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Military Operations Research Society (MORS) Oral History Interview

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Glenn A. Kent Interview (MORS)

Kent, Glenn A.

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INTRODUCTION

Oral Histories represent the recollections and opinions of the person interviewed, and not the official position of MORS. Omissions and errors in fact are corrected when possible, but every effort is made to present the interviewee's own words.

Lieutenant General Glenn A. Kent, USAF retired, was the Air Force Assistant Chief of Staff for Studies and Analysis from 1968 to 1972. He received the MORS Wanner Award in 1980. At the time of this interview, Lt Gen Kent was a senior research fellow at RAND. Lt Gen Kent died 25 April 2012.

MORS ORAL HISTORY

Interview with Lieutenant General Glenn A. Kent
March 22, 2005; April 19, 2005; July 5, 2005
RAND, Arlington, Virginia
Jim Bexfield, FS, and Bob Sheldon, FS, Interviewers

Bob Sheldon: It's March 22, 2005. We're at RAND in Pentagon City to interview Lt Gen Glenn Kent. Let me start by asking you to give your parents' names, and how they influenced your career.

Glenn Kent: My parents' names are Louis and Virl Kent. I was born in Nebraska, but my parents moved our family to Colorado when I was three without asking me. They went there to what my granddad in his diary called a paradise. I used to think he was a smart man until I read that diary. He called Manzanola, Colorado, paradise. *(Laughing)* It's flat. It's a part of Colorado that's flat, hot, dusty, and dry. It has no redeeming features as far as the climate is concerned. The only redeeming feature is that not many people live there, or want to.

Bob Sheldon: What did your dad do for a living?

Glenn Kent: He was a farmer for a while and went broke on a farm.

Bob Sheldon: What kind of farm?

Glenn Kent: The farmers there did row crops. All of it is irrigated out of the Arkansas River. And most of them had a few cattle—cows you milk, cattle you slaughter. Typically in the summertime they'd run them on the prairie where nobody lived, and then feed them out and sell them to a feed lot. The summer we left the farm,

a tremendous five sigma hailstorm wiped out all the crops. My dad left the cattle out on the prairie a little longer than usual, and along came a blizzard and he lost them all. So we moved off the farm that fall. That's during the Depression days, during the Dust Bowl days of the time. And the southeastern part of Colorado was in the Dust Bowl. He worked for Libby Canning Company, and then finally lucked out and got a job as foreman working for a guy named Hayden. Hayden Ranch—a famous ranch in that area—15,000-acres with quite a few head of cattle. And he worked for Hayden the rest of his life essentially.

Bob Sheldon: Did you do some work on the farm or ranch?

Glenn Kent: I did when we lived on a farm. Absolutely.

Bob Sheldon: Was that good OR training?

Glenn Kent: It was good training to make you ever thankful for small blessings. *(Laughing)*

Bob Sheldon: How old were you when you moved off the farm into town?

Glenn Kent: I was about fourteen.

Jim Bexfield: About high school age?

Glenn Kent: Yes.

Bob Sheldon: Where did you go to high school?

Glenn Kent: In a little town by the name of Manzanola. It's listed on some maps of Colorado, but not most. It's 20 miles west of La Junta, and 46 miles east of Pueblo, so it's between Pueblo and La Junta, which are shown on all the maps in Colorado. It's on Route 50. And the population of that area lives along the river and the railroad. The railroad parallels the river, and they have a junction every nine miles. According to folklore, that spacing is dictated by God; it means that a farmer doesn't have to run a wagon more than four or five miles to get to the depot.

Bob Sheldon: Did you excel in math early in high school?

Glenn Kent: Early on, I knew math. I knew more math than the math teacher.

Jim Bexfield: How big was your high school?

Glenn Kent: It was really large. There were 14 in my graduating class. That was a small class, but typically 20 people to a class.

Jim Bexfield: And you probably played basketball?

Military Operations Research Society (MORS) Oral History Project Interview of Lieutenant General Glenn A. Kent, US Air Force

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Glenn Kent: Yes, I did. I tried to. I didn't do very well. I had the unfortunate happenstance of having skipped the second grade. So people in my class were older than I was, typically by a couple of years.

Jim Bexfield: Did you skip second grade because you were doing so well in first grade?

Glenn Kent: I skipped from first to third. The first grade teacher thought she was doing me a favor.

Jim Bexfield: To give you more of a challenge?

Glenn Kent: Yes. But Manzanola was an oasis—it's gone downhill now. It's not the town it used to be. All of 300 people live there. Some people lived in town and ran the farms from there, a couple of miles out. But Manzanola was the scourge of the Arkansas Valley. They were basketball and football champs year after year there. They beat up on other little towns along the route there. Not La Junta.

Bob Sheldon: Were you part of the basketball or football teams?

Glenn Kent: No. I went out for both of them, but I didn't especially excel.

Jim Bexfield: So what was your favorite activity in high school?

Glenn Kent: I went out for those, and that took up my time. I don't know that that took up enough of my time. The only thing I excelled in was track. I ran the mile, and I did fairly well in that.

Bob Sheldon: Do you recall how fast you used to run the mile?

Glenn Kent: No. Later on I knew the time, but I don't know it in high school. It was just enough to beat people. *(Laughing)*

Bob Sheldon: Where did you go to college?

Glenn Kent: I went to Western State College. I didn't go to college the first semester I was out of high school. In Colorado they have a law—I guess it's still in effect—that the valedictorian of each class, no matter how large or small it is, gets a certificate. This certificate is good for tuition at any state school for four years. And I was valedictorian at Manzanola. Beat out all of 14 people. So they give this certificate for every class and every 20—if you have 25—every 25 graduates you have, why they give another certificate. But I still didn't go to college first while I was out. I had a job

driving for a man by the name of "Old Man Beaty."

The average income of Manzanola was probably higher than any city in the United States of America. The trouble was the wealth was all in one family. Anybody that had any money in Manzanola worked for Mr. Beaty. He had—count them—60 farms. He owned the bank. He owned the grain elevator. He owned a string of grain elevators and a string of alfalfa mills. He ran cattle down on the river bottom. He ran sheep on the prairie out south. He had a manager for each one of these enterprises and they were the people that had the better houses.

So I drove a car for Mr. Beaty. He always had a new Buick. And he was never satisfied. I'd drive on rough roads out on the prairie and think that Buick was going to come apart, and he'd sit over there in the right-hand seat and said, "What are we going like a tortoise for? I gotta go. Go, go, go. Get up. Go." *(Laughing)*

One turning point was when he went on a trip to Europe. He didn't want to go. A trip to London. The trip to London meant two or three days on a train to New York, several days on a ship, and then repeat it coming back. So he's gone six weeks maybe. I'm waiting for him, and he comes back, and I start driving him someplace to visit those farms. He's always making big deals and I'd drive him to Pueblo or wherever.

And he turned on me and said, "Why aren't you in college?" And I said, "I don't have the money, Mr. Beaty." And he said, "You think I ever got where I am by saying I couldn't do it?" I had sense enough not to say I didn't have a rich grandfather like you did. *(Laughing)* But I didn't. And he said, "Look, you think you're going to stay in this town and make a living off of me." And he was about right. He had a guy that ran the bank. A guy that ran the sheep. A guy that ran the alfalfa mill. A guy that ran the cattle. A guy that ran the farms. And he said, "You're too good for this town, so come the first of January, you're fired. I'm not going to be the reason you stick around this town."

Then he said, "You go to college and write me a letter. I'll send you money." So I went out to my dad's on Christmas weekend with another guy named Glenn who went to Western

State. On the way home, he said, "Why don't you go back to school with me?" So I said, "Okay, I will." And because it flashed through my mind that Mr. Beaty said I was fired on 1 January, and that was the day after tomorrow (*Laughing*), so I decided not to try my career working for Mr. Beaty. Mr. Beaty was easily the richest man in all of southeastern Colorado by a country mile.

Bob Sheldon: What did you choose for your major in college?

Glenn Kent: Math and physics.

Bob Sheldon: How did you find your mathematics and physics studies in college?

Glenn Kent: I took every math course I could because I could get an A in them without studying. It's a teacher's college. They teach you how to teach math. So the algebra is about the level of algebra they now teach in the third year of high school, at the senior level. And I'll settle for last in history and economics; those are broadening courses. But I didn't study very hard. I had a good math teacher there by the name of Lucy Spicer, Dr. Spicer. And after her I had a guy by the name of Dr. Reinhardt Schuhmann.

Dr. Schuhmann was—as I look back now, he was an absolute genius. I didn't know it at the time. Or didn't appreciate it if I did know it. He was a Jewish gentleman. His parents were German immigrants. In retrospect, he should have been teaching at Princeton or Yale. But it was hard for him to get a job. He had a German accent that wouldn't quit. Terrible. He was a brusque individual that suffered no one. And he just couldn't get a job befitting his stature. He finally took this job teaching physics and math at Western State.

I avoided taking classes under him because it was well known that he was a tough teacher. But all that came to a screeching halt one day when I was summoned to appear in his office. I went in there and I didn't know what the meeting was about. There were about 10 other guys in the room. I look around and they're all from the "egghead" fraternity, and I'm out of my class. I belonged to the fraternity that plays basketball. (*Laughing*)

Dr. Schuhmann says, "I have an agreement from the President to teach a special course in theoretical physics. It will convene three days

a week. If you stay in the course, you get an A. If you don't stay in the course, you go back and take regular courses. It wouldn't be fair to grade this special course on a curve. So you get an A if you stay in the course. Meets Monday, Wednesday and Friday mornings, 8:00."

He then said, "How many of you are taking advantage of this opportunity?" All the members of the "egghead" fraternity said "Gee, count me in Dr. Schuhmann."

I sat there and didn't raise my hand. Because I could see a lot of wasted time. (*Laughing*) He noticed that, of course. He looked at me and he poked his head right up against mine and he said (with a thick German accent), "Vell Mr. Kent, *vat* is the matter *vit* you?" I said, "I'm thinking." That made him mad. He said, "Vell, *vit* you, I make the exception. If you do not take my course, I will see to it you never get an 'A' in the math department again." And I think, "He can't do that," but then on the other hand maybe he can. I better not take the chance. So I said, "I'd be delighted, Dr. Schuhmann."

And then it became a love/hate relationship that lasted two years. I spent a good deal of time studying for his course—theoretical physics.

Bob Sheldon: You just took one course from him in theoretical physics?

Glenn Kent: For two years.

Jim Bexfield: For two years. It was a long course.

Glenn Kent: Yes, it was one course. It was really just one subject, but fall, winter, spring semesters for two years. So I saw a lot of Dr. Schuhmann.

Jim Bexfield: So what did you do with your spare time in college?

Glenn Kent: I went out for basketball. That was a bone of contention with Dr. Schuhmann. He said, "I do not understand you. You waste your time playing this basketball." But the reason I went out for basketball was that if you made the traveling squad, you got room and board. You stayed at the athletic dorm and ate at the athletic table at the school cafeteria. I just barely hung on being on the traveling squad, meaning the first I think eight or nine players. Dr. Schuhmann thought that was an absolute waste of time.

He was on my back for two years about studying harder. At the end of two years,

I was to graduate. I was to graduate at the end of the summer term because I had not gone in the first fall semester so I had to go to an extra summer term to graduate in four years.

So he calls me in, two weeks before graduation and sets me down, said, "I have now known you as a student for two years, but I do not understand you. You do not study. You do not dedicate yourself. You skip over your homework. You play this basketball. You run with bad people, but still you get the highest grades of the class." He was making the point that I just had not dedicated myself. He said, "I *vant* to know young man, *ven* are you going to wake up and decide to make something of yourself?" And I did the worst thing I could, somewhat unwittingly, I said, "Well Dr. Schuhmann, I just accepted a job coaching basketball at Hotchkiss, Colorado." And the old man just slumped. He put all of this work into me to go coach basketball, oh no. But this story has a sequel to it.

That course was a savior later on, after I got into the Air Force. They sent me to Cal Tech [California Institute of Technology] to study meteorology and aeronautical engineering, all at the same time. I lucked out—there were 20 of us in that class, and Cal Tech only gave a master's degree to three. And I was one of them. So I wrote Dr. Schuhmann a nice letter that said, "Without having taken your course and your prodding me, I would never have made it." That's quite a step to go from a teacher's college to studying aeronautical engineering as a graduate student at Cal Tech. That's a fair step.

Later the war came as a result of Pearl Harbor, and I'm in uniform and transferred from the West Coast to the East Coast. I stopped by Western State at Gunnison, Colorado, made a beeline, interestingly enough, for Dr. Schuhmann's office. He's glad to see me. He said, "*Vel*, we still have the same course." I thanked him again for all that he had made me do in studying math and theoretical physics. He said, "We still have the same course, but it meets at a more decent hour now, at 2:30 in the afternoon and, of course, class is about to begin. Would you come in please?" So I did.

He introduced me as one of his previous students who went to Cal Tech and got a master's degree. He said, "*Vun* of the most dedicated students I ever had."

Bob Sheldon: When did you first learn to use a slide rule?

Glenn Kent: In college at Western State. I first bought a slide rule in 1932, the top of the line, Keuffell & Esser something or other, had a log-log scale on it and an exponential scale.

Bob Sheldon: Do you still have your old slide rule?

Glenn Kent: Yes, I do. But the spring in the cursor's broken.

Jim Bexfield: I noticed behind you what looks like a slide rule case. Is that your personal slide rule?

Glenn Kent: Yes.

Jim Bexfield: Is that your one from college?

Glenn Kent: Yes, sure is.

Jim Bexfield: Wow! You've got a much nicer case than I have. That's your first and only slide rule?

Glenn Kent: No, I had some others but this is the best slide rule I ever had.

Bob Sheldon: Any other math courses in college that impressed you?

Glenn Kent: Not really. I just took the general rig-a-ma-role of Algebra, Algebra II, Trigonometry, and Solid Geometry. That's about it.

Jim Bexfield: So you graduated from college and then you did what?

Glenn Kent: I got a job coaching basketball in a town by the name of Hotchkiss, Colorado. It's quite close to the mountains, but it's on the western slope of the Great Divide. I coached basketball there for three years.

Bob Sheldon: How well did your team do?

Glenn Kent: The team did fairly well.

Jim Bexfield: Were you teaching math?

Glenn Kent: Oh, yes. The normal thing in those high schools is that a coach also teaches math and physics. As a matter of fact, you're really hired as a teacher for math and physics, and you get a little extra for coaching basketball.

Jim Bexfield: What got you out of that?

Glenn Kent: The draft. Before Pearl Harbor, they had a draft and that's the only lottery I ever won in my life. I was in the first wave of draftees inducted. So I joined the Army Air Corps to avoid being drafted into the Army. I passed their physicals, and in those days their physicals were really tough because they had far more candidates than they could accept. That was

before Pearl Harbor, you see. I was only one of eight that passed the physical that day at Lowry Air Force Base. But I didn't quite pass. They noticed this swelling on my right ankle, which I had sprained two or three weeks before. It would have gotten well in no time, but they had to take an x-ray. They found that I'd broken it in college playing basketball, and it hadn't set right. So they had to get a waiver, and the waiver never came. Finally they said, "We have a new proposition for you. We're going to send a group of people to Cal Tech to study meteorology and aeronautical engineering, do you want to join?" So I did.

Bob Sheldon: You joined the Army Air Corps in 1941. How many months before Pearl Harbor?

Glenn Kent: I joined it in July of 1941 and went to Cal Tech. And then Pearl Harbor happened while I was at Cal Tech.

Bob Sheldon: Did you take a standard curriculum at Cal Tech?

Glenn Kent: No, they made a special course for this group.

Jim Bexfield: And it lasted how long?

Glenn Kent: From spring of 1941 until spring of 1942. About a year.

Bob Sheldon: What kinds of courses did you take?

Glenn Kent: We took courses in meteorology and forecasting. The toughest courses in aeronautical engineering were taught by Dr. Homer Joe Stewart, a renowned aeronautical engineer at Cal Tech. He had derived formulas for everything. And mainly our job was to repeat these derivations. The math was so complicated that I finally gave up doing it—I could do the math, but it took me too long. I couldn't do it in the time allotted during the test period. I found out from another graduate student there that Homer Joe always used his derivations as a basis for his quizzes—in fact, his quizzes were derived from these derivations and there were about 30 of them. So I memorized these derivations by rote, absolutely memorized them step by step. I had them on 3-by-5 cards, and when I was out jogging I'd work on memorizing them. So I got an A in every quiz and didn't understand the subject. I not only got an A, I got 100% on every quiz. Simply because I memorized 24 derivations and I was always lucky that the quiz was never out of the book. Meaning

there wasn't a derivation that I hadn't memorized. So there's a certain amount of luck there.

Bob Sheldon: Did you have to take statistics?

Glenn Kent: No. Homer Joe Stewart was great on things like—if you see a flag out there on a flagpole waving, if you know the speed of the wind, the length of the flag, the density of the cloth, and a few other things, you can tell what is the amplitude of the waves on the flag and their repetition rate. I don't see a flag any more without thinking of that formula. *(Laughing)* We learned a lot of useful things like that.

Bob Sheldon: Where did you go from Cal Tech?

Glenn Kent: The orders just said report to March Field. I did. I'm the Second Lieutenant, brand new. Okay? Go out to March Field and report in, and they say "Yes, you're going to be the Vice Commander of the boot camp." I said, "They sent me in to be the Vice Commander of a boot camp—there must be a mistake." I got no sympathy from that lieutenant colonel, who hated second lieutenants. He said, "Orders are orders. Quit complaining."

So I became the Vice Commander of a boot camp to teach close-order drills not knowing anything about them. *(Laughing)* Not much about it. But I survived. The guys that really ran the boot camp were sergeants from the Presidio, and they weren't a happy lot. They weren't a happy lot anyhow, and these were particularly unhappy to be transferred from that garden spot of Presidio up near San Francisco down to March Field. The boot camp was in what I'd call a swamp. They weren't happy, and they don't like second lieutenants. I was there for maybe six months.

Jim Bexfield: And then what happened?

Glenn Kent: They realized I wasn't the home and garden variety second lieutenant. And I gradually won the confidence of the head guy there. The head NCOIC (noncommissioned officer in charge). And they gave me a party when I left. I'll always remember that. They said, "Lieutenant, we don't know what makes you tick. We like you, though. But let's tell you this—you're never going very far in this Air Force. You're too damned easy." *(Laughing)* Too easy. I had no choice.

Jim Bexfield: You were too easy on the people in the boot camp?

Glenn Kent: What I did was I preached to them over and over that we're not here to make these poor GIs unhappy. They're unhappy enough as it is. We're here to help them. We're not here to find out why they can't go on weekend leave. We're here to help and teach. They thought that was a rather unique attitude. I kept hammering that home. That we're not here to entrap them into mistakes. So the weekend leave went up dramatically. Or to say it in a negative way, the number of people restricted from weekend leave went down dramatically. We had a pass in review every Saturday morning between a lieutenant colonel who hated everybody, so I worked up this proposition to him. That during the week we'll observe how hard people try, and put all the people who didn't try very hard in the rear rank. If we find anybody out of step in the rear rank, you can put them down. But not the whole company. They said, "He'll eat you up." So I went up there and he did. (*Laughing*) He said, "I make the policy around here. You're a damned second lieutenant." So I came back and reported that to the Sergeant and I said, "I don't think I presented my case quite as well as I could. I'll try again." The Sergeant rolled his eyes. But I went up there again and he about threw me out. It was a trivial matter as I look back now. Not so trivial then. He said, "All right."

Bob Sheldon: Did your having coached basketball and taught high school affect your style at that boot camp?

