

NASA JOHNSON SPACE CENTER ORAL HISTORY PROJECT

ORAL HISTORY TRANSCRIPT

FREDERICK H. HAUCK
INTERVIEWED BY JENNIFER ROSS-NAZZAL
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ROSS-NAZZAL: Today is November 20th, 2003. This oral history with Rick Hauck is being conducted in Bethesda, Maryland, for the Johnson Space Center Oral History Project. The interviewer is Jennifer Ross-Nazzal, assisted by Sandra Johnson.

Thank you so much for meeting with us today. We really appreciate it.

HAUCK: Sounds like fun.

ROSS-NAZZAL: Yes, I think it will be. I think you'll enjoy this.

My first question for you is about your interest in aviation as a child. Can you talk to us a little bit about that?

HAUCK: Sure. I was born in 1941, just before the start of World War II. My father was a naval officer. My mother's father was a naval officer; my father's brother was a naval officer; my uncle was a naval officer, so there's a lot of Navy in my background; and my father's brother, my uncle, Hamilton Hauck, was a naval aviator. He was a hero of mine, I guess. He was wonderful person, and that, combined with my apparently very early thirst for adventure, combined to make me interested in naval aviation, or aviation, I guess, to begin with. I remember my aunt, my uncle's wife, Patty Hauck, when I told her I was interested in becoming

an Air Force pilot, she threatened to wash my mouth out with soap. The Navy was the only way to go. I was twelve years old or thirteen years old at the time.

When I was young, I enjoyed riding on what was called a Flexible Flyer, which was like a traditional old snow sled, but it had wheels on it, down the back alley of our house here in Washington [D.C., with my] chin about four inches from the concrete and hurtling down the back alley, and I thought that was great fun, so that was some indication of my interest in speed.

When I was in fifth or sixth grade, I remember my two other uncles taking me to Glen Echo Amusement Park here in Washington, where they had a roller coaster. I went on it the first time and it scared the heck out of me, but I wanted to do it again, so that was another indication of my interest in thrilling adventure.

Then when I was in tenth or eleventh grade, our next-door neighbor was a naval aviator who also was a civilian flight instructor, and he offered to take me up in [a] Piper Cub one day. And I remember in this airplane that's made out of, I guess, tubular steel and fabric, one engine, I sat behind him and just looking down at cars and people and so forth, and thinking, "This is great." That was wonderful. So I decided at that point I wanted to be a naval aviator, or that solidified my interest.

When I went to Tufts University [Medford, Massachusetts] on a Navy scholarship, at the time they had a program to try to find out whether people who thought they were interested in aviation really had an aptitude for it. [In] that program, the Navy would pay for the ROTC [Reserve Officer's Training Corps] student to take flying lessons up through soloing in an airplane, and obviously it was to the Navy's benefit. In the event that the individual really wasn't suited for flying or decided they didn't like it, this would save all the time and expense of

starting them in flight training down at Pensacola [Naval Air Station, Florida] and three months of ground school and so forth.

So I did that, and my first flight under instruction was at Hanscom Air Force Base, Bedford, Massachusetts. And I loved it, but I had come to the decision that I didn't want to spend four years in the Navy after I graduated from college, which would have been my obligation as an aviator. So even though I still was thrilled with the idea of becoming an aviator, I didn't think I wanted to commit four years, so I stopped. I didn't solo in that.

So then I did get my degree at Tufts in physics, [and] my commission [as an Ensign in the Navy]. I served just under two years on a Navy ship, the USS *Warrington*, a destroyer, out of Newport, Rhode Island. And as my two-year obligation was coming to a close, the Navy offered to send me to the Naval Postgraduate School, Monterey, California, to study physics. I was married, had a child, and here was this opportunity to get a graduate education while drawing meager but full pay from the Navy and having the education paid for, and it was something I couldn't pass up.

So my wife and I went to Monterey, California, in the summer of 1964, and I studied mostly physics and mathematics courses there and did comparatively well. The Navy selects a few, a small number of their students there to go on at a civilian university for doctoral studies, and the Navy said that I was selected for what was called their advanced science program and they would send me to any university in the United States that would accept me, pay all tuition, everything, to pursue an advanced degree in physics.

So that sounded like a wonderful opportunity. Really, all I would have had to have done to get a master's in physics in Monterey would have been to write a short thesis that summer, but this seemed like too good to be true. So instead of writing the thesis that summer, I went to the

Army's Language School and studied scientific Russian for ten weeks, and then went off to M.I.T. [Massachusetts Institute of Technology, Cambridge, Massachusetts, to become] a thermonuclear physicist. M.I.T. proved to me that I would never be a thermonuclear physicist. [Laughs] It was a very challenging education. I'd never had an engineering course before in my life. It had always been mathematics or physics, which is a scientific discipline, and it was a rude awakening, but I did get a master's degree in nuclear engineering at M.I.T., by the skin of my teeth.

As I came to the conclusion that I wasn't going on for a doctorate, one of my friends who was an aviator said, "Why don't you come down with me. I'm flying a Navy airplane down to Washington. You've always talked about being interested in being a pilot. You can talk to the Navy, see if they'll accept you into the flying program."

So I said that sounded like a good idea. So I went down there, talked to the Navy. They said, "Yes, a lot of people in Vietnam, a lot of pilots being killed, a lot of pilots deciding this isn't what they want to do and they're getting out, and we have a need for pilots." So at the old age of twenty-five, relatively old age of twenty-five, I started flight training in Pensacola. Loved it. Absolutely couldn't believe that I was getting paid for doing what I was doing. Went through flight training and got my Navy wings of gold in February of 1968, and went to Virginia Beach [Naval Air Station Oceana, Virginia] to learn how to fly the A-6 Intruder.

I eventually joined a squadron aboard the USS *Coral Sea*, which was deploying to the Tonkin Gulf. I flew 114 combat, combat support missions over Vietnam and came back and on went my aviation career. So that was the start of aviation.

ROSS-NAZZAL: It sounds like you have a family tradition in the Navy.

HAUCK: Yes. One of my proud moments was swearing in my son at M.I.T. into the Navy, him having graduated from Tufts on an ROTC scholarship. But he's since left the Navy. He's not in the Navy anymore, but that's okay.

ROSS-NAZZAL: I think that's interesting how you pointed out that you didn't actually go on with the program because you didn't want to give two years, but you ended up—

HAUCK: Didn't want to give four years.

ROSS-NAZZAL: Four years. But you ended up doing a whole career with the Navy afterwards.

HAUCK: It is, some things happen that are ironic in retrospect.

ROSS-NAZZAL: At the time that you were interested in becoming a naval aviator, had you been looking at the Apollo astronauts and thinking this might be a possibility?

HAUCK: Well, the timing is such that the word Apollo didn't even exist in terms of spaceflight when I was thinking about becoming a naval aviator. If you recall, Alan [B.] Shepard's first flight was in 1961, and that was my junior year in college, but I was fascinated by the Mercury Program and, of course, later, Gemini and Apollo.

Even before I became an aviator, while I was at Monterey, I had read that NASA was recruiting scientists to become astronauts, and I wrote a letter to NASA saying, "I'm in graduate

school. You could tailor my education however you saw fit to optimize my benefit to the program, and I'd be very interested in becoming an astronaut."

I got a letter back saying, "Thank you very much for your interest. Don't call us. We'll call you." That was in early '65, I think, so it was twelve years later that I was accepted into the astronaut program.

ROSS-NAZZAL: How did you find out that they were going to be selecting Space Shuttle astronauts?

HAUCK: Well, after I did my A-6 Intruder flying in Virginia Beach, I wound up at the Naval Air Test Center in Patuxent River, Maryland. I was a test pilot, went through test pilot training. Flew a number of aircraft in the aircraft carrier environment, including the F-14 Tomcat. I was the project test pilot for the Navy carrier acceptance trials on the F-14.

At the end of that tour of duty, I went to Air Wing 14 on the USS *Enterprise*, which was the first time the F-14 was being deployed overseas, and I flew the F-14 and the A-7 and the A-6 on the *Enterprise*. It was kind of a concentration of, if I can immodestly say, some of the up-and-coming pilots in the Navy, for this new aircraft.

During my second cruise on *Enterprise* in 1977, there was a flyer from NASA saying they were looking for applicants for the astronaut program to fly the Shuttle and, in fact, four of us on the *Enterprise* wound up in my astronaut class, myself, "Hoot" [Robert L.] Gibson, Dale [A.] Gardner, and John [O.] Creighton. Three of the fifteen pilots were from that air wing. Dale Gardner was a mission specialist. Which is really kind of interesting, three of fifteen. What's that? Twenty percent came from that ship.

ROSS-NAZZAL: That's fantastic. So can you tell us a little bit about the interview process that you went through and the application process?

