

**American Meteorological Society
University Corporation for Atmospheric Research**

INTERVIEW OF ELBERT W. FRIDAY, JR.

July 25, 2003

Interviewer: Kristine C. Harper

Harper: Today is July 25, 2003. I am Kristine Harper. I am the interviewer and I am interviewing Dr. Elbert W. "Joe" Friday, Jr. at the American Meteorological Society in Washington, D.C. Joe, could you tell me when you were born and where you were born?

Friday: I was born 13 July 1939 at a little town in Southwestern Arkansas called DeQueen. The town still exists. It is the same population as it was when I was born, right around 3000.

Harper: Okay, so a very small town.

Friday: Very small town.

Harper: Okay, and who were your parents?

Friday: My parents were two of the locals from the area. My mother was Mary Elizabeth Ward.

Harper: Um-hum.

Friday: My father was Elbert W. Friday, who later became "Senior" after I was born, obviously.

Harper: Right.

Friday: They both were local people that had grown up on some of the local farms, and so on. Dad had joined the Army about a year before I was born, and Mom stayed at her parents' farm, her mother's farm. Her dad passed away by that time, and I was born in the little corner bedroom there in a house that no longer exists. It is under a parking lot now. That was the origin. That is the family.

Harper: Okay, now, did your dad stay in the Army then?

Friday: He stayed in the Army for a full -- then later joined the Air Force -- for a full 30-year career.

Harper: Okay.

Friday: And, would have stayed in longer had they let him. He thoroughly enjoyed it, thoroughly loved it.

Harper: And, what kind of work did he do in the Air Force?

Friday: He was a communications engineer when it finished out. He spent about the first 15 years of his career, were spent as enlisted in various capacities, and so forth, and then he moved into this kind of intermediate technical grade that they have in the Army and the Air Force called a Warrant Officer.

Harper: Right.

Friday: And, he served as an Arctic Specialist, as far as communication and engineering is concerned.

So, he spent a year in Point Barrow, Alaska; a couple of years in Thule, Greenland when they were putting in the early distant, distant early warning radars there. He spent some time in Goosebay, Labrador, which has a native _____ (s/l Inuit) name that I cannot pronounce, although I have visited it recently. And so he spent quite a bit of time north of the Arctic Circle, completely remote for us. So, my mother, in some respects, was almost a single parent. . .

Harper: Right.

Friday: . . . for a substantial portion of her life.

Harper: And, when were your parents married?

Friday: They were married in 1938, spring of 1938, I can't remember the exact date. I think it was February.

Harper: Okay. So, ah, you were the oldest child?

Friday: I am the oldest. I have two brothers.

Harper: Two younger brothers?

Friday: Two younger brothers. One has just turned 60, so he is four years younger than I am, and the other is four years younger than he is, and so, we were spread

around, and three boys being raised at that time was certainly a demand. On Mom particularly.

Harper: Makes me tired just to think about it. So where did you move, then while you were a kid?

Friday: After I was born, Mom and Dad tried to spend as much time together as possible, so as he was moving around various places, generally in the South and Southeast, I kind of bounced around with him. Midland, Texas; Lubbock, Texas; military installations there during World War II. Dad did not go overseas – I'm sorry, he did go overseas in World War II, but it was to Adack, Alaska, which is on the tip of the Aleutian Chain.

Harper: Right.

Friday: He actually saw combat there because the Japanese actually tried to invade Adack with a small party, and they were turned back, but again, he was primarily dealing with communications, listening-post type of activities there at the Aleutian Chain. But, we moved around very frequently during that time period, and, and periodically when Dad would go overseas, we would move back to DeQueen, Arkansas and stay with my grandmother and kind of bounce back and forth like that. By the time I started in grade school, the first couple of years were actually in DeQueen, Arkansas, and then they went around to various places, including Memphis, Tennessee; Warner Robbins, Georgia; again, a few places in Texas at various times. Ah, Tinker Air Force Base, Oklahoma, where I started to get my Oklahoma connection. I spent a year there, sophomore year there. Went out to San Rafael, California for my junior year and the first half of my senior year. Dad then got an overseas assignment and we went back to Midwest City, Oklahoma. Mom could not join him at the time, and so we went back to Midwest City, Oklahoma, and stayed there because it was right across from Tinker Field, Tinker Air Force Base.

Harper: Um-hum, sure.

Friday: . . . and so I graduated from Midwest City High School. I chose to go to the University of Oklahoma for an undergraduate degree, simply because it was cheap.

Harper: Right.

Friday: It was \$86 a semester . . .

Harper: Sure.

Friday: . . . was the tuition at that point. And, I graduated from high school on one day. Mom and Dad left for overseas. Dad had finally gotten to a position where he could bring a family with him . . .

Harper: And, where was he heading?

Friday: Newfoundland!

Harper: Okay.

Friday: St. John's, Newfoundland.

Harper: Okay, yeah, I understand. I was stationed in Iceland for two years.

Friday: Right. St. John's, Newfoundland. And so, the family went there and I went and stayed with my grandmother again down in Arkansas for the summer and from that time on I was basically on my own.

Harper: Sure. Now, what was it like moving around and changing schools all of the time for you when you were a kid?

Friday: It was, in some respects, you know, you could use the term "character building," because you get a chance, you get a chance to be on your own a lot, independently. You get a chance to meet new people, make new friends. At the same time, that's difficult, particularly for a, I think for a child that tended to be introverted. I tended to be an introvert, and so, it was a little difficult in that capacity. I didn't like the idea of moving around so much, but it was just a part of the life, and so I recognized that was a point. At the same time, I always enjoyed seeing the new locations. We always drove across country, one way or the other, and when we went to California, for example, we had a wonderful time going through Petrified Forest, Painted Desert, Grand Canyon, you know, all of those things that I saw as a teenager and thoroughly enjoyed those kind of things.

At the same time, I recall that in my sophomore year, in Midwest City High School, I had finally found that I was starting to be a little more outgoing and interacting. I had run for one of the student offices. Ah, it was publicity manager for the school. Now, this was the kid that was always on the intercom in the morning, you know, making the announcements for the day and all of that. It was pretty much of an historic track record there that the publicity manager was in very good stead to be elected either class president or vice-president the following year because of all of the publicity and the fact that he or she was a well-known quantity. And, I won that election by one vote. There were three or four recounts, and out of a class of 200, and probably around 170-or-so voted, I won that election by one vote. And, ah, I went home that night so excited and before I could make my announcement about what was going on at the dinner table when Dad came in, Dad came in and said, "I got a reassignment today. We will be

moving in a couple of months. And, so, I had never told them that I had won the election. I just didn't go, you know, beyond it at that point.

Harper: Yeah, right.

Friday: But, I remember that was probably one of the biggest disappointments that was caused by the moving.

Harper: Ah-hah.

Friday: I came back to Midwest City in the middle of my senior year and had it not been for the fact that, that I had been there my entire sophomore year, it would have really been a lonely time coming into a high school graduating class in the middle of your senior year . . .

Harper: Right, right.

Friday: But, I met my wife at that time. She was a junior at the time, and we got married a year and one-half later when I was a sophomore in college, and she had graduated from high school and had gotten a job, so that was the criteria; and, we are still married today, so . . .

Harper: That's a good deal.

Friday: So, it's 44 years later.

Harper: Very good.

Friday: You know, from that standpoint, the moving around was fine.

Harper: Yeah, it worked out well. How long, I know in those days as compared to now where tours tend to be longer for most military people because there is not enough money to move people around. What was the shortest period of time you were someplace, while you were in grade school, and what was the longest period of time?

Friday: Well, the longest period of time was the year and one-half I actually, we were in San Rafael, California, ah, and usually it was about a year or so. Dad moved around a lot because of the fact that he was bouncing back and forth to overseas locations that we couldn't go, so, we bounced back to DeQueen, Arkansas several times. And, most of his overseas assignments at these remote locations were only a year, so we would move there for a year, then join him wherever he was going afterward.

Harper: Right.

Friday: And, ah, ah, my, my grandmother had, was still taking care of her farmhouse, and all of that, when Dad went, when I, when we came back from California, but we stayed at Tinker, because at that time with three kids, the ability to have the military base there present with health care and everything else was kind of a deciding factor.

Harper: Sure.

Friday: And, we just stayed in a little rental house just right across the street from Tinker Air Force Base for that period of time.

Harper: Now, were both sets of grandparents or parts of them, still living in DeQueen?

Friday: Yes. Both my, both of my grandfathers had died at an early age through, ah, one was an accident, and the other was pneumonia. Both my grandmothers lived into their 90's, and so my two grandmothers were still alive. They were in DeQueen. They lived about a mile apart down a country road, so I can remember walking back and forth between the two houses very, very frequently.

Harper: Right. And, did you have aunts and uncles living, I mean, was there extended family there?

Friday: The family was not particularly large. My, on my Dad's side, he had one full brother and one half-sister. He, ah, the full brother was an interesting case. He did not like the name Friday.

Harper: Hum.

Friday: His name was John Allen Friday. Ah, as soon as he left home, finished college, ah, going into the oil business down in Texas, he changed his name to John Allen. He dropped the word Friday from the name, and so forth. And, so, that chain disappeared at that point.

Harper: Right.

Friday: My father had three sons. I have two daughters. My youngest brother, who lives in England now has two daughters; but, the middle son, my younger brother, has one daughter and one son, but the son is a confirmed bachelor, and so, I think the name Friday has virtually disappeared . . .

Harper: Died out? Ha-ha.

Friday: . . .at least this arm of the Friday clan as gone away at this particular time. Ah, which is okay. I mean, I'm not hung up on that, but it is kind of interesting. It is a relatively small family, not a large extended family at all.

Harper: Okay.

Friday: It always has been. My, my mother had one, two brothers and a sister. Ah, two of her siblings had no children, and one had one son who is, actually, about three or four years older than I am.

Harper: Um-hum. And, did they all live in DeQueen?

Friday: No. Everybody dispersed. That was the problem with the Arkansas community there. I mean, everybody, as soon as they had the opportunity, left because there really wasn't much opportunity. If you didn't want to stay on the farm and just continue to ah, and these were not huge farms. These were like 40-100 acres, and so forth, so it was more subsistence farming than anything else. You could make a living on it. You could take care of your own immediate needs and have enough to barter or sell to bring in the rest of it, but it was virtually, ah, not a big business sort of thing.

Harper: Um-hum. How would you describe the influence of your family on you? In other words, were your grandmothers an influence in any way, because they were there and you kept going back to DeQueen in-between these things, or were your parents, or one or more, either of your parents more of an influence on you, do you think?

Friday: It is an interesting question. My mother's mother, my maternal grandmother, ah, was a very, ah, outgoing person. That is who I stayed with all of the time. My father's mother was fairly reserved and didn't really want to have much to do with the kids, with us, and so forth. I think we were too much of a problem. We caused too much noise, and all that.

Harper: Um-hum.

Friday: My mother's mother was not that way, although she was, she insisted on discipline. She put up with a lot of nonsense, but you still had to follow the rules and I accepted that. I think we all accepted that. We had no running water in the house. There was, you know, outdoor plumbing . . .

Harper: Right.

Friday: Ha-ha, and well water. And, I still remember when we were there and the kids were, you know, I was maybe 10, you know, then maybe 6 and 2, or 12 and so forth, in that age category, I can still remember drawing several buckets of water out of the well and setting them out in a 30-gallon galvanized tub in the sun to warm up in the afternoon, and the cleanest kid got in first and the dirtiest kid got in last. . .

Harper: Ha-ha.

Friday: You know, sharing the same water, but so the cleanest kid got in first. And, you know, I tell those kinds of stories to my daughters now, and they can hardly believe it because they have lived in a fairly good environment and all that. But, this was a great environment. I mean, the standards were there. The values were there. The moral structure was there. There was a church literally next door to our farmhouse. It was a community Methodist Church, more of a community church than a Methodist Church really. . .

Harper: Sure.

