

# NASA JOHNSON SPACE CENTER ORAL HISTORY PROJECT

## ORAL HISTORY TRANSCRIPT

CHARLES A. BIGGS  
INTERVIEWED BY REBECCA WRIGHT  
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WRIGHT: Today is August 1, 2002. This oral history with Chuck Biggs is being conducted in Houston, Texas, for the Johnson Space Center Oral History Project. Interviewer is Rebecca Wright, assisted by Sandra Johnson and Kristen Starr.

Thank you for taking time to participate in this project. We would like to begin today by asking you how you began your career with NASA.

BIGGS: Well, it actually began when I was about twelve. My dad was an outdoor advertiser or, in the vernacular, a sign painter, and in our family we worked in the business. So I was a sign painter from the time I was about twelve years old, and I felt then I was in the information business. I was also a musician. I played drums. So, really, art and music was all I thought about. Now, I really didn't think about space at the time. That was before, I guess, we were doing anything in space, but art and music was very important.

When I left high school, I interviewed for a musical group at Georgetown, at Southwestern University in Georgetown, Texas, and got a scholarship. Man, I was happy. Going to get into music. Went to what they call Weekend at College, and I looked around, and all these kids were well dressed and driving cars, and their dads were bankers and lawyers. Southwestern was limited to 500 students at the time. All of a sudden it dawned on me, a family of five kids, and my dad's a sign painter, I couldn't afford to go to that school.

So in a panic, I hitchhiked to Houston and joined the Air Force. So that's when my professional career started. That was in June of '55, and I'd turned eighteen in March of '55. So, you know, big decisions at a very young age. Postponed my education, which was the first major mistake I made in my life. I made many more after that.

I was in the service and continued art. Continued music at night playing in the armories and dance bands and earned a few bucks, and continued in the art field as a designer.

After I finished my basic training, stationed at Craig Air Force Base in Alabama, and that was before all the big marches and everything. This was in 1956, after I finished basic training. I was there about a year in the Recognition Materials Branch, and we designed training materials for pilots. So, see, still in the information business, still giving information to people through the use of photography, drawings, video, flashcards, all these sorts of things, to try to teach the pilots the good guys from the bad guys.

Then I applied for a job at Shepard Air Force Base, [Texas]. They were going to send me to Greenland, and I didn't want to go to Greenland. So there was a position open at Shepard Air Force Base. I applied for that. I transferred there a year later. But before I left, I got married to my wife, Geana, and we've been married for forty-six years. [Whispers] I think. [Laughs] This year. So she got on a bus and went to Alabama, and we got married there.

Then I transferred to Texas, Shepard Air Force Base, again in the Department of Intelligence Training, in the information business. We did training for how to service Atlas rockets and how to service B-47s and B-52s. So, again, information, art. Very little music by now.

After being in that job about three years, I read an article in the paper that they were going open a Center, the Manned Spacecraft Center, in Houston, Texas. Now, being from Lake

Jackson, Clute, and that area, I thought not “I want to be a part of the space program,” but I thought, “Hey, here’s a chance to get back home, get a little closer to home from Wichita Falls.”

So I applied for a job. Then in 1962, November of ’62, sent in an application and was accepted, and they wanted me to transfer to Virginia and then in March, move to Houston. I said, “That’s rather foolish. Let me stay where I am now and move me in March.”

So on March the 18th, 1962, I moved to the Manned Spacecraft Center, March the 18th, three days after my birthday. So that’s how I ended up at the Manned Spacecraft Center, Johnson Space Center. I sent them examples of my work, illustrations, drawings, and that sort of thing, and I was selected from a field of how many had applied for the job as a conceptual illustrator there in the Graphics Branch.

WRIGHT: What did you find when you arrived at the Center? Were you located in the buildings that were downtown?

BIGGS: We were in thirteen buildings at the time. We were scattered all over the place, and I went directly to the headquarters building. I’m not sure why. That’s just where Administrative Services Division was located, I guess. That was the Farnsworth-Chambers Building. I moved into a little cubicle there and started doing illustrations. You know, “This is what the Mercury’s going to look like, and this is how it’ll all work.”

I’d sit down with the technicians and the engineers, and we’d talk about it, and then I’d do the drawings and the sketches, and a lot of more boring stuff, too, you know, presentations and flip charts and stuff like that. But basically I was hired as a conceptual illustrator, aerospace

technologist, AST, to do illustrations of what these programs are going to look like, beginning with Mercury.

Went from the Farnsworth-Chambers Building to [upstairs of the] Ben Gordon Loan Building. Went from Ben Gordon Loan to Ellington Air Force Base. Then I moved from Ellington Air Force Base, [Texas,] to Building 326. I even remember the building. Moved from there into Building 419 on site. Now the site's open by now; it's September of '63. So the Manned Spacecraft Center was opened.

I was there for a while. Then I moved to Building 2 on the second floor, and then in '65, when I decided to transfer to Public Affairs, I moved over to Building 1, at the time, which they renamed to Building 2, because Chris [Christopher C.] Kraft wanted Building 1. That was what we [were told].

I was doing cartoons for the [Center] newspaper, and I remember doing a cartoon that showed a guy saying, "Gee! We're finally at the Manned Spacecraft Center on site. We won't have to move anymore," and there was a truck driver standing by a big truck going, "Hee, hee, hee, hee, hee," because we did move even after we got to the Center. But it was sure better than the taxi fleets that ran us around there in Houston, physically call a taxi, the taxi would pick you up, take you from the Farnsworth-Chambers to the East End State Bank for a meeting. Taxi would pick you up at the East End State Bank, take you to Ben Gordon Loan, thirteen different installations.

WRIGHT: Did you receive any type of training or indoctrination of the engineering aspect of what you were drawing?

BIGGS: Indoctrination, no. We worked directly with the people. Well, for example, may I show you the example? I brought some special things. I thought I had this stuff organized a little better, Becky.

WRIGHT: That's all right.

BIGGS: I'm just going to show you some—yes, here we go. [Biggs shows example.] Say, for example, I'd sit down with the Gemini crew and talk about, okay, how's this astronaut [maneuvering] unit going to look, and how far out will you be, and when we land on the Moon, what sort of craters. We'd just sit and talk to them, and they would share their thoughts with me and tell what they thought it would look like. Then I would do the illustrations, go back to them, let them look at it. They'd say, "No, the color's wrong. Originally the command module was black," things like that.

So, no special training per se, but it was what we called in the air force OJT, on-the-job training, just work with them, and you just did it over until you got it right.

WRIGHT: What type of tools were you using at the time?

BIGGS: Guache was the favorite medium then which is watercolor in a tube, and a lot of pencil drawings, a lot of illustrations. Like I say, not only full-color illustrations for publications, but illustrations for reports. After a mission, we'd do the mission report, and typically I'd do the cover of the mission report. So it might be in a pencil medium or charcoal or something like that.

So, really, basically the same thing that some commercial artists would be using in a studio. You use the same tools.

WRIGHT: And how many of you were there? How many were in your crew?

BIGGS: Really three of us, Gerry [Gerald J.] Lyons, Grant Lathey [phonetic], and myself, we were the three conceptual illustrators. Then we had another group of people in that same organization. Most of them did flip charts and reports and stuff like that, but we were the three conceptual people, did conceptual work.

WRIGHT: How did your duties evolve in this area?

BIGGS: Well, it's sort of what you volunteered to do, and then if you proved you had the skills, then they'd continue to let you do it. Of course, that has its down sides, because if you keep volunteering, they would keep piling it on, and that's basically what happened. But I really liked that.

When my boss, Roy [L.] Magin, found out that "He can do illustrations. Then we'll let him do illustrations," I started getting more of those. And that's just the way it went, working with a repetograph [phonetic]. Whatever skill that you had, they'd take advantage of it. That's a pretty small group, and we didn't have a contract support at that time. Later we got some contract support. It was all done in-house by NASA employees.

WRIGHT: At the time that you were doing this specific task, Gemini was under way, but at some point Apollo started to come onboard. Did you have the task of working on both projects or both programs at the same time?

BIGGS: I left Graphics in '65. So about the time I was leaving Graphics, we were moving into the planning stages for Apollo, and, yes, we did. For example, in Public Affairs one of my tasks was working with George [F.] MacDougall [Jr.] in the program office to get rid of all of the artifacts that they accumulated in the Gemini Program. So he and I would go out to California and meet with the [North American Aviation, Inc.] people out there, or meet with the [McDonnell Aircraft Corporation, St. Louis, Missouri,] people, whoever had the hardware, and we'd do through the procedures for disposing of that through established channels for artifacts, and at the same time we were looking forward to working on Apollo. So we're phasing out Gemini, but bringing on Apollo at the same time, and really about the same thing happened between Apollo and Skylab, not as obvious because the same hardware was used, but the same sort of thing.

WRIGHT: Did you have any dealings at all with the Mercury?

BIGGS: Mercury—the Administrator, [James A. Webb,] decided that we should have someone recording the history in art form. So they wanted me to go on a ship for eight days and do the recovery of [L.] Gordon Cooper's flight, Faith 7, I believe it was. I said, "Boss, I get seasick."

And they said, "Okay, what we'll do is send Grant Lathey out there on that ship for eight days, and we'll send you to the Cape [Canaveral, Florida]." So they did. I went to the Cape. I

was there for the launch, covered the launch. I did sketches, made recommendations to my office on how we should cover that. Then ultimately NASA Headquarters [Washington, D.C.] established the fine arts program, where well-known artists, not Chuck Biggses and Grant Latheys, but well-known artists throughout the nation, were used in this program, and I guess it's still in existence today. They would go out to recoveries and landings and document in art form what was happening.

WRIGHT: Where did your drawings end up? Were they only used for in-house work? Were they also released to the media? Did they go to the administration as well?

BIGGS: They went everywhere. They were in reports. And we did nothing on speculation. Everything, these examples here, everything we did, had a purpose for it. If it was to be used in a publication, a work order went in to do an illustration of an astronaut flying, and it was assigned a NASA number, and it went into the photo system. Then anyone who needed that illustration in a presentation—maybe you're putting together a presentation for review on some hardware, you might pull that out of the NASA Archives, get a slide made, pop it into your slide projector, and it becomes a part of that presentation.

So it was used everywhere, a lot of reports, a lot of publications. Of course, NASA's always had a real good audiovisuals repository. So virtually all of the artwork went into the audiovisuals. The only thing I hate is, I heard some years later that all the original art was destroyed, because they just couldn't store it any longer. I wish I'd gotten a lot of my own artwork, but I didn't.

WRIGHT: How did you transition into the Public Affairs Office?

BIGGS: I was doing a lot of work for Public Affairs. They would have an exhibit requirement, and they'd come to the graphics people and say, "Hey, can you do some designs for us?"

So I'd say, "Sure." We'd do some designs, Gerry and myself and Grant primarily.

Then I heard that a position had opened up. A young man had transferred out of that group, out of the Public Services group, and I just applied for the job and was selected and moved over in 1965 into that position in the Office of Public Affairs, doing exhibits work, doing primarily exhibits work.

WRIGHT: And share with us what that entailed, how did you get started and how that evolved into so many of the other exhibits that you did.

BIGGS: Okay, let me read something which I found quite amazing. You have a couple of good questions about how the organization evolved. For someone who was in the same branch, the same building, from 1965 until 1992—how many years is that? Twenty-seven? Twenty-seven years in the same organization, one would think, "Gosh, I'd hate to have a job where I got up every morning and did the same thing for twenty-seven years." But that was what was so unique about this job. As I mentioned earlier, it dawned on me yesterday or so after reviewing this, that they paid me to do this. It was amazing that I didn't have to pay them, because it was twenty-seven years of doing different things.

