HOMEBUILT VORTELATOR KIT BY AD
FLY FASTER AND USE LESS GAS

Aircraft Development has developed a vortelator kit that can ***INCREASE YOUR HOMEBUILT AIRCRAFT SPEED BY 4 TO 7.5 MPH***. This is accomplished by placing vortelators at certain critical locations which will cause the boundary layer to stay attached to flying surfaces for a greater distance, and to keep the boundary layer thinner. The net result of these two actions is that it reduces both the profile drag and skin friction drag components of the parasite drag. Another way to think of it is that the wake behind the aircraft will be smaller, thus requiring less horsepower to propel the aircraft through the air. Figure 1 below shows how this is accomplished. Figure 1 shows the flow of black motor oil on a lift strut, with a short strip of Aircraft Development's vortelator attached, during a flight test. Notice that behind the vortelator mini vortices are created as can be seen by the lines of oil that form behind the vortelator. These mini vortices sweep the oil to a point in between the mini vortices, and that's how the oil lines are formed. Whenever one sees these characteristic oil lines forming behind the vortelator one knows the vortelator is working. The vortelator allows the air flow to stay attached to the lift strut for approximately 80% of the lift strut's chord. In the area where there is no vortelator, the air flow separates from the lift strut and becomes turbulent, at approximately 40% of the lift strut's chord, as can be seen from the pile up of oil at the 40% chord position. At the 40% chord position the lift strut is 2.01" thick, and at the 80% chord position the lift strut is 1.18" thick. That means the turbulent wake coming off the lift strut is only 59% as thick with the vortelator attached as without the vortelator attached. That also means with a narrower wake less horsepower is required to propel the lift strut through the air.

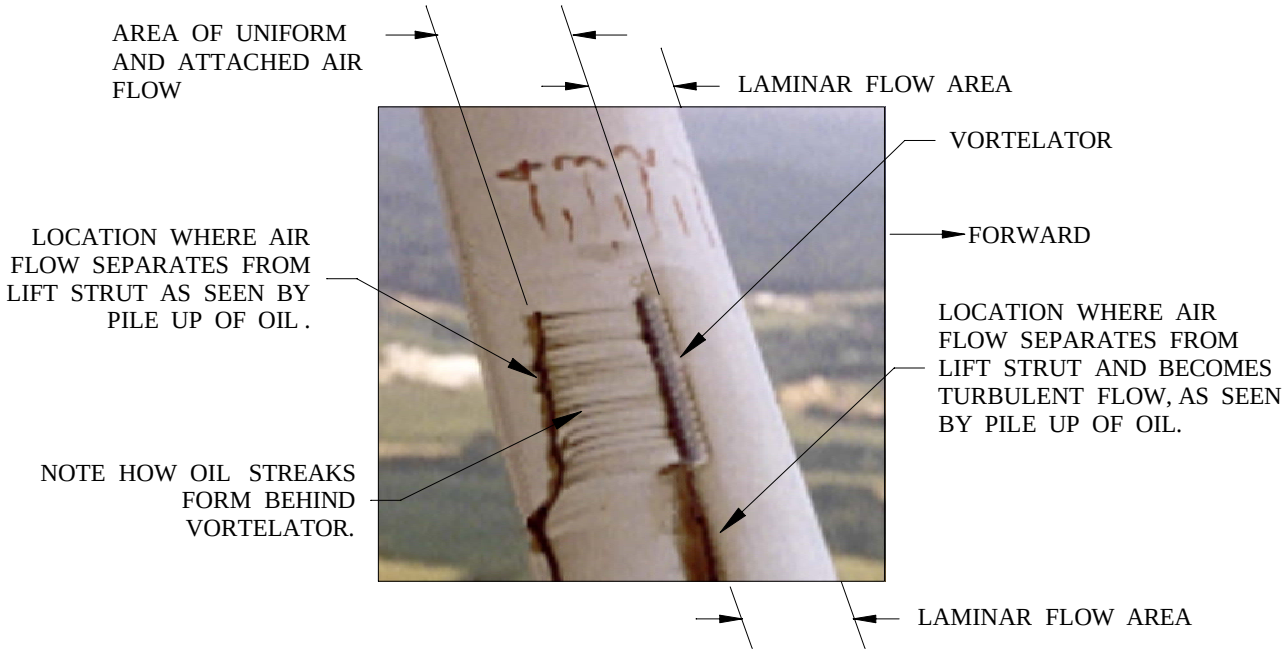

Fig. 1

Figure 2 shows how the oil flow behind short strips of vortelator are uniform until they come in contact with the first sheet metal seam at which point the uniform boundary layer is destroyed. That means the air flow is laminar until it reaches the first sheet metal seam at which point it becomes turbulent high drag airflow. Figure 3 shows that when a vortelator is placed immediately behind a sheet metal seam it reattaches the boundary layer as a uniform flow. This can be seen by the oil lines that form behind the vortelator.