HAUCK: Sure. As a matter of fact, I just [recently] looked through the list of people that were down in Houston the same time I was. It was organized such that groups of pilots would come down for a week's worth of interviews and groups of mission specialists would come down for a week's worth, so you were always—I was in a group of pilots. I think I was told that there were 100 finalists out of around 1,500 applications, 100 that were, twenty at a time, invited down to Houston. I would normally have been in the second group of interviewees because my name begins with "H" and they were doing them all alphabetically, but I had some kind of squadron conflict, so I went down with the "Ms" and "Ns" and that part of the alphabet.

We were told right away that it was an opportunity not only for them to look at us, but for us to look at NASA and to make sure that we understood what the program was all about. You have the outsider's view, "Gee, astronauts flying in space." Sounds great. Well, what does it really mean and what is the day-to-day work when you're not in space or when you're not training to go into space? So NASA was very smart, I think, in terms of making sure that each of the applicants at the end of that week really knew what they were applying for.

So there was, as you would expect, a physical exam, anthropomorphic reach and—I forget what you call it—mobility, psychiatric exams, psychological exams. The physical exams included lab work of everything that they could measure. Electrocardiogram, electroencephalogram. The psychiatric exam there was interesting. There was a good-guy psychiatrist and a bad-guy psychiatrist. The good-guy psychiatrist explored, I'd say, your

feeling, interpersonal interaction sides of you, and the bad-guy psychiatrist evaluated how you did under pressure. For example, “I’m going to read off a list of numbers. Tell me what they are in inverse order.”

And you start with two, five, and you say, “Five, two.” And then three numbers, then four numbers, then five, then six, and you’re sitting there just thinking, “I can’t do this.” At some point, you make a mistake. Inevitably, at some point you make a mistake and the psychiatrist said, “That’s wrong,” with a scowl on his face. “Can’t you do better than that?” Blah, blah, blah. And, of course, he doesn’t care whether you did it with five numbers, three numbers, or eight numbers. He’s more interested in seeing whether you get flustered, whether you get antagonistic.

And as I recall, I might have said, “That’s the best I can do, yes.”

“That’s okay.”

The good-guy psychiatrist would ask you questions such as if you were to wear a T-shirt and there were an animal on the front of the T-shirt and you wanted that to sort of be your symbol, what would that animal be? I forget what I said, and I’m sure he drew some conclusions whether you said a tiger or a turtle or a rat or what.

We had another interesting exercise where we were each individually, separately, put into a sphere made of a fabric that could be zipped up, airtight, oxygen provided to it. In order to get into it, you had to get into a fetal position, into a ball, and the concept of the sphere was it was just small enough so that it could go through the crew hatch in the Space Shuttle in the event that you had to rescue people from one Shuttle to another. The charter was, “We’re going to put you in this. You have oxygen. You have communications. We’re not going to tell you how long

you're going to be in there. At the end, we want you to write a flight report on what you think are the up sides, down sides, what more needs to be studied for this concept.”

So that was fascinating. There was really two objectives there. One is, see how analytical you are about analyzing that—call it a piece of hardware or software. Number two is a claustrophobia test, because you literally couldn't move very much, and it would be very clear if you had claustrophobic tendencies. As I recall, I found it most comfortable to sort of lie on my back with my knees up, and I almost fell asleep. [Laughs] But I wrote my report and, as I say, everyone had to do that. I have no idea, of course, how these things were weighted in the final judgment.

But the big final—it wasn't necessarily final. Someone might have had their board interview early in the week, because they had this scheduled throughout the week. But the big deal was sitting in front of George [W.S.] Abbey and Jay [F.] Honeycutt and John [W.] Young and Carolyn [L.] Huntoon and Joe [Joseph D.] Atkinson and—gee, I can name three-fourths of the people that were on that panel twenty-six years after the fact—and they'd say, “Tell us about yourself,” and just let you talk.

Every once in a while—I don't remember getting any surprise questions, but some of the people got surprise questions. For example, President [James Earl] Carter [Jr.] was President at the time. He had just signed the bill that transferred the Panama Canal back to Panama, and one of the questions was, “What do you think about the Suez Canal situation?” And, of course, the person might have started commenting about the Panama Canal because that was what was in the news, and then one of the board members might say, “Why are you telling us about the Panama Canal? We asked you about the Suez Canal.” And again, it's an opportunity to see how people react under some level of stress and so on.

I remember one humorous one. I don't know who said this, but this person was asked, "Why do you want to become an astronaut?"

He said, "My father was an astronaut. My grandfather was an astronaut. My great-grandfather was astronaut." He was just being humorous, and that went over well with the board.

So that was—I'm trying to think about anything else about that week. It was fascinating. It just made me want to do it all the more. I remember one of my Navy friends, after going down for the interview, decided he didn't want to do it. I mean, he may have even had doubts when he went down there. It turned out he wound up a Navy admiral. He obviously picked his career direction in a way that was good for him.

One other interesting thing in the selection process. I was with a Navy squadron up in [Naval Air Station] Whidbey Island, Washington. I'd left the *Enterprise* and I was number two in command of a Navy squadron, Attack Squadron 145, scheduled to take over as commanding officer of that squadron. One of my squadron mates was Dan [Daniel C.] Brandenstein. Dan and I had been test pilot school classmates in 1971, six years earlier. He and I talked a lot about this. "Hey, are you going to apply for the astronaut program?"

"Yeah, yeah." So we each got—well, a lot of calls. Part of the pre-interview process was the folks in Houston took each folder. Some of the people were rejected immediately. Some, they said, "Well, let's find out more about this person." They make a lot of phone calls. "Hey, do you know Rick?" or, "Do you know Dan? What do you think about him?"

So I got a call one day in my office at Whidbey Island, Washington, and it was John Young. And John said, "I'm on the selection board for this astronaut program." He didn't say

anything about knowing that I was applying. He said, “Dan Brandenstein, he’s in your squadron there. What do you think about him?”

And I told him, I said, “I think he’s a great guy. He’d be a super astronaut.”

He said, “Okay, thank you very much.”

And I said, “Excuse me, but I’m applying also.”

He said, “I know. I know. Thank you very much.”

So what was, really, to me quite wonderful is that two months ago, Dan asked me to introduce him as he was inducted into the Astronaut Hall of Fame. And I had been inducted in the previous class, so two of the people in my class were inducted into the Astronaut Hall of Fame. Two of the three pilots [inducted in 2003 were long time friends of mine]. One I had served with on USS *Enterprise*, and that was Hoot Gibson, and two of us, [Brandenstein and myself], had served together in Attack Squadron 145. So just think, two of us young guys in 1971 starting test pilot school, winding up doing our astronaut thing over that long period of time. Good friends.

ROSS-NAZZAL: When you came back from the interview, did you have a sense that you might actually be called?

HAUCK: Well, that’s an interesting—that goes into another direction. When I got down for the week of interviews, it was clear that the Navy people in the program, astronauts, were really interested in getting to know the Navy pilots, applicants. Dick [Richard H.] Truly and Bob [Robert L.] Crippen, and John Young, all Navy pilots—I may be leaving someone else out—but also people who were in their social group, which included Joe [H.] Engle, Air Force pilot,

George Abbey, head of Flight Crew Operations, Jay Honeycutt, Deputy Chief of Flight Crew Operations, they were interested in seeing us in a social setting, and I had the sense that the Navy folks were reaching out even farther to get to know the Navy folks better. So we'd go over to the local bar, and they'd say, "Hey, after today's interview process, some of us are going over to such-and-such a bar. Why don't you join us."

So, you know, I'd go over there, and Dick and his wife, Cody, and George Abbey might be there and Joe Engle and Bob Crippen, just really getting to know each other better.

So at the end of this week, Dick and Cody invited me and—I'm sure there must have been a couple of other Navy pilots that were in the group—over to their house for dinner. And as we were leaving, Cody, Dick Truly's wife, said, "Rick, I'll bet you a fifth of Chivas Regal scotch that you are invited to come down here."

And I said, "How can I lose with that bet?" If I win, I give her a—in other words, if I'm not invited, I don't have to give her the scotch. If I am invited, I have to give her the scotch. She told me she made the same bet with Dan Brandenstein. I think Cody had a little bit of insight into—and there's no question that part of this whole process was getting different people's insights on the individuals in different environments, and that was kind of a good way to see people in a more relaxed environment.

ROSS-NAZZAL: So when George Abbey called, what was your reaction?

HAUCK: George called—I was in Whidbey Island—and he said, "Hey, Rick. This is George Abbey. Do you remember that job we talked to you about?"

I said, "Yeah, I do."

He said, “You still interested?”

I said, “Absolutely.” Yes, I was just thrilled. Then I was afraid to talk to Brandenstein. Close, close friend. He lived a mile from me. And I thought, “I don’t want to call Dan and say I was accepted, because I don’t know if he was.” And he didn’t want to call me and say he was accepted. So we saw each other—by that time, he’d transferred to another squadron, so we didn’t see immediately the next morning, but within a few hours the word was out and we heard that each other had been accepted, so that had a good ending.

