



THE SPORT FLYER

NEWSLETTER OF THE SHELBYVILLE EAA CHAPTER 1326

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		<i>February 2025</i>
		<i>Volume 22,</i>
		<i>Number 2</i>

***Ch-1326 Websites: <https://chapters.eaa.org/ea1326> or on Facebook
<https://www.facebook.com/groups/1348130305678885/>***

Chapter 1326 meets monthly on the Thursday preceding the Fourth Saturday of the month in the Shelbyville airport conference room at 1800 (or 6:00 PM, whichever you prefer.) Any changes of meeting date and venue will be announced in the newsletter or by text message.

Kommandant's Korner: February 2025

Dear EAA Chapter 1326 members and friends. Wow, it seems like I just wrote this column. Yes, as I talked about 2 weeks ago, we're publishing 2 issues this month so that we can be better getting information on upcoming events out to our readers. I also noted we were trying to provide more "social" events so we can (hopefully) banish the impression we were the "Breakfast Chapter". (Not to be confused with the "Breakfast Club", even though I'm a real fan of "Don't you forget about me" theme from that movie - but I digress.)

So, how are we doing? Hard to say; but, we've sure been working hard trying to get ourselves on the social calendar. We held our FIRST ever VMC Club meeting on January 7th. We only had 5 participants, and our video simulcast didn't work, but at least we got it on the books and got volunteers and participants. Our "normal" "4th Saturday Breakfast" happened on schedule despite the "weather daemons" bursting the drain lines to our sink. Our first "social" Thursday event is scheduled a few days from now with an excellent discussion by Chapter member and CFI, Logan Yoon about the FAA WINGS program. Our next regular VMC Club is scheduled this next Tuesday, February 4th, and

our first Young Eagles Rally for 2025 is scheduled on Saturday February 8th. If you wish to help us with Young Eagles, contact our Chapter Young Eagle Coordinator, Leigh Kelly (leighkelly@pobox.com).

We also said we wished to better support the local Experimental Aircraft builders and owners. Derek Rowe of Tullahoma High School, who runs an aviation education 501(c)3 and owns the RV-6 parts residing in our hangar, is hoping to get volunteers to help assemble that RV-6. Additionally, our own Chapter member (and Project Police member) Lamont Taylor, is hoping to find help completing his "condition inspection" and reassembling his Challenger 2 experimental LSA also currently residing in our hangar. Stay tuned for news and calls for volunteers.



Randy Kelly
President, Ch-1326



Last Month's Meeting

This was a virtual meeting on WebEx. Randy called meeting to order at 6:05 PM. Tim Key, Jake Washburn, Matt Wilkins, Mike Harris, Sharon Tinkler and Randy and Leigh Kelly were on the conference.

Old business: Everybody saw the summary in the newsletter. Tim received the full minutes by email but hadn't reviewed them. He promised to review them after the meeting and provide final concurrence. (After the virtual meeting, Tim reviewed and approved the full minutes.)

Leigh provided the Treasurer's Report: Chapter account balance details are not published in the newsletter but are available to members in the official minutes. Leigh noted recent transactions of \$70 for purchase of two \$35 STEM kits, of which we will receive a \$55 refund from Young Eagles flight credit. Randy paid the EAA Chapter and Insurance renewal fees totaling \$631.00 plus a little less than \$10 for a 2x4 to mount the new banner.

Randy reported he had completed the 2025 EAA Chapter renewal, insurance paperwork and payments. Randy also noted the calendar of events for 2025 was posted on the Chapter website and that the events for the coming two months would be provided in each newsletter.

Randy reviewed the volunteers for the setup on Friday and for the breakfast on Saturday. Volunteers for setup will show up at the hangar at noon on Friday the 24th. The breakfast for Saturday is rescheduled to 08:30 AM-10:30 AM CST. Randy will show up about 06:30 to get coffee ready for anybody who didn't get the word of the new time and shows up before 07:30. Randy requested that cooks show up around 07:15, and other volunteers by 08:00.

New Business: Randy reviewed upcoming events on the new schedule:

--EAA Social, Thursday Jan 30. Logan Yoon, CFI from Hawkins will be presenting a program on the FAA WINGS program. Plan is to serve "walkin' tacos" (chili on chips with cheese

and jalapeno slices). Social time starts at 5:30PM. Program starts at 6:00PM.

--Next VMC Club is the 1st Tuesday of February. February 4th. Randy is currently listed as the VMC POC, but Logan Yoon has volunteered to be a contact also and has reportedly completed the EAA training.

--Our first Chapter 1326 EAA Young Eagles event is scheduled for Saturday 8 February. Rain date is Saturday 15 February. Jake Washburn said he should be able to support the flying and Randy said he would send him a request to build a login on the eaachapters.org website. Tim Rosser said he would be interested in becoming a Young Eagle pilot and asked Randy to send him a link to the YE Youth Protection training.