Listen to this crazy chronology. May '54, May '55, I was a student and an artist in an ad agency. Then in '55 I went in the Air Force, and then in '56 I was an illustrator for the Air Force

at Craig. I'd mentioned this. In '59 I was illustrator at Materials Branch, Department of Intelligence Training. Then in '60 I went to Midwestern [State] University, [Wichita Falls, Texas,] for a year and worked in a sign shop at night. In '62, artist at Shepard Air Force Base. In '62, full-time employment, and I operated my own studio in Wichita Falls.

'61, I applied for reassignment to the Manned Spacecraft Center, Space Task Group, Houston, Texas. That was in November. In March they transferred me to MSC [Manned Spacecraft Center], in March of '62, as a scientific illustrator in the Graphics Branch. In March of '66 I was reassigned to the Protocol Branch, Public Affairs Office, as a visual information specialist, AST, technical exhibits and presentations. Then in April of '66 I was added the responsibility of the exhibits section in the contract management of the branch.

The point is, Public Affairs was so fluid. From day to day it changed, and I think changed for several reasons. One is, the requirements were new; they didn't exist before. Then the requirements, if it was successful, more people would ask for them. So we had to staff up and reorganize to accommodate it.

Then we started getting in the newspapers and people started writing letters. "Gosh, we need an office to answer this mail." So we established the Public Affairs mail room.

Bear with me.

Then in '68 they made me head of Exhibits, Artifacts, and Information Services—listen to all these descriptive names—with now the additional responsibilities of the Artifacts Program and the Public Affairs Library, because now we're bringing stuff back. This is in 1968. What do we do with this stuff?

We had a meeting with the curator of the National Air & Space Museum [Washington, D.C.], Fred Durant, and we had Mercury spacecraft sitting outside. We never thought that these

things would be so historically significant. He just came out of his mind and said, "We've got to have an agreement where we protect these." So I helped implement that agreement, then, to make sure that artifacts got transferred to the Smithsonian Institution, [Washington, D.C.]. So, of course, since I volunteered, they gave me the responsibility of this Artifacts Program.

As I said, people were writing in, so we've got to answer their mail. So we established a Public Affairs Library, and since I volunteered, they gave me that, too.

September of '69, they changed it to the Exhibits, Artifacts, Presentations, and Information Services Section. Now they've added a Speaker Bureau, because we need people to go out and talk about these programs. So we needed a MSC Speaker Bureau. So they established the Speaker Bureau, and I volunteered to run it. [Laughs]

October of '70, now it's the Special Activities Section, and they gave me a NASA employee finally. They gave one guy by the name of Ralph Egan [phonetic] to give me a hand with it. In November of '73, I gained the management of the Public Visitor Program. People wanted to come out and walk where John [H.] Glenn [Jr.] walked, you know. So we said, "Well, we need to open up the front gate and let these people in."

They needed to have a program to control them. So we controlled them with 250 signs on the Johnson Space Center. We let the people in, told them to follow the signs. They walked 2.2 miles to see all these things here at the Johnson Space Center, walked in the middle of the August sun, but enjoyed it, just really loved it. And they gave me a couple of more people to help me.

By then we had Moon rocks back. This is 1973. People wanted to show Moon rocks. So we developed a Lunar Sample Display Program. My boss at the time asked me if I'd work with the curatorial staff and do that. So we did, myself and Paul [M.] Sturtevant, who was my one

NASA guy then, and then we maintained control of the lunar samples as they traveled throughout the world. We worked with USIA [United States Information Agency] on the overseas ones, to display those.

Then '76 I had basically the same responsibilities, but they add protocol and community affairs to the section. Now the community wants us to come out and talk. "Come over and talk to our Rotary group." So that was an added function.

Again, I tell you this to show you how the ebb and tide of the demands. It wasn't so much that we were so smart and we can anticipate what people needed. People were banging at our front doors to find out this information. So we did the best with the staff we had and the financing to provide the support.

Then we had the Visitor Program. We're moving the people around, and that moves me up until about 1980, when I was selected as the branch chief over all of those functions. So here's a fairly limited staff, virtually all of these people trying to do a good job. So they were willing to take on a lot of additional responsibilities. So the Center just kept piling it on, and then we kept working long hard hours to do a good job at it. So it was really in response to public demands, public needs, for the display of the lunar samples, for the display of materials to send out in our eight-state region, for printed materials, fact sheets, photographs of astronauts. Kids would write questions, and we'd answer their questions.

During the Apollo 8 mission we were receiving literally thousands of letters commenting on reading Genesis from the Bible, and we had answers for that. Much of this work, as a matter of fact, the majority of the work, was handled by a contractor staff. We just didn't have the NASA staff to do it. For example, I would have maybe one or two people in my section to help, and the rest was contract support.

WRIGHT: At what point did you become part of the NASA staff? You had mentioned that the United States Air Force had transferred you, but at what point—

BIGGS: Well, I physically transferred as a civil servant. See, when I left the Air Force, I went to work as a civil servant there at Shepard Air Force Base. I kind of glossed over that, but I was military, three stripes on my shoulder. Then I got out of the service after four years. Then I went to Midwestern [State] University for a year, and then I realized, with a wife and two kids, I really had to work. So I came back and worked as a civil servant there at Shepard Air Force Base. So it was a matter of physically getting transferred. I transferred from one agency to the other, one location to the other.

WRIGHT: Well, I can understand why you mentioned you were never bored at your job, because you had something new to do.

BIGGS: Never, never. When 1980 rolled around, the same thing continued to occur, different projects, different challenges.

WRIGHT: Let's talk, if we could, just a few minutes, about the exhibits, when you started gathering these artifacts. How did that happen? Did people call you, or did you formulate a list of what you needed to collect?

BIGGS: In 1968, when Administrator Webb and the Secretary of the Smithsonian, [S. Dillon] Ripley signed the agreement that said NASA shall offer to the Smithsonian all of the space hardware when you no longer have the technical utility for it, the Center director looked down to my boss and said, “You guys need to develop some procedures to make sure that this occurs.” Otherwise, you know how engineers are. They’ll just turn it into scrap and get rid of it.

So my boss turned to me and said, “Why don’t you develop these procedures.” And I did. We put together—which is still pretty much in place today, I guess—procedures that everyone should follow. We described what an artifact consisted of. It was virtually everything, ground test equipment, flight equipment, equipment used in training, because we didn’t want to overlook anything. When this material was no longer required for the agency, it would be turned into excess property, using a separate form, a Form 2275.

This sort of flagged it for the property people, “Hey, this is something special.” Well, once it was flagged as being something special, then it went through a certain screening, and it got special attention. Then we screened it at the Johnson Space Center, at Manned Spacecraft Center, and then we screened it at various organizations, nonprofit organizations, and then, of course, Smithsonian had a look at it. If they declined it, then we could use it at some of these other nonprofit organizations and institutions.

For example, some twenty-seven, twenty-eight years ago, a museum was built in Hutchison, Kansas. You may have heard of it, the Kansas Cosmosphere and Space Center. Max Ary was the founder and director until just most recently, when he went to Oklahoma City, [Oklahoma]. But he would bring in his students in a van. They would drive all the way from Hutchison, Kansas, and they would go through the excess property, looking at things, and they would select items for that museum, load them up, and then carry them back to Hutchison,

Kansas. As a result of that, hundreds and hundreds of items have been salvaged and saved and protected for future generations to enjoy. Smithsonian has even used their expertise to restore spacesuits and that sort of thing because they did develop quite an expertise in that area.

We had procedures that controlled it, that picked up the accountability. They would report back to NASA annually, how it was being used. So we just didn't give it to them, but it was pretty well controlled.

WRIGHT: Was that your decision, of who was able to take a look at this and can take it back with them?

BIGGS: More or less, because, like I say, we volunteered to do all this stuff, and NASA just loved volunteers, and the people over in the excess property, they would handle the paperwork transfer from one internal agency to another, or it might be transferred to the Kansas state excess property agency, and, in turn, the Kansas state agency would transfer it to that museum. But we worked directly with the people in the organizations, physically went over it with them.

I remember one time Max's kids went through with shopping baskets, literally, in the warehouse and would select things to be used. A lot of it, the engineers would call trash, just old pieces of spacesuits, but they would be able to utilize it in educational programs and show the thirteen layers of the spacesuit and have call-outs and describe what these different layers did. So they put them to good educational use.

WRIGHT: When you opened up the doors to the public and installed the signs for the people to come in, you also created a Visitor's Center.

BIGGS: 1963, yes, we did that.

WRIGHT: Tell us about how you were able to decide what went into those collections for the visitors to see and what involvement you had in setting that up.

BIGGS: It started as an open house. Seems like Paul [E.] Purser at the time was really pushing for that. So we had a Sunday open house, and I've forgotten how many people we had in Saturday and Sunday. Something like 20,000 people showed up. At the time we had our regular auditorium, which is there now. That's all we had, and we set up a few exhibits for them to look at. The building was jam-packed. So I took some photographs of it.

Then on Monday morning I sent the photos up to Paul with a little note saying, "You know, we had a very successful turnout, and maybe we should do this more often." So the Center management, senior staff, talked about it for some period of time and decided to do that. We extended it to weekdays, it seems like, and then finally it was every day of the year except Christmas Day, and I guess, to this day, it's the same way. I guess Space Center Houston [Houston, Texas] is closed on Christmas Day.

It was a great success. We opened first the auditorium, and then we opened other buildings, the WET-F [Weightless Environmental Training Facility], the Water Immersion Facility, at one time was open where people could come in. At that time it was just a centrifuge in Building 29, walk around on the floor.

We used what Disney later described as guerilla warfare. We would go into a building, put up ropes and stanchions and bring the people right into the building, let them see what's

going on. The engineers at first hated this, because they'd be working away, and then here's some little girl over here in shorts and a bikini top, you know. "What are these people doing in our building?" But later—and it was a slow process—later they became kind of proud of what they were doing, and if for some reason we closed to the public, they'd call, "Where are the people?"

So they began to take this as a compliment, what they were doing, and not intruding on their work. We had a number of buildings that were open that way: Building 29, the Mission Control, of course, was open except during missions, and we used this guerilla warfare technique, is once you get in there, there's not much that they can do to get you out.

But it was causing problems, and this really leads us to Space Center Houston and how Space Center Houston came about. We had problems with parking. People would have to park down by the Saturn V, and that's another story in itself. We did move the Saturn V here, but they would have to park down by Saturn V. Then they would have to walk all the way up to the Visitor's Center, then from there, 2.1 or 2.2 miles around to the different buildings that were open.

So my boss, Hal [Harold S.] Stall and Gerry [Gerald] Griffin, our Center director at the time, said, "Chuck and Hal, why don't you guys look at building a facility that's paid for by somebody else, where we can accommodate all these people," and that's where the brainchild of Space Center Houston came about in 1984, '85, something like that, to relieve this congestion, because we had nearly a million people walking around on this site.

Now, imagine. After 9/11, allowing a million people a year to come in and park and walk down and just follow the signs throughout the Center. But in those days, that's the way it worked.

WRIGHT: While we're talking about Space Center Houston, give us some background about how that started to evolve. The concept was introduced to you as something to follow up on and you followed up. But yet it became a much larger a project.

