

**NASA HEADQUARTERS NACA ORAL HISTORY PROJECT
EDITED ORAL HISTORY TRANSCRIPT**

ERNIE D. WALKER
INTERVIEWED BY SANDRA JOHNSON
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JOHNSON: Today is June 5, 2014. This oral history session is being conducted with Ernie Walker at his home in Grafton, Ohio as part of the NACA [National Advisory Committee for Aeronautics] Oral History Project, sponsored by the NASA Headquarters History Office. Interviewer is Sandra Johnson, assisted by Rebecca Wright. I want to thank you again for letting us come to your home and taking some time to talk to us today. We really appreciate it. I want to begin by asking you to share with us how you first came to the NACA, a little bit about your background, and what brought you here.

WALKER: My introduction to NACA—of course that was a lifelong dream, because as a kid I was brought up in central West Virginia. A lot of people worked at NACA in Langley [Research Center, Hampton, Virginia]. I was dating a girl, and her relatives worked there, and we had a couple dinner parties with them. I'm 17 years old. I didn't have money to go to college, so I went into the Air Force.

She and I had become engaged before I went overseas, because the Korean War had started. As soon as she graduated from high school, she went to Langley and went to work. That was our goal. Then as it turned out, in the letters I got she was going to the Officers' Club over on the Air Force side of Langley. I got a "Dear John" [breakup letter]. She had met a real nice young lieutenant, and I got an invitation to a wedding, which was fine, because I was overseas for three, four years.

When I came back I called Langley and they said, “We don’t have any openings, but you might try our propulsion laboratory in Cleveland [Ohio, NACA Aircraft Engine Research Laboratory, later called Lewis Research Center].” So I left for Cleveland, and got on a waiting list. Even though the only thing I ever wanted to do was be a photographer for them—their first offer, I turned it down. I was a senior photographer when I came there. There was nothing that they had that I hadn’t supervised people doing in the Air Force. The motion picture, high speed, everything.

They offered me a GS [General Schedule pay grade]-3; \$2,965 dollars a year. I turned it down. I said, “No. No, I’m holding out for \$3,175.” So they didn’t hire me. They hired the guy that was later to become my deputy, later in life. He could not do the work that they wanted—they wanted somebody to do high-altitude photography and motion picture. So, two weeks later they came back and came up to my price and hired me. I went to work there in March of 1954.

In February I had met my wife. Now, I was working. I was working as a supervisor of a lab [laboratory] in downtown Cleveland. It was a graphic arts center. I left that and went to work for NACA. I was the happiest person in the world. My wife was working for the telephone company. When we got married in June of ’55, her crazy telephone hours just didn’t agree with mine. Nine splits—you’d go to work at 9:00 in the morning, you’d go home at noon, and then you’d come back at 5:00 in the evening and work until 9:00 at night. All these crazy hours that the telephone company had.

I asked her, I said, “How much math did you have in school?” She had enough, and because it was a family-generated place, I just went over to personnel and I said, “Hey, what do you need?” I went over to the math department and talked to Dot [Dorothy] Collins, and they said, “Yes, we need girls to analyze data.” One of the things about analyzing the data was that

most of it was recorded on manometer boards. I don't know if you've ever seen these big, 100-inch manometer boards, but every test cell had these big manometer boards where you recorded your pressures.

We photographed those, then the girls would sit with a 10x magnifier and read this 100-inch tube that's reduced down to this long [demonstrates], and read the pressures. One would record, one would read, one record—they'd take turns. Then they would take their Friden [Inc.] and Monroe [Calculator Company] hand calculators and they would work up the data. It could be up to six months before you got your finished data—which was to change drastically in 1957, I think it was, when we had a new computer system. My wife was being trained on it when she left the lab to take care of the kids. At that time we went from six months, to where you could have worked-out data back on your terminal in the control room in less than 10 minutes. It was just a fantastic thing.

JOHNSON: That's quite a difference, six months to 10 minutes.

WALKER: She had worked on that. We had what all of the guys referred to as the "harem." It was an analytical room. It had 35 girls in it. A super amount of guys married girls from there. That was encouraged.

I would like to say one thing about what the organization was all about. Have you ever seen the book *Frontiers of Flight [The Story of NACA Research]* by George W. Gray? Every employee, when you were employed, when you signed the papers, you were given a copy of that book. You'd take it home and read it, and this is your bible. That was the honest way. It was

your bible from then on as far as what the whole organization was, starting from the very beginning.

This *Wing Tips* [newsletter] gives another part of it. This is an old *Wing Tips*. This was our paper. This is October 27, 1942. It explains some of the character of the organization—it's got about personnel training here. Of course at this wartime, it's got the guys that have been drafted into the service, and they're talking in here about if you have any neighbors or friends or anybody that you would like to have—oh, here it is.

[Reading advertisement] “Toolmakers are needed. If you have any friends who are skilled toolmakers or craftsmen”—similar trained—“invite them to consider their chance of locating with AERL [Aircraft Engine Research Laboratory]. This will help you surround yourselves with friends, will help your friends, and will also help AERL to build up its mechanical force. Tell your friend to contact Mr. Hartmann at the gate, and be sure that they are released from their present employer.” Because of wartime, you had to be released.

That was what the philosophy was. Bring your friends and family in. Many of the programs that I worked on, we had finished programs before they were ever even funded. I had a budget that I could buy film, and I had the equipment, and I had a JO [Job Order] to charge my time to, a general JO. A guy would walk in, and he says, “I'm interested in looking at this.” I remember one day, Dr. [Robert W., “Bob”] Graham—did you interview him yet?

JOHNSON: Yes.

WALKER: Bob and Y.Y. Hsu—I don't know if you knew him, he was quite the guy. A couple of the other guys and myself, we were sitting, drinking coffee one morning, and Y.Y. had been

wanting to do Taylor bubble work, study Taylor bubbles. We start talking about what can we do, “How can we do this?” I had friends in all the shops and everywhere.

We went to the fab [fabrication] shop and we found a big steel plate, about this big around [demonstrates], off a cut-off table. We went over to the supply and got a couple of long pieces of pipe. We made a phone call down to Fairview High School [Fairview Park, Ohio]. It had a swimming pool. We went over to the art department and got a bunch of sheets of clear acetate. We did get a hypodermic needle from the medics, and we attached that hypodermic needle and a little pulley—this all happened in one morning—onto the steel plate.

We went down [to the high school], and I called a friend of mine and borrowed the scuba gear. We put it in a deep end of the pool, and taped all of this film together to make a tube this big around [demonstrates]. I’ve got pictures I can show you of this thing. We would blow up a balloon and pull it down to the bottom. When it hit that needle it would break, and this bubble of air would come up through the tube. I would kick loose and float along with it, photographing it as it was moving. From that experiment, then we got the money to build a bigger facility and a hangar, to do the same thing. We also got exiled from ever coming back to the pool.

JOHNSON: The pool at the high school?

WALKER: Yes, because they put it together with masking tape, and it soaked loose in the water and it went into the pool filters. It was one of many times I got in trouble like that.

JOHNSON: You got banned.

WALKER: At [NASA] Wallops [Flight Facility, Wallops Island, Virginia] I got banned a couple times.

But anyway, this is the type of organization we really had. This book [*Frontiers of Flight*] was given to me the day that I signed in. I started reading, and it starts out in 1915, and the mentality of the organization [when it was founded]. That was a very important part, that mentality, because the first budget for NACA was \$5,000. And at the end of the year they turned \$2,500 back to the government. That's the way we were. That's the way we always were.

We had one guy, and he was in charge of money. He figured it cost \$25,000 a year to run a test cell. That paid the engineers' wages, the mechanics, instrumentation guys. Power—the big thing was power because of all of these vacuums and air flow pressures that we had to have. That would pay a test cell for a year. You're able to do a lot. I say the most important thing we had that NASA never had—never, ever had—we had the freedom to fail. NASA was a whole different mentality with [rocket engineer] Wernher von Braun. He had never known what a budget was in Germany, just unlimited funds. “You're going to do something bad; we'll fund you forever.” So he never knew what that was.

