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ROBERT A. R. PARKER
INTERVIEWED BY JENNIFER ROSS-NAZZAL
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ROSS-NAZZAL: Today is October 23, 2002. This oral history with Dr. Robert Parker is being conducted for the Johnson Space Center Oral History Project and is being held in Pasadena, California, at the Jet Propulsion Laboratory. Jennifer Ross-Nazzal is the interviewer, and she is assisted by Rebecca Wright.

I want to thank you for meeting with us today. I appreciate it. I'd like to start with your experience as a scientist-astronaut.

PARKER: Okay.

ROSS-NAZZAL: In '67, at the time that you became a scientist-astronaut, you were actually a tenure-track professor at the University of Wisconsin at Madison. Why did you decide to apply for the astronaut corps?

PARKER: Well, you guys are too young to remember what it was like back in the sixties. I tell people, I tell all young people, which is not just fourth graders, but even college kids these days, the excitement in the world, particularly in [this] country, about going to the Moon was something that just doesn't exist today. I mean, it was way, way, way beyond saving the whales or the rainforest or the ozone layer or any of that sort of stuff. It was just really exciting. And so this was basically the most exciting thing going on. It was more or less related to exploration,

which is what astronomy is about, or science is about generally, but it was just really the most exciting place [to be] part of what was going on.

ROSS-NAZZAL: So can you tell us about the application, the selection, and the interview process that you went through?

PARKER: It was, except for a couple of features, really fairly mundane. One of the amusing parts is that in the fall of '64, a selection began for the first group of scientist-astronauts. At that time, it was pretty clear, you couldn't be over six feet, you had to have perfect eyesight, and you had to go downtown to the post office to get the applications.

I had [an officemate] with me at [the University of] Wisconsin. I was teaching at Wisconsin at the time, and another young professor [shared an office] with me. He was over six feet. I wasn't. He had perfect eyes, but I didn't. And you had to go downtown to get the things. And so, well, it just wasn't worth it, because clearly we weren't going to make it.

Two years later, he was gone to I can't remember where, but I think the University of Texas [Austin, Texas]. But you could just write in for the applications, just like you would write in for any sort of National Science [Foundation] fellowships. It was just a very mundane thing. And it was very clear also that the restrictions on eyesight were softer than they had been before. So it was like, "Hey, why not try and do this. Hey, take a flyer and see what's going to happen."

ROSS-NAZZAL: Can you tell us about going down to JSC for the interview and the tasks that you had to go through at the Air Force base?

PARKER: Yes. That's what I say, as opposed to or in comparison to going someplace for an interview for just a regular job, it was a little bit different. In groups of about ten, I think, we spent a week at Brooks Air Force Base in San Antonio [Texas] undergoing all sorts of tests, most of which were, more or less, ordinary tests but did include the centrifuge ride and did include some balance things that you'd never have seen otherwise. And so that was kind of interesting in and of itself.

I think there were about sixty of us who were in this group that was looked at about ten at a time at Brooks and then [were] also invited down to JSC, which was MSC [Manned Spacecraft Center, Houston, Texas] in those days, to be interviewed, and it was kind of amusing because it was all very secretive. We came in and we were just protocol numbers, no names. We were registered in [the same fashion at the] hotel. It was just very secretive.

We were there [in Houston] for one day. I guess it was two nights, but one day. The first was to go over our physicals and look to see if they had any questions about the physicals. I don't recall that there were any questions in my case. Then they took us out, and they gave us a T-38 ride, basically [to wring] us out. And then we had an interview; later on I was on the other side of [the table] many times.

So again, hey, this is not your normal thing. You don't get into a T-38 and go up and have fun in the summer sky in Houston, hot and terrible as it is. But you don't do that for a normal job. As a matter of fact, I got sick. I don't know if I was the only one who got sick. [In later years I got know the fellow I flew with quite well and flew with him many times.] But [that day, I] just got sick. Not unexpected. And because obviously they selected me, I guess the real thing was not whether I got sick or not, but whether I decided, [based on that experience, that I wasn't interested in learning to fly].

ROSS-NAZZAL: So when you found out you were selected, what was your reaction? What was your family's reaction?

PARKER: It was exciting. It was, "Hey, this is great." And I saw some of the other questions in here about when I finally got selected to go fly on Spacelab-1, and in that case it was kind of like you expected it. You were just wondering when it was going to happen. In this case [of selection to the Astronaut Office], it turned out there was about one chance in six of making it. I don't really know as I knew what the [percentages] were at that point.

But we went out and had dinner that night. My parents happened to be in town. And then that was kind of it. Then two or three days later or a week or two later, when it became officially announced, there was some press stuff at [the] University of Wisconsin and so forth. Yes, it was big, but it wasn't like getting married or having a baby, I guess. [Laughs]

ROSS-NAZZAL: That's an interesting perspective.

PARKER: Yes. Hey, you got a job you were looking for, and it was a big, well-known job. So it's not just another job. But it wasn't that big a deal, I guess. It's hard to think back, because by now that's practically thirty-five years ago.

ROSS-NAZZAL: Tell us what NASA thought about the selection of a second group of scientist-astronauts, and the astronaut corps, how they reacted to this second group.

PARKER: I tried to figure it out last night when I was going over these things. There were astronauts on the selection panel, and so clearly the astronauts knew we were being selected. It wasn't like—boom—someone said, "Hey, there's eleven more people [here]."

[It seemed like] this happened every time we did selections. It seems like, between the time they started to do the selections [and] said, "Yeah, we need these people. We've got all this program running out here. Requirements are going up like this [gestures]." Between when that happens and basically a year later, … [when the group arrives, something always seems to happen that causes the requirements to decrease or the schedule to slip.]

In fact, during [our] selection process we had the Apollo [204] fire. So then we come down [in the fall of 1967], and probably budgets, something happened to the budgets or things got slipped out, and so then we show up and it's like, "Well yeah, we selected you guys, but literally we really aren't sure when you guys will fly or what we're going to do with you, because things have changed since a year ago." As I say, that happened. Seems like that happened—every time we selected people, it was a guarantee something was going to slip. We selected the '78 group, which included Sally [K. Ride] and then they came down, and meanwhile the Shuttle slipped out at least a year.

But I don't remember—(not to say that somebody, two or three people in the corner, weren't grousing)—but I don't remember any overt personal antagonism. Maybe some of them had had the same thing [happen] when they came. But I don't remember any particular problems that way.

We were there for, more or less, six months. Then we went off to flight school. We were in flight school for a year, and then we came back. During that year that we were in flight school we started flying the Apollo missions. So we came back in April and, lo and behold, in May,

Apollo 10, and July, Apollo 11. So we had very little to do with the early Apollo missions. But they really had picked us anyway for the Skylab missions, and the question was when were the Skylab missions going to go. They slipped out, but then the Apollo [program] got shorter. … [And then the Skylab Program shrank to] only three missions for Skylab. So we weren't going to fly on those, and, as I say, the usual thing.

ROSS-NAZZAL: You had mentioned that you returned from flight school around Apollo 11.

PARKER: Yes.

ROSS-NAZZAL: And you became a member of the support crew for Apollo 15.

PARKER: Fifteen. Yes.

ROSS-NAZZAL: I'm wondering if you can talk to us about your role as a member of the support crew. What were some of your duties, the expectations?

PARKER: [After we returned from Flight School], there was about a year, maybe it was nine months, that we spent working some on Skylab, a little of this, a little of that, and a lot of what I would call apprenticeship stuff, just go to meetings, gradually learn. It wasn't a training program, by and large, with specific objectives. Somebody may have sort of sketched something out like that, but somebody was on a committee working about this, somebody's on a working

group doing this, and somebody was worrying about this particular vehicle and what we'd do, some experiments on Skylab. So we were basically off learning by doing.

Sometime probably in the late fall of '69, they were putting together the crew for Apollo 15. In those days, a crew consisted of three prime, three backup, and three support [crewmen]. The three support for Apollo 15 became three of us. Apprenticeship positions, that's really all they were. One of us, Joe [Joseph P.] Allen, was following the science. Karl [G.] Henize was doing the command module, and I was doing [the] lunar module. So [I] started learning all [I] could about the lunar module systems and procedures and stuff like that, and tracking those modules as they were being built, which meant going to Bethpage on Long Island [New York] and testing at the Cape [Canaveral, Florida] when that happened.

So we went from more or less sort of planning what's going to happen somewhere out there to working on something that was going to happen in early '71. Once again, fate got in the way, and fate that time was Apollo 13, and so suddenly everything slipped out again. [Apollo 15 eventually launched in July of '71.] And in particular in my case, we [also] went from one lunar module, the earlier lunar modules, block one, if you will, to the block two lunar modules, which had much more capability, had the rover on them and all. So suddenly because we slipped out, those were going to be available. So bingo, we were off onto those, something new and exciting to do. So we slipped, but we kept on doing the work and getting ready for it.

Then Apollo 15 eventually flew in July of '71. But we [still had gone] from something that was out there someplace [in the indefinite future] to something that's [going] right now. We were working real vehicles, real procedures, real crews. So it was a wholly different world [from Skylab]. It was great. It was great.

ROSS-NAZZAL: So did you participate in simulations with the LM [lunar module] and with the rover?

