

Harold Brown, Oral History Interview—JFK#4, 5/14/1964
Administrative Information

Creator: Harold Brown

Date of Interview: May 14, 1964

Length: 42 pages [NOTE: the page numbering in this transcript is not contiguous with that of Brown's other interviews.]

Biographical Note

Brown, Director of Defense Research Engineering in the Department of Defense from 1961-1965 and Secretary of Defense from 1977-1981, discusses the TFX (tactical fighter experimental) airplane, nuclear-powered aircraft carriers, and testifying before Congress, among other issues.

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Harold Brown, recorded interview, May 14, 1964, (page number), John F. Kennedy Library Oral History Program.



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Harold Brown—JFK#4

Table of Contents

<u>Page</u>	<u>Topic</u>
1	Navy and Air Force's requirements for the TFX (Tactical Fighter Experimental) airplane
17	Choosing a contractor for the TFX
20	Congressional investigation into TFX contracting
25	Conflicts of interest
28, 35	Nuclear-powered aircraft carriers
33	Cuban Missile Crisis
36	Testifying before Congress
41	X-22 airplane

Fourth of Six Oral History Interviews

with

Harold Brown

14 May 1964

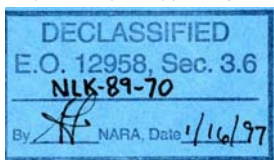
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INTERVIEWER: The last time we talked, we were talking about some specific weapon systems which involved DDR&E [Defense Research & Engineering] decisions, and about your consequent relations with the President [John F. Kennedy] and with Congress and with the military. Perhaps we might move on to talk about the TFX [Tactical Fighter Experimental] as a further category.

I wonder when the TFX became an attractive concept and how it arose. Who proposed it?

BROWN: The TFX as an Air Force tactical fighter goes back to the late 1950s when General Everest [Frank F. Everest], who was first somewhere in the CINCEUR [Commander in Chief, European Command] structure with our forces in Europe and subsequently was Commander of the Tactical Air Command, produced a requirement for an advanced tactical bomber which he wanted to be very fast and go very far, and carry a large bomb load. In fact, in a way or in many ways, as originally conceived, it was a junior SAC [Strategic Air Command] aircraft, that is, a smaller sized version aimed at doing what strategic aircraft could do, but able to go in low at reasonably high speeds, or to go at Mach 2.5 or more at high altitudes.

INTERVIEWER: It sounds like Utopia.



BROWN: No, this is a fairly straightforward requirement, and it is a requirement that can be met without any great difficulty. One can question of course how realistic the mission is.

[-1-]

Nothing much happened on that until 1961, at which time the Secretary of Defense [Robert S. McNamara], as one of a series of tasks which he drew up—McNamara did when he arrived on the scene—asked for a view of what would be the next generation of tactical fighter-bombers, considering what the Navy's needs were, as well as what the Air Force's needs were.

The Navy had had a quite different kind of air-to-air fighter called the Missileer under preliminary development, beginning, if I remember correctly, in 1960. This was a subsonic platform from which supersonic missiles could be launched. It was a carrier-based aircraft whose principal purpose was to defend the carrier, so as to provide an air-to-air defense of that point or in that small area of the carrier task force against incoming enemy aircraft.

Before I arrived in 1961, I think in February, the decision had been made by McNamara to cancel the Missileer, which had, if I remember correctly, or was to have four missiles of maybe 70 to 100 miles range, somewhere between 60 and 80, I guess, as its armament.

This was, when I arrived, one of the first problems to which I devoted a lot of my attention. This was during the summer of 1961. And my studies and the studies of my staff, which I then reviewed, indicated to me that these two very diverse missions could both profit by application of the aeronautics advances that had been made in the previous three

[-2-]

or four years.

INTERVIEWER: Was this a new yardstick that you were applying? You said a minute ago that the request was for a combined assessment of later generation Navy and Air Force needs. How did the concept of looking at these two in the same context arise?

BROWN: It was a result of McNamara's desire to look at things from an across-the-board Department of Defense standpoint, so as to assure that where possible one did not have separate programs to do similar or even very different things if they could be done by a similar instrument. It really was not quite that clear at the beginning. It was not an instruction. It was something that evolved with time. What McNamara started out by asking for was an examination of all tactical air requirements, with respect to what kind of new tactical aircraft should be developed, and there are a whole series of tactical air missions, some of which are done by the Air Force and some of which are done by the Navy and some of which are done by both, and on which the different services tend to place varying degrees of emphasis. These are interdiction—that is, the bombing of enemy bases, airfields, so as to help win the so-called air battle, and of course

if you knock out all of his aircraft on the ground, that does win the air battle pretty well; reconnaissance, which has much the same purpose, trying to find out where his sources of strength are, so that you can then

[-3 -]

go after them.

Air-to-air superiority, there is the ability to defeat enemy aircraft, enemy attack aircraft in the air by shooting them down, and close support, which is the use of air power in an air-to-ground role, but aimed at those enemy targets which are directly in a position to attack your own ground troops.

These are the four roles that were looked at for all the services, so there has been an attempt in this study to look at all these roles and all the services involved, and see what they dictated in the way of new aircraft.

INTERVIEWER: Was this a new mold that these uses were being poured through? Had the Eisenhower Administration [Dwight D. Eisenhower] tried to discipline the requirements in that way?

BROWN: I think that attempts had been made. The idea is not that new and startling, but more usually these things were worked out as compromises by the Joint Chiefs of Staff, or by the services, in which common usage was a technique—or common aircraft were a technique—that they generally didn't get around to. That is, as long as each service or each piece of each service could have something of what it wanted, the idea of trying to combine missions into a single aircraft, or to cause the same aircraft to be used by different services, were generally pretty much submerged.

INTERVIEWER: Do you know how these questions were developed, who developed them?

[-4 -]

BROWN: The question in the simple form of analyzing the various missions of tactical aircraft and seeing what new tactical aircraft should or could be developed for the services to perform these missions with was something that McNamara himself thought of when he came in. It was a very natural question. In its more detailed form, in which I expressed it to you—that is, the identification of the missions and each service's view of each mission, and each service's idea of what kind of aircraft it wanted for that mission—that evolved during the course of the study.