ROSS-NAZZAL: That’s great. What did your wife think when she found out you were going to be an astronaut?

HAUCK: I think she was thrilled for me. Yes, I’m sure. We’ve since been divorced, but she was very supportive. I’ve always thought that it was very tough on my daughter in particular, who was—I think she was in tenth grade, just finishing tenth grade in this very small high school, 400 students. I called her Little Miss Everything. She was in sports, she was on Honor Roll, she was in the Glee Club, she was this, she had her own horse and we had a pasture out in front of our house. Then Dad got his great news, and his great news meant uprooting my daughter at that age, and my son, who was younger. I don’t think that was as big a deal to him.

But they were very supportive, and I had the conversation with my daughter within the last six months. I said, “Whitney, I’ve always felt badly about pulling you out of Whidbey Island.” Because when went down to Clear Lake High School [Houston, Texas], it was 3,000 kids and cliquish and, “What kind of car do you drive?” And blah, blah, blah. She was

miserable part of the time. But she said, “Oh, Dad, it wasn’t that bad. Don’t worry about it.” So that lifted a little bit of a weight from my shoulders.

ROSS-NAZZAL: That’s great. Where did you end up eventually living?

HAUCK: We lived in two places. The first—I was there eleven years. The first six years in Brook Forest, and the last five years in Nassau Bay. My wife [was] in real estate. We’d been in the Navy; we move[d] all the time. So after six years, she got itchy feet and she said, “Hey, there’s this house over in Nassau Bay.”

“Sure.” So, [we] sold the one house and moved over to the other.

ROSS-NAZZAL: That’s a pretty area.

HAUCK: Yes, it is.

ROSS-NAZZAL: That’s very nice. Why don’t you tell us about your first few months in the Astronaut Office and the reception that you were given by all these astronauts.

HAUCK: First of all, all of the “real astronauts,” I’ll call them, they couldn’t have been better to us. They needed us. Through attrition, there were fewer and fewer astronauts there. I don’t know how many—I think there were less than thirty astronauts in the office when we got there. Of course, they’d already started gearing up for Shuttle and they needed help. So we were there

to be helpful in any way we can. They wanted to get us as smart about the systems as soon as they could.

We got training—gee, I'm trying to think how this went. I think we got a year of training that involved—the first six months was virtually eight hours a day, whether it was lectures about the Space Shuttle systems or whether it was an oceanographer talking about observations from space, or visiting one of the other Centers. We might have gone off to Dryden Flight Research Center [Edwards, California] or Lewis [Research Center, Cleveland, Ohio] or Goddard [Space Flight Center, Greenbelt, Maryland] or whatever. Then eventually we got in so we were assigned on-the-job training, assigned specifically to one of the old guys, and I was assigned to Dick Truly.

So it was a great environment. I mean, everyone was very hospitable to us, bending over backwards to make us comfortable and telling us how much they needed us. We felt wanted, and contrast that with—I remember, Dick Truly and Bob Crippen had joined from the MOL Program, the Manned Orbiting Laboratory Program, and when they arrived there, I forget whether it was Deke [Donald K.] Slayton or someone else said, “We didn't ask for you. We didn't want you. Stay out of the way.” Big difference. So I think that they were even sensitive to that kind of a reception. And of course, everything worked out for them, too, but they were not welcomed.

My first big project for Dick Truly was to develop the emergency procedures for flying Space Shuttle. I don't mean that I was supposed to write the procedures. I was supposed to be a coordinator for the flight crew in how they would be formatted, how they would read, what kind of a book they would be in. This was to put in one document, one book, all the procedures that would have to be acted on quickly, either during launch or reentry. Many of them would be on

cue cards Velcroed to the panels around the cockpit, but there wasn't enough space to Velcro all the procedures of the Shuttle. It was much more complicated in terms of crew interaction than any of the previous vehicles.

So Dick said that would be my prime focus and he said, "Why don't you propose a format." So I went home and got my F-14 emergency checklist. I asked one of the Air Force guys to give me an F-15 emergency checklist. I looked at the existing NASA T-38 emergency checklist and proposed a certain format and certain flip pages, how they'd be tabbed, just how it would be organized, what it would look like, and brought that in to Dick Truly. Dick and I tried several versions of that.

And then by this time, Dick and Joe Engle had, of course, been assigned to be backup for STS-1 and prime for STS-2, and John Young and Bob Crippen, of course, were prime for STS-1. So Dick said, "Hey, Bob—Crip—John, what do you think?" And eventually, that's what became the emergency procedures checklist.

Then my job was to work with the flight controllers, who would develop the specific reactions to emergencies, put them in words, try to format them in a way that could be used—not too much detail—used by the flight crew, and that was a massive, massive effort. Then eventually we got to the point where we had an ascent pocket checklist, we had an entry pocket checklist. Because, depending upon the environment, you had different reactions to the same problem. Then we last developed an on-orbit pocket checklist.

So that was all done while I was on support crew for STS-1. Brandenstein and I were support crew for STS-1. He was launch CapCom [Capsule Communicator]. I was with Joe [Joseph P.] Allen, entry CapCom, for STS-1 and 2.

ROSS-NAZZAL: What were your thoughts when you finally saw STS-1 take off?

HAUCK: Well, it was thrilling. Then when I was in mission control for the landing, for the reentry, of course, here was a space vehicle with human being inside it—John Young and Bob Crippen—on its first flight. That had never been done before. Gemini. Mercury. Apollo. Russian Soyuz. Never been done before. These guys are letting it all hang out, and let's hope that it works.

So I was in mission control for reentry as CapCom, along with Joe Allen, and they go into blackout, which is when the plasma surrounding the Space Shuttle basically inhibits any transmission of electromagnetic signals. And you're just waiting there and you're hoping you'll hear them start talking when they're supposed to. I don't recall, it was probably within a matter of ten or twenty seconds of the time when we should hear them that we did hear them, we thought, "Whew. They've survived so far." I mean, that was my thinking.

And I would be surprised if anyone who was really knowledgeable, no one could be 100 percent sure that was going to be a total success. You plan for it, you design for it, but *Challenger* and *Columbia* have proved to us that we're not infallible and the designs have a lot of failure modes.

ROSS-NAZZAL: And there were some tiles that had fallen off on that first Shuttle mission. Was that a concern for you?

HAUCK: Well, it was a concern for all of us, and you could see from the onboard TV cameras, these tiles missing on the OMS [Orbital Maneuvering System] pods, the shoulder pods on the

back of the tail. You just wait for the guys to do the thermal analysis and say, well, that may or may not be a problem. But then, of course, you say, well, if those fell off, how do we know some of them haven't come off the bottom? And there was no—well, I don't think there was, at that time, any way to verify that. So it was tense.

ROSS-NAZZAL: And then you moved on to be a support crew member for STS-2. What was that like?

HAUCK: STS-2. That was still the same. It was just doing the same sorts of things. I was entry CapCom by myself. Joe Allen was going to train for STS-5. So it was just more of the same. I really enjoyed working with Crip and John and Joe. Joe and Dick were just fun to be with. They had a great sense of humor. They were always looking for ways to have fun. They were great to work for.

So that mission launched when? Two. STS-2.

ROSS-NAZZAL: I don't have the exact dates.

HAUCK: STS-1 was April of '81, so STS-2, I presume, was late '81, early '82. So it was right about then that they started naming additional crews, and I was on the list for STS-7 and Crip was the commander, so it was clear that he was happy with what I'd done with him as support crew. That was a great day. It was wonderful.

ROSS-NAZZAL: Can you tell us about that day?

HAUCK: Well, George, I think—George probably called each one of us separately and said, “Can you come over to my office in Building One?” I don’t have a distinct memory of that conversation, so all I remember is that Crip said, “Hey, let’s go over to—,” I wish I could remember the name of the bar—“and have a beer.”

JOHNSON: Outpost?

HAUCK: No, it wasn’t the Outpost then. It was on the other side of the street.

JOHNSON: Singing Wheel?

HAUCK: No. It doesn’t matter. So Crip and Sally [K. Ride] and John [M. Fabian] and I went over there and celebrated and said, “Okay, now we’ve got something we can train for.” Yes, that was great. I was fortunate that I was early on in the selection, both to be co-pilot and commander among my compatriots. I know I’ve heard a lot of grouching about the method in which selection took place; it wasn’t fair and so on. I’ve got no complaints.

ROSS-NAZZAL: You were actually the first pilot from your class to be selected.

HAUCK: Right.

ROSS-NAZZAL: This was actually the first flight of an American woman in space. How did that affect your crew training?

