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**login.microsoftonline.com**

# Next Meeting

**Saturday February 10 - 10:00 AM**

Lower Pilot Lounge at Skylark Airport

John LaRoche will be talking about his trip around the United States.

# Next Event

**Pancake Breakfast**
**Saturday March 24 8:30 – 11:00 AM**

Come out for our hot pancakes, sausages and scrambled eggs. Coffee, juice & milk.
All you can eat for a $6.00 donation.

# 2018 Membership Renewals

Renew your chapter membership through the online store, or mail a check payable to EAA Chapter 1310 to the address at the bottom of this page. We'll get your membership card back to you.

Renew for three years for $60. Save $15.
Thanks go out to all the members who have already renewed.

# Chapter Clothing

New chapter logo T-shirts, sweatshirts and hats are in, and will be available at our next meeting and event.

Our Chapter online store is undergoing an upgrade, and is temporarily unavailable.

**Secretary's Report** – The minutes from the January meeting were unavailable at the time of newsletter publication. They will be published on our web site.

## Treasurer's Report as of 1/31/18

| | |
|---|---|
| MAIN ACCOUNT GROSS BALANCE | 3,954.92 |
| PAY PAL ACCOUNT BALANCE | 948.67 |
| 20 Month 1.55% CD Matures 7/17/19 | 20,051.54 |
| TOTAL ALL BALANCES | 24,955.13 |
| | |
| RESERVED BALANCE | |
| Witkin Memorial Fund | 2,359.52 |
| TOTAL GENERAL BALANCE | 22,595.61 |
| Change vs Prior Month | 72.57 |

Income; Donations, membership, interest
Expenses; Electricity

## Mike Goulian Winds First Red Bull Air Race in 2018

It's been a long wait for Michael Goulian – nine years since the last win in Budapest 2009. Flying consistently fast all week, persistence paid off.

50,000 spectators watched on Abu Dhabi's Corniche as Michael Goulian delivered an impressive 53.695 second time through the track during the Final 4, ultimately pushing him at the top of the podium.

"It was awesome, and my whole team is over the moon. It's been a long time coming to get my second win, but it feels great. I was very fast all week and very consistent. I was excited for Qualifying, excited for the race, but I knew I couldn't get too excited. So we worked on just putting one foot in front of the other and making small improvements. I had a feeling we would do well today, but I didn't want to put the cart in front of the horse. We want to be consistent now and we want to win races, but our aim is to make the Final 4, get the points and be in the hunt for the World Championship."

To watch a post-race interview, visit https://twitter.com/twitter/statuses/959772512723898368

To watch a summary of the event, visit https://twitter.com/twitter/statuses/959852213500895238

And to watch the winning lap, visit https://twitter.com/twitter/statuses/959774905658200066

## ArsTechnica History of Apollo Series

The web site arstechnica has added more chapters of its excellent series on the history of the Apollo program *The Greatest Leap*.

Here are links to all the articles. Each article also includes a video with supplemental material

Part 1: How the Apollo fire propelled NASA to the Moon
"The conquest of space is worth the risk of life," said Gus Grissom.
https://arstechnica.com/science/2017/12/apollo-risk/

Part 2: If Apollo 8 failed, NASA's Moon dreams would crumble.
Apollo 8 and the 50/50 bet that won the Space Race for America
https://arstechnica.com/science/2017/12/apollo-guts/

Part 3: The triumph and near-tragedy of the first Moon landing.
Across the cislunar blackness, we set sail for a landing that almost didn't happen.
https://arstechnica.com/science/2017/12/apollo-triumph/

Part 4: Catching Apollo fever as a new NASA employee.
"In today's day and age, they'd probably all be in jail or something."
https://arstechnica.com/science/2018/01/the-greatest-leap-part-4-catching-apollo-fever-as-a-new-nasa-employee/

Part 5: Saving the crew of Apollo 13.
Remembering the "successful failure" that changed how we see human space flight.
https://arstechnica.com/science/2018/02/the-greatest-leap-part-5-saving-the-crew-of-apollo-13/

Jack Hilditch writes that he was reading a story that mentioned a Formula 1 development by Mercedes called an F Duct. Since he had no idea what that was, he searched and found their development is very clever and a precursor can be seen on the Wilga's (inverted airfoil) horizontal stabilizer in Andy's hangar. The article also has a YouTube video on Aerodynamic stalls to help explain the F Duct concept. That video leads to other aerodynamic videos so he thought it might be an interesting, if slightly 'off topic', piece of newsletter content.

