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Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058

Shuttle Mission 51-A

EVA Transcripts

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SPACECRAFT - docking at elevon hundred.

CAPCOM That's affirm. And leaving the FSS is 2 thousand, 20 seconds to LOS.

SPACECRAFT Okay, I did copy the first part of the last (garble).

CAPCOM Okay. The other red line is leaving the FSS. That's 2 thousand, 2000.

SPACECRAFT Okay, I got that one. Thank you.

SPACECRAFT How do you like that Joe.

SPACECRAFT That is wonderful. I'm ready to go into it Dale. (garble). I'm clear of the -

PAO Mission Control Houston. We have loss of signal through the tracking data relay satellite. The EVA crewman Allen and Gardner are actually several minutes ahead on the timeline. Gardner has already prepared the manipulator foot restraint; set up the tool carrier. Joe Allen has moved to and checked out the MMU thoroughly a long list of checklist of items. The topped off the gaseous hydrogen pressure which is actually the propellant in the MMU and Joe Allen getting into the manned maneuvering unit now with the assistance of Dale Gardner. (Garble) officer reports that they're very close to the expected propellant usage and from every indication they are now stationkeeping with the palapa. Everything going very smoothly so far and the rendezvous has now been completed. The crewman are out in the cargo bay preparing getting their tools ready and preparing to fly over to dock with the palapa. They're running a little ahead on the EVA timeline. Gardner having already completed items 20 minutes into the EVA that were scheduled to be completed by 40. We won't hear from the crew for another 7 minutes till we pick up over Yarragadee. At Guam station, a little bit later than that we'll be out of comission due to a typhoon in that area. The winds are getting too high there and they're going to have to stow their antenna dish and shut down operations at Guam for the course of chat storm. We pick up again in Hawaii over Hawaii 32 minutes for now following that. We're six and a half minutes away from the Yarragadee pass now. Very shortly after Joe Allen gets into his MMU he'll be doing a 5 minute checkout flight then he will take a look at the hydrogen pressure in the MMU. He'll move over to the manipulator foot restraint and will begin the installation procedure for attaching the stinger mechanism to the MMU. A stinger is a long cylindrical shape to probe with deployable toggle bolts on the end of it that attached to the front of the manned maneuvering unit and one will then fly over to the palapa, now 35 feet away from the Shuttle's cargo bay. He will drive the stinger up through the rocket nozzle, the burned out motor

already used to apogee kick motor of the palapa. Once the stinger is up into the cavity which formally held a solid propellant, the toggle bolts will be released and Allen will then use a ratchet handle and wheel to pull the bolts back down tight down to the - till it's locked firmly on the aft ring and at that point he will stabilize the satellite using the nitrogen thrusters of the MMU reducing it to 1 rpm spin rate to zero, then mission specialist, Anna Fisher, will use the mechanical arm to grapple a fixture on the side of the stinger and move the - bolt the satellite and the crewman attached to the satellite over into position for Gardner to attach an A-frame structure to the top of the satellite. That A frame structure has a grapple fixture on the top of it and enables the RMS to change ends that it's holding the satellite with. That's primarily because of the structure of the satellite; not having been built to retrieve. The real strength of it's structure is in the aft end where it will be grabbed with the stinger initially. It also must be attached to the pallet and the airborne supported equipment from the aft end. So the attachment of the A-frame to the top is a temporary device and they (garble) to be switched end over end. Once the RMS, the mechanical arm, has grappled the fixture at the top of the A-frame, the satellite will be turned with the aft end, the rocket nozzle end down, made it to a structure ring on the pallet and then they're are a number of clamps that will be attached to a lip on the separation ring on the aft part of the satellite. Those will be tied down firmly and that will support the entry stresses that will be seen with the satellite in its position there in the cargo bay coming back in on landing. And this is Mission Control Houston. We've completed the playback of the earlier downlink television. Our r xt downlink will be at 8:23 am central standard time, orbit 56. As the spacecraft passes over Hawaii initially and we continue television through Goldstone at Merritt Island. That will be television of the continuing EVA and the - if they are sticking to the timeline, the MMU fly over. That's about 26 minutes from now. Again we will be picking up Yarragadee in about a minute and a half for listening in to the crew activities for EVA. We will not have the Quam station shortly thereafter because of the tropical storm typhoon in that area impacted the ground station operations at Quam. Everything has gone very well with the rendezvous this morning so far. EVA preparations are normal. Propellant usage is good. The palapa satellite is stable and the orbiter at stationkeeping attitude with palapa 35 feet away. All orbiter systems are in good shape and everything seems ready to support the capture of the palapa satellite. This is Mission Control Houston. Mission Control, we're picking up comm through the B-station.

SPACECRAFT -length of target now back on.

Okay, I'll do that right now.

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SPACECRAFT - that is correct.

SPACECRAFT Dale, (garble)

SPACECRAFT Okay, I'll do it.

SPACECRAFT You're clear.

SPACECRAFT Dale has got - (garble). Getting tether. He got it.

SPACECRAFT I did it.

PAO This is Mission Control Houston. We've got loss of signal through the Yarragadee station. Contrary to what we said previously the typhoon affecting the Quam station is not going to keep those people from keeping it open. They're going to continue to man the tracking station at Quam inspite of the bad weather and give us this pass. Will be acquiring through Quam in four minutes. This is Mission Control.

SPACECRAFT All the way counterclockwise with the disk.

SPACECRAFT (Garble) step.

SPACECRAFT Counterclockwise. (Garble) every minute don't I?

SPACECRAFT Okay, now what do you want, Dale?

SPACECRAFT Okay, wait a minute. (garble) needs to be clockwise and the disk fully counterclockwise. Those are the two steps.

SPACECRAFT (garble) can't do that because the handle won't rotate with the disk. You've got to get the disk counterclockwise with the (garble) to the left.

SPACECRAFT Okay. I'll go Joe.

SPACECRAFT There you go.

CAPCOM Discovery, Houston. With you through Quam for 8.

SPACECRAFT (Garble) zero.

SPACECRAFT .. goes clockwise.

SPACECRAFT Okay that's done.

SPACECRAFT We're AOS Guy.

SPACECRAFT Okay, AOS.

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SPACECRAFT (Garble) got it.

SPACECRAFT He's counterclockwised the disk and his ratchet flecter is clockwise.

SPACECRAFT Okay, good.

SPACECRAFT Let me check out the satellite here. Oh, my goodness. Look at that. It looks beautiful. Are we still up D-bar, David? I heard you talking about it at home while ago and I really didn't pay attention.

SPACECRAFT And Houston, we have a stinger flight check to go and we'll be ready to go to the satellite. Joe, check you're CEA tower goes on.

PAO This is Mission Control. They're progressing very well with the EVA, preparing to do the flight check with the stinger on the MMU.

SPACECRAFT Can I ask you a question?

SPACECRAFT Sure. Go ahead.

SPACECRAFT Are we still in the (garble) or do we do that at initial old trick I heard Rick talking about.

SPACECRAFT No we're D-bar.

SPACECRAFT Okay, great.

SPACECRAFT Okay, Joseph, when you're comfortable you can (garble). And Dale /an help you if you're having any problem with (garble).

SPACECRAFT Okay, now. Where am I going - no wait, don't do that Dale. I'm going to back up. Can I just back up?

SPACECRAFT I'd go straight forward for a few potatoes and then pitch down - okay. (Garble) back up.

SPACECRAFT Okay, don't back up.

SPACECRAFT (Garble) pitch steering and pitch around.

SPACECRAFT Go forward for a little bit and pitch down so you can see where you are at.

SPACECRAFT Okay.

SPACECRAFT These are ON. Is that right?

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SPACECRAFT Okay, now I am going to go to at hole.

SPACECRAFT Okay.

SPACECRAFT I'm at hole.

SPACECRAFT Okay, no further back.

SPACECRAFT Okay, I'm going to stop him.

SPACECRAFT Yes.

SPACECRAFT (Garble) he just bumped the fixture a gentle bump.

SPACECRAFT (Garble). I thought I kept it clear but I might have hit it.

SPACECRAFT No, no Dale bumped me. That was me hitting him.

SPACECRAFT Okay. Yaw around to the left when you're comfortable, Joe.

SPACECRAFT Ah, boy you can feel the coupling.

SPACECRAFT Are you're (garble) or normal?

SPACECRAFT No higher, Joe. That's good.

SPACECRAFT Okay, I'm (garble).

SPACECRAFT Okay, is it working norm? Go ahead and go to set staff.

SPACECRAFT Okay, I'm in set (garble) now.

SPACECRAFT Okay, yaw around to the left and tilt towards us. And translate forward just a little bit as you (garble) to keep from bumping into the sun shield. You can go a little higher, Joe, so you can clear Dale.

SPACECRAFT Don't want to get to close to the satellite, gees.

SPACECRAFT You can go a little higher.

SPACECRAFT I would need your (garble)

SPACECRAFT Yes, okay.

CAPCOM Discovery, Houston for Rick.

SPACECRAFT Go ahead Houston.

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CAPCOM Roger, Rick. We'd like for you to go to manual slew in the KU when you get a chance.

SPACECRAFT Okay, we're there. Okay, Joseph.

SPACECRAFT When you're stable, give me a (garble) check pass. (Garble).

SPACECRAFT Yes, I'm going to bring it around. I'm 22 hundred on the right. 24 hundred on the left.

SPACECRAFT Roger. 22 on the right and 24 on the left. Okay, come forward to your target. Real small (garble).

SPACECRAFT This is like flying the simulator. That's there's no noise in gears like behind me.

PAO Joe Allen flying the MMU over to a target on the forward bulkhead to test out the effect of having the additional weight of the stinger on the front of the MMU. Noting it was just like the simulator only it didn't make the same noise with the gears.

SPACECRAFT Okay, Dale. I see you going for 2 boards 1 to 3.

SPACECRAFT I'm getting ready to do an (garble) first.

SPACECRAFT Yes.

PAO Gardner actually 15 minutes ahead of the timeline.

SPACECRAFT And did you need to go further reminder that I wanted to talk to you until we get to talking about the power (garble).

SPACECRAFT Up front.

SPACECRAFT Okay.

SPACECRAFT One thing I do need to sometime Dale at your convenience the big 4 and Joe I'll get one from you at your convenience but not now.

SPACECRAFT I can give it to you right now.

SPACECRAFT Okay, go ahead.

SPACECRAFT Sun shield on the EVA, 6:30, 99 percent power, 98 percent O2, and 4.4 supress. That' it. Give me a second.

SPACECRAFT No hurry Dale.

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PAO And the crew holds to their current progress we may actually getting a picture through Hawaii of Allen docking with the palapa.

SPACECRAFT Got about 2 feet till you get it into the stinger.

SPACECRAFT - talking to?

SPACECRAFT I'm sorry. I'm talking to Joe.

SPACECRAFT I thought you were going to tell me it was going to ram me. Okay.

SPACECRAFT Joe said (garble) forward a little bit please.

CAPCOM Discovery, Houston. Losing you at Guam. See you at Hawaii in 6 minutes.

SPACECRAFT Okay, Joseph. You need to move aft just a little bit to your right. Okay, Joseph. When you're comfortable you can start a slow translation back over to the (garble).

SPACECRAFT That's what I'm going to do, David.

SPACECRAFT No hurry because Dale's still working there.

SPACECRAFT Oh, I certainly am.

SPACECRAFT (Garble) much better here.

PAO Mission Control Houston. We're passing out of range at the Guam station. We'll be picking up in 5 minutes through Hawaii and we expect to get downlink television at that time. Dale Gardner mounting tool boards and the antenna cutter on the manipulator foot restraint. He's setting up the tools he will use in his portion of the retrieval. Joe Allen has already done his stinger flight check. Flying the MMU with a stinger attached to the front to a forward bulkhead target testing out the dynamics of having that large mass on the front of the MMU. He's at the end of that check and very shortly after an EMU status check he will be ready to fly over to the spacecraft. We may get him in the progress of that flyover to palapa as we come back in through television. Crew proceeding very well along the timeline. They're about 15 minutes ahead of schedule in the EVA, holding to that pretty well. Mission Control Houston, we're standing by for acquisition through the Hawaii station. We may actually see Joe Allen flying the MMU over to dock with the palapa. Crew is a little bit ahead on the EVA timeline.

SPACECRAFT (Garble)

SPACECRAFT Okay, I got (garble).

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SPACECRAFT Okay, I got it.

SPACECRAFT Okay, see you later.

SPACECRAFT Okay, good work.

SPACECRAFT You got (garble) for gas, Joe.

PAO Okay, we see Joe Allen with the stinger mounted on the MMU.

SPACECRAFT (Garble)

PAO Long cylindrical -

CAPCOM With you through Guam with TV of the payload bay.

SPACECRAFT (Garble).

SPACECRAFT Can barely hear you; David.

PAO And we see the palapa in the - above the cargo bay.

SPACECRAFT Okay, (garble) activity is the (garble) stuff so you've got some -

SPACECRAFT Yes, I'm looking at (garble) three.

SPACECRAFT Okay.

PAO Last time they had the palapa this close to the Space Shuttle was last February when it was originally deployed. It's made about 3800 orbits since that time.

SPACECRAFT Okay, (garble) looks like he's got 7 (Garble) sunrise. Can I just get you to sit there and look at your target?

SPACECRAFT Boy, how can I miss. If Rick had given me 3 more feet we could have it (garble) omni.

PAO Joe Allen maintaining his position in the cargo bay waiting for orbital daylight for the proper lighting conditions for his flyover.

SPACECRAFT - above you, he's located down to where he's right above your head.

SPACECRAFT Stalli hoe.

SPACECRAFT Joe, I've got to move you a little bit.

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SPACECRAFT Okay. Are you going to put the tool board on here?

SPACECRAFT That's affirm.

SPACECRAFT Okay, I'm going to move my hand up. And done that.

SPACECRAFT Son of a gun. (garble) together is caught again.
Okay, I got it. Okay.

PAO And we're looking at the end effector camera there
at the palapa.

SPACECRAFT Do I have to move my hand again, Dale?

SPACECRAFT Yes, hold on to (garble) beaver for a second.

SPACECRAFT Just move me to the back maybe.

SPACECRAFT Wait, wait. Here let me grab with my other hand
right here. This is still the old (garble), Joe.

SPACECRAFT Oh, I see.

SPACECRAFT There you go. Okay.

PAO This is Mission Control -

SPACECRAFT (garble) stable where you don't spot.

PAO Joe Allen floating freely in the cargo bay.

SPACECRAFT (Garble) aloft.

PAO Waiting orbital daylight before moving over to the
satellite.

SPACECRAFT (Garble) quarter something again.

SPACECRAFT I can't tell. It doesn't look like it.

SPACECRAFT I feel like it's pulling on me.

SPACECRAFT Oh, yes. It's (garble).

SPACECRAFT Okay, let me get this tool board in then I'll get
it.

SPACECRAFT I'll get it (garble) caught on.

SPACECRAFT Looks like a straight line in the (garble) over
these. Maybe the other side of the (garble).

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SPACECRAFT Okay, I'll go get it and (garble), I got the tool board on. Felt like an elephant was pulling on me there.

SPACECRAFT (Garble). Dont' try this.

SPACECRAFT Okay, there it goes. All clear. Guess what I have left to go? The old omni cutter.

SPACECRAFT The old omni cutter.

SPACECRAFT Dale, this is going to work out great because then I can then sit back and watch Dr. Allen do all this. I have nothing to do.

SPACECRAFT (Garble).

SPACECRAFT And laugh.

SPACECRAFT And laugh. Because it was never done before.

SPACECRAFT Okay, Joe.

SPACECRAFT Yes?

SPACECRAFT See if you can give the maneuver that grapple a little bit through the (garble).

SPACECRAFT Well I can't David and I'm watching it real close. If I ding it it will be ever so gently. But I can control it about a 16th of an inch or else.

SPACECRAFT (Garble)

SPACECRAFT Oh, that's what would happen if a couple (garble) here. But (garble) are stable and (garble) little bit of control, I think I was a real clutz. (Garble) Steve would probably say that I am hut I bet it was jet firing.

SPACECRAFT Oh, I see.

PAO This is Mission Control. The EVA crewman in the cargo bay awaiting orbital daylight for the proper lighting to dock with the palapa.

SPACECRAFT (Garble).

PAO Joe Allen in the manned maneuvering unit with the stinger attached to the front.

SPACECRAFT Most of the time now. Can we handle this now?

SPACECRAFT We are.

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PAO Will be coming into orbital daylight just before we
loose our television.

SPACECRAFT I bumped the (garble).

PAO - and that the brief loss until we pick up through
Goldstone.

SPACECRAFT Dale, see if you can stop that grapple fixture from
spinning down to hit the -

SPACECRAFT Joe, I touched it so gently I could do it but I'd
have to sit here and do it for the next 10 minutes.

SPACECRAFT Okay.

SPACECRAFT I haven't even touched it.

SPACECRAFT - it's like a 1 arm sport.

SPACECRAFT I haven't even touched it yet.

SPACECRAFT Dale, you don't feel good.

SPACECRAFT (garble).

SPACECRAFT Dale, a tribual foot.

SPACECRAFT (garble).

SPACECRAFT The sun is coming up guys.

SPACECRAFT Oh, my gosh. Look at it. It's right across the
bay. Okay, lets see, the right lights off from it I guess.

SPACECRAFT Did you (garble) right lights, that's a go.

SPACECRAFT (Garble) with our left lights.

SPACECRAFT Okay.

SPACECRAFT Got a few more seconds in there.

SPACECRAFT I can't do it. I'm going to leave my on, Dale.

SPACECRAFT Oh, that right. You got them.

SPACECRAFT Yes.

SPACECRAFT That's right. Very correct.

GARDNER Ok, Anna, somehow its slid back toward the cabin. Can we go back towards the tail a little more? I can't reach you over here. I don't know if you moved it or if it just creeped.

SPACECRAFT It creeped.

GARDNER (garble) creeping arms.

SPACECRAFT Ok, we're stopping now Dale, is that OK?

GARDNER I need to go a little more towards the tail.

SPACECRAFT (garble) roll help or is that side towards you? The fore side towards you.

GARDNER I need to go towards the tail.

FISHER Dale, if I could take a little of that roll out, then I'll be able to move after that.

GARDNER Ok, forget it, I'll do it.

SPACECRAFT Dale, just stop a second Anna and I will try and go out just a little more.

GARDNER Ok. All I need is three or four inches and I can reach it.

CAPCOM Discovery, Houston.

SPACECRAFT Ok, Dale, (garble).

GARDNER Ok, it's good right there Anna. That's fine.

SPACECRAFT Brakes are on. Go ahead, Houston. Talk to me, what's next?

SPACECRAFT Ok, take the common bracket clamps and the end of fire and check the drive bolts out.

GARDNER Ok.

SPACECRAFT Houston, Discovery, go ahead.

CAPCOM Roger, we're going LOS. A couple of items we'd like you to do for us. We'd like you to terminate boiling water, we'd like you to take tanks three and four O2 heaters to off.

SPACECRAFT Ok, we'll do that.

CAPCOM And we'll see you at Guam at three one.

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SPACECRAFT Now, David, can we view - I'm going to start on my back, head towards the tail and around it that way, still. Wow, look at that. That's affirmative and when I give you the go you'll be (garble) before you laid out so I can pull you over the pan (garble).

SPACECRAFT (Garble).

SPACECRAFT Houston, Discovery. The sun is up and we're ready to go.

CAPCOM Roger, copy that David. We're ready also.

PAO Mission Control. We're about to lose our TV picture through Hawaii. We'll pick it up again in just about a minute through the - about a minute and a half through Goldstone. Things proceeding very well of the EVA. The crewman were holding up waiting for daylight to illuminate the satellite in the orbiter's cargo bay so they'll have good lighting conditions for the docking maneuver. Mission Specialist, Joe Allen, on the MMU with the stinger attached to the front will fly around to the backend of the Orbiter and insert the stinger into the rocket nozzle. The used rocket nozzle of the palapa satellite and held then triggered the toggle bolts and tighten the grip on the satellite. The mechanical arm operated by Mission Specialist, Anna Fisher will then grapple a connecting fixture on the side of the stinger and then will haul the satellite and Joe Allen attached to it back down toward the cargo bay where Guy Gardner or whether Dale Gardner will attached an A-frame structure to the top of the satellite that will enable it to be grabbed by the mechanical arm from the top and then insert it tail down into a retaining fixture in the cargo bay where it will be firmly mounted for the return to earth. We will be picking up in about 27 seconds or so through Goldstone and we should have television back at that time. The orbiter is in the daylight, Allen should be beginning to make his flight to dock with the satellite. And we have our television picture back. Allen not to be seen in the cargo bay. Gardner there attached to the manipulator foot restraint. We see the light reflections from the slowly rotating palapa satellite just above the orbiter's cargo bay. At our cabin rather our payload bay television now coming into daylight the earth below, we see the pacific just west of Baha, California.

SPACECRAFT (Garble).

SPACECRAFT Yes, I do. Yes, I know that.

PAO Now the camera moving up to -

SPACECRAFT Okay, I'm right pretty well behind it.

SPACECRAFT (garble) LOS. Ok.

GARDNER Ok, drive bolts and the guides from PALAPA. Tell you what, (garble), is really hot. We're LOS aren't we?

SPACECRAFT It's hot?

GARDNER David, are you there?

WALKER Yes sir, go ahead.

GARDNER Our gloves, I would guess, are 120 degrees inside right now.

WALKER That's alright, the sun will be going down shortly, that should help you.

GARDNER Ok, PALAPA, PALAPA, there's one drive bolt that's got to come out a little bit.

PAO Mission Control, Houston, loss of signal through the tracking and data relay satellite. As we went over the hill, the crewmen outside were working to put an antenna bridge structure on PALAPA, having removed the Omni antenna. Additionally on the this next orbit, orbit 67 we expect to take some unscheduled television, first through Hawaii and with a acquisition beginning at 10:01 CST and lasting until 10:09 CST then following that almost a full TDRS pass from ten ten central to eleven O four central and since this unscheduled live television comes down at the time of the scheduled Larry Bourgeois change of shift press conference, we will cancel that briefing. Again, we will cancel the Larry Bourgeois briefing to make way for some television coming down of the EVA operations in space.

PAO We're now two hours, two minutes into this extravehicular activity. The procedure has gone very well, every phase of the procedure has been done as planned, first try, both the flyover by Joe Allen on the MMU, the grapple for the docking with the stinger, subsequent grapple by the remote manipulator arm by Anna Fisher onto a grapple fixture on the stinger. Then they positioned the satellite for Dale Gardner to remove the Omni antenna and they're now putting an Omni antenna bridge adapter structure across that part of the satellite so that they can now take the arm, pull it off of one end, put it on the other and position the satellite for the final ring adapter installation. That ring adapter will hold the satellite in the payload bay for the return to earth. And, again, we will repeat, we have cancelled the Larry Bourgeois change of shift press conference which has been scheduled for ten-thirty a.m. central and we'll instead make way for some unscheduled Hawaii and TDRS television on the next orbit. Currently the mission elapsed time, four STS 51-A EVA AIR TO GROUND At1jc 04:02:47 11/12/84 PAGE 28

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PAO See the palapa satellite and Allen lined up to prepare for driving the stinger up into the nozzle.

SPACECRAFT Boy, the sun's in a nasty position. The (garbe) length is about right.

PAO Allen moving in slowly.

SPACECRAFT Okay, I almost can't see it. I'm flying right into the sun. Okay. Okay, I'm penetrating. Toggle full.

PAO And he has pulled the toggle bolts -

SPACECRAFT - both doors. The jetter power coming off and they're back on and I'm starting the toggle. Don't dock, don't dock. (garble) fun with it. Okay. Very (garble) crank, it's pulling it right down. I'm using no gas at all. Don't take it back yet, Dale. Yes, it (garble) - actually it bounces away from the ring, Dale, and then you can crank a little faster and -

PAO Allen cranking down a ratchet handle to tighten up the grip on the palapa satellite. After that he will use his manned maneuvering unit -

SPACECRAFT - pulling it down. Okay, the ratch is broken over, stop the clock, we've got it tied.

PAO And he is firmly attached now to the palapa.

SPACECRAFT (Garble) and hold. And I've got a thousand PAM's.

PAO And we're close to losing our TV picture. You can see Baha, California just beneath them and crossing the coast of Mexico. Allen will use his maneuvering unit to slow the rotation rate of the satellite and we're losing our television picture. We have lost our television picture but we got the best part. Joe Allen docks successfully with the palapa satellite, toggled the - released the toggle bolts up into the rocket nozzle, tightened down the grip of the stinger on the palapa and now will shortly go to satellite attitude hold of the stabilization with the MMU and stop the rotation rate. The orbiter's mechanical arm will then grasp the fixture on the side of the stinger and will pull Allen and the satellite close with the top of the satellite down to the cargo bay where Dale Gardner will then attach an A-frame structure to the top of the satellite. The mechanical arm will switch ends and then they will bring it back down tail first into the cargo bay after Allen has released the stinger and backed away. They'll tighten down a series of clamps into a circular ring pulling the satellite tightly down in a fixture where it will be firmly in place for the return to earth. To dates from now the same procedure is expected to be performed on

days, three hours, fourteen minutes, this is Mission Control, Houston.

PAO Mission Control, Houston, standing by for acquisition signal in forty seconds. A reminder that after this pass we will pick up television through Hawaii commencing at 10:01 CST. That T.V. should last until 10:09 and then we'll have a full TDRS pass lasting until about 11:04 central standard time. And, we'll have a satellite playback after the TDRS coverage.

GARDNER What we have to do is to get out of the configuration we're in, get the A-frame put away, get in (garble) TFR in the other pallet, after reconfiguring the MFR and (garble).

SPACECRAFT We (garble) to you, Dale.

GARDNER Ok, and then I (garble).

SPACECRAFT (garble) the MFR.

GARDNER Then, I pull myself off.

SPACECRAFT You could that, you could that almost anytime actually. You have to go quick (garble) the MMU and go back over the MFR to get the stinger off it.

CAPCOM Discovery, Houston, through Guam.

SPACECRAFT (garble) Houston, Discovery, we're going to let Dale talk, we've got a problem here.

CAPCOM Roger, go ahead.

GARDNER Ok, Jerry, Ok Jerry, here we go. The common bracket clamp will not fit on the satellite. The problem is between the two octagons, between the two common bracket parts of the satellite, is a structure that's sticking out far enough that it is hitting the cross-brace of the common bracket clamp before I could get the V-head bolts even close to driving on to the octagon.

CAPCOM Ok, we copy that and understand.

GARDNER It's not a (garble) structure I can remove, it is massive. I've tried twisting as you can imagine every direction, I tried forcing it on. It's within maybe an eighth to a quarter of an inch of making it, but unfortunately close doesn't count with the common bracket.

CAPCOM What are you proposing to do?
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the Westar. And we're getting the video back through Mila and we see the satellite is stabilized.

SPACECRAFT Is it the right direction, Anna?

SPACECRAFT Looking good, Joe. Okay, at hold now.

SPACECRAFT Spock, at hold.

SPACECRAFT Okay, Joe, in the (garble) right yaw down and that's going to be 180 degrees.

SPACECRAFT Okay, right yaw from 180. Okay, say when.

SPACECRAFT Go now.

SPACECRAFT Okay, here we go.

PAO Allen using his manned maneuvering unit turning his satellite 180 degrees.

SPACECRAFT (Garble) arm is rotating it up to center map now so I'm going to come over closer to you.

SPACECRAFT Aren't you going towards end effector?

SPACECRAFT Yes. Oh my, oh my.

SPACECRAFT We know that.

SPACECRAFT (Garble) the CSF.

SPACECRAFT What land mass are we over?

SPACECRAFT (Garble) New Mexico by the way it looks like to me.

SPACECRAFT Oh boy, it's georgous.

SPACECRAFT It sure is.

SPACECRAFT You're right.

SPACECRAFT Keep it coming, Anna.

SPACECRAFT I see the grapple fixture. I'll give you a call.

SPACECRAFT Okay.

PAO And now we see the grapple fixture there that the mechanical arm will grasp. We're looking at the spacecraft with the camera mounted on the end.

GARDNER We are proposing to go to the no A-frame procedure and I will go up to the PFR in the forward pallet and try a technique perfected by yourself. Let Anna grab, hand it to me, I'll grab the top end, go in temporary stow to get rid of the MMU, come back with the MFR in the aft pallet, take off the stinger and then put on the adapter.

CAPCOM Ok, we copy plan B and proceed.

GARDNER Ok, we've got a little cleanup to do because (garble) so it'll be a short little bit before we get started here for serious.

CAPCOM Roger, understand that and understand you'll be putting the A-frame in a temporary stowage.

GARDNER (garble), I think I'll putting it right back where it goes. Can it be docked.

SPACECRAFT You don't want to do that, Dale, because of the berthing.

GARDNER Oh, yea, we're going to unberth it, we got to unberth it.

SPACECRAFT Oh, ok, that's right, yea you're right, Jerry, temporary stowage

GARDNER We've still got to unberth it.

SPACECRAFT It's got to be, it can't be down on there can it? (garble) can we slip it around?

GARDNER Take and slip it around it. I'm sure we can.

GARDNER Ok, we do make any money by having me come off right now?

CAPCOM Discovery, Houston.

SPACECRAFT Not till sunrise, Joe, we'll think about it.

GARDNER Go ahead, Jerry.

CAPCOM Dale, our preference would be go head and temporarily stow the A-frame as a chance of working the adapter around it after you have it stowed.

GARDNER Ok. Ok, Anna, you can take the satellite up and away now, I think I've got everything off ready to take off.

FISHER Ok, I'll do that.
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SPACECRAFT Oh, how.

SPACECRAFT Bark. (Garble) hold. I still got a thousand and twelve hundred.

PAO Allen reading off GN2 pressure, nitrogen pressure in the MMU. He has plenty left. He is stabilizing the satellite in position for the mechanical arm to grasp it. We see the grapple fixture there in the right portion, center portion of the screen. The mechanical arm on which the camera is mounted that you're looking at it with will move right in close and tighten down on that fixture and it will be essentially be home free. Dr. Anna Fisher, Mission Specialist, maneuvering the mechanical arm.

SPACECRAFT Okay, Joe. Give me a little bit more right yaw.

SPACECRAFT Okay, right yaw, arc.

SPACECRAFT And hold now.

SPACECRAFT At hold.

SPACECRAFT Okay, give me a pitch up please.

SPACECRAFT Pitch up now.

SPACECRAFT Okay stop the pitch.

SPACECRAFT Stop.

PAO And we're getting a brief break in television as we pass through an antenna pattern keyhole. We should pick it up just momentarily again. Allen, fine tuning the attitude of the spacecraft preparing for a grapple as mission specialist, Anna Fisher maneuvers the mechanical arm into place. Should be picking up TV picture again momentarily. So far, this whole procedure has gone very well from the initiation of the rendezvous phase, 5 hours and 15 minutes ago leading up to the satellite grapple just 10 or 15 minutes previous.

SPACECRAFT On way. We're still at a thousand and twelve hundred.

SPACECRAFT Good, Joe.

SPACECRAFT And I can hear the fires thrusting.

PAO And we have our television back. And RMU officer reports moving the mechanical arm in for the docking and the grapple. The motion you see there is because of the relative positions of the arm in the spacecraft, the camera is mounted on

SPACECRAFT Ok, Dale the temporary stowage location is probably the right idea and (garble) feel real comfortable with trying to put it in without doing it.

GARDNER Yea, I understand.

ALLEN And, Jerry, this is Joe, it's getting pretty chilly. I'm up to full heat. With your concurrence I'm going to turn my water off for a while.

CAPCOM Ok, stand by, I think that's good but get a concurrence. And, Joe, we concur on that, go ahead.

ALLEN Ok, water's coming off.

GARDNER David, you've got a section on this in your book there, I'm sure you're pulling it out.

WALKER I have it out and I'm looking at it now.

WALKER And, Joe, I think that once we get sunrise there's no point in keeping you on the top end of that thing anymore, and Jerry listen to me and correct me if I'm making a wrong assumption. We can go ahead and get you down (garble) and get you in a better position to help as quickly as possible once we get (garble).

ALLEN I'll just pull the pin and fly myself and get rid of the MMU. Is that correct?

WALKER We'll do a quick (garble), I can talk you through it and...

SPACECRAFT Ok, I've got 1300 and 1400 (garble) of gas, that should be plenty.

WALKER Yea, we're just going to wait for sunrise, we've discussed moving you around on the RMS to make it a better option but I think it's better just to let you sit...

GARDNER I'll tell you, (garble) header reel on the power tool has stopped working. I must have 1400 yards of string out here all wrapping around everything.

SPACECRAFT Ok, Dale, your tether's snagging on the grapple fixture on the MFR.

GARDNER Ok.

SPACECRAFT Ok, for now. Dale, I think when I get Joe out of that thing I'm going to get him started on configuring the PFR, you aren't already finished.

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the very end of the mechanical arm. The spacecraft satellite and Joe Allen are actually stable as the arm moves in to the target.

SPACECRAFT Bring it on in, Anna. You've got plenty of room.

PAO And we've lost our television picture just as Anna Fisher preparing to grapple the satellite.

SPACECRAFT Okay, Joe, she's got five piece to go to the grapple fixture.

PAO We're still hearing voice from the spacecraft. If we maintain communications through -

SPACECRAFT - getting in my list here like a hawk and now I can see it. Looking perfect, Anna. Looking perfect.

SPACECRAFT Just like a (garble).

PAO If we maintain connection through the tracking data relay satellite we should be able to hear the progress.

SPACECRAFT (Garbie) cycle, looking perfect, Anna, looking perfect, looking perfect. Be gentle though.

SPACECRAFT We have you sir.

SPACECRAFT And how.

PAO And indication of (garble).

SPACECRAFT Good work, Cabot. Way to go.

PAO And we have a rigid group on the satellite. And the folks in mission control are pretty happy about that. Everything went just by the book. The satellite is not originally intended to be retrieved.

CAPCOM Discovery, Houston for Rick.

SPACECRAFT Go ahead, he's listening.

CAPCOM Roger, great show. We see you captured and we'd like for you to do an interconnect hank switch to the right tank of the oms by the completion of the tank switch we'd like you to go right oms ISOL A to GPC. Page 8-70 orbit pocket. Correction that's page 8-4.

PAO And this is Mission Control. We'll have a playback, satellite playback of the EVA operations and the television of what we just saw. That will be coming down here in

GARDNER (garble) first, David.

WALKER I mean after that.

GARDNER I'm just going to get as much of this cleaned up as I can so he has a place to work over here. Or whichever one of us...

CAPCOM Break, break, Discovery, Houston.

WALKER Go ahead.

CAPCOM David, we're fifty seconds to LOS Guam, initial inputs from Hughes indicate that the obstructions may be wave guides. We've been given a go to attempt to deform those, cut them whatever it might take, if that would help. I suggest possibly using the Gardner to tool.

WALKER Yea, I thought about that. Dale, you want to comment?

GARDNER Yea, Jerry, it's not stuff that I can do that to. It's way too strong.

CAPCOM Ok, very good, copy. We'll see you in Hawaii in about five minutes.

WALKER Ok, Dale, as you're working there, let's think out loud a minute. Should, if I pull the pin and the satellite can be handed to me, you can continue to put on the adapter.

SPACECRAFT Garble.

PAO Mission Control, Houston, we've lost signal through Guam, next acquisition four and a half minutes through Hawaii. As we came through Guam the crew reported a problem in the procedures that they have. The problem is in the installation of the antenna bridge structure, there's a piece of the satellite in the way and Dale Gardner reported that he cannot remove that piece of the satellite, a structure of the satellite nor can he lock down the antenna bridge structure. He said he came within about a quarter inch of making it mate, but just couldn't do it. The Hughes customer support room said they felt the structure in the way were some wave guides on the satellite and they would be agreeable to try and lop those off with a pair of lopping shears however, Gardner said that was too massive a piece of the satellite to do that with. Plan now is go to step B in the contingency timeline and attempt to mate the satellite to the locking ring that fits around the apogee kick motor manually rather than using the RMS to steady the satellite as it would be attached to the antenna bridge structure. In other words, they'll try to do this procedure without the antenna bridge STS 51-A EVA AIR TO GROUND At1jc 04:02:47 11/12/84 PAGE 32

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just a few minutes. We still have linkup through the tracking data relay satellite. The operation of the -

SPACECRAFT - bring up the elbow camera and you can control it if you like.

CAPCOM Roger, copy thank you and we have a delta to your maneuver to the solar track attitude, page 7-9 of the EVA checklist.

SPACECRAFT Okay, you have the elbow camera.

CAPCOM Roger, thanks.

SPACECRAFT Okay, and go ahead with the delta to the solar track attitude.

CAPCOM Okay, this is to give us a better KU-band track for orbit 67 and the delta's are - the yaw should be 60, omicron 130, over.

SPACECRAFT Okay, yaw 60, omicron 130 and I'm putting that into work now.

CAPCOM Roger, thanks and on subsequent orbits 58 and subs we'd like you to go to the published attitude.

SPACECRAFT Can you give us a call? We'll try and mark it in our books if you give us a call also. All right?

CAPCOM We'll do that.

PAO This is mission control, we'll have satellite playback in about a minute of the television we saw of the satellite retrieval.

SPACECRAFT (garble) can look at our configurations.

CAPCOM Roger, we need the right oms tank ISOL A to GPC.

SPACECRAFT Right oms tank ISOL A to GPC, okay?

CAPCOM And the talkback should be barberpole.

SPACECRAFT It is barberpole.

PAO Mission Control, we're standing by for a satellite playback of the television of just downlinked from the ground from the Orbiter.

SPACECRAFT Okay, Dale. We should not be translating so you can keep that up with old (garble) at the moment.

structure.

PAO Mission Control, Houston, we're acquiring signal through Hawaii where we expect to take television and join the crew members as they work to solve the problem they have with the antenna bridge structure.

CAPCOM Discovery, Houston, through Hawaii and TDRS.

