JULY 1996/$3

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

Korean War Scrapbook

1st Lt. John Lowery,
334th Fighter Interceptor Squadron,
February 1953

Photography courtesy of Jane's.

The F-22 is built on a simple idea. Stealth. You can't hit what you can't see.

QUESTION: HOW DO YOU AVOID THE THOUSANDS OF ADVANCED GENERATION MISSILES THAT CONTINUE TO BE STOCKPILED IN NEARLY EVERY NATION AROUND THE GLOBE? ANSWER: YOU BUILD AN AIR SUPERIORITY FIGHTER THAT'S VIRTUALLY UNDETECTABLE. IT'S CALLED THE F-22. AND WHEN IT REPLACES THE F-15 AT THE TURN OF THE CENTURY, AMERICA WILL ONCE AGAIN DOMINATE THE SKIES. THE F-22 IS THE FIRST AIR SUPERIORITY FIGHTER BUILT WITH STEALTH TECHNOLOGY. TECHNOLOGY THAT CAN'T BE RETROFITTED INTO EXISTING FIGHTERS. BECAUSE THE BEST WAY TO AVOID A MISSILE IS TO KEEP IT FROM EVER BEING FIRED.

F22
LOCKHEED MARTIN · BOEING
PRATT & WHITNEY

July 1996, Vol. 79, No. 7

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

About the cover: 1st Lt. John M. Lowery, 334th FIS, introduces a visitor to the F-86 Sabre at Kimpo AB (K-14), South Korea, in February 1953. Lieutenant Colonel Lowery, USAF (Ret.), lives in El Dorado Hills, Calif. See "Korean War Scrapbook," p. 26.

AIR FORCE Magazine (ISSN 0730-6784) July 1996 (Vol. 79, No. 7) is published monthly by the Air Force Association, 1501 Lee Highway, Arlington, VA 22209-1198. Phone (703) 247-5800. Second-class postage paid at Arlington, Va., and additional mailing offices. **Membership Rate:** $30 per year; $75 for three-year membership. **Life Membership:** $450 single payment, $475 extended payments. **Subscription Rate:** $30 per year; $25 per year additional for postage to foreign addresses (except Canada and Mexico, which are $9 per year additional). Regular issues $3 each. Special issues (USAF Almanac issue and Anniversary issue) $5 each. **Change of address** requires four weeks' notice. Please include mailing label. **POSTMASTER:** Send changes of address to Air Force Association, 1501 Lee Highway, Arlington, VA 22209-1198. Publisher assumes no responsibility for unsolicited material. Trademark registered by Air Force Association. Copyright 1996 by Air Force Association. All rights reserved. Pan-American Copyright Convention.

Editorial

By John T. Correll, Editor in Chief

The Murky Edges of Mootwah

THERE is a long tradition of employing the armed forces for noncombat missions. The classic example is the Berlin Airlift of 1948–49. It was a humanitarian operation to bring food and fuel to the beleaguered city, but it was also of strategic importance because it broke the Soviet blockade and settled an early crisis of the Cold War.

It's a big jump, however, from the Berlin Airlift to the currently fashionable "Military Operations Other Than War." The present construction of MOOTW includes humanitarian actions, but they are not the crux of it. The emphasis is on borderline missions that may involve the use of lethal force and exposure to lethal danger during periods otherwise regarded as peacetime.

Army Gen. John M. Shalikashvili, Chairman of the Joint Chiefs of Staff, says that "while we have historically focused on warfighting, our military profession is increasingly changing its focus to a complex array of military operations other than war." The Commission on Roles and Missions last year predicted that these operations will be the area of significant growth in employment of US military forces in the years ahead.

Joint doctrine recognizes three kinds of peace operations: peacekeeping (which has the consent of the belligerents), peace enforcement ("coercive use of military force" necessary to compel compliance), and peacemaking (involves mediation and negotiation). The terms are derived from the works of UN Secretary General Boutros Boutros-Ghali.

The concept is an easy fit with the Clinton Administration, which showed an early fascination for "soft power" and "assertive multilateralism" and which is still inclined toward using military forces for limited objectives in various kinds of contingencies. A recent joint doctrine manual states in bold type that "political objectives drive MOOTW at every level from strategic to tactical."

The plan of those who framed MOOTW was that it would never be pronounced as an acronym. That injunction was doomed to failure. The popular way to say it is "Mootwah."

MOOTW grew out of the low-intensity conflict theories of the 1980s. As recounted in *Joint Force Quarterly* by Lt. Col. Ann E. Story of the Air Force Doctrine Center, the Joint Staff decided that the "low-intensity conflict" term was "potentially offensive to host nations" where such conflict might occur. Furthermore, "low-intensity conflict" was not in the vocabulary of other agencies, notably the State Department. That gave

The new joint doctrine retires the spectrum of conflict and recognizes "combat operations other than war."

rise to "operations short of war," which evolved into "operations other than war" and finally into Mootwah.

As late as 1992, US doctrine recognized a *spectrum of conflict* that ran from counterinsurgency to general war. The spectrum was seen as continuous, reflecting an understanding that armed conflict is prone to escalate, spread, or intensify. If we cross the starting line, we should be prepared to stay the course.

In 1993, however, Joint Pub 3-0, *Doctrine for Joint Operations,* retired the spectrum of conflict in favor of the "range of military operations." In 1995, Joint Pub 3-07 divided this range of military operations into war and Mootwah, drawing a hard line between them, with a further subdivision into noncombat MOOTW and—get this—*combat MOOTW.* "Strikes and raids" are categorized as "Operations Other Than War," but they may be regarded as either combat or noncombat operations.

The effect of the doctrine is to establish separation between war and MOOTW and to concurrently characterize an appreciable number of combat operations as something different from war. There are numerous reasons for caution here.

■ **Threshold of combat.** The doctrine makes casual use of military force more likely. It weakens the principle that we should enter armed conflict only after grave consideration and in aid of important national interests.

■ **Loose rules of engagement.** Joint Pub 3-0 warns that MOOTW rules of engagement will be "more restrictive, detailed, and sensitive to political concerns than in war" and "may change frequently during operations."

■ **Demilitarization of military operations.** Joint Pub 3-0 says MOOTW is not proprietary to the Department of Defense. Other US government agencies as well as nongovernmental organizations and international organizations are involved, too. As more military operations are brought under the MOOTW umbrella, they move further from military control.

■ **Command and control.** These operations tend to be international, and some ambiguity remains in the provision that while US officers keep "combatant command" of US forces, a non-US peacekeeping force commander may exert "operational control."

■ **Mission creep.** There is often pressure for limited operations to expand in directions not originally intended. The London *Financial Times* calls the military implementation force in Bosnia-Hercegovina an "accomplice" of the resurgent factions because the IFOR commander avoids crossing the "Mogadishu line" that separates peacekeeping from law enforcement. (In Mogadishu in 1993, humanitarian assistance turned into a bloody firefight.)

It is virtually certain that the involvement of the armed forces in Operations Other Than War will continue and grow. No one else has the discipline, the organization, and the efficiency to do the job. The outlook is rendered more precarious, however, by joint doctrine that conceives of strikes and raids as noncombat operations. It would be a good idea to revive the spectrum of conflict as an element of doctrine and recognize again that there is nothing routine about the employment of lethal military force at any level. ■

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pilots the first shot opportunity in all encounters using our AIM-9X technology. Today, U.S. fighter pilots face superior missiles. They deserve the best. They deserve the Raytheon AIM-9X.

Raytheon Electronic Systems

Letters

Where Was the Navigator?

The circumstances surrounding the recent loss of a USAF CT-43A aircraft in Croatia with Secretary of Commerce Ronald H. Brown, numerous government and business leaders, and the flight crew have caused me a great deal of concern over recent personnel policies regarding the downsizing of USAF's navigator force *[see "CT-43 Crash Claims Six Airmen," June 1996 "Aerospace World," p. 18].* Although I realize the danger of commenting on a mishap investigation before the board has released its findings, I noted that the crew complement did not incluce a navigator. I feel that this omission was a major factor in this accident.

I served as an instructor at USAF's Navigation School at Mather AFB, Calif., during the mid-1970s when T-43s were first used to train navigator students. Of my more than 1,000 flight hours in the T-43A, I flew fourteen missions and approximately sixty-four hours in the mishap aircraft itself.

When these aircraft were acquired, each had twelve student positions and the latest in navigation equipment, including airborne ground-mapping radar. Recent advances in satellite navigation systems and inertial units have made possible accurate en route navigation without the navigator crew member. These advances have also made the 1971-era equipment originally carried on the T-43A obsolete.

USAF has thus been able to realize personnel savings by reducing the size of the navigator force and was able to modify several T-43As for VIP transport because fewer aircraft were needed for training. This process had already begun at Mather AFB in the late 1970s with the removal of initially four and later eight student positions to make way for airline-type seats. I have not been in one of these modified aircraft since 1978, but I understand that the final configuration of these aircraft devoted the entire compartment to passenger seating.

Although many of the conventional skills once taught in navigator training have been rendered obsolete by the electronic advances mentioned above, one critical skill is still urgently required—the active involvement of the navigator in monitoring the departure and approach phases to ensure that the flight path is clear of terrain.

We taught the use of all available aids, including airborne search radar, radio aids, and computers, and we urged our navigators-to-be to be assertive in informing the pilots of unsafe situations. On approaches flown along coastal areas, such as this aircraft was attempting, the contrast between water and land is particularly easy to recognize on an airborne search radar. Even a relatively inexperienced navigator could have easily seen that the aircraft was significantly off course and could have provided a safe heacing.

As a result of the downsizing of USAF's navigator force, transport aircraft that once carried navigators (C-5 and C-141) no longer carry them on most missions, and newer aircraft (C-17 and C-130J) are being designed with no navigator provision. I recognize the impracticability of retrofitting newer aircraft with an extra cockpit position, but I still feel that safety dictates carrying a navigator. . . .

It is particularly strange that an aircraft originally purchased for navigation training should be loaded with so many national leaders and allowed to fly an Automatic Direction Finder approach at an austere airfield in poor weather with no navigator on board. Navigators have saved many crews and aircraft from running into terrain during approach. I cannot help but feel that Secretary Brown and his crew deserved better.

Lt. Col. Tyson T. Travis, USAF (Ret.)
Pine Bluff, Ark.

Do you have a comment about a current issue? Write to "Letters," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Letters should be concise, timely, and preferably typed. We cannot acknowledge receipt of letters. We reserve the right to condense letters as necessary. Unsigned letters are not acceptable. Photographs cannot be used or returned.—THE EDITORS

The Current Navigator Shortage

"And Now, the Pilot Shortage" *[April 1996, p. 70]* was very interesting—and biased toward pilots. The Air Force may face a shortage of pilots by 1998, as the chart on p. 74 of the article indicates; navigators, electronic warfare officers, and weapon system officers are experiencing a shortage now.

One reason for seeing fewer navs in staff positions is that the Air Force Personnel Center has directed that all navs will fly to their 144-month gate (*i.e.,* twelve years in the cockpit). Those navs already out of the cockpit who did not meet that third gate will be returning to flying positions. A recent message released by Gen. Eugene E. Habiger, then deputy chief of staff for Personnel, suggested that 100 percent continuation be given to all passed-over navs to help alleviate the situation.

Another stopgap is the voluntary recall of Reserve and Guard navs to active duty. A news item about this program appears on p. 18 of "Aerospace World" in the same issue as Mr. Callander's article. The Air Force is looking for fifty navs for Fiscal 1996 and possibly fifty navs in Fiscal 1997. If a "drought" chart for navs accompanied the article, you would probably see a loss of approximately 350 navs for 1996. If there isn't a nav shortage, why all the programs to keep us in the cockpit?

Pilots are an integral part of the Air Force, but until black boxes replace the navigator profession, so are we. How about giving everyone his due and telling it like it really is?

Capt. Timothy D. Broeking, USAF
Hurlburt Field, Fla.

Tuskegee Bigotry

This letter is in response to one by Lt. Col. William J. Hill, USAF (Ret.),

THEY'VE ALWAYS SHARED THE SAME VISION. NOW THEY SHARE THE SAME INFORMATION.

The branches of the armed forces have once again pulled together. This time, it is a joint Department of Defense team led by Rome Laboratory. To accomplish their mission, they chose Motorola Government and Space Technology Group to lead a joint government and industry team that will develop the next generation armed forces computing communications device. It's called SPEAKeasy. And what it provides is a first in armed forces history. This is a device that operates on a totally open architecture, with secure communications, interoperability and programmability. Every branch of the military will share a line of communication. And all of these capabilities fit into a compact, lightweight piece of equipment. The armed forces are entering a new frontier in wireless communications. With SPEAKeasy, they will be able to share the same radio system and the same information. Call Rome Laboratory at 315-330-3829 or the Motorola team at 602-441-7274, for more information.

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AIR FORCE
PUBLISHED BY THE AIR FORCE ASSOCIATION MAGAZINE

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BPA Circulation audited by Business Publication Audit

Letters

an instructor of the Tuskegee Airmen during World War II *["Tuskegee Pioneers," May 1996 "Letters," p. 5]*. He took exception to "Tuskegee Airmen" *[March 1996, p. 52]*, which stated that Tuskegee instructors "refused to socialize with the black pilots." Although I am sure Colonel Hill and many other instructors treated the black pilots well, the instructor cadre as a unit discriminated against them.

The black student pilots, fellow officers in the US Army, were denied entry into their own Officers' Club by the instructors. To get around an Army regulation against denying club access to officers, the instructors denied access "to all students," even though black officers at the base who were not students were still denied access. The excuse of fraternization was used only as a cover for discrimination. Colonel Hill is correct in saying that even today, instructors do not fraternize with student pilots. However, student pilots are not denied access to officers' clubs.

Additionally, Colonel Hill said he was "not given the option of belonging to the Officers' Club at Tuskegee AAF." After the Army realized it could not deny access to students, it ordered white officers not to socialize with black officers and enforced this by denying white officers membership in the Officers' Club.

1st Lt. Keith W. Reeves, USAF
Shreveport, La.

Pride and Dedication

In "With the First B-2 Squadron" *[April 1996, p. 36]*, I noted close parallels between the new B-2 operation and the SR-71s. All of the personnel involved with the 509th Bomb Wing and Detachment 2 of the 9th Reconnaissance Wing were selected from the "best of the best," creating a deep feeling of professionalism within a small cadre of men and women.

On March 29, 1996, USAF's only SR-71 unit had a ribbon-cutting ceremony to recognize its new facility at Edwards AFB, Calif. It houses the SR-71s and all of maintenance and operations under one roof. Having attended the ceremony, I can attest that the pride, dedication, and professionalism are every bit as strong as they were when the SR-71 program began.

Contrary to what was stated in the article, the SR-71 crews at Det. 2 also fly the T-38s as companion trainer aircraft.

Col. Richard H. Graham, USAF (Ret.)
Plano, Tex.

Support for CAP

John L. Frisbee's timely "A CAP for the Sub Threat" *[April 1996 "Valor," p. 29]* goes straight to the heart of Civil Air Patrol's record of valor, selflessness, and quiet heroism during the dark hours of World War II. Our current membership takes immense pride in the legacy of our forebears who flew antisubmarine coastal patrol missions during the early part of the war.

Today, CAP continues this same tradition of national service and sacrifice by executing a host of Air Force noncombat missions. We are engaged in deep dialogue with Air Force Secretary Sheila E. Widnall, Air Force Chief of Staff Gen. Ronald R. Fogleman, and their staffs to identify more missions CAP can perform for our Air Force partners—thereby broadening CAP's value to the Air Force and the nation.

AFA's steadfast support for CAP is heartening to our 53,000 officers and cadets and has been a key element in revitalizing and energizing the CAP-USAF partnership. Our hats are off to *Air Force* Magazine and Mr. Frisbee for this assistance in carrying the Civil Air Patrol message to the rest of our Air Force family.

Brig. Gen. Richard L. Anderson
CAP National Commander
Hampton, Va.

Setting the Record Straight

Multiple errors appeared in the caption accompanying the photo on p. 27 of the June issue *["Aerospace World"]*. The photo shows Lt. Col. Henry B. Gaither, Jr., operations officer of the 1st Helicopter Squadron, being cooled down by Capt. Jim O'Connell after leading a formation that set a DoD safety record. Both the spelling of his name and his job title were incorrect in the caption, and the record set (175,000 accident-free flying hours) pertained to helicopter units only. The 89th Airlift Wing commander, Brig. Gen. Charles J. Wax, is also visible in the photo (background, with hat).

Maj. Paul A. Halvorsen, USAF
1st Helicopter Squadron
Andrews AFB, Md.

"Valor" Stories Needed

I am seeking subjects—either individuals or crews—for the "Valor" column. Must be verifiable from official or other reliable sources. Write to John L. Frisbee, Box 1137, Lynchburg, VA 24505.

John L. Frisbee
Lynchburg, Va.

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The Chart Page

By Tamar A. Mehuron, Associate Editor

Who's Up in the Chip Wars?

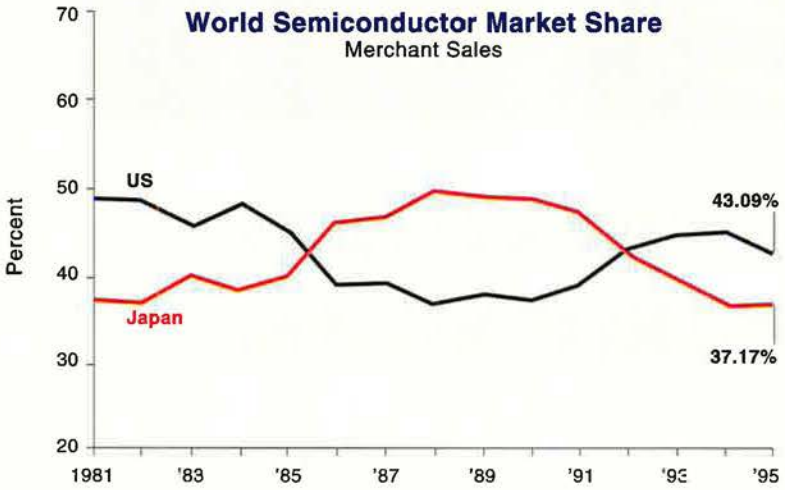
The United States has retaken and maintained a lead in the global semiconductor market, and US industry employment shot up after 1993. So reports SEMATECH, the US semiconductor industrial consortium.

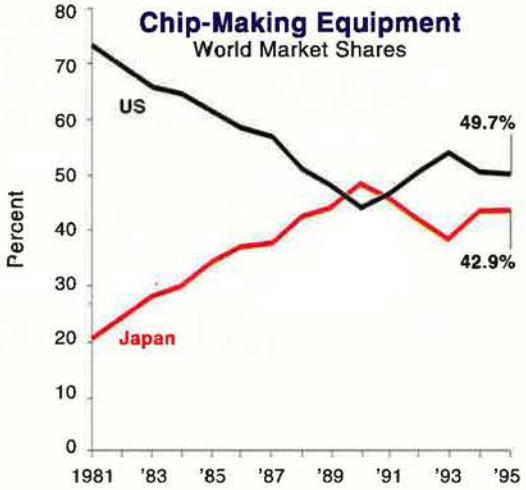
The US market share of merchant chip sales, after bottoming out in 1988, rebounded strongly through 1994. Despite a small drop in 1995, the US still boasted more than forty-three percent of the worldwide market, compared to Japan's thirty-seven percent (chart 1).

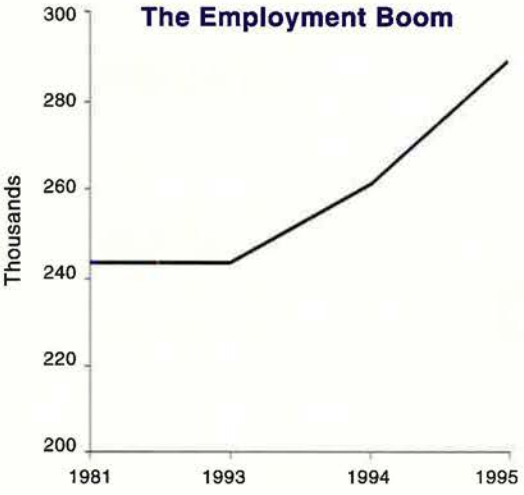
After 1990, the US also recovered its lead in sales of chip-making equipment and accounted for 49.7 percent of the worldwide market in 1995, while Japan's sales hovered at 42.9 percent (chart 2).

Employment in the US semiconductor industry surged in 1993–95, registering an overall gain of eighteen percent (chart 3). In 1992, the US semiconductor industry built or announced plans for only four factories. It plans to build fourteen new factories in 1997 (chart 4).

Source: SEMATECH Annual Report 1995 (March 1996).







Capitol Hill

By Brian Green, Congressional Editor

The Budget Midway

Congress is inclined to add $13 billion to the Administration's defense program, much of the increase pegged to modernization.

For the second straight year, the Republican-led Congress was poised at midsummer to add billions of dollars to the Clinton Administration defense request. Both the House and Senate versions of the 1997 defense authorization bill would add $12.9 billion to the President's number, raising the total to $267.3 billion.

The Pentagon had requested $242.6 billion in budget authority for Fiscal 1997. That amount would fund DoD activities. For defense projects run by the Department of Energy and other federal agencies, the White House sought $11.8 billion.

Defense Authorization

The full House on May 15 approved its version of the 1997 authorization bill. On the Senate side, the bill prepared by the armed services panel awaited floor action.

Increases were concentrated in procurement accounts to correct what critics call a serious shortfall in modernization. The House added $8.5 billion, focusing it on unfunded priorities of the services; the Senate committee's addition was $8.0 billion.

Both measures designated funding specifically for equipment needed by the Guard and Reserve. The House set reserve component procurement at $805 million while the Senate panel approved $760 million for this purpose.

The bills added substantial new money for research and development. The Senate committee tacked $3.7 billion onto the Administration's $34.7 billion request, while the House added about $800 million.

Fighters: The stealthy F-22 fighter, the Air Force's next-generation air-superiority aircraft, received full funding in the bills, at the requested level of $2.0 billion.

The Joint Strike Fighter program, which aims to develop multirole aircraft for the Air Force, Navy, and Marine Corps, was fully funded at $582 million. However, the House would prohibit using any of the money to fund a Marine Corps short takeoff and vertical landing variant.

The House bill provides money to procure six new F-15Es and six new F-16s, two more of each than requested. The Senate committee authorized eight F-16s and four F-15s. The Air Force argues that these additional aircraft will be needed to maintain twenty fighter wing equivalents.

Bombers: The House adds $290 million to the $634 million B-2 bomber request. The additional funding will be used "for upgrades to equip the existing bomber force with [precision guided munitions] and other conventional bomb enhancements."

The B-1 would also get additional funds—$80 million in the House measure (to enhance its conventional capability) and $105 million in the Senate version.

Airlift: The Senate measure adds $249 million to the request of $2.14 billion for the C-17 and added authority to procure nine new airlifters, one more than requested. The House bill adds $290 million and two airlifters to the request. Both measures also approve long-term C-17 multiyear procurement plans that are projected to save millions of dollars.

Munitions: The House and Senate bills include substantial additional funds for precision guided munitions. The Senate panel added $187 million and the House legislation provides $333 million over the request.

Ballistic missile defense: The House National Security Committee (HNSC) and Senate Armed Services Committee (SASC) criticized the President for cutting funds for ballistic missile defense (BMD). Members charged that the Administration lacked any real commitment to deploy effective national or theater missile defenses.

The Senate bill proposes an $856 million increase to the $2.8 billion requested for BMD, while the House measure adds $725 million.

Operations and maintenance: O&M was funded at $91 billion by the House, up from the $89.2 billion requested. The Senate measure adds $166 million to the request.

The most contentious O&M issue this year was the so-called sixty-forty rule, which requires that at least sixty percent of depot maintenance be performed at public depots. The Senate bill would modify the rule to reflect a fifty-fifty split. The House bill retained the sixty-forty split.

Quality of life: House and Senate measures offer a three percent raise in base pay for military members, matching the DoD request. If approved, this will be the first military pay raise in years that matches pay increases in the private sector.

The House bill would increase the Basic Allowance for Quarters (BAQ) by 4.6 percent, 1.6 percent more than the President's request. The SASC bill would boost BAQ by four percent.

The House bill would revoke the Pentagon's "don't ask, don't tell" policy concerning military service by homosexuals. It would reinstate a requirement to discharge service members infected with HIV, the virus that causes AIDS. That measure, passed last year, was recently overturned by Congress. The SASC version of the 1997 authorization bill contains neither provision.

More Budget Legislation

The House and Senate also approved budget resolutions specifying defense top-line numbers substantially higher than those of the Administration. The House resolution mirrors the authorization bill and adds $12.9 billion. The Senate resolution adds $11.3 billion.

Either budget resolution, however, would set defense spending slightly lower than last year's level. Longer-term House and Senate plans would put the Pentagon on a track in which nominal yearly budget increases would not keep pace with inflation.

Congress was still in the early stages of producing a defense appropriations bill, which provides money to carry out programs contained in the policy-setting authorization bill. ■

Aerospace World

By Suzann Chapman, Associate Editor

USAF Mounts Third "Expedition"

The Air Force planned to send an air expeditionary force of thirty-four aircraft to Qatar in southwest Asia late last month. This AEF, the third use of USAF's new operational concept, will augment regional assets and enable USAF units to train with coalition partners, according to a Defense Department statement.

The deployment includes F-15s from the 4th Fighter Wing at Seymour Johnson AFB, N. C., and the 33d Fighter Wing at Eglin AFB, Fla., as well as F-16s from the 20th Fighter Wing, Shaw AFB, S. C., and KC-135s from the 319th Air Refueling Wing, Grand Forks AFB, N. D. It will end in late August.

The first AEF arrived in Bahrain in November 1995. The second, which was to end in June, went to Jordan.

The Air Force Chief of Staff, Gen. Ronald R. Fogleman, described an AEF as a package of US-based fighters that can pick up and deploy swiftly, supported by tankers and backed by a force of long-range bombers that remain at bases in the continental United States. Such packages are expected to deploy rapidly enough to meet wartime standards. *[See "Air Expeditionary Force," June 1996 "Verbatim," p. 85.]*

USAF photo by A1C Sonny Cohrs

C-141B Starlifters taxi for takeoff from Charleston AFB, S. C., part of a joint training exercise with the UK in May. Big Drop III, which took place over North Carolina, involved 144 US and British air force planes lifting 1.5 million pounds of equipment and 5,500 troops.

B-2s Stand-Down

The Air Force placed its fleet of B-2 stealth bombers on a precautionary stand-down from routine training flights on May 10 to determine the extent of a problem with clamps that connect the aircraft's two, internally mounted General Electric F101 engines to the exhaust ducts.

An Air Force official told reporters that a clamp on one Northrop Grumman B-2 had cracked. Each engine has two clamps. The official noted that engineers think the clamps may have to be redesigned to strengthen them for greater-than-anticipated stress.

The Air Force did not announce the precautionary stand-down until media questions brought the issue to the surface. The official stated that although the problem could have caused internal damage, "this is not a safety-of-flight issue." He said the problem was minor and would not have grounded the fleet during wartime, adding that there had been other stand-downs.

He also said that this recent incident with the clamp was not the first one. Apparently, there have been at least two other problems with cracked clamps, one on a test B-2 and one on another production B-2. At that time, the Air Force thought those clamps had been improperly installed, leading to unusual stress on the parts.

Officials at Whiteman AFB, Mo., released one bomber, *Spirit of Nebraska,* from the stand-down May 16, following an inspection of the tailpipe assembly. The Air Force expects to replace the cracked clamps, as indicated by inspections of each aircraft. However, the service plans to return the entire fleet to training operations without waiting for a clamp redesign.

First Block 20 Spirit Arrives

Whiteman AFB received its eleventh operational B-2 Spirit on May 15—the first in the Block 20 series and the third of the Air Force's new stealth bombers delivered in 1996. Majs. Rex Bailey and Eric Single, of Whiteman's 509th Bomb Wing, flew the aircraft from the Northrop Grumman plant at Palmdale, Calif.

The Block 20 upgrade features improvements in avionics, Global Positioning System–Aided Munitions, and terrain-following software. USAF plans to retrofit the first ten operational B-2s, produced in Block 10, with Block 20 upgrades.

Another facet of the Block 20 upgrade—a revised B-2 trainer development process—saved $2 million, which will be applied to Block 30 changes, according to Aeronautical Systems Center officials at Wright-Patterson AFB, Ohio. ASC program officials, Air Combat Command, and B-2 contractors revised the development process for B-2 trainers.

Under the new process, Whiteman AFB received its Block 20 trainers ninety-four days before the first Block 20 aircraft, instead of the normal sixty-day lead time.

The B-2 Block 20 trainers included three Cockpit Procedures Trainers, thirty Weapon System Training Aids, five Computerized Maintenance Trainer Systems, one Crew Escape System Maintenance Trainer, and one Weapons Loading Trainer.

Accident Probe Cites Multiple Causes

The CT-43A crash that killed Commerce Secretary Ron Brown, members of a US trade delegation, and crew *[see "CT-43 Crash Claims Six Airmen," June 1996 "Aerospace World," p. 18]* stemmed from a failure of command, aircrew error, and an improperly designed instrument approach procedure, the Air Force charged.

Investigators cited these causes in the final report of USAF's accident investigation board (AIB), released June 7. "We failed to execute that mission," said Gen. Ronald R. Fogleman, USAF Chief of Staff. "As a result of that failure, thirty-five lives were lost."

USAF convened the inquiry to determine the cause of the April 3 crash outside the airport at Dubrovnik, Croatia. The CT-43 slammed into a mountain while on an instrument approach in a storm. The AIB was headed by Maj. Gen. Charles H. Coolidge, Jr.

Defense Secretary William J. Perry said the probe was "detailed and thorough" and showed "there was no single cause of the crash." The report claimed that

- Commanders failed to rescind authorization permitting non-DoD instrument approaches into unapproved airfields without prior review, despite specific USAF guidance to do so. "The instrument approach flown by the aircrew should not have been flown."
- The aircrew made errors in planning and execution. Among many mistakes, the pilots flew too fast on approach, incorrectly compensated for crosswinds, and did not carry the two Automatic Direction Finders needed for Dubrovnik, causing their failure to identify the missed approach radar and properly abort the landing.
- The nondirectional beacon approach for Dubrovnik did not provide sufficient obstacle clearance as established by international criteria.

Gen. Michael E. Ryan, commander of US Air Forces in Europe, named Maj. Gen. Tad J. Oelstrom, 3d Air Force commander, as Uniform Code of Military Justice inquiry officer. He will review the case and recommend any administrative or disciplinary actions.

Three Commanders Sacked

A week earlier, the Air Force relieved and reassigned three Air Force commanders in Europe caught up in the probe of the crash of the CT-43 carrying Mr. Brown.

USAF announced that Maj. Gen. Charles R. Heflebower, commander of USAFE's 17th Air Force, Ramstein AB, Germany, expressed a lack of confidence in a brigadier general and two colonels who were responsible for overseeing the ill-fated aircraft and its aircrew.

However, the Air Force emphasized that being relieved of duty does not mean these officers had any direct responsibility for the crash. The investigation pointed to problems in the leadership of their unit, Ramstein's 86th Airlift Wing.

The three officers relieved were Brig. Gen. William E. Stevens, commander of the 86th Airlift Wing; Col. Roger W. Hansen, 86th AW vice commander; and Col. John E. Mazurowski, 86th Operations Group commander.

"As a result of facts developed during the investigation of the April 3, 1996, crash of a US Air Force CT-43 aircraft in Dubrovnik, Croatia," stated a USAF news release, "Maj. Gen. Charles R. Heflebower has lost his confidence in the ability of the commander, vice commander, and operations group commander of the 86th Airlift Wing, Ramstein AB, Germany, to continue to effectively discharge their responsibilities. He relieved them [on May 29] with the concurrence" of General Ryan.

Replacing General Stevens on an interim basis is Col. Edward F. McPhillips, who had been serving as vice commander of 17th Air Force. Permanent replacements are expected to be assigned soon.

White House spokesman Mike McCurry told reporters that the Air Force had notified President Clinton in advance, "but he was not required to act on it."

President's Service Claim Stirs Controversy

President Clinton stunned veterans' organizations and members of Congress from both parties in May by claiming to be engaged in a kind of active-duty military service.

Attorney Robert S. Bennett, in a May 15 petition to the Supreme Court, claimed that the President was entitled to protection from civil litigation under the Soldiers' and Sailors' Civil Relief Act of 1940, as if he were an active-duty member of the US armed forces. The petition was intended to stall a sexual harassment suit brought by Paula Corbin Jones, who claims that the President, when he was governor of Arkansas, made sexual advances toward her in a Little Rock hotel room.

Clinton's Legal Claim and the Reaction

The Claim

"President Clinton here thus seeks relief similar to that which he may be entitled to as Commander in Chief of the Armed Forces and which is routinely available to service members under his command."

Attorney Robert S. Bennett, in a May 15, 1996, Supreme Court petition, claiming that President Clinton is entitled to protection from litigation under the Soldiers' and Sailors' Civil Relief Act of 1940 in the Paula Corbin Jones sexual harassment lawsuit.

"Ignoble" Action

"This ignoble pleading is a slap in the face to the millions of men and women who either are serving on active duty or have served on active duty in the armed forces of the United States."

Rep. Bob Stump (R-Ariz.), chairman of the House Veterans' Affairs Committee, in a May 22, 1996, letter to colleagues.

Outraged

"We are outraged today as we read that the President is using the shield of the military to protect himself from some serious sexual harassment charges. If the President took the issue of sexual harassment seriously, he would go to court and take responsibility for and defend his actions."

Rep. Jennifer Dunn (R-Wash.), in a May 22, 1996, statement concerning Clinton's use of his role as Commander in Chief.

U-Turn

"The President does not rely on, or claim any relief under, the Soldiers' and Sailors' Civil Relief Act of 1940."

Attorney Bennett, in a footnote to a new May 28, 1996, Supreme Court brief.

When questioned by reporters, Mr. Bennett said the claim was only one of several arguments advanced to show why action on the Jones lawsuit might be postponed while Mr. Clinton is still in office. The claim produced an outpouring of criticism. *[See box, p. 11.]*

The fact that President John F. Kennedy attempted to use the 1940 Act to put off litigation over a traffic accident may have prompted the Clinton defense team to use the same tactic, a decision White House officials now call politically inept. It did not work for President Kennedy, who had seen combat in the Pacific during World War II.

Apparently, Mr. Clinton's attorneys failed to note that the judge denied President Kennedy's motion without even writing an opinion, as the Washington *Times* pointed out. Mr. Bennett stated May 28 on ABC's "Good Morning America" that the Clinton legal team had not relied on the Act or sought relief under it and that he was filing amended briefs to make that clear.

Shipment Reform Under Fire

Under the current Defense Department household goods shipment program, one in every four moves results in damaged or lost personal property, creating losses totaling more than $100 million per year. Of that amount, DoD recovers less than sixty percent from the moving industry. The balance comes from taxpayers.

Unfortunately, reforms DoD has proposed for the system have drawn protests from many commercial carriers. The Pentagon pays more than $1 billion annually to roughly 1,300 commercial contractors, providing about ten percent of their total business each year. According to Pentagon officials, the carriers fear that DoD plans may eliminate some of the smaller companies from competition.

The military service chiefs wrote Congress to ask for support for their proposals in Fiscal 1997. "The current system is broken," their letter stated. "This unacceptable situation must be corrected," they added, citing the impact on quality of life.

Defense officials recently listed a few "horror stories" about moving: A nearly new sofa and chair arrived from a storage company stained with food and grease because it had been used to furnish a workers' lounge; another sofa was cut in half to fit into a packing crate; an Army sergeant found clothing missing from his household goods shipment being sold at a local flea market; and a VCR was stolen from a locked footlocker.

Currently, service members receive only depreciated value for the missing or damaged items, not a one-for-one replacement. DoD officials said that the reform proposal includes full replacement value, with a ceiling on high-value items.

The Air Force plans to participate in a pilot program in which the military member will arrange directly with the commercial carrier for pickup and delivery of personal property. The service member will also work directly with the carrier if the property is damaged or lost.

The year-long test will involve about one-fourth of the people moving from fourteen bases: Maxwell AFB, Ala.; Moody and Robins AFBs, Ga.; Columbus and Keesler AFBs, Miss.; Seymour Johnson and Pope AFBs, N. C.; Shaw and Charleston AFBs, S. C.; and Hurlburt Field and Eglin, Tyndall, Patrick, and MacDill AFBs, Fla.

Col. John L. Wigginton, chief of the Air Force Traffic Management Division in Washington, D. C., said that the goal is to encourage commercial carriers to give members of the armed forces and their families the same level of service they provide civilian customers.

Clinton Expands VA Benefits

The Department of Veterans Affairs (VA) has extended new benefits to Vietnam veterans afflicted with prostate cancer and a type of neurological disorder that may be the result of exposure to the chemical defoliant Agent Orange.

In a May 24 White House statement, President Clinton said the veterans will now be entitled to disability payments. He also stated that the VA will propose new legislation to aid children of Vietnam veterans who suffer from the congenital defect spina bifida, said to be related to exposure of a parent to Agent Orange.

