

COZY NEWSLETTER #32 January, 1991

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Dear Builders,

*We are making an effort to get this newsletter out before the holidays
to wish all of you a*

Merry Christmas and Happy New Year!

*We have much to be thankful for,
not the least of which is many good builders, many good airplanes, and many safe
flyers.*

*We hope we have many more safe first-flights in the new year
and our best wishes and prayers go to all of you!*

Sincerely,

Nat & Shirley

WHAT WE HAVE BEEN DOING

As soon as we returned from Oshkosh, we started work on the Mark IV plans and the construction of a proof-of-plans aircraft. We knew this would be a big project because we had been through it before. Although we have a little more time now than eight years ago, we also have a little less energy. We decided to be thorough, do a good job, and still try to live a normal (?) life, like going to church on Sundays, not neglecting our friends, children, or Cozy builders, and take time off for a vacation over the holidays. The project grew when we decided to redesign the nose gear for the higher gross weight with a larger nosewheel tire and fork, a Davenport shimmy damper, and sturdier NG-3 4, and 6, together with a stronger shock strut. We also decided to redesign the canard (R1145MS) hardware to eliminate the large hole in the side of the fuselage and resulting draft, and to design special gear attach hardware. These decisions do not reflect on the Cozy design, but seemed appropriate for a larger airplane with higher gross weight.

The redesign decisions would have slowed us down by themselves, but we were unprepared for all of the mail and telephone calls requesting information, and personal visits of prospective builders wanting to check us out and see the prototype. We had planned to keep a low profile until the plans were finished, and not do any advertising or prepare information kits till then. But the word was out (our fault for announcing it in our forum at Oshkosh), the magazines picked it up, and spread the word. There was an especially nice article in December 1990 *Hot Kits* magazine. We have a number of builders who have already started, based upon our agreeing to supply them with advance chapters.

The good news is that the fuselage tub is complete and ready for mounting the gear (we are waiting for hardware from Brock). Redesign of the hardware is complete and in the hands of suppliers. We are currently finishing Chapter 11 (out of 26, but the rest should go much faster) and we located and purchased an engine—an 180 hp O-360 A1A with 1540 TTSN and just topped for \$5,500 plus shipping. Thanks to Vance Atkinson, who tipped us off. The bad news is that we are going on vacation from Dec. 18 to 28, and the plans will not be available by January 1991. We are probably 3 months behind on the plans and, of course, it will take quite some time more to complete the airplane. Some people think we are a large corporation, but we are just two people, and Shirley isn't much interested in building airplanes anymore after 17 years, can you blame her?

Some of you may be concerned about our support of the 3-place. You shouldn't. Actually our continued involvement in design, building, and testing should better prepare us for supporting both designs.

NIGHT FLYING

We don't do much night flying. We completed a trip awhile back after dark, and last summer I took off for Oshkosh before daylight. Night flying can be beautiful, but a forced landing in the dark (and in the mountains) is not pleasant to contemplate. In my younger days in the Navy, night flying was common place. We used to make night joinups and make long cross country flights in formation, when all we could see were the exhaust gases of the leader and wingmen. We didn't even have

landing lights. Runway lights were all. On carriers we didn't have those. But I am older now, and less fearless.

The last *Canard Pusher* had a long dissertation on night flying with some helpful hints. The first had to do with landing lights. Mike reviewed the need to have an adjustable landing light. The Cozy, like the Long EZ, approaches and touches down in a nose-high attitude. To be of any value, the light must point down to light the runway. After touchdown and the nose strut compresses, the light must be readjusted to shine ahead. A fixed position light would be inadequate for landing, or taxiing, or both. The nose would be a neat location if the light would be adjustable from the cockpit--quite a technical feat. A strake or wing location would have the additional disadvantage of producing glare in the cockpit besides compromising structure. So Mike concludes that the location shown in the plans, under the seat, is the only acceptable location if you intend to use it for anything besides an ornament.

When the nose gear is down and the landing light is turned on, some light comes up through the wheel well windows. Mike recommends making a cover which can be placed over the windows after verifying that the gear is down. He also comments that panel lighting can reflect off the inside of the canopy, and recommends making a shade to overhang the panel at night. Comments from any of you who do much night flying would be appreciated!

PROPELLORS

In 1984 we visited Bernard Warnke on a trip to Tucson. We were impressed with him, his shop, his propellers, and the data he showed us. We had intended to order one of his propellers for test, but never got around to it. *Sport Aviation* in Sept. and Nov. 1990 reported on the CAFE propeller competition. Warnke's was one of 6 fixed-pitch, wood propellers tested. Although it didn't place first in any of the categories (climb, cruise, V_{\max}), it came very close to best in all categories. Other propellers which were better in climb were poor in cruise, and vice versa. The interesting thing about the Warnke prop was that it had the least differential between static and V_{\max} rpm, and the closest to constant speed. This translates to more power for takeoff without over speeding the engine at full power cruise. In studying the data, it appears that if Warnke had supplied a prop with slightly less pitch, it might have won all categories! We talked to Bernie recently, and he says he has tweaked his design, and it is doing even better now.

