

This is Gemini Launch Control. We are now T-275 minutes and counting on this morning's Gemini 8 launch. Our countdown is on time, we are still aiming toward a 10:00 a.m. lift off for the Atlas Agena at Launch Complex 14 and the planned Gemini 8 launching some 101 minutes thereafter. Our countdown has proceeded satisfactorily this morning, we have had no holds up to this time. Because of several problems as a result of the mid-count we were a little late in starting our propellant loading of the Gemini Launch Vehicle but this was done in rapid time and the loading was completed and resulted in no effect on the countdown itself. One problem that we still have with us is the communications problem that Gemini 8 spacecraft. We have discovered that in the inter-communications circuits. Between the two astronauts in the spacecraft, the astronauts can hear each other even though they do not push the so-called "Push To Talk Button." This is in the voice control circuit within the spacecraft. We do not know the cause of this problem, but we have determined to proceed with the situation as it is. That is, if one of the astronauts talks either to the block house or to the ground once they are in orbit the other astronaut can hear the conversation. The second astronaut should not hear the conversation unless a "Push To Talk Button" is pressed by the first astronaut. As a result, both astronauts can hear what the other is saying even though they are not talking to each other. This is not considered to be a severe problem; the question was

why it happened in order to determine as some extensive checks of the spacecraft would have to be made. After lengthy discussions and studies of the matter the determination has been made to proceed with this communications, this minor communications difficulty. We are now T-272 minutes and counting. This is Gemini Launch Control,

END OF TAPE

ACCOUNT ON ASTRONAUTS AND FUEL LOADING 3/16/66, 6:20 a.m.

TIME 10. 2

This is Gemini launch control at the Cape. We are T-25~~5~~ 5 minutes and counting this morning on this Gemini 8 mission. The pilots for the mission Niel Armstrong and David Scott were awakened as planned in the crew quarters at the Kennedy Spacecraft Center Operations Building at 7 a.m. Eastern Standard time. The pilots are now up and they will be making preparations for their final physical and breakfast at the Crew Quarters, before departing to the ready room later in the countdown. All systems looking good at the present time. Some twenty minutes ago we started loading the fuel aboard the Agena spacecraft at launch complex 14. A little later in the count we will add the oxidizer to the Agena also with our still aiming toward a 10 a.m. Eastern Standard time lift-off with the Atlas Agena vehicle to be followed some 101 minutes later by the Gemini 8 launch complex 19. All systems looking good - Now ~~T-25~~ minutes and counting. This is Gemini Launch Control.

J. H. ... CAPE ANNOUNCING SIMULTANEOUS COUNTDOWN OF BOTH VEHICLES ...

This is Gemini launch control, and our T-245 minutes in counting on this mornings Gemini 8 mission. All systems looking good in the countdown at present. Some 5 minutes from now the Gemini launch vehicle will join the final phase of the countdown, the Gemini launch vehicle comes into the count, and the G-240 minute mark, and this will at that point complete simultaneous countdown with some 9 different functions all participating at the same time in a simultaneous count. We have completed loading the fuel aboard the spacecraft and in a matter of some 5 or 10 seconds will be ready to roll the tower back at launch complex 14 to proceed with our further tests at the pad with the Atlas Agena launch vehicle. All systems working good, our reports on weather both in the launch area and around the tracking network all look acceptable. T-244 minutes in counting this is Gemini Launch control.

END OF TAPE

This is Gemini Launch Control. We're now at T-230 minutes and counting on the Gemini 8 mission. All systems looking good. The report on the prime pilots for the mission Astronauts Neil Armstrong and David Scott -- they were awakened as planned at 7 a.m. EST some 22 minutes later they took their physicals, taking some 15 minutes in each case, for Astronauts Scott and Armstrong. They were declared physically fit by their doctors, Dr. Fred Kelly and Dr. Norman Pencott. The physicals were followed by breakfast. The breakfast consisted of the following menu: filet mignon, eggs, toast with butter and jelly, coffee and milk. The guests at the breakfast with Astronauts Armstrong and Scott were four of their astronaut colleagues, They were Dr. Kurt Michel, one of the scientist astronauts; Astronaut Walter Cunningham, who is Stoney, the blockhouse communicator for the Gemini 8 mission; Astronauts Roger Chaffee and Alan B. Shepard, who is Chief of the Astronaut Office at the Manned Spacecraft Center. All systems still looking good at the present time. To cover our communications problem once again perhaps in a little more depth, it was discovered during the mid-count last evening that we had a communications problem. The problem is concerned with the intercom in Gemini 8 spacecraft, that is the intercommunication between the two astronauts. In the spacecraft itself, the astronauts have a so-called push-to-talk switch. This is within their voice communications circuit. Now there are modes within the voice communications circuit. The three modes are: (1) push-to-talk, (2) continuous, this means anything either astronaut would say would be heard by the other, and (3) vox record, this is when they record internally in the spacecraft. The problem is concerned with the following: In the first mode

the push-to-talk mode, it was discovered that if an astronaut was talking in that mode the second astronaut, the other pilot, could hear the conversation of the first astronaut. In other words, the button should be pushed so that the second astronaut could hear it. This was not the case, the second astronaut was hearing it without the button being pushed, In other words, it was continually in a continuous mode. After studies of this situation, both here and with checks with the McDonnell plant in St. Louis, it was determined that despite the fact that this occurred, it will have no effect on the mission, either on the checkout during the countdown or on any of the operations in orbit of the Gemini 8 spacecraft. It simply means that when the astronaut does not push the button, the second astronaut can hear the first astronaut talking. There is not even any problem with any interference in the situation whatsoever. One other thing that the project officials took a close look at was could this minor problem sort of be a harbinger of perhaps other problems to follow. And a checkout of the system has indicated that this is not the case. This does not indicate any other problems in the system. So, we basically, at this point, have a very minor problem in the communications, which we feel we can continue the countdown and successfully complete the mission without any difficulty. It's strictly a minor problem simply in the intercommunications. We're now at T-226 minutes and counting. This is Gemini Launch Control.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 7:01 a.m.

TAPE 5 PAGE 1

This is Gemini launch control. We are at T-214 minutes and counting. T-214 on this morning's Gemini 8 mission. We are still aiming for a Atlas/Agena lift-off at about 10 a.m. Eastern Standard time followed by a Gemini 8 lift-off some 101 minutes later. All systems are Go at the present time. We have a minor communications problem in the spacecraft. It's basically that when either of the astronauts talk over the intercommunications system the other astronaut can hear his partner talking. It is nothing considered to be a major problem. We've looked into the overall situation. We feel that there will be no problem whatsoever either during the countdown or during the actual Gemini 8 mission to include, of course the extravehicular activity. This problem is not expected to effect any part of the mission whatsoever. The flying pilots for the mission, Astronauts Neil Armstrong and David Scott were awakened at 7 a.m. They have taken their physical and have set down to breakfast with four astronaut guests. The breakfast menu consisted of omelet mignon, eggs, toast and coffee. Their guests were Dr. Curt Michel, ^{one of} /the new scientist astronauts, astronaut Walter Cunningham, the blockhouse communicator for this morning's flight, Roger Chaffee and the Chief of the Astronaut Office Allen Shepard. At launch complex 14 the tower is being rolled back as we continue through the count. They have already loaded the fuel aboard the Agena Spacecraft and after we get the gantry back into place at launch complex 14 we will proceed with loading the nitric acid oxidizer into the Agena. All systems looking good at the present time. This is Gemini launch control.

ENDSOFTAPE

This is Gemini launch control, we are at T-204 minutes and counting on the Gemini 8 mission. All systems looking good. The gantry removal at launch complex 14, pulling the tower back during the lunar phases of the Atlas Agena Count are just about completed. That is about a 30 minute operation removing the tower and leaving the Atlas Agena alone on the launch pad. When the gantry is completely removed and some 10 minutes from now we will start loading the nitric acid oxidizer aboard the Agena spacecraft. The fuel for the Agena was loaded aboard a matter of 30 minutes ago. As far as the Atlas launch vehicle is concerned, itself its fuel the rocket propellant 1 or kerosene type fuel that is used in the Atlas booster was loaded aboard yesterday. Later in the count after the T-140 minute mark we will load the liquid oxygen aboard the Atlas. This will complete our fuel and propellant loading of the complete Atlas vehicle. The astronauts are continuing their breakfast at the space Center's Manned Spacecraft Operations Building. They were both pronounced physically fit by their two doctors who gave them the 15 or 20 minute physical this morning. Doctors were Dr. Fred Kelly, and Dr. Norman Pencott. Dr. Kelly reported following the physical the astronauts were in excellent shape. He described them as bright-eyed and in good spirit. All systems looking good, now T-202 minutes and 30 seconds in counting. This is Gemini launch control.

END OF TAPE

This is Gemini launch control, now T-194 minutes on this morning's Gemini 8 mission. The countdown proceeds to go smoothly at this time. There was a report that just several minutes ago, some 4 minutes ago to be exact, or 17 minutes after the hour, the flying pilots for the mission, astronauts Neil Armstrong and David Scott, departed their crew quarters at Kennedy Space Center's Manned Spacecraft Operations Building and are now on their way to the ready room at launch complex 16 nearby the launch pad where the Gemini 8 spacecraft is sitting, at of course launch complex 19. They will put on their suits in the ready room at pad 16 and get ready/^{for the call}to go to the pad at about T-125 minutes, or some 60 or 70 minutes from this time. All systems are looking good. The weather men also give a good report. In the Cape Kennedy area we have some scattered clouds, winds from the Northwest at about 12 knots, and we expect a temperature later this morning within the times of the two launches of about 78 or 73 degrees. Scattered clouds, but the area appears to be quite clear at the present time. In the rest of the tracking network the weather is also acceptable, acceptable around the world as a matter of fact. In the mid-Pacific landing zone the weather is partly cloudy winds southeast and 15 knots with a sea condition of 4 feet. Western Pacific partly cloudy also winds north at 10 knots sea to 3 or 4 feet. East Atlantic with partly cloudy conditions winds from the northeast at 15 knots and with a sea of 4 feet. Western Atlantic the landing zone, the weather conditions there are partly cloudy with winds of 5 to 15 knots and with a sea condition of 4 feet. All weather conditions looking well, and with all the conditions of the countdown looking good at the present time. At launch complex 14, several minutes from now we will be ready to load the oxidizer of nitric acid aboard the Agena spacecraft to complete the loading of the Agena. The service structure is now back at the complex 14. We have completed our checks at pad 19 as far as the backup pilots are concerned. Astronauts Pete Conrad and Richard Gordon have been in the spacecraft for several hours. They checked out that communications problem while they were in the spacecraft and they feel, as well as the project officials that there will not be

MISSION COMMENTARY, 3/16/66, 7:21 a.m.

TAPE 7 PAGE 2

difficulty either in the countdown or in the actual flight itself. We understand, also that Pete Conrad has reported the condition to both Neil Armstrong and David Scott. We are now at T-191 minutes and 10 seconds. This is Gemini launch control.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 7:31 a.m.

Tape 8, Page 1

This is Gemini launch control . We are now at T-184 minutes and counting on this morning's Gemini 8 mission. All systems still looking good as the count-down proceeds at the present time . We are just a little less than an hour and a half away from the Agena lift-off scheduled for 10:00 a.m. Eastern standard time. At launch complex 14, we have the gantry service tower removed and we are continuing to load the nitric acid oxidizer aboard the Agena spacecraft. The Agena is powered by hypergolic propellants, that is, a fuel and an oxidizer that ignite when they come in contact with each other. That is a type of hydrazine as the fuel and the inhibited red fuming nitric acid as the oxidizer. We wanted to have the tower back before loading that oxidizer aboard. At the moment, launch complex 16 where the prime pilots, astronauts Armstrong, and Dave Scott arrived a short while ago...they are now going through a mission briefing . The backup pilots are there. Astronauts F. Lee Conrad and Richard Gordon and they are briefing the prime pilots of the status of the mission at this time and they are telling them we are in good shape at this phase in the countdown. All systems looking good. It is T-182 minutes and 40 seconds. This is Gemini Launch Control.

END OF TAPE

This is Gemini Launch Control where at T-174 minutes and counting. T-174 on the Gemini 8 mission. All systems looking good. At this time at complex 16 in the ready room, prime pilots Neil Armstrong and David Scott continue to get their briefing on the status of the mission. Some 8 minutes from this time they will be doning their space suits in final preparations before going to launch complex 19 to board their spacecraft. At launch complex 14 we are completing the loading of the acid oxidizer aboard the Agena spacecraft. We had to put some 10,000 pounds of the oxidizer aboard the Agena. This is fed into a pressurized system and we have reports that the loading is going well. We have some 5 or 10 minutes to go and verification of the acid loading at 14. Back at launch complex 19 the White Room where the Gemini 8^{spacecraft} is located has now been evacuated in preparations for the Gemini launch vehicle pressurization. That is, pressurizing the fuel tanks... Those stages of the Gemini, the fuel and oxidizer tanks. We have to evacuate the area for about a 10 or 15 minute period while a pressurization occurs. This is due some 15 minutes from now. About 1 hour and 17 minutes from the planned Atlas Agena Liftoff at 10:00 A.M. Eastern standard time. To cover some of the highlights of the count from last evening and today - we completed our mid-count at about 9:00 p.m. Eastern standard time last night. We had three difficulties to contend with as a result of the mid-count. Two of them appeared to be problems last evening but turned out to be minor and correctable. The first was concerned with the activation of the fuel cells on the Gemini 8 spacecraft - we had questioned last evening whether they activated correctly. It turned out that the problem was strictly ground support-equipment problem - had plugged and gave the wrong reading. The fuel cells were activated well. All is going well with the fuel cells. The second is a heater circuit concerned with conditioning the spacecraft propellants-orbit attitude and maneuvering system propellants in the Gemini 8 spacecraft. We had a short circuit it was discovered that a wire had actually been cut by one of the shingles off the spacecraft. This wire was fixed and the heater circuit condition is acceptable.

MISSION COMMENTARY, 2/16/66, 7:41 a.m.

Tape 9 page 2

The one problem that is remaining, but we do not consider it to be a major one, is the intercommunications within the spacecraft itself between the two astronauts. It is expected to have no affect on the countdown or on the complete mission including the extravehicular activity. Generally, that is our status at the present time. All looks good at T-171 minutes and counting. This is Gemini Launch Control.

END OF TAPE

This is Gemini launch control now at T-164 minutes and counting. T-164 on the Gemini 8 mission. Countdown continues to proceed excellently, the complete simultaneous countdown actually 9 countdowns in one simultaneous operation. All proceeding excellently at the present time. At the ready room at launch complex 16 Astronauts Neil Armstrong and David Scott are now donning their space suits. They were supposed to do it right at the T-165 minute mark in the count. At launch complex 19 we are starting to bring the Gemini launch vehicle to flight pressures, that is pressurizing the fuel and oxidizer tanks in both stages to bring them up to flight pressure. We have completed loading the propellants aboard the Agena spacecraft at launch complex 14 and are getting verifications of the effects of the fuel loading and the propellant loading of the oxidizer loading at this time. The next highlight at launch complex 14 will be some twenty minutes from this time when we start loading the liquid oxygen aboard the Atlas first stage. All conditions looking good now at T-162 minutes and 45 seconds. This is Gemini launch control.

END OF TAPE

Good morning, this Gemini control, Houston. At -153 minutesⁱⁿ the spacecraft
countdown we^{are} 58 minutes away from the Agena launch. Here in Houston we're
ready to support the mission. John Hodge, the Flight Director, has taken his
position at the Center Console, and let's have a look at the world range.

At Merrit Island the radar has been acting up this morning, it's touch and go
whether it will^{be ready} support the mission. It is not critical to the mission support.
Similarly some difficulties have been encountered with the radar at Patrick, just
south of the Cape. Over at Carnarvon, Australia radar has given the ground crew
trouble there, but they indicate now they^{are} confident they will be able to support the
mission. Similarly at Carnarvon they^{are} having some trouble with their teletype link
back here to Houston. Canton Island station is reporting that their acquisition A
beacon is not functioning and will probably not be functioning at the start of
the mission. Other than that the weather around the world from all reports has
never been better for a manned spaceflight. Gene Kranz said in his experience;
which goes back to the first manned Mercury Redstone launch, he's never seen better
weather around the world. The one exception to that remark^{would} is in Houston here
where a heavy blanket of ground fog is completely swabbing at least this part of
the City this morning, but expected to burn off later in the morning.

Among the representatives viewing this flight from Houston are, Mr. Mauricio Obregon,
who is President of the Federation Aeronautique Internationale, an organization which
maintains world flight records and certifies them. Also here is Mr. Ed Sweeney of
Washington, D.C. who is President of the National Aeronautics Association.

This is Gemini Control, Houston, we'll now switch for an update at Cape Kennedy.

MISSION COMMENTARY, 3/17/66, 8:01 a.m.

TAPE 11 PAGE 2

This is Gemini launch control - - We are go at T-151 minutes and 37 seconds in the simultaneous countdown with the launch vehicles at launch complex 14 and 19. At pad 19 where we have the Gemini launch vehicle and spacecraft we have completed our pressurization of the propellant tanks in both stages and the backup pilots in the mission, Astronauts Pete Conrad and Richard Gordon have returned to the Gemini 8 spacecraft to make some final checks in preparation for the arrival of the flying pilots Armstrong and Scott, some twenty minutes from this time. At launch complex 14 control of the clock - - this is the countdown clock - a critical item since we have nine different countdowns coming into one simultaneous count. The control of the clock is now with the Chief Test Conductor at complex 14. This appeared some 30 minutes ago and the Test Conductor at 14 will maintain control of this clock through the T-90 minute mark in the count, that is until after the Atlas/Agena liftoff. Any holds that will be declared anywhere, either at Cape Kennedy or Mission Control Center at Houston, or a hold for any reason in the World Wide Tracking Network, the hold would be made by the Test Conductor at 14. Also at 14 we are making some preparations for one of the final highlights in the Atlas/Agena count, and that is the loading of the liquid oxygen aboard the Atlas vehicle. This is due some 5 minutes from this time. All is looking well, coming up on T-150 minutes. This is Gemini launch control.

END OF TAPE

This is Gemini Launch Control and now at T-144 minutes and counting. T-144 and counting--some 49 minutes away from the planned Atlas Agena lift-off. All systems still looking good and our simultaneous countdown at the present time. At launch complex 14 where we have the Atlas Agena going through its final checkout. We are just finishing our preliminary checks prior to loading the liquid oxygen aboard the Atlas vehicle. We will load some 18,400 gallons of liquid oxygen aboard in a process that will take 20 minutes. After we complete our loading of this liquid oxygen which has to be maintained at a temperature of 297 degrees below zero. It will continue to boil on through the remainder of the count. That is because of its extremely low temperature. We will continue to top it off, feeding in more liquid oxygen and as the count continues down until we close the vents some 2 minutes 10 seconds before the lift-off. We will be picking up the liquid oxygen loading shortly. At complex 19 the backup pilots, Pete Conrad and Richard Gordon continue their checks in the spacecraft. awaiting the arrival of the prime pilots some 17 minutes from this time. We had one addition to the breakfast list which was reported earlier. Astronaut Donald K. Slayton who is Assistant Director for Flight Crew Operations has also joined the prime pilot Neil Armstrong, and pilot David Scott at the breakfast at the Kennedy Space Center, Operations Building, this morning. Now at T-142 minutes and 16 seconds and counting. This is Gemini Launch Control.

END OF TAPE

This is Gemini Launch Control. Now at T-13⁴ minutes and counting on the Gemini 8 launch. All systems looking good. We/^{are}some 39 minutes away from the Atlas Agena lift-off. If all goes well that will be at 10:00 a.m. Eastern standard time. If we have a nominal performance of the Agena we will expect A Gemini 8 lift-off some 101 minutes after the Atlas Agena lift-off. That is, the Atlas Agena ignition and lift-off comes at the T-95 mark in the count. We will proceed down the remainder of the Gemini countdown. We will have a plan to hold at the T-3 minute mark. If the performance is completely nominal that full time would last some 5 minutes and 47 seconds. Of course, it will be adjusted during the whole period to the exact time to fit into the Agena parameters for the Agena that time in orbit. That would give us a complete time of some 101 minutes between the Atlas Agena and Gemini 8 lift-off. At this time in the countdown in the launch complex 14 we are starting to load the liquid oxygen aboard the Atlas. This is the final phase of the important, unimportant propellant loading of both the Agena spacecraft and the Atlas at Pad 14. At Launch complex 19, the backup pilots Pete Conrad, And Richard Gordon continue their final checks in The Gemini 8 Spacecraft awaiting the arrival of the prime pilots, Neil Armstrong and David Scott who are expected to depart from the Ready room. As far as the countdown is concerned it is some 7 minutes from this time. Now in T-132 minutes; and 17 seconds in counting. This is Gemini Launch Control.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 8:31 a.m.

