Ms. Virginia Whitehead

Oral History

Kennedy Space Center

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MICHAEL HADDAD: My name's Michael Haddad, with Dan Keenan. Talking today, the 13th of February, 2004, with Virginia Whitehead at Kennedy Space Center. Virginia, we'd like to maybe start out with a few things – where you grew up, where you went to school.

VIRGINIA WHITEHEAD: I grew up in New England, in Massachusetts. I used to walk all over the place, but I went to school in New England, because they had a better astronomy department and it was the best deal I got.

HADDAD: So your first love was astronomy?

WHITEHEAD: Yeah, mm hmm, I decided that when I was about 10 years old.

HADDAD: Oh, excellent, and then from there led you to – where did you go to school at?

WHITEHEAD: Well, I went to school at Smith College. I applied at several places and got great scholarships but they didn't have as good an astronomy department.

HADDAD: O.K. And that was in New England?

WHITEHEAD: Yes. In Massachusetts. Yeah, I debated about MIT and Georgia Tech, but I turned them down.

HADDAD. OK. And then once you got out of college, what was your first job. I understand you've worked with some very popular people.

WHITEHEAD: I had planned to go into astronomy right away but I had a little brother who was just coming home from the war so I got a job on the east coast at Johns Hopkins Applied Physics lab, which was really clever because that got me into the missile business. That's where it was starting. I was reducing data on the missiles that they were launching down at the Wallops area, and I worked with Van Allen and Van Allen's future wife and went to their wedding. Van Allen is the guy that the Van Allen Belt is named after. He was a physicist there.

HADDAD: So you worked with Van Allen?

WHITEHEAD: Yeah. That was a great place to work.

HADDAD: Excellent. Excellent. Then I understand from there you moved on to … was it White Sands.

WHITEHEAD: No. I went into astronomy, which I'd planned to do. I went to California and lived on a mountaintop at Lick Observatory for a couple years and worked on the 36-inch telescope there.

HADDAD: Oh. Ok.

WHITEHEAD: So I took a leave of absence after two years and haven't been back. I don't think I'll tell you why I took the leave of absence – maybe I will. Two guys thought I was engaged to them. So, I took a temporary leave of absence.

HADDAD: So you cleared that up and then went back to Lick?

WHITEHEAD: No, I never did get back out there. I got into other things.

HADDAD: O.K. well what happened after that? What was the next step?

WHITEHEAD: Well then I went to Aberdeen and still in the missile business and still reducing data and that was real fun and I took about eight or nine months there and discovered they had an opening at White Sands for someone doing the kind of work I was doing. So I moved out into White Sands, New Mexico, and reduced data there, and they were just bringing the early V-2s in. The war was over and they were just beginning to launch V-2s. So I got to reduce data on the V-2s. And all the rules they made at White Sands were based on what I did. If I did it, they had to make a rule against it, was the way it worked.

HADDAD: Against it? So you worked with some very famous people at White Sands?

WHITEHEAD: Oh yeah. Dr. Debus and Von Braun and Karl Sendler and all those people used to come running into my office and grab the film out of my hands. We did everything. When I was out there it was all optical data. Telemetry was just getting started. And they would just grab that film out of my hands to look at it and I would tell them how fast it was moving and if it was rolling or turning or that sort of thing.

HADDAD: How did … I understand there were some basic ways that you were able to accomplish that?

WHITEHEAD: Well, I just looked at the film and noted how fast the V-2 turned the tail paint patter, based on, I could pick up the phone and call and they'd paint the thing over for me on the pad. When I'd see the same paint pattern coming around that was one revolution. We did things like that. They were just getting started with radar and telemetry.

HADDAD: Then you physically would just stand out there with, what, a pair of binoculars or something?

WHITEHEAD: Oh no. We were taking pictures and we also had cameras with azimuth and elevation angles so we could compute the trajectory. So I did that – all the preliminary data and then we sent it in to the college in Las Cruces to put the whole thing together.

HADDAD: Excellent. I understand out there while you were working in White Sands that you would, sometimes to get away because of working all day you would travel up in the mountains?

WHITEHEAD: Oh yeah, we did a lot of hiking out there, and it was a great place to go.

HADDAD: You became friends with some of the animals up there?

WHITEHEAD: Well, all the animals were my friends. I used to save my spare change and buy steak at the little store on base and feed the mountain lions.

HADDAD: Feed the mountain lions?

WHITEHEAD: And they liked, I'd put it down and run or something, depending on what was going on, but, they would eat the steak I bought for them.

HADDAD: Amazing. Well, at that time, there weren't a lot of women that were involved in that aspect of the space program. How was that for you?

