CHAPTER 6

TWO DECADES OF TACTICAL AIR COMMAND DEVELOPMENT, 1964-84

"If we had asked the Congress in 1961 for $3 billion to buy iron bombs, I am sure we would not have gotten it," opined Gen John P. McConnell, Air Force chief of staff, in 1965. "Before that time . . . the national strategy was that we would use nuclear weapons in places of our own choosing and whenever we wanted to." In line with this judgment, General McConnell was willing to accept a proposition that the dependence upon a nuclear "trip-wire" strategy for the defense of Western Europe had led to a neglect in fielding conventional military capabilities, including tactical air power.[1]

Early Emphasis on a European Nuclear Defense

When the North Atlantic Treaty Organization (NATO) allies could not meet the Lisbon Conference goals set in February 1952 for 96 divisions, of which 40 would be available from M-day through M-plus seven, further studies at the Supreme Headquarters Allied Powers Europe (SHAPE) recognized that there was danger that the allied structure would crumble before it could even take shape. It was recognized that greater reliance would need to be placed upon the use of nuclear weapons at the outset of Soviet aggression. This deterrent strategy was formally stated in Military Committee Document 14/2 (MC14/2). Adm Thomas J. Moorer, chairman of the Joint Chiefs of Staff, reminded a Senate committee that "up to the mid-1960s, the NATO strategy could be described as a 'trip-wire' strategy. The concept was that the first Soviet tank that came across from East Germany to West Germany would bring about an attack of nuclear weapons in Western Europe."[2]

Noted Lt Gen James Ferguson, Air Force deputy chief of staff for research and development:

> When the national policy dictated reliance on massive retaliation, Air Force development became heavily concentrated in the strategic/defense area. In fact, nearly all of the available resources were consumed in satisfying these overwhelming requirements These were "lean years" for tactical developments, and particularly conventional weapons[3]

At the end of fiscal year 1961 the worldwide Air Force tactical fighter force bottomed out at 16 wings, only 3 basic fighter types were developed after 1957,

namely the F-106 interceptor, the F-4, and the F-111.[4] Of these times in the late 1950s, Lt Gen Arthur C. Agan recalled that General LeMay as Air Force chief of staff wanted bombers, not fighters, and, whether knowingly or not, had loaded the Air Staff with SAC people who were not well acquainted with things like "air superiority." The going idea was that hostile air forces could best be destroyed on the ground by bombing attacks at their airfields.[5]

At the outset of the Kennedy administration in 1961 Secretary McNamara formalized and codified a need for a shift of strategy both in NATO and US defense away from principal reliance on nuclear weapons to the development of more nonnuclear strength. This shift in strategy was prompted by an awareness of Soviet nuclear strength and an absence of "low level" military capability to respond to minor provocations.[6] McNamara pressed two major themes on the NATO allies:

> The first was realism—the need to match NATO's strategic assumptions and plans with its *de facto* budgets and forces The second was the need for a balance in NATO's and the Warsaw Pact's over-all capabilities We argued that only the existence of a balanced force could convince an aggressor beyond doubt that whatever effort he might make—would be matched by the Alliance We emphasized that only under these conditions would it become obvious to the Soviet Union that military force of any kind or at any level would be useless as a means to secure political ends.[7]

Ironically, in 1961–66 when he was considering increases in conventional military capabilities, McNamara also increased the number of US nuclear weapons stored and available for use in Western Europe by about 85 percent. In the early 1960s the largest NATO-wide reequipment was the Lockheed F-104 Starfighter, adopted with a nuclear strike capability by the air forces of Belgium, Canada, West Germany, Italy, Holland, and Turkey. The Mirage IVAs of the French *Force de Frappé* and the Royal Air Force's Victor and Vulcan bombers were operational by 1965. McNamara said in early 1966:

> As far as Europe is concerned, it has always been recognized that a massive Soviet conventional attack on Western Europe by large numbers of Soviet divisions might require the use of nuclear weapons—tactical nuclear weapons, for example We are prepared to do that insofar as having the capability is concerned.[8]

In the Berlin crisis of 1961 President Kennedy immediately augmented US general purpose forces by mobilizing National Guard and Reserve forces. After this crisis, apparently as an informal and certainly unpublicized planning objective, President Kennedy accepted the objective of preparing forces for a "two-and-one-half-war" strategy sufficient to mount an initial 90-day defense of Western Europe against a Soviet attack, make a sustained defense against an all-out Chinese attack on either Southeast Asia or Korea, and meet a contingency somewhere else, perhaps the Middle East. General Wheeler subsequently remarked that the "2-1/2-war" concept was only "loosely expressed" and was never budgetarily supported. For his own part, General McConnell said in 1968: "The military strategy calls for the capability to respond to simultaneous contingencies; for

example, conflict in Vietnam and Korea plus maintaining an adequate capability for an initial defense of NATO."[9]

In the US augmentation of general purpose forces, Air Force tactical fighter wings increased in number from 16 at the end of fiscal year 1961 to 21 in fiscal year 1965. In the McNamara projection, 24 tactical fighter wings were authorized. General McConnell said that McNamara personally selected the number 24, saying, "That looks about right, 24 wings. . . . I do not know whether you need 24 wings. I cannot say whether you need 24 wings, whether you need 19 wings, or whether you need—wings. It is purely a matter of judgment." As a matter of fact, at the end of fiscal year 1966, the Air Force roster showed 27 tactical fighter wing numbered "flags," but the number of people and planes did not equate to this size flag force.[10] The expansion of the tactical fighter force was handled first by the retention of old F-100s that had been slated for retirement; the F-100s had a ground attack capability, and they could be refueled in the air, allowing them to be rapidly deployed overseas. Project Forecast had suggested that Air Force needs for an air superiority fighter in the 1970s would be met best by variants of the Navy-developed F-4, "optimized for the air superiority role." The Office of the Secretary of Defense and the Air Force in early 1962 agreed that the Air Force would purchase a number of F-4s to meet the requirements for an air superiority fighter and to fill a void left by the decision to discontinue procurement of F-105s.[11] Although the development of the F-111 (formerly the TFX) would be complete and the aircraft would enter the tactical fighter inventory, still more aircraft would need to be procured, and the decision as to their characteristics involved a substantial rethinking of the tactical air mission.

As a basic approach the Air Force had always argued that its fighters could perform the four tasks of counterair, air superiority, interdiction, and close air support. "If there is justification for specialization, it must be on the basis that it can perform the job more effectively than an aircraft that can do multimissions," said General Momyer, Air Force director of operational requirements. Momyer further argued that multipurpose fighters had been effective in World War II, in Korea, and in Southeast Asia, when F-4s had gone into North Vietnam and also provided close air support in South Vietnam.[12] As it happened, Secretary McNamara had been correct in his demands that the Air Force accept the Navy-developed F-4 instead of procuring more F-105 fighters, but from this he drew a belief that

> the basic premise . . . that one aircraft would serve the requirements of both Navy and Air Force is absolutely sound and ought to be adhered to in our future aircraft design to the greatest extent feasible. . The past belief is that the Navy required a different airplane than the Air Force, and, therefore, you should have the F-105 for the Air Force and the F-4 for the Navy. We have no doubt that to be absolutely wrong. We should never follow such a belief in the future [13]

Secretary McNamara strongly supported the development of the missions of the F-111 with a high degree of commonality for both the Air Force (F-111A) and

the Navy (F-111B). Admiral Moorer recalled: "During the time I was Chief of Naval Operations, we could get any amount of money put in the budget for that airplane even though it had a series of technical and performance difficulties from the Navy point of view."[14]

Although the Air Force's initial special operational requirement (SOR) looked toward a nuclear-capable F-111 suited for flexible employments with a variable sweep wing and afterburning turbofan power, the F-111A ultimately developed into a low-level, all-weather, tactical strike aircraft. At the same time, the Navy continued to want a multipurpose fighter optimized for a fleet air defense interceptor role, which the F-111B could not fulfill.[15] On the other hand, the Navy commenced development of a visual light-attack (VAL) aircraft which was optimized for close air support with new integrated bombing systems, subsonic speed, and large ordnance payload, and Secretary McNamara asked General LeMay to consider taking this aircraft—to be designated the A-7—as a close-air-support fighter. LeMay let it be known that he was "unenthusiastic" about the slow-flying A-7, and Lt Gen James Ferguson provided a rationale critical of an aircraft that could not fight:

> The airplane [providing close air support] must be able to exist in the air before it can conduct ground operations If the airplane has no air-to-air fighting capability, it stays on the bench until air superiority has either been granted or won by some other means. In the last few years, we have not had to fight hostile air before we could attack on the ground; but nevertheless, we might—within a matter of minutes—do just that In our opinion, we must be constantly prepared to do so [16]

Although there was complete agreement within the Air Force on the need to get and maintain air superiority for successful air-to-ground operations, there was no universal agreement on the need for a specialized air superiority fighter. In 1965 parameters for an F-X tactical fighter were in work, and General McConnell remembered: "We had a very difficult time in satisfying all the people who had to be satisfied as to what the F-X was going to be. . . . There were a lot of people in the Air Force who wanted to make that F-X into another F-4 type aircraft." In Vietnam on an inspection visit, Senator Symington said that he "could not find a single pilot who was not pleading for a true air superiority fighter." Generals Ferguson and Momyer, however, were said to believe that the United States ought to have a multipurpose follow-on fighter. In the OSD Systems Analysis Office, Alain Enthoven argued for the effectiveness of cheaper airplanes in large numbers over high-cost specialized planes in scarce numbers. On 29 April 1965 the first Air Force letter on the F-X instructed the Air Force Systems Command to initiate studies on a low-cost, simple, visual air-to-ground attack aircraft with the capability of visual air-to-air combat in the 1970–75 time frame. On 23–25 June 1965 Gen Walter C. Sweeney, Jr., called together a Tactical Air Command Tactical Fighter Tactics and Weapons System Panel at Langley AFB and endorsed the twin ideas that enemy aircraft would best be destroyed on the ground and that what was needed was flexible air power rather than a single-purpose fighter.[17]

In Washington in 1964 as assistant deputy chief of staff for plans and operations at Headquarters USAF, Maj Gen Arthur C. Agan came to believe that the Air Staff was so dominated by Strategic Air Command experience that things like "air superiority" were not well known or stated. Agan assembled a colloquium of fighter aces who had each shot down more than 15 aircraft to discuss the need for a new air superiority fighter. He prepared a paper on "Air Force Doctrine on Air Superiority" which General McConnell sent out over his signature on 3 May 1965 to all major commands and operating agencies. The paper, among other points, bridged the hiatus between arguments for destruction of hostile air forces in the air or at base airfields, thusly:

> Enemy airpower is destroyed in two ways: in the air and on the surface Both methods are essential parts of counterair operations and should be carried out concurrently. Regardless of the tactical air task or mode of attack, survival of the fighter aircraft we commit is at some time likely to hinge on air-to-air capability. Consequently, if *either* air-to-air or air-to-surface attacks are to succeed with attrition acceptable to us, we must provide aircraft, armament, and training which will succeed in air-to-air combat against the best enemy aircraft For air-to-air combat we should *seek* advantages in such performance parameters as acceleration, climb, maximum speed, ceiling maneuverability, sighting equipment, and armament capability. Depending on what we actually achieve, we must adapt tactics to fight best against a given enemy.

The paper also pointed out what was resulting from the fact that the North Vietnamese MiG forces in Southeast Asia were operating in a political sanctuary:

> If political sanctuaries are permitted in the air battle, a large share of combat will be air-to-air—at times and places of the enemy's choosing. Thus, depending upon the effectiveness of air cover, aircraft on strike missions near a sanctuary will require the ability to drop their external ordnance and survive in air-to-air combat

The paper concluded:

> Reconnaissance, close support, or interdiction may hold the key to a particular facet of tactical air operations, but if an enemy makes a determined bid for air superiority, the indispensable condition for success in joint operations will be our ability to seek out and destroy the enemy fighter forces [18]

At the same time that Air Force thinking was turning toward a need for a specialized air-to-air fighter, Secretary McNamara and Doctor Brown, the latter then serving as director of defense research and engineering, demanded that the Air Force procure some less expensive aircraft specifically for ground attack support missions, and were particularly insistent that the Air Force look at the Navy's VAL—now designated the A-7A. The A-7 was to be a subsonic, single-seat, single-engine, relatively long-range plane that could carry a large bomb load. In Senate hearings, Senator Symington decried the news that the Air Force might receive A-7s: "Very sad, as I look at airplane development, the tactical situation, pretty soon we are going to have a plane that flies backwards so as to be sure to support ground troops properly."[19]

General McConnell would later tell how he came to agree to accept modified A-7As under an A-7D designation with changes including more powerful engines, albeit in a considerably lesser number of wings than the secretary of defense programmed for the Air Force:

> We were under considerable pressure by certain elements in the military and by certain elements in Congress because they said we had never provided a capability or a specialized airplane for close support of the Army At that time, the Army was coming in with a strong close air support proposal which was the AH-56, the advanced helicopter. In order to demonstrate that we did want to give the Army every possible means of close support—and I know that we can do it better than they can, particularly with the AH-56—we opted for the A-7 in sufficient quantities to provide close air support for the Army in an environment that did not have intensive defenses. Close air support for the Army in an intensive defense environment would have to continue to be given by the F-4 and in some cases, the F-111. At that time we thought we could buy the A-7 airplane for less than half what an F-4 would cost, and for close air support of troops in a relatively permissive environment it is a good aircraft—was, and still is It has two drawbacks: One is that it takes a long runway for takeoff, longer than the F-4E does. It has a longer loiter capability, so that it can be in the vicinity of the troops for a longer period of time. But in an environment of intensive defense you can't loiter anyhow. Now, when the price of this aircraft went up to $2.8 million, and in addition to that OSD wanted to start substituting these aircraft to the tune of . a 1-for-1 basis with the F-111 and in my opinion it was getting me in a corner [20]

In November 1965 in the preparation of the fiscal year 1967 appropriations request, General McConnell personally recommended to the secretary of defense that the Air Force buy a limited number of A-7D aircraft to provide close air support in a permissive environment. The secretary of defense promptly programmed several more wings of A-7s than McConnell asked for or believed advisable. McConnell bought the A-7 because "it was supposed to be a reasonably cheap modification. . . . We bought it for one purpose, and that was to be able to supply heavy payloads with long loiter time in direct close air support of the ground forces." But the modification of the A-7 for Air Force use ran its cost up substantially, so that it was cost-competitive with the F-4E. The A-7 also turned out to need a longer hard-surfaced takeoff runway than the F-4. It thus cost too much and had to be based far back of front lines. When fiscal year 1970 appropriations requests were being put together, McConnell learned that he could have expected to buy 120 F-4E aircraft for the money programmed to buy 128 A-7s. At this time 74 A-7s were already in procurement, and McConnell attempted to "eat those 74 A-7s or otherwise dispose of them in some way" so that he could use the ongoing funds to secure F-4Es. He attempted to get Admiral Moorer to accept the Air Force A-7s, but the Navy could not use the planes without retrofitting them at a considerable expense. There was no way that the Air Force could support the logistical support and training costs for only 74 aircraft. And since McConnell could not find a taker for the planes he was compelled to seek a solution programming the Air Force for three wings of A-7s "as the best way out of a

decision which, frankly, I wished we had never gotten into in the first place, but we were sort of forced into it by circumstances."[21]

In the view of Gen Gabriel P. Disosway, who assumed command of the Tactical Air Command in August 1965, the "philosophy that you are going to build one airplane to do everything" might have been "all right" in World War II but was no longer applicable in 1965.[22] The Air Force's decision to request procurement of the A-7—a specialized close-air-support aircraft—in November 1965 was referenced on 24 November when Headquarters USAF released a statement of work for parametric design studies for a more sophisticated higher performance aircraft as an air superiority replacement for the F-4. "If you are going to get into a fight with a sophisticated air force, then you have to have fighters to clean him out before you can use the A-7," General McConnell explained. On 8 February 1966 the commanders of the Tactical Air Command, Pacific Air Forces, and the United States Air Forces in Europe recommended to General McConnell that study for the new F-X fighter "must be optimized for the air-to-air role" and "that any attempt to configure the F-X for an air-to-ground mission will result in a second best aircraft, incapable of competing with modern hostile aircraft in aerial combat." On 23 March 1966 the Air Force awarded contracts to Lockheed, North American, and Boeing for parametric design of two classes of fighters, one for air superiority and one for air-to-ground attack.[23] In addition to the F-X air superiority fighter, the Air Force laid plans for an A-X close-air-support aircraft. In June 1966 General McConnell directed the Air Staff to make analyses of what areas of close air support were not being filled to the Army's satisfaction. When completed in August 1966, the analyses showed that the Army was generally satisfied with close air support in Vietnam but that there was a gap in Air Force capabilities that the Army was bridging with armed helicopters, namely the escorting of troop-carrying helicopters and the delivery of suppressive fire during airmobile assaults. There was a need for a follow-on Air Force close-air-support aircraft since it was already evident that the A-7 was too costly and lacked desired CAS performance capabilities. In September 1966 General McConnell directed immediate and positive action to obtain a specialized A-X air-support aircraft for the 1970s.[24]

Although the Air Force was moving toward increased tactical fighter aircraft specialization in 1966, the concept was not completely accepted. Dissatisfaction with the F-111B version caused the Navy to begin working out proposals for a new Navy VFAX fighter, which would desirably be a single plane that could accomplish both attack and fighter missions. On 3 May 1966 Secretary McNamara directed the establishment of a joint Air Force/Navy review team to set up commonality of the F-X and VFAX, and in General McConnell's words, "when you get two services, one of them wanting the same airplane to do something else, you have a hard time coming to agreement." Eventually, on 1 December 1967, a joint memorandum from the Air Force and Navy assistant secretaries for research and development reported that the requirements of the two services could not be met by one aircraft but that there could be a high degree of commonality in propulsion

and avionics. McConnell also admitted that the "Air Force itself could not quite make up its mind about what exactly it wanted in the F-X.... Some people wanted it to have an overall capability, others wanted it to have only an air superiority capability."[25] McConnell wanted the F-X to have "a superiority capability only." In May and June 1968 he explained the need for increased specialization to the Preparedness Investigating Subcommittee of the Senate Committee on Armed Services:

> We believe that the basic requirement is for a balanced force consisting of a family of weapon systems, each designed to do one mission extremely well, and one or more other missions credibly well. To this extent, aircraft in the force will retain, to some extent, a multipurpose character designed to enhance flexibility in application to a variety of conflict situations. In view of this requirement, the force should include aircraft optimized for (1) Air superiority and capable of operating in the enemy's defensive environment with superior performance against first-line enemy aircraft. (2) Close air support with capabilities for extended range or loiter, with heavy payloads, a high degree of weapons delivery accuracy, and high survivability. (3) Deep penetration and interdiction and capable of performing a variety of day, night, and all-weather attack missions .. There are a lot of people in the Air Force who wanted to make the F-X into another F-4 type of aircraft. We finally decided—and I hope there is no one who still disagrees—that this aircraft is going to be an air superiority fighter. Its purpose will be to gain air superiority over the enemy, and absolute air supremacy over the battlefield We do not want to degrade it for anything else[26]

The marked increase in US general purpose and tactical air forces had been sparked by the 1961 Berlin confrontation with the Soviet Union and was designed in no small part to reduce reliance on the old MC 14/2 nuclear trip-wire strategy defending NATO. After 1961 the Soviets relaxed tension in Europe and in 1964 made a cut of possibly 15,000 troops in East Germany. Impatient with American leadership, President Charles de Gaulle led the withdrawal in 1967 of French military forces from the unified NATO commands. At the request of the French, the NATO allies withdrew all forces from France, necessarily relocating NATO headquarters in Belgium and its forces principally in the United Kingdom and the Federal Republic of Germany. In December 1967 the United States recommended a new strategy to the NATO Council of Ministers. This strategy became known as Flexible and Appropriate Response or MC 14/3. Adoption of this strategy was one of the reasons given by France for withdrawing from the NATO integrated military structure. The flexible response strategy called for conventional and nuclear forces, doctrine, and planning which could deter Warsaw Pact aggression. If deterrence failed, NATO countries would seek to defeat aggression at any level of attack (conventional or nuclear). If direct defense failed, NATO allies would use deliberately increased military force as necessary to make the cost and risk disproportionate to the enemy's objectives and cause him to cease his aggression and to withdraw. In the event of general nuclear war, NATO countries would inflict extensive damage on the Soviet Union and other Warsaw Pact countries. This objective would be accomplished in conjunction with the strategic forces of the NATO nuclear powers.[27]

The announced decision in NATO to emphasize conventional aspects of defense placed a greater need for conventional forces on the NATO allies. For the United States 1967–68 became a time of force readjustments in Europe caused both by de Gaulle's demand that all US forces leave France by 1 April 1967 and a need to reduce the adverse US trade balance of international payments. Operation FRELOC got US forces out of France as scheduled but involved establishment of a new logistical support infrastructure running from the United Kingdom through the Benelux countries to Germany—a line of communications potentially vulnerable to a Warsaw Pact attack across the North German Plain.[28] During 1968 the US Army withdrew roughly 28,500 troops from Germany in Operation Reforger, the package including two-thirds of the 24th Division, an armored cavalry regiment, and combat support units—all remaining assigned to the US European Command and pledged to be returned quickly in the event of impending hostilities. Crested Cap was the Air Force's companion package, returning four tactical fighter squadrons (4,800 military spaces) from Germany to the United States for dual basing, and promising to return them when needed.[29]

In justification of the new NATO strategy and also the dual basing of Americans, Secretary McNamara believed that the most likely kind of conflict in Europe would be one arising from miscalculations during a period of tension rather than a deliberately preplanned Soviet attack. It was possible that the Soviets might attack following a concealed mobilization, but such a mobilization would need to be large and therefore would be difficult to conceal. As a result of political tension providing warning, McNamara concluded that the United States could deploy forces back to Europe in adequate time. The Joint Chiefs of Staff on the other hand held that in view of the Soviet threat there was no military basis for the redeployment of US forces from Europe to the United States. They also theorized that the period of warning would be less than McNamara believed. Some of the prospective confusion over warning surfaced in the spring and summer of 1968 prior to the Soviet march of a force, including five divisions, into Czechoslovakia. Remembered Gen David A. Burchinal, deputy commander of the US European Command:

> Now we had every political indicator and warning in the world that the Soviets might move into Czechoslovakia, no one said they would move, no one knew they were going to make the move, and so prior to that time we did not take any particular precautionary measures that that situation might have warranted. So while we say political warning could exist or the indicators would exist, there is a grave question in our minds whether that will serve as an adequate basis upon which the necessary political decisions could be taken to return, let us say, the dual based forces from the United States to Europe[30]

Even though Air Force planning had to provide a capability to operate wherever directed by national authority, Maj Gen George S. Boylan, Jr., director of aerospace programs and deputy chief of staff for programs and resources, admitted that the planners he knew were very sensitive to NATO requirements:

> At all times . . I think every US military planner must keep right in front of him the capabilities of the Soviet Union, and it is against this highest threat that the US Air Force might ultimately be called on to perform. Certainly, through our NATO commitments, we face Soviet capabilities across Western Europe Therefore, it is from this aspect of the threat that high performance capabilities must be acquired for weapon systems [31]

In analyzing the European situation, however, Enthoven made the case for close air support of combat troops—or air capabilities contributing immediately to meeting a hostile attack in high-intensity conflict—as being of principal importance. This would be more valuable than deep interdiction that would make a contribution too late to affect short, high-intensity warfare. After the Air Force tactical air forces had initially expanded from 16 to 21 wings in 1961-62, Enthoven had recommended that the largest gains in tactical air capability could be managed by improving weapons effectiveness and delivery accuracy, and by reducing vulnerability rather than buying more aircraft. Enthoven was skeptical of the F-111 because it was expensive, apt to encounter heavy attrition in deep penetrations of enemy territory, and could be committed to deep interdiction in Europe. In August 1967 Secretary McNamara circulated a draft presidential memorandum (DPM) on Tactical Air Forces for fiscal year 1969 and for five years in the future. As a planning guide, McNamara wanted "to fight indefinitely in Asia while holding enough forces to fight in Europe" for a number of days that were not disclosed. Presidential Advisor Henry Kissinger subsequently wrote that the NATO strategy in 1969 was to stage a 90-day nonnuclear defense of Europe. In view of the promised bombing accuracy of the A-7D aircraft, OSD projected the reduction of Air Force tactical fighter wings worldwide from 24 to 23 wings. The Air Force made a reclama to this DPM without getting it changed. The DPM finalized on 4 January 1968 fixed the five-year Air Force tactical fighter wing strength at 23 wings, a strength which the Joint Chiefs of Staff subsequently noted might be adequate for the initial defense of NATO under optimum employment conditions but would leave a considerable risk that there would be inadequate tactical air forces available to assist any ally elsewhere or perform minor contingency operations. General McConnell strongly disagreed with the redirection:

> In terms of air-to-air combat against the Soviets, we clearly have to have superiority, because if you do not isolate the battlefield and gain air superiority, practically all over the theater, and air supremacy over any given segment of the battlefield at any one time, then you are not going to be able to fight The ground forces are going to get chewed up by the enemy aircraft [32]

Ordering TACAIR Resources for Realistic Deterrence

In Europe the Soviet-led invasion of Czechoslovakia in August 1968 seriously set back what had seemed to be a thawing of cold war relations and forced a reassessment of Soviet nations and their intentions. The occupation of

Czechoslovakia, as it turned out, marked the beginning of a gradual but sustained augmentation of Soviet and Warsaw Pact forces in Eastern Europe. Both manpower and new equipment—tanks, nuclear-capable rockets, and cannon and air defense missiles—were added.[33] On the worldwide scene, however, the Soviet invasion of Czechoslovakia brought a ray of hope to Henry Kissinger, who would become assistant for National Security Affairs to President Richard Nixon as the latter assumed office in 1969. In 1956 Communist China had supported the Soviet Union during upheavals in Poland and Hungary, but in 1968 China offered abusive condemnation of the Soviet Union. On the philosophical level, Kissinger asked through the National Security Council and got an interdepartmental group examination of the assumptions of the Kennedy-Johnson concept of preparations of general purpose forces for two and one-half wars. In his foreign policy report to Congress on 18 February 1970, Nixon stated that he would harmonize doctrine and capability by following a "1-1/2-war" strategy: maintaining general purpose forces adequate for simultaneously meeting a major Communist attack in either Europe or Asia, and contending with a contingency elsewhere. While returning from an Asian visit, Nixon first informally outlined the points of what would become known as the Nixon Doctrine at a press conference in Guam on 25 July 1969, and fully expounded the doctrine in an 18 February 1970 address to Congress. He said:

> The United States will keep all its treaty commitments We shall provide a shield if a nuclear power threatens the freedom of a nation allied with us, or of a nation whose survival we consider vital to our security and the security of the region as a whole In cases involving other types of aggression we shall furnish military and economic assistance when requested and as appropriate. But we shall look to the nation directly threatened to assume the primary responsibility of providing the manpower for its defense [34]

In explaining the "1-1/2-war" concept, Secretary of Defense Melvin Laird and Gen Earle G. Wheeler, director of Army plans, stressed the fact that Secretary McNamara had demanded that the services prepare budget requests on the basis of preparation of general purpose forces for two major wars and a minor war. "They would prepare their budgets, and the budget figures they had worked long and hard on would mean very little because they weren't really in the ball park of what the country could support," Laird said. General Wheeler added: "The forces provided by the budget of past years could not support a 2-1/2-war concept, loosely expressed. We, in effect, were kidding ourselves by having a strategic concept which envisioned such a capability." Under the new initiatives to support what was called "A Strategy of Realistic Deterrence," Laird planned to indicate what the country could support in military expenditures: "If we price out where we are in our budget today, we are realistically in a position—if we discount the present Vietnam situation—where we could support one major war and one minor conflict." Now, he added, "The military departments and the Joint Chiefs of Staff will be asked to develop programs and forces under the total fiscal guidance, and to propose equal cost trade-offs which, in their judgement, will provide a more

balanced program within the total resources available." Whereas the Kennedy-Johnson administration had placed heavy reliance on the use of the draft to meet manpower needs, the Nixon administration expected to field an "all volunteer" military force, and Secretary Laird expected to place heavy reliance upon reserve forces as a part of what he described as a "total force" concept: "Members of the National Guard and Reserve, instead of draftees, will be the initial and primary source for augmentation of the active forces in any future emergency requiring a rapid and substantial expansion of the active forces."[35]

In March 1969 the Bureau of the Budget directed a $6-billion reduction in the federal budget, and the Defense Department and Air Force met substantial reductions. On the eve of his retirement at the end of July, General McConnell faced "a sobering conclusion" that he was leaving the Air Force with "less airpower than when I became its Chief of Staff 4-1/2 years ago." This in part was a result of the fact that the Air Force had been compelled to fight in Vietnam without increased appropriations. McConnell said:

> I want next to make a few observations about the management of the Vietnam war. Hopefully, this conflict can be resolved but the problems are grave; we face a determined enemy abroad and increasing impatience at home. When we are far enough downstream from this conflict, I believe that the evaluation by thoughtful students will produce the conclusion that:
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> (1) It was by far the most closely managed war this country has ever fought. Secretary Seamans pointed out that our 1970 budget expressed in 1964 dollars is about the same as the 1964 budget This means that we have fought the war to a considerable extent at the expense of modernization. Although we have carefully husbanded our resources in the process, I will make no pretense that waste cannot be found, but on the whole, I believe the effort in Vietnam and Southeast Asia has been well managed
>
> (2) It will also be found that the professional military performed admirably under trying circumstances They were again given limited objectives as in Korea—the only previous conflict in which they had been politically restrained from attempting to gain military victory. Under these restrictions our commanders in the field could not take advantage of some unanticipated tactical or strategic opportunities While airpower in Vietnam has been used for close support more extensively than ever before, the overall limitations on its use have prevented its being decisive. . . . The success of airpower in achieving decisive results is predicated on proper employment to exploit its unique capabilities These specific capabilities are range, mobility, responsiveness and tactical versatility. The results of these capabilities are manifest most decisively when offensive air forces strike at the source of enemy strength In the case of North Vietnam, my preference would have [been] to destroy or neutralize his entire military, industrial and logistics base, rather than conducting selective and piecemeal attacks on road and rail nets, and certain power production and industrial facilities. Permission to conduct extensive operations against the complete military air defense environment of North Vietnam was never granted and [that factor] contributed to constant degradation of strike effectiveness In the case of South Vietnam, our successes in supporting ground forces were realized in spite of procedures rather than because of them. Our air capabilities of responsiveness and versatility were generally minimized by the cumbersome, time-consuming, and redundant procedures for obtaining strike clearance through military and civilian officials even in remote and uninhabited areas [36]

With reduced budgetary support, the Air Force envisioned an organization of which Secretary Seamans said: "The Air Force that I see will be leaner, more mobile, more streamlined, and . . . more volunteer oriented." The Air Force programs continued to muster 26 tactical fighter wing flags, but only 21 equipped tactical fighter wings—4 wings of F-111s, 3 wings of A-7s, and 14 wings of F-4s. Only 177 new planes in 1971 and 73 in 1972 were requested for purchase for the Air Force. These were the smallest numbers of annual purchase since the days of the Army Air Corps in 1935. The major factor in the sizing of the Air Force was "economic," but Secretary Seamans pointed out that there was very little ongoing aircraft production under way that could be bought: "We are going through an important aircraft development phase in the Air Force with the A-X, with the B-1, with the F-15, and with the AWACS, and feel it is not a time to procure large numbers of additional aircraft."[37] Although Secretary Seamans and Gen John Ryan were faced with maintaining a transitional holding action during their administration of the Air Force (1969–73), they witnessed the test in combat of F-111s and A-7s in Vietnam. And as they were going out of office in 1973, the Israeli-Arab Yom Kippur War provided new insight in tactical air warfare.

One of the first evaluations required of Secretary Seamans and General Ryan in mid-1969 was to determine the future of the F-111, which was described as probably "the most publicized airplane ever built." As has been seen, the F-111 was projected in 1961 as an all-purpose tactical fighter for the Air Force and Navy. Planning quantities of F-111s specified for procurement were 876 in October 1961, 1,726 in July 1962, 1,923 in May 1963, and 2,411 in March 1964. After this the planned quantities diminished each year, and in 1968 the Navy dropped its planned 705 F-111Bs out of the program, leaving the F-111 to the Air Force exclusively. The reduction in the planned quantity procurement caused large increases in the unit costs of F-111s. For the Air Force, however, the F-111's unique characteristics were vital to the tactical air mission. The F-111 was capable of sustained supersonic speeds, had an extended ferry range for worldwide deployment, could transport nuclear weapons or a 40,000-pound bombload with a high degree of accuracy in all-weather conditions, and was relatively inexpensive in maintenance costs (25 percent less than the F-105).[38] In April 1967 the commander in chief of Pacific Command requested an increased capability to deliver bombs against targets in North Vietnam during darkness and bad weather with accuracy. An Air Force test of available weapons revealed that the F-111A was superior in this regard. The first production F-111A was delivered to the Tactical Air Command at Nellis AFB, Nevada, on 16 October 1967, and 428th Tactical Fighter Squadron began qualifying a small group of pilots for a Combat Lancer evaluation of the plane in Southeast Asia. Detachment 1, 428th TFS, was deployed with six F-111As to Takhli Air Base, Thailand, on 15–16 March 1968. The aircraft demonstrated a clear ability to avoid ground fire by flying low, and they delivered their bombs more accurately in all weather and at night with their advanced radar and navigation system. But two F-111s disappeared while flying over Laos, and it was not known why the aircraft went down. F-111s were equipped with a terrain-following radar which allowed

them to fly automatically over rough topography without colliding with the ground. There was a possibility in Laos, however, that the radar might have not shown the tops of jungle trees but rather set the altitude from the surface of the ground. The cause of these losses remained unknown, but a third F-111 went down at a location where the pilots survived and the plane was recovered. This crash was caused by a tube of sealant which was found to have been left in the pitch-roll control system when the plane was built. Before F-111s at Takhli could complete their shakedown flights, fatigue tests of an F-111 in the United States resulted in the premature failure of the plane's wing-box carry-through structure. All F-111s were restricted from flight pending evaluation of the malfunction. Although the restriction was in effect, the bombing of North Vietnam ceased, and there would not be any utility in keeping the F-111 detachment in the theater. Accordingly, the detachment was returned to the United States.[39]

At night against poorly defined targets in undeveloped areas of North Vietnam, the F-111A blind bombing system demonstrated high potential target destruction capabilities. In the offing was an F-111D model with a Mark II avionics system, including improved radar and navigation systems integrated with a versatile cockpit display. The question confronting Secretary Brown in his last months as Air Force secretary was what to do about the F-111 production line pending a fix on the wing-pivoting apparatus break under static testing. The decision in the secretary's office on 11 October 1968 was to continue acceptance of F-111As with unmodified wing boxes and to place flight performance limits on the planes pending eventual incorporations of a fix. In continuing evaluations of the F-111, Secretary Seamans and General Ryan wanted to go ahead with the plane. "I believe this plane, which has gone through a very tortuous life, is going to provide a very great capability for the Air Force," said Seamans. Ryan added: "I think the airplane is going to be a tremendous asset to us. It will give us a capability for night and all-weather interdiction which we do not have in the Air Force today in the tactical forces."[40]

In discussions of strengthening NATO conventional capabilities, the United States had been holding out the prospect of placing two wings of F-111s at bases in England. These rearward bases would be less vulnerable to Warsaw Pact attack than continental bases, and from them the long-range F-111s would be able to strike targets deep in Europe at night and in adverse weather. In the winter, flying weather over the North German Plain was almost always bad, adding to the advantage of the F-111. Secretary Laird explained the international significance of the F-111:

> The F-111A represents a vital part of our NATO deterrent in Europe . We have made it clear to our allies for some time that this long range all-weather striking power would be part of the NATO forces both for nuclear and conventional operations Deletion of the F-111 portion of the NATO force would weaken our military as well as political position, both in the eyes of our allies and the offspring Warsaw Pact nations.[41]

Even though Air Force leaders continued to insist that the F-111, in Secretary Seamans's words, "represents a major step in modernizing our interdiction and long range penetration capabilities," the aircraft continued to have structural problems. When the wing box difficulty was corrected, another F-111A crashed on 22 December 1969 because of a structural crack in a forged wing pivot fitting. All F-111s were immediately grounded pending inspections for forging cracks, and in the spring of 1970 many critics of the F-111 argued that the aircraft was a "lemon" and that the program should be terminated. In congressional hearings, Gen James Ferguson, commander, Air Force Systems Command, and Lt Gen Otto J. Glasser, deputy chief of staff for research and development, came strongly to the defense of the F-111, but, as a matter of interest, Glasser observed:

> We have learned through our F-111 experience that aircraft that are built for too many purposes, that is too much of a multipurpose airplane is not a good thing. In many cases single purpose airplanes are best, and if an aircraft is to be built for more than one purpose, the purposes should be closely related.[42]

The expertise of the Air Force Scientific Advisory Board and the Air Force specialty teams were applied to the F-111, and all tests of wing pivot fittings failed to reveal any flaws, indicating that the crash in December was an anomaly. The F-111 program was nevertheless proving to be excessively expensive, and the Air Force was compelled to curtail the costs chiefly by reducing expenditures for avionics. The results were four models of F-111s. The F-111A was the basic, original TFX, and the F-111E was a refined "A" model with improved engine inlets and was used for the second tactical F-111 wing. The F-111D version incorporated an improved but expensive Mark II avionics system, which had moving target capabilities that significantly increased its air-to-ground effectiveness. The F-111D equipped the third F-111 tactical wing. The F-111F was fitted with higher thrust engines but equipped with less expensive avionics packages because of budgetary limitations. The F-111F equipped the fourth tactical F-111 wing.[43]

Demonstrating its capacity for nonstop flying early in 1971, an F-111A squadron proceeded without refueling to Upper Heyford, England. This base would receive a wing of F-111s in support of NATO. The first combat-ready F-111 wing, however, was the 474th Tactical Fighter Wing at Nellis AFB, Nevada, in February 1972. On 21 September 1972 the 474th was directed to deploy two squadrons of 48 F-111As to Takhli Air Base in Thailand for air operations against North Vietnam during darkness and adverse weather. The wing was initially committed to low-level operations into the high-threat areas of North Vietnam: it flew 806 single ship missions, of which 729 were successful, resulting in an overall success rate of 91 percent. During Linebacker II in December 1972, F-111s dropped the first bombs, striking MiG airfields and other key targets around Hanoi. On the last two nights of Linebacker II, the F-111s concentrated against SAM sites, and—although other planes were also hitting to cover the B-52s—on these nights the number of missiles fired at the strategic bombers was reduced from an average of over 200 to less than 20 each night. F-111s were also the only aircraft to attack the long, narrow docks

and warehouse areas at Hanoi; bomb damage assessment showed 100 percent of bombs scoring on the docks and warehouses without collateral damage to surrounding civil structures. When operations were pulled back away from Hanoi, the 474th was fragged for medium-altitude bombing missions; 3,253 such sorties were flown, of which 89 led other planes to targets in pathfinder work. Nearly all of the medium-altitude strikes were successful. The wing had a total of six combat losses with one crew captured and later returned. F-111s normally required no aerial refueling on strike missions; in fact, only six missions, all against rail targets in far northeastern North Vietnam, ran short of fuel and had to hit tankers on the way back to Takhli. During the last weeks of combat in Laos, F-111s were counted to be highly successful in bombing at night and through clouds with offset aiming on beacons and allowing close air support for friendly ground troops. This ground beacon/radar offset bombing drew warm praise from General Vogt, commander in Southeast Asia, when he was attempting in the summer monsoon of 1973 to prop up the friendly Cambodian forces. F-111s were able both to bomb in proximity to friendly forces and to lead flights of less sophisticated aircraft to bomb enemy forces endangering friendlies. Early in 1974 Gen George Brown testified that the F-111 provided a "unique" capability to deliver conventional weapons accurately at night and in weather against the toughest targets in North Vietnam.[44]

Since the A-7D close-support fighter was a modified version of the already developed US Navy A-7A/A-7B attack aircraft, it was initially expected that the plane would be a well within the state-of-the-art program that would provide a relatively cheap subsonic aircraft, able to carry a heavy advance load, and with range enough to permit it to loiter leisurely while awaiting targets. Its secondary role was to be aerial interdiction. Designed originally for Navy carrier-based operations, the A-7 required time-consuming and expensive modifications to adapt it to land-based Air Force usage. The initial December 1965 decision to procure the A-7 did not envision the changes necessary to acquire a mission effective close-air-support aircraft, and Gen Otto J. Glasser, Air Force deputy chief of staff for research and development, expressed a later Air Force assessment that the procurement decision "might have been deemed premature from that point of view." After the configuration of the A-7D was determined and authorized, however, the program schedule was stabilized, and a very successful flight-test program was completed in August 1970. The original buy projection was for four wings of A-7Ds, but the projection was reduced to three wings when the tactical fighter force was cut from 23 to 21 wings. A combat crew training squadron for A-7Ds was opened at Luke AFB, Arizona, in the winter of 1970–71, and thereupon deliveries of A-7Ds began to equip the 354th Tactical Fighter Wing at Myrtle Beach, South Carolina.[45]

The 354th Tactical Fighter Wing received an execute order at Myrtle Beach on 3 October 1972 to deploy its three squadrons of A-7Ds to Korat Royal Thai Air Force Base, Thailand, for combat against the North Vietnamese. All 72 aircraft were in place at Korat on 16 October, the same day that the wing flew its first combat sorties. In the airlifted movement, nearly 1,600 people and 665 tons of

equipment were moved by 43 C-141 sorties, 5 Boeing 707s, and 5 C-130s. In combat the daily frag rate built to a sustained 0.87 sortie rate, equating to 62 sorties a day. With its long range, the A-7D could strike from Korat to just about anywhere in Southeast Asia without aerial refueling. Almost from the first day's flying, the 354th began to get kudos from forward air controllers who directed close-support missions and who liked the long-loiter time that the A-7 could stay around and also their bombing accuracy. Col Thomas M. Knowles III, the 354th's commander, said that when the FACs "designate a target and say, 'hit my smoke,' we can hit the smoke." In combat employment, Colonel Knowles estimated the bombing accuracy of A-7s to have been about 10 meters, or at least this was a usual FAC evaluation. Early in November, A-7s took over the work of old A-1s in escorting search and rescue helicopters to pick up downed airmen. According to General Vogt, old A-1s were extremely vulnerable to Communist SA-7 hand-held infrared homing rockets—they were too slow and radiated too much heat, making it necessary to take them out of combat. Normally, an A-7 Sandy search and rescue mission lasted 4 to 5 hours, requiring the A-7 to tap a refueling tanker two or three times. In 12 days of Linebacker II the 354th Wing conducted 230 strike sorties; it was able to bomb visually on only three of the strike days and the remaining efforts were LORAN drops using F-4s as pathfinders. When Air Force air operations ceased in Laos on 23 February 1973, the wing had flown 5,796 strike/attack sorties, 542 Sandy SAR sorties, and 230 Linebacker sorties. Two aircraft and one pilot were lost in combat; the cause of the loss of one plane and pilot over Laos was unknown, but the other plane collided with a FAC, and the pilot was captured and later freed in a POW release. In summing up the wing's experience, Colonel Knowles stated that the A-7D was "the best [close-support aircraft] we have in the active inventory today. . . . We confirmed that our training in the Tactical Air Command provided us with a sound and effective wing team to conduct combat operations."[46]

Over North Vietnam American airmen had learned to live with the early generation SA-1 surface-to-air missiles chiefly by evading SAMs or by jamming missile radars. Efforts to attack Communist air defense were not reliable, one reason being that it was difficult to plot exact locations of electronic emitters. As will be seen, the Air Force at the end of the Southeast Asian war was working on a requirement to develop an advance location strike system (ALSS) employing novel distance measuring equipment for exact targeting and strike direction against electronic emitters.[47] Although the Soviet Union was generous in its support of the North Vietnamese, the major flow of the most modern Soviet weapons went to Egypt and Syria, who were being prepared to avenge their defeat by Israel in the war that had occurred in 1967. Many of the major weapon systems so provided had not been seen previously in combat. Since the land and air battles that were going to take place in the Middle East were fought with many newly developed weapons that would possibly be used in a war against NATO, and since the deployment of combatants in some areas was comparable to those expectable in Europe, the Arab-Israeli wars of June 1967 and the Yom Kippur War of October

1973 stimulated much thought in the United States, including evaluation and reaction that was perhaps keener than the evaluation and reaction to US experience in Southeast Asia.[48]

In the 1967 Middle East War the Israeli Air Force was able to destroy the Arab air forces on the first day with a lightning-fast, low-level air attack against airfields in a preemptive beginning to the conflict launched while the Arab adversaries were poised to attack. After this, the Israeli Air Force decimated Arab tank forces, permitting Israeli armor to wage blitzkrieg assault. In the months after 1967, Egypt and Syria built concrete shelters for their aircraft – chiefly MiG-21Js received from the Soviet Union. The Soviets provided the newly equipped Egyptian and Syrian T62 tank forces with an emplaced SA-2 and SA-3 surface-to-air missile antiaircraft umbrella and a rolling air umbrella of mobile SA-6 vehicle-mounted antiaircraft missiles. The Soviets also provided mobile 23-mm ZSU-23-4 radar-equipped, rapid-firing antiaircraft guns. The SA-6 was a technological surprise; its mobility permitted it to keep pace with advancing armored forces, and the SA-6 incorporated a continuous-wave, semi-actively guided Doppler technique against which existing US ECM jammers were impotent.[49]

The Israeli policy of maintaining a reserve army against a much larger Arab standing army was similar in some respects to the situation faced by the Free World in Europe with respect to the Warsaw Pact. The consequences of surprise attack in the Middle East were more serious, however, since the Israeli ground forces were maintained at only a fraction of their planned wartime manning and whereas NATO forces were held at nearer full strength. Although it was evident to the Israeli national command authority that Egypt and Syria were maneuvering and that attack was possible, the Israelis had been criticized in 1967 for preempting. Since the 6th of October was Yom Kippur, Israel did not mobilize. On this day a combined Arab force of over 2,000 tanks and 100,000 infantry swept simultaneously into the Golan Heights above Jerusalem and into the Sinai desert against a not-yet-mobilized Israeli force of about 400 tanks and 5,000 infantry. Maj Gen Benjamin Peled, Israeli Air Force (IAF) commander, would later say that if the Arabs started another war he felt that in the initial phases he would attempt to gain air superiority by attacking airfields and by locating and suppressing SAM sites, but with Syrian tanks coming down the Golan Heights and the strategic life of the country in jeopardy, his only choice was to throw his air units into the beach to delay the enemy and buy time to mobilize ground force reserves. These early Israeli close-air-support operations had to take place in a heavily defended area under very fluid and chaotic battlefield conditions. The Arabs' dense, ground-based, overlapping, surface-to-air missiles and antiaircraft artillery coreplied with the Israeli army's initial lack of knowledge about their own and Arab troop locations made IAF close air support particularly difficult. In a later recapitulation of these events in Washington, Maj Gen Harold E. Collins, Air Force assistant deputy chief of staff for research and development, said it appeared that the Israelis

> made a basic presumption that the SAM's were not going to bother them all that badly . . So they decided that they would go ahead in, and when they found that the SAM environment was pretty tough, and particularly the fact that that SA-6 had mobility, that drove them down to the deck and, of course, drove them into the AAA. That is where they got a devil of a lot of their losses.[50]

As chairman of the Joint Chiefs of Staff, Admiral Moorer drew several "lessons learned" from the initial war days:

> First, ready, in-being, deployed forces are essential to maintaining the territorial integrity of any area whose defense is required Additionally, the classic doctrine that the priority of employment of air assets must be given to gaining and maintaining air superiority over the battlefield has been proven once again Today, gaining air superiority includes defeating enemy SAMs in detail Until enemy air defenses are degraded, any application of aerial firepower will be costly, but the losses will go down as air defenses are taken out . In the interim, ground forces must be capable of fighting with reduced reliance upon close air support [51]

Although the emergency commitment of the Israeli Air Force and the mobilization of ground forces successfully stalled Syrian and Egyptian thrusts, these forces had to be incautiously employed and losses were heavy. The Israeli Air Force was comprised principally of the US A-4 Skyhawk, the F-4E Phantom, and the French Mirage, the latter having little ground-attack capability but proving useful for aerial combat. According to Minister of Defense Moshe Dayan, the Israeli Air Force lost 102 aircraft, most of which were downed in the first three days of hectic fighting. During this time, Israeli armored forces were thrown at the enemy in tank columns which, unsupported by infantry and artillery, were easily picked off by Soviet-provided, infantry-operated antitank missiles of the AT-3 Sagger type. These early happenings engendered two false but widely spread conclusions: the one was that precision-guided defenses had rendered tanks practically obsolescent, the other that precision-guided missiles such as SA-6s and SA-7s rendered tactical aircraft obsolete. The true facts were that Israeli tanks, once they received combined arms support, rolled back the Syrians from the Golan Heights and ultimately surrounded the Egyptian Third Army on the southern front. As far as total losses of armor were concerned, a clear majority of the tanks on both sides were destroyed by other tanks. A sizable percentage of Arab armor was nevertheless destroyed as a result of Israeli air sorties. Destruction was particularly pronounced in the later stages of the conflict when antiaircraft missile defenses had been suppressed and the IAF brought into action urgently delivered US weapons, such as the electro-optically guided Maverick and the TV-guided Walleye glide bomb, which were reported to have recently achieved kill ratios in excess of 90 percent [52]

Distorted misperceptions concerning the losses of aircraft in the Yom Kippur War failed to focus upon the fact that political considerations prevented the Israeli Air Force from preempting against Soviet missile defenses as it had intended and therefore it had to be recklessly employed in the opening days of combat. When

both Israeli and Arab aircraft were counted, some 46 percent of all kills were scored in the air by other aircraft. Of the Arab losses of 480 to 514 aircraft, 55 percent were downed by Israeli fighters, while only 5 percent of 102 Israeli aircraft were lost in air-to-air fights. Of 222 Syrian aircraft lost in the war, 162, or 73 percent, were destroyed in aerial combat. The other Arab aircraft were shot down by Israeli AAA, US-provided Hawk missiles, except for 58 said to have been downed accidentally by friendly Egyptian and Syrian air defense missiles. Whereas 373 Arab aircraft were destroyed on the ground in the 1967 war, the Arabs' concrete hangarettes were extremely effective in the Yom Kippur action, and only 22 Arab planes were destroyed on the ground. Only 5 percent of Israeli aircraft were destroyed on the ground, possibly because the skies over Israeli airfields were kept "clean" throughout the war, and not one bomb fell on Israel. The successful maintenance of control of the air over Israel protected the IAF infrastructure. King Hussein of Jordan explained to the Arab world that he stayed out of the war and was unwilling to commit his forces because of Israel's control in the air over the potential battlefield. The training of Israeli pilots for air-to-air combat was described by Air Force observers as "outstanding"—far superior to Arab training. The Arab pilots were described as "no qualitative match for the Israeli pilots." Most air-to-air combat occurred in the immediate battle area. The Egyptians had a fairly good radar coverage, and their controllers could tell when the Israelis were coming, although not accurately enough to vector their airmen to long-range interceptions. Accordingly, the Egyptians used defensive orbiting patrols over point defenses that essentially were responsive to what the ground controller said, as was the custom in Soviet doctrine. Israeli pilots customarily penetrated to their targets at low level and high speed, popped up and lofted their ordnance; the Arab pilots were told to attack when they saw the Israeli pilots popping up, and by the time that they got in to attack, it was too late. With airplanes as dense as the F-4Es he was using for ground attack, General Peled insisted that speed was an absolute necessity for survival. A Joint Chiefs of Staff survey team agreed that a lesson to be learned from the Yom Kippur War was that a close-support airplane needed to attack at high speed needed excess thrust for maneuverability to avoid SAMs and sustain high speed, and needed a computer-aided bombing system for an accurate first-pass delivery. Another point raised by the JCS team was that airborne FACs in slow-moving planes could not have survived in such an intense air-defense environment.[53] The Air Force's response to these assertions was that there was a trade-off between speed and relative invulnerability (ability to take hits) in an aircraft. Speed made it more difficult for a pilot to acquire a target. Thus this trade-off was being reflected in the A-X (now the A-10) close-air-support plane. The finding on the survivability of an airborne FAC was additional support for the A-10, since it could—unlike a faster aircraft—find its own targets.[54]

According to one evaluation, if the Israeli Air Force had been able to strike immediately, it could have eliminated SAMs on both fronts in a period of between three to six hours, with an aircraft attrition of probably not much more than 1 percent. After the initial period of the war, the IAF in a brief concentration on

defense suppression destroyed more than six-sevenths of all SAM sites, including four-fifths of the mobile SA-6s. The SA-2s and SA-3s were successfully jammed, and in the last stages of the war, Israeli drones sometimes attracted as many as three dozen SAMs per drone, depleting numerous sites of ammunition. SA-2s and SA-3s were relatively immobile, and thus the Egyptian armor on the Sinai front, after forging a bulge across the Suez, appeared to huddle under the antiair-missile defense umbrella and to lose its momentum of attack. When some armor lost patience and moved out, it was decimated by Israeli airmen. It was reported that SA-2s and SA-3s accounted for less than 40 percent of Israeli aircraft destroyed and that SA-6s and SA-7s accounted for only 10 and 4 percent respectively. More than 5,000 Strella firings were said to have downed only four Israeli planes. Arab antiaircraft (AA) accounted for over 40 percent of Israeli plane losses.[55] In a lecture to the Royal United Services Institute (RUSI) in England, Gen Chaim Herzog discussed air-to-ground action on the West Bank of the Suez Canal, saying: "The first mission of our armored force on the West Bank of the Suez Canal was to knock out the surface-to-air missile sites, which it did effectively. That force literally swept the area for the air force, and it was then free to attack at will." Based on this quotation, one Air Force officer inferred that prior to the elimination of SAM and AA defenses, the IAF was not free to attack at will. In a book written after his lecture to the RUSI, however, General Herzog stated:

> On the West Bank of the Suez Canal, an unusual example of mutual coordination emerged between the advancing ground forces and the Israeli Air Force. As the armored forces on the West Bank of the Canal destroyed one surface-to-air missile battery after another, the Israeli Air Force gained a freer hand and became a major factor in supporting the advancing Israeli forces.[56]

Elsewhere, Herzog was careful to point out, the IAF was successful in dealing with missiles on its own, thus contradicting a popular report that precision-guided Soviet missiles had rendered IAF aircraft almost obsolescent.[57]

"The effective use of airpower appears to me as the difference between destruction and survival for Israel," stated US Air Force Chief of Staff Gen George S. Brown on 21 March 1974.[58] As will be seen, the steady flow of US supplies to Israel by C-141 and C-5A airlift between 13 October–14 November was one of the decisive factors enabling Israel to continue to battle to a successful cease-fire, but the immediate focus of evaluation was on the tactical air aspect of the Yom Kippur War. A Royal Australian Air Force officer at Maxwell AFB, Alabama, Air War College, said the Yom Kippur War necessitated sweeping changes in air doctrine in addition to new equipment. "In the light of the lessons learned from the Yom Kippur War, defense suppression must now be elevated to rank with air superiority, interdiction, and close air support as one of the basic missions of tactical air forces," wrote Wing Commander Hans F. Roser.[59] But General Brown adopted a more measured cadence, namely that "air superiority" included "defense suppression": "You have to gain air superiority. That not only means against enemy fighters, it also means against enemy missiles . . . We have just got to beat those defenses

down. If you ignore the defenses, you are going to pay a terrific price."[60] Gen Robert J. Dixon, commander of the Tactical Air Command, expressed his insight into the Yom Kippur War in a rebuttal to the generalization that missile defenses brought an era where tactical aircraft could no longer survive over a battlefield. His judgment was "less startling but more credible." Tactical air power would need to "control the air-space, suppress the defenses, operate as a combined arms team."[61] In what might be described as a wrap-up of Air Force thoughts on Yom Kippur generalities, Maj Gen Robert P. Lukeman, assistant chief of staff for studies and analysis, responded to a question as to how the Air Force would fight October's Middle East War, as follows:

> Assuming USAF equipment and trained personnel were to be employed, and given the same general terrain, weather and military situation faced by the Israelis, the following general scenario may be constructed First, a comprehensive counterair campaign would be launched to defend friendly air space, and to destroy and suppress enemy ground-based and airborne air defenses The purpose of this campaign would be to obtain air superiority necessary to preclude enemy air attack of friendly ground forces and to permit freedom of action for USAF close air support, interdiction, reconnaissance and theater airlift activities. Simultaneous with the counterair campaign, large numbers of immediate and preplanned close air support sorties would be provided to friendly ground forces using the tactical air control system. An around-the-clock interdiction program would be initiated to destroy, delay, and harass the flow of enemy troops and materiel to the front and to destroy/disrupt his command and control elements Tactical air reconnaissance, both day and night, would be accomplished and provided to the ground and air commanders on a timely basis Tactical airlift would be employed to provide logistical air support as required In support of all these missions, USAF tactical electronic warfare resources—self-screening electronic countermeasures, ECM, support ECM—chaff, flares to counter infrared weapons, and appropriate tactics, would be used to supplement direct suppression of defense and direct attack of hostile control elements Finally, in order to insure optimum allocation of air resources to all missions to be performed and to obtain flexible, responsive command and control, all air activities would be centralized under the USAF component of the U S Army/Air Force/Navy joint task force.[62]

One of the more remarkable things about the Middle East War that deserved recording, according to Maj Gen Harold E. Collins, assistant deputy chief of staff for research and development, was the "capability of the Israeli Air Force, predominantly a fighter force, to achieve air superiority over the Arab forces with their emphasis on SAM defenses."[63] On the other hand, Dr Malcolm R. Currie, director of defense research and engineering, pointed out that new means must be found to protect close air support:

> A major lesson, reenforced by the Mideast War, is the necessity of countering enemy air defense systems which threaten our close air support aircraft We rely on close air support much more heavily than the Soviet Union We must be certain it can operate effectively. Many of our current developments are applicable to suppressing forward air defense. We need to explore some new approaches and we need to fill in gaps in our capability Above all, we need to make certain that our total defense suppression capability will do the job.[64]

A still different forecast was offered by General Herzog:

> The proliferation of light, portable missile launchers in the front lines meant that close air support would be the exception to the rule in the future, with the air force being obliged to concentrate on isolating the field of battle, maintaining supremacy in the air, and destroying the forces in and near the field of battle [65]

Already mindful that the Air Force would need to beat down hostile antiair defenses, General Brown on 2 November 1973 directed the Tactical Air Command and the Air Force Systems Command to review some 112 research and development items on the books that looked as if they would improve tactical strike capabilities, particularly at night and during adverse weather, with emphasis on defense suppression. As a result of this study an aggregate of 11 projects were collectively named Pave Strike ("Pave" being the AFSC code word and "Strike" the project) and mandated for special research and development management emphasis. The emphasis on night and all-weather capability was in recognition that military operations in the Middle East had generally ceased at night except for resupply movements and shifts of troops and armor. There was also a belated recognition that winter weather in Northern Europe was usually inhospitable to low-level air operations. There were three general categories of Pave Strike. First, to detect and target hostile emitters. Here the distance-measuring equipment techniques of the advanced location and strike system (ALSS) that had not gotten to Southeast Asia would be developed into an expanded precision emitter locator strike system (PELSS). Second, to provide strike force protection there would be a need to modify standard F-111As into EF-111As for electronics jamming ECM, to provide a coterie of Wild Weasel F-4Es that would strike hostile emitters, and to develop remotely piloted vehicle (RPV) modules to complement manned activity in ECM and reconnaissance and as precursors laying chaff corridors, saturating and diluting air defenses in advance of penetrating strike fighters. Third, to perfect many more guidance systems for bombs and rockets, especially laser and infrared sensors for the Maverick, which had been ordered for production in large numbers but whose electro-optical television guidance might not be too useful in northern European weather In explanation of Pave Strike, General Collins emphasized that its programs would not be immediately fruitful since all the technology visualized had not yet been developed. Pave Strike would be evolutionary, not revolutionary, but it was important for long-term security to spark the technology it required.[66]

A group of congressmen who visited the Middle East in late November 1973 returned to Washington concerned that the conflict demonstrated that the Soviets achieved more effective military power by a proliferation of rugged, inexpensive devices rather than through the use of expensive, sophisticated technology Congressman Joseph P. Addabbo of New York was especially concerned that in the fighting "we saw massive Soviet supplies used against our sophisticated type equipment." He said that the Israelis had lost heavily because they had met "a wall of steel " He also believed the Soviets stressed quantity rather than quality: "Russia

is not dealing with sophisticated weapons and would not put $60 million into one tank or plane. They would rather have 10 tanks or 10 planes of lesser quality."[67] In a colloquy early in 1974, Secretary McLucas argued that the Arabs had expended a great number of SAMs in comparison with the number of Israeli aircraft downed, but Sen Milton R. Young of North Dakota responded: "Yes, but they [the Arabs] can fire plenty of them. They are not too costly. The Israelis have lost three-quarters of a billion dollars worth of planes, and we paid for them. The ratio is too heavy."[68] As a matter of fact, the Soviets had provided Egypt and Syria with many items of expensive equipment. The Soviet-provided armored personnel carriers (APC), for example, were equipped for chemical-biological war and vastly exceeded the cost of US APCs. The mobile ZSU-23-4 was also extremely costly as compared to the US Vulcan. All systems had optical backup sighting to counter electronic jamming of radars. The SA-6 was not only modern and expensive but was a surprise entrant in the conflict. In the early phase of the war, however, both Arabs and Israelis used tremendous quantities of materiel and had very high rates of weapons expenditures. This trend toward rapid weapons expenditures placed a premium on plentiful, "affordable" weapons, but Director of Defense Research and Engineering Currie warned that the extent to which the performance of an individual weapon should be compromised to lower its cost demanded careful thought in each case.[69] For at least a year before the Yom Kippur War the Department of Defense had accepted an intention to go to a cost-quantity trade-off in weapons procurement to permit a "hi-lo" mix of costs of new weapons, the low end of the mix being designed to permit acquisition of larger numbers of weapons. In this regard, the Middle East War of 1973 gave impetus to the acquisition of more sophisticated weapons and also larger quantities of less costly but still usable weapons.

Response to the Soviet/Warsaw Pact Threat

After 1968, when the Soviet invasion of Czechoslovakia both ended an illusion of détente at the Elbe and marked a beginning of a clearly visible Soviet buildup of frontal attack forces endangering the North Atlantic Alliance, US national security policy gave the defense of Western Europe first priority after the defense of the United States. This policy not only meant that the Soviet/Warsaw Pact threat in large part dictated force sizing, but, in the case of the Air Force, the image of Soviet/Warsaw Pact attack generated characteristics of the new tactical fighter/attack forces. Thus when Lt Gen Alton D. Slay, Air Force deputy chief of staff for research and development, was asked whether the Air Force ought not to place greater emphasis outside Central Europe, and what the Air Force would do if it received additional funding, he responded:

> Our philosophy for a number of years has been if we prepare well enough for the big war, we have encompassed what is required for smaller wars As an example, all of equipment that we have, with few exceptions, is equally applicable, say, for the Horn of

> Africa as for Eastern Germany. . . . Now if we have a large war in Central Europe, quite obviously we can't handle much more, so to answer your second question, what would we do with extra money, we would buy more of the same.[70]

After the invasion of Czechoslovakia in 1968, the Soviets left behind 65,000 men, including five divisions. In this same time span, they began a change of emphasis in their military strength confronting NATO. Until this time Soviet/Warsaw Pact forces were principally defensive. Their air power was defensively oriented, trained, and equipped to intercept rather than to penetrate air defenses or bomb deep within NATO territory. They had a great proliferation of missile defenses, and their armies were disposed as occupation forces rather than in an attack posture.[71] Whereas the United States made force reductions under the Nixon strategy to those required for one and one-half wars, the Soviet Union moved up to a two-and-a-half war capability—expanding and modernizing the forces confronting NATO at the same time they were augmenting the forces in the east confronting China By 1971 Gen David A. Burchinal, deputy commander in chief, European Command, said of the Soviets:

> By almost any quantitative measure such as divisions, tanks, artillery, submarines, APCs—they have a significant quantitative edge. This is true. I think, however, that we are still retaining, overall, by and large, a qualitative edge and we do provide a very essential piece of this equation which is our tactical nuclear presence in Europe which only the United States can provide.[72]

At this time the Warsaw Pact was building a formidable armored force in the central region of Europe, defined in NATO as all of West Germany and the Benelux countries. The three most famous approaches into Western Europe were in the central region: the Fulda Gap in the north, the Meiningen Gap in the center, and the Hof/Cheb Gap in the south. Stated a US Army briefer,

> It is evident that emphasis must be placed on countering the most apparent conventional threat in Europe—Warsaw Pact armor and ground mobility. The Russians are overweight in tanks. If you can stop their tanks, you can blunt their attack Therefore, every means at our disposal must be used to kill his armored vehicles.[73]

In a formal statement in July 1973, Secretary Schlesinger described the pact forces opposite NATO as "indeed formidable," but he nevertheless maintained that the NATO force structure was sufficient to provide "a very limited temptation in the Warsaw Pact to move against Western Europe and thus there is now in Europe a fairly stable situation."[74] Schlesinger's evaluation discounted what he described as "a Pearl Harbor complex" or a belief that the Soviet/Warsaw Pact attack would come like a "bolt from the blue " He conceived that to make an attack, forces as far away as the three Soviet western military districts would need to be moved forward and that NATO intelligence sources would surely be forewarned by all this repositioning of Soviet/Warsaw Pact forces.[75]

The US national strategy guidance provided by President Nixon through the National Security Council in 1969 was predicated on the thesis that "within a period

of 90 days after the initiation of a Warsaw Pact conventional attack on Europe, either a political settlement would be reached, or the Soviets would reach the limits of their conventional capability, or the war would have escalated to nuclear conflict."[76] In this period the Air Force's criterion for the sufficiency of the deterrent in Europe was to be able to sustain conventional conflict for 90 days while maintaining a capability to escalate to the use of nuclear weapons.

Remembering the air power lesson of the World War II Luftwaffe Stuka aircraft that was admirable for close air support but had no other capabilities, a generation of Air Force leaders had held to a doctrine that aircraft ought to be developed on a principle of multipurpose usage. Thus all fighters and attack aircraft should have varying capabilities for close air support. Ending his career as commander of the Tactical Air Command, General Momyer had earlier opposed specialized aircraft, but in 1971 he conceived that military requirements must be rationally developed from the future threat toward Europe. He said:

> We know from our recent experience over North Vietnam, and from the current situation in the Middle East, that the higher threat environments of the future will not be limited to Europe But that is the principal threat, and the other threats in other areas will be reflection of it, on a smaller scale [77]

In view of the "time limit" for a conventional conflict in Europe as well as the probability that any conventional conflict in Europe would probably be of higher intensity than any previous war in which the United States had been engaged, Momyer conceived that the United States and other NATO allies must be

> able to aggressively pursue air operations involving concurrent air superiority, counterair, interdiction, and close air support if deterrence fails In short, we will not be afforded the luxury of accomplishing tactical air missions one at a time if deterrence fails and we are thrust into a conventional war in Europe [78]

The promised intensity of conflict in Europe, Momyer concluded, established "a requirement for a large number of airframes and tend[ed] to emphasize specialization."[79]

At the same time that the Air Force needed aircraft for high intensity and short-time-to-decision conflicts in Europe, Air Force leaders also faced a problem of balancing quality against quantity. In February 1972, Grant L. Hansen, assistant secretary of the Air Force for research and development, was called upon to speak to the subject of "goldplating," which he defined as "having features which are not absolutely necessary for the system to accomplish its intended mission." There had been some systems where this had been the case, Hansen said, but he added:

> The single driving fact in the acquisition of major weapons systems is that the capabilities required for survival in war present hard engineering problems that we have never faced before The history of the cost and complexity of fighter aircraft systems illustrates the problem. In World War I, a fighter aircraft cost about $5,000 By World War II, this rose to about $50,000 By the Korean War, the price had jumped to $500,000, and the cost of fighter aircraft systems of the 1970's [has] increased by roughly another factor

> of 10 If one were to project these trends, by sometime in the 21st century we would be able to afford only one aircraft Clearly, one aircraft, no matter how capable, will be inadequate for the simple reason that it cannot be more than one place at one time...
>
> Obviously, we must compromise between the extremes of capability and numbers to develop new fighter aircraft systems that will have, first, an acceptable exchange ratio against enemy systems, and, second, a cost that will allow us to buy and operate enough to achieve and maintain air superiority for the United States if war should ever come [80]

As deputy secretary of defense in the Laird tenure, David Packard received responsibility for reforming Department of Defense procurement procedures, and his studies convinced him that "by far the most important factor driving the cost [of weapons] up is the capability we ask for in new weapons."[81] Laird and Packard instituted new prototype development, "fly-before-buy," and "hi-lo" policies to drive down development and procurement costs, and Secretary Schlesinger agreed in 1974 that "in many situations, large numbers of relatively uncomplicated systems may prove more effective than equal cost but much smaller numbers of highly complex delivery vehicles." In 1975 Schlesinger stated that the Department of Defense was bound by the high-low mix principle to get a proper combination of sophistication and quantity. He informally defined the dividing line of aircraft cost between "high" and "low" as being a unit cost of about $6 million per copy—anything above that cost being "high" and anything below being "low."[82] With continued cost increases, some critics would argue that the low part of the mix had become so expensive that the "hi-lo" concept was violated, and Secretary of Defense Brown would argue that the last 5 to 10 percent of capability should be given up to secure the number of weapons needed.[83] Well acquainted with problems of the defense of Western Europe as a result of a tour as CINC, United States Air Forces in Europe (USAFE), immediately before becoming Air Force chief of staff in July 1974, Gen David C. Jones agreed with both high-low mix and mission optimization of aircraft:

> The high-low mix and mission optimization go hand in hand The planned mix of USAF tactical fighters emphasizes aircraft performance in specific mission areas This mission optimization enhances proficiency and performance in each area while retaining inherent capabilities in the others It results in significant cost savings when compared to the costs to develop, procure, and operate a force composed entirely of multipurpose aircraft [84]

That the Air Force's concern for developing optimum tactical air capabilities was not academic in NATO was evidenced by a rapid modernization of Soviet/Warsaw Pact air forces. As late as the 1960s the Soviet Union continued to build large numbers of short-range defensive fighters, emphasizing quantity over quality As a result, most observers credited NATO with technological superiority. The appearance of the high-altitude Foxbat/MiG-25 ended this trend, since this plane was equivalent to the US Air Force's never-procured F-12, and it was not only developed but procured in respectable numbers.[85] In the early 1970s and afterward, the Soviets vigorously modernized Soviet/Warsaw Pact frontal aviation,

introducing MiG-21 Fishbed standard combat fighters, Su-17 Fitter swing-wing, ground support planes, and MiG-23 Floggers in all-weather counterair and ground attack versions, all in quantity. By 1975, in NATO's northern and central regions, 3,000 NATO tactical aircraft faced 5,000 Warsaw Pact planes. Soviet and Pact planes were dispersed at many fields under concrete shelters. Pact air defense and fighter control electronics were modernized. One weakness continued to be a Soviet doctrinal precept that air crews fought under ground controllers' directions, but Soviet fighter doctrine began to promote greater flexibility and became more offensively attuned.

As early as 1972 a Senate Armed Services Committee staff visit to NATO was said to have found all major Air Force officials thinking that it would be very difficult to achieve and maintain air superiority in a conventional war. An Air Force response to a congressional query in 1973 conceded that in an attack the Soviets would have the important advantage of initiative and would have a mobile target array, whereas NATO's airfields, ports, and lines of communications from outside Europe were "limited, well known, and susceptible to severe disruption or destruction."[86] Given the numerical superiority of in-theater Soviet/Warsaw Pact frontal aviation forces in 1975, General Brown, who had become chairman of the Joint Chiefs of Staff, was hopeful that between M+3 and M+30 day the Air Force could deploy sizable tactical air forces—both land based and carrier based—to NATO and so hold on to general air superiority:

> The loss of air superiority in a NATO conflict would have a severely adverse impact on the land battle . . Pact planners understand this. . . . Should they succeed, our reinforcements to Europe would be slowed or stopped, which would virtually render impossible our regaining air superiority The choice would then be either relinquish major segments of NATO territory or resort to nuclear weapons [87]

Early in 1975 General Jones made the case for the US Air Forces in Europe fighting as an integral part of the allied air forces under allied control with a US commander:

> In a war in Central Europe, the initial and principal task of Allied Air Forces must be to assist friendly forces in halting the Pact ground offensive This requires that NATO air power become immediately and heavily engaged in close air support operations, while attaining local air superiority as necessary Less immediate critical objectives, such as achieving theater-wide air superiority, must await a reduced need for close air support [88]

In November 1975, Jones reiterated:

> There may be some documents that talk about air doctrines as to air superiority, interdiction and all of that, but we should recognize that as used in Europe, we operate as part of Allied Air Forces under Allied control with a U.S. commander. The plan is to use the air in Europe to stop a breakthrough with very, very limited operations deep in enemy territory or deep strikes for air superiority against his airfields. . I am not saying there will not be some of that But, basically most of our air would be committed to battlefield support and battlefield air superiority [89]

In response to another question, Jones expanded the same theme.

> There is some misinformation around as to what the Air Force's supposed objectives are [in a NATO war]. There are some who have said that we are not out to win an air battle and do deep interdiction, going deep into East Germany and into Poland But that is incorrect . . . The objective of NATO is to keep from losing NATO territory Therefore, our primary requirements over there would be to help blunt an attack, particularly an armored breakthrough. In doing that we should be providing support to the Army both in attacking targets, and overhead in trying to provide some degree of local air superiority—to keep the enemy from attacking our forces, providing information, particularly in the area as to where possible breakthroughs would be, and hitting the enemy in the interdiction role but right over the hill, right behind his main forces as opposed to deep in his territory So we see our primary requirement is to prevent the loss of NATO territory, which is really the objective of the NATO alliance [90]

When asked what proportion of the tactical air force would be used for air superiority, close air support, and then deep interdiction, General Jones responded,

> We do not break it out that way. We categorize it a little differently. We have our F-111s that are called deep interdiction airplanes by most people. We do not plan to use them for deep interdiction It is the best all-weather tactical airplane we have. As a former commander of the 4th Allied Tactical Air Force in Europe, not only the U S Air Force but of our allies, I considered it to be the No 1 plane we would use to blast a break-through at night and in bad weather We are extensively using it in radar beacon offset bombing and in other modes of employment near the front line I do not say that under certain conditions we would not use it deeper behind the lines but primarily it would be used nights and/or all-weather in the forward areas in battlefield interdiction—not really close air support of a soldier in a foxhole but in the forward battle area [91]

During his command in Europe, General Jones noted not only that the Soviets had begun to export their latest and very best equipment to the Warsaw Pact countries in quantity, but that these countries were changing their concepts of tactical air employment. Jones said in March 1975:

> We are reasonably certain that they have now developed a high speed, low altitude penetration capability and an all-weather ground attack capability; the Warsaw Pact forces are improving the overall versatility and flexibility of their fighter/attack aircraft These developments form a marked departure from earlier austere Soviet aircraft capable of performing specialized missions with limited capability to perform secondary functions [92]

In 1977, General Jones remarked:

> The Soviets have a new air force . The significance of this is that for the first time in history, the U.S. Army and the U S Air Force are faced with an enemy who can put thousands of tons of weapons down on our air bases and on our supply lines in our rear areas In World War II, there were few cases of enemy air attacks on our troops, and none in Korea and Vietnam. Therefore, our task is much bigger; the task of air defense is much bigger Our task of surviving—shelter for airplanes, being able to repair

> airfields—is much bigger Their aircraft, I would say, are today quite equal to ours from a technological standpoint [93]

More thoughts about the air superiority situation were provided by Gen George S. Brown in 1978:

> It is our estimate that the Warsaw Pact forces opposite NATO would be able to gain and maintain air superiority over their own ground forces at least in the initial stages of a conflict . The success of Warsaw Pact efforts to extend air superiority over NATO forces would depend on many factors not the least being the relative strength of opposing forces. Because of the larger number of SAM and AAA accompanying Warsaw Pact ground forces, many of the Pact aircraft could be released from defense counter air missions and launched against NATO forces. Because of this, the Warsaw Pact may be able to gain and maintain air superiority over some NATO forces at least for a limited time during the initial stages of the conflict.[94]

At its inception the NATO command organization arched over independent forces of 15 national entities, each of which continued logistical support for their own forces, which were most frequently kept in the owning country. US force locations continued to remain in southern Germany as a result of the historical location of these forces as World War II ended and occupation of Germany began. Under the nuclear response "trip-wire" strategy extant to 1967, command and control was sufficient if it provided surveillance and warning of Soviet/Warsaw Pact aggression. The flexible response strategy, emphasizing capabilities for sustained conventional defense, stressed a need for a command and control establishment far more versatile than required merely for warning. The steady improvement in Warsaw Pact capabilities in 1969 and thereafter, particularly in tactical aircraft able to attack at low altitudes, also demanded a knitting together of allied air capabilities. In acting against external military aggression, the NATO nations were pledged to work together in a common war effort; in peacetime, the only NATO function for which national forces were under NATO operational control was that of air defense. In the American establishment, the US European Command (USEUCOM) existed primarily to provide the US contribution to the Supreme Allied Commander Europe (SACEUR) used in wartime; in peacetime, the CINCEUCOM exercised operational command over assigned forces through US service components: CINC US Air Forces in Europe (USAFE), CINC US Army, Europe (USAREUR), and CINC US Navy, Europe (USNAVEUR). Although maintaining the integrity of NATO airspace and guarding it against attack were peacetime missions of NATO, General Jones, upon becoming CINCUSAFE in 1971, found West Germany divided between two tactical air forces—the Second Allied Tactical Air Force (2ATAF) in the north and the Fourth Allied Tactical Air Force (4ATAF) in the south. There were also six national air forces in NATO's central region. There was very little interoperability between the 2ATAF that supported the Northern Army Group (NORTHAG) with assigned British, German, Belgium, and Netherlands forces and the Four ATAF that supported the Central Army Group (CENTAG) with assigned US, German, and Canadian

forces. With the concept of a short war almost immediately dominated by nuclear weapons, a coordinated application of air power between 2ATAF and 4ATAF had not warranted a great deal of priority. In 1961 the NATO Council had approved construction of an integrated ground control system for air defense called the NATO Air Defense Ground Environment (NADGE), comprising 84 sites in 9 NATO nations and including 2 sites in France. The NADGE system was under construction in 1973 but, like the SAGE system in the United States, it had been overtaken in its building by missiles and third-generation attack aircraft. The NADGE system included many radar sites that were very visible from the air and would be subject to destruction in the first minutes or hours of a war. Since NADGE was a ground-based system there were many terrain-shielded radar gaps through which low-level penetration could be made. The system, moreover, was primarily designed for warning rather than centralized control of aircraft.[95]

Under pressure both to reduce US military manpower in Europe for balance of trade reasons and to rationalize NATO forces for effective conventional defense, General Jones in 1971 conducted an in-depth review of USAFE and its subordinate headquarters, namely, Headquarters Third Air Force at South Ruislip on the outskirts of London, Headquarters Sixteenth Air Force at Torrejón AB, Spain, and Headquarters Seventeenth Air Force at Ramstein AB, West Germany. This study evidenced that USAFE was generously manned with support manpower in relationship to combat manpower because it had been visualized that Air Force commanders would have to receive in a war emergency dual-based rapid reaction and follow-on augmentation forces and make them operative soon after they arrived in Europe. In 1972–73 Headquarters USAFE took over most staff management functions and streamlined the headquarters of the Third, Sixteenth, and Seventeenth Air Forces as operational functions, the Third Air Force being moved to RAF Mildenhall, England, and the Seventeenth from Ramstein AB to Sembach AB, West Germany. The latter move permitted movement of Headquarters USAFE from Lindsey Air Station in the Wiesbaden area to Ramstein AB in mid-1973. At Ramstein, USAFE was collocated with 4ATAF, immediately facilitating closer working relations between US and allied air forces and breaking ground for a conversion of NATO air forces from a deterrent to a warfighting stance.[96]

In June 1974 NATO agreed to create Allied Air Forces Central Europe (AAFCE) and to establish a wartime operations center, effective on 28 June over 2ATAF and 4ATAF. These actions came in recognition of three things – the developing Warsaw Pact threat, the inherent flexibility of air power under unified command, and the need for a capability to commit effectively any of the central region air elements wherever needed in whatever strength throughout the whole region. In explanation of the action, an Air Force spokesman explained its doctrinal rationale:

> The requirement to establish a single air commander for an area of operations is based on sound principles and doctrine established and proven during World War II. These

> principles have been further validated by combat experiences in every conflict since that time. The inherent flexibility and wide ranging capabilities of airpower demand that command and control be centralized to assure optimum employment of these assets and to assure a rapid capability to apply forces where and when they are most needed To exercise effective command and control in modern warfare, the commander must have near real time information on the situation status of forces and the ability to direct and control his forces.[97]

Gen John W. Vogt, Jr., became CINCUSAFE in June 1974 and also assumed NATO command of Allied Air Forces Central Europe (AAFCE) at its establishment. General Vogt set up an initial peacetime AAFCE headquarters at Ramstein, and with US funds in a cooperative project the Federal Republic of Germany commenced building a secure underground bunker facility at Boerfink, West Germany, to shelter the Allied Forces Central Europe (AFCENT) and the Allied Air Forces Central Europe. Installation of US equipment started in 1976, and the facilities at Boerfink were officially transferred to NATO in June 1977. Headquarters 4ATAF was appropriately collocated with Headquarters Central Army Group at Heidelberg.[98] General Vogt, one of the most highly respected and experienced Air Force combat commanders and a World War II fighter ace, immediately began the work of standardizing and "rationalizing" NATO air power in Central Europe. Vogt first wished to come up with adequate command and control, then to standardize air doctrine, operating procedures, and as many facets of air materiel as possible [99]

At the establishment of AAFCE General Vogt was tasked with

> the operational command of the assigned and earmarked air forces in the Central Region and the development of the policy required for the centralized direction of those air forces This was to include the establishment of a common, or at least a fully compatible, air doctrine and procedures region-wide, improvements in interoperability and mutual support, and the tactical evaluation and standardization of training of the air forces.[100]

The background difficulty in rationalizing NATO air power lay both in dissimilar equipment and in dissimilar concepts of employment within the several NATO air forces. On the equipment side, airplanes from the south and central regions could not operate in NORTHAG and vice versa because of communications incompatibilities American and British aircraft carried different bombs, with the result that bomb shackles and lugs were different and planes could not recover and rearm at each other's bases. The Dutch air force had no all-weather fighters capable of interceptions in extremely bad weather, but the Netherlands airplanes had a very fine ground attack capability. On the other hand, the Netherlands have a very small stretch of the forward edge of the battle area (FEBA). None of the NATO allies considered that they could afford to acquire aircraft designed for particularized missions like the US A-10. The United States stressed close air support much more than any of its allies. The Germans were next, and then the British. Some of the smaller allies were almost totally disinterested in close air

support. With limited assets the allies wished to emphasize battlefield interdiction—concentrating where the enemy was massing to exploit a breakthrough—and to leave containment of a breakthrough to the ground forces. The United States and 4ATAF were heavily committed to centralization of TACAIR command and control; the 2ATAF believed that more decentralized methods of operations—especially two aircraft at very low quick-in-and-out—represented the probable realities of wartime. The Germans also liked quick-in-and-out at low altitude and high speed since they were going to be fighting over familiar territory when the crews were training. According to one report the Europeans did not want to be forced into the US mold. Dr Stephen L. Canby wrote about the NATO allies

> They specifically contend that the U S experience in Vietnam is of limited relevance for the European context In the European view, the nearly one-sided nature of that conflict in the air, the constraints of European weather, and insufficiently varied scheduling of U S sorties that unnecessarily exposed U.S. aircraft induced the USAF to prefer a task force mode of operations that may not be appropriate for Europe [101]

Besieged by American persuasion in 1967, the NATO Council had accepted MC14/3, "Flexible and Appropriate Response," but there was a certain reluctance on the part of some of the allies to give up the trip-wire strategy. In July 1973 Secretary Schlesinger reasoned that the Federal Republic of Germany was most supportive of flexible response: "Others of our allies have been inclined toward the trip-wire strategy for reasons of budget savings, or the argument that if the American presence is there, the Russians will never start anything, so why spend the money."[102] After a visit to Europe in February 1974, Sen Sam Nunn of the Armed Services Committee described the allies as believing that NATO should be prepared to fight conventionally for a relatively short time—measured in weeks The concept lying behind this plan was that NATO should not prepare to fight the Red Army in a long, conventional war that would destroy much of Western Europe, as in World War II. Rather, NATO should be prepared to fight very hard at the outset of a conflict to stop any conventional attack on the east/west before it penetrated very far A strategy of initial forward defense at its eastern border was essential to the Federal Republic of Germany, and over the years of trip-wire nuclear planning, the strategy and posture of forward defense was accepted by NATO. The Americans maintained that the logical scenario for NATO to plan for would be a longer period of observed pact buildup for attack—measured in weeks. This plan would permit NATO mobilization and movement of American reinforcement to Europe. The Americans also believed that NATO should be prepared to fight for a longer period conventionally than the allies were willing to lay in logistics to support. Stated Senator Nunn, "These differences in strategic assumptions tend to weaken overall NATO conventional capability because they provide differing bases for force planning and resource allocation among the NATO Allies."[103] In 1975 Secretary Schlesinger agreed that the Warsaw Pact was inclining more and more toward a short war and a strong initial-attack strategy,

dependent on a short mobilization and reinforcement. For this reason he ordered increased combat-to-support ratios in US combat forces in Germany with the increased combat strength to occur in forward deployment, in antitank weapons, and in a more rapid air and sea reinforcement capability. At the highest level the US national strategy guidance which had been predicated earlier on a 90-day conventional war scenario was changed to state: "In order to maintain a conventional deterrent, the United States must have the capability to conduct sustained conventional combat for as long as the Soviet Union and its allies are capable of fighting."[104] In January 1977 Senator Nunn nevertheless reported that the Department of Defense had continued to project a three-week's warning of attack against NATO followed by a conventional conflict of up to six months. Nunn said that there was still no common alliancewide agreement on these issues.[105]

One encouragement for a convergence of thought about air employments in the NATO alliance antedated Allied Air Forces Central Europe and was put in motion by the SACEUR, Gen Andrew J. Goodpaster, who in July 1970 requested the NATO Military Agency for Standardization to establish working parties on air, ground, and naval warfare doctrine. Subsequently, NATO defined doctrine as "fundamental principles by which military forces guide their actions in support of objectives." Doctrine covers a wide spectrum of affairs: at the highest level, "basic doctrine" set forth broad principles of warfare in specific media (land, sea, or air); the next lower level was "operational doctrine," which amplified basic doctrine in needed specific functional areas; finally, "operational tactics," the lowest level, dealt with employment of forces in specific combat undertakings, including how to stop attack by a specific enemy formation. The first meeting of the NATO air doctrine working party convened in Belgium on 21 June 1971. The draft of Allied Tactical Publication 33, "NATO Tactical Air Doctrine," was ratified by the NATO nations and promulgated by the NATO Military Agency for Standardization on 10 February 1975. This manual was designed as the doctrinal cornerstone for employment of air power by NATO air commanders. It accepted the Air Force concept of centralized control of air resources as its key principle, and it was considered particularly applicable to the organization of AAFCE, although employment principles set forth were valid throughout NATO. During 1976 ATF 40, "Doctrine and Procedures for Airspace Control in a Combat Zone," was drafted and circulated for allied approval; it became effective in September 1977.[106]

The mandatory US secretary of defense report to Congress on rationalization/standardization in NATO dated 28 January 1978, in the section on air warfare doctrinal development, ended with the statement: "US leadership in this field continues to drive NATO doctrine development programs."[107] The American effort to add commonality, where possible, to the NATO air effort probably led to assertions—including those of Dr Stephen Canby—that the Air Force was trying to force common tactics on the European allies, over their resistance.[108] General Vogt was quite clear on the fact that, "generally speaking, the American Air Force is way, way out ahead of the European air forces in the ECM business." He told a

journalist, "And I think it's understandable because we've been the outfit that has been fighting in the missile environment, and we had to develop these things." Although the A-10 was scheduled to arrive in Europe, Vogt emphasized a need in NATO for dual-capability aircraft, an ability of a given plane to perform at least two missions. He wanted the new US lightweight fighter to have both an air-to-air and an air-to-ground capability. General Vogt was not at all opposed to specialization on the part of some of the smaller NATO nations, who might want to tailor their limited number of planes to special purposes. When asked to define the main role of the NATO air forces in combat, Vogt replied:

> I think the major, one of the major, if not the major role is going to be to provide a mass of fire power in support of the ground army to turn off heavy Soviet armor in great quantities That to me is I think our main mission, our main challenge But I want to be able to take on the air too, so that they can't interfere—that means neutralize him in the air at the right point in space and time above the battlefield [109]

Vogt expected the air battle to be

> essentially one of maneuver, with a lot of airplanes mixing it up and very much getting back to the old World War I and World War II type of thing Where you have to spot your enemy and identify him and get on his tail and shoot him down . . . I expect in Europe very fluid battle situations, mobile units, Soviet armor which will be moving very fast . . with the FEBA shifting back and forth, and with the air situation above the FEBA pretty much determining the outcome of what's happening on the ground. Because if he's able to get in with a lot of attack airplanes and work over our forces, the battle is apt to shift that way On the other hand, if I can get local air superiority—not air superiority across the Central Front, but air superiority over the battlefield—then of course, we have achieved our objective. We can keep enemy air off the backs of our guys and put a lot of ground support in to destroy the heavy weapons and the armor of the enemy. And that's really what we're going to be doing [110]

One of the problems in the rearmament of NATO air forces was the surge of Soviet/Warsaw Pact air forces in both quality and quantity of aircraft. By the same token, NATO needed modernization of its second generation jet fighters both in quality and quantity. In 1958-59 the Netherlands, Norway, Canada, and West Germany had selected the F-104 as the new standard fighter, and it needed replacement by a new fighter which General Vogt described as "an airplane that can do the close support mission, carry bombs and deliver them effectively, and do an air superiority job when required. In other words, it has to be able to take on Communist airplanes and cope with them, and outmaneuver them."[111] As Deputy Secretary of Defense Packard had recommended, the Air Force in 1972 instituted a lightweight-fighter prototype development program. In explaining what was afoot, Secretary Seamans suggested that some of the NATO countries might want such a plane since it would have utility in a European-type scenario where an enemy would bring the air battle to the FEBA. But from the outset Air Force spokesmen were reluctant to admit of a competitor for the F-15, which would be prepared to fight for air superiority deep in enemy territory.[112] In this prototyping the Air Force

provided design goals for a lightweight, highly maneuverable, sustained supersonic aircraft and left specifics to contractor design teams. On 6 January 1972 the Air Force released proposals to industry, and five contractors submitted responses on 18 February 1972. After evaluation, two lightweight-fighter prototype development contracts, each to build two aircraft, were awarded on 14 April 1972: one with General Dynamics for a YF-16, and the other with Northrop Corporation for a YF-17. Both designs incorporated new technology that greatly increased maneuverability. In addition to maneuvering flaps, the YF-16 incorporated a blended wing/body design which increased lift and provided additional internal volume for equipment and fuel. The YF-16 used a single F-100 engine, which was developed for the F-15, whereas the YF-17 required two YJ-101 engines that were still in development. Both contractors understood that the average unit flyaway cost goal of the lightweight fighter would be held at $3 million in 1972 dollars based on a buy of 300 aircraft.[113]

Early in 1973 Lt Gen Otto J. Glasser was adamant that the lightweight fighter was "purely a technological endeavor." "We have no intention in the Air Force of going into production for this airplane, of asking for a force structure for this airplane," he said.[114] General Ryan said, "The lightweight fighter, as it is presently conceived, is not a weapon system. Instead, it is more of a technology effort so that you can try out these things to see if they do give you that increased performance." But Secretary Seamans was more sanguine, saying,

> Certainly we would not even go to the expense of building a prototype if there were not some chance of it being procured As I visualize it, we could eventually end up with a mix of fighter aircraft, with the F-15 for all-weather air superiority, and with some kind of lightweight fighter that could be used under more visual conditions.[115]

In 1974 the Air Force added a line item to the fiscal year 1975 budget request that called for an "air combat fighter" which would allow continued improvements on the lightweight fighter if tests showed it interesting enough; but there were still no announced plans for its immediate procurement.[116] About this time, Secretary of Defense Schlesinger began to push for the development of the F-16, but General Brown, as Schlesinger recalled, was "very, very cautious in moving toward the F-16 . . . preferring to stay with the F-15."[117] Brown nevertheless called a working group of fighter talent—the best talent from Europe, the Pacific, and the Tactical Air Command—to meet at Wright-Patterson AFB.[118] A key factor in the Air Force considerations was that F-4 fighters would need replacements in the 1980s and F-15s would be too expensive to buy in such great quantities. On 13 January 1975 the Air Force awarded a contract to General Dynamics to develop the F-16, one reason for this choice being that the F-16 had the same engine as the F-15. Air Force Secretary John L. McLucas said, "It is an engine that is already in our inventory, so we won't have to train technicians on the new engine."[119] Prodded by Congress to buy a cheaper fighter than its favored F-14, the US Navy would ultimately take the YF-17 prototype and develop it as the Navy F-18. The Navy liked the YF-17's two engines, among other features. The Air Force programmed

a purchase of 650 F-16s to equip six wings. At the same time that the Air Force opted for development of the F-16, a four-nation NATO consortium team was also in Washington looking at this plane. Secretary McLucas hoped it would appeal to them, both because it would increase aircraft standardization in NATO and because quantity purchases would reduce the plane's ultimate costs. In June 1975 the Paris air show provided a fitting background for the NATO consortium of Belgium, Denmark, the Netherlands, and Norway to announce an intention to participate with the United States in coproduction of the F-16, and ultimately to purchase 348 of the planes, in addition to the 650. In the words of Secretary Schlesinger, the NATO allies recognized the happy circumstance wherein the lowest price aircraft had the best performance.[120]

General Jones commented:

> If fiscal constraints were not a driving factor in planning our fighter force, we would deploy the F-15 in sufficient numbers to meet the total threat. However, in the light of projected fiscal constraints, current plans include development and procurement of the less sophisticated, lower cost F-16 which will complement the F-15 in performing the air superiority role [121]

The Air Force deliberately made the decision not to equip the F-16 for all-weather intercept and all-weather fighting, principally to get a cheaper airplane that would be supportable in the quantities needed. The F-16 would be more dependent on ground radar or AWACS control than the F-15, but it would be a superior fair-weather fighter that could arrest the gap in force size between NATO and the Warsaw Pact. It also was developed with good air-to-ground features. Said Lt Gen Alton D. Slay, Air Force deputy chief of staff for research and development:

> As far as the ground role is concerned, we view it as augmenting the F-111, the residual F-4 force, and the A-10, and it could cover the spectrum throughout that conflict . . It is not as survivable as the A-10 in the close air support environment; so we don't say the F-16 is principally a close-support airplane It is a multimission, reasonably priced addition to our force It just replaces a portion of the F-4 force, and it replaces a portion of the A-7D force
>
> We started out getting an air-to-air fighter. And we found that the things that made the airplane good in an air-to-air role, such as power loading, low-wing loading, also were extremely good in air-to-ground context . As an example of what the F-16 will do close to the ground, I almost had a heart attack watching the F-16 do a split "S" from 2,700 feet It was fantastic as far as maneuverability is concerned So here we have a fighter that has the load carrying capability of an F-4, just due to its low-wing loading and high thrust, it has the turning capability . . actually better than F-86, in an air-to-ground environment And it just turned out that we got more than we paid for in having a multipurpose capable airplane We aren't always that fortunate [122]

In Central Europe the NATO air defense ground environment (NADGE) aircraft warning and control system was not even then completed in 1970 when perceptions first appeared that the Soviet/Warsaw Pact air forces were becoming potentially able to penetrate and attack at low level. Quite soon a large number of

modern Soviet aircraft were being deployed to Warsaw Pact nations, and the Fitters and Floggers in particular were very capable of all-weather attack. Although NADGE control centers could be dug-in and hardened, ground-radar installations could not be so protected. Many of the radars had been in place for as many as 20 years, and it was inconceivable that the Soviets had not targeted them for immediate attack. In 1970–72 NATO examined various ways to counter the threat, which turned out to be adding more fixed radars to the system, deploying mobile radars, or going to an airborne early-warning stance. The last prospect was selected, and the issue was to make a choice between the Air Force's E-3A AWACS, the Navy's E-2, or Britain's Nimrod. The E-2 and the Nimrod were designed basically for fleet sea surveillance and warning, and the E-3A AWACS was the best prospect, but it would be very expensive in unit cost and would have to be financed with substantial sums of money above existing national defense programs. Moreover, the Air Force was taking its time developing a standard AWACS configuration. Maj Gen Richard C. Bowman, director of NATO and European Affairs in the Office of the Assistant Secretary of Defense for International Security Affairs, would recall:

> As you know, even in this country, even with it being our own people, we had trouble convincing many people [about the value of the AWACS] The airplane doesn't drop bombs, it doesn't shoot machine guns and, therefore, if you haven't got a good understanding of the tactical air problem it is hard to picture just why a system that is this expensive should be part of the program [123]

The major NATO problems affecting AWACS was the large cost of the program, but how to use the plane was a secondary concern. According to Gen Lew Allen, Jr., the NATO countries primarily focused on a need for AWACS as a provider of airborne early warning capability.[124] In American design, however, AWACS had the electronics for both warning and interceptor control, and there was good reason for the latter since the plane would be deployed as needed in many parts of the world. The ability of AWACS to look down in the ground clutter of Central Europe and put fighters on targets also would be a decided advantage. But airborne control of fighters in the European view would still provide more centralized direction that was distrusted—especially by the British, who believed that Allied Air Forces Central Europe should only be an overarching and a coordinating headquarters with minimum command and should leave real control (tasking) to 2ATAF and 4ATAF.[125]

In 1974 two Air Force officers voiced answers to why AWACS should not be limited to service as an austere NATO early-warning radar platform and leave data processing and interceptor control to ground-control centers which were hardened and presumably survivable. Lt Gen William J. Evans, deputy chief for research and development, admitted this as a possibility in Europe but argued that elimination of the surveillance and command and control capability of the AWACS would limit its usefulness "to only those areas which would have . . . ground based capabilities, and would, therefore, restrict its use for worldwide contingencies."