PARKER: Yes, to some extent. By and large, the prime crew trained and simulated together, and the backup crew simulated and trained together. The support crew was really more the hardware. Every now and then we'd sneak in to replace somebody who wasn't there, or get some time on the simulator. It was a little catch-as-catch-can stuff. … There pretty much wasn't training dedicated to us.

[During] Apollo 13, we were [scheduled to be] at the Cape, and so we were going down to the Cape that Monday morning. We [still] went on down to the Cape, because what else are we doing to do? The prime crew came back, and actually Jack [Harrison H.] Schmitt and I stayed down there, because we had simulators. We had lots of money in those days. We had simulators both at the Cape and back at [the Manned Spacecraft Center in] Houston. And Jack and I stayed down and ran procedures on the lunar module simulator at the Cape until they were done, and then we came back home just in time for the landing.

At that time we would go—typically you'd leave on Sunday night or Monday morning, fly to the Cape, when you were the number one crew, and work all week and then turn around and fly home on Friday. That was life.

ROSS-NAZZAL: Tell us about the field trips you had to participate in for Apollo 15.

PARKER: Yes, 15 and 17. The geology field trips, great, great things. Great professors teaching us. There were early field trips, which are documented in *Life*, where they would take fifty guys

out, take them all to Iceland to show them what's going on. And take them down to Grand Canyon [Arizona]—and also to Hawaii—I guess, and back. And those were all great boondoggles.

But by the time we were training for specific missions 15 and 17, we were training on specific objectives, and the geologist would take an area, map it, and basically put together a two-day lab, where he would brief us [on] what the photogeology said. So again it was like looking at the Moon, would brief us on the photogeology, set up the tracks they wanted us to take, and those of us who were remaining at home, the support crew, would act as CapComs [Capsule Communicators] and we'd have a small back room of two or three geologists, and we'd be the CapComs.

When we went on the field trips in 15, we'd have the prime crew and their surface CapCom, who was Joe Allen, and their scientists, who were the prime scientists. Then there was the backup crew and their CapCom, which was me, and the backup scientists. So we would run this thing. We'd never been this route before or this area, even, before, and neither had the crew, and by and large neither had the back rooms. So they were getting their information from the maps and from what they were hearing from the crew in the field.

It was great. We just saw all sorts of stuff. I [had] always [been] kind of interested in geology, [and] it was great. One of the geologists I still see occasionally out here. He's at Caltech [California Institute of Technology, Pasadena, California]. But it was just great. And that was like two days in the field, probably, so it took up a better part of a week once a month. We probably did ten of those trips a year.

By the time we did it on 17, we didn't really have a backup crew that anybody was worried about, because there was going to be no 18 or 19. So it was really just the two prime

and myself and the geologists who went out … [because our back-up crew had already trained for Apollo 16].

ROSS-NAZZAL: You had mentioned that you were CapCom for this mission, and I'm wondering if you could talk about the role that you played balancing the constraints of the astronauts either in the command [and] service module or the astronauts on the lunar surface, with the demands of the scientists and the science work.

PARKER: Yes, on 17, I can talk to you about that. On 15, I was the CapCom during the sleep period, see, because Joe Allen was the surface CapCom. So he was there while they were basically awake or certainly when they were out on the surface. So the question there about balancing those things, on 17 we can talk about that, and it really wasn't that big a deal. But for 15, I was the quiet period, [although] we were doing planning and stuff like that.

ROSS-NAZZAL: Why don't you talk to us about that period.

PARKER: The quiet period?

ROSS-NAZZAL: As you were the Goodnight CapCom, what would you do during that period?

PARKER: We would basically represent [the crew], if questions came up about here was a problem or potential problem in the lunar module or the command module, what should the crew be doing about it. Should we wake the crew up on this? Could we wait? … So you're thinking

a little bit about what they're doing the next day, and you're knowing the systems and their procedures just like the people in the control room doing this. They were all the experts and there's all the real expects behind them in the back rooms. So basically there was a plan already, "This is what's going to happen tomorrow." But meanwhile some people, "Well, we need to add this," or, "We need to take this out," and you're basically sort of the crew spokesmen, particularly at two o'clock in the morning.

ROSS-NAZZAL: And would you then present these ideas to Joe Allen when he came on board?

PARKER: Basically you'd tell Joe what's happened. If you look in the—if you watch—and I'm sure you guys have seen or been in there, in the control room—the shift change, everybody comes in and sits down. I don't know how routine it is these days, but there's about a half hour handover on, "Here's all the problems." There's a lot of written documentation in those days where they wrote in their notebooks, a lot of, "Here's what's happened. We did this. This happened, but we've taken care of it with that. They're going to do this tomorrow," or, "They're going to do it the next day instead of tomorrow." All that stuff, just rapidly bring them up to date. But I'm sure you guys have seen basically loose-leaf notebooks with the forms, just wrote into the forms, and page after page after page, everybody handed—called handover.

ROSS-NAZZAL: Let's talk about Apollo 17. I'm curious, you became the mission scientist for Apollo 17, and the first time that there was a mission scientist was on Apollo 15.

PARKER: [Thirteen].

ROSS-NAZZAL: [Thirteen].

PARKER: [Thirteen], which was Tony [Anthony W.] England. … Tony was a geologist, Tony England. Did you guys talk to him?

ROSS-NAZZAL: No.

PARKER: You probably will sometime. I think he's in Michigan these days. Last I heard he was. But he was the first one. Then came Joe Allen on 15. Who did it on 16? Crews really kind of stayed to themselves, still do to a great degree. And then I did on 17. It seemed—and I don't know that it was designed that way and I don't know that it was that way on 14, but on 15 it was, to some extent, the mission scientist was sort of like the lead person in the support crew, for whatever reason. [Joe] sort of integrated on 15 what Karl and I did. We were specialized in vehicles, and he was sort of the overall mission, which sort of makes sense. So this was kind of like, the next step up the ladder, as it were.

So after 15, I went on to 17. The normal sequence would have been 15, 18, because of the way they rolled. They had three crews, and the backups on 15 would have become the primes on 18, and Dave [David R.] Scott and Jim [James B.] Irwin had been [back-ups] on 12. So it's sort of a rolling thing. But 18 disappeared [from the program], and so we came to 17 [as the final mission].

But we had to fly a geologist. That was one of those, semi-political things. To scientists it made a great deal of sense. And what that meant was that Joe [H.] Engle, who had been the

backup lunar module pilot on 14 and would have been the lunar module pilot on 17, suddenly became nowhere. And Jack Schmitt, who had backup lunar module pilot on 15, became the lunar module pilot on 17. I'm not quite sure how the support crew moved around, but the support crew moved around and so we were there. Let's see. I think [C.] Gordon Fullerton [and Robert F. Overmyer were also on] the support crew. …

ROSS-NAZZAL: What was the reaction of the scientist-astronauts to Harrison Schmitt being assigned to this crew?

PARKER: There was no celebration, no riots in the streets, [or] those things. … There may well have been some discussions between Gene [Eugene A.] Cernan and Deke or Al, who was the head of the office, or Tom [Thomas P.] Stafford, who may have been head of the office at that point, over replacing Joe Engle with Jack. But [there wasn't] anything that the run-of-the-mill people [like myself] in the office were aware of at all. Yes, okay, you could see what's going on. [And so I probably said], "Hey, great. I'll work with Jack, [whom I had worked with on 15] and that's great, and Gene," who I didn't know beforehand. …

ROSS-NAZZAL: Why don't you tell us about your duties as a mission scientist.

PARKER: Mission scientist was really the interface between the crew and the science community. Now, that's different and funny when you've got Jack Schmitt, who's a geologist and is going to interact with any scientist he wants to. It's not like had it been Joe Engle. [If it had been Joe], I'd have been the interface between Joe Engle and Gene and the scientists, no questions about it.

But now I've got Jack in there, and, well that was just one of those things which made it easy and hard, I guess. Jack and I worked very well together.

[As] mission scientist, I went to most of the science team meetings. You knew what was being planned, what the rationales were behind that. At the same time, Jack had training. He had lunar module training. He was the lunar module pilot. So he had training for the command module, lunar module, and all those things. So he couldn't go to all those [science team meetings]. So essentially I'm there as his representative, even though he's the scientist as well.

… [And of course some of it was] great fun. I mean, Jack and I spent nights down at the crew quarters naming the craters, because every crew got to name the craters; it was the good way of talking about where they were. And Jack and I spent time naming a lot of the craters in the landing site. Hey, not everybody [gets to do] that.

ROSS-NAZZAL: You also worked on a number of committees during this mission. You worked on the ad hoc committee for mission planning.

PARKER: Tell me, yes. [Laughs]

ROSS-NAZZAL: And the Apollo 17 Editorial Review Board for the preliminary science report. Can you tell us about these committees?

PARKER: They were just committees [and they were preflight]. … [During a mission], you have to be disciplined in this business. You can't say, "Yeah, I'm going to stay up all day for the ten days that Apollo 17's up." You can't do it. And so, yes, you do your work and then the next

shift comes in and they do their work, and maybe it's twelve hours and maybe it's eight hours. But the next shift comes in and you do your work, or whatever the sequence is. So there were planning shifts and there were active shifts.

