



The Flyer



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Experimental Aircraft Association Chapter 44

November 2013

DAVE HURD TAKES FIRST FLIGHT IN HIS GLASAIR

By Dave Hurd & Bob Nelligan-Barrett

EAA 44 member Dave Hurd announced the first flight of his Glasair on Nov 4, 2013. **Congratulations Dave from all of us!**

Dave spent the morning of his flight with Ray, his A&P-IA, to work out some rough running in the engine. After two run-ups and two high-speed taxi tests, it was all over except the flying.

On Dave's first lap around the pattern he noticed a wingtip condensation vortex. Only it was from a leaking fuel cap! Get down now! All the gauges were in the green, and there was no engine disruption, so downwind to base to final and landing. Back to talk to Jeff Paris about a solution. After tightening the cap and checking for other leaks, it was back on the horse again for another flight check.

Everything was fixed and back in the air again. The second flight was uneventful.

Dave said: **I would like to express my appreciation to all those in EAA Chapter 44 who have provided moral (and sometimes immoral) support over the past years while this project wound its' way through the sometimes interminable building process.**

Of special note are: **Dr. John Ghertner**, who was extraordinarily gracious in allowing me to get 5 hours time with him in his magnificent Glasair Super II-S, which was especially valuable in the first hour this afternoon; **Mr. Norm Isler** who has made his Beechcraft Sport available to me over the past few years, which helped keep the old stick-and-rudder skills from getting too rusty; **Mr.**

Bob Northrup who provided technical support from the avionics side, and a much needed kick-in-the-pants on the odd occasion; and Mr. **Ray Chapin, A&P/IA**, who got the Lycoming mill tuned up and singing sweetly.

Two others stand out in my mind as being extraordinarily supportive. They are; **Mr. Jeff Paris, A&P**, whose help and support over the past year and a half helped me push this project across the finish line - I shudder to think how many more "Two more yearses," it would have been without his help. **And most of all my lovely, and understanding bride, Becky, who has put up with the lack of a garage, and the "smell of progress" permeating the house over the past 2 decades.**

My deepest thanks to you all.

In the words of a former professor -
Ultra Nostrum Sominum - "Beyond Our Dreams"



Glasair II similar to, but not Dave's airplane.

OCTOBER YOUNG EAGLE RALLY

by Elise Isler

On October 18th, waiting with bated breath and with much communication between pilots and ground crew studying weather patterns and using all the available modern technology as well as “up to date” weather newscasts, we made a decision we would hold our rally the following morning! It was a very good, educated decision. We were able to successfully fly 20 Young Eagles. Special thanks again to our pilots: Mike Kuyt, Frank Grossmann, Craig Ritson, Tom Bowdler, Norm Isler and from Chapter 46: Paul Quenzler and Art Beyer. Ground crew included: Bill Shaw, Julie Kuyt, Laura Luce, Mr. Chris, Mrs. Chris and Sarah Koch, Jim Weinkauff, Kevin Arganbright, Jack Frenz, Ron Logory, Evelyn Amsler, Mike Clayton, Linda Howell, Jeff Peters, Dave Hurd and Bob Nelligan Barrett.



Sonex Builder/Pilot Craig Ritson & Young Eagle Max congratulate each other after a successful flight.

One person made the comment that they never realized how much “man” power it took to run this event! The wonderful news is not only do we come together and have a good time – but we made some new connections with groups that would like us to come out and present to them, set up another Aero Camp and shared their enthusiasm to spread the news of our program. We never know who we might inspire to pursue aviation goals and/or become a new member. We also get comments such as “I never knew there was an airport in Brockport!” Young Eagles is not just about taking kids for free airplane rides. It helps us get involved in our community and spread the spirit of general aviation. Thank you to all who are already involved and please think about participating next year!

EAGLE SCOUT HONORED FOR SAC PROJECT

by Norm Isler

Sunday October 13 was another special day for our Sport Aviation Center. Boy Scout Troop 94 of Gates, NY held their Eagle Scout Court of Honor in our “home” celebrating Matt Rice attaining the rank of Eagle. One of the major steps to achieving this rank was the work project he completed, providing a great deal of the materials and labor to complete our rest rooms. Matt’s team coordinated the planning, purchase and installation of drywall and mud, installation of the dropped ceilings and recessed lighting, paint, trim and other finish work.



N. Isler photo

In addition to about 45 scouts, friends and family of Matt’s, I was happy to see about half a dozen of our members present to help celebrate Matt’s accomplishment and add their individual thanks and appreciation for his efforts. It was also good to see our members there with cameras helping Matt’s family create an album of this significant event in their life.

Matt’s project, along with two other major SAC improvements were generously funded through the community involvement programs of Triumph Aerospace Systems – Seattle.

