PAO Good afternoon and welcome to change of shift briefing for the orbit 2 shift. On my right, Flight Director, Bill Reeves. On his right Dr. George Fichtl, Mission Scientist for Spacelab 3. On his right Dr. Tom Hallinan of the Aurora experiment and to the far right, Dr. Pierre Brissant of the mercury crystal growth experiment. Bill?

REEVES Ok, good afternoon. This rapidly coming to the close of an extremely successful flight from both a Challenger standpoint and a Spacelab standpoint. Our orbit now is 189 by 193, the NUSAT statistics are 1027 nautical miles ahead of the Orbiter at this time. Today's activity mainly involved doing a maneuver at 6 days, zero hours and 10 minutes to change to a solar inertial attitude where we pointed the nose of the Orbiter toward the Sun with a pitch up of 10 degrees. The intent was to shade the OMS pods in the rear of the Orbiter to correct some temperatures that we were seeing on the propellants, the RCS, aft RCS propellants. Which has turned out to be very successful. It was four hours later we started seeing a recovery of these temperatures in the right direction. Then on rev 98 we had to perform a rolling IMU alignment maneuver to get a good alignment on the IMUs. They've been holding in and setting records this entire flight but as result of the change of attitude for the solar inertial attitude, it caused a drift in the IMUs and so we just wanted to arrest that. And, as I said before the PROP propellant tanks are now behaving properly and when I left the control center we were in the process of getting into the flight control system checkouts and the RCS hot fire so I don't have much to add. I'll pass it to Dr. Fichtl.

FICHTL Ok, thank you. On the way over here I was trying to think of how to prepare my comments and I'd like to open by saying that the mission has been an outstanding success in all regards for...relative to science. And I just reflected on it a bit and I thought about all the vast amount of effort that went into this mission. Looking back over the seven years, the tremendous effort of the scientists, not only the PIs, but their teams, their tecnhicians, the engineering groups, the operational groups, the management teams; to make sure everything is working right and even the press, it plays a very vital role. And it's really mind boggling to think of the enormous effort that went into this mission, the focus concentrated energy that brought about the accomplishment of these experiments. The experiments that were done on this mission, and are being doing right now, are being performed, are very complex experiments and if you try to do these experiments on Earth, they are in it of themselves, extremely difficult and we've seen that we've been able to do these experiments in space which adds an inordinate attitude of complication they've been performed successfully, as you're well aware. Now I'd like to go through and talk about some of the significant, outstanding successes that we've..., significant things that have occurred in this mission. We've grown some

very, appear to be very good crystals, of high quality. We'll know more about this when the vehicle lands and the people that are here can go back to their laboratories and chacterize those crystals. We've completed 29 hours of growth on the third test cell on FES system and they have enough time now to go back and preheat the first test cell to gain some experience on the preheat process. The vapor crystal growth cell was, has completed a hundred and four hours of growth. That crystal has grown to twenty times its original size, they have a lot of crystal there for characterization and to prepare some detectors and evaluate in the context of gamma ray radiation research, and x-ray research. The MICG, we'll hear more about that but they've completed seventy hours of growth and there's enough time to do three extra hours of growth in that experiment. The enormous effort that Taylor has performed on-orbit has resulted in him completing 40 to 45 hours of research, which means he's accomplished 85 to 90% of all of his planned research and so that experiment has been an outstanding success. The geophysical fluid flow cell's continuing to operate, they completed their 84 hours of baseline experiments and we anticipate up to a hundred and seven total hours of experiments accomplished in this mission. The Ames Research Facility has been a tremendous success. They've shown that animals can be taken into space in a research context. They can be housed on-orbit with man and that would now set the stage for very important work to follow on the forthcoming life science research mission, next year, with the Spacelab facility. The autogenic feedback experiment acquired essentially all of their data, they're going to, I believe, find very interesting new results about autogenic countermeasures to space adaptation syndrome and the full story, of course, will be revealed here after she de-briefs the crews and analyzes her data. The urine monitoring system--they've completed all of their calibrations. The ground based calibrations are very close to the orbit ones. There are some slight departures, but those are the result of low gravity and that's what this mission was all about, to calibrate that facility. The ATMOS completed, I believe, 19 runs. I was just talking to the team earlier and they have one solar spectrum that they showed me that they acquired during one second of operation that I believe flying that instrument, if just to get that one spectrum, would justify flying that instrument, but that was just one second's worth of data. That spectrum is a solar spectrum that encompasses two to sixteen microns of the solar spectrum and the infrared wavelength band and this is the first time a spectrum of that resolution has been acquired. I talked to the PI team before coming over here and they have some very, they believe some very interesting new results that I'd rather not present here because I think Barney Farmer should do that. They believe they have found some new molecules, atomic molecules, on the Sun but I think that's Barney Farmer's job to report that. The Aurora--very exciting results. Eighteen experiments and each run that they tried to get Aurora, they obtained Aurora and these have been very

