
EAA Chapter 32 News

The official publication of Experimental Aircraft Association Chapter 32 - St. Louis, MO (Jim Bower, Editor)

May, 2021



STUDENTS FROM THE LUTHERAN HIGH SCHOOL STEM PROGRAM POSE WITH THEIR ADVISORS AND EAA CHAPTER 32 VOLUNTEERS AT THE RECENT EVENT. SEE INSIDE FOR DETAILS.

Newsletter Contributions and Deadlines

Anyone wishing to submit articles, advertisements, rants, etc. to the newsletter should send them to your friendly editor on or before the Saturday ahead of the scheduled meeting. Send contributions to newsletter@eaa32.org.



“We are a family – A family brought together by aviation.”

Paul H. Poberezny

“Aviation seeds must be transplanted to future generations if we are to see our rich heritage passed on for others to see, to feel, to touch, to fly.”

Paul H. Poberezny

I see these quotes and I can't help but hear them in my head in Paul's distinctive deep voice. Growing and reuniting with our aviation family is something many of us look forward to every year with great excitement. Our big family reunion, AirVenture is less than 80 days away now. I have a feeling the turnout there is going to be surprisingly big. Perhaps not record numbers but who knows? So many things are on the verge of surging back as pent-up demand is unleashed.

We're setting up a chapter campsite as we have in past years. EAA allows chapters to reserve up to 6 campsites grouped together. Of course, we have to pay for this in advance and we do need to get our information in as soon as possible to get on the list and have a location staked out. If you're interested, let me know. I'll send a sign-up sheet around at this month's meeting. I think we may already have three or more members interested in bringing their campers, myself included.

Speaking of campers, this month's chapter video with Charlie Becker has information on a new contest from Headquarters for some neat EAA logo gear. The grand prize is the use of a specially decorated teardrop camper and an assortment of the aforementioned gear. I plan on showing the Chapter Video at the meeting.

As we are now starting to have Young Eagle events and other activities that can bring in new members, think about who you might invite to join our family. EAA memberships can begin with student memberships (free to those 8-18 ½ who've completed a Young Eagle flight), family memberships, lifetime memberships (both national and chapter), and Legacy Memberships. What is a Legacy Membership? This is a program where you can gift a membership to someone you think would benefit from joining EAA's aviation family. You can sponsor more than one membership and will receive recognition from EAA. Look on the website under membership for Legacy Membership.

President's Corner

by Bill Doherty

My membership in EAA was first given to me by my father while at Oshkosh in 1992. I had recently completed a master's degree and while we were walking along the flight line, he asked what I might like as a graduation gift. I told him I'd be honored just to join him as a member of EAA and Chapter 32, so we stopped in at the membership building and I signed up as EAA #410591. I think of it as partly my gift to him too for being my dad and my hero.

Let's spread this joy and love of aviation and of our fellow enthusiasts. Chapter 32 was started in the 1950s by people from a multitude of backgrounds including engineers and assembly workers at McDonnell Aircraft. Dad was an engineer with Union Electric. Others were from different industries or were military veterans looking to fly as sport. All had a common interest in aviation along with the sharing of ideas and skills for building their own airplanes. From this group emerged the chapter's first project airplane, a Stits Skycoupe. Members built Pietenpols, T-18s, Emeraudes, and restored Stearmans, Cubs, and many more.

We need to continue to find and invite people from all generations and backgrounds. I see new pilots coming through where I work all the time. I talk to jet pilots who are also building Pietenpols or are interested in newer designs like RVs and Zeniths. Even for aviation enthusiasts who aren't interested in building or restoring a project, but maybe are prospective student pilots or simply just like airplanes, we're a great resource. Many aren't familiar with us, so we have a huge opportunity to reach out and let them know we're here and they're both welcome and invited to be a part of EAA and Chapter 32.

Our monthly Chapter Gathering is at the ARC this Saturday at 10:00AM. We'll check in on our Young Eagles and find out how our Explorer Post relaunch is coming along. We'll also follow up on our Ray Scholarship candidates and see how they're progressing. Afterward, Bob Murray will present session 2 of the Aircraft Electrical Workshop. This is the hands-on session.

As before, if you don't feel well or have a fever please stay home and take care of yourself. If you plan to attend, social distancing is still in vogue and face coverings are required attire even if you've received all the vaccine shots.

I look forward to seeing you all in person again.

As always, check out the EAA.org website for past and upcoming webinars and other programs. There's a lot of interesting videos to choose from. Here's a link where you can find this month's Chapter Video with Charlie Becker. In this month's Chapter Video Magazine Charlie also talks about Project 21 which just broke ground at the AirVenture Museum. They're adding 30,000 new square feet to provide space for a variety of activities including pilot proficiency, STEM, KidVenture activities and more.

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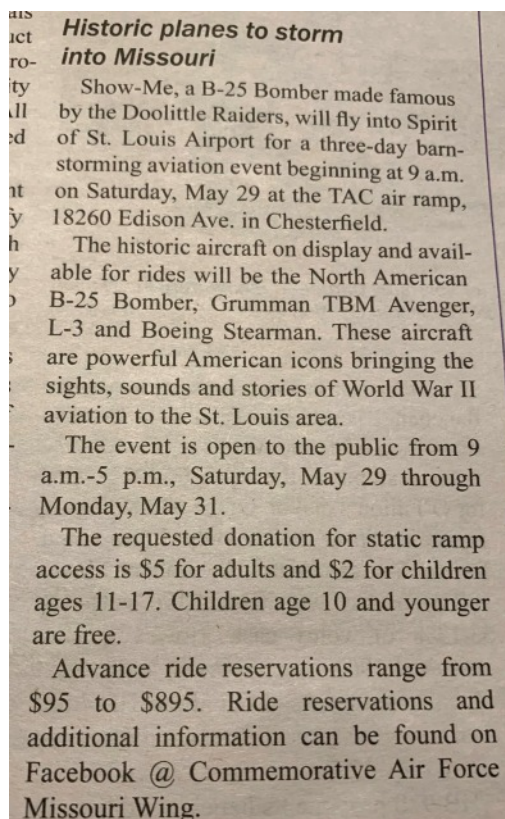
<https://www.eaa.org/Videos/Chapters/6246031977001>

That's all I have this time. I'll see you at the ARC or maybe around the pattern!