Now, this time, I was the communicator while they were on the surface. Ahead of time, I [did work with some of the committees] helping them plan, well, what does Jack want, or, well, yes, but we've got to worry about the lunar module walk-back capability, the engineering part of that sort of stuff. So that's an interesting committee.

The editorial committee? [NASA] put out a science report with a three- to five- or ten-page article from each—I'm sure you guys have those—from each of the PIs [principal investigators] on all that sort of stuff, and there had to be an editor for it. And I guess tradition was by then that [the mission scientist] was the person who was editor. But it really just was a matter of making sure that everybody got their stuff in. [I] didn't do a whole lot of rewriting on it that I recall.

ROSS-NAZZAL: You mentioned doing some work with the crews. Andrew Chaikin talks about your relationship with the lunar surface crew, and he talks about how you and Jack Schmitt joked around quite a bit. I'm wondering if you could talk about the crew's relationship.

PARKER: When you work with a crew for a year and a half to two or three years, you're an entity, whether it's the seven people who are working together on Spacelab 1or whether it's the nine of us who are working on Apollo 17. And so you're really—you're family. [And I] would expect [that] it still goes on today. [Although], since I left there ten years ago, I don't really

know [for sure. And] yes, Jack's sense of humor and mine were both [similarly] bad. We both had pretty caustic, ironic senses of humor that we'd give to each other.

ROSS-NAZZAL: There's one last thing I want to ask you about the Apollo Program. You actually earned an Exceptional Scientific Achievement Medal for your work with Apollo 17, and I'm wondering if you could tell us about the scientific findings for Apollo 17.

PARKER: First of all, that's basically just beads and trinkets. It's nothing. It doesn't really mean anything, that I did anything in particular on that, just one of the things that they pass out to the people in the end. [Then] you've got to realize that, first of all, it's thirty years ago exactly. [And although] the scientists were very involved with the crew ahead of time, once they got their data, they're gone. They're going back home [to work with the data], which is what they should be doing. That's exactly what they should be doing. [And that was also] true on [my] Shuttle flights. Unless you really worked at it, [you lost contact with them after the flight]. And I will say, I did make some two or three good friends among the geologists who were working on both of those missions and among the astronomers.

Like I was on 15. Well, okay, [do you get] to sit around and really enjoy and chip at the rocks and do all that stuff? No, they've got their things to do, and I've got my things. I'm on 17. At the end of 17—boom, I was off working Skylab. In fact, I really had barely time to finish being editor. So, that's "each in its time." So, I'm not the person to talk to about what are any specific results of any of those [flights]. I mean, it was great. You were really part of that, but then it was over, and it was, "And what do we do next?"

ROSS-NAZZAL: As you mentioned, you became the program scientist for Skylab rather quickly afterwards. And I'm wondering if you could talk to us about how your work as a mission scientist on Apollo 17 prepared you for your work as program scientist for Skylab.

PARKER: Yes, I saw that. It's kind of funny. And again, Deke would know the answer to that, because he's the one who picked people for all these things. And why was it me? Probably because I was available. I had just come off of 17, as we said. How much was I prepared by 17? By having worked both 15 and 17, you got the feel of trying to balance off safety and engineering, restrictions versus the science desires, or requirements and the crew. You had gotten this feel for balancing that sort of stuff. And that's really what the program scientist ended up doing or was really designed for.

We still haven't figured out exactly how to do this, really. It's still a problem today, and it will be, I think, for some time, and only now it's Space Station instead of Skylab. But, they're the same thing, really. You've got fifty experiments, and in that particular case you had very short periods of time, thirty, sixty, and ninety days, to do those experiments. They all have little restrictions. You can't do the solar stuff when the sun is set. You're waiting for a flare. If a [solar] flare (which is a big part of the solar experiments) comes, what do you do? You can't just take a pass down the Rockies [at any old time]. It has to be when the vehicle is going down the Rockies, and the weather has to be right. The [biomedical folks] want the data taken on the right time of the day on a regular basis from the crew. …

I didn't know it at the time, because I was, fortunately, having fun doing 15 and 17, but they had this elaborate prioritization scheme, and I think they might even be tempted to try to do this again. You're too young to remember what it was like. This was pre-computer stuff, really,

and some of your people can talk about the kind of computers we used on Apollo. I'll tell you two stories there. [First], when we drew up the plan, the flight plans, we literally had guys with rulers and sharp pencils drawing out those things and measuring out lengths of time that we would do this experiment and then this one would overlap. No, this one couldn't do, erase it, and do it again. Literally that's the way it was done. None of this typing in stuff. [Parker makes typing sound.]

[Second] on [Skylab], if you've talked to [Edward G.] Gibson or [Owen K.] Garriott, you've heard [about] the Apollo Telescope Mount, which was the console that controlled five or six solar telescopes in unison so that you could be making observations of the corona more or less at the same time you were making observations of the flare, more or less at the same time you were making observations just of the general sun, different things with different instruments. These days that would all be programmed up and you'd punch "start," and this thing would run out. You might [do] some reprogramming or the ground might [do] some reprogramming an hour or two before and you [would] still punch "start" and it [would run] out.

Instead [during Skylab], you played it like an organ. We had rows of switches, probably one [row] for each instrument or one or two of each instrument, and you had a card, a Joint Operating Plan, a JOP. And so you're going to run JOP 7B, and so you picked it up like a sheet of music and it was "dup, dup" and fifteen seconds later, "dup." It [is] just amazing when you look back at it and think what you did before computers. But that's just a little sidelight.

[And so they had all the various experiments with various conflicts to sort out in order to accomplish the solar astronomy, and Earth sciences and biomedical and all that sort of stuff.] While we were doing 17 or getting ready for 17, they apparently had a simulation. Deke told me this later. They apparently had a simulation where this elaborate prioritization scheme was

supposed to separate who ran when, [and all that] sort of thing. They ran it for five days or something like that, and it was a total disaster. Someone said, "Hey, we have these experiments interplaying [with] the Apollo guys on the [lunar] surface, and we get [things done]. And we have mission scientists who make those decisions."

It's what I call the omniscient benevolent despot scheme of scheduling science. The mission scientist or the program scientist for Skylab was supposed to understand all the experiments so well that he could decide, "Well, that's the most important one to do today," and he had to be benevolent, of course, all these things. … We [worked] on the planning shift, because all we did was plan. So I worked from ten at night till [eight] in the morning planning [the science to be done] two days hence. There was another fellow who had worked with me on 17 who [alternated with me]. I did it four days a week or four nights a week; he did it for three nights a week.

The job of the program scientist [operated in] semi-real time. If something happened about two o'clock in the afternoon while they were running something, basically [they] did what [they] could [at the time], and then we tried to replan [it for] a couple of days later. If this happened on Monday afternoon, [Monday night]/Tuesday morning we'd come in and be looking at stuff that was going to happen on Wednesday. So we had about a two-day lag there. So it was near real-time planning and trying to balance, and it wasn't always easy.

The thing that really made it work, ironically, is one of your next questions [and that] was the Skylab launch disaster. What that meant was that nothing anybody had planned on was going to work. And so suddenly we could say, "Well, hey, that's what we planned on, but [it's] not going to happen that way. We're doing it this way, dup, dup, dup." Had we not had that, there might have been more resistance.

We ran Skylab on Houston time. I don't know how they run Space Station, partly because we've got the Russians and partly because of other stuff, but we ran Skylab on Houston time, and so we could say, "Okay, from seven in the morning until eleven, we're going to do astronomy stuff. Now, tomorrow, because we've got this particular run coming up on some biomedical stuff, we're running those things from nine to eleven," and so forth. Then the people who ran the solar physics, [for instance], could make their own decisions as to what they did during that block of time. We didn't have to pick which instrument, but we pretty much just picked the blocks of time. And some instruments broke, and then what do you do with that, and how do you schedule time for them to try to work them back, to fix them. There was a lot of that stuff.

ROSS-NAZZAL: You touched on one of my questions. I'm wondering if you can talk about the Skylab 3 mission. When they came back, they had overachieved actually on that mission. They had done 110 percent, and they recommended a pretty—

PARKER: Yes, the Skylab 2 crew, [the first crew], had a hard time. … They were supposed to go up there and [just] start working [on science]. But, in fact, they really had to put everything back together again and demonstrate that the stuff was working [properly] or whatever. [And as a result], they did a lot less science than people expected [before launch]. By the time we went up there [with the] Skylab 3 [crew], we kind of had that worked out. So there was a difference there [between SL (Skylab)-2 and SL-3], yes.

ROSS-NAZZAL: What was your reaction to the crew's suggestion that Skylab 4 do more work, or as much work as they had done in terms of scheduling and balancing?

PARKER: I don't think the Skylab 3 crew—let's see. That was [Alan L.] Bean, [Jack R.] Lousma, and Garriott. I don't think the Skylab 3 crew came back and suggested that specifically. But clearly we [on the ground] expected, hey, the Skylab 3 crew has done work at this rate, [after] a ramp-up for about seven days [and therefore we can expect the Skylab 4 crew to do the same]. … But you're trying to get at the supposed controversy about over-scheduling or the unhappy crew of Skylab 4. There was a difference in how we planned things for 3 and 4. On Skylab 3 and 2, they had launched with flight plans that basically said, okay, you're launching on July 28th [and on August 23rd] at 2:30 in the afternoon, you're going to be doing this. It was all planned out. Well, it never really, of course, quite worked that way, but when they launched, they had very definite ideas about what their rates of work and so forth were [and] what they were doing on which day [and when]. And of course on 2 they certainly didn't happen that way, and it didn't really happen on 3 either.