--Next business meeting is Thursday 20 February.

--Next breakfast is Saturday 22 February.

Jake Washburn noted that he had sent the information about the RV-6 volunteers to Derrick Rowe of Tullahoma High School as requested so we would be able to help Derrick with his RV-6 STEM build.

Randy noted he and Leigh had established a scholarship fund at EAA. Leigh explained that we had converted it to an "endowed" fund so that the residuals would hopefully eventually grow so the fund could continue after we (Randy and Leigh) were gone. Leigh noted that the fund could accept donations from anybody.

Randy asked if there was any more new business. There were no takers. Tim Rosser moved that we adjourn. Leigh Kelly seconded the motion and the group voted unanimously. Randy closed the meeting at 6:50PM.

Leigh Kelly
Acting Secretary

January 25th Fly-In Breakfast

The week prior to the scheduled breakfast, we were notified by one of our "newsletter subscribers" that there was water leaking around the drain pipe coming out of our hangar. We verified the leak then came back the next day to

better assess the problem to discover the drain line from our sink had frozen and fractured. (For some reason, the drain from our hangar sink comes out of the side of the building and goes down into the ramp. We didn't know it was a drain pipe until it started leaking.) Being a good "legal tenant", I immediately notified the "landlord" of the problem and noted that it could impact our breakfast. Kudos to the Shelbyville airport folks, they got somebody out to patch the pipe the next morning to allow us to "limp" through the first breakfast. I even added some insulating foam around the pipe to hopefully give it a little more resistance to the single digit temperatures we were facing before the day of the breakfast.



The pipe that almost cancelled this event. Thanks to KSYI ground crew for the emergency repair.

Setup on the 24th was done in record time. Mark and Randy pulled out Mark's Warrior and Lamont's Challenger. Matt Wilkins, Mike Harris and Lamont Taylor all showed up within a few minutes after Mark and Randy had moved the aircraft to their temporary parking spots. With low double digit temps in the forecast for the morning and an original "partly cloudy" forecast, we figured we would have a light crowd so we only set up 8 tables (in addition to our 2 always present picnic tables.) With so many hands, we were done in about 40 minutes which if not a new record, is probably close.

Seeing as how the new breakfast start time was 08:30 instead of 07:30, I figured somebody probably wouldn't have gotten the word and would be showing up soon after 07:00, so I (planned) on showing up about 06:30 so at least we had coffee to greet the "early birds".



Saturday 06:15. Our current "hangar residents" shivering out in the frost.

Saturday morning, I showed up before 06:30, fired up the ovens to preheat the potato casseroles, bake biscuits and started 3 coffee urns with 30 cups of water each, versus my normal 2x30cuppers and 1x60cupper. (This would be a problem later.)



Looks like it's going to be a beautiful aviator day. Clear skies and high "cons".



The 3 coffee urns perkin' away!

Not long after this Leigh showed up to start biscuits, as well as Nathan (one of our Aviation Explorer members) with a "friend", and Mark Cannon. As "feared" the first aircraft showed up about 07:15 (45mins early), followed in the next 30 mins by at least half a dozen walk-ins who somehow failed to get the word. No matter, I pointed them to the coffee urns and told them to find some friends for some conversation. A couple folks said they were going to meet

friends and would be back in 45 minutes. (They did!) About that time the rest of our volunteers started showing up, Sharon Tinkler, Evan Schaefer and his spouse Andrea, Jake Washburn, Helene Wharton and two of our MTSU Alpha Eta Rho (AHP) aviation fraternity volunteers, Jimmy Swearingin and Declan Cullen.



First two arrivals. Wow, a nice old 57 Skyhawk.



Another "early arriver" which got marshalled into the wrong spot and we had to move later. (That never happens.)

So, by 08:00 we were already experiencing the normal "08:00 rush" even though we weren't supposed to open for another half an hour. With almost a dozen folks waiting, we decided to start cooking early, and by about 20 after the hour we were loading the steam table and folks appeared pretty happy. Mark was already busy on the meat grill, Helene was scrambling eggs by the dozen, and I put our two AHP "Pancake Padawans" to work mixing and flippin' flapjacks. By 08:30 the first two coffee urns were dry, so I put out the additional 30 cup urn of "regular" and started brewing another 30 cups.



The early rush, before official opening time.

Out on the flight line, things were just as busy. Per the "Evil Editor's" direction, I broke formation several times to go take pictures of the airborne arrivals. Most of the aircraft looked familiar, but we had at least a new one that evoked the "...what the H..L is that?" The line folks were busy marshalling aircraft around the ramp and "tanking" some of the aircraft. (We even had to go identify a pilot who for some reason the marshaller had marshalled into a spot, but they later decided it would be better elsewhere.)



