

ACDR-CM Okay. I can see you're getting some bright spots in there. I can't tell where they're coming from.

SFE-OM (Moscow, Soyuz. ...)

14 19 07 SCDR-CM I read you. (...)

14 25 44 ACDR-CM Okay. Alexey says he doesn't have comm with Moscow.

SCDR-CM (Moscow, Soyuz. How do you read?)

CMP-OM ... to this.

14 26 11 ACDR-CM Stand by.

ACDR-CM How's that? .

SCDR-CM (We're ready.)

SFE-OM (Moscow, Soyuz. ... Vance Brand.)

ACDR-CM Okay.

14 27 24 SFE-OM (Moscow, Soyuz 2. We can begin to introduce our friends the first time we find ourselves with the Americans. Dear TV viewers, I am now with Vance Brand in the orbital module. I would like to ask him to say a few words.) Vance, say some words for the Russian people, please.

14 27 52 CMP-OM (Hello. Okay. Good day. I'm very happy to be here. This is my first time in orbit, and we have found very good hospitality here aboard the Soyuz. Soon, we shall eat, and I think that I very much would like to try to taste this food. It can be said that our project here are - is a very important one, and, as you know, everything is proceeding according to program. I think that everything is going very well. Of course, we are friends; we understand each other very well. And I think that soon we'll have dinner. I think we'll soon have dinner. Thank you.)

14 29 28 SFE-OM I want to ask one more question first. How do you like to fly in Soyuz spacecraft?

CMP-OM (Of course, Soyuz is a good spacecraft. It's very good here, very comfortable.)

14 29 47 SFE-OM Thank you very much. (Now, we will continue our TV coverage. Our joint activities with Vance Brand, who is visiting here, will soon come to an end, for this joint activity began at 4 hours at Sun - very little is left. The only procedure that we have left to do is our joint dinner. We have conducted all of our joint experiments, all our joint tasks. We have held several TV coverage sessions about the flight, and now the concluding stage of our joint stay here is approaching. To Vance, for you to remember your stay here, I would like to present to you from the Soviet - the Russian people - a medal of the Soyuz and Apollo. Now, you would - you can be able to see it on your screens. The same kind of medal was presented yesterday to Stafford and Deke Slayton - yesterday. And today, I am presenting this medal to Vance Brand.)

14 31 19 CMP-OM (That's wonderful. Thank you very much.)

SFE-OM It is a gold medal from Russian people to you.

CMP-OM (This is the emblem of the Apollo-Soyuz, yes?)

SFE-OM Apollo-Soyuz Test Project.

CMP-OM (The Apollo-Soyuz.)

14 31 45 SFE-OM (Now we are beginning the - really, we are beginning the final - the conclusion portion of our joint activities here in the Soyuz spacecraft before - No, because soon both of you - both of us will go into the Apollo. We are now beginning our space dinner because we have worked a great deal of time already, and we need some sustenance. Space dinner, as you know - There's some background noise here. There's some interference, I don't understand what it is.)

SFE-OM (Space food consists of several courses. I can't even hear myself. There's some interference here.)

SFE-OM (Moscow, this is Soyuz 2. How do you read? Over.)

SFE-OM (... interference. Moscow, this is Soyuz 2. How do you read? Over.)

CC-M (I hear you normally.)

SFE-OM (Moscow, this is Soyuz 2. How do you read? Over.)

CC-M (We read you. Let go of your intercom button.)

SFE-OM (Roger. We had some interference. How is the picture right now?)

SFE-OM (... Our space food consists of several courses: For the first course today is shchi with sauerkraut, a green shchi. Vance likes green shchi; and for me, shchi with sauerkraut. Second course we have meat, chicken with egg; for the third course, we have juices, black currant juice with sugar. We have coffee. Here we have black plums - plums and strawberries. Here we have everything that is necessary in order to prepare this food. On my right, here is our unique - kitchen. It's an electric kitchen, very comfortable and convenient to use. And I think that our house - housewife at home might be envious of such a kitchen. If I can call this a first course, it's right here. It's already heated. This is a tube which contains the food inside, and I've placed it inside and now am heating it. I would like to ask Vance how he likes our space food.)

14 34 58 CMP-OM (Yes, very much. I like, especially, your bread, the meat, and also the shchi - the soup. I think that Russian food is basically similar to American food. There is not too much of a difference.)

ACDR-CM Hello, Houston, Apollo.

SFE-OM (And this evening we're scheduled to be in your spacecraft, so we'll try your food.)

CMP-OM (Okay.)

14 35 43 ACDR-CM Hello, Houston; Apollo.

CC-H ...

ACDR-CM Roger. You want Alexey to give a commentary about food here?

CC-H Roger. ...

SCDR-CM (Yes.)

ACDR-CM (Are you ready?)

SCDR-CM (Soyuz 1 is ready.)

14 36 34 ACDR-CM Okay. We're up here now on our lunch. In fact, Deke has prepared most of it, since he's in that part of the spacecraft. Alexey's here in the center getting ready to eat. We'll have Alexey say a few words to you.

SFE-OM (Transfer is being carried out.)

SFE-OM (I heard.)

ACDR-CM Are you reading Alexey? Soyuz, are you reading Alexey?

SFE-OM (Where is this to be plugged in? To which connector? But I don't have the TV camera 3. It's in the Apollo now.)

ACDR-CM Okay. They're not - Alexey is eating some steak, some beefsteak.

SFE-OM (I'm writing, I'm writing.)

14 38 13 ACDR-CM It's - Looks like it's barbecued, even - like it's roasted on a grill, but it's in a pack that preserves it.

SCDR-CM (Sit down.)

SFE-OM (... Right now 347/10 is on 347/10-1.)

14 38 57 ACDR-CM Have you been reading Alexey before, Houston?

SCDR-CM ...

ACDR-CM Okay. I think that's switched over to Soyuz is what - Hey, Vance, would you tell Valeriy to set Alexey up so he can talk into Houston?

14 39 26 ACDR-CM While they're taking care of that, Alexey's continuing to eat his beefsteak. He also has strawberries, almonds - -

SFE-OM (... how do you read? Over.)

SCDR-CM Valeriy ...

SFE-OM (Alexey, how do you read? Over.)

SCDR-CM Valeriy ...

SFE-OM (... Over.)

CMP-OM Tell you what, Bo. If - if you want, while we're getting the comm squared away, we can talk a little about our food over here.

ACDR-CM Also - Hey, Vance, tell Valeriy that Alexey reads him and the rest of us loud and clear, but he can't transmit.

14 40 36 CMP-OM Okay, Bo. Well, let's press on.

SFE-OM (So, in the third - in the third - transfer, you don't have to do TV coverage 11.1 from the docking module. This is what Moscow said. Your TV - 11.1 TV session is canceled. Did you copy?)

14 41 06 CMP-OM Okay, Bo. We'll start on the meal here, if you're - if you're all set. I think you can see - I think you can see that Valeriy has spread out a meal for us on the table. We have a little collapsible table here on Soyuz, and right now it's covered with food that's under little rubberband-type devices, such that it won't float away. Most of the food comes either in tubes, such as what you see here, or in cans - like a tuna can - or just in packages - cellophane packages. The - -

SFE-OM (Yes.)

14 41 52 CMP-OM (Yes.) (Laughter) There is an example of something in a cellophane package. It's bread. Now, also, there's a heater for heating up these tubes. The heater's over here on the wall. Don't know if you can quite see it. It's - anyhow, it's an electric

heater. And Valeriy, just a short time ago, put two tubes of soup in there and heated them up for us. It didn't take long for them to heat up, and so now Valeriy has just opened up one of those tubes, and he's trying a little of this soup. This is called shchi, a very common and delicious soup. Incidentally, the foods over there in the Soviet Union are somewhat similar to ours. Naturally, some dishes that are different. In general, I like things like their ice cream, bread, shish kebab, things like that. Here on the table, Valeriy seems to like his shchi very well. I think some of the best space foods are these canned meats like we have here, chicken with eggs; chicken, also tuna, various fishes are very good.

ACDR-CM (...)

14 43 39 CMP-OM Okay. We have napkins - -

SCDR-CM (Valeriy, how do you read me?)

SFE-OM (Weak.)

SCDR-CM Valeriy, how do you read me?

SFE-OM (I read you very weak.)

SCDR-CM (Valeriy, I have no comm with Moscow at all. I just changed my headphones, and I'm now speaking from Deke's place. I did not do my TV coverage of space food. The way I understood you is not to do the TV seance from the docking module. 1.)

SFE-OM (2. When you come in here, take with you - take 4 cartridges with you. Did you understand?)

SCDR-CM (Roger. Over.)

14 44 39 CMP-OM Okay. So anyway, Bo, we're about to start eating, and we'll eat with knives and forks and spoons, just the way you would down on the Earth. Most of the food will stick to the spoon well enough, and things that won't, of course, will be eaten out of the tubes, or, like the bread, will be eaten in bite-sized bits. All in all, it's a very convenient setup up here. With that, unless you have any questions, I think we'll press on and eat.

14 45 28 ACDR-CM Okay, Bo. If you look on TV, you see Alexey eating some soup. In fact, it's potato soup.

ACDR-CM How's the soup, Alexey?

SCDR-CM Okay.

14 46 08 ACDR-CM All righty. You want it off now, right?

15 01 10 CC-H Apollo, Houston through Wa - Wallops for approximately 5 minutes.

15 01 15 ACDR-DM Roger. Through Wallops.

15 04 57 CC-H 1 minute until LOS. Next AOS is Santiago at 75:10.

15 05 44 ACDR-DM What? Yeah, what?

TIME SKIP

15 26 08 CMP-OM Tom, how do you read? How do you read, Tom?

ACDR-DM I read you, Vance. Vance, how do you read?

CMP-OM Okay. How's the transfer going?

ACDR-DM Okay. We're getting ready ... It's been a little slow here. ... did the relay come from Houston?

CMP-OM No, haven't heard - heard them, lately.

ACDR-DM Okay. I wonder about this furnace shutdown here.

DMP-CM Okay. I think you're supposed to go on schedule, Tom, ...

ACDR-DM Is the green light on?

DMP-CM ...

15 27 19 ACDR-DM Okay, group, we'd better synchronize the clock; it's 8 minutes, right?

DMP-CM Check. ... How do you read, Vance?

CMP-OM I read you fine.

DMP-CM Okay. You've got about 30 seconds ... clock.

DMP-CM ... Okay ...

CMP-OM I read you.

ACDR-DM ... I got ... but we haven't put any stuff through here.

DMP-CM Yeah.

15 29 03 ACDR-DM Roger. Hey, Bo, this is Tom. I'm in the docking module working on step 2 of the third transfer. Do you want us to go up here and - and go through this checklist ... removing these samples.

15 29 24 ACDR-DM Okay. The temperature's 29 degrees and the FURNACE COOL light's on, so we can go do it.

ACDR-DM I got it. I've already got it marked out.

15 30 14 ACDR-DM All right, Bo.

CC-H ...

ACDR-DM Yeah. ...

ACDR-DM Yeah. ...

DMP-CM ...

ACDR-DM Yeah. ...

15 32 33 ACDR-DM Okay. Try it. Got it?

ACDR-DM What about that ...? Weren't we supposed to ...? In 5 minutes, ... transfer to ... I ...

ACDR-DM Oh, yeah.

15 34 49 ACDR-DM Yeah. I found it. Yep, it's there ...

CMP-OM Tom.

ACDR-DM ... difference between ... Okay.



DMP-CM Vance ...

15 36 35 ACDR-DM Okay.

ACDR-DM Okay.

DMP-CM Oh, okay. All right.

ACDR-DM Yeah.

DMP-CM ...

ACDR-DM ...

DMP ... yeah.

ACDR-DM They're all ON, Bo.

ACDR-DM Thought they were.

ACDR-DM Yeah.

SFE-OM Apollo, Soyuz. How do you read me?

SFE-OM Apollo, Soyuz. How do you read me?

DMP-CM (I hear you excellently, Valeriy. Stand by.)

SFE-OM What step are you doing now?

DMP-CM Okay. They want to know what step you're on there.

15 40 33 SFE-OM Apollo, Soyuz. What step are - step are you doing now?

SFE-OM Please, Apollo. What step are you doing now?

ACDR-DM (Step 2.)

ACDR-DM ... Take that ... over. ...

DMP-CM Okay.

CMP-OM Yeah. Yeah.

ACDR-DM Go ahead, Bo.

ACDR-DM Yeah, it was. We started the transfer time on schedule. We had to go back and pick up the furnace sample and sign in a couple of books and things.

ACDR-DM Okay?

15 42 04 ACDR-DM Roger. We'll be making it up.

15 43 10 ACDR-DM Okay. ... I thought we were eating and didn't discuss that ... I'll come and get it. Okay. Take that off? Okay, I'm going to -

DMP-CM Okay. ... is closed.

15 44 55 ACDR-DM Yeah, well. ... Oh yeah. (Laughter)

15 45 35 ACDR-DM Okay. Hatch 2's closed. (Hatch 2's closed ...)

SFE-OM ...

ACDR-DM (Valeriy, Vance, now I'm working on step 7 in the docking module.)

CMP-DM (Step 7.)

15 46 26 SFE-OM Soyuz tunnel 2 pressure equalization.

DMP-CM ..., Bo, are you reading okay?

DMP-CM Okay. Yeah, I got mixed up. Our commentary says ...

15 47 08 ACDR-DM (Soyuz, this is Apollo. I am now beginning pressurization.)

15 48 04 ACDR-DM Okay, Bo. We're pressurizing the DM.

16 02 16 SCDR-DM (I used the last film for it.)

16 05 34 ACDR-DM (Valeriy, do you need any nitrogen?)

ACDR-DM ... how do you read - docking module?

ACDR-DM Okay. Up to step 13 now. Looks like we're back on schedule and appreciate your help on the rapid check on hatch 2.

ACDR-DM Pardon me, no; it was step 15. I couldn't read this thing. I've already gone through 13. We're up to step 15.

16 06 30 ACDR-DM (All right.)

ACDR-DM And they don't need any nitrogen.

16 07 52 ACDR-DM Hello, Houston, docking module.

ACDR-DM Everything is going smooth here. Is Lunney around there?

ACDR-DM Okay. You might tell him - I don't know whether I mentioned it or not - I just happened to check the roll index angle that we put on, you know, between the command module and the docking module.

ACDR-DM It's about as close as you can get it to zero. Maybe it's less than a 20th to a 50th of a degree off.

16 08 25 ACDR-DM Yeah. (Laughter) In other words, the zero line is just darn near splitting the other index line.

16 10 39 CC-M (Well, how's the comm check.)

CC-M (End 22 4 comm check.)

16 15 48 ACDR-OM Houston, Apollo. How do you read me over in the orbital module?

ACDR-OM Roger; Bo. Read you 5 by. All connected up for the comm over here in the OM.

16 17 15 SFE-OM Deke, how do you read me?

DMP-CM (Excellently, Valeriy.)

SFE-OM (This is Soyuz. How do you read? Over.)

DMP-CM Go ahead, Bo.

16 18 40 DMP-CM Okay. CM 1 and 2 coming OFF.

ACDR-OM Yeah.

16 23 01 SFE-OM Vance, how do you read me?

DMP-DM (I read you excellently.)

SCDR-OM (Valeriy, how do you hear me?)

SCDR-OM (Okay, Valeriy, how do you read me? I don't read you now.)

16 23 35 ACDR-OM Houston, Apollo.

ACDR-OM Okay, Bo. Sounds like Valeriy's having the same trouble Alexey had this morning. He can read everybody, but he can't transmit. But Vance and him are going to press right on through the transfer.

ACDR-OM Roger. Will do.

16 24 15 ACDR-OM Roger. 1, 2, 3, 4, 5, (5, 4, 3, 2, 1. How did you read that?)

SCDR-OM Houston, this is Soyuz commander. How do you read me?

SCDR-OM I give you short: 1, 2, 3, 4, 5 - 5, 4, 3, 2, 1. How do you read me?

SCDR-OM I read you loud and clear, too.

ACDR-OM Okay. I'll check with Mos\*\*\* (Moscow, Moscow, how do you read me? This is Apollo commander.)

ACDR-OM Houston, this is Tom. It says in the Flight Plan you want us to check with Moscow, too? Over.

CC-H That's right ...

16 25 17 ACDR-OM (Moscow, Moscow. How do you read me?)  
ACDR-OM (Moscow, Moscow, this is Apollo. How do you read? Over.)

16 25 56 ACDR-OM Bo, I don't get them anyplace. Maybe we're configured wrong back on the command module. I don't know.  
ACDR-OM Okay. ...  
ACDR-OM (Moscow, Moscow. This is Apollo. How do you read? Over.)

16 27 56 SFE-DM (Valeriy, Soyuz 2. I hear you well.)  
SFE-DM (What did you say?)  
SFE-DM (Roger.)  
SFE-DM (Micro - VRT power - that is microphone power's turned on. Intercom light is on.)

16 28 56 ACDR-OM (Moscow, Moscow, this is Apollo. How do you read me?)  
ACDR-OM Roger. (Yes, I hear you excellently.)

16 29 42 SCDR-OM Roger. Hatch 4 is closed.  
CMP-DM (Good.)  
SCDR-OM Moscow, this is Soyuz. I read you loud and clear.  
SCDR-OM Okay.  
ACDR-OM Hello, Bob. How is it going?  
MCC-M ...

16 30 53 ACDR-OM (Alexey, are you ready to dump pressure in tunnel 2?)  
SCDR-OM Just a moment, just a moment.  
DMP-CM Okay.

16 31 16 ACDR-OM (Okay. Roger, Bo. Roger.)

16 32 33 SCDR-OM Deke, hatch number 4 is closed. Ready for tunnel 2 depressurization.

SCDR-OM (Standing by, Moscow.)

SCDR-OM (Read you very well. The second comm check - -)

16 33 21 SCDR-OM (Okay, I know, I hear you.)

16 38 37 ACDR-OM Roger. 76:44, Quito. Thank you.

16 40 35 CMP-DM Soyuz, this is Apollo. Hatch 3 and 4 pressure integrity okay.

SCDR-OM Roger. I will have my results in 2 minutes.

16 42 49 SCDR-OM Vance, the results of our pressure check are okay. Go ahead.

16 47 46 DMP-CM Do you read, Tom?

ACDR-OM Hello. Yeah, go head, Deke.

DMP-CM Rog. ...

ACDR-OM Deke, did you call?

DMP-CM Yeah. I'm looking for the floodlight[?] ...

ACDR-OM Read you about 3 by 3. Go ahead.

DMP-CM ... I was looking for the floodlight[?]. Did you have that up in the DM?

16 50 37 CMP-DM ...

16 55 22 USSR Go ahead.

16 57 53 ACDR-OM (Hello. Good day. Hello. Good morning - )

16 59 00 ACDR-OM (...)

16 59 33 ACDR-OM (...)

16 59 59 DMP-CM Okay. ...

SCDR-OM What did you say that ... What are you going ... What do you mean, spacecraft or cable?

TIME SKIP

17 44 39 SFE

(First of all, we found out that we can work together in space and cooperate. If - until this time, we had only been preparing for it - training it. Now we have tested it out in practice. Yesterday and today have proved to us that at the time of our meeting in space - during our rendezvous, our docking, and now during the time of joint activities - we accomplished it all. And this is the most important thing. This proved that we can work together; we can cooperate in space and, secondly, we checked out and proved that the docking system works - that it works as it was designed. In other words, that the technical ideas that had been - and the technical design and the ideas that had been used have proven themselves. Yesterday this was also proven. Thirdly, of course, we received additional flight experience at the same time on - in two spacecraft. This would give us a great deal in terms of training or preparing for future flights.)

17 46 11 CMP-CM

Well, I think the greatest part of our learning, Bo, has been in our training, ... .. I think - I've learned a lot - I think, of course, that if we had another joint flight someday that I'd find it much easier to approach, and if somebody else was on this flight, I'd have a lot of suggestions for him. And I'd certainly recommend such a thing, incidentally.

17 47 31 SCDR-OM

(Today, I have spent 6 hours aboard the spacecraft Apollo in flight - in space, but before this I had been aboard this spacecraft many times before in training. And as a pilot, as a cosmonaut, I like this spacecraft very much. Its appearance, its maneuverability, its capabilities; but, of course, the Apollo has proven itself already - that it's a reliable spacecraft, which makes it possible to accomplish many difficult missions. And even the most difficult mission, which is - involves flying around the Moon and even partially a landing mission. Today I saw it - how it looks in space flight. I like its capabilities for making observations. There are a sufficiently large number of windows to observe the Earth and its equipment. Today, in our flight, I had to do a TV report about space food from onboard the Apollo spacecraft, but for technical reasons it didn't come through because there was no communication. But I can say that the food, which I selected way back on Earth, was the same here and I liked it very

much. I liked the way it's prepared, its freshness, and also with the - in the terms of attention paid by the crew. But once again, I'd like to say that space food is not the same food, which is eaten by people on Earth, no.) But as an old philosopher says, "The best part of a good dinner is not what you eat but with whom you eat." Today I have dinner together with my very good friends Tom Stafford and Deke Slayton because it was best part of my dinner.

17 50 00 DMP-CM ...

17 51 28 SCDR-OM (I am deeply convinced that all of us now - those that are flying aboard spacecraft and those who are not flying, but who are watching and listening to us - all of us are participants of only the beginning of a great human journey into outer space, and there will be all kinds of various space missions in the future. Of course, I would like to once again to be aboard some other spacecraft, which would be able to fly for a long time around the Earth so that with the eyes of an artist I could see the multifaceted appearance of our Earth in very varied colors and appearances to forever retain it into memory and to give it to people. But also we would like - I would like to be at altitudes higher than we are now. From there, the Earth looks completely different. I think that at the beginning of our journey - I think that I am at the beginning of my journey and still we have - we have still a reserve of strength and age and I think we will participate in future space missions.)

17 53 04 ACDR-OM Well, you're talking about the next mission. I would think, naturally, with the background in flight tests that you'd always like to fly a new and a better and a more modern device, and we have one coming along called the Shuttle. I would certainly like to fly that. And I would hope that if Alexey would have a vehicle developed by their country that we could fly maybe in a joint mission. And that would be my - my wish: since man's progress has always been a geometric progress and the benefits derived from science and technology has always helped all of mankind - I would hope that the next mission - say if I do fly one - will be one of the more modern type of vehicle that could have more benefits for everybody.



- 17 53 54 SCDR-OM (And I also agree with Tom and I'd like to say that it's - the spacecraft is one thing, but another thing is with whom you're flying and I'd - this is what I'd like to point out, that I would always like to fly in space with friends to who one trusts and who trusts in one and with whom it is not dull to work with.)
- 17 54 31 ACDR-OM (Of course, it is very important.) I say, of course, it was necessary again. We developed this technique out of working together over a period of nearly a year, and that was over a year and a half ago that we determined that, if we would listen to the other person speak in your own tongue, the individual would speak slower, also more distinctly, and would make fewer mistakes. And so it worked out beautiful as you saw in the rendezvous, and the end results you saw on television, and what you're seeing now. It's also been a great experience for us as far as a - way of communicating with each other. Over.
- 17 55 32 SCDR-OM (We - when we began working on the Apollo-Soyuz Program, the first part of our program was the working out of a rescue system and of a single, androgynous docking unit and testing of that unit. And now we can say that we have done - we have completed the major part - basic part of this program. We have tested these docking units. They work well and they hold us together tightly - strongly. This was the beginning of a large effort in standardizing future systems not just with both our governments or both our countries because future spacecrafts of our country and of the United States would use such units. But we suggest that other states - other countries which will dev - begin developing in this direction, we suggest that they should also have standardized docking units, so that they would be able to perform any kind of service and render any type of assistance to other crews in space. And it is pleasant to us that the beginning of this great grandiose human effort in space has been initiated by our crews here - by our crews of the spacecraft Apollo and the crew of the spacecraft Soyuz.)
- 17 57 22 CMP-CM Well, I think frankly, that the chances are very good, but I don't think it will happen right away. They say that - well, it would probably take at least 20 or 30 years before we would be ready as a world

to go out and explore a planet. I think that's probably reasonable. The only thing, in everything else that we have done, in aviation, for example, we've found that progress was always much faster than we expected. So perhaps the time will come when we will be thinking of exploring planets, probably together - within the next 20 years. I think that would be the way to do it. I think it would save us time, effort, money; it would pool resources, it would - in other words, it would be interesting and it would bring ben - bring back benefits to the whole world.

MCC-H Thank you, Vance. ...

17 58 42 ACDR-OM Well, when - as long as you have motion, you're going to have accidents. Needless to say that - we do all our - our utmost efforts to minimize all the risk. However, after a long period of time, you could conceivably and possibly have some mishap that would require a rescue. The total system we have demonstrated here - that new docking device, the rendezvous system using techniques from both countries, the communications procedures and techniques - could be available in the future if required. Not on an instant's notice, but it could be available. So I think we have taken a great step, that indeed we have opened a new era in the history of man on this, and it will be beneficial. Over.

17 59 47 SCDR-OM Thank you very much.

DMP-CM Okay. Now we're going to get the film. Okay.

SCDR-OM Valeriy, how do you read me?

SFE-CM Okay.

ACDR-OM Bo, how's the weather back in Houston?

DMP-CM Okay, we'd better start getting to work here, I guess.

CMP-CM Okay. ...

18 07 13 DMP-CM Okay, thank you.

DMP-CM Okay, I'll ... regular, anyway. ... your ...

CMP-CM Yep.

18 12 00 DMP-CM Okay, the problem is we've got ... right now.

18 12 29 DMP-CM Never can be sure. ...

CMP-CM ... Valeriy.

18 13 18 DMP-CM Oh, I know, I know why ... ...

DMP-CM Okay. Well, ... the ... thing that I do is Earth obs.  
... cloud cover ...

18 15 10 DMP-CM ... Yeah.

DMP-CM Okay. ... the floodlight down here. ...

DMP-CM Okay. ...

18 23 17 CMP-CM Alexey.

18 23 24 CMP-CM (Soyuz, how do you hear me?)

18 23 32 CMP-CM (Alexey, how do you hear me?)

CMP-CM Okay. Now.

CMP-CM ...

18 24 55 CMP-CM Okay. ... Valeriy, (...) Got that. (...) Okay.  
(...)

18 26 25 ACDR-CM How about letting me ...

CMP-CM Yeah. I've been looking for the cottonpickin'  
camera, only ... can't find it.