By the time we got to Skylab 4, we were kind of comfortable. We didn't need to have that specific a flight plan ahead of time. We also didn't have time enough to put—. Now we're talking about not sixty days, but ninety days [on orbit], and we didn't have time enough to do all that [detailed planning] or train to it or do simulations for it. So we put together a thing that said, okay, we need eight hours a day, or whatever the time was, times three [crewmen], times ninety days. So, okay, we got this many hours. All right. We'll do this many hours of astronomy, this many hours of sun, [etc.]. So we had basically not much better than that, a little bit better than

that but not much better [detail] than that. So the crew probably had no clear visualization of what their schedule was going to be.

Crews are different, and we never worked with them enough to see it one way or the other. That's all there really is to say about it. They also felt that, "Hey, we're not working for ten days, we're not working for thirty days, we're not working for sixty days. We're working for ninety days. We need a more sustainable pace." And that's been one of the questions both for ground and for crews forever, really. For seven days, you [can] ask anybody [to do] anything for seven days.

For instance, on the ground, [too], do we have to have—and I don't know that we've got the answer to that yet—do we have to have 150 people? We did during Skylab. One hundred and fifty people on the ground all the time—July Fourth, Memorial Day, Christmas Day. We worked Christmas Day, New Year's Eve, New Year's Day. … Do we do that [forever] or do we say, hey, for Space Station, you're up there forever? We'll be planning once a week, and if you don't get it this week, we'll get it next week. Because if you have somebody working [the] midnight [shift, they] don't last very long. … It's a hard life, particularly because hopefully it's very routine.

ROSS-NAZZAL: I wonder if you could talk to us about how you coordinated the experiments for Marshall Space Flight Center [Huntsville, Alabama] with the JSC experiments. You touched on this a little bit in your earlier interview, but I'm wondering if you could expand upon it here.

PARKER: Again, that stuff hasn't changed either. When Skylab was put together, [some of] the experiments were thought of as Marshall experiments. The PIs worked with the Marshall

people, and there were [others] that worked with JSC. I've forgotten who were the directors of the Centers in those days. They may have been more or less amicable than they were at other times with other Center directors, [and] it's not just Marshall and JSC. You name [any] two Centers, and [you can] name people who don't get along with the other, because they think the other Center's not pulling its load [or is taking something that should be theirs. etc.].

When I was appointed, I worked for Bill [William C.] Schneider, who was at [NASA] Headquarters, [Washington, DC]. The program was run out of Headquarters in that sense, so it included both Centers, and I reported to Bill. Kenny [Kenneth S.] Kleinknecht, (I don't know what his exact title was), was the local guy on the scene, [and he] was a JSC guy (or MSC in those days. Somewhere in there we became JSC.) So now we've [also] got a JSC guy, which was me, [scheduling the experiments and so the gripe is "He's going to favor all the JSC experiments over the Marshall experiments"]. There may have been—I know that there was some—a little bit of that business at the very beginning, but it wasn't there for very long. [That was really just a matter of showing that you were looking at the science and being fair. And as I said], the fact that we'd had the catastrophe on the launch of Skylab 1 meant that all that stuff didn't matter again. We're starting from scratch here.

ROSS-NAZZAL: Skylab ended, and you actually did some traveling, and you spoke a great deal about Skylab and the scientific findings. And so I'd like for you to share with us what sort of things you talked about. You went to Poland, for instance.

PARKER: Oh, that was just State Department nothing. The Poland thing was just—I think we were opening an art exhibition or something. What we in the astronaut office, you've heard it from other people, call the "potted palm mode. There you are. There's the astronaut. Okay."

But [after Skylab], we did go two or three or four AIAA [American Institute of Aeronautics and Astronautics], AAS [American Astronautical Society], AAAS [American Association for the Advancement of Science], those sorts of things, and Jack [John R.] Sevier (who was my alter ego, as the program scientist) and I would talk about how we managed the operations, the sort of thing I just told you, only probably with more numbers that I can't remember at the moment. And then the PIs would talk about what they have found from their stuff. So again, there was a real separation. We were sort of the lightweights just talking about how we ran the operations.

But [at the same time], operations [was, and still is, one of] the big [significant hurdles]. I thought a long while about that last night, because I would have said, it's not like [catching a touchdown or hitting a home run. It is just the everyday business but it is still a big challenge and one that you tell I still feel a part of.] Operations gets a bad name because it's "just operations," but, in fact, how do you manage all those people, not in that sense, but how do you manage all their activities? The crew and the ground, the PIs who can be their own problems, the crew who can be their own problems, how do you manage those [disparate] pieces and get a reasonable [result].

[Before] I left the manned space flight side of [NASA] and came into space science, we were looking at basically auctioning, where you give everybody so many credits which they now can swap [among themselves for power or downlink or observing time, etc.]. They [have tried] it here in Southern California … with pollution credits. So you could pollute more if you [pay]

somebody for their credits and they polluted less. If you wanted thirty hours of science at a particular time, you could pay somebody else for that with some credits [that they could use] for something [else that they might want at another time. This way the P.I.'s do some of the selections among themselves.] …

ROSS-NAZZAL: In 1974, that same year, you became Chief of the Astronaut Office for the Science and Applications Directorate. That office was actually only created six months earlier. Do you know anything about the history of the creation of that office?

PARKER: Yes. Basically at the end of Apollo, and Skylab really was the end of Apollo, they stuck [the] Apollo-Soyuz [Test Project] onto the end of it, but at the end of Apollo they basically said, "We're building the Shuttle. What are we going to do with you guys?" So there was probably some political stuff going on, but they said, "We've got a pilot office and a scientist office." I think we even had two—we had a life scientist and a space scientist office. This was an office of five people or something like that. And a lot of the pilots who'd flown on Apollo, well, there was nothing coming that was going to be really good, and so many of them left. The [remaining] pilots went off and really concentrated on the Shuttle.

[As for the] scientists? Well, okay, what are we going to do? At that time we looked at a number of things. We did some studies, I mean individuals in the office, did some studies on solar power—this was the big energy crisis time—and some guys did some early work on science or science sort of stuff that would be done on the Shuttle.

I worked a lot on the Spacelab. The Spacelab people had just really started to come in from Europe at the time that we were finishing up Skylab. …

At the same time, I said, "Hey, I need to go back and become an astronomer again." I knew some astronomers. … [And I had met some new ones] by working on the Skylab stuff. So I started going out to Kitt Peak [National Observatory] in Tucson [Arizona] a week a month. I'd get in a T-38, fly out there on Monday, get back in a T-38, fly back on Friday night, one week a month, and basically started doing some astronomy, going up on Kitt Peak to observe and stuff like that. I think some other people did similar things. I don't remember what they were. But I was probably the most successful, and it was kind of easy to fly from Ellington [Field, Houston, Texas] to Davis-Monthan [Air Force Base, Tucson, Arizona]. So it was a piece of cake.

At the same time, people wanted to look some more at this operational stuff. And I think you mentioned it in here. What did we call it? ASSESS [Airborne Science/Spacelab Experiment System Simulation]. …

ROSS-NAZZAL: It's the Airborne Science/Spacelab Experiment System Simulation.

PARKER: Okay, got it.

ROSS-NAZZAL: It's hard.

PARKER: [ASSESS flew some astronomy instruments] out of Ames [Research Center, Moffett Field, California] on a CV-990. [The project] lasted on and off for four to six months. In retrospect, I don't know why we did it, except [that perhaps] Ames [or perhaps Marshall] wanted to be part of [human space operations], wanted to be doing some [payload ops] stuff. Kind of

partly to fill in time [while waiting for the Shuttle. And as a crewman, I felt a] need to just keep [my] hands in this operations stuff and how it works. There were four of us who [flew to operate experiments for other people who had developed the instruments. Those people stayed on] the ground talking to us while the plane flew, and we'd do [the observing]. It wasn't terribly successful, but it was another thing that kind of got people to work together. There were some Europeans in there, and that's when ESA [European Space Agency] was ERNO [Entwicklungts Ring Nord Organization], whatever ERNO stood for. That's when Spacelab stuff started to come into it; so I can remember flying from [SFO] to Bremen, [West Germany], in the middle of it, to be part of a Spacelab meeting. …

ROSS-NAZZAL: Why don't you share with us a little bit more about your role in Spacelab. Until you were assigned to the first Spacelab mission, what were some of your duties?

PARKER: [For the] Spacelab, as [for] all [the vehicles], (the Shuttle, the command module, the lunar module, [and] all those things), particularly during [the] development [phase], but even during the building of each individual [vehicle], the contractor's doing all the work. It would have been Rockwell or Grumman or Boeing or whoever. Every now and then in comes [a] review team, particularly [for] preliminary requirements review, preliminary design review, [and] critical design review. Those are the three big ones, [plus] periodic reviews, and in would come hordes of engineers and crewmen, [e.g.] people from the Cape, who [would say], "How is this vehicle going to work at the Cape? What are the Cape's concerns about last-minute servicing?" And so forth.

