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|---|--|---|
|  | <h1>PROPWASH</h1>  |  |
| <p>EAA Chapter 190</p>  | <p><a href="http://eaa190.com/">http://eaa190.com/</a></p> | <p>June 2015</p>  |

## Photo of the Month:



Time to start thinking September Fly In again.

## Presidents Message:

Aaron Wypyszynski – EAA # 579057

**NOTE:** This month's *chapter meeting* will be at Griffon Aviation, it *will not be at Moontown* Airport.

We saw some great movies last month. The Bob Hoover Documentary was truly amazing! If you were unable to make it to the movie and would like to see the documentary, please let me know as you are more than welcome to borrow it. The IMAX living in the Age of Airplanes was extremely eye opening. There was not as much flying as we were expecting, but it was amazing to see just how much of an invisible impact on our everyday lives!

This month we will be having two great events. Our chapter meeting this month will be at Griffon Aerospace in Madison. We will have a short meeting and then tour the Griffon facilities.

Griffon Aerospace builds UAVs and Target Drones for the U.S. military. They also produced the Lionheart aircraft kits. Our second event will be a visit to see Jeffery Jeram's Pulsair project. The chapter has seen the project every several years throughout the build process, so it will be great to see the progress Jeffery has made.

As always, if you are interested in giving a presentation at one of our chapter meetings or hosting a chapter event. Please contact Wes Conkle so he schedule a time. We are always looking for more presentations

Hope to see you at one of this month's activities!

| Activity                                | Date                          | Time        | Location   |
|---|-------------------------------|-------------|--|
| Chapter Meeting – Griffon Aviation Tour | Tuesday June 16 <sup>th</sup> | 6:30pm      | Griffon Aerospace 106 Commerce Cir Madison, AL 35758 |
| Moontown Pancake Breakfast              | Sat. June 20 <sup>th</sup>    | 8:00-9:30am | Moontown FBO   |
| Fly-In Planning Committee               | Sat. June 20 <sup>th</sup>    | 9:30ish     | Moontown FBO   |
| Workshop Visit, Jeffery Jeram's Pulsair | Tuesday June 30 <sup>th</sup> | 6pm         | 226 Iron Wood Court, Madison AL 35758                |

## Minutes of Last Meeting:

Charles P. Cozelos – EAA # 63381

### EAA Chapter 190 Meeting 12 May 2015

#### Members in attendance:

|                    |                   |                   |
|--------------------|-------------------|-------------------|
| Andrea Atwood      | Meg Krampf        | Ceten Stockey     |
| Jerry Barnett      | Glen Kyser        | Trish Stockey     |
| Wes Conkle         | Kevin MacQuinn    | Bryan Tauchen     |
| Charles P. Cozelos | Chris Madsen      | Aaron Wypyszynski |
| Michael Dunning    | George Martin III |                   |

#### Call to Order: 6:45 pm.

The minutes as posted in PROPWSH were accepted.

The Treasurers Report as posted in PROPWASH was accepted.

Aaron gave an update on the status of the case against us from the crash..

Aaron says he will have the tables purchased by the next breakfast.

Aaron will give a report to the chapter cost and details to get new projection equipment.  
He will present the report at the next meeting.

We will be looking into possibly going to the space center on May 30<sup>th</sup>.

Glen reported on the planning to have our next chapter meeting at the Griffin Aerospace facility in Madison. As details become available

The next meeting Junne there.

**Meeting Adjourned:** 6:57 pm.

After the formal meeting there was movie about Bob Hoover called..... Flying the Feathered Edge. Absoutly a great film.

## Treasurers Report:

Bryan Tauchen - 651954

### March Treasurers Report

#### Treasurers Report

| Date      |                | Dep   | Check | Balance   |
|-----------|----------------|-------|-------|-----------|
| 5/1/2015  | Balance        |       |       | 23,510.19 |
| 5/26/2015 | Deposit        | 15.00 |       | 23,525.19 |
| 5/31/2015 | Ending Balance |       |       | 23,525.19 |

## Safety:

Wes Conkle – EAA # 633811

## Young Eagles:

Aaron Wypyszynski – EAA # 579057

I was recently asked if I could provide a picture of my first Young Eagle flight (yes, I was a Young Eagle myself!). Little did I know that it would lead me on quite the search! The Young Eagles website provides a great resource in that it lists each flight that a Young Eagle has done, searchable by Young Eagle first and last name. I pulled up the logbook, and searched for my flight. There was one flight, dated July 1998, but there was no pilot or location listed for the flight. There were several flights that I had around that time, but did not know which of them was a Young Eagle flight. Unfortunately I lost my first logbook that had several of my flights in it before I started taking flight lessons. After a call to a family friend who provided one of the flights, I was able to narrow the search. It was additional information provided by the Young Eagle office combined with a picture from my first year of flying that solved the mystery!

