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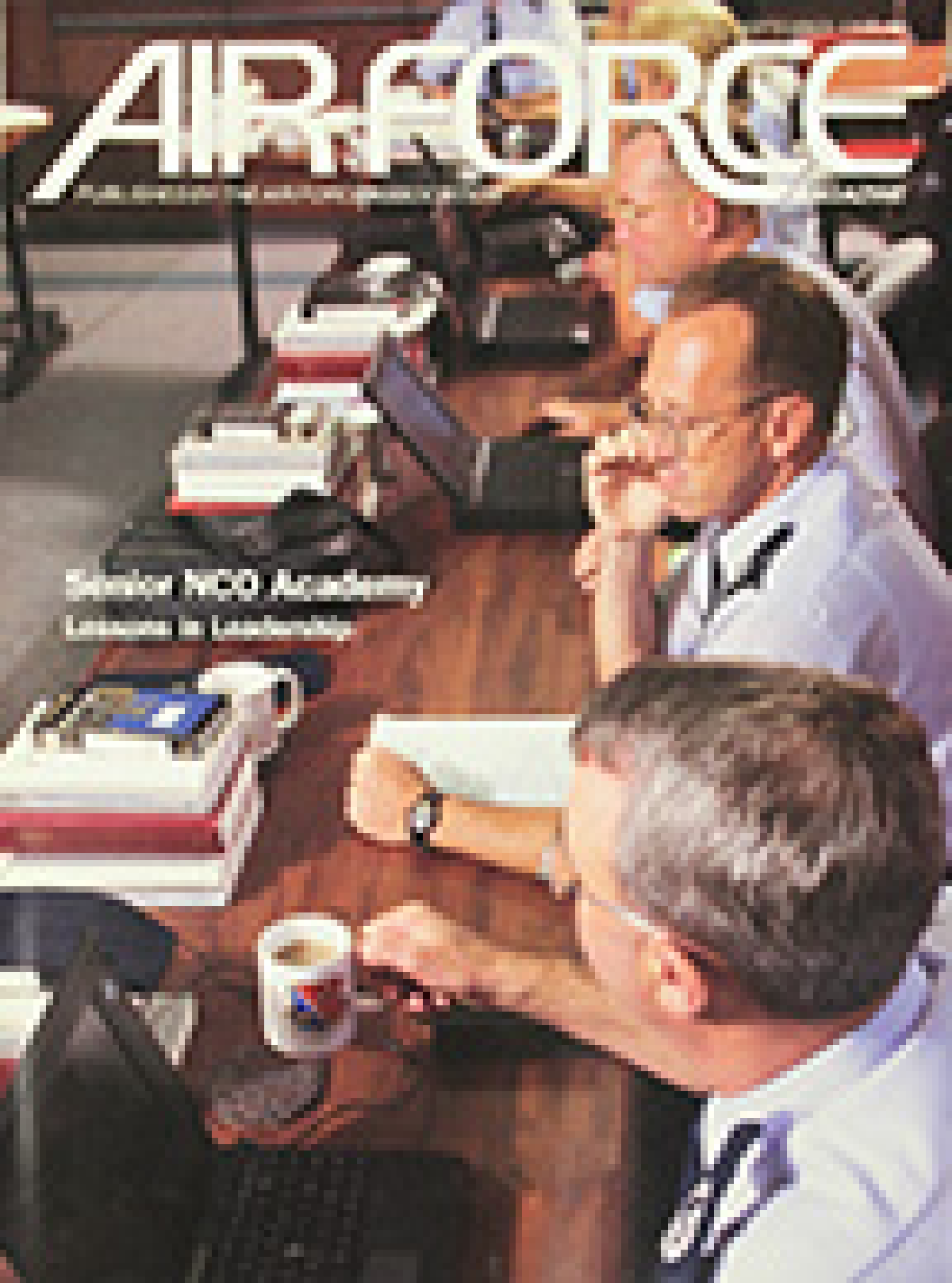

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F22
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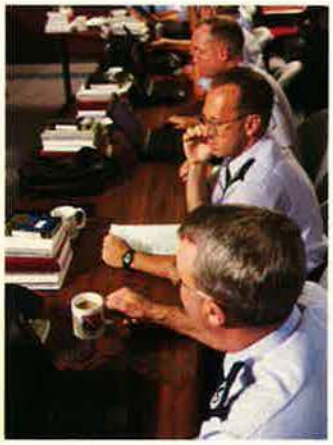
September 1996, Vol. 79, No. 9

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION



About the cover: At the Air Force Senior NCO Academy, Maxwell AFB, Gunter Annex, Ala., the best of USAF's enlisted service members learn what it takes to lead the force. See "Lessons in Leadership," p. 56. Photo by Paul Kennedy.

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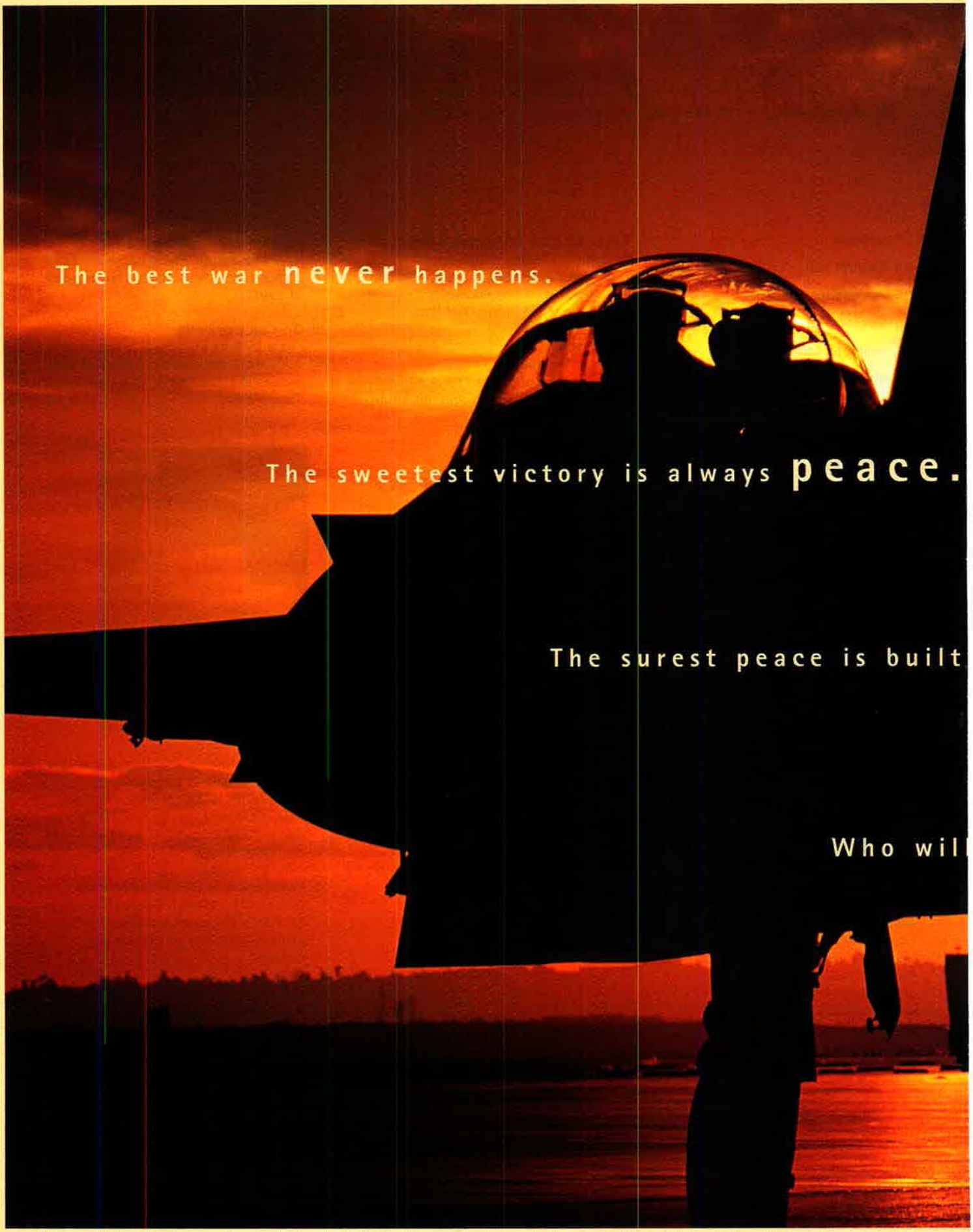

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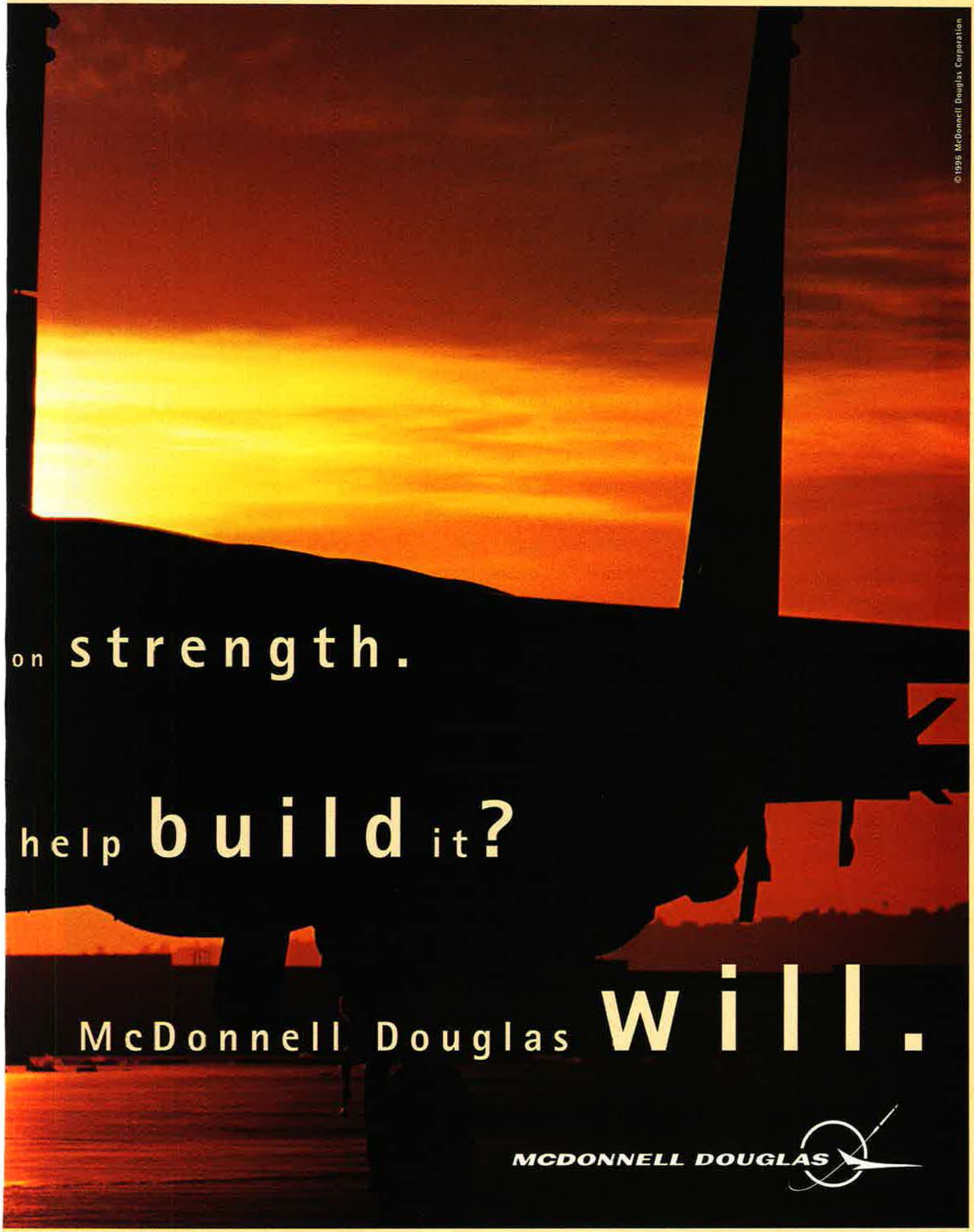
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Editorial

By John T. Correll, Editor in Chief

GAO Launches a Dud

It is difficult to imagine worse military advice than was put forth by the General Accounting Office in "Operation Desert Storm: Evaluation of the Air War," published July 2. This report, summarizing a classified GAO study, planted the impression that stealthy aircraft and precision guided munitions (PGMs) did not perform any better than older and cheaper systems in the Persian Gulf War.

The leading conclusions of the report were that "it is inappropriate, given aircraft use, performance, and effectiveness demonstrated in Desert Storm, to characterize higher-cost aircraft as generally more capable than lower-cost aircraft" and that "air campaign data did not validate the purported efficiency or effectiveness of guided munitions, without qualification."

The New York *Times* ("Stealth, Lies, and Videotape") and other newspapers ranging from the Los Angeles *Times* ("Military Pitchmen Took US for Ride on 'Smart' Weapons") to the *Arizona Daily Star* (" 'Smart' Weapons Flunked") picked up the theme and piled on.

Anyone with a rudimentary knowledge of the Gulf War will sense something askew here. Deep-striking airpower destroyed Iraq's command-and-control system by dawn on the first day. Throughout the war, high-risk missions against Baghdad were left to stealthy F-117As and unmanned cruise missiles. "Smart" weapons struck with astonishing precision. Millions watched on television as a fighter rolled in on the Iraqi Defense Ministry in downtown Baghdad and put a bomb neatly down the airshaft. When Iraq began dumping Kuwaiti oil into the Gulf, the oil-pumping manifold was knocked out by F-111Fs twenty miles away. They steered electro-optical guided bombs in by data link. Before the 100-hour ground phase of the war began, airpower destroyed or neutralized a high percentage of the Iraqi forces.

GAO said that most of the air strikes were by nonstealthy aircraft and nonprecision munitions. True enough, but the precision weapons available were allocated to the most difficult and critical targets. And while the stealthy F-117s flew only two percent of the combat sorties, they attacked more than forty percent of the strategic targets.

How, then, could GAO have spun up such a tale? The unclassified version of the report contains almost no supporting information, but there were clues. Close reading finds recurring references to "limitations of the data." GAO complained repeatedly about "faulty" bomb-damage assessment, then hung critical conclusions on BDA data.

This report spreads the misconception that stealth and precision didn't amount to much in the Gulf War.

Paul G. Kaminski, under secretary of defense for Acquisition and Technology, says that GAO lumped strike data together and prorated the results evenly across aircraft and systems. "All of the strikes and all of the events that happened in between available bomb-damage assessment data were averaged," he says. "So it doesn't matter whether strikes were done early, when targets were highly defended and the survivable platforms were very critical to wiping out defenses, or late. Any events that occurred between two bomb-damage assessments were weighted equally and averaged."

GAO made quite a point that "one-target, one-bomb" efficiency was not achieved. On average, 2.2 precision guided munitions were expended per target destroyed. Smart weapons weren't perfect every time in the Gulf. Also, mission planners allocated more than one munition to targets when high probability of success was deemed necessary. The first shot was probably sufficient in many cases, but the backup round was used for insurance. Considering that it took 9,000 bombs per target in World War II and 176 bombs per target in Vietnam, a success ratio of 2.2 per target in the Gulf War is hardly grounds for complaint.

The bottom-line advice in the GAO report is that "the services' increasing reliance on guided munitions to conduct asymmetrical warfare may not be appropriate." The Air Force provided all of the stealth and ninety percent of the PGMs in the Gulf War. It is the only service with stealthy aircraft today and also the service that advocates an "asymmetrical" strategy, focusing our strengths and unique advantages against the adversary's ability to wage war.

One of the GAO report authors, unnamed, told Tim Weiner of the New York *Times* that "lies were told to help persuade Congress and citizens to buy the next generation of weapons" and that "the better the F-117 looks, the better the B-2 looks." His attitude toward current stealth and precision attack programs is obvious, and the report reflects that attitude.

GAO waded into the Deep Attack Weapons Mix Study, now in progress, saying that we should "temper one of the primary expectations of the DAWMS: that a growing inventory and increasing capabilities of weapons will reduce the sorties required for deep attack missions." That does not mean GAO supports additional force structure or aircraft to fly those sorties, just that advanced aircraft and weapons "require additional justification."

The lethality of air defenses is increasing. Penetration of hostile airspace will become the domain of stealthy aircraft and unmanned systems in future wars. The demand for precision attack is also increasing, not only because the targets themselves are more difficult to destroy but also because precision makes it possible to avoid civilian casualties and collateral damage. The alternative to asymmetrical strategy is traditional force-on-force attrition warfare.

Did stealthy aircraft fail and smart weapons flunk in the Gulf War? Only in the belief of those who misread the history of what happened there and misconstrue the lessons learned. ■

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Letters

The B-36 Battle Continues

As a former member of Strategic Air Command with ties to the B-36 Peacemaker, having been stationed at Carswell AFB, Tex., in the 1950s, I particularly enjoyed "The Battle of the B-36" *[July 1996, p. 60]*.

This aircraft, though rarely mentioned or given its proper due in military aviation lore, was the main deterrent that preserved the peace during those chilly days of the Cold War, mainly between 1951 and 1959. As long as the US had the lethal (for its time) Peacemaker, our Cold War foes were not going to think about aggression.

The B-36 never dropped a bomb or fired a shot in anger. Its foes would not dare anger it. The only battle the B-36 ever fought was the one with the US Navy's admirals for its existence (B-36 vs. the Navy's supercarrier). It is fitting that on p. 67, in the very next article in the July issue, "Eight Decades Over Hollywood," there appears a full-page photo of Jimmy Stewart at the controls of a B-36 from the movie "Strategic Air Command." How apropos!

Joe Weber
Trabuco Canyon, Calif.

I was utterly embarrassed by "The Battle of the B-36." It is the closest thing to propaganda I've read in the pages of *Air Force* Magazine—a lopsided analysis that portrays the Air Force as the unblemished victor of that painful interservice squabble.

The article said nothing about Secretary of Defense Louis A. Johnson's known biases, his vindictiveness against the Navy, or how (in the words of Air Force Historian Dr. Richard P. Hallion, Jr.) the "Korean War [soon] answered any remaining questions about the bankruptcy of his defense policies" and led to his dismissal. Author Herman S. Wolk insinuates that Navy partisans alone took to underhanded dealings to shore up their argument against the Peacemaker and that its only critics had either emotional or economic ties to the Navy and its carriers. Nothing could be further from the truth.

Unsure of just what their roles in the fledgling Department of Defense would mean for their futures, both the Air Force and the Navy were unabashedly parochial. At the end of World War II, both were understandably enthralled with the roles that their strategic bomber and carrier task force, respectively, had played in the American victory.

With the national consciousness fixed on the seemingly inevitable atomic exchange of the next war, both services lost sight of the importance of tactical airpower *and* the combined-arms approach to warfare. Instead, the Air Force and the Navy both sought to tailor forces to support their own agendas rather than make compromises for a more balanced national defense.

Mr. Wolk states that "the great lesson of World War II" was that "mutually supporting services under a unified theater commander" were the key to postwar national defense. However, he misses the mark when he purports that "it was a lesson the Navy took some time to learn," because USAF's Holy Grail approach to strategic bombing was equally misguided. Ironically, within a few years of the Vinson hearings, Navy carriers would strike important targets in northeast North Korea that were immune to short-legged Air Force fighters and to high-altitude B-29 bomb runs challenged by MiG-15s.

Carrier-based tactical aviation contributed nearly half of the combat air sorties in Korea and has played a major role in numerous events since then, but improvements in Soviet air defenses essentially made the B-36 obsolete even as it first reached operational status. Can we honestly call the effort to field one of our most short-lived weapon systems, one that seriously hurt interservice relations, "a fight the fledgling Air Force won"?

Today, faced with smaller budgets and drastically reduced force structure not unlike those faced by the post–World War II services, the Air Force and Navy would both be well advised to remember just how seriously the B-36 controversy hurt our warfighting abilities.

We have to rely on agencies like Mr. Wolk's employer, the Air Force History Support Office, to provide us a *balanced* perspective on our past to help us make better decisions in the present. Unfortunately, if we bank on interpretations as one-sided as "The Battle of the B-36" to influence our choices, we could find ourselves making the same narrow-minded mistakes both sides made in the late 1940s.

Capt. Kirk Lear,
USAF
Jacksonville, 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 Canceled B-54

Your mention of the B-54 in "The Battle of the B-36" sent me scurrying to find my copy of *US Bombers B1–B70,* by Lloyd S. Jones, Aero Publishers, 1966. Mr. Jones gives a sequence of events different from Mr. Wolk's, who implied that the B-36's successes caused the B-54's cancellation.

The B-54 was a B-50 with the proposed 4,300-horsepower Pratt & Whitney R-4360-51 VDT (Variable Discharge Turbine) engines. This engine was also to power the YB-36C with tractor props instead of pushers.

The failure of this engine to materialize resulted in cancellation of the B-54 and caused the thirty-four B-36s ordered as Cs to be completed as Bs. The Air Force turned to installation of jet engines to improve the performance of the B-36D.

TSgt. John R. Radloff,
USAF (Ret.)
Rochester, N. Y.

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Letters

Boeing's Contribution

In an otherwise excellent article about unmanned aerial vehicles *["DarkStar and Its Friends," July 1996, p. 40],* you neglected to mention Boeing's contribution to the DarkStar program.

Boeing is responsible for fifty percent of the DarkStar UAV, including its design and the manufacture of its wings and ground station.

Randolph C. Harrison
Boeing Defense & Space Group
Seattle, Wash.

Hollywood Hits and Misses

In "Eight Decades Over Hollywood" *[July 1996, p. 66],* Bruce D. Callander traces the film industry's portrayal of military aviation. He correctly notes that the Vietnam War inaugurated an era of distinctly negative images of the military. However, both "Fail Safe" and "Dr. Strangelove" owe more to the public interest in nuclear warfare, especially accidental nuclear war, that was prevalent in the late 1950s and early 1960s, than they do to controversies about the Vietnam War.

"Dr. Strangelove" introduced the caricature of the mad general, acting without the authority of his usually witless civilian superiors, who is eager to loose nuclear weapons upon the world. The film version of the novel "The Bedford Incident" (1965), along with "Twilight's Last Gleaming" (1978), "Crimson Tide" (1995), and "Broken Arrow" (1996), all feature commanders obsessed with nuclear war or nuclear blackmail. Surprisingly, the blockbuster summer hit of 1996, "Independence Day," features a decidedly positive image of the military and especially of military aviation.

Also, it should be noted that in "Fail Safe," the bombers featured are not B-52s (as in "Dr. Strangelove") but fictional creations known as Vindicators, and the Soviets do not retaliate for the destruction of Moscow by obliterating New York, N. Y. The city's demise is sealed by the President of the United States, who orders its sacrifice to atone for the destruction of the Soviet capitol.

Duane G. Jundt
Notre Dame, Ind.

Your July issue presented an interesting juxtaposition of articles. Herman S. Wolk's "The Battle of the B-36" detailed the historic rivalry of our Navy and Air Force, while Bruce D. Callander's "Eight Decades Over Hollywood" mentions a movie that, both services can agree, effectively dramatizes the overriding importance of mission: "Twelve O'Clock High."

Members of the extensive Navy community here in Norfolk tell me that the Gregory Peck epic is regularly shown in the various Navy schools (including the Naval Academy), just as it was mandatory viewing for Officer Training School cadets at Lackland AFB, Tex., at least from the early 1960s. Sy Bartlett was the writer for both this picture and "A Gathering of Eagles." (The latter, I would suggest, is an update rather than a remake.)

"Gathering of Eagles," though initially reviewed favorably in *Time* and other media in 1963, has generally been panned by later film critics, I suppose because of too much domestic human interest at the expense of airborne action. I've always felt that the movie is a fairly comprehensive treatment of a SAC operational readiness inspection.

Michael Thro
Norfolk, Va.

The aircraft used in the movie "King Kong" were Curtiss O2C-2 Navy biplanes, allegedly borrowed from Floyd Bennett Field, N. Y., by the directors of the film, Merian C. Cooper and Ernest B. Schoedsack. They were not Air Corps aircraft as stated in the article. . . .

Also, the end of "Bombardier" has Randolph Scott on the ground, not at the controls, and being bombed by his movie superior, Pat O'Brien, in a B-17.

CWO Robert D. Schwartz, Sr., USA (Ret.)
Palm Bay, Fla.

"Eight Decades Over Hollywood" was interesting but skimpy. I didn't miss Errol Flynn's "Dive Bomber," but an obvious omission was "I Wanted Wings," an account of pilot training in the late 1930s at Randolph Field, Tex. Brian Donlevy was the tough instructor; Ray Milland, William Holden, and Wayne Morris were cadets; and Veronica Lake was the siren from the fabled Gunter Hotel who stows away on a B-17 flying into March Field, Calif.

The story was written by Bernie Lay, Jr., and based on his training at Randolph. Mr. Lay led a B-24 group in the European theater of operations and co-wrote "Twelve O'Clock High." Mr. Morris (killed in a buzzing accident in the movie) was an authentic war hero who shot down Japanese airplanes while in the Navy.

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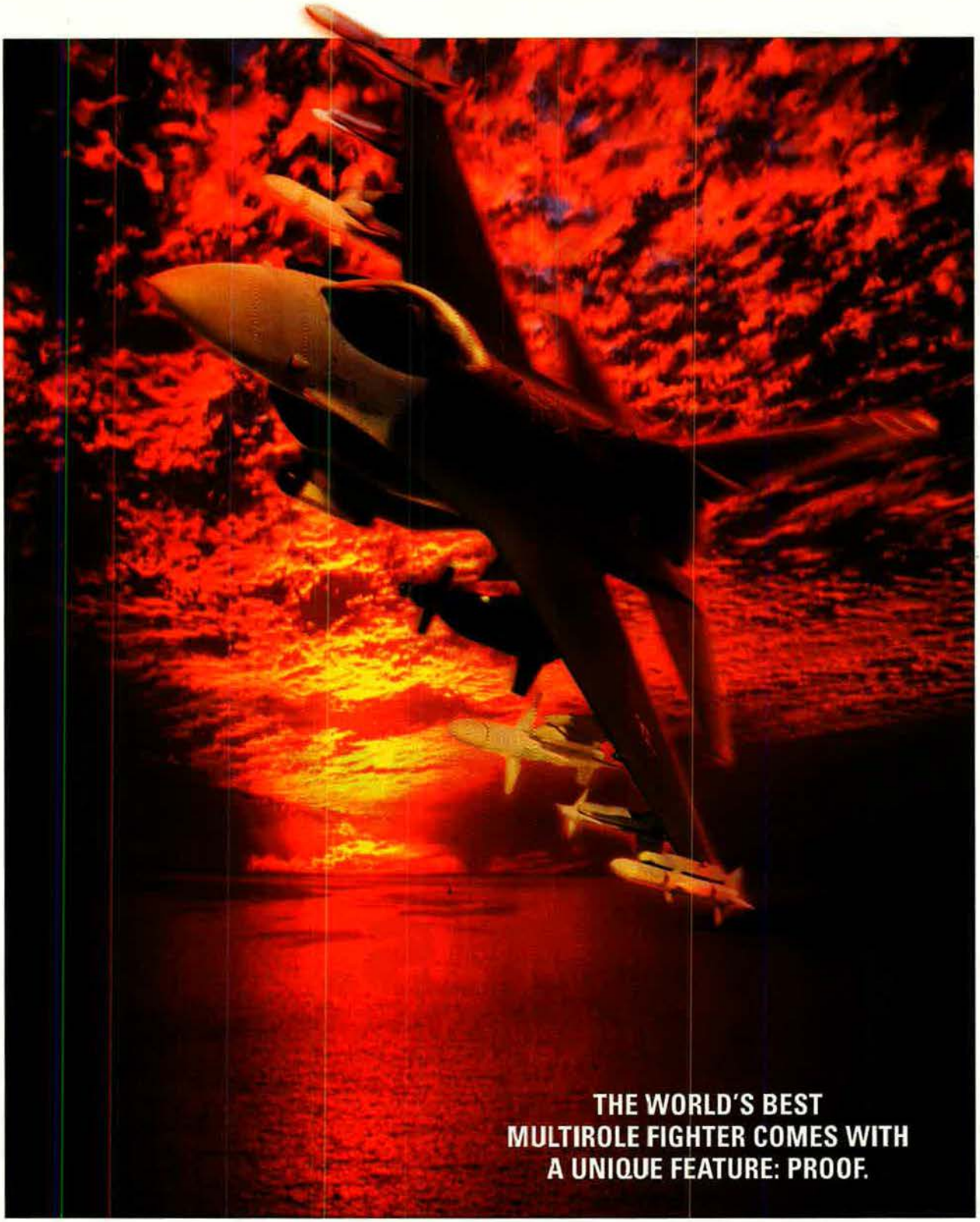

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LOCKHEED MARTIN

Mission Success

in England, I attended the first post-war flying school at Randolph Field where—déjà vu—we lived for a year in the same cadet buildings featured in the movie.

The complement to 1949's "Twelve O'Clock High" was 1948's "Command Decision," adapted from a play by William W. Haines, a staff officer at Eighth Air Force headquarters who transcribed almost word-for-word the anguished debates concerning daylight bombing.

Lt. Col. Regis C. Ginn, USAF (Ret.)
Hermosa Beach, Calif.

As a World War II movie fan, I was interested in, and I commend, "Eight Decades Over Hollywood." However, I was curious about one omission.

In my book, one of the best air combat movies—primarily because it showed the American citizen-soldier at his best—was "The Bridges at Toko-Ri." It was not mentioned, although I believe it received some US military assistance. It would have been particularly appropriate to mention it in the same issue that carried the "Korean War Scrapbook" *[p. 26]*. I assume it was not excluded because it dealt with Navy pilots, given that "Top Gun" made the cut.

Dennis R. Yeager
New York, N. Y.

Missing From the Scrapbook

I appreciated the "Korean War Scrapbook" *[July 1996, p. 26]* and read with interest the historical perspectives those former servicemen brought to light.

I was greatly dismayed, though, when I realized that I saw only one minority airman (2d Lt. Joseph H. Ortega) featured in the entire scrapbook. Is it the case that we have no minority members of AFA who were asked to participate? Were there no minorities in the war?

I did not see any visible minority representation in *any* article in the July issue.

Please advise me as to what this edition of *Air Force* Magazine is broadcasting to minorities.

Col. Edward G. Carter, AFRES (Ret.)
Phoenix, Ariz.

■ *An announcement of the "Korean War Scrapbook" was sent to every AFA chapter on October 10, 1995, asking for personal snapshots of Korean War veterans who are current AFA members. The call for participation was also published in the December 1995 issue of* Air Force *Magazine. We took submissions through March 1996 and used a photo from every AFA Korean War veteran who sent in a photo. Nevertheless, we recognize the responsibility to try harder, and in the future, we will do so.*—THE EDITORS

The Phantom Lives

The F-4 is still on active duty, not in a combat role, not in a drone role, but in a very important training role. You have severely neglected the men and women of the 20th Fighter Squadron in "The Last Phantom" *[July 1996, p. 46]* and "Weapons School" *[June 1996, p. 42]*. The 20th FS still flies twenty-one F-4Es in Air Combat Command (ACC). Our mission is to train German Basic Course and Fighter Weapons School student pilots and weapon system officers (WSOs).

