Squawk List for flight 1854
23 January 2001
1805-2158 UTC

Project IMPROVE test flight 8

(Instruments not mentioned as having a problem are believed to have
worked satisfactorily)

The flight was over the coastal waters of Washington State
southwest of Westport in a quasi-stationary northwest-southeast
oriented rainband that Nick B. later termed a cold front. The legs were
flown in a southwest to northeast orientation perpendicular to the
rainband as it appeared on radar. The coastal flow was east-
southeasterly ahead of front and southeasterly behind the band. This
system, while mostly steady-state had the interesting structure of
having at least four droplet layers in the region between 5 and 20 kft, a
stratocumulus layer partially sampled at 5 kft, and several altocumulus
layers that were marginally sampled or not sampled at all in the
vertical stack. Thus, mainly glaciated conditions were sampled in this
band in spite of the presence of liquid water layers.

OVERALL ASSESSMENT OF MEAUREMENTS

- Generally a good day with the exception of a balky/delayed start to
  the CPI imagery. It was not running until the leg at 11 kft in the
  band.
- Continuing, but reduced in frequency of electrical noise compared
  with early project flights.

1. GPS /WINDS/TURBULENCE/AIRSPEED

GPS tans-vector: No change; data OK; apparently a characteristic of
this system is to only find a new lat-long every 3-15 seconds. Thus for
intervals of the same time period, winds cannot be updated, nor do we
show a location change. Winds and ground speed are thus necessarily
constant, and are derived from the last last lat-long position, which
may have been as much as 10 or more seconds earlier. This also
appears true for the Shadin static temperature measurement.

Rosemount TAS: No change.   LOTS of noise due to dropouts. Appears accurate otherwise; in essence, the trace looks like a bar diagram whose peaks are at the correct true airspeed.

BAT: Not working yet.

2. STATE PARAMETERS

Rosemount temperature sensor: No change. The Rosemount-derived static temperature continues 5-12° C higher than both the reverse flow temperature (tstatr) and the Shadin Air Computer static temperature. However, the Shadin temperature also has a long reset time and so often lags the real temperature by a deg or more. Hence, we really only have a single reliable temperature measurement in real time.
        More effort should be put into fixing our venerable Rosemount temperature probe.

3. CLOUD PHYSICS

PVM-100: Noise spikes are now rare for some reason, only several were observed in flight 1852. Probably should be checked with the HG calibration disk since we are approaching the mid-project calibration stage. The results should be written down.

DMT hot wire: No change. Still impacted by much noise. LWCs are pretty close to that of other probes when the noise is absent.

J-W: Generally worked well with the exception of noise spikes. Grant believes that he has determined the source of the noise and is working to eliminate it. Yay!

2-D cloud probe: Need concentration calculations in real time. Should also be calibrated.

1-D cloud probe: Should be calibrated and calibration documented. Otherwise working well.

HVPS: Occasional noise problems/data dropouts. These, for the most part, seemed to be associated with temperature and pressure changes during ascents and descents that may have resulted in condensation or with LW on the lens from flying in the rain (as happened in KWAJEX).

Radar: Worked well, and data is being recorded.   Some lost data due to hard drive filling up.

CPI: Difficult to get running. Lasers/camera and or both would not fire in the beginning of the flight. Camera images had a mottled appearance when the probe finally did fire up in the leg at 11 kft.   The images improved as the flight progressed with normal operation of the CPI by the end of the flight.   Note: These problems seem to have developed after the inverter loss brown-out mentioned that occurred the previous flight. Some software commands, like disabling full frame acquisition, did not appear to work. May have to re-install the CPI processing software on the plane in case it was corrupted by the power outage.