We had a really neat organization at Lewis because our Director was Dr. Ed [Edward R.] Sharp, the most outstanding man I've ever known. I'd do anything for him. Every Thursday we had “congressional bean soup,” which the recipe was brought up from Langley. He stood in the chow line and ladled out the bean soup and talked to everybody coming through. He knew almost everybody by their name, and he knew something about their families. “How's your little boy doing?” Everybody would do anything for him.

At the same time, we had Abe [Abraham] Silverstein as head of research. They were both very, very close friends of mine over the years. Abe, I traveled with him for several years.

I'm not bragging, but he had quite a bit of respect for me. At one time we were giving a presentation to the governor of the state of Ohio, and all of the regents of the Ohio universities all over the state. This was at the time that John [H.] Glenn [Jr.] had just made his first flight [Mercury-Atlas 6].

We were invited over for lunch at the governor's mansion, had all these prisoners in white jackets serving lunch. He said, "Ernie, you take care of that end of the table questions, and I'll take care of this end." There were a couple times that he would come in and give an introduction, and then he would simply say to people—he did this to me several times downtown—he'd say, "I just got a call. I've got to go to [NASA] Headquarters [Washington, DC]. Mr. Walker will answer any questions you have." We really spent a lot of time together. That man was brilliant, absolutely brilliant. Just unbelievable.

Can you turn this thing off?

WRIGHT: Sure, you want to stop for a second? [pause in audio]

WALKER: AERL, NACA. I don't know if you've heard many people refer to it as that.

WRIGHT: I've seen it.

WALKER: Aircraft Engine Research Laboratory. In 1954, the engine overhaul section had jet engines made by [Frank] Whittle [Power Jets Ltd]—the very first ones—with the rotary, centrifugal flow compressors, and then it had the German axial flow compressor. We were still

looking at all this stuff at the same time we were building. When I was first hired in, one of my jobs was to follow the construction of a 10x10 [foot] Supersonic Wind Tunnel.

JOHNSON: And document it?

WALKER: Yes. That was just one of the things that I had, because it was being built right then. The 8 X 6 [Wind Tunnel] had already been finished. The other thing that was coming up—we were going to fly an airplane on liquid hydrogen; the only airplane that's ever flown on liquid hydrogen. A picture of it is hanging over my desk downstairs, though not with the hydrogen tanks on it. I flew in that airplane for 25 years.

Fred [W.] Haise [Jr.]—Freddy was my pilot going on most of those experiments. There's a big hole up over the Hudson Bay [Canada] in the atmosphere. We used to fly up there at 55,000 feet and do our experiments, where we had one solar constant [measure of solar electromagnetic radiation].

Freddie was always very confident that he was going to walk out if we went down. I kept telling him, "Fred, you're a thousand miles from anywhere. It's the middle of the winter. There's no way you're going to walk anywhere."

He said, "No, you've got to have enough clothes on in case you have to go outside." I used to sweat my butt off in the back there, because he'd have the air conditioner turned up, and it blew out right in my crotch. You had all this snow coming up, actually snow coming out of the air conditioner, because it was 45 degrees below zero [Fahrenheit] outside. He always wore two, three pairs of underwear. He's sitting in the front seat, so he wasn't getting the air conditioning direct.

A lot of the time I'd be sitting in the backseat with my feet up on the instrument panel. I wore big, heavy hunting boots when we were flying up there. Not because I was planning on walking out. I knew nobody was going to walk out from it. If you went down in the wintertime, that was the end of that. That far north, there's nothing there.

JOHNSON: What were you doing on that plane? What were you taking photos of?

WALKER: [The Sun and testing solar cells.] [NASA] Houston [Manned Spacecraft Center, now Johnson Space Center] wanted to know about when the first astronauts were going to use the Mercury [capsule]. "How much light are we going to have coming in there? We want to photograph some stuff inside there. What's the light?" I would say, "It's one solar constant."

They said, "No, we've got to have experiments for it." Houston is great. Document, experiment, document, experiment. Well, okay. I had to fly up and photograph through a filter system that I built, direct sunlight straight over top of me. And it was one solar constant, like I said. That's all there is to it.

It's the same way with the Apollo 13 [accident] investigation. When we did Apollo 13, they called up and asked if we had the zero-gravity facility. They said, "We need you to run a test on a piece of Teflon [polytetrafluoroethylene]-coated wire to see if it will burn in a 100 percent oxygen atmosphere. We want it to be at minus 180 degrees [Fahrenheit], and we want it in zero gravity." They wanted us to come back with a proposal.

Two weeks later, we sent them a final report of the test, done. Fortunately, I had a quartz window about that big [demonstrates], and my desk from another program, a nuclear rocket program, and we had a crazy machinist. We had a real good designer, and he whipped up the

design on the fixtures. The crazy machinist used to drive a hearse, and he kept a lion in the back of it until the lab made him quit bringing it to work.

JOHNSON: A lion?

WALKER: A lion. Nick [Nicholas] Wolansky. I remember going over to the machine shop about 11 o'clock one night, and Nick had two machines running. He was turning the cylinders that we were going to use. He had them really hogging the middle off of it, and the smoke is just everywhere, just from burning oil. He made those in nothing flat, and we built the system.

I had a camera that would run in zero gravity because I'd built it for the facility. I had film that would work in that full vacuum, because I'd done that work ahead of time. It took us about three or four days to put the whole thing together—to design it, put it together, and test it. One of the hardest parts was getting the liquid nitrogen in the test chamber to circulate around this thing with a disconnect so that when we dropped this big package, it would disconnect the nitrogen.

Tom [Thomas H.] Cochran—I don't know if you've ever heard of Tom Cochran. He turned down being Director at Lewis when he retired. He was in charge of all space experiments. He was the original Deputy Director on the Space Station [Freedom]. Tom was a good heat transfer guy. Rensselaer [Polytechnic Institute, Troy, New York] man. He wrote the report to Houston. They looked at the first part of it, which was the outline of the drawings. They called up and said, "Yes, that's good. Go ahead and do it."

I said, "Go ahead and finish reading it. The report's finished."

That's doing work without having any money. That was a common thing; it was done all the time. Having the freedom to fail—nine out of ten things that you discover come from not what you're looking for. I remember the last year I was working, I think, NASA got the I-R [Industrial Research] 100 Awards. There's 100 awards given out every year for outstanding research. I think NASA had something like 96 total of these awards, and Lewis had 75 of the 96, because we had the freedom to fail.

It was a wonderful place to work. Fun. You go on vacation, you couldn't wait to get back to work. That sounds dumb, but it's the honest way it was. Just couldn't wait to get back to work.

JOHNSON: Like you showed us in that newsletter, they encouraged those friendships and they encouraged that atmosphere. The relationship between you as a photographer and the technicians, and then with the researchers themselves—was there any conflict?

WALKER: Oh, nothing like what you people have. I had to go down [to work] on the Titan-Centaur [rocket], down to the Cape [Canaveral, Florida]. They told me, "Don't touch your tool. The union will be all over us. You can't touch your tool." I went up in the tower. I think it was on the 13th level where I was going to be working, on the interstage adaptor to photograph the separation screen between the Titan [rocket] and the Centaur [upper stage].

I got off, and the first guy I met was the mechanic from General Dynamics [Corporation], who I worked with at Lewis, who was a good friend. He runs up and grabs me, gives me a bug bear hug, "What are you doing here?"

I told him what I was going to do, and I said, “They told me I can’t touch a thing.” He said, “That’s my toolbox right there.” He said, “You do anything. This floor is mine, I’m the boss here. You can do anything you want.”

The photograph unit down there sent me a guy. You had to crawl into this interstage. It was going to be four cameras photographing this thing. Number one they said, “We can’t use your connectors.”

I said, “Why not?”

“Well, we didn’t do them.”

I said, “Hey, I did these connectors. They’re potted with silicone. They’ve already been run in a vacuum, and you’re not going to take them apart.” They had all kinds of trouble down there. They had good people, but I’m saying they did some stupid things. I said, “You’re not taking them apart.”

