

BAe146 Instrument and Data summary

Instrument	Status	Comments
AVAPS dropsonde	OK	One flight only (15/01/05)
Broad-Band Radiometers	Unserviceable	throughout
FastFSSP	Operational	LWC < JW/Nevzorov. In-cloud intercomparison suggests due low number concentration
PCASP	Operational	Noise on channels 1 & 2 – rejected from final datasets
Hallett Cloudscope	Unserviceable	Canister full of water.....
2DC / 2DP	Operational	No known problems
Condensation Nuclei (TSI3025A)	Operational	

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CO / NO _x / O ₃	Operational	
GE hygrometer	Operational	Calibrations to be confirmed by intercomparisons
GPS	Operational	
Heimann surface temperature	Unserviceable	Unable to calibrate
INU	Operational	Schuler drifts corrected by automatic Kalman filter vs. GPS
Johnson-Williams LWC	Operational	Clear-air drifts corrected by ref. to FFSSP out-of-cloud data
Nephelometer / PSAP	Operational (except 10/01/05)	Data not examined

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Nevzorov LWC/TWC	Operational	24/01/05 TWC reference wire unwinds – time-varying clear-air drifts
Temperature (Rosemount)	Operational	Uncertainties in adiabatic recovery factors – under investigation.
Total Water Content evaporator	Operational	Large Ly-α absorption path gives saturation around 13 g/kg. Not good for measurements in lower BL
Turbulence probe (radome)	Operational	No sign of water ingestion. Possible problem with AoSS calibration – under investigation. Gives errors in cross-heading wind components.
Aerosol volatility (VACC)	1 flight only	On 21/01/05. Data for this appear good.

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Cloud Condensation Nuclei	Operational	Data recorded manually – not yet processed.
Whole Air Samples	Operational	64 bottles throughout project.
TDLS	Operational	CO ₂ and CH ₄
Small Ice Detector (SID-1)	Operational	Not yet processed. May have role in detecting non-spherical aerosol in polluted conditions eg 21/01/05

BAe146 data processing issues

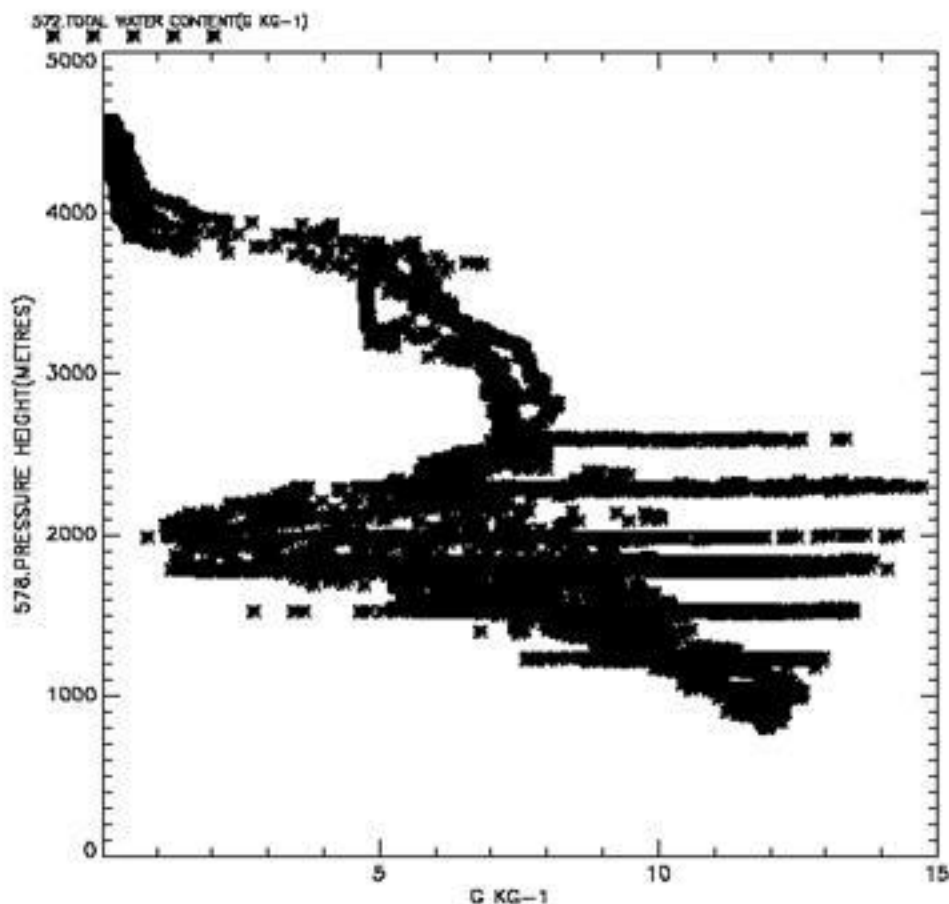
- JW and Nevzorov hot-wire probes
 - clear-air offsets removed using points defined by FFSSP concentration $< 1 \text{ cm}^{-3}$ and interpolating background points across cloudy region.
- PCASP / FFSSP / 2DC / 2DP
 - 1Hz averaged data included in datasets that will be archived
- Data flagging
 - native VMS floating-point - uses 2 least-sig bits as flags
 - NetCDF archive files have additional parameters to contain flag values for each data stream.