Tape 14, Page 1

This is Gemini Launch Control. We are now T- 124 minutes and counting. Some 29 minutes away from the Atlas Agena lift-off. At this point in the countdown it appears that Astronauts Neil Armstrong and Dave Scott are just about ready or have left the ready room at Launch complex 16 to proceed to launch complex 19 and their Gemini 8 spacecraft. They are due to be inserted into the spacecraft at the T-15 minute mark. And the hatches will be closed some 15 minutes later or T-100 in the countdown, and that is 5 minutes before the planned Atlas Agena lift-off. At launch complex 14 at this time we are going through some final command destruct tests. That is a key test between the range 1 e and the Atlas launch vehicle to make final checks on the destruct system. That system would be designated in flight. in the event we would get a bad trajectory. The checks are going through now. We are completing our liquid oxygen, and astronauts Neil Armstrong and David Scott are now on their way to launch complex 19. All systems looking good at the present time. When the astronauts are in their spacecraft they will be able to observe the Atlas Agena lift-off by looking through the windows of the Gemini 8 spacecraft at a television monitor mounted right above the hatches. .of course, outside the spacecraft. All systems looking good at the present time. T-24 seconds and counting. This is Gemini Launch Control.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 8:35 a.m.

TAPE 15 PAGE 1

This is Gemini launch control, now some T-120 minutes and counting, 25 minutes from the Atlas/Agena liftoff. Astronauts Neil Armstrong and David Scott have boarded the elevator at launch complex 19 and have now stopped in the white room. They will be boarding the spacecraft in four minutes from this time or at the T-115 minute mark in the countdown. It looks like they are going to lean against the wall and now their sitting down, they will proceed to get a briefing from the pad crew in the white room and, of course, the backup pilots, Pete Conrad and Richard Gordon, who have spent some three hours in their Gemini 8 spacecraft this morning and will give them a complete briefing on the status of the mission. The status of the overall mission is very good at the present time. We still have that communications problem that was discussed earlier with the intercom for the pilots in the spacecraft. It is considered to be a minor problem that will have no effect on the countdown or the actual Gemini 8 mission, including the EVA, the Extravehicular Activity, Astronauts Armstrong and Scott now seated, getting a briefing from the technicians and the backup pilots in the white room. They will board the spacecraft at T-115 some three minutes or four minutes from this period. All systems looking good. We will now switch you to the Mission Control Center in Houston.

And this is Gemini Control in Houston. During the Atlas/Agena liftoff this morning here is some of the critical events that we will be watching for, and hopefully be in a position to verify for you. First, the liftoff is an indication of a 2 inch motion switch that is actuated when the booster lifts 2 inches from the pad. The booster engine cutoff will occur at 2 minutes and 11 seconds into the flight. The booster engines themselves drop off immediately 2 minutes 11 seconds. At ^{4 minutes} 34.9 seconds we should have sustainer engine cutoff, of course in the Atlas all three engines the two outboard booster engines and the inboard sustainer engines continue

MISSION COMMENTARY, 3/16/66 8:35 a.m.

TAPE 15 PAGE 2

to light off on the pad and they continue to burn throughout. At 5 minutes and - - and even into the flight we have veneer engine cutoff, these are the small engines at the base of the bird, which control the steering of the Atlas. And about three seconds later, 5 minutes 3 seconds, we have the separation of the Agena from the Atlas. Observing on our monitors here as the two pilots enter the spacecraft. They will observe the Agena liftoff from a monitor above their windows, the hatches will probably be closed at that time. Continuing at 5 minutes and 53 seconds or about 50 seconds after separation we will have ignition of the secondary propulsion system on the Agena. These are 16 pound thrusts, the 16 pound thrusts part of the secondary propulsion systems to provide ullage or to insure that fuel is in the thrust chamber area. At 6 minutes and 11 seconds into the flight we should have primary ^{propulsion} thrust from that Agena, that big engine on the Agena. It was at that point in the October 25 attempt when everything went to worms. At 6 minutes and 13 seconds into the Atlas/Agena mission we will have the 16 pound thrusters will shut down, at 6 minutes and 21 seconds the nose shroud, shrouding the target docking adapter will be jettisoned. At 9 minutes and 16 seconds into the flight the primary propulsion system on the Agena is to cut off and hopefully we will be in a suitable orbit.

This is Gemini Control, Houston.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 8:41 a.m.

Tape 16, Page 1

This is Gemini Launch Control at T-114 minutes and counting. T-114, as some 19 minutes away from the Atlas/Agena liftoff. Prime pilots for the mission, Astronauts Neil Armstrong and David Scott were over the hatch and into the Gemini 8 spacecraft at 38 minutes past the hour. They are now hooking up one of the first checks will be some blood pressure checks with the pilots, and of course, communications checks, once they get settled in their Gemini 8 spacecraft. The hatch will be closed at about the T-100 minute and as reported earlier, both pilots will have an opportunity to observe the Atlas/Agena liftoff. Meanwhile at Launch Complex 14, we are reaching the terminal phases of our countdown. The major checks going on. We have completed the range distrust, that is the distrust system within the launch vehicle and are going through a series of final telemetry checks of both the Agena spacecraft and the Atlas launch vehicle. These checks are between the Air Force Eastern Test Range and Launch Complex 14 to make sure that we are getting good quality telemetry readings, good signals from both the Agena and the Atlas. All conditions looking good, now some 17 minutes and 44 seconds away from the Atlas/Agena liftoff. This is Gemini Launch Control.

END OF TAPE

This is Gemini Launch Control. We are at T-109 minutes in counting. T-109 some 14 minutes away from the A^Tlas Agena lift-off. All systems still showing well in the simultaneous countdown. Astronauts Neil Armstron and Dave Scott checking out their communications in the Gemini 8 spacecraft and making their checks with the block house. And also in the block house the capsule communicator Astronaut Walter Cunningham, who is designated Stoney in the countdown. Meanwhile at launch complex 14 we are reaching the final phases of the count. We are now some 13 minutes away from lift-off. Over the final phase of the Atlas Agena count we have some highlights and they go as follows: The Agena spacecraft goes on internal power at the 8 minute mark. Back at complex 19 we close the hatches at 5 minutes, at T-3 minutes and 30 seconds the Atlas vehicle telemetry goes on internal power that is within the vehicle itself. It has been controlled from the block house until that time. We have a final verification of all systems in the launch vehicle at 2 minutes and 30 seconds. The boom, the umbilical line that connects between the tower and the Agena spacecraft is checked to insure that it will come out at lift-off. We secure our liquid oxygen tanking, that is we close the vents in 10 minutes and 10 seconds. The Atlas goes on internal power, that is the batteries within the vehicle itself. One minute and 40 seconds before lift-off. At one minute and 40 seconds before lift-off and at 1 minute and 30 seconds we turn the water on at the launch pad. This is some 30,000 gallons per minute in to cool the pad during the ignition and lift-off. Between actual final phases we go on an automatic sequence with the Atlas at the 18 second mark in the countdown. An ignition button is pushed at that point. There will be a brief hold that lasts 20 seconds between 19 and 18 seconds during the final phases of the count. The count will then be resumed and we will go down automatically to ignition at about the 4 second mark. That will be 95 minutes and 4 seconds in the overall simultaneous countdown. The Vernia engines

MISSION BRIEFING, 3/16/66, 8:46 a.m.

Tape 17, Page 2

ignites first, those two small engines on the side of the vehicle. When they reach the proper pressure we get the full ignition and buildup of thrust of the two boosters and the sustainer engine, those three engines at the base of the launch vehicle which build up a total of 395,000 pounds of thrust. We will get lift-off some 3 to 4 seconds after the start of ignition or at just about the T-95 minute mark in the count. Now 11 minutes and 10 seconds away from the Atlas Agena Launch. This is Gemini Control.

END OF TAPE.

This is Gemini Launch Control. We are now at T-104 minutes and counting. Nine minutes away from the Gemini -- correction, from the Atlas/Agena liftoff. All systems looking good. Coming up in about 50 seconds, the Agena spacecraft will go on internal power, one of the final series of highlights over the last 10 minutes of the countdown. As far as the launch vehicle test conductor is concerned in the blockhouse at Launch Complex 14, he will be watching a special monitor that has a series of lights on it. There are some 20 lights in all. They are go from the color yellow to green as the various events referred to moments ago in our previous announcement occur. That is, all these final events as we go on our sequencer -- these lights will flash from yellow to green. When we get down to the 18 second mark that last green light to come on will be the ignition signal. We will then click on down automatically to the four second mark when we expect ignition. All systems looking good, we now have confirmation that the Agena is on internal. This is Gemini Launch Control T-102 minutes and 50 seconds and counting.

END OF TAPE

MISSION BRIEFING, 3/16/66, 8:56 a.m.

Tape 19, Page 1

This is Gemini Launch Control. On T-4 minutes and counting on the Atlas Agena launch. All situations looking good. At complexes 14 and 19. At Pad 19 we are in the final process of preparing the astronauts in the Gemini 8 spacecraft. The hatches are expected to be closed shortly. At launch complex 14, we have just completed some final guidance tests. We are now at T-3 minutes and 33 seconds and counting. All systems still looking good. This is Gemini Launch Control.

END OF TAPE

This is Gemini Launch Control at T-2 minutes and counting on the Atlas Agena launch and at Launch Complex 19 they are just closing the hatches on the Gemini 8 spacecraft with Astronauts Neil Armstrong and David Scott aboard. They have now closed the liquid oxygen vent on the Atlas launch vehicle as we reach down into the final phases of the count. Coming up at the 140 mark will be the launch vehicle going on to the internal power of its own batteries, of course its been on external power controlled by the blockhouse power up to this time. Now one minutes and 26 seconds and counting. All systems still looking good; our final status check going on at Launch Complex 14 at the present time. All appears still to be go. T-1 minute and 15 seconds. At Launch Complex 19 the crewmen are still working to secure the hatches on the spacecraft. Now one minute and 5 seconds and counting. T-60 seconds and counting on the Atlas Agena at Launch Complex 14. Our final check still looking good at this point. We have now armed the range safety destruct system in the Atlas vehicle. To repeat, when we get down to the final seconds of the count we will have a momentary hold, at about the T-18 second mark as we go on an automatic sequence from that time. Now one minute and 35 seconds and counting. We will get the ignition of the Atlas

vehicle at about four seconds and expected liftoff at 0, or the 95 minute mark in the simultaneous count. Now T-20 seconds and counting. T-18 holding momentarily, now resuming the count. T-15, T-11, 10, 9, 8, 7, 6, 5, 4, 3, we have ignition ...

HANEY IN HOUSTON

And we've got a liftoff. It looked like right on the hour. Fifteen seconds into the flight. Our network controller advises that liftoff was three seconds after the hour, three seconds after the hour. Agena says he looks good and he's go. The Atlas beginning its program. Coming up on 60 seconds, the area of maximum pressure; mark, 60 seconds. Flight Dynamics advises we look good. Booster engine cutoff is planned for two minutes 11 seconds into the flight; we are now at one minute, 35 seconds into the flight. Both the Flight Dynamics Officer and the Agena advise they look good and they are go. The Canary Station is being advised of all the parameters to date; it's a very healthy report. Mark, BECO. BECO did occur on the programmed time at two minutes, 11 seconds. The Atlas now about 50 miles away from the Cape, altitude about 40 miles. Our next major event comes at four minutes and 37 seconds into the flight when a sequence timer is to be tripped. We are 100 miles downrange and almost 60 miles in altitude at the three minute mark into the flight.

ANEY

Three minutes and 20 seconds, and the flight dynamics plot looks very good; earlier in the first minute or two it was somewhat low, a percentage point or two, but now it's following the program value very carefully. We are 175 miles downrange, 80 miles high, and both Agena and Flight Dynamics advises the Flight Director that they are go. Four minutes into the flight, four minutes; and a very smooth ride to this point. Four minutes 20 seconds into the flight, we are 275 miles downrange, our altitude 100 miles. Mark SECO, the Agena advises. That would be at four minutes 40 seconds. The sustainer has shut down. And the Agena Controller advises we have SECO, or the vernier engines, steering engines, also have shut down. As yet he has not confirmed separation. Now Agena Controller confirms that we do have separation, that confirmation came at 5 minutes and 35 seconds into the flight. At 5:53, 5 minutes, 53 seconds we should have SPS 16 pounds thrusters lighting off, and about 20 seconds later, the primary propulsion system. Coming up on 6 minutes, 6 minutes into the flight; and we do have SPS start. Six minutes, 10 seconds. And we have primary propulsion system has ignited, and it is operating. And Agena says it looks good. It was at that point on the primary propulsion system cuts in on the Agena that we lost the bird on October 25th. We are now six hundred and 50 miles downrange, we are 120 miles in altitude

HANEY

and we are aiming here for 161 mile orbit; Agena confirms the shroud has separated, the shroud which encloses the target docking adapter into which Neil Armstrong and David Scott will dock with this bird. Seven minutes, 25 seconds into the flight, and everything has happened, if not right on time, very close to the time, close enough to be acceptable all the way. Next major event to come up at 9 minutes and 16 seconds at which time the primary propulsion system is to shut down. Our trajectory plot now shows as nearing the 160 mile altitude and the bird would be programming over nicely, ready to assume its orbital flight position. All stations report the reception as good, clean telemetry this morning. We are 900 miles downrange.

END OF TAPE

ANEY

The Agena velocity chart here shows up in the Control Center as a green line and it is an overlay over the programmed path and velocity readings this morning, just an exact match. Fits over the white programmed line. Agena said they had a momentary loss of data but it all came right back in. Coming up on nine minutes into the flight, mark, nine minutes. Nine minutes, 20 seconds into the flight and we are standing by for some word on the primary propulsion system cutoff, we've not yet received it. Agena now confirms we have had cutoff. He said the telemetry was somewhat intermittent at the cutoff, but he is able to confirm cutoff, that confirmation came at nine minutes, 40 seconds into the flight. Cutoff should have occurred at approximately nine minutes and 16 seconds. Ten minutes into the flight and Flight Dynamics says we look very close to nominal, and he'll have the information off the computer very shortly. Our plot here would indicate we are very, very close to a 161 nautical mile circular orbit which is precisely what we were asking for. While we are checking for that information, let's now switch to the Cape and find out what's going on at Pad 19.

KING

.....continuing during this good performance of this Atlas Agena in powered flight, we are now at T-84 minutes and 15 seconds and counting. The astronauts have been busy at Launch Complex

KING

19 in the spacecraft, surrounded by the white room at Launch Complex 19. Neil Armstrong came back with some remarks of "very good, very good," as he received the highlights of the Atlas Agena performance. When he did hear that the Agena had ignited and was performing well he came through with a very strong and very happy "very good" remark. We have completed purging the Gemini 8 spacecraft with oxygen, the spacecraft will be purged completely with oxygen and the astronauts now have been advised that they can open their visors. They have complete 100% oxygen in the spacecraft at the present time. Coming up in just several minutes will be a lengthy series of switch-list checks performed by both the Command Pilot Neil Armstrong and the Pilot David Scott. They will check every individual switch in the spacecraft, in front of each of their consoles, and insure that its in the correct position, and verify this to the spacecraft test conductor who is located in the blockhouse at 19. Our countdown is continuing to go well; all systems looking good, both with the Gemini launch vehicle and the spacecraft. Shortly we also will be making preparations to get the technicians back to the elevator and down from the White Room to clear the area. We will be ready to lower the erector at about T-60 minute mark in the count. All going well here at Pad 19 at T-82 minutes and 32 seconds and counting. We now return you to the Mission Control Center in Houston.

HANEY

And this is Gemini Control, Houston. During the last few minutes we have checked the computers, Flight Dynamics advises the Agena is in orbit. It's orbit is as follows: 162 nautical miles by 156 nautical miles, I repeat, 162 apogee, 156 miles perigee. This is as close to...as close as we could hope for with an unmanned vehicle. It's cause for a lot of smiles here in the Control Center and one of the Controllers is passing around cigars which are labeled "It's an Orbit". This is Gemini Control, Houston.

END OF TAPE

This is Gemini launch control coming up on T-74 minutes and counting, mark T-74 minutes and counting on Gemini 8 mission. The astronauts in the spacecraft, Neil Armstrong and David Scott are going through their complete switch check list, that is checking all the switches on their consoles to insure their being in the proper position. They are working this switch list check with the Spacecraft Test Conductor in the block house. During the power phase of the Atlas/Agena launch both astronauts are kept abreast of the flight performance all the way through. The spacecraft Conductor did then advise astronaut Armstrong, had the following quote. He told Neil "It looks like we have a live one up there for you." Armstrong's reply was "good show". Our countdown continues, all systems looking good. They^{are} in the process now of making final clearance from the white room, that the particular height that surrounds the Gemini spacecraft. The technicians are busy at work in the white room at this point clearing out their various final checking material that was used in the final phases leading up to hatch closure. The technicians are expected to leave shortly, we will be aiming to lowering the erector at about the 55 minute mark in the count. We will have a hold in this countdown at the T-3 minute mark. Later in the count the mission control center in Houston, Flight Director John Hodge, will advise the Test Conductor at launch complex 19 of the length of the hold. He will do this by announcing to the Test Conductor the time we want to launch the Gemini launch vehicle. It will be about 101 minutes from the Atlas/Agena liftoff which occurred just about on the hour. We are now at T-72 minutes and 7 seconds with all going well and we will switch you now to Mission Control Center in Houston.

And this Gemini control, Houston, we are 23 minutes into the flight of this Agena and the Agena has been acquired by the Canary Station. The report from Canary was all systems working precisely as asked, very satisfied with the operation of the Agena, reported good stability on the orbit and all and all a very happy report from the Canary Station. Meanwhile, an additional analysis has been done on the trajectory data and our orbit is even better than earlier reported. We now show an orbit of 162 nautical miles by 1159 nautical miles. This is just about as close to circular as we can hope for. At 23 minutes and 50 seconds into the flight, this is Gemini control, Houston.

END OF TAPE

This is Gemini Launch Control. We are now at T-64 minutes and 3 seconds in counting. on the Gemini 8 mission. All going well during the final phase of the count of the Gemini 8 spacecraft. A short while ago the pilots, Neal Armstrong and David Scott were informed about what appears to be an excellent Agena orbit. They were given the numbers and Astronaut Armstrong remarked, "Beautiful, We will take that one." This was followed up by a remark from David Scott where he added, "Roger, that's just what the Doctor ordered." They were both very enthusiastic in their remarks. Now T-63 minutes and 25 seconds in counting at launch complex 19 we have cleared the white room of the technicians who made the final checks on the spacecraft have departed and gone down the elevator. We are going through some preparations leading up to the erector lowering which is scheduled for the 55 mark in the count. Also, coming up within a few minutes will be the opening of the pre-valves in the first stage oxidizer system. The reason we open this one pre-valve early is to permit some oxidizer to bleed down into a stand pipe. That is the so called "pogo stand pipe" that permits us to alleviate some possible pressure pulses that could occur in the propellants in the first stage. This prevents some possible isolations that could occur in flight. The so called pogo test will take place between the 60 and 55 minute mark in the count. We bleed some oxidizer into this stand pipe in order to give it a cushion as far as the propellant isolation is concerned. All looking well, now T-62 minutes and 15 seconds in counting. This is Gemini Launch Control.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 9:40 a.m.

TAPE 24 PAGE 1

This is Gemini launch control now coming up on T-54 minutes and counting - T-54 all going well at launch complex 19 during these final phases of the Gemini checkout. The Agena spacecraft is now coming into the Indian Ocean, and in the Gemini 8 spacecraft to top the pad at launch complex 19 all is going well with astronauts Neil Armstrong and David Scott. We are going through some final preparations now leading up to the erector lowering. This is the service structure that surrounds the launch vehicle and spacecraft. We had a report moments ago from the block house that they expect to start this erector lowering in a matter of minutes. When the erector is lowered, we use a wench system to do it, that is a cable that is attached to the erector itself, and a 150 horsepower motor is used to ease the erector first away from the launch vehicle and spacecraft, and then it gently lowers it down to its horizontal position. We will then, of course, continue on with the countdown. We are now at T-52 minutes and 56 seconds with all going well. This is Gemini launch control.

END OF TAPE

This is Gemini Launch Control now at T-51 minutes and 35 seconds and counting. The erector at Launch Complex 19 is now coming down. The spacecraft is free. It will be about a 10 minute operation to bring the erector down to its horizontal position. We have reports from the spacecraft and from the blockhouse that all is going well at the present time. We now switchh you to the Mission Control Center in Houston.

This is Gemini Control Houston. Another refinement of the data based on Canary data now shows an exact circular orbit of 161 nautical miles on the Agena, which is precisely what we were aiming for this morning. The Agena right now is east of the Tananarieve station and Tananarieve should be reading out its TM which was reading quite well when it passed over the Canary station. Our tentative planning here shows that we want to launch the Gemini at precisely 41 minutes after the hour. Forty one minutes 00 seconds. And it appears that we will be aiming for a launch azimuth of 99.9 degrees. This is Gemini Control Houston.

