The Bend High Desert Flyer of Chapter 1345

WEBSITE: http://1345.eaachapter.org/ *KBDN AWOS 134.425* **December 2015, VOL14, #12**

PREZ SEZ:

It's been a very good year! I wish everyone a great Christmas holiday season!

This month, we are meeting at the "Black Bear Diner" located on 3rd Street, Bend on Wednesday, December 9th. We will start gathering after 5:30. Dinner is off of their menu and yes they bill separately. Of course they have adult drinks so eat, drink and let's be merry!
Our chapter has invited EAA Chapter 617, Prineville, Central Oregon's Oregon Pilots Association as well as the 99's. So far we have about 36 RSVP's! If you want to join us or know anyone who you want to invite, contact me @ maxfly55@gmail.com

Chapter service awards are in hand but I'd like to publicly thank all of our officers and directors for all of your volunteer services! Without your dedication and involvement, we would not be here!

Charles Brown, VP
Jack Watson, Secretary/ Treasure
Dale Anderson, Young Eagles Coordinator
Mike Bond, Newsletter Editor
Henry Graham, Director
Members who are always available when things just need to be done.
A heartfelt "Thank You" to all!
I'll see you at the Black Bear!

Respectfully

Thomas Phy, *President*

Treasurer's Report

Financial: For period 01/1/15 to 11/30/15

TOTAL INCOME	$1055.69
TOTAL EXPENSE	$35.52
NET INCOME (loss)	$1019.98
TOTAL CASH IN BANK	**$2242.66**

Includes $390 IRS refund for 501C(7) to 501C(3) filing

Jack Watson, *Treasurer*

November Meeting Minutes

Minutes of a regular meeting of The Chapter held on November 11, 2015, at the Robertson Hangar at the Bend Municipal Airport.

ATTENDEES
There were some nine in attendance including: Charles Brown, Jack Watson, Henry Graham, Jim Mateski, Mike Bond, Bill Inman, Mike Pederson, Devan Simpkins & Dave Waltman

DINNER
Beginning at 6:00 pm, all in attendance participated in the consumption of Costco Pizza provided by Vice-President Brown @ the bargain price of $1.00 a slice.

MINUTES & TREASURER'S REPORT
As Minutes of the previous meeting as well as the Treasurer's report were published in the monthly Newsletter, a reading of both was dispensed with.

Minutes --continued

PROGRAM
The program for the evening called for viewing an aviation related video, yet the video projector was nowhere to be found so the program was abandoned in favor of a general bull session.

ANNOUNCEMENTS/GENERAL BULL SESSION
The general bull session began at 6:50 pm when the chair recognized Dave Waltman who announced that EAA Chapter 617 was hosting the Switchblade Group at their monthly meeting in Prineville on Saturday, November 14.

Charles Brown then announced that Christmas Valley had completed the addition of their new taxiway as well as the installation of 18 new tie downs and it is rumored that there will be a fuel installation in the not too distant future. He then recounted his service experience of a flight from the continental US to Europe in a Chinook Helicopter, equipped with a large fuel bladder in the cargo hold which also served as a most comfortable bed during the flight, until the point where fuel consumption resulted reducing the thickness of bladder to the point where they were sleeping on the metal deck!

Devan Simpkins then announced that he was presently a senior in High School and in the process of searching for a college with an aviation program that would equip him with the tools to seek a career in aviation.

ADJOURNMENT
With no further announcements, the meeting adjourned at 8:00 pm

Jack Watson, *Secretary/Treasurer*

Young Eagles

Happy winter everyone!

The RV-12 has completed its test period and it flies beautifully. Tom has invited anyone who worked on it to go for a flight in it. It's for sale, so don't wait to long.

The holiday get-together is Wednesday, Dec. 9, at 6 pm, at the Black Bear Diner located at 1465 NE 3rd St. in Bend.

It is a nice easy-going affair to mix and mingle with the EAA Chapter 1345 members, friends, and family. Food is ordered off the menu, whatever you prefer. Everyone/anyone is invited. Some EAA awards will be presented.

So far I have reserved space for Joey and parents and Bert and parents. Anyone else in the YES group ? Let me know and we will make sure space is available.

Thank you,
Dale

PS: The Sonex is signed-off (finished testing), so I'm just waiting for insurance.
Ya-hooo!!!!!

Dale Anderson

Sonja has done it … again!

