

ORAL HISTORY TRANSCRIPT

RICHARD F. GORDON, JR.
INTERVIEWED BY MICHELLE KELLY
HOUSTON, TEXAS – 17 OCTOBER 1997

KELLY: [This] interview of Richard Gordon was conducted [at the Johnson Space Center] in Houston, Texas on October 17, 1997 by Michelle Kelly and assisted by Carol [Butler].

KELLY: ...The first question I'd like to ask you is how you decided to join NASA and how you got involved in becoming an astronaut?

GORDON: Oh, the involvement is really kind of basic. All my peers were involved in the program. I should explain that a little bit. I was at Naval Air Test Center in Patuxent River, Maryland and just graduated from test pilot school in July of 1957. And when Sputnik flew in October of that year, it obviously got everybody's attention. And it wasn't until 1959 when the seven Mercury guys flew and I knew all of them at that time. Even though I was in the Navy, I had worked with the Air Force people on several projects at Patuxent River. Al Shepard [Alan B. Shepard, Jr.] happened to be an instructor of mine in test pilot school.

KELLY: Oh, really?

GORDON: And I knew John [H.] Glenn [Jr.] because he was the desk officer in the Bureau of Aeronautics and he had flown one of the things that I had done later on in 1961. But he was

the project officer for the F8U-3. And General, now, Tom Miller was the F-4 project pilot. That's one of the projects that I worked on. So knowing them and being involved in that work, I was not in a selection group for the Mercury. I keep telling those guys that I was far too young to have been accepted. But in 1962, I was involved in the second selection process. And it was, really, when you think about it, it's a normal professional evolution, if you will. You learn to fly and we were all carrier pilots when we went to test pilot school and space, obviously, is the next addition to it. So 1962 came around and they said, "Would you like to participate in the selection process." All the hands go up and all that. I failed for selection at that time. And fortunately had an opportunity then when the selection came about in 1963 and was selected at that time.

KELLY: And can you tell me a little bit about the selection process and what you went through to become selected?

GORDON: Well, in a nutshell, the selection process, it's kind of interesting, because it's a computer run that you had the basic requirements to become an astronaut. Age, experience, blah, blah. Do you desire to continue in the selection process? And then the affirmative, of course, then gets you invited. At that time in 1962, was a week of physicals at the School of Aerospace Medicine in San Antonio, Brooks Air Force Base. A week as an out patient, a full week of extensive physical examinations. Those that passed that satisfactory were invited to back to Houston, I believe it was in Houston at that, yes it was, it was Houston, for a week of technical interviews. And then after that was over, go back home and wait for the process to

be completed. And there were nine guys selected in 1962. Repeated the process in 1963 and I was one of fourteen people selected in that year.

KELLY: And once then you did become selected, they went through an extensive training program from what I understand for the new astronaut group, or astronaut candidate group.

GORDON: Yeah, they had somewhat of a syllabus. It wasn't firmed, really firm academically but they had a syllabus where we went to kind of ground school for about six months. Academically, as well as, learning pieces and parts of hardware, what spacecraft were all about, what rockets were all about, and that sort of thing. And at the end of that period, we were all assigned to arenas, or areas of, so called, specialization. I'm not so sure that that's the proper terminology. But I was assigned to look and monitor cockpit design for the Apollo spacecraft. Gemini was already well on its way so there was no activity for me in that. But the Lunar Module and the Command Module cockpit design was under my auspices for a period of time.

KELLY: Oh, really? And I understand that you received that assignment because you were probably one of the most experienced test pilots of the group.

GORDON: Of course I was.

KELLY: Well can I ask you a little bit what you did and did you work with some of the engineers in the design or did you make early recommendations or ...?

GORDON: Basically, the design is somewhat basic but you work directly with the system engineers, here at the center. You know in the cockpit, you've got all the systems. You got the navigational system, the electrical system, communication system, propulsion system. So you're really involved with all of them....So that gave me an opportunity to get to know each of them here. In addition to that, you spend a tremendous amount of time at the contractor facility. And in the case of the Command Module, we were always at Downey, California. Fly out on Sunday night and come back Friday night after work. That type of thing. And we did the same thing with the Lunar Module with Grumman Aircraft in Bethpage, Long Island. So it was coast to coast operation. Unfortunately we were in Houston so we had to fly in from Houston to New York or Houston to L.A. And we kind of rotating and it depended upon what was scheduled in the review process. We had systems set up where you had a preliminary design review. Well, all of the system engineers and the contractor engineers, as well, would get together and critique what the design was at that time. Now, the first one was called a preliminary design review [PDR]. And then after those problems that were identified in a PDR were corrected, hopefully, then we had a critical design review. And after that was completed and problems corrected, then you went right into actual manufacturing. So that was the process that we went through.

KELLY: And what types of problems or challenges did you find in designing the Command Module and the LM [Lunar Module]?

GORDON: Oh, mostly arguments between what the government wanted and what the contractor wanted to provide. But those were normal. I don't mean to be that they were confrontational necessarily although sometimes they were. Because every time you change something, you're talking evaluation of delays and costs and those kinds of things. And we were under a great deal of pressure ... I shouldn't say great deal of pressure ... but some pressure because the edict that President [John F.] Kennedy sent down in 1961 that we were going to go to the Moon before the decade was over. So there was always that in the background. So we wanted to do things in a hurry but we wanted to do it properly and right. So there was always that conflict and that mix but things went fairly well until we had the fire.

KELLY: And can I ask you a little about that? Did you become involved after the fire in redesigning the Command Module?