Maj Gen Lee M. Paschall, director of command, control, and communications, and deputy chief of staff for programs and resources, pointed out that both AWACS and the Tactical Air Control System (TACS) would be used in Europe. The AWACS, for example, could not duplicate the large capacity for control existing in the ground TACS. Paschall said:

> When the two systems operate together, they complement each other The AWACS provides continuity of control deep into enemy territory, warning friendly fighters of hostile actions and the ground system of hostile aircraft approaching friendly territory The ground system is then better prepared to counter enemy actions and to defend and support ground forces and installations [126]

Early in 1975 an experimental AWACS went to Europe and flew 21 sorties in a month, interoperating with the US Navy in the Mediterranean, the Royal Navy and Royal Air Force in England, and USAFE in Germany. All facets of AWACS were demonstrated in controlling aircraft and air strikes, running intercepts, and down-linking tracks and information to the NADGE and to the TACS to demonstrate what AWACS could accomplish in terms of providing detailed information to NATO commanders on the ground. In the demonstration AWACS was surprisingly able to pick up fast-moving automobiles on the speed-free autobahns of Germany [127]

In March 1975 Secretary Schlesinger went on record with the statement: "We urgently need an AWACS capability in NATO Europe." But he added that the acquisition costs for AWACS would be much easier for the US taxpayer to understand if the NATO community paid a fair share of the total bill.[128] Under such circumstances the question of how many AWACS the Air Force would buy hinged in part on how many AWACS planes NATO would finance. The Air Force calculated AWACS requirements on a basis of two for each orbit—one in orbit and one on the ground preparing to relieve the one on station. Exclusive of NATO AWACS, the Joint Chiefs of Staff stated that the Air Force's "prudent risk" AWACS requirement worldwide was 53 E-3As, but its "fiscally constrained" objective was set at 34 aircraft In 1975 the Air Force hoped that NATO would buy between 20 and 30 E-3As, or a force adequate for both of NATO's flanks as well as its center.[129] In late 1975 the NATO military committee declared that an airborne early warning (AEW) force was "the only feasible means, in the present state of technology, of providing the necessary enhancement of the defensive capability of the alliance against the growing threat posed by the Warsaw Pact's new and sophisticated weapons systems, particularly against NATO forces at low level." The NATO defense ministers recommended airborne early warning to their civilian superiors as a "priority one requirement." NATO asked for firm cost data on a buy of 20 to 32 NATO-configured AWACS.[130]

As the NATO defense ministers met in an unusual session on 25 March 1977, called solely to reach a final agreement on AWACS, there was an initial expectation that they would agree to recommend to their respective legislatures the procurement of 27 NATO-configured E-3As to be collectively purchased by the

alliance. In the United States the Tactical Air Command had taken delivery of its first production model E-3A on 23 March 1977. Only Iceland, which had no military forces, had expressed no interest in buying into the AWACS force, but Iceland would accept basing effective in October 1978 of a US E-3A contingent to replace the EC-121s that had been covering the Greenland-Iceland-United Kingdom (GIUK) gap into the North Atlantic for the previous 25 years. At the meeting, however, the British were in a bad spot; they had put their Nimrod program on a hold status because AWACS was best for the alliance. In NATO armament programs each ally as a matter of practice always attempted to get the largest advantage for its industries, and AWACS was a program in which the greatest economic return from the NATO-AWACS procurement would remain in the United States. With unemployment running high in an economic downturn, the UK defense ministry was under tremendous political pressure to go for English production of the Nimrod rather than buy into AWACS. The British nevertheless emphasized that they would not opt out of the NATO program; they would put their Nimrods under NATO control, and it would do the same things that their part of the AWACS force would have done. This development sent the military planners back to their drawing boards, figuring out what the Nimrods would do, how many NATO E-3As would be required, and how the cost could be worked out. At a 5–6 December 1978 defense planning committee meeting in Brussels, the NATO defense ministers finally approved what was now called the NATO airborne early warning and control (AEW&C) program. The British contribution would be 11 Nimrods, NATO would procure 18 E-3A aircraft—both Nimrods and NATO E-3As to be interoperable with Air Force E-3As. The program called for modifications to make 52 ground sites interoperable with AWACS aircraft and the refurbishing of a main operating base (MOB) in Germany and some forward bases for the force. The modification of the ground sites was considered important since the procedure would be that the AWACS would send track information down to the hardened sites and they would control interceptions. This was necessary in a high-density attack environment since there would not be enough controllers in the E-3As to handle the entire region. As it was approved in December 1978, the NATO AEW&C program became the largest commonly funded project undertaken by the alliance.[131]

Although President Carter ordered in his Presidential Memoranda 10 a review of national security policy immediately after taking office, his view on NATO was best described as a reaffirmation of the long-standing strategy of US support for the Atlantic Alliance, with—in the words of Ambassador Robert W. Komer, who was bought in as adviser to the secretary of defense for NATO affairs—a few "new wrinkles." At a May 1977 NATO summit meeting in London, Carter stated that the United States would make the alliance the heart of American foreign policy. Carter told the Atlantic Treaty Association Conference in Reykjavík in August 1977, "The United States remains categorically committed to NATO's strategy of forward defense and flexible response." In the Carter view, the United States had let US capabilities to help defend Western Europe lag during a decade of primary

focus on Southeast Asia and had "some catching up to do."[132] In assessing the situation in Europe, Secretary of Defense Harold Brown said:

> In recent years the Soviets, having first established divisional forces and supporting air units, filled them up to full strength and then, subsequently, upgraded their equipment Although I think we probably still have an edge in some things, they are at least in the same ball park with respect to quality of equipment. Currently, they are ahead in numbers and close in quality of equipment. . . . To summarize the NATO situation, I think that we need to do more and our allies need to do more if we are to avoid a situation some years from now when the Soviets may feel themselves sufficiently ahead both in quality and quantity of materials to be encouraged either to make a military venture or, what I think is far more likely in those circumstances to start acting in a bullying, political way.[133]

Just as the Carter administration reaffirmed previous US policy toward the Atlantic Alliance, it also continued the strategy of preparing for one and one-half wars. In a response to a congressional question relevant to this strategy, the Office of the Secretary of Defense observed:

> It is true that Soviet non-nuclear capabilities have grown in size and sophistication, but US and Allied capabilities have changed as well. Most important, however, is the changed situation in Asia While North Korea is no less a source of danger than it was a decade ago, the Sino-Soviet split and our changed relationship with the PRC [People's Republic of China] made it less likely that the North Koreans would receive any external encouragement or support for a major military adventure Overall, it has become much more difficult than in the 1960's to imagine a large-scale conflict on the mainland of Asia requiring US forces more or less simultaneously with the demands of a major crisis or conflict in Europe.[134]

A harbinger of NATO emphasis under the Carter administration was reduction in the fiscal year 1979 budget requests originating in the preceding administration in favor of increases in tactical forces. The Department of Defense explained:

> The basic rationale for this modest shift in our priorities is our assessment (1) that an adequate U.S strategic retaliatory posture can be achieved at some savings with our proposed bomber/ALCM force, vice the previously programmed B-1 force, (2) that a major, collective NATO effort, led by the United States, is necessary to counter the Warsaw Pact's growing capability to conduct a brief, intense conventional campaign in Central Europe, perhaps with only a few days advance warning to NATO; and (3) that improving our capability for such a conflict in the Central Region was sufficiently important at this time to justify some delays in modernization of our naval forces.[135]

To increase the strength of forward conventional defenses, the Carter administration's fiscal year 1979 defense budget included provisions for improved capabilities for rapid reinforcement. In 1977, in the first 10 days of war, the United States could expect to augment its 5-2/3 divisions and 28 tactical air squadrons in Europe by not much more than 1 division and 40 squadrons. The new plan was to be able by 1983 to add 5 divisions and 60 tactical air squadrons in the same amount of time; this by increased strategic airlift and repositioning of supplies in

prepositioned overseas materiel configured to unit sets (POMCUS) stocks in Europe.[136] The Air Force also would modernize its forces in Europe and add additional units: a second wing of F-111s, a wing of F-15s in 1977, and the addition of A-10s which were going to begin to enter the inventory and would be sent to Europe soon.[137]

The Carter administration's priority to the Atlantic Alliance was reflected in the Air Force by activities that Gen Wilbur L. Creech, the assistant vice chief of staff who would become commander of the Tactical Air Command on 1 May 1978, described as full support for the requirements of coalition warfare. Creech said, "We are working hard to keep our people within the Air Force thinking about coalition warfare and its special demands and opportunities."[138] Lt Gen Howard Fish, who was serving as assistant vice chief of staff in 1978, summarized the Air Force needs relative to NATO as:

> Modernized forces, rapid deployment, adequate basing, high unit readiness, increased sortie rates, well-trained and motivated personnel, sufficient spares and munitions, improved airbase survivability and greater coalition warfighting capability through increased standardization and interoperability—all these will be needed to achieve a credible deterrent or war winning capability against the threat confronting us in Europe today.[139]

Under the press to "think NATO," already planned modernizations of US air forces in Europe were accelerated. The first F-15s of the 36th Tactical Fighter Wing were deployed to Bitburg Air Base, West Germany, in January 1977, and the wing (72 F-15s) completed the move in midsummer 1977. In March through midsummer 1977, an F-111F wing (84 F-111Fs) established itself at the Royal Air Force (RAF) base at Lakenheath in England. In 1978 the integrated air defense structure in the 2 ATAF area of responsibility was augmented by the movement of the 32d Tactical Fighter Squadron (18 F-15s) to Camp New Amsterdam, the Netherlands. This squadron gave the Royal Netherlands Air Force some familiarization with Air Force air defense procedures, and a second F-15 squadron was planned for the base in wartime. As already noted, the first operational employment of the E-3A AWACS of the Greenland-Iceland-United Kingdom (GIUK) gap commenced in October 1978, and 14 E-3As were operational by the end of the year. Production of A-10s ran ahead of projections, permitting the United States to notify NATO of the deployment of these close-air-support attack planes beginning in 1979 instead of 1981. RAF bases at Woodbridge and Bentwaters in England were approved as collocated operating bases (COBs) for a bed-down of six squadrons of A-10s, and the aircraft would be rotated to forward operating locations (FOLs) in Europe to train over territory where they would be expected to fight. The first A-10 squadron was activated at Myrtle Beach AFB, South Carolina, in July 1977 and became capable in October, three months ahead of schedule. During 1977 two A-10s made demonstration visits to Korea and six went to Germany. The bed-down of 108 A-10s at Bentwaters/Woodbridge began in January 1979, and the deployment of the last of two squadrons to Woodbridge

was held up according to plan by the decision to begin to schedule A-10s and F-16s directly for the Air National Guard beginning in the summer of 1979. All of this happened before the last regular Air Force squadrons completed conversion.[140] In addition to these deployments to Europe, the Air Force was committed to very rapid reinforcement from the United States. In 1978 the Air Force made a major commitment to have active squadrons under way in less than 24 hours. Air National Guard and Air Reserve forces could be mobilized for deployment within 72 hours after notification. Flow plans and procedures were worked out to get these units overseas in a hurry and to bed them down smoothly and efficiently.[141]

In the Carter administration's emphasis upon the North Atlantic Alliance, the Air Force was committed to sharpen its capabilities to "deploy rapidly, beddown and fight immediately," but preparations for battle by a miscellany of allies continued to be difficult. In a spontaneous answer to a point-blank question put in June 1978, General Fish cited five key readiness deficiencies, in these words:

> I believe that one of the greatest of the deficiencies that we have is our command and control capabilities as far as being survivable and secure. Coupled with this is an insufficient capability to disrupt the enemy's command and control communications. . The second deficiency is, of course, our capability to fight under chemical warfare conditions ... Third, I would say is more realistic training on the ranges, particularly in Europe . Our night and all-weather attack capability is deficient I would put that high on the list. We are working on correcting this deficiency. . A fifth deficiency is our lack of capability to provide adequate airlift for our objectives to get the troops to Europe with their equipment [142]

The prospect of operating effectively within a chemical warfare environment admitted no ready solution, since the best deterrent for chemical warfare was an offensive chemical capability, which the United States had foresworn. Provisioning of airlift, fighter training, all-weather air attack paraphernalia, and antielectronic attack capabilities were worldwide Air Force tactical air problems, and are considered later as such. The problems of developing a NATO command and control and base infrastructure, however, remained fraught with alliance divergencies. In 1978 Ambassador Komer pointed out that in his opinion nothing had been done to integrate alliance communications in the 30 years of NATO. He said, "It turns out, the telecommunication industry is a big operation in other countries besides the United States. Getting the various industrial barons together on some of these things is not exactly easy."[143] In response to a Soviet/Warsaw Pact threat, the Air Force was committed to a rapid, all-out movement of air units to Europe, where host nations would bed them down on collocated operating base (COB) facilities. The COB program thus made available for use by reinforcing US aircraft facilities excess to the needs of host nation at strategically located airfields. Although access to COBs provided a variety of otherwise unavailable facilities, these bases had little access to minimum essential facilities (MEF) – ammunition and fuel storage for initial operations plus adequate ramp space for dispersed aircraft parking. In March 1982 General Allen said that "great progress" had been made in identifying needed COBs and needed essential facilities but neither the

host nations nor the US Congress had been willing to fund the construction. Gen Bernard W. Rogers, commander in chief, US European Command, reiterated: "Unfortunately, because of the limited NATO funding available and a U.S. reluctance to prefinance this effort, we are at present able to support with MEF only a small fraction of the U.S. air reinforcements that deploy to COB's."[144] The COB situation affected the potential of the US for sustained-duration operations in Europe as of 1982. Earlier—in 1980—General Allen and Secretary Hans Mark had pointed to another problem affecting sustained air operations with the newer models of aircraft, caused by a long-time, underfunding of operations and maintenance (O&M) accounts. Allen rationalized how this "inexcuseable" situation had come about:

> It was only a few years ago, that is in the early part of the mid-seventies when the US was still operating on a trip wire strategy against our major scenario of war in Europe.... In the 1973 time period that strategy began to change and it began to be clear that we wanted those aircraft to be able to fight for an extended period of time and not imagine that a nuclear war would start so quickly Therefore, we set goals for ourselves—fifteen days, then thirty days, and later a longer time in terms of the sustainability of the force. These goals determine the war reserve spare kits, the base level sufficiency kits, and other war reserve material which we need. For various reasons in this period of time we have not taken the steps that should be taken to fill up those accounts We have just never done it. As we introduced new aircraft, we were late filling those accounts because we wanted to develop good rates of consumption before we made a large investment in spares—that also put us behind. In other situations we just made compromises against those sustainability factors.... I think it is a case where we have not done the job of management that we should have done.[145]

At the insistence of the United States and over strenuous objections of some European governments, the Atlantic Alliance shifted away from reliance on a nuclear trip wire to an emphasis of a conventional response to Soviet/Warsaw Pact attack. Even so, there continued to be acknowledged reliance on what was described as the "NATO Triad," namely strong conventional forces, theater nuclear forces, and strategic force components. Secretary Brown justified the presence of nuclear warheads in Europe, stating:

> A sizeable continuing NATO theater nuclear force is certainly needed to offset Warsaw Pact forces .. The Alliance strategy is one of controlling escalation and terminating a conflict at the lowest level of violence possible, and the threat of escalation using forces held in reserve contributes to this strategy. The Warsaw Pact must perceive a high degree of risk and of uncertainty as to the NATO response. As long as theater nuclear forces are relatively survivable and can ride out attacks, and backed by highly survivable US strategic forces . the temptations to the other side to strike first are minimized.[146]

Although there were some 7,000 US tactical nuclear warheads in Europe in 1978, Gen Bruce K. Holloway, waiting after retirement, pointed out that there was no doctrine for their employment.

> Fortunately, since 1972 assured destruction has given way to a much wiser strategy of flexibility However, there are still large gaps in the strategy, and even larger gaps in the projected weapon and force structures that must match the strategy. The biggest gap is the lack of a doctrine for employment of tactical nuclear weapons ... We have long held that nukes are not "just another weapon" We have vigorously and self-righteously preached this notion on moral grounds, and not without logic. However, it is time to set aside this Sunday-school doctrine in favor of the kind of hard planning that amalgamates the entire spectrum of weaponry The place to start is in Europe, in the European Command and in SHAPE. In Washington, this shift must be recognized as necessary and encouraged.[147]

In a similar tenor was an article by Col David L. Nichols, who pointed out that the concepts for the employment of nuclear TACAIR were "outdated." "The capabilities of TACAIR delivery systems have greatly benefited from advancing technology," he wrote, "but the mission concept has remained unchanged since 1952, when the first F-84 fighter-bomber was given a nuclear role in Europe."[148] The mission concept was typically nuclear alert, whereby tactical fighters were held ready for striking prebriefed quick-reaction alert (QRA) targets. Nichols agreed that in some instances QRA aircraft would have greater accuracy and inflict lower collateral damage than missile systems. Moreover, TACAIR on nuclear alert was the only means whereby some of the NATO allies could share in a nuclear strike role. But he urged that the QRA mission concept vitiated the potential flexibility of TACAIR, its advantages in mobility, range, responsiveness, tactical versatility, penetrating ability, firepower delivery, target acquisition/battlefield assessment, and recovery and recycling. Nichols argued, "TACAIR should continue with the alert role, particularly peacetime QRA; however, the overall alert concept needs to be modified to allow more flexibility."[149]

Early in 1961 photography by U-2 aircraft laid to rest President Kennedy's fears of a strategic nuclear missile gap with the Soviet Union by revealing that the Soviets had given first priority to the deployment of intermediate-range nuclear force (INF) missiles rather than intercontinental missiles.

Strategist Paul H. Nitze reminisced:

> For a long time, inadequate attention was given to the increasing deployment of the INF missiles by the USSR in part because they were big, inaccurate, liquid fueled and based on soft pads They looked like deterrent weapons, not the kind of weapons one would want if one actually contemplated fighting.[150]

In the planning of the 1950s it was perceived that in Europe theater nuclear forces, by providing strong links between conventional forces and strategic forces and a wide range of targeting options, greatly strengthened deterrence. During the 1960s the Air Force operated Matador and Mace ground-launched cruise missiles, targeting them against fixed-enemy installations such as airfields. The Army fielded a short-range Pershing IA ballistic missile, targeting it against fixed, time-sensitive, and heavily defended objectives. As was seen earlier, NATO wanted and the Air Force requested development of a mobile, medium-range ballistic missile, but

Congress refused to fund its development. The US Army received approval for the development of an extended-range Pershing II missile in the mid-1970s. This missile was to be used in the eventuality of programmed nuclear strikes in support of SACEUR, after which it would revert to general support of the Army in the field. If based in West Germany, the range of the Pershing II would permit it to attack targets in the Soviet Union with very little warning time; it would have an earth-penetrator warhead option; its accuracy, combined with high-velocity, near-vertical trajectory, offered an assured, quick-reaction, all-weather capability for attacking enemy main operating bases (MOBs). The Pershing II was perceived to be a prime candidate for executing a "mousetrap" counterattack in which enemy MOBs would be knocked out while enemy aircraft were airborne during strikes against NATO, thus denying them a place to land or forcing their dispersal to other less-well-defended airfields where they would be easier to attack.

In 1977 the Army attempted to give the Pershing II to the Air Force but the Air Force did not want to pay for its development out of Air Force funding. The Air Force also preferred to proceed with the development of a less complex ground-launched cruise missile (GLCM) which would be fielded in a ready adaptation from a canister and booster launch design concept of the Tomahawk submarine-launched cruise missile (SLCM). General Jones conceived that the GLCM (soon popularly pronounced "glikkum") would take over the QRA nuclear alerts from tactical fighters and free them to fight conventionally. Although either GLCM or Pershing II could be used to attack many of the same all-weather fixed targets, each had unique capabilities to make both attractive. The GLCM, for example, had a stated range of 2,500 kilometers and could outdistance the Pershing. In 1977 General Jones got a small amount of money included in the fiscal year 1978 budget to work on a GLCM.[151] As development of an already nearly perfected submarine-launched cruise missile (slikkum) version of the nuclear-type GLCM got under way rather readily, the US Tactical Air Command could see nothing immediately better for defense emitter suppression than a GLCM with a conventional warhead. TAC asked that such be developed for a standoff defense suppression. Said Gen Robert J. Dixon, the TAC commander, "We have not found anything better . . . and we need a standoff capability desperately."[152]

Before 1977, Soviet theater-dedicated nuclear missiles were at vulnerable fixed sites, and each missile had only one warhead, but during the same year the USSR began deploying new mobile, solid-propellant, 5,000-kilometer range SS-20s. These missiles had three MIRV warheads, and each launcher was also provided with a refire missile, also with three warheads. Ambassador Nitze remarked, "They look like war fighting weapons. Unless they are limited or offset the entire Eurasian land mass would live under an intolerable threat."[153] The Backfire bomber and the Soviet/Warsaw Pact frontal aviation already threatened NATO, and in 1978 Gen Alexander Haig, CINCEUR, noted Europe's growing concern with the increasing imbalance in longer range theater nuclear systems represented by the SS-20. Haig regarded the increased survivability, accuracy, and affordability, "from the European perspective."[154] During the careful allied examination of longer range

theater nuclear capabilities, the United States offered options of drawing on ongoing programs: Pershing II, GLCM, SLCM, air-launched cruise missile, a new medium-range ballistic missile (MRBM), and aircraft. In his analysis of the requirement for allied response to the Soviet threat, Secretary Brown rationalized:

> We do not plan our theater nuclear forces to defeat, by themselves, a determined Soviet attack in Europe, and we rely mainly on conventional forces to deter conventional attack.. It remains essential, nonetheless, for NATO to maintain, or as necessary acquire, the flexibility to leave the Soviets under no illusion that some way exists, by nuclear means, to gain military or political leverage on the Alliance U S Central Systems, of course, remain the ultimate deterrent, and are inextricably linked to the defense of Europe Augmentation of NATO's long-range theater nuclear forces based in Europe, however, would complete the Alliance's continuum of deterrence and defense, and strengthen the linkage of U.S. strategic forces to the defense of Europe Indeed, increased NATO options for restrained and controlled nuclear responses reduce the risk that the Soviets might perceive—however incorrectly—that because NATO lacked credible theater military responses, they could use or threaten to use their own long-range theater nuclear forces to advantage... We must also be able to counter the SS-20s and BACKFIREs from the theater, and place at risk Pact forces and assets deep in Eastern Europe and the western military districts of the USSR. As one example, we cannot permit a situation in which the SS-20 and BACKFIRE have the ability to disrupt and destroy the formation and movement of our operational reserves, while we cannot threaten comparable Soviet forces [155]

In the Atlantic Alliance planning for the modernized theater missile undertaking, the Federal Republic of Germany was willing to accept Pershing II missiles, but it was unwilling to be the only continental country to accept a new long-range nuclear system. Consequently, longer-range GLCMs had to be accepted by the other NATO allies. On 12 December 1979 the foreign and defense ministers of the 14 NATO nations came to a two-track decision about what to do about the Soviet threat, namely to deploy offsetting Pershings and GLCMs; and also seek negotiations with the Soviets to limit such theater nuclear missile systems on both sides. In West Germany US Pershing IA missiles would be replaced one-for-one by Pershing II missiles, and 464 GLCMs would be procured and deployed in hard shelters in West Germany, the United Kingdom, Italy, the Netherlands, and Belgium, the latter two countries reserving the right to have additional time to consider whether to take the GLCMs allocated to them. Since the new theater nuclear systems would be deployed with US units in Europe, the United States agreed to assume most of their costs, except that there was a prospect that basing costs would be paid back from the NATO infrastructure program. The United States also undertook during 1980 to withdraw from Europe 1,000 nuclear warheads that could be released in the modernization effort. In outlining the agreement, Secretary Brown summarized:

> I should stress, in designing this response, that one of its purposes is to lay to rest any questions about the credibility of the US commitment to the defense of Europe. .. Our strategic, theater nuclear, and conventional forces are and will remain capable of thwarting the purposes of any attacks on Europe and inflicting heavy costs on the

> attacker. That is the essence of the flexible response embodied in NATO's military guidance (MC-14/3) and our countervailing strategy, and it is at the heart of credible deterrence [156]

The NATO decision of 12 December 1979 to make a nuclear missile response to the growing Soviet theater-dedicated SS-20 nuclear missile threat was followed by a course of events, some of which do not appear to have been anticipated. The Soviet Union quickly increased the pace of its SS-20 buildup to a rate of one additional unit every five days. In February 1982, the US Department of Defense counted between 285–300 SS-20s in deployment, primarily directed toward Western Europe. Talks in Europe on intermediate-range arms, led on the American side by Ambassador Nitze, made no substantive progress. The Soviets made it apparent that they would not take part in serious arms control talks until they were thoroughly convinced that NATO was steadfast in its commitment to go forward with the GLCM and Pershing II. In March 1982, after the Soviets had fielded some 300 SS-20s with 900 warheads and 900 refire warheads, President Leonid I. Brezhnev announced a unilateral moratorium on the further deployment of SS-20s in the European Soviet Union in the absence of "practical preparations" for the deployment of GLCMs and Pershing IIs. Such a freeze was rejected because it would have locked NATO into a position of permanent inferiority as far as intermediate-range missiles was concerned, but the Brezhnev ploy further aggravated popular unrest in the form of antinuclear demonstrations in Western Europe. These burgeoning antinuclear groups tested the resolution of the Atlantic Alliance: the Federal Republic of Germany, United Kingdom, and Italy were unswayed, but Belgium and the Netherlands were willing to postpone receiving their share of the GLCMs.[157]

Because the Air Force GLCM was a variant of the Navy's Tomahawk and the Pershing II was in some respect an upgraded Pershing IA, the Department of Defense was optimistic about developmental problems. In March 1980 Secretary Brown projected that with procurement beginning in fiscal year 1981, GLCM would reach an initial operational capability in December 1983. The plan was to deploy 160 in Europe by September 1985 and have 464 of them in hard shelters in Europe by September 1988. All Pershing IAs were to have been replaced by Pershing IIs by September 1985. The total acquisition program cost at the inception of the GLCM program in fiscal year 1981 was projected to be $1.5 billion, but by fiscal year 1984, the cost was being quoted as being $3.6 billion. The Air Force's plan was that the Tactical Air Command would organize GLCM flights, each made up of four tractor-erector launchers and each with four missiles that would be assigned to Air Force units at NATO bases. The flights would go out into the field on direction and authorization from SACEUR; they would be subordinate to SACEUR through the Air Force component commander. As it happened, the ground equipment, especially the security for a launch control center and building of the transporter erector-launcher, was more complex and costly than first anticipated. These and other added costs concurrently needed to get an early IOC

combined with inflation to cause the substantial increase of the GLCM program. In March 1981 General Allen could see no way to abandon the GLCM program, since the West German government would not receive Pershing IIs unless the other allies received GLCMs. The Air Force had accordingly not given any thought about what could be done better with the $3 billion plus to be spent for the GLCM program, but Allen added: "If the United States were to choose not to develop and deploy GLCM, the money currently programmed for GLCM would be spent on other priority Air Force programs not currently funded."[158] Another Air Force spokesman, however, had an alternate proposal for the GLCM. Lt Gen Kelly Burke, deputy chief of staff for research, development, and acquisition, in February 1981 called attention to the fact that Air Force F-111s were a very potent dual-capable asset, as were the tactical fighters belonging to West Germany, the Netherlands, Belgium, and Italy that were standing on QRA. The F-111s would remain on quick-reaction alert, and the NATO F-16s and Tornado tactical fighters that would be becoming operational would also be dual-capable fighters. New stockpiles of B-61 nuclear bombs with enhanced safety locks and security features were being stored in Europe. Combined with F-111 accuracy, Burke said, the B-61 "would be adequate for a hardened silo or would destroy a fair sized city. . . . The dual-capable airplane is really the most cost-effective way to add force, because the force is still available . . . for all manner of other missions; they are very flexible. You can put them against any target anywhere." Whereas the Air Force had earlier made the case for the GLCM relieving dual-capable fighters for conventional operations, General Burke now described the GLCM as "a very nice complement" to the dual-purpose plane, "particularly in the fact that it has very long range, it has very high en route survivability, and it is accurate."[159] "The modernization of LRTNF [Long-Range Theater Nuclear Forces] is my No. 1 priority, to follow through and get those GLCMs and Pershing IIs deployed," declared Gen Bernard W. Rogers, supreme allied commander Europe/CINC European Command, on 20 February 1981. He continued:

> Under current conditions with the status of our conventional forces, and particularly our lack of sustainability, we have built ourselves a short war That is why the strategy which I can implement today . is the strategy of "delayed trip" wire, delayed by a certain number of days, depending upon warning time, timely decisions by political authorities . and so on . . When D plus X day comes, we face two options in NATO under current conditions We either have to escalate to theater nuclear weapons or we have to capitulate. Neither one of those is viable in my view and that is why our objective in Allied Command Europe is to get sufficient conventional forces to hold the initial thrust of the lead divisions of the lead armies until we can take under conventional attack the follow-on divisions of those lead armies that follow at about 70 to 200 kilometers behind.[160]

With hard commitments Rogers estimated that the Atlantic Alliance nations could develop the kind of conventional force he described by the end of the 1980s: "Then, if attacked conventionally, we can force the decision to the other side to escalate or withdraw." Meanwhile, the two nuclear legs of the NATO Triad—US

strategic nuclear forces coupled with NATO nuclear defenses—would have to compensate for the third leg—NATO conventional power—in deterring Soviet/Warsaw Pact aggression.[161]

Fixed-Wing Air and Attack Helicopters in Controversy

The concept of US armed services roles and missions antedated the National Security Act of 1947, when the Air Force became a separate service. General Momyer recalled from years of study and experience,

> The Air Force position on this question is based on the promise that each service contributes the particular forces for which it is expert, and collectively, these forces form a unified, mutually supporting combat team By each service specializing in its particular area of responsibility, economy is promoted, duplication is eliminated, and, most importantly, more effective combat power against the enemy is realized.[162]

Although the National Security Act of 1947 established the Department of the Air Force and the Air Force, it also provided that the Army, Navy, and Marine Corps would continue to possess "such aviation as may be organic therein."[163] In 1963 the OSD general council gave an opinion in regard to the aviation composition of the Army in terms of the National Security Act of 1947, stating that "Army aviation includes artillery spotters, observation and liaison aircraft and other similarly small aircraft which it is more efficient to place under the control of the Army, but not typical combat or significant transport aircraft."[164] A 26 November 1956 directive by Secretary of Defense Charles E. Wilson that was later republished as Department of Defense Directive 5160.22, dated 18 March 1957, made it clear that the Air Force included "among its primary responsibilities those of furnishing close combat and logistical air support for the US Army." The directive also contained a specific statement that US Army aviation would not provide an aircraft to perform the function of close combat air support. As has been seen, Secretary McNamara pressed the Army to give more attention to developing an organic airmobility capability and stated that he was not applying such limitations to the Army as the Wilson directive included. He said, however, that he would be sensitive to incipient "serious duplications" between the Army and Air Force. In March 1965 he said:

> The danger is, I think, that the Army will move beyond the procurement of aircraft directly related to its own mission and appropriately assigned to it, such as helicopters, into the procurement of aircraft to carry out functions such as close air support or transport of large quantities of materiel, which functions the Air Force would be better prepared to carry out That is a danger It is one we are sensitive to [165]

Brig Gen William J. Maddox, Jr., US Army director of army aviation, explained the US Army interpretation of the language of the National Security Act of 1947:

> The primary function of the Army is . to organize, train, and equip land forces for operations on land. It is the Army's position that the aviation incorporated into its forces

> and planned for the future is intended to further its mission and not to duplicate either the role or capability of any other service. This includes the role of close air support which the Army shares with all the services . Under the Army's land force charter, it is logical to organize, train, and equip units for which a full-time need is apparent—for example, maneuver units, artillery, helicopter lift and support forces. It is reasonable to rely on other services for actions which are highly specialized or for which there is a nonrecurring need such as naval and air transport and tactical air support [166]

In view of Secretary McNamara's expressed intention not to apply the rigid limits of DOD Directive 5160.22, the Army assumed that the directive was a dead letter. "The entire Howze Board—the air mobility concept," said Lt Gen Robert R. Williams, Army assistant chief of staff for force development, "was in direct violation of that directive." General Williams rationalized that weapon systems were allocated not by what "a piece of paper said 20 years ago" but by consideration in defense budgetary and programming and approval cycles and authorization cycles:

> If a . service wants to develop a new system, any major system, it is required to go through a process in defense where a DCP [development concept paper] is written, all the services comment on it and finally at each step it goes before the [Defense Systems Acquisition Review] Council, of all the Assistant Secretaries, and has to be approved by the Deputy Secretary of Defense [167]

After that the proposal had to be approved and funded by Congress.

The Marine Corps started the airmobility concept using H-19 helicopters for troop lift; but enjoying the support of Secretary McNamara and President Kennedy, who were interested in developing techniques to counterinsurgency, the Army added the attack helicopter as part and parcel of its helicopter airmobility program. Early in 1962 the Army deployed H-21 transport helicopters to Vietnam and used them to transport South Vietnamese troops. A unit of utility helicopters jury-rigged with weapons was soon sent to Vietnam, the original intent being for these aircraft to escort troop helicopters to landing zones. Fire support in the landing zone was still provided by US and South Vietnamese fixed-wing aircraft, but the Army shortly perceived a need for both armed helicopters and fixed-wing fire support in landing zones. The Cobra AH-1G gunship was built and deployed to Vietnam The Army also began to field armed Mohawk fixed-wing aircraft for experimental fire support and sent Caribou transport aircraft to Vietnam to augment local air movement. In 1965 Secretary McNamara theorized that the Army might be moving beyond the procurement of aircraft directly related to its mission. For that reason, he said,

> I have overruled the Army in their request for purchase of what is known as the BUFFALO, as a successor to the CARIBOU to carry on a transport function that I believe the Air Force can properly carry with its C-130s and C-123s. Similarly I have refused the Army permission to buy the MOHAWKS and other aircraft which might be used for close air-support functions [168]

Although the Army considered that DOD Directive 5160.22 was inactive, it officially differentiated between "close air support" and what was now called "direct aerial fire support." An Army statement explained the difference:

> Close air support (fixed wing mission) calls for penetration of a hostile environment, delivery of heavy munitions on relatively stationary targets, and protection of friendly forces against hostile air attack. . . . Direct aerial fire support is provided by the attack helicopter, which is one of a family of ground firepower systems. All its characteristics (weapons, target acquisition, nature of its targets, integration of fires, command and control) it shares in common with other Army weapons systems. Helicopter fires are typical of all fires that take place at the line of contact, the flanks, and within the battle position where a premium is placed on quick response, all weather capability, and a high order of accuracy in delivery of fires There is a small area of overlap between close air support and direct aerial fire support on the battlefield This overlap is considered necessary and desirable.[169]

From the beginning of his tenure as Air Force chief of staff, General McConnell sought solutions for roles and missions conflicts with the Army, and in the spring of 1965, the Army's Gen Harold Johnson was said to have been tired of defending armed Mohawks at great length with other members of the Joint Chiefs of Staff. The two generals conferred privately for six months before arriving at a meeting of minds. A new directive, "Concept for Improved Joint Air-Ground Coordination," signed by General McConnell on 19 March 1965 and by General Johnson on 28 April 1965 put into effect a revised tactical air-control system. This system provided continued centralized control of tactical aviation at Air Force component commander level, but allowed decentralized execution of allocated sorties by new direct air support centers (DASCs) at corps level. A year later on 6 April 1966, McConnell and Johnson signed another agreement personally worked out between them whereby the Army transferred the CV-2 Caribou and the CV-7 Buffalo to the Air Force which became responsible for intratheater fixed-wing tactical airlift. For his part, General McConnell agreed "to relinquish all claims for helicopters and follow-on rotary-wing aircraft which are designed and operated for intratheater movement, fire support—except Special Air Warfare—SAW—or Search and Rescue—SAR—forces and administration mission support aircraft."[170]

In the immediate aftermath of the 6 April 1966 McConnell-Johnson agreement, General McConnell directed immediate and positive action to obtain a specialized air-support aircraft for the 1970s. The US Army in 1966 started a development program for the AH-56A Cheyenne—an advanced aerial fire support system (AAFSS) that would be specifically tailored to future operational needs for higher intensities of combat. There were to be improvements in basic aircraft performance, including hover capabilities, payload, and endurance, and in equipment capabilities to provide more operational flexibility at night and in bad weather, in better navigation, and in longer standoff ranges for weapons firing.[171] In February 1966 General McConnell was asked what he thought about the AAFSS, and he responded:

> Of course, what the Army intends to do with the advanced helicopter that they are talking about is to use it for close support operations, which is traditionally a mission for the Air Force and [one] which the Air Force has always done very well. I have no problems with armed helicopters in their use by the Army in suppressing fire and moving people around I do not think it is essential or necessary to build an armed helicopter with a capability for close support of Army forces, because this is already being done for them by the Air Force and in some instances the Navy In the first place, it will not anywhere near stand up to the examination of cost effectiveness In my opinion, it will cost too much to be able to stand up to cost effectiveness analysis [172]

General Momyer later added that in the McConnell-Johnson agreement he was sure that General McConnell had not visualized that "the helicopter was going to be utilized and turned into the kind of firepower platform that we see in the Cobra and the Cheyenne." Speaking for himself, Momyer said:

> As I understand the functions assigned to the armed services, I consider the deployment of the helicopter gunship as performing close air support, and the close air support mission is assigned to the Air Force and, therefore, I concluded [sic] that it is a duplication of our mission [173]

After their inception in 1966 neither the Cheyenne nor the A-X programs progressed rapidly The Cheyenne development program encountered repeated technical problems, and the crash of a test aircraft during a high-speed run in 1969 caused the Army to terminate a fledgling production program. The Lockheed Corporation, which was developing the Cheyenne, identified and undertook to correct technical problems with the rotor system, but the development program remained at a slow pace while settlement of prospective costs of correcting the design failure was worked out.[174] The A-X program got under way with General McConnell's decision letter in September 1966. Contracted studies in 1967 established the feasibility of what was wanted in the program: a not-too-expensive airplane that could transport a heavy payload, could take off from an unimproved field with short runways, could be very rugged, and could take a beating from ordnance fired from the ground. The Army documented its close-air-support requirements, and the A-X design proposal met the requirements, but the Army did not request the A-X specifically. Gen William C. Westmoreland, Army chief of staff, said that the Army "would leave the development of detailed specifications of the airplane to the Air Force." In 1968 the proposed A-X was getting too big and too expensive and required more study before a supplemental concept formulation package of studies would be ready in September 1969.[175]

Even in its conceptual state, the A-X generated some roles and missions difficulties. At first, the Air Force circulated proposals that the A-X be especially dedicated to Army control, this by assigning A-X units to particular DASCs and allowing the air component commander/Tactical Air Control Center to use them elsewhere only in emergencies. Under these circumstances it was reasoned that the A-X should not be counted "above the line" in the Air Force tactical wing

strength. Maj Gen George S. Boylan, Jr., director of Air Force aerospace programs, rationalized in April 1969:

> With the A-X, . . . I think the Air Force operational procedure and doctrine which will guide the employment of the aircraft will restrict it to close basing, to basing in close proximity to the ground forces, immediate response to the ground forces. I doubt that you would find the A-X, in this operational concept, forward of the main battle area, where the degree of exposure goes up [176]

Oddly enough, Army spokesmen rebuffed the proposition, advocating the A-X or other fixed-wing, close-support aircraft to Army units as being contrary to long-standing Air Force doctrine. The proposition offended the flexibility of tactical air employment and the authority of the joint commander in a theater organization. An Army memo to the Air Force chief of staff on 13 January 1970 stated: "The joint commander should approve the apportionment of air effort on a daily basis. The apportionment should be changed only by the joint commander." Brig Gen William J. Maddox, Jr., director of Army aviation, elaborated:

> Viewed very simply, dedicating aircraft to close air support, and placing close air support strikes under Army control would make these aircraft more responsive to the ground force commander, but there are other factors which militate against this approach for conventional fixed-wing close air support aircraft—prime of which is that fixed-wing close air support aircraft are multi-capable . For a full appreciation of close air support, responsiveness should be examined from the viewpoints of both the joint commander and the frontline soldier These views will differ because the frontline soldier looks only for close air support against the targets to his immediate front. The joint commander, on the other hand, is concerned with a variety of missions which include air superiority, interdiction and reconnaissance, as well as close air support. The joint commander retains control of his fixed-wing close air support assets because they can contribute to other elements of his tactical air mission For instance, the A-X and other fixed-wing aircraft have the inherent capability to perform interdiction as well as close air support. Under certain conditions, interdiction may take precedence over close air support To assign these aircraft to the Army would reduce the responsiveness from the viewpoint of the joint force commander.[177]

In the words of Sen Howard W. Cannon, "The Marines apparently do not have a roles and mission problem since they provide their own close air support." In addition to F-4 Phantoms, A-4M Skyhawks, and A-6A Intruders, the Marines were in the post-Vietnam War years planning a buy of 114 AV-8A Harrier aircraft to be operated from Navy amphibious ships and austere forward-area strips ashore in a primary "ground loiter" close-air-support role. The Harrier had been developed in Britain and was operational in the Royal Air Force. It had swept-wing jet speeds, and it could be employed in a vertical takeoff and landing (VTOL) performance. But the Harrier's combat radius was only 50 miles with the VTOL mode of operation, and its combat time on station was very short. In addition, a typical Harrier sortie could require 8,000 pounds of fuel and ordnance so that the logistics requirements could be formidable for Harriers staging from short-expeditionary runways that could not accommodate logistical air transport supply.[178] From the

Air Force's point of view, General Ryan considered that in the VTOL mode the Harrier's payload capability became too small. Ryan said:

> We believe that it may provide satisfactory performance in the context of the Marine Corps concept of operations, which do not require as much range and payload capability as we do, but it does not appear to meet our close air support requirements [179]

On 22 January 1970 Deputy Secretary of Defense David Packard requested Army Secretary Stanley R. Resor and Air Force Secretary Seamans to develop within 30 days a position paper on the A-X and the Cheyenne which would address their relationship in a close-air-support role. In turn, Lt Gen Robert R. Williams, assistant chief of staff for Army force development, and Maj Gen Glenn A. Kent, assistant chief of staff for Air Force studies and analyses, were tapped as action officers. In Joint Chiefs of Staff usage, close air support was defined as air attacks against hostile targets which are in close proximity to friendly forces and which require detailed integration of each mission with the fire and movement of those forces.[180] But to come to closer grips with the A-X versus Cheyenne comparison, it was necessary to elaborate. "I find," said Secretary Seamans, "that I certainly have learned a lot about close support lately. There are a lot of ramifications to it, and to really understand it, it is necessary to get into a large number of specific tasks, their locale on the battlefield, the method of command and control, et cetera." In a joint memorandum signed on 20 February 1970 the secretaries recommended continued research and development of both the A-X and the AH-56A through at least prototype development. The memorandum also addressed the complementary and competitive aspects of the two systems, and since complete agreement could not be reached, the memorandum outlined the individual service positions. The official Air Force position noted that DOD Directive 5160.22 and "Unified Action Armed Forces" both assigned the close air mission to the Air Force. Assistant Secretary of the Air Force (R&D) Grant L Hansen said, "It is therefore the official position of the Air Force that it needs the A-X at the earliest possible date to provide improved capability for fulfilling its responsibility of providing that close air support for the Army."[181]

In the argumentation about the comparative values of the A-X and Cheyenne looking toward the preparation of a final memorandum from the Army and Air Force secretaries to Deputy Secretary Packard submitted on 26 March 1970, both the Army and the Air Force described the Cheyenne and A-X as both complementary or competitive, as the case might be. Lt Gen Otto J. Glasser, Air Force deputy chief of staff for research and development, asserted: "I am personally totally convinced, perhaps parochially so, that an A-X, which will do 80 to 90 percent of all the missions of the Cheyenne, and at one-third the cost, is the thing to do." If an attack helicopter were needed, Glasser recommended that "a Huey Cobra with an A-X is a much more cost effective solution to the problem."[182] In the final paper, the Army included a list of 17 "Tasks of Combat Air Support," many of which the Air Force pointed out were general tasks of tactical aviation—not close air support. In the end, the two secretaries agreed that the A-X

and an advanced aerial fire support system (AAFSS) helicopter (not necessarily the Cheyenne) were complementary. The secretaries greatly expanded the JCS definition of close air support, breaking it out into eight separate tasks that were listed in an enclosure to their 26 March 1970 report. These were:

> *Task I:*—Support of Engaged Troops This includes the delivery of supporting fires by air against enemy troops (and associated equipment and vehicles) out to the established fire coordination or safety line. Attacks are conducted during day, night and adverse weather conditions against such targets as weapon positions (both ground-to-ground and ground-to-air), bunkers and fortifications, enemy formations afoot, enemy formations of armored and mechanized vehicles, and suspected locations of enemy troops, vehicles, and weapon positions
>
> *Task II:*—Support of Airborne/Heliborne Assaults This includes·
>
> (1) attack of enemy targets in preparation of landing zones; and
>
> (2) supporting fire during landing and extraction.
>
> *Task III*—Escort for protection of aircraft/helicopters (exclusive of those engaged in actual insertion/extraction operations) from attack—both air-to-air and ground-to-air
>
> *Task IV.*—Provision of fire support for air cavalry operations.
>
> *Task V*—Protection of Moving Formations of Troops (afoot or motorized not actively in contact with the enemy).
>
> *Task VII*—Support of rescue missions, including extractions of troops on long-range ground patrols This entails protection of air rescue aircraft from air-to-air ground-to-air enemy attacks and suppressive fire in support of those being rescued
>
> *Task VIII*—General Support of Battlefield Area This entails attack of enemy targets beyond the established fire coordination or safety line and includes Weapon positions (both ground-to-ground and ground-to-air), bunkers and fortifications, enemy formations afoot, enemy formations in armor and mechanized vehicles, enemy command and control facilities and positions; nuclear delivery systems, roads and bridges, combat support facilities, and suspected locations of enemy troops and supplies [183]

These tasks were broader than the JCS definition of close air support, leading Deputy Secretary of Defense Packard to tell the Senate Special Subcommittee on Close Air Support,

> The degree to which any of the tasks identified by the Secretary of the Army and the Secretary of the Air Force in their memorandum fit the definition of close air support depends on the scenario In final analysis, command and control procedures and joint doctrine must remain sufficiently flexible so that close air support sorties can be conducted in coordination with the fire and movement of friendly forces [184]

Deputy Secretary Packard accepted the proposal for prototypes. At this juncture the Cheyenne helicopter was once again in a research and development

phase, with the Lockheed Company confident that its rotor control problems were near solution. On 6 April 1970 Deputy Secretary Packard approved the development concept paper for the A-X to be for the construction by two aircraft companies of two prototype close-air-support aircraft each. When request for proposals went out on 7 May, six companies responded by 7 August, and on 18 December 1970 Secretary Seamans announced that the Fairchild Hiller Corporation and the Northrop Corporation were selected as the contractors for the competitive prototype phase of the A-X program.[185]

In 1970 in the course of House Appropriations Committee hearings on the fiscal year 1971 budget, committee members asked many pointed questions about close air support. In addition, Chairman George H. Mahon advised Secretary Laird that the Department of Defense should thoroughly evaluate available hardware options relative to close air support, including the Harrier, the Cheyenne, and the A-X, before proceeding with substantial procurement of any close-air-support aircraft. Early evaluations in OSD indicated to Deputy Secretary Packard that the issues affecting close air support were really wider than just three different aircraft, and warranted the personal attention of senior management. In February 1971 Secretary Laird established a high-level close-air-support review group with Packard as chairman and with representatives from OSD, JCS, Army, Air Force, and Marine Corps. Gen William W. Momyer, commander of TAC, represented the Air Force. On 8 March 1971 DOD Directive 5160.22, vesting close air support in the Air Force, was canceled. Packard explained the cancellation as being part of his "recent attempt to get rid of some directives that I consider unnecessary." He looked to the Joint Chiefs as advisers on roles and missions and said that there had been no discussions with them on mission changes. He did not see "any movement to change the roles and missions," but he also said that he was "willing and ready to make any adjustment that experience dictates advisable." What he wanted was to generate a better understanding of close air support essentially through the examination of the capabilities of current and candidate aircraft in a small number of scenarios that could represent the range of missions and threat environments. Referring to the A-X, the Cheyenne, and the Harrier as "systems," Packard said:

> The point I want to make is that I do not think the problem of close air support is related to which one of these systems is best, but to what is the best mix of these systems It may turn out that we really should have all three—the A-X, the Cheyenne, and the Harrier Maybe we do not need all three . We are going to take a limited number of specific situations and analyze them and see if a more objective approach will give us some guidance as to which way we can go [186]

From what Packard said, an Air Force doctrinal issues briefing concluded:

> The Deputy Secretary of Defense has made it very clear that decisions to procure new weapons and support systems are going to be made on their merits and not on the basis of any legalistic assignment of roles and missions Further, the responsibilities of the

> services have become somewhat blurred by OSD policies for assigning weapon system development programs.[187]

Since it was already known that the consensus of the OSD hierarchy, both military and civilian, was that one type of aircraft would not meet diverse objectives, the Department of Defense Close Air Support Report submitted to Congress on 22 June 1971 contained few surprises, although its findings were based on a variety of analytical techniques and simulated approaches. Deputy Secretary Packard provided the conclusions and recommendations personally and allowed individual members to append their views. The conclusions noted that close air support was a complex mission. Interaction with ground elements and other weapons was one source of complexity. The diversity of probable scenarios, targets, tactical situations, terrain, and weather conditions also complicated the evaluation process. This complexity and diversity of close air support led to realistic requirements for different types of systems:

> One aircraft cannot do everything another aircraft can. The Cheyenne, Harrier, and A-X center their capabilities in important sectors of the CAS spectrum· Cheyenne in discrete, responsive, highly mobile fires operating as part of the ground maneuver force; Harrier in rapid response to urgent firepower requirements during amphibious operations, and A-X in concentrating heavy firepower, matching selected munitions to different targets, at threatened sectors from dispersed bases. There were four recommendations 1 Continue the Harrier procurement plan 2 Continue the A-X and Cheyenne development 3. Execute tests to resolve uncertainties found during the study so that necessary information for Cheyenne and A-X production decisions and further Harrier procurement would be available 4. Continue to refine the methodology for evaluating and comparing alternative close air support systems and arriving at procurement decisions [188]

General Momyer agreed with the conclusions and recommendations, but he did not accept any intimation that the group was stating a need to procure all three systems for future force structures until such time as extensive field tests were concluded.

The Department of Defense Close Air Support Report had not been completed when the fiscal year 1972 defense budget was sent to Congress, but the recommendations of the report were included in the budgetary request. In view of the questions that had been raised about the three "duplicate" close-air-support planes, Sen John C. Stennis, chairman of the Senate Armed Services Committee, announced formation of a special subcommittee on close air support to be chaired by Sen Howard W. Cannon and to be charged to examine the total close-air-support program as well as specific hardware issues. Testimony on close air support commenced on 22 October 1971, and 21 witnesses were heard on seven hearing days before testimony concluded on 8 November. The subcommittee also had the advantage of testimony on the defense authorization and appropriations hearings in the first half of 1971, as well as the findings of the Packard study, whose findings the Cannon subcommittee concluded were based on inherently defective

computerized systems analyses. In the Packard study, the Cannon subcommittee observed,

> the simulations basically were one-on-one studies, that is they pictured one airplane attacking one tank defended by one anti-tank gun. . . Omitted were the effects of enemy fighter aircraft, suppression of enemy air defenses, SAM missiles, tactical electronic counter-measures, and the fact that many aircraft will be making multiple passes at a host of enemy targets, while flying through a barrage of anti-aircraft fire [189]

In fiscal year 1972 authorization and appropriations hearings it was the Air Force's position that until the Cheyenne and the A-X were successful prototypes there was no way to compare their costs or capabilities. General Glasser noted:

> I think they are complementary and, of course, at the same time there is some overlap Duplication is not always bad Some duplication is highly desirable. Again I am not able to answer too explicitly in advance of completion of the development of the two aircraft [190]

Testimony in the Cannon subcommittee hearings generally repeated existing Army and Air Force positions. But Admiral Moorer, speaking as JCS chairman, took a more detached view:

> In closing, I would like to reemphasize that under the current state of engineering knowledge, no single aircraft can provide the capabilities necessary to satisfy the close air support tasks that may be encountered in future operational environments For this reason, I believe that a mix of fixed wing aircraft and helicopters which permits a variety of operational and deployment alternatives to the spectrum of targets, tactical situations, terrain, and visibility conditions that will be encountered by U S forces is our best solution to the close air support problem.[191]

Admiral Moorer pointed out that the Joint Chiefs of Staff were responsible for the development of joint doctrine. Admiral Moorer further commented, "After service tests and the development of service employment concepts are completed as to new close air support equipment, it is anticipated that the JCS will require joint testing for refinement and further integration into close air support joint doctrine."[192] And Deputy Secretary of Defense Packard concluded that helicopters were necessary for air support under conditions of limited visibility. He said:

> One thing I have already alluded to is that under certain conditions of visibility and ceiling, you just can't use a supersonic aircraft unless you are going to use a radar bombing system which is not sufficiently accurate to be dependable Under those conditions if you need close air support the only way you are going to be able to get it is with rotary-wing aircraft [193]

Senator Cannon's Special Close Air Support Subcommittee completed hearings on 8 November 1971 and released its report on 18 April 1972, although a declassified version of its hearings had been published earlier. The report endorsed Air Force-Army and Navy-Marine command and control systems. It pointed out,

however, that the Department of Defense "should redefine and assign the roles and missions of close air support." As the report was said to make clear, "in the twenty-four years since the Key West agreement of 1948, a series of interservice agreements and the evolution of helicopter technology have left the original definition and assignment ambiguous and unclear." The A-X program was judged "well worthy of prototyping," and the subcommittee recommended that an evaluation of the A-X should include a flyoff with existing close-air-support aircraft, especially the A-7D, and that the A-7D production line should be kept open until the flyoff tests determined whether the A-X would take the place of the A-7D. Senator Symington had long been a critic of the A-7D and disagreed with this recommendation. The subcommittee's recommendations regarding the Harrier and the lack of mention of the Cheyenne drew later clarification from Senator Cannon. The subcommittee did not believe duplication between the Harrier and the A-X "to be a valid issue," but it said that the Harrier was an experiment in V/STOL technology, resulting in a plane whose range and payload were so limited under VTOL conditions that no large procurements of it should be justified. The subcommittee's only mention of helicopters in its recommendations was: "Assuming that questions regarding helicopter vulnerability are resolved successfully, the subcommittee believes that there is a valid requirement for a more capable helicopter." Senator Cannon later said this sentence was not a specific recommendation for the Cheyenne.[194]

The Packard study report on close air support had recommended that the Cheyenne, Harrier, and A-X programs be continued until operational testing could be completed to resolve certain specified uncertainties about each. The Cannon subcommittee report called for flyoffs between the A-X and existing close-air-support aircraft. In December 1971, however, a General Accounting Office (GAO) report called attention to the fact that the Packard report did not focus on testing the Cheyenne, the Harrier, and the A-X against each other, but merely testing them against predecessors in their separate categories. The GAO also pointed out that there was no cohesive plan covering total defense requirements for close air support. Instead, the sizes and tactical concepts of close air support were proposed by the individual services planning independently. When asked about these concerns, Secretary of Defense Laird remarked that force planning integration was handled each year in the planning, programming, and budgeting cycle. "I think we are realistically working and attempting to define our CAS requirements and are carefully building our knowledge as we go to provide sound joint doctrine and operating procedures," Laird said. Although Laird considered that phase I of the Packard study provided "a good understanding of CAS environments, targets, concepts of operations, and CAS weapon systems required," he directed the study group to provide a phase II report on command, control, and logistics and basing requirements for providing close air support Laird stated:

> It is entirely in keeping with the Total Force Concept that existing roles and missions be examined to determine which Service and which weapon system can contribute the greatest amount to a given task. It is also in keeping with the Total Force Concept to adjust existing roles and missions to better use our existing and planned resources [195]

The way in which flyoff tests of close-air-support aircraft would be handled remained unsure in early 1972. Secretary of the Air Force Seamans told Senator Symington that tests would be run on the two A-X candidates to select one of them. Similar prescribed tests would be run on the Cheyenne. "On the basis of all these tests, the Department of Defense will then make a decision whether to proceed in production with the Cheyenne or with the A-X.... Not with both.... That is the understanding that we have in the Department of Defense."[196] General Westmoreland, Army chief of staff, dramatically disagreed:

> The Army considers the Cheyenne as an integral part of its ground combat forces, the same as a tank or a howitzer In fact, when the decision was made to develop the Cheyenne, the Army traded off tanks and howitzers for the capability of raising part of its fire support means a few feet above the terrain and providing it with a significant increase in speed and maneuverability . If any trade-offs exist, they are between the Cheyenne and other land combat fire support means and between the A-X and other aircraft capable of performing the fixed wing close air support mission There is no competition and no viable trade-off between the fixed wing and rotary wing capability The Department of Defense has repeatedly testified before this and other committees that both capabilities are required and that they are complementary and not competitive [197]

The Army's Cheyenne development program had been started specifically to meet the stringent requirements of a European-type war. The Cobra attack helicopter, while very effective in Southeast Asia, could not perform a full range of tasks required of the Cheyenne, although Cobras equipped with the tank-killing tube-launched, optically directed, wire-controlled (TOW) missiles could be deployed to Europe much earlier than the Cheyenne would be operational. There was no growth potential in the Cobra without a major redesign effort. Still, in 1971 some estimates of the projected costs of one Cheyenne had increased to well above $5 million, and the Army officially projected its cost to be $3.8 million. While the Cheyenne had lingered in development, alternative advanced gunship candidates were being developed privately by two helicopter companies. Sikorsky's Blackhawk started flying in August 1970, while Bell's King Cobra was flying in September 1971. Both were promised to be less costly than the Cheyenne. Because of the Cannon subcommittee's hearings, the Army had a flyoff between the Cheyenne, the Blackhawk, and the King Cobra, after which in August 1972 it announced the termination of the Cheyenne program and the initiation of a new program to develop an advanced armed helicopter less complex and less costly than the Cheyenne. Development contracts were awarded to two contractors each to fabricate two flying prototypes to be evaluated in a competitive flyoff. Testing of these two competitive prototypes was completed in September 1976, and

Hughes Helicopters of the Summa Corporation won a full-scale engineering development contract for the Army's antiarmor helicopter of the future.[198]

Unlike other Air Force aircraft the A-X was designed specifically for frontline close air support. The four basic characteristics of the A-X include lethality to targets, responsiveness, survivability, and simplicity. The two A-X prototypes—the Northrop A-9 and the Fairchild A-10—had their first flights in May 1972, and from 10 October through 9 December 1973 there was a flyoff testing of the two planes at Edwards AFB, California. The A-10 was declared the winner. The question now became one of meeting the demands of the Senate Armed Services Committee that there be flyoff tests of the A-10 and the A-7D. During 1972 Maj Gen Robert P. Lukeman, assistant chief of staff for studies and analyses of the Air Force, commenced computer analyses of the A-7D and A-X. Saber Armor-Alpha, a study published in March 1972, projected the A-X as much more survivable than the A-7 against the same enemy defenses. The problem was then extended to a projected analysis of total force effectiveness of the A-7D and A-X in a study called Saber Armor-Charlie. The study team was led by an experienced fighter pilot, Col John R. Bode, and in preparation for it, a board of fighter officers was assembled to draw up operational concepts. After weeks of arguing about how each airplane would be used, the group identified the one fundamental concept intrinsic to the close-air-support mission. In the battle area, a very fluid, irregular line called the forward edge of the battle area (FEBA) divided friendlies from enemies. Colonel Bode demonstrated that the fixed targets behind the enemy lines could be systematically attacked with prior planning.

> We plan the ingress routes, and we often use non-visual systems We try to make high speed, single pass attacks if we possibly can to hit those targets and keep moving. The FEBA is very fluid. It has the characteristics that our friendly forces are always close to it . . . That requires very intimate integration with the fire and maneuver of the ground forces That is not only the definition of the mission, but in my opinion that is the key concept of the close air support mission . So that means that any airplane that is bought . . . to do the close air support mission has got to go through a visual acquisition phase, when the fighter pilot determines for himself where the friendlies are and where the enemy is. Besides that, the pilot has to specifically identify and locate a specific target and fly the airplane so as to aim at that target That is particularly true of targets like tanks because for hard mobile targets like tanks, if you don't aim at it, you don't kill it . . . This requirement for visual acquisition and this requirement for aiming the airplane at the target actually sets up the design of close air support aircraft It comes out with different features from what you would get if you designed for the interdiction mission or the air superiority mission.[199]

Each of the computer simulations of the Saber Armor calculations favored the A-X over the A-7D, even though when there was a concern about how a factor should be weighed, it was weighed in favor of the A-7. The data was submitted for study by a Defense Systems Acquisition Review Council (DSARC) that met on 17 January 1973 and selected the Fairchild A-10 as the prototype winner. The Saber Armor studies were also briefed to the Senate Armed Services Committee, which in 1972 had recommended "a flyoff, a side-by-side flight comparison" between the

A-X and the existing close-air-support airplanes. In March 1973 General Glasser argued with Senator Cannon that there could be no meaningful flight test between the fully operational A-7D and the only partly fabricated A-10, but the Senate Armed Services Committee remained adamant and again in July 1973 recommended the flyoff. Senator Cannon insisted that the A-10 with its relatively slow speed could not have the survivability that the paper studies claimed. He had talked to many pilots back from Southeast Asia who told him that speed was necessary for survival in a high-intensity environment.[200] As a result of heavy Israeli aircraft losses in the Yom Kippur War, congressmen were intensely interested in hearing Secretary McLucas and General Brown relate the A-10 to such an intense missile-defense environment. Said McLucas:

> I think we can say that under the rubric of lessons learned in the Middle East, it did not change our views on the A-10 . . Our feeling is that the activity in the Mideast demonstrates that weapon systems should not be considered in isolation from the rest of your force; we would employ our force in a combined action [201]

General Brown pointed out that the A-10 was not going to hover over enemy defenses; its targets would be at the FEBA. Brown added:

> One thing that we do acknowledge is that the A-10 is built conceptually along the lines of the Stuka of World War II It is a limited performance airplane for limited purpose It is not an airplane that you would send deep into enemy territory to do interdiction, airfield attack, these sorts of things It is not fast enough . So you would go to the F-4 or the A-7 But to stay in the battle area and keep working, hammering right up there where the tanks are, is what the A-10 is built for [202]

In April and May 1974, a flyoff between the A-7D and the A-X was held at Fort Riley/McConnell AFB, Kansas, where Army units were deployed in terrain and formations representing a Soviet deployment and active Hawk antiaircraft missile crews attempted to track the aircraft. Four pilots flew each aircraft an equal number of sorties, and the weapon systems evaluation group monitored the tests and analyzed the results under the aegis of the director of defense research and engineering. Following the competition DSARC IIIA was held in July 1974.[203] The A-10 entered production soon after the competition and Maj Gen Harold E. Collins, assistant deputy chief of staff for research and development, explained its characteristics, saying:

> The A-10 is specifically optimized to perform the close air support mission and has excellent maneuverability which will enable it to operate under low ceilings and to employ optimized attack profiles The aircraft will carry up to 16,000 pounds of ordnance for attacking ground units Besides the Maverick missile and cluster munitions, the A-10 will be equipped with the GAU-8 30 mm gun for destroying hard targets such as tanks. The survivability features of the A-10 will allow operation of the A-10 in a high threat environment. The simplicity of the aircraft will allow low maintenance and support requirements as well as high sortie rates The A-10 can stage from austere forward bases and be very responsive to requests for air support [204]

Dr John S. Foster, Jr., director of defense research and engineering, in April 1973 asserted that there was no "unwarranted duplication" between the A-X and the AAH. "Although there is some overlap in capabilities, they operate in different ways and perform best under different situations; thus, they present a much more difficult problem for the enemy to counter."[205] In August 1973 Maj Gen James J. Hill, director of programs and deputy chief of staff for programs and resources, advanced the idea that the role of the AAH was distinguishable from the role of the A-10, the latter being "clearly a close air support role as we have defined it within DoD." Hill explained:

> The AAH is being developed primarily to support airmobile operations and as a helicopter escort aircraft, providing light suppressive fires from positions over friendly territory against targets which threaten an air mobile assault at or very near the forward edge of the battle area It will be capable of engaging armored targets which have penetrated the FEBA, but it is not envisioned as an aircraft that would survive if exposed to the dense enemy firepower expected to exist beyond the FEBA.[206]

As Air Force chief of staff, Gen George S. Brown fostered improving relations with Gen Creighton Abrams, his comrade in arms in Vietnam who became Army chief of staff. In fact just before Gen Robert J. Dixon took command of the Tactical Air Command in October 1973, Generals Abrams and Brown told him they wanted the agreements and good relations in Vietnam carried forward in peacetime.[207] Ending the controversy that had waged so many years, the Army and Air Force in mid-1975 agreed on the relationship of the attack helicopter and fixed-wing close air support, with this announcement:

> The *attack helicopter* is integral to the Army ground maneuver unit and is an *extension of organic firepower.* It is to be employed with, or to the rear of, ground forces along the *forward edge of the battle area* (FEBA) to provide helicopter escort and suppressive fire, to counter enemy armor at the FEBA, and to counter surprise enemy armor penetrations behind friendly lines.
>
> The Army and Air Force agree that the *attack helicopter does not perform CAS* but is intended to complement Air Force CAS capabilities The attack helicopter and Air Force close air support offer the ground commander a complementary capability in terms of a wider spectrum of fire support, enhanced responsiveness, flexibility and capability Because of the *limited range, speed and firepower of attack helicopters* as compared to Air Force fixed-wing CAS capabilities, the Air Force does not consider the attack helicopter as duplicating Air Force CAS.
>
> *Air Force CAS resources are centrally controlled by the Air Force component commander* and respond to the theater-wide CAS requirements of the ground commander—whereas *attack helicopter elements* are integral to the Army's combined arms team and are under control of, and employed directly by, the *various ground commanders* to which they are assigned Through centralized control of Air Force resources, the Air Force provides a means to fully exploit the broader operational capabilities of tactical airpower.[208]

At Langley AFB, Virginia, where TAC headquarters was located, General Dixon quickly established amicable relations with Gen William DePuy, commanding general of the the Army Training and Doctrine Command (TRADOC), whose headquarters was located at nearby Fort Monroe, Virginia Dixon recalled: "We said at the beginning . . . that we think we have a tough job on our hands in the air-land battle, and we are setting out to do that job. We have not mentioned roles and missions yet."[209] The two generals agreed that the Army did not have a separate air force General DePuy said:

> I find it very difficult to think about the Army's helicopters as another tactical air force . . We think about cavalry and we think about infantry, we think about communications, and we think about supply . It just would not work to take Army Aviation out and put it in the Air Force any more than we want to take the Air Force and put it back in the Army.[210]

General Dixon agreed: "The Air Force does not consider Army helicopters an aviation force in the contest of a separate force. I think we have grown up. I think we understand each other. I think the overwhelming size of what we have to do takes first priority with us."[211]

US Navy and Marine Corps Tactical Air

During the hearings of the Senate Special Subcommittee on Close Air Support in 1971 Sen Barry Goldwater argued that the Air Force, Army, Navy, and Marine Corps were all operating tactical air forces despite soaring costs of tactical air weapons.[212] He thought it necessary to reiterate the purpose of the hearings: "It is not an effort to eliminate anything; it is an effort to answer the question of whether we need one, two, three or four tactical air forces. We started out with one, we have grown to four." Goldwater's remedy for the four duplicative tactical air forces, appended to the close-air-support subcommittee's report, was for the Department of Defense to clarify the basic roles and missions of the services. He said, "My concern is imbedded in duplication, a very costly duplication."[213] Over the years after 1971, senators frequently brought up the subject of the four tactical air forces, asking whether there was any plan in the Pentagon for their coordination and why could such common missions as air superiority and ground support be centralized under a single air force.[214]

During the Senate close-air-support hearings, Admiral Moorer had pointed out that development of joint doctrine for united operations was a JCS responsibility, and he had anticipated that joint testing would yield integration into close-air-support joint doctrine.[215] As a matter of fact on 13 February 1967 the Joint Chiefs of Staff had requested the Air Force to develop a joint doctrine for close air support in accordance with JCS Publication 2 and the chief of staff Army/Air Force agreement of April 1965. The Air Force assigned the project to the Tactical Air Command; by 1971 the undertaking had foundered after five drafts of a manual had been circulated among the services without arrival at unanimous

agreement.[216] In the aura of good feeling after the Army-Air Force accords on the AAH and fixed-wing A-10 operations, Gen David Jones took the position that there was some duplication in the tactical air forces fielded by the Air Force, Navy, and Marines but that when the size of the Soviet tactical air forces was considered there was a need for as large a total US force as possible. "We are coming closer together and I think in the next few years we will do better than we have in the past."[217] Gen George S. Brown in February 1976 responded to a question about the four tactical air forces by saying:

> Duplication between the tactical air elements of the four Services is more apparent than real. There is some overlap in capabilities among our various aircraft, but within the Department of Defense, the four Services establish and maintain separate air elements to perform their assigned roles and missions. The tactical air elements of each Service are tailored to meet specific Service mission requirements, some of which require very specialized tasks. They collectively contribute to the total U.S aerial firepower available.[218]

Brown stated the purposes of the tactical air elements in some detail useful to an understanding of their separate taskings:

> The Air Force has structured its tactical air forces to meet its primary responsibilities, to include general air supremacy, air interdiction, air defense, close air support to ground forces, theater airlift, air reconnaissance, and to provide air forces for joint amphibious operations and airborne operations. In a theater of operations, the Air Force component commander (AFCC) centrally controls assigned or attached resources and integrates all TACAIR operations Tactical airlift and tactical reconnaissance missions, as well as combat fighter operations are employed to meet the threat in concert with the overall land campaign Navy tactical air forces are tailored to accomplish specialized operations, primarily oriented toward supporting the combat operations of a naval campaign. The responsibilities of Navy aviation include sea control, fleet defense, and local air superiority in an area of naval operations, and for sea projection operations, including support of amphibious assaults. Navy TACAIR will be used to strike opposing air, surface, and submarine forces at extended ranges, providing a defense in depth against missile and torpedo attacks.
>
> The primary mission of the Marine Corps is to provide Fleet Marine Forces of combined arms, including aviation components, with the ready capability to project combat power ashore against significant opposition. Such operations will include the seizure of defense of advanced naval bases and the conduct of such land operations as may be essential to the prosecution of a naval campaign. The Marine air arm is integral to the balanced air/ground team and is sized to Marine ground force requirements
>
> Army aviation is dedicated to the Army's primary function of conducting prompt and sustained combat operations on land. The attack helicopter is organic to the Army ground maneuver unit and is an extension of organic firepower. The attack helicopter does not perform close air support, but is intended to complement close air support capabilities. The attack helicopter and Air Force fixed wing close air support offer the ground commander a complementary capability in terms of a wider spectrum of fire support, enhanced responsiveness, flexibility, and capability. In building tactical forces, we should base our judgements on the major threat – general war. That is the basis upon which the primary functions of our Services were developed and concomitantly how our

> forces have been structured The availability of naval aviation cannot be assured to support the air/land campaign in the advent of a major war in Europe. Each Service will be performing its primary functions and will probably have little opportunity to perform collateral functions in support of the other Services [219]

Where General Brown's description of the separate service taskings held good during the 1970s, his prediction that there would be little opportunity for collateral functions was not entirely applicable. In fact as the 1970s progressed, the Joint Chiefs of Staff favored intermingling of collateral functions, as witness this statement filed in 1983:

> Military Service capabilities have been tailored to unique service missions while contributing to the total military effort to support US national objectives The Joint Chiefs of Staff have increased emphasis on integration of unique combat capabilities from other services into traditional single service missions, thereby expanding total combat capability The war fighting perspectives of the unified and specified commanders in the field are strong influences in this process as the JCS develop more comprehensive joint doctrine and new weapons systems [220]

The National Security Act of 1947 provided that the US Marine Corps, within the Department of the Navy, should be organized to include not less than three combat divisions and three combat air wings. This mandate recognized that the Marine Corps had continuously developed the art of amphibious warfare. The division/wing organization bespoke the fact that a forcible entry on a hostile shore in the face of a determined enemy was one of the most difficult of all military operations. Maj Gen H. S Hill, Marine Corps deputy chief of staff for Air in 1971, explained:

> The key to success of such an operation is the rapid buildup of combat power ashore, from an initial zero capability, to full coordinated striking power to defeat the enemy Initially, attack aircraft are provided from the aircraft carrier striking forces and subsequently from expeditionary airfields ashore supplemented with carrier aircraft. During the early phase of an operation, close air support and naval gunfire represent the only means of destroying targets that oppose the Marine Corps rifleman. Naval gunfire resources have been diminishing steadily since World War II and air support is the only remaining candidate available to fill the growing deficiency in firepower.[221]

The Marine Corps division/wing ground/air team was designed and practiced to provide immediately responsive air support to ground. As long as Navy carrier aircraft were present they provided air superiority and interdiction, and Marine aircraft were fully devoted to close air support [222]

In a discussion of the Marine Corps in 1976, Gen George Brown pointed to its role and mission as being well beyond amphibious warfare Its three active and one reserve divisions and wings were important parts of the nation's general purpose land and tactical air forces. Brown continued:

> The Marine Corps' broader mission notwithstanding, our Marine amphibious forces constitute the only self-sustained, forcible-entry capability in the U S arsenal today Our

> airlifted forces could deploy rapidly, but are not as readily sustainable as amphibious forces In addition, the ability to forward deploy afloat amphibious forces will continue to be essential for meeting short-notice requirements for military power in distant areas.
>
> The U.S. cannot pre-position land and tactical air forces in every possible area where a crisis may threaten its interests, nor can it count on limitless base rights in overseas areas. Our capability to conduct amphibious operations with a force of combined arms offers the U S an advantage in a conflict, including a NATO-Warsaw Pact war where the availability of such forces provides defensive depth, resilience and capacity for opportune counterstrokes on the flanks of Europe, from the North Cape to the Eastern Mediterranean.[223]

As of 1978 in a NATO war, two Marine amphibious forces were earmarked by formal agreement for NATO, and when assigned to the Supreme Commander Europe would be the major element of his strategic reserve. There were no plans calling for the employment of Marines in NATO's Central Region; rather, plans called for a strategically mobile (preferably amphibious, although Marines could deploy by airlift) force in a variety of scenarios from the Arctic to the Mediterranean.[224] In the Marine Corps the accepted doctrine and practice was that there was a synergistic effect of the Marine Air-Ground Task Force (MAGTF) functioning together as an entity and that to fragment the team would violate a viable combat entity. As has been seen, the long-standing Air Force position was that—in General Momyer's words—"in a theater of operations it is absolutely essential that there be one air commander in order that the air can be employed where it is needed most; and you can't have areas within a theater that are under the various jurisdiction of different people." Momyer urged that once a MAGTF came into a theater, the Marine ground division should come under the theater air commander responsible for total close air support.[225] The Marine position on the inviolability of the MAGTF offered some difficulty in conceptualizing NATO reinforcement. Since there would be a serious shortfall of tactical air capability in NATO at a war's beginning and since the Marine air elements could be expected to arrive in advance of the ground division, would SACEUR have operational control over the air elements? Would SACEUR allow the Marine task force to continue to possess air elements once the MAGTF was ashore since the Marine air elements would be the only air assets in NATO that SACEUR did not own and control? When Lt Gen Andrew W. O'Donnell, deputy chief of staff for plans and policies, USMC, was called upon to answer these questions in 1978 he drew upon the stated policy of Gen Alexander Haig as SACEUR that "national forces are employed in a manner in which they are committed nationally or organized." O'Donnell was confident that Haig would support the Marine position. "He has recognized, as have all joint planners throughout the world, the entity that exists in the Marine air-ground team. . . General Haig has stated that he would be remiss if he would reduce in essence, the capacity of what he views as a viable combat entity." Under these circumstances the Marine Corps's position on the command of air elements during and after a deployment to NATO was as follows:

> The Marine Corps considers organic aviation assets deployed in advance of other elements of a Marine Air-Ground Task Force (MAGTF) as advance combat elements of that force Our employment concepts envision the simultaneous deployment of command elements of the MAGTF headquarters together with whatever combat elements—air or ground—are initially deployed The MAGTF commander will report to the NATO commander to whom ordered and will employ his forces to accomplish missions as assigned him by that commander Upon arrival of all elements of the force, the MAGTF will continue to carry out assigned missions as an integrated, combined arms team in accordance with approved NATO plans Those plans provide explicitly for retention of the integrity of the MAGTF We assume that formally approved Alliance plans constitute sufficient guarantees that Marine forces will be employed in consonance with those plans and with U S national doctrine for the employment of such forces [226]

In joint service negotiations it would continue to be the USMC position that the MAGTF commander would retain ownership of his organic air assets both during and after amphibious operations. During joint operations the MAGTF air assets would normally be in support of the MAGTF mission, but the MAGTF commander would make sorties in excess of the MAGTF direct support requirements available to the joint force commander for tasking through the air component commander Similarly, the MAGTF commander would make sorties for air defense, long-range interdiction, and long-range reconnaissance available to the joint force commander for tasking by the air component commander. But if the joint force commander considered it necessary as prescribed in JCS Publication 2, "Unified Action Armed Forces (UNAAF)," he could exercise other more direct methods of command and control over Marine air elements in his area of operations.[227]

In the Key West agreements of 1948 the Air Force had accepted collateral functions for maritime operations to include interdicting enemy sea power through air operations, conducting antisubmarine warfare and protecting shipping, and conducting aerial minelaying operations. But after 1948 the Air Force did little about these missions for several reasons noted by Maj Gen Robert N. Ginsburgh, USAF, Retired:

> First of all, the supremacy of the US Navy was so great that it neither needed nor wanted Air Force assistance in controlling the seas At the same time, the Air Force was not interested in diverting its efforts from concentration on its primary functions And finally, both Services questioned the capability of Air Force weapon systems to contribute significantly to the sea control mission [228]

The first notable Air Force maritime employment occurred during the Cuban missile crisis, when Soviet freighters carrying missiles were en route to Cuba and their exact location was unknown Then B-47 strategic aircraft were used in an Atlantic Ocean sea search to locate these vessels.[229] In 1968 Air Force EC-121s commenced patrol coverage of the Greenland-Iceland-United Kingdom (GIUK) gap into the North Atlantic, because the route was habituated by Soviet Bears and

Bisons from the Murmansk area and was the prime threat route for any penetration against North America.[230]

In 1970 when Admiral Zumwalt became chief of naval operations he judged that the United States had "just slightly better than an even chance . . . of winning a sea control war . . . with the Soviets." "After 1970," Zumwalt added, "our chances for success . . . diminished."[231] Zumwalt asked the Air Force to broaden its contingency plans to use B-52s for mining important waters, and this was approved in 1971. He proposed early in 1972 and brought it up again at an OSD breakfast in November 1972 that the Air Force's tactical air wings ought to be made carrier capable so that the United States could have optimal basing in instances where there was a lack of access to local airfields. Gen John Ryan, then Air Force chief of staff, had a study of the proposal made and declined to pursue it. Zumwalt later made this same proposal to Secretary Laird and Deputy Secretary Packard, and both declined to touch it because of its jurisdictional complications. Later on—in 1978—another different proposal questioned why US Navy aircraft assigned to aircraft carriers that were withdrawn from sea duty during periodic port overhaul could not be detached to airfields in England. The Navy explained that its aircraft maintenance support equipment was permanently installed in its aircraft carriers and could not easily be put ashore; moreover, the Navy NATO commitment required that any ships in overhaul be returned to operations in 30 to 45 days. Removal of critical air-wing-support equipment and personnel would cause a considerable delay in meeting the NATO commitment.[232]

"We believe the Air Force can help the Navy control the seas," Secretary of Air Force McLucas said in a mid-1974 address. "Today, with longer-range aircraft, radar and other sensors in all our tactical aircraft, and guided weapons, we should be able to attack effectively even maneuvering enemy ships in virtually all of the major sea lanes."[233] Early in 1975 both Adm James L. Holloway III, now chief of naval operations, and Gen David Jones spoke favorably about the use of B-52s—probably B-52Ds—in augmenting Navy-sea control capability. Equipped with the Navy's Harpoon antiship missile, Holloway considered that B-52s would be a "beneficial adjunct" to the US Navy but not a completely dependable asset since the major role of the B-52s was in the SIOP.[234] On 2 September 1975 Holloway and Jones signed a Memorandum of Agreement (MOA) on "The Concept of Operations for USAF Forces Collateral Functions Training." This memorandum envisioned that Air Force capabilities might be employed to perform search and identification, electronic warfare, tactical deception, attack against surface and air units, and aerial minelaying. Air Force resources would be trained for these tasks that complemented and supplemented sea control operations and for which an inherent Air Force capability already existed. Since primary functions might necessarily preempt the availability of Air Force resources, the agreement recognized that a primary organic capability for sea control would have to be maintained. In the performance of the collateral tasks and training for them, Air Force forces would remain under the operational control of appropriate Air Force commanders and operate in support of naval

commanders.[235] Under this agreement SAC, USAFE, PACAF, and TAC commenced training crews of B-52s, F-4s, and F-111s in conjunction with the US Navy. In the developing relationship, Navy spokesmen were careful to emphasize that any collateral support received should not influence the structuring of general purpose naval forces which were designed to carry out two principal missions: sea control (which included both subsurface and surface threats) and power projection. Thus, it was said:

> The rationale for use of Air Force assets for certain maritime functions is primarily one of providing an austere power projection in certain areas of the world where our naval forces do not normally deploy and which is capable of quick reaction to Soviet surface ship deployments during conditions of either crisis or sustained conflict [236]

Admiral Holloway rationalized:

> I think aircraft have a number of advantages as an antisurface ship weapon system, in that they can move quickly to the scene of an encounter; they can search for targets .. The disadvantage is in lack of staying power of an airplane It is good for sort of a one time shot and delivery of a weapon. You cannot keep long range aircraft on station, for example, in the Indian Ocean surveilling Soviet surface task forces in times of tension That can much better be done by our own surface and subsurface fleet [237]

In the late 1970s there was much favorable comment about the use of Air Force collateral resources for sea control, but there were actually some grave limitations on the Air Force side to the undertaking. Gen Russell E. Dougherty stated, "As commander in chief of SAC, I found that I had a lot of capabilities that I could share with other commanders that were very difficult to share." He and Adm Isaac C. Kidd, who was commander in chief, Atlantic (CINCLANT), recognized the potential long-range surveillance and sea-attack capability of SAC and began to exercise it. Dougherty said, however, that this was a "personality sensitive" matter because there was "no systemic opportunity to do this as a matter of routine." Dougherty continued:

> Also, because of the peculiar nature of the way we do things in the Department of Defense, I could use my capability in support of his [Admiral Kidd's] command, but if I got out there and found that I needed something to help me do that job better, I couldn't come back and ask for it because it was a collateral mission and could not generate a requirement Collateral missions by definition inside the Department of Defense can't drive a requirement So I had to use only the capabilities I had developed for other commands to be able to apply to his command, mine laying and long-range surveillance. If I could do it with what I had in hand, fine If it required something new, something changed, something to be procured, I couldn't get it because it was a collateral mission [238]

As a matter of fact, B-52s had very little antiship capability, mainly because neither gravity bombs nor limited-range glide bombs provided any standoff capability such as would be needed for an effective attack against any kind of

defended group of combatants of the Soviet navy. Explained Gen Richard Ellis, CINCSAC, in 1981:

> SAC has been tasked by the Joint Chiefs of Staff Joint Strategic Capabilities Plan to perform three collateral missions: aerial minelaying, conducting antisubmarine warfare and interdicting enemy sea power through air operations. . . . Given the proper tactical situation, our aerial minelaying can be a most effective deterrent. However, our sea power interdiction capability is severely limited by the lack of weapons with enough range to allow aircraft survivability. Most importantly, today we would have to remove forces from their SIOP commitments in order to accomplish these missions.[239]

In 1981 Adm John T. Hayward, chief of naval operations (CNO), was very concerned about the danger of Soviet Backfire land-based Navy bombers against US fleet units at sea, especially in the North Atlantic. He wanted to work with Gen Lew Allen to increase the number of AWACS aircraft to assure fleet protection, but he was skeptical about counting on the Air Force for assets not under Navy control. He was concerned that in a crisis, most available AWACS would be assigned to highest priority NATO missions in the Central Region. Similarly, the Navy was concerned about any proposal to augment antiship maritime support B-52 capabilities, since in an emergency the national command authorities would decide to generate a maximum nuclear SIOP force, and the B-52s would likely be withdrawn from an antiship role.[240]

During the Carter administration the emphasis laid upon strengthening NATO's Central Region had reduced funding for Navy and Marine Corps units worldwide. In the Reagan administration, Secretary of the Navy John Lehman, Jr., actively promoted a "maritime strategy" different from what he described as the "laid-back, Carter" strategy for protecting the sea lines of communication (SLOC) to Europe. Lehman's proposal was to protect the SLOC by offensively striking the Soviet Navy near its heavily defended fleet bases. In addition to a five-year plan to build to a 600-ship Navy including 15 carrier battlegroups, Secretary Weinberger in 1982 stated defense guidance that expanded the role of Air Force aircraft in defending the sea-lanes against Soviet long-range bombers armed with antiship missiles. Weinberger said, "Where geographically feasible, we plan to establish barriers composed of land-based interceptors, supported by long-range surveillance systems, to detect and engage Soviet bombers before they can threaten our naval forces transiting the sea lanes."[241] Staff preparation between the Navy and the Air Force developed areas of needed activity. The Navy essentially believed that it had sufficient assets to deal with antisurface warfare requirements and discouraged Air Force resource commitments to attacking ships, especially since B-52s lacked standoff munitions. The Air Force was planning on increasing mining capability in B-52H aircraft that were programmed for a new strategic projection force. The most pressing area where the Air Force could help the Navy was in antiair warfare. The new CNO, Adm James D. Watkins, considered the Backfire and Soviet submarine-launched cruise missiles to be the biggest threats to the

American aircraft carriers. Already Navy airmen were working very closely with Air Force AWACS controllers. "The AWACS aircraft has pulled the Air Force and the Navy closely together throughout the world. They are operating off Japan, Okinawa, and periodically Iceland," Watkins said. Even though he was favorably impressed with what was being described as Air Force-Navy "interoperability," Watkins sought formal memoranda of agreement (MOA) with Gen Charles Gabriel, who had taken over as Air Force chief of staff. Watkins noted: "I felt there was need to put teeth behind some of the rhetoric of interservice cooperation."[242] Gabriel and Watkins jointly signed a basic MOA on 9 September 1982, and on 25 October Secretaries Verne Orr and Lehman joined them in another endorsing MOA called, "Joint USN/USAF Efforts for Enhancement of the Joint Cooperation." In Gabriel's words:

> The memorandum of agreement with the Navy acknowledges that we can do the job better—together. Our first efforts will be directed toward sea lane air defense We plan to have our skills for doing this through a joint training program and realistic joint exercises Other areas in which the Air Force can help include indications and warnings, surveillance and targeting; command, control and communications, aerial minelaying; electronic warfare; delivery of Navy special operations force and aerial refueling.[243]

The top-down endorsement of the basic MOA on 25 October emphasized joint training and interoperability and agreed to establish a joint training center and "war at sea range" at Key West, Florida, that would develop joint tactical doctrine for maritime operations as well as combination air superiority, surface warfare, and undersea warfare training for both services. In February 1983, General Gabriel summarized the new Air Force-Navy relations:

> Let me say this—with the new CNO, Admiral Watkins, we are going to do everything we can to work closely together. . . The F-15s and the AWACS will give cover to the Navy wherever they need it. . . . We practice it in the Pacific and in the Atlantic all the time now and in the Med[iterrean] and Indian Ocean We can do that. We do have the crossover We don't have the parochial blocks any longer[244]

The Tactical Air Command—Training and Doctrine Command

In the aftermath of the roles and missions embroilment generated by often parochial assertions incident to the Cheyenne-AX programs, General Brown as Air Force chief of staff and General Abrams as Army chief of staff had hoped that the mutual understanding and common outlook they had shared in combat in Southeast Asia could be carried forward in peacetime, institutionalized, and expanded into a continual working process within and between the Army and the Air Force Brown and Abrams personally impressed these thoughts on Gen Robert J. Dixon while he was on his way to take command of the Tactical Air Command on 1 October 1973. Four days later, on 5 October, General Abrams wrote Gen William E. DePuy, commander of the US Army Training and Doctrine Command

(TRADOC), with headquarters at Fort Monroe, Virginia, seven miles from Langley AFB, Virginia, of his desire for Army-Air Force cooperation:

> I have long believed that since there exists in the Army and Air Force a unique complementary relationship to conduct warfare on the landmass, it is absolutely essential that a close relationship exist, at all levels, between the two Services. The Army's recent experience in Southeast Asia has further reinforced my belief in the essentiality of close working ties with the Air Force.... The problem that George Brown and I both face, is how to carry over this commonality of purpose which existed so clearly in Vietnam, as it has in other operational settings, into the entire fabric of relationships between the two Services.[245]

On 16 October 1973 Dixon and DePuy met jointly and commenced a TAC/TRADOC relationship that matured from a dialogue to a partnership. The steady growth of Soviet/Warsaw Pact forces threatening NATO, already evident in number and capability in 1973, demanded that, in General Dixon's words, "the Army-Air Force air-land battle team get the most capability out of what we have and provide the most precise, analytical and coordinated information possible on our needs for added capabilities."[246] In view of the 1973 threat Dixon and DePuy decided first to focus improvements of existing joint combat capabilities on procedures to win the air-land battle. It was soon clear to Dixon and DePuy that the services in the past had tended to identify and present for DSARC review systems individually. Instead, the effectiveness of each individual system was often highly dependent on interface with other systems.[247] As a start, to begin to carry on daily work, the TAC deputy chief of staff for plans and the TRADOC deputy chief of staff for combat developments were made comanagers of a joint actions steering committee, and at their first meeting they established joint TAC/TRADOC working groups to devise procedures for airspace management and reconnaissance/surveillance. Soon, working groups on electronic warfare, air logistics, and remotely piloted vehicles (RPVs) were established. The working group arrangement did not provide a structure for continuous and detailed analysis. The air-land forces application (ALFA) directorate was accordingly formed with five Army and five Air Force officers, headed by a leader who rotated each year between services. Because ALFA was small it was authorized to form joint groups from TAC and TRADOC staffs to address particular problems related to the ALFA mission of developing concepts and procedures to win the air-land battle. By 1976 ALFA was working seven problem areas: airspace management, reconnaissance/surveillance (including RPVs and remote sensors), air defense suppression, electronic warfare, forward air controller/forward observer, air base defense, and air logistics.[248] The Langley AFB ALFA was actively supported by USAFE and USAREUR, and in 1976 these European commands organized their own joint directorate of air-land forces application (DALFA), located at Ramstein Air Base, West Germany, and charged to center on current problems of how best to generate maximum combat power. DALFA

focused on more immediate concerns than the longer-range ALFA, getting some quick evidences of Army-Air Force cooperation in Europe.