DMP-CM Well, take the one here, take the handhold, and ...

18 26 38 CMP-CM (Okay. Please speak.)

18 26 45 CMP-CM (...)

CMP-CM Okay. Boy, we've got some reconfiguring to do here.

DMP-CM ...

CMP-CM Okay. ...

DMP-CM ... Okay.

18 27 34 CMP-CM Okay. Well, we've got to change the lens on the other camera. I'm pretty sure.

DMP-CM ...

CMP-CM Yeah. Right. Remove wide angle. Now if I can find the wide angle.

DMP-CM ...

CMP-CM What?

DMP-CM ...

CMP-CM Oh. Well, I'm looking. I'm kind of worried, though, because I haven't found it. Oh wait. Oh boy, I wonder where it is.

DMP-CM Not there.

18 28 14 CMP-CM Nope.

DMP-CM ... Tom ...

CMP-CM No telling where he put it.

CMP-CM Would you call him, I wasn't able to get him a minute ago. I sure can't find it. I don't know what it looks like.

DMP-CM ...

18 29 10 CMP-CM Hey, Tom, how do you read?

ACDR-OM Loud and clear. How me?

CMP-CM Okay I've got you now. Hey, we're really hanging here, looking for the - the zoom lens for the TV. Do you happen to remember where that is? It's not in F-2.

ACDR-OM It's not in F-2?

CMP-CM No.

ACDR-OM Perhaps it's on the left side of the couch.

DMP-CM Wait a minute.

18 29 45 ACDR-OM Are you sure you don't have it up?

CMP-CM Okay. It's just that - -

ACDR-OM You know, I bet you'll find it up because that's where it was set up. I changed it out after - the tour yesterday. ... where it said change it to a wide angle.

CMP-CM Well. It's not in F-1, is it?

DMP-CM No. I doubt it. ... put it there because ... right.

CMP-CM Okay. Why don't you just go ahead and set up the angles, and I'll keep looking. Oh, boy. How in the heck - here it is. God damn.

ACDR-OM The only other place I can think is ... look in one of those TSBs, you know, either somewhere on the right or the left.

18 30 33 CMP-CM Okay. We found it. We found it.

ACDR-OM Where was it?

CMP-CM It was toward the very back of F-1.

ACDR-OM You mean F-2, don't you?

CMP-CM I mean F-2.

ACDR-OM Yeah. Okay. ... - -

18 30 47 CMP-CM There you go.

ACDR-OM - - in F-2 ...

DMP-CM Okay. ... I'm supposed to disconnect ... and move it here.

CMP-CM Okay.

DMP-CM I can't because I've got to go backwards, ...

CMP-CM Okay. What CCU do you want ...?

DMP-CM ... 9 ... 8.

DMP-CM Can you install it there?

DMP-CM ...

18 31 36 CMP-CM Okay.

18 31 43 DMP-CM I'll bet you those valves ...

CMP-CM ...

DMP-CM ...

DMP-CM ...

DMP-CM ...

CMP-CM ...

18 32 52 DMP-CM Did already. ...

18 33 44 DMP-CM ...

18 38 19 CMP-CM That camera in back of me won't see anything anyway. Nope. Oops. Okay. Valeriy, we got a good scene. This is a crazy attitude.

CMP-CM ...

CMP-CM Yeah. I guess I must be going backwards. Well, sideways at least.

CMP-CM Okay. Can I have your - comm cable Deke?

DMP-CM Yeah.

CMP-CM Thanks.

18 39 26 CMP-CM Houston, Apollo. How do you read? ... Okay. ... Ah. Okay. (Fine.) Houston, Apollo. How do you read? Houston, Apollo. Okay, no? Well, maybe we're too early.

18 40 18 CMP-CM ... Got to keep ...

18 40 34 CMP-CM Houston, Apollo. How do you read?  
 CMP-CM ...  
 CMP-CM Yeah. ... What do you think this is, Deke? Yeah.  
 Do you know what it is? Yeah. I see. I was just  
 wondering if you'd recognize it. Okay.

18 41 30 CC-H Apollo, Houston through MILA. Over.

18 41 37 CMP-CM Okay. Now - Let's see what we got to catch up on here.

18 54 05 SCDR-OM (Kubasov. Kubasov.)  
 CMP-CM Valeriy.  
 SFE-CM ...

18 54 18 CMP-CM (Speak.)  
 SFE-CM (...)  
 SCDR-OM Hey, Kubasov.  
 SFE-CM (Who is calling Soyuz 2?)  
 SCDR-OM (I am Soyuz. I am calling you.)  
 SFE-CM (What's the matter, Soyuz 2?)

18 54 37 SCDR-OM (Listen, did you connect TK-3 connector to J-box?)  
 CMP-CM Okay. This must be the - kit number 4.  
 SCDR-OM (Roger.)

18 55 03 CMP-CM Go ahead.  
 SCDR-OM (Moscow, this is Soyuz. How do you read me?)  
 SCDR-OM (Moscow, when I came over there, I connected our  
 TK-3 and mounted it there. Then, I returned it to  
 another mount, but I didn't disconnect the connector  
 according to the documentation.)  
 SCDR-OM (I wasn't supposed to do it anyway. Moscow, did you  
 copy?)

18 55 53 CMP-CM Gee, Bo, would you try again? You were cut out there, then.

18 56 10 CMP-CM Hey, Deke. If you're through, why, just put ... on sampling. If you're through there, we've got to finish the sampling and get going on that -

18 56 28 ACDR-OM Go ahead, Bo.

19 00 32 ACDR-OM Roger. Did you want to cover this presentation of seeds and these medals on TV? Over.

CC-H Roger. And we see you on TV now.

19 01 24 USA (... very well ... to MCC-Houston ...)

USA Affirmative.

USSR (...)

CC-H Command module, Houston.

DMP-CM Roger.

19 02 04 CC-H On panel 10, we would like to request you to check the S BAND thumbwheel to 3.

SCDR-OM ... you must have ...

CC-H Command module, Houston. Over.

CC-H Command module, Houston. That was the FM thumbwheel to 3.

SCDR-OM You will hold the ... please, beginning ...

ACDR-OM Okay, Bo. You ready?

CC-H Roger. We can see you holding the box there.

ACDR-OM Okay. (I'm beginning. Allow me to present to you on behalf of the United States of America, to give your people and your government a present of the United States, a present to your people.)

19 03 10 SCDR-OM I am sure good trees must grow from these seeds.



CC-H Apollo commander, Houston. We're not reading Alexey.

USA (... our contact ...)

ACDR-OM Okay. Say again, Bo. Did you see that?

CC-H We read you, but we didn't read Alexey during the last part of his acceptance.

SCDR-OM (How do you read me?) How do you read me?

CC-H (Now we read you, Alexey.)

USA ... get back to ...

ACDR-OM (Joint medal for the Soyuz-Apollo mission between the United States of America and the Soviet Union.)

19 04 49 SCDR-OM (Good evening, dear television viewers. ... it's already 22:00 hours in Moscow time. The final operations are taking place aboard the spacecraft. At this time - Tom, a little bit lower. That's it. Lower. At this time, aboard the Soyuz spacecraft we have Apollo commander Tom Stafford, while Valeriy together with Vance Brand and Deke Slayton are aboard Apollo. Our joint operations are coming to an end. We are concluding ...)

USA ... Apollo ... Number 330, Roger.

SCDR-OM (Our final operations ... Tom Stafford gave me pine seeds in this little red container - box ...)

USA ... Apollo ... read your ...

19 06 49 SCDR-OM (... growth on the territory of our nation. The final operations - medals joined in space. One half of the medal was launched aboard Apollo, and the second half of the medal was launched on Soyuz. And now we here in the orbit of an artificial Earth satellite - we join these two halves, Tom. The medal carries the emblem of our flight - docked Apollo and Soyuz spacecraft. On the reverse, two flags side-by-side - the flags of the Soviet Union and the United States of America. I am giving this medal to Tom Stafford, and Valeriy Kubasov will bring back from Apollo the other medal, which we will return to the Soviet Union.)

19 07 19 ACDR-OM Okay. (Thank you very much.)

19 07 26 SCDR-OM (What have we done in this time? We had very saturated program - had to do quite a number of operations in a very limited amount of time. We had to do a series of transfers, also watch the systems on-board our spacecraft. All this requires very careful monitoring, very careful observations. Also, at the same time, we had to perform a whole series of reports, still pictures, movies. We only had five people here between the two spacecrafts - five crewmembers, and that's really not enough people to do all the things that we had to do, but we had to find a way to do it.)

19 08 27 ACDR-OM Okay, Houston.

SCDR-OM (Give us the image ...)

SCDR-OM (... , how and where.)

ACDR-OM Okay. Command module, say again.

SCDR-OM (Who turned it off? We really shouldn't have anything bother anybody.)

19 09 36 ACDR-OM Vance, how do you read?

ACDR-OM Deke, how do you read?

DMP-CM ...

ACDR-OM Okay. I was just trying to get through with the rest of the - Deke and Vance are putting the - those medals together with Valeriy. They want - they're going to say something on TV, I was listening here.

SCDR-OM (Roger.)

19 11 27 CMP-CM Go ahead, Houston.

CC-H ...

CMP-CM (Yeah, we don't have the filter.)

CMP-CM Okay. We can look again.

CMP-CM Deke, do you mind -

DMP-CM Yeah.

CMP-CM Do you mind, kind of letting me get by here and I'll check for that filter again. But I sure don't know where it went. On that ... camera filters. Maybe I can find it.

CMP-CM ...

DMP-CM Yeah. Let me get ...

19 13 10 ACDR-OM Vance, how do you read; I haven't been reading you at all.

CMP-CM Okay, Houston. Reading you loud and clear; and, Tom, reading you loud and clear.

ACDR-OM Okay. I can read you now.

CMP-CM ... Okay.

CMP-CM Okeydoke.

DMP-CM - been up to.

DMP-CM Okay. You getting ... down there?

CMP-CM Yeah. I'm setting clock sync. If I can find it - if I can find the time.

DMP-CM ...

19 14 45 DMP-CM What have we got in here, Vance?

CMP-CM Supposed to - see, that was supposed to be, Deke, several things there. Signing certificates, one thing or another ... Okay.

CMP-CM (Soyuz, this is Apollo.)

SCDR-OM How do you read me?

CMP-CM (Good, Alexey. We've got about 50 seconds to time sync.)

SCDR-OM Yes.

CMP-CM (Giving count down now. 7, 6, 5, 4, 3, 2, 1 - )

19 16 04 CMP-CM MARK.  
SCDR-OM We are synchronized.  
CMP-CM (That's good.)  
DMP-CM Okay. That damn clock ...  
CMP-CM No.  
DMP-CM ... worry about that. ...  
CMP-CM Okay.  
SCDR-OM (...)  
CMP-CM (Yes. Yes.) Okay. (The other ...) Hey, ...  
CMP-CM If Bo will what?  
DMP-CM The filters aren't ..., Bo.  
CMP-CM All right. We're looking for the big camera filter,  
Bo. Hey, Tom, have you seen that?  
ACDR-OM Hey, Vance. It was either back on the one in 605 or  
in F-2.  
19 17 54 CMP-CM Rog. It's not in F-2.  
DMP-CM That's where it was the last I saw it, was in F-2.  
SCDR-OM Tom.  
DMP-CM Okay. Let's press on here. We're getting - -  
CMP-CM Yeah.  
SCDR-OM (...)  
ACDR-OM (Yes. ...)  
19 18 11 CMP-CM Okay.  
SCDR-OM Tom.  
CMP-CM (The hatch is open.)

ACDR-OM ...

SCDR-OM ...

CMP-CM (The hatch is open.)

DMP-CM Also, there's ... down here.

CMP-CM Yeah. ... say docking ... No. Let's look under the ... here ...

19 18 43 DMP-CM Okay.

CMP-CM Okay. Valeriy.

DMP-CM (Okay. Please.)

CMP-CM (...) Yeah.

CMP-CM (Yes. ...) Yeah. ...

CMP-CM Got you. Okay. ...

ACDR-OM ... in the bag. ... in the bag. ... which bag did you look?

DMP-CM Okay. I'll just put these back ...

19 22 08 CMP-CM I think we should put thse back in here, too. ... Where do you want me to put them ... Where do we ...? In what?

DMP-CM ...

CMP-CM Hey, they're falling apart.

DMP-CM ...

19 23 00 CMP-CM ... Okay. (Open. Yes, yes.)

DMP-CM No, not in ...

CMP-CM Huh?

DMP-CM ...

CMP-CM ...

DMP-CM Yeah.

CMP-CM You give me ours?

DMP-CM ... ours ...

CMP-CM Oh, okay. Good. (Good. This is - gave - I -)

ACDR-OM ...

CMP-CM ... Yeah. ... Yep.

DMP-CM ...

CMP-CM Okay. Except we've got something for him.

DMP-CM ...

CMP-CM Okay.

19 23 56 DMP-CM Valeriy? (...)

CMP-CM (Our hatch is open.)

DMP-CM ...

CMP-CM Yeah. (Help ...)

CMP-CM (After the flight, how do you say ... In America, we will print the time of launch and landing.)  
(Laughter) Lift-off and ... landing.

19 25 48 CMP-CM (What) Oh, yeah. Yeah. (This is -)

DMP-CM Okay. I've got the film.

CMP-CM (Yes. This is film.)

CMP-CM Oh! Okay.

DMP-CM Okay. I'm going up in the DM.

CMP-CM Okay.

DMP-CM ...

CMP-CM Where's the DM Checklist - -

DMP-CM I don't know, but where'd you put it ...

19 26 24 DMP-DM Okay. Okay. (We're beginning operations in the docking module.)

DMP-DM I think I put it there, Vance. Check and see.

CMP-CM Okay. All right.

19 26 40 DMP-DM Okay, Bo, if you're reading, I got the 35 flash ...

CC-H ...

CMP-CM Okay. I'm stowing AS-2 kits 3 and 4, ...

DMP-DM Okay, that's the - -

CMP-CM The bungee bags. Yeah.

DMP-DM I got them now. I think we ...

DMP-DM Okay. And I'll turn off the TV STATION SELECT and do the TV things here.

DMP-DM Okay. And I'll head for the DM.

CMP-CM Okay, just - yeah. You've packed the - you're - you're ... It's the DM TV camera prep, if you will.

DMP-DM ... - -

CMP-CM Yeah.

DMP-DM - - what to do.

CMP-CM Okay.

DMP-DM ...

CMP-CM Okay.

19 28 16 CMP-CM Okay. Guys do a ...

CMP-CM Go ahead, Bo.

CMP-CM Oh, okay. No.

ACDR-OM ... We're just finishing up - -

USSR ...

ACDR-OM - - the third - -

USSR ...

ACDR-OM - - period up here and relaxing a little bit.

CMP-CM (That's fine.)

19 29 04 ACDR-OM We've had a wonderful experience here. And Alexey and I are looking at the procedures to go through now. We also had a snack.

ACDR-OM Bo, are you sending the TV over to the Soviet Union at this time? Over.

ACDR-OM I'd like to just say hello to the people there.

ACDR-OM Okay.

USSR ...

ACDR-OM Okay. It'll take about a minute or 2.

CMP-CM Yeah. Oh. Deke, the ... - -

ACDR-OM (Dear Soviet television viewers. Allow me as the representative of the United States of America to send to you best regards from the people of the United States. This is a happy time for the whole crew. We're happy, very happy to receive - to be together here in the first international flight after 2 years of joint preparation and training. We astronauts and cosmonauts - not only - not only have worked together, but we've become good friends. I'm sure that our joint work, friendship, will continue, even after this flight.)

19 30 56 CMP-CM (...)



ACDR-OM (I am also sure, dear television viewers, that this flight will open the way to further cooperation and friendship between our two countries. The - yesterday's - let the things that went on yesterday and today in our flight be a good thing for both of our peoples. Thank you and good luck.)

USSR (...)

19 31 33 DMP-DM Hey, Bo, you reading the DM?

DMP-DM Okay. Over. Which TMs - or TV do you want back in here? We took one out, you know, and I'm supposed to check the monitor, and we've got nothing here - -

19 31 50 SCDR-OM Ladies and gentlemen of the press. You can see with me Tom Stafford, Soyuz - Apollo commander, today in space - -

ACDR-OM We ... see - -

SCDR-OM - - in orbital module of the Soyuz spacecraft, the representatives of two countries: Soviet Union and the United States - United States and Soviet Union. We are conducting - we are conducting our Soviet - -

DMP-CM ...

SCDR-OM - - our joint Soviet/American flight because our people - -

CMP Yeah.

SCDR-OM - - and our governments want to work together in spirit of cooperation between our country, because a lot of experts in the America and in the Soviet Union did a great job to make this flight possible. We worked together during - for 2 - for 2-1/2 years. We know each other very well. I know Tom Stafford; Deke Slayton, and Vance Brand are very hard-working guys. We like working together with them. Before our joint flight, we were a lot of times in the United States and the American astronauts were a lot

of times in the Soviet Union. Every time we knew each other better and better. We know a lot about America, American people, about American customs. We know what the American people want. I am very glad that today we work - we are working in space together with our good friends, Tom, Deke, and Vance. I'm sure that our joint flight is the beginning of very great cooperation in space. Thank you very much.

DMP-DM Go ahead, Bo.

ACDR-OM ... How do you read?

DMP-DM Yes, but which one?

ACDR-OM ...

DMP-DM You going to replace the one under ...?

ACDR-OM Hey, Deke, what step are you doing now?

DMP-DM Okay. I thought you wanted the TSB ...

DMP-DM Okay, ...

19 35 37 SCDR-OM Deke, how do you read me?

DMP-DM (Excellent, Alexey.)

SCDR-OM What are you doing now?

DMP-DM (First ...)

19 36 07 SCDR-OM (How do you read me?)

TIME SKIP

20 01 59 CMP-CM Bo, how do you read? CP.

20 02 57 DMP-DM ... Over.

CMP-CM Go ahead, Deke.

DMP-DM (... pressure ...)

20 03 37 SCDR-OM Partial pressure oxygen 120, CO<sub>2</sub> 4 millimeters.  
Okay?

ACDR-OM Yeah.

20 05 00 SCDR-OM Okay. We're going to proceed to open hatch number 4.

20 06 10 SCDR-OM Hatch number 4 is open.

CMP-CM ...

20 18 03 CMP-CM Roger. Loud and clear.

CMP-CM Okay.

ACDR-OM Hey there, Bo. We're all over in the DM here - or  
OM, rather - -

SCDR-OM (Laughter) Houston ... (laughter), Houston.

ACDR-OM - - with the old microbial exchange.

ACDR-OM Right.

CMP-CM Okay, Bo.

20 20 48 SFE-DM (Moscow, this is Soyuz 2.)

SFE-DM (... Not bad. How do you read, Moscow? This is  
Soyuz.)

SCDR-OM (Moscow, this is Soyuz. The situation onboard is as  
follows: We're conducting the microbial flora sampl-  
ing experiment; hatch 4 is open; final operation of  
the fourth transfer.)

20 21 39 CC-H Apollo, Houston. Through Newfoundland and then ATS.

CMP-CM Okay, Bo.

DMP-DM We're on step 16, Bo.

USSR (... Story.)

USSR (... of the fourth transfer.)

CC-H Did you understand. Step number 16 and if you have a DM Checklist in your hand, would you go to page 5-16, step 26.

DMP-DM Okay. Go ahead.

CC-H Deke, did you answer me? I thought I heard you very weakly.

DMP-DM Rog. Standing by for your info.

20 22 26 CC-H Roger. Where it says, "AC DM SOYUZ TUNNEL VENT ISOLATION - OPEN and DM SOYUZ TUNNEL VENT - VENT." Cross those two steps out, temporarily, and the Soyuz crew will give you an okay to vent the tunnel to vacuum.

DMP-DM Okay, do that later ...

CC-M (Repeat Soyuz 2.)

CC-M (... 1 millimeter)

USA Yeah.

CC-H They'll give you that okay later - perhaps 20 minutes or a half hour later.

DMP-DM Okay.

DMP-DM Good.

SCDR-OM (Okay, so the first phase is 6 minutes. The standard is 10 over a period of 6 minutes. For the second phase, after 20 minutes, the standard is 1 millimeter for 6 minutes and the ...)

USSR ...

DMP-DM Well - -

20 23 52 SFE-OM (Okay, I'll clarify it one more time. Are you listening? Two phases: First phase 6 minutes; standard is 10 for 6 minutes. Second step: In 20 minutes, standard is 1 millimeter for 6. If everything is normal, inform Apollo about hatch integrity and close the caps.)

USSR (... respectively.)

SFE-OM (And at what time?)

20 24 36 DMP-DM (... 00, 54:01:09.00 each.)

USSR (What happened?)

ACDR ...

20 24 50 CMP-CM Okay.

20 30 01 ACDR-OM Okay.

USSR-OM (...)

USSR-OM (...)

20 31 11 ACDR-OM Okay, Bo. We're hooking up to the - the TV cameras in the orbital module to DMI on the docking module.

CC-H ... the report.

USSR ...

USSR ...

20 39 08 CMP No, you just got rid of it, Bo.

DMP Sounds good now, Bo.

ACDR Yeah.

20 42 20 ACDR Roger. You're all set.

DMP-OM Yeah. They've been up for a while, Bo. They're already turned on.

CC-H ...

CMP           Go ahead.  
 CC-H           ...  
 CMP           Okay.  
 CC-H           ...  
 20 43 15      CMP           Yeah, that's verified. It's ON.  
 20 43 22      CMP           TV STATION SELECT is on CM, however - would you like  
                   that - UP TELEMETRY?  
 CC-H           ...  
 20 43 33      CMP           You got it.  
                   DMP-DM        Okay.  
                   ACDR           (Good-by.)  
                   USSR           (Good-by.)  
 20 48 31      DMP           (Good-by. We wish you the best of success.) We  
                   hope we've opened a new era in history of man.  
                   USSR           Good luck.  
                   ACDR           (Our next meeting will be on the ground.)  
                   DMP           (Step 20, Valeriy.)  
 20 50 06      SFE           20 is completed.  
                   DMP           Hey, Vance, can you read us?  
                   CMP           Yeah. Go ahead.  
                   DMP           Hey, Vance, you read?  
                   CMP           Yeah. Go ahead. Yes, I read. Go ahead, Deke.  
                   DMP           Okay, got to do a little reconfiguring here on  
                   panel 6: VHF FM to RECEIVE; AM, OFF; AUDIO CONTROL,  
                   NORMAL; verify POWER, OFF.

20 50 54 CMP Okay. It's in work.

20 51 22 CMP POWER coming OFF now.

20 52 47 DMP Okay, Vance. At panel 6 here, FM, T/R; AM, T/R, POWER ...

DMP (Two shutters.)

20 56 45 ACDR Okay, Bo. Valeriy's working on their hatch and getting things set up for the UVA eclipse.

ACDR Solar eclipse.

21 00 17 ACDR Okay, they're closing hatch 4.

21 01 01 ACDR Tunnel is closed. Hatch 3 is closed. (Hatch 3.)

ACDR Vance, you read? Vance, you read us?

DMP Hello, there.

ACDR Vance, how do you read?

ACDR Vance, you read?

USSR (...)

ACDR (Soyuz, how do you read me?)

CMP How do you read, Tom? How do you read, Tom?

ACDR Loud and clear, Vance.

CMP Okay. I assume you got the connector cables disconnected.

ACDR Yeah, right. ... disconnected those power ...

CMP Okay, we must be out of configuration.

ACDR Okay. Vance, would you set MASTER on the CM camera?

21 03 37 CMP Rog. MASTER on the CM.

21 04 36 CMP Houston, Apollo.

ACDR Houston - -

CMP Houston, Apollo.

CMP Roger. I have P52 results for you.

21 05 00 CMP Okay, stars 33 and 35; NOUN 05, all balls; NOUN 93, plus 00.129, minus 00.084, minus 00.088; and we torqued at 43:00.

CMP Roger.

ACDR (Soyuz, this is Apollo. We're getting ready to dump the pressure in tunnel 2. Over.)

SCDR We are ready.

ACDR (Read you.)

21 06 49 ACDR (I'm beginning the dump.)

CMP Hey, Tom. I've got the probe and the drogue in the tunnel. When you come through, we might temporarily put them in the DM so we've got a little working room.

ACDR Yeah, I think that's a great idea. Let's go ahead and we'll - we'll stow them up here for tonight. What do you think?

CMP Super idea.

ACDR Roger.

21 08 23 CMP Roger. Three POWER switches going OFF.

21 12 29 CMP (Soyuz, this is Apollo. How do you read me?)

SCDR (Real good.)

CMP (I'm beginning the maneuver for solar orientation.)

SCDR ...

21 13 22 ACDR (Yes, right now. Roger. ... how is everything going?)

ACDR (Soyuz, Apollo. Do you read me? You do ...)

21 20 51 SCDR Okay. Understand you. (...)



21 32 44   ACDR    Okay, Vance.  Let's position the ... valve.

            CMP     Okay.

21 34 19   CMP     ... five of up, too.  Okay?  I'm going to send  
                  container 4 up, too.

            DMP     Water?

            CMP     No.

            CMP     Seems to me that we're safe[?] for a few days.

21 36 26   SFE     Deke, how do you read me?

            DMP     (Okay, Valeriy.)

            SFE     We forgot four ... magazines.

            DMP     (... repeat please.)

            SFE     We for - ... magazines, in the DAC.

            DMP     (...)

            SCDR    ... We took film using DAC 02 - these magazines we  
                  forget - we forgot on the Apollo spacecraft.  Do you  
                  understand me?

            DMP     (Yes, understand, but ... when you land - after that,  
                  okay?)

            SCDR    You have to land it?

21 37 47   DMP     (Yes.)

            CMP     Hello, Dick.  How are you?  Good to hear your voice.

21 42 44   ACDR    Hello, Dick.  How are you?

            CC-H    Hi, Tom.  I'm doing great.  How about you?

21 42 49   ACDR    Well, ...

21 48 22   ACDR    Okay.  I'll check with him, Dick.

            CC-H    Okay.

