

ORAL HISTORY 2 TRANSCRIPT

KENNETH S. KLEINKNECHT
INTERVIEWED BY CAROL L. BUTLER
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BUTLER: Today is July 25, 2000. This oral history with Ken Kleinknecht is being conducted for Johnson Space Center Oral History Project. We're in the studio at the Johnson Space Center. Carol Butler is the interviewer.

Thank you so much for joining us today and taking time out of your vacation.

KLEINKNECHT: You're quite welcome. Glad to do it.

BUTLER: We're glad to have you. We talked previously about some of the specifics of your career. I wanted to go back and talk about some of your general thoughts and impressions while you were working with NASA, beginning back with when you first became involved with the Space Task Group. Previously you'd been working with a lot of experimental and high-performance aircraft. What were your general thoughts about a space program at that time when you came to work with it?

KLEINKNECHT: I'd been working with all of the X- research airplanes, X-1, -2, -3, -4, -5, Douglas Sky Rocket, X-15. We didn't think an awful lot about it until we got serious about it. Then really, we were the only people within NASA to have had hands-on experience with hypersonic speed, and I thought and hoped that I could contribute something to the program

by applying my experience. So I moved from Edwards [Air Force Base, California] back to Langley Field [Virginia] with the Space Task Group, working with Bob [Robert R.] Gilruth.

BUTLER: I think you certainly did apply a lot of that knowledge and experience that you had gained to help out with the program. You moved into a lot of interesting jobs and tasks.

KLEINKNECHT: I sure did. I wouldn't have it any different. There was ups and downs all the time, but through Apollo we always had a goal that could be completed. Of course, the Shuttle is a continuing program, and we hope the Space Station will be continuing. We hope it'll be started soon.

BUTLER: Hopefully, we see that make some progress tonight.

KLEINKNECHT: Yes.

BUTLER: As you were starting on the program, the ultimate goal, as you said, after Apollo, was to get to the Moon, but there was somewhat of a spirit of competition as well with the Russians [Soviets] who now we've gotten involved with in the Space Station. But at the time that you were working on these early programs, Mercury, Gemini, and Apollo, were you very aware of what the Russians were doing and was there much pressure, or was it more just working toward the goal?

KLEINKNECHT: Well, there was always pressure to land on the Moon, but we never had any pressure to sacrifice safety for the schedule. Of course, it was a technical race, not a political race then. I think now everything's political. It's not up to me such to say whether that's good or bad.

BUTLER: Certainly it's very different than it used to be.

KLEINKNECHT: Yes.

BUTLER: The space program kind of went through an evolutionary—well, it was very evolutionary. It started with Mercury with one person and moving up to Gemini and Apollo and so forth. Each one became more technically complicated with broader goals, broader objectives, and you were involved with each program along the way. How did you take lessons learned from the previous programs and apply them to the next?

KLEINKNECHT: Well, I guess part of it we called program memory; you remember a lot of things. We kept some documentation of lessons learned. Some of it seems like they've lost it all in the way they—of course, I was in manned spaceflight all the time, but some of the testing and configurations they're putting out in these unmanned space projects, I think leaves something to be desired. But we must not overlook the fact that they are very, very difficult programs and they have less margin for error than manned programs, evidenced by Skylab. We would have lost a total program if we hadn't taken advantage of the opportunity for man to accomplish something in space. Even without planning or training, I think we

accomplished around 105 percent of what we set out to do after we had a very major structural failure.

BUTLER: Talking about Skylab and the failure, when that first happened, you had faced other failures before, in Apollo, problems like Apollo 13 and other minor failures along the way, too, but, as you mentioned, with Skylab that was such a major, a very critical—and could have meant the end of that program. How did everyone come together in a such short period of time to make that fix and make it work?

KLEINKNECHT: They didn't do it in short period of time. It would appear that way, but as an afterthought, when you look back, we've all been together all the time. We just didn't know how close together we were. But everybody—the industry, contractors, universities, and NASA centers—all pitched in. As a matter of fact, we couldn't stop getting some of the help we needed, because it was more than we could control.