Glenn Kent: It might have helped me some. But I think what helped me more was to understand that I'm not there to make those guys more miserable than they are. They're miserable enough. So I went up and said you know they built the boot camp on March Field down in the marshy areas, and had a lot of rain that year. The place was turned practically into a swamp. We need to move the camp to drier ground. He would hear nothing of it. And I persisted on that. The second time I went to him on that, why he said, "All right." I told him, "Look, we won't stand down the training. We'll move over the weekend." So we moved over the weekend to a better place. And everybody was thankful for that. The Sergeant began to be impressed. They hated this lieutenant colonel. They knew him up at Presidio. He was a senior NCO up

there, and they promoted him directly to lieutenant colonel. They hated him anyhow, and they hated him because he got promoted. They were pretty impressed that I had persevered twice in a row with this guy. So things picked up at the boot camp because at least we were on dry ground.

Jim Bexfield: So what happened next, when you got reassigned?

Glenn Kent: Then they called out to March Field and said, "You were right." (*Laughing*) And they sent me to study under a guy by the name of Joe George, Chief of Meteorology down at Eastern Airlines, Atlanta, Georgia. I was down there for about nine months.

Bob Sheldon: What did you study from him?

Glenn Kent: How to forecast weather. How to draw weather maps. He was the chief meteorologist for Eastern Airlines, which was a big outfit at the time.

Bob Sheldon: Was what you learned from him different from what you learned in the Cal Tech weather school?

Glenn Kent: Yes, it was more practical, because I worked in his office and we had to make forecasts that meant something for Eastern Airlines. It was putting into practice what I'd been taught theoretically at Cal Tech.

Bob Sheldon: Where did you go from there?

Glenn Kent: I went to Goose Bay, Labrador. I think I made First Lieutenant soon after I arrived at Goose Bay and Captain soon after. Not very far apart. Goose Bay was part of the North Atlantic ferry route. Where they ferried aircraft to Europe—the staging base was Presque Isle, Maine, and they ferried them first to Goose Bay, Labrador. From there to BW-1 Greenland, which is on the southern tip of Greenland. From there to Keflavik, Iceland. And from there to Stornoway in the United Kingdom. If you follow me.

Somebody else was the station weather officer. I was about third in rank. Things came to a change, though, one day. They had Visiting Officer's Quarters (VOQs) that were built along the flight line where transient crews stayed. They're like an austere hotel. And they had a dining room there. You could eat there and the food was a little better than the ordinary mess. And the room was crowded. In walks a colonel—big, strapping guy, looked like he

owned the world. There weren't too many colonels around in those days, at least not up there. He looks around, and I'm sitting there by myself, and the only vacant seat in the house is opposite me. So he walks up and says, "Captain, may I join you?" Well, of course.

We started conversing, and all of a sudden I detected it took a different turn. Then he looks at me and he said, "Look, I'm up here under direct charter of Gen Arnold to straighten out this ferry route. Because the planes weren't coming through as fast as they should, and Eisenhower is complaining to Arnold. And I'm up here to straighten it out." His name was Ford. Col Ford. "Wild Bill" Ford.

He said, "I'm putting together a crew to go out—I'm going up to BW-1 and establish a control center there. I'm going to put together a crew in your honor." I look at him, and he said, "Look, I can get anybody I want, so don't tell me that you work under orders from somebody else." Finally, I realized that the guy meant business. I said, "Yes, sir. When do we leave?" "Right away. Pack your bags and be down there at the hangar."

"Yes, sir." So I did. I get to the hangar and he marches up to me and pins Major leaves on me. He said, "I'm promoting you to Major." I at least had sense enough to say, "You can't do that, I've only been a Captain six weeks." (*Laughing*) But he did. And he had the authority to do it.

I paid for that by working for Wild Bill Ford for the next two years. Twenty-four hours a day, seven days a week, 365 days a year. And he meant it.

Jim Bexfield: And this was at —

Glenn Kent: BW-1. It's a code word. Blue West One was the code word for Narsarsuaq Air Base.

Jim Bexfield: What was it close to?

Glenn Kent: I'll tell you exactly where it is. It's 35 miles up tundra arctic fiords on the very southwestern tip of Greenland.

Jim Bexfield: It was pretty cold?

Glenn Kent: Nope. It wasn't cold. Labrador was cold. Labrador is ungodly cold. But Greenland—on the western slope you don't get the bad weather they get on the eastern slope. Those Aleutian lows form up there, and occluded fronts go around them, and they dump an ungodly amount of snow on the eastern coast

of Greenland. That's what makes it an icecap. But if you go down to the southern tip, on the western side, where the air has to come over the ice cap to get to you, it's warmer.

Bob Sheldon: What did you do to improve the flow of aircraft?

Glenn Kent: Every morning I reported down at the weather station at 2:00 a.m. I had to write out the movements of the day, which is a big job. You're constrained by tie-down slots. The winds come up and they lost aircraft, so there was a rule that you don't park an airplane unless there's a tie-down slot for it. That holds at Greenland and Iceland both. Those airports were very constrained. So you had to figure out what slots were going to open up in Iceland, and ship an aircraft from Greenland up there, and because that opens up slots in Greenland, you ship one from Presque Isle up to Greenland. You had to make out the movements of the day, and you had to be careful that after the movements of the day were executed, there are no aircraft at either Greenland or Iceland for which there wasn't a tie-down slot.

You had different types of aircraft, and you may, on marginal days, send the B17, which we had a few of going through there. They were mostly B25s—you might send them but not send the B26s. That's because the B26s, the Martin Marauder, had an operating altitude of exactly 13,000 feet. There were always clouds across the straits from Greenland to Iceland. It's a question of how high they are.

Bob Sheldon: How much did the flow of aircraft increase after your work?

Glenn Kent: Ford got great credit for it, and justly so. He improved the situation dramatically. I think there was a book written about it—I can't remember the name of it—about how Bill Ford became a legend up there.

Jim Bexfield: What happened after the war to Bill Ford? Did he stay in the military?

Glenn Kent: Ford had been a roommate of Arnold during flying training and he went to TWA and was a captain. After he finished his tour in Greenland, which lasted about two years, until the ferry was over, he left BW-1 and went back to the states and became a captain at TWA again. He went up there at the direct request of Arnold and agreed to do it as long as required. Wild William knew everything.

Jim Bexfield: So he probably knew you before he sat down next to you at the dinner table?

Glenn Kent: No. I don't think so. I found out that's the way he operated—if he liked you.

Bob Sheldon: Did you work on the ferries coming back?

Glenn Kent: No. Because by the time he left Greenland, Bill Ford was a brigadier general. I left two days later. That's what he always said, "You're going to leave here two days after I do." (*Laughing*)

Jim Bexfield: And B17s would go through, but you would keep them longer because they couldn't fly?

Glenn Kent: No. B26s. They just wouldn't be sent. So they'd have to stay over until the weather was good. We had one shot a day. Especially in the wintertime. It's hardly a shot. The sun doesn't come until late and sets early that far north.

Jim Bexfield: And the ceiling for the B17s was what? About 17,000?

Glenn Kent: I think it was higher than that. But I don't recall for sure.

We had commercial airlines, too. They called them contract pilots. They were flying C47s and C46s up there. Flying cargo. They were contract pilots from airlines in the states. We could send them in pretty bad weather. You understand that some of these pilots going through there were six weeks out of training. They couldn't do instrument letdowns. So it was disaster if the fog rolled in on Iceland as it did on us a couple of times.

Bob Sheldon: What was your loss rate due to airplanes falling out from weather?

Glenn Kent: It went down dramatically. Before Ford went up there, it was fairly high. But it went down dramatically. I don't know the number, but it went down dramatically with Ford up there.

The only recreation was at the officers' club, shooting dice, playing poker. But I didn't have much time for that obviously. I got so I couldn't sleep. I was lying there in bed. I'd say, "Go to sleep, you have to get up at two." Finally I just wore myself out. I was in marvelous shape otherwise. So I went to the hospital and he gave me something to induce sleep and put me in the hospital. At 7:00 the next morning the doc comes in, wakes me up. Said there's been a new diagnosis.

Gen Ford says you aren't sick. (*Laughing*) And he wants you to report for duty within the hour.

Bob Sheldon: He had a second opinion.

Glenn Kent: Yes.

Jim Bexfield: But you had a good sleep. What happened when you left there?

Glenn Kent: I went from there to Grenier Field, and I was at Grenier for I don't know how long. I was the weather officer at Grenier Field in New Hampshire. And along came V.E. Day and then V.J. Day and I got out of the Army Air Corps and went back to Colorado and worked for the Bureau of Reclamation for a while.

Bob Sheldon: What did you work on for the Bureau of Reclamation?

Glenn Kent: Predicting floods on the major river in Wyoming. It's either the Yellowtail River or the Yellowstone River. I was working on flood design for the Bureau of Reclamation. How big does the dam have to be to hold a 30-year flood?

Jim Bexfield: And that was in what town?

Glenn Kent: Denver.

Then I got a letter that offered me a commission in the Air Corps so I took it.

Jim Bexfield: This was in 1946?

Glenn Kent: Yes. Went back there and was sent to Westover Field. I'd been there a short time when they announced that there was a problem with these isolated weather stations in the far north and they were sending somebody up there to be sure it wasn't the Weather Service's fault. They sent me back to Goose Bay, Labrador, and I was not happy. (*Laughing*)

That was a rather traumatic affair up there, because the inspector general (IG) was up there constantly. The United States government had made an agreement with Canada to keep certain isolated stations open that later became part of the DEW (Defense Early Warning) line. And some of the stations were regularly closing down, so it became a big, number one item for the IG. The guy that was really fouling it up was the Commander of Goose Bay, the Colonel. He was finally relieved of duty.

Bob Sheldon: Were you a Major?

Glenn Kent: I'm still a Major. Yes.

So I left Goose Bay under a cloud. Not by the IG. The IG didn't get after me. They got after the right person. I went from there to Westover and the IG said, "I have to get you out of Goose

Bay." Because by then I was at loggerheads with the Commander. They found this group of people they were going to send to study radiological engineering, how to mitigate the effects of atomic bursts. We went to the Naval Postgraduate School at Annapolis. I was sent belatedly to that group because a guy that was scheduled in the group got sick. So that changed my whole career in a new direction.

Bob Sheldon: How large was your class?

Glenn Kent: Originally there were 27. I remember the exact number because they sent you to the Naval Postgraduate School to prep you to go to University of California at Berkeley for the course. And they only sent 13 on. Less than half. I made the cut and went to Berkeley. Got a master's degree in radiological engineering from Berkeley, a special course. From there I was assigned to the Pentagon.

Bob Sheldon: Were there a lot of physics courses in that radiological engineering curriculum?

Glenn Kent: Yes. At the Naval Postgraduate School it was a lot of physics and a lot of math. At Berkeley it was more, but not so much math. Math was the killer at the Postgraduate School.

Bob Sheldon: That's what weeded out the other half?

Glenn Kent: Yes, the math killed them.

Bob Sheldon: After you graduated from Berkeley, what was your assignment?

Glenn Kent: I was assigned to the Armament Division in the Pentagon. The Armament Division was a division under a two-star general by the name of Yates [Donald Yates, later a Lt Gen] who had Research and Development.

Bob Sheldon: What was your role?

Glenn Kent: My first job was a fairly interesting one. I might say ahead of time that of all the people I worked for, Yates was the smartest and the meanest. Easily. On both counts.

I was assigned to a very secret project that nobody knows about today because they didn't know about it then. So I'll call it Project X. Project X was a very secret idea. It was totally wrong. The concept was to take the waste from nuclear reactors, grind it up, make it into pellets by putting certain binder material in it, put the pellets in fluted spheres about the size of a softball, put the spheres in a dispenser, maybe a 1,000-pound dispenser. You'd dispense this

over some area, the spheres would come apart at the right time and deposit these little pellets. They were going to create a barrier on the central front in Europe. A barrier in the sense that if a Russian tank tried to drive across there, the crew would be sick before they got to the other side.

I don't need to say that they didn't file an environmental impact (*Laughing*). One reason they kept it secret I think is because they didn't want to alarm the Germans. It didn't make much sense. I had an adverse reaction to it from the get-go. I'm a major, and the Colonel, that's my immediate boss, is from the Chemical Corps, and this is his pet project. The Chemical Corps of the Army was involved in it, too.

I decided to make a calculation. It's an interesting problem, because there comes a day when you lose as much radiation as you had. So there's an equilibrium point, depending on how many nuclear reactors you have. Let's look at the equilibrium point; the point at which I know there won't be any more than that the next day. Because there, as much decays that day as you add. And see how long the barrier might be. There had been some calculations made, but I reviewed them and they were obviously naive and fatally flawed.

So I went to the physics department at RAND and they helped me. They thought it was a neat project to work on, and we came out with a number of 100. Meaning the barrier you could create would be 100 miles long. Maybe it was 10 miles wide. The width was determined by how long you had to stay in it to get a sickening dose of radiation. But it was less than 100 miles long.

Bob Sheldon: This covered the Fulda Gap?

Glenn Kent: Yes. You got it. It is a miniscule part of the central front, even though it uses all the nuclear material they had. The Russians could easily drive around it. I showed this study to my immediate boss. It's not a bound-up study or anything. It's written out by me. The computers were unknown in those days. And my boss wasn't happy. I don't know to this day how it happened, but Yates got wind of this study and he invited me up there to tell him about it. So I did. I handed him this handwritten thing and he put it in his briefcase (*Laughing*). So obviously my immediate boss wasn't happy about that either.

About two weeks later Gen Yates calls me up there again. He said, "Let's review the bidding here. You're a Major. You've been in on this project about two months. But you know it all because you went to school. You did the study. I was foolish enough to believe you. I showed it to the other people. They had a steering group for this project of other generals. They referred your study to a Dr. Libby at the University of Chicago, who reports that your study is fatally flawed. What have you got to say for yourself? I was foolish enough to believe you, and you left me hanging out to dry. What have you got to say for yourself?"

I said, "I don't know that the study is wrong. Before we decide it's wrong, I want to see Dr. Libby's critique." "Are you telling me that you know more than Dr. Libby?" Dr. Libby was a renowned physical chemist [he won the Nobel Prize in Chemistry for 1960]. I said, "No. It's really not my study, Gen Yates. There were three very smart people at RAND involved in this: Dr. Al Latter, Dr. Ernie Plesset, and Dr. Leon Goure." Names that are fairly commonly known now. They weren't so well known then.

So he said, "Alright, I'll get hold of Dr. Libby's critique." In two weeks we reported back up there. Now with the RAND guys in tow, they say Dr. Libby is way off. "We stand by our number. It's less than 100 miles." So armed with that, I set about to cancel the project. And I did. I finally succeeded. Of course, now it would die of boredom.

Bob Sheldon: Did you find out what Libby's critique was?

Glenn Kent: The fuel there is from the ground; how much fuel there is from the tank, how much can the crew absorb without getting sick? These are not well established numbers. So there's plenty of opportunity—the crew is irradiated by pellets near the tank. So you had to integrate outward. It was not an easy calculation. I learned then it was far easier to damn the critique than to support your own study. (*Laughing*)

Jim Bexfield: RAND was in California at that time?

Glenn Kent: Yes.

Jim Bexfield: So you were traveling to California for this?

Glenn Kent: Yes. I had taken a trip there under other pretenses. I couldn't say it was for

Project X, because nobody knew about Project X. Anyhow, I went out there at some risk, read those guys into it.

Bob Sheldon: What were your other projects at the Armament Division?

Glenn Kent: At the headquarters of the United States Air Force. One other important one was the MB-1 rocket. I might go through the saga of that. In those days, there were no ICBMs. None to count. The main threat to the United States was Soviet bombers. The Soviets had a bomber that was something like a B29. We didn't have Sidewinders or Sparrows (air-to-air missiles), but rather a free-flight rocket that had a likelihood of hitting a bomber that was quite low, if you follow me. It didn't have its own guidance.

So I came up with the idea, which wasn't one of my better ideas, why not put a nuclear warhead on the end of this rocket and make up for the miss distance. (*Laughing*) Yates thought that was a splendid idea, and bought it, and sent me out to Albuquerque to be the program manager for this rocket that's got a nuclear warhead on the front end of it. So I was transferred to Albuquerque.

Bob Sheldon: You had already spent three years working for Yates?

Glenn Kent: It was about three. In the meantime I made lieutenant colonel and was transferred to Albuquerque. When I got to Albuquerque, they also made me the Vice Chief of the Research Directorate. Later, an officer by the name of Col Giller [later Maj Gen Edward Giller became assistant general manager for military applications at the Atomic Energy Commission] came in to be the Chief. That was the genesis. The lab out there is now called the Air Force Weapons Lab. But the thing that consumed a good deal of my time at first out there was the MB-1 rocket. I was a program manager. And that's the lesson that taught me well: to be aware of the ORD (Operational Requirements Document) requirements.

My first job was to define in some detail the characteristics of this rocket. It was to go on the F89J, so we were to use an existing rocket motor. So that told you what thrust you had available, whatever that rocket motor gives you. We had to use the fire control system on the F89J, which was alleged to be about a 24 mil system—a one mil area is one foot in a thousand. We were

to shoot at a maneuvering B29. Now the analysis of that was pretty daunting, because I didn't know the lethal volumes. Lethal volume wasn't well known in those days, so I went to Wright Field to get those lethal volumes. They let the contract. I had Research do it.

The lethal volume is not an even sphere. There's a lobe for the gust on the lower side of the wing, and another on the top of the wing. Gusts for the horizontal tail, the vertical tail. Airplanes can take a lot of gusts head-on, but they can't take transverse gusts. So it's a complicated affair.

I was a little leery of what Wright Field provided me in these volumes so I had the physics department at RAND, Dr. Leon Goure and Dr. Ernie Plesset, do an independent study of these volumes. Not satisfied with that, I went to Sandia Corporation. I had a good relationship with the guy that ran it. He put two guys—Dr. Dyke and Dr. Wood—on the project. It's a pretty daunting analysis to figure out what's the probability of kill given an engagement. If you don't know the lethal volumes, you don't know for sure what the error is and all of that.

We had to shoot a maneuvering bomber so there's an offset error. The fire control systems on the F89J just predicted where the aircraft would be if it pulled no Gs from the last time you saw it. So if it's pulling Gs, there's an offset, and that goes up as time-squared. So the time of flight of the rocket was critical.

I had approximated the lethal volumes out there as an equivalent sphere, which turned out to be a mistake to do mathematically. Meaning that the volume of the sphere—a perfect sphere is the sum of the globes out there. Now I can do it using mathematics: what is the probability of the shot being within the sphere? But that approach grossly understates the probability of kill. Leon Goure and the guys at RAND had a computer, which I didn't. So they did it stochastically. They Monte Carlo'd where the actual hits were and saw whether they were in one of these volumes. They didn't do it mathematically. They did it stochastically—if I have the words right.

They also looked at those volumes and decided the right two volumes were off by a factor of three. But even so, when they do it stochastically, they get a high probability of kill. So there

are two errors. In my original cut, I did it by approximating the sphere and using large volumes. Using the larger volumes, I got about point eight (0.8). But I got smarter and knew the volumes were wrong, and that you should do it stochastically, and there were compensating errors, so you got about the same answer.

Well, the requirements people from the Pentagon came out there and thought I needed help. They said they had a document that stated the requirements for this rocket. It was a 2 kiloton warhead. Time of flight, 3,600 feet per second, average velocity for five seconds, and 20 mil error. Well, I go to Los Alamos and ask them what's the size of the warhead to get a 2KT yield and take that and put it on the front of that rocket I have, and it won't go 3,600 feet per second. It's not executable. But according to these other numbers, I get a high probability of kill.

Well, at that time I was using the wrong analysis. I was using the large volume, and the mathematical approach to determine probability of kill. Shortly after they left, I found out both of them were wrong, but I still got about the same answer because I had compensating errors.