Until then stay vigilant and fly safe!

Blue Skies!
Bill Doherty,
President
EAA Spirit of St. Louis Chapter 32

From Mid Rivers Newsmagazine May 5, 2021



April Meeting Minutes

Dave Deweese



April's meeting began with the Pledge, Bill Doherty presiding.

We observed a moment of silence for Victoria Ward, a cherished member of our chapter and that of Jefferson City as well.

We approved last month's minutes as posted in the newsletter.

Don gave the treasurer's report including checking, savings, and Ray Foundation account balances.

New members or visitors: Brian Bell has a Zodiac 601 on Potosi. He bought a new canopy to replace the damaged original and is requesting help getting it installed. Theresa Harkins has a Cessna 150 and is interested in the Young Eagles program.

Flood report: as of this morning the Mississippi is at 17.1 and is falling. We plan to get some equipment palletized to make it easier to move out next time.

We held part 1 of our electrical workshop, Bob Murray reports that they held the first presentation on Zoom, went 2 hours and covered concepts. Next session will be hands-on, likely in May after the meeting. Considering how long the first session went there will likely be a third. You can attend the next session even if you didn't sit through the first. The first one was recorded, Bill will look up the location.

Bill would like to get more workshops in the pipeline, welding for example. Let him know if you have expertise.

We've got three candidates for the Ray Foundation: Vasili, Marco, and Wesely. We've been approved by HQ for another 100% scholarship.

Rick May reports that we had to cancel our last event due to rain. He's rescheduled for May 8 and proposes we run events for the second Saturday of each month through September. If you're going to participate please visit YoungEaglesDay.org and register as a user, then specify your job. In June there will be events on June 5 (Creve Couer) and June 12 (ARC, International Young Eagles Day). Ron Burnett has a friend (David Zilch) who's teaching a high school aviation class, he'd like to arrange an event on a Thursday or Friday here at the ARC, preferably in May. Bill asks to make sure you're up to speed with the Youth Protection Program. You can

get there from the EAA website, My Account, Training Information.

Jim Hall reports on the Explorer Scouts post. They held a virtual meeting Tuesday evening. The Greater St. Louis organization suggests targeting the fall for re-establishing the post. Andrew's looking at interest in attending this year's Oshkosh: there will be some activities focused on Explorer Scouts. Bill has some contacts at Spirit, e.g. introducing how an FBO works. He says there was a recent program for the Red Tails.

We're still looking for volunteers for the Membership Committee.

Mike Schwartzkopf has food cards and reminds us of the shopwithscrip.com program: we've made \$99 this year so far. Bill reports he's been using it and it's fun to use.

New Business:

Motion made, seconded, and voted yes to get Victoria Ward added to the Memorial Wall.

Art added brighter lights (9000 lumen LED bulbs, about \$90 per at Home Depot) to the northeastern corner of the ARC to facilitate building his Zenith. (This is his donation to the chapter for usage of the space.) We may add the to the rest of the building. Art reports that it helps a lot for precision work.

Airventure's coming up, Jeff Stephenson talked about getting a campsite. If the chapter wants to camp together they'll combine some sites (typically 2-6 with the option of 4 more.) and stake out the area. We've done it the past few years, though the earlier we let HQ know the better the spot we get. There is an up front outlay of cash, it's about \$250 per site. Bill will work with Jeff on this.

Jim and Frank have worked on Chris's Zenith, some more wrapping will take place on the 23rd.

Rusty got the wings mounted and removed on the Art/Rusty Zenith and they're continuing work on plumbing.

Bob's plane is done and ready for engine tests.

Bill Jagust is in attendance and will likely get roped into flight testing for our growing Zenith squadron.

Dave Doherty reports that the vintage chapter 39 at Creve Couer has reformed and is planning on building a replica of an early Benoit seaplane. They're looking for volunteers and members. Contact Dave or Albert Stix if you're interested. (VAA39.org)

Battery For Sale

Odyssey PC680 battery; still tests normal but not sufficient for electric dependent engine. Purchased May 2018. Ideal for build to test and power systems, or even sufficient through weight and balance phase. \$30.00.

Will deliver at meeting Saturday. Ron Burnett (314) 518-8563



For Sale

Zenith 601/650 empennage Kit, save big \$650.00

Ron Burnett 314-518-8563



Learning as we Go

“Glory Days”

mr. bill

With the music of “Glory Days” in the background, I was reading the last month’s newsletter article written by Ron Burnett. What an awesome story.

With the recent February 2021 announcement by Bombardier of discontinuing the Learjet Line of Business jets, I was sent back to the days of living one mile east of the Chicago Midway Airport. With low clouds and strong winds out of the west or southwest it was awesome watching the airplanes “crank and bank” as they were circling off the ILS runway 31 approach to Midway, twisting and turning for the approach and landing on runway 22 over my parents’ home. It was easy to determine if the jet was a Learjet with the big, 386 gallon fuel tanks hanging out there on the wingtips. Of course, it was a dream of mine to be able to do that same thing someday, flying the Learjet series.

My first Learjet experience was in college when the nearby cities Learjet Jockey came into the college town airport for cheap fuel and said he was flying to Canada the next day. So, we college kids showed up and got a ride in this Learjet 23-020. Oh boy! What a flight. That was ALL it took.

