

TACTICAL AIR WARFARE

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DEPOSITORY

HEARINGS

BEFORE THE

TASK FORCE ON NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS

OF THE

COMMITTEE ON THE BUDGET
HOUSE OF REPRESENTATIVES

NINETY-FIFTH CONGRESS

FIRST SESSION

—
JUNE 21, 23, AND 28, 1977
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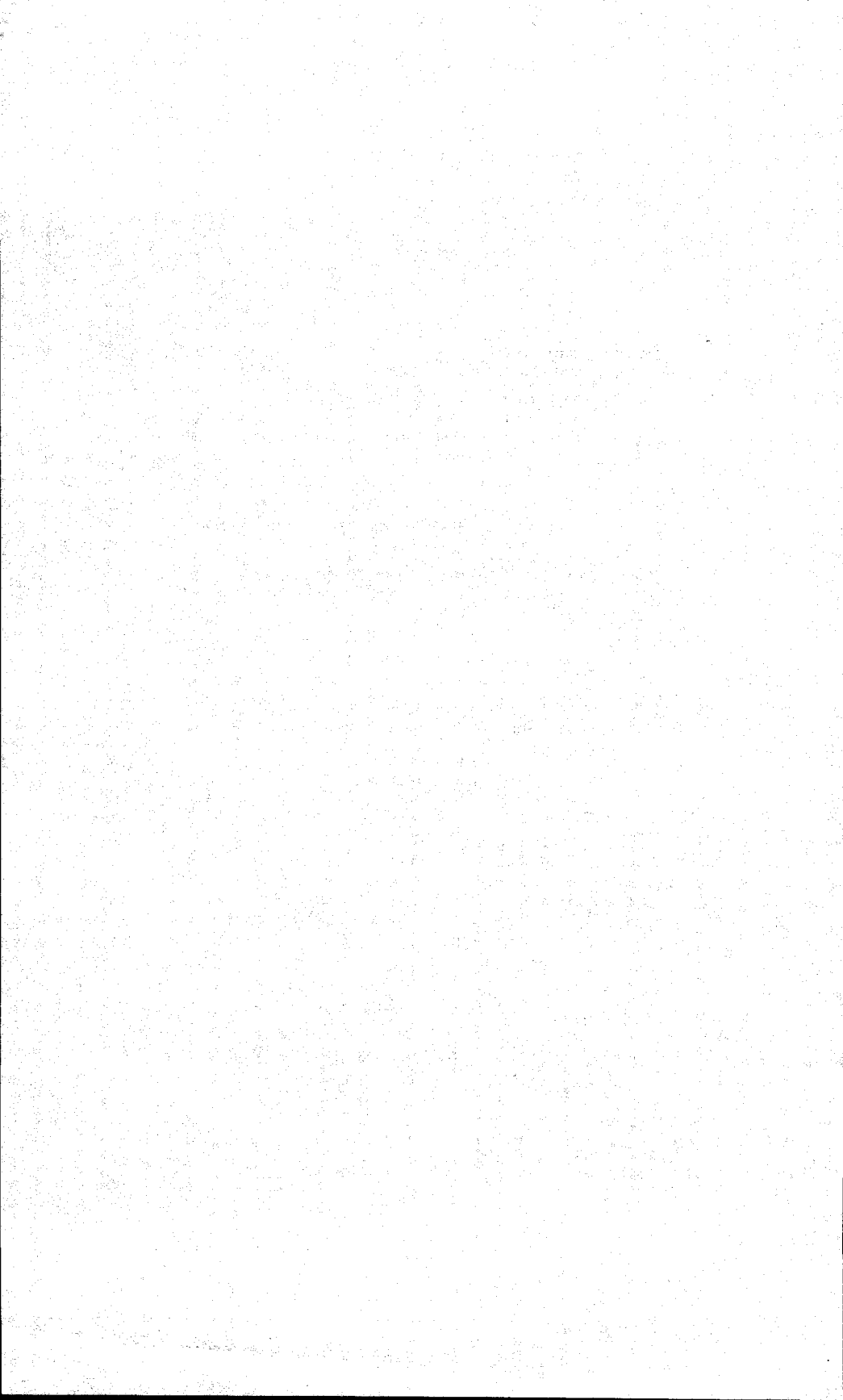
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TACTICAL AIR WARFARE

TUESDAY, JUNE 21, 1977

HOUSE OF REPRESENTATIVES,
TASK FORCE ON NATIONAL SECURITY,
COMMITTEE ON THE BUDGET,
Washington, D.C.

The task force met, pursuant to notice, at 10 a.m., in room 304-A, Cannon House Office Building, Hon. Robert L. Leggett, chairman of the task force, presiding.

Present: Representatives Leggett, Pike, Mattox, Holt, and Downey.

Mr. LEGGETT. The meeting of the National Security Task Force of the House Budget Committee will please come to order.

This morning the National Security Task Force starts a series of three hearings on the general subject of tactical air warfare. TACAIR consumes a large share of our defense dollars. In the fiscal year 1978 budget the procurement cost for new aircraft for the Air Force and Navy is programed at about \$6 billion. Over the 5-year period 1978 through 1982, the defense program calls for spending of \$16.5 billion on new tactical aircraft for the Air Force and \$11.0 billion for the Navy. The total budget for TACAIR, including all operating costs, missile procurement, aircraft modifications and spare parts is running at about \$25 billion per year, or \$125 billion in the 5-year plan.

In order to appreciate the requirement for this large allocation of resources, I believe the task force will find it useful to review the basic concept of tactical air warfare, why we have it, why the force structure is currently designed as it is, and what changes we can anticipate for the future.

We will be discussing how the requirement to conduct effective and sustained air warfare operations against Warsaw Pact forces drives tactical air force planning and how ready our forces are to meet the need of that contingency. We will also devote attention to how the Navy plans to fulfill its mission of sea control and force projections, and what weapons systems are programed to meet those demands.

In addition, we have asked the Air Force to be prepared to discuss its program to choose a follow-on interceptor for the continental air defense of North America. Although this is not directly related to the tactical air budget estimates it is assumed that the weapons

system platform will be chosen from within the current tactical air inventory. We will be interested in how that choice will be made and its impact on tactical aircraft production costs.

In the course of our review it will, of course, be necessary to devote some attention to the requirements for, and capability of, specific weapons systems. In that connection, however, our purpose is not to conduct any line item reviews of the defense budget, but rather to get a better understanding of what these large allocation of resources buy for us, and in addition, to give us a basis for projecting future budget requirements in this area.

To open our hearings our witness today is Charles E. Myers, Jr., Assistant Director for Air Warfare in the Defense Directorate for Research and Engineering—D.D.R. & E. As stated in Mr. Myers' background statement, his office is responsible for "plans, management, and rationale in support of research and development programs in the mission areas of air superiority, interdiction defense suppression, and reconnaissance. Based on his official duties and extensive background in this area, we are hoping that Mr. Myers will be able to help us to understand how the Defense Department sees the tactical air problem and what it is planning to do about it. Subsequently, we will have hearings with the Navy and the Air Force to learn about the specific TACAIR program of the individual services.

Mr. Myers, welcome to the National Security Task Force. I understand you have a prepared statement which will be included in our record as though you had delivered each and every word of it. You can divert from that as you choose. We have three or four members including Mr. Pike who has had extensive background in tactical air hearings before the Armed Services Committee and some of its subcommittees. We are in an open session, so all the material presented today will be of a nonclassified nature. It might be new to many folks, but I can assure you it is probably all published in Aviation Week, Time magazine, and the New York Times.

Mr. Myers, it is very nice to have you here. You may proceed as you choose. I would reemphasize we are concerned with the macroeconomic picture and the overall effect of large procurements on the overall budget figures which will be presented during these hearings.

**STATEMENT OF CHARLES E. MYERS, JR., ASSISTANT DIRECTOR—
D.D.R. & E.—AIR WARFARE**

Mr. MYERS. Thank you very much, Mr. Chairman. Actually I am pleased to have the opportunity to chat with you and present an overview in the hope that it will be useful to you in understanding the basis or the rationale that underlies some of the recommendations of our office makes to the Secretary of Defense. I find where there are differences in points of view relative to defense equipment, very often it boils down to the fact that those who disagree are looking through different windows. Once we all begin to look out of the same window we begin to align and reach a point to where the disagreements are often very minor rather than major.

I cannot say that we are all looking out of the same Pentagon window but I think we are pretty much looking out of the same side of the building, and that is progress.

Mr. LEGGETT. Especially when you have a five-sided building.

Mr. MYERS. I will run quickly through the statement and ad lib here and there where I think it needs some emphasis or explanation. I want to apologize for the use of acronyms. It is almost unavoidable.

I thought a bit of history would be appropriate because it will tend to explain to many people how we got to where we are. Since we are not comfortable with what we have, it is of interest to know how that came about. Understanding that also provides some insight as to where we might be going and how successful we might be in attaining the goals that have been established.

During the late fifties and early sixties, the focus was on nuclear war. This period spawned a family of attack aircraft such as the Air Force F-105 and F-111 and the Navy A-4, A-7, and A-3J, all for deep strike with nuclear weapons. Air defense requirements dictated a family of interceptor aircraft such as the Air Force F-101, F-102, F-106, and the Navy F-4. These four aircraft were designed to counter nuclear bombers under low visibility conditions using radar and radar missiles.

Performance criteria for the interceptors emphasized a quick climb to 40,000 feet and acceleration to Mach 2 speed to minimize the time from takeoff to intercept. The air-to-air missile weapons included both conventional and atomic warheads. Many people do not realize that at that time we did have atomic air-to-air missile weapons. The air-to-air weapons family excluded the gun because the visualized air intercept was based on a long-range kill, usually head-on, with no requirement for visual contact. It also seemed needless to design the cockpits for external visibility other than that required for takeoff and landing. Also such factors as aircraft signature, that is, the appearance of the airplane, its size, whether or not the engines smoked, and so on, were given no consideration nor was aircraft systems vulnerability to AAA. For both attack and interceptor aircraft there was to be little contact with the enemy defenses nor would the envisioned nuclear action entail a prolonged conflict or high sortie rates. It was all going to be accomplished, the nuclear combat, in a matter of hours.

Mr. LEGGETT. This was kind of a post-Korea time frame you are talking about?

Mr. MYERS. Yes. This was particularly midfifties and late fifties, up through about 1962. You recall back in those days the Air Defense Command was the major command in the U.S. Air Force. And, most of the flying would be from well-stocked and adequately manned bases. Air-to-air close combat—dogfighting—was again declared a thing of the past. The same declaration followed World War I, World War II, and Korea. Close air support and battlefield interdiction were not emphasized. Pilot training was not heavily oriented for these missions.

It was against this background that President Kennedy, in July 1961, issued the call for our forces to provide, “* * * a wider choice than humiliation or all-out nuclear war.” There was considerable

momentum on the part of our research and development community in driving technology to yield the sophisticated equipment which could increase our margin of superiority over the Russians in a possible nuclear conflict. A few years later, before any perceptible change could be detected in the character of our forces, we found ourselves heavily engaged in the conflict in support of South Vietnam.

Our experience in Southeast Asia of the midsixties demonstrated that some of the sophisticated equipment and weapon concepts of the nuclear age were less than useful and on occasion, hazardous for our own forces. The need for a gun for dogfighting became readily apparent as did the need for air combat training. The discarded "rules-of-engagement" which dictated visual identification were revived. When defending against nuclear penetrators the consequences of the penetrator getting through are so high it is acceptable to kill an "unidentified" aircraft. You know where you are and you know where they are and you fire a weapon without ever having seen the airplane you are firing against. Things are a lot more orderly and you can manage to do that with some confidence that you are shooting an enemy.

In Southeast Asia the problems of target acquisition on the battlefield plagued the pilots of the high performance fighters as they tried in vain to locate and attack illusive vehicles and people. The softness of our jet aircraft was a problem because the designers were not instructed to worry a great deal about the vulnerability aspect of the design for a nuclear conflict. It was common, even if you had redundancy in a hydraulic system, to run both sets of lines right down the strong back of the airplane. If that area was damaged, both the primary and secondary hydraulic systems were damaged and control was lost. Fuel cells did not have to be lined to prevent leakage, and so on. The lack of resilience contributed to the high losses from simple enemy AAA defenses.

Controlled attrition in an endless contest became a way of life and had a detrimental and lasting influence on mission planning, tactics, and flight techniques. Defense suppression became a mission unto itself with emphasis unheard of in past conflicts.

In past conflicts we performed a token amount of defense suppression. It was performed along with the primary objective of the combat mission.

Time was not a factor. Standoff became a golden objective. The orchestrated air armada which requires much planning, timing, coordination, unobstructed communications, and good weather evolved as a basis for writing requirements and projecting equipment needs for future air forces.

The concepts of the nuclear age coupled with the exposure of SEA were to combine with a third force that was emanating from the Pentagon and Congress in influencing the requirements which determine the character of tactical combat aircraft. Cost effectiveness, C/E, and an apparent limitation of force size became very strong factors. First, the criteria for approval of a new aircraft included an analysis which would project a significant cost effectiveness advantage of the new aircraft over the existing one. It was advantageous, of course, for the proposed system to combine many

mission tasks such that it could, within the analysis, be compared to two or three special-purpose systems and obviously show a C/E improvement. The fact that the new aircraft was to be much more expensive than any of the alternatives was not a great hindrance. Additionally, the Congress had established limitations on the numbers of aircraft in the tactical force. The constraint on force size naturally led military planners to insist that each airplane be fully capable of performing more than one mission and, hopefully, for more than one service. You may recall that the concept for the TFX—F-111A—was that it would combine deep all-weather nuclear and conventional strike, all-weather intercept, close air support, reconnaissance and air fighting both from land or aircraft carrier. And, it was to be more C/E at this combination of missions than any existing aircraft.

While in the proposal stage, particularly with a bit of technical optimism, it is understandable that one could begin to accept such a concept.

Following the TFX and with the appearance of enemy fighters and the birth of the dogfight, the USAF launched a CFP for a new fighter, the FX. The new USAF fighter, as described in the FX CFP, was an all-weather, deep interdiction, attack-fighter-interceptor—it was destined then to weigh 60,000 pounds and cost \$20 million. Fortunately, the forum in the defense arena assisted in paring it down to the all-weather interceptor-fighter with the emphasis on air fighting, which we know today as the F-15.

Mr. STORM. Basically what you have told us, we designed a force with which we went into Vietnam and it turned out to be the wrong force. You are getting into discussion of how we came to understand the error of our ways and to go into the reasoning for the force we have now. How satisfied should we be that we are going on the right track now, whether or not the systems we have today either in being or about to come out, are really the systems we need?

Mr. LEGGETT. Before we answer that, there was a commonality program that a lot of us thought was modestly successful. Why don't you explain why that was an inadequate force vis-a-vis Vietnam and combined with the A-4's and A-6's?

Mr. MYERS. The force we have today pretty much is the remnants from that nuclear age force with modifications. Relative to the "common" airplane, the F-4, found both in the Air Force and Navy, actually if you park those airplanes side by side and begin to delve into the airplanes you will find they are not as common as you think they are. There are two different radars. You go through the systems and you will find there is a great difference between those two airplanes. Not that there is not significant commonality; there is. I just want to mention there is significant difference also.

Relative to the question about the armed forces and its adequacy for Vietnam, I do not think any tactical air force could be adequate for an action such as Vietnam. Any time that you order an air force to fly through a shooting gallery on a programmed basis for 9 years, I would not know how to begin to design the equipment to participate and be effective in that activity.

Mr. PIKE. That being the case, why would not our adversaries plan nothing but additional Vietnams instead of the great war in

Europe that we love to contemplate because that is one we won? Why don't they plan and why would they do anything except plan additional Vietnams, whether in Asia, South America, or Africa?

Mr. MYERS. I can only speculate as to what is in the minds of the Red planner. He may very well be in the midst of creating similar situations.

Mr. PIKE. I would think so too. You are saying it is hopeless to design a tactical air force to counter that.

Mr. MYERS. To counter that kind of activity?

Mr. PIKE. Yes.

Mr. MYERS. The relevance of tactical air in that kind of activity with those kinds of constraints, and how we conduct ourselves—I know there are segments of that activity where specialized equipment is going to be very valuable, but overall for that kind of activity a tactical air force may not be terribly useful in the form in which we visualize it.

If I could continue on through this, which does address the primary assignment of deterrence in NATO, then I would be happy to discuss other aspects.

The all-purpose syndrome was strong in the early sixties because of the forces I mentioned—it is still with us and will persist until there is an incentive to support other than an all-purpose system. The decade of the sixties has tempered the community to accept that combat aircraft will be ever more expensive. Unfortunately, along with this has come the acceptance of an ever-decreasing force size.

In the midsixties, both defense and industry people made an effort to counter the higher cost/smaller force trend through the design of special-purpose, lower cost combat aircraft. They focused on the fundamentals of basic tactical air warfare and the development of fighter and attack aircraft tailored for the missions of air fighting over the FEBA and antiarmor to support an intense ground battle between modern equipped armies. From these efforts evolved the lightweight fighter and AX programs and eventually the F-16 and the A-10.

In the early seventies, the general guidance contained in President Kennedy's speech reappeared in a formal sense in the form of the Secretary of Defense planning and programming guidance memorandum—PPGM. This document directs us to focus on the task of development and fielding an array of equipment and forces which can deter a Warsaw Pact conventional attack against NATO.

That really is a terribly important point because down at my working level we do not in each office choose to work on those things that most interest us. We have that guidance that tells us where to emphasize our effort.

The air warfare effort under the Deputy for Tactical Warfare Programs, is to guide the development of weapon systems which can provide our tactical air forces the hardware which can be effective in a NATO/Pact conflict.

A note there. The emphasis is on defense. We are trying to build a force that will cause the Pact to be discouraged about any adventures in Europe.

The character of enemy forces and their attack strategy can be best described as a superblitz by echelons of massive armored piledrivers.

Relative to that, if you just dwell on history, they haven't changed much since 1942 to 1945 on the eastern front. It is just that it is modern.

The often expressed need for increased NATO firepower may be an oversimplification of the solution for countering such a force. Multiple flanking counterstrokes to destroy Pact cohesion and increase stress on their battlefield mechanism, to disrupt their command and control, and to create confusion and disorder are perhaps better choices.

I want to mention what the great war historian Lidell Hart said, "Your target should be the mind of the enemy commander, not the bodies of his troops."

Mobile antitank/armored teams with tactical air support can drain the momentum of a blitz offensive. The ability of tactical air to support and lead such actions is the justification for its cost. The potential of the tactical air forces, in the eyes of the Red war planner, emerges as the measure of the worth of tactical air in deterring a Pact attack.

How can one evaluate the worth or capability of a tactical air force in peacetime? What are the measures? During the sixties, our analytical community attempted to evaluate equipment in terms of cost effectiveness with units such as ton miles/dollar. In other words, if you are comparing two airplanes, you would measure how many tons it could carry and how many sorties per day it could fly and its cost. That was a very accepted basis for comparison. The same cadre of analysts relied upon firepower scores per invested dollar for ground forces. In effect, they were hoping that if you want to evaluate two armies, count the number of guns they have, the ability to fire them, and you have a clear picture as to which one will probably win an engagement. Although readily obtainable and understandable, such measures are seldom sound measures of a combat potential, although they are not to be ignored.

A realistic assessment of a tactical air force must be based on an evaluation of its: Leadership; tactics; training; equipment numbers; equipment in commission rates; sortie rate potential—how many sorties per day can they fly with those airplanes?

Ability of aircraft weapons to inflict multiple kills per pass for battlefield interdiction—BI; ability of fighters to win in the crowded dogfight—crowded dogfight is a term that we have taken from the Israelis, who described activity in their past conflicts wherein it was common to have dogfights involving 40 to 50 airplanes. I would suggest that in a Warsaw Pact-NATO engagement, if it comes, major crowded dogfights would constitute the primary air-to-air combat activity.

Weapon effectiveness in a chaotic environment. War is chaotic; plans for operations in the absence of command and control; ability to prosecute mission in spite of heavy defenses; resilience of the force.

Research and development efforts and choices of technology must be sensitive to these same factors. We may take heavy losses in the

first day. Also, we must give consideration to the battle arena weather and terrain and likely actions of a resourceful enemy. Except for a few brief moments in history, our U.S. Air Forces have not experienced combat in a defensive situation, especially against such a capable enemy force.

That is a major point. We are always carrying the war to the enemy. The NATO problem is a defensive situation. There are some advantages to that when you discuss equipment and tactics. This difference has to be highlighted.

For the NATO/Pact problem the weather must be assumed as marginal with low ceilings and poor visibility; the enemy will have the option of initiating the attack, therefore confusion and disorder must be taken for granted; individual battles will be chaotic and desperate; it may not always be possible to disengage from the enemy; orchestrated actions will be difficult to conduct; the battle situation will be fluid; our bases will be subjected to attack; communications will often be jammed; stores maybe destroyed by direct or covert enemy actions; key support personnel and facilities will be subject to attrition. Relative to maintaining sophisticated equipment, if some key people do not show up it has to have an impact on tomorrow's sortie.

This is the environment in which proposed solutions must be judged. This, is an environment which our military staff planners and those who guide our weapons R.D.T. & E. have begun to use in considering the combat utility of proposed systems. From my perspective, all is not black.

Whereas it may not be practical to expect sufficient funding to field a clear firepower superiority over the Warsaw Pact, it is conceivable that we, with NATO, can field a force which could disrupt and blunt a blitz offensive. The key is to choose equipment that we can afford to procure and operate with such frequency that our crews can maintain a high state of combat proficiency. Further, the forces must have hardware depth such that early high losses can be absorbed. Fighters that cost \$20 million each and precision guided weapons that cost a \$100K are unlikely candidates to form such a force.

Tactical air of World War II, Korea, and Southeast Asia amassed an effectiveness history against ground vehicles of less than 0.1 kills/mission. We must provide weapons and training such that this ratio can be raised at least to unity or better on a per-pass basis. This means we have to be much, much more effective than we ever have been. This means that many aircraft and pilots must be accomplishing many kills/pass.

The traditional sortie rates must be tripled and sustained for significant periods if we are to turn the tide. Such sortie rates are hardly possible with large formations which combine the attack, fighter escort, and defense suppression orchestrated by an airborne controller. Instead, many small flights on numerous tracks appear to be a more manageable and effective operational concept.

I would like to mention that is not an original concept. It is the concept that is embraced by the European air forces today, the French, the Germans, and the British. We are in evolution. It should not be an inflexible force. What looked reasonable or good or

effective in Southeast Asia may not be terribly effective in Europe. You cannot perform a blanket transfer. Some of the concepts need modification.

Minimum altitude tactics where the airplanes are flying very low for performing battlefield interdiction appear attractive and complement the smaller formation, random track concept. Appropriate aircraft force size and weapons to support the suggested methods are not characteristic of our existing force. However, we are in transition and many R. & D. efforts are underway which provide a base for growth in the direction suggested. Tactics are in evolution and it is our goal to launch the development of munitions and equipment which can be useful for full exploitation of the expanded tactical options of the early 1980's.

Things that we are prepared to do we probably will still be able to do. Thus we will expand the options available to the Air Force commanders so they can go whichever way is appropriate for the problem they are facing.

The momentum of existing development and procurement coupled with the institutional inertia always makes change painful. Congress, hopefully, will encourage the change. A fundamental and attractive inducement which can accelerate improvement is the option for increasing the size of our tactical force within a fixed life cycle cost—LCC—ceiling. The allure of extra wings of aircraft can curb the tendency toward gold plating and induce a rejection of the multipurpose goals of the past which paved the way to highly sophisticated, expensive systems and hence the ever-decreasing force structure.

In working the problem, we try to focus on the goal of deterrence. Deterrence is attained by displaying forces and equipment in such a fashion that the Soviet war planner and military analyst will be less than confident that he can successfully execute multiple, rapid advances, especially from a peacetime posture.

When I use the word "display" I do not mean merely display in publications and display on the ramps of our airfield in the United States. I mean exercise in a manner such that the enemy may believe we can accomplish our goal.

We make one important assumption in our work; it is that the Soviet staff is fully capable of assessing our conventional capability to react and blunt their attack. The Communists have engaged U.S. forces for a decade and having fought with and against our equipment in many environments since 1941, there can be no mysteries about the potential combat utility of our advertised conventional systems for a war in the European environment.

An assessment from such a perspective provides the basis for a reevaluation and redirection to expand and improve the capability of TACAIR. I will discuss some of the more obvious desired additions or changes related to some key tasks. These are samples of the kind of objectives and programs we are supporting in the short term for improving the NATO/Pact problem of conventional deterrence.

PROTECTION OF HIGH-VALUE ASSETS FROM INITIAL SOVIET AIR STRIKES

NATO radar directed surface-to-air defenses such as Improved Hawk, Patriot, and Roland could serve to make the airspace above

a few hundred feet most hazardous. An additional task would be to close the very low-altitude penetration corridor to the low-flying enemy strike aircraft. The classical approach to this task is a force of all-weather interceptor fighters which are equipped with effective look-down radars and shot-down missiles which are effective against low-flying targets while employing countermeasures.

The candidates for this feat are the F-15 with a beyond visual range—BVR—missile such as the AIM-7F "monopulse," AIM-7 Skyflash, and the new, smaller, fire-and-forget AMRAAM. Today's interceptors pretty much have to remain locked on the target until impact with the target by the missile that the airplane has launched. This constrains battle tactics and would be relieved by "fire-and-forget."

It is desirable to pick a target, fire, pick another target, and attack it while the first missile continues on to that original target. That is the direction in which we are moving.

This new missile will be small enough that it can be used on smaller fighters such as the F-16, F-18, F-5, and Mirage. Today's Sparrow weighs about 500 pounds. Therefore, the all-weather—AWX—interceptor air defense force could be expanded with less expensive airplanes than the F-14 and F-15.

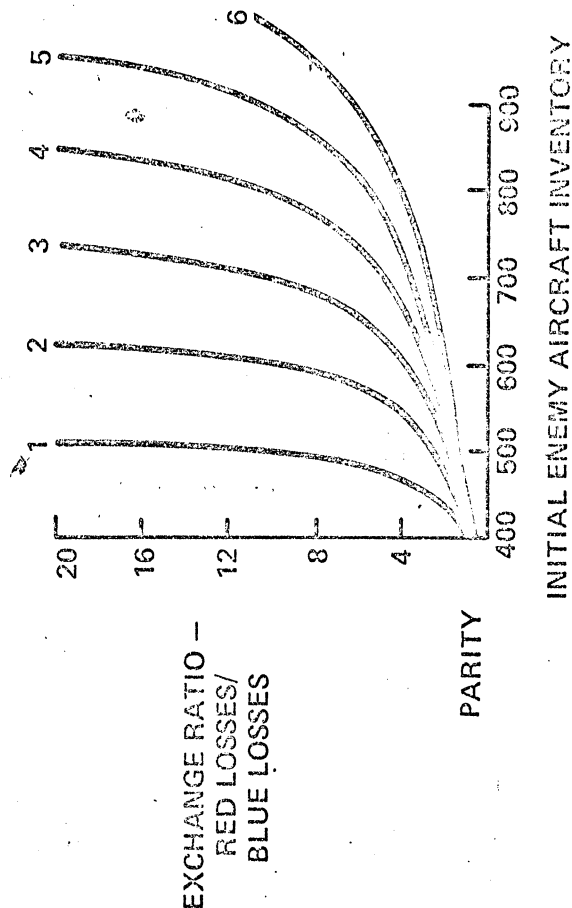
COUNTERSTRIKE AGAINST THE AGGRESSOR'S MAIN OPERATING AIR BASES (MOB'S) TO GAIN THE AIR-TO-AIR INITIATIVE

If NATO air forces were to absorb heavy first strikes from the Pact and if they were badly outnumbered to begin with, no conceivable amount of air-to-air fighting capability would permit a return to parity in a few days. I want to put this Vu-Graph on. This is a mathematical model that could be used for many purposes. It shows the sensitivity of exchange ratio versus force level to attempt to achieve a push condition.

[The chart referred to follows:]

SENSITIVITY OF EXCHANGE RATIO VS FORCE LEVEL TO ACHIEVE "PUSH" CONDITION

RED & BLUE SORTIE RATES EQUAL, 1:1
 ENGAGEMENT PROBABILITY = 0.8
 DECISION PROBABILITY = 0.4
 USAF BEGINS OPERATIONS WITH 400 AIRCRAFT



Mr. MYERS. If the problem was that the enemy has twice as many fighter airplanes as you have and your question is, What would it take in the kill ratios to bring those forces into balance? It is very important how long would it take. You are going to come down the scale but at different rates because you have a superior kill capability, so as they come down they slowly come into line. The question is, How long does that take?

These curves are drawn for an engagement probability of 0.8. They had 900 airplanes and we had 400 airplanes and we have a choice on kill ratio. Assume we could kill at the rate of 2 or 4 to 1. That means that it is probably going to take you about 7 days to reach a push condition. If we want to be optimistic about technology and say let's spend some money and kick that up, let's put it up to 8 to 1. It would take us a little under 6 days to reach a push condition. Twelve to one requires 5 days to reach a push condition.

That relates to the problem in Europe in which the Pact decided to attack because it is a very short distance to the Rhine River. You really only have a couple days to do something significant. You do not have 3 months.

An immediate, unstoppable counterstrike capability that is insensitive to weather is needed for attacking main operating airbases—MOB. It, coupled with followup aircraft attacks, could degrade the aggressor's air operations and attrite their force to the degree that NATO air could capture the initiative on the first day of a war. The prime candidate for the task is a surface-to-surface ballistic missile which is targeted against the MOB's. Funding for such a missile is included in the fiscal year 1978 budget in the form of a conventional warhead.

BLUNTING THE BLITZ THROUGH DIRECT AIR ATTACKS AGAINST THE FIRST AND SECOND ECHELONS OF ARMOR AND SUPPORTING ELEMENTS

This activity falls under the missions of close air support—CAS—and battlefield interdiction—BI. The character of the targets are massive concentrations of tanks, APC's, mobile artillery and mobile air defense systems. They could be expected to spill through the road network and would be attempting to move a considerable distance each day.

For security reasons we do not put numbers in statements like this, however, if we go back to World War II, movement by the armored divisions of the Soviet force on the eastern front of 50 to 80 kilometers per day, 25 to 40 nautical miles per day, was not unheard of as they progressed against the German force.

Keep in mind that in a double envelopment attack from East Germany, the maximum distance that any unit must move to reach Bonn is about 180 nautical miles. This is why it would be so critical to effectively blunt the attack in the first few days. The terrain varies from rolling hills in the south to the plains with forests in the north.

By the way, it occurs that the U.S. forces, which are the mainstay of NATO, just happen to be in place in the best defensive positions. We are sitting in the areas that are most difficult for enemy armor to penetrate. The areas that are really tank country are the least defended in the north.

The northern regions are best suited for rapid movement by armor. The weather often produces a low overcast with visibility under 3 miles. In our work, we generally assume there is a solid overcast at 1,000 to 1,500 feet. We exercise the possible solutions under those conditions. Relative to the value of TACAIR, as I mentioned, the strength is in the most defensive terrain. The weakness is to the north in the tank country. The value of TACAIR may very well be the ability to bring firepower to bear in those northern regions on short notice to try to blunt those attacks until ground forces can be brought to bear.

Keep in mind that ground forces not in position may have to display movement rates much higher than the attacking force in order to get to their positions. An additional problem you have is that if you are on the west side trying to move east, you are moving against the flow of your own refugees. The enemy does not have that problem.

The Soviets could be expected to move continuously through the night, though at reduced rates. Tactical air would have to blunt the main thrusts until the NATO ground forces could be brought to bear, to provide close support against these lead elements and to destroy the followup reinforcements.

The individual tank kill objective is to create such damage as to put the vehicle out of commission for a few days, generally referred to as a mobility kill. This is an important point. It relates very much to cost. Would you be content with a weapon that would probably knock a tank down so it could not be used for 3 or 4 days?

Such a kill can be effected by direct hit from a few rounds of the 30mm GAU-8 cannon, or a couple of Rockeye bomblets. Strafing by 20mm cannon, the standard gun the F-104, F-4, F-16, F-18, A-7, and A-4 will hardly bother a tank although it would force the crew to buttonup and thus slow their progress. That is not unimportant.

A 30mm pod is needed to increase the lethality of these fighter and attack aircraft. Considering the history I related in the beginning of this briefing, it should come as no surprise that our air forces are less than well equipped to handle the antiarmor problem in the European environment. Important improvements in early stages of development or procurement include the A-10 airplane, the GAU-8 cannon and area munitions and dispensers for the tactical option of minimum altitude attack. Also, for conditions where the defenses are less threatening and/or the weather is less restrictive, we are accumulating precision-guided munitions—PGM's—in the form of guided rockets, laser-guided bombs and guider dispenser-delivered antiarmor munitions.

Associated with the efforts to kill the armored and support vehicles, we are conducting R. & D. directed at suppression of the radar directed defenses.

The Wild Weasel operation—the Air Force has a number of F-4's that are especially configured to detect emissions from defensive radars. These airplanes and their pilots are, you might say, optimized to find and directly assault those radars that are associated with the missile and gun defenses.

Air Force Wild Weasel operations can be rather effective providing the specialized F-4 aircraft can be equipped with an

antiradiation missile which is effective for the battlefield problem. A current effort in that area is under the HARM project which has recently been restructured with special emphasis on the Wild Weasel concept.

One obvious and historically effective means of slowing armor is mining. The most effective mining, as demonstrated at the battle of Kursk Salient in 1943, was to plant thousands of mines by hand 18 inches apart.

Air-delivered mines can also be fairly effective when distributed in a timely manner from tactical aircraft either via minimum altitude spreading or from medium altitude toss bombing maneuvers. We are developing a common mine for use by the Army and Air Force; it is known as GATOR. Another mine under development is the PIRANAH; this weapon can be used to mine streams and river ford areas and could be very effective at slowing an advance in some areas.

Other R. & D. efforts of interest include investigation into the possibility of using forward-fired missiles from very low-flying aircraft.

The problem is difficult because of the inability of the human eye to acquire and recognize targets at distances necessary to afford an opportunity to accomplish weapon launch before getting so close to the target that launch and guidance are impossible. When flying at 200 feet in low-contrast conditions we are not sure how far away you can see armor. We should have sufficient basic data on this question this year to form a basis for a conclusion relative to the practicality of such a system.

My discussion thus far has focused primarily on the USAF relative to our primary conventional war deterrence responsibility. I will now discuss briefly U.S. Navy tactical air arm which comprises about 40 percent of the total U.S. tactical air resources, an air force, including the USMC, that is larger than any other NATO nation. From a historical standpoint, it is interesting to note that the USAF has absorbed and is flying more Navy developed aircraft and weapons for the interception and attack missions than the Navy. I am referring particularly to the F-4 and A-7 with associated weapons such as the Sparrow and Sidewinder air-to-air missiles. At the present time, efforts to supply the Navy with derivatives of Air Force initiated aircraft developments are yet to be successful, albeit the F-18 program may represent a breakthrough.

It has been generally accepted that the environment of the aircraft carrier is so rigorous that the impact on design criteria makes it difficult or impractical to go from a land-based design to a carrier-based design. On the other hand, it appears that a fighter or attack airplane designed for carrier operations is easily adapted to land-based operations.

The carrier design, however, must bear the burden of structure and fuel relationships which, for equal levels of technology, constitute a serious penalty in performance and cost which are difficult to accept for the land-based mission. On the other hand, the environment of the carrier is less rigorous than that of an airfield which is exposed to the weather, mud, dust, enemy attacks, and general chaos one can expect when operating within easy reach of enemy

air, their agents, and what could be a hostile surrounding population. We must keep in mind there are supposedly thousands of enemy agents operating in Germany. We must anticipate that they will contribute to our problem when operating from land bases.

Weapons components and subsystems can be stored, handled, tested, and repaired in an orderly and controlled environment aboard a carrier even during a war, whereas such an environment is unlikely for an airfield adjacent to enemy territory. I am citing this difference to make the point that certain design criteria and levels of equipment sophistication which may be acceptable from a support standpoint on a carrier may be impractical for operations from an airfield. The bottom line is that as good as commonality sounds, it is not always practical.

In the interest of containing the scope of this presentation, I will restrict my comments on naval tactical air to a few major points which you may wish to examine in greater depth later.

The tactical fighter, interceptor, and attack elements of naval air are primarily to support the projection of power ashore which we interpret primarily as a means of supporting USMC or U.S. Army amphibious landings in an invasion where only sparse supporting land-based air could be brought to bear. That is the view of naval air from our office. As you talk to various people around this town you find there are other views. That is one you can come to grips with and it could be supported.

The high value and apparent vulnerability of an aircraft carrier to air attack is a legitimate reason for having a large portion of carrier aircraft designated for protection of the carrier and associated task force. The visualization of the role of naval tactical aviation accounts for the character of the force which emphasizes fleet air defense in the form of the F-4 and F-14 along with long-range ground attack aircraft.

Close air support and interdiction of a Pact/NATO kind of battlefield have not been high on the Navy tactical air priorities. Assuming you may have to work a considerable distance from the beach, the aircraft have to have long legs and they also have to have an amount of reserve fuel.

Nor has it been possible to identify how a significant portion of that tactical air force can be directly used to counter a Pact attack. It was recently suggested in the Congressional Budget Office report on the Tactical Air Force that, " * * * it might be wise to establish a Navy capability to operate its tactical aircraft from land bases in Europe." The report suggested that, "If the Navy had 'bare base' kits, its tactical aircraft could operate from land bases in Europe."

The proposal has merit, however naval air tactics and equipment requirements would have to be modified to make the expense worth the effort. Further, naval units would have to exercise in the European land-based environment if they were to be useful when called.

I have covered a number of points which I feel should be of primary interest to those who would strive to understand the relevance of tactical air and the associated R. & D. efforts. I want to offer one last point which may dominate all other considerations in assessing or developing a combat force whether it be on land, sea or

in the air. A historical analysis of war and battle activity supports that the dominant factors in the effectiveness of a combat force are training, tactics, and leadership. It is possible to procure equipment with such inherent complexity, sophistication, and operating cost that it is impractical to provide sufficient training for the air and ground crews to be effective in a war environment. A force of simple reliable systems operated by highly trained crews will accomplish more in the chaos of battle than might be suggested by classical analyses. If the cost of tactical air is an issue and if funding constraints are to be considered, I would advise that funding for training exercises be protected.

In summary, I hope my presentation has provided some insight into our effort to relate the high priority NATO war deterrence goal to the R.D.T. & E. programs we are supporting. I have attempted to illustrate the importance of the combat environment to equipment characteristics and our defense goals. I hope that this brief overview will provide a basis for further discussion and will be helpful to you in consideration of future budget issues.

[Testimony resumes on p. 34.]

[The prepared statement of Mr. Myers follows:]

PREPARED STATEMENT OF CHARLES E. MYERS, JR.

AN OVERVIEW OF TACTICAL AIR R&D OBJECTIVES
FROM THE PERSPECTIVE OF THE
ASSISTANT DIRECTOR (AIR WARFARE), ODDR&E

During the late fifties and early sixties, the focus was on nuclear war. This period spawned a family of attack aircraft such as the Air Force F-105 and F-111 and the Navy A-4, A-7 and A-3J, all for deep strike with nuclear weapons. Air defense requirements dictated a family of interceptor aircraft such as the Air Force F-101, F-102, F-106 and the Navy F-4. These four aircraft were designed to counter nuclear bombers under low visibility conditions using radar and radar missiles. Performance criteria for the interceptors emphasized a quick climb to 40,000 feet and acceleration of Mach 2 speed to minimize the time from take-off to intercept. The air-to-air missile weapons included conventional and atomic warheads. The air-to-air missile weapons excluded the gun because the visualized air intercept was based on a long range kill, usually head-on, with no requirement for visual contact. It also seemed needless to design the cockpits for external visibility other than that required for take-off and landing and such factors as aircraft signature (size, smoking engines, etc.) were given no consideration nor was aircraft systems vulnerability to AAA. For both attack and interceptor aircraft there was to be little contact with the enemy defenses nor would the envisioned nuclear action entail a prolonged conflict or high sortie rates. And, most of the flying would be from well-stocked and adequately manned bases. Air-to-air close combat ("dogfighting") was again declared a thing of the past. (The same declaration followed

WWI, WWII and Korea.) Close air support and battlefield interdiction were not emphasized. Pilot training was not heavily oriented for these missions.