exciting. They've been all different and very bright and prominent features. We also have had a case here where the spacecraft has passed through the Auroras. This is a new first for the mission. So we can make ensitue measurements of (garble). The IONS is currently operating. They will complete, they have completed 58 hours on that facility and should pile up another five or six more hours until the payload is deactivated. I should point out, here's an example where we have continuing research in space. This experiment was a follow on from early Skylab work where they flew detectors on Skylab and discovered these (garble) cosmic rays. They have now followed through with a new flight, Spacelab 3 and carried on their research as a follow up to Skylab and are probing these (garble) cosmic rays in terms of what their sources are, what their ionic state is. The detector stack that they have developed is a new stack in the sense that it will provide the ability for the PIs to back calculate when the cosmic ray enter the stack. This a very new thing and in this sense the historical base that we see in research where we build upon past results, this is a very clear example of that, where we have past results, we build upon that and carry forward space research. Ok that's, that concludes my summary in terms of scorecard. I'd like to take the opportunity here to say that, maybe at the risk of being a bit emotional, that this has been an honor for me. This is my first time that I've been involved with a Spacelab program and NASA, my past work has been involved with research and that in the atmospheric sciences and also involved with the development and design of space vehicles. So this has been a new thing for me. It's been very exciting and its been a pleasure to work with the PIs. And, it's been an honor for me. So with that I'll close my comments.

PAO Dr. Hallinan, would you care to tell us about the progress of the Aurora experiment?

HALLINAN The Aurora experiment is basically an attempt to provide a comprehensive, photographic and video record of the Aurora as seen from space. And it's different from the other experiments on-board in one major respect. There was no special equipment designed for this experiment. The experiment was designed to be carried entirely with standard NASA Orbiter equipment. The Orbiter television camera and the 35 mm camera and I'm very pleased the equipment has worked flawlessly. I think NASA's to be congratulated and I think this could point the way to a lot of future experiments. A lot of experiments require special dedicated equipment but there are a lot of things that can be done with relatively standard equipment too, so I'm glad to see that that's working out. We have obtained pictures of, video pictures of standard frame rate pictures of the Aurora in a number of different situations, now a number of different types of Aurora. We've seen very dynamic features of fast moving, fluctuating forms that we see from the ground but this was the

first chance to ever see anything like this from space and you get a very different perspective from space. So I'm basically very pleased with how it's going. I did bring along one picture, a set of pictures of the Aurora from the ground just so you can see what it is that we're talking about. A lot of the pictures from space looked something like this but, of course, the perspective is different, we're getting different information out of it. I think that's really about all I want to say about it now. It's been very successful, I've been especially pleased with the fact that we've actually seen Aurora on every pass. I had originally expected that we'd only see it on maybe two passes out of three. We're very fortunate. The other thing I would add is that the, we were able to do this because of an extremely fortunate coincidence in orbit planning so this particular orbit was ideal for us in that it was a high inclination orbit and goes to high latitude and also there are only two places in the world where the Aurora moves down to slightly lower latitude, one's in Eastern Canada and the other's off the coast of Anartica, down south of Australia. And this particular orbit happened to go past those places and the one south of Australia was in the darkness, so it was an absolutely choice of orbit and perfect attitude of the spacecraft. So that's what's enabled us to carry out this experiment even though there've been many manned space flights before, it hasn't been possible to do.