Through a joint USAFE/USAREUR regulation, specific USAFE wings/squadrons were aligned with USAREUR divisions/regiments. Units so aligned cooperated with each other in daily planning and execution of close-air-support training and planning for effective support of Army war plans. Since Army general defense plans reflected expected enemy main axes of attack, a tactical air plan and exercise called Creek Braille was practicable. The concept of Creek Braille hinged on the ground commander identifying probable axes of attack; aircrews studied maps and area photography, and visually identified key terrain features, predesignated contact points, and preselected kill zones. Such preplanning, it was reasonable to expect, would result in a rapid response to a familiar target area, an increased possibility of effectiveness on a single ordnance pass, and an effective counter to hostile communications jamming, enhanced aircrew survivability through greater familiarity with the geographical environment, but decreased reliance on a command and control system that might be degraded by enemy action. Creek Braille was a technique and a prospective prudent response to chaotic conditions likely to exist in NATO's Central Region during the first few hours or days of a Soviet/Warsaw Pact attack.[249]

One of the first achievements of the TAC/TRADOC ALFA was the agreement on airspace management produced by an airspace management working group. The issue of Air Force overcontrol of low-altitude Army traffic was resolved by a flexible and simple establishment of a situation-dependent ceiling, where all air traffic above the ceiling operated under positive control of the Air Force tactical air control system and all Army traffic below the ceiling operated under procedures established by appropriate authority, such as operations orders for particular undertakings. Large-scale operations in the low-altitude regime were handled as exceptions to usual rules if need be. The altitude ceiling was set by joint force commanders, since terrain varied from place to place. The TAC/TRADOC arrangement for airspace management was accepted by both the Army and Air Force and was printed as a joint manual on 1 November 1976.[250]

The success of TAC/TRADOC in providing an agreeable system for aerospace management in a battle area was hailed by both General Jones, the JCS chairman, and Gen Fred C. Weyand, the later Army chief of staff, as a harbinger of the solution of air-land problems. General Weyand wrote:

> I have read the joint manual of aerospace management and believe it a major step toward insuring the integrated efforts of our air and land forces on the modern battlefield. Bill DePuy is very enthusiastic about the prospects for success in addressing other areas of mutual concern The progress made in resolving our airspace management problem is proof that his enthusiasm is well founded [251]

In projecting the TAC/TRADOC cooperative venture General Dixon expected to begin with procedures, expand to include current and future concepts, thence

joint requirements and priorities, and ultimately to address force structure. General DePuy gave more emphasis to developing common procedures:

> We are working on the procedures . . . for close air support, air defense suppression and a lot of other things. It is not that this has never happened before, but I submit to you it probably has not ever happened before with the intensity that it has right now. We are doing this because we have one objective General Dixon and I are not in the R. & D. business, we are not in the force structure business That is done by others We have a mission which is to make the joint Air Force-Army team out there, the joint task force, as effective as we can by learning how to do these things together, the techniques, the tactics and the procedures.[252]

In General Dixon's view, the TAC/TRADOC "dialogue" developed into a "partnership," but it was nevertheless true that the partnership was better able to develop procedures than to handle resulting quantification of requirements. Analysis of systems, moreover, revealed that there were synergistic interrelations of prices adding to the complexity of quantification. For example, effectiveness in prices of reconnaissance/surveillance affected defense suppression. As work progressed, there were nevertheless desirable learning outcomes. In defense suppression, for example, the joint working group took 40 Army and Air Force systems that related to the defense suppression task and developed a picture of what could be done most effectively with existing capabilities, but could not immediately address what was needed or duplicative because the group lacked a means of systemic quantification. On the other hand, joint suppression of enemy air defenses (J-SEAD) procedures manuals were conceived and published, and specific bits and pieces of joint work were addressed and quantifiable. After the Yom Kippur War General Brown had directed that programs be looked at in defense suppression and that those with the most promise be brought forward as soon as possible. The existing Wild Weasel system used in Southeast Asia had many known deficiencies, and as a result an F-4G Wild Weasel optimized to detect, identify, locate, attack, and destroy enemy threat radars in Eastern Europe was put into development. The J-SEAD study essayed a rough, initial, joint quantification of the effect the programmed F-4G Wild Weasel would have. Before this could begin, however, the conferees discovered that there was no single source document that had the details on Warsaw Pact ground-based air defenses needed for analytical purposes. They therefore built and published a handbook on Warsaw Pact ground-based air defenses (code-named Hydra). The resulting study showed that the advanced F-4G Wild Weasel would effectively reduce total fighter losses in the US *V* and *VI* Corps areas of Central Europe by an undisclosed figure, simultaneously increasing the number of fighter sorties to be available at the end of the first three days of hostilities.[253]

The TAC/TRADOC examination of J-SEAD also yielded new thinking on the subject of the airborne forward air controller (FAC) and his survivability in a European defense environment. At Air Force level in 1976 there was thinking that a new, more-survivable FAC-X aircraft was quite possibly going to be a two-seat

A-10.[254] There was general agreement that the O-2 and OV-10 aircraft used by airborne FACs to find targets, identify them, mark them for attack, and to direct strike fighters would be grossly vulnerable in Europe. The TAC/TRADOC joint study proposed to address the problem by a new concept of operations that moved the airborne FAC to a rear position on the battlefield, changed his role to that of a coordinator of air strikes, and placed greater reliance on Army forward observers to acquire and designate targets. This concept was refined in concert with USAFE and USAREUR, and in November 1977 it was tested during more general maneuver exercises of Army attack helicopters and A-10s at Fort Hunter Liggett, in California. This joint air weapon system (JAWS) exercise used four Army scout helicopters, one of which lifted the Air Force ground FAC to an elevated view. The airborne Air Force FAC was in an OV-10 a number of kilometers back of the FEBA, where he acted as a communication link between the FAC in the scout helicopter and the four strike A-10s. The airborne FAC passed on target information, air defense locations, and the battle situation. In JAWS the abilities of Army strike helicopters and A-10s were demonstrated to be complementary in attack as well as a complication to the enemy air defense problem.[255]

The TAC/TRADOC joint reconnaissance/surveillance study group was called upon to perform a mission area analysis, quantifying joint capabilities and needs in 1980, 1984, and 1994. One past obstacle in quantifying reconnaissance/surveillance had been in defining analytically how to relate reconnaissance/surveillance to success in other mission areas and to determine precisely how reconnaissance/surveillance relates to the outcome of the air-land battle. To counter a Warsaw Pact offensive it would be necessary to destroy enemy forces before their contact with friendly forces, to have situation assessment and decisions in near real time, to identify elements posing the greatest threat, and to concentrate friendly firepower. The task was to get reconnaissance/surveillance to air and ground commanders who needed it to get their forces directed at the right place at the right time to stop an enemy advance. The existing 30 Air Force and Army systems could find and report groups of things, but with limited firepower there was a need for discriminate applications The critical demand for reconnaissance/surveillance was thus to identify the enemy's combat momentum, which was essentially a combination of massed firepower and movement. The essential task of reconnaissance/surveillance was timely location and reporting of combat momentum.[256] In the European maneuver, NATO forces were outmanned and undergunned. They could not fight on a one-to-one basis and win. They had to maneuver effectively both on the ground and in the air. But to maneuver effectively, there was a need for information that was timely, useful, and given to the right commanders at all echelons. There was also a need to locate targets with essential timeliness and accuracy to bring Air Force or Army weapons to bear on them.[257]

As it happened, the main TAC/TRADOC contribution to the Air Force-Army reconnaissance/surveillance planning was the development of a joint mission element needs statement (MENS) since the reconnaissance programs undertaken

in the early 1970s strayed into some blind alleys, resulting in delays that eventually demanded expedited attention in 1977 at the Air Force-Army Washington staff level.[258] In Southeast Asia the Air Force had used remotely piloted vehicles (RPVs) for reconnaissance purposes basically to reduce manned aircraft attrition in high-threat environments. By using photographic RPVs over Hanoi, for example, the Air Force successfully reduced losses of photo aircraft and crews. The RPV equipment that was used in Southeast Asia was innovative and plagued with reliability and recovery problems, but it was made to fulfill an emerging combat mission by what was described as a Band-Aid approach—fixing defects and making improvements as needed. The Army and the Navy also experienced failures in RPV programs in the late 1960s that left them somewhat unenthusiastic about such techniques. The Air Force had some enthusiasm for RPVs, provided they could meet basic requirements of reducing manned aircraft in high-threat environments or of achieving significant cost advantages over comparably manned aircraft systems or providing a means of acceptable operation in politically sensitive areas or missions. In 1974 the main Air Force development RPV program was Compass Cope, or the twin prototype fabrication of two models of a high-altitude, long-endurance RPV that would be outfitted for signal intelligence (SIGINT), battlefield surveillance, precision emitter location strike system (PELSS), ocean surveillance, communications relay, or atmospheric sampling as needed. The Boeing Company fabricated a prototype YQM-94A and the Teledyne Ryan Company built a YQM-98A. The Air Force RPV program also included a tactical expendable drone system (TEDS) that would fly one-way missions to confuse, saturate, and degrade Soviet/Warsaw Pact defenses. A low-medium altitude multimission RPV (MMRPV), designated AQM-34, would be needed to fill reconnaissance, electronic warfare, and air-to-ground strike control requirements.[259] In addition to RPVs, the Air Force reconnaissance programs also included the upgrading of RF-4C aircraft to provide a quick-strike reconnaissance (QSR) capability that would be needed to counter a Warsaw Pact offensive.[260]

In September 1977 the Air Force realized that its ongoing reconnaissance programs were based on what was described as "a Vietnam War/Korean War/World War II mentality." There were problems in all-weather surveillance, getting the right information to the right user, and saturating communications lines. Under the direction of Gen Alton D. Slay, deputy chief of staff for research and development, Air Force and Army staff representatives undertook what they expected to be a "landmark effort which will have a long-term effect on the composition and employment of all reconnaissance resources of the United States." The study was approved by the Army and Air Force chiefs of staff on 1 December 1977 and was reflected in changes to the fiscal year 1979 budget and adjustments to the Army-Air Force five-year development plans. In addition, a coordinating committee was established at the general officer level within the staffs of the Departments of Army and Air Force to correlate reconnaissance programs of the two services. The resolution of reconnaissance/surveillance brought marked reductions in RPVs. General Dixon explained, "RPV technology and development

has not matured to the point where RPVs can effectively perform all portions of the time sensitive reconnaissance mission. . . . Believe me, if we could get an efficient RPV – efficient in the overall sense – we'd press to have it produced."[261] Even before the reconnaissance study, the secretary of the Air Force canceled Compass Cope because it could not be justified as cost-effective: expected attrition in landing and takeoff posed excessive costs, and it could not be expected to have the lift capacity required for weight of the precision location strike system (PLSS). General Slay said, "I was never able . . . to make what I considered a real compelling case for our analysis on the cost effectiveness of Compass Cope."[262] The Air Force/Army Reconnaissance Force Study recommended that additional AQM-34 low-to-medium altitude remotely piloted vehicles not be procured, the rationale being based on the limited operational utility of the reconnaissance RPV and the high total cost and the complex recovery problems associated with current RPV operations. Additionally, the study concluded that the Air Force should look toward the Army, looking at a simple, cheap RPV for operation in and about the FEBA to save manned reconnaissance aircraft, rather than to continue to buy and operate bigger, more expensive RPVs.[263]

The major recommendation of the Air Force/Army Reconnaissance Force Study reflected a need for recce architecture conversant with the hostile threat to NATO and the prospective NATO strategy to deal with an enemy attack. "It is not feasible to match the Soviets man for man and tank for tank. However, it is possible to fight outnumbered and win provided you know when and where to employ your forces, and if they are employed against those elements of the threat, which if destroyed or degraded, reduced drastically the overall combat capability of the enemy," said Brig Gen Charles R. Canedy, deputy director of Army requirements and an Army aviation officer.[264] These were "critical modes," and they were command posts, communications centers, fire direction centers, weapons, prime movers, and jammers. The study proposed to reopen the U-2R production line at Palmdale, California, with stored tooling and produce 35 TR-1 high-altitude reconnaissance aircraft to be used as platforms for all-weather battlefield surveillance in the form of the precision location strike system. The PLSS was an advancement of the advanced location strike system (ALSS) being built for Southeast Asia requirements at the time US involvement in the war wound down. In the description of Maj Gen Richard C. Henry, director of development and acquisition and deputy chief of staff of Air Force research and development, the PLSS was admittedly complicated and expensive. "But every time we march up to the brink and address that system, we find that that is the only way that we know how to deliver weapons on target with execution accuracy."[265] The TR-1 and PLSS programs were strongly supported by both Army and Air Force, and procurement of the first two TR-1s started in fiscal year 1979. Produced at the Advanced Development Projects Division (Skunk Works) of the Lockheed California Company, the TR-1 program encountered an almost immediate cost overrun because its costs were shared with Lockheed's discontinued L-101 transport aircraft. The TR-1 was capable of long loiter standoff surveillance from altitudes

above 60,000 feet; its modular payload changeable-mode concept permitted its use with a variety of reconnaissance sensors or to act as an airborne relay for the PLSS.[266]

Even though the PLSS was only partly in production and mostly still being designed in 1981–83, both the Air Force and the Army placed a high priority on the TR-1 and the PLSS. The Air Force planned to establish two TR-1 reconnaissance orbits and one PLSS Triad (three orbiting TR-1s) to cover the Central European borders. These orbits would provide critical indications and warning during peacetime and target detection and identification for battlefield management and strike execution during hostilities. The three sensor-equipped TR-1s would pick up any electronic radiation site from across the border, triangulate its location, and send the information back to the central processing ground station. The ground station, either in West Germany or England—and perhaps in both places, with the second station playing backup—would process the emitter location and provide the information to strike aircraft or friendly artillery for attack suppression. "It is our doctrine to key upon the command, control and communications elements of the Soviet-Warsaw Pact forces recognizing that they are highly centralized in their control," explained Brig Gen Richard D. Kenyon, the US Army aviation officer and the deputy chief of staff for operations and plans.[267] The TAC commander, Gen Wilbur L. Creech, described the PLSS:

> A critical element of our overall approach to defense suppression is the Precision Location Strike System (PLSS) Now, PLSS essentially is a system that provides . a precise location on each enemy threat emitter through electronic intercept by high-flying TR-1 aircraft The great beauty of the system is that it allows us to keep track of those various threats in real time, and to develop the strategy for countering them. . . Our strategy will call for us to kill some, disrupt others, and very importantly, to avoid the rest . . In this sense, PLSS is to the ground threats as AWACS is to the air threats [268]

Second Echelon Attack/AirLand Battle

In 1972 Col Kenneth L. Moll of the Air Force Directorate of Doctrine, Concepts, and Objectives conceived of a project for putting together an Air Force future concepts workbook detailing where the Air Force should go and how to get there. Moll suggested among other things that criteria should be devised for measuring and comparing different concepts. When the project ran on without completion, Maj Gen Leslie W. Bray, Jr., who was the director of Doctrine, Concepts, and Objectives, suggested that a series of seminars like those used in the curriculum of the Air War College "back off and reexamine all of the concepts and doctrines for the employment of airpower that have been evolved and been handed down to us." The first week of the seminars concentrated on land and naval warfare, and from the discussions of the past emerged a new concept which General Bray was going to call "tactical counterforce."[269] Bray wrote:

> Tactical Counterforce has as its objective the destruction or disruption of major ground forces that threaten, but are not engaged with, friendly ground forces The targets are enemy firepower elements located beyond the forward edge of the battle area. Because it strikes directly at enemy land forces rather than lines of communication, Tactical Counterforce differs from current perceptions and from the traditional emphasis of interdiction. . . . Isolation of the battlefield—interdiction, as it is commonly perceived today—would continue to be another essential function of tactical air. But Tactical Counterforce adds an enlarged dimension to current perceptions of interdiction [270]

In the NATO Central Region, Bray pointed out, Warsaw Pact forces were poised on two fronts—designated "initial" and "reinforcing." The initial spearhead divisions were expected to break through NATO defenses and the reinforcing second echelon would exploit the breakthrough: this was the standard Soviet tactic of mass assault.

> It might be possible to use Tactical Counterforce against the fast-moving spearhead units before they came into contact with the friendly ground forces, but this is likely to be a brief, transitory phase. In the latter and continuing stages of the attack, the spearhead units would be operating within the reach of friendly ground forces; air attacks against these units would fall within the purview of close air support. But the bulk of the Warsaw Pact forces (the driving part of the wedge) would be deployed beyond the reach of friendly ground forces and outside the area covered by close air support If a large number of these elements of enemy firepower (tanks, artillery, personnel carriers) could be rapidly attrited by Tactical Counterforce, the momentum of the attack would be blunted. Friendly ground forces, with close air support, could cope much more easily with the reduced pressures exerted by the spearhead and residual forces, thus significantly improving the prospects of halting the attack.[271]

On the basis of experience with aerial interdiction in Southeast Asia, it had been fashionable to demean the significance of air attack in any so-called choking off of enemy movement toward a ground front. On the basis of systems analysis, Alain C. Enthoven, for example, argued that deep interdiction in Europe would not be productive.

> It would be virtually impossible to disrupt the flow of essential war materiel from rear areas to the front by means of a conventional bombing campaign against railroad centers, bridges, and roads Systems analysis studies indicated that even if flow capacity could be reduced by as much as 90 percent, the remaining capacity would be enough to reinforce and resupply an 80-division Warsaw Pact force Moreover, an interdiction effort of this magnitude would require forces far in excess of even those recommended by the Services This point is important, because half an interdiction campaign is not worth much [272]

Possibly on the basis of such interpretations, Admiral Moorer, while JCS chairman, burst out:

> God forbid that we base our future on the total concept of operations as they have been conducted in South Vietnam. I think one of the unfortunate outcomes of this is that there has been placed in the minds of many people some question as to the utility, for

> instance, of air interdiction in a combat environment. And here again it would be a grave mistake, I think, to draw conclusions with respect to the effectiveness of air interdiction solely on the basis of the way it has been conducted in Southeast Asia.[273]

In his exposition on tactical counterforce, General Bray noted that because of emphasis in Vietnam, Korea, and World War II, "interdiction today has come to be identified almost solely with reducing the flow of men and materials." Bray had in mind the use of new technology to track and destroy enemy forces. "Indeed, if airpower can find and strike enemy forces as effectively as is suggested by the new technology, this independent capacity should be given marked emphasis. It might well emerge as a significant and perhaps decisive factor for countering enemy land forces in the future."[274]

During the 1970–73 years the US Army was trying to restructure itself from the Vietnam experience, and the Army staff recognized that there was no well-articulated military policy. Of the possible wars of the future, a mechanized war in NATO Europe, although the least likely war, was the most important in terms of national survival and Western civilization. An analysis in TRADOC of more than 1,000 tank battles made it apparent that the smaller side did not necessarily lose to the numerically superior enemy. The 1973 Middle East War, moreover, demonstrated there was a "new lethality" in defense weaponry. Using terrain as a combat multiplier, the defender needed to see deep to find the following Soviet/Warsaw Pact echelon, move fast to concentrate forces, strike quickly before the enemy could break the defenses, and finish the fight quickly before the second echelon closed.[275] As the Army studies were progressing, the Air Force concept of interdiction as an attack against the Soviet/Warsaw Pact second-echelon forces fitted well. Lt Gen Robert R. Williams, US Army assistant chief of staff for force development, believes air superiority offers a deterrence to the enemy air force in Europe. With massive armor, he continues, the Army can drive back the enemy and hold them there.[276]

In 1976 General DePuy sequenced American responses to a massive Soviet attack.

> The first thing we really need to know is where is that attack going to take place That is one of the first areas where we are dependent on the Air Force. . We need to see back where the second and third echelon are, and we need to see back there before it happens.[277]

While the US ground forces were racing to the scene of attack, DePuy continued,

> we would hope . . that the US Air Force was working on his second echelon so that that particular problem did not arise on the battlefield. It is doubtful that the Air Force would eliminate the second or third echelon. It is highly desirable that they do it a lot of damage [278]

On 1 July 1976 the Army issued a new version of Field Manual 100-5, *Operations*, that placed great emphasis on the concept of "fight outnumbered and win" by a combination of use of terrain as a defense multiplier and the "new lethality" of new antitank weapons. Emphasis was on winning the first battle—a firepower battle along the forward edge of the battle area. The 1976 version of FM 100-5 set in motion a pointed doctrinal debate by critics who insisted that it was based upon a conception of firepower/attrition and gave no real attention to a maneuver concept of war.[279]

In 1977 Gen Donn A. Starry replaced General DePuy as commanding general, TRADOC, and he brought a close interest in tactical doctrine sharpened by his most recent assignment as a US Army corps commander in West Germany. In Starry's eyes the focus of FM 100-5 on the central battle along the FEBA overlooked the enemy's massive second-echelon exploitation forces which, by Soviet doctrine, would roll through the first echelon and exploit any gains it had made. A Soviet/Warsaw Pact combined-arms army deployed in a depth of about 100 kilometers, its first-echelon divisions were about 30 kilometers deep, its second-echelon divisions about 50 to 60 kilometers back, and the reconnaissance elements of the second-echelon army were about 120 kilometers to the rear. Overall, Starry said, the enemy wanted a pre-attack preponderance of force of a minimum of 3 to 1 and preferably 6 to 1. On what he came to describe as the "extended battlefield," Starry demonstrated that a US Army corps commander would find it "essential for friendly air to keep enemy air off his back," would need "aerial reconnaissance and surveillance because he does not himself have the means to see the second echelon divisions or the second echelon army," and would have to depend on tactical air to interdict the movement forward of enemy second echelons since—except for the nonnuclear Lance missile—a corps commander's "organic fire support can reach only about as far as he can see." In the way of "observations" from the description of the extended battlefield, Starry said:

> Counterair, electronic warfare, and air defense operations must be carefully integrated and correctly employed in order to defeat the weight of airpower that the enemy can bring to bear on us. Finding the second echelon divisions and armies is so critical to the corps commanders that timeliness of response and responsiveness of coverage of the air reconnaissance system must be established and guaranteed beyond doubt . . . Breaking up the mass and slowing the momentum of second echelon forces is critical to the ground commander fighting the first echelon. The air commander must concentrate on this task, for the ground commander hasn't the organic resources either to find or to fire at the second echelon. Forces fighting the first echelon must have the additional target servicing capability of aerial firepower to win against a breakthrough. Therefore, it is imperative that we completely integrate fixed and rotary wing antiarmor systems, and learn how to direct them in battle under command of a team leader, with whom they have trained extensively.[280]

To add clarity to the new Army fighting concept, General Starry chose "AirLand Battle" to describe it, since he conceived that the battlefield had a deeper dimension in time as well as distance, in air as well as on ground. A brigade

commander looking beyond his forward line of own troops (FLOT) had to influence events up to 15 kilometers behind the enemy's rear, a division commander up to 70 kilometers, and a corps commander up to 150 kilometers. These distances translated into time from the FLOT to the onrushing enemy attack—12 hours for the brigade, 24 for the division, and 72 for the corps. In describing the new strategy, Gen Edward C. Meyer, Army chief of staff, talked of the old NATO defense strategy as fight and fall back, and said that as a change NATO forces would oppose an initial enemy attack, would not break away, would keep to the enemy's side, and would attack his flanks. Gen George Blanchard, commander in chief, US Army Forces, Europe, added:

> That still doesn't say that you don't have to move some battalions in front of penetrations But the doctrine addresses that as well. And the great thing of the mobility of the battlefield, of the armored battlefield, is that you are allowed, if you will, to do that kind of activity, to attack, counterattack, in a somewhat different way than we think of from the traditional World War II counterattack involving a whole corps or a whole division. It is a counterattack even at the company level, throwing off balance, if you will.[281]

Blanchard agreed with a questioner's comment that intelligence requirements for the new strategy were higher than ever before. He said:

> I think your comment is a good one, because intelligence requirements which have always been high become even higher . and the ability to see across to the other side becomes essential. In fact, the total capability of NATO intelligence-wise, not just the United States, has to be integrated into the type of fusion capability that we are attempting to gain through our allied concept, as well as through our US concept And the ability to perform what we refer to as target acquisition becomes extremely important on the battlefield, both to the Army and Air Force forces.[282]

Although the July 1976 edition of Army Field Manual 100-5, *Operations*, was able to encompass the incipient AirLand Battle concept, the 1976 manual continued to remain under attack, especially by the loose coterie of congressmen, civilian defense analysts, and mostly junior military personnel described as the military reform movement. One charge was that ever since the American Civil War the US military strategies were based upon attrition of the enemy rather than maneuver, and that the Soviet Union was obviously better able to endure a head-to-head war than the United States.[283] Under General Starry's initiatives, the air-land concept gradually took form in 1977–80. TRADOC presented the extended battlefield concept at the Army Commanders' Conference of October 1980, and General Meyer approved it at that time. After this, TRADOC developed briefings about AirLand Battle that were widely presented in Washington and throughout the Army. The congressional reform caucus was favorably impressed. At Fort Leavenworth, Kansas, work proceeded on revisions of FM 100-5, the principal author being Lt Col Huba Wass de Czega, an officer assigned to the Command and General Staff College. The draft revision was published in September 1981 and was subjected to an extended review in the Army prior to its

publication in August 1982.[284] The codified doctrine placed primary emphasis on maneuver, counterattack, and the ability to keep the enemy off balance. Wass de Czega said that the purpose of second-echelon attack was not so much to whittle down the enemy troops before they reached the front as to throw off their timing. "The idea is to throw his timetable off so that we have a maneuver advantage," he said. "If you have the capability to make the long shots now and then, you loosen up the other side. But you can't count on those long shots, and they are not your bread and butter shots."[285]

The name AirLand Battle implied that there was cooperation and agreement between the Army and the Air Force, but in fact the doctrine was a unilateral development of the Army. Army leaders pointed to a memorandum of understanding between Generals Meyer and Gabriel signed in April 1983 as evidence of Air Force endorsement of the AirLand Battle, but to more critical viewers the official agreement merely committed the Army and Air Force to cooperate in "joint tactical training and field exercises based on AirLand Battle doctrine." One member of the AirLand Forces Application Agency, Maj James A. Machos, said of the Meyer-Gabriel MOU, "It does not acknowledge AirLand Battle doctrine as the sole governing principle for joint training and exercises, nor does it concede unequivocal primacy of AirLand Battle doctrine over established Air Force doctrine."[286] Another unnamed Air Force official said: "When we say we agree with the air-land battle concept, what we are saying is that we agree that the concept is a good concept for the Army."[287]

Both during the drawing of the concepts and later when appearing in the published field manual, the Army's AirLand Battle doctrine occasioned discussions of Air Force TACAIR. Because of the vast numerical superiority of the Soviet/Warsaw Pact forces, Edgar Ulsamer, an *Air Force Magazine* senior editor, pointed out, there would be a subtle change in air superiority doctrine:

> If intelligence is right, NATO ground forces could achieve local superiority against the first assault echelon The second, equally decisive, "if" is whether US and other NATO tactical airpower would be able to deal with the Pact's second echelon before it could engage NATO ground forces at the forward edge of the battle area. This, then, leads to the third requirement for a successful defense by NATO forces—the rapid achievement of local air superiority over the main battle area to permit interdictions of Pact follow-on attacks [288]

Elaborating on Ulsamer's diagnosis, Robert S Dotson, an Air Force Reserve officer employed as a national security budget examiner in the Office of Management and Budget, added the prediction that the main air-ground battle would be against the Pact's second echelon and, in the exposition of this matter, coined a new term, *battlefield air interdiction* (BAI). In explaining the new term, Dotson noted that AFM 2-1, *Tactical Air Operations—Counter Air, Close Air Support, and Air Interdiction*, did "not differentiate within the air interdiction function relative to the forward edge of the battle area (FEBA)." He meant the term *battlefield interdiction* to refer to that portion of the air interdiction function

in support of friendly ground forces beyond the range of weapons organic to those ground forces.[289]

At the Air War College, Col Robert D. Rasmussen almost immediately noted that the dividing line between close air support and interdiction had always been the fire support coordination line (FSCL) that had originally been called the bomb safety line. Detailed integration of air missions with the fire and movement of friendly forces was required for close air support within the FSCL for the safety of the friendly forces; detailed integration of air interdiction missions with the fire and movement of friendly forces outside the FSCL was not necessary because the safety of friendly forces was not involved. Rasmussen protested that fragmentation of the air interdiction into BAI and long-range interdiction ought to be stopped. "There is *no need* to fragment it, and the results could be degrading not only to the clarity of roles and missions but, more important, to combat effectiveness," he wrote. "There was no reason to subject interdiction strikes beyond the FSCL to cumbersome procedures necessary for friendly troop safety in the case of close air support."[290]

Rasmussen particularly objected to the fact that the draft of AFM 1-1, *Functions and Basic Doctrine of the United States Air Force*, in progress in 1978 had "broken off a piece of the interdiction mission, given it a separate title, and then essentially applied to it the definition of close air support in requiring it to be coordinated with the ground commander's fire and maneuver." Nevertheless, the 14 February 1979 edition of AFM 1-1 provided:

> That portion of the air interdiction mission which may have a direct or near-term effect upon surface operations—referred to by the term "battlefield air interdiction"—requires the air and surface commanders to coordinate their respective operations to insure the most effective support of the combined arms team [291]

In NATO's Central Region, Army and Air Force organizations recognized a generic relationship of all operations in direct support of land forces as "offensive air support," the generic classification including close air support (CAS), battlefield air interdiction (BAI), and tactical air reconnaissance (TAR). Battlefield air interdiction was subject to joint Army/Air Force planning but did not require the detailed integration of CAS; it was flown beyond the FSCL and up to the reconnaissance and interdiction planning line—normally 80–100 kilometers beyond the FSCL. Published in 1980, Allied Tactical Publication 27(B), *Offensive Air Support*, highlighted the distinctions earlier accepted in the Central Region and gave international doctrinal status to BAI.[292] In December 1982, the US Army, US Readiness Command, and Tactical Air Command published a joint operational concept entitled "Joint Attack of the Second Echelon (JSAK)."[293]

Upon the emergence of battlefield air interdiction as a viable concept, two Royal Air Force officers proposed in separate articles in 1979 and 1980 that BAI would be less risky and more productive and could fulfill the same role as close air support in helping to blunt and stop an armored thrust. They urged that the CAS mission had become too complex and had a disproportionate risk/reward ratio.[294]

In rebuttal, Maj Michael O. Beck, chief of the ALO/FAC Training Section, TAC, urged that both CAS and BAI were essential since TACAIR was in Beck's description a "force multiplier" in support of a ground army. Using AirLand Battle parlance whereby the capability to identify and deal with a Pact target was called "servicing" the target, Beck wrote:

> The value of TACAIR to the ground commander can be summarized by the term *a force multiplier* CAS serves to reduce the stress on the battlefield by boosting the service rate of the engaged forces BAI, on the other hand, serves two separate purposes: BAI decreases the enemy's arrival rate through disruption and dispersal, and it enhances the overall friendly service rate through in-depth attrition. Both missions are essential. If the enemy's arrival rate exceeds the combined friendly air/land service rate at the line of contact, the defender will be driven back or overrun. Likewise, if the service rate at the line of contact does not match or succeed [sic] that of the enemy, the enemy's arrival rate will be of little consequence; a breakthrough will occur anyway. . In summary, the effective use of air power is now, as it has been in the past, dependent on the dynamics of the battlefield In order for TACAIR to make an effective contribution to this joint battle, the flexibility and capability to perform both CAS and BAI must be preserved and perfected [295]

Although much of the discussion of BAI concerned destruction of enemy force capabilities, Gen Edward C. Meyer, Army chief of staff, pointed out another temporal aspect of Army-Air Force systems in second-echelon attack.

> Their mission is not just killing tanks Their mission is also making certain that the reinforcing armored forces are either slowed or destroyed, and I say slowed, because slowed is equally important. If you are up in the front lines fighting and if you can keep the enemy from closing all of his forces on you at the same time, that is important to you [296]

In the AirLand Battle focus, Army forces had vital interests not only on their immediate forward line of own troops but well out ahead of the FLOT. A US corps was expected to fight in an assigned area of influence and to get the necessary information to fight in the corps monitored area of interest out beyond the area of influence. The actual geographical size of these areas depended on situational factors (mission, enemy, terrain, troops, and time available) and the reaction time that a particular troop unit needed to counter battlefield developments. The corps in the AirLand Battle concept was the focal-point fighting unit, with any field army organization being available for logistics and support. The normal combat reaction time for a corps was 72 hours, a time guideline that translated into a distance guideline of 150 kilometers beyond the FLOT for the area of influence and 300 kilometers for the area of interest.[297]

In a theater the air commander had historically had the responsibility for interdicting air strikes against targets beyond the Army FSCL, being responsible for the location, identification, and attack of such targets. The ground force commander provided information from his sources and kept the air commander knowledgeable about Army interests in specific targets, but the air commander

made decisions to attack, appraised results, and reported results. When asked for a background appraisal of the AirLand Battle concept of army corps as the focal points of operations with far-out areas of influence and interest, General Momyer suggested that:

> The Corps is seeking to be self-sufficient for any target array that has an influence on the Corps commander's strategy and tactical operations If carried to its logical conclusion, it means the Corps commander is directly concerned with any enemy formation no matter how far away, if it could eventually impact on the operations of his Corps—an absurd idea, I think one would agree [293]

Another air officer's appraisal demonstrated that the luxury of allowing each corps commander to "call his own shots" would fragment the *theater* air interdiction effort, replacing the theater perspective with several narrow, possibly conflicting, corps perspectives. Both General Momyer and Major Machos of the ALFA argued the case for a field army or army group over the multiple corps to provide overall guidance and continuity to ground operations. Momyer said:

> The Army doctrine is deficient in not having a headquarters, field army, above a multiple Corps deployment. These Corps cannot be directed out of the theater headquarters which has a full-time job of planning and directing the theater campaign as well as the day-to-day activities of coordinating the efforts of all the major forces.[299]

Although the April 1983 Air Force-Army memorandum of understanding did not mean that the Air Force was adopting completely the Army's AirLand Battle concept, senior Air Force officers concluded that the services working together under the MOU would improve the effectiveness of joint operations and help to iron out doctrinal differences between the Air Force and the Army. At a tactical air conference on 11–15 April General Creech wrapped up with the admonition that the Air Force should "take a positive approach" to the AirLand Battle concept and should welcome more Army input to the interdiction process. He insisted, however, that the AirLand Battle and its extended battlefield concept caused no change in the fundamental application of the principles of air power. The only reason for the detailed coordination of close air support was for the safety of friendly ground troops. BAI was a form of air interdiction (AI); it implied a closer target, and the Army should have more interest and voice on BAI targets, but BAI should not be "mixed up" with CAS. Handling AI targets was an Air Force responsibility.[300] Earlier than this conference—in June 1981—General Creech had already expressed confidence in the ability of air-to-ground optimized F-16s being able to handle BAI as well as CAS, but he worried about what he considered to be relative inattention to long-range interdiction capabilities that were going to be needed. With the exception of the F-111s, the shortfall in long-range offensive interdiction appeared "very, very serious."[301]

In February 1983 Secretary Weinberger indicated that he was looking to the Joint Chiefs of Staff for an evaluation of "means for improving the development of joint doctrine which may be required as more sophisticated target acquisition and

attack systems become available to field commanders."[302] Although the Joint Chiefs of Staff were kept briefed as a body, the initiatives for organizing, training, and equipping a compatible, complementary, and affordable total force that would maximize joint combat capabilities to execute air-land combat operations were worked out by six months of joint Army-Air Force effort and approved and issued in a Memorandum of Agreement by General Gabriel and Army Chief of Staff Gen John A. Wickam, Jr., on 22 May 1984. The MOA included 31 initiatives bearing on the air-land combat team and pledged the two services to an annual review/updating of the agreements to confirm their continued advisability, feasibility, and adequacy. The subjects handled as initiatives were (1) area surface-to-air missiles/air defense fighters, (2) point air defense, (3) countering heliborne assault threats, (4) tactical missile threats, (5) identification, friend or foe (IFF) systems, (6) rear area operations centers, (7) host nations support security equipment, (8) air base ground defense, (9) air base ground defense flight training, (10) rear area close air support, (11) mobile weapon systems, (12) ground-based electronic combat against enemy air attacks, (13) airborne radar jamming systems, (14) the precision location strike system (PLSS), (15) joint suppression of enemy air defenses (J-SEAD), (16) combat search and rescue, (17) rotary-wing support for special operations forces (SOF), (18) a joint tactical missile system, (19) Army and Air Force munitions RDT&E, (20) night combat, (21) battlefield air interdiction, (22) a joint target set, (23) theater air interdiction systems, (24) close air support, (25) air liaison officers and forward air controllers, (26) manned aircraft systems, (27) a joint surveillance and target attack radar system (J-STARS), (28) the TR-1 program, (29) manned tactical reconnaissance systems, (30) intratheater airlift, and (31) cross-service participation sister service programs essential to the joint conduct of air-land combat operations. In signing off on the MOA, Generals Wickam and Gabriel viewed their action "as the initial step in the establishment of a long-term, dynamic process whose objective will continue to be the fielding of the most affordable and effective airland combat forces."[303]

Electronics: Key to the Advancing Tactical Air Command Air Program

"The eighteenth century was the era of land wars, the nineteenth of the sea The twentieth was the era of airpower, but war will be shaped in the twenty-first century by the electromagnetic combatants. The Air Force *must* be ready."[304] This was the prediction of Maj Gen Gerald J. Carey, Jr., in 1980, closing his career in command of the Air Force Tactical Air Warfare Center at Eglin AFB, Florida. In the deserts of the Yom Kippur War, Casey pointed out, the Israeli Air Force—"one of the finest air forces in the world"—was very nearly beaten by Egyptian ground forces moving under an umbrella of mobile air defense and surface-to-air missiles. He said, "The Israeli Air Force was devastated until Egyptian momentum stalled, and the Israeli ground forces were brought to bear against the SAMs."[305] Although the

Israelis lost 150 aircraft in the first three days of combat in 1973, they exploited electronic combat in 1982 in the destruction of Syrian SAM sites in the Bekáa Valley, followed by the wholesale devastation of Syrian MiG-21s and MiG-23s with minimal loss of Israeli F-15s and F-16s. In this textbook air battle, the Israelis used remotely piloted air vehicles to spoof and photograph Syrian SAM concentrations to provide real-time intelligence. An astute British defense expert who was very proud of Britain's successes in the Falkland Islands nevertheless commented: "We fought yesterday's war in the Falklands. The Israelis fought tomorrow's war in Lebanon."[306] Lt Gen Kelly H. Burke, USAF, Retired, added: "Lebanon was the war of the future—a war in which electronic combat was a central and dominant theme."[307] To Secretary of Defense Weinberger the British demonstration of new technology in the Falklands and the Israeli success in defeating the Syrian Air Force so easily demonstrated the "decisive effectiveness of high technology weapons."[308]

At the peak of its activity in Southeast Asia in fiscal year 1968, the US Air Force possessed 32 numbered tactical fighter wings. As US involvement in Southeast Asia wound down, the Air Force tactical air structure was programmed to include 23 regular wings of F-4s, F-111s, A-7s, F-100s, and F-105s in fiscal year 1971. For fiscal year 1972, however, the Air Force tactical force size was reduced to 21 active wings, this because of dollar and manpower constraints and adjustments in the national strategy which placed added emphasis on assistance to allies as opposed to direct use of American air power. The reduction in active tactical air wings also reflected Secretary Laird's "total force" policy of increased dependence on reserve forces The rapid and smooth transition of Air National Guard and Air Force Reserve units into active service in 1968 had been, in the words of Gen John D. Ryan, "a proud chapter in Air Force history." Said Secretary Seamans in 1971, "The Air Force that I foresee will be leaner, more mobile, more streamlined, and . . . more volunteer oriented."[309] Also in fiscal year 1972, Lt Gen George S. Boylan, Jr., Air Force deputy chief of staff for programs and resources, explained that the Air Force was moving away from the old concept of a single "fighter-bomber" to perform all combat missions and felt that "only specialized aircraft, such as the F-15 and A-X, can meet the critical demands of mission effectiveness at the extreme ends of the performance spectrum." Force structure limitations precluded specialization for every role. A year later Boylan asserted:

> If dollars were no restriction, manpower was no restriction, the optimum fighter structure probably would be basically three types of aircraft. One aircraft, in sufficient quantity, for air superiority unencumbered by any other equipment or mission, one for interdiction probably optimized along the lines of the F-111 having very sophisticated sensors, navigation equipment that would permit it to fly through bad weather or during night and perform precision attacks on targets relatively distant from the front lines Then the third would be an aircraft designed or optimized for close air support This aircraft. . would be unencumbered with the very sophisticated sensors, the equipment, the range and weight that is required in the interdiction mission.[310]

Although General Boylan reported that the Air Force favored specialized tactical aircraft, the limits on active tactical fighter wings, first at 23 wings and then at 21 wings, led to an effort to program the A-X "below the line"—that is, not among high-performance-capable tactical aircraft. In 1969 Boylan stated that it was the Air Force's position that the A-X should not be chargeable within a 23-wing strength. In 1970, however, the Air Force considered the A-X so important as to be included in the ongoing 23-wing active force. "One major advantage of the A-X is that because of its estimated low cost, it may give a well-sized force, even within tight fiscal constraints," it was said. In 1971 when the tactical active air structure was reduced to 21 wings, General Momyer was still hopeful that the A-X would be "additive" to the force structure.[311]

Although the Air Force was authorized only 21 active tactical fighter wings from fiscal year 1971 through 1975, it actually had 26 numbered tactical air wings on active duty, but each at reduced aircraft strength. Air Force studies had long revealed the desirability of according a tactical wing a unit equipment strength of 72 aircraft, divided into three squadrons each with 24 UE aircraft. With a 24 UE squadron, it was possible to put up 4 flights of 4 aircraft at an average use rate of between 0.9 and 1, which gave a daily capability to the squadron of some 16 combat sorties and at the same time provided a formation and total fighting force of optimum capability against an enemy. The 26-wing force structure was made fiscally possible by reducing squadrons to less than the desirable strengths.[312] Of the 26 tactical fighter wings, 15 were in the continental United States, 8 were in Europe, and 3 were in the Pacific. These actual peacetime deployments were driven largely by political agreements and understandings, the need to provide a credible in-place deterrent force, and finally by resource availability. Each year based on secretary of defense guidance the US unified commanders determined the force levels required to execute the national strategy in their theaters. US fighter force requirements to conduct close air support were calculated on the basis of providing five sorties per day per engaged maneuver battalion. On the basis of command inputs and their assessment, the Joint Chiefs' joint strategic operations plan (JSOP) each year reported "prudent risk" and "minimum risk" force requirements.[313] In 1974 the Air Force set a goal of 40 tactical fighter wings—26 active and 14 in reserves—with 2,880 aircraft (72 combat-coded per wing) by 1980.[314] Early in 1975 in consideration of the fiscal year 1976 budget, Secretary Schlesinger agreed to program a five-year growth of Air Force active tactical air wings to 26 wings, this through the "hi-lo" mix of less expensive A-10s and F-16s into the tactical air inventory that would hopefully allow these wings to be equipped with 72 UE aircraft each and still be within fiscal constraints. Ten reserve ANG and AFR wings would be supported, thus providing a modernized tactical force of 36 wings. The 26 active wings programmed were conceived as necessary to promote deterrence without mobilization, respond in crises, and blunt an initial thrust while awaiting mobilized reinforcements from reserve assets. The Air Force objective force was a larger number of wings than fiscally attainable, and the 26 active wing force contained greater risks than the objective force. It nevertheless

represented to the Air Force the best balance between combat capability to pursue directed strategy and existing fiscal and manpower constraints.[315]

Although Secretary Schlesinger's "hi-lo" mix fiscal constraint cleared the way for the beginning of the Air Force tactical strike program toward 26 active and 10 reserve wings, it also locked the Air Force into a binding posture, one that was ill conceived in terms of Soviet challenges. The assumption had been that the TACAIR modernization would continue US technological superiority, but it began to be evident in the early 1970s that this advantage was fading. General Dixon said in 1978, "We are out-numbered. We have had the technical advantage over the years. I am told by experts, and I have my own view, that the technological advantage is vanishing."[316] Periods of darkness and bad weather had historically provided a sanctuary for resupply and reconstruction of combat elements, and winter weather in northern Europe had always been characterized by poor visibilities for aerial operations. In the north German plain region around Hanover, throughout January, there are only about 8.5 hours of daylight in each 24-hour day, and during those days the cloud ceiling is 1,000 feet or higher for only 6.3 hours with an average visibility of three miles. Therefore, the winter weather at low levels in Germany is almost always difficult. In the 1970s the Soviets and Warsaw Pact forces equipped and trained for night and all-weather combat and combat-support operations. Their tanks and helicopters were equipped with sensors and night-viewing devices. At first, Air Force Studies and Analysis took some comfort from its study of weather conditions and offered consolation that winter weather in northern Europe was cellular. Thus, in the words of Maj Gen James A. Welch, Jr., assistant chief of staff for studies and analysis,

> One can look at the very cellular nature of the bad weather and the good weather and find that the cells of bad weather are in fact somewhat smaller than the size of the large armored breakthrough So that we can attack some part of the armored breakthrough most of the time even though you cannot attack all of it most of the time [317]

This rationale was not too comforting. Since NATO had 900 kilometers of border to defend, the Soviet/Warsaw Pact nations could select their time, point of concentration, and choice of weapons, and would be less dependent on air support than the NATO forces, who would count on air support for mobile firepower. A joint analysis conducted by the Army TRADOC and the Air Force TAC in 1979 determined that the Air Force's most prominent deficiency in the close air support and battle interdiction mission area was its inability to detect, attack, and destroy hard mobile targets at night and in bad weather. "Everything we see about the Soviets indicates we had best be prepared to meet them under all weather conditions," Gen Lew Allen said in 1980.[318]

In the early 1970s the avionics in the F-111 and A-7 gave capabilities to deliver ordnance against fixed targets at night and in bad weather and combined with ground beacons to allow some capability to deliver conventional munitions on battlefield area targets. The Air Force, however, could not plan to send A-7s and F-111s against armored vehicles, and in the growing emergency in early 1978 it

requested an appropriation to fund a night and adverse weather attack program. One question occurring in Congress at this time was that since everyone had known about Europe's weather for centuries, why had someone not laid night/all-weather attack requirements on the A-10 and F-16 programs? Dr William J. Perry, under secretary of defense for research and engineering, answered this question first.

> When the F-16 and A-10 aircraft were designed a night/weather attack requirement was uncertain, since the threat was not perceived to be so lethal nor was the threat perceived to be intent on promulgating a battle during night or poor weather conditions as it is today [319]

Perry also mentioned the pressure to hold costs down on the F-16 and A-10. The F-16 had a ground-mapping radar and an accurate inertial navigation system (INS) which provided it with some night and adverse weather capability against fixed targets It was also able to maneuver sharply within visual range of targets in marginal weather where higher performance airplanes would not be effective. Perry said later of the F-16:

> We kidded ourselves a little bit on the F-16 thinking we were buying an inexpensive airplane What we were really building was an incomplete airplane. . . One of the reasons this airplane is inexpensive is because we satisfied ourselves that we could operate it as a dogfight airplane in an air superiority role, which means it would deal with other airplanes either with a gun or with a short-range heat seeking air to air missile [320]

The design of the A-10 was determined in the same era when there was pressure to keep cost moderate. "The A-10 was specifically designed for performing close air support," said General Dixon. "The concept was to keep the system as simple as possible for forward base operation and high sortie rates."[321] The A-10's maneuverability and weapons provided for close air support under adverse weather that would otherwise restrict such operations, but it had no autonomous navigation capability other than pilot dead reckoning to reach a target area. The Air Force had always considered that a self-contained navigation system would improve the aircraft effectiveness, but the improved capability—at the time the A-10 was decided upon—did not seem to justify the increase in cost. In March 1968, however, General Dixon reported a recent demonstration of an A-10 equipped with an INS and flown at England AFB, Louisiana. In low-level flight the INS significantly increased the A-10's first-pass effectiveness and substantially enhanced its ability to divert to a secondary target. Additionally, the INS allowed the pilot to devote more attention to external surroundings, which was advantageous for survivability in high-threat environments.[322] The A-10 was equipped with a 30-millimeter rapid-firing antitank GAU-8 cannon and electro-optical Maverick missiles. Although the television-guided Maverick got good results in tests against high-contrast targets at White Sands, New Mexico, and the Israelis used them to good effect in scoring 40 hits out of 49 firings in the Sinai desert in the Yom Kippur War, the requirement for optical guidance of the

Mavericks with TV heads did not work very well in the limited visibility circumstances of Europe. Deputy Secretary of Defense for Research and Engineering Robert A. Moorer admitted.

> Television Maverick does not work very well in Europe. I think that is one case where, in my opinion, R&D has failed and it failed because we did not test that weapon in a realistic environment .. That was a mistake, and from that, I think the lesson we should have learned is that we must test those sophisticated weapons in a realistic operational environment [323]

Lt Gen Thomas H. McMullen, TAC vice commander, told a NASA Tactical Aircraft Research and Technology Conference in December 1980:

> As we are now equipped we fight the next war only part time Our night and bad weather capability is limited in both quality and quantity. As I see it, these two areas (and I note they are *two* areas), they rather than new speeds or altitudes, are the new frontiers for TACAIR.[324]

As it happened in 1978 and 1979, the Air Force had the need for night and all-weather attack of moving targets fully in mind but lacked substantial resources to handle them in a hurry. "It would be prohibitively expensive for us to build all, or even most, of our aircraft to operate all night or in bad weather," remarked Gen David Jones in 1978.[325] Of such night and all-weather capabilities for the A-10, General Dixon said: "If we had unlimited resources there would be a requirement now—as it is, we have to work on this and see whether we need and can manage to squeeze it into a force structure which is already budget limited."[326] Another reason for not rushing to a solution fix was that new technology that had not existed in the early 1970s was becoming available and needed proper evaluation.[327] In addition to the electro-optical television head Maverick, which was excellently accurate under conditions of high pilot visibility, the Air Force had under development an imaging infrared (IIR) head Maverick for use in low visibility and at night and a laser head Maverick that would home in on laser-illuminated targets In 1978 the Air Force canceled its part of the laser Maverick and concentrated on development of the IIR Maverick as the weapon of choice for low-attack A-10s either by day or night. Despite adverse journalistic publicity regarding the Maverick program, this decision still held good in 1983.[328]

To fly to a target in bad weather, accomplish target acquisition, and determine weapons release points under such adverse conditions, attack aircraft would have to have sensors to provide for terrain avoidance, navigation to the target areas, and target acquisition, and night/adverse weather weapons that were effective. The mission, withal, was so complex that it appeared possible in 1978 that a two-man crew might be needed, one person to pilot and one to work the sensors and weapons. On the other hand, automatic techniques—some of them on-the-shelf—might be added to a single-seat airplane, taking the load off the pilot and allowing one man to perform night/all-weather attack. Industry saw an opportunity to come aboard with proposals, such as a two-seat A-10, a two-seat F-15, and, of

course, the Navy's two-seat F-18. In fiscal year 1980 budget requests offered in early 1979, the Air Force asked for an appropriation to study an "Enhanced Tactical Fighter" (ETF)—the use of an existing aircraft with state-of-the-art avionics and munitions for night/all-weather attack. The two leading candidates were the F-15 that was already in a two-seat training version and the A-10, which Fairchild Aviation was plugging strongly. The precise mission element needs statement (MENS) for the ETF had no firm grasp of ultimate mission requirements or cost, however, with the result that Congress refused to fund the ETF.[329] Still hoping to keep the A-10 in production, Fairchild bailed back one of the planes from the Air Force and modified it with a second seat and sensors for tests at Edwards AFB, California, carried out by the Air Force Systems Command and Tactical Air Command. General Creech, the TAC commander, gave Fairchild "high marks" for using its own funds for the test plane, but he could not see putting it into production. The real need for the night/all-weather ETF was for second-echelon interdiction, and the A-10 continued to be too slow for penetration, best qualified even at night to operate along the FEBA in close air support. The tests did show, however, that an existing plane augmented with sensors would be affordable enough to be secured for clear nighttime or nighttime, under-the-weather operations. On the other hand, General Creech said that the development of an ETF for in-weather operations would not be soon "do-able" for reasons of costliness. Early in 1982 when speaking on the fiscal year 1983 Air Force budget request, General Allen would not be swayed from a decision to end A-10 production:

> The A-10 is an excellent weapon, and the GAU-8 is a super gun We have never had a gun that has the effective accuracy that that gun has, nor the antiarmor kill capabilities that those munitions provide Further than that, the A-10 armed with a Maverick, represents an addition to those capabilities which makes it one of the finest specialized aircraft for antiarmor kill that has ever been built So, we are very pleased with the aircraft and we continue to be impressed with this armor-killing capability However, we have met the basic inventory objectives It is a specialized aircraft, it is an antiarmor aircraft It was designed largely for high-armor concentrations of the sort encountered in the central region of Europe, although it has application elsewhere. We have concluded that we have now met the inventory objectives and finished production with the 1983 requests [330]

In one sense the enhanced tactical fighter seemed in 1979 to have been officially terminated by Congress, and Lt Gen Kelly Burke, deputy chief of staff for research and development, turned to an effort to meet the same requirement by a different approach, namely finding a means to take advantage of the large number of single-seat fighter aircraft that the Air Force was going to wind up owning. The Air Force was going to have to be more pragmatic, to attempt to do more with less. "Capability improvements to our aircraft, therefore, are to help redress existing aircraft inventory shortfalls rather than to allow reductions in future force structure," Burke explained.[331] One potential candidate for procurement was the LANTIRN (low-altitude navigation targeting infrared for night) system that could

be used to provide a portion of the A-10s and F-16s with a night, under-the-weather capability in the 1983–85 period. Burke continued:

> It appears to us that the confluence of technology is such that we can, in fairly short order, develop this LANTIRN pod which will let those single place aircraft have a very good night/under the weather capability at low altitude with multiple kills per pass, and greatly add to our air to ground capability with those existing airplanes. . . Not all weather, it is night/under the weather We just don't know how to do that against mobile and imprecisely located targets. But night or under the weather, down to a few hundred foot ceiling, couple of miles visibility, we can do it [332]

Another aspect of LANTIRN was that it increased day capabilities to find targets.[333] By 1981 the development contract for LANTIRN broke the system down into two pods: the LAN navigation pod enabled an aircraft to go in at very low altitude and come out the same way; the TIRN targeting pod enabled a pilot to deliver ordnance at night with essentially daytime accuracy. A given attack might require one or both of the pods, which being smaller at any rate had lower drag than a single pod. In 1981 General Creech ticked off advantages of operating A-10s and F-16s at night with LANTIRN. Operating at night provided more firepower with the same number of aircraft, denied the adversary the sanctuary of darkness, provided NATO ground forces the possibility of air support that they would need at night, provided a sanctuary for friendly air operations, and exploited a technological edge as an offset to quantity on the other side.[334] Some in Congress questioned the Air Force's move away from specialized aircraft: in 1982, Sen Alfonse M. D'Amato of New York complained:

> I should point out that the IIR Maverick . coupled with the LANTIRN pod capability, will change the A-10 from a day-only tank killer to a night and adverse weather tank killer . We believe that will basically double the effectiveness of the A-10 in that it will permit it to operate during the night when, we believe, Soviet tactics require those tanks to move.[335]

The F-16 had started out to be good in the air-to-air role and the characteristics that made it good in this role, such as power loading and low-wing loading, also made it good in air-to-ground context. Lt Gen Alton Slay said in 1976, when speaking the praise of the F-16, "You need to be able to get well ahead of the power curve when you are delivering ordnance to get back up to make a re-attack, to turn fast, to be able to stay low."[336] Lt Gen Thomas Stafford, the 13th test pilot to fly the F-16, also marveled at it: "It is amazing, this little airplane that weighs half of an F-4 can carry the same bomb load as the F-4 twice as far using less fuel. It is the only airplane we have ever designed to pull nine G's That is a lot of G's to pull."[337] As an interceptor, however, the F-16 could not compare with the F-15, the latter with long range, far more powerful radar, and medium-range radar-guided air-to-air AIM-7 Sparrow missile. The F-16 had a smaller radar and a short-range AIM-9 Sidewinder infrared heat-seeking missile; its lack of a radar-directed missile meant that it would yield first shot to an adversary with radar missiles. There

was a limitation to the Sparrow in that the F-15 had to keep its radar pointed at the target until the missile reached it; in Red Flag training at Nellis AFB, Nevada, little inferior F-5 "aggressor" planes not infrequently came in behind F-15s intent on tracking other targets. In fiscal year 1977 Congress appropriated the first funds to finance development of a joint Air Force/Navy "Sparrow follow-on missile" that came to be called the AMRAAM or advanced medium-range air-to-air missile. Suited either for the F-16 or F-15, the AMRAAM had a fire-and-forget radar aboard the missile itself, and it allowed a pilot to engage two or three targets at a time and to fight successfully while outnumbered. With the AMRAAM an F-16 pilot could fire on, say, a MiG-23 before the MiG could intercept the F-16. If the F-16 got into a dogfight, it could easily turn the MiG inside out.[338] In fiscal year 1982 budget hearings, General Creech urged support for AMRAAM; and in 1983 hearings Maj Gen Robert Russ, deputy chief of staff, operational requirements, Air Force, declared the AMRAAM to be the "No. 1 priority air-to-air program for the TAC air forces."[339]

In the F-15 development and test phase the plane demonstrated a conventional weapons delivery air-to-ground superiority to both the F-4 and A-7 aircraft. In 1979 and 1980 both Generals Allen and Creech maintained that it was highly desirable to keep the McDonnell Douglas Corporation F-15 production line open with a buy of additional aircraft beyond the current program quantity of 729, to be procured prior to the program cutoff in fiscal year 1983. Whereas the focus of attention in the 1970s had been upon Western Europe, the Soviet invasion of Afghanistan and the beginning of the Iranian seizure of American hostages in Tehran in late 1979 made the Carter administration interested in the non-NATO world. General Creech was particularly impressed with the problem of distances in Southwest Asia and found the prospect of a "missionized F-15" particularly attractive in that regard.

> I think it [the F-15] is an outstanding airplane for the Rapid Deployment force and it is particularly attractive in the Persian Gulf and Middle East because of its range In fact, range in the Persian Gulf area takes on a whole new importance that one does not feel in Central Europe, for example, although range is important there, because the distances are awesome Saudi Arabia is bigger than the United States east of the Mississippi [340]

Creech referred to the missionized F-15 as "an interesting case," but in 1980 he felt compelled to give all-out priority to getting LANTIRN for the F-16 and A-10.[341] This same year, the Air Force had also received funding for a mission analysis looking toward the development of an advanced tactical fighter (ATF) that was wanted for service in the 1990s. The "gestation period" of a new fighter program was conceived to be from 10 to 14 years, and the ATF was expected to be "next-generation" technology, not an upgraded version of an F-15 or F-16.[342]

In 1980 the Air Force projected a tactical fighter wing structure for the end of 1981 as being 12 reserve wings (10 in the Air National Guard and 2 in Air Force Reserve) and 26 active wings broken down with 1 in Alaska, 3 in the Pacific, 8 in

Europe, and 14 in TAC. It was still not expected that the Air Force would reach its full 26-wing goal of 1,872 aircraft until 1984, and considering assigned aircraft, General Creech figured worldwide TACAIR strength as being 34 wings (23 active and 11 reserves).[343] In view of the marked increase in the Soviet threat, Creech urged that the tactical air wing program should surely be increased to the 40 wings projected earlier and by the mid-1980s should include at least 5 additional active wings. Both Creech and Allen thought highly of the competency of the Air National Guard and Air Force Reserve units. Gen Lew Allen said that one of the "finest things" done in recent years was the formulation and enforcement of the total force concept, where, he said, "we fight together as Active and Reserve forces." But mobilization was always a serious dislocation to the nation and it was becoming "very difficult to respond to any conflict these days without mobilization."[344] Creech said in 1981:

> I would fully expect a Guard or Reserve unit going into combat, given the same kind of equipment, would fly better than an active squadron This is because the pilots are much more experienced and, for that matter, the maintenance people are as well They are first rate [345]

Nevertheless, the active forces had to bear the burden of forward deployment and also had to be available in sufficient numbers in the continental United States to provide training and support to the forward-deployed forces.[346]

The revitalization of the American defense program by the Reagan administration commencing in 1981 faced some difficulty in regard to tactical forces This was explained by Lt Gen Kelly Burke:

> Within our force planning we gave highest priority to strategic force modernization, followed by readiness and maintainability, and finally, to tactical force modernization and growth. . . . We recognize the overriding requirement for strategic force improvements, but we cannot ignore the global threat and very significant enhancements in Soviet conventional forces over the recent years . In this regard, B-1 and MX are critical programs At the same time, we cannot neglect tactical aircraft modernization and force expansion programs because of the evolving Soviet threat.[347]

Despite the priority to strategic forces, the Reagan administration also looked with favor on tactical power. The security guidance policy recognized that the Soviet threat was global and that the United States must be prepared to meet the threat globally in a sustained, conventional manner. Deputy Secretary of Defense Frank C. Carlucci emphasized the "vital interest" in Southeast Asia and the need for conventional US responses to Soviet activity there. "Unless we are prepared to put troops on the ground, I don't think the Soviets are going to believe we are credible," he said.[348]

Early in 1981 the Reagan administration announced that the Air Force had been forced to procure aircraft inefficiently and that the objective now would be to accelerate aircraft programs while reviewing force requirements. In the planning for aircraft procurement approved in 1981–82, the Air Force was authorized to

increase to 40 tactical fighter wings (26 active and 14 reserve) in 1986 and then to 44 tactical fighter wings in 1990.[349] By early 1981 the McDonnell Douglas Corporation had turned out a demonstration missionized air-to-surface F-15 Strike Eagle that was very attractive to the Air Force. In thinking about possible employments in Southwest Asia, General Creech was attracted to the range and capabilities of a missionized F-15 which could be deployed there, initially performing in air-to-air combat, if necessary, and then serving in an air-to-ground attack mode. In a missionized configuration the F-15 would also be prepared to perform deep interdiction and counterair strikes against enemy airfields like an F-111 would do.[350] General Creech was especially enthusiastic about what he described as a dual-capable aircraft that could deliver either tactical nuclear or conventional munitions, and the Air Force asked funding in fiscal year 1982 for a derivative fighter based on the F-15. As it happened, however, General Dynamics had been working on an F-16XL with a redesigned "cranked arrow" wing that would provide substantially more internal fuel and payload lift Congress would not approve funding of an enhanced F-15E in fiscal 1982 until such time as a derivative F-16E could also be tested.[351]

After give and take with Congress in 1981 in regard to fiscal year 1982 appropriations requests, the Air Force got a new perspective for the future requirements of tactical aviation. For fiscal year 1983, Lt Gen Kelly Burke explained:

> We have argued amongst ourselves, and in give and take with the Congress, to push back that new fighter quite distantly because the major changes that have come along in our business in the past few years have not been in airframe or aircraft engine improvements but in electronics There is a dramatic improvement in electronics So, the trend—and I think it is a correct one—is to keep airplane designs longer and update the electronics portions of it to go with the older engine and old airframe That basically is what we are doing We are proposing to buy about 250 fighters a year. We are proposing to modernize them mostly in the electronic sense and not tactical development of the new airplane [352]

The advanced tactical fighter (ATF) would be pushed back to the mid-1990s; it would be a "new technology fighter and a step ahead of the Russians."[353] In making a decision on the enhanced fighter, General Gabriel said he was going to look for "the most affordable and effective capability we can get at the cheapest price." Essentially he wanted the "E-model" F-15 or F-16, whichever chosen, to "get back in the second-echelon area . . . back before the follow-on [enemy] forces begin to fan out and come to the front, say, 200 kilometers back. . . . That is the area that right now, at nighttime, low-level, only the F-111 can handle. We can't get back there with anything else," he continued.[354] In comparison with the F-16E, the F-15E had a significant advantage in range that particularly fitted it for service in Southwest Asia or the Pacific. On 24 February 1984 General Gabriel announced that he had selected the F-15E as the new dual-role derivative fighter for air-to-air and deep-interdiction missions. It was going to be a two-seat aircraft, with provisions to employ AMRAAM and LANTIRN, plus a weapons load comparable

to that of an F-111. The Air Force planned on 392 F-15Es, enough to equip 12 squadrons and 2 training squadrons. In addition, new F-16s with improved air-to-air and air-to-ground capabilities would be bought, the program objective of the F-16 being increased from 1,388 to 2,651 to support a force modernization and equipment of 40 tactical wings. An advanced tactical fighter would remain in development for service in the mid-1990s. Air Force evaluation of the "cranked arrow" wing F-16XL would continue as a possible advanced version of the F-16 Fighting Falcon.[355]

In 1982–83 the US military services each undertook visionary efforts to foresee their individual and collective programs at the turn of the century, around the year 2000. The US Army led the way with "AirLand Battle 2000." It was a security classified future concept of the world environment during 1995–2015 and the requirements of battle that would drive Army training and equipping. AirLand Battle 2000 saw future battlefields becoming more fluid, shorter in duration, and more difficult for the commander to control. The study was said to urge a style of waging war in which agility, deception, maneuver, and tools of combat were used to face the enemy with a succession of dangerous and unexpected situations more rapidly than he could react to them.[356] Like the Army, the Air Force regularly reviewed its strategies and capabilities to meet an anticipated Soviet threat, and, conducted in 1982, Air Force 2000 envisioned the way that the Air Force should adapt itself to the world in two decades. After the Air Staff completed Air Force 2000, it began working with the Army Staff to meld the respective concepts in a new study called Focus 21.[357] These studies were classified, but Air Force leaders gave some public indication of the look of the future. In Europe, where the Soviet threat was most severe, the numerical superiority of Warsaw Pact air forces was expected to remain, and the Soviets were expected to continue to attempt to narrow the US technological lead in key areas. The main requirements of the tactical air forces would be to gain air superiority over the battle area and to provide offensive support to the land forces. The Air Force and the Army would need to work closely together to effect an organizational integration of combat capabilities. A joint AirLand Battle doctrine would be necessary as a first step in countering the threat from the Soviet and Soviet-surrogate forces. Priorities needed to be established for fighting battles, especially in the first hours. Success of a forward strategy for NATO depended upon the development of a rugged and common command, control, communications, computing/information and intelligence (C^4I^2) capability to aid in establishing the unity of effort and most effective application of force against the enemy. The whole question of antijam communications, General Lew Allen emphasized, had to be the focus of enormous attention in all plans for AirLand Battle.[358] As matters stood in mid-1964, General Creech, in context of six years as TAC commander, described planning relationships with the Army as "going magnificently" and "at an all-time high."[359] Keyed to the background year-2000 plans, an Air Force "Fighter Road map" existed on the lines sketched above and outlined the force size, mix, and capabilities needed into the future.[360]

NOTES

1 House, *Department of Defense Appropriations for 1967 Hearings before a Subcommittee of the Committee on Appropriations*, 89th Cong , 2d sess., 1966, pt 1·532 (hereafter cited as *1967 DOD Appropriations*)

2 Senate, *Department of Defense Appropriations for Fiscal Year 1974· Hearings before a Subcommittee of the Committee on Appropriations*, 93d Cong., 1st sess., 1973, pt 1 136 (hereafter cited as *FY 1974 DOD Appropriations*)

3 House, *1967 DOD Appropriations*, pt 5 386

4 Statement of Secretary of Defense Robert S McNamara before the House, Armed Services Committee on the Fiscal Year 1965–69 Defense Program and 1965 Defense Budget, 27 January 1964, 84, Senate, *U S Tactical Air Power Program. Hearings before the Preparedness Investigating Subcommittee on Armed Services*, 90th Cong., 2d sess., 1968, 91

5 Lt Gen Arthur C. Agan, USAF, Retired, US Air Force Oral History Program Interview 857, 2 October 1973, 15, 31

6 M J Armitage and R. A Mason, *Air Power in the Nuclear Age* (Urbana, Ill . University of Illinois Press, 1983), 192–93

7. Robert S McNamara, *The Essence of Security, Reflections in Office* (New York· Harper & Row, 1968), 37

8 Armitage and Mason, *Air Power in the Nuclear Age*, 191, House, *1967 DOD Appropriations*, pt. 1 84

9 Henry Kissinger, *White House Years* (Boston Little, Brown & Co , 1979), 220, House, *Department of Defense Appropriations for 1970. Hearings before a Subcommittee of the Committee on Appropriations*, 91st Cong , 1st sess , 1969, pt. 7 383 (hereafter cited as *1970 DOD Appropriations*); Senate, *U S Tactical Air Power Program*, 79

10 Senate, *U S Tactical Air Power Program*, 117, Senate, *Fiscal Year 1977 Military Procurement Authorization Hearings before the Committee on Armed Services*, 94th Cong., 2d sess , 1976, pt 9 4899 (hereafter cited as *FY 1977 Military Procurement*)

11 Senate, *FY 1977 Military Procurement*, pt 10·5698

12 Senate, *Close Air Support Hearings before the Special Subcommittee on Close Air Support of the Preparedness Investigating Subcommittee of the Committee on Armed Services*, 92d Cong , 1st sess , 1972, 192–93 (hereafter cited as *Close Air Support*)

13 House, *Department of Defense Appropriations for 1969 Hearings before a Subcommittee of the Committee on Appropriations*, 90th Cong., 2d sess , 1968, pt 1 329 (hereafter cited as *1969 DOD Appropriations*)

14. Senate, *FY 1974 DOD Appropriations*, pt 1 614

15 Ibid , House, *1969 DOD Appropriations*, pt 6 262

16 Senate, *Department of Defense Appropriations for Fiscal Year 1965 Hearings before the Subcommittee of the Committee on Appropriations and the Committee on Armed Services*, 88th Cong., 2d sess , 1964, pt 1 738–40, Senate, *Department of Defense Appropriations for Fiscal Year 1966: Hearings before the Subcommittee of the Committee on Appropriations and the Committee on Armed Services*, 89th Cong , 1st sess , 1965, pt 1 1140 (hereafter cited as *FY 1966 DOD Appropriations*).

17 Senate, *U.S Tactical Air Power Program*, 92–93, Senate, *Department of Defense Appropriations for Fiscal Year 1970. Hearings before the Subcommittee of the Committee on Appropriations*, 91st Cong , 1st sess., 1969, pt 4 664 (hereafter cited as *FY 1970 DOD Appropriations*), Maj Gen Edward A McGough, Oral History Interview 860, 23 September 1973, Lt Gen Arthur C. Agan, Oral History Interview 857, 2 October 1979, Gen Louis C Wilson, Jr , Oral History Interview 1178, 7–8 November 1979

18 Agan interview; Gen John P McConnell to all major commands and operating agencies, 3 May 1965, *Air Force Policy Letter for Commanders. Supplement*, 6 June 1965, 24–26.

19 House, *Department of Defense Appropriations for 1966· Hearings before a Subcommittee of the Committee on Appropriations*, 89th Cong., 1st sess , 1965, pt. 3 340, pt. 5.17; Senate, *FY 1966 DOD Appropriations*, pt. 1:419, 491, 1140, 1254.

20 Senate, *FY 1970 DOD Appropriations*, pt 4.122–26.

21. Ibid , 124, Senate, *Fiscal Year 1970 Military Procurement Authorization, Research and Development, and Reserve Strength. Hearings before the Committee on Armed Services*, 91st Cong., 1st sess , 1969, pt. 1:1000–1 (hereafter cited as *FY 1970 Military Procurement*), Senate, *Department of Defense Appropriations for Fiscal Year 1971· Hearings before the Subcommittee of the Committee on Appropriations*, 91st Cong., 2d sess , 1970, pt. 4.308–15 (hereafter cited as *FY 1971 DOD Appropriations*)

22 Senate, *U S Tactical Air Power Program*, 112–13

23. Senate, *Department of Defense Appropriations for Fiscal Year 1967. Hearings before the Subcommittee of the Committee on Appropriations and the Committee on Armed Services*, 89th Cong., 2d sess , 1966, pt. 1.931, Senate, *FY 1970 DOD Appropriations*, pt 4 664.

24 Directorate of Doctrine, Concepts and Objectives, US Air Force, Doctrinal Divergencies Briefing, January–June 1968; Dr Edward C. Misher, *The A-X Specialized Close Air Support Aircraft: Origins and Concept Phase, 1961–1970*, Office of History, Headquarters Air Force Systems Command, vii–viii.

25. House, *Department of Defense Appropriations for 1968· Hearings before a Subcommittee of the Committee on Appropriations*, 90th Cong , 1st sess., 1967, pt 3 395 (hereafter cited as *1968 DOD Appropriations*); House, *1969 DOD Appropriations*, pt 2 123, pt. 3 205; Senate, *FY 1970 DOD Appropriations*, pt 4:664

26 "We Have to Maintain Superiority in Air-to-Air Combat Capability," *Air Force Policy Letter for Commanders*, 15 February 1969

27. McNamara, *The Essence of Security*, 37–38, Armitage and Mason, *Air Power in the Nuclear Age*, 193; Theodore R. Milton, "Thoughts on Our National Strategy for the Future," in *Grand Strategy for the 1980s*, ed Bruce Palmer, Jr. (Washington, D C. American Enterprise Institute for Public Policy Research, 1978), 59, Secretary of Defense James R. Schlesinger, *The Theater Nuclear Force Posture in Europe*, in House, *Department of Defense Appropriations for 1979· Hearings before a Subcommittee of the Committee on Appropriations*, 95th Cong., 2d sess , 1978, pt 4 (hereafter cited as *1979 DOD Appropriations*).

28. House, *1969 DOD Appropriations*, pt 1:531.

29. Ibid , pt 1 532, pt. 4 970–71; Senate, *United States Security Agreements and Commitments Abroad, United States Forces in Europe Hearing before the Subcommittee on United States Security Agreements and Commitments Abroad of the Committee on Foreign Relations*, 91st Cong., 2d sess., pt 10 2061–64.

30. Senate, *United States Security Agreements and Commitments Abroad*, pt 10 2061–65, McNamara, *The Essence of Security*, 81

31. Senate, *FY 1970 Military Procurement*, pt 2 1525

32 Alain C. Enthoven and K. Wayne Smith, *How Much Is Enough? Shaping the Defense Program, 1961–1969* (New York: Harper & Row, 1978), 216–25, Kissinger, *White House Years*, 392; Senate, *U.S Tactical Air Power Program*, 116–23, 130–33; Senate, *Department of Defense Appropriations for Fiscal Year 1972 Hearings before a Subcommittee of the Committee on Appropriations*, 92d Cong., 1st sess , 1971, pt 4 69 (hereafter cited as *FY 1972 DOD Appropriations*)

33 Senate, *U S Forces in Europe: Hearings before the Subcommittee on Arms Control, International Law and Organization of the Committee on Foreign Relations*, 93d Cong , 1st sess , 1973, 104–5.

34 Kissinger, *White House Years*, 166–67, 220–25

35. House, *1970 DOD Appropriations*, pt. 7.381–85, Senate, *FY 1972 DOD Appropriations*, pt. 1:47–75, 178–81

36. Senate, *FY 1970 DOD Appropriations*, pt. 4:102–3

37. Senate, *FY 1971 DOD Appropriations*, pt. 4·7; Senate, *FY 1972 DOD Appropriations*, pt 4 13, 57–58; Senate, *Fiscal Year 1973 Military Procurement Authorization. Hearings before the Committee on*

Armed Services, 92d Cong., 2d sess, 1972, pt. 2.1131–41 (hereafter cited as *FY 1973 Military Procurement*); Senate, *Fiscal Year 1974 Military Procurement Authorization Hearings before the Committee on Armed Services*, 93d Cong, 1st sess, 1973, pt. 6 4371 (hereafter cited as *FY 1974 Military Procurement*)

38. House, *1968 DOD Appropriations*, pt. 1 824, House, *1969 DOD Appropriations*, pt. 2 122, Senate, *FY 1970 DOD Appropriations*, pt 4 34.

39 Senate, *Department of Defense Appropriations for Fiscal Year 1969 Hearings before a Subcommittee of the Committee on Appropriations*, 90th Cong, 2d sess, 1968, pt 1 70–71, House, *1969 DOD Appropriations*, pt 6 222–31, 256–60, House, *Department of Defense Appropriations for 1973· Hearings before a Subcommittee of the Committee on Appropriations*, 92d Cong., 2d sess, 1972, pt 7.1155 (hereafter cited as *1973 DOD Appropriations*)

40. House, *1970 DOD Appropriations*, pt 4:346–47, pt 3 796–97.

41. Ibid, pt 7 47–48, Senate, *FY 1971 DOD Appropriations*, pt 1:43, 149–210

42. Senate, *Fiscal Year 1971 Military Procurement Authorization, Research and Development· Hearings before the Committee on Armed Services*, 91st Cong, 2d sess., 1970, pt 2 1136–37 (hereafter cited as *FY 1971 Military Procurement*), Senate, *FY 1971 DOD Appropriations*, pt 4 10, pt. 5:584–85, 748–65

43 House, *Department of Defense Appropriations for 1971· Hearings before a Subcommittee of the Committee on Appropriations*, 91st Cong., 2d sess, 1970, pt 6 584–85 (hereafter cited as *1971 DOD Appropriations*), Senate, *FY 1972 DOD Appropriations*, pt 4 23–26, 510–14, Senate, *Department of Defense Appropriations for Fiscal Year 1973· Hearings before a Subcommittee of the Committee on Appropriations*, 92d Cong, 2d sess, 1972, pt 4 781–83 (hereafter cited as *FY 1973 DOD Appropriations*)

44. Senate, *FY 1972 DOD Appropriations*, pt. 4.23; Senate, *FY 1974 Military Procurement*, pt 6 4689–4708, House, *Department of Defense Appropriations for 1975 Hearings before a Subcommittee of the Committee on Appropriations*, 93d Cong., 2d sess, pt 7 1137 (hereafter cited as *1975 DOD Appropriations*)

45 Senate, *FY 1971 DOD Appropriations*, pt. 4·308–15, Senate, *FY 1972 DOD Appropriations*, pt. 4:20; House, *Department of Defense Appropriations for 1972 Hearings before a Subcommittee of the Committee on Appropriations*, 92d Cong, 1st sess., 1971, pt 5 1010 (hereafter cited as *1972 DOD Appropriations*)

46 Senate, *FY 1974 Military Procurement*, pt 6 4670–88, Gen John W. Vogt, Jr, "Implications of Modern Air Power in a Limited War," US Air Force Oral History Program Interview 723, 29 November 1973

47. Senate, *Fiscal Year 1975 Military Procurement Authorization, Research and Development, and Active Duty, Selected Reserve and Civilian Personnel Strengths Hearings before the Committee on Armed Services*, 93d Cong, 2d sess., 1974, pt 8 4454–55 (hereafter cited as *FY 1975 Military Procurement*)

48 House, *1975 DOD Appropriations*, pt 4·465–69.

49. Ibid, 4244–45, House, *Department of Defense Appropriations for 1976 Hearings before a Subcommittee of the Committee on Appropriations*, 94th Cong., 1st sess, 1975, pt 4 370–71 (hereafter cited as *1976 DOD Appropriations*).

50 House, *1975 DOD Appropriations*, pt 1 449–51, Senate, *FY 1975 Military Procurement*, pt 8.4308–11

51 Senate, *FY 1975 Military Procurement.*, pt 8 4308–11

52 Uri Ra'anan, "The New Technologies and the Middle East· 'Lessons' of the Yom Kippur War and Anticipated Developments," in *The Other Arms Race*, eds Geoffrey Kemp, Robert L. Pfaltzgroff, Sr, Uri Ra'anan (Lexington, Mass Lexington Books, 1975), 79–81, Senate, *Department of Defense Appropriations for Fiscal Year 1975. Hearings before a Subcommittee of the Committee on Appropriations*, 93d Cong, 2d sess, 1974, pt. 5 183, 186 (hereafter cited as *FY 1975 DOD Appropriations*)

53 Uri Ra'anan, "The New Technologies and the Middle East," 83–84, Gen Chaim Herzog, *The Arab-Israeli Wars*, War and Peace in the Middle East (New York: Random House, 1982), 311, Senate, *FY 1975 Military Procurement*, pt 8 4241–52, 4306–18.

54 Senate, *FY 1975 Military Procurement*, 4312–13

55 Uri Ra'anan, "The New Technologies and the Middle East," 84–85

56 Gen Chaim Herzog, "The Middle East War, 1973," *RUSI Journal*, March 1975, 15, Maj Donald J. Alberts, "A Call from the Wilderness," *Air University Review*, November–December 1976, 39; Gen Chaim Herzog, *The Arab-Israeli Wars, War and Peace in the Middle East* 310-11.

57 Herzog, *The Arab-Israeli Wars*, 310–11

58 *Air Force Policy Letter for Commanders*, 1 April 1974

59 Wing Comdr Hans F. Roser, RAAF, "Defense Suppression, Mission or Tactic?" *Air University Review*, July–August 1978, 26

60. House, *1975 DOD Appropriations*, pt 2 273.

61. Gen Robert J. Dixon, "The Range of Tactical Air Operations," *Strategic Review*, Spring 1974, 23–24

62. House, *1975 DOD Appropriations*, pt 9 285.

63 Senate, *FY 1975 DOD Appropriations*, pt. 4 585

64. Ibid , pt 1 520

65 Herzog, *The Arab-Israeli Wars*, 311

66 Senate, *FY 1975 DOD Appropriations*, pt 4.6–8, 26, 51–53, 526, 578–79, 607–8, Senate, *FY 1975 Military Procurement*, pt 8 4448–71

67. House, *1976 DOD Appropriations*, pt 1 65, House, *Department of Defense Appropriations for 1977: Hearings before a Subcommittee of the Committee on Appropriations*, 94th Cong., 2d sess , 1976, pt 1:566 (hereafter cited as *1977 DOD Appropriations*)

68 Senate, *FY 1975 DOD Appropriations*, pt 4·6

69 Senate, *FY 1975 Military Procurement* , pt. 3 791.

70 House, *Department of Defense Appropriations for 1979 Hearings before a Subcommittee of the Committee on Appropriations*, 95th Cong , 2d sess., 1978, pt. 5:99

71. Senate, *US Forces in Europe*, 105, Senate, *Department of Defense Appropriations for Fiscal Year 1977 Hearings before a Subcommittee of the Committee on Appropriations*, 94th Cong , 2d sess , 1976, pt 1 407 (hereafter cited as *FY 1977 DOD Appropriations*)

72 House, *1972 DOD Appropriations*, pt. 9:33

73 Senate, *Fiscal Year 1972 Military Procurement Authorization. Hearings before the Committee on Armed Services*, 92d Cong , 1st sess , 1971, pt 5 4149 (hereafter cited as *FY 1972 Military Procurement*)

74 Senate, *US Forces in Europe*, 60–61.

75. Ibid , 86, House, *1976 DOD Appropriations*, pt 1·255.

76. Senate, *FY 1977 Military Procurement*, pt. 9 4854

77 Senate, *Close Air Support*, 179

78 Ibid

79. Ibid.

80. Senate, *FY 1973 DOD Appropriations* , pt 4 691–93

81 Report, David Packard to Melvin Laird in ibid , pt. 1 389

82 Senate, *FY 1975 Military Procurement*, pt 1 29, House, *1976 DOD Appropriations*, pt 1 58–59, 65

83 House, *1979 DOD Appropriations*, pt 5 4; House, *Department of Defense Appropriations for 1982: Hearings before a Subcommittee of the Committee on Appropriations*, 97th Cong., 1st sess , 1981, pt 6 313 (hereafter cited as *1982 DOD Appropriations*).