Well in February 1986 I was hired on by a company that was



An old Preister Aviation Lear 23 owned by “Whatcha” McCollum Aviation in Danville, IL (1979)

growing fast in the Banking Data Industry. I started out flying a Cessna 310R for the company scooping up 300 to 400 pounds of paper checks nightly at various cities along my route in the Midwest. Those checks written by you people, that had to be transported to a Federal Reserve Facility and cleared for payment, was my cargo. We would fly to hubs in Pittsburgh, PA in the early part of the evening. At 0200 we all met up in Chicago Midway for the late hub to distribute the checks.



When I arrived for my first day of Cessna 310R training the company had just acquired its first Learjet 35 turbofan aircraft. (It was mentioned that I would be a Lear Captain in five years. (It took 22 months. the airlines started hiring in 1988.) Until this time the company was flying a group of older Learjet 23, 24, and 25 models. The Learjet 20 series were the pure turbojet aircraft that turned jet fuel into a bunch of noise. In fact, here is a Learjet 25 takeoff view that you rarely see:

<https://www.youtube.com/watch?v=MI7bHDIWTVk>

(Anybody know what that white line is on top of the fuselage?) Answer below.

How cool is that. And the left turn after takeoff was how we flew the “Important Bank Data” at night. Cranking and Banking! YEE Ha! Cargo don’t complain! Back in the day those Learjets were the jet to have. You would call up William “Bill” Lear and tell him what you wanted. The early ones were used by Frank Sinatra, Elvis, and William Lear himself. But in the 1980’s the Cessna Citation Jet showed up on the scene with its nice flying characteristics, fuel tanks on the inside of the wing, quiet footprint, and a single pilot version, that made it the jet of the future. And speaking of future, here is that Learjet pilot today with his parting gifts from the night freight company.

Yes, those were the glory days. I was flying eight legs a night to eight different cities. Logging almost 8.0 hours of Pilot In Command (PIC) jet time for that BIG



mr. bill with his Lear 35/36 poster and his Learjet windshield paperweight (and airline mask.)

airline job or a nice cushy corporate job.

As the stars aligned, right after getting 1,000 PIC jet time at the night freight jet job, Trans World Airlines called me to start the “Glory Days” with an airline career.

As for the Learjet, it went from corporation to corporation, but it would never regain its Glory Days. After 3,000 of the jets were delivered from 1966 to 2021, its history came to an end.

The Cessna Citation jets could keep up with the changing times in the corporate world. Cessna has 14 variations of the Citation. In fact, Cessna has manufactured over 7,500 Citation Jets, forming the largest business jet fleet.

So the days of me thoroughly pre-flighting my Lear 25 jet are gone. It was a great time zipping into cities, shutting down the left engine, having big bags of canceled checks falling into the laundromat carts that were pulled up along side of the left side of the airplane. The co-pilot would open the door, run around the jet for his pre-flight. After the off loading of thousands of pounds of canceled checks in full plastic bags, the other cart of checks was rolled up to the door and tossed into the jet. With the words “CLEAR” the cart was clear of the jet’s left wing, the co-pilot would lock the door, and I started taxiing out to the runway while starting the left engine. The co-pilot would jump in his seat, buckle up the seat belts, run the litany of the check list, and I would turn the jet onto the runway. “Your aircraft!” He or she would hold the brakes, run power to 98% N1 (engine rpms), and let go of the brakes!

So what happened to my favorite Learjet.....

https://reports.aviation-safety.net/1992/19920612-0_LJ25_N38DJ.pdf



mr. bill thoroughly inspecting Lear 25B, N 38DJ

All photos from mr. bill’s article

Not a pretty ending to a beautiful jet. They were a handful to fly close to the ground. Lots of Dutch Roll.

Notice too that I was in black pants and shoes and nicely dressed. I quickly learned during this time that the airlines were hiring and scooping up corporate pilots. One day in the Denver Airport FBO a man yelled into the crowd of corporate pilots, “I need a Lear 35 Captain NOW! Any takers. \$70,000 a year (1988) in Salt Lake City!” I was dressed in dirty jeans and some type of shirt. I quickly realized that my appearance meant something.

As for the Glory Days right now? My Pilot In Command (PIC) time equals my Second In Command Time (Copilot SIC.) So, I would have to say life has been a good balance. With 30 more months to go before age 65, and the airlines hiring again as of today, LIFE IS GOOD!

Q? The Learjet 23/24/25 had the same engines as the T-38? What were those engines?

A: The military called them GE J-85s. We civilians called them General Electric CJ-610s. GE built 2,059 variants of the CJ-610.

The line on the top of the fuselage was the oxygen bottle line that was stored in the vertical stabilizer of the Learjet 20’s series. You had to climb up on a ladder to open an access panel to turn ON and OPEN the O2 oxygen bottle.

There was a problem with the Learjet 35 series also. They put that oxygen bottle laying on its back in the front nose section of the Learjet’s nosecone with the ON/OFF indicators up. Get ready for these instructions. Because of the OFF/ON valve was on top of the bottle, when you did not see any words looking into the O2 side access panel, the bottle was in the OFF position, because the OFF position was at the top at the indicator. When you turned the valve 90 degrees (toward you) the valve was now ON or OPEN! But you saw the word OFF from your 90 degree point of viewing the bottle. So, seeing OFF through the access panel meant the bottle was in the OPEN position for the oxygen bottle.

Think Lear 35 and a famous golfer.

Also, the pointed part at the top of the vertical stabilizer of the Lear 20s series, and the first 12 Lear 25s, was a place for the ONE ANTENNA that Bill Lear had NOT designed yet but was going to make and place in that forward section of the top of the tail. After the first 12 Lear 25s were built, it was determined that the antenna thing was not going to work out and the tail design was made smooth.

Dave McGougan's Kitfox Project

The pictures are of my new brake parts, the first photo shows the new brake pedal extensions which were not original, but necessary in order to advance the mechanical cable to the brakes. The next two pics show the newly fabricated connector plates which attach to the axle and connect to the brake backing plate. I can now install the cabling and route them to the wheels. I would also add that I am working on the glass doors at home. I had to order another sheet of Plexiglas to replace the one lost in the flood. This is the third try on the doors; hope I have it right this time. Also started routing the pitot tubing. I also made contact with a company in Mount Vernon, Indiana that will overhaul my Rotax engine much cheaper than the guy in Florida and I hope to drive it out there this summer. So that's about it for now. It slows me down being an hour away from my plane and being a person who hates driving.