Agent Orange was a herbicide—containing dioxin—used in Vietnam to defoliate trees and remove cover for the enemy. Spraying missions occurred from 1965 to 1970. According to the Administration, 2.6 million veterans served in South Vietnam or in adjacent waters.

Vietnam veterans are not required to prove exposure to Agent Orange; the VA presumes all military personnel who served in Vietnam were exposed.

The decisions follow the VA's review of a report by the National Academy of Sciences on the effects of Agent Orange exposure. The NAS study found new limited or suggestive evidence to show an association between exposure to Agent Orange and the onset of prostate cancer, acute and subacute peripheral neuropathy, and spina bifida.

As of April, the VA had received 75,084 claims from Vietnam veterans or their survivors seeking disability compensation and death benefits related to Agent Orange.

Photo © William T. Randol

The Dover AFB Museum, Del., in May celebrated the restoration of a P-51D dedicated to the Tuskegee Airmen. The Mustang was painted in the markings used by Dr. Roscoe C. Brown, who took the opportunity to climb into the cockpit. As an AAF captain, Dr. Brown commanded the 100th Fighter Squadron.

Air Force Secretary Sheila Widnall gave the Joint Primary Aircraft Training System a thumbs-up after a brief flight from Andrews AFB, Md. With her was Lt. Col. Warren Hansen, USAF (Ret.), Raytheon's JPATS flight-test manager.

New Review in the Works

Despite earlier hedging, Defense Department officials have revealed that DoD needs to conduct another comprehensive force review as a follow-up to the 1993 Bottom-Up Review (BUR), the results of which now are seen by many as fiscally, and to some extent structurally, unrealistic.

Senior Air Force officials stated last year that they saw a need for a new review, probably early in 1997.

Senate Armed Services Committee members stated at a Center for Strategic and Budgetary Assessments conference in April that they want a follow-on to the BUR. They said the 1993 study was useful but is no longer adequate and that they may include requirements for a new review in the Fiscal 1997 defense authorization bill.

Edward L. Warner III, assistant secretary of defense for Strategy and Requirements, said at the Washington conference that Defense Secretary Perry had agreed that another major force-structure review is needed at the start of a new administration. He added that DoD leaders are committed to conducting a new study whether or not the Clinton Administration wins another term.

Passenger Aircraft to Get GPS

In the wake of the CT-43 crash that killed Commerce Secretary Brown and thirty-four others in April, Defense Secretary Perry directed the services to install Global Positioning System equipment in all passenger-carrying aircraft by Fiscal 2000 and flight data recorders (FDRs) by Fiscal 1999.

DoD estimated the total cost for these additions at $335 million above what the services had already planned to spend to integrate GPS equipment aboard military aircraft.

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Senior Air Force officials told reporters at a briefing May 15 that they plan to purchase 737 interim GPS sets for about $4 million by the end of this fiscal year. Those sets will enable the service to provide a GPS capability that is flight-rated (but not integrated to the aircraft) on all USAF passenger aircraft—about 1,200 of them. Officials said they expect the systems to service more than one aircraft because they can be moved from one aircraft to another.

USAF plans to speed its planned installation of fully integrated GPS receivers to meet the Fiscal 2000 deadline. The accelerated program covering all USAF passenger aircraft will cost about $70 million.

Service officials also expect to acquire and install FDRs in USAF's distinguished visitor aircraft by Fiscal 1997. The FDRs will help in accident reconstruction and provide data for routine maintenance functions. DoD officials also noted that the services' installation of cockpit voice recorders had a lower priority than the GPS receivers and FDRs.

F-22 Engine Nears Completion

Pratt & Whitney announced May 6 that it had begun assembling the first F119 turbofan flight-test engine for the Air Force's new air-superiority fighter.

The company began fabricating parts for the F-22 engine in January 1995, and "now we're on the last lap," putting the company right on schedule, said Walter N. Bylciw, senior vice president of the F119 program.

Pratt & Whitney expects to deliver the first pair of F119s to Lockheed Martin, the F-22 prime contractor, in September. The company will build twenty-seven engines for nine flight-test aircraft. First flight is slated for May 1997.

Agreement Reached on Korean War POWs/MIAs

DoD announced May 10 that the US and North Korea had reached an agreement that should lead this year to joint recovery operations for the remains of US servicemen missing from the Korean War. Both sides planned a working-level meeting last month to iron out details for joint operations.

The agreement also settled on $2 million as the compensation the US will pay to North Korea for costs associated with returning 162 sets of remains in 1993 and 1994.

Alan Liotta, deputy director, Defense Prisoner of War/Missing in Action Office, said that the amount of the compensation "had been a stumbling block" for some time, preventing broader discussions on future recovery efforts. However, he told defense reporters that the $2 million would not be a precedent for future payments but had been based on what the US felt were "fair and reasonable costs for the nature of the recovery."

"One of the benefits of a joint recovery operation is that because we'll be in the country, we'll be able to get an accurate reflection of costs," stated Mr. Liotta.

Mr. Liotta also told defense reporters that the North Korean "recovery techniques were not allowing us to make positive identification" of the remains. Consequently, of the 162 sets, only five have been positively identified. Part of the recent discussions with the North Koreans took place at DoD's Central Identification Laboratory in Hawaii, where US officials explained US recovery techniques and legal constraints in identification.

More than 8,100 US servicemen remain unaccounted for from the Korean War. Pressed for an estimate, Mr. Liotta said he expected to recover "around 3,000 to 4,000," but

Senior Staff Changes

RETIREMENTS: M/G Roy D. **Bridges,** Jr., M/G Robert W. **Parker.**

PROMOTIONS: To be **Lieutenant General:** John A. **Gordon.**

To be **ANG Major General:** Keith D. **Bjerke,** Edmond W. **Boenisch,** Jr., Stewart R. **Byrne,** John H. **Fenimore** V, Johnny J. **Hobbs,** Stephen G. **Kearney,** William B. **Lynch.**

To be **ANG Brigadier General:** Brian E. **Barents,** George P. **Christakos,** Walter C. **Corish,** Jr., James V. **Dugar,** Fred E. **Ellis,** Frederick D. **Feinstein,** William P. **Gralow,** Douglas E. **Henneman,** Edward R. **Jayne** II, George W. **Keefe,** Raymond T. **Klosowski,** Fred N. **Larson,** Bruce W. **MacLane,** Ronald W. **Mielke,** Frank A. **Mitolo,** Frank D. **Rezac,** John P. **Silliman,** Jr., George E. **Wilson** III.

CHANGES: Col. (B/G selectee) Franklin J. Blaisdell, from Cmdr., 30th SPW, AFSPC, Vandenberg AFB, Calif., to Cmdr., 21st SPW, AFSPC, Peterson AFB, Colo., replacing B/G Gerald F. Perryman, Jr. . . . **B/G (M/G selectee) Donald G. Cook,** from Dir., Ops., Hq. AFSPC, Peterson AFB, Colo., to Cmdr., 20th AF, AFSPC and Cmdr., ICBM (CTF-214) Task Force, USSTRATCOM, Francis E. Warren AFB, Wyo., replacing retired M/G Robert W. Parker . . . **B/G Michael M. Dunn,** from Fellow, Council on Foreign Relations, AFIT, New York, N. Y., to Senior Mil. Ass't to the Dep. Sec'y of Defense, OSD, Washington, D. C. . . . **M/G (L/G selectee) John A. Gordon,** from Spec. Ass't for Long-Range Plans, Hq., USAF, Washington, D. C., to Associate Dir. of Central Intel. for Mil. Support, CIA, Washington, D. C. . . . **B/G (M/G selectee) John D. Hopper, Jr.,** from Cmdr., 34th Training Wing and Comdt. of Cadets, USAF Academy, Colo., to Vice Dir., Log., J-4, Jt. Staff, Washington, D. C.

Col. (B/G selectee) Theodore W. Lay II, from Spec. Ass't to Dir., Force Structure and Resources, J-8, Jt. Staff, Washington, D. C., to Cmdr., 1st FW, Hq. ACC, Langley AFB, Va., replacing B/G William R. Looney III . . . **Col. (B/G selectee) Fred P. Lewis,** from Dir., Jt. Transportation Corporate Information Management Ctr., Jt. Transportation Control Ctr., Hq. USTRANSCOM, Scott AFB, Ill., to Dir., Weather, DCS/P&O, Hq. USAF, Washington, D. C., replacing retiring B/G Thomas J. Lennon . . . **B/G William R. Looney III,** from Cmdr., 1st FW, Hq. ACC, Langley AFB, Va., to Comdt., Armed Forces Staff College, NDU, Norfolk, Va., replacing retiring B/G Roger E. Carleton . . . **Col. (B/G selectee) Stephen R. Lorenz,** from Cmdr., 305th AMW, AMC, McGuire AFB, N. J., to Cmdr., 34th Training Wing and Comdt. of Cadets, USAF Academy, Colo., replacing B/G (M/G selectee) John D. Hopper, Jr.

B/G (M/G selectee) Gregory S. Martin, from Vice Dir., Force Structure, Resources, and Assessment, J-8, Jt. Staff, Washington, D. C., to Dir., Operational Requirements, DCS/P&O, Hq. USAF, Washington, D. C., replacing M/G David J. McCloud . . . **M/G David J. McCloud,** from Dir., Operational Requirements, DCS/P&O, Hq. USAF, Washington, D. C., to Dir., Force Structure, Resources, and Assessment, J-8, Jt. Staff, Washington, D. C. . . . **Col. (B/G selectee) Robert M. Murdock,** from Cmdr., AFIA, Kirtland AFB, N. M., Office of the IG of the Air Force, Hq. USAF, Washington, D. C., to Dep. US Mil. Representative to NATO Mil. Committee, Brussels, Belgium . . . **B/G Gerald F. Perryman, Jr.,** from Cmdr., 21st SPW, AFSPC, Peterson AFB, Colo., to Dir., Ops., Hq. AFSPC, Peterson AFB, Colo., replacing B/G (M/G selectee) Donald G. Cook.

Col. (B/G selectee) Steven A. Roser, from Cmdr., 11th Wing, Bolling AFB, D. C., to Cmdr., 305th AMW, AMC, McGuire AFB, N. J., replacing Col. (B/G selectee) Stephen R. Lorenz . . . **Col. (B/G selectee) Mary L. Saunders,** from Chief, Log. Plans Div., Hq. AFRES, Robins AFB, Ga., to Dir., Transportation, DCS/Log., Hq. USAF, Washington, D. C., replacing retiring B/G Thomas R. Mikolajcik . . . **Col. (B/G selectee) Francis X. Taylor,** from Dir., Spec. Investigations, Office of the IG of the Air Force, Washington, D. C., to Cmdr., AFOSI, Bolling AFB, D. C., replacing retiring B/G Robert A. Hoffmann.

SENIOR ENLISTED ADVISOR (SEA) RETIREMENT: CMSgt. Kathy **Ballard.**

SEA CHANGE: CMSgt. Marc A. Mazza, to SEA, Hq. AFMC, Wright-Patterson AFB, Ohio, replacing retired CMSgt. Kathy Ballard. ■

that could change once DoD can make an on-site assessment.

USAF Aids Evacuation

USAF units played key roles in Operation Assured Response, the evacuation of American citizens and others from Liberia in west Africa in April.

Two MH-53 Pave Low helicopters and seventy-one members of the 352d Special Operations Group from RAF Mildenhall, UK, moved more than 2,100 people in six days from the US Embassy in Liberia.

During that time, Mildenhall's 100th Air Refueling Wing KC-135s flew more than twenty missions and pumped more than 135,000 gallons of fuel for US aircraft during the operation.

Other USAF participants in the operation included C-130s from the 86th Airlift Wing at Ramstein AB, Germany; MC-130 Combat Talon IIs and MC-130 Combat Shadow refuelers from Mildenhall; and AC-130 Spectre gunships from Hurlburt Field, Fla.

News Notes

■ The *Enola Gay* exhibition at the National Air and Space Museum in Washington, D. C., passed the one-million-visitor mark on May 16. The exhibit, which features the restored forward fuselage of the famous World War II B-29 bomber, opened June 28, 1995, and reached the million mark in less than eleven months. Museum officials plan to keep the exhibit open at least through 1997. Eventually, the entire aircraft will be assembled for display at the museum's Dulles Airport annex in northern Virginia, scheduled to open in 2003. The previous record holder, drawing 800,000 visitors, was a "Star Trek" exhibit.

■ A crew from the 1st Helicopter Squadron, Andrews AFB, Md., won the Air Force Association's 1995 Lt. Gen. William H. Tunner Award. The crew was cited for transporting a critically ill retired Air Force member from Andrews to the Naval Medical Center, Bethesda, Md., in poor weather. Lt. Col. Henry B. Gaither, Jr., Capt. Michael W. Harding, and SrA. James M. Strauss flew through 100-foot ceilings and visibility of less than one mile on November 14, 1995.

■ Charleston AFB, S. C., received the twenty-fifth production C-17 Globemaster III on May 2. It was the thirteenth consecutive new airlifter delivered ahead of schedule by prime contractor McDonnell Douglas Corp.

■ According to McDonnell Douglas, Lt. Col. Randy Sadler and Lt. Col. Paul Sykes have become the first Air Force pilots to exceed 1,000 hours in the C-17. Colonel Sadler, assigned to Air Mobility Command's Operating Location Delta at Charleston AFB, oversees C-17 aircrew training. Colonel Sykes is the chief of Standardization and Evaluation for the 315th Airlift Wing, the C-17 Reserve Associate unit at Charleston.

■ The first Titan IV launched from Cape Canaveral AS, Fla., in 1996 blasted off April 24 with a classified payload. It was the ninth consecutive successful Titan IV launch and is the first of five planned for the nation's largest expendable launch vehicle this year. Space and Missile Systems Center officials also noted it was the 100th launch of a Titan using large solid rocket motors, soon to be replaced by the Solid Rocket Motor Upgrade.

■ Air Force personnel officials announced April 26 that the service will combine testing cycles for promotion to senior and chief master

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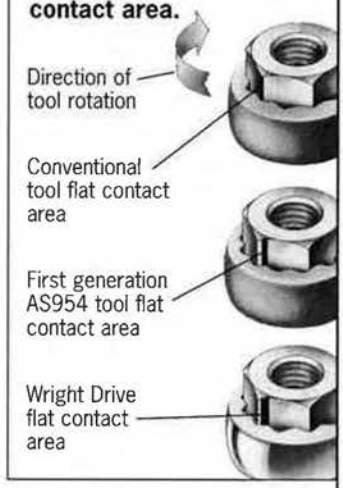

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sergeant beginning this year. The first combined test date will be in September. Officials said the change will improve efficiency of personnel resources and relieve some stress for those taking the test by moving the cycle out of the normal reassignment time frame.

■ USAF successfully tested Rockwell's AGM-130 standoff weapon with inertial midcourse guidance (MCG) and an Improved Modular Infrared Seeker on April 15 at Eglin AFB, Fla. It was the first test using the improved seeker, which greatly enhances the missile's day/night and adverse-weather capability, stated a Rockwell news release. It was the third test for the MCG, which uses an inertial navigation system/Global Positioning System to autonomously guide the missile to a target.

■ The Veterans Affairs Medical Center in Dallas, Tex., is the first VA medical center to offer managed health care, under DoD's Tricare program, to dependents of active-duty personnel and to retirees and their dependents under age sixty-five. VA officials expect to add nearly 11,000 new patients, which will generate additional revenue to fund expansion and improve services. The Dallas facility also serves as the prototype for future arrangements between DoD and the VA.

■ Guardian Challenge, an Air Force Space Command exercise, wrapped up April 26. Winners were 20th Space Surveillance Squadron, Eglin AFB, Fla.; 22d Space Operations Squadron, Falcon AFB, Colo.; 7th Space Warning Squadron, Beale AFB, Calif.; 5th Space Launch Squadron, Cape Canaveral AS, Fla.; and 319th Missile Squadron, F. E. Warren AFB, Wyo.

Adm. Jeremy Michael Boorda, 1939–1996

Adm. Jeremy Michael Boorda, Chief of Naval Operations, died May 16 in Washington, D. C., of a self-inflicted gunshot wound. Admiral Boorda was the first US sailor to begin a career in the enlisted ranks and rise to the office of CNO, the Navy's top position. He was fifty-six.

Highly regarded by many for his leadership and concern for sailors and their families, the Admiral served at a time of great turmoil in the Navy. He confronted many controversies stemming from the Tailhook scandal as well as a range of "social" problems concerning the role of women in the Navy.

Admiral Boorda was born in South Bend, Ind., in 1939. He enlisted in 1956, attained the rank of petty officer first class, and was selected in 1962 for commissioning. He served in many command positions, including Commander in Chief, Allied Forces Europe, where he led NATO forces in Bosnia. In 1994, he became the twenty-fifth CNO and a member of the Joint Chiefs of Staff.

Admiral Boorda left two notes, one to his family and one to "the sailors," neither of which was immediately made public.

■ USAF picked the 70th Fighter Squadron, Moody AFB, Ga., to provide the A-10 demonstration team for nearly forty air shows across the nation this year. A-10 Thunderbolt II demonstrations highlight the aircraft's combat features. The team leader, Capt. Christopher Plamp, noted that all the team members volunteered for the extra work, knowing they still have to deploy to southwest Asia.

■ SrA. Kimberly M. Hilliard, 62d Mission Support Squadron, McChord AFB, Wash., carried the Olympic flame for slightly more than half a mile on May 6, serving as one of the runners carrying the torch on its eighty-two-day trip across the US to Atlanta, Ga. The United Way of Pierce County, Wash., selected the airman because of her volunteer efforts in the community.

■ For its Drug Free program, the 11th Wing, Bolling AFB, D. C., won honorable mention/special recognition in the national Public Service Excellence Awards. The wing competed against 130 federal government nominees.

■ Reserve Col. Betty L. Mullis became the first woman to command an Air Force flying wing when she took charge of the 940th Air Refueling Wing, McClellan AFB, Calif., May 5.

■ McChord AFB, Wash., became the first major Air Force installation to complete 100 percent remedial action in place, which means the remedial or cleanup action has been selected and begun at all of its sixty-five hazardous sites. Of those sixty-five sites, identified in 1982, nine are on the National Priority List.

■ The 7th Engineer Squadron Environment Flight, Dyess AFB, Tex., won the DoD Environmental Pollution Prevention Award for 1995. The flight won the award for reducing hazardous waste by more than eighty percent and municipal solid waste by sixty-seven percent. The base is five years ahead of schedule in meeting USAF and Defense Department waste-reduction goals of fifty percent.

■ Tyndall AFB, Fla., won USAF's Gen. Thomas D. White Natural/Cultural Resources Management Award for a large base and the DoD Natural Resources Conservation Award for having the best program during the previous three years. Tyndall encompasses more than 29,000 acres. Offutt AFB, Neb., won the General White Award for small bases, and Kadena AB, Japan, won for overseas installations. Eglin AFB, Fla., won DoD's 1995 Environmental Quality Award in the industrial category. Hurlburt Field, Fla., won DoD's 1995 award for the best overall environmental program among nonindustrial installations. ■

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Valor

By John L. Frisbee, Contributing Editor

David and Goliath

Many extraordinary encounters took place in the skies of World War II but none more bizarre than this.

THE Tenth Air Force in India was, throughout most of its life, the smallest of the AAF's combat air forces but with a large geographical area of responsibility and an important mission. It was responsible for helping to defend the supply line from India to China and for interdicting the Japanese supply net running from Rangoon, Burma, to the north of that country. Its heavy bomber force—consisting of a few B-24s—was the 7th Bomb Group, based at Pandaveswar, northwest of Calcutta, whence it flew very long missions to targets mostly in Burma.

On March 31, 1943, the 7th BG's 9th Bomb Squadron was dispatched to destroy a railroad bridge at Pyinmana, about halfway between Rangoon and Mandalay and near two active enemy fighter bases. The formation was led by Col. Conrad F. Necrason, 7th BG commander. The B-24 on his right wing was piloted by 1st Lt. Lloyd Jensen whose copilot was 2d Lt. Owen J. Baggett. On that mission, Baggett was to earn a distinction believed to be unique in Air Force history.

Before reaching the target, the B-24s were attacked by fighters. Colonel Necrason was severely wounded, and Jensen's aircraft was fatally damaged. Oxygen bottles were shattered, intensifying a fire in the rear of Jensen's bomber. Nineteen-year-old Sgt. Samuel Crostic slid out of his top turret, grabbed two fire extinguishers, and fought the fire in the rear of the aircraft while standing on a catwalk over the open bomb bay. The plane still was under attack by enemy fighters, taking many hits along its fuselage. To help defend the aircraft, copilot Baggett took over the top turret until Sergeant Crostic had emptied his fire extinguishers, giving the crew time to prepare for bailout.

Smoke and fumes filled the B-24. Jensen ordered the crew to bail out. With the intercom inoperative, Baggett hand-signaled the gunners to hit the silk and, nearly overcome by fumes, put on his own chute. He next remembers floating down with a good chute. He saw four more open canopies before the bomber exploded.

The Japanese pilots immediately began strafing the surviving crewmen, apparently killing some of them and grazing Lieutenant Baggett's arm. The pilot who had hit Baggett circled to finish him off or perhaps only to get a better look at his victim. Baggett pretended to be dead, hoping the Zero pilot would not fire again. In any event, the pilot opened his canopy and approached within feet of Baggett's chute, nose up and on the verge of a stall. Baggett, enraged by the strafing of his helpless crewmates, raised the .45 automatic concealed against his leg and fired four shots at the open cockpit. The Zero stalled and spun in.

After Baggett hit the ground, enemy pilots continued to strafe him, but he escaped by hiding behind a tree. Lieutenant Jensen and one of the gunners landed near him. All three were captured by the Burmese and turned over to the Japanese. Sergeant Crostic also survived the bailout. Baggett and Jensen were flown out of Burma in an enemy bomber and imprisoned near Singapore.

In the more than two years he was held prisoner, Owen Baggett's weight dropped from 180 pounds to ninety. He had ample time to think about his midair dual. He did not at first believe it possible that he could have shot down the enemy while swinging in his chute, but gradually pieces of the puzzle came together.

Shortly after he was imprisoned, Baggett, Jensen, and another officer were taken before a Japanese major general who was in charge of all POWs in the area and who subsequently was executed as a war criminal. Baggett appeared to be treated like a celebrity. He was offered the opportunity of and given instructions on how to do the "honorable thing"—commit *hara-kiri,* a proposal he declined.

Owen Baggett may have achieved the most unusual aerial victory of the war.

A few months later, Col. Harry Melton, commander of the 311th Fighter Group who had been shot down, passed through the POW camp and told Baggett that a Japanese colonel said the pilot Owen Baggett had fired at had been thrown clear of his plane when it crashed and burned. He was found dead of a single bullet in his head. Colonel Melton intended to make an official report of the incident but lost his life when the ship on which he was being taken to Japan was sunk.

Two other pieces of evidence support Baggett's account: First, no friendly fighters were in the area that could have downed the Zero pilot. Second, the incident took place at an altitude of 4,000 to 5,000 feet. The pilot could have recovered from an unintentional stall and spin.

Retired Colonel Baggett, now living in San Antonio, Tex., believes he shot down the Japanese pilot, but because that judgment is based on largely indirect and circumstantial evidence, he remains reluctant to talk much about it. We think the jury no longer is out. There appears to be no reasonable doubt that Owen Baggett performed a unique act of valor, unlikely to be repeated in the unfolding annals of air warfare. ■

Thanks to Colonel Baggett and to Charles V. Duncan, Jr., author of B-24 Over Burma.

The Air Force is emerging from the drawdown and looking ahead to its configuration for the future.

The Evolution of the Force

By John A. Tirpak, Senior Editor

THERE will be no "gut-wrenching, nine-G turns" in the Air Force's program during the next few years, according to the USAF Chief of Staff, Gen. Ronald R. Fogleman. The service's budgets figure to stay fairly constant—perhaps even move upward a bit—and the seismic shifts in force structure and personnel that marked the first half of the 1990s have ended.

This dawning era of stability, however, will be marked by steady evolution of the force into something new, which might not closely resemble today's Air Force. "We are no longer the Cold War Air Force," said Air Force Secretary Sheila E. Widnall, who then added, "More importantly, we are no longer the *post*–Cold War Air Force."

The Secretary explained, "We have worked through the 'drawdown era' to preserve our core competencies, to protect our people, and improve our readiness." The Air Force, she said, is "postured to execute fully our role in the national military strategy, . . . and we have a clear vision of the road ahead."

That "vision" will be fully articulated this fall. The Air Force is expected to complete a broad-gauged, eighteen-month study that will prescribe what it needs to do now and in years just ahead if it is to be fully capable, properly sized, and well equipped in 2025.

The conclusion of the USAF study will coincide with the start of what the Pentagon is calling its "quadrennial strategic review," a successor to the Clinton Administration's 1993 Bottom-Up Review of Defense Needs and Programs. That review determined that US armed forces should be capable of fighting and winning two major regional conflicts (MRCs) at about the same time. It established force levels that it said would support the two-MRC strategy.

The BUR set USAF force levels at twenty fighter wing equivalents (FWEs) and up to 184 operational heavy bombers. Today the Air Force has twenty FWEs, of which thirteen are active and seven belong to the Air Force Reserve and Air National Guard. There are about 150 bombers—100 of which are operational and the rest in a semi-inactive status. USAF also made other critical reductions. (See Figure 4, p. 23.)

The Guiding Light

Billed as a "synergistic" product of several studies of potential technological and political developments, the Air Force vision will be used to chart the course for everything from modernization investment to training, General Fogleman said.

"I know how precious the dollars will be" in the future, said the Chief of Staff, "but I don't want [the review] to end up being a 'shopping list' " of programs to buy. He expects the vision statement to encompass what the Air Force means to the country, what it brings to the equations of defense and power projection, and how it can deliver on its "core competencies."

"The program we have right now is pretty good," General Fogleman added—and he said he does not expect the vision statement to trigger a sudden, radical departure from the way USAF has mapped its future and proposes to do business. At first, the vision statement will likely have minimal impact on everyday life in the Air Force, he said. Yet, the General said he is "anxious to get going" on the task of steering investments toward the technologies and methods that will keep USAF a dominant military force well into the future.

Maj. Gen. John W. Handy, USAF director of Programs and Evaluation and therefore a key figure in planning, asserted that the Air Force already is benefiting from the effort of crafting the design of the service three decades hence. "Last year," said General Handy, ". . . we did not have the sense of vision into the future that we have this year; . . . and the clarity next year will be even better" regarding where USAF should apply available resources.

USAF's vision will do more than simply give it a roadmap for developing technologies necessary to maintain future control of air and space, General Handy said. "Once people get caught up in it, they get excited, and light bulbs start going on over their heads."

Figure 1. **DoD Funding Trends**

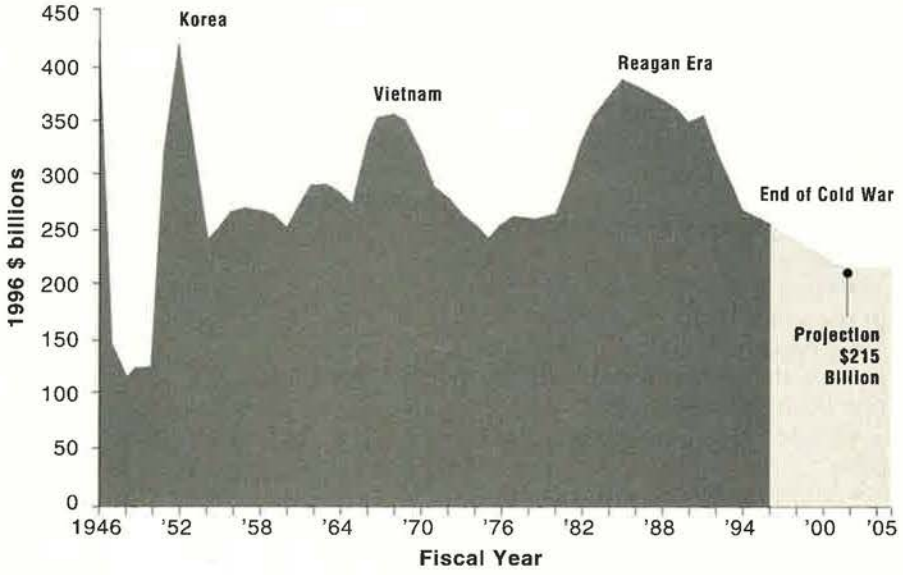
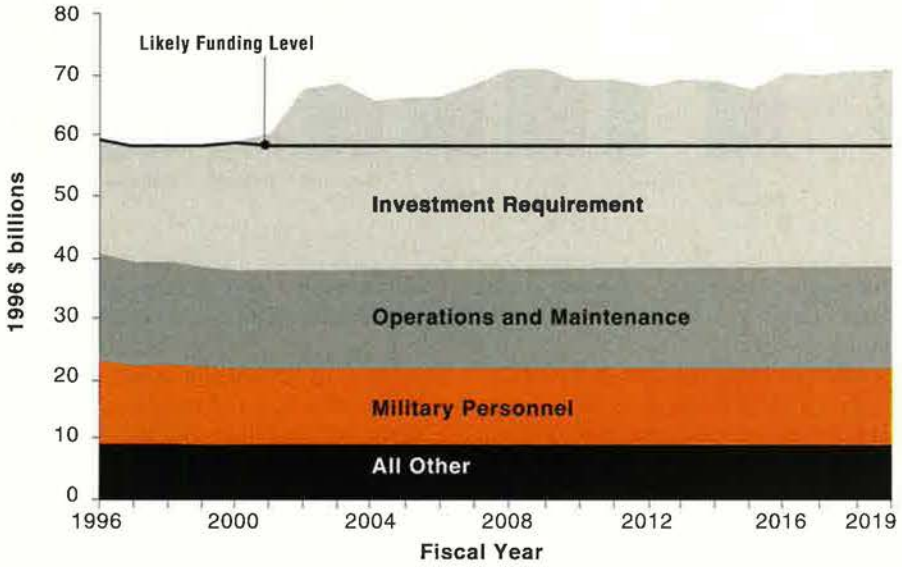


Figure 2. **Requirements vs. Funding**



Resources appear to be leveling off, said officials. The Republican-led Congress showed every sign this spring of honoring not only most of the Air Force's spending priorities but also much of its "wish list" of items it could not afford under its Administration-imposed budget "top line."

The near-term Air Force budget priority continues to be the C-17 airlifter. Key Congressional committees approved going ahead with a multiyear procurement that would pare five to ten percent off the per-airplane price.

USAF's midterm priorities center on obtaining a variety of conventional weapons upgrades to the Air Force's fleet of heavy bombers, supplying all its combat aircraft with smart and standoff munitions and laying the groundwork for the F-16's replacement, the Joint Strike Fighter.

The new F-22 air-superiority fighter remains by far the highest Air Force spending priority for the long term. Meanwhile, the Air Force's "ongoing" priorities include upgrades to space-launch systems and space-based warning capabilities.

The Top Ten

General Fogleman, in testimony before the Senate Armed Services Committee, listed USAF's top "unfunded" requirements, in order of importance:

- More E-8 Joint Surveillance and

Target Attack Radar System (Joint STARS) aircraft.

- F-15 fighters to offset attrition.
- F-16 fighters to offset attrition.
- Additional Global Positioning System (GPS) equipment.
- Improvements to E-3 Airborne Warning and Control System aircraft.
- Reengining of existing AWACS airplanes.
- More RC-135 Rivet Joint electronic surveillance airplanes.
- Additional digital crosslinks, such as the Joint Tactical Information Distribution System.
- More C-130J intratheater transports.
- More precision guided munitions.

General Fogleman said that priorities were assigned by regional commanders in chief, who value the capabilities of Air Force intelligence, surveillance, and reconnaissance platforms.

General Handy said that the Fiscal 1997 budget sent to Congress in March reflects "continued attention to 'Global Reach, Global Power,' " the Air Force's 1990 white paper. He noted that the paper's basic elements are sustaining deterrence, providing versatile combat capability, providing rapid mobility worldwide, controlling space, and building US influence. A new element—"added in the last twenty-four months"—is "ensuring information dominance." *[See "The New World of Information Warfare," June 1996, p. 30.]*

"It's amazing how that has increased tremendously in importance . . . in everything we do," General Handy observed. So critical has it become to preserve access to information—while denying it to an enemy—that "Global Awareness" will likely be added to "Global Reach, Global Power" as the Air Force's semiofficial motto.

Resource priorities have changed since last year, noted General Handy. He said that the latest Defense Planning Guidance, prepared by the Office of the Secretary of Defense, still gives top priority to the combination of readiness and sustainability, as it has throughout the Clinton Administration.

However, modernization—generally regarded as having been neglected during the drawdown years—has moved up into the number two position, bumping force structure into third on the priority list. Defense support infrastructure comes in last.

Get Serious

"We really need to get serious about modernization," said General Handy. "For four years, we've lived off savings [from] . . . quickly getting down to BUR force structure and manning levels, . . . but [the amount saved] is spent. All those resources have been reinvested."

From 1985 to the present, General Handy noted, the amount that the Air Force has committed to procurement of new aircraft has fallen seventy-three percent. In a speech to the Air Force Association symposium in Dayton, Ohio, last year, he said that the service was on a "560-year replacement cycle" with regard to its fighters—a rate that he observed was "not sustainable." This year, the Air Force budget request included money for four F-15Es and four F-16Cs. Assuming the request is approved, said the General, the replacement rate will go down to only 160 years.

"It's a start," he observed.

Several Congressional committees moved early in the budget cycle to add a pair of aircraft to each request. General Handy said the Air Force needs eighteen new F-15Es, which it would like to buy at a rate of six per year. The F-15E force is down to zero attrition reserve aircraft. USAF also needs 120 new F-16s to keep its wings at full strength until the arrival of the Joint Strike Fighter in 2010, but the Air Force does not know how it can afford to buy that many.

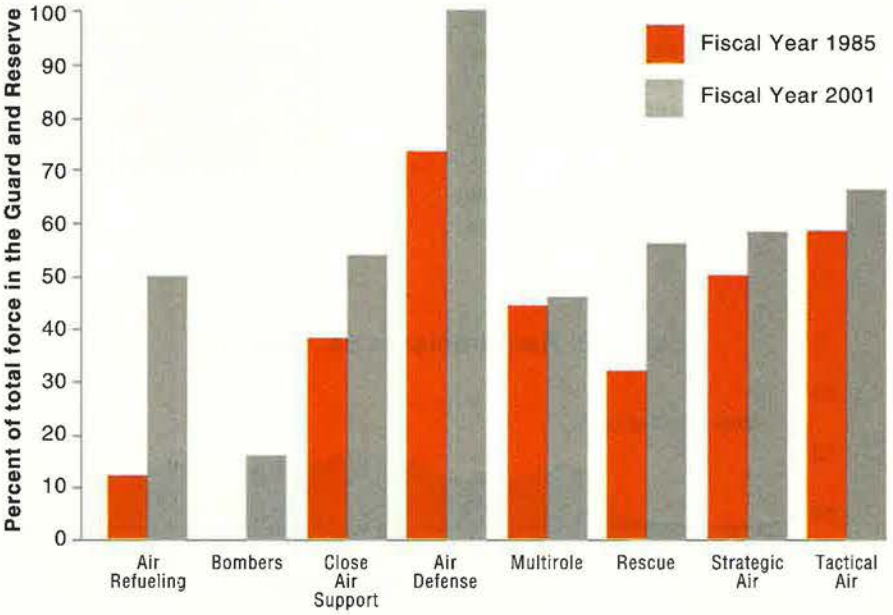
Based on current plans, the Air Force from 2001 to 2020 will fall chronically short of required spending levels, General Handy said. (See Figure 2, p. 21.) There will be a $3 billion to $5 billion gap each year between stated and validated requirements and funding that the Air Force plans to request.

"Is there a bow wave [of steadily increasing unfunded requirements] lurking out there?" asked General Handy. "That always comes up, and the answer is, there is *always* a bow wave out past the [program objective memorandum] years. . . . Over time, you work your way through it."

General Handy noted that some believe the Air Force has pushed requirements out beyond the current funding horizon and that it won't be able to carry out the necessary modernization when the requirements materialize. General Handy said, however, that the trick is to decrease some of the service's "fixed" costs so that modernization "can be afforded."

USAF is attacking those fixed costs by aggressively seeking ways to di-

Figure 3. **Shifts in the Force Mix**



vest itself of functions that can be more efficiently performed by the private sector, in any area where a nonorganic capability is not important to war readiness.

These measures include massive "privatization in place," such as that proposed for the huge Air Logistic Centers at Kelly AFB, Tex., and McClellan AFB, Calif., all the way down to base support functions, such as "plumbing, refuse collection, electrical contracting, and civil engineering," said General Handy.

Under a DoD-wide initiative, housing may be built by private contractors, then leased to the government, dispensing with many infrastructure costs associated with base housing.

Eliminating blue-suit or USAF civilian employee functions saves money by eliminating pensions, medical care, and other personnel-support costs. These funds can then be applied to USAF modernization accounts, General Handy said.

Other costs might be avoided, too, the General noted. For example, some think F-16 attrition may not occur at as high a rate as predicted, and, if so, fewer will have to be bought to keep the squadrons filled. Planned modifications may be dropped if they do not significantly add to capability or if the airplane involved is already on its way out of the inventory.

