

ORAL HISTORY TRANSCRIPT

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NEAL: I want to take you back to the beginning. How did you get to be an astronaut? What was the training that was necessary to move you into that field?

COOPER: Well, now, I was only one of many test pilots that they were screening the records of. I was at Edwards Air Force Base [California] in experimental flight tests. I was the Project Manager of a number of the programs; in fact, I had about 14 programs that I was actively pursuing at the time. I also could fly over at Flight Ops [Operations], and I was very happy in my job when I was ordered to report to Washington [DC]. No explanation or anything.

NEAL: Had you even at least made application?

COOPER: No. I didn't even know we were going to have a space program.

NEAL: Just a big grab bag, and they reached in and grabbed you?

COOPER: In fact, there were three of us from the base that were leaving, that were ordered to report to Washington. And our commander called us in and said, "Do you have any idea what this is about?" We said, "No, sir. We don't." He said, "Well, I don't either." But he said, "Don't go volunteering for anything foolish." [*laughs*]

NEAL: And so, what happened after that? How did you find out?

COOPER: We reported into Washington; and we were told we were going to have a space program. “You’re one of a number of potential candidates to start the competitive process for selecting astronauts for this program. And we’ll give you a whole day of briefing on who’s going to be involved, what your position would be within the program, who you’ll be working with, how we’ll utilize it, how the program will be developed, our best-guesses at this point in time and how, step-by-step, we’ll develop the program. And those who are interested, you can sign up at the end of the day; and those who are not interested, can return home. No questions asked.”

NEAL: I take it you signed up at the end of the day.

COOPER: I signed up at the end of the day. I did have one or two thoughts about, “[Do] I want to give up the job that I had and go into a new unknown?” I didn’t hesitate very long.

NEAL: Did you ever regret that decision?

COOPER: No.

NEAL: Explain that to me, would you, Gordo?

COOPER: Well, I think, you know, when we got on the program, I practically had to pinch myself every day to think that I’m really here, because it was really an opportunity to really do some pioneering, because we had no idea what we’d find in space. And every day was truly an “Oh, gee whiz!” day. We were learning as we moved along, and we were in a position to really design the program as we started it.

NEAL: In the beginning, how did you get along with the other six of the seven?

COOPER: Oh, very well. I knew most of them from previous programs. Of course, I knew the other two Air Force officers very well and had been with Gus [Virgil I.] Grissom for a number of years before the space program.

NEAL: But, beyond that, can you go more detail into on these answers for me?

COOPER: Well, we got along very well. I think we were all a close little group. We were kind of like a bunch of brothers. We might argue amongst ourselves. We might have disagreements. But we were able to put our collective thoughts together; and when we came out with a decision out of the astronaut room, it was a single decision. There were no minority and majority decisions.

NEAL: Was there what you might call a competitive urge? Was the competition very strong? There are movies and there are books that would lead us to believe that.

COOPER: Oh, everybody was very competitive. I think we all were very competitive. But I think there was some difference between all of us and who really super team players and who were super competitors. It ranged all the way, but everybody was on the high level of competition.

NEAL: You don't have to answer this question, but I'd appreciate it if you would. Can you give me your impressions of the other members of the group at that time? Not today; today, you're all very friendly. But I wonder, at that time, your impressions of the rest of the Mercury group.

COOPER: One of the things that impressed was I realized immediately that the Navy had given their officers a little better schooling and a little better orientation in public relations. Those of us from the Air Force [who came] in shaking the sand out of our leather jackets were at a little bit of a new experience on any kind of public relations. So we rather had to learn. And, of course, the one who was the most experienced in it and the most talented in it was John [H.] Glenn [Jr.]. He was already a very professional public relations man. And then the three Navy officers were certainly more schooled in public relations than we were from the Air Force.

NEAL: Well, let's take them one by one. Can we do that?

COOPER: Sure.

NEAL: Alan [B.] Shepard [Jr.], for instance. What were your impressions of him?

COOPER: Well, I had met Al and had known of Al through some joint programs that we had had between the test centers. I had known of him and very, very briefly had met him previously, but we met on the start of the competition. He and I were in the first group to start out on the competition together, the first group of six; and we went through all the whole competitive process together. So, we were close friends before we came on the program.

NEAL: [M.] Scott Carpenter.

COOPER: Scott I met in Washington. I had not known Scott before. I met him in Washington when the large group was assembled; and then, of course, met him when we came on the program.

NEAL: Deke [Donald K.] Slayton.

COOPER: Deke I had known at Edwards. Of course, we were stationed together there at Edwards, so I knew Deke very well from years back.

NEAL: What kind of a man was Deke?

COOPER: Deke was a great guy and a very close friend. He was a good pilot and a good administrator, and really a solid citizen type.

NEAL: How about Gus Grissom?

COOPER: Gus, of course, was probably my closest friend of all of them because I had been with him for a number of years previous and we had done a lot of flying together; we'd been in school together; we'd been in Test Pilot School together. So were old, long-time friends.

NEAL: Wally [Walter M.] Schirra [Jr.]?

COOPER: Wally I had known just briefly. I had never known him until we really got into meeting in Washington for the start of the competition. But, Wally and I always hit it off very well; and Wally is a great, great guy.

NEAL: In the beginning, back as you were first starting Mercury, specialization was pretty much the order of the day. In what did you specialize, and what did it do for you?

COOPER: Well, I had a lot of propulsion background in my education. I had worked a lot on engines and propulsion, so I more or less was moved into the first of the propulsion systems we were going to be working with, which was the Redstone rocket.

NEAL: Redstone. But you didn't fly in Redstone? Why was that, do you think?

COOPER: Well, they were saving me for the last and the best, I guess.

NEAL: [*laughs*] Spoken like a true Mercury astronaut. Well, you know, as we begin into the flight program itself, prior to the flight program, if I remember correctly (and I'd need your analysis of this, if you would give it to me), most of the things with which you trained—the training articles—didn't exist. They had to be worked up, dreamed up . . .