GORDON: Yeah, most of us did. Frank Borman, of course, was on the review board at that time to determine the cause of the fire. And that was the only one ... well, we were first going to fly two of them. Block, so called, block one vehicles and they were only designed to go into Earth orbit. But after that, we decided that, or NASA decided they'd go immediately to the, so called, block two. Incorporating all those fixes that were identified from the fire. Number one, a quick opening hatch. One that you could open within seconds rather than taking minutes to open. And there's a story behind why that hatch was designed in that manner to begin with. But then had to eliminate all flammable material which ... creature comforts, we had a lot of flammable materials in there for our convenience and the things that

we needed to do. The redesign of the spacecraft itself in the terms of potting of the instrument panel, wire tray runs, we protected electrical wiring throughout the spacecraft because this was assumed to have been the source of the ignition in Apollo 1. So we had worked on those things and worked very closely with the contractor as well as the other new thing that was in the block twos, the tunnel and the docking mechanism, the probe, if you will, that they put on the Command Module. So once those things were done, we were ready to fly and finally in October of 1968, we were back on track again.

KELLY: And can I ask you what you think perhaps NASA's most valuable lessons learned were at that time after the fire and redeveloping the Command Module?

GORDON: Well, we did one more thing. The probably the big thing they learned that, we were very, very fortunate and we became complacent because of the environment we were working in, 100% oxygen in both Mercury and Gemini. And all of a sudden here ... and that had been an original design argument to begin with, mixed gases as opposed to 100% oxygen. But we had been successful for ten Gemini flights and six Mercury flights and so we were operating a Command Module with a 100% oxygen. At that time, we seemed to have no problem but we had flammable material and 100% oxygen. And all that was needed for a disaster was a source of ignition. Well, we found that too. But I think that was probably one of the biggest things in the spacecraft, the design of the hatch was axiomatic. It evolved very logically. But the reason it took a long time, we had to start designing systems in the vehicle that would provide nitrogen and oxygen, at least for the pad operations until we got into flight. Then as the atmosphere leaked out, which it does at a very slow rate, nitrogen would

be replenished with oxygen so eventually, in flight, we were back to 100% oxygen. But I think that in itself, the time to redesign and test between January of '67 fire and October of '68 flight. Took a while to get those things done.

KELLY: I understand from some of the other people with whom we've spoken about how they felt at time when they learned about the fire. And how did you feel when you learned of it? Were you surprised at all or?

GORDON: Oh, I think that we were all shocked about it. I certainly was. You know, we hadn't contemplated anything like that. And here was a routine test on the pad. Who would have suspected anything like that was going to happen in that particular environment. And I think it was a shock that it happened. I think it provided resolve in all of us that we were going to continue and do the things we had to do to accomplish President Kennedy's edict that we were going to go to the Moon and safely come back before the decade was over. Recognizing we had a problem, the ability to correct and do something about it, and a strong desire to continue with that commitment. Because we could have very easily said, "Well, this isn't worth it." But it is worth it.

KELLY: Absolutely. And it seems like that was a really extensive project for you to be involved with?

GORDON: Well, I'm sure it was. It was about that time, of course, when I finished my Gemini career in September of '66, I was reassigned right away to an Apollo crew. So we

were involved in that. I was part of Jim [James A.] McDivitt's crew as a backup Command Module pilot. So we were immediately involved in taking the second, excuse me, it was the third Command Module but the first Lunar Module into flight on Apollo 9. So we were happily involved with all of that activity. And we were very concerned with about the weight of the Lunar Module. It was overweight like some of us are today. And we had to go through a super weight reduction program. So that, of course, delayed some of the early Lunar Module flights to the Moon because they were overweight and didn't have the capability to perform a lunar landing.

KELLY: I was wondering if we could go back a little bit to Gemini?

GORDON: You can go back to anywhere you want.

KELLY: And talk about some of your experience on Gemini. And I understand that you were assigned as part of the backup crew of Gemini 8. And what was your work like in preparing for that mission? Did you work very closely with Neil [A.] Armstrong and Dave [David R.] Scott?

GORDON: Oh, very much so, very much so. Pete [Charles C. Conrad, Jr.] and I were backup crew. And you obviously ... when you first start out, you do everything together. Everything is identical. You go to the same places, you do the same thing. And it's not until very near the end that the backup crew kind of steps back a little bit and lets the primary crew take the load of the training because this is really what it's all about. But Gemini program was very

interesting. When President Kennedy said we were going to go to the Moon, we hadn't even been in orbit yet. You know, what's this idiot telling us that we're going to the Moon, we haven't even been in orbit so we had a lot to learn. We had to learn ... the essence of the Gemini was to give us the experience that we needed to go to the Moon. Long duration, we hadn't even been in orbit yet. So we had to at least stay in orbit, or zero g, for ten days which was the design mission to the Moon. We did that with Gemini 7, staying in space for fourteen days. And the next thing you started working on which was essential to Apollo was docking, or excuse me, was rendezvous first. You have to rendezvous first before you can dock. In other words, you have to meet before you can link up if you catch my drift. So the rendezvous problems were many and varied and we tried a lot of different techniques from 6, 8, 9, 10, 11, and 12, different ways to accomplish a rendezvous. And then, of course, the docking procedures with the Gemini vehicle. That, with the maneuverability of Gemini, we could change its orbit which you couldn't do with Mercury. Once you were there, you were there. We could maneuver during reentry so that we could, hopefully, navigate to a precise landing in the water. In addition to that, Gemini, even from Gemini 4, gave us a little bit of insight into extravehicular activity. What was required to do those kinds of things. So it led to some of the redesign or the design of the Lunar Module suit. The environmental control system that you worked in to control metabolic rates and those things. So Gemini was a very, very important bridge between Mercury and Apollo. And it was essential that we did ... it was a very exciting time too because we were flying. Once we started flying with Gemini 3, we were flying every two months...I need a glass of water too.