END OF TAPE

This is Gemini Launch Control. Now at T-44 minutes and 5 seconds and counting. All going well at Launch Complex 19. And at the Mission Control Center in Houston. The erector is now down and we are proceeding with our countdown. Coming up shortly will be a series of reports by Astronaut Scott on the status of the spacecraft. It will include reports on the Environmental Control System, Pressurization, and orbit attitude and the status of the propellants in the/maneuvering system. That's the propellant system for the spacecraft. We have just completed some important tests between the blockhouse and the spacecraft. This is a capability of the launch vehicle test conductor to recommend an abort early during the flight. Of course, the astronauts themselves would conduct an abort during these early phase of the flight. The launch vehicle test conductor does have a capability of recommending, however, and the system was just checked here a few moments ago. Now in the Mission Control Center here at Cape Kennedy both backup pilots have arrived and they are monitoring the countdown from the location at this time. That is Astronauts Pete Conrad and Richard Gordon. They have joined Deke Slayton, who is assistant Director of the Manned Spacecraft Center, for flight crew operations at the Astronauts monitoring controls here in the Control Center. All looking good at the present time, T-42 seconds 55 seconds in counting. This is Gemini Launch Control.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 10:01 a.m.

TAPE 27 PAGE 1

This is Gemini launch control now T-34 minutes and 3 seconds and counting on the Gemini 8 mission with all systems looking good. AT this point in the count-down we are going through a so called program sequence test at launch complex 19. Involved is that busy Mark 3 radio command guidance system which first supported the Atlas/Agena launch and now late, actually, probably 20 or 30 minutes ago returned its work to launch complex 19 to complete the final guidance checks there. During this particular sequence test we check out the flight control system of the launch vehicle which is the primary system and also the secondary program sequence of the flight control which are concerned with the spacecraft computer. The astronauts will be monitoring this test and reporting on its results as far as the spacecraft is concerned. The crew is busy in the block house checking its data on how its going with the launch vehicle itself. Also going on in the spacecraft are some voice communications checks over UHF and very high frequency channels between the astronauts and the block house. All systems looking good now at T-32 minutes and 50 seconds and counting. We will have a hold at the T-3 minute mark in order to coordinate liftoff of the Gemini 8 with the passing Agena. We will insert some 1050 miles, -thats 1050 nautical miles, behind the Agena with the Gemini 8 spacecraft if all goes well. The hold is expected to last about 5 minutes and 47 seconds. However, the Flight Director will give direct confirmation on this later in the count when he advises launch complex 19 of the exact launch time. He will actually confirm it at the 18 minute mark in the countdown. This is Gemini launch control.

END OF TAPE

This is Gemini Launch Control. Now at T-29 minutes. Mark T-29 minutes and counting. All systems still going well at launch complex 19. We are still in the midst of our flight controlled test between the block house, the Mark III radio command guidance system, and the Gemini launch vehicle and spacecraft. It appears to be going well at the present time as all systems look well at this phase of the count. Now I will switch you to the Mission Control Center in Houston.

This is Gemini Control in Houston. We are 1 hour and 6 minutes into the flight of the Agena. All continues to work quite satisfactory. The Agena is now East of the Australian continent. As it came into the approximate 1,000 mile/zone of the acquisition narvon station. The station seemed to have a little trouble logging up on the C-band and the S-band radars which gave us a mild start. Apparently a ground problem that has been cleared up and they acquired a very valid and solid signal from both beacons. They continued to track the Agena through and were quite happy with the performance of the Agena system. Meanwhile, a message has gone out to all stations on the range describing in some detail the communications problem which has been followed very carefully since early in the day. Again, to touch on it this seems to be a situation where the pilot on their intercom, when they are in the intercom position, are actually transmitting. The situation where we are getting to much communication. They all note some degradation in the signal strength. It is entirely possible that this situation will clear itself up. Once in orbit we have experienced it before. Very rough communications in the first orbit as we did in the Gemini 6 flight, but by the second orbit they were well cleared up and continued 24 hours. At 1 hour and 8 minutes in the flight of the Agena, this is Gemini Control in Houston.

END OF TAPE.

This is Gemini Launch Control. Now T-24 minutes and 3 seconds and counting. All systems still looking good at the pad. We are coming on the so-called OAMS static test here in the next several minutes. This is a test of the thrusters in the adapter section of the Gemini spacecraft. These thrusters are part of the orbit attitude and maneuvering system which gives us our propulsion when we are in orbit. There are a total of 16 engines or 16 thrusters in the so-called OAMS system. Eight of these engines have a thrust of 25 pounds, two of them have 85 pounds of thrust and 6 of the engines have 100 pounds of thrust. During this test of thrusters coming up here shortly, we will test the 25 pound thrust engines that ring the base of the adapter section to the spacecraft. We will test them to check the yaw, the pitch, primarily and to insure that they are all working satisfactorily. This also permits us to condition the propellant system in the spacecraft. We will get some puffs from the thrusters coming up shortly. All systems looking good. T-22 minutes and 51 seconds and counting. This is Gemini Launch Control.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 10:16 a.m.

TAPE 30 PAGE 1

This is Gemini launch control coming up on T-19 minutes and counting. Our static test of the thruster system for the propulsion for the Gemini 8 spacecraft is going on at the present time and the tests are going well. This is being monitored, both by the astronauts in the spacecraft and the block house at pad 19. The astronauts are confirming what the block house data shows, that the thrusters are performing very well. We appear to have just about completed a very excellent test on the spacecraft propulsion system. We will be leading into some final tests of the Gemini 8 launch vehicle. Coming up in just about 25 seconds from this time will be the Flight Director, John Hodge in Houston, advising the crew at launch complex 19 the exact time that we want to launch the Gemini spacecraft. This will be coming up shortly and we will pass it on to you at the time. Now coming up on T-18 minutes and counting this is Gemini launch control.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 10:19 a.m.

Tape 31, Page 1

This is Gemini launch control at the Cape coming up T-16 minutes and counting. All going well. Moments ago the Flight Director advised the Cape that we want to have a launch at 40 minutes 59 seconds past the hour. Let me reiterate we want T-0 or ignition at that time. Ignition of the Gemini launch vehicle at 40 minutes and 59 seconds past the hour. The nominal close of a brief window hereafter would come at 45 minutes and 8 seconds after the hour. To repeat, ignition of the ^{Gemini} launch vehicle at 40 minutes and 59 seconds after the hour. Nominal close of our window: 45 minutes and 8 seconds after the hour. We will be launching on a azimuth of 99.9 degrees. The pad at the present time, the cooling the block house are going through a series of range safety tests with the Air Force Test Range. All going well now at T-15 minutes and counting. This is Gemini Launch Control.

END OF Tape

MISSION COMMENTARY, 3/16/66, 10:26 a.m.

Tape 32, Page 1

This is Gemini Launch Control. We're now at T-9 minutes and 3 seconds and counting, with all going well at Launch Complex 19. The Agena spacecraft which has been inserted into a successful orbit is now crossing the Pacific approaching California, about mid-way between Hawaii and California at this time. In the meantime, we are going through the final phases of the countdown at Launch Complex 19. We will go into a planned built-in hold at T-3 minute mark in the countdown. We will resume this hold in time to make an ignition of the Gemini launch vehicle at 40 minutes and 59 seconds after the hour. The hold time will be some 5 minutes and 45 seconds. When we pick up at the T-3 minute mark, aiming for the 40 minute and 59 seconds ignition after the hour, the radio command guidance will put the final flight parameters into the vehicle for the flight, this will be for the flight azimuth. It will put in the proper roll program at that time. We are now at T-8 minutes and counting. This is Gemini Launch Control.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 10:31 a.m.

TAPE 33 PAGE 1

This is Gemini launch Control coming up on T-4 minutes and counting with all systems looking good at launch complex 19. Our checkout is proceeding very well, and what has been a very excellent countdown has been one of most complicated count-downs that has been conducted at Cape Kennedy in view of the fact that some 9 different activities were brought in simultaneously during the dual operation of launching the Atlas/Agena at the 95 minute mark and coming up on the Gemini 8 liftoff. We will go into a hold some 30 seconds from this time at the T-3 minute mark. This hold is expected to last 5 minutes and 54 seconds. We will then resume our countdown at T-3 minutes leading to an ignition of the Gemini launch vehicle at 40 minutes and 59 seconds after the hour. This is the exact time we want in order to coincide our insertion into orbit of the Gemini 8 with the Agena which will be swinging around shortly on its first orbit of the earth. We are now at T-3 minutes and holding. T-3 minutes and holding. This hold is expected to last 5 minutes and 54 seconds. This is Gemini launch control.

END OF TAPE

This is Gemini Launch Control. We are still at T-3 minutes, we have just resumed the count. T-3 minutes and counting on the Gemini 8 mission. We have completed our planned hold and are now proceeding down to the final minutes leading up to an ignition of a Gemini launch vehicle at 40 minutes and 59 seconds past the hour. The Mark 3 radio command guidance system now has fed the final flight parameters into the launch vehicle and spacecraft. It will be launched on a azimuth of 99.9 degrees. Now two minutes and 30 seconds and counting. During this phase of the countdown and over the final five minutes just about all sequences monitored in the blockhouse worked automatically as far as the launch vehicle is concerned; we are an automatic sequence and we are checking the various events as the click off during these final phases. Now at T-2 minutes and eight seconds and counting. This is Gemini Launch Control.

This is Gemini Launch Control, now at T-1 minute, 47 seconds and counting. We do have a clearance for a launch. The stage one fuel pre-valves have been opened, this permits the fuel to feed down just above the thrust chamber of the launch vehicle. Now coming up on T-90 seconds, mark T-90 seconds and counting. All systems looking good during this

final phase of the count. We will get ignition of the Gemini Launch Vehicle at 0 in this final phase of the countdown. Zero ignition, the two engines will build up some 430 thousand pounds of thrust just prior to liftoff. Once the vehicle builds up 77% of this thrust we get a go for liftoff. This will occur some four seconds after ignition. Now T-1 minute and counting as we go through out final checks. T-50 seconds and counting, if all goes well the Gemini 8 will be inserted into orbit some 1,015 nautical miles behind the Agena. T-40 seconds and counting, T-40. In the blockhouse the crew is reporting as they monitor the various activities over the final phase. Now T-30 seconds and counting. T-20 seconds and counting. Fifteen, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0, we have ignition...

HANEY IN HOUSTON

And we have a liftoff at three seconds, three seconds. Neil Armstrong reports the clock has started. Roll program is in, Armstrong says. Twenty seconds into the flight, and Armstrong says the pitch program is in, 30 seconds into the flight. All clocks are in sync on the ground and in the spacecraft. Forty-five seconds into the flight. Flight Dynamics says he looks good at the mark 50 second mark. And Dave Scott gives us his first report, the cabin pressure at 5.7. Everything looks good, the distance now from the Cape about four miles, altitude 24 miles. One

HANEY

minute and 30 seconds into the flight. The Flight Director has just been advised that thrust looks good. Mark one minute plus 40 seconds and the crew has advised that they look good. That digital command system update has been received in the spacecraft and Scott has depressed a little button on the right side which indicates to the ground that it was received. Flight Dynamics says we are go for staging, we are two minutes, 10 seconds into the flight. The Ground gives Gemini 8 a go for staging. Two minutes and 32 seconds into the flight, the spacecraft now about 52 miles downrange and Armstrong says we have staging and second stage has ignited. Armstrong said they noted the staging and saw a little fireball behind them. Guidance looks good, we are now at 50 miles altitude. We are about 100 miles downrange. The Surgeon reports he's well satisfied with the values he's reading on both crewmen. Flight Dynamics says we are right down the middle, all the data agrees. The plots are on exact overlay of the planned values. Three minutes and 50 seconds into the flight, and communications have been reasonably good, as sharp or sharper than we can recall on any past launch. Four minutes into the flight. Flight Director has advised his controllers to stand by for a status checks. He's checking each one of them now. He's gotten a go from all positions here in the Control

Center, Jim Lovell, our Cap Com, has just advised Armstrong that he is go from the ground. Downrange distance now about 280 miles, altitude 80 miles, and again Flight says we are right down the middle on our traces here. Five minutes into the flight. Mark .8 have achieved 80% of the velocity desired. We are now 85 miles high and Lovell assures Armstrong again that he looks very good here on the ground. We have second stage cutoff, approximately 5 minutes, 40 seconds. Five minutes 50 seconds, in about 10 seconds the crew should initiate their thrusters, Flight Dynamics confirms again he is go and Lovell is passing this up to the crew. Six minutes, 5 seconds into the flight, and Armstrong advises they have completed their burn, they are free of the second stage. Six minutes, 40 seconds into the flight and as yet we've heard no numbers on the orbit, but we believe it will be very close to the planned value

END OF TAPE

As yet we have heard no numbers on the orbit, but we believe it will be very close to the planned value. The Guidance Officer advises there was zero out-of-plane burn..absolutely no out-of-plane deviation. Flight Dynamics advises they should have some numbers for us on the orbit shortly but he advises the Flight Director that it looks nominal, which would make it a 146. We will stand by and get further confirmation on that. This is Gemini Control, Houston. 8 minutes^{30 seconds} and the spacecraft is now out of the Bermuda acquisition zone. We may have further contact by Antigua. The Flight Dynamics Officer advises based on the early data, the low speed data which will be refined our initial orbit is 85 by 155. This will be rerun and ^{analyzed} and further data will be cranked into it and I am sure there will be refinements. But at 9 minutes in the flight, it appears to have an acceptable orbit for the Gemini 8 spacecraft. Meanwhile we have racked up the conversation through the lift-off phase. The conversation begins at T-1 minute and while we are refining the data on the orbit we will play that tape right now.

HOU ...M-1 cc coming up on 130 launch vehicles transferred to internal power.

S/C Roger

HOU Standby to (garbled)

HOUS Stage II prevalves coming open. 5 seconds.

T-20 seconds mark. 10 9 8 7 6 5 4 3 2 1
IGNITION, LIFT-OFF

S/C Roger

HOU Roger...Gemini

S/C garbled

HOU Roger, Roll

HOU Good liftoff 8.

S/C roll ones' in, we have a pitch program

HOU Roger, Pitch program

Mark. 50 seconds. You are looking good 8.

S/C garbled, cabin pressure is 5.70

HOU ...at the cabin

Mark 1 + 40. You're looking good, 8.

S/C Thank you, DCS is in.

HOU Roger, DCS.

S/C Stage 2 tanks look good.

HOU Gemini 8 you are go from the ground for staging.

S/C DCS is in.

HOU Roger, DCS

S/C Roger, we have staging..ignition

HOU Roger, staging.

S/C ...we saw the falling fireball here.

HOU I understand you have guidance.

S/C Rog, we have guidance

Zero pitch, and 1 degree yaw right coming in

HOU Roger, your guidance looks good on the ground

S/C pitch...yaw about a quarter of a degree

HOU Roger, your plots are looking very nominal here on

the ground, 8.

S/C The second stage was real good, mission.

HOU Gemini 8, you are go from the ground.

S/C Roger, it's looking good up here.

HOU Mark point 8, Gemini 8.

| | |
|------|---|
| S/C | We are going to. .. (garbled) |
| | are |
| HOUS | You/looking very good here on the ground. |
| S/C | garbled |
| HOU | Roger |
| S/C | garbled |

MISSION COMMENTARY, 3/16/66, 11:03 a.m.

TAPE 36 PAGE 1

This is Gemini control, Houston, they are 21 minutes 52 seconds into the flight. Jim Lovell, Aircraft Com. has just been in touch with the Gemini 8 spacecraft via the Ascension station. We have a refinement on that initial orbit which we gave, we are presently show based on Antigua data, an orbit of 87 by 147 miles, and this, of course, is very comforting. We were trying for an orbit of 87 by 146. We would expect perhaps further refinements on this when we reach the Carnarvon station and I believe we will except as reasonably final the Carnarvon data. But right now our orbit for the Gemini 8 spacecraft is showing 87 by 147 nautical miles. In their conversation via ~~ascension~~ Armstrong came back with a "all systems O.K." report from the Gemini 8 spacecraft. Apparently the temperature in the frog egg experiment, we can't tell which one, the frog eggs are inside of both hatches. In one of the compartments, perhaps both, ^{are} ~~they~~ noting a slightly elevated temperature and, therefore, plan to activate the frog egg experiments somewhat earlier than planned in the flight plan. At present they plan an activation of 40 minutes into the flight. Meanwhile we have some data from the Agena orbit, and just a few of them to show you how close to the nominal the Agena achieved in its successful flight this morning. We showed an altitude at orbital insertion, actual altitude of 161.3 miles versus a planned altitude of 161 nautical miles. At cutoff our feet per second actual on the Agena was 25,365.9 versus a planned cutoff of 25,369 feet per second. That's 3.1 feet per second off the planned mark. For the Agena we are presently showing a 160.6 actual, nautical miles versus the planned of 161. We have the very ^{tape} brief/conversation recorded from the Ascension tracking station. We are prepared to play it for you now.

HOU Gemini 8, Gemini 8, Houston Cap Com, over.

S/C This is Gemini 8.

HOU Roger, your orbit has been changed to 87147.

Your go for a nominal M equals 4, there will be a slight/^{plane}change. We'll give you that information later and we understand the frog egg temperature is a little hotter than normal and we want to remind you to activate the right unit number one handle at time 4.0.

S/C Time 4.0, also systems look okay in the spacecraft.

HOU Roger. All systems okay and standing by for UHF No. 2 check.

S/C Okey. Houston, This is Gemini 8 on UHF No. 2, how do you read me?

HOU Roger, Gemini 8, this is Houston/^{reading}you slightly, garbled, but allowed, how are we?

S/C Can you read me if I speak slower.....

HOU This is Houston, Roger

S/C We are going back No. 1.

HOU You are going No. 1.

END OF TAPE

This is Gemini Control, Houston. Over Carnarvon, some 45 minutes ago, the Gemini 8 space craft was given a go for 16-1, a flight of at least 24 hours. The ground station read out all the values, checked through the systems, did a lot of work with Dave Scott calling out values from the spacecraft. Both parties, the spacecraft and the ground, very satisfied with what they read. The doctors endorsed the -- both pilots, said they were in excellent shape as they went of the Carnarvon area. Their first manuever, which will be a slight heighth adjustment is to come at one hour and 34 minutes and 37 seconds into the flight. It will be a negative delta V or adjustment downward of the heighth. Of some three feet...a delta V of three feet. Carnarvon data also confirmed the Antigug data and we are presently calling our Gemini 8 orbit a 147 by 87 mile -- nautical mile -- orbit. We have now the tape conversation from Carnarvon and will play it.

Houston Capcom

Gemini 8, Gemini 8, Houston Capcom.

S/C

Hello, Houston Capcom, now we are reading you well.

Capcom

Roger, this is my first call. Don't forget your radiator flow at zero 35.

S/C

Okay. Radiator flow.

Capcom

Roger, and around zero zero four zero, the sea reentry command, C-adapter continuous and the S-3 experiment.

S/C

I didn't quite get that one. Say again, please.

Capcom

Roger, at four zero, C-Reentry command, C-adaptor continuous and the frog egg experiment.

S/C

Roger, we got that.

Capcom

Roger and we are just standing by.

HOUSTON FLIGHT

Carnarvon, Houston Flight.

Carnarvon

Houston Flight, Carnarvon capcom.

Hou Flight

Roger, do you have any questions.

Carnarvon

Negative. We see the unbalance in the fuel celss. Everything

Carnarvon The Agena looks real good.

Hou Flight Roger.

Carnarvon Have valid S-band track Agena Carnarvon.

Hou Flight Roger. How's that S-band temperature there Carnarvon?

Carnarvon Say again flight.

Hou Flight How's that S-band temperature?

Carnarvon Stand by one. Hotel 063, S-band temperature is 137 degrees.

Hou Flight 137, that's very good. It's going down a bit.

Carnarvon Correction on that parameter number -- it's hotel
049.

Hou Flight 049, roger.

Carnarvon Flight, Carnarvon. We've lost one FRW 2 high power
command transmitter. We still have one good.

Hou Flight Roger. Carnarvon, Houston Flight.

Carnarvon Flight, Carnarvon, Cap Com.

Hou Flight We haven't got your Charlie on Agena yet.

Carnarvon We transmitted that. Will transmit again.

Hou Flight Roger.

Carnarvon Carnarvon has Gemini telemetry solid.

Hou Flight Roger.

Carnarvon Dropping out.

Carnarvon Gemini 8, Carnarvon Cap Com.

S/C Hi there, Carnarvon, go ahead.

Carnarvon How are yall doing?

S/C Must fine.

Carnarvon are
 Okay, we/showing you real good here on the ground, we're
 giving you a go on your radiator. Put your evaporator
 to normal.

