

ASTP (USSR) MISSION 081/1  
Time: 11:34 CDT, 16:34 GMT  
7/15/75

KIO This is the Soviet Mission Control Center. The Soyuz spacecraft has crossed the equatorial plane and has begun the 4th orbit. The time of the equatorial crossing was 19:34:29. The longitude at the equator was 54.28 degrees. The Soyuz spacecraft is in the drift mode of the flight. The crew is busy with preparations for conducting the 1st maneuver to form an assembly orbit. The Soyuz orbital parameters that will exist after the maneuver have been communicated. In the 4th orbit, the Soyuz spacecraft will fly through the following tracking stations: American tracking station Madrid, from 19 hours 46 minutes to 19 hours 53 minutes. Then, it will enter the coverage zone of the Soviet tracking stations Tbilisi, Eupatoria and Djusaly. After that, the spacecraft will be tracked through the American tracking station, Orroval Valley in Australia and the station Quito in South America. Mission Control Center, Moscow.

KIO (This is Soviet Mission Control Center. Moscow time is 19 hours 44 minutes. The Soyuz spacecraft is in its 4th orbit. In one and one half minutes it will enter the communication zone of the American tracking station Madrid. At the present time the spacecraft crew has completed manual orbital orientation of the spacecraft, according to the local vertical and the rate gyro. The local vertical makes it possible to orient the spacecraft in such a manner that its solar panel plane would be perpendicular to the orbit. The spacecraft is oriented for braking, in other words, its braking engines are pointed towards - against the line of flight. Forty seconds before AOS. The onboard report will be on the technical communications line. This is Moscow Mission Control Center.)

USSR (Moscow, this is Soyuz. I read you well.)

MCC-M (Soyuz, this is Moscow. We are waiting for information on performing of manual orientation and transfer to the orbital orientation mode.)

USSR (Moscow, this is Soyuz. Orientation has been completed. Yaw - 180.) We are in (garble) mode. (We have orientation.)

MCC-M (Soyuz, this is Moscow. Roger. Globe correction performed?)

USSR (Yes, we've - globe correction was performed at the specified time.)

MCC-M (Soyuz, this is Moscow. Understand you. Over.)

USSR (You understood it correctly. Everything is normal. Everything is within the normal range.)

MCC-M (Soyuz, this is Moscow. Roger. Over. Soyuz is (garble).)

USSR (We have a lot of noise of some - some kind of noise in our communi comm system.)

MCC-M (Soyuz, this is Moscow. Roger. Over.)

USSR (Moscow, this is Soyuz. Do you have any - any data for us?).

MCC-M (Soyuz, this is Moscow. So far, no. We are waiting for your data and for your reports.)

USSR (Garble) (Everything is normal onboard. We are operating ...)

MCC-M (Soyuz, this is Moscow. Could you give us an estimate of the accuracy of mode maintenance?)

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USSR (Yes, of course. The accuracy is quite good -  
maybe within 1-1/2 degrees range. Good, good accuracy.)

MCC-M (Soyuz, this is Moscow. Roger. Copied.)

USSR (Do you have any ques - other questions for us?)

MCC-M (Soyuz, this is Moscow. No, not so far. Waiting  
for communication over our ground station.)

USSR (We have our noise squelch systems on, but we still  
have noise.)

END OF TAPE

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CC-M (Soyuz, this is Moscow. The time is 19:54. Turn on your duplex.)  
KIO (This is Soviet Mission Control. On decision of the Mission Control - directors - at 19:54 the crew will switch over to duplex communication line - being turned on now.)  
CC-M (Soyuz, this is Moscow.)  
SFE (Moscow, this is Soyuz. This is Soyuz 2. I lis - I hear you well. How do you hear me?)  
CC-M (Roger.)  
SFE (Roger.)  
CC-M (Get ready to receive the data for the maneuver number 1.)  
SFE (Ready.)  
CC-M (Page 171.)  
SFE (Ready.)  
CC-M (Addition: The approach and correction engine time, 7 seconds. Delta-V, 115 and 0; 20:65, time. How did you read? Over.)  
SFE (Approach and correction engine time, 7 seconds; Delta-V, 115 and 8; alpha zet, 20:65.)  
CC-M (Roger. You understood it correctly.)  
USSR (To monitor - will you give us some data?)  
USSR (Let us have it.)  
CC-M (Time for monitoring, 20:50 on pitch; the normal, 172. That's all.)  
CC-M (So, you will only have monitoring on - yes, correct - page 181.)  
USSR (No, I think it - we will be in daylight, right?)  
CC-M (Correct.)  
USSR (That is correct. We have set out our ...)  
CC-M (Do it according to your own judgment.)  
USSR (But when the state vector is entered, we can't monitor it.)  
CC-M (Correct. You can take it off.)  
CC-M (Engine burn will be in daylight.)  
USSR (We're monitoring for 2 minutes approximately.)  
CC-M (Soyuz 2, take one other radiogram. Form - without form. After completing the maneuver, do a spin on the orientation thrusters with an angular rate of 3 degrees per second counterclockwise.)  
USSR (After completing the maneuver, do a spin by orientation thrusters with a 3 degree per second angular rate.)  
CC-M (Roger. Against the clock, counterclockwise; that was correct. So until the next comm session.)  
USSR (How long communications will we have?)  
CC-M (5 minutes.)  
CC-M (The precision of orientation is about 2 degrees.)  
USSR (Roger.)

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USSR (Ready to write down the comm sessions.)  
CC-M (21:21, 21:25 over Madrid. 21:26, 26 - 36 - Moscow.)  
CC-M (Y-axis orientation without rate gyro?)  
USSR (That's correct.)  
CC-M (Orientation for braking, 180.)  
CC-M (What? Would you say again please?)  
USSR (Did you do a time check?)  
CC-M (We did this according to Moscow time.)  
USSR (Roger.)  
CC-H (It is now 20:00:20.)  
USSR (Moscow, this is Soyuz. How do you read?)  
CC-M (Soyuz, excellently.)  
USSR (We are getting ready with the TV camera. Everything  
has to be put in order - put away. It's not so simple as it is  
during a sim.)  
CC-M (Roger.)  
SFE (Moscow, this is Soyuz 2. Delta-V; when will that be  
entered?)  
CC-M (At 20:34:40 delta-V will be in - put in. This is  
according to the program - that it'll be - it'll be turned on by the program.)  
USSR (I'm just checking while there is time. I thought I  
would ask you so I wouldn't have to look for it.)  
CC-M (Roger. Some place around 20:34:40. By the first  
checkmark.)  
USSR Just a minute.  
CC-M (We've written down the whole program, so we're just  
sitting down here and doing it all.)  
USSR (Roger.)  
USSR (In weightlessness it's difficult to say and difficult  
to do. Everything is swimming around.)

