Greater Savannah Chapter 1514
EAA, Inc.
Newsletter
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December 2015

"To promote, encourage, and facilitate in a harmonious and inclusive manner all recreational aviation activities with an emphasis on education, safety and fellowship".

Upcoming Programs and Events

Gary Arms, Program Chairman

December 1, 2015:The December 1st Christmas Party is at 6 p.m. at Carey Hilliard's, 5350 Hwy 21/Augusta Rd., Garden City. No RVSP needed. Spouses and guests are invited. Order from the menu.

To participate in the White Elephant gift exchange, bring a wrapped gift - $10 value suggested. The gift exchange is the highlight of the party. (You might want to offload that gift you were stuck with last year.)

November General Meeting

EAA Chapter 1514 held its annual elections in November. The current slate of officers was re-elected.
President - Keith Gay
Vice President - Mike Wordell
Treasurer - Jack Scott
Secretary - Doug McKissack

Staff: Gary Arms will continue as Program Chairman.

The members present authorized the expenditure of $330 for EAA National chapter dues and insurance.

Fly-Ins

U.S. Sport Aviation Expo
January 20-23, 2016
Sebring, FL

Sun 'n Fun International Fly-In & Expo
April 5-10, 2016
Lakeland, FL

Design Group Minutes

By Will White

November 10, 2015

In Attendance:
Joe Buttner
Taher Surti
Arman Motamedi
Esteban Villa
Willard White

Our first objective, The Silver Chain, didn't advance. We do have a line on a device that may be able to "listen" for the stall warning horn and activate the stick shaker. We'll do more research to see if that can be added to our device.

Tail design and the location of the horizontal tail drew quite a discussion. The consensus location turned out to be very similar to the RV arrangement; with the horizontal tail mounted on a "notch" on the top of the tail boom. Our project gained a third frame at the rear which will allow the horizontal tail to be positioned perhaps as much as eight inches further aft. Consequently, the H-tail can be slightly smaller.

Thirteen, is the number we need to remember about landing gear position. There are a number of other factors of course, but the main landing gear on a tail dragger should basically be located 13 degrees ahead of the most forward cg location to minimize the possibility of tip over. On a trike, the main landing gear is located at the angle of attack resulting in a Cl of 0.9 plus three more degrees – in other words about 12 or 13 degrees aft of the aft-most cg location. This makes it easier for the airplane to rotate on take-off and minimizes the likelihood that it will fall over on its tail when the passenger steps on the aft spar to board.

De-cleco-ing
De-filming
Deburring
Dimpling

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Design Group Minutes continued from page 1

2015 Officers:

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Jack Scott 912-441-6577 jscott@echosierra.net

Chairmen of Standing Committees:

Design Team Chairman:
Willard White 912-925-2478 whiteat50@comcast.net

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EAA Chapter 1514 meets the first Tuesday of every month at 6:30 PM at Lovezzola's Pizza, (328 US Highway 80, Pooler. 912-748-6414) or at an offsite location as dictated by that month's program. The December meeting will not be at Lovezzola's.

The December 1st meeting will be the Chapter's annual Christmas party. It will be held at Carey Hilliard's on Hwy 21 in Garden City, 6 p.m. Spouses and guests are invited. Order from the menu.
See **Upcoming Programs** for details.

The deadline for the January 5, 2016 newsletter is: Close of Business, December 24, 2015.

Re-cleco-ing
Riveting

There; that's what we did. I did the measuring, marking, drilling and clecoing and brought some training strips to the meeting, so the Group could practice our dimpling and riveting skills. The results were quite good. Although the process was time consuming, the flush pull rivets were pretty aerodynamic and attractive. For the record we used .020 6061T6 and 3/32 flush pull rivets spaced 3/8 in. from the edge and at ¾" intervals.

We ran out of time but began the debate about horizontal tail spar design anyway. Va determination wasn't controversial, but the safety margin debate is ongoing. Our horizontal tail is symmetric, it is 78 inches long, chord is 27.5 inches and it is 2.75 inches thick at .3c. Esteban showed us some information of FAR part 23 appendix A that we hadn't seen before. Hopefully, that will simplify the design. We'll also have to debate whether the "arm" in the load calculation is 18.5 inches (constant loading) or whether it is 17.1 inches (the average between elliptic and constant loading theory).