BUTLER: That spirit of teamwork is very important for making the whole program happen, and you had kind of seen that before, I'm assuming in Apollo 13 and in other similar events. Can you tell us some about some of the people that made up this team, both on the NASA side and the industry side?

KLEINKNECHT: Well, I can't cite at any one time anymore, but there was about 480,000 people working on Apollo before the landing.

BUTLER: Quite a few.

KLEINKNECHT: Yes.

BUTLER: So many that had to come together to make it all happen. Again kind of talking with Skylab, you also worked later in your career on Spacelab and tied in with the Space Shuttle. Then looking now as we talked briefly about the Space Station and that hopefully that's coming up to speed now, do you have some comparative thoughts on the three programs and things that we learned during Skylab that should apply to Space Station today or did apply for Spacelab?

KLEINKNECHT: Well, nobody will ever just be able to dispute the fact that Skylab was our first space station. Spacelab, I guess, is sort of on the border, but it was not as general a lab as Skylab. But we learned a lot of lessons about testing and they're all there. They're still there, about testing systems end-to-end, environmental testing. I'm afraid we're getting to be better, faster failures. I think we can turn that around. It is unfortunate to read about something that went on or was the cause of one of the recent anomalies, and say, "You know, we knew that. We've been there before." But when you looked in the—what's the newspaper for JSC?

BUTLER: The *Roundup*.

KLEINKNECHT: *Roundup*. You don't see many names you know anymore. I think the last two, I didn't see a name in it I knew. So those people are gone, and you lose a lot of experience.

BUTLER: Hopefully some people are managing to pass the experience down to the new people coming in, or hopefully through a project like ours.

KLEINKNECHT: We had some differences between each of the original programs. It seems that every program manager wants to do it his way. Sometimes they're better ideas and sometimes they're not.

BUTLER: You did serve as a manager in some form or another for most of these programs, but yet you came from a very engineering and technical background. Did your background prepare you for these duties, and did you feel you were able to balance them?

KLEINKNECHT: Well, I'd worked with the rocket engines. We had rocket engines in X-1, X-2, and X-15, and so I was very familiar with the rocket engine and its operation and with flying advanced hardware. We were the only place you could find it, at Edwards and Lewis [Research Center; Cleveland, Ohio] to some extent.

BUTLER: Was there a typical day for you while you were at NASA?

KLEINKNECHT: I don't think so. Get up at six, go to work at seven, come home at eight, and handle things as they came up. I had a goal of never being indecisive. There are people that manage by indecision, waiting. My philosophy was, all right, after you had what you thought was enough information to make a decision, get started down the pathway to where you wanted to go. If that wasn't right, you could always turn back and do it over. Doing that was less expensive than being indecisive and carrying a program down two parallel paths. We did that at times for technical reasons because it was clear for some aspects of a program, it could go either way. But there were other circumstances that would say, you shouldn't do this. So we carried them in parallel until we could settle those questions.

BUTLER: Can always make sure you had the best choice then by having those two.

KLEINKNECHT: Yes.

BUTLER: It certainly seemed to have panned out pretty well.

KLEINKNECHT: Let me talk about the early part of the programs. Of course, we didn't have money. All we had to do was dream about money, and somebody'd jam some down our throat in Mercury. In Apollo, it got a little tighter. Then after the Apollo fire we were able to get more money. I don't think the fire was the cause for it. I think we did a lot of things after the fire that didn't necessarily have to be done. You know, you have to be careful in situations like that that if isn't broken, you don't fix it. There was a lot of things that weren't broken that got fixed and cost a lot of money. I thought at one time the way to become a

hero was to foul something up and then come in and spend your way out of it. The more money you spent, the bigger hero you were. There's been some cases of that.

BUTLER: Luckily, I think, a lot of people were very concerned, as you had mentioned earlier, of the safety and were willing to pay that extra—

KLEINKNECHT: Yes, and there's always of things that aren't black and white, but if you keep trying to improve everything you had, you never get there.