A Little More Risk

General Fogleman noted that some F-15 modifications may be eliminated, not only because the mods would cut into funds needed for the F-22 fighter program but also because the nation enjoys such a huge advantage in air superiority that "we can live with a period of risk," he said.

General Handy noted that USAF long has observed a "five-year rule" in dealing with older aircraft. "If it's going to be retired in five years or less, we don't modify it," he said.

In the case of the B-52 bomber, which has been judged to have a long service life ahead of it, "we may want to do mods," said the General. In the case of the C-141 airlifter, now rapidly being replaced by the C-17, "we won't bother unless there is a safety-of-flight issue."

At AFA's Air Warfare symposium in Orlando, Fla., last February, General Fogleman said that the capability of tomorrow's systems may make it possible to buy fewer platforms than are fielded today. This, too, could draw the "requirements" line closer to the available budget top line, said USAF officials.

However, in expanding on those remarks before the Senate Armed Services Committee, the Chief of Staff said it is possible that USAF's future "peacetime" operations—participation in multiple regional contingencies, enforcement of "no-fly" zones, and the like—may not permit the Air Force to carry out a one-for-many replacement scheme and may prove to be more taxing than the more conventional "warfighting" operations.

"I can't definitively tell you . . . I'm going to need more or less air-superiority squadrons in the future than I need today," the General told the Senate panel, though he added, "Intuitively, I think it will be less."

Lt. Gen. George K. Muellner, principal deputy assistant secretary of the Air Force for Acquisition, told the Military Research and Development Subcommittee of the House National Security Committee that the F-22 is one of the "least concurrent" combat airplanes ever bought by the service. By that, he meant that the Air Force is not simultaneously developing and producing various systems with a high degree of risk.

He added that, because of the lack of concurrency in the program, seventy to eighty percent of the required F-22 fixes are to be completed before the end of the current development, test, and evaluation phase. The first developmental F-22 is to fly in May 1997.

The Air Force's Fiscal 1997 budget request for the new F-22 stealth fighter remains based on a schedule for replacing F-15s one-for-one, leading to deployment of 438 F-22s by 2010. That would provide enough fighters for four F-22 wings with adequate reserve, attrition, training, and maintenance aircraft.

General Fogleman told the Senate panel that the Air Force plans to provide special operations forces fifty CV-22 tiltrotor aircraft, which "we forecast . . . will be able to replace eighty or so airframes, . . . a combination of helicopters and tankers needed to get them the additional range."

General Handy said that, to find savings to put into modernization, "the big money . . . is in base closures." Of the total DoD base realignment and closure savings expected through 1990, the Air Force will have yielded seventy-one percent, or $4.7 billion, of DoD's $6.6 billion.

"We are constantly fighting the tooth-to-tail ratio," said General Handy. "We feel that we're getting it sensibly balanced."

Officials note that, since 1988, the Air Force's spending on operations and support—including infrastruc-

Figure 4. **The Air Force Drawdown, 1985–2001**

Selected Categories

Aircraft purchases	down 73 percent
Aircraft inventory	down 29 percent
ICBM inventory	down 47 percent
Major overseas installations	down 68 percent
Major US installations	down 26 percent
Active-duty end strength	down 38 percent
Civilian end strength	down 38 percent

ture—declined by twenty-eight percent, but spending on modernization dropped sixty-six percent.

Acquisition Reform

The Air Force is counting on acquisition reforms to help reduce some of the traditional costs—and time involved—in buying new systems. It is an area that so far has yielded nearly $3 billion in savings, but it is difficult to quantify or predict how much the reforms can save in the long run, General Handy acknowledged.

General Handy said his office, taking "an average of predictions from many sources," anticipates that military budgets will level off at about $215 billion annually (in today's dollars) by 2005. (See Figure 1, p. 21.) If the predictions come true, it will mean "a lot less funding in our future," he said, and will make further consolidation of service functions even more critical.

The future Air Force may have an even larger role for the Guard and Reserve. One scenario reviewed in Air University's "Air Force 2025" study is the possibility of putting ten of USAF's twenty FWEs into the reserve component—three more than exist there today.

"I can't think of any area where we are not divesting substantially to the Guard and Reserve," General Handy said.

He noted that since 1985, the Guard and Reserve have taken over all of the CONUS air defense mission and half the air refueling mission (up from one-eighth). The Guard and Reserve have more than half of the search-and-rescue capability, more than half of the close air support function, and two-thirds of all tactical forces in USAF. (See Figure 3, p. 22.)

The Air Force projects that it will spend $22.7 billion on mobility forces over the course of the Future Years Defense Program (FYDP). The mobility program includes not only the C-17 but a KC-135 modification that permits a two-person crew to fly the airplane; purchase of the C-130J and

Figure 5. **Fighter Force**
(Primary Aircraft Authorized)

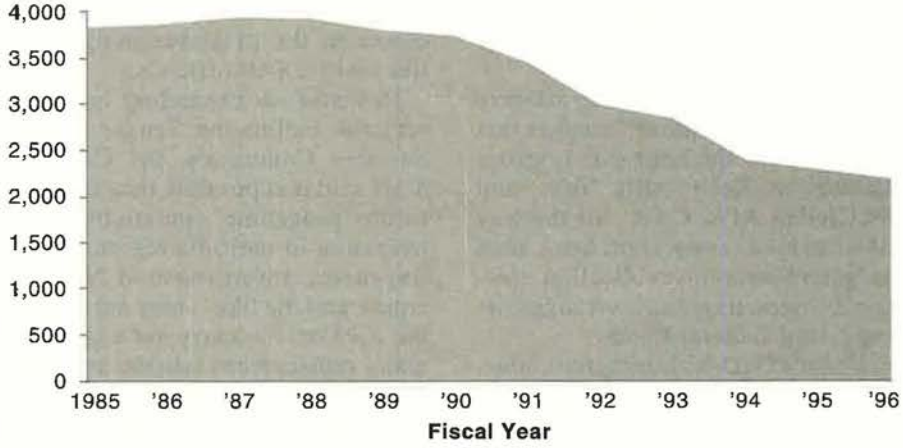
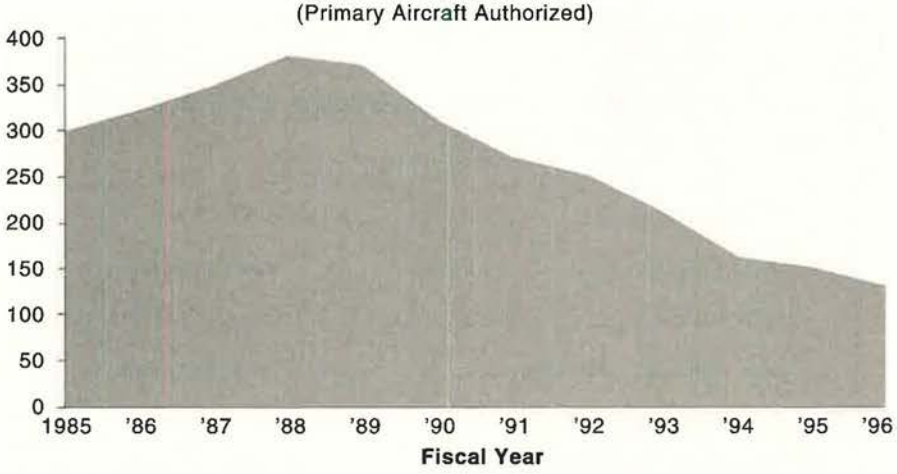
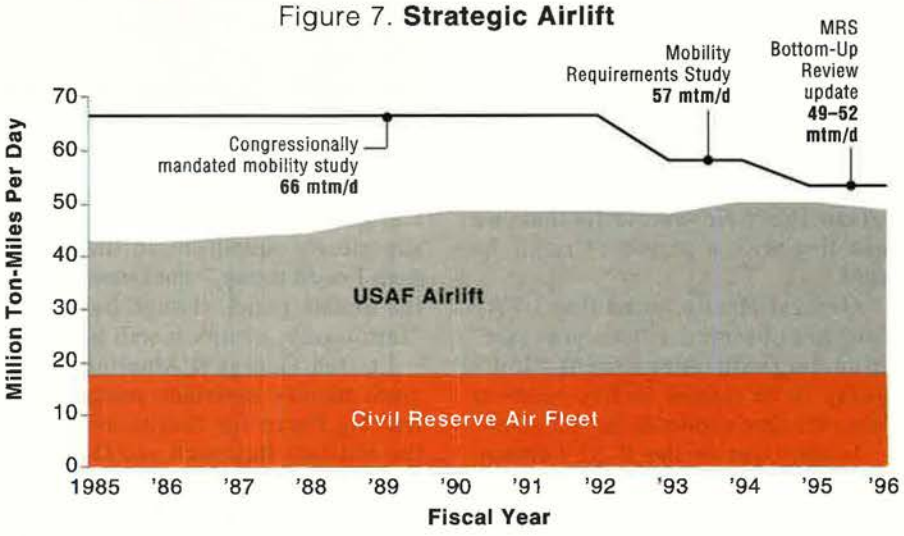


Figure 6. **Bomber Force**
(Primary Aircraft Authorized)



In the post–Cold War restructuring of the US military, the Air Force shed large numbers of fighters and heavy bombers but slightly increased its long-range airlift capabilities.

Figure 7. **Strategic Airlift**



its conversion to "special mission" configurations; improvement of the C-5's high-pressure turbine; procurement of a new "VCX" executive transport; and purchase of defensive systems for all airlift aircraft. Integration of GPS capability is not included in the FYDP but may be added later.

Because it offers greater range, altitude, and endurance than earlier types of C-130s, the J model will be used to take on the Compass Call, Airborne Battlefield Command and Control Center, and other special-mission configurations.

A new "tactical requirements study" due out this summer likely will conclude that the Air Force needs fewer C-130s than it now operates, General Fogleman said, meaning it will be possible to move toward an all-C-130H tactical airlift force. This, in turn, will buy the time needed to equip special-mission units with C-130Js.

Another key feature of the Air Force program is the developmental Airborne Laser. The ABL, mounted in the nose of a 747, will enable USAF to shoot down ballistic missiles in their boost phase over the launch nation's territory.

"I really believe the ABL will be to directed energy what the F-117 has been to stealth," General Fogleman said. "It costs $1,000 a shot, and you get forty shots."

General Fogleman noted that the idea has not yet been greeted with much enthusiasm outside the Air Force, so "for the foreseeable future, we're just going to have to suck it up" and fund the system single-handedly.

Still, General Fogleman believes it will have an enormous payoff, and "then everyone will get on the bandwagon."

General Handy reported that the lack of a modern short-range, heat-seeking missile is the most glaring problem in the air-superiority field. The current AIM-9X program is "hotly discussed." The service has concerns that the program will not be able to deliver the needed capability in the time allotted and within available funding. Industry and defense officials said the program may be dropped in favor of a partnership with the European Advanced Short-Range Air-to-Air Missile or the Israeli Python weapon.

The "precision employment" category comprises the greatest number of new programs, including the Joint Standoff Weapon, Sensor-Fuzed Weapon, and Joint Air-to-Surface Standoff Missile (JASSM), which is the successor to the canceled Triservice Standoff Attack Missile (TSSAM). General Muellner told the House National Security Committee that USAF expects the JASSM to cost $400,000 to $700,000 per copy, as opposed to $2 million for each TSSAM round.

Precision employment activities will consume about $15.7 billion of the Air Force's budget over the FYDP.

The new precision munitions have "very little to do with what that term meant in Vietnam," General Handy said. Compared to the older weapons, these new systems have far greater accuracy and autonomy and greatly increased reliability and effectiveness, which, the General said, puts them in "a different category" from the 1960s- and 1970s-vintage weapons. The combination of platforms and weapons will give USAF an unprecedented level of accuracy in hitting targets.

Family Resemblance

General Handy also said that the Air Force is "very satisfied" with the progress to date on the Joint Strike Fighter program. Soon, two of the three competing teams will be selected to move ahead with the project, and one will be dropped. Many have expressed misgivings about the project, which is expected to use common engines and avionics to bring forth a family of stealthy, inexpensive combat aircraft for the Air Force, Navy, Marine Corps, and the UK's Royal Navy. The program is now fully funded and has the full support of the Air Force, he said.

The Air Force is not seeking money to buy more B-2s or to keep the production line warm. However, President Clinton directed that the $493 million appropriated by Congress for the B-2 last year be applied to converting the first test aircraft—AV-1—into a full-up Block 30 airplane. Asked by lawmakers if the conversion would keep the B-2 production line warm, General Muellner answered, "In part." He explained that the problem is holding the vendor base together over a longer term. The single retrofit operation "does not deal with the vendors' issues because it is only one more aircraft," he said.

Space systems will command $21.8 billion of USAF's FYDP funding. General Handy said, "If this were a stock, I'd say, 'Buy.' "

The space-systems element—including the Evolved Expendable Launch Vehicle, Milstar, satellite communications, and Spacebased Infrared—"gets better and better because you're not holding on to older systems for long periods," the General said. "It's bound to be an area we invest more in," he added. "We hope to transition over time to cheaper launch capabilities [and] . . . smaller, more capable payloads . . . with a fair amount of reliance on commercial augmentation."

The information-dominance area will get $7.53 billion over the FYDP. In this respect, the Air Force asked Congress to look seriously at adding two E-8 Joint STARS aircraft to the FY 1997 program but did not include them in the formal budget request, General Handy said. The move would be undertaken to speed up the introduction of the E-8s into the inventory. The airplanes would come off the "back end" of the buy and not be an increase to the overall program.

"It would be valuable to get an additional capability into the field sooner," said General Handy. "They have done an incredible job in Bosnia[-Hercegovina]." He added that every theater commander wants to be able to get one on short notice.

USAF's trainer fleet has entered a period of major recapitalization. The Air Force has taken delivery on dozens of T-1A Jayhawk tanker/transport trainers and T-3A Firefly flight screener aircraft and is about to start ramping up production of the Joint Primary Aircraft Training System (JPATS).

General Handy said the T-1A "really does feel like a much bigger aircraft" and noted that the JPATS "has saved, and will save us, a lot of money." A little more than $1 billion is in the training program through the FYDP, which includes JPATS and upgrading the T-38 Talon with avionics that will make it more similar to current front-line airplanes. ■

These snapshots from the albums of Air Force Association members recall the era from the perspective of those who served.

Korean War Scrapbook

Richard P. Dedinas enlisted in the Air Force in November 1951 and was an F-86 crew chief at Johnson (formerly Irumagawa) AB, Japan, when this photo was taken. He also pulled alert duty at Nilgata AB, Japan. Chief Master Sergeant Dedinas, USAF (Ret.), lives in Greenfield, Mass.

Sgt. George E. Ryan was part of a forward air control team that went where the 3d Infantry Division did to direct air strikes. This shot was taken near Yonchon, South Korea, in the summer of 1952. Master Sergeant Ryan, USAF (Ret.), resides in Colorado Springs, Colo.

Capt. Gordon L. Whitted sits in the cockpit of his Douglas B-26 Invader, flying night interdiction from Kunsan AB, South Korea, in June 1953. He was mission-scheduling officer and commander of Flight A of the 8th Bomb Squadron. Major Whitted, USAF (Ret.), presently resides in Lakeland, Fla.

In the spring of 1953, A1C Samuel M. Gardner, dressed up and ready for a trip into town, pauses to have his picture made near the runway at Chunchon AB (K-47), South Korea. Today, Sam Gardner is AFA vice president for the Midwest Region. He presently resides in Garden City, Kan.

1st Lt. Gene L. Rohr (left) gets a ride to his aircraft for a mission out of Taegu AB (K-2), South Korea, in 1953. He was an F-84 pilot with the 58th Fighter-Bomber Group. Lieutenant Colonel Rohr, USAF (Ret.), lives in Granite Bay, Calif.

Lt. Col. Edwin L. Heller was commander of the 16th Fighter-Interceptor Squadron at Suwon AB, South Korea, when this photo was taken in the summer of 1952. He flew forty missions and had 3.5 aerial victories (in addition to 5.5 during World War II) before he was shot down. He landed in China and was a POW for two and a half years. Lieutenant Colonel Heller, USAF (Ret.), lives in Grass Valley, Calif.

1st Lt. Sam Forbert, Jr., stands in front of an F-51 Mustang, Rotation Blues. *between missions in the summer of 1952 at K-46, a forward airfield at Hoengsong, near Wonju, South Korea. He had flown P-51s in World War II and was called to active duty with the Mississippi Air Guard for the Korean War, where he was a pilot with the 18th Fighter-Bomber Group. Colonel Forbert, USAF (Ret.), lives in Meridian, Miss.*

Spot Maj. Hal A. Strack, 22d Bomb Wing radar officer and mission-briefing officer, prepares to loft a football at Kadena AB, Okinawa, in the summer of 1950. He flew combat missions as radar operator on the B-29 piloted by Capt. David C. Jones (who went on to be USAF Chief of Staff and Chairman of the Joint Chiefs of Staff). Hal Strack is an AFA national director. Brigadier General Strack, USAF (Ret.), lives in Incline Village, Nev.

2d Lt. Robert M. Sweet, an RF-51D pilot with the 45th Tactical Reconnaissance Squadron, stands by his aircraft at Taegu AB (K-2), South Korea, in 1950. He also flew forward air control missions in T-6 aircraft. Colonel Sweet, USAF (Ret.), presently resides in Englewood, Colo.

F-84E Thunderjet crew chief SSgt. Claude H. Bradley sits atop bombs to be loaded for the next mission at Taegu AB in November 1951. He was assigned to the 154th Fighter-Bomber Squadron of the Arkansas Air Guard. Major Bradley, USAF (Ret.), presently resides in Bella Vista, Ark.

This shot of TSgt. William R. Dooner was taken outside of 116th Fighter-Bomber Group Operations at Misawa AB, Japan, in the winter of 1951–52. He was noncommissioned officer in charge of the intelligence section of the group, which was an Air National Guard organization formed of units from California, Georgia, and Florida. Major Dooner, USAF (Ret.), lives in Carmichael, Calif.

1st Lt. Donald Thomason (far right) leans on the nose gear of Army Gen. Mark W. Clark's Constellation at Chinhae AB (K-10), South Korea, in October 1952. General Clark, commander in chief, UN Command and Far East Command, had flown in to meet with the President of South Korea, Dr. Syngman Rhee, and Army Gen. James A. Van Fleet, commander of Eighth Army in Korea. Lieutenant Colonel Thomason, USAF (Ret.), lives in Spokane, Wash.

It is Saint Patrick's Day, 1952, and B-26 pilot 1st Lt. R. W. Fox (right) poses with his crew at Pusan AB, South Korea. He also spent some time in the lines with the 3d Infantry Division. There was a jeep, he recalls—but no road to Hill 355. Also shown here are the navigator Lt. Bill White; the bombardier, Capt. Ed Gibbons; and the gunner, Cpl. Joe Riley. Colonel Fox, USAF (Ret.), lives in Middleton, Mass.

1st Lt. Ben F. Crouch stands beside the RB-26C Skivvy Boy *at Kimpo AB (K-14), South Korea. He flew fifty combat missions—the last two on a Friday the 13th—as a pilot and crew commander with the 12th Tactical Reconnaissance Squadron in 1952 and 1953. Lieutenant Colonel Crouch, USAF (Ret.), lives in Statesville, N. C.*

SFC Angelo Di Giovanni (left) and Sgt. Frank Flannery of the 1st Cavalry Division have "dinner" somewhere in South Korea in June 1952. Sergeant Di Giovanni's previous service was in Fourteenth Air Force. He is now president of the Richard S. Reid Chapter of AFA in Green Valley, Ariz. Presently resides in Green Valley, Ariz.

In the spring of 1952, permanent buildings were not yet ready at Kadena AB, Okinawa, so Sgt. Herbert J. Casanova, an engine mechanic on the B-29s that were bombing North Korea, was quartered in a tent city. The sign reads, "Brooklyn City Limits, Non Residents Keep Out." He presently resides in Bohemia, N. Y.

Lt. Col. William B. Colgan, commander of the 111th Fighter-Bomber Squadron, was flying F-84E Thunderjets out of Taegu AB, South Korea, when this shot was taken in March 1952. During World War II, he had flown 208 combat missions in Europe in P-40s and P-47s. Colonel Colgan, USAF (Ret.), lives in Fort Walton Beach, Fla.

Capt. Edward J. Brisick (last on the right in front row) and fellow pilots and observers stand in front of a T-6 aircraft at Pyongtaek AB, South Korea, in April 1951. They flew front-line reconnaissance and acted as forward controllers for Air Force and Navy fighter-bombers. Lieutenant Colonel Brisick, USAF (Ret.), lives in Irvine, Calif.

MSgt. Winton O. Sanson stands in front of Operations at Brady AB, Japan. In 1951 and 1952, he was assigned to the 437th Troop Carrier Wing, a Reserve unit that had deployed from Chicago, Ill. Senior Master Sergeant Sanson, USAF (Ret.), lives in Dana Point, Calif.

Air Force responsibilities during the Korean War weren't limited to Korea. In November 1952, SSgt. Kenneth A. Robinson was serving with the 102d Aircraft Control and Warning Squadron on the western outskirts of Benghazi, Libya. Later on, he served three terms as president of AFA's Igor Sikorsky Chapter in Stratford, Conn. Presently resides in Palm Coast, Fla.

Sgt. Jerome F. Arnoldy spent Christmas Day in 1951 with his Marine Corps antitank platoon near the Thirty-Eighth Parallel. He later joined the Air Force Reserve and retired as a senior master sergeant in 1989. Presently resides in Chico, Calif.

Capt. Rex W. Warden, Jr. (third from right), and his fellow pilots relax between missions at Taegu AB in October 1950. This was the first forward base to be used by jet fighter-bombers of the 49th Fighter-Bomber Group. Also shown are Lt. "Bones" Bonetti, Lt. "Fish" Bellinger, Lt. John Tully, Lt. "Robbie" Robertson, and Capt. John Jackson. Rex Warden lives in Rancho Santa Fe, Calif.

Lt. Budd H. Butcher stands by his F-80C aircraft at Taegu in 1951. He flew 136 missions in the F-80C and six in the F-84E. Colonel Butcher, USAF (Ret.), lives in Colorado Springs, Colo.

SSgt. Ivan L. McKinney gives directions to a landing aircraft, using his MPN-1 GCA radar scopes at Ernest Harmon AFB, Newfoundland, Canada, in 1952. From 1992 through 1995, he was AFA state president in Louisiana. Lieutenant Colonel McKinney, USAF (Ret.), lives in Bossier City, La.

2d Lt. Joseph H. Ortega named his F-51 The Spirit of Boystown *after Father Flanagan's famous boys' home, from which he had graduated. Shortly after this photo was taken at Osan AB, South Korea, "I flew this Mustang in the last US Air Force combat mission to be flown by F-51 Mustangs," he says. Lieutenant Colonel Ortega, USAF (Ret.), is a past president of AFA's Castle AFB, Calif., Chapter—now the Maj. Gen. Charles I. Bennett, Jr., Chapter in Merced, Calif. He lives in Davenport, Fla.*

A1C John W. Roach (first in front row) and his colleagues were the 371st Bomb Squadron, 307th Bomb Wing, ground crew of the month at Kadena AB, Okinawa, in January 1953. Beyond their B-29 aircraft in the distance is the East China Sea. Sharing the honor with Airman Roach were MSgt. Eddie Nevin, the crew chief, A1C Melvin Nichols, and A1C Whitney Savoy. John Roach is a past president of AFA's Burlington, Vt., Chapter. Presently resides in Williston, Vt.

Lt. William H. "Buddy" Gallup, Jr., F-86 pilot with the 334th Fighter-Interceptor Squadron, logs some leisure time in quarters at Kimpo AB, South Korea, in the summer of 1951. Colonel Gallup, USAF (Ret.), lives in Virginia Beach, Va.

1st Lt. Chester L. Blunk of the 731st Bomb Squadron—the first light bomber unit trained for night low-level missions—stands by the "Operations Office" tent at Taegu AB, South Korea, in November 1950. He was a "navigator, bombardier, radar operator, or a combination of all three" at various times on fifty-eight combat missions in the Douglas B-26 Invader. Lieutenant Colonel Blunk, USAF (Ret.), lives in Little Rock, Ark.

1st Lt. John H. Fredrickson, a radar officer with the 319th Fighter-Interceptor Squadron, stands with an F-94 on the ramp at Suwon AB (K-13), South Korea. Presently resides in Cape Canaveral, Fla.

F-84 pilot 1st Lt. Patrick J. Halloran departs squadron ops for the flight line at Taegu AB in 1952 in a combat prelude to a high-altitude recce career in U-2s and SR-71s. Major General Halloran, USAF (Ret.), lives in Colorado Springs, Colo.

The transient aircraft commander waiting patiently for approval of his flight clearance is Maj. Russell E. Dougherty. The scene is the newly constructed Base Operations Building at Pusan AB (K-1), South Korea. The Major went on to become commander in chief of Strategic Air Command and (from 1980 to 1986) Executive Director of the Air Force Association. General Dougherty, USAF (Ret.), lives in Arlington, Va.

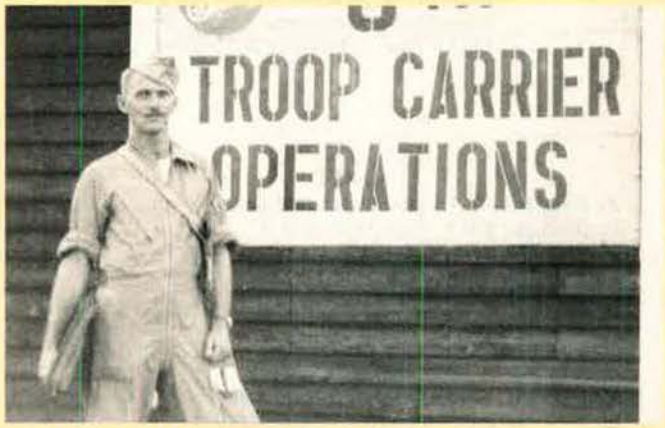
At Pyongtaek AB (K-6), South Korea, in October 1951, Capt. Edward J. Monaghan points to the hole in his T-6 "Mosquito" made by a 12.7 mm bullet. The bullet hit a communications dynamotor, which exploded and damaged half the instruments in the cockpit and wounded Captain Monaghan, who went on to become an AFA national director. Lieutenant Colonel Monaghan, USAF (Ret.), presently resides in Anchorage, Alaska.

Usually, Lt. A. E. Tyra flew a T-6 aircraft in his duties as a forward air controller in Korea, but he was assigned for a while to the 1st Cavalry Division/7th Infantry Regiment at the front lines where this photo was taken. Major Tyra, USAF (Ret.), lives in Merritt Island, Fla.

This shot of Capt. Arlo S. Potter, B-26 pilot at Kunsan AB, South Korea, is from the 8th Bomb Squadron yearbook. Primarily, the unit flew night interdiction missions over North Korea. Lieutenant Colonel Potter, USAF (Ret.), lives in Albion, Pa.

A Korean boy watches as wounded are loaded onto Lt. H. R. Dunlap's C-47 at Hongchon April 12, 1951. The landing strip was a riverbank, sand and gravel bar, about 2,000 feet long. His unit was the 21st Troop Carrier Squadron. Major Dunlap, USAF (Ret.), lives in King William, Va.

Lt. Daniel J. O'Brien poses with a Korean friend at Seoul City Airport (K-16), South Korea, in November 1950. Lieutenant O'Brien was an air rescue pilot, flying SA-16 and SB-17 aircraft in Korea from November 1950 to November 1952. Major O'Brien, USAF (Ret.), lives in Kirkland, Wash.



In this 1952 photo, TSgt. Lowell A. Smiley had just returned to Tachikawa AB, Japan, from a mission to Korea on the C-54 Bully Beef. *Chief Master Sergeant Smiley, USAF (Ret.), lives in North Highlands, Calif.*

Lt. Marc J. Michalakes, a pilot with the 315th Special Air Missions Psychological Warfare Detachment, stands beside "The Voice," a C-47 outfitted with speakers and from which leaflets were dropped. This photo was taken at K-37, a mile south of Taegu, South Korea. Lieutenant Colonel Michalakes, AFRES (Ret.), lives in Colden, N. Y.

1st Lt. Harold S. French, B-29 navigator, stands with a cleaning maid, Sachiko, at Kadena AB, Okinawa, in 1953. He was assigned to the 19th Bomb Group, whose crews struck North Korea from their base on Okinawa. Lieutenant Colonel French, USAF (Ret.), lives in Spokane, Wash.

1st Lt. Anthony R. Glaudino and Igor I. Sikorsky, the famous helicopter inventor, stand by one of the first H-19 production helicopters to come off the line. The shot was taken in October 1951 at the Sikorsky Aircraft Co. in Bridgeport, Conn., where Lieutenant Glaudino was the assistant officer in charge of the resident Air Force office. He had been a crew chief working on the first military helicopter, the XR-4, in 1942 and had met Igor Sikorsky at that time. Lieutenant Colonel Glaudino, USAF (Ret.), lives in Commack, N. Y.

1st Lt. Richard P. Schumann sat for this portrait in the summer of 1953 after he returned from a tour in Korea, where he flew B-26 combat missions out of Kunsan AB (K-8), South Korea. Colonel Schumann, USAF (Ret.), lives in Shalimar, Fla.

In May 1952, Nuel E. Sanders (left) had just returned to NAS Barbers Point, Hawaii, from a deployment to NAS Atsugi, Japan. He was a radar–electronic countermeasures crew member on Navy P2V Neptune aircraft. From Atsugi, he flew reconnaissance missions over Korea, the Sea of Japan, and the Yellow Sea. Today, Nuel Sanders is a national director of AFA. His colleague in this photo is Petty Officer Joe Hanlon. Mr. Sanders presently resides in Sun Lakes, Ariz.

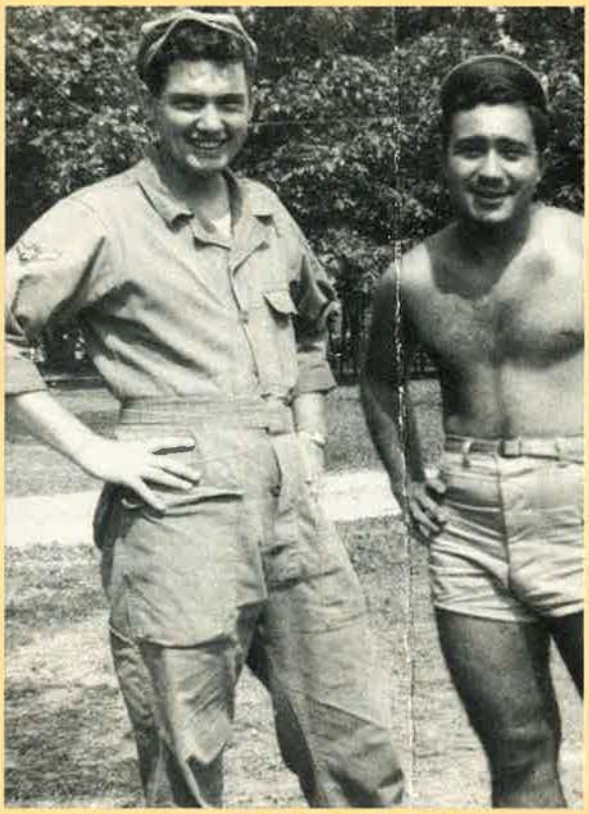
John H. Schuck sent this picture home to his family from site K-52 in the Yanggu Valley "to show I had friends there." A3C Schuck was a radar technician with the Tactical Air Direction Post Detachment of the 608th Aircraft Control and Warning Squadron. The dogs are Mitty, the unit mascot, and her son, Pup. John Schuck now flies with the Confederate Air Force and lives in Plymouth, Minn.

MSgt. Joseph N. LaRocca inspects a jet engine at Suwon AB (K-13), South Korea, in 1952. He was assigned to the 51st Fighter-Interceptor Wing, which flew F-86 Sabres. He spent his entire military career in propulsion systems, beginning with early jet engines at Muroc AAF (now Edwards AFB), Calif. Chief Master Sergeant LaRocca, USAF (Ret.), lives in New Windsor, N. Y.

Lt. Gustave D. Hennig, Jr. (right), an RB-26C radar officer assigned to the 12th Tactical Reconnaissance Squadron, poses at Kimpo AB, South Korea, in 1952 with Lt. John H. Hansy, pilot of the crew, and Lt. Raymond C. Hennessey, the navigator. Gustave Hennig now lives in Citrus Heights, Calif.

In Korea in December 1951, Col. Francis S. Gabreski briefs Robert S. Johnson, then immediate past president of AFA, on the F-86 Sabrejet. (Bob Johnson was Colonel Gabreski's wingman in the 61st Fighter Squadron in World War II and fourth-ranking ace of that war.) Colonel Gabreski is the top living American ace with a total of 34.5 aerial victories—twenty-eight in World War II and 6.5 in Korea. He was recalled to active duty during the Korean War and commanded the 51st Fighter-Interceptor Wing. Colonel Gabreski, USAF (Ret.), lives in Dix Hills, N. Y.

Manpower was short at Yokota AB, Japan, in August 1950, so aircrews joined in the loading of bombs. Here, 1st Lt. Harry A. Anderson (without shirt), copilot of this B-29, and Staff Sergeant Jones, a ground crewman, take a break from the duty. Colonel Anderson, AFRES (Ret.), lives in Oklahoma City, Okla.



This picture was taken October 12, 1951, and creased in the middle by Kathleen O'Connor, who carried it in her wallet while her future husband, Pfc. James M. McCoy, left, was away on Air Force duty. (The Air Force did not switch to the grade designation of "airman" until April 1, 1952. At right is Pfc. Marco Maggio.) In time, Jim McCoy became Chief Master Sergeant of the Air Force and served as National President of AFA. He is now AFA Chairman of the Board. Presently resides in Bellevue, Neb.

SSgt. Richard J. Harrington (second from right) and friends in the 6401st Field Maintenance Squadron celebrate Christmas at Kimpo AB in 1951. When not enjoying the fine dining experience, this unit recovered downed aircraft for repair or salvage. Presently resides in Dale City, Va.

Newly commissioned 2d Lt. Robert N. McChesney (right) hears wisdom from Capt. C. B. Hodges on a WB-29 over the western Pacific. Robert McChesney is now an AFA national director and currently resides in Barrington, N. H.

Pfc. Wanda Blair and Pfc. Theodore O. Eaton were stationed at Hamilton AFB, Calif., in 1950 when these photos were taken. They married in September 1951. Ted Eaton was subsequently assigned to duty at Osan AB, South Korea, and eventually retired from the Air Force as a chief master sergeant. He is AFA state president in Indiana. The Eatons live in Springport, Ind.

When this photo was taken in the spring of 1952, SSgt. Ronald I. "Rip" Powell (third from left) and his colleagues had just set up a new Shoran beacon at Baker site on a mountaintop northeast of Seoul, just below the Thirty-Eighth Parallel. He is currently president of AFA's Tacoma, Wash., Chapter. Major Powell, USAF (Ret.), resides in Steilacoom, Wash.

Maj. Russell M. Olson (center) had flown missions over Germany in World War II and B-29 missions in Korea. When this shot was taken in 1952, he was maintenance officer at Kimpo AB, South Korea. Sgt. John Dewan, right, was maintenance supervisor. Army Sgt. Bob Heinly, left, was Sergeant Dewan's cousin. Major Olson, USAF (Ret.), presently resides in Orangevale, Calif.

1st Lt. Chester T. Kochan receives the Distinguished Flying Cross at Pyongtaek AB, South Korea, in the spring of 1951 from Col. Timothy O'Keefe, commander of the 6147th Tactical Control Group. Major Kochan, USAF (Ret.), lives in Austin, Tex.

These second lieutenants were part of Air Weather Service graduation ceremonies in June 1953 at Saint Louis University, Mo. Standing, left to right, are Bruce Swezy, Bill Roper, Jim Kistler, Frank Kingston, and Bert Chrow. In the front row, left to right, are Bob Erickson, Hugh Miller, and Max Keeney. After leaving service, Max Keeney was instrumental in developing AFA's membership and insurance programs and currently serves as AFA's director of Membership Operations. Presently resides in Bethesda, Md.

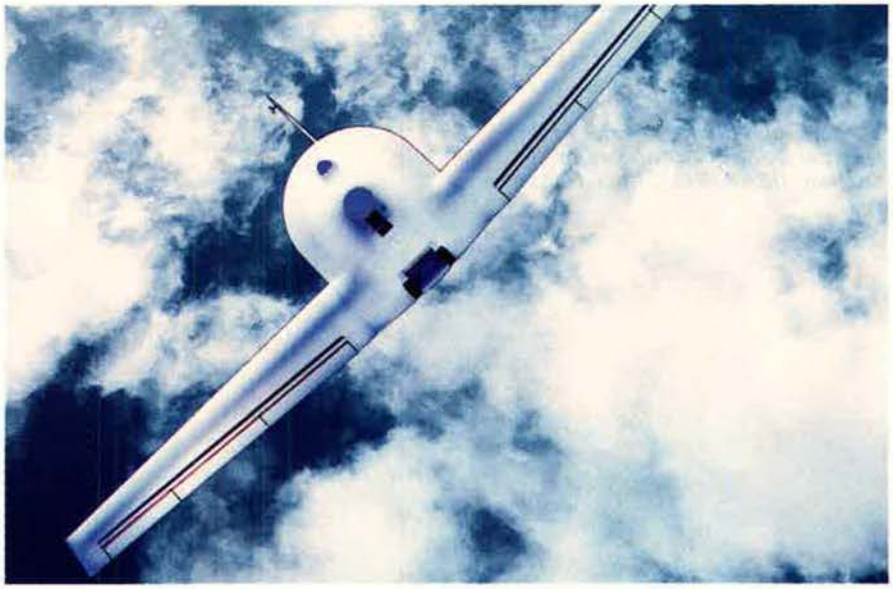
Maj. Winton W. Marshall waves from the cockpit of his F-86 fighter on November 30, 1951, as he returns from the mission over North Korea on which he became the sixth jet ace in USAF history. Lieutenant General "Bones" Marshall, USAF (Ret.), lives in Honolulu, Hawaii.