END OF TAPE

ASTP (USSR) MISSION SR3/1  
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MCC-M (Soyuz 2, this is Moscow. We'll be interested in knowing the entire list of data which is on page 174 and 175; pressure, the times, et cetera.)

SFF (Okay.)

MCC-M (And, also in accordance to the program on page 150 - though yes, there will be some data there.)

MCC-M (Soyuz, this is Moscow. Now the session is coming to an end. Have a good flight, and until we see you at - hear you at the next communication session -)

USSR (Thank you, Moscow, this is Soyuz. We are anxiously awaiting the data on the operation of the - -)

KIO (This is Soviet Mission Control Center. The communication session with the Soyuz spacecraft has come to an end - with the Soviet Mission Control Center. During the last communications session, the Soyuz spacecraft was in range of the following stations: the American tracking station in Madrid, the Soviet stations - tracking stations, Eupatoria, Tbilisi, and Djusaly. The Soyuz spacecraft will be in communication by the following tracking stations: the Orroral Valley in Australia and Quito in South America. At the present the Soyuz spacecraft is in orbital orientation mode and during its flight the - the spacecraft is pointed with its braking retrofire engines forward along its orbital flight path and is flying in an oriented mode. The crew of the spacecraft received some updating on the data for performing the programmed maneuver at the end of the fourth orbit, also data on stabilization - for the rate gyro, corrected time for the engines, the thrusters and also the im - the pulse value. At the beginning of the fifth orbit, the first maneuver will be performed in form - achieving the assembly orbit. This is Moscow Mission Control Center.)

SPEAKER (Garble) (English)

CC-H This is Air/Ground. (English)

CC-H Where will that be? (English)

CC-M Where? (English)

CC-H Where, meaning on what channel will I be getting that?

(English)

CC-M Okay. (English)

CC-H Okay. Thank you. (English)

CC-M You're welcome. (English)

KIO (This is Soviet Mission Control Center.)

KIO (This is Soviet Mission Control Center. The Soyuz spacecraft is on its fourth orbit. In 36 seconds it will enter the zone of coverage of the American tracking station in Orroral Valley, Australia. The spacecraft is now over the central part of this continent. At the Soviet Mission Control Center it has been calculated the predicted parameters of the orbit after the first maneuver for the assembly orbit at the beginning of orbit 5. The orbit at this - will have the second parameters. Twenty-one hours 3 minutes crossing the equator. Longitude, 96.8 degrees at the equator. Maximum altitude, 227.6 kilometers; minimum altitude, 192.15 kilometers. Period, 88 minutes, 0.62; inclination, 51.78 degrees. We're turning on the communication - radio communications from the spacecraft.)

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ASTP (USSR) MISSION SR4/1  
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CC-M (This is Soviet Mission Control Center. Moscow time 20 hours 36 minutes. The Soyuz spacecraft has been in flight 5 hours and 16 minutes. At the present time, it has left the coverage zone of Orroral Valley tracking station. The spacecraft has also - is now leaving the Earth shadow. At the fourth orbit, a reserve communications session was planned over the American Orroral Valley tracking station in Australia. In this case, this reserve communications session was not used. The program for communications on orbit 4 has been completed. According to the telemetry data, the onboard systems of the spacecraft are on order - in order. There are no comments - no remarks on the health of the cosmonauts, and the program is nominal for orbit number 5. This is the Mission Control Center. Received data for the conducting on the first maneuver in achieving assembly orbit. These data are as follows: time for deorientation of the gyros, Moscow time 20 hours 35 minutes 40 seconds; switching on of the approach correction and engine, 20 hours 51 minutes 40 seconds, Moscow time. As a result of the operation of the engine, which will be fired for 7.4 seconds, the speed of the spacecraft will be changed by 3.4 meters. The spacecraft will have 357.5 degrees yaw and 0.4 of a degree pitch. This is Moscow Mission Control Center.)

MCC-H (Garble) ground? Okay. Got it. Thank you.

CC-M (This is Soviet Mission Control. Moscow time, 20 hours 51 minutes 35 seconds. The Soyuz spacecraft has been in flight for 5 hours and 31 minutes. At the present time, in accordance to the flight program, the approach and correction engine must - should be switched on, and the spacecraft is due to achieve a different - a new orbit. The corrective pulse will be done over the Pacific Ocean at the end of the fourth orbit. This is Moscow Mission Control.)

CC-M (This is Soviet Mission Control Center. Moscow time is 21 hours and 3 minutes. The Soyuz spacecraft has been in flight for 5 hours and 43 minutes. The spacecraft is completing its fourth orbit and is now over South America around the equator at longitude 76.81, longitude west. At the next - the fifth orbit, it is planned to have a comm session over the Madrid ground station at 21 hours 20 minutes and then Eupatoria and Dzhuzaly ground stations. After this, the crew is planning to dump pressure from the habitable portion of the descent module, to pump out the condensate, and later on to begin the scientific program, in particular, the experiments on the zone forming fungi and microorganisms - microbial exchange. This is Moscow Mission Control Center.)

