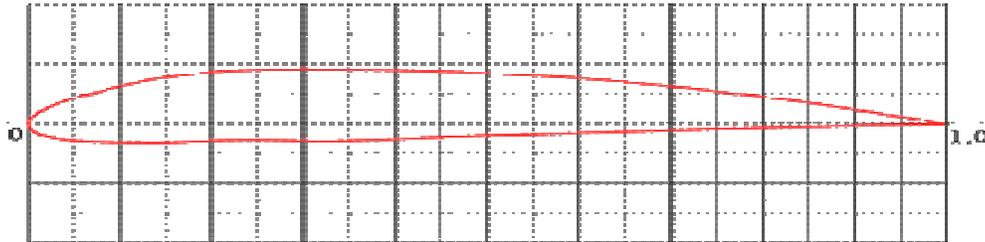


The Man Behind the Clark 'Y' Airfoil

Ron Peterka

Clark Y



Model builders owe a debt of gratitude to the fellow who designed the ubiquitous Clark 'Y' airfoil. This airfoil is simple, provides predictable lift at reasonable drag, and has a 'soft' stall reaction with easy recovery. It has enough depth for strong main and rear spars for a robust structure that handles 'G' loads well.

It is easy to build straight and un-warped with 70% of the bottom surface flat and easy to mount on an airframe. Mounted flat relative to the thrust line it provides about 2 degrees of actual incidence for good lift and low drag. The airfoil can be accurately drawn from coordinates (calculus) or simply TLAR (that looks about right) and gets similar performance if the high point of the airfoil is set at about 27 % of chord length and thickness at around 10 - 12% of chord. A generous leading edge radius gets soft stalls, a small LE radius provides a sharper stall.

The man we can thank for the Clark Y airfoil is **Virginus E. Clark**. He was born in 1886 and passed away in 1948. He designed the Clark Y in 1922 and that airfoil has been used in a huge number of commercial, military, and amateur built aircraft since its inception. He was no one-shot genius.

His book "**Elements of Aviation : An Explanation of Flight Principles**" copyrighted in 1928 is a scholarly treatise on aviation as it was known at that time of explosive research and invention in aviation known as "the Golden Age". In this book Clark described exactly how a wing develops lift during flight. His description correctly gives Bernoulli's principle the slight part it plays in developing lift and correctly describes the affect of Newton's Laws of Motion creating lift by changing the direction of airflow over an airfoil to create "downwash".

For some unknown reason the idea that Bernoulli's principle was the primary cause of an airfoil developing lift was accepted and it has only recently Clark's description has been proven, again, to be correct. The most widely used book to

teach pilots, "Modern Airmanship" published originally in 1957 and reprinted in 1966 taught the Bernoulli concept. The FAA in it's A & P teaching manuals printed in the 1970's uses the Bernoulli principle to describe lift from an airfoil.

Clark's affect on aviation didn't end with his book, or his airfoil design. He also paired with Howard Hughes to develop the "Duromold" moulded plywood process for Hughes' aircraft company. The process was used in the construction of the Hughes flying boat, the "Spruce Goose".

Clark's book is available on-line at -
[HTTP://babel.hathitrust.org/cgi/pt?...:num=198](http://babel.hathitrust.org/cgi/pt?...:num=198)