

INTERVIEW OF
MR. PAUL DONNELLY
KENNEDY SPACE CENTER

AUGUST 23, 2003

BY

DR. ORVILLE BUTLER

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DR. ORVILLE BUTLER: I'm Dr. Orville Butler and we're in the home of Paul Donnelly on South Merritt Island.

MR. PAUL DONNELLY : Indian Harbour Beach.

DR. ORVILLE BUTLER: Indian Harbour Beach. Gotta get those places right.

MR. PAUL DONNELLY: Yeah.

DR. ORVILLE BUTLER: And I guess I'd like you to start out by telling us a little bit about your background and the route that brought you to Kennedy?

MR. PAUL DONNELLY: Okay. All right after Peal Harbor I joined the Navy and I had started at Penn State. I had a semester in and I was gonna get a business degree. They tested me in the Navy and put me into the first of the electronic programs. I was pretty good in math. Modestly, I was a very good math student, so that's how I got into the program, and only cause it changed my career field, so to speak, because of the work.

Then they sent me through a number of electronic schools – University of Chicago, (inaudible) City College of Pennsylvania. Had courses at MIT. We were stationed at the Bureau Standards at Washington. The old Bureau of Standards – hydraulic labs. That's where we developed our first missiles. They were radar controlled dryders (phonetic) and we built the prototypes right there, and I wired some

of the electronics for the prototypes and then put them into production. We finally took them to the fleet in 1945.

We had three (3) squadrons of aircraft. Patrol planes had one (1) of these missiles under each wing. It was fully automatic and locked on the target, and released it and it tracked ships. After the war, we started adding propulsion to our devices and the sidewinder was one (1) of the most famous.

All during this time, Dr. Dryden, who headed our group up in Washington, D.C. He was in civil servant at the time at the Bureau of Standards, he then became the head of NACA, Deputy of NASA. When NASA was formed, I wrote him a letter – do you remember me, Red Donnelly, I used to drop the missiles – I was testing them and space. He said, yes, and he said, you take this letter to Bob Gilruth at Langley if you want to join us, and I did. And that's how I came into NASA. Course they sent me directly down here to help set up the operations. Then, I was the only a spacecraft test conductor during Shepard's flight, Grissom's flight and Glenn, Carpenter, Schirra and Cooper. All of Mercury and in Gemini.

DR. ORVILLE BUTLER: When you said that they sent you directly down here, is that back when they were test firing missiles?

MR. PAUL DONNELLY: Yes. Missiles. We fired some unmanned vehicles too.

DR. ORVILLE BUTLER: So about what time did you arrive here?

MR. PAUL DONNELLY: I moved my family out February, '59.

DR. ORVILLE BUTLER: Okay.

MR. PAUL DONNELLY: And in '61, we lost a couple of unmanned shots, but May 5, '61, we lost Shepard, and in July we lost Grissom and then we went over to the Atlas pad and launched Glenn, Carpenter, Schirra and Cooper and then started the Gemini program.

That's why I hired some people to be some test conductors and shared the wealth with Gemini and then in Apollo, the early unmanned shots. In '64 they decided that they were gonna put some – before the spacecraft was separate than the launch vehicle.

Then they decided that they were gonna put a man in charge of both the operations. There were a number of us and the (inaudible) and I got picked. I got the launch vehicle in '64 and became the Launch Manager and launched all the Apollo's – ASTP with the Russians and our last project was – I took the group out to Edwards Dryden's Space Center, named after this doctor that headed our group way back in the 40's and did the drop test of the Enterprise. That was my last project, I retired in '78.

Then I looked around on the outside and I took the job of USBI here. We built the recovery ships and did the first test Shuttles with them. Retired again in '78, **(NOTE: He said '78, but I believe he meant '88)** - not because I wanted to, but I was the Vice-President for United Technologies and their policy is vice president has to retire on their 65th birthday and that's what I did. About 48 years working in that business.

DR. ORVILLE BUTLER: Yeah. What was the Cape like when you first came down here in '59?

MR. PAUL DONNELLY: Well, it wasn't much there. Those hangers – Hanger S. That's where we started. We just had a part of it. The old Vanguard under Bob Gray, Dr. Bob Gray had it unmanned. He had most of the hanger. He gave us a little spot in it – we put chicken wire fence around it and that's where we started was Hanger S. Kind of primitive.

Then we operated out of there and then built the building next to us – the AF Hanger – that was for Gemini. That's where we did our first Gemini work. Then, of course, we built Kennedy as it is now. Pad 39, VAB, DOBS building and all those buildings. I saw 'em all go up.

DR. ORVILLE BUTLER: What do you remember about some of the variety of leadership. Much of the construction of Launch Complex 39 or the Merritt Island facility, while it was done in the Army Corp of Engineers. Was very heavily influenced by design philosophies of Wernher von Braun and the management of?

MR. PAUL DONNELLY: The (inaudible) had a big input into it and the Corp was out there, but the man that really brought it all in, was Dr. Rocco Petrone. He was in the Army and then he got out and '66 , '64 or '66, became the Program Manager, but he was the drive. He integrated the whole mess and I went to work for him in '64.

Up to that time I worked for Gilruth group in Langley or Houston – In '64 Kennedy became a Center and he became the Director and I went to work at the Kennedy Center.

Actually I worked for Debus directly at first and then when the facilities came along, Petrone switched over to operations and he became the Launch Director, and I worked for him directly as Launch Manager.

I would say that the big drivers in those days were Gilruth at Langley and Houston developing the spacecraft, von Braun, of course, was at Huntsville, developing the launch vehicles, and Petrone drove things here – they got the facilities built. Another guy, I don't know if you ever talked to him, Don Buchanan.

DR. ORVILLE BUTLER: My co-author talked with him.

MR. PAUL DONNELLY: Yeah. He was a real cog in all this – getting the facilities built. Of course, during the flight part of it, getting ready – I ran the operations for the spacecraft at first, and craft had the flight people and I had the test conductors, the ground test conductors.

DR. ORVILLE BUTLER: Did you do both spacecraft and launch vehicle at that time?

MR. PAUL DONNELLY: In '64 I got – I had the test conductors for both groups. Of course in Apollo it was all in-house – it was all at Kennedy. See when I had the spacecraft for the Mercury and Gemini the first two (2) mercury's are Redstones. They were von Braun's vehicles. Then we went to the Atlas pad, that was the Air Force and then the Titan pad was the Gemini – they were the Air Force again (inaudible) the boosters.