84. House, *1977 DOD Appropriations*, pt 1:176.

85. Senate, *FY 1973 DOD Appropriations*, pt. 1:680–81

86. Senate, *FY 1973 Military Procurement*, pt. 2:1123, Senate, *FY 1974 Military Procurement*, pt 1 400; Senate, *FY 1977 Military Procurement*, pt. 9.4855

87 Senate, *Department of Defense Appropriations for Fiscal Year 1976 Hearings before a Subcommittee of the Committee on Appropriations*, 94th Cong., 1st sess , 1975, pt. 1:355 (hereafter cited as *FY 1976 DOD Appropriations*)

88 Ibid., pt. 4 103, Senate, *Seminars, Service Chiefs on Defense Mission and Priorities, Task Force on Defense of the Committee on the Budget*, 94th Cong., 2d sess , 1976, 3 9, 23–24

89 Senate, *Seminars, Service Chiefs on Defense Mission and Priorities, Task Force on Defense of the Committee on the Budget*, 94th Cong , 2d sess , 1976, 3 9, 23–24

90 Ibid

91. Ibid

92 House, *1976 DOD Appropriations*, pt 2 129, Senate, *Department of Defense Appropriations for Fiscal Year 1978 Hearings before a Subcommittee of the Committee on Appropriations*, 95th Cong., 2d sess , 1977, pt 1·530, 968 (hereafter cited as *FY 1978 DOD Appropriations*)

93. Senate, *FY 1978 DOD Appropriations*, pt. 1.530–968

94. Ibid.

95 Ibid , *FY 1978 DOD Appropriations*, pt 1:969; House, *Department of Defense Appropriations for 1981. Hearings before a Subcommittee of the Committee on Appropriations*, 96th Cong., 2d sess , 1980, pt 4 72–75 (hereafter cited as *1981 DOD Appropriations*), Senate, *FY 1974 Military Procurement*, pt. 1.176–77, House, *1977 DOD Appropriations*, pt 3 61

96 Senate, *FY 1973 Military Procurement*, pt 2 1118–20, Senate, *FY 1974 Military Procurement*, pt 1 179–80, pt 2 1104

97. House, *Department of Defense Appropriations Hearings before a Committee of the Committee on Appropriations, H R. Oversight of Fiscal Year 1975 Military Assistance to Vietnam*, 94th Cong., 1st sess , 1975, 718–19, House, *1976 DOD Appropriations*, pt 2 164–65, House, *NATO Standardization, Interoperability and Readiness Hearings before a Special Subcommittee on NATO Standardization, Interoperability, and Readiness of the Committee on Armed Services*, 95th Cong , 2d sess , 1978, 1094–98 (hereafter cited as *NATO Standardization, Interoperability, and Readiness*).

98 House, *NATO Standardization, Interoperability, and Readiness*, 1094–98.

99. Gen John W Vogt, Jr , "Allied Air Power in Central Europe—The View from the Top," interview, *International Defense Review*, January 1975, 43–44

100. Armitage and Mason, *Air Power in the Nuclear Age*, 198

101. House, *1979 DOD Appropriations*, pt 4 354, pt 5 92–93; Dr Stephen L. Canby, "Tactical Air Power in Armored Warfare, The Divergence within NATO," *Air University Review*, May–June 1979, 14.

102 Senate, *U S Forces in Europe*, 79.

103 Senate, *Policy, Troops and the NATO Alliance, Report of Senator Sam Nunn to the Committee on Armed Services*, 93d Cong , 2d sess , 1974, 4–5.

104. House, *1976 DOD Appropriations*, pt 1 255; Senate, *FY 1977 Military Procurement*, pt 9 4855

105 Senate, *NATO and the New Soviet Threat; Report of Senator Sam Nunn and Senator Dewey F Bartlett to the Committee on Armed Services*, 95th Cong , 1st sess , 1977, 18.

106 History, Directorate of Doctrine, Concepts, and Objectivities USAF, January–June 1971, Aerospace Doctrine Division, n p , Senate, *FY 1978 DOD Appropriations*, pt. 1.238, House, *1979 DOD Appropriations*, pt 4:137–38, 161–63.

107. House, *1979 DOD Appropriations*, 163

108 Canby, "Tactical Air Power in Armored Warfare," 12, Maj Donald J. Alberts, "Tactical Air Power within NATO, A Growing Convergence of Views," *Air University Review*, March–April 1980, 60

109. Vogt interview, "Allied Air Power in Central Europe—The View from the Top," 46

110 Ibid

111 Ibid , 45

112 Senate, *FY 1973 DOD Appropriations*, 87–88; Senate, *FY 1973 Military Procurement*, pt 6 3585.

113 Senate, *FY 1973 Military Procurement*, pt. 6·3574–83, Senate, *FY 1974 Military Procurement*, pt. 6 4465–73

114 Senate, *FY 1974 Military Procurement*, pt 6 4490.

115. House, *Department of Defense Appropriations for 1974: Hearings before a Subcommittee of the Committee on Appropriations*, 93d Cong., 2d sess., 1974, pt. 2:43 (hereafter cited as *1974 DOD Appropriations*)

116 Senate, *FY 1975 DOD Appropriations*, pt. 4·23

117. Edgar F. Puryear, *George S. Brown, General, U S. Air Force· Destined for Stars* (Novato, Calif.. Presidio Press, 1983), 220, Senate, *FY 1975 Military Procurement*, pt. 6·2876

118 Senate, *FY 1975 Military Procurement*, pt 6 2876.

119 Senate, *FY 1976 DOD Appropriations*, pt. 1 610–11, pt. 4:73–77, 464–67; Senate, *FY 1977 Military Procurement*, pt. 9·5098–99.

120 Senate, *FY 1977 Military Procurement*, pt. 9·5098–99.

121. Senate, *Seminars, Service Chiefs on Defense Missions and Priorities*, 3 66

122. Senate, *FY 1977 Military Procurement*, pt 9 4886, 4896–97

123. Ibid., 4954–76, 4983–88, Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1979: Hearings before the Committee on Armed Services*, 95th Cong., 2d sess , 1978, pt 6.4692–4705 (hereafter cited as *FY 1979 DOD Authorization*).

124 House, *Department of Defense Appropriations for 1980 Hearings before a Subcommittee of the Committee on Appropriations*, 96th Cong , 1st sess., 1979, pt. 2:517–18 (hereafter cited as *1980 DOD Appropriations*)

125. Canby, "Tactical Air Power in Armored Warfare," 6–7

126 House, *1975 DOD Appropriations*, pt. 4·494, pt 7:1318–19.

127. Senate, *FY 1977 Military Procurement*, pt 9 4989.

128 House, *1976 DOD Appropriations*, pt 1 4101, pt. 5·1266

129. Ibid

130. Senate, *FY 1977 Military Procurement*, pt 9 4955; House, *1977 DOD Appropriations*, pt 1·119, pt. 5·142

131. House, *1979 DOD Appropriations*, pt 4 79–81; Senate, *FY 1979 DOD Authorization*, pt. 6 4692–94, Senate, *Department of Defense Appropriations for Fiscal Year 1980 Hearings before a Subcommittee of the Committee on Appropriations*, 96th Cong , 1st sess., 1978, pt 1 623, pt. 4 57 (hereafter cited as *FY 1980 DOD Appropriations*)

132. House, *1979 DOD Appropriations*, pt 4 83, 135, House, *NATO Standardization, Interoperability and Readiness*, 497–98.

133. Senate, *FY 1978 DOD Appropriations*, pt. 1:185–86

134. Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1980. Hearings before the Committee on Armed Services*, 96th Cong., 1st sess., 1979, pt 1·173 (hereafter cited as *FY 1980 DOD Authorization*)

135. House, *1979 DOD Appropriations*, pt. 2·677, Senate, *Department of Defense Appropriations for Fiscal Year 1979· Hearings before a Subcommittee of the Committee on Appropriations*, 95th Cong , 2d sess., 1978, pt. 1·474–76 (hereafter cited as *FY 1979 DOD Appropriations*)

136 Senate, *FY 1979 DOD Appropriations*, pt. 1:474–76

137 Senate, *FY 1978 DOD Appropriations*, pt. 1:236–38

138 House, *1979 DOD Appropriations*, pt. 4:68; *Air Force Policy Letter for Commanders Supplement*, May 1978, 18

139. House, *NATO Standardization, Interoperability and Readiness*, 356

140. House, *Department of Defense Appropriations for 1978 Hearings before a Subcommittee of the Committee on Appropriations*, 95th Cong., 1st sess., 1977, pt 2 25 (hereafter cited as *1978 DOD Appropriations*), House, *1979 DOD Appropriations*, pt 2 843, pt. 4:169–70, 246; Senate, *FY 1979 DOD Appropriations*, pt 1 1096, pt. 6:4565–75, 4645–63, Senate, *FY 1980 DOD Appropriations*, pt 1 139–52, pt. 4:1074–81; Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1981: Hearings before the Committee on Armed Services*, 96th Cong., 2d sess , 1980, pt 4:2200–10 (hereafter cited as *FY 1981 DOD Authorization*)

141 House, *NATO Standardization, Interoperability and Readiness*, 339–57.

142. Ibid , 357

143. House, *1979 DOD Appropriations*, pt 4·86–87.

144. Senate, *Department of Defense Appropriations for Fiscal Year 1983· Hearings before a Subcommittee of the Committee on Appropriations*, 97th Cong., 2d sess , 1982, pt 1 305, pt. 7:4363 (hereafter cited as *FY 1983 DOD Appropriations*)

145 House, *Department of Defense Appropriations for 1981· Hearings before a Subcommittee of the Committee on Appropriations*, 96th Cong , 2d sess , 1960, pt 2·436–37 (hereafter cited as *1981 DOD Appropriations*)

146 Col David L. Nichols, "Who Needs Nuclear TACAIR?" *Air University Review*, March–April 1976, 16; House, *1979 DOD Appropriations*, pt 2 787.

147. Gen Bruce K. Holloway, "United States Grand Strategy for the Next Ten Years," in *Grand Strategy for the 1980s*, ed Bruce Palmer, Jr., 27–28.

148. Nichols, "Who Needs Nuclear TACAIR?" 19–20.

149 Ibid

150 House, *Department of Defense Appropriations for 1983· Hearings before a Subcommittee of the Committee on Appropriations*, 97th Cong , 2d sess , 1982, pt 4 810–11 (hereafter cited as *1983 DOD Appropriations*)

151 House, *1978 DOD Appropriations*, pt. 1:573, pt. 2 104–6, 288, pt 3 339, 692; Senate, *FY 1978 DOD Appropriations*, pt 1 964

152 Senate, *FY 1979 DOD Authorization*, pt 6 4481.

153 *Annual Report to the Congress, Caspar W Weinberger, Secretary of Defense, Fiscal Year 1983* (Washington, D C: Government Printing Office, 1982), Soviet Military Power annex, 26–27, House, *1983 DOD Appropriations*, pt. 4 810–11

154 House, *1979 DOD Appropriations*, pt 4 21

155 Senate, *FY 1980 DOD Authorization*, pt 1 105; Senate, *Department of Defense Appropriations for Fiscal Year 1981: Hearings before a Subcommittee of the Committee on Appropriations*, 96th Cong., 2d sess , 1980, pt 1 69–70 (hereafter cited as *FY 1981 DOD Appropriations*)

156 House, *1981 DOD Appropriations*, pt 1 552–53, 618; Senate, *FY 1981 DOD Appropriations*, pt 1 67–71, House, *1982 DOD Appropriations*, pt. 2 208.

157. House, *1983 DOD Appropriations*, pt. 1:3, pt 4 380–81

158. Senate, *FY 1981 DOD Appropriations*, pt. 1:71, House, *1982 DOD Appropriations*, pt. 2·207–8, House, *Department of Defense Appropriations for 1984· Hearings before a Subcommittee of the Committee on Appropriations*, 98th Cong., 1st sess , 1983, pt. 2 142–43 (hereafter cited as *1984 DOD Appropriations*)

159. Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1982: Hearings before the Committee on Armed Services*, 97th Cong., 1st sess , 1981, pt 7 3891–92 (hereafter cited as *FY 1982 DOD Authorization*)

160 Ibid., 3849–50, 3861, 4328–37, 4362–63

161. Ibid

162 Senate, *Close Air Support*, 184

163 Herman S Wolk, *Planning and Organizing the Postwar Air Force 1943–1947* (Washington, D C.: Office of Air Force History, 1984), appendix 9.

164 Senate, *Close Air Support*, 185

165. Ibid , 12

166. Senate, *FY 1966 DOD Appropriations*, 305.

167. Ibid

168. Senate, *Close Air Support*, 76–77, 100–1, 136–37

169. Ibid ; Senate, *FY 1966 DOD Appropriations*, 305

170. House, *1971 DOD Appropriations*, pt. 5:64–65.

171. Frederic A Bergerson, *The Army Gets an Air Force· Tactics of Insurgent Bureaucratic Politics* (Baltimore: Johns Hopkins University Press, 1980), 117–20, Col John Schlight, "USAF in Southeast Asia South Vietnam, 1965–1968," history manuscript, Office of Air Force History, 223–27, "The

Forty-Year Split (evolution of land-air doctrine and practices in the U.S.)," *Army Magazine*, October 1965, 64; "Concept for Improved Joint Air-Ground Coordination," *Air Force Policy Letter for Commanders. Supplement*, June 1965, 27–32, Senate, *Close Air Support*, 86

172. Senate, *Close Air Support: Report of the Special Subcommittee on Close Air Support of the Preparedness Investigating Subcommittee of the Committee on Armed Services*, 92d Cong., 1st sess., 1972, 23 (hereafter cited as *Close Air Support. Report*).

173 House, *1967 DOD Appropriations*, pt. 1·533

174. Senate, *Close Air Support*, 188.

175. Senate, *Close Air Support: Report*, 23–24

176. Senate, *FY 1970 Military Procurement*, pt. 1·1583, 1896–97, Senate, *FY 1972 Military Procurement*, pt 5 3852.

177. Senate, *FY 1972 Military Procurement*, pt. 5 3852

178 Senate, *FY 1970 Military Procurement*, pt 2.1536–37; Senate, *Close Air Support*, 154, 85–86.

179. Senate, *Close Air Support*, 252–69, Senate, *Close Air Support. Report*, 22–23

180. House, *1971 DOD Appropriations*, pt 1 648.

181. Ibid.

182 Senate, *FY 1970 Military Procurement*, pt 2 925–28, 948–49; House, *1971 DOD Appropriations*, pt 6 678

183 House, *1971 DOD Appropriations*, pt 6 678

184. Senate, *FY 1971 Military Procurement*, pt. 2:1140–44, Senate, *Close Air Support*, 99–100

185. Senate, *Close Air Support*, 40

186. Senate, *FY 1972 Military Procurement*, pt. 5:3852.

187. Ibid.

188. House, *1972 DOD Appropriations*, pt 2.36–38, Senate, *Close Air Support*, 12–16; History, Directorate of Doctrine, Concepts and Objectives, US Air Force, July–December 1971, appended "Doctrinal Issues Briefing."

189 Senate, *Close Air Support*, appendix A. Department of Defense Close Air Support Report.

190 Senate, *Close Air Support. Report*, 1–6.

191. Ibid.

192. Senate, *FY 1972 Military Procurement*, pt 2 1289, pt 5 3872–73, Senate, *FY 1972 DOD Appropriations*, pt 4.646.

193. Senate, *Close Air Support*, 7.

194. Ibid, 31.

195. Senate, *Close Air Support: Report*, 25–26; Senate, *FY 1974 Military Procurement*, pt. 1 190–92.

196 House, *Department of Defense Appropriations for 1973 Hearings before a Subcommittee of the Committee on Appropriations*, 93d Cong, 2d sess, 1972, pt. 3 529–30; Senate, *FY 1973 Military Procurement*, pt 2·709

197. Senate, *FY 1973 DOD Appropriations*, pt. 4:25, 83.

198 Senate, *FY 1973 Military Procurement*, pt 2:1294

199. Senate, *Close Air Support: Report*, 23–24; Bergerson, *The Army Gets an Air Force*, 122, Senate, *FY 1974 Military Procurement*, pt 2.190–92, *Department of Defense Annual Report for Fiscal Year 1978*, 167; *Department of Defense Annual Report for Fiscal Year 1979*, 147.

200 Senate, *FY 1974 Military Procurement*, pt. 6:4526–74.

201. Ibid

202 Ibid, pt. 2 954–56, pt. 6:4562, 4566; Dr George M Watson, Jr, "The A-10 Close Support Aircraft, 1970–1976," *AFSC Historical Publication*, iv–v

203. House, *1975 DOD Appropriations*, pt. 2·302–3

204. Ibid., pt. 7:1098–99, pt. 9.225–26, Senate, *FY 1979 DOD Appropriations*, pt. 4·602–6.

205. Senate, *FY 1979 DOD Appropriations*, pt 4 602

206. Senate, *FY 1974 Military Procurement*, pt 2 999

207. House, *1974 DOD Appropriations*, pt 5 1647.

208 Senate, *FY 1977 Military Procurement*, pt. 10 5639

209 *Air Force Policy Letter for Commanders*, 1 September 1975.
210. Ibid
211. Ibid.
212. Senate, *FY 1977 Military Procurement*, pt 10:5639–40.
213 Senate, *Close Air Support*, 105
214 Senate, *Close Air Support· Report*, 28–29
215 Senate, *Seminars, Service Chiefs on Defense Mission and Priorities*, 3.7; Senate, *FY 1977 DOD Appropriations*, pt 1 527.
216. Senate, *Close Air Support*, 7
217 History, Directorate of Doctrine, Concepts, and Objectives, USAF, July–December 1967 and July–December 1971
218 Ibid.
219 Senate, *Seminars, Service Chiefs on Defense Mission and Priorities*, 3:6–7.
220 Senate, *FY 1977 DOD Appropriations*, pt. 1:527–28
221 Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1984· Hearings before the Committee on Armed Services*, 98th Cong , 1st sess , 1983, pt 1 481 (hereafter cited as *FY 1984 DOD Authorization*)
222 Senate, *Close Air Support*, 252–69
223 Senate, *FY 1977 DOD Appropriations*, 527
224 House, *NATO Standardization, Interoperability and Readiness*, 435–36, 443–44.
225 Ibid , 435; Senate, *Close Air Support*, 209
226 House, *NATO Standardization, Interoperability and Readiness*, 435–36, 443–44.
227 "Omnibus Agreement," Tactical Air Conference, Langley AFB, Va , 11–15 April 1983, appended to report, Col Arthur E. Ivins and Lt Col William Mack, Air War College, subject Trip Report (HQ TAC/XPJ), 10–15 April 1983.
228. Maj Gen Robert N Ginsburgh, USAF, Retired, "A New Look at Control of the Seas," *Strategic Review*, Winter 1976, 87.
229. Senate, *FY 1975 Military Procurement*, pt. 7.3918
230 House, *1977 DOD Appropriations*, pt 5 140
231 Ginsburgh, "A New Look at Control of the Seas," 87, Elmo R. Zumwalt, Jr., *On Watch, A Memoir* (New York. Quadrangle/New York Times Book Co , 1976), 70–71, House, *1979 DOD Appropriations*, pt 5 238
232. Ginsburgh, "A New Look at Control of the Seas," 87, Zumwalt, *On Watch*, 70–71; House, *1979 DOD Appropriations*, pt 5 238
233 *Air Force Policy Letter for Commanders*, 1 July 1974
234. House, *1976 DOD Appropriations*, pt 2 42, 615
235. *Air Force Policy Letter for Commanders· Supplement*, November 1975, 29–31
236 *Air Force Policy Letter for Commanders*, 1 August 1976, House, *1977 DOD Appropriations*, pt. 1 797, 882, pt 2 183.
237 *Air Force Policy Letter for Commanders*, 1 August 1976, House, *1977 DOD Appropriations*, pt. 1:797, 882, pt. 2:183
238 House, *Reorganization Proposals for the Joint Chiefs of Staff Hearings before the Investigation Subcommittee of the Committee on Armed Services*, 97th Cong , 2d sess , 1982, 476–78 (hereafter cited as *Reorganization Proposals for the JCS*)
239 Senate, *FY 1981 DOD Authorization*, 3844, 4328
240 Ibid , 3925–27.
241 James D. Hessman, "Sea Power and the Control Front," *Air Force Magazine*, July 1983, 52; Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1983. Hearings before the Committee on Armed Services*, 97th Cong , 2d sess , 1982, pt. 7 4363 (hereafter cited as *FY 1983 DOD Authorization*), Senate, *FY 1984 DOD Authorization*, pt. 1 255
242. Senate, *FY 1982 DOD Authorization*, pt 3 1281–82, Tactical Air Conference, Langley AFB, Va., 11–15 April 1983, *Air Force Policy Letter for Commanders*, 15 November 1982, "Air Force and

Navy Agree to Closer Ties," *Air Force Magazine*, January 1983, 30; House, *1984 DOD Appropriations*, pt. 2:88, 430, 491.

243 "Air Force and Navy Agree to Closer Ties," 30.

244. Ibid.

245. Gen Robert J. Dixon, "TAC-TRADOC Dialogue," *Strategic Review*, Winter 1978, 46

246 Senate, *FY 1979 DOD Authorization*, pt 6.4423, Dixon, "The Future and Tactical Air Command," *Air Force Policy Letter for Commanders' Supplement*, February 1976, 19–20

247. Dixon, "The Future and Tactical Air Command," 19–20.

248. Dixon, "TAC-TRADOC Dialogue," 47–48, Senate, *FY 1977 Military Procurement*, pt. 10 5615–16

249 Senate, *FY 1977 Military Procurement*, pt 10 5636–37, House, *1979 DOD Appropriations*, pt. 5.94; House, *NATO Standardization, Interoperability and Readiness*, 398–99.

250 Dixon, "TAC-TRADOC Dialogue," 48, Senate, *FY 1977 Military Procurement*, pt. 10·56 17

251. Dixon, "TAC-TRADOC Dialogue," 48

252. Senate, *FY 1977 Military Procurement*, pt. 10.5613

253 Ibid., 5628–29, Senate, *FY 1979 DOD Authorization*, pt 6.4430–31, 4564, 4728–37.

254 Senate, *FY 1977 Military Procurement*, pt 9 4887

255. Ibid , pt 10.5622; Senate, *FY 1979 DOD Authorization*, pt 6·4432, 4482–89, 4494–95

256. Senate, *FY 1979 DOD Authorization*, pt 6 4440–41

257. Ibid , 4894–95

258 Ibid , 4908

259 Senate, *FY 1975 Military Procurement*, pt 6 3037, 3049–51, 3055, pt 8:4393–4407.

260 Senate, *FY 1977 Military Procurement*, pt. 9 5164–75

261 Senate, *FY 1979 DOD Authorization*, pt. 6 4498, 4889–4951; History, Directorate of Concepts, July–December 1977, 80

262. History, Directorate of Concepts, 80.

263 Ibid.

264. Senate, *FY 1977 Military Procurement*, pt 9:520–522, Senate, *FY 1979 DOD Authorization*, pt. 6 4738–57, House, *1979 DOD Appropriations*, pt. 5·52, House, *1983 DOD Appropriations*, pt 2 671.

265 Senate, *FY 1979 DOD Authorization*, pt. 6 4738–57

266 Ibid.

267. Senate, *FY 1983 DOD Authorization*, pt 4 2636–37, House, *1983 DOD Appropriations*, pt 2.671–73, House, *1982 DOD Appropriations*, pt 6 4, 32–33, 345

268 House, *1982 DOD Appropriations*, pt 6:4, 32–33, 345

269 History, Directorate of Doctrine, Concepts, and Objectives, US Air Force, July–December 1972, 122; January–June 1973, 113

270. Ibid

271. Speech by Maj Gen Leslie W. Bray, Jr , to National Security Industrial Association, 15 March 1973, in *Air Force Policy Letter for Commanders. Supplement*, June 1973, 31–38, Bray, "Tactical Counterforce" *Air Force*, June 1974, 36–40

272. Enthoven and Smith, *How Much Is Enough?*, 222

273 Senate, *Close Air Support*, 18

274. Bray, "Tactical Counterforce," 38

275 Gen Donn A Starry, US Army, "A Tactical Evolution FM 100-5," *Military Review*, August 1978, 2

276. Senate, *Close Air Support*, 113

277. Senate, *FY 1977 Military Procurement*, pt 10 5606–12

278 Ibid.

279 William S Lind, "Some Doctrinal Questions for the United States Army," *Military Review*, March 1977, 54–65; Lind, "Military Doctrine, Force Structure, and the Defense Decision Making Process," *Air University Review*, May–June 1979, 21–27.

280 John L. Romjue, "The Evolution of the AirLand Battle Concept," *Air University Review*, May–June 1984, 6; Senate, *FY 1979 DOD Authorization*, pt. 6.4444–54

281. Romjue, "The Evolution of the AirLand Battle Concept," 7, House, *NATO Standardization, Interoperability and Readiness*, 1107.

282 Romjue, "The Evolution of the AirLand Battle Concept," 7

283 Edward N Luttwak, "The American Style of Warfare and the Military Balance," *Air Force Magazine*, August 1979, 86–88; Lt Col Walter Kross, "Military Reform Past and Present," *Air University Review*, July–August 1981, 101–8.

284 Romjue, "The Evolution of the AirLand Battle Concept," 6–15

285. Michael R. Gordon, "The Army's 'AirLand Battle' Doctrine Worries Allies, Upsets the Air Force," *National Journal*, 18 June 1983.

286. Ibid.; Maj James A Machos, "TACAIR Support for AirLand Battle," *Air University Review*, May–June 1984, 16–24.

287 Gordon, "The Army's 'AirLand Battle' Doctrine Worries Allies, Upsets the Air Force "

288 Edgar Ulsamer, "TACAIR—History's Most Potent Fighting Machine," *Air Force Magazine*, February 1976, 22

289 Robert S Dotson, "Tactical Air Power and Environmental Imperatives," *Air University Review*, July–August 1977, 29.

290 Col Robert D. Rasmussen, "The Central European Battlefield, Doctrinal Implications for Counterair-Interdiction," *Air University Review*, July–August 1978, 12–13

291 AFM 1-1, *Functions and Basic Doctrine of the United States Air Force*, 14 February 1979, 2 13

292 Wing Comdr Jeremy G Saye, "Close Air Support in Modern Warfare," *Air University Review*, January–February 1980, 6; Lt Col Donald L. Alberts, "An Alternate View of Interdiction," *Air University Review*, July–August 1981, 40

293 Senate, *FY 1984 DOD Authorization*, pt. 1:122

294 Group Capt Ian Madelin, Royal Air Force, "The Emperor's Close Air Support," *Air University Review*, November–December 1979, 82–86, Saye, "Close Air Support in Modern Warfare," 2–21

295 Maj Michael O Beck, "Close Air Support," *Air University Review*, September–October 1980, 100–1

296. House, *1984 DOD Appropriations*, pt 2 260

297. Machos, "TACAIR Support for AirLand Battle," 19.

298. Ibid , 21, memorandum by Gen W W Momyer, USAF, Retired, to Col D R. McNabb, Headquarters USAF/XOXID, subject: Background Paper on Theater Warfare Planning Boundaries, 1 April 1981, in Headquarters USAF/XOXID, Doctrine Information Publication no 10, Background Information on Air Force Perspective for Coherent Plans (Command and Control of TACAIR), April 1981

299 Memorandum by Gen W W Momyer, USAF, Retired, to Col D. R. McNabb.

300. Clifton Berry, Jr , "USAF Doctrine Comes Alive," *Air Force Magazine*, July 1983, 34–36, General Creech's discussion of AirLand Battle, Tactical Air Conference, Langley AFB, Va , 11–15 April 1983, appended to report, Ivins and Mack, subject Trip Report (HQ TAC/XPJ, 10–15 April 1983)

301 House, *1982 DOD Appropriations*, pt 6 9–10, Senate, *FY 1983 DOD Authorization*, pt 4 2575.

302 Senate, *FY 1984 DOD Authorization*, pt 1 122

303 Department of the Army/Department of the Air Force, Memorandum of Agreement on US Army-US Air Force Joint Force Development Process, 22 May 1984

304 Maj Gen Gerald J. Carey, Jr , "The Electronic Air Force Electromagnetic Combat," *Air Force Magazine*, July 1980, 83–87.

305 Ibid

306 Lt Gen Kelly H Burke, USAF, Retired, "Electronic Combat· Warfare of the Future," *Jewish Institute for National Security Affairs Newsletter*, February 1983

307 Ibid

308 Senate, *FY 1984 DOD Authorization*, pt 1 168

309. House, *1971 DOD Appropriations*, pt. 1 274; Senate, *FY 1972 DOD Appropriations*, pt 4:13, 57–58; Senate, *FY 1972 Military Procurement*, pt. 5:3781

310 Senate, *FY 1972 Military Procurement*, pt 5:3781, Senate, *FY 1973 Military Procurement*, pt 6:3522

311 Senate, *FY 1970 Military Procurement*, pt. 2·1536–37, Senate, *FY 1971 Military Procurement*, pt 2 948–49; Senate, *Close Air Support*, 202.

312. Senate, *FY 1977 Military Procurement*, pt 9.4894–95.

313. Ibid , 5691–92.

314. Senate, *FY 1983 DOD Appropriations*, pt 4.146.

315. Senate, *FY 1977 Military Procurement*, pt 9 4898–4900, House, *1976 DOD Appropriations*, pt 1:333, pt. 2:128–29, Senate, *FY 1976 DOD Appropriations*, pt. 4:188–89.

316. Senate, *FY 1979 DOD Authorization*, pt. 6·4490

317. Ibid

318. House, *1979 DOD Appropriations*, pt. 4 306–7, pt. 5:17–18, 89, House, *1981 DOD Appropriations*, pt 2 408, House, *1980 DOD Appropriations*, pt. 6·519, Senate, *FY 1981 DOD Authorization*, pt. 4·2249

319. Senate, *FY 1981 DOD Authorization*, pt. 4·2249.

320. Senate, *FY 1979 DOD Appropriations*, pt 5:232–33, House, *1981 DOD Appropriations*, pt. 5:379–80

321 House, *1981 DOD Appropriations*, pt 5 379–80

322 Senate, *FY 1978 DOD Authorization*, pt 6 4499.

323. House, *1981 DOD Appropriations*, pt. 7 667

324 *Air Force Policy Letter for Commanders*, 15 December 1980

325. Ibid

326. Ibid

327. Senate, *FY 1979 DOD Authorization*, pt. 6·4499, Senate, *FY 1979 DOD Appropriations*, pt 1:1097; House, *1979 DOD Appropriations*, pt. 5:91.

328 House, *1979 DOD Appropriations*, pt 5 91, 712; Senate, *FY 1980 DOD Appropriations*, pt 1 687, House, *1980 DOD Appropriations*, pt 7 390, House, *1984 DOD Appropriations*, pt 2 187–54.

329 House, *1979 DOD Appropriations*, pt 5 17–18, House, *1980 DOD Appropriations*, pt 6:519, House, *1981 DOD Appropriations*, pt. 3 997.

330 House, *1980 DOD Appropriations*, pt. 7:510–11, House, *1981 DOD Appropriations*, pt. 2 408–9, 9.121; Senate, *FY 1983 DOD Appropriations*, 310–12

331. House, *1980 DOD Appropriations*, pt. 7·510–11, House, *1981 DOD Appropriations*, pt 2 408–9, 9 121; Senate, *FY 1983 DOD Appropriations*, 310–12

332 House, *1981 DOD Appropriations*, pt 2 408–9.

333. Ibid., 404, 407, pt 3 1000.

334. House, *1982 DOD Appropriations*, pt 6·5, 32

335 Senate, *FY 1983 DOD Appropriations*, pt. 1·313

336 Ibid

337. Ibid

338 Senate, *FY 1977 Military Procurement*, pt 9 4896–97, Senate, *FY 1980 DOD Appropriations*, pt 4:1627

339. House, *1982 DOD Appropriations*, pt 6 9, Senate, *FY 1983 DOD Authorization*, pt. 4 2593

340. Senate, *FY 1983 DOD Authorization, pt. 4.2593*

341 House, *1980 DOD Appropriations*, pt 2 404, pt. 3:997, pt. 9 143, 144.

342 Ibid , pt. 3 1021, 1053; House, *1982 DOD Appropriations*, pt 6 43

343 Senate, *FY 1981 DOD Appropriations*, pt. 4·2200–10

344. Ibid

345 House, *1982 DOD Appropriations*, pt. 6·3-4, 8, House, *1983 DOD Appropriations*, pt. 2·364–65

346. House, *1982 DOD Appropriations*, pt. 6 190, Senate, *FY 1983 DOD Appropriations*, pt. 1 513

347 Senate, *FY 1983 DOD Appropriations*, pt 4 146–47

348. Ibid , pt 3 292, House, *Reorganization Proposals for the JCS*, 837.
349. Senate, *FY 1983 DOD Appropriations*, pt. 1 315, 358, pt 4 120–21, 146
350 House, *1982 DOD Appropriations*, pt. 6 9, 23.
351 Senate, *FY 1982 DOD Authorization*, pt 3 1271–76, Senate, *FY 1983 DOD Authorization*, pt. 4 150–53, 2597–99
352 Senate, *FY 1983 DOD Authorization*, pt 4 150–53, 2597–99
353. Senate, *FY 1983 DOD Authorization*, pt. 4·2599; Senate, *FY 1983 DOD Appropriations*, pt 4 143
354 House, *1984 DOD Appropriations*, pt 2 104–5
355 *Air Force Magazine*, May 1984, 159–60
356. House, *1984 DOD Appropriations*, pt 2 335–36
357 Brig Gen John A Shaud, United States Air Force deputy director of plans, Deputy Chief of Staff/XPO, "Toward the Future," *Long Range Planning Conference, Theater Warfare 2003*, 12–13 April 1983, *Air Force Policy Letter for Commanders*, 15 February 1982.
358 House, *1983 DOD Appropriations*, pt 2 392–93
359. See John T Correll, "Where TAC Is Heading," and Lt Gen Robert D. Russ, "The Fighter Roadmap," *Air Force Magazine*, June 1984, 50–63
360 Ibid

Lt Gen George S Boylan, Jr., director of aerospace programs and deputy chief of staff for programs and resources

Maj Gen Robert P. Lukeman, assistant chief of staff for studies and analysis

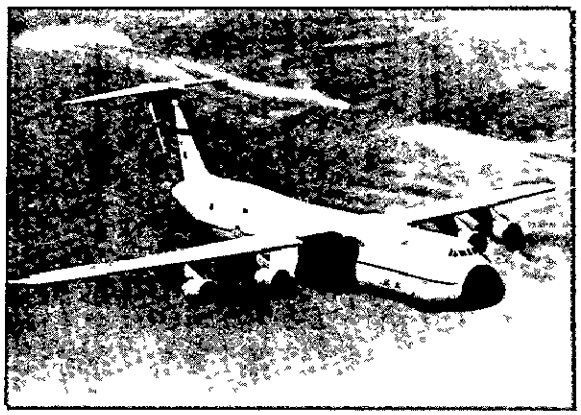
Gen Wilbur L. Creech, commander of the Tactical Air Command

Gen Alton D Slay, Air Force deputy chief of staff for research and development

Gen John W .Vogt, Jr , commander in chief of the United States Air Forces in Europe

Lt Gen William J. Evans, deputy chief of staff for research and development.

Lt Gen Kelly H Burke, deputy chief of staff for research, development, and acquisition



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Robert S McNamara
secretary of defense

Caspar W Weinberger,
secretary of defense

CHAPTER 7

THE AIR FORCE IN THE DEFENSE DEPARTMENT

Shortly after his retirement as chairman of the Joint Chiefs of Staff, Gen David C. Jones wrote:

> Although most history books glorify our military accomplishments, a close examination reveals a disconcerting pattern unpreparedness at the start of a war; initial failures, reorganizing while fighting; cranking up our industrial base, and ultimately prevailing by wearing down the enemy—by being bigger, not smarter. . . . Although the current threat to our security is great, there is little likelihood that we will have the time to regroup if we do not meet the threat effectively at the outset of any major conflict We can no longer afford the degradation of our defense capabilities that comes with less than effective organization [1]

In April 1982, in his last weeks on active duty, General Jones did not feel that he could leave office in good conscience without speaking out strongly about defense organizational defects. Jones said in April 1982:

> Historically our military organization has tended to lag behind the changing demands of the defense environment. Organizational change has come more often than not in the aftermath of wartime failure than as a result of forward planning. . . . We got by in the past because of our industrial base and the factors of time and space which allowed us to mobilize that base In the world wars we had the buffers of geography and of allies who could carry the fight until we mobilized and deployed After World War II we depended largely on our nuclear superiority to cover imbalance in conventional capabilities and deter direct clashes with the Soviets . Vietnam was perhaps our worst example of confused objectives and unclear responsibilities The organizational arrangements were a nightmare, for example, each service fought its own air war. Since that time we have been concerned with how to react more effectively to contingencies, but have not as yet devised a way to integrate our efforts to achieve maximum joint effectiveness without undue regard to service doctrine, missions and command prerogatives . . Because of our past successes with superior resources in wars of attrition, our military institutions have not been forced to reexamine established doctrine or to break down the institutional barriers in the interests of achieving greater force effectiveness through imaginative combinations of the resources and doctrines of the separate services. We have bureaucratized our military institutions—and the great strength of a bureaucracy is its ability to protect and preserve institutional interests and self-image against the demands of a changing environment We are comfortable with the past because it is the future, not the past, that challenges outmoded concepts, doctrines and organizational arrangements.[2]

General Jones's demands that the United States look to the organizational deficiencies that prevented combining the forces of the four armed services into

the greatest possible joint warfighting capability kindled a lively interest in organizational complexities that generated perhaps more discourse than action.

Continuing Complexities of Defense Organization

In his address to Congress that contained the proposals enacted as the Defense Reorganization Act of 1958, President Eisenhower had defined a central issue: "Separate ground, sea, and air warfare is gone forever. If ever again we should be involved in war, we will fight in it all elements, with all services, as one single concentrated efforts."[3] As military assistant to President Eisenhower, Gen Andrew J. Goodpaster had participated in the preparation of Eisenhower's defense reorganization proposals that became law in 1958. Thinking back in 1982 to these times, General Goodpaster recalled that it had taken "the unique experience of an Eisenhower administration and the unique confidence of the American people in his military judgment to accomplish the reform measures of 1958, and even those did not go as far as he desired." Still speaking of Eisenhower, Goodpaster said:

> I think as President he said that on many, many, many occasions, the loss of effectiveness, and the effects of duplication came from over-concentration in the service role When stung from time to time, he would deplore the parochialism that was being shown. Always his emphasis was on looking at these problems from the perspective of the national need, the provision of security against the overall threat that we were confronting. On the question of the integrated point of view, it was his hope, though he acknowledged some doubt, that through the changes that were put into effect in 1958, the emphasis on the corporate duties of the Joint Chiefs of Staff would become overriding.... I think that the system has not measured up to his hopes in that regard [4]

It was General Goodpaster's opinion that the "corporate duties" of the Joint Chiefs of Staff visualized by President Eisenhower had not had priority and that the Joint Chiefs had not contributed to an effective US national security policy, strategy, and posture. The service chiefs had been heavily burdened with service responsibilities; their military advice and plans, he said, "lacks the timeliness and responsiveness it should have, reflects too much of 'weapons push' and service proponency rather than an 'operational requirements pull' based on overall strategy. Joint advice on budget formation and resource allocation, though a heavy burden to the whole organization, is not of such an order or of such a quality as to influence these decisions in a sufficiently major and useful way."[5] The 1958 reorganization act had vested "full operational command" of US forces assigned to unified or specified commanders, their line of command proceeding from the president, to the secretary of defense, through the Joint Chiefs of Staff to the unified or specified commander. In this function the Joint Chiefs of Staff did not initiate but transmitted the instructions of the national command authorities (the president/secretary of defense). The service departments and service chiefs did not possess command authority but were charged to train, organize, and support

the force units assigned to the operational command of unified/specified commanders. It was General Goodpaster's opinion predicated upon his position as supreme allied commander in Europe in the 1970s that the information and recommendations of unified/specified operational commanders needed "to be strengthened and reflected in overall military planning and resource allocation."[6] Gen Russell E. Dougherty, who had served as chief of staff SHAPE and also CINCSAC shrewdly pointed out that even though the service departments and chiefs "provided, prepared, procured" and the unified/specified commands had "operational command" it was nonetheless true that "he who pays, controls." Dougherty said:

> That to me is one of the most serious weaknesses in our system We have developed a system that is designed for bookkeepers and accountants and have lost a historical and strategic perspective on how to correlate forces to achieve objectives, either by defensing or by way of containing and defeating an enemy We have abdicated to the bookkeepers, we think along that line [7]

Making another point General Goodpaster said:

> If the services would realign their forces to do the jobs in the field as seen by the people that bear the responsibility there, I think that this would be a more efficient, a more effective directed pattern of programs and effort than if the impetus comes from the weapon systems themselves [8]

When President Kennedy took office in 1961 his Democratic party platform had pledged him to make a complete examination of the organization of the US armed forces, and to this end in the summer of 1960 Kennedy asked Sen Stuart Symington to head a study committee looking toward national defense reorganization. The report of the Symington committee received by President-elect Kennedy called for a very high degree of centralization of authority in the Department of Defense, and in the years to follow both Symington and Roswell L. Gilpatric, who served on the committee, changed their opinions.[9] As deputy secretary of defense from 1961 to 1964n, Gilpatric recalled that he concluded that there was "a value in having the senior service officers, the men who have risen to the head of their respective services, be in juxtaposition to the Secretary of Defense through bodies such as the Joint Chiefs." He believed and so wrote in 1964 that the Joint Chiefs ought to continue to be "a planning body." "When it came to issues of resources allocations, force strengths, missions," Gilpatric said, "I felt that the chiefs should not have any say in that process, nor should they be in the line of command from the President and Secretary of Defense down to the unified and specified commands." Gilpatric remembered that President Kennedy called the Joint Chiefs to the White House to meet with the National Security Council early in 1961; the subject of the meeting was what to do about Communist military advances in Laos and Gilpatric said that Kennedy got five different views from the five Joint Chiefs. Gilpatric also recalled that the Joint Chiefs split three ways in advice to Secretary McNamara during the Cuban missile crisis of 1962. According to Gilpatric, President Kennedy

nevertheless did not want to pursue any basic changes in the National Security Act, because he did not want to take on the two chairmen of the Armed Services Committees, Sen Richard Russell and Congressman Carl Vinson.[10]

As seen earlier, Secretary McNamara studied the 1958 defense legislation and opted for secretary of defense actions that were far short of the Symington committee recommendations. It seemed to McNamara that two major deficiencies needed action. He said:

> First, some of the combat ready forces had not been placed under the unified and specified command structure Second, the Joint Chiefs of Staff had yet to be provided the organizational and management tools they needed to give the most effective day-to-day operational direction to the combat forces [11]

McNamara therefore created the US Strike Command in 1961. Actions were already under way to form the Defense Communications Agency (DCA) and McNamara expanded its charter. The Defense Supply Agency (DSA) was formed to supervise the procurement of common items of supply for the several services. Service intelligence functions were consolidated under a new organization, the Defense Intelligence Agency (DIA). There were other actions such as assigning the Air Force responsibility for space research and development, a responsibility previously distributed among the three services. Another similar action was the assignment to the Air Force of the principal responsibility for managing missile ranges, a responsibility previously shared with the Navy.[12] The intelligence reorganization produced one voice speaking for defense in the US Intelligence Board, which produced national intelligence estimates. When there was dissatisfaction with the unitary intelligence estimates and intimation that DIA might be split up and returned to the services, Gen George S. Brown liked the DIA as "a reasonable organization." He said in February 1976:

> Personally, I think it would be a mistake to tear that house down and go back where we were years ago.... You know, you just look at the bomber count—we spent billions of dollars in air defense for this country when there wasn't any Soviet bomber fleet. We spent billions on missiles when there wasn't a missile gap If there was a missile gap, it was because we had so many and they had very few, which was precisely the reverse of the picture that was put out.[13]

After the Bay of Pigs incident in 1961, Gen Maxwell Taylor recalled that President Kennedy was "very dissatisfied with the Joint Chiefs of Staff performance." Taylor said that Kennedy's primary complaint against the Joint Chiefs with regard to the Bay of Pigs "was that although they didn't think it would work, they never came to him and said so, because they weren't asked. The question wasn't put to them, so there was no response." After the Bay of Pigs, Taylor said of President Kennedy: "He felt that he would be more comfortable if he had a military man in the White House, someone beyond the military aide type, who could assist him in coping with the military questions in the future after the Bay of Pigs." In 1961–62 General Taylor served as military representative to the president,

maintaining liaison to the president with the Pentagon and with the CIA. During this time Taylor recommended and Kennedy agreed that the Joint Chiefs should provide him with unfiltered advice but that it should not be purely military since all problems were affected by political, economic, and psychological factors as well as military ones. This idea was incorporated into a National Security Action Memorandum in 1961. The position of military representative to the president was not filled again when General Taylor was named chairman of the Joint Chiefs in 1962 Viewing his experience in retrospect, General Taylor concluded that the Joint Chiefs had never satisfactorily carried out their responsibility to serve as the principal military adviser to the president, the National Security Council, and the secretary of defense. Taylor said, "The fact is that the Chiefs have traditionally been loath to volunteer advice to higher authority, particularly if its substance would impinge seriously upon service interests. In my day, the slogan in the JCS was just answer the mail and nothing more."[14] He also recalled that President Eisenhower had understood staff work and was completely comfortable with the National Security Council. Taylor nevertheless concluded that Eisenhower gave the Pentagon less personal attention than did Presidents Kennedy or Johnson, both of whom elected to use the National Security Council as a vehicle for ratifying what had already been decided upon in the closer confines of the Oval Office. Both Presidents Nixon and Ford made more use of the National Security Council, but General Brown, who served under the two men, reported different reliance on military advice. Brown said President Nixon "had his mind on other matters, and the national security affairs were carried on pretty much according to existing policy and with the momentum they had gained. So the Joint Chiefs' relationship with President Nixon was rather *pro forma*. We didn't have much personal contact with the President " Brown said that President Ford used the National Security Council frequently and regularly in formal session: "The Joint Chiefs of Staff were represented at each and every one of those meetings, and either I or the acting chairman was expected to participate fully in the discussion. We had extensive personal contact both socially and in a business way with the President," Brown recalled.[15]

The Blue Ribbon Defense Panel

"I inherited a system designed for highly centralized decisionmaking," said Secretary of Defense Melvin R Laird of his initiation to the Pentagon at the beginning of President Nixon's administration. Laird continued:

> Our centralization of decision making in so large an organization as the Department of Defense leads to a kind of paralysis. Many decisions are not made at all, or, if they are made, lack full coordination and commitment by those who must implement the decisions. The traffic from lower to higher echelons may be inhibited, relevant and essential inputs for the decision maker can be lost [16]

According to Air Force Secretary Robert C. Seamans, Jr., the problem of overcentralization was endemic within the Air Force as well as within the OSD. And his swan song to the Senate Appropriations Committee in the spring of 1969, Gen John P. McConnell, retiring Air Force chief of staff, also had bewailed high centralization and the burden of providing more and more information to upper-level decisionmakers. McConnell said:

> In running flying units, I never had any trouble When a squadron commander goofed, he was fired. In our procurement and development areas, I can't find anyone to fire Too many people at too many levels have had too much to say about the program [17]

During 1969 the Nixon administration sought to rejuvenate the National Security Council (NSC) and to make it a much more meaningful organization than it had become in the Kennedy-Johnson years, when many of the matters handled by President Eisenhower's NSC had been decided by the president and a single cabinet officer or group of government officials. In July 1969 President Nixon assembled a distinguished Blue Ribbon Defense Panel, headed by Gilbert W. Fitzhugh, chairman of the board of the Metropolitan Life Insurance Company. Nixon assigned the panel a very broad charter to study, report on, and make recommendations on the organization and management of the Department of Defense, including the Joint Chiefs of Staff, the defense agencies, and the military services. According to one congressional staff person, the Blue Ribbon Defense Panel was not incumbent, since "every incoming defense administration believes itself duty-bound to show that it has a new approach, one that will be vastly superior to the old ways, more conducive to economy, efficiency, and responsibility."[18] Adm Thomas Moorer, the Joint Chiefs of Staff chairman at the time, had a different explanation for the Blue Ribbon Defense Panel, saying. "This was a study motivated by disagreement between the Secretary of Defense and Henry Kissinger [the presidential national security adviser], the prime target being the Joint Chiefs of Staff who had nothing to do with the study in the first place."[19] Required to report within one year, the panel embraced its mission with enthusiasm engendered by a realization that its investigation was the first broad-scale study of defense organization since the commissions on the organization of the executive department chaired in the 1940s by former President Herbert Hoover. The panel had a large research staff which plumbed sources and conducted interviews both within and outside of government. At the outset of the work, President Nixon told the panel that what he was looking for was criticism. "I think it's important to remember that, because our report is critical, and it's not balanced for that reason," cautioned Fitzhugh.[20]

The Blue Ribbon Defense Panel completed its task within the year as specified, and after delivering copies of the report to President Nixon and Secretary Laird, Fitzhugh released the document at a news conference in the Pentagon on 27 July 1970. He spoke candidly of defects in the Department of Defense. Fitzhugh said:

> The problems we found are not with people, it's with the organizational structure itself Frankly, we think it's an impossible organization to administer We are amazed it works at all, it's so big and cumbersome under the present organizational structure The basic difficulty we found was a diffusion of responsibility. There is nobody below the level of the Secretary and the Deputy Secretary that has the purview of the whole operations of the Department. The same people have an interest in everything, so that they are all bogged down with too much detail work, too many responsibilities, there are too many man killing jobs, and nobody really has the responsibility for anything... Everybody is somewhat responsible for everything, and nobody is completely responsible for anything. So there's no way of assigning authority, responsibility and accountability. You can't hold anybody accountable There is nobody you can point your finger to if anything goes wrong, and there is nobody you can pin a medal on if it goes right, because everything is everybody's business, and . what is everybody's business is nobody's business [21]

The Blue Ribbon Defense Panel Report—although perhaps influenced by the 12-month limit on its time of preparation—was the most exhaustive examination and commentary on the organization and operations of the Department of Defense. The report would continue to be cited and for this reason its nine-page executive summary carried thought for both immediate and future reflection.

BLUE RIBBON DEFENSE PANEL REPORT

EXECUTIVE SUMMARY

– The purpose of this summary is to provide a quick review of the six-chapter report resulting from the year-long study by the Blue Ribbon Defense Panel The Panel's report offers recommendations in a number of areas including organization, management of materiel resources, management procedures, personnel management and conflicts of interest This summary covers the major recommendations of the Panel in the area of the organization of the Defense Department and several of the more significant recommendations in the other areas

As a result of its examination of the Defense Department, the Panel found that

– Effective civilian control is impaired by a generally excessive centralization of decision-making authority at the level of the Secretary of Defense The Secretary's ability to selectively delegate authority and decentralize management, while still retaining personal authority on major policy issues of the Department, is seriously inhibited by the present organizational structure

– The President and the Secretary of Defense do not presently have the opportunity to consider all viable options as background for making major decisions, because differences of opinion are submerged or compromised at lower levels of the Department of Defense

– There are too many layers of both military and civilian staffs, and staffs are too large in the Office of the Secretary of Defense (OSD), the Military Departments extending down through the field commanders, the Joint Chiefs of Staff and the Unified and Component Commands. The results are excessive paper work and coordination, delay, duplication and unnecessary expense

– The present arrangement for staffing the military operations activities for the President and the Secretary of Defense through the Joint Chiefs of Staff and the Military Departments is awkward and unresponsive; it provides a forum for inter-Service conflicts to be injected into the decision-making process for military operations; and it inhibits the flow of information between the combatant commands and the President and the Secretary of Defense, often even in crisis situations.

– The Joint Chiefs of Staff could more effectively perform their important statutory role as principal military advisors to the President and the Secretary of Defense if they were relieved of the necessity of performing delegated duties in the field of military operations and Defense Agency supervision

– The present combatant command structure does not facilitate the solution of many serious problems which materially affect the security of the nation. For example, recent advances in technology require much closer coordination in planning for and employing the forces of the Continental Air Defense Command and the Strategic Air Command than can reasonably be expected with two separate commands Also, the present Unified Commands do not bring about unification of the Armed Forces, but rather are layered with Service component headquarters and large headquarters' staffs

– There is substantial room for improvement and greater integration of management throughout the supply, maintenance and transportation systems of the Department The most critical need for improved effectiveness is in the support of the Unified Commands.

– There is no organizational element within OSD with the capability or the assigned responsibility for objectively making net assessments of U S. and foreign military capabilities.

– There is no adequate organizational element within OSD that is charged with the responsibility for long-range planning for the structuring and equipping of forces or for other similar purposes.

– No formal mechanism exists within OSD to assure adequate coordination among the various elements of the Department

– The present functional assignments of Assistant Secretaries of the Military Departments contribute to duplication between the efforts of the Military Department Secretariats and the Service military staffs, and also between the Military Department Secretariats and OSD

– The policies of the Department on development and acquisition of weapons and other hardware have contributed to serious cost overruns, schedule slippages and performance deficiencies. The difficulties do not appear amenable to a few simple cure-alls, but require many interrelated changes in organization and procedures

– Operational test and evaluation has been too infrequent, poorly designed and executed, and generally inadequate.

– Procurement procedures do not sufficiently reflect the national need to maintain an adequate, but not excessive, industrial base

– The promotion and rotation systems of the Military Services do not facilitate career development in the technical and professional activities, such as research and development, procurement, intelligence, communications and automatic data processing

– The acquisition and retention of officers and enlisted men in the Armed Services are becoming increasingly difficult for a number of reasons, including (1) personnel policies with respect to compensation, promotion and retirement, and (2) the negative attitude of segments of the public

– While policies on equal employment opportunity for military and civilian personne' and for contractors appear adequate, implementation responsibilities and functional assignments are fragmented and diffused and have impaired the achievement of effective results

– The statutes and regulations regarding conflicts of interest are ambiguous, conflicting, and inequitable, and are not uniformly enforced.

To effect substantial improvement in these conditions, the Panel makes the following recommendations

1. The functions of the Department of Defense should be divided into three major groupings

(a) Military Operations, including operational command, intelligence, and communications (herein called Operations),

(b) Management of personnel and materiel resources (herein called Management of Resources), and

(c) Evaluation type functions, including financial controls, testing of weapons, analysis of costs and effectiveness of force structures, etc (herein called Evaluation)

2 Each of these major groups should report to the Secretary of Defense through a separate Deputy Secretary Appointees to these three positions should be drawn from civilian life, and should rank above all other officers of the Department of Defense except the Secretary. One of the three should be designated principal deputy The General Counsel, the Assistant to the Secretary of Defense (Atomic Energy), the Assistant Secretary of Defense (Public Affairs), and the Assistant to the Secretary of Defense (Legislative Affairs) would continue to report directly to the Secretary of Defense. The staff of the Office of the Secretary of Defense should not exceed 2,000 people.

3 The Deputy Secretary of Defense for Management of Resources should be delegated responsibility for the following functions:

(a) The Military Departments, which should continue under the immediate supervision of their Secretaries;

(b) Research and Advanced Technology;

(c) Engineering Development,

(d) Installations and Procurement (a modification of the present Installations and Logistics);

(e) Manpower and Reserve Affairs,

(f) Health and Environmental Affairs;

(g) Defense Supply Agency; and

(h) Advanced Research Projects Agency

There should be an Assistant Secretary of Defense for each of the functions (b) through (f) inclusive, who reports and provides staff assistance to the Secretary of Defense through the Deputy Secretary of Defense (Management of Resources) The position of Director, Defense Research and Engineering, should be abolished, and his functions reallocated between the Assistant Secretary of Defense for Research and Advanced Technology and the Assistant Secretary of Defense for Engineering Development

Functions (g) and (h) should continue to be constituted as Defense Agencies, each under the immediate supervision of a Director

The Advanced Research Projects Agency should be delegated the responsibility for all research and exploratory development budget categories Funds for such research should be budgeted directly to this Agency, and the Agency should be authorized to assign or contract for work projects to laboratories of the Defense Department or in the private sector, as appropriate.

4 The Deputy Secretary of Defense for Operations should be delegated responsibility for the following functions

(a) Military Operations,

(b) The Unified Commands,

(c) Operational Requirements,

(d) Intelligence;

(e) Telecommunications (and Automatic Data Processing),

(f) International Security Affairs;

(g) Defense Communications Agency; and

(h) Civil Defense Agency (if Civil Defense is to be retained in the Department of Defense)

Three new major Unified Commands should be created. (1) A Strategic Command, composed of the existing Strategic Air Command, the Joint Strategic Target Planning Staff, the Continental Air Defense Command, and Fleet Ballistic Missile Operations, (2) A Tactical (or General Purpose) Command, composed of all combatant general purpose forces of the United States assigned to organized combatant units, and (3) A Logistics Command, to exercise for all combatant forces supervision of support activities, including supply distribution, maintenance, traffic management and transportation. No Commander of a Unified Command should be permitted to serve concurrently as Chief of his Military Service.

The responsibilities now delegated to the Joint Chiefs of Staff by the Secretary of Defense to serve as military staff in the chain of operational command with respect to the Unified Commands, and all other responsibilities so delegated which are related to military operations and the Unified Commands, should be assigned to a single senior military officer, who should also supervise the separate staff which provides staff support on military operations and the channel of communications from the President and Secretary of Defense to Unified Commands. This officer should report to the Secretary of Defense through the Deputy Secretary of Defense (Operations) This senior military officer could be either the Chairman of the Joint Chiefs of Staff, as an individual, not ex-officio, the Commander of the Tactical Command, or some other senior military officer, as determined by the President and the Secretary of Defense

There should be an Assistant Secretary of Defense for each of the functions (c) through (f), inclusive, who reports and provides staff assistance to the Secretary of Defense through the Deputy Secretary of Defense (Operations) The Defense Communications Agency and the Civil Defense Agency would each be under the immediate supervision of a Director

All intelligence functions of the Department of Defense and all communications functions should report to the Secretary of Defense through the Deputy Secretary of Defense for Operations

5. The following steps should also be taken

(a) To provide the staff support on military operations, and the channel of communications from the President and the Secretary of Defense to the Unified Commands, an operations staff, separate from all other military staffs, should be created.

(b) The responsibilities now delegated to the Joint Chiefs of Staff by the Secretary of Defense to serve as military staff in the chain of operational command with respect to the Unified Commands, and all other responsibilities so delegated which are related to military operations and the Unified Commands, should be rescinded, and consideration should be given to changing the title of the Chief of Naval Operations to Chief of Staff of the Navy

(c) All staff personnel positions in the Organization of the Joint Chiefs of Staff and in the headquarters military staffs of the Military Services which are in support of

activities, such as military operations, which are recommended for transfer to other organizational elements, should be eliminated

(d) The Organization of the Joint Chiefs of Staff should be limited to include only the Joint Chiefs of Staff and a reconstituted Joint Staff limited in size to not more than 250 officers augmented by professional civilian analysts as required.

(e) The Unified Commanders should be given unfragmented command authority for their Commands, and the Commanders of component commands should be redesignated Deputies to the commander of the appropriate Unified Command, in order to make it unmistakably clear that the combatant forces are in the chain of command which runs exclusively through the Unified Commander;

(f) In consolidating the existing area Unified Commands into the Tactical Command, major organizational and functional advantages will be obtained by:

(1) Merging the Atlantic Command and the Strike Command,

(2) Abolishing the Southern Command and reassigning its functions to the merged Atlantic and Strike Commands,

(3) Abolishing the Alaskan Command and reassigning its general purpose function to the Pacific Command and its strategic defense functions to the Strategic Command, and

(4) Restructuring the command channels of the sub-unified commands.

(g) The responsibilities related to civil disturbances currently delegated to the Army should be redelegated to the Tactical Command, and

(h) The Unified Commanders should be given express responsibility and capability for making recommendations to the Deputy Secretary of Defense for Operations, for operational capabilities objectives and for allocations of force structures needed for the effective accomplishment of the missions assigned to their Commands

6. The Deputy Secretary of Defense for Evaluation should be delegated the responsibility for evaluation and control-type activities, including:

(a) Comptroller (including internal audit and inspection services),

(b) Program and Force Analysis (a modification of the present Systems Analysis Unit),

(c) Test and Evaluation,

(d) Defense Contract Audit Agency; and

(e) Defense Test Agency.

There should be an Assistant Secretary of Defense for each of the functions (a) through (c) inclusive, who reports and provides staff assistance to the Secretary of the Defense through the Deputy Secretary of Defense for Evaluation

The Defense Contract Audit Agency should be continued as a Defense Agency, under the immediate supervision of a Director.

A Defense Test Agency should be created to perform the functions of overview of all Defense test and evaluation, designing or reviewing of designs for test, monitoring and evaluation of the entire Defense test program, and conducting tests and evaluations as required, with particular emphasis on operational testing, and on systems and equipment which span Service lines The Defense Test Agency should be under the supervision of a civilian Director, reporting to the Secretary of Defense through the Deputy Secretary of Defense for Evaluation

7 The number of Assistant Secretaries in each of the Military Departments should be set at three, and except for the Assistant Secretaries (Financial Management), they should serve as senior members of a personal staff to the Secretaries of the Military Departments without the existing limitations of purview imposed by formal functional assignments. The Assistant Secretary (Financial Management) should become the Comptroller of the Military Department, with a military deputy, as in the current organization in the Department of the Navy

The Secretaries and Service Military Staffs should be integrated to the extent necessary to eliminate duplication, the functions related to military operations and intelligence should be eliminated; line type functions, e g., personnel operations, should be transferred to command organizations, and the remaining elements should be reduced by at least thirty percent (A study of the present staffs indicates that the Secretariats and Service staffs combined should total no more than 2,000 people for each Department)

8 Class II activities (Army), Field Extensions (Air Force), and Commands and Bureaus (Navy), all of which are line, rather than staff in character, which are now organizationally located under the direct supervision of staff elements in the headquarters military staffs of the Services, should be transferred to existing command-type organizations within the Services

9 The Defense Atomic Support Agency should be disestablished. Its functions for nuclear weapons management should be transferred to the operations staff under the Deputy Secretary of Defense for Operations, and its weapons effects test design function should be transferred to the Defense Test Agency

10 The administration functions presently assigned to the Assistant Secretary of Defense (Administration) should be assigned to a Director of Pentagon Services, reporting to the immediate office of the Secretary of Defense He should be responsible for operating the facilities and providing administrative support for the Washington Headquarters.

11. A Net Assessment Group should be created for the purpose of conducting and reporting net assessments of United States and foreign military capabilities and potentials This group should consist of individuals from appropriate units in the Department of Defense, consultants and contract personnel appointed from time to time by the Secretary of Defense, and should report directly to him

12. A Long-Range Planning Group should be created for the purpose of providing staff support to the Secretary of Defense with responsibility for long-range planning which

integrates net assessments, technological projections, fiscal planning, etc. This group should consist of individuals from appropriate units in the Department of Defense, consultants and contract personnel appointed from time to time by the Secretary of Defense, and should report directly to him

13. A Coordinating Group should be established in the immediate office of the Secretary of Defense. The responsibilities of this Group should be to assist the Secretary of Defense and the Deputy Secretaries of Defense in coordinating the activities of the entire Department in the scheduling and follow-up of the various inter-Departmental liaison activities; to staff for the Secretary the control function for improvement and reduction of management information/control systems needed within the Department and required from Defense contractors; and to assure that each organizational charter of the Office of the Secretary of Defense is of proper scope and coordinated and in accordance with the assigned responsibility of the organization. The responsibility for the Department's Directive/Guidance System, currently assigned to the Assistant Secretary of Defense (Administration), should be assigned to this group The coordinating group should be headed by a civilian Director, who should also serve as executive assistant to the Secretary of Defense

14. The Army Topographic Command, the Naval Oceanographic Office and the Aeronautical Chart and Information Center should be combined into a unified Defense Map Service reporting to the Secretary of Defense through the Deputy Secretary of Defense for Management of Resources

15. A new development policy for weapons systems and other hardware should be formulated and promulgated to cause a reduction of technical risks through demonstrated hardware before full-scale development, and to provide the needed flexibility in acquisition strategies The new policy should provide for

(a) Exploratory and advanced development of selected sub-systems and components independent of the development of weapon systems;

(b) The use of government laboratories and contractors to develop selected sub-systems and components on a long-term level of effort basis,

(c) More use of competitive prototypes and less reliance on paper studies;

(d) Selected lengthening of production schedules, keeping the system in production over a greater period of time,

(e) A general rule against concurrent development and production efforts, with the production decision deferred until successful demonstration of developmental prototypes;

(f) Continued trade-off between new weapon systems and modifications to existing weapon systems currently in production;

(g) Stricter limitations of elements of systems to essentials to eliminate "gold-plating",

(h) Flexibility in selecting type of contract most appropriate for development and the assessment of the technical risks involved;

(i) Flexibility in the application of a requirement for formal contract definition, in recognition of its inapplicability to many developments,

(j) Assurance of such matters as maintainability, reliability, etc., by means other than detailed documentation by contractors as a part of design proposals,

(k) Appropriate planning early in the development cycle for subsequent test and evaluation, and effective transition to the test and evaluation phase, and

(l) A prohibition of total package procurement

16 The effectiveness of Program or Project Management should be improved by:

(a) Establishing a career specialty code for Program Managers in each Military Service and developing selection and training criteria that will insure the availability of an adequate number of qualified officers The criteria should emphasize achieving a reasonable balance between the needs for knowledge of operational requirements and experience in management,

(b) Increasing the use of trained civilian personnel as program managers,

(c) Providing authority commensurate with the assigned responsibility and more direct reporting lines for program managers, particularly those operating in matrix organizational arrangements, and

(d) Giving the program manager directive authority, subject to applicable laws and regulations, over the contracting officer, and clarifying the fact that the contract auditor acts in an advisory role

17 Increased use should be made of parametric costing techniques for developments and procurements to improve the quality of original and subsequent estimates, and to help offset the difficulties of estimating the costs of unknowns

18 A separate program category* should be established for test and evaluation, especially operational testing, and the responsibility for overview of all Defense test and evaluation efforts should be assigned to the Defense Test Agency.

19. Specialist careers should be established for officers in such staff, technical and professional fields as research, development, intelligence, communications, automatic data processing, and procurement

20. In order to improve the process of acquisition and retention of military personnel, the Executive Branch should develop, and submit to the Congress for its consideration as necessary, a total military personnel program which coordinates and reconciles all the separate considerations, particularly including, (1) military compensation and

* Program categories are those categories of activities used for internal planning and management in the Department, e.g., strategic offensive forces, strategic defensive forces, research and development, intelligence, etc.

retirement, (2) personnel policies on promotion and rotation, and (3) acquisition programs, such as Reserve Officers Training Corps.

21. The duration of assignments for officers should be increased, and should be as responsive to the requirements of the job as to the career plan of the officer. Officers continued on an assignment for this reason should not be disadvantaged in opportunity for promotion

22 Executive Orders and Department of Defense Directives with respect to matters of equal employment opportunity for Department of Defense military personnel, civilian employees and contractors, as set forth in the existing comprehensive programs for insuring equal opportunity, should be administered from a sufficiently high organizational level in the Department to assure effective implementation, and the procedures for assessing penalties for non-compliance should be reviewed and clarified

23 The Secretary of Defense should recommend clarifying changes in conflict of interest statutes, should amend the regulations to clarify them, and should make certain administrative changes to insure uniform enforcement.[22]

The Blue Ribbon Defense Panel report was 237 pages and contained 113 specific recommendations. Fitzhugh remarked that 90 percent of the recommendations could be carried out without legislation, which meant that Secretary Laird could select ideas that he liked and use them. Many of the recommendations dealing with procurement already had been put into effect by Secretary Laird and Deputy Secretary Packard in the year that the report was in preparation. Three of the 14 members of the panel filed dissenting opinions, emphasizing disagreements about the proposed downgrading of the services, service secretaries, and service chiefs. These matters, together with the recommendation for three principal defense groups of military operations, resources, and evaluation, drew most rhetoric. Admiral Moorer, then chairman of the Joint Chiefs, later remarked that the Blue Ribbon Defense Panel report was "so bad that five of the members [actually only three, although two other members were compelled to leave the panel early] dissented. . . . Nothing of substance was ever accomplished by this study. But you will find it as a reference in every subsequent study," Moorer added. In mid-August 1970 it was reported that Admiral Moorer insisted on and got a no-holds-barred session for the Joint Chiefs with Laird and Packard. Moorer was said to have told Laird that the services, service secretaries, and service chiefs could not be downgraded; that strategic direction of the armed forces could not be workably separated from planning and from individual service responsibilities; that the unified command structure was satisfactory and did not require creation of super commands for tactics, strategy, and logistics; and that the Joint Chiefs of Staff machinery was highly efficient, had been perfected over the years, and should not be tampered with. Later on Moorer would caution that his service as JCS chairman at a time that the United States was

heavily involved in a very unpopular war had convinced him that "organizations and procedures in the military command structure must be set up in such a way as to work particularly well in wartime rather than during an extended period of peace when the priorities of public interest in the military invariably get turned around."[23]

In a public commentary on the Blue Ribbon Defense Panel Report, Secretary Laird concurred in general with the panel's objectives, but preferred to implement new management concepts at a measured rather than precipitous pace. He remarked that he wanted "to avoid the tendencies toward increased staffing and overhead... inherent in many of the specific Panel recommendations."[24] In a blunt talk in Los Angeles, Deputy Secretary Packard disavowed the recommendation for the three deputy secretaries of defense. He said: "The report greatly underrates the Joint Chiefs of Staff." He added: "We intend to give the Service Secretaries and their Services more responsibility so that they can do their jobs." Of the 113 recommendations of the Blue Ribbon Defense Panel, Packard reported acceptance of 48, conceptual implementation of 33 others, continued consideration of 21, and rejection of only 11. The 11 rejections out of hand had to do with the organization of the recommended major new unified strategic, tactical, and logistics unified commands and assignments of deputy secretariats.[25] In 1971 Secretary Laird implemented a number of changes in organization that were in part attributable to the Blue Ribbon Defense Panel. These included establishment of the Office of Assistant Secretary of Defense (Intelligence) and of the Office of Assistant Secretary of Defense (Telecommunications), of the deputy director (Test and Evaluation) within the Office of the Director, Defense Research and Engineering; and establishment of the Central Security Service, Defense Investigative Service, Defense Security Assistance Agency, and Defense Mapping Agency.[26]

Although it was reported that Laird and Packard agreed at the meeting with Admiral Moorer and the Joint Chiefs in August 1970 that the Joint Chiefs of Staff ought to be left alone and not tampered with and that means ought to be found to decentralize authority to the service departments, these matters were kept under study during 1971. In the end, Laird announced that he did not share the Blue Ribbon Defense Panel's view that US military command structure was "unwieldy and unworkable in crisis and too fragmentary to provide the best potential for coordinate response to a general war situation." Experience in the first three years of the Nixon administration nevertheless demonstrated that improved management and control of forces was greatly needed. Deputy Secretary Packard and Admiral Moorer analyzed the problem and effected some solutions. In the command structure effected in 1958 the chain of command ran from the president to the secretary of defense to the commander in chief, unified and specified commands. In this same year, however, Secretary of Defense Neil McElroy directed that orders would be transmitted "through the Joint Chiefs of Staff" Thus the Joint Chiefs were an agent for transmitting orders; General Taylor pointed out that they had "a staff function" and no command authority over the CINCs The

Blue Ribbon Defense Panel recommended that for clarity McElroy's direction should be rescinded.[27]

In 1972 Secretary Laird acknowledged that "limited advantages may perhaps be realized by separating the Joint Chiefs of Staff from the operational matters" but that "the total impact of this action must also be considered." The old procedure was kept in effect; however, in a revision of the Worldwide Military Command and Control System (WWMCCS), it was provided that critical, time-sensitive, instructions would go from the national command authorities to the chairman of the JCS who, acting for the JCS, would have authority to pass instructions directly to the operating forces. The role of the Joint Chiefs of Staff thus remained one of agency, not of command, and only the president or the secretary of defense could originate orders to the unified and specified commanders.[28]

Even before the Blue Ribbon Defense Panel met, the Department of Defense had begun to examine the US unified and specified command structure, particularly in view of President Nixon's new Nixon Doctrine and Strategy of Realistic Deterrence. On 1 January 1972, as will be seen, the US Readiness Command replaced the US Strike Command and the STRICOM's geographical areas of responsibility were reassigned. The Blue Ribbon Defense Panel recommended a very strong increase in the authority of unified commanders, namely:

> The Unified Commanders should be given unfragmented command authority for their commands, and the commanders of component commands should be redesignated Deputies to the commander of the appropriate Unified Command, in order to make it unmistakably clear that the combatant forces are in the chain of command which runs exclusively through the Unified Commander.[29]

Secretary Laird did not accept this recommendation, pointing out that unified commanders had maximum authority. Laird ruled:

> The current Unified Command Plan gives the commanders of Unified and Specified Commands maximum authority possible consistent with statutory requirements. This includes the authority to exercise operational command over all forces assigned to the command. The Unified Commanders have the authority to exercise those functions of command involving the control of assigned resources, composition of subordinate forces, assignment of tasks, designation of objectives, and full authoritative direction necessary to accomplish the mission of the command In consonance with the National Security Act of 1947, as amended, each Military Department is responsible for the administration of its forces assigned by that department to the combatant commands. The Defense Department is operating under this system at the present time [30]

Although congressional legislation provided the basic structure of national defense organization, every president had retained the authority to take military advice where he chose. "We can play with organizational charts all we want to," commented Sen John C. Culver, a key member of the Armed Services Committee, in 1978, "but what ultimately determines the process is what is congenial to the

decision maker—that particular president's preference and most comfortable mode of operation."[31] In 1971–72 the handling of an appropriate response to increasing North Vietnamese aggression in Southeast Asia posed unusual complexities to the niceties of defense chart-books. In early May 1972 Admiral Moorer asked Chief of Naval Operations Adm Elmo Zumwalt to produce for President Nixon a concept for mining Haiphong and other North Vietnamese ports, this without the knowledge of Secretary Laird, who was strongly committed to Vietnamization and opposed to the commitment of additional US forces to the war.[32] When the increased US activity occurred, Secretary of the Navy John H. Chaffee said that he would have opposed the Hanoi and Haiphong minings, but he had had "no inkling" that such was planned. Secretary of the Air Force Seamans said that he first knew about the increase in air raids to take place against North Vietnam when he saw accounts of it on television. A little later, Seamans ruefully admitted that even though he had attempted to remain abreast of overall Air Force operations to perform his basic responsibility for managing resources and for acting as an adviser to the secretary of defense he never learned of diverted B-52 bombings into Cambodia until long after the fact. Embarrassed about being kept in the dark about Cambodian bombing, Secretary Seamans stated:

> I think a way should be found for the service secretaries to be more involved in operational activities I think it is undesirable to be a service secretary and not know of something of this importance is going on . I think the chain of command must be kept simple and straightforward, and I do not think the service secretary ought to be in the chain of command but I think that he should be involved in important operational matters in a timely way[33]

After this, DOD regulations charged service chiefs to keep service secretaries informed on matters before the Joint Chiefs of Staff, but when he was queried about such matters Gen George Brown, JCS chairman, responded in 1976: "Today, the Service Secretaries are responsible for procurement, maintenance and training of forces. Once the forces are trained and equipped, they are turned over to the unified and specific commanders, who in turn operate under the Secretary of Defense."[34]

Personnel Cuts Affected Unified Commands and Organization

In the Defense Reorganization Act of 1958 Congress affirmed the validity and necessity of a unified command concept. With the advice and assistance of the Joint Chiefs of Staff, the president, through the secretary of defense, was authorized to establish unified or specified combatant commands for the performance of military missions and to determine the Army, Navy, and Air Force force structure to be assigned to the combatant commands for the performance of military missions. The importance of the structure was emphasized by the fact that the president personally approved and signed the Unified Command Plan, assigning missions and responsibilities to commanders in chief. The command plan was expected to

provide organizations that would permit an immediate application of defense forces in wartime, but the organization also had to reflect political accommodations to mold allied national forces into a cohesive unity. Effective on 1 January 1973 the Nixon-Laird administration revised the Unified Command Plan for the first time since 1963, and these worldwide command arrangements continued under scrutiny during the 1970s. In September 1977 President Jimmy Carter asked for an "unconstrained examination" of the national military command structure. The study, prepared by New York banker Richard C. Steadman, when released in July 1978, addressed the subject of the Unified Command Plan at some length but contained no "ultimate solutions" since it was thought possible "to draw up four or five alternative UCPs, each one about as good as the other." The report concluded, however, that "changes to the UCP are usually controversial, producing split opinions among the JCS."[35]

The National Command Plan organizational doctrines existing in the 1970s ran back to World War II. Each unified commander was expected to have a joint staff, comprised of officers from all military services which had forces assigned to the command. Although the unified commander exercised "operational command" over assigned forces, this was expected to be exercised through component commanders of military services having forces assigned. The component commander thus melded the "operational command" flowing from the national command authorities through the unified commander and the "service supervision" originating in military departments. This organizational doctrine was expensive in terms of general officers and headquarters personnel. Thus, in the NATO organization, the US European Command was located in Stuttgart, the US Army Command in Heidelberg, the US Air Force Command in Wiesbaden, and the US Navy Command in London. Europe also was divided into regions (North, Center, South, and Flanks), with land, naval, and air organizations for each region. In 1972 there were 37 headquarters in the Allied Command Europe, and the United States participated in 24 of them.[36] With the dissolution of USCINCMEAFSA effective on 1 January 1972, the area of responsibility of the US European Command was extended to include the Red Sea, the Persian Gulf, and the Middle East to the eastern border of Iran. This was intended to strengthen the planning capability for defense of the southern flank of NATO and for countering increased Soviet presence in the Mediterranean and Middle East areas. Also on 1 January 1972 the scope of responsibility of the Pacific Command was expanded to include the Indian Ocean to 62 degrees east longitude, those South American countries formerly holding membership in USCINCMEAFSA, the Aleutian Islands, and a portion of the Arctic Ocean. As has been seen, the US Pacific Command included component commands—ARPAC, NAVPAC, PACAF—and subunified commands—the Military Assistance Command, Vietnam (MACV), the Military Assistance Command, Thailand (MACTHAI), and US Forces Korea. Both Generals Westmoreland and Abrams were elected as COMUSMACV to serve as their own Army component commander. To overcome the deficiencies of the subunified command organizational structure,

COMUSMACV designated specified component commands as executive agents for common-user logistical support in specified corps areas in Vietnam and named the COMUSMACV for air as the executive agent for MACV air operations. In the 1 January 1972 delineation, the area of responsibility for the US Atlantic Command was expanded to include the international waters around Africa and South America. The Atlantic Command had no Army or significant Air Force forces assigned (one small Air Force unit was designated the Iceland Defense Force). The US Southern Command (SOUTHCOM) remained primarily responsible for defending the Panama Canal, offering military assistance activities in Latin America, and planning contingency operations that might be required in Latin America. The US Alaskan Command was assigned a geographical area of responsibility, but its principal mission was to participate in North American air defense.[37]

In 1973 Secretary James Schlesinger took note of the soaring costs of military manpower and ordered actions to review the superstructure of the Defense Department, field organizations, and major military command headquarters with a view to decreasing headquarters staffing. As a corollary activity, Schlesinger wanted to achieve a greater degree of force interdependence among the services without "going into the delicate area of roles and missions at this time." Schlesinger remarked, "At this stage, I would predict that the JCS and the military services will not willingly or readily volunteer for any traumatic experiences."[38] The assignment of review of the defense superstructure was given to William Brehm, assistant secretary of defense for manpower, who had close contact with Gen George Brown. Brehm said, "When I talked with General Brown, I found that he was very positive about the whole idea of conducting the review, particularly after he became chairman [of the Joint Chiefs of Staff]."[39] The Air Force's approach to reducing staffs was to streamline headquarters personnel in many cases to people absolutely needed for operations and matters of actual control of forces and to concentrate functions such as chaplain, legal, finance, comptroller, and civil engineering. Thus, the headquarters staffs of the Third Air Force in the United Kingdom, the Seventeenth Air Force in West Germany, and the Sixteenth Air Force in Spain were cut back by over 50 percent.[40]

At the urging of Secretary Schlesinger that the Army obtain more combat capability from the manpower resources, Gen Creighton Abrams developed planning to increase the Army's 13-1/3 active divisions to 16, chiefly by shifting manpower spaces from support to combat units. Abrams's plan involved closing seven Army headquarters around the world, including US Army, Alaska, and the US Army Southern Command. The question of closing the Army Pacific component command in Hawaii drew the most questions, and to these inquiries Abrams retorted: "The way things work, it has nothing to add and it is too far away to subtract."[41] Secretary Schlesinger would not agree to closing the Army Pacific Command unless General Brown was accepted as JCS chairman. "General Brown did support it," remembered Brehm, "and this was important in making the change come about."[42] ARPAC was disestablished effective 31 December 1974, at which

time a CINCPAC support group, headed by an Army major general began to provide some of the functions of an Army component commander such as liaison, advice, and assistance to PACOM, the Navy, and the Air Force component commanders. PACOM exercised operational command over Army units through subordinate unified commanders, the most important Army units being in Korea. In Korea, effective on 1 July 1974, Headquarters Eighth Army, the United Nations Command, and US Forces Korea were merged into US Forces Korea, which served as a PACOM subordinate unified command with a four-star Army officer in command.[43]

The Army's decision to eliminate Army component commands in the Unified Command Plan was said to have been applauded in the House Military Appropriations Subcommittee, and it was suggested that the Air Force and Navy might want to do the same. At that juncture, however, the Air Force already had made larger headquarters staff cuts than had the Army, though the Army's cuts were more dramatic. General Brown called for some caution in regard to reducing Air Force support for unified commands. "We can do lots of things in peacetime," he warned, "but we do not want to disrupt an organization that can support combat action."[44] In the Pacific, nonetheless, the Air Force followed a policy of reducing its presence as tensions diminished. In fiscal year 1974, Headquarters Fifth Air Force in Japan was reduced in size when Headquarters Pacific Air Forces (PACAF) took over a number of functions not directly related to operations and matters of actual control of US Air Force forces on Okinawa and in Korea. As it turned out, moreover, the commander, Fifth Air Force, commander, US Forces Japan, and as such had many functions other than purely Air Force business. In the command shuffles in Korea in 1974, there was some argumentation in the Air Force that Headquarters Fifth Air Force ought to move to Korea. But such a move would have severed the peacetime interface between Headquarters Fifth Air Force/US Forces Japan and the Japanese Self-Defense Forces. General Brown also said: "In my view . . . if it were in Korea and hostilities were to start, the first thing we would have to do would be to get the headquarters out of the way and get it back to Japan." Thus Headquarters Fifth Air Force remained in Japan in new facilities built for it at Yokota. In the command reorganization in Korea in 1964, the commander of US Air Forces Korea/314th Air Division reported to the commander of the Fifth Air Force, who was responsible to CINCPACAF as CINCPAC's Air Force component commander for the status of forces and training of air units in Korea. In time of war, the commander of the US Air Force Korea/314th Air Division would report immediately to the CINCUNC/COMUSKOREA, as the senior US officer in Korea, and would become the air component commander for him.[45]

In 1974 the Joint Chiefs of Staff worked on a revision of the Unified Command Plan that Secretary Schlesinger also undertook to find ways "to gain management effectiveness by reducing headquarters and support units, and at the same time improving command and control of combat units."[46] On 28 February 1975 Schlesinger announced disestablishment of the Continental Air Defense

Command (CONAD) and the Alaskan Command (ALCOM) as unified commands. CONAD was replaced by a specified air defense command. In a novel command arrangement, ALCOM was replaced by the Alaskan Air Command, whose commander gained a three-star billet and became the senior military officer in Alaska, the DOD coordinating authority there, and the commander of the Alaskan North American Air Defense region. As a part of this reorganization, Schlesinger announced that the concept of a joint task force would receive added emphasis in Alaska. In the event of a natural disaster, emergency, or hostilities, the Alaskan Air Force commander would command a reinforcing task force organization and would report directly through the Joint Chiefs of Staff to the national command authorities.[47] The Air Force did not plan to identify specific units to reinforce Alaska but instead to pull units for the purpose from available and combat-ready sources in various parts of the United States.[48]

When the Army had disestablished the US Army Pacific Command, General Brown had opposed a similar disestablishment of the Pacific Air Forces until work on revisions of the US Unified Command Plan jelled There were some arguments, for example, that US Forces Korea ought to be made into a unified command for Northeast Asia or at the very best there should be an arrangement whereby the commander of US Forces Korea would remain under PACOM in peacetime but in times of crisis would report directly to Washington. In July 1974 Gen Louis L. Wilson, Jr., took command of PACAF and began to look to its future. In the drawdown of US forces in the Western Pacific, PACAF would retain the Fifth Air Force in Japan and the Thirteenth Air Force in the Philippines. In the Philippines the Thirteenth Air Force would have only one base—Clark Air Base on Luzon.