HAUCK: It didn't affect it very much. There were obviously a lot of demands on Sally from a PR [public-relations] standpoint, but Crip and Sally and—I forget if Chris [Christopher C.] Kraft was still Director of the [Johnson] Space Center at that point. I don't remember. But Crip, Sally, George Abbey and whoever was the director, I think actually had a meeting [to] talk about what would be a reasonable expectation of her responding to public-relations things. So that was, I think, kept well under control and it didn't hurt our training at all.

It was interesting. There are situations where maybe it's the potty training or something else and you start—gee, I've never been involved in professional discussions with a woman about these. Of course, men usually are treated by male doctors, and quite often females are treated by male doctors, so it's not as if that's unusual for women, but at the time, it was unusual for men, I guess, to find yourself in a proximity—but it was not a big deal, and there weren't any questions about compromising individual privacy or anything. That was never an issue. It was just uncomfortable in a few situations, but the discomfort disappeared easily.

Sally was great. She's a number one professional; very industrious; always thinking about the objectives for the flight; and a good sense of humor; very productive. It was a pleasure. And Crip set the right tone in terms of what his expectations were of the crew, and we just did it.

We'd have press conferences, and Sally would be the focus of 99 percent of the questions, but that was fine. I remember one press conference just before we flew. Someone from *Time* magazine or something said, "Sally, do you think you'll cry when you're on orbit?"

And of course, she kind of gave him this “You gotta be kiddin’ me” kind of look and said, “Why doesn’t anyone ever ask Rick those questions?”

But that went great. The flight went great. Crew interaction was great. It couldn’t have been better.

ROSS-NAZZAL: Why don’t you share with us a little bit about the training that you underwent for this mission.

HAUCK: Well, the most interesting thing, the most challenging aspects of that mission, from its objectives were, it was going to be the first time that the Space Shuttle was going to fly in close proximity to another object. Of course, rendezvous and proximity operations had been very important for the Moon missions. NASA had done that. Some of the early programs in Gemini were meant to demonstrate the ability to rendezvous with another object. *Stationkeep[ing]* is a term [used to describe flying in close formation with another object]. Of course, we knew that Shuttle had a lot of capabilities that had been designed into it, and STS-7’s—one of its major objectives was to flight-test the ability to do the last stages of a rendezvous and fly very close to another object when you’re both going 17,000 miles an hour. That was called prox ops, proximity operations.

In order to accomplish that, we carried up a satellite mounted in the cargo bay, built by MBB, Messerschmidt-Boelkow-Blohm, called SPAS-1, meaning the first of the SPAS. I forget what SPAS stood for. Shuttle Pallet Satellite. SPAS.

So the objective was using the arm—Sally was prime on the arm—lift it out of the cargo bay, release it. Crip would fly the Shuttle with it just sitting there, because you can always drift

relative to each other, so you need to make sure you can fly close to it comfortably, then back away, fire the jets to back away from it, eventually up to 1,000 feet, fly around it, see if you can fly it without having the reaction jets upset the satellite. Come back in.

Of course, every hour and a half—thirty-five minutes of the hour and a half—thirty-five minutes are in darkness. [The] satellite [had] some lights on it so you can see it. [We were to] evaluate how easy, how hard it was to maintain formation with the satellite. I forget whether there were two different days of doing that or just two different periods, but Crip flew the first set of tests maneuvering around it and then I flew the next set of tests. And that was great. It was just wonderful to be the new guy on the block and be given this responsibility to do some of the flying around this satellite. And it all went well, and we got a lot of good data and wrote up a good report on it.

Of course, other than that, there were other experiments that Sally and John did. One of them was the Continuous Flow Electrophoresis System, which the concept was to be able to use microgravity to extract pharmaceuticals that are hard to extract in a terrestrial earthbound environment. We also had two satellites to launch from the cargo bay. One was for Telesat Canada and one was for the Indonesian Telecommunications Group, so those were the primary objectives, launch two satellites that would propel themselves up into useful orbits, experiment with proximity operations around the SPAS, and do the CFES in-cabin experiment, plus a number of other in-cabin experiments.

The flight was seven days. Of course, we were scheduled to come back to land as the first flight ever to land at Kennedy Space Center [Florida]. President [Ronald W.] Reagan was going to be there, and we got all set and ready to come back in, and the weather didn't cooperate. We stayed on orbit an extra revolution of the Earth, another hour and a half, hoping the weather

would clear. It didn't, so we targeted going in to the Edwards [Air Force Base] complex in California. So it's kind of interesting to think that, "Well, we're going to land in Florida. Nah, we can't, so we'll go around the Earth a couple more times and land in California."

ROSS-NAZZAL: What was the crew's reaction to that?

HAUCK: I think we were disappointed. I mean, we'd met the President, had lunch with the President probably six to eight months before the flight. The five of us had lunch at the White House. I'm obviously diverging back to this anecdote. President Reagan couldn't have been a more congenial person, just smiling and cracking jokes, but still asking intelligent questions about what we were doing. We said we were STS-7, and he said, "Contrary to most people, seven has not been a very good number for me," and he read off a couple of things, whether he was defeated in his first gubernatorial election on something the seventh. And he said, "And John Hinckley shot me on the seventeenth" or twenty-seventh or seventh of the month. I don't think he used his name. I think he said, "That guy shot me," and he laughed.

We went in and had lunch. Five of us, Gerry [Gerald D.] Griffin, who was then the head of the Johnson Space Center, Ed [Edwin] Meese, who was the Attorney General, Gil Rye, who was on the President's staff. That was it, and we just sat around and had a lovely time. Then we went out to the Rose Garden, and a bunch of reporters were out there—Sam Donaldson and others—and said hi to the reporters.

So anyhow, back to STS-7. We were disappointed that we didn't get—or, I was disappointed that we didn't get a chance to land at Kennedy Space Center. Of course, all of our families were there, so it was disappointing not to come in there. And I remember we said,

“Okay, here we are. We’re ready to come in. We’ve got at least an hour and a half delay,” because that’s an orbit of the Earth, maybe three hours’ delay. “So what does everybody want to do?”

And I forget which one of us said it, because this was near the Olympics, I think. “Let’s have a space Olympics.”

Crip was a little wary of this, but he said, “Okay, what do you want to do?”

[Someone] said, “Okay. We’ll time this. Each person, in turn, will have their hands, coming up from middeck to flight deck through that opening on the port side, hands curled over the floor of the flight deck.” We’re down on the middeck. “And on the count of three [snaps fingers], go as fast as you can up into the flight deck, down through the starboard entryway, down through the middeck and come back up and put your hands—.” Actually, we had reinstalled the ladder for 1-G operations. “Come back to the top rung of the ladder.”

So he said, “Okay.” So we each did that. Timing. And we gave out five awards. Sally won the fastest woman. John Fabian won the competitor that caused the most injuries. No one got hurt, but I think his leg hit Crip coming around at one point. I think Norm [Norman E.] Thagard was the fastest man. Crip was the most injured, and I forget what I—I was the most something. I don’t know what it was.

So then when we came back and we flew into Houston, and I forget whether it was the day we got back or two days later, when there was a big celebration out in the campus between Building One and Building Four, and all of Johnson Space Center was there out on the grass, and I told the story of the Shuttle Olympics, and Crip was there going, “Oh, you shouldn’t have. You shouldn’t have,” and you look around and see if Gerry Griffin is smiling or not. But it was okay. It didn’t cause any problems.

ROSS-NAZZAL: What do you think was the highlight of your first mission, if you had to look back and say this was the highlight?

HAUCK: Looking out the window during launch and seeing the sky turn from blue to black in a fraction of a second, because as you leave the atmosphere, the sun's rays are no longer being filtered by the air molecules, no longer being reflected by the molecules, and so, of course, on orbit, in bright day, you don't want to look at the sun, but if you look—here's the sun and over there the sky is black, of course. I remember Crip saying—I was looking, glancing out the window, startled—I mean, I knew that that would happen, but I just got—he said, “Eyes on the cockpit.” Yes, okay, “Back to work.” Watch all the gauges. So I guess that's one thing that stands out in my memory. Everything about it was thrilling.

I guess it was the flight—was it STS-6 that [William B.] Lenoir and [Story] Musgrave did the first space walk?

ROSS-NAZZAL: Yes. [Donald H.] Peterson and Musgrave.

HAUCK: Yes, thank you, Peterson and Musgrave. And they had to wave off a day because—or one of them. Maybe it wasn't that. Maybe it was the next—one of the flights, Lenoir—wasn't Lenoir an EVA [Extravehicular Activity] crew member?

ROSS-NAZZAL: That must have been five, with Joe Allen. Is that the mission you're thinking of?

HAUCK: Yes. In any case, one of those two missions, maybe both of those two missions, the EVA had to be delayed because the guys weren't feeling very well. And I remember in the case of Bill Lenoir, it was blamed on the fact that he'd brought jalapeño peppers up into orbit and eaten jalapeño peppers. But in any case, there'd been some delays of EVAs, and so the decision was made, we've got to try to learn more about what later became called Space Adaptation Syndrome, space sickness.