Aviation Explorer Post 9032

Status Update as of May, 2021

In April a query was sent out to previous AE Post 9032 members to explore the potential interest level among them for attending the Aviation Explorer Base during 2021 Air Venture. The response level was minimal at this time; so it has been decided not to pursue an early post renewal in order to attend the Oshkosh event and wait until Aviation Explorer Post 9032 activities are resumed during the fall of 2021

In addition to many of the past AE Post 9032 Advisors, other individuals have also expressed an interest in becoming an AE advisor including: Bill Doherty; Frank Dressel; Ed Ruhbeck; Chrissy, Kujawa & Andrew Hedlund. They'll be a welcome addition to future post activities

Requirements to charter a 'Learning for Life' Explorer Post:

The participating organization (EAA 32) should establish an EIN (Federal Tax Identification Number) for the Explorer Post

There is a \$75 charter fee for the sponsor organization

Yearly fees for youth and advisors is \$42

Explorer charters run for one year; normally starting in October after a youth recruitment drive in September (some of the documents needed can be reused from the earlier AE Post 9032)

Steps for the renewal of the charter for AE Post 9032 with the Greater St. Louis Area Council (GSLAC) will begin before this coming fall after establishing a flexible schedule for advisor training and youth recruitment

Additional Aviation Explorer Post Advisors are always welcome to join for the planned fall season of the 2021 AE Post 9032 restart

For AE Advisors (both previous & those who have recently signed up) a Virtual Meeting is scheduled at 7pm on May 11, 2021; login information will be sent out to those who have expressed interest in Aviation Explorer Post 9032

From 1977 to the 21st Century in a Few Weekends

Bob Murray

If you learned to fly in the late 70s like I did, the Mooney M20J (aka Mooney 201) cockpit shown in this picture was the pinnacle of single engine airplane instrument panels. Dual Nav/Comms with ILS (Instrument Landing System), DME (Distance Measuring Equipment), and an autopilot all made for a state of the art airplane.



1977 Mooney Panel

There have been only a few changes to this panel since 1977. The ADS-B transponder is new, although operationally the pilot enters the same 4-digit squawk code as a 1977. The blank panel on the right is where the inoperable ADF (Automatic Direction Finder) was removed. The OAT (outside air temperature) gauge and clock on the left are newer digital models. But overall, a pilot who time traveled from 1977 would feel right at home.

However, 45 years of technology advancement cannot be ignored, even in the somewhat slow-changing world of small airplane flying. This is especially true for flying IFR (Instrument Flight Rules). ILS approaches were installed only at larger airports. Many smaller airports had VOR (Very high frequency Omni Range) approaches and a few more had approaches using the ADF. For better or for worse, the VOR and ADF approaches are going the way of the dodo. They are too expensive to maintain and not nearly as accurate or convenient as (drum roll please) . . . GPS.

The single biggest change in navigation in the last 20 years has been due to the Global Positioning System. Thanks to taxpayer investment in space launch capability and the bright minds in the US DoD, their

research institutes, and contractors, we now enjoy the convenience of knowing exactly where we are on the planet using a device that fits in a shirt pocket.

Convenience is one thing, but safety and capability are orders of magnitude more important to airplane navigation. The culmination of all this technology is a box we can put in our small airplanes that guides us through dense clouds to about 250 feet above a runway at just about any airport, big or small. And unlike older instrument navigation systems, there is no need for expensive equipment on the ground at or near those airports. Guidance is provided solely by the satellites in the sky above. Data storage in the GPS unit itself knows every airport and the approach procedures for routing us safely to the runways, all while avoiding inconvenient antenna towers and nearby mountains.

Colt Wendt, the owner of this particular Mooney, likes to travel about the country using his very capable 180 mph airplane. With plenty of experience flying Black Hawks and King Airlifts in the Army and now flying C-40s in the Air Force Reserve (thanks

Colt, from all of us!), he has no problem navigating in the Air Traffic Control system on instrument flight plans. However, the number of airports he could use as a destination was dwindling. Colt had to pull the trigger on a better solution.

And the result is a Garmin GNC355 certified IFR GPS navigator. You can see it here in this picture, replacing the top Nav/Comm radio.

While the GPS unit can stand alone and drive the same navigation instrument as the old King Nav/Comm, more utility is gained by the addition of another spiffy little device known as the Garmin G5. This digital display replaces the DG (Directional Gyro) and acts as an HSI (Horizontal Situation Indicator). This combines heading and course guidance to give a much better situational picture than a DG.

The G5 also has a PFD (Primary Flight Display) mode. This can serve as a backup to the attitude indicator, which is critical to instrument flying but is notorious for quitting at a very bad time due to the failure of the vacuum pump that drives it. The G5 is powered by electricity, of course, but better yet has its own backup battery so that you can keep the top side of your airplane



Instrument Panel with New GPS and G5

pointed toward the sky instead of the other way if the electrical system should be working less than nominally.

The G5 displays airspeed and altitude obtained from the pitot/static system. It can do one better if it knows the air temperature. Remember in ground school using the E6B whiz wheel mechanical computer to calculate density altitude, true airspeed, and wind correction angles? You probably don't because you rarely used it in flight. But a tiny little computer can calculate that stuff continuously if it has the right data inputs. With OAT information, the G5 can compute true airspeed. That combined with knowledge of ground track and speed from the GPS and magnetic heading results in knowing the speed and direction of the wind. It is much easier to navigate knowing the wind and what heading to hold to correct for it. A lot of useful knowledge with the addition of an outside air temperature probe.