"Doc Piper" would be proud his Cherokees are still goin' strong 60+ years later.



Another Piper inbound.



A vintage taildragger makes an appearance.



That's an interesting bird.

Back inside, we had pretty much filled up our "light morning" table setup. The first "early birds" were already done and heading out though, so we didn't have to start setting up more tables like we do on the "heavy" mornings.



Jake and Mark cooking meats for hungry aviators.

We kept the assembly line going till almost 10:00 as we had plenty of food to feed the last of the folks and amazingly enough, only a few folks drifted in after the "usual" 09:30 end time. I relieved my AHP "pancake padawans" so they could go see the airplanes that were out on the ramp. (What good is it to be a pilot in a professional aviation fraternity when you can't go look at the airplanes on the flight line?) I was too busy answering questions and helping cook that I never got a real close count on the aircraft that showed up, but I'm guessing it was somewhere around 15-17 aircraft.



A C-182A Model. (Straight tail. No "Omni-Vision. No cowl flaps.)



A 60's vintage Skylane. (Her wheel pants look just like Lois's.)



A more "modern" Skylane practicing "ground formation" with members of "Van's Air Force".



Still another Skylane. (Interesting paint scheme. I wonder this owner had the same paint shop we used for "Lois.")



This looks like the GA "Fast lane".



Line guys serving thirsty airplanes.

The crowd had really thinned by 10:15 so we started feeding volunteers, bussing tables and began cleanup.



Somebody brought their own crumb sweeper (he turned away every time I tried to take his picture.)

With all the volunteers, we had the tables and chairs put away, steam table put up, money counted, and the Warrior and Challenger put back

in the hangar by a little after 11:30. We don't keep an "official" detailed count of all the folks that walk through the door, but the unofficial count based on donations and the number of eggs consumed was about 67 participants, about twice the number we originally expected. It was time to declare "Victory"!



Clear skies for the flight home.



Randy Kelly
Staff Editor

Technical Korner:



Evil Editor Zurg: More advanced engine technology is usually a good thing in aviation. It usually gives us more power, better behaved engines and better range. To quote a famous engineer though, "...The more they overthink the plumbing, the easier it is to stop up the drain..." This month, Project Police and Fellow EAA Editor Russ Erb provides us a tale of the "double edged sword" aspect of advanced technology. He also provides a good reason to "know YOUR airplane."

Being Advanced Isn't Always A Good Thing

Getting your comeuppance is never fun, or to say it another way, karma is a b****. For the last several years, when someone asked me how the Bearhawk was running, I would tell them that it had me worried. When they asked why, I would say I couldn't find a single squawk. I was very

much in the "I love my airplane" state. You might think that would be the desirable state, but my assumption was that the normal status for an airplane was at least one thing is broken. However, if the fault is not known, it can't be fixed. It was meant as a joke, but this is the story of an unknown problem that slowly grew until finally noticed when it grounded the airplane.

The Context

One of the benefits of flying the same airplane over and over is that you learn what to expect. As built, Bearhawk Three Sigma has a cooling problem, but it is a problem that can be managed. I know what is causing it and what I would change if I were to rebuild the cowling, but the problem isn't bad enough to justify the effort of rebuilding and repainting the entire cowling. Some of the problem has to do with stuffing an O-540 into a cowling originally designed for an O-360. The updated design, as ships with Bearhawk kits, addresses these problems and from what I understand works just fine.

Rather than address the cooling problem through rebuilding, I have chosen to address it through procedure. This procedure has been shown to work reasonably well in ambient air temperatures up to 100°F. Takeoff is done at maximum power with 2700 RPM to get to a safe altitude and airspeed as quickly as possible. While best rate of climb airspeed is about 75 KIAS, I always climb at 100 KIAS to give more cooling airflow over the engine. At an altitude high enough to turn back in case of an engine failure, usually between 500 feet and pattern altitude, I will reduce the RPM to 2400. Reducing the RPM reduces the power produced and also reduces the excess heat produced. This procedure will usually keep the maximum cylinder head temperatures (CHT) between 400°F and 435°F steady state. Upon reaching cruise altitude, I reduce the RPM to 2100, which works well for economy while still at wide open throttle (WOT).

If all of the CHTs cool to around 360°F or below, I can close the cowl flap, which reduces drag an imperceptible amount. This will cause the CHTs to rise, with the happy zone being between 380°F and 400°F. This is cool enough to not worry, but hot enough to promote good lead scavenging.