So I think with about six to eight months to go before we were to fly—we were a crew of four and then they said, “We've got to learn more about space sickness,” and so Norm Thagard was added to the crew. He was a physician. And parenthetically, he and I had first met when we were both—I was a student naval aviator, he was a student Marine Corps aviator, and we were both on the USS *Lake Champlain*, learning to land airplanes on aircraft carriers.

But anyhow, in order to try to learn more about space sickness, they generated a bunch of tests, and I was one of the guinea pigs for the tests. So as soon as we got on orbit, got down into the middle deck, and Norm had these visual things that I had to watch, and they're spinning, and, boy, did I get—so I felt miserable. I mean, they accomplished their purpose. At one point I said, “Hey, guys, I've had it. I'm going to go into the airlock,” which was just a nice place to go hide. And I said, “I'm going to close my eyes, and please don't bother me until I come out.” I mean, I didn't know whether I was going to throw up. I just felt miserable.

And I guess it was about four hours later I started to come out of that and that resolved itself. So that was memorable and that wasn't fun.

What else? I guess that's all I can think of right now.

ROSS-NAZZAL: Did you have any challenges that you had to face on this mission?

HAUCK: Well, the proximity operations, flying the Shuttle, I thought was a big challenge, because here you're in the loop, flying the Shuttle. So much of Shuttle flying is automatic. You type in numbers and then press a button, and the Shuttle does what it's supposed to do. But here was something that really depended upon your ability, your skills that you trained, so, yes, that was the challenge.

ROSS-NAZZAL: After the mission, did you have any PR work that you had to do?

HAUCK: Oh, we had lots of PR work, yes, and to help shield Sally to some extent. I think in many cases she'd be asked to go somewhere, and in many cases it would be "You either get the whole crew or you don't get anybody," and that kind of helped keep the traffic down. That certainly wasn't exclusively true, and I'm sure Sally would tell [you], "God, I wish that were true." But we went and did a number of PR things.

We went to the White House for a state dinner. It was a Reagan state dinner in honor of the Emir of Bahrain, and we carried with us a flown flag, Bahraini flag, and had a little photo opportunity just before the cocktails. It think it was after—the way this works at the White House, at least from the two times that I've done it, for a state dinner, people come in, are announced, go into a cocktail reception in the West Room, I think. I think that's right. Then there's a reception line formed and everybody troops through and is greeted by the President and the First Lady and the honored guests.

And after we'd all gone through the receiving line, they organized a little standup with the President and Mrs. [Nancy] Reagan and the Emir and the five of us presenting this thing. So that was fun. I enjoyed that.

I sat at the Vice President's table, Vice President [George H.W.] Bush, and he just seemed to me to be a lovely guy. Someone asked him, during the dinner, "Are you going to Houston for Christmas?"

And he said, "You know, if I went to Houston for Christmas, can you imagine the number of Secret Service people who would be uprooted and they couldn't spend their time with their families?" And he said, "I'm not going to do that to them."

ROSS-NAZZAL: That's nice.

HAUCK: Yes. So I thought that was nice.

Let's see. That was fun. I guess there were five or six times that I came face to face with President Reagan and two or three times with President [George H.W.] Bush, and that was always fun. I mean, just think, you're meeting the President of the United States. And I left before subsequent Presidents took office.

ROSS-NAZZAL: Once you'd finished your PR work for this mission, what did you do between the time you were assigned to your next mission and the time in between?

HAUCK: STS-7 was the middle of June '83. Typically, you'd have about a month—you'd have a week of crew debriefs and maybe a month of PR obligations, so that took me into July, maybe

August, and I was almost immediately assigned to my next mission, which was—it wasn't originally called STS 51-A; it was called something else. Things were happening so fast, manifests were changing. I think originally I was going—I don't know what we were going to do. I'd have to go back through my files, but it wasn't what we eventually did.

And by the way, the numbering of the flights there, which was STS-1, 2, 3, 4, 5, 6, 7, 8, 9—there was no STS-10. I think that's when the renumbering started. And it's my sense that there was someone [that] decided, "We are not going to fly a mission called STS-13." Thirteen-phobic. So at some point, they said, "Okay, we're going to rename these missions."

And also because you'd plan a mission, you'd get everybody started on it, and then something would cause that mission to slip past another mission, so that, in itself, was causing confusion. "We're going to fly STS-12 before we fly STS-11." So it's easier if you don't number them sequentially, to say, "Well, we're going to fly mission 52-C." Of course, that confuses everybody.

The way they decided to number them was take the fiscal year in which the mission was originally scheduled, and when that was started, it was four, fiscal year '84. The second number will be a 1 if it's going to land at Kennedy; it'll be a 2 if it's going to land at Vandenberg [Air Force Base, California]. Or launch out of Kennedy, launch out of Vandenberg. Then we'll letter them A through Z until you get to the next fiscal year. So I think 41-C was Bob Crippen's third flight, and I think that was the first oddly numbered flight.

So I was going to fly 51-something. I don't know what it was. But I wound up with 51—51-A is what it eventually was, but it seems to me there was some other number. Maybe not. Maybe I'm confusing that with the flight that I was going to fly before the *Challenger* accident, which was another flight.

So 51-A, let's call it that in any case, was going to be—I'll call it a plain vanilla flight. Go up, deploy two satellites, do some on-orbit experiments, come home. We were probably a couple of months into our training when, in February [1984], two satellites were deployed from the Space Shuttle, one being WESTAR VI and the other one being PALAPA-B2, and they malfunctioned, both of them, leaving them in useless orbits. It seems to me they were orbiting 400 to 600 miles above the Earth.

The value of those two satellites in the commercial market was a couple hundred million dollars. They were insured for a couple hundred million, total. And I don't know what the sequence was in how this happened, but the insurers wanted to try to get them back. NASA wanted to demonstrate the capabilities of the Space Shuttle. McDonnell Douglas [Corporation], who had made the solid-rocket motors that had failed, were very interested in getting them back so they could study the failure mode. So you put those all together, and there was great motivation from all sides to mount a rescue mission to bring those satellites back. So that was in February when it happened, so it took a month or so for people to coalesce on, "Gee, we really would like to try to get these back, and does it even make any sense to talk about trying to do it?"

When it was determined that, yes, we should at least start talking about it, there was a question of which crew. Which crew will do this? And we were well aware that this discussion was going on, and we really wanted to do it, because this was going to be very exciting. I think there were a number of things that worked in our favor. One was just the timing of our mission. I had flown proximity operations on STS-7. Clearly prox ops would be necessary to do this mission. ... I mean, there were just components there that, if you put everything on balance, I'm sure—George Abbey, I'm sure, made the assignments, said, "Okay. Hauck's crew's going to do this," or work on it.

So prior to this, STS 41-C, with Bob Crippen in command, had repaired the Solar Max [Maximum] satellite, with “Pinky” [George D.] Nelson and “Ox” [James D. A.] van Hoften doing EVAs, and Pinky actually going out to and latching onto the Solar Max satellite. And the way in which he did that involved a capture, an automatic capture feature that was mounted onto the MMU, Manned Maneuvering Unit, and as Solar Max rotated, Pinky was supposed to fly up to it and, as it was rotating, slip this over one of the pinions, one of the metal bars that was attached to Solar Max, and trigger something and clamp on it. Well, the clamping system didn’t work, but they wound up getting the satellite, and that’s someone else’s story.

So there had been a rendezvous with a satellite and an on-orbit repair at this point. But what we were going to do was not go up and try to repair them, but capture them and bring them back into the cargo bay and bring them home. So the first proposal was that, well, maybe there can be a capture feature that can lock onto this little metal stub that was probably two inches long and an inch in diameter, that was called an antenna snubber. When the WESTAR and PALAPA satellites were to get up on orbit to operate, the circular reflectors would be released and [they] would come up, and this snubber would keep the reflector in the proper position. That was the only place on that satellite that there seemed to be something sticking out that you could grab onto.

So that was how the thinking was going and how people thought that was the only way that it could be grabbed. And I remember one morning Dale Gardner came in and he said, “I was up all night.” He said, “I was thinking this is not going to work. It’s too small, the snubber’s too small, the rates are too high, and we got to do something else. There’s got to be a better way.”

And whether he alone or he talking to some of the EVA equipment people or what, came up with the idea of developing what was later called the stinger, and the stinger was mounted on the MMU and essentially was a probe that could be driven up inside the solid-rocket motor cone, the rocket already having been fired, so that wasn't an issue. The idea is, you push the probe up into the cone and then you release fingers—I just saw some of the original drawings of that in my files—pop open and snag at the throat of the cone and then you spin a wheel down that screws it down and you got it.

And it had the advantage [that] you didn't have to match any rates with the satellite. If you're going down the axis of rotation, you don't have to do anything other than be on the axis of rotation and then capture it. And then, of course, there's some rotation that's transmitted through the mechanism to the astronaut, but you just flip a switch on the MMU and nitrogen jets are fired and it's stabilized. So it was a brilliant idea.