WHITEHEAD: Well I was for a while about the only one there, but I started a data reduction group and had about a hundred people working for me, and there were a surprising number of girls that came in, you know, that had math majors. And I had a lot of guys working for me too, but, I used to never sign my name when I was asking them to come (sign it all the way – my first name) so they wouldn't know I was female, in case they had any prejudices against working for a female. And then, when we'd show 'em around, they'd usually take the job, 'cause we had a lot of fun.

HADDAD: I understand you knew some other famous females -- who became famous later on -- as far as the president of a certain organization – the NOW organization I understand?

WHITEHEAD: The president of what?

HADDAD: Of the NOW organization?

WHITEHEAD: Oh, well yeah, I went to college a couple years behind her [Betty Friedan]. She was in my house and when she later on founded the NOW group – National Organization of Women – she thought we were prejudiced against, and I thought she was rather crazy, because I always figured it was a real

advantage to be female ‘cause the guys would do anything for you. Course at White Sands, when I first went there, I was the only girl except for the secretaries. And I just thought, well most girls didn’t major in those things … in those days.

HADDAD: Did you hold any other jobs while you were out there, or does that focus mostly on what you did with Von Braun and Debus, was there anything else that you did?

WHITEHEAD: Well, I did all the data reduction for all the missiles, you know, there were DOD missions and various missions. In fact, early on, the people that later turned into JPL were out there doing great work. They’d been around for a long while. And the Nike people were Douglas people, so some of the same people that are still in the business were out there and I was reducing data for them. There was one girl that worked for the Douglas people out there too, that came along about that same time. But that was a fun place and we used to go out and watch the launches right outside the blockhouse until they made a rule against us being out there when they blew up over our heads.

HADDAD: Before you got to Kennedy, what was maybe one of the strangest jobs that you had? Or was there a strangest job?

WHITEHEAD: Strangest job? Well I did … I became a writer for a little while and took off on a boat when I got married and was trying to sell articles and the only thing I was selling was the true adventure stories of what we were doing. I wasn’t selling my fiction. They liked my true adventures better. So I did that and then we came in here, and, I had been sending these stories out to quite a few people I knew and some of those people from Alamagordo New Mexico had moved here and started into data reduction. So when I got to the dock in Eau Gallie, I had a job offer to come out and do data reduction here.

HADDAD: They were waiting for you?

WHITEHEAD: The guy wanted to start his own business and he wanted me to take over.

HADDAD: So that’s what pretty much got you to the area?

WHITEHEAD: That’s, well, we came in here, I was intending to look for a job, but I didn’t have to look. I just got hired right on the spot. He founded Soroban Engineering after that. He stayed there for a while.

HADDAD: So that began your career at Kennedy Space Center?

WHITEHEAD: Well, that was down at Patrick [Air Force Base]. That was before NASA. So I was down there doing the same kind of thing, the big data reduction

group, reducing data and the Germans showed up there, of course. The same Germans I knew at White Sands were based at Marshall then and, the same people were coming in getting data from me when I was down at Patrick.

HADDAD: So a lot of the people you'd worked with at different centers and locations all over the country …?

WHITEHEAD: Dr. Debus was down there and Karl Sendler and all those same people were down there getting the same data from me. And we had our own big data reduction group. We were doing it all then.

HADDAD: So then after Patrick, what was the next thing?

WHITEHEAD: Well I took off on the boat again, and then we did that for a little while and then I stayed home for a while and raised kids, and then taught school.

HADDAD: So you were a teacher in the local area here?

WHITEHEAD: Yeah I taught at Cocoa Beach High the year it opened. They were desperate for teachers, you know, because people were pouring in here. It was easy to get a job if you had math and science degrees.

HADDAD: So they were gearing up for the space program?

WHITEHEAD: Yeah, and they didn't have teachers. You know, you could walk in the door the day before school started and say here I am and they'd hire you. So that's the way it was in the early days around here. Yeah I taught at a lot of the local schools 'cause I didn't want to sign for a full-time job. I'd work for a year at a time. I taught at a couple junior highs. I got to know all the kids who came out here to work eventually.

HADDAD: Incredible. Incredible. And so then the next step after that then you ended up coming back?

WHITEHEAD: Yeah, well, the funny thing was the head of personnel out here was telling me my experience was too ancient when I first applied. But all of a sudden I think Betty Freidan did me a favor because they were trying to get women hired. They thought we'd been discriminated against, so when I applied this time they grabbed me up quickly. So I came out here to work.

HADDAD: What was your first job here at Kennedy?

WHITEHEAD: The first job I had was … in the computer field. They were just starting into the computer business and I was doing a little programming. And then I got into assigning space, which was a great job because you got to see the whole center and knew where all the space was. Later on when I worked with

customers I knew what I could get and I knew everybody out there and they would have to do something for me, ‘cause ..

HADDAD: They wanted their space?

