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111 Second 1 2A Fubar 600 - Directional Stability Evaluation for CG Location

1 message

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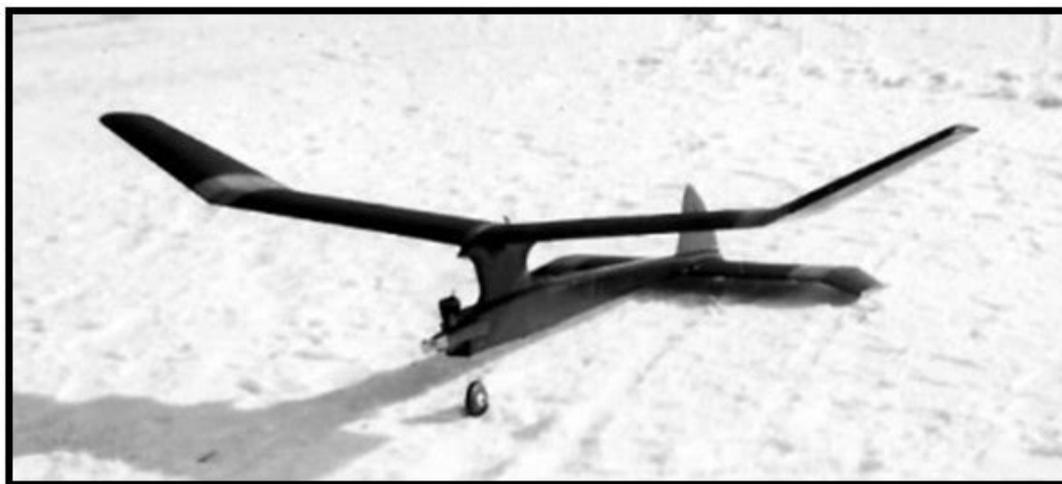
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*Second 1/2A Fubar 600**June 24, 2020*

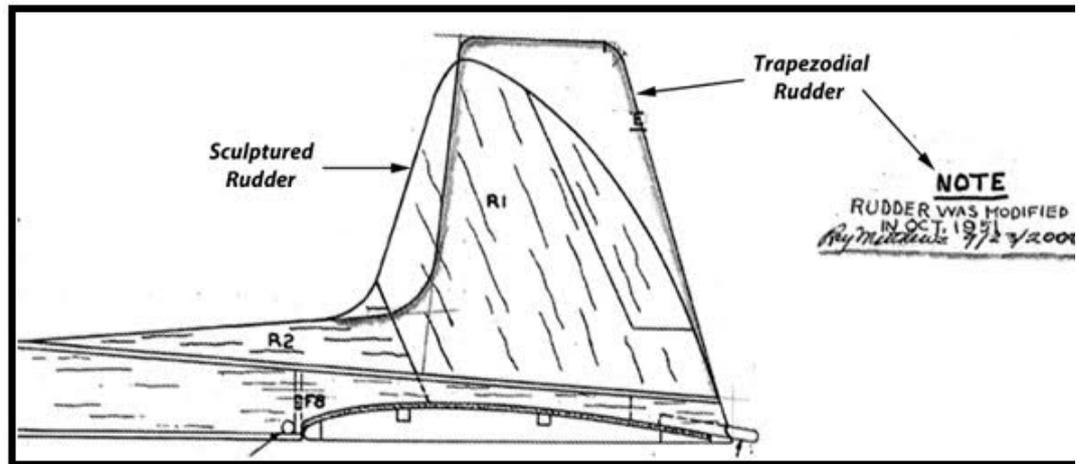
History Behind the two Fubar Vertical Tail Designs

Ray Matthews competed his new competitive design of the 65 inch Fubar and built the first on January of 1948.



The Fubar design was characterized by three distinct features: (1) the sculptured vertical tail, (2) the stab's turned down tips for takeoff with a mono-wheel, and (3) the signature color scheme of yellow fuselage, wing, and tail with black insets trimmed at the wing's polyhedral breaks in the horizontal tail just before the tips turn down. All three of these features can be seen in the image above.

Ray designed the 36 inch Fubar around the Torp .049 for the Half-A competition in 1950 to be very competitive. However to resolve a flight issue, Ray changed the design of the sculptured vertical tail. He introduced an improved trapezoidal design shown below in October of 1951 as Ray's note below indicates. Ray also incorporated the trapezoidal vertical tail in his later Fubar designs. Only Fubar's with sculptured vertical tails are legal for SAM competition due to the SAM design rules established in December 1950.



Fubar Directional Stability

The methods Dr. Sergio Montes provided for calculating the model's Longitudinal and Directional Stability was presented by Dr. Mark Drela (PhD MIT aerodynamicist), in two papers: (1) "Lab 8 Aircraft Design Rules" and (2) "Basic sizing checks for homebrew RC thermal gliders". While our models are not absolute gliders, once the power is stopped they behave as gliders so Dr. Drela's

The 1/2A Fubar 600 has been balanced at a point 1.8 inches forward of the wing's trailing edge at maiden flight which corresponds to a $CG = 80.77\%$ root chord. Alfredo Herbon added the 1/2A vertical tail area-moment geometry to the figure below using his ACDC program. This geometry assesses the directional stability provided by the 1/2A Fubar 600 sculptured vertical tail.

+/-10.5° for low rate in Report No. 106.....Tandy