COOPER: Well, that's right. And people ask why we trained on a lot of the things we did. We trained in anything we could think of to train on that might be of value to us, we tried and trained on, because we were literally writing the book on how to train an astronaut as we went along. So anything that we thought might be of any help at all, we got busy and did some training on it.

NEAL: Isn't it a little strange that you could design equipment when you didn't even know what the conditions were under which your body would function or not function as the case might be?

COOPER: And the best of "medical experts" (and I put that in quotes) had no idea what the body would or would not do. I can remember that a lot of the medical experts were claiming that the body would not accept any fluid or food and be able to swallow in under zero

gravity, that we would probably choke. And there were a lot of other of these “medical experts” who said that man could not withstand the rigors of the launch, and others who said that zero gravity—the cardiovascular system would not be able to function under zero gravity. So there was very little known about the total human body at that time.

NEAL: Did you ever worry about all that?

COOPER: No, we really didn't. I think the man who had the most practical point of view on it was Dr. Bill [William K.] Douglas, who really felt that man was a lot stronger and a lot more rugged a device than the medical profession gave him credit for.

NEAL: The powers-that-be finally decided on flight systems, and I guess one of the things they were thinking of was that astronauts should talk to astronauts. So all of you took up different positions along the line. Can you describe how that functioned, how it worked when actually the first flights began?

COOPER: Well, this made a lot of sense because, since we'd been training together, we were certainly the most experienced on all the different systems; and the astronaut system interfaced, so that putting the rest of us in, when one made a flight, positions around the world really made a lot of sense. Because we knew what that astronaut making the flight was going through, and knew the systems and knew the cockpit and knew all the switches and everything better than anybody else.

NEAL: You manned some of those positions. Can you describe those for me, in detail?

COOPER: Well, for instance, on the very first one, you're talking about the Redstone. What we really were doing was the key part of the launching was being done out of the blockhouse for the Redstone, and I was the capsule communicator in the blockhouse. So I controlled all of the communications going in and out of the spacecraft to the ground. I had worked very closely with Al on all the final countdown and all the pre-tests and then the testing, and we'd put in a lot of time—long, long hours—getting to that point ready for launch. So, I was there. And then as we progressed through the various flights, generally the backup of the team would be the man who'd be the capsule communicator; and, of course, later we were moving the authority for the flight after liftoff, once we opened the Houston site, then the Mercury Control Center moved to Houston after liftoff. So, the capsule communicator generally would be in the Control Center.

NEAL: That was actually in the Gemini series, wasn't it?

COOPER: Right.

NEAL: During Mercury it stayed at the Cape [Canaveral, Florida], as I remember.

COOPER: Right.

NEAL: So then, working out of the Cape as they were, you've described the Shepard flight. You were in the blockhouse. Where were you for Grissom's *Liberty Bell*?

COOPER: I was in the Control Center at the Cape.

NEAL: It says here, by the way, that you were also flying chase in an F-106.

COOPER: Oh, you're right. *[laughs]* As a matter of fact, . . .

NEAL: [*laughs*] My notes are pretty accurate. They were given to me by the historians.

COOPER: You're correct. We decided we would . . . We wanted to see, because we'd had trouble with the first Mercury-Atlas disintegrating and determining that the interface between the spacecraft and the booster was a questionable entity, we wanted to get some pictures of the high-Q phase (in other words, as you're going through the densest atmosphere at the fastest speed, which gives you the most dynamic pressure and causes the greatest stress on the spacecraft/booster interface). We wanted to get some pictures of that and just be able to see if we could get in close. So I had a Bell & Howell photon camera and came in with the 106 to pick up Gus as he began to move over and really began to get into the high-Q area.

NEAL: After that, it says here that you went to Point Arguello [California] for the chimpanzee Enos two-orbit flight. You couldn't communicate with the chimpanzee, could you?

COOPER: No, I was there for Scott Carpenter's flight. Oh, I'm sorry. I *was* at Point Arguello for the chimpanzee flight, and then I was at Guaymas [Mexico] for Scotty Carpenter's flight.

NEAL: Actually, you went, in this case, sort of a dress rehearsal, wasn't it?

COOPER: Yes, it was.

NEAL: With the chimp, to see how the systems might work. Well, I guess the one that I remember most was when John Glenn flew, and you went to Australia.

COOPER: I went to Australia.

NEAL: Do you want to talk about that one? Because that was pretty wild.

COOPER: Well, it was a great locale. We had the tracking site north of Perth, Australia. And, of course, we had a lot of delays in getting John launched, so I was there for quite a period of time. We had a joint team there composed of both the Australians and Americans. It was a good bunch, and I enjoyed them thoroughly—including the Australian flight surgeon, who was there at our site. So it was a good team, and they did a great job on the tracking side.

NEAL: You also, by that time, must have learned a few lessons about public relations. I'm thinking of the people of Perth and the lights. Would you describe that for me?

COOPER: Yes. There was a question about what could an astronaut really see on night-side, in the dark; what could he see in the way of lights? So the people of Perth, including the mayor of Perth, decided that they would bring up all the lights they could. And British Petroleum turned up some big oil-fired torches that they had out south of Perth, that put out umpteen thousand BTUs [British Thermal Units] per torch; they turned all those on. And everybody in Perth brought their lights up to see if John could see the city of Perth. Of course, he could see almost each and every light, but it was a well lit-up area.

NEAL: It was certainly one of the best public relations devices for that flight, as well as being an engineering requirement.

COOPER: It was. It turned out to be—it really captured the imaginations of people, I think.

NEAL: In an engineering sense, I'm noticing here that you had to get some information from John about the heatshield problem. Do you remember the heatshield—for John was a major problem? And apparently you loomed large in getting the information that was necessary to figure out what to do.

COOPER: Yes. Well, we'd had an indication that John's heatshield had already separated; in other words, that it had unlocked—not necessarily separated, but that it had unlocked. So we were concerned that if it were really unlocked, could any wild oscillations jar the heatshield loose and lose the heatshield? So we needed to back ourselves up to give us all the best assurance we could that it was truly still locked.

NEAL: Of course, it worked.

COOPER: It worked.