It was against this background that President Kennedy, in July 1961, issued the call for our forces to provide ".....a wider choice than humiliation or all out nuclear war." Our air forces were not equipped or trained for conventional or limited war. There was considerable momentum on the part of our research and development community in driving technology to yield the sophisticated equipment which could increase our margin of superiority over the Russians in a nuclear conflict. A few years later, before any perceptible change could be detected in the character of our forces, we found ourselves heavily engaged in the conflict in support of South Vietnam.

Our SEA experience of the mid-sixties demonstrated that some of the sophisticated equipment and weapon concepts of the nuclear age were less than useful and on occasion, hazardous for our own forces. The need for a gun for dogfighting became readily apparent as did the need for air combat training. The discarded "rules-of-engagement" which dictated visual identification were revived. The problems of target acquisition on the battlefield plagued the pilots of the high performance fighters as they tried in vain to locate and attack illusive vehicles and people. The softness of our jet aircraft, their lack of

resilience contributed to the high losses from simple enemy AAA defenses. Controlled attrition in an endless contest became a way of life and had a detrimental and lasting influence on mission planning, tactics and flight techniques. Defense Suppression became a mission unto itself with emphasis unheard of in past conflicts. Time was not a factor. Stand-off became a golden objective. The orchestrated air armada which requires much planning, timing, coordination, unobstructed communications and good weather evolved as a basis for writing requirements and projecting equipment needs for future air forces. The concepts of the nuclear age coupled with the exposure of SEA were to combine with a third force that was emanating from the Pentagon and Congress in influencing the "requirements" which determine the character of tactical combat aircraft. Cost effectiveness and an apparent limitation of force size became very strong factors. First, the criteria for approval of a new aircraft included an analysis which would project a significant cost-effectiveness advantage of the new aircraft over the existing one. It was advantageous, of course, for the proposed system to combine many mission tasks such that it could, within the analysis, be compared to two or three special purpose systems and obviously show a C/E improvement. The fact that the new aircraft was to be much more expensive than any of the alternatives was not a great hinderance. Additionally, the Congress had established limitations on the numbers

of aircraft in the tactical force. The constraint on force size naturally lead military planners to insist that each airplane be fully capable of performing more than one mission and, hopefully, for more than one service. You may recall that the concept for the TFX (F-111A) was that it would combine deep-all-weather-nuclear and conventional strike, all weather intercept, close air support, reconnaissance and air fighting from land or aircraft carrier. And, it was to be more C/E at this combination of missions than any existing aircraft. While in the proposal stage, particularly with a bit of technical optimism, it is understandable that one could begin to accept such a concept. Following the TFX and with the appearance of enemy fighters and the rebirth of the "dogfight," the USAF launched a CFP for a new fighter, the FX. The new USAF fighter, as described in the FX CFP, was an all weather, deep interdiction, attack-fighter-interceptor - it was destined then to weigh 60,000# and cost \$20M. Fortunately, the forum in the Defense arena assisted in paring it down to the all weather interceptor-fighter with the emphasis on air fighting, which we know today as the F-15

The all purpose syndrome was strong in the early sixties because of the forces I mentioned - it is still with us and will persist until there is an incentive to support other than an all purpose system. The decade of the sixties has tempered the community to accept that combat aircraft will be ever more expensive. Unfortunately, along with this has come the acceptance of an ever decreasing force size.

In the mid-sixties, both defense and industry people made an effort to counter the higher cost/smaller force trend through the design of special purpose, lower cost combat aircraft. They focused on the fundamentals of basic tactical air warfare and the development of fighter and attack aircraft tailored for the missions of air fighting over the FEBA and anti-armor to support an intense ground battle between modern equipped armies. From these efforts evolved the Lightweight Fighter and AX programs and eventually the F-16 and the A-10.

In the early seventies, the general guidance contained in President Kennedy's speech reappeared in a formal sense in the form of the Secretary of Defense Planning and Programming Guidance Memorandum (PPGM). This document directs us to focus on the task of developing and fielding an array of equipments and forces which can deter a Warsaw Pact conventional attack against NATO. The "Air Warfare" effort under the Deputy for Tactical Warfare Programs, is to guide the development of weapon systems which can provide our tactical air forces the hardware which can be effective in a NATO/PACT conflict. The character of the enemy forces and their attack strategy can be best described as a super blitz by echelons of massive armored pile drivers. The often expressed need for increased NATO firepower may be an over-simplification of the solution for countering such a force. Multiple flanking counter strokes to destroy PACT cohesion and increase stress on their battlefield mechanism, to disrupt their command and control, and to create confusion and disorder are perhaps better choices. Mobile anti-tank/armored teams with tactical air support can drain the momentum of a blitz offensive. The ability of tactical air to support and lead such actions is the

justification for its cost. The potential of the tactical air forces, in the eyes of the Red war planner, emerges as the measure of the worth of tactical air in deterring a PACT attack.

How can one evaluate the worth or capability of a tactical air force in peacetime? What are the measures? During the sixties, our analytical community attempted to evaluate equipment in terms of cost effectiveness with units such as ton miles/dollar. The same cadre of analysts relied upon firepower scores per invested dollar for ground forces. Although readily obtainable and understandable, such measures are seldom sound measures of a combat potential. A realistic assessment of a tactical air force must be based on an evaluation of its:

- o leadership
- o tactics
- o training
- o equipment numbers
- o equipment in commission rates
- o sortie rate potential (missions/day)
- o ability of aircraft weapons to inflict multiple kills
per pass for BI
- o ability of fighters to win in the "crowded dogfight"
- o weapon effectiveness in a chaotic environment
- o plans for operations in the absence of command and control
- o ability to prosecute mission in spite of heavy defenses
- o resilience of the force

Research and development efforts and choices of technology must be sensitive to these same factors. Also, we must give consideration to the battle arena weather and terrain and likely actions of a resourceful enemy. Except for a few brief moments in history, our US Air Forces have not experienced combat in a defensive situation, especially against such a capable enemy force. For the NATO/PACT problem the weather must be assumed as marginal with low ceilings and poor visibility; the enemy will have the option of initiating the attack, therefore, confusion and disorder must be taken for granted; individual battles will be chaotic and desperate; it may not always be possible to disengage from the enemy; orchestrated actions will be difficult to conduct; the battle situation will be fluid; our bases will be subjected to attack; communications will often be jammed; stores may be destroyed by direct or covert enemy actions; key support personnel and facilities will be subject to attrition. This is the environment in which proposed solutions must be judged. This is an environment which our military staff planners and those who guide our weapons RDT&E have begun to use in considering the combat utility of proposed systems.

From my perspective, all is not black. Whereas it may not be practical to expect sufficient funding to field a clear firepower superiority over the PACT, it is conceivable that we, with NATO, can field a force which could disrupt and blunt a blitz offensive. The key is to choose equipment that we can afford to procure and operate with such frequency that our crews can maintain a high state of combat proficiency. Further, the forces

must have hardware depth such that early high losses can be absorbed. Fighters that cost \$20M each and precision guided weapons that cost a \$100K are unlikely candidates to form such a force.

Tactical air of WWII, Korea and SEA amassed an effectiveness history against ground vehicles of less than .1 kills/mission. We must provide weapons and training such that this ratio can be raised at least to unity or better on a per pass basis. This means that many aircraft and pilots must be accomplishing many kills/pass.

The traditional sortie rates must be tripled and sustained for significant periods if we are to turn the tide. Such sortie rates are hardly possible with large formations which combine the attack, fighter escort and defense suppression orchestrated by an airborne controller. Instead, many small flights on numerous tracks appear to be a more manageable and effective operational concept.

Minimum altitude tactics for performing battlefield interdiction appear attractive and complement the smaller formation, random track concept. Appropriate aircraft force size and weapons to support the suggested methods are not characteristic of our existing force. However, we are in transition and many R&D efforts are underway which provide a base for growth in the direction suggested. Tactics are in evolution and it is our goal to launch the development of munitions and equipment which can be useful for full exploitation of the expanded tactical options of the early 1980's.

The momentum of existing development and procurement coupled with the institutional inertia always makes change painful. Congress, hopefully, will encourage the change. A fundamental and attractive inducement which can accelerate improvement is the option for increasing the size of our tactical force within a fixed LCC ceiling. The allure of extra wings of aircraft can curb any tendency toward gold plating and induce a rejection of the multi-purpose goals of the past which paved the way to highly sophisticated, expensive systems and hence the ever decreasing force structure.

In working the problem, we try to focus on the goal of deterrence. Deterrence is attained by displaying forces and equipment in such a fashion that the Soviet war planner and military analyst will be less than confident that he can successfully execute multiple, rapid advances, especially from a peacetime posture. We make one important assumption in our work; it is that the Soviet staff is fully capable of assessing our conventional capability to react and blunt their attack. After engaging US forces for a decade and having fought with and against our equipments in many environments since 1941, there are no mysteries about the potential combat utility of our advertised conventional systems for a war in the European environment.

An assessment from such a perspective provides the basis for a re-evaluation and redirection to expand and improve the capability of TACAIR. I will discuss some of the more obvious desired additions or changes related to some key tasks. These are samples of the kind of

objectives and programs we are supporting in the short term for improving the NATO/PACT problem of conventional deterrence.

o Protection of High Value Assets from Initial Soviet Air Strikes.

NATO radar directed surface-to-air defenses such as Improved Hawk, Patriot and Roland could serve to make the air space above a few hundred feet most hazardous. An additional task would be to close the very low altitude penetration corridor to the low flying enemy strike aircraft. The classical approach to this task is a force of all-weather interceptor fighters which are equipped with effective look-down radars and shoot-down missiles which are effective against low flying targets while employing countermeasures. The candidates for this feat are the F-15 with the BVR missile such as the AIM-7F monopulse, AIM-7 Skyflash and the new, smaller, fire-and-forget AMRAAM. This new missile will be small enough that it can be used on smaller fighters such as the F-16, F-18, F-5, and Mirage; therefore, the AWX interceptor air defense force could be expanded with less expensive airplanes than the F-14 and F-15.

o Counterstrike Against the Aggressor's Main Operating Air Bases (MOBs) to Gain the Air-to-Air Initiative. If NATO air forces were to absorb heavy first strikes from the PACT and if they were badly outnumbered to begin with, no conceivable amount of air-to-air fighting capability would permit a return to parity in a few days. The problem is illustrated in the fan curves displayed here. An immediate, unstoppable counter-strike capability that is insensitive to weather is needed for attacking

Main Operating Airbases (MOB). It, coupled with follow-up aircraft attacks, could degrade the aggressor's air operations and attrit their force to the degree that NATO air could capture the initiative on the first day of a war. The prime candidate for the task is a surface-to-surface ballistic missile which is targeted against the MOBs. Funding for such a missile is included in the FY78 budget in the form of a conventional warhead, fixed base version of Pershing II.

o Blunting the Blitz through Direct Air Attacks Against the First and Second Echelons of Armor and Supporting Elements. This activity falls under the missions of Close Air Support (CAS) and Battlefield Interdiction (BI). The character of the targets are massive, concentrations of tanks, APC's, mobile artillery and mobile air defense systems. They could be expected to spill through the road network and would be attempting to move a considerable distance each day. Keep in mind that in a double envelopment attack from East Germany, the maximum distance that any unit must move to reach Bonn, is about 180 KM. This is why it would be so critical to effectively blunt the attack in the first few days. The terrain varies from rolling hills in the South to the plains with forests in the North. The northern regions are best suited for rapid movement by armor. The weather often produces a low overcast with visibility under three miles. In our work, we generally assume there is a solid overcast at 1000 to 1500'. The Soviets could be expected to move continuously through the night, though at reduced rates. Tactical air would have to blunt the main thrusts until the NATO ground forces could be

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I have covered a number of points which I feel should be of primary interest to those who would strive to understand the relevance of tactical air and the associated R&D efforts. I want to offer one last point which may dominate all other considerations in assessing or developing a combat force whether it be on land, sea or in the air. A historical analysis of war and battle activity supports that the dominate factors in the effectiveness of a combat force are training, tactics and leadership. It is possible to procure equipment with such inherent complexity, sophistication and operating cost that it is impractical to provide sufficient training for the air and ground crews to be effective in a

war environment. A force of simple, reliable systems operated by highly trained crews will accomplish more in the chaos of battle than might be suggested by classical analyses. If the cost of tactical air is an issue and if funding constraints are to be considered - I would advise that funding for training exercises be protected.

In summary, I hope my presentation has provided some insight into our effort to relate the high priority NATO war deterrence goal to the RDT&E programs we are supporting. I have attempted to illustrate the importance of the combat environment to equipment characteristics and defense goals. I hope that this brief overview will provide a basis for further discussion and will be helpful to you in consideration of future budget issues.

Mr. LEGGETT. Thank you very much for that very provocative analysis. You are very soft spoken; you are measured in what you say; you are high on the list of defense planners in the Pentagon and certainly the implications of what you say are significant.

Some of the things that you are saying are that there is a blur between the strategic and the tactical; that the recent wars are probably not the kinds of conflicts we will be faced with in the future; that we do appear to be mesmerized with the NATO kind of confrontation with respect to all forces except the Navy; that the Navy is not postured very well to support NATO; that any kind of NATO engagement will be over so quickly that conventional resupply from the United States in a conventional war might be beside the the point.

That is what I got out of what you are saying. It seems to me if we get into a war in Europe that it is not going to be the kind of thing where you can have a tactical confrontation, disengage, go back and have a highball at the club and get ready for the next day's engagement, because we are going to have the kind of thing where you penetrate virtually every stage immediately.

I think we are all aware of General Hollingsworth's analyses and the plea thereto, the vulnerabilities that we have in our so-called line confrontation. Certainly I think in any kind of long-term deployment where we have forces arrayed on either side of a line, the force that chooses to be the aggressor can pick his time and place and surprise, and he may not surprise you today or 1 year from today or 3 years from today or 5 years from today, but certainly maybe 10 years from today there has to be a time when surprise can be a mighty effective kind of activity.

The question comes up as to whether or not we are poorly deploying or misallocating a large portion of our assets in the TACAIR field. I know at the outset we had in mind that the A-10 would be a \$1.5 million vehicle with certain limited capabilities. Now the costs are up considerably. The FX was to be a few-million-dollar vehicle. The costs on that, including the Navy version, are up considerably.

On the other hand, I think you can project that in spite of the fact that you have F-14's loaded down with considerable amounts of capability, due to the large numbers that are being constructed the unit costs, at least the current flyaway costs, are reasonably comparable with future program costs of some of the so-called lesser developed vehicles. Do you want to address yourself to that?

Mr. MYERS. One point I did want to make. The emphasis on Europe I do not think is improper in that we have to present a capability that would discourage the Pact from exercising the option of attacking NATO. We are just going to have to do that. It could be so inviting. Whether or not that is the most probable war is subject to debate. In fact, I might yield to those who say that is not the most probable area for the next activity, but it is one you cannot afford to walk away from.

If you are properly equipped for that deterrence problem, that same equipment will be very useful to handle lesser conflicts in other areas.

It appears to me that that is the case with some modification. In fact, the reverse is not true, that to concentrate on the form of military activity that might occur in some more remote climate, some lesser threat, will be almost useless in the NATO arena. You just have to focus on the antiarmor problem, for example.

We killed a number of armored vehicles in Southeast Asia, PT 76's. You do that by strafing it with an A-7, but you are not going to have any more effect against a T-62 tank with a .20 millimeter gun than maybe causing the crew to close the hatch.

Relative to the cost of the equipment, it is true that it all comes out worse than you had hoped. We had designed to cost goals on airplanes like the AX and the lightweight fighter. You remember when that was a \$3 million airplane. We did not make that, what has finally evolved as a missionized fighter airplane. I am not ready to concede that was a futile effort.

I relate to the thoughts of the guys in the backroom who were pushing those cost constraints. The guys in the backroom to whom I refer was a coalition of people both in industry and in the military who were struggling with the same problem with which Congress struggles, the cost of equipment and a declining force structure.

It seemed almost impossible to win arguments about what should the capability of the equipment be. How could you constrain the requirements? Can you limit the capability? They argued in support of requirements for a simplified airplane and never win that argument. So, finally, they gave up and said, let's try to establish a ceiling on how much it costs, because if we can establish a ceiling on how much it costs, that will constrain its character.

They did. The F-16 turned out to be about half the size of an F-15. It is a very high-performance, very agile fighter airplane; the same way with the F-17 relative to the F-14.

The AX turned out to be the A-10, which is maybe a little bigger and more expensive than we had envisioned, but it did not turn out to be what it could have, which was another all-weather deep strike do-everything airplane in the 1980 era. So it was constrained. It costs more, yes, but look at the character of it. It very clearly is devoted to that one major task of interdicting the battlefield and killing armor.

The F-16 evolves with extra capabilities. Basically, however, that airplane is still a very capable fighter, which I think will handle the threat far into the future.

Mr. LEGGETT. Mr. Pike.

Mr. PIKE. Thank you, Mr. Chairman. There are several things in your statement that causes me great concern as we try to think where our money should go in preparing for possible future conflicts.

When we are talking about, tactical air as opposed to strategic air or anything else, the whole concept that we are gearing our efforts to defend a NATO-type conflict just indicate to me that while the Russians may be using the same tactics that they used in World War II, we have not learned anything since World War II.

We have fought two wars since World War II and neither of them has remotely resembled that kind of conflict. If we prepare to fight another NATO war, it would be my guess the next war we fight will not be another NATO war.

As I said earlier, I cannot conceive of any reason on earth why a Soviet military planner would not be going the direction which you say we cannot even defend against. I think you are just as wrong as can be that we cannot provide a tactical air force for that kind of defense. But assuming you are right, that would be even more reason for the Soviets to go in a different direction.

I take personal affront when you say on page 16 that the Navy has put a low priority on close air support. The Marines invented close support. The Air Force was dragged kicking and screaming into the concept of close air support. The Air Force never in its career built an aircraft for the purpose of close air support until they built the A-10, and then they were ordered to do so. They did not want to do that.

The Navy and the Marines in particular invented close air support and were the experts in close support. You may gather from this that I was a Marine Corps pilot.

Mr. MYERS. I recall.

Mr. PIKE. For you to say the Navy has never shown an interest in it just flies on the face of history.

Mr. MYERS. Sir, I would not say that.

Mr. PIKE. Your language was—I would not bother reading it again; page 16.

Mr. MYERS. I said they had not put a high priority on close air support and interdiction of a Pact/NATO kind of battlefield. That is a fact. Let me explain that.

Mr. PIKE. Yes.

Mr. MYERS. Taking as an example basic munitions—first of all I would like to give the Marine Corps credit for the fact that the Marine Corps has a system for conducting close air support and they have a capability to operate autonomously, which we admire and we need more of that. They know how to perform close air support, but there is not a gun in an airplane in the U.S. Marine Corps that will do much more than knock a chip of paint off a T-62 tank.

Mr. PIKE. There was not one in a close air support aircraft in the Air Force until we made them.

Mr. MYERS. I am not differing with you on that. I am just saying we have not seen any emphasis on equipment for that particular problem.

Mr. PIKE. I have very strong feelings on the subject of close air support. I held hearings on it early during the Vietnam war, and we were terrible. I think that the force we had during the Vietnam war was just exactly what we are planning now, a force that would have done pretty well in Europe. I think the force that we are planning today is a force which, once again, would do very, very badly in the kind of war that I believe we are likely to be confronted with.

I would like to get to a much broader picture, which I think is timely. That is this: How often in your planning career when you have gotten all through with your planning and your tradeoffs—let's assume all of your assumptions are correct—have you found that political judgments intervene to upset that which you had so carefully planned?

Mr. MYERS. Continually.

Mr. PIKE. What good does it do for us to have your office if, when you are all through with your planning and your analysis, political judgments intervene?

Mr. MYERS. I would like to step way back from that question.

Mr. PIKE. I bet you would.

Mr. Chairman, I ask unanimous consent to withdraw the question. The man's job is on the line.

Mrs. HOLT. Mr. Chairman.

Mr. LEGGETT. Mrs. Holt.

Mrs. HOLT. The point that I want to ask about is that we keep talking about not being prepared for the kind of war that we know is happening and is going to continue to happen. But isn't the reason we have kept some kind of stability in the NATO-Pact area is because we have been strong there? The minute we let up, those tanks are going to come rolling across the border there.

Your answer is not to change our means of defending ourselves but to find ways to make the means interchangeable? Is that what you were saying?

Mr. MYERS. Yes. It just does not appear wise to let down. The NATO nations are dependent upon us for our support, and we are doing the best that we know how to field forces which would discourage an attack.

You do not always have to have a force that is clearly superior, because it would seem to me that a planner who is exercising a possible adventure has to be able to display to his bosses, his political bosses, a high degree of confidence that he is going to role through it like a dose of salts. I think that a modest goal would be to field a force that would cause them to be very shaky about the success of that operation.

Back to Congressman Pike's point, which is ever there. Perhaps what we have to do is to make a more directed effort to provide a segment of the force and that is not just hardware. If you really look into it, it is probably people and knowledge of how to operate in that other environment. There have been times when we try to do that but maybe on occasion it gets brushed aside, but it is something we probably ought to have. But right now in our office our effort is truly much dedicated to the NATO problem and by direction.

Mr. LEGGETT. I do not mean to take your time, because you can get as much as you want, but considering the fact that the Soviets were selling roast beef for 50 cents in 1954 and they are selling it in 1977 for 55 cents a pound and they are selling their houses for exactly the same thing, which indicates that wage-price controls have been alive and well over there for the past 20 years. The fact that they can buy the same amount today for the ruble that they could back in 1954, does that not force us to look for more cost-effective things on our side since we have this huge escalation, 69 percent, since 1969? Isn't that right, Mr. Pike? You know those figures.

Mr. PIKE. Since 1969; I think that is about right.

Mr. LEGGETT. Considering that, and considering that we have this creeping inflation on the allied side and the free world side where we are continuously spending more and more and getting less and

less, it kind of forces us not to produce a mirror image of the Soviet Union on our side. We have to produce airplanes that can shoot and target 20-plus foreign targets. We have to develop the lookdown, shootdown capability. We have to develop all of the various sophistications on our vehicles. We cannot have 30,000 tanks. We have to have a few XM-1 tanks, but they have to be the very best in the world.

What you are saying here is in some way we would be perhaps much better off, if not a better balance of power, if we had more of a mirror image to the Soviet Union than we do. Unfortunately, with our system we just cannot afford it. We do not have forced conscription so we cannot have 5 million men under arms. All we can have is 2 million. That forces us into certain kinds of expensive consolidations of equipment and activities that necessarily are the kind of deterrent that we are forced into.

Mr. MYERS. That could be that we have been induced into a direction that is not best. Take a fighter squadron, for instance. It has considerably less airplanes than it has pilots. Now, could you visualize in the first day of action you would have pilots standing around with no airplanes in that they were shot up, came back and landed, slid in on their bellies? What they would really need is a new airplane to climb into. We do not have any extra supply like that.

Mr. PIKE. Would the gentleman yield?

Mr. LEGGETT. Mrs. Holt's time.

Mrs. HOLT. I yield back my time.

Mr. PIKE. There is also the opposite corollary, a strafing attack aimed at the airfield just happens to kill more pilots than it does airplanes. It works both ways.

Mr. MYERS. The basic thought I mentioned was relative to inducement to go the other direction is a key question. Will it ever be permissible to consider increasing the force size if the character of the aircraft were less sophisticated?

Mr. PIKE. On that, if I may, Mr. Chairman. There are things in your statement with which I wholly agree, and once is that you have to be able to do it in all weather and at night.

I complained about this until you got very tired of hearing me complain about this in my 15 years on the Armed Services Committee, but you cannot go all weather/night with unsophisticated aircraft. I think you are absolutely right to say we have to be able to do it at night and we have to be able to do it in all weather, but that is not an unsophisticated aircraft.

Mr. MYERS. Yes. You recall that particularly during the war we had specialized units as night fighters.

Mr. PIKE. I was one of them.

Mr. MYERS. The point has been discussed much in the last year, should we have a night attack version of, say, an A-10, and should that be a dedicated force? Should there be a night wing from which you would extract detachments? Because the suggestion is that those people that live and work at night probably are 10 times more effective than someone who does it on a casual random basis. That goes down to the night crews. They get the job done when it is black.

Relative to night and all weather, the question arises, take the problem of degrading that Red ground commander's program at night. Because of the nature of night operations it may be—just because of the nature of night operations—even if you had an airplane, very sophisticated system for night operation, which we could guarantee you could find a tank and you would have a very high probability of killing a tank. Because of the nature of night operations, do you think you could operate a force that is large enough with such intensity that it would constitute more than harassment to that army commander?

I think not, but, on the other hand, I would suggest that you should have the capability anyway. You should not give the enemy a free ride, but do not expect that you are going to stop his advance at night—no way.

Mr. LEGGETT. Mr. Mattox.

Mr. MATTOX. No questions.

Mr. LEGGETT. Let me ask this one question. Do you think there is a balance of power in Europe today?

Mr. MYERS. I really cannot do justice to that question. There is a balance for some reason.

Mr. LEGGETT. The committee is going to get a net assessment in a few days.

Mr. MYERS. We are not at war. The enemy did not attack. Is it because they perceive our military capability is such they would fail? Or is it because of some other reason?

Mr. LEGGETT. Maybe it is because the Communists are successful in Italy today. We have a guest today from my Armed Services subcommittee. Mr. Downey, do you have any amicus curae type questions that might be helpful?

Mr. DOWNEY. I thank you for the opportunity. Along with the Research and Development Subcommittee, I was privileged to travel to Europe and ask the Europeans their idea of tactical air war and close air support in Europe. It is really surprising they have a much different view than we do.

As you mentioned, our tactics would be in terms of using the A-10 for close air support. The British would use the Harrier against breakthroughs in armor. How do we reconcile these differences, and who is right and who is wrong? Are the British going to fight one way, the Germans another?

Mr. MYERS. We had a number of meetings last year with representatives from the four air forces, the four-power air forces, and those differences became apparent. The purpose of the meeting was to discover why we cannot cause more joint utilization of our research and development resources, why don't we get together and develop the same kinds of weapons.

The basic problem to that is differences in battle concepts and tactics. We are not discouraged with that. We are working the problem of bringing the two together and discovering who is right or wrong. It turns out it is not a matter of who is right or wrong. It is a matter of which is most likely to be most useful in that arena. They, of course, have thought about their problem for a long time, and they do have different views.

They are low-level attack oriented. They are small flight oriented, as I mentioned. Close support, interestingly enough, I think in the eyes of the British and Germans may not be a viable mission for tactical air forces in the true sense of the word.

Close air support by JCS definition means that the Red and Blue forces are so intermeshed that we now require close integration of our fire. They would believe that is a happy situation. Red and Blue are intermeshed. That means we do not have a breakthrough in process; they are not rolling over us 50 kilometers a day.

The place for TACAIR to excel is to hit those points after a breakthrough or in an area where there was never any resistance in the first place. Once it reaches a point where the ground forces are intermeshed and there is a struggle, European air forces would probably decide to go on to another place where the enemy is still running free.

Mr. DOWNEY. If I might continue in this line for a few minutes. One of the interesting things we learned from the Israelis in their view of close air support is that they would not use it offensively, as we have planned to apparently, air against armor, because of the things they learned in the 1973 war with respect to the air defenses.

They would like to suppress, if they could, any air defenses before they would use air against armor. It would seem to me we might want to take a lesson from them since they were the ones who were fighting. Obviously it was a different environment than Europe. But would you not agree we learned a lot from the problems the Israelis had with the use of air against armor?

Mr. MYERS. I think we learned a lot. Of course they had similar problems. They were using the same category and families of equipment that I mentioned were the residue from the nuclear strike days. Their airplanes are just as soft as ours—some of them are the same—and they were not successful at close engagement against armor that is protected with light, medium automatic weapons fire. It does not take very sophisticated defenses to discourage pilots of planes if they are so soft they cannot tolerate a few rounds of AAA.

Mr. DOWNEY. How many sorties do you think could be done in a wartime environment in the European theater per hour? I have heard estimates as high as 800.

Mr. MYERS. All across the front? I would rather not try to guess.

Mr. DOWNEY. It would be a lot.

Mr. MYERS. Yes. My visualization is if you made a smoketrail behind each airplane that is flying, it would look like a bowl of spaghetti.

Mr. DOWNEY. Since obviously you are going to be flying a lot of visual contact, you are not going to be able to tell from a platform at 30,000 feet who is the enemy, and you have to tell somebody who has a Mig on his tail how he wants to be vectored against the enemy. What does AWACS give you other than early warning? How does it help you do a number of successful sorties per hour?

Mr. MYERS. It may turn out that the justification for AWACS is that first few hours. It can bring about not only warning, not just here comes the attack, but where and in what sectors. You are sitting there with not enough air to go around; where are you going to focus it?

Mr. DOWNEY. Why couldn't you have a less sophisticated platform to tell where they are going to go? We are going to know that, hopefully, from the ground, and then we will put AWACS in the air. Why would you need as expensive a platform as AWACS to tell you they are coming in the numbers they are coming? Why couldn't you do that with another airplane?

Mr. MYERS. Would you mind if I back away from that question?

Mr. DOWNEY. All right. The other point I would like to make, I agree that you need commonality and you need to get along with the Europeans if we are going to have an effective fighting force in Europe. It seems to me while we want to have a monopulse air missile, the British have proven their Skyflash works. The AIM-7F does not hit very much, does not work. The British decided to buy the Nimrod instead of the AWACS. We all of a sudden canceled the Skyflash. It seems to me that is a terrible discouragement of commonality.

Mr. LEGGETT. We are getting into line items now.

Mr. STORM. The service-projected assessments of balance between NATO and Pact tend to focus on the ability to defeat Pact air forces. Are you suggesting that a better measure of our TACAIR effectiveness would be its capability against Pact armor?

Mr. MYERS. The primary contribution of TACAIR will be measured by its capability to blunt the major thrust, particularly those that might be out of control. Now there are two basic situations. Let's turn the weather on and let's turn the weather off. If the attack begins when you have low ceilings and 2 or 4 miles visibility beneath the ceilings, then there may not be a lot of Red enemy fighter interference with tactical aircraft that are attempting to blunt those armored thrusts beneath the overcast simply because there is just no room, they cannot be seen down through the overcast, there is no room for a lot of air activity.

On the other hand, if you turn the weather off and it is a clear day—I will refer again to the eastern front in World War II—you can expect there is going to be a flock of enemy airplanes in the vicinity of the major armored thrust.

Now, in order for TACAIR to be effective, in order for A-10's to be effective at blunting that armor, the pilot has to be able to concentrate a little bit on that job. If he has to be looking over his shoulder and involving himself in defensive maneuvering during each run, he is not going to kill much armor.

So one of the primary functions of the F-16 would be to try to control the enemy air activity in that local zone to make it possible for the A-10 and after aircraft to do their business against the armor. That is one reason why you need the fighter for the air-to-air crowded "dogfight" problem. The other reason is during that first few hours if they launch major air attacks, somehow you have to attrit that force. I would like to use the Vu-Graph.

The surface-to-air missiles make life pretty difficult for tactical airplanes at medium or high altitudes, the Red zone is covered by all manner of surface-to-air radar-guided missiles. It is the area down close to the earth where it is difficult to stop low-flying bombers. So one solution to that is to put an all-weather interceptor in this zone who can see down and shoot down and break up those

raids and attrit those forces that are attempting attack on the major airbases and other high value assets.

The F-14's were operating from land bases; I would think that would be a primary function of an F-14. Also I suggest there is a free zone way up high. It is not the primary worry because the number of airplanes that can fly very high is very small compared to the number that can fly very low. Every airplane can fly under that ceiling if the visibility permits. You can put a lot of airplanes below a 1,000-foot ceiling.

Here on this Vu-Graph is one visualization of the air activity over an armored thrust. This is an attempt to portray the problem. Put yourself in the position of the inteceptor pilot viewing the scene through his radar or the fighter pilot viewing it visually as he approaches the area of combat. This is a very crowded sky, a very crowded dogfight.

Mr. STORM. Could you give us the value of long-range radar? What is the possibility of being able to fire at targets beyond visual range?

Mr. MEYERS. The primary value of the radar and radar missiles on the F-15, the primary value is to stop that low-altitude penetrator. The degree to which you will be able to fully use that radar is going to be a function of many variables. In that particularly bad situation, I portrayed, it is going to be difficult. In other situations it will be useful.

One of the more useful aspects of that radar appears to be the ability to pick up a track, even if your intention—you could be out of missiles, you don't have any left, either because you fired them all or we have run out. The flight commander can pick up the approaching flight and because of the presentation in the cockpit, it will tell him where to focus his eyeballs, what piece of sky to stare at so he can pick up early the incoming fighters. As has been documented hundreds of times—the advantage of seeing the other guy a few seconds earlier makes the difference usually between winning and losing a fight. So it is useful to that point. But its primary reason for being there, not that I would not, however, suggest putting a \$250,000 or \$300,000 radar in every fighter airplane in the world. Its primary usefulness is to stop the low altitude penetrator. It is also useful for the task I just cited.

Mr. DOWNEY. Can I just ask one question on that point?

Mr. LEGGETT. Mr. Downey.

Mr. DOWNEY. If that is the case, that few seconds—and that was demonstrated in Vietnam that most of the back-seat fellows in the F-4 picked up the incoming Mig's—if I may be provocative here, why would you ever want an F-18 if the F-14 provides back-seat capability and the F-18 doesn't?

Mr. MEYERS. The subject of one versus two seats has been analyzed and reanalyzed and reanalyzed. I guess the net result of it all is that there is an advantage for the mission of all-weather intercept, there is an advantage to having a second seat. That crewman who sits back there is a specialist who is going to be much better at reading radar, generally speaking, than the man sitting in the front seat. His attention is focused; he is going to see things sooner because he does it better.

Keep in mind that the reason for the F-14 and the sustaining reason for financing the F-14 is its contribution to defense of the aircraft carrier and the associated task force. That is what it is there for.

The fallout capability to see aircraft while flying in a crowded sky and other such action is just that, it is a fallout. So if you were going to design a system primarily for the problem of defending high-valued targets in all kinds of weather, you probably would lean toward a two-place airplane. But you don't get it for free. It costs more, it is going to be a bigger airplane.

Mr. LEGGETT. Thank you very much Mr. Myers. I think that your testimony has been lucid and enlightening for our members on the task force.

The Chair has some questions that have been prepared by the staff. We will submit those. If you can answer those for our record in due course that would be very helpful.

[The questions referred to follow:]

REPLIES TO QUESTIONS BY CHARLES E. MYERS

Question 1. How serious a threat is Warsaw Pact tactical air to NATO forces? To what extent do we design our tactical systems to meet that threat and to what extent is our antitank and other air-to-surface mission more important?

Answer. Warsaw Pact tactical air is a serious threat to NATO forces and it is increasing in both quantity and quality. Warsaw Pact tactical air strike/attack capabilities present a serious threat to NATO air bases and can be expected to harass and slow the movement of NATO land forces attempting to move to positions to meet Pact thrusts. Warsaw Pact fighter and interceptor capabilities present a serious threat to our strike/attack tactical air forces which could prevent them from accomplishing their missions without prohibitive losses. We attempt to design our tactical systems to meet the perceived Warsaw Pact threat in accordance with policy and guidance. Since the Warsaw Pact tactical air threat is likely to be the most severe threat, we feel our efforts will provide a satisfactory overall capability which would meet lesser threats. In all our planning, we attempt to accommodate all threat requirements, including the Warsaw Pact threat to NATO. In assessing threats, we try to treat each in an appropriate manner, ignoring none at the expense of another. We certainly attempt to maintain a balanced capability vis-a-vis the air-to-air, antitank and air-to-surface mission requirements. Although each critical mission has roughly equal importance, we believe that we must gain air superiority and protect our high value targets (such as air bases and facilities) from enemy attack as a prerequisite for any other mission. Unless we do this, we cannot expect to have a viable capability to perform these other missions no matter how good our equipment.

Question 2. Much is said about the prevalent bad weather conditions in Europe for Air Operations. To what extent can technology overcome this problem?

Answer. Adverse weather affects both air-to-air and air-to-ground mission capability. In each case we must be able to locate and track targets, identify them, and use the appropriate weapon to kill them. In addition, our aircraft must be able to "operate," i.e., take-off, navigate and land safely. Technology is available to provide the capability to locate and track airborne targets. We are developing weapons technology which will provide our fighter/interceptor aircraft with the capability of killing airborne targets under adverse weather conditions, when accompanied by ECM, when flying low and taking evasive actions. Technology at present is unable to provide a completely adequate airborne target identification system which will enable our fighter/interceptor aircraft to employ their weapons in the optimum manner. We recognize the target identification problems and are attempting to solve it. Technology is available to alleviate the impact of adverse weather on purely operational aspects of TACAIR operations. We can provide the capability to launch aircraft under extremely adverse weather conditions. Both airborne and ground navigation systems provide accurate and reliable enroute navigation. Electronic warfare technology provides a capability to detect threats and counter enemy AAA, missiles and aircraft to a degree. IR decoy technology appears to provide a reasonable defense against heat-seeking missiles. Our technology provides perhaps the best

terminal navigation capability in the world, allowing our aircraft to recover under extremely poor weather conditions. In summary, we have made enormous improvements in our capability to minimize the impact of adverse weather on TACAIR operations. We are continuing to exploit technology which will correct existing deficiencies or limitations.

Question 3. Warsaw Pact forces seem to have ever-increasing densities and sophistication in their antiair systems. To what extent are we prepared to meet this threat?

Answer. Warsaw Pact forces do indeed have ever-increasing densities and sophistication in their antiair systems. This threat is always considered in our planning to develop new aircraft, weapons, or equipments. We provide the pilot with comprehensive threat warning information which helps him to recognize and avoid threats presented by enemy AAA, SAM and aircraft defenses. We are continuing development of weapons systems which will depress enemy antiair systems effectiveness. We have air-to-surface antiradiation missiles in inventory and under development. We also have air-to-air antiradiation missiles under development. We have "defense suppression" air-to-surface weapons in inventory or under development. In addition to these active measures to defeat the enemy antiair threat, we have passive protection programs aimed at increasing the survivability of our aircraft by reducing their vulnerability to enemy antiair systems. Forthcoming aircraft, such as the F-16, F-18, and A-18 will also have superior aerodynamic performance in terms of maneuverability and acceleration which will also enhance their ability to survive enemy antiair systems threats. Our technology base is critical to our efforts to prepare our tactical aircraft to meet and survive enemy antiair systems and we are constantly looking for new technology which will provide improvements. Additionally, new tactics coupled with area munitions dispensing techniques may be the most important step we can take to counter the threat.

Question 4. Is it possible that air defenses are getting too sophisticated? Should we anticipate the possibility that air support of troops by fixed wing aircraft will soon become an outmoded weapons concept?

Answer. Enemy air defense are in fact becoming more sophisticated and effective, but we still believe that TACAIR can operate effectively in support of ground troops providing the aircraft and weapons are optimized for that mission. Keep in mind that the most important function of TACAIR may be the ability to interdict and contain an armored thrust until ground forces can be brought into contact. When enemy armor is moving rapidly, the associated defenses are much reduced in effectiveness. This fact coupled with new tactics, area munitions, the GAU-8 gun and a tough aircraft like the A-10 should afford our air forces an opportunity to be effective. New weapons concepts, such as precision guided weapons which provide both standoff and off-axis launch capability, may further enhance the survivability of our fixed wing TACAIR. It is possible that classic close air support (CAS) as practiced in World War II, Korea, and Vietnam, may be an outmoded concept except under benign conditions, but we firmly believe that TACAIR support of troops by fixed wing aircraft is still not only viable but a preferred alternative.

Question 5. Isn't the A-10 an aircraft which we should have had in the last war, but which may not be able to survive in a sophisticated air defense environment?