The Warnke prop will be our choice for the Mark IV, and based upon its excellent showing in the CAFE, we are adding Bernard Warnke to our approved supplier list.

SUPPLIER NEWS

We have been unable to contact Sport Flight for the last 3 weeks, and don't know if it is still in business. It does excellent work for a reasonable price, but we don't know if we can depend on it over the long haul. We will be looking for another source for stainless exhaust systems, just in case, and will keep you informed.

Fox Light has changed its name once more to Airplane Plastics Co.

Our approved suppliers are:

1. Basic Materials

- Wicks Aircraft • 410 Pine St. • Highland, IL 62249 • (800) 221-9425
- Aircraft Spruce • Box 424 • Fullerton CA 92532 • (800) 824-1930

2. Prefab Metal Parts

- Brock Mfg. Co. • 11852 Western Ave. • Stanton, CA 90680 • (714) 898-4366

3. Prefab Fiberglass Parts (Main & nose gear struts, Cowlings, Turtleback, etc.)

- Feather Lite • PO Box 781 • Boonville, CA 95415 • (707) 895-2718

4. Canopy and Windows

- Airplane Plastics Co. • 8300 Dayton Rd. • Fairborn, OH 45324 • (513) 864-5607

5. Propellers:

- Bernard Warnke • HCR 1, Box 1717 • Tucson, AZ 85736 • (602) 822-1166
- B & T Props • 75872 Mosby Crk. Rd. • Cottage Grove OR 97424 • (503) 942-7068
- Ted's Props • PO Box 824 • Concrete WA 98237 • (206) 853-8947

6. Exhaust Systems: To be confirmed

CUSTOM SHOPS

We have warned you before about custom shops. We have heard of many bad experiences, including poor quality, misrepresentation, and over-charging. We have been reluctant to mention names, but don't want any more of our builders to get hurt. The worst (out of several) seems to be **Fitzgerald Composites** (formerly Quality Composite Components), judging from the number of stories we have heard. Awhile back, one of our builders told us he was initiating a law-suit against Quality Composite Components, which we presume was the reason for the name change.

Larry Fitzgerald does not do the work himself, because he is allergic to epoxy. He hires unskilled young men who work unsupervised when he is away promoting his business (and maybe even when he is there). When parts are finished, it's virtually impossible to tell if they were built correctly, and if they look bad on the outside, who knows what is inside? We have advised the EAA about the many complaints we have received, but they say they cannot take action unless they receive complaints directly from builders. In the meantime, this shop continues to aggressively advertise Cozy parts, and a 4-place pre-fab fuselage which bears little resemblance to our design. As far as we know, this shop is not qualified to design aircraft or to redesign those designed by others. While this shop has generated the most complaints, builders have been burned by at least two others that we know about.

If you don't have the time to build an airplane yourself from plans, we urge you to either buy a factory built, or else consider a pre-fab design from a reputable supplier. Please take this advice seriously--if you don't, you will put your money, and maybe even your life at risk!

ALLERGIES

We have been using the RAE epoxies since 1976, without any allergy problems. Part of the time I even neglected to apply skin cream, and I guess I was getting careless. Then, a couple of weeks ago while I was making a layup, I rubbed one eye with a finger that must have had some epoxy on it.

Well, I couldn't believe how my upper and lower eyelid swelled up! I even had a sympathetic reaction of the other eye. It only lasted a couple of days, but was enough to remind me to be more careful.

BUILDER HINTS

1. Need lead tape to balance your ailerons? The Industrial Tape Div. of 3M Co. makes several different types. The type you should order is #422, which has acrylic adhesive, available in 36 yd. rolls 3/8, 1/2, and 1 in. wide. Call your 3M Distributor.
2. Have you noticed that the nose gear strut supplied by Feather Lite is not symmetrical at the top? It is not their fault. They are using the permanent tooling supplied to them by RAF. Check yours. Draw a centerline up from the bottom and extend it straight to the top. You will probably find one side is 3/16 in. wider than the other. Before wrapping it, grind away some glass from the wide side and then add flox to the narrow side until it is symmetrical, and then wrap it. Making this correction will make it easier to install the gear straight.
3. Brian Heinitz (see his letter) suggests using LAVA soap for cleanup, and buying DC switches from NAPA auto parts stores.