KELLY: Would you like to stop for a moment?

GORDON: Yeah. OK. That was basically the reason for Gemini. And my first crew assignment was backup Gemini 8 with Pete Conrad. And, of course, Neil Armstrong and Dave Scott flew that flight.

KELLY: And did you work with mission control after you found out that Armstrong and Scott had been gyrating wildly after they got ...?

GORDON: I was actually in Mission Control at the time. We seemed to gravitate toward there and stay up when the crew stayed up. As the backup crew, you're usually behind Capcom, Capsule Communicator. I don't know why they would call it capsule anymore but I guess we still do. But we were there to help them. Interpreting what the crew was doing and where they were at that particular time. That was a little hairy if that is the proper word to describe the event as well.

KELLY: It sounds like it.

GORDON: Oh, they were in trouble. We didn't really realize that at the time but when we got a look at the revolution rate that they were experiencing and that thruster staying on, until they got that under control, they had a problem.

KELLY: And were you available to help them in any way?

GORDON: Oh nope, just sitting there helping the Mission Control sort that thing out. And actually they had that problem out of, I think if I recall correctly, basically out of communication. They solved it and they solved it by using the reentry control system. When they came back AOS situation, acquisition of signal. When we learned that they had indeed activated the recovery system, well that was the end of the flight. They were obligated to reenter at the first opportunity. The only Gemini flight that landed in the Pacific Ocean.

KELLY: And then, moving on. You went onto become a pilot on Gemini 12 then, I'm sorry, Gemini 11?

GORDON: Deke [Donald K. Slayton] had a, apparently, a three flight rotational system set up for crews rotating from prime to backup which didn't hold true in all cases because every now and then, he'd slip somebody else in as he did on our backup crew. I flew our backup on 8. Three more flights later, I was prime on 11. Consequently, it happened with my experience in the Apollo program as well. So we came off the backup crew for 8 and were immediately assigned to Gemini 11.

KELLY: What was your experience like on 11. Once you got up, I understand, you conducted one of two EVAs [Extravehicular Activity]. And on your first, particular, EVA, I understand that you did some work in trying to create artificial gravity. And I'm wondering if you wouldn't mind elaborating on that EVA and part of your mission?

GORDON: Well, that was something I was looking forward to a lot. We had not been too successful in doing work outside the spacecraft in EVAs. If you talk to Gene [Eugene A. Cernan]. Well Gene Cernan had a problem on 9. Of course, Ed [Edward White II on Gemini IV] was very successful because he didn't have to do any work. All he got to do is have fun, float around outside. But Gene had trouble on 9. And that was basically a metabolic problem as well as anything. Mike had some problems on 10 in getting to the other Agena and being able to control himself. And I thought we had a pretty good handle on that for 11. The experience that we gained in training in the zero G airplane looked like we were going to be okay but we, once again, had problems. I got myself in a real bind. Pete and I were so jacked up for that EVA and excited about it that we actually completed all of the procedures at least an orbit, or an hour or so, before we were to go out. So there we were sitting there in a pressurized suit getting ready to go outside. Well the last thing I had to do was put this gold visor on my helmet. And I couldn't get the damned thing on. I mean I struggled and struggled with that thing and apparently. <Loud noise - microphone drops> Golly!

KELLY: That's all right.

GORDON: You know what I'm going to do. I'm going to put that right there if that won't bother anybody.

KELLY: No problem.

GORDON: We were so far ahead of the procedure list that we were sitting there in those pressurized suits and when it came to for me to put the visor on, the fit tolerances were tighter than I had anticipated. Even though I had put it on my helmet before. I'd probably done it without the suit being pressurized. And I struggled with that thing. Tried to arms up there and get that gold visor over my helmet. I totally exhausted myself. I even put my head down inside that cockpit and had Pete try to put it on. And we couldn't get...and finally I got the thing on but I was behind the power curve, if you will, in terms of metabolic rate. So I had really worked up a real heat load in there. And then when I got out of the spacecraft. We opened the hatch and I flew out with all of the debris. And the first thing that I had to do was to install the camera on the outside. Which was easy enough to do because I was still basically standing on my seat and being able to hold myself in. But then the next thing I was to do was to propel myself to the Agena and attach the tether which would keep the two vehicles together. It had a 100 ft tether on it. And in training, I had been able to always wedge my legs between the Agena and Gemini spacecraft. And then be able to use both hands to attach the tether. Well, I couldn't keep myself in that position. I kept floating away so I ended up having to hold the docking bar with one hand and put the tether and the locking mechanism on there with the other. And I've always equated that to the task of trying to tie your shoelace with one hand. And that was a lesson we brought back from that EVA. And I was so far behind the power curve with metabolic rates. I was perspiring. My eyes were stinging from my salt solution that they decide to quit. But the lesson learned there, which finally Buzz [Edwin E. Aldrin, Jr.] did it on Apollo 12, was we need restraint systems when you're out there. And developed those restraint systems whether it was a place for your feet, a window washer belt, or something that keep you in place while you have both hands free.

Because if you don't do that, you're just going to float away or float off somewhere else. That was the basic lesson there. Painful for me because I wanted to complete it. I was supposed to go back to the adapter section and eventually have a little propellant system that I could fly around with and never got to do it. So that was the end of that.

KELLY: I have a classic picture here of you.