Answer. Without question, the A-10 could have been extremely useful in both the Vietnam and Korean wars. Its survivability is markedly superior to other inventory tactical aircraft for a number of reasons. It has a very rugged structure, with multiple redundant, armored vital systems. Its engines have very low IR signatures when viewed from most aspects, and heat seeking missiles will find it a much more difficult target than other aircraft. The A-10 is also highly maneuverable, even with a large payload. These and other features were incorporated in the basic A-10 design to enable it to survive a sophisticated air defense environment where it is expected to operate. We believe the A-10 is less vulnerable to most enemy defenses than other tactical aircraft. It has flying qualities which make it the best airplane in our inventory to exploit near minimum altitude attack tactics. The GAU-8 cannon and future dispenser munitions will afford an opportunity to accomplish multiple kills per pass against armor. No other airplane has an equal capability today. Recent tests demonstrated the ability of the A-10 to operate beneath very low ceilings in poor visibility again unmatched by any other aircraft.

Question 6. What are we buying to counter the SA-7 threat?

Answer. The SA-7 hand-held surface-to-air heat-seeking guided missile represents a threat primarily to low-flying aircraft, since the missile has very short range and very low-altitude capabilities. In addition, the SA-7 has a very small warhead and it frequently will not kill an aircraft even if it hit it. We could counter the SA-7 in several ways. One way is to use an IR decoy such as a flare. We have a number of IR

decoys in inventory and a number of advanced IR decoys under development. We can also counter the SA-7 by designing our aircraft survivable by virtue of its maneuverability, armor plate, tough structure, and redundant control systems. Finally, we can counter the SA-7 by employing tactics which minimize exposure to the limited firing envelope of the SA-7.

Question 7. Is the TOW equipped helicopter a viable tank killing system in Europe?

Answer. The TOW equipped helicopter could be a viable tank killing system in Europe under some circumstances. Neither it, nor any other system would be effective under all conditions possible. A helicopter system has advantages and disadvantages as compared to a fixed wing system. The helicopter is obviously slower, has less payload and shorter range than a comparable fixed wing aircraft. The helicopter is more maneuverable than a fixed wing aircraft in terms of turn radius, but it is not capable of high sustained "G" loads. The helicopter is capable of operating at extremely low "nap-of-the-earth" flight altitudes and can thus see terrain and topographical features to mask it from enemy weapons. At the same time it is less capable than a fixed wing aircraft of overflying enemy defenses. Because the helicopter has less payload, it can carry less armor and electronics equipment for threat warning and countermeasures than a comparable fixed wing aircraft. The helicopter has the unique capability to launch and recover without the necessity for a long large operating base and this gives it unique flexibility and survivability. The armed helicopter and the fixed wing attack aircraft should best be viewed as complementary rather than competitive when it comes to performing the antitank mission. The helicopter may show some advantages for CAS while the fixed wing counterpart will excel at interdiction of the battlefield.

Question 8. What are the primary antitank munitions we are buying? How confident should we be in the ability of Maverick and TOW missiles to kill tanks? Will the A-10 kill tanks primarily with missiles or with its guns? How confident should we be in its tank-killing capability?

Answer. We are buying and developing both guided and unguided antitank munitions in addition to the GAU-8 30mm gun. Maverick and TOW are available in several versions. We are also buying the Mk-20 Rockeye unguided weapon. We are also planning to cross-certify the UK-designed BL755 weapon for use on our aircraft. The SUU-30 dispenser system can dispense antitank bomblets. Our development programs are aimed at increasing our very low-altitude capability using munitions which will kill more than one target on each pass. The Maverick and TOW tank kill probability is expected to be acceptable providing they are employed within their intended envelope. Success will depend on terrain, visibility, contrast, the defenses, etc. The A-10 provides the pilot with the option of gun or missiles for killing tanks. The pilot will use whichever option appears to most appropriate for a particular scenario. The A-10 can also employ Rockeye, BL-755 and SUU-30, although from higher altitudes than desired. We feel that A-10 has the best chance of killing tanks of any aircraft in the world. The GAU-8 gun affords the pilot a good opportunity to make multiple kills per pass, a very significant factor.

Question 9. In air-to-air combat, do the Pact forces have any aircraft which pose a threat to our fighter in a 1-on-1 engagement?

Answer. Although Warsaw Pact fighters may have less capable AI radars and air-to-air missiles, a number have excellent performance in terms of acceleration, turn rate, climb, and speed. We can expect that Warsaw Pact forces will be provided with a new fighter designed to counter our new F-16 and F-18 air combat fighters, and these aircraft will be comparable in performance in every way. In many engagements the Pact fighter will have the benefit of GCI control and our aircraft will be denied this aid, and thus the Pact fighter will pose an even greater threat to our fighters. It is important to remember when making sterile 1-on-1 comparisons that real world air combat will consist of "many-on-many" rather than 1-on-1 dogfights. Furthermore, our fighters are likely to find themselves outnumbered by Pact fighters.

* * * * *

Question 11. To what extent will we be relying on radar target acquisition and radar missiles such as the Sparrow in a European air war? Can we expect any better performance here than in Vietnam? Will the Sparrow F program deliver the performance it promises?

Answer. I view the air war activity in two major categories: (1) The attempt by NATO all-weather interceptors to blunt the initial massive strikes by Pact air forces against our high value, prominent targets, and (2) the contest for local air control in the vicinity of major ground thrusts, particularly during periods of good weather. In the first case, particularly at night or if the strike forces are flying beneath a low

ceiling, the radar missiles could be used effectively, even without positive identification, at least against the initial waves. Once NATO and Pact air sorties have become numerous and intermixed, radar missile usefulness will be a function of the ability to sort friend from foe. Hopefully, our R. & D. in this area will yield a solution. The second case will often evolve the "crowded dogfight" wherein 50 to 100 fighter and attack aircraft are in combat against each other and ground targets in a relatively small volume of airspace. In this situation, the information available from radar is less useful, chance for error is high, and the situation is generally chaotic. Even the IR mission has limitations here. The cannon and the IR missile will probably be more cost effective for this situation than any form of radar missile. Relative to SEA radar missile performance, the AIM-7F will be more cost effective than the previously deployed Sparrows because it is much more reliable and is more maneuverable.

Question 22. What is the status of the Navy V/STOL program? In view of future Navy plans for smaller carriers, shouldn't you be devoting more effort to this area?

Answer. The Navy is currently conducting extensive design and conceptual studies which involve wide industrial and NASA participation. In February 1977, a Request for Information/Quotation (RFI/Q) was announced to industry, with the specific purpose of obtaining industry inputs on the Type "A" V/STOL. Industry provided responses relative to technologies and concepts which appeared, to industry, as being the most promising. The Naval Air Systems Command is currently evaluating the responses and will prepare, for a November 1977 submission, a RFQ for more detailed and finite industrial proposals. The RFQ would require major vendors to provide complete developmental approaches. During this same interval, additional analyses are being performed by the Navy such as: ship/aircraft operational interface problems, independent assessment of the technology base to ascertain the scope and/or degree of program risk and cost involved, and performance comparisons of other alternative approaches. The V/STOL program is structured to allow for maximum applications of latest technology. V/STOL decision points and their relationship to the overall long-range planning of the Navy for both ships and aircraft, have been established so that other alternatives can be pursued without force or mission degradation. These critically time-phased decision points are interrelated with the completion of concept studies and technology assessments. During the same timespan, efforts to accelerate proof of critical technologies are underway. The scope and objectives of the program, as proposed by the Navy, are considered to fall within Department of Defense directives and comply with direction from higher authority.

Mr. LEGGETT. We have taken on some interesting matters this morning in a nonclassified form. We have not expanded the parameters into all kinds of other issues that we might have to fight a full war in the world or in NATO. It has been more of a general briefing on the public record with respect to TAC force structures, which involve a considerably large expenditure of our defense budget.

On Thursday the committee will review with the Navy, again, tactical aircraft in room 210. The meeting will be unclassified. At that point we can contrast the views of the Navy with the witness today. Gentlemen, it has been very helpful.

The meeting will stand adjourned until Thursday.

[Whereupon, at 12:10 p.m., the task force adjourned, until 10 a.m., Thursday, June 23, 1977.]

TACTICAL AIR WARFARE

THURSDAY, JUNE 23, 1977

HOUSE OF REPRESENTATIVES,
TASK FORCE ON NATIONAL SECURITY,
COMMITTEE ON THE BUDGET,
Washington, D.C.

The task force met, pursuant to notice at 10:25 a.m., in room 210, Cannon House Office Building, Hon. Robert L. Leggett, chairman of the task force, presiding.

Present: Representatives Leggett, Pike, Lehman, Simon, and Mattox.

Mr. LEGGETT. The meeting of the National Security Task Force will please come to order.

This morning we are going to continue our hearings on the subject of tactical air warfare. We opened our hearings on Tuesday with a general overview and historic perception of weapons system development and force deployment considerations. We also discussed the probable scenarios in a Warsaw Pact/NATO engagement and how our TACAIR forces could best contribute to a favorable outcome in that contingency.

Today we continue our hearings with a look at sea-based TACAIR. We will be interested in how the U.S. Navy and Marine Corps interpret their roles and missions in this area and how well prepared they are to meet them. We also recognize that there are substantial force structure modernization issues that impact on the future aircraft inventory of both the Navy and Marine Corps. We are interested in learning the status of that issue which concerns future procurement plans for F-14 and F-18 fighters, and for A-7 and A-18 attack planes.

In addition, we hope to learn about current Navy development efforts for V/STOL aircraft systems. In view of the Marine Corps long-standing commitment to V/STOL, and the Navy for smaller aircraft carriers by some, and other V/STOL-capable ships, we are interested in learning about the extent of the current commitment and the projections for future investment in V/STOL systems.

Finally, we would like some specific treatment of the question of how Navy and Marine Corps TACAIR would contribute directly and effectively to the major threat currently facing the NATO alliance. That threat appears to be a major offensive by Pact forces in Europe.

Our primary witnesses today are Vice Adm. F. C. Turner, Deputy Chief of Naval Operations for Air Warfare and Lt. Gen. Thomas H. Miller, Deputy Chief of Staff for Aviation, U.S. Marine Corps. In addition, we have a number of supporting witnesses which we can recognize in their proper turn and identify them.

So we are pleased to welcome first Admiral Turner. You have submitted a statement. You can proceed. I would remind you that this hearing is open, it is on the record, and so everything you say is taken down and published. All right.

STATEMENT OF VICE ADM. F. C. TURNER, DEPUTY CHIEF OF NAVAL OPERATIONS (AIR WARFARE), DEPARTMENT OF THE NAVY; ACCOMPANIED BY REAR ADM. J. H. ALVIS, USN, F-14 PROJECT MANAGER, NAVAL AIR SYSTEMS COMMAND; REAR ADM. R. C. MANDEVILLE, USN, DIRECTOR, AVIATION PLANS AND REQUIREMENTS DIVISION, DCNO (AIR WARFARE); CAPT. M. G. BASFORD, USN, HEAD, PROGRAM AND BUDGET BRANCH, DCNO (AIR WARFARE); AND CAPT. G. W. LENOX, USN, F-18 PROGRAM MANAGER, NAVAL AIR SYSTEMS COMMAND

Admiral TURNER. Thank you.

Mr. Chairman and distinguished members of the committee, it is a privilege to present to you today the Department of the Navy's views on carrier aviation. To assist me is Lt. Gen. Miller, Marine Corps Deputy Chief of Staff for Aviation.

On my right I have Rear Adm. R. C. Mandeville, Director of the Aviation Plans and Requirements Division with respect to Air Warfare; on my far left we have Rear Adm. J. H. Alvis, the F-14 project manager of the Naval Air Systems Command. I have other officers behind me who could speak to any of the aircraft that you have an interest in.

At the outset, I would like to make the point that the aircraft procurement, Navy—APN—account, of which I am the appropriation sponsor, encompasses the procurement of all USN and USMC aircraft, spares, and support equipment. With that as an entree, I would like to move to a brief overview of naval aviation, with emphasis on the aircraft carrier and its air wing.

I have a few slides that would illustrate some of the points I would make if you would bear with me.

[The slides referred to throughout the hearing appear on pp. 85-118.]

Admiral TURNER. We would urge that we should continue to support a balanced naval aviation force in order that the Navy and Marine Corps can carry out the mission of prompt and sustained combat operations at sea. The two main functions within this mission are control of the sea, properly called sea control, and power projection. Practically all of our aircraft contribute to one or both of these functions and they do so as part of an integrated fighting force, primarily in our carrier air wings.

Each type of aircraft in the carrier air wing has a specific function designed in the aggregate to defeat an enemy on, under, and over the sea. For instance, of the aircraft that you see on that carrier, the airborne early warning aircraft, the E-2C, and the F-14, with its PHOENIX missile system, as a team shoot down aircraft,

and particularly antiship missiles, whether they be launched from submarines, surface ships, or bomber-type aircraft; the A-7E and A-6E aircraft search for and destroy surface warships at sea and conduct long-range strikes against enemy naval installations, from which the threats to the sea emanate. The fighters escort them; the KA-6D tankers provide the extra fuel for extended range or time that the entire air wing can operate. Also, the same air wing contains the S-3A and SH-3H with dipping sonar to locate and sink submarines. The EA-6B jammers blind enemy radars, and reconnaissance aircraft support all these tasks.

Since the enemy at sea is able to mount at any time a coordinated multithreat attack from different platforms, our carrier air wings must be, and I assure you they are, prepared to engage and defeat that enemy with a 360-degree, 24-hour, all-weather offensive capability.

The management challenge we face in the Navy and in Congress is to determine the numbers and types of aircraft required, and procurement schedules, that will allow us to maintain naval air power force levels adequate to meet the Nation's global maritime requirements, and yet remain within tight fiscal constraints.

As you know, Marine aviation is an integral part of Naval aviation. When I spoke of power projection, I was also referring in part to the Marine Corps role of amphibious assault; that is, projection of power ashore from the ships at sea. To accomplish this, Marine aviation provides five functions for the Marine air-ground team. These are antiair warfare—offensive air support, reconnaissance, including tactical electronic warfare, assault support, and control of aircraft and missiles. The programs I sponsor and am about to describe are required to support these as well as Navy missions.

Since Navy tactical aircraft force levels are related to the number of carriers in the fleet, it might be appropriate to review the trend of carrier force levels.

Since 1962, the pre-Vietnam era, our carrier forces have steadily declined in numbers, to the point that in the FYDP years, we will have half the number of carriers and carrier air wings that we had 15 years ago.

This chart shows the number of carriers and time frame. It shows the decline and the elimination of the ASW carrier called the CVS, and shows the continuation of the CVA, the attack carrier, and now the blending of the two into our CV aircraft carriers. The total level is down from about 29 to now about 13.

Without question our nuclear-powered *Nimitz* carriers are vastly more capable than their predecessors but, as you can well appreciate, there is much to be said for adequate numbers, both as a peacetime deterrent to conflict, and as a fighting force. Likewise, our procurement of naval aviation aircraft has also been sharply reduced over the years.

In 1962 we procured 684 carrier-type aircraft as opposed to 68 requested in the fiscal year 1978 budget; in that 15-year span a reduction from 684 to 68 carrier aircraft. While we must acknowledge that both the cost and capability of carriers and aircraft have risen sharply, so has the threat to freedom of the seas, in the new

Soviet *Kiev* carriers, *Kresta* and *Kara* cruisers, long-range BACK-FIRE bombers and cruise missile-launching nuclear submarines of the two classes as shown, this one carrying eight missiles, the next one also carrying eight, but being capable of firing these while submerged.

I would like to discuss briefly our carrier-type aircraft and note how each contributes to the fulfillment of the Navy's mission in support of national policy.

The F-14 Tomcat is the Navy's firstline maritime air superiority fighter. Its long-range radar and near-simultaneous PHOENIX missile long-range launch capability is unequaled by any other aircraft in the world. It is also an outstanding close-in, "dogfighter." To date we have forward deployed F-14 squadrons six times on our various carriers.

Our F-14 procurement profile has changed significantly. In order to achieve a more cost-effective and production-efficient procurement, we are requesting 44 F-14 aircraft in fiscal year 1978, 60 each in fiscal years 1979 and 1980, and 42 in fiscal year 1981. The total projected buy will be 521 aircraft.

Mr. LEGGETT. The conference report right now on the floor on that is at 40?

Admiral TURNER. Yes, sir, but the total projected is going to be 521. Included in the revised procurement profile is the decision to use the F-14 as an interim reconnaissance platform to replace our RA-5 and RF-8 aircraft.

This is a picture of the aircraft in the reconnaissance role.

An additional benefit to this early F-14 buy-out is realized in the F-4 program where the average age of the Navy-Marine Corps inventory is 12 years. The advanced buy will enable us to retire 40 F-4J's and lower the average age of our fighter force. We have been updating our F-4 forces since 1972 by converting F-4B's to the F-4N and converting F-4J's to the F-14's.

This is the prototype YF-17, nearly identical to the F-18. The F-18 is not in production yet, but the program is progressing as we hoped it would. It promises to provide an aircraft that will have much higher reliability and maintainability than we have experienced heretofore with any aircraft. This reliability requirement has been a part of the total procurement package negotiated between the contractor and the Navy.

The initial production aircraft will be going to the Marine Corps to replace their aging F-4 aircraft. Subsequent aircraft will replace the Navy's A-7, and the third lot will add to the Navy's fighter force. We are asking for the first long lead funds in fiscal year 1978.

Attack aircraft in our tactical air wing, the A-6E and A-7E continue to increase in capability, constantly are being modernized, and are in overall excellent condition. The A-6E shown here is our only true day-and-night, all-weather tactical aircraft in the Department of the Navy.

Mr. LEGGETT. How many of those do we have?

Admiral TURNER. We have 12 squadrons of these in the Navy, and 5 squadrons in the Marine Corps of this all-weather attack aircraft.

The other attack aircraft in the tactical wing is the A-7E. This is a mature combat-proven light attack aircraft that performs superbly in strike, interdiction missions, close air support and at-sea surveillance.

The E2-C, the next one, early warning aircraft, is undoubtedly one of the premier aircraft aboard our carriers. It provides for airborne early warning and command and control for the entire carrier air wing; it provides the fleet commander with an extensive air and surface picture. Subsurface surveillance and attack activity can also be maintained, displayed, and relayed by data links, this very important kind of information can be exchanged between air and surface fleet units. When this aircraft operates in concert with the F-14, we believe we have the finest air intercept combination in the world today.

The improved EA-6B jammer, by its ability to suppress enemy radars, greatly enhances the effectiveness of carrier and Marine air wings. This aircraft shown here, due to its unique electronic warfare capability housed in the various pods—those ugly looking things you see under the wings, but let me hasten to add, highly effective—is often called upon by other services to assist in the testing of their equipment and the development of their tactics in a jamming environment.

Rounding out our balanced and highly effective tactical carrier wings are our sub-hunting aircraft, the S-3A Viking and SH-3H Sea King. The Viking, shown here, provides marked improvement in our ability to find, locate, and destroy submarines under the seas.

Its current sensor suite, for example, provides a fleet commander with about the same capability from a carrier-based aircraft that he has come to expect from the land-based P-3C. The earlier limitations of the SH-3H ASW helicopter are being corrected and the resultant sensor suite is proving to be very capable in the close-in prosecution of submarine contacts, where acoustic methods begin to lose effectiveness.

In summary, in order for a Navy carrier force to be able to act effectively, it must possess the balance and inherent flexibility in its aircraft that I have described. An aircraft carrier so equipped provides the multipurpose airpower capable of maintaining control of the surface, under the surface, and in the air above the seas. We need to continue to update these naval aviation carrier-based forces in order to ensure that this unique and far-ranging capability remains available to the United States as an instrument of its national policy.

If I may now, I would like to have General Miller follow with a brief statement on the Marine Corps aircraft.

[The prepared statement of Admiral Turner follows:]

PREPARED STATEMENT OF VICE ADM. F. C. TURNER

Mr. Chairman and distinguished members of the committee, it is a privilege to present to you today the Department of the Navy's views on carrier aviation. To assist me is Lt. Gen. Thomas H. Miller, Marine Corps Deputy Chief of Staff for Aviation. At the outset I would like to make the point that the Aircraft Procurement, Navy (APN) account, of which I am the appropriation sponsor, encompasses the procurement of all USN and USMC aircraft, spares, and support equipment. With that as an entree I would like to move to a brief overview of naval aviation with emphasis on the aircraft carrier and its air wing.

We need to continue to support a balanced naval aviation force in order that the Navy and Marine Corps can carry out the mission of prompt and sustained combat operations at sea. The two main functions within this mission are control of the sea and power projection. Practically all of our aircraft contribute to one or both of these functions and they do so as part of an integrated fighting force, primarily in our carrier air wings. Each type of aircraft in the carrier air wing has a specific function designed in the aggregate to defeat an enemy on, under, and over the sea. For instance, the airborne early warning aircraft, the E-2C, and the F-14, with its Phoenix missile system, as a team shoot down aircraft and antiship missiles—whether they be launched from submarines, surface ships or “bomber” type aircraft; the A-7E and A-6E aircraft search for and destroy surface warships at sea and conduct long-range strikes against enemy naval installations; the fighters escort them; the KA-6D tankers provide the extra fuel for extended range or time; the S-3A and SH-3H locate and sink submarines; the EA-6B jammers blind enemy radars, and reconnaissance aircraft support all these tasks. Since the enemy at sea is able to mount at any time a coordinated multithreat attack, our carrier air wings must be, and are, prepared to engage and defeat that enemy with a 360-degree, 24-hour, all-weather offensive capability. The management challenge we face in the Navy and in Congress is to determine the numbers and types of aircraft required, and procurement schedules, that will allow us to maintain naval airpower force levels adequate to meet the Nation’s global maritime requirements, and yet remain within fiscal constraints.

As you know, Marine aviation is an integral part of Naval aviation. When I spoke of power projection, I was referring in part to the Marine Corps role of amphibious assault; that is, projection of power ashore from the sea. To accomplish this, Marine aviation provides five functions for the Marine air-ground team. These are antiair warfare, offensive air support, reconnaissance (including tactical electronic warfare), assault support and control of aircraft and missiles. The programs I am about to describe are required to support these as well as Navy missions.

Since Navy tactical aircraft force levels are tied quite closely to the number of carriers in the fleet, it is appropriate to review the trend of carrier force levels.

Since 1962—the pre-Vietnam era—our carrier forces have steadily declined in numbers, to the point that in the FYDP years, we will have half the numbers of carriers and carrier air wings that we had 15 years ago. Without question, our nuclear powered *Nimitz* carriers are vastly more capable than their predecessors. But as you can well appreciate there is much to be said for adequate numbers, both as a peacetime deterrent to conflict, and as a fighting force.

Our procurement of aircraft has also been sharply reduced over the years. In 1962, we procured 684 carrier-type aircraft as opposed to 68 requested in the fiscal year 1978 budget. While we must acknowledge that both the cost and capability of carriers and aircraft have risen sharply, so has the threat to freedom of the seas: in *Kiev* carriers, *Kresta* and *Kara* cruisers, backfire bombers and cruise missile launching nuclear submarines.

I would like to discuss briefly our carrier type aircraft and note how each contributes to the fulfillment of the Navy’s mission in support of national policy.

The F-14 “Tomcat” is the Navy’s first line maritime air superiority fighter. Its long-range radar and near-simultaneous long-range missile launch capability is unequaled by any other aircraft in the world. It is also an outstanding close-in “dogfighter.” To date we have forward-deployed F-14 squadrons six times—twice each aboard *Enterprise* and *Kennedy* and once aboard *America* and *Constellation*. We are scheduled to deploy four more squadrons this year aboard *Kitty Hawk* and *Nimitz*.

Our procurement profile for the F-14 has been changed significantly. In order to achieve a more cost-effective and production-efficient procurement, we are requesting 44 F-14 aircraft in fiscal year 1978, 60 each in fiscal years 1979 and 1980, and 42 in fiscal year 1981. The total projected buy will be 521 aircraft. Included in this revised procurement profile is the decision to use the F-14 as an interim reconnaissance platform to replace our RA-5 and RF-8 aircraft.

An additional benefit to this early F-14 buy-out is realized in the F-4 program where the average age of the Navy-Marine Corps inventory is 12 years. The advanced buy will enable us to retire 40 F-4Js and lower the average age of our fighter force. We have been updating our F-4 forces since 1972 by converting F-4Bs to the F-4N and converting F-4Js to the F-4S.

The F-18 is not in production yet but the program is progressing as we had hoped it would. It promises to provide an aircraft that will have much higher reliability and maintainability than we have experienced before with any aircraft. This reliability

requirement has been a part of the total procurement package negotiated between the contractor and the Navy. The initial production aircraft will be going to the Marine Corps to replace aging F-4 aircraft. We are asking for the first long lead funds in this budget year.

The attack aircraft currently in our air wings, the A-6E and A-7E, continue to increase in capability and are in overall excellent condition. The A-6E is the only true day and night all-weather tactical aircraft in the Department of the Navy. The A-7E is a mature, combat proven light attack aircraft that performs superbly in air support, deep strike and at sea strike/surveillance.

The E-2C is undoubtedly one of the premier aircraft aboard our carriers. It provides the airborne command and control necessary to operate the carrier air wing successfully in all aspects of fleet operation. It provides the fleet commander with an extensive air and surface "picture." Subsurface surveillance and attack activity can also be maintained, displayed, and relayed by data links between air and surface fleet units. In addition, when the E-2C operates in concert with the F-14, we have the finest air intercept combination in the world today.

The improved EA-6B, by its ability to suppress or jam enemy radars, greatly enhances the effectiveness of the carrier and Marine air wings. The aircraft, due to its unique electronic warfare capabilities, is often called upon by other services to assist in the testing of their equipment and tactics in a jamming environment.

Rounding out our balanced and highly effective carrier air wings are our ASW aircraft, the S-3A Viking and the SH-3H Sea King. The S-3A provides marked improvements in our ASW capability at sea. Its current sensor suite, for example, provides a fleet commander with about the same capability from a carrier-based aircraft that he has come to expect from the land-based P-3C. The earlier limitations of the SH-3H ASW helicopter are being corrected and the resultant sensor suite is proving to be very capable in the close-in prosecution of submarine contacts, where acoustic methods begin to lose effectiveness.

In summary, in order for a Navy carrier force to be able to act effectively it must possess the balance and inherent flexibility in its aircraft that I have described. An aircraft carrier so equipped provides the multipurpose airpower capable of maintaining control of the surface, the subsurface, and the air above the seas. We need to continue to update these naval aviation carrier-based forces in order to ensure that this unique and far-ranging capability remains available to the United States as an instrument of its national policy.

Mr. LEGGETT. Very well.

STATEMENT OF LT. GEN. THOMAS H. MILLER, JR., DEPUTY CHIEF OF STAFF FOR AVIATION, HEADQUARTERS, USMC

General MILLER. Thank you, Mr. Chairman.

Mr. Chairman and distinguished members of the committee, I am pleased to have the opportunity to appear before you today with Admiral Turner to brief you on the Marine Corps aspects of naval aviation.

As you know, naval aviation is made up of Navy and Marine air components. The procurement, modification, and support of the aircraft which make up these Navy and Marine components is fully integrated. For the most part, the Marine Corps and Navy operate the same kinds of aircraft with differences only in response to Navy or Marine Corps peculiar requirements.

Examples are antisubmarine warfare, or our Marine Corps peculiar power projection requirements of amphibious assault and operations from austere sites ashore. In the latter respect, Marine Corps aviation is indeed a landward extension of naval aviation. Because of this requirement to rapidly build up combat power ashore in austere sites, the current air assets of the other services do not have the capability nor can they meet Marine Corps requirements. Therefore, we believe we must have unique weapons systems such as the V/STOL AV-8A aircraft shown here.

The combatant element of the active Marine Corps is organized into three division-wing teams. The purpose of the three Marine aircraft wings is to provide air support for that young Marine on the ground in terms of antiair warfare, offensive air support, assault support, which includes electronic warfare, and very importantly, the reconnaissance and command and control.

In providing this support, the Marine Corps operates fighters to protect both the troops on the ground and friendly aircraft from attack by enemy air. Tactical electronic warfare aircraft are used to gather intelligence for the Marine commander and to disrupt enemy weapons systems which use electronic devices to be sure that air support will surely be available. Troops and their equipment are rapidly transported into the most effective combat area with Marine assault lift helicopters escorted by attack helicopters and supported by close air support from Marine fighter and attack aircraft. Reports on enemy movements are rapidly passed to the landing force commander by organic reconnaissance aircraft.

We are proud of this closely integrated team. The Marine crossing the beach or assaulting the hill can be confident of being supported by those with whom he has trained, and who understand and share his personal concern for reaching his assigned objective. Furthermore, this combined force of military effort is under a single commander.

The integration of aviation functions to fulfill our primary mission of service with the fleet for the prosecution of naval campaign, results in Marine aviation being the Nation's only TACAIR and helicopter assault force which is trained, equipped, and ready to operate from sea bases and austere expeditionary bases ashore. This inherent versatility enables Marine aviation, although relatively small, to be ready to respond whenever and wherever needed with a composite force capable of meeting the majority of enemy threats.

Although you, the Congress, have allocated a portion of the Nation's TACAIR and land force aviation assets for employment in Marine Corps missions, you may rest assured that we recognize them as a swing force to support other U.S. services when required. In light of the limited numbers of national TACAIR assets when compared to threat nation forces, this augmenting capability combined with our versatility to operate in a shipboard or land-based role is particularly important. However, fiscal constraints and manpower restrictions have reduced Marine TACAIR forces in the past 12 years—that is commencing with prior to Vietnam buildup—by almost 25 percent.

It must be recognized that although each type of aircraft operated by the Marine Corps has a primary mission we try to avoid overspecialization. Thus, our antiair warfare F-4 fighter and the replacement F-18 are optimized, wherever economically and technically feasible, to perform the offensive air support attack function. Further our V/STOL light attack AV-8's can be a formidable fighter armed with its SIDEWINDER missiles and 30mm cannon. The EA-6 electronic warfare aircraft is a dual function aircraft; performing passive electronic reconnaissance and active offensive air support with its electronic jammers. This multimission capability is just one example of why Marine air is just a cost-effective

force. In addition, Marine aviation has less base support and generally is manned by lower ranking personnel thus giving the Nation more combat power for the tax dollar.

These combat-ready Marine aviation forces are deployed around the globe on ships and at overseas bases. They are a proven cost-effective mobile force available to provide almost immediate response throughout the world in peacekeeping deterrence, rescue, or presence.

Even though we Marines have been ordered ashore only on a relatively few occasions, the Nation has called on its naval forces in support of its diplomatic objectives more than 170 times since World War II. More recently this amphibious force, with the Navy, was called into action for evacuation operations in Cambodia and Vietnam, and to rescue the *Mayaguez*. The importance of these forces, including Navy and Marine aviation, is obviously not lost on the congressional committees. You, the Congress, have consistently supported us over the years. We are proud of your confidence in the Marine Corps and will strive to continue to be worthy of that confidence.

Thank you, Mr. Chairman.

Mr. LEGGETT. Thank you very much, General Miller.

Let me ask you, how does the Marine Corps get its aircraft on station at foreign bases? Do you transport them there by carrier?

General MILLER. Several methods, by aircraft carrier, by smaller helicopter carriers, and by in-flight refueling as we fly them to their objective.

Mr. LEGGETT. I guess you used both methods to get your vehicles to the land bases, say, in Vietnam.

General MILLER. Yes, sir.

Mr. LEGGETT. And it has been suggested that the Navy could carry out part of its mission very much like the Marine Corps does in certain areas through land-based support facilities. What are your views on that or are you allowed to comment on that?

General MILLER. I would prefer to defer to Admiral Turner, if I may, sir, since that is a question I interpret for the Navy.

Admiral TURNER. Would you like me to answer that one?

Mr. LEGGETT. Yes.

Admiral TURNER. Yes. I think the Navy serves—

Mr. LEGGETT. More specifically, the question would be: Since areas like the Mediterranean are so saturated with submarines, very difficult to see, missiles, you have long-range capability able to discriminate and knock out big targets and things like that, that perhaps in certain areas nonblue water-type encounters, the Navy capability might be better deployed from revetted land-based capability?

Admiral TURNER. Having served as the fleet commander in that Mediterranean for the last 2 years before coming to Washington, I can comment on that in some detail as you would like.

It is an area that has changed in the last 15 years, from an area that was dominated completely by U.S. naval forces to an area now in which the Soviet Navy has deployed in large numbers. It has undoubtedly changed the power equation in that sea. But it has not changed it to the drastic—to the extent that perhaps would be

inferred by some of your comments. I was concerned while there that there was a considerable amount of Soviet naval force but I felt that I had enough force in the 6th Fleet to adequately handle that situation at all times. Nor did I envision the use of land bases. Our experience has been that we are best off relying on our logistics support coming from the sea and remaining at sea.

So I do not share your pessimism about the Mediterranean. I feel that it is important for us to utilize our forces wisely, to move them according to the threat, which varies from day to day. Right now it is rather modest, other times more intense. But the flexibility of the Navy to move in or out, around, behind, further away, is one of our key assets; the inherent logistics which we rely on at sea is the second, and, third, our experience with land bases is that they are politically susceptible to elimination on short order and we would be wise not to rely on them.

Mr. LEGGETT. The total projected force structure for the Navy as far as numbers of tactical aircraft, say over the next 2 years, 5 years, is what number?

Admiral TURNER. Navy's tactical force levels are based primarily on the number of aircraft carriers. We are authorized 12 large deployable carriers and one carrier for reserve and contingency purposes. We are authorized 12 air wings to go with those 12 carriers. The 13th carrier does not have an air wing, but two reserve air wings are related to it and train on it. In the next few years there should be hopefully no change to that force level.

Mr. LEGGETT. How many aircraft are in those wings?

Admiral TURNER. Each wing is composed of the numbers and types I showed here. There are two fighter squadrons, three attack squadrons, there is an early warning squadron, a jamming squadron, a reconnaissance squadron, and an antisubmarine, sub-hunting squadron, both fixed wing and rotary wing. So there are nine different types of aircraft in the tactical air wing on the carriers to do the multipurpose role that I have described.

Mr. LEGGETT. What is the number of aircraft?

Admiral TURNER. The total number in that wing, as we saw in the picture here, would be about 90 aircraft.

Mr. LEGGETT. Ninety?

Admiral TURNER. Yes, sir.

Mr. LEGGETT. Times 12 then would be something over a 1,000 aircraft, is that right?

Admiral TURNER. Assigned to the carriers, yes, sir.

Now there are other aircraft in training squadrons that prepare people to go to the carriers, which would be an additive number. There are also aircraft in a maintenance and materiel pipeline, being modernized and repaired and the like.

Mr. LEGGETT. With proliferation, one of the goals of modern war strategists, does that not make all of your 1,000 tactical air capability totally dependent on the survival of those 12 support platforms?

Admiral TURNER. The 12 wings are assigned to the 12 carriers and that ratio is the one that we are authorized and work with.

Mr. LEGGETT. Does that not cause you some concern, in some areas?

Admiral TURNER. It is a question of what is the threat at the given time, and what is the problem faced. In some cases one or two carriers is quite adequate; in another case it may be that six or eight would be indicated for the tactical responsibilities at hand.

Clearly the numbers of carriers we have now are those that we can afford. The number of carriers we would like to have to meet our worldwide commitments is considerably more than the 12.

Mr. LEGGETT. I understand that, but you have to work within the framework of what you have, not what you would like to envision in your best dreams of the defense posture.

Admiral TURNER. Yes, sir.

Mr. LEGGETT. You know, just as a novice, it does cause some of the committees some problems envisioning these war charades. You have indicated that in the early sixties we were building multiple-hundreds of Navy tactical aircraft. Of course we were building up the F-4 fleet, and of late we are building at a considerably lesser number. Obviously one of the major reasons is that the current aircraft cost considerably more than the earlier aircraft; is that right?

Admiral TURNER. Yes, sir.

Mr. LEGGETT. So that caused you some concern, obviously, or you would have shown that chart?

Admiral TURNER. That is right.

Mr. LEGGETT. You would like more aircraft, right?

Admiral TURNER. Yes. I would like to add, I did not include our patrol land-based aircraft, with regard to your question on land bases. That is a separate issue. They are related. For the carrier wings and carriers we prefer not to be involved with land bases.

Mr. LEGGETT. All right.

Some of the materials you provided the committee carried a classification of what seemed to be considerably high. Comparing the materials, the materials that were presented in public session to the Senate Armed Services Committee and House Appropriations Committee, and the public session materials seemed to be in considerably more detail than the materials you provided to this committee, I was wondering why you gave the very high classification to the materials presented to this committee that did not appear to be all that different.

Admiral TURNER. Yes, sir. The classification of those figures released to the public, which cover the 5-year defense plan, are unclassified and of course are in considerable detail.

The information which we provided to you went out to many, many years beyond that 5-year period and gets into the extended planning annex which in the Navy document system is classified, because they are long range and represent, total planning. The information is also less precise, the further we proceed out into the future.

Mr. LEGGETT. I have looked at your charts and I have looked at the charts published in the Senate documents and in the House documents before the Appropriations Committee, and they both appear to cover a broad span of years.

Admiral TURNER. I would be happy to recheck it again for you, Mr. Chairman. If it is within the 5 years, all the details should be

exactly the same. Beyond that, the projections have to be classified and they should also again be the same in the classified area.

If I may, I will be happy to check it and provide it to the chairman.

Mr. LEGGETT. Do you stand by your testimony today which you delivered earlier this year with respect to the development and deployment of various tactical air squadrons for the U.S. Navy?

Admiral TURNER. I certainly stand by whatever I said, yes, sir.

Mr. LEGGETT. The position of your office is exactly the same as it has always been for the past 6 months, is that correct?

Admiral TURNER. I would hesitate to say that anything is fixed and firm here; things do change, beyond my control. As far as the plans which we developed, they are changed from time to time by outside influences. Whatever they are at the given time, I will relate to the absolute best honesty that is within me.

Mr. LEGGETT. Do you want to indicate the major changes that have occurred in the last 6 months beyond your control?

Admiral TURNER. I think I would have to get some specifics as to which ones we are talking about, ships, aircraft.

Mr. LEGGETT. We are talking about tactical aircraft today.

Admiral TURNER. Any particular one program?

Mr. LEGGETT. Is there any particular one program that changed in the last 6 months?

Mr. PIKE. Any within the last 6 days?

Admiral TURNER. Not within the FYDP. That has been the 5-year defense plan. It still remains the plan. It gets changed for various reasons. That is what we started out with and so far as we know it is still standing.

Mr. LEGGETT. I don't want to take any more time at the outset than I have. I yield to my colleague on the right, Mr. Pike.

Mr. PIKE. Thank you, Mr. Chairman.

First of all, I would like to ask General Miller to comment on a statement which we got the other day from Charles E. Meyers, Jr., Assistant Director of Air Warfare, in which he said "Close air support and interdiction of a Pact-NATO kind of battlefield have not been high on the Navy tactical air priorities."

General Miller, would you care to comment on this?

General MILLER. Thank you, Mr. Pike.

Yes, sir, I would have to disagree with that statement because, as you well know, close air support has been very high in the Marine Corps requirement. We feel close air support is an absolute necessity in almost any kind of air-ground team operation of which the Marine Corps has been the forerunner in developing.

Mr. PIKE. Admiral, you stated that the prototype YF-17 was identical to the F-18. Do you really mean that?

Admiral TURNER. As nearly as we possibly can measure the two aircraft. The thing that is almost identical is the thrust-to-weight ratio of the two aircraft, the performance then being the same.

Mr. PIKE. What is the weight of the YF-17 as opposed to the F-18?

Admiral TURNER. If I may, I have the project manager behind me with the details, sir. This is Capt. Glen Lenox who has the information on it exactly.

Captain LENOX. I am the project manager of the F-18 program. I do not have with me the precise weights of the aircraft, either the YF-17 or the F-18.