Houston, We Have A Problem

After finishing the condition inspection in early May, I flew the Bearhawk several times and engine temperatures seemed normal. Having changed nothing mechanically or operationally, while climbing out on 10 August, one of the CHTs reached 442°F (above my threshold of 435°F) with several other CHTs close behind. I stopped the climb and reduced the throttle, flying level for about four minutes to let the CHTs come back below 400°F, then pushed the throttle in for climb power to complete the climb. I had done this before when the outside air temperature (OAT) was 100°F, and after rejecting the initial heating from takeoff power, the CHTs would remain reasonable for the rest of the climb. On this occasion, the OAT was 89°F, which isn't quite 100°F, but still warmer than normal, so I attributed the high CHTs to the high temperature of the cooling air.

On a flight on 24 August, the highest CHT in cruise was 411°F, but the OAT was colder at 62°F. This was a notably higher CHT than normally seen in cruise (usually below 400°F), and it clearly wasn't because of a hot atmosphere. This was still within "limits" so I didn't take any action.

Things started getting hot on 11 October, when shortly after takeoff, the CHTs rocketed through the threshold of 435°F, reaching 445°F before I could get the throttle back. Again, I let the temperatures cool below 400°F, but when I pushed the throttle back in, the CHTs started rising rapidly again. I reached my cruising altitude, but the hottest CHT remained high at 422°F. OAT was 77°F, cool enough that overheating should not have been a problem. I wondered in flight if the cowl flap linkage had failed and the cowl flap had been blown closed. Inspection on the ground showed that the cowl flap was still in the fully open position.

Thinking this was a cooling problem, I inspected the baffle seals around the engine and found that they appeared to be drooping with age, leaving a gap between the seal and the upper cowling, presumably letting the cold intake air escape, rather than being forced down around the cylinders. I spent about a month collecting

materials and replacing all of the baffle seals around the engine.

Anticipating that this would solve my problem, I took off on 9 November, and while climbing to altitude, watched as the CHTs rapidly rose past 435°F, at which point I pulled the throttle back and immediately returned to the airport for landing. Replacing the baffle seals had no effect.

WTF, Over?

So if the problem isn't with the cooling air, what else could it be? When we were student pilots, we were taught to put the mixture in the full RICH position when running at high power settings, such as takeoff and climb. The extra rich mixture reduces the peak temperature of the burning fuel because the carbon atoms and hydrogen atoms are all fighting each other trying to join up with oxygen atoms when there aren't enough oxygen atoms to go around. The leftover carbon and hydrogen atoms remain bonded, absorbing some of the thermal energy that the luckier atoms released as they broke apart and joined up with oxygen atoms. Since that thermal energy goes into just increasing the kinetic energy of the hydrocarbons, there is less thermal energy to increase the temperature of the surrounding cylinder walls. This protection breaks down if the fuel flow is insufficient, such that the fuel-air mixture is not as rich as it is supposed to be. I have read many times that fuel injection systems must be adjusted to provide more than a threshold fuel flow at full power, lest the engine overheat from running with too lean a mixture. However, my engine is carbureted, and the fuel flow at full power had not really changed from before the overheating to after the overheating. That didn't seem to be the problem.

One other possibility was that the ignition timing had changed and was now advanced too much. The burning of the fuel-air mixture is timed ideally so that the pressure in the cylinder reaches a maximum when the crankshaft is 15-20° past top dead center (TDC). This is sufficiently past TDC to provide meaningful torque on the crankshaft, but not so late that the pressure doesn't have sufficient time to push on the crankshaft. The burning of the fuel-air mixture takes about 6 milliseconds, which equates to about 90° of

crankshaft rotation. To reach peak pressure at 15-20° past TDC, the spark must occur around 25° before TDC. The peak temperature that the burning mixture reaches depends on the pressure (compression) that the burning occurs at. The higher the pressure, the higher the peak temperature. A subtle point is that as the burning continues past top dead center, the temperature starts decreasing as the piston starts moving down, with the increasing volume reducing the pressure. This keeps the peak temperature under control and controls the amount of thermal energy that goes into the cylinder walls.

If the timing is too advanced, the spark occurs earlier, and the fuel-air mixture is burning as the piston is still going up, and reaches its peak pressure closer to TDC, and thus at a higher pressure. Because the pressure of the burning is higher, the peak temperature is also higher. When the peak temperature is higher, there is more thermal energy going into the cylinder walls, increasing the CHTs. Additionally, because the burning is complete earlier in the crankshaft rotation, it has more time to cool as the cylinder volume expands, resulting in a lower exhaust gas temperature (EGT), even though the peak temperature was higher.

Beware of Your Assumptions

This theory of overheating because of excessively advanced timing is all well and good if your engine uses magnetos. It is easy to understand how magnetos can get out of timing. It could be as simple as the little clamp holding the magneto in place is a little too loose and the magneto turns a few degrees, which advances the timing a few degrees. Also, there are a lot of plastic parts (non-conductive) in a magneto that could wear or break. Many an engine has gone from smooth running to scarily rough just because one gear tooth broke in a magneto, upsetting the timing.

