

COZY NEWSLETTER #77 Apr. 2002

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Co-Z Development Corp.

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Subscription rate: \$16.00/2 yrs., \$20.00/2 yrs. OUS

(2-year renewals save us record keeping)

Cozy Mark IV Owners Manuals - \$15

Cozy & Cozy Mark IV decals - \$5 ea. (specify color)

Subscribing to the Cozy Newsletter is a requirement for all builders. The Cozy Mark IV plans are obsolete unless updated by all changes or corrections in the newsletter. All builders must subscribe to the newsletter. First Edition plans holders need newsletters #34 to present. Second Edition plans holders need newsletters #52 to present. We have just printed the Third Edition plans, which have been updated through newsletter #75. New plans purchasers will receive an assortment of back newsletters (we no longer have copies of all back newsletters) plus a complimentary one-year subscription to start them off on the right foot. They will need to renew when that has expired. The older copies, which we can no longer supply, are available on the Unofficial Cozy Web Page. The newsletter is the principle means by which we communicate with builders and support their projects. The newsletter contains plans corrections and changes, builder hints, information and updates about our suppliers, shopping info, first flight reports, and other news of interest to builders. We answer telephone calls whenever we are home and personal letters as well, but please enclose a stamped, self-addressed envelope if you expect a reply. We encourage newsletter input from builders (letters and pictures) which would be of interest to other builders.

“Cozy” and “Cozy Mark IV” are trade names of Co-Z Development and are the names given to airplanes built according to the plans and instructions of Co-Z Development. Just because you buy a set of Cozy or Cozy Mark IV plans, does not mean you have to build your airplane exactly according to plans. It is an experimental airplane and you can, in fact, make whatever changes you desire. But then you have a new, untested design, and shouldn't register or insure your airplane as a Cozy or a Cozy Mark IV.

Co-Z Dev. and Aircraft Spruce are the only ones authorized to sell plans and construction manuals, and Co-Z is the only one authorized to provide builder support for the Cozy airplanes.

AUTHORIZED SUPPLIERS

Authorized suppliers are those suppliers we selected because of their excellent reputation in the industry, whose parts and materials we proofed in our plans model and who agreed to supply the same parts and materials to our builders.

1) Basic Materials

Wicks Aircraft 410 Pine St. Highland IL 62249 (800)221-9425	Aircraft Spruce Box 4000 Corona, CA 91718 (909)372-9555	A. Spruce East Box 909 Griffin GA 30224 (800)831-2949
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2) Metal Parts

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

3) Fiberglass Parts

Feather Lite
1327 S State St, Arpt.
Ukiah, CA 95482
(707)462-2939
(Also propellers)

4) Canopy & Windows

Airplane Plastics Co.
9785 Julie Court
Tipp City, OH 45371
(937) 669-2677

B & C Spec.
PO Box B
Newton KS67114
(316)283-8662

5) Specialties

Custom Aircraft
14374 Olde Hwy 80
El Cajon CA 92021
(800)561-1901

6) Exhaust Systems

Performance Props
Box 486
Patagonia AZ 85624
(520)394-2059

Sensenich Props
2008 Wood Ct.
Plant City FL33567
(813)752-3711

7) Prop Hub Exten.

Saber Mfg.
3601 Nassau Ct.
Granbury TX 76049
(817) 326-6293

Note: Featherlite has moved and now have a new address and telephone number. Their alternate number is (707)462-3424.

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) 277-5996.
- 2) **Electric speed brake actuator kit.** Wayne Lanza (561) 664-9239.
- 3) **Switching and breaker panel.** Wayne Lanza (561) 664-9239.
- 4) **Fuel sight gages.** Vance Atkinson (817) 354-8064.
- 5) **Electric nose-lift.** Steve Wright (615) 373-8764.
- 6) **Electric nose-lift, Spring steel safety catch,** and improved **MKNG-6 and NG-6 Pivots** with tapered roller bearings. Jack Wilhelmson (843) 884-5061.
- 7) **Electric pitch trim.** Alex Strong (760) 254-3692.
- 8) **Voice annunciated warning system.** Richard Lewis (423) 376-1450.
- 9) **Rebuilt flight instruments.** Howard Francis (not a Cozy builder) (480) 820-0405.
- 10) **T-shirts,** etc. Bill Walsh, nogofsu@sprintmail.com. (407) 696-0942.
- 11) **Antennas.** RST Jim Weir (530) 272-2203.
- 12) **Teflon & Stainless Hinge Pins Replacement.** Gary Hall (954)979-9494.
- 13) **Nosegear crank ratchets.** Bill Theeringer (805) 964-5453.
- 14) **Embroidered clothing.** With pictures of a Cozy, name, N number, etc. in any color. Trish Vermeylen (609) 693-4819.

PLANS CORRECTIONS/CLARIFICATION

- 1) Chap. 11, p.3: On NC-3, change 2.3" to 2.0".
- 2) In Chap. 16, p.2, the plans show the bearings for the aileron torque tubes inside the fuselage, CS 108 and CS 115, to be made from 1/4" thick phenolic. These are quite acceptable, however, inexpensive bearings FMN10 may be substituted, in which case the holes in bearing blocks CS-109 and CS-118 must be relocated and enlarged to accept AN-4 bolts.

- 3) In Chap. 19, p.14, the plans show the bearings in the wing rib for the aileron torque tubes to be made from ¼” thick phenolic. These are quite acceptable, however, inexpensive bearings FMN10 may be substituted, in which case they must be floxed and glassed in place. Thank you, M. White.

