PAO Okay, good evening and welcome to our combination flight control team/change of shift briefings and the Spacelab 3 Science Briefing. We have to my right Bill Reeves, the offgoing Flight Director and to his right Dr. George Fichtl, the Spacelab 3 Mission Scientist, Dr. Barney Farmer with the Atmos experiment and Dr. Pat Cowings with the Autogenic feedback. We'll go ahead and start with Bill - give us a rundown on how the Orbiter's doing and then proceed with the science.

REEVES Okay, there's not much more to add about the Orbiter. It's behaving itself very well. The orbit is unchanged from yesterday's press conference at this time. It's 192 by 189. The attitude rearing is a very stable attitude having no more vernier firings than what we spoke of before. We are now 640 miles, nautical miles behind NUSAT and still opening at 10 till 11 nautical miles per rev. We did get a report from the people at Weber State in Ogden, Utah that they did establish contact with NUSAT last night and it responded with a message of NUSAT one to Weber ground. They did not retrieved any sensor data as of yet and they're going to make another attempt tonight at 8:40 central daylight time. We'd like to pass on our compliments to the team out there. They've done an outstanding job with NUSAT. We are still working toward a nominal intermission with the landing at Edwards at 11:04 central daylight time on Monday. Our consumable status is unchanged from the last reports and as far as work onboard we have no inflight maintenances left to work. We're pretty much caught up. And I guess with that I'll pass it on.

PAO Okay, thank you.

FICHTL Well, I'm very pleased. Extremely pleased report that we have no problems, the science activities on the mission are proceeding smoothly. We have 12 investigations in progress and all of those investigations are getting high quality data. We have three materials processing experiments as you know in the FES. We have completed the second cell growth and we'll be loading the third cell later today into the FES facility. On the VCG crystal, we completed 88 hours of growth with about 4 to 500 percent of growth by volume. If you looked at the display of the crystal that came down you'll see that it has a remarkable clarity. You can see the faceting on the crystals and it's much more clearer than the crystals I've seen from the PI's site in AG&G. So it looks to be extremely high quality. And the teams are very excited about the quality of the crystal. It's about 8/10's of a centimeter in diameter. MICG facility completed their first phase this morning. They are now tonight going into a second phase of growth for another 70 hours and their completely pleased about that. The DDM facility which is the exciting moment this morning when they came online, is proceeding to get dropped flotation experiments. What they have planned to

do today is to go and do a very extensive number of experiments involving flotating drops. Tomorrow they will be spending quite a bit of their time on oscilating dropped dynamics and on the sixth day they're doing to do a new area of experimentation that they did not originally plan called compound drops. What we're talking about are droplets which may have cilicone oil on the interior and then maybe a liquid water layer on the exterior and these are emissable liquids and there looking at the oscitory and rotational characteristics of these droplets. Another type of drop we might look at is a droplet with an air bubble in the interior. There's quite a bit of interest in the material science area in these types of configurations. I should point out that the calibration that they did the forms yesterday is going to be used for two missions they have coming up on the shuttle middeck experiments; one in January, involving acoustic continuous processing experiment and then another experiment which involves a 3 axis acoustic levetator device. So that data is extremely crucial to those experiments. In the GSFC we've completed sixtythree hours of growth and we're proceeding very nicely. The PI mentioned that the instrument had a bit of space adaptation syndrome earlier in the mission by having a few computer problems. Those apparently have all gone away and we're proceeding very nicely and it appears we'll get the 84 hours of experiments plus we have a replanning request in for another 12 hours of data. So that's going to be very exciting to get all that data. The ARC, things are proceeding very nicely. The primate number 1 is taking on food, a banana that has been supplied by one of the crewmembers and is consuming the onboard banana pellets. The AFT experiment is proceeding very nicely. I won't talk about that. Dr. Cowing who is here from Aims Research Center will provide a briefing on that and have some flight (garble) to show you roughly how that system works. On the Atmos instrument we have completed the 19 observations of one day ago. Dr. Farmer here will provide some of his first preliminary results. Their very exciting results as you'll see and you'll see that they're going to lead to very important odds about the chemical processes in the atmosphere. On the Aurora, there were four very exciting observations. We've got a lot of things going for us this mission, I think maybe somebody upstairs, because the Aurora that we've got, we've observed are all different. They are Aurora - their bright enought to do some very detail analyses and two of the aurora's if you would watch the observations, the Shuttle pass right through the - pass right through the Auroras and I think Overmeyer made a comment that on the scale of one to ten he rated those a 20. On the IONS experiment there was another exciting feature in the mission. That experiment was activated this morning. It's collecting data. I'd like to clarify or rectify a perception that apparently we had in this experiment. When the panel days doors open on the Shuttle, that experiment was collecting data. And what we have in there are