A majority of the instructors are USAF pilots and WSOs with diverse backgrounds, ranging from the F-4G, RF-4C, F-111F, and F-16C to the F-15C. We work as a team with German Air Force instructors.

The last active-duty F-4Es (yes, that's with a gun) are at Holloman AFB, N. M., flown by the 20th FS. Come see our outstanding squadron (rated outstanding by ACC's May Quality Air Force Assessment) before the jets are replaced with German F-4Fs with pulse-Doppler radar in mid-1997.

Capt. Roger J. Witek, USAF
Holloman AFB, N. M.

ID the Enlisted

The picture in "Aerospace World" showing a female airman briefing the Secretaries of the Army, Navy, and the Air Force on board an E-3 Sentry aircraft *[June 1996, p. 20]* was a significant event. It could have been a much more significant event for the enlisted corps if *Air Force* Magazine had identified SrA. Jennifer Bishop of the 963d Airborne Air Control Squadron from Tinker AFB, Okla., as the airman briefing the secretaries. . . .

CMSgt. Michael R. O'Boyle, USAF
Tinker AFB, Okla.

William Tell's Top Gun

The third line of the 1959 listing in "William Tell Top Guns" *[May 1996, p. 127]* should read: Maj. John T. Guice, 152d FIS (ANG), Tucson IAP, Ariz., F-100A. Both the unit and the base were listed incorrectly.

Maj. Gen. John T. Guice, USAF (Ret.)
Tucson, Ariz.

Capitol Hill

By Brian Green, Congressional Editor

The Intelligence Control Schism

Congressional committees, DoD, and the CIA square off on the roles of intelligence users and producers.

A MAJOR effort to reform foreign intelligence operations provoked severe disagreements in Congress this summer, most of which have yet to be resolved. Serious infighting broke out among the Department of Defense, the CIA, and the House and Senate intelligence and defense panels. Each has an ambitious reform agenda, and each wants the reform package to reflect its institutional interests and perspectives.

The disputes flared openly in July when Sen. Arlen Specter (R-Pa.), chairman of the Senate Select Committee on Intelligence, blocked the Fiscal 1997 defense authorization bill. The defense bill, written by the Senate Armed Services Committee, specified reforms at odds with Senator Specter's own intelligence reform bill.

The need for reform is widely recognized in Congress. Numerous organizations gather intelligence. However, inefficiencies, inattentiveness to post–Cold War needs, and lack of accountability have led to serious security and intelligence breakdowns.

"Demands for rapid responses to diverse threats in a rapidly changing world necessitate a streamlined intelligence community," said Senator Specter. Rep. James V. Hansen (R-Utah), a member of the House's defense and intelligence panels, argued that the US intelligence effort is snarled by uncertain authority and massive duplication of effort. "It amazes me [that intelligence] ever does get to the warfighter," he said.

On solutions, however, no such consensus exists. Bureaucratic and political contenders were locked in major disputes over control of policies and budgets, as well as how best to respond to consumers of intelligence.

Intelligence committees sought to concentrate authority in the hands of the director of Central Intelligence, John M. Deutch. Though DCIs have nominally been in charge of intelligence, "the director has, in fact, lacked sufficient [authority] to exercise this responsibility effectively," said the House Intelligence Committee.

To help concentrate that authority, the House reform measure proposed to strip DoD of much of its control over the national intelligence budget, activities, and personnel. It would give the DCI authority to reprogram defense intelligence funds and transfer senior personnel. Also, it would have created a new deputy director responsible for intelligence community management and given the CIA authority over all human intelligence (humint) activity.

The Senate reform bill would also have increased the role of the DCI in allocation of defense intelligence resources and placement of personnel and would consolidate humint authority under the DCI.

DoD and the defense oversight committees objected, seeking to retain authority in the military.

"What is really at stake here [is] the ability to support the military's critical wartime mission," said Rep. Floyd D. Spence (R–S. C.), chairman of the House National Security Committee. "It is clear that tomorrow's battlefield will be even more dependent on the timely supply of accurate intelligence."

Reflecting the view that intelligence support to the warfighter is paramount, Deputy Defense Secretary John P. White testified that "intelligence is . . . a product that we provide for people to use, particularly our combat leaders. Therefore, the focus, in our judgment, ought to be on the consumer, not the producer."

Secretary White said the Pentagon opposed the transfer of authorities to the DCI. "The Secretary must have clear and unambiguous lines of authority to the intelligence elements within DoD," he said. "Confusing the clear lines of authority that currently exist would make it more difficult for DoD intelligence elements to perform their most important mission."

Even Mr. Deutch testified that he opposed concentrating the authority over intelligence budgets in his office. "You cannot put the Secretary of Defense or the deputy secretary of defense in a position where they are . . . running agencies over which they don't have budget control," he said.

Service witnesses testified that concentrating humint under the CIA would be a "huge step backward."

The top reform priority for the Congressional defense committees and DoD was creation of a National Imagery and Mapping Agency (NIMA). DoD and the CIA proposed and the Senate defense authorization bill approved NIMA as a combat support agency, consolidating the Defense Mapping Agency, DoD's Central Imagery Office, the CIA's National Photographic Intelligence Center, and imagery functions of other agencies.

Mr. White said consolidation would "allow us to develop and manage digital mapping and imagery databases, simultaneously to provide information for warfighters on demand." He also noted that NIMA would actually draw CIA and other imaging assets under DoD authority, reversing the course proposed by the intelligence committees.

In July, the House National Security Committee approved a substitute for the House Intelligence Committee bill that closely tracks DoD priorities. That measure would allow the DCI to move DoD intelligence funds and personnel only if the Defense Secretary approved. The provision to consolidate humint assets was dropped. NIMA, omitted from the original House reform bill, was included as a combat support agency.

In early August, controversy continued in the Senate. While the Senate Armed Services Committee and Intelligence Committee resolved most of their differences, Senator Specter and his colleagues worried that designating NIMA as a defense support agency would give short shrift to its nonmilitary customers. The DCI, they argued, should have greater control over NIMA. The Senate Intelligence Committee also continued to insist that the DCI have authority to reprogram defense intelligence program funds. ■

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LOCKHEED MARTIN

Aerospace World

By Suzann Chapman, Associate Editor

B-2s Get Their First PGMs

The Air Force's B-2 Spirit stealth bomber fleet received its first batch of precision munitions, Air Combat Command announced July 8.

An ACC statement said the 509th Bomb Wing, Whiteman AFB, Mo., had taken delivery of the first seventeen Global Positioning System–Aided Munitions (GAMs). They will allow the B-2 to hit within twenty feet of a target. "The US Air Force now has a war-fighting capability that combines long range, large payload, stealth, and near-precision in one aircraft—the B-2 bomber," said ACC.

Plans call for the 509th, by year's end, to have 128 GAMs, built by Northrop Grumman and Hughes. It achieves high accuracy by targeting off of signals emanating from the GPS satellite navigation constellation.

The weapon is intended as an interim precision weapon, filling a gap until the bomber can be equipped later this decade with the more advanced Joint Direct Attack Munition.

The total weapon system, the GPS-Aided Targeting System/GPS-Aided Munition (GATS/GAM), uses the B-2's synthetic aperture radar and GPS with a Mk. 84 2,000-pound bomb.

US Sees Expanded Troop Threat

Secretary of Defense William J. Perry warned that US forces are operating "in the face of what I consider to be a threat of weapons of mass destruction" (WMD) wielded by terrorists.

The truck bombing of Khobar Towers near King Abdul-Aziz AB, Saudi Arabia, on June 25 killed nineteen US troops and wounded hundreds. However, warned Secretary Perry, 'We see more significant attacks that are possible."

Speaking to reporters on July 17, he said DoD identified a WMD attack as a potential threat, particularly in the Middle East, but also in such European countries as Bosnia-Hercegovina and Turkey.

The Secretary said the US takes seriously reports that terrorists could attack with chemical or biological agents or high-explosive bombs of up to ten tons. That would be at least four times larger than the bomb—thought to weigh a maximum of 5,000 pounds—that blew out Khobar Towers.

"We're going to prepare for a very intense threat," said Secretary Perry.

USAF photo by SSgt. Cesar Rodriguez

Gen. Ronald R. Fogleman, USAF Chief of Staff, visits Khobar Towers, the scene of the June 25 terrorist attack that killed nineteen USAF servicemen and wounded hundreds. While there, he presented four Airman's Medals to three Security Policemen and a doctor, who risked their lives to save others.

US Forces Move to Safer Location

Washington announced July 31 that DoD will move air operations and 4,000 troops from Dhahran and Riyadh to a more remote location within Saudi Arabia to improve security from terrorist attacks.

The US forces will move to Prince Sultan AB in Al Kharj, a remote desert base about fifty miles from Riyadh.

Three Patriot antimissile batteries in Dhahran will remain there, but their crews—some 500 US personnel—will move from the Khobar Towers apartment complex to the King Abdul-Aziz compound, the Saudi military base near the towers. Another three Patriot batteries will remain in Riyadh, but DoD officials said personnel will be consolidated in a more secure area.

A joint US-Saudi statement released July 31 said that the "moves will be initiated immediately and completed on an urgent basis without interrupting ongoing operations."

The relocation, expected to be completed this month, will cost approximately $200 million. The US and Saudi Arabia will share the cost equally, according to DoD officials.

DoD also announced that it was sending about 750 family members home from Saudi Arabia. Approximately 1,000 of the 5,000 US personnel in the region had been serving on accompanied tours, but Secretary Perry told reporters last month that number would decrease "significantly."

DoD Launches Antiterrorism Plan

Defense Secretary Perry told Pentagon reporters July 17 that he had launched a new "Force Protection Initiative" (FPI) to beef up security for US military forces worldwide.

Noting the steady escalation in both the size and sophistication of terrorist operations, the Secretary called for new, more wide-ranging defensive actions.

"We cannot deal with those attacks adequately just by moving fences and just by putting more Mylar on glass,"

WITHOUT PRECISION BEAM CONTROL

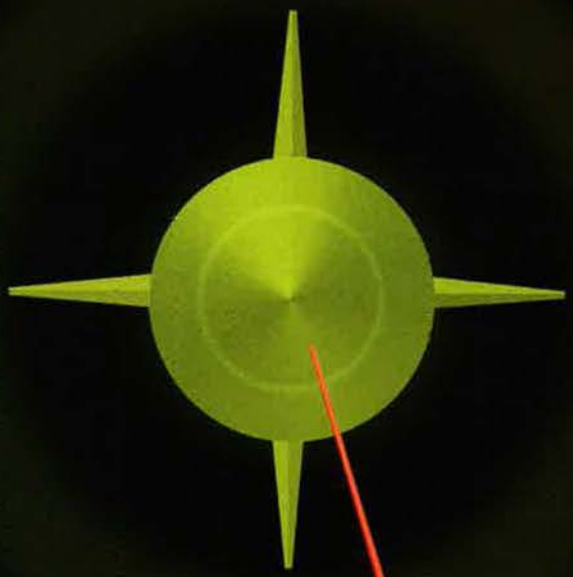

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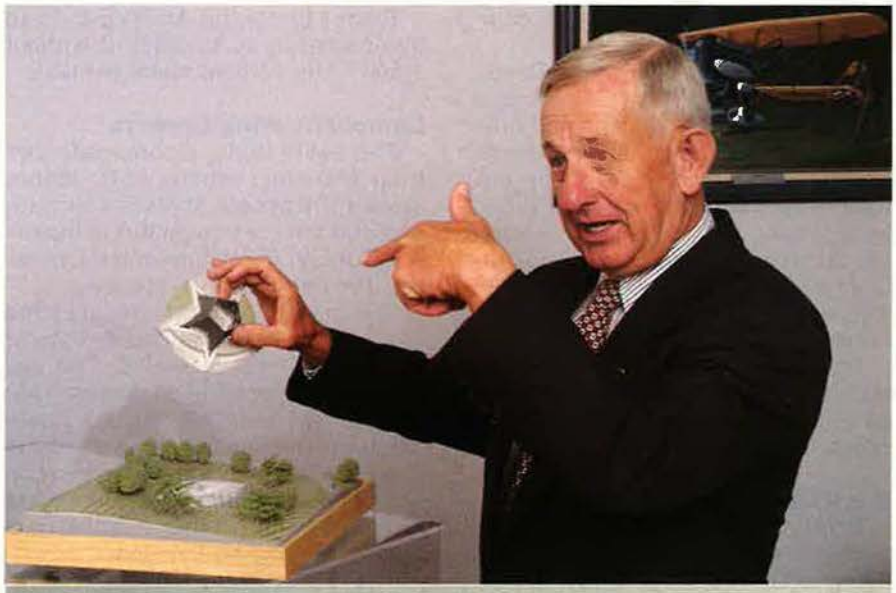
Photo by Paul Kennedy



Lt. Gen. Robert D. Springer, USAF (Ret.), executive director of the Air Force Memorial Foundation, removes a model of the future Air Force Memorial from a diorama of its site to show a visitor how it will appear from the air.

Air Force Memorial Design "Rolls Out"

The plan for the forthcoming Air Force Memorial was formally unveiled at a "rollout" ceremony in Washington, D. C., June 24. The memorial will be situated on a grassy slope adjacent to Arlington Cemetery in Virginia, between the Iwo Jima Memorial and the Netherlands Carillon.

The design will be a futuristic five-pointed star, fifty feet high, without a roof. The finish will be nonreflective gray. Visitors will take stairs down to the exhibit level, where they will find three halls—the Air Force past, present, and future—and a meditation room.

Lt. Gen. Robert D. Springer, USAF (Ret.), executive director of the Air Force Memorial Foundation, explained that while the Marine Corps and the Navy have long had memorials in the nation's capital and Army memorials are found all over Washington, there is not one for the Air Force.

The Air Force Memorial will open to the public around 2000. It will be paid for by $25 million in privately raised funds. The largest single contribution to date was received in July, a $500,000 bequest from the estate of Ruth A. Eaker, widow of the legendary Gen. Ira C. Eaker. AFA stalwart Jack B. Gross of Harrisburg, Pa., recently donated $25,000 to the foundation. AFA's Thomas B. McGuire, Jr., Chapter in New Jersey recently pledged $5,000 in the name of David C. Noerr, AFA's longtime director of Volunteer and Regional Activities, who died in January.

Inquiries and donations should be directed to the Air Force Memorial Foundation, 1501 Lee Highway, Arlington VA 22209-1198.

he warned. "We have to make some fundamental, drastic changes in the way we configure and deploy our forces."

He said that "a fundamental aspect" of the FPI would be to move US troops out of urban areas to more remote, isolated sites. A senior defense official, speaking to reporters, said the theater commanders in chief have been ordered to review and strengthen force-protection measures and to put their very best people on the job.

Navy, DARPA Start Arsenal Ship

The Defense Advanced Research Projects Agency selected five contractor teams to carry out Phase 1 of the Navy "arsenal ship" development program, DoD announced July 11.

The arsenal ship is a high-priority Navy effort to acquire the capability to deliver large quantities of ordnance in support of land engagements. It would be a minimally crewed, remote-control, floating missile launcher.

The Pentagon said the ship would provide "massive firepower for long-range strike," plus naval surface fire support and theater air defense. The idea is that the warship would have hundreds of vertical launch missile system cells and an advanced gun.

Each industry team gets a $1 million contract. Total value of research and development, comprising the first four phases, is $520 million. Virtually all major shipbuilders are included.

Senate Sharpens F-22 Cost Review

Sen. Charles E. Grassley (R-Iowa), a critic of USAF's F-22 fighter, successfully pressed for an analysis of cost that would make direct comparisons between the fighter's current cost and that established in July 1991.

The new independent estimate, due next March, is to be prepared by DoD's Cost Analysis Improvement Group. The CAIG prepared the 1991 DoD report on the F-22, an eighty-page estimate that the Senator charges was buried in the Pentagon because it had negative implications for the F-22.

Senator Grassley evidently believes that program costs may have grown significantly, and he wants the new study to present an apples-to-apples comparison between 1991 and today.

The F-22 provision was included in the Senate's version of the 1997 defense authorization bill, approved in July. The House bill contained no such measure, which must survive the House-Senate conference in September to go into effect.

"My amendment merely directs the CAIG to use the July 1991 report as the point of comparison," said Senator Grassley. "The F-22 is one of DoD's biggest programs, and it needs scrutiny and disciplined analysis. The last time around, the CAIG hid in the weeds. I don't want to see that happen again."

USAF Disciplines Sixteen

Air Force officials announced August 6 individual disciplinary actions taken against sixteen officers following its probe into the April 3 CT-43A crash outside Dubrovnik, Croatia. Thirty-five passengers and crew, including Commerce Secretary Ronald H. Brown, died in the crash.

Gen. Michael E. Ryan, commander of US Air Forces in Europe, directed actions ranging from punishment under Article 15 of the Uniform Code of Military Justice to counseling. According to a USAF statement, the officers involved had an opportunity to present mitigating information to General Ryan prior to his final decisions.

Brig. Gen. William E. Stevens, who was relieved on May 29 as 86th Airlift Wing commander at Ramstein AB, Germany, received a reprimand under Article 15 "for dereliction of duty for negligently failing to ensure that

non-DoD published instrument approaches were not being used by 86th AW aircrews without first obtaining a Terminal Instrument Procedures (TERPS) review and approval from USAFE."

Col. John E. Mazurowski, relieved from duty on May 29 as 86th Operations Group commander, received a reprimand under Article 15 "for dereliction of duty for willfully failing to ensure" that 86th AW aircrews did not use non-DoD published instrument approaches without first obtaining a TERPS review and USAFE approval.

Maj. Gen. Jeffrey G. Cliver, former USAFE director of Operations, received a letter of reprimand for "failing to exercise effective oversight of Air Force flight directives, failing to delineate responsibilities within his organization, and for not inquiring into the apparent failure" of the 86th AW to comply with USAF directives.

Col. Roger W. Hansen, relieved from duty May 29 as 86th AW vice commander, received a letter of reprimand for "failing to take appropriate measures to ensure the wing complied with the requirement to have non-DoD published instrument approaches reviewed for safety before they were flown."

USAF officials released a summary of the actions taken against the other twelve officers: four colonels and two lieutenant colonels were given administrative letters of admonishment; two lieutenant colonels and two majors received administrative letters of counseling; and two lieutenant colonels were given verbal counseling.

The Air Force released the names of the senior officers receiving the "most significant sanctions, in light of the substantial public interest." It did not release the names of the officers given "lesser sanctions" to provide them "the opportunity to learn from their mistakes."

More Tuskegee Airmen Absolved

The Air Force exonerated seven more Tuskegee Airmen who were unfairly disciplined in the aftermath of a World War II racial incident.

The seven black officers had been reprimanded for trying to enter the all-white Officers' Club at Freeman Field, Ind., in 1945. The War Department had integrated the club, but the local commander maintained segregation.

The reprimand was placed into the records of all seven. In the most recent action, the Air Force formally and officially corrected those records to reflect the fact that they had committed no offense.

A total of 101 black Army Air Forces officers received letters of reprimand for entering the club, but the Air Force has corrected the permanent records of only twenty-two. One of the airmen, Roger C. Terry, was convicted by a general court-martial of assault for brushing against a superior officer while trying to enter the club. The Air Force in recent years overturned that case.

At Freeman Field, black officers from the Tuskegee Institute trained as B-25 navigators with the 477th Bomb Group.

B-2 R&M Indicators Up

USAF said July 8 that it will now permit each B-2 bomber to put in 400 flying hours between major phase inspections—more evidence, it reported, of the bomber's reliability and maintainability.

A phase inspection is an in-depth look at an airframe to detect existing problems and prevent new ones. When the Air Force began B-2 phase inspections at the 509th Bomb Wing, Whiteman AFB, Mo., in September 1994, flying time between examinations was only 200 hours. Maj. Gen. Richard N. Goddard, ACC's director of Logistics, approved the move to the 400-hour phase inspection interval.

"This important milestone significantly reduces scheduled maintenance man-hours, reduces cost of ownership, and increases aircraft availability," said Col. Larry Conkle, 509th Logistics Group commander.

Nozzles Go Supersonic

An F-15 fighter equipped with thrust-vectoring engine nozzles made aviation history, USAF reported in June. Air Force officials disclosed that the fighter achieved supersonic speed using only nozzles for flight control, which had never before been accomplished.

During the flight, over Edwards AFB, Calif., the F-15 used no flaps, slats, or ailerons but achieved superb control, USAF officials said.

The F-15 is a flight test-bed for the Advanced Control Technology for Integrated Vehicles (ACTIVE) program, part of a $30 million effort begun in 1992. The program is a joint project of Wright Laboratory's Flight Dynamics Directorate, NASA, Pratt & Whitney, and McDonnell Douglas.

The aircraft produces about 4,000 pounds of vectoring force from each engine, used to influence pitch and yaw.

Plans call for the ACTIVE F-15 to fly at speeds up to Mach 2 without either of its vertical stabilizer tails.

Composite Wing Deploys

The 366th Wing, a composite unit from Mountain Home AFB, Idaho, moved 500 people, thirty-six aircraft, and 408 tons of equipment to Incirlik AB, Turkey, for its turn in the Operation Provide Comfort rotation.

The first group of Mountain Home jets—F-16s from the 389th Fighter Squadron—arrived July 3. The deployment, completed on July 11, represented what USAF officials called "the largest single unit swap-out in the five-year history of Operation Provide Comfort," the operation to protect the Kurds in northern Iraq by keeping Iraqi aircraft out of a no-fly zone.

The 366th Wing deployed to replace the 23d FS, Spangdahlem AB, Germany, along with the 492d and 493d Fighter Squadrons, RAF Lakenheath, UK.

NASA Selects Lockheed's Spacecraft

NASA officials on July 2 chose the Lockheed Martin VentureStar as the winner of a competition for the X-33 Single-Stage-to-Orbit Reusable Launch Vehicle (RLV).

Plans for the vertical-takeoff, horizontal-landing vehicle were developed by Lockheed's famed Skunk Works. McDonnell Douglas and Rockwell also had entered the competition, but fell short.

Lockheed Martin is to lead Phase II of the RLV program—valued at more than $1 billion through 2000—and produce a subscale demonstrator vehicle to begin flying March 1999.

VentureStar flights will demonstrate the technical and financial feasibility of creating a fleet of RLVs sustained by the commercial space-launch market, according to a Lockheed Martin press release. Development of the full-scale operational VentureStar will begin around 2000.

VentureStar's attributes include an aerodynamically efficient lifting-body configuration, linear aerospike engines that adjust automatically to provide maximum efficiency, extensive use of high-strength, low-weight composites, fast mission-turnaround through streamlined servicing procedures, and standardized containers for payloads.

Four Receive Airman's Medal

Four Air Force members of the 4404th Composite Wing (Provisional) each received an Airman's Medal July

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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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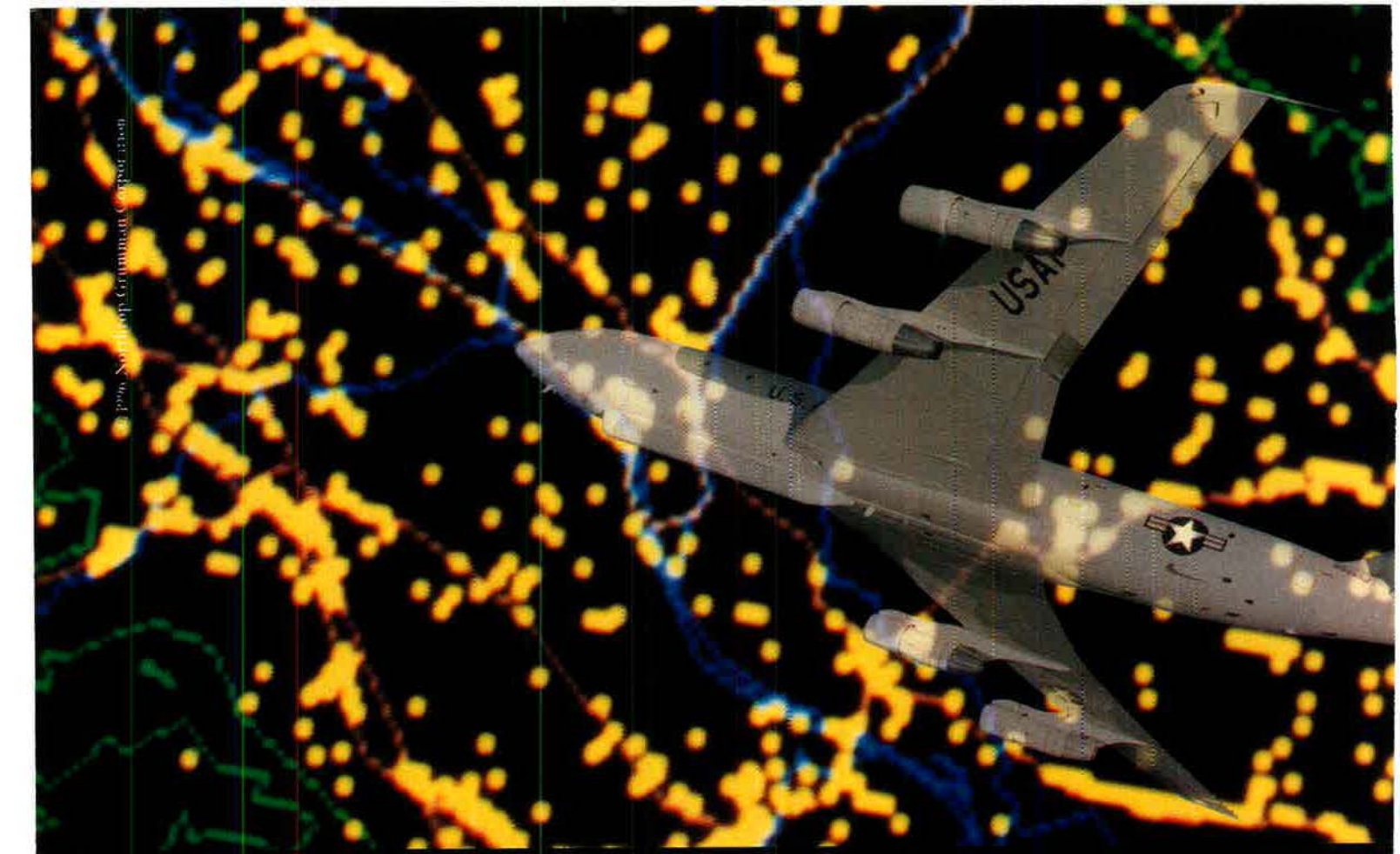

Providing and exploiting unprecedented situat onal awareness make it one of America's most effective

3 for their heroic actions before and after a truck bomb blast killed nineteen USAF personnel at King Abdul-Aziz AB, Saudi Arabia, on June 25.

USAF Chief of Staff Gen. Ronald R. Fogleman presented the medals to three Security Policemen: SSgt. Alfredo R. Guerrero of Modesto, Calif., assigned to Edwards AFB, Calif.; SrA. Corey P. Grice of Latta, S. C., assigned to Kelly AFB, Tex.; A1C Christopher T. Wagar of Graham, Wash., assigned to Malmstrom AFB, Mont.; and flight surgeon Maj. Steven P. Goff of Big Bend, Wis., also of Malmstrom AFB.

The three Security Policemen, assigned to the 4404th Security Police Squadron, were on duty on top of the building and spotted the truck pulling up to a fence nearby. They radioed in a message and began evacuating the building. The truck exploded four minutes later.

Major Goff, of the 4404th Medical Squadron, was cited for his efforts to save lives after the explosion.

The Airman's Medal is awarded for heroic acts during peacetime.

New Strategy Review on Tap

The Senate on June 25 issued a call for a new major review of the nation's defense strategy and the armed forces required to carry it out. The provision was contained in an amendment—approved unanimously—to the Senate's 1997 defense authorization bill.

Sen. Joseph I. Lieberman (D-Conn.), the amendment's sponsor, said it would require an independent, nonpartisan review of US defense strategy, force structure, force modernization plans, infrastructure, and other elements of the defense program and policies, "with a view toward determining and expressing the defense strategy of the United States and establishing a revised defense program through the year 2005."

The Senate action would establish a group of nine defense experts, appointed by the Defense Secretary in consultation with the Senate and House authorizing committees, to carry out the review. The National Defense Panel also would assess DoD's own quadrennial review, due next year, as it progresses, as well as the final report, and comment on the findings of the review to the Secretary of Defense.

The panel's report would be completed by December 1997.

Harassment Declining, but Not Gone

A recent DoD survey of the troops indicates that sexual harassment in the active-duty force has steadily declined but has not disappeared by a long shot.

Data for the years 1988 and 1995 showed a decline—from sixty-four to fifty-five percent—of military women who reported receiving uninvited and unwanted sexual attention from someone at work during the past twelve months.

Survey respondents with six to ten years of experience were asked how often sexual harassment occurs compared with a few years ago. Sixty percent of female respondents reported it occurs less frequently. Only ten percent of female respondents said sexual harassment occurs more often today.

Despite the downward trend, DoD officials noted that the problem was still afflicting more than half of all military women and deemed any harassment unacceptable. Secretary of Defense William J. Perry said, "All employees of this department have a right to carry out their jobs without discrimination or harassment."

The Defense Department survey included responses from more than 34,000 women.

News Notes

■ An F-16 fighter crashed into a residential area in Pensacola, Fla., July 11, killing a four-year-old boy and severely injuring his mother and one other person. The fighter was en route from Shaw AFB, S. C., to Eglin AFB, Fla., in a move away from the path of Hurricane Bertha. Capt. Frederik G. Hartwig, of the 77th Fighter Squadron, ejected safely. The body of the child, identified as Shawn Cannon, was found in the charred ruins of his home. His mother, Robin Cannon, was taken to a local hospital, suffering from burns, said police. A crash investigation was under way.

■ In Rodeo '96, the 19th Air Refueling Wing, Robins AFB, Ga., became the first team to win back-to-back Best Air Mobility Wing honors. Rodeo officials made the announcement July 1 during the competition's closing ceremonies at McChord AFB, Wash. The meet featured seventy-seven Air Force teams and sixteen foreign teams and some 1,800 personnel during the last week of June. Four days later, the 19th ARW was deactivated and reactivated as the 19th Air Refueling Group.

■ The 35th Fighter Wing, Misawa AB, Japan, celebrated on June 18 as the Air Force's "Wild Weasel" designation returned. The wing's tail code was changed from MJ to WW during a formal ceremony held at the base.

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According to the unit's official history, the 35th began training Air Force aircrews in the radar detection and suppression mission, also known as Wild Weasel, at George AFB, Calif., in July 1973. Pilots flew the F-105, then later the F-4C and F-4G. George AFB closed its doors in 1992. The 35th FW was activated at Misawa October 1, 1994, where it operates F-16s.

■ Navy Cmdr. David Cheslak took command of the Air Force's 562d Flying Training Squadron, Randolph AFB, Tex., in June, becoming the first naval flight officer to command an Air Force squadron. The 562d FTS trains student naval flight officers and navigators and a variety of foreign officers in advanced navigation, crew coordination, and communications. Staffed with Air Force and Navy instructor navigators since October 1994, the squadron commenced use of a fully joint syllabus last spring.

■ An F-16C pilot saved his aircraft after an engine flameout forced him to make an emergency landing June 27. Capt. Chris Rose was returning to Andrews AFB, Md., from a training mission over North Carolina's Dare County Firing Range when the engine quit and he had to make a dead-stick landing at Elizabeth City Coast Guard Station, N. C. Captain Rose, pilot and executive officer for the 113th Wing, D. C. ANG, was forced to land on a 7,000-foot runway, 1,000 feet less than recommended.

