



March 2021

	WHEN:	WHERE:	PROGRAM:
MARCH MEETING	Saturday, MARCH 13TH, 1:00 pm	Ray Robinson's Shop Fernald, IA	WHAT'S HAPPENING!

WHAT'S FLYIN' THIS WAY !!!

Ray Robinson's shop has become so popular the past couple of months, that word has gotten out that it's the place to be! On Saturday the 13th of March we will be meeting again at his well heated and spacious shop, and this time we will have a joint meeting with EAA Chapter 135 from Ankeny. The meeting will begin at 1:00. Don't know what we will be talking about other than an update on the Scholarship Program we are working on last month, and probably a lot of hangar flying!

There will be plenty of room to social distance and spread out a bit. Bring a chair and a story to share.

Just a reminder that we are working on moving our website to the new EAA provided webspace. You can see it here at <https://chapters.eaa.org/ea675>

See you next Saturday!

WHAT FLEW BY !!!

Ray and Sandy Robinson, once again, hosted our chapter meeting in their shop in Fernald. Those present talked about the Scholarship funds we have and decided to split it in two parts to benefit two individuals in different fields of aviation. Lorin Miller has a synopsis of what was discussed on the next page and we will have more updates at the next meeting.



There have been a few days recently that have been conducive to flying and it has been noted that there has been some activity at the Marshalltown airport with members chipping ice and getting their airplanes ready to fly, if not already in the air. The season is here for flying!



•President



Paul Adams
2144L Marsh Ave.
Marshalltown, IA 50158
641-753-6222

djpradams@gmail.com

•Vice President

Lorin Miller



309 West St.
Colo, IA 50056
515-231-2563

lorindmiller@hotmail.com

•Sec/Treas



Dave McCurry
5 Valley View Rd.
Marshalltown, IA 50158
641-752-4729

dmccurry@centurylink.net

•Newsletter Editor



Corey Butcher
2940 Arney Ave
State Center, IA 50247
641-351-5476

coreybutcher@voisin35.com

Visit your NEW Chapter 675 website!
<https://chapters.eaa.org/ea675>

CALENDAR

There are a couple of fly-ins on the Iowa DOT aviation calendar. It's good to see the optimism coming back!

Saturday, March 13th
1:00 pm
EAA 675 Gathering at Ray's Shop
Fernald, IA

Saturday, May 8
Boone Municipal Airport (BNW)
Fly-in breakfast
7 a.m. – 11 a.m.
Pilots-in-command free
515-291-5094 (Dale Farnham)
Email: defarnham@msn.com
Website: www.farnhamaviation.com

Monday, July 26 – Sunday, August 1
EAA AirVenture
Oshkosh, WI

Subject: Webinar “How to survive an amateur Built Certification

On behalf of the Des Moines Flight Standards District Office and the FAA Safety Team. We are starting outreach webinars to the amateur built aircraft community.

This is an invitation to the Webinar “How to survive an Amateur Built Certification”.

The webinar is on March 10th 2021 from 07:00 – 08:30 pm.

Please use the following link to sign up for the webinar.

<https://attendee.gotowebinar.com/register/2899790807505430795>

If you know of anyone that could benefit from this webinar, please forward this information.

Should you have any questions, Please use the contact information below.

Best Regards-
David M. Hintz
FAAS Team Program Manager
Airworthiness
Des Moines, Iowa Flight Standards
(515)289-4817 Office
(515)999-2918 Telework Office
(515)201-5014 Cell

FAAS Team's Mission Statement:

Improve the Nation's aviation accident rate by conveying safety principles and practices through training, outreach, and education; while establishing partnerships and encouraging the continual growth of a positive safety culture within the aviation community.

Scholarship Update by Lorin Miller

FYI – this was the major topic of discussion at our last chapter meeting and my walk away action was to create/ document a proposed Scholarship program offering.

All individuals present in the chapter agreed that they would like the scholarship to be split into 2 offerings at \$750 each instead of using it for something like an Intro to flight program. There was a proposal that we open up for donations to bring the total scholarship up to \$2000 in total if possible – making it \$1000 each. I'm not opposed to that and think it's a good idea. College is EXPENSIVE...

The scholarships were to be listed as applicable to an “Aviation Related Educational Program”. Some of the examples are: Aviation Management, Aviation Maintenance, Aviation Pilot, Aviation Electronics Technician, etc. Almost everybody keyed in on the maintenance/electronics technician idea and felt that there is little scholarship focus for those programs and wanted one of the scholarships to go in that direction if possible.

