NASA JOHNSON SPACE CENTER ORAL HISTORY PROJECT
ORAL HISTORY TRANSCRIPT

MICHAEL L. COATS
INTERVIEWED BY JENNIFER ROSS-NAZZAL
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ROSS-NAZZAL: Today is October 10th, 2012. This interview with Mike Coats is being conducted for the JSC Oral History Project in Houston, Texas. The interviewer is Jennifer Ross-Nazzal, assisted by Rebecca Wright. Thanks again for agreeing to take some time to sit down with us and talk about some of your colleagues, the first six women astronauts. We appreciate it. I had a chance to visit with [M.] Rhea Seddon a few years ago, and she told us [about] meeting you down here in January, when your class came down to be introduced to the media and to the Center. She remembered that she approached you and extended her hand out to you. What are your recollections of that event?

COATS: Well, I remember Rhea being—what's the right word—a little more outwardly friendly than the rest of them. The first six women, I think, were reserved. They didn't know quite what to think about all these—here we had all these military fighter pilots and test pilots. All of the six were initially reserved, I think, and quiet. Rhea, she opened up a little sooner I think than the rest of them did. I'm not sure why, but it was just her personality. So she introduced herself to people and that was nice. I think as a group we were pretty proud that we had the first six women in the group and the first three African Americans and the first Asian. It made the group special obviously.

As old fighter pilot guys we were wondering, "Well, let's see. What are these people like?" Of course we had the women. Some of them were medical doctors. Some of them were

scientist types. Sally [K. Ride] and Judy [Judith A. Resnik], of course, had fairly new PhDs. I'd say Rhea and Judy were the two most extroverted if you will, outward if you will. Judy was a little more quiet I think than Rhea initially. Of course I got to know Judy quite well because we trained together and flew together. She wasn't bashful. She certainly held her own. Fighter pilots tend to tease each other a lot about everything. There's not much mercy shown, so we would occasionally tease the women and all the mission specialists. It wasn't just the women. We'd razz them about different things. At first they were taken aback I guess. In the academic world or medical community they didn't do as much of that, but it didn't take long for them to get fairly comfortable and throwing it right back at us.

If we did something silly or stupid they'd point it out, enjoy doing that. I thought the group melded together fairly well, because we traveled a lot together. We took the whole class to visit all the Centers. I missed the trip to Goddard [Space Flight Center, Greenbelt, Maryland] because my son was born, but other than that we all traveled together around the country to all the Centers. We had not just the classroom work, but we got to socialize a lot. I think we got pretty comfortable with each other fairly quickly.

ROSS-NAZZAL: Can you talk about some of those softball games and picnics and things that you guys did that stand out in your memory? I understand you did quite a bit of socializing as a class.

COATS: Well, I remember we had a touch football game with the older astronauts, the Apollo astronauts. When we got down here, we were a class of 35, and there were only 29 left from earlier programs so we outnumbered them right off the bat. At least I was wondering, "How are

we going to be received?" Well, we were received very well, they were quite happy to get some more people into the office. They were very good about mentoring us and taking us under their wings. We each were assigned a mentor. So I think, as an office, we came in and were welcomed I thought pretty well.

We did have a touch football game, the new class versus the old guys. Supposed to be just touch, not with this group. This is a competitive group. I think we had a broken ankle or sprained ankle and a twisted arm or something like that. Guys take it pretty seriously.

ROSS-NAZZAL: Did the women play or just the guys?

COATS: No, the women didn't play. Racquetball was big back then; a lot of us played racquetball. Kathy [Kathryn D.] Sullivan was a very good racquetball player. I thought I was pretty good too but boy, you didn't want Kathy to get behind you because she loved to hit you with the ball. She was a strong girl, and she could hurt. You'd come out and say, "Well I won, I think, I got these red welts all over my body." It was a very competitive group.

Sally had been a very good tennis player. It was a fairly competitive group. We all took swimming together, scuba lessons and so forth, because most of them were going to have to do EVAs [Extravehicular Activity] and get scuba-qualified. So we spent a lot of time at the Clear Lake Rec Center pool. And they would play some underwater hockey in the deep end of the pool. It's nine, ten feet down there and you're trying to push something around. You got to swim down, hold your breath, and push this. You're fighting each other out of the way. Women participated in that, and they were just as aggressive.

Now turned out women float better than men do, they're more buoyant. You had to do a two-minute float or five-minute float. Hands out of the water like this. [Demonstrates] For some of the guys, especially the guys that were heavily muscled in good shape with no fat on their bodies, they had a hard time floating. Judy was so buoyant that she could float with her head up and her feet out of the water, just like this [demonstrates] as long as she wanted to. She could have floated for days if necessary. We're all sitting there trying so hard to breathe and pass this float test. She was laughing at all of us. Some of the guys swam better than others. We spent a lot of time in the pool, and that was a competitive thing. I don't know why they kept wanting us to. They broke us into teams, and we'd play underwater hockey and other things. It was fun, but boy, there was blood in the water frequently, unfortunately.

I thought it was a really good class. I didn't go out drinking or socializing. I had a new baby at home, I had a five-year-old girl so I was at home most evenings. Didn't go to happy hour a whole lot. So other than the times when we all traveled together, I didn't spend a lot of time and I can't even tell you who did exactly in the class. Some people I know spent a lot of time with George [W.S.] Abbey drinking at happy hour, and others didn't. So I'm not sure exactly who socialized after work and who didn't. Other people would know better than I do.