CMP ...  
 21 49 31 SCDR How do you read?  
 ACDR (I read you loud and clear. How me?)  
 SCDR Okay, I read you loud and clear. Tunnel 2 pressure  
 check is okay.  
 ACDR (...)  
 SCDR ...  
 ACDR (...)  
 21 50 49 SCDR We're heroes.  
 ACDR (Heroes, yes. ...)  
 21 53 48 USSR (Kavkaz, this is Soyuz. How do you read?)  
 CMP Yeah.  
 USSR (Kavkaz, Kavkaz. How do you read? Over.)  
 ACDR It's a little over 5. A little over 5.  
 21 54 26 CC-H Apollo, Houston. Newfoundland for 7 minutes.  
 ACDR Roger.  
 SCDR (Kavkaz, how do you read?)  
 21 54 58 CC-H Apollo, Houston. AOS in Newfoundland for 2 minutes -  
 for 7 minutes, excuse me.  
 ACDR Roger.  
 CMP What do you want, Tom?  
 SCDR (Kavkaz, this is Soyuz. How do you read me? Over.)  
 CC-H And, Apollo, Houston. Just so we can keep our  
 record straight, wonder we - if we could verify a  
 couple of switches. One is on panel 181. Like to  
 verify that the TV AMPLIFIER has been put to BYPASS.  
 21 55 45 CMP That's verified, Dick. That's verified, Dick.

CC-H Okay. And the other one is - when we had data, which we don't have right now here at Newfoundland, it didn't look like we had started the - or - or got the WASTE STOWAGE VENT valve to VENT. So we'd like to just verify that those two callouts about 81 hours in the Flight Plan in the CP's column had got done.

CMP Yeah, that's done. We have the QD attachment on the waste vent, and the ...

21 56 23 CC-H Okay, real fine. We'll be locking up on the ATS here very shortly. Sometime this evening, I've got a new block data pad for you. So, at your convenience, we need you - somebody gets out the Updates Book, I'll be glad to read it up.

21 56 36 CMP Okay, maybe we can get it, as soon as we have ATS.

21 56 47 SCDR (Kavkaz, ... in simplex mode ... band but they aren't responding yet.)

TIME SKIP

22 44 05 ACDR Real good. Thank you, Dick.

CC-H Okay. ...

ACDR Okay.

ACDR ... cue card. ...

ACDR Oh. Hold that for the UVA.

22 45 43 ACDR ..., what about ...? ... put those up ... Deke, go get the UVA cards out now.

ACDR You need to ... this ... is about all it says. Okay, ...

ACDR ...

22 48 09 CMP Houston, Apollo.

22 53 07 ACDR Yeah. We're supposed to go to bed in a couple of hours.

ACDR Vance, what have you got ...?

ACDR Does ... leave that ... zero?

DMP I didn't. I thought you meant while ...

ACDR ...

ACDR ... leave on the ...?

ACDR ...

DMP ...

22 56 49 ACDR ... hell of a long time ...

ACDR ... Well, what's ...

DMP ... Oh, man!

ACDR ...

22 59 30 ACDR Here, Deke.

ACDR You know ... Deke, you got any idea what - Oh, I see. ...

DMP Where's that Kleenex you were using? ...

ACDR Oop! ...

ACDR ...

ACDR ... that's ...

23 05 36 CC-H Apollo, Houston. Apollo, Houston. 1 minute until LOS; Goldstone at 82:57. See you there.

23 17 08 CC-H Apollo, Houston. Short pass at Goldstone for 2 minutes.

CC-H Apollo, Houston. Short pass at Goldstone for 2 minutes.

ACDR Houston, go ahead.

23 17 43 CC-H Tom, we got a real low elevation pass at Goldstone, just a couple of minutes here. We'll pick you up at Newfoundland in about 10 minutes from now.

23 24 58 ACDR Well, there's coffee in here but I'll be damned if I can see it.

ACDR All right.

23 26 27 ACDR Pardon me? ...

23 26 54 ACDR I think I could have ... it.

23 26 58 CC-H Tom -

ACDR Here it is.

23 28 18 ACDR We might as well drink some coffee. We'll probably have to ...

23 28 49 ACDR What - what do you do - what do you think of getting the purge on.

# # #

DAY 200

00 18 03 ACDR Okay, ... that.  
ACDR Where's the presleep ...? 1-49.

00 20 05 ACDR Cycle the H<sub>2</sub> FANS. Chlorinate the potable water.  
...  
ACDR Cycle H<sub>2</sub> FANS, S1-8. Okay, ... Okay. ON  
sequentially at 1-second intervals for 1 minute,  
then OFF. H<sub>2</sub> FANS 1 and 2.  
ACDR Okay. Clean CIRCUIT RETURN valve behind 382. ...

00 22 30 ACDR ... CABIN PRESSURE RELIEF valve ... NORMAL.  
PRESSURE EQUALIZATION VALVE, CLOSED. DM TUNNEL VENT  
valve, DM/CM DELTA P. Now, the only thing is ...

00 23 25 ACDR Okay. That does it. I've already got ...  
ACDR ...  
ACDR All we need is to fix the ... Get this ... bracket  
... ... film back in there ... Anybody else ...

00 25 16 ACDR ... furnace ... furnace ops, page 7-3.  
ACDR Oh. Canister change. 9 into A and stow 7 in D-4.  
ACDR That's all right. We can make them go. ...  
Okay. ...  
ACDR ...

00 28 07 ACDR ... Say what?

00 28 20 ACDR You want to turn on the cabin fans? ... cabin fans  
... CABIN FANS coming ON.  
ACDR No. There's nothing here, it's ...  
ACDR ...

00 31 11 ACDR Is that chlorine coming out? Can you tell, Vance?  
Good God.  
ACDR The whole thing leaked out?

00 31 52 ACDR All right. I don't think we ought to call the ground  
on it. ... we did have the ...

ACDR Hey, if I do this whole - the whole thing's going to ... .. makes it better, it'd be all right. ...

ACDR ...

CMP Yes, both ...

ACDR ...

00 46 18 ACDR Hey! PARTIAL PRESSURE's up ... Get it down ... It's up to 6 psi. Fuck! ... up. ... down.

00 47 15 ACDR Is it down?

TIME SKIP

08 18 30 CC-M (Give it to us unformatted first, then 2, and then 14.)

USSR (53.)

USSR (Squares ...)

USSR (10.)

CC-M (... per format.)

SFE (\*\*gram - ... will be in format 2 because Alexey transmitted the 14th.)

SFE (\*\*gram 2.)

USSR (...)

08 20 45 CC-M (Current - please repeat the current and activation time.)

USSR (...)

CC-M (... 67th is 1651. And the seconds?)

CC-M (Roger. Copy.)

USSR (- of potassium.)

USSR (...)

USSR (Under ... monitoring.)  
CC-M (We got everything. You don't have to give us an  
acknowledge.)  
CC-M (... isn't necessary. We have format 3, also.)  
SFE (... begun. Well, okay, we'll prepare it. We'll  
prepare it all.)  
08 29 28 CC-H Apo -

TIME SKIP

09 41 51 CMP Yeah. I guess it does look a little out of focus.  
SFE (Number 12 ... the 14th and the 13th also ...)  
CMP Okay. How's the focus.  
DMP Well, anyhow ...  
ACDR ... turned on ... - -  
CC-M (...)  
SCDR (We opened the MPS valve ...)  
CC-M (Right.)  
SFE (The pressure is 620.)  
09 43 16 CMP Yeah, we - we were kind of wondering why - what it  
would be like ...  
CMP I think we'll have to give you some wakeup ... re-  
turn sometime.  
CC-M (Report your current pressure.)  
DMP ...  
CMP ...  
09 44 40 SCDR (We have now collected all equipment to be returned  
and stowed in the container. There's quite a bit of  
it. After we've finished -)



CC-M (We'll report on the systems. That's okay, just ...)

09 45 59 CMP Yeah. ...

DMP ...

SFE (... 710.)

ACDR (...) ... the outside plane.

SFE (... 780.)

CMP (...)

SFE (... 790.)

09 47 38 CMP I think it's the - it's from the attitude of the ...  
 because I don't know ...

ACDR ...

CC-M (I didn't copy you.)

SCDR (The pressure is 780.)

SCDR (... 790. At the hundred mark, it will go 800 -  
 795. The pressure is 800.)

CC-M (... when you release pressure the valve will freeze,  
 so about 100 millimeters from what you want, it  
 should be moved, otherwise it could freeze and not  
 close.)

SCDR (The valve handle is now closed.)

CC-M (... how much did you use up?)

SCDR (Moscow, this is Soyuz. How do you read?)

CC-M (Copied 00.)

SCDR (Roger.)

USSR (Okay.)

CC-M (Go ahead.)

SCDR (Transmit an example.)

CC-M (... 51.)

SCDR (... 44, 45.)

09 54 27 ACDR ..., Deke, ...?

DMP I'll give you that ...

ACDR ...

SCDR (This sequence will be done from TA-1 (laughter) with TK-1.)

CC-M (Which sequence is this?)

SCDR (TV-14.1, operation per plan. TK-1 is on bracket TA-1. But there's no TK - oh, the continuation - Yes. Now it's clear, it's clear.)

CC-M (Not TK-1, but TA-1.)

SCDR (Correct, correct, we understand it all now.)

CC-M (Fine. Thank you.)

SCDR (We understand - not just TV-14.1 but also the continuation of TV-14.1.)

ACDR ... better.

DMP What?

09 56 55 ACDR ... That docking has gone softer than ... docking. When they're docked - has gone softer ... The fact that ...

ACDR Huh? Yeah. I was ... Why don't you go over there. I'm not cool over here yet.

CMP Boy, I'm sure going back to the ... Huh?

ACDR Whoever picked this attitude ...

CMP They're just going for ...

09 58 23 ACDR Oh, they're ... What about ... LiOH ...? 10 into B; stow 8 in D-4. 9 to A and 7 to D-4. ... 9 and 10.

ACDR Huh?

DMP ...

DMP Yeah.

10 04 30 ACDR Vance, you got a ...?

CMP No.

ACDR ...

CMP ...

ACDR ...

ACDR ... the ground ...

CMP I tell you, Tom, ...

ACDR Better still, we'll give ... a call and ...

10 04 58 CMP I - I don't think ...

ACDR I don't either. ...

ACDR ...

CMP ...

ACDR ...

CMP Okay.

ACDR ...

CMP ...

ACDR ...

10 06 57 CMP Boy, we all better strap ...

ACDR Oh, yeah. (Laughter)

ACDR Okay. It says ... - enter the ..., right?

CMP Yeah.

10 07 42 SCDR Apollo, Soyuz. How do you read me?

CMP ... (Well.)

SCDR Tom, how do you read me?

CMP (Well.)

ACDR (Very well, Alexey. How do you read me?)

SCDR I read you loud and clear. How are you, Tom?

ACDR (Very well. We slept ...)

10 08 09 SCDR We slept well, too. Tom, we are getting ready for undocking.

ACDR (Very well.)

ACDR Okay. ... LiOH ...

10 17 52 CC-H ... the one that you end up installing on panel 11 to be put in MASTER, and the one that you take over to 871 to be in SLAVE. That's just changing the position on each of those cameras.

10 18 04 CMP Roger. Panel 11.

CC-H And I'll be saying good evening to you and talk to you in the morning.

ACDR ...

10 18 25 CC-H Morning, that is.

10 25 50 CMP ... Flight Plan.

10 26 47 CMP (Soyuz, this is Apollo.)

CMP Hey, Tom?

10 28 53 CMP ... (Soyuz, this is Apollo.)

ACDR ... Yeah, ...

CMP ...?

ACDR Yeah, they ...

ACDR ...

DMP ...?  
ACDR ... the last dock ...  
ACDR ...  
10 32 40 CMP Yeah.

TIME SKIP

11 00 33 DMP See any ... buildup ...?  
CMP You know, thunderstorms look a lot closer to you.  
Yeah.  
DMP Oh, hey, Vance.  
CMP This one here? Okay?  
DMP ...  
CMP Yeah. That's what I said - that's what I said at  
first. That's one of my ...  
11 01 07 DMP ... me too ... I didn't see ...  
CMP Look at them. Are they pipes or are they mountain-  
tops?  
DMP They look like - look volcanic to me.  
CMP We're going to come up on Cairo in a minute.  
CMP I ...  
CMP Yeah.  
11 02 06 CMP Right. Time to what?  
CMP There you go. That all right?  
CMP Look at that country.  
DMP Beautiful.  
DMP Yeah. ...

11 02 54   CMP       There's Cairo.

              DMP       Now here's the - here's the Red Sea right off to my  
                          left. Come right over ...

              DMP       Unfortunately, Bo, we need about all we can get for  
                          visibility.

              CMP       Boy, there's Cairo. Really - -

              DMP       There it is. Boy!

              CMP       No problem.

              DMP       Oh, great! ...

              DMP       Yeah. We want everything we got.

11 03 26   DMP       Say, that stuff's pretty ... right there.

              CMP       Yeah. See the pyramids?

              DMP       Yeah! (Laughter)

              CMP       My God! I think I did. I've got to get a map though.

              CMP       Gosh, look at that! Look at that water. (Sneeze)

              DMP       I know where we're supposed to be, but I'm not sure  
                          I - we're going too fast.

              CMP       We're going to get a good view of the Levantine  
                          Rift here.

              DMP       ... we have a fantastic view of the -

11 04 15   CMP       Houston, look. We - we've got some fantastic view-  
                          ing and picture taking of Africa right now.

              DMP       No, we're in the Middle East right now.

              CMP       I know.

              DMP       Hey, that's Israel right down there. There's the -  
                          there's the Sea of Galilee. ... God damn - Boy,  
                          that's ...

              CMP       Yeah.

CMP Okay, I think we're ...

DMP ...

CMP Okay.

11 05 58 DMP Now's the time to use the tape recorder ...

CMP Yeah, we'll ...

DMP ... use the ...

CMP ... Baykonur.

11 06 54 DMP Okay. ...

CMP You got all the maps there.

DMP No. ...

CMP Yeah. I think you're supposed to have them.

DMP ...

CMP ... 66. Tom, you need to get the map out of ...

CMP Yeah. We got to find out where we are real - fast  
and then see if we can get Baykonur. We're ...  
R-3 ...

11 07 53 DMP Okay. ...

CMP Okay, we'll see if we ... around - -

DMP ... 06.

DMP Got to be exact about this. ...

DMP I don't know, but they're obviously - getting to be  
...

CMP Yeah.

DMP ... like - -

CMP Yeah.

11 09 08 DMP If it's half as good as ours, you ought to be having  
a ball.

CC-H ...

CMP Okay. Does that help?

DMP Okay. I've blocked the number 1 window here with a  
map. Is that helping you some?

DMP It should be around ...

CMP Yeah. We've got to be going north of it.

ACDR Yeah.

DMP I'm going to have to take it down periodically to  
get a view here.

DMP Yeah, it's ...

CMP Well, I'll ...

CMP Tom, ... we'll get ...

DMP Yeah.

CMP Yeah.

11 10 33 DMP That God damn caution and warning!

11 10 40 CMP I don't know why we're getting that now. ...

DMP ...

CMP ... ..

DMP ...

CMP ...

DMP ...

CMP ...

DMP Hey, could I get me one?

CMP Let's see. I guess they want the windows ...



CMP Why don't we just put it up ...  
 11 12 28 DMP I'll put this one in this window, Vance. ...  
 CMP I hate to do it to the better one.  
 DMP ... this window here now ...  
 DMP I'll cover this one ... the cover ...  
 CMP Tom?  
 ACDR Yeah.  
 11 12 46 CMP Do you feel this is more ..., covered?  
 ACDR What?  
 DMP I don't mean to - -  
 CMP They need us to ... plan ...  
 ACDR It did?  
 CMP Oh, a little while ago.  
 DMP This window, here, is the only one ...  
 ACDR They want this one ... out. Hell, I just put one up  
 here with no problem.  
 CMP Oh, yeah. ... that's ...  
 DMP ... won't bother you. It's only in window 1.  
 ACDR It's only window 1 and the hatch ...  
 DMP I've got window 1 covered but it's ...  
 11 13 17 ACDR Hello, Houston; Apollo.  
 ACDR Roger. For a change, we thought we'd give you some  
 wake-up music.  
 11 13 32 USA (Music: "Proud Mary")  
 ACDR Hey, wake up.

11 15 10 SCDR (Apollo, this is Soyuz. How do you read me?)

DMP Yeah, you probably drowned him out ...

ACDR No, I turned off the FM.

DMP Oh, okay.

SCDR (Apollo, this is Soyuz. How do you read?)

ACDR (Excellent. How me?)

SCDR (I hear you poorly with a great deal of interference.)

ACDR (Repeat please, Soyuz ...)

DMP ... talking to Moscow ...

SCDR How do you read me?

ACDR Hey, Houston, we'll have the - and other good selections for you later on.

CC-H ...

11 15 50 SCDR Hey, Tom, we are now in orbital module. In 2 minutes, we are going to go to descent vehicle.

CMP Houston, Apollo.

CC-M (Moscow. Soyuz, how do you read me?)

SCDR (I read you excellently. We are now in the orbital module, in our spacesuits. We are transferring into the DV.)

ACDR ...

SCDR (Onboard everything is normal. The pressure is excellent and everything is on schedule.)

ACDR I turned off the FM ...

11 16 40 CMP Houston, Apollo. Occasionally, we get some very good viewing because of attitude, weather, et cetera. We just now got a couple of visual observations, things that we haven't been able to get as well before. For example, saw the Levantine Rift and Egypt. I think might have seen the pyramids; that's an ... map that we have. And now I've got to see a picture or a layout of - of how the pyramids are laid out when we get back. But I saw two specks that might have been pyramids.

ACDR ... was on the river, west - west of the river?

CMP We think they're the pyramids of Egypt, and that happens to be a visual observation ... had.

SCDR (Will the PEV valve remain open or closed.)

ACDR It was on the west side of the river, west of Cairo?

CMP Yes.

ACDR You want me to turn this off?

CMP No. Don't touch it.

CMP Right.

SCDR (... and repeat it again.)

DMP Now's a good time to comment we haven't done much good work in that area so far due to a combination of cloud cover and time constraint.

11 18 31 MCC-M (... the PEV cap.)

SFE (Roger.)

MCC-M (We've got some kind of loud noise.)

SFE (Roger. We get that periodically.)

MCC-M (... we didn't understand because of loud noises.)

SFE (No. It's the OM electrical controls.)

11 19 05 ACDR Okay. We give them an undocking time at ... - -  
DMP ...  
SCDR (...)  
ACDR - - 95:43.  
DMP Soyuz, Apollo.  
DMP (Soyuz, Apollo.)  
SFE (Moscow, Soyuz. We are transferring to the DV.)

11 19 52 ACDR Huh? Yeah, change places. Yeah.  
SFE Apollo, Soyuz. Apollo, this is Soyuz. How do you read me?  
DMP (Valeriy, I read you okay.)  
SFE Quite well.  
DMP (Good. The undocking time now is 95 hours 33 minutes 20 seconds GET.)

11 20 30 SFE Thank you, Deke.

11 23 26 ACDR It does feel good to wrap those - wrap that ...  
CMP Yeah.  
DMP ...  
ACDR Let's see, undocking time is 95:43.0, right?  
DMP ...  
ACDR And, ... you got a P52 option 3 coming up ...  
ACDR 95:10. 6 or 7 minutes. You have plenty of time ...  
ACDR Yeah. I feel a hell of a lot better. ... pulled out more for you?

11 24 38 SFE (... this is Soyuz 2. I'm in the DV.)  
USGR (...)

SCDR (...) (one moment.)

USSR (...) (Has (...) been cut off on OMP?)

SFE (... Didn't understand the last part.)

MCC-M (...)

SFE (Roger.)

SFE (Roger.)

11 27 38 ACDR Okay. We've got the clock counting up.

DMP (Moan)

ACDR Okay. We're going to undock at 43. So, 20 minutes before that.

DMP Okay. ...

ACDR Say, 95:23.

11 28 04 DMP Okay. ... ..

11 29 03 DMP Okay. PRO, PRO. Do not activate.

11 29 18 CMP Yeah.

11 29 20 DMP Okay. G&N POWER - OPTICS POWER, on ... P52 option 3.

ACDR ... ENTER, VERB 46.

DMP Huh? We PRO, PROed and everything.

ACDR Okay. Okay. Just leave it like that. Go back to POO.

CMP You say POO?

ACDR Yeah. ... back to POO. ... Reset to POO. And then we can go back to - hold it.

11 29 57 ACDR ..., when we torque, will POO wipe out that P and P? Will POO wipe out that P and P? POO's okay.

DMP ... supposed to torque ...?

ACDR Yeah. ...

DMP Okay. But I can't see ...

ACDR Go back to 37.

DMP VERB 37 ENTER?

ACDR Yeah. Again, the POO does not wipe out that P and P. Go back to VERB 37 ENTER zero-zero.

11 30 32 DMP Okay. VERB 37, ...

11 30 39 ACDR Well, that fucking O<sub>2</sub> HIGH FLOW ...

DMP Okay. Now, ...

11 30 49 ACDR Okay. G&N OPTICS POWER, on; P52. Says 35, 36, and 40 are the stars. ... You've already done that.

ACDR ... to get the DET counting.

11 31 20 DMP ... do that. Okay, what time is it?

ACDR 95:43:20.

DMP Okay. 95 - -

ACDR ... make it 20. So say 12:20 - 12:43, make 31. Take it to 29 and we'll ...

ACDR Okay. 3, 2, 1 -

11 32 25 ACDR MARK it. Push hard. (Laughter) ...

DMP ...

ACDR ...?

DMP ... Wish that thing had decent lights.

ACDR Oh. Well - we had, you know, luminescent lights on the docking - the old lunar module type.

DMP Yeah.

11 33 50 ACDR Man, that was something. ... spotlight again, Deke.

DMP ...

ACDR Huh?

DMP ...

ACDR All right. One, two - one, two, three, four.  
Okay ... Deke. Noun 89 or ...

DMP 89. Okay.

ACDR Yeah.

DMP Okay. What next?

ACDR VERB 49.

DMP 49? Okay.

11 34 25 ACDR 95:14:15. Okay, why don't we deactivate the primary  
evaporator? ...

11 34 54 ACDR Okay, now that you got that, we can realine the GDC  
to the IMU.

ACDR Is Myrtle off?

ACDR Myrtle.

ACDR Has that got - Have we got the ... bag on?

DMP ...

ACDR Have we got - we got - we do have that - we do have  
that, Vance. If the waste stowage vent is closed,  
it'll help ... Is it closed? We got that - we got  
that elbow on it. It's supposed to clear out. No  
problem. Okay, there. We're ready in a little bit  
to command OPTICS ZERO, ZERO; G&N POWER, OFF - OPTICS,  
OFF.

CMF Deke? Do you verify CMC in AUTO?

11 36 21 DMP CMC in AUTO.

DMP Okay. We go back to ...

ACDR Okay, I'm about ready for undocking to begin. Oh.  
Come on ... CMC.

11 36 50 ACDR (Soyuz, Apollo. Over.)

SCDR - - ... Tom.

ACDR (Ours also. Please, excuse me. And how is your  
radio range?)

SCDR Okay. Ranging on, Tom.

ACDR (Thank you.)

11 37 12 DMP I don't know; couple of them in the boxes. There's  
a couple of them in the boxes. I don't know.

11 37 16 ACDR VHF AM, off, center; B to DUPLEX.

11 37 22 ACDR ANTENNA, RIGHT, verify; on the VHF gain over there.

DMP I didn't see it, Tom, but a couple of them the other  
day was in them boxes.

11 37 35 ACDR What's your DET reading, Deke?

11 37 39 DMP 34:12. Okay. ... You know - Getting dark yet?

11 37 55 ACDR Okay, go back to P00. Let's give them a mark at  
... and 24. (Soyuz this is Apollo; 5 minutes to sync  
of clocks. Over.)

SCDR Roger. We have 5 minutes before sync the last time.

ACDR Okay. ...

DMP ...

ACDR Yeah.

DMP (Yawn)

CMP Okay, that's -

CMP We got everything configured.

ACDR We got it configured ...



11 39 27 CMP Yeah. ... zeroed in.

CMP ...

ACDR ...

CMP Now, I wonder where my other tape recorder is - I wonder if it's in the same place.

ACDR Could be.

CMP Oh. Okay. Hey, why don't you grab the ...

11 41 36 ACDR I don't know about you guys, but I'm hot.

CMP ...

ACDR Yeah. ...

CMP ...

USA (Music)

CMP Yeah.

ACDR Who played this ...

11 42 02 CMP We'll have to try the girls' showers - -

ACDR Yeah.

CMP - - ... week.

ACDR Yeah, yeah. Girls' showers. (Laughter)

CMP We ought to do that while we're still docked.

ACDR Oh, hell yes!

CMP Yeah, why don't we ... Saturday? ...

ACDR (laughter)

USA (Music)

11 42 28 CMP Okay.

ACDR Okay, we're going to ...

DMP ... coming up. ... 20.

ACDR Okay.

DMP How did you ...?

11 42 51 ACDR Why don't you do it? I don't like the dumb thing.  
(Laughter) I've got one here that says it'll be at  
43:20.

DMP Yeah. 23:20.

ACDR 23:20, right.

DMP Okay.

ACDR Yeah. (Soyuz, Apollo. Ready?)

SCDR Okay, ready.

ACDR (Okay. 3, 2, 1 -)

11 43 25 ACDR MARK.

SCDR (...)

ACDR (Laughter)

ACDR (...)

SFE (...)

DMP (Laughter)

CMP ... it's my turn.

SFE (You're a genius.)

CMP ...

DMP (Laughter)

ACDR ...

CMP ...

ACDR ...

11 43 58 CMP Okay. You want to hear about what you don't do with this translation ...?

DMP No, I don't want to know; Bo might, though.

CMP Okay.

DMP ... translator?

11 44 08 CMP Yeah.

11 51 04 ACDR Okay.

CMP Hell, they're off.

11 51 07 ACDR Oh, I see. Okay. The pump's off. Every - The evaporators are off now, Bo. Yeah. We had the EVAP, OFF \*\*\*

ACDR Okay. There we go. Okay. I'm going to turn - active undocking.

DMP Okay. We have to ... Soyuz. ...

ACDR ...?

CMP Yeah.

ACDR It says here ... Okay, Deke, ...

11 51 52 DMP Yeah.

ACDR Okay. Push the ... coming in.

11 52 06 CMP Okay. It's locked, Deke.

11 52 07 ACDR Okay, back to the right.

CMP All systems ... it says here. ...

ACDR Okay.

CMP Deke, degrade systems. ...

DMP Yeah.

DMP Okay. ...

