jon was rewarded with his successful test hop. He didn't have tears of happiness on his face, but I sure had a lump in my throat.

On the BIG day, the cowling and prop still needed to be installed. The cowling was stubborn. Then the tires needed some air and the tanks needed fuel. After several calls for a fuel truck, we decided to "borrow" a few gallons from a tank in the hangar. It managed to produce only about a half gallon of 100LL. Well, Jon said he had enough fuel to taxi a little so we pushed the Cozy out. Oh boy! The battery was dead! Anybody who would be afraid of a black cat would have said "This ain't the day!" So Skip Barchfeld got out the jumper cables. The engine started, and then came the fuel truck.

So it was time for the high speed taxi tests. On the last run, it not only rotated, but also "crow-hopped" a short distance. Jon taxied in, and after a short stop to allow the engine to cool off, it was time to go for broke. He taxied out. A beautiful take off, flight and landing. No problems were encountered, except a high oil temp. And just as beautiful was the smile and expression of elation shown by Linda, Jon's lovely bride. WHAT A DAY!!!!

4) Benoit LECOQ on 4/9/00 wrote several pages about the preparations he made for his first flight. Then he writes:

I first did an acceleration and stop (up to take off speed to get a feeling of the airplane behavior and the wind). At 5PM exactly French time, I pushed full throttle (2450 rpm static) and let it go. From there the flight went on as scheduled. Initial climb was straight with a slight tendency to roll right, immediately corrected by the aileron trim slightly left. Trim with Alex Strong's trim is smooth and easy. My trim switch is just in front of the throttle and the location is very neat. It operates just as advertised. I then leveled off and reduced throttle to get the engine temperatures. At 2000 rpm, all CHTs between 291 and 331 deg F. I wanted to try a higher speed, but at 2400 rpm I felt a very tiny vibration that was not there before, so I decided it was time to go back for landing. A very nice kiss landing on the very first approach. By the evening we had a party at Gilles Desgruelles home with lots of good french wines. It ended up late evening. Oups, what a day!!!

In summary, I felt very familiar with the plane right away for several reasons: I fly professionally an Airbus 320 which has side stick controls - no big change. I had flown a Cozy several times before and it did help. I had spent lots of time thinking the way I would do that flight. And the controls are very sensitive and homogeneous. The engine behavior was good.

The next day I came back and removed the engine cowlings. I found out the reason for the tiny

vibration on the previous day. There was a tiny mark in between the cowling and the baffling. I sanded the baffling to give additional clearance. I checked the prop torques and they hadn't changed, so I went on to the second flight. It went very well and the temperatures were right on.

The third flight was a demo flight for my wife who watched the bird take off from the ground. I needed to show her that bird flying. I did a touch and go so she could see something. Everything is fine and tomorrow will be another testing day. It looks like my testing is starting very, very well. I am overwhelmed by the joy of flying this bird and think I will do a longer flight after another thorough check. Thanks Nat for your exceptional design. The temperatures are right on because the engine installation is word per word your book, nothing more, nothing less. I think I will easily get 180 kts cruising speed because I still do not have wheel pants and spinner. The performance prop is behaving real well. Yours sincerely, Benoit LECOQ

Paris, France

5) Gaeton Roy writes:

FINALLY! After close to 11 years of work (3135 hours of actual work) since 1987, Cozy III, serial number 299, had its maiden flight yesterday morning at 7AM. It lasted 20 minutes around the St. Hubert airport in the suburb of Montreal. The sky was cloudy, wind calm, temperature 54 deg F. My test pilot, Claude Elie, said that it is a fast machine, sensitive, and flies great! I will keep you posted after I have flown her myself. It will be in a couple of weeks as I am going out to the other end of the country on business for a week. I need to say also that all this was possible due to the superb plans you produced and all your dedication and support to your builders. Many thanks! Gaeton Roy

Montreal, Canada

AWARDS

Both Sport Aviation and Kitplanes are requesting all designers to have their builders send in pictures of their completed projects, with short write-ups, because that is one of the most interesting features for their readers. Kitplanes even offers the incentive of entering the builders in a drawing for a free hand-held GPS. We have found that these pictures and write ups are more impressive with prospective builders than an equivalent sized picture ad. That is why we reward each builder \$100 for their entry in either or both magazines, or an Alex Strong pitch trim, which would otherwise sell for \$175. Recipients for the last 3 months are:

1. Brian Heinitz - Kitplanes May 2000.
2. Marc Pichot - Kitplanes May 2000.
3. Eric Westland - Sport Aviation May 2000.
4. Gene Davis - Sport Aviation June 2000.