SPACECRAFT Go ahead, Jerry, we're with you.

CAPCOM Alrighty, just like a status update quickly.

SPACECRAFT Ok, what we're doing, is Dale is (garble) temporarily stowing the A-frame, when we get sunrise Joe's going to come down kick back the MMU and then go get in the portable foot restrainer on the forward pallet where we'll hand him, Anna will hand him, the spacecraft and Dale will work the other end for the MFR.

CAPCOM Ok, that all sounds good to us and we concur. I've got one DAP change for you when you're ready to copy.

SPACECRAFT Ready to copy.

CAPCOM Ok, to make sure that we don't have any Ku-band pointing problems during this next TDRS pass we would like to tighten up the vernier attitude deadband to two degrees versus the five degrees we've got right now.

SPACECRAFT Ok, that can work. And, in the bay the sun will be up here before very long, you might be thinking about your (garble), Ok?

PAO Mission Control, Houston, the crew reporting that as Dale Gardner down in the lower part of the NASA select picture is temporarily stowing the A-frame structure, the antenna bridge structure, the contingency plan.

SPACECRAFT Are you clear on the separation that everythings off the top of that thing?

ALLEN I'm just going to pull the pin, David and I'm going to put them back their (garble) hole, my (garble) are (garble), my gyro power is on but I'm not in that hole and I'm going to go to normal.

WALKER Ok, that'll be good.

ALLEN (Garble)

WALKER Garble.

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SPACECRAFT Wonderful. Did you get rid of the A-frame, Dale?

SPACECRAFT Gotcha.

SPACECRAFT Houston, Discovery. We're going to solar track attitude.

CAPCOM Roger, we see that.

SPACECRAFT Houston, Discovery. I'm ready to give you that PAM and (garble) check if you want it.

CAPCOM Go ahead, we're standing by.

SPACECRAFT Okay, you've got it?

CAPCOM Roger, we're seeing the temp check.

SPACECRAFT Okay, let me know when you're done with it.

CAPCOM Wilco.

PAO Mission Control. We're looking at a replay of the television reported earlier downlinked earlier of the satellite retrieval. A satellite firmly now in the grip of the -

SPACECRAFT still need your camera light on.

SPACECRAFT Thank you, Joseph. Good call.

PAO Mission Control. Satellite firmly in the grip of the mechanical arm. The will be inverting the satellite now so that the - Dale Gardner, mission specialist, EVA 2 can attach A-frame device to the top of the satellite.

CAPCOM Discovery, Houston. We've got the ASC temp feeling good. Thanks.

SPACECRAFT Houston, Discovery. That last transmission was unreadable.

CAPCOM Roger, Dave. We've got the ASC temperatures. They look good, thank you.

SPACECRAFT Discovery, roger.

SPACECRAFT Okay, (garble) is all configured to start working on the omni.

ALLEN Pardon me?

WALKER Do not push off too hard when you move away from it.

ALLEN No, I'm going to sort of come off very gently and then I'm going to fly, let's see I'm going to fly up near your cabin, I'm just going to drop down a little bit and fly under the arm right back to the FFF. (garble) back off from the (garble) ever so slightly, ok?

WALKER Ok, come between, come between the satellite and me, please.

ALLEN Yea, I will, definitely.

WALKER Ok.

ALLEN And, I'm ready to do it whenever you're ready.

WALKER Ok, Joe, go ahead and pull your pins.

ALLEN Ok, I'm going to do them one at a time and then going to replace them.

PAO Allen now releasing himself from the PALAPA satellite.

ALLEN Ok, one of them is out.

PAO Allen will fly down and dock the MMU to its support structure. He'll quick doff that, take it off quickly and move over to the starboard side of the Orbiter.

ALLEN The (garble) coming out.

PAO Allen will then place himself in a foot restraint and will hang on to the PALAPA satellite while...

ALLEN Back, back in. I'm being careful, I'm not separating anything, I'm being real careful. I'm going to pull the second pin while hanging on to the stinger (garble).

SPACECRAFT Nice and easy, Dale.

GARDNER I'm just having trouble seeing.

SPACECRAFT Garble.

SPACECRAFT Ok.

GARDNER And, it's stowed. Now I'm going to...

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SPACECRAFT Okay, good. He can take a little break. And in a second I'm going to get EMU status from both of you. Okay, big 4 I'll start with Joe.

SPACECRAFT Okay. Hang on a second, David. I've got to (garble) to cover up with my (garble). Okay, 134 from the time, 548, 39 percent power. A 6 percent O2, depress is still normal.

SPACECRAFT Sound good. Okay, Dale.

SPACECRAFT Okay, 135, 550, 79 percent power, 81 percent O2.

SPACECRAFT Okay, sounds good.

SPACECRAFT And what are we reading now, David? Did you guys do a maneuver or something?

SPACECRAFT Yes, I'm maneuvering.

SPACECRAFT All right.

SPACECRAFT Is that why you and Anna can't take off the brakes during the maneuver?

SPACECRAFT We're getting our configures here to do the next maneuver with the RMS.

SPACECRAFT Okay, Joseph, (garble) starting over the starboard wing but raise your eyes when you're down here working in the MFR.

SPACECRAFT With that satellite you don't want that little one to get down over here.

SPACECRAFT Yes, yes. That was the one part of the plan we didn't do quite as well as I was flying right into the sun during the dock - I mean square into it. You're call on the shadowing was real helpful. In fact I could see it there in a move across your body but I couldn't see any of the satellite there for a few moments.

SPACECRAFT Obviously it didn't affect your performance.

SPACECRAFT Maybe it improved it. (Garble) over into control.

SPACECRAFT Okay, we're going to start moving the RMS down, Joe.

SPACECRAFT Okay, great.

SPACECRAFT Oh boy, I guess.

FISHER Ok, Joe, we're (garble) you in a position for installation of the A-frame.

ALLEN Ok.

PAO This is Mission Control, the mechanical arm maneuvering the satellite into position for installation of the A-frame. And, this is Mission Control, propulsion officer reading off the propellant quantities remaining and flight director, Larry Bourgeois observing that the orbiter is in very good shape for the amount of propellant remaining to affect the second rendezvous with the WESTAR satellite two days from now. It'll essentially be a repeat of the same thing that we've seen this morning, rendezvous sequence, a series of orbital adjusting burns, placing the Discovery in a proper lineup to meet up with the satellite.

GARDNER If we had this do all over again, I would have voted for sun over the port wing, not sun over the starboard wing.

SPACECRAFT Don't be wishy-washy, Dale.

PAO And the RMU officer reports that Anna Fisher's maneuvered the arm into position for A-frame installation. The installation of the A-frame is due to begin at...

SPACECRAFT (garble) is being brought down to you by Anna.

GARDNER Wonderful, doing great. (garble) Dr. Fisher.

SPACECRAFT Ok, you just tell her where you want it, alright?

GARDNER Ok. As you bring it down, Anna, I need to go towards the cabin about a foot and a half, move it after me. Wonderful. Keep it coming. Ok, that's good (garble), keep it coming down in 2. Ok, Anna, stop there a second and do a right roll so I can kind of come into that 90 degree angle at a 45, if you see what I mean. Right roll of oh, about 30 or 40 degrees.

PAO Dale Gardner directing Anna Fisher's movements there of the...

GARDNER (garble) orbiter (garble), Anna?

FISHER Use an orbiter roll, right?

GARDNER Orbiter (garble), right roll.

FISHER Ok.

PAO Movements of the satellite into position.

WALKER Ok, you've still got good (garble) and (garble) backing off.

GARDNER Yea, I'm going to back off and I can move myself down a little bit. I'm going to give myself just a little bit of motion of the sort I want.

WALKER Just like an eagle leaving the nest.

ALLEN Ok, garble.

ALLEN garble, I'm (garble) the satellite, look at it.

SPACECRAFT Ok, control mode normal?

ALLEN It is in normal.

ALLEN It is normal. When I'm below the arm, David, tell me.

WALKER Keep coming down. Just continue to (garble) right down towards the starboard longeron and then move towards the cabin a little bit. And, if you take it nice and slow you can probably see your way through as easy as I can tell you.

ALLEN Ok, now (garble) come forward.

WALKER Ok.

ALLEN I'm not interfering with the arm, am I?

WALKER No, you're in good shape, keep coming closer to the cabin a little more.

ALLEN Ok.

GARDNER If you're not using the A camera, I'd take it straight up so I don't (garble) when I go into this foot restraint here.

WALKER Ok.

SPACECRAFT There you go.

ALLEN Yea, Dave, I'm going to ask you also to read the dock procedures to me.

WALKER I will.

SPACECRAFT Garble.

WALKER Can we move up just a couple of inches?

ALLEN You want me to move up?

WALKER Yea, we'll take your picture real quick.

ALLEN That's a good point.

WALKER (garble) since we got moving.

ALLEN Ok, I think I can back into, read the procedures to me now, David, I'm going to...

WALKER Ok, gyro power off once you grab hold of something.

ALLEN Ok, it's off.

WALKER Ok, you can just kind of back yourself down there if you can feel your way around.

ALLEN Hope I don't ding the camera.

WALKER You could turn around and go in frontwards.

ALLEN I want to try and turn the power back on, I'm losing control here.

SPACECRAFT Ok, (garble). Come back up forward, turn around and fly into it.

ALLEN Yea. (garble) do the head down trick like we do in the water tank.

SPACECRAFT I think that's the way to do it. (garble).

PAO Mission Control, Houston, temporary loss of signal as we pass between Hawaii and the tracking data relay satellite. Pick up shortly. The plan again is to manually hang onto that satellite while the adapter ring is installed. Both astronauts would be securely fastened to foot restraints as that procedure takes place. One astronaut would be restraining the spacecraft while the other, Allen, would be putting the adapter ring around the motor nozzle and the other astronaut would apply a downward force as they manually align it up with the V-guides and slip into its final berthing place.

PAO Mission Control, Houston, locked back up again with the tracking and data relay satellite. Correction, this video coming down through the Goldstone tracking station, we're not locked up with the tracking and data relay satellite at this point. We see Allen on the left hand side of the picture preparing to dock the MMU to its support structure in the payload bay. This view from the elbow camera of the robot arm looking down into the payload bay. Gardner on the right hand side of the
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GARDNER (garble) I don't think I can talk you on that one. There you go.

FISHER I think it would be easier if you just told me what you wanted relative to you.

GARDNER That's harder for me to explain.

FISHER I can do either way.

GARDNER Ok. What I want now is to be able to work in at an angle like this, see, otherwise the Omni will be punching me right in the belly here when I try to take the MLI off.

FISHER I understand.

GARDNER There is a lot of carbon coming out of the rocket nozzle.

SPACECRAFT Ok, well good thing we brought along the shower cap.

GARDNER It's by a lot, it's like a pepper shaker.

SPACECRAFT All little pieces?

GARDNER Yep. Ok, Anna, that's good on the roll. Now just bring it over towards me this way and I'll end up bending up like this in order to get in there once you're there.

FISHER Ok, I understand what you want, Dale, just a minute. The Omni antenna is pointed towards the grapple fixture by the MPR there, so we have to keep a close eye on that.

GARDNER Is that clear or did it come this way anyway, so it'll be plenty clear. Just come this way, first. Ok, stop for a second, ok, now go towards the tail about six inches, keep it coming a little more, little more, ok stop, now come down, ok let's try it right there. Anna go towards the tail a little bit, it keeps sliding towards you. Ok, three inches toward the tail, so it'll block the sun here so I can see. Great right there, perfect. Nice flying.

FISHER Brake's on.

SPACECRAFT Dale, I can feel you working on it.

GARDNER I'll tell you what, Joe (garble) may not work in the water, but in space it's a real doozy.

SPACECRAFT Ok Dale, negative instructions from me, do you need some.

picture. Allen after he secures the MMU, will translate across down the starboard side to assist Gardner with the positioning of PALAPA for placement into the final berthing position.

PAO Mission Control, Houston, loss of signal through Goldstone, hope to acquire in about two minutes through the tracking and data relay satellite.

PAO Mission Control, Houston, to restate where we are in this procedure, we're about two hours, fifty-two minutes into the EVA. The first part of the EVA went very well, the flyover by Joe Allen in the MMU, the docking with PALAPA, the subsequent attitude stabilization and grapple by the robot arm of the shuttle to put the PALAPA in a position directly over the payload bay. Dale Gardner snipped off an Omni antenna, the next part of that procedure called for the placement of an antenna bridge structure across the top of the PALAPA and that is the part that has snagged. The antenna bridge structure won't clamp down. And we have acquired through the tracking and data relay satellite.

GARDNER Whew, I got it.

SPACECRAFT That's the same guy who did the (garble).

GARDNER See what happened here?

SPACECRAFT Yea.

GARDNER Did a (garble), it throws it in there.

ALLEN Ok, let's see the MMU is thoroughly locked in.

SPACECRAFT Ok, and the main power's off?

CAPCOM Discovery, Houston, through TDRS.

SPACECRAFT Garble

SPACECRAFT Houston, Discovery, go ahead.

CAPCOM Ok, David, we've got TDRS back up, we'd like you to take Ku to command, please, and we have a comment for Joe concerning thermal mittens when he's got a chance.

SPACECRAFT Joe, you listening?
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ALLEN Yep, when they turn the main power off, go ahead Jerry.

CAPCOM Ok, Joe, based upon Dale's earlier comments, I suggest you might at least think about getting the thermal mittens out of the airlock as you proceed over to grasp the

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GARDNER (garble) you can probably see what I'm doing.

SPACECRAFT I can see it real well. The only thing to remember is to tether the thing.

GARDNER There she is. Ok, I'm going to do some cutting first.

SPACECRAFT Roger that.

GARDNER Oh, maybe not, maybe I can just tether it right down here right now.

SPACECRAFT If you see a convenient place, it might be easier.

PAO Mission specialist, Dale Gardner, preparing to cut off the graphite antenna, he'll be using a pair of clipper purchased from a local hardware store here in the Houston area and modified to be a space equipment.

GARDNER Ok, she's tethered.

PAO And Gardner has tied a retainer, a tether around the antenna, that'll be cut so the A-frame can be properly fit on the end.

GARDNER I am ready to start cutting. Dr. Fisher's speciality. Anna, I think it's ok.

SPACECRAFT She's listening.

GARDNER Oh, we're alright.

SPACECRAFT Ok.

PAO Gardner referring to the fact that Dr. Anna Fisher, a medical doctor.

GARDNER Graphite is cut.

PAO Gardner has severed the Omni antenna.

GARDNER Yea, we got a little bit of (garble) graphite pieces, not near as many as I expected, frankly. And, by the way I got it cut between, there was enough room between the cable standoff and the antenna structure, so I'm going to take the cable ring with me.

SPACECRAFT Ok, good. Looks like the MRI is pretty firmly attached on the (garble) away from you yet.

GARDNER Oh yea, that stuff is really something. (garble)

unbelievable. Hey David, we might have a thermal phenomenon going on here. I may have got twelve hundred pounds in the right, and fourteen in the left. Either that or we discovered and new energy source.

WALKER Well, you might be heating up a little bit, (garble) in their attitude.

GARDNER (garble) we have a souvenir Omni antenna (garble) little old hand, here.

SPACECRAFT Good for us.

GARDNER (garble) we're going right over South Africa, aren't we.

PAO And this is Mission Control, Houston, we're expecting television on the next pass through Hawaii starting at 10:01 central standard time for eight minutes and then at 10:10 picking up through the tracking data relay satellite for nearly an hour until 11:04. So we are expecting live television, unscheduled television at those times. Again, that's starting at 10:01 central time over Hawaii until 10:09 picking up again at 10:10 and going to 11:04 a.m. central standard time through the tracking and data relay satellite. We currently have voice communication with the spacecraft through TDRS, Discovery over South Africa, the southern part of Africa.

GARDNER garble

SPACECRAFT Go ahead.

GARDNER The Omni's off, what's next?

SPACECRAFT Alright, we need to stow the Omni and cutter when the installation, during the installation of the A-frame.

GARDNER Ok.

SPACECRAFT And, Anna will be with you in just a second.

PAO Gardner now moving into the next series.

GARDNER (garble) I'm ready to work.

SPACECRAFT You've got to do the (garble) common bracket, don't you Dale?

GARDNER Oh, you shouldn't have said that.

PAO Gardner will be moving into the A-frame installation here in a few minutes.

satellite if you're going to be exposed to high solar flux for long durations.

ALLEN Ok, I'll think about that.

SPACECRAFT Ok, the main power's off (garble) David, anything else you want done right now?

WALKER Nope, this main power (garble) to go over and help Dale. (garble) the outside the arm.

GARDNER Ok, do you want it by going around.

WALKER Yea, don't go straight across, remember you got to get around the arm shoulder.

GARDNER Ok, Roge. I'm on my way.

WALKER And, the monkey (garble) so stay outside of the longeron for the transmission.

GARDNER Ok.

PAO Mission Control, Houston, Allen has separated from the manned maneuvering unit and has turned the main power off, fastenets curly down. He'll now translate over to the opposite side of the orbiter to assist Dale Gardner. That picture there is of the antenna bridge structure which is now down in temporary stowage. Just after that is the ring into which the PALAPA will be berthed for the trip back to earth. This is a picture of Joe Allen straightening out his tether and locking it down on the slide wire.

ALLEN Ok, Dale, where do you need me now?

GARDNER Just come over here and get yourself set where you can get into this dude.

ALLEN Ok, now I want to come around.

WALKER Dale, did you already get the tool boards on the MFR, the one and two two ones?

GARDNER One (garble) there, but I got to get two, you're right.

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WALKER Ok, no rush, I just was trying to keep track here.

GARDNER Good figure there, David.

WALKER I'd rather be out there with you, but if I have to stay in here, it's fun to watch.

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SPACECRAFT Ok, Dale, for review here, on the A-frame installation, as soon as Anna moves it, you can tell Anna where you want it and she'll move it.

GARDNER Ready?

SPACECRAFT She's ready and listening.

GARDNER Ok, Anna, I need a (garble) left roll. (garble) bracket's over there, so we need to yea, take it up first, that's good. Roll it so I can get into that end over there.

SPACECRAFT Ok, she understands and she's working it.

GARDNER Great.

SPACECRAFT Ah, Dale.

GARDNER Yea.

SPACECRAFT Ah, Dale, if you want to clock it, I'm sure I could loosen it here and you could turn it.

GARDNER No, it's going to work out perfect. You grabbed it right in the right spot, Joseph.

ALLEN Well, it's going to be just like in the seesaw, I'm going to be working on the common bracket, right side up and the bumper bracket, then we'll be upside down.

ALLEN Ok.

GARDNER The Omni was no problem, Joe, it came off quick as a whistle.

ALLEN Ok, talk to Anna.

GARDNER Keep rolling it, Anna. I've got to go quite a bit further.

SPACECRAFT Ok, momentary stop, she's checking something.

GARDNER Joe, once I start working you're going to have to stop swinging your feet like that because it imparts just enough motion to the satellite to make it hard to do fine work.

ALLEN No, I'll be quiet as a little mouse.

GARDNER Ok. I can see you making them wiggle.

SPACECRAFT (garble) how much more roll do you need?

GARDNER Well, right now, I'm glad you're where you're out because you're helping us alot to keep track of things. We're going to be in business here in a little bit.

WALKER Hey, Jerry, on the ground, don't hesitate to come in with suggestions when you have them.

CAPCOM Ok, we copy that and we just were querying as to why Joe is going down the sill there.

WALKER We want to get him around the shoulder of the arm. That's in case he has to (garble) later.

CAPCOM Understand.

WALKER Ok, Joe, you're about to hand up. You're tether reel is catching, ok, there it's fixed. Ok, you're just about to run head first into the other end of the pallet there.

ALLEN Ok, Dale, now, this is where you're going to be working.

GARDNER You're going to be working.

ALLEN Ok, there, ok.

GARDNER (garble) on this thing, we've got to get these angles right.

ALLEN Exactly.

GARDNER (garble) to get up there in the hand reel and try to get into it.

ALLEN Is that the angle?

GARDNER Well, I don't know, that's what we're going to find out here, pardner.

ALLEN Ok, now, my cable's coming over you.

GARDNER Yep, you did good. Hey, twist, that one's in.

ALLEN Ok.

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GARDNER (garble) turn your heel in more. Towards your other heel.

ALLEN Ok.

GARDNER Ok, now a little further, little further, not quite

getting down below the lip. A'most Joe, you're almost there.
Ok, turn it again, give it all you got.

ALLEN (garble) the lip (garble)

GARDNER Yea, Ok, (garble) your right heel back to the left,
ok we don't have a good angle here, let me work on it. (garble)
just a second, we'll get you.

PAO Gardner now assisting Allen as he places himself in
a foot restraint there on the starboard side.

GARDNER Ok, just let me loosen (garble).

ALLEN Ok

GARDNER Ok, don't move.

PAO Allen's space suit is the one with the red stripe
around the legs.

GARDNER Ok, Joseph, try that. You're in there, pardner.

ALLEN Ok.

GARDNER Now see if you can bend back, like you're going to
grab (garble) satellite. No, you're going to be too close.

ALLEN To what?

GARDNER Ok, I need to get you straighter up, the bay.
You're going to be too close to me, see.

ALLEN Ok, I can reach down and hold the, I'm going to
stay here, I ain't moving. You go ahead and move me.
Unfortunately sound like (garble)

GARDNER garble.

ALLEN Let's take a look a second, Dale.

GARDNER You bend back there, are you going to be able to
stay in that position once you get there?

ALLEN I can stay right here for a long time.

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GARDNER Ok, you're too close to PFR though, the satellite
length is going to be too long, and ah...

ALLEN You think it's too long?

GARDNER Yea.

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GARDNER How much? I'd like another twenty degrees.

SPACECRAFT We'll go as far as we can.

GARDNER Ok. I'll be able to take it whatever it is.

SPACECRAFT We're approaching a terminator Dale, you might want to check your lights on shortly.

GARDNER Well I can see, the sun's still a good twenty degrees.

SPACECRAFT Anna's as far as she can go.

GARDNER Ok, Anna I need to do a little bit of orbiter pitch up.

SPACECRAFT Ok, we did (garble).

FISHER Hey Dale, I'm real close to the (garble) singularity, we're going to have to do no more pitch up.

GARDNER Ok.

FISHER (garble) just try to bring it down?

GARDNER Ok, first go toward the tail, that may help on your (garble) too. Ok, a little further, little further.

FISHER No, we're at seventy four five now, we're going to get singularity in another half degree or so.

GARDNER Ok, can you come down towards me?

FISHER Yea, I'm going to do that.

GARDNER You got to come down here just about to where I can reach you now. Ok, stop. Can you go towards my head now for about six or eight inches? Ok, let's hold it right there. Brakes on, Anna.

SPACECRAFT Ok, end of line removal and then the brackets, cables and balance weights.

GARDNER The carbon that's coming out of here looks like about the size of corn flakes. There's a lot of it. Ok, David on the (garble) octagon on the balance weight cut out, only one of the weights is on the inside of the cut out, the rest are on the outside. So we're in good shape with the common bracket.

WALKER Super.

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ALLEN So I need to stand up straighter?

GARDNER Or we got to get the, this thing at a different angle.

ALLEN Well, can you put me up straighter? Right now?

GARDNER Not with you in it.

ALLEN Why?

GARDNER Because it's jammed.

ALLEN Oh, ok.

GARDNER I had to pound it out of here before, Joe.

ALLEN Well, Ok, let me come out and then you can put me in there. I may not be able to get in myself but...

GARDNER Oh, dear, it did it again.

ALLEN What?

GARDNER Well, the universal joint jammed...

ALLEN Let me come out.

GARDNER Ok, I got it. I broke it free.

ALLEN Ok.

GARDNER Ok, let's put this (garble) in this hole. Now we need to tilt it down.

ALLEN garble.

GARDNER Yea, just let me tighten it down, Joe, just a second.

ALLEN That's about where it was before, isn't it, Dale?

GARDNER No, it's back toward the cabin more.

ALLEN Oh, ok.

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GARDNER Now give that a try.

ALLEN Ok.

ALLEN garble, twister.

GARDNER Not quite far enough, you got to go, your heel farther to your left. Ok, now you're in.

ALLEN Ok, now I'm in. Ok?

GARDNER Ok. Now bend back once.

ALLEN (garble)

GARDNER Ok. You think.

ALLEN I think, why not?

GARDNER I'm going to disassociate myself from you here.

SPACECRAFT Ok, I want an EMU status (garble) from you guys when you get a chance.

GARDNER (garble) we got to start (garble), we can't read these in daylight.

ALLEN We can't read them, David. (garble)

ALLEN I got three (garble), 3:04, 4:20 left, 59% power, 64% O2, I'm in good shape.

SPACECRAFT How's Dale?

GARDNER (garble) 04. Four eighteen, 59% power, 35% O2. Joe?

SPACECRAFT Ok, good.

GARDNER Ok, David, what I'd like to do is rather than get (garble) and try to get rid of one and all that right now, I have the power tool which is all I need to soft dock it.

SPACECRAFT Ok.

GARDNER I would like to go ahead and try to do that, then if I get that on there then I'll go ahead and get the other tool board out so I don't, you know, go through this more than once. Is that Ok with you?

SPACECRAFT Yep, that sounds good. Good suggestion.

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GARDNER And I can always go back and get the ole torque wrench when I need it.

SPACECRAFT Ok.

GARDNER I think we're ready to start.

SPACECRAFT Ok.

GARDNER Yea, now, Anna, you're going to present antenna into me, I want to inspect it a few minutes to see if there's a place I might tether to in addition to holding on to the floor bar.

FISHER Ok, I'll bring it over and you just tell me where you want it.

GARDNER Ok.

PAO Mission Control, Houston, with Allen now secured in that foot restraint, one of the most time consuming parts of this contingency operation now behind them. That usually takes a little a while to make that happen. Gardner now going down to get the tools and PALAPA now being swung over. The arm is grappled onto the stinger grapple fixture which is on the other end of the PALAPA.

GARDNER Find me a place. Ok, Anna, now just a second, ok, it's going to have to, the top end's going to have to go aft and I hope this is going to be possible for you. And then the the bottom end's going to have to rock towards me.

SPACECRAFT Looks good, Dale.

GARDNER Ok, while they're doing that Dave, let's talk a second.

WALKER Ok.

GARDNER (garble) go to adapter installation. I have, obviously we're skipping the tool board. I have put the TIM onto the PIM adapter, it's tethered?

SPACECRAFT Right.

GARDNER I have inspected the (garble), they're all open.

SPACECRAFT Ok, you're in the MFR.

GARDNER I'm in the MFR and my power tool is here ready to go as soon as Dr. Allen shows me sunlight.

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SPACECRAFT Ok, I think you're ready, you can just lay there and leave your brain running while your body rests a second.

GARDNER Ok, my body's in fine shape. I really haven't been working that hard, frankly. Been mostly mental, not physical. I wish I could say it was different. In fact I'm turning my

cooling...

ALLEN Ok, Anna, bring it to me, bring it to me and I'm thinking I might...(garble) wait a minute.

GARDNER I need to call time out too. I didn't realize something. I don't have enough tethers to (garble) the stinger. Wait a minute, do we have to temporarily stow it or can I put it right back in here?

WALKER I think you can put it right back in there, Dale.

GARDNER Yea, we're going to berth it by hand, right.

WALKER Yea, you don't get ...

GARDNER I cancel my time out.

ALLEN Ok, David, or Dale, there's also my other tether that's on the FFF which I should have gotten, but didn't.

GARDNER Ok, tally-ho.

ALLEN I'm ok.

GARDNER Ok.

WALKER Alright wait a minute, the reason I want to stop is you need to be real careful right here. Dale, we're going to need your help. The grapple fixture, and we don't have a real good view of it, when he starts handling it, he's not going to be able to see it. You're going to have to help him keep that satellite off the MFR grapple fixture.

ALLEN So, I'm going to keep it down more towards ship than fore/aft.

WALKER Ok, I just want to caution you that...

GARDNER Ok, yea.

WALKER ...impail it on that MFR grapple fixture. I don't think you'll be able to see it once you have hold of it.

GARDNER I see what you're saying. Ok.

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WALKER garble, clear that Dale?

GARDNER Yea.

WALKER Ok, now go ahead Joe, talk to Anna.

ALLEN Ok, Anna, I'm going to put, if you'll bring it in
closer to me...

FISHER Ok

SPACECRAFT now CPA use.

SPACECRAFT (Garble) earlier today.

SPACECRAFT Well we're not having any trouble getting posted the other satellite in the PAM function.

SPACECRAFT I will not let you get too close to anything. What's your (garble) Dale?

SPACECRAFT A2 and 21.

SPACECRAFT You're in good shape.

SPACECRAFT The real attitude to hold that really uses up in side (garble), Joe.

SPACECRAFT Yes I know it does.

SPACECRAFT Sometimes it would sit there and just pull like for 10 or 15 seconds at a time.

SPACECRAFT It's dark out here. We're having such a bright moon today.

SPACECRAFT Okay. (Garble) you, Joe and Dale. One down one to go and we have good sunrise. Rick will not need the RMS, it's going to head back down and Joe will be getting the arm ready for grapple.

SPACECRAFT Sounds great.

SPACECRAFT And (garble) long pass we should be able to get it all done.

SPACECRAFT Where's you're cooling Dale?

SPACECRAFT (Garble) full hot and a little chilly. It's okay.

SPACECRAFT All right.

SPACECRAFT And its 200 tilt back towards Joe a little bit now isn't it?

SPACECRAFT Yes.

SPACECRAFT Okay, David. Lets see if we can run through that little check what we have to do before heading out.

SPACECRAFT Sounds good to me.

SPACECRAFT Okay. Read it to me.

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SPACECRAFT Okay, one last check of the approx.

SPACECRAFT (Garble) told you there 22 and 21.

SPACECRAFT Okay, you're good for that. Helmet lights on, I can see them.

SPACECRAFT Roger that.

SPACECRAFT Five O safety pin release?

SPACECRAFT It's full.

SPACECRAFT (Garble) clockwise?

SPACECRAFT It's clockwise.

SPACECRAFT Give me a call (garble) otherwise I'll call you in a few seconds.

SPACECRAFT I'm already pitched up. I'm going to start right out (garble) David.

SPACECRAFT Okay, and get ready for visors, sun's going to come out.

SPACECRAFT Look at the city (garble), Dale. Look at that, look at the cities.

SPACECRAFT What land mass are we over?

SPACECRAFT Probably Mexico.

SPACECRAFT Yes. There's fire flies out there, Dale.

SPACECRAFT (Garble).

SPACECRAFT Here comes the sun. Looks like a red fire.

SPACECRAFT Right on the tail.

SPACECRAFT Hey Joe. My tether is clear of you. I mean, your tether is clear of me. Right?

SPACECRAFT Yes.

SPACECRAFT Okay.

PAO Mission Control. Transitioning television to Mila.

SPACECRAFT Okay, David. And I won't go until you tell me its bright enough.

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SPACECRAFT Okay, I'm going to get a little key from Rick for that one.

SPACECRAFT Okay.

SPACECRAFT And you're not going to (garble) that one of course.

SPACECRAFT No problem. Allen don't like to fly at night.

SPACECRAFT Isn't that a pretty spin? One with (garble).

SPACECRAFT AVFR. That was a fire (garble).

SPACECRAFT Look at that sun.

SPACECRAFT (Garble) a little closer, Dale. Okay, your suppose to be in the bay.

SPACECRAFT Okay, check and see either on, the R on the set staff.

SPACECRAFT (Garble) I can see that. You're fairly close to the forward bulkhead, Dale. So (garble) your seat just a little - (garble) close to the satellite a bit soon.

SPACECRAFT Get clear of me, Dale. Good (garble).

PAO Garnder now going in after Westar.

SPACECRAFT You have that your visors down, right?

SPACECRAFT Visors down.

SPACECRAFT Thank you.

SPACECRAFT You need to go close your feet just a little bit. (Garble).

SPACECRAFT Why is that?

SPACECRAFT Because your pretty close to the forward bulkhead.

SPACECRAFT The forward bulkhead?

SPACECRAFT And moving to the port -

SPACECRAFT - get hitched.

SPACECRAFT Okay. Just point your shield a little bit. Do you see the end fixture on the arm?

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SPACECRAFT Yes, I have it all on view, Dave. I'm going to fly out between them here.

SPACECRAFT You will be clear on your right.

SPACECRAFT Okay, I can see the arm on my right so I can stay clear of it. No problem.

SPACECRAFT Okay.

SPACECRAFT Okay, I'm going to block your end effector camera for a second here as I go between you.

SPACECRAFT Okay.

SPACECRAFT Sorry Anna, Rick.

SPACECRAFT Dale, do you plan to yaw around?

SPACECRAFT That's affirmative.

SPACECRAFT Okay, you look super incidently.

SPACECRAFT Okay, (garble) going post to the end effector because I don't want to get too close to the satellite, okay?

SPACECRAFT You're doing good. You've got about - got about 14 feet till you get to the satellite.

SPACECRAFT Okay, I just don't want to plume it here.

SPACECRAFT Okay. You have more than that, go on out there.

SPACECRAFT Okay. I won't do my yaw till I see I'm clear of the end effector.

SPACECRAFT Okay, Joseph. You can start working your (garble) fire stuff. I'll talk to ycu.

SPACECRAFT No way. (Garble).

SPACECRAFT Okay, you got (garble) if you want to

SPACECRAFT I'll have it ready by the time Anna gets down.

SPACECRAFT Okay, you got about 3 feet, no more than that with the end effector down.

SPACECRAFT Got past it.

SPACECRAFT Okay, I can't tell (garble).

SPACECRAFT Yes, I waited till it was past my range 3 o'clock and gave it a few potatoes and that made my maneuver.

SPACECRAFT Okay, it's just outside your field of view. You should see it after left eye (garble) here shortly.

SPACECRAFT The end effector?

SPACECRAFT Yes.

SPACECRAFT I'm 12 feet behind it.

SPACECRAFT Okay. Thats (garble). I really can't tell all that well surprisingly.

SPACECRAFT Okay. That looks real nice. No problem.

SPACECRAFT Okay. Give me another prop check here before you start docking.

SPACECRAFT Okay, I'm 19 and 18.

SPACECRAFT Okay. (Garble) based on that.

SPACECRAFT Think I got enough?

SPACECRAFT Yes, and you're clear to dock. (Garble) measure. Watch out for the sun.

SPACECRAFT Yes, if it gets in my eyes I'm going to do a 180 roll.

SPACECRAFT Okay.

PAO Gardner will do a 180 roll to keep the sun out of his eyes, let the shadow of the satellite to keep the sun out of his eyes. Satellite rotation about 2 rpm.

SPACECRAFT Looking real pretty.

PAO And autoable exclamation in Mission Control with this magnificent shot.

SPACECRAFT That's coming up towards your chest.

SPACECRAFT Oh yes, I see what you're talking about. Oh, good. Now the Orbiter's blocking the sun.

SPACECRAFT Okay, don't hesitate to (garble).

SPACECRAFT He's looking good. He's lining it up now. He's lining it up, you're looking good to me, Dale. Moving rate is real slow with it. There you go. It's like about a tenth.

SPACECRAFT Call when he's in Joe.

SPACECRAFT I think he's starting penetration.

SPACECRAFT Looking good, Dale. Going for toggle.

SPACECRAFT The toggle, they got it.

SPACECRAFT Cycle (garble).

SPACECRAFT The cycle on. (Garble) giving it a good knock. Okay. Cycle the gyro power off and back on. Start the torque dual speed disk. Joe?

SPACECRAFT Yes?

SPACECRAFT It's just like you said.

SPACECRAFT You done good, Dr. J.

SPACECRAFT Just like you said partner. Okay, while I'm torqued, I got 1300 and 1200. (Garble) sets itself up beautifully. Doesn't require any work. Look at that. I mean it's just standing perfectly on that thing. Okay, I've done the speed disk and I'm going for the ratchet, David.

SPACECRAFT Okay.

PAO Mission Control. Passing through Mila keyhole. We may get a free snatch of TV.

SPACECRAFT Houston, you can have camera A.

CAPCOM Roger, thank you.

SPACECRAFT Okay, the ratchet is broken over, I'll hard dock. And Joe I didn't even feel myself spitup. It was just like you said. And I stand (garble) staf hole, it's you're call, David. Oh, Dave?

SPACECRAFT Yes sir.

SPACECRAFT I'm standing by on the sad staff attitude hold call when you're ready.

SPACECRAFT Sad staff attitude hold, mark.

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SPACECRAFT Here goes. It's firing. Boy, she stopped. How would you like that?

SPACECRAFT Nice.

SPACECRAFT (Garble) ends. Look at that, look at that!

SPACECRAFT Okay, David. Are you ready for me? Got to go back to work?

SPACECRAFT Yes, go back to work.

SPACECRAFT I was afraid you'd say that. Dave, that stabilization took essentially no problem. My gauges didn't even move.

SPACECRAFT Okay, great. It looks super. I just waited till I saw you're seat and called it.

SPACECRAFT That was good.

SPACECRAFT Okay, David, I'm going to reconfigure.

SPACECRAFT Okay, good. Let me read you a couple of things.

SPACECRAFT What do you know, even Anna (garble) could do it.

SPACECRAFT Great!

SPACECRAFT Okay, I got it tilt.

SPACECRAFT (Garble) and let me see what you're doing. I've got to wiggle around Rick here a second.

SPACECRAFT (Garble). Rotate it down.

PAO Mission Control. Meanwhile aboard the discovery propellant usage very low on this stationkeeping. The Orbiter is very stable.

SPACECRAFT Joe, you're going to want to get your tether over the top of it.

SPACECRAFT Yes, hang on just a second, David. I've to pull the -

SPACECRAFT - seat down, yes you're going to have to straighten the cover restraint to.

SPACECRAFT Okay.

SPACECRAFT That looks good. Now you can fold her up. No wait a minute, Joe. Don't do it yet. You're tether is going to go right into that thing.