DR. ORVILLE BUTLER: A lot of people have talked about difference in cultures. The municipalities of cultures that you had – that brought insight

into NASA and the Kennedy Program and at Kennedy they talk about the influence of Gilruth and the manned space center in Houston on the spacecraft and the influence von Braun and Marshall on the launch vehicle people. Those were very different cultures.

MR. PAUL DONNELLY: Yes, they were.

DR. ORVILLE BUTLER: How would you describe those two (2) cultures?

MR. PAUL DONNELLY: They were different. Well, my job was to integrate them – get them together operationally. Petrone did it at the program level. I did it from an operational level, but I had an advantage. You see, I came from the spacecraft family and I went over and got the launch vehicle so my biggest job was to generate operationally the three (3) Centers. They were all different, but.

DR. ORVILLE BUTLER: How would you characterize them – the difference cultures?

MR. PAUL DONNELLY: Well, let's see. The spacecraft came from NACA, National Advisor of Aeronautics. That's where Gilruth was – came from. And Max Faget, who was head of the design from the government, and of course, Mercury and Gemini were both manufactured and engineered by McDonald Douglas. John Yardley was the big man there. And of course, he became what was NASA on the Space Shuttle.

You see, if Gilruth is what you were looking at – you were looking at the Air Force that supplies those early missiles for both Mercury and Gemini and starting with

Apollo, you would think those – those were a lot easier because you were looking at your own NASA people headed by von Braun. There were some different philosophies on design, I'm opposite design rather than operations engineer - all my life, but you could see.

Both of them were careful – is the word I would say, because not only would you not want to embarrass yourself with your people but with the other people – you know, the boosters. So there was a little competition.

von Braun - he was a great concepts man. The idea man and he had a good team to make it happen. He was a super salesman. I think he had more to do with talk at Kennedy than anyone one person in the world. He was just a super salesman.

First of all he was very distinguished looking. Had everything going for him, ya know - Accent. Wernher and I had no problem. I got to know him. In fact, he used to stop in my office before every launch, but I think a lot had to do with I have an Irish Father, but a German Mother. I told him the story – she came from (inaudible) when she was seven (7) years old, and so we got to be pretty close.

I just look at Gilruth and von Braun as the real drivers. Both great engineers where von Braun was more of a concept type than salesman type and Gilruth was the technical old research engineer. I always thought they got along famously. It's funny – it was the people that had the friction – not the top ones. I think they had a lot of respect for each other, you know.

DR. ORVILLE BUTLER: What sort of, I don't want to use the word in fighting – I think maybe competition would be?

MR. PAUL DONNELLY: Yeah, competition and.

DR. ORVILLE BUTLER: What sort of issues would they compete over?

MR. PAUL DONNELLY: Like the abort system. That took both parties working, you know. I saw some up in (inaudible). It all got done, but again I was pretty young and I had my own job to do. I just saw this side probably – probably more after it happened in later years. I was busting my arce, you know, to get things done. I had a lot of people. That's the thing I always say. Any job you have, if you have a bunch of people, you know, cross section, up here and – but in the Apollo program even the losers, you know the bottom – the cross section Latin, they performed.

One of the most difficult jobs I had when I was running the fire (inaudible) particular 9, 10 and 11 – we went 60 days apart – we were getting the people to go home and rest – get some sleep. They all wanted to stay out there, and that's a helleva lot difference of today – they all want personal time off.

DR. ORVILLE BUTLER: How would you manage that eagerness?

MR. PAUL DONNELLY: You just had to say – get the hell out – I don't want to see you. And again, they used to have little meetings, something went wrong, you know and some guy were out. Wouldn't let him come to the meetings, and

they finally got the idea, you know, there not all (inaudible), but there were a few key people that you had to worry about – that I worried about, that get their rest.

DR. ORVILLE BUTLER: Who were some of the key people that you had to worry about?

MR. PAUL DONNELLY: Now on the spacecraft, course I had George Page, and later he headed up spacecraft operations so I had no problem there. George and I were thicker than thieves you know, cause I hired for the Atlas pad and on the launch vehicle there was a difference in philosophy on how you test. How you schedule.

From where I grew up in the spacecraft being influenced by the contractors on Air Force missiles, they had detailed planning. (inaudible) crews out and (inaudible) , not real paper people and you had to overcome that, you know, to come to some compromise how they were gonna do business. Some of the key people, Page, Bob Sieck, Slater, course, most of those guys retired. I don't know how many you've talked to.

Over at launch vehicle, one (1) of the finest, Dr. Gruney (phonetic) was great technically, but he had some key people that I worked – Irk Ridgel (phonetic) was one of the them. Curley Chandler (phonetic), Bill Wheeler (phonetic) and then I had my own group of test supervisors. The Schick (inaudible). I don't know, I had a bunch of them.

In fact, if you look at the layer leaders, (inaudible) came from the spacecraft side of the business and?

DR. ORVILLE BUTLER: Why do you think that was?

MR. PAUL DONNELLY: Well, few people like to lead. Most people want to be led and I guess there were more people on the spacecraft family that wanted to be in charge. I always wanted to be in charge. A chief in the Navy – the only thing in the Navy structure – they had enlisted men and when I got out I went to work for civil service.

I was 28 years old before I became an engineer. I was a technician for a lot of years. I think that really helped my career, for what it's worth. I knew people. So my real job, oh God, after I made chief in the Navy, just running – managing people. That's what I always wanted to do, and there were a lot of them out there that wanted to be managed.

DR. ORVILLE BUTLER: Let's run through Mercury and Gemini. What are the significant events that you remember in your career during Mercury? Significant problems, successes?

MR. PAUL DONNELLY: Well, you know the operations, you know, moving, testing and launching.

DR. ORVILLE BUTLER: Course operations can have problems too.

MR. PAUL DONNELLY: Oh, yeah, we had our problems, sure. I don't know, you see the original seven (7) astronauts, I knew all the Navy ones except Carpenter, because I was at Tuxan (phonetic) Naval Air station, testing airplanes and ordinance, before I came to NASA. I knew Shepard. He delivered our first jet aircraft,

the (inaudible) Virginia was the test station and about 1949- 1950 as a young JG. I knew Young and Schirra and all that. They all went through test pilot school, but I went over to Butuxan (phonetic).