OLD GOAT RAMBLINGS

by Art Thieme

THE END IS NEAR!
I HAD A PEDICURE!

Our daughter takes my wife to this on a routine basis. She talked me into having one. Now us manly type guys don't do this, but I thought what the H---, I'll try it. Turned out OK, but next time, if there is one, I'll bring along a cup of 40-proof and a book.

STOP THE PRESSES! I got the answer to a Final Jeopardy question. This makes me one out of ...

I have a project that requires a jig saw. I have one. Couldn't find it. Bought a new one. Now that means that I will find the lost one. Hasn't happened yet.

How do companies pay millions in fines and still stay in business? Do they keep a stash just for this and are they charging too much for their product to begin with?

Does anybody ever change their behavior after writing to Dear Amy?

General Aviation News, Oct 25, reports that a group of high powered EAA members have launched a campaign to honor Tom Poberezny. They have a web site <HonorPoberezny.com> and urge you to sing in for support. They plan to honor Tom and his family at the 2014 AirVenture. Great idea!

Aviation Week, Oct. 28, reports that the new Cessna CEO Scott Ernest says there is no future for the Chinese-made Skycatcher. What that means exactly was not reported.

Years ago, the Chapter did not hold a December meeting. As an Old Goat, I am taking December off, and now take the opportunity to wish you all a Happy Thanksgiving and a Joyful Christmas season.

Old Goat, out.

LAST MONTH'S GUEST SPEAKER



13WHAM Meteorologist Glenn Johnson joined us for a presentation on weather forecasting. Although he didn't focus on aviation weather, his talk gave us a behind-the-scenes look into how forecasters for the general public develop their reports. He brought a video that showed how he assembles a particular evenings weather maps.

Thank you Glenn for enlightening us on this important topic.



Craig Ritson and his daughters listen to Glenn Johnson. EAA 44 activities are family affairs. All are welcomed.

PROPELLERS Part VI

by Mike Clayton

In previous installments, we determined how the differences in engine characteristics can influence the choice of a propeller. This process is driven by the ability of the engine to produce torque at a variety of operating speeds.

In case you haven't related to the concept of torque, imagine putting a screw into a piece of wood. The bigger the screw, the harder it is to turn the screwdriver. This force is called torque. So, for a propeller, the bigger the propeller, and the steeper the pitch, the harder the engine has to work to turn it.

We also looked at the efficiency of the propeller/engine combination. The efficiency is determined by the thrust the prop will produce times the speed the aircraft is going, divided by the torque the engine has to produce to make this happen times the RPM of the engine. Uh-Oh! More engineering stuff. Well, its not much more than common sense, so bear with me.

With regard to this, *horsepower is the rate at which the torque is produced by the engine, which is just the torque times the engine speed. The horsepower used by the prop in moving the aircraft is the thrust times the speed of the aircraft. So the efficiency of the prop/engine combination is just "horsepower in" divided into "horsepower out". That is, what you get out of all that effort, divided by the effort itself.* Think of it like interest on a savings account...you put money in, and you get something back for your investment. In the case of efficiency, we hope that the interest rate is high, something like 80%!

So maybe some of this will start to make sense as we proceed to connect the dots. When we are done, it should be clear that the engine and the propeller must work together as a team.

Now it is time to really focus on the prop itself, and see what characteristics it needs to have. From what has gone before, it should start to be apparent, when you think about it, that the prop diameter and the pitch of the prop will determine how hard the engine will have to work to turn it at the desired speed. The actual shape of the propeller blade will also have a big effect on the efficiency of the propeller/engine combo.

There are all kinds of blade shapes out there. Some blades have flat, paddle shaped ends, some have rounded ends, and so on. All of them seem to work, pulling or pushing the airplane through the air. So, what's the big deal?

Recall that in the first installment of this series, I talked about how a propeller is basically a rotating wing. The main difference is that the relative wind passing over the "wing" is higher at the

tip than at the root, because the speed of the propeller blade increases from root to tip. The effective angle of attack of the propeller depends not only on the physical pitch of the propeller at any point along the blade, but also the forward motion of the aircraft, and this will cause the direction of the relative wind to shift in relation to the propeller airfoil at different aircraft forward speeds.

By now, you probably have a headache! Well, never fear, as plain old common sense will help the pain...



Got nothin' to do with Mike's article, just a propeller photo of a FLYING, one-blade J-2 Cub. Photo from the Internet

As a the relative wind moves faster over the wing, the angle of attack (the angle between the relative wind and the airfoil) of the wing needs to be less to produce the desired lift. In addition, the higher wind speed increases the drag over the wing as well, making it harder to move the wing through the air. The angle of attack of propeller blades is (usually) highest near the root and least near the tip because the relative wind over the prop blade is highest near the tip, and least near the root.