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MCC-H This is Air/Ground. This is Air/Ground. (English)  
MCC-H He's on the other line, and for some reason his console can't  
answer too well. Alex is trying to get to you now. Can you hear him? (English)  
MCC-H Did you hear him that time? (English)  
MCC-H Yes. (English)  
MCC-H Okay. (English)  
MCC-H Yes. (English)  
MCC-H Okay. Maurice was telling - telling you that they won't be able  
to patch anything to us. Yes. We've got a little problem here. We've got a prob-  
lem on the left console. Okay. (English)  
KIO (This is Soviet Mission Control Center. In one minute, the  
Soyuz spacecraft will enter the zone of coverage of the Madrid ground station.)  
CC-M (Soyuz, Soyuz, this is Moscow. How do you read me? Over.)  
CC-M (Soyuz, this is Moscow. How do you read? Over.)  
SCDR (Moscow, this is Soyuz. How do you read me?)  
CC-M (Soyuz, this is Moscow. I read you normally. How did the  
maneuver go? Over.)  
SCDR (The maneuver was all right. The engine was - the burn was  
7 seconds long. Orientation is okay. Moscow, this is Soyuz. We just turned off  
the program after accomplishing the spin. The spin was accomplished with a 3-degree  
angular rate counterclockwise. Now we have - -)  
CC-M (Soyuz, this is Moscow. We understood you. Roger. Thank you  
for the information. We're standing by.)  
SCDR (We can also give you data on - on the table on page 171.)  
CC-M (Soyuz, this is Moscow. We are receiving. Over.)  
SCDR (Monitoring on solar orientation state vector. Pitch, zero;  
deviation from pitch, zero; deviation from yaw, (garble) 380; temperature, 29.)  
CC-M (Soyuz, this is Moscow. We understood you. Over.)  
SCDR (Delta-V, 116 and 1.)  
CC-M (Soyuz, this is Moscow. Roger. Over.)  
SCDR (Maneuver time - maneuver time 248, practically.)  
CC-M (Soyuz, this is Moscow. Roger. Thank you. Soyuz, this is  
Moscow. Say again the pressure of fuel and oxydizer after the burn. Over.)  
CC-M (Soyuz, this is Moscow. Roger.)  
KIO (This is the Soviet Mission Control Center. The Soyuz space-  
craft is now entering the zone of coverage of Eupatoria and Djusalj ground track-  
ing stations.)  
CC-M (Soyuz, this is Moscow.)  
SCDR (Moscow, this is Soyuz.)  
CC-M (Soyuz, this is Moscow. I read you normally. Get ready to  
receive a radiogram without form.)  
CC-M (Soyuz, where are you located? Where are you?)  
SCDR (Soyuz 1 is in the orbital module. Soyuz 2 is in the descent  
vehicle. Roger.)  
CC-M (Soyuz, 21:27:00, you will turn on TV camera TK1. Did this  
take place?)  
SCDR (I'll find out.)  
CC-M (Would you monitor that to - by looking at the indicator light  
on the camera? Also, do you have the prelim - turn on the filters on the TV camera.)

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CC-M (The camera - Is the indicator light lit on the TK1 camera?  
Is the red light on, on the camera?)  
SCDR (Yes. Yes. The light is on.)  
CC-M (Does the filter rotate?)  
SCDR (Yes, the filter is rotating normally. Roger.)  
CC-M (Soyuz 2, would you duplicate the action of turning on the  
TK1 camera? Command Elena-1. I am repeating it.)  
SFE (We have given the command Elena-13. No change yet on the  
indicators. We'll wait a little.)  
CC-M (No change?)  
SFE (No change.)  
CC-M (Roger. Soyuz, there is no need to do TV1 and TV2. Later we  
will do a number of TV tests to analyze them.)  
SFE (Roger. Copy.)  
CC-M (Soyuz, this is Moscow. Write down the data on pressure dump.  
21:37:00 beginning of pressure dump. In 7 minutes. How did you receive that?  
Over.)  
CC-M (Soyuz, this is Moscow.)  
SFE (Standing by, Moscow.)  
CC-M (Did you receive 21:37:00 beginning of pressure dump? 21:37:00.)  
SFE (I was busy with the TV camera. Roger. Beginning test pres-  
sure dump.)  
CC-M (You received correctly. How do you feel?)  
SFE (Thank you, normally.)  
CC-M (Then would you write down the next comm sessions?)  
SFE (Go ahead.)  
CC-M (Korolev, 22:33 to 22:40 to 22:42 to 22:49. Moscow, 22:58  
to 23:07. How did you receive?)  
SFE (Academician Korolev, 22:33 to 22:40, 22:42 to 22:49.  
Moscow, 22:58 to 23:07.)  
CC-M (Roger. You received correctly.)

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CC-M (Switch off the pressure integrity monitor and look at the pressure.)

CC-M (How much?)

USSR (Pressure 900 - 880.0.)

CC-M (Soyuz, this is Moscow. The Apollo crew is in the spacecraft getting ready for launch. And they are wishing you a happy flight.)

USSR (Thank you for the information. Would you remind us of the launch time; when would that be?)

CC-M (1 hour 13 minutes 18 seconds before launch, at 22:50:00, thank you.)

CC-M (Everything is normal for launch.)

USSR (Were they given a GO for launch?)

CC-M (They probably will.)

CC-M (A GO for launch will be given at 22:20.)

KIO (This is Soviet Flight Control Center. Moscow time, 21 hours 45 minutes. The Soyuz spacecraft has been in flight for 6 hours and 25 minutes. Eight minutes ago the communication session ended with Soviet ground tracking stations Eupatoria, Tbilisi, and Djusaly. Earlier over Madrid the crew reported the first maneuver for the assembly orbit has been completed. The engine burn was 7 seconds. After that, the spacecraft made a counterclockwise 3-degree-per-second roll to get the solar panels oriented towards the Sun. At the present time the Soyuz commander is in the orbital module. The board engineer is in the descent vehicle. The crew is feeling normally. This is Mission Control, Moscow.)