GORDON: Oh, ride 'em cowboy. Yea, that's it. That was it. You see how I have my legs wedged between the collar on the Agena and the spacecraft and it just wouldn't stay there. But that's it. One of those pictures. And I'm trying to use both hands to work. I finally couldn't do it, I had to hang on to the docking bar with one hand and operate the thing with the other. The second EVA was easy. That was no problem at all. It was basically one of looking at source of UV in the solar system. Standing up in the hatch, outside the spacecraft, but pointing this camera or the spacecraft at a particular area in the solar system where the dark places where they suspected that there may be...UV photographs that they were taking. Actually, Pete and I, in the two orbits they were doing it, I fell asleep during EVA. So that's how difficult EVA is when you can fall asleep. It was a totally different experience.

KELLY: Was that really true? I read that you and Mr. Conrad both fell asleep.

GORDON: True! Daytime I was leaning up against the spacecraft and he was inside like this. We were going over the Atlantic and he said, "Hey Dick, guess what, I fell asleep." And I said, "Guess what, I did too." It was nice and warm and cuddly. Back in the womb, you

know. I'm nice and snugly. But it was a totally different experience between the two because one was so easy. And Dr. [Robert R.] Gilruth had suggested that maybe it would've been better off if we'd reversed the two EVAs. And I think he has a point. Because, I think, the more you're in that environment the more you pick up and the more you learn. And by that time, I would've not had the problem with that bloody damn visor. I wanted to throw that thing as far as I could throw it. But that's life.

KELLY: And what kind of training did you undergo to prepare yourself for the EVAs?

GORDON: Two methods basically. I had an air bearing table here at the center that we used for the propulsion gun I had to propel myself as part of the experiment. That, and the zero G airplane. And those were the basic two training devices except, you know, going through the procedures step by step by step in one G while you're back there looking at the backpack that you were going to put on and that sort of thing. And that's just to get you familiar with step 1, step 2, step 3, on through the recipe book. Unfortunately, we hadn't learned to use the water. This is what Dr. Gilruth had come up with after 11 as well. He said, "We have got to do something different because we're not succeeding very well." And he came up with the idea of utilizing underwater training which simulated, if you didn't try to swim in the water, if you let the environment, pretended like you were in zero G. And they could put weights on your pressure suits so that you could actually think you were in zero G. So it gave us a much better feel for what tools were needed. And it also gave us a better feel for the timeline. In other words, we could stay in the water and stay there for an hour and continuously go on and do the work. In the zero G airplane, you got 25 seconds of simulated zero G going over the

top of the parabola, and 2 G pullout and then you're recovering again. So you're always starting each parabola from a very stable position which led to false assumptions as well. But there wasn't enough of the right training for that. Finally we learned how. It's like a school teacher, you do it over and over again until you get it just right.

KELLY: And I understand on your mission on Gemini 11, it was the first mission that you rendezvoused and, I believe, docked on the first orbit?

GORDON: Yes.

KELLY: And can you tell me a little bit about your work in that area?

GORDON: Well, we approached the rendezvous problem, do KISS, [keep] it simple stupid, to begin with so things worked fairly under control and stabilized. And I think the first one was done with, what they call, M equals 4. In other words, four orbits to make adjustments with the orbits to stabilize. Well there's four times one and a half, that's six hours of rendezvous activity. The lunar mission, because of the short life span of the ascent stage said that we couldn't afford to do things like that in case we had a problem. So we had to rendezvous much faster than that. So we came up, or the people here at the center came up, with the idea that we shouldn't be able to rendezvous within the first orbit. And there was a lot of controversy about that. It was going to be too expensive in terms of fuel and this, that, and the other thing. Well, it did cost a little more fuel but it was pretty dynamic and pretty exciting when you're launched after the Agena and your rendezvous was by the time to get to

Hawaii and dock was by the time you get to the United States. So it was a different way, a different method, of rendezvousing which cut down the time required for rendezvous. It gave you all the rest of that time to take care of other problems that may or may not develop. And it eventually was the way that we rendezvoused on all of the lunar missions. 11 and 12 did somewhat of a hybrid rendezvous technique because we had a CDH [Constant Delta Height], and I forget even what all these terms are now, but it took a little longer than a direct ascent rendezvous. But basically the rest of the missions did the same thing that we did on Gemini 11, they rendezvoused within the first orbit.

KELLY: Now did you work with sextants, did you work with computer guides? What type of navigational tools did you use?

GORDON: In Apollo, we used a sextant and radar. There are two things. In the Command Module, we had the sextant sighting on the Lunar Module and we also had a ranging device from the VHF. We could tell the ranging. You'd tell the computer what those sextant angles were and what the range the VHF said and it would make the computation. On the Lunar Module, it had radar which was its primary method of rendezvousing. So the two were complimentary and very, very accurate.

KELLY: Did you use similar devices on Gemini 11 as well?

GORDON: I'm almost sitting back here trying to figure out what we did use. We had the ground providing calculations and the other way we did was to calculate angles against time

and I had charts. And I would look into, kind of lookup, enter here, exit here, type thing that would give us the velocity correction that we needed for rendezvousing. And of course, we got that information from the rendezvous radar that was in the Gemini spacecraft.

KELLY: And did your work on Gemini 11, as far as rendezvous and docking were concerned, really help you out in your mission on Apollo as well?

GORDON: Almost identical.

KELLY: Really?

GORDON: Yeah. Yeah, except, of course, in Apollo you had a partner in the other vehicle that was doing the reciprocal calculations. So then you compared notes. So basically, the techniques were virtually the same. So we, Pete and I, have always felt very comfortable with that kind of rendezvous because it was the only thing we really worked at. Of course, when I worked on backup on 8 and 9, they did things a little different too.