INTERVIEWER: Well, you have brought me up to the questions that you analyzed yourself when you received this study.

BROWN: The conclusion that I reached, the first conclusion that I reached was

that close air support probably had to be done by a separate aircraft, that is to say, one wanted large numbers of close support aircraft, they should be cheap, the range should perhaps not be nearly as was required for the other missions, and therefore one probably ought to have a separate aircraft for that purpose. Although that conclusion was reached in 1961 and endorsed by the Secretary of Defense at that time, no aircraft of that sort was started until last fall, the fall of 1963, at which time the Navy's VAL aircraft was begun for just that purpose.

INTERVIEWER: So you threw this mission out from the potentiality of commonality? Common use?

[-5 -]

BROWN: It was decided that although any aircraft which one produced for the other purposes would also be able to do a close support mission, it would be sufficiently expensive so that one would not buy very many of them, and therefore one would probably want to have a separate close support aircraft.

This left the missions of longish-range reconnaissance air-to-air superiority, on which the Navy placed a good deal of emphasis, and interdiction—or to put it another way, fighter-bomber capability on which the Air Force, or a tactical bomber on which the Air Force placed a good deal of its emphasis—as the ones which one should look at.

As I indicated, there had been a couple of aerodynamic advances which made substantial improvements feasible. One of these was the turbo-fan engine which is now in use on subsonic jet airliners, and which gives one considerably more fuel economy at subsonic speeds, at low altitudes, as well as at high altitudes. Principally this helps you at subsonic speeds.

The other was the innovation of the variable sweep wing, which by allowing you to move the wings forward on some occasions, produces an aircraft which operates efficiently at subsonic speeds at high altitudes or at low altitudes, and also aircraft which can take off in a fairly short distance, and at low speeds. It produces more effective wing area, and the larger the effective wing area, the higher the lift, and the

[-6 -]

shorter the takeoff distance. By folding the wings back in various positions, one can reduce the drag, which is what you need to do at high speeds, at supersonic speeds. So the combination of variable sweep and turbo-fan engines appeared to offer considerable promise in producing a versatile aircraft, an aircraft which from the Air Force's point of view was advantageous because it could take off on short fields, and it could have a very long ferry range if you moved it subsonically, because it could move its wings forward, move very efficiently at subsonic speeds, which allows it to go a long distance without refueling, and also allowed it to operate efficiently supersonically by folding its wings back, and it would give you high speed at high altitude, Mach 2.5 or so.

INTERVIEWER: The turbo-fan engine can deliver this speed?

BROWN: Well, the fan is not used, or the fan coasts at high speeds, and contributes its principal effectiveness at low speeds. But the engine is not that different. It is still a turbine engine of the kind that can operate in either speed range.

It could also operate at near sonic or supersonic speeds at low altitudes. The advantages from the Navy's point of view were that you could again, by virtue of the variable sweep wing and turbo-fan engine, get quite long times on station if you use the aircraft as a fighter, which is on combat air patrol cruising or flying around the carrier task force to

[-7 -]

keep an eye out for incoming enemy aircraft.

INTERVIEWER: Would this be a reconnaissance mission or would it actually be a...

BROWN: No, combat air patrol, just flying around the carrier waiting for incoming aircraft to attack the carrier.

INTERVIEWER: This is preferable to missile defense?

BROWN: It operates at a distance of 150 miles to which no surface-to-air missile of the air breathing kind or any other kind the Navy has reaches. It provides an outer ring defense.

INTERVIEWER: Is that a valuable increment?

BROWN: It is probably the only way to handle large scale low altitude enemy attacks. The surface-to-air missiles the Navy has now and will have for some time are not very effective against mass raids at low altitudes, although if the air superiority aircraft can pick off a large enough fraction of the incoming enemy aircraft, the missiles may be able to get the rest.

INTERVIEWER: You concluded that the air threat was a realistic one for the carriers?

BROWN: Yes, this was before the Soviets had started to over-fly the carriers, but even before they did, we knew they could. Whether the carrier task force defenses are balanced between ASW defenses and AAW defenses is another matter. It may be that they are not. But in any event, the air defense mission

[-8 -]

is a very important one for the carrier task forces, and if one can do it better, why, they

should.

The Navy mission, of course, could be done by a subsonic aircraft, as was the case in the Eagle Missileer system, and the supersonic aircraft was obviously going to cost more. The question was whether its supersonic speed would give it advantages that paid for what it cost, or whether even if it did not just for the Navy, whether it would for the Navy and Air Force considered together. The Navy had another mission, a beachhead air superiority mission, which required a 750 mile, as opposed to 150 mile radius of action, plus some time on station over the beachhead.

The Air Force and Navy optimum designs were somewhat different. The Air Force had no weight limit in particular. It wanted a long skinny aircraft which could fly very, very fast at low altitudes, because the Air Force felt that vulnerability on the run in to the target was a very strong function, inverse function of the speed, and they wanted to go supersonic to 1.2. The Navy wanted a shorter aircraft. It could be stubbier. They were not so particularly concerned about supersonic capability at low altitudes, or quite so high a speed at high altitudes, although they did want to have Mach 2 or more, whereas the Eagle Missileer had been subsonic even at high altitudes. They did want a larger diameter of the aircraft up front, because they wanted to put a large enough radar in it to

[-9-]

to give them a long range of detection and lock-on to enemy aircraft.

In the end, it was found possible to produce a proposed set of specifications which essentially met the Air Force's requirements—I don't want to use that word—the Air Force's desired characteristics; although they started out with Mach 3, they really didn't know why they wanted Mach 3 capability, and they did come down to Mach 2.5, which is the difference between an aluminum aircraft and a stainless steel or titanium aircraft—and still meet the Navy's limits on weight and size of aircraft.