NEAL: John was also talking about his attitude control system with you as to the reliability; because if it didn't work, the thing that might happen, particularly since you were going to try to keep the heatshield connected.

COOPER: Right. Well, but just to back ourselves up, we elected to keep the retropackage on until it burned off, just to give that added few moments of holding the heatshield in place in case it should be unlocked.

NEAL: Well, finally all these things began to go together, Gordon; and obviously, you served as CapCom [Capsule Communicator], as you mentioned, at Guaymas. Anything special happen there during the Carpenter flight?

COOPER: No, not particularly. That was a good tracking site and a good locale for Scott's flight.

NEAL: The real problem on his flight apparently came when he burned to come home; and there were some errors made, so he overshot the landing site.

COOPER: Well, I think Scott was really so intense on some of the things he was trying to get some data on that he got a little behind—just a *little* behind—the curve on his time there; and everything kind of fogged in on him at one time.

NEAL: Finally, of course, you were assigned to the last flight in the Mercury series; and that put you in as backup for Wally Schirra with his *Sigma 7* mission. Do you remember Wally's mission? You must've been sitting on the edge of your seat because you were up next, trying to glean what information you could glean. Was that true?

COOPER: On Yeah. It's true. Wally and I had really worked hard on trying to find a number of things we wanted to find. One, we needed to find out could you really and truly navigate from space, pilotage-wise? Could you see details enough on the ground to really, truly do some pilotage navigation? You've got to know I'm coming up here, and I'm coming up here, and I'm coming here. And so we had even inflated the spare Echo balloon and painted the various continents on it and built a simulated spacecraft window from the top of Hangar S and turned this balloon at the right rate so we can see what it would look like from space. That was one of Wally's first comments, "Gordo, it looks just like the balloon." So, there were a lot of things that we were wanting to do. We decided that, we felt very strongly that we could develop a technique for flying a lot more than leaving it on partial autopilot or all

autopilot. That we could actually get on to the manual tweak mode and just tweak those thrusters and save a lot of fuel. So, Wally was trying this; and I was happy to get that information because it stood me in good stead then on my flight.

NEAL: Did you know, of a certainty, that you were going to fly next when you were backup with Wally? Had that been determined at that time?

COOPER: Oh, yes.

NEAL: Because I understand there was still some discussion about whether or not you would, indeed, fly in Mercury since Deke, by this time, had been knocked out of the flight-testing portion of the program.

COOPER: Well, of course, he was knocked out when Scotty took the place on the flight that Deke was originally slated to have.

NEAL: And Deke was given the job of running the Astronaut Office.

COOPER: Right.

NEAL: As such, I understand he was instrumental in your being the pilot for that [Mercury] 9 mission.

COOPER: I'm sure he was.

NEAL: And then, just before the mission, something happened. You buzzed the Cape. Do you remember that?

COOPER: Yeah, I was a little mad that day. That was the day before launch, and we had a firm ground rule that we didn't put anything new into the spacecraft or into the pressure suit or anything at the last minute that you could not adequately test. But the medics had overridden this very firm ground rule we had, and they had cut a big hole in the side of my suit and inserted another great, big metal fitting, which rubbed the heck out of my ribs (by the way) in order to put in a hose for a blood pressure cuff that could automatically inflate and they could take blood pressure whenever they wanted it. And this really antagonized me because we had broken all our ground rules here at the last minute. We also had a little ground rule that we would always go out the day before launch and get one of our fighters and take it out and really shake it down and shake out all the kinks. So, being a little angry at the time when I went out to get my fighter ready to go, I came back over the Cape and buzzed the Cape fairly low; and when Walt [Walter C.] Williams happened to walk out of his office and almost fell flat because I was pretty low coming right by his window, lighting the afterburner, he was a little startled. And he was pretty teed off about it, I think.

NEAL: Teed off enough that it is reported that he wanted to knock you off on your flight two days before the mission.

COOPER: That was what was reported to me, that Walt just might pull me off the flight as a result.

NEAL: But, apparently Slayton stood as your champion and had others who, of course, agreed; and so you flew.

COOPER: Well, Walt assured me several years later that he really wasn't going to pull me off, that he just wanted to worry me on it.

NEAL: [*laughs*] That's priceless. Well, how did you come up with the name *Faith 7*?

COOPER: Well, being the last, it was getting harder and harder to pick a name because everybody had picked pretty good names before. It was kind of a large responsibility to pick a name for a spacecraft where it's before the eyes of the whole world. But I decided that I had a lot of faith in all my hardware and my spacecraft, and I had a lot of faith in the launch team, I had faith in myself, and I had faith in God; and I thought that was just a real dilly of a name. So that became the name: *Faith 7*.

NEAL: I understand that there were those at NASA, particularly at Headquarters [Washington DC], who didn't like the name; because, if something happened, you'd have lost faith.

COOPER: Well, we never really worried about what Headquarters thought. They always had been against—somewhat against—anything personalized at all anyway. You know, it was safer not to have *anything* personalized; and the thing that these people at NASA Headquarters didn't realize is that the personalized thing is what really garnered the public's attention and the public backing. And, I think that was a bad mistake they made in Gemini when they took away the naming of the spacecraft; and by Jim [James E.] Webb's own words, he wanted to have spacecraft number 1, 2, [and] 3, and astronaut number 3, 4, and 7, 8. He didn't want any names involved or any personalities involved. He wanted everything depersonalized. And I think the interest of the public waned as a result of that.

NEAL: Funniest thing: On the opposite side, the media, of which I *was* one at the time, were pushing very hard to personalize the flights. People like yourself obviously didn't think that was *all* bad, because you worked with us in that endeavor.

COOPER: I think most of us felt that it *was* important to personalize the flight, that that's what really made the public get close behind and have a close feeling for these things they followed so closely.

NEAL: You may remember, too, on your flight when you flew it: You gave us the first experimental television—black-and-white, not great, but nonetheless . . .

COOPER: It was slow scan, but, you know, we'd had a question whether it would even work from space or not. And so it did prove that it would.