Congratulations and thank you, guys!

OUR WEB PAGE (WWW.COZYAIRCRAFT.COM)

Cozy builder John Slade stopped to visit with us at Sun n Fun. During the visit he mentioned that his profession is designing web pages, and he graciously offered to help us with ours. He has completely redesigned it, made a number of good suggestions, added the "Virtual Fly-In", the "Builder Contacts" and a number of pictures to the "Photo Gallery", and made some other suggestions we haven't gotten to yet. We are very pleased with the result, thank you, John! We would like to add more names to the builder list. If you have a web page, or e-mail address, please check the accuracy, and if you wish to be added to the list, please let us know. Also, we only have pictures of about 1/7th of those who are flying, so send us your pictures, too. Check out our web page and let us know what you think.

ENGINES

There is quite a nice article about the new TCM monoblock diesel engine in Sport Aviation June 2000, p.47. It is planned to demonstrate it at AirVenture 2000 (Oshkosh) in the nose of a Cessna 337 Skymaster. It is a very innovative engine, about the same size and weight as a Lycoming O-360, but with half of the moving parts, 200 hp up to 12,000 ft., water cooled, direct drive, 50% longer TBO and about half the price of a Lycoming. It is acclaimed to be the general aviation engine of the future. It would be ideal for a Cozy Mark IV. One of our builders, Mike Skorija, has his deposit down and is scheduled for one of the first production engines. If I were building now, that is the engine I would use.

LETTERS FROM BUILDERS (some from the net)

5/18/00

Nat,

Cozy Mark IV (ser. No. 412) has an N-number of 2187J, and is at the airport. The wings are on awaiting the prop and extension, which are on order. The end is in sight. I'll send pictures and details after my first flight.

Gary Juergens
Sullivan, MO

3/17/00

Dear Nat,

I sent you the article about Jon Farr's first flight, with his permission. There are four other builders here actively building Mark IVs (plus 2 more with plans). Burke Bristow has just started and has finished his seat back, Terry Winnett is working on Chapter 5, and Brad Doppelt has installed the bottom on his fuselage. I am working on the elevators. I'm continually amazed how you could put the plans together!

Lowell Robinson
San Antonio, TX

6/3/00

Hi Nat!

Well, things have slowed down more than what I would like. I'm down to a short list of things to complete - probably 1 page of notebook paper. I'm nearly done with wiring the instrument panel and about all that's left is a lot of contouring on the wings and strakes. I'd like to get the fuselage primed before the end of June and have it flying by Copperstate. Have a great day!

Brian DeFord

Chandler, AZ

6/3/00

Greetings Nat and Shirley,

Sorry I was unable to see you at Sun & Fun, but I was having surgery for total blindness. Eye better now, but still in congestive failure. I had some nibbles from your ad but I need to run the ad again. I'd like to sell soon and save Blanche that headache. The \$20K is negotiable, but that is about 1/2 price, not including all the work I put in. Nearly all parts (including engine) to finish. I just kept buying parts hoping to soon work on it again. Good workmanship. Thanks and good luck to you two.

Steve Overly

Grove City, OH

6/3/00

Nat,

I am sn 805 and have really just gotten started. I am nearly done with chapter 4. The plans are easy to follow and the web support is a great help. I am using MGS epoxy and I am very pleased. The parts are weighing in at or below the average posted on Marc's web page. Thanks for your dedication in designing a fine airplane (and putting up with us). You have helped to bring me and my family great joy in actually realizing a dream.