ROSS-NAZZAL: You came from a military background. Did you and your wife talk about how you were going to work with these women? You hadn't worked with many women before. You were primarily with your all-male squads.

COATS: Yes, I think we did. It wasn't a big issue for her. She asked a few questions. "Are you going to be training with them and flying with them in the T-38s," and I said, "Yes, sure." She

said, "Oh, okay." That was it. She wasn't crazy about me becoming an astronaut to start with. We'd both grown up as Air Force brats, and I met her on an Air Force base. Our parents lived behind each other so that's how we tagged up. She didn't want me to be an astronaut because she thought all astronauts played around and got divorced. I said, "Well, all Navy pilots play around and get divorced too." She said, "Oh that's reassuring. Thanks a lot." So mostly we would joke about that sort of thing, but she met the wives.

Kathy Sullivan was really good about going out of her way to get to know the spouses. I remember Diane has always been very impressed with how friendly Kathy was. Of course Judy was on the crew, and we trained together so Diane got to know her very well. All of the six women I think were quite respectful of the spouses. So at least from my knothole I didn't see a whole lot of concern. I'm sure there had to be among some of the spouses because everybody's unique, but Diane seemed to be happy. She thought some of them were a little more friendly than others. Sally was probably the most reserved of the six, is my recollection. I think she was wondering what all these military guys were like. She had had no exposure whatsoever to the military, and I think she was pretty skeptical about the value of these crazy people.

Of course Steve was on the same crew with Judy and me, Steve [Steven A.] Hawley. He dated Sally and then married her. So we'd go to dinner as a crew with spouses, and we got to know each other. But Sally was just more on the quiet side, I think, than the rest of them.

Early on I didn't have much interaction with Anna [L.] Fisher. Of course I played racquetball with Kathy a lot. Shannon [W. Lucid] was from Oklahoma, and I'm from Oklahoma—my family is, and so is my wife's family. So I would fly her up in a T-38 and we'd have dinner at her parents' house. So I got to know Shannon pretty well pretty soon. Rhea of

course was pretty friendly. Anna was the one I didn't get to know very well early on. Later on she was on my crew for a while and got to know her, finally.

When we first came in, although we traveled around the country together [and] were in class a lot together, they assigned us different jobs. We wouldn't see each other except for the Monday morning meeting, for a whole week if you will. I was assigned to the SAIL [Shuttle Avionics Integration Laboratory] facility for two years leading up to the first Shuttle mission. We were working seven days a week literally around the clock. There were long periods of time when I wouldn't even get to the Astronaut Office because we were working so many hours over there. Several of us were over there. Other than the classroom work when we were all together, we didn't mix up a whole lot until we were really assigned to crews later on.

I'd say Sally was the most reserved of the group, but she could hold her own too. If you got her engaged, she would stick up for herself. They all would. They're not a shy bunch of people.

ROSS-NAZZAL: Did you read about those women before you came down to Houston and got an idea of who your classmates were going to be?

COATS: Well, a little bit. We read what was available to the general public about them so we just knew in general terms, because we were all curious what the different backgrounds were. It was fascinating. People made a big deal, rightfully so, about the first women, the first minorities. But it was also a very diverse class because we had military test pilots, and it wasn't just the pilot astronauts. We had a number of mission specialists who had also been military test pilots. You had medical doctors, a half dozen of the class were medical doctors. You had

engineers. You had scientists with brand-new PhDs and so forth. They'd all been trained differently, if you think about it, how to approach a problem, what's your thought process. The military pilots, it didn't matter if you were black or white, you tended to think the same way when you're presented with a problem. Well, the same thing with the academic types—the different way of thinking with the medical doctors, which made it a very interesting rich class I thought. We had some fascinating brainstorming sessions. Frequently military test pilot types would say, "Oh yes, well, here's the answer." Somebody like Ron [Ronald E.] McNair would say, "Well, have you thought about this?" We'd go, "No, actually we hadn't. Interesting."

People learned to speak up and speak out. Nobody was senior to anybody else. Rick [Frederick H.] Hauck was one of the older ones. John [M.] Fabian was one of the older ones in the class, but nobody was really senior to anybody else. So I thought the class was fairly outspoken, certainly with each other. That was cool to see because it came up with, I thought, some pretty elegant solutions. It taught us, "Boy, we ought to listen to these people that have different backgrounds and ways of thinking, because they approach problems entirely differently." I think that was an education for everybody.

None of the six women had any military background, so that was new to know how to deal with these military types. Nobody ever wore a uniform so it wasn't like you had the military groups and everybody else. It was all mixed up. They learned to treat each other, I think, as individuals. Everybody was unique. It's hard to stereotype a group, especially when you're all thrown together like this. Essentially we were tasked with learning to fly the Space Shuttle. It was still a new vehicle. It was three years away from flying the first mission, and it was fun. As a group then we bonded, learning how to operate this new vehicle, which was

challenging and fun. Frequently it would be, "Oh what the heck, how does this thing work?" Invariably somebody would figure out, "Oh yes, here it is, and explain to everybody else."

Other than reading the bios before I came down, I didn't know what to expect from these folks. Now some of them, of course, I had known, not the women. Both Jim [James F.] Buchli and Hoot [Robert L.] Gibson had been students of mine at test pilot school. I was an instructor. So I knew them, but everybody else was new to us. It didn't take long to get to know each other pretty well.