So from time to time I would go on one of those teams, and they'd be big reviews. Hanger floors full of 150 people sitting there working on their particular [area or discipline] of it and writing what we called RIDS, which is Review Item Discrepancies, which would then go to a higher board, which would say, "Yeah, yeah, yeah. No, we don't want that one. Yeah, yeah, yeah." And then would go to a higher board and so forth. Then the people who were building it would have to take all these and make the changes and send the bill to somebody.

There were also more specific things from time to time, like for the crew it would be the crew interface reviews. That's not quite the right words, but where [the crew] would look at the switch panels and look at the displays. At this point we're talking in the seventies; [computer displays] are coming into their own. How do we want the displays? It was really kind of like us, the customer, telling Microsoft what to put on its displays, but we got away with it.

I remember the Germans—shouldn't pick [just] on the Germans—but the Spacelab people had this scheme where if you wanted to turn on a switch or a pump, turn on a pump, you did it by software, because the software normally managed it. But you could override it, but you had to type in an eight digit and letter command, and it would turn it on, and eight digit or letter but one or two digits different command to turn it off.

We weren't doing things like that on the Shuttle at all, didn't mean that we were doing them right, but we weren't doing things like that in the Shuttle at all, because we had displays with all those commands showing: "Pump On," "Pump Off." And you clicked on "Pump On," and the computer sent the eight-digit command to do it. And the Germans, they just have this [primitive] thing, "Well, are you going to give us a phone book so we know those things?" Well. So we threw a fit and [they] changed that.

Then how are we going to control the experiments? We had the European experiments, and we had the American experiments. They had their philosophy about how to turn things on. We had ours. And Marshall, in particular, because they were doing most of the experiments, had their philosophy about what we were going to do. So there was all this [operations] development stuff going on in which we inserted ourselves from time to time.

ROSS-NAZZAL: You were finally put on a flight in 1978, and you didn't fly for five years.

PARKER: For five years, yes.

ROSS-NAZZAL: So what did you do during that time period? Were you training during all those years?

PARKER: By and large, we were training. Like everything else, okay. And then months later, but only months later, suddenly, oh, the Shuttle's slipping. So suddenly STS-9 is not in 1981; it's in 1983. I said, "What else is new?" And to some extent, training expands to fill the vacuum. To other extent, we basically had a year when we weren't doing a whole lot of training for it. It was kind of a year's hiatus. It didn't mean we didn't do anything, but we just really weren't terribly active during that year. What did we do? I don't know. Maybe we flew the airplanes more or whatever, because during all this time you're still flying airplanes.

But we spent a lot of time—Owen Garriott and I were the two, and we didn't have backups, but Owen and I spent a lot of time going to Europe and went to Japan once. I think he went twice. We're training on experiments. Because again now, it's not like going to Marshall

or to University of Kentucky [Lexington, Kentucky] to train on an experiment; we're going to Germany. First European mission, so we had to go to every European country that had a piece of it in ESA. So we went to Denmark to look at this little small experiment that they were doing, and we went to France, two or three places in France to look at this or look at that. But they were sort of centralized in Germany, so we spent most of our time in Germany. But we went to all those different places where individual experiments were being developed, [to be familiarized with the science] though, [not of course to decide] what science should be done.

… Now, we had payload specialists with us. A couple of things [were] different [from what] they were during Apollo and Skylab. On Apollo and Skylab, everybody was a bona fide astronaut. That was a career. That was what they did all the time. And the CapComs were the only ones who talked to the crew, almost without exception. I mean, very much almost without exception.

Along came Shuttle, and the new communications satellite, the TDRS [Tracking and Data Relay Satellite], which I guess we on STS-9 were the first to really use, and suddenly the airways were open the entire time, or up [to] more or less 90 percent of each orbit. And we have real, more current scientists on board, the payload specialists. So they know more about the science, and what's going on than we do. We're generalists. I'm an interstellar matter supernova remnant man. We don't do too much of that sort of stuff on Shuttle. And now, because time is [more] available [on] the communication channels, the PIs now can talk to the crew. All this is very different than it used to be and a big improvement, a huge improvement. So those things about how the science gets done [are] very different from what it was during the earlier times and, as I say a huge improvement.

Now, what was the question? [Laughs]

ROSS-NAZZAL: I think you answered it.

PARKER: I answered the question I wanted to answer, but I've forgotten what your question was.

ROSS-NAZZAL: You had mentioned that communication had changed from the Apollo era into the Shuttle era, and in particular you mentioned that the PIs were able to communicate in real time with the mission specialists and the payload specialists. And I'm wondering what impact did that have on the crew and your work.

PARKER: It was still somewhat controlled. There were two channels, one basically controlled in Houston, which was the flight crew, so this was not the science. This is the Orbiter and Spacelab systems stuff [that] was done on that [loop]. Then there was a science loop, which was basically controlled by Marshall. But they had a science CapCom; I don't know if you're talking to those people at all, but Chuck Lewis was the one who was the science CapCom on my shift on Spacelab 1. So there was some control. The PIs didn't just get on there and blather away, but they could have if they wanted to. They might have if they wanted to.

So there was some control. But you didn't have [the procedure like Apollo and Skylab where] the crew would ask a question, [and then], depending on how good the CapCom was, and how good the scientists were, the CapCom would ask the scientists and the scientists would give him something, and the CapCom would rephrase it to talk to the crew, because he thought that's what the crew needed to hear. And sometimes [the right answer got through but sometimes it was lost]. So cutting that [process] back was a whole big help.

The other thing I started to say about the science business was, we had the payload specialists onboard who were more current scientists, so they, to some extent, did get in and stir the pot a little bit about what kind of science was done. We did a lot less of that because we said, hey, we're—which is what I believe crews really are—we're the eyes and ears and hands of the guys on the ground. So if they want us to turn that switch and do this thing this way, we'll do it for them. It's not our decision as to whether, "Well, maybe if we did it this way, we could get —." No. That's their business. You might talk about some efficiencies or saving power or something like that, but that's their business.

Payload specialists, particularly because the payload specialists tend to come from a group that's got one of the major experiments on board, get involved in this a bit. But those guys [the group the PS (payload specialists) comes from] also lose the payload specialist as a particularly active member of their group, because he's got to worry about—he or she—got to worry about all these other things. So, yes, they've got somebody onboard who really understands their experiment well, but, in fact, he's got lots of other things to worry about. And having a PI on board with his own experiment—and we've done this—a PI onboard with his own experiment means that that PI is focused on that, and everybody else is taking care of the rest of things.

On the seven to ten day Shuttle flights, you can kind of understand that. It's a major experiment. On Space Station we're talking about 60 days, 90 days, 120 days, there's no one experiment that one person's going to be [so] focused on for that period of time, [that] you [would] have to take up the PI, as it were, to do that experiment. That's a huge investment of resources, unbelievably huge investment of resources. So basically the payload specialists or the PI going up to fly is not really what you're going to do [on Space Station]. Now, you fly some

people like the teachers, who are generalists, but to fly somebody to work primarily on their experiment, for 120 days, there's nothing that's that important.

ROSS-NAZZAL: Why don't you tell us about some of the experiments that were on board. I know during the first day, for instance, the crew was essentially—there's a quote the crew was "dropped, shocked, and made sick."

PARKER: Oh, on Spacelab 1.

ROSS-NAZZAL: On Spacelab 1. Can you tell us about those experiments?

PARKER: Well, Spacelab, you see, this is now 1983 and it's ten years, more or less, since Skylab. And so this is the first time for the science. Well, we didn't do much solar astronomy, but for the biomedical people ([and] this is the heart and soul of JSC science) this is the first time they'd got a chance to do some of this stuff since Skylab. Well, a major part of Skylab was how well people adapted to zero-G and also the vestibular study. I forget what the acronyms were, but it was 133, I think, where they had the rotating chair, when they did this on Skylab.

So one of the key things that people were looking at on Spacelab 1 was motion sickness. We did a vast armada of tests ahead of time, sort of baseline, I guess, if you will, but also to look at different aspects of stuff on motion sickness. And then up there we had, which was frequent on Spacelab 1, we had European vestibular experiments and American vestibular experiments. We were basically looking to see what the reaction of the human body is to zero-G in vestibular sense. And we had a PS, payload specialist, from the American vestibular experiments. We

kind of knew anecdotally from Skylab and from other flights, a lot of that stuff, but this was trying to be more precise about it, the places where we basically were not tumbled so much. In Skylab, the [rotating]-chair was really to induce nausea. Here we were not so much [trying] to induce nausea, but to look at the circads in the eye, when you have a rotating dome on you or when you were moving back and forth, [etc.]. By now we've [had] lots [of] television things in front of your eye; you're all [locked] in and there were scenes that are moving— [so] what's the eye doing? [And sometimes they are] running warm or cold water into your ear at the same time [as you are watching the scenes] to [also] induce [a] sense of motion.

So there was an awful lot of that done. The shocking refers to something called the Hoffman reflex, which I'm amused to see that they're still doing on the Space Station these days. [In this experiment] you "drop" somebody, [while we simultaneously received] electroshocks into the calf muscle in the right place so [that] it'd come back up to the right place in the spine and create some sensation. I've forgotten what they measured. [As you can see], I'm not a biomedical guy. But these [are all] things which were done [to us].