Stipulations we discussed:

Allowable applicant base: Marshalltown and surrounding area, Iowa Falls and surrounding area.

Student must show proof of enrollment

Scholarship would not be disbursed to the individual, but to the college

Disbursement would be made at the end of the first semester

Recipient would be requested to present to the chapter at least once on what they are learning in college

Garry Brandenburg has provided me a copy of the Izaak Walton scholarship application and program as a starting point for me to draft the proposed program. My goal is to have a draft ready for our review by end of this week.

Let me know if you have any comments please!



Now on FACEBOOK

www.facebook.com/EaaChapter675

Easter Sunday by Doug Boyd

I'm a glider pilot. I've flown a strong, high performance glider in powerful conditions in New Mexico. I know what the sky can be like. I should have known better!

Easter Sunday 2004. I hadn't flown for a couple weeks. It looked nice out and AWOS (automated weather observation system) reported the wind as "calm". OK, let's go! I got the Challenger out about 1:00 o'clock, warmed her up and took off on runway 36. Climbing out, it was immediately a bit bumpy, but no big deal in climb attitude. No other traffic so I did a right turn out heading east and climbing. I leveled out as usual at about 1500 feet AGL and found it uncomfortably bumpy but noticed I was climbing. Thermals! Let's go soaring!

The engine was turning 5000 RPM, well below cruise power, but I was circling in thermals and typically climbing 500 to 1200 feet per minute! Fun! How high can we go? We (the plane and I) climbed up this way to about 8500 feet ASL drifting a few miles east of the airport. I ran out of the lift at about 8500 feet but thought it would be fun to have been to 10,000' so I added power and kept climbing. We hit lift again at about 9500', and I throttled back to cruise power and kept climbing. It was getting cold, outside temp as low as 3°F, and I started to think about the issues of the ride down. But this was too much fun. I kept going. The lift died a little over 12,000 feet, cloud base for the wispy clouds around. That's enough, time to head back.

It got ugly right away. It was rough for this light little seemingly frail airplane. I didn't want to go too fast in the rough air. Much over 65 mph was uncomfortable. And, I wanted to keep cylinder head temperature over 200°F so I needed some power. And, the lift was still out there! It was going to be a slow, bumpy, cold ride down. The lightweight Challenger can be a handful to control in air like this and I was a busy guy. The ride got worse the further down we got. I was concerned about breaking something in a hard bump or even getting rolled. Looking down from high altitude there were clearly snow or ice crystals in the air below me, some kind of precipitation although it never caught on the windscreen. Carburetor ice? That would be all I needed added to my troubles, although I was high over the airport and could dead stick it in if necessary. At mid altitudes the airplane was hard to keep from skidding and slipping in the turbulence. Frequently the doors, secured closed by a stout bungee, would pull open an inch or two responding to unequal pressure on them. Lord, if they come loose and exit through the prop it ain't gonna be pretty! Yup, I was a bit frightened.

It takes a long time to come down from 12,000 feet at 200 to 400 feet per minute especially with your hands full and lots of imagined worries. The seat fell out from under me once, but I never found much sinking air and wasn't sure I wanted to fall into it anyway. It didn't get any better until I was on final about 200 feet off the ground. I carried some excess speed in case I hit a sink hole down there. Back on the ground, the winds were... calm. I was GLAD to be down.

Did I learn something about flying ultralights? Yeah. Ultralights don't belong in rough air. Try to fly mornings and evenings when it is smoother. Whenever you choose to fly, if it is bumpy on take off, give it up. Land. Go home or "fly" in the hanger. Just because it is "calm" on the ground doesn't mean it is calm in the wild blue yonder. (O yeah, the doors now have metal latches.)



WHY DO I FLY

by Paul Adams

With more sitting around than usual these days, one's mind can wonder. One thing I enjoy is looking at old pictures and remembering good times from the past. Of course a lot of that for me is flying, be it building, actual out flying or going to flying events. So naturally the question when reflecting back one might ask, "why do I fly?". So as I contemplated this very deep subject I came up with many reasons of which most were centered around pure joy and also great friends and relationships that have been built over these many years. But I did come up with one that was a little less positive. I am a lousy horse person. And with being a lousy horse person, came some frustration and maybe even a little fear. It goes like this.

