

The Cleco



Experimental Aircraft Association • Chapter 393 • Concord, CA

Mail to: EAA Chapter 393 P.O. Box 272725 Concord, CA 94527-2725

JUNE 1995

YOUR 1995 OFFICERS

PRESIDENT	Fred Egli 935-7551
VICE PRESIDENT	Lisle Knight 527-6846
SEC/TREASURER	Louis Goodell 682-4198
EDITORS	Ken & Linda McKenzie 283-3119

MEMBERSHIP MEETING

June 28, 1995, (the 4th Wednesday of every month) @ 7:30pm, Old Buchanan Terminal Building, Concord Airport. Please wear your badges to help those of us who don't know everyone. Also, please bring chairs — we never seem to have enough.

BOARD MEETING

The board meeting is scheduled for 7:30 p.m., Wednesday, July 5 at Fred Egli's house. If you are interested in attending or have a matter you wish to discuss, please call any of the Chapter Officers.

JUNE PROGRAM

For June's Chapter Presentation, we will be seeing a return visit from Bruce Arrigoni of Formula Power, Inc., in Concord. The Subaru series of engines has been in the forefront of homebuilding recently, with installations made in Murphy, Avid & Dragonfly aircraft. So when a 3.3 liter 375hp Formula Power Subaru is being installed in a Lancair IV, I thought it would pique everyone's interest to receive some information on their newest power plant. I hope it will be an interesting discussion.

Lisle

MINUTES OF THE CHAPTER MEETING held May 24, 1995

The meeting was called to order at 1930 hours, Fred Egli presiding. The minutes of the April meeting were approved as submitted in the May 1995 Cleco.

The 49th annual Airport Open House is on June 18. Please bring your projects, flying or not. We will have the area outside of Navajo. General admission will be between Helicopter Adventures and Navajo.

The date for the picnic was incorrectly announced as being Sat. July 22. The correct date is Sat. July 15. A list was passed around for people to sign up to bring food or to help with preparations for the picnic.

1996 EAA calendar orders are now being taken. Each calendar will cost \$8.00.

Lyle Powell spoke to us about ignition systems. He began by explaining the physics of magnetos, and thereby the need for redundancies. Lyle discussed the drawbacks and advantages to the magneto ignition systems. He finished up his talk by explaining the process he went through to convert to an electronic ignition system. The primary benefit to an electronic system is the more powerful spark that is generated. In fact while Lyle still had one mag on his engine, there was no discernable drop in power when the mag was switched off in flight. The biggest drawback to the electronic ignition is the need for an external source of electricity, i.e. a battery and alternator. If the battery fails the electronic ignition system will fail, therefore it is imperative that a redundant source of electricity is provided for. Lyle uses a small motorcycle battery for backup.

MINUTES OF THE BOARD MEETINGS

The board met for its monthly meeting on Wednesday, June 7 at Fred Egli's house. Attending was Fred Egli, Lisle Knight, Louis Goodell, and Ken and Linda McKenzie.

Fred will place an order for 20 U.S. Tools catalogs.

Toni Tiritilli is heading up the committee to put on the July picnic.

TREASURER'S REPORT

As of June 7, 1995 the balance in the Checking Account was \$1,235 and the balance in the Savings Account was \$2,625.

UNCLASSIFIEDS

FOR SALE: True airspeed indicator, 0-240 MPH new, never used (cost \$172) \$90. — Angle of attack indicator, used (cost \$96) \$50. — Voyager miniature eyeball cockpit lights, new, never used (cost \$40) 2 for \$20. — Vari-eze servo motor, new, never used (cost \$25) \$10. — Gear motors, 28 volt, 2 for \$10. — Dial torque wrench with memory needle, new, never used, \$10. — Tire gauge, 0-130 psi, new, never used (cost \$10) \$5. Call Russ Giffin 510-935-2887.

[5/95]

FOR SALE: Ray Nilson ran into Herb Ross at the IAC gathering at Tracy. Herb is looking to get out of the airplane building game and has 2 Pitts S1S "kits" that he has assembled. Herb will part with these for at least \$10,000 less than they are worth. Each kit consists of wings, fuselage, landing gear, empennage, fiberglass cowling pieces and a lot of et ceteras. All welding and parts needing special jigs have been completed. You will need to cut and fit aluminum panels, cover, and do the details that finish the airplane. If you are interested, Herb can be reached at (209) 478-0122.

