

Conceptual Design and Aerodynamic Study of Joined-Wing Business Jet Aircraft.

ABSTRACT

The concept of joined-wing aircraft with nonplanar wings as conceived and patented by Wolkovitch is attractive due to various advantages such as light weight, high stiffness, low induced drag, high trimmed CL_{max} , reduced wetted area and parasite drag and good stability and control, which have been supported by independent analyses, design studies and wind tunnel tests. With such foreseen advantages the present work is carried out to design joined-wing business-jet aircraft and study and investigate its advantages and benefits as compared to the current available conventional business jet of similar size, passenger and payload capacity. In particular, the work searches for a conceptual design of joined-wing configured business-jet aircraft that possesses more superior characteristics and better aerodynamic performance in terms of increased lift and reduced drag, and lighter than the conventional business jet of similar size. Another significant objective of this work is to prove that the added rigidity possessed by the joined wing configuration can contribute to weight reduction.

Keyword: Aircraft conceptual design; aerodynamic design; joined wing; box wing