Later on Apollo 13, we worked in the same office in Betuxan. Pete Conner (phonetic) and I built houses next to each other, so I knew the first seven (7) real good, and knew them socially. I remember I've been to his house.

I guess during Mercury, we launch MR1 and MR1 lifted off two (2) inches and settled back? That was kind of exciting to see the whole sequence happen, parachutes go out and an escape tire went – I was at blockhouse pad 5. We had about 50 some odd people in the blockhouse in those days. You knew everyone, you know. You knew everyone by first name.

Course von Braun and Debus were there. You know they were involved, you know, saw the things. That was a real wide awakening to see that something could go wrong - it did go wrong. You know, it was a really, I don't know how much you know about that. The relay – we lifted off and the ground was such that it thought it had completed its mission, so it shut down the engine and escape tire went and the parachutes came out, you know for the spacecraft.

I remember von Braun, he says, shook his head – shook his head, it was like he was saying, never again, never again, course he was there (inaudible) the launch vehicle, the spacecraft people – G. Myron Preston (phonetic) was my boss then. He was there. He was the highest in Spacecraft, but that was a real event and a lot of soul searching.

Then we went on – we launched 'em – MR3 was Shepard – MR4 was Grissom. Everyone talks about – it got kind of routine after Glenn's flight. He had that indication of the heat shield – that was a little testy, but most of us felt it was strictly instrumentation, which you wanted.

We had some crew operational flight problems in the Gemini II. In fact, Armstrong on Gemini VIII, where a thruster stopped rotating. We came awfully close to losing that crew in flight. The thing that I always remember in the total program, was Apollo 9, 10 and 11, that we launched 60 days apart. 9 –McDivitt went up and earth orbit and they joined rendezvous. At 10 was Stafford that did everything but land. And 11, it just felt – God, we made it, you know.

The rest of the world – Apollo 11 was important, but for people like me, 9, 10 and 11 were important.

DR. ORVILLE BUTLER: What about 8?

MR. PAUL DONNELLY: Oh 8 was another thing. That was the Dr. Miller's. George Miller. He was. von Braun – in particular, they like to test things peace mill and Gilruth, not as much as von Braun, but kind of like him. George Miller said, no, we're gonna – you see – you couldn't make those decisions today.

We became so bureaucratic You see, that was the third Saturn V – 8 and the first two (2) Saturns we flew, of Saturn V's. 8 flew on the third Saturn V. We had J2 engines on the both of them – problem – not a great problem but there were problems. You would have had to fly to fly another one – the full (inaudible), but he made the

decision and off we went. Great thing that happened. You can never make those decisions – see NASA was a young outfit, young leaders.

In fact, I remember the 20th anniversary of NASA – 1978. In fact, that picture there, Jimmy Carter – that was the 20th anniversary and all the old astronauts came and I was talking to Shepard. I think Frank Borman, I think Jim Lovell were there talking. Shepard used to call me Bishop, and he says, you know Bishop, you've come a long way in 20 years haven't we? I said, yeah, we've launched you to the Moon and back, but you know, in 20 years, we outdid ourselves.

It took the Navy 200 years to become as bureaucratic as it is, and the Navy, in 20 years, caught up. **(writers note : he may have meant "NASA, in 20 years" ...not "Navy")** That's when you saw the bureaucracy, about 1978. After the linkup and before the Shuttle, or before you made decisions. And then you started forming these great committees.

DR. ORVILLE BUTLER: What was the influences that were bringing about that change? I mean, you had a – back in '67 – you had Apollo 1 and the investigation of Thompson investigating Apollo 1, and that brought about some administrative changes, but it didn't seem to bring about the bureaucracy?

MR. PAUL DONNELLY: It became more committee oriented after that. At least a little bit, yeah.

DR. ORVILLE BUTLER: What event is happening in '78, or just before '78?

MR. PAUL DONNELLY: Well, that was just a milestone when we got together. You see, we had no manned operations from July '75 until April '81, and you had a lot of thinking – not like Apollo – like Apollo, you know make this like an airline, all that stuff. And you had that moving, and we want to cut the paperwork down that we had in Apollo – it practically doubled with Shuttle.

So you saw it did happen and more people, where used to it was kind of a dominating Center, trying to get that changed where you put things at Headquarters, you know. Depends on the people that you had, and it got more like the military. NASA headquarters was a tag on, you know.

DR. ORVILLE BUTLER: To what extent do you think that it also had to do with the fact that, with Apollo you had a mission, and?

MR. PAUL DONNELLY: More than you had a mission. You have the Country and the President behind you, and you had all the damn money you could spend.

DR. ORVILLE BUTLER: Okay.

MR. PAUL DONNELLY: That makes life easy. When you had the Country behind you and all the money you need.

DR. ORVILLE BUTLER: When you have all the money, bureaucracy tends to be factored to money?

MR. PAUL DONNELLY: Yeah, that's right.

DR. ORVILLE BUTLER: And now you're going through budget cuts and you have lay offs, or reduction in force beginning in '68?

MR. PAUL DONNELLY: Yeah, it was in the facilities (inaudible).

We had four hundred thousand people, I believe at one (1) time were involved. I think we had twenty-six thousand at the Cape. That's just the way like is and you've got people involved that want a change.

I guess change is good but sometimes it's bad, if it (inaudible) with what you had. Like the Gemini program, that whole thing was run with less than a Billion Dollars and you had some good people managing it. Chamberlain (phonetic) that came from Canada. Having a senior moment there. I can't remember the Program Manager from Houston. Anyway.

DR. ORVILLE BUTLER: Chris?

MR. PAUL DONNELLY: No, no, Chris was operations. Chuck Matthews.

DR. ORVILLE BUTLER: Okay.

MR. PAUL DONNELLY: Yeah Chuck was a quiet, silent manager – he was a great manager and a great engineer. He ran the Gemini program and made it happen. Hell, we had 12 launches. We didn't have any problems, we had some near misses like Gemini VIII, and of course, we had to shut down the engines with Stafford pad, I think it was Schirra with him. We didn't have any real big problems.

Apollo, we had the fire at 34.

DR. ORVILLE BUTLER: You had a perfect launch record after that.

MR. PAUL DONNELLY: Huh?

DR. ORVILLE BUTLER: Then you had a perfect launch record after that, of Apollo.