S/C Evaporator is normal.

Carnarvon Okay. Now about your quantity read switch to ACSO 2
 position and leave it there until I tell you to move
 it.

S/C Roger.....

Carnarvon Okay, I'm showing you on prelaunch are you doing some
 computations or can you go on to catch up?

S/C Ready, I'll check it first.

Carnarvon Okay, let's go to catch up. Okay, got you in catch up.
 Now your battery and your fuel cell. Go ahead.

S/C 1A - 950.0, 2A - 4.8, 2B - 5.2, main buss is 24.5.

Carnarvon Okay, I copy that.

Hou Flight We got that Carnarvon.

Carnarvon I am going to give a go for 16.1.

Hou flight Very good, go ahead.

Carnarvon Okay, you're go for 16-1. How about that?
 We're going to need your computer run again now. How
 about setting up 52 minutes and counting up I'll give
 you a time hack at that time.

S/C Okay.

Carnarvon I can't read you, Flight.

Hou Flt Stand by.

Carnarvon We're getting a Gemini dropout.

Hou Flt Roger. Will you check activation of Experiment S-3 at 4 0 minutes.

Carnarvon Ok. Did you start S-3 at 4 0 minutes?

S/C It was 4 0

Carnarvon 4 0 what?

S/C 4 0 and ten seconds

Carnarvon Ok.

Hou Flt Carnarvon, did you get that quadriplex signal strength.

Carnarvon Roger. Quadriplexer is -65.

Hou Flt Roger.

Carnarvon We are getting very poor Gemini telemetry, Flight, we are dropped out at the present time.

Hou Flt Roger

Carnarvon C-Band track at Gemini Carnarvon, have telemetry back in.

Hou Flt Roger

Carnarvon Ok, we've cut our computer summaries you can go to Prelaunch anytime you want.

S/C Couple of pulses in yaw.

Carnarvon OK. Your Agena looks real fine

Hou Flt Roger.

Carnarvon Say again.

S/C You couldn't have done anymore for us than you have. You've got everything going.

Carnarvon That's what we are here for, isn't it?

Hou Flt Carnarvon, Flight.

Carnarvon Flight, Carnarvon

Hou Flt You might check and see if they have an antenna selector
adapter.

Carnarvon LOS on the Agena, say again Flight.

Hou Flt You might check to see that they've got antenna select
to adapter.

Carnarvon Roger. Flight our radar confirms the adapter beacon.

Hou Flt Roger.

Carnarvon Now what did you say about storms?

S/C I said there were storms just ahead of us... we can
see them on

END OF TAPE

S/C There is some clouds just ahead of the chamber - - -

HOU Well, we could use some rain.

S/C -----

HOU About like the last time you were here. Let me know when you going over to the prelaunch. How did you - - -

S/C Garble - - O.K. we have the address if you're ready to copy it down.

HOU .Go ahead -

S/C 80 was - - - at 004, 81 was 00001, 82 was -000--

HOU Ok, I got it allright. Got your prelaunch now. Ok - - - - I don't have anything for you, I'll stand by now and let you count.

Carnarvon in flight.

CARNAVON Inflight Carnarybn

H I didn't get those ratings. Would you read them out to me please. They were pretty low.

CAR OK. 80 -0004, 81-0001,

HOU I though that was four zeros.

CAR I'll check it if you want. Let me have your Cor 81 again .

HOU Cor 81 was 00001.

HOU Ok, I was right, Thank you.

CAR Cor 81 -00001, We have - garble - - 82 is 0004.

HOUSTON Roger

CAR Everything looked fine. The Agena looked good going over the hill. ^{are} They/ in good shape and everything is Go.

HOUSTON Roger - Thank you Carnarvon.

CAR You got an extra amount of summaries also.

HC This is Gemini control, Houston, We'd like to review some of the maneuvers

coming up. These values may change, but probably only slightly. Presently the spacecraft is over Hawaii. They are in conversation now, but first we will cover this maneuver information. At 1 hour 34 minutes and 37 seconds into the flight they are to perform a slight height change. This will come south of New Orleans several hundred miles out over the Gulf, on this pass on and below the U.S. The Delta V is now to be a -2.9 or retrograde maneuver. This will leave the spacecraft with an estimated 722 pounds of usable fuel onboard. At 2 hours and 18 minutes and 25 seconds into the flight the spacecraft is to perform a phasing maneuver which will require a delta V or a delta velocity of 51.2 feet per second. At 2 hours and 45 minutes 31 seconds into the flight the spacecraft will perform a lane change or maneuver calculated to get rid of a very slight wedge angle in the two orbits. This angle is presently estimated at .05 degrees. The spacecraft will be oriented with the blunt end north and will burn toward the south. It will burn 25.7 feet per second and this will leave the spacecraft with some 643 pounds of fuel remaining. We will be along 3 hours and 47 minutes and 36 seconds into the flight, the spacecraft will perform its coelliptic burn, or circularization burn. This is one of the larger burns 59.2 feet per second and it will leave the spacecraft with 583 pounds. At 5 hours and 4 minutes into the flight the spacecraft will initiate its terminal phase maneuver and at 5 hours and 36 minutes into the flight they will perform a maneuver which will require a 43.6 feet per second. This will be the terminal phase final. Now, as we have been talking, we have been hearing in our other ear that Wallie Schirra and Frank Borman who are returning from their far eastern tour, we believe their in Hawaii and we understand they

MISSION COMMENTARY, 3/16/66, 11:58 a.m.

TAPE 38 PAGE 3

are trying to contact the spacecraft. They haven't put out a call for several minutes but Neil Armstrong and Dave Scott are aware that their being paged and the Schirra advised that their call sign is Gemini 76. At 1 hour and 20 minutes into the flight this is Gemini control, Houston.

END OF TAPE

This is Gemini Control, Houston. We've just been handed the final computer runouts on the initial orbit for the Gemini 8 spacecraft. It goes like this - these are conditions/^{at}second stage cutoff plus 20 seconds. In other words, that time when the spacecraft would have parted from the second stage. The insertion velocity at SECO plus 20 seconds was - the actual was 25,737 feet per second. This against a planned value of 25,730 feet per second. The perigee presently shows 86.2 actual, 86.2 nautical miles, as against the planned value of 86.8 nautical miles. The apogee, actual, 146.2 versus a planned apogee of 146.0. We have conversation between the ground and the spacecraft from Hawaii and here it is.

HAWAII Hawaii, have the Agena T/M solid.

HOUSTON Roger, Hawaii.

HAWAII Hawaii. Is the Agena go?

HOUSTON Roger, Hawaii.

FLIGHT Hawaii, Houston Flight.

HAWAII Hawaii. Go ahead.

FLIGHT Can we have a contingency "A", Agena, please?

HAWAII Roger. Copy contingency "A".

FLIGHT How do things look?

HAWAII Agena looks very good.

FLIGHT Go. Ok. Does that - - Hawaii, Houston Flight.

HAWAII Hawaii. Go ahead.

FLIGHT Can we have that S-band temperature, please?

Hotel, 49.

HAWAII Roger. HO 49 is 142 degrees.

FLIGHT Roger.

HAWAII Hawaii. This is Gemini T/M.

FLIGHT Roger, Hawaii. Go. Hawaii, this is Flight. We would like an Agena LOS main.

HAWAII Roger. Agena LOS main and be advised that Wally Schirra, Gemini 76, is attempting to contact Gemini 8. Over. He's inbound in an aircraft to Honolulu.

FLIGHT Ok. How about that?

SCHIRRA Hello, Gemini 8. Gemini 76, over.

HAWAII Gemini 8, Hawaii Cap Com.

SCHIRRA Gemini 8, this is Gemini 76 en route Honolulu. Do you read?

HAWAII Gemini 8, Hawaii. We have a maneuver load for you. Are you ready? Over.

S/C We're all set.

HAWAII Roger, transmitting maneuver load.

S/C Rog. Got DCS light and reset.

HAWAII Roger and are you ready to copy the update? Over.

S/C Stand by, Hawaii.

HAWAII Roger.

S/C Now we have you in sight down there. It looks like a nice day.

HAWAII Beautiful weather here.

S/C Ok. Go with the update, Hawaii.

HAWAII

Roger. GETV - 1 34 37. Delta V 2.9.
Burn time, 0 plus 05. Yaw, zero; pitch
zero. Address 25,9 00 29. Address 26,
all zeros. Address 27, all zeros. Thrusters
forward, maneuver retrograde. Did you
copy?

S/C

Roger, Hawaii. Got it. GET burn - 01 34 37.
Delta V, 2.9. Duration, 0 plus 05. Yaw,
zero; pitch zero. Address 25, 9 00 29,
address 26, all zeros, 27, all zeros.
Both confirmed. Thruster forward, man-
euver retro.

HAWAII

That's correct. And also be advised that
Wally Schirra's been attempting to contact
you. His call sign is Gemini 76. He's
inbound to Honolulu.

S/C

Oh. Very well. We're standing by.

SCHIRRA

Hiya, Dave. How do you read?

S/C

Is he trying to contact us on UHF or HF?

HAWAII

He was on UHF. I haven't heard him for a
couple of minutes.

S/C

Ok.

HAWAII

Hawaii here, has Agena LOS.

FLIGHT

Roger, Hawaii.

HAWAII

Gemini 8, Hawaii. We have nothing further
for you. Standing by.

MISSION COMMENTARY, 3/16/66, 12:04 p.m.

Tape 39, Page 4

S/C

Ok. All's doing well up here.

HAWAII

Roger.

END OF TAPE

This is Gemini Control, Houston. A little additional information on the inclination of these two vehicles - the Agena achieved a 28.86 degree orbit - that is the degree that it is running north and south of the equator. The planned value for the Agena was 28.87 degrees - off by .01 degrees. Meanwhile the Gemini 8 achieved a 28.91 degree inclination - the planned value there was 28.86. So on our one plane change maneuver we will burn off that .05 degree difference in order to make the two inclinations match. The Guaymas station acquired Gemini 8 only a minute or so ago. Let's tune in on that conversation live.

GUAYMAS Flight, Guaymas. We have both birds go. Gemini 8's still in mode one.

FLIGHT Roger.

GUAYMAS He's barely readable on my UHF here, Flight.

FLIGHT Ok.

FLIGHT Hawaii, Houston Flight.

HAWAII Hawaii, go ahead.

FLIGHT Did the crew confirm that they got that maneuver update ok?

HAWAII Rog. Affirmative.

FLIGHT Roger.

HAWAII He's got the catchup now, Flight.

FLIGHT Ok.

This is Gemini Control, Houston, here. In just four minutes the spacecraft will perform their first maneuver and as we've been talking the Texas station assumed control. Let's go back live.

FLIGHT

Guaymas, Flight. We have it now.

GUAYMAS

Roger.

HOUSTON

Gemini 8, this is Houston Cap Com.

We're standing by for your burn.

S/c

Roger. About three minutes to go.

This is Gemini Control, Houston.

We're about one minute away from the

burn. Mark one minute.

S/c

Going right over the coastline now and --

HOUSTON

Roger, Dave. Stand by for a 30-second
mark to burn.

S/c

Ok.

HOUSTON

Mark - 30 seconds to burn.

S/c

Ok.

S/c

. . burn.

HOUSTON

Roger. Burning, Flight.

FLIGHT

Roger.

S/c

Burn in, mark.

HOUSTON

Roger, we're standing by for your burn is
off.

HOUSTON

Gemini 8, will you place your T/M switch
to real time-delayed time?

S/c

Ok.

HOUSTON [

Gemini 8, this is Houston requesting tape
playback switch to continuous.

S/c

Stand by, Houston.

HOUSTON

Roger, will do.

HOUSTON

Gemini 8, this is Houston. You don't have to answer. We'd like to have your computer in prelaunch when you can.

S/C

. . . is almost a foot per second. Computer's in prelaunch and we're putting tape playback to continuous.

HOUSTON

Roger, thank you. Understood you were taking out the residuals. How did it go?

S/C

Yeah, we took out the residuals but they seem to be building up on us with time.

HOUSTON

Rog. That's part of your accelerometer bias.

S/C

Yeah, I think that's right. Are you going to update that bias?

HOUSTON

Whenever you're ready we're going to send you an accelerometer update.

S/C

Ok. I think we're probably - stand by a minute.

HOUSTON

Roger. We're standing by.

S/C

Ok, go ahead and send the new bias for us.

HOUSTON

Roger, coming up.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 12:20 p.m.

TAPE 41 PAGE 1

S/C We haven't got a light yet

HOU Standby, it's coming 8.

S/C Got a light, reset.

HOU Roger, the light.

S/C This is Gemini 8, we got your^{up}/date

HOU Gemini 8 this is Houston, the accelerator bias update was good.

S/C Roger, thank you.

S/C Roger, understand phase adjust at 02182649.3 1+07 yaw 0 pitch 0
250049/R³, 26 and 27 ~~are~~ all zeros, aft thrusters - -

HOU Roger, Dave, O.K. And, Gemini 8 would you - - - blank - - - Gemini
8 this is Houston, you will probably expect an update of that phase
adjust maneuver over Ascension, over.

S/C Okey, understand.

This is Gemini Control Houston. That will conclude the conversation
for this pass as the spacecraft moves we've had LOS from the Antigua station.
We expect further contact several minutes from now when they are in the zone
of the Ascension Island station. At one hour and 46 minutes into the flight
of Gemini 8, this is the Control Center in Houston.

END OF TAPE

This is Gemini Control Houston at 2 hours, 9 minutes into the flight of Gemini 8. The crew by now has probably completed their first meal in space. They were reported having their lunch at approximately an hour and 50 minutes into the flight. Meanwhile, the surgeons console here has passed on some information about heart rates at various points in the flight to date. During the launch phase, Neil Armstrong showed a high heart rate of 146 and the low during the powered phase of flight was 120. Neil's normal heart rate runs between 65 to 70. David Scott, meanwhile, reached a high during the launch phase of 128, his low was 91. And Scott normally runs about 55 beats per minute. During the burn -- during the first burn -- south of New Orleans Neil's heart reached a peak rate of 105. At loss of signal at Antigua, his heart rate was 80. Dave Scott, during that burn, showed a heart rate of 75 and at loss of signal at Antigua his heart rate was 60. We have some tape conversation from the Ascension station between Gemini 8 and Jim Lovell, here in Houston. We're ready to play that conversation for you now.

ASCENSION

Roger, I have an update to your phase adjustment maneuver if you're ready to copy.

S/C

.....

ASCENSION

Are you ready 8?

S/C

Be ready in a second.

ASCENSION

Roger, we're standing by.

S/C

Ready now.

ASCENSION

Roger, your GET burn 02 18 25. Delta V - 50.6.

Delta P - 1 + 08. Yaw - 0. Pitch - 0. Core - 25.00 5 06

ASCENSION Cores 26 and 27 - all zeros. Thrusters aft -
maneuver posigrade.

s/c All on Gemini 8 GET 02 18 25. Delta V - 50/6.
one + 08. 0 yaw. 0 pitch. 25 00 5 06. 26 and
27 all zeros. Aft thrusters posigrade.

ASCENSION Roger, that is correct. I hope you are enjoying
your eating.

s/c Fine, not bad at all.

ASCENSION Ascension LOS.

This is Gemini Control Houston as the spacecraft went over the Tananarive area the ground and the spacecraft simply tagged up, there was no additional discussion. We're about five minutes away from our next maneuver of phasing adjust, which is programmed for two hours, 18 minutes, 25 seconds into the flight. You heard Jim Lovell update Neil Armstrong on the precise values of wanting this burn. We can confirm that the earlier burn was done apparently, there was some accelerometer bias in some of the guidance components which left some residual numbers in their incremental velocity indicators and these had to be burned off but this was done in the -- we were satisfied ^{that} the initial maneuver was carried off successfully. This is Gemini Control Houston.

END OF TAPE

This is Gemini Control Houston, at two hours, 40 minutes into the flight of Gemini 8. Presently our charts show the spacecraft 375 nautical miles away from its Agena target vehicle and the mission progressing very nicely. The crew completed their second maneuver between Tananarive and Canarvon at the appointed time on this last pass across the Indian Ocean. We have a tape of the conversation confirming that maneuver with Carnarvon and we'll play it for you now.

S/C Hello, Carnarvon, Gemini 8.

CVN How are you doing?

S/C Ok. We've completed our burn on time, our residuals known, the fuel is PQR 3, 88%.

CVN Ok. Your OAMS stop was 80%?

S/C 88

CVN 88, ok, I copy that. Did you activate S3 at 2+10?

S/C Stand by.

CVN Say Again.

S/C No, we missed it. Ah, hang on here.

CVN They missed their S3 flight.

Hou Flt Roger, stand by. Go ahead with it now, Carnarvon.

CVN Say again, flight.

Hou Flt Go ahead with it now.

CVN Ok, go ahead and activate your S3 at this time.

S/C S3 complete at 225.

CVN Ok.

S/C Carnarvon, I have C-band track.

CVN Ok, I have a pre-change update, let me know when you are ready to copy.

S/C Stand by. Ok, go ahead.

CVN OK. GETB 024550, Delta V 26.2, burn time 0+35, yaw 90 right, pitch 0, corese 25 and 26 are zeros. Core 2790262, thrusters aft, maneuver south, over.

S/C Roger, we understand. GET burn 024550, Delta V 26.2, 0+35, yaw 90 right, pitch 0, 25 and 26 all zeros, 2790262, aft thrusters maneuver south.

CVN Very good, you're looking real fine; your Agena's looking real good, too.

S/C Thank you.

CVN Ok. You're looking real good, we'll hang on loose here and keep quiet.

S/C Rog, understand.

S/C Yeah, we'll see your tomorrow.

CVN Oh, very well. They just went over to prelaunch Flight.

Hou Flt Carnarvon, Houston, Flight.

CVN Flight, Carnarvon.

Hou Flt Can we have another Gemini main please?

CVN Roger. He's now at prelaunch and looks real good.

Hou Flt Roger. Carnarvon, flight.

CVN Flight Carnarvon.

Hou Flt How's his TR?

CVN TR is right where it was before, lacking about 3/8th of a second.

Hou Flt Very good.

CVN The signal strength on the quadriplexer and dioplexer seems to be dropping down, its not holding up right past the spacecraft now.

Hou Flt Ok.

CVN We have Agena LOS at Carnarvon.

Hou Flt Roger. Any problems?

CVN No, everything's real fine all the way with both vehicles.

Hou Flt OK.

CVN Carnarvon has Gemini telemetry LOS. Coming back in again. LOS all systems at Carnarvon.

HANEY This is Gemini Control Houston. That concludes the Carnarvon discussion. We had hoped the spacecraft would be within the Hawaii sphere of acquisition for this upcoming burn, which is to take place one minute from now, at two hours, 45 minutes and 47 seconds. A burn requiring 26.2 Delta V, 26.2 feet per second, at the conclusion of this burn the fuel remaining on board is estimated at 643 pounds which should be more than adequate for the terminal phase maneuvers which use so much fuel during a rendezvous mission. This is Gemini Control Houston.

END OF TAPE

This is Gemini Control, Houston, at 3 hours, 9 minutes into the flight of Gemini 8. The plane change burn was completed on time at 2 hours and 45 minutes into the flight. Just prior to Hawaii acquisition. The crew confirmed that over Hawaii. We've also completed another burn - a tweak burn - which came approximately 3 hours, 3 minutes into the flight, while they were over the west coast of Mexico, about 4 minutes ago. This had been an unplanned thing but it was to smooth out certain parameters here as the two vehicles close on each other. A very small burn, only two feet per second, quite similar to the one performed in their first rev as they crossed the Gulf of Mexico. The crew has been advised - as soon as they acquire the Agena, which should occur momentarily, radar acquisition - they have been instructed to send a command to the Agena which would have the effect of turning on the acquisition lights on the Agena. It's been determined here to go ahead and let the crew send this command. The command can also be sent from the ground, but the decision is to let the crew send this command. We have audio tape now from the Hawaii station and then we will bridge into the conversation as they cross Mexico and presently swing down over the island chain into South America. Here's the tape.

HAWAII

Gemini 8, Hawaii.

S/C

Go ahead, Hawaii.

HAWAII

Roger, we have you go and I have an Agena acquisition update when you're ready to copy.

S/C

Rog, go ahead. Then I'd like to have you take a look at our cabin pressure. We're presently reading 5.1.

HAWAII

Stand by. Roger, we have a ground reading of 5.25.

S/C

Ok. We'll keep an eye on it.

FLIGHT That's ok, Hawaii. That's a good number.

S/C Let's go ahead with the acquisition.

HAWAII Roger, GET/acquisition - 3 plus 07. GET
of
of 248, 3 plus 15. GET rendezvous, 3 plus
15. Azimuth zero degrees, elevation 7
degrees. GET sunrise at TPF, 05 37 00, plus
or minus one minute. Do you copy?