IMPORTANT NOTICE:

It is stated in the construction manuals and from time to time in the newsletter, that your plans are obsolete unless up-dated with design changes and/or corrections published in the newsletter. It is essential for all builders to have a current subscription and continue to receive the newsletters.

BUILDER HINTS

- 1) **Tachometers:** Marc Pichot writes from France: “I use a 12 volts digital tach from EQUUS (diesel, model 6625), the special sensor is a small magnet & reed switch (made by EQUUS too). Precision is 10 rpm, dimension of the tach is same as a small aeronautics instrument & price is less than \$50. I bought mine in Pep Boys, Washinton D.C. 10 years ago, and never had a problem. It is sold in Europe too by the Conrad company and all my amateur builder friends are using it now in my area. Model 6624 can be used too, but the signal captured is taken on a spark plug cable. The magnet is located and fixed with epoxy in one hole of the starter ring and the reed contact is mounted on a small bracket available with the sensor bolted on the starter frame.” Marc Pichot.
- 2) **Antenna installation:** There was some discussion on the internet about whether to sand the copper foil we make antennas out of and lay up directly over the top, or whether to put something over the copper so the epoxy will not bond. There was talk of this many years ago in connection with putting an antenna in the main gear strut. Because the strut flexes, there was concern about whether the foil might break. There is no such concern with antennas in the winglets, wings fuselage or canard. As a matter of fact, if the layup is not bonded to the antenna, there is a good chance you could have a delamination which would spread.
- 3) **Cutting airfoils.** If you “screw-up” when cutting airfoils, and have a bad cut on one side (top or bottom), no need to throw it away and start over. Just slice the airfoil apart, and splice in a piece of styrafoam (like making a sandwich), and re-cut it. Don’t know how to make a sheet of styrafoam? Just clamp your hotwire saw ½ inch or so above your work bench, and slide your scrap chunks of styrafoam underneath, sorta like cutting boards from logs. The beauty of composite construction is its hard to spoil something so bad you can’t fix it.
- 4) **Torque values.** Dennis Butler responds to concerns about breaking loose flox-captive screws in the firewall: “I’m wondering if the problem of breaking loose flox-captive screws in the firewall might be due to over-torquing the lock nut. I believe that most homebuilders have a natural tendency to over-torque everything. My own way to keep that tendency under control is to use a torque wrench whenever possible to torque the fastener to the value in the following table.

Bolt	Thread	Torque (in-lb)
AN3	10/32	20-25
AN4	1/4-28	50-70

AN5	5/16-24	100-140
AN6	3/8-24	160-190

For non locking nuts, I use the mid-range value, and for locking nuts (all metal), I use the highest value in the range. My only exceptions to this rule are for cases where the structure will not withstand the torque. For example, aluminum torque tubes (where torquing to the specified value would deform the tube). In these cases, I simply tighten to the “snug” point. Using this process, I have never had a flox-captive screw or bolt come loose.”

- 5) **Firewall coatings:** Cozy Builder Chuck Bowser of the FAA sent me this quote out of AC 20-135 “Powerplant Installation and Propulsion System Component Fire Protection Test Methods, Standards, and Criteria,” dated 2/6/1990, Paragraph 7(b)(2) – “.....Past tests have shown some ablative and intumescent coatings become extremely brittle when exposed to flames. Vibration can cause the coating to flake off, exposing the base material. Current experience has not supported the use of an intumescent coating as an acceptable fire protection coating.....”
- 6) **Fuel drain holes.** Wayne Hicks cautions that when you tap the holes in the aluminum slugs in the bottom of the strakes for the drain valves, be aware that the one-eighth NPT tap is tapered, and you need to be careful not to run it in too far. You need to keep checking. The drain valve should have 2 threads still showing when it is finger tight. Thanks, Wayne!
- 7) **Pour foam:** Keith Spreuer writes: “Perhaps this is old news but it’s new to me and works great! I am doing the fairings over and under the strake with pour foam. I was gluing foam blocks on with 5-minute, but found that where ever the glue oozes out, it is very difficult to sand. I decided to try bonding the foam blocks on with pour foam. I mixed up a small amount and poured it on the foam. I let it rise quite a bit but while it was still soft, I stuck the pieces in place and held them in position. It cures very fast and sands great. I also found that some areas can be filled by pouring the foam on to wax paper. Let it rise and then stick the foam puddle into the desired area. This worked real nicely around the fuel sump area rather than trying to carve foam to fit the complex shape. I have some photos of my SVX engine installation I can send you, should I?”

Editor: Yes, our builders would be interested

FOR SALE

- 1) **Cozy Mark IV 4-place aircraft.** 220mph cruise on 10 gph. 150 hrs TT airframe, 150 TT IO-360 Lycoming. First flight 9/8/98. Always hangared. Exceptionally nice Cozy with full instruments: KX155, Collins transponder, ELT, Stereo CD player, intercom, Audio flight engine monitor system, Electric trim, electric speed brake, electric retract, 3-blade Performance prop. \$99,900. Tel (480)671-7355 or email cozy42cz@qwest.net for more info or references.

Editor: This Mark IV would be an award-winner at Oshkosh.