The Young Eagles office noticed that my flight was entered as part of a large group of flights that volunteer student pilots from the University of North Dakota had submitted. A picture from my trip to Aviation challenge here in Huntsville solved the mystery. During the trip, I received a flight in a Piper Arrow. Painted on the tail of the aircraft, which I happened to take a picture of, was the UND logo! Who could have imagined that that first flight, so many years ago would not only be my first flight, but also my first flight flying in what would one day become my home airspace!

**Risky Business**

**A Detailed Guide to Virgin Galactic’s Space Flight, from Hitting Supersonic Speeds to Hurling into Zero-G**

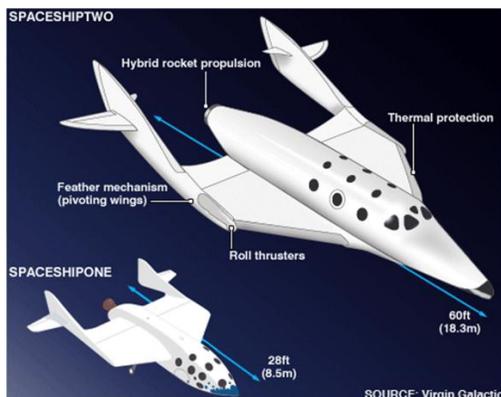


Figure 1: Richard Branson in Mojave, California, in 2010. Behind him, SpaceShipTwo hangs from the twin-fuselage mother ship, WhiteKnightTwo.

More than 700 people have paid up to \$250,000 for a ride on Richard Branson’s Virgin Galactic. In this excerpt from *Vanity Fair*’s April 2015 article about the mogul’s risky business, William Langewiesche details the particulars about Virgin Galactic’s trip to space.

BY WILLIAM LANGEWIESCHE

[HTTP://EN.WIKIPEDIA.ORG/WIKI/WILLIAM LANGEWIESCHE](http://en.wikipedia.org/wiki/William_Langewiesche)



PHOTOGRAPHS BY JONAS FREDWALL KARLSSON

It is possible to fill in some details of future flights when passengers will be aboard. The cockpit is open to the cabin. The pilots sit side by side at the controls. The passengers—as many as six—sit in two single-seat rows behind them, beside large circular windows, with other windows overhead. Their seats are upright for the launch and climb but can be rotated backward into a reclined position to counter the effects of G-loads during the re-entry. It will be helpful if the

passengers have gone through some high-G and zero-G training in advance, in addition to the two or three days of preparation that Virgin Galactic expects to provide in New Mexico during the run-up to the flight. Over many years as an aerobatic flight instructor, I observed that people quickly learn to handle loads of up to three Gs, but that, depending on their physical condition and seat position, some get tunnel vision and begin to black out above that. Zero and negative Gs present no such risk, but, like flying upside down, take longer to get used to—usually about five hours of aerobatic training in flight until the vomiting stops.

So, here's the scene, and it starts off clean. Each flight should last about an hour and a half in total. The passengers sit strapped in and upright wearing padded helmets and flight suits emblazoned with the Virgin logo. The mother ship lifts off and climbs for about 45 minutes to an altitude of 47,000 feet. At the moment of release, the spaceship does not merely drop but pitches down for a clear



separation. The maneuver is felt by the passengers as a slight negative G that raises them against their seat belts—the same sinking sensation that can sometimes be felt on a commercial jet in moderate turbulence. Then the co-pilot ignites the rocket, and there is nothing moderate about it. The motor achieves full thrust within a second and shoves the aircraft forward with a relentless three-G acceleration that pushes the passengers against their seatbacks and keeps them there. The G-load in that axis is relatively benign, because it does not drain blood from the head, but, in combination with the vibrations and noise, it may disorient some passengers and will likely surprise most.