[5/95]

FOR SALE: RV6/6A tail kit in box with complete set of plans, plus construction video. \$600. Contact Jim King at (818) 504-1147.

[5/95]

INTERNET ADS & MISCELLANY

Subject: New Franklin Engine Specs

Date: 24 May 1995 08:50:27 -0400

The Franklin PZL-F4 is an FAA certified engine producing 120HP at 2800RPM and 5Gal/hr. The unit will drop onto a standard 0-200 mount and weighs within a few pounds of the O-200 as well (226lbs dry). The engine is also available with high compression pistons (10:1) and will then produce 140HP. Price is \$7,800 and they are in stock. The PZL-F6 is a 6 cylinder engine producing 220HP at 2800RPM and 8Gal/hr. Price is \$11,800 and they are running 45 day delivery. Both engines have both radial and bed mounts, removable cylinder sleeves which are field replaceable,

removable top cover for ease of inspection and a built in crankshaft damper. The oversized cooling fins require no between cylinder baffles. These are among the quietest, smoothest powerplants out there. For full specs with pictures, performance graphs and schematics, send an SASE to me at: Kurt Kuhlmann, 307 N. Gertruda St., Redondo Beach, CA 90277

Subject: HARTZELL PROP FOR SALE - CHEAP!!!

Date: Wed, 31 May 1995 00:35:04 GMT

Hartzell 2 Blade constant speed prop, HC-C2YR-4CFC8477A-4, 470 TT since Santa Monica Propeller overhaul. Currently on Lycoming I-O-540 powered Staudacher S-300, new 3 blade MT ordered, need to sell. Great prop for Glasair or other high performance, 300 H.P. homebuilt. Includes high tech lightweight composite spinner and governor. e-mail or call Geryl Mortensen at (214) 931-1111. Best offer over \$2,500.

Subject: RV-6 for sale

Date: Tue, 30 May 1995 01:33:21 GMT

For Sale - RV-6 in excellent condition. Everything was new when built. 160 hours total time. 180hp O-360, C/S prop. King Nav-Com, DME and Transponder. Northstar Ioran, HSI, Horizon, autopilot and lots more. Located in Dallas TX area. Price is \$65,000. Please call (214) 423-7398 after 1800 CST or weekends.

Don't miss this one -

Don Hammer >> Jet Aircraft Consulting <<

Subject: Instruments for sale.

Date: Mon, 12 Jun 1995 04:52:05 GMT

Instruments For Sale:

1. Instrument & Flight Research Inc Rate of Climb indicator 0 - 2000fpm (scale). \$75
2. Pioneer accelerometer ("G" meter) range: +/- 12g units. \$100
- SOLD! 3. Cambridge electric variometer. \$150
- SOLD! 4. Winter STW-5 variometer. \$220

All instruments come from a sailplane that has upgraded it's instrument panel, and not the result of a crash. All instruments are working, however no documentation exists.

If you are interested please contact: Oscar S. Alonso, (714) 966-3107 (day/voice mail)

Email: oscar@nx1.westminster.ca.us

Calendar of Events

Chapter Events

- July 15 - Annual Picnic held on the lawn next to Navajo Aviation.
Dec 17 - Annual Awards Dinner @ Petar's Restaurant in Lafayette.

Workshops

- June 5 - July 1 - OTTUMWA, IA - 16th Annual Composite A/C Const. Workshop. 800-726-2585, ext 183.
June 24 - 25 - GREELEY, CO - Alexander Aeroplane's Builders' Workshop. 1-800-831-2949.