Within my family group there are some horse lovers, real down to earth horse lovers. They are as big a sicko about horses as I am about flying. I get the chance ever so often to join them in their horse outings. One of my early outings with them occurred at Yellow River in northeast Iowa. A beautiful place. We took our campers. The horse people share their camper with their horses. Humpf? On the first evening we sat around the campfire, much like we do at aviation events, and the talk centered around horses, go figure. Well horses and mules that is. I learned an important lesson, mules are more sure footed than horses and a little easier to ride. As we sat at the campfire the smell of equestrian life surrounded us. Horses are hay burners. They turn hay into little piles on the ground which has a definite horse aroma. Makes you feel like you are out west on a cattle drive. Each night we would feed the horses hay and water. One horse, the one I was to ride the next day, kept kicking his water bucket over. I asked brother in law Dave, why? He said with a smile on his face, "Maybe she doesn't like you." Humpf again.

Up early the next day, a cowboy breakfast and preparations for the morning trail ride. Here I am with my overseer, the horse owner I might add, Dave.



I realize he looks more the part than I, but after all he was once a real cowboy.

Is that horse looking at me? To leave the campground we had to cross a small creek. As me and my steed approached the creek she stopped. I used all that I had learned in my very recent 3.2 minute horse riding training session and nothing. We just stayed there. The good news Dave came back. He says, oh yea, I forgot to tell you old so in so there doesn't like creeks. Dave took the reins and pulled us across. Next came "the hill". As we, my horse and I, climbed the hill my fellow equestrian partners were at the top, turned and with plenty of laughter and jocularly watched my ascent. As I slide around on the saddle I remembered the camp fire discussion about sure footed mules versus horses. But I made it. The morning's ride was short, in my riding partners minds, only 2 and 1/2 hours. We arrive back at the camp site, which was not a problem for me as far as guiding the horse. Once she saw the campsite and hay off we took. Now it was time to get off.. did so. Now it was time to walk, not so good. A simple explanation is I hurt and wondered if my knees would ever touch each other again. I desperately needed a cold libation. But had to give the old hay burner her hay and water. She kicked the bucket over again. To bad!

We sat around the campsite having lunch. They discussed which trail they would tackle that afternoon. The key word is "they". I went trout fishing. As I fished I remembered the look the horse gave me before we left.



All I can say is smoked trout tastes really good. Oh yea, and sitting in the cold stream was priceless!

So "why do I fly"? I won't list all the reasons but here are a few new ones I learned that day. Plane seats are comfortable. Planes fly over streams with ease. Planes climb easily with the push of a throttle, a slight pull on the stick and a little right rudder. AHHHHH! There is a sequel to this story. I will make it short. It was the look brother-in-law Dave had after I talked him into flying with me in the Citabria. After the flight and back at the hangar he was a little green shall we say. He was also bowed legged, like I was after my horse ride, but that was natural for him caused from his long equestrian life. I asked how he liked his "ride". He mumbled fine. I asked him if he liked the barrel role, no answer. Like

on my horse ride my legs were the shape of his horse, on Dave's ride his face was the color of my plane. My plane couldn't look at him like his horse looked at me, but I made up for it with my pleasant facial expression.

To many horse pictures in this article. Here is an airplane picture.



Dave's favorite airplane, my 1968 Citabria that brother in law Dave got his ride in. As a foot note. This airplane came from out west in Wyoming where it spent many hours as a ranch plane and was used to go out and inspect the cattle.

Two brothers owned it, but they liked the comfortable seats, the view from above of streams and the easy climb capability! The next picture is for brother in law Dave! Around we go, yippee!



I wonder if he remembers his 3.2 minute lesson I gave him as we buckled into our parachutes. His question was, why do we need a parachute. My answer was just to listen to me and if I say bail out, do so and pull this little silver handle. I then said if he didn't understand the bail out order and said huh, he would be talking to himself. Shoot, that's way more instruction than he gave me. I guess I am nicer.

Electric Propulsion article 7

Roll Royce Accel Electric plane project.... Pushing the limits of electric power

Researched by Ronald Borree EAA Chapter 237

Rolls-Royce is working to build the fastest single seat electric airplane of all time. To get there, it has to solve an assortment of complex engineering problems.



Imagine climbing to the skies from England in a sleek 500 HP electric plane over the White Cliffs of Dover heading to France at 300 MPH. The top speed of a Spitfire doing the same flight in 1944 was about 369 MPH with a 1,000 HP Merlin V12 gas engine. While not necessarily flying over the White Cliffs, this plane will soon be attempting a new speed record over England.