They came out there again and said, "Have you changed the program?" I said, "No. Because I get a good probability of kill with 1.8 KT, 3,200 feet per second, and so on. And that's executable. I can do those, but I can't meet your requirements." They say, "Don't complain about what you can't do. Just meet them." (*Laughing*) Which is just insane garbage.

They pressured me, and I made a tactical error. They said, "Are you going to change to these requirements?" I said, "No." And they are aghast. This is three colonels. I think I was Lieutenant Colonel at the time, saying no to them. I said, "The only way there will be a change is if you get a new program manager." They said, "We'll work that problem." (*Laughing*) And that was a tactical error I made. They went back to the Pentagon and the next thing I knew, the Chief of Staff at the Air Force had commissioned a Scientific Advisory Board of the Air Force to look at this mess of the MB-1 rocket.

They hired a guy I'll call Dr. X to critique my study. I called him and said, "My original study has been changed—I revised it." He cut me off. So I made the decision right there on the phone, let him think I used the original approach. See?

Because he now thinks that my analysis is fatally flawed because I used a larger volume. He doesn't know that if you do it stochastically you still get about the same answer. And he thinks it's something I did alone. I didn't—he cut me off, and I didn't tell him that RAND and Sandia Corporation had both looked at this and got about the same results that I came up with.

So come the day before the SAB, Dr. X gets up and has a stirring critique of the wrong study. (*Laughing*) And he's spending the morning doing that and then he said to the SAB eloquently, "Well, what do you expect in a form of analysis from a colonel that doesn't understand ops analysis and supported by five Lieutenants with handheld calculators?" See, he had a computer. We had calculators.

It came my turn. I had a slide that said I used smaller volumes in my analysis than Dr. X did in his, so we can do away with the argument about volumes to Dr. Allen Puckett. (Dr. Puckett headed that SAB and was huge later on, a CEO at Hughes Aircraft Company). So volume isn't an issue. Dr. X made the mistake of saying it is.

And he said, "The volumes I got from Wright Field." But I said, "I didn't use them." (*Laughing*) "And we now know the error that you made in your study and that is this approximation of the sphere." So you'd say mathematical technique.

This rather unnerved him to say the least. By then it's clear to the SAB that it wasn't my study, it was RAND's and Sandia Corporation's also, and they're sitting there in the audience ready to get up and testify, and that the big error is the approximation of the sphere versus the stochastic approach.

I had rehearsed this fairly carefully. My career was on the line because I'm about to be relieved of that MB-1 project. I said, "Dr. X, in your critique you said we used the standoff distance, which mattered a lot because the offset went up as the time of flight squared." So I said, "You said for an offset, for a safe escape we should have used the business that the pilot never got more than 25 rem (Roentgen Equivalent Man—a measure of radiation absorption) and we used a number that the median dose would be 30 rem or something like that. I asked

my Lieutenants, "Which is the more demanding standoff?" And you know what they said to Dr. X? "You're right about how you can't depend on these Lieutenants. They tried to do the analysis and said they didn't know how to calculate it without using a binomial or normal distribution. But evidently with your computer you could. So now we'll all stand aside for a moment and you can inform this group how you calculate a binomial distribution."

He said, "But I didn't use binomial distribution." I said that my lieutenants indicated they can calculate three sigma, two sigma, and so on, but not binomial." He said, "I didn't use binomial. You know what I used. I used three sigma." "And called it binomial and you accuse me of mathematical ineloquence?" (*Laughing*) "You owe an apology to these five lieutenants."

At this point Dr. X said, "I refuse to stand here and be harassed by this Colonel." I said, "Fine. Sit down. I win, you lose. The analysis is without error. And yours is fatally flawed. The game is over." At which Dr. Puckett said, "Not quite so fast." (*Laughing*) But I got a clean bill of health. A little luck played out. From then on I was untouchable, running the MB-1 rocket. The SAB gave me an absolutely clean bill of health. Reported back up to the Chief that he's doing it exactly right, and to follow those requirements from the Pentagon would be a disaster.

The MB-1 project, from an acquisition standpoint, was a howling success. It came in on schedule. Shortly after this it was pre-planned, I was to hand this over to another guy and spend most of my time running the Research Directorate. The other guy was Col Bill Black, but he brought the project in. But it came in on schedule, ahead of schedule, under cost, and on performance. How could I miss? Los Alamos said that we can get 1.9 KT so I put them down for 1.8. Douglas said they can get 3,400 feet per second out of that rocket for this, so I put them down for 3,200. As a requirement.

So from that standpoint, it was highly successful. But along came Sidewinder already at two-thirds of the way through, and they owed me one project. I went up to Naval Weapons Center out there in the desert in California and realized the MB-1 rocket was obsolete before it ever made the IOC.

So you can now find MB-1 rockets hidden away in some museum, but that's about it. They built quite a few of them. But they never were used in combat, of course. They became unusable because of the fallout. They wouldn't let you fly over cities with them. Because of the nuclear warhead they became unusable.

Bob Sheldon: There was no guidance system on the MB-1?

Glenn Kent: No. That was the secret of them. We didn't know about guidance then. The Naval Weapons Center hadn't yet invented this guidance. They were just inventing it. So in retrospect, I should have stepped up to the plate and reported that this thing was obsolete half-way through the project. But, in my defense, I didn't know that Sidewinder was going to work as dramatically as it did.

Jim Bexfield: You were there for how many years?

Glenn Kent: Three.

Jim Bexfield: Had you met Jasper Welch (later an Air Force Maj Gen) at that point?

Glenn Kent: Yes. I'd visited a Captain Welch while he was working up at Livermore. He was normally under the Research Directorate, but we just had oversight of these guys. Another we had oversight of was a guy by the name of Lew Allen at Los Alamos, who later on became the Air Force Chief of Staff. I knew of Jasper, but that's just sort of in passing. I went from Albuquerque to the Air War College.

Jim Bexfield: You were a colonel at that point?

Glenn Kent: Yes.

Jim Bexfield: What did you do for fun in Albuquerque?

Glenn Kent: Well, worked. (*Laughing*) There wasn't a whole lot to do there. However, the people at Kirtland Air Force Base were a pretty closely knit family, and there was an officers' club and so on. I wasn't particularly the most popular guy on the base. There was a one-star head of the Center and then there's a Base Commander who commanded Kirtland Air Force Base. I'm a tenant on the base, and I'm a nuisance to them. They don't look at it that they're there to serve the tenant. They look at it, "We're here; those damned tenants are a bother." (*Laughing*)

I didn't get along too well with them on several accounts. One is worth repeating. They

came up with a base evacuation plan, in case of nuclear attack. Now in those days we stored nuclear weapons at Manzano Base. The concept was that when the bell rings, the B29s would come to Kirtland Air Force Base, be loaded with these weapons, which are trucked from Manzano Base to Kirtland, and off they go to war. Wow! So Manzano Base is a big target. It was supposed then that Kirtland Air Force Base was probably the prime target of the Soviet Union if they attacked with bombers. So they had a big air defense zone there. They wrote an evacuation plan for Kirtland that had some meaning because it seemed as though Kirtland would be the target.

And it goes on and it says in the evacuation plan that there aren't too many ways out of Albuquerque. It was a phone system alert like, "You phone Joe and Bill, and Bill phones two other guys," and so on, and it cascades upward. But it adds parenthetically that this all should be done quietly. We do not want to alert the civilians in Albuquerque. They would clog the roads. So there's a big deal at the Center about this plan, and everybody was congratulating this guy about finally getting a plan, how we certainly needed one and so on. So I started. I said to them, "So this is the military in their grandest image. It isn't as though the captain is deserting the ship; he's deserting the ship and fixing it so the passengers can't." (*Laughing*) "And here you are, saving these relics down on the flight line—you know, World War II vintage aircraft that have no purpose except for flying hours by people that aren't in combat units."

I said, "You'll be the laughing stock of this community if this plan ever becomes known." The next day a note came down from the Center Commander that it wouldn't be necessary for me to attend staff meetings any more. (*Laughing*) But they trashed the plan, of course.

Bob Sheldon: Did you feel at home in Albuquerque, since you were close to Colorado where you grew up?

Glenn Kent: No. It had a lot of the same characteristics as Colorado. Flat, dry, and dusty. (*Laughing*) Not as bad as southeastern Colorado.

Bob Sheldon: So you got picked up for the Air War College. Did you enjoy your studies there?

Glenn Kent: I enjoyed the Air War College.

Bob Sheldon: Did you write a paper at the Air War College?

Glenn Kent: It wasn't much of a paper. I remember the subject. As I look back now, I could have taken on a bigger problem, but I didn't. The one thing that struck me—I noticed the guys from these headquarters—both Headquarters of the United States Air Force in Washington and the Headquarters SAC. And I said, "If that's the kind of guys that they have up there in Plans, I can make my way in Plans." I don't have a doctorate degree in math or physics, and I'm not going to go very far in this research and development business. So I'll volunteer to go to Plans in the Pentagon. Now if you're so stupid that you volunteer to go up to the Headquarters of the United States Air Force in the Pentagon, they have to give you the job. I found a job waiting for me. Weapons Plan Division, but don't read that as just all weapons. It was nuclear weapons. But they didn't call it that for reasons of image. They just called it the Weapons Plan Division.

So I volunteered to go to that. As a vice-division—I don't know whether they call them Commanders of those divisions or not. I had volunteered to go there and they sent me. That was the big turning point in my career. I went from being a colonel that was invited not to attend staff meetings to being the fair-haired boy. I worked for the most dominant three-star general in the Air Force, Gen Gerhart [John K.]. And I did that because of my knowledge about nuclear weapons.

In the original bomb, you inserted the nuclear device in the end of the bomb, in flight. Now Los Alamos had come up with that sealed pit test and that's what came up—that's what was the Armed Forces basic weapons project for nuclear—it reads nuclear weapons. And they came up with a big cascade to railing against "sealed pit" weapons.

Bob Sheldon: Sealed pit. What's that?

Glenn Kent: It's a sealed pit—the pit being the plutonium. It's in the sphere, and it's sealed. It's in the bomb to begin with. They thought that was too dangerous. But I started looking at it and I decided it wasn't. There was no more danger in that than any other concept. They gave a briefing before Gen Gerhart and I argued that I thought some of the things they said were wrong technically. And they were.

Up until that point, Gerhart was inclined to go along with AFSWP (the Armed Forces Special Weapons Project [The Armed Forces Special Weapons Project was formed under a Navy Admiral at first, and reports directly to the Chairman of the Joint Chiefs of Staff. Now they'd report to the USD(AT&L), the Under Secretary of Defense for Acquisition, Technology, and Logistics.]). Because they're the Oracle on nuclear weapons. They're the organization formed for this purpose for all three services. So we had that session and Gerhart called me back in after. He said, "Where did you learn so much about the bomb?" I said, "Well I was stationed at Albuquerque for a couple of years, and working on this very subject." That impressed him and I became his Mr. Everybody for nuclear weapons—even to whether it'd be a deterrent and everything else. Even the subjects that were not technical. But of course, we did go the sealed pit way. It turned out that other people in AFSWP agreed with me; there was a great division of opinion down there. So this briefing that was given was taken off the street.

That put me in with Gerhart. Gerhart is one of the great unsung heroes of the Air Force in my view. He was a SAC general in 1960 or thereabouts. I was in Plans for about four years. He put together a briefing that said we're not going to have TAC turn nuclear like SAC. That's exactly what TAC was trying to do, to get into the megaton business. There's a SAC general way back there, saying nuclear weapons are an unusable force. He said, "I'm not going to say that publicly. That's what guides me. We're going to make TAC into the best conventional force the world has ever seen." A SAC general. He could get away with that because LeMay, who was then Vice Chief, and Tommy White, who was then Chief, liked him. Gerhart could get away with it.

He liked me, and I was his chart maker. By that I mean he told me what he wanted to say, and I'd put it on the chart, and I wouldn't have misspelled words and wrong syntax or anything. After two or three tries, I'd get it about right, and that was way above anybody else. So I became his chart maker. I didn't actually paint the charts. Somebody else did. It was on paper. We didn't have PowerPoint.

He put together a briefing that became famous, turned the Air Force around. He said we're going to buy F-4s from McDonnell Douglas. That didn't set well with a lot of parts of the Air Force because the F-4 was a Navy airplane. But he said we're going to do this. We're going to put more money in TAC than SAC. That's heresy. These were all his ideas. Not mine. And that's important to the story, because then a new general came in from SAC. Before he came in, I reported directly to Maj Gen (later Lt Gen) Glen Martin who reported to Gerhart. And now all of a sudden I reported to this general who reports to Gen Martin, who reports to Gerhart. Another layer. He knows about this briefing so he wants to hear it. I go in there and I don't get by the first two charts—he says, "Where you getting all this stuff, Colonel?" I didn't say from Gerhart. I tried to defend the chart on the merit of the case, and he informed me that he made policy, and colonels didn't. In effect, he said, "Throw the chart out." What he did say specifically, "I want a cost-effectiveness analysis of megatons delivered by F-4s dropping 1,000-pound bombs versus B-47s dropping megaton bombs." I said, "It's not a relevant comparison. Obviously the B-47 is going to win. It takes quite a few 1,000-pound bombs to make a megaton."

So he, in effect, throws me out. He's at me again about two days later. This time we make progress. We get through another two charts. And he is just livid. He said, "Have you made the analysis yet?" I said, "No." "Do you know how to do it?" "Yes. I could do it in a heartbeat." He says, "I'm taking you off this project." "Well, I'm not on the project because I'm in the Weapons Plan Division. I'm on the project that Gerhart put me on to make the charts."

Jim Bexfield: What'd he say when you said that?

Glenn Kent: I said, "You'll have to check that with Gen Gerhart." He said, "I will." And he went up to Gen Gerhart and explained to Gen Gerhart he'd taken me off this project because of my weird ideas—all of them are Gerhart's. (*Laughing*) So that afternoon I was working directly for Gen Gerhart.

Jim Bexfield: And this other general didn't get too far?

Glenn Kent: Yes, that's right. That was a bit of luck there. So Gerhart kept giving me better and better jobs. One job he gave me that stands out was—there was an argument about the strike plan—SAC had a strike plan, the Navy had a strike plan for their submarines, and the Air Force had a strike plan for their bombers. They used the word "loosely coordinated" but that just meant—I'll show you part of what I'm doing. Each one.

That was underlying, but people came up with the idea of having—which we have today—a CINC SAC. Well, it isn't called SAC. It's Strategic Command now. And the submarines would be assigned to that. But that, of course, sent the Navy through the roof. But the die is cast. At first it was an organizational problem of putting together that command. Putting the submarines under them. I am doing this thing, and I've got enough to do without worrying about what those guys are doing down there in Doctrine.

Gerhart called me in and he said, "I just came from the Chief's office, and he said, we can't afford to lose this, so I'm putting you on it." "Yes, sir." So I go back two days later and say, "Gen Gerhart, if your position is you can't afford to lose, you'd better change your position. Let's stake out a position we can win. And that position is there will be a Single Integrated Ops Plan (SIOP). Each word is operative. Single plan. Integrated. It's an operations plan, making the best use of what you have. And it is a plan. Let's forget this business of command authority. It doesn't matter. As long as there's a Single Integrated Op Plan, what does it matter? So there'll be a joint strategic planning staff established at SAC at Omaha. Run by CINC SAC with a Navy Admiral three-star under him. But a joint staff. And they'll come up with a Single Integrated Op Plan."

Now it seems like that has motherhood written all over it. But the Navy resisted that mightily, because they abandoned their first efforts and this is just a way—a slippery slope of getting there. Their real purpose is to get their subs out from under CINC SAC. The water's already poisoned. So they resisted it mightily. That's probably an understatement. It went on and on. The Secretary of Defense got wind of this, of course, and was firmly convinced that

that was the way we ought to go. So for a period of six months I did nothing but live and breathe the idea of this SIOP.

Bob Sheldon: Did you coin the term SIOP?

Glenn Kent: Yes.

Jim Bexfield: Who was the Secretary of Defense at that time?

Glenn Kent: Thomas Gates. An investment banker from Philadelphia and a brilliant man. Bless his soul. So I go ahead—and of course, I'm briefing Gerhart about this about every other day. So I have pretty close ties to Gerhart and Gen White. One day Gerhart calls me in and says, "Let's review the bidding. Your plan is—you've finagled around so that they're going to have a trial run out there at Omaha on this. The idea being if the trial run succeeds, that's a big step toward getting that whole procedure approved. The Navy has resisted that, but we've got the Secretary of Defense to demand that there be a trial run. And then you finagled around and got the Secretary of Defense to sign a letter that says ..."—it wasn't the letter I sent up there, but Gates changed it. My letter said I'm working clandestinely through Gates' military assistant, Brig Gen George Brown (later Chief of Staff of the Air Force and then Chairman of the Joint Chiefs of Staff).

Jim Bexfield: Yes, I used to work for him.

Glenn Kent: Yes. And in the letter I fashioned they would go to Omaha on the 18th of December, 1960, to review the plan. Gates signed it to approve the plan. But I'll accept blessings when I see them. Which is a bigger bite to chew. And so I told Gerhart—when Gerhart said, "You've done extremely well. You've maneuvered this thing bureaucratically through every nook and cranny and now we're in a pretty good position, and your idea is they'll go out there to Omaha and brief the plan, and Gates will approve it. Or at least nod. And then if the plan is split by the services, it goes up for adjudication and you win." That was my PERT diagram.

"We need more convincing proof that he will approve the plan. Work on it. I'm not satisfied that we're going to win this on the merits of the case out there." "Yes, sir." The traffic going home that night was particularly bad, and an idea, which turned out to be brilliant, came to my mind. I learned from this that semantics matter.

The plan is an ops plan. It's to make the best use of force. It is silent as to whether that outcome is acceptable or not. The argument is best use of force. Best use of force has to do with whether you send this weapon at this DGZ, Designated Ground Zero, or another one. So I've narrowed the argument down to best use of force; it's a matter of DGZs.

"My plan is, Gen Gerhart, that we will sharpen up this argument as a matter of DGZs to the point where Gen Thomas Power, bless his soul, at SAC will convene a group two weeks before the 18th of December out there to say—and at the end of the meeting, he will quietly say, 'Do any of you have any changes to the DGZs?' Hopefully there will be a few changes. We accept all the changes, regardless of merit; and therefore, they have bought the plan." (*Laughing*)

Gerhart looked at me and said, "You think it'll work?" I said, "I don't know." Gerhart said, "We'll try." So he goes up and explains this to the Chief of Staff, Gen Thomas White. White calls Power and he said, "I can't explain to you what I have in mind, but no problem, Gen Power. I'll send the Colonel out there and he'll explain it to you." So that afternoon I found myself in a C-47 against strong headwinds making our way to Omaha. I arrived there about 5:00. Staff car meets me to whisk me up to the presence of Gen Power. I'd never had a conversation one-on-one with Gen Power before in my life. He doesn't know me from Adam. Well, he knows me, because of my work on the site all of these days and months, but he says, "What do you have?" So I have to explain it to him. He listened intently. He looks at me. He says, "That smells of entrapment." (*Laughing*) "Four-star generals don't do that." He says, "I said that smells of entrapment." I said, "It is." He said, "I'll do it." And he did it masterfully.

He came out there on the 18th of December. There was an argument about factors that affected the outcome of the plan. Gen Power got up at about 11:00 in front of this group. All the rank of the universe is assembled there. Gen White barely made the first row.

Bob Sheldon: Were you there?

Glenn Kent: Oh, yes. In the back sitting by Gen Gerhart. Each service could have one action officer in the room. So, we told Gen Power,

"I'll take it back there." At 11:00 was my first diagram. At 1:00 he's through this. But the other arguments had gone on, and everybody is getting mad, and irritated, and lunch is past due. Gerhart says, "Did he (Power) understand?" I said, "Yes, sir." "Well, where is it?" Power was waiting for the right time. He got up and with great eloquence recited this argument about the plan—as far as the plan's concerned, that's my job that they offer it. There is no disagreement. A hush fell over the room.