Another interesting aspect of this installation is that this Mooney has a 1970's era analog autopilot, specifically a Century IIB. Both the artificial horizon and the DG feed attitude and heading information to the autopilot so it can do its job. Replacing the DG with a G5 could have forced a complete autopilot upgrade. Fortunately, there are a lot of airplanes in this exact situation. Garmin saw it as a target rich market so they have an "app" for that, a little interface box called the GAD29B.

The full set of new units added for this upgrade are:

- Garmin GNC355 GPS navigator and comm radio
- Garmin G5 flight display
- Garmin GMU11 magnetometer

- Garmin GAD13 OAT interface
- Garmin GAD29B adapter to connect GNC355, G5, and Century autopilot
- Deklin AIU-900 autopilot coupler

So what does this all cost? Add up the prices for these items from Aircraft Spruce and it just tips the balance at \$10,000, not unreasonable for the capability it provides.

But then there's installation. This is a certified aircraft so we can't just start hacking away like we do on experimentals. Isn't that going to significantly increase the price? Doesn't it have to be done by a certified avionics shop? Not necessarily. While an A&P can install avionics, many don't have the experience to do it quickly, which keeps the specialized avionics shops in business. However, anyone can work under the supervision of an A&P who is willing to inspect and sign off the work.

Colt was ready to take on the challenge of installing his GPS upgrade for the dual joys of learning a fun new skill and saving money. And he knew an A&P willing to monitor, inspect, and sign off the installation. But he needed help getting the system designed and some tutoring in wiring avionics. That's how I got involved.

Colt's Mooney is in the hangar behind our RV-10 at Creve Coeur airport. He couldn't help but notice us working on our full instrument panel upgrade last year since we were there for many days over 3 months (see my EAA32 newsletter articles in April, May, July, and August 2020). He stopped by occasionally to check on our progress. He figured if we could do it, so could he! And he was right.

So for a few weekends and evenings of work from mid February through March, Colt did all the crawling around inside the airplane while I stood by (closer to the heater) and made suggestions. This stuff is really fun if you're not the one lying on your back under an instrument panel. Actually, the glare shield is removable over the instrument panel so most work can be done on top.

The result? Success! The plane is back in the air with all the proper paperwork. Everything is calibrated and tested. It has already made an IFR trip to Virginia and back. The old saying has been proved: If I can do it, anyone can.

2021 Young Eagles Season Takes-Off with Double Day Weekend

Chapter #32's re-entrance into flying kids started out this weekend with 2 events. On Friday the 7th we hosted a private event for the Junior & Senior Robotics / STEM class from St. Charles Lutheran High School. David Zilz a fellow EAA member based at Greenwood brought 13 students out in the morning for an introduction to GA. We flew 12 of the students which, except for 2 had never been up in a small aircraft. Interestingly the 2 that had flown GA were the 2 girls in the class. Of the remaining students, many had not had the opportunity to even see clouds from 35,000 feet, so there were a lot of firsts and it was very evident they all had a great time, (best field trip ever was suggested several times). A big thanks to our pilots for coming out and making this time available for them. Ron Burnett, Bob Murray, Jim Hann, Joe Sargent, and Pat Donovan. David Zilz was also there to fly a couple of his students in his Mooney. Late word is Dave is now a #32 lifetime member! Welcome Dave, and it was great to fly your students. Additionally, we have another new member to our chapter and now, also to our YE wing. Welcome to Teresa Harkins who brought her C-150 over as well and before the morning was over, had flown both her 1st & 2nd Young Eagle. Thanks, and congratulations to her we all look forward to having you on board with the group. While the 2 groups were flying builder assistant extraordinaire Jim Hall showed the students the progress taking place on both the Zenith 750s being built. Finally, Bill Wehmeier stopped by and

offered to take all the students down to the CAF for a little tour which they enjoyed. A big thanks to Bill. ("that TBM is huge")

Saturday, with threatening skies and heavy winds straight out of the East we ventured on to try and fly some kids for our regularly scheduled 2nd Saturday of the month event for the year. (that's the plan) Double duty by Bob Murray, Jim Hann, and Teresa who were joined by Jeff Stephenson, and Randy Schroder. Some of our regular YE mafia also were on hand Pam Hanson, Michelle Stephenson, Dave Deweese, Paul Smith, Jim Hall, Lisa Miano and Chris Ward who continued showing the work



being done on his Zenith. Art was there working on his plane and Andrew Mallek from our explorer post. Past President Dave spent a lot of the morning there and we all enjoyed spending time together again. New members Harry Rahn and Vassillios Georges both helped us on the ramp, a big welcome to both of them as well. Louis Pudor (our most recent scholarship recipient) and his parents came out and joined in. Thanks to all of you for your time and if I forgot someone I apologize. While we only were able to make about 8 flights, we had a great group of people there Saturday, everyone spent a bunch of time together and we all felt it was great to get back together again. All are hoping things will get back to some kind of normal the rest of the year. Thanks to everyone for a great weekend in spite of Mother Nature.

Rick May

EAA Chapter 32 Young Eagle Coordinator



All photos on these pages
courtesy of Lisa Miano



EAA Chapter 32 Hosted Lutheran High School STEM

Students from the Lutheran High School STEM program (Science, Technology, Engineering and Math) (STEM) were shuttled to the EAA 32 Aviation Resource Center (ARC) at St. Charles County Regional Airport (Smartt Airfield) for the aviation event.

Dave Zilz, a Mentor and Director for the Stem2u program arranged the very successful aviation event for the 13 Lutheran HS students with Rick May, EAA 32 Young Eagle Event Coordinator.

Aeronautical procedures and an overview of aviation activities; including introductions to certified and experimental aircraft, FAA regulations, safety procedures, building aircraft and aviation career choices were provided to the students before they were given the opportunity to fly with a pilot in a light aircraft.

EAA Pilots who shared their aeronautical knowledge and flight time using their own aircraft were: Dave Zilz; Pat Donovan; Bob Murray; Joe Sargent; Jim Hann; Theresa Harkins and Ron Burnett.