CMP ...  
 CMP ...  
 11 53 00 ACDR SERVICE MODULE RCS QUAD ... OFF. ...  
 ACDR ..., I'll tell you.  
 11 53 22 DMP We got it at a ...  
 ACDR ...  
 CMP Deke, ...  
 ACDR Okay. ... check that DAP?  
 CMP All right.  
 11 53 54 ACDR Set for 1111?  
 CMP ... five 1's, 146, ...  
 ACDR Yeah.  
 CMP 5 NOUN [sic], push.  
 11 54 09 ACDR Yeah. ... activate the ... .. activate ...  
 Right here. ...  
 CMP Yeah. ...  
 DMP When you activate ... right in ...  
 11 54 35 CMP Deactivate the evaporator. Here let me get ...  
 ACDR ...  
 11 54 43 ACDR High-gain angles are MANUAL, WIDE; pitch, minus 18 -  
 DMP ...  
 CMP Well, any time you get to take the -  
 ACDR Pitch is minus 18 and yaw 220.  
 DMP ...  
 CMP ...

CMP Right there; right ...

11 55 34 ACDR ... 61102. ... and all that.

CMP It better ... you get ...

ACDR ...

CMP Yeah. Well, I was - ...

ACDR ... anywhere. ... Okay. Let me ...

CMP Yeah.

ACDR ...

CMP Tom?

ACDR Yeah.

CMP ... a little difference between 26 000 and 4000.

ACDR Okay. ... Yeah. ...

CMP Yeah.

ACDR ...

11 56 40 ACDR Okay. I got high-gain set. Active undocking ...  
Okay. GUIDE RING CAPTURE light ... 55 go to the  
active undocking ...

DMP ...

ACDR ...

CMP ... TSB over there.

CMP Right here.

ACDR Where? Over here?

CMP Yeah.

ACDR Got the Nikon in here?

DMP ...

ACDR ...

CMP How about the Hasselblad?

ACDR (Cough) Nikon, stay down here.

DMP Okay. ...

CMP ... Tom, ...

ACDR Yeah.

DMP ...

CMP ...

CMP (...)

11 58 43 ACDR Okay. ... Okay. We're going - we're going to A,  
MAIN BUS ...

CMP Ready to go into ...

DMP ...

CMP ...

DMP ...

CMP Yeah. We got to watch this ...

DMP ...

11 59 08 SFE Apollo, we are opening active hooks.

DMP ... All we have is ..., right?

ACDR (... open.)

11 59 26 SFE ... I don't understand you Tom.

DMP (We have opened the active hooks.)

SFE Okay. Open active hooks

11 59 37 ACDR Okay; 56. AUTO RCS SELECT, twelve. MNA; B/D ROLL  
is OFF, all of them - is OFF.

11 59 49 DMP Okay. I'm supposed to do a VERB 46. ...

11 59 56 ACDR VERB 16 NOUN 04 ENTER; SPACECRAFT CONTROL CMC in  
FREE ...

DMP ...

USSR Tom, interface seal compressed off.

12 00 09 ACDR (Roger, Roger.) Okay. RHC, trim R2 and R3, pitch  
and yaw to 0, fly from errors.

12 00 21 CMP ROLL, OFF.

ACDR B/D ROLL, OFF. Thank you. All of the twelve, OFF.

CMP Okay, now.

ACDR Okay.

CMP We should - -

ACDR ...

CMP Yeah. Okay, it's ...

ACDR ...

DMP That yaw there? That's roll, pitch, yaw ...

ACDR Yeah. Yaw's started.

CMP Yeah. Got a good yaw.

ACDR ... I can feel is ... roll. Boy, ...

CMP ...

ACDR Huh? Oh.

CMP ...

DMI' ... great yaw.

ACDR ...

12 01 24 DMP Great big yaw.

ACDR ...

CMP Yeah.

ACDR ...

CMP Yeah.

ACDR Soyuz.

12 01 39 ACDR (Soyuz, this is Apollo. Ready. How do you read?)

SCDR We are ready for undocking, Tom.

ACDR (Roger.) ... coming up at 59. Okay. All your ...

DMP ...

ACDR Okay. Let's put - -

DMP ...

ACDR Let's put our ... in here, okay?

12 01 59 ACDR BMAG MODE, three, ATT 1/RATE 2; SPACECRAFT CONTROL, SCS; do not control roll attitude; EMS MODE, NORMAL.

DMP ... run through that again ... CONTROL - -

12 02 12 ACDR SCS. EMS, NORMAL. - -

SCDR ...

ACDR - - STATION SELECT CM/CM2; TV - VTR POWERS, three, ON.

12 02 35 DMP ...

12 02 38 ACDR Yeah. ... VTR HEAD WHEEL MOTOR DRIVE, ON.

12 02 42 CMP Okay. ... - -

12 02 43 ACDR VTR TAPE, RECORD; DAC on.

12 02 48 CMP Okay.

ACDR We'll quickly count down to it. You got 15 seconds to go.



CMP ...  
 12 02 55 ACDR Stand by to CAPTURE LATCH B. Stand by.  
 CMP Okay.  
 SCDR We are standing by.  
 12 03 06 DMP About 20 seconds ...  
 ACDR Okay, 20 seconds.  
 DMP Ready.  
 ACDR You got ...?  
 DMP ...  
 ACDR Yeah. Okay.  
 CMP ...  
 ACDR Stand by.  
 CMP Okay, it's 5 to go.  
 ACDR (Ready for undocking 5, 4, 3, 2, 1)  
 12 03 25 ACDR MARK.  
 12 03 26 SCDR We have undocked.  
 ACDR (Undocking.)  
 DMP Okay. We got about four in there.  
 ACDR Okay. CAP - -  
 SCDR ...  
 ACDR - - seconds to go minus X for 3.  
 CMP Okay, Tom. What's next?  
 12 03 39 ACDR Okay. Okay, CAPTURE lights A and B, out and LATCH  
 to down.  
 12 03 40 CMP Capture LATCH A and B, I did it. ... down, ...

ACDR All right. At 15, we're supposed to thrust to ...

DMP Are we ...?

CMP At 30, we go minus X for ...

12 03 56 CMP Now.

ACDR Okay.

DMP Okay.

ACDR We could have checked that.

CMP Okay.

12 04 11 ACDR Okay, then, at 3 minutes, we go DSE, LOW BIT RATE.

CMP Got about a 1-degree error. ... line that up on that - -

ACDR ...

CMP I don't know what it was when it shut off, there.

DMP ...

CMP In?

DMP In.

ACDR No. I got it.

DMP ...

ACDR ...

DMP ...

12 05 08 ACDR Okay. Let's go for 3 minutes. ...

DMP ...

ACDR 3 minutes. ...

DMP ...

ACDR ...

DMP ...

ACDR I'm looking for ... ..

12 05 57 CMP (Soyuz, this is Apollo ...)

SCDR Roger.

DMP ...

ACDR Coming up ...

DMP ... 3 minutes ... MAN ATT, RATE COMMAND ...

12 06 35 ACDR - - LOW BIT RATE; DAC, off; MANUAL ATTITUDE - DAC, off, Deke?

DMP ...

12 06 41 ACDR MANUAL ATTITUDE, three, RATE COMMAND; AUTO RCS, sixteen, MAIN A and B.

DMP They're all on.

ACDR ...

DMP Got it.

12 06 49 ACDR Okay. Let's go to -

12 07 06 CMP ... roll or not?

ACDR No.

CMP You eventually have to.

ACDR Eventually you have to.

CMP Because you got to go up and dock with it.

DMP Yeah.

ACDR It's easier if you do.

CMP Let's see, I guess our shadow's off of them now.

DMP ...

CMP ... where it came off.

ACDR Okay, Deke. Stand by. Plus-X for 16 seconds.  
Okay -

12 07 22 ACDR MARK it.

ACDR Okay, 8 seconds gone, 10 seconds, 13, 14, 15 -

12 07 37 ACDR 16. That's it. Stop. Okay.

CMP ... docking. ...

ACDR (Soyuz, this is Apollo. We have the Apollo station-  
keeping now.)

SCDR Roger. Apollo stationkeeping. What is the range?

DMP ... we're not either, Tom.

ACDR (50 meters.)

SCDR Roger.

12 08 14 ACDR Roger. We've undocked and stationkeeping.

ACDR Everything was on time, Bo.

CC-H ... AVERAGE ...

12 08 35 ACDR It's in AVERAGE, Bo.

CC-H Thank you.

ACDR Hasselblad ...

SCDR Soyuz orientation lights on.

ACDR (Roger.) They told me this morning, remember I  
ask ... but I ask them what setting ... 4[00] and  
500.

CMP Roger.

12 09 03 ACDR You got PEAK, Bo.

CMP ... docking.

12 09 41 ACDR Bo, it's in UP TELEMETRY. Yeah, that's right. When I couldn't see that fucking docking. ... undocking ... That's right.

ACDR How's your picture on the tube, Bo?

ACDR Oh, yeah.

DMP ...

ACDR Okay, let me go ahead and ... them.

ACDR Okay. ..., Deke. ... orientation. Right after that we can - we can ...

CMP You have beacons on?

ACDR No. ...

DMP ...

ACDR Okay. We're going to ...

DMP It ... work ...

ACDR Yeah. I told him to turn it on.

DMP ... to get that in.

ACDR Okay. ... - -

CMP ... go ahead ... - -

12 10 54 ACDR Okay. PRIMARY EVAPORATOR activation. GLYCOL H<sub>2</sub>O FLOW, AUTO, and STEAM PRESS to AUTO.

CMP I don't think you have to worry about it. ... attitude, right?

ACDR No, no.

CMP ...

ACDR That's right.

CMP Yeah.

ACDR ...

CMP Yeah.

ACDR ...

CMP ... Yeah.

SCDR What is range now, Tom?

12 11 24 ACDR (About 50 meters.)

SCDR We are now 30 meters.

ACDR (50, 50.)

SCDR ..., Tom.

ACDR Say again, Bo. Keep that ...

12 11 57 SCDR What is the range now?

ACDR (...)

DMP ... No, wait a minute ...

12 12 12 SCDR What is rate now?

ACDR ...

SCDR We are now - Apollo-keeping [sic] - stationkeeping.

SCDR 50 meters.

SCDR I'm ready.

ACDR Okay, now. ... attitude. ... you got AVERAGE.

12 12 40 SCDR Soyuz ready for orientation.

ACDR (...)

ACDR Yeah, that's right. ... Okay. Okay. Let's - -

DMP ...

ACDR Okay. Let's - we're all right. Okay. Grab a couple of pictures of ...

DMP ... got any more of the film.

ACDR Not yet. ... (...)

12 13 25 CMP ... right.

ACDR ... F/4 on the 500 ...

CMP F/4 on the 500?

ACDR Yeah, that's ... That's what the ground told me.

CMP That's the ... after that.

CMP I haven't - -

ACDR ... F/4.

SFE Initiating orientation.

12 13 48 CMP (Ready ...) ...

CMP Okay. ... I - I got it down ... 500. ...

ACDR 500. F/4 500. What about the Hasselblad? ...?

DMP ...

ACDR Okay. Vance, ...

DMP Okay.

ACDR ... Set DET counting up to 96:08 ... At 55 it'll be 13 - that'll make it 47 - 13 ... 47.

DMP ...

ACDR What, the DAC?

DMP Yeah.

12 14 41 ACDR ...teen ... trying to make another ...

ACDR ... Okay. Go ahead.

ACDR 3, 2, 1 -

12 14 58 ACDR MARK. Counting up. Okay, that's 96:08, 47 and counting.

CMP Okay. ...  
 ACDR Okay. VERB 25 NOUN 22 ENTER.  
 12 15 18 ACDR Okay. Plus 197 (cough) 00.  
 CMP ... 014 ...  
 ACDR Deke get me that ...  
 DMP ...  
 ACDR Okay. Deke has the same problem I have. The COAS  
 is completely washed out. It's full up, it's so  
 bright out.  
 ACDR We can look and ballpark it; it's about 50 meters,  
 plus or minus 1 or 2.  
 CMP Hey, look at them ...  
 ACDR Going off?  
 CMP Don't know.  
 CMP Deke?  
 DMP Yeah.  
 CMP Maybe it - -  
 ACDR Oh, that's ...  
 CMP ... Hey, Deke? What about ...  
 DMP No, I don't. ...  
 ACDR (Laughter)  
 CMP No, I - I paid for them too.  
 12 16 34 ACDR Deke's got more than 50.  
 ACDR ...  
 CMP Think I got ...  
 ACDR No, that's ... Yeah, the Hasselblad was ... Let me  
 try that upside down. Try that upside down.



DMP Okay.

ACDR Passive docking checklist. Okay, Deke. Ready to go on this?

DMP Yeah. ...

ACDR All right.

CMP Tom, you got the ...

ACDR I got - I got the ...

DMP ...

ACDR Let me have the ...

CMP ... You didn't have - -

ACDR Yeah.

CMP - - ...

ACDR (...)

12 17 43 ACDR Yeah. ... Better get your COAS ..., Deke.

DMP Well, I considered ...

ACDR It was damn good and light out ...

DMP ... COAS ... eyeball it. That COAS is ...

CMP Well, I ... - -

ACDR ... docked and coming up ... You ... alined?

DMP Yeah.

12 21 33 ACDR All right. Let me know when you're lined up. Line up on ...

DMP I got the ... alined ...

CMP I think ...

DMP I am ...

CMP Give me the docking angles again.

ACDR ... let me check those angles. Stand by. We're  
real busy. Okay. 197 - -

CMP Yeah.

ACDR - - 205 - -

CMP Yeah.

ACDR - - 014.

CMP 14 degrees.

ACDR 14 degrees, 197, 205.

CMP Okay. ...

ACDR That's all I got.

CMP ...

ACDR Just line up - line up on the ...

CMP ... I think I can line up on the - -

ACDR Line up on - -

12 22 23 CMP I think this attitude ... off.

ACDR ... me off.

CMP Deke.

DM Yeah.

CMP ... off.

CMP ... it's off.

CMP Where we at in the ...?

ACDR ... You've got 1/2 GAMMA, Bo.

CC-H Thank you.

CMP And, Bo, we think maybe his docking attitude isn't exactly what we've got on the pad.

DMP No, it's not.

ACDR We know it's not, Bo.

CMP Roll looks good. Pitch and yaw are a little off.

ACDR Okay. Take the mags ... out.

12 23 08 SCDR Tom, APDS mode accomplished.

ACDR (Say again, please.)

SCDR APDS mode accomplished.

ACDR (Roger. Roger. Understand you.)

CMP I'll give you our docking attitude as soon as we have it refined here.

ACDR ...

SCDR Everything is ready.

ACDR ...

ACDR Well, that's everything.

DMP ...

ACDR Okay. ...

CMP Yeah. Just so it'll guide right ...

ACDR Yeah.

CMP Either your right ... or I'll take a ... Right ... you got a good attitude.

ACDR Yeah. ... looks good.

CMP Okay.

ACDR ...

12 24 14 CMP Okay, Bo. We're pretty close. The docking attitude is 195.7, 208.1, and 21 degrees point 3.

ACDR Okay. Let's put ...

CMP Deke has ...

ACDR Huh?

ACDR Okay. ... lined up on the ATS.

DMP Yeah.

12 24 58 ACDR (Soyuz, this is Apollo. Orientation established. Ready for docking.)

SCDR Okay.

ACDR (Roger.)

SCDR We are ready. Go ahead, Tom.

ACDR Roger, Alexey. (Understand.) All right. I think they're ready to do it.

CMP Yeah, but we got to - -

ACDR Okay, here they go.

CMP - - NORMAL.

ACDR Okay. Got the DAC on; EMS MODE, NORMAL.

12 25 40 CMP ... DAC on.

ACDR Okay. It says thrust, thrust plus X for ... seconds. ...

CMP 4 jets.

ACDR 4 jets, yeah.

CMP Not 4 jets. ... jets ...

DMP ... DAC ... out.

12 26 37 ACDR Okay. Why don't you get the DAC film ...

CMP ... can't make it in here.

ACDR Well, whenever you run out.

DMP ... can't make it ...

ACDR ... is okay. You're supposed to be starting way out there ... when ...

CMP ... you go ahead.

ACDR Okay. Let's try that.

DMP Let's get ...

ACDR ... I got ...

DMP ... you up on it ...

DMP ... washed out.

ACDR ... they're all up there. Okay. I'm going to give them a call.

CMP ...?

ACDR Yeah. (Soyuz, I am now approaching Soyuz. We are ready.)

SCDR I don't understand you. Repeat it, Tom.

DMP This where you want ...

12 27 34 ACDR Yeah. (I'm approaching Soyuz.)

SCDR Okay. Keep coming, Tom.

DMP ... COAS ...

ACDR All right. All right. All right, line up - line up his target, Deke. Look at the target. Line that up and put that ...

ACDR Hey, Deke - -

DMP ... go ahead - -

ACDR -- look for ... --  
DMP -- ...  
CMP ... everything else, the bottom's right.  
ACDR ... film ...  
DMP ...  
ACDR ...  
ACDR Deke.  
DMP Yeah.  
ACDR Line up just ... Half of ... That's about right ...  
COAS.  
DMP ... bright light for ...  
ACDR Line up the ...  
DMP ...  
ACDR ...  
DMP ...  
ACDR Ready. ...  
12 28 50 ACDR Okay, Houston. Deke's having the same problem with  
COAS washout that I had.  
DMP The COAS is ...  
CMP Yeah.  
DMP ... absolutely zero COAS.  
ACDR (Distance 30 meters.)  
DMP ...  
ACDR Vance, see ...  
DMP ...

ACDR ... that panel, that ... panel ...

CMP Yeah. Looks to me like it's a pretty good guess as to what ...

DMP Yeah.

ACDR ... get that - get ... light ...

DMP ...

ACDR Aw, you're all right.

CMP We got confidence.

ACDR We got confidence in you.

CMP ...

DMP ... Have any problems ...

CMP Well, that's bet - that's better.

ACDR ...

CMP No. I don't know what setting you're on.

ACDR I tell you, ...

12 30 23 CMP (Distance 30 meters.)

DMP I don't know ... Yeah, ...

DMP ...

ACDR Okay. Now I can - I can see his ... now real good, Deke. Vance, slow it up a little bit.

CMP Yes, I can ... that.

ACDR ... out here in ...

CMP ... Okay; I'll watch ...

CMP Okay. Struts?

DMP Okay. ...

ACDR Every - everything is done.

CMP Okay. It's been done. As soon as we dock, what then?

ACDR Soon as we dock - Okay, I'll tell you. Oh shoot! It's not ...

DMP ...

12 31 20 ACDR ... dock, contact, plus X ... for 5 seconds. MAN ATTITUDE, MIN IMPULSE.

DMP That's right.

12 31 32 SCDR We confirm ...

CMP (...)

ACDR Okay, Deke, coming on his ...

ACDR Oh, shit.

12 31 48 SCDR 50 meters.

ACDR ... pole. See, he pitched down and ... the Earth.

CMP Let's go ...

DMP I didn't hear you, Tom.

12 32 05 ACDR Okay. This COAS isn't going to be worth a ...

12 32 19 CMP Yeah, well you're going awfully slow.

ACDR You're going awful slow, Deke.

ACDR From my position we're getting close. I can't tell you about that target because of my angle.



CMP Yeah.

ACDR You've got good enough - you're in good enough position for a capture right now.

CMP Yeah.

ACDR Vance, you ... left and right.

CMP Yeah. I'm in good shape ... right now. He can see that pretty well when ... turning around. ... a little bit low.

12 32 43 ACDR You're going up.

DMP Still ... a little high ... No, no I'm not.

CMP No you're not, are you?

ACDR Let Deke do the ...

CMP I don't want ... Right.

ACDR Close your rate; slow her down. ...

CMP There you go.

CMP If we get in the way. ...

ACDR Damn sure.

CMP Okay. I'm watching the light. ... your right hand. ... I'm looking for the ...

ACDR ... Yeah. I'm looking for the light. Maybe slow it a little bit.

CMP Okay. You want to watch for the light.

ACDR I'm watching for the light. Stand by. ...

CMP Stand by. ...

12 33 44 CMP Capture.

12 33 45 ACDR (...)
   
USSR (...)

12 33 49 ACDR Yeah, that's got it. Got it.
   
CMP Okay. ... Go ...
   
ACDR Okay. MIN IMPULSE.

12 33 51 CMP MIN IMPULSE. I got it. Beautiful!
   
DMP Couldn't have been lined up any better.
   
CMP Good, Deke. That's great. Hey, (whistle).
   
ACDR That's okay. ... That's okay. Just ... He scared
   
the shit out of me too. That's all right. He's got
   
some real weird dynamics. He's got some weird
   
fucking dynamics.
   
CMP Yeah.
   
ACDR Just let it go.
   
CMP Yeah. That whole docking - -
   
ACDR Oh, fuck! Do you see him? Watch him ...
   
DMP What you can do on that - that ... during the docking
   
period. ... that COAS. ...
   
ACDR You better believe it is.
   
MS Okay, now.
   
ACDR Okay. We have - -
   
CMP All right.

12 34 30 ACDR Okay. We got the lights just exactly as we're sup-
   
posed to have them.
   
CMP That's right.
   
DMP Yeah. Don't forget the ... here.

12 34 43 SCDR Apollo. This is Soyuz. ... initiating retraction.  
 CMP (...)  
 ACDR Okay. That - Okay.  
 DMP Let's - I have to get ...  
 MS ...  
 ACDR All right. I'll be ...  
 CMP All right. It's not hurting anything.  
 ACDR Not hurting anything. You're at MIN IMPULSE.  
 CMP ... at MIN IMPULSE.  
 ACDR You're at MIN IMPULSE. Not hurting a thing.  
 CMP Okay. Deke, suppose I ... retraction ...  
 DMP All stable now.  
 ACDR Okay. MANUAL ATTITUDE, three, MIN IMPULSE, which  
 you got. AUTO RCS - -  
 CMP No, I don't have. I don't have.

12 35 15 ACDR Didn't you go to MIN IMPULSE?  
 CMP No. No.  
 ACDR MANUAL ATTITUDE, three, MIN IMPULSE?  
 CMP No. I can't worry about ...  
 ACDR You were CMC in FREE ... MIN IMPULSE.  
 CMP Okay. ...  
 CMP It stopped. No. By God, it is yawing.  
 DMP Going into gimbal that was causing it.

CMP Yeah. I'd try the hand controller.

ACDR ... what I'd try.

DMP ...

CMP Gimbal up. Yeah. Pitch down. Pitch down.

ACDR Hey, your CMC in FREE ought to be AUTO.

12 36 36 DMP CMC, AUTO. Okay. ...

CMP Pitch down.

DMP ... yawing.

CMP Now, try to get back over here ... Yeah, ... catch up with you.

DMP Okay.

USSR ...

ACDR What the hell happened?

DMP ...

CMP Yeah.

USSR ...

12 36 50 ACDR Yeah, I'm pitching full up.

USSR ...

ACDR What the hell happened? We got some weird - -

USSR ...

CMP I don't know. It could have been from the docking there ...

ACDR Watch the way - his dynamics were going back and forth.

CMP Okay.

ACDR AUTO RCS SELECT. Okay, these - these numbers are OFF. A3 - -

12 35 30 CMP They're OFF, huh?

ACDR That's - -

CMP That's hand control.

12 35 33 ACDR I'm sorry. Shit. CMC in FREE.

CMP ..., Deke. Put these back in AUTO because I don't think that we got ... Okay?

DMP Okay.

ACDR CM - You got FREE, got that?

12 35 48 DMP Yeah. CMC, FREE.

ACDR All right. Okay. A3?

ACDR Okay. You have the jets off. A3?

12 35 53 CMP A3's coming OFF.

ACDR C4.

12 35 55 CMP C4.

ACDR B3. Quick.

12 35 56 CMP Yeah.

ACDR D4.

12 35 58 CMP Okay. Go to CMC, AUTO, real quick. ... gimbal mode.

DMP I know. That's what I'm worried about, here. ... get that son of a bitch.

12 36 08 DMP DAC going off.

CMP Let's see. Have we got everything? We got all of the thrusters.

DMP ... I think it's still yawing.

DMP Okay. We still got some cleanup here.

12 37 48 ACDR Yeah. After he tells us passive docked configuration, we'll have everything else done, right?

DMP Okay.

CMP Guess.

ACDR The final passive docking configuration. Everything else is done.

DMP Okay. My hand controller should still be armed?

ACDR Well - -

CMP I'd leave it armed - -

ACDR THC?

CMP - - but not turn on the THC and - -

DMP Yeah, I'm going to turn that off.

CMP I'd turn off that and leave the hand controller armed, so that you could get it in a hurry if you - -

12 38 10 ACDR Okay. Let's go. POO.

CMP We're in POO.

DMP Okay. We were getting into gimbal out there, Bo, for some reason. So we had to manually crank it out of there. ... in some weird attitude right now.

ACDR Okay. VERB 44 ENTER.

12 38 31 CMP VERB 44 ENTER.

ACDR Load 87, 1111, 00146, all balls.

CMP Okay.

12 38 50 ACDR Next one, 05000, 00050.

CMP Okay.

ACDR Okay. VERB 45 ENTER. Activate the docked DAP.

12 38 56 CMP Okay.

ACDR RHC 2, LOCKED. That's your choice.

DMP ... lock it now ...

ACDR THC, locked.

12 39 04 CMP Yeah.

ACDR EMS FUNCTION/MODE, OFF/STANDBY.

DMP Okay. That's the kind of stuff that helps.

ACDR MANUAL ATTITUDE ROLL, MIN IMPULSE.

12 39 14 DMP ROLL, MIN IMPULSE.

CMP PITCH and YAW, RATE COMMAND.

12 39 17 DMP Yeah.

ACDR LIMIT CYCLE, OFF.

12 39 20 DMP OFF.

ACDR DEADBAND RATE, MIN and HIGH.

12 39 24 DMP Okay. DEAD - RATE - HIGH.

ACDR THC POWER, OFF.

12 39 28 DMP POWER, OFF.

12 39 29 ACDR RHC POWER in NORMAL number 2, OFF. REC POWER DIRECT 2, OFF. BMAG MODE, three, RATE 2. MAIN BUS TIE, OFF. They're coming OFF.

12 39 44 ACDR AUTO RCS ROLL SELECT, A/C ROLL, we got four MNA; and B/D ROLL, four, MNB.

CMP Deke.

ACDR Yeah.

CMP Give me those again? A/C ROLLS all up to A and B/D ROLLS all up; and I think he's going to have to turn OFF - -

DMP B/D ROLLS are all in A - -?