General Wilson was impressed with PACAF's remoteness from the Western Pacific—it was closer from Hawaii to the United States than to Korea or the Philippines. He wanted to relocate PACAF headquarters in the Western Pacific, but he could find no place for it. At this same juncture, Secretary of the Air Force John L. McLucas and Gen David Jones accepted "Tight Belt West" plans that PACAF should be disestablished and that the Tactical Air Command should assume the majority of Air Force management and support functions, conducted through senior Air Force commanders in the Pacific. General Jones stated:

> The Tactical Air Command has historically been the doctrinal "parent" of our tactical air forces, in the sense that among other responsibilities, TAC is the principal point of contact and coordination with the Army's Training and Doctrine Command, develops and tests combat tactics, trains all our tactical aircrews, and has operational control over the majority of the US based tactical air forces We propose to move toward broadening TAC's direct role in tactical airpower world wide by extending its responsibilities to our tactical Air Force units in the Western Pacific [49]

This "application of the single manager concept" promised to free approximately 2,000 headquarters and support personnel assigned to Headquarters PACAF. In December 1974 Secretary Schlesinger announced that he had approved the recommendation to disestablish Headquarters PACAF, but that this would not be

done pending review of the entire Unified Command Plan. As it happened, Gen Robert Dixon, the TAC commander, was not in favor of the plan to have TAC take over the functions of PACAF, although he did not fight the project. General Wilson was also not in favor of the disestablishment. He noted that in the spring of 1975 somebody put the proposal to bed; he didn't know who. At any rate, it was apparently decided that TAC would write some basic policies and regulations, and the rank of CINCPACAF would be fixed at lieutenant general.[50]

Said Air Force Secretary Thomas C. Reed in February 1976:

> Because there is a finite amount of money, because the Soviet threats are very severe, and because the difficulties of penetrating to the Soviet targets are very difficult, we have had to make some very hard choices. The Air Force has faced up during the past 2 years to cutting out a great many things that are important. As the Department of Defense spokesmen said in their various appearances this year, we are past the point of cutting out fat, of cutting any support, we are now into substantive meat.[51]

In addition to other cuts, the Air Force in 1975 redesignated the Eighth Air Force on Guam to Barksdale AFB, Louisiana, where it replaced the Second Air Force, whose designation was retired. The Air Force kept the 3d Air Division on Guam. At about this same time the Air Force Communications Service at Richards-Gebaur AFB, Missouri, was merged with the Military Airlift Command at Scott AFB, Illinois. In 1976 Air Force Headquarters Command at Bolling AFB, Washington, D.C., was abolished. In 1977 the Air Force resisted a proposal to subdivide the Air Defense Command (ADCOM) among several other commands, including dual tasking of TAC's tactical fighters with an air defense/interception mission, but ADCOM's aerospace defense resources were transferred to other major commands within the Air Force in 1979.[52] The reductions in Army organizational structure affected by General Abrams also affected PACOM activities and command interrelations with the Air Force at the field army-tactical air force level. Some maintained that the Army component, US Army Pacific, should be reestablished; this headquarters was needed to provide more senior Army representation in military diplomatic activities in the large PACOM area where ground forces played important roles in many countries. General Abram's acceptance of a new Army doctrine that the Army corps would be the highest echelon for tactical maneuver and strategy decisions in effect eliminated the Army's group/field army; the Air Force found the "corps concept" to be short-sighted as it eliminated joint force interface at the component level of command.[53]

Secretary Brown and the Steadman Report

When President Jimmy Carter assumed office in 1977 he gave special attention to his selection of a secretary of defense. "The Pentagon needed some discipline," he reminisced, "and I wanted both a scientist with a thorough knowledge of the most advanced technology and a competent business manager, strong-willed

enough to prevail in the internecine struggles among the different military services."[54] President Carter selected Harold Brown, who had served as director of Defense Research and Engineering and secretary of the Air Force during the Johnson-McNamara years. And so, Brown returned to high office in the Department of Defense after an eight-year absence and found that many old problems were still around. Brown remarked:

> If Government officials [would] stay in the executive branch long enough to have to live with the problems they have made, it would lead to more responsible behavior on their part. They would be more careful about making the same mistakes again I hoped that I had avoided that by being away 8 years, but I find that in coming back I recognize not only the same general problems but also some of the same problems in the same programs [55]

In regard to the needs to be faced in trying to organize the top military echelons, Brown conceived the problems revolved around planning and executing the operation of military forces in peace and war, how to get the best military advice into political-military decisions made generally by civilians, and how best to structure, equip, and train military forces. "Organization as such," Brown said, "cannot deal fully with any of these problems by itself, though poor organization makes each of them more difficult " Brown observed that in his judgment since the late 1950s no president or secretary of state had found defense organization satisfactory either in terms of planning and operations or of military advice. The question then was why had not Defense Department administrations—especially his own—put forward a plan for reorganization. He answered:

> Any such change requires a major expenditure or investment of political capital It requires good relations with the Congress, and it requires strong Presidential backing . . . Such changes are best proposed either by a departing or recently departed administration, which cannot be accused of self-aggrandizement It requires also informed support by an incumbent administration [56]

Early in his administration, Secretary Brown revealed his agreement with President Eisenhower's message that "separate ground, sea and air warfare is gone forever." In an address at the commissioning of the USS *Eisenhower* in 1977, Brown predicted that future operations would involve "coordinated efforts of land, air, and . . . naval forces, in elements functionally configured . . . led by officers who understand the functions and qualities that our armed services share, as well as the particular capabilities and traditions which enrich each of them."[57] Brown reiterated on another occasion·

> Almost all modern military operations are joint operations and have been so since World War II Reconnaissance, target acquisition, and designation are now very largely done from the air, or even from space, the ranges of manned and unmanned attack vehicles, ballistic or aerodynamic, launched from land or sea, are much larger than they were before, the land and sea battles are now very strongly influenced, if not dominated, by control of the air; and air and sea forces need land bases. . . . For all these reasons, the operational commands charged with planning and executing combat operations

> require a much closer integration of the different services than was necessary in the past, even in World War II [58]

Secretary Brown recognized that improvement was needed but believed that an effort should first be made to achieve it without new legislative or massive reorganizations, the dominant theme being an emphasis on jointness. He believed there was no way a committee like the JCS could function in the chain of command, and so he used his chairman of the Joint Chiefs—Gen George Brown succeeded by Gen David Jones—as his agent to the unified and specified commands. "I practically never issued an order directly . . . almost always the . . . chairman sent it out. It was his responsibility to consult as much as he felt necessary with his colleagues."[59] One of Brown's early innovations was to require each CINC to send him every 90 days a personal letter describing the situation in the writer's command. In September 1977 President Carter signed a memorandum calling for an "unconstrained examination" of the national military command structure, and Secretary Brown was ready with a study director and a study plan. The "Report to the Secretary of Defense on the National Military Command Structure," prepared under direction of New York investment banker Richard C. Steadman, took the better part of six months before it was ready to be released in July 1978. The report did not recommend spectacular changes as the Blue Ribbon Defense Panel had done; for the most part it contained practical recommendations for making the system work better. The report noted:

> What emerged . was a consensus that, by and large, the system had been generally adequate to meet our national security needs in peacetime, crisis, and wartime We did find, however, a general perception of some fundamental shortcomings which may make it incapable of dealing adequately with our future needs.[60]

The main thrust of the report looked toward strengthening the JCS chairman, particularly in providing national advice on program/budget and constrained force issues, and toward enhancing the role and effectiveness of the JCS joint staff. The report concluded that joint staff work could be improved, without structural change, by soliciting more guidance from senior officers prior to staffing; by having fewer requirements for service consensus, which resulted in watered-down compromises; by more analysis of alternatives; and finally by assigning more capable officers to the joint staff. At the end of the Steadman report an admonition was appended:

> In the event that these measures are not implemented, or if they should not prove effective . . . then solutions of a more fundamental nature directed at resolving the inherent tensions in the current organization, such as separating the joint advice and command functions from those of service administration, would become necessary. This might be accomplished by establishing a body of National Military Advisors entirely independent of Service responsibilities, although this would be drastic and controversial [61]

As it happened both Secretary Brown and the Steadman report showed great concern about the status and prospects for US unified commands overseas. Secretary Brown wanted to give unified commanders greater control over his component commands that responded more to service headquarters in the Pentagon. This included initial planning for contingencies that ought to originate in the unified commands. The unified commanders needed to have an increased role in determining military requirements and budgets. Both Brown and Steadman were critical of the command chain in the Vietnam War. Brown said:

> In the Vietnam war . . the Joint Chiefs as a group really had very little to say That wasn't enough to win the war, but without it it would have been even worse Certainly, the command chain in Vietnam, during the Vietnam war, was the most fouled up thing in recent history, in part because the Joint Chiefs refused to face up to the issue of how you organize command in the field for the most efficient operations.[62]

A major portion of the Steadman report was given over to a command by command evaluation of the US unified and specified commands. The report also focused on US experience in wartime/crisis handling since the defense reorganization of 1958. The report offered only general observations about DOD management of the Vietnam War:

> First, and most importantly, however imperfect our command arrangements may have been, few would make the case that the nature of the command system had any appreciably negative effect on the conduct of the war . Second, in thinking about the future we should take little comfort in the fact that we were able to work with a jury-rigged command structure in Vietnam Third, Washington certainly was too deeply involved in the details of actually running the war, particularly the air war in the north On the other hand, we believe that Washington failed to use the analytical tools available to evaluate with both overall policy and operational performance Neither the reasonableness of stated objectives and the strategy for obtaining them, nor the cost-benefit analysis of various tactical options was subject to rigorous scrutiny Moreover, Washington did not exercise independent judgment when evaluating requests from commanders in the field There was a tendency to give the commander what he wanted . If the US ever again is involved in a protracted war, its basic premises, its strategy, and its tactics should be subjected to rigorous analysis in Washington [63]

In addition to the broad impression of the Vietnam War, the Steadman group studied 10 large and small crises: Middle East War (1967); sinking of the USS *Liberty* (1967); capture of the USS *Pueblo* (1968), Middle East War (1973); Cypress War (1974); Evacuation from Cambodia (1975); evacuation from Saigon (1975); seizure of the SS *Mayaguez* (1975); Beirut evacuations (1976); and the Korea tree-cutting incident (1976). The study concluded that crisis built around CINC's contingency plan "seemed to run more smoothly than those that were predominantly conducted *ad hoc*." There was, however, a notable tendency to bypass command channels, since communications advancements made it possible for a remote decisionmaker to talk directly with on-scene commanders The report cautioned:

> In sum, military commanders must be aware that *any* use of military forces will be of interest to the command authorities and that employment of these forces may be closely directed from Washington The civilian leadership, on the other hand, should be aware that by-passing the established chain of command does cause problems and may add some risks.[64]

Although unified and specified commanders prepared contingency plans, the Steadman report indicated that individual theater readiness or contingency plans were not collectively reconciled on a unified basis. The position of under secretary of defense for policy, created at Secretary Brown's behest in 1977, had been given staff responsibility for the interaction of foreign policy and defense policy, for planning, and for helping the secretary of defense evaluate the advice of the Joint Chiefs of Staff on military strategy and operations. Secretary Brown also had felt a need for a small operational staff—possibly best to be shared with the chairman of the JCS—to review the adequacy of military contingency plans.[65] The Steadman report recommended that the under secretary for policy should assure that national security policy and objectives were provided and reflected in JCS/Joint Staff plans for contingencies/crises, conventional wars, and tactical and strategic nuclear wars. Under a new planning guidance for contingency planning issued by Secretary Brown in 1979, the under secretary for policy was charged with reviewing JCS guidance for contingency planning as well as the plans themselves on the secretary of defense's behalf.[66]

In a reflection of his service in Washington both as chief of staff of the Air Force and the chairman of Joint Chiefs of Staff, Gen George Brown noted that Secretary Harold Brown "had me doing the things Steadman recommends" but that "the big difference is that I was not provided with any staff help; therefore I had to discuss these very important programmatic and weapons systems problems and draw on things I knew before I got the job, with no help from a staff."[67] In search of advisory and evaluation talent, General Brown as early as 1978 drew upon a study group of five retired flag officers—Gen William V. McBride, US Air Force; Gen Walter T. Kerwin, US Army; Adm Frederick H. Michaelis, US Navy; Gen Samuel Jaskilka, US Marine Corps; and Lt Gen Charles A. Corcoran, US Army—and one civilian, William K. Brehm. The group was known as the Special Study Group of the Chairman of the Joint Chiefs of Staff, and in 1978 it evaluated Nifty Nugget, which, as will be seen, was an influential mobilization and deployment exercise of US forces that resulted in substantial changes in the US Readiness Command. In 1980 the group evaluated follow-up check exercises called Proud Spirit. In these exercises the group's primary task was to determine the effectiveness of military operations planning and execution and of DOD crisis management under simulated major mobilization and deployment conditions. Following the evaluation of Proud Spirit for the Joint Chiefs of Staff, Gen David Jones, who had become JCS chairman, asked the group to analyze the overall JCS organization and procedures. He also asked the group to confer with the senior chiefs, the

CINCs, and other senior military officers to obtain their impressions and suggestions, and then to prepare a report for him.[68]

After a study involving a comparison of their own experiential views (three of the five military members had served lengthy tours as vice chiefs of their respective services) with the views of officers currently serving in highest positions of military leadership, the group members hammered out findings and recommendations in a long succession of meetings. Work that began in the spring of 1981 culminated in an unclassified report dated April 1982. The study group proposed several initiatives to increase "jointness" and "improve joint activities." Each initiative was judged important in its own right, but the steps had to be viewed collectively to appreciate their essential impact. The group also stressed that

> initiatives taken by the JCS to increase "jointness" and improve Joint activities will have maximum impact only if the civilian leaders—the President, the Secretary of Defense, and other Defense executives, both now and in the future—actively support the improved JCS organization, and solicit and use its products Such support goes beyond pro forma meetings, it requires a basic change in approach on the part of the civilian leadership from the general pattern of the last 20 years or more The Chairman must have a strong voice in defense councils, both formally and informally, representing the Joint community, including the CINC's The advice of the Service chiefs, as a corporate group alongwith the Chairman, must be actively solicited on the wide variety of national issues to which they can contribute in unique ways.[69]

The recommendations of the group were: (1) Establish the position of vice chairman in the grade of general/admiral to act for the JCS chairman in the chairman's absence. (2) Refine the process of focusing the attention of the JCS on issues of major national significance and strengthen the chairman's authority to resolve other issues. (3) Require the Joint Staff to prepare the service chiefs for JCS meetings and to support the chiefs generally in the resolution of joint issues they address. (4) Change the practices and policies that result in overemphasis on the consensus-seeking "committee" approach to the development and approval of joint papers. (5) Improve the preparation and experience levels of service officers assigned to the Joint Staff and other Joint activities such as Unified Command headquarters. (6) Involve the CINCs and their staffs in Joint Staff activities. (7) Strengthen the Joint Staff through an organizational realignment that improves workload distribution. As part of the increased emphasis on preparation of officers for joint duty, the study group strongly endorsed a recommendation made by Gen Russell E. Dougherty, USAF, Retired, for the National Defense University's (NDU) Board of Visitors that a special NDU resident course be set up for all newly selected general and flag officers of the line to increase their sensitivity to and knowledge of Joint matters. The study group also recommended a special study of the unified command concept to determine how the role of the CINC could be increased in planning and operations, particularly in the relationships between the unified command headquarters and the component command headquarters and between the unified command headquarters and the Joint Chief of Staff/Joint Staff.[70]

Reorganization Proposals Foster Service Interdependency

In congressional hearings in early 1982, Gen David Jones skipped much of the usual chairman's thick posture statement because, he said:

> I think the most important issue facing us today in national security is the issue of the organization of the military. We do not have today an organization that can use . . . essential resources as efficiently as it should .. We have made some progress, but the system is remarkably resistant to change The system we have developed is a patchwork which grew out of our World War II experience and only has endured a few changes since the National Security Act of 1947.[71]

General Jones was completing four years as JCS chairman, and he said his perspective was quite different from when he had served as Air Force chief of staff. Jones stressed that the Joint Chiefs were a committee and that committees were "notoriously poor for running things," particularly when they were expected to act unanimously. Jones's specific recommendations were to make the JCS chairman—rather than the JCS—the principal adviser to the national command authorities, especially on issues where fundamental service interests clashed; to give the chairman more oversight of the readiness of the joint commands; to give the chairman a more direct hand in the selection, promotion, training, and assignment of people in joint positions; to provide for a deputy chairman; and to eliminate the service staffs' ability effectively to "veto" the content of joint advice. Although most of these specific recommendations dealt with the chairman, Jones emphasized that he was most interested in strengthening the joint system. "We have combat commanders in the field. . . . They don't have enough say in what is going on, whether it is in resource allocation or new programs. So it is the joint system that I would like to see strengthened," Jones emphasized. When asked for a personal example where his reforms would have resulted in a better product from the JCS, Jones replied: "During the Vietnam war there was a great fragmentation of air effort. We fought multiple air wars in Southeast Asia with only a loose coordination rather than an efficient central direction."[72]

In an article in *Armed Forces Journal International* published on 31 March 1982, Gen Edward C. Meyer, chief of staff, US Army, agreed with General Jones, but urged still more reform:

> My own personal judgment is that the changes urged by General Jones, while headed in the right direction, do not go far enough to correct what ails the JCS. . . . We must find a way to provide better balanced, sounder, and more timely advice from senior Service professionals in addition to strengthening the Chairman and the Joint Staff[73]

Meyer subsequently stated that he wrote the article because "I consider the way in which we develop our forces and the way in which we provide the advice on those force developments to be a very elemental issue."[74] In the article and in subsequent congressional hearings, Meyer ticked off the basic changes he thought necessary:

> First, I believe we need to separate the service chiefs from the day-to-day operations of the Joint Staff. They would no longer be members of the JCS. . . . Second, in lieu of the current JCS, I would propose that we create a body of senior officers who would deal on a day-to-day basis with the kind of critical issues and the allocation of resource issues that are essential if we are to have a balanced military force. . . . Third, I believe we have to increase the role of the chairman so he is the provider of military advice concerning inter-service capabilities and requirements, and the provider of advice on operational matters. . . . Fourth, we need to increase the role of the unified commanders so that they are involved in contingency planning, as well as the determination of requirements . . . Fifth, I believe there needs to be a decreased role for civilians below the level of the Secretary of Defense in providing military input on national security matters . I believe the military must be charged with doing a better job so that military advice is better and therefore more acceptable to senior civilians. . . . Finally, there would be an improved opportunity for the service secretaries and service chiefs to work the very critical issues, today, of the right organization, the right equipment and the right tactics so that we have effective forces on the battlefield of the future [75]

General Jones's rather unprecedented departure from custom in criticizing the existing JCS organization before the House Committee on Armed Services in February 1962 provoked extensive debate during the hearings of the committee's Investigations Subcommittee held in April–August 1982. The hearings more fully developed the views of Generals Jones and Meyer and brought testimony from the other service chiefs. Adm Thomas B. Hayward, chief of naval operations, reported that he was deeply offended by the slanderous criticisms of the Joint Chiefs. "While I am a naval officer first," Hayward said, "I am also well aware of my obligations and responsibilities as a member of the Joint Chiefs of Staff. I find scant difficulty in fulfilling my service obligations and those of the JCS objectively and simultaneously." "Reorganization," Hayward urged, "is simply not necessary. In fact, I have grave reservations that reorganization along the lines proposed would . . . be the first, dangerous step toward a general staff which the Congress clearly has not supported in the past, and which I do not support now."[76] Gen Lew Allen, chief of staff of the Air Force, agreed with the key feature of strengthening the role of the chairman of the JCS, but Allen opposed any change that would fail to ensure that the service chiefs remained an integral part of the joint process Allen testified:

> I believe it is important that the Service Chiefs continue to perform the dual roles of head of a Service and a member of the JCS because they provide the essential linkage between joint strategic planning and the resultant force programming, equipping, and training performed by the Services. These two roles are not in conflict—on the contrary, these two responsibilities must be integrated to insure the Service can effectively and responsively satisfy joint requirements It is incongruous to state that a chief has the time to concentrate on Service-related programming and budgeting issues—but not on the joint strategic planning issues which define and shape those same service programs Effective joint planning cannot be done in a vacuum by a purely advisory group, free of the responsibility to implement or support those plans Military advice is trusted most from those who are responsible and prepared to provide the capabilities to implement that advice.[77]

At the end of the three months' hearings, the House Armed Services Committee's Investigating Subcommittee drafted a bill which increased the authority of the JCS chairman somewhat, provided for a deputy chairman, and proposed to establish a senior strategy advisory board of 10 retired officers at the rank of general or admiral who should have served a term on active duty as a member of the Joint Chiefs of Staff. They would meet no less frequently than once a month and provide their advice and recommendations to the Joint Chiefs, the secretary of defense, and to the president on matters they would deem appropriate. In the Investigations Subcommittee, Rep Samuel S. Stratton of New York resolutely justified the senior strategy board:

> My idea would be to limit the board to a group of retired military experts . I think what we need is to tap the experience of people like General Jones, Admiral Hayward . and someone like Admiral Moorer—people of that stature. . . . We have all kinds of acquisition people and research people and weapons development people, but nobody knows a damned thing about how to fight a war.[78]

The subcommittee of the House Armed Services Committee reported its bill which it designated as the JCS Reorganization Act of 1982. The bill passed in the House readily, but it died without action in the Senate at the end of the 97th Congress.[79]

In the summer of 1982 while the House hearings were under way on the proposed JCS Reorganization Act, Secretary Weinberger asked the newly appointed chairman of the Joint Chiefs, Army Gen John W. Vessey, Jr., to have the Joint Chiefs examine the proposals of General Jones and others relative to reorganization. "We agreed we would do that personally," Vessey later said, "and not engage staff officers." In the fall of 1982, the Joint Chiefs submitted their recommendations to Secretary Weinberger, some that would require changes in law and some that could be implemented without legal changes. In their discussions, the Joint Chiefs recognized three fundamental relationships that had to be cultivated: with the president and the secretary of defense, among the chiefs themselves, and with unified and specified commanders in the field. "In the past," Vessey noted, "the relationship of the chiefs to the President at times had been only through the Secretary of Defense," this despite the fact that by law the chiefs were the president's military advisers.[80] The chiefs persuaded President Reagan to meet with them regularly, around a table or over lunch, where they freely made known their defense philosophies. The president's "Star Wars" proposal, emphasizing strategic defense initiatives, was said to have arisen from a February 1963 meeting with the Joint Chiefs. The new Air Force chief of staff, Gen Charles Gabriel said: "This group of Chiefs is closer to the President than any I have seen."[81] General Vessey met with Secretary Weinberger as a daily practice, and once a week the chiefs all met with the secretary to discuss a previously agreed upon agenda. With Secretary Weinberger, General Vessey attended meetings of the National Security Council (NSC); Vessey additionally asked the individual chiefs to stand in, in quarterly rotation, for him in meetings with the secretary and the NSC that he was unable to attend, this in lieu of an authorized deputy chairman.

General Gabriel said of this practice: "It has been most revealing to me and a great education to be exposed to the N.S.C. and what goes on over there at those levels with the President."[82] To strengthen relations with the unified and specific commanders, Vessey asked each to come to Washington and tell the chiefs about their contingency plans. Vessey remarked: "We found some things that were not right, things of great strategic importance to the United States that had not been tended."[83]

The legal revision that the Joint Chiefs of Staff wanted was to modify the line of command running by law from the president, to the secretary of defense, to the unified commanders, with the Joint Chiefs serving only a staff function for passing command orders Their recommendations that the chairman of the Joint Chiefs of Staff should be placed in the line of command and that the Joint Staff should be enlarged were proposed to Congress in April 1983. General Vessey was said to have gone somewhat further, endorsing an effort that would put the chairman in the National Security Council and perhaps change his title to something like "chief of defense staff."[84] Early in 1983 Rep Ike Skelton of Missouri worked in close collaboration with Gen Maxwell Taylor on a bill which was designed to reform the JCS. Numerous provisions of this bill were incorporated in a House Armed Services Committee bill that passed the House with broad bipartisan support in 17 October 1983. This bill, House Report (HR) 3718, Joint Chiefs of Staff Reorganization Act of 1983, established the chairman of the Joint Chiefs of Staff after the secretary of defense in the chain of combatant commands, made the chairman a member of the NSC, eliminated numerical restrictions on the size of the Joint Staff, and directed the secretary of defense to ensure the independence of the Joint Staff. It also gave each service chief and unified or specified commander an opportunity to comment on Joint Staff reports The bill was referred to the Senate Committee on Armed Services, where, as had been the case a year earlier, there was no action on it.[85]

In a very penetrating analysis of the future of the Joint Chiefs of Staff appended to his testimony before the House Armed Services Investigating Subcommittee in 1962, John G. Kester, who had served a number of years in the Pentagon and then most lately as a special assistant to Secretary Brown in 1977 and 1978, pointed out that the Joint Chiefs of Staff had originated in World War II to model the chiefs of staff organization after Britain's high command. Kester reminded his readers: "The JCS are a product of history, not of logic. If we did not already have the Joint Chiefs of Staff, it is not clear that it would be necessary to invent them."[86] Early in 1964 proponents of reorganization of the US Joint Chiefs of Staff gained ammunition when, in Great Britain, Prime Minister Margaret Thatcher announced a sweeping reorganization of the British military hierarchy that would create much stronger central control of the military services. Gen David Jones expressed dislike for the British decision to centralize weapons procurement, arguing that this went too far in taking decisions away from the services that actually would use new weapon systems But overall, in the joint command plan, Jones said "In the joint arena, I think what they've done is the way we ought to go."[87] The controversy for

and against reorganization of US defense was played out both in the public press and on the floor of Congress. Former Secretary of Defense James Schlesinger demonstrated that in the existing organization. He argued:

> The general rule is that no service ox may be gored. . . The unavoidable outcome is a structure in which logrolling, back-scratching, marriage agreements and the like flourish It is important not to rock the boat This implies a built-in difficulty in formulating and executing military operations. . . . In all of our military institutions, the time-honored principle of "unity of command" is inculcated Yet at the national level it is firmly resisted and flagrantly isolated. Unity of command is endorsed if, and only if, it applies at the service level. The inevitable consequence is both the duplication of effort and the ultimate ambiguity of command [88]

Ex-Secretary of Defense Harold Brown and Gen David Jones were quoted as saying that the US command system had failed in crisis and war. Brown was quoted as saying, "Certainly, the command chain in Vietnam, during the Vietnam war, was the most fouled-up thing in recent history, in part because the Joint Chiefs refused to face up to the issue of how you organize command in the field for most efficient operations. We had problems in Korea in organization, and Vietnam was an organizational nightmare. All four services were in logistics in Vietnam, each service ran its own air war."[89]

In 1984 the US Navy and Marine Corps took the lead in opposing greater defense centralization. "It's a terrible, terrible move, terribly pernicious," said Navy Secretary John F. Lehman, who was said to have lobbied strenuously against the House bill. "It would very seriously diminish civilian control of the military." He said that to put the JCS chairman on the National Security Council as an equal to the secretary of defense would seriously threaten traditional military subservice to civilian authority [90] "I recognize a Trojan horse when I see one," commented the former Marine Corps commandant, Gen Robert H. Barrow. "This is a dangerous proposition we are talking about here."[91] Retired Adm Thomas H. Moorer responded that the JCS should not be blamed for failures in Vietnam:

> It was not the Joint Chiefs of Staff who made the decision never to invade North Vietnam or overthrow Ho Chi Minh . It was not the Joint Chiefs of Staff that put a 30-mile buffer zone along the Chinese border and thereby permitted the Chinese supplies to be assembled in large quantities, and then slide into Hanoi at night [92]

Neither the Reagan administration nor the Republican-controlled Senate Armed Services Committee was reported to be enthusiastic about HR 3718, though the committee chairman, Sen John Tower, said he was interested in pursuing JCS reform as a part of a larger package for reorganizing all of DOD. Thus, unable to get consideration of its measure, the House Armed Services Committee attached an amendment to the fiscal year 1985 defense authorization bill to restructure the JCS by placing the chairman in the national military chain of command, allowing him to select the Joint Staff, making him a member of the National Security Council, and giving him unilateral authority to advise the president on military matters.[93]

Late in September 1984 a Senate-House conference committee hammered out a consensus from their respective revisions of the fiscal year 1985 defense authorization measure. The conferees agreed that the far-reaching aspects of JCS reorganization ought to await a more mature consideration of changes in other parts of the Defense Department. The conferees nevertheless adopted some of the provisions that the House wanted: These included empowering the JCS chairman to act as spokesman for the unified and specified commands, allowing him to set the agenda for the Joint Chiefs of Staff, and allowing him to select the officers to be assigned to the Joint Staff. The conferees also approved language highlighting the importance of the defense reorganization issue, especially for changes in the Joint Chiefs of Staff and the Office of the Secretary of Defense. In the 99th Congress that would take office in 1985, Sen Sam Nunn, the ranking Democrat on the Senate Armed Services Committee, expected that the reorganization and strengthening of the Joint Chiefs would be a matter drawing keen attention.[94] General Jones, for one, was not completely discouraged about the prospects for reorganization. "What we have been able to do over time is create a constituency in Congress. We have created a climate so when there is an administration that really wants reform, there is a constituency on the Hill to do it," he said.[95]

NOTES

1 Archie D Barrett, *Reappraising Defense Organization* (Washington, D C National Defense University Press, 1983), xxiii, xxv

2 House, *Reorganization Proposals for the Joint Chiefs of Staff Hearings before the Investigations Subcommittee of the Committee on Armed Services*, 97th Cong., 2d sess , 1982, 52–53

3 Ibid , 442–44, 461–62

4 Ibid

5 Ibid

6 Ibid

7 Ibid

8 Ibid , 442–78 passim

9 Ibid , 630, 636–42

10 Ibid , 479–83

11 Ibid

12 Senate, *Department of Defense Appropriations for Fiscal Year 1965· Hearings before the Subcommittee Department of Defense of the Committee on Appropriations and the Committee on Armed Services*, 88th Cong , 2d sess , 1964, pt. 1 297, House, *Department of Defense Appropriations for 1969 Hearings before a Subcommittee of the Committee on Appropriations*, 90th Cong., 2d sess , 1968, pt 1 222–24.

13 House, *Department of Defense Appropriations for 1977 Hearings before a Subcommittee of the Committee on Appropriations*, 94th Cong., 2d sess , 1976, pt 1·633 (hereafter cited as *1977 DOD Appropriations*)

14 House, *Reorganization Proposals for the JCS*, 801–17, John Charles Daly, moderator, *The Role of the Joint Chiefs of Staff in National Policy* (Washington, D C American Enterprise Institute for Public Policy Research, 1978), 18, 24

15 Daly, *The Role of the JCS in National Policy*, 24–26

16. Senate, *Department of Defense Appropriations for Fiscal Year 1971 Hearings before a Subcommittee of the Committee on Appropriations*, 91st Cong., 2d sess , 1970, 13.

17. Senate, *Department of Defense Appropriations for Fiscal Year 1970 Hearings before a Subcommittee of the Committee on Appropriations*, 91st Cong., 1st sess , 1969, pt 4 35–37; Claude Witze, "A Package Tied in Blue Ribbon," *Air Force Magazine*, September 1970, 27.

18 Witze, "A Package Tied in Blue Ribbon," 26, House, *Reorganization Proposals for the JCS*, 156.

19 House, *Reorganization Proposals for the JCS*, 156

20. *Report to the President and the Secretary of Defense on the Department of Defense by the Blue Ribbon Defense Panel*, 1 July 1970, iv–vii, news briefing by Gilbert W Fitzhugh at Pentagon, 27 July 1970

21 *Report to the President*, 4

22. Ibid , 1–9

23. Witze, "A Package Tied in Blue Ribbon," 29; Col R. D. Heinel, Jr , "Laird Dumps Fitzhugh Findings after Secret Meeting with JCS," *Armed Forces Journal*, September 1970, 37; House, *Reorganization Proposals for the JCS*, 156

24. Heinel, "Laird Dumps Fitzhugh Findings after Secret Meeting with JCS," 37

25 Senate, *Department of Defense Appropriations for Fiscal Year 1972· Hearings before a Subcommittee of the Committee on Appropriations*, 92d Cong., 1st sess , 1971, pt 1:140–54; House, *Department of Defense Appropriations for 1972: Hearings before a Subcommittee of the Committee on Appropriations*, 92d Cong., 1st sess , 1971, pt 2 31–33

26 Senate, *Department of Defense Appropriations for Fiscal Year 1973· Hearings before a Subcommittee of the Committee on Appropriations*, 92d Cong , 2d sess , 1972, pt. 1:348–63 (hereafter cited as *FY 1973 DOD Appropriations*)

27. Senate, *Fiscal Year 1973 Military Procurement Authorization Hearings before the Committee on Armed Services*, 92d Cong., 2d sess , 1972, pt 2 705–7 (hereafter cited as *FY 1973 Military Procurement*); Daly, *The Role of the JCS in National Policy*, 16; House, *Reorganization Proposals for the JCS*, 519, John G Kester, "The Future of the Joint Chiefs of Staff," *American Enterprise Institute Policy and Defense Review*, 5, *Report to the President*, 35

28 Senate, *FY 1973 DOD Appropriations*, pt 1 356–57; Senate, *FY 1973 Military Procurement*, pt. 2 706

29 *Report to the President*, 57, Senate, *FY 1973 Military Procurement*, pt 2 706

30 *Report to the President*, 57

31. Daly, *The Role of the JCS in National Policy*, 17.

32 Elmo R. Zumwalt, *On Watch, A Memoir* (New York: Quadrangle Books of the New York Times Book Co , Inc , 1976), 384–89

33 Senate, *Bombing in Cambodia Hearings before the Committee on Armed Services*, 93d Cong , 1st sess , 1973, 90–91, 93

34. Senate, *Strategic Arms Limitation Agreements Hearings before the Committee on Foreign Relations*, 92d Cong , 2d sess , 1972, 115, Senate, *Bombing in Cambodia· Hearings before the Committee on Armed Services*, 93d Cong, 1st sess, 1973, 90–91, 93, House, *1977 DOD Appropriations*, pt 1 601–2.

35 Senate, *FY 1973 DOD Appropriations*, pt 1 354–55, *Report to the Secretary of Defense on the National Military Command Structure*, July 1978, sec 2

36 Senate, *FY 1973 Military Procurement*, pt 2.711–14

37 Senate, *FY 1973 DOD Appropriations*, pt 1:354–55; *Report to the President*, 46–49

38 House, *Department of Defense Appropriations for 1975: Hearings before a Subcommittee of the Committee on Appropriations*, 93d Cong., 2d sess , 1974, pt. 1 527 (hereafter cited as *1975 DOD Appropriations*).

39. Edgar F. Puryear, *George S Brown, General, U.S. Air Force. Destined for Stars* (Novato, Calif · Presidio Press, 1983), 239.

40 Ibid, House, *Department of Defense Appropriations for 1974 Hearings before a Subcommittee of the Committee on Appropriations*, 93d Cong , 1st sess , 1973, pt. 2:39

41 *Report of Secretary of Defense James R. Schlesinger to the Congress on the FY 1976 and Transition Budgets, FY 1977 Authorization Request and FY 1976–1980 Defense Programs*, 5 February 1975, III–39.

42. Puryear, *George S. Brown*, 239.

43 House, *1975 DOD Appropriations*, pt 1 709

44 Ibid , pt. 2·322.

45 Ibid , pt 2·326–78

46 "More Changes in the Unified Command Structure," *Air Force Policy Letter for Commanders Supplement*, 15 March 1975.

47 *Report of Secretary of Defense Donald H Rumsfeld, Annual Defense Department Report, FY 1977*, 27 January 1976, 236–37.

48 House, *Department of Defense Appropriations for 1976 Hearings before a Subcommittee of the Committee on Appropriations*, 94th Cong , 1st sess , 1975, pt. 2 168–69 (hereafter cited as *1976 DOD Appropriations*)

49 Senate, *Department of Defense Appropriations for Fiscal Year 1976 Hearings before a Subcommittee of the Committee on Appropriations*, 94th Cong., 1st sess., 1975, pt. 4 86

50. Gen Louis L. Wilson, USAF Oral History Interview no. 1178, 7–8 November 1979, 201–7

51 Senate, *Fiscal Year 1977 Military Procurement Authorization· Hearings before the Committee on Armed Services*, 94th Cong , 2d sess , 1976, pt. 2 963

52 House, *1976 DOD Appropriations*, pt 2 72–73, 171, Senate, *Department of Defense Appropriations for Fiscal Year 1977· Hearings before a Subcommittee of the Committee on Appropriations*, 94th Cong , 2d sess , 1976, pt 1 855, House, *Department of Defense Appropriations for 1978 Hearings before a Subcommittee of the Committee on Appropriations*, 95th Cong., 1st sess., 1977, pt 1 588–89 (hereafter cited as *1978 DOD Appropriations*); "New Approval to Aerospace Defense," *Air Force Policy Letter for Commanders· Supplement*, 15 April 1979, 2

53 *National Military Command Structure Report*, July 1978, USAF Doctrine Information Publication 10, *Background Information on Air Force Perspective for Coherent Plans* (Command and Control of TACAIR), April 1981

54 Jimmy Carter, *Keeping Faith* (New York. Bantam Books, 1982), 55

55 House, *1978 DOD Appropriations*, pt. 2 47

56 House, *Reorganization Proposals for the JCS*, 114–15

57. Ibid , 109, Kester, "The Future of the Joint Chiefs of Staff," 13, citing remarks delivered at commissioning ceremonies of the USS *Dwight D Eisenhower*, 18 October 1977

58 Kester, "The Future of the Joint Chiefs of Staff "

59 House, *Reorganization Proposals for the JCS*, 122

60 *National Military Command Structure Report*, July 1978, 1, 70, 76–77

61 Ibid

62 House, *Reorganization Proposals for the JCS*, 110, 124–25

63 *National Military Command Structure Report*, July 1978, 24–26

64 Ibid., 26–33

65. Harold Brown, *Thinking About National Security* (Boulder, Colo Westview Press, 1983), 207

66 *National Military Command Structure Report*, July 1978, 47, House, *Reorganization Proposals for the JCS*, 550

67 Daly, *The Role of the JCS in National Policy*, 9

68 House, *Reorganization Proposals for the JCS*, 702–9.

69. Ibid

70. Ibid , 470–71, 707–62

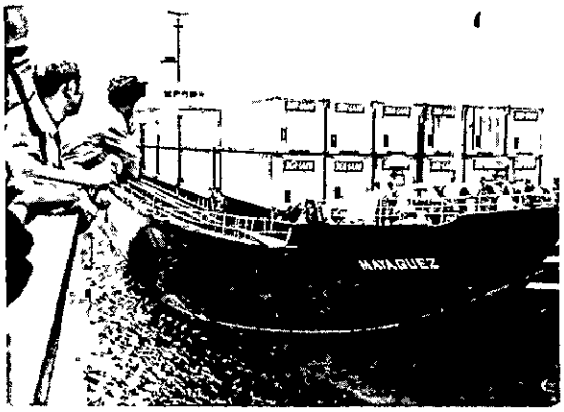
71 House, *Department of Defense Appropriations for 1983 Hearings before a Subcommittee of the Committee on Appropriations*, 97th Cong , 2d sess , 1982, pt 1·14–15, 348–49

72. Senate, *Department of Defense Appropriations for Fiscal Year 1983 Hearings before a Subcommittee of the Committee on Appropriations*, 97th Cong., 2d sess., 1982, pt 1 31–32

73. House, *Reorganization Proposals for the JCS*, 5–6

74 Ibid

75. Ibid.
76. Ibid., 97–101.
77. Ibid , 179.
78 Ibid., 971–1002
79. Barrett, *Reappraising Defense Organization*, xvii
80. House, *Department of Defense Appropriations for 1984: Hearings before a Subcommittee of the Committee on Appropriations*, 98th Cong., 1st sess , 1983, pt. 2:95.
81. Ibid
82. Ibid
83 Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1984. Hearings before the Committee on Armed Services*, 98th Cong., 1st sess., 1983, pt 1·35–36, Richard Halloran, "Reshaping the Joint Chiefs by Way of Persuasion," *New York Times*, 29 June 1983, 1–14.
84 Halloran, "Reshaping the Joint Chiefs by Way of Persuasion," 1–14
85 Extensions of remarks of Rep Ike Skelton of Missouri in the House, in *Congressional Record*, 28 September 1984, E 4083; "Bill Revamps JCS," *Defense Week*, 26 September 1983, 4.
86 John G Kester, "The Future of the Joint Chiefs of Staff," *AEI Foreign Policy and Defense Review*, in House, *Reorganization Proposals for the JCS*, 516–37
87 Gerald F Seib, "Overhaul the Military Chain of Command," *Wall Street Journal*, 14 August 1984, 30
88 James R. Schlesinger, "Reorganizing the Joint Chiefs," *Wall Street Journal*, 8 February 1984, 32
89 Fred Hiatt, "The Wars Within," *Washington Post*, 23 July 1984, 1
90 Ibid
91. Ibid
92 Ibid
93. Martha Lynn Graver, "JCS Reorganization May Get Senate Ear at Last," *Air Force Times*, 18 June 1984, 28
94. *Congressional Record*, 27 September 1984, S 1207 and S 1210, 28 September 1984, E 4083
95. Seib, "Overhaul the Military Chain of Command," 30



SS *Mayaguez*

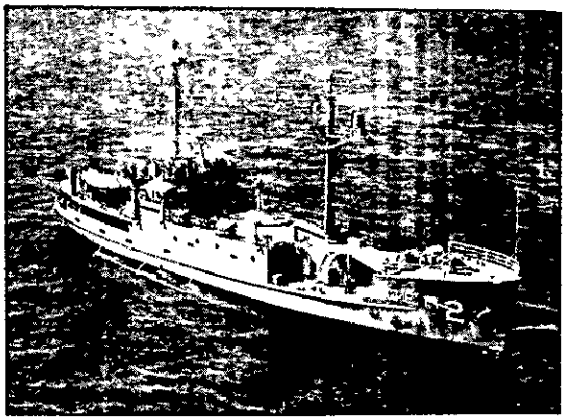
Neil H McElroy,
secretary of defense

Thomas C Reed,
secretary of the Air Force

John L McLucas,
secretary of the Air Force

Gen John W Vessey, Jr ,
chairman of the
Joint Chiefs of Staff

John F Lehman, Jr ,
secretary of the Navy



USS *Pueblo*

CHAPTER 8

GLOBAL AIRMOBILITY FORCES

"Airlift is an exceedingly important function of the Air Force," Air Force Secretary Hans M. Mark remarked in 1980, "but it is one of those functions which is so all pervasive that people tend to forget about it." For his own part, Secretary Mark viewed an airlift enhancement program as second in importance only to the modernization of strategic nuclear deterrent forces.[1]

In its beginning in World War II, airlift was an adaptation of existing civil air transport aircraft to military usages in worldwide airway links. The Air Transport Command's Hump operations into China and the Military Air Transport Service's Berlin airlift, and its support for the Korean War—while notable operational undertakings—were makeshift operations and in no sense an application of ready forces according to an established plan. The MATS airlift of the 1940s and 1950s was conducted with aircraft similar to the commercial air transport industry and was designed primarily to provide logistical resupply, often of articles that had been neglected in forward deployment plans. Air transport customarily provided an emergency means of overcoming shorts in logistics. This point-to-point air transport operation was aptly described as "the eraser on the logistician's pencil."[2]

New Concepts and Requirements

In the 1950s in the Emergency War Plans premised on general nuclear war, the Strategic Air Command was accorded the first and overriding priority for MATS airlift to support its restrike capability. Airlift for Tactical Air Command's nuclear-capable elements came next. The remainder of airlift capability, if any, would be allocated to the Army. There were no formal provisions for limited war situations requiring massive ground force deployments, although it was assumed that in an emergency MATS would draw on its own resources and civil air transports for limited war airlift. The principal commitment of military funds to strategic bombers and ICBMs precluded the possibility of much increase of MATS capability through modernization of the airlift forces. After the Korean War, the Air Force used MATS to tighten its logistical accounts by rapid transportation of high-value parts and equipment, and MATS also had some success in persuading the Army and Navy to follow the same procedures. In 1958, however, the institution of the Airlift Service Industrial Fund required the military departments to pay for formerly gratis MATS airlift, and it became more difficult for MATS to "sell" its services. Already in a lesser priority to combat air forces,

MATS was jealously regarded by many civil air carriers who wanted government business. At an intratheater level, MATS was circumscribed by the long-standing existence of tactical troop-carrier aviation.[3] As has been seen, in the late 1950s congressional committees were very critical of the failure of the Air Force to prepare MATS adequately for a wartime mission not in competition with civil carriers. Later on, Air Force leaders would generously credit the House Special Subcommittee on National Military Airlift, and especially its chairman, Rep L. Mendel Rivers, with supplying the impetus beginning early in 1960 for the modernization of MATS. Congressman Rivers maintained this interest in airlift when he became chairman of the House Committee on Armed Services, insisting that the Military Air Transport Service be given the added prestige of a redesignation as the Military Air Transport Command. This was accomplished by congressional action in 1965 in the form of an amendment to the military procurement authorization bill, and on 1 January 1966 the name of MATS was changed to the Military Airlift Command (MAC).[4]

Although the Kennedy and Johnson administrations were committed to a military strategy of flexible response, it was by no way simple to determine how force—other than air power—could be easily projected to contingency conflict areas. As Alain Enthoven noted from a systems analysis viewpoint, "It was not easy . . . to get comprehensive and accepted estimates of how many forces we wanted to move, where we wanted to move them, and how fast." As this problem came under scrutiny, the most significant study was performed in 1963–64 under the leadership of the JCS Special Studies Group, and entitled "Rapid Deployments of Forces for Limited War," dated 10 July 1964. The study was predicated on the World War II-Korean War experience where in the first few months the enemy swept over a lot of territory that had to be retaken. If the free world had had an ability to reinforce rapidly, it could have checked the aggression and ended the wars more quickly. The study postulated countering enemy assaults in Europe, Korea, and Southeast Asia, comparing three strategies: (1) a "forward" strategy, emphasizing a capability to put fully equipped fighting men into action in a few days; (2) a "defensive" strategy, emphasizing only enough immediate capability to maintain a foothold; and (3) an "intermediate" strategy somewhere in between. The forward strategy required rapid deployment, the defensive strategy slow deployment, and the intermediate strategy a medium rate of deployment. In terms of the cost of a major conventional war, the study estimated that a forward strategy would save more than $10 billion. It reached a general conclusion that the optimum solution for rapid deployment would include prepositioning of equipment and with high-speed-ship sealift and airlift which included a projected C-5A transport plane that was still under study. These conclusions were confirmed in a joint Air Force/Army AIRTRANS 70's study, dated September 1964, and a Weapon Systems Evaluation Group Study, dated February 1965.[5] Secretary McNamara summed up the studies, saying: "All of our studies show that the length and cost of a war, as well as the size of the force ultimately required to terminate it favorably,

are importantly influenced by how fast we can bring the full weight of our military power to bear on the situation." All things considered, McNamara favored a "strategy of a mobile central reserve supported by adequate lift capability and balanced prepositioning . . . as the preferred alternative for meeting the rapid response objectives." McNamara's plan for strategic mobility included emphasis of strategic airlift, the use of "forward floating depot" ships in which balanced stocks of equipment and supplies were maintained on stations overseas, and procurement of a new class of fast deployment logistics (FDL) ships that would be committed to a rapid deployment mission at all times.[6]

When Gen Howell M. Estes, Jr, assumed command of the Military Airlift Service in July 1964 he approached the challenge of developing what he conceived to be a kind of combat airlift without precedent, since it had never existed and did not then exist. The classic lesson of strategic mobility, he wrote, was that there was "*no classic lesson—except to be ready for anything, anywhere, at any time.*" He advanced a thesis that modern combat airlift was fundamental to strategic mobility by which US armed forces could maintain a "kind of universal spatiotemporal readiness." He believed that the kind of strategic airlift that he envisioned was "as much conceptual as technological." Historically, the constraints on airlift had been combinations of at least nine factors: speed, range/payload trade-off, flexibility of employment, cubic capacity, load ability, self-sufficiency, terminal base requirements, full dependency, and direct operating costs. In airlift history, no single aircraft had made a significant improvement in alleviating the self-limiting constraints on strategic airlift, but at the outset of his command Estes conceived that the C-141 would begin a transition to the kind of strategic airlift he envisioned and that the giant C-5A would to a very great extent minimize the airlift limitations of the past Estes predicted:

> It will for the first time permit the MAC force to respond without qualifications to total airlift requirements, including the maximum demand—the division-force move And it will come much closer to putting airlift in a cost competitive position with surface transport[7]

As Estes was ending his command of the Military Airlift Command in 1969, he took another look at the purpose of strategic airlift, drawing upon Sun Tzu's axiom, "There has never been a protracted war from which a country has benefited." The basic functions of a modern combat airlift force were to help prevent any type of war if possible and to help bring it to a swift conclusion if deterrence failed Estes wrote:

> The role of modern combat airlift, then, is to airlift combat forces and all their battle equipment, in the size and mix required—with the greatest speed—to any point in the world, no matter how remote or primitive, where a threat arises or is likely to erupt.[8]

The strategic airlift force had to be so constituted and geared as to move sizable forces if necessary in opposite directions and keep them resupplied until surface lines of communication were operating at capacity. Estes maintained:

> Given the capability to satisfy this maximum demand, the airlift force can with lesser efforts operate jointly with sealift or prepositioned equipment or both, or in tandem with fast deployment logistic ships, once the initial rapid-reaction requirements have been fulfilled. But the basic requirement is invariant to rush integral, combat-ready fighting forces anywhere, including the battle area itself, without a preliminary massing of logistics, within hours of the time a decision to commit has been taken; and to reinforce and sustain them for as long as airlift is the only practicable way to do it.[9]

As early as 1950, Gen William H. Tunner had proposed unsuccessfully that in the interest of economy and efficiency the Air Force ought to unify all air transport organizations, ending the historical distinction between tactical troop carrier and strategic air transport aviation. In 1964, the Tactical Air Command and the Military Air Transport Service were called upon to prepare new doctrinal manuals for troop carrier and airlift aviation, and a doctrine development committee in MATS proposed the time was right to end the distinction between tactical and strategic airlift. The committee proposed: "With the present and future capacity of MATS to perform all phases of the airlift mission, the concept of airlift need no longer be fragmented, but can now become an entity." In a letter to the Air Force on 23 September 1965 forwarding a proposed single airlift manual, General Estes agreed that multipurpose C-130, C-141, and soon the C-5A ended the distinction between the "two-manual" approach consideration of "assault" and "strategic" airlift. Estes wrote:

> Airlift is an instrument of national and military power in its own right, as well as an essential supporting element to strategic and tactical combat forces. . . . It is my opinion that the full functional capability of airlift must be addressed as an entity in order to exploit the flexibility of airlift forces. Such capability cannot in any way be considered divisible.[10]

On 7 January 1966, Maj Gen Arthur Agan, assistant deputy chief of staff for plans and operations, wrote Estes that Gen John P. McConnell, with advice from the Air Staff, wanted separate assault and strategic airlift manuals to be prepared by TAC and MATS working together to avoid duplication. Consequently, AFM 2-21, *Strategic Airlift*, published in September 1966, focused on intertheater airlift, but an introductory chapter did note that strategic airlift could augment tactical airlift forces. In fact, in limited wars, MAC's forces could introduce combat forces directly into battle areas and deliver supplies to deployed forces.

A new AFM 2-4, *Tactical Air Force Operations – Tactical Airlift*, was published in August 1966. It conceived that either strategic or assault airlift could augment the other, but that there normally would be an "interlock" or "interface" wherein strategic airlift would generally deliver goods and people to a rear base and tactical airlift would then deliver them, on a sustained basis, to the Army brigade level

(battalion/company level if required), where the Army would redistribute with organic assets.[11] Later on, General McConnell would explain his distinction between strategic and tactical airlift. He conceived that strategic airlift provided the ton-mile capabilities allocated by the Joint Chiefs of Staff to move rapid deployments of men and materiel into an objective area. Tactical airlift had to satisfy a theater commander's needs that would depend upon many changing variables such as distance of forward movement, availability of surface transportation, tactical mobility requirements, and amounts of routine and emergency resupply and personnel movements.[12]

In view of the strategy of flexible response, the Air Force Aeronautical Systems Division looked to a transport aircraft to replace the old C-124 and C-133 cargo aircraft that had been long in service. The result was the C-141 Starlifter, selected for development in 1961. Based on planning in cooperation with the Army, the C-141A was configured to carry 98 percent of an airborne division for distances of up to 5,500 nautical miles at a speed of more than 440 knots. The first aircraft rolled out of the Lockheed factory in August 1963, and the first flight occurred on 17 December 1963. In its design phase, the C-141 was well conceived, but quite soon the problem of a heavy logistic support plane was back before the Aeronautical Systems Division, since the Army now wished to be able to get infantry divisions airlifted and a still larger "outsized" cargo transport was needed. The result was a capacious C-5A Galaxy design with advanced-technology engines providing the lowest specific fuel consumption of any Air Force power plant and therefore also providing a very economical airlift operating cost. As a result of studies which led to approval of the C-5A program and the letting of a novel total-package procurement contract to Lockheed in August 1965, it was determined to be more cost effective to reduce procurement of C-141s from a planned 20 to 14 squadrons and to procure a planned 6 C-5A squadrons with 96 unit equipment planes and a total buy of 120 of the giant but versatile transports.[13] The decisions to invest in large and expensive C-141s and C-5s called into question the likely vulnerability of such aircraft in combat environments. Secretary McNamara examined the danger, but he concluded that the large transports would be no more vulnerable than merchant ships that would move in by sea. The chief hazard to the planes would be in protecting them on the way to combat area airfields and assuring control over the place they landed. These were limitations, but there were similar limitations on sealift associated with submarine attack or other attacks at sea.[14]

It happened that the development of the Department of Defense plans for strategic mobility began to be affected in 1964 by increasing US military commitments in Southeast Asia. In fiscal year 1965, the airlift force of 517 MAC aircraft and 260 MAC-committed Air National Guard and Air Force Reserve aircraft was almost exclusively propeller-driven with the exception of 28 C-135 jet aircraft, these being aircraft that Secretary McNamara had diverted to MATS solely to provide an interim modernization of the airlift capacity pending delivery

of more capable aircraft. In 1966, General Estes freely admitted that Southeast Asia was the only contingency operation he could handle.

> We don't really have the capability today to meet the needs of one contingency operation to the extent we would like to... much less two. If we had another contingency, JCS would simply have to make priority determinations as to how the available airlift is going to be employed .. Further, we would certainly have to do such things as activate the Reserves, federalize the Guard, activate CRAF [Civil Reserve Air Fleet].[15]

As C-141s with their greater range, speed, and lift entered the MAC operational capability, the active airlift force of propeller-driven aircraft shrank. The C-141 would become the strategic air cargo workhorse airlifter of the Vietnam War; in the peak year of 1968 MAC mustered 224 C-141s and 170 propeller types into its active airlift force. The first three C-5s began operational service in 1970, and by that time the C-141 force was at full strength. The only other aircraft still in the active MAC airlift fleet were three dozen propeller-driven C-133s that were held on to handle outsized cargo.[16]

As a part of the plans and preparations for strategic mobility, a MAC wing/Army division affiliation program commenced in 1965, including exchanges of liaison officers and development of closer working relations between Air Force and Army units. MAC also entered on a very large body of studies, some in-house, but more in conjunction with OSD and the Army field forces. As an example of the studies, General Estes conceived that too much previous thought had been given to the use of major, sophisticated airfields. This had been the case in Big Lift, the highly touted "massive" reinforcement of NATO forces, with a full division deployed from Texas with little more than toothbrushes to marry with equipment already prepositioned in Germany. Estes conceived that airlift aircraft of the future were not going to enjoy sophisticated airfields like the Rhein-Main complex, but would fly troops and a major portion of their equipment to closer distribution points to the front lines. Thus it was important—and planning began—to learn how to unitize cargo carried by C-5s to permit full volume and weight utilization and still permit a cargo breakdown suitable to Army troops in forward areas. Another study was a tandem point examination of how to marry men and equipment delivered overseas by sea shipment with airlift to move them into the forward areas.[17]

The MAC strategic mobility planning fitted into the larger mobility studies of the OSD Systems Analysis Office, which by 1968 had developed a computer model that tied together some 3,000 separate mobility factors relating to the cost, capabilities, and limitations of each major component of US mobility forces. Assuming a certain fleet of ships and aircraft, certain readiness standards, and certain world deployment schedules, the best operational strategy could be computed. Under some circumstances, it was best to operate the FDL ships and C-5s in tandem; that is to have the FDL ships carry loads to ports and then have the C-5s fly the loads from ports to the combat zone. The analyses also suggested that a balanced mix of airlift, sealift, and equipment positioning to meet US deployment objectives consisted of 6 C-5A squadrons, 14 C-141 squadrons, and

30 FDL ships; prepositioned equipment in Europe and the Pacific; a civil reserve air fleet; and 460 commercial cargo ships. This was the posture that would support a two-and-one-half war strategy and provide the capability of simultaneously reinforcing NATO forces and rapidly deploying general-purpose forces to counter a major conventional attack in Asia, as well as meeting a minor contingency in the Western Hemisphere.[18] Congress accepted the Air Force's requirement for C-141s and C-5As, although there was a reduction in support for the Galaxy as it became evident that the program was experiencing cost overruns. Congress also initially accepted the FDL ship concept; the development and prospective procurement of 30 of these ships to be managed with the same "package-procurement" concept as was going to give trouble with the C-5A. Nevertheless, the FDL ship program was increasingly subjected to criticism from industrial, maritime, and congressional sources. Ship-building interests did not like the novel-design demands of the FDL ships which in effect were more akin to aircraft manufacture than ship building; the House Armed Services Committee was not convinced that FDL ships would not be used in competition with the private merchant marine; and there was also a growing disenchantment with American involvement in Southeast Asia and a feeling that the FDL ship would make it easier for a president to involve the United States in foreign military adventures. In 1968, during hearings on fiscal year 1969 military appropriations, the procurement of the fast deployment logistics ships was disapproved in Congress on the basis of a lack of immediacy of need for the vessels in light of the stringent US fiscal situation. At this same time, the giant C-5A cargo airplane was becoming in some circles "a dirty word," mainly because of a large predicted cost overrun. The need for rapid deployment and systems to provide it came under a cloud since it appeared possible that the capabilities might result in, as Sen Richard Russell said, the United States assuming the function of policing the world.[19]

Strategic Airlift Support of Southeast Asia

In a generalized description of Military Airlift Command experience in support of US combat in Southeast Asia (SEA), a MAC briefer appearing before the House Armed Services Subcommittee on Military Airlift stated: "What was a transportation agency in the 1950's, is rapidly becoming a strategic combat airlift force for the 1970's."[20] Although strategic airlift requirements in support of Southeast Asia were built up relatively slowly, MAC began the SEA support period with 21 squadrons of C-124s, 3 of C-133s, 7 of C-130s, and 3 of C-135s. Of the new aircraft to be available, the C-141 began flying into SEA in August 1965, and by 1968 the last of 284 C-141s was produced. MAC received its first C-5 on 17 December 1969, and the first C-5 mission was flown into Vietnam in August 1971. The old C-124s took 95 hours to make the trip from Travis AFB, California, to Saigon and return, and at a mission utilization rate of 6.7 hours per day that came out to just over 13 days for one trip.[21] As the commander of MAC, General Estes

said he wanted "every bit of airlift that I can get."[22] Even in peacetime operations, MAC was programmed to increase its flying hours in a surge capability for national emergencies. In October 1965, the flying rate of MAC C-130s, C-135s, and C-141s was 5 hours a day per aircraft, with three crews per aircraft. The experience of the Air Force and MAC with the operation of large aircraft had always shown that the pacing item was not the ability of the airplane to meet high utilization demands, but it was the ability of the other parts of the airlift system to support the airplane itself. The principal pacing item was the aircrew and maintenance capability that generated the flying hours. Other constraints could occur in terms of load and offload capabilities, perhaps weather, and of course enemy action if it were encountered. To meet the airlift demands of Vietnam, beginning on 1 October 1965, MAC increased the flying rates of most of its aircraft from 5 to 6.5 hours per day by 1 April 1966 by going to a planned 48-hour workweek. On 1 July 1966, nearly a year after OSD established the surge requirement, MAC reached its objective of eight hours per day. This rate required four crews per aircraft, plus other manpower and resources; fortunately, the additional manpower was available because of the earlier than planned phaseout of certain Strategic Air Command B-47 and KC-97 units. As MAC viewed this experience of increasing its surge rate, certain facts became predictable. It was to be expected that economic constraints would preclude peacetime manning to support maximum attainable wartime utilization rates. Obviously, MAC would not be in so fortunate a position as to receive aircrews and maintenance personnel by transfer from the Strategic Air Command, nor would the Air Force be able to afford the time required to train the additional new personnel needed for an appropriate airlift surge rate.[23]

At the onset of MAC's enlarged commitment to SEA support, the command was the gaining command for Air National Guard and Air Force Reserve units equipped with old propeller-driven transport planes, including such miscellany as C-97s, C-119s, C-121s, and C-124s. Although MAC drew upon the voluntary efforts of some of these units to take over cargo needs that permitted the transfer of the more productive MAC aircraft to the cargo needs of Vietnam, most of the Guard and Reserve transports, as Air Force Secretary Harold Brown said, were "just no good for strategic lift." As MAC was going to an all-jet force, the Reserve and Guard planes had peculiar support and en route base requirements that were becoming unavailable and economically infeasible. The Reserve and Guard squadrons, moreover, could not compete favorably with commercial airlift available for hire because their old aircraft were so expensive to operate. Initially, the Air Force intended to deactivate many of the Reserve and Guard squadrons and to convert a few of them to C-130 tactical air transport usages, but General Estes—faced with the prospect of possessing jet cargo aircraft whose flying-hour potential was considerably higher than the manpower MAC could expect to be authorized in peacetime—asked that Reserve units should be established to be associated directly with MAC C-5 and C-141 squadrons. The 1966 MAC planning for the Reserve associate program visualized that the associate groups would use

MAC aircraft and maintenance equipment and train with the MAC squadrons in peacetime. During emergencies, the Air Force Reserve personnel would augment MAC so that high utilization of the more productive jet equipment would be possible. General Estes submitted the associate unit plan to the Air Force in 1967 and after it was held up for a reevaluation of the whole Air Force Reserve program, the MAC associate program was approved by the Air Force and OSD. The first Air Force Reserve associate unit was activated at Norton AFB, California, on 25 March 1968 and in the next several years a Reserve associate unit complemented each of the 17 MAC active duty airlift squadrons. And eventually, 50 percent of MAC-authorized C-5 and C-141 crews would be air reservists, available in emergencies. The associate crews demonstrated their willingness to perform: the first C-5 to land in the Middle East in the 1973 crisis, for example, was manned by a Reserve aircrew.[24]

In addition to the Reserve associate program, other C-97 and C-124 groups provided voluntary fill-in flights to Vietnam. Twelve Reserve aerial port squadrons and six Reserve mobile en route support squadrons were assigned to MAC in 1966, and two additional Reserve en route squadrons were activated at Norton and Dover AFBs in 1968 to guard against multiple contingencies in addition to SEA. Personnel not needed in the associate program were used in forming the support units. During the Combat Fox airlift to Korea, incident to the seizure of the USS *Pueblo* by North Koreans in January 1968, 5 of the 19 Air Force Reserve C-124 groups were called to active duty primarily to backfill regular channel airlift requirements into Southeast Asia.[25]

The expansive requirements of the Southeast Asia conflict caused MAC to make heavy demands on CRAF, the contracted arrangement dating back to 1952 that provided civil augmentation of military air transport capability in time of emergency. Whereas the CRAF program in the decade after 1952 envisioned that it would be activated in its entirety in an emergency, the Air Force took steps in 1963 to convert CRAF to conditions of cold war, limited war, or contingency operations, whereby the civil airlift augmentation force would be capable of selective, discriminate, and flexible responses. In a change in policy, the Air Force took CRAF out of a wholly standby status and provided for portions of the capability to be used in daily augmentations of the military airlift force. Under this new concept, MAC negotiated peacetime contracts with CRAF carriers as agreeable between MAC and the carrier, while emergency stages I, II, and III required the carrier to commit airlift, by model and series, as appropriate to the emergency. The CRAF was composed of four segments: international long range, international short range, domestic, and Alaskan. Its major and most critical role was to augment the long-range military strategic airlift capability withdrawn from worldwide airlift operations when the military airlift was needed to support an emergency. It was the presidential, congressional, and defense policy that commercial airlift should be procured on a basis that would support a more viable, modern, civil air transport industry.[26]

At the time of the SEA force buildup, MAC airlift modernization was in its initial stages, and it would not be until August 1968 that the new C-141 force would become fully operational. As a result, MAC leaned heavily upon civilian augmentation, especially for the movement of passengers, a task best suited to civilian airliners. In view of the substantial growth of commercial air transportation between the Korean War and the SEA force buildup, conditions never warranted activating the compulsory contract features of CRAF; in the crisis period immediately following capture of the USS *Pueblo*, the carriers were asked to volunteer more expansion airlift to avoid declaring a Stage I CRAF emergency. They responded by providing nearly twice as much cargo airlift as in the preceding months. In the domestic CRAF, MAC contracted the LOGAIR and QUICKTRANS services to transport high-value cargo items between the Air Force Logistics Command and the Navy Supply Systems Command. CRAF aircraft also carried approximately 98 percent of defense mail. Although international CRAF flights transported cargo, the commercial carriers as a rule were reluctant to purchase aircraft suited to a full range of national defense cargo airlift needs, since such aircraft probably would be inefficient in commercial competition. Much military equipment could not be fitted through civil aircraft doors. In the beginning of the C-141 development, the Air Force had expected that this plane would be procured by commercial air carriers as a cargo carrier. The commercial carriers, however, considered that the tail-loading feature of the C-141 was a weight penalty for economical usage and did not try a version of the Starlifter. And, of course, there was no commercial usage economically feasible for a C-5 Galaxy. In Southeast Asia, the MAC operation was required to operate in a larger number of airfields than could the CRAF commercial aircraft. The Vietnam experience clearly demonstrated the divergent path taken by the military and civil aviation in the development of aircraft Nevertheless, it was evident that civil airlift would continue to be needed to replace military airlift in routine-type functions throughout the world in times of emergency. But commercial airlift would not be routinely suited for the kind of unit deployments that MAC envisioned from the SEA experience.[27]

In the strategic airlift operations into Southeast Asia, MAC's review and modifications of aerial port/route structures yielded dramatic results. In the early stages of the conflict at the beginning of 1965, all MAC passengers and cargo bound for SEA went out of the aerial port at Travis AFB, California, bound for either Saigon or Bangkok. This created a tremendous loading problem at Travis and a redistribution problem in SEA. As SEA workload increased and the C-141s came on line, MAC operated regularly into 10 airfields and serviced an additional 16 airfields in SEA on an as-required basis, the objective being to deliver as close to the customer as possible. Whereas MAC aerial ports had formerly been at coast-out airfields in the United States—east coast for Europe and west coast for the Pacific—the longer-range MAC aircraft permitted a "multidirectional port concept." Routine channels over the northern Pacific were established between

aerial ports of embarkation (APOEs) at Dover, Delaware; Charleston, South Carolina; and later McGuire AFB, New Jersey. In 1965, APOEs were also opened at Kelly, Norton, and McChord AFBs to support specific destinations in the western Pacific. The expansion of the multidirectional APOEs relieved airlift congestion and reinforced the source-to-user airlift concept. To minimize maintenance, refueling, and support requirements in SEA, MAC airlift inbound to SEA refueled at Clark Air Base in the Philippines, Yokota Air Base in Japan, or Kadena Air Base on Okinawa, completed their mission into SEA, and then recovered at Clark, Yokota, or Kadena This pattern reduced MAC ground time and refueling needs at the forward airfields.[28]

During the heavy resupply into SEA, MAC operated approximately 73 flights (44 military and 29 commercial contract) per day into Southeast Asia with an average ground time of 1.8 hours. Tables 2 through 4 summarize MAC operations worldwide in 1961–74 with the principal activity of course being in the Pacific-Far East.[29]

In addition to the high-volume logistical airlift, MAC combat airlift also came into play in SEA and the Far East, flying integral battle units and their equipment into war areas in a de facto state of war. Between 23 December 1965 and 23 January 1966, a fleet of 88 C-141s, 126 C-133s, and 11 C-124s flew 231 missions in airlifting the 3d Infantry Brigade, 25th Division, from Hawaii directly to Pleiku Air Base, in the far interior of Vietnam. The operation was called Blue Light and, although initiated on only five days' notice, it went very smoothly. For one thing the MAC 1502d Air Transport Wing (renamed the 61st Military Airlift Wing) had been training with the 25th Division for some time. The missions were flown as scheduled flights over predetermined routes and although Pleiku Air Base facilities were rudimentary, the airfield was relatively secure. The Blue Light airlift gave first tests to the new C-141s, and these aircraft were fully used beginning on 17 November 1967 in Operation Eagle Thrust, wherein 391 airlift missions, in 8 noncontinuous increments, lifted 10,024 troops and 5,357 tons of equipment of the 101st Airborne Division, minus one brigade, from Fort Campbell, Kentucky, to Bien Hoa Air Base, Vietnam Twenty-two C-133 missions flew outsized equipment and 369 C-141 missions lifted personnel and cargo. Using engine-running offloads at Bien Hoa during Eagle Thrust, the C-141 sorties were accomplished with an average offload time of 7.4 minutes, thus reducing ramp congestion and potential exposure to ground fire. C-133s were on the ground an average of about two hours. Eagle Thrust was leisurely flown in an elapsed time of 42 days; had such been required, General Estes remarked that even in this end-1967 time frame he could have massed his resources and completed the mission in two and a half days. Although Blue Light and Eagle Thrust hold implications for the future, Estes observed that they were not definitive laboratory experiments: "For one thing," he pointed out, "a good part of the massive logistical base had already been fairly well established; and, for another, the concept of the operation did not call for minimum closure times."[30]

TABLE 2
Military Airlift Command Passenger and Cargo Movement
(Ton-Miles)

Fiscal Year	Military	Commercial	Total	Percent Commercial
1961	1,069.7	281 7	1,351.4	20.8
1962	1,084.0	532 9	1,616 9	33.0
1963	1,168.8	595 0	1,763 8	33 7
1964	1,140.1	517 1	1,657.2	31.2
1965	1,449 3	722.3	2,171.6	33.3
1966	2,061 4	1,317.5	3,378.9	39.0
1967	3,163.9	2,275.4	5,439 3	41.8
1968	4,783.0	2,652 2	7,435 2	35 7
1969	4,369.7	2,792.0	7,161.7	39.0
1970	3,739 9	2,291.2	6,031.1	38.0
1971	3,228.4	1,548.5	4,776 9	32.4
1972	2,760.2	1,887.5	4,647.7	40.6
1973	2,488 1	1,021 3	3,510.0	29.1
1974	1,932.2	559.5	2,491 7	22.5

Source: Headquarters MAC.

TABLE 3
Consignment of Military Air Cargo: Fiscal Years 1960–75

Fiscal Year	MAC	Tons Consigned Commercial Airlines
1960	151,206	17,581
1961	133,291	26,409
1962	108,038	73,669
1963	115,282	69,077
1964	153,158	43,683
1965	187,325	66,067
1966	236,252	102,106
1967	397,297	201,905
1968	516,006	163,073
1969	577,719	147,603
1970	554,652	103,991
1971	469,614	57,143
1972	383,648	133,350
1973	366,468	84,674
1974	262,219	28,728
1975	254,572	18,752

Source Headquarters MAC.

TABLE 4
MAC International Civil Airlift Procurement: Fiscal Years 1960–75
(In millions of dollars)

Fiscal Year	Revenues		
	Passengers	Cargo	Total
1960	47 9	41 9	89 8
1961	53 8	55 6	109.4
1962	77 2	104 8	182 0
1963	100 9	103 6	204.5
1964	98 7	88 1	186 8
1965	108 7	122 6	231 3
1966	188 3	166 2	354.5
1967	268.8	325 7	594.5
1968	332 6	244 9	577.5
1969	336 1	190 0	526 1
1970	320 6	120.5	441 1
1971	294 1	45 1	339 2
1972	222 0	146 3	368 3
1973	155.0	77.4	232 6
1974[1]	119 0	27 2	146.2
1975[2]	173 0	31 0	204 0

[1]Fixed buy for cargo was $30,000,000 but only $27,200,000 utilized for movement of cargo. Unused dollars were converted for movement of passengers during fiscal year 1974

[2]Fixed buy for cargo was $20,500,000 which increased to $31,000,000 through expansion during fiscal year 1975.

Source Headquarters MAC.

Later MAC airlifts in the Pacific-Southeast Asia were much more urgent. On 25 January 1968, MAC received an alert that a major force deployment reactive to the *Pueblo* incident would require movement of tactical air units from multiple onload points to diverse offloads in Korea. In Operation Combat Fox, beginning on 28 January, MAC supported the move of TAC fighters and C-130s and Air National Guard fighters from the United States, as well as moves of Pacific Command forces intratheater, into Korea. MAC C-124s, C-130s, C-133s, and C-141s flew more than 80 missions to Korea from the United States, SEA, and Japan. As seen already, President Lyndon Johnson directed a mobilization of five Air Force Reserve C-124 squadrons, which filled in regular channel airlift requirements, and commercial airlift was also called upon for assistance. Between 29 January and 17 February, MAC's deployed airlift control elements (ALCEs) at Osan, Kimpo, Kunsan, and Suwon, Korea, and at Misawa, Japan, and handled 1,036 aircraft, 13,683 tons of equipment, and 7,996 troops. Although Combat Fox was winding down, the Joint Chiefs of Staff alerted MAC on 12 February 1968 to begin deployment of additional forces to Vietnam within 48 hours to counter the

Tet offensive. The requirement of MAC Operations Order 9-68 was an airlift—code-named Bonny Jack—of an Army brigade from Fort Bragg, North Carolina, to Chu Lai and a reinforced Marine regiment from El Toro to Da Nang. As seen, MAC made a special appeal to commercial carriers, which responded with sufficient additional airlift to keep the backlog at MAC ports within acceptable limits while the combat airlift was in progress.[31]

In April 1972, when most US forces had been removed from Southeast Asia and it was necessary suddenly to redeploy air units from the United States to meet the North Vietnamese Easter offensive, the new capabilities of the Military Airlift Command were strikingly demonstrated. On 5 April Gen Creighton W. Abrams, Jr, urgently requested additional forces, and the Tactical Air Command started Constant Guard, a series of air deployments that numbered I through IV. As Constant Guard kicked off, a squadron of F-105Gs, two F-4 squadrons, and several EB-66s departed for Thailand, while 38 C-141s lifted 854 men and 400 tons of cargo in the move, and 4 TAC C-130s moved en route maintenance teams and their equipment. Constant Guard II was a similar move of two more F-4 squadrons to Thailand. Constant Guard III was the largest single move in the history of TAC, and four squadrons of F-4s moved to Thailand. In nine days, MAC C-5s, C-141s, and commercial carriers moved 3,195 personnel and 1,600 tons of cargo. In Constant Guard IV, two C-130 squadrons were moved to Taiwan, and MAC also took over the Pacific intratheater lifts so that the tactical C-130s could give full attention to in-country work. During this period, MAC also provided airlift support to SAC B-52 and tanker forces moving back to Guam and Thailand. Before the Easter offensive, giant C-5s had not operated in a combat environment, but on 3 May the US Military Assistance Command, Vietnam (MACV) asked for an emergency lift of six 49-ton M48 tanks from Yokota in Japan to the rocket-hazarded airfield at Da Nang in Vietnam. In expedited procedures, nearly all tie-down chains were removed during taxi, and as the C-5 cargo door opened and ramps were extended, the tank drivers started their engines. The tanks drove off under their own power, and the offloading sequence was timed at seven minutes. Ground times in the dangerous area were 30 minutes or less. Immediately after this lift, the C-5s moved 42 24-ton M41 tanks and eight 7.5-ton M548 tracked vehicles to Da Nang and Cam Ranh Bay. Altogether in 1972 the C-5s flew 303 missions into Southeast Asia.[32]

Early in 1975 when the Republic of Vietnam was collapsing under a North Vietnamese assault, this time not opposed by American air attack, MAC C-141s and C-5s rushed military assistance and lifted refugees from Vietnam. MAC flew Operation Babylift, the airlift of some two thousand orphans, most of them destined for homes in the United States. This humanitarian effort was unfortunately marred by the crash landing of a disabled C-5A shortly after takeoff from Tan Son Nhut Airfield on 4 April, killing 155 persons, mostly children.[33] The C-130 and C-141 transports evacuating South Vietnam in 1975 carried antiradiation devices to warn of surface-to-air missiles, but the employment of

unarmed C-141s and especially C-5s in a combat situation raised some questions in Congress. In November 1975 Gen Paul K. Carlton, MAC commander, was asked how far forward the C-5 was going to operate. General Carlton answered:

> It depends on how much carrying the freight to that point is worth to the JCS . . We have already used the airplane both in Saigon and Danang . . in very high risk zones We have operated under the threat of the SAM . as well as air-to-air, under very unusual circumstances such as the second Tet offensive when we hauled tanks into Danang. We don't expose it unless the risk is worth it. We treat it very carefully and conservatively, but to answer your question, if the risk is worth taking to win the battle, we will take it. Just like we will with any airplane. . . . The JCS makes the decision on the use of the C-5 under almost all circumstances of risks [34]

A New Maturity of Strategic Airlift: The C-5A Story

In the Department of Defense analyses of the impending revolution in worldwide force mobility so avidly sought after 1960, the gigantic but highly versatile C-5A Galaxy air transport was expected to provide a significant technological breakthrough. General Estes wrote in 1966:

> Although the C-5 does not radically breach the state of the aeronautical art, it will to a very great extent minimize the airlift limitations of the past It will for the first time permit the MAC force to respond without qualification to total airlift requirements, including the maximum demand – the division-force move And it will come much closer to putting airlift in a cost competitive position with surface transport [35]

For a time in 1969–70 and for a number of reasons the C-5A became "a dirty word, a lightning rod for pent-up resentments," and these resentments "put the need for rapid deployment and the systems that would provide it under a cloud."[36] Speaking to the problem of whether the Air Force had made a mistake in procuring the C-5A, Gen David C. Jones was going to say that the Department of Defense, the Air Force, and possibly the Congress had "collectively made an error" but it was not in trying the C-5 since it was a "fine airplane . . . a good aircraft." The errors in the C-5 program were found in the total program package in research and development and up through the procurement of aircraft to meet certain unattainable specifications, plus an Air Force "reluctance to come to Congress and say we have a problem and we ought to change our whole program."[37]

The Air Force's specific operational requirement (SOR) for a CX-HLS aircraft that became the C-5A originated with Military Air Transport Service visualizations of an aircraft large enough to move all Army equipment, thus ending the practice of "tailoring" combat units for air movement, often with a substantial loss of firepower. The major features designed into the C-5A enabled it to reach any part of the globe with minimum refueling stops or, if necessary, without stopping, with aerial refueling. Its high-flotation, 28-wheel landing gear would permit it to land on 4,000-foot unpaved fields. Its cargo deck was truck-bed height when the landing gear was made to kneel, and for vehicular loads the aircraft could drop each end

of the cargo deck to provide ramps for easy exit or access. The aircraft had special avionics to permit it to follow terrain at low altitudes and to pinpoint targets for airdrop at night or in adverse weather. Although General Estes did not think the C-5 would strain the state of the art of aeronautics, this position was not shared by others later. In 1971 Deputy Secretary of Defense David Packard, who inherited the C-5 problem, declared that "the Air Force asked for more features on the C-5A than were really necessary. . . . There were a lot of things that I think everybody now realizes were not really necessary for this plane, and they added significantly to the cost."[38] On the other hand, the Air Force considered that the characteristics desired in the C-5A were justified by long airlift experience. Secretary Seamans said of the C-5: "It was based on all the operational experience derived from more than a decade of airlift usage in Berlin, Beirut, the Congo, Korea, and extensive development exercises in the field."[39]

In the development and procurement of new aircraft, the Air Force always had followed a procedure of completing a research and development phase amounting to about 20 percent of the total systems acquisition cost. The Air Force then negotiated the production requirements for aircraft, associated data, and equipment at a later date as best it could with the single contractor who had done the development work. This procedure virtually eliminated effective competition for 80 percent of the total acquisition costs involved. Moreover, the Air Force could not make a firm initial computation of the eventual total cost of a system. A new contractual concept to be used for the C-5A (and which would have been used for the fast deployment logistics ship) was put forward, namely a total-package procurement that envisioned that all development and production and as much support as was feasible would be procured under competition in one total package containing price and performance commitments. Three contractors—Boeing, Douglas, and Lockheed—competed for the aircraft and two—General Electric and Pratt and Whitney—for the engines. A total-system responsibility clause held the contractor responsible for the complete system performance, including the government-furnished engines, and the contractor was to be held responsible for taking any action, including correcting discrepancies, that might be required to obtain the guaranteed performance. Gen James Ferguson, commander of Air Force Systems Command, would say in 1970:

> The nature of this contract was one which placed major dependence on the contractor for management decisions after we told him what we wanted in the way of performance The terms of the contractor were such that the Air Force had little control over the development Putting it in oversimplified terms, we would meet him at the end of the runway and take a look at the first airplane That is slightly overstated That is the essence of it [40]

In the aeronautical procurement environment of the early 1960s, there was a "buyer's market" since there was strong competition for the fewer aircraft systems that were being projected. In the bidding for the C-5A contract, General Electric successfully competed for the engines, and the Lockheed Company was the low

bidder for the C-5A airframe; the contract award was announced in September 1965 with production to begin in fiscal year 1967. The Air Force liked the prospects of Lockheed building the C-5 because the company had a good record in building the C-130 and C-141 military transports. Even in September 1965 it appeared that Lockheed's management had underestimated costs and bid unrealistically low, but the management apparently conceived that the C-5 would be a scaled-up version of the C-141 and would present few production problems. This was not to be the case, and 1965 was right at the point where the US inflation trend was going to accelerate rapidly by virtue of the pressures for additional armaments for Southeast Asia. Lockheed had not included in its proposal a line item to cover its estimate of the impact of inflation, although it later appeared that the company had envisioned and provided for from $100 million to $150 million in inflation costs in the long eight-year program. In addition to increasing costs, the contractor also had to go back and make engineering changes to provide the airplane which he had contracted to deliver. These changes involved additional costs, and they also were going to affect the serviceability of the production plane. To meet aircraft weight requirements and payload specifications, Lockheed removed weight from the wing. This involved some degree of risk of weakening the wing, and it turned out that the result severely affected the lifetime of the C-5A.[41]

When Secretary of Defense Melvin Laird took office as a member of President Nixon's administration in 1969, he already had learned that the C-5A program was facing substantial cost-overruns, a matter which he also apparently thought had been attended to by Air Force officials in the previous administration.[42] Early in 1969 the Air Force figured the cost of the C-5A program, originally set at $3.1 billion not including spares in 1964, had climbed to a projected $4.348 billion, the gross unit flyaway cost increasing from $18 million to $26.9 million.[43] In the Joint Strategic Objective Plan 72-79, the Joint Chiefs of Staff stated a requirement for six squadrons of C-5s and 120 aircraft. The 120-aircraft fleet would include 96 unit equipment aircraft, enabling the basing of 32 unit equipment planes at Dover and Travis and 16 unit equipment aircraft each at Charleston and Kelly. The other planes would have been used for training and command and support. This program was already in doubt because of the cost-overrun projection when, on 13 July 1969, a C-5's wing cracked prematurely during the static load test. It was going to be impossible to incorporate a major redesign for improved wing-fatigue life since the earliest aircraft that could be caught in production would be the 75th. Therefore, MAC accepted the first production C-5 for operational use in December 1969 with the realization that the wing would restrict the aircraft to a maximum gross weight of 728,000 pounds instead of 769,000 pounds.[44]

During 1969, the maturation of National Security Study Memorandum 3 outlined a national strategy less demanding with regard to rapid deployment of US general-purpose forces, and Secretary Laird also took the increased cost and coupled wing problem of the C-5 in consideration. It was reported that Laird made

the decision to reduce procurement of C-5As to 81 aircraft in all, allowing for four squadrons of these planes. Laird said:

> We believe that these four squadrons of C-5As, together with 14 squadrons of C-141s in the active force and a Civil Reserve Air Fleet of about 450 four engine jet aircraft will be sufficient to meet our basic needs for intertheater airlift movement [45]

With the reduction of the C-5 buy, the Air Force decided to operate the aircraft primarily from 3 major CONUS ports—32 at Travis, 22 at Dover, and 16 at Charleston—and 11 for training, command, and support. With the reduced force it was believed that initial deployments could be as rapid as ever, but the total amount of tonnage would be less.[46] The Military Airlift Command began operational use of the C-5A in June 1970, and in September 1970 it achieved initial operational capability with delivery of eight aircraft to Charleston AFB. In April 1972 when the planes were used during the Communist Easter offensive in Southeast Asia, 57 C-5As had been produced; 6 were in a flight-test program, 5 were used for training at Altus AFB, Oklahoma, 16 were assigned to Charleston, 18 to Travis, 10 to Dover, and 2 had been destroyed in ground accidents.[47]

As he looked back at the C-5A program, General Ferguson was quite sure that total-package procurement had been a mistake. If he were to do it again, he would have elected to contract for the development of the C-5, and then to look at the result and the cost of the program, and then to negotiate a contract for the production. In clearing up the contract with Lockheed, Deputy Secretary of Defense Packard was willing to let Lockheed settle for a $200-million fixed loss, which allowed the company to avoid bankruptcy and made the acquisition cost for the 81 aircraft about $4.5 billion. On 1 February 1971 Lockheed agreed to this settlement, including a new contract that allowed trade-offs in production as they seemed necessary.[48] The question of what to do about structural weaknesses of the C-5A went on before and after the contractual arrangements, and the problem seemed even more serious after 29 September 1971 when an outboard engine on a C-5A preparing for takeoff actually pulled free and tumbled back several hundred feet. In mid-1970 an ad hoc scientific advisory board committee chaired by Dr Raymond Lewis Bisplinghoff completed studies of the C-5A and concluded that with special care the plane could fill the strategic capabilities required of it. Whereas the service life of the plane had been expected to be 30,000 hours, the Air Force could expect to get 7,000 hours without extensive modifications. Additional structure tests revealed much the same conclusions as the Bisplinghoff committee. There were a number of ways to decrease wing fatigue such as through lighter loads, proper distribution of loads, and appropriate flight and fuel profiles. These inexpensive measures promised to give a C-5A over 20,000 hours of service life and did not preclude using the C-5 for higher loads and other mission profiles if these capabilities were needed. Such usage, however, would tax the plane's service life at a more rapid rate. Since the unmodified C-5As in 1972 were being projected to

fly less than 1,000 hours a year, the Air Force delayed a decision to undertake an expensive retrofit of new and stronger wings.[49]

The Israeli Airlift of 1973

Early on the afternoon of Saturday, 6 October 1973, Arab armies of Syria and Egypt, massively equipped with Soviet-built tanks, artillery, and aircraft, attacked Israel from across the Golan Heights and the Suez Canal. The Israelis had known the Arabs were preparing to attack, but they did not preempt lest they appear the aggressor. Moreover, Israel was confident that a war could be ended in a matter of days, and it had stocked military consumables on such a basis. As already noted, however, the Israelis were badly surprised and compelled to expend materiel profligately to afford themselves time for mobilization. In Washington on the first day of the war, Gen George Brown, Air Force chief of staff, heard intelligence estimates that the Israelis were facing a high-rate-of-consumption war for which they were not prepared and that they would be out of major consumables in about seven days. Acting on his own initiative, Brown made a decision to prepare two F-4 fighter squadrons for immediate delivery of their aircraft to Israel and to begin moving ammunition to aerial ports of embarkation. When he had done this, he informed Secretary of Defense James R. Schlesinger of his actions.[50] The Israeli airlift – code-named Nickel Grass – commenced on 6 October, but according to the MAC commander, Gen Paul K. Carlton, Washington authorities, anxious about US oil supplies from the Persian Gulf, found it difficult to determine how supplies would be delivered from the United States to Israel. The result was several false starts. At first MAC was going to move all supplies to an east coast port, where the Israelis would take delivery. Then MAC was directed to plan to haul to the Azores, where Israeli El Al air carriers would pick up. Deputy Secretary of Defense William P. Clements, Jr., stated frankly that if there was any way to supply Israel without using MAC, he wanted to do it; he called a meeting of CRAF airline presidents and gave them a tough lecture. The presidents responded that they were willing to go if Clements would send MAC to lead the way, but that they would not fly alone, since by so doing they would lose every base right in countries not friendly to Israel. They wanted a declaration of national emergency and a promise of indemnity for all assets lost. Secretary Schlesinger was disappointed but not really surprised when the European allies did not accept the American view of the seriousness of the challenge to Israel; as a result, the United States did not ask for the use of European air bases for the airlift, but rather on 13 October elected to begin military flights through Portugal's Lajes Field in the Azores into Lod airfield in Israel. By this time the Soviets had begun an airlift resupplying Syria and Egypt.[51]

Both in the planning and operations, Nickel Grass was directed from a very high level through the Joint Chiefs of Staff but with no central top-level command post. General Carlton said:

> The concept of operating within an established command and control structure was isolated—the Air Force didn't set up a command post to handle our activity; yet, we were working for the Air Force. We found ourselves taking instructions primarily from JCS/J-4 Logistics. Command and control, or rather a lack of it, caused indecision.[52]

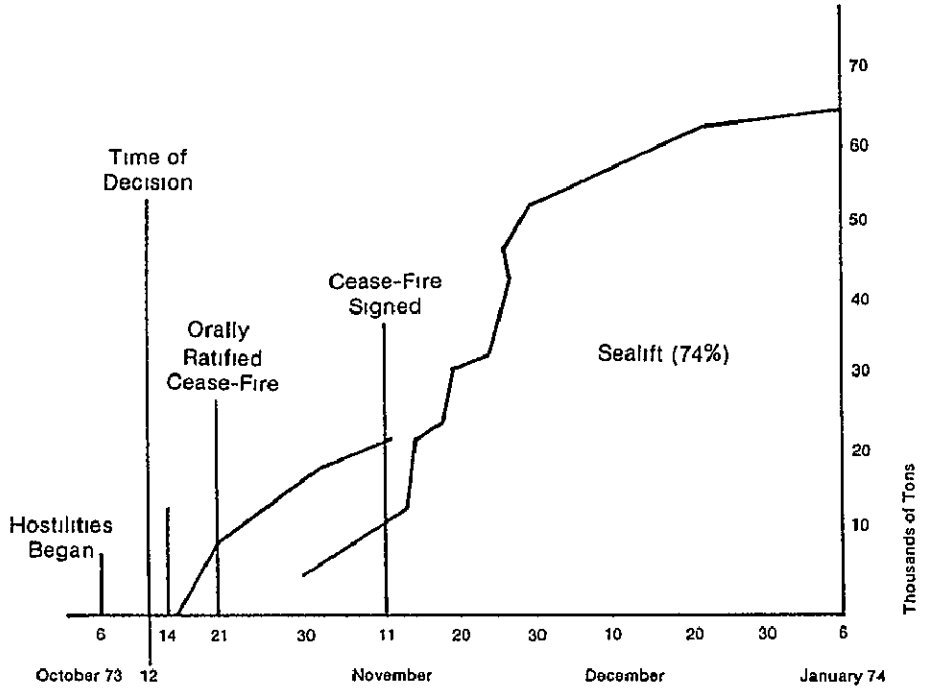
In view of the political complexity, MAC got no use from the European Command's command and control system that could have provided an interface with the US Navy in the Mediterranean. Instead, MAC worked directly with the US Sixth Fleet through the JCS to arrange codes, safe passage procedures, and diversion plans in case of hostile interceptions. In fact, the Navy tracked MAC transports from ship to ship from Gibraltar through the Mediterranean, keeping a ship on station every 300 miles and an aircraft carrier every 600 miles. Early on in the airlift, MAC needed to position airlift control elements and equipment, and movement of very small loads of a couple of thousand pounds incident to the airlift control element (ALCE) deployment and resupply was most feasibly done by C-130s belonging to USAFE and TAC. Midway in the operation, when Soviet threats caused the United States to go on a military alert, all C-130 assets were withdrawn from MAC control. Thereupon, General Carlton had to use C-141s to move very small loads for en route support, which, he said, "didn't make sense" and in the end proved to be "a powerful argument" for consolidating tactical airlift under MAC.[53]

To General Carlton a "vital lesson" of the Nickel Grass airlift was that "the C-5 wasn't a lemon."[54] Air Force Secretary McLucas agreed that the C-5 was a good system. McLucas remarked:

> I think a couple of years ago people were looking at this as an airplane that had experienced terrible technical difficulties and was costing more than it was supposed to. Now I think as a result of the Mideast experience we see it as an airplane that was very capable and did do the mission for which it was designed.[55]

When the national command authorities ordered an emergency resupply operation to Israel on 13 October, a MAC C-5 was en route within nine hours, loaded with 193,000 pounds of cargo. More MAC flights were staged from Dover AFB. The average nautical mile distance from the United States to Lod airfield via Lajes was 6,450 miles. All US equipment reaching Israel before the cease-fire arrived by air, and by the time the first resupply ship from the United States arrived in Israel on 2 November, nearly a week after the 24 October cease-fire, 566 MAC missions—421 C-141 and 145 C-5—had delivered 22,395 short tons of cargo for a total of 144.45 million ton-miles. On 29 of the C-5 missions, vitally needed M48 and M60 tanks were airlifted, a task that could only be accomplished by the C-5. The following table shows the US airlift/sealift in perspective:

TABLE 5
United States Airlift/Sealift
(85,108 Tons)



Source House, *Hearings on the Posture of Military Airlift before the Research and Development Subcommittee on Armed Services,* 94th Cong , 1st sess , 1975, 31

From 13 October to 14 November 1973, the C-5 utilization rate averaged 2.69 hours per day per aircraft, while the C-141 utilization rate was 5.14 hours. The C-5A averaged 74 tons of payload per mission, the C-141 27 tons. In addition to the MAC airlift, the Israelis made good use of their Boeing 707/747 airliners for handling cargo, comprised of mostly ammunition and bombs loaded and unloaded through passenger doors. There were 140 Israeli missions that lifted 5,500 tons for 34.30 million total ton-miles.[56]

Although it proved possible to mount Nickel Grass with only Lajes Field as an en route base, the limited facilities at Lajes and an about one-an-hour-refueling capacity at Lod forced a limitation of the MAC airlift flow eastbound to 36 C-141s and 6 C-5s, with a similar number returning westbound. The use of an alternative route in the North Atlantic for returning aircraft could have enhanced the efficiency of the operation. In his discussions of Nickel Grass, General Carlton revealed that his transports took more tons of fuel out of Israel than they took cargo

in. Fortunately, the Israelis had plenty of fuel; otherwise, it would have been bad news and the operation would have ground to a halt in a hurry. Carlton said:

> This is a lesson everyone has to keep in mind—that destinations should be kept within a radius of airlift aircraft, not simply within its range. Normally, you will want to make fast turnarounds there and not denude the people you're supporting of a critical resource.[57]

In talking about a strategic base for MAC, Carlton envisioned an airfield that could deliver a million gallons or more of fuel a day, equivalent to handling one strategic airplane every ten minutes. In the expedited delivery of fighter aircraft to Israel, KC-135 tankers proved the key to mobility. The tankers supported rapid delivery of F-4s and A-4s and in one case took eight Air Force F-4s nonstop from the United States to Israel. Within 15 hours after departing the United States, some of these F-4 aircraft had been accepted by Israel and were flying combat missions. Aerial refueling also would have been advantageous to MAC. C-5s were capable of air refueling, and MAC put five aerial-refueling-qualified crews at Dover, but aerial refueling was not used because of a fear of the results of aerial refueling maneuvers on the C-5's wing. Later it was evident that aerial refueling would have put less stress on the C-5 wing than the extra takeoffs and landings in the Azores. In the Israeli operation, General Carlton figured that with aerial refueling MAC could have delivered the same tonnage in 44 fewer C-5 missions, 57 fewer C-141 missions than MAC flew, and saved about 7 million gallons of fuel, including the fuel required to operate the tankers. There were, Carlton said, two apparent reasons aerial refueling had to be shared by MAC: "One of them is if you can't get there any other way. . . . The other is when you start to download cargo in order to get more range on the airplane to meet the range you have."[58] Without the requirement to land at Lajes, C-5s and C-141s could have replaced fuel reserves with added cargo loadings. Immediately after the Israeli operation, MAC began to train all its C-5 crews for aerial refueling operation. MAC also stated a requirement that its C-141 fleet be retrofitted for aerial refueling. The Air Force fleet of KC-135 tankers, moreover, had been designed principally to mate with SAC bombers and TAC fighters; the KC-135 was inadequate for refueling C-5s or C-141s, and there was now a requirement for a wide-bodied aircraft as an advanced tanker cargo aircraft.[59]

When sea shipments began to reach Israel, the MAC airlift was counted completed on 14 November 1973, though there were two more flights after this. Much later, a General Accounting Office study of the Yom Kippur War concluded that equipment on the ground determined the results of the war and that US airlift had no direct outcome on that conflict. The report noted that only a small amount of outsized equipment was delivered prior to the cease-fire. On the other hand, Air Force Chief of Staff Gen David Jones pointed out that the Israelis had asked for first priority to ammunition and spare parts. The outsized items that were airlifted were used to benefit Israeli morale. The outsized deliveries also demonstrated that the United States had the capability to deliver such equipment

to Israel. Ample demonstration of the morale-building aspect of the airlift was provided by Prime Minister Golda Meir's dramatic outburst at the sight of the first tank arriving by C-5: "For generations to come, all will be told of the miracle of the immense planes from the United States."[60]

Airlift Consolidation and Specified Status for MAC

Said Secretary of Defense Schlesinger in February 1974:

> I believe that the mobility of our forces is extremely important From the first day I walked into the Pentagon, I have been focusing on the subject, prior to any downturn in the economy, and prior to any war in the Middle East This area has an enormous impact on our ability to help deter conventional conflict in Europe.[61]

As has been seen, one of the Air Force's Corona Harvest recommendations predicated upon experience in the SEA conflict was that steps should be taken to achieve a single airlift command as soon as possible. The principal airlift resources under consideration were the strategic airlift of MAC and the tactical airlift of TAC, but there was also a "support" category that included leased civil aviation services in the Navy's QUICKTRANS and the Air Force's LOGAIR systems, as well as congeries of C-118s, C-131s, T-29s, T-39s, C-97s, and so forth, assigned in ones and twos around the country for administrative support and proficiency flying. During the Middle East airlift of 1973, General Carlton found his task more difficult because he did not have clear title to the tactical C-130s, and the Arab oil embargo and cartel so greatly increased the cost of aviation fuel as to demand changes in support airlift. After much debate within the Department of Defense, Secretary Schlesinger issued a program decision memorandum on 29 July 1974, with amendment on 22 August 1974, that directed the consolidation of all airlift forces in the Department of Defense under a single manager by the end of fiscal year 1977, by which time the Military Airlift Command would become a specified command. The amendment made it clear that the directive included Department of Navy Fleet Tactical Support and Marine Combat Support Transport aircraft, the Air Force being directed to assume this airlift support starting in fiscal year 1977.[62]

On 29 August 1974 Gen David Jones informed every Air Force major activity of the decision to centralize defense airlift in the Military Airlift Command, specifically directing that all tactical C-130 aircraft and associated support in TAC, Alaskan Air Command, USAF South, USAFE, and PACAF would be transferred in place to MAC. A McLucas-Jones explanation of the meaning of the changes pointed out that they expected the consolidation to result in added tactical orientation for MAC, as well as additions of tactical planes to airmobility forces.