Friday: And, we were there every Sunday and sometimes on Wednesday, and so forth, and it was just a natural part of our life, and all. So, from that standpoint – Mom and Dad were very different people. Mom is still alive. Ah, Dad passed away three years ago. Mom is 88 years old now. And, ah, they, ah, Dad had not finished high school. He finally took his GED testing, I think, later on during the time, but he felt that was what really was, you know, was a critical factor was education and he insisted that all three of us go through and at least get our Bachelor's Degree. And, he set certain standards as far as I could enter college, with B or better. And, actually, I was roaming through some stuff at Mom's house not too long ago looking in some of the old records, and so on. I don't think he ever made a B when he was - - ha-ha – in high school, and so forth. I saw some of the old grade cards and all that. It was kind of interesting. But, B or better was his standard. And, I can remember him saying that all the time – “B or better.” And, and, boy I tell ya, it made an influence on all of our performance and all this. Um, so, I think the parents have probably more influence directly. . .

Harper: Um-hum.

Friday: . . .the grand, my grandmother on my mother's side was influential because we did spend a lot of time with her and she did kind of set some fairly strict standards for us to follow.

Harper: Um-hum. Um-hum. Ah, so, was your family always religiously active? Was that an important part of your life?

Friday: It was important, but it, when I saw religiously active, ah, that may be too strong. They always participated in church,

Harper: Okay.

Friday: Ah, they, but they didn't participate in any of the other type of activities. None of the taught Sunday School, or anything of that nature. They were attenders.

Harper: Right.

Friday: They were attenders and supporters from that standpoint. We always attended the pot lucks and various things of that nature. Ah, for the last 20-30 years, I have been actively teaching Adult Bible School and so on. So, I've carried it a little further, I think, than they did, in a lot of respects.

Harper: Um-hum. Um-hum.

Friday: I, I've been chairman of the board at our church in Burke, here, Virginia, here. And, I'm on the board now, but no longer chair. I passed that on. Ha-ha.

Harper: Thank goodness I've given my _____

Friday: Yes, so it is a very important part of my life and has been for a very long time. Yes, it has been a very important part of my life. But, I grew up in the church. It wasn't some sort of mysterious revelation, or a certain epiphany, or anything of that nature.

Harper: Right, right.

Friday: It was just growing up in the church and studying. I always enjoyed reading and studying, and so the more I studies, the more of my own particular convictions developed over the years.

Harper: Um-hum. Um-hum. What would you describe as your major interest in school. I mean, when you were going through school, were there any certain subjects that grabbed your interest more than others that weren't that tough to get the B in that you wanted to make for your Dad.

Friday: Actually, math and science have always been something I have really been fascinated with and I have always taken those courses. It was interesting going from school to school to school because different states have different emphasis and all that. When I came back, for example, from California, and I had taken in that year and one-half I was in California, I had taken physics, I had taken introductory calculus, because they taught it in San Rafael High School at the time.

Harper: Sure, right.

Friday: And, you know, I had taken that kind of thing. I was one of these very narrowly focused kids in college. Ah, and I look back today and it is a real tragedy. Ah, I encourage my kids not to make the same mistake, and they didn't. But, in my 144 hours that it required for graduate program, to graduate from the School of Engineering at the University of Oklahoma, I had a total of six hours that were not science or math.

Harper: That's sort of sad, too.

Friday: It is sad. It was required English I that was required American History.

Harper: History, um-hum.

Friday: That was it. And, it is sad. I mean, it really is sad. I, I regret that to this day. I mean it prepared me wonderfully for the technical aspects, but I have had to learn a lot of other things, ha-ah, as a result of that.

Harper: Um-hum. Um-hum.

Friday: And, had I had that other foundation, I think it would have been a lot different. And, to a certain extent, it was the same way in high school. I really concentrated. Of course, you had to take all of those courses and all that. Now, the one thing that I think was most intriguing, ah, when I came back from California, they did not have any of the math and physics courses that I had not already had. So, what I did, my senior, my second half of my senior year at Midwest City, I took Speech, Play Production, and Debate, in addition to senior English.

Harper: Um-hum. Um-hum.

Friday: And, some general language—ah, German. I had taken one year, first year German out in, out in a California, and they were teaching German in Midwest City. They had just started that program, so I took it, you know, and so forth. So, that was my program. And, I really enjoyed the speech, play production, debate sort of thing. Our debate team won State Champion that year, Oklahoma State Championship that year. We went on to Nationals and got clobbered in the second round, but that's okay, ha-ha, you know,

Harper: That's okay. You went there.

Friday: And, all that. Ah, and, and, that was the time period that I really started to learn not to be afraid to talk to people, you know, in a public type of forum.

Harper: Right.

Friday: And, you were forced to do it, so it was fine. It worked out well.

Harper: Right. Right.

Friday: But, ah, yeah, it's interesting to have looked at that. But, I was always very, very much interested in math and science. I terrorized my poor mother, I remember several times, because I had things that I would be arrested for today and put away, I mean, you know, I was making explosives in the garage. I wasn't

doing anything with them I was having fun in the backyard, setting off my own built-in fireworks, and all that. I had a friend that had a, his father had a machine shop, and he made parts for an airplane company out of magnesium. Magnesium is flash powder.

Harper: Uh-huh. Yes it is. Yes it is.

Friday: And so we would get these barrels full of these magnesium shavings and we would mix them with sulfur or other oxidants and mix them with chemicals that would cause fire, ah, cause color, coloration – strontium for red, you know, and so forth, and copper for blue or green, and all that, and we would mix these things up in three-pound coffee cans. We would fill these things full and bury them in the ground, because otherwise they would just melt, and then light them. And you had these columns of beautiful, gorgeous flame going up 20-30 feet into the air, ah-ah, you know, all that sort of stuff. Like I said, we'd get arrested today for that kind of thing. But, I was always doing that, and ah, had a chemistry set in the garage, electronics in the garage, all these sorts of interesting . . .

Harper: Uh-huh. So, your science interest was mostly physical science.

Friday: Physical science.

Harper: Yes, yes, so were you ever attracted by life sciences?

Friday: No, never was. I did get a, a, interested in organic chemistry for a while because in my own, ah, garage chemistry set I started to get involved in a little bit of the extraction of chemical constituents from natural ingredients, and all that – caffeine out of coffee, and things like that. None of the, I was not into drugs. I have never smoked pot. I have never taken any illicit drug. I was almost a victim of alcohol, but I no longer drink as a result of that, and I smoked tobacco, four packs a day for about ten years and I stopped that as well. So, it wasn't driven by any of that sort of thing. I wasn't a drug lab, it was strictly fun. It was strictly looking at things and, and ah learning – some of the stuff I worked with are now listed as carcinogens and all that. I have never had any results from it that I can tell, although it may change things in the long term,

Harper: Uh-huh, right.

Friday: But, it was fun. It was exploratory. It was to learn things along those lines and seeing how things worked and, ah, you know, I built radios, I built electronic gadgets, and all that. I built proximity detectors that would set off alarms and scared the dickens out of my mother one time when she came out of the garage and I had left it set on, and I had forgotten to turn it off, so all of a sudden this siren goes off as she is walking into the garage.

Harper: So, you're lucky you are still alive!

Friday: Yeah, yeah, yeah, yeah. I had one explosion in my face as a kid. Fortunately I saw it starting because you saw this fire start and it slowly built and it just flashed, but I closed my eyes just in time to have, my eyebrows were singed off, and my eyelashes were actually fused together. I couldn't open my eyes for a minute, but there was no other damage, it was just that, and that was part of the, that was the last time I dealt with what really was fairly high explosives.

Harper: Right. So, how old were you when you first started doing chemistry set.

Friday: Ahhh, probably 12? I got a chemistry set for Christmas one year and enjoyed it very much and continued. And, at that time you could go down to the corner drug store and buy virtually anything and as long as you, you know, I was 13, 14 years old going in and buying things to make explosives with.

Harper: Right, right.

Friday: And, ah, you can't do that today, either.

Harper: No, no, fortunately.

Friday: But, that was a part of the exploratory type of thing and the interest in science. And, I had every intention of going into, ah, and staying in the physical sciences area when I went to college, ah. My major was engineering physics,

Harper: Right.

Friday: which blended all the math and physics and physical sciences together and had a lot of – it had basic engineering courses and virtually everything. You covered all the basic engineering courses – civil engineering, mechanical engineering, electrical engineering and the like, but you also had very, very deep knowledge base in math and physics.

Harper: Right, sure.

Friday: Including advanced nuclear physics, you know, and all this sort of thing, so I was kind of interested in nuclear energy and all that, so I took that engineering physics undergraduate work and one of the things I learned over my lifetime is that you can't plan yourself into a corner.

Harper: Um-huh.

Friday: I had no real idea what I was going to do with this other than this was something that was fun to study, and, ah, but having lived as a dependent of a military person for all of my life, and having noted the fact that Dad spent half of his career enlisted and half his career as an officer, it didn't take me long to

recognize, I was fairly bright, that it was more fun being an officer than it was being enlisted, so, ah, I started in college, graduated from high school in '57, started in college that fall. The draft was in place at the time and there was probably around a 15-25%, somewhere in that range depending on the year, probability of being drafted for a two-year stint in the arm. And, I decided that it was more fun being an officer than enlisted, and I would just as soon serve my country for three years in the Air Force as an officer as opposed to serving it for two years slugging around in the mud with a rifle over your shoulder,

Harper: Uh-huh. Good move.

Friday: So, I was at a land-grant college, the University of Oklahoma was a land-grant college, and every able bodied male had to take ROTC in their freshman and sophomore years.

Harper: Uh-huh.

Friday: And, if you wanted a commission in the services, you signed up for the Advanced ROTC program, which was another couple of years worth of courses and at the end of that you got your commission and if they needed you, then you would go active duty and all this.

Harper: Right.

Friday: So, I went down between my sophomore and junior year and said, "I'd like to sign up for the Advanced ROTC program, Air Force," and they said, "That's great. We'll be glad to have you. What's your major." "Engineering physics." He said, "We don't need you." I said, "What do you mean you don't need me?" I said, "This is a fantastic course, it's got all math and science, physics, engineering and all that." He says, "You don't understand, son. We don't need you." He said – this was 1959 I went down to sign up. I'd just gotten married a little ago, a little earlier, and he said, "We just simply don't need you." He said, "It's two years after Sputnik. We over-reacted to the Soviets launching that Sputnik satellite and we have scientists and engineers coming out of our ears now. We don't know what the heck to do with them all. So, we don't need you." I said, "Well, gee, I really would like to serve in the military – in the Air Force, you know, and get a commission, and all that." And he said, "Well, we can use pilots." And I said, "Well, I'm not really interested," because that is a five year commitment if you went after pilot training. If you just went in as a regular commission, that was a three-year commission,

Harper: Right, uh-huh.

Friday: I said, "Are there any other options?" and he said, "Well, we could put you in supply, or we could send you back to study weather, because we can't find

enough weather forecasters.” I said, “Weather?” He said, “Yeah, we can send you back to study weather,” because supply just totally did not interest me at all,

Harper: Yeah, yeah, yeah.

Friday: Logistics, although knowing how critical logistics is to military operations, that might have been a better career move in some respects, but, you know, you never, alternative university, you just never know.

Harper: That’s right. That’s right.

Friday: So, the, ah, I said, “Well, tell me a little bit more about the weather thing.” He said, “Well, we would send you back to school for a year to learn how to forecast and that would count as one of your three years of obligations.” And he said, “We pay full tuition, and books, and you know, and everything else during that time frame and give you your full salary as a Second Lieutenant, which was \$202 a month.

Harper: Yeah, right.

Friday: And, so he said, “So, we would do that.” I said, “Where would that be?” He said, “Well, if they are just starting a program here at the University of Oklahoma next year so you would probably just stay right here . . .

END OF TAPE 1, SIDE 1

Interview of Elbert W. Friday, Jr.

TAPE 1, SIDE 2

Harper: Okay, we're back on.

Friday: Okay, so anyway, I signed up for that. I ended up going through and getting my commission, and Walt Saucier was the, was the meteorologist that started the weather program at the University of Oklahoma. He came up from Texas A&M. He actually got a reserve – he was a reservist in the Air Force, and the Air Force had negotiated a contract with him to teach basic meteorology to, for Air Force officers.

