



University of North Dakota Citation Research Aircraft



Michael Poellot, David Delene, Cedric Grainger

Overview

The University of North Dakota owns and operates a Cessna Citation II twin-engine fanjet aircraft for the purpose of atmospheric research. This aircraft type has a number of design and performance characteristics that make it an ideal platform for a wide range of atmospheric studies, including both high performance and the ability to be flown at the slower speeds necessary for many types of measurements.



Specifications

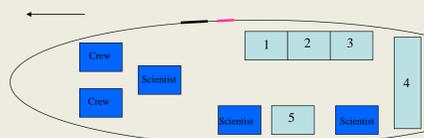
Payload	1528 – 2528 lbs.
Range	1200 nmi
Ceiling	43,000'
Time to Climb: 25,000'/35,000	13/24 min
Endurance	3-5 hours
Weather	- Known icing - Storm penetration 45 dBz
Sampling Airspeeds	150 – 225 KIAS

Modifications

Two wing tip pylons
5 reinforced fuselage locations
6 ports for electric field mills
Side-looking window insert
Anti-iced gas sampling inlets



Cabin Layout



- Instrument Rack
- Seat
- Window Insert
- Door

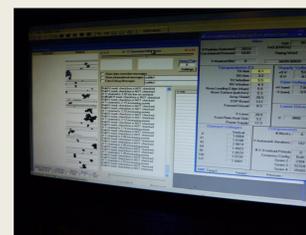
Rack Space

130" of 19" rack
Rack top, specialized racks



Research Power

Total	Below 35,000': 7300W
	At or above 35,000': 5400W
AC	4 KW 110VAC 60Hz
DC	80A 28VDC Instrument anti-icing
	40A 28VDC Instrument power



Measurements

State Parameters

Temperature	Rosemount Total Temperature
Dew Point Temperature	Edgetech Cooled Mirror
Pressure	Rosemount
Water Vapor Mixing Ratio	Maycomm TDL Hygrometer

Cloud Microphysics

Cloud Droplet Spectrum	DMT CDP
Cloud Particles	PMS Optical Array 2D-C
Particle Images	SPEC CPI
Particle Images	SPEC HVPS-3
Liquid Water Content	PMS King
Liquid and Total Water	Nevzorov
Supercooled LWC	Rosemount Icing Rate Meter

Air Chemistry and Aerosols

Particle Spectrometer	PMS Passive Cavity Spectrometer
CN Counter	TSI Alcohol Condensing

Air Motion and Turbulence

U, V, W Wind	Gust boom, INS
Attack and Sideslip, Airspeed	Gust boom, Differential Pressure Transducers

Aircraft Parameters

Heading, Pitch, Roll, Ground Speed, Position, Vertical Acceleration	Applanix POS-AV Strap-down Gyro and Accelerometers with integrated GPS
Cabin Pressure	Setra



Maintenance and Support

Facility	UND Aerospace Flight Support Services FAA Part 145 Repair Station
Capacity	>120 Aircraft, Single engine to Multi-engine turboprop
Mechanics	31 Full Time
Operations	Two Shifts, 7 Days/Week