Capt. Edgar Wolf, Jr., military chairman of the US Defense Bond Drive at Olmsted AFB, Pa., shows his approval of the big purchase of two $1,000 bonds by John Coble on September 26, 1951. The cashier is Mrs. Irene Eby. Edgar Wolf resides in Cherry Hill, N. J. ■

Unmanned aerial vehicles are looming large in the future of the Air Force.

DarkStar and Its Friends

By Peter Grier



The Defense Department intends to develop a range of relatively inexpensive UAVs and put them in the air quickly. This artist's rendering shows the DarkStar Tier III Minus UAV, which is to be a low-observable, "silver bullet" platform for use over heavily defended areas. Opposite is the DarkStar at its rollout at the Lockheed Martin Skunk Works on June 1, 1995.

DECADES after their first use by American military forces, unmanned aerial vehicles (UAVs) may finally be on the edge of becoming full-fledged contributors to US combat capability, with the Air Force playing a leading role in the transformation.

Plans call for the Defense Department to make a significant investment in an array of UAV programs in the latter years of the 1990s. UAVs under development range from small systems intended to give front-line commanders instant information on the state of the battlefield to huge "endurance airframes" capable of mapping an area the size of Indiana in a single day.

UAVs have never been a top priority for the Air Force. However, the march of unmanned vehicle technology—combined with the solid and positive performance of these air vehicles in the 1991 Persian Gulf War—has convinced many of today's Air Force leaders of their future utility.

Most manned reconnaissance aircraft are being phased out of the Air Force inventory. By the turn of the century, the US arsenal of penetrat-

Photo by Erik Simonsen

ing reconnaissance systems will consist primarily of UAVs.

"UAVs hold great promise to perform many theater reconnaissance operations—from surveillance to targeting and bomb-damage assessment," wrote Air Force Chief of Staff Gen. Ronald R. Fogleman in a major policy letter. "Beyond these, we are contemplating their use in a variety of other operations, from peacekeeping or peace enforcement to counterdrug, counterterrorism, [and] peacetime surveillance."

The Chief of Staff concluded, "The bottom line is that, on my watch, the Air Force will embrace UAVs and work to fully exploit their potential."

Air Force use of UAVs certainly is not unprecedented. US forces have long used unmanned aircraft as target drones, and remotely piloted aircraft were used for reconnaissance as early as the Korean War. During the Vietnam War, Teledyne Ryan's Model 147 UAV flew more than 3,000 top-secret reconnaissance and surveillance missions over areas deemed too hazardous for manned airplanes. Launched from C-130s, Model 147s provided photographic images and TV signals beamed to their mother ships in real time.

The Desert Storm Difference

Even so, UAV development languished in the lean years of the 1970s. According to Air Force officials, a general appreciation for the value of UAVs did not reemerge in the US until the 1990–91 Desert Shield and Desert Storm operations.

When Iraqi forces invaded Kuwait, the Pentagon's UAV force consisted largely of one model—the Pioneer remotely piloted vehicle, which the Navy had bought off the shelf in the late 1980s to support Marine operations on land. Six Pioneer systems eventually took part in the Persian Gulf War. With virtually all of the Pentagon's manned reconnaissance assets committed to the area, the Pioneers provided valuable flexibility, spending long hours staring down at the theater's vast desert surface.

Pioneers were often used in conjunction with the Air Force's E-8 Joint Surveillance and Target Attack Radar System standoff aircraft. First, the powerful Joint STARS radar would detect a potential high-priority mobile target. Then, a UAV would be flown into the area to confirm the sighting.

One major lesson the Air Force learned from its experience in the Gulf was that the US needs a diverse family of UAVs, not one all-purpose model. Smaller, target-spotting, tactical UAVs would be easier to operate near the front lines, under the control of corps or division commanders. Larger, long-endurance unmanned vehicles could take off far from the battlefield yet patrol broad swaths of strategic area, in service to joint task force or theater chiefs. Small numbers of low-observable UAVs could fulfill the hard-target reconnaissance mission, just as stealth fighters are used to attack high-value targets.

Such a range of capabilities would mesh perfectly with the Pentagon's emerging "information dominance" doctrine. It could help provide the detailed location data necessary for the best use of many types of precision guided munitions.

Furthermore, it was apparent by the early 1990s that technological advances had taken UAVs far beyond the Model 147 stage. New air-

The Pioneer needs no airstrip, and it has seen extensive use already, including reconnaissance missions over the Persian Gulf, Haiti, Somalia, and Bosnia-Hercegovina. It has an action radius of 115 miles and can stay aloft for five hours.

foils and lightweight materials made possible the construction of large airframes that could loiter aloft for hours. Leaps in signal processing and communications enabled the UAVs to download imagery much more quickly than was possible in the past. This technological advance included the real-time transmission of digital video.

Perhaps most important, the science of robotics advanced to the point that UAVs could be much more autonomous than the autopilot-equipped remotely piloted vehicles of the past. No longer did unmanned air vehicles depend on groundbased "pilots" staring at a TV screen, joystick in hand. Now they could be preprogrammed to fly to wait points, change altitude, and continue to their next target, all on their own. Ground operators with mouse and keyboard could check their progress via computers and alter course as needed.

Going Up

"With all these technologies coming into play, the value of a UAV has gone way, way up," said Lt. Col. Thomas J. Di Nino, director of the Joint Endurance Unmanned Aerial Vehicle System Program Office at Wright-Patterson AFB, Ohio.

This does not mean that the course of UAV development will always run smoothly. The Hunter tactical UAV (TUAV) program was recently canceled after racking up an embarrassing string of test crashes, among other things.

Still, the Defense Department intends to spend some $200 million per year indefinitely for UAV research and development—real money by unmanned vehicle standards. Here are the main programs that will make up the next-generation UAV family:

Tactical UAV. This as-yet unnamed air vehicle is the smallest and newest of the Pentagon's coming generation of UAVs. It supplants a number of previous tactical development programs, including Hunter.

With a projected range of 200 kilometers (124 miles) and an endurance time of four hours, it is meant to provide electro-optical and infrared intelligence for front-line units, such as Army brigades or Marine task forces.

With a bi-wing design, the UAV—formerly known as "Vixen"—can take off and land from unimproved airstrips or from the decks of ships, without aid of parachutes or arresting wires. Alliant Techsystems will deliver six complete TUAV systems, each consisting of three or four air vehicles and a ground station, to the Defense Department for testing, with a decision on possible full-rate production looming in about two years.

The TUAV program could eventually total $1 billion, with a projected requirement of some sixty systems.

Pioneer. The Pentagon intends to continue purchase of Pioneer air vehicles through at least 1997 to provide an interim tactical UAV capability until new models come on line. Plans call for an eventual force of nine Pioneer systems—five for the Navy and three for the Marines, plus one for training.

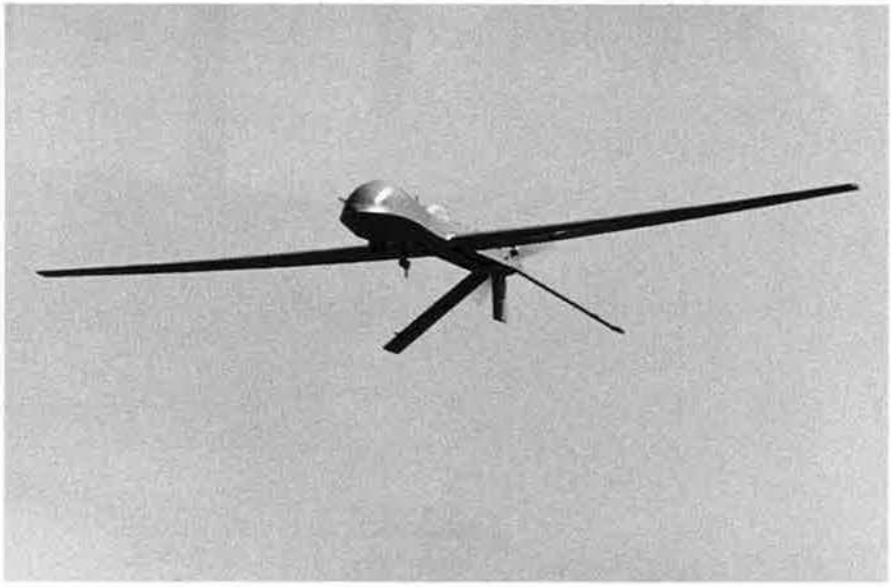
Pioneers have already flown in service over Bosnia-Hercegovina, Haiti, and Somalia, as well as the Persian Gulf. Powered by a twenty-six-horsepower, two-stroke engine,

Formerly, remotely piloted vehicles like this one had to be controlled by "pilots" staring at a TV screen. The new generation of UAVs is much more autonomous, needing only the occasional progress check via mouse and keyboard.

they have an action radius of about 185 kilometers (115 miles) and can stay aloft for about five hours. Their 100-pound payload consists of either infrared (IR) or electro-optical (EO) imaging equipment.

Predator. The bulbous-nosed Predator medium-altitude endurance UAV (Tier II) will be the workhorse US long-range system over at least the next two years, although it is still an Advanced Concept Technology Demonstration program.

With an action radius of 926 kilometers (574 miles) and a 25,000-foot maximum altitude, Predator can loiter on station for twenty-four hours and has a maximum endurance of forty hours. It can carry a synthetic aperture radar (SAR), as well as EO or IR sensors, as part of its 450-pound payload.



The Predator has seen extensive action over Bosnia, with more than 2,500 missions as of mid-May. At 450 pounds, its payload is more than quadruple that of the Pioneer. It also has a longer loiter time and higher maximum altitude.

Much as the E-8 Joint STARS aircraft cut its teeth during Operation Desert Storm, the Predator UAV has already seen action over Bosnia. By May, the Predator fleet had logged 2,620 mission hours staring down at Bosnian territory and had amply proved the UAV's worth, according to Air Force Maj. Gen. Kenneth R. Israel, director of the Defense Airborne Reconnaissance Office (DARO).

For one thing, Predator's ability to loiter and stare at particular areas confounded the efforts of various combatants to camouflage their equipment or conceal their actions. At one point, said General Israel, a particular faction insisted that its M46 tanks were not firing into a town. The Predator buzzed them high overhead to see if this was so, drawing fire for hours as the faction tried to make it go away.

"They didn't believe it could just stay there," said General Israel. "Finally they got frustrated and fired into the town anyway."

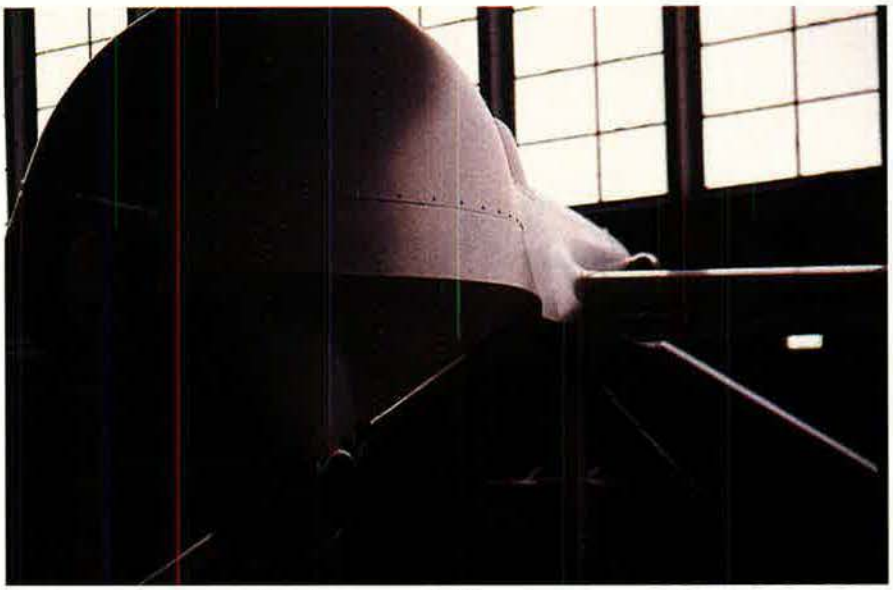
Predators were also used extensively to watch suspected mass grave sites and to document any attempt to tamper with bodies.

Global Hawk. The newly named Global Hawk, once known as "Tier II Plus," is intended to be the backbone of the nation's long-range UAV fleet of the early twenty-first

Vital Statistics

Specification	Pioneer	Tactical UAV	Predator	Global Hawk	DarkStar
Altitude, max.	15,000 ft.	15,000 ft.	25,000 ft.	65,000 ft.	45,000 ft.
Endurance, max.	5 hrs.	12 hrs.	40 hrs.	40 hrs.	8 hrs.
Speed, max.	110 knots	106 knots	129 knots	345 knots	250 knots
Radius	100 nm	108 nm	500 nm	3,000 nm	500 nm
Propulsion/thrust	26 hp	60 hp	85 hp	7,050 lbs.	1,900 lbs.
Length	14 ft.	23 ft.	26.7 ft.	44.4 ft.	15 ft.
Width	1.3 ft.	1.7 ft.	3.7 ft.	4.8 ft.	12 ft.
Weight (empty)	264 lb.	1,204 lb.	773 lb.	7,650 lb.	4,487 lb.
Span	17 ft.	29.2 ft.	48.7 ft.	116.2 ft.	69 ft.
Payload	100 lb.	196 lb.	450 lb.	2,140 lb.	1,287 lb.
Navigation system	GPS	GPS	GPS/INS	GPS/INS	GPS/INS
Sensors	EO or IR	EO, IR	SAR, EO, IR	SAR, EO, IR	SAR or EO

Source: DARO



Predator (above) can pinpoint concealed targets, such as a Bosnian Serb ammunition depot (top photo, below), and then assess the damage to them once they've been hit (bottom photo, below).

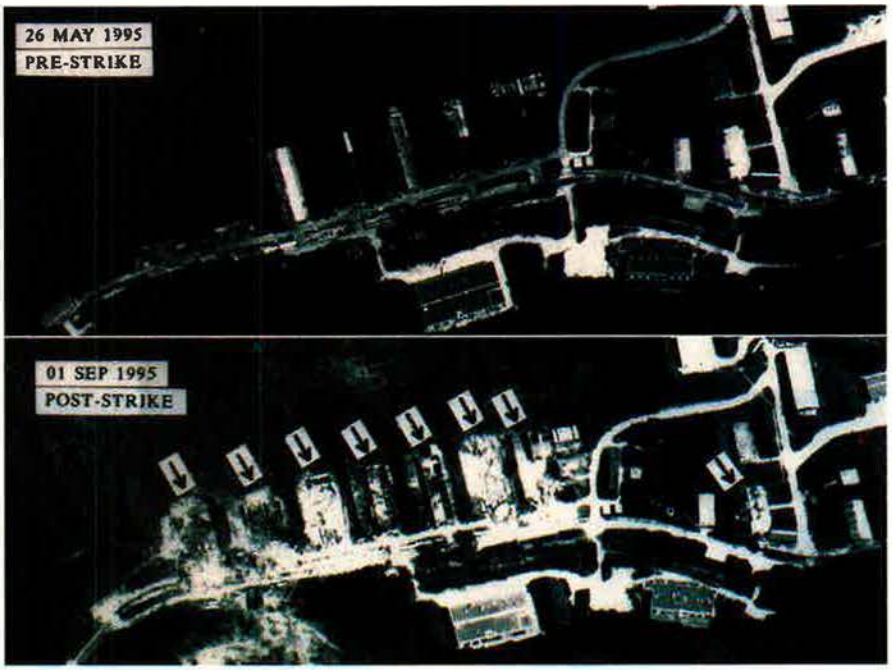
century. Unlike UAVs designed in the late 1970s and early 1980s, which to laymen's eyes resemble oversize model airplanes, Global Hawk will be a true unmanned air vehicle: Its wingspan is more than 116 feet long, and its turbofan engine will generate more than 7,000 pounds of thrust.

With a projected radius of 3,000 nautical miles, this UAV could take off in California, map a vast area on the East Coast, and then return to the West Coast. Its maximum endurance is projected to be forty hours, and its ceiling is planned to be 65,000 feet.

The Global Hawk will carry SAR, IR, and EO sensors, and its search-mode resolution will be three feet. A spotlight mode will provide one-foot resolution, according to contractor data.

The UAV's Hughes-built sensor package will allow ground commanders to switch among radar, infrared, and visible wavelength modes whenever they want. Thus, Global Hawk should be able to sweep wide areas, then zoom in on specific targets as they appear.

Global Hawk will have a relatively large communications "pipe," with the capability to send fifty megabits of data per second. That means it should be able to transmit video images back to ground stations in real time. It should also be able to send SAR data directly to front-line ground troops.



Global Hawk is intended for missions that require long range and a long "dwell time." Such missions could include constant scouring of a large area for mobile missile launchers. The vehicle will communicate with ground stations via satellite, enabling it to be controlled by headquarters far from the forward lines of operation.

First flight is currently scheduled for Fiscal 1997. Flyaway cost is projected at $10 million in Fiscal 1994 dollars.

DarkStar. The DarkStar Tier III Minus UAV is intended to be a "silver bullet" like the F-117 stealth fighter. Highly capable, built in small numbers, used to overfly only the most heavily defended areas, the stealthy DarkStar will have neither the performance specifications nor the payload capacity of Global Hawk, but it will have low-observable characteristics that should enable it to penetrate the best air defenses and survive.

Resembling a plate equipped with long, narrow wings, DarkStar will have an action radius of 926 kilometers, an endurance time of eight hours, and a maximum altitude of 45,000 feet. Its turbofan engine, the Williams International FJ44, is the same one used in the Cessna Citation business jet.

DarkStar will carry either EO or SAR sensors, but, with communications limited to 1.5 megabits per second, it will transmit primarily fixed-frame images while in flight. Its Westinghouse radar, a legacy of the Navy's failed A-12 program, will be able to search for and capture data at a rate of 1,600 square nautical miles per hour.

Built by Lockheed Martin's famous Skunk Works, DarkStar made a successful twenty-minute first flight on March 29 of this year. A second flight attempt ended in a crash on

takeoff in April. The crash is still under investigation, its cause undetermined.

Some members of Congress have occasionally questioned the need for a family of next-generation UAVs. In particular, they wonder why the Pentagon needs two types of endurance unmanned vehicles. Why not build one, they said, and give it both the low-observability of DarkStar and the performance specs of Global Hawk?

The problem with that approach, say US UAV officials, is that loading so many capabilities into one program would end up costing more money. Individual UAVs would become prohibitively expensive.

"Two different endurance UAVs give us more bang for the buck," said Colonel Di Nino of the Joint UAV program office.

The Defense Department's overall UAV goal is to get a range of relatively inexpensive air vehicles with reasonable amounts of utility into the air quickly.

"By the time 1999 rolls around, we should be in a phase where we are demonstrating to the users what the capabilities are of these systems," said Colonel Di Nino.

Global Hawk, seen here in artist's concept, was designed as a huge "endurance airframe," capable of flying from California to Maine, mapping Maine, and flying back. Such UAVs will be invaluable to DoD as it seeks information dominance.

Who's in Control?

While UAV technology is generally in hand, operational concepts are not. The Air Force and its fellow services will be venturing into a new military world with an extensive UAV force, and such questions as who will control them, how will they be deployed, and how will their product be disseminated have yet to be answered.

The preprogrammed nature of their flight plans and the long range of the bigger, "endurance" models make consideration of UAVs and their control somewhat complicated, points out General Israel of DARO.

Basically, users will exert three types of control over next-generation unmanned vehicles, he said. The first will involve simply receiving information—front-line troops tapping into SAR images from DarkStar, say. The second will involve control of where the sensors are looking and where the vehicle is headed on station. This direction would be provided by higher-level force commanders. The third type of control would be actually controlling UAV landings and takeoffs. This is likely to fall to specialized teams who are relatively immobile.

Just because the targets of endurance UAVs change, said General Israel, "you're not going to be sending launch and recovery teams across the country."

Full-scale military assessments of how UAVs will be integrated into force planning should begin in late 1997, said Air Force officials. Planned procurement numbers are not yet set, either, though initial analysis shows that buying four conventional endurance Global Hawks for every one low-observable DarkStar should provide the most economical UAV force mix.

New sensor payloads now in development could make UAVs even more valuable in the future. Among the projects: a signals intelligence payload to give unmanned vehicles a state-of-the-art eavesdropping capability, foliage-penetrating radars, and miniature spectrometers and gas chromatographs to provide chemical analysis.

Vertical-takeoff UAV designs are also in the works, for possible use in urban reconnaissance.

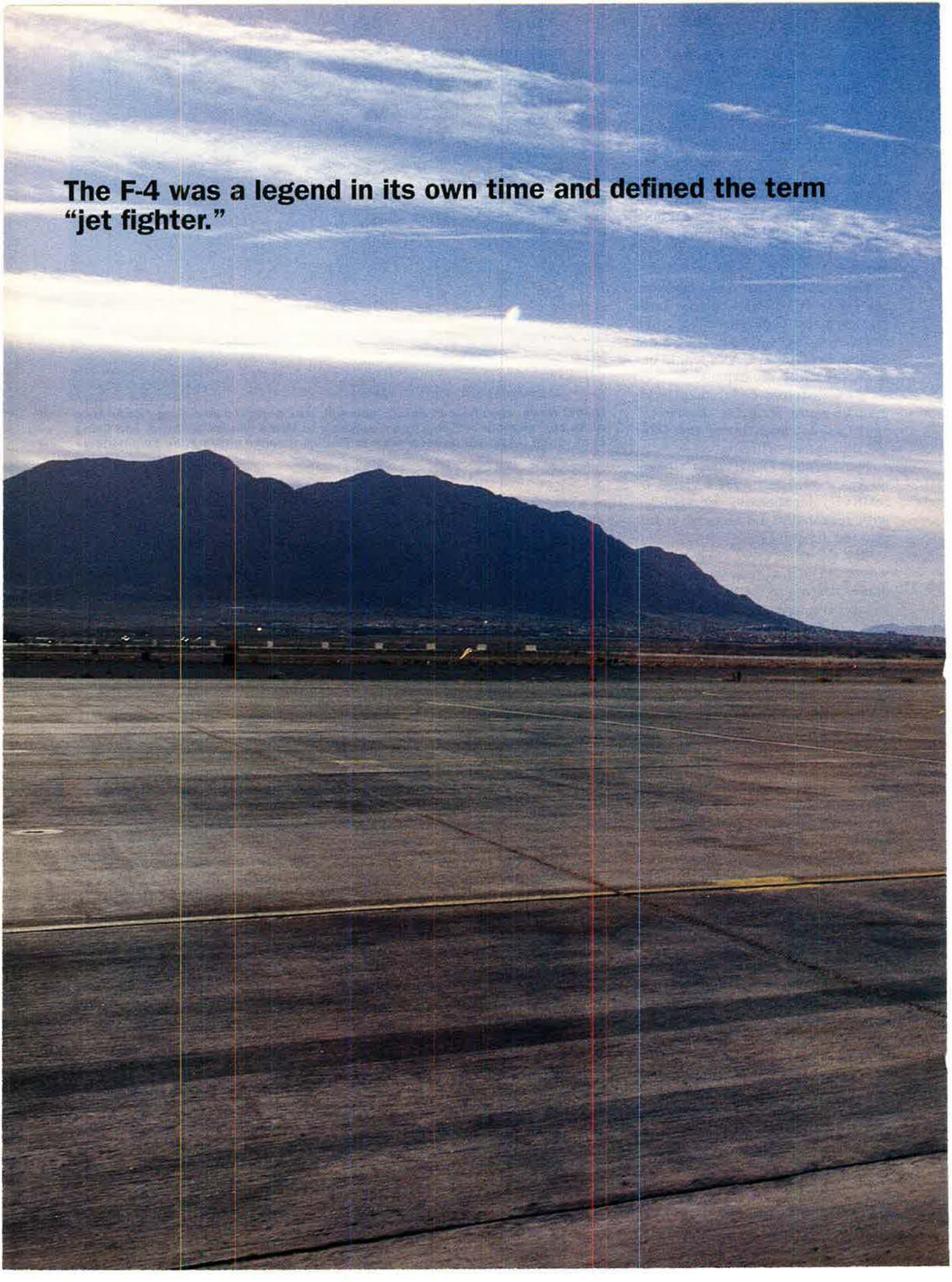
"It's going to be more of a premise in the future that we understand what's on the battlefield before we get there," said General Israel.

The newfound success of UAVs does not mean that US forces will do away with manned penetrating reconnaissance air systems entirely, said the DARO chief. Such venerable aircraft as U-2s will remain in service. The development of more and more capable all-weather, multispectral sensors will benefit both manned and unmanned systems.

Still, in a country where the public appears to want military operations to be carried out with an absolute minimum of casualties, UAVs offer the US a distinct advantage: expendability. Two Predators have been lost during operations in Bosnia, for instance. One was shot down ("Not before taking some fairly exciting pictures," said General Israel), and another was flown into the side of a mountain on purpose after it developed a manifold pressure problem.

When Air Force Capt. Scott F. O'Grady and his F-16 were shot out of the sky over Bosnia, the nation held its breath. When the UAVs went down, "the President didn't call," said General Israel. "That's the difference." ■

Peter Grier, Washington bureau chief of the Christian Science Monitor, *is a longtime defense correspondent and regular contributor to* Air Force *Magazine. His most recent article, "GPS in Peace and War," appeared in the April 1996 issue.*



The F-4 was a legend in its own time and defined the term "jet fighter."

The Last Phantom

Photographs by Paul Kennedy and Guy Aceto, Art Director

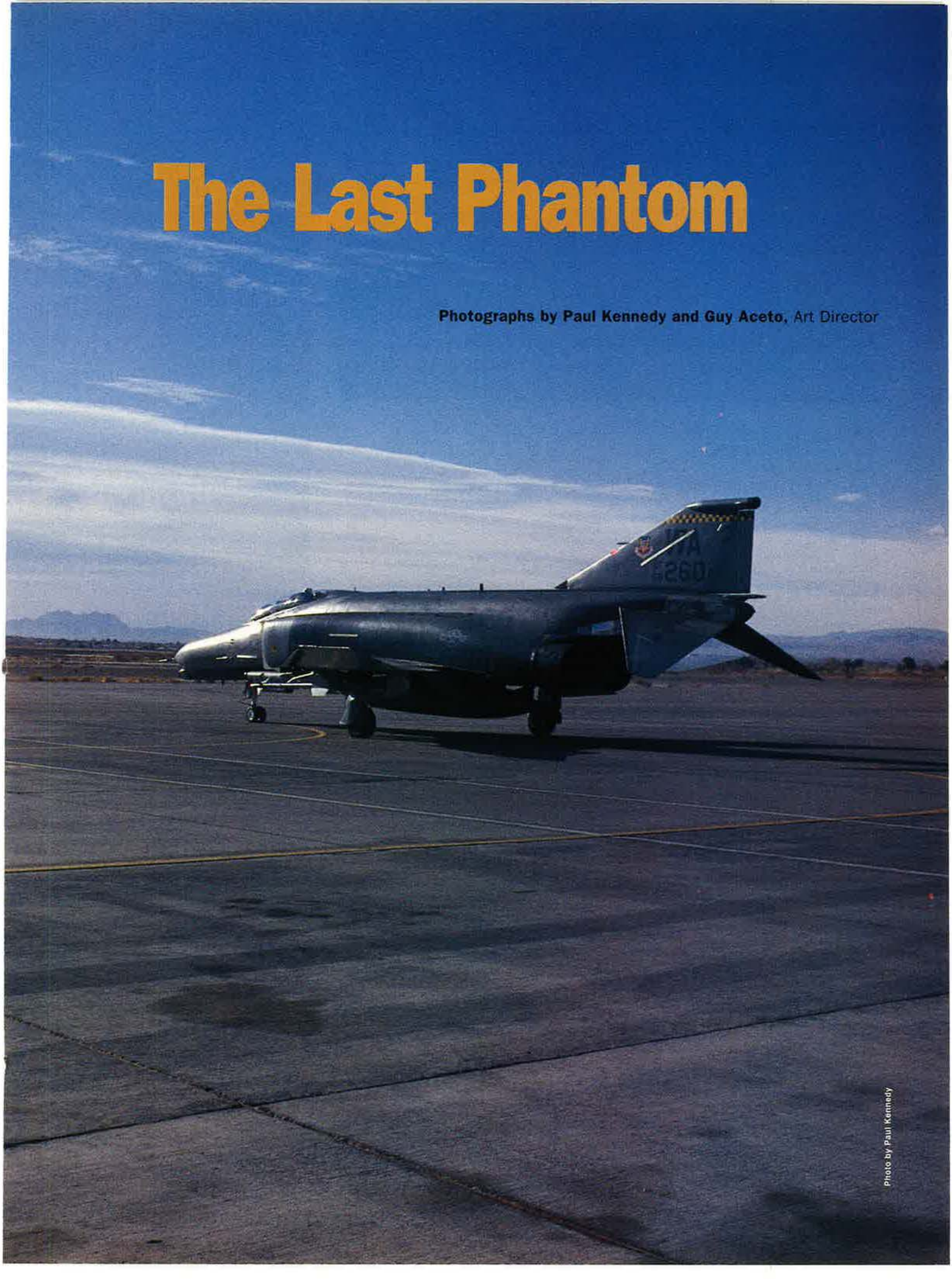


Photo by Paul Kennedy

Staff photo by Guy Aceto

On January 10, 1996, F-4Gs from the 561st Fighter Squadron took off from King Abdul-Aziz AB, Saudi Arabia, on the last USAF combat-coded mission for an aircraft type that had seen service for more than thirty years. At Nellis AFB, Nev. (above), two months later, "Wild Weasel" aircraft retired from the active-duty ranks for good, capping an era during much of which the F-4 Phantom II epitomized a US Air Force fighter aircraft.

Designed by McDonnell Aircraft Co. for the Navy as a carrier-based fleet air-defense fighter, the F4H-1 rolled out of the company facility at Lambert Field, Mo. McDonnell's chief test pilot, Robert C. Little, made the first flight on May 27, 1958. The Navy flew the first production F4H-1 on March 25, 1961. Tactical Air Command headquarters at Langley AFB, Va., took delivery of two Phantoms, designated F-110A, in January 1962. After testing, the first production version—redesignated F-4C—went to MacDill AFB, Fla.

Photo by Paul Kennedy

USAF Phantoms first saw combat during the Vietnam War. The F-4G "Advanced Wild Weasel," a conversion from the F-4E, grew out of the need for defense against North Vietnamese surface-to-air missile (SAM) and antiaircraft artillery sites. Before its conversion, this F-4G (above) had been piloted by Capt. Fred W. Sheffler and weapon system officer Capt. Mark A. Massen, both of the 336th Tactical Fighter Squadron, who shot down a North Vietnamese MiG-21 in August 1972. Twenty-four years later, the aircraft—shown here at Nellis AFB—still wears a red star, a reminder of that engagement.

Photos by Paul Kennedy

During its prime, the Phantom II was USAF's dominant fighter. At Nellis, Lt. Col. (Col. selectee) Jim Uken, last commander of the 561st Fighter Squadron, recalled, "It was not unusual fifteen years ago to come to Nellis for a Red Flag and have almost one hundred percent of the players [flying] F-4s." He noted, "It's been modified to do virtually every mission that the Air Force or the Navy has offered." Above, some of the last F-4Gs, from the 561st FS, await their final sorties from the Nellis flight line. The unit had flown the Phantom since converting from F-105G "Weasels" in 1978, while at George AFB, Calif.

Staff photo by Guy Aceto

Photos by Paul Kennedy

Moving confidently around a Phantom, assistant aircraft crew chief A1C Gabrielle Montoya of the 561st FS exemplifies the knowledge, skill, and professionalism that kept the Phantoms flying. After a stellar performance in the 1991 Persian Gulf War, the 561st and its F-4s were reactivated at Nellis, and maintenance personnel volunteered for a last chance to work on the legendary fighter. Despite the aircraft's age, dedicated "Weasel Keepers" kept it going through numerous TDYs to southwest Asia, maintaining mission capable rates rivaling those of newer aircraft. A couple of F-4s will fly on in foreign air forces and as drones in testing units, but most will reside in the boneyard at Davis-Monthan AFB, Ariz.

Since the mid-1980s, "Wild Weasels" had been paired with F-4Es or F-16s in highly effective hunter-killer teams. There is no direct replacement for the two-seater and its superb ability to handle the Suppression of Enemy Air Defenses role. For now, the single-seat F-16 Fighting Falcon, equipped with the High-Speed Antiradiation Missile Targeting System, will counter SAM threats. The development of the AGM-88 (above) is one of the Phantom's legacies. In the past, nearly every weapon that could be shot, dropped, or fired from an aircraft was standard equipment on a Phantom.

Photo by Randy Jolly

The first F4H-1 prototype in 1958—with its nose plunging down and its tail surfaces jutting up—prompted the wisecrack that the aircraft looked like someone had stepped on its nose and kicked it in the tail. By 1996, one of the last Phantoms in flight over the Nevada desert was thought by many to be a study in beautiful lines and form.

During the Vietnam War, the Phantom's speed, acceleration, radar, and weapon systems made it a favorite among USAF's Vietnam War aces—Capt. Richard S. "Steve" Ritchie piloted an F-4, while Capts. Charles B. DeBellevue and Jeffrey S. Feinstein were F-4 WSOs. Col. Robin Olds, the first and only USAF ace with World War II and Vietnam War victories, also flew an F-4 and commanded the Phantom pilots of the 8th Tactical Fighter Wing at Ubon RTAB, Thailand.

Staff photos by Guy Aceto

Staff photos by Guy Aceto

Pilot Capt. "Stamp" Walden and WSO Capt. John "Hap" Arnold, both of the 561st FS, prepare for one of their last sorties from Nellis. While some members of the unit had less than a year of F-4 experience, Colonel Uken had two decades with the Phantom, and his father was an F-4 navigator, among the first to make the transition to the QF-4s.

Even as F-4s were phasing out of the force, they were acquitting themselves well, firing some of the earliest shots in the Gulf War, taking down Iraqi air defense sites. The HARMs carried on the Weasels and other systems were so effective that the Iraqis were afraid to turn on their radar equipment. In a somewhat ignominious end for such a legend, the Weasel above is headed for the target range at Nellis. Colonel Uken said some F-4s will be serving in the QF-4 drone program for another ten years.

Photo by Paul Kennedy

Staff photos by Guy Aceto

The Weasel motto—"First In–Last Out"—seems a fitting tribute to the Phantom. In September 1995, the 124th Wing, Idahc Air National Guard, flew the 50,000th sortie of Operation Provide Comfort, over northern Iraq. It was one of its last operational missicns. Once back home on station, the F-4s finally had a mass end-of-tour ceremony, last rides, and a washdown for their crews in April. Like the P-51 Mustang and the F-86 Sabre, the multirole Phantom defined an era. "The Phantom, in my opinion, will go down as one of the great aircraft in aviation history," said Colonel Uken. He spoke for many when he said, "Most of the guys feel privileged to have flown the Phantom. It's been a tremendous aircraft." ■

RUSSIAN MILITARY

By Tamar A. Mehuron, Associate Editor, **with Harriet Fast Scott, William F. Scott, and David Markov**

ORGANIZATION OF THE RUSSIAN ARMED FORCES

Several military structures, each subordinate to Russia's President, composed the nation's armed forces in 1995–96.

Heads of the seven most influential armed organizations sat on the Security Council. They were the Minister of Defense, Minister of Internal Affairs, Director of Federal Border Guards Service, Director of Federal Security Service, Director of Foreign Intelligence Service, Minister of Civil Defense and Emergency Situations, and Minister of Atomic Energy (who commands troops).

Less-prominent power centers, commanded by generals and filled with troops, reported to the President. They included the Presidential Security Service, Federal Agency of Government Communications and Information, Federal Service of Railroad Troops, and Federal Directorate of Special Construction.

Estimates of military forces outside of the Ministry of Defense (MOD) varied from 800,000 to nearly 2.3 million.

The MOD administered eight regular military districts. In addition, Russia had seven districts of Internal Troops, six districts of Border Guards, and seven regional centers of Civil Defense Troops. Each agency supported large local staffs with general officers in abundance. There was much overlapping and duplication in their work but little coordination.