Remember, we were flying the T-38s. Of course you had the pilots. Of course you'd always look for a mission specialist to fill the backseat. Didn't have to have one, but it'd be nice when you could so we would fly with virtually all the mission specialists. You'd go out on an out and back someplace and learn to fly together, work together as a crew. So you tended to get comfortable with each other. As I remember it, all the women were very anxious to become proficient in a T-38. Some were more comfortable than others initially for whatever reason. Some took to it a little quicker than others, but they all got to be very good at it.

ROSS-NAZZAL: You mentioned that you flew with Shannon up to Oklahoma, and I know she's a pilot. What about some of the other women that you recall flying with?

COATS: Well, I flew with all of them. Of course I flew with Judy an awful lot, because as a crew we had to travel. We'd take three T-38s so I flew a lot with Judy. Didn't fly with Sally a whole lot or Anna a whole lot. I seem to remember I flew a lot with Shannon. I flew with Kathy occasionally and Judy, but probably no more than two or three times with Sally or Rhea. Remember they were assigned to crews fairly soon after initial training. Of course Sally was

assigned first and then Judy and then it went down the line. So as soon as you're assigned to a crew you tend to be flying a T-38 with that crew because you're off going to places for training around the country.

Shannon and I had a reason to fly together because we'd go to Oklahoma. My wife had a great-aunt who lived very close to Shannon's parents. They'd pick her up and we'd go have dinner. But you're right, Shannon had had some private pilot time as well and was fairly comfortable in the airplane.

ROSS-NAZZAL: Did you let her fly from the backseat?

COATS: Well, I let her fly up and away. Landing is tricky from the backseat, even for an experienced pilot, so didn't usually let them land from the backseat. You let them sometimes fly an approach. You'd take over before you actually touched down. A lot of them got to be very good at doing it, flying the airplane, flying an approach, but actually touching down, the visibility from the backseat is really lousy so you don't usually land from the backseat. But no reason they can't fly an approach. They got to be pretty good at it. All of them I think got to be pretty good at it.

ROSS-NAZZAL: Your class called themselves the Thirty-Five New Guys. Do you think that the women thought they were one of the guys?

COATS: Yes, I think so. My impression was we were pretty proud of the class. Remember they hadn't picked an astronaut class in a dozen years. We were the first Shuttle class and the first

class with women and minorities. We thought that was pretty special. We were in a lot of classes together, and then we traveled around to all the Centers and Headquarters [Washington, DC] as a class. So we ate together, and I think we bonded together fairly quickly as a class. I was comfortable with virtually everybody. Remember some of us came from totally different backgrounds. Jeff [Jeffrey A.] Hoffman, who's one of my dearest friends, talk about a brainiac. I used to tease him. "Let's see, your father is an orthopedic surgeon; your brother is an orthopedic surgeon, and you're just an astronaut. A degree from MIT [Massachusetts Institute of Technology, Cambridge], and you teach at Harvard [University, Cambridge, Massachusetts]. Gosh. What a waste. You're the black sheep of the family." He spoke several languages. We got to be close with Jeff and his wife Barbara. My wife and Barbara were pretty good friends so you obviously got to be closer to some of them than others.

Frequently it was because the wives would tend to get along well. Terry [J.] Hart, his wife and my wife were both expecting when we got down here. Children were born within a few days of each other. So his wife Wendy and my wife got to be pretty good friends as well.

Remember, we'd been in military squadrons where you tended to bond together, and the wives would get along pretty well and same thing in test pilot school. We were used to being in a group; military was used to being in a group of people with the same sort of mission. It was natural for us to say, "Okay now this is the new mission; this is the group of people we get to work with."

I think for some of the folks, especially the academic types and medical doctors, that really wasn't the case. They were more individual-oriented if you will, but I thought they melded into the group pretty well. We were pretty good about teasing them. If somebody was going to be quiet for a while, we just wouldn't let that get by. We'd have to tease them about

something and bring them out of it if you will, make them participate whether they liked it or not. Obviously some were more introverted than others. With this group it's hard to be an introvert. I'm an introvert, so I was sensitive when somebody was being very quiet. All of a sudden I'd see people, "Okay, we're going to gang up on them."

Survival training we did, geology field trips, and stuff like that. You tend to get to know each other pretty well. The military guys are used to teasing each other ruthlessly and mercilessly if you will. It's good-natured joking. We would do the same thing with the women and everybody else. At first they were going, "What the heck are these guys doing?" Then they said, "Okay, we'll just join in." Judy and Rhea joined in immediately. I think Anna and Shannon and Kathy were a little more reluctant. Sally was the most reluctant but eventually did join in in that order. Rhea was very friendly I thought with everybody, and Judy pretty much was too. I thought it was a really good group. I enjoyed it. It was a fun time.

Before the *Challenger* accident [STS-51L] it was almost like, "I can't believe we're being allowed to do this. We've died and gone to heaven. This is a dream job." We were working long hours, especially leading up to the first Shuttle mission, and then training for our missions we were working long hours. Didn't realize how long or how hard we were working.

It was hard sometimes on the families, which is why I tried to spend as much time at home as I could with young kids. It was really a special time, I thought. You worked hard. You had fun. You worked with really smart people, fun people. You knew what you were doing was important. You knew you were going to get a chance to fly someday, and we did fly.