S/C Roger, understand. GET of acquisition is
03 07; GET of 248, 03 15; GET of rendezvous
03 15. Azimuth zero degrees, elevation
7 degrees, GET of sunrise, 05 37 00, plus
or minus one, for TPF. And do you have
the update for addresses 24, 53, and 54?

HAWAII Negative. Stand by.

S/C Ok.

HAWAII Flight, do you hear?

FLIGHT Roger.

FLIGHT Hawaii Cap Com, Flight.

HAWAII Go ahead.

FLIGHT Ok. 24, 53, and 54 are nominal.

HAWAII Understand - 23, 24, are all nominal.

FLIGHT 24, 53, and 54.

HAWAII Roger.

HAWAII Hawaii copied, 24, 53, and 54 are all nominal.

FLIGHT Ask him how the burn went there, Hawaii.

HAWAII Roger. Do you want me to update 24, 53, and 54 all nominal? Over.

FLIGHT That's right.

HAWAII Gemini 8, Hawaii.

S/C Go ahead.

HAWAII Addresses 24, 53, and 54 all nominal. And we'd like to know how your burn went.

S/C Ok. Understand all nominal on the addresses and the burn was on time and the residuals nulled.

HAWAII Roger, copy.

FLIGHT How are those Agena SPC's coming along, Hawaii?

HAWAII They all clocked out on time, Flight.

FLIGHT Hawaii, Houston Flight.

HAWAII Hawaii, go ahead.

FLIGHT Can we have a quantity read, there, please, on the propellant.

HAWAII Quantity read on OAMS propellant?

FLIGHT That's right.

HAWAII Gemini 8, Hawaii.

S/C Go ahead.

HAWAII Could we get a reading on your OAMS
propellant remaining, please.

S/C 85 percent.

HAWAII Copied 85, thank you.

FLIGHT Roger, I got that.

HAWAII Did you copy, Flight?

FLIGHT Yep.

HAWAII Flight, Hawaii has Agena LOS. All functions
clocked out on time, and it was go.

FLIGHT Roger.

HAWAII Hawaii has Gemini LOS.

FLIGHT Roger.

GUAYMAS Gemini, Guaymas Cap Com.

S/C This is Gemini here.

GUAYMAS Roger, Gemini. We have you go on the
ground.

HOUSTON Guaymas Cap Com.

GUAYMAS Go ahead.

HOUSTON Stand by. We're going to remote through Cal.

GUAYMAS, Say again, Gemini 8.

S/C Everything looks good here.

GAUYMAS Ok. We'd like for you to send your aq lights
on - spacecraft command 251.

FLIGHT Break, break. Guaymas, go remote air-to-
ground.

GUAYMAS Guaymas, remote.

HOUSTON Gemini 8, Houston Cap Com.

S/C Go ahead.

HOUSTON Roger, we want to give you another burn here very shortly - stand by to copy.

GET V, 03 03 41, Delta V, 2 feet, posigrade.

That'll be 000 - I'm now reading you 02 54.

S/C Ok, Houston. We didn't get that. All we got was the ~~GET~~^{burn.} ~~BURN.~~ Say again please.

HOUSTON Roger, the Delta V is two feet per second - 2 plus 0.

S/C Two feet per second.

HOUSTON Roger, and it's posigrade.

S/C . . . posigrade? Is that correct?

HOUSTON That's correct. 000.

S/C Ok.

HOUSTON Counting 25 seconds to burn. I'll count you down. 9, 8, 7, 6, 5, 4, 3, 2, 1, burn it.

S/C We got it.

HOUSTON Off burn. Gemini 8, this is Houston. Let me know what the results were, will you?

S/C Stand by.

S/C Hello, Texas. I think we got it in and got the residuals.

HOUSTON This is Houston. Say again, 8.

S/C Rog. The burn was on time and we got the residuals.

JUSTON Roger. Sorry for that hurried-up thing but we had some malfunctions here that we had to get you a burn in a hurry and so I just thought I'd count it down for you.

S/C Ok. Thank you.

HOUSTON Gemini 8, this is Houston. How is your platform alinement coming along?

S/C Stand by. Houston, we're not in alinement right now. Did you want us for some reason to aline?

HOUSTON Negative. Roger. We were curious how your alinement was going since we got an extra 2 feet per second which our tracking indicated had to be put in and came at a late time, that's all.

S/C Ok. We weren't alined prior to the burn because we didn't think we were going to have to have the burn and we believe we still have some bias errors in the accelerometers.

HOUSTON Roger. Understand and also be informed that the Agena is now configured TDA north and we were just curious how your alinement has been going. Does it look like you've been getting good alinement?

S/C That's correct. We have been getting good alinement.

END OF TAPE

HOUSTON

Roger 8 and if you'll switch your TM switch to real time and delay time for us.

S/C

Roger, real time/delay time.

Houston this 8, advise we don't have a lock on yet, so I guess we'll have to wait until we get a lock before we send 270.

HOUSTON

Rog, understand, you don't have a lock on yet and you are going to wait before you send 270.

S/C

Actually, it's 251 we're going to send.

Houston, Gemini 8.

HOUSTON

Go ahead 8, this is Houston.

S/C

Rog, can you confirm a fuel cell purge at this time.

HOUSTON

Roger, will do, we're standing by.

Gemini 8, this is Houston. If you go to prelaunch, we'll check your accelerometer bias.

S/C

Roger, going to prelaunch and you did say you wanted a fuel cell purge at this time. Is that correct?

HOUSTON

That's right. We're going to watch it.

S/C

Okay, we're getting intermittent lock ons on the radar.

HOUSTON

8, this is Houston. Put your tape play back switch to continuous.

S/C

Rog, go continuous.

HOUSTON

Gemini 8, this is Houston, we're having Delta P lights which was not unusual with 7, but not 8.

HOUSTON

Do you have your crossover on?

S/C

That's affirm and we have no Delta P.

HOUSTON

Aw gee, I'm kind of disappointed.

S/C

We've got a winner up here.

HOUSTON

Gemini 8, this is Houston, your ~~attestrometer~~
bias is right on, looks very good.

S/C

Okay, thank you.

ANTIGUA

Antigua AOS.

HOUSTON

Gemini 8, Houston.

S/C

Go ahead.

HOUSTON

Roger, would you place your TM switch to real
time ^{to your tape play} / in acq and / back switch to command.

S/C

Roger, real time in acq and replay back to command.

HOUSTON

And would you place your cryogenic gaging switch
to ECS02.

S/C

Rog, ECS 02. Be advised we did get a Delta P
light. H 2 purge on section 2.

HOUSTON

Rog, with the Delta P. And now would you place
your cryogenic switch to fuel cell 02?

HOUSTON

Gemini 8, this is Houston, put your cryogenic
gaging switch to fuel cell H2.

S/C

Roger. Houston, Gemini 8, fuel cell purge
complete, the crossover is off.

HOUSTON

Understand, roger, fuel cell purge is complete.
And cryogenic gage switch to off please.

MISSION COMMENTARY, 4/16/66, 2:00 p.m.

Tape 45, Page 3

S/C

Roger.

HOUSTON

Gemini 8, Houston Cap Com, over.

S/C

Go ahead.

HOUSTON

I have your coellectic maneuver update, if you're ready to copy.

S/C

Okay, go ahead.

HOUSTON

GET burn 03 47 34. Delta V - 61.6. Delta P - 01 + 22. Yaw - 0. Pitch - 23 degrees down. Core 25 - 00 567. Core 26 - 00 240. Core 27 - all zeros. Thrusters aft - posigrade down. Do you read?

S/C

Understand GET burn(garbled) ...+22. Yaw - 0. Pitch - 23 degrees down. Core 25

ANTIGUA

LOS Antigua.

END OF TAPE

This is Gemini Control Houston at 3 hours, 39 minutes into the flight of Gemini 8. We are about 9 minutes away from our next burn and major maneuver which will have the effect of circularizing this Gemini 8 orbit at roughly 147 nautical miles. This is to occur at 3 hours, 47 minutes, 35 seconds into the mission. Rather large burn, a Delta V at 61.2 feet per second. After the burn the spacecraft should read something like 546 pounds of fuel remaining on board. Presently the spacecraft is 170 miles behind the Agena. When we last heard from Gemini 8, they were having intermittent radar lock. It looked like it was locking up fairly well toward the end of the pass over the Rose Knot Victor parked off the east coast of South America. Meanwhile the backup crew members for the Gemini 8 mission, Pete Conrad and Dick Gordon have reached the Control Room here in Houston after a one hour and 50 minute flight from the Cape. Coming with them were Donald Slayton and Astronaut Walter Cunningham also. They came here directly from Ellington Field next to the Manned Spacecraft Center and are conferring with Jim Lovell on the flight progress to date. We have the tape conservation via the Rose Knot Victor station and here it is.

RKV Cap Com Gemini 8, RKV Cap Com

S/C Go ahead

RKV Roger. We did not ^{get} confirmation on that maneuver update.
Would you read...

Houston Standby RKV, standby RKV, we have another one coming through.

RKV Roger

S/C OK. NSR 034734 61.6 01 plus (garbled), yaw 0, pitch 3 degrees down, 2500 567 26 00 240 (7 0000, thruster aft; posigrade down.

RKV Roger.

Houston RKV, Houston flight.

RKV Roger, flight.

Houston Standby to take another burn.

RKV Roger, go.

Houston GETB 03 47 35, Delta V 61.2, burn time 01 plus 22, yaw 0,
pitch 21 degrees down, core 25 00 57 0, core 26 00 22 4,
core 27 all zeros, aft thrusters, posigrade down.

Read it back.

RKV Gemini 8, RKV Cap Com. We have an update.

Houston Read that back to me first.

RKV OK. Standby one please.

Houston Roger

RKV Time is 3 plus 47 35, Delta V 61.2, Delta T 1 plus 22,
yaw 0, pitch 21 degrees down, 25 00 57 0, 26 00 22 4, 27
all zeros, thrusters aft, posigrade down. Roger. Gemini 8,
time on that is 03 47 35, Delta V 61.2, Delta T 1 plus 22,
yaw 0 degrees, pitch 21 degrees down, core 25 00 57 0, core
26 00 22 4, core 27 all zeros, thrusters aft, maneuver posit
grade down. Do you copy?

S/C Roger. 03 47 35, 61.2, 01 plus 22, yaw 0, pitch 21 degrees
down, 25 00 57 0, 26 00 22 4, 27 all zeros, aft thrusters,
posigrade down.

RKV Roger, is affirmative.

Houston RKV, Houston flight.

RKV OK, flight.

Houston Ask him if he has managed to get that Acq light on yet.

RKV That is Agena Acq lights on. He was going to send that command 251.

RKV Roger. We have no indication of it here. We do have phase lock and I think we should get him to take that lock off and try to get that flush load in. We have been unable to get flush load in.

Houston You mean coder on, encoder on?

RKV Yes. Tell him to turn the encoder off.

Houston OK. Go ahead and do that.

RKV Gemini 8, RKV Cap Com. Will you turn your encoder off. We would like to update the Agena with a flush load.

S/C Encoder is off, RKV, and we have negative lock on.

RKV Roger, understand.

Houston RKV, can we have a Gemini main?

RKV Up Gemini. Did you copy, Flight. He had been unable to get lock on.

Houston Say again

RKV He had been unable to get radar lock on.

Houston OK. Did you get the flush load in.

RKV We are transmitting right now. That's affirmative. We have a map...

Houston OK. Why don't you get those Acq lights on from the ground. Tell him you are going to do that.

RKV Roger. Gemini 8, RKV Cap Com. We are going to send the Acq lights on from the ground here.

S/C Go ahead.

RKV Roger. We have it verified by map.

RKV Roger. You may turn your encoder back on.

S/C Affirmative.

RKV Roger. Go ahead, flight.

Houston It is ok. We read that. Very good, RKV.

RKV Thank you. We will have a LOS. We are having a break up right now on Agena.

Houston Roger.

RKV OK. We are getting an indication occasionally of a radar lock.

Houston Roger

RKV We have radar indication again. We have had our first LOS of Gemini and Agena. We expect maybe some more here shortly.

Houston RKV, Houston

RKV RKV

Houston Did you get indications of power output on the transponder?

RKV Station is LOS

This is Gemini Control Houston. About two minutes ago, Neal Armstrong called in over Tannanarive and he was able to confirm at that time that radar lock had been established. A solid radar lock was, had been linked up and he gave us, about two minutes ago. He said the range was 158 nautical miles. This is an all important element of a rendezvous mission - - the establishment of that radar link. The pilots say that if they had to lose any of the several things involved in a rendezvous mission, that is the platform, the computer or the radar, they would much prefer the least. The one they would rather have over anything else is the radar. At 3 hours, 47 minutes into the mission we do have this brief conversation via Tannanarive. We will play the tape for you now.

Tannanarive This is Tannanarive remote.

Houston Gemini 8, Houston Cap Com.

S/C This is Gemini 8. Go ahead.

Houston Do you have solid radar lock on with the Agena? Over.

S/C Houston, Gemini 8 reads you loud and clear.

Houston Roger. Do you have solid radar lock on with the Agena? Over.

S/C That is affirmative. We have solid radar lock. Just a second and I will give you our current range.

Houston Roger. Thank you, sounds good.

S/C We are indicating a 158 miles range and elevation of about 4 degrees.

Houston Roger, sounds good and I am seeing about 3 minutes and 9 seconds until your burn.

S/C Roger.

Gemini Control Houston here. We are 3 hours 48 minutes, 51 seconds into the flight which would indicate we should be just about completing the circularization burn. We will stand by, we should have confirmation on that from the Tannanarive station. Signal loss not due for another two minutes I would say. Our big rendezvous display chart here in the Control Center is etching a circular ring for the spacecraft, matching it up with the circular Agena orbit. Jim Lovell is putting in a call now, lets listen.

END OF TAPE

S/C

Okay, our (Garbled) Residuals are none.....

Hou

Roger, lefthand burn complete, residuals are none. Did not
get the rest .

This is Gemini Control Houston. You heard Neil Armstrong confirm that he had completed his circularization burn. He had no residuals left, apparently a clean maneuver. And now we are advised that Tannarive has had LOS, loss of signal. Our next maneuver coming up at 5 hours and 13 minutes, 35 seconds into the mission -- and appreciate that this is an update over the time given earlier -- we now show for the terminal phase initiation maneuver five hours, 13 minutes and 35 seconds. This is Gemini Control Houston.

END OF TAPE

Gemini Control Houston here, four hours, 10 minutes into the flight. Gemini 8 now in contact with the Coastal Sentry Quebec., some five, 700 miles south of Japan and the conversation is going something like this.

S/C CSQ, Gemini 8.

CSQ Go ahead.

S/C Got a data point, ready to copy.

CSQ Go ahead.

S/C 8.10, 4.8, 126.65, 156, 290.8, 604, looks like we're about five minutes late

CSQ Roger, copy.

Houston flight, CSQ, we have initiated the Agena load, we have memory compare, we are getting a memory read out at this time.

HOU FLIGHT Roger.

CSQ Gemini 8, CSQ, you can turn your recorder back on at this time.

S/C Okay, going back on.

CSQ Flight, CSQ.

HOU FLIGHT Go ahead.

CSQ Roger, we are showing an indication that the tape recorder is off at this time. We are checking it.

HOU FLIGHT Tape recorder is off?

Tape recorder is off? On Gemini?

CSQ That's affirmative.

HOU FLIGHT CSQ, Flight.
CSQ Go ahead, flight.
HOU FLIGHT Will you get a PCM count on that ACS control gas pressure and temperature?
S/C CSQ, Gemini 8, data point ready.
CSQ Roger. Go ahead.
S/C Number 12 - 6.0, 421.59, 451, 273.4, 570.
CSQ Okay, I copy.

Gemini Control here, while the conversation continues, we show -- we read the spacecraft and the Agena now separated by approximately 100 nautical miles. That will be at 4 hours and 12 minutes into the flight. Let's go back to the conversation.

HOU FLIGHT CSQ, Houston.
CSQ Go ahead Houston.
HOU FLIGHT Can we have a contingency Charlie on the Agena please?
CSQ Roger. Sh.
S/C CSQ here's a data point now, ready?
CSQ Go ahead.
S/C 5.6, 119.05, 152, 273.4, 564.
CSQ Roger, that's data point 13.
S/C That is correct.

END OF TAPE

This is Gemini Control, Houston, at 4 hours 39 minutes into the flight of Gemini 8. Since Hawaii we've heard Dave Scott calling out some of these values, the plots on his angle of his target, the Agena target, the range, the range rates, and other values. A series of numbers which he does not break and probably will not be understandable without the proper chart. But this is how the conversation has gone since Hawaii.

HAWAII Gemini 8, Hawaii Cap Com.

S/C Go ahead, Hawaii.

HAWAII We'd like you to turn the encoder off.
We're going to reconfigure the beacons
from here to tape dump.

S/C Ok, encoder coming off.

HAWAII And would you place your T/M switch to
real time-delayed time, please?

S/C Real time-delayed time.

HAWAII Flight, Hawaii has both vehicles go.

FLIGHT Roger, Hawaii.

HAWAII Roger, go ahead, ready to copy.

S/C Point no. 20, 7.4, 101.07, 155, 216.9, 452.

HAWAII Roger, copy.

HAWAII Gemini 8, Hawaii. We'd like to get an
OAMS propellant readout when you have a
minute.

S/C 75 percent.

HAWAII Roger, 75.

FLIGHT Hawaii, Flight.

HAWAII Hawaii, go ahead.

FLIGHT How about the dump?

HAWAII Roger, the dump's in progress now.

FLIGHT Ok. I didn't hear you ask for that.

HAWAII We commanded the tape recorder. It was in command position.

FLIGHT Spacecraft?

S/C AII . . . copy.

FLIGHT Ok.

S/C AII No. 21, 7.0, 98.50, 154, 207.4, 434. Hawaii copy?

S/C AII Hawaii, Gemini 8 with another point.

HAWAII Ready to copy.

S/C No 22, 7.4, 95.93, 159, 201.9, 421

HAWAII Roger, copy. And you can place your T/M switch back to real time hack after this.

S/C Real time hack in.

HAWAII Now, Flight, Hawaii.

FLIGHT Go ahead, Hawaii.

HAWAII Roger, we completed the Gemini tape dump. And we got a five-minute dump on the Agena but we weren't able to position the tape.

FLIGHT Stand By. That's ok, Hawaii.

HAWAII Roger. And are you copying these data points?

FLIGHT Roger. Yeah, we're getting them.

FLIGHT Hawaii, Flight.

HAWAII Hawaii, go ahead.

FLIGHT Have you got the beacons reconfigured?

HAWAII That's affirmative.

FLIGHT How about those PCM counts?

HAWAII Stand by.

FLIGHT Ok.

HAWAII Flight, Hawaii.

FLIGHT Go.

HAWAII What PCM counts would you like?

FLIGHT That's ECS gas pressure and temperature,
D059, D070.

HAWAII Copy.

FLIGHT Hawaii , Houston Flight.

HAWAII Hawaii, go ahead.

FLIGHT What was the problem with getting the tape
reconfigured?

HAWAII We just didn't get the change of state, Flight,
so we left it on. We did get a five-minute
dump.

FLIGHT Ok. Understand.

HAWAII Flight, Hawaii.

FLIGHT Go, Hawaii.

HAWAII Roger, we had LOS before we were able to
get those PCM counts and we did get the
recorder positioned on the Agena.

FLIGHT Roger.

HAWAII We must have missed the request for those

PCM counts.

FLIGHT That's my fault. I asked you for that in addition. Not to worry - we'll get it from Guaymas.

HAWAII Roger.

FLIGHT Guaymas, Flight.

GUAYMAS Go ahead, Flight.

FLIGHT Do you have your special - your MI?

GUAYMAS That's affirmative.

FLIGHT Ok. It's all yours.

GUAYMAS Roger. Flight, Guaymas.

FLIGHT Go ahead.

S/C
~~GUAYMAS~~ Guaymas, Gemini 8. Want a data point.

GUAYMAS Go ahead.

S/C No. 27, 8.4, 83.26, 149, 166.9, 349.

GUAYMAS Guaymas copied.

GUAYMAS Both birds still looking good Flight.

FLIGHT Roger.

GUAYMAS Those PCM counts are still the same, Flight.

FLIGHT Roger, Guaymas.

S/C Gemini 8 with a point. Ready to copy?

GUAYMAS Copy.

S/C No. 28, 9.1, 80.75, 151, 157.8, 332.

GUAYMAS Guaymas copied.

GUAYMAS Flight, Guaymas. That S-band transponder's risen about 3 degrees since acquisition - it's at 108 degrees now.