Paul Chumbley

Elizabethtown, KY

5/10/00

Nat,

How about this (for a testimonial). Flying my Cozy is as close to flying an F-16 as you can get-best bang for the buck. The bubble canopy provides excellent visibility and the cruise performance is truly fantastic. Suffice it to say that my Chuck Wolcott-built Cozy is everything that I thought it would be-performance, comfort, and most of all, FUN!

Brian Bishop

'98-99 Thunderbired Commander/Leader

5/15/00

Dear Nat,

My annual is completed and I am cleared for 3 more years. I have installed a new MKNG6 (like Jack Wilhelmson's with Timken A2126 bearings) which I machined from a block of 2024T3. I was anxious to judge the results. Ground turning is easier than ever, easier to counteract some cross wind and the front leg seems far more rigid than before. So the mod is positive. I remember having some noises in the bronze bearings. Nothing now. So I confirm what I told you at S 'n F.

Marc Pichot
France

5/2/00
Builders,

(Before the government removed the deliberate errors in the GPS, you would be asked to believe that your house was on wheels and seemed to be moving around). I used to have that problem with my bed in college, we used to call it 'bed spins', You would put your foot on the floor to keep the bed from spinning, if it made smoke and sparks and such because the bed was spinning to fast, you were in deep trouble.

Norman Muzzy
Cedar Falls, IA

5/1/00
Dear Nat,

The reason I asked about Nylaflow brake lines is that I have mine well wrapped with fiber fax and then aluminum foil. When I changed my brake pads this past March they were still very flexible. Since there is no date for deterioration, I guess you just have to swing the brakes when you change the pads, and if they snap, you change them. Correct? Bob Woodall still has his original lines - I will ask him.

Ken Brimmer
Bowie, MD

4/30/00
Hello friends

Yesterday was very exciting-our Cozy N871F has a home at the airport! Thanks to everyone who showed up to help move the Cozy out of the paint shop and onto the trailer. We had a convoy driving out to the airport and we attracted a lot of attention! Then we moved the main wings from Terry's shop to the airport. This is the first time in a LONG time that the entire airplane has been in one spot.

Yes, we finished painting the interior Wednesday evening and the plane looks great. I'm eager to see the whole thing assembled with the paint job. Kevin and I want to say THANK YOU to everyone who has given their help and support over the last 7 1/2 years. We really appreciate 14 of our EAA friends in Lubbock giving up the majority of their Saturday to help us move the plane.

Well, maybe by June N871F will be flying! Kevin still has a lot of final assembly to do plus the avionics check before we can taxi test and get the FAA to sign her off. Having the plane at the airport is a GREAT feeling!

Carrie Funk
Lubbock, TX

4/30/00
Dear Nat,

Claudia and I met you at your Falcon Field hanger a couple of months ago. We have enjoyed following the experiences of your many enthusiastic builders through their web sites. Both of us are impressed by your design and conservative pragmatic approach to homebuilding. Seeing your aircraft was a thrill; we were impressed, and decided to purchase plans. We have enjoyed studying the plans and we are looking forward to beginning our project soon. We would like to meet and correspond with other builders in the valley.

David Murphy
Scottsdale, AZ

4/28/00
Nat,

Thanks. Excellent plans. I didn't know building was so much fun. I should have started this 10 years ago.

Robert Peplinski
Brookfield, WI

Builders, 6/6/00

Here are some numbers from a recent flight check of a new Performance 64x72 three blade prop:

Take off rpm is 2450

75% at 8500 is 2750

I've had three Performance props. This is the best one yet. The first one turned 2360 on take off (and has been retired). I developed some very small hair line cracks across the grain right where the hottest air comes out of the engine. There is no logical explanation for cracks in that area other than heat. I'd flown a couple of flights with an OAT of over 100 and that probably did it. Clark Lydick loaded the blades to 200 pounds on the bench and they did not break, but we decided to retire it anyhow. The cracks were very, very tiny, but they were there and would not go away with surface sanding.

The second prop turned up 2400 on take off. It was a good performer on the runway, in climb, and in cruise. Unfortunately, the #4 exhaust pipe did it in with just 7 hours total time.

The third one, which Avemco paid for, Clark Lydick built on the week end of April 14 and shipped to

Alabama the following Tuesday. Its pitch is a micro or two less than it's predecessor.