Harper: Um-hum. And, there wasn't a pre-existing meteorology program at Oklahoma at that time?

Friday: No, no, there was no pre-existing program. This was the beginning of the Oklahoma program at that time. And, it started actually the year before I went into it and I think about nine students at that time. There were twelve of us in the class that I was in in 1961. It included some interesting people. I was there, Bob Sheets was there, who later became the director of Hurricane Center. Walter Bock (sp) is still with ah, the Army at Research Triangle Park. He went back and finished up his Ph.D. and he has been heavily involved in turbulence and diffusion sort of activity. Marshall J. McFarland, who finished up his Ph.D. later on. He went to teach in Texas for a long period of time, I think still is. And, several other people. Most of the people that went into this program. They served their couple of years and they got back out, and they went back into whatever they were starting. But, in our case, we had 5-6 of us that stayed in Meteorology out of the twelve, which was pretty good.

Harper: That's pretty good! Uh-hum.

Friday: And, it turned out to be, I had, as I graduated from college, I had a job lined up with Westinghouse Nuclear and then I said, I understand, but I'm going into this. They recruited me, and I said, "Well, when you get ready, six months before you finish up your military, give us a call and we'll bring you on board." I graduated number one in my engineering class, ahhhh, so I was being sought for employment.

Harper: Sure, that would make sense.

Friday: So, that is what I intended to do, and all this, because now I could back into the nuclear engineering area and that was kind of interesting and all that.

Harper: Sure, right.

Friday: But, the fact was that the meteorology turned out to be so fascinating.
_____ (s/l Sauchet) called up Bob Fletcher, who was the chief scientist of the
Air Weather Surface at the time, and a friend of his. . .

Harper: Uh-hum, uh-huh.

Friday: And, he said, "I've got a guy here that you might want to consider
bringing into your headquarters into scientific services. He's got a good
background in math and engineering and all of that." I did not know that at the
time, but found out later on.

Harper: Right.

Friday: And, he said, "You might want to consider bringing him in there instead
of just sending him out to detachment forecasting jobs someplace, because if you
do that, I'm afraid you're going to lose him." And, if they had done that, I
probably would have done exactly what I planned on doing, but the fact is, I got
involved very early on in some very exciting things. It was the beginning of
computer applications for Meteorology.

Harper: Sure.

Friday: It was in support of what was euphemistically referred to as the National
Technical Means. At the time it was so highly classified, we couldn't even
breathe a word of it. We couldn't even, you know, say what we were doing or
anything of that nature. Now, they've got a big building out her, ah, outside of
Dulles, the National Reconnaissance Office, you know, and all that sort of stuff,
and spy satellite activity,

Harper: Ha-ha, yes.

Friday: But, we were, I mean, as a brand new second lieutenant and a young kid
just fascinated with science anyway, within a matter of no time I had my
fingerprints on all of these super-secret, state-of-the-art technologies, and all of
that, and was contributing to their operating efficiency,

Harper: Uh-huh, uh-huh.

Friday: And, it was just absolutely stimulating and exciting, and so, all of a sudden
I found out I had a 20-year career in the Air Force that was over. So, I never got
out, I never went into nuclear engineering. The Air Force sent me back for a
Masters and Ph.D., you know, and all that, and you know, it was just absolutely
fun, and, I guess I have really been blessed, because I have enjoyed every job I
have ever had in the system, and, learned something from everyone, and ah, felt
that I was able to contribute something to everyone, and you know, you can't ask
for much more than that.

Harper: No, you really can't. How, ah, what kind of courses did they teach during your one-year, initial meteorology training?

Friday: The requirement for people going into that program was they had to have math or engineering back – math, science, or engineering background, so that all of the pre-requisite courses were taken so that you didn't have to worry about teaching somebody vector analysis,

Harper: Right, yes, good idea, right.

Friday: You didn't have to worry about teaching thermodynamics, or physics, or anything of that nature, so – in that one year we had, ah, two courses, ah, synoptic analysis, in essence. What is really going on in the atmosphere? How do you draw a weather map? Now, bear in mind, this is 1961. Weather satellites had just been launched, so if we had absolutely nothing other than the station data being plotted on a map, trying to figure out what was going on .

Harper: Right, and did you hand-plot your own data?

Friday: We hand-plotted our own data. We hand-plotted our own data, we hand analyzed our own maps. We made forecasts from those maps, and so forth. We had forecasting contests among the students,

Harper: Sure, of course.

Friday: You know, and all of this. We did our own briefings, you know, from the material, and that was again in preparing you to do the same sort of thing in the Air Force activities, and all that. So, we had two courses there, one each semester. We had two courses in dynamics, which is a mathematics of what is really going on in the, in the atmospheric motion, and so you learned all of that. And, we had a course in atmospheric thermodynamics. We had a course in atmospheric optics, atmospheric physics, cloud physics, things of this nature. So, it was a pretty intense program. In a year's program, you had literally completed enough hours in the field of meteorology to have qualified for a Bachelor's Degree in it.

Harper: Right, right.

Friday: But, that is what it was designed to do. It was designed to basically provide all of that kind of training to people who had had all of the rest of the stuff.

Harper: Uh-huh. Yeah.

Friday: It was intense. We were altogether in the same classes,

Harper: And you were all Air Force, right?

Friday: We were all Air Force. Now, there were a couple of civilians that were in that class, because that was the beginning, as I said, of the program, and all this. Now, in the meantime, when I was there, I went ahead and I finished up all but my thesis for a Masters in Nuclear Engineering. I went ahead and took Nuclear Engineering courses, and all that sort of thing. Ah, the University was sloppy. They didn't have a good system. Um, in graduate school, I would take 20-22 hours a semester, and about the middle of every semester I would get a call from the graduate college, "You can't take over 16 hours here." And, I said, "Oh, I didn't know that, but I'm doing okay." "Yeah, you're doing okay, but, you know, you're not supposed to do this. It is only supposed to be 16 hours in graduate school." By the time next semester rolled around, nobody put a stop on anything, so you just continued to do it, and, ah, when I was going back for my Master's and Ph.D., I took enough courses, actually, for a Ph.D. in Industrial Engineering. All of the op's analysis reliability theory, all these sorts of things were fascinating to me. I just really enjoyed that aspect of the uncertainty issues. . .

Harper: Sure.

Friday: Forecasting under uncertainty, and making decisions under uncertainties, and all of that. And, it helped me a lot. That kind of, when you see all of these cost/benefit studies and things of that nature you understand what went in them. You also understand how poor all of them are, but that is a different issue.

Harper: That's right, but at least you understand how (inaudible) Yeah, that's exactly right. Um, where did most of the people in the class go? You go into basically a staff position. Where did most of the rest of the (inaudible) go.

Friday: Most of them went directly out to base weather station forecasting jobs, and so forth, and virtually all of them, except one other person, got out of the Air Force. I stayed in the Air Force; one other person stayed in the Air Force. All of the rest of them – Bob Sheets, Walter Bach (sp), Marshall J. McFarland, all of these guys got out of the Air Force as soon they could. They enjoyed meteorology, but they didn't enjoy the forecasting. That duty forecasting type of activity.

Harper: Sure. Right, right.

Friday: They enjoyed meteorology, so they came back and they got their graduate work and Bob Sheets came back to the University of Oklahoma, worked on his Ph.D., then went back to the Hurricane Research Laboratory in Miami, and then subsequently became the Director of the Hurricane Center.

Harper: Uh-hum. Right.

Friday: You know, so, that is what most of them did. Several of the guys went back to their original jobs, their original careers. There were a couple of mechanical engineers that finished up their service and then went back – I've lost touch with most of them over the years. I mean, we, as a crew that went through a lot together, we stayed in communications for a long time, at least, you know, a couple of notes a year, usually at Christmas, and the like, but I still see a few people, but not very many of them, and I've lost touch with most of them.

Harper: Right. With the program that was set up at Oklahoma, was that fairly typical for the Air Force at the time? In other words, besides Oklahoma, did they have (inaudible) all around the nation?

Friday: They had about 5-6 programs that _____ (s/l rittees—RTTY's?) formed the nucleus of a lot of weather programs going. In World War II, they started programs at MIT and Chicago, big programs there,

Harper: Yeah, the Big Five, yeah.

Friday: And you know, and so forth. They really ran through quite a few (inaudible) St. Louis University, I think.

Harper: UCLA

Friday: UCLA.

Harper: Cal-Tech.

Friday: Cal-Tech, right. Now, most of those programs have kind of gone moribund now.

Harper: Well, certainly Cal-Tech disappeared a long time ago.

Friday: MIT doesn't have anything other than a graduate program, and so forth. Now, Chicago's program, now that Ted is dead, Fujita is dead, it doesn't have an awful lot left there to cause attraction to anyone.

Harper: Right,

Friday: But, they started programs, ah, in this era. They had one at St. Louis University. They had one at Florida State, and that was the beginning of really the _____ (s/l Flores) day timer activity.

Harper: Uh-huh.

Friday: They had one, where else, I can't remember where the others were at the time. But, the University of Oklahoma. They had one at Texas A&M.

Harper: Had they started at Penn State by that time?

Friday: Ahhhh, I don't know. I don't, I don't recall, quite honestly. I think they probably had, but, see, the Air Force, there were so few people graduating in the field, in meteorology per se, and virtually nobody was interested in going into the military (inaudible), so, so, the Air Force looked at it as just having to grow their own.

Harper: Sure, right.

Friday: Because they couldn't, they couldn't recruit. Now, there is no problem and there's people that go, go in all the time with many, with as much output as there is from the meteorologist, so they could get the number of people they need out of regular recruiting. They don't have these special programs set up anymore.

Harper: Right, yeah, because even, ah, when I was in graduate school in, from '83-'85, at the Naval Postgraduate School because, all Navy people go to the Naval Postgraduate School,

Friday: Right, right, right,

Harper: Um, we had, even at that time we had Air Force Second Lieutenants coming in for one year for the same kind of program, um, that you had.

Friday: When I got ready to compete for the, ah, Pentagon job, that was my last assignment in the Air Force, working for the Under-Secretary of Defense in Research and Engineering, Research and Engineering, ah, I had to go out and spend a semester out at Monterey to learn how to spell oceanography.

Harper: Right, right.

Friday: So, I got out and took twelve hours of oceanography in one of their sessions out there.

Harper: Ha-ha. Right, yeah.

Friday: And, all this, which was fine. I enjoyed it. I hadn't in school in a long time and I said, "Oh, my gosh. I don't know if I can even learn, if I can do a simple integral anymore, but it all came back.

Harper: Right, it doesn't take too long to come back. Uh, all right, so tell me a little bit about your first position in the Air Force. So, they send you to this place where you cannot even speak the names. What kind of work were you doing?

Friday: It was basically what, what the Air Force referred to as “staff weather officer.” It was somebody who knew what weather was all about, who knew what the capabilities of the weather forecasting enterprise was, but also had to learn the customer’s operation, and needs, and weather sensitivities very well. So, you really ended up getting to know the customer very well. I spent a lot of time out a Sunnyvale in Southern California; El Segundo Space Missile Division; and some of these over organizations, and all of that. And, I got to know a lot of the scientists and aerospace engineers in these areas. I got to kick the tires on the vehicles before they were launched, you know, and so forth, and sat in mere, utter amazement to watch those things. So, most of that has been declassified now, and very, you know, the concept, the very idea of the fact that these were these huge reels of film, you know, that we’re, we’re going through and snapping pictures, then you drop these dang things out of canisters that are caught out of the middle of the Pacific Ocean,

Harper: Middle of the Pacific Ocean.

Friday: And, the fact is, is that, your forecast, your weather input into that, was going to make the difference of whether or not they got pictures of clouds or pictures of intelligence. And, it was, ah, and so on, you *knew* that you had a bearing on this system. So, you learned, so my first job was really, as a staff weather officer to this community. And, we were at that time developing the first automated cloud forecasting system that would use the best information that we had. We were developing computer models that would take those data, make cloud forecast, then interface it with the requirements of the user in their own decision progress,

Harper: Uh-huh, uh-huh.

Friday: And this is one of the reasons I was very much interested. When I subsequently went back to grad school and decision-making under uncertainty, because that is basically what these guys were doing.