However, such a problem could never occur in my airplane, because my engine has dual Lightspeed Engineering Plasma III electronic ignition. There are no adjustments on the ignition boxes that I could mis-set to cause a timing problem. I checked the pickup behind the flywheel to see if it had moved, and it was still securely lined up right where it should be. With

no way to adjust the timing, how could the timing be out of adjustment?

Time to Call In the Cavalry

Having now eliminated every conceivable problem that could cause overheating (leaking cooling air, insufficiently rich mixture, excessively advanced ignition timing), I still had an engine that was overheating in spite of my analysis.

I hadn't signed up for any aviation maintenance service in the past, because having an experimental, I did my own maintenance, so I didn't need someone to represent me when dealing with the mechanic's shop. I didn't think I needed the consultation of an expert, because having studied internal combustion engines in great detail since 1993, I considered myself an expert in engine diagnosis. I've made computer models of engines and written and published many articles about engines. However, something was wrong, and I was at an impasse, unable to make progress. I had slipped all the way over into the "I hate my airplane" state. It was so depressing that I didn't want to think about it. Fortunately, I was able to see that it was time to seek some outside help.

I have long been a fan of the work of Mike Busch, having read his books, read his articles, listened to his webinars, and listened to his podcasts. His company, Savvy Aviation, offers a subscription service for aircraft maintenance advice and representation, which is great for owners of certified aircraft that are forced to have someone else fix their problems. I didn't need the representation, but Savvy does offer a service where you can upload engine monitor data and ask their experts to look at it and make recommendations about what problems the data might indicate. After all, they look at thousands of data sets, so they get pretty good at reading the data. I decided that this was probably my best option, so I signed up for the service for \$189 a year.

At this point, it seemed like a reasonable deal, since the only idea I had was to replace the carburetor, which would have cost around \$1334, and I had low confidence that would solve the problem, since the fuel flows hadn't really

changed. I uploaded the full set of engine data that my engine monitor had, which went back to the last condition inspection. I opened a trouble ticket, described my problem, and waited for a response, hoping desperately that someone would see something that I wasn't seeing.

After the standard welcome messages, my analyst asked a few establishing questions, like had any work been done on the airplane (No), was I flying at a slower airspeed than before (No), do the baffles look good (Yes, just replaced), do you have cowl flaps (Yes, they are full open), and has the mag timing been checked (what mags?). I told him "Mag timing is NA. The engine has dual Lightspeed Plasma III ignition. The ignition modules do connect to Manifold Pressure." He did some more research, looked at the data in detail, and asked some more questions. I responded to his questions, and asked if there was possibly a problem with the carburetor that would cause it to deliver less fuel flow at full rich. He said that the carburetor maximum fuel flow is determined by the orifice size. While there are shops that can adjust the orifice size, that wouldn't explain an increase in CHT over time. After all of this discussion, he said "After talking with a colleague with lots of experimental knowledge, we do recommend looking towards the ignition timing."

Time To Talk To Lightspeed Engineering

At this point, I started to realize that my assumption that the problem could not be in the ignition boxes might be invalid. I sent an email to the contact at Lightspeed Engineering, manufacturer of my ignition systems, which happened to be Klaus Savier, the President of the company. I described my problem, and included that the Savvy analysts suggested that my problem might be excessively advanced ignition timing.

I waited for his reply, desperately afraid he was going to say what I had assumed, that there was no way the box could get out of adjustment.

But that's not what happened. Klaus replied "Your systems are 18 years old. I recommend that you send the two boxes for upgrades and repair. Then we know for sure that there is no problem with the system."

Since Lightspeed Engineering is at the Santa Paula airport, about a 1.5 hour drive from home, I decided to drive the boxes down there rather than shipping them. While there, I asked about how the timing could possibly change. Klaus said that electronic components can degrade with time. For example, consider a capacitor that you expect never to see more than four volts, so you install a capacitor with a six volt rating. Over time, that capacitor degrades until it cannot handle four volts, and thus fails. You don't know which components are going to fail with time, so you build it and wait for it to happen. When it happens, you replace the part with a better part, such as a ten volt capacitor. Now I understood that there was a mechanism for the boxes to fail.

A few days later, I went back to pick up the repaired boxes, and Klaus mentioned that while testing before making repairs, he had indeed found that one of the boxes was firing with excessively advanced timing. Just what I wanted to hear. There was a New Hope, and it had nothing to do with Luke Skywalker or his sister Princess Leia.