A photographer comes, and that guy had to be six-foot three [inches]. Probably weighed 230 or 240 [pounds]. You had to crawl in through this interstage adapter on top of a fuel tank to go around and put these cameras in the back here and here and here. He looks at this, and he looks at the print of where they’re going to go, and he says, “That’s awful hard to get in there.” He said, “You crawl in there and bring the cameras out, and I’ll load them.” It’s only a Nikon 35-millimeter [film] camera.

I said, “If I crawl back in there, I’m loading that camera. I’m not going to crawl out here and then crawl back in again.”

So on launch day, instead of getting a six-foot six guy that weighed 240 pounds, I got two little shrimpy guys, and I had to pay them eight hours of straight time and four hours of overtime

to load and unload four Nikon cameras. We just didn't work like that. That was the whole difference.

WRIGHT: Mr. Walker, can I ask you a question? While you're talking about it, I'm trying to visualize it. How did you prep [prepare] for those types of photos, when you had to go in and document it? Did they give you blueprints? How did you know what you needed to take before you got there to take photos?

WALKER: I usually was sitting in on the design, right at the beginning, and it was usually done in my office or my conference room. The engineers would come in and they'd say "Hey Ernie, we want to do this and this and this."

I'd say, "The easiest way to do it is this and this," and that's the way we did it. One of the things—our apprentice designers had to work in the fabrication and machine shop for six months during their training. That was so that they would know what could be manufactured, not draw up stuff that couldn't.

Everybody was close. We had dances all the time, put on by the lab. All we had at the dance was draft beer and potato chips. It was a sock hop, records, in the Ad [Administration] building. You got all your beer and your potato chips you wanted, and you got to go to the dance. If I remember right, I think it was a dollar and a half, but if you brought a girl it was only a dollar and a quarter.

Of course, Dr. Sharp was at every apprentice graduation. He always hugged all the apprentices' girls or wives. He was a wonderful guy. If Dr. Sharp wanted it, you'd just do anything for him.

JOHNSON: One of the other gentlemen talked about the graduation for the apprentices. They made such a big event out of it.

WALKER: It was a big event. Then after it was over, that's whenever I'd be up in Dr. Sharp's office until two or three o'clock in the morning. It was just a wonderful place to work. My greatest honor that I ever received was my retirement party. My retirement party was the biggest one that was ever held at NASA. The cafeteria was full. You never saw such a conglomeration of high-end engineers in your life, because I worked with all of them for years. It was just—everything about it.

JOHNSON: You did have the privilege of seeing everything that was happening in the lab.

WALKER: Everything. I made a suggestion, sent it to management, about having a paper written up each month of what everybody is doing, because I would see people duplicating work. I told management, and what really came out of it was that Ernie Walker gave a senior staff briefing. Every year I would give a briefing to senior staff about everything that I was doing for the year.

I remember one time—[Bruce T.] Lundin was the [Center] Director, and I was giving this briefing, and it was on an ion engine. We'd worked on this engine, and I showed a photograph of the thing working. It's just perfect, that nice blue plume coming off of it. Then we wanted to run some high-speed film on it. We'd finished the program, it was all finished. I ran the high-speed film, and this plume actually turned on and off, on and off, and on and off. The engineer in charge of it said, "No, no, there's something wrong with your camera."

We had to send the camera back to the manufacturers, Cinerama [Corp.], and they said, "There's nothing wrong with this camera." Then we'd come back and I said, "We did it," and it started all over.

Their director was sitting there, and he jumped up and he goes over to Lundin and he said, "He's not making it right," and Lundin said, "Well, I saw the pictures." I finished up. I just told the projector, "Stop the film," and I let him rant and rave, and rant and rave, and carry on. And then when he finally settled down, I said, "Start the film."

When we got through, the Director sidled up and he said, "You kind of ran over your time, didn't you, Ernie?"

I said, "Well, I was interrupted."

I was known for being slightly outspoken, but it was the truth. The guy would have been faking this thing all the time. The film doesn't lie. At the end of a year, you've got money left over. Everybody does. All of the researchers, the first thing they did was come to me. They said, "What do you need, Ernie?" I had the best equipment there was, the latest and the greatest.

JOHNSON: Talk about some of that equipment, if you will, and the changes from when you first started in '54 until you retired in '88.

WALKER: In 1954, all of our equipment was old. The cameras we were using to record the manometer boards and the test cells were six-inch-focal-length aerial cameras from World War II. We set them up—and it was a very precise thing, setting these things up. You had to have them squared perfectly for distortion of these tubes, because these tubes are reading the pressures through the whole engine. They normally would be about the size of that wall over there

[demonstrates], and they could be up to 10 feet high. You'd have a camera hidden behind the control room wall over here, looking through a hole, photographing that, and you'd have a camera over here, photographing this wall. Then the girls did the data reduction from that. We did that, and then the Altitude Wind Tunnel [AWT] had cut-film cameras that they used for recording theirs.

Of course, every time you had an explosion in an engine, it blew all the mercury out of the top of those tubes. They had a terrible time cleaning up the mercury in the AWT, but it wasn't unusual. You got splattered with mercury and you didn't worry about it. We did not have much in the line of equipment. We had one high-speed camera. Everything was jerry-rigged. That was one of the things we did. We bought off-the-shelf cameras, and then we modified them ourselves.

I got a call from Houston whenever they were first going to go to the Moon, and they're talking about the camera the astronaut is going to carry on their chest. They were going to spend all this money building this camera, and they wanted me to pay for part of it. I said, "I have no use for that camera at all. It's so specialized, it has no use to me at all."

The guy who was in charge of instrumentation at [NASA] Ames [Research Center, Moffett Field, California]—he was on the phone at the same time. This was a phone conference. He said, "I don't want any part of it. I have other things to do." They went and developed a camera just for that purpose, and really, it could have been done otherwise. But when you have unlimited funds, you just spend money.

The guys at the end of a year, when their projects were up, they'd come in and they said, "What do you need, Ernie?"

I said, "I need this and this and this."

They said, “Well, start writing PRs [purchase requests].”

I said, “How much can I write it for?”

They said, “We’ll tell you when to stop.”

I was a manager that let the employees run the organization. I had 42 of the finest employees there were. A large percentage of them had master’s degrees, mainly because they got a photographic degree, and they went out looking for a job and they couldn’t get a job, so they went back to school and got an advanced degree. I got criticized for that. They said, “Why do you hire only people with master’s degrees?”

I said, “Because I can pay them the same money.” I said, “Hey, I got co-ops [cooperative education students]. That’s my starter boys.”

You would go and say, “Hey, I’m going to do this or this.” Then whenever it came time for the engineers, they’d come in and they’d say, “Hey Ernie, I need help with this.”

“Okay, we’ll take care of it.”

We had a lot of instrumentation cameras. Of course some of the projects, like the Viking Program [Mars probes]—we were running it at [NASA] Plum Brook [Station, Sandusky, Ohio], in the big Space Power [Facility]. It was 32 cameras on that, and none of them were redundant. Every one of them was looking at something different. You need a lot of equipment, and it all had to be synchronized. We modified them by putting a signal generator into the camera itself. The whole idea was it takes a couple weeks to get ready, and you go, boom, and it’s over.

We wanted the cameras to run at 500 frames a second. They had to be precise, so they had timing on the inside of them. Then we put these little coils on a shaft somewhere in every camera, and this coil feedback went to the master computer. There was a limit on the master computer, and whenever this voltage—generated by this actual mechanical device, not power

going to the camera; motion is doing it. When it got to 500 frames a second, the signal went to the computer. Then when all 32 of them were at 500 frames a second—it's microseconds—the computer would fire the explosives. We built all that stuff, because it wasn't available. Houston would go and give a big contract to some company to build them.

We were fortunate. We got a wonderful optics lab there, and electronics people. They just bent over backwards. I played softball on the hangar team against the electronics guys. We had beer parties together. We really, really were a band of brothers all the way around. There was none of this stab-in-your-back coming. That just didn't happen, nothing at all. You don't look good if any member of your organization looks bad. That just didn't happen.