WHITEHEAD: Yeah – to get what I wanted the people that had the space owed me something so I could get things done for my customers. So that was really a super job.

HADDAD: So you had a good look at the infrastructure...

WHITEHEAD: I assigned space all over Kennedy Space Center, on the Cape side and over here. So I got to know where everything was going on and what it was and who did it.

HADDAD: And then, I guess just continuing on after that sort of go through a progression maybe of the next step?

WHITEHEAD: Well, I heard about this job of an LSSM. They were launching missiles mainly across the river in those days. But I applied for that and got it.

HADDAD: And LSSM stood for?

WHITEHEAD: Launch Site Support Manager. So I did that and started supporting customers who were launching their payloads here, getting them what they needed.

HADDAD: So these were the payloads that would go sit on top of a booster rocket, for example, different types of booster rockets?

WHITEHEAD: Yeah, I started with a few across the river and then I did some of the early missions over here. I did the GAS cans on STS-5 with, again, some of the Germans. I filled in for somebody who wasn’t available. And that was a lot of fun.

HADDAD: What were some of those that you worked on, some of those GAS Cans? We’ll focus on those for right now - some of the unique GAS Cans, some of the unique experiences that dealt with when you were working with the GAS program.

WHITEHEAD: Yeah, well I was getting them through all the safety wickets and everything. They didn’t have a very fancy program. I was doing all the safety packages in the early days when I worked with them ‘cause they hadn’t done them. That simplified life getting them through here.

HADDAD: The GAS program was … stood for?

WHITEHEAD: They were just starting then. I only filled in for somebody. I wasn't really doing it. It was the first job I had on this side of the river, doing a couple of those.

HADDAD: And those Getaway Specials – they were just small containers at that point, right?

WHITEHEAD: Yeah, well they were the normal cans. They started those early - the five-foot ones that they have now.

HADDAD: And then some of the other work that you did as Launch Site Support Manager?

WHITEHEAD: Well then I inherited telescope – Hubble Space Telescope. And I found out that they wanted to stay clean, so my next job was cleaning up Kennedy Space Center. And actually it came at a perfect time because we were having a down time here and there was not much work going on, so I think I was keeping Kennedy Space Center employed by all the things I was changing to keep Hubble clean. And … everybody loved it.

HADDAD: Like what were some of the things that you had to do?

WHITEHEAD: I was changing out materials, you know, I'd go to the PCR – Payload Change-out Room -- and take some things out that we didn't think should be there. We changed all the oils in all the facilities so they wouldn't outgas. We had to get a special kind of oil. Everything had to be very cleanable and not off gas. That sort of thing. I even got down in the tunnel of the O&C doing something down there 'cause somebody was going to keep experiments down there.

HADDAD: So you had to work with the Hubble Program with the local facility people?

WHITEHEAD: Yeah I started with them very early on, so that's when we got things to change, and, of course we had a lot of people here locally that got in. It got a lot more complicated as we went on. I built the battery lab out in the VAB, for their batteries, which, again, was one of the things that was keeping people employed. I felt like Mr. Roosevelt. I was the Kennedy WPA. So, we kept the economy going around here, during that time.

HADDAD: What other kind of things did you have to do to support Hubble? The battery lab, the cleanliness of the facilities …

WHITEHEAD: Well, in the battery lab we had to check things out and test all their equipment. We also set up an antenna down by the Vertical Processing Facility

and did a lot of this testing. They claimed this was a ship and shoot payload. I've never had such a long ship and shoot payload because we had a test program that went on for several years communicating with stations all over the world, basically. But definitely all over the country. So we did a lot of testing and brought hardware in here and did that testing.

HADDAD: So literally the antenna you set up here was used to test communications between literally places all over the world.

WHITEHEAD: Yeah we did a lot between California and here and then the customers would come in. The Goddard people came in, and we had a trailer with an antenna down there too at the VPF and had lots and lots of people here.

HADDAD: And you were the main focal point pretty much between Kennedy Space Center and Hubble?

WHITEHEAD: Yeah, I got everything done for them because the Launch Site Support Manger provides everything they need and keeps them out of trouble. I got into trouble once in a while, but they didn't.

HADDAD: And then some of the other things, once Hubble was here you had to do testing and then was there anything else unique that maybe came up during …. There was a lot interest in Hubble. I'm just trying to get some background on all the things that had to occur before Hubble was actually able to get launched on the shuttle.

WHITEHEAD: It was mainly that huge testing program and all the testing for contamination. We had a lot of people here in our payload contractor group that helped me with keeping things clean also and doing all that testing. We were putting out samples, particularly NVR [Non-volitile Residue] samples and collecting gas samples and analyzing them. We did a lot of that. We had a whole program going to analyze all that data.