PAO Thank you. Dr. Brissant?

BRISSANT I would like to say that we have been very lucky because we did not have any problem of our experiments. Our experiments was, the from first time on Spacelab 1 in December 1983, so we have made a second experiment in Spacelab 3. With the first results of Spacelab 1, we are trying to understand the first steps of nucleation and so we did not put any seats in our cartridges, as the opposite of the other experiments. We would like to understand what are the (garble) of nickel conviction of the first step of nucleation. So, we have made two sets of experiments, 70 hours each one and in about 3 hours, we will finish a second phase, so we will have about 6 cartridges of experiments.

PAO Ok, we'll take questions here in Houston. Dave Dooling?

DOOLING (HUNTSVILLE TIMES) Dr. Hallinan, how many hours of video tape, or minutes do you have on the Aurora and how many frames of film do you estimate have been shot? We've seen some stunning stuff but I think we've only seen a fraction of what's been show so far.

HALLINAN Well, they've approximately 3 hours of video tape and that's at 60 frames per second. I think that was...I did work that out but I don't recall. I think it was about a half

million individual photographs.

DOOLING And, in frames of film? Still photography?

HALLINAN That I don't know yet, I won't find that out until after the mission. But it covers the same, the same general time period.

PAO Craig?

CRAIG COVAULT (AVIATON WEEK) Two questions. Dr. Hallinan, do you plan to request to fly the experiment on the first Vandenberg launched mission about a year from now?

HALLINAN I don't have any specific requests in at the moment, I would certainly like to do that. I doubt that it's possible to do it on this sort of time scale.

COVAULT Ok, and for George, on the materials processing experiments in general, how would you chacterize the work load over the course of the week for the guys working on that. What that about what you expected, or perhaps in some areas a little more than what you expected?

FICHTL When we planned the mission, we had work laid out, you know, that the onboard crew was to do and it wasn't all scheduled time but we anticipated that, there would be anomalies, working with anomalies and so forth. I would say that there's probably more than I really expected.

PAO This gentleman in the back.

BRIAN SISLACK (VOA) For Dr. Fichtl. How would you compare and contrast this mission with Spacelab 1 in terms of what was accomplished and in terms of, I guess, its smoothness?

FICHTL I don't think I'm in a position to comment on the Spacelab. I followed Spacelab 1 part of the time and I've seen the results. I think in terms of total numbers of experiments Spacelab 1 was extremely successful. I'm not aware of percentages of success rates and things of that nature but in terms of total scientific success, I would say that there would be comparable impact coming out of both missions.

PAO Mike?

Dr. Hallinan, just to check on the Auroras. You actually only obtained Auroras on the Australia, Anartic part of the pass, not in Canada, is that correct?

HALLINAN Right. The ones in Canada were in daylight in the orbit so it was only in Anartica.

And you got eighteen Aurora observations, is that correct?

HALLINAN Right.

How many of those were ones in which you actually flew through and Aurora?

HALLINAN I think we flew through it three times.

PAO Dave Dooling?

DOOLING George, your other workload and that of the people in the POCC (garble)... How difficult was it or how demanding was it, especially compared to what you may have anticipated after talking with the Spacelab 1 team. And how much replanning effort went on?

FICHTL As far as replanning of this mission, compared to mission 1, I think there was less, quite a bit less, in terms of our processing RRs and OCRs. I don't have the specific numbers to refer to but I have the impression that we were significantly less. Of course, we had fewer experiments. As far as our own workloads?

DOOLING Yes.

FICHTL I think my workload is a little bit more than I expected. I anticipated something like twelve hours and maybe two hours beyond that, and some days it went beyond that until 12:14.