SPACECRAFT I'm going to go on the other side and the sun up, Joe's up there -

SPACECRAFT (Garble) having a sign in the bay here shortly.

SPACECRAFT Okay.

SPACECRAFT Joe, your visor is going to be your partner for minute (garble)

SPACECRAFT Okay thank you, Dave. Good call because it's now Down now. Dale comes up - okay, it's tilted up and I'm am essentially -

SPACECRAFT Okay, you can now start working your tethers.

SPACECRAFT Before I do what with them? What do I need to do with tethers?

SPACECRAFT Well not yet I guess. You need to - (garble) you need to do them not yet.

SPACECRAFT (Garble) kinds of wasted the RMS there, Joseph. That's all.

SPACECRAFT Is the RMS on the way?

SPACECRAFT It's working. I'm here shortly. Just keep you much doing and then you'll be ready in plenty of time.

SPACECRAFT Okay, Joseph.

SPACECRAFT (Garble) trying to get (garble).

SPACECRAFT To get what?

SPACECRAFT The RMS is coming.

SPACECRAFT Okay, (garble) news.

SPACECRAFT Okay, make sure that you're in good shape to let it loose because you don't have a tether now. And -

SPACECRAFT (Garble) a minute, there you are.

SPACECRAFT All right.

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SPACECRAFT Okay, Joe. Anna has the arm and is right above you.

SPACECRAFT Okay.

SPACECRAFT But it's still quite a ways away.

SPACECRAFT Okay. You wanted to bring it down didn't you?

SPACECRAFT No (garble) I wanted to just come get it. I can't leave this position, David.

SPACECRAFT Okay.

SPACECRAFT (garble) right where I am. (Garble) like 6 inches over the grapple fixture.

SPACECRAFT Yes. She's going to bring it down very very close.

PAO Mission Control Houston. We'll have a satellite playback of the orbit 96 MMU flyover at 6:45 am CST.

SPACECRAFT Move it a little more and I'll put her right in there. (Garble) like any other (garble) that's correct.

SPACECRAFT - a second, Joseph.

SPACECRAFT Pardon me?

SPACECRAFT You have plenty of time. She's going to bring it in a little closer and she's opening the stairs.

SPACECRAFT Okay.

SPACECRAFT You can tell her what she thinks she needs to do.

SPACECRAFT I'm just going to lift her up here Anna if you want.

SPACECRAFT When you're ready lift up.

SPACECRAFT Okay. It's snared Anna now. I don't see any reason you can't - pull it in.

PAO Mission Specialist, Anna Fisher, doing manual grapple on the MFR at this point.

SPACECRAFT - this better.

SPACECRAFT Okay.

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SPACECRAFT Agree, Anna, keep it coming.

SPACECRAFT Is my back pretty close to the C guide back here?

SPACECRAFT Fairly close. I wouldn't look back anymore.

SPACECRAFT Okay. Well, I keep enough angle like this.

SPACECRAFT You know it will touch the side over here if I put a sill.

SPACECRAFT Okay, Eddie, you can come another 8 or 10 inches here. Dale you're steady as a rock.

SPACECRAFT But of course.

SPACECRAFT Okay, Anna, lets try it right here once. I don't want to be too close to put this on.

SPACECRAFT Okay, Joe, set up your fuel supplier -- put a basic valve -- that's probably going to be me.

SPACECRAFT I hope it's you

SPACECRAFT Thanks a lot, Joseph.

SPACECRAFT Okay. Very good. And I'll just try to hold it steady. Okay?

SPACECRAFT I won't react real hard against the (garble).

SPACECRAFT Try not to let it move to much.

SPACECRAFT If you want it rolled, Dale, I can roll it.

SPACECRAFT (garble) it's just the nozzle cover so I think I don't need that right now.

PAO Dale Gardner attaching the cover over the rocket nozzle. The crew is manually managing that satellite. Having abandoned some of the hardware originally designed for handling that equipment.

SPACECRAFT Discovery. You got less than a minute to go. Everything was fine on the big soar. You all are LOS.

CAPCOM Okay, Dale, thank you. We appreciate that.

SPACECRAFT Joe, push it down towards me -- It's coming up away from me.

SPACECRAFT Get those CAMS lined up, Joe.

SPACECRAFT Okay, Anna, pull the arm down -

SPACECRAFT Don't pull the arm, Joe, leave it where it is.

SPACECRAFT I won't but pull down closer. I can get it - the arm has got to come down. There you go. Okay.

SPACECRAFT Joe, that thing has to come - has to rotate towards the cabin a little bit.

SPACECRAFT Okay, she's going to have to loosen something - really got to.

SPACECRAFT Okay, she's going to open it up.

SPACECRAFT Okay.

SPACECRAFT You want that finished at 180 out from the end effector on this. It's got to come about 10 degrees this way. What's wrong with that. Go ahead and get it.

SPACECRAFT Is it in the snares? You can't tell can you, Joe?

SPACECRAFT Go ahead - the balls are up in the socket.

SPACECRAFT Okay, we're going to (garble) you guys.

SPACECRAFT Okay.

SPACECRAFT We've captured, we're going to rigidize now.
Okay.

SPACECRAFT Okay, now wait just a second. I think I see - I'm going to come up on it. Don't do anything. There is a grapple fixture.

SPACECRAFT (Garble)?

SPACECRAFT A tether - this is peachy. On the inside of the workstation.

CAPCOM Discovery, Houston. You're about to get a PPO2 alarm -

SPACECRAFT Okay, there you go, Anna.

CAPCOM When it's feasible, I'd like you to close the complete orbit -

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SPACECRAFT Joe, get on the other side. There you go. It should come right up now.

SPACECRAFT Okay.

SPACECRAFT No, wait, wait just a second, Anna, wait just a second.

CAPCOM Discovery, Houston.

SPACECRAFT I don't believe this. You know that is a real zap. Those yellow (garble) have to come up -

CAPCOM Discovery, Houston.

SPACECRAFT Joe, wait a minute. Don't pull it out. Don't worry. I've got to get that tether out of there.

SPACECRAFT Joe, no. Get your hand out of there.

SPACECRAFT It's not -

SPACECRAFT Joe, keep your fingers out of there. You're going to get them caught.

SPACECRAFT I can pull it out if -

SPACECRAFT Okay, we extended, Joe and the -

PAO Mission Control Houston. A reminder this is not live television select. This is a replay of the previous orbits TV through Hawaii, Goldstone, Mila. Our next live television will come down through those same tracking stations in about 1 hour.

SPACECRAFT I cannot believe the tether on the inside would do that. Okay, hang on a sec.

SPACECRAFT Dale, what's happening is it looks like the end effector tether to the MFR is keeping us from lining up properly.

SPACECRAFT No, it's the wrist tether that we hung on it Dale.

SPACECRAFT What?

SPACECRAFT That wrist tether we put on there?

SPACECRAFT Yes, believe that.

SPACECRAFT Did you get it out?

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SPACECRAFT (garble) it needs to come -- well, I won't worry about left and right now.

SPACECRAFT No, I moved it left and right on purpose, Dave.

SPACECRAFT Is that enough forward? Do you want it down more, Dale?

SPACECRAFT Okay.

SPACECRAFT We all just work together on it now, and I'll only talk if it starts to get out of hand.

SPACECRAFT All the fix are joined if you will go with (garble) and move it around the bay, okay?

SPACECRAFT I copy --

SPACECRAFT Okay, I'm not going to do it -- just going to try to keep it from coming back up.

SPACECRAFT Okay.

PAO This is Mission Control. Dale Gardner working to complete the attachment of the nozzle cover.

SPACECRAFT Dave, did you have any trouble with those pushes.

SPACECRAFT No, I'm doing okay.

SPACECRAFT Joe, could you look down at your seat while you're doing this and see what the top of the satellite is going raise a few feet.

SPACECRAFT Yeah.

SPACECRAFT Okay. Good.

SPACECRAFT No, I can maneuver with that as a reference, but that's the only reference I got, David.

SPACECRAFT Okay. That's a good reference.

SPACECRAFT Just let Dale put it where he wants it for now.

SPACECRAFT It is the (garble) link, Joe. You just see how (garble), you are?

SPACECRAFT (garble) it's just easiest to be when I do that.

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PAO Asked from the elbow joint camera on the mechanical arm, and we can see Joe Allen on the end of the arm holding the top of the satellite.

SPACECRAFT How would you like them right now? If we could stiffen up the pivot end --

SPACECRAFT Okay. But, Dave, see I could put it wherever I want so it's very comfortable here.

SPACECRAFT Okay.

SPACECRAFT Move it in. Now move it an inch.

SPACECRAFT Okay, I'm with gojo -- the cover is on.

SPACECRAFT Okay. I've got it with two (garble).

SPACECRAFT And it's lifted up out of the way so, Anna, why don't you take Joe up a couple of (garble) when I get the adapter in here -- it's out of my way.

SPACECRAFT Will do that.

SPACECRAFT Okay. I'm going back after the two tools.

SPACECRAFT Okay.

CAPCOM Discovery, Houston, handing to TDRS and will get more TV through Goldstone.

PAO Mission Control. We've lost contact with the Spacecraft through the Hawaii station. We'll be picking up momentarily for voice through the tracking data relay satellite. Then we should get more television -- What we were looking at there just a few moments ago was the --

SPACECRAFT I'll tell (garble) looks easy. When I walk off this tether, it's like a whole different EVA. You know that?

SPACECRAFT Yeah, the tether is a --

SPACECRAFT It's amazing. It's just like -- it's not even the same show anymore.

SPACECRAFT Roger that.

SPACECRAFT Okay, well that will get it to sunrise.

SPACECRAFT Oh, great, I could use the light.

SPACECRAFT Hang on just a second, I going to take it out.
Just don't unsnare it Anna.

SPACECRAFT She won't. It's captured. You're in good
condition.

SPACECRAFT Okay, now. Have me light, let's see I got a deram
like this, don't I?

SPACECRAFT Joe, it's got to come around to your left.

SPACECRAFT It's got to come like this doesn't it?

SPACECRAFT Yes. It needs to be 180 out from the camera which
is right by your left hand. Or your right hand excuse me.

SPACECRAFT Okay, I just put it opposite your right hand.

SPACECRAFT Okay, I think it's good.

SPACECRAFT A little bit more (garble).

SPACECRAFT Okay, it looks lined to me right now.

SPACECRAFT That's looks good.

SPACECRAFT It looks alined.

SPACECRAFT Okay, see if you can push it towards the center
line a little bit. That's good.

SPACECRAFT Okay, go ahead, Anna.

SPACECRAFT (Garble). Perfect, perfect, perfect, perfect.
Okay, sorry to cause the trouble.

SPACECRAFT Now let me get oriented to where I are.

SPACECRAFT Anna's still rigidizing, sort of hang -

SPACECRAFT Let me - I don't want to get my tether (garble) -

SPACECRAFT I've got to come like this.

SPACECRAFT (Garble) unfold the (garble) now.

PAO Mission Control, Anna Fisher has the end effector
hooked up on the remote manipulator foot restraint.

SPACECRAFT (Garble) get that folded.

PAO (Garble) in his ceased motion.

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SPACECRAFT And when we get there, it's going to be lighter time.

SPACECRAFT Joe, I want you to move that satellite back out a little bit to your right.

SPACECRAFT Okay, it's coming right, David.

PAO And this is Mission Control. We expect to get television through the Goldstone station here very briefly.

SPACECRAFT Just going to hold it right there.

SPACECRAFT Okay, I'll pick up the angle from my feet.

SPACECRAFT Is that about correct?

SPACECRAFT No, you're going to have to move it some more, I just want to get it away from the cabin.

SPACECRAFT That's good.

SPACECRAFT I want to show you what a job he did on the shower curtain.

SPACECRAFT Well, he did a nice job on the shower curtain.

SPACECRAFT And you're doing a nice job of hanging onto that thing.

SPACECRAFT (garble)

SPACECRAFT Sixty foot advisor call.

SPACECRAFT We would probably appreciate it. Where he could reach is --

SPACECRAFT Yeah, but my hand is a little wrapped up.

SPACECRAFT You're dogging lights are on and pointing straight up. One pointing straight up.

SPACECRAFT Ah, hah. Very good. They caught us.

SPACECRAFT I didn't want you to run the battery down for God's sake.

SPACECRAFT This is eagle light time to get new batteries.

SPACECRAFT I know, but --

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SPACECRAFT Okay, Joseph. Now you have to do, now you have to tether. The MFR to the RMS.

SPACECRAFT Okay.

SPACECRAFT And you're now moving at a rapid (garble). 27 minutes to sunset. I'll talk you through it. You still have plenty of time.

CAPCOM Discovery, Houston.

SPACECRAFT We're with you.

CAPCOM Roger. We see your (garble) for PPO2 went feasible. We'd like you to close complete orrophis.

SPACECRAFT It's tethered. And (garble) tethered myself. (Garble).

PAO Mission Control. Joe Allen now tethering himself to the Westar satellite. He is -

SPACECRAFT Safety tether. I know where the safety tether is.

SPACECRAFT Outer space.

PAO Joe Allen in the process of tethering himself to the Westar satellite. He's also - his feet are locked into the manipulator foot restraint which is now on the end of the robot arm. Dale Gardner is also still attached by the stinger in the MMU to Westar.

SPACECRAFT Okay, now.

SPACECRAFT Dale, your waist tether with your safety tether attached has to go to the ISOL.

SPACECRAFT Okay, Dave. You checked it on the patch? I think I am?

SPACECRAFT Can't really see from here, Joe.

SPACECRAFT Okay, I am.

SPACECRAFT Yes, it's pulling.

SPACECRAFT Okay, now I'm go to the I-bolt with my safety tether.

SPACECRAFT Okay, you got (garble) come over the top, over the top, not that way, Joseph. You're wrapping it around the tether. Your right hand has got to come over that - there you go.

SPACECRAFT Nice call, David. Got it.

SPACECRAFT Okay, do you want to lock it, Joe?

SPACECRAFT Yes.

SPACECRAFT She's going to raise the MFR just slightly.

SPACECRAFT Okay, it's unlocked. And (garble) ingress.

SPACECRAFT Okay, Anna's going to start moving it. (Garble) very slowly.

SPACECRAFT Joe, are your finely coming up here to see me?

SPACECRAFT You've been having fun, Dale?

SPACECRAFT Okay, Joseph. Anna's going to start moving the arm up to get you out of the bay and we wanted to touch that with you except to tell you what's happening.

SPACECRAFT Okay.

SPACECRAFT Let her rip. Sorry to take so long, David. We're still - what's our time?

SPACECRAFT 20 minutes till sunset.

SPACECRAFT We've got lots of time.

SPACECRAFT (Garble) get the extension out of your way there, Joe.

SPACECRAFT Pardon me?

SPACECRAFT (Garble).

SPACECRAFT Okay.

SPACECRAFT Dale, I'm wondering how much I should put it out of the way.

SPACECRAFT Let's see. I'd get it back to a 135. You don't want it there getting it in the way of the satellite.

SPACECRAFT 135 right, Joe.

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SPACECRAFT Crisis time. We're going to be in the personal cassette recorder batteries before long.

SPACECRAFT I thought we already were.

PAO Mission Specialist, Joe Allen now hanging on to the end of the satellite there to stabilize it.

SPACECRAFT Joe, we're going to be moving you up a little more. I'd forgotten how tall Dale is.

SPACECRAFT Ah, yes.

SPACECRAFT When he gets into that T05 -- don't want him to bump into the bottom of the satellite.

SPACECRAFT Okay.

PAO Mission Control. The --

SPACECRAFT --reclose the hood --

PAO Mission Control. The laughter we heard a couple of minutes ago here in the flight control room, flight controllers amused, Allen has his camera with him and expected him -- he is known as a good amateur photographer and half expected him to ask Gordon to hold the satellite while he got a couple of snapshots.

SPACECRAFT We can see the nozzle -- shower cap pretty well now and so we're going to take a couple of pictures of it while you're conveniently located.

SPACECRAFT Okay.

SPACECRAFT Want me to rock it more to you?

SPACECRAFT No. It's okay. I'll tell you when if we do.

SPACECRAFT Okay.

SPACECRAFT Well, Dale, if there's anything you'd like to change about that TSR angle, now is the time.

SPACECRAFT Well, it's -- I need (garble) needs to be placed up a little bit too.

SPACECRAFT Okay.

SPACECRAFT Yeah, I didn't want to make it too tight, Dale, least you had to redo it yourself.

SPACECRAFT You did right. You did exactly right.

SPACECRAFT Okay.

SPACECRAFT Skip that camera tether down on that.

SPACECRAFT That's what caused trouble before. She may get the tip of the thickness of the tether was enough not to make that thing sit.

SPACECRAFT Dave, when you started having all those problems I went to free drift here to see (garble) so if you see anything coming out of her (garble) today you do the job around hold again.

SPACECRAFT You're getting better by the moment.

SPACECRAFT See? It all worked out. Besides I got a better view this way.

SPACECRAFT Oh boy!

SPACECRAFT What's wrong, Joe?

SPACECRAFT Oh, that rotation train was really tough. When you pull it it feels like it may - you've got to go another half and inch before it finally snaps.

SPACECRAFT Yes, okay. Dale?

SPACECRAFT Yes.

SPACECRAFT You're drifting into a good attitude. And in a little while I'm going to give you an at hold and till you name the (garble) another small pitch or slight roll. (Garble) get you into a good attitude.

SPACECRAFT Super. I can see him. I'm going to need a pitch down and a roll (garble) aren't I?

SPACECRAFT I agree.

SPACECRAFT Okay.

SPACECRAFT What's your gas?

SPACECRAFT It's still the same. I'm in free drift. I haven't used any.

SPACECRAFT How's the disk?

SPACECRAFT 13 and 11.

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SPACECRAFT You know my record on the tightness of hand grip.

SPACECRAFT No, remind me.

SPACECRAFT Later.

PAO Mission Specialist, Dale Gardner, working with some of the tools there preparing to get ready to attach the structural frame work to the bottom of the satellite. Joe Allen continuing to hold the WESTAR by its antenna as he stands on the end of the mechanical arm. Orbiter passing over the coast of Baha, California, now. The sun just coming up on the Earth below. Orbiter is already in sunlight. Allen managing to hang on carefully to the satellite not moving too fast in any direction so that it doesn't build up any momentum. There're man-handling the satellite much as they did on the recovery of PALAPA two days ago. This time slightly different techniques with Allen on the end of the mechanical arm rather than near the side of the Orbiter's payload bay. They reported that it's going better today this way, and they are about an hour ahead of the timeline as laid out for them yesterday. Shuttle is passing over the west coast of Mexico now from the Pacific.

SPACECRAFT Yeah, before you finish, with the forward stinger in there, you may want to think about tilting that thing a little bit more towards the starboard wing to get yourself up a little further out of the bay than you ordinary like to work in. You can do that and still reach the adapter.

SPACECRAFT I don't think I can do that.

SPACECRAFT This job with the stinger, I don't understand. Is it close to my head or something?

SPACECRAFT Well, it looks like when you -- we're not sure -- but it looks like you might be kind of close to it when you try to put the adapter on. But I think you're okay. It's a clean-up -- not an essential.

SPACECRAFT What's the land mass, Dave?

SPACECRAFT Say it again.

SPACECRAFT Well, I think we're coming up on Mexico again.

SPACECRAFT Oh, yes.

SPACECRAFT You're left foot's in. You're right foot's not.

SPACECRAFT Actually neither of them are.

SPACECRAFT And neither is the TFR tape.

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SPACECRAFT You've got more things moving than I thought.

SPACECRAFT Yep, just let me look at this.

SPACECRAFT Okay. We'll be advising you. Now, you've got a tether under your right leg and it's -- there you go.

SPACECRAFT Lots of time, Dale. You may want to lock that tether reel again.

SPACECRAFT (garble)

SPACECRAFT Say again.

SPACECRAFT It is.

SPACECRAFT Oh, okay.

SPACECRAFT Okay. (garble) sits in but she can -- now the left one's almost in. Got them both. Nope, the left one's still not in.

SPACECRAFT Which way does it have to go.

SPACECRAFT Needs to go forward and to the left.

PAO This is Mission Control. We are getting our television again through the Merritt Island station.

SPACECRAFT What about now?

SPACECRAFT Nope.

SPACECRAFT Now, I got it.

SPACECRAFT You know, you have restored my faith in you, and I though we were here once before.

SPACECRAFT Okay, help me get rid of this.

SPACECRAFT PFR again. Okay, Joe, we're about to go to work. I am in the

SPACECRAFT Okay.

SPACECRAFT Oh, you just lost a wrench, Dale.

SPACECRAFT Where did it go?

SPACECRAFT Just came off the tether.

SPACECRAFT Where did it go?

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SPACECRAFT Okay, I'll tell you what. Let's go ahead and take an attitude hold now.

SPACECRAFT Okay. There it is.

SPACECRAFT Joe, give me a little bit of a roll right.

SPACECRAFT It's been (garble) hold stop working here for a second.

SPACECRAFT Okay, tell me when it stops if you're not moving the (garble).

SPACECRAFT Okay, roll right.

SPACECRAFT Roll right.

SPACECRAFT Okay, mark. How you doing, Joe? Did you get that extension over there?

SPACECRAFT Yes.

SPACECRAFT Bob and roll.

SPACECRAFT Bob and a roll.

SPACECRAFT Oh boy, what a view! Which end are you?

SPACECRAFT Okay, pitch down, Dale?

SPACECRAFT pitch down.

SPACECRAFT Stop the pitch.

SPACECRAFT Stopping the pitch.

SPACECRAFT Joe, I can see your shadow on sun shield, looks like your coming up here.

SPACECRAFT Looking great.

SPACECRAFT Have you been taking pictures?

SPACECRAFT Joe, (garble) one to the right.

SPACECRAFT I'm sorry say again.

SPACECRAFT will that extension go anymore to the right, Joe?

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SPACECRAFT It went towards the payload bay or towards the cabin -- it's up against the forward cabin bulkhead. Can you see it?

SPACECRAFT (garble) I don't see anything.

SPACECRAFT It was the torque wrench.

SPACECRAFT Oh, yeah, I see it.

SPACECRAFT Dale?

SPACECRAFT Just a second.

PAO Gardner going after a wayward wrench that drifted off away after (garble) become detached from its tether. Particularly the small items have to be tied down to avoid having them float away in space.

SPACECRAFT Come off the tether or did the tether point come loose?

SPACECRAFT Well, now that I can relax after moving 25 miles an hour here, I'll figure it out.

SPACECRAFT Gemini!

SPACECRAFT (garble) we're not putting any translation in that.

SPACECRAFT Was it on the min. workstation and those jaws let go again?

SPACECRAFT No, it was on my -- waist (garble). Let's see what has happened here.

SPACECRAFT I don't know. I must have thrust both black book, that's all I can figure out.

SPACECRAFT Okay. Let me go back to business here. Sorry about that.

SPACECRAFT Good chance, David. Good eye.

SPACECRAFT Got through taking all that extra money for.

SPACECRAFT We're going over several volcanos here. One, two, three of them. A two are smoking and one looks like it's active.

SPACECRAFT Okay. Those, I guess, are the Guadamalawans.

SPACECRAFT Yep, you're right.

SPACECRAFT David, he pulled so hard I'm afraid I'll get it back. I'm having a hard time bending down and getting enough forward force to me. I've got lots of room to work here. All the room in the world.

SPACECRAFT Okay.

SPACECRAFT Sort of like a security blanket. Something to hold on to.

SPACECRAFT All right. Are you happy?

SPACECRAFT How's my attitude Dave?

SPACECRAFT Your attitude looks pretty good.

SPACECRAFT I think you're perfect.

SPACECRAFT You're feet are right towards to cabin and I can roll you a little bit but there's no point.

SPACECRAFT No it doesn't matter to me. It's for Joe.

SPACECRAFT Okay, you're going to present it to him really nicely.

SPACECRAFT It's beautiful.

SPACECRAFT It feels like it's so high above the payload bay.

SPACECRAFT It's looks like your high.

SPACECRAFT Feel funny out there NFR?

SPACECRAFT Okay, Dale. Standby for a cycle gyro power.

SPACECRAFT Okay.

SPACECRAFT I'm one foot away from now, Dale.

SPACECRAFT Fantastic.

SPACECRAFT I'm going to touch the omni now. I'm touching it.

SPACECRAFT (Garble) cycle gyro power.

SPACECRAFT I'm not putting too much -

SPACECRAFT Cycle power, there you go.

SPACECRAFT Okay.

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SPACECRAFT (garble) eagle eye set up.

PAO Mission Control. The Discovery just passed over the Yucatan Peninsula.

SPACECRAFT Yucatan is listing, we're going over Costa Rico.

SPACECRAFT Can't hear you -- beautiful, Frank, I can see all of it.

CAPCOM Roger, we copy that. I think Franklin's saluting.

SPACECRAFT Well, it looks to me like there maybe just enough play in that big tether hook to let that thing loose.

SPACECRAFT Just a second. I'll talk to you when I get in this state again.

PAO Mission Control. They were referring to astronaut Franklin Chang a native of Costa Rico.

SPACECRAFT It's tethered now, all right.

SPACECRAFT Is the seal hooked?

SPACECRAFT I can't tell right this instance.

SPACECRAFT Okay. (garble)

SPACECRAFT He say seal okay.

SPACECRAFT Feels good.

SPACECRAFT All right. Nice work, incidently. That was us quick of translation I've seen anybody do without getting hurt.

SPACECRAFT I hate to lose my tools.

SPACECRAFT Gardner back in place after retrieving a wayward wrench.

SPACECRAFT A camera -- and it was doing up and I knew if I didn't get there quick, I'd never get there.

SPACECRAFT Okay, sports fans.

SPACECRAFT Flip the page, David, page two.

SPACECRAFT Hang on a second.

SPACECRAFT Hey, I can look over and see that all these adapter latches are opened up and free.

SPACECRAFT (Garble) cycles.

SPACECRAFT I'm going to take it under my arm.

SPACECRAFT Don't move it too fast, Joe. It's - you've got
trice the (garble) here.

SPACECRAFT Yes.

SPACECRAFT Okay, Joseph. Make sure there's nothing sharp
there.

SPACECRAFT And it's very loose stuff and I'm going to pull
back the MLI here.

SPACECRAFT Okay, lets (garble).

SPACECRAFT (Garble) 800.

SPACECRAFT I wouldn't do that while I'm out here. You got
trice the mast to work with.

SPACECRAFT Okay.

SPACECRAFT Don't want to get a raid started.

SPACECRAFT Joseph, you need to move the thing a little to
your right.

SPACECRAFT Okay, I'm going to move it a bit and then -

SPACECRAFT - pivot around - be careful, your going to bend
that omni. Don't need alot of force. Very gently.

SPACECRAFT David, David, I recommend I get off.

SPACECRAFT No, I'm doing fine. I'm doing fine. Where do you
want it moved, David.

SPACECRAFT You want it moved to the right?

SPACECRAFT Okay, a little bit to the right there -

SPACECRAFT (Garble) yaw to your right very gently.

SPACECRAFT That's what i'm doing.

SPACECRAFT That's enough right. Okay.

SPACECRAFT And tell me when you want it stopped.

SPACECRAFT Stop it now but stop it gently.

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SPACECRAFT Okay. Let me get back with you here. (garble)
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SPACECRAFT Well, Joe, let me tell you what's happened. I'm
now in the BFR --

SPACECRAFT Okay.

SPACECRAFT Both tools are on me -- that's the torque wrench
and the power tool.

SPACECRAFT Okay. Super.

SPACECRAFT After having to retrieve one from mid air or mid
space --

SPACECRAFT Yeah, I got the radio report.

SPACECRAFT And I am now way back here waiting for the people
in the cabin to tell me that's it's time to pull the adapter up.

SPACECRAFT (garble) how are you doing?

SPACECRAFT You can go ahead and start working the adapter.
I'm just moving checklist. I dropped my when I was trying to
keep sight of that thing.

SPACECRAFT Well, it's up to you folks in there to release the
latches. I'm at that point, I think.

SPACECRAFT Okay.

SPACECRAFT La dee dee

SPACECRAFT Okay, understand you have hold of it. I don't see
you have a hold of it.

SPACECRAFT Well, when you tell me you're ready, I'll grab it.

SPACECRAFT Okay. We're waiting on you to grab it. We'll
release the latches.

SPACECRAFT Okay. I'm ready for the numbers 2 and 3.

SPACECRAFT Okay. The live (garble) are coming after them.

SPACECRAFT I see movement on both.

FAO Mission Control. We are about to lose our
television picture here. They are releasing the latches holding
the adapter ring down to the pallet structure, and Gardner will
then attach the ring to the satellite.

SPACECRAFT Believe me brother, there's no other way to stop it. Okay, it's stopped. Now which way you want it?

SPACECRAFT I can pitch it up or down, left or right and I can roll it.

SPACECRAFT Okay, we're going to get Dale off of there first.

SPACECRAFT Okay.

SPACECRAFT Dale, hang on one second till I change a page or two and I'll be with you.

SPACECRAFT Okay. I'm not going anyplace.

SPACECRAFT Go to (garble) nothing coming out of the nozzle until you grabbed it. Now I have a couple of little pieces. I saw nothing up until that point.

SPACECRAFT Ok, Dale, you know the Omni's a little off center so its perfect and then I've peeled back the MLI, there's mosquito netting under it that's quite tough, though, I don't think I'm going to be able to...

GARDNER Just a minute, I don't know why David left me here.

SPACECRAFT (garble) David get me off there, hang on. (garble) in the cockpit a little bit.

GARDNER Ok.

SPACECRAFT Is Anna going to move us?

GARDNER Wait till I get off.

SPACECRAFT Ok, Dale, go ahead and pull the pins and I'll talk to you.

GARDNER garble

SPACECRAFT (garble) CBA's on, I know they are.

GARDNER The ears are on and I'm going to go normal.

SPACECRAFT Roger, normal control mode and you can push free very gently, I mean really gently so we don't want to take (garble). You're above the orbiter starboard wing and forward in the bay.

CAPCOM Discover, Houston, we see you in (garble).

SPACECRAFT I see you flying, Dale.

GARDNER Yea, I got all this black stuff that came out when I blasted my thrusters in there.

SPACECRAFT And the stinger is with you.

GARDNER Yes, but the tip is not.

SPACECRAFT Ok.

GARDNER Ok, I see where I'm going, I've got it. (garble), well I think I'll fly it.

SPACECRAFT Ok, take your pick.

GARDNER (garble) we screwed up.

SPACECRAFT Yep.

GARDNER We messed up.

SPACECRAFT Yep.

GARDNER (garble) hold the (garble) in.

SPACECRAFT Oh, yes, that's ok. You can get out of it.

GARDNER Ok, no problem.

CAPCOM Discovery, Houston.

GARDNER Ok, what I'm going to do is just go over to the stinger, where the stinger goes and grab hold, pull the pip pins and just leave it there.

SPACECRAFT Can you tether it off? Do you have a tether left?

GARDNER No.

SPACECRAFT Yea, you're comfortable, right?

ALLEN I'm fine. Tethers, let's see. Dale, there's your safety tether.

GARDNER Oh, wait, I know where there's one. I left (garble) tether right over here on the FSS. I'll just go get it.

SPACECRAFT Yea, yea, and there's also one on the A-frame, yea two of them. Either one of which you could use.

CAPCOM Discovery, Houston.

GARDNER I'm officially using zero gas.

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SPACECRAFT (garble) 3 R opened.

SPACECRAFT Okay. I'm ready for number 1.

SPACECRAFT All right. I have a (garble) on it. I good a right hand.

SPACECRAFT Hey, up come the four -- the 540 -- I scared me. I felt like I came out of the foot restraint.

SPACECRAFT Okay. Getting it over my head.

SPACECRAFT Okay. Number 1 -- trying to store it -- have you guys oriented the close outs?

SPACECRAFT Not yet.

SPACECRAFT No, we're pretty close.

SPACECRAFT Why don't you do that. Get your eyes right between two of them for me.

SPACECRAFT And I can torque it here.

SPACECRAFT And I'll work on the door close while you're doing that.

SPACECRAFT That bumper bracket is close to pointing forward.

SPACECRAFT Hey, Joseph, I want to talk to you about roll here.

SPACECRAFT Okay.

SPACECRAFT I want you to roll the satellite to your left very slowly.

SPACECRAFT Ah, you mean you want the bumper bracket to go that way?

SPACECRAFT I want the satellite as you look at to rotate counterclockwise.

SPACECRAFT (garble) counterclockwise, I understand that.

SPACECRAFT (garble) knows those clock directions.

SPACECRAFT Here it comes.

SPACECRAFT Keep it coming.

SPACECRAFT More?

SPACECRAFT Ok, good. Watch your feet up here.

GARDNER Yea, I see them. I'm going with this corner of the FSS here.

SPACECRAFT Ok, just going to let you sit there, we're not going to be paying a lot of attention to you for a while, so just hang on to that satellite.

SPACECRAFT Ok, it's easy and you tell me which direction you want. If you want it at all in any different direction, Ok.

SPACECRAFT Ok, right now it looks great, you've got a lot of leeway, just don't let it move. Just kind of keep it where it is.

SPACECRAFT Well, it's sort of a compromise between it and me to tell you the truth, Dave. But we're getting along.

SPACECRAFT That's good.

CAPCOM Discovery, Houston.

SPACECRAFT Go ahead.

CAPCOM Roger, we're going LOS.

SPACECRAFT We're with you.

CAPCOM ...listen you over Yarragadee and talk to you at Guam at one two. A couple of notes, you're about to get an OMS RCS interconnect (garble) alarm. As before, no action, press on to the bingos. We recommend vernier rates on the RMS and you're about to get PPO2 alarm, recommend shutting off the bleed orifice.

SPACECRAFT We shut off the bleed orifice, roger on the vernier rates. That standing at attention, and thank you for the OMS caution.

CAPCOM Roger.

SPACECRAFT I'm going to come down and get this tether, Dave.

SPACECRAFT Ok, I'm not going to try and talk to you about it, you know what you're doing.

SPACECRAFT I can see everything fine, here. Just watch this safety cord here for me if you can of Joe's.

SPACECRAFT I'll let you know when we lose signal strength here.

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SPACECRAFT That looks good. Drop it there.

SPACECRAFT Okay.

PAO This is Mission Control Houston. We continue to get voice from the EVA through the tracking data relay satellite. We'll be having a replay at about 5 and a half minutes or so at 8:15 a.m. of the recent downlinked television of the EVA operations. We also intend to cancel the change-of-shift press conference with off going flight director, Larry Bourgeois, according to its normal schedule at 8:35 be occurring during the course of the EVA. That change-of-shift press conference is cancelled.

SPACECRAFT Back a little. Okay. You're doing good.

PAO We will have a post EVA briefing sometime later in the day, perhaps coinciding with the Randy Stone press conference.

SPACECRAFT -- between the soft top latches and the bottom of the skirt.

SPACECRAFT Roger, that.

PAO And that briefing scheduled at 4:15 this afternoon central time. We'll have the downlink television again, a replay of the downlink television -- going out at 5 minutes of the previously downlinked television that we had through Hawaii, Goldstone, and Mila.

SPACECRAFT And the (garble) both leaned back and I just pulled the adapter back. I want to get it right down here where I don't have to play around with it too much, I can just snap it right on.

SPACECRAFT Dale, deliver it with (garble).

SPACECRAFT That's good. That's what I want.

SPACECRAFT Keep it coming.

SPACECRAFT I -- stop just one second. Dale, the way you are putting that on there, we might want to roll it back to the right a little bit.

SPACECRAFT You mean clockwise or counterclockwise?

SPACECRAFT Clock.

SPACECRAFT Dale, you can put it on anyway you want to. I'm going to have Joe clockwise it a little bit.

PAO Mission Control, Houston, loss of signal through the tracking and data relay satellite. Next up Yarragadee in 8 minutes, 40 seconds. As we went LOS, Joe Allen was on the end of the robot arm and the manipulator foot restraint, he tethered himself to the Omni antenna side of WESTAR. Dale Gardner still connected via the stinger to the other end of WESTAR. Next procedure would be for Gardner to doff the MMU then come back down the payload bay underneath WESTAR to attach the adapter ring that fits up around the PKM nozzle and that ring would then be used to latch the WESTAR down onto a specially modified spacelab pallet in the forward part of the payload bay. NASA select currently has a playback of the previous orbit's downlink television through Hawaii, Goldstone, MILA. We'll have a similar pass coming up on this orbit. Also, Hawaii, Goldstone, MILA, EVA operations. Current mission elapsed time, six days, fifty-four minutes even and this is Mission Control, Houston.

PAO This is Mission Control, Houston, we're three minutes away from acquiring communication through the Yarragadee station for about a four minute pass. Then after the Guam station we'll pick up over Hawaii for some downlink television of EVA operations. That coming at 7:41 a.m. central standard time. We should be seeing the continuing activity in the berthing of the WESTAR satellite into the Discovery's cargo bay. The propulsion's officer in Mission Control, who is generally charged with keeping track of such things as the reaction control systems and the orbital maneuvering system engines and the propellant usage reports that the spacecraft's use of propellants was less than predicted, prediction based upon the first rendezvous and that total quantities of propellants are very good and the orbiter's in good shape as far as the availability of its propellant.

SPACECRAFT (Garble). Okay. And, if you push the (garble) out of the way, you can come easy. That's what I didn't do right.

PAO Mission Control, we're getting downlink voice through the Yarragadee station.

SPACECRAFT Bill, can you still (garble)

SPACECRAFT Ten four. We've managed it to be, finished everything else.

END OF TAPE

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SPACECRAFT Okay. You want me to clockwise it now?

SPACECRAFT Yes. Clockwise slowly.

SPACECRAFT That's good.

SPACECRAFT Okay.

SPACECRAFT Get her a little more, Joe. A little more clockwise roll.

SPACECRAFT That's good.

SPACECRAFT Get her wind up?

SPACECRAFT Dave, is it wind up?

SPACECRAFT Yeah, it's pretty good now.

SPACECRAFT Anna can bring it down more if she wants.