We just had such a good time. I could go on and tell you stories and stories and stories about the different times, the things that went on that was really having a good time and working your butt off. I remember I was running—it was an Explorer [Satellite Program] or the Viking, one of them. It was a big shroud test. I started at 8:00 in the morning. I turned the data over to the engineer at 5:00 the next morning. Come home, had breakfast, took a shower, changed my clothes, and went back to work and started another test at eight o'clock the next day.

I didn't finish until almost six o'clock that night, and we were supposed to go out for a dance that night. I got home and I'd gotten my second wind, because I'd been working for 32 hours straight. I come in here and my wife says, "I don't think so. You look too tired to me."

I said, "No, I'm feeling good now. I can go all right."

She said, "Sit down for five minutes. Supper isn't quite ready, just sit down for five minutes."

JOHNSON: You crashed.

WALKER: That was the end of that. And we had no money. Your per diem—all those years that we were down at [NASA] Wallops [Flight Facility, Wallops Island, Virginia]—my recovery team did all the recovery work for Wallops, [NASA] Goddard [Space Flight Center, Greenbelt, Maryland], Langley, and Lewis.

JOHNSON: Talk about that. That's pretty interesting.

WALKER: Lived in an airplane. Had an R4D [Douglas C-47 Skytrain aircraft]. The airplane had a system in it. It had a CERTO [coherent electromagnetic radio tomography] beacon so we could follow these objects and pick them up, and we built the recovery systems. That was part of our job at Lewis, too, with this group I was working with.

First one—we had contracted with this company for a helicopter to pick it up and bring it in to shore, because it's got film in it. We're flying around out there, and it was terrible. It was in the wintertime. We only had less than 150 feet between the ocean and the clouds, and we're trying to keep track of this thing. We keep dropping out smoke bombs on it. It's floating in the water. "Where's the helicopter?" Finally, the helicopter comes. "How far are you guys out?"

"We're 80 miles out, offshore."

"Oh. I can only fly 40 miles."

He could only fly 40 miles. He started the engine, and then they took the battery out and left it sitting on there. The guy then was going to pick it up and bring it in. We went and got a bunch of Marines and a couple Sikorsky SH-3s [Sea King]. Big helicopters. That was so much different then, because we had all kinds of power. We had one of the young Marines put on a

poopy suit [anti-exposure, cold water survival suit]—well, we were all using poopy suits in the wintertime, because you just didn't have anything.

I remember one time, we had just taken over that naval station there [Navy Auxiliary Air Station Chincoteague, Virginia], so we were using the fuel out of their underground tanks that had been there for five years. Boy, we were almost 100 miles out in this helicopter, and it was terrible as far as conditions. The crew chief would come running back, put his finger up on the transmission, and look. If his fingers weren't white, it wasn't running too hot.

You'd stand there and look out, and you'd see a whole piece of a cowling just tear off and go "*shoop*." Of course it had no windows in it. Had the front nose off, because I had a ramp going out that I crawled on to get out from under the blades to photograph this thing coming back in. Then radar directed us to where the impact point was. We were at the impact point. You were the target, because we had to photograph this thing to see if parachutes were open and the floatation gear come out, and everything as it went by.

One time, I hear this big roar. The noise was so bad that you'd stuff your ears full of cotton, and you'd have a hard hat on, and you'd still—it was just a terrible noise level. That's why I have hearing aids now. I hear this thing roaring by. The launch vehicle, the rocket itself—Wallops had goofed up a little bit on their track going out. They took us out, and actually the Aerobee [suborbital] rocket—after it had fired and exhausted itself—fell between our two helicopters. That's what was roaring by, that rocket coming by us. But it was fun.

In between, we tried to do things for our Wallops people. The young engineer who was responsible for us, for our logistics—we got weather cancelled for launch that day. He said, "Gee, I'd love to go and see my house from here."

“Come on,” and away we went. We’re flying across. That whole Delmarva Peninsula is very flat. They raise a lot of tomatoes and they raise a lot of chickens, and there’s little pine groves here and there.

These young Marine pilots, they’re whipping along there. We pop over the trees and come back down, and they popped up and come back down. The guy [farmer] said he had 5,000 chickens. That’s what he sued for, because they quit laying for three days. This helicopter had two big [Pratt & Whitney] R-2800 [Double Wasp] engines coming back with the shaft, driving one big rotor. Those engine cowlings were painted with big eyeballs. We popped over the top of that thing. Chickens ran into the wire, everywhere. We were 100 feet off the chicken yard. All you see is chickens flying in every direction.

JOHNSON: That’s one giant hawk coming after them.

WALKER: We were in trouble for that. The Chincoteague [Island] ponies—you’ve heard of those, right? They were having a pony swim, and it was crowded, so we decided we’d go and watch from a Marine Corps helicopter. These boats are lined up all the way across from Assateague Island to Chincoteague Island. They had just crowded the ponies into the water, and here we come.

Our coordinator, Jim [James W.] Usler, was a very wonderful guy. He got ripped off all the way around as far as promotions goes, for other reasons than with us. He didn’t want to go, so he was sitting in the motel, listening on the radio. The narrator said, “And the ponies are going into the water, and they’re starting to swim across. And here come two big Marine Corps helicopters with big eyeballs painted on them. The ponies are turning. They’re going back over

top of the drivers.” It had taken them a couple weeks to round up those ponies. It didn’t take us very long to spread them all over the island again. It was a great life.

I hadn’t been there very long. I got there and Howard [C. “Tick”] Lilly was still there as a pilot. Howard was—without a doubt, he was one of my heroes. Colonel [John] Stapp from the Air Force was my big hero, because he was the guy that proved that you could take 45 g’s [45 times the force of gravity] on the rocket sled at Holloman [Air Force Base, New Mexico], even though his eyeballs came out of his head doing it. We had to go through the altitude chamber once a year. This young doctor tried holding his breath, and he blew two quarter-sized holes in his lungs because they dumped the vacuum on him. Those guys were real heroes.

Howard was flying a [Douglas] DD-558[-1 Skystreak]. I think that’s what it was. I know there’s one left, because my wife and I were down at [Marine Corps Base] Quantico [Virginia]. Our number two son had graduated from college and been commissioned in the Marine Corps. His commission was held right here in the court [courtyard of the Walker home]. He was in his advanced officers’ training at Quantico, and we went down to see him. He’s tied up during the daytime, and we were out just walking around. They’ve got wonderful trails and everything.

We’re back in the woods, and all the sudden we come on to this fenced-in area, and there’s a D-558 sitting there. I think there were only three of them made. Howard died in one of them. But the mentality was that you’re doing a job. He read data off the instruments all the way down. He knew he was going in. He left Lewis shortly after I started there, to go to California.

Joe [Joseph A.] Walker—Joe was killed on the XBs [supersonic test aircraft]. He was on a [Lockheed] F-104 [Starcraft], and he found out what the wingtip vortex was on the [North

America] XB-70 [Valkyrie], and it tore the whole end off that XB-70. The poor four guys up front, they're flying along and there's not a dang thing they could do about it. They know they're going to die. It took them, oh, I guess half an hour more before they actually came down and crashed. But there was nothing they could do about it. All their controls were gone. Of course, Joe died instantly.

Bob Graham, he recruited the first guy to land on the Moon.

JOHNSON: Neil [A.] Armstrong.

WALKER: He told you that, right? Bob was a wonderful guy. He had probably the finest bunch of researchers in the world. He really did. They just all one day said, "Eh, basic research is nothing. We don't want to do that. We're just doing development," and scattered them to the winds. Don [Donald R.] Boldman was one of those guys—Dr. Robert [J.] Simoneau, Dr. Y.Y. Hsu, Steve [S. Stephen] Papell. I can't even remember all the guys' names.

I worked very closely with all those guys, because we had this Room 215 in the chem [chemistry] lab, and each one of them had a test rig in this room. They were dangerous rigs, though. Of course these were all heat transfer, so you got a lot of juice around. It wasn't unusual to have bare wires running. Safety committee never went in 215, they never went there.