NEAL: Funniest thing, though: Again, NASA Headquarters said, "Yeah, that's fine. But you can't have it until we get ready to fly off to the Moon." So, there was a huge gap between your flight and the early television and what happened later. What do you think about something like that?

COOPER: It kind of goes along with what NASA said. I can recall that memo saying that: "If an astronaut desires, he may carry a camera." That's the importance they put [on] the pictures from space. And having already been a pretty experienced photographer, that just raked me somewhat. I felt they just didn't understand the whole thing at all, and they certainly could not put out a memo like that and understand the importance of photography.

NEAL: I was under the impression that every one of the Mercury flights carried cameras.

COOPER: Well, John and Scott carried Instamatics™. Which is fine. It's better than no camera. So, we went down and locally procured a Hasselblad and modified it for Wally's flight; Wally and I were working on this. And that was the first quality camera that was taken.

NEAL: The astronauts themselves did those modifications?

COOPER: No. We did it in conjunction with the camera lab, the Air Force camera lab, down at Patrick [AFB, Florida].

NEAL: Then you flew a lengthy mission. But before you flew it, I guess you had to rest up on the launch pad. You're famous for that story.

COOPER: Well, I had my work all done and we had a built-in hold to get the range up to speed. I'd already been up several hours, so I thought that would just be a good opportunity to get a little nap.

NEAL: *[laughs]* And you took one.

COOPER: So I took a little nap.

NEAL: *[laughs]* Everybody was a little shocked. Obviously, it shows that you were relaxed and that you weren't really worried about what was going to happen.

COOPER: That's true.

NEAL: What was your primary responsibility during that mission? How would you define that?

COOPER: Well, my primary responsibility was to really find out how all the modes of the spacecraft worked, show that we could really fly them; to get off the stable table and prove that I could come back with the attitude I wanted to recapture the stable table and put it on and off; and then to fly manually most of the rest of the mission. I had planned on getting a lot of pictures of various things. I had several things for visual. I had a little ball that I ejected, put out, to see what the dynamics of it would be as it got further and closer to the spacecraft on its own trajectory, and to see at what distance I could see the little flashing light that was on it.

NEAL: Could you describe how that worked; in other words, the results?

COOPER: The results were very good. I didn't see it initially when I was supposed to be able to see it. And then I saw it a number of times the rest of the flight, at different times. So, we got some good data out of it on what distance you really could see a light in space.

NEAL: How far could you see it?

COOPER: Oh, quite a few miles. And this was interesting because, theoretically, people didn't really know what you *would* be able to see in space in vacuum; because, without air to transmit the objects, could you really visually see them any distance at all?

NEAL: I'm surprised under weightlessness that your eye lenses wouldn't give you all sorts of strange corrections.

COOPER: Well, that's one of the things that the medical thought might happen. As it turns out, it didn't at all.

NEAL: As a matter of fact, observations on the body were said to have been one of the major reasons for what you were doing on that flight. NASA was still very anxious, particularly, because yours was the first fairly lengthy duration mission.

COOPER: And there again, I was the first one to fly long enough to power down and go to sleep and see if you *could* sleep in space, and to medically observe an astronaut at sleep in space, and then wake up and get your senses back with you, and pick up and go ahead and do the job.

NEAL: Any observations on going to sleep and then waking up that you could share with us?

COOPER: At the time I was supposed to power down and go to sleep, I was just at that point in time I was coming up over the high steppes of India and coming in, and I realized I was coming right in to the first time we'd ever been able to fly in day-side daylight over the Himalayas. So, I was in a power-down mode, just on tweak pulse, and so I could do a lot of tweaking, and they wouldn't even note any fuel being gone. So very quietly every time I came over the Himalayas for several orbits, I managed to get some good pictures of the Himalayas. And so they thought I was asleep all that time. And then, I had a fairly low heart rate anyway, and they really didn't take into consideration how much lower you'd be in space, and then how much lower you'd be in space when you went to sleep. So when I came whistling over the horizon asleep, *truly* asleep, the first time, they woke me up just to see if I was okay. I guess my heart rate was really way down there.

NEAL: While you sneaked a peek at the Himalayas. [*laughs*]

COOPER: Yeah.

NEAL: Did you have any problems either with your personal comfort or with the spacecraft?
Any real problems during the flight?

COOPER: Not really any real problems. We always had trouble keeping the temperature of the suit adjusted, because the valve was so sensitive that, when you went a little too far on it for coolness, you'd tend to freeze it up. You'd have to back off and get it unfrozen and then—

NEAL: It might be good to mention the fact that, in those days, you didn't fly shirtsleeve.

COOPER: That's right.

NEAL: Particularly in this day, because, in recent years, astronauts have flown in shirtsleeves. But in those days, you kept the suit on, didn't you?

COOPER: Kept the suit on the whole mission, yeah.

NEAL: Was that true—That was true for Mercury; how about Gemini?

COOPER: In Gemini, Pete [Charles C. Conrad, Jr.] and I tried to get approval to fly in just a regular flying suit on Gemini V, since we were *not* going to be doing EVA [Extravehicular Activity] and we thought we had developed enough reliability in the pressurization system at that time we could be able to fly in a flying suit. But, NASA wouldn't approve it. So, the first thing we go into orbit, the first thing that happened is our helmets and suits came off; and we were in our undies.

NEAL: That was in Gemini.

COOPER: In Gemini.

NEAL: But, of course, in Mercury you kept the suit on and had the temperature problem. And, I noticed that, finally as you got ready to make your entry (or reentry, depending on which way you like it), a warning light came on.

COOPER: Just about the 19th orbit.

NEAL: That must've been a thrill.

COOPER: Oh, yeah. The .05 g green warning light came on, which is the light that tells you you're starting to reenter. I was sure that I wasn't reentering, because there had been nothing to slow down my speed at all. And, of course, as usually happened on these missions, we had long spaces that we were out of radio contact; and I was out of radio contact when this happened. So when I got in radio contact first time, the Cape was kind of concerned when they heard about this light on. Then we proceeded on the next orbit or so to try to analyze, go through various procedures to try to find what it was. And we realized I was, slowly but surely, having an electrical fire from my relays; and they *did* short out the inverters. So, eventually I lost my total electrical system.