Providing further aviation information and ground crew support during the event were: Rick May, Harry Rahn, Jim Hall and Bill Wehmeier.

Bill Wehmeier (who is also a Commemorative Air Force member) was tour guide to the students for their visit to the Smartt Field CAF hangers and introduced them to the WWII TBM Avenger and L3 Liaison aircraft.

All of the students were extremely excited about the chance to fly in a light aircraft and learn more about aviation. This was great event for both students and volunteers.



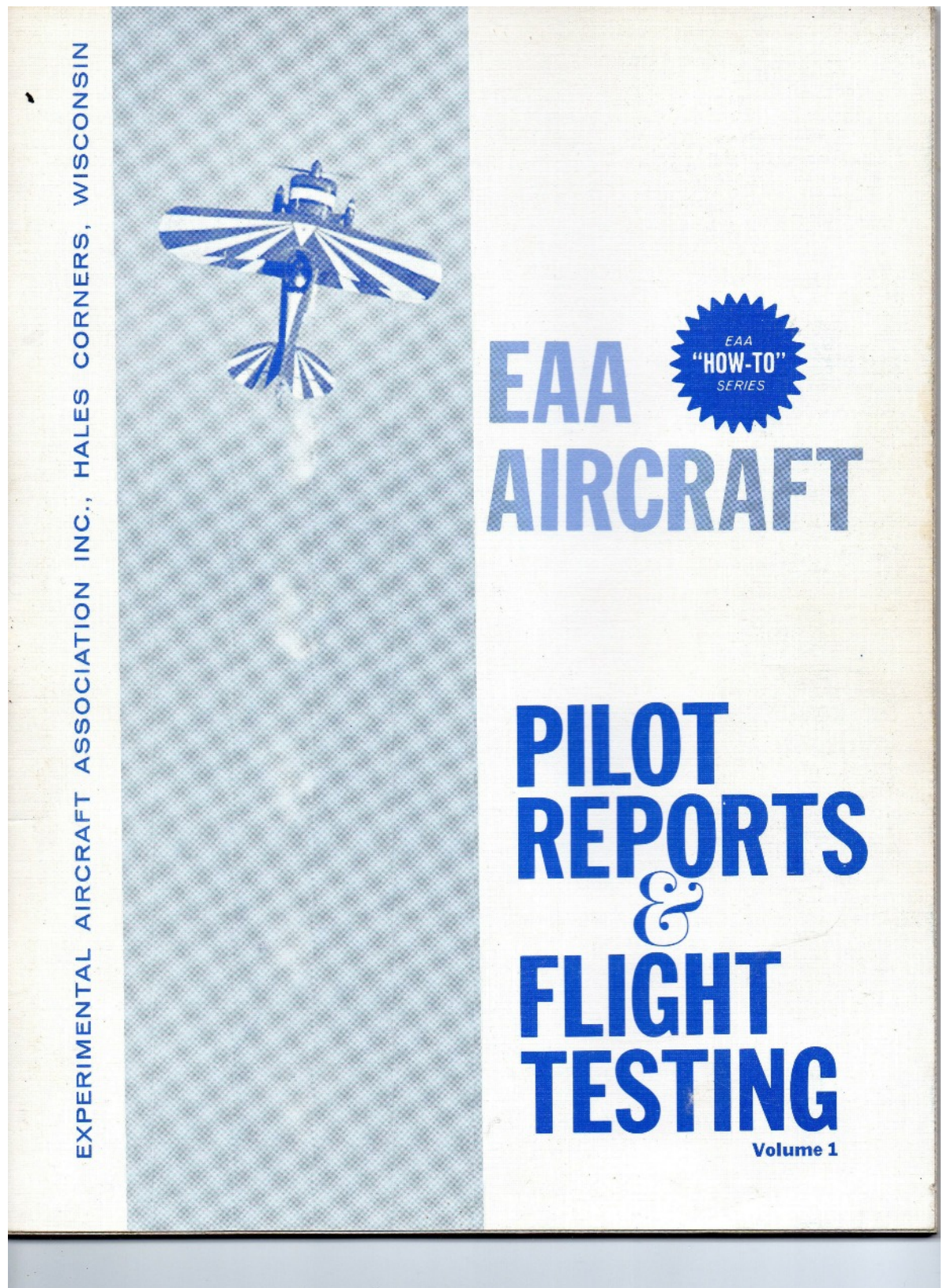
Young Eagles Special Event Creve Coeur Airport Youth Aviation Day / Gateway Youth Aeronautical Foundation June 5th 2021

We are looking for a few pilots & volunteers that would be available for a special event at Creve Coeur airport on Saturday June 5th. This event is being sponsored by the airport and “Gateway Youth Aeronautical Foundation” Hours are from 10AM to 4PM. Along with chapters #64 & #1402 & We are planning on flying Young Eagles for the day. Anyone interested please call or e-mail me directly at rmay5154@aol.com or (314) 503-6042. Have no idea how big the attendance will be but local associations and other vendor participation appears to be strong. (food trucks). Facebook “Youth Aviation Day” <https://www.youthaerofoundation.org/>



Blast From the Past

This comes from the Lee Arnold collection via Miles Leisman. It's from 1970 when Chapter 32 was published in the EAA on Pointers on Test Flying. Thanks to our friend Lee Arnold for keeping files dating back into the 1940s





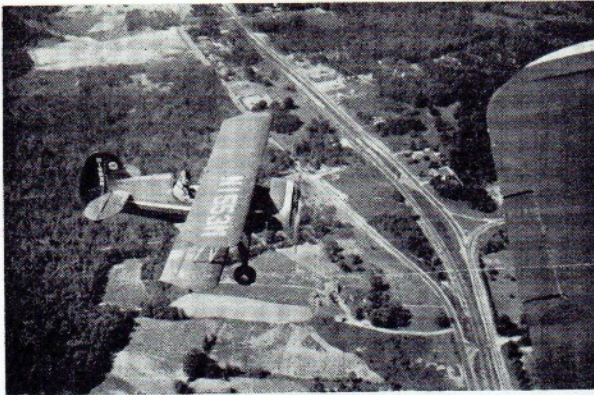
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SA—Sport Aviation
E—Experimenter



Extra caution is needed when testing very small airplanes, because they react quickly to air forces and are sensitive to the controls. These characteristics show up very clearly when such a plane is shown alongside one of more conventional size.