Fly-ins & Airshows

- June 23-25 - COLUMBIA, CA - 20th Annual SW Stinson Club Fly-in. 510-686-3812.
June 23-25 - LONGMONT, CO - 17th Annual EAA Rocky Mountain Regional Fly-in/Airshow. 303-798-6086.
June 30-July 2 - SEATTLE, WA - Museum of Flight Flightfest '95. 206-764-5720.
July 5-9 - ARLINGTON, WA - 26th Annual North-west EAA Fly-in / Sport Aviation Convention. 360-435-5857.
July 7-9 - LOMPOC, CA - 11th Annual Piper Cub Fly-in. 805-733-1914.
July 15 - VACAVILLE, CA - Solano Air Fair. 707-466-0322.
July 16-20 - SPOKANE, WA - American Bonanza Society Annual Convention. 706-290-0792.
July 18-23 - OSHKOSH, WI - 380th Bomb Group Reunion. 501-362-2891.
July 22 - SUSANVILLE, CA - Susanville Airfaire. 916-257-0334.
July 27-Aug 2 - OSHKOSH, WI - 43rd Annual EAA Fly-in -and Sport Aviation Convention. Wittman Regional Airport. Contact John Burton, EAA, P.O. Box 3086, Oshkosh, WI 54903-3086, 414-426-4800.
Sept 14-17 - RENO, NV - '95 National Air Races.
Sept 29 - SAN JOSE, CA - Reid-Hillview Airport Day.
Sept 30 - PALO ALTO, CA - Palo Alto Airport Day.
Oct 7-8 - TRACY, CA - Golden West Fly-in
Oct 12-15 - PHOENIX, AZ - Copperstate Regional Fly-in. 602-750-5480.

Oshkosh Travel Partners

Don Baldwin is planning to drive back again this year with his trailer. Anyone interested in spending two weeks for the trip should contact him now.

Bob Russell from Chapter 512, Placerville, would like to fly back in a light plane. Says he will share expenses and can help navigate. Call him at 916-642-1084.

MORE STUFF FROM THE INTERNET

Subject: Re: Airport Neighbors
Date: 31 May 1995 13:57:39 -0400

One group got a law passed that every complaint against the airport by an area resident had to be filed away (with the Registrar of Deeds?) under that person's name and address. Then, when the homeowner placed that house for sale, they had to reveal to potential buyers all of the "hazards" and "nuisances" attached to it. Oddly enough, there quit being complaints!

In California, the real estate disclosure laws require the seller to advise the buyer of any problems or deficiencies with the property known to the seller. If the seller has made noise complaints, they are maintained at the airport office. One case went to trial and the buyer recovered a substantial amount of money from the seller on the claim that he did not disclose the "airport noise problem" with the property. The seller had made a number of noise complaints.

J Gates

Subject: Re: Best trailing edge shape
Date: Sat, 03 Jun 1995 16:39:26 -0700

In article <3qe7le\$6h@newsbf02.news.aol.com>, lancairman@aol.com (Lancairman) wrote:

There seems to be some that advocate the use of a fairly blunt trailing edge on flying surfaces. If you know anything about it please:

Give the formula. The source of the information. The actual REAL WORLD TESTS that are the basis for such claims

Many thanks!

Lars Giertz, Houston, Texas

I have some experience with this topic. You may have noticed that high performance aerobatic aircraft like the Sukois and Extras have very thick trailing edges, especially on their ailerons. This gives them greater structural integrity by making the surfaces stiffer, and it also gives them more "bite" because the turbulent flow off the trailing edge tends to make the control surface act as though it has a longer chord without having the weight and flutter problems associated with that longer chord.

I fly a Glasair I-FT and have flown a mess of other peoples' Glasairs and there is a large variation in aileron feel among these aircraft. Since all the ailerons came out of the same mold and are the same size, I attribute this difference to the only thing left for the builder to change -- the thickness of the trailing edge. (Sure, the very old

kits required that the builder cast his own counterweights, which brought with them some variation in "spade" area, but we're talking recent history). Generally, the thicker the trailing edge the better the feel. This is especially sad for guys who worked like crazy to get a razor edge only to learn it hurt their handling. My trailing edges were (out of pure laziness) squared off and fairly thick. Bob Herendeen flew my plane several times and always marvelled at the nice ailerons.

Now the rule you are looking for. Thickening the trailing edge helps up to a point and then it starts to add drag, which I presume you don't want to do in a Lancair. So limit the thickness to 1 percent of the chord or less. That will get you the most benefit without taking a drag hit. That's also why ailerons tend to be the control surface that most noticeably get this treatment, because they have the most chord to work with.