KELLY: And then I'd like to ask you a little bit about your transition into Apollo. You had mentioned earlier how you were working with the modules themselves and their development. How did you find your transition between the Gemini and Apollo programs since Apollo was already underway once you'd finished up with Gemini 11?

GORDON: Well, it was a transition between the two. I was working on the spacecraft and its design on Apollo. I was taken off of that and put in a Gemini. I mean I was assigned to a flight crew. So I was working on Apollo for a period of time up until we started training for Gemini 8, and then I sat on a flight crew. And from that time on, I was on a flight crew until I retired, or virtually until I retired. So then when Gemini 11 flight had finished in September of '66 then we were right back in the Apollo, picking up virtually on where we had left off before.

KELLY: And was the training, at all, any different?

GORDON: No, more the same. You know, more complicated. The vehicles were more complicated. The things that we were trying to do were more complicated. The simulators were much more sophisticated. So the transition was easy. I mean it was not that difficult. You just had a different vehicles and more sophisticated training devices and you stepped right into it. It's like going from say a DC-9 to a 747 type of transition. And it's things that you could easily make without any problem.

KELLY: That's great. And I understand you were then assigned to the backup crew of Apollo 9?

GORDON: Um huh.

KELLY: And when you were assigned to that backup crew, was it known as Apollo 9 at that point?

GORDON: No, I think not. And I'm just trying go back. I've always been mad at Jim McDivitt because we could have been on Apollo 8 instead of Apollo 9. And there's a significance to that.

KELLY: Can you tell me a little bit about it?

GORDON: Well, as things turned out, the decisions that were made after 7 flew which was nothing more than, nothing more, the first flight of the Command Service Module. Then we were ready to fly Apollo 8 and we didn't have a Lunar Module for it. So what are you going to do with Apollo 8. Jim's [James A. McDivitt] crew was the next one up. I mean in a normal rotation of things, he would have been assigned [Apollo] 8. But he, in his own reasons and wisdom, as the crew commander, wanted to stay with the Lunar Module. He had worked...as a crew, we had worked on the Lunar Module so long that he wanted to go ahead and stay with the flight that would have the first Lunar Module with it. And I don't recall all of the machinations that went on then with Frank coming on to Apollo 8 and Mike Collins had surgery about that time and then Jim Lovell [James A. Lovell, Jr.] took his place, Bill [William A.] Anders was on 8. And the decision was made since there was no Lunar Module to send it to the Moon. Which in retrospect, was a pretty damn bold decision because if we had done that and it was Apollo 13 they would have never had gotten back because the Lunar Module was the only thing that saved them. So I look back at that and say, "You know, that

was a pretty damn bold decision and the proper one to make at that time because why repeat the same things that Apollo 7 had done.” So they decided to something different with Apollo 8. And in those days, we had other plans. First of all, we were going to go into real high elliptical orbit and test the heat shield gradually up to thirty six thousand feet per second and all that sort of stuff. And that got all modified, thankfully, or we’d never made it before the decade was over. But with that decision having been made and Jim wanting to stay with the Lunar Module, Apollo 9 became the first flight of the Lunar Module in Earth orbit as well. So that’s where we were. We were still the backup crew for McDivitt and his crew which was Dave [R.] Scott and Rusty [Russell L.] Schweickart. So I’ve always blamed Jim McDivitt for not letting his backup crew be on Apollo 11.

KELLY: I think I understand. And I understand then, just from your inference, the reason why you are disappointed because then you weren’t assigned as the prime crew on 11.

GORDON: Oh, that’s a jester. I mean I’m jesting. There’s no control over that. It could have been anybody or anyone and nobody was selected to be the first crew to land on the Moon. It just happened to be Apollo 11. If Apollo 10 had not been successful, it probably wouldn’t have been Apollo 11. So most of this is talking amongst us girls, ribbing each other about who should have been where when. But we weren’t. And then as 9 was very, very successful flight. Both vehicles in Earth orbit. And we moved onto Apollo 12. During that process of going onto Apollo 9, we’d lost one of our crew members. C. C. Williams [Clifton C. Williams, Jr.] was killed in an airplane accident and Al [Alan L.] Bean was reassigned in his place. So Conrad, Gordon and Bean were together through Apollo 9 and also prime crew

on Apollo 12. Which was great for us. We were extremely compatible and had a lot of fun. The only surprise on Apollo 12 was a lightening strike. Everything else was, as they say in the community, nominal which, of course, means insignificant. I've never seen a connection between the two but that's one of the vernaculars of space language.

KELLY: Well, I wouldn't call it insignificant by any means.

GORDON: Well, that's what nominal means if you look it up in the dictionary. But that was a surprise. Something nobody thought about, nobody trained for and that thunderstorm in November of 1969 about thirty-six seconds after launch got everybody's attention.

KELLY: And would you mind telling me a little bit about that?

GORDON: Well, there's not much to tell you about that really. It struck and some people say it was a static discharge, others were...it didn't make any difference because the consequence of it was to knock the fuel cells off the electrical busses. The fuel cells were providing us electrical power at the time. Fortunately, during launch, procedures say that you'll have the batteries turned on as a back up system. If we hadn't had those on, we'd of had an automatic abort. So the batteries picked up the required electrical load and we proceeded from there. Al Bean got the fuel cells back on the line during the boost phase and the only thing that left once we got into orbit was realigning the platform because we lost a platform in a little subsequent strike at fifty-three seconds. The inertial measuring unit, well it didn't fail, but the information from the inertial measuring unit to the computer was interrupted so we had

no indication of what our attitude was. The attitude reference system was doing this. So once we got into orbit and got it realigned, everything was okay. I mean we checked everything we could in the orbit and a half before we had to reignite the S4B [rocket]. And the only the lost was the quantity gauges on the reaction control system. And that was of no consequence really because the ground was able to tell us what quantities we had. In the school of physics, PV does equal RT . So with the pressures and temperatures, they were able to tell us what quantities we had. And it wasn't missed at all. But that was the only thing that we found. Fortunately, the recovery system was not interrupted.