MR. PAUL DONNELLY: Oh yeah, exactly – every one (1) of them on time. I think Apollo 17 was the only one (1). Now Apollo 12 we had a weather hold and Apollo 17 we had a hardware problem. Yeah, most of them were right to the second on time. Good people, good machinery. These things were made by men, this rotating machinery, you got two (2) things against ya – men made 'em and you have rotating machinery. You're gonna have problems somewhere. You have to have problems. That the way life is.

DR. ORVILLE BUTLER: The problem with a spaceship is, it's pretty risky business.

MR. PAUL DONNELLY: Yeah but there was stuff we done and – even in the launch vehicle we had a lot of redundancy in it. I never thought about it, I was having fun. (laughter) Had a hellava lot of fun.

DR. ORVILLE BUTLER: Occasionally you did have some problems, and some pretty severe problems.

MR. PAUL DONNELLY: And they were corrected.

DR. ORVILLE BUTLER: What do you remember about Apollo 1?

MR. PAUL DONNELLY: You mean the fire?

DR. ORVILLE BUTLER: Yeah.

MR. PAUL DONNELLY: Well, I was in charge of test. Petrone was there. I don't think Debus was there that night. Lot of people got shipped out.

You know, I came, I saw a lot of death in the Navy, in the service the three (3) years I was – and even Petrone, who was a career Army man, but he never saw combat. I just come to accept it.

I guess I could accept it for 'em, and Gus was a particularly a good friend of mine. My wife said I was always a little cold when it came to things like that, but there's not a damn thing you can do about it – well, afterwards you can. I talked to a lot of guys. A lot of guys really – Yardley – well, Joe Shea (phonetic), I don't know if any of these names mean anything to ya - there up in the higher hierarchy. Joe Shea (phonetic) and Yardley both had mental problems over it, but that's life. It's a risky business.

Flying that damn airplane that takes off at Melbourne, it's still risky. Like I say they were made by men and rotating machinery, something could go wrong.

DR. ORVILLE BUTLER: How did Apollo 1 affect administration and testing at Kennedy?

MR. PAUL DONNELLY: Not too much. We didn't change much. I guess we looked a little deeper as far as inspection, but there really, the manufacturing had changed, and the (inaudible) inspection. After the fire we found out we didn't really.

DR. ORVILLE BUTLER: You went back and inspected the spacecraft for Apollo 3?

MR. PAUL DONNELLY: Well, later Apollo – we found some problems. It's the same thing you experience as a 20 year old Shuttle that are flying.

You got to get back into it. There was a difference of philosophies. Treat it like an airplane – well maybe we treated it too much like an airplane – or airline operation – didn't go in and poke around enough. It's something, you know – you either be a Monday morning quarterback but they were getting a lot of damage on the Shuttles – caught up with them.

Now the Challenger thing was stupid management mistakes. Go out that morning with the temperature, when they knew all along they had trouble with those seals in cold weather. I always said the old launch team would have never launched them – Challenger.

Petrone – if he was in charge that day, like the days of Apollo, would have never launched it. In fact, he was out in California screaming – don't launch – don't launch.

DR. ORVILLE BUTLER: Petrone was quite a character, wasn't he?

MR. PAUL DONNELLY: Petrone missed his call – he should have been a district attorney. He was a very pro – pro – pro. I liked him. I liked to work for him. He was an SOB, is what he was. He was a ruthless – driving people. Unless I drove the operations, I was kind of the fair haired boy, because he was worried about the program and the engineering, you know.

He was a hard guy – when he got down on you – it's was hard to get on the good side of him again. I resurrected a couple guys he got down on. It was tough. Yeah, he was tough, but Christian Catholic, goes to Mass, typical Italian, heart of the

world, you know, but he was a very key person in all this and the facility building. He practically ran Kennedy.

He – very demanded. A lot of people just loved him and a lot of people hated his guts – and that’s a typical leader.

DR. ORVILLE BUTLER: Sure. And it didn’t matter which side you were on, you certainly respected him.

MR. PAUL DONNELLY: Yes, that’s right. That’s right. Yeah, I still talk to him once in a while – we talk to each other.

DR. ORVILLE BUTLER: How is he doing?

MR. PAUL DONNELLY: Great. He’s a little borderline diabetic and a little heart problem. He’s the first man I ever worked for that was younger than me. He’s three (3) years younger than me. His birthday is March 31st and mine’s March the 28th, and Warner’s was the 25th.

I was project manager of the Bicentennial. You know when we put the logo and the flag on the VAB. There was a White house meeting and Shearer (phonetic) was the Center Director and Wernher had left NASA, and he was at Fairchilds and he came to the meeting.

We had one of the companies to come down and put these things on display and it was on the 25th. Now I might be wrong, it might be on the 23rd. That’s when Ford was President. Let’s see ’76 Ford was in. He wasn’t supposed to be in the meeting, had the Secretary of Commerce and Transportation and people like that.

I was the project engineer, or manager for Kennedy, and the word leaked out to Ford that that was Warner's birthday, so he came over and said Hello. I've got pictures of all of them. Kennedy and Johnson and all the ones that came to the Cape, you know. I got him in the White House.

DR. ORVILLE BUTLER: You've mentioned that Apollo 9, 10 and 11 were real biggies in your memory?

MR. PAUL DONNELLY: Well yeah. This is how I remember afterwards. I may not at the time.

DR. ORVILLE BUTLER: Sure.

MR. PAUL DONNELLY: There we were, we launched Shepard the 5th of May, '61 and Kennedy announced the 25th, I think, we went to the moon. Wernher had a lot to do with that as I told you before. Five (5) years to the day, we roll our first Saturn V out to the launch pad. Five (5) years to the day, and you could not start the day, design a vehicle, and do that today. It was difficult to do that an airplane or (inaudible).

From the concept – to remember from the 25th, '61, biggest vehicle we had was the Atlas and the Titan, you know and that happened, and that was a great day moving that thing out. Then of course, we did the unmanned launches, two (2) of them. The third one (1) was Gorman (phonetic) and Lowell (phonetic) around the moon, that was 8, and I guess, 9, 10 and 11, we had two (2) pads – we had three (3) firing rooms and we had all those up and going.