BIGGS: In '76, let's digress a moment to talk about the Saturn, because it plays into Space Center Houston. 1976, I made a proposal to Chris Kraft that we bring a Saturn V here. The technical guys had talked to him, and they said, "We've got this Saturn V scattered all over the U.S. We've got some at Michoud [Assembly Facility, Louisiana], some at Mississippi Test [Facility]." At the time it wasn't [the NASA John C.] Stennis [Space Center, Mississippi,] yet. "We've got some up at Rockwell [International]. We're paying thousands of dollars a year to keep this thing in dry nitrogen, and we'll never fly it again. So it's available if you want to display it."

Well, I thought it was a pretty good idea. So I put together a presentation. Jack [John W.] King was the Director of Public Affairs at the time, and we went up to senior staff, and we pitched it to senior staff. After our glowing presentation, Jack and I looked at Chris, and he said, "What do you want a Saturn for? This is the Manned Spacecraft Center."

Well, Jack started apologizing, and Chris said, "I'm only kidding, Jack. I think it's a great idea. Let's do it."

So we physically moved that Saturn here for about what it cost us to maintain each year. About \$60,000 is what we spent to relocate it here. As I said, one stage came from Michoud. Some came from Mississippi Test, and then the SLA [phonetic] and the command service module came from Rockwell out in California.

We didn't have any place to put it. So we brought it in the back gate. We barged it in, stopped. We had to remove the back gate and the guard shack because we couldn't get it through. We used a prime mover to pull it on its little wheels, and it's still sitting on its transporter. We pulled it in the back gate, moved it down to the parking lot, and parked it on the parking lot, and then left it there until it was finally moved to its current location.

So we had this big Saturn on display, and, like I say, more people are coming out, and we've got parking problems. So that's when Gerry asked us to do this study on Space Center Houston. Then we could show off the Saturn, and we could show off everything over at Space Center Houston.

So we looked at ways to do it. We did a little study. I had my in-house contractor, Service Technology Corporation, at the time did a study on the best approach. We looked at having the feds to fund it. No way, José. We looked at having the state to do it. The state was in pretty bad troubles at the time, in the mid-eighties. So about the only way we could do it was to set up a nonprofit foundation, go to the marketplace, sell bonds, and pay for it, like business does things.

So we did. We brought in the experts in the field, the Price Waterhouses and the different design people, to help us with the project. We organized a foundation, the Manned Space Flight Education Foundation. William [R.] Kelly, one of the former directors here, was the chairman, and we had NASA and outside directors on that foundation. Hal Stall was the president of the foundation. I was the vice president and corporate secretary. Chris Kraft was a voting member. We had other voting members, and these members changed over the years.

We set up the nonprofit foundation with the help of people who do this sort of thing in a financial environment. We went out and sold 68.4 million dollars' worth of bonds, based on

survey and studies and feasibility studies that had been done, saying, yes, you can support this sort of bond issue with a million people year. Harrison Price [phonetic] did a demand study that said we should have about a million-seven attend the Center, and that would more than pay for the cost.

Then we got about 5 million in donations, somewhere around 5 million in donations. Then NASA Headquarters gave us some money for brick and mortar, because we felt that since they had helped KSC [Kennedy Space Center, Cape Canaveral, Florida,] establish theirs, they should at least do the same for us. So they agreed to give us some money for brick and mortar, but nothing for operations.

So we did that. We went out and sold the bond issue. I think it was about a thirty-year bond issue at 9-3/8 percent, something like that, pretty high at that time, and Space Center Houston then came into being a real project, with the money in the bank.

We chose Disney to be our designer, and for several reasons. The Apollo 1 accident had occurred by now, and there was the Challenge Center, and they were looking for financial support from the public. We felt that the financial support probably wasn't there in the form of donations, although the community donated quite well. So we felt that the bond issue was necessary.

So armed with the bond issue, we went to Disney and we said, "Can you design and build this thing?"

And they said, "Well, yes, let's do it in stages." As they put it, "You can buy us by the yard. First, we'll do the feasibility conceptual work, and then we'll have it built. You guys manage it, and we'll have it built. Then if we think it's viable, we'll then operate it for you." So that's what we did.

We signed a contract with Disney, Walt Disney Imagineering, WDI. Bob Rogers, who was a former employee of Disney for a number of years, was then the key guy for Disney, and he drew on current Disney people as well as former Disney people and put together a team to design the concept that's Space Center Houston.

We met with them. It was interesting. Last night I was putting together some of this stuff, and I found an old tape where Sig [Sigurd A.] Sjoberg and Chris Kraft and myself and others got together across the street at one of the little private rooms at the hotel and just had a get-together session and talked about the program, because we had to teach Bob Rogers about space and bring him up to speed on the culture of the Johnson Space Center and what was important to us and what our goals were, before he could put that into the design for Space Center Houston.

The Space Center Houston was also to act as an official Visitor Information Center for NASA, even though they're separate and apart. No federal money goes to Space Center Houston, and it would be the official Visitor's Center, but at the same time it would be an autonomous organization. It would pay its own way and wouldn't use federal funds, and they would pay their own pay with admission charges. So that's the way it came into being.

The foundation was established. It provided oversight with all working members on it. Charlie [Charles F.] Bolden [Jr.], for example, was one of the board members, and he was almost personally responsible for the oversight of building the full-scale mockup of the Shuttle. It's over in Space Center Houston today. He'd go out to the plant and make sure the switches were configured in the right—so these were working people. They weren't people that we put their names on the left-hand side of the letterhead, but they came to meetings and they participated and they committed their staff and their resources to make Space Center Houston happen.

WRIGHT: How much specific involvement did you have with the exhibits? Did you help move those artifacts and state which ones that you felt needed to be in there?

BIGGS: Yes, we did. That's a sort of a two-prong story. One is, we felt that we really owed Bob Rogers a free hand in designing this thing. We can't say, "Okay, Mr. Rogers, design this facility for us, but we want this here and this here." So we allowed him to do that with the creative people that he had at his disposal.

The one thing that we really disagreed on was the artifacts he wanted to hang in the ceiling in the cafeteria. We disagreed with that, because past history had shown us that people came out here to see John Glenn's spacecraft and they came out here to see real Moon rocks. So artifacts were real important to them.

So we had a firm—the name escapes me at the moment—to actually do a little side study, to make sure that we were right in our thinking, and he agreed with us wholeheartedly. He said it would be a shame to not give these artifacts the attention that they deserve. Typically this is the way Disney uses artifacts. If you go to the Pavilion on the Seas down at Disney in Florida, they'll have an undersea diver hanging from the ceiling in the gift shop. So that was typically the Disney way to do it. But he agreed with us.

So Hal sort of gave me the responsibility, again, of developing the artifact area and at least giving Disney some pretty firm guidance on that, which I did, using our very capable in-house contractor staff to help with the design work.

The one area that Hal wanted me to handle personally, actually two areas, one was the tram tour, because we thought that was pretty important, to be able to bring the people onto the

Johnson Space Center. See, the fact that people we knew would confuse Space Center Houston with the NASA [Lyndon B. Johnson] Space Center, that could work in our favor, because we wanted them to feel like they were at NASA.

Legally they were separate entities. That twenty-three acres of land was under a license agreement for the foundation to use. But we wanted them to feel like they were at NASA. Well, the way to really make them feel like it is [NASA is] to bring them on site, put them on a tram, take them around, show them where the astronauts trained, take them into those buildings.

So he asked me then to design the tram tour. One of the architectural people here in the Architectural Branch worked with me. I'll get his name for the record [Donald H. Holick Jr.]. It escapes me right now. He and I then put together a plan to where a tram, because the tram by then had been selected, the tram would go from building to building. We worked on the architectural entrances and what did we have to do to change the buildings and that sort of thing.

So that was really taken out of Disney's hands. Disney gave us some guidelines. So we designed the tram tour, and we put that into motion, all of it to be paid for by the Center. Anything that was on the Johnson Space Center, the Center would pay for it. Once we crossed that line between the two properties, then the foundation would pay for it.

Then the other thing that Hal asked me to handle personally was the display of the Skylab. This big Skylab actually belonged to the Smithsonian. Remember in 1968 we said that we would give everything to the Smithsonian. But we really didn't want to give them the Skylab. So what we had to do was to put the Skylab into position before the building was built. So Hal said, "Why don't you figure out how to do that."

And he said, "I also want the people to walk along on the floor and walk right into the Skylab. I don't want them to have to climb up."

So, again, I went to our very capable in-house engineering people here. I went to the program people, and they didn't have time because they were trying to send men to the Moon.

So I went to the folks who deal with building regular buildings here on Earth, and they assigned me a guy about my age and a young lady about twenty-one, right out of school, and the two of them literally took that problem and resolved it by putting a well down into the floor. We built special cradles for the Skylab, moved the Skylab into position, covered it, because it rained a couple of times. We covered it, and then the building then was physically built around the Skylab.

We informed Smithsonian that their Skylab was in our building, but the building would have to be removed before they could get it out. It really worked out well. I did have my doubts about my boss' desires, but in retrospect, it worked well. You'd walk right through the Skylab and right out the other end, and it's a much more dynamic feeling.

So, those two areas. Everything else was pretty much taken [care] of by the Disney design team.

WRIGHT: Speaking of Hal Stall, how much involved was he with the day-to-day process?

BIGGS: Very much, very much. As a matter of fact, and not [to] be said in a mean way, almost to a fault. He felt so responsible for Space Center Houston because, really, he was the guy that had sold it to the Center director, and he was the president of the foundation. If this thing was successful, that was great. If it wasn't, it was really Hal's fault.

So Hal probably, to a fault, got involved in all the decisions. I think at some later date it was felt that Hal cannot perform his job as Director of Public Affairs and make all the decisions

concerning Space Center Houston. So I think he finally realized that and backed off and delegated more to the Director of Space Center Houston and folks like myself and others. But he was working a double shift, trying to make sure that everything was done right, worrying with things like should we put covers on the sides of the [trams], and what scene will be used in the painting depicting the Earth in the lobby of Space Center Houston. The guy really carried too heavy of a load.

WRIGHT: You also, though, were doing double duty, weren't you? Weren't you still doing your other public affairs work?

BIGGS: Oh, yes. Our regular work, too. Then during missions, of course, I was a great volunteer. The Center needed someone to operate on the console, and so beginning with Apollo 8, I said, "Well, I can do that. I'm a ham radio operator. I know how to use electronics. I'll be happy to be what we call the assistant director," the AD.

So I supported then the commentator. You know, we had one person. Back in the old days when we had [John A.] "Shorty" Powers, we called him "Voice of the Astronauts" or "Voice of Mission Control," whatever his little nickname was, but later they just called it public affairs commentator. Well, the public affairs commentator needed a mechanical person, a person to talk to the media, "Okay, ten seconds, we'll be releasing audio," or, "Ten seconds, we'll get the feed from Moscow." This is on a private channel, and we'd inform the media what to expect. Then the commentator would only talk about the mission, and that's what went out to the world.

So I was his assistant, and I would support him in that task, so I just volunteered to do it. So, during simulations I'd go over and simulate with him and learn the technology and learn the

mission profile. Then during the mission I would work an eight-hour shift typically, ASTP [Apollo-Soyuz Test Project] I worked a twelve-hour shift, and then go back to my job at seven at night or eight at night and then catch up on all the paperwork that was my desk and get away at ten or eleven at night, and then the same thing.

Of course, these are lunar missions and last ten days and then you're back to normal. After ASTP, I finally stopped because my boss at the time, Ben [Bennett W.] James, said, "You can't fly Skylab and work in the branch." So at the end of the ASTP, then I gave up my position as assistant director on the console during missions.

WRIGHT: Was Apollo 8 your first mission in that?

