



**March 2014**

**•President**



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

[djpradams@gmail.com](mailto:djpradams@gmail.com)

**•Vice President**



David Cheung  
703 W. Main St.  
Marshalltown, IA 50158  
641-751-9785

[davidscheung@juno.com](mailto:davidscheung@juno.com)

**•Sec/Treas**



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

[dmccurry@centurylink.net](mailto:dmccurry@centurylink.net)

**•Newsletter Editor**



Corey Butcher  
2940 Arney Ave  
State Center, IA 50247  
641-493-2415 (hm)  
515-331-2943 (wk)  
[coreybutcher@eaa675.org](mailto:coreybutcher@eaa675.org)

	<b>WHEN:</b>	<b>WHERE:</b>	<b>PROGRAM:</b>
<b>MARCH MEETING</b>	The 13th at 7 pm	<b>FISHER COMMUNITY CENTER</b>	<b>3D PARTS PRINTING</b>

**WHAT'S FLYIN' THIS WAY !!!**

Dan Adams will be giving a talk about 3D printing and what it may mean for us airplane guys in the future. Sounds very interesting and hope everyone can make it. (because we still can't fly!)

Don't forget TJ's at 6pm before the meeting.



**"Drone" completely crafted with 3D printing**

**WHAT FLEW BY !!!**

About 17 members gathered on another cold, cold Thursday night in February at the Fisher Community Center. Prez. Paul Adams brought the meeting to order, then opened the table for members to share updates and reports. A few of them are on the next page.

Break time with treats supplied by Dale Benskin and, I think, Charles Kuhlman, was followed by Les Risius sharing his adventures to different parts of the country visiting aviation museums. Les brought a powerpoint presentation with some of the the pictures he took along the way. Some of the museums he shared were...

The Museum of Flight Restoration Center at Paine Field in Everett, Washington is a part of the Museum of Flight located on the south side of Boeing Field in Seattle, WA. The restoration center is home to approximately three dozen aircraft in varying states of restoration by the Museum's 40 or so volunteer restorers. One of the unique aircraft they are working on is a DH106 Comet airliner which is partially outside with it's nose inside.



*...continued on next page*

# CALENDAR

For those of you on the internet, all of the information for aviation events are available in many places. Links to the websites that have all the info you need are listed below. If you do not have internet access, and a specific event you are interested in is not listed in the newsletter, just call me and I will be happy to look up the info for you.

Thursday March 13, 2014 7 pm  
(6pm Taco Johns)  
EAA Chapter 675 Monthly Meeting  
Fisher Community Center

[www.eaa.org/calendar](http://www.eaa.org/calendar)  
[www.FunPlacesToFly.com](http://www.FunPlacesToFly.com)  
[www.flyins.com](http://www.flyins.com)  
[www.socialflight.com](http://www.socialflight.com)

---

## **Les Risius' Museum Tour** (continued)

The [Flying Heritage Collection](#) of Microsoft cofounder Paul Allen is also located in Everett, Washington. This is a collection of rare military aircraft and land units, comprised of examples from Germany, Japan, Russia, the United Kingdom and the United States. Most are in flying condition.

[Museum of Mountain Flying](#) in Missoula, Montana is dedicated to Johnson Flying Service which pioneered many of the tactics and uses for mountain flying operating between 1928 and 1976. Not a large collection, but each aircraft somewhat unique. The centerpiece is a DC-3 in flyable condition that was one of the original Johnson Flying Service aircraft. They are looking for the finances to pay for fuel and insurance in order to fly it to Oshkosh.

[Minuteman Silo Historic Park Museum](#) between Rapid City and Wall, South Dakota maintains a full featured Cold War missile and its launch silo.

[The Cavanaugh Flight Museum](#) in Addison, Texas is the home of 'Fifi', the only flying B-29, as well as nearly 60 other aircraft from WWI, WWII, Korea, Viet Nam and some civies. Most are airworthy. They give rides in some of the aircraft (including a SkyRaider), and have many presentations throughout the year in addition to taking some of the planes on tours around the country.

Thanks Les, for a good presentation!

---

## **Member News**

**Bruce Gapstur** reset the alignment on his L3 engine mount and installed a new kidney on the engine.

**Charles Kuhlman** reports no progress on the Q2 engine, but he has acquired a MIG welder and is practicing.

**Mike Hargrave** says it's too cold to fly, so he makes engine noises. Where, we're not sure.

**Dan Adams** challenged the cold and changed a tire that was getting worn on his Tripacer.

**Loren Bovee** sold his Cessna 172 and now has a Garmin 296 GPS for sale, and a panel mount GPS he is willing to give away.