Those of you still thinking about a prop, do consider at least 2400 rpm on take off no matter who builds it. The performance difference from 2360 to 2450 is quite noticeable. You may lose a knot or two on the top end, but who cruises above 2700? This current prop yields 165 KTAS at 12,500 at 8 gph with rpm at 2580 and it really gets me off the ground.

I had one moment of concern on the first flight with the Performance after removing Felix. Take off and climb was very smooth and I was pleased how things were going until climbing through 5000', when a very noticeable vibration developed. Now mind you, I am very gun shy of any vibration these days and I thought what is going on now!? I pulled the power back and returned to home plate without further ado. I figured the engine might have failed internally, after all, and pulled the oil screen and filter expecting to find a ton of metal - but there was nothing. Next I went after the prop. Its balance was almost perfect and track was too. Then I got into the ignition system. I had recently installed those new blue wires from Jeff Rose. Guess what, the #4 spiral wire insert was not making good contact with the spiral core. I put it all back together, gave her some new oil, and blasted off one more time. No more vibration. (There is a certain primal pleasure in finding a problem and fixing it). Flying the Cozy is a good as ever.

David Domeier
Chesterfield, MO

6/7/00
Open letter to David,

I liked your few messages on all the stuff that went on on the brakes issue. I loved your answers and agree with them. I now have nearly 10 hours logged on my Cozy Mark IV and it is a tremendous fun to fly with it. I have the same prop you have and get 2430 rpm at take off with one Jeff Rose ignition and the Ellison TBI. I get the same figures you have in flight and need to be careful not to overspeed above 2700 in flight. At 2600 rpm, I get 173 kts IAS at 2000' and OAT 70 deg. F. This is about 180 KTAS. I have not been able to climb above 4500' yet because the traffic is heavy around Paris. This morning I tried to but was not allowed by the control center due to airline incoming traffic to ORY and CDG. I built the bird exactly per plans except for a forward hinged canopy. I am able to hold full take off power with the Cleveland brakes and did a few hard braking landings to see what minimum landing lengths I could get. They work perfectly and the plans design is perfect as of my flying experience with the airplane. Nat is a very nice guy and I very much appreciate his help.

Benoit LECOQ
Paris, France

4/21/00
Builders,

My exhaust system is an original two into one system with slip joints and stainless springs made by Sport Flight 14 years ago. When it was discovered that a 4-pipe system increased performance, I cut my large pipe lengthwise and welded in a flat separator plate to isolate the exhaust pressure pulses. My rpm at cruise increased 100 rpm. This system has been working fine for 500 hours and has welded on heat muffs. It has the advantage of a round pipe through the baffles and cowling. It has the added advantage

of multiple point support. My experience as an engineer tells me that the failures with the 4-pipe system is caused by resonant vibration in a pipe that is supported rigidly at only one end. If this is the cause, not welding the heat muff on will change the resonant frequency and may fix the problem, however, it would appear that a multiple point support system that eliminates the chance of a broken pipe exiting the airplane is needed.

Jack Wilhelmson
Mt. Pleasant, SC

Editor: Supporting the pipes where they go through the aft baffle satisfies Jack's suggestion.

4/17/00
Builders,

Regarding the tendency for a 4-pipe design to go through the prop, I believe it shouldn't go through the prop on failure if you can keep the baffling tight around the pipes as Nat suggested. I use 1/8 inch silicone baffling material tight against the pipe and I don't think my pipes could get through there on a failure. I find it difficult to pull them out for maintenance myself. That, in addition to welded shrouds that couple the pipes together, should keep them inside the cowl under most failure modes.

My hangar mate had a similar #4 pipe fracture that separated from the cylinder head completely. But it didn't move more than 1/2 inch toward the prop before hanging up on the shroud and baffling. In fact, he didn't know it had failed until he took the cowl off to check out the weird sound the engine was making.

Dewey Davis
Warrenton, VA

4/9/00
Dear Nat,

After 3 years and 200 hours of flying, my Cozy finally made it into Kitplanes "Completions". I love the way it flies, but my stock pitch trim needs adjustment every 10 hours or so. I hear the Alex Strong electric pitch trim kit is about the best out there (hint). Maybe I should put one in my Cozy this spring before the fly-in season hits (hint).