KELLY: Yes, I understand that. I read in Mr. Slayton's [Donald K. "Deke" Slayton] book, *Deke!*, that he mentioned that they had contemplated what to do about the situation. And how do you feel about that? That they thought, 'Well, you know, there's nothing we can do now, why not let them go to the Moon.'

GORDON: Well, and that's the only correct decision that they could have made. If they would have made us come back, we would have been highly upset. The word is pissed-off...is what we would've been. But yeah, they were concerned about the pyros because the recovery system was full of explosive devices. And they thought, 'Gee whiz, if that system has been bad, the crew would have been just as dead coming back from Earth orbit as they would coming back from the Moon so why not go ahead.' And it was altogether fitting and proper. We never even thought about it. We never even discussed it. I mean we were going to go. I mean, that was the only thing we were even concerned about. Once we saw that the spacecraft...the integrity of the vehicles looked to be pretty good, we didn't even contemplate

that we were going to come back. We thought maybe they'd take a little longer look and keep us in another orbit or something but they didn't even do that.

KELLY: And it also seems significant too that President [Richard M.] Nixon watched your launch. And I believe that that was the first time a president had ever seen a launch.

GORDON: Yeah, he got all wet too. That is correct. And some people say the decision to launch was simply because he was there. I don't believe that. I don't think that NASA...makes decisions based upon those kinds of inputs. That's not the way we did business. And I hope they're not doing it today because that would be totally incorrect. If he didn't get to see the launch, there were many more that he could come back and go to. So the idea, and I've heard that in some corners, that the only reason they launched us in that kind of weather was because he was there. I'm not buying that one.

KELLY: And once you did go ahead and launch and once you checked out your vehicle and realized that, you know, your spacecraft was intact and you were on your way to the Moon, what types of things did you perform at that time, what types of things did you do to prepare for your mission out to the Moon?

GORDON: On the way out?

KELLY: Yes.

GORDON: Well, that's a three day trip. And we were still all excited about, not the flight and the trip because we hadn't accomplished a mission yet. Which was a totally different thing than coming back home because the mission had been essentially completed except for reentry. We had the Lunar Module onboard. We could see it out there in front of us on the way. We had to do a barbecue maneuver for thermal control. In another words, we had to have the spacecraft perpendicular to the plane of the orbit so that we would stabilize the temperature, a slow barbecue maneuver. Exposing all pieces and parts of the exterior of the spacecraft to the sun. And it was an acclamation period. We had a lot of things to do. We looked into the Lunar Module, we opened the hatch. The three days going out went by fairly, fairly rapidly. You know, it was always a fascination to look back at the Earth and see it getting smaller and smaller and smaller and the Moon getting bigger and bigger. So that was...it was a relaxed time but we were still excited because we hadn't done anything yet. And, of course, when you first arrive at the Moon, that's kind of an exciting time itself because it's a totally different place to be. And the first time you get a chance to look at it you really want to see most of it. And you only get to see half of it because that's all that's ever illuminated. But once we got into orbit then, of course, it was...the rest of the work had to be done.

KELLY: And once you did get into orbit then, I understand, you had, the LM probably took off and you were in your Command Module. And when we were speaking with Mr. Collins, he mentioned that he wasn't able to track the landing sight of the LM. And I understand that you were able to.

GORDON: Well, you know, that's somewhat of a...probably the reason that Mike wasn't able to track it, he didn't know where the hell they landed.

KELLY: Right.

GORDON: And they didn't know where they landed. The ground didn't know where they had landed because of the navigational problems that they experienced. You know, the accuracy with which their state vector was and then Neil had to fly beyond the boulder field. Well, to correct those kinds of problems, we were assigned a specific target called Surveyor 3 which was in a specific crater on the lunar surface. And the reason for learning how to do that was later missions we're going to land along side thirteen thousand foot mountains and big valleys that were six hundred meters deep and a kilometer across, the highlands of Descartes and Hadley Rille on 15 and Taurus-Littrow on 17. Later on, these sights were not picked but we knew that we wanted to go to other places that were going to require precise navigation.

KELLY: It sounds very interesting. It sounds like it was probably a difficult job for you.

GORDON: Well, that and the difference was, I knew where that spacecraft was going to land. And I could see the crater in my optics. I could identify the crater and I saw a source of light, reflected light, on the rim of that crater. And I didn't see the shape of the LM or anything like that. But I knew that they were going to land on that crater and I knew the only thing that was going to look like that, my own interpretation was that had to be the Lunar Module. Well I stuck my neck out to about here and said, "I see the Lunar Module." And it was but it

was just a source of reflected light off of the Lunar Module that I saw. It didn't look like anything else down there. I think, who else saw the landing sight, I think Stu [Stuart A.] Roosa claims that he did also on 14. And I think that trick of it was that you had to know where they landed. If you didn't know where they landed, you'd never find them.

KELLY: What types of things?

GORDON: I always said I had superior vision. That was the only reason I was able to see.

KELLY: Well, maybe that's true as well. I'm sure you've been asked this a million time and I want to apologize if it is being redundant or repetitive. But I'd like to ask you what types of things did you do in your Command Module while they were on the surface.