CMP Yeah.  
 DMP B/Ds are all what?  
 CMP A.  
 12 40 07 DMP All A. ...  
 CMP Yeah. ...  
 ACDR COAS POWER, OFF.  
 CMP How about PITCH and YAW, Tom? You want those ...  
 docked DAP.  
 ACDR Okay, now, what I called - -  
 SFE Apollo, Soyuz ...  
 ACDR Okay. It says AUTO RCS SELECT - -  
 ACDR That's all it says - -  
 SFE Apollo, this is Soyuz.  
 ACDR ...  
 CMP Okay ... - -  
 12 40 36 SFE Interface seal compressed.  
 ACDR Okay. Roger. Understand you.  
 SFE APD - APDS mode accomplished.  
 CMP We got our ring lights there now?  
 12 40 48 ACDR Yeah. Everything's squared away.  
 CMP Light - -  
 ACDR That STRUCTURE RING CONTACT light ...?  
 ACDR ...  
 12 41 04 CMP Okay. You're going to disable them - -



12 41 55 CMP I wonder if that ... maneuver ... docking attitude -  
docked attitude.

DMP I don't know. ... another attitude.

CMP Yeah.

ACDR Yeah.

ACDR Okay. Yeah, I got that ... degrees ...

CMP Well, good show, Deke. Do you have any trouble at  
it at all?

DMP No. ...

MS ...

ACDR Being - being in an inertial attitude like that ... ?

12 42 42 DMP ... pretty good ... that black background there ...  
came out ... blend right into the black, though. ...

ACDR Yeah. We're burning up in here, Bo.

ACDR It's a little hot with all the cameras on.

DMP ...

12 43 23 ACDR Well, when we went to the - when we went to the docked  
attitude, that's - that's the attitude; go back to  
that.

CMP All right ... go back to that ...

DMP Yeah, it's docked ...

CMP I'd guess ... vacuum.

DMP ... We'd better do that, I think. ...

CMP ...

12 44 02 DMP Looks like we're supposed to be in a docked attitude.

CMP I don't know. You want to ask, Deke, ... and see what  
they say?

DMP Houston, Apollo.

DMP Yeah, we're in some random attitude here, due to getting into that gimbal lock situation. And we're debating whether to maneuver back to the docked attitude or leave things go. What's your recommendation.

DMP Okay.

ACDR I can go and get that hatch, yeah. ...

ACDR Yeah. Whoops!

ACDR Well, let's see - Yeah, it's going to be ... on ... Yeah. Oh, by the way, you won't have to ..., you know. ...

CMP Yeah. ...

CMP Okay. Roger. ...

ACDR ...

DMP I'll be all right.

12 45 19 SCDR (Moscow, Soyuz. Do you read me?)

CMP You think he's had too much to drink? (Laughter)

M-MCC (Read you loud and clear. How do you read me?)

SCDR (Everything is nominal. We had an integrity check. 3 minutes passed, the pressure has not changed; that is, it varies in normal limits. For the last 3 days, we have such trouble - When we are flying over the Soviet Union territory, they begin to transmit the weather reports from the airports ... We get all of it. As soon as ... docking and undocking, the noise starts.)

ACDR ...

SCDR (...)

DMP You haven't heard from Alexey yet, Tom?

ACDR Oh, it's too early ...

12 46 47    CMP        Okay, the three power switches are off. ...

            ACDR        I'm going ahead - I'm going up - I'm going to go up  
                          and get that hatch out.

            CMP        Yeah, I think you ... Yeah, it looks like - -

            ACDR        No. No, I don't ...

            CMP        Yeah.

            ACDR        ...

12 47 26    CMP        Yeah. You're right, Tom. Yeah.

            ACDR        Well, I guess ... dock because it's late. Looks like  
                          we've been stood up.

            USSR        (...)

            CMP        ...

            USSR        (There is nothing besides audio equipment. This is  
                          the third day that the magnet is being overheated.  
                          The landing course is 194 degrees, the temperature is  
                          27 degrees, humidity 43. That's what is constantly  
                          being transmitted. ... SIMPLEX and VHF. We have  
                          SIMPLEX AM and dual VHF on.)

            ACDR        All righty. (...)

            USSR        ...

            ACDR        Start it, Deke.

12 48 13    DMP        Yeah.

            CMP        ... huh?

            ACDR        It's supposed to be ...

            DMP        I'll tell you one thing ...

            CMP        ...

            DMP        ...

CMP Yeah. It looks like ...  
 ACDR Going over Russia?  
 CMP Yeah, probably ...  
 12 49 30 CMP I wonder if that's that ...  
 DMP ...  
 CMP ...  
 USSR (...)  
 DMP ...  
 USSR (Come on, speak.)  
 CMP We'll just leave that hatch ...  
 ACDR Yeah, well - -  
 USSR (... Orroral from 12:43 to 12:49)  
 12 50 24 ACDR Take down the hatch, Deke. ...  
 DMP Okay; will do it ...  
 ACDR That's right. Put it down and hold the hatch down.  
 DMP Okay.  
 ACDR ...  
 DMP All right.  
 CMP I guess we can probably get that damn black bag out.  
 ACDR Yeah.  
 CMP ...  
 DMP That is a good idea.  
 CMP May be ...  
 ACDR ... Get that black bag up in the docking module.

12 51 07 DMP That's a good idea. ...

DMP Why don't we ...

CMP Tom, we want to get a reading after undocking. ...

ACDR ...

CMP Oh.

DMP Soyuz, Apollo.

SCDR Go ahead.

DMP (Alexey, ...)

SCDR I don't understand you, Deke.

DMP (...)

SCDR Go ahead. Okay.

12 51 51 ACDR Put that black bag up there, too, will you.

ACDR ... I turned on the mixing. ... I'm going to turn on that fan up here, too.

DMP Whew! That's warm.

ACDR Yeah, sure wish we could - -

CMP Looking back, I wonder if we got information on it?

ACDR No, it didn't.

DMP ... I don't know, I feel like maybe ... trouble on this thing.

ACDR I'm going back ...

DMP Okay, - -

ACDR I'll take a ...

DMP ... a little earlier.

ACDR Vance?

CMP Yeah.

ACDR ... pitch ...

CMP Eight, what?

ACDR Yaw.

12 52 35 CMP Yaw. Okay, that's the ...

12 52 42 ACDR ... on the way out.

13 05 52 CMP We got one whale of a reading.

ACDR Roger. And, Bo, again, you wanted the helium inject at this time, right, at 96:40?

ACDR Okay. That's page 7-3 in the DM Checklist.

ACDR Okay. Roger. 7-5; 7-5; 7-5; 7-5.

13 06 40 ACDR Glad he got that - glad he went ahead and got that out of there on time.

ACDR Okay. Got the - got the OPTICS at ZERO?

13 07 15 CMP Yeah.

ACDR ...

CMP ... pretty close to nominal.

ACDR ... right on top of ... ..

CMP Yeah.

13 08 56 ACDR Okay. ...

CMP Yeah.

ACDR No, if you don't have it, then don't put it in.

13 09 04 CMP Okay. ...

ACDR Pardon me?

ACDR All right, I'll get it. What was the temperature?

CMP Yeah.

ACDR Huh?

ACDR Is that the ...?

CMP Yeah.

ACDR Is that the ...?

CMP Yeah.

13 10 20 CMP Oh, good. Hey, this is ... Tom, want to see something ...

ACDR Oh, yeah, that's ...

CMP Hey, Deke, ... this ...

(Music)

CMP Oh shit!

ACDR What?

CMP I got dirt all over me! The lid was off, and I pulled it off, and the damn thing -

ACDR The lid was off?

CMP Yeah.

13 11 18 ACDR Want a towel?

CMP No, I'll get a ...

CMP I know it; I was trying to take it off.

ACDR Oh, I see. Yeah.

CMP ... more difficult.

CMP ... pardon my quick reaction.

ACDR All right. ...

CMP Yeah.

13 12 00 DMP Did you mount that bracket and penlight, Tom?  
ACDR Yeah.  
ACDR ... all day today ...?  
CMP ... A3.  
ACDR Can I help you on that?  
CMP Oh, I'll have this ... in a couple of minutes.  
USA (Music)

13 13 35 ACDR ... Listen to ... sing.  
USA (Music; singing)  
CMP (Laughter)

13 15 26 ACDR Hot dog! ...  
CMP Hey, say, you ought to let them hear it.  
ACDR Yeah. Get the one with the showers too. The girls  
in the shower.  
CMP I've got a whole pocketful of good Russian stuff.  
Stuff - ordinary - respectable stuff.  
ACDR Yeah.  
CMP Yeah.  
DMP Yeah.

13 16 00 CMP Okay.  
ACDR Okay. Hold it. Want to get that ... bag? Let's see,  
this is the fifth day. But why don't ... Is that  
bag full?  
ACDR Yeah, but we want TSB. Why don't we take that TSB.  
...  
CMP TSBs, though, don't hold much. I think we ought ...



13 16 48 ACDR Okay. Let me ... I know where the other one is ...  
... the very bottom of U-2. It's in the bottom part  
of U-2. ...

ACDR Hey, yeah. ...

13 17 52 CMP Hey, Tom.

ACDR Yeah.

CMP ..., but let's play this one first.

ACDR Yeah.

ACDR ... is the mike on - in here.

13 18 54 CMP Yeah. We've got to have one of them for ... to keep  
the balance right up there. ...

ACDR ...

CMP Yeah.

ACDR ... let me have that tape and I'll rewind it and put  
it on ...

CMP Yeah. Well, I thought we would wait for ...

13 19 32 CMP All right. Fine ... Tell you what we can do; we  
can use one of them for trash, Tom, and when it came  
time to jettison, we can try to stow a couple of  
TSBs in the - put it wherever we could - locker or  
anything else. If we could keep the bag of solar  
research stuff, ... trash ...

13 20 13 DMP We need a new battery, Tom.

ACDR ... Deke.

CMP Yeah.

ACDR ... that didn't work ... did it?

CMP No, no. You've got to rewind it. No, that Carole  
King is on the other side, Tom.

13 21 10 ACDR Oh. I put the right side up, I thought.

CMP It's the number 2 side - got to be up.  
 ACDR Right.  
 CMP Anyway, that plays ...  
 ACDR ... Carole King ... upside down.  
 CMP I ... setting up the ..., but I could do that.  
 ACDR Going to do that. Okay. Want me to help you on that, Deke?  
 13 22 13 ACDR That's the last one we got. Big ones? Got two ... last one. ...  
 CMP I still think it's ... cause Deke ...  
 ACDR ...  
 CMP Oh, yeah.  
 SCDR Apollo, Soyuz. How do you read me?  
 ACDR (Excellently, excellently.)  
 13 23 04 SCDR Pressure integrity of Soyuz and interface volume is okay, Tom.  
 ACDR (Roger.)  
 CMP Well, let's see now ...  
 USA (Music)  
 ACDR Here you are.  
 ACDR (Soyuz, Apollo.)  
 SCDR Go ahead.  
 ACDR (... this is Russian music.)  
 USA (Music)  
 13 24 09 ACDR (Do you hear well?)  
 SCDR Very good. Well. Go ahead.

USA (Music)

CMP Okay. I guess ...

ACDR Oops. Sorry ...

ACDR (... of the launch configuration.)

13 24 42 CMP Hey, do you want to go up?

ACDR See the black bag up there? Let's get those things down.

CMP Okay. Tom. I got one of these - these - -

ACDR Where do you want to put them?

CMP How about in here?

ACDR We got the - got the big black bag ...

CMP There you are.

ACDR ...

CMP Yeah, that's okay.

ACDR Okay, the big black - -

CMP No, no wait a minute.

ACDR ... that's what it is.

CMP Yeah. Yeah - I guess so.

13 25 40 ACDR Just think about ...

CMP It depends on how long we have to leave it. It - ... go down.

13 25 47 ACDR Yeah, it ...

CMP Well, ... may be ...

ACDR Got it on.

13 26 36 CMP Okay; go on through, Deke.

CMP Huh?

DMP ... okay.

CMP All right.

CMP Well, first we got to do these things right now. Why don't you get this battery out, and - as soon as I get the battery I'll be able to ... Hey, Tom, you don't need to ... the battery ... pulled them out.

13 27 24 CMP Hey, Tom. Suppose you can make the food.

ACDR Sure will. What're we having?

CMP I don't think ... snack.

13 27 53 CMP Return to A3.

CMP Battery. Got it?

ACDR Yeah.

13 29 39 ACDR Got the - got the food all cooked up.

ACDR Okay, Vance. The wheel's at A3.

13 37 17 ACDR Did you get done?

TIME SKIP

14 36 07 CMP Yeah. Okay.

ACDR Ah-ha. I brought - I got this Conway Twitty, and we'll wait and put it in - in the one that was ... and put it in ...

CMP Yeah. Well, I don't think - No, I didn't think it was a song. I didn't think was a song ...

CMP Okay.

ACDR ... We may not have it.

ACDR Okay. ...

ACDR How about that. (Laughter)

14 38 20 ACDR BMAG MODE, three, RATE 2. This is after docking; after we've loaded the DAP. I have it checked off. RH 2 POWER DIRECT 2, OFF, and RHC POWER, OFF. BMAG MODE, three, RATE 2. I have it checked off. ... verify. AC ROLL, MNA, B/D ROLL ... COAS POWER, OFF. ... do much from that angle - looking down at those pictures from that angle, doesn't look like ...

CMP ...

ACDR We got Orroral Valley here coming up right now.

CMP Okay.

ACDR Okay. Now let's go to this undocking attitude. I have to hit a VERB 49.

CMP Okay. ... what we got here.

ACDR All righty. Here's the new attitude. Plus 02600, plus 30700, ... Everything is checked. Plus 02600, plus 30700, ...

ACDR Okay.

CMP ...

ACDR ... maneuver 10:05, 98:35. Want to do it over?

CMP (Soyuz, this is Apollo.)

SCDR Go ahead.

CMP (Alexey, we are beginning the maneuver.)

SCDR Go ahead.

ACDR Okay. Now ... Okay. ... get an update ...

CMP Okay. We're getting to Orroral Valley right now.

ACDR ...

CMP ...

ACDR ...

CMP ...

ACDR High-gain angles. Pitch, yaw, okay. Plus 03 - oh, here's - plus 33, plus - -

CMP Yeah. We need to get one bag there, Deke. All you have to do is take it out, use it as is and then stow it back there. But make sure that you got the valve closed and everything ... And, then later ... dump. Huh? Okay. We got a pass over Orroral Valley. He's going to explain a few things. See what he says.

CMP Yeah. They're kind of hard to put on. They have to go into the reset ...

14 42 05 CMP ... I - to tell you the truth, never used one, Deke. That's how the big boys told me. ...

ACDR ... Look there, Deke.

ACDR ... You got to use the pressure, too. ... It's uncomfortable, I'll tell you.

CMP Actually, you have to open the valve to take a leak, then close it.

ACDR Open it ...

CMP ... leak it out later.

ACDR Open when the valve is parallel to the line of flow.

14 42 37 ACDR I've never liked them. You just - you always ... because you can't get enough ... to see the ..., and you muff the whole thing.

CMP Oh, no. I think ... That's okay. (Laughter) I'd like to ...

CMP Incidentally, Deke, when you put that bag in the ..., and I'll probably - both run up there and see ... When you put that back in there. My T-shirt's in the bag. Give it to me then ... but not - no hurry.

ACDR Okay; we've maneuvered to the altitude ... Orroral Valley. We want to get ... Orroral Valley at - should be here now.

CMP Yeah; any minute.

ACDR Let me tell you, one thing you need to do is to tweak up that volume.

CMP ...

ACDR Yeah. But do that first. ... I got it. Got it. That - that was an option - that was an option 1, right?

CMP Sure hope we're facing the Earth. Option 3.

ACDR We got an option - Oh, we did an option 3; we need an option 1.

14 44 50 CMP We did the option 1.

ACDR Okay.

CMP ...

ACDR Yeah, but it gives you an option 3 down ...

CMP That was R-4.

ACDR Okay. Yeah.

14 45 54 CMP Need a ...

ACDR Yeah.

CMP Get the other one; 42. And I won't torque until we talk to them.

ACDR Okay. We got contact now.

CMP Okay.

CMP Okay. We're ready to torque.

ACDR Okay. Torque 39?

CMP Yeah. But I won't.

ACDR ... minus 87.

ACDR Hello, Houston, Apollo.

ACDR ...

CMP ... plus - minus 87. Oh, I see. Plus 35, plus 78, minus 87.

ACDR Hello, Houston, Apollo through Orroral.

ACDR ...

ACDR ... never came up.

CMP Okay.

14 47 39 ACDR This was - this must have been a real low pass.

CMP Yeah.

14 47 41 ACDR We'll start the torque later.

CMP Yeah. Deke, ... torques.

DMP ... going to torque at 27:45.

14 48 09 DMP I hate to say it, but that God damn bag ...

CMP Is that right?



ACDR ... back pressure ...

DMP No, and I didn't put it in ...

ACDR Yeah. It usually is pretty clean that way.

DMP ...

CMP Hey, Tom. Do we have any other stations ... ATS before we undock?

14 48 34 ACDR Okay. Orroral ... Oh, yeah. We've got Quito, Ecuador, and we got ATS. Ecuador and ATS. ... quite a bit. Okay. We got 30 minutes until ...

CMP Maybe Quito would be a good place to do it.

ACDR What's that?

14 48 58 CMP Then - it'll be at least - wondering until they get the ATS. That's ...

ACDR Yeah.

CMP Okay. That's all finished. I'm going to go up and change clothes about now.

14 49 30 ACDR How about putting this stack of ...

DMP ...

CMP I thought you were going to say you're going to go up into the DM.

ACDR Oh, I might get - I might try that too. ... I would say the pressure ... back pressure ... with each one. ...

14 50 07 CMP Anything going on the Flight Plan today?

ACDR No. We - we did that - we did it early, you know.

CMP Yeah.

ACDR ... I've got to turn on the VHF ...

DMP It'll be about 30 ...

ACDR Okay. ... Okay. Okay; ... and all that free torquing and all that ...

CMP Yeah. Okay.

ACDR We'll have to do another VERB 49 from this angle. Yeah. Hit a VERB 49 ... .. Okay. ... 26 307, ... 00. Okay. Okay.

DMP Okay. Now what do I do? ...

ACDR Okay.

14 52 20 ACDR Okay. Now we go to a P20. Okay. It's - it's 98:30. ... I'll ... It says P20, option 5, quad C ...

DMP ...

ACDR Yeah. Okay. ...

14 53 03 DMP Okay. ...

ACDR Okay. ...

14 53 36 ACDR Okay.

14 54 18 ACDR Vance, don't start the P20. We don't do it yet. NOUN 78, plus 30 ... plus three zeros ... 47 ... Okay, Vance. ...

14 55 31 SCDR How do you read me?

ACDR (Good, how do you read me?)

SCDR I read you loud and clear. Just now, Valeriy Kubasov and me are in descent vehicle.

ACDR (Roger.)

CMP (How are you?)

SCDR Thank you. Very well. As always.

14 55 57 CMP (Yes. Good man. Fine fellow.)

14 56 04 ACDR Okeydoke. ... attitude ... squared away for awhile?

CMP Yeah.

ACDR ... checklist, here. We got - we got Quito coming up down here at 54.

CMP ... tape recorder, there?

ACDR Yes, and it's all set to go. I'll be back in a minute. I just wanted to ...

SCDR Vance, what is the best time of your working day today?

CMP (How long we ... module?)

ACDR The best time, he said.

SCDR You don't understand me. I ask you, what is the best time of your working day today?

CMP (Today?)

SCDR Yes.

CMP (Laughter) What's the best time? (Yes, I want to say, I will think about it and ...)

14 57 05 SCDR I see.

CMP Let's see. What the hell. Well, let's see.

SCDR Do you like ... day?

CMP (...) Alexey, do I like what?

SCDR ... day?

CMP (I think that, today, the docking was very interesting.)

SCDR You are right. ... solar eclipse experiment.

CMP (Yes. This - this experiment was it ...?)

SCDR I believe.

CMP (Okay.)

SCDR ... from the ground.

SCDR The ultraviolet experiment will be a good experiment.

CMP (Yes. ... very important.)

SCDR Yes.

14 58 36 DMP ... in the Flight Plan about your ... camera? ...

DMP ...

CMP No, I don't know of anything. I - I don't think in practice we ever had any of that ... turning that on and off.

DMP ...

14 59 21 CMP ... to go.

DMP ...

CMP Maybe I'll ... It'd be nice to have some, though. ... I wonder if we just ...

DMP ...

14 59 35 CMP Yeah. I - I think we ought to do it on our own if we can - -

DMP Yeah.

CMP - - do it without lousing up something else.

DMP ...

CMP Good idea. Okay. We'll need the Hasselblad in there.

DMP ... let's see ...

ACDR After you torque, while you're up there, I'll need another VERB 49, you know, because ... angle ...

CMP Oh, okay.

15 00 18 CMP (Soyuz, Apollo.)

SCDR Go ahead.

CMP (See the horizon? It's a beautiful sight.)

SCDR Let's see. Very nice. ...

CMP (Yes. ... of course.)

ACDR (Do you understand) pretty good?

15 00 57 SCDR Yes, sir. Of course. Of course.

DMP (Laughter.)

CMP (Of course, it is Russian - -)

15 01 05 SCDR Oklahoma language is the same as Russian language.

MS (Laughter)

ACDR (Yes.)

SCDR Very difficult for everybody.

MS (Laughter)

CMP (They speak very slowly in Oklahoma.)

SCDR Like Tom?

CMP (He talks fast - faster.)

SCDR ...

CMP (Did you understand the words of the ...)

15 01 46 SCDR Yes. Of course. Vance, I'll tell you, the FE said, "Alexey, do you understand Tom?" I said "Of course." But I don't understand. I wait to hear something about ... if I hear. But I don't understand Tom.

ACDR/DMP (Laughter)

ACDR No, that's a problem.

CMP (It's very good to fly together in space, isn't it?)

SCDR Very excellent.

15 02 38 SCDR It is necessary to fly in space together with our wives; I believe after this ... are going to understand each other.

MS (Laughter.)

CMP (That's very correct.)

CMP And when it's not possible to under - understand women.)

15 03 28 CMP Okay. It's getting about time to - -

DMP Okay. 99 - -

CMP (...)

SCDR Go ahead.

CMP (Alexey, please turn the ranging on.)

SCDR RANGING, ON.

CMP (Roger.)

15 03 54 ACDR Okay. VHF A, OFF.

CMP A, OFF and B to DUPLEX. RANGING, ON. Okay. ...

DMP ...

DMP ...

CMP Nope. Gosh darn.

DMP Maybe you hit the RESET.

CMP No.

DMP (Laughter)

ACDR Okay. Set the DET counting up to the undocking pad time. Okay. Now, we think it's going to be 99:07.

DMP ...

ACDR Okay. All right. Let's go to the passive undocking checklist ...

15 04 52 SCDR Preparing for undocking.

CMP (Yes.)

ACDR We got ... DELTA-V SET.

DMP There's something wrong here. ...

CMP Maybe it's because we're too close, Deke.

ACDR If you're too close, you get kind of harmonics and all that.

CMP Better turn it off, maybe ...

15 05 18 ACDR Turn it - I'd turn it off and leave it closed. Are you out of film on that film pack, Deke?

DMP Yeah.

ACDR Well, there must be ... film pack. ...

DMP ...

ACDR Yeah. But we - we got - we've got - we've got some color exterior, though ...

ACDR Well, any bandolieros [sic] up here? After this ...

CMP You guys each have your urine bag - -

15 05 47 ACDR ... forward in the fucking whole edition.

DMP Well, the only thing is, Tom, we've already got six ...

ACDR Yeah. I think it's great. Just pick yourself ...

DMP ... forget this ...

CMP Yeah.

15 05 56 ACDR That's right. But why don't we just - That's got more priority than the other thing.

DMP (Laughter)

CMP I - I still think we ought to ask Houston if they can suggest a mag and then - -

ACDR All right. If we don't, we're getting fucked whether we ... or right.

15 06 18 ACDR Okay. Let's go through these. Hatch 3, CLOSED. Hatch 3 PEV, CLOSED; I sure hope so. EMS/MODE, DELTA-V SET to STANDBY, ... Okay. Delta-V<sub>C</sub> to minus 101.3 - pardon me - to plus 101.3. Got it? EMS function, DELTA-V.

CMP All right.

15 06 36 ACDR RHC POWER number 2, AC/DC. Got it? RHC POWER DIRECT 2, MNA/MNB, right? SPACECRAFT CONTROLS CMC, HOLD, verify.

DMP ... going to verify this. This - -

15 06 50 ACDR Well, we went back to AUTO after we did the VERB 49. We tweaked it up, Deke. MANUAL ATTITUDE, three, MIN IMPULSE. DEADBAND/RATE, MIN and LOW.

15 07 02 DMP Okay.

ACDR BMAG MODE, ATT 1, RATE 2.

15 07 05 DMP ...

ACDR Okay. THC POWER, on.

15 07 10 DMP On.

ACDR COAS POWER, on.

15 07 12 DMP On.

ACDR RHC number 2, LOCKED.

15 07 15 DMP RHC 2, LOCKED.

ACDR THC, ARMED.

15 07 20 DMP ARMED.

ACDR And VERB 16 NOUN 4 ENTER.



15 07 39 DMP We've got to get these circuit breakers ...

ACDR Yeah. That - that comes - next thing.

DMP Okay.

ACDR Inform Soyuz, "Prepare for - preparing for undocking."  
(Soyuz, Apollo. Now we are preparing for undocking.)

SCDR Roger.

ACDR Okay.

DMP I'll watch the lights, Tom.

ACDR All right, should be coming on.

DMP ... amber.

15 08 32 ACDR Okay. Next one should be coming bright, there.

DMP Yep.

ACDR Okay. 2 - 4 - 6 - 8 ... 12. Okay ... got ...  
alined ...

ACDR ... Should be alined with the IMU.

DMP Yep.

ACDR Over Quito, we turn ABSORPTION POWER, ON. I guess  
this time after 99:04 I'm going to be ...

15 10 19 ACDR Okay. Acquire ATS, ... down here at 90 - Why do we  
still have that O<sub>2</sub> FLOW HIGH?

CMP You got that off down there, that valve?

ACDR ... checking ... Yeah. That ... going on ...

ACDR Everything off?