- 2) **Award winning Mark IV.** Dr. Kurt Van Hulzen writes: Nat-as you probably have heard by now, my Mark IV is for sale. This is the plane Dennis Oelmann built and won an outstanding workmanship award at Oshkosh 2000. I hate to sell this wonderful plane but we had our 3rd child about a year ago and my business continues to grow (along with it’s

increasing needs for capitalization). Anyway, if you know of anyone looking for an excellent example (all the credit goes to Dennis!) of a Mark IV, I would appreciate it if you could forward them my name. Tel (800)708-2504, email pigdoc2@pionet.net. Dennis is also more than willing to discuss this plane with anyone. Thanks for allowing me to realize my dream of owning/flying a Cozy, even if it has been for only two years. Hopefully when the kids grow a little and the business stabilizes, I can become part of the Cozy family once again.

Editor: Kurt purchased an un-approved pre-fabricated fuselage tub to start his project. He was so frustrated because none of the plans-built parts fit, he asked for my help. I recommended that Dennis take over the project, which he did. Dennis converted it to a Mark IV, which won an award at Oshkosh. I am pleased I was able to contribute.

PUBLICITY

Norm Goyer's article on the Cozy Mark IV appeared in the March 2002 edition of Custom Planes, which featured canard airplanes. It was a very nice article with a lot of pictures. Norm said it sold out quickly on the newsstand. We will arrange to have reprints made for our info kit and any of our builders who would like copies.

WHAT WE HAVE BEEN DOING

We sent out Newsletter #76 just before leaving to celebrate the Christmas holiday season in Minnesota with family. If you haven't noticed, in my haste, I misnumbered the pages in newsletter #76. Very embarrassing! But evidence that I am not perfect. During one busy week, we made it first to St. Paul, then up to Duluth, then down to Rochester, and then to New Prague, where we had a family get-together, including Shirley's sister and friend.

We generally take a 2-weeks vacation in January, while Shirley's Canadian friend, Shirley Lewis-Smith, is staying here with us to avoid several cold months in Canada. This year, our youngest son, Duncan, and his wife, Stephanie, invited us to join them in Hawaii. They may have had an ulterior motive, to help babysit our newest grandson, Luke. But he is such a neat kid we jumped at the chance! We had a wonderful time, thank you, Duncan and Stephanie!

It's embarrassing to say this, but after we got back from Hawaii, we took an additional 2-weeks vacation on our favorite island in the Caribbean, St. Martin. This may have been a little extreme, but after all, we have been retired now for 17 years, still working fairly hard, and in our late 70s. We took a lap-top along to Hawaii, to check in our email, but it was a little more difficult when we were out of the country, because the computer connection to the internet there was so darn slow, and we get so darn many spam messages, probably because we have a web page! We were sure glad to get home!

CHRISTMAS PROMOTION

We advertised on our web page that we would award gift certificates to anyone ordering plans during the 12 days of Christmas. We thought it would be interesting to see how many people read our web page. It wasn't quite a true test, because

someone brought it up on the Cozy Builders Forum. But we did succeed in getting a lot of new builders during these 12 days.

\$50 AWARDS

Our best advertising is enthusiastic builders who invite others to see their projects or take them for a ride in their Cozys. We prefer to spend some of our advertising allowance by rewarding those who influence others to start building, so, to show our appreciation, we still are sending a check for \$50 to builders whose referrals result in a new Cozy builder. So we sent an award to Terry Winnett in San Antonio for influencing his brother, Kenneth Winnett, to build a Cozy. If you remember, it was Kevin Funk who influenced Terry to buy plans originally. It is good advertising to have satisfied customers!

\$100 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. 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 award each builder \$100 for their entry in either or both magazines**, or an Alex Strong pitch trim, which would otherwise sell for \$175. We haven't seen any entries so far this year, but let us know if we missed any.

Send in your pictures!!!!

FIRST FLIGHTS

ACCIDENTS

The purpose of reporting accidents is to alert builders to the probable cause in the hope of preventing a reoccurrence:

Aircraft: Cozy III N41CZ.

Location: Punta Pescadero, Mexico.

Date: January 18,2002

Injuries: 2 fatal.

Aircraft damage: Destroyed.

What reportedly happened: Pilot/owner Anoir Rizk and passenger Richard Thomas were part of a group of canard pilots and passengers flying to a resort at Punta Pescadero, near La Paz on the Baja Peninsula in Mexico for a week-end of relaxation on a trip organized by David Orr. The runway at Punta Pescadero is reported to be about 50 ft. above sea level, with a significant drop off at the approach end of runway 29. A witness reported that the wind was "from 330 at 10 to 20 knots", and "tumbling over the buildings and dropping into the gully just short of the runway". He reported that the aircraft was observed to be on a low final approach and dropped suddenly, disappeared below the approach end of the runway, and did not come back up, but crashed into a concrete retaining wall below the runway threshold and about 50 feet short of it.

Probable cause: Too low an approach and failure of the pilot to allow for a downdraft at the approach end of the runway.

Background: The owner/pilot of N41CZ, Anoir Rizk, did not build the Cozy he was flying. He purchased the Cozy built by Jack Grandman. Jack said he was a pediatrician from Los

Angeles in his middle 50s who had previously owned a Varieze, and had about 350 hours on it. Jack said he gave him 3.5 hours of dual instruction before he soloed. He said that during the check out, he observed that Anoir had a tendency to get very low far out on final, and he made a very strong point of explaining that he should make steep approaches with the Cozy. He said Anoir had more than a year and several hundred hours in the Cozy.

According to the LA Times, the passenger, Richard E. Thomas, 69, was a retired, ex-Rockwell executive. He spent five decades working on the country's space program, first as an engineer on the Apollo missions, and then as point man for the space shuttle program. It said that during countdowns at Kennedy Space Center in Florida, it was Thomas, standing amid staff members in the control room, who gave the launch its go-ahead.