Then when *Challenger* happened it brought it down to Earth. This can be a serious dangerous business. You knew that intellectually, but now you knew it emotionally as well. Those were our classmates, our friends, on the *Challenger*. Of course I'd flown with Judy. That

was her second mission, *Challenger*. That was hard for everybody. I flew down as soon as the accident happened. *Challenger* blew up. They sent Brewster [H.] Shaw and me down in a T-38. So we were down there within about two hours of the accident. We were down there essentially for six months, helping first on the photo team and then later with debris recovery.

Judy, she and her sisters wore a little necklace. For deaf people, the I love you sign is like this [demonstrates], a hand sign. Well, they had the emblem that they all wore around their necks. They had a deaf member of the family. We recovered that in some of the debris, got the necklace back. That was pretty emotional to find that piece of jewelry. We also found miniature Navy astronauts wings that Mike [Michael J.] Smith had flown and that was hard. Mike and I had gone way back. He wasn't in our class. He was the next class. Mike and I had been at the Naval Academy [Annapolis, Maryland] together and Vietnam on the same ship together, different squadrons, and then the same test pilot school class, same instructors together. We were the two spin instructors at test pilot school.

Actually the night before the deadline to apply in 1977 we were agonizing about whether to even apply to the Astronaut Office. I decided to go ahead and apply. Mike decided no, I want to go back and see what the peacetime Navy is like. We'd flown a lot of missions in Vietnam, and he wanted to see what peacetime Navy was like. He didn't apply that year. I got a letter from him from the Mediterranean when I was down here that first year. I got a letter from Mike, "Well, the peacetime Navy really sucks. Nobody's shooting at us, but we got all these Mickey Mouse inspections now we didn't use to have to worry about." So he applied two years later and was in the next class, unfortunately on *Challenger*. That was hard when I found his miniature Navy wings.

So that brought it down to Earth that this was serious business. It became much more of a serious job than a dream, if you will. We were determined to do everything we could to make sure it never happened again. That became the focus on the class. You wanted to do your missions as well as you possibly could, but you also wanted to make it as safe as you possibly could, a real focus. In my case anyway it changed the dynamic considerably. Losing Dick [Francis R.] Scobee and Judy and Ron McNair, El [Ellison S.] Onizuka, [who] were all classmates, and then Mike Smith, who was even closer for me, was pretty hard. We wanted to make sure that didn't happen again and then 20 years later it happened again. So it is an unforgiving business.

ROSS-NAZZAL: That's true. NASA makes it look easy.

COATS: Yes they do. They tend to downplay the difficulty of it too. I've had a lot of people say, "You need to dramatize your problems, not downplay them." Yes, but it's hard for engineers to do that.

ROSS-NAZZAL: You mentioned several times that your class would play jokes and pranks on each other. Any interesting anecdotes you can share or stories you remember?

COATS: Let me think. Mike had some of them in his book [*Riding Rockets: The Outrageous Tales of a Space Shuttle Astronaut*], Mike [Richard M.] Mullane. You had to be careful with Judy. You could play jokes on her, but she was going to get you back. Let me think if I can come up with some. That was a good crew to fly with. We had Mike Mullane and Steve

Hawley and Judy and me. Of course Hank [W.] Hartsfield was the commander, and he was the only veteran. He'd flown STS-4. Now he's experienced. We're all rookies. I remember in the simulator it was a fun crew because there's a lot of dead time in the simulator. You do runs, you do an ascent run. It takes them a few minutes to reset, do another one. So there'd be some dead time. You'd be sitting there. You didn't have time to unstrap, but you'd have a few minutes to tell jokes.

Hank Hartsfield and Steve Hawley and Judy had a photographic memory for jokes. Judy got it from her father. Her father was a real character. We got a chance to meet him, and we bonded with him immediately. Judy was really good at telling stories and jokes and Mike. I was the worst at telling jokes. We'd play sports trivia and that sort of thing. Mullane hated sports. Mike Mullane just hated sports trivia. In fact that was one of the jokes on the crew. We would quiz each other on sports trivia. Of course Mike never knew anything. Back then Earl Campbell was a big star for the Oilers. Finally one day somebody asked a question totally different, nonsports. "What's such and such?" Mike Mullane said, "Earl Campbell, damn it." Well, that became the joke for everybody. The answer to any question was Earl Campbell. "How many watts does this light have?" "Earl Campbell." Mike got frustrated because he didn't know any sports and had no interest in sports.

Judy was very good, and Steve had a photographic memory for it so we had a lot of fun as a crew. So there wasn't any quiet time in the simulator. It was a really fun group. It was fun to train together and travel together. It was fun to fly together in the mission, really enjoyable group of people. Some of the other crews weren't that way. I heard, talking to some of the instructors, that some of the crews there'd be absolute silence in the cockpit for minutes on end

between runs. They got along but they just weren't quite as garrulous, if you will. So that was a fun crew to train with.

I think Judy had been—oh, I know she had been burned a little bit. She had been married. She had worked very hard to put her husband through law school, I think. Then he was supposed to work to put her through graduate school and get her PhD in EE [Electrical Engineering]. He surprised her by divorcing her. She was pretty bitter about that so she had to put herself through graduate school. I think she was a little skeptical about men in general, that's my feeling. I remember walking in one morning early, coming down the hall. I could hear somebody typing on the typewriter just furiously. I walk in and Judy was typing like 120 words a minute. She looks up and was surprised to see me. "Don't you ever tell anybody I know how to type." "Okay." Well, she'd worked as a secretary putting her husband through school. She didn't want anybody to know that. She'd been an English major in college too, as well as technical. So she was very good at proofreading and correcting letters and that sort of thing, very talented lady.