Accelerating through Mach 0.95, the aircraft wobbles as shock waves develop on its wings and tails. This is known as a burble, and it marks the entry into supersonic flight. The shock waves change the airflow over the conventional control surfaces—the elevons—and render them almost useless, forcing the pilot in supersonic flight to fly entirely by trimming the stabilizers on the tail. Flying by trim is difficult to do well,

but with pilots like these the passengers probably don't need to worry. At Mach 1, the pilot rolls the pitch trim aft to a pre-determined position, and the spaceship responds by bending the flight path upward at a rate that pushes the passengers straight down into their seats with a force of 2.5 Gs. The passengers are now experiencing a total of 5.5 Gs, divided between two distinct vectors, and are rotated onto their backs as the spaceship accelerates ever more steeply upward. As they approach the vertical, nearing Mach 2, the pilot rolls the trim forward to capture the position, and 2.5 Gs are stripped away. Pointing straight up, the ship rockets into air growing so thin that the aerodynamic speeds decrease rapidly even as the ship keeps accelerating through Mach 3. At around that time, after about one minute of burn, and when an onboard instrument shows that the vehicle has sufficient energy to follow a ballistic path into space, the pilots shut down the rocket motor. The effect for the passengers, who are lying on their backs, facing straight up, is to go immediately from a condition of three Gs to the zero-G state called weightlessness.



**Figure 2: SpaceShip Two Break up**

they drop toward the surface, their path matches the curvature of the earth. They go into an undiminishing free fall around the planet. It is the free fall, the vertical acceleration, that produces zero Gs. This may be intuitively obvious when it comes to the initial descent from the apogee, before the atmosphere begins to slow things down, but it is equally true during the ascent, after the rocket motor cuts out and the vertical deceleration is due purely to gravity's pull, without the complications of aerodynamic drag. Pure accelerations, negative or positive, have the same effect. Slowing while going up feels exactly like falling down.

An abrupt transition from three to zero Gs is what shuttle crews went through. A shuttle commander told me it was disconcerting the first time, like stepping off a cliff into a vacuum. It helped to remain strapped into a seat for a while, and then to avoid unusual movements for the first day or two. But aboard the Virgin spaceship, this is the moment the passengers have been waiting for, and they won't have time to get acclimated. After a pilot gives the O.K., they can push a single release button, free themselves from their straps, and go floating around. They have about four minutes of this before needing to settle down. Some may be so stunned by the rocket flight that they don't dare release, but we can assume that having gone this far most will follow through with the plan. Once they release, they can have a great time: do somersaults in midair, assume yoga positions, think lofty thoughts about life on earth, and try not to kick one another in the face. We have also entered here into the realm of projectile vomiting. Virgin Galactic insists that this will not be a problem, but presumably it will equip passengers with quick-access sick bags. Whatever happens in the cabin, the passengers are on their own; the pilots remain strapped in and cannot move aft to help.

Though slowing, the spaceship is still climbing rapidly. A few seconds after the rocket shutdown, as the vehicle shoots through 210,000 feet, the air outside becomes so thin that the aerodynamic forces amount to the merest breeze. The pilots activate the reaction-control system—the compressed-air jets—and raise the tail into the feathered position. The action of feathering at this point uses the last of the outside air to gently pitch the spaceship onto its back. Very soon after that there is essentially no drag on the vehicle; it is above the atmosphere, though not yet in space. It keeps climbing and would do so in exactly the same manner, no matter what the attitude—tail first, sideways, whatever—but through the overhead windows the upside-down position gives the passengers the best view of Earth below. In this attitude, inverted, the spaceship climbs through the 100-kilometer Kármán line and then goes 10 kilometers higher, to an apogee of 361,000 feet—at least if it performs according to

This has little to do with being in space. In fact, Branson's passengers, now at an altitude of about 150,000 feet, are only halfway there. But even if they were all the way there, somewhere above the Kármán line, or three times higher, where the shuttle flew, it would not mean that the earth's gravitational pull had somehow been escaped. Indeed, the force of gravity at those altitudes is nearly the same as on the ground.

Objects achieve low orbits not by levitation but by the energy invested in their speed: with no atmosphere to slow them down they travel so fast horizontally (at least 17,500 miles per hour) that, as



**Figure 3: SpaceShip Two Crash Site**

the original plans. The view from here stretches for hundreds of miles and includes gently curved horizons topped by a thin line of atmosphere, with the blackness of outer space beyond.