KIO (This is the Soviet Mission Control Center. Moscow time, 21 hours 55 minutes. In accordance to the flight program the crew is beginning its - the scientific experiments. The Soyuz comm - spacecraft commander has to perform an experiment of the micro-organisms, S1. The purpose of this experiment is to study the weight of - the effect of Earth's magnetic folds, cosmic radiation, and weightlessness on the development of various organisms. The distinctive feature of this experiment is the fact that the experiment is being performed in thermostatic devices and the organisms are developing in there. The "biokat" device is a - these are biological thermostatic capsules which are - which maintain a very precise temperature down to an accuracy of 0.5 degree centigrade. The diameter of this device is 38 millimeters; length about 108 millimeters; 33 grams weight. This device consists of a power unit and its main body around which are the various components which ensure... The purpose of this experiment is to study the factors of space flight on the nature and rate of growth of micro-organisms. The experiment is using protei micro-organisms which is - the insert is in a form of a capsule of a non-translucent material. Inside this is an ampoule with a micro-organism culture, and this contained in special chambers with the nutrient medium. The indicator which is installed there changes its color depending on the effect of micro-organism products. Thus we - the device was established - was set up in the orbital module of

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the spacecraft before launch. Twice a day before - during this whole flight one of the crewmembers takes the capsule out of the device. Visually he determines the growth of the micro-organisms and records the results and then replaces the capsule in the device. At the present time these - this operation is being performed by the Soyuz commander. After the flight is completed the ampoule will be placed in the thermostatic device in the descent vehicle. The Zone-Forming Fungi experiment, one of the joint Soviet-American experiments, will be performed on suggestion of the Soviet side - Soviet side - and will be performed to study various factors such as weightlessness, periodicity of growth, splitting of these cells, and multiplication. There are many data of the effect of solar activity on the biosphere. For example, leukocytes of the blood, the - also the frequency of disease of various animals, plants, and the human beings. Here we are going to study effects in space. Also, the heavy nuclei in the range of high and very high energy. Studies of the effect of cosmic radiation on the human organism is necessary to ensure the safety of space vehicles and on the crews aboard the space vehicles. This is Moscow Control Center.)

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KIO (This is the Soviet Mission Control. Moscow time 22 hours 7 minutes. We are turning over the floor to a member of the third crew, cosmonaut Vladimir Alexandrovich Dzhanibekov.)

MCC-M (During the last orbit, the Soyuz spacecraft performed a maneuver. The Soyuz has to perform one other maneuver. The orbit at which the docking will be taking place, which is called the assembly orbit, must be about 225 kilometers high and with a period of about 88.9 minutes, where the docking will take place. The first maneuver has already been performed. After launch, the initial orbital parameters were calculated, also the time of orbit and the pulse that was necessary, the engine burn. These data were inserted into the onboard computer which would burn - fire the engine. Before the separation, the Soyuz crew performed a manual orientation of the vehicle; in other words, making a roll in space, and then the engine was burned at 20 hours 51 minutes 40 seconds Moscow time and worked - and the burn was 7 seconds long. Now the parameters of the orbit are - of the new orbit are being calculated, and soon they will be available. All systems of the spacecraft operated normally, and the onboard system which was - which carried out this maneuver worked normally. Now the orbit of the Soyuz spacecraft has become considerably closer to the calculated assembly orbit at which the docking will take place. The Apollo will also have to - in the course of its rendezvous and approach for docking - will also have to perform a number of maneuvers in order to equalize its orbit with the Soyuz spacecraft's orbit. The mixed maneuver - maneuver of the Soyuz spacecraft is planned for tomorrow. I'd like to wish a successful start to the Apollo spacecraft and a successful accomplishment of the planned program. The best of everything. We shall anxiously await the report of Apollo launch. End of commentary. This is Moscow Mission Control.)

CC-H Where will this be? On which channel? (English)

CC-H Okay. (English)

KIO (This is the Soviet Mission Control Center. Moscow time is 22 hours 20 minutes. The Soyuz spacecraft has been in flight for 7 hours. Now the Soyuz is completing its ninth orbit. At the present time, the Soyuz spacecraft is passing over the Pacific Ocean. The Mission Control Center has determined the actual parameters of the orbit after the first maneuver of assembly orbit. The orbit of the fifth orbit has the following parameters: maximum altitude, 231.71 kilometers; minimum altitude, 192.41 kilometers; rotation, 88.67 minutes; inclination, 51.78 degrees. This decision was made according to trajectory measurements which were - came in from Tbilisi and Eupatoria ground tracking stations during the last orbit. At the present time, the spacecraft is approaching the zone of coverage of the Soviet tracking ship Academician Korolev. Eleven minutes - and 1/2 minutes remain until the AOS. This was Moscow Mission Control.)

KIO (This is the Soviet Mission Control Center. Moscow time is 22 hours 28 minutes. The Soyuz spacecraft is - has been in flight for 7 hours and 8 minutes. At the present time, it has completed its fifth orbit. The next will be - The longitude at the present time will be minus 99.36 degrees at the equator. At the next - the sixth orbit, the crew of the Soyuz spacecraft has to perform the following program: At the beginning of the sixth orbit, the cosmonauts will dry off - will stow for drying their gloves. They will begin to perform the S3 experiment, embryonal development of fish embryo. This experiment will be done within coverage range of Tbilisi and Eupatoria ground stations. The cosmonauts will report on the status of onboard systems.

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After ending the drying of the gloves, the crews will start to put away their pressure garments, the space suits, and will continue to monitor the onboard systems. At the present time, the Soyuz spacecraft has approached the equator and after - in 3 minutes and 24 seconds, it will have acquisition of signal of the tracking ship Academician Sergei Korolev, the ASK tracking ship. Radio communications from the Soyuz to the Soviet Mission Control Center will be relayed over the technical commentary channel. This is Moscow Mission Control Center.)

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KIO (This is the Soviet Mission Control Center. In one minute the Soyuz spacecraft will enter the zone of coverage of the Soviet tracking ship Academic Sergei Korolev.)  
MCC-M (Soyuz, this is Moscow.)  
USSR (Standing by. We hear you well.)  
MCC-M (Soyuz, would you give the command G11? Turn on TV camera 4, G11.)  
USSR (We are issuing that command. We have issued that command G11.)  
MCC-M (Roger. How is the pressure dump going?)  
USSR That's 54 minutes. We have dropped the pressure to 736 millimeters. How did you receive?)  
MCC-M (Roger.)  
MCC-M (Soyuz, this is Moscow. We have given the go for Apollo start. Fourteen minutes remaining to Apollo launch.)  
USSR (Roger.)  
USSR (So, wish them a successful launch from us.)  
MCC-M (Thank you. We'll transmit that.)  
MCC-M (The Apollo crew is ready for launch.)  
MCC-M (Soyuz, this is Moscow. How is the TV camera doing?)  
USSR (The TV camera ... same thing.)  
MCC-M (Roger.)  
MCC-M Is the indicator light on K11 on?  
USSR (There is an indicator light on K11.)  
MCC-M (Roger.) Soyuz, this is Moscow. When entering the zone of communication with Moscow at 22:56 (at 22:56 communications with Moscow. We would like you to do a verbal broadcast on Text T3.) How did you read me?  
SPEAKER (TV 3.1 session. Do it verbally for radio.)  
MCC-M (Soyuz, this is Moscow. Give the J12 signal. Turn it off.)  
USSR (We have turned off G12.)  
MCC-M (Roger.)  
USSR (The experiment of - experiment of zones forming fungi has been conducted.)  
MCC-M (Valeriy, where do you have the TV script? We have to do it verbally.)  
MCC-M (Soyuz, this is Moscow. Page 185 of your reference manual.)  
MCC-M (How did you read, Soyuz?)  
USSR (Copied.)