So development work went on that, we had to train to do the rendezvous, we had to develop the procedures, we had to develop contingency procedures. What if we can't, for some reason, grab the satellite that way? Then what are we going to do? So we had all sorts of contingency procedures.

We had to train for the contingency where the astronaut who's in the MMU—there's a stuck-on nitrogen cold-gas jet and he starts going off in a loop-de-loops like a balloon released and just blowing itself off in a corkscrew. And that, of course, would take a couple of failures for that to happen, but then we knew that if, in my case, the commander flying the Space Shuttle didn't immediately maneuver away from the satellite and go after him, he'd be gone. Timing was critical because orbital mechanics propagates differential velocities very quickly. And I think we figured that if that were to happen and if he were to go off away from Shuttle, if I didn't

maneuver the Shuttle within fifteen seconds and go after him, he was gone. So that was maybe not a likely scenario, but it was something we had to train for and part of the risk.

Meanwhile, McDonnell Douglas and the Space Shuttle Program had to develop the hardware that would go into the Space Shuttle to accept these satellites once they were snared. Hughes [Aircraft Corporation] had to develop the procedures where, by firing the small amounts of fuel ahead of them, could bring them down to orbits that were compatible, and to orbits that you could go to one first and then go to the next one. So this is incredibly complex mission development, and I think it's just a huge testimony to the efforts of everybody that we went from concept to execution of that whole mission in eight months. It was incredible. I mean, think about trying to do that now. My guess is it would be very difficult to do that.

So, people say what was your favorite mission, and each one has its own aspects, but this one was innovative, it was challenging, it was unique, it was the first space salvage in history, where you actually brought something back that was derelict. Everyone worked really hard on it. They had creative people doing creative things.

And then, of course, we went up to fly it. First deployed a satellite, a LEASAT satellite, and then rendezvoused with WESTAR—sorry. I forget whether we picked up WESTAR first or PALAPA. But all this unique hardware that McDonnell Douglas and Hughes had developed, Dale Gardner tried to attach it and it didn't fit because the satellite had not been made precisely the way the drawings had it. There'd been something that instead of being here, was a quarter of an inch somewhere else, or an inch, or there was a cable in the way or something.

I mean, this is a long story in itself, but Joe Allen had to hold onto the satellite with his hands for one full orbit of the Earth, while Dale Gardner was working on taking hardware out of the cargo bay and clamping it onto the satellite. This required a lot of thinking on orbit, and I

give Joe Allen and Dale Gardner and Dave [David M.] Walker primary credit for coming up with concepts there. Meanwhile, the guys on the ground are developing concepts and were bouncing those off between each other, from ground to space, and when all was said and done, it worked.

So then we had another day to think about, well, now we know we probably have a problem. How will we—I think PALAPA was first—how will we get WESTAR in, knowing that—we’ll assume that we have the same problem and let’s start from the very beginning, developing a better way to do that. And we got that one in. So that was—I mean, when we locked that one down in the cargo bay, we cheered, and we know the people in Houston cheered.

I’m reminded, before the launch, I saw a NASA press release or a statement from one of the people in the NASA Press Affairs Office saying, “STS 51-A. The crew’s going to go up, they’re going to launch a satellite, and they’re going to bring back two satellites,” as if it was a piece of cake. And I was livid. I thought, “Here we are, NASA is shooting themselves in the foot because we are implying that this is easy.

And I had the opportunity to see this gentleman the morning of the launch, and I said, “You have set NASA up for a humongous failure by the nature of this press release.” And I said, “In my view, if we get one of these satellites back, it’ll be amazing, and if we get both of them back, it’ll be an miracle.” And I said, “You have not done NASA any favors.”

Well, we got both of them back, thankfully, but we were close to getting neither of them back. So there’s no sense in trying to tell the American people and the taxpayers that what you’re doing is easy, because it isn’t easy. It’s very hard, and any implication that it’s easy is a disservice to everybody. So that’s a little side note.

ROSS-NAZZAL: I think this might be a good place for us change the tape.

HAUCK: Okay.

ROSS-NAZZAL: Would you like to take a break for a minute?

HAUCK: Sure.

[Tape change]

ROSS-NAZZAL: While you're talking about STS 51-A, I had a couple of questions for you.

HAUCK: Okay.

ROSS-NAZZAL: Was there a point when you looked at the goals or objectives for this mission and thought perhaps it was too risky for you and the crew?

HAUCK: I don't ever remember thinking it was too risky for us physically, threat-to-life kind of risk. I always thought it was risky in terms of being able to pull it off. And the insurance community, there were two prime players; one, a Lloyd's [of London] underwriter named Stephen Merrett; the other one, a U.S. underwriter named James Barrett. James Barrett founded this company [AXA Space]. That's how I happen to be here.

But Jim came down and visited Johnson Space Center and we offered to take him through the simulators and show him what we were working on. I remember at one point he said, “Nothing that we are asking you to do is worth compromising your safety,” which doesn’t need to be said, but it was nice to hear him say that. And we never thought that we were really—or I never thought. It would be good to ask, if you haven’t already, to ask Joe Allen or Dale Gardner as EVA crew members if they felt that they were—they were certainly doing something riskier than I was doing, because they were going outside and they were going untethered on the MMU, each of them, Joe for the first one and Dale for the second one.

I don’t remember having a fear of failure, but I remember being very upset at this press release that I’ve already talked about, because up until that point, I thought it was very clear that we were doing something that had a fair amount of mission risk to it.

ROSS-NAZZAL: Can you compare and contrast the public interest in this mission versus the interest in your first mission? Do you have a sense of the differences or the similarities?

HAUCK: Well, Sally was the focus of the first mission. Secondly was the prox ops, and I’d say secondarily by a long shot. But in the knowledgeable press community, whether it was the science writer at *The New York Times* or coverage [in] *Aviation Week, Space Technology*, clearly the STS-7 prox ops was very important and got a reasonable amount of coverage.

STS 51-A was clearly a new use of the Shuttle, an expansion of exploring the capabilities of the Shuttle, and so there was a lot of interest there. I know there were front-page articles in *The New York Times* about that mission, during the mission. There were front-page articles in *The New York Times* about STS-7 and, of course, there certainly were for STS-26. But the

interest in 51-A centered around the unique aspects of this mission. It was clearly different from anything, other than perhaps 41-C, that had been done up to this point.

I didn't mention, when we got back, we went to the White House and were given—this is really interesting to contemplate. We were presented with the Lloyd's Silver Medal by the President of the United States. Now, I think that a lot has to do with the special relationship that he had with [Prime Minister] Mrs. [Margaret] Thatcher, but Lloyd's, the organization, Lloyd's is an organization that's a building; it's a meeting place. It's not an insurance company; it's a group of insurance people. They decided that what we did merited their Silver Medal, which had only been presented five times since World War II. And it's presented to recognize something like extraordinary achievements and efforts to minimize the losses to the insurance community there. I forget what it said.

And the chairman of Lloyd's came to the United States, through the efforts of Stephen Merrett, who I've already mentioned, and there was this ceremony at the White House. It was very brief, but the five of us were there; the British Ambassador to the United States, who read a message from Mrs. Thatcher; the chairman of Lloyd's, who told the assembled people the significance of what we had done and what the Lloyd's medal was. As a matter of fact, I have his remarks. I just came across them somewhere, so if that's something that you'd like a Xerox of, if that would be useful, fine.

But he said that only once before had the Lloyd's Silver Medal been presented to a woman. And, of course, Anna [L.] Fisher was on our crew, so this was the second time. And he told the story of the woman, the wife of a sea captain, and he—I forget what happened to him, but he was indisposed and the ship was in extremis, and she saved the ship. She was an American. So that lent a little bit of color to the ceremony. And the President handed us each

the Lloyd's medal, and that was kind of the end of it, and he went off to do his business and everybody left, except the five of us, a few other people and the Vice President, George Bush. And he said, "Well, would you like to see how the other half lives?" He said, "Come on into my office." So we went into his office and we sat down and we chatted, and he just couldn't have been more pleasant. And that was unique in itself.

So, okay, so 51-A, Stephen Merrett, I will mention, arranged for the crew to go to England for four or five days, and it was an extraordinary trip. We flew over on Concorde, all of us and our spouses, except Dave Walker wasn't married at the time. We gave a presentation in the Lloyd's Captains Room to the Lloyd's underwriters. We were guests of honor at a formal dinner at Mansion House, hosted by the Lord Mayor of London. I didn't know I was going to have to, but I had to speak.

