

DocumentID	241353
Vortragstitel	Box Wing Fundamentals - an Aircraft Design Perspective
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Preisträger	
Vortragssprache	englisch
Seiten	15
Veranstaltung	Deutscher Luft- und Raumfahrtkongress 2011
Veranstaltungsort	Bremen
Veröffentlicht in	Deutscher Luft- und Raumfahrtkongress, Tagungsband - Manuskripte, 2011; Seite 601 - 616; DGLR e.V.; Bonn; 2011
Stichwörter	Box Wing Aircraft Design
Abstract	<p>A systematic and general investigation about box wing aircraft is conducted, including aerodynamic and performance characteristics. The design of a promising medium range box wing aircraft based on the Airbus A320 taken as reference aircraft is performed. The design is taken through the general steps in aircraft preliminary design. The fuel consumption of the final aircraft is 9 % lower than that of the reference aircraft. The aircraft layout is well balanced regarding the position of the center of gravity and the travel of the center of gravity is minimized. This is necessary due to the aircraft's particular characteristics concerning static longitudinal stability and controllability. The low wing tank capacity requires an additional fuselage tank. Because of its high span efficiency the aircraft has a glide ratio of 20,4. Its wing is about twice as heavy as the reference wing. This is partly compensated by a lighter fuselage.</p>