This was not done easily. It was done only by lots of meetings between the Navy and the Air Force operational people at which each insisted that the other justify its proposed aircraft characteristics, and each was forced to back off to the extent that it could not really prove those.

Now, it was never really possible to prove one's supposed requirements, because what you specify in an aircraft always is an accommodation between desires and penalties, since every desire carries with it, if met, a corresponding penalty in cost or complexity, or degradation of performance in some other desired way.

INTERVIEWER: Who started to think about a single aircraft, and when? You haven't reached that point yet, have you?

BROWN: I think we have, because it was during the summer of 1961 that we asked ourselves whether you could not do

[-10-]

this with a single aircraft.

INTERVIEWER: That is your office?

BROWN: Yes, yes. We went through five or six rounds of acrimonious argument.

INTERVIEWER: Was this a fiat from this office?

BROWN: In the end, the Secretary of Defense decided on the basis of a report which I submitted, which included all the Navy and Air Force divergent views and agreeing views, and they had some of both.

INTERVIEWER: How did they ever get in the same ballpark? Did this first study in early 1961 give any guidelines which would lead one service or the other to even approach common ground?

BROWN: They started out by submitting an aircraft which each had optimized to its own purposes. One aircraft was 50,000 pounds, and the other was 65,000 pounds. Both aircraft went Mach 2.5 at altitudes. One was subsonic, that is .9 Mach and the other was Mach 1.2. Both of them had variable sweep. Both of them had turbo-fan engines. That made them close enough together so that it was clear that one should consider whether it might not be a single aircraft.

After that, each service pointed out what it felt it could not give on and what it felt it could give on. There were several attempts by the Navy to change its specifications when it looked as if there might be a single aircraft. But at

[-11-]

some point it became necessary for the Secretary to act and for me to advise him, and I so did in the late summer of 1961. He directed that a single aircraft set of specifications be sent out to industry for bid so that one could see how close it was possible to come to having a single aircraft.

INTERVIEWER: In what form did the Navy...

BROWN: No, I think you have missed some of the conversation. At one point we had to make, or I had to make a recommendation and the Secretary had to make a decision. This happened late in 1961, late in the summer of 1961, and he directed that they go out on a single aircraft bid which did meet the Navy's specifications and the Air Forces specifications, to see whether indeed it was technically feasible to do, and for this purpose, industrial participation was considered necessary.

At the same time, he pointed out that this aircraft, if we developed it, would be to meet the interdiction, reconnaissance, air superiority mission, and that to meet the close air support mission, as exemplified by the A4D, which was Navy's close support aircraft, another aircraft would have to be developed. As I say, that didn't come to fruition until late

in 1963. The aircraft which the TFX was supposed to replace was the F4H, which was the Navy's air superiority aircraft and the F105, which was used by the Air Force for its interdiction missions.

Well, that, then, was the next step, and after that

[-12-]

there was a series of rounds of competition in industry which at the same time refined the design and indicated to what extent it was possible to meet these requirements. In the end, I think that following all of this, the conclusion was that it was possible, that it would be very difficult; nevertheless it was feasible. There was, as you know, an incidental large argument over the selection of a contractor, which was not unrelated however to some fundamental questions, and I will come back to that in a minute. It now remains to be seen how close we will actually come. One thing is already clear, and that is it is going to be hard to keep the Navy weight. The Navy is much more interested in weight than the Air Force. The Air Force is doing the development, and is being pressed by the Navy to keep the weight down. The original Navy specification that went out to industry, as I don't think I mentioned, was 55,000 pounds maximum. The Navy, after the competition, the rounds of competition, agreed that weight was not the fundamental problem but wind over the deck, carrier compatibility and so on were, and accepted a 58,000 pound or so, 59,000 pound aircraft in its version. It looked for a while as if the weight was going to go sky-high to about 69,000 pounds, but now it has started to come down again. I think it now around 63,000 pounds mission weight. If we can get it down a little bit more, I think it will meet the Navy's needs.

INTERVIEWER: What came to be the differences in the

[-13-]

aircraft between the two services?

BROWN: Well, it was always considered that there would be, that fundamentally the aircraft would be the same, but that since their armament, for example, was going to be very different, they would not be identical. The Navy aircraft was to carry six air-to-air missiles, and the Air Force aircraft was to carry 2,000 pound internal ordnance store, and lots of possible external ordnance. The Air Force aircraft started out being strictly a nuclear weapons deliverer to go in fast and low. That is why I say it was a junior SAC bomber. But during the course of the design competition, or during the study that took place during the summer of 1961 and the design competition that took place over the next year or 15 months, it turned into a much more versatile aircraft, capable of delivering large quantities of non-nuclear ordnance as well. That is an evolution that is still going on, as change the avionics—that is, the navigation system and the bombing system, and so on—to try to get more accuracy, which will make it still better as a non-nuclear weapons deliverer.

The Air Force's ideas about what the aircraft would be used for changed a fair amount during the course of the study and the subsequent competition, and continues to

change during the development. So there was that difference between the two aircraft. Also, because the weight was more important to the Navy than to the Air Force, and bluntness was more acceptable,

[-14-]

there was an additional difference in that a section of the Air Force aircraft just behind the pilot's seat is taken out in the Navy aircraft, which costs it a little bit in range or time on station, and costs it a little bit in drag, too, because fineness ratio there is the length divided by the diameter. It is less in the Navy aircraft than would be desirable for a supersonic aircraft, from the point of view of drag. The Navy, however, reduces the weight of its aircraft by-doing this, and considers it worth it.

In the same way, the Air Force aircraft has a sharp nose. The Navy Aircraft has a blunter nose with a radome in front of it. This again increases the drag of the Navy aircraft, but they want a bigger diameter so as to put in the radar for air-to-air combat. That is why that is designed that way. If I remember correctly, about 80 percent of the parts, or 80 percent of the aircraft by weight is common in the two versions.