■ The Air Force has selected 6,068 of 54,163 eligible staff sergeants for promotion to technical sergeant. This represents an overall 11.2 percent selection rate for the cycle. The average selectee had 6.8 years time in grade and 13.1 years in service.

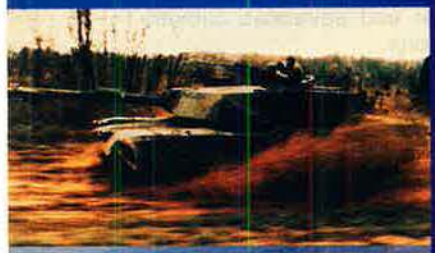
■ McDonnell Douglas on July 3 delivered the twenty-sixth production C-17 aircraft to the Air Force. The advanced transport was flown from the C-17 assembly facility in Long Beach, Calif., to the 437th Airlift Wing, Charleston AFB, S. C. The Air Force officially accepted the new C-17 on May 31, but it was held at the plant for installation of its airborne defensive system.

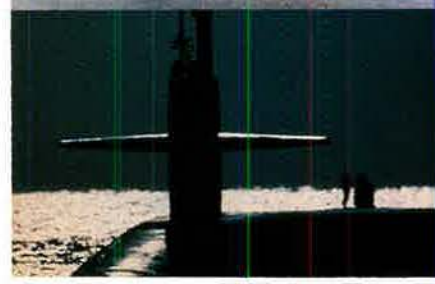
■ Gen. Walter Kross assumed command of both Air Mobility Command and US Transportation Command during a ceremony July 15 at Scott AFB, Ill. He replaces Gen. Robert L. Rutherford, who retired after a thirty-five-year career. General Kross had been director of the Joint Staff at the Pentagon.

■ Air Force Reserve Individual Mobilization Augmentees—formerly limited to augmentation of active-duty units in wartime, contingency operations, and pre- and post-mobilization—now can be assigned to positions that support Military Operations Other Than War as well as other specialized or technical missions. This change was outlined in a May 6 DoD directive.

■ The Department of Defense announced in June that the Defense Nuclear Agency has been renamed the Defense Special Weapons Agency. This change was made to reflect the agency's mission more accurately under its 1995 charter. Its lineage dates to the World War II–era Manhattan Project, which produced the first atomic bomb, and it had nuclear-support responsibilities throughout the Cold War. Its mission now includes support of both nuclear and advanced conventional weapons.

■ Croatian President Franjo Tudjman awarded the Order of the Croatian Trefoil to the thirty-five Americans who were killed in the April 3 crash of an Air Force jet near Dubrov-





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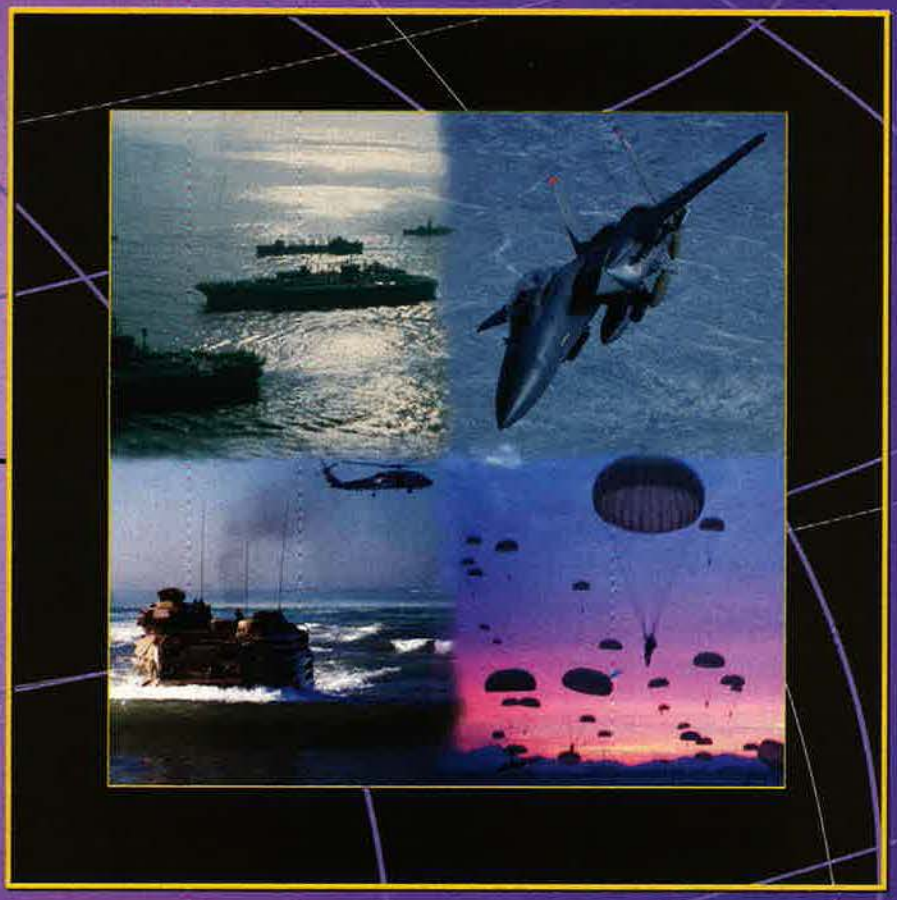

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nik, Croatia. Among the dead were Commerce Secretary Ronald H. Brown and six US airmen. Croatian Ambassador Miomir Zuzul presented the posthumous awards on behalf of the Croatian President in a July 1 ceremony held at the Croatian Embassy in Washington, D. C.

■ President Clinton named four military officers to 1996–97 White House Fellowships: USAF Maj. David A. Moore, a POW/MIA family liaison and support officer; Navy Lt. Cmdr. Susan D. Fink, a protocol officer to the commander in chief, US Atlantic Fleet; Navy Lt. Cmdr. John Wood, a crisis action planner for US Central Command; and Army Maj. Loree K. Sutton, a psychiatrist enrolled at the US Army Command and General Staff College. Fellows spend a year as special assistants to senior White House and Cabinet officials.

■ In July, Air Force Security Police leaders announced their top five outstanding units for 1995: large unit award, 39th Security Police Squadron, Incirlik AB, Turkey; medium unit award, 77th SPS, McClellan AFB, Calif.; small unit award, 85th SPS, NAS Keflavik, Iceland; Air Force Reserve unit award, 419th SPS, Hill AFB, Utah; and Air National Guard award, 156th SPS, Carolina, Puerto Rico.

■ The 52d Airlift Squadron, Moody AFB, Ga., and 50th AS, Little Rock AFB, Ark., took top honors at the nineteenth annual Airlift Congress at Toulouse-Francazal AB, France. It was the first time US units have participated in the multinational event. The 52d placed first in Best En-Route Navigation to an Airdrop Event and Best C-130 Crew. Little Rock's 50th placed second in both categories.

■ An Air Force veterinarian in June earned a Department of Agriculture award for his work in preventive medicine. Maj. (Dr.) Donald L. Noah, an infectious-diseases analyst for the Armed Forces Medical Intelligence Center, Fort Detrick, Md., received the 1996 Dr. Daniel E. Salmon Award for his work on battling the Ebola virus in Zaire in June 1995.

■ The Public Relations Society of America presented the Air Force two Silver Anvils, the industry's top award, for its work in crisis communications and employee communications. The Air Force won for its public affairs activity in educating the public about Operation Joint Endeavor in Bosnia and for "Employee Communications: Roadmap for the 21st Century," a program to provide information to more than 600,000 active-duty, Guard, and Reserve members.

■ In August, SMSgt. Michael R. Kerver became the 1996 Spencer B. Dukes USAF First Sergeant of the Year. He is assigned to the 37th Airlift Squadron, Ramstein AB, Germany. The award, renamed this year in honor of CMSgt. Spencer B. Dukes, recognizes the important contributions and leadership qualities exhibited by Air Force first sergeants.

■ Rodney A. Coleman, assistant secretary of the Air Force for Manpower, Reserve Affairs, Installations, and Environment, presented USAF's small business awards at a June 18 conference in San Antonio, Tex. The Secretary of the Air Force Award for Program Excellence went to the Human Systems Center, Brooks AFB, Tex. The 49th Fighter Wing, Holloman AFB, N. M., won the Air Force Activity Special Achievement Award.

■ Air Force Communications Agency dedicated its new 24,000-square-foot Technology and Interoperability Facility in memory of engineering technician CMSgt. Johnny Scott Pepple. Chief Pepple, who worked in communications for most of his thirty-nine years of military and civil service, died in November 1995.

■ Two USAF officers—Maj. Gen. Marcelite Jordan Harris, director of Maintenance, and Lt. Col. William G. Gregory, a NASA astronaut—each received a 1996 Ellis Island Medal of Honor, given to honor Americans for their outstanding contributions to the nation. They received their medals at a May 19 ceremony on Ellis Island, N. Y., where more than twelve million immigrants entered the US from 1892 to 1924.

■ The Air Force selected two members to take part in DoD's Executive Leadership Development Program, say officials with the Air Force Personnel Center. Maj. Jim H. Keffer, an air liaison officer with US Atlantic Command in Norfolk, Va., and Maj. Charles D. Lutes of the 21st Airlift Squadron at Travis AFB, Calif., will work at various levels within the Department of Defense with the goal of enhancing their decision-making skills and leadership.

■ Nine teams representing training groups from Goodfellow, Sheppard, and Lackland AFBs, Tex., Vandenberg AFB, Calif., and Keesler AFB, Miss., took part in Top Tech VII, an instructional competition held at Keesler on June 6. Lackland was the overall winner of the competition for the fifth time in the past six competitions.

■ The Air Force's 3d Civil Engineering Squadron, Elmendorf AFB, Alaska, earned the Balchen/Post

Award (formerly the Col. Bernt Balchen Award) for outstanding achievement in airport snow and ice control, military airport category, for 1995. Officials said the Elmendorf team's performance prevented air operations from being halted because of snow. The 5th CES, Minot AFB, N. D., was named runner-up.

■ In May, the 60th Aircraft Generation Squadron, Travis AFB, Calif., was recognized as the best aircraft maintenance unit in the Air Force for 1995, taking that honor for the second straight year. The 60th AGS, responsible for maintenance of the thirty-seven C-5 Galaxy transports based at Travis, comprises 536 military and thirty-five civilian workers. The 60th AGS turned in an aircraft departure reliability rate of ninety-eight percent.

■ SrA. Santiago Santana, Jr., a medical materiel journeyman at Keesler AFB, Miss., received the 150,000th associate in applied science degree from the Community College of the Air Force. A member of the 81st Medical Group, the twenty-five-year-old airman will receive a bachelor's degree in psychology in December and plans to apply to Officer Training School.

■ The 17th Training Wing, Goodfellow AFB, Tex., won the 1996 Verne Orr Award, USAF announced in April. Sponsored by the Air Force Association, the annual award was established in honor of former Secretary of the Air Force Verne Orr and recognizes the wing that most effectively uses its human resources. The unit will receive the award at AFA's National Convention this month in Washington, D. C. The 17th TRW was commended for setting a benchmark for joint training.

■ The 56th Supply Squadron, Luke AFB, Ariz., won the 1996 Air Force Daedalian Maj. Gen. Warren Caret Supply Effectiveness Award and thereby received the title Best Supply Squadron in the US Air Force.

■ USAF's 48th Fighter Wing, RAF Lakenheath, UK, won the 1996 Phoenix Trophy for the most significant weapon system and equipment maintenance achievements in the Defense Department. The unit's 2,100 maintenance personnel turned in the highest F-15 maintenance statistics in the Air Force as it maintained one of DoD's highest optempos, with twenty-five percent of its work force continuously deployed. John P. White, deputy secretary of Defense, presented the trophy June 13 as part of the 1996 Secretary of Defense Maintenance Awards. Other USAF winners were the 1st Component Repair Squadron, Langley AFB, Va., and the 31st Special Operations Squadron, Osan AB, South Korea.

■ Five USAF officers were among thirty-five service members and civilians chosen by NASA in May to participate in the space agency's shuttle program. The five astronaut candidates who will train to become pilots or mission specialists are Capt. James M. Kelly and Majs. Duane G. Carey and Paul Lockhart (all pilot trainees), and Capts. Edward M. Fincke and Rex J. Walheim (both mission specialists). Plans called for astronaut candidates to report in August to Johnson Space Center in Houston, Tex., to begin a one-year candidacy program.

■ SSgt. Michael L. Hill II, who saved two children from drowning in the Atlantic Ocean at Virginia Beach, Va., was awarded the 1996 Vanguard Award, given to enlisted members who have performed a heroic act, on or off duty, that saves a life or prevents serious injury. Assigned to the 35th Fighter Squadron, Kunsan AB, South Korea, Sergeant Hill was deployed to Langley AFB, Va., with the 8th Fighter Squadron, Holloman AFB, N. M., on August 8, 1995, when he rescued the children, who had been

Senior Staff Changes

RETIREMENTS: B/G Roger E. **Carleton,** B/G John H. **Garrison,** B/G Peter F. **Hoffman,** B/G Robert A. **Hoffmann,** B/G Thomas J. **Lennon,** B/G Jeffrey S. **Pilkington.**

PROMOTIONS: To be **Lieutenant General:** Frank B. **Campbell,** Roger G. **DeKok,** Patrick K. **Gamble,** Charles H. **Roadman** II, John B. **Sams,** Jr.

CHANGES: Col. (B/G selectee) John R. Baker, from Dep. Dir., Ops., DCS/P&O, Hq. USAF, Washington, D. C., to Cmdr., 18th Wing, PACAF, Kadena AB, Japan, replacing B/G (M/G selectee) William T. Hobbins . . . **Col. (B/G selectee) John S. Boone,** from Vice Cmdr., SMC, AFMC, Los Angeles AFB, Calif., to Dir., Plans, Hq. AFSPC, Peterson AFB, Colo., replacing M/G Lance W. Lord . . . **M/G (L/G selectee) Frank B. Campbell,** from Dir., Requirements, Hq. ACC, Langley AFB, Va., to Cmdr., 12th AF, ACC; Cmdr., USSOUTHCOM Air Forces; and Air Force Component Cmdr., USSTRATCOM, Davis-Monthan AFB, Ariz., replacing retiring L/G James F. Record . . . **B/G Bruce A. Carlson,** from Cmdr., 49th FW, ACC, Holloman AFB, N. M., to Mission Area Dir., Global Power, Ass't Sec'y of the Air Force for Acquisition, Hq. USAF, Washington, D. C., replacing M/G John W. Hawley.

Col. (B/G selectee) John L. Clay, from Sys. Prgm. Dir., Navstar GPS JPO, AFMC, Los Angeles AFB, Calif., to Vice Cmdr., SMC, AFMC, Los Angeles AFB, Calif., replacing Col. (B/G selectee) John S. Boone . . . **B/G (M/G selectee) Charles H. Coolidge, Jr.,** from Cmdr., 22d ARW, AMC, McConnell AFB, Kan., to Dir., P&O, Hq. AETC, Randolph AFB, Tex., replacing M/G Donald L. Peterson . . . **M/G (L/G selectee) Roger G. DeKok,** from Dir., Ops., J-3, Hq. USSPACECOM, Peterson AFB, Colo., to Cmdr., SMC, AFMC, Los Angeles AFB, Calif., replacing L/G Lester L. Lyles . . . **B/G Howard G. DeWolf,** from Cmdr., 90th Missile Wing, AFSPC, Francis E. Warren AFB, Wyo., to Dir., Inter-American Region, Office of the Ass't Sec'y of Defense (International Security Affairs), Washington, D. C.

M/G (L/G selectee) Patrick K. Gamble, from ACS, Ops./Log. Div., SHAPE, NATO, Mons, Belgium, to Cmdr., Alaskan Command, USPACOM; Cmdr., 11th AF, PACAF; and Cmdr., Alaskan NORAD Region, Elmendorf AFB, Alaska, replacing retiring L/G Lawrence E. Boese . . . **M/G John W. Hawley,** from Mission Area Dir., Global Power, Ass't Sec'y of the Air Force for Acquisition, Hq. USAF, Washington, D. C., to Dir., Requirements, Hq. ACC, Langley AFB, Va., replacing M/G (L/G selectee) Frank B. Campbell . . . **M/G Charles R. Heflebower,** from Cmdr., Interim Combined Air Ops. Center 3, NATO, and Cmdr., 17th AF, USAFE, Sembach Annex, Ramstein AB, Germany, to ACS, Ops./Log. Div., SHAPE, NATO, Mons, Belgium, replacing M/G (L/G selectee) Patrick K. Gamble . . . **B/G (M/G selectee) William T. Hobbins,** from Cmdr., 18th Wing, PACAF, Kadena AB, Japan, to Dir., Plans and Policy, J-5, Hq. USACOM, Norfolk, Va., replacing M/G (L/G selectee) John B. Sams, Jr.

Col. (B/G selectee) Jack R. Holbein, Jr., from DCS, Hq. USSOCOM, MacDill AFB, Fla., to Cmdr., 314th AW, ACC, Little Rock AFB, Ark., replacing B/G Donald A. Streater . . . **Col. (B/G selectee) Dennis R. Larsen,** from Ass't Dir., Ops., Hq. PACAF, Hickam AFB, Hawaii, to Cmdr., 49th FW, ACC, Holloman AFB, N. M., replacing B/G Bruce A. Carlson . . . **M/G Charles D. Link,** from Ass't DCS/P&O, Hq. USAF, Washington, D. C., to Spec. Ass't to Chief of Staff, Hq. USAF, Washington, D. C. . . . **M/G Lance W. Lord,** from Dir., Plans, Hq. AFSPC, Peterson AFB, Colo., to Cmdr., 2d AF, AETC, Keesler AFB, Miss., replacing retiring M/G Henry M. Hobgood.

L/G Lester L. Lyles, from Cmdr., SMC, AFMC, Los Angeles AFB, Calif., to Dir., BMDO, Office of the Under Sec'y of Defense for Acquisition and Technology, Washington, D. C. . . . **M/G Donald L. Peterson,** from Dir., P&O, Hq. AETC, Randolph AFB, Tex., to Dir., Plans, DCS/P&O, Hq. USAF, Washington, D. C., replacing M/G Robert E. Linhard . . . **Col. (B/G selectee) Craig P. Rasmussen,** from Cmdr., 62d AW, AMC, McChord AFB, Wash., to Cmdr., 305th AMW, AMC, McGuire AFB, N. J., replacing Col. (B/G selectee) Stephen R. Lorenz . . . **Col. (B/G selectee) Gilbert J. Regan,** from Staff Judge Advocate, Hq. PACAF, Hickam AFB, Hawaii, to Staff Judge Advocate, Hq. AMC, and Chief Counsel, Hq. USTRANSCOM, Scott AFB, Ill., replacing retired B/G Thomas L. Hemingway.

M/G (L/G selectee) Charles H. Roadman II, from Cmdr./Dir., AFMOA, Office of the Surgeon General, Bolling AFB, D. C., to Surgeon General, Hq. USAF, Bolling AFB, D. C., replacing retiring L/G Edgar R. Anderson, Jr. . . . **L/G Charles T. Robertson, Jr.,** from Vice Cmdr., Hq. AMC, Scott AFB, Ill., to Cmdr., 15th AF, AMC, Travis AFB, Calif., replacing retiring L/G Bruce L. Fister . . . **Col. (B/G selectee) Steven A. Roser,** from Cmdr., 11th Wing, Bolling AFB, D. C., to Cmdr., 437th AW, AMC, Charleston AFB, S. C., replacing B/G (M/G selectee) Gary A. Voellger . . . **M/G (L/G selectee) John B. Sams, Jr.,** from Dir., Plans and Policy, J-5, Hq. USACOM, Norfolk, Va., to Vice Cmdr., Hq. AMC, Scott AFB, Ill., replacing L/G Charles T. Robertson, Jr.

B/G Thomas J. Scanlan, Jr., from Dir., Space Sys. Acquisition and Ops., and Dir., Office of Space Launch, NRO, Ass't Sec'y of the Air Force for Space, Hq. USAF, Washington, D. C., to Dir., Ops., J-3, Hq. USSPACECOM, Peterson AFB, Colo., replacing M/G (L/G selectee) Roger G. DeKok . . . **B/G William E. Stevens,** from Cmdr., 86th AW, and Cmdr., Kaiserslautern Military Community, Hq. USAFE, Ramstein AB, Germany, to Ass't Dep. Under Sec'y of the Air Force (International Affairs), Office of the Under Sec'y of the Air Force, Washington, D. C., replacing B/G James D. Latham . . . **B/G Donald A. Streater,** from Cmdr., 314th AW, ACC, Little Rock AFB, Ark., to Vice Cmdr., 8th AF, ACC, Barksdale AFB, La., replacing Col. John C. Mangels . . . **B/G (M/G selectee) Gary A. Voellger,** from Cmdr., 437th AW, AMC, Charleston AFB, S. C., to Dir., Ops., Hq. AMC, Scott AFB, Ill., replacing retiring M/G Edward F. Grillo, Jr.

SENIOR EXECUTIVE SERVICE CHANGE: Frank O. Tuck, to Dir., Depot Maintenance, Hq. AFMC, Wright-Patterson AFB, Ohio, replacing retired James C. Wallin. ■

carried out to sea by a powerful undertow.

■ The environmental management team of Nellis AFB, Nev., won the Air Force Environmental Restoration Award for cleaning up contaminated base sites. The Nellis cleanup involves forty-four sites at the main base, thirteen in Indian Springs, seventeen at Tonopah Test Range, and sixty-eight on the Nellis Range Complex. The sites include landfills, old fire training pits, and fuel leak areas. The Nellis effort is running two years ahead of schedule, said officials.

■ A joint USAF-Army emergency medicine training program conducted at Wilford Hall USAF Medical Center and Brooke Army Medical Center was ranked the best in the nation, following a test taken by residents in the 105 training programs across the US. The program has been ranked in the top five for the last four years and ranked second in 1995.

■ The Department of Defense and Department of Veterans Affairs on June 20 announced the award of $7.3 million for twelve research studies to government, nongovernment, and academic institutions to investigate possible causes and treatment of illnesses suffered by Persian Gulf War veterans.

■ TriWest Healthcare Alliance of Phoenix, Ariz., has been awarded a $2.32 billion, five-and-a-half-year contract for Tricare/CHAMPUS healthcare delivery and managed-care support services in DoD Health Service Regions 7 and 8, which comprise much of the US midwest and southwest regions.

■ Under Secretary of Defense for Acquisition and Technology Paul G. Kaminski, DoD's top weapons official, suggested the Pentagon might reduce the Navy's buy of carrier-based F/A-18E/F Super Hornets if development of a follow-on Joint Strike Fighter goes well. He told the Defense Writers Group on July 23 that one option for the Super Hornet program is to "terminate earlier" than planned—meaning short of the Navy's goal of 1,000 aircraft.

■ Pratt & Whitney announced July 9 that it had completed assembly of the first advanced F119 engine for the F-22 fighter flight-test program. The powerplant emerged from the company's Middletown, Conn., facility, where workers also were assembling the second F119. The company was to deliver both engines this month for installation in the first flight-test F-22.

■ The Army–Air Force Center for

Success where it matters the most. In combat and in the budget. Raytheon's AIM-9X gives an incredibly unfair advantage in the two places it matters most. In combat, and the budget. Only Raytheon has demonstrated the required

technologies in captive flights and flight tests. Our superior performance entry centers around a high resolution seeker head. This unique design permits the critical OBA angles

required to gain the advantage in close-in engagements and features a proven and reliable thrust vector control actuation system for maximum maneuverability. Additionally, the extensive use of commercial and nondevelopmental components keeps our costs low and minimizes risk. U.S. fighter pilots deserve the best. Give them the Raytheon AIM-9X.

Raytheon Electronic Systems

■ Low-Intensity Conflict, located at Langley AFB, Va., since 1986, deactivated June 30, transferring its USAF responsibilities to the Air Force Doctrine Center. On July 1, the center stood up a new Air Force Military Operations Other Than War office. It will now handle all Air Force MOOTW business.

■ US military recovery experts are to travel to North Korea this month to continue a search for the remains of Americans killed during the Korean War. In July, a ten-person team arrived in the North Korean capital of Pyongyang to begin the search, starting with a visit to the site of an F-80C fighter crash near the Korea-China border. US officials say 8,100 Americans are still considered missing in action from the Korean War.

■ The Air Force on June 4 dedicated the new 1st Lt. Laura Ashley Piper Auditorium at Goodfellow AFB, Tex., June 4. Lieutenant Piper, a distinguished graduate of the intelligence officer course at Goodfellow, was killed over northern Iraq on April 14, 1994, when the Army UH-60 Black Hawk helicopter in which she was flying was mistakenly shot down by an Air Force F-15 fighter.

■ The Hennessy Trophy Awards, given in recognition of the best appropriated-fund Air Force dining facilities, were presented in May. Winners were Scott AFB, Ill., in the single-facility category, and Lackland AFB, Tex., in the multiple-facility group. The Air Force Reserve Special Award winner was Pittsburgh IAP/ARS, Pa. The Air National Guard Special Award winner was McGhee Tyson Airport, Tenn.

Obituaries

Edgar Ulsamer, longtime senior editor of *Air Force* Magazine and former AFA assistant executive director for Policy and Communications, died July 24 in West Palm Beach, Fla., after an extended illness. Mr. Ulsamer fled his native Austria when Hitler came to power, and during World War II, he was a parachute agent for the US Office of Strategic Services. Captured by the Gestapo, he was sentenced to death but escaped from a prison convoy, swam the Danube, and made his way to Allied lines. After the war, he came to the United States and in 1965, joined the AFA/*Air Force* Magazine staff. His writing output was prolific, and his information-intensive articles on defense issues and monthly column, "In Focus," were recognized as particularly authoritative and had a significant following among top government policymakers. In addition to his magazine work, Mr. Ulsamer organized national symposiums, supervised dealings with the news media, and assisted AFA leaders in the formulation of policy. He retired from the staff in 1987.

Maj. Gen. Robert E. Linhard, special assistant to the USAF Chief of Staff for Long-Range Plans, died August 3 at his home in Fairfax County, Va., after a heart attack. He was forty-nine.

He was commissioned in 1968 and served first as a Titan II launch officer. He was also a Minuteman airborne missile launch officer, combat crew member, and missile test director. In Washington in 1980, General Linhard became a Joint Staff strategic force planner, then worked on the White House National Security Council staff as director of defense programs and arms control for four years. He served from 1986 to 1989 as President Reagan's special assistant for nuclear issues and arms control.

He negotiated the agreement establishing the US-Soviet Nuclear Risk Reduction Centers. He went on to serve in USAF and Joint Staff strategic planning and policy positions and was formerly USAF director of Plans, deputy chief of staff, Plans and Operations, at the Pentagon.

Retired US Navy **Capt. David McCampbell,** the Navy's all-time leading ace and World War II Medal of Honor recipient, died June 30 in Riviera Beach, Fla., at eighty-six. Captain McCampbell, known in the Navy as the "Ace of Aces," scored a total of thirty-four victories—nine of them during a single mission in October 1944. In that fight, for which he was awarded a Medal of Honor, Captain McCampbell and one other US fighter intercepted and attacked a formation of sixty Japanese aircraft, driving them away from the US fleet that was their target. ■

Index to Advertisers

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The USAF Chief of Staff talks about airpower, the Air Force, and the future.

First Force

By John A. Tirpak, Senior Editor

TECHNOLOGY is finally catching up with the predictions of early airpower theorists, and the US Air Force is rapidly becoming—if it has not already become—the unique "enabler" of virtually any military campaign by the United States, according to Gen. Ronald R. Fogleman, the Air Force Chief of Staff.

In a series of interviews with *Air Force* Magazine, and in recent speeches, General Fogleman has described the Air Force as the key needed to obtain entry into practically any theater of operations and the weapon of choice in dealing with most of the no-notice, come-as-you-are conflicts and crises the US is likely to face in the future.

In the array of military capabilities available to the US, the Air Force has become the First Force.

General Fogleman's views, and the realities underpinning them, are likely to have a significant impact on the upcoming national strategy review and debate, likely to begin in earnest next spring. The review will

Painting by Nilo Santiago / USAF Art Collection

Photo by SSgt. Angela Stafford

General Fogleman wants to make sure the Air Force maintains the lethality, sustainability, and punch to do the "heavy lifting" necessary to win a war.

explore the question of whether the existing strategy of being able to fight two nearly simultaneous major regional conflicts (MRCs) is sound and whether it is possible to carry it out with the current force structure.

The Chief outlined why, in his opinion, debate over the so-called "four air forces" issue has been put to rest. Further, he described the Air Force's increasing reliance on bombers to carry out national strategy, the evolving role of aircraft carriers and air expeditionary forces, the rising importance of unmanned aerial vehicles, and the potential for directed-energy weapons to revolutionize warfare.

Oversell

Early proponents of airpower, such as Billy Mitchell and Giulio Douhet, "promised more than they could deliver," remarked General Fogleman. "The technology really wasn't there to fulfill the vision" of a force aloft that could dominate the battlefield and decide most of what happened on the surface below.

However, the advent of nuclear weapons and, later, the emergence of stealth technology, precision conventional weapons, and a global reconnaissance capability, have had a dramatic impact. The vision of an Air Force that is first among equals in both security and power projection is "really starting to come of age," the General said.

"I sincerely believe that the inherent characteristics of airpower will make it the weapon of choice by the national command authorities, as we get deeper and deeper into this transition from the Cold War" into whatever follows, he asserted.

The General went on, "Early in a conflict—with our range, our speed, our flexibility, our maneuverability, our lethality—airmen will normally be first engaged. They will get there first; they will be in a position to set the battlefield while other forces are employing."

Only after air dominance has been achieved—to enable safe transit for airborne and seaborne forces into the theater—will it even be possible for a regional commander in chief to make the transition to a naval or land strategy, said General Fogleman. Only then could a CINC reapportion forces so that the Air Force might serve a supporting role to a land or maritime strategy.

"People need to understand that the American way of war has changed," General Fogleman said.

In a speech at an airpower doctrine seminar at USAF's Air War College at Maxwell AFB, Ala., in April, General Fogleman noted that US military leaders who conducted Operation Desert Storm in 1991 had reached a critical conclusion. "We discovered," he said, "that conventional air operations could not only support a ground scheme of maneuver but also directly achieve operational- and strategic-level objectives—independent of ground forces or even with ground forces in support."

He said airpower "has fundamentally changed the nature of warfare, but our joint and combined doctrine has not caught up with this development."

The General took pains to make clear that he rejects the idea that the Air Force can win wars by itself, a charge often leveled at the Air Force with little supporting evidence.