FOR SALE

Cozy project with plans, complete through fuselage assembly. Excellent work! \$1500. I have decided to build the Mark IV. Tom Carver (208) 245-3944.

FIRST FLIGHT REPORTS

1. Ron Kidd, Grove City, OH
2. Tom Gross, Melbourne FL

Their letters follow:

Nov. 6, 1990

Dear Nat,

After four years and 3600 hours, Cozy 417CZ flew 11/3/90. The maiden flight was beautiful. It was a very clear morning, crisp and cool. The plane performed exactly as you said it would! Climbs out at 120 KIAS/1300 FPM. She flew the pattern at 2000 ft for about 30 minutes and landed at Rickenbacker ANG base about 6 miles south. We did touch and go's there and experimented with loading the front seat to check the difference in runway length requirements (it is a 12,000 ft strip, 150 ft wide).

We have made four flights now, 3 hrs total time and are adjusting pitch trim spring tension and baffling. Oil temps are on the high side (210 degrees). She has flown to 165 KIAS level flight and is as smooth as glass. I did not fly it initially, as I am a low time pilot, but flew the second flight and the only word to describe it is "awesome"!

I widened the fuselage 2 in. at the front seat and had the canopy blown larger. This modification probably cost me 500 hours! So many dimensions and related components had to be refitted due to the change. We had to custom make the turtle deck and custom mold the rear windows. I feel that it

was a necessary and beneficial change due to my circumstances. I am 6'4" and weigh 220 lbs. and required the extra width and canopy clearance at shoulder level. I also used a toe brake kit which gave me a little more leg room.

The engine is an O-320 E2D with a Great American 62x72 prop. I made all the modifications as they came out, i.e. HD brakes, nose wheel, strut spring, shimmy damper, etc.

I lost the nose wheel during high speed taxi tests. The swivel casting failed at 60 knots and she rode the strut 150 yds down the runway. No real damage, but it was a wild ride. Somehow it didn't go through the prop. I had drilled the casting and installed a grease fitting. It weakened it enough to fail, with the extremely rough runway my hangar was at. She is now hangared at a rural airport with a nice 4,000 ft strip.

For those who are still building, I would like to say "hang in there", it will get finished if you persevere! This was my first project and I am sure I made every part at least twice. But it was worth everything. The airplane flies like a guided missile. I used roller bearing torque tube and aileron kits which makes the controls so responsive that the Cozy is an extension of your body.

Thanks Nat, for designing such an incredible machine and for making it possible that an amateur like myself can have this indescribable experience. Thanks to builders Rick Cahill, Vance Atkinson, and Jon Aspen for support, with special thanks to Burl Fife for the initial flight and subsequent check out. And thanks to all the other people in my life who put up with my **OBSESSION** for the past four years. Now it is time for some fun!

Ron Kidd

Hi Nat,

Well, Cozy N144TJ took to the air on March 4, 1990. Once in the air, everything has been going pretty good. As of last evening, I did the first flight with wheel pants installed. I can now say that the plane has achieved my greatest hopes of performance by going over the 200 MPH mark (level at 1,500 ft).

On my first taxi test, the master cylinders were mounted in the nose but on each side. The left brake felt real good, but the right was somewhat weak, even after several bleedings by several different methods. I decided to try anyway, because the slow speed taxiing was controllable. So there I was at the end of the runway. I gave a bunch of throttle and off I went. I quickly reached 70 knots but did not rotate because this was supposed to be a taxi run. I backed off on the rpms and braked to get the speed down to where I could just lift the nose. About this time I realized the end of the runway was very quickly coming at me. I pulled off the throttle and started hitting the brakes, but couldn't brake hard because the right brake was weaker than the left, which meant I could only brake as good as the weakest brake in order to stay on the runway. As I came to the end, I tried to turn, but my forward speed started a side skid. I was headed toward a big "TAXI" sign, so I decided to hit hard left brake and go straight off the end of the runway. This worked, but a taxi light hindered a smooth transition to the grass. Off came the light and the nose gear, and when the strut hit the dirt, it collapsed, after which I finally came to a reasonable stop. Total damage: Retract mechanism (it wasn't Brock's), screws holding nosewheel to strut sheared, crack on prop tip from impact with nose wheel, and minor scratches on the bottom of the nose. Also big bruise on my ego, but I learned from it, and this time the lesson was cheap.

I installed a Brock retract mechanism, replaced the bolts holding nosewheel assembly to strut, installed Cleveland masters both on the pilot side, and put a heavy duty cross tube between pilot and passenger brake pedals. Brakes work great now. Prop repaired.