Secretary Gates was an investment banker. He took over, and from there on it was slam dunk. Gates said, "That is the most remarkable statement." And he recited it. So as far as the plan is concerned, there's no disagreement. He queried the Navy about it and the Navy did about as bad as they could rebutting it, acting like they'd never sent the memo in, and Power has it right there in front of him. The memo from the Navy Admiral out there. The Navy Admiral said, "On something like that I'd have to refer it to the headquarters." And that just blew Gates right out of the water. He said, "What have you been doing out here for the last three months? That's what you were sent out here for. To develop the plan. And now you act like this is a new subject?" So he was just scathing in his attack against the Navy. And then he suddenly stood up and said, "I have a farm to save. The plan will be approved. Without further discussion. Without change. And today."

Admiral Burke of the Navy, a very resourceful gentleman, said, "It would be rather awkward if Congress were informed that you coerced the JCS [Joint Chiefs of Staff] into approving these plans before they were submitted to them formally." I thought, oh, my—of all the things I thought of, I'd forgotten to send it to them. They'd been briefed on it over and over, but it hadn't been submitted formally. So Gates recovered by saying, "You have a point Admiral. I amend my former statement as follows. The plan will be approved, without further discussion, tomorrow morning at 9:00."

So all these four-star admirals and generals had to unpack their bags. They had planned on parting later that afternoon. (*Laughing*) And Power says, "There will be a reception at the officers' club at 6:30." He nods for me to get up and tell his staff what's going on, so I did.

The rest is history. But it turns out that's how I got promoted to general. Power saw to it.

Bob Sheldon: How many months after that were you promoted?

Glenn Kent: It was a year or so. I found out later that Power took extraordinary measures. He became embarrassingly my supporter. Like telling his own staff, "If Col Kent said so, it must be right." (*Laughing*) Telling his own staff off. So, I have a different image of Gen Power than a lot of people.

Jim Bexfield: What kind of image do the others have?

Glenn Kent: A rather demanding guy and all. Not very friendly. And whatever he says goes.

But that's a rather interesting study, in effect analysis without numbers. But that it pays to worry things around until you get down to the nitty-gritty of it. So I made my way. As a colonel, in winning arguments. I didn't win them, but I worked for important people and I helped them win arguments.

Bob Sheldon: How long did you stay in that job?

Glenn Kent: I stayed in Plans for about a good four years. I went to Harvard in 1961, I think.

Bob Sheldon: What were some of the other hot topics that you worked on in the Plans Division?

Glenn Kent: I had a pretty good job as a colonel in Plans, in nuclear weapons. They had the Weapons Plans Division, but don't think weapons systems, don't think nuclear weapons—it's named Weapons Plans to not attract too much attention. In those days, we dealt with the Rainbow team and the JCS about the fabrication of nuclear weapons for the next year and the allocation of them. So that was an ongoing tussle.

Each year, in those days, the Department of Defense had to send to the Atomic Energy Commission an order for the weapons they'd build during the next year. We were on a plutonium diet; there was just so much plutonium. Meaning each weapon took so much plutonium and the amount of plutonium total couldn't be larger than a certain number because the AEC couldn't create any more. That order came out of the JCS and the Secretary of Defense. They

had meetings and the JCS asked about this. It went on and on. And wrangling around what weapons. For example, the Army was using a lot of plutonium in their Davy Crockett system and that takes plutonium away from bombs for the SAC—have you ever heard of Davy Crockett?

Bob Sheldon: No.

Glenn Kent: It's a small weapon. The idea was that they would use it on a tactical basis in Europe. Mainly to blow up bridges. It would stop the Soviet advance and make choke points. They wanted a whole bunch of them, and that took money; but more importantly, it took a lot of plutonium. The amount of plutonium in a bomb is practically independent of the yield. It takes about the same amount of plutonium for the primary. So that was a continual thing. We worried about it.

After the weapons are built, they're allocated. Whether they go to SAC or CINC PAC or the Army or wherever. Some of them, it's pre-ordained. If it's a Davy Crockett, it obviously goes to wherever the Army says. But there was a contest between the Navy carrier air and B-47s. I did pretty well on that by inventing the idea of loading to force.

I invented the load to force and this would just drive these guys up the wall down in the Joint Staff, because they wanted to argue about how much more space do we have to destroy, how many industrial things—and my argument was that other people would make policy and they have built this many B-47s; it's our humble duty to load them. So I avoided much of this policy debate about how much do you have to destroy and so forth.

We had load factors in those days of about 80 percent, as I recall. Meaning our B-47 and B-52 aircraft on SIOP alert were loaded only at the 80 percent level. As a matter of fact, that carried the day. When I took over that division, my predecessor was inclined to be in the policy business—all about how much destruction is necessary in our retaliatory strike. And that's a never-ending subject, retaliation. A lot of social science in it.

I invented the idea of the load factor. There's somebody way above my pay grade as a lowly colonel who has decided to build these B-47s and B-52s and it's my beholden duty to load them to the best effect.

I avoided the political science bit of this about how much do we need and I drove them—the Army and Navy—wild on that argument. To the point where the Navy Captain said, "If you give that speech one more time, I'll throw up." And I said, "Get a bag."

On load factor, I could look very generous. I would load the Navy aircraft up to 90 percent while SAC was at 80. SAC didn't like that. But I pointed out, "Look, this thing goes up for split to the OSD. We've got to be on the side of motherhood. 90 for Navy and they're complaining about 80 percent for SAC?" I could do that because there weren't many Navy aircraft. I could load them out and it doesn't affect my load factor too much. But at least I got the load factor in there as a guiding principle.

Later on, Gen James Ferguson wants to give me the job of Development Planning in Systems Command at Andrews. It was a short conversation. I said, "Gen Ferguson, I'll take the command if Development Planning means planning the developments of this command." Pause. That's quite a difference from what they're doing now. That's how I said, that's what the name said. He looks at me, done deal. So you know I have great leverage. I'm planning the developments of this command and I took this charge very seriously, and a lot of other people didn't think that was my business. The guy before me is writing some obscure document called the Technology Roadmap of the Air Force or something. Just stuff like that, that nobody paid attention to.

Jim Bexfield: And then Gen Rogers followed you?

Glenn Kent: Yes, well on down—he worked for me when I went there. Ferguson liked Rogers so he said I'm giving you Brig Gen Felix Rogers [later head of Logistics Command] to work for you. He was a great guy and very able.

When I took over that job, development planning was writing such obscure and useless things. They weren't actually writing them, but they were fostering them. The plan for technological warfare—I don't believe such a thing existed. But I had a choice whether I went down there or not. I had said to Gen Ferguson, "If development planning means planning the development to this command, I'll take the job."

He winced a little bit. I said "Well, that's evidently what it means."

He said, "OK." So I took the charge very seriously—planning the development of this command. I planned what concepts we would underwrite or implement. I never got a direct charter for that, but I acted like I had one. Gen Ferguson, the only comment he ever made was one day he said, "I think you're taking that statement a little too seriously." But he never did say no.

Up until that time it was more or less left to the Center Commander as to what they did. There was no central direction. There was Air Force Electronics Development Command at Hanscom Air Force Base and Lt Gen Kenneth Schultzhad BMO and there was another center for space. They were later combined, as I recall; they were separate then. So I take that seriously and that carried over from Systems Command when I was transferred to take Studies and Analysis. I said, "Well now I'm in a real good position to plan the developments of this command." I never did have a charter for it, but it was there because I had the ear of the Chief.

Bob Sheldon: What were the major projects you had going on under you in that job?

Glenn Kent: The F-15 was one, which I nursed along. I didn't have anything to do with the technical aspects of it, but I saw to it that Gen Schriever [Gen Bernard Schriever] got money to pursue his path toward putting satellites in space, and so on. I was more or less along for the ride, just to help monitor at the headquarters if some guy didn't cut his money. Minuteman was another project. The concept of Minuteman had already been described. All I had to do was to ride herd and see that somebody doesn't cut the money in my favorite project.

Bob Sheldon: Somewhere along the line you went to Harvard?

Glenn Kent: Yes, I spent a little over four years in Weapons Plans Division of the Director of Plans at the headquarters under Maj Gen Glen Martin. He had a remarkable group of colonels working for him. At one time Gen Martin, a two-star general (later a three-star), had as the Director of Plans, Gen Russell Dougherty. They were all colonels then, Col Dougherty, Col Robert Dixon, Col William Goade, Col David Harbour,

and myself. And all those colonels made general, and some of them made four-star general.

After four years of working endlessly at night and so on, I went to Harvard to the Center for International Affairs.

Bob Sheldon: How did you get picked for that Harvard assignment?

Glenn Kent: Gen Martin put my name in I think. I was through with my tour at the headquarters, so I went to Harvard for a year. The Center for International Affairs. It's, in some respects, not my cup of tea, because this center was populated by people from the foreign services of 14 countries, like France, Italy, Germany, Argentina, Indonesia, Cyprus, Japan, Korea. So it was all about diplomatic matters and political science, not about ...

Bob Sheldon: No mathematics involved?

Glenn Kent: Well, I got it involved, but that wasn't the name of the game. That was an interesting course. It had a strong economics flavor. Each member of the group had to present two seminars during the course and that meant you had to write a paper, 10 pages or so long, hand it in, and be prepared to defend it at the seminar. The seminar wasn't to brief the paper, it was to discuss the paper, and one of those had to be on economics. So I postponed that as long as possible, because some of the people at the seminars were graduate students from Harvard. And some of these guys had been sent around the world to help people in their economics and I'm to give a seminar? By that time I had thoroughly antagonized them so I knew they'd have their sharp knives out, but I avoided it by giving a presentation. "For shame, for shame, for shame." I went through with meticulous detail all of these disasters that they had caused to these developing countries trying to make them into an economic structure like ours. I said, "I have often wondered what I should do after I retire from the military to make up for what I've done to humanity by being in the military, and now I know I shall go around the world protecting the innocent people from the likes of you."

Bob Sheldon: Did they draw their spears on you?

Glenn Kent: Well, yes, of course they didn't like it and there was a heated discussion, but it's on my turf. I'm not obliged to know about

economics. All I have to know is that they made a disaster out of some of these nations by taking them out of their tribal habitats and trying to make them make shoes in a shoe factory. They forgot all about the well-being of the nation and tried to make the shoe factory a profitable one.

Bob Sheldon: What was the other seminar you gave?

Glenn Kent: For the other seminar, I was on fairly solid ground, but it was not to their liking. It was about arms control, and I was protesting the approach to arms control where they restrict the number of missiles you can have, and let the size of the missile grow and don't try to constrain that. I accurately predicted that that would be a disaster someday. This was the days before MIRV.

Bob Sheldon: What did you base your analysis on?

Glenn Kent: That we ought to constrain, for example, the volume of missiles and just let them have so much total volume of missiles. If they want to make small missiles and more of them, within that stated constraint of volume, that's what I want you to do. I am constraining your destructive power, but letting the survival float.

I carried that through for a long time and it finally carried the day, years later with Nunn, and after I retired, with Nunn in the Senate.

That began my theme about constraining throw weight; that's the same as constraining volume, constraining throw weight. And that's a tale unto itself. I pushed that idea in many directions over the years. That was in 1963. It started at Harvard. As a matter of fact, I brought it to a head there and got some converts. They had a joint arms control seminar there that met every other month. It was joint between MIT and Harvard. They met at the Faculty Club at Harvard, because they had a better club than MIT did. Two guys, one guy from Harvard and one from MIT, had been commissioned by the Arms Control and Disarmament Agency (ACDA) in Washington to develop an arms control agreement, a tentative one, a trial run. You know this is the early days of arms control. They gave a briefing on it and I pointed out that you're doing the wrong thing. You're constraining the survivability measures and not

constraining the destructive power and we'll pay for that later on. Well, they didn't, you know, what does a colonel from the Air Force know anyhow, because Harvard was a hotbed of antimilitary in those days. So ensued a fairly lively debate. But Dr. Tom Schelling came to me after that meeting and said, "You're right."

He wrote the master book *The Strategy of Conflict* in 1960, taught the Strategy of Conflict at Harvard. I took it when I was at Harvard in the Center. I skipped every seminar I dared and went to his courses. But he said, "You're right, so I want you to flesh that out and make a presentation of it," which I did. So in due time I presented it at Harvard. The deck was stacked against me because those guys didn't like the military. They didn't like the fact that a colonel in the Air Force was telling those revered professors that they might be wrong.

How dare you? So I didn't get through the briefing. After the briefing, Dr. Schelling and Professor Robert Bowie, who was the Director of the Center, and Dr. Henry Kissinger were there. Dr. Kissinger had been the Associate Director of the Center from 1957 to 1960 and Director of the Harvard Defense Studies Program from 1958 to 1971. Kissinger came to me and said, "I think you're right." I think he forgot it later on, or didn't adhere to it, but anyhow they scheduled me again. This time Schelling and Bowie both get up to introduce it and said, "His logic is impeccable. His math is right. Just listen." And they admonished me, "Don't rise to the bait, you know? They'll say bad things but just let it ride." So I did and I got through it.

Bob Sheldon: What were the bad things they said about it?

Glenn Kent: They weren't substantive. The verification. But I said I'm just constraining volume and you can measure volume. These are history professors and political science professors, and math is not their cup of tea.

Finally at the end of that second session, a Dr. Somebody with a foreign accent, a history professor there, said, "Colonel, by your mathematics you have taken and made a complicated subject impossible to understand." So I forgot Schelling's admonishment and I said, "I'm sorry you said that Doctor," and he presses on and I said, "I'll tell you why I'm sorry. I went to a little old teacher's college. You'd have

spitting contempt for their standard of excellence in math. But if I went back there and said, 'Dr. Schuhmann, look at this math.' He would look at me coldly and say, 'My dear young man that is only simple arithmetic.' So if you don't understand it, I would advise you don't tell anybody."

To continue that story, when I'm in WSEG (the Weapons System Evaluation Group) I convinced the Deputy Secretary of Defense, Paul Nitze, of this so he bought into it. This is when I had WSEG, and they had an arms control agreement fashioned over there in ACDA. And Kissinger was the head of the National Security Council; he was the national security adviser, and he sent it to the Secretary of Defense for a review. Then he had this team review it. It was a loaded deck. There were four proposals, three of them lousy and one of them not. In my view, they were all pretty bad, but one not as bad as the others. So that's all they wanted, was an endorsement of number two. It was just a pro forma exercise so they could say to the Congress, "Have you consulted the military?" "Oh yes, we have, we sent it to the Secretary of Defense and they voted for number two."

So I had a report fashioned, after some difficulty, but I inserted in the report a section 2A. Now notice I just call it 2A, so he could take it out and nobody would know the difference. It reads right along. It's just that 2A is inserted in there, and 2A said essentially the following: "Number two is the least worst, but all the proposals have the serious flaw in that they constrain the defense or other survivability measures and do not constrain the offense, the destructive capability." It was in the context of a duel between ICBMs. So I went to Nitze and said, "Now Dr. Nitze, I don't want to make any unnecessary waves and you notice what I've done here, I've inserted section 2A. Section 2A has the concurrence, as we stand here, of exactly one mind—mine. Of all the people on that group, CIA ACDA, State Department, JCS, Army, Navy, Air Force, none of them concurred with that." So I said, "There's only one person that wants that section 2A in there, so you don't have to put it in. It's your call, if you say don't put it in, I'll just say, yes sir." Nitze thought a little bit and said, "I'll get back to

you tomorrow." He called me the next day and said, "It stays."

We sent it over there across the river. Nitze goes on an extended trip someplace. They wait until Nitze's gone and call me and said, "Thank you very much, for that report. It was excellent, except just delete section 2A." So I said, "I'm not at liberty to do so." This was somebody working for Kissinger calling on behalf of Kissinger, although he was careful not to say so. And I said, "I'm not at liberty to do so. Dr. Paul Nitze said put it in and I can't, in good conscience, overrule that decision." Well I could have if I wanted to, but—and they put further pressure to delete section 2A because that would complicate matters over there. Finally they ditched the whole report, rather than...

Jim Bexfield: How was 2A different from 2?

Glenn Kent: Well, no, my statement was I didn't write a proposal. I just said that this wasn't proposal 2A, it was section 2A. It was just some remarks that said all of these arms control proposals are flawed—including alternative 2, the fact that they were proposal 2 and 2A is just happenstance.

Bob Sheldon: Let's get back in sequence with you finishing up at Harvard. Any other notable people that you met?

Glenn Kent: My office mate at Harvard was Jörg Kastl, a rather remarkable man. He was in the German Army at the defeat of Stalingrad. He and about a hundred other people made it back all the way from Stalingrad back to Germany by foot.

He later was the ambassador from Germany to the Soviet Union. So we made friends with people like that, from these foreign countries. Another gentleman, Duk Choo Moon, became a close friend. He was later Ambassador from Korea to Belgium, Italy, and the United Nations. We also made lasting friends of John Barnes of England, who became Ambassador to the Netherlands and Israel; Nikos Kranidiotis of Cyprus, the longtime Ambassador to Greece; and Gérard Gausson, later Ambassador to Sweden. My wife has kept in touch with all of them for many years.

Jim Bexfield: Getting ready to leave Harvard, did you have your assignment already in hand?

Glenn Kent: It was given to me, but I didn't particularly pick it. Dr. Harold Brown had

known of me. He was then head of DD R&E, so I suddenly found myself assigned to Dr. Brown, as his military assistant for strategic matters. That's before he was Secretary of the Air Force, and before he was Secretary of Defense. So that was a very good assignment.

Bob Sheldon: Did you meet him before you went to that job?

Glenn Kent: I don't recall that I did. Somehow or another he knew of me. I was his military assistant for strategic matters and you could do as much as you wanted or as little as you wanted in that job. I was very lucky; early on I got the ear of Dr. Brown. So he let it be known to the people in PA&E (Program Analysis and Evaluation), Dr. Alain Enthoven and company, that anything they had to say, run it through me before he would see it. They didn't want to particularly come to me, but they had to. The way that Dr. Brown was on all of the matters—he stuck to that rather religiously. They'd try and give him a paper and he'd just say, "I'll read it when Gen Kent has seen it." Well, I was a colonel at first, then I later made general.

That put me in the spotlight in more than just technical matters. McNamara, strangely enough, had more confidence in Dr. Brown about strategic matters of a political, or strategic, nature than he did in the other people that worked for him. In many cases he asked Brown directly for a piece of paper; that made it clear he didn't want other people to know about it.

I ended up helping Dr. Brown in that role, even to the point of reviewing McNamara's testimony to Congress. I didn't write it, somebody else did, but I had a hand in reviewing it. I lucked out with Brown. It wasn't that I was never wrong, but he never knew it.

Jim Bexfield: Did he have a quantitative background? Was he in engineering or mathematics or ...?

Glenn Kent: Dr. Brown maxed the course in math. That guy knew math upside down, over and out. Dr. Brown had an amazing mind. He'd work on a subject and I'd think, "How am I going to present it to him and get it through?" because he was an impatient person, and I'd go as fast as I could. When I'm two-thirds of the way through, he finishes it better than I could. And he could remember things that happened.

I'd tell him something and then a month later he'd say, "You said on such and such a date, so-and-so." "I did?" But I lucked out pretty well with Dr. Brown. I hadn't been there but about a month when the Army came in with a milestone briefing about a Nike-X. Nike-X, in retrospect, was a flawed concept. We didn't know about hit to kill in those days. The interceptors were armed with a nuclear warhead.

And there was a lot of money going into that effort. Of course it finally was canceled for a variety of reasons. The Army had a briefing about the effect—what difference it made to have a defense called a Nike-X. They gave this briefing and the defense looks pretty good. During the briefing, I had been taught by Schelling at Harvard, ask yourself the question, "Who has the last move?"—and be careful. You better settle that before you do anything else. Who has the last move? It occurred to me in this concept, that the offense, the Soviet Union, has the last move.