I think that as time goes by, after this aircraft is through its preliminary development, and as we change the subsystems on each aircraft, what we are going to find is that we are going to give each version a subsidiary capability in the other region, that is to say, the Air Force aircraft will be optimized for air-to-ground delivery, but will also have an air-to-air delivery capability, so it will want a radar for air-to-air. The Navy aircraft will be optimized for air-to-air capability, but will have some air-to-ground capability. So we may end up

[-15-]

with an aircraft in each service which does both things, but is different not for its purposes, but for its environment; that is to say, the Navy aircraft has to be on a carrier and has to be lighter, and so on. Incidentally, having to be on a carrier, the Navy aircraft has to have, for example, a different landing gear and a hook to catch on the cables on a carrier. But in order to make the two aircraft similar from a structural point of view, even if the Air Force aircraft doesn't have the hook, it has the strength so that if you put a hook on it, it would be able to be caught by a carrier cable.

INTERVIEWER: Well, what will the purposes be that will have been served by making this aircraft this way?

BROWN: By having a single development, one will (a) save quite a lot of development money, (b) and I think maybe this is more important, have a more common logistics system, and in so doing save quite a lot of money, because you will have a single production line, you will have in effect a single spare parts line, and divergence once started, of course, tends to continue. By keeping these things together, we may even someday be able to induce the services to take a common view for the purposes of aircraft. Now, it will never be an identical view, because they do operate under different conditions at least some of the time. But fundamentally, I think it is very

important that one not let differences in hardware exaggerate differences in use, differences in procedure, differences in

[-16-]

function.

INTERVIEWER: These three things you have just mentioned, were they original criteria in your mind and the Secretary's mind, or were they developed subsequently?

BROWN: From the very beginning they were an important reason for having one aircraft if you could have one aircraft.

INTERVIEWER: How did you come to the conclusion that they should look at tactical aircraft the same way? Was this a product of this spring 1961 study?

BROWN: I don't know what you mean when you say they should look at tactical aircraft in the same way. They certainly looked at them from their own points of view, but we did insist that there were four functions, and this is what came out of the study. This is something which all of the participant had agreed.

INTERVIEWER: Did this come out of the study?

BROWN: It came out of the study. It is something on which all of the participants agreed; namely, that there was interdiction, reconnaissance, air-to-air superiority, close air support.

INTERVIEWER: The thing that does not come out yet in my mind is what all of the distress has been about this development.

BROWN: The argument was, at least on the surface, an argument about choice of contractor. However, the reason or the deciding reason for choosing one contractor instead of

[-17-]

another was that the winning contractor, General Dynamics, had made its Air Force and Navy aircraft more alike by far than the Boeing Company had done with its aircraft, and it was concluded—and it is a conclusion with which I agree—that although each design, the General Dynamics design and the Boeing design, had advantages and disadvantages—in neither case I think were these decisive—that the differences between Navy and Air Force versions in the Boeing design would inevitably tend to produce in the end two completely different aircraft, and the desirable characteristics which I have enumerated before would be lost.

The Navy—I won't say both services, because I think this was principally the Navy's reason for feeling as it did—felt that was a pretty good idea, and that is why they felt so strongly in favor of the Boeing aircraft. I think that the Air Force's reasons are a little harder to see. I won't say the Air Force's or the Navy's because these really are an individual group of officers in each service. The Air Force's officers' reasons I think were somewhat different. I think that they were misled by some of the performance figures that were claimed without seeing behind them into what they really meant.

INTERVIEWER: At what point did the President get involved in this?

BROWN: Since I wasn't involved directly with the President, I don't know. To the best of my knowledge, the

[-18-]

President was involved when the Secretary of Defense went over and told him what the decision was.

INTERVIEWER: This was in the fall of 1961?

BROWN: This was in November of 1962.

INTERVIEWER: So 1961 and 1962 were the time of design studies?

BROWN: Of competition.

INTERVIEWER: Of design competition.

BROWN: The President did not get into it, so far as I know, at the point of the Secretary's decision that there would be a single aircraft, and that we would go out to industry for competition. He got into it when the Secretary informed him of his decision on who should get the contract. He had to—the Secretary did this because it was a development contract that in the end would run many hundreds of millions, perhaps a billion dollars, and a production contract that would amount to several billions of dollars. On something of that size...

INTERVIEWER: Only two bidders?

BROWN: It started out with six, and the first round of the competition, four of the six were eliminated. The four that were eliminated were North American, Republic, McDonnell, and Douglas, I believe.

INTERVIEWER: At what point was this in time, do you remember?

[-19-]

BROWN: That was either in the fall of 1961 or the spring of the following year. Well, November of 1961, say.

INTERVIEWER: It was November 1962, you say, when the decision was made on the contractor?

BROWN: Yes, that is right.

INTERVIEWER: When did it start to bubble out of the Congress?

BROWN: December and January, December of 1962, and January of 1963. The staff of the McClellan Committee began an investigation which led the committee to undertake an investigation beginning, if I remember, in February of 1962, with the announced expectation of having a couple of weeks of hearings in February of 1963. It is now May of 1964. Those hearings are concluded, although there have not been any since August of last year.

INTERVIEWER: Were these special hearings?

BROWN: Well, this committee is a permanent investigating subcommittee of the Government Operations Committee of the Senate, so that every hearing is a special hearing.

INTERVIEWER: Can you at this point assess what the original motives were in their going into the issue?

BROWN: What are the motives of Congress? I think sometimes they are to raise hell, but I think a more polite and perhaps more accurate way of putting it is to see that government operations are carried on properly. I think that some

[-20-]

of the people on the committee started out with the idea that this was a questionable decision which they wanted to hold up to public scrutiny. Since then, of course, a lot of people have gotten very annoyed with a lot of other people, and I think perhaps feelings are much stronger now than they were then.

INTERVIEWER: What role did Senator Jackson's [Henry M. Jackson] political problems play in the investigation?

BROWN: Well, I can't believe that they were not part of the reason for his interest in the case. A several billion dollar contract lost to the Boeing Corporation, who are the biggest defense contractor in his state—

although most of the work would not have been done in that state but would have been done in the Wichita plant, still quite a lot would have been done in Seattle—invariably influenced him. I don't consider that improper by any means. On the other hand, I don't think he knew when he urged, if he did, Senator McClellan [John L. McClellan] that there be an investigation, what proportions it would assume, and how no one, at least neither he nor the Defense Department would gain anything in the end by it.

