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CC blowing to add range with STOL capability to a Cessna 310

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Turbocharged propeller aircraft like the: Cessna 310; Beechcraft Bonanza and Cessna Cardinal, all have a wing area which is about 30% larger then is optimum for maximum range, when cruising at 20,000 ft altitude, which is the limit for turbocharged piston engines. The reason is that FAA- FAR 23,49 (a)(6), requires that all propeller driven aircraft, weighing less than 6600 lbs, must have a stall speed of no more than 62 knots (71.3 mph), in order to assure safe landing and takeoff, from airports with only a 2500 feet long runway. This FAR 23, 49 does not apply to Jet Airliners. As they begin to cruise efficiently at 30,000 ft for maximum range, at _{CLoptimum}=0.6. As the weight of the aircraft reduces with fuel usage, it must climb, to higher altitudes, to maximize range by flying at its most efficient wing lift coefficient: CL=0.6. Due to turbocharger limitations, propeller driven aircraft are limited in climb to a cruise altitude of 21,000 ft. Therefore, the large wing area Cessna 310 is equipped with flaps, which can be deflected to 45°, to provide CL up to 2.6, which enables take-off and landing on a 2500 ft runway. Such an excess wing area is not fuel efficient for cruise at 20,000 ft altitude. This paper describes a solution to this problem, which is to incorporate: an in flight deployable and retractable: "Circulation Controlled, blown round trailing edge." To provide the extra lift needed during take-off and landing, to satisfy FAA- FAR 23,49 (a)(6)". To increase cruise speed and range, by flying with a reduced wing area.

Biography

John L Loth received BS 1957, MS 1958 and PhD 1962, with dissertation titled: Radiation from High Temperature Plasma's from the University of Toronto, Canada. From 1958-1959 he was on a Fellowship at the CNRS in France, where he designed, build and tested their 1st steady flow, magnetically stabilized plasma generator. In 1962 he was appointed Assistant Professor in the Dept. of Aerospace and Aeronautical Engineering at the University of Illinois, where he taught: Aircraft Propulsion, Supersonic and Hypersonic flow. In 1967 he joined the faculty of Aerospace Engineering at West Virginia University as an Associate Professor and was promoted to Professor in 1969, a position he held till his retirement in 2013. In addition to the above mentioned courses he taught flight testing during his 1st 15 years at WVU. In 1970 he designed the 1st CC Technology Demonstrator aircraft. After 52 years of teaching Aerospace Engineering, he retired in 2014. Now he does research on UAV's at the rank of Professor Emeritus and holds 18 US Patents.

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