We went to Oxford, where Stephen Merrett had gone to Exeter College, and spent the evening at high table with the dons of Exeter College, and had the chance to go into the common room and have one-on-ones with the students. We went to 10 Downing Street and spent an hour with Mrs. Thatcher, just the five of us and the U.S. Ambassador and Stephen Merrett. After we chatted for a while, having tea, she said, "Let me show you around a little bit." She took us into her Cabinet Room. She said, "Up there on the wall is a painting of one of my predecessors who let some of our colonies get away from us."

Then the other memory I have of that is walking—it's a spiral staircase. Once you walk in the door at 10 Downing Street, immediately to the left is a spiral staircase that goes up to the working quarters, I guess, and that's where we were. And so we're walking back down, I'm side-by-side with Mrs. Thatcher, and she says, "I'm coming to the United States to address a

joint session of the House and the Senate. Do you have any suggestions what I might speak about?"

And I said, "Well, the space program is something that is of mutual interest to the British and the U.S., and it's not controversial, and you certainly couldn't go wrong talking about that." Well, I don't think her remarks had anything to do with it.

I was also asked while I was there to extend to her an invitation to come to a launch. I mean, I was asked by NASA to ask her that. And she said, "Well, you know, I'd love to do that, and if I did, it would have to be at a time when the weather in Florida is worse than it is in England, and that might be hard to find. But you know, my predecessor, as Prime Minister, was voted out of office in part because there were horrible storms in England and he was off on holidays in Bermuda or the Bahamas or somewhere and he didn't come back, and the people never forgave him for that, so I can't go to Florida if it looks like I'm going on a vacation."

Then the other visit we had, we went to Kensington Palace and had tea with Prince Charles, and that was fascinating. We went into the palace, went into what I'd call a holding room, a very pleasantly appointed room. It had a bathroom off to the side. I remember I went into use the bathroom and saw, on the wall, in a frame, a page out of Prince Charles' log book, where he had soloed in a helicopter. So, later on, after we'd met him and were chatting, I said, "I saw the page out of your log book about when you soloed."

And he said, "Oh, you've been to the loo, have you?" [Laughter]

Well, in any case, we went up, escorted us upstairs. We were kind of briefed on the protocol by a member of his staff. He came in. I introduced the crew, and I said, "This is Dr. Joe Allen. He's a solar physicist astronaut. This is Dr. Anna Fisher." I said, "She's a thermometer doctor."

And he said, “Oh, you Americans. You have the most interesting things you like to do with your thermometers.”

And I said, “Your Highness?”

And he said, “I was in Palm Beach, Florida, playing polo one day and it was beastly hot, and I was exhausted and I had heat stroke, and I was taken to the hospital. After they checked to make sure that I had health coverage, they admitted me, and I was kept overnight. And every hour, a different nurse would come in to take my temperature, you know where.” [Laughter]

So I said, “Okay.” Well, he was actually delightful, and he made it a point, I noticed halfway through the audience, he would engage one of us in reasonably substantive conversation. There would be this change of his attention to the next person, almost seamlessly, two or three minutes with them, and he went—each person, spouses, astronauts, each person.

In the middle of one of them, we heard this, on the ceiling, “click, click, click, click, click, click. Click, click, click, click, click, click.” And he says, “Well, I guess you know who that is. That’s His Highness.” Prince William. And he was three or four years old, and he was upstairs, trotting across the floor. We never saw [Princess] Diana.

So that post-flight was really quite an extraordinary post-flight. I’ll mention, not in that great detail, but Sally and I went on a post-flight tour of Europe. After STS-7, we went to England, Belgium, the Netherlands, Germany, Hungary, Yugoslavia, and Norway, and it was fascinating. We met with the Queen of the Netherlands. Oh, Italy. We met with the Premier or Prime Minister or President, whichever is the most important in Italy. We were scheduled to have dinner with the King and Queen of Belgium, but his father had died three weeks ago, so they were in mourning. We stayed at the home of Ambassador [L. Paul] Bremer in the

Netherlands, and he is the gentleman who's now in Iraq as the head of the efforts to get that organized.

And Sally and I went to Norway. It wasn't originally on the schedule, but we were chatting and we realized that we both had Norwegian heritage, so we called NASA Headquarters [Washington, D.C.] and said, "Can we add Norway on?"

And they said they'd check on it and they said, "Sure. They'd love to have some people with Norwegian heritage." Then we met with the King of Norway when we were there. He was delightful. We were taken into his library and introduced, and he said, "Please sit down." An elderly gentleman. And we were warned that he had a nervous habit, and the nervous habit was to appear to be giggling when he would respond to his part of the conversation. "So don't let it put you off."

So, "Tell me about your spaceflight." So we'd say a little bit about it. And he'd say, "Oh, yes, hee, hee, hee, hee, hee, hee." It was just a nervous habit.

Then he'd sit there and it almost looked like he was going to go to sleep, and I thought, "Oh, I've got to salvage this," and I'd say, "Your Highness, the painting on the wall of a naval officer on a sailing vessel, can you tell us about that?"

"Oh, that's my father, the King of Denmark. Hee, hee, hee, hee, hee." And he'd tell us a little bit about that, then his head would start to sag.

And I'd say, "Your Highness, I understand you competed in the Olympics as a yachtsman."

"Oh, yes. Hee, hee, hee. I'll tell you about that." Then pretty soon, the door opened and it was time to leave.

So you think of memories, of unique memories that you have as a result of spaceflight. I remember at the end of the twenty-one days, Sally and I were exhausted. Before we left, we realized, with all good intentions, that if we let the schedulers schedule us without us having an input, we would be going nonstop from eight in the morning till ten at night, and so we laid out some ground rules. We said, "What should the ground rules be?" Every two hours, we get fifteen minutes by ourselves. We get a day off every six days, totally off. And a few other things, somehow limiting the amount of press, and how we interacted with the press. There should always be someone there to moderate the questions. We shouldn't have to fend for ourselves. Every hour we should have a potty break. And we know if we hadn't done that, it would have been even more exhausting. But as it was, except for the days off, every night we were on, whether it was at the Ambassador's house here or there.

But it worked. We laughed about it. We had a twenty-year reunion down at the beach house in June and we laughed about some of those things.

Okay. So, after all of that and after 51-A, I was assigned to be the Astronaut Project Officer for Centaur. Centaur was an upper-stage, second-stage, upper-stage rocket that's very thin-skinned. It's a thin aluminum skin. It's pressure-stabilized, which means if it's not pressurized, it's going to collapse by its own weight. If it were not pressurized, but suspended and you pushed on it with your finger, the tank walls would give and you'd see that you're flexing the metal.

Its advantage was that it carried liquid oxygen and liquid hydrogen, which, pound for pound, give better propulsion than any other, than a solid-rocket motor. Shuttle was obligated to launch the Ulysses probe and the Galileo probe, both interplanetary probes, and they needed the

most powerful rockets they could have, and there was back and forth, could the inertial upper stage launch them or couldn't it, and no, it couldn't.

In any case, at some point the decision was made, well, we've got to use the Centaur, which was never meant to be involved in human spaceflight. And that's important because rockets that are associated with human spaceflight have certain levels of redundancy and certain design specifications that are supposed to make them more reliable.

And clearly, Centaur did not come from that heritage, so, number one, was that going to be an issue in itself, but number two is, if you've got a return-to-launch-site abort or a transatlantic abort and you've got to land, and you've got a rocket filled with liquid oxygen, liquid hydrogen in the cargo bay, you've got to get rid of the liquid oxygen and liquid hydrogen, so that means you've got to dump it while you're flying through this contingency abort. And to make sure that it can dump safely, you need to have redundant parallel dump valves, helium systems that control the dump valves, software that makes sure that contingencies can be taken care of.

And then when you land, here you're sitting with the Shuttle Centaur in the cargo bay that you haven't been able to dump all of it, so you're venting gaseous hydrogen out this side, gaseous oxygen out that side, and this is just not a good idea.

So I was working the issues on that and then George called me one day and said, "Rick, I want you to command STS 61-A," I think it was called, "which will be the first launch of the Shuttle Centaur, to launch Ulysses solar probe." And Dave Walker four days later, "Four days later, you will launch with Galileo." And the reason they had to be so close together was because of the positioning of Earth in its orbit. There are certain times of the year that require less energy to get either to Jupiter—isn't that where—Galileo went to Jupiter, I think.

ROSS-NAZZAL: I think.

HAUCK: I think so. And to get to where Ulysses was supposed to go out of the ecliptic, around the sun, they needed to go in April. They needed to go in the first ten days of April. So Dave and I wound up on those crews, commanders of those two crews, and we started working through those issues, and it was clear this would be very difficult. We were going to have just four crew members, because that minimized the weight. We were going to 105 nautical-mile altitude, which was lower than any Shuttle had ever gone to, because you need the performance to get the Shuttle Centaur up because it was so heavy.

The whole integration of the Shuttle Centaur had its problems, which were being managed out of the Lewis Research Center. Lewis had been the program managers for Centaur, Atlas Centaur, and so they knew the systems.