HADDAD: You were pretty much the main focal point for getting Hubble ready to launch?

WHITEHEAD: That's what we did. Whatever I dreamed up that we needed to do, we would somehow do it.

HADDAD: Were there any other major payloads here at the space center that you worked on?

WHITEHEAD: Yes, later on. You know, Hubble was pretty much a full-time job but I gradually was getting into some of the foreign payloads that were coming over. The first deployable payload, the SPAS, was a German payload and I did all the SPAS missions.

HADDAD: What did that entail as far as you had to work with international engineers …?

WHITEHEAD: Yes, they were all international customers and we did the same thing for them, you know, provide their support – whatever they needed. This was their first payload so it was educating them to the way we did business. They had a lot of communications that they wanted to do. The interesting thing about the SPAS is initially they were controlling from Houston. They were sending the data back to Houston. But, finally they decided it would be nicer if they could control it from here, so one of the early SPAS we set up a payload operations control center across the river in the hangar we were in. And we did that for a couple of missions and then for some of their later missions we built them a big payload operations control center right here on this side and other people have used it later for some of the Goddard missions, the telescope and various things. But that was a lot of fun and we had to really work to get that going 'cause that was the first time anybody had controlled a spacecraft from KSC. So that made it rather special.

HADDAD: Excellent. And you had a big part in making all that happen – you had to get all the infrastructure that needed to be done, to allow them to literally communicate with their satellite while it was in orbit, in space?

WHITEHEAD: Yeah, that's what we were doing.

HADDAD: And there was …

WHITEHEAD: During the mission we had a whole group of people down there in the multi-operations support building, where they were.

HADDAD: So you did the initial creation of the center then participated during the flights?

WHITEHEAD: That's right. Checked it out and used it a few times.

HADDAD: And it was very successful.

WHITEHEAD: And it's down there still for people to use, 'cause the Germans left their hardware here.

HADDAD: I understand that there was sort of a unique animation or there is, everything …I understand there was an item called SPOC. I guess it was the SPAS Payload Operation Control Center?

WHITEHEAD: Yeah, that was the name. They used to have a picture of Dr. Spock in there. In fact I've got one in my office of Dr. Spock that they had.

HADDAD: And they had a special nomenclature, or title for you as well didn't they?

WHITEHEAD: Well, let's see. What did they call me? People always had titles for me. I can't remember what I was here. I was the Great White Mother at White Sands. I can't remember what the Germans were calling me. What did they call me? I forget.

HADDAD: But that was a very unique time, again, it was the first time that there was an operations control center here at Kennedy – actually on the Air Force side and then at Kennedy Space Center.

WHITEHEAD: That's right. And it was also the first deployable mission from the orbiter too. We turned around and took pictures of the orbiter for the first mission. That was neat.

HADDAD: Do you remember which mission that was?

WHITEHEAD: STS-7 I believe. I think it was seven. Unless it was 11. We were on some of those early missions.

HADDAD: So you interacted with a lot of foreigners. Were there any other payloads that maybe were international type payloads?

WHITEHEAD: Well, of course, the Germans had the Italians working with them and the Swiss and I think we had a few Japanese experiments on there too, so we got to meet a lot of them. Of course it always gets a little complicated getting people through the door when they're foreign nationals. I still haven't fixed that. That's one of the things I've got to fix, is make it easier to badge them. It's not as bad as it used to be.

HADDAD: That's was another role as an LSSM. You not only had to worry about the facility, you had to worry about security access.

WHITEHEAD: Getting people in. Getting their procedures approved. Getting all the hardware they needed and set up for them. Getting their office space and whatever they needed. Anything they asked for. Only once have I ever turned down a customer. I won't tell you which one, but, I thought they were asking for too much.

HADDAD: So out of all those years you've worked that was the first one ..

WHITEHEAD: Just one that I've done. It was great working with the Germans, you know, I used to tell them I didn't know how we beat them in the war, their payloads were so good and they knew what they were doing. And it was so nice working with them instead of fighting with them 'cause you know during the war

my brothers were over there fighting them and I was over here supporting them. And of course all they wanted to do was go to space. Those guys, even the V-2 guys, you know, that's all they wanted. And the same ones came here and followed on with the SPAS missions.

HADDAD: In your time here, did you get a chance to work with any of the astronauts, any of the crew members?

WHITEHEAD: Well, yeah, as a matter of fact, Bill Readdy was one of the .. we got to know the astronauts pretty well on the early SPAS missions 'cause they were very actively involved and they'd come over to our hangar across the river and, practice a little bit with the Germans and so forth. Sally Ride went on one of our missions, and we got to know her. And of course Bill Readdy is Deputy Manager up there. I was trying to get him to fly down and go hurry up this space flying business again, but he didn't take me up on it.