BIGGS: Apollo 8 was the first. So 8, 9, 10, and 11, I was there for the lunar landing. Then Apollo-Soyuz, those five missions.

WRIGHT: Well, if we can, let's talk some about your reactions to being there in the midst of all that was going on. History was being made. Apollo 8 certainly was a historic time because of the first time that we had gone to the Moon.

BIGGS: Yes, Apollo 8 was history, the first time we went around the Moon. As I said, what I saw mostly from Apollo 8 was all the cards and letters we got about reading Genesis. But it was an exciting mission.

WRIGHT: Did you write the answers to those, from you, or was that a formulated answer?

BIGGS: No, we developed on the computer—by now computers are pretty well being used. I used to come at six o'clock and teach myself the computers. We started with the old IBM Displaywriters, very bulky, big eight-inch disc drive. I'd come in at six and read the manuals to teach myself the computer.

So we'd put answers on the computers, and we had them by paragraphs for the personalized answers. Then we started developing what's commonly used now is just the fact sheet. Again, we responded to the demands of the public. We weren't so smart that we could anticipate, and we didn't really have the luxury of having the time or the resources to anticipate a lot, but we were good at responding, and we had a real good NASA staff and an excellent contractor staff.

So we'd get a letter about something, spacesuits, so we developed a fact sheet on spacesuits, get it printed, put it on the shelf. How do they go to the bathroom in space? We developed one on that, put it on the shelf. So, many of these answers could be answered then with one or more fact sheets. But many of them were tailored, were personally tailored, and we used the paragraphs, or the supervisor of the library would physically write a detailed answer to that question. We, NASA and contractor, did an excellent job responding to the mail.

Most of the Apollo 8 mail then was taken over by the Astronaut Office. Since it reflected directly on the astronaut, they felt the responsibility that they should be answering that. So they did. They took most of that off of us. But we did get a lot of sideline mail as a result of that.

And what else did you ask?

WRIGHT: We were talking also the missions that you were serving as the assistant director for the commentator. Just being part of that actual happening, you were right there in the midst of it.

BIGGS: Oh, yes. Yes, and I'm sure that I was probably an exception, but, you know, at the time I really didn't realize that. That [it] was so historical. It was interesting, it was fun, and I really loved doing it, and when I would finish a mission, I'd take my books and notebook and throw it away, because I knew when the next mission came around, I'd have another one. I really, to be very honest, didn't realize how historical all this would be some day. I knew it was important, but I didn't really know how important it was. Then, remember, I had this other job. So I would go back to my other job.

Well, let's use an example on Apollo 11. I got a call from—[someone in Dr.] Charles [A. Berry's office] ... and he said, "Chuck, we need a back quarantine facility for the Apollo 11 crew press conference prior to flight."

And I said, "Well, first, what is a back quarantine facility?"

He said, "Well, these astronauts are going to be up on stage, and we're going to have dirty old newsman out there coughing, and kids and everything, and we don't want them to get some sort of cold or germ or something that they're going to take into space with them."

I said, "I'm not a doctor. I don't know the requirements."

He said, "Oh, we can tell you that. It's 0.5 microns per square inch, and we need 25 cmf of air movement," and so forth and so on. So they described the project physically over the phone to me. And he said, "Can you design us something that goes up on the stage at the auditorium so when they sit in front of this thing they won't get any kind of germs or anything?"

So I said, "I guess so." So I researched around a little bit, no medical training whatsoever, and I found a company out in Los Angeles, [California] called Farr Clean Wall, and they had a filtration system that they built. They said, "Sure, we have those. They come in two-foot by ten-foot cubicles, and if you want twenty feet, you're going to need ten of these things, and they weigh so much." They said, "When do you need them?"

I said, "Oh, I need them day after tomorrow."

They said, "No problem. We can get them on a 747 out of Los Angeles, fly them into Houston, and have them delivered to you."

I said, "Great. How much are they?"

He said, "They're four-grand a piece."

I said, "Boy, that's not too bad, 40,000. Okay, let's do it."

So they shipped them. I got with the tech services people. See, my whole career has been not so skilled myself, but being able to find the skilled people and bring them together as a team and get them to work together. So I worked with Jack [John W.] Kiker and his people over in tech services, and we got the team together, and when these things came in, they decided how to build them. They put clear plastic walls up on either side to provide a pathway for the air.

The press conference was held. It was held on time, and the medical people felt confident that the nasty old newsmen didn't give the astronauts any kind of germs.

A couple of days later, I got a call from this gentleman out in Los Angeles and he said, "Chuck."

"Yeah?"

He said, "How are we going to get paid?"

Now, I had done all this, absolutely no paperwork whatsoever, because it was important to do. In those days I think NASA did more of that. You know, we got the job done and figured out how to justify it later, and I say this in a good way.

So I called my good friend over in the contracts area, Mr. [William A.] Cooke. I said, “Mr. Cooke, how in the world are we going to do this?”

He said, “You shouldn’t have done it, but you had to do it,” and so he backdated a purchase order, took care of it, and everyone was happy. But I thought about that years later, and we could have never done something like that in the nineties. But, you know, we’re going to the Moon. We’re doing things that man’s never done before, and people were willing to really go out on a limb for us, and here’s a company that shipped forty or fifty thousand dollars’ worth of hardware, and they didn’t as much as have a written purchase request. So that was before the mission itself, and that was my first recollection really of Apollo 11.

Then during the mission it was my shift, eight hours, try to get my work at the office, get a little sleep, and then before you knew it, I saw these guys climbing down the ladder on the lunar surface. We got out our little flags and we all waved them, and Kraft lit up that stinky cigar of his. In those days, everybody smoked cigars in the control center, which they stopped later.

Then, all of a sudden, probably a day or so later, it really started dawning on at least me what had occurred and that we really had been a part of history. But it took two or three days later for it to really sink in.

WRIGHT: Did you think about some of those earlier drawings that you have done about what it was going to look like when they landed on the Moon?

BIGGS: Yes, but, really, I lived for the day, because I didn't have much time to reflect back, because each day was a new day. As I said before, it was twenty-seven years of something different every day.

WRIGHT: How much of an impact did the lunar landing have on your office afterwards? Did you have more media now starting to come out to the Center?

BIGGS: Yes, what we did—and that's a good point, because I hadn't even thought about it when I'd been rolling this interview around in my mind—the auditorium, the one I was talking about, where the public came, was emptied for Apollo 11. We moved everything out of it. We rented a tent, a big circus tent, and put it by the side of the auditorium, and moved all of our artifacts and exhibits into the circus tent, and we converted the auditorium into a press center. So all of these newspeople had their assigned tables, and they were there with their broadcasts, and we had, of course, a lot of foreign press there.

That became a massive news center. Of course, the interest was just wild from around the world. Newspapers came in from around the world with the headlines, "Man Lands on the Moon." Probably the only time we got that much press was with Apollo 13, when man failed to land on the Moon but were successful in getting them back to Earth safely.

But one thing that you must remember about my job, my office did everything except media. So while we supported the media to a great degree and then during missions we worked closely with them, the media was one-half of the building, and then our operation was the other half.

But obviously being in the same building, we could see that the interest was just phenomenal, and the interest not only there, but one of my jobs was to go out to the homes of the astronauts. Then, again, I'd volunteer. They said, "We need someone to go to Gene [Eugene A.] Cernan's home up in Belleville, Illinois, and stay with his parents," wonderful people, "because they're real nice people, and they may be taken advantage of by the media."

So during Gene's Gemini flight, I flew up to Belleville, Illinois, and stayed with his folks. We'd come out and talk to the media every morning. Well, unlike some astronauts' family, they made them coffee and cakes and set up tables out on the lawn. [Laughter] It was sort of a picnic, because, of course, they were proud of Gene, proud of what he had and was going to accomplish.

Then I did the same thing with the next Gemini flight. Gemini X, I was with John [W.] Young's family down in Orlando, Florida, and I stayed with his stepmother and his dad, physically in their home, and did the same thing.

What surprised me the morning of Gene's launch, we were all watching the television, and his dad came in, and he was all dressed up. His stepmother said, "Well, where are you going?"

He said, "I'm going to work, lady. I've got a citrus plant to run." [Laughter] He got in his car and went to work.

But those kinds of assignments, my whole career was an assignment-based career. Between assignments were dull. The assignments, that's where the fun was, you know, the special tasks, whether it was a World's Fair or Paris [France] Air Show or a mission or working in the control center or helping with educational programs or designing the Apollo 11 van.

Speaking of Apollo, after Apollo, Headquarters decided we should take the Apollo spacecraft around to every state capital. So a Headquarters person, of course, was the lead in designing the tour, but they didn't have the capability to design and build such a vehicle that would move an Apollo around. So they asked my office to do that, and I relied on Colin Kennedy, who was an excellent designer in the office, and a couple of our contract people.

We put together a team and designed the Apollo 11 van, for lack of a more sophisticated name, which housed the Apollo 11 spacecraft, the whole Apollo, and a lunar rock from Apollo 11. The sides folded down, and we could drive this thing then to the state capitols, open it up, and it would stay there for a few days, and the public would be invited to get through and look at it.

You know, NASA was criticized over the years for not doing more, but we did a lot, and as public affairs. Again, admittedly we responded to the demands, but once we realized the demand was there, I think the agency did a darn good job in providing information and experiences to the public.

We took that van to fifty states, every state, and ended up going to Hawaii, flew it to Hawaii, and that was the last stop. It took quite a while.

WRIGHT: Did you travel with it at all?

BIGGS: No, I didn't. We hired a good friend of mine [Elwood Johnson], as a matter of fact, to stay with it. Again, in NASA style, we were always on a pretty thin pocketbook. So he would put on his workclothes and set it up, and then he would take his workclothes off and put on his suit and then be there with the inaugural ribbon-cutting.

I think it started in Sacramento [California], and I think at the time our former president was the governor, and Governor [Ronald] Reagan cut the ribbon, and this friend of mine welcomed the press. Then when the opening was over, he'd put his jeans back on and tore it down and then jumped on a plane and went forward and was there when it rolled up. He did that for thirty consecutive stops until he just almost broke down.

We had to take him off the road and put someone else on it for the balance of it. But that was literally a one-man show. But we moved that command module and that Moon rock to fifty states.

WRIGHT: Wow. What about vendors that wanted to have their products associated with the space program? Did you handle them, like Tang?

BIGGS: No, that was a media thing, and there was a process at the time that the media office would approve all vendor ads. The ones that come to mind are Tang, Fisher pen, Omega watch, but they certainly weren't restricted. Many vendors would find out that their products were being used, and then would just take advantage of that publicity in their marketing, but that had to be approved by the media office as well. But I had nothing directly to do with that.

WRIGHT: Apollo-Soyuz was a bit of a different program for everybody.

BIGGS: It was. For me, Apollo-Soyuz really started in 1973. We were looking for a good theme for the Paris Air Show. Not me, but someone came up with the idea of an international effort between the French, the Russians, and the Americans, and we would do a pavilion on Apollo-

Soyuz. Rather than going into the U.S. pavilion—that's normally where we displayed—this time we would build a pavilion of our own. Sounded like a great idea, and I volunteered to do it.

So my first meeting was with the Russians. I went over with Working Group 3, with Don [Donald C.] Wade, who was structure mechanics, head of Working Group 3. I went over for a planning meeting to Russia with him, and I sat down with their counterparts, a guy by the name of Igor Ponchitellin [phonetic], and Igor was my counterpart in the Soviet Union, working for their space program.

