

Convair-580 Research Aircraft

The NRC Institute for Aerospace Research (NRC Aerospace) Convair-580 research aircraft is a multi-purpose flying laboratory supporting an extensive range of projects. The NRC Convair-580 is equipped with state-of-the-art instrumentation for measuring atmospheric state (temperature, pressure, humidity and three-dimensional wind) and aircraft state parameters. In addition, through partnerships with other agencies, NRC has integrated sensors and systems for advanced remote sensing, in-situ cloud physics studies, and aeromagnetics measurements.

Since its integration into the NRC fleet, the Convair-580 has helped advance Canadian scientific knowledge in diverse national and international collaborative projects that include:

- environmental studies
 - detection and characterization of aircraft icing
 - extratropical transition of hurricanes, arctic storms and severe weather systems
 - aircraft performance in severe weather
 - the transport of pollution and air quality in urban areas.
- remote sensing systems and algorithm development
 - spotlight synthetic aperture radar development
 - airborne infrared spectroscopy and short-wave IR hyperspectral imaging for target detection and classification
 - aircraft icing detection using remote sensing.
- aeromagnetics
 - military target detection
 - precision aeromagnetics including horizontal gradiometry and in-flight sensor qualification.

Up-to-date systems

NRC Aerospace is constantly developing and improving the aircraft's on board installations. Project specific



NRC Convair-580

research instrumentation has been combined with our suite of standard research support capabilities that includes high-speed data acquisition systems, air sampling inlets, multi-camera video recording systems, multiple navigation sensors, under-wing and wingtip mounted instrumentation sites.

Recently, we have integrated a Short Wave Infrared (SWIR) hyperspectral imaging system that has 160 channels covering the spectral ranges of 1000 nm to 2450 nm. We are also in the final development stage of a dual-frequency (W and X-band) fully polarimetric Doppler radar system. This NRC Airborne W and X-band radar system (NAWX) will be integrated onto the Convair by January 2006.

Experience and versatility

The Convair is backed by an experienced technical team whose focused, responsive airborne research and experimentation can meet the needs of a broad client community.

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Technical specifications

Research aircraft:	<ul style="list-style-type: none">Convair-580 twin engine, long range (up to 5 hours) turboprop
On-board installations (NRC Aerospace and its collaborators Environment Canada and Defence Research and Development Canada):	<ul style="list-style-type: none">Workstation layout for easy installation of experimentsMultiple navigation sensors (GPS and INS)Satellite communication system for data, voice and fax transmissionAir inlet and exhaust system for atmospheric samplingWing-mounted pylons for 10 canister-mounted instrument storesMulti-camera video recording systemArrays of cloud microphysics probesLICOR water vapour and CO₂ measurement systemDual dropsonde system for wind, temperature and humidity profilingAeromagnetism for geophysical explorationUpward and downward looking radiometersSpotlight radar for ship/ground target classificationsInfrared imaging spectrometerShort Wave InfraRed (SWIR) hyperspectral imaging systemCloud radar systems (W and X-bands system NAWX and dual-view Ka-band)
Special configurations:	<ul style="list-style-type: none">As required



Researchers on the Convair-580 collecting icing data



Cloud physics probes mounted on wing pylons

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