BUTLER: That's true. It must have been hard sometimes to call that line, to say, "Okay, we're here. This works, but we've got to stop." Hard to make those decisions.

KLEINKNECHT: Yes. Was it Joe [Joseph F.] Shea had a saying that "the better was the enemy of the good." There were times when we actually improved ourselves into some problems. Fortunately we found them through the comprehensive testing program. But it can be done.

BUTLER: There are so many parts and so many pieces of everything that had to come together to make it all happen, especially for Apollo, and you were starting from basically having never done this before, never sent a man into space on Mercury, and it all happened within a time frame of less than ten years. It took so many technological advances along the way. Did you ever stop and wonder if it was all really going to happen or to ponder some of those changes?

KLEINKNECHT: No, I didn't ever stop and think or wonder if it was going to happen. I always felt if it wasn't going to happen, I ought to go do something else. But we had a young, energetic group of people that worked on it, and they really believed that they were doing it for the good of the country and the good of the program, not for their own good. A lot of things go on now that people are doing something that's self-supporting. Of course, as the bureaucracy gets older and bigger and stronger, there's going to be more of that, and there wasn't much bureaucracy when we started. I think something like thirty-eight people, I believe, in the Space Task Group that started with Mercury, and I don't know what it grew to in Apollo, other than this total up over 400,000. Anyway, in Gemini we had a Redstone arsenal. I mean a—I can't think of it. Well, now, anyway, a German booster that had been modified and—well, I just lost my train of thought. Forget it.

BUTLER: Okay. You were talking about the fact that during these early programs that it was a lot of young people, energetic, really wanting to focus on the program and for the good of the country, and people made a lot of sacrifices in working a lot of long hours and time away from home. Do you have any thoughts on how the families reacted to all that?

KLEINKNECHT: Very hard on the families. Let's see. I spent one year more than half of the nights away from home, and we had two daughters and a son. The oldest and the middle are daughter[s] and the youngest is a son. About halfway through Gemini, we decided our son needed a father. I used to travel and then I'd work the whole weekend, too, catching up on mail and so forth. I made a decision that I wasn't going to work on the weekends anymore,

period, and I didn't. We think it saved us a son, fine—well, the girls both and the son are fine young people. Freddie works for Lockheed Martin on the CSOC [Consolidated Space Operations Contract] Project now. But then I would wait till they went to bed at eight o'clock Sunday night, and I'd go in and work till one, reading mail.

BUTLER: I'm sure that they really appreciated that, that you were able to take the time and spend with them. It seems like some of your interest in the space area has rubbed off on your son then. Must be rewarding to see him sort of follow in your footsteps.

KLEINKNECHT: Yes.

BUTLER: Again talking about the people and sacrifices people made, one of the people who hasn't got a lot of exposure in the program is Dr. Gilruth. He did a lot, but he's always been kind of behind the scenes when it comes to the written histories and published books and such. Can you tell us a little bit about him? You worked pretty close with him for a while.

KLEINKNECHT: He's the biggest unsung hero I think I've ever known. He's truly the father of manned spaceflight, not rocketry. Seems like everybody is more interested in rockets, so [Wernher] von Braun got all the publicity, and von Braun is more outgoing, he could talk to the people better. Bob just had his mind focused on the technical aspects of the program and how to get there.

I can't ever remember Bob telling anybody how to do something or to not do something. He just talked with them and talked with them, and, if you will, negotiated till

they thought his idea was theirs and then it got done that way. Of course, he hasn't been recognized after, and now it won't do him any good. He doesn't know what's going on in the world now.

BUTLER: Unfortunately.

KLEINKNECHT: He was the one that went up to see [Dwight D.] Eisenhower to brief him on the Mercury, and Eisenhower said, "What are we waiting for? Let's go."

BUTLER: The space program certainly owes a lot to Dr. Gilruth.