HADDAD: So you still interact with those people?

WHITEHEAD: Well I didn't – it surprised me, I got an email. I think our Director told him I was there or something, so I got an email from him. So I answered him.

HADDAD: And then also as we went from the Shuttle payloads into Station, Space Station. What kind of activities were there with the Space Station?

WHITEHEAD: Well, very early on I helped one of the other LSSMs because I was a good on-the-floor person. So I got to work on the first Russian docking mission, which was a lot of fun. And, again, the Russians were real good. I loved working with them. They didn't speak English as well as the Germans. We had a number of interpreters. But they were good. I did a lot with them on that first docking mission.

HADDAD: That was one of the first elements to come through Kennedy?

WHITEHEAD: Yeah. We did that here in the SSPF. So I have worked on a number of those and I've enjoyed working with all the foreigners. Again, you know, it's amazing that, when I was young we were out there fighting all these people and now we're all working together. It's so neat. I love it.

HADDAD: You currently work in the ISS payloads directorate under Tip Talone?

WHITEHEAD: Yeah. Tip used to help me at the pad. He was on my good list. I had a good list of people who would help me with anything and Tip was so great out there during telescope days. So I would've asked for him for a boss. you know, he was really good out there at the pad.

HADDAD: What were some of the other things that – so you worked with Tip before?

WHITEHEAD: Oh yeah. It was nice knowing all the people who could do things and it was nice of management 'cause they would often recognize the same people that were on my good list. The people I could call and get what I needed; management would promote them. I got to know those people and I would pick them out and then they would go and promote them and then they would be so busy, they couldn't help me that much anymore, but it's nice to know management knows who's good.

HADDAD: Excellent. Tell me about some of the student experiments, or maybe memorable students, 'cause you'd worked with students as well, right?

WHITEHEAD: Yeah, well, after telescope and the SPAS missions slowed down I started working with the Goddard Hitchhikers. So, they had some of the student experiments, you know, initially on them. They had everybody's university experiments. They had a lot of experiments on one of those Hitchhikers. And then after that I inherited the Getaway Special program, after a couple of people, including you, had worked on it. And I enjoyed that too because the students would come down here, and there's also the student Space Experiment Modules that flew in some of those GAS cans. They would have schools all the way down to pre-schools. I had one recently, in fact, on the 107 mission that blew up. And I brought a little 4-year-old in. I don't know whether the whole world was happy with it, but the 4-year-old was happy. He was a customer so we brought him in and showed him his payload.

HADDAD: So you worked with the whole gamut of students on a variety of experiments?

WHITEHEAD: Yeah, a lot of the students would come down. The teachers were great, you know. They would come down here with the students and bring 'em down so we'd get to tour them. They had some great programs out at the Visitors Center, the Space Education Center, and we would take them there. Then we'd take them on a tour and show them the pad and show them the GAS facility. We had a lot of those students.

HADDAD: I'm just curious, what kind of experiments, different experiments were the students working on?

WHITEHEAD: Well a lot of them were just flying things to see what happens. A lot of them were doing seeds, you know, the younger ones, simple experiments. Some of the older ones were doing more complicated things where they would actually be moving things around and pressurizing things in their experiments. They had quite a number of them. I didn't get that involved with the experiments 'cause by the time they would come here, usually they were pretty much

assembled. Sometimes they would put things together down at the GAS facility. And a few of the students would come. But the little ones usually had relatively simple things. They would compare things on the ground with what went in space or seeds that didn't fly with seeds that did. It's a great program for children.

HADDAD: I guess, just some of the other things, other activities that had happened as far as concentrating on the job. There were other things that maybe while you were here, just some unique aspects of anything, like, I understand there was one time a misunderstanding of some traffic cones?

WHITEHEAD: Oh, I don't know how you heard that, but I was just going home at night. I knew those traffic cones were to block the visitors coming in, so I figured I could move a couple and go out. I let several more people go through while I was waiting there with the cones, and by the time I let all the other people through the security police came up and told me I wasn't supposed to move cones. Of course I'd been using them down at my facility and putting them in place. But I got a ticket for that. So after that I made them put up signs, detour signs here in the parking lot. At least you wouldn't get up there and be surprised. You would know you had to go around.

HADDAD: Anything else like that that comes to mind? I don't want to embarrass you. Just anything. What it is is try to get an idea of things like that … you influenced the signs being made for other people at Kennedy. Any other things along that same line that maybe you had influence to change rules or policy or influenced something to change here at Kennedy Space Center…

WHITEHEAD: I was always trying to get support for the customer, whatever they needed, and try to get them to see launches and that sort of thing. I think I was breaking all my ground at White Sands, where they made all the rules – based on if I did it, it must be wrong. Well I even did that here in the early days. One of the things I was doing with telescope is sampling everything. And I can remember getting some early samples and sending them out in the canister when I was still used to the informal way we worked at White Sands where you just did it. And when they got out at the OPF or wherever and opened them up, there were my samples and I hadn't gone through the ropes and the writing and got approvals, so … And who put those in? And it turned out it was Virginia again.