> As we have modernized our aircraft over the years, we have realized that the line between tactical and strategic airlift has blurred appreciably For example, our C-130s have a strategic capability and can be used in this role (as, indeed, they have in the past).

> Similarly, our C-5s and our C-141s have a tactical capability Therefore, we are transferring all tactical airlift aircraft to MAC—except, of course, for those in the Reserve forces, which will come under MAC's operational control if called up. The result will be one command responsible for both strategic and tactical airlift roles and for management of resources between them [63]

In addition to this, the MAC charter was broadened by picking up responsibility for support aircraft. At this time, the Air Force ordered over 400 of the old support aircraft phased out. The more efficient T-39/C-135 support aircraft were retained but placed under MAC as the single manager. This streamlining promised to release over 6,000 manpower spaces and to reduce fuel consumption by roughly 150,000 gallons per day. The elimination of more than 400 support aircraft had a drawback since it posed a loss of continuation pilot proficiency; to offset this loss partially, the Air Force elected to increase T-39/C-135 utilization rates and to make proficiency training the primary mission of these aircraft. Initially, however, the planes were placed at operating locations throughout the United States, where they were available to provide a by-product airlift. Each command/separate operating agency was authorized to request MAC airlift on a priority basis through a central airlift scheduling facility where MAC consolidated the requests for their most efficient accommodation.[64]

In making the decision for the consolidation of airlift in the Military Airlift Command, Generals Jones and Carlton saw the need to "recognize and preserve the image and spirit" of the tactical airlift force. To this end, Carlton prepared a program designed both to retain the "tacticalness" of the C-130 units and to improve the tactical orientation of the C-5 and C-141 units.[65] One point of contention arose almost immediately in October 1974 when representatives of MAC and USAFE met to develop a plan for the "as is/where is" transfer of the resources of the two C-130 groups kept on temporary duty status in Europe. USAFE wanted to keep tasking authority directly to the individual flying units and crews, this to be exercised through an airlift control center (ALCC) collocated with USAFE headquarters at Ramstein Air Base. The aircraft were used to provide essential day-to-day tactical airlift for the European Command, such as airdrop training of US Army forces in Europe, deployment and redeployment of Air Force and Army tactical units for Central Europe to training/gunnery ranges in Southern Europe, and necessary carrier, mail, and priority support airlift within the European theater. MAC would not accept the level of detailed control USAFE wanted, but the debate generated a theater airlift manager concept, whereby a designated senior officer would exercise operational control of theater airlift for the Air Force component commander and also manage airlift for MAC.[66] Gen William G. Moore, Jr., who succeeded General Carlton as CINCMAC in 1977, was a tactical airlifter who had commanded the 834th Air Division in Vietnam. General Moore found some residual problems of force integration still lingering, particularly a "big MAC, little MAC" syndrome where many of the C-130 people felt they did not get the same level of support as the C-5/C-141 people. Because of distances involved, Moore also found it hard to get desired working relations with

the theater air component commander. He needed a strong, on-the-scene command; accordingly, Moore reestablished the 322d and 834th Airlift Divisions at Ramstein and Hickam to ensure full airlift support in Europe and in the Pacific.[67]

"Becoming a specified command," said General Carlton, "followed very logically from airlift consolidation."[68] Said General Moore of MAC designation as a specified command,

> It was apparent that the commander of MAC had too many bases during contingency operations For instance, during the Israeli Airlift, General Carlton found himself taking directions from too many sources It became very apparent that MAC had to be the Air Force airlift spokesman in forums involving the JCS and unified commanders.[69]

General Carlton said that resistance to MAC's being designated a specified command directly responsible to the Joint Chiefs of Staff came from the theater commanders who wanted to own their own airlift fleets. As a matter of fact, the Air Force—while somewhat reluctantly agreeable to airlift consolidation—opposed designating MAC as a specified command. The influential Directorate of Doctrine, Concepts, and Objectives argued that such would begin a splintering of Air Force forces by mission, for example, a reconnaissance or a strike/attack or an interdiction specified command might be in order. Others argued that unified or specified commands should be combat oriented, whereas MAC's business was logistical. Some pointed out that the JCS, through the joint transportation boards, already could assure equitable application of airlift. On 13 March 1975 Air Force Secretary John L. McLucas accepted Air Staff recommendations and told Secretary Schlesinger that MAC should not be designated as a specified command but should remain an Air Force major command. The Joint Chiefs of Staff, less the chairman, concurred in the Air Force recommendation not to establish MAC as a specific command. But Gen George Brown, JCS chairman, wrote a separate memo to the secretary of defense recommending:

> Airlift resources are major assets for furtherance of our security policy, and the importance of airlift as a factor in planning for combat operations will be heightened by the consolidation of tactical and strategic systems. Under these circumstances, the MAC Commander should receive his strategic direction directly from the Joint Chiefs of Staff, who are charged with this responsibility under the law.[70]

As the discussion continued, MAC proposed that it would be a specified command reporting to the JCS and secretary of defense in all matters concerning war planning, contingency operations, and JCS exercises and a major command reporting to the Air Force secretary and chief of staff concerning peacetime operations and the budget. On 9 June 1976 Deputy Secretary of Defense Clements reaffirmed the decision to make MAC a specified command. The unified command plan (UCP) was appropriately changed, and on 16 December 1976 the president approved the UCP change, which finally went into effect on 1 February 1977.[71] According to General Moore, who as incumbent handled the change from

COMAC to CINCMAC, the transformation from major command to specified command was "a very smooth transition" since the procedures actually had been evolving for a number of years and the change had been clearly evolutionary rather than revolutionary.[72]

The Modern Airlift Era

Secretary of Defense Harold Brown stated in 1979:

> Given a desired schedule for the deployment of forces, the mobility forces required for initial deployment can be determined relatively easily. Likewise, given daily consumption ratios, the mobility forces required for sustaining support can be determined It is much more difficult to make a judgement on how much capability to buy for the third function—movement in response to unpredictable shifts in the demands of combat—because this involves estimating how frequently exigent tactical situations will develop [73]

Estimating Mobility Requirements Proves Difficult

In 1981 the congressionally mandated mobility study made by the OSD and JCS was prefaced with the twin observations:

> One of the major problems of any mobility analysis is that the results are very heavily influenced by assumptions . Another problem of mobility analyses is that they tend to focus on the scenario This is necessary to do the analysis but acts to obscure the military requirement for flexibility.[74]

Upon his arrival in office, Secretary of Defense Schlesinger's interest in airlift was directed toward its potential enhancement to US reinforcement of NATO. He wanted to be able to move a US division by air to Europe in 7 days instead of being confined to moving it in 19 days. He said, "I believe that we should expand our airlift so as to enhance our NATO reinforcement capability. That, in turn, should give us ample capacity for Pacific contingencies and the 'off design' cases."[75] During hearings on the posture of military airlift in November 1975, Brig Gen Jasper A. Welch, Air Force assistant chief of staff for studies and analysis, recalled that the thrust of mobility planning was still focused on Europe. Welch said:

> While our mobility forces give us the ability to project combat forces any place in the world, we naturally concentrate on priorities in Western Europe—where the ground forces of the United States and the Soviet Union are in the most approximate confrontation.[76]

With the strategic airlift force current in 1975, Welch computed that 14 days would be needed to move the 70,000 tons incident to one infantry division to Europe. With enhancements to airlift being requested and, Welch said,

> with an integrated sealift, airlift approach, we expect in the 30-day period to be able to deliver essentially all of the Active Army Forces and their closely associated and affiliated Reserve units, plus all of the Air Force equipment and units which we plan for deployment to NATO [77]

Gen David Jones said:

> Today we have a capability to move about 180,000 tons to Europe in a month with our airlift That is about half of what we believe is necessary to get the fighting element over We are not trying to get a capability to deploy everything by air The total requirement in a European conflict for initial movement and initial supplies is over 3 million tons So what we try to do is to get a capability for about 370,000 tons by air, and the remainder by sea in that time period [78]

Plans for the NATO airlift were coordinated with the European allies. In response to US queries, the allies stated in November 1973 that they had sufficient airlift to support their individual needs. In January 1975 US representatives held briefings and discussions with senior political and military representatives of NATO on strategic airlift. NATO officials agreed to press on with improving the reception capability of NATO airports and hoped to use NATO civil aircraft to speed US troops and equipment from the airports where they landed to the battle areas where they would be needed as fighting units.[79]

At a meeting of NATO heads of government in May 1978, President Carter reaffirmed that "the US is prepared to use all forces necessary for the defense of the NATO area." In fulfillment of this policy, Secretary of Defense Harold Brown announced a plan to speed reinforcements to Europe, this entailing a capability to triple US combat planes in the theater to 1,900 within a week and to increase US troop strength from 200,000 to 350,000 within two weeks. A key part of the plan would be to match up Army battalions with supplies and equipment in prepositioned overseas materiel configured to unit sets (POMCUS) storage in Europe. Brown said that the NATO-Warsaw Pact confrontation was "by far the most demanding contingency we consider[ed] in our planning" but that there were other areas in the world "such as the Middle East, the Persian Gulf, or Korea" warranting consideration in mobility planning. "Although we do not plan the capability for simultaneous all-out deployment to one of these locations and to Europe, our planning must account for the possibility that war in any one of them could lead to war in Europe " The two key areas in which mobility forces would have to be improved would include an ability to deploy additional US ground and air forces to Europe rapidly and an ability to deploy and support forces in limited contingencies without reliance on intermediate bases or overflight rights [80] In October 1978 the United States conducted a first full-scale simulated computerized mobilization exercise in many years. Called Nifty Nugget, this 21-day marathon involved 24 military commands and 30 civilian agencies and examined the planned reinforcement of US combat units in Europe. The exercise was said to have demonstrated that after many years of talk, the United States was not prepared for a mobility reinforcement of NATO. There was no central mechanism

for implementation and coordination of complex mobilization and deployments and of the activities of the Military Airlift Command, the Military Sealift Command, and the Military Traffic Management Command. The airlift part of the exercise suffered from a lack of coordination; moreover, plans called for many more aircraft than could be made available, particularly when contingency plans for more than one area had to be implemented simultaneously.[81]

Before 1979 the major concern of US defense mobility planning was a rapid reinforcement of NATO, but regional developments during 1979 broadened the spectrum of mobility requirements. The danger of the marked Soviet buildup of power against NATO continued to grow, but the collapse of a friendly government in Iran in January 1979 led to a chaotic revolution headed by the Ayatollah Khomeini and the seizure of US hostages in the American embassy in November 1979. In September 1979 it was revealed that a Soviet combat brigade was stationed in Cuba, and in December 1979 Soviet military forces initially invaded Afghanistan. In 1979 the United States also began to know "with considerable confidence" that in the 1970s the North Koreans had been engaging in a major military buildup that was not geared to defensive considerations. The full geopolitical importance of the Middle East was impressed upon the US government when President Carter in his State of the Union message in January 1980 stated: "Any attempt by any outside force to gain control over the Persian Gulf region will be regarded as an assault on the vital interests of the United States and such an assault will be repelled by any means necessary, including military force."[82] Robert W. Komer, under secretary of defense for policy, had been designated to head a DOD mobilization deployment steering group in the wake of Nifty Nugget. With the emerging power vacuum in the Persian Gulf, Komer pointed out that the United States was confronted with a three-front problem, instead of a two-front, or one-and-one-half front problem.

> In addition to our vital interest in Europe, our vital interest in Northeast Asia, we now have the problem of what to do to deter or defend Persian Gulf oil, particularly if the Soviets decided to take advantage of the enormous strategic gains they could achieve by meddling around in that particularly vulnerable area [83]

Komer's studies suggested that "we ought to try to finesse one of the three fronts since we couldn't possibly handle three fronts simultaneously."[84]

In January 1979 Secretary Harold Brown's presentation of US mobility forces for the reinforcement of Europe banked heavily on programming to preposition military equipment in the NATO countries. A year later, Brown's solution for NATO reinforcement still hinged on prepositioning. He said:

> The Rapid Reinforcement Program will produce at M+14 a total of US ground firepower greater than is in the entire German Army and twice the number of air squadrons that are in the Luftwaffe . . . The timely provision of this massive reinforcement depends in the first instance on our ability to preposition unit sets of equipment in Europe, fly troops over to them by passenger aircraft, and deploy our fighter squadrons to protected and well-stocked allied bases [85]

Although prepositioning had advantages, it was not an entirely satisfactory solution to mobility shortfalls, even in Europe. Some items, such as helicopters and air defense systems with heavy use of electronics, were not suitable candidates for prepositioning. Moreover, no one knew how a crisis would develop. The United States might well want to shift forces to some place other than Europe's Central Front. No one knew where contingencies outside the NATO area might occur. Brown stated:

> It is possible that we would not get help from our NATO allies; there probably will be little or no prepositioned equipment and supplies, and, at least in some cases, we would be less willing to divert civil ships and aircraft from their normal business Finally, operational problems will be greater. In particular, we may be operating over longer distances with few or no intermediate bases, and reception facilities may be limited Improving our capabilities in such circumstances is an important objective of our program In particular, we want to have the capability to deploy quickly (and support) at least a small force to distant locations without reliance on foreign bases or overflight rights [86]

The emerging power vacuum in Southwest Asia demonstrated that US defense interests were no longer regional but had become global. Gen David Jones, the JCS chairman, expressed the Joint Chiefs' views:

> In the 1950s, 1960s and even in the 1970s, although with greater risk, we could afford to deal with issues on a regional basis In the 1950s, in Korea we could literally decimate our military capabilities in much of the rest of the world and get by with it In the 1960s, we could fight a war in Vietnam and rob Peter to pay Paul and get by with it Now we need to address events on a global basis, and when we look at the greatest danger—several events occurring simultaneously—we have what the JCS have stated for a long time—a strategy/force mismatch, the inability to protect all our interests with the forces we have available We also have a geographic asymmetry, in that we have vital interests close to the Soviet Union and far from us while they have no truly vital interests far from them and close to us. So they have a geographic advantage, particularly in Southwest Asia [87]

According to Ambassador Komer, who said that he had "interfaced" with the Joint Chiefs and Joint Staff "very actively" to work out a Persian Gulf policy, the Joint Chiefs in 1980 were "terribly concerned that any major US-USSR regional clash anywhere in the world might quickly escalate to global war." Komer continued:

> And the JCS have been fascinated by what is called horizontal escalation—that if we are attacked someplace where we are vulnerable, let us say the Persian Gulf, instead of trying to contest the enemy where we are weakest and he is strongest, we should, in effect escalate by attacking him someplace else where we are stronger and he is weaker [88]

Maxwell Taylor was often well informed on defense policy. In an interview in June 1950, he was emphatic that the Middle East was the wrong place to have a military confrontation with the Soviet Union since the United States no longer had the means to sustain military operations of any significant size on the periphery of the

Soviet Union. In the Middle East, however, it was important for the United States to sustain sufficient force to present the Soviets with a present risk of escalation.[89]

In part because of the identification of serious deficiencies in the ability of the United States to deploy combat forces to NATO that became apparent in Nifty Nugget and in part because of uncertainty over how to deal with other potential contingency areas, the Department of Defense military appropriations request for fiscal year 1981 asked for funds for a new airlift modernization program. In restructuring mobility objectives, the Air Force required funding for a new C-X airlift aircraft that would both project into a theater and meet intratheater airlift requirements. In the spring 1980 Department of Defense appropriations hearings, the House Armed Services Committee rejected development money for the C-X, questioning the pertinency of a new airlift plane that could carry only one XM-1 tank. The Senate had a better opinion of the C-X, but both the House and the Senate wanted the Department of Defense to give more attention to mobility planning. As enacted on 8 September 1980, the Department of Defense Authorization Act of 1981 required the secretary of defense to conduct an analysis of the mix of aircraft, sealift, and prepositioning required for the United States to respond to military contingencies in the Indian Ocean area and other areas of potential conflict during the 1980s. It also provided that no funds could be obligated or expended for a full-scale engineering development or procurement of the C-X or any other new transport aircraft until the secretary of defense certified in writing to Congress that US national security required the C-X; that the military cargo to be airlifted to the Indian Ocean was sufficiently well defined as to identify a deficiency of military airlift; that the military cargo was sufficiently well defined to provide justification and design for a new airlift aircraft; and that plans for a new airlift aircraft were sufficiently advanced as to make full-scale engineering development both economically and technically feasible.[90]

New Perspectives on Airlift Aircraft

In the first few years of the 1970s the volume capacity of Military Airlift Command's channel and special assignment airlift declined sharply with the reduction in support for Southeast Asia In fiscal year 1975, it was only about 30 percent of the 7-1/2 billion ton-miles of fiscal year 1968, the peak year of Southeast Asian activity. These figures pointed to a major airlift problem: in wartime there was a much larger requirement for airlift than could be used in peacetime. In peacetime, moreover, the Department of Defense divided its limited passenger and cargo business between aircraft of the Military Airlift Command and the Civil Reserve Air Fleet. MAC's peacetime flying hours were necessary to maintain a crew proficiency suitable for a desired surge for emergencies, and MAC was customarily under congressional pressure to find a productive use for MAC's flying hours in peacetime, at the same time providing an incentive necessary for CRAF's commercial carriers to acquire significant numbers of wide-bodied jet cargo/

convertible aircraft for use in military augmentation. In the post-Vietnam years each of many mobility studies undertaken showed that there was an impending shortfall in both intertheater and intratheater airlift, particularly for "outsized" and "oversize" cargo. Outsized cargo was the air cargo that exceeded the loading capacity of C-130/C-141 aircraft and required use of C-5 aircraft. Typical outsized cargo items included the Army's M60 tank, 155-mm howitzer, and CH-53 helicopter. Oversize cargo required the loading capabilities of a C-130/C-141 aircraft and could not be carried in commercial aircraft without modification. Typical examples of oversize items were the UH-1B helicopter, standard Army 6-ton truck, and a 6,000-pound forklift. In 1975 the Air Force considered in regard to airlift capabilities:

> The greatest need is for capacity in long-range aircraft to move vehicles (particularly the smaller personnel carriers and trucks) which we call oversize cargo Secondly, we could use a somewhat greater capacity for the outsize tanks, guns, and recovery and repair vehicles which only the C-5 can airlift today We have ample passenger and bulk cargo capacity in the aircraft of the Civil Reserve Air Fleet [91]

In hearings on the posture of military airlift in November 1975, the Air Force's airlift enhancement initiatives sought means less costly than procuring new transports for strategic airlift. The options included increased utilization rates for the C-5 and the C-141 aircraft; aerial refueling of the C-5 and the C-141 through new engines for KC-135s and obtaining a new fleet of advanced cargo/transport aircraft; stretching the cargo capacity of C-141s, using tactical C-130s to augment the strategic airlift force with eventual replacement of C-130s by more versatile advanced medium-short-takeoff-and-landing transport (AMST); and by motivating CRAF carriers to obtain and operate oversize-capable wide-bodied jets in their commercial inventories. In 1975 MAC intended to move military passenger traffic primarily by contract with CRAF airlines. Since the level of military cargo requirements was below that which could be handled by MAC in programed training, MAC expected to use its cargo capacity generated as a by-product of training before contracting with the airlines for substantial peacetime cargo service.[92]

In any prospective military airlift augmentation, General Carlton said in November 1975, CRAF was "a great national mobility asset. It has done yeoman service for us down through the years. It is the cheapest way to do the job, if the vehicle available will meet your requirements."[93] As the MAC commander, Carlton considered that he was responsible for any necessary mobilization of both the military and civilian airlift fleets. The military fleet had an adequate number of big C-5s and C-141s but an absolute minimum number of crews and supplies to make their flying hours go up to the 12 hours per day that would be desirable. The civil fleet had lots of crews and supplies and was operating aircraft from 8 to 10 hours every day, but the commercial passenger planes were unsuited to military cargo lift. In the early 1970s the Air Force had hoped that commercial cargo demands would result in the CRAF carriers buying wide-bodied cargo jets that

would be available for government service. But the demand for commercial carriers capable of handling oversize cargo did not materialize. Beginning in 1974 the Air Force sought appropriations to compensate commercial carriers for modifying aircraft for freighter use; while the carriers were reported to be interested in this enhanced CRAF program, Congress rejected it in fiscal years 1975 and 1976.[94] When the enhanced civil cargo fleet did not materialize, the Air Force launched a new idea in fiscal year 1980 and submitted it to Congress in early 1979. This time, Gen Lew Allen proposed to subsidize the cost of cargo modifications when the aircraft were being constructed. Allen strongly urged that the enhanced CRAF would be "many, many times cheaper" than any other way of providing expanded strategic airlift, but in March 1981 he ruefully stated that the enhanced CRAF program had been, for reasons unknown to him, unable to work up much support. The airlines had been unwilling to buy any wide-bodied, cargo-capable aircraft. "It has been a source of enormous frustration that we have not, among us all, found the key to moving ahead with [the enhanced CRAF]," he said.[95] In May 1982, Allen remarked that the people who went to war in the future were going to go on commercial CRAF airliners but that there was still no arrangement whereby the airlines would convert their passenger airplanes quickly to cargo-capable airplanes, which meant strengthening floors, putting in larger doors, and doing other things that increased weight and operating costs in a commercial employment.[96]

A vital factor in airlift augmentation was to realize the full potential of existing resources. At the time that the C-141A production was on the line, it was evident already that the new plane had enough power to lift more cargo than the cubic content of its short fuselage could accommodate. The plane had been kept short to facilitate its operation from advanced shorter airfields. These facts were fully disclosed in congressional hearings in 1965, when it had been declared feasible to stretch the C-141s still in production by inserting plugs in their fuselages; at this time, the Air Force with Secretary McNamara's support would not accept the proposal since it asserted that C-141 production might be delayed for a year, the time required to make and test the changed version. The Air Force had hoped that commercial aviation would buy a civil cargo version of the C-141A, but airline companies would not accept a plane that would not be able to carry maximum cube ordinary cargo using the power that was available.[97] Based on its performance in operation, the C-141A "cubed out" before reaching its full weight carrying capability: the size or bulk of most cargo that could be airlifted in the C-141A exhausted the usable cargo volume before the aircraft reached its maximum allowable load. The lift in the Arab-Israeli conflict of 1973 clearly showed that the C-141A fleet was volume constrained. In fiscal year 1975 Congress authorized a technical feasibility prototype modification, adding 23 feet to the length of a C-141 fuselage, and also adding an aerial-refueling capability. The resultant C-141B had 13 pallet positions, 3 more than the C-141A. The modification program was completed in mid-1982, and of it Gen Robert E. Huyser, CINCMAC, said: "Other

than CRAF the C-141 stretch program is the most cost effective airlift enhancement program in being today."[98]

Strictly speaking, the C-5A wing modification was not an enhancement to airlift, but it was essential to the preservation of the plane's strategic outsized-delivery capability. The life of a C-5A was projected to be 8,000 hours without wing modification, a severe reduction to a design goal of 30,000 hours. Even with reduced peacetime flying, the service life of the C-5A would run out in the mid-1980s. The unmodified wing was not hazardous in flight but certain restrictions were nevertheless practiced. The theoretical 200-foot terrain-following employment was abandoned, since at such altitude the rough air buffeted the vulnerable wing. The high-flotation landing gear was not used for any landings in plowed fields according to original design, since the rougher any landing, the worse the condition of a wing. The greatest strain was on what MAC called the "GAG cycle—the ground-air-ground cycle," so the rough field-landing capability was not used.[99] In December 1975, the Air Force began to design a modification to the C-5A wings that, in the end, involved a major rework of wing beams as well as surfaces. Replacement of the C-5A with a comparable field-landing capability, however, would have cost three times as much as the proposed modification. The modification program was finally set up whereby the wings would be modified as each C-5A went through scheduled inspection and repair as necessary (IRAN). The first production aircraft entered the Lockheed-Georgia facility in January 1982, and all 77 surviving C-5A aircraft were scheduled to have been modified by the end of fiscal year 1987.[100] Whereas it had originally been thought that the C-5A would be compatible with a small, austere forward airfield environment, this did not prove practicable even for a modified-wing aircraft. C-5 tests on unprepared surfaces at Harper Dry Lake and on matting at Dyess AFB were terminated because of runway and aircraft damage. Air Force Secretary Hans Mark wrote:

> The results of these tests plus the operational experience we have gained over the past 12 years have shown that the C-5 is not compatible with the small, austere airfield environment because of the aircraft size and operating characteristics I know that originally we thought C-5s should be able to do that but we were wrong.[101]

The Air Force had bought KC-135 aerial-refueling aircraft to support Strategic Air Command's long-range bomber missions, and these planes had successfully extended the range of tactical aircraft in Southeast Asia. During the Israeli airlift in 1973, aerial refueling of C-141s and C-5s could have greatly benefited the hauling of cargo and also reduced congestion in the Azores and time-on-ground refueling at Lod airfield in Israel. It was obvious that aerial refueling of transport aircraft would speed a NATO deployment and preserve NATO fuel reserves, since the transports would not need to refuel at offload points. Whereas a reskinned and reengined KC-135 would continue to be effective in refueling bombers, experience showed that a wide-bodied transport/refueler would be needed to satisfy the fuel needs of C-5s and C-141s. In 1973 the Israelis flew a Boeing 747 with about 140,000 pounds of cargo nonstop from the United States to Israel, and Gen David Jones

notes that that cargo capability could have translated into fuel to take fighters or transports directly into the Middle East. General Jones pointed out, "Operating from the US territory, either from the United States heading east or Guam heading west or southwest, we can refuel fighters, and we can take fighters en route to any, virtually any base in the world without support."[102] Air Force Secretary Thomas C. Reed added: "It is the concern about the unreliability of overseas bases that principally drives the Advanced Tanker Cargo Aircraft [ATCA]."[103] In an early estimate, the Air Force specified that about 65 of the ATCA would be appropriate for a European reinforcement scenario. By taking advantage of available commercial wide-bodied aircraft, the Air Force could have the new tanker/cargo plane with very little development effort. The mid-1975 lull in commercial aircraft purchases, moreover, provided a very competitive atmosphere for buying military transport aircraft off the shelf. In bidding for ATCA, McDonnell Douglas offered the Douglas DC-10 and Boeing offered the Boeing 747, both of which met the tanker/cargo criteria. In December 1977, the Air Force's source selection considered the DC-10 had more cost advantages and accepted it for purchase as a KC-10. As a notional number, the Air Force asked for 41 KC-10s, and Lt Gen Thomas P. Stafford recorded his surprise when the Ford administration upped the number to 92 aircraft. When President Carter took office the number first went to zero, but Secretary Harold Brown on reclama accepted a small program with 20 KC-10s. Before going further Brown wanted a better understanding about the feasibility of new engines for 615 KC-135s held by the Air Force. Although KC-10 planes could transport both fuel and cargo simultaneously, the refueling task was the major activity, and the planes were assigned to the Strategic Air Command as the single manager of a common user force. The refueling mission would be most usual. In 1982, the first eight KC-10s were in service at Barksdale AFB, and the Air Force program had settled on a 60-aircraft buy, each at a given price with discounts in the latter purchase years. In an interesting logistical support arrangement, the Air Force also bought into the billion-dollar pool of spare parts for the DC-10 existing worldwide and underwritten by the owners and operators of these planes.[104]

At the same time that Project Forecast recommended the CX-Heavy Logistics Support Aircraft that became the C-5, it also recommended a vertical short takeoff and landing (VSTOL) aircraft. By 1970, however, the Tactical Air Command could see no early availability for technology to admit a VSTOL plane. Moreover, the Army's inventory of thousands of helicopters had reduced the operational requirement for a frontline Air Force airlift vehicle. "We take a realistic view and admit," said an Air Force briefer in January 1970, "that the C-130 and its replacement should be operated more rearward to avoid heavy enemy fire, and that aircraft of lesser cost must handle the far-forward requirement."[105] At this time, the House Military Airlift Subcommittee accepted the TAC recommendations that while VSTOL was currently impractical there was nevertheless "an urgent requirement to develop a STOL aircraft with greater

payload and operational capability than the existing C-130." The subcommittee added that this should have the "highest priority" in the Air Force budget for fiscal year 1972.[106] In response to Deputy Secretary of Defense Packard's case for increased use of prototyping to cut weapons development costs, the Air Force Systems Command did a prototyping study in 1971 for an advanced medium STOL transport (AMST), and in January 1972 requests for proposals were released calling for bidders to propose a technology demonstrator according to desired tactical airlift parameters. In January 1973 Boeing and McDonnell Douglas were given contracts to build and test two prototypes each. From the start of the AMST undertaking, the Air Force had trouble getting funds to keep the prototype development going—so much trouble in fact that the companies involved put significant amounts of their own money into the effort in the expectation that they would produce a plane that would have a substantial civil usage. Using a "sort of cut and paste" approach—a cockpit of a DC-10 and the landing gear of a C-141—McDonnell Douglas got its YC-15 on a first flight well ahead of schedule in August 1975, and Boeing's more sophisticated YC-14 flew a year later. The US Army was actively supportive of the AMST, and the Combined Arms Combat Developments Activity at Fort Leavenworth, Kansas, concluded in August 1977 that a tank-carrying AMST offered the Army the "most flexible and efficient tactical airlift system." MAC also was a strong supporter of the AMST, considering it responsive to all intratheater airlift needs as well as to the mobility and flexibility of forces engaged at or near the forward edge of the battle area.[107]

The flight-test program of the YC-14 and the YC-15 was completed in August 1977, and the Air Force wished to proceed to source selection of one or the other planes in anticipation of a contract award in April 1978. But the program continued to be in financial trouble: the AMST had started off with a projected average flyaway cost of $5 million per aircraft; with inflation the cost had grown to about $10 million; and by 1982 with continuing inflation it could be as high as a $20 million airplane. In December 1977, Secretary of Defense Harold Brown directed that the AMST be dropped from President Carter's fiscal year 1979 defense budget request. Brown estimated that the AMST program would cost $9 billion in procurement money. Brown explained:

> We decided that because we really had no confidence that we would spend the $9 billion of procurement money that would be needed to procure a fleet of those, that we would cancel the program. Now it may be that the contractors will still go ahead and develop something for a commercial use and we would then be willing to consider that. But our uncertainty about the justifiability of the procurement requirement caused us to conclude it was not fair to lead the contractors on further.[108]

A little later, Brown would add that the cancellation of the intratheater airlift AMST was based on an assumption that in a most likely European conflict a sophisticated transportation network would compete favorably with the "speed and responsiveness of tactical airlift." At the same time that he dropped the AMST, Brown directed the Air Force to work with the other services, particularly the

Army, on a study of the entire intratheater mobility problem. The study also would include all airlift and resupply-type operations and every conceivable way of doing the job, such as additional POMCUS, additional prepositioned supplies within the European theater, more use of strategic airlift, even CRAF, and moving tanks on tank carriers instead of by air. With zero money in the fiscal year 1979 budget, Gen David Jones saw very little prospect of resurrecting the AMST, but he added: "We have not foreclosed some day in the future having a widebody tactical airlift."[109] In 1979, with Gen Lew Allen as Air Force chief of staff, the Air Force still insisted that it was essential to produce a new wide-body tactical airlift aircraft to keep pace with Army requirements, but it felt unable to consider adding the beginning of such in its fiscal year 1980 budget requests because of other higher priority claims on prospective appropriations. The Military Airlift Command agreed with the Air Force's view. In January 1981 Gen Robert E. Huyser, CINCMAC, said:

> I have said before Congress that if we had all the money in the world and I was not physically constrained on how much I could spend on airlift . . . I would pick a larger AMST than was tested, and I would pick a modern updated C-5 type aircraft—two airplanes [110]

The tactical airlift modernization study, ordered by Secretary Brown, showed that the AMST was the most cost-effective method of meeting intratheater airlift needs as stated by the using services, but it also admitted that the AMST had not been fully justified in terms of alternate intratheater transportation means. An odd thing nevertheless happened to the AMST before the project died. In 1978 Secretary Brown directed the Air Force to look at the AMST for an airmobile employment of MX intercontinental missiles. As already seen, this concept was discarded, but not before a good look was given to the McDonnell Douglas YC-15, particularly its propulsive lift technology. The potential was there to build a larger plane that would have a long-range deployment capability without compromising the excellent tactical performance demonstrated in the AMST prototypes.[111] As it happened, the growing chaos in the Persian Gulf and the Soviet invasion of Afghanistan late in 1979 focused Department of Defense and Air Force priorities back on intertheater airlift. Intratheater airlift, remarked Gen Lew Allen, was still important, but the first priority problem was intertheater airlift. In October 1979 the Air Force laid a purely intratheater AMST to rest with a decision to pursue a C-X, an aircraft larger than the C-141, smaller than the C-5A, and capable of both strategic and tactical missions. Since the C-X was in part derivative from AMST, there were those who said the Air Force abandoned the AMST to make room for the C-X. This was rebutted by Deputy Under Secretary of Defense for Research and Engineering Dale W. Church who in June 1980 pointed out that the AMST program "was on the rocks and about to go before the idea of a C-X was even created."[112]

Organizing for Strategic Mobility

When the US Strike Command (STRICOM) was established with headquarters at MacDill AFB, Florida, on 19 September 1961, it was intended to provide an integrated, mobile, highly combat-ready force to augment existing unified commands or to serve as a primary force in the Middle East or Africa. CINCSTRIKE also was designated as CINC Middle East, Africa, and South Asia (CINCMEAFSA). A small US Navy component—the Middle East Force—was deployed in the Persian Gulf-Indian Ocean area. There were two joint task forces: JTF-7, commanded by an Air Force major general, centered on the Middle East and South Asia and JTF-11, commanded by an Army major general centered in Africa. On 1 January 1972 Strike Command was reorganized as the US Readiness Command (REDCOM). The new REDCOM was a unified command with a primary mission of providing a general reserve of combat forces to reinforce other unified or specified commands. REDCOM lost geographical responsibilities outside the United States and the US Navy and Marine component units. Its command comprised the US Army Forces Command and the US Air Force Tactical Air Command and was responsible for exercising these forces for joint operations.[113]

Each year in the late 1960s, REDCOM conducted four Army-Air Force joint readiness exercises, and a concept of a rapid deployment of forces to Europe began to emerge when it appeared that POMCUS equipment in NATO could not be a total solution to expeditious reinforcement. This occurred because the Army could not store equipment for all units in Europe and suddenly found it had nothing to go anywhere else. According to Gen Volney F. Warner, CINCREDCOM, a concept of a rapid deployment Army force began shaping up around the 18th Airborne Corps (82d and 101st Airborne Divisions), which would not position materiel equipment in Europe. Nifty Nugget revealed that there was a great lack of coordination for emergency movements: MAC airlift was 20 percent underutilized; many of the deploying units were counting on the same airlift or sealift; in one scenario commanders wanted to make a major change in the flow of units overseas but the MAC computer system would not accommodate the change; in another scenario units arrived at a port and the ship for them was not there. Because of these identifications of defective organization, the Joint Chiefs of Staff following Nifty Nugget established the Joint Deployment Agency as their transportation management extension at MacDill AFB; assigned CINCRED the additional mission as director of the Joint Deployment Agency; and charged the agency with pulling together the lift of the Military Traffic Management Command, Military Airlift Command, and Military Sealift Command in conjunction with supported forces to ensure that overseas CINCs could receive reinforcements in desired sequences and in the time required.[114]

Although REDCOM was moving toward a conception of more rapid deployment, General Warner thought the command was just "bumping along" until the Middle East situation became a catalyst for vigor. As Soviet military sales of T62 and T72 tanks in the Middle East increased arms there by 400 percent, Warner saw a marked change in world affairs. He said, "The day that the 82d could charge off and cope with that problem on its own is probably over. The day that the Marines could do it on their own is over. The time for anointing a single service as the Rapid Deployment Force is over."[115] After the fall of the shah of Iran and the identification of a Soviet combat brigade in Cuba, Secretary Harold Brown directed in October 1979 the establishment of a joint task force. In March 1980 he established Headquarters, Rapid Deployment Joint Task Force (RDJTF), as a subordinate of the US Readiness Command to conduct planning and training for Southwest Asia. In August 1980 he directed RDJTF to focus exclusively on Southwest Asian contingencies.[116] Units from all services were earmarked for inclusion in the RDJTF, under the command of Marine Lt Gen Paul X. Kelley, thus conceptualizing a combination of the formerly divided RDFs, one a Marine force moved by the Navy and the second an Army force deployed by the Air Force.[117]

Since rapid response was the key to successful employment of a US rapid deployment force in most scenarios, Secretary Brown posited "that we must have more airlift, complemented by fast sealift, to meet the global challenges to our national interests."[118] In the winter of 1979–80, however, Brown did not agree that the additional airlift would need to be a new C-X: it could be an existing aircraft like the C-5 or a suitable modification of a plane like the Boeing 747. Since it would require a lot longer to take the AMST design and build a big airplane around it, he really leaned toward a C-5 or B-747 but he had promised the Air Force there would be at least paper competition between the two alternatives.[119] Ongoing airlift studies made it evident that there was a very real shortage of intertheater airlift for new Army weapons, which were projected to be larger than ever before. Although a C-X would be able to operate from short airfields, Secretary Brown doubted that it would be used for intratheater airlift very much, except perhaps after initial deployments had been made. Brown also pointed out that lengths of combat area airfields might not be as important as runway widths, which affect the ability of a transport to taxi and offload quickly.[120]

In planning for a C-X the Air Force rationalized that 85 percent of all transport aircraft were designed and built in the United States and that commercial industries were best qualified to design a military airlift plane. General Huyser, CINCMAC, considered this a wise decision, and he also wanted to take advantage of the new technology that was developed by Boeing and McDonnell Douglas in their AMST programs. Secretary Brown continued to insist that the Air Force must keep the option open to accept some modification of an existing aircraft. Even though the Air Force's specifications for the airlift plane it wanted numbered 2,400 pages, Brown said that if cost and schedule savings were enough a decision would

follow that some of the requirements could go unmet. To both senators and congressmen, however, it appeared that the Air Force had not made an adequate case for a C-X, especially in the aftermath of the many problems that had occurred with the C-5. The Research and Development Subcommittee of the House Committee on Armed Services strongly favored strategic mobility but recommended the deletion of C-X funding since the C-X did nothing to address near-term lift deficiencies. In the Senate Armed Services Committee, there was objection that the 2,400 pages of specifications indicated that the Air Force did not know what it wanted, or else the Air Force was attempting to get a new airplane without looking at the option of using a modified plane.[121] As already noted, the Department of Defense Authorization Act of 1981, enacted on 8 September 1980, required the secretary of defense to submit a comprehensive report on US military mobility requirements to Congress and stipulated that no funds for a C-X would be forthcoming until the secretary of defense certified its necessity for national security.

The clarification and formalization of US strategic mobility requirements really started in mid-1980 during the congressional hearings and was anchored in the congressionally mandated mobility study (CMMS) of April 1981. In June 1980 Sen John Stennis, chairman of the Armed Services Committee, requested Secretary Brown's testimonial assurance on the need for the C-X and on mobility as it concerned the Persian Gulf. Stennis wrote Brown:

> The Committee needs to know whether or not a rigorous plan has been developed to allow our forces to be properly supported if they are called on to deploy to the Persian Gulf region Do we yet know how best to spread the logistics load among airlift, sealift and prepositioning—given the special requirements in that part of the world?[122]

On 5 June 1980 Secretary Brown revealed to the Senate Armed Services Committee that the United States was developing an option to reduce deployment time into the Persian Gulf area by prepositioning combat materiel in a force afloat at an Indian Ocean anchorage, probably at Diego Garcia. In presenting the C-X, Brown addressed the overall strategic mobility picture.

> Analysis of scenarios for NATO, the Persian Gulf, and Korea show that prepositioning and sealift are very important, both for follow on force buildup and sustaining support We cannot afford to preposition combat equipment everywhere and although shipping is the least expensive way to satisfy the heavy requirement in a protracted conflict, sealift is slow; it is measured in weeks rather than days We can go into more detail . later on, but the key is getting there very quickly. This may be the determining factor and airlift has that advantage
>
> Who is there first may be more important in deterring a conflict than who can get there with the most forces over a longer time So, to meet time and transportation requirements, and to prevent the expensive loss of territory in the first few days of conflict, we must rely on airlift Its key mission is to project and sustain combat forces until other means of transportation can follow on, but there are many threat situations

where airlift is the only means to provide a rapid response either as a result of geographical location of the threat area or the speed with which the threat develops.

Our organic airlift assets are the C-5A and the C-141. In time of war and national emergency, these assets would be augmented by the Civil Reserve Air Fleet. Our airlift must be adequate to meet requirements of a NATO-Warsaw Pact conflict in Europe simultaneously with a lesser non-NATO contingency.

Recent events have underscored our need for flexible, early, and rapid reinforcement As we modernize Army and Marine Corps equipment to meet the continued Soviet building of conventional forces, even though we plan to miniaturize some of it to provide flexibility which comes with heavy equipment, our airlift requirements will exceed our capability, especially the capability to transport outsized cargo.

We need about [deleted] the organic airlift capability that we now have if we are to respond simultaneously in Europe and elsewhere

Let me talk about the aircraft characteristics and this will be my final point. I believe the following are desirable for needed improvement of our airlift force

Our studies have shown our current shortfall for intertheater airlift of outsized and nonoutsized cargo For intratheater airlift the situation is not as obvious in terms of shortages in overall capacity, but our current fleet of intratheater airlift, the C-130, is aging and it can't carry outsized equipment. In fact, by 1986 these airlift shortages, particularly intertheater airlift, will be such that the major portion of Army firepower equipment cannot fit in anything except the C-5 The C-5 wing modification will keep the capability and it is very valuable in the present inventory, but it won't reduce our shortfalls

Completing all our aircraft modification programs to enhance the present force will still leave our capability significantly short of mobility requirements

There is no quick solution to the outsize lift requirement Even a C-5 derivative would take several years.

We have two broad alternatives to remedy this shortfall by providing additional outsized cargo carrying capability: one is to buy an aircraft of new design; the other is to buy an existing or modified version of existing aircraft, with the C-5, and the Boeing 747, as examples

A new design would have the advantage of better adaptability to operation in and out of small, austere fields. That would increase the number of air bases open to us and reduce crowding on larger ones A fallout of this capability, which I don't put very heavy weight on, is that it would improve our intratheater capability. On the other hand, modifying an existing design would produce a somewhat earlier operational capability with correspondingly lower development costs and risk. It would also reduce dependence on en route bases for this particular portion of our air deployment requirements.

The balance between these two forces, in my judgment, depends on details of overall cost and capability which we won't have until we have firm evaluated contractor proposals after the first year of the program So we have not made the choice between these alternatives, nor should we at this stage Instead, we are asking for detailed

> proposals from industry for both alternatives and will make the choice after we receive and evaluate them, at which time we will have a much better handle on system cost and capabilities In the interim, we will continue the operational evaluation of the C-5's ability to operate from small, austere air bases.
>
> To summarize, we have a critical need for intertheater airlift of outsized cargo We need to get started by requesting bids on alternative designs for C-X this year. What kind of aircraft in exact terms we will decide after a thorough review of the cost, schedule, and performance data generated by the contractors and firm proposals in response to our request for proposals [123]

During House hearings, Gen Volney F. Warner, CINCREDCOM, supported the C-X as a Middle East necessity because it would operate into 70 percent of the available airfields whereas the C-141B could operate into only 43 percent of them. To meet the requirements of airlift users, Warner said that the C-X must be capable of deploying outsized loads directly into an area of operations, be air refuelable, be capable of performing intertheater airlift when required, and have night and weather capabilities to permit airdrop and air landings into austere areas under adverse conditions. The airdrop capability needed to be an integral part of the aircraft design.[124]

The congressionally mandated mobility study was forwarded to Congress by Secretary of Defense Weinberger on 30 April 1981. The study was done by OSD and the JCS with support from the Air Force and the other services. It analyzed four scenarios and concluded that the United States was short of all forms of mobility: airlift, sealift, and prepositioning. With specific regard to airlift, the congressionally mandated mobility study recommended that on a baseline of 1986 the United States should set as a minimum goal the possession of a combined intertheater airlift capacity of 66 million ton-miles per day over intertheater distances. The study recommended an increase of 25 million airlift ton-miles per day, of which at least 10 million should be of outsize airlift capacity.[125]

On November 1980 Deputy Secretary of Defense W. Graham Clayton approved a C-X mission element need statement with an added promise that the secretary of defense would have final say on the choice of a C-X or a derivative transport. Boeing, McDonnell Douglas, and Lockheed made proposals for the new airplane. At the same interval, the Air Force asked the same three companies to recommend an imaginative and innovative way to provide cheaper airlift. In the C-X competition Lockheed proposed that the Air Force should take advantage of the ongoing C-5 program and procure C-5N models (later designated the C-5B) that would have the new wing and other retrofitted changes that had been made in the C-5A. On 24 April 1981 Secretary of the Air Force Verne Orr advised Congress that the improved C-5 did not meet the requirements of the C-X. Orr nevertheless disclosed that he had "deep concern" about coming to Congress with another all-new weapon system and had not made up his mind about the C-X even though there was "a tremendous amount of enthusiasm" about the plane among his military associates

> When I look at the out-year costs of the MX and out-year cost of the [B-1] bomber, which I put at a higher priority than I do the C-X, when I consider there are some other airlift alternatives which may be weighed, I have deep concern about coming before Congress with another all-new weapon system. I haven't resolved that in my mind.[126]

Orr announced on 28 August that McDonnell Douglas was the C-X source selections choice, but the Air Force continued to study the C-5 and also a Boeing-747 option to the new airlifter that was called the C-17. The proposal that the Air Force buy passenger jets for conversion to cargo usages was economically permissive, but the B-747 freighter and its deck stood 16 feet above the ground and required special equipment to load, unload, and even fuel it. Such equipment was not likely to be found in small airfields. If civil airliners were to be used, the Air Force rationalized that they might as well be CRAF planes. In November 1981, the chiefs of staff of the Army and Air Force and the Marine Corps commandant informed Congress that they were in accord on the selection of the C-17, and on 7 December Secretary Weinberger certified to Congress that "the national security requirements of the United States for additional military airlift capability meant initiation of the C-X program." Meanwhile, sentiment in Congress was against a C-X research and development undertaking, and on 22 December 1981 Deputy Secretary of Defense Frank Carlucci told Secretary Orr that he had decided to postpone selection of an airlift aircraft pending a new Air Force systems analysis study of alternate proposals. This analysis endorsed the C-17, but for a short-term solution the Air Force indicated that it would accept a program procuring the 44 KC-10s which it had an option to purchase plus CRAF enhancements. In the long run, however, the Air Force wanted C-17s with a 1988 initial operational capability (IOC) since the aging C-130 and C-141 fleet would be needing replacements. Under the pressure of forming defense budget requirements for fiscal year 1983, Secretary Weinberger asked the Air Force to consider the C-5 and C-17 under the assumption that either aircraft could be funded at the fastest prudent pace, as justified by a more urgent national requirement for mobility. Until this time, the Air Force had considered that the advantage of earlier availability of a C-5B was more than offset by better military utility and the potential of the C-17 as the ultimate replacement of the C-130 and C-141 force. Under Weinberger's promise of faster funding for airlift, Secretary Orr noted that the C-5B would be operationally available about three years earlier than a C-17. Accordingly, in view of the CMMS conclusion that an airlift shortfall was serious already, Orr felt that the Air Force had to go with the most expeditious short-term fix, which was announced on 26 January 1982 by Lt Gen Kelly Burke, Air Force deputy chief of staff for research, development, and acquisition. The solution was to procure the remainder of the 44 KC-10s for which the Air Force had options and 50 new C-5Bs which Lockheed would produce on a firm fixed price proposal. This combination of aircraft would cost an estimated $11 billion and would provide the quickest near-term answer to the shortage of strategic airlift.[127] Secretary Orr said that his

> overriding consideration in the choice between the C-5 and C-17 is the conclusion—documented in the CMMS and numerous other studies over many years—that a significant shortfall exists now! Consequently, the objective is to increase airlift capability as quickly as possible Hence, a good program soon was chosen over a somewhat better program later.[128]

To Secretary Weinberger the decision to procure the C-5s and KC-10s reflected the high priority that the Reagan administration was giving to projecting US military power worldwide rapidly. Air Force officials, nevertheless, remained staunchly supportive of the C-17. Gen James R. Allen, CINCMAC, wrote Weinberger on 5 April 1982 that the capabilities represented by the C-17 were needed both to alleviate remaining intertheater shortfalls and to satisfy initial intratheater requirements as a replacement for the aging C-130s and C-141s. The new C-5s would increase outsized capability by over 60 percent and the KC-10s added flexibility. Together they could deliver 1,870 tons of cargo a day to main operating bases in Southwest Asia, but this created an additional intratheater requirement of 1,235 tons a day for the already overworked C-130s that could not lift outsized cargo.[129] In testimony in June 1982, Deputy Secretary Carlucci said that the C-5/C-17 assessment was not an "either/or" proposition. The United States needed intertheater airlift immediately and the C-5 would provide that; the United States also needed an intratheater capability, but this requirement was not as urgent. Carlucci said that the C-17 would make an excellent replacement when the C-130s and C-141s began to phase out in the 1990s.[130]

On 29 September 1983 Secretary Orr and General Gabriel jointly released the US Air Force Airlift Master Plan. The plan was based on analytical and trade-off studies and provided force structure recommendations geared to the year 1998 and to the next century. The overall constraining factor in the master plan was the CMMS recommendation that the US airlift capability should be at least 66 million ton-miles per day. The master plan therefore outlined a requirement for 180 C-17s by 1998 to compensate for retirement of 180 older C-130s, retirement of the 54 oldest C-141s, and transfer of remaining C-141Bs to the air reservist forces. Active duty and Reserve forces would retain 114 C-5s. The CRAF program would retain a minimum of 11.3 million ton-miles per day, plus a minimum of 144.9 million passenger-miles per day. Over the longer term into the next century, the plan envisioned the replacement of the 180 C-141Bs in the reservist forces by 40 C-17s. To maintain the CRAF contribution at a constant level, the master plan stated that it "may be necessary for the military and civilian sector to jointly develop a new-technology advanced Civil/Military Aircraft (ACMA)."[131]

According to Secretary of Defense Weinberger, the Reagan administration inherited an obsolete defense policy that was "discredited by its failure to recognize and cope with the deterioration in the global military situation."[132]

> The 1-1/2 war or the short war . . that you would have a short, sharp conventional exchange, followed by a rapid escalation to nuclear, are not likely or probable paths for us to follow It is necessary for us to maintain our deterrent, not to try to be

> superior to them or anything of that kind, but to maintain a deterrent capability of resisting aggression in more than one part of the globe together with our allies [133]

In the first year of the Reagan administration, services were instructed to equip and train a part of the total force for rapid response and flexible employment. The five-year objective for mobility forces was to develop the Rapid Deployment Joint Task Force to Southwest Asia within four to six weeks and continue preparations to deliver six more divisions in 10 days, to fall in on the POMCUS, and join the four US divisions there quickly. NATO reinforcements also included positioning 60 Air Force tactical air squadrons within 10 days. In the current capability of 1981, the strike force nominated for Southwest Asia would be an airlifted "show of force" that would serve, in General Warner's words, "to show we have the will to put them on the ground quickly so that if the Soviets bump up against them they will have the first US-Soviet confrontation we have had since 1917."[134] For viability the Southwest Asia force would depend upon airlifted supplies, then prepositioned supplies from Diego Garcia, and eventually ship delivery. In recognition of the need for a full-time major commander to develop detailed plans for a wide range of possible contingencies in Southwest Asia, the Rapid Deployment Joint Task Force (RDJTF) was chartered as a separate joint task force, reporting directly to the national command authorities through the Joint Chiefs of Staff. Its commander was given operational control over selected Army and Air Force units and assigned operational planning responsibility for Southwest Asia. On 1 January 1983 the RDJTF was upgraded to unified command status, and its commander was designated as the commander in chief, US Central Command (CINCCENT). The primary mission of the new command—with its headquarters remaining at MacDill AFB—was to deter Soviet aggression and protect US interests in Southwest Asia.[135]

The RDJTF/USCENTCOM was a four-service headquarters, with Army and Air Force components assigned and assurance that the Navy and Marines would operate in support when the task force deployed into an existing unified command's area. The Air Force designated specific units for inclusion, the composition and size of the force to be tailored to particular contingencies. The units identified were a SAC strategic projection force, four tactical fighter wings, and support forces including airlift, reconnaissance, and air rescue forces. The combat readiness of all these units was improved where necessary by drawing spare parts and munitions from other units. Of the capabilities of the RDJTF in mid-1962, Deputy Secretary Carlucci said: "Our assessment is that with adequate warning time and with the capability for air interdiction the RDJTF would represent an adequate deterrent to the Soviets in Southwest Asia."[136] SAC's Strategic Projection Force supported RDJTF in accordance with a Memorandum of Agreement affirming policies and principles and by the establishment of a SAC operating location at MacDill AFB. According to one scenario, the commander RDJTF/CINCCENT would receive an alerting message from the JCS for a deployment. He immediately would ask MAC for airlift and SAC for command

and control aircraft, these being expected to land at MacDill with their banks of radios that gave global communications.

In the Southwest Asia scenario, the SAC Strategic Projection Force of B-52H aircraft was planned to begin operations in advance of the tactical forces since they could be deployed within 24 hours and begin employment within 48 hours. Utilizing night, low-altitude tactics the B-52s would strike targets such as airfields and lines of communication. Upon deployment of tactical forces, the B-52s would be available in a support role. Under command relations, CINCSAC continued to command the Strategic Projection Force, but when it was deployed in support of the rapid deployment force (RDF) it came under the tactical command and control of the air component commander of the RDF, who had the authority and responsibility to develop plans and direct the targeting and tasking of the B-52s. Although the Strategic Projection Force supported the RDF, it also would stand alone in support of any theater commander since the force's B-52Hs (selected for long-range and low-altitude capabilities) were a fast, globally deployable capability that could respond quickly to national tasking. Until general-purpose forces could be deployed and employed in significant numbers, the SAC Strategic Projection Force could be the first response to contingencies at great distances from peacetime operating bases.[137] Gen W. L. Creech, as commander TAC, was also the air component commander of REDCOM. He met periodically with CINCREDCOM and the commanding general, Army Forces Command, for necessary activities. The Tactical Air Command had a full-time study group that, in Creech's words, "does nothing but worry about where we will bed down the RDF. We know all the potentialities, we know which bases can accommodate fighters, we know how much POL they have, we know the lengths of runways, even how much water is available, where we might bed down crews and maintenance people and the like."[138] TAC also conducted training deployments to Egypt and Saudi Arabia, as well as recurring Red Flag exercises specially designed for RDJTF designated units.[139]

The function of the Military Airlift Command in rapid deployment was primarily one of lifting the forces specified rapidly. In General Huyser's last appearance before the House Military Appropriations Subcommittee in June 1981, he discussed the strategic significance of airlift.

> I appreciate the opportunity .. to discuss with you the airlift capability and what I think it does for the Rapid Deployment Force, which is to put the R in Rapid and make it a big R. I think that in the past this has not been given proper attention or proper priority There were times in the last year when I felt that we finally were going to get around to understanding, that if we are going to have forces, that they are of little utility unless they can be properly projected and on a timely basis .. I would like to remind you of the things rapidity gives to forces In my opinion, it offers the all important factor of having the potential to be a deterrent force, if you are there soon enough with enough. I guess it is the old statement of "he who is there fastest with the mostest is going to do the bestest" Secondly, I think it has the potential for containing conflict, if there are conflicts, to a manageable size. Thirdly, I think it reduces the number of forces required if you are timely enough Fourthly, I think it gives you the opportunity to get into a

> winning posture. So, I think these are four things that rapidity adds to the fighting forces.[140]

In an interview published in January 1982, Gen James Allen, who had become CINCMAC at Huyser's retirement, emphasized the same strategic significance of airlift.

> The nation's highest priority is to restore and maintain the strategic balance vis-à-vis the USSR. In my judgment, the second priority should be to improve our capability to project well equipped, highly trained, combat-ready land and air forces to overseas theaters. Within this priority, there needs to be a balance between deployable combat forces on the one hand and airlift deployment capability on the other. If we had 2000 C-17s and nothing to carry in them, the overall deterrent capability would be minimal. Conversely, the best equipped and trained CONUS-based forces aren't going to deter the Soviets if we don't have a manifest capability to deploy them when and where needed.[141]

Although the Air Force appeared to continue to regard the Military Airlift Command as a logistical support-service activity, actions taken in the 1970s for increased organizational savings provided MAC with diverse warfighting capabilities in addition to airlift. In 1976 the Air Force recognized that MAC and the Air Force Communications Service (AFCS) operated worldwide, frequently at deployed locations with small detachments. To save people and money AFCS was phased out and its functions transferred to MAC. The savings accrued to the Air Force, but MAC's worldwide stature was enhanced through integration of the airlift and communications missions.[142] In March 1983 the Air Force again sought savings by merging Special Operations Forces (SOF) that had been assigned to TAC with MAC's Aerospace Rescue and Recovery Services (ARRS). This move was expected to result in economies on both sides since the ARRS and SOF both employed C-130s, the one for rescue and the special forces for AC-130 gunships and MC-130 support aircraft. Both forces had helicopters in relatively small numbers. It also was anticipated that low-level tactics developed for MAC C-130s and C-141s would be useful in special operations. In January 1984 the 375th Aeronautical Airlift Wing joined ARRS and SOF under command of a new MAC air force—the Twenty-third Air Force. Unlike MAC's Twenty-first and Twenty-second Air Forces that commanded airlifters from McGuire and Travis AFBs, the Twenty-third had worldwide responsibilities for special operations, rescue and recovery, aeromedical airlift, weather reconnaissance, air sampling, drone recovery, space shuttle support, support for SAC missile sites, and the CONUS operational support forces.[143]

As it happened, the expansion of the Military Airlift Command mission to include special operations forces, although parsed for efficiency of administration and logistics, proved fortunate operationally in the US rescue operations in the Caribbean island of Grenada, where Cuban troops were building military installations and further threatening the Western Hemisphere. The activity in Grenada beginning on 25 October 1983 was conducted by a special

USCINCLANT joint task force which controlled the Marine forces on the northern part of the island and the Army forces to the south. MAC airlifted Army units to the island and then set up and controlled the airfield at Point Salines. It provided logistical resupply from a base of operations in Barbados. A new CINCMAC, Gen Thomas M. Ryan, Jr., described the overall performance of MAC units as "absolutely outstanding." He saw one of the significant aspects of the Grenada operation as involvement in almost every mission area for which MAC was responsible: Special Operations Forces' AC-130H gunships and MC-130E Combat Talons, weather, security police, audiovisual, aeromedical evacuation, and a combination of C-9, C-130, and C-140 airlift. Ryan said, "Everybody got a piece of the action and everybody performed very, very well." Ryan asserted that MAC's mission had shifted from one of essentially strategic logistical airlift to a mission based upon a national recognition of the tie-in between MAC and other US combat forces:

> It's become increasingly apparent to the leadership of this country that while we develop more capable conventional forces, we must concurrently develop the mobility resources to quickly deploy those forces into battle and, once deployed, resupply them. Since conventional forces have assumed a greater role in deterrence, as we attempt to raise the nuclear threshold, then the backbone of that deterrence must be the means of deploying them So, I think the expression "MAC—The Backbone of Deterrence" accurately describes the current mission and goal of the command.[144]

NOTES

1 House, *Department of Defense Appropriations for 1981: Hearings before a Subcommittee of the Committee on Appropriations*, 96th Cong , 2d sess , 1980, pt 2:292 (hereafter cited as *1981 DOD Appropriations*).

2 House, *Military Airlift· Hearings before the Subcommittee on Military Airlift of the Committee on Armed Services*, 91st Cong , 2d sess , 1970, 6349 (hereafter cited as *Military Airlift*).

3 Gen Howell M. Estes, Jr , "The Revolution in Airlift," *Air University Review*, March–April 1966, 5–6.

4 House, *Military Airlift· Report of Special Subcommittee on Military Airlift of the Committee on Armed Services*, 89th Cong., 2d sess , 1966, 7177–79 (hereafter cited as *Military Airlift Report of Special Subcommittee*).

5 Alain C Enthoven and K. Wayne Smith, *How Much Is Enough? Shaping the Defense Program, 1961–1969* (New York. Harper & Row, 1971), 234–36, Senate, *Fiscal Year 1970 Military Procurement Authorization· Hearings before the Committee on Armed Services*, 91st Cong , 1st sess , 1969, pt. 2 2027 (hereafter cited as *FY 1970 Military Procurement*).

6 House, *Department of Defense Appropriations for 1968 Hearings before a Subcommittee of the Committee on Appropriations*, 90th Cong., 1st sess , 1967, pt 2 328 (hereafter cited as *1968 DOD Appropriations*)

7 Estes, "The Revolution in Airlift," 3–15; Estes, "Modern Combat Airlift," *Air University Review*, September–October 1969, 13–25

8 Estes, "Modern Combat Airlift," 13–25

9. Ibid , 18

10. Ibid

11. Maj Charles E. Miller, "Airlift Doctrine" (Maxwell AFB, Ala.: Center for Aerospace Doctrine, Research, and Education, 1984), draft manuscript, chap. 6, 1–7.

12. Senate, *Department of Defense Appropriations for Fiscal Year 1970: Hearings before a Subcommittee of the Committee on Appropriations*, 91st Cong., 1st sess., 1969, pt. 4:134 (hereafter cited as *FY 1970 DOD Appropriations*).

13 Maj Gen Harry E. Goldsworthy, "Aircraft Development: Its Role in Flexible Military Response," *Air University Review*, January–February 1969, 20–31; House, *Department of Defense Appropriations for 1965: Hearings before a Subcommittee of the Committee on Appropriations*, 88th Cong., 2d sess., 1964, pt. 3 8; Senate, *FY 1970 Military Procurement*, pt. 2.2093–94.

14 Senate, *Department of Defense Appropriations for Fiscal Year 1966· Hearings before the Subcommittee on Department of Defense of the Committee on Appropriations and the Committee on Armed Services*, 89th Cong., 1st sess., 1965, pt. 1.362–63 (hereafter cited as *FY 1966 DOD Appropriations*).

15 Senate, *Department of Defense Appropriations for Fiscal Year 1965: Hearings before the Subcommittee on Department of Defense of the Committee on Appropriations and the Committee on Armed Services*, 88th Cong., 2d sess., 1964, pt. 1·152.

16. Ibid., House, *Department of Defense Appropriations for 1967: Hearings before a Subcommittee of the Committee on Appropriations*, 89th Cong., 2d sess., 1966, pt 3 590–91; House, *Hearings on the Posture of Military Airlift before the Research and Development Subcommittee of the Committee on Armed Services*, 94th Cong., 1st sess., 1975, 457–58 (hereafter cited as *Hearings on the Posture of Military Airlift*).

17. House, *Hearings on the Posture of Military Airlift*; Estes, "Modern Combat Airlift," 22–23; House, *1968 DOD Appropriations*, pt. 5:709–10.

18. Enthoven and Smith, *How Much Is Enough?*, 234–35.

19 Ibid., 238–39; Comdr John L. Jones, "The Birth and Death of the Fast Deployment Logistics Ship (FDLS): A Case Study of Futility" (Carlisle Barracks, Pa.: Army War College, 28 February 1972).

20. House, *Military Airlift*, 6350.

21. Miller, "Airlift Doctrine," 42–43.

22. Ibid.

23 House, *1968 DOD Appropriations*, pt 5:717; House, *Military Airlift*, 6249, 6260.

24. House, *1968 DOD Appropriations*, pt 2:757–59, pt. 5:708–9, 716–21; House, *Military Airlift*, 6259–75; House, *Hearings on the Posture of Military Airlift*, 15, 576

25 House, *Military Airlift*, 6273, Miller, "Airlift Doctrine," chap. 6, 53.

26. House, *Military Airlift: Report of Special Subcommittee*, 7182; House, *Military Airlift: Report by the Subcommittee on Military Airlift of the Committee on Armed Services*, 91st Cong., 2d sess., 1970, 9234–36 (hereafter cited as *Military Airlift: Report*)

27. House, *Military Airlift*, 6278–80; "The Requirement for Strategic Airlift," in Senate, *Fiscal Year 1973 Military Procurement Authorization· Hearings before the Committee on Armed Services*, 92d Cong., 2d sess., 1972, pt. 2.1154–57 (hereafter cited as *FY 1973 Military Procurement*), House, *Hearings on the Posture of Military Airlift*, 18–19.

28. Miller, "Airlift Doctrine," chap. 6, 44–46, House, *Military Airlift*, 6349–65.

29. House, *Hearings on the Posture of Military Airlift*, 103, 109.

30. Miller, "Airlift Doctrine," chap 6, 49–52; Estes, "Modern Combat Aircraft," 24.

31. House, *Military Airlift*, 6339–40; Miller, "Airlift Doctrine," chap 6, 53

32. Miller, "Airlift Doctrine," chap. 6, 59–60.

33. Ray Bowers, *Tactical Airlift* (Washington, D.C.· Department of Air Force History, 1983), 640–41; Gen Paul K. Carlton, "The Military Airlift Command," *Strategic Review*, February 1975, 64–72.

34 House, *Hearings on the Posture of Military Airlift*, 88–89.

35. Estes, "The Revolution in Airlift," 9.

36 Enthoven and Smith, *How Much Is Enough?*, 238–39

37 Senate, *Seminars, Service Chiefs on Defense Mission and Priorities, Task Force on Defense of the Committee on the Budget*, 94th Cong , 2d sess., 1976, 3:58–59 (hereafter cited as *Seminars, Service Chiefs on Defense Mission and Priorities*)

38. Senate, *FY 1970 Military Procurement*, pt 2 2093–94; Senate, *FY 1970 DOD Appropriations*, pt. 6.28–29, House, *Department of Defense Appropriations for 1971. Hearings before a Subcommittee of the Committee on Appropriations*, 92d Cong., 1st sess., 1970, pt.2 41 (hereafter cited as *1971 DOD Appropriations*).

39. Senate, *FY 1970 DOD Appropriations*, 29.

40. Senate, *FY 1970 Military Procurement*, pt. 2:2093–94, House, *Department of Defense Appropriations for 1969. Hearings before a Subcommittee of the Committee on Appropriations*, 90th Cong., 2d sess , 1968, pt 3 363–73, Senate, *Department of Defense Appropriations for Fiscal Year 1971. Hearings before the Subcommittee of the Committee on Appropriations*, 91st Cong., 2d sess., 1970, pt. 4:476 (hereafter cited as *FY 1971 DOD Appropriations*)

41. Senate, *FY 1971 DOD Appropriations*, 4 476, Senate, *FY 1970 Military Procurement*, pt 2:2093–94; House, *1971 DOD Appropriations*, pt. 5:1018; Senate, *Seminars, Service Chiefs on Defense Mission and Priorities*, 3 58–60.

42 House, *Department of Defense Appropriations for 1970. Hearings before a Subcommittee of the Committee on Appropriations*, 91st Cong., 1st sess., 1969, pt. 7·438–39.

43 Ibid , pt. 2:805–7.

44. House, *1971 DOD Appropriations*, pt. 5.804–5; Senate, *Department of Defense Appropriations for Fiscal Year 1977· Hearings before a Subcommittee of the Committee on Appropriations*, 94th Cong , 2d sess., 1976, pt. 5:384–85 (hereafter cited as *FY 1977 DOD Appropriations*)

45 Senate, *FY 1971 DOD Appropriations*, pt 1 44

46 Ibid , House, *1971 DOD Appropriations*, pt. 1:205–6, pt 5 804–5

47 House, *Department of Defense Appropriations for 1972. Hearings before a Subcommittee of the Committee on Appropriations*, 92d Cong., 1st sess , 1971, pt 5 1012–13 (hereafter cited as *1972 DOD Appropriations*); House, *Department of Defense Appropriations for 1973· Hearings before a Subcommittee of the Committee on Appropriations*, 92d Cong., 2d sess , 1972, pt. 7:1139 (hereafter cited as *1973 DOD Appropriations*).

48. House, *1971 DOD Appropriations*, pt 6.621; House, *1972 DOD Appropriations*, pt 2 41, pt 5:1012–13.

49. House, *1973 DOD Appropriations*, pt 1 106–7, pt. 7.1179–80, Senate, *FY 1973 Military Procurement*, pt. 3:1481–97, House, *Department of Defense Appropriations for 1974: Hearings before a Subcommittee of the Committee on Appropriations*, 93d Cong., 1st sess., 1973, pt 2 14–15; Senate, *Department of Defense Appropriations for Fiscal Year 1974. Hearings before a Subcommittee of the Committee on Appropriations*, 93d Cong., 1st sess , 1973, pt 4:408–9.

50. Elmo R. Zumwalt, Jr., *On Watch, A Memoir* (New York· Quadrangle/New York Times Book Co., 1976), 432–33; Edgar F. Puryear, Jr., *George S Brown, General, U S. Air Force, Destined for Stars* (Novato, Calif.: Presidio Press, 1983), 222–23.

51. "Interview General Paul K. Carlton," *Airlift Operations Review*, July–September 1981, 1–7, Senate, *Department of Defense Appropriations for Fiscal Year 1975: Hearings before a Subcommittee of the Committee on Appropriations*, 93d Cong., 2d sess., 1974, pt. 5 124 (hereafter cited as *FY 1975 DOD Appropriations*)

52. Carlton interview, 2–3.

53. Ibid.

54 Ibid

55 Ibid , 3, Senate, *FY 1975 DOD Appropriations*, pt. 4:11; House, *Hearings on the Posture of Military Airlift*, 460.

56. Senate, *FY 1975 DOD Appropriations*, pt.4. 30–31, 55–56; Senate, *FY 1975 DOD Appropriations*, pt. 1·173–74, pt. 4:84–85.

57. Carlton interview, 3–4

58. Ibid.

59. Ibid; House, *Hearings on the Posture of Military Airlift*, 77–79; Senate, *FY 1975 DOD Appropriations*, pt. 4:84–85

60. Senate, *FY 1977 DOD Appropriations*, pt 5.441; House, *Department of Defense Appropriations for 1977. Hearings before a Subcommittee of the Committee on Appropriations*, 94th Cong., 2d sess., 1976, pt. 1:127 (hereafter cited as *1977 DOD Appropriations*)

61. House, *Department of Defense Appropriations for 1975: Hearings before a Subcommittee of the Committee on Appropriations*, 93d Cong., 2d sess., 1974, pt. 1:340 (hereafter cited as *1975 DOD Appropriations*).

62. House, *Hearings on the Posture of Military Airlift*, 571–72; House, *Department of Defense Appropriations for 1976. Hearings before a Subcommittee of the Committee on Appropriations*, 94th Cong, 1st sess., 1975, pt. 2:31 (hereafter cited as *1976 DOD Appropriations*).

63. House, *Hearings on the Posture of Military Airlift*; House, *1976 DOD Appropriations*, pt. 7:823.

64 Ibid

65 Miller, "Airlift Doctrine," chap. 6, 72–73 citing letter, Gen Paul Carlton, commander, Military Airlift Command, to Gen David C. Jones, chief of staff, US Air Force, 16 November 1964.

66. Miller, "Airlift Doctrine," chap 6, 74–75; Senate, *Fiscal Year 1974 Authorization for Military Procurement: Hearings before the Committee on Armed Services*, 93d Cong., 1st sess., 1973, pt 6:4388.

67. "Interview General William G. Moore, Jr.," *Airlift Operations Review*, April–June 1982, 4, 6

68. Carlton interview, 5.

69. Moore interview, 6; Carlton interview, 5.

70. Miller, "Airlift Doctrine," chap 6, 75–78

71. Ibid.

72 Moore interview, 6.

73. Senate, *Department of Defense Appropriations for Fiscal Year 1980 Hearings before a Subcommittee of the Committee on Appropriations*, 96th Cong., 1st sess, 1979, pt. 1 152 (hereafter cited as *FY 1980 DOD Appropriations*).

74. Senate, *Department of Defense Appropriations for Fiscal Year 1983. Hearings before a Subcommittee of the Committee on Appropriations*, 97th Cong., 2d sess., 1982, pt. 3:10 (hereafter cited as *FY 1983 DOD Appropriations*)

75. House, *1975 DOD Appropriations*, pt 1:160–61, 340

76. House, *Hearings on the Posture of Military Airlift*, 230–32

77. Ibid

78. Senate, *Fiscal Year 1977 Military Procurement Authorization: Hearings before the Committee on Armed Services*, 94th Cong., 2d sess, 1976, pt. 2:960 (hereafter cited as *FY 1977 Military Procurement*).

79. Senate, *Fiscal Year 1975 Military Procurement Authorization· Hearings before the Committee on Armed Services*, 94th Cong., 1st sess, 1975, pt. 6 2723; House, *Hearings on the Posture of Military Airlift*, 177.

80. Senate, *FY 1980 DOD Appropriations*, pt. 1:38, 154.

81. James W. Canan, "Up from Nifty Nugget," *Air Force Magazine*, September 1983, 82–88.

82. House, *Department of Defense Appropriations for 1982. Hearings before a Subcommittee of the Committee on Appropriations*, 97th Cong., 1st sess, 1981, pt 4 203 (hereafter cited as *1982 DOD Appropriations*).

83 House, *Reorganization Proposals for the Joint Chiefs of Staff· Hearings before the Investigations Subcommittee of the Committee on Armed Services*, 97th Cong., 2d sess, 1982, 560–61

84. Ibid

85. Senate, *FY 1980 DOD Appropriations*, pt. 1 155–56.

86. Ibid, Senate, *Department of Defense Appropriations for Fiscal Year 1981. Hearings before a Subcommittee of the Committee on Appropriations*, 96th Cong, 2d sess, 1980, pt 1:37

87 Senate, *Department of Defense Appropriations for Fiscal Year 1982. Hearings before a Subcommittee of the Committee on Appropriations*, 97th Cong., 1st sess., 1981, pt 1:42 (hereafter cited as *FY 1982 DOD Appropriations*)

88 House, *Reorganization Proposals for the JCS*, 561

89. *US News & World Report*, 23 June 1980, 52.

90. Public Law 96-34, *Department of Defense Authorization Act*, 1981, sec. 203, House, *Department of Defense Appropriations for 1981. Hearings before a Subcommittee of the Committee on Appropriations*, 96th Cong., 2d sess., 1980, pt. 3:934, 1009-11 (hereafter cited as *1981 DOD Appropriations*)

91 Senate, *Department of Defense Appropriations for Fiscal Year 1976· Hearings before a Subcommittee of the Committee on Appropriations*, 94th Cong., 1st sess., 1975, pt. 4:206, House, *Hearings on the Posture of Military Airlift*, 3-5

92 House, *Hearings on the Posture of Military Airlift*, 2-7, 201-10.

93. Ibid.

94 Ibid., 500-3, 493, 495; House, *1977 DOD Appropriations*, pt. 1:126.

95. House, *Department of Defense Appropriations for 1980. Hearings before a Subcommittee of the Committee on Appropriations*, 96th Cong., 1st sess., 1979, pt 2.413 (hereafter cited as *1980 DOD Appropriations*), House, *1982 DOD Appropriations*, pt 2 261; Senate, *FY 1983 DOD Appropriations*, pt 3 50-51, 60-63.

96 Senate, *FY 1983 DOD Appropriations*, pt 3 50-51, 60-63.

97 Senate, *FY 1966 DOD Appropriations*, pt. 1:331-33, 1094-98.

98 House, *1982 DOD Appropriations*, pt. 4 290; Senate, *FY 1983 DOD Appropriations*, pt 3 8

99 House, *Hearings on the Posture of Military Airlift*, 37, 209.

100. Ibid, Senate, *Department of Defense Appropriations for Fiscal Year 1978. Hearings before a Subcommittee of the Committee on Appropriations*, 95th Cong., 1st sess., 1977, pt 1 936; Senate, *FY 1982 DOD Appropriations*, pt 3 8.

101 Miller, "Airlift Doctrine," chap 7, 53-54.

102 Senate, *FY 1975 Military Procurement*, pt. 6:2718-19.

103 Ibid

104 Senate, *FY1975 Military Procurement*, pt. 6:2718-19, House, *Hearings on the Posture of Military Airlift*, 204, 206, 607-8, Senate, *FY 1977 Military Procurement*, pt. 5:2918-20; House, *1980 DOD Appropriations*, pt 3 707, House, *Department of Defense Appropriations for 1983· Hearings before a Subcommittee of the Committee on Appropriations*, 97th Cong., 2d sess., 1982, pt 2 292 (hereafter cited as *1983 DOD Appropriations*), Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1983· Hearings before the Committee on Armed Services*, 97th Cong., 2d sess., 1982, pt. 4:2643, House, *1980 DOD Appropriations*, pt 3 707-8.

105 House, *Military Airlift*, 6392-93

106 Ibid, House, *Military Airlift. Report of Special Subcommittee*, 9231

107 House, *Hearings on the Posture of Military Airlift*, 277-80, Senate, *FY1975 DOD Appropriations*, pt 4 53-54, 24-25, Miller, "Airlift Doctrine," chap 7, 28-35.

108 Maj Edward F Whittel, ed, "Interview Robert E Huyser, General," *Airlift Operations Review*, January 1981, 5.

109 Ibid.

110. Ibid.

111. Miller, "Airlift Doctrine," chap. 7, 36; House, *1980 DOD Appropriations*, pt 3 700-1; House, *1981 DOD Appropriations*, pt 2 357, 383

112. Miller, "Airlift Doctrine," chap 7, 36, House, *1981 DOD Appropriations*, pt 9 353.

113. House, *1981 DOD Appropriations*, pt 4 176, 209

114. Ibid, 215

115. Ibid, 194

116 Senate, *FY 1983 DOD Appropriations*, pt 3 281

117. House, *1981 DOD Appropriations*, pt. 4 177

118 *Department of Defense Annual Report Fiscal Year 1982* (Washington, D.C. Government Printing Office, 1981), 198

119. House, *1981 DOD Appropriations*, pt 1 43, 526-27.

120 House, *1982 DOD Appropriations*, pt 4 294-96.

121. Ibid.; Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1981: Hearings before the Committee on Armed Services*, 96th Cong., 2d sess., 1980, pt. 4:2626–27 (hereafter cited as *FY 1981 DOD Authorization*); House, *Department of Defense Authorization Act: Report No. 96-916, Committee on Armed Services*, 96th Cong , 2d sess., 1980, 90

122. Senate, *FY 1981 DOD Authorization*, pt. 4.2612–14.

123. Ibid.

124. House, *1981 DOD Appropriations*, pt. 4:178.

125. Senate, *FY 1983 DOD Appropriations*, pt. 3:10–13; Edgar Ulsamer, "The Airlift Master Plan," *Air Force Magazine*, May 1984, 58–59.

126 Miller, "Airlift Doctrine," chap. 7, 18–23, "Air Force Position on the C-5/C-17 Issue," *Air Force Policy Letter for Commanders*, 15 February 1982.

127. Miller, "Airlift Doctrine," chap 7, 18–23; Ulsamer, "The Airlift Master Plan," 60–61.

128 Ulsamer, "The Airlift Master Plan," 60–61.

129. House, *1983 DOD Appropriations*, pt. 1:6–7, 192; Miller, "Airlift Doctrine," chap. 7, 24–25.

130. Senate, *FY 1983 DOD Appropriations*, pt. 3:310–11.

131. Miller, "Airlift Doctrine," chap. 7, 25–26; Ulsamer, "The Airlift Master Plan," 59.

132. House, *1983 DOD Appropriations*, pt. 1:6–7, 192.

133. Senate, *FY 1983 DOD Appropriations*, pt. 1:17

134. Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1984: Hearings before the Committee on Armed Services*, 98th Cong., 1st sess., 1983, pt. 1:32–33, 303–8.

135. House, *1982 DOD Appropriations*, pt. 4·215–16.

136 Senate, *FY 1983 DOD Appropriations*, pt. 3 224–27, 280–87.

137. Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1982. Hearings before the Committee on Armed Services*, 97th Cong., 1st sess., 1981, pt. 7:3844–45; House, *1982 DOD Appropriations*, pt. 2:21, 156, pt. 4:377–78.

138 House, *1982 DOD Appropriations*, pt 2 21, pt. 6·47

139. Ibid

140. Ibid.

141. Ibid., pt 4·279, James Allen interview, January 1982, 3.

142. House, *1976 DOD Appropriations*, pt. 2:31.

143. "CINCMAC Discusses Airlift Issues," *Airlift*, Spring 1984, 5–6, "Military Airlift Command," *Air Force Magazine*, May 1984, 109.

144 "CINCMAC Discusses Airlift Issues," 5–6

Gen Paul K. Carlton, commander of the Military Airlift Command

Frank C Carlucci, deputy secretary of defense.

Dale W Church, deputy director of research and engineering for the Office of the Secretary of Defense

William P Clements, deputy secretary of defense

Gen Robert E Huyser, commander in chief of the Military Airlift Command

John H Chafee, secretary of the Navy

CHAPTER 9

THE AIR FORCE IN SPACE

In the aftermath of the Soviet Sputnik, Air Force Chief of Staff Thomas D. White viewed the new realm of space as a continuum of the long-familiar atmosphere—the whole being describable as aerospace. To exert control over the land and the sea it had proven necessary to control the air. "We airmen who have fought to assure that the United States has the capability to control the air," White told the National Press Club in November 1957, "are determined that the United States must win the capability to control space."[1] As already seen, White subsequently amended his perception to note that the aim should be to exercise control *in* space rather than *of* space; this control was perhaps to be managed by a blockade of an adversary's entry into space. Air Force leaders also viewed desired space vehicles in terms of the old higher, faster, farther criteria applied to aircraft. The principal objective of the Dyna-Soar X-20 program undertaken in 1957 was to develop an experimental space glider and to demonstrate the feasibility and practical value of a pilot-controlled, maneuverable reentry and recovery from orbit at a time and place of a pilot's choosing. The Air Force's view was that man's discretion would be necessary for operations in space and that military superiority in space would be essential to an international enjoyment of space for peaceful purposes.

Discourse and Decisions on Manned Military Spacepower

President Eisenhower's willingness to keep space peaceful caused him to sponsor in 1958 the formation of the National Aeronautics and Space Administration (NASA). In his successful race for the presidency, John F. Kennedy voiced a belief that the United States was lagging behind the Soviets both in space and ballistic missiles Early in his administration, Kennedy's National Aeronautics and Space Council, headed by Vice President Lyndon B. Johnson, recommended a NASA program to begin with suborbital and earth-orbital Mercury flights, followed by Gemini orbital flights to include rendezvous, docking, and extravehicular activity, and concluding with Apollo flights landing Americans on the moon. Kennedy approved the program, arguing that the lunar landing objective "would be a sufficiently difficult goal, and its achievement before the Russians would repair the US image and restore confidence in American technological superiority."[2] According to Deputy Secretary of Defense Roswell L. Gilpatric, the Kennedy administration was determined not to provoke an arms race in space. "An arms race in space will not contribute to our security," Gilpatric

stated in 1962. "I can think of no greater stimulus for a Soviet thermonuclear arms effort in space than a United States commitment to such a program. This we will not do."[3] Looking backward after twenty years' reflection, Gen Bernard A. Schriever recalled that the Kennedy administration's desire to attain an accommodation with the Soviet Union brought on the undebated effect of stifling military innovation. "Let's not have too much technology," Schriever said that the new administrators urged, "because it might force us into new systems programs. We were stifled and inhibited by policy, not technology and know-how."[4]

In the Defense Department, Secretary Robert S. McNamara established two fundamental criteria for the military space program. First, it had to mesh with NASA's program in all vital areas so that the Department of Defense and NASA programs, taken together, would constitute an integrated national program. Second, projects supported by the Defense Department had to hold a distinct promise of enhancing military power and effectiveness. McNamara was quite critical of what he described as the ongoing practice he found on taking office—of service initiation of "large projects with rather ill-defined purposes."[5] In 1963 both Secretary McNamara and Dr Harold Brown, then director of Defense Research and Engineering, were far from convinced that there was a defense requirement for man in space, and this skepticism translated into questioning about the X-20 Dyna-Soar. Early in 1963 McNamara got an agreement with NASA that the Gemini astronauts would perform some military space experiments, and, as has been seen, in December 1963 McNamara canceled further development of the Dyna-Soar. He simultaneously announced that the Air Force would commence development of a manned orbiting laboratory (MOL) that would allow the Defense Department to determine whether there would be a role for a military man in space.[6]

Also in 1963 the Air Force had sought approval for an Air Force space program, spelling out the two basic objectives of, first, augmenting by use of space systems the existing military capabilities of US terrestrial forces and, second, developing a military patrol capability for the protection of US interests in space. The Dyna-Soar had been a "key element" in the planned military patrol capability, and with its cancellation the principal Department of Defense undertakings in space were primarily support missions for terrestrial operations. Secretary McNamara also favored devoting a major part of the defense space budget to technological building studies and equipment developments that would comprise the building blocks of any future system that might be needed for operation in space. For the Air Force a Titan III missile booster put in development in 1961 for the purpose of launching Dyna-Soar was continued as a McNamara favored "building block" for a planned lift of the MOL and other possibly unforeseen usages.[7]

The feasibility of the building-block approach was tested in 1963–64 when President Kennedy was concerned that the Soviets were fielding an orbital bomb. He then directed development without delay of an active antisatellite capability. In just about a year the Air Force turned out Program 437, comprising a Thor missile booster and already-on-hand guidance. Practice firings placed simulated nuclear warheads within a lethal five-mile range of targeted space debris, and the

satellite interceptor was counted as operational in 1964.[8] The Air Force seems also to have continued to look with some favor on the Bambi (ballistic missile boost intercept) concept of a satellite system capable of infrared homing on hostile missiles or satellites in their vulnerable boost phase; but Secretary McNamara dismissed the Bambi as "nothing more than a paper study of a very esoteric system."[9]

Both the Program 437 interceptor and the Bambi, in its original concept, would have used nuclear warheads in space. In 1970 Air Force Secretary Robert C. Seamans, Jr., was queried about the dangers of intercepting Soviet satellites with nuclear weapons. He made reference to the 1957 United States treaty pledging that the United States and other United Nations member nations would not orbit weapons of mass destruction.