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MCC-M (Soyuz, this is Moscow. We are now finishing communication over the ship at 22:42. We'll be over Yuri - the tracking ship Yuri Gagarin. Then we will give you some pads without - radiograms without pad and then give us 0-20. Form 0-20.)

USSR (Roger.)

USSR (Over the Yuri Gagarin ship, if it's ready.)

MCC-M (How do you feel?)

USSR (We feel all right. Excellent.)

MCC-M (Roger.)

USSR (Garble) Are you getting these data?

MCC-M Yes, we are getting them. Everything is normal.

(You're just crossing over the launch pad.)

KIO (This is Soviet Mission Control Center. In one minute the Soyuz spacecraft will enter the coverage zone of the Soviet tracking ship Cosmonaut Yuri Gagarin.)

MCC-M (Soyuz, this is Moscow.)

SFE (Moscow, this is Soyuz 2.)

MCC-M (Soyuz 2, how do you read?)

SFE (We read you all right. How do you read?)

MCC-M (Read you well.)

MCC-M (Write down.)

USSR (Ready.)

MCC-M (Ready? Copy radiogram number 10: 00:10:00; turn on your onboard lights and beacons. Turn off them at 00:20:00. How did you copy?)

USSR (00:10:00; turn on onboard lights and beacons. 00:20:00; turn them off.)

MCC-M (Roger.)

MCC-M (Number 11. 23:00 telemetry will be over the second transmitter.)

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USSR (From 23:00 telemetry will be on second transmitter.)  
USSR (Right.)  
USSR (Is 020 ready or will you transmit it later?)  
USSR (I'm just getting ready with it.)  
USSR (Roger.)  
SCDR (Moscow, this is Soyuz. Pressure is 710 millimeters. 2.6  
millimeters drop per minute.)  
MCC-R (Roger.)  
USSR (Roger.)  
MCC-M (Soyuz, this is Moscow. 3 minutes 20 seconds before  
Apollo launch.)  
SCDR (Roger.)  
MCC-M (Soyuz, this is Moscow. We're doing 020. 1 minute  
left exactly before Apollo launch.)  
KIO (This is the Soviet Mission Control Center. In 1 minute  
the Soyuz spacecraft will enter the zone of coverage of the Soviet ground  
tracking stations Eupatoria and Tbilisi.)  
MCC-M (Soyuz, this is Moscow. Soyuz, this is Moscow.)  
SFE (Moscow, this is Soyuz 2.)  
MCC-M (Soyuz 2, I read you normally.)  
MCC-M (Everything with Apollo is going along normally. How are  
things with you?)  
SFE (Everything is okay here.)  
MCC-M (Roger.)  
SFE (We are ready to receive TV 31, the text of TV 31.)  
MCC-M (How do you read?)  
SFE (This is Soyuz. We read you well. We're waiting.)  
SCDR (We've just gotten the report that the Apollo launch was  
successful, has achieved orbit. We heartily congratulate Deke Slay -  
Tom Stafford, Vance Brand, and Deke Slayton. But the main event of the  
Soyuz-Apollo flight is still ahead of us. Our space vehicles are still  
thousands of kilometers apart. We're in different orbits, and it must  
be one. So I think, especially, we still have a lot of work ahead - to  
do a great deal of work - accomplish a great deal of work in the next 2  
days. Our spacecraft is now on its sixth orbit. We're flying over the  
Mediterranean. We are approaching the Black Sea. Now through our  
right porthole we can see a black, black sky. We feel very well. We are  
gradually becoming adapted to weightlessness. We could say, we could  
almost be already adapted. Although for - these feelings are not new for  
both of us. All the main systems onboard the spacecraft are working  
well. Immediately after insertion, we have tested our systems and we have  
completed the first orbit - or maneuver in or - in assembly orbit. The  
program of our first work day is approaching its end. In one orbit we  
will be getting ready for sleep. Everything - the best of everything to  
you. Goodbye until tomorrow.)  
MCC-M (Thank you Soyuz. This is Moscow. Excellent. We are  
waiting for 020.)  
SCDR (We're giving you - we will give you 020 so be ready for 020.)  
MCC-M (Ready to receive.)  
SCDR (01. First 0. Second 0. 02. Absent. 03. First 2. Second  
0. 04. First 0. Second 1. 05. Cancel. Six zeroes. 07. 0. 0. Eight  
zeroes. 09. Two each. 1000. 1100. How did you read? Over.)  
MCC-M (Twelfth and thirteenth?)  
SCDR (1200. 1300.)  
MCC-M (Thank you. Receive 020.)

ASTP (USSR) MISSION SR9/2  
Time: 14:45 CDT, 19:45 GMT  
7/15/75

SCDR (Moscow, this is Soyuz. At 1 hour 15 minutes of pressure -  
of dump pressure 692.)  
MCC-M (Roger. Pressure 692 after 1 hour 15 minutes of dumping.)