Harper: Right, yeah.

Friday: And, ah, so, that is one of the reasons I took a lot of those type of courses and learned a lot from that. Ah, but, I, still, there’s still several things that I remember very well from that. There were two, brand, new second lieutenants that came in at the second time. Ah, and we were both newly, relatively newly married a couple of years, and we both started our families about the same time, and you know, and so forth, and kept track of each other over the years. He went in, I stayed in the weather business, and he went in because we were doing computer applications. He-he went off in the computer direction and had his career in the computer side; I had my career in the weather side. We both retired as Colonels. He went to a farm in Minnesota and I came here to D.C. So, you know, ha-ha, it is interesting to have watched that. But, we were dealing then

with a lot of these systems, but we were also dealing with a brand, new – at that time very highly classified – weather systems and defense meteorological satellite program was highly classified at that time, as well.

Harper: Sure, uh-huh.

Friday: And, ah, so we were involved in the first application of that to support the other systems.

Harper: Uh-huh, uh-huh.

Friday: And, again, it was so, you wanted to tell everybody what you were doing, but you couldn't –

Harper: Yeah, it was so cool!

Friday: But, it was so great to have been involved in that and say, you know, “son-of-a-gun,” and I can remember, not right at that time, but a few years later I was brought in to consult on a couple of new programs and I was signing the access cover sheet – you know, who has had access to this document – Henry Kissinger's name was two above me on the list, you know, and things of that nature. And, and, at one time, later on, in our support operation, but I was actually running the Operational Support Unit for these people,

Harper: Sure.

Friday: Out at an, and so forth, we had secure line there, and you never could tell when the phone rang who was going to be on the other end. A couple of times it was Kissinger, wanting to know “What the hell is going on in so-and-so,” and, so you, you could provide that kind of information. So, this was really heady experience for a brand, new second lieutenant who had bounced around for a long time and, ah, and, all of that. It was exciting. And, and, ah, you know, ah, but it also was very informative in a lot of other aspects. I had a couple of guys who were bosses. One of them was a gentleman by the name of Earl Kendall, who passed away fairly recently. He, after he retired from the Air Force, he went to teach meteorology/oceanography at Old Dominion University, subsequently became the Dean of Men there, and, you know, and so forth, but passed away recently from Alzheimer's. An absolute brilliant guy. He wasn't very military, in the fact that he was kind of sloppy in the way he carried himself in his uniform, and all that. He chewed cigars constantly, and all that, it was one of these kind of things --

Harper: Ha-Ha, Yeah.

Friday: It wasn't unusual to see a little cigar spittle running down his ribbons.

Harper: Ha-ha-ha-ha.

Friday: Ah, but, ah, absolutely brilliant. He would come in and just enjoyed working with him so much because he would come in and say, “This is what I think we ought to do, “ you know, he’d come in a talk to you for 15 minutes and give you enough ideas and work to do for the next three months, and all. The other person, his boss, was a guy by the name of Don Martin, who subsequently became head of the Meteorology Department at St. Louis University after he retired. He has also passed away now, but these guys were really very, very influential in making, 1) letting us do our thing, in other words, turning us loose, giving us a job to do, turning us loose, letting us do it, but at the same time, keeping the reigns on. I remember after I had been there for about three or four days, bear in mind I graduated with a 3.84 from the Engineering School at the University of Oklahoma, number one in my class,

Harper: Right, right.

Friday: So, I mean, I was, I knew that I knew everything there was to know,

Harper: To know! That’s exactly right.

Friday: And, I was asked by Col. Martin, I guess, to put together a position paper on such-and-such, take a look at the various issues, give us the option, and so on, you know, standard practice in any kind of staff position in the military or elsewhere. So, I put together two pages of absolutely deathless prose. I cover all the issues, I put this together, the best possible work that can ever be done. I got it back the next day covered with red ink. I could hardly find my original words in all that. And, I, at first, was just really upset, and then I said, “No, you’d better not take it that way. You’d better understand that this is the guy you’re working for and he’s got a way he wants to do things, and all that, and it’s best to understand what’s going on and what he wants at the time.” And, I learned a lot from him, as far as that’s concerned. ‘Cause, bear in mind, I’d had one semester of English,

Harper: Uh-huh, yeah.

Friday: And, even though we did have a “technical writing course” as a requirement in engineering, ah, it wasn’t really very thorough and it wasn’t really very good. Ah, it could have been a lot better than it was. It was better than nothing, but still, so I learned a lot about really expressing yourself in writing, at least at that time. So, that, that was very useful. Ah, so, you know, it was really a shock to the system to, to have that happen to you, but again, very informative. So, that, it was so much fun in this particular time, that I forgot all about going into nuclear engineering, and all of this, and suddenly I recognized the fact, about five or six years into my career, hey, I forgot to tell these guys I’m not

Harper: Not coming back.

Friday: I'm not coming back. I expected they probably knew it by that time, but, ah, in any event, that was, that was what I was doing. Ah, constantly traveling.

Harper: Your home base was here?

Friday: No, home base was Scott Air Force Base, Illinois. That was headquarters of the Air Weather Service.

Harper: Air Weather Service, right.

Friday: But, I went to here frequently to use the computer system when we were doing things that were unclassified, you know, just your basic computer models that we were writing, and all that. And, I learned all about the computers, the IBM 7090's were here at the time, and this was the time period in which all of the input was in punch cards or, or, or magnetic tape. And, we would come in, the Weather Service, Weather Bureau at the time, would be running the computers in the daytime, and we would come in and have them all night.

Harper: Uh-huh. Now, what was going on at Offutt at the time. Didn't Air Weather Service have its own models running at Offutt?

Friday: Weather Service was beginning to have its own models running at the time. This was 1961, 1962 time frame. JNWP had broken up just a couple or three years before that, and Paul _____ (s/l Wolk?) had taken his bunch . .

Harper: Group and gone to Monterey

Friday: and gone to Monterey, and ah, the guys at Offutt were, were going up there, and they were running, not only their own computers. They were using the SAC Headquarters' computers at the time. SAC had an IBM 7090, and it was much the same way. We could get on that machine at night. So, I did all the work at night. I'd come up here and we would, ah, we would just take over the machine room here, come in with our tapes and our cards and all that sort of stuff, and run the program, check 'em out, go through all this process, and then when we got ready to run classified type operations, we'd have to go to Offutt. So, I spent a great deal of time going back and forth and living out here at _____ (s/l Suitland)

Harper: Uh-huh.

Friday: And, also at Offutt Air Force Base.

Harper: And, how would you characterize the modeling that you were doing for the Air Force? That you and others were doing for the Air Force. How, how were your models different that the National Weather Service was running?

Friday: We were not doing numerical weather prediction per se. We were taking the results of the numerical weather prediction and driving a cloud forecasting model with it.

Harper: So, were you doing like model output statistic kind of things?

Friday: We actually worked quite a bit with the early days of, ah, the guys at Travelers' to take a look at their Reeb and MDA processes and all of that to use a lot of their model output statistics here.

Harper: Um-huh.

Friday: Actually, before Weather Service started using model output statistics, we were doing it. But, the way we were doing the forecasting itself, we were calculating trajectories from the numerical model and we were using the equivalent varitropic model at the time.

Harper: Sure, yeah, okay, uh-huh.

Friday: Very old, very (inaudible), early technology.

Harper: Right, very old, right, yes.

Friday: So, the level of modeling in both of these organizations was about the same and we were using that output, we would calculate the trajectories—where the air come from that would be over a certain, and then by going in a computing the cloud cover there, looking at it initially, and then forecasting what changed, rising years that cause increased cloud cover, you inducted, changed the cloud cover. We used empirical, statistical methods on Doppler statistics to covert these moisture parameters to cloud cover, and all of that. So, it was fairly crude, but it was fairly effective, I mean, it was much better than you can do manually,

Harper: Sure, right, uh-huh.

Friday: which was a criteria, and it could be done fast. The manual process took too long, because what you wanted to do is you wanted to have as short a period of forecast as you could, because that also improved the accuracy.

Harper: Uh-huh.

Friday: Forecast accuracy drops off very fast with time, particularly in the early days. And, so, you wanted to move as close to the observation time as you could. And, of course, the DMSP, the military weather satellite, was basically designed

to provide a first light scout so that you could forecast what was going to happen when the rest of the operations were (inaudible) . . .

Harper: Right, right, and how would you characterize those first DMSP pictures. I mean, I came into the business in 1974 overseas where if we got one, gray, nimbus picture a day with somebody tuning it in, it was just a huge boon, for us.

Friday: Right, right.

Harper: Ah, what were those early DMSP pictures like to use?

Friday: The, very, DMSP started the first, what was called a wheel-type of operation. The early 417 DMSP predecessor was a wheel-type of operation. The camera was spinning perpendicular to its orbit plane,

Harper: Okay.

Friday: It was spinning, and it would catch when it, it had an IR sensor that would catch when it came across the horizon and catch when it went back into space, and it would continue to integrate that so that when it was nominally looking down it would snap the camera.

Harper: Sure.

Friday: And there would be two pictures, actually two cameras. One looking slightly to the right, one looking slightly to the left, and this would give us, then, a bow-tie on the ground.

Harper: Okay.

Friday: And so forth, and it would just continue to snap those things. Every roll it would snap another picture, so you would get a progression of these pictures across the ground. Ah, these were much, much better than the NOAH, ah, weather bureau pictures at the time. Much better than the ESA pictures, much more detailed. When I went back to graduate school, ah, I was doing some fluid mechanics modeling because the research project was there and I was just interested in something that I can do and finish the requirements and all this, and it was fun doing it. So, we were doing modeling of Von Karman vortex trails. These little whirls that you see off of the Canary Islands, out in there, so we were doing modeling of that based on some terrible, terrible TIROS pictures that you can just barely see this little curly thing. And, of course, I had been using DMSP and I had seen these things in all of their full glory and resolution,

Harper: Right, right.

Friday: and I was pulling my hair out that I couldn't say, "See, this is what it really looks like." But, ah, that was still classified at the time and you couldn't use that. But, they were much better than the TIROS or NIMBUS pictures. They were designed, from the very beginning, it was designed for operational use, so that when these bow-ties, for example, were such that you could really see what was going on, and they were aimed, and as they moved forward, then, with the new ones after you saw them, where you had these _____, swats pictures liad out with the constant resolution cross-track, third nautical mile resolution, detail work and all that,

Harper: Uh-huh, uh-huh, right,

Friday: I mean we thought we had died and gone to heaven when all that was coming out.

Harper: Right, no kidding.

Friday: But, all of this sort of thing, DMSP was designed from the very beginning for the operational use of those systems directly. Not that TIROS hasn't been, but, but, ah, that was the driving factor. In TIROS and NIMBUS, it was more than technology driving that it was the operational use. And, there was an agreement between the military and the satellite development and Ness, Nestis' predecessor, and the senior people – Dade Johnson and his senior staff – were briefed on the DMSP, so there was technology transfer between the military and the civilian satellites, but they were usually running a generation behind.

Harper: Right, yeah. That was really kind of apparently so much, still okay. All right, how much lead time? So, you're providing these forecasts for these folks who are going to launch, what, rockets? Or _____, or were they launching airplanes, or . . .

Friday: No, no, no, they were operating a satellite. They were either going to snap a picture, or not snap a picture of an intelligence target.

Harper: Okay, right, that's fine. Now, how much lean time did you get? I mean, so you're sitting there, I mean, were you with the deal that you constantly put out outlooks and they decided when to take the picture, or did they need to take a picture and then you were called upon to come through . . .

Friday: The satellite was in orbit for a period of time and in the early days it was in orbit only for a handful of days. Eventually they became in orbit for many days and, before, that was while they were still doing films. After they went to electronic transmission of information, then the need for this kind of data became less critical, obviously,

Harper: Right, sure.