INTERVIEWER: Do you see any legitimate basis for the Senate's inquiry, aside from airing the issue?

BROWN: I think it is perfectly legitimate for the Senate to look into any action of the executive which they think questionable. I think that quite a lot has come out publicly from this. Although it started out as an examination

[-21-]

of the contract award, it got to be an examination of military-civilian relations. I think it got to be an examination of the requirements process. I think it got to be a questioning of the whole decision-making processes of the Department of Defense, and of the way in which contracts are awarded normally. It is very, very illuminating. It is not as illuminating as it would have been if it had been a fairly-run hearing, which I don't consider it to have been. I think that the committee staff and chairman had decided before they started what they wanted to prove, and they have chosen the witnesses and asked the questions accordingly.

INTERVIEWER: What did they want to prove?

BROWN: That the Secretary of Defense had made a mistake and that he should reverse his decision. Now, even so, I think that there can't help but be some illumination for anybody who reads the whole record and understands it. I think the public has not done that, and so I think it is divided into two pieces, that is, the public; one piece which feels that the civilians unjustly and incorrectly overruled the wisdom of the military to make a contract award to a politically favored contractor, and then I think there is a larger group which feels that this was a case of Secretary McNamara making a wise decision to save a billion dollars in overruling the military who did not particularly care about money, but wanted their own way. I think that the truth is not as simple as either of those

[-22-]

things, but I think that that is the way the public sees it.

INTERVIEWER: How did Korth's [Fred Korth] involvement get dragged into this? How did the committee find out about him, and do you think he did anything that was improper?

BROWN: I think his actions in the TFX case, so far as I can tell, were completely proper. I think as Secretary of the Navy, he took a careful look at the source evaluation as was his responsibility, by the way—the Secretary of the Navy and the Secretary of the Air Force have the contract responsibility in those military departments; the responsibility is not with any military man—he called a meeting in which he asked the senior Navy people, so many of whom later inveighed against the selection, whether they agreed with him that this was a close competition, and could reasonably go either way, and none of them said anything. He looked into these other questions of the kind that I talked about—namely, the divergence of Navy and Air Force versions in the Boeing design—and cast his vote with the other civilians involved, Zuckert [Eugene M. Zuckert] and McNamara, for the General Dynamics aircraft.

The principal analysis was made by Zuckert. Zuckert carried the ball, Korth concurred, and McNamara approved the decision.

Now, Korth had business connections in Fort Worth where the aircraft was to be made. He owned stock in a bank which had a loan to General Dynamics, a loan secured by

[-23-]

government bonds, so that that financial stake did not in the opinion of the legal people here, or in my layman's opinion, constitute a conflict of interest. A more real question was whether his own future and his own investment in his bank was not tied up with the prosperity of Fort Worth, which it was, and didn't that depend on General Dynamics, and it did to a degree. But even so, I don't think that there was either a legal or an ethical conflict of interest there. I think if you pursue conflict of interest past one or two degrees, then everyone has a conflict of interest about everything, and I think that the law recognizes this, and official rules governing conflict of interest recognize this. So that although he has been castigated for his part in the TFX, I don't think that that is justifiable. It did turn out, and the committee uncovered in the course of its investigations of Korth's personal activities that he had maintained a continuing close contact with bank officials, the officials of the bank from which he was on leave, that he had solicited—I won't say solicited business—that he had done things on behalf of the bank, although none of it produced any financial return to him, or immediate financial return to the bank, and that he had generally behaved foolishly in this regard. But that really is quite a different matter from a conflict of interest, and had nothing to do with the TFX case.

INTERVIEWER: You suggest a paradox which supports his integrity. On the one hand, the Navy would be pressing towards

[-24-]

the potentiality of two planes, and it would be the Boeing Company which would offer that possibility by what you have said.

BROWN: Oh, yes, but if that is as much as you look at, then it argues that he was

delinquent in his duty to the Navy in order to serve his own personal interests. That is, he should have been for Boeing, because that is what the Navy in some sense wanted. But of course the Navy in this sense is a group of Navy officers who would prefer to have their own aircraft, and I think he very rightly did not consider that to be in the best interests of the country.

INTERVIEWER: Can we talk for a bit about the problems of conflicts of interest generally, I mean so far as you have seen them? Do they exist? Have they been a problem in this or any other set of decisions you have been concerned with?

BROWN: Well, I think that financial conflict of interest is not a problem at the top levels of the executive branch. In the Defense Department it is removed in a rather straightforward fashion by the Senate Armed Services Committee, which goes quite a bit farther than the conflict of interest law provides. The conflict of interest law provides that you must disqualify yourself from any decision or action in connection with a matter in which you have a financial interest. The executive order goes farther and says that you should disqualify yourself from anything in which you might have the appearance of a financial conflict of interest. The Senate Armed Services

[-25-]

Committee goes still farther in the case of executive officials who are presidential appointees whom they must confirm, by saying that they won't confirm anyone unless he sells all of his—separates himself from any financial interest in any company which does more than \$10,000 worth a year of business with the Defense Department, which removes the financial conflict of interest pretty well.

INTERVIEWER: Direct financial conflict of interest.

BROWN: Direct financial conflict of interest pretty well, in a way which Congress could remove it for itself, of course, by adopting a regulation that forbade any senators to cast a vote on a matter in which he had a direct financial conflict of interest in the same way, but that is not likely to be done.

In any event, this removes the direct financial conflict of interest. Indirect financial conflicts of interest involving holdings of wives and minor children also can be resolved, although the committee does not require that. The executive order requires either that they be divested or that a ruling be made that they are *de minimis*, and I forget what the ruling is.