But all these real researchers—Bob [Robert C.] Hendricks. Did you talk to Bob? He was out here for supper a couple months ago. His wife was a photographer. Not at the lab, but she was a photographer.

Andy [Andrew J.] Stofan—I got Andy when he was just a fresh out, and set up a rig for him to study slosh on the Centaur. Andy and I have been very, very, very close friends ever

since. He was here for a meeting, and he came to see me. His daughter, [Dr. Ellen R. Stofan], now she's a big shot in the Headquarters [NASA Chief Scientist]. She was just here on an inspection of some kind.

I got the job one day—it was shortly after the union was formed. I got a call to go to the Ad building. That wasn't unusual. They told me that they wanted me to do a survey. They said, "We want you to do a survey, Ernie, on why our engineers joined the union. What caused them? With this family relationship, why would they join the union?"

I said, "That's not my cup of tea, or training even."

They said, "Yes, but you have a good relationship with everybody, and we want you to go talk to the mechanics and the engineers, and just with everybody that you can think of." They gave me a list of some of the people. We had 1,700 people that were eligible to join the union when it was being formed. If I remember right, 160 people voted for the union.

JOHNSON: What year was that happening?

WALKER: That would be the '70s, probably sometime in the '70s. A hundred and sixty people actually voted in the election, and 55 percent of that 160 voted for a union. So less than 100 people, out of 1,700, brought the union in. All the people said, "If you didn't vote, that's a no-vote in my idea." I said, "Yes, but it didn't work that way." It was run by the Department of Labor.

I went around, and it was really interesting. One guy in particular—my division did report publishing. I'd do as much background on each person as I could without getting into trouble before I went to visit each one of these people. This guy, we only published six of his

papers worldwide. One goes to the Library of Congress, so that leaves five. One stays in our library here. Now we're down to four. And that's about all the people in the world that could even understand what this guy was writing about.

I asked him, "Why did you join the union?"

He said, "Because my boss doesn't know what I'm talking about."

I said, "Your boss is a very bright guy."

"Yes, but he doesn't understand what I'm talking about."

I said, "Yes, but your boss has 35 people, and he's supposed to get you money and keep everybody off your back so you can do research. He can't know what all 35 people are talking about."

"Well, he didn't know what I was talking about, so I joined the union."

That's the kind of mentality that I ran into everywhere I went, just stupid reasons for joining the union. Then there were a few that, if you gave them a job as pie-tasters in a pie factory, they would be unhappy. But it was an interesting program that I went through on that.

JOHNSON: Talk about that department. Like you said, your area did the printing on the reports, too. How many people did you have working under you?

WALKER: I had 42. I had 42 people, and they were 42 of the finest people in the world. It took me a while to convince some of my management. Every Wednesday afternoon at three o'clock we had a meeting in the conference room. We had two shifts, because you have to have people work at night. You can only run your [wind] tunnels—you can only get electricity for them between 11 [p.m.] and 6 [a.m.] in the morning. The people would come in early that were on the

second shift, and the people that were leaving would stay over, and everybody would go to the cafeteria. At the time the cafeteria was in ERB [Engine Research Building], where we were. Everybody would go get a coffee and come back to the conference room and sit down. I would tell them everything I knew that was going on, and everything in the programs that we were going to be having coming in.

The division had nothing to do with these programs. We had a division chief who was a complete idiot. The Peter Principle [management theory that job candidates are promoted based on current capabilities rather than suitability for new role] was exceeded many times before he became division chief. He should have been fired a long time before that. For example, he said, "All of you have to cut your budget by 20 percent, but the item number one on this list is exempt."

I said, "What's item number one?"

"Oh, that's all the magazine subscriptions for the library."

I said, "So I'm going to cut research, and you're going to keep the library subscriptions?"

"Well, we have to have those there."

I said, "What about research?"

"You send a letter out to research and tell them they have to cut back their request."

"Oh, no. No, no, I won't send out anything like that." I said, "How do you expect me to do it?"

He was just a complete idiot. Your budget, you had to do at least 10 times. "All right, try it now with 3 percent increase. Go and do it now with a 4 percent decrease. How are you going to cut it?" He had just told me in a division meeting, "Everybody has got to come up with 10 percent more work." Well, we had computerized everything. That idiot, the first time I had

in my budget for five computers—these were going to run image analyzers—he says, “You just forget about those. Editorial is going to take care of buying your computers.”

I said, “Yeah? How come?”

“You just don’t worry about it. They’ll be delivered to you.”

I said, “Okay.” He had a bunch of old Wang [Laboratories] word processors, and that’s what he sent me. They didn’t do anything, except they were word processors. That’s the kind of guy.

He told me, “We’ve got to have 10 percent more work.”

I went in to my people. By this time, I’d gotten them pretty well attuned to they’re running the place. I walked by the black-and-white film processing, and one of the real old employees, old World War II vet [veteran]—he had been at Plum Brook, and they were going to just can [fire] him out of there when they closed Plum Brook. I brought him back to Lewis, because I couldn’t get any slots. Anything is better than nothing.

I got along all right with him, but he was a rabble-rouser. We’re walking down the hallway and I hear him rabble-rousing in the black-and-white printing. All the photographers used the same machine to process their black-and-white film. I just stopped in the hallway there. He’s rambling about something, and trying to stir up trouble. One of the younger guys said, “Well, bring that up at the meeting Wednesday.” I knew then that they had taken over.

I went in and I told them, “We’ve got to have 10 percent more work.” They all go, “Ah, we can’t do that.” I’ve got a picture that was taken just about the time I told them that, downstairs. The good Lord sits up here, if you believe in him. He gave me a little bit of wisdom there, and I said, “We’ve computerized everything. All of you are working your butts off. You can’t work any harder, I know that. So we have to work smarter.” By nine o’clock the next

morning, I had three suggestions on my desk that would take care of 10 percent. Really far-out types of suggestions.

They ran the place. We had those meetings, and everything was brought up, and everybody that had a problem [was heard]. Now, this consisted of a print shop, but we had all of the copier machines. I just inherited these things, a long line. Composing, layout and stripping, motion picture, still photography, electronic photography, television, imaging. We'd come up with the imaging, logo. That was all under my bailiwick.

We would have picnics and play volleyball and steak roasts.

JOHNSON: Your group?

WALKER: My group. We invited in the people in editorial that worked directly with us all the time, and the people from the art department that worked with us on a constant basis, and anybody in the division. The division chief told me, "You can't do that. You've got to invite everybody."

I said, "No, I don't. This is my branch picnic."

He said, "No, you've got to invite everybody."

I said, "Then you have a division picnic for them. That's what you're saying." I said, "I don't want the division. A lot of the people don't work good with us. These are people that have to work together every day. They're from different departments, but you've got a friend over here, you get things done. You've got a friend over here, you get things done."

They really looked forward to them. We had four a year. We played volleyball, and they wore their big emblem sweatshirts, and they really got along great. Just was a super, super group of people. I hated to leave. I really hated to leave them.

But George [Mandel] asked me to find another job. He had just given me a highly successful [rating], because I did research work. I ran the branch during the day, then I ran a program. I had a program on aircraft icing that was running in a tunnel at night. Not getting paid for that. That kept my sanity. He had taken my goals and put them into his job description, and then of course my director [Edward A. Richley] took the goals and put them in his.

He got on my case. He said, “You made my secretary cry.” She used to work in the photo lab. I said, “How did I make your secretary cry?”

“You made her cry over Louie [Siman].”

I said, “Now wait a minute. I remember that day very well, and she wasn’t crying. She was just [angry]. That’s all it was.”

He said, “You did it.”

I said, “No. Louie was being forced to leave, to retire.” I said, “We had coffee and cake for him, because he worked with us. He worked for me. He was the forms manager.” That was another thing that had nothing to do with me, but I had forms managers. Each one of these guys they had trouble with, they [gave to me].

I went to work one morning. I’d been on vacation to Canada for two weeks with the family. I walk in, and the boss says—I don’t want to mention the name—“So-and-so is going to be working for you.”

