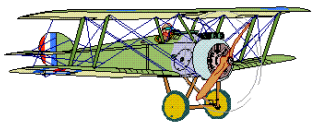
www.rocketcityrc.com



THE RCRC NEWSLETTER

ROCKET CITY RADIO CONTROLLERS, INC. HUNTSVILLE ALABAMA

AMA SINCE 1936

... an AMA Award of Excellence Club!

Proudly serving the Huntsville community at the Captain Trey Wilbourn Model Airplane Field..

P. O. Box 2163 **Huntsville, AL** **November, 2011**

Officers		
President Peter Wick		256.883.7571
Vice President James Fowler		256.882.1784
Secretary Tony Coberly		256.882.7193
Treasurer Wayne Gladden		256.881.6048
Newsletter Editor Mike Norton		256.653.6632
Committee Chairs		
Field John Williams		256.656.9499
Programs James Fowler		256.882.1784
Publicity Bill Mitchell		256.650.5181
Safety Wayne Gladden (Chair)		256.881.6048
Web Editor Jerry Poplin		256.883.7588
Flight Instructors		
Tony Coberly	By App	256.882.7193
Rick Grim	By App	256.656.0859
Pete Wick	By App	256.883.7571
Bill Mitchell	By App	256.650.5181

Prez Sez

Ok people. This is the last Pres Sez that I will be writing since the new election for the board is this month. I am writing this on the eve of Daylight Savings Time and I must say that I get jet lag each time the time changes! I hope that Bob Walls' Toys for Tots Fly-in went well today. While I was unable to attend, I was there in spirit.

Please do not forget the Pylon Race on the 19th of November. I plan to be there too.

Be sure to attend the November meeting and elect your new board.

The field is looking good for the beginning of the winter flying season. The field chairman tells me that he had to have 7 or 8 frequency pins replaced due to loss and/or damage at a cost to the club of over $50. If you inadvertently take one home after flying, please remember to bring it back.

It has been a privilege to serve as president of the club for the past year. Successes I have had, such as they are, are largely due to the hard work of the board I had to work with. Many thanks to Jim, Wayne, Mike, John and Tony!!

Our new web master is Tom Southerland and he is now changing the web site with some new ideas.

See you at the field,

Peter Wick .

Minutes of the October 2011 Membership Meeting

The President called the meeting to order @ 7pm on Oct. 18, 2011. There was not a quorum or 20% of the voting members present including the Pres., VP, Treas., and News Letter Editor.

There was one guest present who indicated his interest was helicopters. He had recently transferred to Huntsville from San Diego.

The acting secretary indicated there was one correction to the September. Meeting Minutes. This was that "CD" needed to be changed to "TR" or treasurer. This was accepted and the Sept. Minutes were approved as modified.

The Treasurer's report was read and accepted as read. The Floor stated the Coke machine was not giving change as required and the Pepsis were out of date. The treasurer will examine this and will take corrective action.

The President. and Floor discussed asking Tom Sutherland (next year's Web Editor) to give a presentation and answer questions about the Web site. The president indicated He would follow up on this suggestion.

There was not a Program Report. Field reported the roof problem on the north side of the pit area had been repaired by the efforts of the President, Field Chairman, and Paul Webb. During the Publicity Report discussion it was suggested by the Floor that attempts should be made to publicize the "Toys for Tots" event the first weekend in November. The Vice Pres. indicated He would discuss this with Bill Mitchell (publicity chairman).

There was no Safety Report. There was no Old Business Report. The only New Business discussed was the "Toys for Tots" event. The Floor and Board would appreciate any publicity and want to insure that the U.S. Marines are included.

Door prizes were handed out.

The Program was an excellent presentation of lift factors representative of low Reynold numbers- in this case model aircraft by Basil Cooper.I think we all learned something new about angles of attack and airfoils. Thanks, Basil.

The meeting was adjourned at 8PM.

Minutes of the November 2011 Board of Directors Meeting.

The board meeting was called to order on November 1st at 6:00. The president, vice president, treasurer, and newsletter editor were present.

The members who acted improperly at the pattern meet were made to sit out for 30 days. Letters were sent to them with return receipt requested.

SWADA now knows an official number.

The pattern event will be held next year during the 3rd week in September.

The field chairman straightened our roof.

Tom Sutherland has agreed to take the web editor job.