I think the real conflicts of interest are a little bit different. I think that the real conflicts of interest have to do with people's own associations. I come from Livermore. I am even on leave from Livermore, although it is a meaningless leave,

[-26-]

because there is no job for me to go back to there, but the people I know from Livermore,

they come in and talk to me about their programs, I am inclined to listen sympathetically. This is not a very great problem in the Defense Department, since Livermore is an AEC [Atomic Energy Commission] contractor, not a Defense contractor, and we affect them only indirectly. But anyone in the Defense Department who knows anyone, has been anywhere, has ever done anything, has thereby accumulated a set of impressions and friendships, and those inevitably color what he does.

INTERVIEWER: How about your consultants? Are you confident about them?

BROWN: The solution—I am not confident about anyone particularly. The solution in the case of consultants, and I think in the long run the correct solution for everyone, is disclosure, and we follow that solution in the case of consultants. We ask them to disclose their financial interests. They do so. Those are on record. They then can give what advice they want, so long as I know that if I follow a consultant's advice, and it is rather seldom that I am really influenced that much by a consultant's advice, I can always go and look up his financial interests and discount his advice, if I want to. After all, someone who gives advice does not have the responsibility for the decision. The decision has to be taken by someone whose job it is to do that, and then the only thing that you can ask is that he know the extent to which a consultant's or an

[-27-]

advisor's advice is tinged by his interest or prejudice.

INTERVIEWER: This means you have to be selective in the questions you ask, as well as to have buffers for the answers.

BROWN: Not necessarily. I think to come back to my own observation on this, it is up to the man who takes the advice to know enough about the man he is getting the advice from to know how much to discount what he says, and not just on the basis of financial interest, but on the basis of prejudice of any kind.

INTERVIEWER: Is this really a workable standard? Do you have people who are—if you say everybody is to some extent tainted with this, your tools for judging them must get pretty blunt.

BROWN: Yes. I think they need not be very fine, because the advice you get comes from enough different sources so that only gross prejudice or gross conflict may be worried about.

INTERVIEWER: Well, if you think this covers the TFX adequately, we can move on to something else.

BROWN: Yes, I think it does.

INTERVIEWER: Why don't we move on to the nuclear carrier?

BROWN: All right. The nuclear carrier was authorized, if I remember correctly, in fiscal year 1962 budget. Let's see, is that right? No, I guess I am wrong. I think it was authorized for fiscal year 1963. I have to go back and look now, because I don't really remember it. In any event, it

[-28-]

happened soon after I came here. I was involved only marginally. I think I saw the arguments for and against. It was a recommendation that was really made by others; namely, the Comptroller's Office in OSD [Office of the Secretary of Defense] and the Navy, both of which recommended against the nuclear carrier on the grounds that it cost too much, and I didn't know enough about it to have any contrary opinion. I know; that is right; it was originally decided soon after I arrived, early in the spring of 1961. Then it came up again in connection with the fiscal 1963 budget, which we made up in the fall of 1961, whether to decide to have a nuclear carrier.

At that time I got into it a little bit more. I decided it cost more, but it was probably worth it, and so I recommended, but not very strongly, that the decision be reconsidered and that it be made a nuclear carrier. The Secretary decided that it should be a non-nuclear carrier. I didn't get into it very much after that, until it became a big congressional issue.

In the interval I had learned quite a bit more about this matter and concluded, as the Secretary said, the real problem was not nuclear carriers or non-nuclear carriers, so much as it was what would the total nature of the Navy be? What should the force level be? How big should carriers be? How many escorts should they have? How many carrier task forces should we have? And until you decided this, you could not really have a very firm opinion on nuclear versus non-nuclear carriers.

[-29-]

It is certain true the nuclear carrier has advantages. It can go a much longer distance without refueling. It can carry more aircraft fuel and carry more ordnance. On the other hand, the big advantage comes from all-nuclear task forces, in which all of the ships are nuclear, and can therefore all travel at this high speed for a long period.

The additional increment of cost in the nuclear carrier is large but not enormous; that is to say, maybe it is \$100 million, and if you cap the fact that you don't have to buy black oil over a period of ten years, it shrinks to a rather smaller amount, maybe 20 or 30 million dollars. But as you look at smaller ships, the extra cost for nuclear power gets larger and larger. If there are eight ships in a task force, then you find that over a period of ten years you are many, many hundreds of millions of dollars more expensive.

So the question is not whether a nuclear task force is better than a non-nuclear. It clearly is. But whether you would rather have five non-nuclear or six non-nuclear task forces or five nuclear task forces, if that is the difference in cost. The Congress refuses to see it this way. They say the question is not what a given amount of money will buy, but what is the best thing you can have. Unfortunately, the best thing you can have it not one nuclear carrier

or two nuclear carriers or ten nuclear carriers. The more you have and the more money you spend, the better off you are. The question is to decide

[-30-]

whether for a given level of expenditure you are going to do things one way or the other. So the problem is much more complex and it is very important to try to keep the number of ships up. And of course, the more expensive you make the ships, the fewer of them you will have, because there always is a budget limitation.

Well, I recognized all this, and I still think we should have had a nuclear carrier, but because I recognized it, and because the best man to send up to plead your case is somebody who is against it, but at least knows the arguments on both side, I got sent up not to defend but to explain the decision to the Joint Committee in 1963, when it came up, and I did. I am not sure they got very much satisfaction out of me. They subsequently heard from McNamara. He told them the same things, and he concludes, of course, that the decision was right, and it should have been a non-nuclear carrier. I think he was influenced in this a good deal by a reaction of President Kennedy to a trip that they took in I think late 1961 or early 1962, to look at some carriers. First of all, Kennedy was negatively impressed with the fact that the carrier task force did not work too well, and that its surface-to-air missiles did not work, but he was more impressed, I think, with the great vulnerability of these enormous investments. You put \$350 million into a carrier, and seven or eight hundred million dollars into the aircraft on it, and one submarine can sink it. Under those circumstances, you really should be worrying about

[-31-]

their vulnerability, which nuclear power helps, I think, but also you ought to be thinking about making it less expensive so you can have more of them, so that you won't be so badly damaged by having one of them sunk. Also, by having more of them, you have them in more places at once, and that in peace time is an extremely important thing, if showing the flag is the thing, or getting there quickly is important. You want to have them spread out over the world so that they can get there as trouble starts, rather than when it is too late to do something about it.