> We have an international agreement not to use nuclear warheads [in a satellite interception employment], not even to test them except underground. This would open up Pandora's box again, and certainly give other countries latitude, say the Soviet Union, for further testing.[10]

Although the major focus of attention in the early 1960s was on manned space flights, the major Department of Defense applications in space were principally in support of terrestrial forces through the use of satellites for strategic intelligence surveillance, communications, navigation, weather, and other similar activities. Before 1961 the Defense Department freely acknowledged that it was developing photographic reconnaissance satellites that would replace the U-2 effort that was terminated in May 1960 with the Soviet shoot down of an American U-2. On 11 August 1960 Discoverer 13 successfully returned a photo-capsule, thus beginning the development of increasingly sophisticated surveillance of the Soviet Union. The Kennedy administration ordered complete secrecy on the subject, even though the Soviets initially complained and proposed a United Nations ban on reconnaissance from space. The Soviet Union started launching its own recon satellites in April 1962, and thereafter these surveillance flights came to be regarded by both sides as a stabilizing influence. In the antiballistic missile treaty of 1972 the USSR and the United States agreed not to interfere with "national technical means of verification"—a joint euphemism for the spy satellites.

President Carter made general reference to photoreconnaissance in a 1978 speech, and by 1980 US Air Force Secretary Hans Mark acknowledged that the space satellites had proven their worth as national technical means of treaty verification, arguing that strategic missile warning and surveillance "stand out as being of vital importance to national security."[11] In addition to surveillance, navigation and communications satellites provided vital support to terrestrial operations. The Navy's Transit family of navigation satellites reached full operational status in July 1964, allowing missile submarines to position themselves for accuracy within some 200 to 300 feet, close enough for the Polaris missiles to be effective against countervalue targets.[12] In another space application the Air Force began development of satellites for a defense communications system. This

initial defense communications satellite program (IDCSP) got 19 satellites placed into near-synchronous equational orbit with communications to about 30 terminals deployed worldwide. The system provided sustained communications support to Southeast Asia and Seventh Fleet operations, and to the departments of defense and state during the Arab-Israeli conflict. In addition it furnished a previously unavailable capability—the transmission of high-quality photographs in a matter of hours rather than days.[13]

Although the capabilities of unmanned satellite applications were quickly offering potentially revolutionary support augmentations to military operations, a major US emphasis was still being applied to the possibility of manned space projections. "If you cancel the DYNASOAR, you cancel the Air Force," General White had warned. At his retirement as chief of staff, White made a short talk, stating:

> There was a time once when the people who controlled the known ground of the earth, controlled the world Then the people who controlled the sea, controlled the world. Today people who control the air control the world, and I predict to you that tomorrow those who control space will control the world [14]

In early 1965 an article in the *Journal of the Armed Forces* declared: "It is all but incredible that after 7 years of space research no manned military project has reached the hardware stage."[15] Gen John P. McConnell, who became Air Force chief of staff in 1965, was readily willing to admit that the United States had "made a mistake in not developing a weapons system which we could use in space," but he added:

> I think we are putting as much emphasis on space . . . as we can with the money that's available to us. I anticipate that we will continue to place appropriate emphasis on space I am inclined to agree with General White that in the far distant future if we go to military usages of space, and this is way down the road in my opinion, that he probably will be right [16]

In March 1965 Alexander Flax, assistant secretary of the Air Force for research and development, fended off a question about whether the building-block approach to space weapons development might not be too slow or too conservative by demonstrating that technological innovations of revolutionary portent came as reactions to a threat that would be countered or a clear application that would provide a great advantage. Flax added:

> Our problem in attempting to take the initiative in this space weapons area is in seeing a clear application that will obviously give us a great advantage, or a threat that must be countered Neither the people who look at the military side of this picture nor those who look at the technical side of the picture come up with a clear-cut application or threat of that nature, so that although we have numerous specialized military space programs, we have not seen any big new one that looks like we must embark on it right away. I think our proposed orbital laboratory program is intended to see what a man can do that we cannot do in the unmanned systems. This may not in fact turn up something we do not anticipate. But we do not at this time have a definite enough answer

to justify going ahead on more than just the elements of the building blocks of the system [17]

The Air Force had started preliminary investigations of a space laboratory in 1958, well before Secretary McNamara's directive in December 1963 to design and use an experimental MOL to demonstrate to an outboard pilot how could he add to the capabilities of military space systems. As defined by the Department of Defense in December 1963, MOL included a Titan III booster, a somewhat modified Gemini capsule, and a canister laboratory about 10 feet in diameter and 25 feet long in which two crewmembers would work at experiments for up to 30 days before reentering the Gemini capsule and recovering on earth. During 1964 the Air Force worked with 17 contractors studying experiments and subsystems to be incorporated in the MOL. In January 1965 the Department of Defense issued new and expanded instructions on the MOL, including a mandate for the Defense Department and NASA to compare configurations of the Apollo system with the Gemini/MOL configuration plan. The fiscal year 1966 defense budget included $150 million to fund initial MOL development efforts, and given early approval in 1965 to proceed with full-scale development the Air Force's estimate was that the first-manned orbiting laboratory could be launched in midfiscal year 1968.[18] In-depth DOD-NASA analysis recognized that major NASA systems such as Apollo could not effectively accomplish the desired MOL mission for the basic reason that the respective missions were too dissimilar. When this conclusion was made, President Johnson announced on 25 August 1965 that he had authorized the Department of Defense to proceed with the development of the MOL. Johnson then explained why the United States should explore outer space: "We dare not leave this area of our universe to become a monopoly in the hands of those who would destroy freedom. We must therefore obtain and maintain a leadership for the free world in outer space and we are trying to do that."[19]

As the MOL program gained approval, a manned space policy committee with equal representation from the Defense Department and NASA was formed in January 1966 to review areas of duplication between the MOL and Apollo programs. Despite this coordination, MOL was soon, and repeatedly, accused of being a duplication of NASA activities, especially when NASA outlined an Apollo follow-on to the lunar landings that would use the NASA Saturn booster and Apollo capsule for an orbital Apollo applications program, subsequently renamed Skylab.[20] In fiscal year 1966 the Air Force was unable to commit all of the $150 million appropriated for MOL, leading Secretary McNamara to conclude that the program was attempting to proceed faster than technology could support. For the MOL in fiscal year 1967 the Air Force initially requested $395 million, but it was evident soon that the schedule for development was going to slip nine months and only $230 million would be needed. Dr Harold Brown, now secretary of the Air Force, asked Secretary McNamara for the $230 million. "We were told," Brown said, "that if we asked for $395 million first and then could justify only $230 million we could not calculate very well."[21] McNamara thereupon allocated $150 million

for fiscal year 1967 since he concluded that technology could not support more than this. When Brown reargued the matter he was told that he could reprogram Air Force funds if the MOL development warranted a larger expenditure. But Brown could see no way to use other scarce Air Force funds for MOL.[22] In fiscal year 1967 the Air Force completed design work, including the design of a necessary launch complex at Vandenberg AFB, and 12 MOL astronaut pilots were selected from among Air Force, Navy, and Marine Corps air officers. In fiscal year 1968 Secretary Brown was holding to an end-of-the-calendar-year-1969 date for first operations of the MOL, but he really doubted that this would be possible. In fiscal year 1969 the Air Force requested $600 million for major component development of the MOL and completion of the launch complex at Vandenberg AFB. With the MOL program in full-scale development, Brown predicted an initial launch of a two-man crew in mid-1971.[23]

After the mid-1960s competing US national requirements for support of the war in Indochina and for social concerns brought reduced support for national space endeavors. In his second term, President Johnson maintained interest in both the Apollo lunar landings and MOL, but several leading American scientists were beginning to argue that unmanned space technology could explore space far cheaper than a manned spacecraft. In the spring of 1968 an amendment to eliminate the MOL very nearly came up on the floor of the Senate. Although President Johnson reduced the NASA appropriations, he continued to support Apollo as a national goal. And the first lunar landing promised by President Kennedy came six months into the administration of President Richard M. Nixon, when Neil Armstrong and Edwin Aldrin, Jr., set foot on the moon on 20 July 1969.[24] The fiscal year 1970 defense budget prepared by the Johnson administration contained $576 million for the MOL. While a member of Congress, the new secretary of defense, Melvin R. Laird, not only had strongly supported the project but at one time had filed a mandatory report to the effect that the project was not being funded at a rapid enough rate. In February 1969 Laird conducted a thorough review of the MOL program, which could be reduced to two hardware qualification launches to qualify the Titan IIIM/Gemini B structural hardware and four 30-day manned flights. The elimination of one manned flight reduced the fiscal year 1970 requirement from $576 million to $525 million. The schedule called for the first unmanned launch in early 1971 and the first manned flight in early 1972.[25] In his 1968 election campaign, however, President Nixon had pledged to curtail NASA operations until the national economy could afford more funding, and in the spring of 1969 the House of Representatives had pressed for spending limits on government activities. Early in June Secretary Laird needed to cut back the defense budget, and he had a choice of reducing or terminating numerous small but important efforts or one of the larger, more costly programs. With the concurrence of President Nixon, Laird decided to cancel the Air Force's MOL program. The deputy secretary of defense, David Packard, announced the decision on 10 June 1969. Laird explained his reasoning:

> We were and still are confident that man's presence in orbit can enhance the effectiveness of equipment and speed its development for both manned and unmanned use in future systems. Man is unique in his talents, ability, and adaptiveness, as recent NASA flights have clearly demonstrated, but the cost of putting and sustaining him in space is very high . The potential worth of the unique experiments planned for MOL plus the information expected on man's utility in space was not as valuable to Defense as the aggregate of other priority programs. . . . Since the MOL program was initiated, major advances have been made by both NASA and DOD in automated techniques for unmanned satellite systems. . . . These experiences as far as unmanned satellites are concerned have given us confidence that the most essential Department of Defense space missions can be accomplished with lower cost unmanned spacecraft.[26]

Secretary Laird stated that his decision to cancel the MOL did not reflect on the Air Force or the contractors of the program, which was, in his judgment, "practical and achievable." The Air Force then began to terminate the MOL within 24 hours after being so instructed; at this time, the launch facility at Vandenberg AFB was almost complete, and the Air Force elected to complete it for use in launching Titan III-type missiles for other purposes. Other technological items of interest to NASA were turned over for possible support of NASA's planned Apollo applications (Skylab) flights, which in 1973–74 would send three-man astronaut crews to work in a minispace station, the longest mission lasting 84 days. In terms of funding, $1.37 billion had been appropriated and obligated on the MOL program, and Secretary Laird estimated that the program would have cost an additional $1 billion or more in fiscal years 1971 through 1974.[27]

Although the decision to cancel the MOL was made at the highest levels, the Air Force apparently was not wholly dissatisfied with it. In the 1970 proposed program, the original amount allocated for military astronautics was about one-third of the total Air Force research, development, test and evaluation (RDT&E) program, and the manned orbiting laboratory accounted for one-half of the military astronautic request. Secretary of the Air Force Seamans made the point that the Air Force needed to press on with the F-15 fighter and C-5 airlift programs, as well as with improved air defenses. He said that "increasingly severe budgetary pressures . . . and the rapid progress we have made with unmanned space vehicles, have finally resulted in the conclusion that the cost of a manned system is too great to be borne at this time."[28] A year later, Grant L. Hansen, assistant secretary of the Air Force for research and development, had much the same reasoning about the cancellation of the manned military space experiment. Hansen said:

> It is a fact of life . that our aircraft fleet has gotten so behind the times that we have to have a great concentration of effort in that area to be able to get a modern fighter and bomber and airborne early warning system and combat air support aircraft One of the things we are sacrificing in order to be able to afford to do those things . is the further exploitation of capabilities in space for the things in the future.[29]

A New Air Force Policy of Space Applications

In the aftermath of the cancellation of the manned orbiting laboratory in mid-1969, Air Force policy shifted almost immediately from space in the abstract to the attainment of space applications. "Relative to priority in our efforts in space," stated Assistant Secretary Grant Hansen, "space is really not a program in the Air Force. It is a place where we do things and each project which utilizes space competes for funds on its own merit."[30] Gen James Ferguson, commander of the Air Force Systems Command and as such generally responsible for Air Force space projects, agreed with Hansen on the meaning of space.

> I think perhaps, the word has been distorted in the sense that space is [considered] separate from the rest of the environment in which we operate What we are searching for are ways of performing our assigned missions more effectively. There are certain advantages in operating in space [31]

In this "space applications" policy concept, the national space doctrine became generally expressed in the Pentagon in a single sentence: "Space is not a mission; it's a medium."[32]

In mid-1969 President Nixon charged a space task group headed by Vice President Spiro Agnew with conducting a study of post-Apollo activity. Secretary Laird was a member of the group and Secretary Seamans usually served as Laird's representative. In September 1969 the group made public three alternatives the nation could undertake, ranging downward in potential expense from a lunar base and manned flight to Mars to the least expensive option of an earth-orbiting space station and a reusable transport system to shuttle between the earth and the orbiting station. Until this time all recoveries from space had been directly down from orbit in a parachute mode. Secretary Seamans especially liked the space shuttle concept: "The shuttle will be able to come back from space much like an airplane, landing on a landing strip, and have considerably more maneuverability so there would be much more flexibility in bringing a package back from space at any time desired."[33] At this same time, the Air Force was also greatly interested in decreasing the costs of putting typical payloads into orbit, desirably by developing "a launch vehicle which we can recover and refurbish and use again and not throw it away every time."[34] In February 1970 the NASA Apollo applications program was trimmed down. On 7 March 1970 President Nixon's space policy emphasized applications in a carefully worded statement: "What we do in space from here on in must become a normal and regular part of our national life and must be planned in conjunction with all of the other undertakings which are also important to us."[35] In this milieu the Air Force got a go-ahead for development of an early warning satellite system, with two satellites over the Western Hemisphere and one over the Eastern Hemisphere, using infrared sensors to detect missile launches. Secretary Seamans nevertheless emphasized: "Our space activity is not an end in itself, but a means for accomplishing functions in support of existing forces and missions."[36] Because of national fiscal stringencies

President Nixon did not give a go-ahead for NASA's development of a space shuttle or space transportation system (STS) until January 1972 and then only because it would be of value to the Department of Defense and because it promised drastically to reduce launching and operational costs through reusable vehicles.[37]

"The high cost of space operations," Secretary Seamans observed in 1972, "... still prevents us from developing a space capability in all areas where we think satellites could enhance our national defense." For this reason the Department of Defense was very interested in NASA's space transportation system. Seamans expected the shuttle to be used to orbit the majority of DOD payloads, thus replacing expendable launch vehicles. Seamans added:

> The shuttle offers the potential of improving mission flexibility and capability by on-orbit checkout of payloads, recovery of malfunctioning satellites for repair and reuse, or resupply of payloads on orbit thus extending their lifetime. Payloads would be retrieved and refurbished for reuse and improved sensors could be installed during refurbishment for added capability.[38]

The Air Force was designated as DOD's executive agent for the space transportation system which was to be developed and tested by NASA. An agreement that was originally signed on 17 February 1970 and revised in August 1972 established a NASA/Air Force space transportation committee to report jointly to the NASA administrator and the secretary of the Air Force to maintain a continuing review of STS to ensure that it met DOD and NASA requirements.[39] Air Force responsibility for the STS as the DOD executive agent was placed in the Directorate of Space under the deputy chief of staff for research and development, through a shuttle program element monitor. The Air Force Systems Command was designated as the implementing command of the DOD shuttle program with a system program office established under the space and missile systems organization (SAMSO) in Los Angeles. A SAMSO deputy for launch vehicles managed the Air Force program activities.[40] In early projections, DOD planned to transition all of its spacecraft from launch on expendable boosters to launch on the NASA space shuttle during the period from FY 1980 through FY 1985; the change expected to result in a cost per launch of about half of that paid for launches with large expendable boosters.[41]

In an address in August 1975 Brig Gen Henry B. Stelling, Jr., Air Force director of space, predicted that for both the United States and the Soviet Union space systems were going to support virtually all military forces and could strongly influence the outcome of conflicts. He said there were four basic reasons for using military space systems:

> *Uniqueness*—some functions essentially can only be done from space, such as near real-time warning of a ballistic missile attack, *Economics*—some functions are more cheaply done from space, such as long-haul communications, *Functional Effectiveness*—some functions are more effectively done from space, like meteorology; and *Force Effectiveness Enhancement*—some space functions greatly enhance the effectiveness of terrestrial forces.[42]

The first three functions had been dormant, but Stelling predicted that in the late 1970s—"the Shuttle decade"—force effective enhancement would become increasingly important.[43] In an article published in late 1974, Gen Jacob E. Smart, who had served with NASA following his retirement from the Air Force, pointed to the "wide-range of tools" being provided by space-related technologies, but he questioned whether the United States was facing up to the challenges and opportunities of the space age. Smart wrote:

> Presently there are multiple agencies of the US government engaged in space related activities, each pursuing programs to fulfill its own missions. This of course is proper but points up the question: Does the sum of the individual agency's perceived roles adequately fulfill the total national need? There is no central policy coming from the top, guiding and coordinating these efforts.[44]

Smart said "we are witnessing the swift development of a new form of power which, like the air, land, and sea powers, will have applications that are political, military, economic and sociological."[45] In a further development of this same theme, Col Morgan W. Sanborn pointed out the view of space as a medium to be used for the enhancement of terrestrial forces that led back to the early days in which aviation was cut up without any common doctrine. There was no real organization or employment doctrine for space. In the Air Force, the Air Force Systems Command was responsible for the checkout and launch of DOD satellites, and it also operated certain space systems because it had the needed engineering talent to do so. The Aerospace Defense Command (ADC) operated space detection and tracking systems. The Strategic Air Command operated a meteorological satellite program. The Navy, along with the Air Force, was developing a Fleet Satellite Communications System, while the NAVSTAR (now global positioning system—GPS) program was being designed to support all three military services as well as civilian users. Sanborn wrote:

> The point is that space has become an amalgam of systems and users . . . The need for a separate space command within the Air Force . . . seems obvious. This command could well develop into a space force when future requirements demand such a specialized and large-scale effort.[46]

According to Secretary Seamans in March 1970, the Air Force was "very much concerned about the presentation of our . . . satellite capability, because of its importance to our military posture."[47] On 19 October, 20 October, and 1 November 1968, the Soviets successively launched three cosmos satellites, the latter two making fly-by rendezvous with the first. Subsequently all three were observed to be accompanied by fragments. It was determined that "Soviet technical capabilities would permit them to develop any of several types of antisatellite systems during the next ten year period if they so desire."[48] The Soviets again flew satellite intercepts in 1970 and 1971. The US-USSR Antiballistic Missile Treaty of 1972 prohibited interference with reconnaissance satellite verification of treaty compliance and it prohibited the development, testing, or deployment of

space-based ABM systems and their components.[49] In the Department of Defense satellite programs of the early 1970s it was evident that the greater part of program costs were not actually in space but in ground reception modes. Thus by increasing the size, power, and capabilities of satellites it was possible to achieve economy in the operation of forces. Thus, phase II of the defense satellite communications system consisted of only four high-power satellites in stationary equatorial orbits, each weighing almost 10 times as much as the smaller phase I satellites. The two phase II satellites launched in 1973 gave the DOD better long-distance capacity to the Pacific and Europe and the launching of the other two satellites completed the system in 1975.[50]

At first the Air Force viewed the Soviet antisatellite activity with concern but not with dismay. In 1972 Lt Gen Otto J. Glasser, deputy chief of staff for research and development, said it would be a "pretty tough problem" to knock out all satellites "simultaneously, or anything like simultaneously." "Of course you realize," he concluded, "that the minute any one of them is attacked that this raises everything else to a very high state of alert, so that all is not lost in one Wagnerian cataclysm."[51] Soviet space activities, nevertheless, continued to give concern, especially the rate of Soviet military space activity in comparison with that of the United States. The total number of Soviet launches surpassed that of the United States in 1971 and the rate of separation increased. In the first half of 1973 the USSR launched 42 satellites and the United States launched 9; in the first half of 1974 the USSR put 50 payloads into orbit compared to 15 for the United States. The Soviets stressed that their cosmos satellites were for scientific purposes, but there was no doubt that they also were for military data gathering, navigation, or position fixing. On 2 March 1977 the United States had 381 payloads in space; the remaining 3,842 objects in space consisted of 438 payloads of other nations (chiefly the USSR) and 3,404 pieces of debris. That the Soviets maintained a much higher rate of payload launches than the United States could indicate an inferiority of their satellite technology's longevity, on the other hand, it also showed a depth and high degree of launch capability to reconstitute satellite resources or replenish errant satellites.[52] In 1976 the USSR resumed testing of capabilities to inspect and destroy satellites, using three target satellites and four interceptors. In 1977 the same activity was repeated; single interceptors were flown in 1978 and 1980, while two were flown in 1981. In 1981 an intercept flight was made for the first time in large-scale Soviet maneuvers, which included missile launches and the launch of two other satellites for reconnaissance and navigation.[53] At the resumption of Soviet antisatellite activity in 1976, the Department of Defense intensified its studies of the effects of laser radiation and nuclear effects with a view to providing hardening to reduce damage to critical satellite components. In 1979, however, Lt Gen Thomas Stafford, Air Force deputy chief of staff for research, development, and acquisition, reported that the satellites were designed to perform their functions with stringent weight allowances that prohibited inclusion of burdensome defensive measures. These defensive measures would have negatively impacted a high level of survivability. To make the spacecraft ultimately hard and

invulnerable would be a task that was beyond the scope of present expendable boost vehicles technology and even to the space shuttle when it became available.[54]

A presidential-level study of US military space policy began during the administration of Gerald Ford and was continued in the Carter administration. In the last year of the Ford administration, Congress passed the National Science and Technology Policy, Organization, and Priorities Act of 1976. This act established larger responsibilities in the Office of Science and Technology Policy (OSTP) within the Executive Office of the President, and this office began to play the dominant role in formulating space policy under President Carter. A series of joint studies involving the National Security Council, the Department of Defense, the Office of Science and Technology Policy, and NASA addressed the fragmentation of US space activities and sought a coherent national space policy. On 9 May 1977 Air Force Chief of Staff Gen David C. Jones signed out a letter to all major commands entitled "Air Force Space Policy." Referring to the growing US reliance on space operations, which was accompanied by a growing threat to the free use of space, the letter affirmed that activities in space relating to the development of weapon systems, military operations, and defense of the United States – conducted in accordance with national policy and international law – were among the prime Air Force responsibilities.

On 20 June 1978 President Carter issued a presidental directive 37 (PD-37) on national space policy. The directive established a policy review committee within the National Security Council (NSC) to provide a forum for considering space policy news and providing for a rapid referral of space issues to the president. Specifically, NASA was directed to pay virtually all the costs associated with the space shuttle; the Department of Defense was chartered to design survivability into space systems, develop an antisatellite (ASAT) capability, and to "bump" civilian payloads from scheduled shuttle flights if national security required. NASA rejected any claims to sovereignty over outer space and any limitations on the fundamental right to acquire data from space. It held that purposeful interference with space systems should be viewed as an infringement upon sovereign rights. It also stated that the United States would pursue activities in space for self-defense and would thereby strengthen national security, improve deterrence from attack, and help monitor arms control agreements. Concerning space systems survivability, PD-37 stated: "Identified deficiencies will be eliminated and an aggressive long-term program will be applied to provide more assured survivability through evolutionary changes."[55]

The heavy emphasis on military space in PD-37 caused consternation within the civilian space community. Consequently the NSC Policy Review Committee for Space recommended and on 11 October President Carter signed PD-42, "US Civil Space Policy." The thrust of this directive was summarized by its third tenet, which stated that the United States would not be committed to a high challenge such as Apollo. As resources from shuttle development phased down greater attention would be given to new space applications and explorations.[56]

Building a Space Command and Space Doctrine

Although General Jones had signed out the Air Force space policy declaring operations in space to be among the Air Force's primary responsibilities and President Carter had issued two directives on national space policy, Lt Col Charles H. MacGregor and Maj Lee H. Livingston, two Air Force officers who were completing three years of lecturing on space at Air University schools in the summer of 1978, declared that "our civilian leaders in the Department of Defense seem to understand the significance of military space systems better than the professional military." The two authors charged most Air Force officers with "professional parochialism"—an interest in airplanes and with attitudes that are "either indifference or a profound conviction that military space programs are merely flashy gadgetry." There was no single organization with primary space responsibilities: the Air Force Systems Command (AFSC), Air Defense Command, Strategic Air Command, and Defense Communications Agency all "had a piece of the pie." "Space systems," MacGregor and Livingston wrote, "have no high-ranking spokesman, no single manager to orchestrate our efforts, below the OSD." In January 1977 the Air Force director of space had conducted an Air Force space symposium to exchange ideas and concepts between the operating commands and the systems and development community, but MacGregor and Livingston charged that only the Air Defense Command was familiar enough with space systems to provide substantive requirements for future operational capabilities. The two men argued a need for a separate space command, plus an active participation of the operating commands in formulating requirements and shaping an evolving doctrine for space.[57] In a talk to an Air Force Association symposium in October 1978, Gen James E. Hill, commander of Air Defense Command, proposed that there should be a single point to deal with US space defense matters. "We are today at the point," he said, "where we must develop the doctrine and we must foster the visions which will give us security in the unbounded reaches of space."[58] Shortly before his retirement in 1979, General Hill wrote to the Air Force chief of staff that "unless we make an explicit organizational decision which assigns to a single organization the Air Force responsibilities in space operations once and for all, we will be faced with serious, negative, long-term impacts on resource management and planning."[59]

As it happened the formal mission statements for the Air Force in DOD Directive 5100.1 (June 1969) and in JCS Publication 2 (October 1974) had not mentioned space as a separate area of military operations. DOD Directive 5160.32 (September 1970) had been more specific in addressing space operations since it provided: "The Air Force will have the responsibility of development, production and deployment of space systems for warning and surveillance of enemy nuclear capabilities and all launch vehicles, including launch and orbital support operations."[60] An Air Force space mission organizational planning study completed in February 1979 concluded that there was consensus within the Air Force that it should actively seek designation as the executive agent within DOD

for space and that it should improve its organizational structure to conduct space operations, this without any consensual agreement on timing or direction. When President Carter's PD-37 charged the Department of Defense with developing capabilities to monitor the situation in space, protect US and friendly space assets, and deny space as a sanctuary for potential enemies, a memorandum from the assistant secretary of defense for C^{3}I to the chairman of the Joint Chiefs of Staff and the chief of staff of the Air Force directed that the old NORAD space defense center would become ADCOM's space defense operations center (SPADOC). The NORAD space surveillance system operated a center in the Cheyenne Mountain Complex in Colorado Springs, Colorado, and maintained a catalog of all man-made objects in orbit. The OSD memo announced that SPADOC was viewed as a centralized management and operations center relative to space; Lt Gen Charles A. Gabriel, Air Force deputy chief of staff for operations, plans and readiness, demurred however and noted that when SPADOC achieved the capabilities visualized by OSD the Air Force would allow SPADOC to be the military focal point for DOD management of US space activity. For the time being, the Air Force was unwilling to impose authority on the individual space system owners and operators without their agreement.[61]

Air Force Manual 1-1, *Functions and Basic Doctrine of the United States Air Force*, printed on 14 February 1979, for the first time identified space operations as being of the nine basic operational missions of the Air Force. It provided: "The Air Force mission in space is to conduct three types of space operations: space support; force enhancement; and space defense." The space support operations included launch and recovery activities, on-orbit support, and satellite surveillance and control. The use of space systems was said to multiply the effectiveness of surface, sea, and aerospace forces by conducting global surveillance, serving as penetration aids, providing global communications capabilities, enabling operation of worldwide command and control systems, producing precise positioning and navigational data, and presenting detailed and timely meteorological information.[62] During 1979 the Air Force also heeded the recommendation of the space mission organizational planning study that the Air Force should acquire military capabilities in space. The chief organizational changes were in the Air Force Systems Command, where a need to isolate space systems from the acquisition of the MX missile demanded that the old space and missile systems organization (SAMSO) be divided. An Air Force space division was shredded out to be headed by an AFSC deputy commander for space operations. The space division's mission would be to develop new spacecraft and also to pioneer means by which payloads could be flown on the space shuttle. The Air Force also planned to construct a consolidated space operations center (CSOC) near SPADOC. The center would have a mid-1980s operational capability to serve as mission control for space shuttle flights related to national security. This center would control various satellites in orbit. Given these reorganizations, one camp of Air Force thinking urged that the space organization was sufficient; another camp said that more changes would need to be forthcoming, but it was too

soon for major changes; and a third camp reasoned that a complete reorganization was long overdue. In the summer of 1980 the Air Force Scientific Advisory Board examined national space activities and Air Force organization for space operations. This report commended the Air Force for an outstanding job of evolving experimental space systems into reliable operational systems, but it concluded: "Given current capabilities and potentials of space systems, the AF organization for operational exploitation of space is inadequate. . . . There is insufficient emphasis on an integrated force structure in which space systems are included as essential elements."[63]

As secretary of the Air Force in January 1980, Hans Mark considered "enhancement of our ability to conduct operations in space" to be "exceedingly important" for the Air Force. Having considerable experience in space technology, Mark sometimes felt that no one listened to him because he advocated innovations in the space program. On a visit to the United States Air Force Academy in January 1980, Mark challenged the institution to apply its academic expertise to a study of a military space doctrine.[64] In his analysis of the Air Force organization for space, Lt Gen Richard C. Henry, commander of the AFSC's Space Division, explained the difficulty in separating acquisition from operations, the former being a normal AFSC responsibility and the latter operational function normally being the duty of a unified or specified command. Henry demonstrated that all spacecraft in orbit were highly technical in their construction and support. "There is," he wrote, "nothing routine about either launching or supporting spacecraft on-orbit and we still need to rely heavily on engineering talent for both functions."[65] The Air Force's talent of mostly young engineering officers was concentrated in AFSC, a group of men fresh from college who did not remain long on active military duty. Henry argued:

> The issue centers on our inability to define the line between acquisition and operations. It is very clear in a mission such as space defense Yet, it is not so clear in the other mission areas where space systems are primarily in a supporting role to our operating forces: in communications, navigation, meteorology and the like . . We have a modicum of capability. We think we know what to do We think we know how to do it We don't yet, however, have the wherewithal—the direction—to get there . . . What is important is that we move out in thinking our way through the basic strategy and doctrine for the military use of space The alternative is to be captured by the technologists and the systems they develop I sometimes think that we are in that situation today[66]

Although the first applications in space may have been experiments tailored and supported by engineers, Lt Gen Jerome F. O'Malley—Air Force deputy chief of staff for plans, operations and readiness—could see a dawning of space operational activities. On 1 November 1980 he was addressing the Air Force Manned Space Flight Support Group assembled at the Johnson Space Center in Texas to work on the military applications of the space shuttle. O'Malley said:

> I believe the use of space by military forces is at a point paralleling the position of air power after WW I . The potential for space to become a more hostile environment

> is increasing. It is increasing for the very reason that air became an arena for hostilities first, because space systems provide increasingly important support—some would say a decisive edge—to military forces; and second, the technology for space conflict is available.[67]

O'Malley argued that the Air Force must give organizational recognition to space:

> We must apply the same considerations to space systems as we do for other operations We must design space assets, and structure their supporting organization in a manner responsive to the needs of operational forces—and integrate them into these forces—to allow field commanders to be confident that space capabilities will be there when they are needed.[68]

O'Malley was reminded of the maxim of Giulio Douhet: "Victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after the changes occur." "We would do well," O'Malley concluded, "to remember these words."[69]

In response to Secretary Mark's challenge at the United States Air Force Academy, the academy established a working group with expertise in astronautics, management, political science, and doctrinal development. An interdepartmental special topic course in space doctrine was organized and taught to cadets during the spring 1981 semester, and a USAFA Military Space Doctrine Symposium was convened and held on 1–3 April 1981. Solicited papers were published in *The Great Frontier: A Book of Readings for the Military Space Doctrine Symposium*, distributed a month prior to the symposium. The 246-person symposium was organized into three roundtable panels on US space operations doctrine, US space organization doctrine, and USSR/international space operations and organization doctrine. Each panel attempted to find consensus to questions posed to it. A pervading thought of the symposium directors was that it would be possible to learn from the past, decide where the Air Force must be in space by the year 2000, and articulate the doctrine that would assure a successful and logical progression toward the goal. In the end one panel member was outspokenly critical that "a gathering of 'space cadets' as was represented here is tantamount to 'preaching to the choir'." He recommended that future symposia include actual operational elements of the Air Force beyond the space community.[70] And since consensus was not reached on many pivotal organizational issues, participants recognized that the symposium served more as a stimulus than a response. The panel on space operations doctrine faltered when no commonly accepted definition of doctrine resulted from roundtable discussions, although, as will be seen, a weak consensus did emerge on specific characteristics that doctrine should possess. The chairman of the space organization doctrine panel provoked his group with an opening statement, contending that organization for space was *not* the problem; rather, what should we *do* in space was the precedent issue. There was a consensus that in the long run a dedicated space organization structure was inevitable, but there was also agreement that an optimum organizational structure would depend upon a clear conception of space itself, whether it would be a medium (place) or a mission.[71]

Early in 1981 an Air University air power symposium and the Air Force Academy Military Space Doctrine Symposium concluded that there was no space doctrine, that a space doctrine was needed, and that the Air Force needed to get its doctrinal house in order. Lt Col David E. Lupton pointed out after some reflection:

> These conclusions were not totally correct because there was a space doctrine, one that governed the employment of space forces even though it had not been officially published The symposia attendees were correct in their criticism, however, because the doctrine, in effect, was a nondoctrine: that space should be a sanctuary, free from military forces It is doubtful that many of the attendees at either space doctrine symposium would have accepted that the best way to employ space forces was not to have space forces [72]

Lupton conceived that differences of opinion on possible space organization and what technologies to fund had resulted from differing fundamental beliefs that never had been broken out openly. He described four belief structures or schools of doctrinal thought relative to space. The first school had followed a "sanctuary" or "free skies" doctrine for space in which it was seen that space surveillance systems for mutual inspection of treaty compliance had a tremendous stabilizing influence on international relations and was too important to jeopardize by an intrusion of weapons into space. A second "survivability" school was similar to the sanctuary school but suggested that space applications—communications, meteorology, and surveillance—were effective in peacetime but could not serve wartime functions because of their inherent vulnerability. A third cluster of thinking was a "control" school, which suggested the value of space forces by using air power or sea power analogies and argued that the capability to deter war was enhanced by the ability to control space. A fourth school harked back to the old military axiom that domination of the high ground ensures domination of lower lying areas. The "high ground" school argued that global-coverage characteristics of space forces, combined with directed-energy or high-velocity-impact kinetic weapons, provided opportunities for radical new national strategies, including a space-based ballistic missile defense.[73]

At the opening address of the Air Force Academy Military Space Doctrine Symposium, Gen Bernard Schriever expressed confidence that the new administration of Ronald Reagan had a policy of realism toward the Soviet threat, that policy determinations that had stifled and inhibited developments in space would no longer stand in the way. "It seems to be a very propitious time to get going in space," Schriever said.[74] As viewed in short retrospect by Dr Robert S. Cooper, director of the Defense Advanced Research Projects Agency, the Reagan administration brought an intensified reaction to Soviet space activities that began to surge with the fielding of Soviet antisatellite and ocean surveillance capabilities. Cooper said:

> Up until a few years ago we had chosen not to build an antisatellite system . . because nothing that the Soviets were doing in space was so threatening to our forces on the

> surface that we believed we needed to deny them the use of any specific spacecraft.... We were willing to fight all battles with the Soviet Union leaving their spacecraft in a sanctuary.[75]

In the late 1970s especially, Soviet writings viewed space as a military arena to be dominated to achieve victory in modern superpower warfare. The large Soviet space launch rate was estimated to be 85 percent military related, and there were a record 97 successful launches in 1981. The Soviets had considerable redundancy in their space vehicles, shorter lived satellites with more frequent replenishment, and a capability for rapid satellite replacement. "All of that space activity," Doctor Cooper said, "leads one to believe that the Soviets have some grand scheme or ulterior motive; they want to gain some kind of sovereignty in space."[76]

In May 1981 Lt Gen Kelly Burke, Air Force deputy chief of staff for research development and acquisition, welcomed the capability of the space shuttle as a high-volume multiuser transport, but he also summarized the risks inherent in the existing US space program. Burke said:

> With or without the shuttle the US military space program faces the following risks: —Loss of existing capability through failure to provide adequate redundancy or robustness of current systems. —Inability to quickly replace or backup key elements of existing systems lost either through natural disaster, normal wear out of on-orbit systems, or enemy action —Loss of technological lead in key areas which, if fielded by the Soviets, would threaten our space infrastructure. —Inability to deter, defend, or retaliate effectively against actions hostile to our space infrastructure [77]

Upon taking office in January 1981 President Reagan's team, as already seen, applied more interest to the prospects of discovering a space-based strategic defense against rapidly growing missile forces. Said James P. Wade, Jr., assistant to the secretary of defense for atomic energy and acting principal deputy under secretary of defense for research and engineering in March 1981:

> My observation is that with a new team coming aboard you will see an increased interest and emphasis on measures associated with active defense. . I believe personally the program has been underfunded over the past several years, in the sense of pushing technology and trying to understand what is the maximum potential in terms of where it could be applied and how and soon could it be applied to military problems.[78]

In an 18 September 1981 statement to Congress, President Reagan spoke of reordering the priorities of the space program, and his fiscal year 1982 NASA budget request was $600 million less than President Carter's. The space shuttle was exempt from cuts, and on 10 July 1981 former Secretary of the Air Force Mark was sworn in as deputy administrator for NASA. Soon afterwards, Maj Gen James A. Abrahamson, a fully trained astronaut in the old MOL program and a successful program manager for the F-16 fighter, was appointed associate administrator of NASA for the space shuttle program. The first space shuttle flight by the *Columbia* already had been accomplished successfully on 12 April 1981, and in reference to it President Reagan told Congress "the space shuttle did more than prove our

technological abilities It raised our expectations once more. It started us dreaming again."[79]

During 1981 and into 1982 centralization of management of space activities within the Department of Defense received much attention from senior management. A space operations committee was established within the Office of the Secretary of Defense, chaired by the secretary of the Air Force, and a department wide study looking toward production of a comprehensive DOD space policy was commenced under the chairmanship of the under secretary of defense for policy, Dr Richard D. DeLauer, who had been a program manager in the space program. Doctor DeLauer charged Dr Robert S. Cooper to act as the principal focus for review of space research and development across all mission areas.[80] In November 1981 Edward C. Aldrich, Jr., under secretary of the Air Force, spoke of "the direction we appear to be moving toward in establishing a policy for the DOD role in space." He said:

> The way in which we operate our space assets must be more coordinated and integrated in the future as we expand our space operations and commence routine launches of military satellites with the Shuttle. The right answer may be some form of a "space command" for the operation of our satellites and launch systems The Air Force is moving in that direction [81]

In November 1980 General O'Malley had spoken of the need to recognize that space was no longer a research and development environment only and to make it an operational medium also. Late in 1981 the Air Staff formed a directorate of space operations within the Office of Air Force Deputy Chief of Staff for Plans and Operations. The Air Force also elevated commander in chief, North American Aerospace Defense Command (CINCNORAD) to a four-star level, commensurate with his responsibilities for space, missile, and aircraft defense of North America.

The Air Force Institute of Technology established a course in space operations.[82] In 1982, in preparation of the fiscal year 1983 budget's five-year defense projection, the Air Force stated its objectives in space: "Enhance space order of battle. Develop more survivable and enduring systems at all levels of conflict. Provide more evolutionary (rather than revolutionary) improvements. Exploit the STS to its fullest."[83] Brig Gen Bernard P. Randolph, director of space systems and deputy chief of staff for research, development, and acquisition, explained:

> The top two objectives address the fact that we in the Air Force consider space in terms of more military capability than we have used in the past, therefore, we wish to enhance our space order of battle, buy more, if you will, to assure that we have the necessary support, and assure that these systems we put on orbit as part of our space program will survive throughout the length of conflict.[84]

Early in 1982 the General Accounting Office (GAO) advised Congress to limit funds for the Air Force's planned consolidated space operations center (CSOC)

until the Department of Defense came up with an overall plan for military exploitation of space. The report said that CSOC "could be used as a nucleus for a future space force" or a "future space command" and that it ought to be planned with that in mind.[85]

Whether "space" was a "mission" requiring the organization and functioning of "space forces," disparate and coequal with land, sea, and air forces, or whether "space" was a "place" was apparently actively debated in 1982. The outcome was that space was a place and not a mission and that "space systems compete with other types of systems in establishing the most effective means of accomplishing a given mission." To the Air Force, space continued as part of the operational medium where it could perform missions and specialized tasks.[86]

Space defense and an ASAT comprised a unitary Air Force mission, and the F-15-launched ASAT, working in cooperation with the Cheyenne Mountain SPADOC, was under development; but other ongoing space systems supported all military services. The backbone of military space communications in the late 1980s would be the military strategic and tactical relay satellite (MILSTAR), which would provide worldwide coverage for the strategic and tactical requirements of the Army, Navy, and Air Force. The NAVSTAR GPS navigation system would produce precise signals, allowing worldwide location to within 16 meters. The signals would be available to commercial users as well as the military services. A defense meteorological satellite program (DMSP) would provide instant weather information, even showing thunderstorms in progress.[87]

On 4 July 1982 President Reagan selected the occasion of the welcome home ceremonies for the final test-flight of the space shuttle to announce an awaited and revised national space policy. Major portions of the space policy paper were said to have borne security classifications, but a five-page fact sheet outlining the policy was issued by the White House. The basic goals of the national space policy were to strengthen national security, maintain US space leadership, exploit space for economic and scientific benefits, expand private investment and involvement in space, promote international activities in the national interest, and cooperate with other nations in maintaining the freedom of space. The policy emphasized the close coordination between NASA and the DOD, while keeping the civil and military space programs separate. Antisatellite capability was endorsed as a specific program for development with operational deployment as a goal. The policy also called for survivability and endurance of space systems for times of crisis and conflict and the development of attack warning, notification, verification, and contingency reaction capabilities to threats to US space systems. Early in his administration, President Reagan had abolished the Presidential Review Committee on space established within the National Security Council by President Carter; the new policy provided that space policy would be implemented by interagency mechanisms and a senior interagency group on space that would provide "orderly and rapid referral" to the president for decisions on space policy matters.[88]

On 21 June 1982 a few days before his retirement, Gen Lew Allen, Jr., announced the planned formation of a space command to be effective on 1 September 1982 with headquarters in Colorado Springs, Colorado. Air Force Space Command (SPACECMD) was formed as planned on 1 September 1982 with the mission of managing and operating assigned space assets, centralizing planning, consolidating requirements, providing operational advocacy, and ensuring a close interface between research and development activities and operational users of Air Force space programs. The commander of Space Command also was to serve as CINCNORAD and CINCADC. The commander of the Air Force Systems Command's Space Division was assigned the added duty SPACECMD's deputy commander. In a related reorganization, the Air Force established the Air Force Space Technology Center at Kirtland AFB, New Mexico, subordinate to the AFSC Space Division. Within this framework it was conceived that the Air Force Space Technology Center would work on basic technology; Space Division would be responsible for research, development, launch, and checkout; and the operational space commands then would assume in-orbit control, management, and protection responsibilities. SPACECMD immediately took over the space defense operations center already operating in the Cheyenne Mountain Complex; ground breaking occurred in May 1983 for the consolidated space operations center, which was to have the missions of controlling operational spacecraft and managing DOD space shuttle flights.[89]

In the autumn of 1982, Gen Charles A. Gabriel, Air Force chief of staff, explained the military significance of space "Space is the ultimate high ground.... The magnitude and direction of the Soviet military space effort demands that we meet these challenges, employing the full range of aerospace assets in our nation's defense. . . . The nation's highest defense priority—deterrence—requires a credible warfighting capability across the spectrum of conflict."[90] Air Force Secretary Verne Orr developed the same theme:

> As in the 1920's when we were just learning about the possible uses of airpower, today we are still learning how space based capabilities can contribute to our national defense posture And while some might view that space can be kept a weapons-free sanctuary free of military systems, history tells us that each time new technological opportunities present themselves, nations invariably employ them to avoid being placed in an inferior defense situation Our nation will continue to pursue avenues to foster the peaceful use of space consistent with the President's national space policy We and the Soviets are now . highly dependent on space for many military support functions, e.g., warning, communications and command and control. This dependence will undoubtedly grow. As a minimum then we must ensure that our space systems can operate in a hostile wartime environment, survive and continue our defense requirements As national use of and investment in space increases, protection of our resources will be essential Because such protection introduces the possibility of space-to-space, space-to-earth, and earth-to-space operations, it is in our national interest to be prepared to accomplish them Prudent preparations, such as ASAT, also give us a hedge against technological surprise, and ensure we are not placed in a permanent position of disadvantage by Soviet initiatives [91]

In explaining why the Air Force had established Space Command, General Gabriel pointed out that it was

> mostly . . a consolidation of what we had in being. A new way to organize with the operational beacon as opposed to just [a] technological driver. The operational will now be the driver . . . What we have done is pull together the operational and technical—technological push was what we had before.[92]

Maj Gen Bruce K. Brown, vice CINCNORAD/assistant vice commander, Space Command, pointed out that several factors converged in 1982 to cause the Space Command's activation:

> These factors included the Soviet threat in space, our Nation's increasing dependence on space systems, an ever increasing national space resource commitment, and the need to take full advantage of the space shuttle to enhance man's presence in space. Lastly, on July 4, 1982, President Reagan announced that the most important goal of the United States space program was to strengthen national security. As a result, we now have a policy which underscores the need to move Air Force space programs out of the research and development community into the operational world.[93]

As early as 1977 drafting of a military space doctrine manual to be controlled as AFM 1-6 was begun in the Doctrine and Concepts Office of the Air Force Directorate of Plans (HQ USAF/XOX). The first drafts of this manual proposed that space forces be provided by an Air Force component commander to work within a joint force directed by a unified commander with authority from the national command authorities (NCA) through the Joint Chiefs of Staff.[94] The space manual had been projected for completion in 1981 so that it would be available to provide policy direction for the military space program but it was delayed, one reason being an argument over whether space was a medium or place or a mission. This argument was resolved, as explained by Maj Gen John H. Storrie, director of space, Air Force deputy chief of staff for plans and operations. Storrie explained:

> The bottom line is space is a place, it is not a mission. We are going to continue to do those things in space that we do in the atmosphere and on the ground and on the seas We are not going to go out and do those things in space just because the technology is there . . . We are going to do them because we can do them better from space, or we can do them more cost-effective.[95]

Despite these decisions, the Air Force looked upon its Space Command as the initial step that could lay the foundation for the eventual integration of space systems into the unified/specified command structure. In early 1964 the joint statement of Secretary Orr and General Gabriel on the fiscal year 1985 Air Force posture strongly recommended a unified command for space, saying:

> We have developed the various space programs based on technological advances and mission requirements. However, no single military organization exercises operational authority over military space systems in peace, war, and the transition period from peace

> to war To make our space systems more effective and responsive, and to ensure a clear chain of command from the NCA to combatant forces, we proposed a unified command for space This new command would exercise operational command over US military space systems which provide support to the combatant forces of the unified and specified commands In the future, space-based systems may become available which will add a truly new dimension to conducting warfare. After an extensive review of command arrangements for space, the Air Force recommends a unified space command be formed soon.[96]

In support of the Air Force advocacy of a unified command for space, Gen Bernard Randolph, Air Force director of Space Systems and C^3, deputy chief of staff for research, development, and acquisition, argued that:

> First of all, it is the character of space systems to support a number of users It is very difficult to say that a space system was an Air Force, Navy, or Army system because . the way we work the space systems in the main is in fact jointly. . . I don't think the country can afford multiple organizations in space Space is just too expensive The Air Force strongly supports the idea of a unified command We designed the kind of things that command would do to support all the fighting forces . There is no such thing as a unique Navy or Air Force system Almost every space system applies to all the services.[97]

Although a US Navy spokesman agreed that the Air Force should take the lead in antisatellite programs for space defense, the Navy in 1983 organized a Naval Space Command of its own and appeared generally opposed to a unified space command. "I am having a hard time in my own mind defining what the mission of a unified command is in space," said Vice Adm Gordon R. Nagler, director of command and control, Office of Chief of Naval Operations. "For example, today the Air Force command in space is both acquisition and operations. I am not too sure if that is not in conflict a little bit."[98] Adm James D. Watkins, chief of naval operations, doubted the need for a unified command. Watkins was quoted as saying, "I would also worry unless there were significant improvements to be gained " Navy Secretary John F. Lehman, Jr., flatly disagreed with the need for a unified space command.[99] In March 1984 Admiral Watkins testified that he would not oppose a unified command at a right time. He said:

> I think that a unified command should be a command that has the potential to fight a war and if it is going to be a command established during a massive R&D program, then I don't really understand it So I think there is confusion as to the need for a unified command at this particular time [100]

In 1984, however, the Department of Defense accepted a unified US space command with Air Force, Navy, Army and Marine Corps participation as "the next evolutionary step." On 30 November 1984 a Department of Defense press release announced the activation of the new unified US Space Command (USSPACECOM). The announcement said that the new unified command would "better serve US interests and the needs of our allies worldwide by providing an organizational structure that will centralize operational responsibilities for more

effective use of military space systems."[101] The Joint Chiefs of Staff established a joint planning staff for space (JPSS), a directorate on the Joint Staff, to develop transition plans.[102]

At the same time that the preparation of AFM 1-6, *Military Space Doctrine*, was perplexed by the question of whether space was a medium or a mission, there was a question as to whether the manual was to be a compendium of fundamental, unencumbered principles of space combat operations or a statement of restricted objectives in space. In a paper prepared for the Air Force Academy Military Space Doctrine Symposium in 1981, Lt Col Dino A. Lorenzini, who was assigned at the Naval War College, urged: "Military space doctrine should address . . . fundamental possibilities for space warfare now in the hope that we can plan more deliberately and prepare more decisively for the uncertain events that lie ahead."[103] In an article published in 1982 Lorenzini additionally proposed that two versions of space power doctrine might well be issued. An unencumbered version would be a "basic" space power doctrine relevant to the practice of warfare in space; a constrained version would be an "operational" doctrine taking into consideration national overall space policy decisions.[104] At the National Defense University, Col Casper J. Schichtle, while assigned as a senior research fellow, prepared a research report on space policy and organization which touched on space doctrine. His review of the January 1979 draft of the proposed AFM 1-6 brought his criticism that the Air Force was bound to a peaceful use of space whereas the Soviets were headed in another direction. He urged that the Air Force publish AFM 1-6:

> As a body of principles governing military activities in space for the foreseeable future, it should be a natural flowdown from stated national space policies In addition, it should contain all but the most sensitive military space plans and signify the defense establishment's desire to "come out of the closet "[105]

When AFM 1-6, *Military Space Doctrine*, was officially published on 15 October 1982 its first and longest chapter discussed, "National Space Policy, Executive Guidance, and Legal Constraints," and a lengthy bibliography basic to the chapter, was appended. The major thrust of the doctrine was that space systems would be consistent with national policy. As explained officially by Secretary Orr and General Gabriel the basic philosophy of the new space doctrine was to preserve free access to and transit through space for peaceful purposes for both military and civilian users. To do this, forces would need to be maintained that were capable and ready. Then, if conflict became unavoidable, the United States would be prepared to use the force necessary to secure resolution at the lowest level and on terms favorable to the United States. The basic military objectives in space as defined in the doctrine were:

> To maintain freedom of space, To increase effectiveness, readiness and survivability of military forces, To protect the nation's resources from threats in, through and from space; and To prevent space from being used as a sanctuary for aggressive systems by our enemies [106]

In addition to AFM 1-6, the Air Force conceived that the Space Command would take a next step by creating more specific "operational space doctrine."[107] Secretary Orr defended AFM 1-6 as being a "strong emphasis" on doctrine and strategy for space. "The doctrine," he said, "provides a basis for determining strategy and will give focus and direction to the development of future space systems."[108] On the other hand, there was an apparent feeling in the ranks of young Air Force space enthusiasts—who were being called "space cadets"—that AFM 1-6 was so bound by national and international agreements as to provide incomplete forward-looking guidance for future conflict in space.[109]

President Reagan's Strategic Defense Initiative

Even before Ronald Reagan's election to the presidency he was known to favor a shift away from the effort to find US security in constant buildups of a strategic offensive military system. During a meeting with Reagan at the beginning of 1983, the Joint Chiefs of Staff raised the question of the lack of emphasis on ballistic missile defense (BMD), the lack of a clearly stated BMD goal, and no strong commitment of the nation's scientific talent to BMD. The Defense Department for several years had been passing up promising BMD proposals because of overall budget constraints, even though there had been "remarkable advances" in possibly pertinent technology. The chiefs were said to be "in total community" on examining a BMD initiative, and Reagan "showed considerable interest," ordering that the idea be developed further.[110] At the end of a speech devoted to promoting the fiscal year 1984 defense budget, Reagan on 23 March 1983 first sketched his Strategic Defense Initiative (SDI) He said that he was ordering "a comprehensive and intensive effort to define a long-term research and development program" aimed at defending the United States and its allies from ballistic missiles. The day following Reagan's speech, the White House announced that Secretary Weinberger would be responsible for an interagency study, with advice from outside the government, of what BMD technologies seemed most promising and how they would be used. The study was to be in the president's hand by the autumn of 1983, when the fiscal year 1985 defense budget would be under review. A White House spokesman explained that BMD would not be turned into a crash program but could be "a sketched-out crash program."[111]

The study request by President Reagan was accomplished under a senior interagency group-defense policy, chaired by Deputy Secretary of Defense Paul Thayer. A defensive technologies study team, headed by Dr James C. Fletcher of the University of Pittsburgh and including over 50 of the nation's top scientists and engineers, was formed both to assess the feasibility of achieving the BMD goal and to structure a research program for it. The principal finding of the Fletcher study was that, despite the uncertainties, new technologies held great promise for eliminating the threat of ballistic missiles to the United States and its allies. In the autumn of 1983, President Reagan's BMD projection, known properly as the Strategic Defense Initiative but popularly called "Star Wars," began to be

integrated into the fiscal year 1985 defense budget in notional steps visualized by the Fletcher panel. There was to be a research phase to the early 1990s when a future president and Congress could make a decision for full-scale engineering development looking in turn to sequential deployments of defensive systems. The Fletcher panel emphasized the importance of strong control management for the SDI, and accordingly, effective on 16 April 1984, Secretary Weinberger named Lt Gen James A. Abrahamson as director, Strategic Defense Initiative Organization (SDIO). The director of SDIO was chartered to report directly to the secretary of defense; he would prepare an integrated SDI objective memorandum that would be coordinated with service Program Objective Memorandums but would not be available for trade-offs to meet service or defense agency needs except upon decision of the deputy secretary of defense. General Abrahamson remarked:

> So our job is, with a small staff, somewhere around 80 people or so, to ensure that we have good central planning and good central direction, and then to encourage really effective ways to minimize the bureaucracy and make the most creative use of the talent that is there in each of the Services to proceed with the program. So what it means is that we will have authority for very direct and accelerated communications and direction down to each of the Service elements. We will have authority to use different contracting techniques .. to try to streamline that operation so that we can operate in an aggressive way to move this technology ahead So we have a central office, but [we are] relying on the talent that is already out in the Services.[112]

In the same months that the Strategic Defense Initiative was in projection, the Air Force was progressing with an Air Force space plan that reflected an intention to exploit the military potential of space, focus technological development, and redress deficiencies across all mission areas in space. In testimony in support of the Air Force portion of the fiscal year 1985 defense request in March 1984, Secretary Orr and General Gabriel spoke formally of the SDI, noting that the program would involve all three services' space programs and gather together money from them. The Air Force continued to voice support for a unified space command, stating:

> This new command would exercise operational command over US space systems which provide support to the combatant forces of other unified and specified commands. In the future, space-based systems may become available which will add a truly new dimension to conducting warfare [113]

As of 1984, however, the Air Force endorsed "a Space System Operation Strategy that fully integrates space systems into the military force structure and provides sufficient survivability of our critical space systems to allow the US time to provide central support to our forces."[114] Secretary Orr and General Gabriel explained: "We emphasize space systems' survivability because effective military operations in the modern battlefield are increasingly dependent on satellite surveillance, warning, communications, meteorology information, and navigation."[115]

In revising AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, as it was finally published on 16 March 1984, the Air Force summary of changes from

the 1979 edition noted: "Space is a place, not a mission, and is described as part of the operational medium where the Air Force can perform all of its missions and specialized tasks." The 1984 manual read:

> Space is the outer reaches of the aerospace operational medium In fulfilling U.S national security objectives, the Air Force has the primary responsibility for maintaining the United States' freedom to act throughout the aerospace. Space, as a part of that medium, provides an unlimited potential and opportunity for military operations and a place where the Air Force can perform or support all of its missions and tasks [116]

In the congressional budget hearings in March 1984, Secretary Orr and General Gabriel were in no hurry to extend military operations into space. The purpose of the F-15 ASAT program was defined as deterrence:

> The purpose of the F-15 ASAT program is to remove an asymmetry which exists between the US and Soviet military space capability. The current unilateral capability of the Soviets to threaten or negate US space systems with an ASAT could contribute to instability during a crisis. The primary mission of the F-15 ASAT is to assure our free access to and transit through space by deterring Soviet attacks against our space systems. If deterrence fails, our ASAT would provide us the capability to "respond in kind" to Soviet attacks on our space systems [117]

The F-15 ASAT program was only one part of a comprehensive effort to reduce the vulnerability of US space systems. The Air Force rationalized:

> No satellite system can be made totally invulnerable to all threats any more than an airplane or ship can be made totally invulnerable. The objective is to ensure the satellite system can provide service to our combat forces through a predetermined level of conflict [118]

In the Air Force's space systems architecture satellite survivability was a major consideration, and there were five major areas for increasing survivability: maneuver, hardening/shielding, possession of orbital spares, ability to replenish rapidly, and ability to fire back at attackers. The low-earth-orbit reconnaissance satellites were most vulnerable, and, as General Gabriel pointed out, both US and Soviet communications satellites in geosynchronous orbits at altitudes of 19,000 nautical miles above the earth along the equator were outside the range of the Soviet ASAT or the F-15 ASAT that the Air Force was projecting. In 1984 General Gabriel stated that the Air Force had no plans to select a capability to attack the high-altitude geosynchronous satellites that were so important to both the Soviets and the United States. Gabriel said:

> I would not . recommend that we build such a system I would rather both sides not have a capability to go to geosynchronous with an ASAT In fact I would like to be able to agree with the Soviets that we do not have any ASATs if we could verify it properly. Because we are an open society, we need our space capabilities more than they do.[119]

NOTES

1. Col Cass Schichtle, *The National Space Program: From the Fifties into the Eighties*, National Security Affairs Monograph 83-6 (Washington, D.C.: National Defense University Press, 1983), 52.

2. Ibid.

3 *A Compilation of Material Relating to U.S. Defense Policies in 1962*, 88th Cong., 1st sess., 77.

4. Keynote speech by Gen Bernard A. Schriever, USAF, Retired, 2 April 1981, in *The Great Frontier, Military Space Doctrine: The Final Report for the United States Air Force Academy Military Space Doctrine Symposium, 1–3 April 1981*, ed. Maj Paul Viotti, 26–27.

5. Senate, *Department of Defense Appropriations for Fiscal Year 1965. Hearings before the Subcommittee of the Committee on Appropriations and the Committee on Armed Services*, 88th Cong., 2d sess., 1964, pt. 1:170–74 (hereafter cited as *FY 1965 DOD Appropriations*)

6 House, *Department of Defense Appropriations for 1965: Hearings before a Subcommittee of the Committee on Appropriations*, 88th Cong., 2d sess., 1964, pt. 5:12–16, 70–76 (hereafter cited as *1965 DOD Appropriations*)

7 House, *Department of Defense Appropriations for 1966: Hearings before a Subcommittee of the Committee on Appropriations*, 89th Cong., 1st sess., 1965, pt. 3:170 (hereafter cited as *1966 DOD Appropriations*).

8. Ibid., pt. 2:373, pt. 5 150, Thomas Karas, *The New High Ground, Systems and Weapons of Space Age War* (New York: Simon and Schuster, 1983), 148–49.

9 House, *1966 DOD Appropriations*, pt. 5 150.

10 House, *Department of Defense Appropriations for 1971: Hearings before a Subcommittee of the Committee on Appropriations*, 91st Cong., 2d sess., 1972, pt. 1 623 (hereafter cited as *1971 DOD Appropriations*).

11. Karas, *The New High Ground*, 98–99; Marcia S. Smith, *Space Activities of the United States, Soviet Union, and Other Countries/Organizations, 1957–1982* (Washington, D.C.: Government Printing Office, 1983), CSR-20, Lt Col David E. Lupton, USAF, Retired, "Space Doctrines," *Strategic Review*, Fall 1983, 46.

12 House, *1966 DOD Appropriations*, pt. 5 8; Karas, *The New High Ground*, 130.

13 House, *1965 DOD Appropriations*, pt. 5:10–11; House, *Department of Defense Appropriations for 1969 Hearings before a Subcommittee of the Committee on Appropriations*, 90th Cong., 2d sess., 1968, pt 2 129, 450 (hereafter cited as *1969 DOD Appropriations*)

14. Senate, *Status of U S Strategic Power: Hearings before the Preparedness Investigating Subcommittee of the Committee on Armed Services*, 90th Cong., 2d sess., 1968, pt. 2:257.

15. House, *1966 DOD Appropriations*, pt. 3 855

16 Senate, *Status of U S. Strategic Power*, pt. 2.257.

17 House, *1966 DOD Appropriations*, pt 5:151

18 Ibid., 197–201.

19 House, *Department of Defense Appropriations for 1967: Hearings before a Subcommittee of the Committee on Appropriations*, 89th Cong., 2d sess., 1966, pt. 1:478–79 (hereafter cited as *1967 DOD Appropriations*); House, *Department of Defense Appropriations for 1968: Hearings before a Subcommittee of the Committee on Appropriations*, 90th Cong., 1st sess., 1967, pt 2.755–56 (hereafter cited as *1968 DOD Appropriations*).

20. Senate, *Department of Defense Appropriations for Fiscal Year 1969. Hearings before a Subcommittee of the Committee on Appropriations*, 90th Cong., 2d sess., 1968, pt. 4 2331–32 (hereafter cited as *FY 1969 DOD Appropriations*).

21. Ibid

22. House, *1967 DOD Appropriations*, pt. 1:256–57.

23 House, *1968 DOD Appropriations*, pt 2 749, Senate, *Department of Defense Appropriations for Fiscal Year 1968: Hearings before a Subcommittee of the Committee on Appropriations*, 90th Cong., 1st sess., 1967, pt 2:623 (hereafter cited as *FY 1968 DOD Appropriations*); House, *1969 DOD Appropriations*, pt. 2:128–29, Senate, *FY 1969 DOD Appropriations*, 19.

24 Schichtle, *The National Space Program*, 66–70, Senate, *Status of US Strategic Power*, pt. 2 256–57

25 House, *Department of Defense Appropriations for 1970. Hearings before a Subcommittee of the Committee on Appropriations*, 91st Cong., 1st sess., 1969, pt. 4:359 (hereafter cited as *1970 DOD Appropriations*).

26 Ibid , 333; Senate, *Department of Defense Appropriations for Fiscal Year 1970: Hearings before a Subcommittee of the Committee on Appropriations*, 91st Cong., 1st sess., 1969, pt 1:6–8 (hereafter cited as *FY 1970 DOD Appropriations*).

27 Senate, *FY 1970 DOD Appropriations*, pt. 1:7, pt. 4.673–79, Schichtle, *The National Space Program*, 74

28. Senate, *FY 1970 DOD Appropriations*, pt. 4.25–26, 673–74

29 House, *1971 DOD Appropriations*, pt 6·615–16.

30 Ibid.

31 Ibid., 616

32. Col Morgan W Sanborn, "National Military Space Doctrine," *Air University Review*, January–February 1977, 75

33. Senate, *Department of Defense Appropriations for Fiscal Year 1972. Hearings before a Subcommittee of the Committee on Appropriations*, 92d Cong., 1st sess , 1971, pt 4 48 (hereafter cited as *FY 1972 DOD Appropriations*).

34. Senate, *FY 1972 DOD Appropriations*, pt 4 48, Senate, *Department of Defense Appropriations for Fiscal Year 1973: Hearings before a Subcommittee of the Committee on Appropriations*, 92d Cong., 2d sess , 1972, pt. 4·94–95 (hereafter cited as *FY 1973 DOD Appropriations*)

35 Senate, *FY 1972 DOD Appropriations*, pt 4 48, Senate, *FY 1973 DOD Appropriations*, pt 4.94–95, Schichtle, *The National Space Program*, 71–76

36 Senate, *FY 1972 DOD Appropriations*, pt 4 48, Senate, *FY 1973 DOD Appropriations*, pt 4:94–95, Schichtle, *The National Space Program*, 71–76

37. Senate, *FY 1972 DOD Appropriations*, pt. 4.48; Senate, *FY 1973 DOD Appropriations*, pt. 4:94–95, Schichtle, *The National Space Program*, 71–76.

38. Senate, *FY 1973 DOD Appropriations*, pt. 4:77, 90.

39. *Air Force Policy Letter for Commanders*, 1 April 1973, Senate, *Fiscal Year 1974 Military Procurement Authorization, Research and Development, Construction Authorization for the Safeguard ABM and Active Duty and Selected Reserve Strengths Hearings before the Committee on Armed Services*, 93d Cong., 1st sess., 1973, pt 2 1027–28 (hereafter cited as *FY 1974 Military Procurement*), Senate, *Fiscal Year 1975 Military Procurement Authorization, Research and Development, and Active Duty, Selected Reserve and Civilian Personnel Strengths: Hearings before the Committee on Armed Services*, 93d Cong , 2d sess , 1974, pt. 6 2746–49 (hereafter cited as *FY 1975 Military Procurement*).

40 *Air Force Policy Letter for Commanders*, 1 October 1975.

41 Senate, *Department of Defense Appropriations for Fiscal Year 1978: Hearings before a Subcommittee of the Committee on Appropriations*, 95th Cong., 1st sess , 1977, pt 5 182 (hereafter cited as *FY 1978 DOD Appropriations*)

42. *Air Force Policy Letter for Commanders*, 1 October 1975.

43 Ibid

44 Gen Jacob E. Smart, "Strategic Implications of Space Activities," *Strategic Review*, Fall 1974, 19, 21

45 Ibid

46 Sanborn, "National Military Space Doctrine," 76, 77–78

47 House, *1971 DOD Appropriations*, pt 1 622–23

48. Ibid

49. Schichtle, *The National Space Program*, 11–12.

50 House, *1971 DOD Appropriations*, pt. 6:87; House, *Department of Defense Appropriations for 1976. Hearings before a Subcommittee of the Committee on Appropriations*, 94th Cong., 1st sess , 1975, pt 2 13–14 (hereafter cited as *1976 DOD Appropriations*).

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51. Senate, *Fiscal Year 1973 Military Procurement Authorization, Research and Development, Construction Authorization for the Safeguard ABM and Active Duty and Selected Reserve Strengths. Hearings before the Committee on Armed Services*, 92d Cong., 2d sess., 1972, pt. 3:1440 (hereafter cited as *FY 1973 Military Procurement*)

52. Smart, "Strategic Implications of Space Activities," 23; House, *Department of Defense Appropriations for 1978. Hearings before a Subcommittee of the Committee on Appropriations*, 95th Cong., 1st sess., 1977, pt. 2:370 (hereafter cited as *1978 DOD Appropriations*)

53 Smith, *Space Activities*, CSR-61 and 62.

54. Senate, *FY 1978 DOD Appropriations*, pt. 1:253, pt 5:28–29, 189, House, *1978 DOD Appropriations*, pt 2:370, pt. 3:533

55. House, *Department of Defense Appropriations for 1980. Hearings before a Subcommittee of the Committee on Appropriations*, 96th Cong, 1st sess., 1979, pt. 3:307 (hereafter cited as *1980 DOD Appropriations*)

56. Schichtle, *The National Space Program*, 78–82, "The Air Force Space Policy," in *Air Force Policy Letter for Commanders*, 1 June 1977, "Air Force Is Developing and Protecting Assets in Space," *Air Force Policy Letter for Commanders*, 15 November 1978

57 Lt Col Charles H. MacGregor and Maj Lee H Livingston, "Air Force Objectives in Space," *Air University Review*, July–August 1978, 60–62.

58 "Air Space Defense and Operations Control Center," *Air Force Policy Letter for Commanders*, 1 December 1978

59. Dr Charles W Cook, deputy assistant secretary of the Air Force for space plans and policy, "Organization for the Space Force of the Future," 21 June 1981, in *The Great Frontier, Military Space Doctrine*, ed Viotti, 2.472.

60. Maj Douglas H. May, "The Space Shuttle and Arms Limitation Verification," in *The Great Frontier, Military Space Doctrine*, ed. Viotti, 3:760.

61. Lt Col Robert S Dickman, "A Doctrinal Look at SPADOC," December 1980, in *The Great Frontier, Military Space Doctrine*, ed. Viotti, 1:223–25.

62. AFM 1-1, *Functions and Basic Doctrine of the United States Air Force*, 14 February 1979, 2–6, 2–8, and 2–9.

63 Cook, "Organization for the Space Force of the Future," 2:472–76, House, *Department of Defense Appropriations for 1982: Hearings before a Subcommittee of the Committee on Appropriations*, 97th Cong, 1st sess., 1981, pt. 2 33 (hereafter cited as *1982 DOD Appropriations*)

64. Speech by Schriever, in *The Great Frontier, Military Space Doctrine*, ed Viotti, 1, 24; House, *Department of Defense Appropriations for 1981: Hearings before a Subcommittee of the Committee on Appropriations*, 96th Cong., 2d sess , 1980, pt 2:293.

65 Speech by Lt Gen Richard C. Henry in *The Great Frontier, Military Space Doctrine*, ed Viotti, 61–70.

66 Ibid

67 Ibid ; F Clifton Berry, Jr., "Space Is a Place," *Air Force Magazine*, June 1982, 36–42.

68 Berry, "Space Is a Place," 36–42

69. Karas, *The New High Ground*, 17–18; *The Great Frontier, Military Space Doctrine*, ed Viotti, remarks of Lt Gen Jerome F O'Malley to Manned Space Flight Support Group, Johnson Space Center, Texas, on 1 November 1980 Air Force Office of Information press release, November 1980, O'Malley, "The Air Force in the Space Era," *Air Force Policy Letter for Commanders Supplement*, January 1981, 2–6.

70. Foreword by Lt Col Thomas J. Eller, professor and head, Department of Astronautics and Computer Science and chairman, Steering Committee, 1981 United States Air Force Academy (USAFA) Military Space Doctrine Symposium and Maj Charles D. Friedenstein, director, 1981 USAFA Military Space Doctrine Symposium in *The Great Frontier, Military Space Doctrine*, ed. Viotti, 1–3 April 1981, 1:ii–iv passim.

71. Ibid

72 Lupton, "Space Doctrines," 40–41; this perceptive is extracted from *On Space Warfare A Space Power Doctrine* (Maxwell AFB, Ala Air University Press, June 1988) See chapter 3 of this book

73 Ibid

74 Schriever speech, in *The Great Frontier, Military Space Doctrine*, ed Viotti, 27.

75 House, *Department of Defense Appropriations for 1984. Hearings before a Subcommittee of the Committee on Appropriations*, 98th Cong., 1st sess , 1983, pt 8 449 (hereafter cited as *1984 DOD Appropriations*)

76 Ibid , 433, Senate, *Department of Defense Appropriations for Fiscal Year 1983· Hearings before a Subcommittee of the Committee on Appropriations*, 97th Cong., 2d sess , 1982, pt. 1 389 (hereafter cited as *FY 1983 DOD Appropriations*), House, *Department of Defense Appropriations for 1983· Hearings before a Subcommittee of the Committee on Appropriations*, 97th Cong , 2d sess , 1982, pt. 4 459 (hereafter cited as *1983 DOD Appropriations*).

77 Senate, *Department of Defense Appropriations for Fiscal Year 1982. Hearings before a Subcommittee of the Committee on Appropriations*, 97th Cong., 1st sess , 1981, pt 4·735 (hereafter cited as *FY 1982 DOD Appropriations*).

78 Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1982. Hearings before the Committee on Armed Services*, 97th Cong., 1st sess , 1981, pt 7.4155 (hereafter cited as *FY 1982 DOD Authorization*).

79 Schichtle, *The National Space Program*, 82–84

80 Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1983 Hearings before the Committee on Armed Services*, 97th Cong., 2d sess., 1982, pt. 7 4612–13 (hereafter cited as *FY 1983 DOD Authorization*)

81 Ibid

82 O'Malley, "The Air Force in the Space Era," 6

83 "Use of Space for National Security," *Air Force Policy Letter for Commanders*, 15 January 1982.

84 Senate, *FY 1983 DOD Authorization*, pt 7 4854

85 Karas, *The New High Ground*, 19

86 Ibid , 19; Lupton, "Space Doctrines," 37, 45

87 Senate, *FY 1983 DOD Authorization*, pt 7 4853–64

88 Schichtle, *The National Space Program*, 84, "Reagan Space Policy Endorses ASAT Development," *Airspace Daily*, 7 July 1982, 26–27

89 Edgar Ulsamer, "Spacecom. Setting the Course for the Future," *Air Force Magazine*, August 1982, 48–55, Gen James V Hartinger, "The New Space Command," *Signal*, March 1983, 23–26, "Space Command· Facts about the Formation," *TIG Brief*, 13 September 1982, 13–14, "Space Command," *Air Force Magazine*, May 1984, 112–13, AFR 23-51, *Space Command (SPACECMD)*, 25 July 1983

90 AFM 1-6, *Military Space Doctrine*, 15 October 1982, Foreword

91 House, *1984 DOD Appropriations*, pt. 2:129–30

92 Ibid , 86–87

93 Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1984: Hearings before the Committee on Armed Services*, 98th Cong , 1st sess , 1983, pt. 5:2666 (hereafter cited as *FY 1984 DOD Authorization*)

94 Maj Gen William R. Yost, "National Space Policy and Aerospace Doctrine," *Air Force Policy Letter for Commanders. Supplement*, January 1980, 14

95. House, *1984 DOD Appropriations*, pt 8 475.

96 House, *Department of Defense Appropriations for 1985 Hearings before a Subcommittee of the Committee on Appropriations*, 98th Cong., 2d sess., 1984, pt 2 55 (hereafter cited as *1985 DOD Appropriations*)

97 House, *1984 DOD Appropriations*, pt. 8:466–68

98 Ibid

99 Ibid , 466, 477–78

100 Ibid

101 Ibid

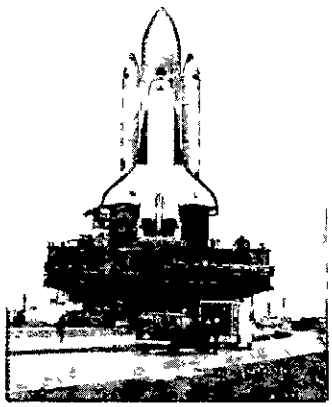
102. House, *1985 DOD Appropriations*, pt. 2:543, 683–84; *Air Force Policy Letter for Commanders*, 15 December 1984.
103 Lt Col Dino A. Lorenzini, "Military Space Doctrine Considerations," in *The Great Frontier, Military Space Doctrine*, ed Viotti, 1:179.
104 Lorenzini, "Space Power Doctrine," *Air University Review*, July–August 1982, 18
105. Col Cass Schichtle, *Policy and Organizations. The Next Step in the National Space Program* (Washington, D.C National Defense University Research Directorate, 1983), 48, 55–56.
106 AFM 1-6, *Military Space Doctrine*, 15 October 1982
107. Ibid ; House, *1984 DOD Appropriations*, pt 2 44, 130.
108. AFM 1-6, *Military Space Doctrine*, 15 October 1982
109. House, *1984 DOD Appropriations*, pt. 2.44, 130; Maj Charles D. Friedenstein, "A Critical Analysis of the First Air Force Manual 1-6, *Military Space Doctrine*," report 83-0800 (Maxwell AFB, Ala.· Air Command and Staff College, 1983)
110. "Reagan Seeks Boost for 'Subcritical' BMD Program," *Aerospace Daily*, 25 March 1983, 145–46
111. Ibid
112 Pertinent papers and discussions of the Strategic Defense Initiative are included in House, *1985 DOD Appropriations*, pt 5 665–829.
113 Ibid , pt. 2:24, 54–56, 162
114 Ibid.
115 Ibid
116 Draft AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, October 1983, 4–10; AFM 1-1, 16 March 1984, para. 2-2
117. House, *1985 DOD Appropriations*, pt 2·190–96, pt. 5:434–41.
118 Ibid
119 Ibid

Maj Gen James A. Abrahamson, associate administrator of NASA for the space shuttle program

Col Casper J Schichile, Jr , senior research fellow at the National Defense University

Lt Gen Thomas P Stafford, Air Force deputy chief of staff for research, development, and acquisition

Maj Gen Henry B Stelling, Jr , Air Force director of space



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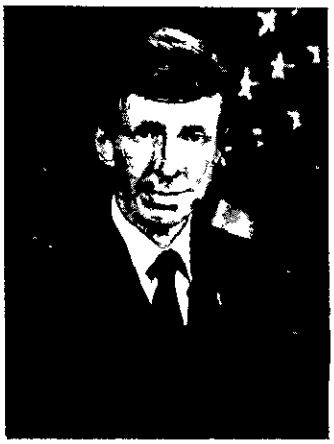


James P Wade, Jr , associate secretary of defense for atomic energy

CHAPTER 10

THE NEVER-ENDING QUEST FOR AIR FORCE DOCTRINE

"Basic air doctrine," stated the first edition of AFM 1-2, *United States Air Force Basic Doctrine,* in 1 April 1953, "evolves from experience gained in war and from analysis of the continuing impact of new weapons on warfare. The dynamic and constant changes in new weapons makes periodic substantive review of the doctrine necessary " Immediately following these sentences, however, the manual promised: "The application of this doctrine to the roles and missions of the United States Air Force will promote the effective employment of air power in military operations."[1] Gen Hoyt Vandenberg signed the foreword of the manual. The April 1954 and April 1955 editions of AFM 1-2 signed for authentication by Gen Nathan Twining did not include the sentence specifying a need for "periodic substantive review" of the doctrine [2] On the basis of the promise in the April 1953 edition that adherence to the prescribed doctrine would promote the effective employment of air power in military operations, Maj Rudolph P. Wacker, an Air Command and Staff College student in 1967, concluded that "there was apparently no doubt in any air staffer's mind that this early doctrine was infallible if applied. . . . The obvious implication was that we had applied all our past experiences and new weapons systems and had created an infallible doctrine."[3]

Recognition of a Need for Dynamic Doctrine

The basic text of the 1953 and 1954 editions of AFM 1-2 was virtually unchanged, and these manuals clearly reflected air experience in World War II. The main thrust of these manuals was that air power could be employed against the heartland of a nation and in peripheral areas of conflict; that weapons of mass destruction should be used in heartland attacks; that control of the air was essential in peripheral actions and desirable in heartland attacks; and that the final selection of targets must be based on military factors but that an enemy's emotional response to air attack must be considered for its psychological impact on his national will.[4]

The 1955 version of AFM 1-2 also stressed the lessons of World War II but reflected additional thinking from the Korean conflict and the cold war. The manual demonstrated the applicability of air power to deterrence but its main concentration was on how to apply force if deterrence failed. Air power's greatest opportunities lay in direct attacks against the enemy's heartland (his war-sustaining resources) but it could also conduct operations in his periphery (his air and surface

efforts). This manual concluded with the admonition: "The paramount consideration for the security and well being of the United States is the timely provision of adequate air power."[5]

In the early 1950s Maj Gen Lloyd Hopwood's reformation of the Air Command and Staff School (ACSS) at Maxwell AFB gave good attention to Air Force doctrine in the curriculum for field grade officers to Air Force doctrine. Hopwood encouraged student thesis analysis of extant Air Force doctrine and also personally delivered a lecture on air doctrine, which Lt Gen George G. Loving, Jr., who had been a student in ACSS in 1955–56, would remember many years later as being "extraordinarily good" and a "real influence on me."[6] As has been seen, the Air Force in the aftermath of the Defense Reorganization Act of 1958 elected to relieve the Air University of the responsibility for preparation of Air Force basic doctrine and to retain the function in an air doctrine branch under the deputy director for policy, Directorate of Plans. At this juncture there was said to be a school of thought on the Air Staff that air doctrine written in the AFM 1-2 manuals was immutable, inflexible, and so fundamentally sound as to require neither further justification nor analysis, but the Air Staff did not object to the Air Command and Staff School studying air doctrine.[7]

Especially in 1958–59 Air Command and Staff School student analyses of air doctrine were quite critical. In his paper assaying the effects of intercontinental ballistic missiles, Maj William Y. Smith (whose subsequent career would culminate with four stars) demonstrated that the 1955 AFM 1-2 emphasized offensive action, basing its conclusion on five characteristics of aircraft that made them incomparable offensive weapons: range, speed, flexibility, mobility, and penetration ability. Smith showed that a ballistic missile lacked the manned aircraft's principal advantage: flexibility. On the other hand, missiles were powerful offensive weapons for reasons other than those which made the aircraft a unique offensive weapon. Since Soviet ICBMs would open the United States to attack, Smith urged that AFM 1-2 was deficient in the scant attention it gave to defense. He wrote:

> The point here is not that the present air defense system is completely inadequate. The point is that present teachings of the Air Force do not satisfactorily stress the urgent requirement for a sound defense. In neglecting this facet of doctrine, present USAF doctrine neglects a vital portion of the Air Force's war mission.[8]

Smith recommended that "studies be initiated immediately to develop a 'symmetrical' air doctrine that would refocus Air Force thinking to give defensive actions a priority equal to that given offensive ones."[9] A consolidation of other student theses on Air Force basic doctrine pointed to the main announced objective of air power as being control of the air, to be attained by offensive air strikes on enemy bases. This meant in operations in peripheral areas, air control would demand air strikes on Soviet bases.

> Our emphasis, springing from our doctrinal position, has been on the deterrent effect of nuclear striking power and an air force designed to attain control of the air This emphasis, which dictates USAF operational requirements, is a natural result of our doctrine position. As a result, current theater commanders, faced with the prospect of limited wars of many categories, are not adequately equipped to plan for and conduct the wide range of actions necessary in this type of a conflict and must overcome by ingenuity the handicaps placed upon them by the inflexibility of our doctrinal position.[10]

Col Roy R. Walker offered still another recommendation in an Air War College thesis in April 1959, even though he recognized it was not likely to be adapted. Walker contended that AFM 1-2 be rescinded and not be replaced by any similar publication. Instead, the secretary of defense should require the Joint Chiefs of Staff to consider and recommend a national military doctrine for approval by the secretary of defense and the president. Following this, force doctrine—Army, Navy, and Air Force—should be written on a team principle within the parameters of the national military doctrine.[11]

As has been seen, the Air Staff refused to approve a suggested Air University revision of AFM 1-2 designed to reflect the impact of new weapons and defense reorganization, but a revised version of *United States Air Force Basic Doctrine* was issued under Gen Thomas D. White's authentication on 1 December 1959. This version contained very few changes from its three predecessors, the most notable exception acknowledging developments in missiles and space by replacing the words "air power" with "aerospace power." The new version described aerospace as the operational medium of the Air Force, "the total expanse beyond the earth's surface." To the list of predominant characteristics of aerospace forces—range, mobility, flexibility, speed, and penetration ability—was added "firepower delivery," manifested in accuracy, fast reaction, high rates of fire and launch, and the capability to employ maximum power weapons if necessary. Aerospace forces were to take advantage of every opportunity to exploit these characteristics. Thus it was said·

> Employment of Air Forces in the aerospace must be considered in terms of effects that are possible of achievement on the surface of the earth in both general and limited war, and effects to be achieved in space-oriented operations against hostile space vehicles, or in other operations not having a direct effect on earth areas and populations [12]

The manual replaced the old words of necessity—gaining a "dominant position in the air"—with a new objective of getting "general supremacy in the aerospace." Its new concluding admonition was:

> The aerospace is a medium in which freedom to operate during war will be of vital military significance That nation, or group of nations, which maintains predominance in the aerospace—not only in its military forces but also in its sciences and technologies—will have the means to prevail in conflict [13]

The 1959 manual outlined a military scenario ranging from general through limited war, cold war, and peacetime explorations of aerospace to advance man's knowledge. Since national survival was paramount, preparation for general war must have precedence, although forces for general war were expected to have limited-war applications. The problem of identifying and preventing "wars of national liberation" soon to be met in Southeast Asia was not foreseen.[14] The 1959 manual was the first basic doctrine publication to touch on space. Writing in 1973 Lt Col Donald L. Cromer pointed out that the basic doctrine manual series failed

> to address where a space doctrine fits in let alone what it should be . Leaving the subject as an implied part of doctrine runs the risk of misinterpretation, as well as requiring each individual or office to create his own doctrinal basis for space planning and employment The fact that we do not have a codified space doctrine stands as mute testimony of this premise [15]

Although the Air Force had mentioned keeping its doctrine "dynamic," the editions of AFM 1-2 issued in the 1950s were reminiscent of the state of past or present military art in that technology was driving doctrine rather than doctrine directing technology. Reminisced Eugene Zuckert, who became secretary of the Air Force in 1961:

> Frankly, I do not see quite the same degree of inventiveness in our concepts and doctrine that we have demonstrated in technology and in military adaptation to technological change... We can't afford to let military science, which governs the use of weapons, fall behind the physical sciences that create those weapons. More than that, military science, which includes doctrine, ideally should stay well ahead of technology to give technology meaningful direction.[16]

Especially in 1961, as already noted, Zuckert maintained that some Air Force leaders "were still approaching top-level problems of national security in terms of the concepts, doctrine, and study methods of the early 1950s."[17] Zuckert evidently was enforcing a new rule that Air Force doctrine should be designed to support national policy and strategy, which was different from the view of a pure military aerospace doctrine based upon the absolute capabilities and limitations of aerospace forces in peace and war. In terms of President Kennedy's flexible response strategy, AFM 1-2 placed excessive emphasis upon massive retaliation and mass destruction and did not give adequate emphasis to the application of precisely measured power in limited or general war.