They can see where we put these interceptors and tailor their tactics accordingly. So they don't have to attack the defended area to kill people. They have the last move, but the study by the Army had the inherent assumption, not stated, that the United States had the last move, in the following construct. They said they had gone to the JCS and gotten an account of the SIOP. The RISOP (the Red Integrated Strategic Operational Plan) was allegedly the Soviet equivalent of our SIOP.

Well, that's nonsense because the Soviets hadn't developed it; somebody in JCS had. The Soviets had the last move. They didn't have to adhere to it. So they had two weapons at a certain number of DGZs, and each weapon had one warhead and nine decoys.

Bob Sheldon: What's a DGZ?

Glenn Kent: Designated Ground Zero. The probability of intercepting an object was some number like 0.75, so you could do a binomial expansion and find the probability that one weapon will detonate, two weapons will detonate, or no weapons will detonate at the DGZ. They looked pretty good, but they've got it camouflaged and as always, they did a lot of work. In retrospect, given their RISOP, you could do the thing in an hour with a slide rule,

with bad eyes. It's just expanding the binomial distribution at each of these places. But I said to myself, I better keep still because I'm the new man on the block here, and this is the first time I've been exposed to this. Maybe I'm missing something. When the meeting was over, I followed Dr. Fubini [Dr. Eugene G. Fubini, son of mathematician Guido Fubini], a Brown deputy. Dr. Fubini was the wild Italian. He had many patents on radar and he was also a great brain and a quick learner. I went back to him and said, "I'm disturbed to no end about that briefing." And I went through the binomial—there's no guarantee that the Soviets would attack like that. What if instead of sending two weapons to that DGZ, they send three? I go from being quite successful to dismal absolute catastrophic failure, by definition, because I spent all my interceptors on the first two weapons. Dr. Gene Fubini said, "Well how do you do it? How do you think about it?" I said, "I don't know, but not this way." He took me into Dr. Brown immediately and Dr. Brown, we got about halfway through it when he said, "Oh my, what are we doing?" He called the Army back in and said, "The construct is fatally flawed and we have to start all over."

So about a day later he called me and said, "In addition to the Army, to think about this, I'm giving the job to IDA (Institute for Defense Analyses) and to you." Of the three I was the only one that came up with the answer, but not by myself. I was beginning now to understand that I had to balance the firing doctrine at a battery: when he sees some incoming object, he has to balance leakage versus exhaustion. If he's totally concerned with leakage, he fires everything he's got at those. If he's worried about exhaustion, he thinks a little bit about that because there might be another weapon coming that he doesn't know about. And somebody said there are two guys at Bell Labs that addressed this about a year ago and wrote a paper.

So I got in touch with them. The two guys were Dr. Robert Prim and Dr. Thornton Read. So I got hold of Bob Prim. He said, "I'd be glad to come down and show you that paper," which he did. He had the math in it just absolutely elegant. So I picked it up and incorporated it into my analysis of the effective expenses and handed it to Brown as a trial balloon. Brown

bought it and that became the method of doing it. Inherent in it was the Prim/Read theory. I made Bob Prim and Thornton Read famous or notorious, with the Prim/Read theory. The construct was to make the marginal return of RV that the Soviets could send to the United States the same. That means on defended sites you put in more interceptors than the others. Some interceptors you don't put in, because the worth of the target is so poor, so low—so that its marginal return, even if it's one interceptor defending, is about the same. It's about what you're gearing up for.

So the construct was there's a price you charge per target and beyond that price you can have it for free, if he pays the price. But the price he pays is purported to be the worth of the target divided by some constant, like λ . And λ is what you decide to make the defense, it's the marginal return that you'll accept. The lower the λ , the more interceptions you have to have, because you have to charge a higher price. And you can connect the relationship between the price you decide to charge, and the number of interceptions you have to have.

So I did that and Brown thought it was great, told IDA to put it on the computer, told STR, scratch that—whatever company on the West Coast was under contract to the Army—to follow this approach. The contractor on the West Coast bought it. They didn't have any problem. They thought it was absolutely right on. The only trouble was they were incompetent computer programmers. They just couldn't get their computer there to do what they wanted it to do.

This was back in 1965 or 1966 or thereabouts. Computers weren't user friendly then. IDA took a different stance. It bothered them to no end that some Air Force general figured this out. I didn't figure it out. Well I did in part, but I didn't figure it out as elegantly as Prim and Read did. I copied it. So they wanted to review the approach and they almost got fired for it. Because Brown would then give me "what ifs." You know, "What if the probability of kill of the interceptors is 0.6 instead of 0.75? What if the total attack is more RVs? What about decoys and all that?" I could handle those "what ifs." After I got it set up, it'd take me about an hour and a half to do each "what if," with a Friden

calculator. Brown found out and he said, "I thought I was setting it up for IDA to do these 'what ifs?'" I said, "They're over there still figuring out the theory." So they got a stern reprimand from Brown because of that.

He said, "Well how about the company on the West Coast?" He said, "Go out there until they can do it right." And I said, "It's easier on me if I do the 'what ifs' myself with my Friden calculator. Just give me one guy to help me. Then wait until they make that computer out there do their bidding." So I became the calculator for defense.

The Army was quite cooperative about this. They made the Nike-X look far less effective than they had, but the top echelon of the Army never had a problem with that.

Bob Sheldon: Did you understand the Prim/Read algorithm? Could you follow that yourself?

Glenn Kent: Oh, yes, absolutely. There's nothing complicated about it. As a matter of fact, Bob Prim described it to me in the morning. By afternoon I had a formula that explicitly showed the relationship between the number of interceptors and the price you're going to charge.

Bob Sheldon: Something you could program on the hand calculator now.

Glenn Kent: Well, I can write the formula down and solve it with a slide rule. There are pocket calculators you can program in the formula. I never did, because we didn't have pocket calculators in those days. We had Friden calculators.

Bob Sheldon: Based on the results you gave, did Dr. Brown change some of his acquisition decisions?

Glenn Kent: He began to have worries about defense. That and the Soviet threat. He then began to have misgivings about it, but at that stage there was no termination of the Nike-X. The goal then was to make it work. Later on—the demise of the Nike-X was wrapped up into a larger thing called damage limitation. Along the way, about every four years, while they have a ...

Jim Bexfield: Not the QDR?

Glenn Kent: Yes, the QDR, I don't think they called it a QDR in those days, but it's the same thing. And there were many issues to address.

A gentleman, an analyst who worked for Enthoven by the name of Dr. Frank Trinkl, was in charge of an organizing effort to address these issues. It was a smorgasbord of issues, 20 in all. Some of them cast a long shadow and to say I'm going to get an ad hoc group in to study this and get a worthwhile product is nonsense. It was a disaster waiting to happen.

He wanted me on it and I declined. So they went to Brown and said, "We asked that Gen Kent be on it and he said 'No.'" So Brown calls me in and I said, "Dr. Brown, it's a disaster waiting to happen." He said, "Your charge is to join that group and keep it from happening." So I said, reluctantly, "Yes, sir." I went down there and tried to reorganize the effort. And I pointed out to Dr. Trinkl that of the 20 items, eight had to do with limiting damage to the United States from a nuclear attack by the Soviet Union. Why don't we bundle those together and just study damage limitation? And see what mix we should have of civil defense, active defense, bomber defense, and counterforce, in order to limit damage to the United States. So that even in a second strike I can attack his residual forces with counterforce to decrease the attack on the United States.

That's an uphill grind, because we had to do it both ways. So for Soviet first strike the counterforce isn't a strong player, you see? US damage can only depend on civil defense and active defense, Nike-X and bomber defense.

So Dr. Trinkl said, "That would require a lot of analysis." I said, "Right." But he said, "We can't do it. We just don't have the forces to do it," and I think he was absolutely right. But quite illogically he said, "That's too hard to handle. We'll go back to where we were," which is studying the 20 issues, including the eight. That shows we're just going to do a warmed over version of something on all the items. So I kept pestering him about it and he said, "I don't want to hear any more about it." I said, "So you agree with my construct?" He said, "No," and I said, "Well you haven't heard enough, I'll repeat it." Whereupon he fired me, absolutely used the word. He said, "You're fired." I said, "Thank you."

After that episode I decided I'd better go back to Dr. Brown so he heard it from me before he heard it from somebody else. And I went in.

I had to restrain myself; I just said a quiet "Hello." So he said, "Alright, do it yourself." That's where I got into damage limiting. So I inherited the job, rendered a tentative cut at it, showed how do it on the basis of marginal return of each one of these agents and then Secretary Brown gave me some extra people to help me do it. We rendered the tentative report and handed it in to him. I think that took us about three months.

Bob Sheldon: Were you still at Andrews?

Glenn Kent: No. I'm working for Brown, in the Pentagon. This took me about three months. I handed it in to him. Lo and behold three or four days later, he calls me down there and says, "I showed this to Mack Murray. He thinks it's great. He's now commissioning a big joint study and you're running it." A representation from each of the services, JCS. I was stunned, but what can I say.

Bob Sheldon: You were a colonel at the time or a general?

Glenn Kent: General. So, I finally got that report out. Limiting damage in the United States, which stands as a monumental effort even today. One bar chart in particular in that report caught the eye of both Brown and McNamara. I showed that if we stayed on the 70 percent utility line, 70 percent of the United States would survive a basic Soviet attack. What we had to spend total, and within that total, how much we were going to spend on active defense, civil defense, on Nike-X, bomber defense, and on counterforce.

What caught their attention was the marginal returns, the exchange rates at that point. To stay on the 70 percent line, if the Soviets upped the ante, increased the threat, how much do I have to spend compared to what they spent to increase the threat? How much do I have to spend to counter it, on the margin? At the 70 percent line, that is about three to one.

Bob Sheldon: We have to spend three times as much as them?

Glenn Kent: The 90 percent line is more like five to one, as I recall. And that did it. Because they wanted to look to the reactive Soviet threat. There was some gee and hawing around about it. So I was present when a great decision was made about the direction this nation was going.

Brown called me and said, "McNamara wants to see your charts again." So, I'm the chart carrier. I go up there and he looks at that chart and wants to know if he has the right understanding of what the exchange rate is. Three to one. And he did. And Brown chimes in and says, "I've had other people look at it and I am convinced it is three to one, or worse." So McNamara says, "Well, in effect this is a vacant strategy." Vacant. Won't work. We're not prepared to outspend the Soviets at three to one. At 70 percent surviving, you say 70 percent surviving, General, that sounds pretty good. Do you know what our detractors will say? Only 60 million dead. We're spending all this money. What we must do is negotiate an arms control agreement with the Soviet Union to restrict defenses so that we can constrain the offense. So that was the genesis of the ABM Treaty of 1972.

Nike-X died along with all the others in damage limiting. So, I got a lot of flak for that.

Bob Sheldon: Who did you get flak from?

Glenn Kent: I didn't get flak from McNamara. McNamara bought it lock, stock, and barrel. That's why I got flak from other people. The way they put it, it was the greatest mistake we ever made in strategic matters, and that is the ABM Treaty of 1972.

One of my detractors wouldn't let that up for years. Every time he'd see me, "There's the man that was the genesis of the ABM Treaty, the worst of our greatest strategic disasters, the ABM Treaty of 1972. They were giving me more credit than credit was due about being the architect. That wasn't my purpose.

Jim Bexfield: Did they still point the finger at you during the Star Wars development? The Strategic Defense Initiative?

Glenn Kent: Oh, yes. That carried over. On the Star Wars development, I took another slightly different approach. I didn't oppose Star Wars directly. What I did was say, "Look, you have to be careful, think this out, because we're likely to put in a defense that looks pretty good against a ragged Soviet offense after our counterforce attack." So, I coined the word, we have "conditional survivability." Meaning this nation survives if we strike first. The Soviets might have this same thing. Their nature to survive is based on strike first, so that destabilizes the idea of first strike stability. I wrote several reports on

that and got a lot of flak from all the dedicated Star Wars people. That was a bad chapter in our strategic thinking. They never did take on the issue of first strike survivability directly, except one analyst. He was pretty clever. He would suggest that it looked like I was wrong without ever having said it.

Bob Sheldon: Getting back to the 1965 era, when Vietnam was heating up, was there competition for defense funding for operations in Vietnam as opposed to strategic defense?

Glenn Kent: Oh yes. I didn't really get into the matter of what the allocations would be, but there certainly was competition for the dollars.

Jim Bexfield: Was there competition getting to Harold Brown and McNamara, getting to speak to them and work with them?

Glenn Kent: Yes. Conversations with both those gentlemen were exceedingly short. They were both very capable men with minds that would run ahead of you, and they were quick learners and decisive. I recall one episode in particular. Both Brown and McNamara had been briefed on some goings on near Tallinn, the capital of Estonia. Became known as the Tallinn Complex. There's a lot of construction there and the Tallinn community was not sure what it was all about. Most of the speculation centered on it being part of an integrated and complex ABM system for the Soviet Union. It looked as though the Soviet Union might be starting on an ABM system. That was before the Treaty of 1972.

Dr. Brown, who was a man of great foresight, worried about that. So he faxed a letter for McNamara to sign telling him that even though we weren't certain what that was, we couldn't afford to wait. We better think about how we would respond to a Soviet ABM deployment. So McNamara says okay he'd sign such a letter. He added to that letter. He said, "Although I'm not convinced, personally, that this will ever amount to anything, in terms of an ABM system, nevertheless, we can't afford to wait. We must start now and think about our countermeasures in case they do continue with an ABM system." So, he sent the letter to Brown. Brown called me in and said, "Come up with recommendations." In about three weeks I went to Project Polaris, under Admiral Levering Smith, and to the Ballistic Missile Office (BMO)

and asked for their recommendations and came out with six or seven recommendations.

We need more throwaways. We're going to have to use decoys and we need more throwaways. So fill out the tube in the Polaris subs and that became the Poseidon Program. The Navy wants to put on the new missiles. They aren't individually targeted, but they spread out over an area pattern. So we'll do that. Number three, upgrade Minuteman, give it more thrust. Number four, put a post boost, post vehicle on Minuteman that can independently target RVs. And that was the beginning of MIRV. Number five was starting a technology program to understand decoys: how to make lightweight decoys that are credible.

So, I handed it in to Brown. The total of it didn't take more than three pages. Of course, I had some solid people at Aerospace and RAND and other places suggest what concepts we should undertake to counter an effective defense. But it's interesting to note that Brown, he piddled with it a little bit and sent it to McNamara. And McNamara within the week sent back "OK, RMC" on every one of them. Just think what it takes now to get anything of that magnitude started. Mission Needs Statements and ORDs and other countless mindless documents.

One thing you can never accuse Brown and McNamara of being was not decisive and not incisive.

Jim Bexfield: They did that based on a three-page document?

Glenn Kent: Yes.

Jim Bexfield: Amazing.

Glenn Kent: They knew behind it was Admiral Smith of the Polaris Project, saying that's what he would do—Polaris. And BMO and the Aerospace Corporation say, "Yes, that's what we should do to Minuteman." So there was consensus of the community. The document handed to Dr. Brown was three pages.

That was in the days when people trusted each other. Brown trusted the judgment of those people. That's what they recommend and that's what Gen Kent recommends. I'll recommend it to McNamara, and McNamara's the same way. That Dr. Brown recommends. So, the process was more about people than about documents as it is today.

Bob Sheldon: Let's go forward to you becoming Deputy Director of Development Plans. Was that immediately following?

Glenn Kent: You're right. I left DDR&E and went to become head of Development Plans at Andrews.

Jim Bexfield: You were there from 1966 to 1968?

Glenn Kent: Yes. Over at Andrews. That's correct. There was a short year in between when I left DDR&E before I went to Andrews. I worked for Gen Joseph Holzapple.

Jim Bexfield: What did you do for him?

Glenn Kent: Assistant for Concept Formulation.

Bob Sheldon: Then from Andrews, you went to take charge of Studies and Analysis. Was that a natural progression for you?

Glenn Kent: No. That happened under very peculiar circumstances. Gen McConnell had just been made Chief. I get a call. I don't know if he knows me from Adam. I think it has something to do with Systems Command. I say to the guy on his behalf, his exec officer, "What's the subject?" Because I figure I better inform Gen Ferguson before I go see the Chief. His exec officer calls back in about five minutes and says, "The subject is, Gen McConnell wants to see you in his office alone at 0800. Period." "Yes, sir. I got it." I don't know what the subject is. So, I go over there. I walked in. Gen McConnell looks at me with his eyes and says, "Sit down boy." He started calling me "boy" then and he never got over it. He says, "Sit down boy." He says, "I've been watching you. I need a guy like you on my staff. I'm surrounded by yes men up here that try to figure out what I want to hear and not what I should hear. So, I'm putting you on my staff for that purpose. I want a guy who thinks hard and thinks clear and will tell me what I should hear. And if I find that once you're on my staff you're catering to those three-star general yes men, you're fired." Well, that's quite a charter. He then added, somewhat parenthetically, "I'm giving you Studies and Analysis to run." Well now, what more could I ask? Here I am empowered to work directly for the Chief and got Studies and Analysis to help me think. And I parlayed that into the next four years, as much as I could.

Bob Sheldon: When you initially went to Studies and Analysis, who were your senior officers reporting to you?

Glenn Kent: They were very capable. Col Eugene Steffes (later a Maj Gen) was there. I inherited a bunch of young majors and lieutenant colonels. One I inherited was a lieutenant colonel by the name of Larry Welch (later Gen). So I inherited a lot of good people there. I had a little difficulty when I first arrived. Some of them began to fret about this hands-on approach of mine. "How dare you change my chart!" There was a good deal of resistance to that. They'd been used to just handing it in, and the General would sign it and that's it. So, I began to have a problem on that score. My exec officer, Col Steffes, a very dedicated young officer, came to me and said, "The fact is that you have unrest among the troops." So I called them in and said, "I understand some of you don't like my hands-on style. It's not apt to change. It'll probably get worse. If you don't like it, I'll give you a deal you can't turn down. You can ask for a transfer out of this organization; you can leave without any bad report. But if you stick around, it's my way." Interesting enough, about a fourth of the people transferred out. The best thing that ever happened to me. All those empty slots. Now I can recruit people again.

So, we had somewhat of an unstable beginning. There was a transportation study. I was going into the detail of what they'd been doing with the Army by direction of the JCS. I couldn't understand what it was up to. I said, "Who was going to use it? What's it for?" And on and on and on. Some of the math was wrong by inspection. The interesting thing was the other General had approved it but hadn't signed off on it yet. They said, "You can't hold it up. We have an agreement with the Army; the Army General signed it and so on." So, the Army General called me and said, "I understand you don't like that report." I said, "Right." He says, "Could I talk to you?" He came over and talked to me and he said, "You know, I didn't like it either, but I was told that the Air Force liked it." So, he just cancelled it, much to the chagrin of the people who worked on it, no doubt. As a matter of fact, all of them quit. They were part of the fourth that quit.

Bob Sheldon: When you first got to Studies and Analysis, where were your study taskings coming from?

Glenn Kent: That's a good question. The way it worked was Studies and Analysis was framing up their own study program and getting it blessed by the Air Staff warden. Shortly after I arrived there, why I'm handed this thing that we had to hand to the Air Staff warden to get approval of our studies program. And I say, "I don't want that Air Staff warden telling me what to do." They said, "Well, it's in regulation." I said, "Show me the regulation." They couldn't find it. I said, "Maybe no one in the Air Staff can find the regulation. Let's just don't go down there and see what happens." Nothing happened.

So, I tried not to seek approval for what I was doing. That's constraining on you. I never had any problem with that because I always worked the Chief's problem, one step ahead of him. That puts the onus on you to be sure that you're supporting the Chief.