Friday: Other than for planning purposes. But, they had two requirements. They had kind of a planning outlook in order to, because they would keep track of what kind of opportunities they had for intelligence gathering over the next couple or three days, and they would tentatively plan out what they were going to be doing – how the camera was going to be moving, what pictures they would take or not. And, we would provide them with a planning forecast on a one-day basis: It's really going to be cloudy over here. It's going to be partly cloudy here. It's going to be clear there. So, they would concentrate in those areas and optimize their total operation ahead of time for that. Then, that morning of the operation at noon, we would provide them with data as soon as we could, and they would get the data as soon as we got the information from DMSP, we would run a model. We would send out for their particular operations that day, we would send out specific forecasts, which they would then use in their final decision-making process. So, it had, and then, because they needed to know if they really got that data or not, if they didn't get high-priority data the next time they were over, they might want to take another shot. Then, we would tell them what they actually saw when they were looking down later on, so that they could say, "Okay, we've probably got this one, we don't have to worry about it again." Or, you know, the cloud forecast was terrible and there turned out to be cloud over the target, so we missed this one.

Harper: Right, uh-huh, he-he!

Friday: And, so, it was, it was both a planning, an operational forecast, and then an operational assessment. So, all of that was going into that process. And, it was really a very, very effective working relationship between the weather operators and the user community, to optimize that.

Harper: And, so...

END OF TAPE 1, SIDE 2

Interview of Elbert W. Friday, Jr.

TAPE 2, SIDES 1 & 2

Harper: All right, now we are back. Again, this is Tape 2. Okay, so, were you doing this, was this an Intel outfit that you were doing this for?

Friday: Yeah, yeah, it was. It was, again, ah, I can't go into a lot of the details . . .

Harper: Sure, I understand that. Generically.

Friday: But, it's, it's basically, generically what became the NRO.

Harper: Right.

Friday: National Reconnaissance Office. They were the ones that were actually operating it, but we were involved in a lot of other things, too. Ah, over-the-horizon radar was a technology that was just being developed at the time and, ah, the way the over-the-horizon radar worked at that time, it really wasn't a radar in the common sense, but it was, it was a system for, basically, watching the ionosphere and watching holes being poked in the ionosphere by missiles coming up, and then you could start to track the missile, and all of that, and, but, solar activity also affects the ionosphere, and, uh, so, there is a real question, then, when you saw some disturbance going on, was it because the bad guys were launching a missile, or was it because the sun had just spewed out a bunch of stuff?

Harper: Uh, huh, right.

Friday: You know, and was that affecting it. So, we got involved in a lot of these kinds of activities, various support activities along that line. We got involved in support of new aircraft. The SR-71, the Blackbird, when it was being developed by the Skunk Works out at Lockheed, out in the west, Area 51, it was, it was a whole new regime (sic). We had never had aircraft operations at those altitudes before at those speeds.

Harper: Uh-huh, uh-huh.

Friday: And, so, we were learning. We were trying to provide them with as much information as we could from the atmosphere. At the same time, we were learning from them about how variable the atmosphere really was at 100,000 feet that we really didn't understand. Time variability, spacial variability, and providing type of support for that, so, you know, you work hand-in-glove with these folks to try to understand what's going on, and again, it is that kind of excitement that was going on along those lines.

Harper: Right. Were those, were those high-flying birds, were they carrying, ah, any kind of meteorology sensors onboard? Either temperature, or . . .

Friday: Virtually all of the aircraft have some instrumentation on board for their own performance measurements that is used for meteorology – the temperature, pressure, you know, and all that, and from any kind of navigation system, you can also derive winds.

Harper: Uh-huh, uh-huh.

Friday: So, I mean, we, we would get that information, but you know, it was only periodic flights. It wasn't something that you could use operationally, but certainly, we would use that to understand what was going on in their own operating regime that was causing them problems. So, ah, we got involved in a lot of that kind of activity.

Harper: Uh-huh. And, how, ah, you know, what was your approach to forecasting for an aircraft that was clear way beyond the normal – wonder where the jet stream is, and can we get these people to Europe or Japan.

Friday: Well, that was a real problem for us, because in a lot of respects, we didn't have the information that they really needed as far as the forecasting was concerned. Ah, we ah, you know, you did the best you could from whatever climatology was there, whatever old rocket data you might have when we used to send up the rockets _____ and get the high-altitude data. We started to understand some of these patterns up there and so we could start to use some of the satellite coverage to try and give some general patterns, ahhhh, but ah, the precise type of information wasn't as good as it should have been. Again, our major support for those guys was really their targeting, not their, ah, not their flight. Their flight planning was handled as best as you could, ah, and we weren't involved in that, but we were still involved in the same sort of thing there in support of the U-2, and in support of the SR-71, as far as whether or not they could be successful in their mission application is concerned. I can't go into a lot of detail

Harper: Right, I understand. Um, so, how long did you work for this outfit?

Friday: Well, the first four years of my career, I worked for them there, and then I went away to school – went back for my PhD, Masters and PhD.

Harper: And, so, when did you start the program at Oklahoma, your graduate program?

Friday: Graduate program: I started in 1966, and, ah, went through, initially it was back for a Master's program, but again, since I had everything except the meteorology courses that I needed, and had a lot of stuff that counted toward it

already on the books, ah, I went back with a counter proposal, as I negotiated it with the ah, the ah folks at the University of Oklahoma. I went back with a counter proposal after I got there to Offutt (?) to let me stay on, not for a year for a Master's, but for 18 months, and I thought I could finish both the Master's and the PhD in the time frame. And, ah, they approved it. And, I almost did it, except, after my dissertation was about 90% complete we had a fire in the research facility at Oklahoma. Completely destroyed my equipment, completely destroyed ever documentation of the work that I had done and I did not have backups anyplace – I learned the necessity of backup at that time.

Harper: Backups? Uh-huh.

Friday: The only saving grace is that my dissertation was based on a modeling by both numerical modeling, fluid mechanical modeling, and then just some simulation theory of rotating thunderstorms. That is what I was doing on the dissertation type of activity, and ah I had collected all of the data. I had virtually completed the analysis and had about 90% of the dissertation completed, and I, ah, fortunately, had turned in the computer program, the computer model the night before to the computer center, and it was about four or five boxes of cards,

Harper: Of course,

Friday: and so forth, so, it was not destroyed. It was the only thing that was still intact. However, I had learned all of the wrong paths to take in the research before, and so forth, and we managed to convince Gene Bearley (sp), who was the head of the Atmospheric _____ (society), a section of the NSF at the time, to provide money to redo the experiment, because it was his program that we were doing the work on in the first place, and he provided that, and it cost me an extra six months, so instead of 18 months to finish my Master's and PhD, I did it them in two years, which is not too shabby.

Harper: Which is not too shabby at all.

Friday: Not too shabby, so I finished that up. And, I went right back in then to the type of staff weather work that I had been doing in the past, but slightly different capacity.

Harper: So, who did you work under at Oklahoma? Who was your advisor?

Friday: I had, actually it was interesting. I had two people that really served as almost co-advisors. One was Walt _____, who had founded the operation. Walt was, still is, he is still alive and still as bright, as brilliant as ever, but Walt _____ (Saushay) is probably one of the best synoptic meteorologists that I think exist, or has ever existed. He understands the atmosphere, so well, in a sense of what's really going on. What actions are going on, and so forth. So, he is very practical. He's the one that taught our synoptic lab when I was back and learning

how to spell weather in the first place. He wrote one of the finest meteorological analysis text books in 1995 at Chicago called – Meteorological Analysis –

Harper: That's right,

Friday: And, ah, ah, that book is still, in my opinion, the best there is in that field of Atmospheric Analysis. Ah, my other co-adviser was Yoshi Sasaki. Sasaki is just the antithesis of _____ (Saushay). He is the consummate theoretician. Yoshi is the one that took back in the mid-60's, some very esoteric mathematical techniques called "variational analysis," and converted them into applications in the field of meteorology and it is that three-dimensional, variational analysis, four-dimensional analysis programs that he developed the theory for that are now the fundamental analysis techniques used in American weather prediction, and he is still continuing to work in that area to improve those techniques even further and to make additional advances in how you can, how you can do that. So, this was kind of intriguing. I mean, I had both of those guys on my committed, and both of those guys were advising me on what to do, So, I had to be able to cover both ends of this. Ah, it was fun. I had a mathematician on the committee, I had a civil engineer hydrologist on the committee . . .

Harper: And, so, how did you pick your topic?

Friday: The rotating thunderstorm modeling?

Harper: Yeah, yeah.

Friday: Ah, again, I got there, I talked to the various folks that were around the University for probably a period of a week and one-half. I didn't have a research topic in mind when I got there. I knew the sort of stuff I was really interested in I couldn't do because it was too classified,

Harper: Right,

Friday: And, I couldn't think of a way of doing non-classified versions of it, the decision theory and all that sort of thing. Ah, so, I couldn't work in that area, so I, ah, in the processing of talking there, I talked to a professor Gene Wilkins, who was an adjunct professor at the University. He spent most of his time at LTV in Dallas Texas, but he came up to, to, Norman periodically. And, he had just received a grant from the National Science Foundation to do this fluid modeling, and he said, "I need a graduate student to work on this." And, I said, "You've got one. Not only that, I come free, you know, you don't have to pay me because the Air Force is paying all this."

Harper: Right, yeah.

Friday: So, ah, that's, that's how I did it. I mean, it was an available research project that sounded interesting. It wasn't, ah, it wasn't anything I had in mind ahead of time, but it sounded interesting and it was a good study. It was one that you could actually cover all aspects of. And, it turned out that all of the modeling supported each other, whether it was the computer modeling, the fluid modeling, or just the simulation theory, just the theoretical development. All of the conclusions came out to be supporting each other. So, you didn't have any of this thing, "Well, this works, but this doesn't," sort of thing, so, it was kind of a unifying type approach to it.

Harper: Right, uh-huh.

Friday: Not that it was particularly outstanding or instrumental research. I don't think, uh, it hasn't made any big difference in the field, but it was, ah, certainly good exercise in, it taught me a lot about the numerical modeling aspects of things, and a lot of simulation theory work. Uh, and so I finished it up. That study there, as we were starting that study back in 1966 when I first got there – I finished up in, ah, December 1968. Ah, and ah almost turned out to be a real disaster. My wife was expecting our first child when we came to the University and she was about six months along, I guess. And, we had been there a few days and she went into labor and we had our son premature. He died the next day of "pyla-membrane" (sic - s/b hilar membrane) disease, the same thing that killed,

Harper: Uh-huh, was too early.

Friday: The same thing that killed the Kennedy baby, and all. But, so, the first month or so there was just really very emotionally draining, depressing, and all that, but, we bounced back, and we did it, what made it so difficult was the fact that she'd had four-or-five miscarriages prior to that, so we had been trying for some several years to start the family, and ah, so, this was a , but on the other hand, after a relatively short period of time she got pregnant again and our oldest daughter was born while I was in school there.

Harper: Uh-huh.

Friday: She was actually born, ah, about two-or-three days after I got final approval on my dissertation, before I put into final print, so I finished all of the real work at that particular time. And, I remember my final oral exam, when I went forward for defense of that, and I had already finished all of my written exams and all this, so I went forward for defense of the dissertation, and I finished that whole process. It was pleasant. There was not real nastiness in it, and all of that. And, as all of the committee members signed the cover sheet, you know, they went back over to the Graduate School, they said, just take this over to the Graduate College and, you know, take care of that, so I did, and said, "Well, what else do I have to do?" and they said, "Just finish up your current course work." This was in the fall, a couple of, about a month before the end of the semester, actually, and I said, "Well, okay," but they were just seminars, so I didn't have to

worry about that, and all this, so, you know, I walked out of the front door of the graduate college administration building, and you know, the clouds didn't part. There were no prophets, no angelic revelations. I went back to our place we were living. I picked up my, at that time, about three-or-four month-old daughter and she peed all over me and I didn't realize what real life is all about. You know, I mean, this put it in proper perspective, and, ah, you know, but I had, about a month before that I had been notified that I had been selected for Major at three years ahead of schedule in the Air Force, and so, I was really, you know, just on cloud 9 with all this sort of thing. New daughter, major below-the-zone, and finishing up PhD within weeks. When she peed all over me, that put it in all proper perspective, you know.

Harper: Yes, okay, so I'm a dad,

Friday: Yeah, yeah.

