

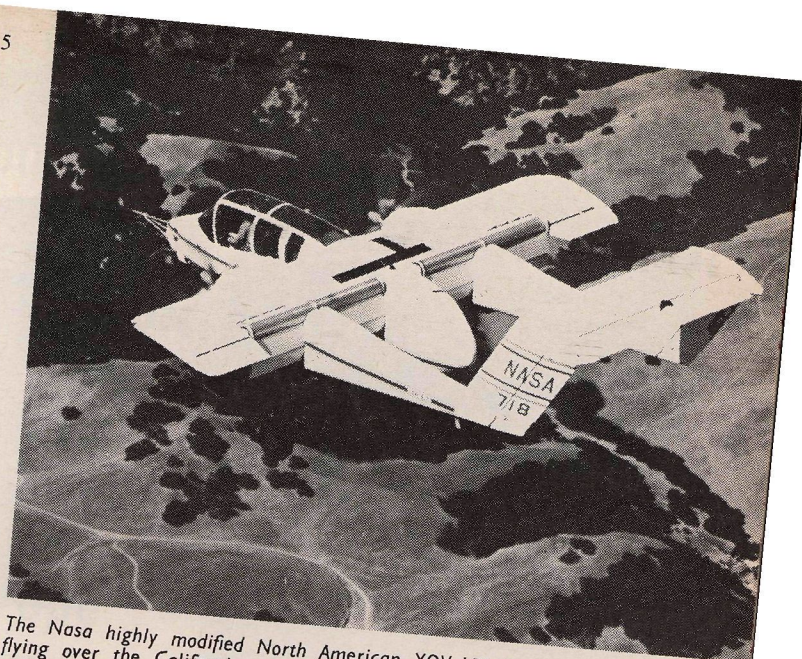
Nasa's YOV-10A

NASA'S OFFICE of Advanced Research and Technology is now flying a highly modified North American Rockwell YOV-10A Bronco in a programme to investigate the use of rotating cylinders to induce slipstream to flow smoothly over flaps set at very high angles of depression. Peruvian Professor Alberto Alvarez-Calderon, known for his "wing-span" flaps, is working with the US Government agency on this project.

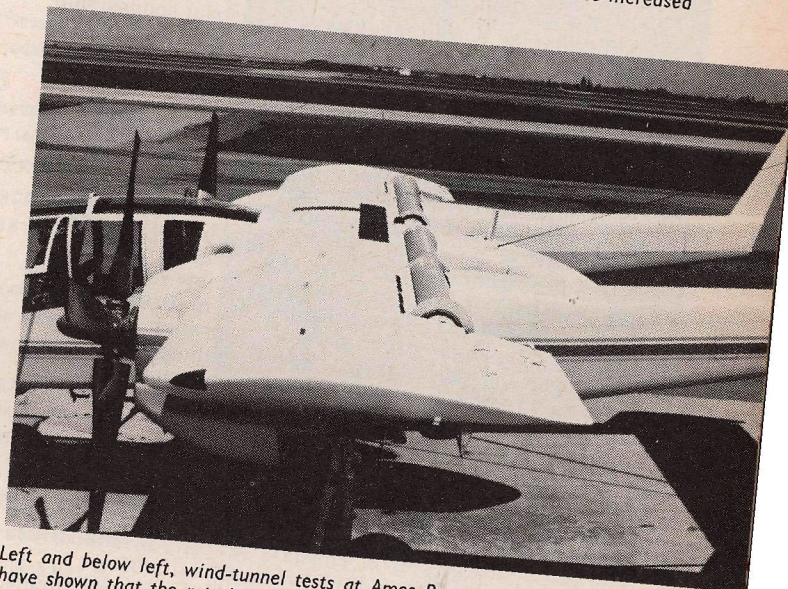
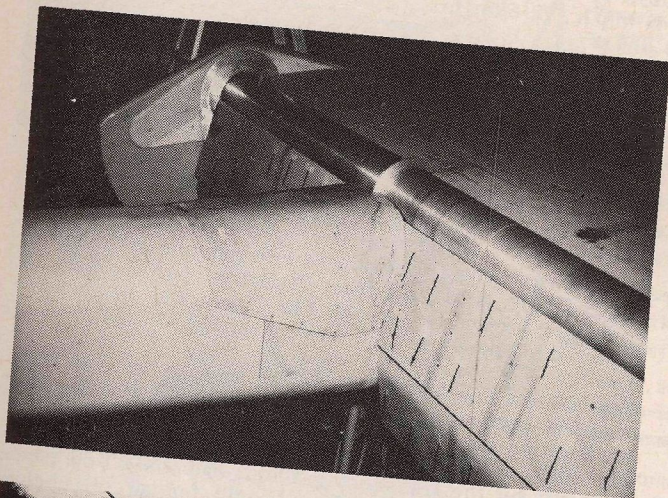
The US Navy has provided the Bronco as a flying test-bed, which North American has modified. The company carried out the initial testing, but the current programme is a joint Nasa-US Army Air Mobility Research and Development Laboratory endeavour, and the craft is now being flight tested at the Nasa Ames Research Center in California.

The rotating cylinder flaps on the YOV-10A extend spanwise across two-thirds of the wing and protrude slightly into the airflow over the wing. When the cylinders are rotated rapidly in the direction of the airflow, the exposed surface of the cylinder induces the propeller wing and deflected flap, thus providing increased lift at low forward flight speeds. This is particularly useful during Stol operations. Nasa wind-tunnel tests have indicated that the smoother airflow across the wing and deflected flap greatly increased the lift.

The Bronco test aircraft has been fitted with Lycoming T53s in place of AiResearch T76s, and propellers are cut-down Curtiss-Wright units developed for the Canadair CL-84 tilt-wing Stol type. Their original diameter was 14ft and is now 9ft 5in.



The Nasa highly modified North American YOV-10A Bronco is seen flying over the Californian countryside, above. Below, the rotating cylinders extend over two-thirds of the wingspan and produce increased lift at low forward airspeeds



Left and below left, wind-tunnel tests at Ames Research Centre, Calif, have shown that the rotating cylinders greatly increase lift. Below, the cut-down Curtiss-Wright propellers are driven by a pair of Lycoming T53s