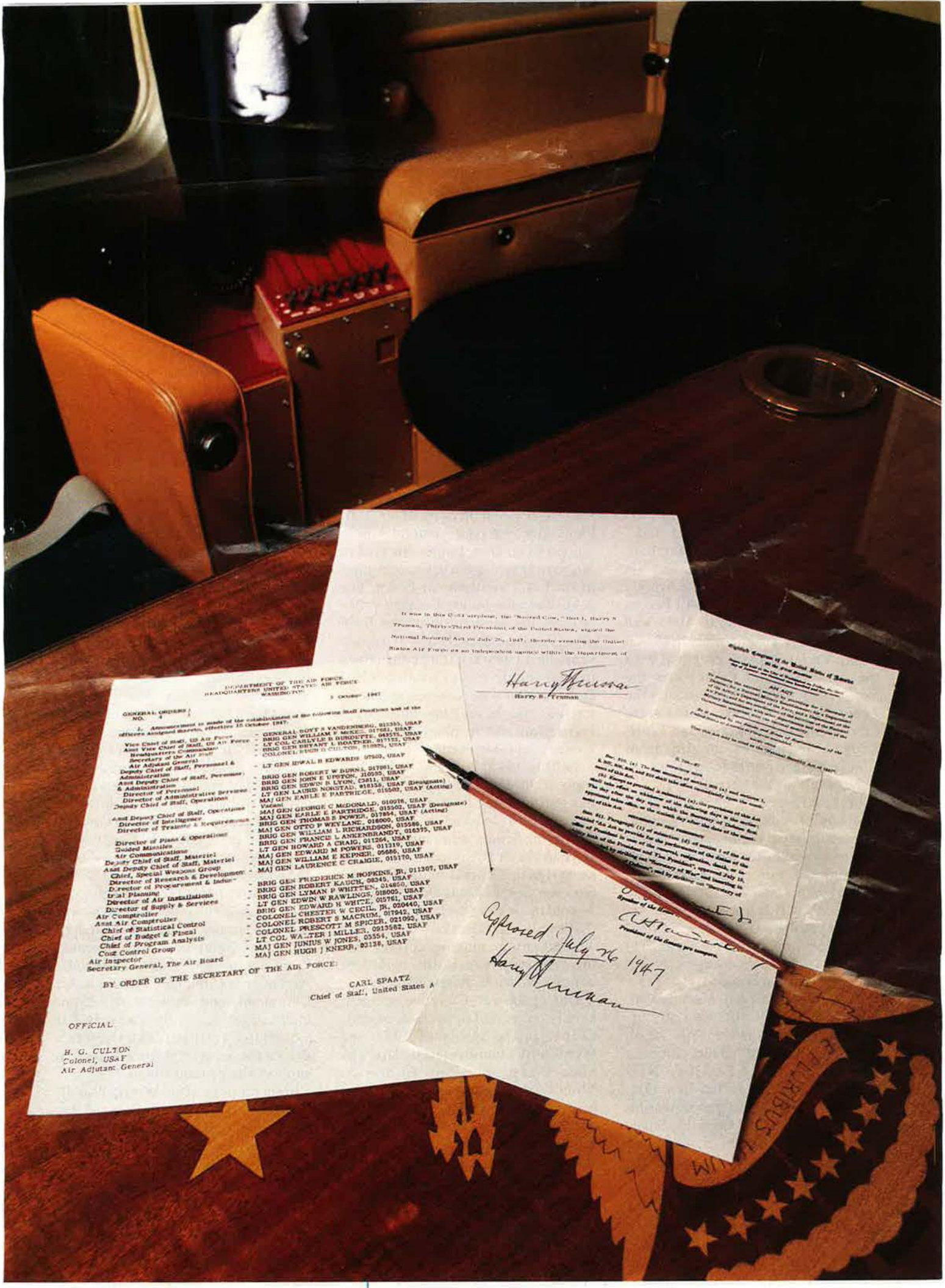
"Don't misunderstand me," he told his audience. "I'm not claiming we have all the answers or can go it alone. That's certainly not the case." Rather, said the General, USAF must "ensure that our doctrine provides us the tools necessary to orchestrate airpower in conjunction with other component operations, because this produces tremendous synergistic effects." The capabilities of the Air Force must always be employed "to accomplish the objectives of the joint force commander—the commander in the field," he said.

More Equal Than Others

But he also said that, in his last six years of joint assignments, "one of the fundamental truths I've discovered is that joint warfare is not necessarily an equal-opportunity enterprise."

The General described the 1991 Gulf War—which set new standards for speed of success and minimal casualties—not as a "template" for how all future wars will be waged but rather as "a proving ground" for the modern capabilities of airpower. The air campaign—including the airborne sensors that provided superior knowledge of enemy movements—was a decisive demonstration "that the technology has caught up with the vision," General Fogleman said. "The capability has been proven."

The Gulf War was also an example "of what airpower can do when you have an enlightened commander in chief," the General told *Air Force* Magazine. He said Gen. H. Norman Schwarzkopf, the overall commander of coalition forces in the Gulf, "was under a lot of pressure to kick off the land campaign early, . . . [but] he understood that with his airpower, . . . landbased [and] seabased, he had a tool [with which] he could be working on the other guy's center of gravity while he was building up his land forces." This, in turn, "took away



It was in this C-54 airplane, the "Sacred Cow," that I, Harry S Truman, Thirty-Third President of the United States, signed the National Security Act on July 26, 1947, thereby creating the United States Air Force as an independent agency within the Department of

Harry Truman

Harry S. Truman

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON

3 October 1947

GENERAL ORDERS
NO. 4

1. Announcement is made of the establishment of the following Staff positions and of the officers assigned thereto, effective 15 October 1947.

Vice Chief of Staff, US Air Force	- GENERAL HOYT S VANDENBERG, 012355, USAF
Asst Vice Chief of Staff, US Air Force	- BRIG GEN WILLIAM F MCKEE, 017981, USAF
Headquarters Commandant	- LT COL CARLYLE B BURDETTE, 043515, USAF
Secretary of the Air Staff	- BRIG GEN BRYANT L BOATNER, 017173, USAF
Air Adjutant General	- COLONEL HUGH G CULTON, 010875, USAF
Deputy Chief of Staff, Personnel & Administration	- LT GEN IRVAL B EDWARDS 07503, USAF
Asst Deputy Chief of Staff, Personnel & Administration	- BRIG GEN ROBERT W BURNS, 017981, USAF
Director of Personnel	- BRIG GEN JOHN E UPSTON, 010595, USAF
Director of Administrative Services	- BRIG GEN EDWIN B LYON, 03811, USAF
Deputy Chief of Staff, Operations	- BRIG GEN EDWIN B LYON, 03811, USAF (Designate)
	- LT GEN LAURIS NORSTAD, 018134, USAF (Acting)
	- MAJ GEN EARLE E PARTRIDGE, 015502, USAF (Acting)
Asst Deputy Chief of Staff, Operations	- Vacant
Director of Intelligence	- MAJ GEN GEORGE C MCDONALD, 010016, USAF
Director of Training & Requirements	- MAJ GEN EARLE E PARTRIDGE, 015502, USAF (Designate)
	- MAJ GEN THOMAS S POWER, 017854, USAF (Acting)
	- BRIG GEN OTTO P WEYLAND, 018000, USAF
Director of Plans & Operations	- MAJ GEN OTTO P WEYLAND, 015586, USAF
Guided Missiles	- BRIG GEN WILLIAM L RICHARDSON, 016375, USAF
Air Communications	- BRIG GEN FRANCIS L ANDREWS, 011264, USAF
Deputy Chief of Staff, Materiel	- LT GEN HOWARD A CRAIG, 011319, USAF
Asst Deputy Chief of Staff, Materiel	- MAJ GEN EDWARD M POWERS, 05686, USAF
Chief, Special Weapons Group	- MAJ GEN WILLIAM E KEPNER, 015170, USAF
Director of Research & Development	- MAJ GEN LAURENCE C CRAIGIE, 011307, USAF
Director of Procurement & Industrial Planning	- BRIG GEN FREDERICK M HOPKINS, JR., 011307, USAF
Director of Air Installations	- BRIG GEN ROBERT KAUCH, 08345, USAF
Director of Supply & Services	- BRIG GEN LYMAN P WHITTEN, 014850, USAF
Air Comptroller	- BRIG GEN LYMAN P RAWLINGS, 018005, USAF
Asst Air Comptroller	- LT GEN EDWIN W WHITE, 015761, USAF
Chief of Statistical Control	- BRIG GEN EDWARD H CECIL, JR., 020440, USAF
Chief of Budget & Fiscal	- COLONEL CHESTER W MACRUM, 017942, USAF
Chief of Program Analysis	- COLONEL ROBERT S MACRUM, 021092, USAF
Cost Control Group	- COLONEL PRESCOTT M SPICER, 0213582, USAF
Air Inspector	- LT COL WALTER J MILLER, 03554, USAF
Secretary General, The Air Board	- MAJ GEN JUNIUS W JONES, 02138, USAF
	- MAJ GEN HUGH J KNERR, 02138, USAF

BY ORDER OF THE SECRETARY OF THE AIR FORCE:

CARL SPAATZ
Chief of Staff, United States A

OFFICIAL

H. G. CULTON
Colonel, USAF
Air Adjutant General

Public Law 253 - 80th Congress
Chapter 343 - 1st Session
S. 758

AN ACT

To promote the national security by providing for a Secretary of Defense; for a National Military Establishment; for a Department of the Army, a Department of the Navy, and a Department of the Air Force; and for the coordination of the activities of the National Military Establishment with other departments and agencies of the Government concerned with the national security.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Security Act of 1947".

Approved July 26 1947
Harry Truman

General Arnold, who had succeeded the late Maj. Gen. Oscar Westover in September 1938 as Chief of the Air Corps, immediately activated his ties to the aircraft industry; the result was the start of enormous airpower mobilization for war.

The Ostrich Egg

Roosevelt's lofty, if impossible, aircraft production goal subsequently prompted Robert A. Lovett, assistant secretary of war for Air, to warn General Arnold, "It is a little bit like asking a hen to lay an ostrich egg. It is unlikely that you will get the egg, and the hen will never look the same." General Arnold replied that the goal was ambitious, but "if we can induce her to lay it, I feel that we must accept the wear and tear on the hen."

With Nazi Germany on the rampage in Europe, the Army Chief of Staff, Gen. George C. Marshall, and the Secretary of War, Henry L. Stimson, moved "to permit Air Force autonomy in the degree needed." General Arnold, General Marshall, and Secretary Lovett agreed that the major task was to build up the Army's combat air arm. The Army Air Forces was established in June 1941 and achieved *de facto* autonomy in March 1942, when it became co-equal with the Army Ground Forces and the Services of Supply, subsequently the Army Service Forces. At the same time, General Arnold became a full-fledged member of the US Joint Chiefs of Staff, representing the AAF view on all air matters.

In the midst of a global war, General Arnold, with immense foresight, created groups within AAF Headquarters to plan for a postwar independent Air Force. In early 1942, only a few months after the Japanese attack on Pearl Harbor, General Arnold created his Advisory Council to consider important issues and deal with organizational concepts relevant to a postwar Air Force.

This council, first headed by Col. Charles P. Cabell, included at various times during the war Cols. Jacob E. Smart, Fred M. Dean, Emmett O'Donnell, Jr., and Lauris G. Norstad. Colonel Smart recalled that, when he reported to General Arnold, the AAF Chief emphasized that Smart should spend 100 percent of his time "thinking" and "not doing any of the routine work of the staff."

Subsequently, General Arnold and Colonel Smart presented to General Marshall a concept that they thought was sound. General Marshall turned it down cold. As they walked back to General Arnold's office, the General admonished Colonel Smart, "From now on, I want you to spend thirty percent of your time thinking and seventy percent on how to sell an idea." Equally important, General Arnold formed the Special Projects Office in April 1945 under Col. F. Trubee Davison (former assistant secretary of war for Air) to coordinate the AAF's postwar planning with the War Department General Staff.

Even before the war, General Arnold made it a top priority to identify and encourage officers whom he thought well suited to key command and planning positions. In July 1943, with an eye firmly on postwar planning, he brought Brig. Gen. Laurence S. Kuter back to Washington from the Mediterranean theater, appointing him as assistant chief of air staff, Plans. One year later, General Arnold tapped Brig. Gen. Lauris Norstad to return to Washington to become chief of staff of Twentieth Air Force. The AAF had encountered severe problems in the production of the B-29 bomber, and General Arnold wanted someone in whom he had confidence to take charge of its planning. General Norstad was destined to play a crucial role in crafting unification legislation and in planning for the independent Air Force.

In May 1945, with the war in Europe at an end and Japan defeated but still refusing to surrender, General Arnold ordered Kuter to the Pacific as deputy commander of the AAF in the Pacific Ocean Area, and he assigned General Norstad to the two-star post as Plans chief. General Arnold made clear to General Norstad that he should take the lead in postwar planning, making certain that the postwar organization would be compatible with independence.

During the war, Congress was also keenly interested in postwar organization. In the spring of 1944, the Woodrum Committee (named for Virginia Democratic Rep. Clifton A. Woodrum) considered the question of unity of command. This committee failed to report legislation but opened the way for creation of the JCS Special Committee for Reorganization of National Defense. Headed by Adm. James O. Richardson, the committee in April 1945 recommended the establishment of a single Department of National Defense with three co-equal services. Admiral Richardson himself cast the lone vote dissenting from the majority report. He opposed formation of a separate Air Force, fearful that the Navy would lose its air arm.

When the US dropped two atomic weapons on Japan and the war ended, General Arnold, Gen. Carl A. Spaatz (who would succeed General Arnold as Commanding General, AAF, in February 1946), Lt. Gen. Ira C. Eaker, AAF deputy commander, and General Norstad turned their full attention to reorganization. Their goal was to make the Army Air Forces co-equal with the War Department General Staff, which would preserve the position that the AAF enjoyed in wartime and enable it to make the transition into a single department setup. General Spaatz said, "When it came time for the Air Force to assume a co-equal status with the other services, there would be need for only a minimum amount of reorganization."

Keep Your Shirts On

However, in late 1945, the War Department boards that considered reorganization rejected the AAF's view and made the Air Staff co-equal with the Army Ground Forces Staff under the War Department Staff. The AAF leaders were chagrined, but Gen. Dwight D. Eisenhower, a promoter of airpower independence, assured General Spaatz of his continuing strong support. Said General Eisenhower, "The Air Force boys should keep their shirts on and plan for separate airpower."

In March 1946, General Spaatz—after talks with General Eisenhower (who had replaced General Marshall as Army Chief of Staff)—created three major combat air commands: Air Defense Command, Strategic Air Command, and Tactical Air Command. Formation of Tactical Air Command fulfilled Eisenhower's desire for a tactical air element to support the ground forces.

Immediately after World War II, Generals Arnold and Eisenhower emphasized that the most important lesson of the war was the absolute necessity for unity of command. This meant the emergence in the various theaters of an autonomous air ele-

ment, commanded by an airman, co-equal with the land and naval forces, each responsible to the Supreme Allied Commander.

"Only with this co-equal status," General Arnold argued, "could the air commander authoritatively present before the Supreme Commander what he could accomplish, assume the responsibility for its accomplishment, and be free to carry out that responsibility with full appreciation of air capabilities and limitations."

During the war, coordination had been achieved through actions of various committees and boards of the Joint Chiefs of Staff. However, General Arnold noted that there were "too many vital and basic matters on which there had been no agreement and therefore no solution. . . . Without the pressures of war, the coordination that does exist will tend to become less complete and less effective." In short, the time had come to legislate a single Department of National Defense with three co-equal services—land, sea, and air.

General Arnold should be considered the first founder of the Air Force, but General Eisenhower must be recognized for the role he played in persuading Congress to establish an independent Air Force. General Arnold's advocacy was complemented by Eisenhower's statesmanship.

The basic argument advanced by General Eisenhower to Congress clearly carried the day. In key testimony on November 16, 1945, on the subject of unification, Eisenhower immediately departed from his prepared remarks and stressed the crucial contribution of the air forces to D-Day operations and victory in Europe. He said:

"The Normandy invasion was based on a deep-seated faith in the power of the Air Forces in overwhelming number to intervene in the land battle, *i.e.,* that the Air Forces by their action could have the effect on the ground of making it possible for a small force of land troops to invade a continent. . . . Without that Air Force, without its independent power, entirely aside from its ability to sweep the enemy air forces out of the sky, without its power to intervene in the ground battle, that invasion would have been fantastic. . . . Unless we had faith in airpower as a fighting arm to intervene and make safe that landing, it would have been more than fantastic; it would have been criminal."

General Eisenhower had become an advocate, like General Arnold, of an independent Air Force. The Supreme Commander had worked especially well with General Spaatz in North Africa and western Europe. He admired General Spaatz's quiet competence and called him "the best operational airman in the world." General Eisenhower's respect for what modern airpower could accomplish had grown by leaps. He believed deeply in the principle of the "three-legged stool"—a national defense setup with each service mutually dependent on the others in a single Department of National Defense, fostering unity of command and also economy.

Too Expensive

Eisenhower noted that "competition is like some of the habits we have—in small amounts, they are very desirable; carried too far, they are ruinous." A unified defense establishment would buy more security for less money. After succeeding General Marshall in November 1945 as Army Chief of Staff, General Eisenhower spoke of his deep conviction to the War Department General Staff:

"The Air Commander and his staff are an organization coordinate with and co-equal to the land forces and the Navy. I realize that there can be other individual opinions, . . . but that seems to me to be so logical from all of our experiences in this war—such an inescapable conclusion—that I, for one, can't even entertain any longer any doubt as to its wisdom."

The General added, "no sane officer of any arm could contest this thinking that the air forces have long ago grown up, and, if anything was needed to show their equal status with all others, we certainly have proved it in Europe, and from all I hear they have certainly proved it in Japan."

Additional support for a separate Air Force came from President Harry S. Truman. Having succeeded President Roosevelt in April 1945, Truman had long maintained a close interest in the military, which had been heightened during the war by his Senate committee's oversight of military procurement and its documentation of fraud and waste in the defense industry.

Like General Eisenhower, President Truman was convinced that the defense organization needed to be changed. "One of the strongest convictions . . . I brought to the Presidency," he once said, "was that the antiquated defense setup . . . had to be reorganized quickly as a step toward ensuring our future safety and preserving world peace." The Pearl Harbor disaster, he said, had been "as much the result of the inadequate military system, which provided for no unified command, either in the field or in Washington, as it was any personal failure of Army or Navy commanders."

President Truman recognized the need for a unified command. "The Joint Chiefs of Staff," he said, "are not a unified command." Although during the war there had been cooperation among the services, this would be much more difficult during peacetime when funds became scarce. In many respects an economic conservative, President Truman could no longer abide the services engaging in fierce competition for funds.

President Truman advocated "parity" for airpower, based on the lessons of the war. He said:

"Airpower has been developed to a point where its responsibilities are equal to those of land- and seapower, and its contribution to our strategic planning is as great. In operation, airpower receives its separate assignment in the execution of the overall plan."

In December 1945, President Truman recommended to Congress a single Department of National Defense, headed by a civilian and complemented by an Office of the Chief of Staff of the military. The President's plan was greatly influenced by the existence of the atomic bomb, whose enormous destructive power ended the Pacific war.

With President Truman now clearly behind defense reorganization, General Norstad was ready to play a major role in unification legislation and the promulgation in December 1946 of a unified command plan. In General Arnold, General Norstad had watched a believer in action, with determination to drive things through, no matter what the cost. General Eisenhower's influence on General Norstad was different. The Supreme

The Army Air Corps, 1926–47

Organizational changes in the US Army's air arm prior to and during World War II resulted in some persistent confusion. The key question revolved around the status of the Air Corps.

With establishment of the Army Air Forces on June 20, 1941, the Air Corps became subordinate to the AAF. On March 9, 1942, when the AAF became co-equal with the Army Ground Forces and the Services of Supply (subsequently the Army Service Forces), the Air Corps then continued to exist only as a combat arm of the Army, like the cavalry or infantry.

During the war, personnel continued to be assigned to the Air Corps. Thus, during World War II, documents with the letterhead, "Headquarters Army Air Forces, Washington, D. C.," showed a signature block of "Joseph Smith, Colonel, Air Corps." Congress created the Air Corps on July 2, 1926, and it was abolished with the National Security Act of 1947, establishing the United States Air Force on September 18, 1947.

During World War II, the Army's twenty-eight corps were autonomous. Officers were commissioned into the corps of their specialty. Personnel spent entire careers in a single corps, and officers owed as much loyalty to the corps as to the Army as a whole. The corps had great freedom, and as a result, empire-building was rampant.

Consequently, when USAF was established in September 1947, the Air Force leadership decided not to create a corps system. Most USAF officers were assigned to the Officers of the Line of the Air Force, where they competed on the same promotion list. Exceptions were chaplains, medical personnel, and lawyers. Each of these specialties resided outside the Line of the Air Force, each with its own promotion list. Within the Line of the Air Force, specialization was accomplished by career fields. Unlike the Army's corps system, officers of the Air Force were commissioned into the Air Force and owed their loyalty to the Air Force.

Allied Commander in Europe exhibited the power of reason, the importance of optimism, and the determination not to be derailed by details.

Just before General Arnold's retirement in February 1946, General Norstad held conversations with General Arnold, General Spaatz, and Stuart Symington, assistant secretary of war for Air. All agreed that a future conflict might well start in the air. An independent Air Force should be devoted exclusively to building the world's best Air Force. This meant controlling its own promotion list and presenting its own budget to Congress.

Navy Wariness

In early 1946, General Norstad and Vice Adm. Arthur W. Radford worked closely as advisors to the Senate Military Affairs subcommittee drafting unification legislation. This subcommittee reported a bill in April 1946 that included features of the War Department's Collins plan, the Navy's Eberstadt Report, and General Norstad's own work. The bill called for a single Department of Common Defense, three co-equal services, and a Chief of Staff of Common Defense as military advisor to the President. The Navy however, continued to oppose this legislation. Secretary of the Navy James V. Forrestal and the uniformed naval leaders remained wary of establishing an Office of the Secretary of Common Defense as well as an independent Air Force.

However, President Truman wanted action. He ordered Secretary Forrestal and Secretary of War Robert P. Patterson to resolve their differences over the legislation by the end of May 1946, noting that he had decided not to propose a military Chief of Staff of the Defense Department. General Norstad and Symington went to work and were careful to keep Patterson informed.

General Norstad enjoyed a fine working relationship with Symington, who said, "I have put my heart and my lungs in your hands." General Norstad and Symington met with Forrestal and Admiral Radford and during May reached agreement on eight points. However, they failed to resolve the difficult questions of a single department, a separate Air Force, the future of land-based aviation, and the status of the Marine Corps.

President Truman reacted by meeting with Patterson, Forrestal, Norstad, and Radford, stressing that a Department of National Defense should be created, headed by a civilian. Each military department would be administered by a civilian secretariat. The Navy would be able to keep the Marine Corps, Truman said, and also aircraft essential for naval operations. The services, the President told Patterson and Forrestal, "should perform their separate functions under the unifying direction, authority, and control of the Secretary of National Defense. The internal administration of the three services should be preserved in order that the high morale and *esprit de corps* of each service can be retained."

Forrestal then implemented an important change in the unification negotiations by replacing Admiral Radford with Vice Adm. Forrest Sherman. Even within the Navy, Radford had been considered a "hard-liner." Forrestal and Adm. Chester Nimitz, the Chief of Naval Operations, concluded that Admiral Sherman could negotiate more effectively, and it was now clear that President Truman would not tolerate any stalling. Admiral Sherman was not opposed to a separate Air Force and was considered more moderate than Admiral Radford, who subsequently noted that Admiral Sherman and General Norstad had "removed the impasse between the services."

Ike's Signal

The JCS in July 1946 formally charged General Norstad (now director of Plans and Operations for the War Department General Staff) and Admiral Sherman with writing a draft unification plan that could be supported by both the Army and Navy. As head of Plans and Operations, General Norstad held a position that more than a decade earlier had been filled by Brig. Gen. Frank M. Andrews, the first airman to hold the post. Eisenhower had specifically requested General Norstad, indicating his confidence in the airman and simultaneously signaling the War Department as to where he stood on unification.

General Eisenhower and AAF leaders desired unity of command based on functions, whereas the Navy wanted to establish commands according to geographic areas. General Norstad and Admiral Sherman wanted to create a system of unified commands in which every theater would have a commander responsible to the Joint Chiefs of Staff. Every unified commander would have a joint staff with

three service commanders under him. Each theater commander would control land, sea, and air operations in a specific area. The problem in the Pacific (which had made for a sometimes sticky situation during the war) was solved by forming two commands—Far East Command and Pacific Command. Seven unified commands were created under the Outline Command Plan, approved by the JCS and signed by President Truman in December 1946.

Following approval of the plan, General Norstad and Admiral Sherman worked closely with the Senate Military Affairs Committee, which provided for a Secretary of National Defense and Army, Navy, and Air Force departments, each headed by a civilian.

Roles and missions would be defined by executive order, to be issued concurrently with Truman's approval of the legislation. General Norstad and Admiral Sherman agreed that they would always appear together before the committee. "We agreed," General Norstad said, "that if one of us was called, one would notify the other and would also suggest to the committee that they call the other member. Admiral Sherman and I were invited every time. It was clear that there were differences between us, but they never really split us on the principles. We never wasted time re-arguing differences between the services."

In late February 1947, President Truman sent Congress a draft of the National Security Act of 1947, calling for a Secretary of National Defense to head a National Military Establishment consisting of departments of the Army, Navy, and Air Force. The Marine Corps would remain part of the Navy Department, and naval aviation would handle naval reconnaissance, antisubmarine warfare, and protection of shipping.

Hearings were held in the House and Senate, and in early June the Senate Committee on Armed Services approved the bill. A conference committee crafted final legislation, and on July 26, 1947, President Truman approved the National Security Act of 1947, establishing the Office of the Secretary of National Defense and co-equal services—including a United States Air Force.

Flexibility

The National Security Act allowed the Air Force flexibility in organizing its headquarters and field structure. Like the Army and Navy, the Air Force would be constituted as an executive department. The Department of the Air Force would be headed by the Secretary of the Air Force, a civilian appointed by the President and confirmed by the Senate. The US Air Force was established under the Department of the Air Force. The USAF Chief of Staff would be appointed by the President for a four-year term. All officers, warrant officers, and enlisted men of the Army Air Forces would be transferred to the US Air Force.

President Truman's first choice to be Secretary of National Defense was the esteemed Robert P. Patterson, Secretary of War, but he turned the post down, saying that his finances dictated that he leave government service. President Truman then chose James Forrestal, who might have been expected to influence those naval officers who all along had opposed unification and the formation of an independent Air Force.

Stuart Symington, assistant secretary of war for Air, who had spearheaded the unification drive in Congress, was named by President Truman as the first Secretary of the Air Force. General Spaatz became the first Air Force Chief of Staff.

Thus, the creation of the Air Force in 1947 marked the culmination of a long journey. However, as Secretary Symington noted, it was also only the first chapter in a longer story. Much remained to be done, and many challenges would have to be confronted. Although service roles and missions had been detailed by President Truman via executive order, a long struggle over functions was inevitable. As Mr. Symington observed, the Secretary of National Defense had been dealt a weak hand, and this office would have to be strengthened, as indeed it would be in 1949. In the year preceding the 1949 amendments to the National Security Act, Defense Secretary Forrestal had been unable to resolve roles-and-missions conflicts among the services. In deep mental distress, he resigned in March 1949 and subsequently took his own life.

The Air Force has often been described as the most technologically advanced of the military services. This was as true in 1947 as it is in 1996. Underlying the technology, however, and the doctrine, plans, and organizations, were the people who shaped the vision and the optimism over long decades, culminating in a United States Air Force. These were courageous pioneers, and their images remain vivid in our minds: flying crude machines in rough weather, putting their lives on the line; accomplishing record long-distance flights and breaking speed records in the 1920s and 1930s; expressing unpopular ideas, putting their careers in jeopardy; and building global air forces in World War II that defeated totalitarianism.

The airmen who led the Army Air Forces in a war that spanned the globe were the same visionaries who formed the Air Force before giving way to a new generation. Their perspective remains relevant. "We believe," General Eaker said in June 1947, "that the Air Force stands at the threshold of a new era. Whereas in the past it has been largely a corps of flying men, in the future . . . it will be more nearly a corps of technicians and scientists."