HADDAD: But it was all for the good? Sometimes the rules maybe weren't the best.

WHITEHEAD: Oh yeah. Well unfortunately, if I didn't know them in those days and I didn't ask the right people … But we collected good data.

HADDAD: But even sometimes when there were rules that just weren't right or didn't make sense, you took action to change things.

WHITEHEAD: Well, people think I sometimes bend the rules, but I tend to try to follow the rules. Maybe because I can make it happen they think I'm bending the rules. But I'm just sort of going around, and I've had people say to me the only reason they do things for me is they know I'm not going to go away so they might as well do it. So that's a good system too. They get tired of seeing you so they say, 'oh well I'll do it this one time'.

HADDAD: How long have you been at Kennedy Space Center?

WHITEHEAD: Well, I was just looking this morning to see. I can't believe it's going on 30 years. It hadn't seemed that long. I used to think half a year was a long stay somewhere and here I am nearly 30.

HADDAD: Now this next question you do not have to answer. I know it could be a sensitive question. Your age?

WHITEHEAD: Well, I'm not quite 80 yet.

HADDAD: When will you turn 80?

WHITEHEAD: In March.

HADDAD: You'll be 80 years old.

WHITEHEAD: And I'm planning to work until my grandchild is through college and she just hit eighth grade this year. So I guess about another 8 years. And then I'm going to work for a year to earn money for law school. That's my next plan, unless they rush this Mars thing so I can go to Mars. But I don't know if I can hang around waiting.

HADDAD: Speaking of which, I've heard a story that when you were young you had told fellow students something.

WHITEHEAD: Well I got into this business because I loved reading about the stars. I knew all the stars when I was a little kid and could identify the planets. So, one day we had to do an oral talk in school so I decided to do one about a voyage to the moon. And, unfortunately most of the kids – it was realistic enough – believed me. So I think more than half the class thought somehow I had really been to the moon and I ended it telling them I was going to Mars. And I'm still waiting so I told Tip yesterday that we had to expedite that manned mission to the moon and Mars 'cause I haven't been yet. I really haven't been to the Moon. But don't tell any of my classmates.

HADDAD: Excellent. Excellent. Do you want to take a break? Maybe we'll take a break here then and give you a chance to catch your breath, get something to drink.

WHITEHEAD: Oh, no problem.

(break)

DAN KEENAN: This is Dan Keenan. It's February 13, 2004. We're going to continue our interview with Virginia Whitehead. Just to continue on what we were saying … We were talking about how you were able to navigate through the system and get so much done. Just some of your ideas and your belief systems.

WHITEHEAD: Well, once I learn that there are rules, I try to follow them. And if it gets too hard to follow them I try to get a temporary change or a one-time waiver and people will usually be helpful and do that, if it's something we really have a reason to do. And, you know, if I have to work a little harder to follow the rules, I do. It may be a pain sometimes, but as long as I get what I'm looking for it really doesn't bother me that much. And people are nice; people are cooperative just about everywhere I go. You find the right person and you ask them if you can't do it, who can, and you go to the next person.

KEENAN: It sounds like you're not afraid to give a little push back on, if you see it doesn't work.

WHITEHEAD: No. Not at all. Hey, I'll ask, I'll find whoever can make something happen and do it. And if I don't have the right person – often it's the little guys way down in the trenches who will help you the most. You don't have to go to the bosses, you know. If you find the guy with the hands-on experience that can do something, then you go to him. I start there. But if they can't do it I ask them who can. And they'll send you to the right person. Or maybe they'll decide to do it themselves, when you start asking. So that works, too. But people are helpful. I mean, I've always found that.

KEENAN: You know, if you really are, if you're nice to people and you respect them, then they'll do anything for you.

WHITEHEAD: Yeah. You know, you just ask. I always say ask and you shall receive. And it works. It works. You just have to ask.

KEENAN: I mentioned this to you off-camera, but I wanted to ask you: What about you has helped you remain so open to change, and the possibility of new opportunities?

WHITEHEAD: Well, whatever works, you know. I don't always 100% agree with the changes, but I'll go try to change them if I don't like something. I try to make it work the way I want it to work, and I don't mind asking if I need to.

KEENAN: Got ya. And you had mentioned that for a long time you had moved from place to place.