Also, it was shown many, many years ago that the ideal wing shape is basically elliptical. A good example of this is the WWII Spitfire wing. This is one of the reasons the aircraft was such an outstanding performer.

At least part of the reason for this is that lift goes to zero at the tip of the wing. Since the pressure on the bottom of the wing is higher than that on top, the air on the bottom wants to curve upwards at the end of the wing, towards the lower pressure above. This results in a "tip vortex", which every pilot knows to avoid when landing or taking off behind a large heavy aircraft. These vortices waste energy, and increase the drag, reducing the overall efficiency of any aircraft wing. On the other hand, if the wing chord is nearly zero near the tip, there will be lower lift generated in that region, and also weaker tip vortices, increasing overall wing efficiency. For this reason, propeller tips should go to zero chord, in order to work efficiently, just like the Spitfire wing.

This is OK, as far as it goes, but where should the propeller blade be the widest, and what should be the actual variation in pitch (angle of attack) from root to tip? To answer this question well, we would need to delve into fluid mechanics, which is really messy mathematically, and needs lots and lots of work, as well as grounding in

Physics, and Mathematics of the advanced kind. More Engineering stuff!

However, we are not trying to design the propeller, just to understand how it works, and why. Again, common sense will help! Here are some pictures of propellers that are very efficient in moving airplanes, starting with the propeller built by Charles M/ Olmstead about 1918 (third from the left in the picture next page). Olmstead was the first U.S. Aeronautical Engineer, lived in Buffalo, and developed a very advanced propeller. It set many records with the Curtiss flying boats, and exhibited an increase in efficiency over its contemporaries of 20%!

Again, the Olmstead prop is third from the left in this picture from the Air Force Museum website. Note how it compares to the other propellers of the time. It has a very small tip, and a very wide chord about 1/3 of the way from the root to the tip. This is consistent with the ideas we have begun to develop.



Below is a picture from the internet of a modern propeller, designed by Paul Lipps. See the article in the EAA Experimenter (http://www.eaa.org/experimenter/articles/2009-02_clippse.asp). Look at the shape, and compare it to the Olmstead propeller, developed in 1918. Notice the striking similarity of the shapes. These designs are both state-of-the-art for their time, and separated by nearly 90 years! What they have in common is the recognition that the shape of the blade must be tapered, and that the widest part of the blade must not be near the tip, but roughly 1/3 to 1/2 of the way from root to tip. These features help assure that the distribution of lift along the rotating wing is nearly elliptical, which as we discussed earlier, is the ideal for best performance. There are also features that drive the pitch along the radius of the propeller, assuring that there is nearly constant thrust produced along the blade.



The next picture, is of my propeller, obtained from Lonnie Prince (Prince Propellers).



Notice that it also has a similar shape. This design is also intended to account for many factors, such as the torque of my engine, and the speed of the Kitfox (slow), and again producing the ideal distribution of lift along the blade for my own aircraft and engine. This is an experimental design, and flight testing will determine whether or not we have it right.

So, I will close for now, and simply point out that the correct propeller shape will provide the best combination of efficiency and performance for a given engine. In addition, the propeller has to be designed not only to work with the engine, but also with the aircraft, accounting for the aircraft top speed. A properly designed propeller will be very quiet, compared to many other designs, as the tip vortices will be low. These are responsible for a lot of aircraft noise, and so the aircraft will be quiet. In fact, properly designed propellers are found on most drone aircraft, where stealth is important!

While all this is complicated, there are some simple rules of thumb that can be used to select a propeller. I will follow up with a discussion of these in another installment.

**EAA Chapter 44
Board of Directors' Meeting
8 Oct 2013**

Board Members Present: Williams, Hurd, Byers, Nelligan-Barrett, North, Isler and Peters

Other Members Present: Greeno

Reports:

- President (Rob Williams):
 - No specific items
- Vice President (Norm Isler):
 - No specific items
- Treasurer (Dave Hurd):
 - Report read and approved.

Business:

- Building Committee (Darryl Byers, et. al.)
 - Looking for someone to cover the snowplowing for the upcoming winter.
- Capital Campaign (Larry Greeno)
 - The Board reviewed a refined EAA 44 vision statement prepared by Larry Greeno. The purpose of this document is to present the goals and activities of a future Chapter 44.
 - The Board reviewed the possible creation of a Hangar Project Committee to begin long range planning for the various features of a Chapter 44 hangar.
- Old Business:
 - Norm met with a sales representative from Brighton Sound to review Chapter needs for sound system/hearing impaired amplification. For the latter an FM system may be a better choice than the older induction loop technology. The estimated total cost was more than Chapter could realistically allocate. The Board discussed options for a simplified, lower cost design. Issue tabled pending additional information.