Hope it helps.

Bob

Subject: Re: Best trailing edge shape

Date: 6 Jun 1995 12:57:33 -0400

Instead of squaring off the trailing edge of the ailerons on my Lancair as described in the plans, I bevelled the TE about 30 degrees to the chord--so that the upper surface was longer. That gives the effects of a "squared off" TE, but also gives the appearance of a sharp TE, which matches the flaps. The feel is the same as the factory aircraft with square TEs.

Jim Gates

Subject: Composite Gas Tank - Long

Date: 13 Jun 1995 12:43:00 GMT

In response to a suggestion that I post the information I received from Stan Montgomery as well as my experiences in translating that information into reality, here is the result:

Rather than make up the pieces of the tank from straight fiberglass over a mold which would be a purely fiberglass tank, Stan told me to make it up from a fiberglass foam sandwich. He wanted me to use 1/4 inch foam for several reasons. 1. Constructing the tank with foam creates a insulating barrier against the temperature differences from night to day minimizing water condensation within the tank. 2. By using the foam and two layers of fiberglass on either side you are actually making three separate layers of material the gas must seep through in order to leak instead of just one since the foam itself is impervious to fuel as well. Also, the use of the foam/fiberglass sandwich facilitates the construction of hardpoints which I will get into later.

He recommended a resin called 2427 which is slightly more flexible than earlier resins when hardened and a weave of fiberglass called crowsfoot.

His drawings and those other people sent me were simple. You take a sheet of the foam and make sure it's big enough to make the largest piece of the tank. In my case, I had to splice extra pieces together in order to get the size I needed. I bonded them together using micro-balloons. Next I created enough slurry of microballoons to prime the entire surface of the sheet and squeegeed it as evenly as I could all over it. Then I cut out a section of the crowsfoot fiberglass big enough to be able to be folded over and make the second layer and laid one half on the tank. I then mixed up enough resin/hardener to cover that and squeegeed it in making sure everything was super saturated. I next folded over the other half making the second layer and squeegeed in more resin. Then you lay on something called "peel-ply" which is polyester cloth, usually white but color doesn't matter and squeegee it down onto the fiberglass. What this does is draw the resin to the surface and cure it with the pattern of the cloth. When all is cured you peel the cloth off and discover that the surface of the fiberglass leveled off and has the roughness of the cloth weave which is a surface that is ready for the next bonding step. If you didn't do this, you'd end up with the fiberglass weave which you would then have to sand down for the next layer to properly bond. This is OK and has been done for years but proper sanding to rough up the surface also cuts strands of fiberglass which doesn't happen using peel-ply.

Speaking of resin, Stan is a proponent of using a small electronic scale to weigh out the amounts of resin/hardener rather than using a metering pump. It's easy to do, you just set the scale to grams and put a cup on it. The cup actually weighs a bit so you just zero the scale once the cup is on it so that the scale weighs only the resin or hardener you are pouring in. You pour to the appropriate weight, whatever the ratio calls for and then mix the two together. The mixture must be within 95% optimum in order to get the proper bonding of the hardener and resin.

Now I let that layer cure (overnight) then cut off the excess material hanging over the sides and flipped it over and repeated the procedure for the opposite side. Once enough pieces had been created to make the tank I carefully measured out the sides, ends and bottom and cut them out on my band saw. I then carefully sanded each edge flat for proper mating.

By the way, I made up a flat working surface and covered it with plastic sheeting. This allowed me to lay the foam and glass on the surface and let it cure there. Since the resin won't stick to plastic, it was easy to peel the stuff off the work surface once it had cured.

The tank is bonded together with flox which is chopped cotton fibers with some resin mixed in and is available

from most aviation supply businesses including Alexander. You mix it to a paste configuration and trowel it onto the surfaces to be mated. I tried to get all the surfaces coated with this stuff but in reality you only need the sides to bond into place because the next step will seal them together for good. That next step is to mix up lots of floc and radius all joints. I made up all kinds of tools to assist with the radius but ended up with a simple plastic spoon which worked fine. This mixture of floc has to be dry enough to hold shape in the vertical and not ooze down.