Both men will be sorry missed by their friends and heirs.

APPROACH TO LANDING ON FINAL

Crashing short of the runway is one of the more common causes of accidents, and sadly, fatalities. We recommend, and we hope it is taught to all student pilots, that you fly your base and final approach high enough and tight enough that you don't need power to reach the runway. In fact, you should be high and tight enough that you need to use the landing brake, and maybe even both rudders to lose enough altitude to land on the first 1/3rd of the runway.

I learned to fly in the Navy too many years ago to mention. The Navy assumed that every pilot would become a carrier pilot, and they sure didn't want airplanes to be on extended finals chasing the carrier and getting caught in the downwash behind the carrier (the flight deck of a carrier is about 60 feet above the water, and when it is cruising forward at 30 knots into the wind, you can be sure there will be a downwash behind the flight deck). So in primary training there is a little exercise we had to practice and practice until we could do it right every time. The exercise was called "slips to the circle", and a corollary, "S-turns to the circle".

I was in primary at NAS Glenview, IL in the winter of 1945, flying open-cockpit N2S Stearman bi-planes. At the outlying fields, which were really just farm pastures, they would paint a 100 ft. circle in the snow. You would fly a pattern at 800 ft, and on downwind just opposite the circle, you would close the throttle and start a gradual turn onto base and then a turn onto final. You would put the airplane into a slip, and then pull out just in time to touch down in the circle. In the winter, of course, with snow on the ground, you would hit the throttle just before touching down, and then go around again. With "S-turns to the circle", you would do everything the same except to make a quick s-turn to lose enough altitude (with idle throttle) to touch down in the circle. If you didn't master this technique, you would get "washed out".

After the war, when I was in the reserves at NAS Wold Chamberlain (now Mpls International) we used to fly our Navy planes over the runway in echelon, peel off one at a time, and make a continuous circle to touch-down. Unfortunately, the airport was also a commercial airport and National Guard base, and the Navy traffic patterns didn't meld too well with the commercial and guard traffic, so they made us break up our

formations over a fictitious "point x-ray", and straggle in for a landing just like the commercial pilots and air force jocks. But now, whenever I can, I make a close-in pattern, because I sure would not want to get caught dragging in my final with power on, and then have an engine failure.

Out here in the West, we fly into airports on the top of mesas, like Sedona, AZ, and St. George, UT, where there are steep drop offs on both ends of the runway. You can always expect a downdraft at the approach end of the runway, which can be fatal if you are too low.

Please don't fly low approaches!

Bill Swears writes:

1/22/02

I recently had an adventure with my Cozy. I took a fellow pilot out. He has several thousand hours as a helicopter pilot and his commercial instrument fixed wing tickets, although it had been several years since he'd flown fixed wing. Our first practice landing was to be at a small airstrip on the south end side of Kauai. We had a 15-20 knot crosswind, pretty common here in Hawaii. On final, I suddenly lost lift, had my airspeed drop about 15 knots, and was no longer able to slip or roll enough to stay lined up for the landing.

Not knowing what was wrong, I added full throttle and nosed down. As the ground came up, I flared again, but hadn't yet developed enough airspeed to fly out, or cushion the landing. We hit fairly hard about 20 feet right of the runway, on rough sod, the nose wheel slammed fairly hard, then I was able to get it back up in the air, and had just enough power to stay airborne. I looked around and realized both rudders were extended. I asked my fellow pilot to take his feet off the pedals!

Even though I'd shown him the rudder operating characteristics, he slipped into the old habit of resting his feet on the pedals, which evidently led to an unconscious effort to control our heading with pedal...or maybe hit the brakes since we were landing much faster than he probably ever did in a Cessna, and certainly faster than he ever would in a skidded helicopter. At any rate, my sudden loss of aerodynamic flight was caused by his using the rudders as air brakes, and then, when he saw there was a problem, bracing against the pedals for the impact, thus exacerbating the problem.

Since I've always found my Cozy to be extremely docile in crosswinds, I'm wondering if something similar might have happened here (in the Punta Pescadero accident).

Bill Swears,
Hawaii

Editor: It is entirely possible. However, in approaching a elevated runway, it is still good practice to come in high, to avoid downdrafts, and if there are none, it might be necessary to deploy both rudders to come down in the first 1/3rd of the runway.

SUN N FUN 2002

Sun n Fun this year is scheduled from Sunday, April 7 to Saturday, April 13. We have reserved exhibit space AC-2 for our Cozy N14CZ, and hope to see as many of you there as possible.

Cozy builder Bill Walsh always arranges for the Cozy Banquet. He writes:

It is close to that time again. The Sun N Fun Red Barn experience. BUT this year there has been a change...one that I hope will FINALLY fill the reserved room with like minded aviators. The function will now be referred to as "The Canard Enthusiast Event". I am sending this as an invitation to not only Cozy builders, BUT anyone building, flying, or wanting to build a canard aircraft. Please forward this onto anyone who will be attending Sun N Fun that would be interested in meeting. If you belong to another canard associated newsletter or newsgroup, please pass this information along to your organization. They can contact me at my email address: nogofsu@earthlink.net. Thanks.

Bill Walsh

AIRVENTURE 2002 (OSHKOSH)

This year Airventure (Oshkosh) is scheduled for Tuesday, July 23rd to Monday, July 29th. We will be exhibiting our Cozy N14CZ at the same spot as in previous year, the South entrance to Exhibit Bldg. A. We have also scheduled a Cozy Builder's Forum for Friday, July 26th. We hope to see as many of you this year as possible.

