

The Adaptive Compliant Trailing Edge (ACTE) II Sub-Project within the Flight Demonstrations and Capabilities (FDC) Project was established to assess key elements of ACTE flap system performance through flight demonstrations on the NASA's Subsonic Research Aircraft Testbed (SCRAT) G-III aircraft. The G-III aircraft, operated out of Armstrong Flight Research Center (AFRC), was modified by replacing the original equipment Fowler Flaps with the ACTE flap system for the planned ACTE II flights. Primary objectives of the ACTE II Sub-Project were the following:

- Expand speed envelope from 0.75 Mach to 0.85 Mach
- Explore "twisted" flap deflection for load alleviation
- Collect noise and drag data for model validation

The ACTE II flight demonstrations were highly successful as they accomplished key objectives while logging significantly more flight hours than originally anticipated. Throughout the flight test campaign, the ACTE flap structure showed no issues even at higher Mach numbers up to 0.85 Mach. Through in-flight investigations of twisted flap performance, it was confirmed that twist can be employed to manipulate the center of pressure to enable the redistribution of loads on a lifting surface. Further, through in-flight drag measurements, ACTE flap drag performance was assessed and characterized to enable the validation of computational models.

In addition to proof of concept for this novel flap configuration, the results of the ACTE II Sub-Project confirm that this technology holds promise for increased structural and operational efficiency of future, clean sheet aircraft designs.

<https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20180005456.pdf>

<https://www.nasa.gov/feature/nasa-flight-tests-advance-research-of-flexible-twistable-wing-flaps-for-improved-aerodynamic>