Rolls Royce is pushing the electric propulsion design envelope with a plane called the Accel using a triple stacked set of electric motors combined with three 6,000 cell battery packs to break the speed record for electric flight. The first flight is anticipated in 2021.

What they're working on is very much in the performance-or-bust category, namely a largely stock Nemesis NXT airframe coupled with meaningful—if short legged—electric power.

The [Nemesis](#) NXT—which wasn't even racing the year it was selected—looked perfect, mainly because it has no fuel in its wings. Instead it features one rather large gas tank between the cockpit and engine. This is perfect placement for the concentration of the battery pack—right atop the CG (center of gravity)—and so the NXT was selected.

The prototype airplane has three powerful stacked Yasa 750kW axial electric motors driving the propeller. This arrangement allows lower rotating speed than conventional (Internal Combustion Engine) power for a quieter, more stable ride. Should any of the battery cells inside the three ultra-strong battery cases fail, then artificial intelligence will shut that battery down. However, the aircraft can fly on two motors, or even one, or one battery pack if needed.

The company considered different types of lithium-ion cells including cylindrical, pouch, and prismatic. Then, it decided cylindrical cells were best for energy capacity, and fast discharging at high power.

The entire propulsion system is liquid cooled. Instead of running coolant around the components, they've routed coolant right into the heart of both motors and batteries. This requires a non-conductive "dielectric fluid of some sort," along with a pump and two heat exchangers. The latter will live at the bottom of the cowling, about where the stock NXT cooling air exits live. According to a [Rolls-Royce](#) press release they packaged 6,000 cells in each battery pack to minimize weight while maximizing thermal protection, devising a liquid cooling system whereby every cell directly contacts the cooling plate.

The plane could travel as far as 200 miles on a single charge at moderate power allowing it to fly from London to Paris. The company says it is building the airplane with an eye on short commercial flights.

.....In any case, the inside word is, left at maximum power the e-NXT exhausts itself in 6 minutes, which just goes to show how much energy there is in a tank of gasoline. Given a more typical flight profile using partial-power takeoffs, expect 10-minute flights over the airport but no more. This is exactly in keeping with the ACCEL NXT's mission, which is just as highly specialized for speed as other electrics are for endurance. As always, it's difficult to have both.



Laura Wood of Rolls-Royce stands behind and Josh Playle of Electroflight in front of the three YASA 750R motors; next aft is the silver box denoting the inverters and cooling apparatus. The battery pack lives directly above the wing and is therefore not visible here. Zuken E3.series software was used to design the ACCEL NXT's custom CAN bus wiring and cooling system, the better to support the extensive battery management, cooling, data acquisition and telemetry.

General Specifications:

Specs:	Performance:
One Seat "Accel " NXT airframe (carbon over aluminum airframe sub structure)	Top Speed: 300 mph est.
24' Wingspan	Current Range: ~ 200 miles at medium output... London to Paris estimated
2,600 lbs Empty Weight	Max. Cruise: 200 MPH for one hour estimated by author based on approximate 216 Kwh battery and 1. Kw power use per mile for 200 miles. (London to Paris)
3-Blade Propeller.. 2,400 rpm typical	
Total maximum of 400kW power output on three stacked Yasa 750R motors (750 volts); liquid-cooled, axial flux AC motors with invertors/controllers. Sevcon DC/DC convertors 500 HP at maximum thrust per Rolls Royce releases. Short term peak power may go beyond 1,000 HP.	
Three 72kWh Battery Packs -Liquid cooled. 450 pounds each totally 1,350 pounds.	

Information and data shown are taken from the Rolls Royce websites and various news releases/articles with web links shown below. Information is believed reliable. Rolls Royce should be consulted for additional data as needed.

<https://www.rolls-royce.com/innovation/accel.aspx>

<https://www.safran-electrical-power.com/electrical-systems/our-engineustm-electrical-motors>

<https://spectrum.ieee.org/energywise/energy/batteries-storage/the-battery-innovations-behind-rolls-royces-ultrafast-electric-airplane>

<https://www.upsbatterycenter.com/blog/dense-electric-battery-for-rolls/>

<https://www.avweb.com/features/inside-the-electroflight-rolls-royce-electric-racer/>

<https://cleantechnica.com/2020/01/29/rolls-royce-claims-its-latest-electric-airplane-battery-has-the-highest-energy-density/>