NEAL: You lost the *total* electrical system?

COOPER: The total electrical system.

NEAL: Can you explain that in terms that I can understand? As a pilot, what does it mean when you've lost, literally lost—

COOPER: Well, it meant that I had the manual push/pull rods to activate the jets for attitude control. I had eyeballs out the window for my attitude—my pitch, roll, and yaw attitude. I had a wristwatch for timing. And I had to activate each and every one of the relays, and I'd have to manually fire the retros while manually flying the spacecraft. So, everything had to be done manually. I'd have to control the spacecraft all the way through reentry. I'd have to put my drogue out manually. And I'd have to deploy my parachute manually. I'd have to deploy the landing bag manually.

NEAL: It sounds to me like you just described why they needed test pilots to fly in the early days of the space program.

COOPER: Well, that's true; and that's really what we'd been wanting to do all along. So, it just gave me the opportunity to do what we'd been wanting to do.

NEAL: How close to the landing target did you come?

COOPER: Well, I was pretty lucky on that. I have a picture, looking right up the tower, the *USS Kearsarge's* tower, the main chute is opening. So I was right over the carrier, and the wind drifted me about, roughly, two miles away. So they could just taxi over and put out a boon, and hoist me onboard; and I got out of the spacecraft right on the carrier then.

NEAL: Effectively, that pretty well rang down the curtain on Mercury, didn't it?

COOPER: Yes. We were hoping to have another Mercury flight, but [there] was a little soul-searching about whether it would interfere with the upcoming Gemini mission. And by this time, then, we had been dedicated by the President [John F. Kennedy] that we were going to

go to the Moon and go within that decade. Anything we could do to cut down time we needed to do. So, the last Mercury flight was eliminated in order to speed up getting into Gemini.

NEAL: Well, I guess that brings us to Gemini. What about the transition from Mercury to Gemini? In an engineering sense, what did you do, Gordo?

COOPER: Well, Gemini was really just an enlarged Mercury. We made improvements on the Mercury. We went from a 1- to a 2-pilot crew so you could do more tasks. And we moved all of the systems out into an adapter section to get them out of the spacecraft. The noise level in Mercury was really quite high because of the inverters and the motors and all the things running right *in* the same shell you were in. So, in Gemini then, we moved all of these systems out into an adapter section. We needed more room, too, for putting in fuel cells and batteries and a propulsion system to be able to do a little bit of orbital maneuvering for rendezvous. So Gemini, then, was going to be the mission to really and truly test *all* the systems and get them all ironed out and tested and ready to go for the Apollo Program to do the lunar mission.

NEAL: You worked on Gemini III before men actually flew in Gemini, didn't you?

COOPER: Yes.

NEAL: What did you do on that flight?

COOPER: Well, I didn't fly.

NEAL: No. I said you worked on it before men flew in Gemini.

COOPER: On yeah. Well, there was a little bit of a transition, of course, in getting your systems going, getting the positioning of where you were going to locate things; how you'd take all the equipment they wanted you to take, because you really had less space per person than you did in Mercury; but, thankfully, it was a little more strategically arranged so that you had a little more usable room, really. And that was mainly because we had these storage lockers that were in back of you, and you could squirm round and take equipment in and out of those storage lockers.

NEAL: With Gemini IV, Mercury Control moved to Houston and became Mission Control. With Gemini V, you were ready to fly again. Tell me about your partner on that flight as you got ready for it.

COOPER: Well, Pete Conrad was my partner on the flight. A few days after my Mercury flight, we were going to jungle survival school; and Pete was my partner on the jungle survival school, so we got to know one another pretty well out surviving the jungle together. And then very shortly thereafter, we began to make preparations for our Gemini V flight. We worked long and hard at it, and since we couldn't do any EVA or do the other things, because we were so loaded—we were absolutely crammed—with equipment of all kinds they wanted you to have. We had the first fuel cell. We had the first radar. We had the first all-up computer. These were all things that needed to be tested and proven. And we had some 20 some-odd cameras of different types and several hundred rolls of film of different kinds. [There were] a lot of different types of film and pictures they wanted made, including a lot of the Apollo translunar sites for navigation if you couldn't get a navigation star and those types of things. So we felt that the spacecraft was so loaded and going to be so busy with all the

things we were testing, we decided—And one of the things that needed to be tested was going the full eight days. So we named it, you know, put “8 Days or Bust” on this old Conestoga wagon. We were lumbering along there for eight days, getting everything all done to get to the goal we had to get to.

NEAL: NASA wouldn't let you name the spacecraft by this time. So instead you gave it “8 Days or Bust.”

COOPER: Well, we had a little episode; because Pete and I—The Gemini [flights] before that didn't have any name or any patches; and Pete and I decided that everybody in the military, every pilot in the military, has an organizational patch, and they take great pride in their patches. We decided we were going to have a patch, Jim Webb or no Jim Webb. So we designed and had some patches made, and had them sewn on our flight suits; and two nights before the launch, we were invited to fly back to Houston in a T-38 and have dinner with Jim Webb at Bob [Robert R.] Gilruth's house. We decided this would be an opportunity to confess our sins, so we told him about the patch, with which he went almost into hysterics! And he and Pete almost had fisticuffs. So we got this all broken up; and he finally said, “Okay. Tomorrow I want you to send somebody up to Washington with a copy of this patch so I can see what it is, and I'll tell you whether you can fly it or not.” So, the following day, he took a look at the patch and then wired us back down an approval. He said, “From now on, it'll be called a ‘Cooper patch.’ I will approve it on one condition.” He said, “I don't like the ‘8 Days or Bust’ cause if you only do 7 days, then the public's going to say ‘You busted.’” So he said, “If you'll tape over the ‘8 Days or Bust’ until you make the 8 days, then I'll approve the patch.” So, that's what we did.

NEAL: It's an incredible story. I don't think I'd ever heard it before, Gordon. Did that achieve much notoriety? I really hadn't heard it.

COOPER: I guess not a lot. We got our patch, and we had the "8 Days or Bust" on it, even if it was behind tape.