Why Didn't I Think of That

Sometime, long after I had the airplane disassembled, I realized that I could have done a simple test in flight to indicate if ignition timing was the problem. Assuming that only one of the two boxes would have failed, I could have tried turning off one ignition box at a time while in flight. The engine temperatures should have returned to normal when running on the good system, and increased when running on the bad system. Of course, that would have required me to accept that there could be a problem in the ignition system.

Yep, That Was Your Problem!

After assembling all of the parts I needed, I finally reinstalled the ignition boxes and carefully reassembled the airplane. On the morning of 23 December I made a test flight, climbing according to my normal procedures to 5000 feet AGL. This time the CHTs behaved themselves, with none of them exceeding 400°F. I flew for 1.2 hours, and the engine behaved just like it did before the overheating problem reared its ugly head.

Hindsight Really Is 20/20

Now knowing what I am looking for, I can see the problem developing in the engine monitor data. Because of funding constraints, flying this year was very constrained, so there aren't a lot of flights to look at. It didn't help that I spent the month of September and part of October with a bum foot that made me concerned about being able to get the airplane out of the hangar safely. Here is a summary of data pulled from the engine monitor.

Date	Maximum CHT During Climb (°F)	OAT (°F)	Takeoff Fuel Flow (gal/hr)
12 May 2024	406, 403	66	23.5
27 May 2024	402	66	21.3
7 June 2024	393	83	21.9
10 June 2024	396	75	22.2
20 June 2024	423	72	21.8
6 July 2024	424	94	21.4
6 July 2024	427	76	21.5
3 August 2024	441, 410, 408	86	21.6
10 August 2024	442	89	21.9
10 August 2024	420	73	20.8
24 August 2024	411 (cruise)	62	21.4
11 October 2024	445 (422 cruise)	77	21.8
9 November 2024	437	55	21.5

The first flight after the condition inspection was on 12 May. The flights from 12 May through 10 June all fall within expected ranges based on prior operation of the airplane. The problem seems to have first expressed itself in the flight on 20 June. The maximum CHT is significantly higher than the previous flight, but at a similar OAT. It wasn't noticed at the time because it didn't exceed the warning threshold. The next two flights on 6 July showed a similar issue, even though the OAT on one flight was significantly higher.

The problem really grew on 3 August. On this day, we were taking photos from the ground of takeoffs and landings, so this flight consisted of three separate patterns, each to a full stop landing. Because each of the flights only climbed to pattern altitude, I did not notice the temperature exceedance on the first flight. Strangely, the

second and third flights did not get as hot, but Klaus had said that the problem I was having can be intermittent. Even so, the temperatures were still higher than they should be at pattern altitude.

Finally, the problem was hinted at on 10 August, and clearly identified on 11 October.

Looking at the fuel flows, we see no real change with time, which eliminates concern that there might be a problem with the carburetor.

Bonus Analysis

I posted the engine monitor data from the 23 December test flight to Savvy Analysis so that my analyst could see that everything was back to normal. To explain a sudden spike in the EGT trace, I mentioned to him that I had done an in-flight "mag check" at that point. Being the excellent analyst that he is, he looked at the traces to see if EGT increased when one of the ignitions was turned off. (EGT would increase because it takes longer for the whole fuel-air mixture to burn than when each spark plug only has to burn half of it. Because it takes longer, it hasn't cooled as much before going out the exhaust valve.) He noted that for one ignition, the EGT on cylinder #3 dropped when it should rise. He recommended that I check the spark plug for that ignition in cylinder #3. Since I didn't know which one it would be, I started with the lower plug, since I have only seen lead fouling on the lower plugs. Sure enough, the lower plug on cylinder #3 was heavily fouled, as seen in these pictures. Rather than try to clean the plug, I simply replaced it with a new plug.

**Added Instrumentation**

On the Lightspeed Engineering web site, the list of products includes a small display that can be ordered that will give a readout of manifold

pressure, RPM, and the current spark advance for each ignition system. As this is the only way I found to measure the spark advance (especially airborne), I requested to purchase such a display. I found out that this display was no longer available for purchase, because many EFIS displays and engine monitors now available can accept and display those inputs. Also, the millivolt meter displays that he had been using were getting more expensive and harder to obtain.

Unfortunately, my EFIS displays and engine monitor are old enough that they don't accept external inputs. As a compromise, I asked him to add the necessary wires for these data to my connectors. The DSub connectors required soldering and had many other wires already in the way. I figured that rather than struggle with doing it myself, I would just pay the man who already knows how to do it instead.

I ran these wires to another DSub connector behind the panel where I can plug in a diagnostic harness for checking the spark advance with a multimeter. This will be available on the ground or in flight. If I suspect the timing has shifted in the future, this will allow me to measure it directly. At a minimum, the spark advance can be checked as part of the annual condition inspection.