DMP Yeah.

ACDR Makes me want to try - -

CMP ... malf.

ACDR What?

15 11 22 CMP It was the - urine thing that broke open.

ACDR Did you put it closed?

CMP Yeah. Closed it.

ACDR Okay. What do we got?

CMP Where's the ...

ACDR Got to be ...

CMP What?

DMP Got to be ... Well, I'm going to ... while you're ... There's dirt on it.

CMP Dark picture. ...

ACDR We got plenty of film on ... Hasselblad, but it's not out, is it?

DMP ...

ACDR Perhaps we should have a new one on here. No.

CMP ... it's got 23 ... the other 15 ...

15 12 19 DMP What is that? Look down there.

DMP ...

ACDR ... Well, it looks - it looks as if the ...

CMP Huh?

DMP ...

ACDR All out?

CMP Maybe we should ...

DMP Yeah, it did. ...

ACDR Okay. Put this back ...

15 12 59 CMP Okay. I wonder if we've been shooting blanks?

DMP I don't know. Okay. ... go ...

ACDR Okay. The film's okay for the - that's the reflex, right? CX12. ... CX12 from A-6. CX07 and CX08 from B-5. We'll clear up ...

CMP Okay. We'll get the CX12. If you want to hand me the old one, I'll put it away.

DMP ...

15 13 35 CMP You've got a slide back of the window somewhere. A cloth.

DMP On the window?

CMP I mean on the ... Yeah. ...

DMP Okay. ... working here ...

ACDR Here you are, Vance.

CMP ... B-5. ... get one more thing in.

ACDR That puts us back, what?

ACDR Same place ...

DMP Yeah.

DMP Okay. That's 47 minutes ...

15 14 53 SCDR Apollo, Soyuz. Are you ready for undocking?

ACDR Yeah, I can get ... other side.

ACDR (...)

ACDR Houston, Apollo through Quito. How do you read? ... ABSORPTION POWER, ON.

CMP ...

ACDR Okay; let's go to that monitor - monitor we have for the ...

CMP Looking good.

DMP ... On the test meter position. ...

CMP ... Well, let's see what it's doing. Okay; it must be about C, 8. Okay. It must be 8, C. Okay?

DMP Make sure. ...

CMP I did.

DMP Okay.

CMP ...

ACDR And I got that on time. ...

15 16 24 ACDR Houston, Apollo through Quito. How do you read? Houston, Apollo. Houston, Apollo. If you read, we forgot to give you absorption power. We'll acquire ATS - in another 3 minutes when we undock. ...

CMP You got ATS set up?

ACDR Yep, I got it set up; I'll reverify that.

DMP Okay, now Vance, ... as far as I'm concerned ...

CMP Okay, but I don't want to rush the part where we're getting into min impulse burn. Seems like - you have to be in a hurry to get your maneuver.

DMP Yeah.

15 17 19 CMP And I want to do the min impulse right.

DMP You're right. We'll do it all right. Yeah. You're right.

ACDR Okay; - -

DMP Mainly, I guess we'll ...

ACDR - - passive undocking checklist.

CMP Right.

DMP You - you don't have ...

ACDR Vance, what time you got?

DMP ... undocking. At this time, we set the clock.

CMP At when?

ACDR 56. ... All right, I got a bunch of things ready to go through ... burn ...

DMP Yeah. Okay.

ACDR Say, you ought to set this over there.

DMP Yeah. ... I want to go to ...

ACDR Right. Right.

DMP ...

15 18 28 CMP Hey, Deke. You got a spare in your pocket?

DMP Yeah. It's ... I need one for this ...

ACDR Okay. ...

DMP Well, Vance ...

CMP Want your jacket? I'm going to get mine.

ACDR Put it on, you mean? Yeah, I think I will too ...

DMP Only because that one little old thing.

ACDR You want a spare flashlight bulb right now, Vance?

CMP Yeah. I - I've got a good one ...

ACDR You got a good one. Well, you ought to - maybe when you go down there, ... Both of mine are stuck up here on the ...

15 19 10 DMP I got one spare. The others have been ...

ACDR Yeah. But I need one to go down - -

ACDR I had it right here in the ...

CMP How much time we got?

DMP 30 minutes - Well, we got 4, I think 4 ... I ...  
preloaded it ... time. Take it from storage. ...

ACDR ... I had it right here before we docked because I  
wanted to get ... right here.

ACDR Okay. ...

CMP ... show, huh?

ACDR Well, wait. We hit - came up with the ...

15 20 22 ACDR Yeah, we still got - we still got ATS - should be  
coming up at 59. We should have ATS now. We got it.

DMP There you go.

15 20 34 ACDR Roger, Bo. Read you loud and clear.

ACDR Roger. RELAY and we have the UV ABSORPTION POWER, ON,  
at 98 plus 56 plus 00.

ACDR ...

ACDR Not really.

DMP ...

ACDR I don't - I don't want to tell. I could ...

CMP Yeah.

ACDR It's right over me. ... for the docking module.

15 22 53 SCDR Apollo, Soyuz.

ACDR ...

SCDR We are ready to undocking.

DMP Okay. ... DAC on right now. Okay. We never got  
any film in there, did we?

CMP Well - Yeah, I ...

15 23 08 SCDR Undocking, Tom.

15 23 12 ACDR Okay. (Roger.) All right; okay. AUTO RCS, 16, MAIN A and MAIN B. EMS MODE NORMAL. DET, STOP. Turn DAC on.

DMP Okay; and then monitor. ...

15 23 41 ACDR Houston, do you have any recommendations for a new film magazine for the DAC?

SCDR INTERFACE SEAL COMPRESS, OFF.

15 23 59 SCDR INDICATOR, OFF. INTERFACE SEAL COMPRESS, OFF.

ACDR Is that interior or exterior?

CMP Evap deactivation. It's already done.

ACDR Any of them back in there? Let's not get all wrapped up in that ...

CMP Yeah.

15 24 17 DMP Or we'll blow this son of a bitch.

ACDR That's right. If they can give us the mag, why - fine, if not ...

CMP Okay. I got one thing here.

DMP We're liable to - -

CMP Let me see if it will work.

DMP We're liable to separate any time now.

ACDR Okay.

DMP Then, man, we got to go.

ACDR Okay. That's right ...

ACDR Okay. We're ready for it, too.

DMP Yeah. Damn sure.

15 24 45 ACDR Okay. You got ... Okay; monitor -

CMP Looks different. I still - -

ACDR ...

ACDR Is CMC ON?

CMP Yeah.

ACDR Okay. ...

CMP ... Okay. You told me to press through.

DMP Yeah ...

ACDR Okay. It's ...

DMP Yeah.

ACDR Can you just ... with it?

DMP Yeah. ... Boy, I'm glad it didn't get that 1-1/2 on that ...

CMP Shit.

DMP Okay.

15 28 01 ACDR Okay. I'll - Okay, I'll ...

SCDR Tom, be careful.

15 28 07 ACDR Okay. VERB 45 ENTER.

CMP Okay.

ACDR Okay; VERB 45 ENTER.

CMP It's in.

ACDR VERB 31 ENTER ...

15 28 14 CMP Yeah; got it.

ACDR RHC LOCKED, verify ... securely locked ... ... down.



CMP           MIN IMPULSE ...  
 SCDR           ... now.  
 ACDR           (About 20 meters.)  
 CMP            Okay.  
 SCDR           15.  
 ACDR           (I can see the antenna.) Okay; he's coming up.  
               You're okay, Deke. Hold what you've got. Yeah. I  
               can see his antenna coming up. Coming up ... right  
               there. Back off from him. Back off. You may have  
               to go to SPS and back off ... Go up.  
 CMP            Yeah. Yeah ...  
 CMP            You're closing on him.  
 DMP            Okay. ...  
 ACDR           Yeah.  
 ACDR           I'd say you're about 40 feet - maybe 35.  
 DMP            ...  
 15 29 37 ACDR    Okay. We're going down ... still closing.  
               ACDR           ... everything else in here.  
               ACDR           Get that switch?  
 15 29 55 CMP     VHF RANGE SET.  
               ACDR           ... DELTA-V SET, BACKUP.  
               CMP            Okay. So, Deke, keep 18 meters ahead of him - -  
               DMP            Yeah.  
               CMP            - - 8 degrees body and P20 is going to do its thing.  
                               EMS DELTA-V SET, BACKUP. You got all that stuff?  
               ACDR           Yeah.  
               CMP            Okay.

ACDR ... back ...

15 30 15 CMP Okay. EMS SET, BACKUP.

ACDR He's going to the right a little bit. I still think - -

DMP ... got the right attitude.

CMP About lined up on ...?

15 30 33 ACDR Well, but he's supposed to ...

CMP You got to remember, now, your - 58's holding local horizontal there for you.

DMP Yeah.

ACDR So you need to back up and go to the right - or I can go for - Okay; you got it. Okay.

15 30 48 DMP Man, this is ...

SCDR Tom, what are your range now? Rate.

15 31 28 ACDR (The rates are ...)

ACDR ... the VHF RANGE ...

CMP ...

ACDR Back it up ... to the right.

DMP I know, but ...

ACDR Oh, shit! ... backed it down, Deke. Look out.

ACDR Backed it ...

ACDR God damn.

CMP HAND CONTROL POWER's OFF, Deke.

DMP Was it off?

15 32 08 CMP Yeah, I got it on.

ACDR We called that one off on the list.

DMP Huh?

ACDR Yeah, we called that ...

CMP Okay; you want to try ... - -

15 32 19 ACDR Back to tracking now.

DMP Okay.

CMP Okay. We're all right now.

ACDR Okay. Try it again, Vance.

ACDR You got it?

CMP Yep, ...

15 33 01 ACDR Wait a minute, wait a minute, wait a minute. ...

CMP I'll give you a VERB 58, and you can take your maneuver here.

ACDR Okay.

CMP Okay ... maneuver ...

ACDR Yeah.

CMP You'll have to move down there.

ACDR Yeah.

15 33 02 ACDR Okay.

CMP Okay?

ACDR Look at the pitch. I still think - -

DMP ...

ACDR God damn. I don't like the pitch. ... pitched up too high.

DMP That's all right. Just get lined up with ATS.

15 33 18 CMP Let's see; we're going to go to ... What are we - -

ACDR ... back off of him ...

DMP Okay. I ...

CMP ... get the hand controller and - -

15 33 32 ACDR Yeah, I know.

CMP ...

ACDR ...

CMP Yup.

CMP ... get the hand controller back on.

15 33 54 ACDR I know ... asking what about rates.

CMP Yeah - EMP. Got it back on.

ACDR Okay. He's coming up.

CMP All right

ACDR He must have ...

DMP Okay.

ACDR Get a COAS check.

CMP Good.

DMP We'll try again.

CMP Okay; I'll hit it.

15 34 12 ACDR Something wrong with those angles.

SCDR Tom, please inform us about Apollo stationkeeping.

ACDR (20 meters.)

DMP It's useless going on, guys.

15 34 25 DMP ... we're lined up along his axis ... Shit, that's the problem.

CMP What?

DMP We're way below him even though we're supposed to be lined up on his axis.

CMP I don't think we're necessarily ... his axis ...

15 34 39 ACDR Yup.

CMP And everything's perfect but ... I can recheck P20 if you wish.

ACDR Check that.

CMP Checked it, and we've got it set NOUN 78. Let's see.

CMP ... Okay; plus 90 degrees, minus 82.75, and plus 180.

15 35 04 CMP Okay. We're all right, Deke.

ACDR That's all right.

CMP Got to be.

DMP Remember the last time around - -

CMP Yeah.

DMP - - ...

CMP But, if that's the case, we shouldn't worry about it ...

DMP ... down here to the ...

15 35 18 CMP Yeah.

DMP Better go up ...

ACDR Got 4 minutes?

15 35 24 DMP 99:21. Yeah. ... Okay.

TIME SKIP

16 14 04 DMP Really ... won't we?

CMP We're not falling behind yet in what we're doing ... falling behind on his own.

ACDR Yeah. His orbital ... X-axis ... within his ...  
Try to get him on the spotting scope.

CMP He wanted the - he wanted the lights on so he could  
see if we could see him?

ACDR Yes. I'd like to ... There it is.

CMP Oh, okay.

ACDR See the green?

CMP I'll bet ...

16 14 44 ACDR Deke, ...

CMP Deke?

DMP Yeah?

ACDR Now he's coming around behind us.

DMP That's where we're supposed to.

ACDR You have the one ...

CMP No, that's him rotating, too.

CMP We're not all that - -

ACDR ... yeah, I got him.

DMP ... are those beacons ... 50 meters.

CMP Yes. We're starting to go behind him now. Okay.

16 15 25 DMP Right now, I got about a 3-1/2. Let's see, we're  
within 100 meters, right now. ...

CMP ... must be 10.

DMP Yes. That's been the bias in that all the time.  
Depending on ...

CMP I guess - -

DMP I'll keep it in the bottom - right ...

CMP Great!

DMP ... I just want him to skim through it.

CMP Yes.

DMP We're coming in at what angle?

16 16 15 CMP We're at - 295 right now. No - 45 degrees. Not very far back. I'll tell you, Deke - if we don't start falling behind pretty soon, we're going to have to take a pulse ...

DMP Maybe we ought to do it right now. What's the ...?

CMP Okay.

16 16 34 DMP To AUTO? CMC, AUTO?

CMP Ah - yes. It's CMC, AUTO - and - -

DMP Pulse left.

CMP Pulse right. ...

DMP Left - left.

CMP I mean - -

DMP ...

CMP - - left.

DMP ...

16 16 49 CMP Back to SCS?

DMP Yeah. Then I - -

CMP Then we keep tracking him on - -

DMP I'm tracking.

CMP ... Okay, it's going down. Little better. Boy, your up/down is beautiful.

DMP I'm pretty sure ... 3-1/2, so we shouldn't be - We getting some rate on that thing now?

CMP Yes. I - it just started climbing, though. I think you need another one - another pulse ... But I don't know. You can't get too much closer without having the spotlight on them.

ACDR Yeah. I'm in the process of ...

DMP Tom - Put it down to 1?

CMP Yeah.

ACDR He wants the spotlight?

DMP Well, I don't - That - that doesn't bother me. That's going to be - ... .. off the bottom ... 150 meters.

ACDR Let's put it on for 2, anyway. All right?

DMP Well, I'll tell you what, Vance. I'll just put in ...

16 17 55 ACDR (Soyuz, Apollo.)

CMP Want more? Okay.

SCDR Roger.

ACDR There's your spot. Look at that. Great.

DMP Right in the field.

SCDR I think - -

16 27 35 DMP Hey, we come in there ...

SCDR Roger, Tom.

CMP MAN ATT, three, MIN IMPULSE.

16 27 39 DMP All right.

CMP Okay. Your - -

SCDR I see your spacecraft very well.

ACDR (Yes.)

SCDR I see you. I see you - and your friend.



ACDR (Fine.)

SCDR Where Dekey-Wekey now?

ACDR (Laughter)

DMP What's that?

ACDR Said where is Dekey-Wekey?

16 28 06 CMP (It will soon be over ...)

SCDR You're right, Vance. You're right - right.

16 28 18 CMP (I think you could hear it.)

SCDR We are going to talk about it after our flight. Tcm,  
I have seen your flash.

ACDR (Yes.)

DMP What?

ACDR Maybe he's got a flashlight in there?

SCDR Can you smoke cigarette?

ACDR (No, cigar.)

DMP (Yes.)

ACDR Okay; let's get a picture of that.

16 28 46 SCDR Oh, very good picture, very good picture! Your  
spacecraft made of gold.

CMP You ready?

ACDR Yeah. Get the right exposure.

DMP ... we got 16 millimeter. Anybody got - Wait a minute.

ACDR We got to get a CX - CX 04.

CMP Okay. Got it? God! Look at that!

DMP Got the movie camera?

ACDR No.

CMP Don't even know where it went to.

16 29 12 DMP I got the movie camera, but I ain't got no film.

ACDR CX04 is where it's called. It was just out here about 30 minutes ago.

DMP Let's go and we if we can find one.

16 29 18 ACDR That's what I say. Screw all the other experiments. This is the number 1 priority for flying the mission. Fuck. Take all the film you want.

16 29 42 ACDR I am.

DMP Boy, we're going to have a problem here now, though. That Sun's going to be right in my fucking eyeballs. Well, I think I'll maneuver out of the way. Boy!

DMP Okay. How much time have we got until we do the - 500?

ACDR Okay; just let me look at the Plan.

CMP Well, I'll tell you. Here's a CX05, if it isn't shot up.

DMP It won't do us any good right now, because - -

ACDR Yeah, color exterior.

DMP Yeah, except that Sun is bright. ...

ACDR Go ahead and load the thing up.

CMP I may have to scream for help from someone.

ACDR Okay.

16 30 33 CMP Here's the PAO - -

DMP That's good. Hand it over.

CMP - - ... Yeah.

ACDR I - I - -

DMP ... If you want - -

ACDR - - I can handhold it over here if you can ... over here, Deke.

DMP Yeah, but ... into the Sun, Tom.

CMP Okay. I'll do it.

ACDR I can see him okay.

DMP Oh, I see.

ACDR I can see him in good shape.

16 30 46 DMP Yeah, okay. Well, I'm not worried about the pictures at this stage. I'm worried about losing him visually ...

ACDR Yeah, I see. The Sun's coming out right behind him.

DMP Yeah, I know. ... I can barely see him.

ACDR I - I've got him. I can get him with the movie camera.

CMP Oh, you can? Okay, then, let me give you the movie camera.

ACDR We better call him ...

16 31 07 SCDR Roger, Vance. It's a very good show.

ACDR Let's just string it out. That's okay.

DMP ... up there. That's right.

ACDR Got the power on?

DMP Well, he pulled the plug. Vance pulled the plug on it. Here it is.

ACDR Oh - okay. I can - -

CMP No plug on that thing.

ACDR That's okay. I'll just put it ... you put it across at the beginning ...

DMP            You don't see the Sun, Tom, huh?

ACDR           No, I ... see him out in front of me.

DMP            I'll be damned.

CMP            (Please.)

SCDR           Tom, I see you have not ...

ACDR           (Yes.) ... part of me. I can't get ...

CMP            (Please, hold your cue card.)

DMP            Seems pretty upset that you were going to be ...

DMP            That's why they wasn't predicting.

16 31 50    ACDR           Yeah. It'll go by in a minute at orb rate.

CMP            Yeah. I don't think you'll lose ...

CMP            I think the rates are pretty - -

ACDR           Our rates are in good shape here. I can still see him out of a quarter of my ... You're okay. You've got perfect spacing. Don't sweat it. Vance ...

CMP            (... like a grown up.)

16 32 13    ACDR           Okay; let's make sure we've cleaned up these ...

CMP            Yeah.

ACDR           It's okay, Deke. I can look way down in the corner ...

DMP            Yeah. I don't see him. I'm working my way down here.

CMP            Can you maneuver to local horizontal? You're supposed to aline the IMU when you get a chance, and we'll set the DET up to the 500 meter.

DMP            Depends on where and how ... Okay, what's - -

16 32 34    CMP            Tom? I'll bet you a nickel Alexey wants you to turn on those lights until the programed time.

ACDR           Yeah. ... Damn.

DMP That would have been the most frustrating thing in the world to ... that old son of a bitch the one time you need it.

ACDR Okay. We got him finished. Okay.

CMP One thing that worries me is that window. That could bomb out the whole thing, too.

ACDR Sure could. I got 17 minutes to ...

ACDR What's the high-gain angles.

16 33 24 CMP I find you can see him if you kind of stay along the window.

DMP Yeah. I wonder if this - -

ACDR Well, what are you ...

DMP Man, we could see him outside, I think, 100 meters, Tom, with that spotlight.

ACDR Oh, yeah. That's what people said you couldn't - Jimmy said - Jim Sutherland said - over 300 feet with it. He got the same spotlight.

DMP ...

ACDR ...

CMP Well, I'm glad it's not biased the other way.

ACDR Yeah.

CMP We could have flown ... this week ... relied on it.

DMP Well, soon as we started out, kind of allowed the God damn relative position ...

16 34 21 CMP Yeah. I wonder if he's got his beacon off now. No?

DMP The damn light's not where I can see it.

CMP Maybe ... you ought to remind him. ...

DMP We supposed to call him on it?

CMP Yeah. (Soyuz, Apollo.)

ACDR Hand that to ...

DMP Want to have this, Tom?

ACDR No - no - okay.

CMP (Soyuz, Apollo.)

16 34 43 SCDR Go ahead.

CMP (Alexey, release ... communication ... double VHF  
SIMPLEX.)

ACDR Hell, I can't see him because of the Sun angle.

DMP Well, I can see him enough to go - -

ACDR All right.

DMP ...

ACDR What we've got into the roll ... getting fucked. ...  
roll ...

CMP Okay. Our EXTERIOR LIGHTS RENDEZVOUS, OFF?

ACDR I think we've fucked.

CMP ... spotlight. And configure for VHF SIMPLEX, which  
I think was A, SIMPLEX. ...

16 35 48 CMP Okay; you can roll to a heads-down attitude when  
you're ready, Deke.

DMP ...

ACDR Well, okay. You got to have a new - yeah, you have to  
have a new VERB 25 NOUN 78 on that ...

CMP Nope - not - well, when we start the roll maneuver.  
But - I guess we could ... until Deke is ready  
here. ...

ACDR ... 90, 972 ...

CMP Right.

ACDR In other words, ... the roll. ...

CMP Deke, can I set your DET counting up to 100:50.

DMP Yeah.

16 36 33 CMP Then, as soon as Deke says go, why - then we could ... that, I think.

DMP You better get that foot a little higher; you'll hit the roll.

ACDR Yeah. ... hand. ... docking mechanism. Okay. ...

DMP Say that wasn't ...

CMP Pretty bright, isn't it?

SCDR Tom, at this time, I'm going to restation our space-craft from 104 to 020.

ACDR What ... back to zero ...

SCDR You understand me?

ACDR (Roger.)

DMP ... I wonder if we could get him to wait - -

ACDR He's only 17 minutes late. He's only 17 minutes late here.

SCDR Tom, how do you read me?

16 37 54 ACDR (Roger, ...) I got him. ... tying him down ...

SCDR Oh. Just now, I am going to - do the following maneuver. From ... to zero.

ACDR (Roger. Roger. Go on, please.)

DMP ... Say, and I'll tell you - ... I've got this ... camera here ... spotlight ...

16 39 03 DMP ... the Sun out of the window. ...

ACDR Okay; go ahead Vance. ... NOUN 78 before we roll? It is, isn't it?

CMP Yeah, uh-huh. But if - Right, it's usually before. If you set it now ... you'll get a NOUN 58.

ACDR Yeah.

CMP And it will say - take us to another attitude.

ACDR Yeah.

CMP ...

CMP Well, that was exciting.

ACDR Yeah.

16 39 43 CMP God damn. I figure we got data from what - about 3 degrees here. Something like that?

ACDR ...

DMP ... .. lucked out ... Because theoretically, that thing should have been ...

CMP The thing is that the burn charts were working pretty good. What to do to those oxygen ...

ACDR Yeah.

CMP ...

ACDR ... Deke.

ACDR Oh, I see him now. He's up there.

DMP Dropped down below again ...

CMP (Laughter) God damn. That could burn your eyes out too, couldn't they. Yeah, I see him; he's coming out.

DMP ... pretty good ...

16 41 14 SCDR Tom, Soyuz orbital orientation established.

ACDR (Roger.) I'll be fucked if he claimed it wasn't.

ACDR ...

CMP Yeah. Not with respect to us they're not.



ACDR Yeah. But ... the horizon.

CMP Yeah. Not with respect to - We're level with the horizon.

DMP I'm going to get up ... roll.

CMP Maybe he's still - -

DMP ... MAN ATTITUDE.

ACDR May be yawing 180.

DMP We're looking down his God damn neck.

ACDR Yeah. His axis - X-axis - that's ... I thought he was yawing.

CMP My COAS is on him.

16 42 31 ACDR Wait a minute; I see what he was doing. But it must be taking him forever. See that? Yawing now.

CMP Aw, hell. He's getting fucked doing it. That's a weird looking spacecraft.

DMP Really weird. ... Yeah, we're going to get good ...

DMP Okay; now before we start the 500, ... 180 roll, right?

16 43 20 CMP Yep. Don't know ... to get all the data there.

ACDR Okay. Got a ready.

DMP ... behind him. Let's see a 180 - We're going to be - he's going to ... Right? ... should be reading right now.

CMP ... schematic ... looking at it sideways. And I believe that's what you do.

ACDR ... we're a - we're out of plane ...

DMP ... reflector's on the right side of it.

DMP He ought to get yawed - he ought to be doing his yaw 90 degrees to the left ... the reflector.

CMP What's that?

16 44 23 DMP Why would he - be there. He's going to ... around and move out of plane, and instead we'll end up yawed 90 degrees, ... reflector to look at.

ACDR Are we in plane now?

DMP Not quite, but almost. We're in plane, we're just not ... yet. We ... even gone to zero degrees yet.

DMP Well, let me get up over here for a minute.

CMP And any time you want to roll, why - -

DMP ... .. I want to get that lined up ...

CMP Tom, why don't you give me that - ... the numbers in the computer, but I ...

CMP Okay. NOUN 78.

ACDR VERB 25.

CMP Okay.

16 45 33 ACDR Plus 90 degrees, plus 9725, plus 18000.

DMP ...

DMP Oh, shit! ... Get setup for the roll?

CMP Yeah, we're setup now.

DMP Okay. The problem is the computer ... roll ...

CMP Computer will roll. Computer is rolling.

DMP Yeah. Got a low rate, though, with that.

ACDR Yeah.

DMP Let me get up here and really ...

CMP Okay. Come to think of it, though, entered ...

ACDR You did?

CMP Yeah. ...

CMP Okay. I guess I'd better go back and reload the originals, again.

ACDR ...

16 47 16 CMP ... seems to think so. It starts in about a minute or so.

ACDR Probably ...

CMP We're getting this uplink activity light - light ...

DMP We are? Here it is ...

CMP Okay.

ACDR The first one is okay. The second one is minus 8275. VERB ...

CMP Okay; give me the whole thing, and we'll back up.

ACDR Okay; plus 90 degrees.

16 47 48 CMP Plus 82.75?

ACDR Minus 8275. Plus 9 and minus 8275.

CMP Plus 0?

ACDR Plus 180. 180 degrees. Okay.

16 48 20 CMP Plus 180.

