Squawk List for flight 1901,
Second flight flown on Thursday, 13 December 2001,
IMPROVE II CV-580 flight 11.

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

## OVERALL LOOK-WEATHER

This flight sampled the post-frontal orographic stratocumulus clouds over the Cascade mountains of Oregon after the CV-580 fueled up at Duck International Airport in Eugene. The tops of the clouds were so low that the aircraft was more out of cloud than in cloud over the higher terrain at 10,000 feet ASL. More cloud top was intercepted on the MVA pass at lower elevations on the upslope side of the crest. Droplet concentrations were again very low, 10s cm-3 and this resulted in a broad droplet spectrum. A few isolated drizzle drops were encountered; more than we encountered were likely below the flight level given the broad droplet spectrum.

## OVERALL LOOK-INSTRUMENTATION

CPI was being repaired on the ground.
Hot wire LWCs did not work.

## 1. AIRCRAFT PARAMETERS

Tans-alt dropouts at: 0518-0525 and 0655-0706 UTC. Caution must be used when analyzing data in these time ranges since the tans-alt will not reflect the altitude changes that occurred. Probable cause: Loss of a satellite or two.

## 2. STATE PARAMETERS

**Rosemount static temperature (tstat)**: Noise spikes remain absent since J-W powered down while in-flight. The Rosemount temperature is virtually the same as the tstatr at takeoff, but then diverges to higher temperatures than tstatr as the flight progresses. This behavior is very much similar to the old problem we have had with tstat that was first noted around flight 1809 except that the magnitude of the maximum temperature difference (about 2-3˚ C) is less than we were observing in those early days of the problem. Thus, tstat cannot be considered a reliable measure of temperature except in rare circumstances, usually near the beginning of the flight. (Heater effect?) No correspondence with TAS has been noted (as has always been the case.)

**Cambridge chilled mirror dewpoint (dp):**

**Ophir dewpoint (dp_o):** Very noisy 0706 to 0757 UTC. Sharply diverges from the Cambridge dewpoints in dry atmospheric conditions experienced between 0710 and 0740 UTC.

**Rosemount analog pressure transducer (pstat)**: Continues to exhibit spurious changes in pressure of up to several mb in per second.

## 3. Cloud Microstructure Probes

**DMT Hot wire device:** Did not work; no response whatever to cloud penetrations.

**JW Hot wire device:** Power was shutoff to the J-W to eradicate the noise spikes seen in several other parameters.

**PMS 1-D cloud probe**: Counts in clear air compromise in-cloud data since the spectra look similar. Seems to be the same problem that we have been having. I don't believe now that the 1-DC probe has worked properly now since it was moved from the right to left wing and interchanged positions with the FSSP-300 even in spite of some spectra that, on first consideration, appeared to be satisfactory.
A look back into a previous project (ASTEX) where it worked produced rather different spectra (akin to Marshall-Palmer—steady decrease in concentration as the size channels increase) than those that we are seeing now (semi-Gaussian or inverted Gaussian where the peaks are in the larger and smaller size channels. Looks now like all the recent 1-DC spectra are suspect.

**SPEC CPI**: Not installed, being repaired in consultation with SPEC by Charlie Black.
Progress was made, but it is not yet fixed.

## 4. AEROSOLS

Not QC-ed.