I'm trying to remember some of the stories in Mike's book about what Judy would do to get even with us. The one story you may have heard is we had the pad abort with the crew first time we tried to launch. Counted down, two of the engines started and then shut down on the pad. So we had the first pad abort. Of course what we're doing is rocking back and forth; when the engines start the Shuttle rocks back and forth. All of a sudden it's quiet, and we're still rocking. We're going, "Well, that's not what I expected." Nobody said anything for about ten, 12 seconds, which is a long time. Finally Steve Hawley uttered the famous phrase. "Well, I thought we'd be a lot higher when the engines quit." That started everybody talking of course. Then we found out we had the fire outside. The same engine that had caused the abort was

leaking hydrogen. They had a hydrogen fire they had trouble putting out [and were] dumping water on it. So it took them a while. The fire, turns out, was actually coming up the left side where the hatch was. It was a little bit of a concern.

We knew here we're inside a vehicle that's meant to withstand 3,000 degrees so we weren't terribly worried about that unless the solid rocket boosters blew up or something. But we were sitting on this great big gas tank out there, liquid hydrogen. So we're up on the flight deck, four of us on the flight deck, Judy and Charlie [Charles D.] Walker were on the middeck. They can't see us up on the flight deck. So Hank decides he's going to have some fun.

Judy was a little concerned, so he decided to play that up a little bit. We're giving hand signals to each other like [demonstrates], and we're saying, "Oh, boy, they got to put that fire out. Boy this could be dangerous." Hank finally said, "Now Judy, when they finally open that hatch, you get the heck out of the way, because we're coming out of here."

Well, they opened the hatch, and she came out like a scalded dog. Remember, second woman to fly. She comes out with this scared look on her face. Remember back then it was just the blue cotton flight suits. We didn't have those orange flight suits. So she comes out, and then the rest of us stroll out like it's no big deal, a walk in the park.

Well, on the news that night all you saw was, "Second woman in space is terrified in pad abort. Calm, cool test pilots," which we thought was pretty funny. She didn't think that was funny at all watching the news that night. She didn't speak to us for two weeks. She was furious, just absolutely furious.

She would give as good as she got. I'm trying to think of some of the tricks she'd pull. I have to think about them. Mike has some of them in the book he talks about. You ask a question about her hair getting caught in the camera, and that was alarming. It was up on orbit. I

was the primary cameraman and she was supposed to be the backup for the IMAX camera, which is a great big camera, and it's got a big belt that just loops around really fast. We had unstowed the camera. It was important to get some good footage of the flight because we were trying to make that *Dream Is Alive* movie. They hadn't got as much footage from the previous flight as they had hoped.

So the very first thing we were going to do was photograph the deployment of the satellites. We get up there. I had set up the camera in the back window, and all we had to do was turn it on. But I said, "I got to go get the guard for the belt that goes around really fast." Big loop drive belt. Hank said, "No, no, we're running late, just forget the guard." I said, "You sure you want to do that?" Remember Judy's hair was floating out like this. She had long hair, and it was floating out. It was a great big bush. He said, "No, no, you get up there in the seat," because my job was to hold attitude, make sure we held attitude when we deployed the satellite. Hank's job was then turn the camera on.

So I'm sitting up there monitoring the attitude. They're counting down the deployment. About ten seconds before deployment Hank turns on the camera, and I hear it whir up to speed. It's pretty loud. Then I hear this hideous scream. I hear the camera going [imitates sound], just tearing itself apart. I look back, and Judy is holding her head. Gobs of her hair got caught in the belt drive. We deployed the satellite but of course we didn't get it on film. When I got a chance I opened up the camera. It's a big box that's just got a few spindles and the film winds around, so most of it was supposed to be empty. The film was wound so it was mostly just empty space. It was jammed full with film chips and black hair to the point I couldn't put my finger anywhere. I stayed up all night chipping out the hair and the film chips. Pulled out a lot of her hair. Then I noticed that the sprockets were actually bent a little bit. "Oh dear." The ground of course was

calling us asking, "Did you get some good film?" "We'll, talk to you later." They had seen some circuit breakers pop.

Poor Judy, she was the backup camerawoman. Now she was like a beaten dog. She wasn't going anywhere near that camera. I got to do all the filming with the camera. It turned out that the film actually worked. The thing was in focus, and we got some really good scenes. A lot of the scenes Judy had noticed real-time might be good in the movie. They had done some preflight planning of course. I needed to get this scene and this scene and this scene. "If you see anything else that's interesting, especially living and working up here, make sure you get that on film."

Judy had noticed of course when we were sleeping your arms float out, and it looks spooky and her hair floats out. "Oh we got to get that on film!" Turned out to be one of their favorite scenes when we got back, but we didn't know if the film was going to turn out or not until they got back and got the camera.

When we landed they kept asking us. "Have you used up all the film? How are you doing with the film?" We had nine canisters. We kept putting them off. We didn't give them a straight answer. I think they were pretty worried. The whole company was at risk. They took the film and had to take it to Fort Worth as I remember. It was the closest IMAX theater that could show the stuff. They called me at 2:00 a.m. I'd just landed from my first Space Shuttle mission. They called me at 2:00 a.m. to tell me how excited they were, that they got a lot of good footage. A lot of that was Judy saying, "Hey this would be cool to film." But she wouldn't operate that camera. She stayed away from that thing. So that was good.