Perhaps no airman possessed as brilliant and farsighted a vision as General Arnold. The aircraft of today, he said in 1945, are "the museum pieces of tomorrow." To General Arnold, "an air force is always verging on obsolescence. Present equipment is but a step in progress, and any air force that does not keep its doctrines ahead of its equipment, and its vision far into the future, can only delude the nation into a false sense of security." ■

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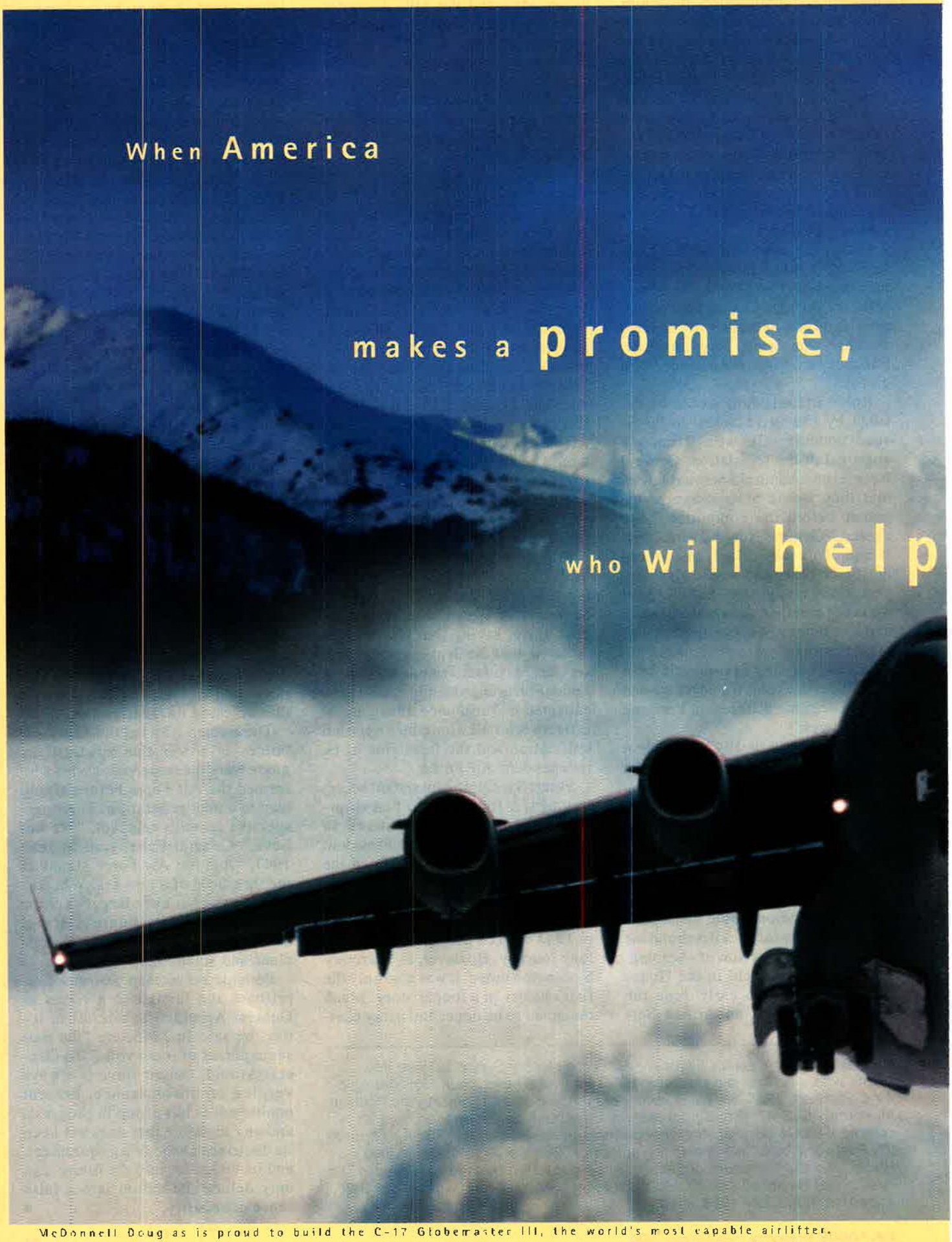

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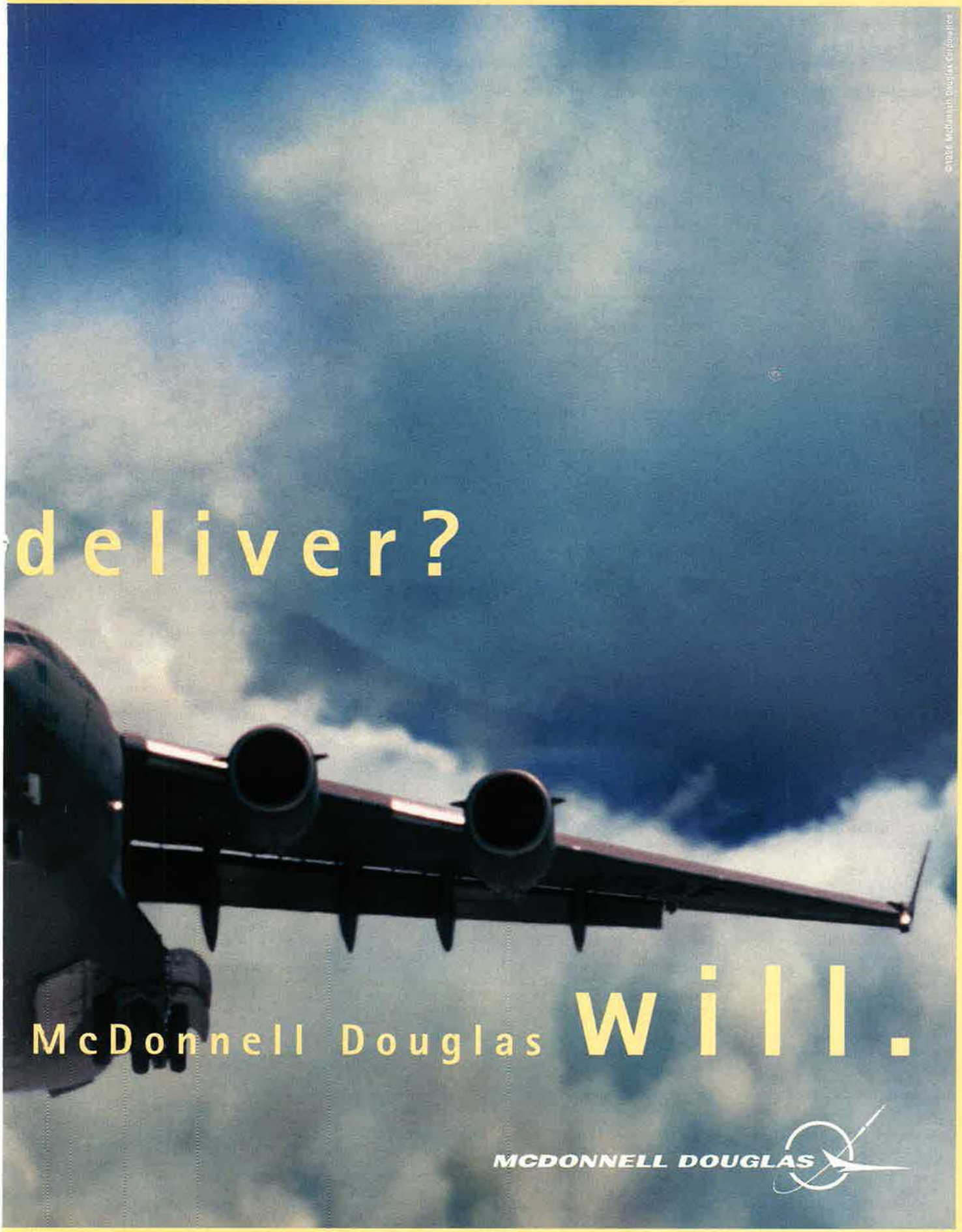
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When the mission calls for guided weapons, Texas Instruments keeps the Air Force on target.

HARM Targeting System currently on the F-16

JSOW – Joint Stand-Off Weapon

WCMD – Wind Corrected Munitions Dispenser

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When duty calls, the Air Force has to be ready at a moment's notice. And one company, TI, is ready to give them every competitive advantage with surgically precise guided weapons systems. Like the HTS, which makes the F-16 a fully-integrated HARM delivery system. Or JSOW, which allows pilots to fire accurately – "no more going downtown." Or WCMD, a technology that knocks the wind out of dispenser weapon delivery.

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TEXAS INSTRUMENTS

what's next

These five intelligence specialists are AFA's 1996 Team of the Year.

Inside Intel

The 1996 Team of the Year members (left to right) TSgt. William D. Thomas, TSgt. Edwin K. Warwick, A1C Gabriel B. Bowie, A1C John S. Foreman, and SSgt. Joseph L. Kipping take time out during a visit to Washington, D. C.

Air Force intelligence personnel obtain information from many and varied sources, process it, and rapidly disseminate the product, which can range from images to unique signals plucked from the air by sophisticated collection systems. Five enlisted members from the intelligence field were selected by the Air Force and AFA as the 1996 Team of the Year.

Honorees were chosen from among seven career fields comprising some 10,000 enlisted personnel throughout the Air Force. At a salute to this year's team, AFA National President Gene Smith stated, "Although intelligence has always been a force-multiplier, in today's unsettled world, intelligence is even more important."

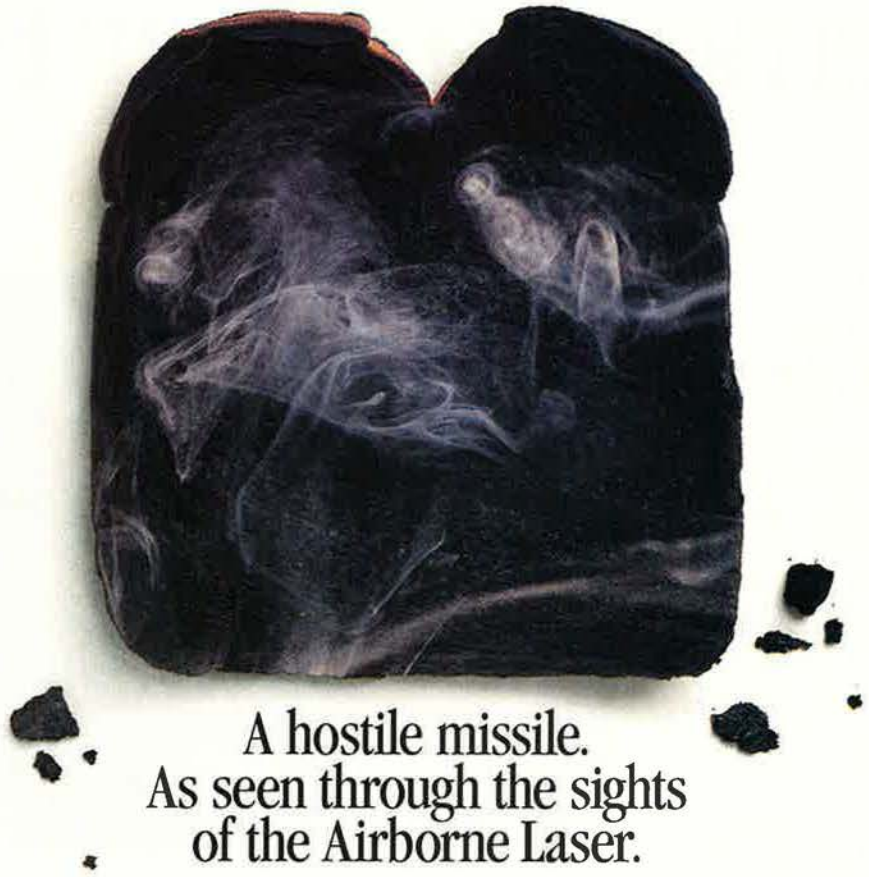
■ **A1C Gabriel B. Bowie** is an intelligence operations apprentice, assigned as a tactical air analyst to the 32d Air Intelligence Squadron, Ramstein AB, Germany. Airman Bowie's supervisors commend his outstanding work as an analyst of Middle Eastern and Balkan air activity. He also served two tours as an indications and warning analyst—one supporting the US National Intelligence Cell in Vicenza, Italy, the other supporting US Air Forces in Europe's headquarters staff. At the intelligence cell, he was watch NCO, providing intelligence support for such high-tempo Balkan air operations as Operations Provide Promise and Deliberate Force.

■ **A1C John S. Foreman,** an imagery interpreter apprentice, is assigned to the 30th Intelligence Squadron, Langley AFB, Va. He deployed to Saudi Arabia in support of Operation Vigilant Warrior, which began in the fall of 1994, and was commended for furnishing timely and accurate intelligence products. In 1995, he was on temporary duty in the Persian Gulf region for 170 days, supporting Operation Southern Watch over Iraq. While deployed, he was chosen to be imagery editor for advanced synthetic aperture radar system missions. He is the only junior airman who has qualified for supervisory duty in the Mission Intelligence Segment, where contingency airborne reconnaissance system operations are directed.

■ **SSgt. Joseph L. Kipping** is a signals intelligence (sigint) production journeyman, serving as a command-and-control warfare (C^2W) intelligence analyst at the Air Force Information Warfare Center, Kelly AFB, Tex. His installation of nine Sensor Harvest C^2W Integrated Target Analysis tools provided the Air Staff with state-of-the-art C^2W data for contingency planning and provided C^2W targeting analysis of potential adversaries. At the request of the Naval Security Group commander, Sergeant Kipping installed Sensor Harvest C^2W on the Sixth Fleet flagship USS *LaSalle*.

■ **TSgt. William D. Thomas,** a cryptologic linguist, is assigned to Tactical Information Broadcast Service (TIBS) programs, Air Intelligence Agency, Kelly AFB, Tex. He has resolved severe problems plaguing European TIBS operations that support troops in Bosnia-Hercegovina. He established himself as the authority on TIBS operations and training. He served as AIA's in-theater liaison with the Directorate of Operational Requirements, coordinating both intelligence and operational requirements. He also trained NATO operators and has deployed six times in recent years in support of Operations Desert Storm, Southern Watch, Provide Comfort, and Provide Promise.

■ **TSgt. Edwin K. Warwick,** a sigint analyst, 381st Intelligence Squadron, Elmendorf AFB, Alaska, serves as a surveillance-and-warning center supervisor. His superiors say that he distinguished himself as leader of Elmendorf's Tactical Sigint Interface Center. His production of intelligence information for Southern Watch commanders and Washington area users was outstanding—more than 300 error-free, time-sensitive, technical reports. In one instance, he created an on-the-spot solution to communications problems that threatened the ability of USAF units in the Gulf region to process urgent information. ■



A hostile missile. As seen through the sights of the Airborne Laser.

A missile rises from an enemy launch site. It's still accelerating when a searing beam of energy bursts from the horizon, destroying the weapon in an instant, while still over the territory of those who launched it.

The Air Force's Airborne Laser (ABL) will revolutionize the way we fight–and prevent–wars. The autonomous ABL can fly anywhere in hours, ready for action upon arrival. Able to destroy enemy missiles while they're still climbing, it's a valuable complement to other systems that address these threats later in their flights.

ABL is the outgrowth of a quarter-century of technical progress–mature, and ready to report for duty. It promises America a true 21st-century defense. And the Rockwell team is directing all its energy to ensure ABL's success.

ABL TEAM

Rockwell

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AFA and the Air Force name the best crews, crew chief, and aerial tactician of 1995.

Foremost in Their Fields

Chennault Award

Best Aerial Warfare Tactician

Maj. Robert J. Beletic of USAFE's 31st Fighter Wing (4190th Provisional Wing), Aviano AB, Italy, wrote the book on the USAF F-16 airborne forward air control (AFAC) mission. The manual he wrote has been submitted to the Air Warfare Center at Nellis AFB, Nev., for inclusion in Multicommand Manual 3-1. It covers AFAC tactics, pilot equipment, rocket employment, and laser-guided bomb (LGB) employment during close air support configurations. As assistant operations officer of the 555th Fighter Squadron, Aviano AB, he planned tactics for the air raids near Pale—the Bosnian Serb stronghold—during Operation Deliberate Force in Bosnia-Hercegovina, marking the first time F-16s have used LGBs in combat. He wrote the wing upgrade syllabus and developed an extensive training program. Major Beletic was largely responsible for planning the employment of LGBs used in Deliberate Force. His tactics also provided crews maximum flexibility during poor weather in Bosnia.

Hoyt Award

Best Air Refueling Aircrew

The professionalism of the crew of TURBO 48, 22d Air Refueling Wing, McConnell AFB, Kan., saved a multimillion dollar Air Force aircraft and its crew. On March 16, 1995, GASSR 31—a KC-135R from Altus AFB, Okla.—lost its left main landing gear truck assembly in a routine touch-and-go landing at the base. With little fuel and few options, the tanker called for assistance. Forty-six minutes later, the TURBO 48 crew was flying toward the crippled tanker for a reverse-refueling rendezvous. Once in position behind GASSR 31, TURBO 48 began supplying fuel. Complicating the procedure was GASSR 31's inability to refuel at tech-order airspeeds. The rescue tanker fought to maintain aircraft control, refueling the aircraft at thirty knots below prescribed speed. After multiple refuelings of GASSR 31, the TURBO 48 crew flew chase until the damaged aircraft landed safely at White Sands Space Harbor, N. M. Crew (left to right): Capts. Glenn M. Farrar and Michael E. Leighton. Not pictured: Capts. Nicholas S. Myers, Bradley K. Wright, and Thomas E. Wood, and MSgt. Jack B. Martin, Jr.

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Dec. 22, 1994
May 14, 1995
July 10, 1995
Nov. 6, 1995
Dec. 5, 1995
April 24, 1996
May 12, 1996
April 24,1996
May 12, 1996

July 2, 1996. Another thunderous success for America's silent hero.

Even though this most recent Titan IV launch could be heard up and down the Florida coast, the Titan IV remains America's silent hero. The Titan IV is our nation's primary access to space for national security and interplanetary exploration. We take pride in congratulating the Titan Team for this 179th space launch mission success.

TITAN IV

America's Silent Hero®

A MESSAGE FROM LOCKHEED MARTIN, PROUD MEMBER OF THE TITAN TEAM.

LeMay Award

Best Strategic Aircrew

Based at Barksdale AFB, La., Crew R-70 of the 96th Bomb Squadron set a new world speed-over-distance record in a B-52 during Long Rifle '95. They flew 6,200 miles unrefueled, carrying a payload of nineteen 500-pound bombs, maintaining an average speed of 550 mph. During the flight, the crew also carried out a flight-test program focusing on sensitive telemetry equipment. Conducting the test on a training mission saved the Air Force more than $100,000 in flight-test costs and provided important data. Crew (left to right): aircraft commander Capt. Russell F. Mathers, pilot Capt. Daniel G. Manuel, Jr., radar navigator Capt. Henry C. Jenkins, Jr., navigator Capt. Ralph Delatour, and electronic warfare officer Capt. Allen D. Patton.

O'Malley Award

Best Reconnaissance Crew

This composite crew from the 45th Reconnaissance Squadron and 97th Intelligence Squadron, both of Offutt AFB, Neb., flying an RC-135S Cobra Ball, performed numerous missions of national importance, including a short-notice deployment to collect data on foreign ballistic missile systems. The crew developed tactics, checklists, and safety procedures for a new sensor—a laser range finder—and thus enhanced the aircraft's role in theater missile defense. Crew (left to right): SSgt. Thomas Lawton, Capts. Valerie Noll, Edward Franklin, Richard Blocker III, John Harrison, Robert Floyd IV, and Richard Sutton, and (not pictured) Maj. Jerry Huff, Capts. Thomas Hirstand and David Pavik, MSgt. Robert Allen, TSgts. Robert Brandriff, Wendell Miller, and Mark Trimmer, SSgt. Sherolyn Hallmark, and SrA. Barry Navarre.

Power Award

Best Strategic Missile Combat Crew

Crew S-121—Capt. Paul B. McArthur (standing) and 1st Lt. William L. Rittershaus—Minot AFB, N. D., took first place in the Command Data Buffer weapon system competition at Guardian Challenge 1995. In Minot AFB's first Air Force Space Command Nuclear Surety and Technical Inspection (NSTI), their performance helped their unit, the 742d Missile Squadron, earn an Inspector General rating of excellent. Captain McArthur led the development of the NSTI preparations plan and conducted near-perfect IG-observed evaluations of squadron crews—a key element of the unit's success. Lieutenant Rittershaus's performance on his NSTI missile-procedures trainer observation ride and his 100 percent score on NSTI codes testing were key factors in squadron and group excellent ratings.

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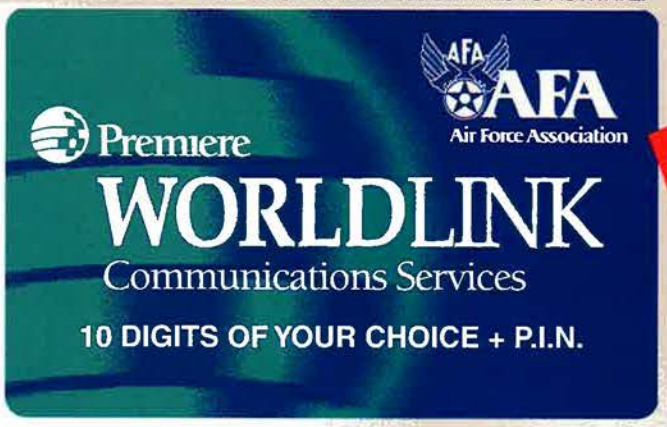

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- **Easy-to-use services –** simple prompts and menus make services a snap to use.
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U.K. to U.S.	$ 7.35	$ 9.64	$ 9.62
Australia to U.S.	$ 8.35	$ 11.40	$ 11.38
New Zealand to France	$ 15.20	$ 19.12	$ 20.94
Singapore to Australia	$ 14.30	No Access*	No Access*

** No Access means calling card does not allow service between these countries. All rates based on U.S. dollar, 5-minute call duration during peak period. Listed AT&T and MCI rates are those in effect as of April, 1996. Rates subject to change without notice.*

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Space Operations Award

Best Space Unit

When the Joint Chiefs of Staff directed a Titan IV launch call-up five months early and ninety days into another launch cycle, the 30th Space Wing launch crew at Vandenberg AFB, Calif., responded. Working twenty-four-hour days for more than 200 days, the crew brought together the efforts of contractors, Air Force agencies, and nearly 900 workers. The result was the fifth successful launch of a Titan IV from Vandenberg (December 5, 1995). The launch achieved a bull's-eye insertion into orbit. Crew (front row): 1st Lt. Jeffery M. Parks, Lt. Col. Michael E. Hatch, Capt. Timothy A. Slauenwhite, and Capt. Kent B. Dalton; (back row): Capt. David G. Helfrich, SSgt. Lee J. Williams, 1st Lt. James E. Colebank, and (not pictured) Capts. Stacey L. Nelson, John S. Shattuck, and Thomas J. Chiavacci.

Tunner Award

Best Air Mobility Aircrew

Despite rain, fog, and overcast, the MUSEL 08 helicopter crew from the 1st Helicopter Squadron volunteered for an emergency medevac mission to transport a retired USAF member from Andrews AFB, Md., to Bethesda Naval Hospital, Md., on November 14, 1995. The UH-1N crew determined that the most direct route would take them near towers and over heavily populated areas. Shortly after takeoff, the weather deteriorated into heavy rain. The crew cut airspeed to seventy knots and relied on low-level visual navigation. Exemplary coordination, pinpoint navigation, and outstanding aviation skills enabled the crew to land safely at Bethesda, in the midst of whipping winds and heavy rain and between tall trees and buildings. Crew: aircraft commander Capt. Michael W. Harding, copilot Lt. Col. Henry B. Gaither, Jr., and flight engineer SrA. James M. Strauss.

CMSAF Thomas N. Barnes Award

USAF's Top Crew Chief

Outstanding leadership, dedication to duty, and desire to complete the mission earned SSgt. Thomas G. Woller the honor of Crew Chief of the Year. Assigned to Hurlburt Field, Fla., he is a dedicated crew chief on an MC-130E Combat Talon with the 8th Aircraft Maintenance Unit, 16th Aircraft Generation Squadron, 16th Special Operations Wing. In 1995, Sergeant Woller maintained a 100 percent mission-effectiveness rate for four consecutive months and launched 249 sorties totaling 931 flying hours, achieving a 92.2 percent on-time departure rate. He was specially selected to work at a bare-base location in a JCS-directed exercise, in which his aircraft performed flawlessly. ■

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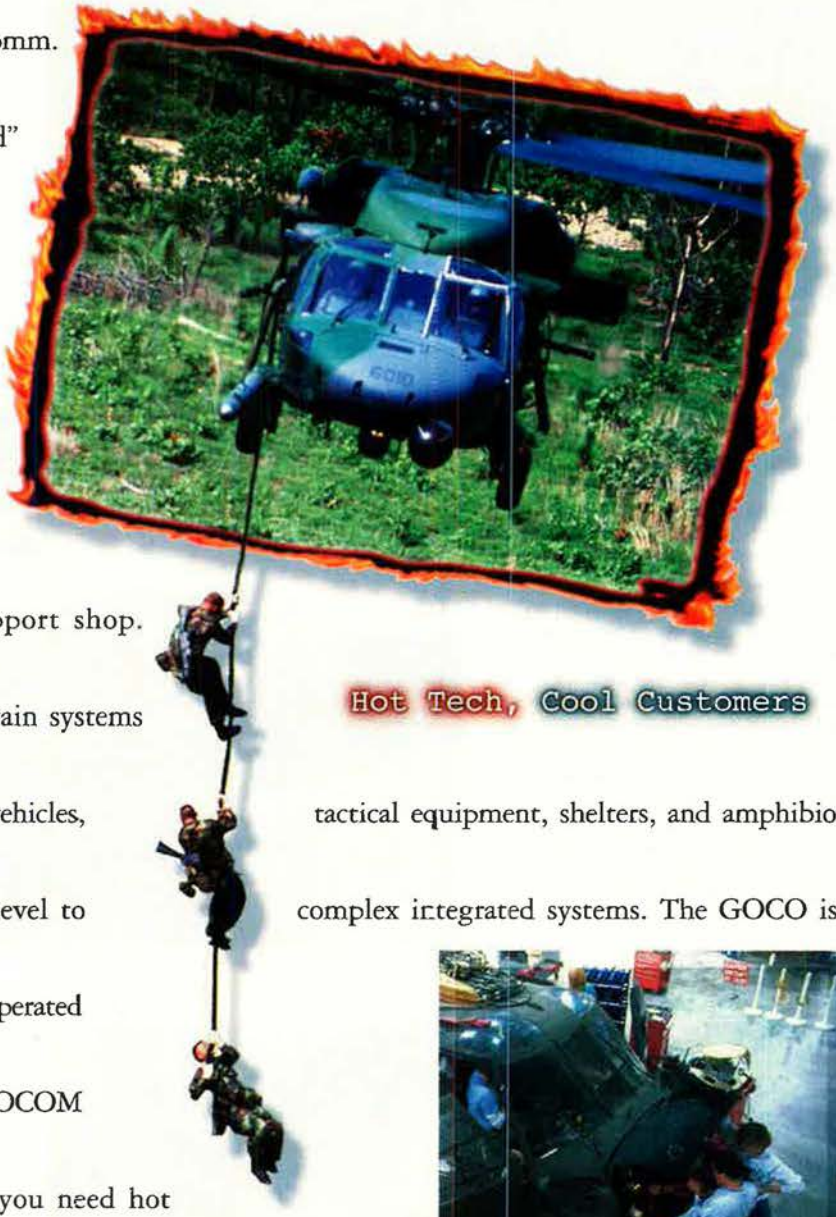

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Raytheon E-Systems

From Indiana to Incirlik, these 1995 ANG and AFRES award winners proved the strength of USAF's Total Force.

On-Call Capability

President's Award

Outstanding AFRES Crew

On June 10, 1995, two C-130Hs from the 64th Airlift Squadron, O'Hare IAP/ARS, Ill., embarked on a mission to an Indiana drop zone. An indicator on one C-130 warned of trouble with the left main landing gear. Bad weather swirled around Chicago, so the crew was directed to Grissom ARB, Ind. The gear would have to be cranked down manually, but a load blocked access to the gear. To empty the C-130, the crew decided to conduct an emergency drop at Grissom, where the drop area was one-half the minimum size. Having gained permission to drop, the loadmasters rerigged the two pallets for a sequential airdrop. Both loads landed squarely on target. The crew then cranked the gear down, returned to Chicago, and landed safely. Left to right: MSgt. James F. Downey, flight engineer, and Capt. Kenneth C. Petray, aircraft commander. Not pictured: Capt. Stephen J. Burling, navigator; 1st Lt. William H. Rohder, copilot; SSgt. Brian Whiteside, flight commander; MSgt. John H. Rossler, loadmaster; TSgt. Larry G. Mitchell, loadmaster; and SSgts. Andrea R. McClam and John T. Moscon, loadmasters.

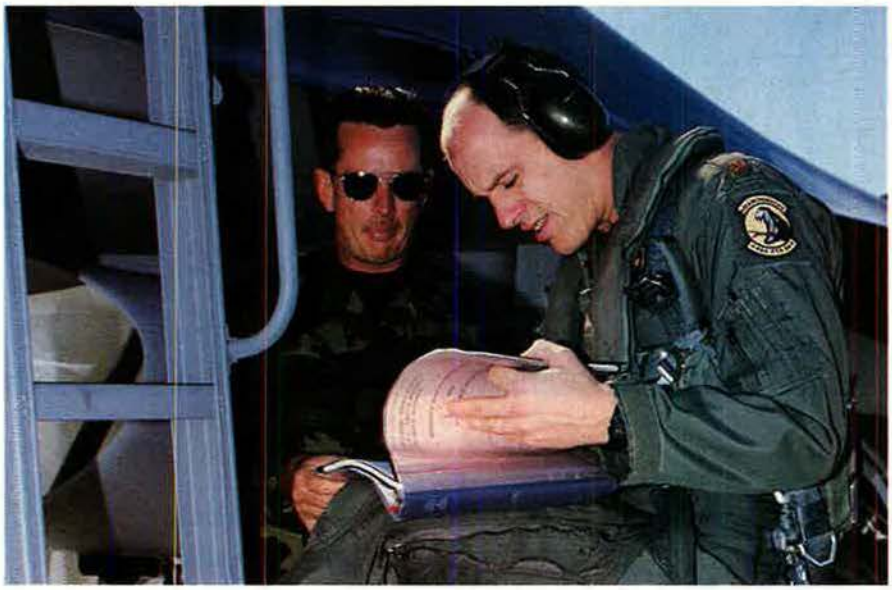
Earl T. Ricks Award

Outstanding Airmanship in the ANG

On December 5, 1995, four members of the 129th Rescue Wing, Moffett Federal Airfield, Calif., rescued a critically injured eighty-two-year-old sailor adrift in a small boat nearly 1,000 miles west of San Diego, Calif., in a storm generating rain squalls, high winds, and twenty-foot swells—at night. The sailor had suffered a critical head injury and had gone without food and water for seven days. The pararescuers from the 129th located the sailor's boat tethered to a small fishing vessel, parachuted into the Pacific, assembled their medical equipment, and struggled on board the sailboat. The team transferred the sailor to the fishing vessel and headed for California, giving him emergency medical treatment around the clock for three days. On day four, the team arrived at Morro Bay, Calif., and took the patient—alive—to a local hospital. Crew: SMSgt. Alan L. Williams. Not pictured: SMSgt. Timothy V. Young and SSgts. Jeffrey A. Borg and Gregory S. Hadfield.

Outstanding Guard Unit

The 104th Fighter Wing, an A-10 unit based at Barnes MAP, Mass., contributed 510 personnel and twelve combat aircraft to Operations Deliberate Force and Deny Flight in the Balkans from August through October 1995. The wing's troops deployed to Aviano AB, Italy, mounted 207 combat sorties, and became the first A-10 outfit whose pilots conducted night combat missions using night vision goggles (NVGs). During Deliberate Force, the 104th achieved the highest overall weapons effectiveness score—95.8 percent—of any unit in theater. The unit also participated in two NVG combat search-and-rescue attempts to retrieve two French flyers shot down over Bosnia-Hercegovina.