**Ed Boehm** says its so cold, Sweet Pea is talking to him. He also bought another pocket 'Drone'.

**Gary Nablo** has the Taylor Monoplane mostly covered. Has just three pieces to go.

**Dale Benskin** along with **Lorin Miller** have been working hard on restoring Dale's Piper Clipper. They are also gathering the materials to build a WagAero Sport Trainer, a J-3 look alike. Lorin will be welding the fuselage in his basement and he has also started a [blog](#) on the build for everyone to follow along.

**Garry Brandenburg** did get his 172 out of the hangar...after chipping all the ice away!

**Gary Kirchgatter** our miniature engine member, is starting a boxer engine.

**Paul Adams** has the Double Eagle wings ready to cover and will soon be looking to get the material for his fuselage.

**Don Feld** says about his Rans S6E project..."Finished the main gear and put all three on to see what this tricycle thingy is going to look like setting on its wheels. Tempted to get in, but no seats or floor yet. That's next.



Now on FACEBOOK  
[www.facebook.com/EaaChapter675](http://www.facebook.com/EaaChapter675)

Visit your Chapter 675 website!  
[www.eaa675.org](http://www.eaa675.org)



## Numbers

I recently read an interesting book and some internet stories about the SR71. As you can imagine, the SR71 being the worlds fastest and highest flying aircraft, it's all about numbers. One of the numbers that amazes me, is that the Y12, the early model of the SR-17, first flew in 1964! That is remarkable considering that the speed and altitude have never been surpassed.

While reading the book, a couple of stories really got my attention, although there were a lot of excellent stories. One of these stories we sport type flyers can equate to, the other maybe not so much. Both involve numbers. I will paraphrase the stories for brevity and then provide some SR71 facts and figures.

The first story involves a flight over the southwest part of the US at 80,000 feet and a speed of mach 3 plus. The rear crew member, called the RSO, operates the electronic equipment allowing the front pilot to concentrate on flying the SR71 because getting behind the SR71 while flying is a real big no no.

While flying, the RSO was monitoring the local ATC channel, Houston Center. A local flyer broadcast was heard from a Cessna 172 pilot requesting a ground speed check. The Houston air traffic controller responded in that typical low controlled voice with a 115 knots. After a moment of silence a Navy F18 pilot called Houston and asked for the same, a ground speed check. Houston again answered with a speed of 608 knots. The Pilot of the Air Force's SR71 found this unusual since he knew the flight instruments on the F18 gave ground speed information. But almost immediately the pilot new what was up; obviously a show off Navy pilot wanting the world to know (since the world was listening) he was the king of speed. The pilot of the SR71 wanted to correct this wrong but knew the radio work belonged to the RSO even though he did have a mike button. But within a second of that thought the pilot heard a mike click and the RSO officer request a speed check from Houston Center. The cool and calm Houston air traffic controller in his low voice answered with 2183 knots. Not to let the moment pass just yet, the RSO responded with "our indicators show a ground speed closer to 2200 knots. The

air traffic controller responded with a little break this time in the usual casual low tone, "your instruments are probably a little more accurate at that speed then mine". Ahhh, the numbers game at mach 3 plus while flying in a black sky looking at the curvature of the earth!

The second story maybe we cannot relate to as much. Again, at mach 3 plus and at 80,000 feet, an SR71 was executing a 32 degree bank turn (32 degrees was the typical bank angle used in operational turns). The J58 engine used on the SR71 had a nose piece that helped control the sonic shock wave at the inlet of the engine. (See the discussion on an unstart below in note 1). Occasionally the J58 would, shall we say, hick up and lose power (referred to as an unstart) as the automated controls on the nose cone had a glitch, or the pilot had certain vents set incorrectly or even sometimes for unknown reasons. On this particular flight the SR71 was loaded at a cg rear of the aft limits for testing purposes. With all that, the aircraft started having control issues as the augmented flight control system could not keep up, the aircraft departed controlled flight and immediately broke up. Imagine that at mach 3 plus!