KLEINKNECHT: A lot of these people that were working for self—I don't want to say "preservation," for self-recognition, I guess—that want to step in and take over, you know. Mercury, we had—well, in fact, the doctors for a long time didn't know whether we ought to do it or not.

BUTLER: That's true.

KLEINKNECHT: There was a number of them that was against it, or at least wanted to slow it down. I won't say they were against it. But when we got the first flight off, everybody wanted to jump aboard, and they did.

BUTLER: They began to realize that it could be done and that everybody would be okay.

KLEINKNECHT: And they wanted to be a part of it then. Didn't want to sit back and say, "Well, we told you so."

BUTLER: That brings up an interesting point. Early on, very early on, as the program was just getting started, the Space Task Group was able to bring in a lot of younger people, and a few of the upper management types, a lot of people didn't want to get involved early on because it seemed such a long shot or that it wouldn't be possible. People talk about how the younger people just didn't know that it wasn't possible to do, that they just were excited about it.

KLEINKNECHT: Well, that's good.

BUTLER: Were you very involved—a large group of individuals came down from Avro [Ltd.] up in Canada to fill in some of that middle-management role. Did you have a lot of involvement with that or dealing with them in general?

KLEINKNECHT: Well, we worked with them. They were integrated right into our organizations. It wasn't a separate group sitting out to the side. They were all very good people.

BUTLER: Just fit right in without many problems, and everybody just want to work for the program?

KLEINKNECHT: Yes.

BUTLER: As the program had built up and working on Mercury, working on Gemini and Apollo and always shooting for the goal of getting to the Moon, as the Apollo Program was being accomplished, as the landings were happening, was when you transferred over to work on the Skylab Program. But Apollo only lasted for a few years before it was terminated. Did you have any thoughts with the ending of the Apollo Program and the loss of that specific goal?

KLEINKNECHT: I didn't. There were a lot of people that wanted to extend Skylab. They even tried to, and I think that was ludicrous. We designed the program to accomplish certain experiments, we did that, and it was over. We could have flown some more. Great expense, and we'd have just been repeating—generally, we'd been repeating what we've already done, and to some extent, we're doing that with Shuttle now because Space Station hasn't come along on time.

I think Apollo accomplished its goal, and there was no more reason to fly except to glorify some more astronauts, I guess. See, Mercury was designed to be a three-orbit spacecraft—no, an orbital spacecraft, one orbit. When I came to the Space Task Group, it was too heavy to do one orbit. We kept working on weight, working on weight, and we got it down to we could do three orbits. So I guess—see, my memory's so bad—was John [H.] Glenn [Jr.] the three-orbit?

BUTLER: I believe so. Three or six.

KLEINKNECHT: No, it wasn't six. We could do John's mission comfortably. Then during the interim between Apollo 6 and Apollo 7, we got to the point we could do six orbits, and Wally [Walter M.] Schirra [Jr.] did six orbits. Then [L. Gordon] Cooper [Jr.], we were able to do thirty, thirty-two, thirty-four hours or something. We had a vehicle almost finished that could do—was it a week? I think a week. Al [Alan B.] Shepard [Jr.] was schedule to fly it. The whole center was interested in it.

We went to see [NASA Administrator James E.] Webb, and Webb said, "No, that's the end." Of course we were quite unhappy about that, but in his wisdom he said, "We have nothing to win and everything to gain. If that mission is a failure, it may stop the whole program." So, in so many words, he says, "Let's quit while we're ahead." That was a tremendous answer. On looking back, it was exactly the right thing to do. I wasn't very happy with it at the time, though.

BUTLER: Understandably. But you did move on to Gemini to have the longer duration flights. Of course, unfortunately, Al Shepard wasn't able to fly, but he did get his time a little later.

KLEINKNECHT: Yes, he did.

BUTLER: Jim Webb is another person that unfortunately we can't talk to, but can you tell us a little bit about him as a NASA administrator, his career for so many years?