We came up with a plan where we would dock an Apollo and a Soyuz together, and then with some peripheral exhibits and put it in a building of its own, fly the three flags of France, the U.S., and Russia, Soviet Union, out front, and that would be our entry to the 1973 Paris Air Show. That was a fun experience.

We basically designed the Apollo-Soyuz official emblem at that time. It says, "Apollo-Soyuz," and in the center we had "1975," but some of our more realistic technical people said, "Well, if we don't fly in 1975—." So we put the little Apollo-Soyuz dock in the center and changed the design a little bit.

As a matter of fact, I'll give you three a prized possession. Here from the Soviet Union, dated 1972, this was the emblem that we designed, and I'm serious, there are not many of these. [Biggs brings out emblems.] There's one each, and it was the official pin for the Apollo-Soyuz exhibit at the Paris Air Show, and you'll notice, it has the 1975 in the center. Like I say, when our program people saw that, they said, "Well, let's be safe." So the official emblem for the Apollo-Soyuz ultimately was the docked Apollo-Soyuz in the center of the pin. The basic concept was a Russian concept. I thought that was one of their better designs.

We did that. We worked with the Russians. Rockwell International, under contract to NASA, refurbished the command and service module for our use. The Russians then provided, out of spare parts, a Soyuz that they would dock on the other end. Sort of like the Skylab episode, we had to put the vehicle into position before we could put the building around it, and it turned out to be a dome. We used a dome for that 1975 pavilion.

So we found out by working with the people who built the dome—Chartersphere was the name of the company—that they could put part of it around. We could put the vehicles in the center. They could take a crane then, and lift the top of the building on, and that's the first time it had ever been done, and it actually worked.

I was there for a few months as the co-director of the Apollo-Soyuz pavilion. My counterpart, the Russian director, Igor Ponchitellin, was there the same length of time. The two of us, again, we just brought the talents together to get the pavilion built, Rockwell providing the expertise to build the Apollo. Their construction people built the Soyuz. It all came together.

We brought in volunteers both from the Russian side and from the American side to be the translators and the tour guides. Leo Shabin [phonetic] and Luviet [phonetic], Al Luviet, were two well-paid NASA engineers but volunteered to go to Paris, [France]. They can speak French, and so they went, and they were our tour guides. It was a very, very successful program.

At that time I met for the first time the Russian astronauts, [Valeriy Nikolayevich Kubasov and Alexei Arkhipovich Leonov], and, of course, Vance [D.] Brand was there, and Tom [Thomas P.] Stafford. They came to the air show and participated in the air show and were there for the press events.

Then later, two years later, I was on the console during the Apollo-Soyuz mission and worked the midnight-to-noon shift and did basically what I used to do on the Apollo missions,

[was] release the audio and the video. It was, of course, all pre-arranged with the Soviet Union. We had a book, had a game plan, that we went by in releasing of the video. A very, very successful flight, and, as you well know, the first international flight for us.

I think the agency got—I can't speak for the administration, but I think we got as much out of it as they did. They probably learned some technical insight from us, but at least we got to see facilities that heretofore we'd never been able to see. We saw Baikonur, their own site, Star City, where they train their astronauts. We got our people together.

I remember the first meeting of Working Group 3, the Russians were all on one side, and the Americans were all on the other side, and by the time the program was well under way, they were all leaning over to each other. These people now had become a team, and it wasn't the U.S. and the Soviets, but it was the Apollo-Soyuz Working Group.

WRIGHT: Did you have much interaction with the flight controllers?

BIGGS: Not really. My console duties were well defined. As I said, we had a book. We had a mission plan that we followed on everything from releasing video to physically what image would be on the mission control [screens]. When the Russians took a video from our control center, they wanted to know what would actually be up on the screen at the time. That was all scripted out well in advance. Of course, our public affairs people and their public affairs people met for over a year developing a joint public affairs plan on how to release video and how all that would work. But my role was pretty well defined right to that seat in the Mission Control Center.

WRIGHT: Was it somewhat interesting for you to have had spent so much time putting the actual pieces together for a ground simulation and then yet getting to be part of it as the actual thing happened? Were there some similarities in any of the things that have happened?

BIGGS: Well, no, but going along with what you just said, the pre-launch was with the Paris Air Show, and then, of course, the mission itself, but there was a post-mission involvement as well, and I really didn't know that there was a requirement, but I got a call from Headquarters saying, "We're putting together the Apollo-Soyuz post-flight tour, and we need someone to go with them on this tour and to help with presentations." This is when my art skill came in handy. "Be able to do inscriptions of photography and that sort of thing, and we need someone to help us now to develop the hardware that would be presented."

Now, prior to that, I had been asked to help NASA develop what was called the symbolic activities items. It consisted of flags of each nation that would be carried, two halves of a plaque that would mount, would go together in space, and the Russians would carry a half, and we would carry a half, [and two halves of a coin joined in space]. Headquarters asked me to [help] develop these.

Here we are in the clean room inspecting them prior to being packaged. So all this material was packaged, and then we put it into a flight bag, and it was all carried onboard both the Russian spacecraft and the American spacecraft. So after the mission, much of this was presented as we made this tour, this tour of six cities in the U.S. and six cities in the Soviet Union. So I said, you know, old Chuck volunteers. I said, "Sure, I'd love to do that. Something to tell my grandkids about." So I volunteered to be the gifts and presentations officer. You

know, we had to have nice zippy titles. So I was the gifts and presentations officers for that post-flight trip.

It's interesting. Let me just read to you the schedule. Here was our schedule. In the U.S., we went to Washington, Chicago, [Illinois], Omaha, [Nebraska,] Salt Lake City, [Utah,] San Francisco, [California,] Lake Tahoe, Los Angeles, [California,] Atlanta, [Georgia,] Nashville, [Tennessee,] and New York, [New York]. Now, can you imagine traveling with the Apollo-Soyuz crew, with the attention that these folks got, all of those different locations?

Then when we flew to the Soviet Union, we flew in Air Force Two and flew to Russia, and did basically the same kind of tour in the Soviet Union. Went to Leningrad, Volgograd, Novosibirsk, [Kiev, and] Moscow. We went to an equal—everything had to be equal. We went to an equal number of cities in the Soviet Union and the same sort of activities with people lined up along the streets, just reaching out, just trying to have a chance to touch the cosmonauts and the astronauts.

See, that's the thing about space. Space, even when the interest in the U.S. after the lunar landing started to wane a little bit, it really didn't drop off that much in the foreign countries. So the astronauts were always in demand. They were always heroes in foreign countries.

WRIGHT: How long were you gone on this tour?

BIGGS: Oh, it took a long time. Oh, just glancing at this schedule, there's October the 24<sup>th</sup> in there. When did we leave? We left the 14<sup>th</sup>, 15<sup>th</sup>. It looks to be about ten days, ten or twelve days, just on the U.S. leg. Then, like I say, we did sort of the same thing in the Soviet Union.

So all along the way my responsibility was to make sure that the right people got the right presentations, it was appropriate for their particular level, especially in the Soviet Union, and that it didn't embarrass anyone, and that we recognized all the right people. So many of those things I had to do in real time. Gene Marionetti or someone from Headquarters would come over and say, "Okay, here we've got the supreme head of the Soviet," whatever, "and we need a photo for him."

So I would get out my little bag of tricks and inscribe a photo to the head of the supreme whatever, and then they would make the presentation, and this happened throughout the entire tour. They in turn were also giving presentations to take back with them. So I would collect those, make sure they were packaged properly, make sure I had the information on who they were from, so we could make a caption when we got back to the U.S. and put them on display in the auditorium.

WRIGHT: Quite a memory.

BIGGS: Yes, it really was. I took a few photos along the way, but unfortunately, with all my interest in photography, I didn't have that much time because I was constantly carrying bags and helping people. But I got a little photography back.

WRIGHT: That's good. Well, I'd like to talk some more about that. We're going to take a break for just a minute and change out the tapes, and then we'll pick up where we left off.

WRIGHT: Speaking of those, you didn't keep a formal journal, but tell us about the little notebooks that you kept.

BIGGS: Anytime I traveled, just my memory, and even when I was younger than I am now, was not all that great. I'd take a little notebook that I can stick in my back pocket and make notes. This happened to the one that I used on the Apollo-Soyuz post-flight trip. [Biggs shows notebook.] For example, here are the items received: 9/21/75, received books and medals for each crewman; received the mayor's golden medallion of the city, each crewman, blue and white ribbon, etc., etc. I could make notes, and when I got back to Houston, then I could do captions and put them on display and that sort of thing, just to keep records.

Then I also inscribed the individual presentations, and I could keep records of the inscriptions here, who I inscribed them to: William Weir [phonetic], large photo, crew, so forth. I just picked up a couple. I had one for every major trip. Even after I left NASA, I continued to do this. This was the Paris Air Show, and you can always tell my temperament. These things were like my wife. I'd get in at night, and I'd talk to my little book, because I didn't have a wife to tell and explain how many problems we'd had that day and what went right and what went wrong.

Later, I've gone back through these things and read them, and they're quite interesting, quite interesting, some not repeatable over the air. But these were the records that I kept on each individual trip.

WRIGHT: How much time did it take, and what was your process to prepare for one of these trips? Maybe you can take one of the trips that you did and you can give us an example.

BIGGS: The air shows, we knew that they were always in June, July timeframe. So I would normally start asking this at Headquarters. They were the odd years, '71, '73, '75, so forth. I'd always start pressing Headquarters, "Are we going this year?" Because Headquarters has typically—and probably still do—has typically looked to the Johnson Space Center to manage these kinds of activities. Expo '67 was the first one I did. Expo '70. Then most of the Paris Air Shows. So they would look to JSC to do that. So you try to anticipate it and try to come up with a theme. In some cases, we didn't have time to plan them.

For example, in the Peaceful Uses of Outer Space Conference, the Unispace in '82, less than a week before the show opened, the Administrator at the time, I think, was [Robert A.] Frosch, said, "Who do we have over there for the agency?" They said, "Oh, we hadn't thought about that. We've got the exhibit designed and built, and it's being installed now, but we really hadn't thought of who would be there for the show." So my Center director got a phone call, asked if I would get on a plane and go to the Vienna, [Austria,] and spend ten days in Vienna, which I did. So sometimes you had very little advance notice at all.

Same thing happened at the first landing of the Shuttle at White Sands [Missile Range, New Mexico], STS-[3], I believe it was. Two days before the Shuttle landed, two or three days, [White Sands Missile Range's Major] General [Alan A.] Nord realized he didn't have a visitor program of any kind, a special guest program, and he knew that people liked to see Shuttles land. So, again, my Center director asked my boss if they could put me on an airplane and send me to White Sands and meet with General Nord and come up with a plan for that, which they did.

When I arrived, they met me at the airport and a helicopter with General Nord, and we flew around White Sands and determined where we would place the various components of this

activity, and it worked quite well. As a matter of fact, I received one of my few NASA awards for my performance on that, because it was [on] very little notice. I had to literally grab a bag, get on an airplane, and go.

So some had a lot of time to plan. Some, we had very little planning time at all.

WRIGHT: Would you share with the some of the ones that were most memorable, some of the international exhibits that you set up? You mention, of course, the ASTP. Were there others that you remember quite vividly?

BIGGS: The air show ASTP certainly will stay with me forever. That was quite an accomplishment, to get everybody to work together. We were on foreign soil, and we had an American company bringing in a building, and we were working with the Russians.

I'll give you a for-example of how complex it was. That was to be a shared event, cost-shared. The Russians would pay half. We would pay half. So I asked my counterpart, Igor Ponchitellin, I said, "Igor, how should I keep my documentation to bill you?"