SPACECRAFT Hey, Joe, this is the time when you got to try to push down, okay?

SPACECRAFT Okay.

SPACECRAFT Just a minute. Not yet. I'll help give you a call.

SPACECRAFT Okay.

SPACECRAFT Okay, Joe, now push down.

SPACECRAFT Nope.

SPACECRAFT You know when he's pushing on it, it looks like it's going forward towards the cabin.

SPACECRAFT (garble) and to your left. We need to keep it from doing that.

SPACECRAFT (garble) no stopper, Joe.

SPACECRAFT Okay, stop it.

SPACECRAFT Well, which way is it going. I can't --

SPACECRAFT Well, the bottom is going towards the tail.

SPACECRAFT Okay. I though you said it was going towards the cabin. I'm moving it --

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SPACECRAFT You got to come about two more feet towards the camera, Anna. I'm looking right up into the nozzle.

SPACECRAFT Okay, Joe, (garble) slow. That was about a 10 or 15 degree swing, and that's quite accessible right now.

SPACECRAFT (garble) if, I think, are the airput brakes on?

SPACECRAFT He stopped just momentarily. It caused about a 15 degrees swing. It's just information.

SPACECRAFT Okay.

SPACECRAFT You keep it covered towards the camera, Anna, and I'll tell you when to stop.

SPACECRAFT I can react to get that if I got some warning. You know, if you can't tolerate it.

SPACECRAFT She's going to be working very slowly and gently. It's going to take awhile, but we got all the time in the world.

SPACECRAFT Yep. We gct the (garble) time now.

SPACECRAFT It was great, Anna, keep it coming. Nice move -- perfect.

PAO Dale Gardner with the device known as the shower cap in his hand.

SPACECRAFT Another foot to go towards the cabin. To wind up right now, I'd rear gear over my right shoulder.

PAO Cover goes over the end of the rocket nozzle on the WESTAR. Helps prevent particles of carbon left over from the burning of the engine from infiltrating out into the cargo bay.

SPACECRAFT Okay, Anna, that's good. You can stop the X -- now bring it down towards me.

SPACECRAFT Okay, Dale, you're about 3 c -- Dale maybe (garble) and a half?

SPACECRAFT Gotcha. I can see that pretty well from here.

SPACECRAFT Okay. I'll keep calling you just to check.

SPACECRAFT Heck, we're almost right at the cabin on this floor with pallet.

SPACECRAFT Yes, sir.

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SPACECRAFT Well, it's doing a little of each.

SPACECRAFT Okay.

SPACECRAFT It looks like you got at least one of them.

SPACECRAFT Standby. Just give me a second here. I don't know what I got. I got something.

SPACECRAFT (garble) you have to throw back. I can't tell yet.

CAPCOM Discovery, Houston.

SPACECRAFT Gentlemen? We got a cell stuck.

SPACECRAFT A keeper, all right.

SPACECRAFT A keeper?

SPACECRAFT (garble) you go ahead.

CAPCOM Yes, sir, David, we have terminated TV this pass and we are showing an over tap on one camera. Take care of it for us, please.

SPACECRAFT Thank you. We'll do it. Do you know which one?

CAPCOM Negative.

SPACECRAFT Okay. We'll check it.

SPACECRAFT Now, what do you want me to do, Dale, just --

SPACECRAFT No, it's time to just relax, I'm going to start working on these soft docks.

SPACECRAFT No, relaxing (garble). Oh, can I hold it in the same position without it doing drifting (garble)

SPACECRAFT Okay.

SPACECRAFT Okay, four --

PAO Mission Control. Dale Gardner reporting that he has soft docked the adapter ring to the base of the satellite.

SPACECRAFT Okay.

PAO He will now begin cranking down the attachment clamps.

SPACECRAFT (garble) you until you sound like you forgot --

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SPACECRAFT Well, I'll tell you which ones I'm doing so that I don't get them messed up, okay?

SPACECRAFT Okay.

PAO This is Mission Control. We'll start a replay in about 1 minute of the earlier downlinked television --

SPACECRAFT Send this (garble) to the pivot, Dale, unless you want me --

PAO -- Coming up at 8:15

SPACECRAFT I'm going to need the --

SPACECRAFT I'm pitching in the order now.

SPACECRAFT Well, you're also rolling --

PAO Again, that will be a replay of earlier downlinked television.

SPACECRAFT where? I don't care.

SPACECRAFT Okay, I got five onboard for number 1.

SPACECRAFT Okay.

SPACECRAFT One, I have one for five.

SPACECRAFT Holy smoke.

SPACECRAFT Number 5, Dave.

SPACECRAFT Roger.

SPACECRAFT You're rolling it, right, Dale?

SPACECRAFT Yeah, but that was a torque wrench.

SPACECRAFT Okay.

SPACECRAFT Can you believe that?

SPACECRAFT Yeah.

SPACECRAFT Cause that's what happened. We just started torquing the whole satellite.

SPACECRAFT Okay, do you want me to not let it do that?

SPACECRAFT No, it right at the end. It doesn't really matter.

SPACECRAFT Okay.

SPACECRAFT Okay, I'm going for 3.

SPACECRAFT How are you holding up, up there?

SPACECRAFT I'm doing okay.

SPACECRAFT Arm makes it easier, huh?

SPACECRAFT Much easier.

SPACECRAFT Okay.

SPACECRAFT Well, we're not going to keep you up there too much longer. Promise you.

SPACECRAFT There you go for 8, David.

SPACECRAFT Okay.

SPACECRAFT Do you see that position that (garble) going down there?

SPACECRAFT Yep, we can see it all. It's looking super.

SPACECRAFT It should be an eighth of it showing now.

SPACECRAFT You mean the wrench is bringing it down within an eighth?

SPACECRAFT That's right.

SPACECRAFT (garble) directly with the torque wrench.

SPACECRAFT Okay. 1 5 3 8 4.

SPACECRAFT Well, you're not using torque wrench, yet, are you?

SPACECRAFT I'll be at the power tool, Joseph.

SPACECRAFT You know, that's what I thought.

SPACECRAFT I figured now within an eighth of inch, half of them are good, yeah.

SPACECRAFT All right. I won't have to use that torque wrench too much.

SPACECRAFT Dale?

SPACECRAFT Truly's gone. You'd get mad at me if I tore it up.

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SPACECRAFT Yes sir.

SPACECRAFT Without the torque wrench.

SPACECRAFT Well, it got away last time. Was when you were taking the big tether and it off the mini work station at the sametime.

SPACECRAFT I figured that out when I saw you put it back on.

SPACECRAFT Oh, when I was in that transfer thing, huh?

SPACECRAFT Right.

SPACECRAFT Okay. Well, I'll just hold it and the tether when I take it off here to get ready to use it.

SPACECRAFT Exactly. And that will prevent --

END OF TAPE

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SPACECRAFT --Certainly is -- Mr. Salatory and his crew at Hughes and the (garble) that put these rendezvous together. So, we'll give credit where credit is due.

SPACECRAFT The spacecraft was great. Couldn't have been better.

SPACECRAFT And we're about to light the adapters right, Dale

SPACECRAFT The adapter is working like a peach.

SPACECRAFT (garble) great -- groups will be happy to hear that, we know.

SPACECRAFT Barry and Warren and Joe and all those guys. They did a great job on this thing.

SPACECRAFT Well, we ain't through yet guys, but when we are we are going to owe an awful lot of to a lot of people.

SPACECRAFT We got to get all but 3. We back out there, don't we?

SPACECRAFT No, we go all but 2 right now. So we're there.

SPACECRAFT (garble) not even close and you still got a --

SPACECRAFT We got to dock it.

SPACECRAFT Well, that's true.

SPACECRAFT Oh, no. Do have 3 left, but they're spread out.

SPACECRAFT Okay.

SPACECRAFT Seven?

SPACECRAFT Going to get seven, are you?

SPACECRAFT Mocking seven.

CAPCOM Discovery, Houston, direct.

SPACECRAFT Sizes (garble), Okay, Jerry, just a second.
Advise those guys who are going to go in the dark.

SPACECRAFT Well, pretty quick.

SPACECRAFT No, I guess, I was fooled by a shadow. That's okay.

SPACECRAFT All right.
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SPACECRAFT Go ahead, Jerry.

CAPCOM Okay, Rick, I got one action for you on Spec 6 when you're ready to copy.

SPACECRAFT Okay, I'll get something to copy with.

SPACECRAFT We do what we expect the position of the gear hear
--

SPACECRAFT Go ahead, Jerry.

CAPCOM Okay. We would like to re-enable TV camera over Temp alerts on Spec 60, Item 1 plus 0740847. And then an item 9 execute.

SPACECRAFT (garble) a little clockwise, Joe.

SPACECRAFT Okay, that's fine.

SPACECRAFT That'll be about all I need.

SPACECRAFT Good.

SPACECRAFT I never (garble), Jerry, one more to go after this one.

CAPCOM Roger, you've got plenty of time.

SPACECRAFT Here we go. (garble)

SPACECRAFT (garble) did you ask, Jerry?

CAPCOM Okay, thank you, that, we copy your comments here, Dale. It sure looks like it has been fun.

SPACECRAFT It worked just like we planned except for me using a different bolt that's bigger than we planned on it.

SPACECRAFT But I know (garble) wanted to find out if that normal separation worked anyway, and I'll tell you it worked like a champ.

CAPCOM Roger, Danny is real happy. He's been smiling all day.

SPACECRAFT I betcha.

SPACECRAFT Okay. Go up for number 6.

SPACECRAFT Okay? And it's no rotation. It's just this arm pitch or whatever you want to call it.

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SPACECRAFT Okay, Dale, --

SPACECRAFT I got to go a little further up the socket.

SPACECRAFT Opps, sorry, Joseph.

SPACECRAFT That's okay.

SPACECRAFT I can stop it from twisting.

SPACECRAFT Before you leave there, the ground (garble) is conveniently located over here.

SPACECRAFT Okay, I'll do that.

SPACECRAFT Take (garble)

SPACECRAFT You know you might want to move it.

SPACECRAFT Move it -- don't clock it -- move it down into your right a little bit.

SPACECRAFT Okay, I'm going to move it. Is there anyway you can get it?

SPACECRAFT --to your right and towards your seat a little.

SPACECRAFT So, Dale, can get -- so he can get it?

SPACECRAFT Okay, Dale, hold on to that wrench while you do that.

SPACECRAFT I thought of that this time.

SPACECRAFT Dale, you just pull it to where you want it.

SPACECRAFT Well, which steps go for. Where do you see one, Dave?

SPACECRAFT There's one right by your left hand. That's here on this trunion.

SPACECRAFT On the number 1 trunion?

SPACECRAFT Well, no, I was thinking about the number 3 trunion which is right above your head right now.

SPACECRAFT I can see that one. There maybe one that's more convenient for you.

SPACECRAFT That looks good to me to.

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PAO Mission Control. A reminder we did cancel that Larry Bourgeois change-of-shift press conference as it occurs during the EVA. The change-of-shift press conference was cancelled. Six more minutes remaining on tracking data relay satellite. Gardner tightening down the last bolts to fix the adapter to the end of the satellite, and then they will prepare to berth it down into its pallet structure.

SPACECRAFT Yes. Rotate number 1 back towards me?

SPACECRAFT Okay.

SPACECRAFT Let see, that's clockwise for you?

SPACECRAFT In fact, it ought to be right there, shouldn't it?

SPACECRAFT No, we got to go a little further, Joe, then we can line up to berth it, okay?

SPACECRAFT Okay, Dave. Check the checklist -- make sure we haven't forgotten something here.

SPACECRAFT Okay. Well, the torque wrench stuff is all done. You got all nine of them.

SPACECRAFT Tell you what, let me go through and check every position one more time.

SPACECRAFT Okay. That doesn't cost anything.

SPACECRAFT To make sure I got them all flush because I could do it very quickly here.

SPACECRAFT Are you twisting it on purpose here?

SPACECRAFT Yeah, I'm looking it over for position indicators.

SPACECRAFT Okay.

SPACECRAFT Dale, do it a little more slowly please.

SPACECRAFT Okay, like done.

SPACECRAFT They are all flush. Okay?

SPACECRAFT Okay. We've got the grounding stuff, now we need to rotate the number 1 trunion towards it -- towards the cabin.

SPACECRAFT You tell me when to stop it.

SPACECRAFT I'll tell you.

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SPACECRAFT Keep it coming. Joe, just let it rotate. Hang on to it, but let it rotate in your hands.

SPACECRAFT Yeah, I'm (garble) let go.

SPACECRAFT Don't let it go.

SPACECRAFT I'm letting it rotate.

SPACECRAFT Okay, stop, Dale.

SPACECRAFT Joe, that's where we want to keep it, right there.

SPACECRAFT Okay.

SPACECRAFT There's going to be some fine adjustments obviously, but this is pretty good.

SPACECRAFT Okay. We only have to get Dale out of there.

SPACECRAFT Joseph, I'm going to let go now, you got it.

SPACECRAFT Okay.

SPACECRAFT I'm going to get back to the aft starboard. Is that what you want next?

SPACECRAFT You are going to go to the aft starboard for the berthing, Dale. And you are going to need the PFR.

SPACECRAFT You sure?

SPACECRAFT I think so. But you know better than I can once you go by it.

SPACECRAFT Dale, we are going to move the satellite up a little bit while this is going on.

SPACECRAFT It's coming slowly towards your back.

SPACECRAFT Dale, you want to move the satellite slightly down into the right in your reference frame -- no rotation -- just a slight yaw and pitch down.

SPACECRAFT Okay, (garble) okay.

SPACECRAFT That's good. Stop that.

SPACECRAFT Okay.

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PAO Mission Control. The astronauts preparing to berth the satellite in it's retaining device in the payload bay. Gardner moving along towards the aft starboard side of the pallet to get ready for the berthing.

SPACECRAFT I'll tell you.

SPACECRAFT Joe, keep a good grip on that thing.

SPACECRAFT You (garble) the foot restraint, Dale?

SPACECRAFT Yep.

SPACECRAFT Was it frozen (garble) again?

SPACECRAFT No.

SPACECRAFT I got it.

SPACECRAFT Yeah, okay.

SPACECRAFT Good work, Dale.

SPACECRAFT I just thought it better if I had to do it that way guys. I just --

SPACECRAFT I know. That's why I wasn't chipping at you.

SPACECRAFT Thank you. I appreciate it.

SPACECRAFT You're so good to me at times.

SPACECRAFT Okay.

CAPCOM Discovery, Houston. A minute and a half to LOS.
Guam next at 49. Super job, guys. See you over the hill.

SPACECRAFT Thank you, Jerry.

SPACECRAFT What are you doing now, Dale? Stowing stuff or --

SPACECRAFT Nope. I'm just down here with the trunion.

SPACECRAFT I've got to walk off my old tether here.

SPACECRAFT Yeah. Make sure it's not inside anything there.

SPACECRAFT Oh, it's on the proper side. Yeah, good.

SPACECRAFT Joe?

SPACECRAFT Yeah.
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SPACECRAFT I'm listening.

SPACECRAFT Okay. I want you to move that satellite to your
right and down again, just like you did before.

SPACECRAFT like in --

SPACECRAFT and a little pitch down.

SPACECRAFT Okay, here comes the pitch down --

SPACECRAFT Okay, guys, before you do anything, we got to come
back about 6 feet.

SPACECRAFT We know that.

SPACECRAFT Okay.

SPACECRAFT Well, yeah, move it -- translation --

SPACECRAFT We want it straight when we translate it.

SPACECRAFT Okay.

SPACECRAFT Okay, now, is it yard right enough?

SPACECRAFT Yeah, that's good. Now we are going to need a
little bit of a clockwise roll.

SPACECRAFT Clockwise to me?

SPACECRAFT Yep.

PAO Mission Control, Houston. We have loss of signal through the tracking data relay satellite. The mission specialist preparing to position the satellite for the berthing operation. Pilot Dave Walker giving instructions looking out the aft windows and assisting in the positioning of the satellite, astronaut Joe Allen on the end of the mechanical arm, grasping the antenna of the satellite and position it as required. And Dale Gardner now moving to the proper location for his job in the berthing of the satellite into its attachment fixture in the cargo bay. We will be picking up in 19 minutes through the Guam station for about an eight and a half minute pass; then we'll get back into Hawaii. Our next TV opportunity coming up at 9:19 -- 19 minutes after 9 o'clock this morning central standard time. This is Mission Control, Houston.

PAO This is Mission Control, Houston. We are 6 minutes away from picking up communications through the Guam station

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capture/berthing of satellite WESTAR. We expect downlink television from the spacecraft -- live from space -- continuing berthing operations at 9:19 a.m. central standard time. That will be over the Hawaii station on orbit number 98. As we last heard from the crew through the tracking data relay satellite several minutes ago, they had completed tightening down the bolts on the adapter ring, the piece of structure mounting to the tailend of the satellite that then enables it to be attached firmly to a pallet in the cargo bay. And astronaut Dale Gardner was then going to move along the side of that pallet into the proper position for aligning the pins into there latches. They may have completed that by the time we hear from them next, and we may have again completed the berthing operation -- putting the satellite into its proper position. And there will then be two retrieved satellites in the Shuttles cargo bay. Propulsion's officer reported that propulsions margins/propellant margins are very good, and the ground even joked with the crew a little bit earlier about they got enough to go get another one if they see anything flying loose around there that they want to rendezvous with. Coming up at 4 minutes, 20 seconds through the Guam station, this is Mission Control Houston. Mission Control standing by for acquisition through Guam.

SPACECRAFT This is Discovery.

CAPCOM Go ahead Discovery.

SPACECRAFT Roger. We have two satellites latched in the bay.

CAPCOM Roger. That gave us a big cheer down here.

SPACECRAFT Dale.

SPACECRAFT Yes sir.

SPACECRAFT This thing works like metal to me.

SPACECRAFT It's wrapped in tinfoil. It's no big deal.

SPACECRAFT Okay. Now you tell, right above the hex nut.

SPACECRAFT No. Between the brack and the nut, there's about an eighth of an inch there.

SPACECRAFT I don't

SPACECRAFT This one's different.

SPACECRAFT Now, I see what you mean. You came down with the bracket.

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SPACECRAFT That's right. But you can cut it right above the bracket if you want. The little coax standoff, you see that. You can turn it right above that if you want.

SPACECRAFT Yeah. Then I'll turn it up here.

SPACECRAFT If you (garble)

SPACECRAFT If you go back a little that, right at the top, and you'll see the little copper tubes in there, (garble) right in there.

SPACECRAFT That's good. Four little copper like tubes that you can tether to.

SPACECRAFT You've got to peel back the velcro, you can't just pull it down. Rip it, that's it. There you go.

SPACECRAFT Dale.

SPACECRAFT What?

SPACECRAFT This thing has got

SPACECRAFT Careful in there, might be sharp

SPACECRAFT I got another place to tether. I can't get it to tear, I can't get it to come loose.

SPACECRAFT Okay.

SPACECRAFT I can't get it do nothing. I got another full proof place to tether, so I'm going to do that.

SPACECRAFT What's you're plan Joe?

SPACECRAFT Okay. There's a tie off the wires, they're very well tied off, and I'm going to tether above that tie off.

SPACECRAFT Okay. Coming (garble) Let me get the cutter first.

SPACECRAFT Yeah. And it'll be well tethered. Okay. Now I need

SPACECRAFT Yeah, that'll bring you over here.

SPACECRAFT Okay. And, I need to go, Dr. Dale, the easiest possible way, and what else do I need? Only,

SPACECRAFT That's enough.

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SPACECRAFT Okay.

SPACECRAFT Okay, and I'll have this thing ready for you to tether it for me, okay?

SPACECRAFT Have a steel grip on it.

SPACECRAFT Okay. You're above the awning.

PAO Mission Control. Astronaut Joe Allen preparing the lop off the graphite awning antenna which extends up from the top of the satellite. Crew reported that the satellite is latched down in the cargo bay.

SPACECRAFT (garble) around by hand.

SPACECRAFT Pardon me.

SPACECRAFT It's a little easier to translating around by hand.

SPACECRAFT Never.

SPACECRAFT I thought it was great.

SPACECRAFT I can't see that I'm playing around my feet, but you can probably lower me (garble) on that.

SPACECRAFT I think I can see exactly what you're doing now, so, we'll bring you right in here.

SPACECRAFT No. No. I had it.

SPACECRAFT Let go of it. Put it snap.

SPACECRAFT It's snapped. I have it.

SPACECRAFT Okay. I'm waiting Bill.

SPACECRAFT Okay. Take me back.

SPACECRAFT Okay, Dale. You can go to work on the A frame I guess.

SPACECRAFT No. I want to get rid of these tools first because they are going to get into my, I think.

SPACECRAFT Okay. Good idea.

SPACECRAFT Okay. Dale. Unless I miss my guess, you're going to acquire 2 tethers in the process of stowing that thing, right.

STS 51-A EVA AIR TO GROUND At2j 02:16:45 11/14/84 PAGE 11

SPACECRAFT That's okay. Dale let me ask you a question. Could you stow it after you cut it so long, or did you have to re chop it?

SPACECRAFT No, it'll stow.

SPACECRAFT Okay. And wait a second, wait, wait, wait. I don't think you're, that's it. That's better. No, now, you have to keep them to the right, that's good. That's good. Now, let me ask you a question. Can you pitch me up like this a little bit. And then lower me.

SPACECRAFT He can pitch you up a little and you tell me when to stop.

SPACECRAFT Okay. Oh, yes!

SPACECRAFT Amazing.

SPACECRAFT Don't get to much angle Joe, or you won't be able to feel the satellite with your feet.

SPACECRAFT Yeah. Good call David. That's probably good enough. Move me back a little bit. That's fine. And, then, stop, stop, stop.

SPACECRAFT Joe, I want you to watch you're feet as she moves you.

SPACECRAFT Anna, move me a little bit aft, aft, towards the tail. Okay. It's towards my right side. That's good, that's good, that's good. Stop. Stop. Now, on a foot. Move my feet down. I've got good clearance David.

SPACECRAFT Okay. Don't forget Joseph, you're going to need to tether that thing before we cut it off.

SPACECRAFT I will.

SPACECRAFT (garble) Stop. Stop. Okay. Now, this is tethered, I have got a trusty weight tether. Now, let's see. I better not un-, well, I'm going to do something else Dave.

SPACECRAFT Before you do that (garble)

SPACECRAFT Okay. I am afraid to take off my weight tether. I don't know which one I'm tethered to this with. And what I'm going to do, I'm going to tether this and then I'm going to cut it. I've 2 hands on the cutter.

SPACECRAFT Let us help you out here.

STS 51-A EVA AIR TO GROUND At2j 02:16:45 11/14/84 PAGE 12

SPACECRAFT Okay.

CAPCOM Discovery, Houston. Hawaii in 6.

SPACECRAFT We're on the (garble) Joe.

SPACECRAFT Plus TV.

SPACECRAFT Okay.

SPACECRAFT Now, if you can see which one I'm going to unfasten, that's fine.

SPACECRAFT I can, and that's what we're going to do. Now. That was a LOS call, now just wait a second Joe. I need to confirm what you've tethered yourself to the end of the lift with.

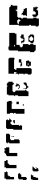
SPACECRAFT Okay. I'm going to show you. See this?

SPACECRAFT You're hands are in the way Joe.

SPACECRAFT Okay. Do you see it now?

SPACECRAFT Just lift your...

PAO Mission Control, Houston. We have loss of signal through GUAM. Pick up in 5 minutes through Hawaii. At that time we expect to have downlink television of the continuing EVA



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

operations, mission specialist, Joe Allen preparing to IOP off the OMNI antenna extending up from the top of the WESTAR satellite so that it will be out of the way. Crew were reported to just as we acquire signal through Guam, we now have two satellites retrieved and locked down in the cargo bay. Primary activities remaining in this EVA after the removal of the OMNI antenna will be cleanup and stowage of the tools and the A frame device which moved out of the way earlier. That will essentially be the end of the retrieval operations. The crew is more than an hour ahead of the timeline that was worked out for them yesterday. They worked very rapidly. Everything went quite smoothly this morning in the retrieval of the WESTAR. There are sufficient propellants onboard the Orbiter to achieve even the one more rendezvous and capture if there were another one to be done according to the propulsion officer in Mission Control.

SPACECRAFT Okay. We're going to be AOS Hawaii momentarily is TV.

SPACECRAFT Okay.

STS 51-A EVA AIR TO GROUND At2j 02:16:45 11/14/84 PAGE 13

SPACECRAFT Anna if you'll move me over to the top windows, I'll go ahead and polish them off. They need a little bit of dusting and cleaning on the outside.

CAPCOM Discovery, Houston through Hawaii with TV.

SPACECRAFT Roger that Jerry. As you can see, we've got the OMNI antenna, Joe has very carefully cut it off and is holding it while we wait for Dale to finish a little cleanup and store the A frame, and then we'll give the OMNI antenna and the cutter to Dale.

SPACECRAFT Dale. You may have to loosen one of those tethers, because I tried to pull it pretty tight.

SPACECRAFT Okay.

PAO Mission Control. The Shuttle in darkness now. Will be crossing over into daylight halfway through this pass. Astronaut Joe Allen on the end of the mechanical arm. The crew is now stowing the tools and will be completing the EVA shortly. This view from the elbow joint of the mechanical arm.

SPACECRAFT First, I'm going to get rid of this piece of (garble)

SPACECRAFT No. It's hooked on the tether.

SPACECRAFT I noticed that.

SPACECRAFT Okay. I didn't have a trash bag.

SPACECRAFT Yeah, I'll put it in my trash bag.

SPACECRAFT Don't you think that was clever of me?

SPACECRAFT I wondered how you were going to handle that.

SPACECRAFT First, you didn't offer any suggestions.

SPACECRAFT I didn't think about it until I came over here. Pull that string. Okay. This is fine.

SPACECRAFT (garble) pretty clear from satellite.

SPACECRAFT Okay. Okay. I can see them. Thank you.

SPACECRAFT Okay, in fact you might want to stop just a second and look up and to your left so you can see where we put Joe so you'll know what your maneuvering with.

STS 51-A EVA AIR TO GROUND At2j 02:16:45 11/14/84 PAGE 14

SPACECRAFT Oh, okay.

PAO This is Mission Control. And, there is the WESTAR satellite birthed into it's pallet structure in the cargo bay. And, as astronaut Joe Allen on the end of the mechanical arm and the manipulator foot restraint. Dale Gardner working in closer into the cargo bay.

SPACECRAFT Okay. Now wait Dale.

SPACECRAFT I see. I see.

SPACECRAFT Okay. Good. Just lower.

SPACECRAFT 30 seconds to sunrise.

PAO Mobile will be coming into daylight in about 30 seconds.

SPACECRAFT You're coming back (garble) Yeah, yeah, tuck it under you. That's it. (garble) you're going to need a visor here in a few minutes.

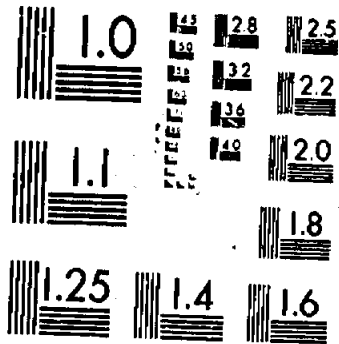
SPACECRAFT Okay.

SPACECRAFT Like right now.

SPACECRAFT Well, I guess.

SPACECRAFT Sun visor.
SPACECRAFT Dale.
SPACECRAFT Here is the drager tube that is floating to you.
SPACECRAFT Here it is.
SPACECRAFT Okay?
SPACECRAFT Put it into your trash bag.
SPACECRAFT I can if you can hand it to me.
END OF TAPE

END
DATE
FILMED
DEC. 10
1984



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Transcript Profile

Flight 51-A

C-60

MET	General Activity	Cassette #
T-000:01:52	Crew ingress	1

GMT Time	NOTES
312:11:18:	
312:11:10:00	Crew ingress

6:20 AM
11-07-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
T-000:01:01:49	51-A	3

GMT Time	NOTES
312:12:23:30	Talk of wind factor B.
12:24:00	On sequencing
12:24:35	Discussion at T-20
12:26:00	Launch Control - Bob Seck talked to crew about wind. Waiting for info. from latest balloon. Upper winds shears exceed structural load limits. Will have
12:32:50	Backup Computer testing - verifies that 3 computers will work in case throughout countdown.
12:33:17	Tanks pressurized. Cabin leaks checked - cabin vents open.
12:35:35	Final instructions to convey vehicle people in case of pre-launch abort.
12:38:00	3013 - new alternates for Discovery Modification to single engineers to MICO - 17400. Error in cue card.
12:39:07	Air-to-ground voice check complete
12:41:00	Computer guidance transferring to back up computer. Test conductor says close cabin vent valves. During hold in hold coming up; decision will be made concerning weather.
12:43:00	Build-in 0-20 min hold

6:45 AM
11-07-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
T-20 H28		84

GMT Time	NOTES
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312:12:45:20	Verification read off Last BFS updates when countdown
12:48:35	Determinator of wind factor expected in next few minutes

312:12:52:50	Saved Control - Decel - no thrust. 7:17 AM Tomonaw 22. mis. wind. Upper level wind shears en route between 20,000 and 50,000 ft. level. Wind + tail shudder beyond red line. Control does very smooth.
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7:30 Am
11-07-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette # 6
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GMT Time	NOTES
312:13:31:00	

4:15 am
11-08 84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette # 10
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GMT Time	NOTES
	General Status Report

11-08-84
5:06 Am

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
T - 47:00		12

GMT Time	NOTES
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313:11:07:00	Cabin leak check completed
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T-20:00 313:11:35:12	Explanation of 10 minute hold
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11-8-84
12:17:00

Transcript Profile
Flight 5L-A

MET	General Activity	Cassette #
06:08:40	+V	21

GMT Time	NOTES
18:18:20	NOT SET UP FOR TV
18:26:40	SETTING UP FOR TV
18:27:57	COM
18:29:30	AOS FEEDS TDRSS
18:30:50	-COM- UNSCHEDULED TV
18:32:25	LIVE TV
18:33:40	FLIGHT DECK TV
18:46:20	COM - END TV FROM TDRSS - RMS CHECKOUT COMPLETE
18:53:10	SEE PLAYBACK OF SUNSHIELD CLOSING
18:53:53	COM - REPLAY OF SUNSHIELD - WILL NOT INTERFERE WITH BRIEFING
19:16:42	LOS - MOONLIT NIGHT OVER MADAGASCAR
19:43:10	REPLAY QUEUED UP
19:50:45	COM - REPLAY NEXT TDRSS
19:55:41	WE'LL LIVE LIVE TV THEN VTR DUMP
19:56:43	CONFILVARD
20:04:25	AOS TDRSS
20:05:15	READY FOR DUMP
20:06:30	BRIGHT SPOT IS THE MOON

11-08-84
6:35 AM

Transcript Profile
Flight 01A

NET	General Activity	Cassette #
T - 20:00	T - 20:00 Burst Q Hold (10 minutes)	13

GMT Time	NOTES
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313: 11:33:12	Explanation of hold (conflict alignment) will be completed.
	01A commenced - 309 (TS experiment)
	Computer 2 processes
11:38:00	Verify recorded data
11:38:30	Ⓢ Time label for reporting of problems & recommendations
11:39:38	5 minutes left in hold COMMUNICATOR (lost device) Workload determined briefing or receipt
11:43:11	Launch Control - 2 satellites to be launched.
11:45:03	T - 20:00 and comm counting OPS 101 in ascent
	Burging fuel cells in process
11:45:50	Have slow break-up computer in comm configuration and OPS 101
11:47:03	Not tracking BPS
11:47:39	Tracking now
11:48:20	BPS to manual
11:48:49	BFS to OPS 1
11:49:01	Launch Control not clear breaking up
	As config complete
11:52:40	RCS Quantities
11:53:	100 * 100

Transcript Profile

Flight 51-A

MET 0:07:54.13 00:08:00.30	General Activity LIVE TV	Cassette # 22
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GMT Time	NOTES
313: 20:14:15	INDEXING NOW
20:14:45	AIRLOCK HATCH OPEN
20:15:50	5 MINUTES LEFT - DUMP APPRECIATED
20:14:40	COM DROP OUT
20:17:20	-THANKS FOR THE CARD AT THE CAPE
20:18:55	TV
20:20:20	"THAT WILL HOLD HIM!"
20:20:50	VOICE DROP OUT
20:21:39	BACK WITH TRSS
20:22:19	ANOTHER DROP OUT
20:27:46	COMM - LIVE TV - WHITE SPOT IS NOT THE MOON BUT
20:27:46	A GAS BUILD-UP IN THE CAMERA
20:32:45	COMM - BURN
20:34:13	AOS TRSS
20:34:35	THANKS FOR THE VIDEO - WAIT ON THE PAD
20:36:13	READY TO COPY OHMS BURN PAD
20:39:17	STAND BY FOR ONE CORRECTION
20:39:54	READ BACK

11-28-84

5:56 AM

Transcript Profile

Flight 51A

KEY	General Activity	Cassette #
T- 10:40	OK for launch per Managers	14

GMT Time	NOTES
313: 11:54:27	Prove computer self-sufficiency hold at T-9:00 Problem with Integration Console Watching clouds north of landing pad. 22 min. wind
11:56:05	T-9:00 holding for 10 min all functions must be brought up. status status
11:57:17	Capability of shuttle extended by recovery satellite. slowly lowered to safe retrieval alt. recovery look good - good insurance practices.
11:58:50	Intercept not launched. Several problems with Integration Console.
11:59:37	Do for launch Check off of areas - Do, Do, Do - Managers
12:00:00	Do in 3 min - need few minutes
12:00:30	945 not performed; give 946
12:00:45	Com check
12:01:30	Launch Control - all go except for Integration People.
12:02:23	Down sequences Tim Tabb

11-8-84
2:41.55

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
8:25:19	L	23

GMT Time	NOTES
20:20:40:75	READ BACK CONT.
:20:44:50	COM - PHASING BURN - 8 sec burn Palapa sat.
20:56:54	LOS TDRSS
20:58:00	COM - LOS
21:03:40	COM CHECK SANTIAGO
21:30:55	AOS OVER HAWAII
21:31:30	WILL GET DATA OFF RECORDERS
21:33:50	FOR DAVE - GO FOR FUEL CELL PURGE AND KU POSITIONING
21:35:56	COMM - 25 min full Phasing burn. AHEAD OF SCHEDULE
21:41:00	AOS TDRSS - DROP OUT CAUSED BY CONFIGURATION PROBLEM.
21:42:04	COMPLETED KU BAND POSITIONING, FUEL CELL PURGE IN PROGRESS.
21:44:00	COM - PHASING BURN
21:53:18	CONFIGURATION LOOKS GOOD FOR THE BURN
21:58:04	STATIC
22:01:30	COM - PHASING BURN
22:02:18	FULL DURATION BURN
22:03:25	BURN COMPLETE - SUCCESSFUL
22:05:39	STATIC - CAN'T HEAR
22:13:16	READY TO TAG UP
22:13:45	MANUVERING FOR IMS - GO AHEAD
22:15:11	THANKS
22:16:15	COMM - FILTER CLEANING

Transcript Profile

Flight 51-A

MET	General Activity	Cassette #
0:10:01:54	PRE-SLEEP - SLEEP	24

GMT Time	NOTES
313.22:17:05	COMM CONTINUED
22:28:44	DMOS CONFIRMATION
22:56:24	DMOS WAS ACTIVATED - WORKING WELL
23:01:02	COM- LOS
23:33:10	COM- CHANGE OF SHIFT BRIEFING CANCELLED - REVIEW OF TODAY'S EVENTS
23:36:39	Turn off cabin fan
00:00:29	com: change of shift briefing cancelled
00:14:38	com:
00:30:00	com:
01:03:45	COM: ORBIT 10
01:31:59	com: uplink review
02:01:43	com: crew activity plan 158 naut. mile orbit

6:12 AM
11:08 84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
T - 02:40	Launch, SRB Separation Negative Return	15

GMT Time	NOTES
313:12:12:20	
12:12:55	SRB engines to restart position
	Vent valve closed; pressurization underway
12:13:15	Computer will verify engine capability
12:13:50	Liquid hydrogen at
12:14:03	1 min and counting
12:14:33	Switching control
12:14:55	Go for Main Engine Start
12:14:57	Main engine start
*** 12:15:02	Eng Off LIFT OFF *** 313:12:15:00 GMT
12:15:10	Cleared tower
12:15:40	Readings
16:07	Max aerodynamic pressure
12:16:24	Throttle up 50
12:17:20	SRB Separation confirmed confirmed
12:17:29	1 stage nominal
12:17:53	2 engine capability
12:18:40	Status check in Mission Control -- all systems Go.
12:19:06	Negative Return
12:20:09	Go to APO
12:20:27	Go to MECO

11-08-84
6:20 AM

Transcript Profile
Flight 51-A

NET 000:00:05:43	General Activity	Cassette # 15 cont
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GMT Time	NOTES
313 12:20:45	
12:21:17	Single engine capability
12:22:14	Single engine present MECO
12:22:41	Engines throttling back to 3-G
	Engines 70-65 % maintenance 3-G
12:23:45	Main engine cut off confirmed.
12:24:02	E.T. Separation confirmed (External Tank)
12:24:22	APU ^{or} low
12:24:44	Commentator - OHMS low
12:25:30	Separation - both engines look good.
12:26:00	Center good - low underway
12:26:29	Both launch dump underway
12:28:17	OHMS / complete - residual ^{is} good.
12:29:12	^{COM} Commentator - Blackback
12:30:07	" Over central Atlantic

Transcript Profile
Flight 51A

MET	General Activity	Cassette #
000:18:17:30	SLEEP PERIOD / WAKE UP CALL	26

GMT
Time

NOTES

314 06:31:29	PAD: CANCEL CHANGE OF SHIFT BRIEFING
07:00:42	PAD: ^{DISCOVERY} SLIGHTLY NORTH OF THE EQUATOR. NO NO MAJOR OUTSTANDING
	PROBLEMS W/ SPACECRAFT. DISCOVERY GRADUALLY SAT
	DISCOVERY IN ORBIT 2 ORBIT ADJUST BURNS TODAY.
	CREW HAS ABOUT 35 MIN IN SLEEP PERIOD. DISCOVERY IS IN ORBIT 14
8:00:10	PAD: REMINDER - CANCELLATION OF SHIFT BRIEFING. PAD
	RETRIEVAL RETRIEVAL OF PALOFA SCHEDULED FOR FRI. DAY 5 OF FLIGHT.
	NO MAJOR ORBITER SYSTEMS PROBLEMS.
8:10:10	CHANGE OF SHIFT BRIEFING CANCELLED
8:25:57	PAD WAKE UP CALL "GOOD MORNING STARSHINE"
	DISCOVERY HOUSTON, "GOOD MORNING"

11-08-84
6:30 AM

Transcript Profile
Flight 51A

MET	General Activity	Cassette #
080:50:15:37		16

GMT Time	NOTES
313-12:30:40	
12:30:50	Playbacks
12:30:50	COM - Playbacks
12:34:35	OILMS look good - no changes
12:35:00	Here Gardner family enjoyed B-Day celebration for Dan
12:35:45	COM Comments - all look good.
12:36:12	COM Maining to OILMS & burner; loaded targets
12:36:56	Starting OILMS prep. Learn a night side open
12:37:30	COM - Gardner's B-Day - 36 yrs old today
12:40:25	APU Valve
12:42:35	Will look at it
12:43:05	Thermal Evap message - Nothing there - just for info. Sustained on panel 12-2 - A off B6 auto Fuel Pump Valve Cool.
12:44:00	Nozzle temp slightly below limits - nothing to worry about (Thermal Evap message)
12:44:42	Disappeared from Pump Valve
12:44:57	COM - Cool APU #2
12:44:12	COM - Burn coming up, targets loaded good; cooling on APU 2 working.