WHITEHEAD: Yeah when I was young I didn't realize it, I thought I'd stayed a long time. Well I know at Silver Springs I left after six months, and it seemed like I'd been there a long time before I moved to the next career. I guess I was trying new things, you know, and I'd left my next job, which I worshipped, after 2 years and went to another place and then found I could go to White Sands, so I did after another 6-9 months. It was always fun to go to a new place and see how they did things.

KEENAN: You like the change?

WHITEHEAD: Yeah, I always thought it was fun to try something new and different.

KEENAN: One of the things Mike mentioned earlier was your working with young people. One thing I noticed, that, as you spoke of the 4-year-old as your customer. You're very customer-centered. What's been the joy there?

WHITEHEAD: That's why I've stayed in this job. I used to be a manager. Of course when I was a manager of a large group of people I would take care of them. They were my kids I guess. And now my customer is my customer, no matter who they are. And if they're these little ones that I've inherited recently, they're my customer, and if they're a 4-year-old and want something, hey the 4-year-old, I try to give him what he wants when he's here. And we have some very tiny customers on some of those student experiments, and when they want to do something I try to help them.

KEENAN: Try to work it out?

WHITEHEAD: Exactly

KEENAN: I guess ... I don't know if this question has been asked before, but how do you get so much done?

WHITEHEAD: Well, I do what has to be done and I don't stop. Again, I don't mind asking. If you ask enough people you can get things done. Everybody is helpful – they want to help. And if they know they're working to help a payload everybody wants to help. I don't get too much negative feedback on things. I think it's, you know, I tell them who it's for. I think everybody out here wants to help the customers.

KEENAN: I agree with you. Do you know, do you think it's, I realize that so many people want to help, but sometime people have a hard time asking for help. There's sort of that stoic sense?

WHITEHEAD: I don't mind asking anybody and if somebody wants to take over and do it, I let 'em, and then I do something else. Very often I'll find when I ask for help, the person wants to do it, and I let 'em. I don't have any restrictions on what I do versus what my help does. Whoever wants to do it, as long as it gets done. And that's the way I work.

KEENAN: Moving back to the list of questions here – what are your plans for the future? You've already covered going back to law school.

WHITEHEAD: That's down the road. I want to finish working with the customer and hopefully we can start moving out again soon. It bothers me now that we seem to have slowed down a bit. I'm hoping we get to moving and have lots more customers, whoever they are. And it's so much fun working with the foreigners and working with the students. I just enjoy all of them, you know, having the world get along. And having the kids get interested in the space business and wanting them to go on in it. We've got to get the little ones interested so we'll have a space program in the future. So, it's fun being with them, and I just love working with all our ex-enemies. I think it's the greatest thing. It is so nice to be working with them rather than fighting with them as when I was young.

KEENAN: It's a testament to the progress we've made.

WHITEHEAD: Yeah. It's so great. Those are our customers and they're working here with us. I enjoy it.

KEENAN: Absolutely. I don't know that Mike asked this, but what do you want to be remembered for?

WHITEHEAD: I have never worried about being remembered for anything. As long as I get everything done while I'm doing it that's all I'm concerned, I don't have any hang-ups on being remembered for anything. I never thought about it. You know, it wasn't anything. I just hope I get it all done.

KEENAN: You said this a couple times. And I really loved it – 'if I did it, it must be wrong.' I like that; it kind of says you're entrepreneurial.

WHITEHEAD: Sometimes you have to do things that way.

KEENAN: It shows you're pushing a little, doesn't it?

WHITEHEAD: Well, we have customers and I want to push if I can't get it done for them. And most people you don't have to push too hard. You just have to push a little bit.

KEENAN: It seems that most people really are almost, I think, one of the reasons we're here interviewing you now is because you have a vision and your vision is connected to your feet and you've been marching to that vision for a long time. And there's a lot of people who are interested in helping but they don't necessarily have that vision, or they don't know how to help so when somebody like you comes along, they're very happy to help you, and be a part of something greater.

WHITEHEAD: Yeah. Everybody helps. That's what I've noticed out here at Kennedy, and wherever else I've been, if you ask people, they'll help you. You just convince them that it's for a good cause; they want to do something for a good cause. People just don't say no.

KEENAN: What would you say to the work force out here right now, that's in the position of just sit and wait, or work and wait for the next launch? What would say to them about the future?

WHITEHEAD: Well, we're going. We're going to have to do whatever people need done so we can get started and I personally wish it would be sooner and I'd be willing to volunteer to fly sooner, but, you know, we've got to be patient and get going and then try to get everything done.

KEENAN: If you think 10 years out for space, what's your vision for, what's your hope?

WHITEHEAD: Well I hope we can expedite this moon work a little bit. You know we've been there before and it seems like we've got that down the road a little bit too far. That's what I would try to push is try to figure out a way to do it sooner. If we're going to Mars we need to keep that in mind. I keep thinking I want to go. Maybe sooner. I would love to go to Mars. That would be fun.