Mr. PIKE. I have a document that purports to be, and let me just bounce some numbers off you and see how they ride. The YF-17 takeoff weight was supposed, according to the documents I have, was 20,745 pounds. Does that sound reasonable?

Captain LENOX. I cannot comment on the precision of that, sir.

Mr. PIKE. The F-18 was not 20,745 but 33,654.

Captain LENOX. That is a correct number for the fighter configuration of the F-18, yes, sir.

Mr. PIKE. Right. That is a weight increase of well over 50 percent, over 60 percent, as I figure it. Don't you have the same engines in both aircraft?

Captain LENOX. They are basically the same engines, sir. The F-404 engine in the F-18 is slightly heavier than the prototype engine in the YF-17.

Mr. PIKE. How much more thrust does it develop?

Captain LENOX. The exact thrust figure is classified, but it develops approximately 10 or 15 percent more thrust.

Mr. PIKE. If you add 60 percent more weight and add 15 percent more thrust, how do you maintain the same thrust-to-weight ratio?

Captain LENOX. You cannot, if you add in those proportions. I cannot define for you what makes up the 20,000-pound number you quoted, but the all-up fighter configuration of the F-18 and the thrust of the F-18 as compared to the all-up takeoff equivalent configuration in the YF-17 and the thrust of that aircraft when compared show that the combat thrust-to-weight ratio of the YF-17 is only very slightly greater than the F-18. The aerodynamic performance, the maneuvering performance, of the two aircraft is nearly identical.

Mr. PIKE. When you talk about the aerodynamic performance, are you not talking about comparing a plane which has been built, the prototype YF-17, with a plane which has not been built?

Captain LENOX. The plane which is not yet built is very close to the plane which has been built, and we are using that prototype effort and the information from the—

Mr. PIKE. Have you ever loaded the YF-17 which has been built to the weight that you anticipate the F-18 will weigh in order to measure its aerodynamic capabilities?

Captain LENOX. That would not be a meaningful measurement for us, sir, because the engine is not changed in that same comparison. It would be like loading up an F-18 when it is built with a much heavier load to compare it with some other aircraft.

Mr. PIKE. Let me ask another question. How does the fuel carried by the F-18 compare with that of the F-17, as to weight? Never mind the precise gallonage. I don't care.

Captain LENOX. Yes, sir. The F-18 carries approximately 80 percent more fuel at takeoff, internally.

Mr. PIKE. Internally.

Captain LENOX. Yes, sir.

Mr. PIKE. Would the total weight be double?

Captain LENOX. Not quite.

Mr. PIKE. The point I am trying to make, Admiral, is that it seems to me that when you say that the F-18 and the F-17 are identical, you are really reaching a long way for identity, and I

would ask the project manager, at the risk of jeopardizing his four stripes, whether he might not agree with me.

Captain LENOX. I agree with the Admiral regardless of the threat to the four stripes, sir. We have a considerable amount of detailed flight test information and wind tunnel information on the YF-17. We have a considerable amount of wind tunnel information on the F-18, and a very good correlation between the two. We have a high level of confidence in our performance projections for the F-18, and when compared to the data available from the YF-17, our turning performance, our specific excess power and maneuverability of the F-18 are almost identical with that of the YF-17. We have a very high confidence in those estimates.

Mr. PIKE. I will only say that I spent enough of my life on the Armed Services Committee to know that the projections of what planes are going to do before they are built are not necessarily such that give me the same high degree of confidence that you have, but I congratulate you on your confidence.

Admiral, I want to get back to an issue which I deem to be very serious. I asked Mr. Meyers the other day how often in his career he had watched Defense judgments overturned by political decisions, and his response was that he had seen it happen many times.

There was a story 2 days ago on the front page of the New York Times to the effect that a decision by the Navy regarding the rate of procurement of two aircraft, the F-14 and the F-18, had been overturned by political pressure. Do you know anything about that? Did you read the story, Admiral?

Admiral TURNER. Yes, sir, I did.

Mr. PIKE. Was the story in essence an accurate story?

Admiral TURNER. I think that is a very broad question. I would like to deal more with specifics because the story is so broad, if I may.

Mr. PIKE. All right. Had the Navy made an in-house decision to curtail production of the F-18 aircraft?

Admiral TURNER. The Navy has been looking at, specifically from my office, the financial dilemma we face in trying to afford both force level maintenance, increased readiness, and modernization. My responsibility is to try to do all three of those things within the fiscal guidance provided. I find that we are somewhat overextended. That is a very difficult and challenging position. We, therefore, proposed a number of different alternatives, looking at major programs, of abolishing, delaying, or adjusting in F-14's, P-3C's, A-F18's. We looked at all of these things and worked through the Navy decisionmaking process looking toward fiscal year 1979. A compromise proposal was reached which involves all of those aircraft, and that has now been presented to the Secretary of Defense for his decision.

Mr. PIKE. Well, when the compromise proposal was reached, did it involve a curtailment or a delay in production of the F-18?

Admiral TURNER. Mr. Pike, I find that in the decisionmaking process, I am obliged to provide the information to the Department of Defense but not allowed to talk about it until the decisions are made by the Secretary of Defense in his internal decisionmaking process. The answer will not be really forthcoming until probably

September. That which we sent down will now come back at us for further issues, further discussions: How about this way? How about the other way, et cetera?

Mr. PIKE. Are you allowed to talk about whether or not there was political pressure applied to the White House and to the Pentagon to overrule the recommendations of the Navy?

Admiral TURNER. I do not know of my own knowledge, sir. I can't answer that.

Mr. LEGGETT. The time of the gentleman has expired. Mr. Lehman.

Mr. LEHMAN. No questions.

Mr. LEGGETT. Mr. Simon.

Mr. SIMON. I am willing to yield some of my time to my colleague from New York.

Mr. PIKE. I thank the gentleman.

You have no personal knowledge whatsoever other than what you read in the article in the New York Times about any political pressure being exerted in this decisionmaking process?

Admiral TURNER. I am aware of the article in the paper.

Mr. PIKE. You hadn't heard anything about it before you read it in the paper?

Admiral TURNER. I do find in the broad sense that all of our aircraft procurement programs are a great issue to many, many segments of our population, industrial, and civil.

Mr. PIKE. No, I mean specific about this decision, Admiral Turner.

Admiral TURNER. No, sir, nothing specific.

Mr. PIKE. You heard nothing about it until you read about it in the New York Times.

Mr. LEGGETT. Would the gentleman yield?

Admiral TURNER. No pressures on me, sir, as far as my making the decisions or making recommendations.

Mr. LEGGETT. Would the gentleman yield?

Mr. PIKE. It is Mr. Simon's time.

Mr. SIMON. I will yield to the chairman.

Mr. LEGGETT. You are well aware that the conference report that this very minute is being argued on the floor of the House for our 412 authorization bill on armed services provides that the F-14 program shall be reduced from, I guess, 900-and-some million down to 700-and-some million and 44 aircraft is down to 40 aircraft, and that the full funding is provided by unanimous decision of the conferees, of which I am one, of the House and the Senate Armed Services Committees, that the F-18 program would move ahead and that we do state in that report that the program shall not be curtailed or otherwise interfered with—prefatory language I admit in the report—but you are well aware that those statements were made in the report.

Admiral TURNER. Yes, sir.

Mr. LEGGETT. And that is made by conferees who are politicians, right?

Admiral TURNER. Yes, sir.

Mr. PIKE. If I may continue on the gentleman's time, the politicians which I am referring to are not those who were the conferees.

I recognize the interest of those who were the conferees. I am referring to the politicians mentioned in the New York Times, and in particular the Speaker, who is alleged to have called the White House and the Pentagon in an effort to turn around this Navy decision, and if you tell me you know nothing about it other than what you have read in the paper, that is the end of my question, although I am obliged to state that in the position in which you find yourself in the Navy, I do find that just a little hard to believe.

Admiral TURNER. Well, sir, if I may in my own defense, I have had no politicians call me, no presidents of companies. I have been under the usual kinds of queries from manufacturers representatives or agents in town, but I have not been queried, pressured by any other source or even discussed these matters.

Mr. PIKE. And you have no knowledge as to whether the Navy's recommendation will be accepted or rejected above the line, as you say.

Admiral TURNER. I know what will happen is that from these matters will now flow program decision memoranda from the Secretary of Defense that will come back to the Navy Department questioning our stands, our recommendations, and challenging us to alternative courses of action and the like. This is the routine.

Mr. PIKE. That is the way a political decision does get transferred into action by the Navy, is it not?

Admiral TURNER. We have ample opportunity to reclama, to restate the Navy's position, and we then stand by for the decisions of our superiors in the chain of command.

Mr. PIKE. I fully understand that.

Mr. LEGGETT. I don't think this record should stand that any inquiry by the Speaker or any other member of the House or Senate is tainted with any wrongdoing regardless of any implications of the New York Times. We all make inquiries. We all make penetrating inquiries many times, and I know the gentleman from New York has an interest in the F-14 aircraft, and certainly you get information on the F-14 aircraft and you make a very penetrating case.

Mr. PIKE. But I do it in the open at a public hearing called by you, Mr. Chairman.

Mr. LEGGETT. And you get your information many times though through private sessions and I get my information on many weapons systems likewise in public and private sessions and it all goes into the mill, and I think what we are all working toward is an adequate cost-effective national defense.

Mr. PIKE. So am I, Mr. Chairman, and my point is I hate to have military decisions turned around by political pressure.

Mr. LEGGETT. I would say that the decision, as far as our Armed Services Committees are concerned, was determined by the facts as we saw them, and we are very reluctant to climb up the hill and climb down again too many times.

Mr. SIMON. I am going to attempt to retain my time here.

Mr. LEGGETT. You can have your full 5 minutes, Mr. Simon.

Mr. SIMON. All right.

I am one of those on the committee who can understand dollars and cents. I am a long way from being knowledgeable in the areas

you are talking about. I am impressed not only by your answers but by the questions that my colleagues have.

But, General Miller, you said something that interested me, as I put the dollars and cents together, because when we are talking about the dollars and cents budget, we are talking about very high personnel costs. You said that Marine aviation is manned, generally, by lower ranking personnel than the other services, and I wonder if you could give me any more details on that.

General MILLER. I can provide you much more detail for the record if you would prefer. However, generally our aircraft maintenance people per squadron have less staff NCO's and officers, ground maintenance type officers, than the other services.

Mr. SIMON. And have you found that a hinderance to your operation?

General MILLER. That is a difficult question to answer because we have not attempted to raise the level of rank and structure. We put what we think we can operate in our squadrons with the constant eye on what we can afford. Where we find deficiencies, then we attempt to raise the rank structure and experience level. Certainly as aircraft weapons systems have increased in complexity, we have been forced to move into the more experienced personnel and thus incur a more expensive personnel cost. However, we find from the studies that have been done over the last 3 or 4 years that we still have a lower rank structure than do the other services. To compare us to them, because of the different environment in which we operate, I find it difficult to draw an exact comparison.

Mr. SIMON. But I would be interested in having a copy of those studies because it seems to me one of the things that we face is a tendency to sometimes overrank personnel, and that we can operate in many instances without moving up quite as rapidly as we do. And that brings me to another question that is part of a personnel problem as well as a budget problem, that is, this up-and-out policy that if you are a captain in the Army—let's take the Army since they are not represented here and it is easier for you to answer.

Mr. LEGGETT. There is a captain in the Marine Corps.

Mr. SIMON. We will take the Army's, and you are a captain and you either have to achieve that promotion to major or you are moved out. It occurs to me that this does two things. No. 1, it forces maybe a higher level of rank movement than we should have, and, second, there are people who are maybe very good captains but should not become majors, and sometimes under this system they do become majors.

I am just curious, and I would like Admiral Turner to comment on this in addition to General Miller, any reaction you have to this present policy, both its impact on the budget and its impact on personnel.

Admiral TURNER. That is a very large question, but I did have a number of years of experience in our Bureau of Naval Personnel and am acquainted with our promotion programs in general, and, of course, it starts with the fact that the services are constructed as a triangle, and we have by law finite sizes to that total shape of the officer corps or the enlisted structure, and we have selection boards that at the vital selection points, again based on law, select a

certain number to move ahead and others to move out. And this is how we have organized our structures from time immemorial. It does have connotations on individual and personal considerations, budgetary matters and the like.

I would say to you in all sincerity that I am most convinced that our selection process is a most admirable and equitable one. It does seek to provide the Navy and, of course, other services as well, the most capable and most potential people at the next succeeding level, but by design we do select out. It is a competitive organization. By its very nature engaging in war it is competitive, and only the best shall move ahead.

Mr. LEGGETT. Would the gentleman yield at that point?

You indicated that you have been doing this since time immemorial.

I recall seeing a television program showing some rather aging captains before World War II, and I have talked to some folks who were around when we changed that law, and there are a lot of folks who think that when we changed from allowing folks considerable time in grade to the current program of accelerated up and out, that perhaps we went too far.

Mr. SIMON. And that the triangle you are talking about has a little bit of a hudge there on the top as a result.

Admiral TURNER. It is a very broad issue. When I said "time immemorial," while referring to my time, which seems like an awful long time, and I faced countless selection boards at every advancement, every successive year point, and I have grown accustomed to it. That is the way we do it. It is compete and progress or out.

Mr. LEGGETT. But don't you think it is crazy that many of your contemporaries who didn't make admiral or vice admiral are now out in private business, valuable to private business, making \$100,000 a year plus, and serving various industries, and we are concerned now with what they call double dipping and such as that? I don't really see that so much as an offense, but I do think that the loss of trained manpower to the Department of Defense is a waste, and there are some folks that can go out and get these \$100,000-a-year jobs, but there are a lot of folks that just kind of sit on their duffs and retire at 50 years or 45 years of age or they also go out and sell real estate in a totally unrelated field, and I think that the trained capability and resource in the military is something that we just fritter away, and because you are use to it you kind of don't know how to change it.

We see these escalating pensions going up through the roof, not only on the uniform but on the civilian side. The combination of 80, you know, when we get out at 55 may not be the greatest thing either.

Mr. SIMON. And it seems to me there are some, you have probably know some admiral, Tom Smith, maybe who is a fine lieutenant commander but who just really shouldn't move on up, and under the present system we say you are out.

Admiral TURNER. Yes, sir, and of course the judgment is involved in what are those decision points. How long should those men stay in the military? Do you want young fighters, competitive people, or

shall we have a longer lived organization that perhaps isn't quite as competitive? These are judgment factors, and the service has tried to be in step with the times. But here I begin getting out of my realm and these are personal opinions.

Mr. SIMON. General Miller, may I ask you your opinion?

General MILLER. If I might comment on your last point, you said that this gent is not really of the caliber that you would consider for promotion and should you force him out. I think you have to remember that he is presently holding one of the billets that is limited basically by law. We will say that he presently is a lieutenant commander and eligible for promotion to commander, if he stays on active duty you can't promote a high-caliber lieutenant to lieutenant commander who does have the ability to move further up. You are forced by this situation to stagnate a certain rank by holding these people around and you can't get the eligible people promoted, although you would like to retain these officers who possess technical skill or some who really has no long future or promotional capability. I think my statement much follows Admiral Turner's.

Mr. SIMON. Thank you very much.

Mr. LEGGETT. I am not satisfied with that answer but we could pursue that for a long time.

Mr. Mattox.

Mr. MATTOX. Admiral Turner, I have been somewhat critical of the carrier force in the Navy ever since I have been big enough to read it and study it, that is, with the advent of missile technology. I have been a little bit concerned about it, and I know that the public generally believes that the carriers out there in the Mediterranean are protecting us from the Russians invading us over here in the mainland. They figure you are going to cut them off someplace in the Mediterranean. I am a little concerned about it and I would ask the question, What you really see to be the role of the carriers out there in the Mediterranean? And this is a preface to some other questions. This is not just in the Mediterranean but in the general world mission of the carrier. I would be interested in knowing how you envision it or see it.

Admiral TURNER. All right, sir, if I may, let me take an example with which I am most familiar, and that is the U.S. 6th Fleet in the Mediterranean. It has been there for a generation composed largely around the carrier forces. Fifteen years ago it was uncontested, unchallenged, and worked as part of the NATO forces, as the striking and support force in southern Europe, and worked hand in glove with the armed forces of the southern region of Europe in the defense of that area.

Their primary mission was to engage in the land and air battle for southern Europe. The fleet was committed to that mission, and also to the projection of other kinds of power, the Marines if needed into the land battle in southern Europe. This was the fleet utilization at those times.

Mr. MATTOX. This is 15 years ago you are talking about.

Admiral TURNER. That is still the mission. But what has happened is that the Soviet Union has interjected a whole new fleet into the Mediterranean. This has neutralized the 6th Fleet to a

considerable extent and whereas before we were talking primarily power projection from the ships to the shore in support of the NATO alliance, now with the introduction of the Soviet fleet in the same waters, we have to look first at sea control. If we can't control the sea and handle the Soviet fleet in the Mediterranean, then there will be no power projection ashore and assistance and support of the NATO nations.

So the Navy, in this instance the 6th Fleet, now looks at the Soviet ships nearby, the aircraft nearby, and has to think first of control: To be able to suppress, neutralize that enemy force before it could get on into any kind of power projection in assisting the NATO alliance. This is the national interest. Such assistance is in the national determination as to how to use this fleet.

Mr. MATTOX. Let me ask you a question at this point.

Admiral TURNER. Yes.

Mr. MATTOX. How many carriers do the Russians have out in the Mediterranean?

Admiral TURNER. It depends from time to time; sometimes one, sometimes two.

Mr. MATTOX. How many aircraft do they have in the Mediterranean?

Admiral TURNER. They have two different kinds of carriers. One carrier is solely for helicopters. The new one in the picture I showed you, the Kiev, carries helicopters as well as V/STOL aircraft that are just coming into their technology and inventory. The numbers of aircraft are rather modest, 19 in that area, 25 to 30 in—

Mr. MATTOX. They have 25 to 30 and they are competing against our what?

Admiral TURNER. 180 perhaps.

Mr. MATTOX. Their airplanes that they have will not in any way compete with ours, will they?

Admiral TURNER. They are just getting started into the V/STOL and tactical carrier deployment. There are other carriers they have in production that are coming along. This is just the beginning of a significant change in the Soviet fleet.

Mr. MATTOX. Do you envision that the fleet is really going to be participating in an effort to repel a Russian invasion of Europe, particularly, let's say, northern Europe? That is where their forces are strongest I understand.

Admiral TURNER. This, of course, is a very large issue. The central front is a bit far from the carriers, but the southern front is of great concern to Italy, Greece, Turkey, France, the NATO alliance—one, not exactly in the military sense—the fleet, as the striking and support force, is committed, in its mission to assist in the land and air battle in southern Europe. But before that can happen, they would have to work against the Soviet fleet.

Mr. MATTOX. Is the mission that we are planning that of a mission to fight in an age of a nuclear war or are we fighting in the age of a second World War-type traditional confrontation that would take place in southern Europe?

Admiral TURNER. Let me walk the cat back just a little bit. The purpose of those forces is to indicate our resolve, our capability, and

to instill confidence in our allies that we are capable totally to deter and not have a war. Hopefully that will be successful.

Mr. MATTOX. Are these conventional forces that which deter or are they nuclear forces that which deter?

Admiral TURNER. That is in the mind of the beholder, but I would say it is the combination of the flexibility and the range of options available to NATO and our Nation by the presence of that Navy on that southern flank.

Mr. MATTOX. The point I am trying to get at, and trying to bring into it is this: The Russians, even though they have a navy in the Mediterranean, they have very little airpower, and the airpower that they have is not very significant in its abilities. We are struggling now, and you are struggling in your questioning, particularly over this F-18 that you are talking about, and I assume later you will be talking about an A-18 type of aircraft. You are talking about an aircraft that has a very small incremental step forward from, say, the A-7E, and particular if the A-7E had some later design model.

I am curious as to why we need that very small incremental step forward for the Navy, particularly the carriers, when in effect those aircraft are dealing more in a peacekeeping-type mission, police-type mission, rather than an all-out war with Russia when Russian has no aircraft really to compete with it, particularly in the zones that you are having the aircraft. I hope I have made my question clear.

What I am trying to say is why do you need a new toy to play with instead of keeping the old toy that will do just as good a job for the mission that you have specifically got to carry out?

Admiral TURNER. Am I saved by the bell?

Mr. LEGGETT. No. Those are the quorum bells.

Admiral TURNER. First, the Soviet air capability that is of most concern to the 6th Fleet is not that from the two new carriers. That is developing. It is the long-range naval air BACKFIRE bomber type that I showed you here.

Mr. MATTOX. From a land base?

Admiral TURNER. From a base in Russia, yes, that can cover all of the Mediterranean. That is the No. 1 air threat.

Mr. MATTOX. If they fire up there and start attacking the fleet, those aircraft carriers, are we going to respond with the A-7E or are we going to respond with some other type missile system?

Admiral TURNER. If I may, let me—

Mr. MATTOX. I don't mean to be argumentative, and I don't mean to question your logic, but I am a little concerned that we are dancing two separate dances at the same time using two sets of logic at the same time, and we are not able to pay for both sets is what I am concerned.

Admiral TURNER. I certainly owe you a clarification and I think it starts with the F-18 and its role in the Navy. I think that is central to your question. What is the purpose of this aircraft and why are we buying it?

Mr. MATTOX. Yes.

Admiral TURNER. Then how does it fit in with these perceived needs? The F-18 is primarily being designed, built, and produced to

replace, first of all, all of the F-4's, the entire Marine fighter force, all 12 squadrons. That is first. Second, it will replace all 24 squadrons of the Navy's A-7E's. That is a lot of airplanes. Then, third, to complement the existing fighters the Navy already has, the F-14.

So those are the three reasons why we are buying the aircraft, the three missions for which it is intended. We are after increased reliability, maintainability. The aircraft will do the job better than the existing F-4 and A-7. It is a more agile, more maintainable, more reliable airplane than the others.

Mr. MATTOX. If it meets the projections after it has been built.

Admiral TURNER. We are working the contractual arrangements to the best of our ability to put in those contracts incentives which return to the manufacturer benefits to him, if he can meet our increased reliability and maintainability.

Mr. MATTOX. At that point let me ask you this; do you have at this point in the Navy, or is this story anywhere correct that was in the New York Times, you in effect have indicated that if you have your way that you would rather shelve the F-18 type program right at this point, at least as far as present budgetary matters are concerned, and you would postpone the purchases of that to take up some other higher priority in your budget, and that would mean in effect it is a secondary type of requirement as far as the Navy is concerned, this type of refurbishing of the force, I guess, is more, I don't mean to say, modern or with some type weapon? Is that an accurate picture? Is it a secondary type proposal or firstline proposal?

Admiral TURNER. It is a very real requirement for the F-18, as I have attempted to indicate in the three categories that I mention. The timing for when the aircraft are required to replace the Marine F-4 fighters and the Navy A-7E's, and Navy F-4's at a later date concerns requirements in terms of force levels and projection into the future. There is a definite requirement for the aircraft in those three areas. We want the aircraft. We have a problem with its procurement as well as the procurement of all other kinds, because of the prices of aircraft, and the difficulty of affording economic procurement programs in all of the aircraft that we need. That gives us the problem of precisely which ones and at what time. I will say that our plans do involve the continued planning for and the requirement for all of the aircraft that we have been talking about.

Mr. LEGGETT. The time of the gentleman has expired.

There is still a quorum call. We can start on more questions by members.

Mr. LEHMAN. Mr. Chairman.

Mr. LEGGETT. We will recognize Mr. Lehman at this point.

Mr. LEHMAN. I just have one question that sort of follows up on Mr. Mattox.

My question is about the actual role in a nuclear war of surface naval forces, either Russian or American, in the Mediterranean. I can see the need for the political presence and the need to have a visible force in the Mediterranean, but it seems to me that in a real nuclear conflict the first thing that would disappear would be both the Russian and the American Mediterranean fleets. Yet how much

money is put into these fleets, and I am talking about both sides, that are so very vulnerable? The Russians, especially, have to go through the Straits of Bosphorus which NATO straddles. At least with the Straits of Gibraltar we have friendly nations on both sides as we move in-and-out of the Mediterranean. I guess what I am concerned about is this: How much of our fleet's mission is political visibility, presence? To what extent will this force be a viable, effective military operation in the event of an all-out war? At what point does one mission start overlapping the other?

Admiral TURNER. That is a very involved question, Mr. Congressman, and we have thus far focused in on the Mediterranean and the 6th Fleet. I think I am best capable to speak about that. But we should not lose sight of the fact that there are other seas, there are other oceans. The Navy, the naval forces, have a great role to play in those as well. Other conditions apply in other areas.

Mr. LEHMAN. Could you yield back just a second? Looking at the map, I always think the Mediterranean as sort of a cul-de-sac, almost a death trap.

Admiral TURNER. I have to challenge that view because it is 2,000 miles wide, and it is 400 miles from north to south at its widest place, and there is a lot of water out there, particularly if you are trying to find something.

I would also note that in the worst case situation, which you have led up to, all fixed targets will be the first to go. They are the easiest. With naval forces we are talking about mobile moving platforms with their own defenses, in depth, capable by the choice of the commander to be in this place today and 500 miles further away tomorrow, and that is the flexibility and the mobility that allows us not to find ourselves in the doomsday, painted-in-the-corner approach.

My responsibility running the 6th Fleet was never to get in that situation, never to be surprised, and by demonstrating the capabilities, flexibility and the will of our country, that we minimize the possibility of the worst events eventuating, and I think we have the capabilities, not only in the Mediterranean but in other fleets as well, and a national asset that is priceless. Forgive the personal involvement, but it has been a lifetime of mine doing just this, and I think that the Nation would be well advised, and certainly I would so advise it, to maintain these kinds of forces, because they have the mobility, the flexibility that does not apply to any other force.

Mr. PIKE. Would the gentleman yield?

Mr. LEHMAN. Sure.

Mr. PIKE. Admiral, I want to say that I certainly agree with you as to the utility and flexibility of our naval carrier task forces. I remember for years the argument against ours was that they weren't necessary because the Russians didn't have any. Now that the Russians are building some, it seems to me that what we have done is demonstrate that our technique was such that it gave them sufficient concern that they decided they had to go the same route, and the question is where do we go from here?

The statement was made earlier that perhaps the Marine Corps planes could fly off the land. I happened to have been a Marine pilot who did fly off the land, and obviously any naval plane can

land at a land base if it really wants to or has to or there is any advantage in it. The corollary, however, is can any other non-naval plane land on a carrier which just might be left after the fixed bases were removed?

Mr. LEGGETT. The answer to that is the B-25.

Mr. PIKE. All they did was take off, which is much easier, by the way.

Mr. LEHMAN. I yield back my time.

Mr. LEGGETT. Your time has expired.

This is the second call of a regular quorum call. We will have to go answer the quorum call at this point, and then hopefully the members who want to ask more questions can be back here in 5 minutes.

Staff has some questions. Mrs. Holt has a question and we will take advantage of nobody in their absence.

Mr. PIKE. Mr. Chairman, I was just going to suggest that we might deem this to be more important than answering the quorum call. Could we stay and continue the hearing instead of going over and answering the quorum call?

Mr. MATTOX. Give me your card and I will take care of it.

Mr. LEGGETT. I think the suggestion is excellent.

Mr. Hale, are you prepared on some questions this morning?

Mr. HALE. Yes, sir.

Mr. LEGGETT. And Mrs. Holt has a question here. Mr. Cove do you want to ask that in the best way possible?

Mr. COVE. The other day when Mr. Meyers was up here, he put forth a list of things which he said would give us a realistic assessment of tactical air capability. While he emphasized that hardware is important, his top priorities were leadership, tactics, and training.

Mrs. Holt, coming out of that discussion, left this question: How do budget cuts on defense impact upon aviator recruitment, training, and retention—both in the Active Forces and also in the Reserves? Hardware is important but are our investments in manpower commensurate with our budgetary targets on weapons and equipment? What are your major human factor's problems?

She would like to have some general comments or insights. The question I think really revolves around how are you doing in people. Over the long term we have large investments in modernization, but the budget projections pretty much keep the people and the maintenance costs at a fairly constant level. We are seeing evidence now that this just isn't happening. The question is: Are we cutting the people and maintenance funds at the expense of modernizing these forces with new expensive equipment?

Admiral TURNER. In this era of constrained funding, some compromises or tradeoffs are usually necessary. There was no tradeoff requiring a reduction in people but one was necessary in the maintenance funding area. In this case, a reduction of funding was deemed necessary to achieve a proper balance between the modernization of forces and the maintenance or readiness of the existing forces.

One or two short comments. One of the attributes that attracts us about the F-A18 is the hope to be able to have a more reliable, more

maintainable weapons system that does require fewer people to maintain it, that does not fail as often as some of our present systems. This is the philosophy wherein we are advancing moneys as incentives to the manufacturers to achieve quantum orders of improvement in reliability, and fewer incidents of failure, more mean time between failures, thus translating into more availability, more readiness for the given dollars, and fewer cannibalization items that require us to swap parts back and forth because of the lack of supportive hardware.

We think this is a way to go. This is the intelligent and sensible way to manage a weapons system, and we are trying to gear up Navy and Marine Corps procurement along these lines because we recognize the very strong impact on people if the system does not meet these kinds of requirements.

Mr. LEGGETT. Admiral, the statement was made a moment ago that the Soviets were kind of mirror imaging us in carriers. As a practical matter their carriers are considerably different than what we have, and I guess the only fixed wing that they are capable of operating off of their carriers as I understand it are V/STOL-type vehicles. I wonder if you would compare perhaps on the open record here as best you can the V/STOL's of the Soviet's versus our Harrier's, and where we might go with V/STOL capability as you see it.

Admiral TURNER. Yes. The central theme, as I take the question, is a review of our V/STOL situation in comparison with others which are now ongoing, and where is the Navy going with V/STOL? Is that it essentially?

Mr. LEGGETT. Yes. I wanted you to confirm the Soviet's capability to project airpower is limited to helicopters and a 30- or 45-minute operational V/STOL aircraft.

Admiral TURNER. That is correct, yes.

Mr. LEGGETT. And that is kind of a very light punch, is that not correct?

Admiral TURNER. That aircraft carrier is the forerunner of the future for the Soviets, of course. The carrier and its aircraft at the present are not a great threat. They represent a kind of technology and a situation that we well understand.

The carrier and its limited number of aircraft are in our view designed for sea denial, that is to inhibit our use of the seas.

Mr. LEGGETT. Inhibit our dominance.

Admiral TURNER. Yes, indeed, yes, indeed.

Mr. LEGGETT. All right.

Admiral TURNER. What will come from these is speculative. I think we can just leave that one, but it is the beginning.

As far as our own V/STOL, we, of course, have the Harrier, and General Miller could also speak to that one. The Navy is looking at V/STOL aircraft and I believe from your opening remarks, that you would like to know a little bit about our V/STOL plans. If I may, I would like to show you one chart that shows very briefly our V/STOL decision points.

As to vertical and short takeoff and landing aircraft, we do have helicopters that do this. The Harrier does this. The Soviets have a Yak-36 that does this.

We are now looking at the possible V/STOL applications to naval aircraft, and we are doing design studies leading to a 1979 decision to see if the technology of the present American industry will satisfy our needs for aircraft that need replacement, possibly by V/STOL, not right now, but in 1991-95.

We have two groups of aircraft now which are very fine aircraft that will require replacement in 1990's. The first group that are subsonic, carry large payloads, stay a long time on station, and use many sensors.

A second group needed in 1995 would be replacements for our present attack and fighter aircraft. These would be supersonic. In sum, we have a very fine stable of aircraft now. They don't need replacing in a general sense until those times that I have indicated. So we are looking ahead to see if we could possibly not only meet the military requirements for our existing aircraft, but meet them with an aircraft that would be equal to or better than the existing ones, be able to takeoff and land in a short run or vertically, and therefore enable us to put these aircraft on ships other than aircraft carriers.

Mr. LEGGETT. And they have a supersonic capability?

Admiral TURNER. In 1995, not now.

Mr. LEGGETT. Do you see any light at the end of that tunnel?

Admiral TURNER. This is the process by which we are exploring the tunnel with our flashlight.

Mr. LEGGETT. It looks like you are giving an awful lot of thought to that.

Admiral TURNER. As I mentioned, the requirement, what we are looking for, is something that is equal to or better than that which we have, does a military mission subsonic or supersonic, and is capable of being staged through smaller aircraft, smaller ships, much smaller than aircraft carriers. If we can do this, we will have added immeasurably to our strategic mobility, that is the ability to put airpower on different kinds of ships in different places. We will have added immeasurably to our tactical flexibility for the same reasons on a local basis. So the future beckons, but there are a lot of bumps in the road. It isn't all going to be easy at all, but we do have the time to kind of look at this and see if it will work. Many manufacturers are interested in doing this. We will make a decision in 1979, with the Congress' blessing, to proceed, if the studies are positive enough, with a prototype development and fly off, because it is a new area as far as we are concerned. We would want to do this kind of very thorough "fly before buy."

Now if the studies don't give enough promise, and our technicians say don't do it, all right, fine, then we will go on and, in about 1985, we will continue the development of follow-on conventional takeoff and landing aircraft. So we are not cutting any bridges behind us. This is a very deliberately paced, thoughtful program.

Now, hopefully, we think that the studies are going to be positive. We will go into a prototype development, and at the end of about 5 years, and the engine development is the most critical here by the way—

Mr. LEGGETT. How much money do you have in that budget for 1978?

Admiral TURNER. We have two programs for V/STOL development and V/STOL support. After the committee conference, the V/STOL development is about \$18 million in 1978, and the V/STOL support was reduced to about \$8 million as I recall. I could be a little bit over in those figures but we had asked for \$32 million for this program, and the compromise looks to be about \$18 million. The total involvement by 1979 on a go or no-go will be about in the order of \$62 million, if the Congress approves.

Then proceeding on with the prototype development——

Mr. LEGGETT. Assuming you invent this thing, then you could engineer it after 1986.

Admiral TURNER. After 1986? We will have proven in two aircraft, that it is flyable and has the military application that I have described.

Now we have nine aircraft manufacturers that have come into us with proposals for the design studies, four engine manufacturers, and a multiple number of avionics firms that say to us, "Yes, it is feasible, and this is how we are scoping it out for you."

We are examining these multiple proposals to see if the technology warrant going into that prototype development. We have plenty of time to study it thoroughly, with the consent of the Congress, and move out to achieve what would hopefully be a very worthwhile, long-term investment for the Nation and the Navy.

Mr. LEGGETT. The laws of physics are pretty much against you, unless you can develop an extremely light weapon, some very light gasoline. The alternative is you are going to be putting up an airplane that can't stay up very long and can't carry very much.

Admiral TURNER. I would just point, with all respect, to the AV-8 that the Marines operate and do very well with. We have had it aboard our carriers. It doesn't have everything, but it is the beginning. We are developing the Harrier for a follow-on program, along with the technology in lightweight composite materials, in greater thrust in engines, et cetera. I am convinced that we are on the right track, but with deliberate speed.

Mr. LEGGETT. We have readiness problems, don't we?

Admiral TURNER. Readiness problems?

Mr. LEGGETT. Readiness problems with, say, the AV-8? The overall target for readiness for the Navy for their tactical aircraft it what percentage?

Admiral TURNER. The operational readiness is a term applied to materiel readiness of a weapons system.

Mr. LEGGETT. With all its systems functioning?

Admiral TURNER. There are gradations. There are full systems capable ratings, and there is an operationally ready rating. This enables us to manage all of our logistics, our repair and maintenance facilities and to assess quantitatively what is the status of our weapons system for use, but it does not give us the total picture of the readiness of a unit, a squadron, a ship. It tells us materially if it is ready to be utilized?

Now the utilization rate of the Harrier has been steadily improving. General Miller can speak to that. The overall readiness of Navy attack aircraft has steadily been improving. We are right now at one of the highest points in the last 2 or 3 years.

Mr. LEGGETT. What percentage is that?

Admiral TURNER. The reason I am hesitating for a moment, I would like to provide complete detail for you of these numbers because I am very proud of them and the progress we are making, but they are classified in their total sense.

I would say here at the highest point in the last couple of years, overall Navy, we are at the highest point full systems capable. In particular you would like to hear that the F-14 deployed is meeting the Chief of Naval Operations standards for material readiness for deployed aircraft. That is the first time it has happened for a considerable period of time. We are on the right track. I am pleased by the way we are going in readiness.

As Mrs. Holt asked in her questions, "Do we have enough funds for the readiness to maintain the material readiness?" Well, we hope we have your continued support in that regard.

Mr. LEGGETT. Obviously that is a function of money.

Admiral TURNER. Yes, sir.

Mr. LEGGETT. I know we used one C-5, at least one at Travis Air Force Base, continuously to provide parts for the others to fly at a utilization rate of 1 hour and 15 minutes per day.

As a practical matter, you do have readiness problems with your aircraft in the Navy, do you not?

Admiral TURNER. Well, these are very efficient and complicated machines and they require a great deal of support. When the support is lacking for various reasons, then the readiness of the machine is less than desired.

We would be the first to say that our performance in the past couple of years, a few years back, was not what we could all be proud of, neither the Navy for its aircraft nor for the support we received in the material items required to keep these aircraft operating, both in support and in deployed conditions. But we are on the right track.

Mr. LEGGETT. I guess a large part of what I know about the AV-8, the Harrier, is from the newspapers. They indicated that you crashed, I guess, 20 percent of your vehicles, something like that; you did not lose the pilots but I think something like that crashed. So obviously those were not ready. Then you had an operational readiness rate that was below 50 percent for the balance. Can you tell me today, General Miller, how many of your V/STOLs are ready to fight today?

General MILLER. We have adequate aircraft to equip our AV-8 squadrons. We have lost 16 AV-8's since fleet introduction.

If I might, I would like to comment on the three areas that you have mentioned here. With regard to accidents the first 7 years of this aircraft performance, when compared to the F-4 and the F-8, which were similar type of aircraft, the accident rate is just about the same in the first 7 years of their operation.

Mr. LEGGETT. Yes, but your crash time was inverse, was it not?

General MILLER. That is correct.

Mr. LEGGETT. They crashed theirs when they were learning how to fly it and you crashed yours after you learned how to fly it?

General MILLER. Yes, sir. There are some reasons. Again, if I might address the accident rate as it relates to V/STOL, compared

with conventional aircraft, then I will come back to your specific point. The Harrier by its nature is designed to do the same job in 15 minutes, that most aircraft would do in 1 hour.

Mr. LEGGETT. Because they are forward-based?

General MILLER. Yes, sir. The pilot, however, goes through the dangerous part of the flying in that 15 minutes, where the conventional aircraft pilot does it in an hour. The accident rate is computed on the number of accidents per 10,000 flight hours. Therefore, you penalize the V/STOL by comparing its accident rate with the conventional aircraft accident rate, which is based on hours-a-flight whereas V/STOL is a sortie-oriented airplane. The AV-8 conserves fuel and responds quickly. We are looking at the AV-8 accident rate in an attempt to try to draw some correlation as to how you compare it with CTOL aircraft.

On the logistics support—let me go back first to the inverse rise. In the early days of the Harrier program we recognized that flying the AV-8 involved a greater scope of flying skills than any flight school in the world teaches today, all the way from the low speed of the helicopter to high-performance aircraft. The close supervision of training in the earlier years of this program left little to be desired. We spent long hours, and carefully trained experienced pilots. A lot of the AV-8 program depended on whether we had an accident in the early days. Such an accident could have jeopardized the whole outcome and growth of V/STOL in this country.

As we moved through these years, we attempted to do away with the feeling that you had to be a superman to fly the AV-8 which normally appears in every new airplane only a selected few started out first, and we attempted to show that it was not necessary to be superhuman. It is my own personal opinion that we attempted to move a little too fast converting to conventional training methods.

In the last 2 months we have readjusted our training, and have gone back to some of the basics of the transitional area between low-speed and high-speed flight. We feel we will be totally successful with this revised training program because we have proven in the earlier years what this kind of training accomplished. Most of our pilots who have had accidents are people who have had less than 100 hours in the airplane. The AV-8 is a typical airplane in that it breeds confidence in a young pilot early and he feels he knows the airplane; and he can become a little too overconfident at first. I think we can adjust this by revised training methods.