He said, "Oh, at the end of the show, on NASA letterhead, write me a bill."

I said, "Oh, okay. I'll do that." So not really believing Igor, all along the way I kept proper invoices and maintained a pretty good ledger on expenses. So the show ended, and I said, "Igor, we need to settle the books." We had established a bank account in Paris in one of the local banks and established it in francs. I said, "Here's your bill. This is how much you owe."

He said, "Okay, thanks." It was four hundred and something thousand dollars, whatever. Off he went to his embassy, and a few hours later he came back white as a sheet and said, "I

need invoices. I need audit trails.” Well, fortunately I had that for him. So it was the two cultures working together.

When he left the show, he said, “Would you mind going with me to the train station?” He was afraid that his life might be in danger, and he said, “If I survive the purge, then everything will be okay.” I followed him to the train station. Two Russians followed us. Once he was on the train and gone, I was comfortable, and I went back to my duties at Paris.

So it was different. It was interesting. The planning of it was very interesting, because it was two different cultures working together, one, which had been a closed culture, and, of course, our culture, which had always been open, especially to the media. But they learned very quickly. For example, their control center had never been televised before, and by the time Apollo-Soyuz flew, they had cameras, studio cameras, in their control center. So they were quick students. They really learned how to do it.

WRIGHT: Tell us about when you went to Japan. You set exhibits up in there as well.

BIGGS: Expo '70. Expo '70 was probably the first time that was the World's Fair. In Expo '70 we looked at a few photographs before. I worked with USIA. NASA rarely did anything on its own. That one Paris Air Show might have been an example, Apollo-Soyuz. We either worked through Commerce Department or we worked through the United States Information Agency.

Expo '70, we were working through the United States Information Agency. They asked if we would provide exhibits to fill a certain portion of that show that year, Expo '70. Let me see what I did with it. Well, I can't lay my hands on it. But what we did is we emphasized—I think we had the Apollo 8 there.

So we had the hanging Apollo. We had the hanging Gemini, the real flight hardware. This was the first time that a lunar module had been displayed, a real lunar module. We worked with Grumman [Aerospace Corporation] out of Bethpage, New York, on that. Grumman took an LM [Lunar Module]-2 descent, LTA [Lunar Module Test Article]-8 ascent stage, mounted them together, and that's what we displayed there. We had some of the Grumman people come over to help with the installation, and then we had the Japanese to help with just labor.

Well, I was impressed that the Grumman people installed one leg, the Japanese stood there very patiently watching, and then they scurried about, following the same techniques that the Grumman people followed, and started putting on the other legs, and within a short period had the lunar module assembled. So they really caught on fast.

When we were hanging the Gemini—this was the first time that it'd ever been suspended—the nose kept wanting to rise up. So we decided the nose is open and there's a space where the parachute was, so we said, "We can put some lead weight and ballast it out." So we didn't know how much weight we needed. So I'm thinking, "How can we figure out what we need?" when one of the Japanese crew chief hooked a rope on the end of it, called over one of the little Japanese workers. He jumped on and held it. No, not enough. He called over another. He jumped on, and after about the third try, they found a Japanese that leveled out the Gemini, asked him how he weighed, and then sent out for that number of kilos of lead to balance out the Gemini. So those kind of stories are quite interesting.

WRIGHT: How did you collect all of the different artifacts and have them arrive when you needed? Did you have them sent to a central location and then shipped to Japan, or could you tell us about some of the logistics of getting your exhibits there?

BIGGS: Fortunately, that was handled by our shipping people. We would provide them with an address, where the stuff had to be shipped. In each case, it was a little bit different, but typically it shipped right to the facility, and security was on hand. Even during the construction phase of things like World's Fairs and Paris Air Shows, we had twenty-four-hour security on hand. We've had very, very little vandalism or theft in any of these shows, Expo '70, the World's Fairs, Paris Air Shows.

You ask about some of the more memorable. In 1981, '81, we had a meeting at Marshall Space Flight Center, [Huntsville, Alabama,] and Headquarters want to talk about what we might do at the next Paris Air Show that might really be outstanding. So I talked to our technical people, and Joe [Joseph S.] Algranti said, "Let's take the Orbiter. Let's take the *Enterprise*."

I said, "Joe, can you fly the *Enterprise* to Paris?"

And he said, "I can fly the *Enterprise* anywhere in the world." He referred to it as a lightweight Orbiter.

So I said, "Well, sure, let's pitch that." So I put together a presentation with Joe's help, and I went to Marshall, and we proposed that we take the Orbiter to the Paris Air Show and put it on display in 1983. Most people there were quite surprised that the agency was willing to do that. Again, this flies in the face of people saying, "NASA Public Affairs should do more to publicize its image." NASA Public Affairs did a lot, and as we look at some of these programs and activities, it's the tip of the iceberg on what NASA has done over the years.

So we did. The transportation people—and, again, all I did was to get the right players together. I went to transportation and got Horace [L.] Bell, and Horace Bell said, "Sure, we can figure out. We'll bring in cranes, and we'll lift this thing on top of the 747." Joe Algranti's

people, they figured out how to fly this thing to Paris without making a stop midway. On the other end, they figured out how to get it off with cranes. They had to build special cranes to get it off, or bring in special cranes. So we did.

We had a Paris Air Show. We took the Orbiter. It flew down the Champs Elysées on the back of the 747 and landed at Paris, and it was a very successful event.

So right after that, in 1984, came the World's Fair in New Orleans, [Louisiana]. We'd gone to Paris. We could sure get it to New Orleans, and Paris was almost a dry run for New Orleans. So the New Orleans World's Fair in '84, we did the same thing. We built a pavilion. We told the NASA story. The JSC contractor sound people put together a [special video with an original] musical score. We built the exhibits, installed the exhibits, and right next to it, we parked the *Enterprise* for everyone to see. They could almost go up to it and kick the tires. Again, we relied on these same experts at JSC. Horace Bell figured out how we could put it on a barge and float it out the Intracoastal Canal and build cranes and get it off the barge, just a lot of experts that it would take to make one of these operations, especially when you're using flight hardware.

You build exhibits. You build them small enough. You break them down, and you ship them. But when you move an Orbiter somewhere or a lunar module, a full-scale piece of hardware, it takes a lot of skill and expertise to make it work. At the end it's quite successful. Now, unfortunately the fair wasn't that successful, but the NASA exhibit certainly was.

WRIGHT: How did the dawn of the Shuttle era affect your office, your procedures? Everything that had been put in place for the Gemini-Apollo days, but now we're switching to a different

type of spacecraft and a different type of era with the Shuttle. How did this affect your folks? How did it affect your exhibits?

BIGGS: Well, we tried to stay ahead. That's a good question, exhibitwise. Typically we would fly a mission, and then we would show the results of that mission in the auditorium. One day Kraft was walking through, and we had Mercury, Gemini, and Apollo, and he said, "Really, we need to get all this stuff out and start talking about the new program, Shuttle." And we did.

The down side was, we didn't have hardware for Shuttle. We had hardware from Mercury, Gemini, Apollo, and we could show hardware, and we rely a lot on artifacts. So we had to start building more multimedia exhibits, and we developed with NASA Headquarters, really ramrodding it, developed this series of exhibits called the compatibles, where we tell various stories using sort of a basic theme shell, but using different audiovisuals.

We started traveling these around the country. So from an exhibit standpoint, we started relying more and more on audiovisuals and less and less on actual artifacts, because the artifacts didn't exist. We re-flew the Shuttle. So after STS-1, we couldn't put STS-1 in the auditorium because it's going to fly on the next flight, and we relied more and more—and that was maybe a good thing because it forced us to start using more technology in our shows and more multi-screened video walls, as they're referred to, to tell multimedia stories about the program. It also forced us to do a little soul-searching on the future and talk about what's going to happen in the future and why this is going to benefit Joe Six-Pack Taxpayer.

As far as the impact on our office, we did basically the same thing where we worked with the astronauts. We would go out to the launch site, be there with the special guest groups, with the astronauts' families for launch. So that didn't really change all that much. Again, we're a

pretty small staff, had about thirty contractor people, but only had about seven or eight NASA people in our branch. So we were spread really thin during missions.

WRIGHT: During the life of the Shuttle era, and while you were Chief of the Public Service Branch, we had the *Challenger* accident, and media took a different attention or paid different attention to the space agency, and, of course, Johnson Space Center got a lot of that attention when President Reagan came down to do the memorial service. Can you share with us those days, and where were you when you learned about the *Challenger*, and what your days were like after that?

BIGGS: I was sitting in my office watching television when I heard Steve [Stephen A.] Nesbitt say, "It looks like we might have a problem." I've forgotten who it was at the time, but one of the astronauts walked through the office, and I could tell, you know, that he knew we had a problem as well. I wasn't working on console anymore, so I literally saw it from the television in the office.

My boss was a stickler for planning, so he had forced us to really plan meticulously for some sort of problem. We had it in different phases. You know, phase one, we had problem. Phase two, had to ditch the bird without a fatality. Phase three, we had a fatality. Of course, this is the worst-case scenario. We literally, off the shelf, got our plan for action and implemented that plan. I'll have to admit, I probably wouldn't have written it if he hadn't have forced me to, because I had such confidence that we'd never have anything like that to happen, and he had to foresight to know that we'd better be prepared for it, and we were.

The people in the office really did most of the work. We worked with the ninth floor in putting together the mechanics of Reagan's visit. I had people out working with various people from the security divisions, from the White House. I was sort of a point of contact. I stayed in my office, answered the phones. We had two-way radios to all the people.

As a matter of fact, I didn't even see the memorial. I was there in the office making sure that the office was covered. And the people did their job. They followed the procedures. And it was quite an emotional impact. I think so many NASA JSC people, NASA people throughout the agency, almost felt a little responsible, even though they weren't. I think people just had a feeling of responsibility for that. But things were different, sort of like after 9/11. You know, things just weren't the same for a long time.

WRIGHT: What kind of impact did it have on your exhibit schedule? Were there more people interested in seeing the information from the agency, or was there a decline?

BIGGS: Probably no change. You know, Shuttle was flying fairly often. That was 51-L. Shuttle was flying a lot. I didn't take much when I left the agency, but I took that 51-L plan with me, and it's a binder about that thick, and it really addressed everything, what we do with the families, you know, everything.

I think probably in some cases more interest, more people wanted to know about it. Our mail picked up. Of course, the media interest picked up. So many media are just waiting for something to go wrong. When things are all going right, they're not around, but I don't say that in a mean way. That's just their business. That's the way they sell paper and TV time. But it quickly got back to business as normal as far as our products were concerned, public mail and

exhibits and tourists. Tourists continued to come. The Center wasn't closed for any reason. The gates were open, and the tourists continued to come and visit.

WRIGHT: After we returned to flight, or it might have been even before we returned to flight, another area that you were involved in was part of the SAREX [Shuttle Amateur Radio Experiment] program.

BIGGS: SAREX was interesting. As a ham operator, we had our JSC local radio amateur club. Lou [Louis W.] McFadin and myself and others thought it would be neat if we could fly some radio gear on board the spacecraft. So Owen [K.] Garriott, W5LFL, I believe was his call sign, is his call sign, he said, "Sure, I'll be happy to work with you."

So the hardware was developed, virtually at no cost to NASA. He had his license. We worked with other ham organizations, ARRL [American Radio Relay League] and other fraternal organizations for support, and put together a program, which NASA graciously accepted as a bona fide experiment, Shuttle amateur radio experiment, short name SAREX, and it flew for the first time on STS-9 with Owen Garriott.