ACDR You want this camera back over there?

DMP ... pictures. ... before they do the ...

CMP Okay. ...

ACDR Okay. Plus 90 degrees.

CMP Okay.

ACDR Minus 8275. Plus 180; 180 degrees.

DMP Okay. We ... .. you guys are ready, I'm going to begin the roll.

16 49 22 ACDR Okay. ...

CMP Okay.

ACDR Ready?

CMP I'm ready.

ACDR Ready, Vance?

CMP Yup.

16 49 28 ACDR Okay. Let me ... Okay. Vance, enter those new numbers?

CMP Yup.

16 49 32 ACDR Okay. MANUAL ATTITUDE ROLL, ACCEL COMMAND. MANUAL ATTITUDE - RHC, roll 180 degrees at 2 degrees per second.

DMP Okay.

ACDR ...

DMP Okay.

ACDR Ready to go?

CMP/DMP Yeah.

16 49 54 DMP What happened here? ... There we go.

CMP Yeah. That frightened Tom. (Laughter)

ACDR (...)

DMP ... COMMAND. Won't stop rolling.

ACDR Did it stop?

DMP ... God damn.

16 50 17 CMP You're in MIN IMPULSE. Oh, I see. Okay.

DMP Wait a minute ... rolling.

CMP Yeah. ...

DMP Oh, okay.

MS ... after awhile.

DMP Go ahead, Tom.

DMP Whoops, there's the God damn ...

ACDR They are, Deke, making it tougher than hell.

DMP I think they're doing something, and I discovered they hadn't.

ACDR ...

CMP Okay, Tom?

ACDR Yeah.

CMP Give me the new numbers now.

ACDR Okay; the new numbers: plus 90 degrees, plus 97.25, plus 180. Oh beautiful! Right there, Deke, you're there. Continue horizontal.

DMP ...

ACDR Roger. We've just rolled 180 degrees, Bo.

16 51 31 ACDR Okay. Back to CMC AUTO.

CMP Deke.

DMP What?

CMP Got a picture.

DMP Go ahead.

CMP Okay.

ACDR (Soyuz, Apollo.)

ACDR Go ahead.

ACDR        Okay. Power on, and it's bleeping back and forth ...  
0.3 ...

USSR        (Moscow, I read you.)

DMP         I'm going to close up on him just a little. Our ...  
too far out.

ACDR        Okay. You hear what he said he's going to do? He  
wants ... rear reflectors.

USSR        (Regards to the personnel and thanks for your good  
work. We'll receive your congratulations after the  
flight. Great thanks.)

DMP         I didn't hear what he said.

ACDR        I couldn't remember what you - what Bo said.

ACDR        (Yes. MCC Moscow wants to talk to you over our ship.  
Over.)

SCDR        Okay, we are ready.

ACDR        They're ready; they got it.

DMP         We all set here now?

CMP         Yeah. You're all - -

SCDR        (Moscow, Moscow this is Soyuz. How do you read?)

16 52 29    ACDR        ATTTITUDE SET to GDC.

MCC-M       (Thank you. Read you loud and clear.)

ACDR        Where is that?

CMP         It's on the checklist. It's not important.

USSR        (We are located now ... At the right, we see the  
Apollo spacecraft.)

16 52 51    ACDR        CM function ...

USSR        (Everything is nominal.)

CMP         Okay, how we - -

USSR (Thanks.)

ACDR They want to use their rear reflectors.

DMP ...

16 54 03 CMP You know what? I don't want to get them in trouble or anything, but I'm wondering if they have a light leak in the window ...

DMP You can damn well see some light in the window.

ACDR ... Yeah. That's right.

ACDR Okay.

CMP That just might be what ...

ACDR Oh, okay.

CMP Houston, Apollo.

16 54 44 CMP Loud and clear, Bo. Bo, we have a question.

CC-H Go ahead.

16 54 51 CMP We thought we could see a light leak in their window - or perhaps not covered - one or the other. Would that have any effect?

CC-H We'll check.

CMP Look at the contrails down there.

ACDR Yeah.

16 55 13 MCC-M (Soyuz, this is Moscow. How do you read me?)

ACDR Can't you see the way the damn clouds are moving?

CMP Oh, I see. Those, you mean. I thought you meant - -

ACDR Yeah.

CMP - - some kind of ...

ACDR Oh, no, no. See the way the clouds are moving?

CMP Oh, yeah.

17 06 30 DMP ... you guys, we're coming up here on 4 minutes.

CMP Okay.

DMP 101:28.

ACDR Roger. Is that the data take?

CMP That means that we can be late ... 30 minutes.

DMP/ACDR No.

ACDR 101:08. That means we got to be there - a data take in 24[?] minutes.

DMP Okay; we're counting down and we got ... minutes to go.

CMP I thought you said start the burn.

SCDR (...)

ACDR Understand, Bo.

17 07 36 CMP Okay. Tom, are there any last-minute things before 59:30?

ACDR Don't think so. Okay; let's - Oh, ... RCS - SCS RATE COMMAND; RHC, ARMED.

17 07 48 CMP Yeah. That's ..., but nothing from - up to that point, huh?

ACDR Nothing here. We got the get evaporator deactivated and get plus Y to the right ...

CMP Looks like we got good initial conditions here.

DMP ... window there?

DMP (I see you, Alexey.)

SCDR We see you.

ACDR Houston, Apollo.

SCDR I see Vance now.



DMP (...)

SCDR Very good. 50 meters.

DMP (Well.)

17 08 44 ACDR Okay. On this start here, right now we're going in-plane forward; and he's yawed 90 degrees. Affirmative?

DMP I don't know what he's going to do.

ACDR Is he going to keep his present - -

CC-H ...

ACDR Okay. Yawed 90 degrees to the velocity vector. All right.

CC-H ...

ACDR (All right) ...

CMP Okay; they're doing ... Right.

DMP ... right. Okay.

CMP And 59:12.

ACDR ...

DMP Yeah. That'll do ...

CMP Okay.

ACDR ...

CMP Go to SCS; three RATE COMMAND, MAN ATT; and RHC, ARMED. Hey, you did 11 degrees both ways, Deke.

17 09 45 SCDR (Moscow, this is Soyuz. I read you excellently. How do you read me?)

CMP You wanted auto maneuvering.

DMP I think the maneuvering, Vance, unfortunately, is going to be - -

ACDR ... I think you're still about 25 feet from ...

DMP I'll back ...

SCDR (Moscow, Moscow.)

17 10 02 ACDR Check the maneuver, Vance, I'm going to drop.

CMP Okay; no sweat.

17 13 45 ACDR Okay, we're back banking now. All right.

CMP They may have to come down about 12 degrees.

ACDR ...

CMP Four degrees, yeah.

SCDR (Moscow, this is Soyuz. I hear you excellently. How do you read me?)

ACDR Let me get the yaw around; the yaw is in now. Okay?

CMP Yaw is right in.

ACDR Uh huh.

CMP ... Where you want to be?

DMP ...

SCDR (Moscow, this is Soyuz. I read you excellently.)

CC-M (Roger, Soyuz.)

17 14 23 SCDR (Now the situation is as follows. Apollo went by our rear, and we saw it through our right window. The distance was about 30 or 40 meters. It is holding distance very well. Now I'm watching it through the right window. And we'll maneuver should something happen. Over.)

17 14 45 DMP Okay; how's the - -

CMP Okay. Your roll is ...

SCDR (It is a 180-degree roll, in relation to us, upside down.)

DMP Okay; yaw is ...

DMP Okay. How is the pitch coming there now?

CMP You're about 11 degrees - -

DMP Okay; I'll ... the auto maneuver.

17 04 16 ACDR They're still yawed 90 degrees, Bo.

DMP It said 90 degrees in the orbital plane, here.

ACDR They're not yawed in plane, Bo; they're 90 degrees to it.

CC-H Roger. Understand. ...

CMP Okay. Thanks, Bo. Thanks, Bo. For your info, we grabbed that one because we couldn't find the first one you called up. It was a PAO mag.

17 04 46 DMP And, for your info, Bo, the last time we came back into plane, we were still in the dark, and ... Sun rising right behind the Soyuz was a real bear. Can anybody tell yet if that's going to happen next time around?

DMP Okay. I just wanted to inform you that the last time around, we came into plane in darkness, yet. And turns out that the sunrise is directly behind Soyuz. And we had a difficult time there until the Sun got over our head. I would expect the same thing to happen at the 500 meters.

CC-H ... and I understand ...

DMP Hey, wait a minute. We're behind - we're ahead of him now. We are be - -

17 06 01 ACDR Yeah, ... We are behind him going forward - we are behind him going forward. We are plus-X forward in the plane.

DMP Will be when we get around there.

CMP Yeah, the second one is just coming back in an opposite direction, sort of.

ACDR Yeah, ... yaw zero.

CMP ...

DMP ...

ACDR ... damn right.

CMP Where?

CMP Okay, you'll ...

DMP Just wait a minute and I'll - -

CMP Okay. You're real close now - 4 degrees ...

17 15 35 SCDR (...)

CMP Okay; you'll see them - -

DMP ... see them.

CC-H Apollo, Houston. We'll be - we'll be coming up on sunset here in just a few minutes.

ACDR Okay.

CMP Okay; it's coming in by itself.

DMP ... Coming in.

CMP Now it's a matter of going in. Be a little harder in the dark.

DMP ... CMC?

CMP Yeah. First you better go ahead and go back to the configuration for NULL ... as before.

17 16 03 DMP Yeah. Okay. Now where should I be in the ...?

TIME SKIP

17 49 16 ACDR You want the spotlight on him, Deke?

DMP ...

CMP Yeah. How far out ... 44?

DMP 45.

CMP Houston, Apollo.

CMP Apollo, Houston. We got out to .24 on the EMS, which is obviously biased.

DMP ...

17 49 49 CMP - - on the 500. Roger.

DMP Okay.

CMP Think we should ...

DMP ...

CMP Good. Okay.

17 50 13 DMP Oh. ... see he's out there, ... turn those off.

17 50 19 ACDR Okay.

CMP ... I think we - we got two good data takes ...

DMP Yeah, it's very likely ...

ACDR Where are you - where are you at down here?

CMP Okay. We're at ..., Tom.

ACDR I don't have that.

17 50 44 CMP Look down past the 28-minute burn. We've done the MIN IMPULSE, the CMC, RHC, LOCKED - -

ACDR CMC.

CMP We've got a VERB 16 NOUN 04 - -

ACDR Yeah.

CMP ..., COAS, and after ... we get in close enough to stop, why, that's when it's - we'll be - Later, we'll be in SCS.

DMP ... going to need that ...

CMP Yeah, I think. Let's not be doing the work that's - -

DMP Might as well do that 50. ... we'll be in primary ...

ACDR Okay. Primary glycol - -

CMP ...

17 51 25 ACDR Primary glycol activation.

CMP ... okay. You got that? You're going to the sextant?

ACDR What time is it? Yeah, we've got - we got finished up pretty quick.

CMP Pretty close, yeah. Just about on time.

ACDR Yeah. Yeah, we're right on time.

CMP ... your clock.

DMP Yeah.

CMP ... good. And ... quad ... Right about ...

DMP Oh. Oh.

ACDR Where'd you find the CM ...

CMP I found it up in ... I don't know what it was doing there.

17 52 22 ACDR It's supposed to be in the docking ...

17 52 48 DMP I think I got some ... film ...

CMP Very good.

CMP It's beautiful when daylight comes up.

DMP Oh, yeah. It's beautiful ... came over the horizon down there. You can see the backlighting on it - the silhouette. ... things ... my camera ready. Go to the ... attitude in 5 ...

CMP Yeah.

ACDR Aha. That ... is CX04, PAO. Ha - ha. Right.

CMP You know, I still can't get used to the fact that the sky and the ground seem to flip-flop.

ACDR Oh, yeah.

DMP Yeah.

ACDR You peek out there and you think that blue stuff is the - -

CMP ...

ACDR - - ground.

DMP Yeah. Sure does it.

17 54 08 CMP Boy, his spacecraft sure looks good.

DMP Green ...

CMP Huh?

DMP Looks like green ...

ACDR Earth obs and solar eclipse.

DMP Think we already did the solar eclipse. ... Far as I know, there's only one magazine ... Earth obs. Gee, I hope - ...?

ACDR Yeah.

17 55 42 CMP Ready? (Ready? ...)

ACDR We took ...

CMP ...

ACDR We've got to get a good picture here of this thing.

CMP Yeah.

DMP ... Let's see ... It's really far out. We can go with a spot, change the light. I probably won't though. Let's see, Sun will be - -

CMP The Sun's coming up.

DMP ...

CMP ...

DMP How're you going to ...?

ACDR ..., Deke?

CMP I can do it right here.

SFE Apollo, Soyuz. What is the range now?

17 57 12 DMP (Ah, Valeriy. Right now, 5 feet.)

SFE 3 feet?

CMP Oh, Deke?

DMP (5 feet.)

SFE (Okay.)

17 57 36 CMP Here it comes. Get it. Man!

DMP ... (Laughter) ... Still don't think those ...  
engineers ...

CMP Maybe not.

DMP ... we've got it spotlighted.

CMP Yeah.

17 57 58 DMP Okay.

ACDR ...

DMP ...

CMP Well, it's about 0.3 or 0.4 - It really doesn't ...

DMP See, got ...

CMP Yeah; 0.04, Tom.

DMP ... And the next ...



CMP But that's quite a way ...  
 DMP Yeah. Should be - we're supposed to be through ...  
 17 59 24 ACDR (We didn't have dinner ...)  
 CMP (...)  
 DMP ... lights. Turned them off.  
 CMP Yeah.  
 18 01 30 CMP (... dinner)  
 SFE Roger; ...  
 CMP Yeah.  
 18 01 59 ACDR Okay. You break out 90 degrees from the orbital  
 flight plane.  
 CMP What? Ah, well ... roll ... is not ... It can go out  
 of band. We're coming in one ... of his ... because - -  
 ACDR We're coming in ...  
 CMP Yeah.  
 ACDR Okay. ...  
 CMP Yeah.  
 ACDR ...  
 DMP Okay; I'm going to get this ...  
 CMP Okay. SCS and RATE COMMAND.  
 18 03 02 DMP Okay. RATE COMMAND ...  
 CMP And I'll start monitor - -  
 DMP ... COMMAND. Okay.  
 CMP Go on MANUAL ass - ATTITUDE, MIN IMPULSE, all three.  
 (Laughter)  
 18 03 21 DMP MIN IMPULSE.

CMP Track Soyuz. And ... NOUN 78.

DMP Okay. It's a little high in the ...

SCDR Tom, when are you going to finish your work?

ACDR (Soon.) ... finish your work?

CMP Hey, look at all the clouds that's down there, all ... circle.

18 03 59 DMP They didn't tell whether to push her down or not, Tom. Hold on. Okay. RATE COMMAND?

CMP Okay. Yeah.

DMP ... MAN ATT and pitch, RATE COMMAND, huh? Right?

CMP Yeah. RATE COMMAND, three of them.

18 04 17 DMP Okay. ...

CMP And - -

DMP - - want to pitch down.

CMP Okay.

DMP Four jets?

CMP I think - -

DMP Okay. What do you think? Supposed to be - -

CMP Okay. The up one.

CMP Yeah. The only thing is I don't know when you pitch down ...

DMP Yeah.

18 04 42 CMP Okay. ... up. Yeah. Okay. The other one's okay.

DMP ...

CMP Okay. Meters are doing fine. Your up down's pretty good.

DMP ... I've got to get it back in here ...

ACDR ..., Deke?

DMP Yeah.

SCDR Tom, what is the range now?

ACDR (Right now ...)

CMP ...

SCDR Apollo, Soyuz. What is the range now?

DMP Tell him ...

ACDR Yeah.

ACDR (Soyuz, Apollo. Right now, 55 meters.)

DMP ...

CMP Yeah.

ACDR Yeah, yeah. I think that range is normal.

SCDR Apollo, Soyuz. How do you read?

ACDR (Okay. Excellently. How me?)

CMP Okay. You're up to 5 degrees. ...

DMP Plus 5?

CMP No, you've got to go minus ...

18 06 27 ACDR (55 meters.)

ACDR What step are you at?

DMP Oh, about ...

18 06 47 ACDR (... meters.)

DMP ...

ACDR What ... have you got? ...?

DMP ...

CMP Okay. That's 15.

ACDR ... looks like 30. Been waiting ... 20 meters.

CMP Yeah.

ACDR Right.

CMP (Laughter)

ACDR (Look at your orientation lights.)

CMP Yeah. Going back to 3 degrees? Yeah.

SFE Orientation lights off; beacon off.

18 07 50 DMP Probably be 20 minutes before you can - -

CMP Okay.

ACDR We're supposed to do it right here.

SCDR How do you read me, Tom?

ACDR (I read you well. How do you read me?)

SCDR I read you well. Okay; what is the range now?

CMP 5 degrees off of roll - -

ACDR (58 meters.)

CMP ...

18 08 11 DMP ... over there, we'll go minus X for 3 seconds.

SCDR Did you finish your work?

ACDR (Yes, I had my breakfast.)

DMP Okay. Let's go to minus X.

SCDR ...

DMP ...

CMP Yeah.

DMP Plus for 3 seconds?

CMP Right. ...

DMP Yep.

SCDR Tom, did you collect data?

ACDR Yeah. (Goo - good data.)

DMP Okay. Now - -

SCDR Okay.

CMP Okay. You ready? Let's get going. MIN IMPULSE, CMC, RHC LOCKED, then - well, I'd let the computer take it. ... this VERB ...

CMP Turn to - -

DMP I think it's down.

CMP It's up.

DMP No. I think it's down.

CMP Well - -

DMP Okay.

CMP - - since we're almost - Well, - -

18 09 38 DMP We're about there. Let's take it. Okay; this is - MIN IMPULSE ...

CMP CMC, MIN IMPULSE.

DMP CMC. Yeah. ...

ACDR Have you got CMC ...? Got - -

CMP Get it?

ACDR Yep.

CMP And lock RHC?  
 ACDR Yeah.  
 18 10 11 CMP We're locked up.  
 DMP ...  
 CMP Yeah.  
 ACDR I think ... I don't think we've got it all.  
 DMP Okay.  
 ACDR I don't see his ...  
 CMP Okay. Your needle's are set ... Okay; I don't -  
 ... never went down to low. We're down to - -  
 ACDR You want me to take that?  
 CMP - - 112. Yep.  
 ACDR Okay. ...  
 18 10 48 CMP Yeah. Okay. What's next?  
 DMP Don't know.  
 CMP Okay. ... back.  
 DMP ...  
 CMP Okay. We're going to do this at 50 meters for a  
 heck of a long time, so when you get a chance to,  
 GDC aline to 0,0,0. And we'll set the DET up. We've  
 got quite a way ... Okay; there's 102:16:00.  
 ACDR You subtract that ..., huh?  
 CMP Yeah.  
 ACDR Maintain 50 meters.  
 DMP When are going to do ...?  
 ACDR Aw, not too much longer.

DMP Then we'll be back ...

CMP We don't have as much time to wait as you might expect to - Let's see, 102:16 plus - -

ACDR ...

DMP ...

ACDR Okay.

DMP Okay. If you want to, you can aline that ...

ACDR You want to set it up - check the checklist? Check on page 7-16. You want the checklist? He wants the checklist.

CMP Yeah. I'll have to check. I'm right in the middle of the checklist.

18 12 40 CMP Okay. You listening, Tom?

ACDR Yeah.

CMP GET is 102:16. And that's plus - -

ACDR Plus - 7.

CMP 7.

ACDR It's 23 or 22 to ...

CMP 37 ... Yeah.

ACDR Start it in 7 seconds.

CMP I - Oh, yeah. I'm sorry. ...

ACDR Oh.

CMP ...

18 13 05 ACDR Okay. (Soyuz, Apollo. Right now, turn on second VHF SIMPLEX. Soyuz, Apollo.) Soyuz, Apollo.

SCDR Go ahead, Tom.

18 13 49 ACDR (Excuse me. Delta 2 VHF SIMPLEX. Over.)

SCDR We received you.

ACDR (Okay.)

CMP Hey, your ... got in too close, ... (Laughter)

ACDR Okay. We've got ...

CMP ...

DMP Yeah.

CMP Okay.

DMP ...

CMP ...

DMP ...

DMP ...

ACDR Yeah, I - How much was that last one?

CMP What rev's ...

ACDR ...

CMP ...

DMP ...

18 18 50 ACDR ... No, ... I don't want - -

ACDR ... What page? ...

CMP ...

SCDR Did you already finish your work?

ACDR (Yes. I finished everything.)

18 19 46 SCDR In 5 minutes, we are going to photograph Apollo.

ACDR (Roger.)



ACDR Coming up on that maneuver now?

SCDR (You know?)

CMP ...

18 19 56 ACDR Okay. Here we go.

ACDR Okay; verify. Okay. When we get up to there, which is 102, 3, 4, 5, 6, 7, 8 - at about 8 - -

DMP ... here?

ACDR Translate down ...

DMP 102 ... 3, 4, 5, 6. Okay.

18 20 21 ACDR That's where you've got it? I've got MANUAL ATTITUDE, RATE - I've got FDAI scale 5 and 5, SCS - -

SFE Are you ready for me, Tom?

DMP Four on, 2 seconds.

ACDR I'll get back to you.

SFE Roger.

SCDR In 4-1/2 minutes, we are going to photograph Apollo at range 130.

ACDR (Thank you.) At 1 what?

CMP At range 130, I think he said.

ACDR (Repeat, please.)

SCDR Soon, we are going to follow your work.

ACDR That's it. 2, 9 - -

18 21 03 ACDR 3. ... guidance; in time!

DMP Big, bad - -

ACDR Start getting it!

CMP 3 seconds - -

ACDR Get - get it in FREE, pitch rate.

18 21 11 DMP Going FREE.

SCDR 4 minutes.

DMP ... Tom? ...

SFE Okay. If you be finished, we are going to finish your work.

ACDR (...)

DMP Don't think I do. ... ..

CMP Yawing.

DMP Big yaw.

18 22 06 CMP Off. ...

DMP Okay; now. Okay. You got it? ...

18 23 16 CMP 51:30, about 4 minutes.

TIME SKIP

19 14 20 CMP Check out the ...

ACDR ...

CMP ...

ACDR Process the VERB 49.

19 15 00 ACDR ... Okay. ABSORPTION POWER, OFF and COVER, CLOSED.

DMP ...

CMP ...

DMP ... close the ...

19 15 20 ACDR Why do we ... with out-of-plane angle? Why in the hell are we closing the covers ...?

CMP Oh, ... getting ...  
 ACDR Yeah. No. That's right. ... has a question. ...  
 19 15 41 ACDR Houston, Apollo.  
 CMP ... checklist, Tom. ...  
 ACDR ... out-of-plane data attitude. Shit! ... power ...  
 CMP Okay; what's next?  
 ACDR ... out-of-plane maneuver and then ... Flight  
 Plan. 103.  
 CMP ... the urine dump?  
 ACDR ..., right?  
 19 17 06 CMP ... 37 - It's supposed to be ...  
 ACDR ...  
 CMP ...  
 ACDR We're 102:50. ... out of plane ... 102 ...  
 CMP Yeah, ...  
 ACDR ...  
 DMP ... two ...  
 19 18 30 ACDR ... gimbal lock. ...  
 CMP 45 degrees. ... Okay.  
 ACDR We already closed these covers ... okay ...  
 CMP We're not on ATS.  
 19 20 03 CMP After the maneuver, ABSORPTION POWER, OFF ...  
 ACDR ... yaw?  
 CMP 249.

19 22 01 CMP Power down BMAG 1. ... Okay.

19 22 10 ACDR MARK.

19 22 11 CMP MARK. ... BMAG ...

19 40 58 ACDR ...

CMP Is that a star out there?

ACDR No, that's urine. (Laughter)

ACDR Yeah. ... Sure, I thought it was ...

19 42 10 CMP Well, Myrtle's shaping up.

ACDR I'll tell you, this urine system ... a hell of a lot better than ...

CMP Have any - ...

ACDR Yeah. The ...

CMP ... where it ought to be.

ACDR ... in A-5.

19 45 45 CMP Oh. I see.

ACDR ...

19 48 16 CMP He went over to ...

CMP I think.

CMP Yeah. Yeah. Oh. That's right. Oh. I got that out ... Okay. You know - ... before we get ... we have to get all that stuff stowed away.

19 49 04 CMP Yeah. I know ... bring small ones and the ...

19 49 47 CMP Yeah. A-5, I guess, is where bags are.

ACDR ... bags, yeah. We got bags. ... bags.

19 50 20 ACDR Let's see, where's ...

CMP Oh. You're looking for ... I thought you were  
 looking for film bags. Okay. ...

19 53 49 CMP ...

ACDR ...

19 54 21 ACDR Deke, ... think you can get that bag down?

ACDR You want to play that on Alexey?

CMP Girls' showers. Yeah, why not.

ACDR Why not. (Laughter)

CMP Wonder where ...

ACDR ... it right up there ...

ACDR You ready?

19 57 30 CMP (Soyuz, Apollo.)

19 57 35 SCDR Go ahead.

19 57 38 CMP (... party.)

USA (Recorded sound effects)

19 58 51 SCDR ...

ACDR (...)

SCDR ...

MS (Laughter)

19 59 01 SCDR Did you hear it?

CC-M (...)

MS (Laughter)

19 59 11 DMP ... Alexey.

19 59 57 MS (Laughter) ...

20 00 06 CMP Oh, what are we going to do tomorrow. (Laughter)

DMP ...

ACDR Yeah. They sure did.

DMP Roger. ...

SCDR Apollo, Soyuz.

ACDR (... We read you, Soyuz.)

20 01 41 SCDR Why - you have ...

ACDR (...)

CMP (Okay; I understand.) Wait, wait. Wait, wait.

SCDR Okay.

20 02 32 ACDR That's okay.

ACDR Okay.

SFE (Moscow, Soyuz. How do you read?)

SFE (We performed loading at 10 - 22 hours, 55 minutes; 21 ... 1 hour, 21 hours, 55 minutes, 22:55; voltage, 27; charge, 21; and load, 20. Everything onboard functioning normally.)

CMP ...

20 04 28 CMP That's good.

ACDR That ... good.

USSR (...)

ACDR ...

SCDR ... (Yes, yes. ... disconnected; connected it to connector 12 in the OM.)

USSR (... turned off. FM simplex remains.)