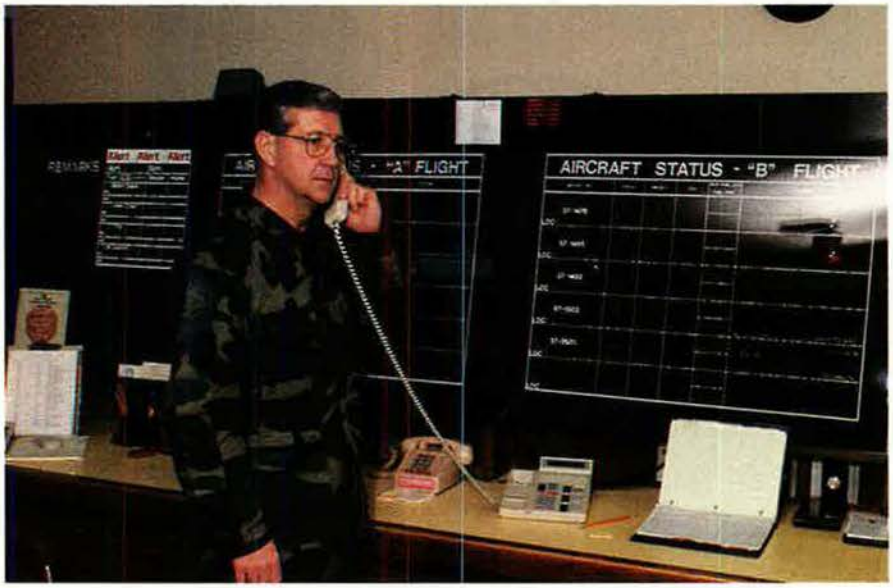
Outstanding Reserve Unit

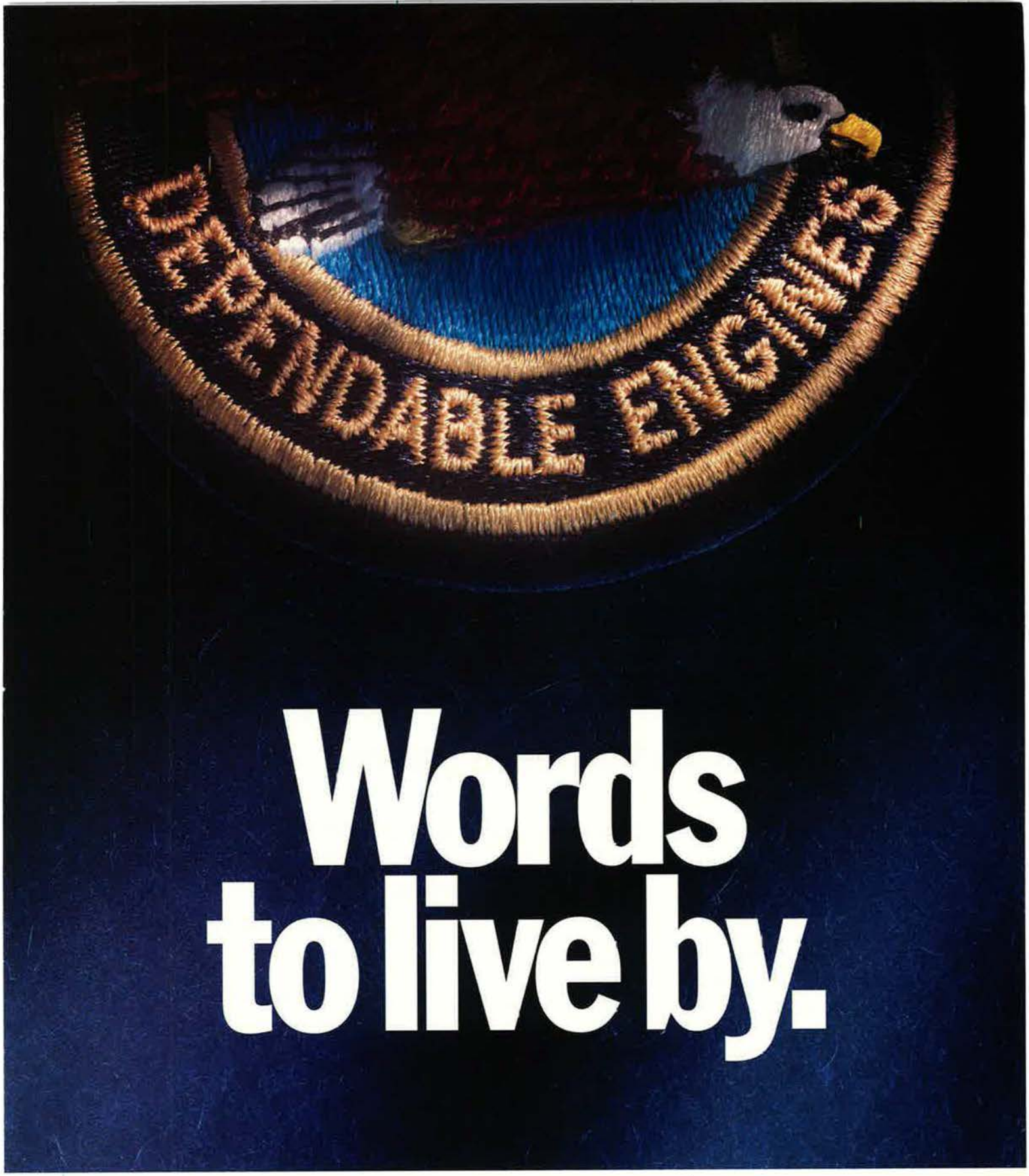
The 419th Fighter Wing, Hill AFB, Utah, combined an operational readiness inspection with a real-world deployment—a first for an AFRES unit. To start the ORI, the 419th deployed eleven F-16s, eighty-four tons of gear, and more than 300 troops to Incirlik AB, Turkey, to participate in Operation Provide Comfort II, the enforcement of a no-fly zone in northern Iraq. Pilots of the 419th flew 513 combat sorties (totaling 1,400 flying hours), becoming the first AFRES wing to cover a tasking of more than seventy-five days single-handedly. The 419th completed a total of 4,297 accident-free flight hours, winning an Air Force Flight Safety Award, with an average mission-capable rate of 87.7 percent—nearly fourteen percentage points above the AFRES goal.

Chief Red Award

Outstanding Aerospace Maintenance

CMSgt. James H. Honeycutt, assigned to the Logistics Support Flight, 134th Air Refueling Wing, McGhee Tyson Airport, Tenn., played a major role in the recent source selection of a contractor for Pacer CRAG, resulting in the award of a $750 million contract to provide a predictive wind shear radar, a flight-management system, and other improvements for the KC-135 fleet. His contributions to testing the AN/ASW-48 digital autopilot system and the successful upgrade of the APN-59 radar system resulted in significant savings. ■





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Gallery of NATO Airpower

By John W. R. Taylor and Paul Jackson

Together with the "Gallery of USAF Weapons" in the May 1996 issue of *Air Force* Magazine, this Gallery gives information on all first-line aircraft and missiles in service with NATO air forces. The French Air Force is also included, as France remains a member of NATO although it withdrew from NATO military command in 1966.

Attack Aircraft

Alpha Jet

Germany is withdrawing the last 30 of its original 175 Alpha Jets, following their relegation to providing "Europeanization" flying for pilots trained in the US. Of the others, 45 were donated to Portugal in 1993. They are operated from Beja by No. 301 Squadron for close air support and TASMO (tactical air support of maritime operation), including six with electronic countermeasures equipment in the rear cockpit, and by No. 103 Squadron for advanced training. No. 301 was declared combat-ready this year and has a NATO role in reinforcing the southern flank in Italy.

Contractors: Avions Marcel Dassault-Breguet Aviation, France, and Dornier GmbH, Germany.
Power Plant: two SNECMA/Turbomeca Larzac 04-C20 turbofans; each 3,175 lb st.
Dimensions: span 29 ft 10¾ in, length 43 ft 5 in, height 13 ft 9 in.
Weights: empty 7,749 lb, gross 17,637 lb.
Performance: max speed Mach 0.86, service ceiling 48,000 ft, max mission radius, hi-lo-hi 668 miles.
Accommodation: basically, crew of two in tandem, on zero/zero ejection seats. Pilot only in combat role.
Armament: hardpoint under fuselage and two under each wing for up to 5,510 lb of stores, including centerline 27-mm gun pod and four cluster bombs, and 82- or 119-gallon tanks. Bombs and rocket packs optional.

AMX

The AMX close-support, battlefield interdiction, and reconnaissance aircraft was developed jointly by aerospace manufacturers in Italy and Brazil. The first of seven prototypes flew in Italy on May 15, 1984, and the first Italian-production AMX on May 11, 1988.

Italy's original requirement for 187 single-seat AMXs to reequip eight squadrons has been scaled down to 136, including 26 AMX-T two-seat advanced trainers. First to receive AMXs in September 1989 was No. 103 Squadron, part of 51 Wing at Istrana. No. 132 Squadron/3 Wing at Villafranca received its first AMX in November 1990; No. 14 Squadron/2 Wing followed in July 1991 and is now at Rivolto; No. 28 Squadron/3 Wing began reequipment in June 1993. The two squadrons of 3 Wing have a partial reconnaissance commitment, using Oude Delft Orpheus camera pods inherited from the unit's former RF-104 Starfighters, to be replaced by an internal sensor package in 2001. Latest to be equipped, in 1995, are Nos. 13 and 101 Squadrons of 32 Wing at Amendola, their advanced training role requiring the additional use of AMX-Ts. At a later stage, the two-seater may be adapted for other roles requiring two crew, for which reason it has been cleared to launch the Marte antiship missile.

Contractor: AMX International (Alenia, Aermacchi, Embraer).
Power Plant: one Rolls-Royce Spey Mk 807 turbofan; 11,030 lb st.
Dimensions: span 32 ft 8½ in (over missiles), length 43 ft 5 in, height 14 ft 11¼ in.
Weights: empty 14,837 lb, gross 23,700–28,660 lb.
Performance: max speed at height Mach 0.86, at S/L Mach 0.84, service ceiling 42,650 ft, combat radius 328 miles lo-lo-lo with 6,000 lb of external stores.
Accommodation: pilot only, on zero/zero ejection seat.
Armament: one 20-mm M61 multibarrel gun; twin centerline pylon and four underwing pylons for bombs, cluster bombs, ASMs, and rocket pods; and two wingtip Sidewinder rails. May gain Elbit Opher IR-guided bomb system. Max external stores load 8,377 lb. Internal bay for reconnaissance or ECM pallets.

Corsair II (A-7E, A-7H, and A-7P)

Sixty landbased A-7H Corsair IIs were delivered to the Hellenic Air Force in 1975–77 for TASMO. Equipping No. 347 Squadron at Áraxos, and Nos. 340 *Lialaps* and 345 *Perseus* at Soúda, they retain the folding wings and 15,000 lb st nonafterburning Allison TF41 turbofan of the US Navy's A-7E on which they are based but have no in-flight refueling capability. They were followed by five two-seat TA-7Hs and 36 ex-USN A-7Es, supplied from March 1993 to Nos. 335 *Tigreis* and 336 *Olympus* Squadrons at Araxos, replacing F-104G Starfighters.

The 43 A-7Ps delivered to the Portuguese Air Force since 1981 are refurbished USN A-7As, with TF30-P-408 engine, a mix of A-7D and A-7E standard avionics, AIM-9P Sidewinders for the secondary role of air defense, ALE-40 chaff/flare dispensers, SPS-1000 RWR, and a Westinghouse ALQ-131 (Block II) ECM pod. They equip Nos. 302 *Falcoes* (for TASMO) and 304 *Magnificos* (for close air support) Squadrons at Monte Real and maintain an occasional detachment in the Azores. Six TA-7Ps were also supplied. The A-7Ps have recently suffered serviceability problems, and several have been withdrawn due to shortage of engine spares. *(Data for A-7P.)*

Contractor: Vought Corporation, USA.
Power Plant: one Pratt & Whitney TF30-P-408 nonafterburning turbofan; 13,400 lb st.
Dimensions: span 38 ft 9 in, length 46 ft 1½ in, height 16 ft 0¾ in.
Weights: empty 16,175 lb, gross 42,000 lb.
Performance: max speed at S/L 697 mph, service ceiling 41,000 ft, combat radius 675 miles.
Accommodation: pilot only, on ejection seat.
Armament: two 20-mm Mk 12 guns; two pylons under fuselage and three under each wing for up to 15,000 lb of Sidewinder AAMs, Maverick and Shrike ASMs, bombs, rocket packs, mines, 30-mm Mk 4 gun pods, ECM pods, sonobuoys, and flares.

Harrier GR. Mk 7

Harrier tactics have changed since the original Mk 1 version demonstrated its ability to operate out of woodland clearings close to a front line. The Royal Air Force's GR. Mk 7 is generally similar to the USMC AV-8B, except for having an additional pair of wing pylons for AIM-9L Sidewinder AAMs. Its greater range enables it to be used for interdiction missions against targets to the rear of a battle area. The Mk 7 retains the basic fuselage of the original Harrier but with a raised cockpit similar to that of the Royal Navy's Sea Harrier and with lift improvement devices under the fuselage. The wing has a supercritical section and is made largely of carbonfiber and other composites. Compared with the wing of the Harrier/AV-8A, it has greater span and area and 10° less sweep. Max external load is 10,800 lb at the max short takeoff and landing (STOL) weight. Equipment includes GEC-Marconi FIN 1075 INS and a Hughes angle rate bombing set (ARBS) with TV/laser target seeker/tracker, working in conjunction with a mission computer.

Delivery of the 94 production single-seat Harrier IIs ordered for the RAF, with the initial designation GR. Mk 5, began in May 1987, the first unit being No. 233 OCU (now No. 20 Squadron) at Wittering. No. 1 Squadron was redeclared to NATO with GR. 5s in October 1989, followed by No. 3 in Germany during 1990. The last 34 RAF aircraft were built to "Night Attack" standard, with the designation GR. Mk 7. Their equipment includes GEC-Marconi forward-looking infrared (FLIR), Smiths head-up and head-down displays, and cockpits compatible with night vision goggles (NVGs). GR. 7 deliveries began in September 1990 to No. 4 Squadron in Germany; No. 3 began upgrading to Mk 7 two months later, followed in June 1992 by No. 1 Squadron (the first RAF Harrier unit to use the night avionics operationally) and the OCU from January 1993. All Mk 5s are being modified to Mk 7 under a contract due to be completed later this year. Delivery of 13 Harrier T. Mk 10 two-seat equivalents of the Mk 7 (lacking only ARBS) began in January 1995. Harriers were based in Turkey for reconnaissance patrols over northern Iraq in 1993–95 and are currently in Italy for missions over the former Yugoslavia, where they saw their first combat in September 1995. These Mk 7s have been further upgraded with FIN 1075G INS, which includes Global Positioning System (GPS). The Harrier force will be concentrated in the UK from 1997. *(Data for Harrier GR. Mk 7.)*

Contractors: British Aerospace plc, UK, and McDonnell Douglas Corporation, USA.
Power Plant: one Rolls-Royce Pegasus Mk 105 vectored-thrust turbofan; 21,500 lb st.
Dimensions: span 30 ft 4 in, length 47 ft 8 in, height 11 ft 7¾ in.
Weights: empty 15,542 lb; gross for VTO 19,180 lb, for STO 31,000 lb.
Performance: max speed at height Mach 0.98, at S/L 661 mph; STOL T-O run 1,427 ft; combat radius (hi-lo-hi) with 4,000 lb weapon load 684 miles.
Accommodation: pilot only, on zero/zero ejection seat.
Armament: provision for two 25-mm gun pods under

AMX, Italian Air Force *(Paul Jackson)*

Harrier GR. Mk 7, Royal Air Force *(Sgt. Rick Brewell)*

fuselage; four hardpoints under each wing, plus centerline position, for two or four Sidewinder AAMs, 12 BL755 or CBU-87 cluster bombs, or five 1,000-lb bombs. Alternatively, 500-lb bombs, Matra 155 or CRV-7 rocket pods, or 300-gallon tanks or centerline reconnaissance pod. GEC-Marconi Zeus internal ECM; Plessey missile approach warning system radar in tailcone.

Jaguar

Jaguars of the RAF and French Air Force were delivered with Adour Mk 102 turbofans, but RAF Jaguars were retrofitted with 7,900 lb st Adour Mk 104s. Those with Nos. 6 and 54 Squadrons at Coltishall are mostly GR. Mk 1As and two-seat T. Mk 2As, with the more compact and capable Ferranti FIN 1064 inertial navigation system (INS) instead of their original NAVWASS (navigation and weapon-aiming subsystem) equipment. They will continue in tactical support and ground-attack roles until replaced by Eurofighter 2000s early next century. However, delays with the Eurofighter have given the Jaguar a new lease of life, resulting in the conversion of 12 aircraft in 1995–96 to carry a GEC-Marconi TIALD (thermal imaging airborne laser designator) pod. These 10 GR. Mk 1B and two T. Mk 2B aircraft also have FIN 1075G INS with GPS. A Jaguar '96 upgrade, now under way, includes BAe Terprom ground proximity warning system.

The French Air Force now has only four squadrons of single-seat Jaguar As in No. 7 Wing at St Dizier and (to disband next year) No. 11 Wing at Toul. The former unit includes a mix of Jaguar As and two-seat Es in Squadron 2/7, the OCU. The last 30 French Jaguars built are equipped to carry ATLIS (automatic tracking laser illumination system) designator pods for AS 30L laser-guided ASMs and laser-guided bombs (LGBs). *(Data for Jaguar A.)*

Contractor: SEPECAT Consortium, France and UK.
Power Plant: two Rolls-Royce Turbomeca Adour Mk 102 afterburning turbofans; each 7,305 lb st.
Dimensions: span 28 ft 6 in, length 55 ft 2½ in, height 15 ft 9½ in.
Weights: empty 15,432 lb, gross 34,612 lb.
Performance: max speed at height Mach 1.3, at S/L Mach 1.1; service ceiling 45,000 ft; typical attack radius, hi-lo-hi 875 miles, lo-lo-lo 570 miles.
Accommodation: pilot only, on zero/zero ejection seat.
Armament: two 30-mm DEFA 553 guns in fuselage; centerline pylon and two under each wing for 10,000 lb of stores, including AS 30L laser-guided ASMs, BGL 400 LGBs, 550 and 880 lb bombs, Belouga cluster bombs, BAP 100 area denial bomblets, BAT 120 antirunway bomblets, F1 rocket pods; Magic 2 AAMs, Barracuda electronic emission detectors, Barem or CT 51J jamming pods, Phimat chaff/flare pods; 317-gallon tanks.

Mirage F1-CT

Fifty-five French Air Force F1-C-200s replaced in the air defense role by Mirage 2000s have been converted to F1-CT standard for attack duties, with a refueling probe, upgraded radar, head-up display (HUD), and INS, plus laser rangefinder, Martin-Baker F10M ejection seat, radar warning receiver (RWR), and ASMs. The first was handed over to what is now Squadron 1/30 *Normandie-Niemen* at Reims in February 1992; 2/30 *Alsace* was declared operational in April 1994. The last F1-CT was delivered on March 27, 1996. *(Data generally as for Mirage F-1.)*

Armament: internal 30-mm gun plus two Magic 2 AAMs on wingtips, rockets, bombs, BAP 100 and BAT 120 bomblets, Belouga cluster bombs, and laser-guided bombs. Max external load 8,820 lb.

Mirage 2000N and 2000D

Following the withdrawal of Mirage IV-Ps from their strategic bombing role, Mirage 2000N two-seat nuclear strike aircraft have complete responsibility for the air attack task of the French *Forces Aériennes Stratégiques*. They have been in service with Squadron 1/4 *Dauphiné* at Luxeuil since July 1, 1988, and with 2/4 *Lafayette* and 3/4 *Limousin* (detached to Istres) since 1989–90. By comparison with the Mirage 2000C, the 2000N has a strengthened airframe for flight at a typical 690 mph at 200 ft above the terrain. Its primary weapon is the 300 kT *Air-Sol Moyenne Portée* (ASMP) medium-range air-to-surface nuclear missile. Equipment includes ESD Antilope 5 terrain-following radar, two SAGEM inertial platforms, two improved TRT AHV-12 radio altimeters, and Thomson-CSF color CRT head-down displays in each cockpit. Self-defense aids comprise two Magic AAMs and an integrated countermeasures suite comprising a Serval RWR, Caméléon electronic jammers, and Spirale automatic chaff/flare dispensers. SAT Samir missile plume detectors were ordered in 1994. The first 25 aircraft, with only ASMP capability, are designated 2000N-K1; 2000N-K2s, built since 1988, also have conventional attack capability. The last of 75 aircraft was delivered in 1993 to complete a fourth squadron (2/3 *Champagne*), which was commissioned at Nancy on September 1, 1991, and uses only nonnuclear armament.

Definitive conventional attack version is the Mirage 2000D, of which 86 have been funded and about half delivered to date. Minor differences from the 2000N include the addition of GPS, one more multifunction display (MFD) in the front cockpit and two more in the rear, and deletion of the ASMP interface; the radar is Antilope 5-3C with terrain reference capability. Both versions can carry two 528-gallon drop tanks, but the 2000D offers a wider choice of weapons, including laser-guided AS 30L ASMs and BGL bombs, Apache standoff weapon dispensers (from 1997), bombs, and rockets, as well as several types of sensor pod. The first squadron, 1/3 *Navarre*, was declared operational at Nancy on March 31, 1994; EC 3/3 *Ardennes* has followed; and EC 2/3 is soon to reequip from 2000Ns. Specification is generally similar to that of the Mirage 2000C, except for a length of 47 ft 9 in.

Jaguar GR. Mk 1A, Royal Air Force

Tornado IDS, Italian Air Force

Atlantic, Italian Air Force
(Paul Jackscn)

Tornado IDS

Fourteen years after entering service, RAF interdictor/strike (IDS) Tornado GR. Mk 1 aircraft currently equip Nos. 9, 14, 17, and 31 Squadrons of Strike Command at Brüggen, Germany, and an OCU, No. 15 Squadron, at Lossiemouth. Their equipment includes a Texas Instruments multimode ground-mapping and terrain-following radar, GEC-Marconi FIN 1010 digital INS, Decca Doppler, HUD, and laser rangefinder and marked target seeker in an undernose pod. Weapons include nuclear bombs (to be withdrawn March 1997), but Nos. 9 and 31 specialize in defense suppression with ALARMs (Air-Launched Antiradiation Missiles), and No. 14 has day/night TIALD (thermal imaging airborne laser designator) pods.

In April 1996, work started on the first of 142 RAF GR. Mk 1s that will undergo a midlife update (MLU), involving embodiment of a FLIR, a digital map generator, new HUD and pilot's MFD, improved ECM, and GPS. The prototype upgraded aircraft, designated Tornado GR. Mk 4, flew May 29, 1993. In 1994, 24 redundant strike Tornados began to reequip Nos. 12 and 617 Squadrons at Lossiemouth, after conversion to GR. Mk 1B standard, with provision for four Sea Eagle antiship missiles.

German Air Force Tornados equip seven strike/attack squadrons, two each with JBG 31, 33, and 34, and one with JBG 38, alongside the OCU. The IDS version also equips Nos. 102, 154, 155, and 156 Squadrons of the Italian Air Force, which, like German squadrons, can carry MW-1 antiairfield bomblet dispensers. Italy also has six Tornados in No. 156 Squadron equipped to carry Thomson-TRT CDLP laser designator pods for Paveway II LGBs.

A joint German-Italian MLU has been formulated in two parts, the first involving addition of increased computer power, MIL-STD-1760 digital data bus, and provision for the Apache standoff weapon and other precision munitions, such as GBU-33 bombs guided by a Rafael Litening designator pod. Part two, in 1999–2001, will add FLIR and an associated MFD, laser INS, GPS, new defensive aids computer, missile approach warning, and enhanced RWR. Updated Italian Tornados will also have a microwave landing system.

Contractor: Panavia Aircraft GmbH (BAe, UK; DASA, Germany; Alenia, Italy).
Power Plant: two Turbo-Union RB199 Mk 103 afterburning turbofans; each 16,075 lb st.
Dimensions: span 45 ft 7½ in spread, 28 ft 2½ in swept, length 54 ft 10¼ in, height 19 ft 6¼ in.
Weights: empty 31,065 lb, gross more than 61,730 lb.
Performance: max speed at height Mach 2.2 clean, Mach 0.92 with external stores; radius of action, hi-lo-hi 863 miles.
Accommodation: crew of two in tandem, on zero/zero ejection seats.
Armament: two 27-mm IWKA-Mauser guns in fuselage; seven fuselage and wing hardpoints for 19,840 lb of external stores, including AAMs, ASMs, and ARMs; cluster bombs, napalm; "smart," retarded, and conventional bombs; rocket packs; flare bombs; jamming/deception and chaff/flare ECM pods; and fuel tanks.

Bombers and Maritime

Atlantic

Most production Br 1150 Atlantic antisubmarine aircraft were delivered for naval duties and are not eligible for inclusion in this gallery. The 18 purchased by Italy are operated by the 86th and 88th *Gruppi* of the Italian Air Force, based at Cagliari/Elmas and Catania/Fontanarossa, respectively, with Italian Navy personnel making up half of the crews. They underwent an extensive upgrade under Dassault-Breguet management. A GEC-Marconi Avionics AQS-902C sonobuoy processing system and Litton INS were installed, together with Thomson-CSF Iguane radar and other features of the French Navy's much-improved Atlantique 2. Antisubmarine equipment, in addition to the retractable radar, includes a magnetic anomaly detector (MAD) tailsting and an Arar electronic surveillance measures (ESM) pod at the tip of the tailfin. The entire upper and lower rear fuselage provides stowage for sonobuoys and marker flares.

Contractor: SECBAT international consortium, under Dassault-Breguet (French) direction.
Power Plant: two Rolls-Royce Tyne RTy 20 Mk 21 turboprops; each 6,106 ehp.
Dimensions: span 119 ft 1 in, length 104 ft 2 in, height 37 ft 2 in.
Weights: empty 52,900 lb, gross 95,900 lb.
Performance: max speed 409 mph at height, service ceiling 32,800 ft, range 5,590 miles.
Accommodation: crew of 12, comprising two pilots, flight engineer, three observers, radio navigator, ESM/ECM/MAD operator, radar/IFF (identification, friend or foe) operator, tactical coordinator, and two acoustic sensor operators. Provision for 12 relief crew.
Armament: internal weapons bay accommodates all standard NATO bombs, mines, 385 lb depth charges, four homing or nine acoustic torpedoes, or two Exocet missiles. Underwing pylons for two AS 30 or Martel missiles.

Aviocar (C-212)

Specially equipped versions of the CASA C-212 Aviocar STOL utility transport have been delivered for military duties. Nine Srs 100/200s were ordered by the Spanish Air Force for search-and-rescue (SAR) missions (Spanish designation D.3A/B). Two Srs 300s optimized for fisheries protection, and funded by the European Union, were delivered to Portugal in October 1994 for No. 401 Squadron at Sintra; they are equipped with SLAR in addition to the Swedish-designed MSS (maritime surveillance system) fitted to three of the Squadron's existing ex-transport C-212s. Operational equipment can include a nose- or belly-mounted AN/APS-128 search radar, searchlight, FLIR, sonobuoys, smoke markers, and camera in the maritime patrol version; and a belly-mounted radar, ESM, OTPI, MAD, tactical processing system, IFF/SIF transponder, sono-

buoy and smoke marker launcher, and weapons in the ASW version. *(Data for Srs 300.)*
Contractor: Construcciones Aeronauticas SA, Spain.
Power Plant: two AlliedSignal TPE331-10R-513C turboprops; each 900 shp.
Dimensions: span 66 ft 6½ in, length 52 ft 11¾ in, height 21 ft 7¾ in.
Weight (maritime patrol version): gross 17,637 lb.
Performance: max cruising speed 220 mph, loiter speed 121 mph at 1,500 ft, service ceiling 26,000 ft, range 519–1,665 miles.
Accommodation: crew of five (maritime patrol) or six (ASW).
Armament: provisions for carrying torpedoes, such as Mk 46 and Sting Ray, unguided rockets, and ASMs, such as Sea Skua and AS 15TT.

F27 Maritime

The three squadrons of Spain's Canary Islands Air Command (MACAN), based at Gando, Las Palmas, include No. 802 Maritime Surveillance and SAR Squadron, equipped with four Cougar helicopters and three F27 Maritimes (Spanish designation D.2). The F27 Maritime is generally similar to the basic F27 (now reengineered as Fokker 50) twin-turboprop transport (which see). Unarmed, it carries a crew of up to six persons and has a Litton 360° search radar in a ventral radome. Its standard fuel gives it an endurance of 10 to 12 hours or a range of up to 3,107 miles.

Two F27 Maritimes of the Royal Netherlands Air Force are assigned to non-NATO duties in the Netherlands Antilles.
Contractor: Fokker BV, the Netherlands.

Gulfstream SMA-3 and Gulfstream III/IV

Three SMA-3 special-mission derivatives of the Gulfstream III executive transport delivered to the Royal Danish Air Force, in 1982, have a cargo door on the starboard side, forward of the wing, Texas Instruments APS-127 sea surveillance radar, Litton 72R INS, and a detachable centerline SLAR pod. They are operated by No. 721 Squadron from Vaerløse, near Copenhagen, and detach in rotation for duty at Narssarssuaq, Greenland. Their primary task is fishery protection over huge areas of sea around Greenland and the Faeroe Islands. Additional missions are airdrop, medevac (including airborne surgery), SAR, tactical air transport, and VIP transportation for members of the nation's royal family. Three standard Gulfstream IIIs form part of the equipment of No. 306 Special Transport Squadron of the Italian Air Force, based at Rome/Ciampino. Three are operated by No. 224 Squadron, Turkish Air Force, at Erkilet/Kayseri. Most recent addition to the NATO fleet is a secondhand Gulfstream IV delivered to 334 Squadron, Royal Netherlands Air Force, in December 1995 as a VIP transport. *(Data for Gulfstream SMA-3.)*
Contractor: Gulfstream Aerospace Corporation, USA.
Power Plant: two Rolls-Royce Spey Mk 511-8 turbofans, each 11,400 lb st.
Dimensions: span 77 ft 10 in, length 83 ft 1 in, height 24 ft 4½ in.
Weights: empty 36,173 lb, gross 69,700 lb.
Performance: max cruising speed Mach 0.85, service ceiling 45,000 ft, range with VFR reserves 4,537 miles.
Accommodation: (maritime) crew of seven.
Armament: none.

Nimrod MR. Mk 2P

As a consequence of diminished Russian submarine activity, the RAF reduced its Nimrod MR. Mk 2P maritime patrol force to 26 aircraft in 1992–93. With airframes based substantially on that of Britain's pioneer Comet 4C jet airliner of the 1950s, they are equipped with Thorn EMI Searchwater long-range surface vessel detection radar, GEC-Marconi Avionics AQS 901 acoustics processing system compatible with a wide range of passive and active sonobuoys, and Loral 1017 Yellow Gate EWSM in wingtip pods. An in-flight refueling probe and provision for Sidewinder and Harpoon missiles were added as a result of experience in the Falkland Islands campaign in 1982. During the Persian Gulf War, some Nimrods gained a FLIR turret, missile approach warning, Bofors BOZ-103 chaff/flare pods, and a GEC-Marconi towed radar decoy.

Nimrod MR. 2Ps currently equip Nos. 120, 201, and 206 Squadrons of No. 11/18 Group of RAF Strike Command at Kinloss, Scotland. A fourth squadron (No. 42) is the OCU. They are often used as aerial command posts for complex or large-scale SAR operations. It was announced in July 1996 that 21 of these aircraft will be completely rebuilt with new wings, engines, and avionics, as Nimrod 2000, for service in the twenty-first century.
Contractor: British Aerospace plc, UK.
Power Plant: four Rolls-Royce RB168-20 Spey Mk 250 turbofans; each 12,140 lb st.
Dimensions: span 114 ft 10 in, length with refueling probe 129 ft 1 in, height 29 ft 8½ in.
Weights (approx): empty 86,000 lb, normal gross 177,500 lb.
Performance: max speed 575 mph, typical low-level patrol speed 230 mph, service ceiling 42,000 ft, typical endurance 12 hr.
Accommodation: crew of 12.
Armament: up to nine torpedoes, Harpoon missiles, mines, or bombs in weapons bay; two underwing pylons for Sidewinder AAMs.

Orion (P-3), Aurora (CP-140), and Arcturus (CP-140A)

The original P-3A Orion antisubmarine and maritime patrol aircraft had an airframe based on that of the Electra airliner, with 4,500 ehp Allison T56-A-10W turboprops, APS-80 radar, ASQ-10 MAD in a tailboom, and an ASR-3 sensor to sniff the exhaust of submerged diesel-powered submarines. Mines, nuclear or conventional depth bombs, and torpedoes were carried in a weapons bay forward of the wings. Ten underwing pylons could carry more torpedoes, mines, or rockets, as well as a searchlight. Sonobuoys and acoustic devices were launched from the cabin.

Two P-3As equip No. 221 Squadron of the Spanish Air Force, at Morón, together with five P-3Bs (Spanish designation P.3) operated formerly by No. 333 Squadron of the Royal Norwegian Air Force; they have the standard APS-80 radar, ASQ-10 MAD and AQA-7 acoustic processing system, plus later addition of FLIR, Have Quick secure radios, and provision for Harpoon ASMs. Norway replaced them with four Update III P-3Cs for what was once its primary task of detecting Russian submarines leaving Northern Fleet bases in the Murmansk area, from the base at Andøya in the far north of Norway. These aircraft have much-improved avionics, including an IBM Proteus acoustic processor to analyze signals picked up from the sea, a new sonobuoy receiver, a Texas Instruments AAS-36 undernose IR detection set, and Harpoon missile capability.

No. 601 Squadron of the Portuguese Air Force at Montijo has six ex-Australian P-3Bs, redesignated P-3P after major retrofit, a detection sensors upgrade, and expanded processing capability able to accommodate Data Link 11, ALR-66(V)3 ESM, and interactive displays for the tactical coordinator and pilot. A new AN/APS-134 radar, dual AQA-7V9 sonar processor, infrared detecting set (IRDS), and Harpoon capability make the P-3Ps comparable to a P-3C Update II.5. In 1993, Greece confirmed its intention of leasing two ex-USN P-3As and four P-3Bs to replace Grumman HU-16s of No. 353 Squadron at Elefsis. Deliveries began in 1995, for overhaul by Hellenic Aerospace before entry into service.