It was quite successful, and we involved the schools and involved radio ham operators from around the world. That program went on. We included television at a later time. I have photographs here of me sitting at the console with Lou McFadin and others, beaming down video from the spacecraft. As far as I know, the program's still alive and well and operating probably on Space Station.

One thing that the federal government did was, they passed a no-code license, which would allow virtually anyone to get a ham radio license. One of the drawbacks to getting a ham

license was that you had to be able to send and receive code at certain speeds, and so many people just don't have the dexterity to do that. So it kept a lot of people from getting their ham radio license. Well, now there is a no-code license. So you don't have to know code at all. So probably all or most astronauts are ham radio operators now or can be very shortly if they want to be.

WRIGHT: What other type of educational programs were you involved in?

BIGGS: Well, education was in the office, but I really deferred mostly to the educators, Jim [James D.] Poindexter and the other educators, Bob Workman, who were in the office to work with the Department of Education in this state and other states to develop their programs. We had school groups that would come in and visit the Center. They developed curriculum for the different school systems. Lots of tours, special tours for the educational groups. Annual conferences each year, educational conferences. Lots of publications. So many of our publications were directed to young people, fact sheets, just the printed material in the library, directed to young people, so had a big educational component in it.

We developed the *Astronaut Fact Book* primarily out of the demand from schools for information about astronauts and missions. So we said, "What the heck? We'll just develop a book and that answers all those questions, *Astronaut Fact Book*."

WRIGHT: Educating the personnel at JSC, their product was the *Roundup*. Were you instrumental in starting that or being part of that at all?

BIGGS: The *Roundup*? No, I didn't have—I wrote a few articles for it. I was instrumental in getting an art show put together on space art. As I mentioned before, I believe that the art program, NASA art program, came into being, and I thought it would be a great idea to display a lot of this artwork, but we really didn't have a place to do it, so the University of Houston-Clear Lake, [Houston, Texas,] agreed to do it. So we had a special evening event there, a reception, and invited the artists and have their work on display. We had a very nice turnout for that. We got some good press.

So I wrote a few articles for the *Roundup* about those kind of events. As a matter of fact, I received the *Roundup* for years after I retired, and finally I sent them an e-mail and said, "Look. I get it on the web. Save your postage and don't send it to me anymore."

They said, "Great. We'll save 50 cents a month." But it's a good tool. Of course, most centers have their own in-house little house organ, but the *Roundup*'s good. I used to collect them until my file cabinet almost got full.

WRIGHT: You helped to leave a lasting legacy from a space artist for Johnson Space Center when you talked with Bob McCall about doing the mural. Tell us how that happened.

BIGGS: Well, Bob and I had been friends for years. There are a few people that I hold in great esteem, and Bob's one of them. Being, as I mentioned before, an artist myself, somewhat of an artist, Bob was always one of my idols. I thought it would be great if he could do a mural talking about the space program in the auditorium, and that's when the public came there. It was before Space Center Houston, of course. So he said, "Sure, I'll be happy to."

So I talked to Chris Kraft, who was the director at the time, and he said, “Okay, get him to put us together a proposal.” So I wrote some guidelines for it, and [Bob] sent [us] a proposal, and Dr. Kraft looked at it and said, “It’s too much. We can’t afford it.” So he said, “Call Bob and tell him.”

I said, “Okay, Chris.” So I called Bob and said, “Bob, we just can’t afford it.”

He said, “How much can you afford?”

I said, “Well, I don’t know. Let me check.” It seems like his original estimate was about \$130,000, and that was all expenses, you know, relocation, per diem, everything.

So I went back to Chris and said, “Chris, how much can we afford?”

He said, “All we can afford is [\$]50,000, turnkey, everything.”

So I called Bob McCall back again—this is all by phone now—called Bob McCall back and said, “All we can afford is [\$]50,000.”

He said, “Okay.” So for less than half of his original proposal, and it was worth the [\$]130,000 that he first proposed, he took on that task and literally rented a real nice apartment over at Bal Harbor and brought his wife here. We set up scaffolding for him, and had size put on the wall and canvas, and he did a little master sketch for Dr. Kraft to look at, and Chris looked at it and said, “Two things I don’t like.”

And I said, “Oh, really? What’s that?” Bob wasn’t there, just Chris and myself.

And he said, “There are no women and there are no blacks.”

So I went back to Mr. McCall and said, “Here are our two problems.”

And he said, “We can take care of that easy enough.”

So women were added in the control center. At the time we had female control center flight controllers. A black astronaut was added. At that time we had [several] black astronauts.

We took the sketch back to Chris and he approved it with those two changes. So the mural then was completed on the wall.

I'd drop in now and then because that was open to the public at the time. The public would come through and look at the exhibit, and here's Bob McCall up there painting away.

The way he did that, he did a master sketch and then photographed the master sketch on slides, and then he would project those sections of the slides onto the wall. So he would get it very accurate.

So I remember one day I was over there, and this little girl was saying, "Mr. McCall." He's up on the scaffolding. "Mr. McCall."

Finally he recognized she was calling him. He said, "Yes, dear?"

She says, "How does this exhibit work?" [Laughter]

He said, "So I should get a training course on your exhibits." But he was there for several months working on that mural, and I was at a Paris Air Show. This was in June.

I came back from the air show, and he came to the office and said, "Do you have a few minutes?"

I said, "Sure."

He said, "I'd like for you to come over." So I came over, and he said, "Lean on the scaffolding." So I leaned on the scaffolding, and in just a few minutes he painted me in on the left-hand side, next to George [W. S.] Abbey, of the mural, leaning against a console. He said, "You're the guy that made this happen, so I want to make sure that you're in the mural," which I appreciated very much. Great guy.

WRIGHT: He is that. He is that.

You left NASA in 1992. What caused that decision to leave after twenty-seven years?

BIGGS: Oh, I don't know, Becky. Maybe old age. Maybe I was burning out. I just started feeling like NASA was beginning to look for reasons not to do things in the realm of public affairs, rather than trying to figure out how to do them. We never did anything improper or inappropriate or illegal, but we would bend every rule that we could to do something if we thought it was good for the agency, we thought it was good for the image, we thought it informed the public.

That's what the Space Act is.

The Space Act says that we should inform the public on NASA programs and the result thereof, the good and the bad, and that's what we tried to do in public affairs, or at least what my staff tried to do. There was always this sort of invisible wall between media and between public services, because many of the people at the time thought if you could get a article in the newspaper, 100,000 people read that, but how many people go to a county fair? So media must be worth more than public services.

So I sensed that more was being done to say no than effort expended to try to figure out a way to say yes. I think I got just a little disillusioned, and I think part of it was just burnout. That was quite a twenty-seven-year schedule to maintain and a lot of personnel changes and shift in responsibility and that sort of thing.

And I just felt maybe it's a good time. I'd been there thirty years, go on and do something [else]. I had moved into a job, too, that had fewer of these projects to do and more things that weren't so much fun, like performance [evaluations] and problem children in your staff and that sort of thing. So maybe I was ducking some of my responsibilities as a manager

and a supervisor, I don't know, but it just wasn't as much fun anymore. My daddy used to tell me, "When it's not any fun anymore, maybe you shouldn't be doing it." So in very good stead with my boss, I gave them a year notice, I said, "I think I'll be retiring when I turn fifty-five," and I did.

Fourteen days from thirty years, I retired after coming to JSC. I arrived at JSC in March the 18<sup>th</sup>, and I was for grins going to retire on March 18<sup>th</sup>, and the human resources person told me, "Well, you'll lose two weeks' pay."

I said, "Why?"

They said, "Well, Congress passed a law that says you have to retire within three days of the first of the month, or you don't get paid for that time."

And I said, "Well, did they save any money?"

And she said, "No, people just wait."

And I said, "So will I." So I waited until the first of [April] and retired the first of [April] 1992.

Then it was nice that I could say no to jobs that I didn't want to do. I brought this because it's the first job I did after leaving NASA. [Biggs brings out project paperwork.] The phone rang, and this is the Pittsburgh Air and Space Museum proposal, and it was the director of aviation for Allegheny County in Pittsburgh, [Pennsylvania,] and he said, "Hey, we've got a new airport, and we don't want to just tear down the old airport. We want to make a museum out of it, and we hear you're the aerospace museum specialist."

And I said, "Well, that's right." So that was my first nongovernment project to work on, and the phone's just continued to ring. Working with the Japanese, a new space museum in Ikuyu [phonetic], Japan, a new space museum in Nagoya, working with NASA contractors,

Spacehab, Johnson Engineering, Muniz, [Engineering Inc., and] other contractors on space-type educational facilities. I worked with ESA [European Space Agency] in Holland helping them establish a User Information Center for the ISS [International Space Station] program. So now I have the luxury of saying, “No, I’m sorry, that particular project really doesn’t interest me.”

I’ll give you a nice example of one of our friends, Tom Stafford. Tom has a museum in Weatherford, Oklahoma, and I was fortunate enough to locate thirteen mostly full-scale mockups of NASA spacecraft and aircraft that a company in Australia had built for a show that was going to be in Singapore. The organizer absconded with the money, and here this poor guy has all this hardware that he can’t use. So, to make a long story short, he agreed to sell it at a very nice reduction.

Stafford was interested for his museum, but he said, “Gosh, we need someone that will go over there and inspect it and make sure that it’s repaired appropriately.” It’d been two years since the show had folded. He said, “I really can’t afford to send anyone.”

I said, “Buy me an airfare. I’ll go.” So, you know what? It wasn’t the money; it was the challenge of the task. So Tom did. He bought me an airfare to Sydney, Australia, and when I got to Sydney, it was about a hundred miles northeast of Sydney to the plant. I spent five days in this plant and inspected the hardware and made arrangements for the shipment. It was shipped to Weatherford, Oklahoma, and it’s now on display for the thousands of people to see.

So it’s the challenge, what makes it interesting. If it’s a dumb, dull thing, I tell them, “No, thanks. Thanks. I have other things to do.”

WRIGHT: You’ve also spent some time teaching on the college level.

BIGGS: Yes, I like to teach. I mentioned to you this morning that the morning paper had a photograph of one of my former students. Because of my consulting, though, in about 1997, I cut back to just part-time or substitute teaching, because it was really impacting my travel. I was having to turn down projects that I really wanted to do. But, still, to this day, I substitute teach, more, it seems, at San Jacinto College [Pasadena, Texas] now.

I've taught both at the University of Houston-Clear Lake, and San Jacinto College, in the fine arts, either in an art capacity or primarily in photojournalism. That's really where my strengths are, in photojournalism, and those are the classes I usually teach.

WRIGHT: Are your students aware of your background with NASA?

BIGGS: They are. As a matter of fact, I maintain a notebook of an example of every student I've ever had. When I start a class, the first day of class, I pass out these notebooks, and I say, "Now, I don't care what kind of photographer you are. You can do it as well as these students. Some of these students didn't know how to load film when they came into this class." I say, "It's up to you. You can do it if you want to," and I pass those notebooks around.

One of my last classes I taught, just for grins, I brought in a notebook of some of the work that I had done, primarily some of my early artwork. I was surprised that so many of them found that quite interesting, that a photographer would also be an artist. That kind of made me feel good, because I got a lot of compliments. "I didn't know you could do that kind of work." So it was kind of interesting. But primarily it was a photo class. So I shared with them, not my photo work, but other students', because I thought that would mean much more to them, to see what other students had done.

WRIGHT: Looking back on your career with not just JSC, but with NASA, what do you consider your most challenging milestone that you faced?

