

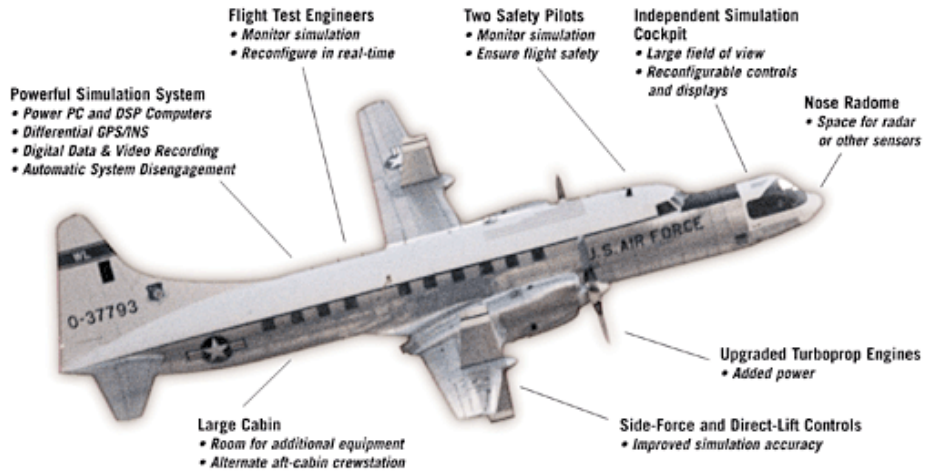


Flight Research Group > Airborne Simulation > Calspan Operated Variable Stability Aircraft

- Total In-Flight Simulator (TIFS)
- Variable Stability In-Flight Simulator Test Aircraft (VISTA)
- Variable Stability Learjet 24 / Learjet 25

The U.S. Air Force NC-131 Total In-Flight Simulator (TIFS) Aircraft

- The TIFS is the most capable in-flight simulator. It is operated by Calspan under a Cooperative Research and Development Agreement (CRADA) for the US Air Force Research Laboratory.
- The TIFS is a highly modified Convair-580 (AF C-131) twin turboprop transport. Calspan finished the development of this IFS in 1970 and has operated it ever since on over 30 major aircraft development and research programs.
- The TIFS unique features include a separate two-place evaluation cockpit and control over all six rigid-body degrees-of-freedom. Special aerodynamic controls (including sideforce and direct lift surfaces) and a model-following control system permit the TIFS to produce motions at the simulation cockpit that completely duplicate the computed responses of the simulated aircraft.
- Its primary use has been in the development and evaluation of new aircraft flying qualities, flight controls, and cockpit displays, as well as general flight research in these areas.
- A second configuration of the TIFS called the Avionics Systems Test and Training Aircraft (ASTTA) has a large avionics nose, which is interchangeable with the simulation cockpit nose. This configuration allows the addition of customer-supplied equipment such as large prototype radars, infrared cameras, and other sensors.
- An instrumented crew station is installed in the aft cabin to accommodate system operators.



Capabilities of USAF NC-131 Total In-Flight Simulator (TIFS)



Reconfigurable Simulation Cockpit



ASTTA Crew Station



ASTTA Nose

[TIFS Handout](#) 

The U.S. Air Force Test Pilot School Variable-Stability In-Flight Simulator Test Aircraft (VISTA) NF-16D

- Calspan has operated the VISTA/F-16D under contract for the USAF since it was delivered to the USAF in 1995. Calspan designed and installed its variable stability system and other experimental systems.
- The VISTA/F-16D was originally based at Calspan's hangar in Buffalo, NY through October 2000; it is now stationed at Edwards Air Force Base and is operated and maintained by Calspan for the USAF Test Pilot School.
- VISTA is used as a research and training tool by the USAF Test Pilot School and customers worldwide.
- VISTA's unique features include a front evaluation cockpit which allows the pilot to fly the aircraft through a separate simulation flight control computer which can be programmed to simulate the response characteristics of any aircraft.
- It has a five degree-of-freedom simulation system which reproduces the three rotational, and normal and axial force characteristics of the modeled aircraft.



Capabilities of VISTA



USAF NF-16 Variable Stability In-Flight Simulator Test Aircraft (VISTA)

[VISTA Handout](#) 

Learjet 24 and Learjet 25 Variable-Stability In-Flight Simulator Aircraft

The Calspan Flight Research Group Variable Stability In-Flight Simulators are highly modified Learjet Model 24 and 25 aircraft, respectively. The aircraft are owned by Calspan and operated and maintained by the Calspan.

- The Learjets provide Three Degree-of-Freedom (3-DOF) airborne simulation capabilities for advanced stability, control and flying qualities demonstrations and research. They are also used to test/demonstrate advanced flight control systems concepts.
- The two aircraft are used in these capacities to support flight test training of test pilots and flight test engineers around the world, as well as support new aircraft development programs.
- The Learjet Model 24, designated N101VS, development was started in 1979 and it first flew in its modified state in January of 1981. The second Learjet, a Model 25 registered as N102VS, began service in March of 1991.
- A third Learjet, Model 25, was purchased in 2005 and will be an operational VS aircraft in 2006.



Capabilities of the Calspan's Variable Stability Learjets



Variable Stability Learjet 24



Variable Stability Learjet 25

[Learjet Handout](#) 