Epilog

If you don't already, I highly recommend that you listen to the "Ask the A&Ps" podcast, sponsored by AOPA. It is released on the 1st and 15th of the month. Mike Busch, Colleen Sterling, and Paul New answer call-in questions about people's thorniest aircraft maintenance problems. It's a great way to learn about diagnosing problems, and will certainly help when you find yourself trying to diagnose your own problem.

One of the things they say over and over is that your airplane should have an engine monitor. All of the analysis I have talked about was possible because there were data available recorded by the engine monitor. If I didn't have an engine monitor, the problem I had could have gone unnoticed for much longer, especially if the lone CHT probe happened to be on the one cylinder that wasn't overheating. That could have easily led to engine damage well in excess of the cost of an engine monitor. Engine monitors are readily available now, unlike thirty years ago, and at a price that makes having one an obvious decision.

It's good to be back to "I love my airplane".



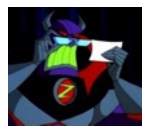
- Russ Erb

EAA Chapter 1326 Young Eagle Report



Between the "weather daemons" and the "new year" school/activity schedules, we didn't get any Young Eagles flights done in January. As I noted earlier, we (Ch-1326) are trying to get some regular Young Eagles rallies scheduled this year. The first event is scheduled for Saturday February 8, provided the "weather daemons" are amenable and we have enough volunteers (rain date Feb 15th). Those of you who are on our "Young Eagles" mailing list have probably already gotten a "are you available" email either from me, or from the EAA's Young Eagle event website (eaachapters.org). Anybody who isn't a Young Eagle Pilot, but would still like to help, we still contact Leigh Kelly (leighkelly@pobox.com)

Project Police Aircraft Spotters Quiz



Evil Editor Zurg: Two months ago I gave you a "what's wrong with this photo" question regarding this caption and aircraft:

U.S. Forces Conduct Targeted Strike On Iranian-Aligned Weapons Facility In Syria



The aircraft the Thunderbirds are flying are F-16 "Fighting Falcons", and the quiz from last month was a "double header". The first question being, what is the other nickname the F-

16 has, and second, where did that nickname come from?

One of my Project Police responded that the F-16 had originally been envisioned with the name Falcon, but seeing as how there was already a "Falcon" bizjet in the market, the "Fighting" was added to Falcon. (Maybe) Said PP also correctly noted the F-16 community called it the "Viper", and speculated that, "The nose and inlet look like a snake about to strike?".

Well, maybe, but that is not the "lore" I was referring to. First we need to go back in time to culture around the mid/late 70s timeframe when the F-16 was being developed. In 1977, the SciFi world exploded at the release of "Star Wars", with space craft doing low level attacks and flying "fighter like" maneuvers. The entertainment industry jumped on the bandwagon, and one of the more successful TV franchises to successfully capture the audiences was "Battlestar Galactica", a flying "spacecraft carrier" which featured this SciFi fighter, the Mark-I "Viper".



"Mark-I Viper"

Although the Air Force generals were fixated on the F-16 (Fighting) Falcon, the new fighter pilots in the USAF pilot pipeline had a different idea of what to call a new hot single seat fighter. And so, the unofficial "Viper" nickname was adopted by the pilots that flew and loved the F-16, and that moniker has stuck since then.



OK, for this month. My veteran Air Force Project Police routinely tell me "Flexibility is the key to Air Power". While that may be true of Air Power, it's DEFINITELY true in the publishing business. I was all ready to dig up an old aviation movie aircraft to tease you with, when staff Editor Randy sent me a picture of this interesting aircraft that showed up at their breakfast that he thought worthy. Dual cockpit, main gear that looked like they'd been stolen off a "Chipmunk" and elliptical wings reminiscent of a Supermarine Spitfire. Here's a repeat of the shot Randy sent me, and your obvious task is "what is it?"



Send your "guesstimate" to Staff Editor Randy Kelly, at electricrow@pobox.com.



Project Police Tales Wanted

EAA members OR aviation enthusiasts. Do you have an interesting project you'd like to talk about or show us? Have you seen an interesting or unusual aircraft? Do you have an interesting maintenance or build story? Did you take a flight or ground trip to someplace you think your fellow aviators would like to visit? Snap some pics and write up a short report or make some notes to give to our



staff writer Randy Kelly for inclusion into *The Sport Flyer*. We're not picky. ***We don't care if you're from OUR EAA Chapter, some other EAA Chapter, or just an aviation aficionado*** – we'll publish your story anyway. **IMPORTANT LEGAL NOTE** - If you shoot pictures of minors at your event and they are easily recognizable, you need to let me know whether their parents or guardians give permission for us to use that image.