If I can address the logistic problem: The logistic problem is not necessarily related to V/STOL aircraft. The Harrier was an off-shore procurement. There was another nation who defined and operated its tactical air force in a different logistic concept. Its industry worked in a different way than we do in this country.

We felt that a saving could be achieved by bypassing some of the ways we do things in this country since the Royal Air Force of the United Kingdom already had operational squadrons.

Again we found that some of the concepts which we use in building up the logistic support concept in this country are extremely sound and we should not have tried to bypass them in the interest of saving some dollars. Had we done it that way, we would not have had the problem of supporting the AV-8 here in the United States.

I must say that the airplane's performance is rather impressive, because when it is flying it stays in commission well. Our problem has become more one of repair of component parts in a manner which was not consistent with the way we do in this country.

Mr. LEGGETT. Did you not have enough money for parts?

General MILLER. We had enough money. It was that the logistic plan was not initiated at the very beginning to get the support organized and set up properly. I think that the GAO report on that issue, and Navy comment, will further verify that.

Mr. LEGGETT. Is your readiness rate now going up?

General MILLER. Our readiness rate is going up and I say it compares very favorably with the other aircraft that we have in the Marine Corps.

Mr. LEGGETT. Which would indicate that it compares favorably with the F-4?

General MILLER. Yes, sir. It is a little behind the F-4 right now but we are catching up. We have the trend line moving in the direction in which we think it should go and we have the problem under control this month.

We are accepting our last AV-8A this month. The McDonnell-Douglas Corp. which is building the AV-8B, is also taking over the management, supervision, and support of the present AV-8As.

Mr. LEGGETT. All right. I want to ask one thing. Is the F-14 readiness also improving, Admiral Turner, or are there problems there?

Admiral TURNER. The overall readiness of the F-14 is slowly coming up. We are still working on the improvement of the total system. We have been concentrating on the deployed aircraft. As I indicated, those deployed now particularly to the Mediterranean in the recent months have come close to the CNO standard for operational readiness.

Those operating on the west coast, at AIMVAL/ACEVAL at Nellis Air Force Base, have been reported in the public press in the last 4 months of an operational ready rate of between 80 and 90 percent.

So the answer to your question is yes. It is a slower job bringing them all up to the CNO standards, but in the specific areas where it really counts, in deployed squadrons, and in this particular test, absolutely yes.

Mr. LEGGETT. Certainly we have a lot of money invested in that aircraft and we have to make it a capable vehicle. The public press did indicate that it went from something like 40 percent to 32 percent from say 1975 to 1976. Your effort at Nellis has been to try to beef up the readiness of that aircraft, has it not?

Admiral TURNER. No. That particular test was looking at other things. But in one of the quantified comparisons it was possible to determine how the various aircraft material readiness varied on a day-to-day basis.

Mr. LEGGETT. If you take out the Nellis performance, what is the readiness of the 14's today?

Admiral TURNER. It is 50 percent, thereabouts.

Mr. LEGGETT. So you have gone from 32 to 50 percent?

Admiral TURNER. That is correct, yes.

Mr. LEGGETT. That is a considerable improvement.

Mr. Hale, do you have questions?

Mr. HALE. Yes, a few things. Operational readiness was one of them. Could you provide at all any of the preliminary results on the AIMVAL/ACEVAL results? The reason for the question is, there has been some discussion that the F-14 may not be as capable in a low-sophisticated, high-density threat, something that you may find in a contingency situation, as possibly the F-18, but that this was maybe being dispelled by the results of the AIMVAL/ACEVAL test.

Admiral TURNER. Our reporting requirements are to the Department of Defense. The reports of the air intercept missile evaluation are being collected at this very time. Both Air Force and Navy are putting together joint and separate reports which we are required to give to the Department of Defense, D.D.R. & E.

I do not have any preliminary finite answers to provide you. I have been out there, observed it, I have some qualitative impressions. But as far as finite results, I really am obliged to give them to the Department of Defense first. There is one general observation I would like to make. The readiness performance of the F-14 in AIMVAL/ACEVAL has demonstrated the benefits which accrue from both the reliability and maintainability standards established for the aircraft and from proper support. The aircraft has attained operational readiness figures well in excess of CNO standards and above those of the other aircraft involved in the evaluation. In performance, the F-14 is proving to be as good a "dogfighter" as any aircraft in the U.S. inventory.

Mr. HALE. I understand. The DSARC on the F-18, when is DSARC-IIIa taking place?

Admiral TURNER. I am told it is March 1980.

Mr. HALE. Are there scheduled three milestones of the DSARC-IIIa, B, and C?

Admiral TURNER. Yes, there are.

Mr. HALE. With the DSARC in that time frame and the discussions in 1978 with respect to the research and development of the F-18 and whatever will come out in the 1979 budget that you are currently operating on, would it be fair to say that the production decision, the DSARC-IIIa production decision will be moot by the fact that in the budget for 1979 and 1980 funds will already have been approved for long lead production and an initial buy?

Admiral TURNER. May I have Captain Lenox address that? He is the project manager and has those details.

Captain LENOX. The DSARC-IIIa decision in March 1980 will be for the limited production aircraft. This is a lot of 30 aircraft, the second lot of production. Prior to that there will be a DSARC level program review with the Department of Defense for an OSD decision on the release of full funding for the very first production aircraft; there are only nine aircraft in this first pilot production lot.

Mr. HALE. That is after the 11 aircraft?

Captain LENOX. Yes. The first four of those aircraft provide the production quality airplanes that we need for the Operational Test and Evaluation force for their operational testing to provide the kinds of inputs that they need for later DSARC decisions for full

fighter production. The third DSARC, I might add, is in January 1982, and that will be for full attack production rates.

Mr. HALE. Thank you, Captain Lenox.

Captain LENOX. Certainly.

Mr. HALE. On the operational readiness question, maybe Admiral Alvis would be the appropriate one to address this question to.

We have not mentioned the recent funding for the fix on the TF-30 and in that regard the decision, or a nondecision, as to whether or not something other than the TF-30 will be used for subsequent F-14's at some time, regardless of the decision of the mix between F-14's and F-18's, is resolved. Could you bring us up to date on the status of the TF-30 fix and follow that up with what the current thinking is on the new engine, if there is to be one for the downstream 14's or even a reengine of the current 14's in the inventory?

Admiral ALVIS. Yes, sir. I would like to talk to you about what we are doing to improve the present engine. When we get to the area of the possibility of a new engine, I will then defer to Admiral Turner.

Our program to improve the reliability of our present TF-30's is going extremely well. We started getting modified engines off the production line in January of this year. We also are modifying the earlier engines to give them the containment around the front of the engine and redesigning the first stage of the turbofan. Up to this point we have had absolutely no problems with those redesigned engines. Excuse me, I should say reworked engines with the improvements in them.

Mr. HALE. The blades are being contained?

Admiral ALVIS. We have not lost any. We have not thrown any blades since we redesigned the first stage, but that decision to put containment around the first stage was not arrived at lightly.

We knew we could improve the first stage, but we had a very prestigious group of the best rotating machinery people available in this country to review the TF-30, to see if we were doing the right things. They said, you are. Redesign the first stage to give yourself a better margin of safety, but over the long haul in operating the airplane you are going to pick up foreign object damage, little nicks in the leading edge of the blades. Somewhere along the line you are going to throw a blade. So go ahead and put the containment on it. You should do that.

I think that it is probably pretty well agreed by now that all turbofan engines in fighters should have containment around the fan stages.

So the rework of our engines is in full swing. We are very pleased with the results. We have done a lot of testing on them. We think we are on the right track. We have not had any problems with the reliability of these engines since we have started this program.

Mr. HALE. Getting into the area of a replacement engine, Admiral Turner?

Admiral TURNER. Yes. The Navy has had a requirement for a follow-on engine for the F-14 since its very inception and that requirement still stands for the threat of the mid-1980's or late 1980's.

The funding to reengine the F-14 fleet is quite considerable, on the order of \$2 billion plus dollars. The research and development for a competitive hardware demonstration for three possible manufacturers, GE, Pratt and Whitney, and Allison is estimated to be somewhere in the order of \$500 million. So it is close to a \$3 billion program. The matter is being addressed in POM-79.

While I can restate the requirement, it is a matter of affordability again, which is presently being decided at this moment in the Secretary of Defense's forum.

Mr. LEGGETT. That \$1 billion was in 1975 dollars? You said \$2 billion plus?

Admiral TURNER. It is in escalated dollars, then-year dollars, starting with the introduction of the follow-on advanced engine in about 1982 to 1983.

Mr. LEGGETT. It would cost, I believe the record before the committee is something like \$2.8 billion in then-year dollars?

Admiral TURNER. \$2.3 billion for production and \$0.5 billion for research and development, yes, sir.

Mr. LEGGETT. Would it be your intent to keep all three engine competitors in the game while the \$500 million is being expended, or at some point determine a viable candidate?

Admiral TURNER. The congressional direction gave the Navy \$15 million in fiscal year 1977 to conduct "a hardware demonstration and a competitive source selection." So that would have to be opened up to all contenders.

Mr. LEGGETT. You did not do that?

Admiral TURNER. Sir?

Mr. LEGGETT. You did not do that?

Admiral TURNER. Not yet, sir, because of the necessity to make available to those who would bid on the development of a new engine an indication of the funding profile to which they could advance their engineering technology. We do not have a funding program at this time.

Mr. LEGGETT. When do you anticipate you will get it?

Admiral TURNER. The matter is being, as I stated, resolved at this moment in the Department of Defense. We will be coming back to the Congress with a decision and recommendation at that time, probably about September, sir.

Mr. LEGGETT. What is your estimate at this point as to the time frame for resolution of a winner in an engine competition?

Admiral TURNER. I will have to turn to Admiral Alvis. Could you answer that?

Admiral ALVIS. I do not think we could really give you a very good answer.

Admiral TURNER. We can look at the data we have that is preliminary from the three manufacturers now and provide for the record, if we may, our best estimate as to the time. The minimum time required for an F-14 engine competition, to include a hardware demonstration, is one year from formal go-ahead. This hardware demonstration would be limited to ground static tests of the engine. However, if a total of \$41 million is appropriated for the engine competition, the Navy believes it is possible to expand the hardware demonstration to include engine flight tests. This option is viewed

favorably in as much as it would provide better preselection information about engine-airframe compatibility—such as engine stalls. While a flight test hardware demonstration would extend the minimum time required for an F-14 engine competition to 2 years, it is believed that initial fleet introduction would not be affected; planned initial fleet introduction of 1983, depending on the programmed budget, could be met with either hardware demonstration option. The governing factor was for an introduction of operational capability about 1982 to 1983, to include both retrofit and whatever aircraft might be in production at that time.

I need to give you a research and development profile in time, which I do not have at this moment. If I may provide that, I would be happy to.

It must be emphasized that the programmed or planned budget and the research and development time profile for an F-14 follow-on engine are necessarily interrelated. However, the time profile is approximately as follows:

October 1977, Presolicitation Notice; March 1978, Demonstrations Commence; October 1979, Source Selection.

Mr. LEGGETT. All right.

Mr. HALE. Admiral Turner, the direction of the ongoing discussion of whether we want to put the performance in the weapon or the performance in the platform keeps cropping up. It seems that with the precision-guided munitions and sophistication in the weapons, that there is an ever-increasing pressure to say, let's keep the platform simple and maybe even a platform that we have, and not work so much on the agility of the platform but worry more about the agility of the weapons.

Is this fully flexed? This is in conjunction with the second part of it. If we do go with an advanced technology engine for the fighter force, and if you had a scenario of a very sophisticated force consisting of 100-percent deckload of F-14's with the advanced technology engine, and we were smarter in our attack weapons, which clearly I think the industry is moving toward, there may be alternatives to developing that performance in a new platform that has the agility and the smartness that the weapon may already have. Would you just address that for the record?

Admiral TURNER. Yes. I think we do in all weapon systems look at the balance and the trade-off as to whether the weapon platform or the weapon itself should have the sensors, the detectors, the processors, and the like.

That clearly indicates, for instance in the F-14 we need to look at its rate of climb, its reaction time, and how quickly it can get to altitude before it would begin utilizing its long-range missile system.

Then it is a question of, since it has a long-range missile, to have the commensurate detection, classification, processing equipment in the aircraft in order to utilize a long-range missile. If it did not have that, despite the great range of the missile, it would be unable to cope with the target at a great range. So it is a balance and a combination of putting the weapon system in the place to do that which it is designed for. Clearly in some instances we can make missiles do more of the work for us. That is kind of the way we are going.

Mr. HALE. I was thinking of the attack aircraft, more specifically.

Admiral TURNER. Yes, attack aircraft as well. Cost begins to drive us to a go-slow approach, because if you are using conventional weapons now, the cost keeps going up as we make them smarter. As a result we can only have fewer of the smarter weapons.

The targets that we see as likely in most scenarios continue to multiply. So again a balance is required between a number of very smart precise weapons and others that can handle the great numbers of targets or the installations which we might have to operate against.

I could be more specific if you gave me a specific case, but those are some of my thoughts on it.

Mr. LEGGETT. Mr. Myers, who was here from D.D.R. & E., the other day indicated that the targets were multiplying, that our sophistication was requirement consolidation in our weapons platforms. It was his opinion that perhaps this consolidation required some reevaluation. In fact, he clearly indicated that he thought that that was kind of wrong, that we ought to have multiple platforms and multiple proliferation.

Admiral TURNER. I certainly cannot object to having more.

Mr. HALE. The rest of the questions we could insert in the record.

Mr. LEGGETT. We will submit the rest of your questions for the record and we can get the answers to those in writing in due course.

Mr. STORM, do you have questions?

Mr. STORM. Just one question.

Earlier in the hearing we dealt on the problem of close air support and that Mr. Myers had mentioned it in relation to the central battle in the NATO Pact forces. He said preparing for that was not high on the priority list of the Marine Corps.

Can you respond, what is the Marine Corps doing, if anything, in training for the possibility that it might be involved in a contingency on the northern plains of Europe?

General MILLER. Our training programs are extremely broad in scope because the Marine Corps considers itself a worldwide force as well as just for the European environment. We are doing an increased amount of training in the night and all-weather aspect of close air support.

We are doing a great deal of training in the use of electronic countermeasures. We learned a number of lessons out of the Middle East war, in that many people recognize the absence of close air support because of the lack of an electronic countermeasure capability. We have worked in this area for many years.

The Marine Corps has had for a long time the only tactically electronic warfare aircraft to protect its close air support airplanes in the frontline areas from SAM's and other type missiles.

Mr. STORM. Is it not true that both the Navy and the Marine Corps have, up until recently, at least not exercised in any direct way the possibility of a NATO Pact contingency?

In other words, you have not flown F-14s into the European theater or AE-6B's and used them for possible jamming exercises, is that correct? Are you planning something like that in the future?

General MILLER. No, sir, for over the past 6 years that I personally have been involved, we have held quite a number of joint

exercises in the NATO environment with our fixed wing and helicopter aircraft. The Navy also has participated.

Mr. STORM. That has been on the flanks, primarily, is that correct?

General MILLER. In September 1976 we had Operation Teamwork, which was on the Norwegian coast. We later participated in Operation Bonded Item, which took place on the Danish west coast. This area enters into the central region of operations. The very nature of amphibious warfare is its deterrent to war, because of its ability to go anywhere. We consider it very much of a deterrent to the problem in central Europe because the adversary must watch his flanks. It thereby reduces some of the threat in our opinion to the central front if the adversary has to distribute his forces to take care of his flanks.

Mr. STORM. The specific problem Mr. Myers was addressing was a tank assault on NATO forces. Questions were raised about the contribution the Marine Corps and Navy TACAIR might make specifically to stopping that tank assault, whether you had the type of munitions to do that and whether you have exercised the training possibility of having to participate in it?

General MILLER. We think we do. There is some different philosophy in the way to counter armored attack. I think basically the Marine Corps feels that it does not take a tank to stop a tank. We believe that infantry with antitank weapons and air is a much more effective antiarmored force, based on the high mobility of the infantry with its highly mobil supporting firepower.

The weapons which we have we feel are very effective against tanks. We are naturally looking at improved weapons, Maverick, Hellfire, APAM, Rockeye; we do not feel that we need to restructure in order to be able to counter armor and serve in the central European area.

Mr. STORM. Thank you, Mr. Chairman.

Mr. LEGGETT. Very good. It is 12:30. We have gone I think several hours and have taxed the witnesses. We have obtained just about as much information as I think we need in a public session today. The testimony was very helpful to the committee and will help us formulate the decisions that we need to make. Thank you very much.

Admiral TURNER. Thank you, Mr. Chairman.

General MILLER. Thank you.

[Questions by the task force staff along with replies from Admiral Turner follow:]

QUESTIONS SUBMITTED BY STAFF AND REPLIES BY ADMIRAL TURNER AND GENERAL MILLER

Question. The Navy forces are (facing) an aircraft procurement dilemma of near-term affordability and combat effectiveness. What is your current modernization plan to solve this dilemma?

Answer. The current plan is to proceed with the F/A-18 program. This program coupled with the current F-14 procurement profile will allow us to continue the modernization of our fighter forces and attain the authorized level of fighter squadrons as well as replacing USMC F-4s. The A-18 will replace the A-7E in our light attack squadrons. This aircraft will provide our strike forces with the increased maneuverability to meet the projected threat environment of the late eighties and into the 1990's.

Question. Does the F-14 need a new engine—and if so, why? When could a new engine be available, how much would it cost and where is the money coming from? Are any funds included in the current POM for a new F-14 engine?

Answer. The Navy has stated consistently, since F-14 program inception, the requirement to reengine the F-14 in order to combat the threat through the 1990's. Present experience with the installed engine, TF-30, indicates further, a savings in operating costs is achievable with a new engine.

The earliest initial operating capability would be 1982. This is possible only with a near-term program commencement and with a realistic development program.

The estimated cost of such a program is in excess of \$2 billion. In view of total Navy priorities and current constraints, the Navy cannot afford a program of this magnitude at this time.

This issue is currently being discussed with the Office of the Secretary of Defense.

Question. If the F-14 were to have a new engine, with increased thrust and performance, wouldn't that investment result in making the F-14 one of the best fighter aircraft in the world today? Why would we buy a less capable F-18, if we made a decision to go ahead with the new engine?

Answer. Yes, the Navy anticipates that with a new, higher thrust engine the F-14 would dominate any known or postulated threat. It is the intention of the Navy to employ the F-14 aboard all aircraft carriers to provide maritime air superiority. The prime importance of the F/A-18 program is to replace our A-7E light attack aircraft and USMC F-4's as well as complement our fighter force.

Question. If the Navy were to go ahead with an engine replacement program, how would the replacement engine be selected? Is the Navy still considering the F-401 (a version of the engine in the Air Force F-15) as the leading candidate?

Answer. The original plan to reengine the F-14 involved a replacement of the TF-30 with the F-401 engine, both of which are Pratt and Whitney engines. Current congressional direction, as stated in the fiscal year 1977 budget authorization, gave the Navy \$15 million to conduct "a hardware demonstration" and "source selection" for a replacement engine for the F-14. There are three major engine manufacturers showing in this program, including Pratt and Whitney.

Question. The Navy has reported high operations and support costs and low operational readiness for deployed F-14 squadrons. Recently nearly \$80 million in reprogramming have been requested for the F-14 OR Improvement Program and other increases in F-14 readiness. What are your realistic views as to improving this situation?

Answer. The operational readiness rate has almost doubled in the past year as a result of the increased emphasis on the F-14. We are also extremely pleased with recent data showing that the latest F-14 configuration delivered to the fleet has achieved a dramatic increase in readiness and reliability. The Navy is optimistic that we are gaining on the problem caused by concurrency early in the program. The ongoing AIMVAL/ACEVAL program has unequivocally proven the F-14 can be consistently maintained at a very high state of readiness.

Question. How time sensitive is the full production go-ahead decision on the F-18 to the fighter/attack force mix in the fleet today? What are the implications if the F-18 program is not pursued and no F-18 or A-18 aircraft are procured?

Answer. If the F/A-18 program is not pursued, the implications are that additional F-14's would have to be procured to replace Marine Corps and Navy F-4's in the late 1980's. Additionally, A-7E procurement would have to be continued to maintain Navy light attack force levels. The full production go-ahead decision on the F/A-18 is not particularly time sensitive; however, with no A-7E production, the A-18 will be required after 1985 to maintain our light attack force levels.

Question. In its role of patrolling the sealanes, the carrier task forces face threats from air-launched, surface-launched, and subsurface-launched missiles. Can any aircraft, other than the F-14, counter this threat? How effective is the F-14 against that threat?

Answer. The F-4, which is being replaced by the F-14, is considered to have a very limited antimissile capability. The F-18, currently being developed, is being designed as a strike escort fighter. The F-14 has demonstrated its ability to intercept and destroy missile-sized targets successfully. No aircraft in existence, or in development, will have the capability of the F-14 to counter this threat.

Question. What sorts of missions does the Navy envision for the proposed V/STOL aircraft? In what threat environment are they expected to operate? To what extent are the performances criteria dictated by the presumption that they will have to engage in air-to-air combat with the highest performance Soviet fighters?

Answer. The Navy's program for the development of V/STOL has identified two basic types of V/STOL aircraft to fulfill many of the Navy and Marine Corps mission needs. The Type "A," which will be developed first, is expected to satisfy the requirements for antisubmarine warfare, airborne early warning, airborne tanking, carrier onboard delivery, and Marine medium assault. With an anticipated initial operating capability of 1991, the Type "A" will replace the E-2, S-3, and H-46, which will be over 20 years old. The high performance, supersonic Type "B", which is expected to fulfill fighter and attack requirements, will be introduced about 1995.

Ongoing Navy studies indicate that high performance V/STOL aircraft can satisfy Navy requirements. Requirements of future aircraft, V/STOL in this case, are predicated on the ability of all forces to carry out the Navy's mission in face of projected future threats, including aircraft as capable as the BACKFIRE and its follow-on. The tactic of forward basing V/STOL aircraft on picket ships, far from the task force center, can greatly improve the ability of a force to meet the threat of high-speed raids.

Question. What role do you envision for the AEW and ASW variants? How does this role fit into a force that already contains a large number of helicopters and will contain a large number of land-based patrol and warning aircraft?

Answer. The Navy's program goal of fewer types of aircraft generates the need for multimission platforms. The V/STOL aircraft, as part of this overall program, will provide these functions, but not necessarily in the traditional sense. An AEW aircraft may be capable of controlling surface launched missiles. The ASW aircraft could provide over-the-horizon surveillance and targeting, thereby geometrically increasing a surface combatant's area of influence. The role of V/STOL supplements all of our aircraft assets, land-based, patrol and rescue aircraft or helicopters embarked on surface combatants. It is the combination of these forces, land-based and sea-based, relaying information to the force commander that will enhance the capability to successfully and judiciously deploy forces.

Question. Does the V/STOL program compete with the F-18 program and why do the Marines require both? Will not the AV-8B equipped with modern air-to-ground and air-to-air munitions substitute for the payload and maneuverability characteristics of the F-18?

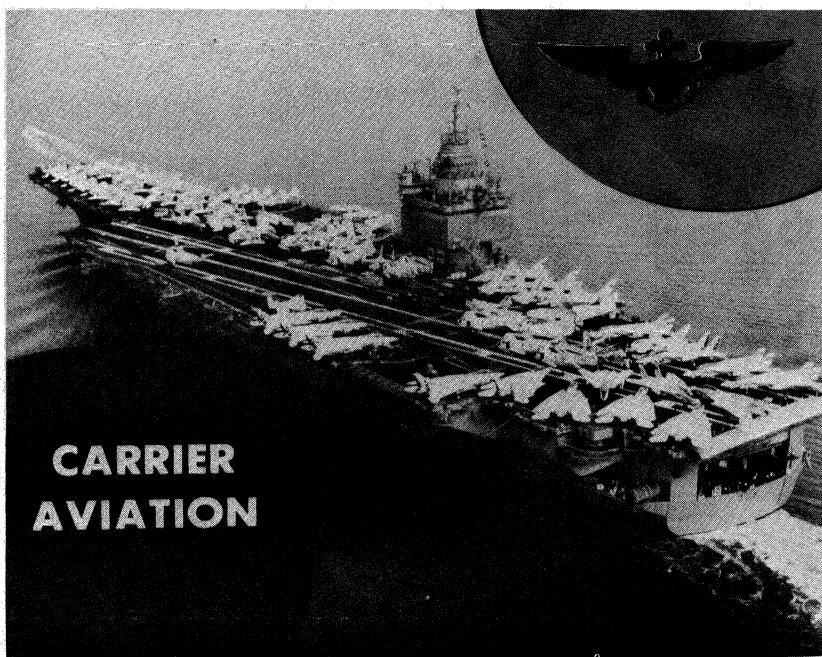
Answer. The Marine Corps requirement for a fighter is to counter the threat. The F-18 is designed to meet and beat known and future threat aircraft in all-weather conditions. High thrust-to-weight ratio coupled with outstanding aerodynamic features give the F-18 superior fighter maneuvering performance, outstanding supersonic dash capability, and significant STOL performance. The AV-8B light attack aircraft is designed as a subsonic highly deployable, quick response, survivable close air support aircraft optimized to operate in a high-threat environment from austere forward sites. The small size of the AV-8B relative to the F-18 restricts it from carrying the weapons systems necessary to achieve all-weather threat superiority. The AV-8B's small size, high subsonic speeds and agility does provide it with a formidable defensive capability against threat fighters.

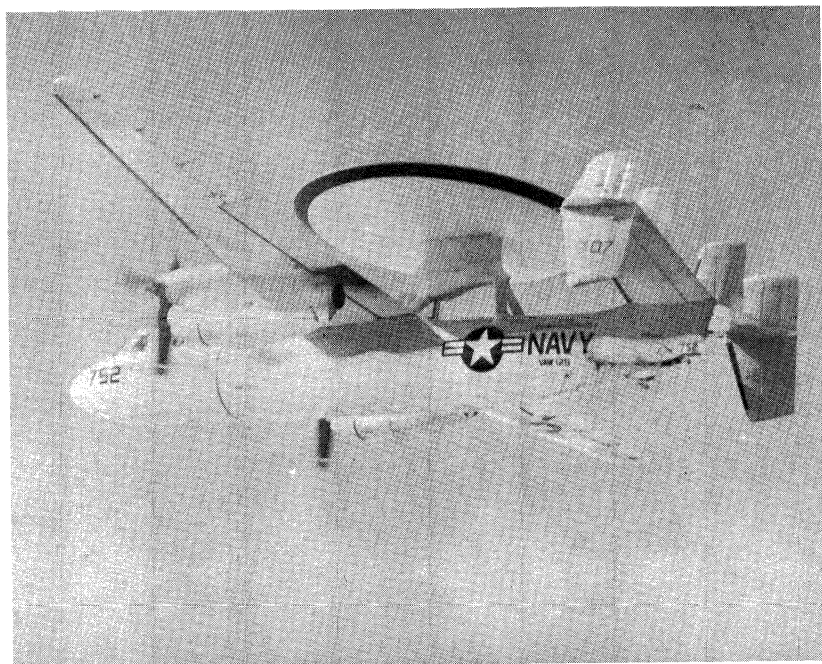
Question. What is the planned role of sea-based tactical air in a conventional NATO/Pact war?

Answer. The primary emphasis for sea-based tactical air in a conventional NATO/Pact war must necessarily be placed on the sea control function; that is, controlling those ocean areas essential to our support of NATO forces via the sea lines of communication, and, denial to the Warsaw Pact of those ocean approaches, and the airspace above them, which the enemy could use to employ naval weapons against NATO forces ashore. This sea control mission requires destruction of the Soviet multiple threat—BACKFIRE bombers, submarines, and surface ships—all of which are capable of launching cruise missiles from great standoff distances. Only the aircraft carrier's tactical air assets are capable of killing all these platforms prior to reaching their maximum missile launch ranges. Any use of tactical air assets in a projection role must necessarily be limited until the battle for sea control is won.

[The slides and illustrations referred to follow:]