FLIGHT one zero eight?
GUAYMAS Roger.
S/C Guaymas, Gemini 8 with a point.
GUAYMAS Go ahead.
S/C No. 29, 8.9, 78.27, 152, 150.5, 318.
GUAYMAS Guaymas copied.
HOUSTON This is Houston Cap Com.
S/C Say again.
HOUSTON This is Houston. We have it and we also
have your ground TPI backup when you're
ready to copy.
S/C Stand by. Ok, we've got a visual on the
Agena at 76 miles.
HOUSTON Roger, understand visual on Agena at
76 miles.
S/C At least we have some object in sight. or
something that looks like it would be the
Agena.
HOUSTON Understand a visual Agena, or Sirius, 76
miles.
S/C Yeah, could be a planet.
FLIGHT Guaymas, Flight. Guaymas, Flight.
S/C Guaymas, Gemini 8, go ahead with the TPI.
GUAYMAS Roger. GETV, 05 13 13; ETNSR, 01 25 38;
Delta V, 32.6; forward, 32.0; up, 1.7; left,
5.7; R sub D, 32.5; Delta R sub D, 131;
azimuth, 27.4; elevation, zero.

J
S/C Rog, Guaymas. Real smooth. Stand by. I'll
get it back to you.
S/C Guaymas, Gemini 8.
HOUSTON This is Houston Cap Com. Go ahead, 8.
S/C Ok, TPI coming back at you. You ready?
HOUSTON All set to go.
S/C 05 13 13, 01 25 38, 32.6, 32.0 forward, 1.7
up, 5.7 left, 32.5, 131, 27.4 on the elevation,
and zero on the azimuth. How's that?
HOUSTON Other way around, Dave. Azimuth is 27.4
and zero on the elevation.
S/C Yeah, that's what I thought you said. Ok.
HOUSTON Otherwise it sounds good. We'll check that,
Dave. That doesn't sound right.
HOUSTON Roger, Dave. That is 27.4 on the elevation.
FLIGHT RKV, Houston Flight.
RKV Houston Flight, RKV Cap Com.
FLIGHT Roger, on that terminal phase backup solu-
tion, we should have reversed the elevation
and the azimuth. Just check with him, will
you? Elevation is 27.4 up, azimuth zero.
RKV Would you read the el please, again?
FLIGHT Roger. Elevation 27.4 up.
RKV Roger, I copy 27.4 degrees up.
FLIGHT Azimuth, zero.
RKV Affirmative.

This is Gemini Control, Houston, 4 hours 48 minutes into the flight. In the course of that conversation ~~you heard~~ Neil Armstrong say that he had acquired visually the Agena. He gave the range as 76 miles and he had that acquisition at 4 hours 40 minutes into the flight. This is Gemini Control, Houston.

END OF TAPE

This is Gemini Control Houston. We're five hours, eight minutes into the flight. And in about 2 to 3 minutes, we estimate the pilots will begin their terminal phase initiation. The magic number here is not so much time as the angle. When they achieve an angle from their target vehicle of 27.4 degrees, they will begin their terminal phase initiation and some 32 to 33 minutes should be very much in the proximity of the target vehicle. We have some tape from the recently concluded pass over the Rose Knot Victor parked off the southeast coast of South America and here's how that conversation went.

RKV Roger, we'd like to confirm on this TPI that you did copy correctly with the at 27.4 up and azimuth at 0 degrees.

S/C All right, we understand that.

RKV Roger, we also show on the ground that the L band ~~6088X~~ is not locked.

HOU FLIGHT Not on is the terminology.

S/C Understand, is that correct.

RKV Roger, that's what we're showing on the ground. How are you reading..... (garbled).....

S/C Roger, understand

RKV L band coder is on flight. It's just the coder lock light that shows it's not on.

HOU FLIGHT Forget it.

S/C RKV got a data point, you ready?

RKV Roger.

S/C No 41 - 14.9, 49.78, 138, 58.7, 142.

RKV Roger.

S/C Also, be advised that your TPI and TPS may be approximately 9 minutes late.

HOU FLIGHT RKV Houston Flight.

RKV Go ahead flight.

HOU FLIGHT Forget the rest of it.

RKV Rog. Flight, we're showing that the L band is on, however, we're showing that the L band coder is not locked and I think there may be some kind of instrumentation problem with this, because he says he's getting good data points and everything.

HOU FLIGHT We're talking about encoder on which prevents us from sending commands.

RKV Oh, encoder, yes, that's off.

HOU FLIGHT Okay.

RKV Sorry, I misunderstood.

HOU FLIGHT Great.

S/C RKV, RKV, Gemini 8, with a data point.

RKV Roger, go ahead.

S/C 42 - 15.5, 47.74, 137, 45.2.

RKV Roger, would you confirm that your encoder is on?

S/C It's on now.

RKV Roger, thank you.

Flight, RKV, S band case temp - hotel 049 is sitting

at 118 degrees.

HOU FLIGHT

Okay, that's fine.

RKV

By the way, we had visual sighting

HOU FLIGHT

Very good.

S/C

Number 43 7.2, 45.5, 138, 34.3, 102.

.....(garbled)....

HOU FLIGHT

RKV, Flight.

RKV

Go ahead flight.

HOU FLIGHT

Agena contingency dock please?

RKV

Roger, Delta.

HOU FLIGHT

Yes, we have some old Air Force types here.

RKV

Okay. Say, sorry about that mix up on the encoder.

HOU FLIGHT

That's okay.

RKV

Flight, both vehicles are looking very good at LOS
here.

HOU FLIGHT

Roger.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 4:00 p.m.

Tape 51, Page 1

This is Gemini Control Houston at five hours, 19 minutes into the flight. We can assume, although we have not heard from the spacecraft since the Rose Knot Victor that their terminal phase initiate maneuver is completed. Jim Lovell is attempting to reach them now. They are over in the Tananarive area off the east coast of South Africa. This would place them some 25 to 26 miles below and behind the Agena as they begin to sweep gently up to 161 miles, orbital altitude of the Agena. This is Gemini Control standing by.

END OF TAPE

This is Gemini Control Houston at five hours, 24 minutes into the flight, some 11 minutes after the terminal phase initiate burn and according to our plots the spacecraft should be about 17 miles below and beneath the Agena. We've had no further word via the Tananarive station. We are standing by here on the premise that they will call us when they have some new information for us. This is Gemini Control Houston.

END OFTAPE

This is Gemini Control Houston. Still no further word. We have talked with Jim Lovell, the Spacecraft Communicator at this point. He says he is hesitant to contact the crew because this is one of the most difficult parts of the flight. Both crewmen are quite busy, Dave doing his mathematical exercises in the final approach, and Neil controlling the thrusters. They are now east of the Tananarive station. We expect to hear from them again in about 15 minutes. Make that 10 minutes when the Coastal Sentry Quebec acquires off the east coast of China and during the course of that pass they should go into their terminal phase final. We have been advised that some of these events like the final approach and certain of the docking, lets make that read the final approach, will take place in daylight, in other words, several minutes, perhaps five minutes pass the sunrise line out there this morning. At five hours, 30 minutes into the mission, this is Gemini Control Houston.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 4:15 p.m.

Tape 54, Page 1

This is Gemini Control Houston at 5 hours, 34 minutes into the flight of Gemini 8. The Agena currently showing 7 hours, and 15 minutes of flight. Still no word from our crew members. All eyes here in the control center glued to our big displays and every ear listening for the first word. John Hodge now in contact with the flight controller on the CSQ, he has advised him we have no special instructions for the ship. Of course, we would like to hear as soon as possible what their status is as soon as CSQ acquires. That acquisition should come about 5 minutes from now. This is Gemini Control Houston.

END OF TAPE

This is Gemini Control Houston, 5 hours, 39 minutes into the flight. Flight Director John Hodge has advised the Coastal Sentry Quebec controller that he would like the range and range rate read out at approximately 30 second intervals when the CSQ acquires the two vehicles, which they should within a very few seconds. About five minutes from now, then, the Gemini 8 spacecraft will go into its terminal phase final maneuver, which is programmed for 5 hours, 45 minutes, 37 seconds into the flight. This calls for a ~~burn rate~~ ^{will} of 39.8 feet per second. And it/leave onboard some 458 pounds of fuel, according to our estimates here, which are based on telemetry.

Momentarily, we should have acquisition by the CSQ. Dick Gordon who backed up Dave Scott in the Gemini 8 preparations as the pilot crew member, has taken a station right on top of the Flight Director's console. He/occupied it for about the past two hours, keeping a very close plot with the values that Dave Scott called out earlier.

(Pause)

The Coastal Sentry Quebec controller advises they ~~show about~~ range of about 38,000 feet. They did acquire telemetry solid about 60 seconds ago.

(Pause)

The Coastal Sentry Quebec controller just advised the Gemini 8 spacecraft that they had nothing for them. They were standing by. This brought an acknowledgment from Neil Armstrong. And he said that they'd be back to them later.

(Pause)

The Coastal Sentry Quebec advises the range is now about 14,000 feet. And as soon as several people in this Control Center heard that reading their thumbs went up indicating that things were going along very well.

Another range reading, about 12,000 -- 12,100 feet.

(Pause)

All these values are coming from the ground station there at the Coastal Sentry Quebec. Five minutes and 44 minutes. Range now quoted at 10,800 feet.

(Pause)

We're coming up on the terminal phase final maneuver. John Hodge has just queried CSQ for another range reading.

(Pause)

CSQ advises the range is now about 7500 feet.

(Pause)

Range now 6800 feet. We have an exceptionally clear signal, voice signal from the CSQ today.

Range now 6100 feet.

(Pause)

A new range reading at 5700 feet. The big question now is whether the distance will be closed while we're still within the Coastal Sentry Quebec range of acquisition. I would estimate we've probably got another two minutes. The next station, of course would be Hawaii. That station to acquire at 5 hours 58 minutes into the flight. Some 10 minutes from now.

(Pause)

And now we have another reading on range of 4900 feet. And expect to lose signal any second. The pilots have not had any voice conversation with CSQ during this pass but that is understandable, since they are both very busy fellows at this terminal phase. CSQ now advises they have lost signal with the spacecraft. Their last range reading at loss of signal was 2100 feet. 2100 feet from the Agena. All systems aboard both the Agena and the spacecraft performing very nicely. We should

MISSION COMMENTARY, 3/16/66, 4:20 p.m.

Tape 55, Page 3

reacquire the spacecraft in perhaps 8 minutes from Hawaii and will be back to you at that time. This is Gemini Control Houston.

END OF TAPE

This is Gemini Control Houston.....and there is the world we have been waiting for. I paused because just as I opened the announcement, Hawaii called them. Neal Armstrong came back that we are station keeping, we are about 150 feet apart. 150 feet apart in their presently, perhaps 1000 west of Hawaii. A minute or two ago, Jim Lovell attempted to raise the spacecraft through the Range Tracker, a ship parked 1500 west of Hawaii. We could barely hear Neal acknowledging the call and could not read his voice. It is quite clear now and all he has said in response to the Hawaii Capsule Communicator's question: "How is it going?". "We are 150 feet apart and station keeping." They should advise any minute about their docking plans as to when we can expect that to occur..

PAUSE

Neal Armstrong has given us a little update and he says the Agena looks fine. The antennas are all in the proper position. He described the TDA as looking fine, it is apparently no worse for the wear from 7 hours and 42 minutes in flight, and they are apparently maneuvering their spacecraft around in order to get some of the readings off the status display panel located just above the TDA. They are being given at this time, some yaw maneuver times, some other values. Lets tune in on it and follow the conversation live.

S/C Roger, understand. Yaw maneuver 071000.

Hawaii Also, while you are at up plus 96 degree heading, the Agena will go to flight control mode 7 for 30 seconds.

S/C Understand; 96 degrees up C 7 for 30.

Hawaii The SPC load we are transmitting contains Agena clock reset. We are very anxious for it to be executed even if it cuts short your platform parallelism. Over.

S/C Say that last one again, please.

Hawaii Roger. The SPC load we are transmitting contains a clock

reset for the Agena. We are anxious for it to be executed even if this means cutting the platform parallelism test short.

S/C Roger. Understand. SPC has the priority over the platform parallelism, in essence, is that right?

Hawaii That is right.

Hawaii Flight, we are having difficulty getting a compare and necessity C load.

Houston Flight OK, let us know when you have got it. How about the tape dump?

Hawaii Tape dump is doing fine.

Houston Roger

Hawaii Also their C band beacons have been reconfigured.

There is Gemini Control Houston here. During the lull in the conversation... here we go again. Lets go back to the spacecraft.

Houston Flight Go ahead.

Hawaii Roger. We are unable to get some of the initial commands into the yaw maneuver necessity C load. It is still showing Os.

Houston Standby. You have about enough time to retransmit. Do you want to do that?

Hawaii Roger. Hawaii is retransmitting, flight.

Houston OK. If after this one you don't get it in, send inhibit and we will do it again over RKV.

Hawaii Copy.

Houston Hawaii, flight.

Hawaii Flight, we are transmitting SPC disable.

Houston Roger. Hawaii, flight, is that a memory readout or a memory compare?

Hawaii We have tried for both, flight. The memory readout shows zeros in quite a few of the commands.

Houston Roger. Hawaii, flight.

Hawaii Go ahead.

Houston Will you ask the crew when they first saw the acquisition lights.as they came in.

Hawaii When they first saw acquisition lights. Roger.

Houston Right

Hawaii Gemini 8, Hawaii. We would like to know when you first saw the acquisition lights as you approached.

S/C We will have to go back in the data and dig that out.

Hawaii Roger.

S/C We think it was 45 miles but we will have to check out the tape.

Hawaii Roger. Copy and we are ready to copy the readouts if you have them. The readings in the status display panel.

S/C Roger. Looks like we are about 80 feet out still and we have a main red off, main green on, armed off, secondary high on, secondary low on, attitude on, rigid off, power on and can't quite see the dock yet.

Hawaii Roger. Copy.

S/C Pretty bright up here.

Hawaii Flight, did you copy?

Houston Roger, I got red off and green on and then I lost it. Do you want to come again. Thats ok, we have got them all.

Hawaii Roger, understand. Then he said that they can't give us the readings from the status display panel. They are using a sexton to get the information they have.

Houston OK

Hawaii We have LOS at Hawaii.

Houston Roger

This is Gemini Control Houston. That will wrap up the conversation in Hawaii. The flight plan from here calls for the actual docking to take place over the Rose Knot Victor parked down off the east coast of South America. The Rose Knot Victor is to acquire the spacecraft at 6 hours 32 minutes into the flight. We presently show 6 hours 8 minutes into the flight. All in all the pilots are acting extremely "Ho-hum" about the whole thing. They were being urged here to say a bit more about their situation and if anything, I think they sounded more relaxed over Hawaii in reporting these events than they have sounded ~~during~~ point during the flight. We have now the complete tape of the pass. There may be some interest in listening to the initial contact. We will play the entire tape through for you at this time.

END OF TAPE

Houston How does it look?

Hawaii All right. We have both vehicles go Flight.

Houston Roger. Ask him how he's doing?

Hawaii Gemini 8, this is Hawaii.

S/C Go ahead.

Hawaii Roger. How are you doing?

S/C Station keeping at about 150 feet.

Hawaii Roger. Have you transmitted UHF to stable.

S/C That is correct.

Hawaii Roger. We have an SPC load to transmit.
Would you enable it, please.

S/C Sure will.

Houston Hawaii, Flight.

Hawaii Flight, Hawaii. Go ahead.

Houston We'd like to get an onboard OAMS propellant
remaining, too.

Hawaii Stand by. Gemini 8, Hawaii.

S/C Go ahead.

Hawaii Roger. Would you turn up your encoder,
please?

S/C OK. Doing a little BAO work up here.

Hawaii Gene, it looks in fine shape. PBA is out
and rigidized. The lifters sticking out as

expected on the PBA. The diapole is up.
The engine looks good and he's turned the
acq lights off.

Houston Roger. Copy.

HAWAII Did you copy all that, Flight?

Houston Roger.

Hawaii Gemini 8, we'd like an OAMS propellant
reading.

S/C We have 55 percent.

Hawaii Copy, 59.

S/C That's 55.

Hawaii 55. And we're standing by to copy the
status display panel readings.

S/C OK. We'll have to get over on that side
of it. Gemini, Hawaii.

Hawaii Go ahead.

S/C We have a yaw maneuver time for you if you're
ready to copy.

Hawaii OK. Go ahead.

S/C Had a yaw maneuver at 07 10 00. That's
GET.

Hawaii Roger. Understand yaw maneuver 07 10 00.
Also, you're at a +9 degree heading. The
Agena will go to a flight control mode 7 for

30 seconds.

S/C Understand 96 degrees FC 7 for 30.

Hawaii And the SPC load we're transmitting contains Agena clock reset. We're very anxious for it to be executed even if it cuts short your platform parallelism. Over.

S/C Say that last one again, please.

Hawaii Roger. The SPC load we're transmitting contains a clock reset for the Agena.

S/C Rog.

Hawaii We're anxious for it to be executed even if this means cutting the platform parallelism test short.

S/C Roger. Understand SPC has priority over the platform parallelism, in essence, is that right?

Hawaii Affirmative.

Houston That's right.

S/C OK.

Hawaii Flight, we're having some difficulty getting a compare on this SPC load.

Houston OK. Let us know when you've got it. How about the tape dump?

Hawaii Tape dump is going fine.

Houston Roger.

Hawaii Also, the C-band beacon has been reconfigured.
Flight, Hawaii.

Houston Go ahead.

Hawaii Roger. We're unable to get some of the
initial commands in for the L maneuver
in this SPC load. It's still showing
zeros.

Houston Stand by. You have about enough time to
retransmit it. You want to do that?
Hawaii?

Hawaii Roger, Hawaii is retransmitting, Flight.

Houston OK. If after this one you don't get it in,
send inhibit and we'll do it again over RKV.

Hawaii Copy.

Houston Hawaii, Flight.

Hawaii Flight, we're transmitting SPC. Disable.

Houston Roger. Hawaii, Flight. Is that a memory
readout or a memory compare?

Hawaii We've tried for both, Flight. The memory
readout showed zeros in quite a few of the
commands.

Houston Roger.

Houston Hawaii, Flight.

Hawaii Hawaii, go ahead.

Houston Will you ask the crew when they first saw the acquisition lights as they came in?

Hawaii When they first saw acquisition lights, Roger.

Houston Roger.

Hawaii Gemini 8, Hawaii.

S/C Go ahead.

Hawaii We'd like to know when you first saw the acquisition lights as you approached.

S/C We'll have to go back in the data and dig that out.

Hawaii Roger.

S/C We think it was 45 miles but we'll have to check on the tape.

Hawaii Roger. Copy and I'm ready the copy the readouts if you have them now. The readings from the status display panel if you have them.

S/C Roger. Looks like we're about 80 feet out still and we have main red off, main green on, armed off, secondary high on, secondary low on, attitude on, rate is off, power on,

and can't quite see to dock yet.

Hawaii Roger. Copy. Roger, understand.

S/C Pretty bright up here.

Hawaii Flight, did you copy?

Houston Roger. I got red off and green on and then I lost it.

Hawaii You want to come again?

Houston That's OK we've got them all.

Hawaii Roger, understand. And he said he can't give us the readings from the status display panel. They're using a section to get the information they have.

Houston OK.

Hawaii And we have LOS in Hawaii.

This is Gemini Control in Houston. We have replayed the conversation following our rendezvous, and to recap one thing and another, the two vehicles have matched velocity, that is, Gemini 8 has matched the Agena velocity of 25,365.9 feet per second, or in miles-per-hour 17,294.9. They are running at a 60 to 80 feet apart as they move across the eastern Pacific. Also, based on early TM values, our controllers estimate that the spacecraft used only 180 pounds of fuel in that terminal phase, final maneuver, and this would match very closely with

MISSION COMMENTARY TRANSCRIPT, 3/16/66, 4:50 p.m. Tape 57, Page 7
the fuel usage demonstrated by Gemini 6 in its rendezvous with
Gemini 7. It's all touch of irony today as this rendezvous
took place just west of Hawaii. The two pilots, the command
pilots for Gemini 6 and Gemini 7, Wally Schirra and Frank Borman,
were in an airplane and they are headed also for the island of
Hawaii. They should land there later this afternoon after a
Far Eastern tour. Again, we should acquire the Rose Knot Victor
should acquire at 6 hours 32 minutes into the flight. We're
presently showing 6 hours 16 minutes into the flight, and the
physical docking is to take place over the Rose Knot Victor.
This is Gemini Control Houston.

END OF TAPE

This is Gemini Control Houston at 6 hours, 32 minutes into the flight. Flight Director Hodge has just talked with the controller on the Rose Knot Victor, they have agreed on their procedures there. We're standing by waiting for some word. There goes a call up to Gemini 8.

We heard Gemini 8 acknowledge the call. Hodge asked the Rose Knot if they were docked. We are advised they are not docked as yet. And the Rose Knot has just told Gemini 8 to go ahead and dock.