# F Ducts: How do they work? | Formula One technology

Jan 7, 2012

When McLaren's F-Duct system first appeared in pre-season testing it was hailed by many a a true stroke of genius, a classic example of out-thinking the regulations. With the basic idea being that the driver is able to alter the airflow over the rear wing, without infringing regulation 3.15 (below), and in doing so gain a speed advantage on straights.

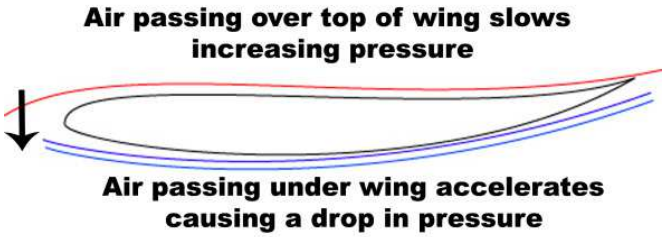
> *3.15 Aerodynamic influence : With the exception of the cover described in Article 6.5.2 (when used in the pit lane), the driver adjustable bodywork described in Article 3.18 and the ducts described in Article 11.4, any specific part of the car influencing its aerodynamic performance :*
>
> *Must comply with the rules relating to bodywork*
>
> *Must be rigidly secured to the entirely sprung part of the car (rigidly secured means not having any degree of freedom) ;*
>
> *Must remain immobile in relation to the sprung part of the car.*

This speed advantage appears to have given the team the upper hand at the Shanghai circuit, Racecar decided to investigate the theory behind the new system.

**Why is the F-Duct beneficial?**

**Basic wing theory**

First we need to look at some basic aerodynamic theory regarding wing profiles and lift/drag ratios. At the simplest level a wing generates downforce due to its profile accelerating airflow on its lower surface in relation to the flow over the top surface. If flow is accelerated pressure drops, with the result being a pressure differential between the upper and lower surface of the wing and thus a net downward force, as illustrated below.



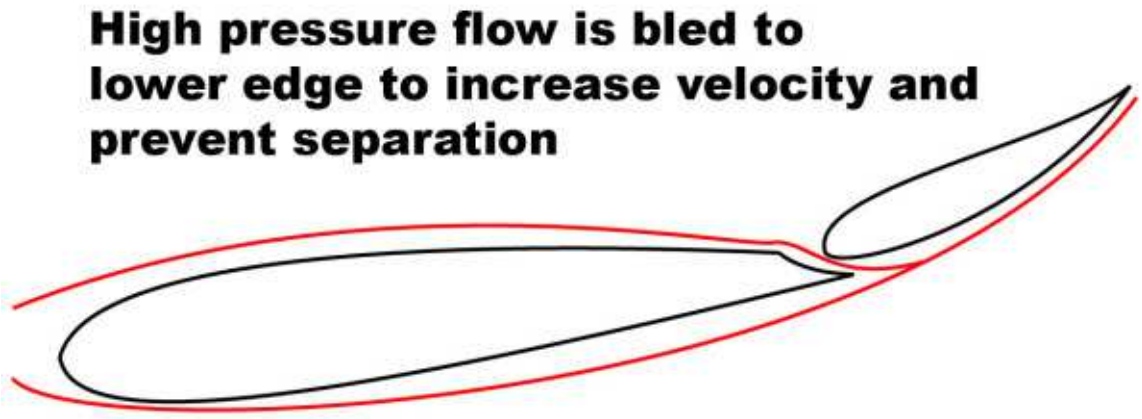

**Flaps and slot gaps**

If the angle of attack of a wing is increased it can ultimately 'stall' due to flow separation along the trailing edge, with a resultant loss in downforce and consequently aerodynamic grip.

https://youtu.be/Ti5zUD08w5s

The above video shows a lift generating wing stalling, however the basic theory is the same for a downforce generating racecar wing.