November 24, 2015

In Attendance:
Esteban Villa
Doug Mckissack
Taher Surti
Melvin Zahn

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Willard White

We were joined for the first time by Melvin Zahn. Mel has flying, technical writing, and riveting experience. Welcome to the group, Mel, we look forward to working with you.

We began with discussions about the tail boom. There was no interest in making it removable.
Frames will be added at fs 157 and 187. A frame will be added at fs 127 to increase rollover strength at that location and to support a small baggage box behind the seats.

A printed handout showing the full size of the Arduino Pro Trinket was distributed. It is 1.47 inches by 0.7 inches by 0.2 inches thick. To this we'll have to add the sensor and the shaker motor, but our project might be able to fit into a 1 x 1 x 2 container. There was more discussion about adding a stall horn activator, but at this point it seems to be quite complicated, and we still have much to do with our prime objective. Mel suggested that we try to find a combination of RPM, throttle movement and stick movement that would increase the precision of our device. Another possibility that was put off was the pressure pad sensor activated stick shaker. It's just a concept that would require considerable development.

The main event was Esteban's presentation of FAR 23 Appendix A. Appendix is the "simplified" version of FAR part 23, complete with illustrations. Esteban also showed us the ASTM which, while for LSA airplanes, is very similar to Part 23 and has better illustrations. Both of these documents are available to read and download on our website.

We measured Doug's head-room requirement and our airplane is a little short. I'll revise the drawings so that there is 40 inches of headroom.

Our updated specifications were handed out; it appears our airplane is getting a little nose heavy. Engine weight is 171 lbs. with two magnetos, perhaps 165 lbs. with one magneto and one electronic ignition. For reference, the cowl on my Q2 weighs 8.4 pounds. We estimate the wooden prop weighs 7.5 lbs. and the 10" spinner about a pound. Esteban will update the detailed weight and balance and then we'll discuss corrections.

Loads and strength of materials was the next subject. It's complicated, we have fCy for 6061T6 (35 ksi) and 2024T3 (36 ksi). As I understand it, we must check against fCy at 3.8 g loads and against fCu at 5.7 g and meet both requirements. Tension loads are much easier; fTu is 60ksi for 2024 and 42ksi, fTy is 44 and 36 respectively. The safety margin is 50%.

Taher offered to help with CAD drafting. We'll have some sorting to do to avoid duplication of efforts, but I gladly accepted the offer.

We loaded our 65 horsepower airplane model into X-Plane and did a maximum gross weight takeoff on a 99-degree day out of KSAV. That went well; rate of climb was 500 fpm. We moved to Hodges airport and the result was pretty entertaining. We cleared the trees, but not with a comfortable margin. We increased the horsepower to 75 (done with a $1,000 set of big valve heads) and without changing the prop cleared the trees comfortably at 1,000 lbs. on a 99-degree day. We then did a max gross weight landing at Hodges on a 99-degree day. We used 80 mph on final and stopped with about one-fifth of the runway remaining. Conclusions: 1. Carrying an adult American male passenger should be considered a "Special" procedure requiring additional attention to aircraft performance and an additional 5 mph on final approach. 2. We were using a "cruise" prop, a "climb" prop might be required for comfort when flying out of a short grass runway in the summertime.

We also set the airplane at cruise at 6,000 with the cg at ¼ chord and looked at the elevator position. The horizontal stabilizer is currently indexed at -1 degree and the elevator was deflected down (trimmed nose-down) 1.25 degrees. This is quite acceptable, but something of a surprise. We didn't have time to experiment with moving the cg forwards two inches and aft two inches, but we'll continue to study the horizontal stabilizer index setting.

We'll meet next on Tuesday the 8th of December. Objectives: Progress on the Silver Chain, Progress on the design of the horizontal stabilizer, new profile drawings.
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