Jim Bexfield: How did you stay one step ahead of him?

Glenn Kent: By attending staff meetings, figuring out these issues and coming back and holding a meeting and saying, "This is an issue that is going to need ventilation. What can we do?" That's the way to stay one step ahead. You're not one step ahead if you wait until he asks.

Jim Bexfield: Can you give us some examples of those one-step-ahead issues that you studied?

Glenn Kent: One program was the F-15. I didn't design it, but we had a heavy influence through Larry Welch of designing what the F-15 looked like. I realized too that there was going to be the issue between why the Navy developed a new fighter and the Air Force developed a new fighter. We've got to be prepared to win that argument. It's things like that. So we did a lot of work preparing ourselves for the argument. Sure enough there came a day when there was a group commissioned by the Secretary of Defense to look at why two programs, the Navy's F-14 and the Air Force's F-15 that we carry today, mainly through the work that I bonded with Larry Welch and his people.

Bob Sheldon: One of the things that both Gen Welch and Col Hork Dimon told me is that you

would send some of your officers out to brief other very high ranking officers, and you wouldn't go along with them. They were impressed by that. How did you determine which ones you would send off like that?

Glenn Kent: Obviously they went through the grindstone before they went off, but I said, "You don't need me around. You're to defend yourself. You're to defend what you're going to say. Don't depend on me. You're on your own."

There was an interesting thing one day when the Army and the Navy were continually telling us how vulnerable our Minuteman silos were to Soviet attack by ICBM. Then it occurred to me that a more appropriate graph was to plot Soviet weapons available on the abscissa and U.S. weapons available on the ordinate. Start at an inventory point of where we both were and then there's a drawdown. These became the fish hook curves I became known for. So, there's a drawdown, but it shows that the Soviets have to give up RVs to kill RVs. See, the line comes down steep at first because they attack the submarines in port and so on, but then it flattens out. This was far more to the point than just plotting this liability to Minuteman versus weapons on the abscissa.

Jim Bexfield: You called it a fish hook. Where does the hook come in?

Glenn Kent: It starts on the point on the upper northwest corner of the graph and they come around like that and they go flat at first for the Soviet first strike and then steep and then it goes steep at first for the Minutemen. The curves look like a fish hook; not exactly, but they were called the fish hook curve. I figured this gives us a better representation of what's going on. So, I put out the dictum that all people in the Air Force will use such a plot. Well, there's always somebody around that worries not about the subject of the matter but about, "He doesn't have any authority to tell us how to draw our graphs out here at SAMSO [Space and Missile Systems Organization] and so on." So, there's noise about it. I figured I'll show it the Chief, and the Chief will say that to everyone who will plot it and that'll get their attention. So I scheduled it in a staff meeting. That's staying ahead of the problem, see.

But the different slant is the vulnerability of Minuteman, and I had a major who gave

the briefing. Now, the Major was a sleeper. He looked like a country boy from someplace but he was one sharp cookie. He gives the briefing. It has to be short to go to the staff meeting; it has to be under 10 minutes, or seven minutes or something like that. He gets through it. The Chief says, "Great. That's an excellent idea and we all ought to, as the briefing says, we all ought to plot it that way and not plot it short of Minuteman going to practically zero."

A three-star starts in on the Major. I said quietly, "The Major is doing all right defending the chart." The Chief of Staff, Gen John Ryan, keeps looking at me and motions me to get in the act. I ignore him at first. Finally he glares at me to get in the act. So, I did and made short shift of the three-star.

Bob Sheldon: Who was the Major?

Glenn Kent: I don't remember his name. But, that's my idea. I'm going to let that Major defend himself as long as he can. I'm not going to step in there. People asked the Major, "How did you do?" And he said, "Nothing but what Gen Kent didn't ask." He understood what I was doing, according to my own dictum, "You defend yourself when the enemy appears."

Bob Sheldon: You talked earlier about reviewing the slides that your analysts were producing. I heard from various folks that they went from producing one set of slides to get out the door to producing three generations of slides. Could you talk about that process?

Glenn Kent: Well, that's not quite right. In those days, they weren't slides; generally, they were charts. I had a graphics department that I defended in front of the Chief to the bitter end so that I didn't have to stand in long queues where other people had charts made. So changing the chart wasn't a trivial matter. It meant the graphics department had to erase the old and maybe start a whole new chart. They hand-lettered them. Well, I believed that if we can improve something, we should. Our product is going to, on the margin anyhow, be our best. So if there is something we can do to improve the chart, we will, and don't worry about the graphics department. They get paid for overtime. It was a civilian run outfit.

Bob Sheldon: They still had a graphics shop in AFSAA when I got there in 1990.

Glenn Kent: Is that right? I defended that graphics shop until the bitter end. People were continually trying to just have one graphics shop for the Pentagon and I convinced two Chiefs (both Gen McConnell and Gen Ryan), "No, I need my full graphics shop."

Bob Sheldon: For those people that left, how did you find new people to backfill? What kind of characteristics did you look for?

Glenn Kent: My idea of recruitment was, I would listen to briefings from some other agency, and if the guy did real well I'd write his name down. Another more direct recruiting was to go out to AFIT and give a speech once a year. They would tell me the name of their best five graduates. I did a review of the five and select two. I got some great lieutenants that way. I recruited them by name. I had a Captain Dave Fee as my personnel section. A captain! He could out-manuever any other personnel section in the Pentagon. I can't claim too much credit. Lt Gen Bob Dixon (later Gen) was head of Personnel and he called me in and he said, "Anybody you want within limits." I had it ready made that if there was an appeal of somebody, I had a friendly audience, Gen Dixon. I spent a lot of time recruiting.

For example, Col Jasper Welch (later Maj Gen) is just graduating from his year at National Defense University and I realize the catch he is. He worked for me twice before and I called Captain Fee and I said, "I've had my head up and locked. I should have had my request in for Col Welch months ago, so I'm a late starter, but get him." Captain Fee comes back and said, "He's already been assigned with three-star general request." I said, "Well, try and get him." "It's hopeless General." I said, "Try anyhow. I have to have something to complain about and say I don't get the people I need." If nothing else, we'll lay down a marker. I find out that Lt Gen John Carpenter was head of Personnel. Gen Carpenter gives my request more license than I thought. I'm a two-star and he's assigned to a three. The three-star knows Welch very well and he's not idle about his request form. But by hook and crook, we out-manuevered him, and finally in a pique of anger, Gen Carpenter says, "I've assigned him to Glenn; I don't want to hear any more about the subject." Which was all right with me but not all right with the three-star.

Then arose another problem. The Secretary of the Air Force, John McLucas wants him. So, I hang in there. It looks like I was bound to lose. But I write letters to the Secretary saying, "Obviously we both want him, but I need him to guide others. So, he is a multiplier working for me, but not for you. I need him to mentor other people." And so on. McLucas would write back nice letters and about the fourth one he took the letter and went down to the Chief, "Give him to Glenn. I don't want any more letters."

I spent a lot of time having a colonel working for me to whom Gen Momyer had decided to give a wing. Well, I'm not going to stand in the way of progression like that. Personnel comes down and explains it to me and by now they know my name. We have no choice but to send him to Momyer. I say, "I don't want to talk about that. Of course you're going to give him to Momyer, but you're robbing me blind. I want to know who you're going to give me to replace this colonel." I said, "Who have you got? I want a water walker." He says, "Well, this guy coming from Vietnam and he's going to Plans, but you can't have him, he's going to Plans." I said, "I want him."

Dixon is head of Personnel so I have an ace in the hole with him. And I want him. One of the guys says, "How do you know you want him, General? You've never met him." If he's so good, I can't have him, I want him. So they changed the orders for Col James Ahmann, and in walked Col Ahmann who later on was a three-star general. A very capable guy. He was a calming influence to all those fighter pilots that worked up there. So I spent a lot of effort on recruiting people.

Bob Sheldon: During this time, Dr. Brown had transitioned—

Glenn Kent: Yes, Harold Brown had become Secretary of the Air Force.

Bob Sheldon: Did you have many encounters with him when you were in Studies and Analysis?

Glenn Kent: Yes. Oh yes. There was an interesting thing that took a hold there. He came down there and the Chief then was Gen McConnell, and McConnell and Brown got along famously although they had two totally different temperaments. Gen McConnell calls me in. He said, "The good news is Dr. Brown

is going to be Secretary of the Air Force. The bad news is he likes you and wants you to work for him." So, that was alright. Finally they made a compromise that I was on the staff of Gen McConnell but that I could work for Dr. Brown, and that was no bother at all. Matter of fact, Gen McConnell told me once, "I keep protesting against it so he'll be sure and keep doing it."

Jim Bexfield: What are some examples of things you studied for Dr. Brown?

Glenn Kent: Some of them had to do with arms control. Generally they weren't studies dedicated to Dr. Brown, but Dr. Brown was at liberty to have me come up to his office and talk to him. See, that's all he wanted in the first place, and he never abused that. So, I worked for Gen McConnell and Brown. I had no choice. If Brown calls, you go. It never bothered McConnell a bit. McConnell passed himself off as a barefoot boy from Arkansas. He was the wiliest general I ever met. He thought about three moves ahead.

Jim Bexfield: Is there an example of that?

Glenn Kent: I could give you one example of how McConnell operated. He operated in strange ways, but he makes a move and he knows what he's doing. Some people from OSD, I won't name them, went to SAC with malice of forethought to review the SIOP. They came back with a scathing report about the Joint Strategic Planning staff and their efforts in developing the SIOP at Omaha. They had a list of specifications of things that they'd found were grossly wrong and handed it to McNamara. McNamara called Brown and McConnell in and said, "I have no choice." And they made recommendations that this whole affair be referred to a Blue Ribbon committee to look at.

But McConnell, he sees the slippery slope. That to form a Blue Ribbon committee, it's under the control of Alain Enthoven, Assistant Secretary of Defense for Systems Analysis. And the real thing up for grabs here is not to revise the style, but they wanted the planning to be done by PA&E. McConnell sees this and he called me in. He said, "I just returned from a meeting with McNamara and Brown on this matter, and McNamara said I have no choice but to form this Blue Ribbon committee." But he says, "You know Glenn, that's a slippery slope. And I pulled the one ace I had in the hole. You.

McNamara likes you." He said, "Let's give it to Gen Kent before we form this Blue Ribbon committee." Now he said, "Glenn, boy, Secretary Brown is going to call you up there and say 'No whitewash.' and you nod and say, 'Absolutely not.' Glenn, the Air Force ain't wrong and don't you forget it." (*Laughter*)

So, that's exactly what happened. I go up there and I was commissioned to look at it. By now I had realized that it's better to attack than to defend. I shall not defend what the JSTPS [Joint Strategic Target Planning Staff] is doing but attack the critique by Enthoven and company. They had one item in there, the amount of effort they're putting on the Tallinn System is ridiculous. They used the word ridiculous. R-I-D-I...they spelled it correctly. So I put some analysts on this. What is the proper attack? Let's get a handle on the proper attack on the Tallinn System and you could make a good mathematical construct. You do defense suppression so that the rest of the armies get through. You take them off of the tactical primary targets and your goal. Your measure of merit is the primary target, but you can optimize the amount for primary targets by how much you put on defensive pressures of the Tallinn System.

I got to SAC and showed them this analysis. They're out there, but they don't see the problem that McConnell sees. The slippery slope problem. That they'll lose the JSTPS of Omaha. They don't see that, so I have to go to great lengths. The three-star general out there said, "I don't agree with that." And I said, "Why don't you argue that out with Gen McConnell. I'll get him on the phone." And I did and he told that three-star out there in Omaha in no uncertain terms that he knew exactly what he was doing and so on.

We don't know the effectiveness of the single-shot probability of each one of these complexes at the Tallinn System. We don't know if you get one optimum and it's two-tenths and the other optimum is at eight-tenths and so on. The more effective it is, the more defensive suppression is appropriate. If it's at eight-tenths, the appropriate amount to put on there to maximize according to our mathematical constructs was just a little more effort than SAC was putting on it.

So I go to Omaha and I said, "Give me a hint of what you say the factor of this system is."

"We don't know." "Give me a hint. You've got some direction surely on this business from an NIE [National Intelligence Estimate] or something." Well, they're worthless. They handed them in and it just shows you how it pays to be lucky. There I spot the words, see how they waffle it from the NIE. We judge this between 20 and 80 percent. Eureka. I can argue that you should plan for the worst case. Maximize the mins. I rode to glory on that.

So, I show this to Brown and McConnell and they hold a meeting with Enthoven and his people. So, Dr. Brown, the Secretary of the Air Force, and Gen McConnell in there and I open up by saying, "You have to plan in the face of uncertainty. The people at Omaha can't tell a Minuteman silo to survive on the other hand. It has to be concrete decision. Now SAC has staked out their position and I think they're putting about five RVs on this complex. On different elements of the complex, there were several different elements so, but five sticks in my mind. There's five on each element of the complex. And you have said this is ridiculous. I have an analysis here that shows that it's right on the mark. But first we have to see before I open up on that, that we understand the theory of the Min-Max or the Max-Min." Enthoven thought he understood it. I said, "Just in case you don't, I'll recite it again." This is just to nail it down. So, I said the following, "SAC has picked the number five. What is your number? Now your number that you repeat has got to be one or zero or two because if it's four, you can't say that SAC is ridiculous. So you boxed yourself in. Your numbers are two, one, or zero. What is it?" They said, "We're not going to get in the numbers game with you." I said, "Well, what do you mean? You got in the numbers game. You said SAC numbers are too high and you won't even offer what your number is. Now, there's something wrong here." At which point, Dr. Brown said, "Gen Kent, I don't think we need to conduct this meeting in such a confrontational way." (*Laughter*) This is why I say Gen McConnell is always one move ahead. He says, "That's right General. I don't like your attitude about this, the way you're treating these people. You're dismissed."

So, I leave the room. An hour later, he calls me up there and he said, "I had to get you out

of there. I didn't want the argument about what the number was, but the argument I wanted was that they had none. That they wouldn't offer any." And I said to Brown, "If they go ahead with this, I'm going to make this known to everybody that will listen." I said, "The game is over, we win." (*Laughter*). So McConnell is one wily customer.

Jim Bexfield: Did you have many dealings with Alain Enthoven?

Glenn Kent: Many. Some of them good and fruitful. Some of them not so good. We were on opposite sides or different sides. I had dealings with Alain when I was up in DDR&E and when I had Studies and Analysis. I actually liked Alain, although we were at loggerheads on many different issues. He was smart. I always remember one time up there, he was frustrated with me and he said, "I don't know how to cope with you. You got all these majors and lieutenant colonels working for you. You tell them what the answer is and they say, 'Yes' and try to show you're right." I looked at him said, "My goodness, is there another way?" (*Laughter*)

Bob Sheldon: Did you notice a change from Johnson to Nixon in 1969?

Glenn Kent: No, I didn't.

Jim Bexfield: Did the politics of Brown taking over as Secretary of the Air Force float down to your level?

Glenn Kent: No. I still kept in touch with Brown even when he became Secretary of Defense. It was never very formal but he would call me and ask me to give him a paper on such and such and I would gladly do it.

Jim Bexfield: Sometime around 1971, Clayton Thomas moved in. You used to have the Studies and Analysis, and then AFGOA (Air Force Operations Analysis) became part of Studies and Analysis. Can you talk about that transition?

Glenn Kent: Some other person, 'not me.' That's important. 'Not me.' And 'not my people.' They worried about why two groups were reporting to the Chief for analysis. I was willing to let sleeping dogs lie but it was coming to a head, so I commissioned a lieutenant colonel who worked up there in AFGOA. I got in touch with him and said, "Figure out a way to make this transition go as smooth as possible and

not be disruptive." So, we came up with the idea that we would just merge and I would hire each one of those guys in AFGOA. There were half a dozen of them. I gave Clayton Thomas the job of Chief Scientist as I recall.

Jim Bexfield: You had a Rick Camp. I've forgotten who the leader was. He was a big guy.

Glenn Kent: Yes. I made him my Assistant Deputy. My stance was, they can come if they want to. If they don't want to come work for me, okay. But there's a job waiting for them down there. A responsible job, not just a square peg job. I expect them to do good work. About three or four of them accepted, Clayton Thomas being one of them.

Jim Bexfield: I think it was closer to five or six.

Glenn Kent: Yes. So we made the transition smoothly. Interestingly enough, I had one colonel in a senior position that kept fighting that problem. He'd come to me and said, "You don't have to do that. You don't have to give them good jobs down here." I said, "I know I don't but I said I would. So that's it." He kept pestering me about that and I fired him because he was screwing it up. He was making a bad deal. He was in favor of inviting Air Force officers, but didn't want to work for civilians.

Jim Bexfield: As I recall, you had Gus Tra-pold.

Glenn Kent: Yes, it wasn't Gus.

Jim Bexfield: Wasn't he one of your colonels?

Glenn Kent: Yes, Gus was always loyal. Gus was my Deputy. This was another colonel.

Jim Bexfield: What kind of interactions did you have with Clayton Thomas?

Glenn Kent: Very good. He spent more of his time interacting with the people, the other analysts. Jasper Welch and Clayton got along quite well. They were both there at the same time. They made it work. I told Jasper, "You're both to mentor people and I hope you can be fit to do it together." Jasper said, "Amen." And so did Clayton. That was a good move because we got Clayton. That helped it in the long run and it helped to no end.

Gen Ryan called me in when he heard of this proposition that I'd given them good jobs down there. He said, "You don't have to do that." I said, "I know. But I'm doing it for the good of the Air Force." He said, "Okay. Done."

Because the Personnel and the Manpower people thought they had to get in the act.

Jim Bexfield: Another person's name was Zimmerman.

Glenn Kent: Carroll Zimmerman. Right. He stayed in my office for awhile and gracefully retired.

Jim Bexfield: Sometime during your four years at Studies and Analysis, you went to MORS or you sent a bunch of people to MORS. Do you remember early encounters with the Military Operations Research Society while you were there?

Glenn Kent: Not anything specific. I supported MORS. I was one of the MORS sponsors.

Jim Bexfield: With Jasper Welch, he had a little side office right next to yours and he was doing some special papers for the Congress? Do you recall that whole activity?

Glenn Kent: Yes, that started with Black Friday. On one Friday, Senator Stennis took out of the Armed Forces Bill the money for AWACS, for the full-scale development, for the last lot for the C-5, and the F-15. Those are the big three. It culminated because of our effort on AWACS. Earlier, Senator Stennis, Chairman of the Armed Services committee, had asked for a justification for the AWACS because Senator Proxmire had an amendment to his bill. Proxmire was continually putting in amendments to the Armed Forces Bill and deleting things. He put one in on AWACS. It was going to be debated on the floor of the Senate. So, he was relying on Goldwater to carry the day. Goldwater, in turn was relying on the Air Force to give him a paper on it. Senator Goldwater convinced Stennis to leave it in and he would defend it on the floor of the Senate. So, Goldwater requested some support from the Air Force. Whatever document they had to give to Goldwater to help him counter Proxmire was delivered on the floor of the Senate to Goldwater 10 minutes after Proxmire finished. Stennis manipulated things so there wasn't a vote taken on AWACS at the time. He postponed it. But of course Goldwater and Stennis are furious at the Air Force. Whereupon Goldwater sent a stinging message in bold, cursive handwriting to Ryan that said, "Get your act together. How can I support you with support like this from the Air Staff? L&L means Late and Lousy. (L&L is supposed to

stand for Air Force Legislative Liaison)." Signed Goldwater. Oh, it was a stinging, written out in cursive handwriting on a 5 x 7 sheet delivered in person by a courier, hand delivered to the Chief of the Staff, Gen Ryan.