GORDON: I was very busy on the Command Module. I had a lot of assigned tasks. Number one, I was all alone, I had to fly a three man vehicle. That kept you fairly busy. But I had a lot of landmarks to track for navigational purpose. A tremendous amount of photographs to take. We had a four camera array, Hasselblad array, that fit into the circular window on the hatch that required a certain amount of tracking to take more photographs. And the film was different. I had IR film, we had false color IR, we had black and white, and we had normal color. So we were mixing the cameras and it was on an interval. As you went across certain parts of the Moon, the illuminated part obviously, you were taking pictures. The rest of the time was involved with housekeeping, a sleep period, and then I also had a plane change to make. I had to ignite the SPS, Service Propulsion System, by myself to make a plane change

because we simply had landed, I think, three degrees south of the equator, something like that. So as the Moon rotated, I had to make a plane change to get back overhead for their rendezvous. And that was basically it. It was a fairly busy time. If you knew those two other clowns that I lived with, you'd be happy to have a little time alone yourself. So that's what I always tell everybody. "Were you sad being alone?" I said, "Hell no, if you knew those guys, you'd be happy to be alone."

KELLY: Were there a lot of antics on the mission?

GORDON: Well, yeah. We just had a great time with each other. We have a lot of fun. We're very comfortable with each other. Pete and I got so that we communicated without speaking and if you know what that means. And we still do that today.

KELLY: That's wonderful.

GORDON: We had a lot of fun. They had a good time on the lunar surface. They came back so damn filthy that I wouldn't let them in the Command Module. I made them strip, take every bit of clothes off they had. I don't know what it was about the storm, but it had an extraordinary amount of dust that clung to their suits. When I looked into that Lunar Module when they took that hatch apart, all I could see was a black cloud in there, I didn't see them at all. I looked in there and said, "Holy smoke. You're not getting in here and dirtying up my nice clean Command Module. So they passed the rocks over, they took off their suits, passed

those over, took off their underwear, and I said, "Okay, you can come in now." That was something. And, you know, the dust disappeared on the way back.

KELLY: Did it really?

GORDON: Never found it. It had migrated outside the bags we had the suits in and everything. Of course, we clogged up all the filters and everything with the dust but it was all gone by the time we got back or we thought it was all gone. Maybe it wasn't.

KELLY: And at that time, I understand you went through your reentry procedures after arriving back at the Earth. And were you in charge of those procedures?

GORDON: Yeah. Once we got into orbit, the Command Module was mine to fly. So I did the transposition and docking with the Lunar Module. I didn't do the rendezvous but I did the docking. I was the active participant in the docking. And I occupied the left hand seat when I wasn't down in the lower equipment bay doing star sightings or whatever. So I was the bus driver, yeah.

KELLY: It sounds like you had an excellent landing as well.

GORDON: Well, yeah. There wasn't much to do other than monitor the landing. Once you start the reentry, of course, fortunately the computer does very, very well. So you're sitting there basically monitoring its performance in case something obvious goes wrong, you can

take over and manually fly the same kind of reentry that it was going to fly because all the information is there for you to be able to do that. And you just sit there and watch it and it did its thing. It was spectacular, it was absolutely spectacular. Eight minutes from the time you enter the atmosphere at roughly four hundred thousand feet until the chutes open. So it's a very dynamic time.

KELLY: ...How was it so dynamic in your opinion?

GORDON: Well, it's very fast, the G loads build up, you're anxious to get, what we call, sub-circular and it digs into about 6 G. And it gets sub-circular and then it starts maneuvering but the visual aspect. Damn, I'd jump up and go holler at those guys but it's there office, isn't it. As the ablative material comes off as the heat builds, the colors behind you and because the spacecraft is maneuvering for entry, it's kind of a corkscrew out there behind you. And the material is burning off at different temperatures and there's yellows and reds and greens and purples and they're all mixed up. So it's like, "Wow, look at that!" But then your inside, your head's inside monitoring the performance because you're trying to navigate back to where the ship is. You have a specific point in the Pacific Ocean that you're supposed to land and you want to land there as close as you can just to get the hell out of it. That's all.

KELLY: And I understand too that once you did get out of it, they threw you some garments. I understand that they did not use the biological ...?

GORDON: We didn't use the BIGs [Biological Isolation Garments] on 12. We wanted to do as little of that as possible being the kind of people we are although at the same time, appreciating some of the requirements of the medical community and the people on Earth. They found out from 11 that there was nothing there to cause any problems so they eliminated the BIGs but we did have to wear our respirator when we got out ... in case we had bad breath. Oh dear. Anyway, that's all we wore and then we had our blue flight suits on. We went immediately into the ... well we didn't, we had the white coveralls on. We had blue flight suits in the Mobile Quarantine Facility [MQF]. We went directly then into the Mobile Quarantine Facility.

KELLY: And how long were you in the MQF?

GORDON: Uh, all the back here from Hawaii. Well in the ship for a day to get back to Hawaii and then the flight back to Houston. I'd have to go back and really look at that. I think we were probably there for three days maybe, two or three days, three days probably. That's a long flight from Hawaii to here. It was probably fourteen hours, a day and a half. It takes a lot of time just to get off the ship and get into the airplane to get us back here as well. But it was comfortable. We had everything ... no, we didn't have everything we needed but most everything we needed.

KELLY: That's great. And then you proceeded onto the Lunar Receiving Laboratory?

GORDON: Yeah, they backed the MQF up to, what is it, building 37 at that time. I think it was. And we were right in quarantine.

KELLY: What types of things did you do when you were in quarantine?

GORDON: Must you know?

KELLY: You don't have to tell me if you wouldn't like to.