NEAL: Well, your launch was successful. There you were in orbit, and one of the major things that you were trying to research was fuel cells; and I understand that you had some problems with those early on.

COOPER: Yeah, right off the bat, we had the oxygen pressure drop to practically zero. By all the ground rules, I had to go into total power down. So we powered everything down, brought everything down to low, low electrical power; and, of course, it happened again when we were out of radio range. So, as we came whistling over the horizon into communication, Houston realized we were all powered down and they really panicked there for a moment; and it looked like we were going to have to reenter another orbit later. But, fortunately, and this is a story a lot of people don't know: When Pete and I were going through the altitude chamber with Gemini V, we had to go through and do these various tests; and the tests finished on a Friday; the spacecraft was due to be shipped Saturday morning to the Cape from St. Louis in order to stay on the time schedule. But one of the things we wanted to do was, we wanted to run some tests in the altitude chamber by decreasing both oxygen and hydrogen pressure, *drastically*, to see if the fuel cell would continue to run at altitude. NASA said, "No, we can't afford the time. If we do it over this week, we can't afford to delay until next week to do it. And if we do it over the weekend, it would cost us triple time of overtime, so we're not going to do it." So Pete and I went to Jim

Webb and told him the story—I mean, we went to Jim [James S.] McDonnell [Jr.]—Mr. McDonnell, head of McDonnell Aircraft [Corporation]—told him the story on it, and he said, “I’ll pay for it. Let’s do it.” So we spent the weekend in the altitude chamber at *his* cost, doing the test; and if we had *not* done that test, we would have reentered an orbit later. But because we had done the test, we knew the fuel cell *would run* at lower pressures, so we decided to try it for a while and baby it, and see if we could get the pressure back up. And a few orbits later, we began to get indications that we were going to get the fuel cell back on line.

NEAL: So the flight was saved. Sleeping schedules also, once before, had come up and had created some kind of problem. Now you’re flying two guys in the spacecraft. So, I wonder what you discovered about how to sleep with a partner.

COOPER: Well, theoretically, it seemed like it made a lot of sense that, if one could work while the other slept, we were going to get a lot more work done. One could just be getting his sleep, and then he could take over the night shift and run tests while his partner slept. But in the real, live world, it didn’t seem to work that way because all of a sudden on the normal diurnal cycle, which we still were acclimatized to, we came whistling over the horizon, both of us asleep. So after a little debate between us and the ground, we decided we’d reset the schedules; and so, we both slept and both worked at the same time.

NEAL: That pretty well confirmed what Jim [James A.] McDivitt and Ed [Edward H.] White [II] found on the flight before yours, didn’t it? They found about the same thing. Ever since then, I take it, that the astronauts had learned the lesson and the schedules had been set so that they eat, sleep, work on the same schedules.

COOPER: Right.

NEAL: I noticed here, you had a planned rendezvous for this mission, because Gemini was setting out to discover rendezvous techniques. But something called a “*phantom rendezvous*” instead was actually done.

COOPER: We had a rendezvous pod, which we ejected; and shortly after we had ejected the rendezvous pod, we had our radar all powered up and we were getting ready to start our rendezvous, we had this fuel cell problem and had to power down. So we lost our rendezvous pod. So, rather than not have any rendezvous data, since we did have a good all-up radar (we had an all-up computer and all this type thing), we decided to pick a point in space and say, “There’s where the rendezvous pod is, and let’s go do a rendezvous with it.” So they could set it up on the computer to do that, which we did, and it turned out to be very successful. So we did conduct a simulated rendezvous with a point in space if you will.

NEAL: Of course, one of the biggest things, too, at this point in the space program was to investigate and find out what to do about things that broke down. Now once you had made the phantom rendezvous, other things, I gather, created problems which had to be resolved. Can you discuss those for us?

COOPER: We had a little sight that we used for photography as well as for radar and all that type of thing that had a little lighted crosshair on it. The sight broke down, so we had a little tool kit on board. We took that all apart and repaired it, and got it operable again. We had a number of cameras that gave us some little minor problems that we repaired. We were losing our thrusters; they were clogging up and just spitting liquid instead of igniting; we’d lost

approximately half our thrusters, so we devised a scheme. We had a purge exit for hydrogen on one side of the fuel cell, hydrogen on one side, and a purge nozzle on the other side for oxygen; and then we had a urine dump on the bottom. So at the right time, we could purge hydrogen, purge oxygen, and dump urine. That gave us three more attitude thrusters. By really working diligently at it, even though we lost a lot of our attitude control, we could lumber along and finally get the attitude we had to, to do a lot of the experiments we wanted to do.

NEAL: It sounds to me like you and your partner, Pete Conrad, made quite a team. Perhaps it might be a good idea to evaluate him as your right hand or your left hand, or the way in which the two of you made a pair of hands that solved problems.

COOPER: We worked very well together. Pete's a very, very go-getting type guy. He's a—

NEAL: Fun-loving guy, too, isn't he?

COOPER: Yeah, he's very capable.

NEAL: He likes to laugh.

COOPER: Yeah, he does. He's got a lot of good humor. We had to have a good sense of humor about a lot of things, because it did get long and arduous.

NEAL: As a matter of fact, you had to slow down just a bit because of your power limitations. That must've made life a little boring from time to time. Was it?

COOPER: Yeah, it got a little boring not being able to do all the things we really had planned on doing. You know, a number of things; we were having to slow down when we did do

them. Some of them we caught up on a little later when we got power back up. But others, we had to skip.

NEAL: When the time came to enter, that's where you picked up the pace. Not because of anything in space, but because of events down below. Do you remember that? I'm thinking of the fact that you had to accelerate your landing, because Hurricane Betsy was moving in to your planned landing area. So could you cover that base for us?