Most of the organizations had their own schools for preparing officers. Advanced training often took place in Defense Ministry academies, with the most senior officers going to the Military Academy of the General Staff. These non-MOD centers were not paramilitary forces in any sense. With the treaty-driven downsizing of the MOD, many regular officers simply transferred to one of the other "power ministries."

Russia's conventional military capability had declined dramatically. Russia's defenses were based principally on nuclear weapons—tactical and strategic. First use of nuclear weapons, under certain conditions, was specified in Russia's new military doctrine, adopted in 1993. Emphasis was given to command and control of strategic forces, both offensive and defensive. Work appeared to continue on the massive, deep, underground battle station in the Ural Mountains.

Armed Forces under the Defense Ministry. These forces had primary responsibility for defending Russia against external threats. Despite talk of a major reorganization and abolition of the Troops of Air Defense, MOD forces still were divided into five services, as in the Soviet era. Moreover, there were two smaller services: Military Space Forces and Airborne Forces, referred to as a "means of the Supreme Command." These latter forces were to be the basis of Mobile Troops, which would have their own air transport capability. This, however, appeared far from realization. Plans for regional theater commands likely have been temporarily shelved. Other considerations, such as the war in Chechnya and actions in the "near abroad," got priority.

The Defense Ministry. This once highly professional body has become politicized, rife with dissent and corruption. Troops went for months without being paid. Lack of housing remained an acute problem. The Chief of the Main Directorate of Military Budget and Finance was fired and tried, but not convicted, for investing funds intended for payment to troops. Even President Boris N. Yeltsin complained about the need for reform in the Armed Forces, a need that was supposed to have had high priority when the USSR disintegrated. In five years, little had been accomplished.

Gen. of the Army Mikhail P. Kolesnikov, chief of the General Staff of the Russian Armed Forces and First Deputy Minister of Defense, was bypassed on major decisions, such as operations in Chechnya. He sought to keep the General Staff out of politics. Dr. Andrei A. Kokoshin, first deputy minister of defense for Military-Technical and Economic Policy, appeared to provide effective leadership in his assigned area.

The Strategic Rocket Forces (RVSN) had first priority in personnel and equipment. According to Gen. Col. Igor D. Sergeiev, commander in chief, this service accounted for three-fourths of Russia's total nuclear potential and two-thirds of the nation's strategic nuclear forces. He further claimed that the RVSN requires the service of nine to ten percent of Russia's military personnel and five to six percent of its military budget.

Despite Russia's severe financial situation, the RVSN maintained a high state of combat readiness and training. A Topol ICBM of the RS-12M series was launched November 10, 1995, from the Plesetsk State Testing Ground in the final stage of the tactical exercise of a missile regiment. A newer Topol, the RS-12M2, flew its second test in September 1995; first flight had been in December 1994.

The Troops of Air Defense (VPVO) remained the second largest MOD service, with four major operational commands: missile-space defense troops, surface-to-air missile troops, air defense (aviation) troops, and radiotechnical (radar) troops. Aircraft of the air defense forces (PVO) consisted primarily of MiG-31s and Su-27s, the latter being shared with the Air Forces.

A new air defense agreement was signed for cooperation within the framework of the Commonwealth of Independent States (CIS), recognizing that it took decades to create a single system of defense for air, sea, and land borders, using the PVO, PRO (antiballistic missile defense), PKO (antispace defense), and control and communications. The ABM system around Moscow continued in operation. This ABM system, together with Russia's deep battle management complexes and shelters, has no counterpart in the United States.

The Air Forces (VVS) were divided into long-range (strategic), frontal (tactical), and transport aviation. Frontal and transport aviation played major roles in Chechnya. Chief of the Air Forces was Gen. Col. of Aviation Peter S. Deynekin. In October 1995, strategic-rocket carriers—Tu-160s, Tu-95MSs, and Tu-22M3s—took part in a live firing exercise. Progress on the Air Forces' new fighter project 1.42/1.44 appears to have stalled, but the MiG Design Bureau's efforts to revive it continue.

The withdrawal of Russian aircraft from eastern Europe and some areas of the "near abroad" overloaded the airfields in the central and eastern regions of Russia. Work to expand these airfields is under way.

For some time, Air Forces pilots in the rank of major received the equivalent of $110 to $155 per month, while pilots in the other power structures, such as Border Guards, Internal Troops, and Federal Agency of Government Communications and Information, were receiving $320 to $380 per month. This marked difference in pay was corrected in early 1996. Pilots averaged about thirty training hours per year. To ensure a continuing flow of pilots, the Air Forces advertised five boarding schools, featuring "primary flying" for fifteen-year-old cadets. These "prep" schools prepare young men for regular higher military pilot aviation schools.

The Ground Forces (SV) remained the largest MOD service, but their numbers were greatly reduced. Gen. Col. Vladimir M. Semenov, commander in chief of the Ground Forces, said that their strength would be dropped to 440,000. Neglect of the Ground

Forces was reflected in their poor showing in Chechnya, where they were the worst trained, paid, clothed, and fed of all the troops engaged there. Teenagers with scarcely any military training were thrown into combat against an experienced foe.

Ground Forces' helicopter gunships, which previously had been part of the Air Forces, were used extensively in Chechnya. Because they attacked unarmed targets, mostly civilian, it was difficult to determine how effective they might be against an armed opponent. The 2,000 Ground Forces helicopters are old, and replacements are scarce. Efforts are under way to remedy the helicopter shortage with an Mi-28 Havoc and a Ka-50 Hokum attack helicopter competition. The Mil Helicopter Design Bureau has proposed an extensive upgrade of the Mi-24 Hind, called the Mi-35.

The Navy (VMF) still maintained Black Sea, Baltic Sea, Northern, and Pacific Fleets, plus Caspian and Kamchatka Flotillas. Russia sought to keep its Black Sea Fleet port of Sevastopol, located in Ukrainian Crimea, after the fleet had been divided between Russia and Ukraine. The best Baltic Sea ports now belong to Estonia and Latvia. The sole remaining aircraft carrier, the *Kuznetsov,* carried Su-27Ks and Ka-27 helicopters. The submarine fleet remained a vital part of Russia's strategic nuclear force. In early 1996, stepped-up activity from this force was noted, with some boats operating near the US. Work continues on a new multimission submarine, the first in the *Severodvinsk* class.

Lineup of Russian Aerospace Power, 1995

Strategic Forces

Includes Russia, Ukraine, and Belarus Strategic Forces. Russia had operational command and control of all three nuclear forces.

789—Intercontinental Ballistic Missiles. SS-18 (RS-20): 150. SS-19 (RS-18): 204. SS-24 (RS-22): 72 (36 silo-based, 36 rail-based). SS-25 (RS-12M): 363.
140—Strategic Rocket Force Helicopters. Mi-8 Hip: 140.
113—Long-Range Bombers. Tu-95MS6 Bear-H6: 31. Tu-95MS16 Bear-H: 57. Tu-160 Blackjack: 25.
524—Submarine-Launched Ballistic Missiles. SS-N-8 (RSM-40): 100. SS-N-18 (RSM-50): 192. SS-N-20 (RSM-52): 120. SS-N-23 (RSM-54): 112.
33—Strategic Ballistic Missile Submarines. Delta I–class (Murena): 7. Delta II–class (Murena-M): 1. Delta III–class (Kalmar): 12. Delta IV–class (Delfin): 7. Typhoon-class (Akula): 6.

Air Defense Forces

1,029—Interceptors. MiG-23 Flogger: 300. MiG-25 Foxbat: 84. Su-27 Flanker: 325. MiG-31 Foxhound: 320.
16—Airborne Early Warning and Control Aircraft. A-50 Mainstay: 16.
100—Strategic Antiballistic Missile Launchers. ABM-3 (SH-11) Gorgon: 36. ABM-3 (SH-08) Gazelle: 64.
2,825—Strategic Surface-to-Air Missile Launchers. SA-2 (S-75): 150. SA-3 (S-125): 100. SA-5 (S-200): 500. SA-10 (S-300P): 2,075.

Air Forces

130—Medium-Range Theater Bombers. Tu-22M Backfire: 130.
898—Tactical Counterair Interceptors. MiG-23 Flogger: 251. MiG-25 Foxbat: 21. MiG-29 Fulcrum: 433. MiG-31 Foxhound: 57. Su-27 Flanker: 136.
965—Ground-Attack Aircraft. MiG-27 Flogger: 189. Su-17/22 Fitter: 230. Su-24 Fencer: 367. Su-25 Frogfoot: 179.
551—Reconnaissance/ECM Aircraft. MiG-25 Foxbat: 40. Su-24 Fencer: 80. Su-17 Fitter: 30. Il-22 Coot: 20. An-12 Cub: 125. An-26 Curl: 250. Tu-134 Crusty: 6.
40—Tanker Aircraft. Tu-16 Badger: 20. Il-78 Midas: 20.
1,352—Aircraft of Military Transport Aviation. An-2 Colt: 300. An-12 Cub: 320. An-22 Cock: 40. An-24 Coke: 100. An-32 Cline: 50. An-72/74/79: 20. An-124 Condor: 26. An-225: 1. Il-76 Candid: 300. Tu-134/154 Careless: 20. Yak-40 Codling: 25. L-410VP Turbolet: 150.

Naval Aviation

1—Aircraft Carrier. *Kuznetsov*-class CTOL ship: 1.
130—Bombers and Strike Aircraft. Tu-22M Backfire: 130.
93—Fighter/Interceptors. MiG-25 Foxbat: 8. MiG-29 Fulcrum: 35. Su-27 Flanker: 30. Su-33 Flanker: 20.
147—Fighter/Attack Aircraft. Su-24 Fencer: 70. Su-25 Frogfoot: 50. MiG-27 Flogger: 27.
49—Reconnaissance/Electronic Warfare Aircraft. Tu-95 Bear: 24. Su-24 Fencer: 25.
335—Antisubmarine Warfare Aircraft. Tu-142 Bear-F: 58. Il-38 May: 36. Be-12 Mail: 65. Ka-25 Hormone-A: 25. Ka-27 Helix-A: 88. Mi-14 Haze-A: 63.
205—Helicopters. Ka-25 Hormone: 75. Ka-29 Helix: 25. Mi-6 Hook: 10. Mi-8 Hip: 70. Mi-14 Haze: 25.

Note: Increases in some categories from 1995's military aircraft lineup reflect equipment changes to maintain minimal readiness and force levels or internal shifting of assets. In addition, new information on some aircraft types is also reflected in changes to inventory data.

Russian and US Grades

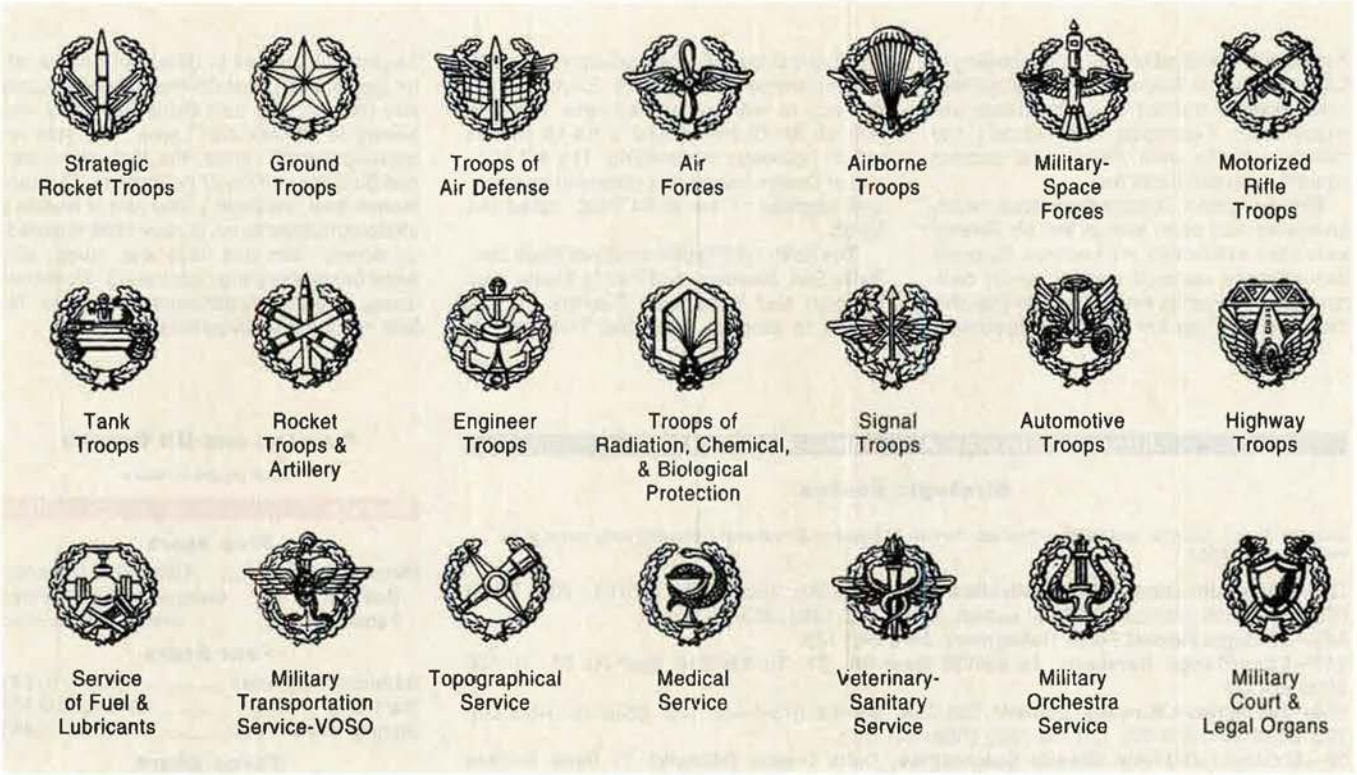
Naval grades in italics

Russia	US
Five Stars	
Marshal of the Russian Federation	General of the Army General of the Air Force *Admiral of the Fleet*
Four Stars	
General of the Army	General (USA)
Marshal of Aviation	General (USAF)
Admiral of the Fleet	*Admiral (USN)*
Three Stars	
General Colonel	Lieutenant General
Admiral	*Vice Admiral*
Two Stars	
General Lieutenant	Major General
Vice Admiral	*Rear Admiral (Upper Half)*
One Star	
General Major	Brigadier General
Rear Admiral	*Rear Admiral (Lower Half)*
O-6	
Colonel	Colonel
Captain (1st Class)	*Captain*
O-5	
Lieutenant Colonel	Lieutenant Colonel
Captain (2d Class)	*Commander*
O-4	
Major	Major
Captain (3d Class)	*Lieutenant Commander*
O-3	
Captain	Captain
Captain Lieutenant	*Lieutenant*
O-2	
Senior Lieutenant	First Lieutenant
Senior Lieutenant	*Lieutenant Jr. Grade*
O-1	
Lieutenant	Second Lieutenant
Lieutenant	*Ensign*

No Russian officer currently holds the rank of "Marshal of the Russian Federation." Four "Marshals of the Soviet Union" are alive today: S. L. Sokolov, V. G. Kulikov, V. I. Petrov, and D. T. Yazov. The first three are officially listed as "advisors to the Minister of Defense of the Russian Federation." Marshal Yazov was imprisoned for his role in the August 1991 coup attempt in Moscow but was released under the parliamentary amnesty granted in February 1994 to numerous political plotters.

RUSSIAN MILITARY EMBLEMS

In December 1995, Krasnaya Zvezda *published the twenty-one new emblems of the Russian Armed Forces. They depict four of the five services: Strategic Rocket Troops, Ground Troops, Troops of Air Defense, and Air Forces, plus service branches and rear services.*



RUSSIAN DEFENSE MINISTRY As of May 1, 1996

Gen. of the Army Pavel Sergeievich Grachev

Born 1948. Russian. Russian Federation Minister of Defense since May 1992. Member of Security Council (October 1993). President Yeltsin appointed him leader of group to disarm the Chechens (December 1994). Offered resignation in July 1995 over failure to end conflict in Chechnya. Yeltsin refused it. Chairman of Council of Ministers of Defense, Commonwealth of Independent States (CIS). Ryazan Higher Airborne Command School (1969). Frunze Military Academy (1981). Military Academy of the General Staff (1990). Airborne Division Commander in Afghanistan. More than five years in two tours in Afghanistan (1981–83, 1985–88). First Deputy Commander, then Commander of Airborne Troops (December 1990–August 23, 1991). Supported Yeltsin during August 1991 coup attempt. First Deputy Minister of Defense, USSR, and Chairman of the State Committee, Russian Soviet Federated Socialist Republic (RSFSR), for Defense Questions (August 23, 1991). First Deputy Commander in Chief, Joint Armed Forces, CIS, (January–April 1992). First Deputy Minister of Defense, Russian Federation (April–May 1992). Backed Yeltsin in October 1993 during a confrontation between the President and Parliament. Hero of the Soviet Union (1988). Promoted May 1992. Married, two sons.

Dr. Andrei Afanasievich Kokoshin

Born 1945. Russian. First Deputy Minister of Defense since April 3, 1992. In January 1996, given title of State's Secretary. The only civilian in the top echelons of the Ministry of Defense. Deals with the State Duma and Federation Council and the military-industrial complex. Promotes arms sales abroad. On Council for the Military-Technical Policy of the Ministry of Defense Russian Federation, where he focuses attention on development of military technology. Graduated from the Moscow Bauman Institute of Technology (1969). Was Deputy Director of the Institute of the United States and Canada of the Russian Academy of Sciences, specialist for military-political questions and national security. Doctor of Sciences (History, 1982). Professor. Corresponding member, Russian Academy of Sciences. Author of many articles and books on military policy, disarmament, and conversion. Reserve officer. Married, two children.

Gen. of the Army Mikhail Petrovich Kolesnikov

Born 1939. Russian. Chief of the General Staff and First Deputy Minister of Defense since December 1992. Author of 1996 book, *Strategic Nuclear Rocket Weapons.* Omsk Tank-Technical School (1959). Malinovsky Military Academy of Armored Forces (1975). Military Academy of the General Staff (with gold medal, 1983). Served thirteen years in the Far East. Corps commander (1983). Army commander in the Transcaucasus Military District. Chief of Staff and First Deputy Commander of the Siberian Military District (1987). Chief of Staff and First Deputy Commander in Chief of the Southern Theater of Military Operations, USSR (1988). Chief of the Main Staff and First Deputy CINC, Ground Forces, USSR, (1990). Deputy Chief of the General Staff, Chief of the Main Organization and Mobilization Directorate (1991). Same for Joint Armed Forces, CIS (April–June 1992). First Deputy Chief of the General Staff, Armed Forces, Russian Federation (June–December 1992). Promoted May 1995. Married, son and daughter.

Gen. of the Army Konstantin Ivanovich Kobets

Born 1939. Russian. Deputy Minister of Defense since June 1993 and Chief Military Inspector of the Armed Forces Russian Federation since September 1992. Kiev Military Signals School (1959). Military Signals Academy (1967). Military Academy of the General Staff (1978). Doctor of Military Sciences, Professor. Chief of Signal Troops, USSR, and Deputy Chief of the General Staff (1987–91). In 1991–92, Chairman of the State Committee, RSFSR, for Defense and Security; State Advisor, RSFSR, on Defense; and in September 1991, simultaneously Chairman of the Committee on Military Reform. Promoted 1991. Married, one son.

Gen. of the Army Vladimir Mikhailovich Toporov

Born 1946. Russian. Deputy Minister of Defense, Russian Federation, since June 1992. Odessa Artillery School (1968). Frunze Military Academy (1975). Military Academy of the General Staff (1984). Twenty years in Airborne Troops. Chief of Staff and First Deputy Commander Far East Military District (1989–91). Commander of Moscow Military District (September 1991). Was coordinator for sales of military equipment through *Voentekh* (1992–95). Promoted 1996. Married, two sons.

Gen. Col. Vladimir Timofeievich Churanov

Born 1945. Deputy Minister of Defense since January 1995 and Chief of Logistics of the Armed Forces since July 1992. Volsk Military School (1966). Military Academy of Logistics and Transport (1979). Military Academy of the General Staff (1987). Served in Soviet Forces Germany (1966–71), Transbaikal Military District (1972–76), Kiev Military District (1979–84). From chief of logistics of an army, became Deputy District Commander for Logistics, Chief of Logistics of the Moscow Military District. Promoted 1993. Married, son and daughter.

Gen. Col. Anatoly Vasilievich Solomatin

Born 1939. Deputy Minister of Defense since January 1995 and Chief of Construction and Billeting of Troops since December 1993. Pushkino Military Construction and Technical School (1962). Leningrad Higher Military Engineering-Technical School (1969). Started service in the Main Directorate of Naval Construction. Later assigned to the Main Military-Construction Directorate. After 1969, served in the Far East Military District, from chief of a construction directorate to Deputy Commander for Construction and Billeting (1983–87). Chief of the Main Engineering Directorate of Air Defense Troops (1987–91). Deputy Chief of Construction and Billeting Troops of Armed Forces (October 1991–93). Distinguished Builder award. Promoted 1994. Married, one daughter.

UNIFORMED CHIEFS OF THE MILITARY SERVICES

Commanders in chief are listed in the same order of service precedence as applied in the days of the Soviet Ministry of Defense. However, these commanders are no longer deputy ministers of defense.

Gen. Col. Igor Dmitrievich Sergeiev

Born 1938. Russian. Commander in Chief, Strategic Rocket Forces, Russian Federation, since August 1992. Black Sea Higher Naval School (1960). Dzerzhinsky Military Engineering Academy (with distinction, 1973). Military Academy of the General Staff (1980). Transferred from coastal artillery to Strategic Rocket Forces in 1960. Chief of staff, then division commander (1975). Chief of staff and first deputy commander of a rocket army (1980–83). Deputy Chief of Main Staff of Strategic Rocket Forces (1983), then First Deputy (1985). Deputy Commander in Chief, Rocket Troops, USSR, for Combat Training (1989–December 1991). Deputy Commander, Strategic Forces, Joint Armed Forces, CIS, and Deputy Commander, Strategic Rocket Troops for Combat Training (January–August 1992). Promoted 1991. Married, one son.

Gen. Col. Vladimir Magomedovich Semenov

Born 1940. Karachaievets. Commander in Chief of the Ground Forces since August 1992. Baku Higher Combined Arms Command School (1962). Frunze Military Academy (1970). Military Academy of the General Staff (with distinction, 1979). Chief of staff and deputy division commander (1975–76), then commander (1979). Army corps commander (1982) and army commander (1984). First Deputy Commander, Transbaikal Military District (1986–88), then Commander (1988–91). Commander in Chief of the Ground Forces and Deputy Minister of Defense, USSR (August 31–December 31, 1991). Commander of General Purpose Forces, Joint Armed Forces, CIS (March 1992). Promoted 1989. Two daughters.

Gen. Col. of Aviation Viktor Alexeievich Prudnikov

Born 1939. Russian. Commander in Chief of the Air Defense Troops since August 1992 and Commander in Chief of the Commonwealth Joint Air Defense Force since February 1995. Armavir School for Pilots (1959). Gagarin Military Air Academy (1967). Military Academy of the General Staff (1981). More than two years as commander of a fighter aviation regiment (1971). Deputy air defense division commander (1973), commander (1975); first deputy commander of a detached air defense army (1978–79 and 1981), then commander (1983). Deputy commander of a district for Troops of Air Defense. Commander of the Moscow Air Defense District (1989–91). Commander in Chief of the Troops of Air Defense and Deputy Minister of Defense, USSR (August 25–December 31, 1991). Commander, Troops of Air Defense, Joint Armed Forces, CIS (January 1992). Military Pilot First Class. Promoted 1989. Married, two sons. (Younger son died in 1991.)

Gen. Col. of Aviation Peter Stepanovich Deynekin

Born 1937. Russian. Commander in Chief of the Air Forces since October 1992. Balashov Military Aviation School for Pilots (1957). Gagarin Military Air Academy (1969). Military Academy of the General Staff (with gold medal, 1982). Bomber pilot. Deputy air army commander (1982), then commander (1985). Long-Range Aviation Commander (1988). First Deputy Commander in Chief, Air Forces (1990–91). Commander in Chief of the Air Forces and Deputy Minister of Defense, USSR (August 31–December 31, 1991). Commander, Air Forces, Joint Armed Forces, CIS (January–July 1992). Distinguished Military Pilot (1984). Promoted 1991. Married, three children.

Adm. Felix Nikolayevich Gromov

Born 1937. Russian. Commander in Chief of the Navy since August 1992. Active in celebrating the 300th anniversary of the Russian Navy in 1996. Pacific Ocean Higher Naval School (1959). Naval Academy (1983, by correspondence). Military Academy of the General Staff (1991, by examination). Pacific Fleet (1967–76). Chief of staff of a training division, Leningrad Naval Base (1977–81). Chief of staff, then commander of an operational squadron (1981–84). First Deputy (1984–88), then Commander of the Northern Fleet (1988–92). First Deputy Commander of the Navy, CIS (March 1992). Promoted 1988. Married, daughter and son.

Moscow's Active-Duty Military Forces, 1989–95: USSR and Russian Federation

Force element	1989	1990	1991	1992	1993	1994	1995
Theater forces—ground, air, naval	2,690,000	2,187,000	2,150,000	1,205,000	1,082,000	1,045,000	923,500
Strategic forces—offensive/defensive	890,000	876,000	755,000	366,000	230,000	245,000	279,200
Command and rear services	1,450,000	925,000	650,000	180,000	100,000	105,000	176,000
Total forces	**5,030,000**	**3,988,000**	**3,555,000**	**1,751,000**	**1,412,000**	**1,395,000**	**1,378,700**

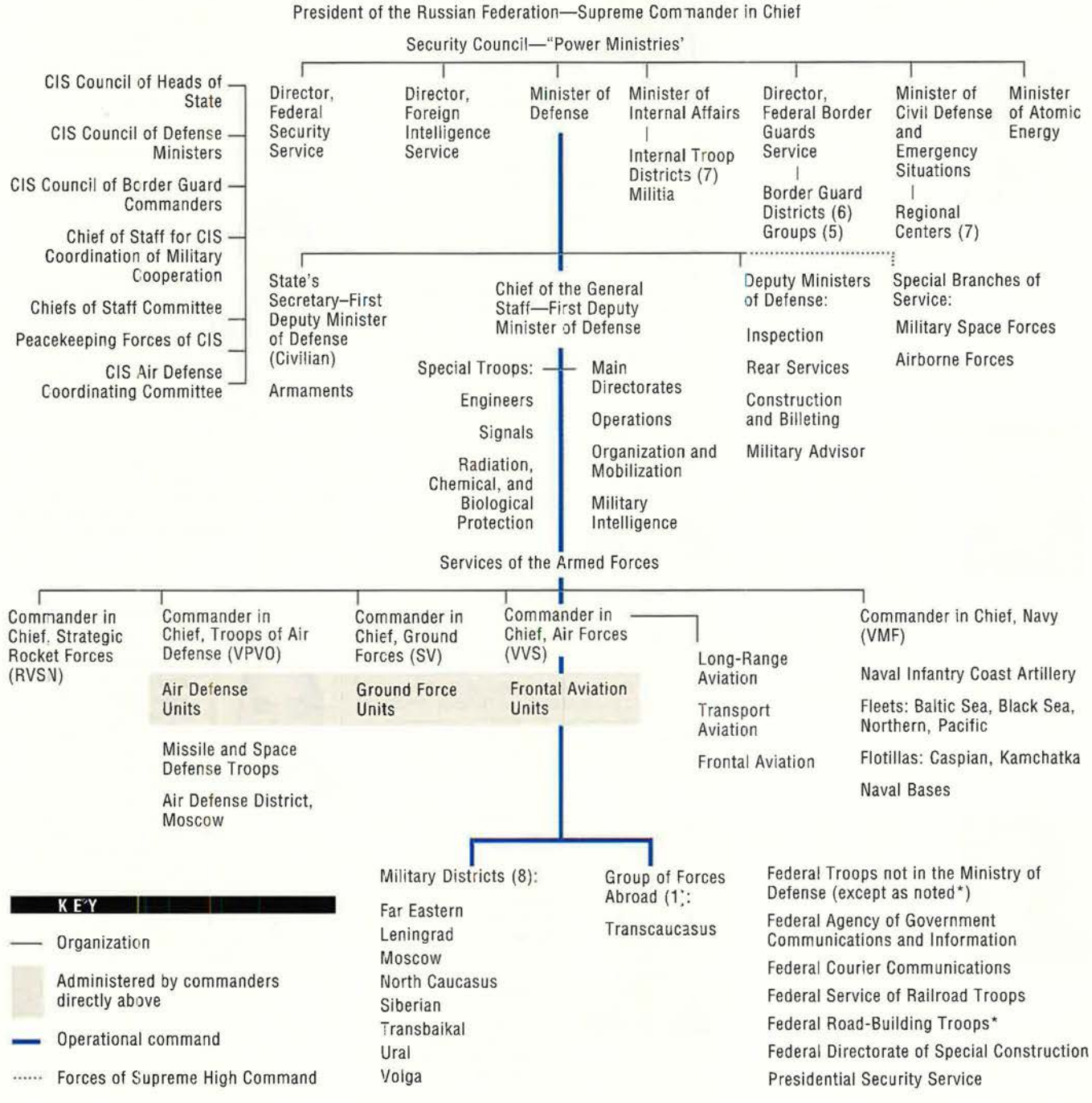
The active military population of the Soviet Union peaked in 1989, the year the Berlin Wall fell and the Warsaw Pact collapsed. Moscow initiated major force reductions. In late 1991, the USSR itself collapsed, leaving Russia with a portion of Soviet forces while large numbers of troops stayed in newly independent nations, such as Ukraine and Kazakhstan. Moscow's active-duty forces continued to decline during the first four years of the Russian Federation.

In this table, and in the table at right, "strategic offensive forces" includes Strategic Rocket Forces and strategic nuclear elements of Air Forces and Navy.

These tables do not include Border Guards and other nontraditional uniformed services.

Structure of the Russian Armed Forces

As of May 1, 1996



Active-Duty Military Population, 1995

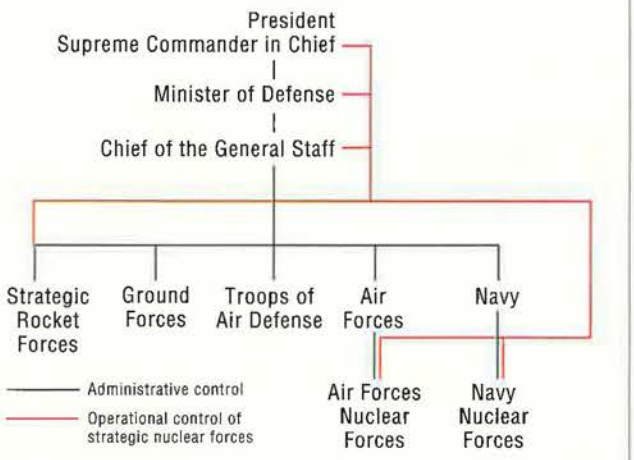
Force element	Authorized	Actual
Ground forces	850,000	637,500
Air forces	170,000	136,000
Naval forces	200,000	150,000
Strategic defensive forces	200,000	160,000
Strategic offensive forces	149,000	119,200
Command and rear services	220,000	176,000
Total	**1,789,000**	**1,378,700**

Strategic Nuclear Warheads, 1991–95

Nation	1991 USSR	1992	1993	1994	1995
Russia		7,644	6,766	6,902	5,961
Ukraine		1,408	1,264	1,594	1,056
Kazakhstan		1,360	1,260	1,040	0
Belarus		54	54	36	18
Total	**11,159**	**10,466**	**9,344**	**9,572**	**7,035**

Supreme High Command of the Armed Forces of the Russian Federation

As of May 1, 1996



Strategic Nuclear Weapons of Russia and the Other Nuclear-Armed Former Soviet Republics, 1995

	Russia	Ukraine	Kazakhstan	Belarus	Total
ICBMs	671	100	0	18	**789**
Warheads	3,085	704	0	18	**3,807**
Bombers	69	44	0	0	**113**
Warheads	552	352	0	0	**904**
SSBNs	33	—	—	—	**33**
SLBMs	524	—	—	—	**524**
Warheads	2,324	—	—	—	**2,324**
Total vehicles	**1,297**	**144**	**0**	**18**	**1,459**
Total warheads	**5,961**	**1,056**	**0**	**18**	**7,035**

All data are current as of December 31, 1995. In early 1996, Belarus and Ukraine were returning the remainder of their nuclear warheads to Russia, per agreement, and becoming nuclear weapons–free nations. Adjustments in Russian strategic forces also have taken place in 1996.

Russia has operational command and control of the nuclear weapons of Belarus. Ukraine has asserted administrative control of former Soviet nuclear forces on its territory.

Zero indicates that that particular nuclear weapon type was deployed in that country at one time but is not deployed there now; a dash indicates that a weapon was never deployed in that country.

Strategic Nuclear Forces, 1989–95: USSR and Russian Federation

Force element	1989	1990	1991	1992	1993	1994	1995	Difference 1989–95
ICBMs	1,378	1,373	1,393	1,031	884	773	671	–707
Long-Range Bombers	150	155	141	135	74	95	69	–81
Submarine-Launched Ballistic Missiles	954	924	912	864	788	732	524	–430
Ballistic Missile Submarines	70	61	59	57	52	47	33	–37

The USSR collapsed in late 1991. Russia retained all of the seabased strategic weapons. Russia also retained most of the ICBM and bomber forces, though a significant number of these weapons came under control of Ukraine, Kazakhstan, and Belarus. None of the forces of these nations is counted in this table after 1991.

External Deployments and Peacekeeping Forces

As of May 1, 1996

Algeria	100
Angola (peacekeeping)	15
Armenia (group of forces)	9,000
Bosnia-Hercegovina (peacekeeping)	491
Cambodia	500
Chechnya (occupation force)	38,000
Congo	20
Croatia (peacekeeping)	726
Cuba	800
Georgia/South Ossetia (peacekeeping)	3,000
Georgia (group of forces)	22,000
India	500
Iraq/Kuwait (peacekeeping)	14
Moldova/Dniester (peacekeeping)	6,400
Mongolia	500
Mozambique (peacekeeping)	25
Peru	10
Rwanda (peacekeeping)	17
Syria	500
Tajikistan (peacekeeping)	12,000
Turkmenistan (joint forces)	11,000
Vietnam	500
Western Sahara (peacekeeping)	29
Yemen	300
Total	**106,447**

The "Revolt of the Admirals" focused on the big bomber, but the real issues ran much deeper.

The Battle of the B-36

By Herman S. Wolk

Above, after the conflict with the Navy was resolved, USAF Chief of Staff Gen. Nathan F. Twining (left) and Strategic Air Command Commander in Chief Gen. Curtis E. LeMay (right) show Italian President Giovanni Gronchi a model of the B-36. Opposite, a B-36, with four jet engines and six propellers on its 230-foot wingspan, fills the sky all by itself.

THE 1949 "Revolt of the Admirals," which initially focused on the Air Force's B-36 intercontinental bomber, was one of the most bitter public feuds in American military history. This controversy over strategy and weapons began with the 1945–47 struggle over unification, when the US Army Air Forces (AAF) was fighting to become an independent service.

Following World War II, Gen. of the Army Henry H. Arnold, Commanding General of the US Army Air Forces; Gen. Carl A. Spaatz; and Lt. Gen. James H. Doolittle emphasized that the demonstrated effectiveness of all forms of airpower made the AAF the lead service in the American defense phalanx. General Doolittle, testifying before the Senate Military Affairs Committee, pointed out that the Navy was no longer the first line of defense for the United States. The US required an independent Air Force featuring an in-being strategic atomic force that could deter any aggressor from initiating conflict. This would be the country's strategic concept in the postwar era, and it was supported by President Harry S. Truman and Army Chief of Staff Gen. Dwight D. Eisenhower, among others.

After the war, the Navy feared it might lose its air element to an independent Air Force and that even the Marine Corps might be lost. Moreover, the naval leadership, convinced that the Navy required everything to make it self-supporting in pursuit of its mission, opposed Truman's and Eisenhower's concept of mutually supporting services under unified command. In the Congressional hear-

ings on unification, General Eisenhower emphasized that economy would be a driving force in postwar defense matters and that the nation simply could not afford the Navy's concept of self-sustaining forces in the World War II mold.

The centerpiece of the Navy's vision was the carrier task force that, during the war, became central to its Pacific strategy. In the postwar period, Navy Secretary James V. Forrestal took the lead in promoting the maritime strategy of depending on larger and faster carriers and opposing the creation of an independent Air Force.

Compromise and Conflict

The National Security Act of 1947, which established the United States Air Force, clearly was a compromise. The Act, as well as the so-called "functions paper" (actually, Truman's Executive Order), failed to resolve roles-and-missions disputes among the services. The new Air Force and the Navy—at conferences at Key West, Fla., and Newport, R. I., in the spring and summer of 1948—could not work out their differences over the strategic atomic mission and other functions questions.

The Air Force relied on the B-36 intercontinental-range bomber to accomplish the strategic mission supporting the Truman Administration's policy of deterrence. In August 1941, Robert A. Lovett, assistant secretary of war for Air, and Maj. Gen. George H. Brett, chief of the Army Air Corps, determined that the potential loss of bases in the United Kingdom called for development of a long-range bomber that could fly a round trip from the US to Europe. Until that time, no aircraft had even approached this proposed range of 10,000 miles.