I think this had a big effect on McNamara's decision not to go from carriers costing \$300 million to carriers costing \$400 million, and I think it is a good argument. I still think that the right thing to do is to go nuclear, and it may be that the next carrier—well, I think that the next carrier ought to be nuclear if one can find a way to bring its cost down by having a new reactor, which is now under development, installed, and by not trying to make the carrier so big and put so many airplanes on it.

INTERVIEWER: How much experience has there been with nuclear surface ships?

BROWN: Well, there is a nuclear carrier, the Enterprise, which has been operating now for about three years. There is a nuclear cruiser, and a nuclear frigate, and of course there is an enormous amount of nuclear

submarines. Everybody

[-32-]

agrees that nuclear submarines are the best thing. But the same thing is not obviously true of nuclear surface ships. I think it is true. I think it is obviously true that they are better, but they are not so much better that the fact that they cost so much more doesn't make a difference, and it does.

In the case of a nuclear submarine, it is pretty clear that even if a nuclear submarine costs three times as much and you only have a third as many of them, that is what you ought to have. In the case of nuclear destroyers, or nuclear frigates, which also cost at least double, maybe triple, it is not clear that one third as many nuclear ships is better than a given number of non-nuclear ships. I believe that in the case of a carrier, you have enough advantage from going nuclear that you probably ought to do it. In order to make that come true, though, in order to make my judgment be right, I am sure that the tactics are just going to have to be changed completely. It may be that what you want is a nuclear carrier which will protect itself at a distance with its aircraft, a guided missile frigate, which will protect it close in from those aircraft which get through and have to be shot down with surface-to-air missiles, and a nuclear submarine or two to protect it from submarines, from which I think it is currently in much more danger than it is from aircraft.

INTERVIEWER: What was the experience with the nuclear surface ships in the Cuban crisis?

[-33-]

BROWN: It was pretty good. Admiral Hayward [John T. Hayward] who commanded the Enterprise task force—he had a task force of which the Enterprise was the capital ship—said that during the Cuban crisis his escorts could not keep up with him, because they had to stop to be refueled, so he just left them behind and ran away from them, and he hoped, from enemy attack. One technique for avoiding submarine attack is to proceed at top speed, because the Soviet submarines at the moment can't go as fast, and if they can't catch you from behind, they have to approach you from the front, which gives them almost no time to aim at you. There is a very, very narrow cone in which they have to be in order to be able to intercept. That is one good tactic. I am not sure whether it is the best, but it is one that is particularly well suited to nuclear carriers which have no escorts, because their escorts can't keep up with them.

INTERVIEWER: Was there in fact this kind of play with the Soviets?

BROWN: No, we never really got to that point. There were Soviet submarines in the area, but they used fairly conventional tactics, and they never got to the point where it looked as if they were going to start attacking our ships. But I think we were worried that they might at any time start to get into that posture.

INTERVIEWER: Did you ever have any personal contact with the President on nuclear powered ships?

[-34-]

BROWN: No, I did not, and I don't know what he felt about them. I do know, as I say, that he felt that big surface ships were very, very vulnerable.

INTERVIEWER: What was the congressional involvement?

BROWN: Congressional involvement was an attempt by the Joint Committee on Atomic Energy during the fall of 1963 to get the Secretary to change his mind and decide to make the carrier nuclear after all, since the contract had not yet been let. This was pushed by Rickover [Hyman G. Rickover], and successfully pushed through the Navy, and I must say that I did not try to stop them. I thought it was worth bringing up again. I discussed this with McNamara before he made his final decision. It was perfectly clear that he was not going to change his mind. I told him that I disagreed. He said this might be something on which he was making a mistake, but as mistakes go, he didn't think it was a very big one. You see, one of the things he was trying to do was to pry open the Navy oyster on this, and get them to come clean on what it is they ought to be doing, not only in nuclear versus non-nuclear carriers, but how many carrier task forces there should be, how many escorts, what tactics they should use, and what the hell is it they should be trying to do; that is, what is the function of the Navy? He was hoping to get them to in studying the nuclear versus non-nuclear carrier make them face up to all of these problems. He didn't really succeed.

INTERVIEWER: Had he been wrangling with them for a long

[-35-]

time on other aspects of the trouble?

BROWN: No, he kept asking these questions and had not gotten any answers. I think maybe now that Paul Nitze [Paul Henry Nitze] is Secretary of the Navy, and he has a great interest in these things and considerable capability, I think, for leadership on this particular front, the Navy may face up to them.

INTERVIEWER: Did the Congress ever get wind of any differences between you and McNamara?

BROWN: Well, I think in 1963, the spring of 1963 when I was testifying before the House Armed Services Committee, I mentioned that—I forget what the occasion was, but they pushed me into saying what I had given advice on, and they said—when I said that I give him advice but I don't make his decisions for him—they said, well, he never makes a decision different from what you

recommend, does he, and I said yes, he did an this particular case the previous fall, the fall of 1962. So they knew, and the Joint Committee, I think, knew, but they did not choose to make much out of it. I am glad they did not.

INTERVIEWER: How do you think you did on your brushes with Congress over those three years?

BROWN: I do well, or do very well with some committers, I think. I do very well with the House Defense Appropriations Subcommittee, George Mahon [George H. Mahon] and Jerry Ford [Gerald R. Ford]. I think they are very well informed. I think they are judicious. I think they are honorable men in every way. I think even when politics is

[-36-]

involved and they try to keep politics out of it, they play fair. In fact, all of the members of that committee—I think it is a very good committee. I think they have a fairly high regard for me as well.