From its apogee the ship now begins to fall, accelerating vertically to more than Mach 3 and a rate of descent of 200,000 feet per minute. During the fall, the pilot uses the reaction-control jets to pitch the aircraft right side up again, with its wings level and nose slightly below the horizon—the attitude it will be forced into by the feather as it descends into the upper atmosphere. The procedure is not necessary for

safety but helps to avoid the violent pendulum oscillations that Mike Melvill endured. By now the passenger seats have been reconfigured to a reclined position in anticipation of the G-loads to come. The passengers are still floating around. Virgin Galactic has run zero-G tests with a cabin mock-up being flown in brief parabolic arcs, and believes that, when the pilots give the word, ordinary passengers should be able to return to their seats and strap in. This remains to be seen. Those who do not succeed in reaching their seats will have to lie in the aisle for the re-entry. The G-loads come on gently at first, but then ramp up quickly as aerodynamic drag slows the descent. The total time experiencing loads above 2 Gs is about 40 seconds. The loads build to 5.5 Gs, then subside. This is not a dual-directional force but a single vector toward the cabin floor. The pilots are conditioned to take it sitting up. Because of their reclined positions, few if any of the passengers will have trouble.

By the time the re-entry ends, at about 60,000 feet, the descent rate has slowed to subsonic speeds. The pilots unfeather the tail, returning it to a conventional position, flush with the fuselage, and locking it there. This pitches the nose down steeply, about 45 degrees below the horizon, and puts the aircraft into a dive. The pilot pulls out of the dive and enters a relatively sedate glide at 185 miles an hour. The passenger seats are returned to the upright position. The glide lasts 20 minutes and finishes with a touchdown on the runway. It is not clear how many of the passengers will be in a condition quite yet to celebrate. But it is doubtful that any of them, having invested so much in the experience, will regret having made the flight. All that is in the future. But, barring another accident, it is a future that seems certain to come.

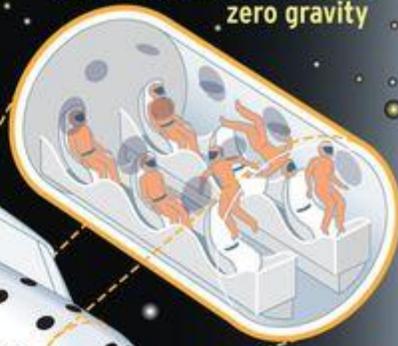
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## HOW IT WORKS

Virgin Galactic had hoped to complete its first ever commercial space tour by 2015 in the revolutionary SpaceShipTwo aircraft

**"Feather" configuration**  
Tail section rotates upwards for greater stability during re-entry

Passengers have the option to float around the cabin in zero gravity



**3 361,000ft (68.3miles)**  
Maximum planned altitude. Rocket burn stops and SpaceShipTwo feathers

**4 Re-entry**  
Feather position slows down aircraft, reducing heat build up, allowing it to safely fall back through earths upper atmosphere

**2 328,000ft (62.1miles)**  
Karman line - altitude where passengers become astronauts

**5 70,000ft (13.2miles)**  
Wings de-feather for glide home

**1 50,000ft (9.5miles)**  
Release from mothership and launch to Mach 4

## WHAT WENT WRONG

2nd stage of deployment activates without command

Shortly after launch, one of the pilots unlocks the feather deployment system

WhiteKnightTwo carries SpaceShipTwo to launch altitude

## Virgin Galactic's SpaceShipTwo

- Length: 65ft
- Wingspan: 27ft
- Pay load: 6 passenger astronauts  
2 pilot astronauts



Seconds later the spaceship breaks-up in mid-air and crashes to the ground



## Next Generation of Pilots:

Hannah Brock – EAA # 1018039.

I think I will tell you about my flying lesson. It has been months and months since I've been able to go flying, and I can't wait to again. Hopefully we can fly this month, but the last few months it has been raining on the third Saturday.

I have a flying lesson even when the weather is bad, I don't get to fly, but have to go over things with Mr. Brooks. I have had to study Carburetors, Magnetos, Propellers, and this month Wings. It's no fun to sit and read through the Pilots Handbook of Aeronautical Knowledge and learn about these things, but later it's cool knowing about them and how they help you fly. Another thing I like is that the boys at school don't know any of this, and they think girls don't know anything about motors and stuff like that.

Hopefully this Breakfast the weather will be good enough to fly again. I don't think I can remember all the things I have to do to fly the plane, but I have my checklist and Mr. Brooks is a good teacher so it will be OK. Next month I will let you know what happens, and I hope to see lots of you at the Breakfast.