Different crews – I had different test supervisors and it was fairly demanding. Once we got 9 and 10 over, I kind of felt a relief, you know, cause we had to do them. Course we still had – we were in the seventh month of the (inaudible) when we finally launched the (inaudible). They were demanding. They were the years, that I remember the (inaudible) people, Ike, Andy Pickens, Ed Vana (phonetic) and those guys that – excuse me..... (phone ringing) It was a lot of work.

DR. ORVILLE BUTLER: Those three (3) missions were also known as for being ones where the processing at Kennedy had worked out all the glitches and they came to be more routine in terms of being able to get things ready to go.

MR. PAUL DONNELLY: There were all on time. That was our heyday – 9, 10 and 11, in the launch business.

DR. ORVILLE BUTLER: And then after that, originally, they were gonna have all the way up to Apollo 20 and they started cutting back. What was the mood out here when you began to have cutbacks and you didn't have another mission ready to go yet?

MR. PAUL DONNELLY: I really can't remember as - I saw the end of Mercury, the end of Gemini and course I (inaudible) on 17 for while and I know there was talk about the link up with the Russians. That was something coming and of course the Shuttle was in the, so to speak, in the works. I just felt there would always be a space program. In fact, I felt in my lifetime we'd be on Mars. I think I'm gonna have to be a hundred and fifty.

The Country and politicians have lost interest in it. You have to have something to drive the technical world, you know (inaudible) the steam engine at one time drove it. Automobile drove it. Airplane drove it. And space certainly drove it, in later years. I don't know what the hell you're gonna do with – unless you think about those smart bombs and stuff where it melts in the war, but that's not gonna drive it. Got to have something that the public sees. I don't know – I don't know what's gonna happen to it.

DR. ORVILLE BUTLER: So after Apollo began slowing down, you had Skylab and ASPC. What was your involvement in those two (2)?

MR. PAUL DONNELLY: I was still the Launch Manager. I played Director somewhere – I was the Launch Manager – I was until we hooked up to the Russians, and after that I was made Director of Shuttle Operations.

DR. ORVILLE BUTLER: The hook up with the Russians. Up until now they've been in a competing program, and all through Apollo, at least through the public, was viewed as a race with the Russians. Was that the mood at Kennedy?

MR. PAUL DONNELLY: People like (inaudible) never really saw that. We knew it was out there. You see, when we linked up with them, we had developed our guidance systems. We did all the maneuvering to link up, you know. The (inaudible) for MIT developed these systems. We led in the guidance world and maybe the communications world. Their boosters were developed by Germans too, you know.

They were – I don't think they ever were the details of – as I understand – the inspections, and they were more adventurous building the (inaudible). In fact, there was just one down in Brazil the other day. Did you read that?

DR. ORVILLE BUTLER: Ut-uhm.

MR. PAUL DONNELLY: Yeah, killed 20 people. The launch vehicle. There was different cultures, different worlds, but they were smart. In fact, one of their crews came down - we entertain them and I took the (inaudible) to Disney World and the – I asked him one day – I said, what do you think about our country? We were over at Disney and – what impresses you most? And we were off the meter there on the right, and he says, well, being able to go to an automobile parts place, to buy parts. Said they didn't have that. If you had an automobile to get a part, you just couldn't go to a parts store.

The other thing he liked our citrus fruit – out in our yard picking fruit. I have a good friend who lives in Cocoa Beach. He had (inaudible) and has the idea spot there where the river and the canals come together and they were entertaining at the home next door and (inaudible) came over and he was depth fishing. I don't know if you know what (inaudible) is, you hold the – and that impressed him. The three (3) things that impressed him. The parts, the citrus, and you could go in your backyard and go fishing.

DR. ORVILLE BUTLER: After AFCP you move on, or maybe you're already involved in Shuttle?

MR. PAUL DONNELLY: No, I was looking for lots of things to do and that's why I volunteered to take the Bicentennial – head it up. Had a lot of people that weren't doing anything. So we had those domes, you know, installed and industry came in with their equipment to display it. In fact, everyone thought we were gonna lose our butts – we made over Half a Million Dollars and put into the parking lot.

Fletcher was Administrator then, and after that I got a bunch of metals. My people had fun with the metals. He gave me a leadership metal for running the Bicentennial. He says that's great, and that's after – you gave me a – said – Hey Paul, how ya doing? Remember the days? – didn't ask about the next launch or anything. He was impressed with that because no-one wanted to get into it.

I remember we had a number of meetings in Washington and a couple at the White House. The Department of Transportation and Commerce says – oh no, you take five (5) years and put anything on our land. Five (5) years? I said, these people that made things happen, and we went to the Moon. I said, look at it this way, just look at it as a big church bazaar. We built the damn thing and in the last ninety days, and you're gonna tear it down.

You could see their thinking was not like ours at NASA. You can do anything if you set your sites and have the right people, and we did it. We built the damn thing with success and it was the biggest Bicentennial in the country here at little 'ol Cape Kennedy.

Here let me show you a picture of it.

DR. ORVILLE BUTLER: Okay. You have all sorts of domes out there.

MR. PAUL DONNELLY: Yeah we had all these domes and that where they displayed their equipment. Ford was President then, he didn't come down to see it, but. Him and Reagan never got down here. Clinton never got down here either. All the early Presidents came.

Let me show you my (inaudible). See where it's me and Young. This is Kennedy. This is Dr. Dryden, who I worked for way back in the early 40's on the missiles. Okay. Here I am with Johnson. Here I am with Tricky-Dick. And this was the 20th anniversary of NASA, when (inaudible) came down. This was '87, we were.

DR. ORVILLE BUTLER: It's up at the White House.

MR. PAUL DONNELLY: Yeah, but it's the 25th anniversary up at the Space Museum the night before and some of those (inaudible) invited us up to lunch the next day. Frank Gorman (phonetic) Senior George (phonetic). These were all what I thought were the stars of the program – these three (3). (inaudible).

DR. ORVILLE BUTLER: And the stars you have here are Gilruth, Debus and von Braun.

MR. PAUL DONNELLY: And, of course Craft (phonetic), Rocco for Debus. This guy here was I was making test conductors in (inaudible), I think we gave him the port. He was an Air Force captain at the time. He later became three (3) stars.

DR. ORVILLE BUTLER: And what was his name? I'm not reading it there. This is Crow or Crown?

MR. PAUL DONNELLY: Cromwell. He was big on Apollo. He was program manager.

DR. ORVILLE BUTLER: So you took care of the Bicentennial and then you volunteered to handle learning to fly the Shuttle?