- Lifetime membership – discussion about creating a list of specific guidelines to help determine eligibility for awarding a lifetime membership. Possible areas could include contribution to sport aviation, support of Chapter 44 activities and participation in Chapter leadership. One possible method of vetting a potential candidate would be to assign/solicit a sponsor who would present information supporting the candidate's case for life membership.
- Bob Nelligan-Barrett reviewed the possible reasons that the Chapter did not receive an AOPA Foundation Grant. It appears that the focus of the successful applicants were on support and outreach programs for handicapped and underprivileged groups.
- New Business:
 - BOD Elections – Nominations will be solicited at the October general membership meeting for the five open spots on the Board.
 - Norm requested that that the Board approve the allocation of Chapter 44's Young Eagle credits towards the purchase of identification lanyards. These will help to identify Chapter members during public events such as Young Eagle rallies and AOPA safety seminars. Rob Williams moved to approve, Dave Hurd seconded. Passed unanimously.
 - Norm noted that he may have a possible new Eagle Scout candidate willing to work on a Chapter service project, possible ideas include improved shop facilities, library shelving / dividers, etc.

CONTACT EAA 44



The Flyer is published monthly. For an electronic copy, go to <eaa44.org> and enter your email address where requested. For a mailed hard copy (\$10), contact Treasurer Dave Hurd. For membership info, contact Treasurer Dave Hurd.

Stories and photos by the editor unless otherwise noted. Article deadline is 1st Tuesday of the month. Send submissions to Editor Bob Nelligan-Barrett.

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EAA 44 is a 501(c)3 organization.

Gifts of cash, securities or other property to the Chapter for the benefit of the Sport Aviation Center are welcome and fully tax deductible.

Contact Treasurer Dave Hurd for details.



Sport Aviation Center of Western New York

REGIONAL CALENDAR

See the Upstate NY Aviation Calendar for fly-in breakfasts and other events.

<UPSTATELIST.ORG>

ALIEN WORLDS & ANDROIDS

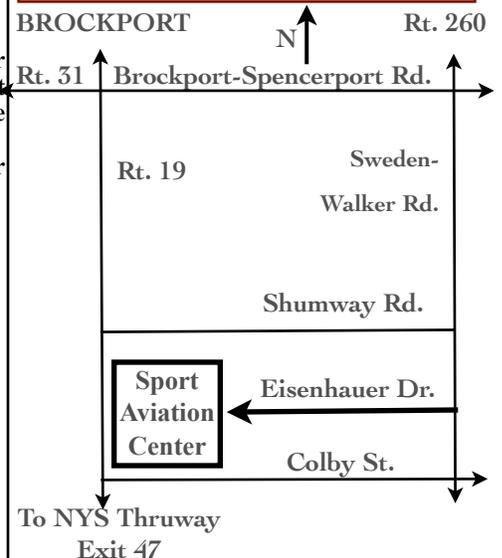
Rochester Museum & Science Center, Rochester NY <rmsc.org>
Showing now thru Dec. 22.

HISTORY OF SPACE PHOTOGRAPHY & ASTRO-VISIONS

George Eastman House, Rochester NY <eastmanhouse.org>
Showing now thru Jan 12
One show on the history of space photography and the other on how artists have included space in their art.

"PAST, PRESENT, & FUTURE: ROCHESTER CONNECTIONS TO SPACE PHOTOGRAPHY 7 IMAGING" Sat. Nov. 23, 2 PM
PM, Dryden Theater

KODAK CONTRIBUTIONS TO SPACE PHOTOGRAPHY Tues. Dec. 3, 6 PM, Dryden Theater



EAA 44 Calendar



NEXT GENERAL MEETING

Tuesday Nov. 19

Craig Curren,

Space Travel Agent,

Galactic Enterprises

It's Steak Night and Elections so please bring a dish or dessert to pass to complement our dinner. Come out to VOTE in SPACE!

Nov. 19 General Meeting
Nov. 23 SAC Sat. Work Day

Dec. 10 Board Mtg.
Dec. 14 SAC Work Day
Dec. 17 Holiday Dinner
Dec 28 NO SAC WORK DAY

**HAPPY HOLIDAYS TO
YOU AND YOUR FAMILY**

All activities take place at the Sport Aviation Center unless otherwise noted.

Sport Aviation Center

44 Eisenhower Dr. 14420

Brockport Airport/
Ledgesdale Airpark (7G0)

43° 10' 56" N 77° 55' 1" W

Board Meetings-

2nd Tuesday of the month, 7 PM

General Meetings-

3rd Tuesday of the month

Dinner 6:30, Meeting 7:30

SAC Saturday Work Days-

2nd & 4th Saturdays, 10 AM

Bob Nelligan-Barrett
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