This got Gen Ryan's attention. He convenes a meeting. It's 4:00 in the afternoon on Friday. He is Black Jack Ryan at his best, and the meeting is very short. He said to certain people at the meeting, "You, you, you, and you assorted three-star generals and myself and the General who was head of L&L appear at 8:00 tomorrow morning in this office. I have to leave for Vietnam at about 10:00, but come prepared to tell me how we're going to fix this."

So, we all appeared at 8:00 the next morning. Gen Ryan sits at the head of the table. It's a long, thin table. I sit as far down on the left as possible. I had done a careful study and found out that you're least noticeable at that spot. (*Laughter*).

The three-stars say something and Black Jack is still Black Jack Ryan, and Ryan is in a real violent mood. He'd interrupt them and tell them, "That's stupider than the last thing you said. Tell me how we're going to fix this." And these guys are getting it every time they opened their mouth, it's rammed right back down their throats. He kept coming back to how we're going to fix this. Suddenly, Ryan points his finger at me and he says, "You! You usually talk too much. I didn't invite you up here to try and sit this out. What've you got to say?" I looked at him. He said, "Stand up and say something."

So, I did. I let it rip. I'd been rehearsing what I was going to say until midnight. I said, "The reason I haven't joined in the conversation so far, Gen Ryan, is because it's about how to band aid a fatally flawed system. And I want no part in it. We've got to have people who are proactive on this subject and not reactive and wait until the crisis appears before they start thinking. I'm not against the major who wrote that paper beginning at 5:00 Thursday evening until 8:00 the next morning. I'm against the system that puts a major like that in that flaw. The major was a PEM (Program Element Monitor). He knows they're going about to build AWACS and knows all about the financing and programming of AWACS, but he doesn't know why the AWACS is there in the first place. That's an

operator's job, it's not for technical people. You've got to form a group of your smartest colonels, headed by somebody who will be accountable for it. They would be proactive to this Congress. When a request comes in, they start working on it exactly seven and a half minutes after it arrives in the high rent district." That's because the request from Goldwater had stayed five hours in Ryan's office. Time wasted. No value added.

Ryan said, "How do you get seven and a half minutes?" I said, "I've tried it, Sir. If you walk briskly, you can walk from your office to any place in the Pentagon in seven and a half minutes." (*Laughter*) About that time, he had had enough. I fared better than the others. He didn't say I was stupid.

Ryan abruptly ended the meeting and departed for Andrews to go to Vietnam. At the staff meeting Monday morning, Ryan is gone and the deputy, Gen J. C. Myer (the ace in WWII), the Vice Chief, holds the staff meeting. There's some perfunctory things said. After the staff meeting, I depart and he sends the executive officer paddling down the hall and he yells, "The General wants to see you." So Gen Myer opens up. And Gen Myer always had to analyze people, and he did it very well. He said, "You continually amaze me. I thought, 'There sits that guy thinking he can sit this out down there on the left and Gen Ryan is going to blow his cover. But I realized now you weren't sitting it out. You were waiting to be called. You were sitting there spring-loaded. You must have practiced that speech you gave until midnight.'"

I said, "No, I'm a slow learner, General. It took 'til two in the morning." He said, "Well, I was impressed. You were right on. We've got to totally revamp the way we support these systems. We can't let the technology people do it. It's got to come from the operators." I made that point. He said, "Gen Ryan called me from Hickam Sunday. He thought about this all the way to Hawaii and he says you're right. Now what were your reckless words, General? Form a group, put some general officer in charge and make him accountable. Guess what. You get to do that." I said, "Okay." Whereupon he said, "You ought to protest a little bit because here you are about to be put in a place where the three-stars let it fall through the cracks and

throw you in the breach. You ought to protest." I said, "Well, General. I'll protest all you want to; I got work to do though." So I got the job. I departed there, went back to my office. I had expected that to happen and wanted it to happen.

He said, "Be gone." So, I went back and within an hour I formed a central integrating group of people to work for me. I had a little meeting with Jasper Welch, Col Ahmann, and other trusted agents. I opened up by saying, "Guess what? I've been able to get a new charter on which, if we go for broke, it's going to be with great visibility. And Jasper, you're in charge." Later, I said to JC Meyer, "Can I draw on people other than that work for me? I want one or two others." And I had them already in my mind. So, I formed a group and had people who worked for me plus one. Ahead of the group was Jasper Welch. Very prominent in the group was Col Larry Welch [later AF Chief of Staff], Col James Ahmann [later Lt Gen], Col James Callaghan [later Lt Gen], and Col Richard Boverie [later Maj Gen]. All these people that I put on this central integrated group became generals later, except one and he deferred a promotion to colonel to get out of the Air Force and run his dad's business. He had a chance.

The proximate cause was to get AWACS back in the bill. See it's been deleted from the bill. Stennis, to avoid embarrassment by Proxmire deletes it himself. It preempts the whole affair. Incidentally, Stennis not only deleted AWACS, but the last buy of the C-5 and the FX which became the F-15. You know, that was a bad day.

So, we hold a meeting about the advocacy of AWACS. AWACS started out to be a Fire Warning and Control System for Continental Air Defense—defense against Soviet bombers. But it was losing its traction because people were arguing as Proxmire did, why defend against the least likely threat, because the Soviets in the meantime have gotten ICBMs. We tried to make an argument. It turned out to be a weak argument. We'll defend against what we can defend against. But that argument doesn't have much traction. So, the meeting held forth for an hour and I announced, tomorrow morning at 8:00 come prepared to give something new about AWACS. The analyses from the past

aren't going to carry the day. So, the next morning they convened and after a little bit, there was a sleepy-eyed lieutenant colonel sitting there by the name of Larry Welch who said, "The eyes and ears of commanders around the world." I said, "Find a friend."

So, the advocate of AWACS then has got to be Gen Momyer at TAC and not General X out of Air Defense Command. I went to Gen Ryan and Gen Meyer that day and told him that we had the ship, and that he had to call Gen Momyer and tell him of the ship so that Momyer would get on board. I said, "We've got to have an operator with the stature of Momyer to lay it on the line about AWACS. Eyes and ears of commanders around the world." And that was done. Momyer was a little reluctant at first, but we wrote the papers for him and he caught on readily and was enthusiastic about it.

So, we got AWACS back on the bill in about two weeks. And we got the last lot of the C-5s and the F-15s or the FX back in about two and a half weeks, for which I got credit.

We started in and we maxed the course. That central integrating group did amazingly well. Within a week, we had those three items restored. Then Gen Ryan said, "It worked so well, I'm going to give you 12 major programs." I said, "General, you're killing the goose. Twelve for this special treatment, we'll be overloaded. I'll take eight but not all." So, he then named 10 and we wrote the advocacy papers for the major weapons of the Air Force and then it worked out magically. It worked like magic. Jasper and all those people worked closely with L&L, anticipated problems and prepared the papers ahead of time. L&L was anxious for me to succeed because, believe me, they are on the hot seat on that. It was a far cry from a major being given the problem at 5:00 at night. It worked out famously and we got great kudos for all that.

Bob Sheldon: Did you get back in Goldwater's good graces after that?

Glenn Kent: Oh, absolutely. Goldwater wrote a glowing letter to Ryan that "Your man Kent has changed night into day. I'm getting great support."

Bob Sheldon: Did you get the seven and a half minute response time?

Glenn Kent: By now it doesn't necessarily go through the Chief. The request comes in to the

legislative liaison guy and he goes directly to me and we anticipate these problems. We don't wait until the crises to start thinking and writing about it.

The extent that I was to review all the testimony ahead of time by any of the warlords before they went and testified to Congress. Ryan made that stick in spades. Not that I had veto power, but if I had anything in there that worried me, I'd go to Ryan and tell him and Ryan would decide which way to go. He made it stick, and we never missed a lick. We were lucky that it's all it could be. And we were proactive in the business. We anticipated if it was going to be an issue. In general, we had to be aware of what Proxmire was up to, which we were able to do. And be sure that we could rebut any analysis that his people turned out.

See, Senator Proxmire was a formidable opponent over there. He and Ted Kennedy and some other senators had bonded together and formed a group of analysts who were pretty good, so we had our work cut out for us.

One thing I remember in particular, they had a study that showed we ought to use more of the CRAF, the CRAF being the Civil Reserve Air Fleet. How do you rebut that? Not directly. What you do is talk about an innovative deployment of a mechanized division and you haul the outside cargo in a C-5, the oversize in the C-141 and all other cargo and personnel in the CRAF. To have an integrated deployment, we need a few more C-5s than we're ordering. So, the more CRAF you have, the more C-5s you have to keep up. See? So we turned the argument around and submitted it to Goldwater and he puts it into the Congressional Record and they quit. It was things like that, because we were able to take their analysis and generally turn it around some way or another.

Jasper was a genius at figuring things like that out. I don't know if he figured that one out but he was a genius at computer programming. He was way ahead of his time.

Jim Bexfield: He was very bright.

Glenn Kent: Jasper had some people working for him. For example, I'm on a group down there to look at how we base our ICBMs, how we base our strategic RVs. For openers, I said I checked with the Chief, and in the long run we ought to go toward the idea that up to one

half are put in subs at sea. And the other half is divided somewhat evenly between bombers on alert and ICBMs. But before, Mr. Navy, it seems as though you've staked out positions and put them all at sea, and for that we have to really examine their vulnerability at sea. The Navy was foolish enough to take the bait and not agree to the 50 percent thing from the Air Force.

The guy that ran that group, Lt Gen Arthur Oberbeck of the Army, was mightily impressed by that. He said to the Navy, over and over, you ought to take this thing and run. The Navy gave a briefing about the ballistic missile submarine. They had some factor and so on, and the Soviet subs never made engagement.

Jasper took the same data and did it stochastically, not by expected value, and took the factors that were in the Navy report. That's important. He gave a briefing down there to that group. I introduced him. After Jasper got through, I said, "What's the problem, Admiral? You only lose a sub every two weeks." (*Laughter*)

The Navy adopted that technique, got the computer program from Jasper and used it. They didn't come formally to the Air Force, but they came to Jasper. He was able to put that program together in three days and come down there and brief them. And nobody could touch him. He knew the page number and the paragraph number for every one of those factors and the only difference was stochastic.

Jim Bexfield: What's your favorite Larry Welch story?

Glenn Kent: My favorite Larry Welch story is when I was at Systems Command. The operators, every time they took too long shaving in the morning, it put a new requirement on the F-15. It had to have more thrust-to-weight, a certain flight regime, sustained turn rate, more payload, more range. So they're defining an aircraft that can't be built. It's not an executable program. I tell Gen James Ferguson, Commander of Air Force Systems Command, they're just going to make this a disaster. I tried to stamp out these stupid requirements, but every time I stamped one out, another one arose. It takes me two weeks to a month to knock one out. It takes them only five minutes to put in a new one. I'm behind the power curve here. I said, "Larry, I want to just let them run rampant and

then you, at the right time, have an agonizing reappraisal of this. You and the head of TAC—go out there to Kirtland and Wright Field and define what these "requirements" are." He said, "Okay."

In the meantime I leave and go to Studies and Analysis. When I get to Studies and Analysis, I tell Larry Welch, "If we go do this, there's going to be an agonizing reappraisal of this someday and gear yourself for it." So he became very familiar with the technical carpet plot from Wright Field. I get a call from Gen Ferguson. He says, "The time has come. I have two slots on that group out there. This is a group of colonels. I'll give you one. You told me that you have this water walker over there that you'd like to have one of the slots. I'll give them to you. Give me your names." So, I say, "Lt Col Larry Welch." He said, "What? These are colonels. I'm not going to waste my slot on a lieutenant colonel." I said, "Come on, General. He doesn't know. He's oblivious to rank. Rank doesn't mean anything here." So, Ferguson said, "Alright, but before I waste my slot on a man, I want to see this water walker."

I sent Larry Welch over to see Gen Ferguson. The minute Larry leaves Ferguson's office, Ferguson calls me and said, "He's our boy." So, Larry went to Wright Field on this agonizing reappraisal and dominated the sea. He had both studies as *carte blanche* and had Tac Avenger to get some idea what a certain attribute did or did not carry to the side. So, he was able to dominate the scene and did an absolutely outstanding job of defining the F-15. Not designing, but defining the main characteristics of the F-15. He had Tac Avenger and when it came to that issue of shooting the F-14 or the F-15, the Navy tried to present it as if we should start a new program. I tried as best I could and it was fairly successful, passing it off that we already had a program. We'd just barely had a program. And it was through my doing that we had a semblance of a program in Wright Field. So, it wasn't adding a program. It was choosing between the two.

Finally, we went on with this for about a week. The Navy in the meantime had released a press thing to the *Washington Post* that the world had a fighter, the F-14, why do we need another one? Had some guy from CNA come

in and give a briefing that compared the two aircraft. I had gotten my hands on that briefing and showed it to Larry Welch. I said, "Can you tear it apart?" He came back about two hours later and said, "It's a slam dunk." Well, he may not have used those words. Something like, "No problem, no sweat."

He went before this group. I opened it up, but I had a slightly different tactic. I said, "You know, Admiral, I've been wrong. We shouldn't have two programs, we should have ours. So the choice is whether you buy ours or not. Not whether we buy yours. And I have a briefing here that can put tears in your eyes on that matter. There are approaches to this that are far, far superior to yours." And after Larry gave that briefing before this committee, the Admiral completely changed his mind; he saw the merit of two programs. I didn't want to try to get the Navy in it anyhow.

So, Larry had a lot to do with the advocacy of the F-15 and understanding and defining it. He alone defined the F-15, because by all accounts, nobody else had done their homework before they appeared out there in Wright Field like Larry had.

Jim Bexfield: Can you say something about Brig Gen Leon Goodson, later Commander of Air Force Center for Studies and Analyses? He was a major when he worked for you.

Glenn Kent: Leon was doing some work there, this had to do with the central front. It didn't occur all in one time, but through a period of osmosis, we came to the idea that we would take the major mission area for the aircraft. Air Force has two missions, one of them is to keep Red-delivered ordinance off of Blue troops and the other is to put Blue-delivered ordinance on Red troops. And we'll look at the difference. There's several ways we can use aircraft. We can attack the enemy's airfields, we can sweep over the battlefield, we can defend our own airfields, and so on. So, it's a duel between two airports—the major mission area is anchored to the ground. Now, what is the optimum allocation of aircraft, day by day, to maximize that at the end of 15 days.

Leon, Scott Meyer, and Lou Finch worked on that. After about nine months, I came in and said, "We're not making any progress." So, I gave them a lecture, "You'll not get a bad

ER (Effectiveness Report) from me if you don't succeed. But, you'll get a bad ER if you don't try."

Another time I told Leon, "You keep wanting to go back to the operational Air Force. I tell you what. The day when you are on top of this problem, you can go." (*Laughter*) But after a year and a half, they had a masterpiece, which stood us in great stead. It's called Saber Grand. We taught the computer how to play chess and the computer could finally play chess better than anybody else. It had a tremendous effect on the Air Force. I briefed it to Gen Ryan one day. He thought it was great. He said, "We could put in different options at modernizing and see which one moved the pipper better than that gradient of 'Red minus Blue' and 'Blue minus Red.'" See, we could put a gradient with lines on there, lines equal difference or straight lines out radially, and see which one moves the pipper more.

Gen Momyer called me, and when Momyer was angry at you, his voice got whiney and he raised his pitch. And he's at his worst. He said, "I just came from the Chief's office, he told me about the study you had." I said, "Yes, sir." He said, "I thought you would have showed it to me first, Glenn." I said, "When do you want to see it." "Tomorrow morning, 9:00, my office, promptly." I go to Maj Goodson and say, "I can't go, but I'm sending Larry Welch and Col Ahmann to fly cover for you." Momyer knows both those men. So, they went down there and I wait and they came back and said, "He was pretty cranky at first, but he warmed up at the last." About three days later, Momyer called me and said, "Glenn, I think we've got something here." Notice, "we" got something here. "I'd like to work with your boys on this. Could you send them down again?" I said, "When?" He said, "Tomorrow morning, 9:00."

They went down there and as a result of that Momyer said, "I want you to hand that over to my people." I said, "It's too complicated. You can have some kind of control over Goodson." So, Momyer took Goodson around the world. Why? Because it showed that the best allocation was what Momyer had been preaching. You have to defeat the enemy first—then the Air Force is first. It made it in spades and that's why Momyer bought into it. Then he used it as

a training aid for his operators to see what different allocations of forces meant and how you'd do badly if you didn't pay attention to destroying the enemy first. So, I obeyed Momyer's doctrine and Momyer essentially adopted that and adopted Leon. He took Leon around the world and Leon was at his disposal. Leon made many trips down to the TAC staff at the direction of Momyer.

Bob Sheldon: How did the quantity versus quality argument play into the buy of the F-16?

Glenn Kent: The F-16, the lightweight fighter, was advertised as 80 percent of the capability of the F-15 and 75 percent of the cost. But that's a pretty narrow cost effective thing. Not enough to grab the minds of men. I thought about Lanchester where he says, "Quantity has a quality all of its own." So, I put together a very quick analysis based on the parity of forces. It had to do with the ratio of Blue to Red squared times gamma over lambda. The quality. And based on that, its quantity changes creates this square. I went up there and sold that to Gen J.C. Meyer. He already had a warm fuzzy feeling about Lanchester because we used that argument against Enthoven.

So, I didn't start from scratch on that. But JC Meyer said, "Okay. You got it. But I'm not going to be out in front on this." The lightweight fighter people had poisoned the well with Gen Meyer because tangled up in their briefing on it was always this idea that no one understands air-to-air combat except we few fighter pilots. That didn't set well with JC Meyer who was a leading ace on the Central Front in WWII.

So, it was sold on the basis of the trade between quantity and quality goes as a square of the quantity. As I said, I didn't start from scratch on that argument because we'd used it earlier to refute Enthoven about the quality on the Central Front.

Bob Sheldon: When I interviewed Seth Bonder, he mentioned that you contracted him to go TDY to Germany to interview some Soviet defectors who'd been analysts.

Glenn Kent: That's right. Seth is correct. I don't recall any details of the report that he made as a result of that. I don't know what was in it, but it certainly can't be classified now. It was a good report because Seth became one of my favorites then, as a result of that.

Jim Bexfield: You spent four years from 1968 to 1972 as the head of Air Force Studies and Analysis, and then you were replaced by Maj Gen Robert Lukeman. Did you have any say in who replaced you?

Glenn Kent: I was asked to head the Weapons System Evaluation Group (WSEG) by Johnny Foster and it was a three-star slot, so it was hard to turn down. Bob Lukeman is a very smart guy. He's a very good analyst and he's a very capable guy. I think he doesn't have that failing now—Bob doesn't tolerate fools gladly. And it was hard to work for him. I didn't work for him; he worked for me, but I didn't have any problems with Bob.

I was about at the end of my tour in the Air Force after 32 years and the job at WSEG came open. It was a joint organization that rotated; the head of WSEG rotated among the Army, Navy, Air Force. And the Navy man is about to retire so they gave me the job. As a matter of fact, the head of WSEG reports to two people: the chairman of the JCS and the DDR&E, which now works for the Under Secretary of Defense for Acquisition (USDA). Johnny Foster requested me so the Air Force conceded and I became head of WSEG.

Bob Sheldon: He knew your track record?

Glenn Kent: Oh yes, I knew Johnny very well. When I was at Systems Command, we couldn't get the laser-guided bomb to work. The bomb itself might work, but we couldn't get the designation down. We didn't have the designator stabilized, and it would break lock, it would jitter a little bit.

Johnny Foster wanted to show that the technology could help with the war in Vietnam. So, he called me in and said, "I'm going to threaten the Air Force to take this over unless they let you run it. But I don't want to run it. I want you to run it. This is just to get their attention." And so that happened.