BAe146 data processing issues

- NetCDF conversion
 - has been under development
 - aim is to make datasets compatible with common display and analysis tools
 - use of pad values to fill missing times enables use of `ncplot`
 - some incompatibility of time data with new NCAR Aeros package
 - datasets currently contain parameters at their recorded frequency, eg:
 - T, u, v, w – 32 Hz
 - Td, JW LWC – 4Hz
 - Nevzorov – 8Hz

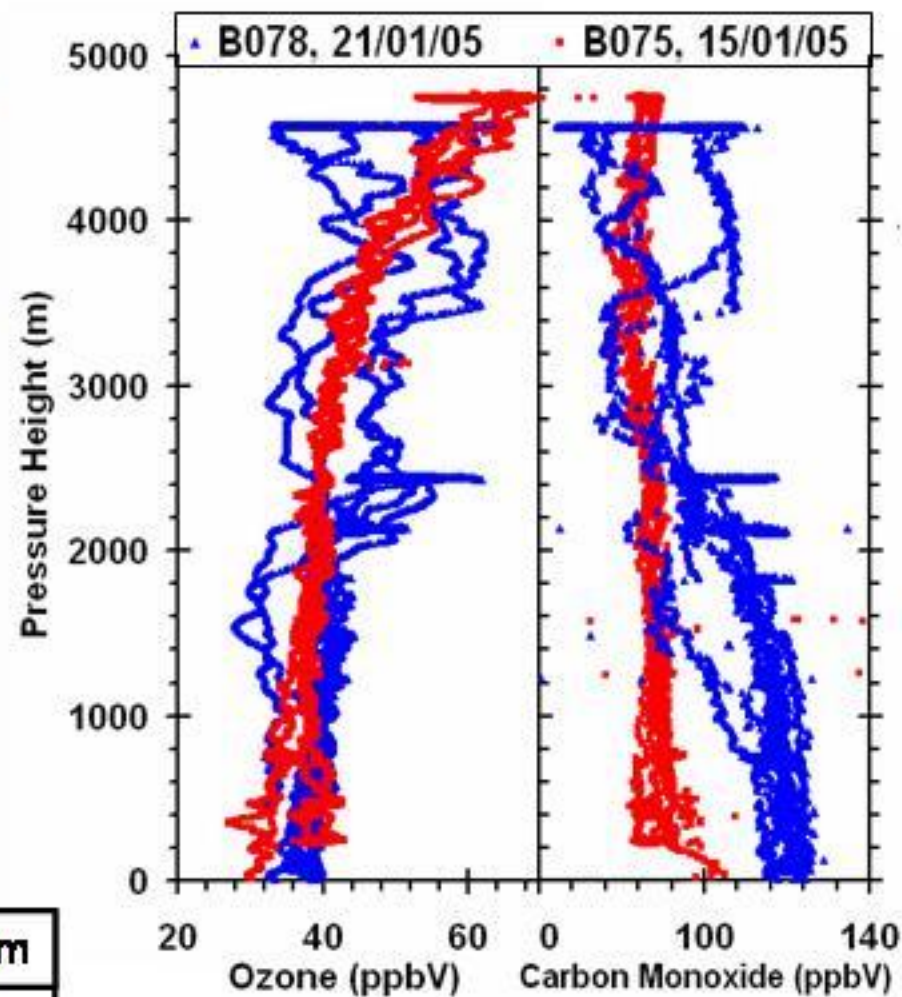
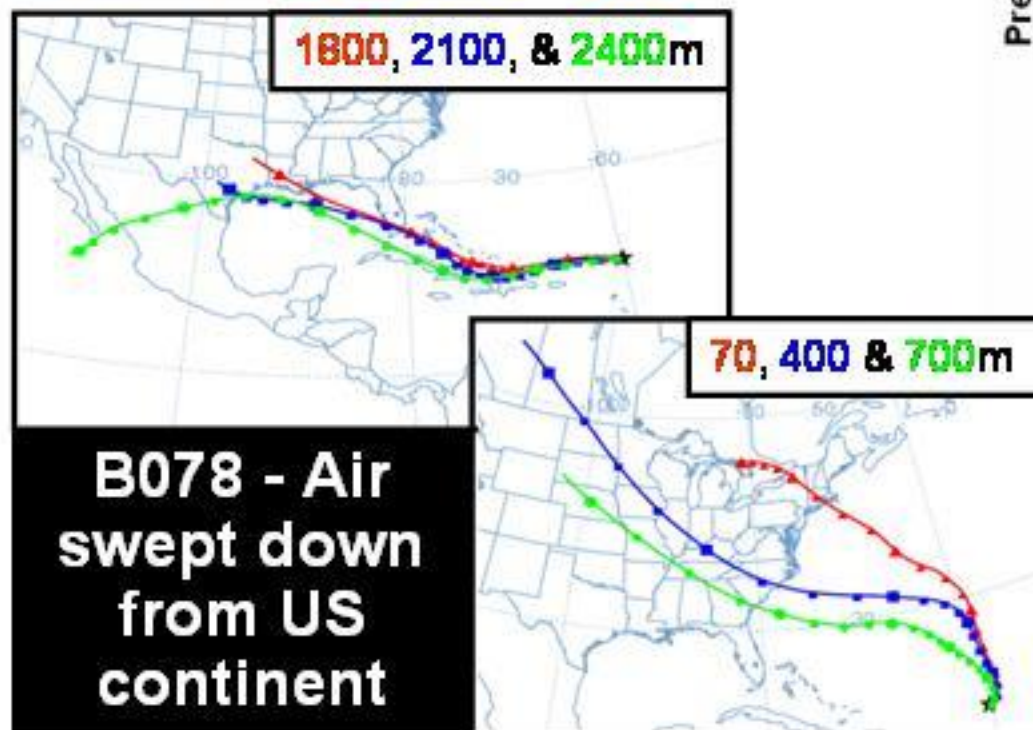
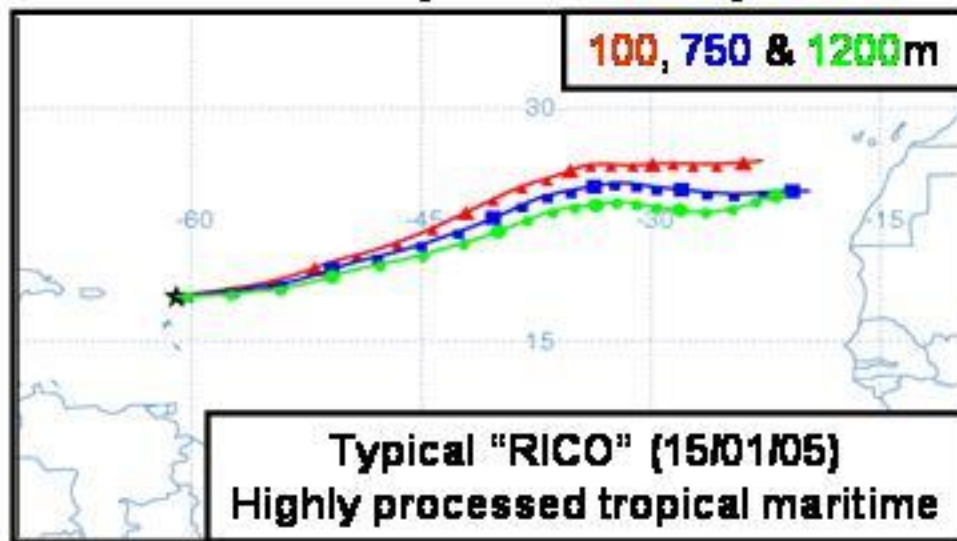
TWC evaporator saturation

B080 24-JAN-05 12:29:56-19:32:30



- probe saturation occurs at threshold water vapour density
- hence threshold mixing ratio increases with decreasing pressure
- probe generally unusable below ~800m altitude
- and in peaks of high condensate within cloud
- but will be usable to examine humidity fluctuations around cloud boundaries.

B078 (21/01/05) – Continental Influences



Clear differences in profiles of CO and O₃

B078 – Significant Sulphate below cloud.

During the levels flown on B078, the major concentration drop at -180°C is due to evaporation of sulphate aerosol, sea salt aerosol observed in 'Cloud' runs