Before anybody says it, I will. My Cozy doesn't have a trim stripe on it, and it ain't gonna get one! Sorry guys! Over the years, I've put painter's tape all over the airplane to see how different trim schemes would look. And every time, I rip off the tape and decide the plane looks best all white. I even was ready to hire a professional custom painter to do something really cool to my airplane. He turned down the job (and the money) because his artistic eye decided the Cozy looks best as it is. The airplane is distinctive on its own and speaks for itself. Trim is only needed to add character and style to shapes that lack those things. Ever see a solid white Cessna without trim colors. UGH! I rest my case. Let's all take care of ourselves and have an accident-free fly-in season!

Brian Heinitz
Gold River, CA

4/15/00

Dear Nat and Shirley,

Please note we have moved again. This is the second time I have had to move my Cozy by land, and I have vowed that it won't happen a third time.

Things are progressing slowly but steadily. Right now I'm in the process of adding an addition to the barn. My two-car garage gets a bit tight when things start to come together. I'm hoping to finish that up this weekend, and move my big bird out there next weekend. Please stop by if you're ever in Mississippi. Olive Branch is just outside Memphis.

Greg Prince
Olive Branch, MS

4/1/00

Dear Nat,

Well I have completed about 43 hours on the Cozy and all was well until I checked my compression. On #2 cylinder I found that it had 0 psi, and #4 cylinder had about 55 psi. This prompted me to take apart the cylinders and see what was happening. I found most of the rings on #2 were gone and one ring on #4 was broken. After rebuilding, I am in the air again. I mention this to show that with only about 110 hp effective, I was still able to get about 125 kts out of the airplane. Performance, to say the least, has improved with the new rings and piston I installed. I have enclosed some photos of the device I have used for over a year now to remove my wings all by myself without help.

Richard LaCourse
Worland, WY

Nat, 3/21/00

Enclosed is a check for the newsletter. I really enjoy my Cozy, putting over 100 hours on it this past year. Thanks for keeping us up to date with the newsletter. See you at Sun 'n Fun.

Richard Reitz
Houston TX

3/24/00

Hello, Nat,

Please note I have moved. I've been slowed down, of course, by the move, and am anxious to get started again. My girlfriend's gracious offer to have part of her garage turned into an aircraft factory is much appreciated...I just don't think she quite knows what she is in for! Looking forward to saying hello again at Oshkosh!

Alan Wirbisky
Eden Prairie, MN

3/10/00

Dear Nat & Shirley,

I met you and Shirley a couple times at Arlington, and have worked hard over the last few years to be able to afford an airplane. I still have to build a work shop (my better half called it a garage) this summer so I don't expect to start building until fall. I am 45, a programmer, debt free (for now), recently widowed, one daughter of 16, struggling to finish BSc CompSci at UofCalgary, used to be a helicopter mechanic. The one person who has had the most influence on me to select a Cozy MK IV is, of course, Marc Zeitlin and his web site. Marc's web site has given me the confidence to say, "Yeah, I can do that!"

Graham Neal
Calgary, AB Canada

Dear Nat, 3/19/00

Progress is steady on plans #760 and is gaining momentum as our enthusiasm grows day by day. The construction is in our blood now and we find ourselves "staying home" to work on some yet unfinished portion of the plane. We are still working on the fuselage and anticipate having it on the gear by midsummer. We both enjoyed meeting you and Shirley at Oshkosh last summer and hope to see you again soon.

John & Nevada Hohde
Carr, CO

3/19/00

Nat,

I have decided not to sell my Cozy for a few more years. I flew with my 16 year old daughter for the first time in a long time today. She and I haven't been getting along for the past several years and we reconnected again with the airplane. She has been flying with me since she was a baby. She told me that some of the best memories in her life were the times that she flew with me. She wants to fly with me and fly the Cozy. She is full size now, has her drivers license and actually has the makings of a good pilot. She has a good sense of the instruments, where she is in the air, and what she is doing. This is my opportunity to spend the last couple of years that she will be at home doing something with her that she really enjoys. We had grown too far apart. My wife says that she will fly more with me again too. It just took until it really looked like the airplane would be sold until they said anything to me about it. They are both hard over about my keeping the Cozy. I will just have to take it easy on my back and wear my back support band when working on it. I hope to make some fly-ins this year.