Immediately after the creation of USAF in September 1947, criticism of the B-36 began appearing in newspapers and journals. Some of this criticism came from Hugh L. Hanson, a Navy employee with the Bureau of Aeronautics, who had also contacted Forrestal, now Defense Secretary, and several Congressmen. The Secretary of the Air Force, Stuart Symington, complained about this to the Secretary of the Navy, John L. Sullivan. Nevertheless, the attacks continued.

In 1948 and 1949, the Air Force made several decisions that led to Strategic Air Command's reliance on the B-36 for the SAC atomic deterrent mission until the B-52 long-range bomber could enter the operational inventory. In 1948, following the Soviet-inspired Communist coup in Czechoslovakia and the Soviet Union's blockade of Berlin, the possibility of war increased. The Air Force emphasized that the B-36 was the only aircraft capable of delivering the atomic bomb from bases in the US.

In early 1949, SAC Commander in Chief Gen. Curtis E. LeMay recommended to Gen. Hoyt S. Vandenberg, USAF Chief of Staff, that the Board of Senior Officers review the B-54 program because B-36 tests with jet pods had been outstanding. Compared to the B-54, the B-36 with jet pods was faster, operated at higher altitude, and had greater range and bomb-carrying capacity. Subsequently, the B-54 was canceled. Symington informed Secretary Forrestal that the B-36 could fly from the US and could, "because of its speed and altitude, . . . penetrate enemy country without fighter escort, destroy the strategic

Adm. Arthur Radford was one of the leaders of the Navy's charge against the B-36. He called the huge bomber "a billion-dollar blunder" and claimed that US reliance on strategic bombing was excessive.

target, and return nonstop to its base on this continent."

Stress and Suicide

Ironically, given the nature of the struggle then brewing between the Air Force and Navy over the B-36 and the atomic mission, Truman had named Forrestal as Secretary of Defense after Secretary of War Robert P. Patterson had turned down the post, pleading that his finances forced him to return to the private sector. Forrestal had led the campaign against a strong National Security Act and an independent Air Force. When he became the Defense Secretary, he showed himself to be a weak coordinator, unable under the new law to step in and resolve the many differences among the services.

Having failed to provide strong support to Truman's 1948 political campaign, Forrestal's influence waned significantly. At the same time, his health began to fail. He resigned in March 1949, in deep mental distress, and in May jumped to his death from a window on the sixteenth floor of the National Naval Medical Center in Bethesda, Md.

To replace Forrestal, Truman named Louis A. Johnson, a former assistant secretary of War (1937–40) who had served as the President's chief fundraiser during the 1948 campaign. Secretary Johnson began by reviewing military procurement programs and quickly focused on the Navy's flush-deck supercarrier *United States* on which construction was to start in April 1949. The Navy estimated the cost of the carrier at $190 million, but this figure failed to include the thirty-nine additional ships required to complete the task force. Total construction cost was $1.265 billion, a staggering sum in 1949. Johnson immediately asked the Joint Chiefs of Staff as well as retired General Eisenhower for their opinions.

Adm. Louis E. Denfeld, Chief of Naval Operations, defended the supercarrier, calling it necessary "in the interest of national security." Gen. Omar N. Bradley, Army Chief of Staff, and General Vandenberg, Air Force Chief of Staff, strongly opposed construction, arguing that the supercarrier would duplicate the function of the Air Force's landbased bombers. Eisenhower also opposed building the carrier.

In late April 1949, after informing President Truman, Johnson abruptly directed that construction of the carrier stop immediately. Navy officials were outraged at not being informed of the decision. Navy Secretary Sullivan resigned in protest, emphasizing that the decision could have "far-reaching and tragic consequences." Rumors immediately surfaced within the Navy's high command that Johnson was pro-USAF and was determined to cut the Navy down to size.

The stage was now set. This bitter confrontation, precipitated by the Navy and its advocates, had been foreseen by General Eisenhower. "Someday we're going to have a blowup," he predicted in January 1949. "God help us if ever we go before a Congressional committee to argue our professional fights as each service struggles to get the lion's share. . . . Public airing of grievances . . . someday . . . will go far beyond the bounds of decency and reason, and someone will say, 'Who's the boss? The civilians or the military?' "

High-ranking naval officers, determined to make the case for the supercarrier and against the B-36, took action. The Navy's Op-23 "research and policy" office had been formed in December 1948. Capt. Arleigh A. Burke, a World War II destroyer commander and future Chief of Naval Operations, took charge of this office in early 1949. He placed Op-23 under tight security (causing the press to speculate that it was involved in shady business) and directed his people to collect detrimental data on the B-36 while amassing positive information on the supercarrier.

Going public, naval officers criticized the B-36 as being too slow and vulnerable to enemy defenses. This, however, was only the beginning of what turned out to be a vicious campaign to discredit not only the B-36 but also the top leadership of the fledgling Air Force. In April and May 1949, an "anonymous document" made its way around Washington, D. C., charging that Symington, Johnson, and Floyd B. Odlum, chairman of the board of Convair, had put the heat on the Air Force to buy B-36s, in spite of the bomber's deficiencies.

Brig. Gen. Joseph F. Carroll, director of Air Force Special Investigations, traced the anonymous document to Cedric R. Worth, a former Hollywood scriptwriter, who had served with the Navy during the war and was now an assistant to Dan A. Kimball, under secretary of the Navy. Glenn L. Martin, an aircraft manufacturer whose bombers had lost out to the B-36, had provided Worth with considerable data. A Navy court of inquiry subsequently determined that Cmdr. Thomas D. Davies, Op-23 deputy to Captain Burke, had also fed material to Worth.

The charges in the Worth document became public and reached the floor of the House of Representatives when Rep. James E. Van Zandt (R-Pa.), a Navy advocate with wartime naval service, called for an investigation of the allegations. Secretary Symington denied the charges and also requested an immediate investigation. Rep. Carl Vinson (D-Ga.), chairman of the House Armed Services Committee, agreed to hold hearings. In June, the full committee consented to hear the B-36 procurement case and to hold an inquiry into strategy and unification issues. Thus began one of the most fractious public confrontations in US military history.

The Navy's supporters in the press held back nothing. Hanson Baldwin, military editor of the New York *Times* and a graduate of the Naval Academy, described Symington as one of the "nastiest" politicians in Washington, someone who had "ganged up on Forrestal." Baldwin charged that Symington had played "dirty pool and dirty politics, . . . [was] a two-faced goad who was not respected by most of the people in the Air Force." Baldwin even went so far as to claim that Symington was the only service secretary not asked to be a pallbearer at Forrestal's funeral because the family actually believed that he had contributed to Forrestal's death.

The Air Force Case

Vinson's committee held hearings on B-36 procurement in August and on strategy and unification in October 1949. In June, Symington appointed W. Barton Leach, an Air Force Reserve colonel and Harvard Law School professor, to coordinate and direct the Air Force case for the B-36. Leach had served with Army Air Forces and had earned a reputation for incisive analysis of AAF operations in Europe.

He proceeded to organize the Air Force case by analyzing the charges, preparing replies to the allegations, making a study of the aircraft industry, preparing a memo on Symington's policies relative to the aircraft industry, collecting all Air Force statements on the heavy bomber program chronologically, analyzing all Inspector General reports on the B-36, and preparing an explanation of Air Force action on the B-36.

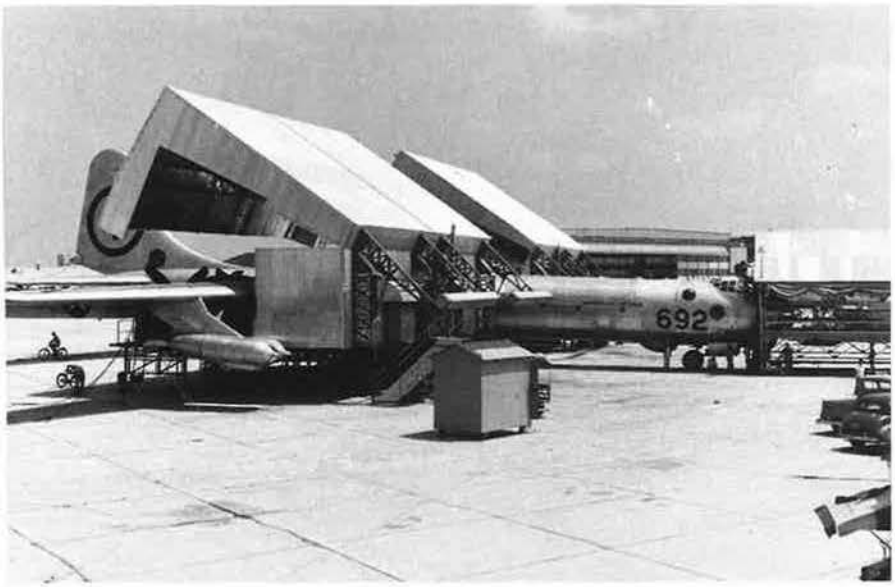
The result of Leach's massive effort was "A History of B-36 Procurement," which Vinson had requested and which formed the foundation of the Air Force's presentation to the committee. In early July 1949, the Air Force Association's third annual National Convention, held in Chicago, also helped counter the Navy's charges by disseminating material on the B-36 Peacemaker's mission and operational characteristics. At 45,000 feet, this intercontinental bomber was anything but vulnerable. Each day during the AFA meeting, seven B-36s flew up from Fort Worth, Tex., circled the fair area at low level, and returned nonstop to Carswell AFB, Tex.

In regard to B-36 procurement, Symington informed the committee that "at no time since I have been Secretary has any higher authority attempted to recommend in any way the purchase of any airplane. . . . Every aircraft that was purchased by the Air Force during my tenure was recommended to me by the Chief of Staff of the Air Force and his staff." Modifications in the B-36 program were approved by Symington only after recommendations had been made by General Vandenberg, Lt. Gen. Lauris Norstad, and Gen. Joseph T. McNarney. Symington also strongly denied that he had ever discussed formation of a large aircraft combine with Floyd Odlum or any aircraft manufacturer.

Gen. George C. Kenney, a former SAC commander in chief, testified to the committee that, although he initially opposed production of the B-36, the bomber had been modified to be "the fastest, longest-range, best altitude-performing, and heaviest load-carrying bomber in the world." Had he changed his view under political pressure? No, replied Kenney. "If the bomber had the performance and would do the job that I was charged with carrying out, I would buy it."

General LeMay also took the stand, saying "I expect that, if I am called upon to fight, I will order my crews out in those airplanes, and I expect to be in the first one myself." Van Zandt questioned LeMay closely, but the SAC commander in chief insisted that the B-36 was the only bomber that could accomplish the intercontinental mission.

An extensive case study of the B-36 hearings by Professor Paul Y. Hammond of Johns Hopkins University, published in 1963, concluded that, "because of the careful preparation of the Air Force, no inconsistencies or contradictions capable of exploitation appeared in the testimony. The result was an impressive showing for the Air Force." In contrast, according to Hammond, the Navy's Op-23 office failed to provide much help to the Navy's witnesses. Moreover, noted Hammond, "most of the hostility that developed towards Op-23 was of the Navy's own making. . . . Op-23 was treated by the Navy from the beginning like dirty business; and



With its 160-foot length and forty-six-foot height, the B-36 was too large for most hangars, so USAF was forced to devise other solutions to allow mechanics to work on the bomber and yet be sheltered from the elements.

From 1951 to 1959—when the Cold War was at its frostiest—the B-36 stood alert twenty-four hours a day, serving as one of the main deterrents to aggression by the Soviet Union.

the press had soon drawn the same conclusion. Upon its establishment, it was located next to the Office of Naval Intelligence, and its activities from the beginning were subject to an unusual degree of secrecy."

The Vinson committee subsequently exonerated Symington and Johnson and stated that it found "not one scintilla of evidence [to] support charges that collusion, fraud, corruption, influence, or favoritism played any part whatsoever in the procurement of the B-36 bomber." According to the committee, Symington, the Air Force leadership, and Secretary of Defense Johnson made it through the hearings with "unblemished, impeccable reputations."

After the procurement hearings, the Navy immediately convened a board of inquiry to investigate the origin and release of the anonymous document supposedly written by Worth. Worth had, under oath, "recanted and repudiated" the allegations contained in the documents and was dismissed. The Navy's court of inquiry, however—although it found "distorted propaganda" against the Air Force—found no cause for disciplinary action against any of the Op-23 personnel, including Captain Burke and Commander Davies.

The twelve days of unification and strategy hearings, convened in October 1949, revealed a somewhat less definitive outcome than the procurement sessions had.

The Navy's witnesses before the House Armed Services Committee took their cue from Adm. Arthur W. Radford, who stated that he did not believe the threat of an "atomic blitz" provided a deterrent to war. He focused his guns on the B-36, calling it "a billion-dollar blunder" and claiming that, in his view, its poor performance made it a "bad gamble." He went along with the Joint Chiefs to the extent that he agreed that strategic bombing should be the primary role of the Air Force. However, Radford emphasized that the Air Force and the nation had placed excessive reliance on this concept.

Strange Tales

Other Navy witnesses made similar arguments. Admiral Denfeld, the Chief of Naval Operations (who was relieved of his post at completion of the hearings), stressed the way in which the flush-deck carrier was canceled. Navy Cmdr. Eugene Tatom, head of research and development for aviation ordnance, made the stunning claim that "you could stand in the open at one end of the north-south runway at the Washington National Airport, with no more protection than the clothes you have on, and have an atom bomb explode at the other end of the runway without serious injury to you." Tatom's statement was labeled absurd by Secretary of Defense Johnson, Sen. Brien McMahon (D-Conn.) and Rep. Chet Holifield (D-Calif.) of the Joint Committee on Atomic Energy, and other members of Congress.

The strongest counterattack on the Navy's position was launched by Secretary Symington and General Vandenberg. Replying to the charge that the Air Force placed too much reliance on the B-36, Symington showed that, in Fiscal Years 1949 through 1951, the B-36 accounted for only 2.9 percent of the number of aircraft and 16.3 percent of the cost of all airplanes purchased by the Air Force.

This was telling testimony, but

The first Air Force Secretary, Stuart Symington (center), seen here with Gen. Carl Spaatz (left) and Gen. Hoyt Vandenberg, was attacked viciously during the battle for the B-36. Some went so far as to implicate him in Secretary Forrestal's suicide.

Radford, aware of these figures, chose to ignore them. Symington then zeroed in on the effectiveness of strategic bombing. He reminded the committee that strategic bombing had been approved and assigned to the Air Force by the Joint Chiefs of Staff. "The most disturbing feature of the attacks against the Air Force," Symington said, "is what they have done and are doing to imperil the security of the US. It was bad enough to have given a possible aggressor technical and operating details of our newest and latest equipment. . . . It is far worse to have opened up to him in such detail the military doctrines of how this country would be defended."

Vandenberg reiterated Symington's points, reinforcing them with technical details and adding that, so far as the flush-deck carrier was concerned, "my opposition to building it comes from the fact that I can see no necessity for a ship with those capabilities in any strategic plan against the one possible enemy."

Following Vandenberg, General Bradley, now Chairman of the Joint Chiefs of Staff, unleashed heavy fire against the Navy. He said that the Navy's "careless detractions of the power of this [atomic] weapon have done national security no good and may have done our collective security, in these precarious times, untold harm." He wished that the Navy's testimony had never been delivered, he added. "This is no time," emphasized the usually mild-mannered Bradley, "for 'fancy dans' who won't hit the line with all they have on every play unless they can call the signals." The gut problem, according to General Bradley, was that the Navy had opposed unification from the start and had never completely accepted it.

This was a point *Air Force* Magazine made in a December 1949 retrospective on the strategy and unification hearings. It noted that the investigation left a great deal to be desired because it could not proceed in a logical manner; to be complete and comprehensive, the hearings would have to start with a consideration of the nation's classified war plans. This would have torpedoed the Navy's arguments. The magazine emphasized, however, that "the Admirals found, as a by-product of the hearing, that civilians still run the defense establishment as the provisions of the Constitution intended, and their reeducation in this particular was most timely."

Careers were ruined and reputations impugned in the "Revolt of the Admirals," but the B-36 vindicated its proponents before eventually finding its way to its final resting place in the desert at Davis-Monthan AFB, Ariz.

Unreconstructed Admirals

This struggle, ignited by unreconstructed, high-ranking naval officers, had deep roots in the 1945–47 period, when the Army Air Forces won the battle to establish an independent Air Force. The Navy all along had been reluctant to cede the atomic mission to the AAF in a period of stringent budgetary cutbacks. This became especially critical when the Truman Administration made strategic deterrence the centerpiece of its postwar national security policy. The Air Force, with the B-36, was front and center in the nation's defense establishment—hence, the Navy's unbridled attack on the B-36 bomber.

Years later, Stephen F. Leo, Symington's director of Public Relations, described the Navy in this era as being "out of control." The Navy had been dragged, kicking and screaming, into the National Security Act of 1947, and its opposition to a strong Secretary of Defense reflected a reluctance to join the unification team. General Bradley emphasized that the Navy had refused to accept unification "in spirit as well as deed."

Army Chief of Staff Eisenhower showed his frustration with the Navy when he stressed to the Congress that the postwar national security establishment had to be structured like a three-legged stool, each military service mutually supportive of the whole. This was the great lesson of World War II—mutually supporting services under unified theater command. It was a lesson that the Navy took some time to learn.

The extraordinarily able first Secretary of the Air Force, Stuart Symington, many years later described with enthusiasm to this author the B-36 confrontation and the Revolt of the Admirals as "a great battle." He might have added (because he surely knew) that it was a fight the fledgling US Air Force won. ■

Herman S. Wolk is senior historian, Air Force History Support Office, Hq. USAF, where he has served since 1966. He was a historian at Hq. Strategic Air Command, 1958–66. He is author of Planning and Organizing the Postwar Air Force, 1943–47; Strategic Bombing: the American Experience; *and a commemorative booklet, "Independence and Responsibility: The Air Force in the Postwar World." Mr. Wolk is also the author of "General Arnold, the Atomic Bomb, and the Surrender of Japan," to be published by the LSU Press in* The Pacific War Revisited *(1996).*

Eight Decades Over Hollywood

Since 1911, filmmakers have been unable to resist the drama inherent in military flying.

By Bruce D. Callander

Springer / Corbis-Bettmann

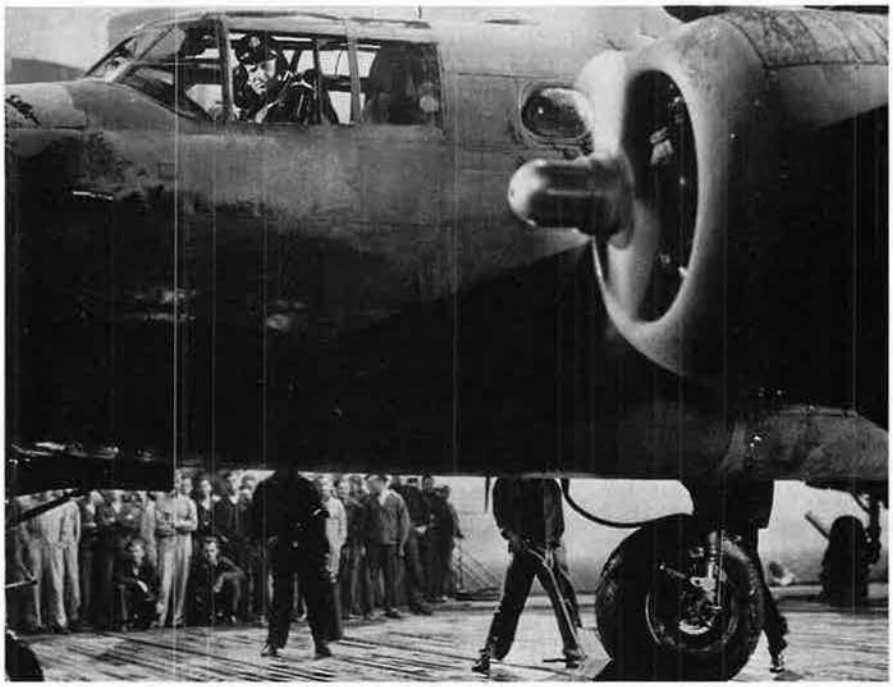
Hollywood recognized early on the drama, history, and interesting technology a military aviation story could bring to the screen, awarding "Wings" (above) the first Academy Award for best picture. For some actors, the movies reflected real life, as in the 1955 movie "Strategic Air Command," when former B-24 pilot Jimmy Stewart (opposite) took the controls of a bomber.

In 1911, a young Army lieutenant named Henry H. Arnold was taking part in a Long Island air meet when a filmmaking company recruited him to serve as a flying stuntman in a movie titled "The Military Scout." This was one of the first encounters between military aviation and the movies.

"The Military Scout" did not turn out to be a blockbuster, but it was modestly successful, and it marked the start of the movie industry's long-running love affair with flying and the military—a romance that would span the century and take in many of Hollywood's top stars.

After his own brief stint in the movies, Lieutenant Arnold went on to bigger things—commanding US Army Air Forces during World War II and becoming a five-star general. However, "Hap" Arnold never lost his interest in films. Before and during the war, he recognized the effective role that movies could play, both as training aids for the troops and as a means of winning and maintaining public support for the war effort.

For its part, Hollywood discovered that military aviation was a gold mine of story material. Many pic-



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While technical errors sometimes cropped up in Hollywood's Army Air Forces, the industry did strive for realism. "Thirty Seconds Over Tokyo"—in which Spencer Tracy portrayed Jimmy Doolittle—contained footage from the actual mission.

tures followed that first effort. In 1929, the industry awarded the first best-picture Oscar to "Wings," starring Richard Arlen, Buddy Rogers, Clara Bow, and a young Gary Cooper. The film focused on the US Army Air Service of World War I and was followed by several look-alikes, such as "Dawn Patrol," "Crimson Romance," and "The Lost Squadron." Later, movie pilots in Jennys battled the bad guys in Saturday serials, and Air Corps airplanes even helped rescue Fay Wray by shooting King Kong off the Empire State Building.

Today, the Air Force probably still would OK Lieutenant Arnold's participation in the movies, because it took place on his own time and at no cost to the government, but the arrangement would involve considerably more than buttonholing a pilot at an air show *[see box, p. 71]*.

Beyond the Back Lot

Through the earliest years, the military cooperated with Hollywood on an informal basis. Surplus warplanes were cheap, and many World War I veterans were looking for work. As a result, producers needed little technical or logistical help from the military services. By the mid-1930s, however, the Army Air Corps had begun to fly much more sophisticated fighters and bombers. Air warfare became harder and harder to simulate on Hollywood's back lots. Film companies needed professional help, and the armed services, struggling to build or even maintain their strength, saw films as good promotional tools.

In 1935, Hollywood sent an all-star cast to Randolph Field, Tex., to film "West Point of the Air." Flight students and instructors saw themselves portrayed by Wallace Beery, Robert Young, and Robert Taylor. Four years later, Britain's Ralph Richardson and Merle Oberon starred in a similar story about RAF trainees, "The Lion Has Wings," released while Europe stood on the brink of war.

During World War II, Hollywood saw military movies as its contribution to the war effort. The services did what they could to help. With the troops busy on several continents, however, producers often had to settle for filming training exercises or using stock footage. As a result, Hollywood's presentation of the war often was limited. A film's hero might be shown taking off for a mission in a P-40 and coming home triumphantly in a P-51. Today's USAF technical advisors would have cringed at such inaccuracies, but civilian audiences at the time didn't seem to notice.

The typical script took farm boys and young city slickers through the rigors of flight training into a sanitized version of combat. Extras fell, but the hero rarely received more than a scratch. Enemy pilots were sinister but inept, and, if our side didn't always win the battle, it was sure to win the war.

For all their shortcomings, some of the films weren't bad, even by today's standards. "Air Force" (1943) told a convincing story about a B-17 landing at Pearl Harbor during the Japanese attack. In one scene, John

"Air Force" (1943) director Howard Hawks had two USAAF officers as technical advisors on the project, starring John Garfield (left). It was filmed primarily at Drew Field, Fla.

Garfield shot down an enemy fighter from the ground with a waist gun cradled in his arms. Today, an Air Force liaison officer probably would tell the director that this was pretty farfetched, but in wartime the audience liked to believe it could happen.

"Thirty Seconds Over Tokyo" (1944), a re-creation of Ted Lawson's book about the famous 1942 B-25 raid led by Jimmy Doolittle—portrayed by Spencer Tracy—also may have had its flaws, but it was moving. The same could be said of "Flying Tigers" (1942), starring John Wayne.

On a few occasions, Hollywood shot the war "live." One film crew went to wartime England to fly with Eighth Air Force crews and came home with a documentary that General Arnold ordered distributed to

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One of the movie industry's better efforts at portraying the military, "Twelve O'Clock High" showed the pressures of the air war in Europe. Here, Gregory Peck (standing) speaks to his aircrews, many of them Eglin Field, Fla., extras.

Corbis-Bettmann

Along with rare combat footage, good acting contributed to the success of "Twelve O'Clock High." Dean Jagger (at the wheel, listening to Gregory Peck) won a best supporting actor Oscar for his performance.

GI theaters. The original "The Memphis Belle" (1944) still stands up better than the fictionalized version produced almost fifty years later with all the technology at the command of today's moviemakers.

Some movies turned out to be real duds—"Bombardier" (1943), for example, which began with cadets learning to run the Norden bombsight and ended with their bombing Tokyo from a B-17 with their former instructors (Pat O'Brien and Randolph Scott) at the controls.

A Few Star Pilots

Hollywood was not too generous about providing manpower to the services. Many actors were too old for military duty, while others were more valuable wearing uniforms in films than they would have been in combat. Of those who enlisted or were drafted, only a few gravitated toward the air services. Ronald W. Reagan and William Holden were two who chose the Army Air Forces and served most of the war with the AAF's 1st Motion Picture Unit at Culver City, Calif. The unit had been established by General Arnold.

Alan Ladd served a few months with an Air Force line unit before receiving a medical discharge. Ray Milland tried to trade his civilian flying time for a pilot's commission but wound up as a civilian flight instructor. Burgess Meredith served in air intelligence.

A handful of stars saw air combat. Clark Gable, for example, flew missions with the 351st Bomb Group, gathering material for a training film for aerial gunners. Jimmy Stewart served a full tour as a B-24 pilot with the 445th Bomb Group. After the war, Colonel Stewart remained in the Reserve and eventually retired as a general officer. He also was one of the twelve veterans who founded the Air Force Association in 1946.

Hollywood probably made its best World War II films after the war had ended, when it could stop pretending it had all been a piece of cake. In 1949, "Twelve O'Clock High" had Gregory Peck shaping up a bad-luck bomb group. "Command Decision" in 1948 showed Clark Gable agonizing over heavy losses. Our side still won, but now we could admit how high the cost had been.

Moviemakers did not display the same enthusiasm for portrayals of air operations in the Korean War as they had during the two world wars. Beyond filming a few quickies show-

In 1955, Gen. George Kenney (right) escorted June Allyson to the premiere of "The McConnell Story," about Korean War ace Joseph McConnell. Hy Averback (center) interviewed them at the event for "The Tonight Show."

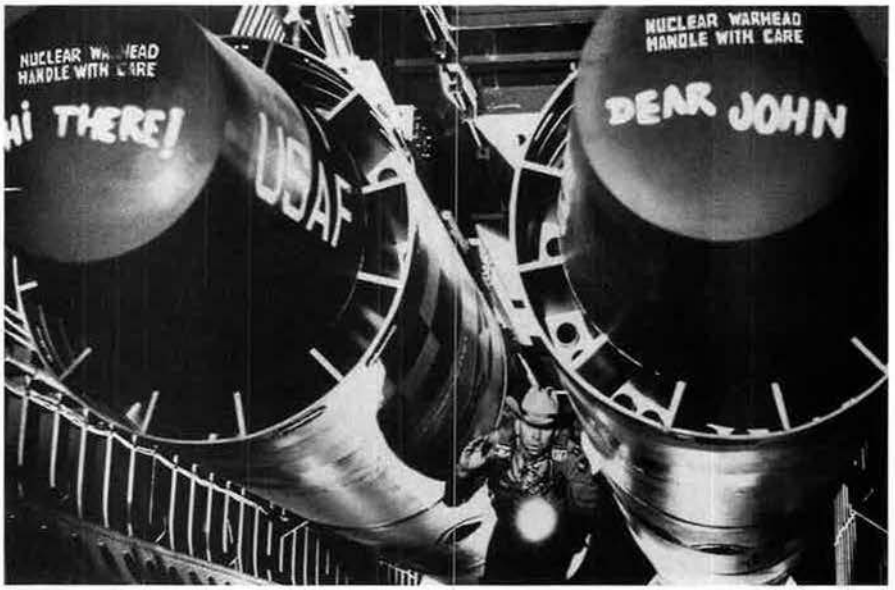
ing new jet fighters, producers largely ignored that fight. An exception was Warner Brothers, who put out "The McConnell Story," a 1955 film biography of Capt. Joe McConnell, a triple jet ace in Korea who died in a 1954 crash. The film, with Alan Ladd in the title role, had its world premiere at AFA's ninth annual National Convention in San Francisco.

The war had been over for five years when Hollywood unveiled "Battle Hymn," the true story of Dean Hess, a minister who became a World War II fighter pilot, flew in the Korean War, and befriended an orphanage. The movie did not score well at the box office.

Films about the "new" Air Force did better. In "Strategic Air Command" (1955), Jimmy Stewart, back from combat, commanded a SAC outfit while his film wife, June Allyson, bit her nails. It inspired other films about SAC, including "Bombers B-52" (1957).

The year 1963 saw the opening of "A Gathering of Eagles," a remake of the classic "Twelve O'Clock High."

Then came the Vietnam War, however, and the beginning of an antiwar, antimilitary era in filmmaking. As public opinion turned against the war, Hollywood veered from the production of films supporting the services toward those portraying military leaders as villains.



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Some Hollywood productions carried an antimilitary message in the 1960s. At the climax of one of the most famous of these, "Dr. Strangelove," actor Slim Pickens rode an atomic bomb to earth, bronco-style, to start World War III.

Madmen and Nukes

The pro-SAC movies of the 1950s gave way to more equivocal portrayals. "Fail Safe" (1964) was the fictional tale of a B-52 mission gone awry, culminating in the nuclear destruction of Moscow and Soviet retaliation in kind against New York city. Also put on the screen were fantastic tales of military madmen running amok with nuclear weapons. The most famous of these was "Dr. Strangelove, or: How I Learned to Stop Worrying and Love the Bomb" (1964), a dark comedy starring Peter Sellers in three roles. The movie featured a SAC B-52 headed for Russia on an irretrievable mission and ended with the pilot (Slim Pickens) riding an atomic bomb down to the target to begin World War III.

During this period, even Hollywood's retelling of old war stories carried an antimilitary message. "The Blue Max" (1966) showed a World War I German ace (George Peppard) becoming a national hero, then being killed by an ambitious superior. "Catch-22" (1970) presented a bizarre collection of reluctant crewmen, bumbling commanders, and scheming ground officers.

The Air Force lent little cooperation to such films, and its efforts to put more positive images of the service on the screen were largely fruitless. During the Vietnam War era, Hollywood, like much of the public, seemed unable or unwilling to distinguish between a politically unpopular war and the men and women who were trying to make the best of a bad situation.

The problem may have been less about ideology than it was about the studios eyeing the bottom line and deciding that Vietnam didn't sell. Charles Davis, chief of the Entertainment Division, Western Region Office of USAF Public Affairs in Los Angeles, Calif., sums it up this way:

"Vietnam was an unhappy story heading for an unhappy ending, which breaks the basic rule of entertainment."

The bitter taste lingered well after the Vietnam War ended, but, gradually, public support for the military returned. With it came a reconciliation of sorts between Hollywood and the armed forces, especially military aviation.

A major breakthrough came in the 1980s with release of the highly successful "Top Gun," starring Tom Cruise. The film was about Navy F-14 Tomcat crews, but it rekindled Hollywood's enthusiasm more generally for military aviation. The services now could provide new and startling "props"—such as high-tech fighters and supersonic bombers—as well as new combat scenarios packed with action.

Corbis-Bettmann

With some exceptions, moviemakers paid less attention to Korean War air operations than they had to previous wars. Even with Rock Hudson as the star, the Korean War movie "Battle Hymn" was not a big success.

Less Impressed

These days, however, the Air Force is not as star-struck as it was in the 1930s, and approval of projects is not easily won.

USAF's Western Region Office recently considered a proposal for a film about a disgruntled Air Force pilot flying a nuclear-armed F-117A toward Washington with a plan to shut down the government permanently. Officials suggested the screenwriter rework the story or forget about official cooperation.

A recent Columbia Pictures proposal sparked a different response. The movie is a heartwarming story about a father and teenage daughter trying to teach a flock of Canada geese to migrate south. Flying two ultralight airplanes in formation with the flock, the pair puts down at an Air Force base (played by Niagara Falls IAP/ARS, N. Y.) and then flies to a happy ending. Columbia not only got to film at the base but had access to a horde of extras who did not need help from the wardrobe department. Under DoD rules, military personnel may perform with the filmmakers during off-duty time. The film (working title: "Father Goose") is set for release this year.

Unlikely to gain cooperation, say DoD instructions, are projects that "appear to condone activities by private citizens when such activities are contrary to US government policy." The director making a movie about the macho loner who launches a private war, for example, is unlikely to get help from the services.

On the other hand, comedies with a military setting are not automatically ruled out. The services bristle at stereotyping sergeants as wheeler-dealers and generals as bumbling buffoons, but the antics of individuals coping with service life have been a Hollywood staple since the silent-movie days.

The services draw the line when the laughs are at the expense of the military establishment. The Army did not object to a script that featured a female Army recruit struggling through the rigors of basic training, but it did balk at the portion of the script that called for her to deal with a lecherous general officer.

The Air Force had no objection to a Disney comedy about an enlistee with a fear of dogs who winds up assigned to DoD's dog-handling program at Lackland AFB, Tex. The difference, said Mr. Davis, is that the humor lies in the individual's being out of his element, not in service life itself.

Once approved, service cooperation can range from helping scriptwriters get a feel for military jargon

Movie Rules and Regs

Armed service cooperation with film and television productions now is governed by a long DoD regulation (Instruction 5410.16). Each service has additional guidelines and an office to deal with producers throughout the life of a project.

For the Air Force, the contact point is the Western Region Office of USAF Public Affairs, housed in the Federal Building in Los Angeles, Calif., and directed by Lt. Col. Thomas Worsdale. It reviews scripts and recommends or advises against service involvement. Final approval or disapproval comes from the Defense Secretary's special assistant for Audiovisual Media.

Criteria for approval are comprehensive. The production must present an authentic or at least feasible interpretation of military life. It must be informational and considered to be in the best interest of public understanding of the services.

If a producer receives the Pentagon's official blessing, he can draw on service resources ranging from technical advice on uniforms to the systems needed to re-create a full air battle. The film company must pay for expenses, such as a liaison officer's per diem costs, flying hours, and consumables. Costs can run into the millions, but service cooperation can make the difference between an authentic production and a routine shoot-'em-up created in the studio.

In return for its assistance, the service receives assurances from the producer that a film will approximate authentic military life and that the film might help spur recruiting and increase support for the service.

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Clark Gable (with microphone) talks to a damaged bomber's crew in "Command Decision" (1948). He understood this perilous situation: As Captain Gable, he had flown bomb missions in World War II.

and have no military background, so they appreciate the help."

Such was the case with "Apollo 13." This account of the 1970 moon mission that went wrong is mostly a NASA story, but the Air Force assisted through its 30th Audiovisual Squadron, Vandenberg AFB, Calif. Vandenberg itself was the setting for "The Net," a film about a computer hacker trying to stop a satellite launch. The Air Force found the premise of that film believable and cooperated. The Defense Department, however, balked at a similar story line in "WarGames," the 1983 story of a teenage hacker (Matthew Broderick) who accidentally breaks into North American Aerospace Defense Command computers.

Military cooperation does not guarantee commercial success, of course, but successful productions can be

to supplying a liaison officer and opening a base for location shots. However, the production company not only must pick up the tab for the use of the assets but also must restore any government property involved to its original or better condition. If the script calls for more action than the Air Force can justify as routine training, the producer must foot the bill for the extra amount.

The Defense Department does not take IOUs. Producers must furnish a line of credit from a reputable bank, carry full insurance, and sign a statement absolving the government of liability.

Even if a producer agrees to the conditions, approval comes only after lengthy negotiations, during which the Air Force may ask for major script changes.

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Paramount Director William Wellman had World War I flying experience, which enabled him to gain the War Department's cooperation in producing "Wings" (above). Today, a USAF public affairs office works with the movie industry.

Unsalvageable

In some cases, scripts can't be doctored enough. For example, the focus of the recent blockbuster "Broken Arrow" is a disgruntled Air Force officer (John Travolta) who steals a bomber with nuclear weapons aboard. USAF worked with the producers but still found the script unacceptable and withdrew support. In the end, the producer used computers to create most of the aerial effects.

"It was just too unrealistic to suggest that an Air Force officer would do the kinds of things Travolta did," said Lt. Col. Thomas Worsdale of the Western Region Office. "It isn't something we could see happening in real life."