Harper: This is my daughter. This is a good thing.

Friday: It's a good thing. It's a good thing.

Harper: So, the Air Force didn't dictate in any way what you studied?

Friday: No, no they didn't. Ah, the Air Force has been, has always been, in the field of meteorology at least, fairly good about that. Ah, They send you to a school that they feel comfortable with and they basically let it go from that. You actually do have to forward your program of studies for approval, but I've never known a lot of, I mean, as long as people were, were not trying to slough off with six hours a semester, and things like this, you know. Usually, the only concern they had was – are you going to get through this program in your allotted time, and are you taking courses fast enough and all that. That was usually the only concern they had.

Harper: Right, uh-huh, right. And, were there other Air Force officers there also with you in this program?

Friday: Yes, yes. By that time, ah, the University had developed a pretty substantial weather program – this was 1966. The program started in 1960. I was in the class of 1961 in Basic Met, so, this was 1966 when I got there and by that time we had a fairly substantial program, ah, John McCarthy was a grad student there. Ah, John Lewis was a grad student there. He and I both finished up our PhD about the same time. Ah, we had several other folks there who subsequently, who came up as graduate students with _____ (Saushay), and teaching assistants and all that sort of stuff at the time when he came up from Texas A&M, included Rex Inman, who subsequently became head of the department, and so forth. Ah, Stan Barnes who is out at _____ (s/l DenCar), I think Stan is still out there. He may be. Ah, Dick Whitehead, who went down to NASA, Johnson,

to run some of their environmental program down there later on, and Sam Hall, who went up to Offutt, basically being some of their support activities. So, those were also graduate students when I was there. Ah, I'm trying to think of any, ah, Chuck Doswell. I don't know if you know Chuck or not.

Harper: I just recognize the name.

Friday: He is one of our characters. Runs around in a cowboy hat and a beard all the time, of course, I run around with a beard, but ...

Harper: But, not the cowboy hat.

Friday: Not the cowboy hat. So, ah, in any event, it was just getting started, and the severe storms lab was active on the North Campus at the time. And, so it was starting to move forward with the Doppler radar, initial radar studies, and all this.

Harper: Uh-huh.

Friday: So, it was an interesting time and the University was really expanding fairly rapidly its meteorology program.

Harper: Um-hum. And, what kind of competing card did you ask?

Friday: Ahhh, not very much. I can't remember, I can't even remember the machine. It was less than I had to deal with in the Air Force. And, it was frustrating because this was the first time that I had a closed shop. I couldn't actually go in and do things myself. (cough) And, I was so used to going in and running a program and if something glitched right there, just changing one card and putting it back in and going right back again. And you could do a lot of turn-around. You can do that same thing now when you are doing terminal work, you know, when all the input is electronic as opposed to cards, but at that time, you would put in the program. If you mis-punched one card out of this four boxes of cards, you get the whole thing back the next day with a one-sentence error in this card . . .

Harper: Card, right.

Friday: Then, next time you go to the next card and find, you know, so it was that kind of very, very time-consuming process.

Harper: Right. I figured. Been there. Okay, so you leave, you get your PhD, and now you are going to be reassigned, so where does the Air Force send you now?

Friday: Right back to Scott Air Force Base, right back doing exactly the same thing I had been doing before. Ah, I was somewhat disappointed in that. I had kind of hoped, perhaps, this would be an opportunity to go to Air Force

Geophysics Lab in Cambridge, ah, ah, or up to some of the other locations, Holloman, or something like that. . .

Harper: Uh-huh.

Friday: Or, even out to support some of these guys that I had been, you know, more directly. Some of these things that I had been doing in the past, but, ah, I went right back to Scott. I went back into the same type of position that I had before, but doing much more, much more staff weather work, ah, to a lot of new weapons systems that were coming on line at the time, and, ahhhhh, so it was that kind of activity. Shortly thereafter, however, I didn't stay at Scott very long this time. Shortly thereafter (inaudible) things become a self-fulfilling prophecy in almost all bureaucracies. Because I had been so successful in making things work for this community and this community had the highest priority of anything going in the government at that time, ah, the endorsements on your efficiency reports were done at very high levels, and that is basically the reason for being in the right place at the right time, and being fortunate enough to do a good job at it, ah, that's why I got promoted three years ahead of schedule,

Harper: To Major.

Friday: To Major. But, that puts you on a different track, because you are now in a different category and the self-fulfilling prophecy sort of thing. This is guy is successful, therefore, we are going to send him to Command and Staff College, and so after I had been at Scott a year, and a half, then we went to Command and Staff College. And, of course, that puts you in a whole new, new area of where to go and all of this, ah, and Vietnam was running around, very actively at the time, so after coming into staff, I got my assignment in Vietnam. Now, my reason for going to Vietnam was to run the, at that time, Top Secret Weather Modification Program that was going on.

Harper: Compatriot.

Friday: Compatriot, right, and Popeye, all of the various things that they wouldn't buy over the years and all of this.

Harper: Right, right.

Friday: But, by the time I got there, the program was shut down. I went there in '72.

Harper: Uh-huh. Things had pretty much hit the fan on that program by that time, right?

Friday: Well, what happened was, as the guys tried to use it tactically as opposed to strategically, and when the bad buys actually started coming in with more conventional military maneuvers in the South, hit that are north of Saigon, and all

of that, I said, "Hey, we can bring some rain over it, you know, and we can start to bog them down a little bit, and enhance the rainfall over their own battle areas." And, so the first time that they did that, they did! They formed some very good clouds, really started some rain over the enemy forces. Clouds then drifted over friendly forces and bogged everybody down.

Harper: Uh-huh.

Friday: Ah, was it, I can't remember, it wasn't, Westmoreland had left by that time. I can't remember whether it was _____ (s/l Vote) or who was the four-star that was over there at the time, but I was not there at the time, but my predecessor virtually had a phone thrown at him and says, "Blank, blank. Not only do I have to fight the VC, I also have to fight my own damn weathermen." And that was the termination of the project. And, so by the time I got over there, even though I was technically in charge of it, it was basically just closing down and destroying 25,000 Top Secret documents. The problem with that is document control. It is the code word, Compatriot, Popeye, Foot_____, all those certain things, those were all Top Secret. Those words were top secret.

Harper: Uh-huh, yes, that's right.

Friday: And, instead of sending in, and so most of the Top Secret documents that we were destroying were one-page teletype messages that subject Compatriot, such and such is visiting the project tomorrow, serial number so-and-so.

Harper: He-he!

Friday: You know, don't put a subject on there, for crying out loud. Just address it to the individual and say that, and then you have an unclassified document.

Harper: Right.

Friday: Or, for Official Use Only, as opposed to, I mean, every one of those things I had to have three copies of the destruction sheet.

Harper: Right. What were they thinking? They weren't thinking, apparently.

Friday: They weren't thinking. They weren't thinking. Ah, so, ah, you know, the first thing I did was I bundled up everything and, ah, and, ah, we destroyed everything. Took it down and burned it, and had all the documents of which ones we had destroyed, and all that. And, ah, shipped back a small amount of records back to the Pentagon, the useful records, 'cause most of the stuff was, like I said, was trash. And, then I ended up as Operations Officer for the squadron, planning our phase down. We knew that the cease fire activities were moving forward fairly rapidly, so, we planned the phase down of the activity there. And, I came home on R&R in January, came back to Oklahoma where my wife was staying.

Harper: And, this is January of what year?

Friday: '73. The cease fire began in January '73 and went through March '73. So, I came back home on R&R, and the cease fire was actually declared while I was home on R&R, and I thought, well, maybe I'll get a chance to stay here. But, I, I had only been in country at that time for eight months, as opposed to – seven months, I guess it was, as opposed to, ah, 8-9-10 months. Everybody that had been in country by 10 months, they all got to come home. I went back over, became the squadron commander, then I had to execute my own bloody closure plan, which is always terrible when you have to execute your own plan. Ended up having to do that by modernization of the weather service, too, but that is a different issue. And, ah, so, we had a lot of things to do. We ended up moving out, at that time we had the still classified defense meteorological satellite program there in country supporting all of the operations.

Harper: Right.

Friday: Well, we moved that over to _____ (s/l N'com Phnom) Thailand where they continued to support the air operations over Laos and Cambodia.

Harper: Uh-huh, uh-huh.

Friday: And, I went over there as Unit and Squad Commander for another four months.

Harper: Uh-huh. And, how many folks did you have there? How many weather type people did the Air Force have in country there?

Friday: Well, when I first got there we had about 300, and, ah, but they were drawing down fairly rapidly, ah, I think when the cease fire was declared, we have about 125 left. We closed down the weather offices up at D'Nang at that time. This was all of the Vietnamization program, turning them over, and we closed down the office down in _____ (Cantow) down in the delta, so we were all collapsing inward at the time. Ah, the real frustrating thing during the cease fire, ah, we had been told that planning guidance was to get as many people out as early as possible. Keep the bare minimum number of people you need to really close it down, so we had really planned an exponential drawn-down, and we had planned that there would be about five of us that would stay and do all of the detailed cleanup work, and all of that. All of the final paperwork, and everything of that nature. The first thing that we would do is get the van out, ah, and, ah, get everything retrograded – all of the supplies and everything. Either forward it to the N'com Phnom, or retrograde it out. And, we did that first week. Man, we got the van out with no sweat. We were down, ah, we had a C-5 go into the N'com Phnom, Thailand. It was the only time a C-5 ever landed there. When it took off, it ended up, actually I guess when it landed, it ended up scooting around some of

the runway. The runway was mostly PCP, that pierced steel planking, you know, and so forth.

Harper: Sure, yes.

Friday: He kind of scooted around a little bit of it when he came in, big bird, but it was the only thing that would carry this van – the van was a huge one.

Harper: Uh-huh. Uh-huh.

Friday: So, we got it over there and we were only down for one pass. We only lost one pass of DMSP.

Harper: That's pretty darn good!

Friday: It was up within five hours after, after we took it down. Oh, that worked wonderfully. And, I got quite a few people out, not a lot, I mean, not as many as I – we were actually on track. And, then 15 days into the 60-day cease fire period, the North Vietnamese were supposed to release the POW's. They released 25% of them. Kissinger really got angry. He said, if you are only going to release 25% of them POW's, we are only going to draw down 25% of our people, and so immediately we got word that instead of the exponential draw-down, we want a linear draw-down. Well, I was already below my linear draw-down, because I had drawn down quite a few people early, which meant that I wasn't going to be able to move anybody out now for another month. And, we suddenly, as everybody was coming back in to Tonse (tin?)____, ah in Saigon, we had 8000 GI's at Tonse___ Air Base with not one damn thing to do. Now, you start talking about problems. Ah, I was on the Wing Commander's Staff every day, so every day we would go in for the Wing Commander's Staff meeting and it was mostly dealing with all of the problems that occurred during the day, and, ah, it was incredible. I mean, we put in, we, we, we had free food, free beer, free everything, ball games, intermur...., you know, just trying to get everything going just to keep people busy . . .

Harper: Occupied, yeah.

Friday: As opposed to going downtown and getting in trouble. We had an awful lot of 'em that went downtown and got into trouble, but, eventually it worked, you know, we, we eventually got everybody out, and, I almost got fired there because we had a weather reconnaissance aircraft come in and I put 15-20 of my people on board that, and got them over to Thailand. Figured they could get home from there. I got called in by the two-star that was the head of Military Airlift Command and, of course, the Air Weather Service was a part of Military Airlift Command.

Harper: Right, right.

Friday: And, he said, “Major,” he said, “You have just screwed up our entire program.” He said, “We are being controlled by command, here.” He said, “Since you got 20 of your people out, that counts against the total MAT list,

Harper: He-he!

Friday: He said, “So, I can’t get anybody out here.” He said, “You pull that again, and I’ll have your . . .” you know, and so on.

Harper: He-he-he-he.

Friday: And, I said, “Yes, sir. I’m sorry, sir. I didn’t realize that. I thought it was an opportunity to help out a lot of problems and all of that and I apologize. It will not happen again.” “All right, Major,” he said, “It damn sure better now.” As I walked out of the door, as I was walking out of the door he said, “I just wish I’d have thought of it first.” Ha-ha-ha!!!