Transcript Profile

Flight 51-A

MET	General Activity	Cassette #
000:20:17:12	Wak. Up/Preparing for today	27

GMT Time	NOTES
314: 8:28:37	"WHAT ARE THOUGHTS ON PROTECTING TANKS C+D?"
08:30:50	PAO: CREW ALREADY UP GETTING READY FOR THE DAY.
	NOTICED HYDROGEN GAS BUBBLES IN WATER TANKS - HAS HAPPENED
	ON OTHER MISSIONS
08:33:25	PAO: There will be some communication from central Australia
08:38:52	in answer to questions on Water tanks: Tanks C+D are basically full. Going LOS
	See ya at 4:01"
08:46:37	PAO: Discovery now over Pacific Ocean. Crew is getting
	ready for today. Flight controllers getting ready for
	weather briefing
08:57:17	Getting ready for breakfast.
09:10:47	CryoO2 tank are complete
09:15:31	PAO: Discovery now over the Atlantic. Orbit #15
	Later this morning crew will be doing a test
	objective. There are 2 orbital adjustments There are 2 orbital adjustments
	scheduled for today

11-08-84
6:55 AM

Transcript Profile
Flight 51-A

MET	General Activity OMS 2 Run	Cassette #
050:50:41:00	Blew out candles,	16 cont.

GMT Time	NOTES
313:12:54:30	
	Cooling looks good on B side
	Left reaking not good
12:56:23	ZOS
12:57:18	COM - Configuration good for OMS 2 Run. Propellants dumped.
313:13:06:09	COM - Awaiting AOS at Yuzgodi
6:49	AOS
6:57	Do OMS 2 right a check list. Can check a speaker microphone
13:07:28	Didn't blow out candles until 8:33
13:07:40	Tot of people down her apparatus that.
13:09:03	COM - Orbit adjustment throughout mission for Palapa rendezvous.
13:12:24	Teletype configured
13:14:12	ZOS tell Hawaii
13:15:09	COM
13:33:38	AOS
13:33:45	Good & Clear
	1 hr. 8 min. complete

time
11-9-89

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
000:21:05:35	KU Band, DMOS Report, Problem with Aeroflex Camera	28

GMT Time	NOTES
31 09:20:22	PAO - cont.
09:23:36	Do you want us to copy data on this align - negative.
09:29:28	^{proceeding} Time for an antenna check ^{okay} . Not using KU band - go ahead
09:32:22	-KU band cable position is complete
09:33:02	Update on DMOS DMOS
09:50:22	Anna Fisher reports DMOS is running efficiently
10:00:37	PAO: OK at 2:20pm. About to acquire communication w/shuttle.
10:15:58	PAO: Pick up again in about 17min. Crew is proceeding w/ planned activities for today. Deployment of Dulsac anac later today
10:34:17	AOS
	Display unit bit - power supply problem possibly
10:34:55	CRT 4 is powered off - hasn't been
10:35:24	Had powered CRT 4 - screen is blank
10:36:04	No action on power apbl?
10:37:40	Question for aeroflex camera. First reel, after 30ft no red light, no sound of pulling film. Changed magazine. Same thing. Batteries looked good, second battery good; mag changed, changed belt lenses - nothing. Fuses to at aft end over intact; asymptom looks as they have blown

11-08-84

7:34 AM

Transcript Profile
Flight 51-A

MET	General Activity	Flight Data Error.	Ops	Cassette #
000 01:19:15	Illegal message	MICRO Switch Fail	PLB Open	11

GMT Time	NOTES
13:34:25	Delete step - stay on B side for cooling of valves.
13:35:17	Load 3 & 4 only or 1 & 2 also?
13:35:40	Illegal message!
13:36:00	Prepared to open PLB doors
	Copy will watch
13:36:40	Switch on O-T Micro switch fail - fail ^{continues} unsuccessful during copy take to GPC.
13:37:25	Flight Data File error - load 3 & 4
13:38:59	IOS tell TDRSS - may have problem looking on
13:44:48	AOS
13:44:57	OIM Ports look good - PLB doors opening
13:45:10	2nd Door just opened
13:47:39	Utility for you
	42 - couldn't get it - CRT 4 is yours again.
13:48:25	Parameters coming onboard, just don't need CRT
13:49:11	IOS
13:51:17	AOS-
13:51:30	Do for orbit OPS
	Send news to all of us up here
13:51:43	COM.
13:55:55	Do to clear out fails if you desire
13:58:20	Close air shields on time
58:50	Comm

11 8 84
7:59 am

Transcript Profile
Flight 51-A

MET	General Activity KUBand Activated.	Cassette #
000:01:44:09	Star Tracker Door Open.	17 cont.

GMT Time	NOTES
313:13:59:00	
13:59:29	Switches on A-12
13:59:40	APU heater - 1 Break to OFF 3-A to auto.
14:03:20	a turning current breakers out -- how do we put - this in?
14:03:50	Temp on SYNCOM
14:04:22	Temp - current breaker in, go to read.
14:04:47	D. take High Load off - go for Verneers (containing comb.)
14:05:07	COM -
14:06:54	Fuel cell amps on 2-3 for SYNCOM or cell 3?
14:07:32	Working on it.
14:07:45	Amps on all fuel cells, not just cell 3
14:07:57	1-3, 181, 176, 177, after 196, 200, 237
	Dalley & CFIS not onboard; both yellow, do we really need to put it?
14:09:14	Star tracker door opened on time.
14:09:17	K-U Band activation
14:10:20	ML 86B - Dalley over & heater breakers should be cut.
14:13:59	Bundle of questions - ^{wait till} → ^{Wastes} Water dump or new? (Dale)
14:15:27	D. ahead & open
14:22:04	COM

4:40 AM
11-9-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
600:22:24:00	CRT-4 Power Cycles	29

GMT Time	NOTES
314:10:39:32	Wavents changed fuses. Dood lost light, in ready position no indicator of light meter working.
40:41	Power cycle CRT 4.
41:20	Mark - OFF then ON
41:40	No joy
41:45	Come back - good antenna display
42:00	CRT - cycling ON and OFF, display once every 2 seconds.
314 42:24	CRT 4 powered OFF
10:46:00	COM
314:11:17:26	HA Burn Pod - RCS Burn
11:19:00	Readings for burn
11:20:27	Read back
11:21:21	Pay 9.5 for OMS burn OMS right TV roll, TRIMS, NA... (ends at 11:21:34)
11:23:37	Read back
11:24:49	Targets on board for HA burn - Display over Houston
11:24:54	Looking at procedure for changing fuses.
11:25:25	Fuses - two different sizes - Have 4 extras

5:21 AM
 11-09-84

Transcript Profile
 Flight 51-A

MET	General Activity	Cassette #
000:23:11:30	Aeroflex Camera having problems.	29 cont.

GMT Time	NOTES
314:11:26:10	
11:27:22	COM
11:37:00	ADS through Jagsade
11:37:50	Com - flight controller looking at aeroflex camera.
11:42:00	Amp fuse blown - take out meter, check
	resistance of fuse; if bad change out fuse
	10 = 3/4 amps.

11-8-84
8:25 AM

Transcript Profile
Flight 51-A

MET 00:02:07:17 00:01:45:00	General Activity KU-Band check out, RMS Power, Tach-ends configured,	Cassette # 18
---	---	------------------

GMT Time	NOTES
313:14:22:30	KU Band checked out good, it's yours
14:23:00	Dodd self test a Star Tracker?
14:23:20	Affirmative
14:23:45	COM
14:26:44	COM - antenna blocked - LOS
14:27:44	Change Shift 10:00 am at JSC with ^{Day} Dren Yargach at 2-6
14:40:00	COM - SYNCOM + TELSAT Test Prod.
	Change Shift 10:00 AM
14:42:49	RMS Power to complete (anna)
14:47:30	Jesse is GPL and antennas in auto.
14:47:55	Tach-ends configuration OK with u-
14:49:30	LOS till Hawaii
15:07:44	COM
15:08:30	Readings
15:10:00	Switches
15:10:40	On front of the panel Heater - all fan switches to auto.
15:25	LOS
15:16:10	COM
15:19:10	ADS TDRSS

Transcript Profile
Flight 51-A

5:44 am
11-9-64

MET	General Activity	Cassette #
000: 23:27:30	Procedure for checking & changing fuses	30

GMT Time	NOTES
314: 11:42:50	Pulled fuses before checking it?
11:43:00	Remove magazine and batteries
11:43:40	Use pair of ^{needle} nose pliers to remove fuses
11:44:33	YOS
11:45:00	COM
11:45:24	HRM activation
11:46:20	COM
11:48:38	Do not change magazine. Step 2 of PRM?
11:49:03	Yes
11:44:30	COM
11:57:00	COM
12:10:00	COM
12:13:30	Checked fuses ^{fuses} all good. Then light comes on some motor drive. Nothing happens with light meter.
12:14:50	Did not replace fuses; must be good
15:55	Did you check fuses in or out of camera
12:16:13	Took them out.
12:16:26	COM - Coming upon bus
29:28	(Small lapses to run out and see shuttle ^{shuttle} fly over)
29:28	During last bus - lights disappear in ground & shuttle attitudes.

9:35
Am

Transcript Profile
Flight 51-A

MET	General Activity waiting or dropouts, MUSIC,	Cassette #
000:03:19:55	Roar & Volcano (Bright Red Light)	19

GMT Time	NOTES
313:15:34:55	On time line. Systems can look around ADS
313:15:37:16	COM - Shift Briefing 10:00 Am PLB View 10:44 am
15:40:20	TPSS Drop out. Configuration all look good
40:43	Checking out payload cameras; no problem yet
15:48:00	COM
15:49:40	Just catching a syllable every sec in audio
15:50:10	COM - Trying to work on dropout
51:48	COM - Palapa bus; busy Time-line
16:06:25	ZOS
16:19:51	ADS
16:20:30	MUSIC* Waiting or A/D value cool.
16:20:50	Turn off on time.
16:22:12	ZOS tell Duon
16:22:55	Turned off boiler controller - that must have been reason for alarm.
16:23:23	COM - ZOS - Meaning a nature of music unknown.
16:25:54	COM - Satellite playback through Hawaii expected at 11:00 Am.
30:13	ADS
30:30	Looking outside - Bright red light, couple of adjoining islands; maybe volcano.

6:30 AM

11-9-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
00:00:15:09		30 cont.

GMT Time	NOTES
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314:12:30:00 Pln b maneuvers to form attitude

12:33:16 Bus attitude looks good.

(Yo) of about $1\frac{1}{2}$ degree.

12:33:43 Wandering about th. degree.

12:35:45 -COM

12:53:14 Commentator

59.4) COM.

13:02:15 LOS

13:03:30 Close B values

13:04:24 COM

7:10 Am
11-9-84

Transcript Profile
Flight 51-A

MET 01:00:54:00 00:00	General Activity Cleaning of filters & fans.	Cassette # 31
--	---	------------------

GMT Time	NOTES
314:13:09:20	
13:12:24	AOS
13:12:42	Had good burn.
13:18:36	COM
13:19:50	LOS
13:20:43	COM
24:30	
13:25:00	COM - 9:45 Am - Change of Shift Briefing 2:11 pm Pre-Deploy In TELSAT
13:38:54	AOS
45:44	LOS
47:28	AOS
47:36	Test on IMU fans. DEU filters very clean.
13:55:46	Turning off cabin fan in a few minutes
13:56:00	Dumb want to clean fan when we fly as you know all good work
13:58:00	Doxygenit!
13:58:20	Speaking of wiring. Pleased with what with Dr. J
13:58:44	Satellite picture look good
13:58:50	Can see HIA + Madagasc Bay

1035
11-8-84

Transcript Profile
Flight 51-1

MET	General Activity	Cassette #
000:04:20:00	Video, Beautiful Fullman,	20

GMT Time	NOTES
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313:16:35:20	
16:35:39	Taking control of PLB - allow configure; take checkpoint.
16:36:15	Tell Hawaii at 2-8
44:00	AOS
44:12	Suzie coming up
44:14	Dood picture - teleprinter coming on board
16:44:28	Cameras at MOEB disposal
16:45:12	Bad and shadowing in the bay See changes
16:45:27	check point - enable return
16:47:04	Times at check point Hot spot with camera
16:48:37	Dood shot of Erik
16:49:00	Get eyeballs unlocked to get out of hot spot
16:50:30	in cabin
16:50:44	Beautiful full moon
16:51:34	Test of TV - going LOS
16:52:00	COM
16:53:15	AOS
16:54:04	Dropped out
17:04:51	Continuous drops with TDRSS - expect to continue till next new, till then - keep ground stations

Transcript Profile
Flight 51A

8:00
AM
11-9-84

MET 01 01:45:00	General Activity Nunivane, "Best to our Families", Waving Hand.	Cassette # 31 cont.
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GMT Time	NOTES
3:14 14:00:27	Other visitors. One over boat to our families.
14:01:34	Looking at KSC - wave waving hand.
14:07:14	Picture of hummer - no defined eye Circular area of cloudiness.
14:32:10	COM - PALAPA pointed at proper angle
14:36:29	Boiled enough water. Temp back to normal and cycle FESS
14:38:16	But lost angle with TORSS; dropping cont.
14:38:36	Sea temp is back to norm
14:38:51	Did hear you.
14:39:10	Thought we were 205

17-08-84
11:05

Transcript Profile
Flight 51A

MET 000:04:50:30	General Activity	Cassette # 20 cont.
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GMT Time	NOTES
313:17:05:30	
313:17:08:14	COM
17:11:37	
17:12:40	COM
17:23:47	AOS -
17:24:00	Took message or teleprinter. Verify 1,2,3.
17:24:12	Just sentence really hit home
17:24:28	Who the historian in the group.
17:24:36	Dis comp.
17:30:48	Jawd - Clear
17:45:34	COM - Weather Briefing in progress
18:05:32	COM - RM RMS CHECK OUT
18:05:30	AOS - GUAM
18:12:45	LOS
18:15:27	COM - SATTALITES - RMS CHECK OUT

8:40 am

11-9-89

Transcript Profile

Flight 51-A

NET	General Activity	Cassette #
001:02:24 40	Problems with fuel lines, Test for Aeroflex	32

GMT Time	NOTES
314:12:39:49	COM
14:48:50	AOS through Yagodi
14:49:02	Attitude problem during fuel line - - ground problem in MOCC. No impact - for flight.
14:50:00	Ready with tools to go to work on aeroflex
14:50:15	Working on procedure just enjoy the view.
14:54:24	AOS - team team change
14:54:49	Looking forward to getting Mr. Teland's project into orbit space
14:55:00	COM
314:15:02:51	AOS Orbit 2 team
15:13:46	AOS through Hawaii
15:15:44	COM
16:12:58	Test for Aeroflex camera - fork in lens, metal ring with pins, push all the way in to O. to run
16:15:20	COM

10:30 Am
11-9-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
001:04:16:00	Waking - complex,	33
GMT Time	NOTES	
314:16:31:12		
16:35:59	AOS	
	Configure for TV over Hawaii and we will give you IV. Found no obvious pin - saw "2 such marks:	
16:38:07	Pushing pin, see nothing Normal level	
16:38:47	Levers malfunctioning; push pin in	
16:39:18	Not causing any motion.	
	Tried button in various positions. Takes force amount of force in OFF. On other 2 positions, force decreased but no motion.	
16:40:46	Have Haven't switched out 10 amp fuse	
16:41:57	Take lever in Start, depress pin all the way; lever leaves go to OFF.	
16:43:00	Trying to move lever but can't force. Moves 16 th gear 1".	
16:43:28	Mechanical pin. Waking on a fix.	
16:43:44	Y'all are working hard, we can tell.	
16:44:25	COM	
16:49:25	COM	
16:50:15	AOS	
16:50:31	Dal said if lever in stand by and push pin levers goes to OFF but not when put in Start position.	

10:50 AM
11-9-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
000:04:36:38	Avionics Problem	33 cont.

GMT Time	NOTES
314:16:51:49	Set Set up for TV if you have anything
16:52:38	Could give in cabin - but lighting not good. Technical problem with camera.
16:53:24	OFF - feel opening force, then more seated feel per force with less force. Stand By - pins depress no opening force, no pins into OFF. <u>START</u> - Similar to Stand By, pins across a function, not back to OFF.
16:55:06	ITM people listening. Try to find out something proper.
16:55:31	Screws are small enough.
16:55:47	Qualifies screws smaller than width of pin.
16:59:14	COM
16:59:25	AOS
17:04:11	COM
17:06:25	Depress pin to Stand-By - use start button on hand prop.
17:07:12	Pin depress rest of the way -- nothing happened.
17:07:46	Repeated instructions.
17:08:07	That's not what we did. were using button on the side

Transcript Profile
Flight 51-A

11:07 AM
11 9 84

MET	General Activity	Cassette #
061 01:54:05	Asropex	34

GMT
Time

NOTES

314:17:09:10	No joy. Worried about fuse micro switch is not working.
17:09:49	Could very well be the case IFM guys have bright idea
17:17:47	Over Guatemala + Costa Rica
17:47:11	-Water message expected due to water loop on. Square the message.
17:51:39	COM-
17:12:27	
17:13:05	Termination of Tail hands and what about pulling circuit breakers.
17:14:49	Weather message aboard.
17:20:	
23:45	COM
26:21	AOS
26:40	Getting ready for check
18:31:27	COM
19:08:50	PADS TO CALL UP
19:10:29	ENABLED VOICE RECORD
19:10:50	DEPLOY PADS
19:12:02	READ BACK
19:12:35	SEP PAD

1:50 PM
11-9-81

Transcript Profile
Flight 51-14

MET 01:07:35:30	General Activity PRE-DEPLOY	Cassette # 36
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GMT Time	NOTES
314:19:51:15	BURN?
19:52:19	TELEMETRY COMING DOWN OVER GUAM - COM
19:53:57	LOS
19:56:46	COM - DEPLOY
20:01:00	AOS TDRS - READY FOR TV
20:03:33	STATE VECTOR
20:04:50	COM
20:06:06	PROCEED WITH PRIMARY
20:09:40	JUST LIKE THE SIMULATOR
20:10:17	HANDING OVER TO TDRS
20:12:26	BACK WITH YOU
20:14:07	CAN YOU READ IT? WE TAKE GOOD PICTURES
20:17:03	KEEP AWAY HOT SPOTS
	CHRISTIAN CAME AND SAW YOU
20:19:50	NO PROBLEMS
20:20:30	COM - ON DMUS
20:21:25	APPRECIATE TEACHING ON STS-7
20:22:34	WILL HAVE LIGHTS ON AND RECORD
20:23:23	JOHN YOUNG - CREW SENDS HIM POSSUM FARGO?

2:20
11-9-89

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
01:08:09:00		37

GMT Time	NOTES
314:20:25:00	FORGET OUR ABSENT TEE BALLS
20:28:43	COM - EVERYTHING - LOOKS GOOD
20:30:37	COAST OF SOUTH AMERICA - LOOKS PRETTY
20:32:05	COAST OF CHILE COM
20:33:51	DOC. GARDNER FIXING DUNE
20:35:55	COM - IN DEPLOY ATTITUDE
20:41:16	COM
20:43:31	COM - SUN SHIELD - DEPLOY
20:46:07	COM
20:50:11	COM - OPEN SUN SHIELDS
20:51:36	COM - " " "
20:51:51	COM - BOTH SIDES LOCKED
20:52:44	COM - SPIN TABLE
20:53:17	COM - SPIN TABLE STEADY AT SRPM
20:54:23	COM - TERMINAL SEQUENCE WILL BEGIN IN 7 MINUTES
20:55:40	COM -
20:56:38	READY FO DEPLOY
20:58:15	COM - 3 MINUTES TO TERMINAL SEQUENCE
21:01:00	COM - 3 MINUTES TILL DEPLOY
21:01:50	COM - TERMINAL SEQUENCE HAS STARTED
21:04:46	COM - DEPLOY ON TIME
21:06:09	COM - POST DEPLOY
21:07:10	COM - VIDEO - DUMP TOMORROW 9:34 - CST ORBIT 35

12:00 AM
11-10-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
001:16:01:44	Sleep Period	41

GMT Time	NOTES
314:04:40:58	COM: xxxx Some problems with the clocks.
04:45:15	COM: Clocks are back on line and will be back on screens in a minute. Mission 0000 elapsed time 1 day 16 hrs and 31 min
05:00:56	COM: 3 hrs 14 min left in sleep schedule.
05:30:29	COM: Cabin temp 77.7°f. All is quiet in mission control rm.
06:01:52	COM: Discovery is below Pallopa. Discovery on the ascending node of Orbit 29.
06:31:50	COM: Wake up in about 00:00 1 hr 42 min.
06:53:16	COM: Timing clocks have gone down again. Problem is being investigated at this time.
07:01:09	COM: Change of shift briefing cancelled.
07:05:53	COM: Clocks are back up. No full report on cause of clocks being down.
08:00:15	COM: ^{city} Wakeup in about 15 min. Very few problems on shuttle being looked at.

3:10AM

11-10-84

Transcript Profile

Flight 51-A

MET	General Activity	Cassette #
001:20:46:00	Unscheduled IV. of cabin	43

GMT Time	NOTES
315:09:05:36	COM: Discovery now crossing the equator and about to enter orbit 31.
09:20:02	Had some problems with Tetra
09:21:14	Verify that the cross ^{right} OHNS cross feed is closed
09:27:16	Appreciate messages
09:31:18	Going LOS over Bermuda in 40 sec.
09:34:05	Line 37 of messages?
09:45:00	Unscheduled IV views of cabin
09:47:53	Elbow camera looking back at cabin
09:41:18	View of middeck
09:51:05	About 9 min on Tetra pass left
09:52:20	Com:

4:00 AM
11-10-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
001:21:40:00	DMOS Report, SEP PAD Readings	44

GMT Time	NOTES
315:09:56:58	COM: Looking down w/ DV.
09:57:32	Breakfast time in the mid deck
09:58:17	"Too early to listen to Rave sing!"
09:51:32	Crew waves goodbye 'as DV goes off
10:00:09	COM: Crew getting ready for deployment of Syncom in about 3 hrs.
10:24:09	COM
10:31:29	COM - SYNCOM deploy in about 2 hrs orbit 33.
10:44:09	AOS through TDPS
10:46:03	DMOS - flashing dot dot - everything working fine (Anna)
10:55:30	Uploading Sep vector - target for burn.
10:55:50	Passing over confederate air force
11:01:07	COM
11:01:26	Deploy Pad 330 31A MET. . . Readings
11:02:12	Readback
11:02:36	SEP
11:02:36	SEP Pad Readings On-pad ground checks, down mod. . . Then after connected in ground configuration during and after burn.
11:04:50	Readback
11:06:09	Mod readback
11:06:25	No ^{GO} deploy Sep pad?
6.48	If we do it will be next orbit

11:12 Am
11-10-84

Transcript Profile
Flight 5A

MET
002:01:58:00

General Activity

Cassette #
51 cont

GMT
Time

NOTES

315:17:14:45 Lat. Video

17:14:54 COM

17:15:41 Quarterly down to 22% COM

17:16:25 Turning off Win lock up to 250

17:17:00 Breddent to stop it. at 97°

17:16 COM

17:18:20 Signature of dumps compare to Challenge dumps

① 17:20:24 Temp decrease steep. OK to 50° with no significant ice build up.

17:20:50 Dumps now today?

17:21:20 Try 2 more times to get to 10% today.

17:22:00 COM - Saw space vents

5:05 AM
11-10-84

Transcript Profile
Flight 5-A

MET	General Activity	Cassette #
001 22:50:20	Complex, MADS Slung Under	45
GMT Time	NOTES	
3:15:11 01:29	COM - Info re SYSCOM deploy	
11:09:15	COM - Change velocity - towards Mach 171 to 169 nautical miles @ 170 by 113	
23:50	Camera operator - Reported engine trouble - faulting - seemed well. Sight meter - hand held at operator	
11:24:36	To rear - pull film - all lights work. Sight indicator shows green at bottom. Over writing, trying to center on com center manually. AEA calling cancel. orange felt outside	
11:25:55	Try to find answer	
11:26:04	Car film automatically or give a new T Stop.	
11:36:08	Deploy count down clock 1+19	
11:36:32	ZOS MADS slung gauges ON	
11:45:54	AOS - recording now in progress of Payload AOS	
47:45	Breaking up assuming AOS call	
11:47:50	Cancel how do you read now?	
11:54:20	Words Clear	
11:54:30	Heard you start AOS - no signal strength	
11:55:00	ZOS	
11:56:30	Com	

11-10-84

11:23 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
002:05:08:45		52

GMT Time	NOTES
315:17:23:58	
17:26:05	COM - Nozzle temps
17:27:55	Reinitiated waste water dump. - VIDEO
17:28:27	Turned off the dump. being over. - cleared
17:28:53	- Set back up to 250° - second portion should go fairly well
17:29:26	COM
17:30:50	2 remaining dump tries. Last one too short to count.
17:31:24	4 cycles allowed total. Because of heater?
17:31:50	Experience
17:32:19	COM
17:35:07	COM - Nozzle 248°
17:35:28	Well Well!
17:36:17	COM Air to Air?
17:38:04	COM - 17.4% waste water levels
17:40:17	Lost TV - what we saw looks good
40:34	COM -
42:14	See primary, temps about 60°. 14% level. was up do it again.
50:50	RCS bus pads available.
51:21	Will finish dump then call you.

6:00 AM
11-10-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
00:23:45:30	Arrive F-Stop, Commander Truly.	46
GMT Time	NOTES	
315:12:00:00	Comm. continues	
12:13:16	Comm	
12:13:55	AOS - Unmanned Hawaii	
12:14:06	Set up for TV	
12:14:19	Manual F-Stop of 8 for gas	
12:14:26	Stop for the best	
12:14:55	Turn for pass.	
	TV comment to Max - A, PMS allows flight deck and middle. Will regain control at 10 min pass.	
12:16:00	Shudder speed?	
12:16:23	1/48 for shudder speed.	
12:17:06	Give a call when start bringing downlink TV.	
12:17:35	Dark or display Varyy ASA 100	
12:18:20	Orange filter should be working 2 F Stops	
12:18:44	No work FA.	
12:19:02	No cameras till Mila	
12:19:11	as commander Truly listening?	
12:19:26	Dmb see him now	
12:19:38	Is he in town.	
12:19:52	Has a great interest in this success.	
12:21:40	AOS	
12:21:56	Protected - low	

6:22 Am

1110-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
002:00:07:29	Houston's Shuttle, Sp. Thunderstorm	46 cont.
GMT Time	NOTES	
345:12:21:00		
12:25:56	Mark -	
12:26:27	Repetit Houston see us in dawn's early light.	
12:26:53	COM - 29 min away for SIMS deploy.	
12:27:17	See us looking up in the morning sky.	
12:27:52	Beautiful sunrise	
12:28:03	Thunderstorms coming in may not see you.	
12:28:18	We all need water sometime.	
12:28:47	COM - Pico driver out	
12:29:06	SIMS probably got deployed directly at the cur.	
12:30:00	COM	
12:31:49	TV through MILA	
12:31:55	Turned off Alpha camera do to cur. Hot spot in deck camera because of velocity vector and unsecured windows.	
12:32:10	Cabin TV	
12:33:03	COM	
12:33:21	See thunderstorms	
12:33:30	Alert of rain this morning	
12:34:07	Feels a little different from our SIMS last J.	
12:34:10	Certainly is.	
34:32	Temps behaving well. About 79° today.	
35:08	Skic strip at CAPE - clouds	

11-10-84

12:05 PM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
052:05:49:37		53

GMT Time	NOTES
315:18:05:10	
18:21:27	COM - STANDING BY FOR AOS
18:24:30	805
18:25:00	DID COMPLETE THE DUMP
18:26:35	PULL BRAVO CIRCUIT BREAKER
18:28:31	TARGET COMING UP - GETTING READY TO BERTH ARM
18:29:50	COM - BERTHING ARM FOR PLANE MANUVER, CHECKING SPACE SUITS
18:31:30	COM - AOS HAWAII
18:42:25	COM - FAN TURNED ON SUIT - TWO GOOD SUITS
18:51:24	COM - ALL THREE SUITS ARE GOOD
18:58:53	^{FT/SES SETTING} PHASE BURN NOT BAD - THAT'S AFFIRMATIVE
19:00:25	ORBITED LOOKS GOOD FOR BURN.
19:07:06	COM - PLANE CHANGE MAN. - VECTOR GOOD
19:09:15	COM " " "
19:11:34	JUST COMPLETED THE BURN
19:13:05	COM - TELIMTRY
19:18:45	EMU HELMET LIGHT
19:19:30	COM

6 41 Am

11-10-84

Transcript Profile

Flight 51-A

MET	General Activity	Cassette #
002:00:35:35	SYNCOM DEPLOY	47

GMT Time	NOTES
515:12:40:10	
12:40:39	COM - 15 min. from SYNCOM deploy.
12:44:20	Do for deploy
12:45:07	SYNCOM looks good for deploy.
12:46:21	Burst off pins coming out
12:46:34	COM - pins out 10%
12:46:46	Light quiff bands - how is altitude
12:46:54	Looks good.
12:47:28	COM.
12:48:00	Burst off pins 35%
12:51:41	Pins out, heaters on
12:51:54	Sounds real good
12:52:17	COM
12:53:46	Clear up disable both motors
12:54:00	Donna get that now
12:54:19	Burst off pins time. 4 (low) & predictions.
12:54:38	1:30 Mark
12:55:20	COM
12:56:17	Shoo away - DEPLOY!!!
12:56:22	Good show

11-10 84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
002:	OMNI deployed.	47 cont.

GMT Time	NOTES
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315:12:50:00	2 nd Frisbe on its way
12:50:20	Turn of spec.
12:57:35	Omni's coming out.
12:57:57	Omni fully deployed (antenna)
12:58:24	COM. wheel began programmed spin-up. Coming up 12 rpm. separator drum.
315:13:00:05	COM. Play list expected in 5 minutes.
13:00:35	Normal jets or maneuvers.
13:03:56	Drop rate
13:04:00	SYNCOM = spinning up.
13:05:05	up to 12 RPM's
13:06:03	COM
13:06:13	20 RPM's
13:06:27	COM. should reach 33 RPM; is at low attitude
13:07:54	27 RPM's
13:08:05	Attitudes & rates down
13:08:20	Roll, pitch (Bad Breaking up + Dropping out!)
13:09:06	Bad angle shells with bad Yorgadi
13:09:24	Ready for burn - readings later.
13:11:20	COM
13:16:15	COM
13:22:51	AOS
13:23:01	Numbers coming down

7:23 AM
11-10-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
002:01:08:00		47 cassettes

GMT Time NOTES

315:13:23:16 Readings
23:37 Sounds good
30:40 AOS - looking for ~~playback~~ playback at TD12SS
48:47 AOS

~~Complete~~
13:49:05 Complete bus 51 seconds
Looks like you're 2 for 2

13:49:35 Joe setting up VTR, preparing for start of run, putting pens in.

Transcript Profile
Flight 51-A

11-10-84
7:50 AM

MET	General Activity	Cassette #
002:01:35:18	VTR Playback SYNCOM Deploy	48

GMT Time	NOTES
315:13:50:00	
13:51:36	When do you want TV
13:51:46	AOS FOR TDRS - 5 min.
13:53:17	Plan for TV for INCO full deck deployment, deck - PTM run
13:53:46	Sounds like good show.
13:56:21	YOS
13:56:33	COM XXXXXXXXXX
13:58:46	COM - VTR
58:58	AOS - on payload bay
59:35	Anna putting arm away - will see small maneuver as she drive
14:00:3	
14:00:41	Deploy VTR dumps
14:02:03	Good bus confirmation
14:02:20	Fantastic views of earth
14:02:49	See it coming up
3:03	Flight deck
3:44	o
14:03:46	Treat section - PKM run
14:04:12	Dark side - haze lays down earth horizon
14:04:35	(Audio echo)
14:04:46	Tail off
14:04:57	Keeping back of satellite with camera

11:30pm
11-10-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
002:14:47:55	Sleep period	58

GMT Time	NOTES
315:03:01:28	COM:
03:14:41	COM: Lights on helmet work now
03:21:30	COM: Mission ended ^{ended} today 15 hrs 7 min. Flight day 4 activities
03:58:56	COM:
04:29:25	COM: Discovery is 171 by 169 naut miles. Weather briefing ascending rate of 45
04:59:30	COM: Execute package info. Crew wakes approx 1:45 min
05:28:45	COM: Change ⁱⁿ contingency landing sights for Sun. Inflight maintenance procedure today on the helmet for Monday EVA
06:00:21	COM: stop Change of shift briefing has been cancelled. Cabin temp 75.9°F Mission ^{Elapsed} Time day 17 hrs 46 min Shuttle is on ascending rate of orbit 45. Discovery will be visible to Houston at 5:14am
6:30:08	COM:

8:02 Am
11-10-84

Transcript Profile
Flight 51-A

MET
602:01:50:27

Cassette #
48 cont.

GMT
Time

NOTES

315:14:05:00

14:05:33 RMS info from ANNA. Switch working.

14:05:53 CONGRATS - deploy!

14:06:10 Do not erase video cassettes. Had a couple of interceptions.

14:06:33 See you at next big moment.

14:06:45 Cam has payload camera.

14:09:03 Video of pellets: Com - Toys bolts

(C) 14:14:30 Com - crull

14:17:40 Com - ~~700~~ Cargo Bay - A frame

14:18:12 Pint mounted mmu

14:39:27 Com interlocking

14:39:43 Tracking small fuel leak

12:30AM
11-11-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
002:18:18:42	Wake Up Activities/Cancelled 2 maneuvers	59

GMT Time	NOTES
315:06:45:04	Wake up call "Victory at Sea" Theme: "Good morning Houston" Discovery plays song back to Houston "Who will buy this wonderful morning" Barbara Strisand
06:48:39	Delete the IMU this morning, also delete the 2nd maneuver
06:41:47	COM:
06:57:55	1 minute to telex ^{TDRS} LOS
07:02:30 07:02:30	COM:
07:13:03	W/UHF turned off - we've got some scratchiness Copy
07:17:12	Wire + YRV normal temp was lower made increase in power usage. Turned overhead lamp on.
07:18:50	COM: Reminder change of shift briefing cancelled
07:22:01	Say hello to Michael Stevens. Can you see the Cotter River? Yes
07:38:25	COM: Last portion of orbit 35.
07:41:46	COM:

11-10-84
7:40 AM

Transcript Profile
Flight 51-A

MET 002 02-25-24	General Activity	Cassette # 49
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GMT Time	NOTES
14:40:17	
14:41:36	COM (Brian Walek)
14:55:45	COM aft-thruster leak - extremely small.
	Discomb shown in propulsion quantity.
	- Fuel lower temp of thrusters. No flight
	or rendezvous impact.
15:01:17	AOS through Yagodi
15:02:30	Working fuel leak - F4R should be trip clear.
	No action
15:03:04	Terminate boiling water.
15:03:35	Guest had lunch preparing for check out.
15:04:29	AOS bill Dean
15:11:18	AOS
	Position of camera body correct during deploy
	OFF.
	Procedure for auto mode working
15:12:19	Spot meter usable but auto would be unusable
15:17:50	AOS - Looking for TV over Hawaii
15:24:22	COM - AOS

9:25 AM

11-10-84

Transcript Profile
Flight 51A

MET General Activity

Cassette #

49 cont

03:09:49

GMT
Time

NOTES

315:15:24:42

AOS

24:49

Setting up TV

15:25:57

mmu check out

26:09

Download inhibited - no video

15:26:26

VIDEO

15:26:39

Small pieces of metal coming out of battery hold in lights.
Cannot get lights to work.

15:27:50

Both sets of lights or no?

15:28:00

Both - tried new batteries. One piece of metal is
a small stand off screw.

15:28:50

COM - Lights in crewman helmet

29:37

Batteries as good. Something in electronics.

15:30:49

Can take cameras.

15:31:00

Need to go to ~~com~~ command.

32:18

Dropping out for minute. Orbit 2 team coming in.

15:32:37

Any more TV?