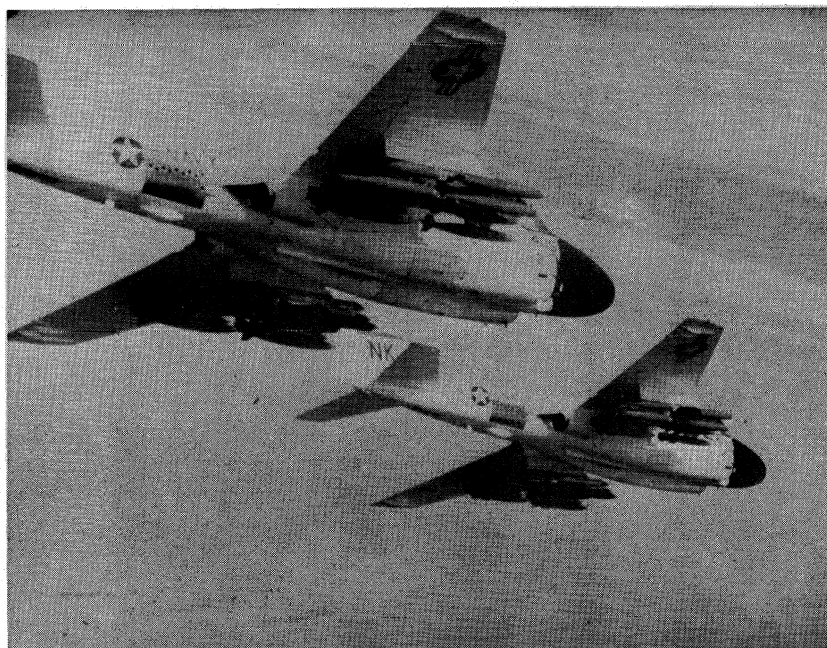


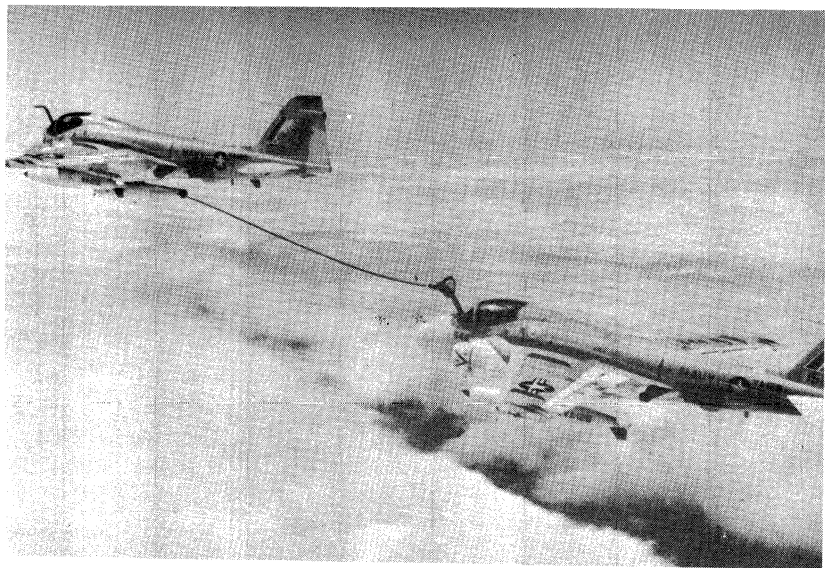


PHOENIX LAUNCH FROM NAVY F-14



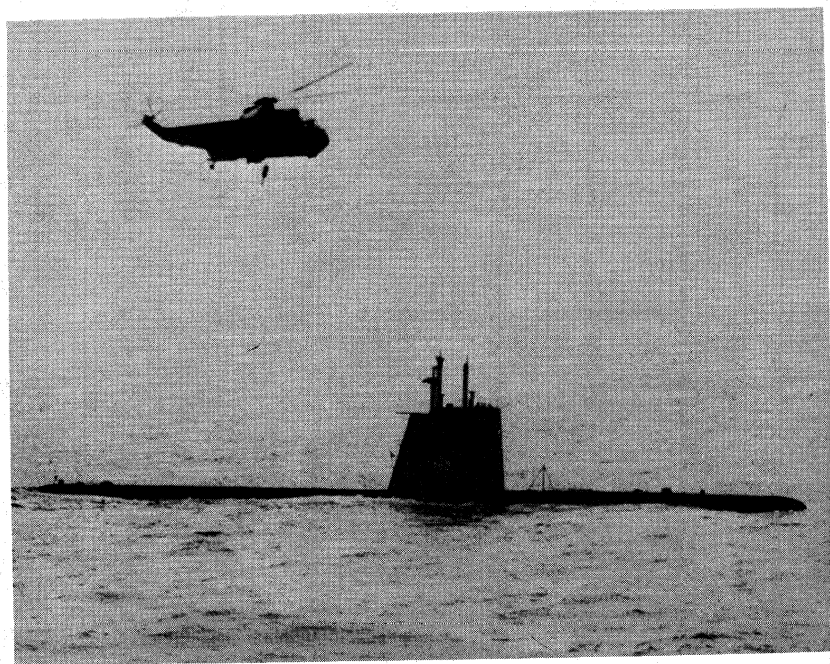






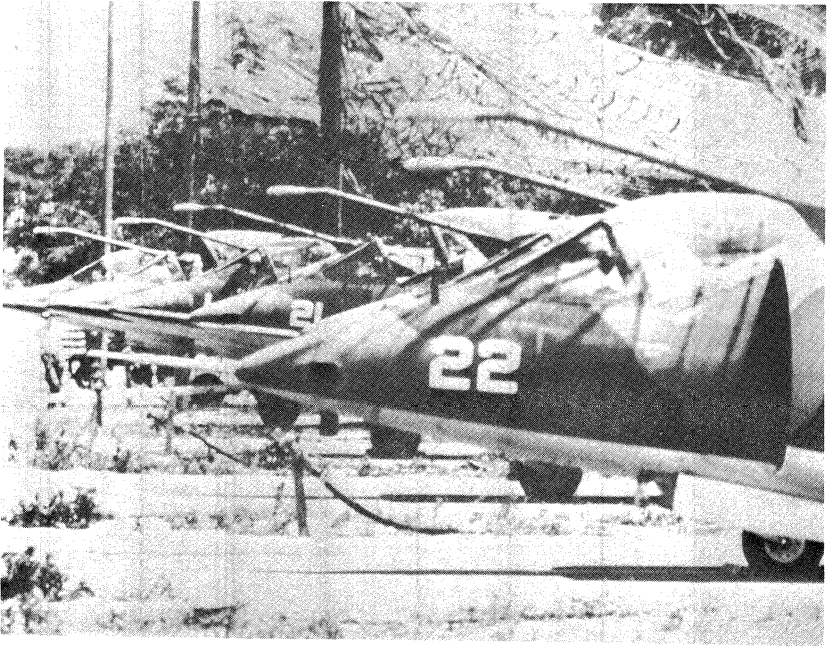






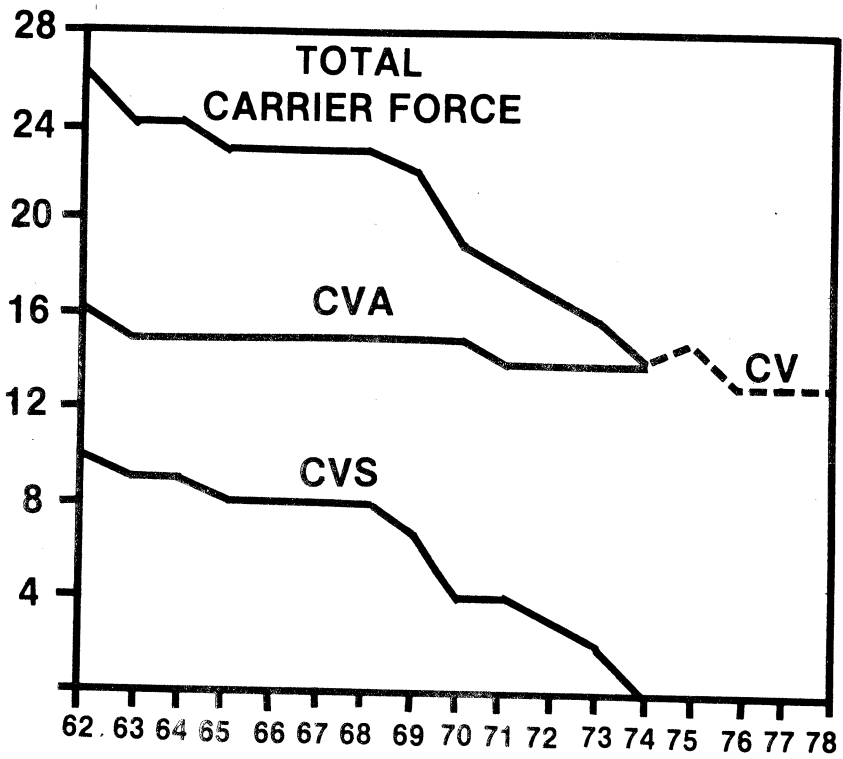




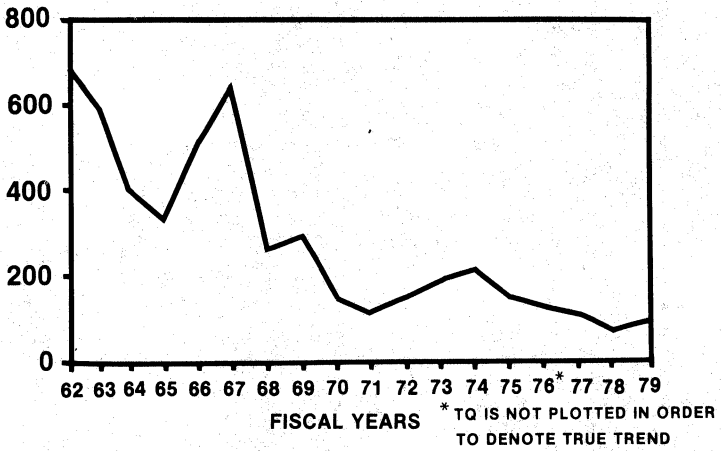


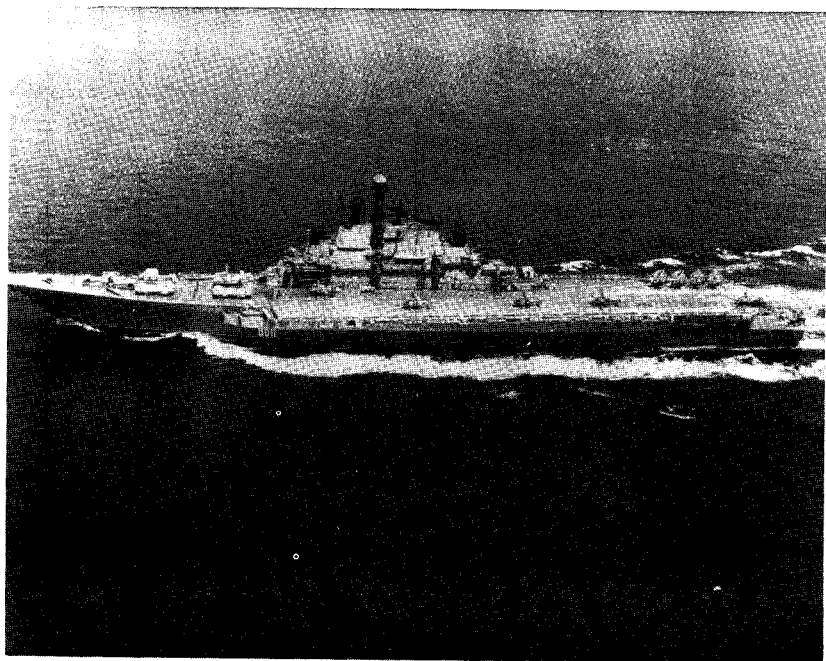


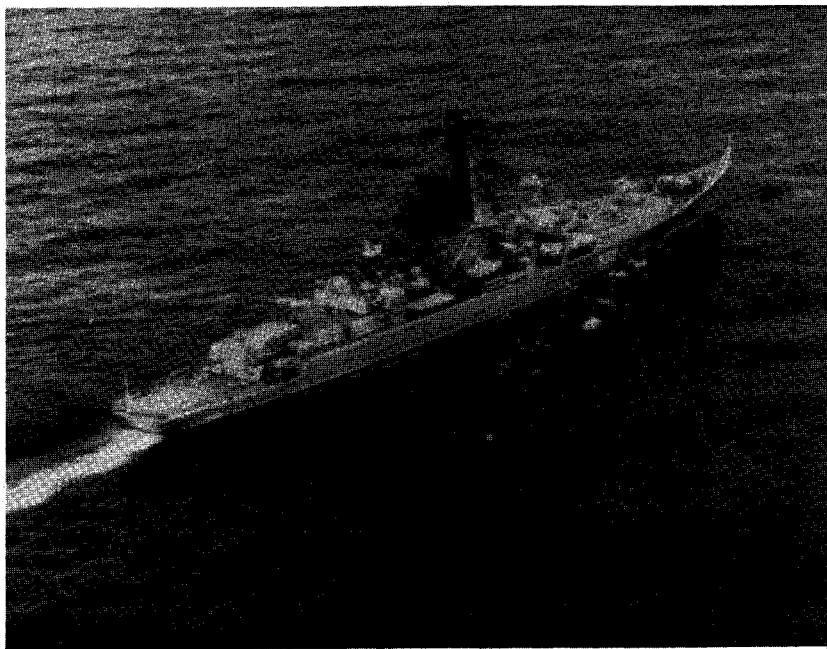
CARRIER FORCE LEVEL

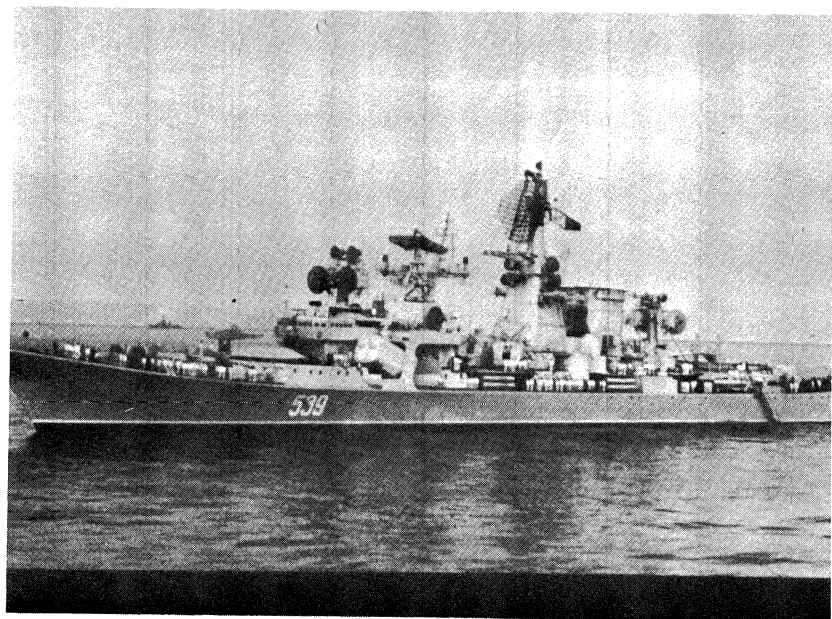


DON CARRIER AIRCRAFT PROCUREMENT



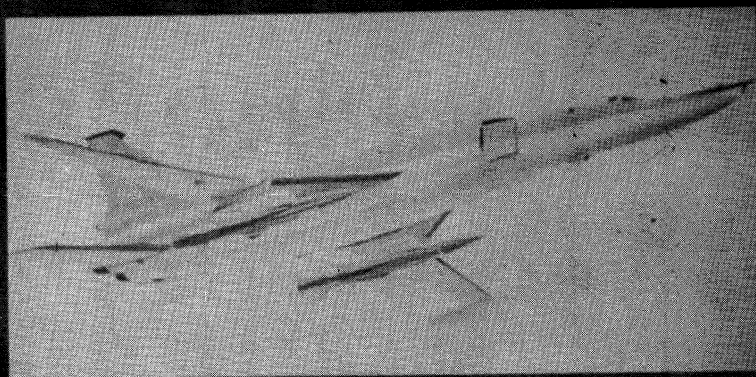


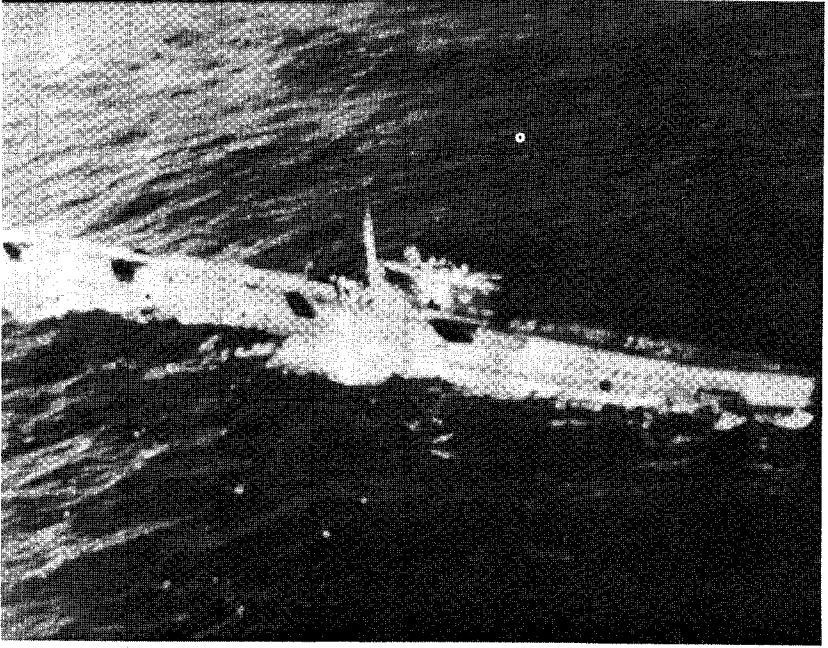


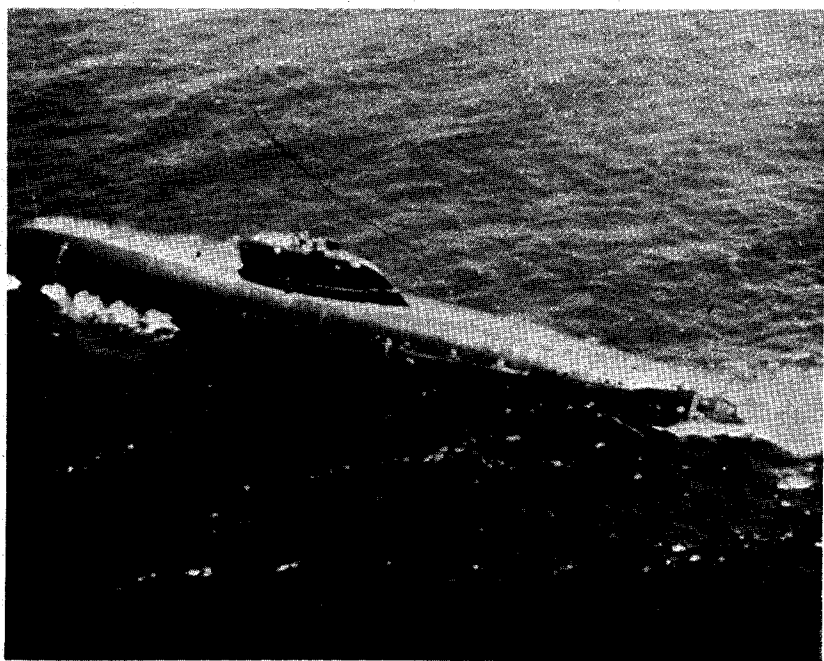


SECRET

BACKFIRE B







F-14A

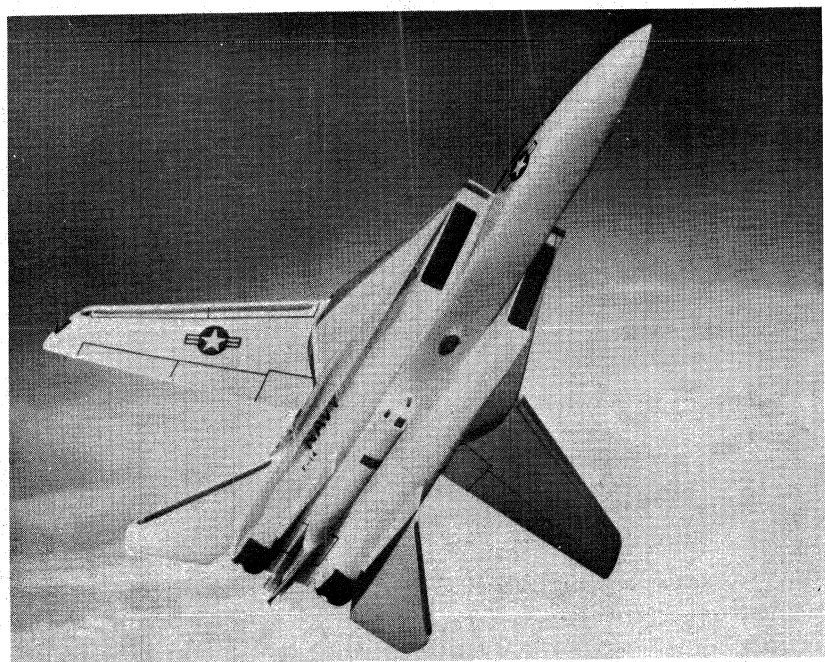
TOMCAT

GRUMMAN

MISSION

AIR SUPERIORITY FIGHTER
FLEET AIR INTERCEPT
AIR TO GROUND ATTACK









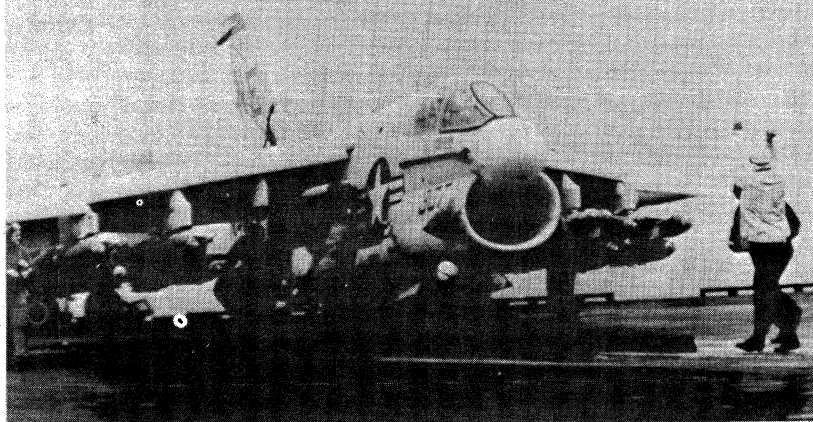
A-6E INTRUDER GRUMMAN**MISSION**

DESTRUCTION OF ENEMY SEA AND LAND TARGETS WITH CONVENTIONAL OR
NUCLEAR WEAPONS UNDER DAY AND NIGHT ALL-WEATHER CONDITIONS
WITHOUT VISUAL REFERENCE TO THE TARGET



A-7E CORSAIR II**VOUGHT****MISSION**

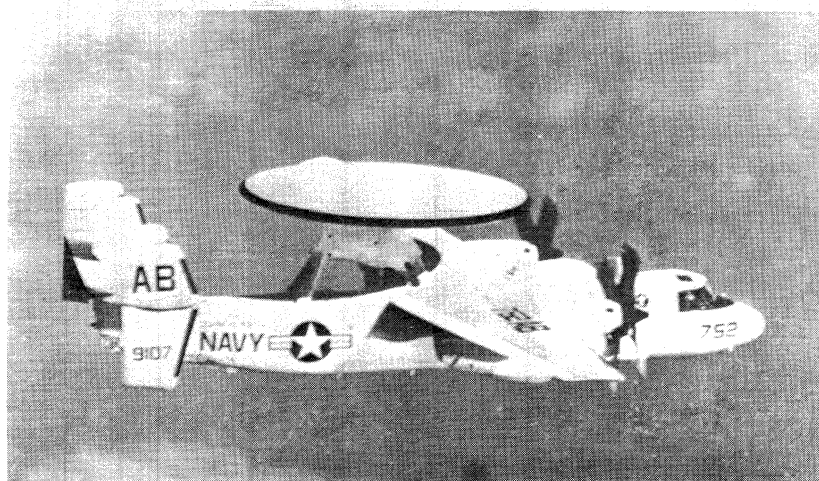
GENERAL PURPOSE LIGHT ATTACK. OPTIMIZED FOR VISUAL ATTACK IN
STRIKE AND INTERDICTION MISSIONS

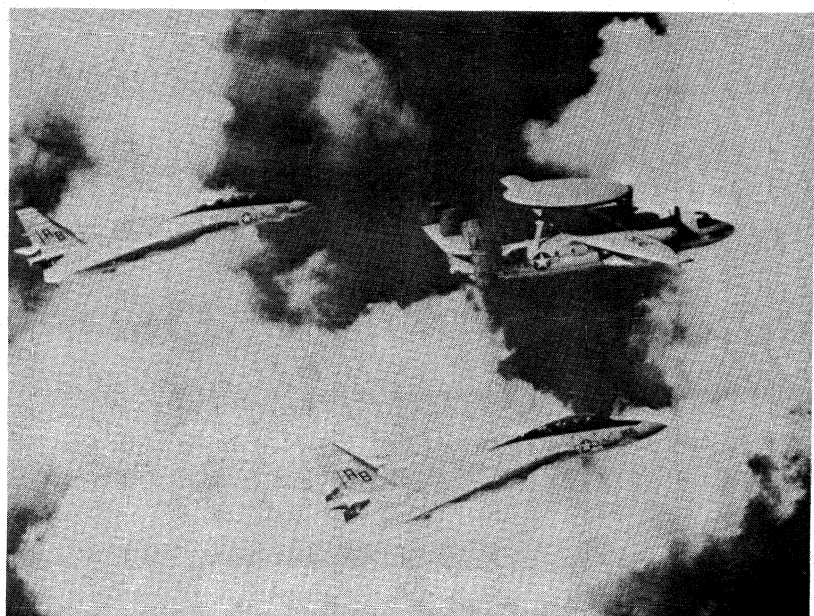


HAWK E-19

MISSION

AIRBORNE EARLY WARNING, COMMAND AND CONTROL





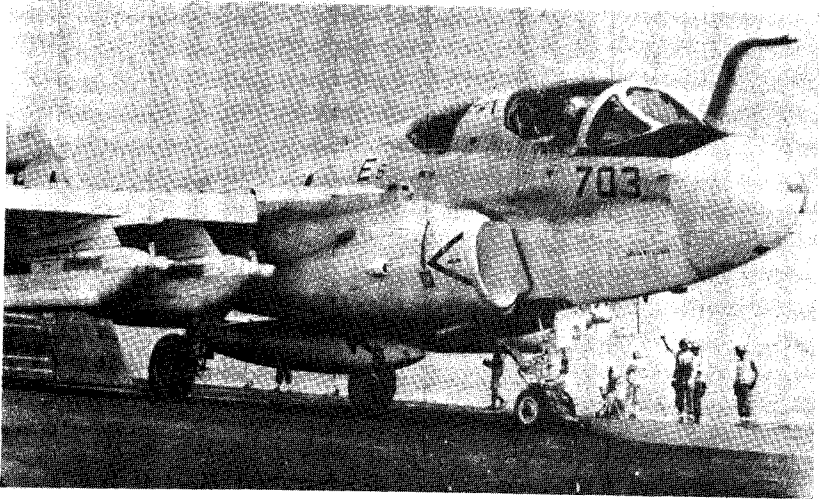
PROWLER

EA-6B

GRUMMAN

MISSION

ALL WEATHER TACTICAL JAMMING SYSTEM



S-3A

VIKING

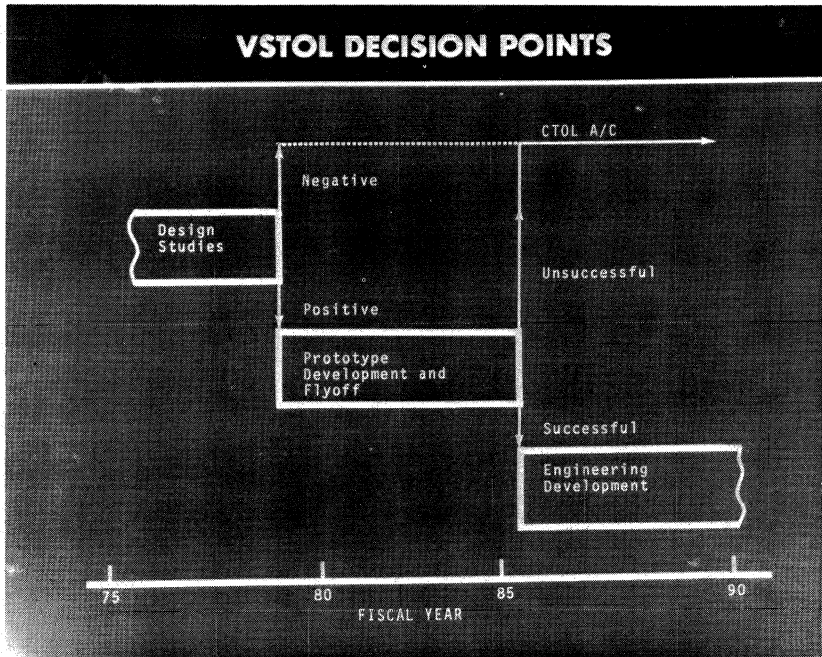
LOCKHEED

MISSION

CARRIER-BASED ANTI-SUBMARINE AIRCRAFT DESIGNED TO COUNTER
THE QUIET NUCLEAR SUBMARINE THREAT OF THE 1980s







[Whereupon, at 12:31 p.m., the task force adjourned until 10:00 a.m. Tuesday, June 28, 1977.]

TACTICAL AIR WARFARE

TUESDAY, JUNE 28, 1977

HOUSE OF REPRESENTATIVES,
TASK FORCE ON NATIONAL SECURITY,
COMMITTEE ON THE BUDGET,
Washington, D.C.

The task force met, pursuant to notice, at 10:20 a.m., in room 210, Cannon House Office Building, Hon. Robert L. Leggett, chairman of the task force, presiding.

Present: Representatives Leggett, Lehman, Mattox, Holt, and Regula.

Mr. LEGGETT. The meeting of the National Security and International Affairs Task Force will please come to order.

Our committee, of course, is concerned with budgetary matters and with macroeconomic effects. This morning we conclude a series of three hearings on the general subject of tactical air warfare. As was stated earlier, TACAIR consumes about \$25 billion per annum of our limited defense resources. Of course, we have limited resources for everything. In our hearings we have been reviewing the requirement for this allocation of resources in an attempt to form a basis for anticipating possible changes in force structure and funding levels in the future.

We have also discussed how TACAIR can best contribute to blunting a Warsaw Pact armor assault, and how we are preparing for such a contingency.

Today we continue these hearings with the U.S. Air Force. We are concerned with the progress of the Air Force program to build from 22 to 26 active air wings, which was to be accomplished within available Air Force resources. We also want to review the acquisition programs for the relative new systems, the F-15 and A-10, and, of course, the development progress on the F-16.

Finally, we would hope to continue our discussions of how well prepared U.S. TACAIR is to meet the threat in Europe. We will be interested in the Air Force evaluation of that threat and how it plans to meet it.

In addition to these and other areas which we will treat within the context of TACAIR, we plan to devote some time to the subject of Continental Air Defense. Specifically, we want to deal with the question of choosing a followon interceptor to replace our current firstline interceptor, the F-106. We want to know whether an interceptor is in fact required and why.

I understand the Air Force believes that perhaps the F-15 properly configured might be utilized for this mission. We want to know how the Air Force arrived at their conclusions, the basis for selection, et cetera. We also are interested in whether consideration was given to the possibility of assigning the air defense mission to the Tactical Air Command.

Our primary witnesses today are Maj. Gen. James B. Currie, Director of Programs, Office of Deputy Chief of Staff, Programs and Resources. He is accompanied by Col. C. C. Rogers, Brig. Gen. Charles Donnelly, and Brig. Gen. George Lynch. In addition to these Air Force witnesses, I am pleased to see that the Army will be represented here today by Brig. Gen. Charles E. Canedy.

I think that is enough of a preliminary statement. We have a very qualified staff here to assist in conducting the cross-examination. I would remind you that we are in what we call an open session. We do not intend to go into a closed session today or tomorrow. Please keep that in mind. I think your presentation will be helpful.

STATEMENTS OF MAJ. GEN. JAMES B. CURRIE, DIRECTOR OF PROGRAMS, DEPUTY CHIEF OF STAFF, PROGRAMS AND RESOURCES; ACCOMPANIED BY BRIG. GEN. CHARLES L. DONNELLY, JR., DEPUTY DIRECTOR OF PLANS, DEPUTY CHIEF OF STAFF, PLANS AND OPERATIONS; BRIG. GEN. GEORGE C. LYNCH, DEPUTY DIRECTOR OF BUDGET, COMPTROLLER OF THE AIR FORCE; BRIG. GEN. CHARLES E. CANEDY, ACTING DIRECTOR REQUIREMENTS AND ARMY AVIATION OFFICER; AND COL. CRAVEN C. ROGERS, JR., CHIEF, TACTICAL DIVISION, DIRECTORATE OF REQUIREMENTS, DEPUTY CHIEF OF STAFF, RESEARCH AND DEVELOPMENT

General CURRIE. Thank you, Mr. Chairman. I appreciate the opportunity to discuss with you Air Force tactical air programs. Since World War II, Air Force tactical airpower has provided the United States with a significant military capability. U.S. defense policy during these past 30 years has been, and continues to be, to meet threats to the United States and to its allies as far forward as possible.

Tactical airpower, using aerial refueling, can deploy rapidly over long distances and is uniquely suited for the task of responding to a wide range of military operations. Forward deployed, these forces provide a peacetime presence that assures allies of our Nation's support and presents our enemies with a credible deterrent. The quick movement of tactical airpower during crisis situations has served the cause of peace by preventing what might have been imminent conflict. There are many examples of deterrence that have taken place over the past three decades.

Tactical airpower is a powerful hedge against uncertainties concerning the timing and location of a possible future conflict or confrontation. Because versatility and flexibility are the key elements of tactical airpower, a significant part of our overall ability to confront the Soviet Union and the Warsaw Pact is vested in our forces in Europe, the Tactical Air Command and the Air Reserve

Force components. Whether war should begin suddenly or after a period of tension, the tactical air forces will bear the brunt of combat operations and will suffer the inevitable consequences of combat against a determined, well-equipped and well-trained opponent. We believe, therefore, that it is incumbent upon us to see to it that our tactical fighter force has the best possible equipment, training, and support.

U.S. tactical airpower is not unique to the Air Force. The Navy and Marines have significant tactical air forces that can be brought to bear against the enemy.

To the extent that the location of major conflicts can reasonably be predicted—and we believe the highest threat area to be central Europe where land-basing rights can be assured—land-based tactical air forces, in our view, apply the greatest amount of firepower against the enemy's forces at the least cost.

Air Force tactical aviation has three primary missions: Close air support of our allied ground forces, counterair, and interdiction. I would like to take a few moments to explain what these missions are and how they interlock to perform the overall mission of tactical airpower.

Close air support provides direct support to engaged friendly ground combat forces. In both quantity and quality, the Warsaw Pact continues to field an impressive array of tanks, self-propelled artillery, and organic air defense weapons. By destroying enemy armor before it can engage our forces, or during an engagement, tactical air forces can enhance the ability of our Army to take and hold ground.

To provide effective close air support, we must strive to attain and maintain both air superiority and counterair operations. If those aircraft flying close air support are destroyed by the enemy, clearly the NATO effort will suffer. To carry out the counterair mission requires aircraft designed to engage and defeat the enemy in the air, and strike his airfields and air defense communications and radar systems on the ground. This portion of the air battle will be very fluid and wide ranging, therefore we in the Air Force like to say that when the Army sees nothing but our close air support aircraft, the air superiority aircraft are really doing their job.

The third major mission for tactical air—interdiction—is to attack enemy forces and installations well before they can support the attack against friendly forces. Air interdiction missions require day, night, and all-weather capabilities. They are also the most difficult missions and require the most versatile fighter aircraft.

Force levels necessary to meet the threat with minimal risk are significantly larger than the currently programmed 26 active and 10 reserve tactical fighter wings. Even though the Air Force plans quantitative increases and major qualitative improvements in its tactical air forces over the next 5 years, fiscal realities in the alliance limit the United States and our NATO allies in achieving parity with the Warsaw Pact in numbers of aircraft. We are hopeful, however, that quality will overcome quantity.

The deterrent impact of a modern fighter force will come through its balance of size with quality, with the ability to offset larger opposing forces because of the potential for multiple kills per sortie,

and through higher sortie rates. This capability applies to all mission areas, and is achieved through the technological superiority of both the basic airframes and weapons such as the Maverick, the AIM-9L and AIM-7F air-to-air missile and the GAU-8 30mm antiarmor gun.

Our 26 active tactical fighter wings are assigned to three major commands: The Tactical Air Command—TAC—located in the United States, the Pacific Air Forces—PACAF—and the United States Air Forces in Europe—USAFE. All of these commands use the same aircraft and equipment; however, the mission of the 15 wings assigned to Tactical Air Command is broader than that of the overseas commands. While the three PACAF and eight USAFE wings prepare for immediate air combat overseas, TAC trains and readies augmentation forces, including the Air National Guard and Air Force Reserve, for use in either of the combat theaters.

The 10 Air Force Reserve and Air National Guard wings are capably manned and equipped with high-quality weapon systems, and are an integral part of the tactical air forces. We rely upon these mission-ready forces to perform a wide range of combat and support missions, and their capabilities are taken into full account in Air Force planning and operations.

The modernization and expansion of the Air Reserve Force tactical fighter force is no less a priority program than our goal of fully equipping the 26 active wings by the end of fiscal year 1981. Nominally, each of the active wings would be equipped with 72 unit equipment—UE—aircraft. Currently the force is short of that equivalent by about three aircraft wings. In other words, we have now the equivalent of 23 wings Mr. Chairman.

I repeat—modernization and full equipage of the total tactical fighter force is, in our view, one of the Nation's most urgent requirements. Soviet fighter force modernization and expansion is well underway, particularly in Europe, and parallels the modernization of Soviet ground-based air defense and supporting systems.

The F-15, F-16, and A-10 systems which are being introduced into the force will give the United States the most capable and flexible tactical fighter force available within the bounds of fiscal reality. As these modern aircraft enter the inventory, aging weapons systems in the Reserve Forces like the F-100 will be replaced by the vastly more capable F-4's, A-7's and A-10's, some of which will be delivered new from the factory. We also plan to equip the Reserve components with new F-16's but that modernization program is not planned until the early 1980's.

The tactical air forces are structured to provide the most effective mix of weapon systems to meet the full spectrum of intense air combat. While certain aircraft must have the flexibility to operate throughout the combat environment, others need not, and can be designed for more specialized missions.

For example, the higher cost F-15 and F-111, because of their sophisticated avionics systems, can perform a variety of complex missions. At the other end of the spectrum, lower cost aircraft such as the A-7 and A-10 are designed to conduct the more specialized air-to-ground mission. Somewhere in the middle are F-4's and F-16's which are able to complement both the sophisticated and special-

ized aircraft. Currently, the Active Force is made up of the F-4, F-111, A-7, the F-15, and we are just beginning to add the A-10. The F-16 will enter the force in 1979.

The 10 wings in the Air National Guard and Air Force Reserve are predominantly oriented for the air-to-surface attack mission. The F-100's and F-105's, both pre-Vietnam vintage aircraft, are obsolescent, and average 19 and 15 years in age respectively. Technological improvements in enemy ground defenses have reduced the effectiveness of these older aircraft and systems. Recently, A-37's, new A-7's and F-4's began to enter Air Reserve units and will allow them to more effectively reinforce the Active Forces in a contingency.

Our new tactical fighter systems include the F-15—this highly maneuverable, all-weather weapon system provides the U.S. Air Force with the most potent air-to-air fighter in the world. The F-15 possesses high maneuverability, is capable of all-weather, beyond visual range intercepts and engagements, has lookdown/shootdown capability, a 20mm Gatling gun, and radar and heat-seeking missiles. The F-15 has been designed to counter the rapidly growing Soviet TACAIR threat, has twice the radar detection range of the highly capable multipurpose F-16, and greater range and combat-staying capability than the F-4.

The F-16—a multipurpose fighter that complements the F-15 in the air-to-air role and provides a potent ground attack and nuclear strike capability. The F-16 possesses excellent maneuverability, an accurate and reliable avionics weapons delivery subsystem, a 20mm gun and heat-seeking missiles, low-operating costs and provides standardization within NATO. Its reliability reduces maintenance and logistic support requirements and it has a high sortie generation capability.

The A-10—this relatively low cost, unsophisticated, rugged aircraft will provide responsive, sustained, and concentrated armor killing firepower with great precision. This capability is particularly significant in light of the Warsaw Pact's tank advantage over NATO. The A-10's great maneuverability will permit effective close air support in the marginal weather typical of Europe. It has high-survivability features, a 30mm rapid-fire gun, and can employ a wide variety of sophisticated munitions such as Maverick, Rockeye, and laser-guided weapons.

MANPOWER

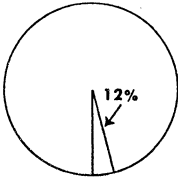
This increase in combat capability can be achieved within relatively stable overall manpower levels. We now, Mr. Chairman, have about 571,000 military manpower spaces authorized for the Air Force. New technology has increased aircraft reliability even though these aircraft are far more sophisticated than the fighters they are replacing.

The reliability features should permit decreased maintenance manning requirements and lower operating costs. Technology advances such as these means that we are able to fully equip the 26 wings with less than 5,000 additional people, and those from within the relatively stable total Air Force programed manpower levels.

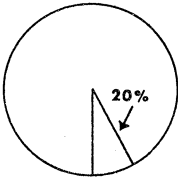
The next page in my statement addresses some of your questions regarding total obligation authority which the Air Force has available to it, Mr. Chairman, and that percentage which goes for tactical air.

[The information referred to follows:]

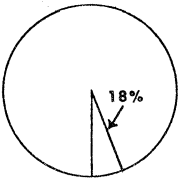
TACAIR Fighter Costs* as a Percent of Total Air Force Budget



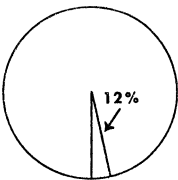
TACAIR percent of total Air Force TOA in FY 74 was 12%;



For FY 78, the current budget year, 20%;



For FY 79, the authorization year, 18%; and



For FY 82, the last year of the FYDP, 12%. The increase in FY 78 and 79 can be attributed primarily to aircraft procurement. Only the F-16 is to be in procurement in FY 82.

* Includes costs of TACAIR active and reserve squadrons, fuel, personnel, base level supplies and equipment, and War Reserve Materiel. Also included is aircraft and missile procurement.

General CURRIE. In 1974 we were procuring F-4's, A-7's were in R. & D. for what was then the lightweight fighter, now the F-16 and in the R. & D. phase for the F-15. The total percentage was about 12 percent. During the budget year, fiscal year 1978, we are at the peak of our procurement for F-15, A-10, and F-16. Next year, the authorization year, there will be a decrease as we come up on the learning curve for production of those weapons systems. By 1982 we project we will be at about the same level of percentage of overall TOA as we were in 1974.

We, therefore, have confidence that we can equip our 26 Active wings and 10 Reserve wings within the allocations that we project.

In the area of force improvements, our R.D.T. & E. and procurement programs are structured to provide force improvements dictated by the changing threat. Tactical fighters and their avionics and armanent systems must be effective in day, night, and adverse weather operations.

We need to improve our target acquisition and precision weapon delivery systems, so as to increase the effectiveness and potency of the F-4 which will remain in the inventory for at least another 10 years. When I say in the inventory, I mean the total Air Force fighter tactical inventory.

Examples of ongoing improvements include PAVE SPIKE, PAVE TACK, and PAVE PENNY:

PAVE SPIKE is a self-contained target acquisition and laser designation system currently being installed on the F-4 which will allow the aircrew to deliver a family of precision guided weapons with significantly improved accuracy. This capability, and others like it, will increase the probability of destroying a target by orders of magnitude, thereby reducing both weapon costs and the exposure of aircraft to hostile fire.

PAVE TACK is a self-contained infrared target acquisition and laser ranger/designator system planned for F-4, RF-4, and F-111 aircraft. Fully integrated with the aircraft navigation-attack system, it will significantly improve target acquisition and kill capabilities during day, night, and certain adverse weather environments. It, too, will permit employment of precision guided munitions.

A third program, PAVE PENNY, will provide day or night laser-designated-target acquisition for single-seat aircraft. The system will enable pilots to quickly and positively acquire laser-designated targets, even beyond visual range.

Weapons currently under development will complement these modifications and improve total system combat capability. Improvements to the TV-guided Maverick missile, in the form of laser and infrared seeker heads, will increase our overall flexibility and around-the-clock capability to seek out and destroy a wide range of targets.

The GBU-15 modular guided weapon system will be equipped with modular warheads, seekers, and guidance systems. The modular design enables the air combat commander to assemble the most appropriate weapon to meet the demands imposed by day or night conditions, weather, and the threat environment.

Modest avionics improvements to the A-10 will counter the increasing threat posed by Soviet armored forces and the proliferation

of air defenses organic to their Army units. Programed improvements include an inertial system for accurate, self-contained navigation during periods of low visibility, an internal chaff/flare system to defeat radar and infrared seeking missiles, and an update to the radar warning receiver. These enhancements will increase the A-10's effectiveness and survivability.

ELECTRONIC WARFARE

Electronic warfare is integral to successful air operations in a sophisticated threat environment. Self-protection and support jamming systems contribute directly to aircrew survivability, and we know from combat experience in Southeast Asia that we must exploit the potential offered by technological advances in these areas.

We must be capable of suppressing enemy surface-to-air missiles and antiaircraft gun systems.

The EF-111A tactical jamming system, now in development, will provide one piece of the tactical fighter force mix required to effectively suppress defenses. By jamming enemy radars, it will permit other Air Force missions—and those of our allies—to be flown with less interference from enemy air and defense systems.

Another piece of the defense suppression force mix will be provided by the F-4G Wild Weasel—a modified F-4 aircraft. It is a self-contained system capable of detecting, identifying, locating, and then delivering ordnance to suppress or destroy enemy threat radar emitters. The need for Wild Weasel aircraft is well documented by our experiences in Southeast Asia and the Israeli experience during the 1973 war.

But these very capable aircraft will be relatively few in number. Therefore, it is necessary to equip individual fighters with self-protective countermeasure systems. We are in the process of modifying our fighters to carry chaff, flares, and electronic countermeasure systems to enhance their survivability and better insure mission accomplishment.

AIR-TO-AIR ARMAMENTS

In the counterair mission area, significant efforts are being expended for armament system improvements such as the AIM-7F air-to-air missile. This latest member of the Sparrow family has much greater reliability and operational effectiveness than previous AIM-7 series missiles. The AIM-7F's all-weather, beyond visual range capabilities make possible the lookdown/shootdown capability of the F-15.

The F-16 was designed for the close-in, within visual range combat environment and subsequently will not have the sophisticated radar and other longer range attack features of the F-15. Testing of the AIM-9L infrared air-to-air missile has proven it to be a potent weapon in the close-in dogfight. Thus, the F-15 and F-16, using the AIM-7F and AIM-9L and their guns, will provide a complementary high-low mix of both cost and capability.

Subsystem improvements are an essential element of the development and acquisition cycle of all major weapon systems. The F-100 engine, for example, experienced some problems when it was introduced with the F-15. The Air Force has placed top priority on solving these problems. Most have been eliminated and we are confident that corrective actions underway will resolve all remaining concerns with the engine.

Modifications to aircraft will continue to play a large part in our force capability improvement efforts. They increase total force effectiveness without incurring procurement costs of new aircraft and increase reliability and maintainability so as to keep operating and support costs at a minimum. Air Force aircraft, avionics, and munitions programs are aimed at providing the means to accomplish mission objectives in the most effective manner possible.

DEPLOYMENT ISSUES

Should a major confrontation occur in NATO, CONUS-based fighters could rapidly augment the USAFE force of about 500 now in place. Without additional bases, these tactical fighters or reconnaissance aircraft would be bedded down at each of the USAFE main operating bases—MOBs. Airlift aircraft and other support forces would add to that total.

The vulnerability of the force concentrated on just a few bases would be very high and attrition from enemy attack would be unacceptable. Use of collocated operating bases—COBs—and standby dispersal bases—SDBs—can reduce the average base loading significantly.

The improvements to be obtained from the COB program, which is being implemented in concert with other alliance members, will reduce our vulnerability and by so doing increase our force effectiveness. The investment in the protective facilities such as aircraft shelters means aircraft survival on the ground which in turn means that expensive and irreplaceable aircraft will be available to perform their missions. There are several aspects to the program.

For example: Currently, about 700 aircraft shelters are either constructed or funded, therefore, if each aircraft were to be sheltered, a shortfall exists. We are asking for \$60 million this year and next to reduce aircraft vulnerability.

The Air Force has two major aviation fuel shortage problems in Europe. Some jet fuel storage is not properly located and movement of this fuel to the point of intended use is not assured because of enemy action, of course.

Second, main operating bases—MOBs—standby bases—SBs—and collocated operating bases—COBs—have too little wartime reserve fuel stocks on base. The Air Force has programed \$11.5 million in fiscal year 1978 for semihardened fuel storage facilities located on collocated operating bases to help solve both of these problems. As an interim measure, the deployment of air transportable hydrant refueling systems is planned to provide additional storage where shortfalls exist. I might add that those systems are vulnerable to enemy attack.

Lack of hardened facilities for avionics maintenance shops is a third area of concern. Therefore, we have taken action in the fiscal

year 1978 budget request to harden essential avionics maintenance support facilities for deployed aircraft.

A final problem area involves munitions storage. Currently a large percentage of munitions is stored at a few large storage sites. Loss of one of these early in a conflict could seriously impair our fighting capability. To resolve this problem, we are currently looking at improving storage at individual European bases.

READINESS

We are frequently asked how ready we are to go to combat. It is a good question that deserves an honest answer because readiness is the end product of the national investment in hardware and manpower. It is also difficult to answer because statistical readiness data alone are not always a meaningful measure of a unit's combat capability. The real measure of readiness is a mix of this statistical data and the commander's estimate of how well his people will do against the enemy. We are doing a number of significant things to help commanders make a more accurate estimate in this most important area.

Red Flag exercises conducted at Nellis AFB, Nev., provide aircrew training in a realistic, multithreat environment. Between December 1975 and April 1977, Red Flag trained over 3,800 Active and Reserve aircrews flying over 14,000 training sorties. Participation in these exercises is not limited to TAC. Air Defense Command forces participate to provide realistic air defense of the friendly bases of operations, and Strategic Air Command forces provide high and low altitude conventional bombing sorties, as well as inflight refueling for the fighter forces. The Army and Navy also play in Red Flag in their respective mission roles; the Army for example, has provided base perimeter defense and air defense of friendly operating bases, and the Navy by providing fighter augmentation during tactical missions.

Several unique features of Red Flag permit unparalleled training. The size of the training area and its low population density allow supersonic flight and very low altitude navigation training. Live ordnance is delivered on much of the range, and few ranges offer such a wide variety of targets. The area is also large enough to allow relatively unrestricted operation of electronic warfare equipment. We believe continued Red Flag operations at the Nellis complex will prove to be invaluable in providing challenging and realistic readiness training.

To complement the Red Flag program, we have instituted the Blue Flag program at Eglin AFB, Fla., to provide realistic training in the planning, execution, coordination, and control of tactical air operations. Emphasis is placed on command and control systems and the interoperability of communications and intelligence supporting these systems. Blue Flag, in addition to providing continued readiness training for battle staffs, also provides the facility for developing requirements, concepts, and procedures for existing and new command and control systems.