Harper: Standard rules, so it’s better to beg for forgiveness than ask for permission. He-he-he.

Friday: Right.

Harper: Let me change the tape side, because we’re going to run out.

END OF TAPE 2, SIDE 1

Interview of Joe Friday

TAPE 2, SIDE 2

Harper: Okay, we're back on the second side of tape #2, so you've gotten your folks out of here, at least, at least several of them. How much longer were you in country?

Friday: Well, we were there, ah, I mean, I went out the last day of the cease fire, which was, if I remember correctly, the twenty-third of a, of a March. And, there were five us that were there still on the last day. And, we did, we cleaned up all of the paperwork and we took care of all of the documentation and all of this, and that is mainly what we did the last day, but, the last couple or three weeks, but there really wasn't that much to do, so, you know, I would go to the staff comman. . . Wing Commander's Staff Meeting in the morning, and that was my duty for the day, for all practical purposes.

Harper: Uh-huh, uh-huh.

Friday: So, just mainly we're killing time. And that is really the frustrating thing, 'cause I wanted to get ahead, go on over to Thailand, or N'com Phnom, Thailand. I knew I was going to be running that organization, so I wanted to go on over and get that all organized and established, but because of the silly rule, I think Mr. Kissinger got angry with the North Vietnamese, we couldn't do it.

Harper: Right. And, so then you left Vietnam and you went to N'com Phnom, Thailand.

Friday: To N'com Phnom, Thailand.

Harper: Okay, Thailand. And, how long were you in Thailand?

Friday: Four months, so that I finished my entire 365 days of , of assignment – eight months in Vietnam, and then four months in Thailand.

Harper: Uh-huh. And, what kind of support were you providing in Thailand?

Friday: Thailand was continued air operations, I mean, even though there was no operations going on over Vietnam, per se, because of the cease fire, there were still operations going on over Cambodia and Laos, air operations, and, ah, so we were supporting the air operations over that country. We were also supporting the Task Force Alfa. I don't know if you are familiar with that or not. Task Force Alfa was the nerve center for McNamara's electronic fence around Vietnam.

Harper: Okay.

Friday: It was where we were doing all sorts of listening devices, and things of that nature, and, so, there was a lot of support for that. We were also, ah, also operated there weather radars that did detailed analysis of rainfall, and all of this, for, that had originally been in support of the weather modification program.

Harper: Right.

Friday: And, all, but it was mainly fighter operations, helicopter operations, things of that nature. Just strictly air operations.

Harper: Uh-huh. And, how big of a team did you have?

Friday: Ahhhhhhhh, probably around 30 people.

Harper: Okay.

Friday: It was a large, you know, squadron headquarters. Squadron headquarters was myself and one person, and the rest of it was basically the operations activities there. We also had people, ah, in addition to that, ah, we had people at about four or five other locations there that reported to me at the time.

Harper: Uh-huh. Uh-huh. Okay, so you finally get to leave Thailand, and what is the month and year, and where do you go?

Friday: I come back in July of '73, '73, and I go to Offutt Air Force Base, ah, and, ah, so, which is, which is great. I have been there many times, obviously, but I have never been assigned there, so we go to Offutt Air Force Base where I am in charge of the Special Project Shop – it is actually providing the operational weather support to these folks that I have been doing staff weather work for all of my other, rest of my career.

Harper: Uh-huh. Uh-huh.

Friday: And, ah, I'm, I'm selected, by the way, for lieutenant colonel just before I leave Thailand, and, so, I come back as an LC, and ah, which is, ah, and again, self-fulfilling prophecy, after I had been at Offutt for a very short period of time, like a year and one-half, I'm selected for the Air War College.

Harper: And, where is the Air War College located?

Friday: Maxwell Air Force Base.

Harper: Okay.

Friday: As is Command and Staff. Command and Staff and the War College are both at Maxwell Air Force Base.

Harper: That's right.

Friday: So, ah, ah, I'm a lieutenant colonel down there. Ordinarily the War College is for lieutenant colonels and colonels, and, ah, so I go down there for a year. This was the centennial year, or bicentennial year, '75-'76 time frame.

Harper: Right. And, so, what kind of, I mean I know what people do at the Naval War College. What do people do at the Air War College?

Friday: Probably the same thing they do at the Naval War College, except concentrate on ah, the Air Force. It's ah, you know, both Command and Staff, and War College are really management schools more than anything else. There are, there is some geopolitics. There is some military tactics strategy issues, and all of that, but only 50%, or maybe even more of that, deals with management – personnel management, financial management type of activities – ah, those kind of things. So, that's really what it mostly concentrates on.

Harper: Uh-huh, uh-huh. And, that takes a year.

Friday: Takes a year.

Harper: And, so then it's time to roll out again.

Friday: I go back to Offutt, and, ah, spend about a year, a little over a year there. And, there is a vacancy that is coming up in the air staff, not in the air staff, in the DOD staff. It is the military assistant for environmental services and sciences on the DDRNE, or actually at that time it was called the Undersecretary of Defense for Research and Engineering Staff.

Harper: Right.

Friday: So, it is in the scientific side of the house. This is a position that is filled, can be filled by any service, and so, I end up being in competition for that and I have to go out to Monterey for a semester. As a matter of fact, on the second of July, I am told that on the fifth of July I have to be out at Monterey to start a quarter's worth of class.

Harper: Right, for the summer quarter, right.

Friday: And, I already have all sorts of plans for the family. The kids are enrolled in all sorts of things, and all this, so there is no way I could take them with me. I am fortunate enough, however, on such a short notice, to get a, ah, a room at Herman Hall, the headquarters building, right there on campus,

Harper: Right, yes, Uh-huh. Uh-huh.

Friday: And, I'm told that I can only have it for a couple of weeks, then I've got to go over to some other housing area on the whatever-it's-called – what's the name of the military, Army installation is over there?

Harper: Ft. Ord.

Friday: Ft. Ord, and, you know, commute back and forth. I don't really like that idea, so I get on very, very good terms with the person that's running the BOQ,

Harper: Q, right, good idea.

Friday: And, I end up staying the entire quarter there in Herman Hall without ever having to move.

Harper: Yeah, which is not a bad place to stay.

Friday: It was very good. Excellent place, and, so, that was it. But, I did, I spent a lot of time studying oceanography and getting to know some of the Navy guys out there, and, and understanding what is going on.

Harper: And, so, who was, ah, this is the late '70's, now, so who is doing oceanography at the Naval postgraduate school in those days? Is Dale Leaper there?

Friday: Leaper is there. Ah, Martin is still there, in meteorology.

Harper: Sure, right, uh-huh.

Friday: He is still there, and, of course, having studied Haltner(?) and Martin's textbook, I really felt it was a wonderful opportunity to get to know him a little bit and talk to him a bit.

Harper: Uh-huh. Uh-huh.

Friday: Ah, Reinhardt? No, Reinert.

Harper: Reinert.

Friday: Reinert was there. And, those were the guys I had the courses under, primarily. I took, I took, ah, some introductory oceanography. I took theoretical oceanography. I took some operational type of things dealing with, ah, sound retracing, and all this sort of thing.

Harper: Sure, right, acoustics.

Friday: ASW, and the acoustics activities. Ah, so, it was, a you know it was fun.

Harper: And, Monterey is not exactly a tough place to be . . .

Friday: No, it's not a tough place. I remember one morning thinking I had absolutely overslept because I woke up and the sun was shining in, as opposed to the usual fog. (Cough) But, it was the right time. It was just the only day that I was there that it wasn't foggy in the morning.

Height: Ha-ha-ha!

Friday: But, that was a fun time. And, then I ended up, you know, came back, and I didn't hear anything, didn't hear anything, so I figured that, well, okay, I don't have to worry about that. Then, on the seventh of December, Pearl Harbor Day, I am told that I have to report on the third of January to the Pentagon. In the meantime, I have been selected for O6, and ah, ah, again it was below the zone. I ended up getting selected – by the time you add 'em altogether, I pinned on my Eagles at 16 years service, which was about five years ahead of schedule.

Harper: Right. Yeah, I figured that out from looking at your little bio sheet.
Right.

Friday: And, that was frightening. It really was frightening, because when I got notified that I was on the list for O6, the initial reaction I had was euphoria, and then after about 20-30 minutes, I started to say, "What the heck am I gonna do?" "I don't know how to be a colonel." Ha-ha. I mean, things were happening too fast in that capacity. Ah, but, I thoroughly enjoyed the Pentagon job. I mean, it was, it was eye opening in a lot of respects. I spent a year doing the environmental sciences side of the house, looking at all, and serving as overseer of the, ah, services called it micromanagement, but it was really overseeing . . .

Harper: And, what did, when they said environmental sciences, this is now late '70's, what were you including?

Friday: Meteorology, oceanography, geophysics, astrophysics, space weather, all these sorts of things. All of the environment sciences were included in that particular area.

Harper: Okay.

Friday: Anything that DOD was doing in that area, so I oversaw the Air Force, Army, Navy, Marine programs in both weather support and operational support, as well as the research and development programs.

Harper: Uh-huh. Uh-huh.

Friday: All the way from six-one through six-six.

Harper: Uh-huh. Uh-huh.

Friday: Basic research through applications, and, you know, and so forth. So, it was very, very informative. Ah, I mean, I knew the Air Force programs fairly well, but I didn't know, I didn't know the Navy, Army, Marine programs, and, but one of the things I noted right off the bat is that there were a lot of things that would be served better if there were cross-communications between the services along those lines. I mean, this was a time period when some very significant things were happening with our weapons systems. They were getting smart.

Harper: Uh-huh. Uh-huh.

Friday: You know, we'd experimented toward the end of the Vietnam War with some smart weaponry, and all that, trying to do some laser-guided type of work and all this, so things happened in the, in my position there. I came in, I was briefed on various things, and I remember one thing the Army guys were briefing on the new developments they had, were having, for their main battle tank, ah, what was it called? Hellfire, I think was the name of the shell that they were developing, which was a laser-designated, laser-guided, ah, weapon.

Harper: Uh-huh. Uh-huh.

Friday: And, so, what would happen is, this shell would be fired out of the tank, and then it would home in on the target that was illuminated by a forward observer pointed a laser at the target.

Harper: Uh-huh. Uh-huh.

Friday: And, I said, "boy, you know, this guarantees improvements. That's really great. Where are you going to use this?" "Well, it's going to be on the main battle tank, in Europe." "Oh, okay." "Ah, are we ready, are we gonna make a first strike in Europe?" "Oh, no, this is purely defensive. Our strategy is defensive in Europe." I said, "Oh, okay. When, what are the bad guys gonna come across to fall the gap?" He said, "What do you mean?" I said, "When are the bad guys going to come across the _____ (fall the gap)? He said, "Well, we don't know, but we'll be ready for 'em." And I said, "You do know." I said, "If you look at the history of the Russian military, they never initiate an operation, anything than the dead of winter when they feel that they have the advantage. What are you gonna do? Have you tried this thing out in snow?"

Harper: He-he-he.

Friday: "No, we haven't tried it out in snow." I said, "Yeah, you know, maybe you ought to do that."

Harper: Might think about that.

Friday: Well, they ran some experiments as a result of that interaction, and they found it didn't work at all in snow. I mean, the laser beam would just blossom forward as soon as it hit the, just be destroyed by this. They actually managed, as a result of that activity, however, to do some changing. See? This is the kind of stuff I'd been doing all the time before for all these other folks.

Harper: Uh-huh. Uh-huh.

Friday: Asking those kind of questions. Looking at what are your weather sensitivities, and all. Have you really tried it out? What do you need to support it. Well, they actually worked with some different frequencies and some pulsing techniques, and things of that nature, where they could get some marginal operation. I was on a conference call yesterday, ah, they could get some marginal operation in moderate snow, heavy snow wiped 'em out. White snow they could operate.

Harper: Right.