ROSS-NAZZAL: Interesting.

PARKER: I mean, yes, you're up there both as the operator [and the test subject] of [the experiment]. I mean, when we were doing that experiment, one of us was the subject and one was the operator, then we turned around an hour later and the other guy would be the subject and you'd be the operator.

ROSS-NAZZAL: Tell us about the crew relationship. This was the first time a crew had actually been split into two teams for the Spacelab so that you could operate it twenty-four hours a day. How did that impact the crew's relationship?

PARKER: Not too much, I don't think. I will say this, the fact that we had twenty-four [shifts] in terms of going back now to Skylab operations—it was just a giant step ahead, just like the communication, giant step ahead. Because in the old days, [if] we wanted to observe something over Iran or [somewhere], we [might] have had to wake the crew up two hours early. Couldn't possibly do that. It was one of those things. Now there was always a crew available; so you could do that. Just say, "[We'll] do it." And whoever was up did it.

But when we were training the science crew, we had prime and backup for the American payload specialist and the prime and backup for the European payload specialist, and then Owen Garriott and myself. So that's six of us. And the six of us almost always traveled together and did the training together. At the very end, in the last year or so, when it became obvious this is going to be on your shift and this is going to be on their shift, we separated a little bit in that sense. But still, you could do an experiment on both shifts. So we trained together a great deal. We spent a lot of time together, not just living in Clear Lake [Texas] but because we traveled together, from Huntsville to Europe, to Japan. So even more time together, because there you're together twenty-four hours a day.

So I don't think we felt separated so much. The payload specialist might have felt separated from the Orbiter flight crew, which was John [W.] Young and Brewster [H.] Shaw [Jr.], because they weren't participating in these trips. But, in fact, for myself, they're two of my best friends to this day, particularly Brewster Shaw, even though he was on the other shift.

Now, [to some extent that may be because] I served as the flight engineer, the center seat guy. So at the same time as we were training on the experiments, I was training, particularly the last year, with Brewster and John on ascents and entries. So for a good last six months or so I'd be training on Mondays with them doing ascents and entries, fly to Huntsville, do experiment training, fly back and do ascents and entries on Wednesday, and back and forth. So I got to know, or keep in touch with them, maybe, a lot better than the others. But again, Owen had known them for years as well.

ROSS-NAZZAL: This is probably a good time for us to take a break.

PARKER: Okay.

[Tape change]

ROSS-NAZZAL: So after you landed, you spent approximately a week in isolation. Can you talk to us a little about that?

PARKER: Yes, I'd say relative isolation. We landed at Edwards [Air Force Base, California] and was not so much isolation as it was just [being] more or less constantly available to the PIs for testing. There must have been some cardiovascular testing, but by far most of the testing was vestibular, and it was, to some extent, a repeat of the baseline stuff they'd done ahead of time and more or less some of the stuff we'd done on board, and then looking to see as it changes back. Have you talked to Byron [K.] Lichtenberg, or will you?

ROSS-NAZZAL: No, we haven't. He's not on our list.

PARKER: Okay. So let me tell you a little bit about the vestibular stuff, then. A large piece of the vestibular stuff that was part of Spacelab 1 came out of MIT [Massachusetts Institute of Technology, Cambridge, Massachusetts], Larry [Laurence R.] Young, who [later] was at some institute, the [National Space] Biomedical [Research] Institute, [in] Houston for a while. The proposition was that [in zero-g] the brain stopped listening to the inner ear, because the little calcium plates [were] no longer sitting on the hairs [sending signals to the brain]. So when you rotate your head this way [moves head], nothing happens, and so pretty soon the brain stops listening to it. That's the way it adapts. And the same model works with people down below on a sailboat or on an ocean liner and so forth.

And therefore, you'd be sick for a while or not feeling well for a while, and then when you came back, you'd still be immune to it for a while. And so they were busy testing [us to see] to what extent can we demonstrate this sort of thing. As I said, we did a lot of baseline testing ahead of time, and we did a lot of [post-flight testing at Edwards]. But we weren't isolated except for convenience sake.

Amusingly enough, of course, the vestibular senses are, to some extent, affected by alcohol, but fortunately we had a lot of Europeans scientists who were working on this, [the vestibular experiments]. So the idea that you'd have a couple of beers or a wine or two at night, which might affect your vestibular [reflexes], they viewed as perfectly normal [and] so they didn't restrict us on that.

My wife was out here for a while, and we went into Palmdale [California] one night to have Mexican food and a beer or two, and a bunch of the Skylab guys who I knew from Marshall were over at another table, a little ways away, and they never acknowledged that I was there. It was like I thought they'd come over and chat and visit and so forth. Never acknowledged me.

Three or four, maybe five years later, they said that they thought that I had gone AWOL [Absent Without Leave], and they just didn't want to notice that I was there, because they thought that I wasn't supposed to be there.

Vestibular stuff is also, to some extent, tied to circadian cycle, and we had been on two shifts. I'd been on what was the nightshift. But we came back, and we basically didn't test at night. We tested in the daytime. So, there were definite compromises made that [probably complicated the results]—but who knows. In fact, when you come back, your vestibular system is not what it was when [you] left. They flew us in the KC-135 one day, and we were absolutely immune. They would drop us and again measuring things, like the calf and so forth, but the first day or two they had to have somebody behind us because we didn't catch ourselves fast enough.

ROSS-NAZZAL: This flight also won an award, the Halley Space Flight Award.

PARKER: More beads and trinkets.

ROSS-NAZZAL: All right. All right. We'll move on from there.

PARKER: More beads and trinkets.

ROSS-NAZZAL: Let's talk about *Challenger*. Where were you when the *Challenger* accident occurred?

PARKER: We were preparing to fly in forty days or nights or whatever, to go observe Halley's Comet on the next Shuttle flight, the very next one. That morning we were over in Building 5, training launches and entries, stopped to go watch the *Challenger* launch in a small room, on TV. Obviously we didn't fly forty days later. Interestingly enough, forty days later it was even colder that morning. [Laughs]

ROSS-NAZZAL: Yes, I've read that.

PARKER: And so what did we do after that, you ask.

ROSS-NAZZAL: Yes, what did you do?

PARKER: Amusingly enough, no one knew what was going to happen. … Oh, dear, that was in January of '86, and the next Shuttle was not until '88. So it was two and a half years later. …

So we, [the crew of ASTRO], did a number of things. First of all, we didn't really know who was going to fly, [or] what were we going to do. It's amazing when you look back at that stuff these days, the rate at which we thought we had to keep pumping this stuff out. It's what we told the world and to a great degree we told ourselves, (not just the astronauts, but NASA), and we believed ourselves, which people do from time to time. … We had to do that, because we had to launch to go observe [Halley's Comet]. "We've got to get these guys [the *Challenger*

crew] off." The pressure was [then] on the previous crew before *Challenger*, and they're the ones who slipped basically through Christmas. And we had to be there to go see Halley's Comet. You'd have thought the world was going to come to an end, [if we, (NASA), didn't make our launch windows].

[Likewise], in May of 1986, we had two flights [scheduled with] an IUS [Inertial Upper Stage], because we were going to launch Ulysses and Galileo, I think, and we had to have those things, "had to make those windows." And my favorite expression is, "Guess what? The sun kept on rising and the sun kept on setting." [The sun] didn't even notice [that we missed our windows]. It's just amazing, the rate at which we thought we were doing things.

We [ourselves] thought that we were going to fly in March, early March, to observe Halley's Comet, and we looked ahead and said okay, and [we'll] obviously observe March time stars—stars that were up at night in March. And then we'll come around and we'll fly again maybe in November, same crew, rotate [one] payload specialist. Hey, this is really getting into production. This is great. And it didn't happen. [So, in February of 1986], we didn't know what we were going to do.

When you look at JSC and the civil servants and the contractors, [you can see that] we've got lots of flight controllers and lots of trainers and lots of crewmen. Are we going to send them all fishing for the next couple of years? No. Got to keep them busy, right? Okay, the trainers need somebody to train. That's called a flight crew. The flight controllers need somebody to control. That's the flight crew. And so we kept on training, not just my crew, but a couple of other crews. We kept on training. We learned how [to launch] satellites. We learned to do this, [and] do that. We kept on training. A lighter schedule, but we kept on training for a year or two until they really got serious about it again. Some people went off and did some other stuff.

In the middle of all that (let's see—February '88 to February of '89) they sent me to Headquarters as a detailee. Basically, in those days Space Station was one major code and Manned Space Flight was another major code, and so I was the Manned Space Flight interface with someone else who was in Space Station, and we were the interface between the Shuttle and the Space Station, and that's what that title really means, integration of Space Shuttle and Space Station.

So I did that for a year, and then came home to get ready to go fly. And while I was up there, September of '88, we flew the first reflight—STS-26. And even though we, [ASTRO], were the next ones to fly, there were the TDRSs that had to get up. There was the Ulysses and the Galileos had to get up. There [were] a number of DOD [Department of Defense] flights that had to be flown. [And] so we did a number of those [flights] before [they] got to us.