Fig. 2

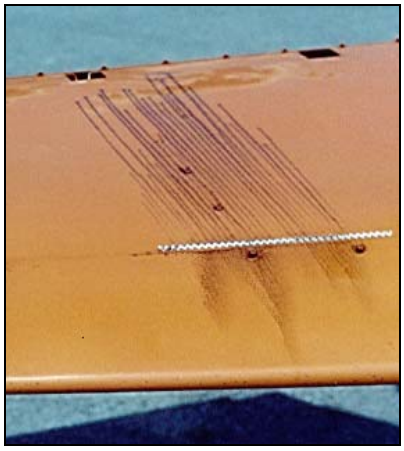

Fig. 3

Fig. 4

Figure 4 shows a short strip of vortelator on a wing with no sheet metal seams. It can be seen from the oil lines behind the vortelator that the air behind the vortelator is uniform and attached all the way to the leading edge of the flap. It can also be seen by the oil flow thickening, that where there is no vortelator the air separates and becomes turbulent well ahead of the leading edge of the flap, thus increasing the aircraft's drag. Installing the vortelator kit gives one the advantage of being able to use less gas by arriving at one's destination sooner, by using the same power setting as previously used before the vortelator kit was installed. Or one can throttle back and fly at the previous cruising speed, before the kit was installed, and even save a greater amount of gas. We believe this kit can help pay for itself in gas savings over a period of time. And to help you do that we have published a booklet you can purchase called, FLY TO USE LESS FUEL. This booklet explains the working speeds of the aircraft such as, speed of most flight time per gallon of fuel, speed of most miles per gallon of fuel, speed of steepest climb etc. It explains these working speeds of the aircraft in simple to understand graphics, no complicated mathematical formulas used. And what's even better there's no need to do a time consuming flight test program to determine the working speeds of your aircraft. This booklet gives simple multiplication factors, based on cruising speed, to determine the working speeds for your homebuilt aircraft.

The vortelator kit 254-2/AD contains a 100 foot roll of vortelator, more than enough for most homebuilts, plus clear instructions with pictures on how to determine where to, and how to, place the vortelators to increase your aircraft's speed. Kit 254-2/AD is intended for those individuals that want to take advantage of the benefits that vortelator kits afford their aircraft. And for which Aircraft Development will not develop kits for because their specific model aircraft do not have enough units out in the field to warrant the expense and time to develop vortelator kits. Aircraft Development is in the process of developing vortelator kits for the more popular homebuilt aircraft. For the current status of available kits see table 1. All kits developed for specific model homebuilt aircraft also contain clear instructions and a 100 foot roll of vortelator.

Though it's not a requirement for homebuilt aircraft these vortelators are FAA STC'd and manufactured under a FAA PMA because they are also approved for certified aircraft. That means you get the benefit of FAA certified aircraft parts. The cost of the booklet 120-1 "Fly to use less fuel" $ 10.00.

Aircraft Development has striven to bring these kits to market at a price that is fair and equitable to the customer in the homebuilt field. To show the value of these kits we give an example of a kit that is probably the most popular kit in the homebuilt field the RV6 series. The owner of a RV6A aircraft spent $42,000.00 and took 2,500 hours to build his aircraft. This particular aircraft had a speed of 153 MPH at 2,500 rpm.

Cost per MPH is 42,000 / 153 = $274.51 per MPH
Hours of labor per MPH is 2,500 / 153 = 16.34 hours per MPH.

The vortelator kit for the RV6A cost $XXX.XX and takes about 8 hours to install on the aircraft. Between the decrease in stall speed and the increase in the aircraft's speed one gets about 7 MPH or more of additional MPH usage.

Cost per MPH will average about $35.00 per MPH.
Hours of labor per MPH will average about 1.00 hour per MPH.

TABLE 1

KIT STATUS	KIT NUMBER	DESCRIPTION OR EFFECT OF INSTALLING VORTELATOR KIT
A	254-AD	Delineates a procedure for determining where vortelators should be placed on an aircraft, for increased speed, by visualizing surface air flow through simple flight tests at straight and level flight at cruising speed. This kit is ideal for those aircraft models that do not have enough aircraft out in the field for Aircraft Development to economically warrant the time and expense of developing kits for.
A A A A A	254-RV3 254-RV4 254-RV6/6A 254-RV7/7A 254-RV8/8A	The vortelating of the airframes of these RV aircraft will give about a 4 to 5 MPH increase in speed and a decrease in the stalling of about 2 MPH. The vortelating of the propellers of these aircraft is more random in nature. From flight tests the increase in speed can be from 2 to 4 MPH depending on the propeller used.
A	254-LANCAIR	The vortelating of the airframes of the Lancair 235, 320, 360 aircraft will give about a 4 to 5 MPH increase in speed. The vortelating of propellers of these aircraft is more random in nature. From flight tests the increase in speed can be from 2 to 4 MPH depending on the propeller used.
A	254-T18	The vortelating of the airframes of the T-18 aircraft will give about a 4 to 5 MPH increase in speed. The vortelating of propellers of the aircraft is more random in nature. From flight tests the increase in speed can be from 2 to 4 MPH depending on the propeller used.
C	254-GLASAIR	

A = Kit available. B = Kit currently being developed. C = Kit planned for development.