I went to Eglin Air Force Base, and met with a guy from Texas Instruments who was a contractor and didn't make one suggestion because the turnaround time was enormous. They want to fix something and send it back to Dallas and a week or so later it would come back. Well, that's ridiculous. We ought to have a machine shop at Eglin and have a better turnaround time. The guy who was the contractor came in with

a guy by the name of Lockhart, a big burly Texan. And he listened to his subordinate tell me how they couldn't have a machine shop and he suddenly looked at me and said, "Get your hat, General, we'll go out and rent a machine shop." They're going to bring their own machinist in but they want the basics of a machine shop.

Partly because of that, but not mainly, we just started having good luck. Everything, instead of breaking or not working, suddenly began to work. So, after not a very long time at all, we got it so that we could reliably designate a target with a laser beam and get the guided bomb to guide on it. I went to Johnny and said, "I think the time has come to ship it over to Vietnam." So they did, with a contractor team in tow. The rest is history. The first time they used it they dropped the famous bridge. And Johnny had a warm and reassured feeling for me from that and other items. My contribution there was just luck.

Bob Sheldon: During your tenure at WSEG, what other issues did you tackle?

Glenn Kent: One of the big issues was the famous A-7, A-10 fly-off. A representative on the House Armed Services Committee was a gentleman from Texas. He wanted the Air Force to buy the A-7 built in Texas. There's a big controversy about it and he got enough power over there to hold up the go-ahead to start the A-10 until this is settled. So they decided they were going to have a fly-off. Starbird was given the job of conducting and overseeing the fly-off. Starbird was a three-star Army general. Smart as all get out, unparalleled in this. He had the ear of Secretary of Defense Melvin Laird, and rightly so. Starbird in turn gave me the job. I was working for him on his behalf.

We wrote the terms of reference for the fly-off between the A-10 and the A-7. I can remember some of the things we wrote. That the pilots would all be F-4 pilots from Vietnam. That none of the pilots would be pilots that had flown A-7 or A-10 before, because they're wed to it and a biased witness. That they would go out on these missions of close air support and write down immediately afterward a mission report, which would be bonded. That nobody's to see it until later. This is so that no one can say that a high-ranking general in the Air Force dictated the answer.

We had some trials along the way. I wrote these terms of reference for the fly-off in great detail. Starbird bought it. Sent it to the Air Force over the signature of Laird whereupon some generals in the Air Force said, "These terms of reference are just guiding principles." And started to do things their own way. I called Gen Dixon (Dixon then was head of TAC) and said, "This isn't going to work. I ran this by these guys in the Air Force before I sent it Starbird. They didn't have any problem with it. Now they think they can ignore it and they're crazy." Dixon agreed with me and laid down the law.

They went ahead and painted one of the A-10s, and then Art wanted to paint the A-7. I said, "That's a foul." They said, "Well, it doesn't do any good." "Why did you paint the A-10? It won't wash. You either have to paint them both or neither one." Dixon said, "I'll look into it." He called me back about 15 minutes later and said, "It's easier to paint than to wash, so we're going to paint both of them." We had little things like that. But that worked out pretty well because Dixon played it right down the line.

It came time to make a report to the Senate and the House Armed Services Committee. This representative from Texas was a little late, so when he arrives, we're sitting in the ante room waiting for him. When he arrives, he looks at Dixon and he said, "I guess you have this all orchestrated. I see you've got your six pilots lined up here." Dixon said, "I have never seen them before in my life until today and I wouldn't have talked to them today if you had been on time. I don't know what they're going to say. If anybody in the Air Force knows what they are going to say, I'll have them for breakfast. That's the edict I put out. They're not to discuss their mission reports with anybody."

The representative from Texas is somewhat impressed by this forceful statement by Dixon and he said, "Who do you want to go first?" Dixon said, "It's your call." It turned out, he called on Maj Dale Tabor (later Maj Gen). I remember to this day. He couldn't have called on a better guy to be an advocate for the A-10. So, that worked out pretty well to have the pilots be the testifiers. And Tabor said, "If I get sent out on a close air support mission, and if I had my choice of the A-7 or A-10, I'm going to call on the A-10."

Bob Sheldon: Maj Tabor had flown both?

Glenn Kent: Oh yes. All the pilots had flown an equal number of sorties in both airplanes and then compared them. That got to the whole argument.

Bob Sheldon: How many of them favored the A-10 versus the A-7?

Glenn Kent: Practically all of them after Tabor.

Bob Sheldon: Did you bring any of your Studies and Analysis experience with you to WSEG?

Glenn Kent: The experience I brought to WSEG from Studies and Analysis was discipline. At WSEG, I wrote a memo shortly after I was there, talked about the two slots in the wall; that the concept here seems to be that there's two slots in the wall; one "out" and one "in."

The one out is the little tiny slot; it's just a directive to do something. The slot in is a report, and that's the total interaction of WSEG and IDA; and this is about to change.

The guys in WSEG and IDA didn't cater to that because they said, "Analysis is analysis and should not be affected by some general they send over here. We object to this intrusion."

That didn't last. So we had greater interaction of me critiquing their studies down to the multiplication. I can remember once somebody said, "This is not what generals are about." I said, "You're absolutely right. I shouldn't have to check your math. But, when I see a string of figures all less than one and you get an answer out the other end, larger than one of them, there's something wrong." You know they had made a stupid error.

So, we had greater interaction. They rejected that at first, but later on when I left WSEG and retired from active duty, they held a party and it's like, "We're gonna' miss you."

When I was at WSEG, I did one thing and I had mixed emotions about how smart an idea it was. I decided I ought to have a campaign model. I wouldn't do that today. I got money from Johnny Foster, \$2.5 million to be distributed among three contractors, and charter them to develop a campaign model for the Central Front. In retrospect, that probably wasn't one of the greatest ideas I ever had. I let a contract go to three people, Dr. Seth Bonder of Vector Research, Dr. Jerry Bracken of IDA, and Dr. Norair

Lulejian of Lulejian and Associates. Now that I think about it, it was more about the mathematics of firefights or battles than about campaigns. Traces of their models are around today. They were the father or the mother or something of the models today, although the lineage is pretty obscure. As I recall, the model developed by Jerry Bracken at IDA became IDAGAM (Institute for Defense Analyses Ground-Air Model). Of the three models, the one that was the best was by Lulejian and Associates, and it was later—some version of it was adopted by PA&E.

The reason I say it wasn't one of my greatest ideas is because, you see, you have to stitch together the firefights and the battles to make a campaign and they didn't do very well at that. As a matter of fact, the work at Vector was mainly about the mathematics of firefights, a model for firefights and Seth Bonder prospered with the Army on that.

But those didn't work out as I expected. I expected to expand on Leon Goodson's Saber Grand so that the model could be used for allocation of the money among different players. They got mired down, all of them. The one in IDA, I cancelled their contract for awhile because they didn't adhere to my idea of the rigors of math. They were pretty sloppy.

These were called campaign models, but they were down to the engagement level in the model. If you have an engagement and you add a few more Blues—if you're flying over their defense—you lose more Blues, but the fractional loss of Blue goes down. So, the idea of plugging into a constant attrition rate—either you'll lose 5 percent of your force or 3 percent, or whatever the number is, is wrong.

IDA made a mistake. They had a young guy over there, alleged to be a mathematician because he had a doctorate degree, and he decided to take me on. The outcome of that was I spent a lot of time putting him back in his box and cancelled the contract.

Then after I cancelled the contract, they on their own redid their math and came back and showed me and I said, "Okay. Reinstate the contract." And that was the beginning of IDAGAM. But as I say, that never worked out very well.

I have one story about my tenure at WSEG. There were two items—one Army and one Air

Force. We were the Weapons System Evaluation Group, and I took it seriously. One item was an unguided, free-flight rocket. The Army called it a missile. It's going to have some kind of CBU in it.

But if it goes 100 miles, it's free-flight, not inertially guided. It can't hit the side of a barn. The Army general over at WSEG, I gave him the project and he declared it useless; we should not proceed with it.

The other item had to do with the Air Force and it had a cheap air-to-air missile to replace Sidewinder and Sparrow. But the only thing about it, it wasn't as capable as the air-to-air missiles we had then. The only thing about it, allegedly, was that it was cheaper. It's going to be made by the same contractors. It's all paper; it's all built on a house of cards. It's cheaper. Well, the contractors will say anything at this stage. So, I declared that null and void.

Dr. Malcolm Currie, the head of DDR&E, called me over there on each one of these items, not both items at the same time, but on different occasions not too far apart. He said this was hampering his advocacy of this Army missile in Congress, and it was hampering our intended sale to Italy. I said, "Well, cancel it." He didn't see the merit of that.

He wanted me to redo the report. I said, "If there's anything wrong with the report, if there's a flaw in it, I'll redo it." He said, "That's not quite what I said." So, I tried to finesse it. But the thing about the air-to-air missile came up too. On both of them I finally, in effect said, "No, I'm not going to redo the report. I've gone back and there's no reason to do it." Plenty of people in the Army think it's a mistake. About the only people who think it's a good idea in the Army is this SPO, this System Project Office.

About that time my other boss, Admiral Thomas Moorer, Chairman of the JCS called me in. He liked me. He said, "Sit down, young man." After exchanging pleasantries he said, "How are you getting along with your other boss?" I said, "Fairly well." "You don't have any problems with him?" "No specific problems."

The Admiral looked at me and said, "Young man, I have the impression that's the first time you've lied to me. Let's get it straight. I know you're lying now; I hope it's the first time. Let's repeat it from the top, down. Do you have any

problems with your other boss?" I realized I'd been had, and the Admiral knew it song and verse about these two programs and some others. So he said, "Look, the military has got to have integrity. And I'm telling you this, if you bow down and redo those reports, you'll have me to answer to." So that made the call easy.

I paid a little bit for that. The head of DDR&E was not enthralled with my running of WSEG. As a matter of fact, what happened was—I learned this later—he decided to wait until I was going to retire and make a move. He said, "The least worst guy you could handle is a three-star general that's going to retire, and we're going to do away with WSEG." That was a cardinal error that the head of DDR&E carried the day. I maybe should've put up more of a fight, but I didn't. Moorer had gone, so there was nobody to carry the ball. But they did away with WSEG.

When I was over there, it was the WSEG/IDA team and that worked pretty well. The civilians in IDA—months after I left—called me back over there for a party and said, "We miss you."

Jim Bexfield: You retired from the Air Force in 1974. So it's been 30 years at RAND?

Glenn Kent: No, I didn't go to RAND right away. I've been at RAND about 25 years. Before RAND, I was a consultant in Northrop and Boeing and mainly on the B-2. I got right in on the B-2, some guy at Northrop who was promoting the whole thing—this stealth aircraft, he was one shrewd apple. He got me right in with both companies, so he could have an influence on how they went. I got tired of that and went to work for RAND after a few years.

I wish somebody would commission a study today of stealth. I have a stealth bomber—let's say at 40,000 feet—and the enemy has SA-10s or SA-20s. I don't remember the details. I made the calculation years ago, when I first came to RAND, that with a high powered jammer that Raytheon can build they couldn't track me 100 miles away. But you see it comes out today because if we're going to loiter up there for close air support. We have no problem in Iraq, but just someplace somebody's going to have an SA-10 or 20 or derivative or something like that.

Bob Sheldon: What projects did you pick up at RAND?

Glenn Kent: I spent a good deal of time talking about first strike stability. I spent more time on that than the subject warranted.

I did that in response to the efforts that were kicked off by Reagan's famous speech about Star Wars, to make nuclear weapons obsolete. I pointed out, and rightly so—but too few people wanted to listen to it—that if you build a defense that can handle a ragged, retaliatory attack of the enemy, it's unstable. He knows it and it's a self-feeding instability. He knows that I know it. I know that he knows it, so that you put in a partial defense like that, it invites each country to preempt, in order to avoid a worse solution.

I purposely, for social reasons, never let the cost of war be below zero. The cost was always zero or above. It was zero if I preempted and destroyed all their missiles, so that I got no damage in return, which is only a hypothetical case but even then the cost was zero.

I spent a lot of time on that, David Thaler and I did. There were some people interested in it, the Jason Group. The calculations were mind-boggling and the Jason Group said they were impressed by it, but would I mind if they hired some mathematician to check it out? They did and they declared it was without error, amazingly enough.

Bob Sheldon: Do you know what mathematician checked it out?

Glenn Kent: No, I don't. It was two guys that worked in some outfit of Lockheed on the West Coast.

I spent a good deal of the time on that. I had one winner in that area—working on a new approach to arms control. It's a long story. It was bought by the "Gang of 6" in Congress, consisting of Senator Cohen, Senator Nunn, Senator Percy, Representative Dicks, Senator Gore, and Representative Aspin.

They latched onto it and through hook or crook and many twists and turns, then sold it to the Scowcroft Commission on Strategic Forces, who in turn sold it to President Reagan, and the new approach to arms control, which is quite different. It's written out in great detail in a book by Strobe Talbott, *Endgame: The Inside Story of Salt II*.

Jim Bexfield: What was the concept behind that?

Glenn Kent: What I objected to was arms control that just stops missiles and ignores the size of the missiles. Like a missile is a missile. Arms control also inhibits survivability while letting the destructive potential grow and making a preemptive strike better for both sides.

My idea is very simple, the concept. Start with national technical means. I can measure the volume of missiles. So I'm just left to deploy so much volume. I made a distinction whether it's wet or dry—you get more thrust per volume if it's dry. Rather than do it on volume, I just said I'll relate it to standard weapon stations. With a missile of this volume, I'll charge it to so many standard weapons stations.

I called them stations, see? I didn't call them weapons. The big thing then was the SSAT—the large, Soviet missile. So I'll charge 18 standard weapons stages. The MX, I'll charge you 10, just to give you some ideas. The Minuteman 3, I'll charge you 3. If it's a really small, single Army missile I'll call you 1.

With forward bombers, very ingeniously, I'll look at the platform of your bomber, which I can look at and test with technical means with satellites, and I just have a formula that says if the projected area of your bomber is so-and-so, I'll charge it so many stations.

It's still the right way to go. Then the guy is free to do anything he wants within the restraint of total volume. And I got nothing but grief about that from Ambassador Rowny from the ACDA. [Lt Gen (retired) Edward L. Rowny was the chief negotiator for SALT.] Of course, needless to say, they're a little edgy. They're a little bit of "not invented here." Here's the ACDA and here comes a guy from outside the agency with a new radical approach to arms control.

They formed an interagency group. The charter of the interagency group was that my approach had five fatal flaws to it—they had to fill in the blanks. They never did fill in the blanks. They finally settled on the idea that it's too complex. But it's not complex at all.

Bob Sheldon: Did the "Gang of 6" like it?

Glenn Kent: Oh yes. They were the ones that made it go. Nunn and Aspin, they latched onto it and I didn't realize exactly what was going on for a while. For a while I was going out to James Woolsey's house at night and Brent Scowcroft was there and Walt Slocombe, and Aspin was

there. And they'd go over it and tidy it up somewhat and I'd go back and work all next day, and meeting the next night and so on. They're tidying it up so that they can push it themselves and I gradually came to realize that there was a reason Aspin was there. To shape it so that they could buy it and push it. He had some ideas of his own, which were good. Ambassador Rowny protested against it until the bitter end. Those guys maneuvered the whole thing. Got the Scowcroft Commission to buy into it. That's why Woolsey and Scowcroft were there, because Nunn and Percy had it in mind to run it by them.

Came the showdown and President Reagan is going to announce in the Rose Garden which one he selects. Woolsey is standing right next to Rowny, and Rowny says, "The President's going to say he rejects this idea." And he didn't; he bought it because Reagan's National Security Advisor William "The Judge" Clark got to him about an hour before the ceremony in the Rose Garden and said, "What are you doing? You're getting all sorts of flak about your approach to arms control and here the guys you need in the Congress are united, bipartisan for this new approach. So is this Scowcroft Commission which you said you take great stock in. What are you doing? I'm not here debating the merit of the thing on a technical basis. I'm here asking, "What are we doing?" So, Reagan reversed and bought it.

And it never went anywhere because about that time, they're going to have another meeting with the Soviets over there, but the Soviets had decided ahead of time they're going to just assemble in Switzerland and then walk out. They sent Woolsey over there with Rowny to describe this.

Bob Sheldon: Since you were doing all these strategic studies at RAND, how did your analysis focus change when the Soviet Union fell apart?

Glenn Kent: It had already started gravitating from strategic nuclear to conventional forces on the Central Front. I didn't convert right away because Star Wars kept me in this "first strike" to go for a while longer than it should have.

Bob Sheldon: I'd like to ask about a publication of yours called "Simple Mathematical Models of Combat."

Glenn Kent: I think that was a report that I did at RAND, "Simple Analytic Solutions to Complex Military Problems."

Bob Sheldon: What brought about that publication?

Glenn Kent: I'd tell the analyses that had been done and somebody encouraged me to write them down. So, I did. It's not as good a document as it might be. I did it with a young lad who was hired for the summer at RAND, Michael Finn. It had a formula for a number of successful sorties, which is just a matter of integrating. You have a certain attrition rate and how many successful sorties do you have for 100 aircraft after a certain number of cycles? That was one formula in there.

Bob Sheldon: One of your papers "On Analysis" was republished in the *PHALANX* recently. One of your thrusts is that analysts don't make recommendations. Comment on that.

Glenn Kent: I said when you're conducting analysis—the analysis is not to have a recommendation. You can have concluding remarks. I don't even want a summary or something like that because you feel an insane compulsion to let the world know what you think should be done. That's up to the Chief to decide, and if he separately wants your recommendation young man, he'll ask you.

I gave that speech to a group of analysts at MORS, I think it was, to stunned silence and downright hostility. I had literally taken the birthright away from the analysts. But later on, they had a change of heart. If you make recommendations something should be done, the guy reads that and he looks at that and if he agrees with it, he doesn't read the report. If he disagrees with it, he throws it away. The report is graded on whether it recommends what you think.

Analysis is to provide insight, not recommendations, so I adhered strictly to that rule when I had done an analysis.

Bob Sheldon: How do you feel about the evolution of the analytic community since the 1990s into the 2000s?

Glenn Kent: I'm afraid to say. The analysis seems to become less transparent with the advent of computers and PowerPoint. And the language has grown. There seems to be a certain lack of discipline nowadays. We pick up buzz

words and run with them and think we've just discovered sex and sliced bread because we've got some buzz word—network-centric warfare and C4ISR are some of my pet peeves. So, I don't know that it's progressed all it should.

Bob Sheldon: What would be your recommendations to the analytic community?

Glenn Kent: There's got to be somebody who can enforce the discipline, but that's a hard thing to do. You've got to have the power to do it, and the dedication to it. But, I can't preach on that because when I first started in analysis, people would try to push me in the direction of saying "that analysis doesn't measure up and so on, to meet some standard." I said, "No, I've got enough to do without doing that."

If there's a report out there with analysis that's wrong and in an important way on an important subject, I'll take it on case-by-case. That's what I am here to do. But I made no effort on my part when I was head of Studies and Analysis to enforce that all across the Air Force. You'd be swallowed by that, so I can't preach too strongly that somebody should do it today.

But to repeat, if I took on a case it was because it was wrong, wrong and on an important subject and had a bearing on an important subject. And then I took it on lock, stock and barrel and they changed, believe me.

Bob Sheldon: Explain what you mean by discipline.

Glenn Kent: Sit down and think about what it is you're trying to do in the analysis, what insight you want to provide, and sketch out in your mind the graphs you want to plot and so on, and then do it rigorously, and have peer review. And I mean peer critique, not just cursory review, it's got to stand peer review. I would have murder sessions in my office that went on for an hour or more on analysis. Somebody would brief it, and others critiqued it. But I mean they were murder sessions. That helps, and of course, discipline.

Jim Bexfield: Of all the jobs that you had throughout your career, which one did you like the most?

Glenn Kent: Studies and Analysis.

Jim Bexfield: That's what I thought. That's the highlight of many careers.