Cope Thunder is PACAF's version of TAC's Red Flag program. Flying units stationed in Japan and Korea are deployed to Clark

AFB, Philippines. Threats are furnished by a T-38 aggressor squadron—which employs potential aggressor combat tactics—and by ground radar simulators. These two types of threats on the Crow Valley Range permit a degree of realism not found on any other PACAF ranges.

One further training mission which is designed to assist the commander in determining and assuring his forces are ready to fight is the dissimilar air combat training—DACT—program like the T-38 aggressor program in PACAF.

Tactical fighter forces have, in the past, received intensive training in air-to-ground weapons delivery, but air-to-air training was limited to similar aircraft using U.S. Air Force tactics. The DACT program is correcting this training deficiency by providing tactical fighter pilots with an adequate background on potential enemy philosophy, tactics, and doctrine. The program provides airborne experience against a simulated enemy threat in an environment closely similar to the enemy air arena so as to create a more lasting, realistic training experience. By providing a well-rounded training program, we are improving our confidence that our fighter crews will be ready to take on enemy fighters—a skill previously acquired only in actual combat.

FOLLOW-ON INTERCEPTOR

We find over the years that we lose the majority of our fighter crews in the first 10 sorties because they are not familiar with the air combat environment. This training program we trust will do away with some of that.

We have been asked to speak about the need for the air defense follow-on interceptor which the Air Force believes should be the F-15A. No one questions the existence of the Soviet BACKFIRE bomber though many question the use to which it may be put. As military men, we assume that because it is a bomber, it is intended to be used to bomb things and because it has long range it will be flown over long distances. The capability of the BACKFIRE leads us to conclude that it could be used against the United States as part of the Soviet Triad. It, therefore, follows that some sort of air defense force should be available to deny the Soviets a free ride.

Today the air defense force consists of 16 squadrons equipped with the F-106, F-101, and F-4. Six of these are in the Active Force. The F-106 is the most capable interceptor we have and there are 12 squadrons, all based in the United States, equipped with this aircraft. Six of the squadrons are Air National Guard units and are underequipped. The F-106, of course, is no longer in production and normal peacetime attrition forces us to rely upon Tactical Air Command assuming some alert duties normally the responsibility of Air Defense Command.

In peacetime, this arrangement is bearable. However, if war comes, the TAC units, be they Active or Guard, will probably be deployed to combat and the thin F-106 force will be insufficient to provide a credible air defense of the United States against intruding Soviet bombers. To overcome this deficiency, we believe we should, over a period of years beginning in fiscal year 1981, convert the

active F-106 force to the F-15. This conversion will release sufficient F-106s to fully equip the existing Guard F-106 units and convert the older three F-101 squadrons. With this force we believe we can provide a credible defense of the United States.

SUMMARY

In summary, Mr. Chairman, we believe that the investments planned for the modernization of the total force provide for quality second to none and quantities that, while not meeting the threat 1-for-1, are sufficient to deter the Soviet Union from directly challenging the United States and its allies. Our readiness is good and getting better, we are deployment oriented, we are working hard on more interoperability with NATO through acquisition of a common fighter—the F-16—and we plan the use of collocated operating bases. Most importantly, we believe we are giving good return for each dollar spent.

Mr. Chairman, this concludes my statement. We will be pleased to answer your questions.

Mr. LEGGETT. Thank you very much, General Currie. That was an excellent general statement and certainly the committee and the United States are proud of the TACAIR through past engagements and I am sure you will be ready when and as you are required to participate in further efforts.

With respect to the last issues first, you indicate collocated bases. That is collocated with what?

General CURRIE. The collocated bases are bases owned by our allies. [Deleted] we have identified 52 bases throughout the alliance, most of them in the central [deleted]. Whether we will put all 52 of those bases to use or not remains to be seen.

The important thing is that those bases are fully operational but they do not belong to the United States. [Deleted.] We intend to take advantage of the capability that those bases possess so that we can bed down our force on those bases and have our force less vulnerable.

Nevertheless, it will take some investment to do that, aircraft shelters, the things I talked about, munition and POL storage, because when our forces deploy, they have to have those kinds of things to survive in a very intense combat environment.

Mr. LEGGETT. Are you thinking of relocating your USAFE units or are you talking about a surge buildup capability?

General CURRIE. The latter.

Mr. LEGGETT. To what extent do you have a synchronized capability with our allies, say, in Europe at the present time?

General CURRIE. I would like to have General Donnelly speak to that, sir.

General DONNELLY. I take it, sir, by synchronized capability you mean synchronized capability as we fight?

Mr. LEGGETT. Well, you had some of the other units before the committee. Of course, we understand that on the ground we have sectors that we defend. It appears that the greatest threat sectors are given to some of our allies and the low-threat sectors are given to the United States. I am wondering to what extent do we provide sector defense in the air?

General DONNELLY. Sir, right now in the total central front going from Denmark all the way down into southern Germany, there are two sectors, if you will, the Fourth Allied Tactical Air Force in the south and Second Allied Tactical Air Force in the north. Both those sectors are connected by common communication so that they can talk to each other.

At the same time, we in the United States have a tactical air control system in the Second and Fourth Allied Tactical Air Forces area which will not only control our aircraft if they are fighting there, but also control the aircraft of our allies or provide threat information. We have a fully integrated system now and we plan to improve it more in the future to make sure that the Second and Fourth Allied Tactical Air Forces are integrated to be able to fight together.

Air, of course, does not stop at a border between the Fourth and Second Allied Tactical Air Force. Air has the responsibility to go wherever the threat is to support allied forces. Certainly air will react where the threat is and assist the allies if in fact they are the only people in contact. I would seriously doubt in a war of that magnitude, that the allies would be the only ones in contact at the moment.

Mr. LEGGETT. I think everybody recognizes that the primary place to keep a balance is between the European countries and on the other hand it might be the least likely place for the utilization of our force capability, at least we hope that is true.

So the question comes up about the extent to which we are ready in Europe and to what extent we provide a balance and to what extent we are operating under a precisely unified operating command.

General DONNELLY. Sir, if I might add, a little over 2 years ago the allies agreed that the central European region should be organized in what we call Allied Air Forces Central Europe which integrates all of the NATO air forces in the central region. That is commanded by Gen. Richard Ellis who is also our Commander in Chief of U.S. Air Forces Europe.

With that integration we were able to establish common procedures to fight the air war in all of central Europe. General Ellis has a deputy from the United Kingdom. He also has an operations officer from Germany and his AAFCE is represented by all of the NATO air forces for the command and control of air forces in the whole central region.

Mr. LEGGETT. Now, your tank killing capability over there at the present time is represented by what kind of vehicles?

General DONNELLY. At the present time, sir, with the F-4 primarily since that is the only air-to-ground aircraft we have over there at the moment. Of course, it is limited compared to what the A-10 will be. The F-4 does have a tank killing capability with some of the Rockeye munitions which is an area munition which has an antiarmor bomblet. It also has some Maverick capability or will have in the very near future. The tank killing capability will improve significantly when the A-10 is deployed to Europe in the near future. The A-10 is just now coming into inventory.

Mr. LEGGETT. In what time frame do you anticipate that being deployed?

General CURRIE. We are now in training with the first wing. The first operational wing will form at Myrtle Beach within the next year. Once it is operationally ready, it will be capable of deploying. There are plans to put the aircraft over in Europe, to bed it down in Europe. The wing at Myrtle Beach and the other five wings will be in the Active Force. Two wings will be in the Reserve Forces. Once we are fully equipped, they will be able to deploy and augment the European force.

Mr. LEGGETT. So do you anticipate that were a war to break out then in Europe, that you would ferry these planes over unit-by-unit to Europe?

General CURRIE. Yes, sir. Ferry is not quite the right word. What we do in Tactical Air Command is under the auspices of the JCS. When ordered forward, Strategic Air Command provides the inflight refueling, Military Air Command the airlift and the Tactical Air Command provides the fighters. It is an integrated move so that the pilots and the crews fly the fighters and the Strategic Air Command provides inflight refueling.

So that within a matter of 10 hours, once the aircraft are in the air, we will be in Europe. We are only limited by the number of tankers that we have onboard to do that job.

Mr. LEGGETT. The tanker program currently is on a 1-to-1 basis, isn't it?

General CURRIE. No, sir. If you mean ratio to fighters, that depends upon the distances and offload characteristics, the weather, a host of variables. It is not necessarily 1-for-1. It can be different. It varies as to time and distance.

Mr. LEGGETT. In essence your A-10 is the tank killer because it has the GAU-8 and no real possibility of deploying that 30mm on any other vehicle?

General CURRIE. No, sir. It is a very, very large cannon. As you know, the A-10 was built around it.

Mr. LEGGETT. The A-10 was almost burned up around it. So the Air Force is still currently fully sold on the capability of the A-10 to perform the job which it was designed to do?

General CURRIE. Yes, sir.

Mr. LEGGETT. What is the capability of the A-10 in a fog environment? You talked about some kind of an inertial navigation capability here, how valuable is that?

General CURRIE. We think very valuable, Mr. Chairman. The A-10 does not have radar. While it can maneuver well with visibilities down to about 1 mile which is not too unusual in central Europe, it needs an inertial platform so that it can proceed to the general target area and know where it is positioned in space and then let down rather than trying to fly at the tops of the trees in limited visibility and perhaps losing the aircraft en route.

But once in that general area when he is in contact with the forward air controller, he knows where he is, he can get a weather report, he can make his descent and then he can acquire either visually or through some other method the target and go ahead and make his strike. He has extraordinary maneuverability close to the

ground. The tactics which we are developing for it will not use the normal pitchup and rollin tactics we use with fighters such as the F-4, but to stay down low out of the threat environments from the ground to air missiles which would go up 400 or 500 feet, stay below that, acquire the target and deliver his munitions.

Mr. LEGGETT. Would the A-10 be getting any of these PAVE systems you talked about?

General CURRIE. They will have PAVE PENNY, the laser target acquisition system which is designed for single place aircraft like the A-7 and F-16. We have it going on the A-7 and F-16 too.

Mr. LEGGETT. That acquires designation until impact, right?

General CURRIE. Yes, but that designation can be done by anyone. General Canedy's people could designate. Once the target is acquired and designated, you go ahead and deliver and leave. You launch and leave.

Mr. LEGGETT. Would you be working with General Canedy's people on interrelated designators like that?

General CANEDY. They are joint. The designator program is a joint program. Similarly, the seeker heads are developed jointly so that we have the same laser coding systems onboard all of our designation system, be they attack helicopter, envisioned scout helicopter or the ground system both short and long range. Similarly, the Air Force can help us by producing laser designation for the Copperhead and Hellfire.

Mr. Chairman, just so that you might sleep better tonight, in October we will have [deleted] attack helicopters in Europe.

Mr. LEGGETT. That is reassuring, and fully ready?

General CANEDY. Yes, sir.

Mr. LEGGETT. As long as we are talking about readiness, you indicated, General Currie, that the statistics that Aerospace Daily put out a few days ago on the operations down at Nellis indicating that the F-14 going from 80 percent to 93.1 percent in a 5-month period, the F-15 going from 78 percent to 70 percent and the 5E is going from 84 percent to 70 percent are not really that meaningful because it is in the eye of the beholder, the commander, that is important in what those airplanes can do. I am somewhat confused by that.

General CURRIE. I saw this article for the first time this morning, Mr. Chairman, so I am not prepared to speak as to how the statistics were derived. I would like to submit some remarks for the record. Operationally ready in the Air Force means that the aircraft and all of its subsystems are totally ready. There are no deficiencies in the aircraft system.

[The information referred to above follows:]

READINESS COMMENTS ON AEROSPACE DAILY ARTICLE

The operational readiness (OR) rates which can be expected of a specific aircraft or weapons system during normal peacetime unit operations are very important as a resource management tool. They do not however provide a reliable or meaningful indication of the capability of a unit to perform its combat mission. The potential for a unit to produce effective combat sorties is the yardstick against which the readiness of combat units must be measured. The unit capability measurement system (UCMS) provides the information necessary to assess the combat capability of a unit in terms of what its assigned aircraft can do. It assesses the capability of a

unit to produce combat sorties in relation to the personnel, aircrew, logistics, and aircraft resources available to it at the time it is tasked to fight. Operationally ready rates were not designed to measure unit combat capability and cannot be used in the context with any degree of accuracy.

Mr. LEGGETT. Of course, on that theory none of our ships have any capability whatsoever.

General CURRIE. However, there is also something known as flyable rate. An aircraft, if the engine is operating and the flight control systems are operating, can be flown and flown safely. So without anything further than what I have here, I really can't comment on the F-14 capabilities. I commend the Navy for a great advance, but I do not know why the F-15 would have come down.

Mr. LEGGETT. Doesn't that mean we have to get other indicators? Obviously the capability in the eye of the wing commander is not a very good standard. The operational readiness for each and every system, considering the fact that these aircraft have large numbers of systems and can blow a fuse at any point because while there might be zero defects when we come off the line, all of our systems do wear from time to time.

Shouldn't we develop a better capability to rate operational readiness? If the aircraft is flyable and its avionic systems are working and it is capable of doing 80 percent of its assigned tasks, shouldn't it be given a 0.8 instead of a zero?

General CURRIE. We are working on a system now which we think will more adequately express just exactly what you have talked to. It will not only say here is where our logistics support ability is today, but also project it into the future. I am not a logistician, but I know we are planning to do these kinds of things. It also projects the commander's estimates of how his training program is going.

For example, he gets a new pilot in his wing and he is not combat ready but he can project forward that that crew will be combat ready or his munitions maintenance load teams or his maintenance people, whomever they may be and he can project forward.

I think the real point we were trying to make, Mr. Chairman, is that we sometimes are inclined to underestimate how fast we can react and how many aircraft and of what kind we can bring to bear at a specific point in time. If you use standard planning factors, it tells you one thing, but when we were called to Korea just recently, we were there and on the ground in just over a day.

I think the capability which we demonstrate and have demonstrated over the years is different than the kinds of things which are black and white numbers on a piece of paper. That is what I was trying to impart to the committee.

Mr. LEGGETT. I will recognize my colleagues in order of their arrival. Mr. Regula.

Mr. REGULA. Thank you, Mr. Chairman. General, you touched on the logistics problem in Europe. I would be interested in the kind of cooperation you get from the NATO allies in having adequate fuel and repair facilities. It seems to me that would be a key element for sustained operations if we are to be successful in repelling any invasion.

General DONNELLY. Yes, sir, I think I can talk to that one. There is great cooperation among our allies, particularly at our collocated

operating bases. Part of the problem, of course, is the fact that they presently have aircraft operating there. If we are to put more aircraft in there, obviously we need more fuel and more munitions in order to allow a sufficient sortie rate.

Our plans are to put in a sufficient amount of fuel for the [deleted] day surge capability to accommodate our aircraft collocated with the allies aircraft. We are having fantastic cooperation by our allies. We have surveyed all the bases in central Europe and selected the ones most effective for us. In all cases the allies have cooperated 100 percent and we have signed agreements with them.

Mr. REGULA. Are you satisfied that our ability to provide fuel and the necessary ammunition and repair facilities would be adequate for your needs at the present time?

General DONNELLY. Yes, sir. The available real estate and the available storage capacity as well as some additional munitions storage capacity will be adequate for [deleted] capability we feel we need.

General CURRIE. If I could interject, sir, you said, "At the present time."

Mr. REGULA. And for future needs.

General CURRIE. If the programs we have laid out come to fruition, we will achieve what General Donnelly has just spoken to. At the present time, as I said in my statement, we are misallocated. We have three very large central storage areas. If you look at raw numbers, you would find that the storage space in those three areas is sufficient to store the munitions which we have a need for. But in fact they are in the wrong place, not too dissimilar from General Hollingsworth's report.

We want to move those munitions and that POL to the places where we will actually need them. If we don't, we believe that as we are moving those things around, we are going to be subject to enemy air attack and we are going to lose them.

Mr. REGULA. What kind of cooperation are you getting from France at this time, if any, in light of their past attitudes?

General DONNELLY. Sir, the cooperation from France primarily right now is the fact that one of our main POL pipelines comes across France. We have had no difficulty with France in permitting us to have free access to the pipeline as well as the output and input. There are certain plans, of course, under certain contingencies to use France if they enter the war with us as far as their bases and this type of thing. They have been very cooperative in our estimation in that regard.

Mr. REGULA. Is this on a contingency planning basis rather than actual access at this point?

General DONNELLY. Yes. As you know, France reserves a right to come into NATO. Rather than "an attack on one is an attack on all," they reserve the right to make their own decision. We cannot say for sure that France would come in on a NATO war. We would hope they would.

Mr. REGULA. Do you think that the sale of computer technology to the Soviet Union by the United States has enhanced their military capability vis-a-vis aircraft?

General CURRIE. I don't think I am competent to answer that, sir.

Mr. REGULA. Thank you.

Mr. LEGGETT. That is a good question not to answer at this point.

Mr. Mattox.

Mr. MATTOX. I don't have any questions.

Mr. LEGGETT. Mrs. Holt.

Mrs. HOLT. I have no questions.

Mr. LEGGETT. Mr. Hale.

Mr. HALE. General Hollingsworth's report indicated warning time as a critical element. There has been a lot of debate up here about warning time. You indicated 10 hours to get an A-10 wing from Myrtle Beach to Europe. Is that 10 hours cutting it close or should not an A-10 wing at some time be based in Europe in the sense that everybody is so concerned about the tank killing capability.

The first echelon of the Soviet wave will certainly be armor and come hard and fast and probably at night. It would seem that flying in that scenario, that the type of experience one can get from flying an A-10 wing in Europe would be valuable. It certainly has to be a lot different from flying one in Myrtle Beach.

What are the plans for the possible deployment of an A-10 wing to Europe, if there are any, and, if not, what is the justification for not having a wing in NATO?

General CURRIE. The current Air Force program identifies a 72 UE A-10 wing for deployment to Europe in [deleted].

Mr. HALE. I understand.

Mr. LEGGETT. Let me ask this: Are there plans to sell the A-10 to our allies and do you make recommendations in that regard, considering the fact that the A-10 is theoretically the tank killer, and since a great percentage of all the tanks in the world are in Europe and we are not really prepared to defend the Chinese very much, wouldn't it be reasonable that since we have this cost-effective, low unit cost vehicle, that our allies be equipped with those in rather large numbers?

General CURRIE. I am not familiar with any foreign military sales regarding the A-10.

Mr. LEGGETT. I am not either.

General CURRIE. However, I don't want to give you the impression, Mr. Chairman, that the alliance and other members don't have any tank killing capability. I was in Britain in February and visited a Harrier base which is an aircraft designed—as you know, we have them also in the Marine Corps—for close air support and multihigh sortie generation rates. The British have the Jaguar with a 30mm gun. It is designed to take on the light armor. But it is not as effective as the A-10's GAU-8. They are producing the multirole combat aircraft, MRCA, with an antiarmor 27mm gun.

Mr. LEGGETT. What kind of aircraft do they put the 30mm on?

General CURRIE. On the Jaguar. In fact, they have two 30mm guns, but it is a slower rate of fire than on the A-10.

Mr. LEGGETT. Can the GAU-8 go on the Jaguar?

General CURRIE. No, sir, I don't think so. If I remember the dimensions of the GAU-8, it is pretty close to 21 feet long. We designed the A-10 around it specifically for that purpose. It is not something you can strap onto an airplane. It is a brute.

Mr. HALE. On your TOA allocation, the 12- to 20-percent range that you alluded to, does that include all the electronic warfare items in R. & D. and in procurement that are coming along?

General CURRIE. I will ask General Lynch to answer that.

General LYNCH. It does include procurement and that R. & D. which is in Major Force Program II, General Purpose Forces, specifically associated with the TAC fighters. The cost figures in General Currie's statement relate to tactical fighters only and not to the total TACAIR mission.

Mr. HALE. With the decision on the B-1 in regard to this allocation of resources, it strikes me that 12 percent is rather low and 20 percent is more like it in the sense that that is probably what we are going to need in NATO.

If the decision on the B-1 is changed from a 244 total procurement to something other than that, would we see that percentage increase over the 5-year plan in TACAIR?

General CURRIE. I don't think I can answer the question. I think that that question really would have to be directed to the Secretary of Defense who would consult with the President and other members of the Cabinet before making those kinds of judgments. It is an extremely complicated question.

Mr. HALE. But you feel satisfied that the 12- to 20-percent range of total obligational authority for TACAIR is in balance with your mission and what your requirements are in NATO?

General CURRIE. Yes, sir. We are proceeding with our goal of equipping the 26 Active wings and the Reserve wings. We have not fallen away from that in 3 years. We have stayed within the budget authorities given to us by the Congress. There have been some perturbations in the fighter program, but by and large we are comfortable with our goal and we think we can achieve it.

Mr. LEGGETT. Mr. Storm.

Mr. STORM. A little further on the A-10. In the opening session of these hearings we got the flavor that tank assault is one of the major problems, if not the one problem, in determining the early outcome of the war. It seems odd therefore that the only tank killing machine in the U.S. Air Force inventory would not be forward deployed in large numbers in Europe, considering the need for training under those conditions.

General CURRIE. I don't believe I said we would not.

Mr. STORM. You talked about deploying only one wing.

General CURRIE. What you have to do first is train. Then you have to have a rotation base, a sustaining base in the United States. Once you have established that, then you can proceed with a pretty good assurance that you can deploy it and go overseas. You have a longer pipeline and other things. You have to program leadtime away for the shelters that have to be built to shelter that aircraft and it is big.

We currently are just beginning to build what we call a third-generation shelter which can accept the aircraft. So you have to make plans ahead. You are exactly right. The No. 1 tank killer is the A-10 together with General Canedy's attack helicopters.

Mr. MATTOX. How many of those helicopters are there?

General CANEDY. I will provide that classified information separately to the committee.

General CURRIE. But we do intend to put a wing of A-10's over there. We do intend to have exercises. We do intend to train the people to operate in the European environment and whether or not the force is here or there, I don't think is really germane because the problem of survivability, the problem of sheltering, the leadtime away to do it and the time that comes when you actually deploy to employ is what is important.

Mr. Hale brought up the problem of warning time and that is a great concern to everyone, whether or not we will get a little warning time or a lot of warning time and how fast we can move. That is why I said that we are trying to be more ready. We are deployment and employment oriented and getting better at it. We have always been good, but we are getting better.

Mr. STORM. What part of the threat do you allocate to the helicopters? Do you have an assumption that helicopters will take care of a certain percent?

General CANEDY. The assumption we have made clearly to the House and Senate is that in that target-rich environment, there is not enough of either one.

Mr. STORM. In a recent GAO report which is classified, it indicated a fairly successful kill rate for the A-10, but also some very high attrition numbers were postulated by the GAO report. Does the Air Force agree that they will have to suffer attrition levels probably higher than historically in the Air Force?

General DONNELLY. When the report came out the A-10 was a new system. Since then we have done evaluation testing at Nellis. We have now developed tactics where we feel the A-10 is far more survivable than the GAO gave it credit for. This happens with every aircraft we have on the line. We have to get it out and fly it against its threat which we perceive.

In fact, we have excellent electronic simulators at Red Flag where we fly against the Russian threat. We think we have developed tactics that will permit the A-10 to survive like any other aircraft.

Mr. STORM. Nevertheless, it seems that the air defense sophistication grows more quickly than the ability of the fixed wing pilots to counter them. Do you see that as a possibility?

General DONNELLY. No, sir, I don't. In Vietnam it was said we could not survive because of the air defense environment. I am here to tell you that I survived nicely. The fact of the matter is that if you give an air defense environment 100 percent kill rate which you could if you look at the system capability, I would guess you would have a lot of trouble surviving in that environment.

By virtue of tactics and an aircraft moving in other than a straight line, the aircraft does survive because the men operating the air defense system are no better and in fact less capable than the pilots flying the airplanes. So with proper tactics which is the secret to the tactical fighter business, the fixed wing will continue to survive along with our helicopter friends in the forward battle area against enemy defenses.

General CANEDY. I think there is another part of that equation that is very important. For every threat there is a counterthreat.

We have testified repeatedly that we can hold, given a 3 to 1 disadvantage against the first frontal assault but not against the second echelon.

Fixed wing aircraft, simply have to clear out the second echelon if we are going to survive. If you put the A-10 against that threat alone, it is not going to survive. If you put the A-10 in with the proper support package and take care of that defense array, it is going to survive. So it is bigger than an aircraft system. It is the whole package of tactics, the counterthreat available, the defense suppression that needs to be provided and all the coordination necessary to make it work.

Mr. STORM. Will the A-10 have that capability when it gets into action? Will you be able, in the deployment of A-10 wings, to use the collocated operating bases in Europe and have equipment available so they can go into action at once, with all systems working?

General CANEDY. Yes, we believe so.

General CURRIE. General Canedy is exactly right. In the statement we bring out the importance of defense suppression, the EF-111, Wild Weasel. We have systems coming down the line that we are hopeful we will be able to deploy.

I believe the GAO report did not give any credit to defense suppression. It did not give credit to the fact that the F-15 is up there killing the guy who is trying to kill the close-support airplane. It did not give credit to the Wild Weasel doing its job or the radars being jammed by the EF-111. The A-10 stood alone. No air battle commander in his right mind would ever send an aircraft into that kind of threat environment alone unless it was the last thing he had. We didn't do it in Vietnam. We didn't do it in World War II and Korea and we are not going to do it in Europe. It is not the way to fight a war. So you can't take a piece of the overall TAC program and separate it out and say stand alone because it doesn't work that way.

Mr. HALE. In that regard, GAO recently published another classified report somewhat critical of the defense suppression activities and ongoing efforts coming out of departments. Specifically it was not critical of those defense suppression activities against electronically driven signatures, but it was critical in the infrared—IR and electro-optical—EO.

Agreed, we may take it as given that the radar signature types can be suppressed, but what are we doing in the electrotrail and IR area of suppression?

General CURRIE. In the IR we have the flare dispenser on the A-10. That is to spoof their SAM-7, the IR seekers and anything else. The chaff is to confuse their radar. I think when we get into EO, we need to speak of that, submit something for the record or elsewhere.

[The following information was submitted for the record:]

THREAT SUPPRESSION CAPABILITY

Emphasis is being placed on increasing our capability to counter the electro-optical and infrared threats. Specifically, we have efforts underway in three areas: Warning equipments, flares and flare dispensers, and electro-optical countermeasures (ECOM). In the warning area, the AAR-34 is currently on the F/FB-111 aircraft. Also an engineering development program was initiated in fiscal year 1977 for an improved IR Warning Receiver for use on combat support aircraft such as the HH-

53, C-130, etc. The ALE-40 chaff/flare dispenser is in production with installations approved for the F-4 D/E and planned for the F-4G and A-7. An internal version of the ALE-40 has been selected for production and incorporation on the F-16 and A-10. Pyrophoric flares designed to match the IR signature of jet fuel and double the radiant intensity are in development for the B-52, F-4, and F-15. AAQ-8 pod-mounted IRCM jammers are assigned to support the COMBAT TALON C-130 aircraft. The COMPASS HAMMER pod, designed to provide visual countermeasures, is currently in advanced development. Other efforts in the overall EOCM area include engine IR suppression kits for aircraft such as the O-2, OV-10, HH-3 and HH-53 which have been developed and are available for procurement. Camouflage paint patterns and colors to aid in the visual countermeasures area have been developed for the AC-130, A-10, F-15, F-16, and F-5.

Mr. HALE. All right. One last thing on the A-10. I understand the Israeli Air Force Chief of Staff has decided the A-10 would not fit into their inventory as far as a close air support tank killer. Is that a fact? Could you address that?

General CURRIE. I have never heard that.

Mr. LEGGETT. Mr. Cove.

Mr. COVE. I would like to get down to some of the budget problems we have. One of the major problems when we look at the budget is the F-15 procurement costs. We are getting what seem to be very high costs for spares. We also seem to see a growth in the configuration, the 2000 program, for instance.

The F-16 was originally designed as a lightweight fighter. Now there is talk about deep interdiction as the aircraft is growing. Can you tell us why we have a PEP-2000 program and how long it is going to last and how much it is going to cost and why we need it?

I think the overtones or undertones here would be, are you putting the PEP-2000 on the F-15 to make it more of an interceptor in the followon role and if so, could we get along without the PEP-2000?

Mr. LEGGETT. Would somebody explain PEP-2000 for us?

General CURRIE. I will ask Colonel Rogers.

Colonel ROGERS. Sir, PEP-2000 stands for production eagle package. As you know, the name of the F-15 is the Eagle. It is the production eagle package. It is a McDonnell Douglas derivative, not an Air Force name. We conducted approximately 2 years ago, an investigation adding fuel to the F-15. This was because when the F-15 was originally designed it was a very fuel-sensitive aircraft. By that I mean in order to hold total gross weight to a fixed number, we sized whatever space was available for fuel and we froze the fuel load.

There has never been a fighter built, if you talk to a crewmember, that had adequate fuel. In order to keep it unclassified from there, let me just make a couple of points: One, we have an aircraft with eight missiles on it and a cannon. It is a fuel-short aircraft in that we have more armament than we have fuel available to use the armament. The success rate of the F-15 is such that through the avionics, the success rate is sufficiently high and we return home with ordnance onboard.

Mr. COVE. Might I interrupt you? We have built airplanes before. Certainly the Air Force spends a lot of time thinking about the ratio of fuel to ordnance. Why didn't you recognize this in the early design?

Colonel ROGERS. Well, keep in mind the time frame in which the F-15 was designed. We are talking about 1968. In that time frame

we used parametric analysis techniques. We have gone well beyond that. Today we simulate this in the computer. We can fight, expend fuel, expend armament, work against a wide variety of threats and through the computer in modeling and simulation we get a much more sophisticated and usable answer than we did roughly 10 years ago. The analysis technique has improved and I think by and large that is the only satisfactory answer.

If I could continue, sir, in this particular regard we looked at a PEP-1000, PEP-2000, and a PEP-3000. The last one was for about 2,800 pounds of fuel. Of those three options, we settled at PEP-2000 as being a cost-effective alternative and as you know, the Air Force is not trying to retrofit aircraft. We want to pick this up in production and proceed. It is cost prohibitive if we tried to retrofit.

Mr. LEGGETT. Does that change any of the outer skin?

Colonel ROGERS. No, sir, it does not.

Mr. LEGGETT. The configuration is the same.

Colonel ROGERS. 1000 and 2000 have a minimum relocation of avionics, in fact almost negligible. It just filled the available space. The aircraft has phenomenal growth capacity internally. The PEP-2000 was considered a good tradeoff in terms of added capability. It is that capability that the Air Force sought to gain.

We must say that the original program which was to add PEP-2000 provisions to roughly 415 aircraft, I am not sure of the exact number, was about a \$196 million program. The revised program which is to pick up in the neighborhood of 325 aircraft dropped to roughly \$164 million.

But what is significant and what we have tried to stress with the committees has been that we have less than 2 percent of the total program cost for a fantastic improvement in capability. We are talking about doubling the fighting time. We are talking about doubling the number of potential kills. Basically, Air Force witnesses before the committees have tried to stress that the Air Force in general would be remiss if we did not pursue that capability.

Mr. LEGGETT. What does that do to your thrust to weight?

Colonel ROGERS. The thrust to weight implications are almost negligible in terms of roll rates, and other measures of agility or maneuverability. It is almost negligible. In the F-15 you have sheer dominance in the air so the very minor degradation of performance is totally acceptable.

Mr. COVE. What this means is that you are not going to boost it with the PEP-2000?

Colonel ROGERS. We would hopefully take the units with PEP-modified F-15's and position them in areas we think the air-to-air threat was the greatest.

Mr. COVE. Is the total F-15 force degraded then?

Colonel ROGERS. No, not at all. The aircraft does everything the Air Force asks it to do. It gives us the performance capabilities. Again, the key ingredient here was the fact that we had a capability or an opportunity to improve the capability substantially for a very modest cost.

Mr. COVE. How much would backfit cost for the F-15's not now scheduled?

Colonel ROGERS. I don't have that number. That has been worked up to retrofit the entire fleet and it is totally exorbitant.

[The following information was submitted for the record:]

COST TO RETROFIT ALL F-15's WITH PEP-2000

The retrofit of the internal fuel tanks required to add the 2,000 pounds of internal fuel capacity is not practical. It would require major changes in the aircraft's internal structure and has never been seriously considered.

Retrofit of the internal provisions for the conformal pallet tanks is technically feasible. However, it is not without extensive modifications to several primary structural components. The cost of retrofitting just this one feature of PEP-2000 is prohibitively high. The unit cost would be approximately \$1.0 million for a total cost of approximately \$400 million to retrofit all F-15's not caught on the production line with provisions for conformal pallet tanks.

Mr. COVE. So there are no plans to do that?

Colonel ROGERS. No, sir, not at all.

General CURRIE. To return to your other questions, the PEP-2000 did not regard any decision for the followon interceptor. It came about as a result of our examinations, as Colonel Rogers has said, regarding the fighting capability of the aircraft in the tactical role.

Mr. LEGGETT. While we are talking about that, you have indicated that you have made a selection of a F-15 configuration for that role and presumptively you looked at all the other aircraft in our inventory. When that selection was made was it Air Force mission-oriented personnel that selected the F-15 over the capabilities of the F-14 or some of the other vehicles or was that an OSD evaluation?

General CURRIE. The Air Force set forth the proposition to the OSD that it should be the F-15, but we had done tradeoff studies regarding an improved F-106X which had been around, that proposal had been around for a long time. There were even excursions into some form of an F-111. But it boiled down to F-16, F-15, and F-14.

Our studies indicated that there is no question but that the F-14 is a very capable and fine air interceptor and in some mission areas is superior to the F-15. Nevertheless, as we do not intend to enhance the F-15 for the air interceptor role, it is going to be the F-15A, the same as the TAC version with a different patch on it. We felt and still feel that the costs of acquiring a different and unique system to the Air Force, the training of that system, having to support it logistically even though we would depend upon the Navy perhaps for some of that support, the overall costs of the aircraft, were far greater than what we would get out of the F-15 with a common training base, supply system, not having to acquire all of that new stuff and we can also trade crews back and forth between Tactical Air Command and Air Defense Command. So we have a larger rotation base.

Explicit in the mission statement of Air Defense Command is that it have worldwide deployment capability. The F-15 would lend itself very well to that worldwide capability. So we still feel that we are on the right road.

Mr. COVE. Has there been a firm decision that we will not build a followon interceptor?

General CURRIE. No, sir.

Mr. COVE. When do you expect that decision to be made?

General CURRIE. I expect you will see some kind of decision when the President submits his budget next January.

Mr. COVE. That early?

General CURRIE. Yes, sir.

Mr. COVE. Is there going to be any flyoff or anybody else get into the act in terms of deciding which aircraft it is going to be?

General DONNELLY. There is no planned flyoff. OSD has not made the decision on which aircraft it is going to be. It is the Air Force recommendation to OSD that it would be the F-15A. As far as I know, that is as far as the decision has gone in the Department of Defense.

Mr. LEGGETT. How many aircraft would you plan for that mission?

General CURRIE. 170 aircraft.

Mr. LEGGETT. How many Century series aircraft do you now have in the intercept mission?

General CURRIE. We now have 278 Century series—200 F-106's and 78 F-101's actively engaged in the CONUS air defense and intercept mission. We have 12 squadrons of F-106's, 6 of which are in the Guard. We have three F-101 squadrons, pretty old planes, also in the Guard. We have a couple of Guard squadrons converting to the F-4, which will be in the air defense role.

Mr. LEGGETT. How do those vehicles acquire low-flying targets?

General CURRIE. Of course Aerospace Defense Command operates an extensive warning system. There is the DEW line, there are the radars which are here in the United States, and we look forward to some enhancements to that system.

Mr. LEGGETT. We have abandoned the SAGE system, have we not?

General CURRIE. No, sir.

Mr. LEGGETT. We have abandoned a large part of it?

General CURRIE. The SAGE system continues to operate. We are looking forward to the joint surveillance system and the Regional Operational Control Centers coming into existence in 1979 and 1980, being completed in Alaska in 1981. That is a cooperative effort between Aerospace Defense Command, U.S. Air Force, and FAA, but we will not abandon the DEW line, which is mostly in Canada. We have 190 F-106's and 54 F-101's; that is the equipment and does not include training aircraft.

Our problem with the 106 force is, as I said in my statement, the aircraft is not in production. Every one we lose is irreplaceable, absolutely irreplaceable. There is no price to that airplane.

This is no different than any other aircraft system. We continue to lose them too. We program F-106 attrition at the rate of about four per year, and that is about what happens, and eventually we have to replace the systems just like we are planning to replace the F-4, the F-100, the SPAD-13, for that matter, if you want to go back to World War I.

Mr. LEGGETT. The F-106's have never been used, have they, for other than training?

General CURRIE. Yes. We deployed them to Korea during *Pueblo*; they have been around the world. We had F-102's in Vietnam,

which was the precursor of the F-106. So they have participated in the worldwide deployment and employment role.

Mr. LEGGETT. What kind of a capability does the F-15 have over the F-106 versus a BACKFIRE, low-flying bomber coming in?

Colonel ROGERS. It is not fair to compare the F-15 and the F-106. The capability difference is remarkable. The F-15, with its lookdown, shootdown capability, AIM-7F missiles, gives us a substantial capability. Your question, as I understand it, is the low-level threat?

Mr. LEGGETT. Yes.

Colonel ROGERS. The F-15 with its lookdown, shootdown capability, which is beyond visual range, is effective against the low-level penetration. I have not personally been associated with the aircraft, but it has a sizable capability. The ranges we cannot submit for the record—

Mr. LEGGETT. Yes.

Colonel ROGERS. Because they are classified.

[The following information was submitted for the record:]

F-15 AND F-106 vs BACKFIRE

Both F-106 and F-15 carry armament suitable for attack of low-flying BACKFIRE. However, in order to productively fire this armament it is first necessary to detect the target and maneuver to an acceptable launch position. Both F-106 and F-15 have sufficient maneuverability for BACKFIRE intercept. On the other hand, F-106 detection capability against low-flying BACKFIRE is about [deleted] miles (depending on meteorological conditions) as opposed to about [deleted] miles for the F-15 under the same conditions. This difference is based on Doppler radar features which the F-15 has but the F-106 does not.

Mr. LEGGETT. All right.

Mr. Lehman, do you have any questions?

Mr. LEHMAN. Just one. I want to apologize for not being able to be here the full time.

Mr. LEGGETT. Do not. We have a lot of things to do.

Mr. LEHMAN. I wanted to followup on a little problem we have in our district. This spring, it was brought to my attention that a Missouri-based company, Teledyne Neosho, was competing for a contract for the overhaul of J57-59W jet engines. They intended to carry out this work in Miami. Pan-American had just moved its overhaul base from Miami, and Aerodex, another large company, had closed out in Miami, leaving a large amount of space available as well as a large unemployed pool of skilled aviation workers.

Congressmen Fascell, Pepper, and I wrote a letter to Secretary Stetson in April requesting his favorable consideration. Mr. Chairman, I would like for this letter to be inserted in the record, if there is no objection.

Mr. LEGGETT. Certainly. It may be made part of the record.

[The letter referred to follows:]

CONGRESS OF THE UNITED STATES,
Washington, D.C., April 27, 1977.

Hon. JOHN C. STETSON,
Secretary, Department of the Air Force,
The Pentagon,
Washington, D.C.

DEAR MR. SECRETARY: We have become aware that Teledyne Neosho (F34601-77-R-1000) is competing for a contract for the overhaul of J57-59W large jet engines to be awarded on June 6. If successful, this company intends to carry out this work in Miami.

While we have no particular interest in Teledyne itself, we are greatly concerned about the economic well-being of the area we represent. With the transfer of Pan Am's overhaul facility to New York and the closing of Aerodex, Inc., which formerly had this contract, Miami was left with a large labor pool of skilled aviation workers. Several thousand of these workers are either unemployed or employed far below their capabilities. Needless to say, we are very excited about the possibility of giving these persons opportunities for employment once again.