ROSS-NAZZAL: Let's talk about that mission, about STS-35. It was the first mission dedicated to astrophysics. As an astronomer, what did you hope to learn from the mission? What were some of your goals or objectives?

PARKER: Again, we had payload specialists on board who came [from the PI groups]. We had three major telescopes onboard: one from University of Wisconsin; one from Johns Hopkins [University, Baltimore, Maryland]; and I guess one from Goddard [Space Flight Research Center, Greenbelt, Maryland]. It must have been, because that's where Ron [Ronald A. Parise] came from. Okay, so we had three major telescopes on board. Each one of them had payload specialists, and we figured we were going to fly three times. So [PS]-A and B, [then PS]-B and

C, and then [PS]-C and A, and so [they]'d each get two flights, and Jeff [Jeffrey A.] Hoffman and I might get three flights out of that by flying each time.

[The PSs] were more involved in science than we were, once again. This time, Jeff and I are both astronomers [and so] we understood the science, but we weren't involved in planning the science so much, again for the same separation of powers, if you will. Our primary role was to operate the instrument pointing system, which was basically a telescope mount that was fastened to the Shuttle and stayed in the Shuttle. These telescopes were highly specialized telescopes. None of them was as big and as far reaching and as whatever as the Space Telescope, which had been launched actually in the flight before ours. Of course, they'd had some problems after that, too. But we were flying these highly specialized telescopes. But our role was to basically aid in the pointing and control of the telescope pointing, sort of like a night assistant, in a sense, which was all well and good.

Two things happened on the way to the [launch]. One was that our [Orbiter] had hydrogen leaks all summer. We didn't get on board and wonder whether we were going to blow up or not, because the hydrogen leaks happened when they were refueling. So they'd wake us up and tell us [to go back to sleep because] we weren't going to go. But we [got that close] to launch, more or less, I think, one, two—we launched either on the fourth or fifth try. Not that it was night after night after night, but it was from June to late November before they finally fixed the problem, and then we launched in late November.

The second thing happened was that [when we finally] got up there the computer control consoles, the ones that talk to the Spacelab computers, which ran the telescope mounts and the instruments, died, shorted [out]. So, suddenly we couldn't point. The ground, in about maybe as little as twelve, but certainly as little as twenty-four hours, came up with a scheme where they

could control [the telescope]. It was not part of the plans [not even the contingency plans], but, [unlike] the Apollo Telescope Mount, these days with computers they can push that little "go" button on the ground as well as the crew can push on it up there, and so they basically controlled the instruments.

What they couldn't do in near real time was guide the telescopes. And myself, probably as opposed to the others who were all younger than I, was used to guiding, sitting there for hours guiding a star on a crosshair. We had really insisted all along, "we need to be sure we have that capability, because if [all] else fails, like the computer consoles blow up, then we need to be able to do that." And we did do that, and we did control them, and we observed maybe a third of what we had intended to. Everybody put a good face on it, but it was a far cry from what it was supposed to be.

ROSS-NAZZAL: This was the first time that the Marshall Space Flight Center served as a control center.

PARKER: Not really, no. I saw that last night. No. On Spacelab 1, they had been the Payload control center. Remember, I told you the guy's name, Chuck Lewis, he was the science CapCom from Marshall. So they had their own POCC, Payload Operations Control Center, back on STS-9, and they probably had it on one or two of the other Spacelab flights in the meanwhile, so it was not the first time.

ROSS-NAZZAL: Okay. You also had a classroom in space.

PARKER: Classroom in space. It's right there, as a matter of fact. [Points to a video tape.]

ROSS-NAZZAL: Yes. Can you talk to us about that?

PARKER: Actually, the person who worked on that in Washington just died. She just died, Pam Mountjoy, of ovarian cancer, nasty stuff.

And again, if you want [a] nice [story], all astronomers were professors or think they're professors. I mean, I did teach for several years, and Jeff probably had, and I don't know about the other two, but we all "know how to teach." So we put together this little class on what astronomy was about.

I guess part of it's going back to the fact that communications [from space] still were not what they are today. But we had a small group of maybe a dozen or so kids somewhere near Goddard and a small group of a dozen or so kids somewhere near Marshall, and we were doing this class to them, and then they could ask questions back up to us. I think that's much more common these days on Space Station. But [in 1990], it was kind of a big deal. We worked on it. We drew our own little diagrams and did our things, like we were at the blackboard and so forth. And it was "okay." The biggest thing was the interaction with the kids, I think.

But in the meanwhile, that same summer that we were working putting that stuff together, I said before that [each] crew kind of [works] together [but in isolation from] the other crews. [So] that [same] summer, Bill [William M.] Shepherd (I give him credit for this) and his cohorts were working on the first of a series that is called *Liftoff to Learning*. Have you talked to Bill?

ROSS-NAZZAL: No.

PARKER: Man, and we never knew about it. So we came back and we did our thing, and it was "home video." It was like Christmas movies. It was terrible. I mean, but it was great because the kids got to talk to us.

Then about six months after that, when they'd finished polishing or putting together this *Liftoff to Learning* thing (which today [seems good but ordinary, much] less than it did then), but then it just knocked your socks off, because they had sat down with people [who really knew what they were doing], and these guys had professionally scripted it. We just talked. They had scripted it. They had blank screens so that you could gesture here and then something was going to be put in there. It was just amazing. And we never knew it, and this was so much more professional than what we did. [We were] just like, "go away, [we don't need any help]," and it showed. It was terrible. But it sort of illustrates the fact that [the separate crews] didn't work together. But that just knocked your socks off after what we'd done. [Laughs]

ROSS-NAZZAL: Tell us about your work at NASA Headquarters. In particular I'm interested in learning how working at NASA Headquarters is different from working at the Johnson Space Center.

PARKER: Well, first of all, you're up there at world headquarters. This is like being at the world headquarters of IBM or General Motors or you name the company, [they're] all [pretty much] the same. You're back at world headquarters, and the concerns are policy. What should we do about this? Not "Should I fly this experiment tomorrow?" or something like that, but "What

should we be doing about cooperating with the Europeans on additions to the Space Station?" And, "We'll get a committee to go discuss this."

As a matter of fact, at one point we did do some of that, "What should we do tomorrow?" [stuff] up there. [But], particularly under [Daniel S.] Goldin, we got rid of that stuff pretty much and pushed it down to the Centers. And your interface, you have this huge interface with Congress and OMB [Office of Management and Budget]. Budget, budget, budget. And that's what it's all about.

The other thing that's surprising for someone who's been at [the lower] levels down [there] at any Center, [and then] comes up to Washington. There, at Clear Lake, in particular, [or] go to Marshall, or Kennedy [Space Center, Florida], [and it's] "NASA." Yes, "NASA." Headlines. "NASA," yes, yes, yes, you go up to Washington, and NASA's just another self-serving bureaucracy feeding at the trough. And suddenly it's, "I'm from—."

"Yeah?"

"I'm from NASA."

"So?"

It's a totally different atmosphere, not at Headquarters [itself] but [elsewhere in Washington, for instance] go to OMB, they don't necessarily think everything NASA wants is a good idea. So it's very instructive.

Another one of my soapboxes--early on I didn't do much of it either, but I have since or was essentially made to do it, and it works both ways. People come into NASA Headquarters, kids, PMIs, Presidential Management Interns, PMIs come into NASA Headquarters with the absolute expectation that they're going to spend—these are twenty-two or -three-year-olds—going to spend the next forty years at NASA Headquarters moving slowly up the chairs, without

ever going to a Center. And people come into JSC or Marshall or wherever and think they're going to spend the next forty years doing just what they're doing today. And there are some people, like Gordon Fullerton, who can still do that. There are a few who can.

But if they want to go up the chairs and get more and more responsibilities, the people at JSC and any Center need to go to other Centers to spend a year or two. They say, "Oh, I have kids." But they need to go to other Centers. Astronauts get to travel around and all that, but it's not quite the same. And they need to go do a tour at Headquarters, so that they know the people that they're going to be interfacing [with]—I mean, when you become—what do we call them at JSC these days? Directors, I guess. When you become not the director of a Center, but the next layer down.

ROSS-NAZZAL: Director of a directorate?

PARKER: Yes. Directorate, yes. Around here they call them "directors for," because you're a "director for _____." But if you're going to do that, you need to know the people you're talking to [back at HQ]. I'm out here and I know a lot of the people because I spent six years up there. I know a lot of the people I'm dealing with just from having been at Headquarters for six years. [For] people who haven't, these are [just] names, there's no association. They don't know what the roles [are], how different the roles are up there.

So if you're going to go up to be a director, no higher, or someplace even lower than that, you just need to go to Headquarters and understand what is Headquarters about. What are their concerns? Why is what I'm trying to do here not getting a response up there? And

Headquarters, by the same token, has to go down and understand what running a project is all about. But there's not enough of that, by a long shot.

I went up on detail during the hiatus after the *Challenger* accident, and then I went up after I flew on 35. It was essentially a very opportune time to go do it. I'd been up there working for [Richard H.] Truly. When I left, Truly went [over] to become Administrator, and Bill [William B.] Lenoir, who'd come in with me back in '67, took over the Office of Manned Space Flight, and so I went back up and worked for Bill. That was very incestuous, [but] very convenient.