The 18 CP-140 Auroras operated by Canadian Forces since 1980 combine the P-3C airframe with the avionics and data-processing system of the US Navy's S-3A Viking, including APS-116 search radar, ASQ-501 MAD, and AYK-10 computer. They have been supplemented by three P-3Cs for economic zone patrol under the designation CP-140A Arcturus. Unarmed and lacking ASW equipment, CP-140As have APS-134 radar and are based at the main CF Aurora base at Greenwood, Nova Scotia (404, 405, and 415 Squadrons). A fourth CP-140 unit, No. 407 Squadron, flies from Comox, British Columbia, on the Pacific coast. *(Data for P-3C.)*
Contractor: Lockheed Martin Aeronautical Systems, USA.
Power Plant: four Allison T56-A-14 turboprops; each 4,910 ehp.
Dimensions: span 99 ft 8 in, length 116 ft 10 in, height 33 ft 8½ in.
Weights: empty 61,491 lb, normal gross 135,000 lb.
Performance: max speed at 15,000 ft 473 mph, patrol speed at 1,500 ft 237 mph, service ceiling 28,300 ft, mission radius (three hr on station) 1,550 miles.
Accommodation: crew of 10.
Armament: max expendable load of 20,000 lb, including 500/1,000/2,000-lb mines, Mk 54 depth bombs, Mk 46/50 torpedoes, Harpoon ASMs, bombs, rockets, sonobuoys, marine markers, acoustic sensors, and parachute flares.

Gulfstream SMA-3, Royal Danish Air Force *(Paul Jackson)*

Nimrod MR. Mk 2P, Royal Air Force *(Sgt. Rick Brewell)*

Eurofighter 2000

Fighters

Eurofighter 2000

After a prolonged gestation, production of the Eurofighter is expected to be given the go-ahead later this year, allowing delivery of the first five aircraft in 2001. It is intended to become the primary single-seat air-superiority combat aircraft of four NATO air forces, with a secondary ground-attack capability. Current plans are for the RAF to receive 232 (with a further 65 on option), Germany 180 (of which 40 will be optimized for ground attack), Italy 121 (plus nine options), and Spain 87. The first of seven development aircraft (DA1), assembled in Germany by DASA, flew March 29, 1994. DA2, assembled by British Aerospace, flew April 6, 1994. Both are single-seaters, with interim 16,000 lb st RB199-122 (Mk 104E) turbofans, similar to the engines of the Tornado. All subsequent aircraft have Eurojet EJ200 engines, first flown in the third Eurofighter on June 4, 1995. Problems with the flight-control system mean that the fourth to fly will be DA6, second of two tandem-seat aircraft. The last three prototypes have full avionics, including ECR 90 multimode pulse-Doppler radar, infrared search and track (IRST), and an advanced integrated defensive aids subsystem. The international manufacturers expect to be producing a combined total of 52 Eurofighters per year by 2004.

A 53° swept tailless delta configuration, with canards, quadruplex digital fly-by-wire flight controls, and instability in pitch, combine to give high agility and STOL capability. A degree of low-observability is embodied, with fuselage, wings, fin, and rudder mainly of carbonfiber composites; but stores are carried externally. Design life is 6,000 hours or 30 years.
Contractor: Eurofighter Jagdflugzeug GmbH, Germany: airframe manufacture by Alenia, Italy; BAe, UK; CASA, Spain; and DASA, Germany.
Power Plant: two Eurojet EJ200 afterburning turbofans; each 20,250 lb st.
Dimensions: span over ECM pods 35 ft 11 in, length 52 ft 4¼ in, height 17 ft 4 in.
Weights: empty 22,044 lb, gross 46,300 lb.
Performance (estimated): max level speed at height Mach 2, T-O run (air combat mission) 985 ft, combat radius 115–863 miles.
Accommodation: pilot only, on zero/zero ejection seat.
Armament: one 27-mm Mauser gun in fuselage; 13 external stations for up to 14,330 lb of AMRAAM, Aspide and short-range AAMs, three external fuel tanks, or air-to-surface weapons.

F-4 Phantom II

The German Air Force has seven squadrons of F-4Fs in four air defense wings (JG 71, 72, 73, and 74), with a total of 152 aircraft, many transferred from fighter-bomber duties. No. 73 Wing has only one Phantom squadron, plus another of MiG-29s. Beginning in 1992, 110 F-4Fs then defensively tasked received an upgrade to give them look-down/shoot-down capability against multiple targets. MBB (now DASA) was prime contractor for the program, known as ICE (Improved Combat Effectiveness), which replaced the existing

Westinghouse APQ-120 radar with an all-digital multimode Hughes APG-65 embodying advanced electronic counter-countermeasures (ECCM). The cockpit has been updated. New equipment includes a Litef digital fire-control computer, Honeywell laser INS, GEC-Marconi digital air data computer, improved IFF, and provisions for four AMRAAMs. A further 40 F-4Fs, formerly serving in the fighter-bomber role with what is now JG 73, have undergone partial update.

The other NATO Phantom operators in Europe have F-4Es, of which three squadrons (337, 338, and 339) serve for both air defense and attack with the Hellenic Air Force at Larissa and Andravidha (two), and five squadrons (111, 112, 131, 171, and 172), mostly for attack, with the Turkish Air Force at Eskisehir, Konya, and Erhac, the OCU being 132 Squadron. The 56 F-4Es originally received by Greece were augmented in 1991 by 28 from USAF. Turkey gained 125 surplus aircraft to add to 72 delivered new. Of these, 165 remain, including 54 that are to be upgraded in Israel almost to the standard of the IAI Kurnass, including new avionics and EW systems, plus Elta EL/M-2032 radar. *(Data for F-4E.)*

Contractor: McDonnell Douglas Corporation, USA.
Power Plant: two General Electric J79-GE-17 afterburning turbojets; each 17,900 lb st.
Dimensions: span 38 ft 4¾ in, length 63 ft 0 in, height 16 ft 5 in.
Weights: empty 31,000 lb, gross 61,800 lb.
Performance: max speed at 36,000 ft Mach 2.16; service ceiling 58,750 ft; combat radius 520 miles.
Accommodation: crew of two, in tandem, on ejection seats.
Armament: one 20-mm M61 multibarrel gun internally; four Sparrows or AMRAAMs and four Sidewinders. Provision for eleven 1,000-lb bombs, SNEB rockets, and 370- and (centerline only) 600-gallon external fuel tanks.

F-5 and CF-5

Single-seat F-5As and two-seat F-5Bs, in various forms, are assigned to fighter ground-attack duties but, lacking radar, are used mostly for advanced/lead-in training. On NATO's southern flank, they are flown by air defense Squadrons 343 and 349 of the Hellenic Air Force and tactical training Squadron 133 and by attack Squadrons 151 and 152 of the Turkish Air Force. These two nations have absorbed many surplus F-5s from elsewhere, including former Netherlands NF-5s; up to 60 Turkish F-5A/Bs may be refurbished for combat training, but the two attack squadrons will receive F-16s next year. Greek F-5s also will soon be replaced by F-16As. All 22 surviving CASA-built SF-5Bs (AE.9s) operated by the Spanish Air Force's weapons school at Badajoz/Talavera la Real have just completed a structural rebuild for a further 4,000 hours of service, plus minor avionics upgrades, including RWR and IFF. Seven unmodified single-seat SF-5As (A.9s) are also used.

Norway's No. 336 Squadron operates as an advanced training unit for four squadrons of F-16s; its F-5As and F-5Bs have received improved avionics and self-protection systems for wartime air defense duties with AIM-9L Sidewinders or ECM support with Samovar (SAM obstruction in velocity, angle, and range) jamming pods. Seven of the F-5As and eight Bs have been equipped by Sierra in the US with F-16 avionics, the first two returning to service in September 1993 and the last in July 1994. Their 1553B digital data bus, air-data computer, GEC-Marconi HUDWAC, Litton LN-93 ring-laser INS, multifunction throttle grip, and instrument panel are all similar or identical to F-16 equipment. *(Data for F-5A.)*

Contractor: Northrop Corporation, USA.
Power Plant: two General Electric J85-GE-13 afterburning turbojets; each 4,080 lb st.
Dimensions: span over tiptanks 25 ft 10 in, length 47 ft 2 in, height 13 ft 2 in.
Weights: empty 7,860 lb, gross 20,040 lb.
Performance: max speed at 36,000 ft Mach 1.4, service ceiling over 50,000 ft, max range 1,750 miles, range with max weapons 368 miles.
Accommodation: pilot only, on ejection seat.
Armament: two 20-mm M39A2 guns in nose; Sidewinder on each wingtip; centerline pylon and two under each wing for about 4,400 lb of AAMs or ASMs, rocket packs, gun pods, bombs, or 275-gallon fuel tanks.

F-16 Fighting Falcon

F-16s built for four European air forces by SABCA in Belgium and Fokker in the Netherlands, to replace F-104s, are similar to basic USAF F-16As and Bs, except for equipment changes. Belgian F-16s have Dassault Carapace passive ECM in an extended fin root fairing; those for Norway and the Netherlands have a brake-chute in this location.

The Belgian Air Force received 160 F-16s, the Royal Danish Air Force 70, the Royal Netherlands Air Force 213, and the Royal Norwegian Air Force 74. All early models have a Pratt & Whitney F100-PW-200 afterburning turbojet, replaced by a 23,450 lb st F100-PW-220 in late-production aircraft. Beginning in 1994, some squadrons have been disbanded or reduced in size, and aircraft placed in storage, as a consequence of lessened tensions with eastern Europe. Accordingly, only 301 aircraft (Belgium 48, Denmark 61, the Netherlands 136, and Norway 56) will receive the MLU finally authorized on June 30, 1993, and due for implementation between 1996 and 2000 at depots in each country. MLU features include a wide-angle HUD, compatibility with NVGs, upgraded AN/APG-66(V2A) radar, BAe Terprom navigation, GPS, improved data modem, and some optional items, such as helmet-mounted sights, microwave landing system, and new IFF. The first MLU aircraft flew on April 28, 1995, and operational trials are just beginning in Europe. Currently, F-16s equip Squadrons 1, 2, 23, 31, 349, and 350 of the BAF; 723, 726, 727, and 730 of the RDAF; 311, 312, 313 (OCU), 315, 322, and 323 of the RNLAF; and 331, 332, 334, and 338 of the RNoAF. Belgian squadrons have been reduced from 18 to 12 aircraft each and 43 F-16s offered for sale. The first of 17 new-build F-16As and three F-16Bs was handed over to Portugal on February 18, 1994, for 201 Squadron at Monte Real. This unit is tasked for air defense, with ground attack as a secondary role.

Turkey and Greece both opted for uprated F-16C/D versions, with a General Electric F110-GE-100 engine and APG-68 radar. The initial batch of 40 Greek aircraft, with Litton ASPIS self-protection systems, was allocated to 111 Wing at Nea Ankhialos, comprising Nos. 330 and 346 Squadrons. A further 40 were ordered in 1992, for delivery from March 1997 for 341 and 347 Squadrons; 80 F-16A/Bs and 40 more F-16C/Ds are to be acquired shortly. Eight US-built aircraft were supplied to Turkey in 1987; a further 232, fitted with Loral Rapport III internal self-protection systems, are being built in Turkey by Tusas Aerospace Industries to equip 10 squadrons. Nos. 141 and 142 formed at Akinci in 1989–90; followed by 161 and 162 at Bandirma in 1991–92; 191 and 192 at Balikesir in 1993–94; and 181 and 182 at Diyarbakir. Next will be Nos. 151 and 152 at Merzifon in 1997–98. LANTIRN navigation and targeting pods were first issued to 161 Squadron in February 1994. *(Data for Greek/Turkish F-16C.)*

Contractor: Lockheed Martin Tactical Aircraft Systems, USA.
Power Plant: one General Electric F110-GE-100 afterburning turbofan; 27,600 lb st.
Dimensions: span over missiles 32 ft 9¾ in, length 49 ft 4 in, height 16 ft 8½ in.
Weights: empty 19,020 lb, gross 42,300 lb.
Performance: max speed at 40,000 ft above Mach 2, service ceiling above 50,000 ft, radius of action more than 575 miles.
Accommodation: pilot only, on zero/zero ejection seat.
Armament: one 20-mm M61A1 multibarrel gun in port side wing/body fairing; Sidewinder AAM on each wingtip; centerline hardpoint and three under each wing for total 12,000 lb of stores, including ASMs (Penguin Mk 3 on Norwegian aircraft), single or cluster bombs, rocket packs, ECM packs, and fuel tanks. Internal chaff/flare dispensers.

F-4E Phantom II, Turkish Air Force
(Denis Hughes)

F/A-18B+ Hornet, Spanish Air Force
(Paul Jackson)

F/A-18 Hornet

Canada acquired 98 single-seat CF-18As and 40 two-seat CF-18Bs. By comparison with US Navy F/A-18s, these have a different instrument landing system and an added spotlight on the port side of the fuselage for night identification of other aircraft in flight. Primary role for Nos. 425 and 433 Squadrons at Bagotville and 416 and 441 Squadrons at Cold Lake is air defense of North America. All four are tasked with overseas deployment on NATO or UN tasks, but only after a 30-day work-up. NORAD alert is maintained by semipermanent detachments at Goose Bay and Comox, while occasional exercises are flown from prepared forward operating locations at Rankin Inlet, Yellowknife, Inuvik, and Iqaluit. No. 410 Squadron at Cold Lake is the OCU. There are 65 Hornets at Cold Lake and 37 at Bagotville, and the remaining 23 survivors are in 30-day storage, although defense plans call for a 25 percent force reduction. In 1995, trials were begun of AGM-65G Maverick and GBU-24B LGB precision attack weapons.

The Spanish Air Force ordered 72 EF-18s in May 1983, designating the single-seaters C.15 and the two-seaters CE.15. Deliveries to equip two squadrons of 15 Group, at Zaragoza AB, began in 1986. The two former Phantom squadrons of 12 Group, at Torrejón AB, also converted to EF-18s by mid-1990. Between September 1992 and December 1994, Spanish Hornets were upgraded to F/A-18A+/B+ standard, with new computers, software, wiring, and pylon modifications approaching F/A-18C/D configuration. Spain's wide-ranging Hornet weapons inventory includes GBU-10/16 LGBs, AGM-65G Maverick and AGM-84C/D Harpoon ASMs, AGM-88 HARMs, and AIM-9L/M Sidewinder, AIM-7F/M Sparrow, and AIM-120 AMRAAM AAMs. On December 28, 1995, the first six of 24 ex–US Navy F/A-18As were received for the eventual reequipment of 211 Squadron at Morón. *(Data for CF-18A.)*

Contractor: McDonnell Douglas Corporation, USA.
Power Plant: two General Electric F404-GE-400 augmented turbofans; each 16,000 lb st.
Dimensions: span over missiles 40 ft 4¾ in, length 56 ft 0 in, height 15 ft 3½ in.
Weights: empty 23,050 lb, gross (fighter escort mission) 37,175 lb.
Performance: max speed Mach 1.8, combat ceiling approx 50,000 ft, combat radius 660 miles.
Accommodation: pilot only, on ejection seat.
Armament: one 20-mm M61 multibarrel gun in nose; Sidewinder AAM on each wingtip; centerline pylon, two on engine trunks, and two under each wing for Sparrow AAMs, CRV-7 rocket packs, bombs, BL755 cluster bombs, ECM pods, etc. Max external stores load 17,000 lb.

F-104S Starfighter

Six squadrons in Nos. 4, 5, 9, 37, 51, and 53 Wings of the Italian Air Force are equipped with the third-generation F-104S, the final version of the Starfighter, developed by Aeritalia (now Alenia). Between 1986 and 1993, 147 of the 205 that had been built received a major weapon system update to F-104S ASA (*Aggiornamento Sistemi d'Arma*) standard. This includes installation of an FIAR R21G/M1 Setter look-down/shoot-down radar, advanced ECM, improved IFF and altitude reporting system, improved electrical generation and distribution, an armament computer and time delay unit for improved weapons delivery, and a new automatic pitch-control computer. Alenia's Aspide medium-range AAM is standard, as an alternative to the very similar Sparrows that accounted for the S designation. There are also 19 older TF-104G two-seat trainers in service with the OCU within 4 Wing at Grosseto.

The Italian F-104s will remain until replaced by Eurofighter 2000s next century, for which reason 90 ASAs and 18 TF-104Gs will receive a second upgrade to maintain operational capability and compensate for delays in the Eurofighter program. The fighters will then be known as F-104S ASA-Ms. *(Data for F-104S.)*

Contractor: Alenia, Italy, under license from Lockheed.
Power Plant: one General Electric J79-GE-19 afterburning turbojet; 17,900 lb st.
Dimensions: span without tiptanks 21 ft 11 in, length 54 ft 9 in, height 13 ft 6 in.
Weights: empty 14,900 lb, gross 31,000 lb.
Performance: max speed at 36,000 ft Mach 2.2, at S/L Mach 1.2, service ceiling 58,000 ft, max combat radius 775 miles.
Accommodation: pilot only, on ejection seat.
Armament: AIM-9L Sidewinder on each wingtip; seven pylons under fuselage and wings for bombs, rocket packs, fuel tanks, and AAMs, including two Aspides or Sparrow IIIs. Max external stores load 7,500 lb.

MiG-29 (NATO "Fulcrum")

Following reunification of Germany, 20 single-seat Fulcrum-As (MiG-29-711 and -712 versions) and four Fulcrum-B (MiG-29UB) two-seat trainers of the former East German No. 3 Fighter Wing at Preschen were retained by the German Air Force for air defense duties in the eastern part of the country. They now operate

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from Laage as 732 Squadron, an element of JG 73, which also has a Phantom squadron at Pferdsfeld. Their armament is unchanged, except for deletion of R-60 (AA-8 "Aphid") AAMs. Further information on the MiG-29 can be found in the "Gallery of Russian Aerospace Weapons" in the March 1996 issue of *Air Force* Magazine. *(Data for Fulcrum-A.)*

Contractor: Mikoyan OKB, Russia.

Power Plant: two Klimov/Sarkisov RD-33 turbofans; each 18,300 lb st with afterburning.

Dimensions: span 37 ft 3¼ in, length 56 ft 10 in, height 15 ft 6¼ in.

Weights: empty 24,030 lb, gross 33,600–40,785 lb.

Performance: max speed at height Mach 2.3, at S/L Mach 1.225, service ceiling 55,775 ft, T-O run 820 ft, landing run 1,970–2,300 ft, range 932 miles on internal fuel, 1,305 miles with external tank.

Accommodation: pilot only, on zero/zero ejection seat (two seats in tandem in Fulcrum-B).

Armament: six medium-range radar/IR homing R-27 (AA-10 "Alamo-A/B") and/or close-range R-73A (AA-11 "Archer") AAMs on three pylons under each wing. Able to carry bombs; 57-mm, 80-mm, and 240-mm rockets; and other stores in attack role. One 30-mm GSh-30 gun in port wingroot leading-edge extension.

Mirage F1

Standard equipment on the basic F1-C, first ordered for the French Air Force in May 1969, includes a HUD and Cyrano IV-M multifunction radar, with a high degree of resistance to ECM. From a peak of 10 squadrons, F1-C strength has fallen to just EC 4/33 *Vexin*, based in Djibouti for air defense/attack/reconnaissance duties, and EC 3/33 *Lorraine* in France, an OCU that also has two-seat F1-B trainers. Of the remainder, 55 have been converted to ground-attack roles (see Mirage F1-CT entry).

The Hellenic Air Force has two squadrons of Mirage F1-CGs, Nos. 334 *Thalos* and 342 *Sparta*, currently at Iraklion and Tanagra, but due for replacement by F-16A/Bs. Beginning in 1975, the Spanish Air Force received 45 F1-CEs (known as C.14As) and 22 multirole Mirage F1-EEs (C.14Bs), with INS, nav/attack computer, and HUD. To balance attrition, 15 single-seat and three trainer aircraft are being received from Qatari and French surplus between 1994 and 1997, going to 111 Squadron of No. 11 Wing at Manises/Valencia. The remainder are shared by two squadrons of 14 Wing at Los Llanos/Albacete from where aircraft are detached to one squadron of No. 46 Wing of MACAN at Gando AB, Las Palmas. Between now and 1999, all 30 C.14As, 17 C.14Bs, and four ex-French F1-Cs in current Spanish service will be upgraded to extend their operational lives to 2010–12, by means of a new navigation and weapons system (radar altimeter, GPS, new computer and stores management system), upgraded ECM, and secure communications. *(Data for Mirage F1-E.)*

Contractor: Dassault Aviation, France.

Power Plant: one SNECMA Atar 9K-50 afterburning turbojet; 15,873 lb st.

Dimensions: span over missiles 30 ft 6¾ in, length 50 ft 2½ in, height 14 ft 9 in.

Weights: empty 16,314 lb, gross 35,715 lb.

Performance: max speed at height Mach 2.2, at S/L Mach 1.2, service ceiling 65,600 ft, combat air patrol endurance 2 hr 15 minutes, attack radius, depending on flight profile and weapon load, 265–863 miles.

Accommodation: pilot only, on ejection seat.

Armament: two 30-mm DEFA 553 guns in fuselage; seven hardpoints for practical external load of 8,818 lb; two Matra Super 530 AAMs, a Matra Magic or Sidewinder AAM on each wingtip, and chaff/flare dispensers for interception mission; or 14 x 250-kg bombs, 30 antirunway bombs, 144 rockets, an ARMAT antiradar missile, AM39 Exocet antiship missile, or laser-guided weapons and designator pod for ground-attack missions.

Mirage 2000C/E

Selected December 18, 1975, as the primary combat aircraft of the French Air Force from the mid-1980s, the Mirage 2000 was developed initially as an interceptor and air-superiority fighter, with a single 19,850 lb st SNECMA M53-5 turbofan and Thomson-CSF RDM multimode Doppler radar. It is equally effective for reconnaissance, close support, and low-altitude attack missions in areas to the rear of a battlefield. The French Air Force's procurement plans were curtailed by defense economies at 124 air-superiority Mirage 2000Cs and 30 Mirage 2000B two-seat trainers. The Mirage 2000D/N strike/attack versions are described separately.

Deliveries of initial production M53-5/RDM aircraft began in 1983, to Squadrons 1/2 *Cigognes*, 2/2 *Côte d'Or*, and the now-disbanded 3/2 *Alsace* at Dijon. Squadrons 1/5 *Vendée*, 2/5 *Ile de France*, and 3/5 *Comtat Venaissin* at Orange have Mirage 2000Cs with more powerful M53-P2 engine and RDI radar, as does 1/12 *Cambrésis*, which initiated conversion of Cambrai-based 12 Wing from Mirage F1-Cs in early 1992, followed by the final squadron, 2/12 *Picardie*, September 1, 1993. The designation 2000DA (*Défense Aerienne*) is used frequently in collective reference to Mirage 2000Cs and two-seat 2000Bs. Funding was awarded in 1994 for the first of 37 late-production 2000Cs to be retrofitted to 2000-5 standard for two squadrons (one each at Dijon and Orange), with RDY radar, modernized instrumentation, new HUD, more automated ICMS Mk 2 ECM/self defense, plus ability to carry MICA AAMs. The first of two prototypes flew on February 26, 1996, and deliveries will begin in December 1997, finishing in 2000. Redundant RDI radars will replace RDMs in early Mirage 2000Cs.

RDI has an operating range of 62 miles. Other equipment on the Mirage 2000C includes SAGEM Uliss 52E INS, Sextant head-up and head-down displays, a detachable in-flight refueling probe, chaff/flare dispenser, and Thomson-CSF Serval RWRs. Mirage 2000Cs patrolling former Yugoslavia were fitted in 1995 with a SAT Samir missile plume detector. Control is fly-by-wire.

Delivery to 114 Wing (331 *Aegeas* and 332 *Geraki* Squadrons) of the Hellenic Air Force, at Tanagra, of 36 multirole Mirage 2000EGs, plus four 2000BG two-seaters, took place in 1988–92. Assigned to defend Athens, these aircraft have enhanced ICMS Mk 1 ECM, including self-protection jammers and Matra Spirale automatic chaff/flare dispensers. *(Data for Mirage 2000C.)*

Contractor: Dassault Aviation, France.

Power Plant: one SNECMA M53-P2 afterburning turbofan; 21,385 lb st.

Dimensions: span 29 ft 11½ in, length 47 ft 1¼ in, height 17 ft 0¾ in.

Weights: empty 16,534 lb, gross 37,480 lb.

Performance: max speed at height Mach 2.2, service ceiling 54,000 ft, range hi-lo-hi with four 250-kg bombs 920 miles.

Accommodation: pilot only, on zero/zero ejection seat.

Armament: two 30-mm DEFA 554 guns in fuselage; five hardpoints under fuselage and two under each wing for max external stores load of 13,890 lb. Two Matra Super 530 and two Matra Magic AAMs for interceptor mission. Ground-attack weapons include eighteen 250-kg retarded bombs or BAP 100 antirunway bombs, 16 Durandal penetration bombs, two 1,000-kg LGBs, six Belouga cluster bombs, two AS 30L or AM39 Exocet ASMs, two ARMAT antiradar missiles, four packs of 18 x 68-mm rockets, two packs of 100-mm rockets, or a twin 30-mm gun pod.

Rafale

Procurement of France's fighter for the twenty-first century has been painfully slow, totaling to date only two aircraft for the Air Force and eight for the Navy; the Air Force plans an eventual total of 234, of which 139 will be two-seaters carrying a pilot and weapon system operator. The Navy has production priority, and the Air Force will not form its first Rafale squadron until 2005.

The original Rafale A prototype first flew on July 4, 1986, and was followed by the two-seat Rafale B and single-seat Rafale C for the French Air Force and single-seat carrier-based Rafale M for the French Navy. All versions have an RBE2 look-down/shoot-down radar able to track eight targets simultaneously, fly-by-wire controls, and HOTAS (hands on throttle and stick) with a sidestick controller. Full-service standard will include automatic terrain-following, Spectra defensive subsystems, IRST, FLIR and laser rangefinder modules, voice-command controls, a helmet-mounted sight, and provisions for carrying an ASMP nuclear standoff weapon. *(Data for Rafale C.)*

Contractor: Dassault Aviation, France.

Power Plant: two SNECMA M88-3 afterburning turbofans; each 19,558 lb st.

Dimensions: span 35 ft 9¼ in, length 50 ft 2½ in, height 17 ft 6¼ in.

Weight: gross 47,400 lb.

Performance: max speed at height Mach 2, at S/L Mach 1.13, combat radius 680–1,150 miles.

Accommodation: pilot only, on zero/zero ejection seat.

Armament: one 30-mm DEFA 791B gun in engine duct; 14 external stations for up to 17,635 lb of MICA AAMs, Apache standoff weapon dispensers, one ASMP nuclear weapon, laser-guided and conventional bombs, AS.30L ASMs and Exocet antiship missiles.

Mirage 2000-5, French Air Force

Tornado F. Mk 3, Royal Air Force *(Sgt. Rick Brewell)*

Tornado ADV

The airframe of the Tornado air defense variant (ADV) differs from that of the basic IDS in having an increased fuselage length forward of the front cockpit, to house the longer radome of the GEC-Marconi AI.24 Foxhunter multimode pulse-Doppler radar, and a small "stretch" aft of the rear cockpit to allow four Sky Flash AAMs to be carried in tandem pairs under the fuselage. After the first of three prototypes flew October 27, 1979, it was found that, together with an increase in wingroot chord, these changes reduced drag, especially at supersonic speed. They also allowed a 10 percent increase in internal fuel capacity.

Of 173 production Tornado ADVs ordered for the RAF, including 52 with dual controls, the first 18 were built as F. Mk 2s with 16,920 lb st RB199 Mk 103 engines. These have been withdrawn from operational service and scrapped. All subsequent ADVs are F. Mk 3s, with uprated RB199 Mk 104 turbofans, a retractable in-flight refueling probe, added head-down display for the pilot, a second INS, new IFF, automatic wingsweep, and other changes. One of the two guns of the IDS is deleted from the ADV, and RAF aircraft used only the two inboard underwing pylons for a combination of tanks and missiles or chaff pods until the outboard pylons were activated in late 1995 to carry a towed radar decoy on aircraft patrolling former Yugoslavia.

The first F. Mk 3 flew November 20, 1985, and deliveries to the OCU (now No. 56 Squadron) at RAF Coningsby began in July 1986. Other units include Nos. 5 and 29 Squadrons at Coningsby (both receiving JTIDS data links), Nos. 11 and 25 at Leeming, and Nos. 43 and 111 at Leuchars. One further unit, No. 1435 Flight, is responsible for defense of the Falkland Islands. Although optimized for long-range interception in the Greenland-Iceland-UK gap, the Tornado F. Mk 3 was the only politically acceptable aircraft when Italy required an interim interceptor because of delays in the Eurofighter 2000 program. Twelve were delivered to No. 12 Squadron at Gioia del Colle, beginning July 4, 1995, and will be followed by 12 to No. 18 Squadron at Trapani/Birgi in the first half of next year. Italian aircraft are adapted to carry Aspide AAMs. *(Data for F. Mk 3.)*

Contractor: Panavia Aircraft GmbH, a UK/German/Italian consortium.

Power Plant: two Turbo-Union RB199 Mk 104 afterburning turbofans; each 16,520 lb st.

Dimensions: as Tornado IDS, except length 61 ft 3½ in.

Weights: empty 31,970 lb, gross 61,700 lb.

Performance: max speed at height (clean) Mach 2.2, service ceiling 70,000 ft, intercept radius more than 345 miles supersonic, 1,150 miles subsonic.

Accommodation: crew of two in tandem, on zero/zero ejection seats.

Armament: one 27-mm IWKA-Mauser gun in fuselage, four Sky Flash or Aspide AAMs under fuselage, four AIM-9L Sidewinders under wings. Two 594-gallon tanks under wings.

Helicopters

Alouette III

The Alouette III was produced first with an Artouste turboshaft, as the SA 316B, and then with an Astazou, as the SA 319B. Both versions continue in NATO service, with the air forces of France, the Netherlands, and Portugal, although now in greatly depleted numbers. A new Netherlands Squadron, No. 302, formed on May 19, 1995, is acting only as a crew and aircraft holding unit for two years until the last Alouette is

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withdrawn. Main uses are now light transport, SAR, and training, although a wide variety of armament could be carried. *(Data for SA 319B.)*
Contractor: SNI Aerospatiale, France.
Power Plant: one Turbomeca Astazou XIV turboshaft; derated to 600 shp.
Dimensions: rotor diameter 36 ft 1¾ in, length of fuselage 32 ft 10¾ in, height 9 ft 10 in.
Weights: empty 2,527 lb, gross 4,960 lb.
Performance: max speed 136 mph, range with max payload 375 miles.
Accommodation: pilot and six passengers or two stretchers and two attendants.