Jack Grandman
Englewood, CO

3/14/00

Dear Nat,

What a great Christmas present - Cozy Mark IV plans. My wife really knew what I wanted this year!

Steve Beck
Cedar Rapids, IA

3/9/00
Hi Nat,

Thanks for inquiring about the first flight of my Cozy. So far my only complaint is not enough time to fly it. What I find amazing is how really different things look from inside the cockpit in the air verses in the garage. Things that seemed important in the garage suddenly don't matter. All of your guidance given in the Plans and Operators Manual is right on target and is perfectly clear when flying.

Thanks again Nat for doing such a great job on the design, the plans and the support. There is a guy building an RV-8 in our local EAA chapter and he complains bitterly about their builder support. I know Marc's e-mail group scares you a little and understandably so, but I think it serves a very useful purpose and maybe saves you a lot of phone calls. Best regards to you and Shirley and I hope to see you at Sun 'n Fun.

Ed Richards
St. Petersburg, FL

5/4/00
Dear Shirley & Nat,

I thank you again for the \$100 check. I don't deserve it because I am rewarded by what you engineered with B. Rutan. For me, my Cozy is not an airplane, it is my prosthesis to fly, and it is the extension of my brain. Even though I am an engineer, with some knowledge in the aerodynamic domain, I am sure that I am not able to invent something like the Cozy. I laugh when my colleagues fly 100 kts burning 7.1 gph while I fly 130 kts burning 5.2 gph..at \$4.36/gal (here in France). To travel the Cozy is the right idea at the right moment.

Marc Pichot
Pont l'Abbe France

Builders, 5/2/00

I posted a message a few weeks ago about my epoxy pump ratio being off. I sent an e-mail to Johannes Meunier at MGS in Germany describing my situation, and also sent him some samples. This week I received a letter from Johannes with technical data. His letter says it all: "The glass transition is a bit lower than for optimum mixing ratio, but is expected to still meet the 54 deg. C requirement the system was developed for."

Whew! I don't have to start over. I just wanted to publicly thank MGS and specifically Johannes for his help. This is a great company and they make a great product!

Rick Maddy
Denver, CO

4/28/00

Hello Nat,

Re your web page, you could ask current builders what were the factors in their decision, i.e. the factors in my decision were:

1. I liked the canard, Rutan history, looks, efficiency.
2. I didn't like the Velocity center stick or kit cost.
3. I liked plans because I needed to spread the cash flow.
4. I liked plans because I could make the decision gradually instead of all at once.
5. I spoke to you, and got a good feeling about the support I would get,
6. I monitored the mail list, studied the archives, and witnessed the builder support

If you asked for builders to send you mail saying why they chose the Cozy, I think you'd learn more about the decision process, and get some good testimonials that prospective customers could relate to.

John Slade
Lakeworth, FL

Nat, 3/17/00

Ever since my first flight several years ago, my oil has always run a little higher than I would like. I just accepted the 200-220 degree temps to be as good as it gets. I just changed the vernatherm (\$235) and presto, oil temps 175-187. I feel kind of foolish now for not trying this sooner. Just thought I'd share this experience to perhaps help someone else (580 hours and counting).

Tim Jones
Jefferson SD

5/22/00

Dear Nat

It's been over a year since you sent me plans. I knew that it would take some time before my house would be finished and my life organized, but I never expected it to take the rest of the century. I finally started cutting the foam, and last night I put the fuselage together. Looks like I'm on track now.

Shaping the foam and working with the resin is a breeze. The manual is fantastic. Thank you very much for such clear, detailed and easy to understand instructions. If my progress in the first 6 weeks is representative for the rest of the project, I'll be flying by August 2002. Greetings from Holland!

Herbert Boks
Alphen Aan Den Rijn

"Knowing about a thing is different than understanding it. One can know a lot and still understand nothing." C.F.Kettering

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