At other times, producers welcome Air Force suggestions in the interest of accuracy. "The draft has been over for more than twenty years," said Mr. Davis. "Most of the people in the entertainment industry are young rewarding for both the producers and the services. Studies have shown that movies are the best media for reaching eighteen- to twenty-four-year-olds who might consider Air Force careers.

It requires only "a small investment," said Mr. Davis, but "that positive exposure is worth millions." ■

Bruce D. Callander, a regular contributor to Air Force *Magazine, served tours of active duty during World War II and the Korean War. In 1952, he joined* Air Force Times, *becoming editor in 1972. His most recent article, "And Now, the Pilot Shortage," appeared in the April 1996 issue.*

US space launches take too long and cost too much. USAF is working with NASA and industry to fix the problem.

Toward Leaner Launchers

By Suzann Chapman, Associate Editor

In 1982, the US had ninety percent of the world's space-launch market, but by 1992 that figure had dropped to thirty percent as the European Space Agency's Arianespace began to take hold in the global marketplace. Other countries also offered "economy" launches of their own.

Cost and efficiency were the driving factors in this realignment. Arianespace provided launches at far lower cost and with a reduced cycle time and fewer employees. The US launch industry, with origins in 1950s-era intercontinental ballistic missile systems, featured long delays and manpower-intensive operations, leading to high cost and unhappy customers.

The Defense Department's 1994 Space-Launch Modernization Plan criticized the delays and lack of responsiveness, noting the impact on DoD and commercial customers. That same year, Air Force Secretary Sheila E. Widnall announced a drive for more routine and affordable space-launch operations.

The effort seems to be paying off for the Air Force. For one thing, USAF and the aerospace industry have managed to drive down the costs and cut the processing times on

As part of the drive to improve space-launch operations, USAF and industry have reduced time on the pad for medium-lift boosters, such as this Atlas II, launched from Cape Canaveral AS, Fla., in December 1995.

today's launch systems. Some cycle times have been slashed by more than fifty percent.

In addition, they are optimistic about the success of the latest effort to produce a new expendable launch vehicle (ELV), saying that the program will pay for itself by 2010. Moreover, they said that the product of the Evolved Expendable Launch Vehicle (EELV) program will help revive the US commercial launch business.

The Defense Department expects that the EELV program will mark the first serious modernization of the nation's launch vehicles and lead to reduced costs. However, until the EELV medium- and heavy-lift versions come on line, the Air Force must continue to use its older ICBM-based booster force.

Improving Medium, Heavy Lift

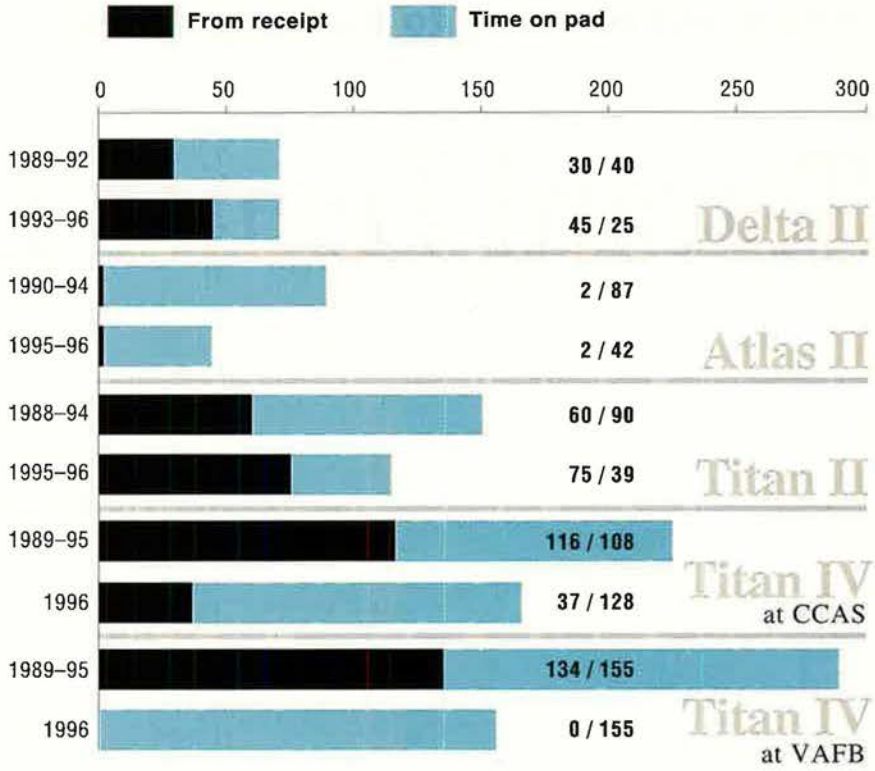
The Air Force and industry are, in fact, streamlining and improving operation of today's fleet, said Col. Tommy Brazie, head of the Space and Missile Systems Center's Launch Programs System Program Office (SPO). He said that SMSC is "driving with our [Air Force] Space Command partners to normalize [launch] operations."

The emphasis has been on reducing time on the pad for the USAF medium-lift boosters—Delta II, Titan II, and Atlas II. The Air Force has improved efficiency and reduced cost by conducting more of its vehicle processing at the contractor plant and launch facility before placing the booster on the pad—so-called "clean vehicle" processing.

This change is illustrated in the chart above right. Time on the pad for Delta II boosters has dropped from forty days in 1989 to twenty-five in 1993. In 1988, Titan II processing took 150 days—sixty at the facility and ninety on the pad. That total has been cut by thirty-six days. Atlas II has shown even greater improvements, shaving forty-five days from its overall processing time, all from on-pad time. Colonel Brazie projects that on-pad processing for Atlas II will fall by another seven days this year.

The Colonel noted that other efficiencies and savings have come from the synergy among DoD, NASA, and industry. The Atlas and Delta programs in particular have benefited from advances in the commercial launch arena. Likewise, DoD's Atlas Reliability Enhancement Program has produced valuable advances that have been transferred to the commercial sector.

Launcher Processing Times (Days)



The Titan IV is the nation's only heavy-lift ELV. It bucks the general proposition that the less time on the pad the better. Colonel Brazie said that performing tests off the pad and then repeating the same tests on the pad was neither necessary nor cost-effective. "We chose to eliminate the off-pad testing instead of on-pad [testing], so we could test the vehicle in the stacked and ready-to-go configuration," he said.

Titan IV has different processing requirements, which depend on its launch location—Cape Canaveral AS, Fla., or Vandenberg AFB, Calif. (See chart above.)

Historically, preparation for Titan IV launches at the Cape took an average of 224 days—116 at the facility and 108 on the pad. Now, processing takes 165 days, a reduction of 26.3 percent in overall cycle time.

At Vandenberg, processing historically has averaged 289 days, with 155 spent on the pad. Today, that time has been cut 134 days, down to only the 155 needed on the pad. Colonel Brazie noted that the difference in processing times between the two facilities is primarily a result of Vandenberg's use of a pad originally designed to launch space shuttles.

For the Titan IV, even more than for medium-lift vehicles, processing times vary greatly depending on the complexity of the payload or the particular satellite being launched.

The fact that current ELVs are tailored to meet specific payload requirements, rather than employing a standard payload interface, adds to cost and creates processing delays.

Maj. Gen. David L. Vesely, commander of Air Force Space Command's 14th Air Force, oversees launch operations on both coasts. He likened the current process to changing the engines on a cargo aircraft each time it's loaded or unloaded. The General noted that, with the new EELV, satellites should have a standard interface with the booster, "like putting [cargo] pallets on an airlifter."

Some standardization for payloads is already in the works for the latest version of the Titan heavy-lift booster. The Titan IVB will employ mis-

sion-unique kits, providing a standard interface for payloads to permit launch-site processing.

The configuration will be the same as for the Titan IVA from the bottom of the rocket to the top of the payload interface skirt. From there up, the Titan IVB will be able to be customized on the pad.

"Should we have to swap payloads, there is reduced schedule impact—we save three months and have reduced cost—about $5 million per vehicle," said Colonel Brazie.

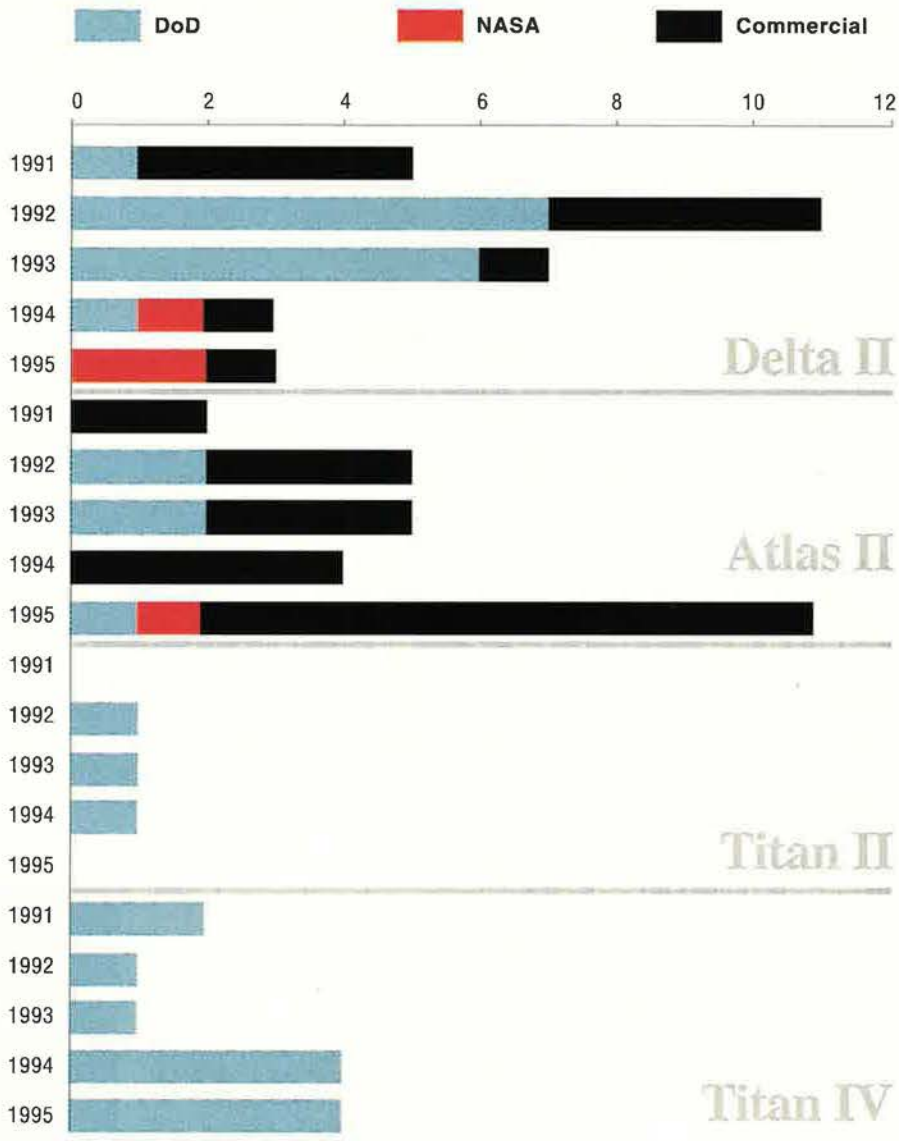
He said that other improvements to the B model include "heroic" measures, such as changing the entire electrical system on the booster core. The new system, which is simpler and more easily checked out, uses up-to-date commercial parts and should "drastically reduce processing times." A new ground system also uses commercial software and hardware instead of the "hodgepodge" system of the A model. The Colonel said the new ground system provides better data earlier, adding that it is much easier and less expensive to maintain.

The Titan IVB will have twenty-five percent increased performance from its upgraded solid rocket motors. The new SRMs will feature three segments instead of the current seven-segment version and will be checked out before they are mated to the core, not on the pad.

USAF plans to launch the first Titan IVB from Cape Canaveral in Fiscal 1997 and from Vandenberg in Fiscal 1999.

Colonel Brazie said the Air Force and Lockheed Martin, the prime contractor for Titan IV, continue to seek further improvements. Telemetry and data lines now run from the launch facility to Denver. The technicians can work from home, saving travel costs and allowing them to be more productive if weather delays occur, he continued.

Recent Launches



New SPO, New Thinking

In 1995, the Air Force began a concerted effort to reduce the cost of spacelift. Secretary Widnall said the Air Force has "officially ended the study phase of improving our space-launch situation, and we're aggressively pursuing the action phase."

In addition to simplifying its procedures and reducing costs to commercial users, the Air Force increased commercial access to Atlas and Delta launchpads on a "noninterference" basis.

Traditionally, military launches have outnumbered commercial launches. In 1994, the split changed to fifty-fifty, and in 1995, commercial launches surpassed military launches. The number of commercial and civil launches is projected to exceed the number of military launches for the next few years.

The Air Force has also been upgrading its launch facility infrastructure under the Range Standardization and Automation program. AFSPC has invested heavily and plans to continue to do so for a few more years.

Interim standardization measures, said General Vesely, also include working with all key players to revamp the space-launch scheduling process, to establish quarterly launch reviews, and to strictly adhere to launch windows.

"There's no quick fix, but we're seeing results with our standardization efforts," he said.

Another streamlining move was creation of Colonel Brazie's launch-program SPO. The new SPO brings current launch vehicles under one management. The Air Force expects the new launch SPO to reduce overhead costs and foster synergy among launch programs.

Colonel Brazie said he plans to cut the size of the program office by forty percent by 1998, in line with USAF-wide acquisition reform measures. He has already reduced ad-

ministrative, contracting, and budget staffs. Similar cuts are in store for technical staff, largely through such initiatives as combining engineering support for solid rocket motor boosters.

The SPO has already proven its capability in the latest Titan contracts, which highlighted recent changes in acquisition strategy. Working closely with the contractor in cost discussion, launch SPO personnel had the information to help them eliminate costly items of scant value.

Colonel Brazie added that the Air Force could shave costs another ten percent by combining Atlas and Titan crews, eliminating the need to keep full crews for each system at each launch facility.

Why the EELV?

Notwithstanding these cost-saving endeavors and process improvements, US launch vehicles remain very expensive, the result of their ICBM-based technology, lack of commonality, and low production rates.

Most experts agree that the optimum solution is to employ a reusable launch vehicle (RLV) with "airplane-like" operation. NASA is pursuing that type of system for the long term, but the need for an improved ELV is urgent. During a decade of indecision, the US spent millions on unsuccessful programs, such as the Advanced Launch System, the National Launch System, and the Spacelifter.

In 1995, the Pentagon initiated the EELV program. This program aims to produce systems that will eventually replace all of today's medium- and heavy-lift launchers. Current plans call for first launch of a medium-lift EELV in 2001 and a heavy-lift EELV in 2005. Both would be based on a core system, a practice that the Defense Department hopes will lead to a cost-effective family of vehicles.

Secretary Widnall said the service is vigorously pursuing EELVs because the US needs "equally viable expendable and reusable launch vehicle efforts to cover our bets for the future." She added, "I don't want to repeat the mistake we made in the early 1980s of having all our eggs in one basket."

The Air Force expects the EELV program to yield boosters that would produce savings of twenty-five to fifty percent compared with today's models. It also expects the program to pay for itself in the 2007 to 2010 time frame, when the US could conceivably make the transition to a reusable launch vehicle.

The Defense Department did not opt for a completely new expendable launch system, said one Air Force official, because it saw "the promise of a reusable system that has higher cost savings" over the longer term.

"From a business standpoint," he said, "it's a smart investment because you get the payback in the investment that you made and then you have the opportunity to transition after that payback to an even more affordable system"—an RLV.

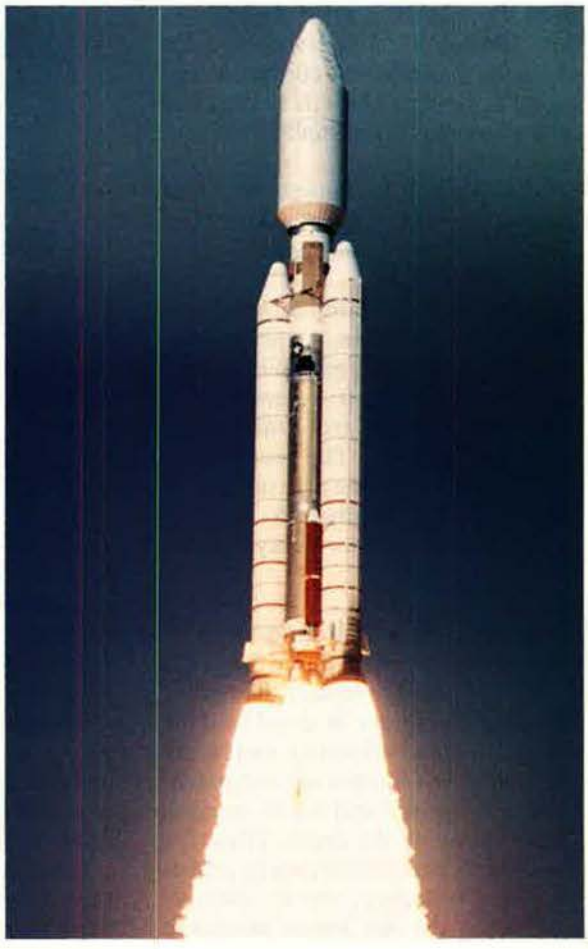
DoD and Air Force officials state that the number one objective of the EELV program is to reduce cost for medium- and heavy-lift space vehicles. They plan to build a "system of systems" derived from existing technology and using commercial standards with minimum military specifications and paperwork.

The "system of systems" approach means both versions would use the same launch capabilities, infrastructure, ground support systems, and payload interfaces. In effect, an Air Force program official said, developing the EELV as a "family" with common elements will yield higher production rates (with lower costs) and reduce the numbers of launch crews, launchpads, and support facilities.

"All those things help to drive down the cost—the operations cost, as well as the manufacturing and hardware costs," said the USAF official. "Overall, it would drive down the life-cycle cost of space launch."

The program will take advantage of a recommendation to phase in new launch programs during satellite block changes to achieve greater savings. There are also acquisition risk-reduction phases or "exit points."

In August 1995, USAF awarded four $30 million low-cost concept validation (LCCV) contracts. Alliant Techsystems, Boeing, Lockheed Martin, and McDonnell Douglas each have fifteen months to develop con-



Through such innovations as a different electrical system on the booster core, a new ground system, and upgraded solid rocket motors, USAF and Lockheed Martin, prime contractor for the Titan IV, seek improvements in the nation's only heavy-lift expendable launch vehicle.

cepts to reduce cost. In keeping with the acquisition reform move, each contractor received only a one-page list of objectives, instead of a multiple-page statement of work.

The major product of the LCCV will be a life-cycle cost estimate (LCCE) with a confidence level of seventy percent. "This is really the heart of what you're buying and evaluating—to see if you can really achieve the cost-savings goal the program is based on," stated the USAF program official. The LCCV also provides such products as draft interface specifications, technology risk-mitigation demonstration results, and operation and support documentation.

In November, the Air Force will select two of the proposed concepts for the next phase—pre–engineering and manufacturing development. Each contractor will receive about $65 million. The seventeen-month pre-EMD phase will provide a greater level of detail, including defined manufacturing processes and final interface specifications. It also produces an updated LCCE at the eighty-five percent confidence level.

The final step is the EMD selection of one contractor, a move scheduled for the summer of 1998. The EMD phase will run for about eight years, leading to operational medium- and heavy-lift vehicles. USAF values the EMD contract at about $1.5 billion.

During EMD, the contractor will conduct low-risk payload flights: two for the medium-lift vehicle in the 2000–2001 time frame, and one for heavy lift in 2003. The contractor will also provide an updated LCCE at the ninety percent confidence level and activate operational facilities and support systems.

The Air Force expects to achieve initial operational capability (IOC) for the medium-launch vehicle in 2001 at Vandenberg and in 2002 at Cape Canaveral, and for the heavy-launch vehicle in 2005 at Vandenberg and in 2006 at the Cape.

The "Epitome"

The Air Force expects the EELV program to produce a commercial booster the military can use, or a military booster the commercial industry can use. Secretary Widnall called it the "epitome of dual-use technology."

"Even though we are not specifically building in or buying commercial-unique requirements, the system . . . will benefit the nation from a commercial and international competitiveness standpoint," stated a program official.

The one-page list of objectives highlights the fact that the EELV program will develop a spacelift system, "evolved from current launch vehicle systems or major subsystems thereof." The four LCCV contractors plan to produce a concept based on current or previous work.

Alliant Techsystems states that it expects "to capitalize on the considerable investment and work that has gone into the two major space-launch advancements in recent years—the Solid Rocket Motor Upgrade developed by Alliant . . . and the European Ariane 5 cryogenic stage developed by Aerospatiale and Société Européenne de Propulsion." Alliant has teamed with Arianespace, TRW, Aerojet, AlliedSignal Aerospace, and others for the project.

Boeing developed the inertial upper stage, used on the Titan IV, and has teamed with Rockwell, Bechtel, Thiokol, and others. The company will focus on "refining the system concept and lowering cost through commonality, simplicity, and the use of commercial practices."

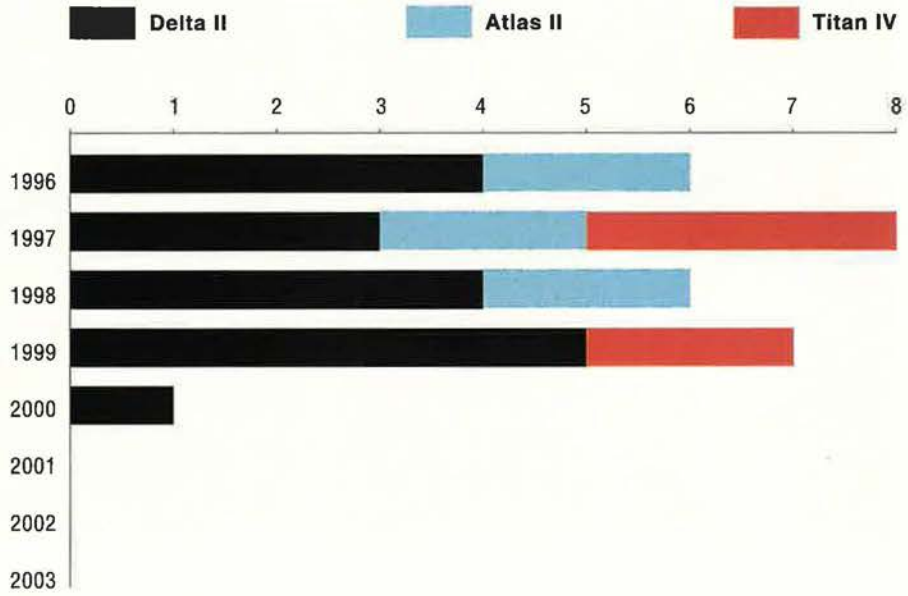
Lockheed Martin announced in November 1995 that it plans to develop a "common core" booster to achieve commonality across medium-, intermediate-, and heavy-lift vehicles. It expects to get leverage from its common-core strategy and its ongoing expertise in the launch business to develop a winning EELV concept.

McDonnell Douglas also plans to develop its current Delta II and new Delta III into a Delta IV family to meet requirements. The company states that its ongoing work, including a cryogenic upper stage, avionics suite, and automated launch processing control system, will provide "validation of the essential building blocks" for the EELV.

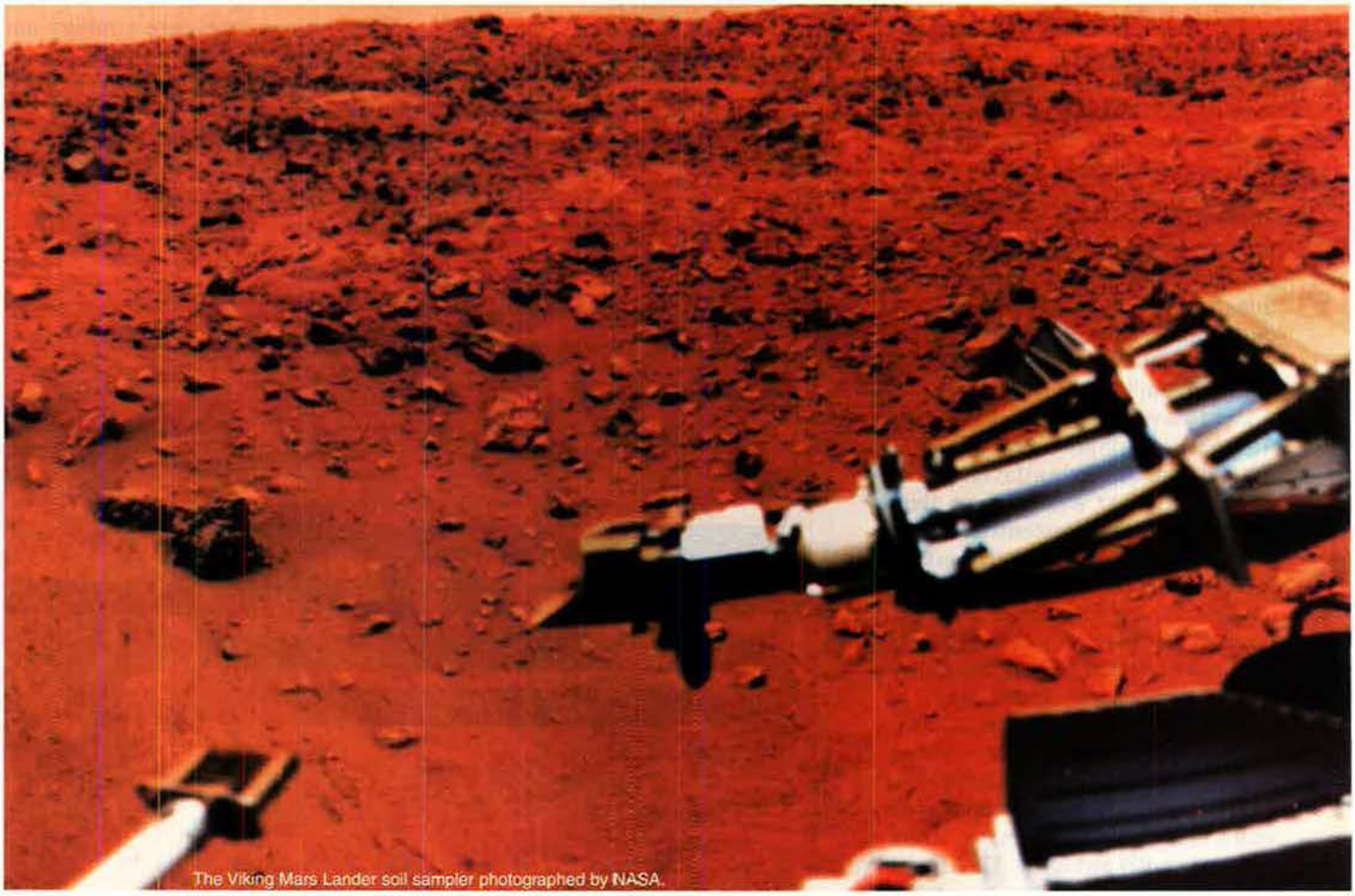
As part of the National Space Transportation Policy, announced in August 1994, the Clinton Administration gave primary responsibility for developing expendable launchers to the Defense Department. The principal responsibility for RLVs went to the civilian space agency, NASA.

NASA is working with industry first to develop a small, experimental RLV, the X-34, capable of lifting small satellites into orbit. It will be followed by a larger version, the X-33. Current plans do not anticipate IOC for the larger RLV until the 2010–15 period. ■

Planned Purchases



THE TITAN. BECAUSE THERE ARE WORLDS TO EXPLORE.



The Viking Mars Lander soil sampler photographed by NASA.

Few Americans have heard of it. But all Americans benefit. Because the Titan IV launches our most critical payloads into earth orbit and beyond. Today, the U.S. Air Force relies on the Titan IV to place national security payloads into orbit, helping America keep an eye on threats around the world. And in 1997, the Titan Team will assist NASA with the launch of the Cassini spacecraft on its mission to Venus, Jupiter and Saturn. America's investment is paying off because the Titan IV is a highly cost-effective launch vehicle. Beginning with the Gemini flights in the 1960s, nearly 200 successful space-launch missions have been completed by the Titan family of

AND WORLDS TO PROTECT.

launch vehicles – Titan II, III and IV. So even though few may realize it, the benefits are clear. Titan makes a world of difference.

THE TITAN

America's Silent Hero®

A message from Lockheed Martin, proud member of the Titan Team.

Air Force Association - Working for its National Membership. July 1996

National Report

Eight International Show Teams Asked to Air Force Fifty

The US Air Force has invited eight foreign aerial demonstration teams to participate along with the USAF Thunderbirds in two days of air shows in conjunction with Air Force Fifty in Las Vegas, Nev., April 22–26, 1997. Air Force Fifty, celebrating the fiftieth anniversary of the Air Force, will be held by AFA in cooperation with the US Air Force.

The week's events will culminate in aerial demonstration programs at Nellis AFB April 25–26. Air demonstration teams from Canada, the UK, France, Italy, Japan, Russia, Chile, and Brazil have been asked to appear.

Air Force Fifty will also feature unique exhibits indoors and outdoors, an international airpower symposium, a chance to see historic aircraft, reunions and meetings for more than forty veterans groups, and a spectacular multimedia historical retrospective of the first fifty years of the US Air Force.

"The Air Force Association has credibility, it has independence, and it has knowledge. That is very important to Congress and particularly to me as a member of the Senate Armed Services Committee. Air Force *Magazine is a valuable source of important information for Air Force personnel—both retired and active duty—and for others who closely follow the military."*

—Sen. Trent Lott

AFA Sets the Pace With Air Force Memorial Support

When the Air Force Memorial opens to the public on Arlington Ridge near Arlington National Cemetery around the year 2000, the Air Force Association will have had considerable to do with making it possible.

AFA has provided office space and administrative support for the Air Force Memorial Foundation since its inception in 1992, and now financial contributions to build the memorial are beginning to roll in. This is part of a nationwide campaign to raise $25 million to build the memorial on a scenic slope overlooking the Potomac River in Arlington, Va.

Retired Lt. Gen. Robert D. Springer, executive director of the foundation, points out that while the Marine Corps and the Navy have had service memorials in the nation's capital for years and Army memorials are found all over Washington, there is no memorial for the Air Force and the men and women who served in it. The planned structure, a futuristic star-shaped design that has met with overwhelming enthusiasm. will correct that.

"AFA served as a catalyst for the Air Force Memorial Foundation," General Spinger says. "They joined forces with the Air Force Sergeants Association early on, and things have taken off since."

The national AFA organization has contributed $400,000 so far and intends to make further donations. The largest single contribution from an AFA field organization is $75,000, which the Central Florida Chapter has raised from the annual Air Warfare symposium in Orlando. (Another $25,000 is pledged from Central Florida.) The Nation's Capital Chapter and the Donald W. Steele, Sr., Memorial (Va.) Chapter raised $10,000 with a five-kilometer running competition last fall and a golf tournament this spring. Utah AFA gave $5,000, and Florida AFA contributed $1,000.

The latest innovation, though, is by Illinois AFA, which sent a $1,000 gift to the memorial campaign in the name of David C. Noerr, longtime director of AFA Volunteer and Regional Activities until his death in January. In making its contribution, Illinois AFA called on all other AFA state organizations to make similar donations in Dave Noerr's memory.

Inquiries and donations should be directed to Air Force Memorial Foundation, 1501 Lee Highway, Arlington, VA 22209-1198. Telephone (703) 247-5808.

AFA/AEF Report

By Frances McKenney, Assistant Managing Editor

Iron Gate Salute, 1996

In May, the **Iron Gate (N. Y.) Chapter** continued its tradition of raising funds for USAF-related charities with its thirty-third annual National Air Force Salute. This year, the celebration spotlighted the Air Force Association, recognizing its fiftieth anniversary, as well as USAF's airlift and refueling missions and its top uniformed leader.

USAF Chief of Staff Gen. Ronald R. Fogleman received the chapter's highest honor, the Maxwell A. Kriendler Award. General Fogleman was honored for his operational and managerial expertise, a leadership style of enlightened concern for Air Force men and women and their families, and an insistence on accountability, making the best Air Force even better.

The award citation noted General Fogleman's commitment to the purpose of the Air Force—to fight and win wars—while pointing out that he has reemphasized "institutional values, standards, and the principle of 'service before self.' " The citation also stated, "He has steadfastly championed a balanced modernization program and directed long-range planning efforts aimed at fulfilling the air and space requirements of the twenty-first century. He has encouraged technological developments that promise revolutionary advances in capability and has broadened the Air Force team to include aerospace industry, winning its support for innovative acquisition reforms that have vastly increased the capability procured for the dollar invested. . . . He is an eloquent spokesman for the contributions of airpower to the new American way of war."

At this black-tie event, Ira C. Eaker Fellowships were presented to Brig. Gen. John O. Gray, USAF (Ret.); Maj. Gen. (Lt. Gen. selectee) Ronald T. Kadish; Gen. Robert L. Rutherford; Frank A. Shrontz, chairman of the board and chief executive officer of The Boeing Co.; Norman R. Augustine, president and CEO of Lockheed Martin Corp.; and Harry C. Stonecipher, president and CEO of McDonnell Douglas Corp. Boeing President Philip M. Condit accepted for Mr. Shrontz. James A. "Micky" Blackwell, Lockheed Martin Aeronautics Sector president, accepted for Mr. Augustine.

USAF photo by Ron Hall

Exchanging greetings before the Iron Gate (N. Y.) Chapter National Air Force Salute are (l–r) AEF Chairman of the Board Walter Scott and Becky Scott, AFA National President Gene Smith and Rae Smith, USAF Chief of Staff Gen. Ronald Fogleman and Miss Jane, Trisha McKee and AEF President Thomas McKee, and AFA National Secretary Mary Anne Thompson.

General Gray was honored in recognition of AFA's fiftieth anniversary, being celebrated throughout 1996. He served for thirty-eight years on AFA's staff—twice as Executive Director—and is a permanent AFA National Board member. He was cited for his key role in establishing the Iron Gate Chapter and in initiating the Air Force Salute.

The other five fellowship recipients focused attention on USAF mobility.

General Kadish is program director for the C-17 System Program Office at Wright-Patterson AFB, Ohio. General Rutherford, from Scott AFB, Ill., was commander in chief of US Transportation Command and commander of Air Mobility Command until his retirement in June.

The other three fellowship recipients—aerospace industry leaders of international stature—head companies whose contributions to mobility go back to World War II and forward to the twenty-first century. Boeing produced the KB-29 refueler and now has more than 500 KC-135s in the active and reserve forces. Additionally, the company's commercial derivatives serve the Air Force in a wide variety of missions, including transportation of the President aboard the VC-25 "Air Force One."

For forty years, Lockheed Martin has been the primary manufacturer of transports. Some of them, such as the C-130, C-141, and C-5, provide the US military with a global reach second to none. Lockheed Martin is also a member of the C-17 Globemaster III production team.

McDonnell Douglas was honored for airlift contributions since the C-47 introduced the airlift era in World War II. The C-54 replaced it, followed by the wide-body C-124 in the 1950s and 1960s. Today, the C-17, the world's most versatile airlifter, continues the tradition.

With this salute, the Iron Gate Chapter is well on its way to $3 million in contributions to USAF-oriented charities.

—James A. McDonnell, Jr.

In Dave Noerr's Memory

Dave Noerr, who was AFA's director of Volunteer and Regional Activities for more than thirteen years before he died in January, has been remembered through an Aerospace Education Foundation scholarship established by Brig. Gen. William W. Spruance, USAF (Ret.), a member of the **Diamond State (Del.) Chapter.**

The CMSgt. David C. Noerr Memorial Scholarship is awarded to an AFROTC cadet at Embry-Riddle Aeronautical University's Daytona Beach, Fla., campus whose parent is an active-duty or retired enlisted member.

AFROTC Cadet 3d Class Jered T. Frahm, son of a retired master sergeant, received the first scholarship, for $1,000, in April at the detachment's pass-in-review ceremony. Detachment Commander Col. J. B. Hall presented the award, with Florida State President William L. Sparks, James W. Councill, and Paul F. Braim, all from the **General James R. McCarthy (Fla.) Chapter.**

General Spruance lives in Florida for part of the year and is chairman emeritus of Embry-Riddle's board of trustees, an AFA National Director, and an AEF Presidential Advisor.

A European Renaissance

The **Lufbery-Campbell (Germany) Chapter** hosted a visit to Ramstein AB by AFA National President Gene Smith in April. Frank M. Swords, who has been appointed National Vice President (Europe) and who serves as interim chapter president, wrote that Mr. Smith spoke at the Ramstein AB NCO Club to an AFA breakfast gathering and at a lunch for senior enlisted people, encouraging them to be advocates of USAF airpower. He also told the groups that he was impressed by the high operations tempo at USAFE.

These events were coordinated by MSgt. Edward F. Hassan and MSgt. Telia A. Hughes, members of AFA's Enlisted Council. Along with Nita Wilkinson and Mr. Swords, they serve as the chapter's interim officers while the group reorganizes. Special assistant to the commander at the Warrior Preparation Center in Einsiedlerhof, Germany, Mr. Swords said he is committed to AFA "because I believe in my Air Force, and as a retired person, I now can devote the time it takes to make the chapter better."