COOPER: Yeah, we had a potential weather problem facing us. Of course, we were kind of sweating out, since we didn't really have attitude control; we were going to have to bring our reentry control system on a little bit early in order to be able to get a proper attitude well prior to retro fire. And there was a little bit of a soul-searching about when we were going to bring that on to assure we had enough time to get the proper attitude, but also not waste too much of the reentry fuel. One other thing that we were really sweating, and we had *all* through our while testing program in the spacecraft: We had babied our computer religiously, and all through this mission we would never allow anybody to send us anything until we'd checked it out and verified it to make sure we got the right upload. So when we were ready to get our reentry upload, since we were going to reenter a little bit early, we had to upgrade and update all the uploads, and we checked this all over and we were getting the right figures and everything, allowing them to be set up there, got it all in, and then, wouldn't you know? When we did our reentry, because we were determined we were going to do a computer-guided reentry, ILS [Instrument Landing System] type, following the needles right in, and we wanted to land on the number 3 elevator. Well, when we started our reentry, we realized very shortly that it was taking us in at way too steep a dive-in angle. Since the

Gemini spacecraft had an offset CG; rolling one way would give you uplift and rolling the other way would give you downward lift, so you had a fair amount of maneuvering with the spacecraft. We realized that it was calling for too much downlift, and we were going to come in way short. So we went to full uplift and recovered as much as we could, but we still were 100 mi. off. It turned out the ground had, in all these intricate calculations, someone had calculated that the Earth rotates 360.00 deg per rotation when, in fact, it rotates 359.999. When you add that all up for 8 days of data, it gave us the wrong reentry data.

NEAL: So, you were right but the facts were wrong. It wasn't a serious—

COOPER: We didn't make any great big ditty about this, but the little sometimes disagreements between the air and the ground, you know, we always had pretty good relations and we wanted to maintain that good relationship. The ground knew that they had goofed on that one.

NEAL: It kind of brings up the basic question of the relationship between other facets of the space team and the astronaut corps *per se*. How would you describe it? Good, bad, indifferent.

COOPER: Well, I think it was quite good all in all. We had some slightly different opinions amongst our astronaut group as to how much they wanted to work with the ground team or not. But I think, in most cases, most of us believed that you wanted to use all that talent you could down there. After all, they were reading a lot of things we were not in flight, and it was well to be able to utilize all that data. And in general, having had a lot of experience at

working with this ground control team previous to my flight, I guess I was really keen on working with them because I realized there was a lot of talent there amongst them.

NEAL: Once you were safely back on the ground, it was time to take a good look at what had happened to your bodies because this was the longest flight to date. You had now had a good deal of space experience. What changes did you experience that you remember?

COOPER: Well, we sure grew a great beard. I had a better beard than Pete's. [*chuckles*] We had a pretty good heavy beard. Surprisingly, I don't think I was any [more tired] than I was after my Mercury flight. Of course, we could move around a little more and we also had learned we needed to exercise a bit, so we'd carried a bungee along with us which we daily got a little exercise with, pulling this bungee. I think, really, we felt we were in pretty good shape. In fact, we felt we'd kept such a neat spacecraft that we felt we were really pretty neat and trim and clean when we got off on the carrier. And only when you'd see people passing out alongside did you realize you really were a little odiferous from all the sweat of 8 days.

NEAL: [*laughs*] You know, that's a factor that most people never think of. They think of space as being a wonderful place to be, and there's never any negative side to it. Are there any negative factors to flying in space? Or is it all happiness and joy? Or is it what you look back on?

COOPER: Oh, I think, you know, certainly there are some negative factors involved. You have to compromise a lot of things you do. Even in zero gravity, as much fun as it is, you have to learn how to use it properly; and even in something like Skylab, you had to learn to

fasten yourself down, secure yourself down, in a position to do any work under zero gravity. So it has some adversities as well as advantages.

NEAL: After Gemini V, you never got a chance to fly again.

COOPER: No, I had the Gemini XII backup team, and I had the Apollo 10 backup team. And I headed up several things, such as Apollo Flight Operations for a while. I headed up Skylab prior to that; and then I headed up the Shuttle Operations input, design input.

NEAL: But, you never got the chance to fly again.

COOPER: I never got a chance to fly again.

NEAL: Any idea why that was? Or was it that there were many people beating on the door?

COOPER: Well, I have some ideas. But who knows why, what all is involved.

NEAL: Right after the Gemini mission, you went on an around-the-world tour, didn't you, you and Pete?

COOPER: Yes.

NEAL: Do you remember anything about that?

COOPER: Well, we were made our President's representatives to Africa, and we took a Presidential airplane and took an extended trip throughout Africa, starting with Haile Selassie. We were house guests of [his] at his palace for a number of days, and on down to Jomo Kinyata and so forth, on down through the pecking order. It was a fantastic trip, and I think that starting out, at the very start of the trip, we stopped in at a big space symposium

they were having in Athens, Greece, and it was the first opportunity—Nobody had ever figured out how cosmonauts and astronauts could meet, in spite of the fact that we were pointing missiles at one another and still in the midst of the Cold War. It was the desire of both the Russian space program and our space program [to] have astronauts and cosmonauts meet and get to know one another. But they couldn't figure out how to do it. Julian Scheer happened to be along with us on this trip to Athens, and Julian came up to me before I was going to give my presentation on Gemini V, and he said, "When you end your presentation," he said, "if you'll walk right straight down the center aisle of the auditorium and turn right at the first break in the seats there on that aisle way, four or five seats in there are two of the cosmonauts, [Pavel I.] Belyayev and [Alexei A.] Leonov." And he said, "Why don't you just unexpectedly break right in on them and walk up and shake their hands and see what happens." So, it really brought the house down. We threw our arms around one another, and then the Greek officials said, "Well, gee whiz, these guys get along fine. Let's seat them together." So, they seated us together at the banquet that night, and the next morning we had breakfast together; and at that breakfast table, we told them how to put a drogue sheet on board, which they were having trouble with stabilization spinning up and collapsing their chutes. We told them how to do that. That started the friendship between cosmonauts and astronauts.

NEAL: For identification for those who are picking up the pieces behind us, Julian Scheer at that time was Associate Administrator of NASA for Public Affairs, wasn't he?

COOPER: That's correct.

NEAL: And Leonov eventually wound up being commander during Apollo-Soyuz.

COOPER: That's right.