The desired velocity for this docking maneuver is about 1 foot per second, that is driving in toward the Agena, the docking adapter. The pilots want at least $\frac{1}{2}$ foot per second to insure that all the latches are engaged and the proper link-up is achieved. But they don't want too much more than 1 foot per second for fear that some damage might be done in the coupling.

Rose Knot Victor shows -- Rose Knot Victor shows -- and now the word is they have docked. They have achieved the dock. They must have only been a few feet away. The Rose Knot Victor controller is congratulating them. Neil Armstrong's only comment was "It was a real smoothie." They apparently were only a foot or two away from the Agena when they put in the call.

Armstrong says that the Agena was very stable during the docking maneuver. They are physically docked now and he says they are having no disturbances at all in their flight path. The actual docking maneuver brought a small chorus of cheers from here, a lot of thumbs up signal in this control center. The Rose Knot Victor controller talking with them. He is advising the pilots that they'd like to update a command load to the Agena. Additional commands for the Agena being readied to be sent up from the Rose Knot Victor, not very much additional conversation coming from the two.

END OF TAPE

HANEY

....Neil Armstrong is making triply sure that the proper command is sent from the Rose Knot Victor. He apparently wants to take no chances which is quite understandable in his present configuration. (Pause) Now the SPC load, or the Stored Program Control load, this is a controller aboard the Agena has received its proper command and both the spacecraft and the ground are happy with that. We have the taped conversation from the start of this pass available for you and we'll play that for you now.

RKV

Gemini 8, RKV.

S/C

...about two feet out...

RKV

Roger, stand by for a couple of minutes here.

HOU

Is he docked?

RKV

Negative, he's not docked yet.

Ok, Gemini 8, we have TM solid. You are looking good here on the ground, go ahead and dock. Flight we're going to hold off on this SPC thing until he does get docked.

HOU

Ok, go ahead with your memory compare.

RKV

Roger.

HOU

Let us know what he does.

RKV

Ok, we have a rigid light....it is not rigid now.

HOU

Say again.

RKV

Ok Gemini 8, it looks good here from the ground, we're showing column rigid, everything looks good for the docking.

S/C Ok, we're going to cycle our stop on switch now.

RKV Roger.

S/C Flight we are docked. And he's really a smoothie.

RKV Oh Roger!! And congratulations, this is real good.

S/C You couldn't have the thrill down there we have up here. Just for your information, the Agena was very stable, and at the present time we are having no noticeable oscillations at all.

RKV Roger, copy. Agena very stable and no noticeable oscillations.

S/C Rog

Hou Flt RKV, Flight. What is the control mode in the Agena?

RKV Stand by, Flight.

Hou Flt Roger

RKV We are in control mode 6 flight.

Hou Flt Roger

RKV Ok, we are showing zeros in those cores and we are going to have him turn encoder off then also the UHF enable.

Hou Flt Ok, you want to send it again?

RKV Gemini 8, RKV. We'd like to update that SPC load, it did not all get in correctly, could you give us UHF enable and the encoder off, please.

S/C I think we'd rather...can we send it in on the encoder ourselves?

Hou Flt Can't do that.

S/C You just want a load and SPC again, is that right?

RKV Rog, we did not get all the SPC load in correctly over Hawaii and we want to finish the SPC load from here. And you cannot do that from where you are. Do you copy, Gemini 8?

S/C Yeah, we copy, we are just discussing it a little bit.

RKV Ok.

S/C Ok, we are going to go along with you on that and want you to make double sure you get the right numbers.

RKV Roger, wilco, we sure will.

Hou Flt RKV, flight, you can tell him SPC's are disabled.

RKV OK

Hou Flt Make him feel a little warmer.

RKV And be advised Gemini 8 that the SPC's at the present time are disabled so regardless of this load does it will still be ok.

S/C We'd like for you to make double sure.

RKV Roger. Could you give us the encoder off please?

S/C It's off.

RKV Roger, thank you. We are sending the SPC load.

S/C How 'bout setting that emergency timer reset, should we open it up.

RKV That's right.

S/C Ok.

RKV Ok, Gemini 8, the SPC's are in. We have reset the emergency timer, and you may have control back again.

S/C Thank you very much.

RKV Roger.

RKV Oh wait a minute, we didn't sent that SPC enable,
do we want to send that Flight, or not?

Hou Flt Right

RKV What?

Hou Flt Confirm the load

RKV Ok. Flight we got a negative on the memory
compare.

Hou Flt Negative?

RKV That affirmative, a negative on the memory compare,
we're getting the print out now.

Hou Flt Take a readout on that, RKV

RKV Rog, that's what we are going.

Hou Flt Let's know which rows have got zero in

RKV Wilco

Hou Flt RKV, Houston

RKV Houston, RKV

Hou Flt Did you send VM word?

RKV That's negative. Gemini 8, we would also like to
send the VM word, would you turn the encoder off
please?

S/C Ok, encoder off.

RKV Roger, transmitting VM word now. Ok, you can turn
the encoder back on. Flight we got no compare on
the VM.

Hou Flt No compare on the VM?

RKV That's affirm.

Hou Flt Ok, that's ok, we can get them to put that in them-
selves.

RKV Ok

RKV You want me to read it up to him?

Hou Flt He has it onboard, standby. Go ahead and read it up to him. No you are not going to have enough time now. We'll pick it up over CSQ.

RKV Ok, flight. I don't know what the heck went wrong with that thing.

Hou Flt Say again.

RKV Say I don't know what the heck went wrong with that VM load.

RKV Gemini 8, RKV, we are about to have LOS, you are looking real good from the ground, congratulations on rendezvous and docking. Flight we've had LOS and we did not get a tape dump.

Hou Flt Roger.

This is Gemini Control Houston here, at 6 hours 44 minutes into the flight. According to the best estimates that we have the actual docking took place at 6 hours, 34 minutes into the flight. We can verify this later through telemetry but that is the estimate of the Flight Director. The pilots still have about two hours work ahead of them before they will power down for the night and suspend their activities after this most busy and successful day. The events will include some maneuvering with the Agena, several yaw maneuvers, they'll use the SPS propulsion system and observe it very carefully. Every event is to be photographed in as much detail as they can. This is Gemini Control, Houston.

END OF TAPE

There seems to be some difficulty with this line. This is Gemini Control Houston, excuse the mechanical delay. The Gemini 8 crew should be about beginning a yaw maneuver with the Agena. They will use the Agena thrusters yawing at about as much as 180 degrees at the rate of about a degree and a half per second. They then will check the Agena gyros and perform additional yaw maneuvers before going into a series of bending mode tests, which will call for an Agena yaw thrusters as well as spacecraft thrusters. And also, during this period as we approach the Coastal Sentry Quebec, they are to perform a fuel cell purge and a little later, they will again exercise the secondary propulsion system when they're back over the Rose Knot Victor. We have some tape conversation for you from the Tananarive station. In this conversation, there are questions about the receipt of some commands that went up to the Agena. According to the Flight Director, the commands were transmitted from the Hawaii station, earlier, and again from the Rose Knot Victor. We got a valid indication that they have been received, then as the spacecraft computer looked at the commands and there seemed to be disagreement on exactly what commands were in. We suspect right now, that the programming may be a bit off in the computer for this particular case, want to underscore it there, there appears to be no problem with the computer, they certainly worked very well coming into the rendezvous. But in this particular area of the program, there may have been improper loading some disagreement with the actual commands that went up for the Agena system. Here now is the Tananarive conversation.

HOU CAP COM

Gemini 8, Gemini 8, Houston Cap Com, over.

S/C

This is Gemini 8.

HOUSTON FLIGHT

Hawaii, this is Houston Flight.

HOUSTON FLIGHT

Roger, 8, reading you loud and clear, I have some information for you, ready to copy?

S/C

Stand by. What kind of information is it?

HOU FLIGHT

Well, first of all, it's about the yaw maneuver, I have some dope for you which we would like for you to follow.

S/C

You mean the SPC's yaw maneuver.

HOU FLIGHT

Roger, we believe we have the load in and we'd like to have you enable the SPC's and let the Agena start coming through. If you run into trouble, and the attitude control system of the Agena goes wild, just send in command 400 to turn it off and take control of the spacecraft. Do you copy that?

S/C

Rog, we understand.

HOU FLIGHT

Roger, okay, stand by. I have another update for you.

S/C

Stand by. I got to get the right book. Go ahead.

HOU FLIGHT

Roger, node 07, 04, 46, Rev 5 67.5 east, 1552 right ascension.

S/C

Roger, node 07, 04, 46, Rev 5 67.5 east, 15 + 52 at ascension.

HOU FLIGHT

Roger, that's correct and would you verify that the L band radar is on please?

S/C

Rog, we sent an off command, do you want us to do it again.

HOU FLIGHT

No, this is the spacecraft L band radar.

S/C

Roger, thefrom the transponder is off.

HOU FLIGHT

Roger, thank you and would you put the ECS02 heater off?

S/C

Okay, going off.

HOU FLIGHT Roger, and EECOM down here thinks that the fuel cell
O2 and H2 heater circuit breaker had opened up during
the Pacific pass and we would like to know if Dave
found that circuit breaker open and did he reset it
after Hawaii?

S/C That's affirmative, he did find it open and he did
reset it after Hawaii.

HOU FLIGHT Roger, big brother is watching.

S/C Say again.

HOU FLIGHT Could you give us an OAMS ^{propellant} propellant quantity readout please?
OAMS propellant.

S/C 51% right now.

HOU FLIGHT Roger, 51%. Thank you.

S/C We've yawed around to 180 now for the parallelism and
it's gone quite well.

HOU FLIGHT Roger, understand, you've yawed to 180 for the parallelism
check.

S/C Right.

TANANARIEVE Tananarivee has LOS.

END OF TAPE

This is Gemini Control Houston. We've encountered some trouble in the flight. Neil Armstrong has backed off from the Agena. He reported this trouble occurred at approximately 7 hours into the flight. We were advised of it some 5 to 6 minutes ago over the Coastal Sentry Quebec. The present situation is, he's using the rate one of his RCS rings to maintain attitude and we are watching the situation very carefully. This is Gemini Control Houston.

END OF TAPE

This is Gemini Control Houston again. Apparently the last transmission was not received by all stations, so we repeat. Trouble has developed in the flight of Gemini 8, while docked with the Agena the configuration apparently got in a maneuver which Neil Armstrong did not like. He elected to undock and back off from the Agena. It is also our understanding that his maneuvering system, his onboard maneuvering system, that is his big thrusters on the adapter are inoperative. He is using one of two rings in his reentry control system to maintain his attitude during flight. It is possible that the flight may be terminated early. This trouble developed, according to Armstrong, at 7 hours into the flight. It was passed on to us some 10 minutes ago while the spacecraft was over the Coastal Sentry Quebec. We presently read 7 hours, 34 minutes into the flight and we are standing by. This is Gemini Control Houston.

END OF TAPE

This is Gemini Control Houston. We are 8 hours and 3 minutes into the flight of Gemini 8. And in view of the trouble encountered at 7 hours into the flight as reported earlier, the Flight Director has determined to terminate the flight in the 7-3 area. We plan to bring the flight down on the 7th orbit in the 3rd, what we call the 3rd zone, which is approximately 500 miles east of Okinawa, it's in the far west Pacific. Our situation out there is as follows - a destroyer named the Mason is about 160 miles away at this time, it is proceeding towards the point, and it should take that destroyer probably 5 to 6 hours to reach the point, which should come very close to the...well it may be a little delayed, get there after the landing itself. The first estimate I have on the retrofire time is 10 hours and four minutes into the mission, in other words two hours from now. Landing should take place some 25 to 26 minutes later. In addition to the Mason, a C-54 has been dispatched from Tachikawa Air Force Base in Japan, its proceeding to the point. Another C-54 is proceeding to the point from Okinawa. The, another location here on the landing point is quoted to me as 630 nautical miles south of Yokosuka, Japan. The weather conditions out there are partly cloudy, visibility ten miles, and the landing will be made in full daylight, its 12:30 p.m. out in the 7-3 area. Again to recap our situation as best we understand it at this point, at 7 hours into the mission, Neil Armstrong noted some maneuvers, the spacecraft-Agena combination getting into some rates that he did not like. He elected to back off from the Agena, undock, which he did. We do not know whether the problem developed in the Agena or in the spacecraft. We do know that the maneuver thrusters on the aft end of the Gemini 8 spacecraft became inoperative in yaw. He did report later he had his pitch thrusters and he also reported he had used one of his reentry control system rings to bring the spacecraft under complete control. That pretty well sums up our situation here, we'll pass along additional information as it develops. This is Gemini Control at 8 hours, 6 minutes into the flight.

END OF TAPE

This is Gemini Control Houston. At this time the flight control team are reviewing retrofire parameters to bring the spacecraft in the 7-3 area. We have been further advised that an HU16 amphibian type aircraft is being dispatched to the scene, again located about 500 miles east and slightly south of Okinawa. In additional discussions with Gemini 8 over the Rose Knot Victor, it was a fairly short pass, Neil did advise that the thruster number 8 apparently failed in an open position. We don't know that that was the complete extent of the difficulty, but he did verify that that thruster failed. We don't know whether it failed while he was still docked to the Agena or after he had undocked and backed off from the Agena, but that's of no consequence at this point. He does have the spacecraft in a very stable attitude, using his RCS system. The Agena is described as ahead and below him, which apparently is a favorable condition for the kind of landing maneuver we want to attempt, of retrocommand is 10 hours and 4 minutes into the mission and to correct an earlier statement it is approximately 32 minutes later that the spacecraft should touch down in the West Pacific. This is Gemini Control Houston.

END OF TAPE

This is Gemini Control Houston. Eight hours, 36 minutes into the flight of Gemini 8. We've had no further voice contact with the spacecraft since it left the Rose Knot area some 10 to 15 minutes ago, and we do not expect any further conversation until the spacecraft is over the Coastal Sentry Quebec which should occur at 8 hours and 52 minutes into the flight. At last reports the Agena was in a stable attitude, I repeat the Agena was in a stable attitude and tracking placed it about 5 miles ahead and below, earlier Neil Armstrong had said about a mile below the Gemini 8 spacecraft. We are also advised by the Recovery Forces that the plan is to take the crew to Naha in Okinawa and they will be billeted there for all the post flight checks. Again the retrofire time is to be 10 hours, 4 minutes into the flight. The splash taking place 32 minutes after retrofire, that to occur in area 7-3 in area 500 miles east of Okinawa. The weather out there in that area is outstanding, waves only 3 feet, visibility 10 miles and they will come down in a daylight situation. Local time will be approximate 12:30. Two airplanes are on their way there, a destroyer is on its way there, in addition a third airplane, an amphibian capable of landing on the water if necessary is also being sent there from Naha. This is Gemini Control Houston.

END OF TAPE

This is Gemini Control Houston. Additional recovery information has been forwarded to us. We now estimate it will be about three hours after spacecraft landing that the destroyer Mason will be on the scene. While the spacecraft lands one C-54 should have already been on the scene for some 20 minutes. It will be overhead, it is equipped to pick up electronic signals as the spacecraft reenters and in general we will get most of our information from that airplane, most likely. That will be patched back through Japan and across the Pacific. A second C-54 should be there some 20 to 25 minutes after landing, along with that amphibian aircraft we mentioned earlier. The retrofire itself which is programmed to take place at 8:46 CST, ten hours and 4 minutes of elapsed time into the mission will take place over south central Africa according to present estimates. Meanwhile here in the Control Center, Capsule Communicator Jim Lovell and backup crew members Pete Conrad and Dick Gordon, are going over the reentry checklist which will be checked out very carefully with the crew. I want to emphasize that there may be considerable communications difficulties in that landing area. We are counting heavily on that relay into Japan, but at best they will be marginal. So post landing information may be a little slow in coming, but we will do our best. At 8 hours and 53 minutes into the mission, this is Gemini Control Houston.

END OF TAPE

This is Gemini Control Houston. We're 9 hours, 2 minutes into the flight and we just concluded the pass from Gemini 8 over the Coastal Sentry Quebec. This was the point, where about two hours ago, we first -- got our first reports of trouble. The trouble itself apparently started at 7 hours into the mission. Neil was over the CSQ about 20 to 25 minutes later, at which time he advised us of it. We would like to play for you now the tape conversation over the CSQ, which is primarily passing up the retro fire times, all the values they'll need onboard to do a controlled reentry. Here's that tape.

S/C We have a GMT in solid, transmitted ACQ lights on.

CSQ Roger.

HOU FLIGHT During your pass, if you have time you can ask the crew -- advise the crew that you have turned the ACQ lights on and we'd like them to see if they can pick up the Agena.

CSQ We're still trying to get a position to determine if we have any recontact problems on retro.

~~HOU~~ FLIGHT Roger

CSQ Gemini 8, CSQ Cap Com, com check, how do you read?

S/C Read you loud and clear. How us?

CSQ Read you loud and clear, we have a new TR and a lift for you.

S/C Okay, the TR we've got is counting up.

CSQ Say again.

S/C The TR we've got is counting up.

CSQ The TR you've got is counting up?
Well, the one we've got is counting down, so don't sweat it.

S/C Verified that module 4 is loaded.
It is loaded, verify 4A and 4B.

CSQ Okay, is your pre-retro check list complete?
S/C We're just finishing up restowage.

CSQ Okay, what about the left secondary O2, verify that it is open.
S/C Open.

CSQ Okay, I'm about to transmit the T 1 to you.
S/C Okay, go ahead.

CSQ Roger, verified on the ground. Transmitting a load.
HOU CER CSQ Cap Com, we want to go ahead and have you transmit the TR. Have you transmitted the TR?
CSQ Affirmative.

HOU CAP COM Is it counting down properly?
CSQ Roger.

HOU CAP COM Okay.
CSQ Okay, I have some MDRISMDIU quantities for you. First of all, let's do the banded message.
S/C Stand by a second.
CSQ Okay.

CSQ Okay, area 7-3 GET on C, 10 04 47, RET 400K,
G 2 + 02, RET RB 28 + 15, tank left 50, tank
right, 60, do you copy?

S/C Roger, understand 7-3 GET on C, 10 04 47, RET
400k, G2 + 02, RET RB 28 + 15, tank left 50,
right 60.

CSQ I have some MDIU for you. All right, ^{Core}03 33, 649, Core
04 64 690, Core 65 01 05 9, Core 66 65 46 0, Core 07
34 72 6, Core 08 4 0 8 66, Core 09 31 7 4 5, Core 10
0 2 5 10, Core 11 13 6 00, Do you copy?

S/C Roger, is that 65 Core or 05?

CSQ 65

S/C Okay, Jim, 03 33 649; 04 64 690; Core 65 01 05 9;
66. 69 460.....; 34 72 6; 08 4 08 66; 09 31 7 45;
10 0 2 5 10; 11 13 6 00.

CSQ Okay, one correction. That's 66. 65 4 60.

S/C Roger, 65460.

CSQ That's affirmative .

S/C Now about 66 90.

HOU CSQ you can tell him, hhis TR's in and counting
properly.

CSQ Would you verify your TR 2 56 circuit breaker is
closed?

S/C It's open.

CSQ Okay, would you close it?

S/C Okay, coming closed.

CSQ Okay, we'd like to know what attitude control mode do you prefer during retrofire?

S/C We don't have any choice. We'll try the Acme if that works, we'll go to rate command on the RCS.

CSQ Okay.

S/C We've just completed our restowage. Our restowage is complete at this time, it will be for all practical purposes the same as launch configuration.

CSQ Okay, we want you to set your remote timer to 15(0) 15 minutes. and

S/C Okay, now what was that retrofire time again please?

CSQ GET OC 10 04 46.

S/C Okay.

CSQ About an hour from now.

 I can give you RKV acquisition power if you like.

S/C Yes, go ahead please.

CSQ Okay, 09 44 37.

S/C Rog, how about GET time hack?

CSQ Okay, I'll give you a GET time hack. At 09 01 00.

S/C Roger. Let me give you mark at 45 you'll then have LOS. Mark.

CSQ Okay. Flight, CSQ

 We've lost all parameters and flight contact with the crew.

CSQ CAP COM

Houston Flight, CSQ Cap Com.

HOU FLIGHT

Go ahead CSQ.

CSQ CAP COM

Roger, I can barely read you, we passed up everything except the mission instructions in regard to the IVI's and - RPA and the black out.

HOU FLIGHT

Roger, we'll pick that up at Hawaii. How do your systems look?

CSQ

Okay, we verify.....