First flight of her self-designed and built motor glider

Hi Tom,

Your video turned out well. I have edited it and posted the first flight video here:

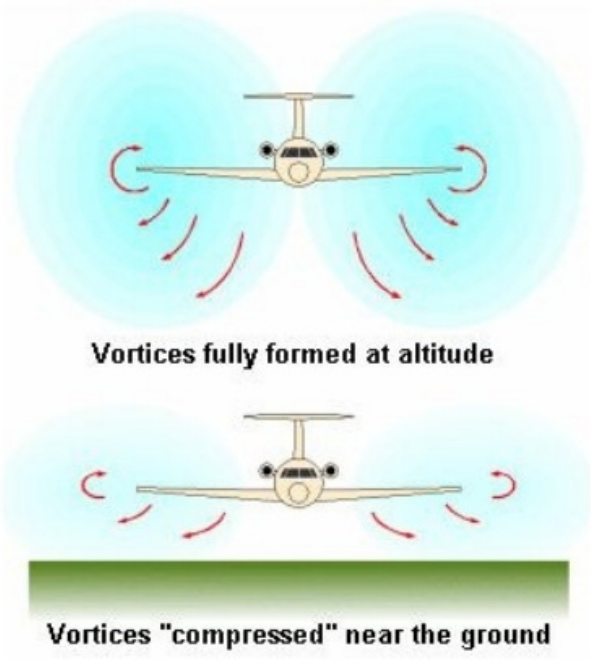
https://youtu.be/JNflcCR2MSw

I have added the description and some more pictures to my web site:
www.caro-engineering.com.
Please share it with the other EAA guys.
Thanks for your help with this.

Sonja

WIG vehicles

-- popularly known as Ground Effect Vehicles, or Wing in Ground (WIG) Effect Vehicles. are a class of craft that fly at altitudes on the order of tens of feet, or a few meters, taking advantage of the aerodynamic principle known as ground effect.
When producing lift, a wing generates strong swirling masses of air off both its wingtips. due to the lower pressure on its upper surface than on its lower surface. This difference in pressure creates lift, but the penalty is that the higher pressure flow beneath the wing tries to flow around the wingtip to the lower pressure region above the wing.
This motion creates a wingtip vortex. As the wing moves forward, this vortex remains, and therefore trails behind the wing. One vortex is created off each wingtip, and they spin in opposite directions
While trailing vortices are the price one must pay for generating lift, their primary effect is to deflect the flow behind the wing downward. This induced downwash component of velocity reduces the amount of lift produced by the wing. In order to make up for that lost lift, the wing must go to a higher angle of attack, which increases the induced drag generated by the wing.

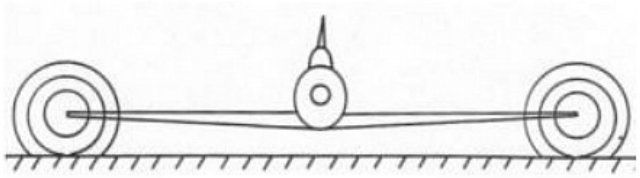


Vortices fully formed at altitude

Vortices "compressed" near the ground

When an aircraft flies very close to the ground, there is often a feeling of "floating" or "riding on a cushion of air" that forms between the wing and the ground. The effect of this behavior is to increase the lift of the wing and make it more difficult to land. However, there is no "cushion of air" holding the plane up and making it "float." In reality, what happens is that the ground partially blocks the trailing vortices and decreases the amount of downwash generated by the wing.

This reduction in downwash increases the effective angle of attack of the wing so that it creates more lift and less drag than it would otherwise. This is the phenomenon we call ground effect, as shown below.



Vortices "blocked" by the ground

Ground effect and its influence on trailing vortices

An additional bonus of ground effect that becomes more significant as speed increases is called ram pressure. As the distance between the wing and ground decreases, the incoming air is "rammed" in between the two surfaces and becomes more compressed. This increases the pressure on the lower surface of the wing to create additional lift.
As might be expected, the impact of ground effect increases the closer to the ground that a wing operates. Ground effect typically does not exist when a plane operates more than one wingspan above the surface. At an altitude of 1/10 wingspan, however, induced drag is decreased by half.

When all of these benefits are taken into account, we find that a vehicle operating in ground effect has the potential to be much more efficient than an aircraft operating at high altitude. The aerodynamic efficiency of an aircraft is expressed as the lift-to-drag ratio, or L/D. In steady, level, non-accelerating flight, a plane's lift is equal to its weight, and the amount of thrust required is equal to the drag it produces. Therefore, the L/D ratio is a measure of the weight that can be carried for a given amount of thrust. The higher the L/D, the more efficient the vehicle. Typical L/D values for conventional, subsonic aircraft are on the order of 15 to 20. By comparison, a ground effect vehicle could, in theory, achieve L/D ratios closer to 25 or 30.

Though ground effect has been known since the early days of flight, most pilots regarded it as nothing more than a nuisance that changed the flying qualities of their aircraft during takeoff and landing. Nevertheless, many researchers soon realized that this phenomenon could be exploited to create a new class of highly efficient craft known as WIG vehicles. Most of the pioneering research into these vehicles was performed in West Germany and the Soviet Union. Perhaps the most successful researcher in this field was Rostislav Alexeiev, head of the Central Hydrofoil Design Bureau in the Soviet Union from the 1950s through the early 1970s. Alexeiev began his career developing hydrofoils, which are boats fitted with underwater wings. When the boat moves, these wing create lift that pulls the boat hull up and out of the water and allows the craft to cruise at higher speeds.