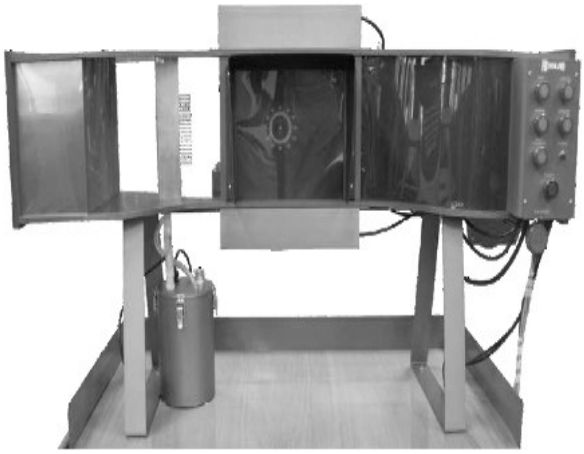
The board meeting was adjourned.

Flow Visualization

When I was a teenager, I was very interested in aerodynamics and read every book and magazine article that I could get a hold of that explained why airplanes fly. After high school, I went off to college to study aeronautical engineering. As I got into my studies, I began to realize that virtually everything that I had learned prior to that time was just plain wrong. I had to unlearn a whole bunch of stuff and learn the correct explanations of what was actually happening. Now than I am in a practicing aerospace engineer, I often read articles in magazines and even in the newspapers trying to explain aerodynamic lift and these explanations are almost always completely wrong. I decided to put together this write up on aerodynamic lift to try to correct some of the wrong impressions given by the various media and to try to do it in a way that does not confuse people with complex differential equations or require a knowledge of physics and chemistry. One of the things that I realized was that the

explanations that one comes across have been greatly simplified in order to avoid complex mathematics and the problem lies in the simplifications that people use to describe aerodynamic flow. For example, the equation describing the Bernoulli principle is actually an equation in three dimensions that not only involves airflow but also heat transfer and viscous flow effects; but most people only see a very simplified one-dimensional version of it. The complete equations can be difficult to solve and often require very large high-speed computers to solve complex flows. Someone writing a magazine article will probably not want to go into that kind of detail especially when perhaps only 1% of his readers would really understand what he was talking about. The author therefore simplifies things and, in so doing, creates more misinformation than correct information. In order to avoid the issue of trying to simplify something that is in fact quite complicated, I have decided that the best way to demonstrate the principles of lift is to actually show the airflow around an airfoil.

One of the earliest ways used to visualize the airflow over a body is what is known as a smoke tunnel. A smoke tunnel is a wind tunnel in which small diameter tubes are placed in the flow upstream of the model. These tubes allow the injection of a smoke fluid into the airflow. The injected smoke then travels with the air over and around the body under investigation. The experimenter can then see what the actual flow looks like and that makes understanding the flow process much easier. The first figure shows a typical smoke tunnel layout, including the tubes for ingesting the smoke.



The second figure shows the typical diagram of flow over an airfoil. This is what we often see in the magazines and newspaper articles.

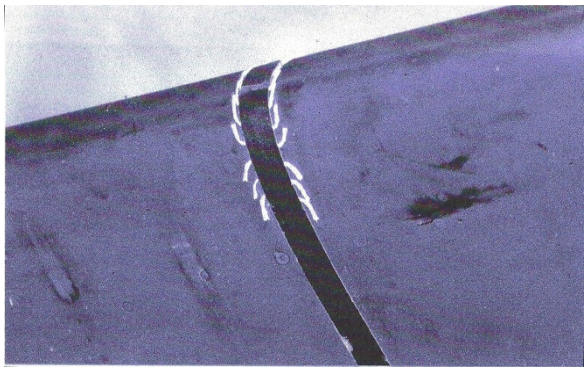
We are often told that the airflow divides at the most forward point of the airfoil and meets again at the trailing edge. We are also told that the air traveling over the bottom of the airfoil takes the same amount of time to get to the trailing edge as does the air traveling over the top of the airfoil. Supposedly the longer path taken by the air over the top versus the air over the bottom meant that the air over the top had to travel faster than the air moving over the bottom. The problem with this is that, if the explanation was correct, a symmetric airfoil could produce no lift because the paths above the airfoil and below the airfoil would always be the same length.

The third figure is a picture from a smoke tunnel showing the actual flow over an airfoil.