KLEINKNECHT: He was just an outstanding administrator. He knew and understood the federal government. I think he knew where a lot of ghosts were hidden in Congress, because when he wanted something, he just went up and told them. One time we went to Webb with a budget for Apollo and he just doubled it. He said, "That's how much it's going to take," and he was right. He talked to people, not down to them. Of course, sometimes he'd get to talking and by the time he finished, you weren't sure about everything he talked about. But he could hold people's attention.

BUTLER: Certainly seemed to be the right man for the job, looking back on it.

KLEINKNECHT: Yes.

BUTLER: Looking back to when NASA was first founded and it was a fledgling agency, people coming in from all over to build it up, to make it happen, building off of the NACA [National Advisory Committee for Aeronautics], and NASA was able to accomplish so much in such a short time, what do you think now that it would take for a program like Apollo to happen again?

KLEINKNECHT: You know, the world has changed so much. I think that's more difficult to answer than to have answered it when we started, because so many of the things that we have in our hands and are using daily now, we didn't have then. They had to be developed. It's almost, can you get any more technological complexity and be able to control it and handle

it? Well, we could go the Mars now if we committed to it and had the money. But heaven forbid we commit to do it by giving money to others. Let them give money to us for a change. We will do the program to Mars, but I don't know how soon it will be. Actually, the degree of success of the Space Station has a lot to do with it. I don't know about the cost, whether that will influence it or not, but it's going to be expensive.

BUTLER: You worked a lot with the Europeans on Spacelab. Now with the International Space Station, it's quite an international conglomerate and cooperation. Do you think that for the Mars mission, that working with someone like the European Space Agency might be good?

KLEINKNECHT: Yes, I do. They've come a long way. I was over there as a senior technical advisor to their program manager when we weren't sure we had confidence that they knew how to do the Spacelab, and I can fully state that they did do everything our way. You know, when you get two people working together, there's always some "wasn't invented here" or "We have a better way," but they had already worked, learning to work together after the war.

You know, you had the Germans, the Belgians, the French, the British, —I don't know who else—but all of Europe. Well, let's say there was thirteen or fourteen nations in the European Space Agency [ESA]. They worked cooperatively, and I guess they were able to keep more top politics out of the decisions, other than money. When a country put in ten percent of the money for a program and they committed to that up front, they were supposed to get ten percent of the work, not necessarily because they were the best, but that worked out

pretty good, too. Then money got short. I don't remember what it was, they had to put in another five percent before they could back out, and none of them backed out. They didn't always have their money when they needed it, but they got almost zero-interest loans to cover what the countries owed. Italy, several times, owed quite a bit, but they got it all.

BUTLER: Able to make it all work and bring it together pretty successfully. Certainly an interesting arrangement.

KLEINKNECHT: Their Spacelab has performed outstandingly.

BUTLER: It will be interesting to see how the partnership grows.

KLEINKNECHT: Yes, but, you know, you wonder. They built it and gave it to us. We had all kinds of agreements, and we could still be using it, but it's been pickled.

BUTLER: Hopefully all will go well with the Space Station on the right side of things, and we'll see some of that progress being made again.

We've covered most of the topics that I had. Are there any thoughts that you would like share with us on anything in your career with NASA or, again, any particular memories or events or people?

KLEINKNECHT: Well, overall, I'd like to say again that I think Bob Gilruth was most likely the most important man in the program for getting it started, getting it organized, getting the money to start with, and managing it through lunar orbit.

Walt Williams came from Edwards where I did and, in fact, he invited me to come. He had a lot to do with the success of the program because he'd been managing the operations of the high-speed airplanes. There's a lot of others. If you start naming, you can't stop, so I'll stop there.

BUTLER: Certainly a lot of important people that all had to be in the right place at the right time and give it a lot to make it all work. We certainly appreciate all you did for the program.

KLEINKNECHT: Well, thank you.

BUTLER: Thank you and thank you for talking with us.

KLEINKNECHT: I hope I'll be around to see the Space Station.

BUTLER: I certainly hope so. I think we're making some progress there, so you should see it.

[End of interview]