KEENAN: Is there anything that you want to say that we haven't covered or just comes to mind about anything?

WHITEHEAD: Well I think, you know, it's great that this country is doing this. This is where the future is and no telling what we're going to run into. We may have to, someday. Maybe this is a very practical thing we're doing. You know, a star doesn't last forever. We may need a new solar system somewhere. It would be smart of us to really know about space, aside from all the things we're learning, that we can transfer to life on earth when we develop things in space. It's just … it's a great business and the people out here have fun doing it. I'd like

to see them keep doing it, and keeping the Brevard economy going so they can enjoy it too. I really think we all lucked out that we have this to work on.

KEENAN: My father came here in ’64 to support Apollo, so I feel very blessed.

WHITEHEAD: Good, good, good.

KEENAN: What do you think about Hubble and the decisions to …?

WHITEHEAD: Well, it bothers me. I keep hoping, you know, they did indicate they might reconsider. ‘Cause of course I was very involved with the original Hubble mission and I’ve done a little work on at least one or two of them since then. And I was going to be doing the next Hubble mission, was working on it. That was my support. So I’m still hoping I get to do it. It just seems like they ought to be able to squeeze that in somehow. If I were in charge of NASA we’d still be going up to fix the Hubble. It’s done so much and I think the country has appreciated everything we’ve learned from Hubble. We’ve learned some great things. It’s something to be proud of, what that payload has done.

KEENAN: It’s remarkable. Do you remember the first time you saw the images of the deep field view, sort of the cosmic soup?

WHITEHEAD: Yeah. It just … everything it’s done. Well, you know, and the other interesting thing is they went up and fixed those first instruments that were out of focus and that sort of thing. That’s impressive that they were able to go up there and fix those.

KEENAN: I remember talking to Charlie Pellerin about that. I don’t know if you know Charlie. He was apparently one of the, he led that repair mission to some extent?

WHITEHEAD: Yeah

KEENAN: It was remarkable

WHITEHEAD: Yeah, I know the people here who just lived and breathed the telescope – the people in the contamination group and our payload contractor – and they were so discouraged when they heard of the problems. We fixed it. We didn’t just leave it up there and not fix it. And that’s the kind of challenge that NASA needs and needs to keep doing. I just figure this is another challenge we have. Obviously we should go up and fix it and use it longer.

KEENAN: If I’m not incorrect I think it was in March of 2001 or 2002 that the Hubble was able to determine that the universe is expanding at an accelerating rate?

WHITEHEAD: Yeah. And they have done so many things, you know, that, when I was young, it's either this or that or something else. And they're beginning to pin a lot of things down about the universe. And that next generation telescope we don't have ready yet. We've got another one coming along but, of course we've got an infrared telescope up there. It's doing a great job also.

KEENAN: I notice that you had mentioned your reading about, your interest was sparked when you were 11 years old. So that would have been around 1935. How much did Einstein and those physicists affect you in your thinking?

WHITEHEAD: Well, he was new in those days. You know, I don't think I'd heard of Einstein at that age. I think by 10 I already knew I was going to be an astronomer. I lived in that section of the library and read every book they had. It just seemed like a fun way of doing things. I found out you had to go to college and get a degree and so that's what I did.

KEENAN: You went to Smith College and got an astronomy degree?

WHITEHEAD: I went to Smith College, got an astronomy degree and a minor in physics and math too.

KEENAN: What would you say to the young people out there that you've worked with or other people who might not feel that they can get to college? What would you say?

WHITEHEAD: You can. All you have to do is set your mind to it and work on it. People will help you; again, they have scholarships out there. They have grants. I was a poor kid. I didn't have money. They had these scholarships out there waiting for me, and the loans that I needed. Everybody should do that, whatever the field. I talked some of my younger brothers and sisters into going, too. Several more of them went to college.

KEENAN: It seems to revolve around enthusiasm, doesn't it? If you find something your enthusiastic about?

WHITEHEAD: If you want to do something, go do it. No matter what it is. That's always the way I've been.

KEENAN: I can't help but feel I'm going to be very influenced by this conversation with you today.

WHITEHEAD: Well, you can do what you try to do. You just have to make up your mind. If people get in your way, you have to ask them to help.

KEENAN: Well, I think, do you have anything else you'd like to say?

WHITEHEAD: I just think this is a great business to be in, and I'm so glad I came here and stayed with it. I still hope I'm going to make it to Mars.

KEENAN: I'll keep my fingers crossed for you.

WHITEHEAD: Yeah, I hope they expedite that.

KEENAN: Well it's been a pleasure to chat with you today, Virginia. I think we'll close it out from here. Thank you.

WHITEHEAD: All right. Great talking with you too.