GORDON: No, the normal routine stuff. I think we had some movies and we had some pretty good meals and we worked on ... I think Pete worked on a Heath kit at the time. But it gave us the opportunity to write all of the reports that were required of us. All of the pilot reports. In addition to that, all of the briefings. Between a biological barrier, we briefed other flight crews, we briefed Mission Control, Flight Control Division, system engineers. So once we got out of quarantine, we were all done. We didn't have anything more to do, Apollo 12 was over with except for the studying of the lunar materials that was brought back. So it was an appreciated time. Even though we felt that we didn't need to be in quarantine, we used it to our advantage. And by the time we got out, all of the reports were written, all of the debriefing had been accomplished and that was it.

KELLY: That's great. Now did you have any time for reflection on your flight? It sounds like everyone was so busy.

GORDON: Not during the time of flight. I think that you do afterwards. And they're pieces and parts you remember. You read the transcripts. You [watch] the videos. "Oh yeah, I remember that." But at the time of the flight, you're busy enough doing other things that you really don't have time to look at that. Al Bean didn't even have time to reflect because he slept most of the way coming back. Crawled into his cocoon and he stayed there. I think most of the reflection of what you saw and what you did probably comes subsequent to the flight, in retrospect. And I think that the best comment. I made it and others have made it. We've often been asked, "What did we discover when we went to the Moon?" "We discovered the Earth." Think about that because you don't get to see the Earth from that kind of distance before and it takes on a whole new perspective.

KELLY: And for you, what type of perspective did it take on?

GORDON: Oh, its beauty. Its apparent fragility. Its uniqueness in the solar system, maybe the universe. Who knows. And I think you look at it, it has been likened to a delicate Christmas tree ornament that's hanging out there all by itself in a black void of space. Blacker than that black briefcase there. Blackest black that you'll ever see. It looks like velvet. And it's the only thing out there that looks like that's the place you ought to be because it exhibits a tremendous amount of fragility. Which I think environmentally, we're probably appreciating more and more. The sheer beauty of this planet is awesome. The blues of the oceans, the whites of the clouds and the khaki color, the appearance of the continent. It's awesome. It really is.

KELLY: I would like to ask you, just very quickly, a little bit about your reassignment after you returned from 12 then?

GORDON: Okay.

KELLY: I understand that they had plans on going through Apollo 20 at that time?

GORDON: Originally, yes. Not...I'm not sure when the decision was made but the missions had been so successful and the risk, reward ratio was diminishing or increasing depending on which is the denominator, that decisions were made not to fly 18, 19, and 20 and to utilize that hardware in a Apollo applications which became Skylab. To utilize that hardware with the exception of the Saturn Vs, of course, for other purposes and not go back to the Moon. When I flew on 12, I did not have the opportunity to fly the last sixty miles which was my desire. And I was reassigned as the backup crew commander on 15 thinking that under the normal rotation process from 9 to 12 to 15, possibly 18, that I'd have an opportunity to go back again which I wanted to do. And that's why I wanted to stay in a crew cycle with the Apollo program. Well, 18 didn't fly so that was the end of that dream. And I've always had a lot of fun with Cernan about Apollo 17 of who was going to be assigned on that flight. And logically, Gene was because his rotation, coming off of Apollo 14 as a backup commander, said that he was going to fly 17. But he stole my Lunar Module pilot and that was the reason that I had told him that he couldn't fly because I had trained Jack [Harrison H.] Schmitt as my Lunar Module pilot and he stole him. The decision, of course, was made that Jack was the only scientist, so called, in the program. In particular, his Ph.D. was in geology. And it

was a natural that he should have the opportunity, or the community. I shouldn't say Jack necessarily but he was in line to do so but the community, at least, would have the opportunity to send a scientist to the lunar surface. Now whether it would have made any difference or not is problematical but it did satisfy the community. And Jack did a good job. I trained him very, very well. And Gene and I used to, and still do, have a lot of fun about who was to fly Apollo 17 when he stole my Lunar Module pilot. And of course, the guy that I've always felt bad for was Joe [H.] Engle who was on his crew and didn't have the opportunity to fly. And Joe handled that very, very well. Like a real man. The cookie crumbles in strange ways.

KELLY: Yes it does. I guess my final question, I'd like to wrap this up for you, is what do you feel that NASA really gained in your experience and in your opinion and how do you feel that they've used what they may have brought into it right now in their current program?

GORDON: Tough question. What NASA gained from the Apollo program is a how-to attitude. I'm not so sure, I guess we could but I sometimes wonder if we could do that again today. And I'm not sure what they learned. In terms of corporate memory, I sometimes wonder if they had learned anything. I know they have. I'm being somewhat facetious but trying to make a point at the same time.

KELLY: You're not alone in that.

GORDON: Yeah, is that right.

KELLY: Yeah, you're not.

GORDON: Well, it's changed a lot. And that can-do attitude, the vigor, and the enthusiasm that was experience in the sixties, I don't know that it exists today. Maybe it does. Maybe I'm just not exposed to it. But I think that's an era that is gone by.

KELLY: Where do you think they should go right now?

GORDON: Oh, obviously they've got to go with the Space Station. No question about that. I'd wished they had at least gone back to the Moon. The Moon is going to be a great training ground for those things that are needed to go to Mars both in terms of hardware and personal experience. All of those things that I'm disappointed that we haven't done that. So twenty five years this December, the last flight was on the Moon and I would have thought that we'd of been back there before now but times have changed. Politically, economically, leadership, desire, willingness, all that's different today than it was then.

KELLY: Well, I would really like to thank you so much. I'm very honored that you agreed to talk to us.

GORDON: No, it's kind of fun.

[End of Interview]