… [And so, folks say to you], "You're not going to go up there and [leave the] astronaut [business are you]?!?! You're [going to be] a bureaucrat?!" [But], there's nothing wrong with being a bureaucrat, because bureaucrats [had] been providing money and opportunities to me from 1967 to 1987, twenty years. So now it's my time to go off and become [the equivalent of a] dean at a college or whatever [and provide that same help to younger folks].

ROSS-NAZZAL: You served out at Headquarters from '91 until '97.

PARKER: Yes.

ROSS-NAZZAL: And you've talked about sort of fostering relationships between Headquarters and the Center. How did you do that in your various positions?

PARKER: Well, those various positions were kind of all the same position with different titles. That's another thing about Headquarters. And I don't know that I was fostering the relationship between them, because I again was, to some extent, trying to decide the policy.

One of my big concerns the last year or two that I was there was, okay, we're going to start building Station. One of my titles was space operations and Spacelab and so forth, and I basically owned the Spacelab program, the vehicle and the stuff there, for a while. But when we start building the Space Station, we aren't going to be flying the same number of flights that we're currently flying to fly science experiments on. How are we going to keep the scientists alive?

I can go to my microgravity friends and say, "Well, what are you going to fly in 2002?" Well, those days it might have been 1998. We thought Space Station would be built a lot sooner. Same thing, we're hiring all these astronauts to fly the Space Station, and Space Station was moving rapidly to the right—or left, whichever way.

We need to be able to fly some science on these, small science. We need to be able to keep people going. Can we fly a Spacelab flight every year? Even if we're flying six flights or eight flights for the Station, to construct the Station, when can we start doing things on Station? Trying to figure that question out. Trying to keep the scientists involved. Meanwhile, the Station gargantuan down in Houston says, "No, we need all the flights and we need every single pound on every flight. There's no room for any of that stuff." Well, wait a minute, let's try and—but we were never getting anywhere.

ROSS-NAZZAL: Well, how did the opportunity to come back to [Caltech at] JPL happen?

PARKER: I don't know how much reading you did ahead of time, but JPL is a contract. It's not a NASA Center like JSC.

ROSS-NAZZAL: Right, yes.

PARKER: You know all those things.

ROSS-NAZZAL: Yes.

PARKER: And so we have about twenty-five people here, this floor, twenty-five people who oversee a contract that NASA, Code S, Space Science, has with Caltech to run JPL. The people who work at JPL are basically Caltech employees. They are soft-money employees, which means that if NASA stopped, ended its contract, they'd all lose their jobs. So there's an office out here to oversee it. They wanted someone out here to change over, and so here I am.

ROSS-NAZZAL: So what are some of your basic duties as director?

PARKER: My basic duties as director are, my fundamental basic—I mean, I'm not a contracts guy. Half of my people here are contracts people, and then I have a security person, a couple of lawyers. This is like its own little microcosm of a Center. A couple of lawyers; a couple of property people; a tech transfer person; an environmental safety and health person. I've probably, unfortunately, forgotten somebody.

We're 3,000 miles away from Headquarters, which sometimes in the past has been very good, and three time zones. I mean, you come in and get going at eight o'clock, well, it's already eleven back there. People are getting ready to go to lunch. When they come back from lunch at one o'clock, well, by that time it's ten o'clock here, so we have a meeting from ten to eleven and then we're getting ready to go to lunch, and by the time we get back from lunch at one o'clock, it's four o'clock and they're going home. So we're kind of independent. I don't know how people did it without e-mail. I really don't. I just don't know how you could do this in the old days, maybe if you were even more independent.

So there's a lot of day-to-day paperwork on the contracts and stuff, making sure the people are doing what they should be doing on the contract. It's oversight. It's really all we are. We're a resident office, or we have been called a resident office, but NASA resident office, and our own name got taken by somebody else, so we don't use that.

[And so finally to answer your question]--my particular job, apart from overseeing the overseers, if you will, is basically keeping NASA and JPL happy with each other. I work for Ed Weiler. Actually, I work for the deputy, because that's his particular role, and I'm the interface between Ed or Chris Scolese, these days, and Gene [Eugene L.] Tattini or Charles Elachi, which doesn't mean that Charles doesn't talk to Ed and Gene doesn't talk to Chris, but I'm the one who's here during all the times when the other guys are at lunch or whatever or meetings. But that's my role. It's a very ill-defined role. It's make sure that each set of people knows what the others are thinking and what their problems are, so that NASA doesn't get surprised and JPL doesn't get surprised. It's just a resident office.

ROSS-NAZZAL: If you don't mind, I'd like to ask Rebecca if she has any questions for you before we end.

WRIGHT: I just have a couple that aren't related. You touched slightly on during your Apollo days that you and Harrison Schmitt had the opportunity to name craters. Did you have criteria that you had to follow?

PARKER: No. No, we named them for friends and famous people in books. One of them is called Shorty and it came from Jack and it's something—I've forgotten. It's some author. It's not a book [that] I know, but it's something about fishing in America with Shorty or something. There's a famous book with that name.

I was a big fan of Zhivago, and so one of them is named Lara. The Russians didn't like that. And there's a whole bunch of them. There's a crater named Henry or Prince Henry or something, which is named for Prince Henry the Navigator. It's just whimsical, great things.

WRIGHT: Sounds like a fun job.

PARKER: Yes, it was. We spent time doing that. It's just an example of the sorts of things that Jack and I [did] working closely together.

WRIGHT: You spent some time while at JSC on the Astronaut Selection Board?

PARKER: Yes.

WRIGHT: Can you share with us about—

PARKER: No, I can't say a thing about that. [Laughter]

WRIGHT: The pros and cons of being on that board?

PARKER: I was on the board in '78, which was the board that selected the first new ones since basically I came. After I came, the next group, [which came in '69] was the remnants of the MOL [Manned Orbiting Laboratory] program, which included Truly and [Robert L.] Crippen. [Now in 1978], it was the first time that we were taking women, and the first time we were [looking for] blacks and Hispanics. I'm not sure we took an Hispanic that time, but we were out looking for [diversity].

NASA advertised, because NASA was doing this. We were just doing the selection. But NASA advertised using whoever was the black female crewman on Doctor Spock. There was a woman that did that. They used her for some of the advertising for it. And we were definitely going after scientists and pilots. We picked thirty-five people, and [before that in 1978] there were probably about twenty people left in the office.

It was an opportunity. It was really kind of impressive, because it was a time in NASA, which is frequently the case, when NASA is really flat-lined before going down, but suddenly we were going to more than double the size of our office and get all this new blood. I mean, the average age of the Astronaut Office had been going down about a year every year, because we

hadn't taken anybody in ten years. Now we were suddenly going to bring in all these young people who had new ideas.

As an illustration, I was an astronomer. Ed Gibson was an astronomer and Owen Garriott [was also an astronomer]. Ed was still there, I think. I think he was even on the panel. But we hadn't done much real astronomy in a long while, [and now] we were picking astronomers who were [still] doing astronomy. … The people in the office, Al Shepard had never used a heads-up display, or John Young. Didn't need that. We weren't going to shoot down MiGs. [These were the people who participated in the development of the shuttle and were now getting close to flying *Columbi*a. Then] the new guys came and it was, "Where's the heads-up display?"

"What do you mean?"

"Holy mackerel. You guys don't—here. Come let us show you this."

"Oh! Well." So we retrofitted the Shuttle with heads-up displays [after the first few flights].

We were operating back quite a ways until suddenly we got this new influx of really good people, really, and more current people, if you will. But it was a lot of long hours looking at applications and a lot of painful hours sometimes, listening to one-hour interviews with these people. But I probably did it three or four times on different boards.

WRIGHT: You must have done it well. They kept getting you back.

PARKER: I don't know. [Laughter] Either that or [everyone] else [had] something more important, I don't know.

WRIGHT: My last question is kind of just one for your own thoughts. Your span of time with NASA has covered so many duties, and you've had so many opportunities. Is there one or maybe two that you wish you could spent more time with or if you could have gone back or you could have been a little more instrumental in setting your own path? Would you have liked to have stayed in one of your paths just a little bit longer?

PARKER: Looking back in retrospect, no. At the time, of course. But looking back in retrospect, I would say no. I might [have] liked to have had a bit more success in continuing the science in the Shuttle during this period, [Station construction], and so forth. But one of the things I learned, which you see a little bit at JSC, of course, but not so much when you're an astronaut, but [certainly] in going to Headquarters, is a thing called turf. Turf, turf, turf, turf. And the greatest idea in the world [that you] and your boss think is a great idea, but his boss doesn't think is a good idea, and two years later it's still being argued about. But that's not unique to NASA either. [That's actually not a very good description of "Turf," but everyone knows what it is.]

ROSS-NAZZAL: Is there anything else you feel that we should cover, anything else that you would like to talk about today that we may have missed?

PARKER: You read through all these things, I assume, right?

ROSS-NAZZAL: Yes, we hit on all the high points.

PARKER: You did all those points, yes.

ROSS-NAZZAL: I was just curious if there is something that we have missed in our research or anything else you would like to add.

PARKER: You pretty much know what my career was. You're going to send it to me so I can add on.

ROSS-NAZZAL: Yes.

[End of interview]