Preliminary Squawk List for flight 1888,
Wednesday, 31 October 2001
This was pre-IMRPOVE II test flight 2.

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

OVERALL LOOK

Moist west-northwesterly flow with multi-layered low and high clouds covered region of flight. Very light rain and sprinkles reached the ground. Tops of the lower clouds were found just above 8,000 feet ASL with two higher mainly ice cloud layers above. Three flyby passes of the PAE tower were made down runway 160 at the start of the flight. Subsequently, a spiral ascent was carried out over and just upwind of the UIL rawinsonde site very near launch time to provide a temperature and dewpoint comparison in which the Convair's state measurements could be checked or calibrated against. Clouds with significant LWC were also sampled to test the cloud LWC probes.

1. **AIRCRAFT PARAMETERS**

Tans-vector system: True heading ("tans-azimuth") not available because the tans-vector is in need of a 24 h period of calibration.

Winds: No wind direction or velocity data were available due to the missing true heading information.

2. **STATE PARAMETERS**

Rosemount static temperature: Tstat tracked the tstatr values well and were virtually identical. The Rosemount temperature sensor is now considered fixed.

Rosemount pressure transducer: Continues to exhibit noise of up to several mb in range per second. These, in turn, can, cause spurious pressure altitude changes of up to 30-50 m in one second. Sensor may be wearing out. It has been acting this way since the SAFARI project and this also means that since the plane's nose has been reconfigured. Subsequently, it raises the possibilities that the fluctuations are real—which I presently tend to believe--and are associated with some change in the turbulent boundary layer flow around the fuselage. We are investigating this latter possibility today (11/1/01).

3. **Cloud Microstructure Probes**

DMT Hot wire device: Did not work.

JW Hot wire device: Did not work, with the exception of the first few minutes of the flight when some LWC was indicated in the first intercept of the stratocumulus layer. Cause unknown—being investigated by Don.

FSSP-100: Integrated LWCs appear low and strangely, all peak LWCs were at about 0.15 g m^{-3} or less. This could be the result of the extremely clean conditions and very low droplet concentrations with many "cloud" droplets outside the FSSP-100 range of 2-47 um.

PVM-100: There was a large discrepancy between the two LWC probes that did work, the FSSP-100 and the PVM.   The PVM-100, which is thought to measure roughly the same droplet spectra as the FSSP-100, had LWC contents that were often 5-10 times that of the FSSP-100 integrated LWC. It is suspected that the PVM-100 was closer to the LWC truth since some modest cu that were sampled near UIL likely had a good deal more LWC than the peak 0.15 g m^{-3} indicated by the FSSP-100. This needs to be closely watched on the next test flight. It is also hoped that we will have another LWC measurement to "arbitrate" these disparate values.

PMS 2-D cloud probe: Worked with the exception of a dead few minute period early in the flight. Real time output of particle concentrations to the laptops on this flight, a first for the CARG group.

PMS 1-D cloud probe: No reliable data recorded. The probe was impacted by noise of undetermined origin that caused huge counts in clear air and thus recovering cloud data is impossible. It did, however, respond to a number of cloud penetrations by having giant spikes as well. The noise was sporadic, however. Alignment problems usually do not cause the vast spurious counts that we saw so this is a mystery at this point. Maybe the dump spot fell off…?

SPEC HVPS: Generally worked but did have brief outages. The outages were characterized by single lines or rectangular areas of densely packed horizontal lines—a common type of outage for this probe. Believed to be due to some sort of contamination on the lens. Don will check lenses for cleanliness.

4. AEROSOLS

No problems noted