MR. PAUL DONNELLY: I took about 100 guys out there. Bob Sieck was my engineering boss. Don Phillips (phonetic) was my operations boss. Gene Thomas (phonetic) later became Deputy Center Director with the program.

DR. ORVILLE BUTLER: What all was involved in learning to fly this new craft?

MR. PAUL DONNELLY: Well, first the Enterprise, we dropped it cause it wasn't meant to flight. How it handled and they picked up some things that – you heard the fly by wire systems that all airplanes have now, it was one of the first. It had some glitches. So the testing was worthwhile. We learned a lot from the engineering part of it now.

It was kind of a piece of junk when I it got here. You know, that first Shuttle. We rebuilt the damn thing here, (laughter) at least from the skin out. They had to push it and get it going.

DR. ORVILLE BUTLER: By that time you had moved on to contractor work?

MR. PAUL DONNELLY: Well, I retired in '78 and I took over USBI, had a lot to do building the recovery ships. After '78 I was with the government and '78 to '88. We didn't launch one until almost three (3) years. We launched 10 in that contract. I learned about industry.

I found out that industry was just as bureaucratic as the government. It didn't change, people didn't change – there all the same people. God made us all alike. Used to hear how different it would be, you know, the government – but it wasn't any different. People are people. I thought that, course UTC was a big outfit, you know. The division I worked for was just peanuts, you know. Back with the engines and carry air conditioning.

UNIDENTIFIED SPEAKER: Hi.

MR. PAUL DONNELLY: This is my real boss here. She's been my boss for 60 years.

DR. ORVILLE BUTLER: Oh my. Congratulations.

UNIDENTIFIED SPEAKER: Not quite.

MR. PAUL DONNELLY: Well, it will be 60 years next March.

UNIDENTIFIED SPEAKER: Can I get you a drink – some coffee or a cold drink?

DR. ORVILLE BUTLER: Oh I think I'm doing fine right now.

UNIDENTIFIED SPEAKER: I have water or I have Sprite or coffee.

MR. PAUL DONNELLY: Where were we?

DR. ORVILLE BUTLER: We were talking about this shift from government to contractor and during the time you were at NASA, there had been a shift, where early on NASA had been the hands-on and through Apollo increasingly stuff was turned over to contractor. Can you talk about what you remember about that?

MR. PAUL DONNELLY: Well, you see, yeah it happened, but (inaudible) is a safe people. Mercury, the contractor was big. Little 'ol Mercury on Pad 5 when we launched Shepard and Grissom. Remember Chrysler had built a vehicle and had their people there and McDonald Douglas had built the spacecraft – had their people there. So, all the changes, it was the mix.

Now the worst thing that happened – that I think that ever happened – when they wanted to make Shuttle operational, and they let that contract out to operate it and lost the design people, you know, who built the vehicles and they went on with another bunch of people, and I think that was a mistake.

If we had followed the philosophy of the Apollo, we might not have had two (2) accidents today. That's my opinion. That shared by the world. The only other guy that I know that thinks that way is Petrone, and maybe I've been influenced by him too.

DR. ORVILLE BUTLER: Petrone would be a pretty strong argument.

MR. PAUL DONNELLY: That changed the world of how you do business.

UNIDENTIFIED SPEAKER: Just plain 'ol water, huh?

DR. ORVILLE BUTLER: Thank you.

MR. PAUL DONNELLY: Course you have to adapt. It worried Rocco a hellava lot more than me. That's when things really changed with the (inaudible) contract that Lockheed won and then later, USA. I think that's where they think their gonna save a lot of money – they didn't save a nickel – probably spent more money.

You (inaudible), at your beckon call - like you do the Mercury, Gemini and Apollo. The design people were all there. They run the contract. The company ran the contract. You had the reputation of the companies there too, to do good work. See in those days, you work for von Braun, and he'd called the CEO of the company, and he'd say, hey, get down here.

DR. ORVILLE BUTLER: There were a few times some of them got called.

MR. PAUL DONNELLY: Yeah, some of them got calls. That's changed. No lines to the people making the hardware. That got solved, that was solved back in the old days.

DR. ORVILLE BUTLER: The company you were in charge of – you said you were in charge of learning the recovery ships?

MR. PAUL DONNELLY: Yeah, those didn't operate and then we assembled the solids. We had the front end with the parachutes and the rear end with the nozzle – what I call built in segments. We assembled them.

DR. ORVILLE BUTLER: And of course you had the seals that were the problem that were the problem in '86?

MR. PAUL DONNELLY: Yep.

DR. ORVILLE BUTLER: What do you remember about that?

MR. PAUL DONNELLY: Well, we do have the seals, but we just assembled them. Oh, we had problems but because - see we had experience. Most of my department heads came from chemical systems. We had the same thing over at the Titan. There, my company build the solid rockets, you know the (inaudible) and had all that experience, but it was the (inaudible) management that let the Challenger launch that cold day.

That was a different thought process where you could really pin it, where with Columbia with the (inaudible) of being there, it was an accident ready to happen. It was forced (inaudible) out.

A lot of people is to blame but, again - it was people. I was a professional killer at one time in the Navy - dropped (inaudible) bombs and... Well, it depends where you are at the time. Your thought process. I don't know what's gonna cure it, that's my problem today, if I had any concerns.

DR. ORVILLE BUTLER: I guess that was gonna be my next question. What direction do you think their gonna go?

MR. PAUL DONNELLY: Something got to happen to drive the people behind it. Whatever it takes. No uncertain terms, the Bay of Pigs had a lot to do us out at Apollo. Kennedy, well he was in a deep (inaudible). You come up with

something to give the American people a winner, and you (inaudible). Great idea. It wasn't his idea, but it good at the time. It was something to get the Country excited again. It has a lot to do with this going on. Maybe we need something like that. I don't know.

These wars and they're fighting – going all around the world fighting, if it something in the country happening again. You know there could be other things and still high speed (inaudible) aircraft, commercial, I thought that was gonna be a big thing, but here lately the (inaudible) going out of business, so I guess that's not the driver, economically.

You've got to have something happen. I don't know what's gonna change the country. And that's the thing about it, the next step that's big, but most of the people believe we should go back to the Moon and build a base there, and go to other planets. That in itself, doing that, would be setting up a colony. Now this was a colony in 1700's, and we need a colony on the Moon, you know. That would maybe get people excited. I don't know, I don't know if that would or not.