I said, “He doesn’t have anything to do with me.” I was just motion picture and scientific photography at that time. He was a still photographer. I said, “Why are you giving him to me?”

He said, “We had some problems with him, and you did so well with those composing people, straightening them up.” He said, “We want you to take him.”

I said, “Where’s he going to be?”

“He’s on leave without pay right now.”

I said, “What’s he on leave without pay for?”

“Trying to strangle his previous supervisor.”

I said, “Why wasn’t he fired?”

“We can’t fire him for that.”

That’s how I inherited these people. But he worked good for me. One day, he got all blustered up and he starts pulling his arm up. He gets up like this [demonstrates], and I said, “John, just think for a minute.” I said, “I spent four years in the military, three years in the Korean War. They didn’t teach me to fight. All they taught me was how to kill.” I said, “What time today did you decide this was going to be your last day on this earth?” He put his arm down, and that was the end of that.

It wasn’t too long after that, I’m sitting there, maybe 6:30 or 7:00 p.m., because I’m trying to catch up on some work. Everybody’s gone. Phone rings. I thought, “I’m not answering the phone,” but I start thinking, “It could be one of the tunnels and they’ve got a problem. I better answer it.” So I pick it up. It’s Carolyn Sudless, union president. She said, “I want you to”—what did they call it when they terminated a guy—“I want you to RIF [reduction in force] so-and-so.”

I said, “Why?”

“He’s disrupting our union meetings.”

I said, “He’s one of your union stewards. He should be allowed to disrupt your meetings.”

She said, “No, you’ve got to RIF him.”

I said, “I’m not. He and I get along good. In fact, I have some people request him, because he’s very talented. Temperamental, but talented.”

She said, “You’ve got to do it.”

I said, “No, I’m not going to do it.”

He was gone in two weeks. The union got rid of him. That was just the stupidity of the thing.

JOHNSON: That was interesting, because we’ve heard that before, that the atmosphere at the lab in the ’40s and ’50s, and with NACA, was the research, and it was more—the freedom to fail. Then things changed as it moved toward development.

WALKER: A big thing that changed was—I was a member of the IAS, Institute of [the] Aerospace Sciences, back in the ’50s. I never was an ARS member, American Rocket Society. I was involved, but not to the extent of aeronautics. Then when they formed up and became the AIAA [American Institute of Aeronautics and Astronautics]—I’m a senior member of the AIAA now.

We used to have a big propulsion conference every year in Cleveland, because this was the propulsion Center. We had this big secret propulsion conference, total lockdown classification. You had the CID [U.S. Army Criminal Investigation Command] there, the OSI [CIA Office of Scientific Intelligence], and the FBI [Federal Bureau of Investigation], and

they're all sitting there with their little monitors in the conference rooms. Everybody would come there and they would want the information from NACA. When we became NASA we still had meetings, but all they commonly wanted was a handout of money.

I remember going down to do my physiological—I think that's what they called it—training down at Wright-Pat [Wright-Patterson Air Force Base, Ohio]. Had to do that every two years. Flew down there in a C-47. There were two or three of us that had to be re-certified. The pilot said, "You guys go ahead. We're going to mess around." We come out to get in the airplane, and it's packed. You can't hardly get in that airplane. There's drums of oil and grease and aircraft parts and everything under the sun packed into that airplane. I said, "What the hell did you guys do, go scrounging?"

Bill Swann was our chief pilot, and he said, "Guy in charge of procurement over here, I know him real well, and he told me, 'Whatever you want, just write up the slip and we'll give it to you.'" [So they loaded the airplane.]

[When I started at the Lab,] we went to get my upgraded flight physical. I had been taken off flight status in the Air Force because I had too big a shell go through my airplane. So when I came here and I had to go and have a physical, I went to an old doctor out in the country. He said, "You did this. Okay, you're all fine," and I'm on flying status again. But then, shortly after that, I had to go down [to Youngstown, Ohio, Naval Reserve Center and take a real physical].

We did everything with the Navy, because Eb [William V.] Gough [Jr.], was our chief pilot at that time, and Eb was Navy. I don't know if you knew it or not, but he was shot down at [the 1941 attack on] Pearl Harbor [naval base]. He went out in a [Consolidated] PBY [Catalina amphibious aircraft] after the Japanese fleet, and he was floating around in the Pacific [Ocean] for quite a while before he was finally found and picked up and brought back. Eb and his brother

both came up here from Langley. I used to get stuck with him. We had to share rooms, because our per diem was only seven dollars a day, and that was your food plus lodging.

I remember one time, on one program, it was Eb Gough, Jack [John H.] Enders—did you talk to Cliff Crabb?

JOHNSON: No.

WALKER: He worked on one of the first analytical computers, back in the mid-'50s, and then he left and went to work for TRW [Thompson Ramo Wooldridge, Inc.]. Then when we became NASA, Enders said, "Hey, we need another pilot, and this guy is a good engineer. He used to work here, but he's going to go and get a job somewhere else. Hurry up." So we hired him. He had never flown anything except a twin-engine Beechcraft [aircraft]. That was the biggest airplane he had flown.

His first day of work, he left with us, the recovery crew, and we didn't come back for 17 days. You go to work your first day on the job, and you're gone for 17 days? He got in quite a bit of flying time during the 17 days. We had one big room in a motel. There were three pilots, a crew chief, our coordinator, Jim Usller, myself, and my assistant, all sharing one room.

JOHNSON: That's quite a crowd.

WALKER: Roll-out beds. I remember one time we thought we had beat the system, because they had just got the Chincoteague Naval Air Station. NASA had just taken that over. We had a bachelors office quarters, so we went in there. Boy, we went down there and bunked in. Of

course, they were just GI [Government Issue] bunks, two bunks to a room, but it was two dollars a day. That gets us five dollars to eat on.

We got back from that, and Esther Wagner was the money person. You've heard of the Farm House [Administrative Services Building]? The Farm House was right across from the apron of the airport. Her office was upstairs in the Farm House. The first thing, we pull over to the gas pumps and fill up the airplane, then put it in the barn. You could start counting, and by 20, Ester would be there. We always carried a couple thousand dollars on the airplane in case you had to buy fuel or do something. When we would come back from these trips, there wasn't a cent in there. There was nothing but IOUs in there. You couldn't draw ahead. You could only submit your expenses after the fact, and it would take them up to six months to pay you.

I flew into New York City to do a job out in Long Island, so I [went to] rent a car, drive out to Eatons Neck Coast Guard Station, get a cutter [boat] to take me out to this island where I was going to shoot my job. Boy, I'm stopped as soon as I hit the car rental place. The guy says, "I won't take a government credit card." He said, "I'll take yours, but I won't take a government card. They're too slow in paying. If you want a car, you've got to pay for it yourself." So I had to put it on my credit card. And that was not unusual.

I remember they called me up and they wanted me to go out to California, Mount Lassen, to do a story on solar-powered fire stations. They said, "We want you to go tomorrow morning." I went over, and finance was raking up change to come up with 80 bucks, that's all. My first stop was going to be in St. Louis [Missouri]. Then from St. Louis I had to go to Albuquerque [New Mexico] and rent a car there, and drive out into the boondocks. My instructions were, "Go to Las Vegas, New Mexico, and you turn right. You go down the road six miles, and there's a mailbox. Turn left and go two miles back into the country, and that's where the solar-powered

station is.” Well, they were wrong. The mailbox wasn’t six miles. It was 10 miles, but it was the first mailbox I came to.

I did that job, and then I had to stay overnight there, because I just couldn’t get any pictures. They wanted a picture to go in the statehouse in [the Capital of] New Mexico, along with all the other stuff. I stayed overnight and got up real early the next morning. Out in the boonies, you talk about in the boonies. I stopped at this first motel that I found, because I’m going to go back out here before sunrise. I asked the lady, “Do you take government rates?”

She said, “No.”

I said, “How much are your rooms?”

“Do you want a shower or not?”

I said, “I’d like a shower.” Then I said, “I’d like a wake-up call.”

“I go to bed.” She hands me a wind-up alarm clock.

I was up and I was out there, and got a real nice shot of the sunrise on these solar panels and all.