Builders Daryl and Kim Lueck, who have been making arrangements for the Cozy Dinner, write:

We will be having the Cozy banquet at Robbin's again this year. Kim and I went to OSH to confirm our reservation, since last year, the Ramada went out of business and didn't notify it's customers, so we wanted to confirm it in person. We confirmed it with Wally, the owner of Robbins. The good news is that we have switched to Saturday evening instead of Friday. This means that those so inclined to go to the EAA Homebuilders Dinner on Thursday, can do so. In addition, everyone can attend the Friday CSA Hot Dog roast and still make the Cozy banquet on Saturday. There will be more information as we get closer, just wanted to give a heads up so we can start our planning early. Daryl & Kim

FOUR PIPE EXHAUST SYSTEM

There has been some discussion of 4-pipe exhaust systems on the internet, and some questions raised. Hopefully, this will clear them up.

2-pipe exhaust systems are lighter, less expensive, and easier to install than a 4-pipe system, but it has been shown that the exhaust pulses from individual cylinders interfere with each other, so a 4-pipe system will produce more horsepower in a 4-cylinder horizontally opposed engine. There is a problem, however, with installing a heat muff on just one of the pipes, because the exhaust from just one cylinder does not produce enough heat for carburetor or cabin heat.

When Jack and Donna Wilhelmson visited us a few years back, Jack and I brain-stormed the problem, and came up with a configuration that allowed the collection of heat from the two longest pipes (#2 and #4). We also thought of making the slip joints longer, so they could be used on the different engine positions in our III and IV Cozys. Then our supplier, Custom Aircraft Parts, in El Cajon, CA, came up with some additional improvements, like special close bends of thicker caliper, so the walls wouldn't be as thin on the outside of the bends, and stainless steel springs at the slip joints, which wouldn't rust. So we consider the pipes supplied by Custom Aircraft Parts to be

the best on the market for canard pushers. They are listed on the first page of the newsletter, under "Authorized Suppliers." Tel: 1-800-561-1901, Fax: 1-619-561-5177.

CARBURETOR AIR FILTER BOX

The carburetor air filter box we show on drawing M-35 provides ram filtered air to the throttle body, or alternately, heated air. It can be built by the builder or the fiberglass parts and necessary hardware can be purchased from Featherlite for a modest amount.

HOW DO YOU MAKE VORTILONS?

A way that works well is to make a flat 3-ply 8 x 8 layup on a piece of plastic, and then cut out a pair of each of the 3 vortilons (see M-18). Then tape saran wrap on the leading edge of the wings at each of the 3 locations. Use a generous amount of saran. Then put down a 2-ply layup over each of the saran wraps on the leading edge of the wing. Make it generous, and use peel ply over the top. Sand the vortilons. After the leading edge layups have cured, remove the peel ply and 5-minute the vortilons to the leading edge layups, using the 67 degree template on M-18 to make sure they are at the right angle. After all are in place with the right alignment, micro the inside corners and tape both sides of the vortilons to the flanges with 2 plies of BID, and peel ply. After cure, remove the flange-vortilons from the leading edge, and trim the flanges to about 3/4" width each side of the vortilon. Paint them. After the wings are painted, stick them on with clear silicone. They will adhere without coming loose even after many head bumps. Put them on before you fly and never take them off!

NOSEWHEELS

The nosewheel we recommend in the plans is the 4" Gerdes NWA-1230. It is well designed, made of cast aluminum, and has the opening for the valve in the center, so it does not distort the valve and the tube. We do not recommend the Brock wheel, which is not as strong and distorts the tube and valve.

ALTERNATE ENGINES

Here is the score card on alternate engines:

- 1) There were two Franklins flying, now only one.
- 2) There is one Mazda 13B flying (Greg Richter), and several in the wings.
- 3) There is one Subaru flying (Al Wick), and several in the wings.
- 4) There is a Cozy Mark IV flying in Venezuela with 2 Suzukis under one cowling and swinging 2 counter-rotating props.
- 5) There is one Buick V8 almost ready to fly (Rego Burger) in South Africa.
- 6) There are several builders with either a Delta Hawk or a Continental diesel on order.
- 7) One builder put a Ford V6 in a Cozy III years ago, but it didn't look very good and was replaced with an O-320.

We don't have performance data on these installations, but we believe they are generally heavier and slower. If and when the data is available, we will be pleased to publish it.

MINIMUM FLYING SPEED

Minimum flying speed for the Cozy Mark IV is determined by the speed at which the canard stalls (but the main wing keeps flying). During our flight testing, we measured this at idle power (800rpm) and 10,000 ft altitude, but not at sea level. We found that the minimum speed was 60 kts at forward c.g. and 50 kts at aft c.g. When the CAFÉ Foundation evaluated Mark Beduhn's plans-built Cozy Mark IV, it reported the minimum speed at forward c.g. to be 68 kts, however, they apparently were not at idle throttle, nor did they report the altitude.

It has been reported that in Switzerland the regulations require that an experimental aircraft may not have a stall speed (Vs) exceeding 60 kts. One could argue that this doesn't apply to the Cozy, because it doesn't stall, but if the bureaucrats give anyone a hard time, Ken Brimmer has good news. He studied the wind tunnel testing that Jim Price did at the University of Michigan, prior to his setting a record in his Long EZ (at approx. 33,000 ft). Jim Price explained how vortilons on both the wings and canard allowed him to increase his angle of attack in setting the altitude record. So Ken, out of curiosity, put vortilons on both his wings and canard just to see what would happen. He said it reduced his landing speed by 10 mph. Wow! But Ken cautions that you have to put them on the wing along with the canard, otherwise the wing will stall before the canard and that is bad news. Anyone who is interested can reach Ken at brimmer@erols.com.