After spending much time and effort in building a small airplane, it scarcely seems sensible to climb aboard, fire up the engine, and blast down the runway on the first (and maybe last!) test hop. A certain amount of deliberation is needed, not only to ensure safety but to make the test-flying produce meaningful results. The following suggestions may be of help in planning your own tests.

Always remember that engine failure during the early flights of an unfamiliar, untested airplane is even more serious than when it happens in a plane with which one is well acquainted. The powerplant in an amateur-built airplane is usually a rebuilt engine which has not been flown for an appreciable period of time, and so it should be thoroughly checked over and run up to make sure all is in good working order.

It is most advisable to install a head temperature gage, with the thermocouple on one of the rear cylinders. Make the usual checks on left, right, and both magnetos, note peak rpm, steadiness of idle, and engine behavior when carburetor heat is applied, all the while watching head temperature. It is fairly common for tightly-cowled engines to overheat after extended ground running, but yours should not do so until after at least ten or fifteen minutes. It normally takes that long to taxi out for the take-off, and the upper limit of head temperature should therefore not be reached in that time. If you cannot run for ten minutes without exceeding the head temperature limit, it may be wise to open up the cowling. To attempt to take off with the head temperature at its limit could lead to engine failure. Also, early testing involves a lot of ground running and if this is carried out with an overheated engine, rapid wear or damage could result.

Start taxi tests on a vacant runway or taxi strip, doing "S" turns of gradually increasing sharpness. If the plane has a conventional landing gear, note its tendency to ground-loop before going to higher speed in ground runs. Feel out the brakes, noting their action and behavior, and the effect on the plane as a whole of hard braking. One way to do this is to make figure-of-eight patterns on the ground, for this involves right and left turns and taxiing at various angles to the wind.

Before any flights are made it is important to establish the location of the plane's center of gravity, with full tanks and with nearly empty tanks. Longitudinal stability is largely dependent on the position of the C.G.,

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becoming weaker as the C.G. moves aft. In no case should the C.G. travel farther back than 25% of the wing chord. Using pertinent calculations found in design texts, calculate the plane's stalling speed so you will have some idea of when to start watching for her to drop out.

On conventional-gear ships it may help to keep the tail wheel on the ground during the first part of the take-off run, to provide positive steering action. The rudder's effectiveness at lower speeds is still an unknown quantity. Make a series of runs of increasing speed, feeling for the take-off point and noting trim, control reaction, unusual vibration, etc. Progress in this manner until flights are made a few feet off the runway, closing the throttle slowly to ease the craft back onto the surface in level attitude; it is still too early to approach the stalled condition. Repeat such runs, going a little higher each time, subject to limitations of runway length. If the field or runway is wide enough, make very gentle "S" turns within its limits as a means of feeling out aileron and rudder responses. All early test hops should be done in, at most, a gentle wind, and on a day when other pilots report smooth air. If a plane is test-flown on a gusty, bumpy day, it can be hard to tell whether surprising reactions are due to turbulence or some quirk in the plane itself.



How a new ship is going to behave in steep climbs and stalls can be calculated with reasonable accuracy, but caution is still the word on the actual test flight. Here a 1929 Davis cocks her nose toward the sky.

The procedure for tricycle-gear planes is much the same, except that the nose wheel should be held on the ground until the rudder becomes really effective, in cases where nose-wheel steering is provided. Watch for any tendency of the nose wheel to shimmy; if it does, close the throttle at once and coast to a slow speed before braking to a stop. The magnitude of shimmying can increase rapidly and cause serious difficulty.

The lifting-off tests will indicate the best technique for making a genuine take-off. For the first real flight, get off as quickly as possible and, without ever forcing the plane into a steep climb, gain altitude quickly, climbing straight out to some appreciable altitude such as 2000 feet. Keep control movements small and gentle, and watch oil pressure, oil temperature and cylinder head temperature closely for any indication of overheating. Level off, set the engine to cruising rpm, and adjust trim for level flight. Make gentle left and right turns, observing stick forces and the amount of rudder needed to counteract adverse yaw. A ball-bank indicator may help here. Stick pressure should increase smoothly with stick deflection; an action such as low initial pres-



During the first flights an amateur plane should be taken to a safe altitude over open country, and initial maneuvers performed carefully and gently. It is rather common practice to fit rudimentary cowlings for the test flight, to guarantee against engine overheating. When the plane has proved its airworthiness, a better cowl can be fitted to improve speed.

sure and rapidly increasing pressure toward the end of the stick movement or vice versa, is a warning that something is wrong. The control linkages and leverages may be badly designed so that as deflection angles increase, mechanical advantage decreases. Or there may be binding. Or turbulence may set in such as to cause a rapid change in control surface loads toward the end of the deflection. Whatever the cause and effect of "funny" feel in the controls, find it and fix it, or at least know what causes it, before going to more advanced maneuvers.

Note any friction effects in the control system, especially in the ailerons. It usually shows up by a sticking of the surfaces in some deflected attitude so that the plane moves away from level flight without pressure being applied to the stick. Often, air loads on the wing increase aileron cable tension and thus increase friction, giving variable and erratic action in rough air.