END OF TAPE

ASTP (USSR) MISSION SR10/1  
Time: 15:03 CDT, 7:43 GET  
7/15/75

MCC-M (Soyuz this is Moscow. Apollo has been inserted into orbit. The insertion was normal.)  
SCDR (Roger.)  
MCC-M (Soyuz, this is Moscow. Next comm session over Yuri Gagarin 00:15 to 00:22.)  
SCDR (Roger. 00:22 - 15 to 00:22 over Yuri Gagarin. Right?)  
MCC-M (Correct.)  
MCC-M (Soyuz, this is Moscow. Everything onboard the Apollo is according to the plan. There are no difficulties aboard Apollo.)  
SCDR (Roger. Thank you.)  
KIO (This is Soviet Mission Control Center. Moscow time is 23 hours 10 minutes. The Soyuz spacecraft is on its sixth orbit, and has been in flight for 7 hours and 50 minutes. During the last comm session the spacecraft was within the zone of coverage of the Soviet tracking ships Academician Sergei Korolev and Cosmonaut Yuri Gagarin. During the program of the last comm session included radio communications of the crew with the Mission Control Center. In this, the cosmonauts reported about the progress of pressure dump from the descent vehicle and the orbital module. Onboard they received a report on a GO for Apollo launch and about the launch of the American spacecraft itself. The crew reported that they have performed their maneuvers. There are no remarks on the completion of the maneuvers. The time of the next communications session has been given to the Soyuz spacecraft. From the Soyuz, telemetry was transmitted to the ground about the conditions of all the systems onboard, and also the biological medical telemetry on the state and the health of the crews - crewmembers of the Soyuz spacecraft. In the coverage zone of the two tracking ships Gagarin and Korolev also included the command radio communications line were switched on. Telemetry was transmitted down from aboard the spacecraft on the status and condition of the various systems onboard the spacecraft. The program of the communications sessions at the last - sixth orbit has been fully accomplished. A radiogram on pad form number 20 was given to the spacecraft. Data was received from the spacecraft on the state of health of the crewmembers and of the operations they have accomplished. Also a confirmation of the receipt of the various radiograms. In accordance with the flight program the crew is completing the drying of the gloves and is now beginning to put away the pressure garments. Then the crew will perform the monitoring of the onboard systems. At the present time the spacecraft is approaching the equator and is flying over the Persian Gulf. This is Moscow Mission Control.)

END OF TAPE

ASTP (USSR) MISSION SR11/1  
Time: 15:18 CDT, 07:58 GET  
7/15/75

KIO (This is Soviet Mission Control. Moscow time, 23 hours 46 minutes. The sixth orbit of the flight of the Soviet spacecraft Soyuz is being completed. At the present time, the Soyuz is in daylight over the Pacific Ocean. According to the flight program, at the present time the cosmonauts should be monitoring the onboard systems of the spacecraft. The next spacecraft communications session with Mos - with this - control - mission control will be in 28 minutes through the tracking ship Yuri Gagarin. The parameters of the Soyuz orbit at the sixth orbit: maximum altitude, 228.65 kilometers; minimum altitude, 191.58 kilometers. The period of the orbit, 88.67 minutes; inclination of the orbit towards the equator, 51.78 degrees. This is Moscow Mission Control Center.)

KIO (This is the Soviet Mission Control Center. In Moscow it is now midnight. It is now the 16th of July 1975. 1 minute to go. The Soyuz - Soyuz spacecraft has completed its sixth orbit around the Earth. At the present time, according to the flight program, the crew of the spacecraft has to be finishing up its monitoring of the operation of the onboard system - and systems - and now getting ready through the next communications session via the Yuri Gagarin tracking ship. Now we shall have the program of the flight for the seventh orbit. After completing the monitoring of onboard systems of the spacecraft, the cosmonauts will communicate with the MCC Moscow and will report on their medical condition. After the end of the communications session, the cosmonauts will have supper. After supper, they will perform their final operations on the final dumping of pressure and monitor the orientation of the spacecraft. The spacecraft is now oriented towards the Sun. Before the communications session with the Moscow Mission Control - 13 minutes remain. This is Moscow Mission Control Center.)

KIO (This is the Moscow Control Center speaking. In a minute into the Soyuz spacecraft, the Yuri Gagarin ship will come into the zone of coverage.)

USSR (Moscow, this is Soyuz. I hear you very well.)

USSR (Moscow, this is Soyuz. I read you well. How do you read me? Over.)

CC-M (I read you excellent. We congratulate you in your successful insertion and wish you best of luck in your work.)

MCC-H The answer was (thank you, thank you very much).

CC-M (We have also got a report on dumping the pressure from the - from the DM. Over.)

USSR (Moscow, this is Soyuz. How you read me? Over.)

CC-M (Read you very well. How about me?)

USSR (Moscow, this is Soyuz. At the present time we just finished dumping the pressure. The pressure is 540 millimeters - 539 millimeters rather, in 2 - at 2 hours 34 minutes. Over.)

CC-M (Roger that.)

USSR (At the present itme, I am going to be monitoring and - monitoring the pressure. Over.)

CC-M (Roger that. Soyuz 2, we'd like to receive from you the format 03. Are you prepared?)

SFE (Right. Give me a - give me a minute. Over. Yeah, I'm ready. Go ahead.)

CC-M (Yes, you're ready.)

ASTP (USSR) MISSION SR11/2  
Time: 15:18 CDT, 07:58 GET  
7/15/75

SFE (The time is 23:50. The first is 12, second is 180, the third is 5, the fourth is 240, the fifth is 15-1/2, sixth is 30, 15-1/2 is the seventh, eighth is 280. The ninth one is 3, 10th is 3, 11th is 240, 12th is 240, 13th is 4-1/2, 14th is 4.5, 15th is 32. Next one is zero, 17th is 10, 18th is 9, 19 is 21, 20th is 22, 21 is 12, 20th - 22nd and 23rd is approximately at - (garble) at about the time of pressure dumping. Over. 24th is 930, 25th is 300, 28th is 270, 29th is 220. How do you read me? Over.)

CC-M (Roger that. Got you real well. Over.)

CC-M (Valeriy, I got you. Go ahead. Tell us about your - We're going to have to do an orientation maneuver after dumping the pressure. Over.)

SFE (I didn't underst - I didn't read you. Say again.)

CC-M (After dumping the pressure, you are going to have to - again do a maneuver. Over. You're going to have to get in touch with MILA when you dump your pressure. What's your - what's your velocity now? Your charge now is zero. Over. You've got some kind of fallacious rotation. Over.)

CC-M (Soyuz 2, when you get out of your LOS, why don't you repeat your rotation maneuver? Over.)

SFE (Roger that.)