That did the job, and I left there. Flew to Denver [Colorado], changed planes, went to Reno [Nevada]. I rented a car that night and drove across the desert and got to Mount Lassen. I wondered why I’m driving across here and I don’t see no lights, no nothing. About 10:00 I got to Susanville, California. My time clock got screwed up, because I had got up and I was an hour early. My mental clock was off. So I went down and got a haircut and talked to some of the local people, because I’m going to take pictures on top of Mount Lassen.

I went to the Department of Forestry. The guy—it’s October—said, “Here’s a key. This will open any building in the forest.” He said, “If it starts snowing, get off the mountain, because we don’t plow them until June.” I didn’t have anybody, but I found my way. I stopped on the

way there. I can see this fire station way up on the mountain. I get out and I get my camera, and I get ready to put my tripod down. “Hmm, those are mountain lion tracks going across there, isn’t it?” Sand is still falling in the holes, too. I’m getting lined up, because I’m thinking, “How the hell?” I don’t have anybody to use for stand-ins or anything.

All of the sudden, I’m looking through the camera and this voice from behind me says, “You having trouble?” About jumped out of my drawers. Turned around, and there was this real old cowboy, just leathery face. He’s got chaps on. Real Roman-nose, horse. Just a typical, typical cowboy. I said, “No, I’m just trying to get a picture of that fire tower up there.”

He said, “Yes, that looks like it would be a pretty good picture.”

I said, “What are you doing?”

He said, “I’m rounding up cows, because we’ve got to get out of here because it’s going to start snowing pretty soon.”

I did go up there, and I’m trying to figure out, “What am I going to do to make something really outstanding out of this,” because I’m shooting for movie release and still photographs, both. I see this fire truck come roaring, and it’s got two young ladies on it. They’re right at the end of their contract in the fire service for a year. Got to talking to them, and they posed for me, and I used them in several shots around the place. They invited me over to their place after supper. Their husbands had gone to Las Vegas to get something, and they were going to be back for supper. They said, “Come on over and have supper with us.”

It was really a learning experience. These girls, they’re young women, but GS [General Schedule pay grade]-3s for firefighters, and they thought that was great, because it’s the poorest county in California. They said, “This is great. It’s a really, really good job.”

I said, “What’s so good about it?”

“You get paper sleeping bags free, and you get all the fire-line frisbees you want.”

I said, “What’s a fire-line frisbee?”

“Peanut butter and jelly sandwiches.”

Everybody drives around—I got up in the morning that day, and all these trucks are parked diagonally into Susanville. Every one of them’s got a dog in the back, and the dogs don’t get out. The dogs play king of the mountain. Some of the dogs could get up on top of the cab, and they’d be sitting up there looking down at the other dogs.

I have lived an interesting life.

JOHNSON: It does sound like you’ve lived a very interesting life. If you don’t mind, I’m going to pause for a second. [pause in audio]

WALKER: Joe [Joseph S.] Algranti—I hadn’t been there very long, and he called me up and he said, “Ernie, grab your camera and come over to the hangar.” I asked him on the phone, “What are we photographing?”

“You just grab a camera and get over here. We’ve got some photographing to do.”

I said, “What do I need?”

He said, “Just anything.” So I grabbed a [Graflex] Speed Graphic and went over. We changed our clothes and he said, “Just leave your camera here in the locker room.”

I said, “What are we doing?”

He said, “We’re going to fly airplanes.”

We had a whole bunch of airplanes that were being modified. They sit when they're being worked on, major changes made in them. In doing that, the seals dry out. So every once in a while you've got to operate them.

JOHNSON: It's like watches. You need to wind them every once in a while to keep them working.

WALKER: Yup, and you had to fly these airplanes. We started out in the morning. I don't remember—I think an [Lockheed] F-94 [Starfire]. Then we had a [Martin] B-57B [Canberra]. I remember it was a real nice day and we were up at 55,000 feet over Cleveland, and you could look out this way and you could see all the way to Toledo [Ohio]. This way, you could see to Buffalo [New York]. The lake [Lake Erie] is 240 miles long there. We flew around that morning a lot, and we called back and told them to get us a pint of milk and a chicken salad sandwich. They had that when we landed, and they had another airplane ready. We climbed into another airplane, and we flew airplanes all day.

That was Algranti.

JOHNSON: A lot of special memories.

WALKER: Oh, lots of them. I was in the flight group there in the hangar. I worked my butt off. The first Mercury capsule was built here. The way they had designed it, the mechanics are putting this first one together, so they figure out how to run the plumbing around for the attitude control jets and the wiring, and I'd take a photograph of it. The lab would make a print and get it

over to design engineering, and they would take my print and start drawing on the final prints, which were going to go to McDonnell [Aircraft Corp.], because they manufactured all of them.

I was involved in the retrorockets, the escape rockets. That's the only time the Altitude Wind Tunnel was ever supersonic, when we fired that escape rocket inside there. Went around a whole loop, and when it went through the test section—that shockwave went through the test section, it was supersonic. Working like crazy, and I was the only guy that wasn't getting paid overtime. I was getting comp [compensatory] time, but—it's funny how things go.

When George told me that I should—I said, “What are you really getting at, George?”

“You're just too independent.”

I said, “What do you want me to do? Find another job?”

He said, “Yes, I'd like that.” I was devastated, I really was.

But I thought about it a little bit, I got a printout of my retirement. I had 38.5 years. I get 70 percent of my pay without even walking out the door, and I didn't have to pay city income tax on it. I didn't have to pay for the insurance anymore, all this stuff. I said, man, I can work a half-day at McDonald's [fast food restaurant] and make more money than I'm making here.

I thought, “Well, I've got to get somebody good in here to take my place.” There was a guy that was in the satellite communication section that was really good, and we were going more and more into electronic television and everything else. I called the director up, Ed Richley, and I said, “Ed, I need to talk to you.”

He said, “Come on over.” I went over. I told him that I was leaving in April. This was in December.

I said, “I'm leaving in April.”

He said, “No, you're not.”

I said, "Yes, I'm leaving in April."

He said, "Well, you can't."

I said, "George asked me to find another job, and I don't feel like finding another job here."

He said, "You don't have to go." He said, "I'll just transfer the whole photo unit over under me directly. You won't be under his division anymore."

I said, "No, Ed, I got a printout."

He said, "What do you mean?"

I said, "I got a printout, and I'm working for nothing."

He said, "You're going to stay here and that's it." He's going on and on.

About four, five times, I said, "But I got a printout. I'm going." First of January, here comes Ed into the photo lab. I said, "What do you need, Ed?"

He said, "I need a portrait taken."

I said, "Okay. What did you do, get an award?"

He said, "No, I got a printout." He left before I did. He sent me a letter from China for my retirement, saying, "I beat you."

JOHNSON: That's funny. Did you all do everything, including portraits for people, all the way to the testing and everything in between?

WALKER: Everything from building up super cameras to—we could photograph up to a million and a half pictures a second. A million and a half pictures a second.

JOHNSON: How did you get to that point? Was that something that you as a group kept developing? It's not something you could just go buy off the shelf.

WALKER: Back when [Beckman] Whitney [model 192] made that camera, the thing weighed a ton and a half or something like that. We started out using it for impact studies for fuel tanks. They were going to build fuel tanks out of titanium. That sounds good, doesn't it? Lightweight and strong. Then Bob [Robert] Dengler came in and he said, "Ernie, I'm going to do some testing on some titanium tanks." What he did was take a big piece of pipe, and the guys made him a ring, and he could screw a piece a pipe on the end of this. The other end was sealed off, and fill it up with liquid oxygen. We wanted a cryogenic condition to test them.

Then he had the shop cut them out, these circles, and he could take this ring and screw it right onto his test section, all different materials. We started testing stainless [steel] and different things. We were firing high-velocity pellets into them. Here comes the titanium, and boy, you never saw anything blow up like that. It's impact sensitive under cryogenic conditions. It just *phoo*—flying in every direction. We used it for looking at tanks and looking at micro-meteorite particles. Then you had it in your inventory, and somebody would come in and you'd say, "Yes, I can take care of that for you."