15:33:00

Keep TV over TDRS

15:34:37

Orbit 2 Team - Did missing

15:35:07

TV Panel switch + command

15:37:34

VIDEO - See strips - triple tape

15:38:52

CAPCOM - missed

31:09

Elbow camera set up

Transcript Profile
Flight 51-A

3:30 AM
11-11-84

MET	General Activity	Cassette #
002:20:41:02		61

GMT Time	NOTES
316:08:54:10	COM
08:57:19	Where'd you get batteries? Intended for use in micro cassette recorders.
09:01:53	Being LOS TDRS
09:03:12	COM
09:20:30	COM
09:20:46	through TDRS
09:21:28	cabin fan switch. Switched from 3m pumps. QR - Sounds good
09:24:17	The no load foldage a little diff. Between 18-26 absolutely no problem.
09:28:27	DPOS status check - .. everything's going well
09:33:53	Cities in Mexico below us 'Olah!' (Rick)
09:35:33	COM: Out of Gulf of Mexico on orbit 47
09:36:24	We see Miami, and that's the Cape
09:36:44	COM-
09:52:26	We just had short loss of up & down link through TDRS
09:57:34	2 flint 21 colon 39 colon over - copy
10:01:11	COM: Review today's TV schedule

Transcript Profile
Flight 51-A

9:40 AM
11-10-84

MET 02:03:24:25 General Activity Cassette #
~~305~~ 50

GMT
Time

NOTES

315:15:39:00

15:39:52 KSC left payload bay ~~is~~ clear.

15:40:34 Mast setting over starboard OMS Pod.

15:41:31 Baha, CA

15:42:00 Thanks for good tips - getting some good scenes

15:43:05 COM.

15:56:57 Procedure to be relayed carefully to Joe Allen.

15:57:00 You don't trust me.

15:57:17 Not at all. Want to make sure Dr. Allen understands

15:57:23 He's definitely the expert.

15:58:18 Joe is ready. get middle camera.

15:58:37 How high on middle

15:59:11 Max aeroflex - may want to copy

15:59:39 Not reading

15:59:46 Daid - clear

15:59:58 on the aeroflex...

MM small silver lens clear forward

lens. Switch in this position. Camera battery
after each filming.

16:01:00 Beadback

16:04:07 COM - Upcoming TV

Press ~~Conference~~ ^{Bridge} 10:15 AM (Change of Shift)

16:04:53 Through with TV - thank for two around bay

4:00 AM
11-11-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
002:21:47:00		62

GMT Time	NOTES
----------	-------

316:10:02:34	COM - cont
10:15:04	Lost contact w/ Discovery, will be back in contact in approx 15 min.
10:25:00	AOS
10:36:55	AOS -
10:41:03	COM - 2 nd Aquis Apogee burn 30 min. shuttle to pass over Houston. 5:10 AM.
10:58:02	AOS -
10:59:27	RCS Pas
10:59:40	Wait, we were set up for OHMS
11:00:08	RCS . . . Stay inly connected. Delta in altitude.
11:02:10	Readback
2:58	Minor Delta .4 instead of .9
3:14	That happens
3:40	Teleports or manifested * fuel leak. Steps 1 & 2 actions complete prior to the burn.
4:02	S Band noise. Got another at 23:40:30. (Clucking 5 seconds.
4:28	Targets for burn onboard.
4:31	on the

11 10 84
~~11 10 84~~

Transcript Profile
Flight 51-A

10:05 AM

MET	General Activity	Cassette #
002:03:50:19	Possibly Fixed Aeroplex	50 comb

GMT Time	NOTES
315:16:05:20	
16:06:16	Setting up RMS powerup and waste dump
16:07:03	Amount of waste water to dump?
16:07:22	10 ⁹⁰ procedure or pay 5-4
16:07:55	Saw for use Hawaii in our use or use RMS light
16:08:20	Able to see it at Hawaii
16:13:35	COM - Change of Shift from Briefing
16:22:40	Feel they have fixed Aeroplex
16:37:35	COM
16:47:10	AUS
16:47:30	Getting positioned for waste dump
16:47:40	If we get to 250° before Hawaii, what?
16:47:45	Put on VTR and will take it later
16:49:56	Second set of heaters - mly below 50°, what we need both throughout?
16:51:10	Don't need heaters during yet. Turn on during

11-16-84
10:52 AM

Transcript Profile
Flight 21-A

ME.T	General Activity	Cassette #
00:04:37-04	Water Dump Video	51

GMT Time	NOTES
----------	-------

315:16:52:00	
16:54:39	SOS - tell Hawaii when we were ready for TV.
16:55:13	COM
17:01:00	COM
17:01:23	Start at dump through PMS In front of shadow cast - formed but didn't grow. Stopped at 62° in fear of ice.
17:02:33	Dumb on hole.
17:02:45	Water dump
17:03:17	Ob would tell daytime wouldn't on the wall
17:05:50	Sides popping out
17:07:15	Start temp check. Video need time for BAM people.
17:07:55	COM
17:09:18	COM
17:10:19	
17:10:47	230° on nozzle tips. Start again at 250°. Stop at 65° - 75°
17:11:57	Dumb that that's necessary too if that gives you a good warm feeling go ahead.
17:12:16	COM
12:17	Anna going to open dump nozzle

11-11-84

4:50 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
002: 22:50:15	SODOR BALLS, S-BAND PM,	63

GMT Time	NOTES
316: 11:05:09	
11:05:46	Food & clear.
11:06:03	S Band PM noise?
11:06:13	Copied
11:06:30	Looking for yellow light
11:06:46	Cont update at TORS. Wait till mid
11:17:50	Steps 1 & 2 complete. No change a slot
11:18:11	Sodor balls we think is problem starting kind created.
11:18:30	Talking a manual, please report.
11:19:12	Understand implication. Knowing or release and gray tape.
11:38:13	Com
	18 min from TORS bus.
41:33	ZOS Have a good bus.
50:24	Com
12:00:03	AOS - (through Yurged)
12:00:20	Had go good bus.
12:07:46	ZOS - kilo Hawaii
12:17:42	Com - Palapa
12:26:07	Com
12:26:14	AOS
12:26:35	Handing Br Breath

6:27 am

4-11-84

Transcript Profile
Flight 51-A

MET

General Activity

Cassette #

003:00:12:10

63 cont.

GMT
Time

NOTES

316:12:27:15

12:27:43

Verify EVA 25 min Pre-Break?

12:28:08

Verified 25 min.

12:33:45

405 - stay in mode - see spec at Jaldetox

12:37:15

405

(1)

(1)

11-11-84

Transcript Profile
Flight 51-A

C

NET	General Activity "watching it like a hawk"	Cassette #
003:00:21:10	Cabin depresses	64

GMT Time	NOTES
12:37:00	Setting up C) W levels. Not depressing. Setting up limits so we'll only charge me.
12:37:30	Looking over your shoulder
12:37:45	Please do. Lots of entries, always chances for mistakes.
12:43:07	Set on set of limits. Start drop-out till Milo.
12:43:40	Watch cabin pressure and ^{PSI} PSI ^{PSI} decrease you go down.
12:44:16	Com-
12:44:52	You're clear
12:45:10	(Shuttle not monitoring)
12:45:31	AOS
13:01:46	Depressing cabin.
13:02:10	Watching it like a "hawk"
13:09:14	Com 12 PSI - down to 10.2 PSI eventually.
	9:38 AM - DMOS
	10:15 AM - Charge & Shift
	11:00 AM - Satellite Playback
	6:15 PM - Charge & Shift
13:14:40	Terminate Boiling Water
13:24:21	YOS
13:24:49	COM - Success in requesting communication TDRSS.
	Finny jet - back of saddle.
13:26:40	Cabin pressure at 10.2 PSI

11-11-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
003:01:23:56	Re-Sparging	65
GMT Time	NOTES	
306:13:38:37	OHMS Run good readings continue. Critical Run, Cost Run spin check.	
13:39:20	Missed TV rolls	
13:39:22	180	
13:34:41	Pitch & weight	
13:40:20	Readback	
13:41:43	Do not readback - target in board	
13:43:09	XOS tell Dean	
13:43:21	Run good all look good.	
13:51:07	AOS	
	51:15 Sparging 1	
13:51:13	About ready to start maneuver towards bus.	
13:51:20	EMU lighted - no action comes with AAA should not leak. Crew for vacuum.	
13:52:16	Waiting with braked brake.	
13:53:59	XOS tell Hawaii	
13:54:09	Maneuvers in progress.	
13:54:25	COM	
14:02:11	AOS through Hawaii	
14:02:24	Noise problem - Blurred into wire with headset?	
14:08:59	Re-sparging	
14:09:25	First wire heard that request.	

11-11-84
8:27 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
003:02:07:00		66

GMT Time	NOTES
316-14:21:50	
14:22:23	Beautiful day down there.
14:22:38	Lot of people saw you this morning.
14:22:53	Makes us feel good & warm inside.
14:34:05	Busy eating?
14:34:18	Noise problem - Swap NSP-1. If bypass you back panel. NSP-2 prior to command.
14:34:57	Feed back on effect.
14:46:44	COM
14:50:18	COM - 2 yrs ago ^{today} Space Shuttle deployed first payload SBS.
15:01:38	JDs for meeting. Darryl & OS.
15:06:24	COM - Alignment of computers
15:25:06	Lead & Clean
15:25:16	Heard crackling again?
15:25:30	Yes. Series of crackles.
15:26:00	Unique to today - last night.
15:26:16	Everynight. Looked over at Mr. Spac.
15:26:48	Ready for TV at Hawaii
15:27:00	Trouble about a little. Swap audio center.
27:35	Audio Center 2

11-11-84

9:45 Am

Transcript Profile

Flight 51-A

MET	General Activity	Cassette #
003:03:24:00		67

GMT Time	NOTES
316:15:40:00	
15:40:20	Anna Fisher - DMOS
43:58	Dave Walker
44:29	Videa Gardner
44:51	Manatee y -
15:45:15	Did of orange juice
15:45:34	Missing person - Where's Joe?
15:46:14	Joe Allen in locker
15:46:47	Live coverage - Hauck
15:47:08	LOS tel TDISS - outstanding show
15:50:42	COM
15:51:56	AOS - UHF through Holdston
15:52:15	Problem at White Sands for TDISS
15:52:34	Last scene was Joe Allen
15:52:59	Popi - Lots of fun. Doing alot of great things. Thanks to Anna. Glad you found Joe - need him tomorrow
15:53:44	Glad to. Always find him in a new place. Can't find anything shaped like a telephone.
15:55:05	
15:55:40	COM
15:00:25	COM - KU Band TV, no more link
15:05:22	COM -

Transcript Profile
Flight 51-A

11-11-84
10:33 AM

MET	General Activity	Cassette #
003:04:18:31		68

GMT Time	NOTES
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36:16:33:00	
16:39:20	See you at Duan
16:53:10	COM - 7 mins for tomorrow
16:58:56	COM - Loss of data - not compatible with - bus prob, wait one orbit.
17:01:52	AOS
17:02:05	Delay NCR bus 1 rev. Make sure of rendezvous
17:03:30	Joi has water out.
17:09:01	Xos till Hawaii
17:13:22	COM - TV for orbita repaired at Nelsbom through TDRS playback through satellite.
17:15:40	AOS
17:15:47	Recharge - check water to verify tank C.
17:16:13	Go to proceed.
17:17:18	Dumped water out of EMU - Annas diet - are we dump?
17:18:35	Verify kind of bus.
17:21:10	at present Bus 62% 6 th day. Have go to do bus if you choose to
17:21:46	Probably well.
17:21:54	Dump to 10% in waste.

11-11-84

11:29 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
003:05:14:08		69

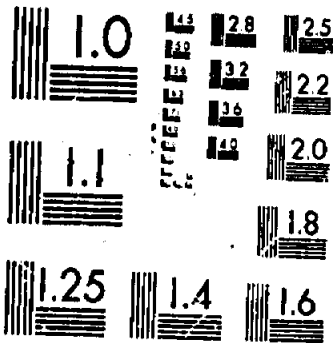
GMT Time	NOTES
316:17:29:14	
17:31:14	Flashing water again.
17:31:49	11.9 from Tank C.
17:32:08	EVA Concerns
17:32:23	-Temp - we were here - had started 7ESS - 170 to SSR-5
17:32:52	Enter SSR5 in block 4.
17:33:25	COM - Walk into space suits.
17:41:54	Ready to do dump. Select cameras to command will watch over your shoulder.
17:42:28	Movement in RMS camera
17:42:38	On command - no picture
17:42:50	Only select end defects
17:44:15	Good picture
17:44:24	Frost forming everywhere except at 6:00 area
17:47:25	Saw little piece of ice get knocked off.
17:48:44	COM Tank quarterly down to 200
17:50:29	COM - chunks of ice shooting out.
17:50:36	Stopped dump at 60°
17:52:54	COM
17:52:54	Video through
17:53:27	INCO can have control of camera
17:53:42	Direct view of arm.

Transcript Profile
Flight 51-A

11-11 84
11:55 AM

MET	General Activity	Cassette #
033: 05:39:00		69 cont.

GMT Time	NOTES
316: 17:55:10	
18:00:20	COM - Christine Fisher in mini flight deck suit.
18:01:14	COM - New time for playback.
18:05:18	COM - 2 nd dump - 25 1/2%
18:11:45	See up at 18%
18:11:54	8% out each time
18:12:11	Letting nozzle tip heat up
18:12:46	Burn pods ready at Dean. Not arm from viewing area to lay during burn.
18:13:21	Storing arm and final dump.
18:14:44	COM - Completed Goldstone video.
18:16:17	COM - moving arm back to cradle to prepare for phase burn.
18:16:49	LOS told Dean
18:19:05	COM
18:40:19	AOS GUAM



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963 A

Transcript Profile
Flight 51-A

7:30pm
11-11-84

MET	General Activity	Cassette #
3:13:18:00	SLER P - Wake up	74

GMT Time	NOTES
02:02:25	COM
02:31:47	COM
03:02:35	COM: 13 to 14 naut miles below palapa.
03:31:59	COM: Orbit is 187.8 ^{naut mi} by 174.4 naut mi. 2 hrs 42 min remaining in sleep period
04:05:28	COM:
04:29:55	COM:
05:06:26	COM: On ascending note of orbit 60
05:33:20	COM:
06:00:25	COM: ^{Discovery} 315 naut miles behind palapa EVA scheduled to begin 7:32 am
06:23:21	Wake up call - stopped it
06:23:55	Wake up call "The Eagle ^{3rd Hawk} " By John Denver "We read you loud and clear" Discoveries song back - " The Greatest Show on Earth " "March of the Gladiators"
06:27:45	Had good sleep last nite and were up and ready to go
06:28:34	COM

12:30 AM
11-12-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
003:11:15:06		75

GMT Time	NOTES
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06:03:00	
317:06:44:34	com: 33 min of AOS through TDRS
06:48:23	com check
06:59:32	just picked up star 20, now 20 & 83 are on the table. delete the Delete maneuver for IMU
7:08:28	COM
07:02:11	Having breakfast - Mexican scrambled eggs are gonna taste good today
07:03:55	COM: Change of shift briefing cancelled
07:10:13	Compliments on clear & precise messages you're sending up.
07:16:53	Los see you at Yardady in 12 min.
07:38:20	See you at TDRS 02
07:39:07	com:
08:03:55	through TDRS
08:04:25	may see PPO2 message - We copy
08:06:33	Get your preliminary burn pads
08:08:15	Rec'd preliminary burn pads - Discovery read it back

2:55 AM
11-12-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
003:20:47:00		177

GMT Time	NOTES
371 08:55:08	com: They have aquired target - locked on to the palapa
09:06:09	com: Pick up in about 6 min throught yargady Review of IV activities today. MMU flyover playback 8:55pm Final phases of rendezvous going smoothly
09:07:04	With you through yargady
09:10:28	We have visual contact through the miss
09:16:38	Should we deselect the star angles on dime? You can deselect now.
09:20:20	Being LOS See you at TDRS
09:22:33	com: We have LOS Spacecraft in proper attitude for hight adjustment
	stopped on counter # 158

Transcript Profile
Flight 51-A

3:35 AM
11-12-84

MET	General Activity	Cassette #
003:21:21:00		78

GMT Time	NOTES
317:09:37:30	com: In final phases on closing in on palapa for final rendezvous.
09:40:48	with you through TDRS - Read you loud & clear - when you get a chance boil some water
09:43:06	we had good self test on ICU band
09:46:40	com: 33 min away from next burn. Saw the palapa earlier. All going well. Final approach to palapa Reminded them to take an aspirin before going out. Orbit # 63
09:59:25	Approx 50 miles separating ^{the} 2 spacecraft Have data on Delta V Delta V only
16:04:22	com: 40 naut mi. behind palapa Burn commencing up in 14 min.
16:25:37	com End star track you have - We'd like a mark history
10:27:01	com: EVA preparations - EVA begin start
10:32:14	com:
10:34:38	com:
10:43:26	AOS through Yargudi

11-12-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
003:22:19:00		79 80

GMT Time	NOTES
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317:10:34:38	
10:45:05	Read NCC solution on page 10-14.
10:45:26	Reading of solution
10:45:50	Readout History - marks. (anno)
10:51:27	AOS - expecting com: B10 checks
10:52:41	Com-
11:10:20	AOS through - Hawaii Com. checks after keepstom
11:10:50	radar lock on - Excellent!
11:11:00	Com - 21 nautical miles radar lock on target
11:12:34	Motor. =.
11:12:52	No for auto.
11:13:04	Com - awaiting com. checks
11:13:55	Lord's clear. Setting up UHF
11:14:22	EV Biomed. problems. Jivet keeping mal. formal from going together.
15:18	Op on A and B Alpha Bravo 1 time.
18:31	Everything looks good.
11:15:41	Adapters finalized. Watch bumper bracket.
11:16:09	Attempt to center.
11:16:26	Read for Lord & Com
11:16:29	Doing A & B

11-12-84

5:17 AM

Transcript Profile
Flight _____

MET	General Activity	Cassette #
063:25:02:00		79 cont.

GMT
Time

NOTES

317:11:17:15	Brows lined: clear with some background noise
11:17:43	COM - EV 1 go Alpha
18:31	EV 2 Dale Mardner
11:18:37	EV 1 on Alpha
19:15	lined: clear Dave
11:19:24	COM
11:19:32	Negative Bu. med. Check switches
20:28	
11:20:33	ask Dave see how Bromed. look
11:20:51	Two good Bromed check
11:20:54	EV 2 going off line
11:21:10	EV 1 reconfiguring air to ground
11:21:47	COM - Balaya turned OFF and ready for retrieval
11:22:17	Discovery - Houston
11:22:35	" "
11:22:59	Balaya isolation valve closed and reconfigured for retrieval
11:23:10	Dave to have something working with open arms
11:24:08	Final Selection
11:24:17	Readings from Houston
11:24:34	Backhaul

11-12-84

5:25 AM

Transcript Profile
Flight 51-A

MET 003:23:10:00 003:42:23:	General Activity	Cassette # 80
--	------------------	------------------

GMT Time	NOTES
317: 11:24:47	Kind TI Delay
11:25:26	Span rendezvous delay
11:25:44	Comm
11:25:52	Comm.
11:30:16	Comm.
11:39:18	Comm
11:39:40	Onboard collector 5° difference in all three axes. Assume it's good.
11:40:07	Onboard collector so good.
11:40:29	Verify maneuvers & attitude attitude.
11:40:44	Verified
11:41:40	Comm
11:44:59	Comm - at burn attitude
11:47:16	Comm Trajectory right on target.
11:53:21	Orbits on its way back after burn.
11:55:13	Comm 50,000 ft. apart
11:56:00	CRT 4 still not working. Writing of orb.
11:56:16	Saw both orbits - BALAPA clearly over last pass above Houston. (Bill Fisher reports)
11:56:41	That's great to hear! (Anna Fisher)
11:56:00	Comm - Joe Allen's EVA schedule changes.

11-12-84
6:00 AM

Transcript Profile
Flight 51-A

MET 003: 23:44:20	General Activity Started Bro Bealle.	Cassette # 81
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GMT Time	NOTES
317:11:54:23	COM - continues EVA schedule. Anna grasped.
317:12:05:04	COM - Lot of calculating going on
12:07:25	Filter prop transfer: will be uplinking something
12:07:47	Talk to ops at Houston if configured if not then - at Yargadi
12:08:14	Status for EVA folks please (Yarg)
12:08:36	ZOS
12:13:22	COM
12:20:43	AOS over Yargadi
12:21:09	COM
12:21:25	COM - Propellant quantities look good.
12:22:54	COM - Review of flight director
12:23:58	AOS - Good & Clear
12:24:23	Computer NCR - 3 min 33 sec. disp.
12:25:00	Started pu-breath 1 min. ago (Cab Gardner)
12:26:18	COM - Time sequence okay.
12:28:31	ZOS - expect cab TV at Houston
12:30:00	COM
12:32:20	COM Everything looks good for rendezvous.

11 12-84

Transcript Profile
Flight 51 A

MET 02:47:35	General Activity	Cassette # 89
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GMT Time	NOTES
317: 15 02:40	
15:02:53	Murray RMS now
15:03:17	Out Boy, 2 girls
15:03:57	Loss of radio
15:04:14	Positioned for installation of A Frame
15:06:32	COM Comparison of Palapa & Westar Satellite
15:06:51	Port wing, not Starboard wing
15:07:02	Dumb to Wrecking Wrecking Dab.
15:07:30	Being brought to you by Anna
15:07:43	Keep it coming
15:08:00	Stop, right hand 30° 40°
15:08:42	Tell me relative to you
15:08:56	Needs to explain
	Work at angle
15:09:22	Lot of carbon out of rocket nozzle - propellant
	in little pieces
15:09:36	Dumb as well
	Antenna pointing towards opposite direction
15:10:00	Blatly clear, come this way
15:10:25	Towards tail
15:10:55	Perfect. Nice flying

6:30 AM

11/10/84

Transcript Profile

Flight 51-A

MET 004 00:18:15	General Activity	Cassette # 82
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GMT Time	NOTES
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317:12:33:25	
12:36:41	COM AOS Hawaii + 9 min. will have TV
12:45:33	COM
12:46:08	AOS
12:46:16	Completed OTC
12:46:21	OC Test. 304 header A/B to auto. for
	presence of cells.
12:47:02	Downlink at 400 conversions
12:47:15	Flit deck modded looking at air lock
12:47:43	COM - Band around for AOS leg designating
	EV-1
	VIDEO
12:49:55	COM - checking connections
12:52:14	Palpa 13,000 ft.
12:53:34	Hatch of airlock
12:53:56	Timing up hatch to seal
12:55:19	Last video
12:06:07	AOS - Clouds Clear
12:57:14	COM
12:57:33	Video - into airlock
12:58:11	Closed hatch

9:11 Am
11-12-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
04:02:56-54	Cutting of OMNI Antenna	89 cont.

GMT Time NOTES

317:15:11:40	A real dizzy.
15:11:55	Can see what Dr. doing.
	Com. disjunct from hardware close to cut graphite antenna.
15:12:48	Fathered around antenna.
15:13:20	Ready for cutting. Dr. Tucker especially.
15:13:57	Graphite cut. Cut clear. Jam between island off a structure.
15:15:23	1200 lbs in the right, 14 in the left.
15:15:53	Remove OMNI antenna.
	Com. unscheduled TV 10:10
15:18:11	A frame installation review.
15:18:30	Left roll take it up first.
15:18:55	Drilled it just in the right place.
15:19:30	Keep rolling Anna.
15:19:41	Stop overexposing your feet Joe.
15:19:53	She is good as a mouse.
15:20:04	20" rise
15:20:29	Orbita pitch up.
15:21:13	No more pitch up working done.
15:21:42	Coming down.

7:00 Am
11-12-84

Transcript Profile
Flight 51A

MET

General Activity

Cassette #

04:00:45:20

82 cont.

GMT
Time

NOTES

317: 13:00:25

13:01:00

Relax as bright as could be

13:01:03

Tallyho - VIDEO

13:01:18

As four landing

13:01:50

COM

13:02:40

John Young was right no problem in seeing this baby

13:02:58

Dash heard that

13:03:42

Depressing outlook (Anna)

Transcript Profile
Flight 51-A

11-12-81
7:05 AM

MET	General Activity	Cassette #
004:00:49:07		83

GMT
Time

NOTES

13:04:19	COM1 PSI starting through air lock hatch
13:04:50	7 th PSI pressure
13:05:17	Seal in hatch looks good
13:06:04	Commander manual control final approach
13:07:25	5-2 PSI pressure
9:30	TV of PLB
13:11:00	OHMS ^{cmd} message: no impact in action
13:11:26	Try camera A
13:11:34	Video of PALAPA
13:13:24	Airlock to vacuum
13:14:28	Good TV. Appreciate the pictures
13:15:22	Com Playback at 7:25 AM
13:16:42	Opening hatch
13:16:50	Pressure left OHMS
13:17:08	Com - hatch open
13:17:50	Com - Extracted order of egress.
13:21:10	Did a good job Houston
13:21:37	EVA - water off zero outflow - both seats blank. Do EVA?
13:22:08	Again
13:22:14	Still breathing down. Alls O.K. Just waiting.
13:24:11	Com - Playback in one minute

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
064:03:06:52		90

GMT Time NOTES

317:	
22:48	
317.15:22:16	Brakes on Anna
15:22:47	Carbor looks size of corn flakes
15:23:10	Only one cut out a outside Dood.
15:23:26	Back towards tail
15:23:30	It creeps
15:23:40	Creeping away
15:23:52	Little more to tail
	Take well out more off.
15:24:19	Forgetful still do it.
15:24:51	All need is 3" or 4" to reach it.
15:25:02	That's good Anna.
15:25:11	Clampet looks
	Terminate working under - heater to off.
	22:48
	6
15:25:39	205 will down
15:26:19	Really hot. 120° inside glass
2637	Palapa Palapa no dry ball has got to come out.
15:26:56	Com - 205

Transcript Profile
Flight 51-A

9:27 Am
11-12-84

MET 04:03:12:00	General Activity	Cassette # 90 cont.
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GMT Time	NOTES
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317:15:27:20

15:45:47 AOS - through Duan

15:46:47 Dab's battery: Conna bracket clamp won't fit. Structure between brackets sticking out. Not a removable - structure Messier. Tried twisting. Conna clamp does not work.

15:47:58 Proper no A-Frame procedure. Conna hand off.

2 gal top. Take off stinger and adapter.

15:48:30 Proceed with plan B.

15:48:43 Now clean up.

15:49:00 Hand built stinger.

15:49:24 Preference slow temporarily

15:49:52 Conna: late satellite upst away

15:51:03 Pretty chilly - fuel heat gonna burn off water.

15:51:20 Water coming off.

15:51:56 David - section is back

15:52:06 We are up, get Joe off. They off, get rid of MMU

53:56 Stinger wrapping around everything. Something is power but not working

Telco engaging a gasp filter Dab

11-13-84

Transcript Profile
Flight 51A

MET	General Activity	Cassette #
004:01:04:48		83 cont.

GMT Time	NOTES
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317 13:24:39	
13:24:55	Open - EMU
13:25:50	Dave Ford & Coon. Water still up.
13:26:09	EV 2 - dumb hear Dal -
13:26:21	-Test. Ford & Coon.
13:26:41	EV1 from IV -
13:28:50	Dave - Houston
13:27:06	EVA comm config?
13:27:17	Yes. Not reading Dal
13:27:31	Check 06 again
13:27:56	Dal faints hear Joe good
13:28:23	Dave - Houston
13:28:35	Dave Ford & Coon
13:28:55	Water in ready for status check.
13:29:10	Right there - we could go get her. Could not get it.
13:29:15	04, 6:33 99% left 02, 99% run 846, 6380, 2.6, 169, 34 amps. - Joe
13:30:10	Status Dal - . . .

11-12-84

Transcript Profile
Flight 51A

MET	General Activity	Cassette #
0611:03:59:50		91

GMT
Time

NOTES

317:15:54:49	
15:55:07	Hughes say obstructions may be from ^{from} guide, cut or whatever.
15:55:56	Much too strong.
15:55:44	--of pin pulled, hard satellite to me (yes) had to get a adaptor.
15:56:48	Com -
16:00:56	Com -
16:01:06	AOS - VIDEO + AUDIO
16:01:21	Slowing A - Frame (at sunrise, get rid of mmu. @
16:01:53	DAP change for KU Band - Veneer Band.
16:02:16	See well to up before long
16:02:31	COM
16:03:13	Don't push off too hard.
16:03:41	Com between me & satellite
16:03:54	For pulling pins one by one
16:04:21	Carbon debris coming out
16:04:44	2 nd pin - not separating anything
16:05:07	2 nd pin stalled
16:05:30	Backing off

11-12-84

Transcript Profile
Flight 51A

MET	General Activity	Cassette #
004:01-16:00		84

GMT Time	NOTES
37:13:31:02	
13:31:13	Slack. None recently. Dale
13:31:27	Secured. Take it low. Unlock section: out of line
13:31:48	Tethers configured
13:32:15	Wrist -
13:33:15	On wrist for ready to leave
13:33:33	can't see for some time. Using cameras for readings
13:33:58	Unsnap straps. MD lights on in.
13:34:70	Holy smoke *
13:34:27	Vision coming down.
13:34:35	Doxy up/down bracket.
13:34:50	Nozzle down in bay
13:35:00	Overhead held in 5 min. would hold it there.
13:35:22	Stay in V-bar
13:36:03	Morgans
13:36:24	at MMO for? Affirmative
13:36:34	Check pressure of nitrogen
37:00	25 + 25
37:07	33 + 29
37:16	27 + 27

7:35 AM

11

Transcript Profile
Flight 51A

MET	General Activity	Cassette #
004:01:22:30		84 cont.

GMT Time	NOTES
317:13:27:19	
13:37:41	Start mmu prep Op.
13:36:07	mmu pressure again.
	25025
13:36:29	mmu looks excellent. Nothing different
13:38:45	Proceed through. Call on step 9
13:36:56	Time has for sunset
13:39:40	Wat status intact
13:40:00	Sunset in 16 minutes
13:40:40	Good descent
13:40:52	Batteries are secure
13:41:15	Wat status contents confirmed
13:41:44	Launch bolts release step 9 starting
13:42:33	30 seconds and get it. Is promised.
13:42:54	Unable to turn right C.D. by to left.
13:43:17	Clockwise won't work.
13:43:30	Open to flow.
13:43:36	Dumb close
43:50	Supply A + B open
44:03	Supply valve open
44:06	So easy
41:10	Closed open, closed - bolts locking
	Closing valve

Transcript Profile
Flight 51-A

11-12-84
10:18 AM

MET	General Activity	Cassette #
004:04:02:53		92

GMT Time	NOTES
317: 16:17:58	ADS-
16:18:00	Dist - I got it. Frager in thro
16:18:19	mmu locked in
16:18:36	KU to command. Comment for Joe on thermal mittens.
16:18:57	Thermal mittens out of airtight
16:19:17	Maki power off
19:27	Do around arm to help Dal
16:20:15	COM
16:21:35	Don't thing your thro David.
16:21:40	Ward. I'd rather be out there.
16:22:07	Why Joe going down?
16:22:33	Joe, thetha catching OK.
16:22:44	Head first into pallet
16:23:05	Did your angles right
16:23:48	Thrust that was it.
16:24:21	MKE head
16:25:01	Joe in foot restraint.
16:26:21	Too close to Dal
16:26:08	Schedule link too long.
26:17	Universal joint from Brodie's fire
26:17	
28:59	Need EMU status
29:11	Comb read

Transcript Profile
Flight 51-A

7:45
11-12-84

MET 004:01:30:00	General Activity	Cassette # 811 cont
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GMT Time	NOTES
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317 13:44:36	Vent done.
13:44:48	Close both CO's
13:45:18	Q done
	Q done
13:45:31	Ready for circuit breakers.
13:45:47	Can't believe what it's like and how endlessly fulfilling.
13:46:16	Numbness that retreats.
13:46:36	Slow Slings restraint
	Help for with donning
13:46:53	LOS till Hawaii Status & stability of satellite
13:47:14	Well behaved.
13:47:30	Lift is.
13:47:39	Looks in good shape
13:48:00	MMU red line #'s
13:48:10	External cable power disconnected.
13:48:25	Temps. readings from Houston.

MISSED SOME OF THE ON TAPE
missed on cassette only

Transcript Profile

11-12-84

Flight 51-A

MET 004:	General Activity	Cassette # 92 cont.
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GMT Time	NOTES
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317: 16:29:14	Maybe scan.
16:29:19	Dab - Dood chop
16:29:25	Joe - Food.
16:30:17	Anna, present antenna end to Joe.
16:32:00	Adepts teltoned Saliba open.
16:32:30	Joe brain while body rests
16:32:47	My body isn't tired.

7:50 AM
11/12/84

Transcript Profile
Flight 51A

MET	General Activity	Cassette #
664: 01:34:37		85

GMT Time	NOTES
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317: 13:49:15	
317: 13:49:28	XOS - COM
317: 14:05:05	COM - Quasi maintaining speed station
	through typhoon in this area.
14: 09:36	Flores and disc counter-clockwise
14: 09:54	Can't Do that
14: 10:07	Down

11-12-64

16:33 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
004: 04:18:50		93
GMT Time	NOTES	
317: 16:33:09		
16:33:38	Help with grapple fixture.	
16:34:16	Will put tether around end.	
16:34:43	Do ahead and slow string in normal place (horizontal)	
16:36:24	Do get it done.	
16:36:36	Dmt spring towards Bay.	
16:36:48	Lean back, move gently.	
16:37:27	See tether configuration?	
16:37:41	Stay in Verniers.	
16:38:11	Ready to release	
16:38:44	Released	
16:39:31	See banded down, lean back.	
16:39:44	No money to close to brackets again.	
16:40:55	A LOT of stuff coming out the back end.	
16:41:53	String off	
16:42:21	Came off dead as a wheel.	
16:43:25	Be careful of FMR	
16:45:59	Com- 5 pressure's good for 4 hours.	
16:46:58	Look it there	

8:10 Am
11-12-84

Transcript Profile
Flight 45A

NET 004:01:56:00	General Activity	Cassette # 86
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GMT Time	NOTES
317-14:10:24	Oh looks beautiful
14:11:00	On V-Bar?
14:11:04	Yes
14:11:30	Forward & pitch down.
14:11:48	- AD Hold
14:12:20	Can feel coupling
14:12:35	Working w/ Nav
14:13:04	A little higher.
14:13:43	Manual slow slow on the KV.
14:14:11	20 on right, 24 on left.
14:14:20	Forward to target (MMU) history weighted.
14:14:42	Takes simulators but no noisy gear.
14:15:30	
14:15:44	Status readings from Joe
14:17:08	I feel between you and the strings.
14:17:29	Jos till Hawaii 6 min.
14:17:59	Joe was comfortable - start translation.
14:18:00	
14:18:04	No hungy, Deb still working
14:18:10	Oh, I saw am.

11-12-84
10:50 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
004:04:36:00		94

GMT Time	NOTES
317:16:51:26	Food w/alt
16:51:30	don't have it yet.
16:52:44	com. Slingshot - hard launch.
16:53:47	Still still coming out?
16:53:50	Yes.
16:54:28	Do or show cap.
16:56:23	Do my grubby hands or it.
16:58:40	almost thro' jump
16:58:55	No more towards star. Doing cups
16:59:16	Sundae
16:59:20	OK Jeez - lights
317:17:00:06	Telling clockwork
17:01:37	RMS spotlight from ANNA
17:02:26	Adaptor at that position?
17:03:10	Glad this isn't a Yeast Syncom.
17:03:30	LOS till Moon
17:03:39	OK - come on show cap
17:04:09	If no joy in 5 min. press on
17:04:50	COM. LOS - Recap

Transcript Profile
Flight 51-A

11:10 Am

11-12-84

MET	General Activity	Cassette #
004:04:54:30		95

GMT Time	NOTES
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317:17:09:10	
17:24:20	COM- Standing by for AOS
17:25:26	Duon sippat during typhoon.
17:26:07	Duon now recording descent record - from Discovery.
17:27:40	Adaptor released faster to Palapa
17:28:00	Not complete communication through AOS Duon
17:38:07	Clear AOS
17:38:16	AOS Hawaii
17:38:30	Tell me when you to touch it.
17:38:39	Got a good firm hold
17:38:49	COM- adaptor is on.
17:39:26	Torquing both wrench.
17:39:57	Little time left
17:40:00	Doing great
17:40:20	Brow - don't let any of the rig part on shoulder (see)
17:41:43	Satellite beautiful inside
17:42:01	See what this is - black - thick heavy metal. It's enormous!
42:35	#3 flush.
42:40	Clotab 180° go
42:55	Good dinner tonight.

11-12-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
004:02:13:30	Docking of PALAPA	87

GMT Time	NOTES
317:14:28:30	Omni utter, Donna went out great 3rd back and 1st wait Dr. Allen.
14:30:31	Two grapple failures.
14:30:40	Would take 10 min.
14:31:47	Edwards - Head to tail
14:32:11	See us up, ready to go - Lost TV.
14:32:25	Com. resume TV at Doldstow
14:34:15	TV resumed - AOS
14:35:40	Orbiter coming into daylight near Pacific.
14:38:03	Allen at Sidleob - ready to mount attempts.
14:38:43	Almost cont on right into
14:38:56	Penetrating jet power off back a
14:39:12	Starting to toggle
14:39:45	Pulling it right down.
14:40:04	Bounces from wing, crank a little faster.
14:40:38	Not to tied - Turnly attached - Docked
14:40:53	1,000 lbs.
14:41:24	Loss of TV picture
14:42:03	COM - reminding EVA expected.
14:43:01	TV through MILA
14:43:30	AO Hold - now
14:43:42	Rights yank 180°

11-12-84

Transcript Profile

Flight 57-A

MET 004:	General Activity	Cassette # 95 cont.
GMT Time	NOTES	
37: 17:43:04	A's your team to cook.	
	OK no.	
	We can probably take your team tonight.	
	OK want dishes.	
17:43:50	Keep a good hold.	
17:44:07	#8 is done.	
17:44:14	Indicators?	
17:44:18	Flush as could be.	
17:44:35	How do you like your steaks cooked.	
17:44:38	Anything. Cow. Or hungry night now.	
17:45:37	4 is flush	
17:47:10	Com - JOS	
17:47:51	AOS - TDRSS	
48:05	Only 2 to go after this according to checklist	
17:48:21	2 up ago and 1 day just satellites launched.	
17:48:51	Check name tag then, make sure you've got	
	the right satellite. Ha! Ha!	