Of course the mission was exciting because we had the water freeze on the outside. Big icicle out there they had to get, and Judy did that with the arm. She knocked off the icicle.

Actually depressurized in case Steve and Mike had to go out on a spacewalk to take care of it. They decided to go and try to use the arm. She did a beautiful job. It was dangerous because the ice was right above the wing. If she hit the wing with the arm now we got a problem. She did a beautiful job of knocking the ice off.

We couldn't use the toilet. Even though they told Judy there was enough space in the wastewater tank that she could use the toilet, the hygiene facility, guys couldn't use it. Of course we had these old Apollo bags. If we took a sock and stuck it in there, it would absorb the urine. It was working out just fine. Judy said, "I'm as good as guys. I can do that too." Not quite as easy for her to do it. It was funny because she'd wait and wait and wait as long as she could. Then she'd finally go out behind the curtain. You'd hear this, "Goddamn it, throw me a towel!" That became Mike Mullane's speech. I don't know if he put that in the book. He'd tease her about that for months afterwards. "Goddamn it, throw me a towel!" So anyway when we landed, here's all these people wearing yellow socks, which was funny. It's actually coincidental.

When I was in the Navy my squadron in Vietnam was the World Famous Golden Dragons, VA-192, which had been famous since World War II for wearing yellow socks, the Golden Dragons. I got to tell you a quick story. I was told we had a huge inspection. Vice admiral was going to inspect the squadron—it was while we were off in Vietnam. So we're all dressed up in our white uniforms. I got my yellow socks on, because I'd been told you always wear yellow socks.

Well, it turned out that the vice admiral who was inspecting us had been in the World Famous Golden Dragons in World War II. He starts with the skipper. It's done in order of rank. I'm the junior one down at the end of the line. He gets to the skipper, commanding officer, and

said, "Skipper, show me your yellow socks." Skipper didn't have yellow socks on. The admiral was a little bit miffed about that. He pulls up his pants leg, and there's a yellow sock. So he goes to the executive officer and says, "Show me your yellow socks." Well, he didn't have yellow socks. He goes down the line, and nobody's got yellow socks on. Admiral is getting madder and madder and madder. "Goddamn it. These traditions. This is important."

He finally gets to me. Before he asks me to show my yellow socks he said, "Skipper, if this guy doesn't have yellow socks on you're in deep trouble." Here's my yellow socks. Admiral says, "This boy just saved your ass, skipper." So yellow socks meant a lot to me.

So when everybody's wearing yellow socks after the Shuttle landing, that was a big deal to me. I think it helped me get a promotion, having yellow socks on at the right time. Anyway, I got away from your question, sorry.

ROSS-NAZZAL: No, no, this is all good. I'm looking for anecdotes. Of course you can write a book, but you need some funny material to include.

COATS: We extended the solar array we had on that, OAST [Office of Application and Space Technology] 110-foot array. It was my job to maneuver the orbiter, put in input to get the array wiggling. Judy's job was to record how long it took to dampen out. Of course the same technology was used to design the arrays on the Space Station. They can extend out, retract. Turned out the arrays were stiffer than they expected, which meant we could actually do more maneuvers, and get more data than we had anticipated or planned for. So Judy did a brilliant job of literally replanning on the fly, working with the ground, saying, "Hey, it's dampening out much quicker than we expected. We can do more maneuvers. Why don't we do this and this

and this?" The ground were very quick to say, "Yes, get all the data you can up there." She did a brilliant job with replanning on the fly, and we got worlds of data up there. It was quite impressive. She was a pretty smart gal.

ROSS-NAZZAL: When the announcement came out that Sally was going to be the first American woman to fly in space, was there any discussion in that Monday morning meeting or among the class? Like, "Well why not Judy or why not Anna Fisher?"

COATS: This is just my personal impression. I think most of us—I certainly expected it to be either Judy or Sally. They were the two that had the PhDs in the technical area, astrophysics and electrical engineering. The others either had medical degrees or biomedical type degrees if you will. I don't know for sure. I could probably go back and check, but I have a hunch. When the names first went up in that class I've been told there were only two names for women on there. They were told, "No, add more." I think Judy and Sally were the first two selected, but I don't know for sure. I can go check obviously now. So we expected it to be either Judy or Sally.

Now obviously we didn't know Judy any better than Sally at that point because we hadn't been assigned to crews. Crew assignment was named about the same time. Sally is going to fly and then Judy. So we didn't really have any strong preferences personally. I thought all six of them were quite competent, capable of flying first, and would handle the attention and pressure well, because they'd been handling it. It was tough being one of the first six women. It was a different time back then. It was still an old boy's network and a lot of rough comments were made.

Even we were shocked at some of the comments from some of the older senior NASA people right up to the Administrator making some comments about the women that we felt were inappropriate. I know they hung together. They worked with Carolyn [L.] Huntoon, their mother hen if you will. They had to put up with a lot of unfair observations, I think. Fortunately I don't think they have to put up with nowadays. But first six women, it was definitely an old boy's network. I'm sensitive.

When the Naval Academy had to admit women—all the service academies had to admit women—the Air Force Academy [Colorado Springs, Colorado] and West Point [United States Military Academy, New York] basically said, "Okay, we'll admit women." The Navy had a bunch of admirals that said, "Over my dead body are we going to admit women to the Naval Academy." So there were a lot of dead bodies because they had to do it anyway. Unfortunately they took it out on the women.