Chapter 1326 Mission Statement

The Mission of the Shelbyville Sport Flyers Club, EAA Chapter 1326 is to enhance the quality of aviation life for its members by providing information about aviation, flying, and mechanical/maintenance knowledge shared by fellow members, guest speakers and special events which respond to the expressed needs and desires of all members.

Chapter 1326 Calendar

January 30th, Ch-1326 Social, Social 5:30PM, Guest Speaker Logan Yoon at 6PM.

February 8th, 2025; Young Eagles Rally, 0900, Sport Flyer Hangar, KSYI airport.

February 11th, 2025; VMC Club Meeting, 1730, Sport Flyer Hangar, KSYI airport.

February 20th, Regular Thursday meeting, 6PM. virtual meeting.

February 22nd, 2025; EAA Ch-1326 Fly-In Breakfast, 0730-0930, Sport Flyer Hangar, KSYI airport.

March 4th, 2025; VMC Club Meeting, 1730, Sport Flyer Hangar, KSYI airport.

March 20th, Regular Thursday meeting, 6PM. virtual meeting.

March 22nd, 2025; EAA Ch-1326 Fly-In Breakfast, 0730-0930, Sport Flyer Hangar, KSYI airport.

Special EAA Chapter 1326 Board of Directors Meetings are sometimes held on an unscheduled, as needed basis. If you need to be at one of those, you'll be notified by email or text.

For a good summary of aviation related social and training events in Middle Tennessee, check out the website <https://www.socialflight.com/>

CHAPTER 1326 ADMINISTRIVIA

To join Chapter 1326, send your name, address, EAA number, and \$20/year club dues to: EAA Chapter 1326, 2828 Hwy 231 N. Shelbyville, TN 37160-7326, attn Leigh Kelly. NOTE: You must also be a member of EAA National (<https://www.eaa.org>, or call 1-800-843-3612, \$40/year National dues).

Contact our officers by e-mail:

President Randy Kelly: electricrow@pobox.com

Vice President: timothy.rosser@mtsu.edu

Treasurer: Leigh Kelly: leighkelly@pobox.com

Acting Secretary: Leigh Kelly

Chapter Technical Assistants are EAA and/or other aviation technology enthusiasts who may or may NOT be a real expert in that area but are willing to share their knowledge and building expertise with other members who need some help (or just a sympathetic ear) while accomplishing their build. If you are able/willing to serve/help in this capacity, please contact Randy Kelly at electricrow@pobox.com.

Composite Construction

Jack Bosse	Bossej3@gmail.com
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Wood Construction

Brennan Lewellen	blewellenvw@yahoo.com
------------------	--

Fabric Construction

Brennan Lewellen	blewellenvw@yahoo.com
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Aluminum Sheet Metal Construction

Kenneth Rutschow	Ken.rutschow@gmail.com
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Brennan Lewellen	blewellenvw@yahoo.com
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Jack Bosse	Bossej3@gmail.com
------------	--

Welding/Welded Steel Tube Construction

Brennan Lewellen	blewellenvw@yahoo.com
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Engine Installation

TBD	
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Certificated Engines

Kenneth Rutschow	Ken.rutschow@gmail.com
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Brennan Lewellen	blewellenvw@yahoo.com
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Jack Bosse (+ROTAX)	Bossej3@gmail.com
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Electrical Systems

Randy Kelly	electricrow@pobox.com
-------------	--

Instrumentation and avionics requirements for VFR/IFR

Jack Bosse	Bossej3@gmail.com
------------	--

Sean Lowe	sean.lowe@patriotavionicsn.com
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Inputs for the newsletter or any comments can be e-mailed to Randy Kelly at electricrow@pobox.com

*From the **Project Police** legal section: As you probably suspected, contents of The Sport Flyer are the viewpoints of the authors. No claim is made and no liability is assumed, expressed or implied as to the technical accuracy or safety of the material presented. The viewpoints expressed are not necessarily those of Chapter 1326 or the Experimental Aircraft Association. **Project Police** reports are generally printed as they are received in the next "convenient" issue, with no attempt made to determine if they contain the standard aviator caveat of at least 10% truth. Please remember that any individually recognizable images of minor persons submitted for an article will be "blurred" unless we have permission from their parent or guardian. So there!*

THE SPORT FLYER

EAA CHAPTER 1326 NEWSLETTER

C/O Randy Kelly

PO Box 767

Shelbyville, TN 37162-0767

<https://chapters.eaa.org/eaal326>



ADDRESS SERVICE REQUESTED

THIS MONTH'S HIGHLIGHTS:

- Kommandant's Komments
- January Meeting notes
- JanuaryFly-In breakfast report
- Technical Korner: Being Advanced Isn't Always a Good Thing.
- Evil Editor Zurg's Aircraft Spotter Quiz
- Monthly plea for "Project Police" participation for new stories