8:45 AM
11-12-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
004:02:31:12		88

GMT Time	NOTES
317:14:46.18	Anna maneuvering air-
14:48:37	move right Yaws
14:46:54	As Hold
14:47:02	Pitch out
14:47:13	Stop pitch
14:47:26	AOS of TV COM
14:48:38	Stall 1,000: 1,200. Near fins thrusting
14:48:50	AOS of TV
14:49:30	Monitor in air - camera at end.
14:50:01	Take it or in Anna got plenty of room
14:50:20	5 ft to rudder failure
14:50:32	Perfect Anna? Looks Perfect
14:50:48	Cycled.
14:50:58	Be gentle though
14:51:01	We have you air.
14:51:11	Good work cabin.
14:51:46	Dread show. Interconnect ^{interconnect} tank airtide
	Page 8-4.
	COM - Bluebird at 8:55 AM.
14:53:07	Control of EMS also camera.
14:53:19	7-9 of EVA checklist

Transcript Profile
Flight 51-A

11-12-94
11:50 AM

MET	General Activity	Cassette #
004:05:34:00		96

GMT Time	NOTES
317.17:49:30	
17:49:33	2 out, and he delivers.
17:49:40	We pick up and deliver
17:50:52	Looking for #6 - 180°
17:51:20	Series of rectangular black lines.
17:51:38	Stop for, gotta work here.
17:52:50	All out - just in time.
17:53:02	Torque wrench came loose in my hand. Torlon joint came loose
17:53:50	Dranding strap.
17:54:00	Stow tool
17:54:14	Part that came off in trash bag
17:56:50	States but want till their mid free
17:57:23	Looking right into our.
17:58:33	Downy TV
17:58:51	Dranded
17:56:58	Job D
17:59:08	See got it.
17:59:13	Job part out of restaurant. Cross to other side

Transcript Profile
Flight 51-A

11-12-84
12:00 noon

MET 004:05:46:00	General Activity	Cassette # 96 cont.
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GMT Time	NOTES
317:18:00:00	Yam sticks aren't cooked yet.
08:00:00	
18:00:40	F = MA done.
18:00:56	Dmb do it Joe.
18:01:50	Sabell's in position plan to berth.
18:01:55	Joe, come help me.
18:02:23	Dab check wire.
18:02:34	Donna berths it from here.
18:02:50	Dab needs Joe help to rotate feet.
18:03:49	Wire pulled a tight won't lock.
18:04:02	We've got it.

Transcript Profile
Flight 51-A

11-12-84

9:54 am

MET	General Activity	Cassette #
004:02:38:50		88 cont

GMT Time	NOTES
317:14:53:47	New Orleans
14:54:06	
14:54:53	Turn to GPC
14:55:04	COM
14:55:50	Not translating. Keep it up with no fear.
14:56:00	A frame? U
14:56:57	Solar track attitude
14:57:45	COM - looking at playback
14:57:58	Worst camera light "ON"
14:58:00	Good call
14:58:46	ASA Temps look good.
14:59:14	Starting on OMNI
14:59:22	Setting EMU status on
317:15:00:02	Joe ... Reading
15:00:27	Dale - Reading
15:00:31	Sensors good.
15:00:54	Anna can't take off brakes during maneuvers?
15:01:15	Flying right into sun during hot call or shading good.
	Didn't affect performance
	Maybe it helped it.

Transcript Profile
Flight 51A

11-13-84
12:10 PM

MET	General Activity	Cassette #
004:05:50:40		97

GMT Time	NOTES
317:18:05:40	
18:05:53	721 Satellite back to your left Dub.
18:07:30	COM Satellite in V Dub
18:08:02	Turner just grab the wire.
18:08:22	Conservation of momentum
18:08:49	Pulls you like a Banche
18:09:16	V Duda still sharp
18:10:21	Not working
18:11:09	Put bar between two yellow things
18:11:36	Watch #1 glass quick
18:11:48	Go Main.
18:11:58	Alright! Palapa
18:12:16	Setting 3 rd latch
317:18:12:41	Palapa down and latched.
18:12:54	Suit status and break.
18:13:00	Do not retrieve ANIK, it's at WHAT?
18:13:47	OK Anik.
18:14:42	A-Fram left.
18:15:04	DAP change. Control to you. Do to nominal attitude
18:15:37	Sorry, I dug lat or birthday present to underwire
18:15:54	Bring in wrench and tether point. Repair between EVA's

11-12-84
12:18 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
004: 06: 00: 00		97 cont.

GMT Time NOTES

317: 18: 15: 20

18: 17: 05

18: 17: 15

18: 18: 20

18: 19: 52

Torquing me around.
Tethers wrapped around right fuel and back
over slide way.
Fuel Boxes 1
Stowed

6

6

Transcript Profile
Flight 51 A

11-12-84
12:21 pm

MET	General Activity	Cassette #
004:06:05:10		98

GMT Time	NOTES
317:	
317:18:20:30	PLB, A-FRAME, MMU close out and emergency wrench. Letting point also left to do.
18:21:20	Now attached, MFR or pallet WESTAR WESTAR - camera bracket into airlock.
18:22:19	Zipper work nice
18:24:00	Doing A-Frame
18:24:30	Always have a back up plan
18:25:31	COM.
18:28:31	DOUBLE CHECK - POINT CAMERA AT MY HAND
18:29:07	GIVE US RUS CAMERA TO DOWN LINK
18:29:40	3 and a half feet
18:30:30	GOOD PICTURE - TRIED TO PUT CROSS BRACKET ON
	NOT ABLE TO PUT ON
18:31:27	ABOUT $\frac{1}{2}$ an inch - painted gloss black
18:32:30	DON'T LEAVE THEM OUT SIDE
18:35:59	POWER TO OFF

12:35
11-12-59

Transcript Profile
Flight 51-A

MET 4:05:20:00	General Activity EVA	Cassette # 99
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GMT Time	NOTES
317:18:35:03	COM - COMING TO END OF TORSS PASS COM GOING IN AND OUT
18:35:43	START BOILING WATER
18:36:06	LEAVE EXTENDERS THERE UNTIL YOU DECIDE TO COME IN
18:36:43	EMU STATUS CHECK
18:38:00	IS THERE ANY REASON TO NOT BREATHE THE ARM?
18:39:13	EMU STATUS BEFORE YOU ENTER AIRLOCK
18:39:35	NOW - DO IT NOW
18:41:05	CLOSE OUT LIST COMPLETE
18:41:27	HAND EXTENDERS INTO YOU
18:42:00	I THOUGHT IN ALL THIS EXCITEMENT YOU WOULD FORGET ABOUT THAT.
18:43:06	LOS TORS - PAYLOAD BAY CLEAN UP - COM
	PLATA PALAPA LATCHED DOWN
18:44:16	AOS THRU GUAM IN 18 MINUTES - UNLES TYPHOON CONDITIONS PROHIBITE
18:59:30	COM - POSSIBLE AOS THROUGH GUAM EVA ET: 5:30
19:03:15	I GIVE UP - GARBLED TRANSMISSION
19:03:51	EGRESS AIRLOCK
19:04:14	WRAPPED UP IN TEATHER -
19:05:21	360 TO YOUR RIGHT

1:20 PM

11-12-84

Transcript Profile

Flight 51-A

NET	General Activity	Cassette #
4:07:08:30	END EVA	101

GMT Time	NOTES
19:19:23:49	OR VALVES ARE OPEN
19:25:16	COM - 6 HOURS INTO EVA - BRIEFING WITH UNDERWRITERS
19:26:48	AOS TORSS ..
19:27:38	REPRESSUREIZATION
19:29:11	GOING UP SLOW
19:29:36	DONT BREAK AN EAR DRUM - STOP.
19:34:47	COM - EVA E.T 6:09:00
19:37:16	COM - PRESSURE UP
19:40:14	COM - PRESSURE ALMOST EQUAL
19:40:57	AIRLOCK HATCH OPEN. GOOD SHOW.
19:41:28	COM
19:46:18	COM - OVER CHILLI
19:50:25	HOUSTON DID YOU CALL - NEG.
19:51:38	COM - EMU FANS TURNED OFF
19:59:10	DISCOVERY - OK, GOOD OPPORTUNITY TO CLEAR STAR TABLES AND GET STAR ALIGNMENT.
20:18:47	LOS TORSS - EVENING TAG UP AT HAWAII
20:40:18	COM - EVENING TAG UP
20:41:54	TROUGH GUAM - AFFIRMATIVE
20:47:11	HAWAII IN 6 MINUTE
20:48:48	COM - AOS OVER HAWAII - EVENING TAG UP - UNSCHEDULED TV
20:53:52	AOS - HAWAII - GOOD MID DECK CAMERA

2:54 PM
11-02-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
4:09:39:00	PRE SLEEP	102

GMT Time	NOTES
20:55:08	A LOT OF SMILING FACES ON BOARD
	STATE VECTOR COMING UP SHORTLY
20:56:20	CONGRATS! GOOD JOB (FROM INSURANCE PEOPLE)
20:57:20	WE KNEW WHO WAS IN CONTROL - STRING GAUGE TO ENABLE
20:58:00	CHECK GLOVES FOR WEAR. - COMING TO KEY HOLD
20:59:06	SOLAR CELLS WERE DAMAGED.
20:59:35	4 MINUTE DROP TO TDRS.
21:00:00	COM - GOOD STATE VECTOR
21:02:08	COM - PLAY BACK
21:04:40	COM - AOS
21:05:24	GOOD TV - ANY NOISE LAST NIGHT
21:06:48	NEXT EVA OPTIONS
21:07:27	^{1/2 OPTION} SECOND OPTION - COMMENTS
21:09:57	SECOND OPTION
21:11:40	THIRD OPTION

Transcript Profile
Flight 51-A

5:45 PM
11-12-81

ET 4:11:31.00	General Activity SLEEP	Cassette # 105
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GMT Time	NOTES
23:46:00	COM CONT.
23:47:26	COM - REPLAY DELTA LUNCH
23:55:12	COM - CHANGE OF SHIFT BRIEFING
318:00:38:00	COM - SLEEP PERIOD - 600 nm. from Westar -
01:00:00	- PHASING BURNS - ORBIT 73 OVER SOUTH AMERICA
01:00:00	COM - DELTA - LIVE PICTURE FROM KSC OF ROCKET DISCOVERY ON ORBIT 73
01:34:30	COM - DISTANCE FROM WESTAR - PHASING BURN.
01:45:36	COM -
02:10:42	COM - 600 nm behind and 1 mi below Westar.
02:32:53	COM. Retrieval of Weststar scheduled for Wed.
03:03:59	COM: Supercoin just completed first burn - looks Good. On descending note of orbit ⁷⁴ B
03:29:31	COM: Crew wake up 2:15 AM
03:32:40	COM: Correction 12:15 AM
03:59:26	COM: descending note of orbit 75.
04:07:05	
04:29:26	COM: The phasing burn that will begin the catch up to Weststar due to be tomorrow.

Transcript Profile
Flight 51-A

10:30pm
11-12-84

MET 004:16:17:20	General Activity Sleep period - Wake up procedures	Cassette # 106
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GMT Time	NOTES
317:05:00:31	com: Cabin temp 73°f.
317:05:31:43	com: com
06:00:35	com: Change of shift briefing cancelled. At 3:07
	a phasing maneuver will take place for the
	catching up to Weststar
06:20:40	Wake up song "Carmin" 1812 Overture"
	With you through Yargady - Good Morning
06:28:26	com: Crew has been awake for several min
06:28:26	
06:29:57	with you at Carma for 9 min
06:30:07	com We are awake
06:31:04	Jongue on stars on the table and then
	delete first maneuver
06:33:38	com
06:35:26	- LOS

Transcript Profile
Flight 51-A

12:40AM
11-13-84

MET 004:18:28:00	General Activity wake up call again - Dropouts in TDRS communication	Cassette # 107
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GMT Time	NOTES
318:06:51:53	com: AOS TDRS
06:52:10	We are AOS TDRS
06:53:28	Discovery plays song to Mission Control
	the "Listen to the Music"
	We copied that - Good-someone needs some
	music in the morning - (Didn't get wake up call)
06:55:33	Mission Control plays wake up call again
	Okay we appreciate you beaming that up to
	us again - we knew you wouldn't forget us.
07:03:24	Message on OHMS
07:04:45	com: Reading up data due to the com drop during
	link up
07:05:15	com: Change of shift briefing cancelled
07:19:21	com: Dropouts in TDRS communication
07:38:11	Boil some water -
07:39:59	Were boiling some water
07:41:38	Henry Las.
07:47:23	com: 000000
07:58:03	With you through yargady
07:58:49	Reading ²⁰ alpha to Discovery

Transcript Profile
Flight 51-A

2:06nm
11-13-84

MET	General Activity	Cassette #
004:19:47:00	OHMS Burn readout	108

GMT Time	NOTES
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318: 08:02:37	Have a good breakfast -
08:14:17	com - Pick up AOS in 16 min
08:33:62	AOS -
08:33:46	OHMS Burn readout
08:36:10	Readback OHMS readout
08:37:06	Good readback
08:49:13	com: Adjustment burn in about 3 min 9 sec. burn

Transcript Profile
Flight 51-A

3:00 AM
11-13-84

MET	General Activity	Cassette #
004:20:35.00	Orbital adjustment burn - unscheduled IV.	109

GMT Time	NOTES
318:09:05:57	Ready for the burn
09:16:18	com. Unscheduled IV in Orbit ⁷⁹ at 4:09 AM
	Over Africa. Crew completed orbital adjustment burn.
09:23:56	-Doing LOS
09:27:06	com. Orbit #78. LOS through TDRS
09:35:01	AOS
09:43:00	
09:45:48	Wait until TDRS - over where? over TDRS - okay well be set up for that
09:48:00	Doing LOS
09:56:04	com. The 2 spacecrafts are approx 400 naut miles apart. Commung up on Hawaii in about 7 min.
16:03:32	Stand by for AOS through Hawaii
10:04:25	AOS. Take waste dump down to about 10%.
10:05:41	Go ahead and dump water - will pick up IV. through TDRS
10:06:22	Standard start time report

9:10 am
11-13-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
005:02:55:27		117

GMT Time	NOTES
318: 15:10:23	COM - continues plans for W-2 EVA procedure
15:12:10	^{COM} Satellite shifted momentarily.
15:18:38	Waste Dump nozzle
15:26:51	Terminate flash comp. for few minutes? (Hurst)
15:27:10	Do for that
15:34:20	NC2 bus. over
15:35:57	COM
15:39:08	Slab vector coming up
15:45:33	Time line doesn't show much - very busy however. Help plan day activities.
15:46:20	Talk over next TDRSS pass.
15:46:32	Telecom message at Hawaii
15:46:46	EMU recharge water quantity 12.2%, changed. BDCU problem tomorrow in orbit, plan and telecom message.
15:52:40	COM - bus as scheduled to improve status for rendezvous tomorrow
15:53:10	Small NC bus - God at Hawaii
15:53:38	Probably no trimming.
15:53:53	was

Transcript Profile
Flight 51-A

4:07pm
11-13-84

MET

General Activity

Cassette #

004 2157 00

110

GMT
Time

NOTES

318:10:09:47

~~time~~

318:10:10:23

Have the picture - were working on it

10:10:41

COM: Looking at waste water dump in

Progress - have extended mechanical arm w/ camera
on it

10:16:21

terminating water dump now

10:16:55

Looks good to go

10:17:40

Saw the increased fuel usage is due to the Omni
antenna - We went into the grafted track

10:19:15

Com: comm difficulties

10:19:20

Were gonna stop and check out whats wrong -
Stand by

10:19:51

Inertial attitude holds station: Joe was looking
directly into the sun when he was ~~get~~ looking
into spacecraft. Dont think that should happen

(Dale)

19:24:12

Stand by

19:24:34

UHF only

19:25:07

Drab antenna found into bay

19:25:18

Bris and cons of plan

4 21 Am

11 13 84

Transcript Profile

Flight 31-A

NET

General Activity

Cassette #

104-22-1130

Ogden 2

110 cont

GMT
Time

NOTES

318 10 26 20

10 27 15

10 26 02

Stopped copying at discussion of Ogden 2

Ogden 2 - ... (Date)

11-13-84

10:21 am

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
005:04:06:12		118

GMT Time	NOTES
318:16:21:12	Continue Pad readback
16:21:30	Change to Pad
16:21:55	Change to page 10-9 of orbit ops.
16:22:26	Step 1, pressure check only, no need to open. day night OAMS interconnected.
16:23:28	Moore note at Hawaii about this issue.
16:24:17	COM
16:29:15	AOS - Hawaii
16:29:26	Burn notes continued with David
16:30:46	Not reference published procedure from Y, check X & Z, give Y ^{TRIM} TRIM only one try.
16:31:20	Bob has attitude
16:31:31	Simplified burns in history.
16:31:48	NCJ burn. . . .
16:32:36	Good readback
16:34:14	Will do I for you
16:34:39	Leave as we are currently
16:49:43	Make sure of one try
16:17:58	Tell EVA before LOS? 19 min.
16:18:33	Be right with you.
16:19:30	Thanks for teleprinter.
16:19:49	Option 2 selected. Recommend V-Bar. MMU pilot roll head inboard to keep out of eyes.

4:30 AM
11-15-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
004:22:15:01	004	111

GMT Time	NOTES
3:18:10:30:07	Dab continues optim two
10:30:38	Proc + Cons Cass avoids wavy corner bracket same time with A. Truro
	- Dorking works well Manual heating simple Inertial altitudes already decreased
	CON - new plan. Not trained not same for Palapa
10:32:07	JOS - Bermuda do transfer as to ground
10:32:35	Copied all
10:33:21	How difficult and timing to hold satellite
10:33:52	(Joe) Easy with OMNI antenna instead of parabolic Very easy to control pitch & yaw
10:34:38	What about hot gloves
10:34:48	Not hot from touching - warm from sun
35:10	(Joe) Not very hot from sun - a coldish man hands. Worried about thermal mittens having gaps
35:56	What about staying in V-Bar
36:11	Why?
36:16	Teleprinter - Bingo's + Bailouts based on V-Bar
36:38	Evaluate real time. Too close or good margin to decide
37:12	Talk a little more. Double in V-Bar
37:22	Yes

11-13-84

Transcript Profile
Flight 51-A

MET 005:05:05:50	General Activity	Cassette # 118 cont
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GMT Time	NOTES
318: 17:20:43	
17:20:51	Use part sled (Dale) for new aft sled wire.
17:21:28	There are wave guides on Westar. Take commo bracket into airdak Back off Allen head ball. Retighten each before going to next.
17:22:26	If all goes planned - take tool board to P/B on log
17:22:53	No requirements.
17:23:05	WET-F last night. in case
	Bumps bracketed first to avoid problem.
23:51	Depressing - SW and com to hard line external power, no cooling.

Transcript Profile
Flight 51A

MET	General Activity	Cassette #
004:50 03:00		(1) cont.

GMT Time	NOTES
318 10:37:55	Operational attached hold not critical to opt for 2, give translating better time as less fuel
10:38:23	Operational at what point
10:38:13	Mozzle pointed at bay
10:38:55	Rick Heard of Mark Thomas inputs on translating.
10:39:07	How about translating yesterday
10:39:33	Already a V-Bar yesterday
10:40:50	Would be mind 500 ft maybe less before inserted hold.
10:40:52	Nominal timeline? Main bracket - A frame
10:41:05	Time backward on why it would fit. Wendan
10:41:37	Hughes thinks so - coming out with drawings. If it would fit, how about nominal time like
10:42:33	Trained and know we could do it without mechanical difficulty, however more experienced "real world" about non-nominal. would go nominal. (Bud Havel)
43:42	Would still opt for #2
43:46	Yes. Less span in P.L.B. If error situation as yesterday, would really cause us problems. (Rick)
44:48	Wat to hear from MOCR. Concerning water dump.
45:02	COM - Recap of previous conversation
45:21	Busy - Out - Dave (Eagle Electronics) EMU lights, fixed torque wrench.

Transcript Profile
Flight 51-A

11:24 AM
11-13-84

MET 005:05:04:50	General Activity SCU Fixed	Cassette # 119
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GMT Time	NOTES
17:24:30	Comments of a timerline?
17:24:40	Outline looks good.
17:24:54	May install antenna and other power tool tomorrow. Get into V market and configure.
17:26:07	After stopped - may have for ant control spacecraft before Oab breaks off.
17:26:41	Leave tape caddy in aerial.
17:26:54	Dumb need it.
17:27:07	No flashlight.
17:27:17	Wads on SCU - 3 floating pins, pins, digimod pins?
17:27:39	Yoked close - describes problem
17:29:26	COM. XOS due to pointing problem.
17:29:51	Try fix.
17:30:24	Try fix SCU carefully
17:30:40	Get at CAM - square pieces at axle. That will side of CAM. All tight, no freedom of movement.
17:31:22	3 wads connected, plugs should have some freedom of movement.
17:31:45	XOS till Dawn
17:31:10	COM - Time lines to be available.
17:54:22	AOS - SCU fixed
51:48	2 prep in chest - decal covers no. down recessed was loose.

4-45 AM
11-13-84

Transcript Profile
Flight SEA

MET	General Activity	Cassette # 111 cont.
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004-02-3410

GMT
Time

NOTES

318:10-40:10

40:20 (cont)

5:36 am
11 13 84

Transcript Profile
Flight 51A

MET	General Activity	Cassette #
004:23:25:50		113

GMT Time	NOTES
318:11:40:36	Manation of tape by Joe Allen
11:41:39	Satellite was so close by
42:11	Tape run out - not sure we really want to check.
11:42:29	TDRSS set up for TV about 7 min.
42:46	Terminal looking wobbly.
11:42:57	COM.
11:47:17	AOS through TDRSS
11:47:58	Good + clear
11:48:05	One more loop to screen. Used 5 or 10 minutes
11:49:42	Comp of options or download. Site to narrate, a screen real time with you watching - not real clear.
11:50:18	No ahead and clear up we'll look at it when you ready.
12:00:11	Insulation wears or gloves - marks of index + thumb yellow insulation. Trayed, doesn't cover feet. Look black because grabbed nozzle.
12:01:16	BCU Problem entering airlock - noticed - Bolts handle plate tries to cool at a funny angle. OD's wouldn't line up. No problem - work on it in airlock.
12:02:32	Good gloves?
2:44	Bent in gripping position last few. Clear + unsecured.

7:30 pm

Transcript Profile

Flight 51-A

MET	General Activity	Cassette #
5:13:17:00	Clocks down - Wakeup	122

GMT
Time

NOTES

319: 2:02:10	COM - NOMANAL FLIGHT DAY 7 PLAN
Local 8:30	com: Clocks are down, Investigating the problem.
02:37:45	Clocks are back
02:59:56	com: clocks MET clocks are working again TDRS communication problems - were working on that now.
03:04:06	com:
03:33:11	com: Orbit 90 - preparations for EVA
04:06:37	com: 152 naut miles behind Weststar Ascending note of orbit 91
04:15:14	Wake up call ^{the} "A few dollars more" Good Morning Houston - Good Morning - were with you through TDRS - We've got one for you "Stars & Stripes Forever" We love that music - sounds good.
04:18:36	Duty - clear out star table, for Anna - Bill called, good luck & best wishes from he & Christian (Anna) Thanks alot - sounds great.
04:20:36	com:
04:30:19	com:
04:30:36	Anna sends ^{best} wishes back to Bill & Christian

G.08 Am
11-13-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
004:23:51-10		114

GMT Time	NOTES
318:12:06:10	TV Download managed by Bob Dardner Camera bracket.
12:06:50	Cabin No VTR of grapple or MMU - cabin access tapes and match up with security list for download later today.
12:07:44	Camera A and RMS allow grapple program.
12:08:02	Switch to COMMAND
12:08:55	Elbow got wavy looking at cameras
12:09:45	Elbows flex - just pulling your leg.
12:10:07	Thumbs up for GNC correct analysis
12:15:11	COM
12:18:27	Com. 2nd TV
12:20:40	Use TV cameras as long as you want. Want want to see torquing.
12:23:05	Not that real time yesterday.
12:25:26	Docking of Joe (black & white)?
12:25:47	Will take it.
12:27:19	Video - narrator by Joe Allen
12:30:32	Want to look around outside.
12:31:12	Tether and versus not tethering
12:31:32	Hindsight - Do not tether. Can hold on handed after safes without.

11:00pm
11-13-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
005:16:17:00	K/U band positioning / Burn# readouts	123

GMT Time	NOTES
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318 04:30:36	Anna sends best wishes back to Bill + Christian
04:40:57	About to do K/U band positioning now
04:42:27	Com - Crew has been told to cancel the maneuvers
04:43:09	We've got the K/U band positioned
05:11:17	With you through Yangady for 7min.
05:18:21	Dropping you for about 4 spec. - will be right back
05:19:21	com: Required communication through Canberra
05:21:21	Have a 2nd state vectors in route to you
05:22:00	
05:22:17	May not document tomorrow's EVA on VCR because of our problems
05:25:01	1min to LOS - talk to you in 15 min
05:26:03	com: LOS at a series of burns will lead up to the catching up of Weststar
05:44:10	POS
05:45:55	ASC temp check
05:46:36	NH targets on board
06:03:59	Maneuver to solar ^{track} attitude
06:05:13	Com: Change of shift briefing cancelled
06:06:19	Com: #s for the burns comming up shortly. 3 major burns

Transcript Profile
Flight 51A

11-13-64
6:38 AM

MET	General Activity	Cassette #
065:00:20:00		115

GMT Time	NOTES
318:12:37:06	Manatee of video continued by Deb Darden
12:37:35	That we bumped it few times. Probably some drop
12:38:00	Shot of light from Dr. Fisher in RMS.
12:38:27	Soft deck released
12:38:35	No No - he was screaming for joy (Hazel)
12:38:59	Discuss checking with Hazel
12:39:39	EOS camera back to you.
12:39:52	Setting up for muddied TV - should place to look.
12:41:19	COM
12:46:04	COM
12:49:47	AOS through Yagade
12:50:48	Lamp Clean
12:56:01	EOS EOS
13:02:24	AOS through Dean
13:02:38	Fisher cleaning filters
13:04:15	COM
13:08:11	EOS till Hawaii
13:09:17	COM
13:14:56	AOS through Hawaii
13:23:57	COM
13:38:40	COM - Cancelling 8:15 AM Change of Shift Briefing. No problems of significance.

111384

Transcript Profile
Flight 51A

MET 00:01:45 00:01:45	General Activity	Cassette # 115 cont.
--	------------------	-------------------------

GMT Time	NOTES
318 13:38:00	
318 13:39:27	COM
13:46:27	See temp check.
13:46:31	Mindwader. Turning off radio
13:46:40	Mindwading of Tellometry
13:46:42	Kill of Bolt (Per McNeil)
318 14:00:44	Wash water nozzle temp. In. Gun cycle up to 250°.
14:01:14	OK. But not unusual temp. several other overheating (Pick)
14:01:45	Working on TPISS display. Panel covered only as necessary.
318 14:11:09	COM (John Lawrence) change of Shift cancelled
14:15:45	LOS
14:16:33	Shm WCS? (Pick Hackett)
318 14:17:11	
14:37:33	ADS - Down
14:38:37	Wool or web on TV at horizon. How much TV do you want?
14:39:00	EVA ready for status recharge
14:40:00	TV. 8 min. plus Terminal a run.

Transcript Profile
Flight 51-A

1:25 AM

11-14-84

MET	General Activity	Cassette #
005:18:50:00	1st ^{2nd} Burn - KU band test & Info on next 2 Burns	125

GMT Time	NOTES
319:07:19:36	With you through TDS - Roger that, Burn in about 3 min.
07:20:37	com.
07:23:08	Okay Houston we had a good burn Boiling water now
07:23:34	com; Next burn 44 min 30 sec.
07:33:27	^W Take KU and test it - will give it back as soon as we've tested it
07:34:28	com: 50 naut miles behind Weststar
07:35:54	com: Rundown on today's activities
07:38:41	Have your NC3 burn pad on its way up.
07:40:34	Had a good self test on KU band - will get it back to you shortly
07:41:09	You can have KU band and were ready for NC3 burn pad - Reading it - Read back
07:42:13	Info on MMU
07:44:13	com:
07:51:53	com: 2V Events for today
08:01:53	
08:10:06	com: NC3 burn completed successfully
	Brief loss of signal
08:11:54	com:

6:30 AM
11/13/84

Transcript Profile
Flight 51A

MET	General Activity	Cassette #
005:02:36:30	TV Through Hawaii - Tour of Shuttle Shuttle	116

GMT Time	NOTES
318:14:41:30	
14:46:28	LOS
14:46:40	COM
14:51:	COM
14:52:08	AOS
14:52:48	TV (Bill Hawes) Shuttle Space Craft
14:53:32	Dave & Anna-
14:54:33	Anna & Steve
14:56:00	Dave
14:56:57	Food area
14:57:11	Food Preparation
14:58:33	Use straws to drink
14:59:15	Wash container out of view
14:59:37	Done by
14:59:50	Bill Hawes
15:00:28	Cecil B. is proud of you (Bar McNamee)
15:00:56	COM - AOS
15:01:06	Data - through TDRSS
15:02:22	COM Option 2 opted for EVA tomorrow
15:02:43	AOS - TDRSS
15:02:57	Dump nozzle heater turned ON.
15:03:15	COM

Transcript Profile

Flight 51-A

MET	General Activity	Cassette #
		125continued

GMT Time	NOTES
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319:08:14:04	com: Reacquire again through Yargady
08:24:07	With you through Yargady on UHF
08:30:46	Qally ho on Weststar
08:31:53	Reading ^{net} Burn plans Read back
08:37:18	Going to see you at MR5 at 4.3

Transcript Profile

Flight 51-A

MET	General Activity	Cassette #
005.20.23.00	Problems w/payload bay lights - radar lock on Weststar	126

GMT Time	NOTES
----------	-------

319:08:39.02	com: Los
08:40:27	com: Notes on what happened earlier and today's activities
08:58:07	com: AOS through TDRS
08:59:16	How do you read us? Loud & clear Question on payload bay lights - didn't come on
09:00:29	com: IV. at 4:28am
09:01:45	com
09:02:48	Go ahead & cycle payload bay light one at a time and give us data on that-
09:04:20	com:
09:05:14	com: Believe they have rendezvous radar lock on Weststar
09:07:19	com: Have solid lock on radar for Weststar
09:09:22	Passing overhead - sure looks nice & clear down there
09:09:48	Go ahead and turn lights off - should be no problem
09:10:14	com: lost communication through TDRS
09:11:15	com: Re established communication through TDRS
09:17:28	You were dropping out when you telling us about the payload bay lights.

Transcript Profile
Flight 51-A

3:13am
12-14-84

MET	General Activity	Cassette # 126 cont.
-----	------------------	-------------------------

GMT Time	NOTES
----------	-------

31a 09:14:09

com:

09:15:34

Final TI delay msg and final TI solution when you were ready.

09:16:13

Reading info. on TI delay & solution - Read back

09:19:56

Ready for EVA com checks - we think'

3:31am
11-14-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
005:21:07:00		127

GMT Time	NOTES
319:09:22:03	Good EVA com check
09:27:46	Janks 3+4oz AB to auto - complete
09:34:04	We have the 4 flight deck cameras on.
09:39:05	com: 1 minute till burn
09:40:32	Good burn
09:46:36	Getting bad signal going 202 see you at Yagadi
09:48:04	com:
09:49:02	.
09:53:51	com: 202
10:00:15	com:
10:01:12	with you through Yagady for 9
10:02:50	
10:04:10	com: mid course correction burn in 1 min.
10:06:17	
10:07:56	4+20 to clip
10:09:25	Bulk head lights work fine
10:09:42	202.
10:15:37	com: 12 min to AOS
10:27:26	com- TV shortly
10:27:44	AOS through Hawaii
10:28:09	Elbow in command and enabled. Crew will control all big cameras.
10:28:50	TV now

Transcript Profile
Flight 51-A

11-14-84

4:35 Am

MET	General Activity Pre Break Complete, Airlat Hatch ^{Closed}	Cassette #
005:22:20:30	Hatch opened to PLB.	128

GMT Time	NOTES
319:10:35:30	
10:35:47	Loss of TV
10:36:06	Com. disrupted temporarily till Doldstone. Viewing - 4:49 Am, 6:20 Am - 35°
10:37:39	AUS -
10:37:48	Comm config done, go to hard press.
10:38:48	TV of airlat
10:39:41	Dale Gardner - go all in on airlat at end of pre-break. (COM)
10:42:15	Com. Less than 5 miles from WESTAR.
10:43:26	Closing of airlat hatch.
10:57:04	Airlat door to vacuum.
10:57:51	Is for nominal.
10:58:00	Opening hatch to PLB.
10:58:19	Com. Random propagation signal. Replay of Mila TV replay - 5:05 Am
10:59:18	XSC saw Discovery & Westar
10:01:07	Not taking KU Band due to microwave system
10:01:33	Westar looks well-behaved.
10:01:39	Com
10:04:37	Confirmation that interference was Mariner saying "hello."
10:08:08	EVA - PT Ops
10:08:25	Micro switch problem - override manifest

5:08

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
005:22:54:00		128 cont.

GMT Time	NOTES
----------	-------

319: 11:09:08	GPC
11:09:57	Cover up
11:10:07	Water on
11:10:11	Display Blank
11:10:20	Status check for Dave Walker
11:11:18	Both tethered

11-14-84
5:12 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
005:22:57:00	Status Checks,	129

GMT Time	NOTES
319: 11:11:46	Wabs on confirmed.
11:12:00	Depress valve closed
11:12:07	Status Check
	EV-1
11:12:48	EV-2
11:13:43	SOP n supplement
11:13:58	
11:14:00	Vision down
11:14:08	Be careful of Delta camera
11:15:14	Dang leg straps
11:15:35	Conn. a PLS checking mmu and strap
11:15:52	Bucket Brigade
11:16:00	Hold conversation to a minimum.
11:16:50	Power tool at hand.
11:17:22	Straight up if you can
11:17:30	Good firm grip.
11:18:05	Tethers tight.
11:18:23	Onid said: Good job. Thank you. Thank you. Thank you.
11:18:47	Yuris already. Holy Mackerel Deb.
11:19:22	Both out of sight. Ill ask questions (David)
11:20:08	Pressure on mmu's 27 ea. (Deb)
11:21:19	Temps. for mmu's - GNC. temp 67'

5-28 Am
11-14-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
005:23:13:00	EVA	130

GMT Time	NOTES
319:11:27:40	Man power. Disc o lights confirmed (Dale)
11:28:03	Numbers foot restraint.
11:28:42	Zos
11:28:54	Launch bolts click as a whistle.
11:29:15	See #'s but not mark.
11:29:25	There it is
11:29:36	Completed
11:29:42	Looks about right.
11:29:55	Dale - can get in myself.
11:30:07	A-Frame then Strange window.
11:30:25	Com-ZOS
11:31:16	Com- mmiu on TV 6:04 Am Blairpark 6:45 Am
11:37:24	Com
11:44:00	ADS
11:44:33	Thanks to Eagle Electronics for fixing my lights (Joe)
11:44:50	Tree of letters? (Joe)
11:45:54	Go ahead and do it.
11:46:15	... My whole body.
11:46:46	Donna pull A-Frame down and tighten it more.
11:48:21	Com- Zos tell Donna then TV at Hawaii.

Transcript Profile
Flight 51-A

11-14-84
5:55 AM

MET	General Activity	Cassette #
COS: 23:40:00	EVA, awaiting Securus in MMU,	131

GMT Time	NOTES
319: 11:55:59	
11:56:03	Sunrise 24 min from now
11:56:11	AOS
11:56:18	Start stings. Sting has 9 min.
11:56:38	Com-205
11:57:32	Status out of way while dark and not busy
11:58:25	Com
319:12:03:38	AOS
12:03:56	60° angle in foot restraint better than 30°
12:04:17	Unditches and retatches?
12:04:36	My left hand.
12:04:53	Stings flight check.
12:05:06	Needs right OHMS repress (Houston)
12:05:24	Good suitable foot restraint?
12:05:40	Status
12:05:46	Go EV 1
12:05:57	Del EV 2
12:06:41	During stings flt. check - wait for sunrise
12:07:12	Go - heat close to grapple fixture
12:07:26	Making no noise of
12:07:36	Don't want you nervous; cool hands Del.