It's funny how - course with Kennedy, had that going for him and his personality. Poor guy never got to do anything. He didn't last long enough. I remember when he – it was early flight Mercury, in particular we had a gathering of the crew, and parties, you know and the Presidents would come down.

Kennedy came down for things we had at the pad and it just happened that in May of '61, Shepard was supposed to take the spacecraft over to the Paris air show. That was the end of month, you know and the State Department got involved

because Kennedy was going to Paris about the same time, and they said don't want Shepard over there distracting from – you know, Shepard was a hero at the time – distracting from the President's visit , so I got picked, No-Name Donnelly.

I took a spacecraft over and was in the receiving line, I was the first one (1) in line to say Hello to him. Kennedy backed off and I backed off, and I was standing there with Kennedy. I was never at a loss for words, so I told him the story about my trip to Paris.

Six (6) days before he was assassinated, he was down here looking at the Gemini and Gilruth had people, he used to have the control center, the flight control here – Mercury and Gemini - in the receiving line to say Hello to the President. I was probably tenth or twelfth standing in line, in the pecking order and Gilruth was introducing the President to the people. He got to me and Kennedy went, hey, I know him, No-Name Donnelly. (laughter) He remembered our conversation, you know.

There was a big write up in the paper about it. That is one of the (inaudible) things that happened. I've met a lot of people. A lot of Presidents. My wife and I got invited to the White House dinner - Tricky-Dick exit – big bash. Remember Arthur Godfrey?

DR. ORVILLE BUTLER: Yeah.

MR. PAUL DONNELLY: Well, My wife's an RN, and when we were stationed at the Bureau of Standards in Washington. That's where we got married in '44. Arthur was in the radio business and he was a patient of hers at Doctors Hospital. Later he came down, and I showed him around and reminded him

when he was a radio man. Probably the most famous person, I guess, who I met would be Nierenberg, he was here on Apollo 8. Jimmy Stewart, course from (inaudible) – he's from Indiana. I showed him around a couple years ago. He would go on active duty and take his two (2) weeks and spend some time down here. So I met a lot of people.

DR. ORVILLE BUTLER: Two (2) questions I have I'd like to ask. One of them is you talked a little bit about Ann Montgomery, and the role of women.

MR. PAUL DONNELLY: Oh yeah, well Joann Morgan, I probably – she retired just recently. My grand-daughter works for her and she was my first female engineer in the firing room. Ann was the second. About a block away down here.

DR. ORVILLE BUTLER: What do you remember about the first women in?

MR. PAUL DONNELLY: I had no problem accepting them. They were both - both of them were not engineers. Both of them were mathematicians as I remember. In fact, they used to kid Ann, later in life, about being an engineer and she went and got her Masters as industrial engineer. I don't think Joann went to school any further. In as much as I had three (3) daughters, I had no problem accepting them.

I always thought girls shouldn't be hindered as their sex. I had no problem. In fact, there were the only couple there, and now the females are in every area. Girls changed. I still don't think they should fight – be involved in combat,

because their still feminine, and one thing a man is different, you know mentally – that can't change.

DR. ORVILLE BUTLER: How readily were they accepted in the firing room?

MR. PAUL DONNELLY: No problem at all. I would think their biggest problem was, at their level, who they're competing against to get that seat. You know what I mean? Cause I had some there that I didn't recognize, because then, hell there was so much to do, we had something for everyone to do.

Not everyone fought to get in the firing room, by the way. Firing room was – we had long hours, test, holds, cancelation of tests in the middle of the night.

DR. ORVILLE BUTLER: And Tip Colon tells stories about how he talked his way out.

MR. PAUL DONNELLY: Yeah , Tip was one of my young operations engineer. In fact, he wanted to leave at one time during the program, and I gave him hell. I said, you think your staying in operations, I'm gonna give you a different job on the pad. Yeah, Tip was one of my young stars. He's done real well. In fact, I would say, Oh I bet I had six (6) or 12 people that worked for me that became higher in the pecking order than I ever did.

See I worked for a man who reported to the Center Director and, Page, I think was the first one. He became Deputy Director after I retired. Bob Sieck went up. JoAnn Morgan. Some of them close, but those three (3), they – so I trained them right.

DR. ORVILLE BUTLER: Another question I wanted to ask about is we talked a little bit about the difference of vehicle and spacecraft people. You have another group of cultures coming in from the industrial world and the different companies, undoubtedly, had different cultures. Can you talk a little bit about the differences as you saw it, between say a McDonald, a Boeing, a Chrysler, a North American, a Rockwell?

MR. PAUL DONNELLY: Well, you see. It would be hard to say. See, when they came in, and when we were deep in the bowels running things at NASA. They had the doubt, they had no other way to go to adapt to the way we did business because, remember, they had to make money for the company – for the stockholders. So.

DR. ORVILLE BUTLER: So NASA was in the cultural driving seed?

MR. PAUL DONNELLY: Yeah, and a little bit different with Mercury and Gemini where we had the Air Force supply the boosters. In fact, you know, my scheduling and planning, you know, I had some in the Navy but I copied my good friend, Tom O'Malley (phonetic), who had a GDA up. I don't know if you ran across that name - O'Malley. Tom and I are good friends – most Irish, and I watched how they did it because remember they were launching missiles while I was back testing airplanes.

To prove the point, George Carla (phonetic) who was a manager at Grumman here. He was just a manager, wasn't even a vice-president, and he took part

of that, what we did – how we did – you know, and I would like to think I had a big part of it, the scheduling methods, and took it back to test page at the Apollo and the F14 was in trouble (inaudible) to that and he headed up the company finally. He took that from a (inaudible) – the (inaudible) of scheduling and if he was living, he'd be the first guy to (inaudible).

So we developed some good things ourselves, but it wasn't our idea. It was kind of like what the Air Force and (inaudible) at the time were doing.

DR. ORVILLE BUTLER: A lot of people talked about the humor and Phillips bring in Air Force style management about '64. If you had a number of people, for instance, down here in the flight activation manager, Colonel Sharp (phonetic) came out here.

MR. PAUL DONNELLY: Sam was a Colonel. I don't remember if he had the Boeing (inaudible). He was a full Colonel . In fact, his rise to fame, a lot of it had to do with some briefings he gave Kennedy of the Minuteman. And Kennedy liked him – it impressed him.

