

Twin Otter Research Aircraft

The Twin Otter Research Aircraft at the NRC Institute for Aerospace Research (NRC Aerospace) is a world-class, fully instrumented airborne platform suitable for conducting a wide range of atmospheric and biospheric studies, and for flight mechanics and flight systems development.

By participating with other government agencies in important field experiments, such as airborne investigations of the sources and sinks of greenhouse gases or the remote sensing of snow and ice cover properties, the NRC Twin Otter contributes important scientific information to Canadian and international studies.

Capabilities

The research capabilities of the aircraft include:

- measurement of atmospheric turbulence and wind shear
- measurement of vertical fluxes of heat, momentum, water vapour, carbon dioxide, ozone, nitrous oxide and methane, in boundary layer studies related to vegetation growth
- radiometric measurement at frequencies between 1.4 and 89 GHz, to remotely estimate snow/ice cover properties or soil moisture
- cloud physics and weather modification studies
- airborne sampling of gaseous and particulate pollutants, cloud water and precipitation, and remote sensing of biospheric processes.



NRC Twin Otter

Research equipment installations on the NRC Twin Otter include real-time digital computing and displays; modern navigation and guidance systems; state-of-the-art air data wind/gust sensing; a GPS-INS integrated navigation system; incident-, reflected- and net- solar radiation measurement systems; weather radar; video recording suite; laser particle spectrometers; and a satellite simulator.

Expert support

The NRC Twin Otter is supported by a research team that is experienced in designing and implementing airborne field experiments of international scope and calibre. Clients can count on NRC Aerospace for responsive and focussed research that meets all their needs.

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Technical specifications

Research aircraft:	<ul style="list-style-type: none"> • Twin Otter low-speed turboprop
On-board installations:	<ul style="list-style-type: none"> • VME real time data acquisition system and displays • Litton LTN 90 Inertial Reference System (IRS) • Honeywell HG1700 INS / Novatel GPS integrated navigation system • Trimble and Novatel GPS navigation systems • Honeywell PRIMUS weather radar • Video cassette recorder (VCR) with 3 optional cameras • 4 Particle Measurement System (PMS) laser particle spectrometers • Microwave Radiometer capability (max. 5) in the frequency band of 1.4 to 89 GHz for snow/ice ground cover measurement • Air, cloud water, and precipitation sampling systems • Relaxed Eddy Accumulation System (REAS) for greenhouse gas flux measurement • LANDSAT and SPOT satellite simulator • Control surface position measurement system
Data acquisition and analysis:	<ul style="list-style-type: none"> • Real-time digital data recording of up to 200 parameters at 32 Hz
Measurement capabilities:	<ul style="list-style-type: none"> • Air temperature • Dew point • Surface temperature • Concentrations of carbon dioxide, water vapour, ozone, nitrous oxide and methane • Size and concentration of cloud droplets and precipitation • Incident and reflected solar radiation; net radiation • Vertical fluxes of heat, momentum, water vapour, carbon dioxide, ozone, nitrous oxide and methane • 3-axis components of aircraft position, distance, velocity, acceleration, attitude and angular rate • Angles of attack and sideslip • True airspeed, ground speed and wind speed • Pressure altitude • Radio altitude • Laser altitude • Terrain height • 3-axis wind components
Special configurations:	<ul style="list-style-type: none"> • As required

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