DOOLING Ok, and did I understand you correctly talking about the ATMOS experiment, you said the spectra had showed some new modules or atoms in the Sun, not the atmosphere?

FICHTL In the Sun. They believe that they've discovered some new molecules but this is very tentative and I felt that Barney Farmer, if he has any statement to make scientifically, that's his call. The team is very excited just from that one spectrum and they have enormous amounts more data to analyze.

PAO Craig Covault, Aviation Week?

COVAULT Let me try again on that, George. If they have found new molecules in the Sun, what is the inherent significance of it?

FICHTL Way I understand it is at these high temperatures most of the matter should be present only in the form of nuclei in terms of finding electra species would be a new find. I think here again I'd like to emphasize it's up to the ATMOS team to

complete their data analysis to arrive at those results.

DOOLING And, on for Pierre. I've heard that you're getting ready with the Spacelab 3 experiment to move on in a few years here to the Eureka activity. Is there something you could say for moving on to the European platform with materials processing?

BRISSANT Yes. What we have tried to do and to understand from Spacelab 1 through Spacelab 3 is to try to build a very important experiment in more time. We have had only one set of cartridges of about 100 hours on Spacelab 1, in Spacelab 3, two sets of cartridges of two times 70 hours. What we would like to do is to have a better experiment, a longer experiment in Eureka. We have asked the European Space Agency to put in Eureka the new experiment which will fly maybe in 1988, about three or six monkeys, about like Spacelab 3, but longer than Spacelab 3. So with the results of Spacelab 1, with the results we hope to have on Spacelab 3, I think that we will make a new experiment, a longer experiment, with only one seed growing in space during a longer time.

PAO Jerry Hannifan, Time-Life.

HANNIFAN Bill, would you bring us up to speed, get us current on the landing conditions for a cast at Edwards? Is the runway still two three, and specifically on the anticipated crosswinds? From what o'clock relative to runway two three. Where's he going to have it? On his nose, or...?

REEVES Ok, I'm sorry I left that out of my opening, opening here. I don't believe anything has changed very much since what Gary told you this morning, I didn't hear exactly what he told you but the nominal end of mission deorbit is, they did change from Edwards two three to one seven at the last report I got. But that's going to change throughout the night and you know, I wouldn't hang my hat on anything you get this early. Predicted winds are still light. Six knots gust to nine so I don't think we have any problem. I don't have the crosswinds cause I don't know what, it's too early yet. And the nominal end of mission landing is still at eleven ten central daylight time. If there is a one rev wave off TIG time, landing time on the one rev (garble) would be seven days, one hour and thirty-five minutes. That's around 12:38 central daylight time.

HANNIFAN Best estimate then is runway one seven for tomorrow morning?

REEVES That's the latest.

HANNIFAN Latest. Ok...

REEVES When I left the control center.

HANNIFAN Ok, then winds from what direction?

REEVES At one seven they were saying three knots gust to five, nine knots gust to fourteen is another forecast.

HANNIFAN But they give you the direction from which the winds were coming, Bill?

REEVES The nine gust to fourteen was from the right.

HANNIFAN The right.

REEVES ...what I've got here.

HANNIFAN Ok, thanks.

PAO Before we conclude we do have some investigators sitting in the audience and for those of you who might wish to talk with them after the briefing, I'll ask Dr. Fichtl now to introduce them.

FICHTL Ok, we have Allen Manion here who's the project (garble) for the MICG facility, Dan Elliman, co-investigator from, on the DVM from JPL, and Carol Ortell with the VCGS facility. She is in charge of the work relative to characterizing the crystal after the mission in terms of its quality and ability to serve as a detector.

PAO Dave Dooling? Wait for the mike.

DOOLING Yea, we'd like to get a hold of Farmer, also, or somebody from his team.

PAO We'll ask them to come over. I think George...

FICHTL ...left town.

PAO Has he left town? We'll see if we can find someone... They heard you were asking Dave. If there are no other questions, this concludes the final science briefing for the Spacelab 3 mission and combined change of shift briefing. Thank you.

END OF TAPE