After visiting Spangdahlem AB, Germany, President Smith headed to RAF Mildenhall and RAF Lakenheath, UK, where he learned about 3d Air Force operations and programs.

He then flew to Aviano AB, Italy, where he was met by Capt. Thomas "T. O." Hanford, who received an AFA Special Award at last September's National Convention in recognition of his role in the rescue of pilot Capt. Scott F. O'Grady from Bosnia-Hercegovina.

During his two-day stay at Aviano, Mr. Smith received briefings on the 31st Fighter Wing's role, visited the 555th and 510th Fighter Squadrons, met Aviano High School's JROTC detachment, and attended a dinner aimed at reviving interest in AFA activities in Italy.

USAF photo by Ron Hall

Monroe W. Hatch, Jr., AFA and AEF Executive Director Emeritus, presented an AFA Presidential Citation to Virginia N. Foster at a Pentagon ceremony celebrating her fifty years of federal service. Mrs. Foster has also been a volunteer at AFA's National Convention for more than twenty years.

New Mexico Goes Regional

When National Vice President (Southwest Region) L. B. "Buck" Webber learned that New Mexico State President Charlie Thomas had lined up Gen. Henry Viccellio, Jr., commander of Air Force Materiel Command, as keynote speaker for the state convention, he was impressed and suggested expanding the event to a regional activity. Among the more than fifty conventioneers at the April gathering were a dozen guests from Texas and a group from Oklahoma. Mr. Thomas wrote, "The results were wonderful."

The **Albuquerque (N. M.) Chapter,** headed by President Leslie A. Bruce, served as convention host.

Brig. Gen. Bruce Carlson, commander of the 49th Fighter Wing at Holloman AFB., N. M.; Col. Michael J. Koerner, commander of the 27th Fighter Wing, Cannon AFB, N. M.; and Col. Elizabeth Ann Harrell, commander of the 377th Air Base Wing at Kirtland, gave briefings at the convention's business meeting. The commander of Air Force Operational Test and Evaluation Center, Maj. Gen. George B. Harrison; Air Force Safety Center Commander Brig. Gen. Orin L. Godsey; and the New Mexico Adjutant General ANG Maj. Gen. Melvyn S. Montano followed with organizational briefings.

A tour of Kirtland AFB afterward took the convention guests to the 58th Special Operations Wing, where they learned about the night vision and low-level capabilities of the unit's MH-53 and MH-60 helicopters and MC-130s and HC-130s. They also visited Phillips Laboratory and its new space structures facility.

More than 100 guests attended the main banquet, celebrating fifty years of AFA and USAF heritage. In his speech, General Viccellio spoke about the changes and challenges facing his command.

Frogmore Stew

South Carolina State President Rodgers K. Greenawalt said his wife, Arcadia, was taken aback to hear that frogmore stew was on the menu for the poolside buffet at the South Carolina State Convention in Charleston, S. C. Fortunately, the Charleston specialty didn't contain frog, despite the name, but was a hearty

broth with shrimp, sausage, and vegetables.

It was one highlight of the May convention, hosted by the **Charleston Chapter.** Another was the awards luncheon's keynote speech by Maj. Gen. D. Bruce Smith, commandant of the Air War College at Maxwell AFB, Ala., who explained the school's role in preparing USAF's leaders. He also paid recognition to the ROTC, JROTC, and CAP cadets in the audience, attending the luncheon as guests of McDonnell Douglas Corp.

The **Strom Thurmond Chapter** was presented with the Most Improved Chapter Award, and Chapter President Guy Everson received an Exceptional Service Award. Chapter of the Year Award went to the **Swamp Fox Chapter.** John M. Settle, president of the Charleston Chapter, was named AFA Member of the Year.

The convention-goers later had an opportunity to attend a briefing on the C-17 by Brig. Gen. (Maj. Gen. selectee) Gary A. Voellger, 437th Airlift Wing commander, then tour a C-17 at Charleston AFB. A dinner cruise in Charleston Harbor on *Spirit of Charleston* capped the two-day event.

Secretary to the stars—three-star generals Hap Arnold and Clarence Tinker—Virginia Langston Wynn posed for this photo at MacDill Field, Fla., around 1941. She told the Eglin (Fla.) Chapter some lively stories about working for Air Corps legends back then.

Helping Hands

Anchorage (Alaska) Chapter President Douglas A. Stark became a friend of SSgt. Mark A. Bramer because of their work together in the local Civil Air Patrol squadron, so he was deeply distressed to learn that Sergeant Bramer was among twenty-four who died in the crash of an E-3 Airborne Warning and Control System aircraft at Elmendorf AFB, Alaska, last September. Though other funds were set up for the surviving family members, Mr. Stark felt his chapter should help, too. They set up a scholarship fund through AEF for crew members' children who enter an academic or training program after graduating from high school.

The Anchorage Chapter raised $13,000 and involved the AWACS unit at Tinker AFB, Okla.—the 552d Air Control Wing—to broaden the fund-raising base. "I felt it was necessary to have it done right," said Mr. Stark, a CAP lieutenant colonel and a land developer.

He also reported that the Anchorage Chapter held its annual awards banquet at the Elmendorf Officers' Club in May. Maj. William Moore, of the 90th Fighter Squadron, and his family received an AFA award for their outstanding contribution to the Air Force community at Elmendorf. Elmendorf's 3d Equipment Maintenance Squadron picked up an award for outstanding contributions to aviation and aerospace progress, and unit member MSgt. Sammy Strunk received the Maj. Norman C. Miller Memorial Award for heroism in life saving.

Air Force dependent awards went to high school students Karin Nagel and Scott Hala. Amphay Syvano received an AFA JROTC scholarship.

Powwow on Maui

Because they have only thirty-four members, it was actually a typical chapter meeting when four **Maui (Hawaii) Chapter** members got together in April for lunch in Kahului on the island of Maui. The fifth person at their table was guest speaker Dawn Duensing, a historian for the American Japanese Association and a US history teacher at Maui Community College.

Ms. Duensing's presentation to the group covered her research into the 442d Regimental Combat Team, whose members were second-generation Japanese Americans, called Nisei. They fought in the European theater and became one of the US military's most highly decorated units. Sen. Daniel K. Inouye (D-Hawaii) is a 442d veteran. Ms. Duensing is compiling an oral history, photos, and memorabilia about these veterans for a Nisei Memorial Center to be built in Hawaii.

The Maui Chapter is headed by John Wilt, a Reserve colonel and a professor of administration of justice at Maui Community College. Other chapter members who attended the lunch were Richard H. Sudheimer, Basil M. Badley, and Rita C. Silva, a World War II veteran.

Space Shot

When the space shuttle *Columbia* blasted into space in October 1995 as STS-73, it carried a photo of the **Cape Canaveral (Fla.) Chapter's** General Reis-El Bara *Columbia* Trophy with it.

The trophy is awarded annually to one of the four AFJROTC units in Brevard County, Fla. Melbourne High School in Melbourne, Fla., is the most recent winner.

After STS-73 completed its fifteen-day journey, landing at the Kennedy Space Center, the photo was framed with a certificate of flight, a photo of the seven-member *Columbia* shuttle team, and a NASA patch commemorating the flight. In January, Kennedy Space Center Director Jay Honeycutt presented the trophy and framed picture to Cadet Maj. (now Col.) Jason L. Clough from Satellite High School, Satellite Beach, Fla., and Cadet Col. D. Adam Steele. Aerospace Science Instructor Maj. Gene E. Syarto, USAF (Ret.), and Principal Thomas A. Sawyer from Eau Gallie High School in Melbourne, Fla., Chapter President David L. Pennoyer, and Chapter Vice President (Aerospace Education) William P. Binks, Jr., also took part in the ceremony.

Mr. Binks had arranged for the photo to travel into space, with the help of Bob Merrilees, a retired Coast Guard rear admiral who now works in public affairs at the Kennedy Space Center.

- **Opening ceremonies:** keynote address
- **Aerospace Education Foundation Luncheon** featuring the 1996 AEF contest–winning AFJROTC unit; Doolittle, Eaker, and Goldwater Fellowships; awards for excellence in education
- **Business sessions:** national elections, adoption of AFA Statement of Policy
- **Awards:** membership awards, national awards to Air Force, government, and AFA leaders
- **Annual Reception** in exhibit halls
- **Salute** to the twelve Outstanding Airmen of the Air Force; address by USAF Vice Chief of Staff Gen. Thomas S. Moorman, Jr.; Toastmaster: CMSAF David J. Campanale

A F A 1 9 9 6 N A T I O N A L

CONVENTION

Sheraton Washington Hotel • September 16–18, 1996

- **Chief's Luncheon:** address by Gen. Ronald R. Fogleman, Chief of Staff, USAF
- **Air Force Anniversary Dinner**
- **Secretary's Luncheon:** address by Hon. Sheila E. Widnall, Secretary of the Air Force
- **Aerospace Technology Exposition** with more than 52,000 square feet of technology displayed by companies from all over the world. Exhibit halls open Monday, Tuesday, and Wednesday

- **Attention Industrial Associates:** Exhibit space at AFA's Aerospace Technology Exposition is still available. Please call Pat Teevan at 703/247-5836 for information
- **Headquarters Hotel:** Sheraton Washington Hotel 202/328-2000
  Also, free housing service is available to match requests with vacancies at several area hotels: Washington DC Accommodations 800/554-2220
- **For further information** call our Convention Information Line 24 hours: 703/247-5800 ext. 2025

Individual Ticket Prices

Any luncheon	**$65** each
Annual Reception	**$78** each
Outstanding Airmen Dinner and reception	**$125** each
Anniversary Dinner	**$165** each

Note: Add $10 to each ticket request postmarked after August 30

This convention will continue the 1996 Celebration of AFA's Golden Anniversary.
For fifty years, we have been proud to be the Force Behind the Force.

The chapter's trophy is named for the late Brig. Gen. Henry J. Reis-El Bara, USAF (Ret.), who was a chapter officer in the early 1980s and who became a supporter of AFJROTC activities when his granddaughter, Beth Ann, was a JROTC cadet. Maj. Bruce Reis-El Bara, the General's son, is a Cape Canaveral Chapter member.

Happy to Work for Hap

Perhaps no man is a hero to his valet, but the Chief of the Air Corps was a wonderful boss, according to his secretary, Virginia Wynn. Ms. Wynn spoke to the **Eglin (Fla.) Chapter** in April, telling them anecdotes about working for then Maj. Gen. H. H. "Hap" Arnold.

In the Air Corps secretarial pool in the 1930s, Ms. Wynn stood out as the only Teletype operator. That's how she landed the job as secretary to the General who would become an Air Force legend and founding father of AFA. She worked for General Arnold from 1938 until 1941, first in downtown D. C. and then in the newly constructed Pentagon.

Eglin Chapter Vice President Joe J. Harrison said the chapter members enjoyed learning little-known facts about the General. Ms. Wynn told them, for example, that because the General was rumored to be the author of children's books under a pseudonym, "Every Christmas, the office was inundated with toys from around the world." She said that General Arnold and his visitors—including Carl Spaatz and Ira Eaker—crawled around the conference room floor, assembling bicycles, erector sets, and other toys for donation to a local children's home.

Through her work, Ms. Wynn also met Jimmy Doolittle, Curtis LeMay, and Charles Lindbergh, who dictated to her a report on his controversial views on the arming of Germany.

Ms. Wynn later worked for Maj. Gen. Clarence L. Tinker (for whom Tinker AFB, Okla., is named) at MacDill AFB, Fla., when it was first opened. Following World War II, she spent two decades living in South America and then in Libya. Today she lives in Niceville, Fla., with her husband, Jacob. ■

Coming Events

July 6, **Mississippi State Convention,** Jackson, Miss.; July 12–13, **Georgia State Convention,** Robins AFB, Ga.; July 18–21, **California State Convention,** Fresno, Calif.; July 19–20, **Oklahoma State Convention,** Oklahoma City, Okla.; July 19–21, **Kansas State Convention,** McConnell AFB, Kan.; July 26–27, **Virginia State Convention,** Charlottesvile, Va.; July 26–27, **Florida State Convention,** Daytona Beach, Fla.; July 26–28, **Pennsylvania State Convention,** Trevose, Pa.; August 2–3, **Michigan State Convention,** Mount Clemens, Mich.; August 2–3, **Missouri State Convention,** Kansas City, Mo.; August 9–10, **North Carolina State Convention,** Goldsboro, N. C.; August 9–11, **Iowa State Convention,** Cedar Rapids, Iowa; August 15–18, **Washington/Oregon State Convention,** Portland, Ore.; August 16–17, **Colorado State Convention,** Colorado Springs, Colo.; August 17, **Indiana State Convention,** Indianapolis, Ind.; September 16–18, **AFA National Convention and Aerospace Technology Exhibition,** Washington, D. C.

Unit Reunions

AACS (Airways and Air Communications Service) Alumni Ass'n. September 26–29, 1996, in Richardson, Tex. **Contact:** Ted Carlson, P. O. Box 177, Stickney, SD 57375. Phone: (605) 732-4476.

AAF/USAF Crash Rescue Boat Ass'n. October 18–20, 1996, in Dayton, Ohio. **Contact:** AAF/USAF Crash Rescue Boat Ass'n, P. O. Box 6004, MacDill AFB, FL 33608. Phone: (813) 527-8671 or (407) 588-5504.

Airlift/Tanker Ass'n. October 29–November 3, 1996, at the Hyatt Regency DFW, Love Field, Tex. **Contact:** Col. Thomas P. Williams, USAF (Ret.), P. O. Box 15538, Little Rock, AR 72231-5538. Phone: (501) 758-6885.

Amarillo AFB, Tex., military and civilian personnel. September 6–7, 1996. **Contact:** Pat Langwell Weaver, 4002 E. 15th Ave., Amarillo, TX 79104. Phone: (806) 374-8660.

Freedom Through Vigilance Ass'n (formerly the USAF Security Service/Electronic Security Command Ass'n). September 26–28, 1996, in San Antonio, Tex. **Contact:** Capt. Joe Rector, 102 Hall Blvd., Suite 234, San Antonio, TX 78243-7036. Phone: (210) 977-4624. Fax: (210) 977-4948.

Korean War Veterans, second annual reunion (all services, 1950–55). October 15–20, 1996, in Virginia Beach, Va. **Contact:** Korean War Veterans Family Reunion, P. O. Box 8946, Virginia Beach, VA 23450. Phone: (804) 467-1233 or (800) 523-4715.

Pecos AAF, Tex., personnel. September 30–October 2, 1996, in Pecos, Tex. **Contact:** Linda A. Bratland, 3100 Moore St., Pecos, TX 79772. Phone: (915) 447-2137.

Sampson AFB, N. Y., Veterans Ass'n, 3650th Military Training Wing (1950–56). September 19–22, 1996, at the Days Inn New Kensington, Pa. **Contact:** Walt Stesey, P. O. Box 299, Interlaken, NY 14847-0299. Phone: (607) 532-4204. Fax: (607) 532-4684.

3d Air Depot Group, CBI veterans (Agra, India, World War II). October 10–13, 1996, in San Antonio, Tex. **Contacts:** Walter B. Neidert, 8300 Meadow Fire St., San Antonio, TX 78251-2303. Phone: (210) 684-5361. C. Keith Coffman, 221 Maplewood Estates, Scott Depot, WV 25560-9745. Phone: (304) 757-6025.

4th Aviation Field Depot Squadron. September 1996, in Denver, Colo. **Contact:** Lt. Col. Robert L. Haun, USAF (Ret.), 7709 99th Ave. S. W., Lakewood, WA 98498-3227. Phone: (206) 584-3938.

4th Combat Cargo Squadron, 1st Combat Cargo Group. September 25–29, 1996, at the Sheraton Plaza Hotel at the Florida Mall in Orlando, Fla. **Contact:** Larry Greenfield, 101 S. E. 44th St., Cape Coral, FL 33904. Phone: (941) 549-0014.

13th Bomb Squadron Ass'n (Korea). October 20–24, 1996, at the Imperial Palace Hotel and Casino in Las Vegas, Nev. **Contact:** William C. Boede, 9410 E. Magdalena St., Tucson, AZ 85710-6625. Phone: (520) 298-6608.

Flying Tigers of the 14th Air Force Ass'n. September 7–10, 1996, at the Red Lion Hotel in Colorado Springs, Colo. **Contact:** Arthur L. Rasmussen, 1902 Altair Dr., Colorado Springs, CO 80906. Phone: (719) 635-8816.

19th Bomb Group Ass'n. September 18–22, 1996, at the Ramada Hotel Downtown in Fort Worth, Tex. **Contact:** George Savage, 353 Diamond Bar Trail, Aledo, TX 76008-3623. Phone: (817) 244-5600.

26th Air Division (Defense), all personnel (1949–58) Roslyn AFS, N. Y. September 6–8, 1996, in Colorado Springs, Colo. **Contacts:** Clifford E. Loper, 2846 Longleaf Rd., Panama City, FL 32405-2045. Phone: (904) 872-9882. Virginia S. Taylor, 903 Sandwich Rd., East Falmouth, MA 02536-4022. Phone: (508) 540-2279.

27th Troop Carrier Squadron. October 9–12, 1996, at the Harley Hotel Cleveland East in Willoughby, Ohio. **Contact:** Robert B. Gruber, 15003 S. E. 46th St., Bellevue, WA 98006. Phone: (206) 641-9427.

32d Tactical Fighter Squadron "Wolfhounds." October 25–27, 1996, in Las Vegas, Nev. **Contact:** Col. Jerry Henderson, 4132 Douglass Loop, USAF Academy, CO 80840. Phone: (719) 472-0164.

33d Fighter Group. October 16–19, 1996. **Contact:** George E. Dively, Jr., P. O. Box 10743, Alexandria, VA 22310-0743. Phone: (703) 836-6576.

39th Bomb Group, Guam (1945). August 15–18, 1996, in McLean, Va. **Contacts:** James W. Wyckoff, 2714 E. Hayt's Corners Rd., Ovid, NY 14521-9768. Phone: (607) 869-2574. Robert Weiler, 2045 Hyde Park St., Apt. 3, Sarasota, FL 34239-3941. Phone: (941) 365-8287.

41st Radio Squadron Mobile/7011th Personnel Processing Squadron (Bremerhaven, Germany). October 17–20, 1996, in Albuquerque, N. M. **Contact:** "Smokey" Blanton, 8005 N. Dona Ana Rd., Las Cruces, NM 88005. Phone: (505) 526-5100.

Pilot Class 43-A-1 (Mather AFB, Calif.). September 25–29, 1996, at the Viscount Suite Hotel in Tucson, Ariz. **Contact:** Wil Graham, 7113 Sabino Vista Cir., Tucson, AZ 85750. Phone: (520) 296-2285.

Pilot Class 45-A (Moody Field, Ga.). October 2–6, 1996, at the Holiday Inn Old Town in Scottsdale, Ariz. **Contact:** Hewitt H. Howard, 3802 W. Echo Lane, Phoenix, AZ 85051-4774. Phone: (602) 841-0027.

48th Fighter Squadron, 14th Fighter Group (World War II). October 3–6, 1996, in South Padre Island, Tex. **Contact:** Joe Onesty, 455 Galleon Way, Seal Beach, CA 90740-5937. Phone: (310) 431-2901.

48th Tactical Fighter Wing (RAF Lakenheath, UK). September 23–24, 1996, in Las Vegas, Nev. **Contacts:** George A. "Pete" Peterson, 3828 Cavalry St., Las Vegas, NV 89121. Phone: (702) 796-8888. Bob Herculson (702) 458-4173.

Pilot Class 49-B. September 17–20, 1996, in Shreveport, La. **Contact:** Col. Vern VanNoppen, USAF (Ret.), 1508 LaFitte Cove, Shreveport, LA 71105. Phone: (318) 797-0768.

Basic Navigator Training Class 52-20 (Ellington AFB, Tex.). October 10–13, 1996, in San Antonio, Tex. **Contact:** Paul R. Lippincott, P. O. Box 840554, Houston, TX 77284-0554. Phone: (713) 463-9769.

Pilot Class 55-K. October 11–14, 1996, in Orlando, Fla. **Contact:** Col. R. Thomas Roe, USAF (Ret.), P. O. Box 911, Palm Beach, FL 33480-0911. Phone: (407) 752-7468.

Mail unit reunion notices well in advance of the event to "Unit Reunions," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information.

64th Troop Carrier Group. October 1996, in Indianapolis, Ind. **Contact:** Vern Montgomery, 6744 Carlsen Ave., Indianapolis, IN 46214. Phone: (317) 241-5264.

68th Bomb Wing "Good Guys." September 23–26, 1996, at The Menger Hotel in San Antonio, Tex. **Contacts:** Jack Bratton, 2 Catalina Dr., Rockport, TX 78382. Phone: (512) 729-7870. Don R. Hampton, 3506 S. Lincoln Dr., Spokane, WA 99203. Phone: (509) 838-4077.

Pilot Training Class 72-02 (Vance AFB, Okla.). August 23–24, 1996, in Enid, Okla. **Contact:** Dennis Morton, 7 High Point, Fort Madison, IA 52627-3100. Phone: (319) 372-1693.

75th Fighter Squadron, 23d Fighter Group, 14th Air Force, China, 1942–45 (World War II). October 24–27, 1996, in Fort Walton Beach, Fla. **Contact:** Don K. Miller, 5515 W. Wash. Center Rd., Fort Wayne, IN 46818-9752. Phone: (219) 489-9629.

84th Bomb Squadron, 47th Bomb Wing (1950–55). October 17–20, 1996, in Fairborn, Ohio. **Contact:** Charles Palmer, 511 Wellington Ave., Newark, OH 43055-6440. Phone: (614) 345-3229.

90th Bomb Squadron (Korea). October 17–20, 1996, in San Francisco, Calif. **Contact:** George B. Pittelkau, 5670 S. W. Fernbrook Way, Lake Oswego, OR 97035-7726. Phone: (503) 639-5077.

96th Bomb Wing. September 27–30, 1996, at the Red Roof Inn in Colorado Springs, Colo. **Contact:** Col. Burton C. Andrus, Jr., USAF (Ret.), 505 Hidden Valley Rd., Colorado Springs, CO 80919-2709. Phone: (719) 598-2206.

155th Fighter Squadron, 164th Airlift Wing. October 19–20, 1996, at the Tennessee ANG in Memphis, Tenn. **Contact:** Lt. Col. Louis Cooksey, 2815 Democrat Rd., Memphis, TN 38118-1510. Phone: (901) 541-7175.

168th Air Refueling Wing (ANG). August 17, 1996, at Eielson AFB, Alaska. Veterans from the 168th Bomb Squadron, 168th Fighter-Bomber Squadron (1946–58), and 437th Bomb Squadron (1942–46) are invited. **Contact:** Lt. Col. Bill Hutchison, 3127 Wabash Ave., Suite 101, Eielson AFB, AK 99702-1794. Phone: (907) 377-1691.

317th Troop Carrier Group, 5th Air Force, Hq. and 41st Squadron. October 11–13, 1996, at the Holiday Inn Columbia Airport in Columbia, S. C. **Contact:** James B. Collier, Jr., 1109 Van Ave., Port Neches, TX 77651-5709. Phone: (409) 727-1912.

330th Bomb Group Ass'n, North Field, Guam (1945). September 26–29, 1996, at the Red Lion Hotel in Omaha, Neb. **Contact:** Robert C. Flischel, 413 E. Center St., Germantown, OH 45327. Phone: (513) 855-7946.

366th Fighter Group Ass'n/Fighter-Bomber Wing/Tactical Fighter Wing and support units (1943–96). October 9–12, 1996, in Myrtle Beach, S. C. **Contact:** John F. Peterson, P. O. Box 392, Harrodsburg, KY 40330. Phone: (606) 734-7912.

376th Air Refueling Squadron Ass'n. September 6–8, 1996, at the Green Oaks Inn and Conference Center in Fort Worth, Tex. **Contacts:** Maj. John H. Yancy, USAF (Ret.), 1051 S. Dobson Rd., Burleson, TX 76028. Phone: (817) 295-1754. John Dowds, 300 Brookview Dr., Hurst, TX 76053. Phone: (817) 268-1252.

384th Bomb Group, 8th Air Force (World War II). October 17–20, 1996, at the Regal Riverfront Hotel in St. Louis, Mo. **Contact:** Theodore Rothschild, 650 Snug Harbor Dr., Apt. G-402, Boynton Beach, FL 33435-6167.

390th Bomb Group Ass'n, 8th Air Force, Framington, UK (World War II). October 1–5, 1996, in Cherry Hill, N. J. **Contact:** Ken Rowland, 13112 N. Howard Lane, Spokane, WA 99000. Phone or fax: (509) 467-2565.

391st Bomb Group, 572d, 573d, 574th, and 575th Bomb Squadrons. September 4–7, 1996, in Savannah, Ga. **Contact:** Samuel S. Lowenthal, 3154 E. Meadowbrook Dr., Phoenix, AZ 85016. Phone: (602) 956-8141. Fax: (602) 955-8526. ■

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Seeking contact with 4th Air Force members based at Hamilton Field, Calif., and pilots at Santa Rosa AAF, Calif., and Walla Walla AAF, Wash., during World War II who were involved with US countermeasures to Japan's **balloon bomb attacks** on North America. **Contact:** Anne-Marie Bennoun, 206 E. 13th St., #4, New York, NY 10003.

Seeking information on **2d Lt. Bernard M. W. Knox,** an armament officer with the 334th Service Squadron, in Bury St. Edmonds, UK, until July 1943. **Contact:** Robert J. Hahlen, 2009 19th St., Monroe, WI 53566-3036.

Offering a USAF series C-97G aircraft **flight manual,** TO 1C-97G-1, Basic, April 1964, including changes to October 1968. **Contact:** Col. Jack E. Gatewood, USAF (Ret.), 358 Sharon Dr., Niceville, FL 32578-1708.

For a US Air Force Academy Library display, seeking a Montgolfier balloon silhouette **patch** from the 2d Composite Squadron (formerly the 6th Observation and 6th Reconnaissance Squadrons). **Contact:** Donald J. Barrett, 2354 Fairchild Dr., Suite 3A10, US Air Force Academy, CO 80840-6214.

For an association, seeking contact with **Mexican-American** World War II aircrew members. **Contact:** Manuel O. Calderon, 4530 Sutter Gate Ave., Pleasanton, CA 94566.

Seeking contact with fighter pilot **Lt. Steven Waller. Contact:** Dr. Porter B. Williamson, c/o Paul Ivory, 4111 E. Pontatoc Canyon Dr., Tucson, AZ 85718.

Seeking addresses of companies that manufacture USAF, AFRES, and ANG **patches. Contact:** Christian Sabon, 23815 Manila St., Clinton Township, MI 48035.

Seeking **patches** from the 26th Munitions Maintenance Squadron, 92d Bomb Wing, Fairchild AFB, Wash.; 37th Munitions Maintenance Squadron, 6th Bomb Wing, Walker AFB, N. M.; and 81st Fighter Wing, Larson AFB, Wash. **Contact:** William F. Hurter, 2027 Kilakila Dr., Honolulu, HI 96817-1226.

Seeking contact with relatives and former colleagues of **2d Lt. Edward E. Phillips,** a P-51B pilot with the 355th Fighter Squadron, 354th Fighter Group, based at Boxted, UK, who was killed in an airplane crash in Sweden on April 15, 1944. **Contact:** Lars Johansson, 9 The Priory, St. Marks Hill, Surbiton, Surrey KT6 4PX, UK.

Seeking information on 49th Fighter Squadron, 14th Fighter Group, **P-38s,** during May 1943, when the unit was in the Oran, Algiers, area. **Contact:** Harold O. Lee, 27 Cherry Hills, Conroe, TX 77304.

Seeking information on a **7th Photoreconnaissance Group,** 325th Wing, 8th Air Force, P-38 last seen April 12, 1944, piloted by Wing Commander Warburton, leaving the Adriatic Sea coast with its starboard engine on fire. **Contact:** Erwin H. Eckert, 14215 Hunter Hill, San Antonio, TX 78217-1349.

Seeking information on **Capt. Tom Hall** and his B-24 crew from the 746th Bomb Squadron, 456th Bomb Group, 15th Air Force, 1944–45. Also seeking information on the 363d Fighter Squadron, 357th Fighter Group, or related associations. **Contact:** Richard J. Verdon, 3101 E. Milham Rd., Kalamazoo, MI 49002-1700.

Seeking **P-38 memorabilia** for museum display. **Contact:** Lloyd L. Levine, 5141 Tyrone Ave., Sherman Oaks, CA 91423.

Seeking contact with **Claude Gourley**—formerly of Danville, Va.—and any other member of the **397th Service Squadron,** 12th Service Group, 14th Air Force, China, 1943–45. **Contact:** Herbert Merrell, 430 Washington Ave., Oneida, NY 13421-1906. ■

If you need information on an individual, unit, or aircraft, or if you want to collect, donate, or trade USAF-related items, write to "Bulletin Board," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Letters should be brief and typewritten; we reserve the right to condense them as necessary. We cannot acknowledge receipt of letters. Unsigned letters, items or services for sale or otherwise intended to bring in money, and photographs will not be used or returned.—THE EDITORS

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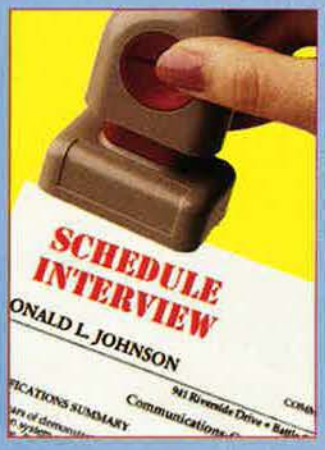

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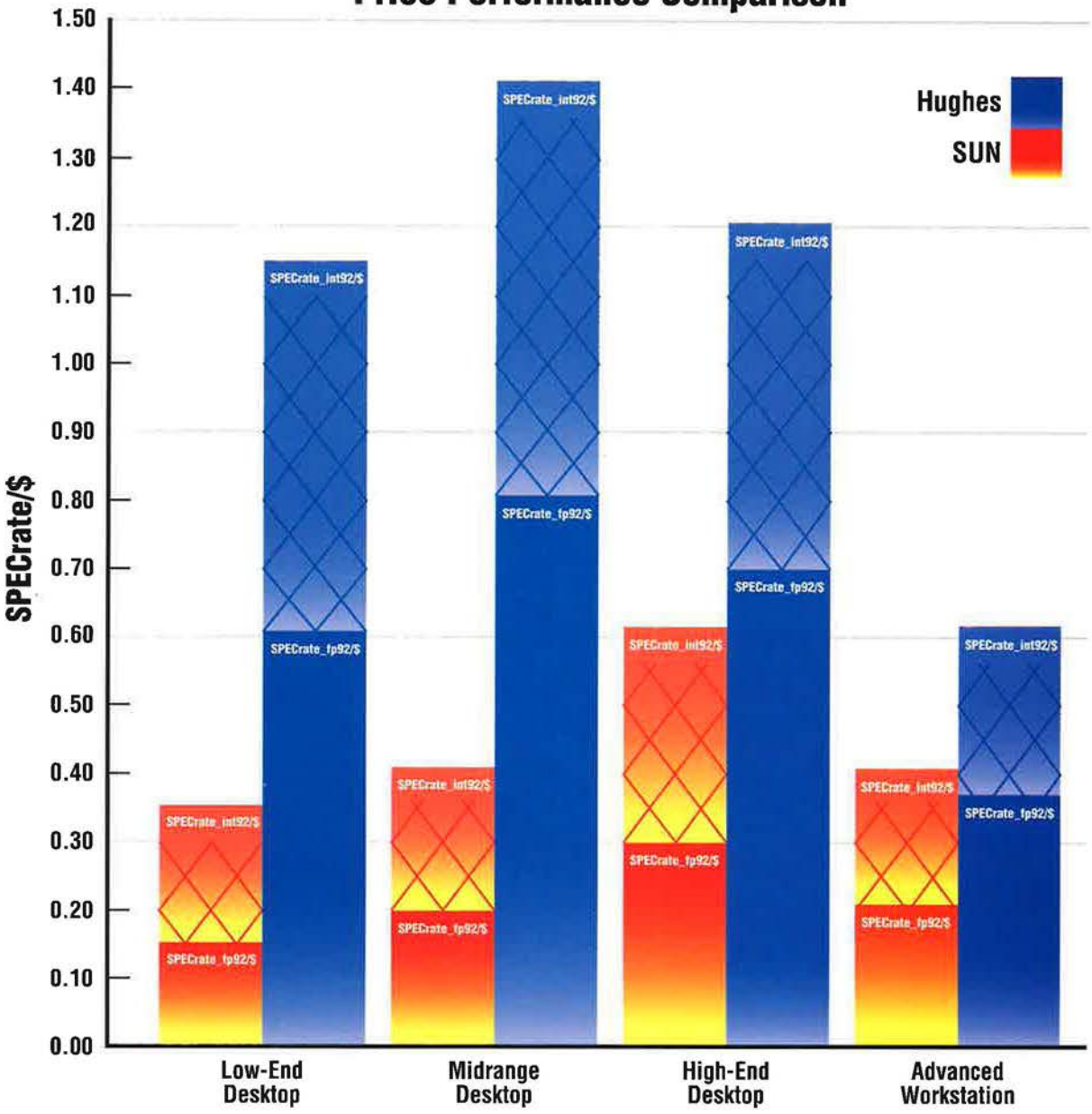

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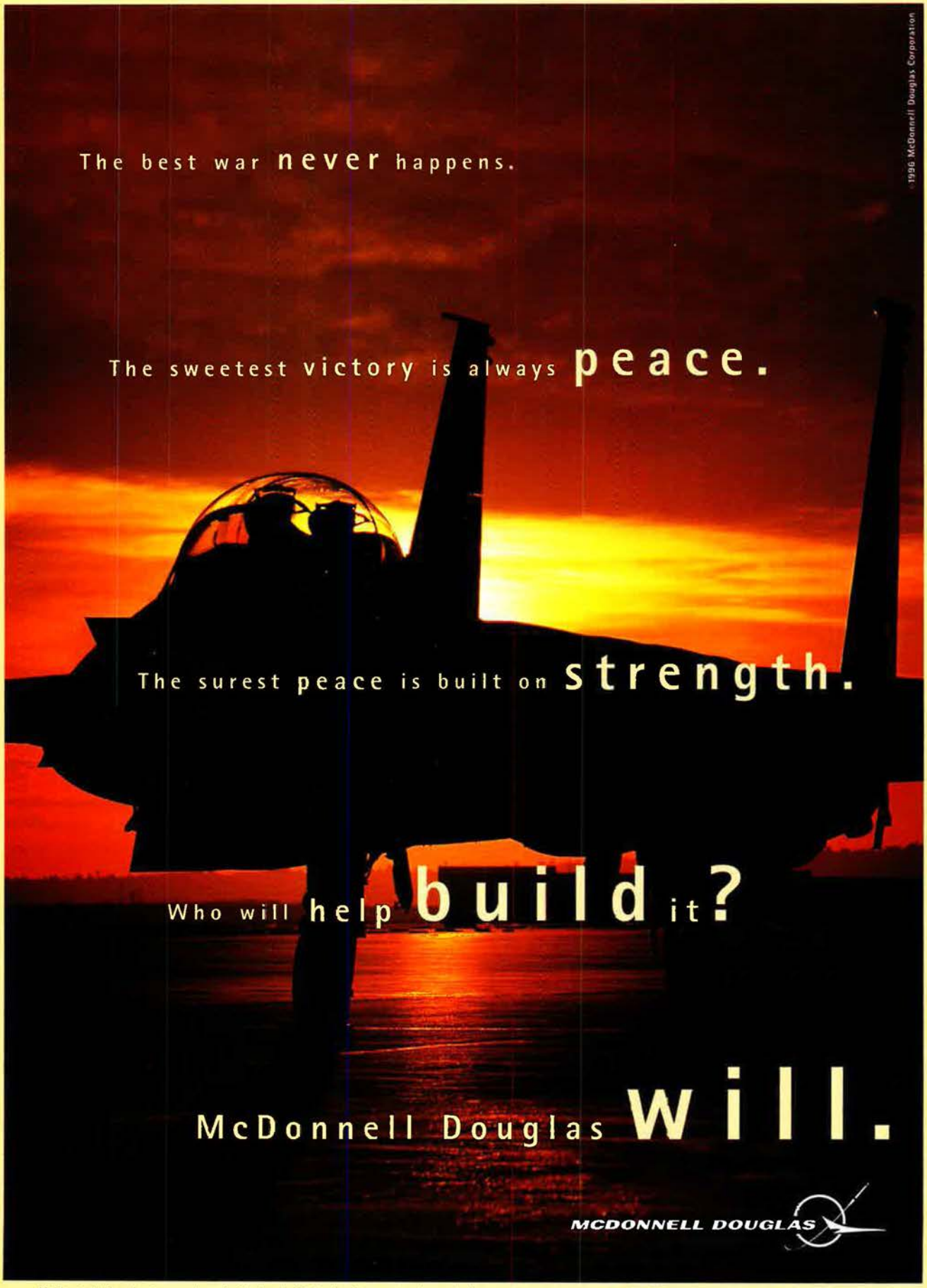

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