But Alexeiev quickly realized that a hydrofoil can only go so fast due to the drag created by the dense water through which it "flies." Why not instead raise the entire vehicle out of the water and cruise at even higher speeds, he reasoned. This line of thought led to a new vehicle with wings above the surface of the water, a vehicle the size of a boat and able to carry a massive payload but able to cruise at the speed of an aircraft. Another advantage of such a vehicle would be the ability to fly at very low altitudes, below the detection range of enemy radar.

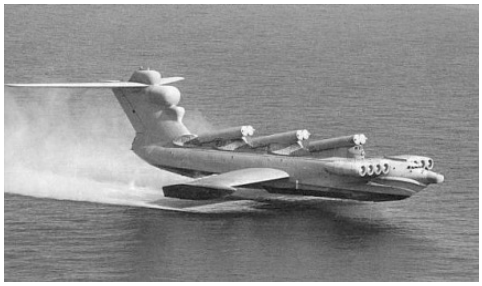
Alexeiev dubbed this new class of vehicle the Ekranoplan, which is Russian for "screen plane." His early designs were numbered under the SM series, an acronym standing for Samorodnaya Model, meaning "self sustained craft." Alexeiev developed a number of sub-scale designs in experimental tests that culminated in 1965 with the completion of the KM , the largest WIG vehicle ever built. Making its first flight on 18 October 1966, the KM was powered by a whopping 10 turbojet engines and weighed up to 540 tons. Eight of the engines were mounted near the vehicle's nose so that their thrust could be deflected underneath the wing to create an initial cushion of air that raised the KM out of the water.

Once the craft was traveling fast enough that the wings generated sufficient lift to keep the vehicle above the water, the thrust was redirected aft to increase velocity.

KM Ekranoplan

The KM was modified numerous times to evaluate the effects of different design elements. These changes included varying the wingspan from 105 ft (32 m) to 131 ft (40 m) and increasing the fuselage length from 302 ft (92 m) to 347 ft (106 m).

The KM, also dubbed the Caspian Sea Monster by American observers who spotted the craft in satellite surveillance, remained in use until 1980 when it crashed during takeoff. Although Alexeiev passed away in 1980, his design bureau continued to build and test Ekranoplans until the collapse of the Soviet Union. One of the more successful concepts was the Lun, which began trials on the Caspian Sea in 1987.



The Lun was of similar design to the KM but smaller and built to carry anti-ship cruise missiles for high-speed attacks against American carrier battle groups. However, the changing political tide and struggling economy in the Soviet Union caused the Ekranoplan concept to fall out of favor, and a second Lun was never completed.

The Alexeiev Design Bureau remains in operation and continues to propose new designs for civilian use, but the market has not yet developed.

Nevertheless, Boeing has taken interest in the WIG phenomenon and proposed a concept for a massive craft to meet a US Army need for a long-range heavy transport. Called the Pelican, the 500 ft (153 m) span vehicle would carry up to 2,800,000 lb (1,270,060 kg) of cargo while cruising as low as 20 ft (6 m) over water or up to 20,000 ft (6,100 m) over land. Unlike the Soviet concepts, the Pelican would not operate from water, but from conventional runways using a series of 76 wheels as landing gear.

Boeing Pelican ground effect vehicle

Unfortunately, most of the improvements in efficiency that make a large WIG vehicle attractive do not translate as well across the spectrum to their smaller cousins. The same reductions in induced drag and the ability to lift a given payload with a smaller wing still apply, but the benefits are not as pronounced.

While a craft operating close to the ground experiences a reduction in induced drag, other forms of drag are increased. Most importantly, WIG vehicles experience greater skin friction drag simply because the air is denser at sea level than it is at high altitude. A large vehicle can tolerate this increase because the decrease in induced drag is far more significant. But for a small vehicle, the decrease in induced drag and increase in skin friction drag are more equal, so only marginal improvements in overall efficiency are possible. Furthermore, the increased drag created by denser air at low altitudes limits maximum speed, so a WIG craft will take more time to travel a given distance than a comparable aircraft operating at high altitude.

Would You Like to Be a Pilot? Have You Dreamed of Flying an Airplane?

EAA Chapter 1345 High Desert Flyers

Young Eagles Flights

What: Kids ages 8-17 fly for free to learn about being a pilot. You can learn more at this link: http://www.1345.eaachapter.org/youngeagles.htm

When: Saturday, June 13 from 8am to noon, weather pending

Where: Bend Municipal Airport, Gibson Air Service (Red Hangar)

What to bring: a parent or guardian to register/sign registration form

Contact: *Dale Anderson at 607-591-1714 or daleanderson779@gmail.com*

2015 CHAPTER BOARD:

President	Tom Phy	541-306-1500
	maxfly55@gmail.com	
Vice-president	Charles Brown	541-576-4912
	cbshomebiz@gmail.com	
Secretary	Jack Watson	541-408-5614
	jswatson30@cs.com	
Treasurer:	Jack Watson	541-408-5614
	jswatson30@cs.com	
Young Eagles Coordinator	Dale Anderson	607-591-1714
	daleanderson779@gmail.com	
Newsletter Ed.	Mike Bond	541-317-8443
	mvbond@q.com	