CC-M (Valeriy, I got a couple of radiograms for you. Yeah, just a minute - 1 second.)

SFE (Without a format?)

CC-M (No, format 23, format 2, and format 3. 23, 2, and 3. Use that format.)

CC-M (Valeriy, we got 1 minute. I'm just going to give you the second format, Valeriy. I'll give you the rest of it the next flight over. Format 2 is radiogram number 14: longitude 32, period is 88 and 59 - is your period. Your orbit is 006 and 0.4. Turnon time is 00.8. How do you read me? Over.)

SFE (My longitude is 32. Period is 88, 59. Orbit is 6 at 0.4. Time is 38.8.)

CC-M (There is 10 seconds prior to the next AOS seance. Over.)

SFE (When's your next seance? Over?)

CC-M (01:47, 01:54. How do you read me?)

END OF TAPE

ASTP (USSR) MISSION SR12/1  
Time: 16:23 CDT, 09:02 GET  
7/15/75

KIO (This is the Moscow Control Center. It's now 35 minutes of the night sequence. During the first stage, the crew has carried out its first sequence of communications with the Control Center in Moscow. The cosmonauts reported a radiogram in the format number 3 - the radiogram concerning the status of the systems on board. In turn - in their turn, the Mission Control Center reported a radiogram in format number 2 and sent up a series of parameters. At the present time, the Soyuz spacecraft is carrying out the seventh orbit around the Earth. It is now located out over the territory of Africa and soon will be nearing the equator. The spacecraft is over the shaded area of the Earth's surface at the present time. During the communication between the crew and the MCC in Moscow - will take place in - at 1 hour 11 minutes through the tracking ship Yuri Gagarin. At the present time the Soyuz crew should begin their dinner. As they were leaving the AOS the crew talked about the dumping of the pressure of the orbital module. The pressure in the spacecraft itself and the orbital module - was 539 millimeters of mercury. The pressure was reduced from 867 to 539 millimeters pressure. The length of the operation took place 2 hours - in 2 hours and 34 minutes. This is Moscow Control Center. Over.)

KIO (This is the Moscow Control Center. Moscow time is 42 minutes of night period. The Control Center is now telling us that on the seventh orbit the communication seance is over. The health of the crew is normal and there is no comment. The crew has dumped the pressure down to 539 millimeters of pressure. As a result of dumping the pressure, the parameters of the maneuver - of the rotation maneuver have changed. The crew has received recommendations that after coming out LOS and into AOS, the crew were to repeat the rotational maneuver, set the spacecraft relative to the Sun and proceed according to plan. This is Moscow Control Center. Over.)

KIO (This is Soyuz Space Center. In Moscow it is 1:00 in the morning. The spacecraft Soyuz is now 9 hours and 40 minutes in flight. Right now it is - right now it is flying over the equator. At the present time, the cosmonauts have - must be finishing their dinner. After having finished dinner - they had various - various of the things that they have selected for their supper. After they finish their supper, they will start preparing their solar orientation of the spacecraft and the maneuver after that. And this operation will start in a few minutes as soon as the spacecraft is out of the shadow. This is Moscow Space Center.)

KIO (This is Moscow CC. Moscow time is 11 minutes after 2:00 at night. Over. We are approaching the end of the seventh orbit for the Soyuz spacecraft around the earth. A couple of minutes ago, the Soyuz spacecraft came out of the shadow - Earth's shadow and now presently is stationed over the equator of the Pacific Ocean - over the area called Eupatoria. The crew is preparing to maneuver manually and will perform a rotation maneuver which will come about the end of the seventh orbit. Based on the data given by - via telemetric means, the pressure in the descent vehicle is 535.9 millimeters of mercury. In the orbital module it's 540.2 millimeters. The temperature of the air in the descent vehicle

ASTP (USSR) MISSION SRI2/2  
Time: 16:23 CDT, 9:02 GET  
7/15/75

is 15.45 Celsius. And the orbital module is 20.2 degrees Celsius. The regular seance of communication will take place in 34 minutes through the Yuri Gagarin tracking ship. This is Moscow MCC out.)

END OF TAPE

ASTP (USSR) MISSION SR13/1  
Time; 17:30 CDT, 10:10 GET  
7/15/75

KIO (This is Moscow MCC. In Moscow it is 1:30 in the morning 16th of July. 2 minutes ago, the seventh orbit of the Soyuz spacecraft terminated. The spacecraft at the present time is in flight for 10 hours and 10 minutes. The program of the flight of the Soyuz seventh orbit calls for the astronauts performing a rotation maneuver around the Sun vis-a-vis the Sun, and getting communication with the MCC in Moscow through their tracking vessel named Yuri Gagarin. At the present time, the cosmonauts will dump the condensate which is inside their spacecraft and will prepare for a rest period. In projecting the parameters - Soyuz parameters for the eighth orbit, the maximal height of the orbit will be 100 - will be 191.66 kilometers in perigee. And apogee 88.61. The angle of inclination against the equator will be 55.78 degrees. At the present time, at the beginning of the eighth orbit, the distance between the Apollo and Soyuz spacecrafts is 6,085 kilometers between the two spacecraft. There remains approximately 15-1/2 minutes prior to the next communication through the Yuri Gagarin tracking vessel. This is Moscow MCC out.)

KIO (This is the Moscow Control Center speaking. In a minute the Ap - the Soyuz will come into AOS and track through the tracking vessel called Yuri Gargarin.)

MCC-M (Soyuz, this is Moscow. Soyuz, this is Moscow.)

SCDR (Moscow, this is Soyuz. I read you well.)

MCC-M (Soyuz, this is Moscow. Listen carefully. It's ultimately necessary for you to carry out these operations by using the television equipment. This equipment is found in the lower storage compartment. In the box number 8 below on the right. To do this you're going to have call out through the control panels. Call up the equipment which found located in box number 8. Do you understand what I mean?)

SCDR (Yes. Yes.)

MCC-M (Take a pencil and write this down.)

SCDR (Okay, we got you.)