Following a lengthy discussion of the possibility of main wing stalls on the internet, David Domeier, ex-military pilot, ex-airline pilot, ex-Long EZ pilot, and presently a Cozy Mark IV pilot, published this:

Builders, 2/27/02

"Flying a canard airplane safely is purely a function of knowing stall characteristics with regard to center of gravity. If the airplane is not loaded to exceed the design cg envelope, it is very difficult, perhaps impossible, to deep stall it.

"A long time ago there was a video produced by NASA on the Long EZ departure characteristics. I saw it at Oshkosh in the early 80's. The test pilot stalled the canard in every possible flight attitude. The final attempt was taking the airplane vertical until it ran out of airspeed and it simply swapped ends and flew out of the maneuver. If one loads the aircraft to exceed the aft cgt limit, stalling the canard is dangerous. Except for flight testing, there really is no good reason to stall any airplane, especially this one."

David Domeier
Chesterfield MO

RADAR SIGNATURE?

Cozy builder/controller Joe Turecamo writes on 12/31/01 I had a Cozy IV pass through my sector several weeks ago at 9,500 ft. 60 miles from our radar site and it showed as a strong primary target. Enroute radar paints us just fine. I'm not sure about the approach control radar, which has a weaker signal.

Joe Turecamo
ATCS NY Center

HEATED PITOT TUBES

There was recently an esoteric discussion on the internet (for about the 10th time) of designing a heated pitot tube for the Mark IV. Cozy builder/pilot Jack Wilhelmson, CFI, who has been flying a Cozy for over 15 years, and who designed a heated pitot in the 80's, posted this on the internet:

Builders, 2/27/02

"Heated pitot tubes are one of the hardest things to test. How do you determine if it works under real icing conditions? By the time you find out that the pitot tube heater is working fine, the canard will have so much ice that the airplane will be in an uncontrollable descent. In fact, icing of the pitot tube is a good warning to get the H out of the icing conditions. Been there, done that."

Jack Wilhelmson

Charleston, SC

Morten Brandzaeg writes from Scandanavia:

I see there is a lot of concern to install pitot heat in canards. Sure it may work fine, but the problem is much bigger aerodynamically if you meet icing conditions than to read the airspeed right. Your GPS can probably get you out of loss of airspeed readings, but experiencing icing conditions in canard airplanes is not recommendable to anyone. Been there, done it. No joy! No problem reading airspeed with no heat installed, but ice on the canard is NO. NO. NO. I believe there is only one solution to icing conditions, make a 180 and fly elsewhere.

M. Brandzaeg

SPAR CAP TAPE

In a recent letter Jerry Aguilar, Aircraft Spruce reports: "As we stand at this moment the machine is working very well. We just had the only specialist on this machine "tune-it-up" and replace a number of faulty parts which increased production by about 60%. I just got off the phone with the Griffin GM and the machine was turning out tape as we spoke. The machine is a unique one-of-a-kind machine, that I have to admit is a bit finicky. The problem is that if it breaks down there is no one to call that has an off-the-shelf replacement part and we experience some delay in repairing it. Right now it is working better than it has in months and we are trying to take advantage of it and produce at least a year's worth of tape while we have the opportunity, so outlook for spar cap tape is very good and we fully intend to continue making the tape. FYI we are intending to transport the machine to California as soon as we have sufficient tape on hand to allow for the move. We think we can better maintain the unit here from our main offices." Jerry Aguilar

EPOXY EXPIRATION DATE

Gary Hunter, epoxy expert, writes: 7/1/02

"When stored properly – basically, that means in a sealed container – most epoxy resins and their hardeners never "go bad". Within the group of resins we have to choose from for building our birds, the only exception is the hardener for EZ-Poxy.

"With resins, the only concern is that they can crystallize. They can be reconstituted to the original condition by heating in the container in a bucket of hot tap water until it has been "de-crystallized". Relax, and use the resins with confidence".

WEIGHT AND BALANCE

John Epplin writes:

11/20/01

“We just completed preliminary weight & balance. I weighed the airplane with the pilot seat occupied and calculated the arm of the pilot. Two people were available, both heavy but one taller, 217 lbs and 197 lbs. The arm came out different than the sample calculations in the owners manual. The manual states 59 inches, I got 55.6 and 56.8 for the two different people. When I can get a lightweight to sample, I will do that also. I have 3 inches of foam in the seat cushions.”

Editor: I am glad John brought this up. The calculations in the owners manual which use 59 inches as the arm for the front seat assume a 2" thick cushion on the seat back and a pilot of 170 lbs and a passenger of 120 lbs. Obviously a 3 inch thick back cushion would move the body forward, and a heavy person has his (or her) c.g. farther forward as well. The combination of the two would explain the numbers that John got. It is suggested that heavy pilots use only a 1 inch thick back cushion, or no cushion at all. We have seen Long EZ pilots that had no cushions at all, just plush carpeting. So keep in mind that heavy pilots or passengers move the c.g. forward, not only because of their extra weight, but because their extra weight is all in front of them.

PROPELLOR PITCH

It can be misleading to compare the pitch of propellers from different sources. Cozy builder Phillip Johnson explains this: “There are at least three definitions of pitch and the most common one used is derived from the angle of the flat side of the blade. This is the easiest one to measure, so it is the one that is usually given. The propeller that I am finishing has a geometric pitch of 81 inches. The effective pitch is 88.7 inches, which is the pitch relative to the maximum chord line. The absolute pitch is 100 inches, which is the pitch to the zero lift line.