Once all repairs and modifications were complete, the first flight went without a hitch. Fourth flight inspection revealed that one exhaust splitter I had welded into the Sport Flight pipes had come out and hit the prop, taking a chunk out of the leading edge. More down time to repair the prop and then off flying again. Great American deserves a compliment here, as the prop came through very well considering the chunk of steel that it hit. The urethane leading edge absorbed the impact, losing a small piece of it, but the wood was not damaged. N144TJ weighs 1005 lbs. with O-320, starter, 35 amp battery, full panel, head sets, spinner, wheel pants and oil.

Some time has passed since I started this letter, as there is now 65 hours on the plane and all is going well. We (my wife and 2 small boys) have made a trip to Pittsburgh with the Cozy (5.5 hrs flight time) plus two stops. My wife loves it and the boys find 10,000 ft a good place to sleep.

I think it's great that you are offering the MK 4 plans. It seems to have a deep message to say to the home builders of the world. America can do without a great 5 cent cigar, but we do need a great set of plans so we can keep building these great little airplanes.

Sorry this letter has been so long in coming,

Sincerely,

Tom Gross

MORE LETTERS

Oct 12, 1990

Dear Nat,

Ser. #466 has not progressed as I had hoped. This has been the summer of extended visits from out of town guests, which we have enjoyed very much, but doesn't get serious work accomplished. I have completed most of the metal parts and spent numerous hours studying the plans and newsletter.

I am very appreciative of all those builders who have gone before and shared their ideas and experiences; especially to Jeff Russell for the info he furnished in Newsletter #31 re the O-320 H2AD engine. I'm sure he has saved me from many headaches, as have other builder hints.

Thanks,

L.B. Smalley

Oct 5, 1990

Dear Nat,

Congratulations on your decision to sell plans for the Mark IV. I know you were deluged with requests for information.

Since I have not been able to begin work on my Cozy, maybe the Mark IV is for me. I sure hope so! Also, the HP LaserJet looks great--and I did notice the difference immediately. Continued thanks for a great newsletter.

Sincerely

Tony Bounds

Sept 2, 1990

Dear Nat,

I am making good progress on my project. I am just about finished through Chapter 16 at this point. I have enclosed a recent photo showing the results of about two years of effort. I estimate the time devoted to construction this far is about 800 hrs. My goal is to fly by the end of June 1992.

Sincerely,
Bob Misterka

11/12/90

Dear Nat,

My Cozy project has been at a standstill for two years now but I am about to start again soon. During this time I have acquired a new job, relocated, bought a new house (with a large 2 car garage) and purchased a Cherokee 180 with 3 partners. We have flown this plane in just about every state on the east coast. It was fun to fly but maintenance was a big factor so we sold it. The first annual was \$4,000--what a shocker!! With Avgas at \$2.00/g and high maintenance costs, the Cozy **STILL** is the better way to go. With one wing, rudders, canopy, engine installation to go, I still have a long way to go. But I still want to finish the Cozy.

Thanks,
Neal Trullson

10/29/90

Dear Nat,

I made a discovery! LAVA brand soap, for some reason, seems to do an excellent job of removing epoxy from unprotected skin (where the epoxy got past the barrier creams). Maybe others would like to know.

Cozy #171's airframe is complete, electrical 30% done, starting engine installation. Won't make Sun & Fun, but definitely be at Oshkosh! (non-stop). NAPA auto parts stores have a large selection of DC switches. Some of them even look good!

Take Care
Brian Heinitz

Nov. 10, 1990

Dear Nat,

My project continues to move forward slowly. I would like to thank you for your answers to my telephone questions. That support has been of great assistance to me. With your help last spring, I was able to make contact with three other Cozy builders in the Connecticut area and to visit their projects. It was useful to see how they had addressed the issues about which I had questions at the time.

Finally, I would like to applaud and encourage you in your decision to market the plans for the Mark IV. Composite home builders of limited means, in search of a fast, efficient, four place design, will clearly benefit from your fine efforts on that project.

Sincerely,
Joe Palmisano

October 29,1990

Dear Nat,

Thanks for the preliminary plans. They look great and very clear.

I am very excited and so is Michelle, about getting the project off the ground (pun).

Enclosed is a sketch I made of the Mark IV [see Gallery below]. I am very glad that you have started this new project. The best of everything to you and your great wife!

Lon & Michelle

PHOTO GALLERY

Lon Cooper's rendering of his Cozy

Tom Gross' beautiful Cozy N144TJ

Bob Misterka's Cozy after 800 hours work

Installing fuselage bottom - courtesy of Charles Nunnelee

Building centersection spar - courtesy of Charles Nunnelee

Ron Kidd's slightly oversize Cozy N417CZ

Robin Du Bois' Cozy project

Robin's nav antenna on fuselage bottom. Can also face forward for more room for Loran ground plane

Robin's elevators during construction