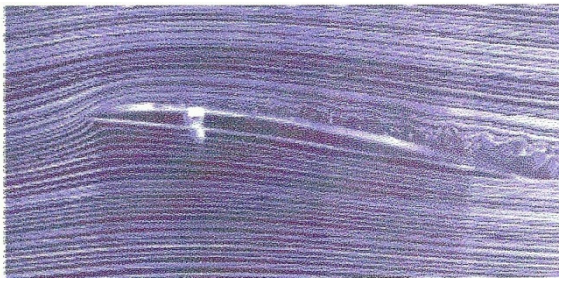
This figure reveals important information about flow over an airfoil (in this case a symmetric airfoil). In the test shown in this picture, extra puffs of smoke were periodically put into the tunnel and, by observing how these puffs flowed downstream, one can get a good idea of the speed of the air flow. One should notice that at the very left hand side of the picture all of

the smoke pulses are generally in line vertically. This means that all of the flow arrives at the left side of the picture at about the same time. But notice the puffs near the center of the figure. The puffs above the wing are much further downstream than are the puffs below the wing. Notice also the puffs on the right hand side of the figure. The puffs above the airfoil are well past the trailing edge of the airfoil while the puffs under the airfoil are just barely past the trailing edge. This shows that, not only does the air flow faster over the upper surface of the wing than it does over the lower surface of the wing, but that it also does not meet at the trailing edge at the same time. The idea that the air traveling over the wing takes the same length of time to travel from the leading edge to the trailing edge as does the air traveling under the wing is a misconception that one often reads when going through the popular literature. Notice also the sixth streamline up from the bottom of the picture. This streamline actually goes all of the way to the surface of the airfoil. This type of streamline we often call a dividing streamline because this is the streamline where the flow above the streamline goes over the wing and the flow below the streamline goes under the wing. You'll notice that the streamline does not go to the leading edge of the airfoil. Instead it goes to a location slightly below the leading edge of the airfoil. This shows that, even for a symmetrical airfoil, the airflow over the wing travels a longer path in less time than does the airflow under the wing. The Bernoulli principle states that this increased airspeed over the top of the airfoil results in lower pressure on the top of the wing versus the pressure under the wing. It is this difference in pressure between the top and bottom of the airfoil that is the source of the aerodynamic lift.

The fourth figure shows the results of a wind tunnel test of a model of a Boeing 737 wing in which tufts have been taped to the wing in order to show the direction of the airflow just above the surface. You can see that, after a certain point on the underside of the wing, all of the tufts point to the rear; but, ahead of that point, all of the tufts point forward indicating that the flow stagnates in that section of the wing and some of the flow and then goes forward and around the leading edge of the wing and the rest of flow goes to the trailing edge of the wing.

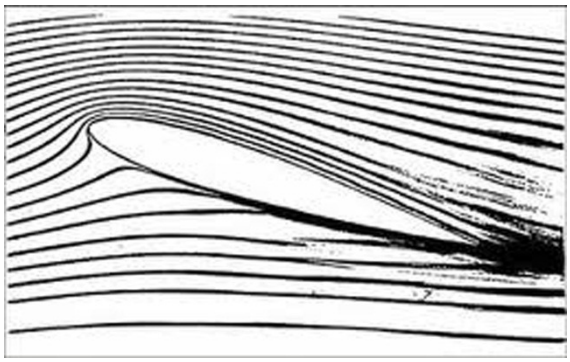


The fifth photo shows a very thin airfoil at an angle of attack of 8°.



You can see that the dividing streamline comes in contact with the airfoil aft of the leading edge.

The last figure shows an airfoil at a high angle of attack.



You can see that, even at a high angle of attack, the flow going over the top of an airfoil does not originate at the most forward part of the airfoil but, instead, somewhat aft of and below that point.

This page intentionally left blank

Rocket City Radio Controllers
P. O. Box 2163
Huntsville, AL 35804

To:

_____

AMA chartered
club since 1964
Number 715

October, 2011

2011 RCRC Event Schedule

RCRC membership meeting – November 16th at 7:00 PM
Board meeting – December 6th at 6:00 PM

†	November 5th & 6th	All day	Toys for tots	Bob walls	256.830.2352
†	November 19th	All day	Pylon race, Chili cookoff	Alan Berard	256.776.9509

Events held at Wilbourn Field unless noted otherwise
† Field closed to non-participants during this event
‡ Field closed to non-participants from noon onward on the Friday before the event