Teledyne Neosho has proven itself to be a responsible and experienced company. Its credentials, which have been submitted to the Air Force, will no doubt speak well for themselves. We believe this company is well-equipped to undertake this project to the mutual benefit of the Air Force and the Miami area.

We would appreciate your giving Teledyne Neosho's proposal every possible consideration.

Sincerely,

CLAUDE PEPPER,
DANTE B. FASCELL,
WILLIAM LEHMAN.
Members of Congress.

Mr. LEHMAN. Although we have not yet received a reply from the Air Force, I have been informed that one of the competitors, Curtiss-Wright, has been awarded the contract. People told me that Teledyne was the low bidder and that Curtiss-Wright was actually the third lowest bidder.

Given this background and recent allegations that political considerations have played a significant part in contract and procurement decisions, I would like to get an idea of how this decision was arrived at. I have had questions from our chamber of commerce and other people in Miami who are concerned, since the contract to service the engines, would have been very helpful economically.

Of course benefit to a community is not the main consideration; obtaining a service at the most reasonable cost to the taxpayers is probably the most important thing. But my constituents are concerned and would benefit from knowing just what the contract criteria are. So if you will get back to our office and to this committee for the hearing record, I would appreciate it.

[The following information was received for the record:]

CONTRACT AWARD

The J-57 engine overhaul contract was awarded using formal source selection procedures as set forth in Air Force Regulation 70-15. Source selection procedures provide a uniform basis for evaluation of technical factors when technical competency is a critical consideration. Areas of primary consideration in selection of a contractor were identified in the solicitation as: (1) Management capability, (2) experience, (3) facilities and equipment, (4) quality control, (5) production plan, (6) safety. Weights were assigned each of these six areas in descending order of importance. Eight firms were solicited; three submitted proposals. The three proposals were evaluated by a board of Government personnel through indepth analysis of the six areas of primary consideration and through an assessment of the proposed prices. On June 16, 1977, award was made to Curtiss-Wright Corp., whose offer was second low in price evaluation; but whose overall proposal was determined to be the most advantageous to the Government.

Mr. LEGGETT. That is an important macroeconomic question for an important district in Florida.

Mr. LEHMAN. It depends on which end of the telescope you are looking at; it could be macro or micro. Thank you very much, Mr. Chairman.

Mr. LEGGETT. Mr. Cove?

Mr. COVE. I would like to followup on the configuration control on aircraft. Let's talk about the F-16, General.

Originally, the F-16 was designed as a lightweight fighter. In recent months we have seen a number of presentations, by contractors and the department, which expand the role of the F-16. Maybe the Air Force is not thinking this way. My question is simply, How do you control the configuration of an aircraft like the F-16? We are going into production, starting off with a certain design, we are going to have a program like the PEP-2000 or whatever, to give the airplane more capability, more roles. Are you going to keep it designed just to be the lightweight fighter that it was supposed to be?

Colonel ROGERS. Mr. Cove, if you look at the F-16 and F-15, the F-15 is not a design-to-cost program, the F-16 program is. Commensurate with that, a configuration steering group was established. It is chaired by the Deputy Chief of Staff for Research and Development and is represented by the general officers, from the other deputates within the Air Staff.

This group's charter is to carefully review every F-16 configuration change that is proposed and to consider operational improvement and design-to-cost impact. Their charter is to maintain the design-to-cost status in 1975 dollars below \$4.555 million, as I am sure you are aware.

The only change in design-to-cost goal that has been made to the program resulted from a decision by Deputy Secretary Clements, to add nuclear capability to the aircraft. That is the only change made to our goal.

Now, internal within the program there are decisions that must be made: Do we go with this concept or that concept—these type things. They weigh very carefully the cost impacts of the two alternatives or the three alternatives or whatever.

There is also the requirement, of course, since this is a consortium venture, that, with a portion of the production being made in Europe, to consult with the Europeans as well. They are participants in the configuration steering group deliberations. But as far as a major change in configuration, such as adding additional fuel, or that type of thing, it just has not occurred.

Mr. COVE. In the present design configuration of the F-16, is it ever going to have a deep interdiction role?

Colonel ROGERS. Well, the F-16, as you are well aware, is a swing fighter. It is responsible for the performing in the air-to-air as well as the air-to-surface mission. Will it ever perform in the deep interdiction role? I would have to say yes, it will. Will there be required changes to it to allow it to accomplish this mission? I am not prepared to talk to that in open session, but we would be most happy to provide that to you for the record.

[The following information was submitted for the record:]

F-16 SURVIVABILITY

There are no required changes to allow the F-16 to survive in performing the deep interdiction mission; avionics to accomplish this mission are installed. These include:

(a) An accurate inertial navigation system allowing low level ingress/egress; (b) a radar warning receiver to alert the pilot of enemy threats; (c) defensive systems including electronic threat suppression, chaff and decoy flares; and (d) an automatic

weapons delivery system providing both accuracy and minimum exposure to point defenses. In addition, the F-16's speed and maneuverability, even at high gross weights, will permit it to degrade attacks by either ground or air threats.

Mr. COVE. I think one of the problems we are facing in the Budget Committee, as we look over the last few years and look into the projections, these systems have a way of growing in size, configuration, weight. The growth is on us before we really see what the cost impact is.

Quite frankly, looking out through the 5 years, it does not look like everything is going to happen. Our concern is to make sure we keep the configuration under control, because once that gets out of control, the money follows and there is not a heck of a lot you can do about it.

Colonel ROGERS. Yes, you are quite right.

General CURRIE. There are reasons, Mr. Cove, as General Canedy pointed out. The threat advances, for every threat there is a counterthreat. I do not think we would be returning good value for dollars spent if we created an airplane, laid it down on paper in 1966, 1970, 1972, planning to operate that system through 1995 and froze the design and said that is it, when it cannot react to the threat that is ongoing.

We have an aircraft modification program which the committee knows about, and it is designed to overcome those new and emerging threats. At the same time, when you are in production and you see a threat coming, if it is within the bounds of fiscal reality to improve the aircraft to meet that threat, I think we should do it. We cannot stand still in time and let the potential enemy be in the acting mode and we in the reacting mode. That is just not prudent military management.

Mr. COVE. I would like to pursue that threat a bit, but I am afraid in an unclassified session it gets a little too tough to decide what is classified and what is not.

Mr. LEGGETT. Mr. Wentzel.

Mr. WENTZEL. In light of the anticipated Warsaw Pact threat environment and the exchange ratios we have experienced in AIM-VAL, ACE-VAL, which have been significantly less than two, is the current high-low mix concept in the all-weather to clear-air mix concept of tactical aircraft satisfactory? Second what alternatives are available to the Air Force to correct any perceived imbalances, if any?

General DONNELLY. The AIM-VAL, ACE-VAL program is not totally complete.

Mr. LEGGETT. Will somebody explain those words?

General DONNELLY. Air intercept missile evaluation, and air combat environment evaluation is the second one. What these two programs try to do, Mr. Chairman, is to look at future technology in the air-to-air environment for missile and gun systems. That is their primary job.

As far as the F-15, F-16 mix, we are confident that the six wings of F-15s which we have programed for, as well as the F-16 in a complementary role, are adequate to take care of the Air Force mission and the perceived threat we have in NATO.

I think you misunderstand a little bit when you talk about clear environment. I think you will find in Europe the clear air environ-

ment is a very low percentage of the time available for any aircraft. So therefore, when you talk about high-low mix, you must take that into consideration, what area of the world you are going to fight in.

Israelis have close to 90 percent clear air environment, whereas you find a lower percentage down in central Europe, maybe 10 or 15 percent. So the all-weather systems are the most effective in Europe. That is the reason we are depending upon the F-15 so much in the air superiority role, or the F-16 when it can maneuver in the environment in which it is designed, as a complement to the F-15 in the air-to-air environmewnt.

Mr. WENTZEL. I wonder if you would turn to fiscal constraints for a second. If fiscal constraints result in a decision to cut back TACAIR wings, what capability would more than likely be given up or cut back?

General CURRIE. The first thing that would happen is, we would stop the modernization of the air Reserve Forces. That is the first thing that would happen. We have a very carefully tailored program, and I have been asked the same question by Senator Nunn's subcommittee, and our program calls for not only filling out our 26 wings but also modernizing the Reserve force.

Let me answer your question another way. I was asked could we have 26 wings quicker than we now plan given the current program of procurement and production? The answer is yes. But what we would do is, we would keep F-100's, F-105's, in the Reserve Forces, for a very long period of time, and we do not think that is an acceptable.

So we have a program which phases all the F-100's out of the Guard by the end of 1979, equips those Guard fighter units with A-10's right off the production line, A-7's and F-4's, and also equips the Active Force with the F-15; by 1980 we will be starting on the first wing of the F-16's and we will have a pretty good bunch of A-10's around.

So if you say let's cut back to 22 wings or 23 wings or some other number, you have to look at the total force. We prefer not to talk about 26 wings. We prefer to talk about 36, 37, 38 wings, which include the Reserve Forces.

You have to look at it in that context because our deployment plans and war-fighting capability hinges upon the contribution that the Reserve Forces are going to give us. That is not going to be available with F-100's.

Mr. WENTZEL. I have a question for General Canedy. In cases where the Air Force and the Army have the same missions, such as antitank warfare, what does your analysis show as far as relative costs of Army and Air Force systems?

General CANEDY. As far as relative costs?

Mr. WENTZEL. Cost comparisons between alternative systems.

General CANEDY. Our approach has been, in a unified approach, as I have responded to Mr. Storm earlier, that there is insufficiency of both today to handle the threat as perceived. I think we are on the track of a pretty good balance between Air Force and Army systems.

With respect to the antitank mission, you cannot just look at the airplanes and helicopters; you also have to look at the other things

capable of killing tanks, ground TOW, ground Hellfire and Dragon—those kinds of things; mines, just a ton of ways to kill tanks. If both systems—air and ground—are not integrated, which they have to be, you never will derive a cost-effective force to handle the threat.

We do not feel that we have enough of either to service that threat in the timely manner that it needs to be serviced.

Mr. WENTZEL. Thank you. I wonder if we could get back to readiness.

General CURRIE, you commented earlier on the readiness-modernization tradeoff in response to my other question. What is the mix in the 1978 budget between readiness and force modernization in this area of TACAIR?

General CURRIE. In terms of dollars?

Mr. WENTZEL. In terms of dollars.

General LYNCH. I cannot give you a precise statement of the modernization and readiness mix. It is definitional to a considerable extent.

I can provide you, however, for the record a breakout that will give you modernization costs and also that which we could define as going for readiness. That is a herd of things. It covers, when you are talking readiness, not only spares, it also covers, of course, your fuel costs to keep aircrews in the squadrons combat ready, things of this nature. We can provide that to you in dollar terms.

Mr. WENTZEL. I think that would be useful.

[The following information was submitted for the record:]

FISCAL YEAR 1978 BUDGET/MIX OF MODERNIZATION AND READINESS

The figures included in the statement deal only with the tactical fighter portion of TACAIR. The question can be better answered in the context of total TACAIR. An aggregation of program elements for Tactical Air Forces is specified in the current structure of OSD defense planning and programming categories (DPPC). The Tactical Air Forces DPPC contains those program elements directly associated with the TACAIR mission, including the appropriate Air Reserve Force programs. Excluded from this DPPC are depot maintenance, management headquarters, and support activities such as base operations, real property maintenance, base communications, and training such as undergraduate and formal combat crew pilot training.

For fiscal year 1978, total TACAIR requirements are \$8.5 billion, of which \$4.8 billion or 56 percent can be considered modernization. This includes R.D.T. & E., procurement of weapon systems and initial spares, and aircraft and missile modifications. The remaining \$3.7 billion is for readiness requirements and includes costs for personnel and procurement of munitions, tactical missiles, and aircraft replenishment spares. Also included under readiness are operation and maintenance requirements such as fuel and base level supplies and equipment.

General CURRIE. Let me see if I can do something here. The procurement lead time, the things that this committee and other committees in the Congress approve for procurement this year come into the hands of the user about 2 years away. So in the procurement accounts you are talking about readiness 2 years away with more modern, more capable systems.

As you approve things which General Lynch has just spoken to in the operations and maintenance account, in terms of available manpower, in terms of training, those are immediate things and lead to readiness of the system as it exists today. The two are not separable.

Mr. WENTZEL. Has this readiness to force modernization ratio changed much over the last 10 years? Also, how do you see it changing in the future?

General CURRIE. That is very difficult to answer, because 10 years ago we were fighting a war. I do not think we could give you a good number.

Mr. WENTZEL. How would you see this mix changing as we bring these new aircraft into inventory?

General CURRIE. As the chart in my statement indicates, in 1974, as a percentage of overall TOA, we were around 12 percent or so. Now we are up around 20 percent of overall TOA, but we are heavily in procurement, which is future modernization, future readiness. We think by about 1982 we will be back down where we were in 1974 as a percentage of overall TOA.

The readiness values are going to remain fairly static, if you also accept the fact that we are going to add about 300 aircraft to the Active Force and another number, which I am not at liberty to give you right now, in the Reserve Forces.

So our operations and maintenance costs will probably go up as a result of flying hours, but our manpower costs are going to come down as a ratio of manpower to aircraft.

We think that the ratio of the readiness thing, which is immediate, what the wing commander needs to fight a war today, is going to remain relatively static.

Mr. WENTZEL. Mr. Chairman, I just have one last question, in the readiness area. Given the increasing dependence of a large segment of our future TACAIR forces on the F-100 engine, I understand from different sources you have been experiencing some difficulties with that engine recently. How much do you think corrective action or fixes might cost, as the F-15 and F-16 come into inventory?

Colonel ROGERS. The difficulty with the F-100 engine is being handled under the component improvement program on that engine, and the total funding for that is \$47.2 million in 1977 and \$42.2 million in 1978.

As we started wringing out the aircraft in the I.O.T. & E., we did discover some difficulties. Of course, that is the reason you conduct followon tests and evaluation. For those particular difficulties, we have a contractor/Air Force team currently working on the stall-stagnation program and we are very optimistic about resolving the difficulties.

In terms of the fuel pump problem, which was the other major problem with the engine, we have returned to the original fuel pump that was on the F-100—three engines. We have seen the problem pretty much go away.

We do have further refinement of the fuel pump that we want to do but we are very satisfied with the progress made to date. It is important to remember, of course, as we go to the F-16, which uses the same engine, there is only a single engine and the emphasis on the program is there; it has Air Force management's attention, I can assure you.

Mr. WENTZEL. Thank you, Mr. Chairman.

Mr. LEGGETT. Will this \$90 million improvement program solve what we know as the current basic problems in the F-100 engine?

Colonel ROGERS. It is common, Mr. Chairman, to have a component improvement program in any engine development.

Mr. LEGGETT. I understand that.

Colonel ROGERS. We would hope that it will, yes, sir. The deficiencies that we currently are aware of, the two I spoke to, the funding level is designed to correct deficiencies, through engineering redesign, to look at a corrective action and then to come back and police up the deficient engines.

Mr. LEGGETT. All right. Were there deficiencies you did not speak to?

Colonel ROGERS. None that I am aware of, sir.

General CURRIE. Do not let me leave you with too warm a feeling, though, Mr. Chairman. The J-57 engine which Mr. Lehman spoke to is in the F-100. We will always have difficulty with engines, just as you have difficulty with your car engine. Things get old and things happen as a result of age. So, although we think we have the immediate problem solved, I do not want to leave you with the thought that nothing is ever going to happen, and when we come back before your committee again you say, "Aha, gotcha."

Mr. LEGGETT. We are not trying to get you. I do want to say that the committee fully supports incorporating the Reserve units as viable instruments of our national defense policy. Modernization of our Reserve capability, with these pilots, with the thousands of hours that we have in air combat, I think is a very important resource for TACAIR.

I think the Congress, and I hope the Department of Defense, is developing the posture that we want Reserve units capable, ready, fully deployable, and powder that we do not want to keep dry necessarily in the future encounters. It is important that they not keep the F-100's and the F-105's, what is left of them, and some of those other capabilities, but that they have modern capability to begin with and maintain it in a high state of readiness.

We recognize that many times the priorities before Congress appear to be procurement. Procurement of course is an item that is aided, reinforced, and assisted by the House Armed Services Committee; the operation and maintenance accounts, which is another important part of readiness, does not come under the scrutiny of this other important committee and, as a result, we are aware that sometimes when you cut down in the undramatic areas, it affects your readiness.

We are concerned about developing some kind of a handle on O. & M. expenditures and training with respect to readiness. It is a little bit unfair for us to hold onto percentage figures of capability when we also restrict your training programs and some of the spares and force cancellation, and things like that. I do hope, though, that in a 5-year period we can achieve a full modern capability in our Reserve units and have increasingly more ready units in our deployed TACAIR forces.

General CURRIE. We are most gratified for those remarks, Mr. Chairman.

Mr. LEGGETT. This session was not very difficult. We did want to go into some of these matters on the public record and express some of our views. Your answers have been very helpful to us.

We have a number of questions which counsel have prepared which we did not get a chance to ask. We will submit those to you. If you will prepare answers for our record, it will be immeasurably helpful.

[The following questions along with replies were submitted for the record:]

QUESTIONS SUBMITTED BY THE TASK FORCE ALONG WITH REPLIES BY GENERAL CURRIE

Question. A. How serious a threat is Warsaw Pact tactical air to NATO forces and to what extent do we design our tactical systems to meet that threat and to what extent is our antitank and other air-to-surface missions more important?

Answer. Warsaw Pact tactical air forces pose a considerable threat to NATO ground and air forces. The upgrade of Soviet tactical forces in the recent years provides the Pact with the capability to carry out attacks on NATO air bases throughout the European theater. Additionally, Warsaw Pact combat pilots spend most of their training in air defense/counterair training, thereby posing a credible and ever-increasing air combat threat to NATO airpower. The Soviets have also begun to employ heavily armed helicopters in support of their ground operations which put at risk NATO armor and ground force formations. The new generation of Soviet ground attack aircraft did an additional threat to NATO rear area forces as well as the first echelon advance forces.

In general terms, a new military system is developed or an in-being system is improved because of (1) a projected deficiency or obsolescence in the existing system; (2) a technological opportunity; or (3) an opportunity to reduce operating cost. A changing and improving threat is the principal factor which has historically caused a projected deficiency or obsolescence in our tactical systems, and, as such, is a major motivation for developing and procuring new capability.

The military utility of a system is measured only in relation to a given threat; therefore, that threat and its impact are basic to all thoughts. In the weapon system design process, the qualitative and quantitative nature of the projected threat is very much an integral part of each decision on configuration, performance, and capability.

Question. Much is said about the prevalent bad weather conditions in Europe for air operations. To what extent can technology overcome this problem?

Answer. The Air Force is emphasizing several areas of technology to address the prevalent bad weather conditions in Europe for air operations. Primary technology areas are infrared (IR) sensing, high speed data processing, advanced electronic sensors, and radar.

Forward looking infrared (FLIR) technology can overcome the effects of some bad weather conditions. The FLIR sensor presents an image in the cockpit which looks much like a TV presentation but is generated by the target scene thermal differences rather than visual light. The thermal signals will penetrate most haze, fog, smoke, and light overcast conditions. The FLIR functions the same at night as during the day since it is not dependent on target illumination from the sun or moon. The Air Force PAVE TACK FLIR target acquisition and laser designation/ranger system will provide a limited adverse weather and night precision weapons delivery capability for the F-4E and F-111F aircraft.

The precision location strike system (PLSS) provides a day, night, all-weather capability to accurately locate and strike, from standoff distances, a wide variety of targets. Targets include both emitters such as radar and nonemitters such as bridges. The PLSS, all-weather, near real time capabilities are aimed at the sophisticated air defense threat and dense signal environment expected in Europe in the 1980's.

Radar can provide the ability for all weather air operations in both the air-to-air and air-to-ground arenas. Current radars can see targets through rainfall from 10-30mm/hr. The radar sensor presents an image in the cockpit which represents other aircraft or a region on the ground. Current radar detection and tracking performance of air-to-ground is limited in providing the AF with the ability to identify with great precision smaller features on the earth such as roads, fields, vehicles, et cetera. Current research and development is being conducted to provide, through higher resolution, the ability to recognize, identify, and designate target precisely in all weather conditions. The electronically agile radar (EAR) and all-weather tactical strike system (AWTSS) are programs oriented toward this effort. Precise all weather self-contained operations would permit the AF to exercise control over the tactical battlefield 24 hours a day. Potential adversaries could no longer plan and execute operations in "bad weather" and expect to operate without strong consideration for air-to-ground activity from the Air Force.

Question. Warsaw Pact forces seem to have ever increasing densities and sophistication in their antiair systems. To what extent are we prepared to meet this threat?

Answer. Defense suppression systems in the Air Force inventory presently are the EB-57, remotely piloted vehicles (RPV), F-4 Wild Weasels, fighter/reconnaissance onboard warning receivers and ECM pods, and the tactical electronic reconnaissance (TEREC) sensor.

The EB-57 provides standoff jamming against early warning, GCI, and acquisition radars (EW/GCI/ACQ) to screen fighter/recon aircraft from the enemy's surveillance net. The EF-111A aircraft is presently in testing and has the improved jamming capability to counter the increased sophistication of the enemy's antiair systems.

The RPVs in the inventory can drop area/corridor chaff and jam the EW/GCI/ACQ net. An improvement in this area to counter the expanding threat is the DC-130H/BGM-34C program designed to increase RPV control and sortie generation rates.

The F-4 Wild Weasel is capable of operating against a wide spectrum of radar and jammer emitters. Wild Weasel radar direction and location capability permits attack against enemy emitters with antiradiation missiles or conventional ordnance. The F-4G aircraft is planned to enhance this important lethal suppression capability of the Air Force.

To counter the highly mobile aspect of the newer enemy SAM systems, the Air Force has the precision location strike system (PLSS) in development designed to accurately locate and destroy the enemy's emitting threat.

The fighter and recon aircraft carry onboard ECM pods and radar warning and receiver (RWR) equipment. Due to [deleted] RWR provides the information requirement to avoid the threat and/or to activate the ECM pods with an appropriate response against the threat.

The TERC sensors in RF-4C aircraft enable the theater commander with an electronic support measure to update the enemy EOB and provide current threat information for self-protection RWR and ECM pods.

The key to overcoming the enemy air defense system is to provide friendly forces with a mix of defense suppression systems to counter the expanding and diverse electromagnetically controlled enemy threat.

Question. Is it possible that air defenses are getting too sophisticated? Should we anticipate this possibility that air support of troops by fixed wing aircraft will soon become an outmoded weapons concept? Will the A-10 be able to survive in a sophisticated air defense environment? What is your deployment goal for the A-10 system? How many Wings in Europe, CONUS, and elsewhere? How quickly can CONUS-based A-10's get to Europe in a crisis?

Answer. Air defenses are indeed becoming more sophisticated as demonstrated by the continuing deployment of newer Soviet systems that are more mobile, more lethal, and less vulnerable to countermeasures. However, as sufficient information is cataloged by our intelligence and technical analysis agencies, each new Soviet innovation has prompted new countermeasure developments and technologies. As a result, our ECM systems, defense suppression systems, and self-protection measures are improving while aircraft vulnerability continues to decrease, maintaining our tactical aircraft as viable elements of AF force structures in the 1980's.

The design and development of the A-10 are indicative of the many enhancements and improvements in tactical aircraft being procured for the 1980's. The A-10 has titanium armor plating to protect the pilot and components of the flight control system. In addition, multiple redundancy in critical flight control components, fire-retarding fuel system, and reduced infrared signature provide a high level of survivability for the A-10 which will allow it to operate in the defensive environment projected for the 1980's. Currently, one wing of A-10's programed for deployment to Europe in [deleted]. The remaining operational A-10 wings will be CONUS based, able to deploy to Europe in 48 hours.

Question. What contribution will Army aviation be able to make in close air support? Is the TOW equipped helicopter a viable tank killing system in Europe?

Answer. Under existing law and DOD/JCS directives, the Army has no assigned CAS mission. Army attack helicopters complement USAF CAS aircraft by killing tanks and other CAS targets. Attack helicopters/CAS aircraft provide a mix of weapon systems using different employment techniques, which synergistically increase battlefield flexibility, responsiveness, and killing power.

The AH-1S Cobra-TOW is a viable tank killer in Europe. TOW defeats T-55/T-62 Warsaw Pact tanks. Cobra helicopters provide significantly increased mobility to the TOW system, permitting employment, as an element of the ground commander's

combined arms team, over wide frontages. These attack helicopters, using nap-of-the-earth flight techniques and capitalizing on the TOW's standoff range for survivability, are used to stop or slow penetration. This tactic buys time for the ground commander who must shift his tank and mechanized battalions to cover this ground.

Question. How do we decide how much of our tactical air warfare requirements should be met by TOW helicopter versus fixed wing aircraft?

Answer. The Air Force provides close air support (CAS) to augment and complement the organic firepower of the Army. The TOW helicopter is an important element of that organic firepower. The Army commander's requirement for CAS is in addition to the capability that his own resources provide. In Europe, for example, the land forces will expect to fight at a significant quantitative disadvantage and Air Force firepower will be required to help close the shortfall. In the initial stages of a Warsaw Pact conflict, the proliferation of targets will require more resources than either service can provide.

The amount of Air Force assets dedicated to the CAS mission will be determined by the theater commander through a process which allocates the weight of effort to be given to each of the Air Force tactical missions: CAS, interdiction, and counter air.

Question. Are there any plans to utilize Navy and/or Marine Corps air assets against a Russian tank blitz?

Answer. Air Force tactical aircraft are planned to support the Army in the central region of the European theater. If a Soviet/Warsaw Pact tank "blitz" were to come in this area, Air Force and NATO aircraft in concert with Army attack helicopters would be used to blunt the attack. Marine Corps air assets on the other hand are structured and planned to support Marine ground forces. These forces are not forward deployed in central Europe [deleted] Marine Corps air assets can be used against tank attacks on these Marine ground forces wherever they are employed. Naval air is structured to provide sea control and conduct naval campaigns. Naval air assets will, therefore, be employed primarily to accomplish these missions and will not normally be available in the central region where the large tank threat exists.

Question. There has been an increasing emphasis in the development of precision guided munitions. Our experience to date indicates these weapons are excellent for fixed targets in clear weather, daylight conditions. What is your planning and rationale for use of PGM in the antitank mission in night or bad weather conditions in a European environment?

Answer. Precision guided munitions (PGMs) have received increased development emphasis due to the high cost effectiveness and force effectiveness they offer over guided munitions. While some PGMs are more appropriate for fixed targets and limited to daylight, clear line-of-sight to target conditions, the imaging infrared (IIR) MAVERICK has been specifically designed to be effective against tanks during night and adverse weather. This system offers greater operational utility than other current or developmental weapons for a 24-hour, adverse weather antiarmor role.

Question. Will the A-10 kill tanks primarily with missiles, or with its guns? How confident should we be in its tank-killing capability?

Answer. The A-10 is being equipped with a full range of conventional munitions including MAVERICKs, antiarmor missiles, and the GAU-8, 30mm gun. A-10's loaded with MAVERICK and GAU-8 have a particularly lethal antiarmor capability that may be employed from standoff ranges with pinpoint accuracy. Combinations of missiles and 30mm guns are the primary tank-killing munitions for the A-10. The battle-generated situation will be the major factor in selecting which ordnance is most appropriate to employ on any single attack. Considering the number of armored fighting vehicles that could be encountered while defending against a Warsaw Pact armored thrust, both guns and missiles will be required to counter an armored thrust.

Operational tests against armored vehicle targets, including some Soviet equipment, have verified the killing capability of the GAU-8, 30mm gun. Similarly, the MAVERICK missile has proven an extremely effective tank killer in both operational tests and combat. The Israelis used a limited number of MAVERICKs in the 1973 Mid-East war.

Question. In cases where the Air Force and the Army have the same mission, such as antitank warfare, what does your analysis show about the relative costs?

Answer. In cases where the Air Force and Army have similar missions, those missions are complementary not competitive. For example, the numerical superiority of the Warsaw Pact requires that we strengthen our capabilities both in close air

support and ground antitank systems. Given the distinctive nature and capabilities of these forces, neither the Air Force nor the Army has seen utility in undertaking an investigation of tradeoffs between them.

Question. In air-to-air combat, do the Pact forces have any aircraft which pose a threat to our fighters in a 1-to-1 engagement?

Answer. All Soviet tactical air-to-air fighter aircraft in the forward area pose a threat to NATO tactical fighter aircraft in a 1-to-1 engagement. Soviet fighters carry airborne radar for enemy acquisition at distances beyond visual identification and are armed with air-to-air missiles capable of hitting targets outside visual range. Soviet fighters are also equipped with cannons for close-in combat. The non-Soviets have modern aircraft with similar capabilities and also pose a comparable threat in a 1-to-1 engagement, although their numbers are much less.

In a relative sense, certain air-to-air fighters are much more capable in 1-to-1 engagements than others, and can be also employed to protect lesser-capable aircraft with other primary missions. In this regard, the F-15 has been designed to be superior to potential Warsaw Pact air-to-air fighters into the late 1980's. Flight tests have already proven that the F-15 is living up to expectations and its presence will reduce the threat of Pact fighters. Greater quantities of F-15's in the Air Force inventory committed to Europe would proportionately increase the superiority necessary to reduce the threat of Pact fighters to all NATO aircraft.

Question. What degree of confidence do you have in being able to deliver close air support at night and in bad weather?

Answer. Close air support (CAS) at night and in bad weather continues to present unique challenges. In general, the degradation in target acquisition makes close air support less accurate and efficient. We can, however, deliver ordnance in this environment with a fairly high degree of confidence using long range navigation (LORAN), ground mapping radar, beacon bombing techniques, or by assistance from ground-based radar control systems. To further improve our acquisition and accuracy, we are developing the PAVE TACK infrared visual acquisition system which is referred to in the prepared statement.

Question. Pact air forces apparently use ground-controlled intercept as their primary air combat maneuver. We found this extremely difficult to counter during the last years of the air war in Vietnam. Have we since solved the problem of defense against this hit-and-run type of attack?

Answer. North Vietnamese Mig activity, including hit-and-run attacks, between February and July 1972 precipitated action by U.S. agencies. Between July 1 and 29, 1972, a procedure was implemented which correlated air intelligence information with U.S. radar data. This information improved our Mig warning capability. Air-to-air results after implementation indicate a marked improvement in dealing with the hit-and-run attack. From February to July 1972, USAF air-to-air losses numbered 18 for 25 Mig kills or an exchange ratio of 1:39 to 1. From August 1, 1972 to January 7, 1973, USAF losses fell to 5 for 23 Mig kills or an exchange ratio of 4.60 to 1.

Today these same techniques provide a hedge against the hit-and-run attack. The Air Force is improving its warning capability through ongoing operational and development programs in central Europe, Korea, and the continental United States.

Question. If a war between NATO and the Warsaw Pact broke out with little or no warning, how rapidly could a substantial portion of the Air Force tactical air forces get to Europe and be operational ready for combat?

Answer. [Deleted] tactical fighter squadrons are planned to augment the 25 squadrons in Europe for 1978 planning. A substantial portion, [deleted] squadrons, will be in-theater within [deleted] days based on a no-warning scenario. These units are operationally ready prior to deployment and are planned for combat within [deleted] after arrival. Employment planning, to include in place forces, requires [deleted] squadrons by D+1; [deleted] by D+3; [deleted] by D+5; [deleted] by D+10; and [deleted] by D+15. An additional [deleted] attrition replacement squadrons are also planned to deploy in the first [deleted] days to maintain operationally ready units at maximum strength.

Question. To what extent will we be relying on radar target acquisition and radar missiles such as the Sparrow in a European air war? Can we expect any major improvements in reliability and performance?

Answer. It is anticipated that radar employment for target acquisition or weapons delivery will occur the majority (approximately [deleted]) of the time in a European air war. Radar missiles will be employed in approximately [deleted] of the missile firings. The AIM-7F which is now in production has demonstrated improved reliability and performance and is the best medium range radar missile in the world. With

the advent of the Advanced Monopulse Seeker after 1980, further performance improvement in clutter and electronic countermeasure (ECM) environments will be available.

Question. Our Air Force grew up on the concept of "bringing the war to the enemy." This means a major dedication of resources to air strikes on targets deep in enemy territory. In view of the time-sensitive nature of a NATO-Pact war, do such deep strikes make sense today?

Answer. In response to your specific question, yes, these strikes make as much sense today as they have in the past. Let me expand on this. First, it should be emphasized that theater tactical air forces are employed in a unified effort, regardless of target locations. These forces are dedicated to the various tactical air missions and are employed in support of the air/land battle by the commanders of unified forces. Two of these tactical air missions that take the air war to the enemy in his own territory are interdiction and counter-air operations.

Interdiction operations are conducted to destroy, neutralize, or delay an enemy's surface forces before they can be brought to bear against friendly surface forces. Interdiction targets, in the NATO-Pact scenario, include the enemy's second and third echelon armored forces as well as his lines of communication and supply areas which will also have a direct effect on the enemy's ability to maneuver his surface forces.

Counterair operations, specifically offensive counterair operations, are conducted to destroy the enemy air order of battle. Offensive counterair targets include enemy airfields, aircraft, and surface defenses including radars. Offensive counterair operations are the most effective means for achieving air superiority thereby allowing us localized freedom of action for our air and ground forces.

In summary, Air Force tactical air interdiction and counterair missions constitute the "deep strikes" to which you refer. In taking the war to the enemy, our tactical air forces pursue those targets which, in the judgment of the theater commander, have the highest payoff. As you suggest, in a NATO-Pact war all targets are time sensitive. The reward in the successful prosecution of these interdiction and offensive counterair operations is enormous and their contributions to the total theater campaign are indeed significant.

Question. How will the air battle in Europe be coordinated? For years we assumed we would have adequate ground control capability. Now we are advised that an airborne control is essential, such as AWACS. What changed to make AWACS a requirement?

Answer. The battle in central Europe will be under the centralized control of the allied land and air forces war headquarters [deleted]. Priority direction and allotment of air resources will be decided by the Commander, Allied Air Forces Central Europe, based upon the current and the forecast land and air situation. Decentralized execution of these directives will be carried out by elements of two and four Allied Tactical Air Forces. In the past, ground-based radars have provided the primary facility for air surveillance and control. Because of line-of-sight limitations ground-based radars provide only limited low-level radar surveillance coverage; they are also highly vulnerable to ECM and/or attack. These deficiencies became more acute with the advent of high-performance aircraft with more sophisticated attack capabilities. In an attempt to alleviate these deficiencies airborne radar platforms were employed by the Air Force as early as the 1950's. However, these platforms were limited to technology of that period and did not operate effectively over land. As a result, the Air Force requirement for an effective airborne overland radar was established in 1963. The airborne warning and control system (AWACS) was developed to meet this requirement. In Europe, AWACS will provide the existing command and control system a new capability for extended early warning and low-altitude radar surveillance.

Question. What consideration was given to using a lower cost alternative to AWACS, such as the Navy E-2C or the British NIMROD?

Answer. Comparative analysis of the E-2C and the AWACS has been conducted both unilaterally by the USAF and by the Department of Defense (DDR&E). The results of the DDR&E analysis were furnished to the Authorization and Appropriations Committees of both the U.S. House of Representatives and the U.S. Senate on March 1, 1976. The major conclusions of this study (based upon demonstrated flight data) were:

Since the two AEW systems are at widely different frequency bands, having both in the U.S. inventory forces the enemy to dilute his ECM resources in order to counter each system.

Both systems have proven capabilities over land and water.

The E-2C is the superior performer in maritime operations for sea surveillance and in managing both the air and sea battle in support of carrier operations.

The E-3A is the superior performer in a dense jamming environment, for height determination of overland targets, for deep look surveillance and control operations and when long distances are required from the operating base to the orbit location.

The Air Force position on the relative merits of the two systems is that the E-3A is the only existing aircraft which can answer the need for deep, wide-ranging, low-altitude attack. The E-2C design for carrier operations imposes constraints in physical size which limit range, endurance, radar size and performance, capacity for consoles and staff, and technological growth potential. More specifically, the E-2C endurance is 4 hours on station at 200nm while the E-3A endurance (without inflight refueling) at the same range is 10 hours. At medium distances it would take approximately four times as many E-2C's as E-3A's to cover an orbit or patrol. The E-2C carries three consoles and operators; the E-3A carries nine, with growth potential for more (an important comparative consideration in a high-intensity conflict). The E-2C radar is not designed to deal with a dense ECM environment, such as that expected in central Europe. Its detection performance degrades rapidly in the face of [deleted] while E-3A radar technology has stressed this area of performance and is one of the most jam-resistant radars yet developed. The most important aspect of E-3A capability is its radar technology breakthrough which overcomes traditional lookdown problems with ground clutter to give clear returns of targets at very low altitudes. The E-2C—designed with heavy emphasis on overwater capabilities—is being modified with an advanced radar processing system (ARPS) to improve overland target detection and tracking, but does not match the E-3A radar performance levels such as detection ranges.

It should be emphasized that the two systems are complementary, each optimized for a particular mode of operation. Thus, the Air Force procurement philosophy is based upon acquiring an E-3A force sufficient to satisfy only those mission areas where the unique capabilities of the system are required to provide essential peacetime surveillance and warning and jam resistant, survivable, command and control, and communications for our deployed forces during wartime.

The USAF has not as yet had the opportunity to run a full scale comparative analysis on the NIMROD AEW because the radar system is in development and has not flown as an integral AEW system. Preliminary information from the United Kingdom indicates that the first aircraft will probably not be available for testing until 1981. Projections now available indicate that the NIMROD AEW would not be as capable as the E-3A, particularly in the areas of overland radar performance and operator/computer capacity.

As a point of interest, it should be noted that NATO agencies have already looked at the E-2C and NIMROD as candidates for the NATO AEW system. During 1974, the NATO Air Force Armaments Group's Subgroup 12 on Detection and Tracking of Low Level Targets evaluated several postulated configurations of the E-3A and E-2C, and the proposed NIMROD. In March 1975, Subgroup 12 concluded that, on operational grounds, a NATO derivative of the E-3A AWACS was the preferred solution to the Conference of National Armaments Directors and the Defense Planning Committee meeting in Ministerial session.

Question. What is the rationale for modernizing our bomber defenses through a follow-on interceptor program, estimated to cost \$2.5 billion, when the Soviets seem to be deploying the BACKFIRE in long-range naval aviation units and the fact that in the event of a strategic attack against the United States we have decided to provide no defense against Soviet ICBMs?

Answer. The intelligence community projects a total of [deleted] BACKFIRE bombers for 1986, of which [deleted] are projected to be deployed in the long range aviation (LRA) force and one-half in the Soviet naval aviation (SNA) units. In addition, [deleted].

The follow-on interceptor with increased performance capabilities and lookdown/shootdown radar is an essential step in the restoration of air defense forces to prevent unopposed bomber attacks against the United States and the exercise of numerous attack options which are now open to the strategic planners of the Soviet Union. BACKFIRE bombers have cruise missile carrying capabilities which permit launch [deleted] from a potential U.S. target. It is estimated that the [deleted]. In this regard, a requirement for increased interceptor range is essential to intercept the threat before cruise missile launch. Emulating US SIOP bomber plans, the Soviets could utilize their bomber force to exercise attack options not possible with ballistic missiles. Employed in either limited nuclear or mass attack options, Soviet bombers can accurately strike military or urban targets, perform post-strike

assessment and attack surviving forces. The bomber has the capability to match specific weapon yields against targets for maximum effectiveness and/or minimum collateral damage and can change missions while airborne. In contrast, missiles are not recallable or reprogrammable, once launched. In the absence of any effective defense, the bomber represents a most flexible and potent weapon. Thus, an objective of U.S. air defense forces is to deter air attacks and limit the attack options of the Soviet offensive force. It must be realized however, that present technology does not permit a cost-effective ballistic missile defense. This technology is an objective that we are aggressively pursuing.

General CURRIE. Thank you, Mr. Chairman.

Mr. LEGGETT. The meeting will stand adjourned, subject to the call of the Chair.

[Whereupon, at 12 o'clock, the task force adjourned.]