“Since the propeller is an airfoil, one can measure the blade angle relative to the angle at which zero lift occurs. Apply the appropriate fiddle factors to convert angle to pitch and you get a very high pitch number. But without a wind tunnel, how would one measure this figure? So the manufacturers pick the number that is simple to define through physical measurement, i.e., the back side of the blade. But don't confuse this with the helix that will be cut through the air when acting as a propeller.”

MEDICAL EXAMS

Cozy builder Joseph Tischler wrote to me asking if I would comment about my experience getting medicals from the FAA, since my angioplasty. He said he considers that, because of his genetics, he is at risk for diabetes.

I had worried for 2 years over a frivolous law suit (which was eventually withdrawn), and my daughter, who is a physician specializing in the heart, insisted that I have an angiogram, even though I was feeling just fine. During this procedure they found that I had two partially blocked arteries, and installed two stents. Those are the little spring-like things they install to hold the artery open. My previous 3rd class

medical was still good for 6 more months. I debated what to do, and consulted with both the experts at the EAA and AOPA. When my 3rd class medical expired (just after Oshkosh) I reported this to the FAA and they said I couldn't fly until I had a nuclear stress test and another angiogram 6 months after I had the stents installed (to see if they were still okay), and then it would take them 3 more months to decide whether or not I was a threat to public safety. Well, I passed that test with flying colors, but the FAA said I would have to take all these tests again in one year, which I did, and passed again with flying colors. So I asked if they would put me back on the 2-year schedule for my 3rd class medical. They said NO, NO! I would have to jump through these hoops every year now. So I have scheduled all my tests again this spring, right after Sun and Fun, so the FAA can decide by the end of July whether they consider me a threat to public safety, or will let me fly for another year. Lots of fun!!! By the way, these treadmill stress tests have to exceed 100% of your maximum predicted heart rate, which is close to 150 beats per minute. That's hard work! Why does the FAA in Oklahoma City think they are more expert than my own cardiologist, who says all these tests aren't necessary? Who nose!

LETTERS FROM BUILDERS (some from the net)

Dear Mr. Puffer,

12/8/01

I have contemplated building a kit-built aircraft for the past 5 years, but the initial cost of the kit has been a major roadblock to that dream. The thought of building an aircraft from just plans seemed extremely challenging and next to impossible. Yet, after studying the construction process of the Cozy from other builder's web sites, I feel that I can do this and it is not impossible. Life is short-participate and enjoy the show. Please send me plans.

Troy Martens
Clare, IA

Nat,

12/03/01

Just put the fuselage bottom on Saturday. I started my plane mid-August. At this rate, what would you guess my finish date to be? Having a great time building this, lots of satisfaction so far. Absolutely amazing how this all comes together. Can't wait to blow past my buddy in his Cessna!!! Thanks.

Ken Grant
Lovell, WY

Dear Nat and Shirley,

12/26/01

I wish you both good health in the coming year. You are certainly an inspiration to us all!

I must admit, I have been stalled over the last 3 years due to a multitude of reasons, but I intend to get started again in the spring. Almost all of the construction is done, so hopefully the remainder will proceed without as much delay, i.e. engine and instrument work. Thank you again, for being the superb developer and supporter you are.

Brian McKiernan
Manitoba, Can.

Dear Nat and Shirley,

10/29/01

The years keep going by faster and faster. I've put a little over 150 hours on my plane in the last two years, and Sue and I have really enjoyed the trips we've taken in the Cozy. We're looking forward to being able to fly a little more frequently in the not too distant future. Hope this finds you well.

Ed Richards
St. Petersburg FL

Dear Nat and Shirley, 12/4/01
Christmas greetings. Thank you for your continued support. Rumors of my first flight are still exaggerated, as money got a little short last year, so building slowed to match. Hoping to get an engine sold shortly which should bring in enough cash to finish. In the meantime, I have been doing some woodworking. Please find an example enclosed as a thank you for developing the Cozy. Hope you have a blessed Christmas!
Dennis Rose
Aromas, CA

Editor: Dennis sent us a Cozy Mark IV, which he had cut out with a jig-saw from a piece of 1" thick wood, mounted on a stand with a clock mounted above it. Very ingenious and very pretty! A big thank you, Dennis!

Nat, 12/18/01
I was able to get my first Cozy ride last week, thanks to Jay Skovbjerg (Cozy III N655DK). What a thrilling experience! I was completely overwhelmed with the performance of that airplane. What a sweet ride! 40 minutes of heaven is a great motivator to get me going on my own Mark IV.

I have my jig table, epoxy pump, epoxy, all the tools I need and a shop big enough. It is now a question of how to get the shop hot enough. Here in northern Utah, we are ordering up tremendous amounts of snow in preparation for the olympics and we have 14 inches in our yard already. Over Christmas I will get the rest of the insulating done and, hopefully, determine a suitable heat source. Keep up the great work.
David Monk
Elwood, UT

Dear Nat, 12/21/01
I would like to order a set of plans. I have dreamed about building a plane for years but never realized that such a plane existed (one that didn't require a major investment from day one). I only learned of your plane from Tom Brusehaver (a member of the same flying club) a couple of weeks ago, so I feel a little impulsive buying these plans, but your \$150 gift certificate for Wicks or Aircraft Spruce has pushed me to make a decision sooner than later (can't pass up a good deal), plus it will make a dent in the cost of the one tool I don't have (epoxy pump). I like big challenges and like crafting things by hand (furniture) although this is a little bigger project than I have ever tackled and one I am unsure I will be able to afford to complete with the engine and instruments, but I have to gamble a little and hope that things will fall into place and allow me to finish this project when the time comes 5-6 years from now and allow me to forever enjoy aviation!