The next thing the pilot thought, he is dead. There was a certain level of serenity about his present condition. But as his body sensors kicked in he finally realized he was alive! His training also kicked in and he started doing the things he felt he needed to do to stay alive. He realized his pressure suit was working and his drag chute had deployed .He was falling towards earth. At what altitude, he didn't know, he couldn't see. His face shield had frozen over. He raised his shield and saw the ground. Trying to open his chute was without success, but then his automatic system opened the



chute. Looking down he saw an antelope staring back which eventually ran off. Following an uneventful parachute landing he immediately heard a voice. A fleeting moment of, maybe I AM dead, passed, and he looked up to see someone bent over looking at him. A local rancher had seen the two chutes descending and flew over to help in his helicopter! Eventually the pilot was flown to the hospital (the RSO officer was killed when the SR71 broke up), was checked out and returned to base! All that was found was some minor bruising! The pilot felt he was lucky and owed his life to many things, the most important being and his pressure suit worked (blood boils above 45,000 feet without a pressure suit), which by the way, was made by David Clark the headset people. Numbers apply here, you have to say his number wasn't up! An anecdotal follow up was the pilot flew within a few weeks (amazing in it self) and was giving a ride in the SR71 to a non Air Force person. Upon take off the pilot ejection light lit up in the rear compartment. The guest passenger called the pilot to see if he was still there, he was. Go figure, don't you think if you were in the back seat you would hear the ejection seat from the front?!

Here are some interesting other notes and numbers on the SR71:

1. At the maximum design speed of 3.2 mach, the J58 turbofan engine provided 20 percent of the required thrust. The other 80 percent came from controlling the sonic shock wave with a moveable cone at the inlet to the engine nacelle and some exit ports further down the nacelle. The inlet cone could be moved in and out 26 inches to control the inlet air reducing the speed of the entering air to .6 mach. The inlet pressure was controlled with the air exit ports. This air was used with the engine exhaust to augment the thrust. Part of the control of the inlet cone and exhaust ports was manual and this was part of the pilots job in flying the SR71. An unstart was the loss of control of the thrust from the inlet nozzle air. It was violent, as you can imagine, and caused both a pitch up and a rolling action. The pilots job was to intervene and recover to a normal attitude. A restart was

then initiated. Above 2.6 mach the automated system was used to restart. The automated restart would unstart the other engine to help maintain control of the aircraft. The unstart phenomenon was different from one SR71 to another. More than one pilot helmet was damaged during a loss of thrust and the ensuing aircraft's violent reaction.

2. The majority of the flying of the SR71 was accomplished on autopilot. Once the autopilot was engaged the pilot used two thumb wheels to input control needs to the aircraft. One was pitch the other was roll. Can you imagine correcting the flight attitude issue after an unstart with a couple of thumb wheels? A high tech plastic tray was dropped down from the control panel to support the pilots wrist during operation of the thumb wheels.

3. A rear looking periscope was provided for the pilot to check a few things, one being rudder trim. Trimming the rudder was a manual process. The rudder trim mechanism was hydraulically operated and at the higher mach speeds the hydraulic fluid would heat up and expand thus requiring the pilot to retrim.

4. A typical high altitude cruise fuel flow rate was 2100 pounds per hour of the specialized JP7 fuel. JP7 (which according to a talk I listened to at Oshkosh is extremely similar to charcoal lighter fluid which caused a shortage for public use at the onset of the program) was used instead of JP4 do to the high temperatures experienced when fling at high mach numbers. A full fuel load was 85,000 pounds. Air refueling once hooked up would take about 12 to 15 minutes, a long time considering the flight control demands on the SR71 pilot.

5. On a mission a photo was taken from 7700 feet. It showed a golf ball on a putting green.

6. The maximum bank angle at the higher mach numbers was 45 degrees. The limitation was the stress applied to the airframe. At speed to go from a bank angle of 35 to 45 degrees required a decent. The descent rate as reported by the author was "only" a decent rate of 3000 feet, only he



says! A change in the engine cone position was also required to avoid an unstart. The higher bank angle was sometimes required because of a colder than normal outside air temperature. The standard temperature at 75,000 feet was minus 56 degrees. If it was colder the SR71 performed better and one area was more speed and thus a larger turn radius (the pilot would also have an issue of the plane wanting to fly above the design altitude of 85,000 feet). In order to not fly over hostile territory such as Russia (according to the book no US President would authorize a flight "over" Russia) the pilot in the cold air and resulting higher performance would have to increase from the normally planned 32 degree bank to 45 degrees to avoid flying over an undesired area. A 32 bank angle at mach 3 yielded a turning radius of about 100 miles.