To get around this problem, dual element or slot-gap wings are used, these allow for some of the high pressure flow from the top surface of the wing to bleed to the lower surface of the wing. This increases the speed of the flow under the wing, increasing downforce and reducing the boundary flow separation. (See below)




If you look at a modern F1 rear wing you can see this concept taken to the extreme, with multi-element wings creating huge amounts of downforce, the downside being a significant drag penalty. However if the flow over the 'flap' section of the wing can be stalled, the lift/drag ratio worsens, but the overall result is a massive drop in the coefficient of lift, resulting in a net reduction in drag, hence the benefits in relation to top speed. It should however be noted that it is only stalling the trailing edge flow that is beneficial as opposed to stalling the entire wing.

**Early solutions**

Previously teams had contrived to create flexible wing sections the allowed the 'slot gap' to close up under high aerodynamic loads, once this became evident to the governing bodies it was rapidly outlawed. Wings are now subject to static load tests to ensure that they cannot flex. So if a team were able to achieve a similar effect within the regulations, considerable straight-line performance gains could be made. Racecarcar spoke to a source in F1 to find out exactly how significant these gains could be.

'If you stall the flap on an F1-wing (in the wind tunnel) then the drag drops enough to calculate that the top-speed of the car could be 3-5kph faster (we did this ten years ago) but the trick is doing it in a way that's legal (well, not illegal). Wind tunnel engineers can do this by altering the

slot-gap geometry and/or changing parts to simulate flexing-on-the-track. It's very easy to demonstrate in a wind tunnel – just very difficult to engineer it so that it's not illegal."

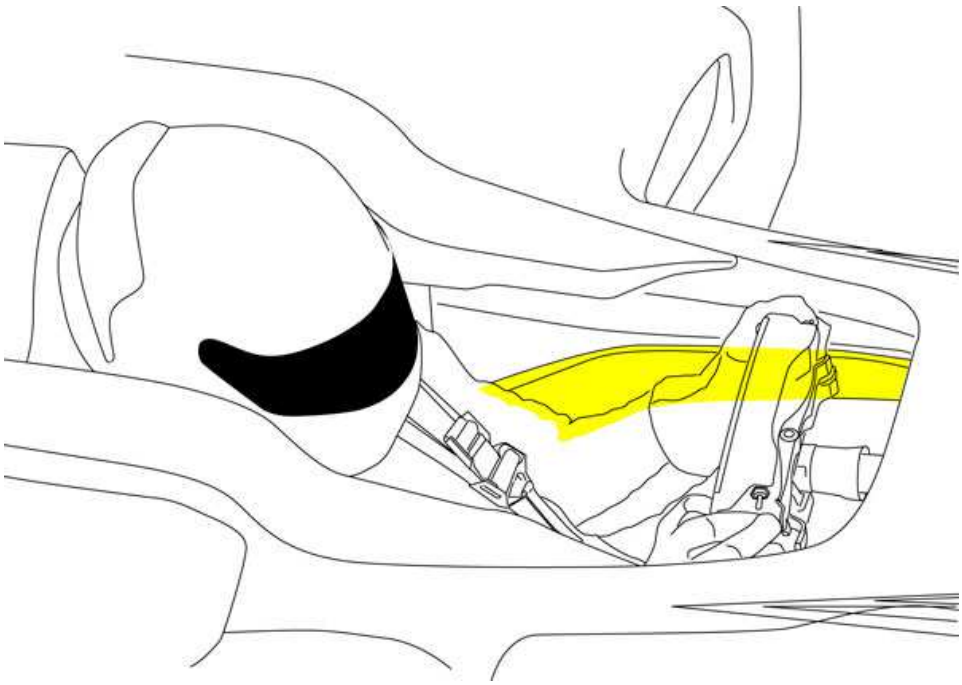
## McLaren's solution

McLaren appear to have found a very neat solution for redirecting the airflow over the rear wing and consequently allowing the flap to stall. Whilst they have been very tight lipped about the system, it is most likely that the conduit from the front to rear of the car has a vent in the cockpit that can be blocked by the drivers left leg, which is not in use on long straights. Blocking the vent could direct enough airflow through the conduit to disrupt the flow over the rear flap and induce a stall. This approach is ingenious for two key reasons:

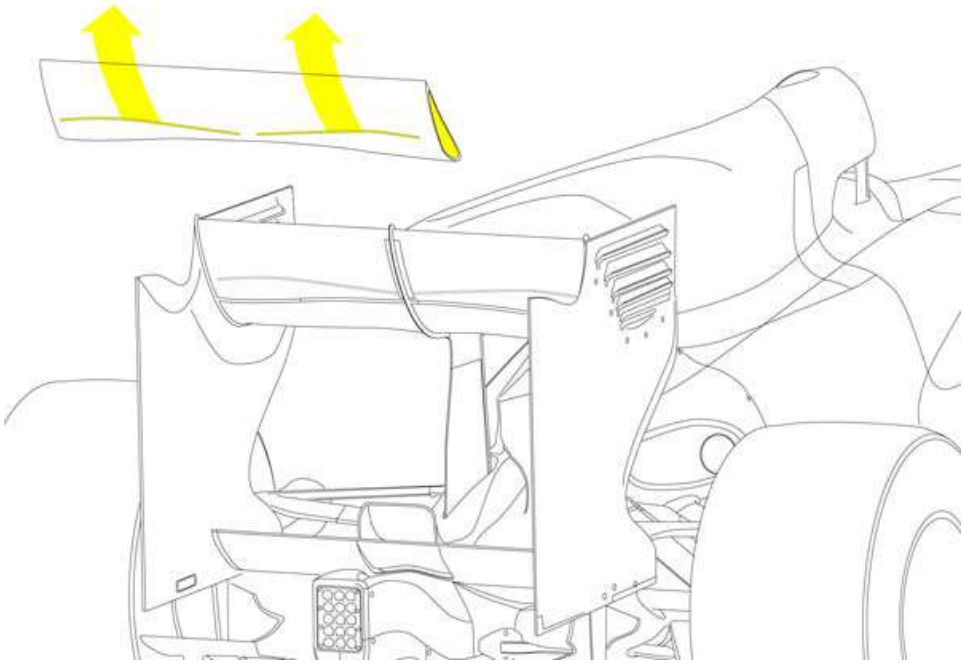
- By using the driver's leg to direct the flow, the regulations are not contravened regarding movable aerodynamic devices.
- By incorporating the design into the monocoque it becomes very difficult for other teams to copy the device, due to the fact monocoques have to be homologated and changes are very expensive to make.

Below are some images of the most probable routing for the system:

(Illustrations by Craig Scarborough)



Sketch of the Mclaren cockpit show a clear channel running alongside the driver.



Additional pair of slot gaps in the upper rear wing element are fed by airflow from the duct that exits from the ‘Shark Fin’ engine cover.

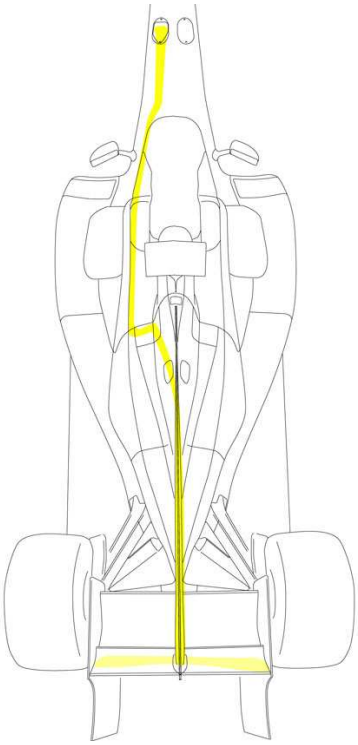


Illustration of the most likely routing for the duct.

Whilst the exact workings of the system are impossible to judge, the above explanation is the most likely. McLaren have managed to get a jump on their competition and a number of teams have already tested their own interpretations of the system, although whether these will integrate as efficiently with their existing aero packages remains to be seen.

F-Ducts were banned at the end of 2010 in favour of an adjustable rear wing

The above is from *Racecar Engineering* magazine
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## Smithsonian's National Air and Space Museum Launches New Podcast

"AirSpace," the Museum's new podcast, aims to tell the human stories of achievement, failure, and perseverance behind the famous machines in our collection. Each episode will demystify the world's most popular museum, and explore why people are so fascinated with stories of exploration, innovation, and discovery.