But in retrospect, the whole concept of taking something that was never designed to be part of the human spaceflight mission, that had his many potential failure modes, was not a good idea, because you're always saying, "Well, I don't want to solve the problems too exhaustively; I'd like to solve them just enough so that I've solved them." Well, what does that mean? You don't want to spend any more money than you have to, to solve the problem, so you're always trying to figure out, "Am I compromising too much or not?" And the net result is you're always compromising.

So I found another interesting situation at the time, that the head of the Office of Space Flight at that time was a very good man, Jess [Jesse W.] Moore, but he did not come out of the manned spaceflight world, and Jess made it very clear that he wanted Dave and myself to be part

of all the substantive discussions, and he was very sensitive to the human spaceflight issues, but he wasn't a human spaceflight guy. And I think that the program would have profited at that point by having had someone there who was more keenly attuned to the human spaceflight issues. As I say, he couldn't have been nicer to us, and encouraged us more and bent over backwards to be sensitive to the issues, but he didn't start out as a human spaceflight guy.

In early to mid-January 1986, we were working an issue having to do with redundancy in the helium actuation system for the liquid oxygen, liquid hydrogen dump valves, and it was clear that the program was willing to compromise on the margins in the propulsive force being provided by the pressurized helium. We were very concerned about it. We had discussions about it with the technical people. I went to John Young about it. And by the way, John Young called this mission "Death Star." That was his name for this mission, which he said with humor, but behind humor, there's a little bit of truth. I think it was conceded this was going to be the riskiest mission the Shuttle would have flown up to that point.

So John and I and other members of the Astronaut Office, I'm sure—I think Dan Brandenstein—I'm not sure if Dan—no, Dan wasn't the head of the Astronaut Office yet. I think John was still, then. I'm not sure. But this was in January of '86, and we went to a board to argue why this was not a good idea to compromise on this feature, and the board turned down the request. I went back to the Crew Office and I said to my crew, in essence—this isn't a direct quote. I don't know precisely what I said, but, "NASA is doing business different[ly] from the way it has in the past. Safety is being compromised, and if any of you want to take yourself off this flight, I will support you."

And of course, it was two or three weeks later that *Challenger* blew up. Now, there is no direct correlation between my experience and *Challenger*, but it seemed to me that there was a willingness to compromise on some of the things that we shouldn't compromise on.

ROSS-NAZZAL: Were you ever thinking about stepping down as commander of that mission?

HAUCK: You know, I probably had an ego tied up with it so much that, you know, "I can do this. Heck, I've flown off of aircraft carriers and I've flown in combat, and I've put myself at risk in more ways than this, and I'm willing to do it." So I didn't ever think of saying, "Well, I'm not going to fly this mission." Knowing what I know now, with *Challenger* and *Columbia*, maybe I would. But NASA was a lot different back there when we'd never killed anybody in spaceflight up to that point. I mean, there was a certain amount of sense that it wouldn't happen.

So anyhow, the *Challenger* accident happened. You'd asked in your questionnaire what I did. I was assigned to be part of a Johnson [Space] Center review of requirements, and it wasn't terribly exciting, but it was something that needed to be done. Meanwhile, other people were down at the Cape [Canaveral, Florida] sifting through wreckage and other people were assigned to the solid-rocket booster problem. So mine was kind of a nondescript assignment.

Then, of course, Jim [James C.] Fletcher was invited back to be the Administrator, invited back by the President. Jim [later] told me that he didn't want to do it, but he said, "When your President asks you, then you've got to do it," so he did. I'd never met him before. He came down and he spoke to the Johnson Space Center as a Center and then he spoke to the Astronaut Office, and his message was meant to be, "Hey, we're going to get to the bottom of this. We're not going to compromise. We're going to do everything to get back on track."

Meanwhile, I had been told in private, in confidence, by Dick Truly and George Abbey that I would command the next flight, after the *Challenger* accident, “But you can’t tell anybody.” Right. And, “You’ve been training for this Ulysses mission. That was a handpicked group because it was a difficult flight. Your crew is [David C.] Hilmers, [John M.] Lounge, and Roy [D.] Bridges,” but Roy had been called back to the Air Force.

So I remember George saying, “I want you to be the commander. Dave Hilmers will be on the flight. Mike Lounge.” He says, “I’ve called Pinky Nelson up at University of Washington [Seattle, Washington] to ask him if he’ll come back.” And he said, “Who would you like to be your co-pilot?”

And I don’t know if he was really giving me a choice or just humoring me when I said, “Dick [Richard O.] Covey.” Dick had not—everyone else in my class, I think—Dick was the last pilot to fly in my class. He’s extraordinarily capable, so why that should be, I don’t know. But most all of them were extraordinarily capable. And if Dick were to take this flight, that would mean he would be the first person in our class to fly as co-pilot twice, rather than pilot and then commander.

But George agreed. He said Covey would be very good. I’m sure he called Dick and said, “Would you do it?” and Dick said “Yeah.” But we couldn’t tell anybody.

So when Fletcher came down—and I’m thinking this was probably in June of ’86—Henry Clemens, who was working TDY, assigned up to Headquarters, working with Dr. Fletcher, said, “Rick, Dr. Fletcher would like to see you at his motel.”

I said, “Okay. Do you know what it’s all about?”

“No, I don’t,” or, “I do, but I can’t tell you.”

So I went to the motel, down on NASA Road One. Dr. Fletcher introduced himself. “Please come in.” And he said, “I’ve got some real problems up here at Headquarters with the Space Station Program, and some words were spoken by the head of External Relations here, which really has provoked a firestorm between the Texas and the Alabama delegations in Congress. And I need someone up here with credibility to help solve this Space Station problem, and I’d like you to come up here and be the new head of External Relations.”

So I said, “Number one, I don’t know anything about that kind of a job, and thank you for—you’re obviously putting a lot of trust in me for this, but I’m not sure I’m the right person. And, oh, by the way, did you know that I’ve been told that I’m in line to command the next Shuttle mission?”

“Yes, I know that.”

And I said, “I hope you understand that, as an astronaut, there’s nothing I’d rather do than command this next flight, and you have the power to say I’m not going to do it, if you want, but please don’t take this away from me.”

And he said, “Well, would you come up for six months?”

And I said, “Can I think about it?”

“Yes, you can think about it.”

So I went back to my office and called Joe Allen. Joe had been head of Congressional Liaison for a while. I talked to Tom Tate, who had been the Chief Staff Officer on Congressman [Donald] Fuqua’s staff at the House, and I said, “Gee, what am I getting myself into?”

“Well, give it a shot.”

So I called Dr. Fletcher and I said, “Yes, I’ll do it.”

So I moved up to Washington in July or August of '86, and at some point—I guess this was still a secret—there was no public announcement as to who was going to be the commander, and who the next crew was going to be. So I started working these issues, and I don't think I did a very good job of it, but trying to—I had to accompany Andy [Andrew] Stofan, who was the Space Station Program Manager, to go over and meet with Senator [Jeremiah A.] Denton from Alabama, and we'd go over and meet with Senator [Lloyd M.] Bentsen from Texas, and the other senator from Texas, [William Philip "Phil" Gramm], and Senator Howell Heflin from Alabama, and go meet congressmen from Texas and go meet congressmen from—meanwhile, every day there was a new crisis in the press regarding the *Challenger* accident, what we were doing about it, whether we were testing this or not testing that, and why we screwed up this way or how NASA was screwed up that way. So even though Dr. Fletcher asked me to come up for Space Station congressional issues, I'd say most of my time was spent on press issues.

Nancy Green was the head of Public Affairs. She did a great job. When I went up there, I didn't want to run the press conferences. Nancy said, "Do you want to run the press conferences now that you're head of External Relations?"

I said, "Nope. You're the spokesperson. You do a great job. You should keep doing that. I'll be there. I'll be in the audience, and if you need me to stand up and say anything, I'll do that."

But I think we got to the point where every morning, Nancy and I, the head of Congressional Relations, and the liaison from Public Relations to each of the codes, Code M in particular, we'd meet; we'd say, "What do the morning tear sheets show? Where are the problems? What fires do we need to put out?" Bob Crippen, who was working up there then,

he'd participate in a lot of these meetings. Jay Honeycutt. And so it was fighting fires for four or five months, I guess.

And then I guess it was January of '87 and it was time for me to go back to Houston. I mean, I'd been going back there and training with my former crew, plus Dick Covey, just because the crews needed to be kept fresh. We knew we were supposed to fly the next mission, but as far as everybody else was concerned, we were just one of several crews that were staying current. So I forget how the announcement was made. I think it was mid-January, but there was an announcement we'd be the crew for that flight.

ROSS-NAZZAL: I think this would be a good time for us to stop today.

HAUCK: Okay.

ROSS-NAZZAL: I want to thank you again for meeting with us. We've very much enjoyed everything that you've told us.

[End of interview]