Eric Peterson
Shakopee, MN
12/31/01

Cozy Builders,
I thought I would add another data point on our discussion of crankcase breather lines freezing.

I have my engine crankcase breather line like Nat's, where it exits out of the bottom of the cowling. This has worked fine over the last couple of years and I've not had a problem with the exit tube freezing over, at least that I know. But being a belt and suspenders type guy when it comes to safety, I ordered a new piece of tubing last summer after reading Howard Roger's excellent post on installing a "whistle slot".

So, last week presented some great weather for flying. When we get one of those clear days in December in the Seattle area, it

usually also means freezing temperatures. So, I arrived at the airport early to install my new tube prior to launching and could not find it anywhere.

I wanted to go flying, but I was having second thoughts until I remembered someone other's advice to just cut a 2" slice in the rubber hose lengthwise. I had hesitated initially because my engine compartment stays relatively clean and I didn't want to make a mess. But, like I said, I wanted to go flying, so I went ahead and slit the hose at a spot where it ran relatively straight and faced the engine so it could stay warm. I didn't think it could make too much of a mess in an hour of flying, but after landing and checking it, there was not a drop of oil anywhere.

Maybe in a few years when the hose has a chance to get harder, the slot may not stay closed on its own and start to drip, but by then I hope to run across that tubing.

Eric Westland
Mulkiteto, WA
12/31/01

Dear Nat,
Happy holidays. Hope Santa (and Shirley) were good to you. I'm glad to tell you that I'll be ringing in the New Year bright and early tomorrow morning glassing the bottom of my strakes. By the time you wake up, I'll have completed the very last major layup on the airframe, and I'll be 90% complete with Chapter 21. Yesterday, a spam can driver wandered into my hangar. After helping to glass the top skins yesterday, I demo'd how to hotwire a core today. He's simply astounded at how "simple" it was to build an EZ plane. Unfortunately for me (I won't get the \$50) and you, he wants a Varieze. But who knows, he might change his mind.

Wayne Hicks
Carrollton, VA
2/12/02

Dear Nat and Shirley,
April and I have been very busy. I'm happy to say that building will begin soon. I have the first chapter materials coming to our new house. April and I have moved to Florence, SC where we got jobs as Air Traffic Controllers. There are no canards here and so far we have not seen any so if anyone is flying through, we would love to see you.

While we were in Oklahoma City, Kevin Funk, owner and builder of Cozy MKIV N9871F took us up for our first Cozy flight. What a ride! Both of us left that flight with smiles and a new excitement to get building. Thanks so much, Kevin!

Well, now that we have our garage and parts on the way, building will start soon. I'll send pictures of our bulkheads.

Tim & April Hedstrom
Florence, SC
12/17/01

Dear Nat and Shirley,
Have a great new year! Got my 709 check ride done two weeks ago (in a Cessna 152). Saturday, N69CZ is heading back to the airport on Monday. She hasn't been there since 4/10/01. Soon to be flying again!

John Vermeylen
Lanoka Harbor NJ

Editor: John had an engine out on the way back from Sun n Fun 2001, and made an emergency landing long on the runway and retracted his nose wheel to stop. The stu... female FAA examiner said he would have to take a check ride before he could fly again. I called her and told her that John did exactly what we recommend: that many accidents are caused by pilots landing short of the runway. "No matter" she said, "he will have to take a check ride anyway"

Dear Shirley and Nat,

2/22/02

Just wanted you to know of the progress I am making on the project I purchased from Steve Overley, in Ohio. In the year and a half I have had the project, I have installed the nose section and nose gear, main gear, firewall, engine mount (0-320), turtle back, canopy frame, brake system, and all inside consoles and seats are done. I have mounted the canard, built the elevators and completed the electric actuated landing brake. With some luck and perseverance I will be flying in two more years. This Cozy will be added to the list of canards I have built (Varieze and Quickie). I am really looking forward to getting it airborne and operational. Please be sure to stop in Meadowlake, near Colorado Springs, if you are ever anywhere near here. We live on the airport and always have a guest room. Please be our guests.

Burrall & Joyce Sanders
Falcon, CO

Nat

3/7/02

We are anexing the latest pictures of our twin Cozy with the new spinner. I hope you enjoy them. They were taken at the Valencia airport. Our airplane is performing nicely, so is our twin pack (the 2 Suzuki engines). We are nearing 500 hours (460) and very proud.

Carlos V. Leon
Venezuela

THOUGHTS FOR THE DAY

Three pilot retirees, each with the usual hearing loss, were taking a walk one fine November day. One remarked to the others, "Windy, ain't it?"

"No," the second replied, "it's Thursday."

And the third man chimed in, "So am I. Let's go get a beer!"

William B. Swears

Try to make original mistakes, rather than repeating those already made by others.Anonymous.

Why did kamikaze pilots wear helmets?..... Ken Murphy

The coach said, "what is it with you, kid, ignorance or apathy?"
The kid replied, "I don't know and I don't care.". Ken Brimmer

She said, "Darling, if it was between me and airplanes, which would it be?" He said, "Donna, you should never ask that question." And she never did.Dick Ward

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