BIGGS: Oh, there's been so many. I thought about that last night. I think probably establishing Space Center Houston was, and that's probably the most lasting, too. The Paris Air Shows, some of them were very tricky, difficult working with the Soviets, was a new ball game. Our technical people found that out. But Space Center Houston is still there. The Paris Air Shows, they come and they go and they close their doors and people may or may not remember them. But Space Center Houston's still here. Nearly a million people a year go through there.

We did some things that had never been done. We built a facility on government property. It's under a lease agreement. We sold bonds to pay for it. We just broke new ground getting that facility open, and probably, if there is a pinnacle of what I've been able to accomplish, that's probably it, and working with a lot of good people, with my former boss, Hal Stall and others, to make that happen. I still have my little gold card that gets me in free, and I take lots of friends out there and show them around.

WRIGHT: Are you still pleased that it's accomplishing its mission?

BIGGS: Still pleased, and I'm not hesitant at all to critique them. As a matter of fact, I do that now and then. I'll go out and go through it and look at a new show and write a critique for Richard Allen, who's doing a marvelous job, and I'll send it to him in a e-mail and say, "Hey,

you might want to look at these things.” He always appreciates it because it’s a good critique and it’s not just, you know, poking at him.

WRIGHT: We’ve covered a lot of years, but before we finish today, I was going to ask Sandra or Kristen if they had some questions that they would like to ask you, so that we can cover a little more ground.

BIGGS: Okay.

WRIGHT: Do you have some things you’d like to ask?

STARR: You mentioned particularly that when you first joined MSC, that the Public Affairs Office went through many administrative changes, different branch changes. I was specifically wondering about the changes in the public affairs officers themselves. Shortly before the Apollo 10 flight, Paul [P.] Haney was replaced by Brian Duff. I was wondering what your thoughts were on changes that this might have made in the Public Affairs Office, and maybe if you could compare the way Paul Haney handled public affairs with the way Brian Duff handled it.

BIGGS: Public affairs vis-à-vis media. See, Paul was primarily a media person. That’s where his interest was, not that he discriminated against public services or special events, we were called then. We were called everything at some point in time. But that’s where his background was. So most of his interest was on the media side. We used to kid, “Well, if they’re going to get additional people, it’ll be down in the Media Branch.” You know, the Media Branch always

[gets] the best of everything, whereas Brian was more public services oriented. His experience was a little broader. He had good media-writing experience, but he had a lot more experience in doing things like World's Fairs and air shows and public events.

So I personally welcomed the change. I worked well with Brian. I sometimes didn't work that well with Paul. However, we are the best of friends. I maintain a [Public Affairs] mailing list now. I helped organize the last three public affairs reunions, and since the first one, I've set up and maintain a web site, and I send out announcements [to former PAO and media folks]. Unfortunately, many of them are because some of our comrades have passed on, but I'm able to report some good stuff as well, and Paul always has a nice little retort that he comes back with.

So we maintain contact and we got along well. But he was a media man's man, and Brian was more public services oriented, and I worked better with him. Like I say, I can't really speak to how the change affected down in the branch. Of course, before that, you know, we had "Shorty" Powers, and "Shorty" was "the Voice of the Astronauts," and everyone remembers him from his voice at mission control.

Paul was on the console, and that was a change that Brian made. Brian said, "We public affairs directors shouldn't be on the console; we should have professionals who are trained to do that. They should be on the console." So that change took place about that time where other people, other than the public affairs officers, were on console and you heard their voices, Steve Nesbitt, [Terry White], John Lawrence and Jack King. The list goes on.

STARR: Do you have any opinion on the Headquarters' role in directing Public Affairs Office here at MSC? Because there is a public affairs function at Headquarters.

BIGGS: Yes, I've always found that worked quite well. I can't address anything after 1992, but up until 1992, I thought the Headquarters-Center function worked real well. Headquarters would fund for something if it were a World's Fair or a Paris Air Show. Then they would look to the Center who could provide that support that was necessary, whether it was video support or designing and building a Paris Air Show.

Really, we at JSC took advantage of that, too, because we had some good skills, and since it was funded by NASA Headquarters, it allowed us to maintain a contract staff that we might not be able to maintain otherwise. So I never really had a problem with it. You might get a different story from someone down the hall, but we worked quite well with our media counterparts.

STARR: I think that's all I have.

BIGGS: That's all the questions you have?

WRIGHT: Sandra?

JOHNSON: I just had one. You mentioned that they projected the amount of people that would be going through Space Center Houston as being higher than the amount that actually did.

BIGGS: Yes, they did.

JOHNSON: We've talked to a couple of other people, like Bill Kelly, and they mentioned that. Do you have any idea why you think the public didn't respond the same way that projections were?

BIGGS: No. I think they just over-anticipated the demand. We're not in downtown Houston. We're off the beaten track. I mean, you've got to come out here to come out to see us, you know, and I think the one point—they said it would go to 1.7 [million visitors a year or] something like that, and then it would taper off, and then it would gradually start to increase. But they thought that the first year that it opened would have 1.7. Well, we had about 800,000 people.

The first year's financial numbers, we were about \$6 million in debt. Maybe that was two years. We had to dip into a contingency fund. So our current director of Space Center Houston, Richard Allen, should get most of that thanks, too, because he made a lot of management changes, personnel changes, operational changes that got them in the black. They're in the black, doing well, but they're still hovering under a million people. But that's not [anything to] be ashamed of. Marshall Space Flight Center, 400,000 [to] 500,000, you know, that's pretty good numbers out where we are.

WRIGHT: Before you leave today, we want you to share some other items that you brought with us, and we can do it however you would like.

BIGGS: I think we covered everything. So you want to just take a look at some of these?

WRIGHT: Sure.

BIGGS: All right, then. This is something that not very many people remember. [Biggs pulls out a proposal.] I'll just sort of describe it. This was an effort in 1978 for us to be one of the Bicentennial projects. We had proposed that the Saturn, which we had at the time, that we would build a complex, much like Space Center Houston, and we would make it a part of the Bicentennial program. We presented that to the Bicentennial Commission. We called it "This Is Your Information Center, Johnson Space Center." But unfortunately, our own Center management decided it probably wasn't a good idea to do that. This actually happened later under the name of Space Center Houston. See, we were hoping to get some funding from the Bicentennial Commission on that.

WRIGHT: Talking about the Saturn, was that well received by people, to bring that in?

BIGGS: The Saturn? Yes, and one of the problems with the Saturn is maintenance. I did a little study working with Jack [A.] Kinzler's people, and we figured the maintenance on the Saturn would be about \$50,000 every three years, the Saturn and the Redstone and the Little Joe 2, and it's beginning to show.

I hear recently that it is now under the control of the National Air & Space Museum, and they're looking for some matching funds to completely restore it and perhaps even build a cover. We had proposed that the Saturn be put under cover, and it really should be. It's a space frame. We were going to put it under cover where it would protect it from the elements, and I hear that

the Air & Space Museum is working toward that end right now and doing that, if they can get the money.

Other things. [Biggs shows a photograph.] These are our friends at the Paris Air Show. I don't know if you see that, that camera, or not. This is Leonov, Alexei Leonov, and Tom Stafford, and they were there at the air show before their mission. Alexei, great guy, he's an artist, too. You probably know that. He picked up this young, little kid, little boy, girl, little girl, and had her in his arm, and Tom Stafford said, "Where's my kid?" He didn't want Alexei to get one up on him. So Tom found him a kid, and they're there posing for the cameras. They were there for the air show, which made it quite successful.

Here we are raising the flags at the air show. [Biggs shows a photograph.] There I am in my younger days—my gracious—dated 1973. So we're raising the French flag, the flag of the Soviet Union, and then the U.S. flag in front of the pavilion. So this Paris Air Show was a real highlight.

Here's the building that I mentioned before. [Biggs shows a photograph.] This is the U.S.A.-CCCP Pavilion with the emblem in the Center, and you notice it's a dome. This is the one where we had to put the Apollo-Soyuz in position, and then a crane put the top on the building.

The Soviets were interesting people to work with. They would make real sure that they were never embarrassed. You know, that's not all bad. None of us want to be embarrassed. So when we agreed on how we would put the Apollo-Soyuz together, they gave us these dimensions. It has to be plus or minus three millimeters on the full length of the ninety feet, because they had to bring their Soyuz, and it has to be mated up. If it's too high or too low, they'll have problems mating it.

So we brought in Rockwell, and they're using their instruments, and they get this thing exactly within tolerances. Then the Russians came in with their Soyuz to mate it. They brought it in, and they moved it into position, and it was about this much too low.

Everybody said, "Oh, my gracious." Didn't bother the Soviets at all. They opened some covers up on the base. There were some wheels in there. They took out some handles. They started cranking. It's a jack, and it comes up and up and up and then finally the two mated. Well, see, there was no reason for those tolerances at all, but that way they want to be real sure that no one gets embarrassed, and, of course, they mated up perfectly. It worked quite well.

Here's some photography in the control center. I really, really enjoyed working in the control center, because it was something different, something new. I hated to give it up, but I knew as soon as we started Skylab, I couldn't work two jobs successfully at once.

This is Parker and myself and one of the transportation gentlemen bringing the Saturn in at the docks right next to where the Hilton is now. We rode it in on a barge and then offloaded it off the barge. See this prime mover? It's just a truck, but they call it a prime mover. This hooks up to the front of the Saturn, and the prime mover just pulled it right into position and put it on site, parked it on site.

WRIGHT: You said it was in different pieces, scattered everywhere?

BIGGS: Yes, it was in different pieces. The command and service module was at Rockwell. The first stage was at Mississippi Test, and the second stage was at Michoud, and they were in big bags of dry nitrogen. That way they were keeping it in pristine condition so that if we ever needed to fly it again, we could.

There's our Apollo-Soyuz in position, or this is our Apollo docking module in position, waiting for the Soyuz to come in. [Biggs shows a photograph.] Then they brought in the Soyuz. Then once everything is in position, then a big giant crane—

WRIGHT: Amazing.

BIGGS: And to work out the mechanics and the details of doing this, it was really exciting for me. I think back on it, and I never really had a fear that things would go wrong, and now I think back on that, and it really scares me. [Laughter] I'd just always assumed, you know, with good people you're going to work your problems out, and there're not problems at all.

Here's our friend Bob McCall. You might find this interesting. Here's Bob McCall up on his scaffolding, working on his mural. Like I say, he was up there for several months. He added the woman, Sally [K.] Ride, and added some of the women in the control center and then added a couple of our black astronauts.

But a great career here, and I enjoyed it, and I'd like to do it again. But only one time around.

WRIGHT: It sounds like your new adventure may give you some great memories as well.

BIGGS: Yes, it's fine, and it's doing many of the same things, many of the same kind of projects.

WRIGHT: Before we close today, is there anything else that you want to add, or anything else that you can think of?

BIGGS: No, not really. As I mentioned before, this is an exercise, whether it's formal like this or not, I think this is an exercise that everyone ought to do, just to kind of reflect back on their lives, especially people that are my age. I turned sixty-five in March, and sometimes I think we might be pleasantly surprised at how much fun we've really had. You know, we dwell on the bad things in life, illnesses and death in the family and that sort of thing. We kind of shove aside and forget the things that have really been great about our lives.

WRIGHT: We certainly are glad you came in today, because we have learned a lot about areas that we had not heard before, and certainly are glad that you spent the time with us. So I thank you again.

BIGGS: My pleasure, my pleasure. Good coffee, too.

WRIGHT: All right.

[End of interview]