DR. ORVILLE BUTLER: What do you remember about the Air Force influence on the management?

MR. PAUL DONNELLY: From the indication of what I said, I didn't see it. I mean, the Debus' and the Gilruths, so I didn't really see it. I know that I personally had a lot of respect for both George Miller and (inaudible) and I considered them my friends. In fact, George is still going. George must be about 83. I think he's

still – at least the last time I talked to him, he was still running a company out in California.

I saw more – I was working with the managers of the Atlas Pad and the Titan Pads. Course I had a lot to do with the Air Force scheduling on the range. To get range time. The Air Force officers, as I saw it, were not as deeply involved in the nuts and bolts as the NASA managers were. I saw that when I got out of the government and went with UTC.

With NASA, when I got together with the biggies, we were talking about relays, valves, something technical, okay – with industry those (inaudible) parts in the organization, you're talking about sales and profit. Make no mistake about it, in fact, when I made Vice-President, I was called to Hartford Connecticut and General Haig (phonetic) had just made President of (inaudible). There were about six (6) of us being Vice-President. They gave badges – that was a big thing.

Well anyway, so I was talking to the Vice-President, my big boss, who is in Norwalk (phonetic), Connecticut not in Hartford, and I told him, I said, Mike Michelson (phonetic) was down. I said Mike, ya know, I told him I was involved with my high hierarchy, we always talked about dials or resistors or transistors or something.

I said, all I talk to you about is sales and profit. He said, Paul, that's what we're after – we make money for the stockholders – all those people down there, we pay them big bucks - they do the talking – they figure it out and you're right, I never get involved in details. He said that. So, it's a different world. I don't know if that makes sense to you or not.

DR. ORVILLE BUTLER: Uh-huh.

MR. PAUL DONNELLY: Where I really – after I retired in '65 and got into the construction business, I found out I led the sheltered life for 48 years. That world is a different world – sleazy people. I'm sure there were other organizations but it was obvious. Different, different thinking. (inaudible) and the league that they were in, you know to succeed, you had to – that's what you had to do.

DR. ORVILLE BUTLER: Any last thoughts – people we ought to talk to - particular memories that we've missed?

MR. PAUL DONNELLY: Well, I was thinking about who was good. Petrone would be good, because he's got quite a memory. He could tell you. He'll say, remember when we had the converter go out and I didn't know ... but he would be great to interview, and I think if you were to push him right, you could interview him. You might have to go to California, but if you want to know Kennedy, to me Kennedy Center was Rocco Petrone.

KSC had other jobs and did good jobs, but I hope history proved it. But he was quite the person. Another young man was Bob Gray, who later came over and joined us.

DR. ORVILLE BUTLER: He headed up unmanned?

MR. PAUL DONNELLY: Huh?

DR. ORVILLE BUTLER: He headed up unmanned?

MR. PAUL DONNELLY: Oh yeah, he'd be at Hunter. He was in Vanguard. He started in Vanguard for the Navy. People I admired was George Page.

George was probably was one of the best test conductors they ever made, and even better than Paul Donnelly. I would say Irk Ridual (phonetic) in engineering. Bob Sieck, program and engineering.

DR. ORVILLE BUTLER: We interviewed Bob last week.

MR. PAUL DONNELLY: He's quite a character. Drove race cars, did he tell you that? He was out ELC, he headed up an engineering crew. I guess the interview said, if you had to do it all over again, and you headed it up, who the hell would you hire. So far those guys I mentioned would be the first ones I would put together.

Now, talking at my level now, not up there, but I'd still like the Gilruths, the von Brauns, the Crafts. Chris has a good bunch of flight directors. Jerry Griffin (phonetic) and Crafts (phonetic) who was Apollo 13. (inaudible) was my counterpart ALT, Chris did a good job in, vice of operations. Cocky little man- rooster, but he was a key.

Now people who passed away was Walt Williams, he dealt with the X15 before he came. George Miller and (inaudible) 'ol George. Of course, my test supervisors. A good one to talk to would be my senior – would be Don Phillips.

DR. ORVILLE BUTLER: I've seen the name.

MR. PAUL DONNELLY: Donald Phillips. Like his son is a operator for the NASA - for the – Don Phillips. He lives in Titusville, and he would be a good one to see because he was in the program part of it during Atlas, and he came to me he wanted to get in operations. He saw a lot of the Air Force way of doing business

and then came and joined me. People still, Kapryan, he kind of stepped – his memory's gone. Walt Kapryan, I don't know if he was on your list.

DR. ORVILLE BUTLER: Yeah, my co-author talked with him.

MR. PAUL DONNELLY: Another guy that would be one of the first ones would be Oris Lambert (phonetic). You ran across that name?

DR. ORVILLE BUTLER: I have.

MR. PAUL DONNELLY: He was in spacecraft operations and later went to work for Lockheed after he retired. He was a pretty key person here.

DR. ORVILLE BUTLER: Very good. Well, I thank you for taking the time to talk with us today and share your memories and we'll take some gems from that.

MR. PAUL DONNELLY: I hope I gave you some information.

DR. ORVILLE BUTLER: Oh, I think so. I think so.

MR. PAUL DONNELLY: Every once in a while I'll be thinking of those people and I'd say what I believe in. I was one of the guys that liked Petrone, not dislike him.

DR. ORVILLE BUTLER: I've met people who felt Petrone, but I haven't met people who had said they disliked him.

MR. PAUL DONNELLY: I guess what I liked about him is while we're looking to fill that job. He came to me and he says, I was a GS 15 then. I don't know if you know about structure. He said, Paul, says, I know you like the console, being a test conductor, but you could sit there for the next 10 years and you'll still be a

GS15. Now you join me and take over the launch vehicle, I'll get you an accepted position. So he did. That was a big thing, you know. That's the real break. You go from a colonel level to a general level in structure – in a protocol and pay too.

So he had watched me from afar. I guess he liked me. I got the job over a bunch of guys that were Debus and von Braun (inaudible). I kind of was part of that. I came over the Spacecraft family. But like I said, you know, you don't have to smart if you're lucky.

DR. ORVILLE BUTLER: Course, it helps to be both.

MR. PAUL DONNELLY: Yeah (laughter).

DR. ORVILLE BUTLER: Very good. Well, thank you so much.

MR. PAUL DONNELLY: You're welcome.

Thereupon the interview ended.