USSR (Now ... we are getting ready to perform.)  
20 06 08 CMP ... make ...  
USSR (The capacity is 164, primary RCS is 88, and backup  
is 20 kilograms.)  
20 06 58 USSR (... from 0.34 to 0.41.)  
20 07 14 USSR (...)

TIME SKIP

21 24 41 CC-H Apollo, Houston. Goldstone for 6 minutes.  
21 30 22 CC-H Apollo, Houston. We're 1 minute from LOS Goldstone;  
Newfoundland in 5 minutes from now.

TIME SKIP

22 21 03 USSR (Is the picture all right?)  
USSR (...)  
22 21 18 USSR (Is the picture all right?)  
22 26 14 CMP They're all joint activity ... And 9, 10, 11, and  
12 are ... Soyuz. U.S.S.R.  
ACDR Okay. Well that's half of the obs stuff. The other  
Nikon thing - the other Nikon ... ..., Valeriy.  
I finished ...  
22 26 45 CMP Yeah. The one I got out - the ones I took yesterday  
were - You finished them up. Those ought to be good.  
ACDR Yeah. ...  
CMP Okay. And we've got one more if I ever find the  
camera. Okay, but how about these CIs, 104 and 112?

ACDR Well, I've got enough ... 5, 6 ...

22 27 47 CMP I'm going to check off the ones we're calling. Okay.  
You've got 3, 4, 5, 6 and what? 7?

ACDR I got 5 - got 5, 6, 4, 12, 7.

ACDR 2, CI03.

22 28 36 CMP Just a second. I got ... Okay, 2 and what?

ACDR Got CI03. 3.

CMP Yeah.

ACDR 4, 5, 6, 7 - -

CMP Yeah.

ACDR - - 12.

CMP Okay.

ACDR ... exterior.

22 29 01 CMP Oh. Well, 02 we don't need. That's DM checkout.

ACDR That's right. ...

ACDR Here's the exterior ...

22 29 15 CMP Okay, just a second. Okay, call one out, and I'll  
see what it is.

ACDR CX01 ...

CMP Okay. That's TD&E.

ACDR ...

CMP That's dock. Okay.

22 29 29 ACDR 3.

CMP Okay. That's test undock.



ACDR 4.

CMP That's Soyuz photos.

ACDR 5.

22 29 38 CMP 5 shouldn't have been used; that's for entry.

ACDR Okay.

CC-H - - minor pad changes for tomorrow's ... we can get to work on them as soon as we can.

22 30 11 CMP Okay, understand.

CC-H Okay. See you at Hawaii.

CMP Righto.

ACDR I got a bunch of ...

CMP Aloha.

22 30 27 CC-H Aloha.

ACDR Okay, Vance. I got that stuff down in A-5 for us. ... 2 we used for Earth obs.

CMP Okay.

ACDR Now, that - -

22 30 40 CMP Yeah. U-2 is getting too crowded.

ACDR Yeah. We'll put that in the last ... got all that film ... that PAO ...

22 30 49 CMP A-5. Nothing else in A-5?

ACDR ... Nothing much.

CMP Make that other ... the bottom sack ... Okay. Do you want to check off the rest of the things, though? Like, we never went over the HRC and - -

22 31 08 ACDR Which ... do we have out of the Hasselblad ...? I got a bunch of them ...

CMP Yeah.

22 31 12 ACDR Let's just mark that one ... CX12 ...

CMP Okay, now that - isn't that the one we had on today, or what?

ACDR No, that's the one ... I shot all those ...

CMP Uh-huh.

ACDR ...

22 31 29 CMP Oh, that - oh, I took the - took it off and I guess you put it back on.

22 31 31 ACDR What?

CMP ... just didn't have any magazine on ...

ACDR ... I'll put ... CX ...

22 31 43 CMP Yeah. And after that, today we put 55 on here, and I looked at it and I thought, well, that's quite a bit ... quick release on it, so I pulled it off.

ACDR Yeah.

CMP I gave it to you and put it up ... warmed up this camera.

ACDR You gave it to me and I shot ...

ACDR Yeah. You want this? ...

22 32 41 CMP Ahh, I'm going to look at M-2 to be sure just what I'm talking about. But today, after all the big action, I took off a magazine.

ACDR Oh, you did?

22 32 52 CMP I - I think I did cause it had 55 on it. Maybe ...

ACDR No. No, it wasn't. I looked at it. ...

22 33 08 CMP Yeah. Let's look in there.

ACDR Go ahead.

ACDR ...

22 33 13 CMP You and I are doing okay. We got this to do until 106:50. But we do need to be set up ATS. ... Pitch 23, yaw 299.

ACDR Okay.

CMP ... Okay. ... Next thing we got is a UVA roll scan and Deke's off doing his ... We'll do that - start it around 50; we got a half hour or more yet to make sure the ..., I guess.

ACDR ...

22 34 54 CMP Yeah. And that's what they want the most, I think. PAO quick release is not movies but it's ... Tell you what, you go down and ...

ACDR ... have to go to that P20.

22 35 29 CMP No. I don't think we want to do that until we get close.

ACDR Is there exact time to proceed on that?

22 35 38 CMP Well, you know, that's one of those deals where we'll pull out the supplement, probably. I - I don't know. I'll have to check. The exact time is someplace. We do have some raster scan EMP stuff tonight.

22 36 11 CMP Yeah. I know I put that - that thing - -

ACDR Did you change it out after ...

CMP Yeah. I know I put it over here. ... just see where it is.

22 36 25 ACDR Yeah. That was the one that ...

22 39 26 ACDR Yeah. ... we have ...

CMP I got a feeling - unless - except there are five more frames than when I took it off. Let me see if there's another one.

CMP Okay. That one's -

CMP You know I think I finally discovered why they never like to have us shoot all the Hasselblad stuff mixed. Because probably the ... figures once the PAO guys get it, you'll never see it.

ACDR Yeah.

CMP Well, I don't know. Let's see what this says, docking - Yeah. I - I wrote on there, docking TV, - -

ACDR Oh.

CMP But I meant film. Well, anyhow, that's good.

22 40 56 ACDR Why don't we get another bag - we'll have - we'll have two bags full.

CMP Okay.

ACDR In the second bag, there's some other stuff. That was the one we took off, and I think this is the one that I popped 35 on. We haven't been shooting much today and - on ...

CMP I - maybe shot a half a dozen times. You know - -

ACDR Okay.

CMP - - when we went over Africa, and we saw ... - -

ACDR Yeah.

CMP - - that Levantine Rift.

ACDR Yeah. I know you said it. Okay. Well, all the rest of the stuff - you got - you got the camera?

CMP It's up in its usual spot probably.

ACDR No, it's not.

CMP Oh.

ACDR There it is. All right. I shot about - at least three sites.

CMP Okay.

ACDR Suppose to put these two on. That should have what we got on ... the Hasselblad. There's still a bunch left in there. Okay. Should we get a little - another - -

CMP Okay. You say you want to - somewhere to put this, so we'll have it for a quick release?

ACDR Yeah. That one - that bag is all filled.

22 42 53 CMP Okay. I guess we need another bag. And - -

ACDR You might check down in A-5 there, any of them will do.

CMP Yeah.

ACDR Just so it'll hold a couple of these.

CMP I guess what I'll do is just get a Hasselblad bag out of B-5.

ACDR Yeah. That's a good idea. You know, where's that - looking ahead in the Flight Plan, we have a mapping pass and a visual obs pass.

CMP Yeah.

ACDR Do you know where that big Hasselblad is?

CMP The mapping Hasselblad?

ACDR The black one - yeah, the black Hasselblad.

CMP No. The last time I even thought about it, it was over on that corner over there. I don't - I - I wouldn't suspect it's in the TSB back there, but I don't know.

22 46 04 CMP Okay. I'm going to designate this one "PAO quick release."

ACDR Okay. ... camera ...

CMP That's probably all.

ACDR Yeah. It's my option ... tell them that.

ACDR Shoot. I've lost at least two pencils. ... let me find one.

CMP Maybe I got an extra. Oh, yes. I got a - I found it somewhere.

ACDR ... contact the ...

22 47 14 CMP Okay, tell you what. We'll - I'll put this down with that other - Hell, did you lose the pen too?

ACDR No, I got it. Say, I'm missing one Pentel.

CMP I got a - -

CC-H Apollo, Houston. We're 1 minute from LOS Hawaii. We'll see - see you when you get locked up on the satellite.

CMP Okay.

ACDR Put it on 10 over 40. 4.

22 53 40 ACDR Got it.

22 53 56 ACDR Okay. On 808, is that thing hooked up? Is the cable hooked up? Just pull the camera around to make sure it's the right one. Okay. On 808, the CAMERA SYNC to CM/DM ...

22 54 30 DMP TV SELECTION, select DM, DML.

DMP DML STATION POWER, ON.

22 54 45 DMP I go to 181; I'll take care of this on 181. Next thing you do is obtain the wicking demonstration. I'll go down to 181 and set that up for you.

22 54 59 CMP Can I help?

ACDR No. ...

CMP Okay.

22 55 08 CMP Well, maybe three is too many in the way. Need me to read your checklist to you while you're doing it?

ACDR ... CM POWER ... That's what I'm going to do.

DMP Come on up, Deke.

22 56 35 ACDR Okay, the next thing. Obtain wicking demonstration. Mount baseplate on food tray, third Velcro row.

DMP ...

ACDR Mount baseplate on food tray, third Velcro row.

DMP Okay. ...

22 58 13 ACDR Mount baseplate on food tray, third Velcro row.

ACDR Obtain yellow syringe, attach yellow ampule. Yellow syringe, yellow ampule.

22 58 55 ACDR You want a bag to put this stuff in?

ACDR ... yellow syringe. Obtain yellow syringe, attach yellow ampule.

ACDR Fill baseplate with water, holding the syringe vertical. That mean water out of the gun or out of that?

22 59 48 ACDR Portable light, high; and DAC, on.

ACDR Fill baseplate with water, holding syringe vertical.

DMP ...

23 01 16 ACDR Portable light, high; and DAC, on. Panel 400. VTR POWER, ON; HEAD WHEEL DRIVE MOTOR, ON; and RECORD.

DMP ...

ACDR Yeah. ... wait until ... halfway up before you -  
Wait until I turn this on.

23 02 08 ACDR VTR is coming ON, HEAD WHEEL DRIVE MOTOR, ON and MODE  
RECORD. Shouldn't this have a green light, Deke?  
Vance?

CMP What's that?

ACDR ...

23 02 23 CMP RECORD? Yeah, it should have a - -

ACDR Green light.

CMP - - green light.

ACDR When I go to RECORD, I get nothing.

CMP Did you go to HEAD WHEEL first?

ACDR Yeah. The HEAD WHEEL DRIVE is already ON. ...

CMP Did you get it?

ACDR ...

ACDR Okay, Deke. You all ready? All right. Just turn  
the DAC - portable light, high, and DAC, on. Then,  
after I've got that, place wicking assembly 1 on  
baseplate..

ACDR ... number 1.

23 03 32 ACDR DAC, on.

ACDR Okay. After wicking has proceeded halfway or 3 min-  
utes' duration, remove - remove the wicking assembly  
and discard; it says fecal bag. ...

ACDR What was that?

ACDR The TV camera shooting the ...?

DMP I don't think so.



23 05 10 ACDR After wicking has proceeded halfway or 3 minutes,  
discard wicking assembly ... Repeat steps 7  
through 8 for wicking assembly 2. ...

ACDR Vance, how you doing?

CMP Okay. I'm just looking ahead on something ...

ACDR ... what film bag ...

23 06 14 ACDR Discard ... Okay. Repeat steps 7 through 8 for  
wicking assembly 2.

23 07 04 CMP That ... roll scan does kind of have me puzzled.

ACDR That damn that portable light's in the way.

CMP Oh, no, it doesn't. We've got the UVA on now.  
That's right. ...

23 07 52 ACDR ... supposed to be looking at the ...

CMP ...

ACDR ... portable light.

23 08 27 ACDR ... turn on the DAC.

ACDR ...

23 08 50 ACDR Okay. After that you clean baseplate with tissues  
and place it back on the tray. Obtain the black  
syringe and ampule. Fill the baseplate with oil ...

ACDR Clean the baseplate ... if I turned the DAC off ...  
Clean baseplate with tissue ... back on the tray.  
...

ACDR ...

23 10 08 CMP Yeah.

ACDR ...

23 10 21 CMP Nope. Not quite yet. Almost.

23 24 18 CMP Yeah.  
ACDR ...  
CMP That's what we're ...  
ACDR That thing is starting to shut the ... down. ...  
23 25 01 CMP Yeah. That's no ...  
ACDR ...  
CMP Kind of like ... Myrtle once she closes those doors.  
ACDR Yeah.  
ACDR ...  
23 25 38 CMP Probably. Yeah. Close the doors ...  
23 27 04 SFE (Is the picture all right?)  
USSR (Soyuz 2, how is the picture?)  
23 27 31 SFE (Yes, how is the picture there?)

# # #

DAY 201

00 47 47 CMP ... back in here. ... That's where we were having all the problem.

ACDR Yeah. That's where we been ... all those problems.

CMP Okay. You understand.

00 48 07 CMP So after this we can power down and then hit the DSE and all that. I wonder how long they want you to do this.

ACDR ... ATS. No we're not.

00 48 22 CMP Dick, how long do you want this raster scan to run?

00 48 29 CC-H 6 minutes, Vance. And we're about - you'll get a flashing "37" when it's - when it's done, and you're - and after that you can go ahead and do the next maneuver. We're about 30 seconds from LOS and Ascension comes up at 108 plus 40.

CMP Okay.

ACDR High bit rate ...

CMP Huh?

00 48 48 CC-H And, Vance, one reminder. We'd like you to acquire the ATS as soon as you get in attitude.

00 48 54 CMP Okay. Okay, let's see. What's that about high bit rate?

ACDR ...

CMP Okay. You were saying something about high bit rate?

00 49 04 ACDR Oh, high bit rate.

CMP Well, at the end, all you do is go stop, and there's a - no, no - no, no - not yet.

ACDR Oh. We've got to stop for ... here.

00 49 17 CMP Well, but if you have to start ...

ACDR ... stop, stop.

00 49 26 CMP Okay. ...

ACDR ...

CMP Okay.

00 49 43 CMP Houston, Apollo.

ACDR Check off this ...

00 50 27 CMP Okay. We got ... in the ...; we got to set this attitude after the next ATS. Minus 64, 292; 121, it's right away after the maneuver.

ACDR Minus 64.

00 51 34 CMP \*\*\* ATS ...

CMP Don't close WASTE STOWAGE VENT valve until 109:29. Hey, that's because, I think - I wonder if that's open now. They think it's open, I guess. We did that purge last night. I'm sure it's ... I wonder if it's open; probably not.

00 52 00 ACDR Purge?

CMP Yeah. ... that - the - you know that purge valve we were supposed to have in there?

00 52 04 ACDR That 90-degree elbow?

CMP Yeah. I don't know - -

ACDR It's there.

CMP Okay.

ACDR It has to be open. ...

00 52 10 CMP Yeah. We - you know, we closed it not - I guess - We had to had [sic] a purge valve or I wouldn't question ... a purge last night.

ACDR What about the battery? Did it ...?  
CMP It should be open.  
00 52 29 CMP Tom, the urine thing ought to be closed.  
ACDR WASTE STOWAGE VENT's closed, ...  
CMP And, let's see, got a LiOH canister change.  
ACDR ... to take a couple of hours.  
CMP How'd it work out? Reasonably good?  
00 53 18 ACDR ... the raster scan going. Okay, flashing "37".  
CMP Okay.  
00 53 29 CMP Okay. EUV powerdown and X-ray powerdown.  
CMP And, as soon as you do that, I'll configure the DSE.  
ACDR Okay.  
00 53 50 ACDR EUV powerdown. TELESCOPE POWER, OFF; COVER, CLOSED.  
CMP Let's see, STOP and then REWIND, FORWARD.  
ACDR Okay. X-RAY PURGE, CAL and hold it for 30 seconds.  
00 54 56 ACDR ... LOW POWER, OFF, center ... Okay, you're shut  
down.  
CMP Okay.  
00 55 37 CMP Oh. Did you go STOP and COMMAND RESET ... VERB 49?

TIME SKIP

01 25 08 ACDR This God damn thing keeps counting and we got ...  
CMP Are you running, Tom?  
ACDR Yeah.

CMP Do you want me to reset it or anything?

CMP Roger.

DMP Okay. Now we got that fifth ... we do not maneuver on the 58 deal, on that P20.

CMP That's right.

01 25 36 ACDR That's old DAP coming back in ...

CMP Yeah.

ACDR Counting up.

ACDR Okay, and then we go - we stationkeep and go to a P20 after. Yeah, okay.

CMP All right.

CMP Okay, that's - this film, ... talking about.

ACDR Okay.

CMP On the FDAI[?].

ACDR If you got time, why don't you go down there and stationkeep.

CMP Yeah.

ACDR You got the film for docking? ... docking ... The main thing is we can get it ...

CMP Get the camera.

ACDR Okay, I've counted up 3 ... here.

DMP What's left?

01 26 15 ACDR Thank you, Vance.

CMP Yeah.

ACDR Here we go.

CMP ... clock.

ACDR Okay.

01 26 22 ACDR ... AUTO.

CMP Okay, ... VERB 58.

ACDR You got a VERB 46 in there?

CMP Yeah.

ACDR Okay, VERB 58.

CMP Okay. We'll wait till this maneuver - -

01 26 33 CMP Okay, GO for the burn. Good. ... got to be sure ...

ACDR Yeah.

ACDR Okay. And 40 seconds, Deke.

DMP Yeah.

01 26 55 ACDR Body diameter's about 8 degrees. THC forward;  
1-1/2[?] feet per second on EMS[?].

CMP Okay; ready for the THC.

CMP Ready?

01 27 07 ACDR THC POWER on?

CMP Ready?

ACDR Yes.

CMP Ready?

ACDR Go.

CMP Now try it.

ACDR God damn ...

CMP Is it working?

ACDR EMS isn't working.

DMP Sure you got it in NORMAL?

ACDR What the hell's going on?

01 27 19 CMP It's thrusting.

ACDR Is it?

01 27 20 CMP Yeah.

01 42 17 CC-H Apollo, Houston through Guam for about 6 minutes.

01 42 23 CC-H Roger. Vance, this is the way - I have a feeling that you guys - -

01 47 58 CC-H - and a yaw of 258, and we need to get those.

CC-H Okay. And we're satisfied with the evaporator now. We'd like the SECONDARY COOLANT LOOP PUMP, OFF. Incidentally, we're about 20 seconds from LOS. I'm going to be standing here - standing by here on these upcoming next couple of STDN passes and also on ATS, and I've got some news here that I haven't had time to read to you tonight. If you'd like to hear it or talk about anything else, just give me a call when we get locked up per the Flight Plan.

01 48 39 CC-H And if I don't hear from you, have a good night's sleep, and we'll see you in the morning.

CMP Okay. Ordinarily we'd like news, but ... in the morning. ...

01 48 49 CC-H ... great. I'll still be here so I'll - I'll be - I'll have it in the morning. See you then.

CMP And Deke ...

01 49 08 CC-H I'm sorry, you cut out. ... say again.

CMP Okay. One last thing, ...

01 49 39 CMP I don't think I got it ...

01 51 27 CMP ... think it's ... 109:32:32.

TIME SKIP



10 19 07 ACDR 177.  
10 19 13 DMP UP TELEMETRY to RELAY.  
ACDR Primary evaporator ...  
DMP I'm sure ...  
ACDR Where's that water ... outlet at?  
10 19 37 CMP It's right down here at the bottom - kind of at the  
foot of the hatch, on one side. Here. Climbing in.  
No. As you climb in the hatch, down and to the  
left.  
ACDR ...  
10 19 50 CMP Yeah - No. No, that's - that's the urine and the  
waste water dump. Let's see. It's down - still in  
that area. Only it's a little more to the left, I  
think.  
ACDR ...  
ACDR Tastes delicious with lettuce and cheese on it.  
10 20 18 CMP You have to be real careful of it, but it's the  
best thing I've tasted up here.  
CMP Okay, it's 20 - -  
ACDR STOP and REWIND?  
10 20 38 CMP Yeah, STOP and REWIND, COMMAND RESET.

TIME SKIP

10 52 11 DMP Yeah. Tom's up there right now. Why don't - why  
don't we do that.  
CMP ...  
DMP Here's something for us, get it right now. ...  
CMP Yeah. I never heard before that.

ACDR Right there. Baseline, go up and ... correct ...

CMP Yeah. ...

ACDR ...

CMP What are you doing?

CMP ...

CMP Okay. ...

DMP What does it say?

CMP It says, ...

CMP Okay. ...

DMP ...

CMP ...

10 55 25 DMP Yeah. Once I ... post[?] photos ... photographs ...

DMP ...

DMP Then later ... indicators are ... black ... territory ... light ... There's a lot of ... things like ...

CMP Yeah.

DMP It's very ...

ACDR Okay. ...

DMP What's it say here, Tom?

ACDR ...

CMP ...

DMP ... where we are. ... plus the ground ... where we really are. Now that's ... one light period, ... there's another period ... that free period of photographs ... that ... got those photographs ...

ACDR ...

DMP ... good angle on it that's why ... .. to follow  
...

DMP ... beyond that it just ... got a very - double ...  
somewhat ... different areas from the other ...  
light, ... parallel.

10 59 23 DMP In other words, one of the best ... goes up and re-  
places ... go back and turn parallel to ... I guess  
it's ..., it ends at the bottom ... the second ...  
And, ...

CMP ...

DMP I can swing clear of the ... right in the ... ball-  
park ... So the overall pattern of 1, 2, 3 ... and  
I think ... photos from an area around ...

ACDR ...

DMP Yeah.

DMP We didn't just find ... we had about ...

ACDR ...

ACDR Okay, let me have your ... That all the ...?

DMP ...

CMP ...

DMP Except for one ...

11 06 01 DMP You got - you guys got ... squared away?

ACDR I'll be - I'll be ...

DMP ...

ACDR ...

ACDR Vance, ... medication?

CMP ...

ACDR Deke, you got any medication?

DMP No.

ACDR Okay. How about water.

DMP There's ... plenty.

ACDR ...

ACDR Vance, I think you got a bad cigar going.

CMP Well, you just ... (laughter). ...

DMP Glad I got my ...

CMP ... no way.

ACDR I'm going up to 6.

ACDR 5.

DMP You going up ...

11 08 10 CMP That's - Yeah, that's a light ... two or three ...

ACDR ...

DMP ...

CMP Yeah. We ought to ... back ...

ACDR ...

ACDR I've been in some ...

11 12 29 CMP Yeah. It was kind of ... last night.

ACDR All right.

CMP Yeah.

ACDR ...

CMP ... the only thing that we've got on ...

DMP Well, Soyuz ...

CMP The only thing that's ... turned off after the un-  
docking ...

ACDR ...

CMP Deke.

DMP Yeah.

11 14 01 CMP You remember when we turned ... docking lights. We turned them off.

ACDR ...

DMP But is there a ...

ACDR ...

CMP What?

ACDR ...

CMP Yeah. They both ...

ACDR They both ...

CMP ... that's when we - that's where we finally get that ...

ACDR ...

CMP Yeah.

ACDR ...

CMP Yeah. I know - -

ACDR ...

DMP Tom, ... in about 5 minutes.

ACDR Okay. ...

CMP Tom.

ACDR That's right. You go in front of ...

CMP Yeah. ...

ACDR ...

DMP Vance.

CMP Yeah.

DMP ...

ACDR ... the whole thing?

CMP Well, how's Tom ... without those frequencies ...

DMP ... That's not very true for me.

ACDR ...

CMP Okay. Remember -

ACDR ...

CMP Yeah.

ACDR ... five of those.

11 16 16 DMP I could hear the ...

ACDR Yeah.

DMP I looked over there, I could hear it pop, pop, pop.

CMP That's it.

ACDR ... You're okay.

CMP ...

DMP Yeah. I never tried to ...

CMP But I saw your - -

ACDR ... may have to turn this ...

DMP ...

CMP I - I think the only thing it could be, is that, somehow or another that ... just cut off. ... RCS.

ACDR ...

CMP Well, don't you remember, though, ...

ACDR Yeah.

CMP You remember looking down in that ...?

ACDR ... The way that turns off ...

DMP ...

ACDR ... That's how I put it. ... Up here ...

DMP ...

CMP All I remember is, those ...

ACDR ...

CMP And - And then I started looking for some film and - -

ACDR That's just - -

CMP - - I said I'm going to ...

ACDR ...

ACDR Yeah, then that ... that's the ...

DMP ...

CMP Try ... to the first and then later ... Well -

ACDR ...

11 18 48 DMP You're right. I kind of had a ...

ACDR ...

DMP ... Yeah. ...

DMP Well, I don't think ... would be ... got down through here.

ACDR ...

DMP I tell you what. You go ahead and with your ...

CMP Right. ...

DMP Great. Let's do it ...

ACDR Let me ...

DMP ...

ACDR ...

DMP ...

11 21 45 CMP You want hot?

ACDR Yeah.

ACDR ... and rates 22.

DMP ...

ACDR Right. ...

11 25 15 ACDR ... seconds to go. 100, 205. ... 100 ... the first time. ...

11 32 28 ACDR ... set up in the same place ...

DMP Okay.

ACDR Let's see, ...

DMP ...

ACDR ...

CMP Stars.

CMP Did you see it ...

DMP ...

CMP Thruster.

ACDR ...

CMP Let's poke around in here ... from where we know we can ...

ACDR ...



CMP Yeah. I'll - I'll put it in this TSB ...  
 ACDR ... that burn.  
 DMP Yeah. It's suppose to be 22.  
 ACDR ...  
 CMP Wonder if we can ...  
 DMP ...  
 ACDR ...  
 11 34 47 CMP That's right, ... So that's correct.  
 CMP I still think you're wrong ...  
 ACDR Okay. ... Ready?  
 DMP Yeah.  
 11 36 29 CMP Okay. You got it solved.  
 ACDR ... problem ...  
 DMP ...  
 CMP 4 ...  
 CMP 4 and ...  
 DMP Tom, you got it?  
 ACDR Not yet.  
 CMP 314.  
 DMP Tom.  
 11 39 21 ACDR ... .. see that fucking alinement.  
 CMP Pardon?  
 ACDR Did you see that son-of-a-bitch go to ... See  
 there, I got to go back ...