The first episode looks at how scientists have adapted to working on "Mars Time," and lets listeners explore what it takes to be a professional Martian without ever leaving our home planet.

Future stories will include the finer points of astro-gastronomy, how artists pick up where telescopes leave off, and why sitting quietly aboard a submarine for months on end may be a great simulation of a deep space mission. New episodes will be released each month. **Read about our hosts**.

The first episode is available now. Listeners can subscribe through Apple Podcasts and other podcast platforms, or **listen online**. **Read full press release**.

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## Future Exhibition Spotlight: *One World Connected*

*This describes feature one of the future exhibitions being created as part of the Museum in Washington, DC's complete reimagining.*

**Scheduled to Open January 2022**. Aviation and spaceflight transformed how Earth came to be viewed and understood as an interconnected world. *One World Connected* will tell the story of how flight fostered two momentous changes in everyday life: the ease in making connections across vast distances and a new perspective of Earth as humanity's home. Featuring an array of satellites, the exhibit will ask visitors to consider how global interconnection touches their lives

and to imagine how advances in technology might impact our future. Among the artifacts that will be on display in the gallery are the **Beech Bonanza** aircraft; the **Iridium communications satellite**; and the **Sirius FM-4 satellite**.

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## 2017 Local Aviation Event Schedule

***Reoccurring Events***

Chapter 1310 Meetings – 2nd Wednesday 7 PM April-October
2nd Saturday 10 AM November, January, February, March at Skylark Airport

Chapter 166 Meetings – Last Saturday of month 10:00 AM (Except July, Nov & Dec) at Hartford Jet Center, 20 Lindberg Drive, Hartford. http://166.eaachapter.org/

Chapter 27 Meetings – 3rd Sunday of month, 10 AM at Meriden Airport http://eaa27.org/

Chapter 324 Meetings 1st Wednesday of month, 7 PM Simsbury Airport
https://www.facebook.com/eaa324/

***Chapter 1310 Events***

| | | |
|---|---|---|
| **Saturday March 24** | **8:30 – 11:00 AM** | Pancake Breakfast |
| **Saturday April 28** | **9:00 AM** | Cleanup Day |
| **Saturday May 12** | | Spring Safety Seminar |
| **Saturday June 23** | **8:30 – 11:00 AM** | Pancake Breakfast |
| **Saturday July 21** | **8:30 – 11:00 AM** | Pancake Breakfast |
| **Saturday August 18** | **11:00 AM – 2:30 PM** | Corn Roast & Cookout |
| **Saturday September 15** | **9:00 AM – 1:00 PM** | Young Eagles Flights |
| **Saturday October 13** | | Fall Safety Seminar |
| **Saturday November 3** | **8:30 – 11:00 AM** | Pancake Breakfast |

**Other Aviation Events for 2018**

April 10 – 15 Sun'n Fun Fly-In, Lakeland Linder Regional Airport, Lakeland, FL
https://www.flysnf.org/
USAF Thunderbirds, DH-115 Vampire "Selene", MIG-17F - Randy Ball,
AeroShell Aerobatic Team, Team Aerostars, Dan Marcotte Ultimate Biplane,
Mike Goulian Extra 330SC

June 9 – 10 Rhode Island Open House and Air Show, Quonset State Airport, North Kingston, RI
USN Blue Angels
https:/www.rhodeislandairshow.com/

June 9 – 10 Old Rhinebeck Aerodrome, Rhinebeck, NY
Opening weekend http://www.oldrhinebeck.org

July 14-15 Galaxy Community Council Great New England Air Show
Featuring the USAF Thunderbirds, Westover ARB, Chicopee, MA
http://www.greatnewenglandairshow.com/

July 23 – 29 EAA AirVenture Oshkosh, Wittman Regional Airport, Oshkosh, WI
www.airventure.org

August 25 Plymouth Air Show, Plymouth Municipal Airport, Plymouth, MA
http://www.plymouthairshow.com/

September 15 – 16 New York Air Show, Stewart International Airport, Newburgh, NY
USAF Thunderbirds

***If you have a topic you would like to see covered in our monthly newsletter, please send a note to Paul at info@eaa1310.org***