two detector stacks. The main detector stack collects cosmic ray information. The cosmic ray enters the stack and from that track within that stack they can access cosmic grey energy, the type of cosmic ray that it was, a nitrogen or oxygen cosmic ray or whatever, and the nuclear charge in the mass. The top stack which rotates provides additional information. Provides a measure at the time of entry so we're now getting that data and we'll probably acquire approximately 60 hours of rotation data on the upper stacks. So that experiment is very healthy. So overall we have a healthy mission. We have experiments proceeding in very good order, collecting data, the PI's are very excited. A number of them have become very emotional. Especially when the IFM procedures were completed. And it's been very exciting. It's hard for me to describe with my own feelings so with that I'll pass on to Dr. Farmer here.

BARNEY Well, as a summary of the Atmos experiment, one of advantages of finishing early in the mission, so-to-speak, is that we've been able to take stock of our science return and from the experiment. And I'll run down that quickly. We've obtained 19 good Atmos facts sequences, sunrises and sunsets, covering the full altitude range. The Atmos instrument is a - has a voracious appetite for data so what that means is that each of these sequences contains about 150 indepedent spectra spaced two kilometers apart vertically. Each of the spectra contains a hundred thousand or so spectrally resolved elements so that the whole mission and for us is equivalent to some acquisition of some three hundred million indepedent atmospheric measurements. That's going to take us a little while to cope with the examination analysis of those data. We have been able to already convert the analog tapes that we have received to computer tapes and send them back to the Atmos computer at JPL and make a preliminary examination of them after they have been transformed to spectra. And in doing this, we've found that we can indeed cover the altitude range with a sensitivity that we expected. Dr. Fichtl showed you on the second day I think, an example of carbon dioxide from those early sunset spectra that was very high in the atmosphere up in the lower thermosphere in fact, and I have a viewgraph which if we could see, we'll show a hotband, an excited state of carbon dioxide low in the atmosphere. It gives me a chance to illustrate the kind of form that our data are in. And from left to right is the wavelength scale. This section of the complete wavelength scale is about a few tenth's of one percent of the total Atmos range. And each of those spectro which have been offset corresponds to the tangent heights shown on the right. So there is the coverage from the top of the troposphere up into the lower metersphere of this carbon dioxide absorption as it decreases with height. From a band such as this we can determine the abundance of the gas and the distribution of temperature and this together with the sensitivity the Atmos has to measure through nitrogen. The density of the atmosphere along

the path allows us to make rather precise, more precise than hitherto in fact measurements of the temperature field in both the stratosphere and the meterosphere. The second viewgraph that I have is one of the three acids that we've so far looked at and identified. These are not new identifications but they are new in terms of the accuracy and precision we'll be able to get. This is nitric acid, one of several bands that we've seen down in the bottom part of the stratosphere and as you can see, you go from 33 kilometers in the top spectrum to 21 in the bottom spectrum the absorption increases very rapidly, an eyeball indication so-to-speak of the layered nature of the nitric acid in the stratosphere. This occurs just below it's peak - just below it's peak in the ozone layer in fact, in addition to the nitric acid we had, hydrochloric acid, hydroflowic acid and in the nitrogen family, nitric oxide, nitrice oxide, nitrogen dioxide and we have water vapor of course and heavy water H2O, methane and some of its isotopes and way up into the meterosphere right through to beyond 100 kilometers we've been able to see the continuous profile of ozone, water vapor, carbon dioxide of course, carbon monoxide. These preliminary examinations of the data lead us to believe that we're right in anticipating that we shall be able to pull out values for some of the more interesting species now involved in the current chemistry as it's understood of ozone, chlorine nitrate, HOC (garble) and be hopefull that there will be other new detections too.

PAO Thank you. On Barney's right is Pat Cowings whose going to provide us a brief description of the AFT experiment, hardware, and what the motivation for the experiment is.