When I went there it was all male. The first women didn't come in until eight years after I graduated. Most of us felt like, "Yes we'd like to have women." Women were cool. I loved them in high school, why wouldn't you like them here? Unfortunately the Navy—I'm generalizing—but they took it out on the young girls. It was 18-year-old girls coming in. Instead of saying, "Okay, you may not be able to do 70 push-ups like the boys do but you can do a different type of push-ups, and we're going to stress you out as much as the boys," just maybe a different way. Instead of doing that, which is the logical thing to do, they said, "Well, you don't have to do anything." Well, that makes the boys jealous and makes the girls not part of the group. That's not the way you do it. It's not the way the Air Force Academy or West Point did it. It took the Navy a few years to get over that, and I'm still mad about that. It's not fair on the girls that came in to do that.

Well, NASA, similar, had people even in 1978 who I thought were pretty immature about that. So I think the women had to put up with some stuff that a lot of people today I don't think appreciate. The attention was nice, nice to be special. I think they enjoyed that, but at the same time they had to put up with some comments and treatment that nowadays would get people fired.

ROSS-NAZZAL: Can you give an example or two that you recall?

COATS: Well, not for the record. I remember the Administrator Jim [James M.] Beggs. I can't even remember the occasion but there was some kind of function right outside Building 1 here on this side. They had a little platform. Sally was supposed to participate. They had media here and then were a whole bunch of people standing around. She was late; I think her plane was late getting back or something so she was a few minutes late. We were waiting. He was obviously irritated. I remember him making a comment loudly to people. "Oh must be the wrong time of the month or something." We're sitting there going, "I don't believe he just said that." Not only that, I don't believe everybody's laughing. Most of us are going, "Oh jeez." Now Beggs wasn't one of my favorite people. Have to know that. I thought he was an idiot. I saw him at the *Discovery* thing this year, and he's still an idiot.

He came from General Dynamics and had been in charge of the F-16 program. When he became NASA Administrator, he made it quite plain to all the astronaut pilots, "I hate pilots. All they ever did was cost me money." As an executive he had a bunch of test pilots to test this new airplane. We're going, "Oh it's really nice to meet you too." So I wasn't a real fan of his anyway, but I thought he was very immature if you will.

So the women had to put up with things. It's hard being the first of anything. You get to be famous for being first. On the other hand, you put up with a lot of stuff that later people who are second and third don't have to put up with. It's just accepted.

It's true whether you're the first African American, the first female, the first African-American female, the first whatever, first female commander of the Shuttle or the Station or whatever. A big deal is made of it. Later on, "Hey, it's no big deal. Everybody's done it." I was on the selection board when we picked the first female pilot astronaut, Eileen [M.] Collins. It may not be fair but you had to pick somebody who was going to be first who couldn't fail, who was extremely poised and extremely capable, because they're going to get a lot of attention and a lot of visibility. If they can't handle it and they fail, that makes it harder for everybody else.

So once you get the first one done and they're successful—and Eileen was wonderfully successful as Sally and Judy were and all the six women—after that it's no big deal. Frequently I was asked later on. "How many women astronauts are there?" I'd say, "I don't know. I'd have to sit here and count. That's not something that we keep track of every day," which was a good thing. To this day I can't tell you how many we have.

I think they had to put up with a lot. Some of it we didn't I think appreciate at the time. I got to know Judy of course better than the others because we spent so much time training together. She would occasionally voice frustrations about questions that they got from the media or whatever. "Well, you wouldn't ask that of a guy, why would you ask that of a girl?"

I flew with Guy [Guion S.] Bluford too, who was the first black astronaut. Guy would say the same thing. "Occasionally I get a really stupid question that nobody else would get." So unfortunately it's just the way things are. They're looking for a story; the media is looking for a

story. Of course back then you had the old white boy NASA mentality. I think we've come a long way; I hope so.

ROSS-NAZZAL: You mentioned the media. I had read that Hoot Gibson had gotten a phone call from *Brides Magazine* about being engaged to Rhea Seddon and left him a message for Mr. Seddon. I was curious if he got razzed from you guys about that.

COATS: Oh yes, we razzed Hoot. We razzed Steve Hawley about being Mr. Ride when they got married of course. Both of them were really good about it, and they took it really well. Hoot being an old fighter pilot, we were brutal on that poor guy. He gave better than he got. Hoot was pretty famous for it.

ROSS-NAZZAL: Do you remember that Monday morning meeting when he and Rhea stood up and announced that they were going to have a baby?

COATS: I don't remember that. I don't know if I was not there or what. We were traveling a lot. So about half the Monday morning meetings we would either be in a simulator training or be flying out someplace. We missed a lot of meetings. I don't remember that announcement, but that's a good thing. I saw Rhea at Sally's tree planting ceremony. It was good to see her. She was a doctor of course at Vanderbilt [University, Nashville, Tennessee] for a long time. My son went to Vanderbilt and had some medical problems. She was very helpful with him. I really appreciate that a lot.

She was the doctor that seemed to fall asleep a lot. We had a sign made up. I don't know if you heard that one. Had a little sign saying, "The doctor is out until." She would literally fall asleep. We'd have an instructor up there. Sometimes they brought back the old Apollo astronaut crews to tell us about their missions. Rhea would love to sit up front for some reason, and then she'd fall asleep.