11-14-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
005:		B1 cont

GMT Time	NOTES
319: 12:08:03	Work at that satellite
12:08:16	of threads, could not drill into pallet HA'
12:08:22	Control attitude hold new HA' HA'
12:08:55	Pacific - deep water tank
12:09:04	Wald for life mat.
12:09:14	Pallet has but slide me home.
12:09:26	Times...
12:10:06	attitude Hold
12:10:34	Working MFR, Joe. Dood.
12:10:46	Not too close to Dab.
12:11:02	Dab. left side close to RMS
12:11:16	Target
12:11:40	Slides nicely
12:12:31	Close to RMS (D) Dab
12:12:49	Down to RMT to grab hold.
12:13:29	COM - Transmitter
12:13:40	AOS
12:13:49	Cycle power
12:13:57	Cycle Joe
12:14:06	Joe. that's a problem
12:14:10	Not already it

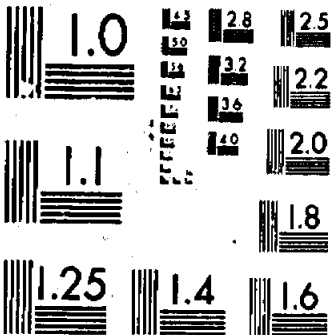
11-14 84

6:23 AM

Transcript Profile
Flight 51-A

MET 006:00:02:39 006:02:39	General Activity	Cassette # 132
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GMT Time	NOTES
319: 12:17:32	
12:17:50	Do not let you get close to anything (Dubs to Dals)
12:18:43	Dark out here.
18:53	Review - no RMS - RME body in grasp. Dony Daylight pass to get it all done.
12:19:23	Little chilly - - O.K.
12:19:35	Satellite starting to tilt back toward tail now.
12:20:07	Checklist
12:20:50	Visors ready - sun coming up.
12:21:10	Look at the city on by.
12:21:18	Over Mexico
12:21:26	Five Miles out there for.
12:23:04	Qw from Paul notes its light enough.
12:22:22	Pretty open.
12:23:50	Dark - Finny
12:24:00	Look at that sun.
12:24:08	Dals you can leave way.
12:24:28	Close to bulkhead.
12:25:26	Class of sun - Excellent VIDEO
12:26:04	Close to indefinite to stay away from sun. (Dals)
12:26:36	Start working MFE stuff.



MICROCOPY RESOLUTION TEST CHART
 NATIONAL BUREAU OF STANDARDS-1963-A

11-14-84

6:26 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
006:00:11:55	Capture of WESTAR.	132 cont.

GMT Time	NOTES
319:12:21:54	
12:27:54	Waket out from sun.
12:28:14	Com. 180 need to avoid sun in up.
12:28:33	Looking real pretty.
12:29:03	Coming up towards chest.
12:29:54	Orbiters blocking sun.
* 12:30:06	Turning to up now. (Joe)
12:30:21	Close in orbit real slow.
12:30:47	Statory generalization.
12:31:03	Toggle - Torques speed dir - WESTAR
12:31:27	Done good!
12:32:00	Doesn't require any work.
12:32:28	Hard dock
12:33:13	Firing
12:33:20	Look at that.
12:34:04	Stabilizers no problem.
12:34:56	Even on NFO can dist. (Dab)
12:35:23	Com - Propellant usage very low orbiter Shuttle stable.
12:36:10	Over feet down + straighter foot restraint.
12:36:44	Sun is very slowly

11-14-84
6:37 am

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
006:00:22:09		133

GMT Time	NOTES
319: 12:37:00	Visor required
12:37:36	Tilted up.
12:37:59	Start working with tethers. Not yet; eventually
12:38:26	Wait for RMS
12:39:29	RMS working & on it's way.
12:40:20	RMS coming.
12:40:33	Tel is loose.
12:41:18	RMS right above you. still little ways.
12:41:42	Bungee down 6" above grapple fixture.
12:42:05	Opening snare.
12:42:23	Talk to Anna
12:42:33	Donna left it up to it (you)
12:42:45	Do snare. Pull it in (MFR)
12:43:15	on the snare?
12:44:05	The bells are up in the socket.
12:44:20	Shuffle fixture, tether in work station
12:44:46	PP02 alarm close complete at or face
12:45:14	Can't believe this yellow tether ropes. Donna gets tether only then
12:45:46	For me, get your hand out of there! Donna get fingers caught. MFR tether keeping it from aligning.
12:47:00	No wrist tether. Don't use snare. Anna

6:47 AM
11-14-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
006:00:32:41		133 cont

GMT Time	NOTES
319 12:47:00	
12:48:01	Put opposite right hand.
12:48:13	Looks aligned
12:48:19	Go ahead Anna.
12:48:27	Perfect.
12:48:32	Sorry for trouble.
12:49:09	Comm. Brakes on, ceased motion.
12:49:45	Tether MPP to RMS
12:50:00	PP02 - close complete offset. (Houston)
12:50:27	Tethered! (Gor)
12:50:31	Tethering myself.
12:51:22	COM
12:51:52	Tethers and EVE bits.
12:52:15	Attached. Pulling.
12:52:29	Over top - not that way for wrapping around.
12:52:35	Now see David.
12:52:54	Unlock?
12:53:03	Yes.
12:53:16	Quarry MPP
12:53:23	Unlocked. Ingressing.
12:54:12	20 minutes to sunset. Lots of time.

11-14-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
006:50:40:10		134

GMT Time	NOTES
319:12:55:06	Thickness of -lethra made it not fit Monday.
12:55:40	Better view this way.
12:55:55	Rotator thing really tough
12:56:08	Dab. good attitude.
12:56:37	Attitude held
12:57:23	Pitch down
12:58:14	Stop pitch
12:58:56	Can see shadow.
12:59:03	Looking great!
12:59:22	Get's of nose to work. (Go)
12:59:34	if you happy.
319:13:00:07	Feel funny in MFR? (Dab)
13:00:32	Touching OMNI, under area
13:00:45	Not too fast
13:00:50	Nothing sharp; make sure
13:01:04	Turn the mass here. Slow
13:01:42	Enough right - stop gently.
13:01:50	Stopped
13:02:06	Get Dab off front
13:02:52	OMNI off center
13:03:33	Bush for gently
13:03:58	TV
13:04:04	See you flying Dab

11-14-84
7:20 Am

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
006: 04:04:30	EVA	135

GMT Time	NOTES
319: 13:19:24	(2nd of static continuously)
13:20:56	Mov real slow.
13:21:40	Com. LOS tel Duam in 5 1/2 min.
13:26:55	AOS
13:27:04	Deatly move to right, aligning in front of you
13:27:22	Stay there. Comfortable
13:27:54	Straps being secured. Moving arm position about on noisy cover insulation PSI 1,000 & 900
13:28:24	O2 header to OFF. (Unmeter)
29:31	Slipping again?
29:41	Careful
29:46	Can't get handle off.
13:29:55	Same as before
13:30:00	No.
13:30:07	Plenty of time.
13:30:26	Del. ratchet handle stowed with pin?
13:30:35	No, but that's not interfering. Not sliding in slot of straps attachment plate.
13:31:27	Both pins, but lost a hand doing it.
31:55	PSR?

11-14-84

7:32 Am

Transcript Profile

Flight 51-A

MET 006:	General Activity EVA	Cassette # 135 cont.
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GMT Time	NOTES
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319: 13:32:35	Check your smooth as could be.
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13:33:09	Tools.
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13:33:37	Need nozzle cover, torque limit and better for PSR.
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13:34:17	Foot restraint position maintained. (Joe)
----------	---

13:34:46	Omb work to hand at it, will work harder when done. (Dale)
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13:36:00	Joe taking out some tilt.
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13:36:13	YOS till Hawaii
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13:36:16	Brakes are on.
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13:37:27	Com
----------	-----

13:41:04	AOS
----------	-----

13:41:17	Collecting ourselves.
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13:41:24	Remember wires out here. Dis dash.
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13:41:18	Directions to done from Dale.
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11-14-84
7:42 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
006:01:28:00		136

GMT Time	NOTES
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319: 13:42:57	Toward.
13:43:00	Looking up into nozzle.
13:44:00	Tuned up over right shoulder.
13:44:20	Foot stop. Pan towards me (Dab)
13:44:56	Back check V guide
13:45:17	Steady as a rock.
13:45:45	Can roll if you need. (Joe)
13:48:29	CAM.
13:48:48	Last of feet bases position of satellite in relation
13:49:35	Cover or letting go.
13:49:46	Anna take up couple of feet
13:50:11	LOS - Houston
13:50:45	Like a whole other EVA with tether. Not <u>was</u> the same
13:51:14	Minut to sunrise.
13:51:56	Nice job at show center.
13:52:07	Nice job hanging on.
13:52:17	Visas down.
13:52:48	Darking light as pointing straight up.
13:53:00	Don't want to run down batteries.
13:53:27	Crisis time batteries.
13:53:38	Thought we already were.

11-14-84

7:55 AM

Transcript Profile

Flight 51-A

MET	General Activity	Cassette #
006:01:39:00		136 cont.

GMT Time	NOTES
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319:13:53:45

13:54:49

COM - Allen and his camera.

13:55:08

Debbug picture of shower cap.

13:55:27

PTR angle changes now.

13:55:49

Record on tightening of hand grips (Joe)

13:57:03

COM - Dale working with tools, attaching framework to bottom of satellite. Joe holding the satellite by OMNI antenna while standing at end of RMS.

13:58:40

Forward Slings - Tilt starboard?

13:58:57

Slings close to my head?

13:54:09

Yikes O.K. Not essential to move

13:54:33

Land mass?

13:54:44

14:00:02

Bolt feet are not in, PTR not tight

11-14-84
8:00 Am

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
006:01:45.86		137

GMT Time	NOTES
319:14:00.27	
14:00:50	Took antenna again. (Dad)
14:01:05	It is. (Dad)
14:01:22	Left foot not in.
14:01:40	Now you got it.
14:01:51	See in face again.
14:02:02	Got wrench, came off table. (Torque wrench)
14:02:24	see it.
14:03:04	Dimmer. I don't know.
14:03:46	Over 3 volcanoes 3 smoking. One active Guatemalan.
14:04:20	Costa Rica beautiful
14:04:37	Frank Chang saluting.
14:04:57	Quickest translator ever seen.
14:05:43	Adapter latches free
14:06:10	Work adapter
14:06:26	Humming
14:06:36	Try to release
14:06:42	#2 & #3
14:06:54	Movement on both
14:07:11	Opp. ready for #1.

11-14-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
006:01:52:40	EVA, Soft Dock,	137 cont

GMT Time	NOTES
319: 14:07:50	
14:08:17	Torquing
14:08:19	Valerong
14:08:31	For roll satellite counterlockwise
14:08:40	For knows that clock direction
14:09:17	COM - Change of Shift cancelled
14:10:56	For clockwise slowly
14:11:25	Lined up pretty good.
14:11:45	Push down
14:12:39	SOFT DOCK!
14:12:50	Over lamp or a camera. Take care of it. (Huster)
14:13:19	COM
14:13:58	Replay in 1 minute.
14:14:25	# 5 Over
14:15:50	Doing for 8 David

11-14-84

8:16 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
056:02:01:13	EVA Power Tool Battery Dying	138

GMT Time	NOTES
319:14:16:10	
14:17:04	Wrench bringing it down. Power tool
14:17:30	Torque wrench was broke Monday during ...
14:18:00	Want to find some way to avoid that.
14:18:49	Warm sun on back.
14:19:10	Put hands under to cool.
14:19:25	OC lower Indiana boy.
14:19:50	Battery has about had it. VL-02. To let it down and later use fingers.
14:20:22	Tighten by hand.
14:20:40	To low speed.
14:20:45	High is max torque.
14:22:00	Getting slower and slower.
14:22:33	Doing for 2
14:22:55	Doing it by hand. Slow
14:23:50	Don't let go of satellite
14:24:19	For notes clockwise.
14:24:35	No, still more (Dae)
14:24:48	Do not let go without warning.
14:26:36	#1 complete
14:26:47	Doing to 5
26:55	Getting hungry again

11-14-84

11:04 AM

Transcript Profile

Flight 51-A

MET	General Activity	Cassette #
006:04:49:27	PMS started	146

GMT Time	NOTES
319:17:04:20	COM -
17:04:50	Handing to TDRSS
17:06:30	AOS Done & Clear
17:06:50	COM
17:09:43	Arlock depressurized
17:09:48	Dir then both of a good handshake a a pat on the back good job (Haskell)
17:09:56	Dir - what. I want you to it (Haskell)
17:11:51	Camera to Dir
17:13:04	COM
17:17:29	Get me know when done with camera will both the arm: (Anna)
17:18:06	Dir with camera. Got a launchload
17:18:31	One happy crew.
17:20:40	COM EVA & Spacelab on. 5:42
17:23:34	Arm lowered into cradle
17:24:49	Arm into retaining device
17:26:16	Arm rolled in,
17:28:49	EMV batteries. No servicing or suits.
17:30:25	COM
17:38:38	TV -

11-14-84
8:32 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
00:02:16:45	EVA, (checking of Posters (9)	139

GMT Time	NOTES
319:14:32:00	
14:32:14	Adaptor working like a peach
14:32:27	Thru 12.
14:32:54	Working 7
14:33:10	Views - good
14:33:30	See Spec 6 action. Portable TV camera... Don 9 upcut.
14:34:34	One more to go after this one
14:34:47	Having fun today.
14:35:06	Normal separation worked like a champ.
14:35:20	Danny smiling all day.
14:36:54	Disengaging the strap.
14:36:31	Strap by #3 turret above head.
14:37:50	COM
14:38:46	Check checklist
14:38:55	Check all 9 positions
14:39:50	Left starboard for berthing, Dal
14:40:58	COM
14:42:36	Joe, keep a good grip on it.
14:43:12	ZOS - super job
14:43:39	Working of tethers (Dal)
14:43:50	Joe - miss satellite.

11-14-84

Transcript Profile
Flight 51-A

8:45 pm

MET 006:02:29:40	General Activity	Cassette # 139 cont.
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GMT
Time

NOTES

319: 14:44:44

44:55 com-203

14:58:35 com

11-M-84

9:01 AM

Transcript Profile

Flight 51-A

NET	General Activity was as latched in bag.	Cassette #
006:02:45:40	Prep for cutting of antenna, antenna cut.	140

GMT Time	NOTES
319:15:00:40	
15:04:12	COM - Standby on AOS
15:04:44	AOS - 2 Satellites latched in the bag!
15:05:00	Looks like metal to me.
15:05:29	Cut right above bracket if you want
15:06:11	Get back below
15:06:48	Can't get it to test, feed, nothing.
15:07:07	Was tied off with tether above to 18.
15:08:49	MFR is great.
15:09:03	Anna can see what she's doing.
15:10:22	Requires 2 tethers?
15:11:06	Pick up and then lower. Oh Yes!
15:11:34	Watch feet as she moves you.
15:12:16	Tether before cutting.
15:12:35	Trusty wrist tether. Which tether?
15:13:13	Zos kill Hawaii
15:14:04	COM - Zos
15:18:50	AOS - Video
15:19:02	Anna - max mo + top window.
15:19:27	OMNI antenna cut
15:19:52	Zos on tether.
15:20:12	COM

5:60 pm

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
6:10:54:00	Sleep period - Wake up call	149

GMT Time	NOTES
319:23:09:48	COM
23:17:32	COM - WASTE WATER DUMP
23:32:30	COM - Discovery over Pacific
320:00:00:00	COM - ORBIT 104
00:30:36	COM
01:05:30	COM - EXECUTE PACKAGE
01:29:35	COM - ORBIT 105
01:59:00	COM -
02:30:45	COM: Weather briefing will be conducted shortly
03:00:08	COM: In flight press conference delayed 6 min
03:29:23	COM:
04:00:13	COM:
04:15:32	COM: Wakeup call "Peter ^{Thump} Jun" "Good morning - how are you all doing - Being low."
04:17:00	COM:

11-14-84

9:20 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
006:03:05:14		140 cont.

GMT Time	NOTES
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319:15:20:17	COM
15:21:08	Det red of this piece. Put in my hand bag. (Dale)
15:21:23	Don't that clearing me? (Joe)
15:22:31	Dale, watch feet
15:22:49	Up and left is Joe
15:23:02	COM - Westas in cargo bay. Aolow, o Jarden.
15:23:33	COM - sunlight in 30 seconds.
15:23:54	Vibes

Transcript Profile
Flight 51-A

11-14-84
9:24 AM

MET 06:03:09:18	General Activity OMNI Slow EVA, Manoeuvring A-Frame	Cassette # 141
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GMT Time	NOTES
319:15:24:20	
15:26:01	Where my safety belts (Dal)
27:15	COM - Dardner manoeuvring A-Frame
15:27:31	YOS - TDRSS audio only
15:29:27	Pin #1
15:29:46	COM - no TV too slow about 90 min.
15:30:02	Pin on it!
15:30:57	Didn't wrap up for me for.
15:31:00	Oh, in way, could've been doing that
15:31:15	It's wrapped. (Joe)
15:32:35	Got it finally
15:32:40	Joe let go
15:32:53	Something caught. (Joe)
15:33:00	Released to me.
15:33:25	Keep a good hold on that little hummer.
15:34:32	Yuno redeemed (Dal)
15:34:40	OMNI started (Dal)
15:34:57	Pin to go in. (Daw)
15:34:58	Joe operation - normal mode EVA (Daw)
15:35:21	Looked, pin in (Dal)
15:36:08	Dal go in and look for visit.
36:27	It's done.

16:30pm
11-14-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
006:16:08.18	Wake up - Change of shift briefing cancelled	150

GMT Time	NOTES
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319:04:31.36 With you through TDRS play back song "Amazing Grace" ^{some one will sail} But force blind faith & luck will win out over superstition

04:33.52 Clear out star tables

04:34.42 Question thought there might be a value out of position

04:36.41 Go ahead & delete ^{IMD alignment} ~~star~~ maneuvers.

04:37.50 Com:

~~04:37.50~~

05:25:40 Going Las

05:26:10 Com-

05:30:29 Com - Change of shift briefing cancelled

05:38:47 With you through Garuda

~~05:41:55~~ ~~Could see star pattern blaze through window last time.~~

~~05:43:00~~ ~~Com~~ next page

12:40am
11-15-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
006:18:22:00	Radio check, Started HRM at 6:18:03 Cabin pressure	152

info.

GMT
Time

NOTES

320:06:41:25	Radio check - how do you hear? Loud & clear - ^{HAS} have some problems - we'll try to get them fixed.
06:43:23	How do you hear? Loud & clear
06:44:46	Started HRM at 6:18:03
006:18:42	Commentary on landing at KSC
006:18:44	Listening to weather briefing. Dale & Joe lock airplane
07:01:03	com:
07:03:24	Los - see you at Yargady ¹¹ .
07:04:14	Com: LOS.
07:07:37	com: Cabin pressure info
07:15:23	With you through Yargady for 9min
07:16:06	With you through Yargady
07:16:48	com: Attempting to get signal lock w/Discovery
07:18:49	How do you hear through Yargady

11-11-84

9:40 Am

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
00:03:25:40	EVA, Briefing of crew in cabin.	142

GMT Time	NOTES
319: 15:40:20	Joe choreograph
15:40:50	B very deliberate.
15:41:02	Dr. Fisher's been working
15:43:04	Disregard message
15:43:17	Anna, this is for.
15:44:39	Complete
15:45:09	Smile: get those noses up to the windows
15:45:27	Beautiful (Joe)
15:46:09	PLB clear-up check, clear-up and the come inside
15:46:35	Thank-you to Anna nice ride.
15:47:44	Status: pass of Joe + Dale. get Joe off MFR, mmu
15:48:19	Torque reset. When do you put MFR.
15:48:34	MFR up front.
15:48:48	Hands out - clear up -
15:49:04	Thanks for that crew always watching.
15:49:23	Com
15:49:33	Joe totally confused. - Turn myself around.
15:50:35	Polak - it's hard.
15:51:02	Wmb rotab with all my might
15:51:17	Then it goes.

1:23 AM
11-15-84

Transcript Profile
Flight 51-A

MET 006:19:07:00	General Activity Jally ho on building 30 / APU start/shutdown	Cassette # 153
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GMT Time	NOTES
319:07:24:35	With you through Kambara for 6
07:24:57	With you load & clear Put jet F4R in top priority APU 3 for FCI checkout - Alright - thank you.
07:29:20	See you through TDRS
07:33:24	com: 202. down link at 3:22 AM EVA + retrieval of Weststar - Calvin pressure info.
07:50:10	Back w/you through TDRS We copy
07:58:17	
07:58:17	Have a Jally ho on ^{BUILDING} bldg 30
07:59:09	com
08:04:43	Setting up for 2V downlink
08:10:31	Just wondered if you loaded 104 & 102 Yes
08:17:54	Ready for APU start Go ahead discovery
08:18:59	Com
08:20:30	Com Now completed test
08:22:17	Ready for APU shutdown Go for APU shutdown
08:42:33	202 - see you at Yarghdy

11-11-84

9:55 am

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
006 03:41:35		143

GMT Time	NOTES
319:15:56:30	
15:56:53	Keeps tether on correct side.
15:57:35	Pre-tethered
15:58:34	Det it.
15:58:37	Dur that mess a cigar.
15:58:51	Putting it on wrist detector
15:59:52	Fold it up.
319:16:00:04	Chase temp (Houston)
16:00:15	Bobbing wrong way. Something really wrong (Dab)
16:00:54	Now 150 off
16:01:15	Dab feet close to satellite.
16:01:27	Up. Anna
16:02:18	St. snapped to fire.
16:02:30	Keeps Anna clear of satellite.
16:02:45	(Houston)
16:04:14	Right knee
16:05:06	Ocean looks beautiful.
16:05:30	For and released tether
16:07:05	Release - cut her loose Dave
16:07:29	Released!
16:08:04	PLB clean up and end of mmu close out.

3:05 AM
11-15-84

Transcript Profile
Flight 51-A

MET	General Activity closed supply water tank B inlet I.V. downlink	Cassette # 154
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GMT Time	NOTES
319: 09:04:19	See you in Hawaii in 6 hrs
09:20:17	With you at Hawaii for 5
	Close supply water tank B inlet
	terminate boiling water - Getting downlink I.V.?
09:21:29	com
09:21:36	I.V. info. - we copy
	Who are we talking to. We have your picture and this is Bonnie -
09:24:14	Take I.V. to command
09:25:52	A min at Hawaii then will be back w/you through TDRS.
09:26:47	com
09:27:03	Processing TDRS
09:27:54	standing
09:30:07	We have a good picture
09:30:26	Talking about the live I.V.
09:31:49	We like the commercials between the live scenes
09:34:00	(Please ^{home made} stand by - commercial between live I.V. the trouble is not w/your net!)
09:35:57	Tell us when you have voice back through MUA
09:36:42	We're back with ya have I.V. again

11-14-84

Transcript Profile

16:09

Flight 57-A

MET	General Activity	Cassette #
006:03:53:30		143 cont.

GMT
Time

NOTES

319:16:08:20

16:04:00

Kilo cameras to check temperatures

16:09:38

Take only the test (Dab)

16:09:58

PLB (lean-ur check best Tool board, (in air lock)

under deck in cabin, A-Frame MFR, work station mini,

...

11-14-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
03:03:56:35	Finishing PLBC Clean-up	144

GMT Time	NOTES
319: 16:11:28	
16:14:09	Do-in start of dump.
16:14:27	(Houston) DAP to Ops. Stop TESS, (upb.) wind handle, fuel status before EV 1 + EV 2 enter airlock.
16:15:00	Dolly, Sue, Bonnie, Bonnie + Bill out congrat. BOCC, MOCC and part time support crew. CONGRATS!
16:17:12	PSA to get rid of this stuff. (Dab)
16:17:41	Dab lost something, found it.
16:19:10	No trash in trash bag.
16:20:37	JOS tell Duon. Ready for TV at Hawaii Look at whatever you want to show us.
16:21:24	Arms coming. Do I lower leg to put arms down. Get bottom too.
16:21:50	Joseph, Joseph.
16:22:16	Undo all bolts?
16:22:34	Com
16:43:29	Ass - Tether not long enough. Ops alright.
16:43:54	Entering airlock, water dump in progress

Transcript Profile
Flight 51A

MET	General Activity	Cassette #
		154 cont

GMT
Time

NOTES

319' 09:38:43

Continued downlink D.V.

Transcript Profile
Flight 51-A

3:40 AM
11-15-84

MET	General Activity	Cassette #
006:21:25:00		155

GMT
Time

NOTES

319:09:40:44	Continued downtime IV and describing it
09:42:15	Back to live IV.
09:44:36	Chats about the end of the show - more later
	Crew says hello to guest cap-com.
09:45:34	Any trouble w/rotation pulse roll - negative
09:47:54	Hold down rotation pulse pilot
09:48:41	Still have IV. through TDRS want a picture of bag
09:49:12	Get good picture out in the bag
09:50:43	com: Live from Discovery
09:53:16	com:
09:59:46	com: Over coast of Africa
10:11:44	com: ^{TV} Discovery passes over South central Africa
10:20:05	See you at Yargady going LPS
10:22:44	com
10:25:25	com
10:29:37	AOS
10:29:54	AFT DAP Panel - no access in free drift.
	Attempt sweep of yaw with PBI (roll pilot)
	may gain recovery

11-11-54

10:45 Am

Transcript Profile

Flight 51-A

MET	General Activity	Cassette #
006:04:29:30		145

GMT Time	NOTES
319: 16:44:37	Holding open feet with my feet (Dad.)
16:45:44	Coming in. Turn off lights (Joe)
16:45:54	When you come in turn off water.
16:46:10	Water feed then thermal cover.
16:46:28	Dump to 5% in 4 tries.
16:46:41	Camera temp check.
16:46:56	Have status check for your info. Later.
16:47:21	Little hole to take pictures.
16:48:27	Camera info in downlink telemetry.
16:49:18	Cont put any TV together for Hawaii. Configure for on-play that's
16:49:49	That's for.
16:50:01	Water off.
16:53:07	COM - No video from Hawaii. Will watch TV for water dump.
16:56:11	AOS - message onboard. Watching dump. Noisy right now. Will get back to you.
16:56:45	TV
16:57:27	Big dumps; clears well, good residue build up. Would prefer not to dump any more today.
16:58:06	Weather message.
16:58:17	Command & camera (Houston)

Transcript Profile
Flight 51-A

11-15-84
4:38 AM

MET	General Activity	Cassette #
006:22:22:30	PBI changed out	156

GMT Time	NOTES
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319:10:37:56	205 tall Hawaii
10:49:00	Com
10:56:20	BBI changed out by Eagle, Elen Fisher and Walker. Have to push harder. Some inter-face problem. Works.
11:01:46	Terminate APPB cooling.
11:02:57	Controller power to OFF
11:04:57	Handing over to Vandenberg.
11:06:47	AOS - Vandenberg
11:07:04	Previous pass was just Vandenberg
11:09:33	stuck in middle
11:44:35	Com - Inflight Press Conference 6:42 AM
11:57:26	AOS
11:06:54	
11:07:30	AOS
11:07:58	2 cameras set up in middle
12:13:27	on recorder (on)

11-15-84
6:41 am

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
006:23:58:36		157

GMT Time	NOTES
319.12.14:00	
12:19:02	Com
12:23:42	Opening format for press conference
12:24:43	Introduce crew?
12:25:34	Not required
12:26:37	Xos tell Hawaii
12:26:47	Press conference at TDRSS.
12:27:52	Com -
12:32:57	AOS through Hawaii
12:39:20	Com
12:41:30	TDRSS in 30 sec. - good comm check
12:43:13	Pictures of meddick
12:43:26	Two cameras
12:43:30	Crew had volume but adequate
12:44:08	JSC News Center - Out Policy handling over
12:44:37	CNN -
12:47:38	Any time thought you were going to pull it off?
12:48:00	Not over confident.
12:48:19	Associated Press significance of capture and handling manually?
12:44:20	Notes -
12:50:22	See Jan or spec shuttle?

11-14-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
087:00:53:20	Presidential Phone Call	159
GMT Time	NOTES	
320:13:07:38	Anna Fisher - enjoy mothering space partner	
	Compatible - good bed time - alone for Christy	
13:08:55	Joe Allen - not hanging to up	
13:09:00	Humans used as interface man of the...?	
13:10:33	Dare how difficult to convert to plan B?	
13:11:28	End of on-flight Press Conference	
13:12:50	Comm Presidential Call coming up.	
13:17:00	Comm.	
13:20:43	Presidential Phone Call.	
13:21:24	Bump a little in	
13:21:42	Next team	
13:22:54	Anna - recommend to Kristin to be witnessed	
13:24:36	Phone call over.	
13:25:26	Camera views - on alone stirred wing	
13:25:52	Comm	
13:31:05	Panel switches - R1, heaters OFF. R12 - open tank B inlet valve	

11-15-84

Transcript Profile
Flight 51-A

7:30 AM

MET	General Activity	Cassette #
007:01:17:10		160

GMT Time	NOTES
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320:13 31:05 Panel Switches

13:34:39 LOS till Decon - Thanks for video.

13:35:30 Com. Change of Shift 8:15 AM - Jacefield

13:40:10 Com. ~~to~~ ~~the~~ ~~briefing~~ TV

13:56:26 AOS Decon

13:56:44 Having another average day in space

13:57:14 Com - O. orbit ¹²⁶ ~~126~~ 7:22:40 4:55 AM.

~~13:57:14~~ KSC ¹²⁷ ~~127~~ 7:23:44:50 ~~000~~

13:01:12 Com. change of Shift delayed 15 min. to 8:30 AM

14:05:11 LOS till Hawaii

14:05:43 Com

14:11:24 AOS - Hawaii and TDRSS

14:16:15 Com.

14:47:20 Com.

15:02:54 Com - weather briefing 9:30 AM from KSC.

15:16:38 LOS

15:17:34 ~~15:17:34~~ Com

15:40:00 Com - Crit in MOCK

15:41:52 LOS Hawaii

15:48:41 AOS - Hawaii - TDRSS

11-15-84
9:50 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
007:03:34-30	TV.	161

GMT Time	NOTES
320:15:49:47	
16:03:06	Mob. for Discovery
16:03:23	Bed out switch to high - normal temp mode
16:06:52	TV looks good
16:07:07	Com-
16:08:07	Com
16:13:08	Coast of Peru
16:14:40	C
16:16:10	Clear -
16:17:07	Com - South Amer. coastline
16:17:48	Coast of Chile
16:21:07	Com - Over South America
16:23:37	South American coastline
16:23:50	Good attitude for touring the world.
16:25:49	Com - over Atlantic
16:34:57	Com. Independence or PMS
16:38:32	Pressure gauge
16:39:24	Slide wire
16:53:00	TV TV

11-15-84
10:52 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
007:04:39:20		162

GMT Time	NOTES
320:16:56:02	Eagle Electronics is into many fields.
17:13:11	AOS - Duon
17:13:24	Weather update before sleep phase
17:27:41	Change in procedure.
17:27:50	Asst. Pres. of Eagle Electronics helping out.
17:28:07	Temp check from Joe
17:29:07	Request right OAMS - lower last A.
30:33	new procedure due to mine circuit failures.
17:30:31	Teleprinter message onboard.
17:31:45	See test data (on m'Nav)
17:33:04	Hold off on interconnect return until we get a good hold on TORSS.
17:36:29	AOS TORSS ISO for interconnect return
17:36:48	Give it to me one more time.
17:37:35	What's your position when complete?
17:41:26	Delete step 3 already in GPC
17:45:33	Confusion - Step 4, ... talk back closed.
17:45:47	Ah -- that's better! (Dave)
17:47:41	Task ISO A.
17:51:08	Step 4 - Tell RCS 3415 Bravo task ISO - open position
17:51:47	Advise us?
17:55:56	Take Right RCS to GPC.

11:52 Am
11-15-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
007:05:37.30		162 cont.

GMT Time	NOTES
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320. 17:52:30	Another change
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17:59:02	KU Band Positioning
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17:14:55	Becky
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12:15 PM
11-15-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
007:06:00:57	EVENING TAG-UP	163

GMT Time	NOTES
320:18:16:25	EVENING TAG UP REENTRY INFORMATION
	WEATHER DESCRIPTION
18:19:43	TAKE RADIOS TO NORM AND CYCLE THE FESS
18:20:35	VALVE POSITION UNKNOWN
18:24:47	TELEPRINTER MESSAGE UP
	LOOKING FORWARD TO SEEING YOU TOMORROW
	SHARING A BEER
18:26:17	COM - LANDING INFORMATION 6:00 am touchdown tomorrow LOS IN 5 minutes
18:36:23	COM - ORBIT 116 over india ocean orbit 2 team
	said good night Re orbit burn ^{MET} 7:22:40:00
	4:55 am est

9:30 AM
11-15-84

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
007:15:17:00	Wake up call	166

GMT Time	NOTES
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03:03:32:15	com
03:45:17	Wake up call "Rocketman ^{Monday!} ^{Reverse Drury the acquisition} ^{Bob Slight} ^{P.F. Holiday Sunshine}
	Good mornin' Houston, Well good morning to you ^{Magyar}
	Discovery
03:47:37	You'll have to have your coffee with no paper, go ahead and torque the stars you have. Roger that.
03:50:53	Delete first 2 maneuvers. Roger that
03:51:31	Configuration changes
03:54:26	KU band positioning
03:55:13	Played song to Houston ^{"several} ^{characters of} ^{Rocketman} ^{fire} "
03:57:46	through with KU band
03:58:01	com: Wake-up
04:16:14	See you at Yargady L's.
04:18:57	com.
04:31:24	com Change of ^{shift} artist briefing has been cancelled
04:41:58	com
04:45:12	Doing best

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
007:18:26:00		168

GMT Time	NOTES
321:06:21:58	See you at TDRS at 2-4
06:40:11	With you through TDRS
06:40:11	.
06:52:24	Back w/you through Mila
06:53:43	com:
06:55:59	com: Sun shields are fully open
06:56:58	com: Orbit ignition approx 3. check away
06:58:28	Didnt catch / set of orbital ignition
07:18:59	execute Execute step 3 PEs check out Ok Richard, Thank you
07:20:53	com
07:29:03	com.
07:44:10	com
07:44:48	with you through Yargady
07:45:09	With you through Yargady - do you read
07:47:41	How do you hear through Yargady
07:48:11	com Here we are - how do you read - loud?
.	Clear now
07:50:08	Right OHMS tank A
07:52:12	You're go for bay load bay door closing
07:52:42	com:

1:55 AM
11-16-84

Transcript Profile
Flight 51-A

MEY	General Activity	Cassette #
007:19:38:66		169

GMT Time	NOTES
07:55:25	Leave KILbard at
07:58:50	Down in 9 ZLH
08:06:59	Pass com radio check
08:09:53	Pass com 914 radio check
08:09:51	Pass 47 radio check
08:13:30	With you through Hawaii for 3 min
08:14:47	Need an ILL verification immediately
08:16:33	Pick you up in 3 through IPRS
08:18:46	With you through IPRS
08:23:28	com
08:27:25	com
08:32:03	Now etc. continuing en route
08:35:14	ASA's need to be powered on
08:38:26	com
08:43:03	Do you ops 3 - With back up you through IPRS

3.40 hrs
1-15-59

Transcript Profile
Flight 51-11

NET	General Activity	Cassette #
09:21:35.00		177

GMT Time	NOTES
09:21:09-09:31	Engine 105
09:31:09	
09:31:52	10 band switches on engine A1
09:51:33	Back to Auto (A1) to B auto
09:53:21	Panel A1 K10 and J1000 gears
09:55:50	com: radio land at Edwards
09:56:06	TDRS
09:58:23	com: repeat standing by for a decision as to where to land
10:02:31	Ready for change of flight mic change
10:04:13	30 mins before we decide where to land
10:08:46	Boundary layer -
10:10:04	Ready for gimble checks
10:12:04	Repeat secondary gimble check. Data dropped out.
10:13:38	Landing gear hydraulic low. Gear not stopped. Still not sure of actual level.
10:14:36	Delta to OHMS - GN2 and Helium alarms possible during burn.
10:15:27	Dimitris look real good
10:15:30	W0 thoughts they look pretty average
10:15:37	com -
10:16:22	AP - pre-act

11-16-84

4:17 AM

Transcript Profile
Flight 51-A

MET	General Activity	Cassette #
007 22:01:40	D. O. Bus. KSC looks good	172

GMT Time	NOTES
321: 10:16:30	
10:19:00	Swaths on MOD-W
10:19:16	02 Big System 2 dropping - valve closed
10:28:35	COM - Reaching decision for landing
10:30:08	Targets
10:32:26	Let us know when vectors are onboard.
10:32:35	Vectors onboard - DO to reload
10:33:10	KSC - Clouds clearing. Cloudy south. 310 winds. 1900 ft TD/W tailwind. GO for the run.
10:33:50	Hydraulic Thermal conditioning not required.
10:34:00	COM
10:36:59	COM - upcoming deorbit burn.
10:38:15	412's onboard
10:39:59	PIA Delta not significant to us (Houston)
10:46:30	Dmit plan to change decision. One minute to TD/RSS.
10:49:12	205 TD/RSS Configure TD/RSS
10:49:24	Alright - we're on our way home.
10:49:42	COM.
50:46	APU's looking good
51:00	Burn 4:55 am - Decon - Hawaii AOS early 5:25. Black out 5:31 - 5:46 am. 5:55. Landing 5:59 am.

11 16 84
5:14 am

Transcript Profile
Flight 56-A

NET	General Activity	Cassette #
007:22:54:12		173

GMT Time	NOTES
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321:11:14:18	
11:14:32	Com. Good status about Oversey - Mach 25
11:16:14	20S no Delta change required No altimeter
11:16:44	Com
11:24:08	Com. Pickups of KSC
11:25:30	Com. Runway 5 - Processing Hawaii data
11:26:02	AGS - Hawaii
11:26:35	^{lights} Power OFF
11:28:48	Com - Interfero 10 seconds.
11:30:08	20S - 40 sec.
11:30:26	Com - Possible Aguarition during black out.
11:31:00	TD 28 minutes
11:31:29	Com (KSC) - Touch Down Status
11:33:25	Com -
11:34:33	Conway Commander
11:38:45	Radio Check
11:38:53	Com
11:49:20	Tach hands
11:50:45	Visual of shuttle

11-16-84

Transcript Profile
Flight 51-A

6.17 AM

MET	General Activity	Cassette #
008.00:04:40		175

GMT
Time

NOTES

321:12:19:45 0 parts per million - oxygen readings earlier
from ammonia level off at rear of shuttle

12:22:02 Hydraulic System

12:22:22 KSC COM - APU: shut down

12:22:46 Do not vent desorb then Do not extended Buses up

12:25:17 Mobile, white room moving into position

12:12:49 Crew Express

END

DATE

FILMED

APR 25

1985