Once this had cured, I mixed more resin and cut out two sets of fiberglass tape, one four inches wide, the other 6 inches. These were laid into the joints both horizontal and vertical starting with the four inch. I had to slice the tapes in half to make them go around the corners otherwise they would have folded back on themselves. I think I did the vertical joints first and then laid in the horizontal. None of this was exactly easy but it can be done. Once this is done, the tank takes on the feel of something immensely strong.

Now you have to measure carefully for where your fuel and drain outlets are because you are going to create hardpoints for them and here is where this sandwich construction comes in handy. For the fuel drain you select the low point of the tank and draw in about a six or seven inch circle then using a Dremel tool and a cutting disc cut out the circle and pry off the fiberglass. Now you slice down through the exposed foam at an angle creating a beveled edge. I additionally rounded off the upper edge using 80 grit sandpaper. Now you cut out round pieces of fiberglass to lay in the depression, use about 12 pieces. After all have been laid in place, each one wetted out in turn, cut out two more pieces each one roughly one inch bigger than the other. So if the depression was 6 inches, the next to last one overlaps the depression by one inch and the last piece overlaps the previous one by another inch which makes it roughly two inches bigger than the depression. What you end up with is a slight depression in the bottom of the tank which is supposed to be the low point of the tank and when that's cured you will have an extremely strong place through which you can drill and opening and install your drain. You will not have to worry about cracking anything, this hardpoint is extremely strong.

You have to do the same for the fuel outlet but that's a little more complicated in that it has to be an opening both at the side of the tank and the bottom; or at least mine does.

Now I had lay in the baffles and bond them in place. Each baffle (two for each tank) was carefully cut out to fit the interior and then holes were cut into it to slow down the gas from ramming from one side to the other. Each hole had to be painted with a mixture of micro balloons to seal off the exposed foam, as did the ends and tops and bottoms. Once this was cured I bonded them in place using floc. Finally I radiused the edges with more floc and

let that cure. Again you lay in tapes to strengthen the bond, first narrow then wider.

My tank installation requires a tunnel right through the tank for a diagonal brace. I had to cut out holes all the way from the corner to the diagonal opposite corner and through the baffles in order to lay in this tube. I made the tube by wrapping fiberglass around the proper sized metal tube which I'd wrapped with wax paper hoping it would slide off easily. It didn't but I got it off anyway by heating it up with my torch. Once it was off the mold I further wrapped it with several more layers of fiberglass to insure the seal. Sealing where the tunnel sticks out the corners was tough but manageable.

Time for the fuel vent now and I got some aluminum tubing from Alexander that was flexible enough to bend to the shape I needed. I drilled through the side and used floc to plug around the opening then laid in patches of fiberglass to cover the floc. On the outside I mounded floc all the way down the tube covering it to the bottom of the tank where the tube bends forward towards the direction of flight. That floc got covered with additional layers of fiberglass.

The fuel sending unit went in next and was held in place with small bolts. I wanted this be removable so I didn't bond it. It is the type that senses the fuel level by reading the fuel with a sensing rod. You calibrate it before installing which I did. Nice to confirm that the gizmo worked.

Almost done now, I just had to make the top. Since the top of the tank was supposed to follow the upper curve of the wing forming a part of the airfoil, I had to make the top curved slightly. I managed this by making up a form out of plywood and sheet aluminum flashing. Once that was made I laid the foam over it and primed and covered with fiberglass then I hung weights on the fiberglass to hold the foam to the proper shape. Once this cured I flipped it over and supported the raised ends with wooden blocks and covered that side.

Now to cover. I laid the top on the tank and confirmed the fit and cut down excessive overlap then mixed up the floc. Obviously you won't be able to radius the inside of this joint so you'd better make sure it has enough floc to seal first time. I piled it up on the top of the tank sides and then carefully lowered the top to the tank trying not to move it around too much once it was in place and weighed it down with convenient bricks or whatever was handy. Once that cured you radius the outside edges and cover each joint with the now familiar two layers of fiberglass tape, the six inch over the four.

Other than bonding in some metal pieces I bent up to spread the stress of where the metal straps hold the tank in place, I was done. This type of construction is tedious but time is what I have, money I don't have.

Corky Scott



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