One day they pulled out the sign and put it there. "Doctor is out." I can't remember which crew it was. It may have been Neil [A.] Armstrong. I'm not sure. One of the crews just cracked up. They couldn't believe first of all she was sleeping and then when they put that sign out they just started laughing, couldn't stop.

ROSS-NAZZAL: Poor Rhea.

COATS: We used to tease her about it. "Did you learn that in medical school? What exactly did you learn in medical school if you were sleeping all the time?"

ROSS-NAZZAL: That's funny. I think she did mention that she had a hard time at first staying awake with some of those presentations.

COATS: Well, she was very personable and fun. Once they figured out that these military guys weren't going to bite, they weren't quite as bad as they expected, they fit in pretty well. Again Sally was the quietest one I think, the most reserved of the group. Boy, she could stick up for herself. If she got mad about something, watch out. Strong convictions.

ROSS-NAZZAL: Mike Mullane paints her as a pretty strong feminist in his book. Did you see that come out of her?

COATS: Yes, I would put her in that category more than the others I guess, as a strong feminist. Hank Hartsfield of course is from Alabama, slightly to the right of Attila the Hun on the political spectrum. Of course Sally was at the other end of the political spectrum. So when we'd get together as a crew and have dinner or something, conversations could be interesting. I think she viewed Hank as a right wing nutjob. It just stirred him up even more. So he'd tease her about that.

Eventually she'd get quiet, which meant she'd gotten really mad about it. You knew how far you could push her and tease her. But usually, if you were really just teasing her, she would be fine. She'd tease back. You didn't want to question her convictions about anything.

She mellowed out later. I saw her a few times over the last five or six years. She had mellowed out quite a bit. She wasn't as demonstrative perhaps as the rest of them. The last ten years or so when I'd see her, she'd give you a big hug. I don't remember hugging her when we first got in the Astronaut Office. She didn't do much of that. But boy, were they smart, all six of those women were sharp as could be. They didn't pick any duds, I'll tell you.

ROSS-NAZZAL: You finally had a chance to get to know Anna Fisher a little better when she was assigned to [STS]-61H, I think, which didn't end up flying. Can you talk about working with her and how different she was from the other women? Especially Judy, who you'd flown with.

COATS: Well, it was a little bit different because Judy was of course training for her first flight. Anna had flown already so this was her second flight. It's almost like when you have your first child you're going to be really strict with your first child. When the second one comes along you're not quite as strict with your second one. It was like that way with the mission. Before you're working yourself to death getting ready for that mission, you don't know exactly what it's going to be like so you're going to prepare for everything. You don't want to make any mistakes.

Second mission, at least you know what to expect. You know when you have to turn it on and work hard and when you can rest and recover a little bit. So Anna was a little more laid-back I guess. Judy worked really hard getting ready for that. It was a challenging mission that first one we flew: three satellites to deploy and a solar array to extend.

Of course other than Hank nobody had flown. We were all rookies. So everybody was working pretty hard. Most of us had flown on that crew [STS-61H] so it was a little more relaxed preparation. On that mission it was really just deploying a big TDRS [Tracking and Data Relay] Satellite, the big part of the mission. We had other experiments to run but it wasn't quite as complicated a mission. It was a little more routine I guess is the word, training, because we'd been through it once. We'd been through the training. So it was a little bit different.

Anna did well. Of course I was the commander then. I had told the whole crew, "If we don't have to be at work, go home. Rest up. Take care of yourself. Take care of your family, because there'll be times when you're going to work long hours for extended periods of time. So if you're not working go home." I remember my first squadron I learned that. I just showed up to my first squadron I was in, it was like at noon on a Monday. The skipper walks in and introduced himself. He said, "What the hell are you doing here?" I said, "Huh?" He said, "Are

you flying?" I said, "No sir." He said, "Go home." I thought well okay. His point was you're going to be working 20-hour days for a long time. If you're not flying and you're not doing any training, go home. Be with the family. I thought well, that's a sensible comment.

So I've always told everybody family first. You take care of your family, and that includes yourself, when you have the time, and work hard when you have to work hard. I had stressed to the whole crew, "When we're here for training, we're here for training. When we don't have training to do, I don't want you in the office just sitting around doing nothing. Be home with the family." So it was because we were more experienced with that crew. The intensity of the training was not as tough because we'd already been through it once and knew what to expect.

It was a little bit different attitude, and it wasn't quite as complicated a flight. Then of course *Challenger* happened while we were training. That messed everything up. So made it a lot more serious.

ROSS-NAZZAL: If you had to look back and say what the legacy was of these six women, what would you say?

COATS: If there was a glass ceiling, they shattered the glass ceiling and made us proud. They all had wonderfully successful missions. Every time they flew I think they distinguished themselves. I think NASA did a pretty good job of selecting those first six women.

Not only did they have to put up with a lot of visibility and attention while they were training for this completely new line of business if you will, but they had to put up with the

occasional comment that was really off base. I thought they handled it extremely well, a lot of grace and a lot of poise.

Maybe they'd gotten used to that in a man's world. They had to prove themselves, and they did. I think they proved themselves quite well. They threw the doors wide open for everybody else, for my daughter and granddaughters someday. I'd like to think they have every opportunity that I had.

So they really were the trailblazers. They handled it quite well. I'm proud of them. All six of them made me proud.

ROSS-NAZZAL: Well, I thank you for your time today. We're getting close here. Do you have any questions, Rebecca? I think we've hit the highlights. So thank you very much.

[End of interview]