The Senate committees, the Senate Armed Services and Senate Appropriations Committee are pretty well dominated by Senator Russell [Richard B. Russell, Jr.], who I think is one of the most intelligent and best informed men, well, one of the most intelligent men in Congress, and one of the best informed on defense affairs. He, like Mr. Mahon and Mr. Ford, makes very shrewd observations, and I think good judgments on these matters. He does not always agree with me, and I don't always agree with him, but I think in all of those committees that I have correctly conveyed the impression I wanted to convey, and I hope it has been an honest impression, of trying to inform them as honestly as I can about what I really think. I have tried to explain what are sometimes very complicated matters to them in a way that they understand, and coming clean with them.

I have had less to do with the House Armed Services Committee. I have been very favorably impressed by Mr. Vinson [Carl Vinson], and I think Mr. Vinson has always considered that I was doing my job, even if he did not like what I was doing. I think there are a number of other members on that committee who are not so interested in whether you are doing your job right or not. They are interested in whether you agree with them or not. If you

[-37-]

don't agree with them, then they really let you have it. So I have had some severe attacks on me during my testimony before that committee. I believe or I have never felt that I was being overborne by these attacks. I have had attacks on me by some of the same people in public, at a time it was not a case of their asking me questions and me giving them answers, but of their expressing judgments on me without necessarily having very much information on which to do it. I think I can stand that, too.

There is now a Research and Development Subcommittee of the House Armed Services Committee, chaired by Mr. Price [Melvin Price], for whom I have a very high regard, and I think that my relations with that committee are quite good. I have not had time

to establish them in the same way that I have with these other committees I mentioned, but I hope a few more sessions with them over the next year or so and I will be able to explain to them what I think is important, and explain it to them, some of these difficult technical matters which it takes a while for any layman to understand.

The Joint Committee on Atomic Energy and I have a rather peculiar relationship. I used to be director of an Atomic Energy Commission laboratory, a laboratory which is a favorite of theirs. They like me, I like them, and I still feel that way about them personally, but we now find ourselves on different sides of the fence on nuclear matters, whereas before

[-38-]

we were generally on the same side. Before the Joint Committee on Atomic Energy was for anything practically that the laboratory wanted to do, and as director of the laboratory, that made me feel great. It is very good in some ways to have a committee of that kind working for you in the Congress. If it is atomic, they are for it, and if you are working on atomic things, it is a good way to get your program done. People who run laboratories, people who are in laboratories are inevitably advocates, and although the director of a laboratory should try to be judicious, if he is not something of an advocate, he is not doing his job right.

Since I have come to Washington, they see me as a critic of some of the things that they are for, or somebody who is standing in the way of some of the things they are for, because I now take a view that goes with my responsibilities. I haven't changed my mind about any of the facts. I now have to look at some additional facts in order to make a judgment, where before I could look at a narrower set and make a judgment in terms of those. So I now find myself on the opposite side of the fence from some of them.

My personal relationships with them are still very good. I think that they really try to browbeat me when I get up there, but I can take that, and in private they are still very friendly. I think it is perfectly true of all government officials that the more things they have to take into consideration

[-39-]

in making their judgments, the more likely they are to change their judgments, and I think this applies to everybody. I think it even applies to presidents.

INTERVIEWER: You mean the more facts you are given, the more you...

BROWN: No, no, the more or the bigger your responsibility is, the more things you have to consider in making a decision, and that may cause you to come up with quite a different conclusion than you would have before. This I think happens to everyone. I think it happens to people who become president after having been a senator, or people who become president after having been vice president.

INTERVIEWER: Do you feel that there were ever any issues in which you buckled to political pressure and in which you buckled wrongly?

BROWN: You mean congressional pressure?

INTERVIEWER: Did you ever buckle, and did you ever buckle wrongly?

BROWN: I don't think I have really had congressional—well, I guess I would have to say that there have been cases, I can't think of all of them, but I can think of a recent one in which congressional behavior or potential congressional behavior has made me behave differently than I would have, or at least has made me agree to do something I would not have.

INTERVIEWER: Can you name an example?

[-40-]

BROWN: Well, the X-22, which is a program that I think we ought to cancel, we are keeping alive, at least partly because the Senate criticized us for a contract award there, and if we cancelled it now in the face of a Navy statement that they want to keep going with it, the Senate would just give us hell.

INTERVIEWER: What is the X-22?

BROWN: It is a VTOL [vertical take-off and landing] aircraft. I don't know yet whether that is wrong. It may be. If it is wrong, it is not a big mistake.

INTERVIEWER: How about contract awards?

BROWN: I have not been involved in contract awards except on giving advice. I have not had to make the decision as to whether to buckle to congressional pressure, but I have seen contract awards that have been influenced by congressional pressure, and by White House pressure.

INTERVIEWER: Could you name some?

BROWN: Yes, although I am going to be very sure not to reveal any of this very soon. I think that the—no, let me put it this way. I think that the X-22 award was influenced by political pressure.

INTERVIEWER: Where did that go?

BROWN: That went to Bell Aircraft. I believe in one other case, the Lance, the decision was not influenced by political pressure. It went to the place where everyone, the

[-41-]

Army, myself included, went to the company we thought it ought to go to, but political pressure was exerted on that company to get it to move its plant to do the job from Dallas to Detroit.

INTERVIEWER: Did you ever see any favoritism to Massachusetts?

BROWN: Not in the Defense Department.

[END OF INTERVIEW #4]

[-42-]

Harold Brown Oral History Transcript – JFK #4
Name Index

E

Eisenhower, Dwight D., 4
Everest, Frank F., 1

F

Ford, Gerald R., 36, 37

H

Hayward, John T., 34

J

Jackson, Henry M., 21

K

Kennedy, John F., 1, 18, 19, 31, 34
Korth, Fred, 23, 24

M

Mahon, George H., 36, 37

McClellan, John L., 21

McNamara, Robert S., 2, 3, 4, 11, 12, 17, 19, 22,
23, 29, 31, 32, 35, 36

N

Nitze, Paul Henry, 36

P

Price, Melvin, 38

R

Rickover, Hyman G., 35
Russell, Richard B., Jr., 37

V

Vinson, Carl, 37

Z

Zuckert, Eugene M., 23