END OF TAPE

This is Gemini Control Houston, nine hours, 22 minutes into the flight of Gemini 8, and in the last few minutes we did hear briefly from the spacecraft as it passed through the Hawaii area of contact. The crew was passed up additional retro information and toward the end of the very brief period we were in contact Neil Armstrong was running through some control mode checks in the spacecraft and he reported one of the happier pieces of news we have heard in some time, that is, that he now has yaw control back on his orbital attitude maneuvering system. This was the system that he reported earlier was inoperative after backing off the Agena. He did report, however, just a minute or two ago, I timed it at 9 hours and 17 minutes into the mission that he did have OAMS control again. This will be of help to him in lining up his platform and preparing for his retrofire maneuver which is to take place at 20 degrees longitude and approximately 0 degrees latitude over Africa. We will attempt to monitor it via the Kano, Nigeria station although we have no great hopes of picking up the signal, that's slightly outside the ring of acquisition for Kano. Again, the weather out in the recovery zone continues good, our maps here show there will be at least six hours of daylight after splash, which is helpful, wave heights as we reported earlier are only three feet, and all in all we look pretty good. We'll be coming up probably in a few minutes after the Rose Knot Victor talks to them, which acquisition should take place at 9 hours and 44 minutes into the mission, some 20 minutes from now. This is Gemini Control Houston.

END OF TAPE

This is Gemini Control Houston. We have been in touch with the spacecraft over the past few minutes, a detailed briefing other than the numbers which they received earlier on the retro positions and their retro commands passed along. We acquired at 9 hours and 44 minutes into the flight. Actually the TM acquisition, the voice conversation picked up a couple of minutes later. The crew sounds quite relaxed coming into this retrofire maneuver. Among other things they were advised to drink some water before their retrofire maneuver. It was also suggested they drink some water after retrofire on their way down to the landing point. The surgeon also has suggested that each of them take a tablet of merazine, this is a tablet to avoid motion sickness. The reason being while the wave height in the landing area is only three feet, its choppy, and they suspect it might cause them to be a little seasick once down on the water. The crew has confirmed they have completed their pre-retro checklist and they^a/further medical suggestion was that if they do elect to leave the spacecraft, the suggestion is to take the medical kit along just in case. Meanwhile the C-54 whose call sign has been passed along to them is nearing the area, the impact, the landing area. It has on board three pararescue men who will leap into the water once they have the spacecraft in sight. They will have with them a flotation collar which they will afix about the spacecraft. At nine hours 53 minutes into the flight, this is Gemini Control Houston.

END OF TAPE

This is Gemini Control Houston. The pilots were counted down in the blind via the Kano Station, and Neil Armstrong, while he said nothing leading up to the point of retrofire, came back with a very reassuring, "We have all four retros, all four have fired". A cheer went up here in the Control Center, and I'm sure everyone can understand why. The contact from here is through the Kano, Nigeria station. Armstrong, after the maneuver, went on to relate that everything was in a stable condition and seemed to be proceeding satisfactorily. We want to emphasize again that there is practically no communication expected now for some time. We are going to try to reach them via the Coastal Sentry Quebec on HF after they emerge from blackout, but that signal at best will be marginal. Probably our first authoritative information will come via one of those C-54 aircraft maneuvering in the area of east of Okinawa. This is Gemini Control Houston. To recap again, we have fired all four retros. They fired successfully and the tape of that very brief conversation which lasted less than 30 seconds is now being replayed to insure that everything was proper, and after hearing it a second time, we are quite satisfied everything was quite proper. This is Gemini Control Houston.

END OF TAPE

MISSION COMMENTARY, 3/16/66, 9:01 p.m.

Tape 71, Page 1

This is Gemini Control Houston, 10 hours, 20 minutes into the flight. We've had of course, no contact with the spacecraft since retrofire. However, we assume that splash will occur about 22 minutes from now. ~~Something~~ just under 22 minutes from now. The computer is driving our display showing the descent of the spacecraft, based on the retro values we were given by Neil Armstrong by the Cano site and it presently shows an altitude of approximately 100 miles. We want to emphasize again that communications are going to be marginal, at best, in this area, we hope perhaps to get some UHF regular radio contact in the area by the Coastal Sentry Quebec. We are certain that the C54 planes in the area as well as the HU 16 will make every effort to contact their bases in Naha or in Yokusuka. And for the moment like everyone else, we're standing by and waiting out this last 20 minutes. This is Gemini Control Houston.

END OF TAPE

This is Gemini Control Houston, ~~20~~ 40 minutes into the flight. As yet, we have received no confirmation of visual contact from the area. However, all ears are cocked for such a message. We estimate that the spacecraft should be on main chute at this time based on the nominal values, based on retrofire maneuver. And, we as I said earlier, estimate splashdown will be 23 minutes after the hour. Meanwhile we've been advised that there are two aircraft in the area now, both the amphibious plane which has swimmers aboard. We also have a C 54 in the area, that has been on station for some time now. The Coastal Sentry Quebec which is some 12 or 1300 miles to the southwest has made several attempts to raise the spacecraft by UHF and HF. Let's stand by for any additional information.

Attention -- Naha Rescue 1 now says they have the spacecraft in sight. It's three miles dead ahead of them, there's no information whether they have it on the water or still on main chutes, but they do verify they have it in sight. I say again, Naha Rescue 1, which is a C54 has the spacecraft in sight. It is overhead. The destroyer Mason right now is approximately 90 miles from that point. We'll come back when we have additional information.

END OF TAPE

This is Gemini control Houston. We have just had a report relayed to us via Hawaii from the aircraft that their position is 25 degrees 2 minutes north 136 degrees 00 minutes east and they advise that they were deploying their pararescue men, there are two pararescue men aboard who have a flotation collar. They affirmed again that the spacecraft is in a stable, upright, good floating attitude. The pararescue men undoubtedly will be the first to talk to the pilots. We have had no reports of any radio contact with the airplane.

This is Gemini Control, Houston.

END OF TAPE

This is Gemini Control Houston, 10 hours 53 minutes after lift off of Gemini VIII. No additional reports from the area, we are standing by. We know the swimmers are in the water and we are assuming this dropout communications was caused by the C-54 dipping down in order to let the pair of rescue men leap into the water. As soon as they get back to altitude, we should have more information from them relayed through Okinawa and on back through Hawaii to the states. Meanwhile, the flight controllers are taking a careful look at the agena and making some plans for it over the next day or two. Some maneuvers will more than likely be attempted. The on board fuel situation of the agena is being looked at and slowly but surely, it looks like the agena will remain in business for a time and while we don't have the detailed flight plan at this point, it should be available within a few hours. This is Gemini Control Houston.

END OF TAPE

This is Gemini Control, Houston. Our situation is this, one of the aircraft in the area, we have two in the area, C-54, from which one pararescue man has leaped and a second is preparing to leap in the water. This aircraft did re-establish contact briefly with the Mason, a destroyer which is moving on the scene. It is now estimated about 75 miles from the point and the C-54 will deploy a second pararescue man momentarily and they will begin to affix the flotation collar. This represents all the information we have at this time. We will come back to you with further developments.

This is Gemini Control Houston.

END OF TAPE

This is Gemini Control Houston. We now have information to confirm that both pair of rescue men are in the water, both jumpers. Their names are, Airforce Staff Sargeant L. Huyett of Manchester, Pennsylvania, and Airman First Class E. N. Neal of Charleston, West Virginia. The aircraft is under the command of Capt. Leslie G. Snyder of Staten Island, New York. In addition to that, the Search I aircraft, an amphibian, is in the area observing the action. It is under the command of Capt. Crayton Frost of Massa, Arizona. This is Gemini Control Houston.

END OF TAPE

This is Gemini Control, Houston, 11 hours 36 minutes into the flight. We have just been advised from the ship that the flotation collar is securely around the spacecraft at this time. There are also three swimmers in the water in the area of the spacecraft and they report everything going very nicely. We still have no report on crew status, we should have something momentarily. I say again the big flotation collar, which is an aid to navigation for spacecraft floating on the waves, is securely about Gemini 8, they are floating in an upright position and there are three swimmers in the water, we do not know the identity of the third.

This is Gemini Control, Houston.

END OF TAPE

Gemini Control Houston here. We've just had a report relayed through Hawaii that the swimmers in the water have been in voice contact with the crew. The crew reports all aboard is fine. I say again, the crew reports their condition is O.K. The plan from the air is to bring the Mason, which is now approximately 50 miles away, along side to pick up the spacecraft and the crew members. This could change, but that is the plan right now. Some 50 miles away, the Mason making approximately 30 knots. This is Gemini Control Houston.

.END OF TAPE

This is Mission Control in Houston. We have just received word that both astronauts are onboard the destroyer USS Mason. They were both onboard at 12:30 CST. The plan now is to go on to Naha where they will off-load off the destroyer. We had a report a few minutes earlier that they astronauts were standing up in the spacecraft with their sunglasses on, smiling and waving. We'll have further announcements later on. This is Gemini Control.

END OF TAPE

This is Mission Control in Houston. We now have word that Gemini 8 spacecraft is on deck of the destroyer, Mason. It was lifted on board at 12:38 AM, Central Standard Time. The astronauts were lifted on board, rather climbed on board, 8 minutes earlier. A Jacob's ladder, which is a rope ladder, was thrown over the side and the two astronauts climbed up the latter to the deck of the destroyer. The Mason is now steaming toward Naha, in Okinawa. The Agena spacecraft is now over the South Pacific, it's 15 hours and 51 minutes in its flight. The Flight Controller reports the Agena is looking good. Plans for the remainder of the night are to take memory readouts from the Agena at stations around the network. The flight plan is now being updated, and the plan now is to pick up the Agena burns earlier than previously planned. No burns will be scheduled earlier than 8:00 AM in the morning, Central Standard Time. The Agena is now in its 10th rev, at 15 hours and 51 minutes into its flight.

This is Mission Control, Houston

END OF TAPE

This is Agena Control at Houston. About 25 minutes ago, a small burn was performed by the primary propulsion system engine on the Agena. The burn time was approximately 2.2 seconds in duration. The ground elapsed time when the burn took place was 23 hours and 24 minutes into the Agena mission. This burn put the Agena into a 160 by 218 nautical mile orbit. It has been determined by the flight controllers that a minimum of five hours space will be placed between each burn. This last burn took place over Carnarvon at approximately 8:24:58. This is Agena Control in Houston.

END OF TAPE

This is Houston Mission Control. We have word here that a medical officer onboard the USS Mason, a Lieutenant Paul Fukuda, who was assigned to the Mason for this mission, just completed an examination of the astronauts. Both were in excellent condition. The blood pressure tests were completed and blood samples taken. Just a few minutes ago at about six minutes after midnight their time, which was 9:06 our time, and the astronauts were reported as resting and "hungry" and having what they called a light lunch of steak and eggs. The Mason is now reported at, an hour ago, was reported at 25 degrees, 42 minutes north, 131 degrees, 45 minutes east, with a steering course of 272 at 30 knots and they were riding well on smooth seas. The Agena is now over the Atlantic Ocean on its 16th rev. A few minutes ago we had a burn of 10^4 delta v which placed the spacecraft in a 160 by 218 nautical mile orbit. Prior to this burn it was in a 160 by 161 nautical mile orbit. The burn was conducted over Carnarvon in the fifteenth rev. The next burn is scheduled to take place some four hours from now. And this burn will take place over Hawaii, and this will be a circularization maneuver. It will also be a 10^4 feet-per-second burn. Some dispersions are expected in this burn, and will be trimmed up later on with the secondary propulsion system. Out of plane and in plane burns will be conducted until fuel depletion, and this will probably throw some dispersions into the orbit. However, these will be taken out later with the SPS, secondary propulsion system. This orbit is good for 210 days, or about seven months. It will be when we get into the circularization maneuver, get the Agena into the circularization mode. Right now we are 24 hours and 19 minutes into the Agena mission. This is Mission Control Houston.

END OF TAPE

This is Mission Control in Houston. Astronaut Wally Schirra, who was on a personal appearance tour in the Pacific, is presently in Hawaii, and he along with Dr. Donald S. Catterson will fly from Hawaii to Okinawa to meet the Gemini 8 crew. Schirra and Dr. Catterson expect to arrive in Okinawa shortly after the USS Mason docks there. They will pick up the Gemini 8 crew and return to Cape Kennedy. It's normally about a 20-hour trip from Okinawa to the Cape. At the Cape, the Gemini 8 crew will have a normal nine-day debriefing. This is Mission Control in Houston.

END OF TAPE

This is Gemini Control Houston. A press conference will be held today at 12:30 CST at the Houston News Center. In the course of this press conference, we will play all of the tapes starting just before the difficulty developed in the flight last night. We'll start with the Tananarive pass and carry all the tape recordings we have right through to retrofire. From the Mason we received a report about 50 minutes ago at 16:11 zulu time. It is now 17:06 zulu. That both astronauts have had a hearty meal of steak and eggs and are now sleeping. The Mason's position at 16:00 zulu was 25 degrees, 39 minutes north; 131 degrees, 22 minutes east. It's proceeding on a course of 272 degrees at 30 knots. The Mason estimates it will arrive at Naha at 23:00 zulu time today. Meanwhile, a party headed by Capt. Wally Schirra has departed Hickam Field in Hawaii in an Air Force 707. Capt. Schirra, along with Dr. Duane Catterson and other NASA people, will land also are estimating Naha at 23:00 zulu today. This is Gemini Control Houston.

END OF TAPE

This is Mission Control Houston. Scheduled burn in the new Agena flight plan was made at 28 hours and 44 minutes into the flight of the Gemini. This was a little over an hour ago in the 18th rev. The purpose of this maneuver was to circularize the orbit. The burn was a PPS burn, a primary propulsion system burn and it took place at 1:44 p.m. CST over the Hawaii station. The burn was at apogee and resulted in a 219.9 by 219.7 nautical mile orbit. The maneuver was aimed at a 220 circular burn. This new orbit is considered excellent. The SPS thruster fired to the burn for ullage of the fuel. The primary propulsion system was initiated for a two-second duration burn of 10⁴ feet-per-second. Hawaii reported that the burn events looked good all the way. The burn was made with the TDA, target docking adapter of the Agena forward in a tight control mode. After the burn was completed, the Agena was returned to a loose control mode to conserve fuel. In this mode, less than 5/100 of a pound of fuel is used each hour for attitude control. The Agena is now in a zero roll, zero pitch, zero yaw attitude. Later today the scheduled plane change burn will take place. This is now set for 6:17 p.m. CST, and will be over the tracking ship CSQ. The Agena will be TDA north with a burn of 1600 feet-per-second out of plane. The burn is expected to move the Agena about one point five degrees out of plane to the north. The Agena is now in the 19th rev. coming up on the Pacific at 29 hours and 52 minutes. This is Mission Control Houston.

END OF TAPE

...the command for the primary propulsion burn which is scheduled to take place about 6:17 CST was loaded into the Agena over the Coastal Sentry and the 21st rev, and the proper loading of the command was confirmed over Hawaii. In addition to the load command, a VM cutoff was loaded. This is the velocity meter that measures the velocity to be gained and then cuts off the primary propulsion system burn at the proper moment. The inclination of the Agena spacecraft after the circularization in the 18th rev at 1:44 p.m. today was 28.88 degrees, this was a change of 2/10ths of one degree in the inclination of 28.86 prior to the burn. The scheduled 1600 foot per second out of plane burn will cause the inclination to go to 30.37 degrees, or make the orbital path curve fatter. This will make the Agena go farther north and farther south of the Equator. The present orbit is good for seven months or about 210 days. The onboard power is described by the flight controllers as being fat. They started with 2580 amp hours of power on board and they still have in excess of 2200 amp hours of power left. The scheduled PPS, or Primary Propulsion System burn is scheduled to take place in the 22nd rev over the CSQ. We are now 32 hours and 28 minutes into the Agena mission. This is Mission Control Houston.

END OF TAPE

This is Mission Control in Houston. We just got word that the U. S. S. Mason with astronauts Armstrong and Scott is now entering the Naha Harbor in Okinawa. Both astronauts are rested and they just completed a hearty breakfast a little while ago and were taken on a tour of the Destroyer Mason. We just received this message just a few minutes ago. The Agena spacecraft now has started its 22nd rev and is 32 hours and 38 minutes into the mission as the Agena crosses the south Atlantic. This is Mission Control in Houston.

END OF TAPE

This is Mission Control Houston. The primary propulsion system burn that was scheduled to take place at 17 minutes after the hour of 6 has been postponed by the Agena flight controllers here in Mission Control. In checking the data in the stored program command mode in the Agena memory, they discovered a slight error, and this is being corrected now. Plans are to make the burn in the next revolution. This burn is a plane change burn of 1600 feet-per-second with the target docking adapter pointing north. This burn is out of plane and it's to see how accurately a plane change can be made and to determine how much in plane velocity results from an out of plane burn. As I said, they are now correcting the error that was discovered in the Agena memory that they had fed into it earlier, and the plans are now to make this burn in the next revolution. This is Mission Control in Houston.

END OF TAPE

This is Mission Control in Houston. We just got word a few minutes ago that the USS Mason is now at the dock in Naha, Okinawa with the Gemini 8 crew, astronauts Armstrong and Scott. This was about 30 minutes ago when the Mason docked in Okinawa, Naha, Okinawa. They were getting the gang-plank in place, and astronaut Schirra was standing by on the dock to greet the Gemini 8 crew as they came off the ship. We have a little more information on the primary propulsion burn that was erased by the CSQ on this last pass. That was in the 22nd rev. It wasn't originally scheduled to take place here, but they discovered an error in the stored program command load in the Agena memory. That is being corrected now, and the plans are presently to make the burn on the next rev. over the CSQ. This will be at approximately 8:00 CST. This is Mission Control Houston.

END OF TAPE

This is Mission Control in Houston. We have just been advised that the Change of Shift Press Briefing has been moved up and is scheduled now for 7:00 p.m. instead of the 7:30 time that was scheduled earlier. Mr. Hodge and some of his people will be going over to the News Center in Building 6 in Nassau Bay across from the Manned Spacecraft Center in just a few minutes. We also have another little bit of information from the USS Mason in Naha, Okinawa harbor. Astronaut Schirra boarded the USS Mason about 10 minutes ago and went onboard to greet the Gemini 8 crew. The Agena is now over the mid-Pacific in its 22nd revolution around the earth at 33 hours and 41 minutes into its flight. This is Mission Control in Houston.

END OF TAPE

This is Mission Control in Houston. The primary propulsion system burn on the Agena has been delayed and at the present time the earliest time that the PPS burn would be scheduled by Flight Director Eugene Kranz is around 2 a.m. tomorrow morning. This 1600 foot per second burn is a burn of about 20 seconds in duration and is planned to be burned north out of plane, that is with the TDA pointing north, Target Docking Adapter pointing north, and this is to see how accurately a plane change can be made with an Agena and determine how much in-plane velocity would result from an out-of-plane of this type. As I said this burn, this PPS burn has been postponed, or delayed, and would possibly be made around 2 a.m. tomorrow morning by the Flight Controllers who will be on duty here all night. In any event they will be here monitoring the systems of the Agena, making certain that the temperatures remain normal, within the systems. They will be monitoring the guidance for consumables in the attitude control system that remain, primary propulsion system, and the secondary propulsion systems fuels. At the present time, the Agena is over China in the 22nd revolution around the earth and some 34 hours and 51 minutes into the flight. The Flight Director wanted to make certain that St. Patrick's Day didn't pass unnoticed in the Mission Control Center and when he came in this evening he had on a green bowler. I don't believe he's Irish, with a name like Kranz, but nevertheless St. Patrick's Day did not pass unnoticed here in MCC. This will be the final announcement from the Control Center tonight and any newsmen requiring information on this burn that may be performed later tonight may obtain said information by calling the NASA News Center in Houston. This is Mission Control.

END OF TAPE

This is Mission Control in Houston. During the night, the flight controllers conducted some exercises with the Agena spacecraft. Two burns were performed, a plane change burn of 1600 feet per second and a minimum impulse of 96 feet per second. The plane change burn was performed at 1:57 a.m. CST this morning. For some reason the yaw angle was off slightly. This caused a posigrade in plane velocity component. Flight controllers think this is possibly caused by the center of gravity not being defined as well as it should have been. When the primary propulsion system engine started the gyros sensed the Agena primary propulsion system was not burning through the center of gravity so the engines gimbaled to make the correction so that the burn would go through the center of gravity. This introduced a dispersion into the guidance and the result that the out-of-plane burn added energy to the orbit and raised the apogee to 336.1 nautical miles, with the perigee remaining at 220 nautical miles. Actually what happened, the spacecraft was not pointing at the right angle and this caused the dispersion. However, the inclination angle that they were aiming at came out nearly as predicted. The dispersion effects of the apogee only, causing it to go up. The inclination angle changed by about 1.7 degrees. Now the minimum impulse burn which was performed a little while ago at 6:43 a.m. was a 96 feet per second burn. This was a retro burn with the TDA, target docking adapter, pointing west, or the Agena spacecraft was flying backward. The burn was performed over the Eastern Test Range and at perigee, this has a tendency to lower the apogee, this brought the spacecraft into a lower perigee. The perigee is now 278.6 by 219.9 nautical miles. The spacecraft is now coming up on the West Coast of North America in the 29th revolution around the earth, 47 hours and 12 minutes into the flight of the Agena. This is Mission Control in Houston.

END OF TAPE