In the recognized Air Staff breakout of responsibilities for doctrine development, the task fell to the deputy chief of staff for plans and operations and was subdivided between the director of plans (HQ USAF/XPD) and the director of operations (HQ USAF/XOP). As it happened, Maj Gen Jerry D. Page, who had been responsible earlier on at Air University for preparing the April 1955 edition of AFM 1-2, was director of plans in 1963 and his office was the office of primary responsibility (OPR) for Air Force Regulation 1-1, *Responsibilities for Doctrine Development*, dated 20 March 1963. For the first time this regulation clarified the

responsibilities for developing basic Air Force doctrine, operational doctrine, and unified doctrine. The regulation made Headquarters USAF/XPD responsible for preparing and disseminating basic doctrine and gave official guidance to the meaning of "basic aerospace doctrine" as follows:

> Basic aerospace doctrine sets forth the fundamental principles for employment of the US aerospace forces to support national objectives in peace and war. Directed toward the overall Air Force posture, it provides: (1) The fundamental reference authority for this employment, and thereby serves as the basis for all Air Force manuals dealing with the tactics and techniques in employment of aerospace forces (2) Information for military instruction in various schools throughout the Air Force and in other military services (3) Material for public and internal information programs (4) Positions supporting budgetary and procurement programs, and negotiations with other services [18]

The regulation provided that operational doctrine was "directed toward specific capabilities" and "developed in relation to specific categories such as tactical and strategic air operations." The responsibility for developing and submitting this doctrine was allocated to SAC, TAC, ADC, MATS, and the other operating commands, and the responsibility for monitoring the doctrine was assigned to Headquarters USAF/XOP. Unified doctrine was to be prepared for joint activities as directed by the Joint Chiefs of Staff. This directorate was responsible for determining the appropriate Air Force organization or command to develop doctrine required by JCS, and Headquarters USAF/XPD was responsible for monitoring the approval process through the Joint Chiefs. In a further allocation of responsibilities, TAC was made responsible for participating with the Army, Navy, and Marine Corps in the development of doctrine, procedures, tactics, techniques, training, publications, and equipment for joint operations that were the responsibilities of one of those services.[19]

Although AFR 1-1 was "official guidance," an ACSS student noted that the guidance was "sufficiently broad to permit vast interpretation in its formulation." "On the basis of this guidance, the basic doctrine could be presented in any number of ways: from a gigantic collection of tomes which happens to detail every foreseeable eventuality of employment, to a single page commander's concept of the 'don't shoot 'til you see the whites of their eyes' caliber."[20]

In 1963–64 Air Force Project Forecast made a comprehensive study of Air Force structure projectable into the 1965–75 time frame, and General Page headed the project's policy panel that sought to identify the goals of national policy that would influence development decisions within the Air Force. The findings of this panel became the grist for a new Air Force basic doctrine manual that would be written under Page's direction by Lt Col Richard C. Bowman, Lt Col George H. Sylvester, and Maj William E. Simons. Page explained to an interested interviewer that he felt strongly that "something new was needed." Although there was a precedent for doctrine to emerge from the scholarly efforts at the Air University professional schools, he considered that "there was a general lack of imagination and insight in the recent efforts from that quarter." As a consequence, Page said

his group undertook the job unilaterally, got the blessings of General LeMay on it, and published AFM 1-1, *Aerospace Doctrine, United States Air Force Basic Doctrine*, on 14 August 1964.[21]

Even a cursory glance through the August 1964 edition of AFM 1-1 reveals its radical departure from the AFM 1-2 manuals of the 1950s. A discussion of the requirement to support national objectives with a strategy of flexible response drew emphasis throughout. This discussion posited a spectrum of conflict wherein national leaders would select the best use of strategic and tactical forces. "The guiding principle in all crises is to limit the use of force to that compatible with particular conflict issues." "Defeat of the enemy," the manual said, "is the attainment of our specific political objectives."[22] The August 1964 manual, unlike its predecessors, did not include a discussion of the principles of war. Whereas range, mobility, flexibility, speed, penetration ability, and (in 1959) firepower delivery had been described as predominant characteristics of aerospace forces, the 1964 manual described required aerospace force characteristics as survivability, command and control (control must be centralized at levels high enough to exploit these forces fully), penetration ability, selective target destruction, and recovery and recycling. Range, mobility, responsiveness, and tactical versatility were said to be "military advantages" if the aerospace medium were exploited properly. The manual also addressed employments of aerospace forces in general war (discussing counterforce, countervalue, active and passive defenses, and requirements for mixed manned and unmanned systems), in tactical nuclear operations, in conventional air operations, and in counterinsurgency. The three less intense forms of warfare required traditional missions of air superiority, interdiction, close air support, airlift, and reconnaissance. The advanced state of alert of the Strategic Air Command during the Cuban missile crisis of 1962 was cited as an illustration of the manner in which manned systems could provide cold war demonstrations in periods of international crises. This doctrinal statement also urged the Air Force to pursue vertical takeoff and landing capabilities when nuclear weapons were used; this injunction did not appear in subsequent versions of AFM 1-1.[23]

In explanation of the objective for the AFM 1-1 1964 basic doctrine manual, the Air Force inspector general explained:

> Objective of the project is to assure a cohesive and supportable delineation of aerospace power and principles for its employment by today's unilateral and unified forces . A complete understanding of Air Force unilateral doctrine is required of all Air Force personnel responsible for developing doctrinal proposals with other services or unified commands Since the views of other services are considered in the development of unified/joint doctrine, an understanding of basic issues which involve the Air Force is required [24]

After the publication of AFM 1-1, the inspector general's brief called attention to the evolutionary change in Air Force concepts and doctrine: "Military concepts and doctrines undergo a constant process of evolutionary change to meet new

times, new ideas, new kinds of weapons." It pointed to a need for a broadly capable aerospace force:

> In this thermonuclear age, the aerospace force must possess a broad range of combat and peacekeeping capabilities It must be programmed and operated in close cooperation with the other services, each of which is a specialized increment of overall US military power . In discussing the four main kinds of aerospace operations— general war, tactical nuclear, conventional, and counterinsurgency— emphasis is placed on our increased options for military response in support of national objectives . . For all confrontations and conflicts, the US aerospace force must have the superior, usable capabilities needed to convince an enemy that any escalating step on his part would place him at an increasingly critical disadvantage [25]

The *Air Force Policy Letter for Commanders* called the new manual "timely reading." "The chapters on conventional air operations and counterinsurgency and the concluding chapter," the *Policy Letter* stated, "are worth reviewing."[26]

The Air Force Directorate of Doctrine, Concepts, and Objectives

In the same time span that the Air Force was enunciating AFM 1-1, the US Army was organizing its Training and Doctrine Command (TRADOC), effective on 1 July 1973, and this new combination of functional combat development centers collocated with Army educational institutions, plus a combat developments experimentation command, was going to be a fertile source of new Army doctrinal undertakings.[27] The shift to the strategy of flexible response was significantly increasing the role and size of general-purpose forces and generating new interservice roles and missions issues. Many of the initiatives of the other services appeared to infringe directly on Air Force roles and missions. Many observers concluded that the Air Force had been caught in a doctrinal and conceptual lag. It was against this background on 1 July 1966 in DCS/Plans and Operations that the deputy director of plans for advance planning was elevated in status and became the Directorate of Doctrine, Concepts, and Objectives (HQ USAF/XOD). The Directorate of Doctrine, Concepts, and Objectives was coequal with the Directorate of Plans and Directorate of Operations under deputy chief of staff for plans and operations. Headquarters USAF/XOD was given the mission: "To do hard thinking about the Air Force of the future . . . because of a continuing need for original, creative thought to help reason and guide the way to the future." This directorate included an aerospace doctrine division, concepts and objectives division, and an interservice liaison group.[28]

The initial director of doctrine, concepts and objectives was Brig Gen Richard A. Yudkin, who was promoted to major general on 1 July 1967. As remembered by Lt Gen George G. Loving, Jr , who, as a colonel in the Directorate of Doctrine, Concepts, and Objectives, was successively a staff officer, chief of the Doctrine Development Branch, and chief of the Aerospace Doctrine Division—the

directorate's work, like that of the Air Staff in general, was for a large part "always putting out fires." Loving said:

> Papers would come to be coordinated, and we would look at them from a doctrine viewpoint .. Fundamentally, we were defenders of the faith. . . . That was one aspect of the job, to try to defend our roles and missions in a rational way that would serve the Air Force well and serve the country well [29]

Loving remembered that everyone in this directorate worked for General Yudkin on whatever needed doing. One of the first XOD studies was an analysis begun on 21 June 1966 to determine what areas of close air support were not being fulfilled by the Air Force to the satisfaction of the Army. Headquarters USAF/XOD completed the analysis on 14 August and briefed the Air Council on 25 August. As already noted, General McConnell signed off on the principal recommendation on 8 September 1966, namely that the Air Force take immediate and positive action to obtain a relatively inexpensive, rugged, highly specialized close-air-support aircraft (the A-X). Another major study of 1966 was the tactical rescue-intelligence system enhancement (TAC/RISE). The Credible Comet study was initiated in 1967 to develop a concept of operations and recommendations for tactical air electronic work. Project New Focus was organized on a temporary basis in mid-1965 and received a permanent charter in June 1967 to explore, refine, and reduce points of differences between the Army and the Air Force in close air support, tactical airlift, tactical reconnaissance, and tactical air control.[30]

In the view of General Loving, the Air Force's decision to build the A-X (A-10) close-air-support fighter and to be "more forthcoming" on other tactical air issues with the Army broke the Army's incursions into Air Force roles and missions. By 1969 the Air Force and the Army were "cooperating actively," much of the logjam on Army-Air Force doctrinal manuals having been broken in a flood of mutually agreeable publications.[31] Air Force operational doctrinal manuals were principally prepared and negotiated in the Air Force operating commands, and in view of the multiplicity of tasks it performed the Tactical Air Command prepared most of the AFM 2- manuals which, after approval by the Directorate of Doctrine, Concepts, and Objectives, were published by the Air Force. The Joint Chiefs of Staff also from time to time directed the services to develop joint doctrine (called "unified doctrine" in AFM 1-1, 14 August 1964) for interservice approval and final action by the Joint Chiefs of Staff. Thus, in 1965 the Joint Chiefs of Staff approved a concept for air-space control in a combat area and directed the Air Force to develop joint doctrine in coordination with the other services. In February 1967 the Joint Chiefs of Staff requested the Air Force to develop joint doctrine for close air support of ground forces, and the Air Force instructed TAC to develop a draft of this. After countless drafts and long negotiations, all service chiefs approved the agreement on "Doctrine and Procedures for Control of Air Space in the Combat Zone" by 17 December 1975, 10 years after the project was laid on. The Air Force illogically published *Doctrine and Procedures for Airspace Control in the Combat Zone* as AFM 1-3, on 1 December 1975, thus putting the manual in the "basic"

AFM 1- category along with AFM 1-1.[32] By 1969 the proposed joint doctrine for close air support had been revised a fifth time; in 1972 deliberations on the joint CAS doctrine were still postponed. As has been seen, SACEUR requested that the NATO Military Agency for Standardization establish a working party to develop operational air doctrine for NATO. In some measure the preparation of NATO doctrine obviated some of the need for the stalled joint CAS manual. NATO doctrine was developed under the Military Agency for Standardization and was embodied in allied tactical publications (ATPs). The key Allied Tactical Publication (ATP) 33, *NATO Tactical Air Doctrine*, was ratified by the NATO nations and promulgated on 10 February 1975. Some 10 of NATO's subsequently published ATPs were of interest to the Air Force and were drafted in the beginning by working parties including Air Force representation. In the Pacific, an Air Standardization Coordinating Committee (ASCC) composed of members from the United States, Australia, New Zealand, Canada, and the United Kingdom, published combined doctrine as air standards (ASs). The Air Force was particularly concerned with AS 45-3, *Tactical Air Operations*, and AS 45-13, *Air Space Control in the Combat Zone*.[33]

When high-priority jobs came into the Directorate of Doctrine, Concepts, and Objectives, people in the Aerospace Doctrine Division inevitably were pulled off doctrinal manuals, and revisions of AFM 1-1 moved forward very slowly. One of the earliest reviews of the August 1964 AFM 1-1 was conducted by an anonymous US Army officer, who remarked: "One of the problems is that doctrinal statements are habitually written to be specific, even dogmatic. The military writer's desire to assert the 'truth' often leads him to resolve imponderables with fortification."[34] To this reviewer the Air Force manual implied that there would be an easy escalation from conventional to nuclear weapons since it was written that "factors of geography and relative local force levels may require US forces to use nuclear weapons in order to assure the timely defeat of aggression and to use technology rather than human lives to end the conflict on favorable terms."[35] The reviewer considered that the experience of 20 years seemed to indicate that military professionals should know that any decision to go to nuclear weapons would be "a very grave one."[36] At the Air Command and Staff College, Lt Col Walter S. Van Cleve found the 1964 AFM 1-1 very hard to teach, and upon assignment as a staff officer in the Aerospace Doctrine Division Van Cleve provided a revised draft of the manual emphasizing easier readability. He also wrote a popularly published chapter on "Aerospace Doctrine in Modern Conflict" before his transfer and death in combat in Southeast Asia.[37]

In the first half of 1967 a draft of AFM 1-1 representing experiences in Southeast Asia as well as old verities was circulated for comment to 21 selected senior officers, 35 air staff agencies, and key Rand personnel. A new draft was prepared in August 1967 incorporating the comments. Again in the spring of 1968 the draft was rewritten to improve format and language and "to improve the content." The lessons of the Middle East War of 1967, the Soviet invasion of Czechoslovakia in 1968, and progressive experience were inserted into the final preprint version of

AFM 1-1, circulated early in 1971. The revised manual was published on 28 September 1971 under the imprimatur of Gen John C. Meyer, Air Force vice chief of staff. This manual defined aerospace doctrine as "an authoritative statement of principles for the employment of United States Air Force resources."[38] The manual divided doctrine into basic doctrine (AFM 1-1), operational doctrine (AFM 2- and 3- series), functional doctrine, and joint (formerly unified) doctrine. Until this time no basic doctrine manual had envisioned "functional" doctrine that was designed to provide "guidance for the specialized activities of the Air Force such as research and development, personnel, training, professional education, communications-electronics, operations security, logistics, civil engineering, finance and budgeting, medical, intelligence, legal, chaplain, and administration."[39] Functional doctrine was published in subject series of manuals addressing specialized activities (for example, the 400- series for logistics) [40]

The September 1971 edition of AFM 1-1 extensively revised all chapters from previous editions, particularly those dealing with nuclear operations and special operations, this being the first version to devote an entire chapter to special operations and to elaborate on three elements: foreign internal defense, psychological operations, and unconventional warfare. Lessons from Vietnam and the Middle East War surfaced in an admonition:

> Though it is the keystone of the United States' deterrent posture, strategic sufficiency may not be a credible deterrent against hostile acts by small powers, whether such acts are initiated by those powers alone or while serving as proxies for larger powers Deterrence of these threats comes from the maintenance of sufficient general purpose forces capable of rapid deployment and sustained operations combined with the national resolve to deploy and employ these forces Thus, strategic and general purpose forces are complementary in providing an overall credible deterrent posture [41]

The earlier categories of general and limited war were replaced by chapters on conventional, low-intensity nuclear, high-intensity nuclear, and special air force operations. This version iterated basic air power tasks as counterair, close air support, interdiction, reconnaissance, airlift, and strategic attack. For the first time, subelement activities were specified such as search and rescue, electronic warfare, air refueling, airborne command and control, and psychological operations, and supporting functions such as logistics, communications, intelligence, weather service, and installation security. For the first time, there was a specific section on "The Role of the Air Force in Space," which was to ensure that no other nations gain a military advantage through exploration of space. It asserted that aerospace systems operations into space were "a natural and evolutionary extension of US Air Force mission responsibilities and operational capabilities." The manual referred to the inherent characteristics of aerospace forces as being range, mobility, speed, versatility, and flexibility. There was no enumeration of the principles of war or principles of employment of air power, except that regardless of the level of conflict central allocation and local direction remained fundamental.[42]

In an analysis of the 1971 edition of AFM 1-1 an Air Command and Staff College study group reporting in May 1972 found the manual to be more attentive to recognition of Air Force roles and missions and descriptive of capabilities required to perform tasks—but not principles of employment—than previous basic doctrinal manuals had been.[43] This change in emphasis may have represented a recognition that the Department of the Air Force was no longer responsible for warfighting but rather for the preparation of Air Force forces for combat employments by unified or specified commanders. In one of his last briefings on doctrinal divergencies among the services, General Yudkin concluded his remarks with an admonition:

> It is evident from the course of events in recent years that historical precedents, parochial logic and official function papers will not be determinant in decisions on which service has what missions, procures what hardware, or achieves what force level The race will normally go to the service that proposes the most in terms of imaginative concepts, substantial requirements, and forward looking solutions. This applies particularly in obtaining approval for initial or prototype hardware Once that is achieved, the tangible nature of hardware can provide the basis for demonstration, persuasion and further approval toward a program But the departure point for success—or if you prefer survival—is flexibility in our thinking, willingness to innovate and to change as we demonstrate the adaptability of our weapons systems and their unique responsiveness to changing news of national need. Starting from this departure point, we require highly developed capabilities to communicate and to focus our efforts in single-minded pursuit of identified objectives [44]

In 1971 Col David M. Murane had been the principal Air Force representative in the NATO air doctrine working effort, and in 1972 he became chief of the Aerospace Doctrine Division in time to see the 1971 edition of AFM 1-1 go into effect. He was somewhat rueful that the manual had gone through as many as 27 drafts in the seven years required for its publication, and he provided a not entirely jocular list of the factors that influenced the writing and coordination process: command background of those who coordinate AFM 1-1, current ongoing air operations, different perspectives or semantics, orientation of original drafter, whims of those who coordinate existing and past AFM 1-1s, current interservice issues, perceived need to comment whether needed or not, the way action officers think their bosses think, and how important the players feel the manual is. Murane also suggested that one of the major benefits of the preparation of the basic doctrine manual was the coordination process which forced at least a portion of the senior Air Force officers to contemplate basic air doctrine [45] During the drafting of the 1972 edition of the basic doctrine manual, Dr Alfred Goldberg of the Rand Corporation had lent assistance He too explained: "The process [of coordinating and approving AFM 1-1] has come to dominate the product."[46]

New Program Directions for Air Concepts and Doctrine

Beginning in 1970 there were a number of perhaps unrelated changes in players and responsibility in the field of air concepts and doctrine. Following the retirement of General Yudkin, Maj Gen Leslie W. Bray, Jr., became director of doctrine, concepts, and objectives (HQ USAF/XOD) in February 1970. General Bray was interested in forward-looking air concepts, speaking to this subject on a number of occasions. In August 1970 the Concepts and Objectives Division (HQ USAF/XODC) was reorganized into a concepts development branch (XODCC) for long-range conceptual planning and an objectives assessment branch (XODCO). In 1971 it was apparent that XOD was a prestigious organization: Col Carl H. Peterson, who took over as chief, Aerospace Doctrine Division remarked: "We were virtually deluged with high-quality nominees for assignment to the Directorate."[47] In response to direction by the Air Force Advisory Group, Project Rand reoriented its efforts toward strategy and doctrine in 1971, devoting a much larger share of its resources in support of the deputy chief of staff for plans and operations (DCS/P&O).[48] After a year's assignment as a research associate with the Council on Foreign Relations, General Loving was assigned as commandant of Air Command and Staff College at the Air University in June 1970. He would remain there until reassignment in January 1973. As seen earlier in connection with the assignment of responsibilities for basic doctrine to Washington, Air University had organized a concepts division in the new Aerospace Studies Institute in 1959, but with the passing of time the ASI Concepts Division declined in prestige. In 1971 Lt Gen Alvan C. Gillem II, the AU commander, judged that the Concepts Division might as well be terminated if he could not get good officers to staff it for advanced thinking. Accordingly, on 30 June 1971 the Aerospace Studies Institute was inactivated with a not inconsiderable saving in manning authorizations.[49]

At the Air University, General Loving startled General Gillem with a question: "When are we going to put the war back in the Air War College?" Loving observed that the study of war had been disappearing from the curricula of Air University schools over the years since he had been a student there. In the Air Command and Staff College, Loving said: "I sought to introduce war subjects en masse. I offered seminars and electives . . . , hopefully, to educate people more broadly in the application of airpower and to stimulate discussion."[50] The Aerospace Doctrine Division asked ACSC to study basic doctrine as one of its priority projects, and ACSC Student Guidance for Research Studies, class of 1972, provided basic guidance for an ACSC basic study group of four students and two ex officio faculty advisers from the school's military strategy and doctrine branch. The initial research project was divided into three main parts: (1) to rewrite AFM 1-1, (2) to record background data and discussion, and (3) to write a draft magazine article for publication. The following year, 1973, an ACSC basic doctrine study group was similarly constituted but built on the previous year's work and turned out two products: (1) a rationale for the content and organization of AFM 1-1 and (2)

specific recommended changes for certain sections of the manual that had been published in September 1971. Lt Cols Donald W. Smith and Haywood S. Hansell III were the ex officio faculty advisers on both years' work.[51]

The initial 1971–72 doctrine study group of Majs William R. Chambers, Don A. Clark, Geoffrey C. Davis, Jr., and Gerald W. Strut took as its starting point an investigation of the meaning and usage of basic air doctrine. It noted a statement made by Col Jerry D. Page in 1955 that basic doctrine was "the collection of essential fundamental truths of airpower." It also noted General White's dictum of 1955 that "the Air Force is a national instrument and evolves no doctrine, makes no plans and makes no preparations other than those clearly and unmistakably called for or anticipated by the national policy." The study group did not consider these two approaches to be mutually exclusive. It stated:

> Basic doctrine represents Air Force fundamental precepts which guide the employment of airpower within the framework of national policy. . . . Guidance from the President, Congress, and Secretary of Defense, combined with the Department of Defense budget process, has a major influence on Air Force doctrine. Therefore political constraints become significant in military strategy and as a result basic doctrine becomes responsive to external pressure. Basic doctrine achieves its value as a single, comprehensive listing of fundamental philosophical principles concerning employment of airpower.[52]

The ACSC 1971–72 study group undertook to prepare a new version of AFM 1-1 and to record its rationale for its thinking. The group's draft manual included three chapters: first, the environment in which air power would operate; second, the characteristics, capabilities, and employment principles of air power; and third, the employment of aerospace forces in modern conflict. Chapter 1 actually concerned the dynamics of modern conflict. It determined that deterrence was "the basic premise on which US Air Force doctrine is constructed." It adopted the continuum of conflict used by Secretary of Defense Laird—strategic nuclear war, theater nuclear warfare, theater conventional warfare, and subtheater or localized warfare—and added peaceful competition. This spectrum of conflict provided an added dimension to a continuum of warfare and found that the potential for limited objectives was implicit in multilevel conflict. The study group pointed out that chapter 4, "Aerospace Forces in High-Intensity Nuclear Operations," of the September 1971 AFM 1-1 was implicit in identifying winners and losers in conventional warfare, something that was outdated by the arrival of a US-Soviet mutual destructive capability. "The bargaining process," wrote Major Strut, "presents an alternative to nuclear confrontation and must be adopted as a cornerstone of our strategic strategy."[53]

In chapter 3 of the recommended AFM 1-1, Major Davis used a concept that aerospace forces had inherent characteristics that gave those forces unique capabilities which if properly employed could attain desired effects. Actually it was hard to separate "characteristics" from "capabilities." Nevertheless, the group agreed that speed, range, tactical versatility, and observation were characteristics of aerospace forces not possessed in the same degree by surface forces.

Capabilities of aerospace forces derived from these characteristics included flexibility, responsiveness, survivability, and surveillance. The group noted that the principles of war had not been included in Air Force basic doctrine since 1959. The principles had been violated considerably, particularly in Vietnam The group urged that the principles of objective, offensive, concentration, surprise, security, and unity of effort were "Air Force basic beliefs and should be included in subsequent manuals . . . Being guides for employment, these principles must be constantly interpreted in light of the changing capabilities of aerospace forces and the unique experiences of airmen." As a concomitant to the principles of war it was obvious that: "Aerospace forces are an entity, aerospace operations require centralized control and decentralized execution, and aerospace forces should be used in the offensive at the start of hostilities." Chapter 3 also demonstrated that aerospace forces produced desired military, political, and psychological effects, the interrelation of which was not always understood. Thus:

> A military victory can be a psychological defeat. The 1968 Tet offensive was a military victory by the United States but a political and psychological victory for the Viet Cong The psychological effects of the Japanese bombing of Pearl Harbor united the American people against a common enemy The psychological effects of all operations must be considered to ensure the proper employment of aerospace forces [54]

Chapter 3 of ACSC draft AFM 1-1 was the principal responsibility of Major Chambers and essentially was an encapsulated combination of four chapters of aerospace oeprations in the 1971 basic doctrine manual. The draft chapter was organized to present (1) the dynamics of modern conflict, (2) the basic employment tasks, (3) the total force concept, (4) the mixed force concept, and (5) the five categories of conflict where air power might play a significant role. Chapter 3 also reflected a view that AFM 1-1s since 1959 had deviated from enunciation of basic doctrine by omitting principles of employment and emphasizing descriptions of operational tasks. To come to grips with the essence of air employment principles, Major Chambers rationalized:

> The Navy regards freedom of the seas as necessary in modern conflict. The Army considers mobility, firepower, and staying power to be prime factors. I believe that air superiority will be the decisive element in the majority of future conflicts The requirement for air superiority is most apparent when the enemy has the ability to conduct significant operations in the aerospace medium If it is not possible to establish air superiority, we must, at least, have the capability to neutralize the enemy's effective use of aerospace. Otherwise, it may not be possible to conduct military operations of any type [55]

In consideration of the early work of the Air University schools, the Aerospace Doctrine Division, now headed by Colonel Murane, in the last half of 1972, concluded that revisions of AFM 1-1 were needed to restate more clearly basic air doctrine in relation to changing national strategies and to take into account the impact of such things as arms control initiatives, new basic concepts, and technology. In 1971–72 the Directorate of Doctrine, Concepts, and Objectives was

tasked to provide an Air Force definition of the Triad concept and an Air Force view of Secretary Laird's total force concept. The Southeast Asian War, the October 1973 War, and a growing focus on European defense spawned a proliferation of "deep strike," "deep interdiction," "air support of ground forces," and "general support of the battlefield" issues.[56] In an appearance at the Air Command and Staff College's block of instruction on air doctrine, Colonel Murane furnished a revision of AFM 1-1, which with a few exceptions followed the organization and language of the 1971–72 ACSC study group's draft manual. Added was a description of the strategic Triad which was the mixed offensive force of manned bombers, land-based missiles, and submarine-launched missiles. Also added was a description of the total force and the statement that: "US active duty, U.S. Reserve, and allied military forces and resources constitute an entity possessing capabilities that can be applied in unique and innovative ways to support deterrence and provide mutual security."[57]

In Washington in June 1974 a draft version of a new AFM 1-1 was at hand, and in September it was briefed to the Air Force Council where the vice chief of staff directed each member to read and comment on it. He also directed that a copy of the proposed revision be sent to Dr William W. Kaufmann, special assistant to the secretary of defense. The chief of staff approved the draft and changes on 4 November, and on 15 January 1975, AFM 1-1, *Aerospace Doctrine: United States Air Force Basic Doctrine*, was printed. In the foreword Gen David C. Jones stated.

> USAF Basic Doctrine is derived from knowledge gained through experience, study, analysis and test. It evolves from changing military environments, concepts, and technology; and through continuing analysis of military operations, national objectives and policy This evolution must be a continuing process so that basic doctrine can remain a useful guide for the conduct of aerospace operations [58]

The manual defined the kinds of doctrine as basic, operational, functional, joint, and combined. Doctrine for joint operations was established by the Joint Chiefs of Staff Doctrine for combined operations was included for the first time in AFM 1-1 and constituted and established "the principles, organization, and procedures agreed upon between allied forces or agencies in combined operations." The philosophy of "sufficiency" was emphasized and the strategic Triad was identified as the highest national defense priority. There was new thought on the effectiveness of aerospace forces when evaluated in terms other than ability to destroy targets, as for example in deterrence, persuasion, and coercion. In this measure logistic support was directly influential on operational capability and so merited attention. Successful accomplishment of the Air Force mission was also predicated on the timely availability of trained and motivated people. In 1974 a Directorate of Doctrine, Concepts, and Objectives briefing on space for the Air Force Council left unresolved whether the Air Force should seek formal recognition of its space mission or whether the Air Force should diffuse space activities into operational commands. The 1975 AFM 1-1 noted that Air Force principles relating to space operations were consistent with the peaceful use of space. "There is, however, a

need to insure that no other nation gains a strategic military advantage through the exploration of the space environment "[59]

In an exegesis of Air Force doctrinal development and the AFM 1-1 of 1975, Lt Gen John W. Pauly, deputy chief of staff for plans and operations, wrote:

> We assert that Air Force basic doctrine is alive and well. History shows that our doctrine has been responsive to changing times and philosophies while maintaining a consistent thread of fundamental principles We can conclude that our doctrinal process is a discipline—a discipline for dealing with new concepts, technology, and roles and missions relationships with other services or allies It serves to sharpen the debate by providing a framework of time-proven principles against which we can illuminate and test contending ideas now and in the future However, in the final analysis, the most important function of doctrine is that it provides the fundamental guidance for the employment of aerospace forces in combat In the experience of three major wars—World War II, Korea, Southeast Asia—we have seen a consistent thread of basic doctrine encompassed in the most fundamental of principles: that air power is an entity and is best employed under the centralized control of a single authority who is at a level that can best orchestrate the total air effort.[60]

After 1970, with Maj Gen Leslie W. Bray in charge, the Directorate of Doctrine, Concepts, and Objectives gave more attention to the development of Air Force concepts than to the recording of doctrine. In 1971 one way to develop ideas was conceived to be "think pieces" called concept development papers. One of these was on the development of long-range cruise missiles for the 1980s. In 1972 Col Kenneth L. Moll, chief of the Coordinated Action Plans Division, conceived of the preparation of an Air Force Future Concepts Project Workbook that would narrate where the Air Force should go and how to get there. This project proved to be "much tougher than originally conceived,"[61] but it provided basic thinking behind a "tactical counterforce" or second-echelon attack strategy. At General Bray's retirement on 30 September 1973 he was replaced as director of Doctrine, Concepts, and Objectives by Maj Gen William Y. Smith, who had prepared his Air Command and Staff School thesis in 1958–59 on the relationship of intercontinental missiles to conceptual air power. On 4 October General Smith told his division chiefs that he wanted to get approval for an ad hoc Air Staff study like Project Forecast to determine future long-term needs and priorities. As it happened the Air Staff was opposed to a large study, but in the latter part of 1974 an ad hoc Air Staff study group headed by Brig Gen John E. Ralph, who had replaced General Smith on 1 July 1974, laid on New Horizons II, 1985–2000. In the early months of 1975 seven study panels tackled such subjects as laser technology, future in space, and night/adverse weather technology. The results of New Horizons II were presented to the Air Force Council on 3 March and to the under secretary of the Air Force on 21 March. As has been noted, in September 1974 General Jones tasked an Air Staff ad hoc group to develop a reorganization plan for Air Force forces in the Pacific. These studies broadened into a concept propounded in the Directorate of Doctrine, Concepts, and Objectives and described as "Tight Belt East" and "Tight Belt West," in which the Tactical Air

Command would have been assigned all worldwide tactical air resources less operational control that would have been retained by CINCUSAFE and CINCPACAF. In 1974, it seemed that "Tight Belt West" would have disestablished PACAF and transferred management functions to TAC, but the proposition quietly fell through in 1975.[62]

On 24 November 1973 Gen George S. Brown as Air Force chief of staff signed a charter for an advanced concepts advisory group—which would be better known as the Air Force's six-man group—to explore new concepts, strategies, and programs for development and employment of US air forces in support of national policies. General Brown wanted in-house, free-flowing ideas, uninhibited by previous or current positions or parochialisms. In the months that he continued as chief of staff, General Brown frequently met with the group and exchanged ideas without attempting in the least to channel thinking. Members of the group, formally put on orders on 22 February 1974, were Cols John L. Piotrowski, Stuart W. Brown, Robert W. Kennedy, William H. L. Mullins, Robert H. Reed, and Leonard J. Siegert After a review of several possible locations, the six-man group elected to settle in at the Air University to escape the "activity trap" of the Washington area. The group had free access to commands, activities, and staffs throughout the Air Force and after the first three months of visits throughout the Air Force it reported: "We are so preoccupied with day to day [concerns] that we have little focus on the future. Our strategic thought has stagnated. We may be letting contemporary doctrine, policies, international agreements and negotiations inhibit our vision of the future."[63] After visiting the commands, the group developed a master list of potential research subjects, many of which proved either too broad for the group or beyond the expertise of group members. During June–November 1974 individual members of the six-man group pursued subjects of their interest; in November 1974 a meeting between General Jones, now Air Force chief of staff, and Lt Gen Felix M. Rogers, Air University (AU) commander, put the group—reorganized into a four-man panel (4-M Panel A)—under General Rogers's operational control. The six-man group already had begun to use student researchers from the Air War College, and the employment of AU students on desired subjects, either individually or in panels with 4-M participants, was the practice. Under the new 4-M charter, 10 very significant concept feasibility studies were completed for the chief of staff. These studies focused on subjects such as Air Defense Command fighter force consolidation, alternatives to Air Defense Command functions and resources, disestablishment of the Air Force Headquarters Command, and realignment of the functions of the Air Force Directorate of Doctrine, Concepts, and Objectives. The original concept of the six-man group specified no particular length for its operation, and by January 1975 the Air Force decided to deactivate the group effective 1 June 1975. The most influential factor in this decision was the need to use a structured environment and to eliminate the free-thinking, unstructured aspect of the original idea.[64]

At its beginning the Directorate of Doctrine, Concepts, and Objectives (HQ USAF/XOD) had been established against a background of belief that the

initiatives of the other services were infringing directly upon the Air Force's assigned roles and missions and that the Air Force was caught in a doctrinal and conceptual lag. One of XOD's principal functions was to be the formulation of long-range concepts, objectives, and strategy, but most of its work dealt with current and near-term issues relating to doctrine, roles, and missions. The doctrine development function of XOD, moreover, turned out to be rather narrow in scope, confined principally to Air Force basic doctrine and developing inputs to new joint or combined doctrine initiatives. In 1974 the Directorate of Doctrine was reported to be so busy putting out fires that there was little time to think at leisure: "Sometimes we feel we are so busy stamping ants," commented one officer in the division, "we let the elephants come thundering over us."[65] By 1974 the "review and comment" work of XOD was largely supportive of the Joint Chiefs of Staff process administered by the Directorate of Plans, and roles and missions issues were being handled routinely in the JCS process as a general rule. The importance of a Headquarters USAF/XOD "interface dialogue" with its component on the Army staff had been reduced when the Army decentralized its doctrinal and conceptual functions to the new Training and Doctrine Command (TRADOC), and the TAC-TRADOC connection became important in addressing and proposing resolutions to outstanding doctrinal and roles and missions issues. Perhaps more significantly, the centralization of decisionmaking in the Department of Defense and its attendant policy, planning, and programming process had tended to shift emphasis away from roles and missions arguments to broader-based decision factors such as costs, effectiveness, vulnerability, survivability, total force, force interdependence, mutual reinforcement, and strategic arms limitations talks. The four-man panel considered this background and proposed in its concept feasibility study on realigning the doctrine, concepts, and objectives functions and responsibilities, completed in January 1975, that the Directorate of Doctrine, Concepts, and Objectives be disestablished; that the directorate's day-to-day doctrinal, conceptual, and roles and missions be transferred to the Directorate of Plans (HQ USAF/XOX); and that a small doctrinal and conceptual studies center be established at Air University. In the shuffle it was proposed that the personnel of the Aerospace Doctrine Division be transferred intact to the Directorate of Plans.[66] The incumbent chief of the Aerospace Doctrine Division, Col Ray L. Thompson, was given the task of rebutting the four-man panel study, but the task of defending the status quo failed—though not to the extent recommended by the panel study. Aiming to get added conceptual thinking on the future of the Air Force, General Ralph put reorganization planning in motion before he was succeeded on 3 November 1976 by Maj Gen John S. Pustay. Two days later the Directorate of Doctrine, Concepts, and Objectives became the Directorate of Concepts (HQ USAF/XOC) under the Directorate of Plans (HQ USAF/XOX), deputy chief of staff, plans and operations. In this reorganization the doctrine development branch (HQ USAF/SOCDD) was placed under the Concept Implementation Division (HQ USAF/XOCD) of the Directorate of Concepts (HQ USAF/XOC).[67]

Another Air Staff reorganization effective on 30 June 1978 established the deputy chief of staff for operations, plans, and readiness, but left the doctrine junction under the Directorate of Plans, assistant deputy directorate for strategy, doctrine, and long-range planning. In this organization the Directorate of Plans remained the single point of contact for the development of all air doctrine, to include the Air Force's contribution to joint and combined doctrine. Headquarters USAF/XOX developed, coordinated, and published basic doctrine in the AFM 1-series. It maintained a doctrine coordinator to manage the development of operational doctrine by appropriate agencies within the Air Staff, the major commands, or the separate operating agencies. It also maintained a doctrine coordinator to manage the preparation, in conjunction with appropriate coordinating agencies, of joint and combined doctrine.[68] In continuing changes, the Doctrine and Concepts Division (XOXLD) was established on 8 January 1979, first under the Deputy Directorate for Long-Range Planning (XOXL) and then, effective on 15 October 1980, as the Doctrine and Concepts Division (XOXID) under the Deputy Directorate of Doctrine, Strategy, and Plans Integration. This latter organization functioned as the office of primary responsibility for Air Force positions on the formulation of basic, joint, and combined operational doctrine, US military strategy and national security policy, basic long-range objectives, war and mobilization planning, and policies and procedures for Air Force-wide mission area analysis.[69]

In January 1975 Col Ray L. Thompson, chief of the Aerospace Doctrine Division, conceived of an added undertaking to provide short, thought-provoking papers that would introduce and clarify long-term issues and stimulate discussion. This effort was known as the "Conceptual Issue Series," and it produced some publishable papers, one being Maj Dennis W. Stiles's "Air Power. A New Look from an Old Rooftop."[70] This beginning was expanded into a more formal "Concept Issue Papers" series and occasionally put out at security classifications no higher than secret to enable as wide a readership as possible The Doctrine and Concepts Division prefaced this CIP series with the statement:

> Concepts are general ideas—dynamic in nature, open ended, and ever evolving They are useful in understanding issues of today and tomorrow They are the basic building blocks of doctrine, operational principles, and the planning process They provide the glue to bind doctrine, technology, hardware, force structure, and force employment Concepts found in the CIPs may be new or they may review and focus on old proven ideas of airpower employment. Ultimately, they will be used as a basis for changes in Air Force doctrine [71]

On 25 August 1978, Lt Col Thomas A. Cardwell III of the Doctrine Section (HQ USAF/XOXFX), Assistant Deputy Directorate for Strategy, Doctrine, and Long Range Planning, issued the first of what would prove to be a substantial doctrine information publication (DIP) series. The DIP-1 was titled "So You Want to Know About JCS Pub 2." DIP-2, "How USAF Doctrine is Developed," soon followed on 5 October 1978. As will be seen shortly, DIP-2 was influential in defining the

parameters of the new AFM 1-1 that would be published on 14 February 1979. The DIPs were printed and widely distributed; some were exhaustive documentation on the rationale of Air Force doctrine DIP-10, "Background Information on Air Force Perspective for Coherent Plans (Command and Control of TACAIR)," dated 24 April 1981, was widely circulated to ensure that Air Force officers assigned to joint and combined staffs worldwide understood all warfighting and command provisions in JCS Pub 2, *Unified Action Armed Forces* (UNAAF). Current Air Force positions on unified and joint command were again broken out in DIP-12, "Command Relationships," published in June 1984.[72]

In the Aerospace Doctrine Division of the Directorate of Doctrine, Concepts, and Objectives, weekly discussions were held in July and August 1975 to determine why the Air Force needed an AFM 1-1 basic doctrine manual and whether the current 15 January 1975 version of AFM 1-1 satisfied Air Force needs. Whereas the 1975 edition had been designedly restricted to principles for employment of US air forces, it was concluded in the latter part of the same year that the manual was "too conceptual for the broad Air Force audience it should reach." It overlooked other fundamental Air Force responsibilities for organizing, equipping, and training Air Force forces. On 15 August 1975 an outline for a new expanded AFM 1-1 went to General Ralph, who approved it but wanted more coverage of the expanding Air Force role in space. Research on the new version was completed in February 1976, and a new draft was completed in May 1976. In September 1976 the draft was sent out to some 60 general officers. The draft sought to provide a document that was interesting, relevant, and useful to all Air Force organizational levels. Emphasis was given to simplified languages. A new approach was also followed, and graphics, illustrations, and quotes were used to break up the format.[73]

The ongoing version of AFM 1-1 during 1977 provoked questions about the Air Force's doctrine structure: the AFM 1- series for basic doctrine, AFM 2- for operational doctrine, and AFM 3- for mission employment tactics. If it were true that operational doctrine and mission employment tactics derived from basic doctrine, then it would have been expected that the subordinate manuals should change as basic doctrine changed. But after 1953 basic doctrine manuals had been revised on an average of every three and one half years whereas AFM 2- and AFM 3- manuals were seldom changed. "The absence of change in subordinate manuals," pointed out Lt Col Donald L. Hutchinson, special assistant to the ACSC commandant for doctrinal and conceptual matters, "suggests that there is no real thread running through our doctrinal manuals."[74] When officers attending the Air Command and Staff College were asked to review the in-work 20 May 1977 draft of AFM 1-1, they were unsure whether the changes incorporated in the draft were fundamental changes in Air Force beliefs or just a different author's approach. Many students observed that AFM 1-1 was trying to be all things to all readers.[75] Such reactions to the work of Washington doctrinal developers convinced them that the general problem with Air Force doctrine was that "there are simply no 'handles' on doctrine."[76] Early in 1977 the Directorate of Plans ordered an

initiative to study the Air Force doctrine program with a view to establishing the appropriate identity of doctrine, locating problem areas, and recommending changes. The research phase involved Air University students and support from the US Air Force Academy, the work of Capt Robert C. Ehrhart of the USAFA History Department being notable. On 4 July 1977 Headquarters USAF/XOCDD published for review a study titled "Concept for Reasoned Change in Air Force Doctrine."[77]

Major Ehrhart would write on the basis of his work on the doctrine development initiative:

> A fundamental problem with Air Force doctrine is the absence of any real consensus as to what doctrine is and just what it is supposed to do We want doctrine to reveal not only the capabilities of air forces but also to offer guidance on how best to use these capabilities We demand that doctrine be both enduring and flexible, that it be valid over time yet responsive to change. We look to doctrine to provide guidance to Air Force personnel, while insisting that it remain open to interpretation. We want it to provide direction, yet not be too restrictive in its direction We expect doctrine to guide research and development while at the same time it adjusts to technological innovations And we insist that doctrine set out fundamental principles for the employment of air forces, while demanding it remain subordinate to national policy ... By trying to stretch a single term, "doctrine," to accommodate all things, we wind up with an amorphous concept that falls short in all areas This criticism is not merely quibbling with semantics· The inability of Air Force people to understand the essence and purpose of doctrine is largely the result of trying to include too much under one umbrella word [78]

Major Ehrhart proposed that the way to solve the complexity was to define doctrine more closely, namely:

> Air Force doctrine is the body of enduring principles, the general truths and accepted assumptions, which provide guidance and a sense of direction on the most effective way to develop, deploy, and employ air power It should not encompass either political influences or specific instructions on the execution of these principles [79]

In his participation in the doctrine development initiative, Lieutenant Colonel Hutchinson (then a major) agreed that a simplified definition of "doctrine" was in order. He would write:

> When the fancy wrappings are removed from the various official definitions of doctrine, two important and critical points remain One is that doctrine is what we believe There is active discussion concerning the process by which we arrive at this belief—whether it is derived from distilled experience or hypothesized in an analytical manner—and whether, based on the process, the belief is worthy to be titled doctrine . The second point is that doctrine is what we teach This includes both formal and informal instructions as well as the learning acquired through socializing. Therefore, doctrine, in a nutshell, is what we believe and teach [80]

At ACSC in 1977–78, Major Hutchinson was research adviser to Maj Douglas S. Hawkins, who prepared a thesis, "Concept for Reasoned Change in Air Force Doctrine," that was a prescient analysis of the Air Force's need for an improved

framework (taxonomy) for describing and categorizing doctrinal thought. Before assignment to ACSC, Hutchinson had been a planning and programming officer in the Concepts Directorate in Washington, and his analysis of the difficulty of the Air Force in recording its basic doctrine led him to suspect that the basic cause was the "inability to deal with the concept of varying levels of abstraction in our belief." He observed:

> Staff agencies, regardless of level of command, do not normally *develop* doctrine but merely *record* the lessons learned or the ideas developed by users and doers in a particular activity. . . . The recorder's job is to gather all pertinent information in a particular area and then, by a process of inductive reasoning, remove the essence at the appropriate level of abstraction to satisfy the needs of the organization To me the most difficult task encountered by the recorder of doctrine is the establishment of the various levels of abstraction into which the beliefs of the organization will be classified An equally difficult task is the grouping of beliefs that are on similar levels and then integrating these groups into the established hierarchy of doctrinal abstraction. It should be noted that this hierarchy of beliefs is a continuum and flows from the most abstract "truths" (basic doctrine) to very concrete notions (procedures). In the Air Force, we have failed to label beliefs at these lower levels as doctrine. We call them "tactics," "techniques," "standard operating procedures," "office policy," or some other well intended name. They all have one thing in common, however. They all reflect what we believe is the best way to accomplish a specific task and can, therefore, be considered doctrine.[81]

Hutchinson went on to attribute the difficulty in recording basic doctrine as being the usual attempt "to get agreement on beliefs at less than a general level, which has led to the inclusion of material to satisfy special interest. As a result, we have something we call 'basic doctrine' that is really a compilation of many subjects of which only one is doctrine."[82] "Basic doctrine properly recorded," Hutchinson said, "would be as useful to the Air Force as was the US Constitution's Bill of Rights is to the United States."[83]

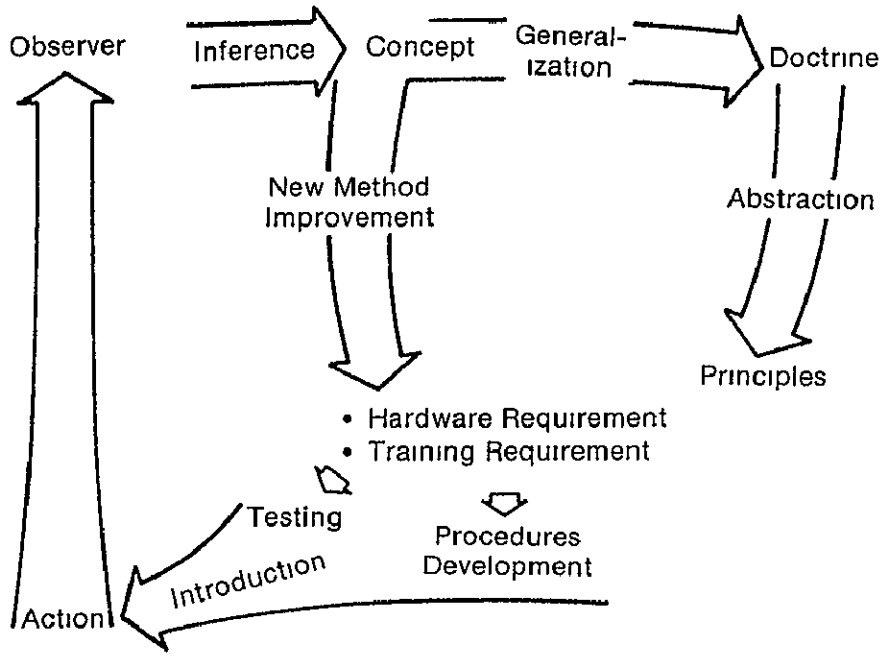
The results of the doctrine development initiative were put on paper in "Concept for Reasoned Change in Air Force Doctrine." The study recommended a restructuring of Air Force doctrine by combining basic and functional doctrine, thus resulting in basic, operational, joint, and combined categories of Air Force doctrine.[84] These decisions were going to be incorporated in a new edition of Air Force Regulation 1-2. Meanwhile on 5 October 1978 Lt Col Thomas A. Cardwell III and Lt Col David R. McNabb published DIP-2, "How USAF Doctrine Is Developed," which incorporated and somewhat elaborated on the new AFR 1-2, *Assignment of Responsibilities for Development of Doctrine and Mission Employment Tactics*, which was published on 22 November 1978. The categories of doctrine were Air Force Basic Doctrine, which "states the fundamental principles for the employment of aerospace forces in support of US national objectives . . . Additionally, AFM 1-1 provides guidance for the specialized activities of the Air Force"; and Air Force operational doctrine, which was "the expansion of the principles stated in the basic doctrine governing the organization, direction, and employment of aerospace forces in the accomplishment of the Air

Force missions." These categories of Air Force doctrine were accompanied by Joint Doctrine and Combined Doctrine. Air Force Mission Employment Tactics (the old AFM 3-series) were said to be logical extensions of Air Force doctrine. It was explained that:

> In short, USAF doctrine is what we believe concerning the use of aerospace forces Within the USAF, doctrine (1) Defines and explains the roles, missions, and tasks of the Air Force; (2) Provides a guide from which weapons development decisions are made, (3) Provides guidance on the interrelationships of Service roles and missions; (4) Is the basis for mission area analysis and force planning; and (5) Provides a point of departure for every activity of the Air Force [85]

AFR 1-2 assigned responsibilities for developing doctrine and mission employment tactics throughout the Air Force. DIP-2, on the other hand, gave an explanation of how doctrine was to be developed. And a follow-on, CIP 79-3, "Concept Development—What Is It? and Who Needs It?" issued in December 1979, further related concepts to doctrine. DIP-2 postulated that doctrine development was "a product of history—what has happened and what we believe—and today's environment—a systems approach to the present. It operates in a dynamic environment. Doctrine provides the bridge from our past through the present to the future."[86] A diagram provides a look at the historical approach to doctrine development:

Doctrine Development



In terms of the diagram, development started when an observer saw an action that appeared to be about the same each time it occurred. For example in air-to-air combat, attacks from out of the sun or from six o'clock in a blind spot was a distinct advantage. This observation was inferred into a concept that to do this was wise, and a doctrine statement would have it that an attack should include a combination of deception, rapidity, and unexpectedness. CIP 79-3 used the same diagram to explain how "concept development is the forerunner of doctrine, and part and parcel of the doctrinal development process."[87] "Both conceptual and doctrinal development are logical aspects of the planning cycle. However, 'doctrine' builds on the past as well as on new concepts; and 'concepts' gropes for the future, with doctrine serving as a point of departure."[88] The CIP elaborated:

> The essential and important aspect of concept development in relationship to doctrine as well as long range planning is that it is *the* dynamic modifier of an otherwise more or less rigid set of rules and projections which serve as the basis for coherent and goal oriented action Concept development is responsible for the continuous revision and update of doctrine It insures that doctrine and planning never remain static and by so doing precludes it from becoming doctrinaire.[89]

But in addition to the historical genesis of doctrine, DIP-2 pointed out that doctrine also was shaped by environmental pressures external to the Air Force. The systems approach to doctrine development was compelled to examine events from the environment in a dynamic perspective. DIP-2 used this diagram to explain the influence of environment in doctrine: As the diagram indicates, national objectives and strategy provided the base, foundation, and anvil used to define doctrinal statements on issues, functions, missions, and the future.[90]

Environment for Doctrine Development

In the same months that the doctrinal development initiative was generating thinking, the doctrine development branch, Directorate of Concepts, was continuing the redrafting of the proposed AFM 1-1, which in the new frame of reference was to be titled *Functions and Basic Doctrine of the United States Air Force*. The composition of the manual would be quite different from its predecessors with large type, numerous headlines, catchphrases, line drawings, diagrams, portrait drawings, and numbers of quotations. It was designed for an expanded audience of career civilians, airmen, noncommissioned officers, military officers, and the general population. The manual was published on 14 February 1979, and in his signature letter Gen Lew Allen wrote: "Whether you are enlisted, an officer, or a civilian in the Air Force family, I believe this manual will help you to think sincerely about why we are in business – why we have an Air Force, and what it must be ready to do in the next 30 years and beyond."[91] Possibly because of language and format, there was an ongoing rumor that the 1979 edition of AFM 1-1 was written to "tell the Air Force Story" rather than as a doctrinal manual to prepare a military force and its commanders for war.[92] The manual focused upon the role of the Air Force in preparing air forces for combat, declaring: "The mission of the United States Air Force is to prepare our forces to fight to preserve the security and freedom of the people of the United States."[93] As a matter of fact, Headquarters USAF/XOCDD had originally conceived of battle doctrine as a chapter in the new AFM 1-1, perhaps fielding some of the ideas of Col John Boyd's *Patterns of Conflict*, or Col Jim Barton's *The Blitz Fighter*, but Air Staff consensus was not reached for inclusion of a chapter on battle doctrine.[94]

Viewed in retrospect, the 1979 revision of AFM 1-1 was described as "essentially a codification and expansion of the ideas that evolved over the years."[95] It stated that the national military objectives were to sustain deterrence, defend the United States, conduct warfare if called on to do so, and resolve conflict quickly and effectively. The levels of conflict were again redefined, this time as localized war, theater conventional war, theater nuclear war, and strategic nuclear war The second chapter on Air Force functions and missions was the longest in the manual (30 pages), and the fourth chapter on organizing, training, equipping, and sustaining aerospace forces was second longest (14 pages). The chapter on functions and missions possibly ran to such extraordinary length because it was mostly a recall of particular legislative actions and functions papers. The nine basic operational missions were said to be strategic aerospace offense, space operations, strategic aerospace defense, airlift, close air support, air interdiction, counterair operations, surveillance and reconnaissance, and special operations. It was asserted that: "Aerospace forces are unique and can be decisive in combat."[96] However, air forces also had to "be effective in supporting the other services in their roles and missions."[97] And in a then-current matter under discussion, it was pointed out that the Air Force had a collateral role against enemy naval forces, this by neutralizing or destroying enemy naval forces, delivering mines, defending friendly naval forces, engaging in antisubmarine warfare, and conducting surveillance and reconnaissance. The characteristics of aerospace forces were

given as speed, range, and maneuverability. The capabilities were flexibility, readiness, responsiveness, presence, destructiveness, survivability, and mobility. The principles for employing aerospace forces were centralized control; decentralized execution; coordinated effort of Army, Navy, Marine Corps, and allied forces with common doctrine and cooperation; and proper use of the principles of war, which were enumerated as objective, offensive, mass, economy of forces, surprise, unity of effort, maneuver, simplicity, timing and tempo, and defensive. The "timing and tempo" probably reflected Colonel Boyd's idea of dominating a battle by operating, as the manual read, "within the enemy's observation-orientation decision-action-feedback time cycle. . . . Maintaining a quicker tempo of action helps to disrupt the enemy's strategy and operations, by creating the confusion and disorder that can lead to the enemy's defeat."[98]

The 1979 edition of AFM 1-1 was hardly published before there was a growing dissatisfaction with it and a growing demand from inside the Air Force for a basic doctrinal manual that took a distinctive stand on how the Air Force was going to fight if the nation called upon it.[99] Wrote Dr Williamson Murray, an avid scholar on military affairs and one of the foremost American authorities on the German *Luftwaffe*:

> What strikes this reader is the emphasis throughout the manual on the role of the USAF in deterrence as opposed to its role as a combat force. . . . On the national level this undoubtedly reflects the basic assumption on which many of America's defense policies rest Nevertheless, when a nation's military services become more concerned with deterrence than with their capability to *fight*, their real ability to deter comes into question [100]

Professor Murray was also critical of the manual's drawings of aircraft, of contemporary people, and of simplified graphics which he wrote "hardly create a serious tone—the type of tone necessary for a manual discussing matters which in the final analysis involve life and death."[101]

In the aftermath of the publication of February 1979—popularly referred to as the "picture-book" edition—one of the functions of the Doctrine and Concepts Division would continue to be the drafting of a less flamboyant version of the basic doctrine manual that would require several years to surface. According to Col David L. Hosley, who was deputy and later director of Headquarters USAF/XOXID in 1980–82, much of the division's work focused on NATO doctrine, the other projected volumes of the AFM 1- series, and efforts to get the AFM 2- manuals updated. As has been seen, the negotiation of NATO doctrine was already in progress and had resulted in Allied Tactical Publication (ATP) 33, *NATO Tactical Air Doctrine*, effective 1 October 1976, and also Allied Tactical Publication 40, *Doctrine and Procedures for Airspace Control in the Combat Zone*, effective in September 1977. ATP-33 was taken as the cornerstone of a series of publications on tactical air doctrine. Those of interest to the Air Force that were going to be printed included:

- ATP-8, *Amphibious Operations*
- ATP-27, *Offensive Air Support Operations*
- ATP-33, *NATO Tactical Air Doctrine*
- ATP-34, *Tactical Air Support of Maritime Operations*
- ATP-40, *Doctrine and Procedures for Airspace Control in the Combat Zone*
- ATP-41, *Airmobile Operations*
- ATP-42, *Counter Air Operations*
- ATP-44, *Electronic Warfare in Air Operations*

In NATO usage, doctrine was defined as "fundamental principles by which military forces guide their actions in support of objectives."[102] The spectrum of tactical doctrine included "basic doctrine" which set forth broad principles of warfare in a specific medium: land, sea, or air. The next level was "operational doctrine," which amplified basic doctrine in specific functional areas. The lowest level was "operational tactics," which dealt with the employment of forces in specific combat missions, such as how to attack a specific enemy formation. The NATO doctrines and procedures were theater specific and did not necessarily drive unilateral US doctrine and procedures worldwide. NATO terminology also was sufficiently different as to demand a *NATO Glossary of Terms and Definitions for Military Use*.[103]

As a result of the doctrine development initiative the Directorate of Plans (XOX) was committed in AFR 1-2, 22 November 1978, as the Air Force office of primary responsibility for not only AFM 1-1 but other basic airspace doctrinal manuals in the AFM 1- series. In this series, in addition to AFM 1-1, a joint manual, AFM 1-3, *Doctrine and Procedures for Airspace Control in the Combat Zone*, had been subjected to lengthy review but had been ultimately agreed upon by the service chiefs and published on 1 December 1975.[104] In the first half of 1977 the doctrine development branch of the Directorate of Concepts was tasked to begin work on an Air Force doctrine concerning the use of space and on another doctrine manual on theater nuclear operations. In the 1978 regulation, these were aligned as AFM 1-5, *Theater Nuclear Doctrine*, and AFM 1-6, *Military Space Doctrine*. The accounts of Air Force nuclear employment concepts, had been fragmented between various manuals, operational concepts and studies. A working group of officers from Air Force concepts, operations, and plans and the Defense Nuclear Agency pulled together a straw man draft that was reviewed and published as a secret classification manual AFM 1-5 on 20 April 1979. Later that year, AFM 1-7, *Chemical Warfare Doctrine*, was published on 26 September 1979 and AFM 1-9, *Doctrine for Electromagnetic Combat*, on 18 September 1979. The 1978 AFR 1-2 also projected AFM 1-2, which was to have been a command and control doctrine. This doctrine was not completed although the subject would be broken out at some length in the 1984 edition of AFM 1-1 and also in Headquarters USAF/XOXID's DIP-12, *Command Relationships*, dated June 1984. Another manual, AFM 1-10, *Combat Support Doctrine*, was projected on Theater Air Operations with the idea that it would describe the characteristics and warfighting principles of theater air

operations in a high-threat combat environment. The draft version of the proposed AFM 1-10 met opposition within the Air Force, and the project was quietly dropped as too complex for completion.[105]

The task of working up an Air Force doctrine concerning the use of space as a military operating medium when assigned in 1977 involved the preparation of a first-of-a-kind doctrine intended to provide a broad overview of the utility of space for military use, a description of military missions in space, and an abbreviated statement of Air Force policy regarding its role and leadership in space. As an added complication the military usage of space was circumscribed closely by international agreements designed to keep space for peaceful purposes. After circulation of a preliminary draft, a review draft of AFM 1-6, *Military Space Doctrine*, was forwarded to the Air Staff and MAJCOMs for coordination in 1980.[106] At this juncture, the progress of the space doctrine foundered because of a doctrinal dispute as to whether space was a place or a mission, specifically whether space was a place where ongoing military missions were to be performed or whether it would be a distinct realm where space power would become coequal with land, sea, and air power. In a speech to the National Space Club in October 1979, Maj Gen William R. Yost, Air Force director of space systems in DCS/Research, Development and Acquisition, had reflected back to the early role of air doctrine in the early days of the airplane and had sensed an "analogy between today's challenge with the unknowns of space to the comparable challenges and unknowns associated with the airplane." To Yost the experience of "airpower's doctrinal founding fathers" pointed out "the requirement to keep doctrine and technology working toward a dynamic synthesis."[107] An Air University air power symposium conducted in 1981 offered similar conclusions: "There is no space doctrine.... We need space doctrine.... The Air Force needs to get its doctrinal house in order."[108] A few months later, in April 1981 a major military space doctrine symposium held at the US Air Force Academy advanced similar conclusions and moved them into a somewhat mystical view that space doctrine was a necessary prologue to Air Force space exploitation. One of the presenters at the academy was Lt Col Dino A Lorenzini, an Air Force officer then assigned at the Naval War College Lorenzini urged that doctrine was necessary:

> The development and articulation of doctrine serve as a focal point for discussion, challenge, and group consensus-building.... Once widespread acceptance is achieved, doctrine establishes a degree of permanence and organizational stability.[109]

He pointed out that space power doctrine would be different from air power doctrine, saying: "The application of space power doctrine is differentiated from that of air power doctrine by the atmospheric boundary above which aircraft cannot fly and below which spacecraft cannot operate."[110] Finally, he confronted the international limitations on military usages of space, proposing that an "unencumbered version" of space power doctrine would be referred to as *basic* space power doctrine, while a "constrained version that follows current

administration policies and treaty obligations will be referred to as *operational* space power doctrine."[111] Lorenzini argued:

> Using basic space power doctrine as the starting point, we can decide exactly what we want to do militarily in space with an awareness of the benefits and risks involved . . Operational space power doctrine spells out the who, what, when, where, and how of military space activities. It should be consistent with the overall space policy decisions of our national leaders and compatible with our basic space power doctrine [112]

As already noted, Lt Col David E. Lupton pointed out that there was a space doctrine as of 1981, even though it was an unpublished nondoctrine "that space should be a sanctuary, free from military forces . . . that the best way to employ space forces was not to have space forces."[113] On 15 October 1982 AFM 1-6, *Military Space Doctrine*, was published under Gen Charles A. Gabriel's authentication as Air Force chief of staff. "Space," Gabriel wrote, "is the ultimate high ground."[114] The manual accepted the proposition that space was not a mission but that "space is the outer reaches of the Air Forces's operational medium—the aerospace, which is the total expanse beyond the earth's surface. Space, then, is an operational environment that can be used for the conduct of Air Force missions."[115] Although the policy implications of the space manual have already been addressed, the manual offered an interesting revelation that, in the case of space, doctrine would need to catch up with technology. It stated:

> Our scientific, technological, and industrial communities have established a resource base from which this nation can logically proceed with expanded space operations Within that framework, our doctrine and strategy must evolve to provide the vision, focus, and direction to guide the development of future space programs, systems, and operational practices [116]

AFM 1-6 stated that the "attributes" of space systems included global coverage, economy, effectiveness, flexibility, efficiency, and redundancy. In AFM 1-1 of 1979, the "characteristics" of air power were said to be speed, range, and maneuverability, and a new 16 March 1984 edition of AFM 1-1 would list the air power characteristics as speed, range, and flexibility. Only flexibility (maneuverability) appeared on both the air power and space power lists, and the definitions of flexibility were different. Lupton pointed out that the environmental conditions of space operations were quite different from those of air operations. Perhaps the difference in characteristics meant that different operating environments (air and space) could not be logically treated under the umbrella term *aerospace*. He argued that the Air Force perhaps should consider air and space as distinct mediums with both shared and unique characteristics.[117]

In 1980 the Doctrine and Concepts Division reviewed the AFM 2- series (operational doctrine) manuals for accuracy and developed a long-range master plan to update them, this work to be prepared according to the 1978 AFR 1-2 by specified lead commands or agencies. Looking at the 1- series manuals as a whole, the average age of the 20 manuals in the series was almost eight years (94 months).

The oldest was AFM 2-31, *Aerospace Environmental Operations*, that had been published in December 1965 and the newest AFM 2-6, *Tactical Air Operations—Reconnaissance*. The 3- series (mission employment tactics) had been created in February 1966 but had never been very popular, and only six manuals in the series had been published, five of them applicable exclusively to tactical air forces. The 1978 AFR 1-2 provided that current publications would remain in effect until superseded by new documents, and none of the specific lead commands or agencies were quick to put through revisions. The Tactical Air Command had produced most of the 2- and 3- series doctrinal manuals, and the TAC-TRADOC interrelationship remained active. The TAC doctrine effort, however, went on record as preferring some more easily disseminated medium than the hard-to-get-coordinated doctrinal manuals. To Headquarters USAF/XOXID, however, the AFM 2- series operational manuals were important since they carried the burden of a presentation on how to fight. To rejuvenate aerospace doctrine, AFR 1-2, *Assignment of Responsibilities for Development of Doctrine*, was published on 25 July 1984. This regulation changed doctrinal categories to basic (AFM 1-), operational (AFM 2-), and tactical (AFM 3-), plus joint and combined. The Directorate of Plans was responsible for the overall policy, control, development, direction, and management of the entire scope of Air Force doctrine. The regulation specified a list of operational and tactical doctrines to be prepared and maintained, their currency to be guaranteed by an annual review and updating as required. Under this mandate the Tactical Air Command began the preparation in 1964 of an AFM 2-XC manual to replace three old manuals: AFM 2-1, *Tactical Air Operations—Counter Air, Close Air Support, and Air Interdiction*; AFM 2-7, *Tactical Air Operations—Tactical Air Control System* (TACS); and AFM 2-10, *Tactical Air Operations—Employment of Air Delivered Target Activated Munitions* (ADTAMS). This new level of doctrine was designed to provide basic guidance for the organization, mission structure, and command and control arrangements to be applied to the entire spectrum of tactical air operations.[118]

Facing the Future: Cooperative Armed Forces Doctrine

"Some doctrine," wrote F. Clifton Berry, Jr., editor in chief of *Air Force Magazine* in July 1983, "is dull as dishwater. A sort of 'motherhood and apple pie' topic studied as part of professional military education, then promptly forgotten in the press of the real world. Too many USAF people have treated doctrine that way. The process of neglect has had the effect of weakening the underlying rationale for building and operating USAF forces and equipment."[119] Berry saw hopeful signs in mid-1983 that the Air Force was not only rigorously engaged in self-examination of its basic doctrine but had taken the initiative to work more closely with its sister services in preparing the combat forces needed by the nation.[120]

On the basis of his experience in the US Air Force Directorate of Doctrine, Concepts, and Objectives, as well as in his doctrinal assignments in the Tactical Air Command, General Loving brought to the Air Command and Staff College in 1970–73 a conviction that "Air Force basic doctrine has evolved from experience."[121] In response to Loving's query about why the Air War College did not teach more about war, Lt Gen Alvan C. Gillem organized a broad study of the Air University curriculum in September 1972 which, among other issues, recommended that the Air War College ought not to try to develop a "blue suit think tank role" since this was a function of Headquarters USAF and such would require a very high priority for the best officers as students and faculty that only a personally extended priority of the chief of staff could provide. The study nevertheless recommended in March 1973 that the Air War College should attempt to support Air Force doctrinal and conceptual activities by emphasizing special student study groups on doctrine and concepts.[122] General Loving's interest ensured a surge of doctrinal studies in the Air Command and Staff College, and in 1972–73 in that school a separate lecture series on military history with a central focus on the role of air power was introduced for the first time.[123]

The prevalent mission of the Air War College would continue to be "to prepare senior officers for high command and staff duty." But on 5 July 1975, the Department of Defense's Committee on Excellence in Education, called the Clements Board after W. P. Clements, Jr., deputy secretary of defense, who headed it, ruled that the individual senior service colleges should specialize in service specialty warfare study—for example, air warfare in the Air War College. The Clements Board called upon each college to maintain or establish a program through which a few distinguished visiting professors would be available to impart their knowledge to faculty and students. The board demanded that the colleges place emphasis on research, saying "For the Senior Service Colleges to maintain excellence in their programs and meet their obligations to their Services, JCS and DoD, they must have active research programs focused on the particular mission of the college."[124] During the summer of 1974 Gen William W. Momyer already had recommended that the Air Force draw upon the personal experience of participants for a series of monographs on US Air Force activities in Southeast Asia, and this series was established in the Air War College.[125] The Air War College also had welcomed the opportunity to invite two civilian scholars to spend a year or more of residence with each of its four departments. In December 1978 the Air War College was being reduced to three departments, thus releasing spaces for two visiting scholars. In a briefing to the Employment of Air Power Planning Advisory Group, Col Thomas A. Fabyanic, chief of the AWC Military Studies Division, proposed to establish the Airpower Research Institute (ARI) at the Air University, using the two primary civilian research associates and other military research associates from the faculties of the AU school system. Both the Army and the Navy were funding research institutes, and Fabyanic urged that the Air Force should do no less.[126] The concept was approved and one of the first steps was to put the Southeast Asia Monograph Series under the incipient ARI. In 1979–80

ARI continued in an unofficial status, funded by resources of the Air University and its then parent Air Training Command. Finally, at the end of June 1980 the limited ARI was established with Colonel Fabyanic as director, two Air Force lieutenant colonels identified as the first military research associates, and two civilian research associates employed for the following academic year.[127]

Shortly after assuming command of Air University, Lt Gen Charles G. Cleveland began to explore new avenues through which the Air University could broaden and deepen its contribution to the Air Force mission. In September 1981 he established Project FLAME (Fresh Look At Mission—Education), and one of its recommended initiatives was to establish a center for aerospace strategic studies, incorporating ARI and other functions in it. In Washington, Lt Gen Jerome F. O'Malley, deputy chief of staff of operations, plans and readiness (HQ USAF/XO), reasoned that the responsibility for doctrinal development ought to remain in Washington since the Air Force needed a doctrine spokesman in the Pentagon to look after its interests. Similarly, Gen Bennie L. Davis, commander of SAC, was concerned that the operational commands not lose their role in developing doctrine. To reassure General Davis, Gen Thomas D. Ryan, Air Training Command commander, provided that ARI would be expanded to accommodate MAJCOM and special operating agency research associates sent to ARI to accomplish research topics desired by their commands while receiving credit for attending professional military education courses. In 1981–82 ARI was in operation while the negotiations for the larger organization—now being designated the Air University Center for Aerospace Doctrine, Research, and Education (AUCADRE)—were progressing. While manpower and personnel matters were still being worked out, Headquarters USAF provided for the designation and activation of AUCADRE, effective 3 January 1983. AFR 1-2, 25 July 1984, provided: "Air University, through the Air University Center for Aerospace Doctrine, Research, and Education (AUCADRE), provides advice, assistance, and research support for HQ USAF/XOX doctrinal development efforts, as required."[128]

The Headquarters USAF/XOX pamphlet DIP-2, "How USAF Doctrine Is Developed," acknowledged: "Doctrine development is a product of history—what has happened and what we believe—and today's environment. . . . Doctrine provides a bridge from our past through the present to the future."[129] On 5 February 1982, a few months before retiring as Air Force chief of staff, Gen Lew Allen, Jr., undertook "to create an environment where our people can learn from warfighting lessons of the past and use that knowledge to better prepare for the future."[130] "I believe," Allen wrote, "that a continuing study of military history, combat leadership, the principles of war, and particularly the application of airpower, is necessary for us to meet the challenges that lie ahead."[131] General Allen tasked General O'Malley to be the Air Staff's focal point for the project—Project Warrior—and in turn on 10 February 1982 O'Malley advised Air Force commanders that he had designated the Directorate of Plans, Doctrine and Concepts Division, as the focal point in his deputate. The goal was to create and

maintain an environment for Air Force people to think and plan in warfighting terms The objectives were to identify ways to improve the warfighting spirit and perspective of Air Force people, to encourage an improved understanding of the theory and practice of war, with particular emphasis on the contribution of air power, and to help toward better planning for the future. O'Malley enjoined all Air Force commanders to "continue the current trend of emphasizing the study and application of military history, warfighting skills, and combat leadership."[132]

One of the foci of Project Warrior was the study of war as a synergy of air, ground, and naval actions. Some of this same interrelationship of forces surfaced in a new view of doctrine published by Lt Col Dennis M. Drew, chief of the Warfare Studies Division at ACSC, in 1982. Here Colonel Drew rationalized that military history was the primary source of military doctrine and that observations of past success or failure could be generalized, tested over time, and abstracted into principles. Unlike most approaches, Drew advised his readers to seek a fundamental doctrine of war which would be the foundation for environmental doctrine (sea power, land power, and air power). The environmental doctrine would yield narrow organizational doctrines concerning the use of particular forces. In Drew's analysis AFM 1-1 was an example of organizational doctrine As a teaching aid, Drew visualized a doctrine tree:

> The trunk of the tree is fundamental doctrine, the basis for all other doctrine types The trunk, of course, has its roots in the ground, which represents history or experience, the primary source for doctrine The tree branches represent environmental doctrine—each springing from the trunk, each individual yet all related The leaves represent organizational doctrine—dependent on both the trunk and the branches, changing from season to season [133]

Drew's conception that the development of doctrine should progress downward from a fundamental doctrine of war was somewhat different from a long-held partisan services view that joint and unified doctrine built upward by amalgamation of air, land, and naval doctrines, but it was not out of context with a new Air Force interest in a synergistic approach to war

For more than a year, with the strongest direction from its top commanders, the Air Force examined its relations with the other services and its basic doctrine in 1962 and 1963. As has been seen, in the autumn of 1982 General Gabriel signed a Memorandum of Agreement (MOA) with the US Navy for closer cooperation in training and operations. In April 1983 Gabriel signed a memorandum of understanding (MOU) with the US Army designed to enhance joint employment of tactical forces. In May 1984 he signed a lengthy Memorandum of Agreement with the Army on joint force development to be pursued by both services. As a doctrinal undertaking these joint service agreements had significant benefits both in substance and in technique: they improved the effectiveness of joint operations, and they ironed out doctrinal differences between the Air Force and the Army. These were clear and concise doctrinal statements, related in time to existing doctrine, avoiding misunderstandings, and enabling commanders and staff to act

on specific propositions. As doctrine the MOAs had at least one disadvantage in that they included both doctrine and procedures in single packages. In focusing upon battlefield operations—and particularly the extended battlefield—rather than doctrinal abstractions, the Army and Air Force were taking hard, critical looks at concepts and doctrines of most-likely theater war and reevaluating them in the light of fighting to win.[134]

As a part of the Air Force's self examination, AFM 1-1 was put under substantial review and revision during 1983 and was published on 16 March 1984 as AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, with authentication by Gen Charles A. Gabriel. The writing of the manual was done by Maj Clayton R. Frishkorn, Jr., XOXID. In the new manual the drawings and flamboyant typography of the 1979 edition had been abandoned. The revision was significantly different in text from the 1979 predecessor in that it focused on warfighting rather than functions. A new chapter titled "Employing Aerospace Forces" discussed interacting fundamentals of warfighting (man, machine, and environment) to introduce the principles of war: objectives, offensive, surprise, security, mass and economy of force, maneuver, timing and tempo, unity of command, simplicity, logistics, and cohesion. In the words of the manual, "aerospace doctrine flows from these principles and provides mutually accepted and officially sanctioned guidelines to the application of these principles in warfare."[135] The new basic doctrine emphasized the role of aerospace forces as an essential element of the Armed Forces—a land, naval, and aerospace team employed in unified action. New attention was given to the Air Force's maritime support mission—recognition of the Air Force's ability to contribute to missions at sea. AFM 1-1 was aligned to AFM 1-6 on space doctrine and reflected the same emphasis, that many Air Force missions were potentially to be performed in space. The manual emphasized that a decision to commit US military forces in the conduct of war must consider the objectives desired, force capabilities, and the will of the people, the latter requirement rather clearly reflecting the US experience in Southeast Asia. Some old fundamental beliefs were reemphasized: air superiority was a first consideration in employing aerospace forces but it was a means to an end in that it permitted a freedom of action to air, land, and naval missions. Another old belief repeated was that air power could exploit speed, range, and flexibility better than land and sea forces and therefore could and should operate independently. Speed, range, and flexibility were most fully realized when air power was centrally controlled and decentrally executed. Possibly because clear control responsibilities would be vital to an Army-Air Force extended battlefield strategy, the manual emphasized unity of air power command in theater operations and a theater approach to warfighting. Although this theater approach had not changed significantly since 1947, it now was more vital than ever. The new edition of AFM 1-1 rather clearly reflected a new spirit of cooperation being found in the Pentagon in 1982–84. Nevertheless, in its concluding paragraph this ninth version of the Air Force's basic doctrine noted:

> In sum, since 1943, several fundamental beliefs have remained embedded in Air Force doctrine Airpower can exploit speed, range, and flexibility, better than land and sea forces, and therefore, it must be allowed to operate independently of these forces These characteristics are most fully realized when airpower is controlled centrally but executed decentrally. The principal missions of airpower have evolved over the years and reflect what airpower does best Although priorities in their application have shifted with changes in national policy, the beliefs about the proper employment of airpower have remained fundamentally constant in the face of profound changes in technology, strategy, and international relations [136]

When earlier Air Force basic doctrine had sought to distill rather timeless attributes and principles of aerospace power for the guidance of the Air Force in being and the Air Force that would be, AFM 1-1 of 1984 emphasized·

> The Air Force continuously refines aerospace doctrine to make it relevant to present operations and viable for future contingencies. This process requires an open channel of communication between those headquarters' staffs charged with formulating doctrine and those echelons involved in the daily process of learning from experience Feedback from these echelons is critical to evaluating and modifying existing doctrine and, when necessary, formulating new doctrine. AFM 1-1 is published, in part, to remind each and every individual in the Air Force of the obligation to keep aerospace doctrine useable [137]

In other words, the Air Force recognized that it had always been and would continue to be in a search for its doctrine for the most effective employment of aerospace power both in peace and war.

NOTES

1. AFM 1-2, *Air Doctrine, United States Air Force Basic Doctrine*, 1 April 1953, 1
2. Ibid , 1 April 1954, 11, and 1 April 1955, 11
3. Maj Rudolph F Wacker, "Managing the Infinities of Basic Doctrine," research thesis (Maxwell AFB, Ala Air Command and Staff College [ACSC], June 1967), 49–50.
4 Ibid., 60–61
5 AFM 1-2, 1 April 1955, passim
6 Lt Gen George G Loving, Jr , US Air Force Oral History Interview, 5–7 July 1983, 85–86
7. Maj Gen Dale O Smith, special assistant for arms control, Joint Chiefs of Staff, "Development of Air Force Doctrine," 15 April 1963
8 Maj William Y Smith, "The Effects of Intercontinental Ballistic Missiles on Air Doctrine," research thesis (Maxwell AFB, Ala.· ACSC, 17 April 1959), passim
9. Ibid
10 Lt Col R. H Brundin, Lt Col F. R. Goldsberry, and Maj R. T Adams, "United States Air Force Basic Doctrine," research thesis (Maxwell AFB, Ala Air Command and Staff School), 1959.
11 Col Roy R. Walker, "Is There Need for USAF Basic Doctrine?" research thesis (Maxwell AFB, Ala Air War College, April 1959), 53–54
12 AFM 1-2, 1 December 1959, passim
13 Ibid.
14 Wacker, "Managing the Infinities of Basic Doctrine," 70–71

15. Lt Col Donald L. Cromer, "An Analysis of United States Air Force Space Doctrine," research thesis (Maxwell AFB, Ala.: ACSC, May 1973), 28.
16. "Secretary Zuckert's Air War College Graduation Address," *Air Force Policy Letter for Commanders· Supplement*, July 1965, 1–4.
17. Ibid.
18 AFR 1-1, *Responsibilities for Doctrine Development*, 20 March 1963.
19 Ibid
20. Wacker, "Managing the Infinities of Basic Doctrine," 5
21 Ibid , 72; AFM 1-1, *Aerospace Doctrine, United States Air Force Basic Doctrine*, 14 August 1964
22. AFM 1-1, 14 August 1964, passim.
23. Ibid , Annex A, "Evolution of Basic Doctrine," A-3 and A-4, in AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, 16 March 1984
24 "Updating Aerospace Doctrine," *TIG Brief*, 10 May 1963, 2
25. "Aerospace Doctrine in the Thermonuclear Age," *TIG Brief*, 11 September 1964, 3
26. "Understanding of Doctrine on Use of Air Forces (AFM 1-1)," *Air Force Policy Letter for Commanders*, 15 April 1965.
27. Gen William E. DePuy, "TRADOC (TRAining and DOCtrine Command) A New Command for an Old Mission," *Army Magazine*, October 1973, 31–34.
28 History, Directorate of Doctrine, Concepts, and Objectives, July–December 1966; History, Directorate of Concepts, July–December 1966, 3
29. History, Directorate of Doctrine, Concepts, and Objectives, July–December 1966, January–June 1967; July–December 1967, Loving interview, 5–7 July 1983, 94–109
30 Loving interview
31. Ibid., 124.
32 History, Directorate of Doctrine, Concepts, and Objectives, January–June 1968, 55–57, January–June 1967, 26–27, July–December 1975, 30, Maj Douglas S Hawkins, "Concept for Reasoned Change in the Air Force Doctrine Program," thesis (Maxwell AFB, Ala.: ACSC, 1978), 60, 71.
33. History, Directorate of Doctrine, Concepts, and Objectives, January–June 1971; January–June 1976, 62–63, House, *Department of Defense Appropriations for 1979· Hearings before a Subcommittee of the Committee on Appropriations*, 95th Cong., 2d sess , 1978, pt. 4:161–63 (hereafter cited as *1979 DOD Appropriations*); Directorate for Strategy, Doctrine, and Long-Range Planning, Doctrine Information Publication 3, *Combined Doctrine—What Is It?*, 1978.
34 Grant McClellan, "Doctrine: An Ever-Present Practical Necessity," *Army Magazine*, January 1965, 43
35 Ibid.
36 Ibid.
37 Draft AFM 1-1, *United States Air Force Basic Doctrine*, 1 February 1966; Brig Gen Monro MacCloskey, *The United States Air Force* (New York. Frederick A. Praeger, 1967), 207–24
38 Draft AFM 1-1, *United States Air Force Basic Doctrine*
39. Ibid
40 History, Directorate of Doctrine, Concepts, and Objectives, January–June 1967, 24, July–December 1967, January–June 1968, 53; January–June 1971; AFM 1-1, *Aerospace Doctrine, United States Air Force Basic Doctrine*, 28 September 1971, 1–1
41. AFM 1-1, *Aerospace Doctrine, United States Air Force Basic Doctrine*, passim
42 Ibid.
43. Maj William R. Chambers et al , "An Analysis and Study of United States Air Force Basic Doctrine," research study (Maxwell AFB, Ala : ACSC, May 1972), 66
44. Briefing on Doctrinal Divergencies in History, Directorate of Doctrine, Concepts, and Objectives, January–June 1968
45 Lt Col Donald L. Cromer et al., "A Critical Analysis of USAF Basic Doctrine," research study (Maxwell AFB, Ala.: ACSC, May 1973), 20–21, quoting ACSC panel discussion on doctrine remarks, 15 February 1973

46 Ibid

47 History, Directorate of Doctrine, Concepts, and Objectives, January–June 1971, July–December 1971.

48 Ibid , 12

49 History, Air University, Fiscal Year 1971, 1 19; conversation of the author with Lt Gen Alvan C. Gillem II, USAF, Retired

50 Loving interview, 198

51. History, Air Command and Staff College, 1 July 1972–30 June 1973, 19; Chambers et al., "An Analysis and Study of United States Air Force Basic Doctrine," III–IV; Cromer et al., "A Critical Analysis of USAF Basic Doctrine," III–IV.

52. Chambers et al., "An Analysis and Study of United States Air Force Basic Doctrine," 34–35.

53. Ibid , 36–48 Maj Gerald W Street acknowledged his indebtedness to Ralph E Strauch, *Winners and Losers. The Roots of Inadequacy in our Strategic Concepts*, Rand Corporation, July 1971, 1–32

54 Chambers et al , "An Analysis and Study of United States Air Force Basic Doctrine," 54–59.

55 Ibid , 60–73

56 History, Directorate of Doctrine, Concepts, and Objectives, July–December 1972, 21, 36, January–June 1974, 42–43.

57. Col Benjamin F. Ingram, chief, Military Employment Division, Directorate of Curriculum, ACSC, to students, class of 1973, letter, subject: Proposed AFM 1-1, 17 January 1973

58 AFM 1-1, 15 January 1975; History, Directorate of Doctrine, Concepts, and Objectives, January–June 1975, 82; July–December 1974, 29

59 AFM 1-1, 15 January 1975

60 Lt Gen J W Pauly, "The Thread of Doctrine," *Air University Review*, May–June 1976, 3–10.

61 History, Directorate of Doctrine, Concepts, and Objectives, July–December 1972, 122, January–June 1973, 17, July–December 1973, 1, January–June 1974, 83, July–December 1974, 78, January–June 1975, 58–59, 70; July–December 1975, 46–48

62. Ibid., January–June 1974, 83, July–December 1978, 78

63. History, Directorate of Doctrine, Concepts, and Objectives, July–December 1973, 3, January–June 1974, 28–29, July–December 1974, 6–7, January–June 1975, 10, History, Air Force Six-Man Group, 1 April 1974–1 May 1975

64 History, Air Force Six-Man Group

65 I B Holley, Jr., "An Enduring Challenge. The Problem of Air Force Doctrine," US Air Force Academy, the Harmon Memorial Lectures in Military History no 16, 1974, 11

66. Four-Man Panel A, "Concept Feasibility Study on Realigning the Doctrine, Concepts and Objectives, Functions and Responsibilities", History, Directorate of Doctrine, Concepts, and Objectives, January–June 1975, 10

67 History, Directorate of Doctrine, Concepts, and Objectives, January–June 1975, 10, History, Directorate of Concepts, July–December 1976, 1–3, January–June 1978, vol 1, pt 1·1–3, Department of Air Force, Doctrine Information Publication 2 (DIP-2), "How USAF Doctrine Is Developed," 5 October 1978.

68 History, Directorate of Concepts, January–June 1978, vol 1, pt 1 1–3

69 History, Directorate of Plans, January–June 1980, 1 84, 87, 110.

70. History, Directorate of Doctrine, Concepts, and Objectives, January–June 1975, 5, Maj Dennis W. Stiles, "Air Power: A New Look from an Old Rooftop," *Air University Review*, November–December 1975, 49–59

71. Lt Col David L. Hosley, Doctrine and Concepts Division, Directorate of Plans, deputy chief of staff, Plans & Operations, to addressees, letter, subject Concept Issue Paper, CIP 81-4, "Deterring Soviet Military Aggression in the 1980s "

72 History, Directorate of Plans, Deputy Chief of Staff/Operational Plans & Readiness, January–June 1980, 1 113, DIP-2, "How USAF Doctrine Is Developed," 5 October 1978; DIP-10, "Background Information on Air Force Perspective for Coherent Plans (Command and Control of TACAIR)," 24 April 1981, memorandum by Col Robert A Norman, assistant director for joint and

National Security Council matters, Directorate of Plans, Deputy Chief of Staff/Operational Plans & Readiness, for agency chiefs and staff officers assigned to joint and combined staffs, 22 May 1981; DIP-12, "Command Relationships," June 1984.

73. History, Directorate of Doctrine, Concepts, and Objectives, July–December 1975, 24; January–June 1976, 55–56; History, Directorate of Concepts, July–December 1976, 62; and January–June 1977, 74

74. Lt Col D. L. Hutchinson, "A New Look at an Old Problem," *Air University Review*, January–February 1979, 72

75 Maj Douglas S. Hawkins, "Concept for Reasoned Change in the Air Force Doctrine Program," research report (Maxwell AFB, Ala . ACSC, 1978), 17.

76 Ibid.

77 History, Directorate of Concepts, January–June 1977, 76–77; July–December 1977, 82–83.

78 Maj Robert C. Ehrhart, "Some Thoughts on Air Force Doctrine," *Air University Review*, March–April 1980, 30.

79. Ibid.

80. Hutchinson, "A New Look at an Old Problem," 69–73; Hawkins, "Concept for Reasoned Change in the Air Force Doctrine Program," passim

81. Hawkins, "Concept for Reasoned Change in the Air Force Doctrine Program."

82 Ibid.

83 Ibid

84 History, Directorate of Concepts, July–December 1977, 82–83.

85 DIP-2, "How USAF Doctrine Is Developed," passim; AFR 1-2, *Assignment of Responsibilities for Development of Doctrine and Mission Employment Tactics*, 22 November 1978

86. DIP-2, "How USAF Doctrine Is Developed."

87. CIP 79-3, "Concept Development—What Is It? And Who Needs It?" December 1979, 9–11.

88 Ibid.

89. Ibid

90 Ibid , 6–10

91. AFM 1-1, *Functions and Basic Doctrine of the United States Air Force*, 14 February 1979, 1

92. Dr Williamson Murray, "A Tale of Two Doctrines The Luftwaffe's Conduct of the Air War and the USAF's Manual 1-1," *The Journal of Strategic Studies*, December 1983, 89.

93. Ibid

94. History, Directorate of Concepts, January–June 1978, 51.

95. AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, 10 March 1984, A-5.

96 Ibid.

97 Ibid.

98 Ibid., passim.

99. F Clifton Berry, Jr , "USAF Doctrine Comes Alive," *Air Force Magazine*, July 1983, 35–36

100 Murray, "A Tale of Two Doctrines," 89

101. Ibid

102. Col David L. Hosley interview, 9 January 1985

103 Ibid ; House, *1979 DOD Appropriations*, pt. 4 137, 138, 161, 162, Tactical Air Conference, Langley AFB, Va , 11–15 April 1983, AFM 1-1, 16 March 1984, B-4

104. History, Directorate of Doctrine, Concepts, and Objectives, July–December 1975, 30

105. History, Directorate of Concepts, January–June 1977, 72–76, History, Directorate of Plans, January–June 1980, 1:110–11, July–December 1980, 1:87; January–June 1981, 1:84; Colonel Hosley interview, 9 January 1985.

106. History, Directorate of Concepts, January–June 1977, 72, July–December 1977, 81; History, Directorate of Plans, January–June 1980, 111; July–December 1980, 87.

107. Maj Gen William R. Yost, "National Space Policy and Aerospace Doctrine," *Air Force Policy Letter for Commanders Supplement*, January 1980, 7–16.

108 Lt Col David E. Lupton, *On Space Warfare. A Space Power Doctrine* (Maxwell AFB, Ala Air University Press, June 1988), 43.

109. Maj Paul Viotti, ed , *The Great Frontier, Military Space Doctrine. The Final Report for the United States Air Force Academy, Military Space Doctrine Symposium, 1–3 April 1981*, 4 vols , Lt Col Dino A. Lorenzini, "Space Power Doctrine," *Air University Review*, July–August 1982, 16–21.

110 Lorenzini, "Space Power Doctrine," 16–21.

111. Ibid.

112 Ibid.

113. Lupton, *On Space Warfare*, 43; see also Lupton, "Space Doctrines," *Strategic Review*, Fall 1983, 36–45

114 AFM 1-6, *Military Space Doctrine*, 15 October 1982.

115 Ibid

116 Ibid

117. Lupton, "Space Doctrines," 37–38

118 History, Directorate of Plans, January–June 1980, iii, Lt Col D. L. Hutchinson, "A New Look at an Old Problem," 72; Tactical Air Conference, Langley AFB, Va , 11–15 April 1983, AFR 1-2, *Assignment of Responsibilities for Development of Doctrine and Mission Employment Tactics*, 22 November 1978, AFR 1-2, *Assignment of Responsibilities for Development of Doctrine*, 25 July 1984

119 Berry, "USAF Doctrine Comes Alive," 84.

120. Ibid.

121. Lt Gen Alvan C. Gillem II, commander, Air University, to commander, Air War College et al , letter, subject The Lightner Board, 13 September 1972.

122 Air University, Review of Air War College and Air Command and Staff College, 22 March 1973, 24–25

123 Ibid , 10

124. Memorandum by W. P Clements, Jr , chairman, Committee on Excellence in Education, to Department of the Army et al , subject The Senior Service Colleges Conclusions and Initiatives, 5 June 1975.

125 History, Directorate of Doctrine, Concepts, and Objectives, January–June 1975, 57

126 History, Air War College, July 1978–June 1979, 39–40

127 Ibid , July 1979–June 1980, 23–24

128 History, Air War College, January–December 1981, 57–60, History, Air University Center for Aerospace Doctrine, Research, and Education, 1983, 1–9, AFR 1-2, 25 July 1984, 5.

129. DIP-2, "How USAF Doctrine Is Developed," 1978, 6

130. Gen Lew Allen, Jr , chief of staff, US Air Force, to ALMAJCOM/SOA/CC, letter, subject Project Warrior, 5 February 1982

131. Ibid.

132 Lt Gen Jerome F. O'Malley, deputy chief of staff, Plans and Operations, to all major commands SOA/CC, letter, subject Project Warrior, 10 February 1982.

133 Lt Col Dennis M. Drew, "Of Trees and Leaves: A New View of Doctrine," *Air University Review*, January–February 1982, 40–48

134. Berry, "USAF Doctrine Comes Alive," 35, Col Thomas A Cardwell III, "One Step Beyond—AirLand Battle, Doctrine not Dogma," *Military Review*, April 1984, 45–51.

135 AFM 1-1, 16 March 1984; "These Are the Air Force's Central Beliefs," *Air Force Policy Letter for Commanders*, 15 June 1984, 2, telephone conversation with Lt Col Clayton R. Frishkorn, Jr , 11 January 1985; Berry, "USAF Doctrine Comes Alive," 34–36

136 AFM 1-1, 16 March 1984, vii

137 Ibid.

Lt Gen George G. Loving, Jr., a student at the Air Command and Staff School, 1955-56.

Col David R. McNabb, publisher of DIP-2, "How USAF Doctrine Is Developed."

Col John L. Piotrowski, member Six-Man Group

Lt Gen Alvan C. Gillem II, commander of Air University

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Gen Nathan F. Twining, member Six-Man Group

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