MCC-M (The operation should be carried following sequence. Unscrew the lowest three screws on the vertical stand. Starting from the floor go up and unscrew the lowest three nuts and working around box number 8 on the right, the lower section. And also you'll have a left stand. Take out two of the lower nuts on the bottom left stand. This stand is about 300 millimeters to the left of box number 8. The screws which are partially covered by the floor, you shouldn't touch those. The problem is that the screws are - are - are hooked up the fixed nut configurations that are very hard to take out. So you can't take the panel very easily.)

SCDR (The ones we are going to take out you're talking about?)

MCC-M Yea, that's right. Further, take your scissors, take - and cut off the decorative panel along the horizontal line parallel to the floor at a height - Take it right near the bracket. You see the bracket? Use your scissors and start cutting - we recommend start cutting from box number 8 and start cutting horizontally right near the bracket. And ... - At first you have to open up the - the cover first. And while you're cutting, be careful not to cut the interior cable - cables. Do you receive me?)

ASTP (USSR) MISSION SRL3/2  
Time: 17:30 CDT, 10:10 GET  
7/15/75

SCDR (Right.)  
MCC-M (Go - Now further, take a knife and make cuts - vertical cuts with a knife along the lines of the screws that were released and the left stand. And make cuts on the panel with a knife along the lines of the floor. And take and tear away that panel along the cuts that you've made. How do you read me?)  
SCDR (Okay.)  
MCC-M Now, the window that you get, you're going to - through this window you're going to be able to have access to the equipment. This equipment which is right next to the wall, the partition of box 8 there are eight plugs - connector plugs which are directed towards the floor and of them, eight of these connectors with cable attachments with coaxial cables. How do you read me on that?)  
SCDR (Read you well, read you well, Roger.)  
MCC-M (Okay, further. Unscrew three of the four bolts that hold this piece of equipment in place. Further, bend or lean the equipment so you can get to the connectors. Just far enough. Now as far as that is concerned, that's it for now. As far as other activities go, when you get into your next AOS probably tomorrow morning, we'll tell you what to do further. Write this down. The next - the next seance will take place 03:20 - 03:27 through Gruik[?]. How do you read me?)  
SCDR (This is Soyuz. We read you well - loud and clear we'll try to do all that. We understand the idea. It will take a little time, but we understand.)  
MCC-M (We wish you a lot of luck on that.)  
SCDR (Thank you.)  
MCC-M (Okay. So in that case - Okay, why don't you go ahead and start doing that then.)  
SCDR (Roger that.)  
MCC-M (Okay. We're interested in the rotation maneuver, in the orientation, and the dumping of pressure.)  
SCDR (Everything is normal. We are now finding ourselves in the rotation maneuver. The 333 faults[?] and 33 and 18 are the parameters on the rotational maheuver. Over.)  
MCC-M (Okay, everything is fine. We're - good luck Soyuz, this is Moscow. Out.)

END OF TAPE

ASTP (USSR) MISSION SR15/1  
Time: 19:05 CDT, 11:45 GET  
7/15/75

KIO This is Moscow MCC. Moscow time is 3:05. The ninth orbit around the Earth has begun. The spacecraft is located over the Pacific Ocean. Soyuz has been oriented with its solar batteries facing the Sun, and has accomplished its maneuver. There remains 14-1/2 minutes before the next regular communication over - through the Yuri Gagarin tracking station. This is MCC in Moscow. Over.)

KIO (This is Moscow MCC. In 1 minute the Soyuz spacecraft will enter the AOS of the tracking ship Yuri Gagarin.)

MCC-M (... 9th orbit. Impulse is 70.01; time of launch - 04:25:46. The work is 157 seconds during the orbit. The angular rate is 073. 11, 05, 58, 18. 094, 12, 07, 32, 09. 096, 12, 08, 42, 39 - 13 13 13.)

SPEAKER (In other words you have two twelves.)

MCC-M (Yes, that's exactly correct. This is 12, 1, 2, 08, 42, 48, 088, 13, 10, 16, 00, 091, 14, 11, 47, 59, 092. Listen, if you received it okay, I don't think you need it any more.)

USSR (Yeah, I got you okay. I read. Roger that.)

MCC-M (The format 23, Valeriy. I just give it to you for the 13th and 14th orbit. Go ahead. 13. Beginning 08:51:54; Academician Korolev, 09:30 - 09:35; Moscow, 09:01 - 09:12, 09:21 - 09:57. 14. 10:20:30; Moscow, 10 - 10:33 - 10:45. 9. 10:49 - 11:25. How do you read me? Over.)

USSR (13:08:51.)

MCC-M (Alexey, if you read it okay, just tell me. You don't have to read it back to me.)

USSR (I got you okay. Read you. Roger on that. Thank you.)

MCC-M (Did you receive that as format 23?)

USSR (Okay. Let me have it.)

MCC-M (Okay number 15, 6th orbit the volume is 443. The 106 and 5/10 is in the primary system, 20 in the reserve system. How do you read me? Over.)

MCC-M (You don't have to give me - you don't have to read it back to me so why don't you just tell me how you read me? Over.)

MCC-M (Soyuz, this is Moscow. How do you read me? Over.)

USSR (I read you excellent. I question to you. What do you think a - without releasing the block can you take the VHF from that or can't you?)

MCC-M (No, we've already freed the TV equipment.)

USSR (Naw, we don't have to do it today, just a question to you when you do it the next time. Can you - in order to take the connector off of it, you gonna have to take off the cable in addition which connects the - which grounds out to the super structure. That is a normal cable - normal grounding cable. It leads to other pieces - it does not lead to other pieces of equipment. In other words the problem this standard cable does not give us an opportunity to free the pieces of equipment - the unit.)

MCC-M (Okay, thank you this all - that's all you have to do, but today go ahead get some sleep.)

ASTP (USSR) MISSION SR15/2  
Time: 19:05 CDT, 11:45 GET  
7/15/75

USSR (What time do we have rest?)  
MCC-M (You got a - you gonna get up in 13th orbit 3 - 10:33.  
10:33 is our first communication with you. You got 27 seconds left. We gonna  
wish you nice sleep. Until we meet you again at 10:33. You got a nice telegram  
from the Apollo crew.)  
USSR (Thank you and say thank you to them. Everything okay.  
Thank you. Get your instructions ready for us when you talk to us again.)  
MCC-M (All right. We got 4 second left, good luck. Out.)

END OF TAPE