## Projects Update:

Jim Harchanko  
Bob Wilson

RV  
Dragonfly

[www.flickr.com/photos/rvflyer03/sets/](http://www.flickr.com/photos/rvflyer03/sets/)  
<http://hiwaay.net/~bzwilson/dragonfly/index.html>

## Calendar of Events:

|                 |         |  |  |
|-----------------|---------|--|--|
| June 16         | 1800hrs | Chapter Meeting  | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a>            |
| June 20         | 0730hrs | Fly-In Breakfast at Moontown   | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a>            |
| June 24         | 2030hrs | Aaron's Airplane Workshop  | <a href="mailto:Aaron.wypyszynski@gmail.com">Aaron.wypyszynski@gmail.com</a> |
| Jul 14          | 1800hrs | Chapter Meeting  | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a>            |
| Jul 18          | 0730hrs | Fly-In Breakfast at Moontown   | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a>            |
| Jul 20 – Jul 26 |         | <b>Oshkosh</b>   | <a href="http://www.airventure.org/">http://www.airventure.org/</a>          |
| Jul 22          | 2030hrs | Aaron's Airplane Workshop  | <a href="mailto:Aaron.wypyszynski@gmail.com">Aaron.wypyszynski@gmail.com</a> |
| Aug 11          | 1800hrs | Chapter Meeting  | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a>            |
| Aug 15          | 0730hrs | Fly-In Breakfast at Moontown   | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a>            |
| Sep 15          | 1800hrs | Chapter Meeting  | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a>            |
| Sep 19          |         | <b>Moontown Airport (3M5) Annual Grass Field Fly In<br/>Sponsored By EAA Chapter 190</b> |  |

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|--------|---------|--|---|
|        |         |  | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Oct 13 | 1800hrs | Chapter Meeting                          | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Oct 17 | 0730hrs | Fly-In Breakfast at Moontown             | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Nov 17 | 1800hrs | Chapter Meeting                          | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Nov 21 | 0730hrs | Fly-In Breakfast at Moontown             | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Dec 15 | 1800hrs | Chapter Meeting & <b>Christmas Party</b> | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Dec 19 | 0730hrs | Fly-In Breakfast at Moontown             | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |

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|--------|---------|------------------------------|---|
| Jan 12 | 1800hrs | Chapter Meeting              | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Jan 16 | 0730hrs | Fly-In Breakfast at Moontown | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Feb 16 | 1800hrs | Chapter Meeting              | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Feb 20 | 0730hrs | Fly-In Breakfast at Moontown | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Mar 15 | 1800hrs | Chapter Meeting              | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Mar 19 | 0730hrs | Fly-In Breakfast at Moontown | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Apr 12 | 1800hrs | Chapter Meeting              | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Apr 16 | 0730hrs | Fly-In Breakfast at Moontown | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| May 17 | 1800hrs | Chapter Meeting              | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| May 21 | 0730hrs | Fly-In Breakfast at Moontown | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Jun 14 | 1800hrs | Chapter Meeting              | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |
| Jun 18 | 0730hrs | Fly-In Breakfast at Moontown | <a href="http://eaa190.weebly.com/">http://eaa190.weebly.com/</a> |

## Ports of Call:

|                   |     |          |                          |
|-------------------|-----|----------|--------------------------|
| Lawrenceville, GA | LZW | EAA 690  | 1 <sup>st</sup> Saturday |
| Rome, GA          | RMG | EAA 709  | 1 <sup>st</sup> Saturday |
| Winchester, TN    | BGF | EAA 699  | 1 <sup>st</sup> Saturday |
| Gallatin, TN      | M33 | EAA 1343 | 2 <sup>nd</sup> Saturday |
| Guntersville, AL  | 8A1 | EAA 683  | 2 <sup>nd</sup> Saturday |
| Murfreesboro, TN  | MBT | EAA 419  | 2 <sup>nd</sup> Saturday |

|                 |     |          |                          |
|-----------------|-----|----------|--------------------------|
| Huntsville, AL  | 3M5 | EAA 190  | 3 <sup>rd</sup> Saturday |
| Shelbyville, TN | SYI | EAA 1326 | 4 <sup>th</sup> Saturday |
| Fort Payne, AL  | 4A9 | EAA 890  | 5 <sup>th</sup> Saturday |

Hazel Green potluck 5:30pm 3rd Saturday each month.