NEAL: Alexei. How about Belyayev?

COOPER: Belyayev died about 3 years later of pneumonia.

NEAL: But at least it was a beginning of working relationships, astronauts and cosmonauts.

COOPER: Following that, some time after that then, General [Georgy T.] Beregovoy and Kalapistov brought their families and came over to the States; I gave them a two-month tour of the United States, in fact. And I think that was the beginning of the end of communism in Russia; because when they went home, they were very free to tell all of their friends about what advantages Americans really have, even the lower-echelon Americans have, compared to what they have in Russia.

NEAL: It was two months. Where did you take them in the United States?

COOPER: All over. We hit everywhere, including the Great Canyon. They had a ball, and we did, too.

NEAL: Supermarkets, that kind of thing, figure largely in it?

COOPER: Oh yeah. We went to General Motors in Detroit and they were given a big, formal briefing; and I got off and called [one] of my friends, who [was] very high-echelon in General Motors, and said, "These guys really would like to see some experimental automobiles." With that, he came up and said, "Enough of all this formalized stuff. Let's take them down and put them in some automobiles." And they turned them loose on the streets of Detroit in these new, experimental automobiles; and they loved it.

NEAL: This brings to mind the fact that you always had a more-than-passing interest in things automotive as well as things astronomical. Have you ever maintained that interest in racing cars?

COOPER: Oh, yeah. I'm still interested in them. I haven't really actively raced any of them the last few years, but I'm still very interested; and I still work on developing engines.

NEAL: Even when you were in the program, I remember you and Gus Grissom worked on things like high-performance aircraft, spacecraft, boats, the whole thing.

COOPER: Boats, airplanes, cars.

NEAL: You name it, you were into it.

COOPER: Yeah.

NEAL: That's what an engineer does for a hobby?

COOPER: That's right.

NEAL: *[laughs]* As well as a living. Well now that John Glenn's elected to fly in space again, I wonder: Would you like to go up again?

COOPER: Sure, and I particularly want to go on the Mars mission.

NEAL: Any chance that you would make it?

COOPER: Well, I would hope so. I would certainly be very happy to do so.

NEAL: I'm going to give you a shot at something here, too, that was specifically asked of us, you and me. Because, when John flies, NASA's figuring that they just might like to have a few applicable quotes from people like yourself who know John well, and get reactions from you, and others, about what you really think of John's flying again.

COOPER: Well, I think it's great. I'm glad to see it, because John will do a good job for them. And here's a will-be 77-year-old body that they have had great medical data for 40-some-odd years on. It'll be a good database. I think it *really* will gain a lot of medical knowledge about what aging does to the cardiovascular system. Does it hurt it, or doesn't it hurt it? I think that will be very valuable information. And John will do a good job for them on the mission. I think also NASA can certainly [be] helped with a little good public relations, and I think John will really help them on that, too.

NEAL: Do you think it will be a high-visibility mission?

COOPER: Yes, I do.

NEAL: Of course, it would be if you were to fly it, too, Gordon.

COOPER: Well, that's true.

NEAL: Would you like to be his backup?

COOPER: Oh, possibly, yeah. I would enjoy taking the flight. But as I say, if I had my preference, I'd really like to be on a Mars mission because I strongly feel that we are way, way overdue getting back to the Moon and getting a manned mission to Mars.

NEAL: From all indications, if there ever is a Mars mission, it's going to be quite some time downstream. Do you think that, perhaps, your age might defeat that goal?

COOPER: Well, possibly. I would hope not, but—

NEAL: You have a lot of good years left, but how many will it take before we go to Mars, do you think?

COOPER: Well, that's the thing that worries me. I think we've been way too many years already going to Mars. We should long ago have been there with a manned mission.

NEAL: You think the same thing about going back to the Moon, don't you?

COOPER: Yes, I do.

NEAL: Even the Space Station, what are your impressions of the Space Station?

COOPER: I think the Space Station is one of the things—What's going to cause it to be so valuable is it's going to cause a large number of nations to start working together in space. And if we can do cooperative ventures in space, we can do a lot more; we can *afford* to do a lot more in space. I think this will be a great testing-ground for getting a number of countries really to working together. Of course, scientifically, we'll get a lot out of the Space Station. I think it will be very worthwhile from a scientific point of view. But, I think the thing that's going to interest people in the *real*, real nuts-and-bolts of *really* finding out what is out in space is when we go back to the Moon, and when we get out to Mars, and when we go mine the asteroids, and do a few things like that. Incidentally, there are some commercial groups that are starting out now that I think, before very long, we're going to see them launching to

mine the [asteroids], because it is a very lucrative venture. If it can't be done under NASA, well, let's do it commercially.

NEAL: Now, Gordon, I've asked an awful lot of questions. It could be that I've failed to ask one that you particularly would like to have had me ask. If so, right now's the time to cover anything that your heart desires. Is there something that you'd like to bring up for posterity, dealing with the space program—past, present, or future?

COOPER: Well, I think, one of the things that people always ask is why there's not apparent public interest in the space program right now. I think there's just as much public interest as ever in space. I think the problem has been the communications process. I think that NASA got into a *very serious problem* of not really trying to communicate to the public here a short number of years ago. I think they're beginning to make amends for that, and doing a lot better now. But, I think they began to feel like they were the only game in town and they didn't really have to make that effort. To communicate to the public, you need to properly prepare the packages to go out to the news media, to go out to the public; and they were not doing that. I think that it would, of course, be a big help if they really got a lot of this stuff out to the public; and, just as a for instance, there are things going on at Ames [Research Center] and at Langley [Research Center] in aviation that are wonderful research things that the public don't have the faintest clue about. I think that NASA needs to advertise that a little more and get that knowledge out to the public a bit more. And, of course, when we move on to doing some lunar missions and Mars missions and some of those, you'll see the public interest really get right to the forefront again.

NEAL: They had a pretty good example of that right here—

COOPER: That's correct.

NEAL: —at the JPL [Jet Propulsion Laboratory]. The Pathfinder went to Mars.

COOPER: Absolutely. The public were hanging on the TVs again.

[End of Interview]