7. I once heard that the SR71 had to be refueled right after take off due to the fuel needed to get airborne and to climb at the lower altitudes. Not so. They did normally require refueling right after take off. But the reason was to purge the air out of the fuel tanks. At the higher speeds the aircraft heated up. This heat and the vapors of the JP7 fuel was a potential explosive hazard. Once purged the resulting evacuated space in the fuel tanks caused by the use of fuel was filled by an automated blanketing system which used inert nitrogen. The pilot monitored this system and a problem with the system was an automatic mission abort including a slow down and decent towards friendlier territory.

8. The J58 engine was the only turbofan engine that could be run continuously on after burner. It used ceramic in the tail

cone to help with the temperatures.

9. To get to the higher mach numbers the SR71 was put in a dive right after refueling to help accelerate through the higher drag of approaching and passing through mach 1. The only indication mach had been exceeded was some small wiggles in some instruments.

10. Mission length varied a lot. Typical was 3 to 4 hours. Long missions were 10 to 11 hours. They all included descents to refuel followed by climbs back to altitude. Very little just sitting and enjoying the view, but there were stories in the book about some phenomenal views. One story being flying amongst the northern lights. Another was the stars didn't twinkle and looked as though they were three dimensional and you could reach out and touch them.

11. Each mission had a minimum of two crews assigned to assure mission success. Some high priority missions even launched two SR71's. One as a back up.

12. A Russian Mig pilot that defected to the west told about attempts to shoot down a SR71. First they were stealthy for their time. The radar signature of a J3 cub. With their speed and altitude, if found, they were impossible to shoot down. The Mig pilot explained... From the rear, the lower altitude Mig launched missile could not catch up. From the front the closure speed was so quick and the air so thin the missile could not react in time. No SR71 was ever lost to enemy action. The Mig pilot and the author, a past SR71 pilot and SR71 wing commander, are both EAA members and both attend Oshkosh!



## **SnowBird Report**

*Gene Adkins and Dave McCurry spend the cold Iowa winters in Arizona where they can get in more flying days (and keep warm). The following is a report of their version of a FOGz breakfast flight.*

Sedona is famous for its red rock formations, the area was under-sea at one time and the soil was laid down in colors of mostly red with some layers of yellow, then compressed over time into rock. . It is a tourists destination and attracts people from all over. Some of the rocks have eroded into unique shapes. There is teapot rock, shaped like a teapot, and castle rock that looks like an old castle, and others. The airport is located on a mesa, and drops off in all directions. The runway is short of 5000 feet and has a slight uphill grade to the northeast. Unless winds cause too much tailwind, the preferred method is to land uphill and depart downhill which means as we were arriving, planes were waiting at the other end of the runway to depart after we had cleared the runway. It is sometimes called a stationary aircraft carrier. Departing, once we cleared the end of the runway, the terrain drops 300 feet.



*Dave (left) and Gene by the C-172 at Sedona, Arizona*

We departed Mesa (Falcon Field) at 0715 and flew for 1 hour to Sedona. Flew at 6500 msl and were below the peaks some-time. Nothing but rocks below. Would be a bad place for engine trouble. Weather was perfect. CAVU and no wind. You are right about an aircraft carrier but we only used half of it.

We had eight planes from Mesa and 13 souls show up. Was typical BS session. People from east and west coast telling of adventures. One of the planes in our flight was a Sonex 2200 Jabiru. He flies at 100kts. It will go faster but likes the fuel burn at that speed. He said he use to own a fast plane (Beech) but got tired of feeding it money. There were a couple of RV's in the flight too. A bird dog was also there. We actually passed him on the way home. That's the only thing the we passed. Gene has a 1956 172 straight tail. We were making 100 kts, about right for that plane.

The restaurant on the field is nice, and this was the proverbial \$100 breakfast. Breakfast was \$12 and I put \$78 in fuel in the airplane. Nice flight, smooth as glass flying over some pretty desolate areas and around and over mountains.

Pancakes are still better at Sully! On the way home Gene diverted to Superstition Mountain which is a couple of miles east of where we live. Now I have seen the top without having to climb it. There is a lot of very rough terrain in AZ. Not sure I would like to sport fly here too much. A BRS chute would be a good investment.

Oh and FYI, It was 75° today. In the 80's next week. Getting too hot!!!!



*Dave McCurry at the controls of Gene Adkins '56 Cessna 172 over NW2L territory on their way to Sedona, AZ for breakfast. Sedona is in the photo to the left, the sliver of runway just about in the center.*