Friday: So, I mean, it, my questioning did help them improve the system. But, on the other hand, ah, all of the various services were all developing their various smart weapons and trying to look at environmental support for them, all independently. So, we put together, as a result of that, a Tri-Service Electro-Optical Weapons System Plan in which guys really got together and, as a result, a lot of progress was made in a fairly short order on improving the systems for that, and, ah, you know, that, that, that's what that position was. After I had been there a year, the previous director of the organization that I was in, which was Environmental and Life Sciences, under DDRA, retired, and I was asked if I would take over the whole thing. Ah, I did. I learned more about chemical/biological weapons than I ever wanted to know. That also included not only chemical/biological weapons; it also included the Health Sciences area, and personnel sciences – training issues, things of that nature.

Harper: Right, right.

Friday: So, from that standpoint, it was a very interesting assignment. Useful assignment in a lot of respects. I still had the primary responsibility for the environmental sciences, then I had people that worked for me in these other areas.

Harper: Right.

Friday: Personnel, I had a medical doctor who was in charge of the medical research, and all this.

Harper: Uh-huh. Uh-huh.

Friday: It was during this period of time that we developed the MRE's, Meals Ready to Eat, or Meals Rejected by Ethiopia, depending on who you listened to. Ah, but Nady Glabs (?) developed the MRI's under that time period and that was a part of our major program overview that we were doing. Ah, so, anyway, it was, ah, it was an exciting time. Ah, I didn't want to come to the Pentagon. Ah, as a matter of fact, I had tried to do anything other than get out of, you know, come here because I didn't think it would be a very good place to raise kids, and all that, in D.C. After I got here, I found out it is a fine place to raise kids. You just gotta raise 'em. You know, they don't raise themselves. You've gotta raise them, and all that, so, because I was in the, organizationally, the senior position in the DOD, in the Environmental Sciences area, I got involved in all of the various interagency committees working with ah, all the other agencies across D.C. on various things. I sat across the table, in many cases, from Dick Halgren,

Harper: Right, right.

Friday: (Cough) And, when it came pretty close to finishing up my 20-year career, Dick started to offer me various positions in, in, in here. My intention was to go back to Oklahoma and teach, or _____ something else. I really wanted to teach, and that is what I've always wanted to do, and so on.

Harper: Uh-huh, uh-huh.

Friday: And, ah, I went back and I interviewed with a few companies. Actually, I went down to the LTV where my old professor that I worked with in my research program was still there. He wanted me to come down and talk to them. I went down to interview at LTV . . .

Harper: And, what does that stand for?

Friday: (s/l) Link Tenco Vault, used to be. It's no longer existing. It was a major, aircraft manufacturer during WWII and the Korean War and all of that. I think they are part, Oh God! Who are they a part of? I think they are not part of Lockheed Martin, ha-ha, you know, it's all of these mergers . . .

Harper: Sure, right, yeah, uh-huh.

Friday: But, they had an environmental sciences shop down there that was dealing with quite a few things, and all this, and he was interested in, in, in getting me coming down there; so, I went down and I talked to them, and, ah, you know, I had an offer, it was okay, it wasn't great, ah, it wasn't really what I had in mind. Ah, I ah, talked to the University of Oklahoma. Yeah, we got something here, but it's not going to be quite available yet, and about that time Fred Schumann decided to retire over at the National Meteorological Center and Bill Bonner (sp?) wanted to go over there and run that. Bill Bonner was the deputy at the time. Prior to that, Dick had asked if I would be interested in going into the Office of

Meteorology, which is more or less the number three position in the National Weather Service. And, he called me up and said, ah, "I got a deal for ya." He told me what Schumann was going to do and Bonner was going to do and he said, "How would you like to come in as my deputy?" Well, that was a very tempting thing. Of course, he couldn't offer me that, because it was a competitive type thing, but I ended up applying for it and getting it and retiring, and that's the way I came here. When I was director of the Weather Service, I would have all kind of folks come in for "career counseling." And, it was amazing. I would see some of these young kids come in and said, "I want to talk to you about my plans and see what you think. I'm gonna do this for a year, and I'm gonna do this for a couple of years, and then I'm gonna do this . . ." I'd laugh at them. And, they would get very concerned because I was laughing, and then I would tell them about the fact that I didn't start out to be a meteorologist. I started out to be a nuclear engineer and Sputnik interfered, so I ended up taking this weather course. Well, I didn't intend to stay in that. I fought like heck because I didn't want to come to the Pentagon; I didn't want to come to D.C. But, the military ordered me here and I proudly saluted and I marched in and I ended up coming over here and Deputy Director of the Weather Service as a result of that. I said, "So, don't plan yourself in a corner." I said, "Have goals in mind. Have things that you want to do, but take full advantage, be able to take full advantage of opportunities as they arise, because if you plan yourself into a corner, you're not even going to look at other opportunities.

Harper: Right, that's right. Why did you decide to retire at twenty?

Friday: We had moved so much, and my kids at that time, my two dau... I have two daughters... they were in their teens. And, the previous move had affected them a little bit, and I remembered my own career, my on movements around, and all of that, and I remembered some of the disappointments that I had had at that time, and, I got a call, about ten months before I retired, from Al Cane (sp) who was the Commander of the Air Weather Service at the time, and Al said, "We gotta decide what we're gonna do with ya, you know, when you grow up." And so forth, and I said, "Hell, I can tell you exactly what I want to do. I want to go back to Offutt. I want to command the Air Force Global Weather Central for six years and I want to retire at 26." He said, "Oh, no, no. We got a lot more exciting things here for you. We're going to send you to Germany for a year as, as ah Second Wing Commander, then we're gonna send you to Third Wing Commander at SAC for a year to get that exposure, then you'll be able to come down here and come in as my deputy and then replace me." I said, "Al, I'm not interested." I said, "It is very flattering, and all that. I'm really not interested. Ah, I'm just cocky enough to think I'm probably the best person you can have to command the Air Force Global Weather Central." I said, "I've been involved in all aspects of it." You know, and all that and he said, "No," he said, "I have no doubt about that, but we got bigger things in there." I said, "Al, I'm not gonna do it." I said, "I've got at the end of this month, I've got to put in my retirement

papers, or I have to accept my next assignment.” There was a ten-month variable window of vulnerability.

Harper: Uh-huh, yes, right.

Friday: . . . in order to keep chaos from occurring in the personnel process. Once you enter that ten months, you could not retire. They would not accept retirement or resignation papers, or anything. And, ah, I said, “So, at the end of this month, I’m putting in my papers unless you and I come to an agreement.” And, we talked a little bit more and he said, “Well, we’ve got great things in store for you. You are going to be able to replace me, run the Air Weather Service, and all that.” Ah, I hadn’t heard anything else from him by the, and so on the 28th of the month, I went down and I put in my retirement papers. About four days later I get a call: “What the hell did you do?” I said, “Al, I’ve known you since you were first a first lieutenant and I was a second lieutenant and we’ve worked together all of these years and you know I do not lie and I do not bluff.” I said, “I told you exactly what was gonna happen and that is exactly what happened.” And, he mumbled a few things, but I was half-way expecting him to deny my retirement, because you could do that . . .

Harper: Sure. Sure you can.

Friday: At 20 years you can do it; 30 years you can’t.

Harper: Right, yeah.

Friday: Ah, it’s only happened once before that I know of in the Air Weather Service, but it has happened before, and I was half-way expecting him to deny it, but he didn’t. And, so, that’s the reason I retired when I did. I would have been delighted to have gone back to Offutt. Ah, we were associated with a nice church there. They were in the process of getting ready to build an Adult Christian Education, or Accelerated Christian Education Program there, which I was interested in participating in. Like I said, that would have been my teaching . . .

Harper: Sure, right,

Friday: . . . and so I was very much interested in that. It was ah, ah, but, that didn’t happen, you know. The situation here developed and, like I said, you know, I came in as Deputy Directory of the Weather Service. My, the job, in addition just to day-to-day business or taking care of all the issues – personnel issues and various things of that nature – was really to plan the modernization _____ planning, leading the planning team on the modernization of the Weather Service. Then, after Dick retired I was fortunate enough to be selected to replace him, and ah, ah, 17 years in the Weather Service, you know, it just was a lot of fun. I enjoyed every bit of it – except getting fired, but that’s different.

Harper: Ha! How did, we'll get to that later. How, ah, how was it to make the transition from being, you know, a uniformed weather person to a civilian weather person? Culturally, you know, what was the difference.

Friday: Probably the transition from the Pentagon to here was easier because in those days, ah, Jimmy Carter came in and directed that nobody wear their uniform in D.C.

Harper: Right, I remember those days.

Friday: Remember those days?

Harper: I sure do.

Friday: As a result, I only wore my uniform two times while I was in Washington: one was the day I pinned on my Eagles and the other was the day of my retirement. So, ah, that was it. That was my total, so I did not wear a uniform per se in the job. I was considered for, as far as everybody there was concerned, a senior executive. Ahhh, I was an O6, but I was actually filling a position that had previously been filled by a two-star, in the old days. Ah, you know, and so forth, and so I was operating in that realm. I was dealing with, the committees that I was set on, I was setting on committees chaired by the administrator of NOAA, you know, or by the number two or number three person in NASA, or things of that nature, so, I mean, I was setting on those levels of committees, and, ah, the only time that it, that I kinda realized that "am I doing the right thing," was about a week before the actual retirement ceremony, and I suddenly asked myself the question that you just asked: "Am I ready to leave the uniform." I hadn't been wearing it for three years, but am I ready to leave the uniform, because I know this business inside out. It is a comfortable area. It has support mechanisms that are there for everybody, and all that, and I – I, that was the only time that I felt a little queazy about the process.

Harper: Uh-huh.

Friday: But, after I retired, I had two weeks of leave that I took between – my last duty day was the 14th of August, and of course, my retirement was the 31st of August. The first of September I became Deputy Director of the Weather Service,

Harper: Uh-huh.

Friday: So, I had virtually no break other than that two weeks of break that I took.

Harper: Right, right.

Friday: And, ah, coming into the National Weather Service was, ah, I-I was very, very determined to get out into the field very rapidly, because I was an unknown, for the most part here. Ah, Dick knew me, and several of the senior folks knew me, but the field didn't know me, or anything of that nature, so, the first thing that I did, is, I visited virtually every regional office in the National Weather Service in the first couple of months, to get out in the field and see what was going on, to meet people, let 'em know that I really did know something about Operations. I had been in that for, you know, and had some sensitivities there. Ah, I let my hair grow very long, ah. I had side burns ending up initially down to here, was brown at the time.

Harper: Ha-ha-ha.

Friday: I grew a beard in that two-week period, ah, two-week leave between the time that I left active duty and the time that I came over to the National Weather Service, but I shaved it off the day before I came over here because it came in with a fair amount of gray and I wasn't quite ready to admit – I was 42 years old at the time –

Harper: Ha-ha-ha.

Friday: I wasn't quite ready to admit that.

Harper: You weren't gonna be a gray beard when you walked it.

Friday: It was still, somehow, itchy, you know, and my kids, my daughter said it looked like hell. So, I decided, well, okay, I'll shave it off. I started this one in about 1990 when we were having all kind of problems getting GOES next launched. And, I came in after about a four-or-five day break – it was a four day holiday, or something – without having shaved, so I had a rough beard, and ah, I made the comment, I said, "I'm not going to shave this damn beard off until we get that GOES program launched. And, I've had it ever since. So, ah, my wife loves it, so I don't, you know, as a matter of fact, when I talked about shaving it off after GOES was launched, the Public Affairs Folks in NOAA basically yelled at me that I shouldn't do that because, ah, it was, it made interesting appearance, as far as the press was concerned.

Harper: Yes, right, right.

Friday: I don't want to go through the process of shaving daily now, you know, it's ah, but, I did. I let my hair grow long and I went out into the field and I made sure that they all knew me, that I just wasn't a retired Air Force Colonel, and I wasn't really retiring. I was transitioning jobs, but I was not retiring.

Harper: Right, right.

Friday: And, it was a lot of fun, ah, getting to know the operation, getting to understand it, and getting a chance to make an impact there as well in a lot of different areas.

Harper: Okay, we're gonna go ahead and stop there, because the tape is almost done.

Friday: Okay, all right. And it is almost – it is 10:00 o'clock.

END OF INTERVIEW