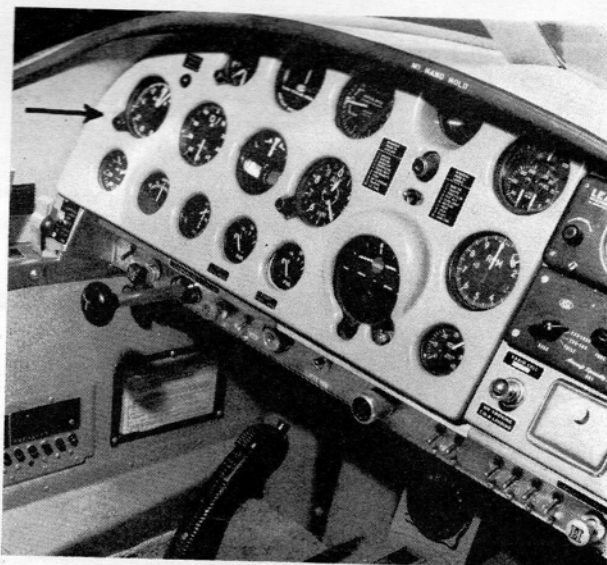
Starting at approximately cruising speed, gradually apply rearward stick pressure and obtain a five to 10 mph speed reduction. If the plane has desirable stability characteristics, control pressure should increase with stick movement. Rearward stick movement should re-



The extension and retraction of laps and landing gear alters a plane's center of drag, changes trim, requires test pilot to be on the alert. Flap extension and gear retraction should be done at a safe altitude during early test flights.

quire a pull force and forward motion, a pushing force. If otherwise, it means the ship may have tricks in store for you.

Next, apply stick pressure to obtain an increase of speed of five to 10 mph above cruising. Release the stick. If the plane has desirable static longitudinal stability, the nose will rise to normal position again. Apply rearward control force in a similar manner, release the stick, and again observe whether the ship returns to trim speed. Usually it is found that steady flight is attained after a few up-and-down oscillations of decreasing amplitude. Should the plane return to trim speed promptly and without signs of oscillation, it is overly stable. A rather thorough discussion of stability characteristics and how to evaluate them is contained in Civil Aeronautics Manual 04, "Airplane Airworthiness", and this would be worth consulting if you should encounter a puzzling stability condition. Again, remember that friction can show up in a control system when it is under flight loads, and if the elevator when released does not return exactly



Minimum instrumentation is common in amateur-built aircraft, but professional test pilots will vouch for the usefulness of certain additional gauges in handling and feeling out a new ship. This "Queen Bee" panel, for example, has a G-meter (arrow). Rate-of-climb and sensitive altimeter help in finding level flight trim. Ball in the turn-and-bank aids in finding right control pressures during turns. Several temperature and pressure gauges help keep tabs on what is happening inside the all-important engine.

to the original trim position, the effect would be to re-trim the plane to a slightly different speed.

Now set speed to about 10 mph less than cruising speed and repeat the above tests. As speed is reduced, angle of attack will of course change to maintain the same lift. This can result in a shift of the wing's center of pressure and consequently the stability characteristics will be altered — perhaps insignificantly, perhaps appreciably. You will want to know which, before going into gliding and stall tests. Adverse yaw effect may be more noticeable as speed goes down, and this too you will want to be aware of so that rudder pressure can be modified to suit. Yet another point is that since the maneuvers just described will lead to G loads a little above and a little below 1 G, wing load will vary enough to show up in the plane's behavior or control reactions.

Starting at 10 to 15 mph above the anticipated stalling speed, gradually apply stick force and reduce speed until a partial stall is obtained. Observe the longitudinal control forces, which may become either lighter or heavier, and also buffeting and rolling. Any or all of these actions will signal the impending stall, and as soon as one becomes apparent ease the stick forward and note the response. If the response lags, it shows that elevator effectiveness weakens near the stall and full-stalls should probably not be attempted until the situation has been studied. A noticeable lightening of stick load just before the stall is considered an undesirable characteristic, for it could deceive a pilot accustomed to well-tested production planes in which stick load has been worked out so that steadily increasing pressure is noted right up to the stall. Elevator weakness is more apt to occur in low-wings than in high-wings, for the wing will sometimes blanket the elevator when the aircraft is flying at a high angle of attack.

It is well to have an accelerometer when testing the plane for structural soundness. The primary maneu-

ver is the steep turn. Gradually increase the steepness until a 2G reading is obtained, then ease off. A good plan is to limit stresses to 2G on the early flights, and give the structure a thorough inspection after each flight during which this load is attained. If all is well, succeeding flights can be made to attain a 3G loading, followed by another careful inspection. This procedure can be followed until the design's limit load factor is reached. Your calculations might have shown that the ship could stand 6G's, but that is no reason to consider it safe to run right up to 6 G's on the first test. Material and workmanship vary, and certainly affect strength!

If the plane has flaps and/or retractable landing gear, study at a safe altitude the effects of flap depression and gear retraction. A high wing plane will normally tend to nose up when flaps are applied, requiring a nose down trim to maintain attitude. A low wing will of course nose down when its flaps are extended, because their drag acts below the plane's drag center. The ability of the plane to climb with flaps deflected should be noted, so that you will know what to expect if it should be necessary to go around after miffing an approach. Also experiment with flap retraction at a good altitude, to see what happens. It can be very dangerous to retract flaps suddenly while close to the ground. And, too, check lateral and longitudinal control and handling in partial stalls, with flaps and gear both up and down.

It is highly recommended that every person involved with designing, testing and flying amateur-built airplanes read the book, "Stick and Rudder", by Wolfgang Langewiesche. It analyzes aircraft behavior and control handling in all conditions of flight and it is impossible to tell how many lives it has saved since its publication in 1944! The government publication, "Civil Pilot Training Manual" not only discusses flight technique in general but has valuable data on climbing and gliding speeds and angles, and on load factors.



The prototype Pazmany PL-1 in its early flight test program. An improved and simplified version, the PL-2 is being built by cadets of the National Chinese Air Force. Upon completion of aircraft, cadets use the Pazmany for flight training.

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