JOHNSON: How much equipment do you think was in your inventory at any given time?

WALKER: I had over 100 instrumentation cameras. I left, and the guy that relieved me was an art-type photographer. He was good, really good. George kept telling him, "You've got too much inventory. You've got to get rid of it." So he started excessing really good, studio-grade

Mitchell [Camera Corporation motion picture] cameras, and all this stuff was going out on excess.

Then George's other big thing was—and this is the saddest thing of all. Headquarters sent down and said, "You've got to have a paper drive and get rid of paper. Too much paper. Too many file cabinets being bought. You've got to get rid of paper." At Plum Brook we had all of these big munitions bunkers, because that was a munitions manufacturing plant in World War II. So we had all this storage space, 35 or 40 of these big bunkers. They would finish a program, or lose funding, and they would pack up everything, all of the hardware and all the paper, all the results, ship it up and set it in a bunker.

George started sending out letters saying, "If you're not going to use it in six months, you have to get rid of it." Everything went. He would put in his monthly report, "I got rid of so many boxes of documents." Hey, the state of Ohio does a better job than that. Everything has to go to the historical society first. But this was just, burn it. Test rigs, junk them.

JOHNSON: That's interesting. We're a little limited in our time because we have another interview, so if you want to look at some of those [photos].

WALKER: This is some of my work [demonstrates]. This was what I was doing by myself, not getting paid for.

JOHNSON: This is the icing that you were talking about?

WALKER: Yes. The reason was that Bill, Dr. [William] Olsen, could not get tunnel time, because he had a personality problem with the guys. I was doing a consultant job for OARDC, the Ohio Agriculture Research and Development Center, on how to spray cabbage plants. I got all these jobs because these camera manufacturers—they sold the research lab a camera, and then they said, “We need some help with this.” They said, “Call Ernie Walker.” I’ve got gobs of letters down there. They’d call me and I’d say, “Write a letter to the director.” They’d write a letter to the director, and the director then would send it over to me. “Ernie, take care of this.”

I was photographing these, and they had a lighting problem. They were wilting the cabbage leaves. I fixed them up with a lighting system. I said, “You got a carousel projector?” They said, “Well, yes.” I said, “Give me that.” So I took it apart, and I took the filters and all of the insides out of it, and I made a light for them. What it does—all of the heat goes out the back of the light, because you’ve got a reflector that reflects light, and it transmits infrared. So the heat goes out the back and the light goes forward. Then you take the filters out of the front of it, and they reflect infrared and transmit light, just the opposite. So you’ve still got all the heat going one direction and all the light going in the other. I had built several of those things before. So I built them one, and boy, they just really thought that was great.

I was looking at some of the films I’d shot for them of the droplets coalescing, and Bill walked in my projection room. He said, “That’s exactly what I think is happening in icing.” We got to talking about it, and he said, “Let’s do an icing project. Let’s try.”

I said, “Well, okay.” We built our fixture, so they take off one panel in the icing tunnel off the roof, bolt our fixture in. It would take 20 minutes, and we could run. Whoever had rented the ice tunnel, if they couldn’t be ready to run by 3:00, the mechanics would call and say,

“Hey Ernie, you want to run tonight?” and we’d run. Then they’d pull out my fixture, put the thing back in, and the tunnel’s back ready to go for the contractor.

JOHNSON: Ready to go for the next person.

WALKER: Because I had friends.

JOHNSON: It was those relationships that you’ve talked about since the beginning.

WALKER: The relationships were everything. Everything was relationships.

In the last portion of this interview, Mr. Walker is referring to photographs in his personal collection.

This was what the old photo lab was. We didn’t have a secretary for a long time. Our secretary died of cancer. We finally got a secretary. My wife was in the computer division. On the way home from work that day, I told her, “Hey, we got a secretary.”

She said, “What’s her name?”

I said, “Grace Toddy.”

She said, “You stay away from her.”

That’s Grace Toddy, and that was Art Laufman our sound man. See, that was some—

JOHNSON: Some of the personality coming out there.

WALKER: Some of the personality coming out.

JOHNSON: Oh, that's interesting. Is this the local paper?

WALKER: It was the Elyria [Ohio] paper, the *Chronicle-Telegram*. That was my private shop where I could modify and do things, make things work different. That's the zero-g [gravity] group. This is where I did a lot of work for the British government and the German government. A lot of top-secret work was done there. Nobody knew about it except the director of the lab, the head of security, and then this group of people. The head of security, because he had to transport our film by courier to have it done all the time. That was a great bunch of guys. This was one of my co-ops [cooperative education student]. Really, really an outstanding co-op.

That's inside the Zero-G [Facility]. You're 550 feet in the air, and I'm using one of my girls to help me. We were mounting cameras along this. I designed this thing to be able to photograph objects falling 500 feet. Actually, we could fire them from bottom up, photograph them going up. Then they would turn around and fall back down, and you'd get 10 seconds of zero-g time, until Houston shut us down. They said they wanted to do all this work on the [Space] Shuttle, and of course then they couldn't get the Shuttle to fly. We were shut down for probably two years. The facility was shut down, from politics from Headquarters. We went back into business again. We would open it up and do work for the Department of Defense.

Getting an award from one of the Directors. This was from the Director. I don't know what this is. She's from editorial. She worked for me in composing, she worked for me in the print shop, and that was my division chief, who was an artist at the time. This is my old—

JOHNSON: Air Force group.

WALKER: Yes, that's my [Korean] War II stuff. This was my photo class. You learned to study there.

JOHNSON: I bet you did.

WALKER: Once a month, you had to do KP [kitchen patrol]. KP started at 2:00 in the morning, and you didn't get off until 9:00 at night. Then they would tell you, "Wash back three times, and that's what you're going to do for the rest of your career." Wash back can be if your mother dies and you go home for a funeral, if you get appendicitis and you're in a hospital, or you fail one phase test—wash back three times.

JOHNSON: It's KP forever.

WALKER: Yes, and believe me, you studied. This group of guys studied like crazy.

JOHNSON: Yes, because you couldn't really control those other things, but you could control how much you learned.

WALKER: I was in politics for several years, too. This was one of my co-op students. We were doing a job for the Navy on torpedoes. There's Andy Stofan and his wife. This was the guy that took the job that I turned down, and he wound up as my deputy.

This one here—my boss really hated this. It went in a little news [article] on the same page, at the same time. He got his recognition award for a federal executive order, and I was elected as chairman of the Society of Motion Picture and Television Engineers. His big point in time, and it was spoiled. Everybody in the lab said, "Boy Ernie, you really faked him out on that one." I didn't have nothing to do with that.

This photograph is showing how you can use one type of lens and change it for all these different kinds of cameras. We made up different kinds of adapters for it, so that you could use them.

JOHNSON: So you worked with the machinists to make those adapters, or were those off-the-shelf adapters?

WALKER: No, we just had them made in the machine shop. Called them up. I won a presidential award there.

JOHNSON: Oh, that's your paper that was in the book?

WALKER: This is one of them. This was another paper that was given. That's the third conference, reducing temperature in high-speed photography. This was one of my co-op

students. This is multi-mirror there. This is performance of multi-mirror quartz line lamps in high-pressure environments. Boy, they can blow up big.

That's some of the stuff I did. I don't know what all this stuff is. There's some from NASA. This is one of our picnics. That's the icing research group. But you see, you worked together. That's Bill Swann. He was head of flight.

I did a lot of medical work. Worked with Dr. Beck starting in 1955, doing heart operations, before we had a heart-lung machine, and then all the way through. This is glaucoma surgery, glaucoma and cataract surgery. One of my most prized commendation letters is from President [Ronald W.] Reagan.

JOHNSON: Oh, really?

WALKER: Yes, on my retirement. The group wrote him and got him to send me a letter.

JOHNSON: Not everyone that retires gets a letter from the president. That's for sure.

WALKER: No. That's him and Nancy [D. Reagan] wishing me the best.

JOHNSON: That's so nice.

[End of interview]