Apache (AH-64)

The 30 Apaches bought to support the armed forces of the Netherlands will be operated from Gilze Rijen by Nos. 301 and 302 Squadrons of the Royal Netherlands Air Force. No. 302 is forming this year with 12 AH-64As borrowed from the US Army; No. 301 will form in 1998 when the first AH-64D Longbow Apaches are received from new production. Further information on the Apache can be found in the "Gallery of US Navy, Marine Corps, and Army Aircraft" in the June 1996 issue of *Air Force* Magazine. *(Data for Apache 64D.)*
Contractor: McDonnell Douglas Helicopter Systems.
Power Plant: two General Electric T700-GE-701C turboshafts; each 1,690 shp.
Dimensions: rotor diameter 48 ft 0 in, length of fuselage (tail rotor turning) 48 ft 2 in, height 14 ft 1 in.
Weights: empty 11,800 lb, gross 17,650 lb.
Performance (with 16 Hellfires): cruising speed 162 mph, hovering ceiling IGE 13,500 ft, max range 253 miles.
Accommodation: pilot (rear) and gunner in tandem.
Armament: one 30-mm Bushmaster Chain Gun under nose, 16 Hellfire ASMs or up to 76 x 2.75-in rockets in pods of seven or 19. Planned additional stub-wing hardpoints for four Stinger or two Sidewinder AAMs.

BO 105 CB

The Royal Netherlands Army owns the BO 105 CB helicopters of No. 299 Squadron at Gilze Rijen, but they are flown and maintained by the Royal Netherlands Air Force. Duties are light transport, observation, and forward air control on behalf of the Army. No armament is fitted, but the BO 105 CBs are equipped for operation at night and in adverse weather.
Contractor: Messerschmitt-Bölkow-Blohm GmbH, Germany.
Power Plant: two Allison 250-C20B turboshafts; each 420 shp.
Dimensions: rotor diameter 32 ft 3½ in, length of fuselage 28 ft 1 in, height 9 ft 10 in.
Weights: empty 2,813 lb, gross 5,511 lb.
Performance: max cruising speed 150 mph, service ceiling 17,000 ft, range with max payload 408 miles.
Accommodation: up to five persons; rear bench seat removable to permit carriage of two stretcher patients or equivalent freight.

CH-113 Labrador

Thirteen aging CH-113 Labrador helicopters form the mainstay of Canada's coastal and inland SAR units, based at Comox, Gander, and Trenton. Each has a 900-gallon fuel capacity for relatively long-range missions, an 11,000-lb cargo hook for external loads, a rear ramp for easy loading, a watertight hull for landing on water, a rescue hoist, a scoopnet for retrieving survivors from the water, and Stokes litters. Under an upgrade program, each aircraft in the entire fleet has been fitted with improved avionics and a high-powered searchlight. Replacement by 15 helicopters still to be chosen is planned to begin in January 2001.
Contractor: The Boeing Company, Vertol Division, USA.
Power Plant: two General Electric T58-GE-8F turboshafts; each 1,350 shp.
Dimensions: rotor diameter each 50 ft 0 in, length of fuselage 44 ft 7 in, height 16 ft 10 in.
Weights: empty 11,532 lb, gross 21,400 lb.
Performance: max speed 170 mph, service ceiling 13,700 ft, range 690 miles.
Accommodation: crew of three; provision for up to 20 survivors.

Chinook (CH-47)

Conversion of 32 surviving RAF Chinooks to HC. Mk 2 standard, equivalent to the US Army's CH-47D, has been completed. The first Mk 2 returned to the UK from Boeing in May 1993 and, with other early arrivals, equipped Nos. 7 and 27 (OCU) Squadrons, both at Odiham. From February 1994, Mk 2s were also issued to No. 78 Squadron on the Falkland Islands (two only) and No. 18 at Laarbruch, Germany. Three more new Mk 2s arrived earlier this year. Of a further 14 ordered for delivery from 1997, eight, designated Mk 3, will be equivalent to the MH-47E Special Forces' variant. Some of these are expected to join No. 7 Squadron; others will go to No. 18 when it moves to Odiham in April 1997. RAF Chinooks are fitted with AAR-47 missile approach warners, ALQ-157 IR jammers, chaff/flare dispensers, and ARI.18228 RWR; some have satellite communications for Special Forces' operations.

No. 298 Squadron of the Royal Netherlands Air Force, at Soesterberg, will receive six new CH-47Ds in 1998, to supplement its seven upgraded ex-Canadian CH-47Cs, delivered from 1995. Assisted by Cougars, the Chinooks support the Netherlands Air Mobile Brigade. *(Data for Chinook HC. Mk 2.)*
Contractor: Boeing Helicopters, USA.
Power Plant: two AlliedSignal T55-L-712F turboshafts; each 3,750 shp.
Dimensions: rotor diameter each 60 ft 0 in, length of fuselage 51 ft 0 in, height 18 ft 11½ in.
Weights: empty 23,402 lb, gross 50,000 lb.
Performance: max speed 185 mph, service ceiling 15,000 ft, mission radius 115 miles with 13,907 lb payload.
Accommodation: crew of four; up to 55 troops, or 24 stretcher patients, or internal or external freight.
Armament: two machine guns in forward hatchway and port forward window.

Ecureuil 2 and Fennec

The French Air Force has received 52 of these twin-turbine light helicopters for surveillance of strategic military bases and other support duties. The first eight are AS 355F1s, with 420 shp Allison 250-C20F turboshafts. The remainder, delivered from January 1990, are AS 555AN Fennecs. Particular assignments of note are combat SAR (with NVG capability) by 2/67 *Valmy* Squadron at Metz and armed patrol of the Ariane rocket launch site in French Guyana by 68 Squadron. On April 1, 1996, No. 32 (The Royal) Squadron of the RAF received two leased AS 355F1 Twin Squirrels for VIP transport from Northolt, London, replacing Gazelles. *(Data for AS 555AN Fennec.)*
Contractor: Eurocopter International (Aerospatiale, France, and DASA, Germany).
Power Plant: two Turbomeca TM 319 1A Arrius turboshafts; each 479 shp.
Dimensions: rotor diameter 35 ft 0¾ in, length of fuselage 35 ft 10½ in, height 10 ft 11½ in.
Weights: empty 3,046 lb, gross 5,732 lb with sling load.
Performance: max cruising speed 140 mph, service ceiling 13,125 ft, range 448 miles.
Accommodation: pilot and up to five passengers
Armament: provision for carrying 20-mm gun and Mistral missiles.

EH 101

On March 9, 1995, the Royal Air Force ordered 22 of a rear-ramped, utility version of the EH-101 to boost its army support forces. The helicopters, which may receive the designation Griffon HC. Mk 1, will first equip a training unit at Benson before entering service with No. 33 Squadron (replacing Pumas) at the same base and No. 72 Squadron (replacing Wessex) at Aldergrove.
Contractor: EH Industries Ltd.
Power Plant: three Rolls Royce Turbomeca RTM 322 turboshafts; each 2,312 shp.
Dimensions: rotor diameter 61 ft 0 in, length (rotors turning) 74 ft 10 in, height (rotors turning) 21 ft 10 in.
Weights: empty 20,613 lb, gross 32,188 lb.

Chinook HC. Mk 2, Royal Air Force

CH-124A Sea King, Canadian Forces *(Alex Hay Porteous)*

Performance: nominal cruising speed 173 mph, service ceiling 15,000 ft, range (approx) 700 miles.
Accommodation: crew of two, plus 30 fully equipped troops.
Armament: optional door-mounted machine gun.

HH-3F Pelican

Thirty-five license-built versions of this Sikorsky multipurpose SAR helicopter have been delivered to the Italian Air Force by Agusta since 1977. The last 15 were delivered with new radar, Loran, FLIR, and navigation computer, which have been retrofitted in the remaining 18 of the original production series. Chaff/flare dispensers are optional. They equip No. 15 Wing, with 85 Squadron at Ciampino (Rome Airport) and detachments at Trapani, Rimini-Miramare, and Brindisi. The Italian Air Force has two similar AS-61A-4s with 93 Squadron at Ciampino for VIP transport.
Contractor: Agusta SpA, Italy.
Power Plant: two General Electric T58-GE-100 turboshafts; each 1,500 shp.
Dimensions: rotor diameter 62 ft 0 in, length of fuselage 57 ft 3 in, height 18 ft 1 in.
Weights: empty 13,255 lb, gross 22,050 lb.
Performance: max speed 162 mph, service ceiling 11,100 ft, range 886 miles.
Accommodation: crew of two or three; six stretchers and 10 seated persons, or 26 troops, or 15 stretchers and two attendants, or equivalent freight.
Armament: optional pintle-mounted machine gun in cabin doorway.

Kiowa

Seventy-four Bell COH-58As, generally similar to the US Army's OH-58A Kiowa, were delivered to Canadian Forces to fill the roles of observation, reconnaissance, command and liaison, target acquisition, and fire adjustment. Known in Canada as CH-136s, they are flown mainly by five squadrons (including four Reservist) and an OCU of No. 10 Tactical Air Group. Replacement with twin-turboshaft CH-146 Griffons (Bell 412CFs) has begun.
Contractor: Bell Helicopter Company, USA.
Power Plant: one Allison T63-A-700 turboshaft; 317 shp.
Dimensions: rotor diameter 35 ft 4 in, length of fuselage 32 ft 7 in, height 9 ft 6½ in.
Weights: empty 1,797 lb, gross 3,000 lb.
Performance: max speed 140 mph, service ceiling 10,000 ft (restriction, as oxygen not available), range 230 miles.
Accommodation: crew of two.
Armament: one 7.62-mm Minigun, or 2.75 in rockets.

Puma

The French Air Force version of the Puma, of which 29 remain, partly equipping four utility helicopter squadrons at home and three overseas, is the SA 330Ba; RAF version is the SA 330E. Both have Turmo IIIC4 engines. RAF Puma HC. Mk 1 assault helicopters have a cargo hook as standard equipment; a rescue hoist is optional. They equip No. 33 Squadron in the UK and part of No. 18 in Germany. In late 1995, the last of 42 to receive the Puma Navigation Upgrade was returned to service. The PNU involved new VOR and Tacan, GPS, ILS, an electronic horizontal situation indicator, integrated defensive aids suite, and compatibility with NVGs and a covert lighting system for night formation flying. The nine surviving Pumas of the Portuguese Air Force are SA 330S1s, with Makila 1A1 turboshafts; five are fitted with ORB-31 nose radar. They equip No. 751 Squadron in Portugal and No. 711 in the Azores, primarily for SAR. Spain's five Pumas are VIP transports.
Contractors: Westland Helicopters Ltd. UK, and SNI Aerospatiale, France.
Power Plant: two Turbomeca Turmo IIIC4 turboshafts; each 1,435 shp.
Dimensions: rotor diameter 49 ft 2½ in, length of fuselage 46 ft 1½ in, height 16 ft 10½ in.
Weights: empty 7,403 lb, gross 14,110 lb.
Performance: max speed 174 mph, service ceiling 15,100 ft, range 390 miles.
Accommodation: crew of two; up to 16 troops, six stretchers and four seated persons, or internal or external freight.
Armament: two 7.62-mm machine guns; other weapons optional.

Sea King

Based on Sikorsky's SH-3 helicopter, Westland's license-built Sea King can undertake such roles as SAR, tactical troop transport, medevac, and cargo carrying, as well as its original naval antisubmarine mission. The RAF uses 25 Sea King HAR. Mk 3/3As (the 3As with improved avionics) to equip Flights of No. 22 and 202 (SAR) Squadrons throughout the UK, and (with Chinooks) No. 78 Squadron in the Falklands. Equipment of the HAR. Mk 3 includes Thomson Thorn ARI 5955 radar and a Decca TANS F computer, accepting inputs from a Mk 19 Decca nav receiver and Type

71 Doppler. Cockpit lighting is compatible with NVGs. Six Royal Navy antisubmarine Sea Kings are expected to be transferred to the RAF for conversion to Mk 3A standard.

Sea King Mks 43 and 48 are similar SAR versions used by the air forces of Norway and Belgium, respectively. Norway's 330 Squadron is upgrading its 12 new or rebuilt Mk 43Bs with both nose-mounted (RDR 1300C) and spine-mounted (RDR 1500) radars, FLIR, and other improvements. The five Belgian helicopters have been improved with FLIR 2000F, replacement RDR 1500B radars, Racal RNS252 INS, and Canadian Marconi CMA 3012 GPS. Denmark has eight Sikorsky-built S-61As for SAR, also recently upgraded with FLIR. Canadian Forces deploy CH-124As on board ships for ASW duties and for SAR, passenger transport, and carriage of slung loads. These are generally identical to the USN's SH-3A Sea Kings, with General Electric T58-GE-8D turboshafts, but have undergone progressive updating. From 1991, six of the 31 Canadian Sea Kings were converted to CH-124B standard, with a new tactical navigation system, acoustic processor, internal MAD, and passive (replacing active) sonar. Canadian Sea Kings are based at Shearwater, Nova Scotia, with 406, 423, and 443 Squadrons, supported by the Reservists of 420 Squadron. Decision on a replacement has been deferred until next year for financial reasons. *(Data for Sea King HAR. Mk 3.)*

Contractor: Westland Helicopters Ltd, UK.
Power Plant: two Rolls-Royce Gnome H 1400-1 turboshafts; each 1,660 shp.
Dimensions: rotor diameter 62 ft 0 in, length of fuselage 55 ft 9¾ in, height 15 ft 11 in.
Weights: empty 13,672 lb, gross 21,400 lb.
Performance: max speed 131 mph, service ceiling 14,000 ft, range 690 miles.
Accommodation: crew of four; six stretchers, or two stretchers and 11 seated persons, or 19 passengers.

Super Puma and Cougar

The French Air Force uses four AS 332 Super Puma developments of the original Puma for support duties at nuclear test sites in the Pacific and four more to equip a VIP transport squadron at Villacoublay. AS 532s, built to military standards, have been reported with the intelligence bureau flight, GAM 56 at Evreux. The Spanish Air Force acquired 10 AS 332s for SAR missions from bases in Madrid, Seville, Gando in the Canaries, and Palma de Mallorca. Four more operate alongside Pumas on VIP duties with No. 402 Squadron from Cuatro Vientos Airport, Madrid. Spanish designations are HD.21 (SAR) and HT.21A (VIP). The Netherlands took delivery on April 1, 1996, of the first of 17 AS 532U2 Cougars for army support duties by 300 Squadron at Soesterberg. *(Data for AS 532U2.)*

Contractor: Eurocopter International (Aerospatiale, France and DASA, Germany).
Power Plant: two Turbomeca Makila 1A2 turboshafts; each 1,845 shp.
Dimensions: rotor diameter 53 ft 1½ in, length of fuselage 55 ft 0½ in, height 16 ft 4 in.
Weights: empty 10,493 lb, gross with internal load 21,495–24,692 lb.
Performance: max cruising speed 170 mph, service ceiling 13,450 ft, range with standard fuel 494 miles.
Accommodation: crew of two; up to 29 troops, or 12 stretchers and four seated persons, or internal or slung freight.

UH-1 (single-engine)

Variants of the single-engine Bell UH-1 Iroquois operated by Canada and Turkey were built in the US; German aircraft were manufactured under license by Dornier; those flown by Greece came from Agusta license production in Italy. Canada uses its CH-118s (UH-1Hs) for transport and base rescue, but replacement with CH-146s began in late 1995 with No. 430 Squadron at Valcartier. Germany's 107 UH-1Ds are intended for liaison and SAR, with 24 assigned to the Air Force's Special Missions (VIP) wing. Of these, four are in executive configuration and will be replaced by Super Pumas in 1998. Greece has Agusta-Bell 205As (UH-1D/H series) for light transport and SAR. The Turkish UH-1Hs are used for support, liaison, and training. *(Data for CH-118.)*

Contractor: Bell Helicopter Company, USA.
Power Plant: one AlliedSignal T53-L-13 turboshaft; 1,400 shp.
Dimensions: rotor diameter 48 ft 0 in, length of fuselage 41 ft 10¾ in, height 14 ft 8 in.
Weights: empty 4,800 lb, gross 9,620 lb.
Performance: max speed 140 mph, service ceiling 10,000 ft (restriction, as no oxygen available), range 360 miles.
Accommodation: two crew and 11 other persons, or up to 4,000 lb of slung cargo.

UH-1 (twin-engine) and Models 212 and 412 Arapaho

The Bell Model 212 is a twin-engine version of the Iroquois, utilizing a Canadian-built power plant. Canada placed the first order, for 50. Now designated CH-135, they are combat area transports, able to carry 12 troops with weapons only, 10 with packs in summer, eight with packs in winter, or six stretcher patients. Options include various types of armament or a rescue hoist for SAR operations. They are being replaced by some of the 100 Bell 412CF (CH-146 Griffons) ordered in 1992 and delivered from October 14, 1994. Initial deliveries were to 403 Squadron at Gagetown (for training); nine are earmarked for SAR at Goose Bay, Cold Lake, and Bagotville, and the rest are for 450 Squadron of Air Transport Group and all seven squadrons of 10 Tactical Air Group, for ground forces' support with 408, 427, and 430 regular Squadrons plus the Reservists of 400, 401, 411, and 438. All are built and certified to civil standards but have extensive military avionics, including provision for a comprehensive self-defense suite.

Italy uses Agusta-built AB-212s for SAR and communications/light transport. Greece has four 212s for transport duties; Norway has 18 Model 412SP Arapahos, with four-blade advanced-technology rotor and improved performance. Seventeen of these were assembled in Norway, to replace UH-1Bs of Nos. 339 and 720 Squadrons of the Royal Norwegian Air Force. The Netherlands received three Agusta-Bell 412SPs from February 1994, to replace Alouette IIIs of the SAR Flight at Leeuwarden. *(Data for CH-146.)*

Contractor: Bell Helicopter Textron, Canada.
Power Plant: one Pratt & Whitney Canada PT6T-3D Turbo Twin-Pac; 1,910 shp.
Dimensions: rotor diameter 46 ft 0 in, length of fuselage 42 ft 4¾ in, height 11 ft 5 in.
Weights: empty 7,500 lb, gross 11,900 lb.
Performance: max cruising speed 143 mph, hovering ceiling IGE 10,200 ft, range with max payload 463 miles.
Accommodation: pilot and up to 14 passengers.

Wessex

Two versions of this turbine-powered development of the Sikorsky S-58 remain in service with the RAF. Wessex HC. Mk 2 tactical transports equip No. 72 Squadron at Aldergrove, in support of the Northern Ireland garrison; No. 60 Squadron at Benson; No. 28 in Hong Kong; No. 84 in Cyprus, providing SAR and occasional United Nations support from Akrotiri; and (soon to be withdrawn) part of No. 22 for SAR missions throughout the UK. Two Wessex HC. Mk 4s wear the red-and-blue livery of No. 32 (The Royal) Squadron, tasked with transporting VVIPs. Wessex will serve until the last is retired from No. 72 Squadron in 2001. *(Data for HC. Mk 2.)*

Contractor: Westland Aircraft Ltd, UK.
Power Plant: two coupled Rolls-Royce Gnome Mk 110/111 turboshafts; each 1,350 shp.
Dimensions: rotor diameter 56 ft 0 in, length of fuselage 48 ft 4½ in, height 14 ft 5 in.
Weights: empty 8,304 lb, gross 13,500 lb.
Performance: max speed 132 mph, service ceiling 12,000 ft, range 478 miles.
Accommodation: crew of two or three; 16 troops, seven stretcher patients, or 4,000 lb of freight.
Armament: provision for ASMs, rocket packs, or machine guns.

UH-1H Iroquois, Turkish Air Force *(Denis Hughes)*

Wessex HHC. Mk 4, Royal Air Force *(Paul Jackson)*

Boeing 707 tanker/transport, Italian Air Force *(Paul Jackson)*

Reconnaissance and Special Mission Aircraft

Aviocar (C-212)

No. 401 Squadron of the Portuguese Air Force operates a single EC-212 Aviocar Srs 100 for electronic intelligence/ECM duties. It carries equipment, including a blunt nose radome and fintip pod, for automatic signal interception, classification, and identification in dense signal environments, which allows a map to be drawn plotting the position and characteristics of hostile radars. Jamming emitters are also carried. The unit has other Srs 100s equipped for photo and magnetic survey.

Two C-212s similar to the Portuguese EC-212 serve with No. 408 Squadron of the Spanish Air Force at Torrejón for ECM duties, under the designation TM.12. Spain also has a few Aviocars fitted with Wild RC-10 cameras for survey work. *(Data generally as for C-212 transport.)*

Boeing 707

Boeing 707s serve in military roles with three NATO air forces besides USAF. Spain's No. 451 Squadron, at Torrejón, has three 707 VIP transports (T.17s); a further 707 (TK.17), fitted with Israeli signals intelligence (sigint) equipment under Project Santiago, will be flown from the same base, with a secondary tanker role. Four 707s obtained for VIP and support flights with the German Air Force's Special Missions unit, at Köln/Bonn, have been partially replaced by Airbuses and will also be converted to tankers. Dornier of Germany headed a team that modified three 707-320Cs as trainer cargo aircraft, with cockpit similar to that of the E-3A, for training NATO Airborne Warning and Control System (AWACS) flight crews and to provide NATO with air transport capability. Italy has four 707 tanker/transports. Operated by No. 8 Squadron at Pratica di Mare, they comprise two with seats for 110 passengers and two combis seating a maximum of 66.

C-135FR and KC-135R

Like KC-135 Stratotankers of USAF, the 11 C-135FRs operated from Istres by two squadrons of the 93d Wing of the French Air Force have had their lower wing skin renewed to make possible another 25,000 flying hours. This justified reengining them with CFM56 turbofans. C-135FRs had originally only a standard USAF-type flying boom, terminating in a drogue for compatibility with the probe-equipped aircraft of the French Air Force. In 1991, work began on fitting two FRL Mk 32 hose-drum units under the wings to free the boom for receptacle refueling of E-3F AWACS aircraft; Thomson-CSF Sherloc RWRs have also been fitted. To maintain capability during the conversion program, France leased three USAF KC-135Rs and now plans to purchase the same number.

Range of the C-135FRs is nearly 3,400 miles. In their other role as transports, each can carry 75 fully equipped troops on sidewall seating, or 77,000 lb of freight over a range of 2,235 miles, or 44 stretchers and 54 other persons in a medevac mission. In 1995, Turkey received two USAF KC-135Rs on loan, pending 1997 delivery of the first of seven "new" conversions it has on order.

Contractor: Boeing Military Airplanes, USA.
Power Plant: four CFM56-2 turbofans; each 22,000 lb st.
Dimensions: span 130 ft 10 in, length 136 ft 3 in, height 42 ft 0 in.

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Performance: max speed 560 mph, service ceiling 50,000 ft.
Accommodation: crew of four.

Canberra PR. Mk 9

Five Canberra PR. Mk 9s of No. 39 (1 PRU) Squadron form the only dedicated strategic photoreconnaissance unit in the RAF. They have recently completed an upgrade program to maintain the fleet until at least 2004, additions including a Zeiss RMK vertical camera (augmenting forward and oblique cameras, plus IR linescan) and GPS. Canberras recently have operated high-level reconnaissance missions over Bosnia-Hercegovina.
Contractor: English Electric Company Ltd/Short Brothers and Harland Ltd, UK.
Power Plant: two Rolls-Royce Avon 206 turbojets; each 11,250 lb st.
Dimensions: span 67 ft 10 in, length 66 ft 8 in, height 15 ft 7 in.
Weight: gross 57,500 lb.
Performance: max speed Mach 0.83, service ceiling 50,000 ft, max range 4,000 miles.
Accommodation: crew of two.
Armament: none.

Challenger (EW Versions)

Six Canadair Challenger 600s are employed on electronic support and training missions by No. 434 Squadron of the Canadian Forces at Shearwater. Equipment of the first three interim CE-144As includes an ALR-76 ESM receiver, ULQ-21/23 radar jammers, a ZS 1910 communications jammer, and ALE-502 chaff dispenser. The other three are currently receiving a definitive EW fit authorized in April 1993. No. 434 Squadron has five more CC-144As, including three used for visual maritime surveillance. Three CC-144B transport versions of the Challenger 601 serve with 412 Squadron at Ottawa.
Contractor: Canadair Inc, Canada.
Power Plant: two AlliedSignal ALF 502L turbofans; each 7,500 lb st.
Dimensions: span 61 ft 10 in, length 68 ft 5 in, height 20 ft 8 in.
Weights: empty approx 23,300 lb, gross 41,100 lb.
Performance: max cruising speed 529 mph, service ceiling 41,000 ft, range 3,220 miles.
Accommodation: crew of four and up to 12 passengers in transport role.

CL-215 and CL-215T

Greece and Spain rely on their air forces for major aerial fire-fighting duties. The Hellenic Air Force's 355 Squadron at Elefsis has taken delivery of 16 CL-215 amphibian water-bombers for this purpose, supplemented by four former Yugoslav aircraft donated on condition that they will be available to combat fires in Slovenia. The Spanish Air Force's 43d Group at Torrejón has received 30 under the designation UD.13, of which 21 have been converted to CL-215T standard, similar to the new-production CL-415, with two turboprops replacing the original 2,100 hp Pratt & Whitney R-2800-CA3 piston engines. Single CL-215s have frequently made more than 100 drops, totaling more than 141,230 gallons, in one day. Full loads of water have been scooped up from the Mediterranean by the amphibians in wave heights up to 6 ft. All are capable of other tasks, and eight of the Spanish aircraft are equipped for SAR and coastal patrol. *(Data for CL-415.)*
Contractor: Canadair, Bombardier Inc, Canada.
Power Plant: two Pratt & Whitney Canada PW123AF turboprops; each 2,380 shp.
Dimensions: span 93 ft 11 in, length 65 ft 0½ in, height 29 ft 5½ in.
Weights: empty 28,353 lb, gross 43,850 lb.
Performance: max cruising speed 234 mph, max range 1,507 miles.
Accommodation: crew of two; payload of 13,500 lb for water-bomber, 8,375 lb for utility version. Crew of six in patrol and SAR versions, with provision for additional seats and stretchers.

DHC-8 Dash 8M (CT-142)

The Canadian Department of National Defence operates four Dash 8M-100s with No. 402 Squadron at Winnipeg, as CT-142 navigation trainers with mapping radar in an extended nose. Basically similar to the standard Dash 8 transport, these aircraft have long-range fuel tanks, rough-field landing gear, high-strength floors, and mission-related avionics. Canada's two passenger/cargo transport CC-142s also belong to No. 402 Squadron.
Contractor: De Havilland Inc, Canada.
Power Plant: two Pratt & Whitney Canada PW120A turboprops; each 2,000 shp.
Dimensions: span 85 ft 0 in, length 73 ft 0 in, height 24 ft 7 in.
Weights: empty 22,000 lb, gross 34,700 lb.
Performance: max speed 310 mph, service ceiling 25,000 ft, range 575 miles.
Accommodation: crew of two; four students and two instructor navigators.

E-3A/D/F Sentry

NATO's AWACS aircraft, which bear the insignia of Luxembourg, were equipped initially to the original standard of USAF E-3A Sentry Nos. 26 to 34. Much of the avionics was produced in Germany, and NATO funded a third HF radio, to cover the maritime environment; a new data analysis and programming group; underwing hardpoints on which operational ECM pods could be attached; and a radio teletype to link the aircraft with NATO maritime forces and commands. The 18 aircraft were delivered between January 1982 and April 1985. Subsequent updating has included the addition of AN/AYR-1 ESM in canoe-shaped pods on each side of the forward fuselage. The Block 1 upgrade launched in 1994 introduces JTIDS, Have Quick secure radios, and new color displays. Germany's DASA is modifying all but the first aircraft.

Main operating base for NATO E-3As is at Geilenkirchen, Germany. Forward operating bases are at Oerland, Norway; Konya, Turkey; Préveza, Greece; and Trapani, Italy.

Seven E-3s were ordered for the RAF and four for the French Air Force, all with CFM56 turbofans. Deliveries to both air forces took place in 1990–92. The RAF aircraft formed No. 8 Squadron at Waddington July 1, 1991, under the designation E-3D Sentry AEW. Mk 1 and were declared to NATO exactly one year later. A second operating squadron, No. 23 (which includes a training flight), formed on April 1, 1996. The French E-3Fs are assigned to 36 *Escadron de Détection et de Contrôle Aéroportée* at Avord. Both the E-3D and E-3F have an in-flight refueling probe and USAF-style receptacle. RAF aircraft are fitted additionally with wingtip Loral 1017 Yellow Gate ESM pods and will receive the JTIDS data link. E-3s of all NATO countries have been heavily involved in operations over former Yugoslavia. *(Data for NATO E-3A.)*
Contractor: Boeing Aerospace, USA.
Power Plant: four Pratt & Whitney TF33-PW-100/100A turbofans; each 21,000 lb st.
Dimensions: span 145 ft 9 in, length 152 ft 11 in, height 41 ft 9 in.
Weight: gross 335,000 lb.
Performance: max speed 530 mph, service ceiling over 29,000 ft, max unrefueled endurance more than 11 hr.
Accommodation: basic crew of 17, including 13 AWACS specialists.

F-16A(R) Fighting Falcon

The aircraft of No. 306 Squadron of the Royal Netherlands Air Force at Volkel are assigned to reconnaissance duties, with the designation F-16A(R). They are fitted with a radar altimeter and carry on their centerline pylon an Oude Delft Orpheus pod. This contains a fan of three TA-8 cameras, plus one panoramic F.415 and infrared linescan. A version of the F/A-18 Hornet's ATARS (advanced tactical airborne reconnaissance system) is sought for 1999 service entry.

In 1995, the Netherlands loaned five Orpheus pods to Belgium, which modified three F-16 aircraft of Nos. 1 and 31 Squadrons to carry them. Denmark's No. 726 Squadron at Aalborg received six reconnaissance pods "home-built" by the Air Force in early 1994, using cameras from retired Saab Drakens, pending availability this year of a specially designed pod by Per Udsen Aircraft Industry. *(Data as for F-16.)*

E-3A Sentry, NATO

Mirage IV, French Air Force
(Paul Jackson)

G222VS and G222RM

The Italian Air Force has two G222VSs for elint/EW duties with the 71st Squadron at Pratica di Mare. Carrying a pilot, copilot, and up to 10 systems operators, this version has a modified cabin fitted with racks and consoles for detection, signal processing, and data recording equipment, with an electrical system providing up to 40 kw of power for its operation. It is externally distinguishable by a small thimble radome beneath the nose and a larger "doughnut" radome at the tip of the tailfin. Four G222RMs (Radiomisure) are used by No. 8 Squadron, also at Pratica, for in-flight calibration of ground radio nav/com facilities. Equipment includes a nose-mounted spotlight. *(Data as for G222 transport.)*

Jaguar GR. Mk 1A (Reconnaissance)

The Jaguar GR. Mk 1As of No. 41 Squadron of RAF Strike Command at Coltishall, UK, are assigned to tactical reconnaisance missions. Standard equipment is a 1,230-lb centerline pod containing five cameras and a Vinten 401 infrared linescan system. In 1990, a VICON 18 Srs 600 long-range oblique photography pod with 36-in focal length camera was introduced as an alternative fit. French Jaguars may carry an RP 36P system, which is nothing more than a standard drop-tank with three nose-mounted cameras. This complements the panoramic camera fitted in the nose of all French Jaguars.

KDC-10

The first of two KDC-10 tanker/transports was handed over to the Royal Netherlands Air Force on October 2, 1995, and is now in service with No. 334 Squadron at Eindhoven. McDonnell Douglas had been awarded a contract in February 1993 to design and convert both aircraft from secondhand DC-10-30CFs, the modification work then being subcontracted to KLM. Features include a 43-ft "flying boom" and closed-circuit TV for the boom controller, who, unlike in USAF KC-10As, sits on the flight deck. Details of the USAF KC-10A can be found in the "Gallery of USAF Weapons" in the May 1996 *Air Force* Magazine.

Mirage IV

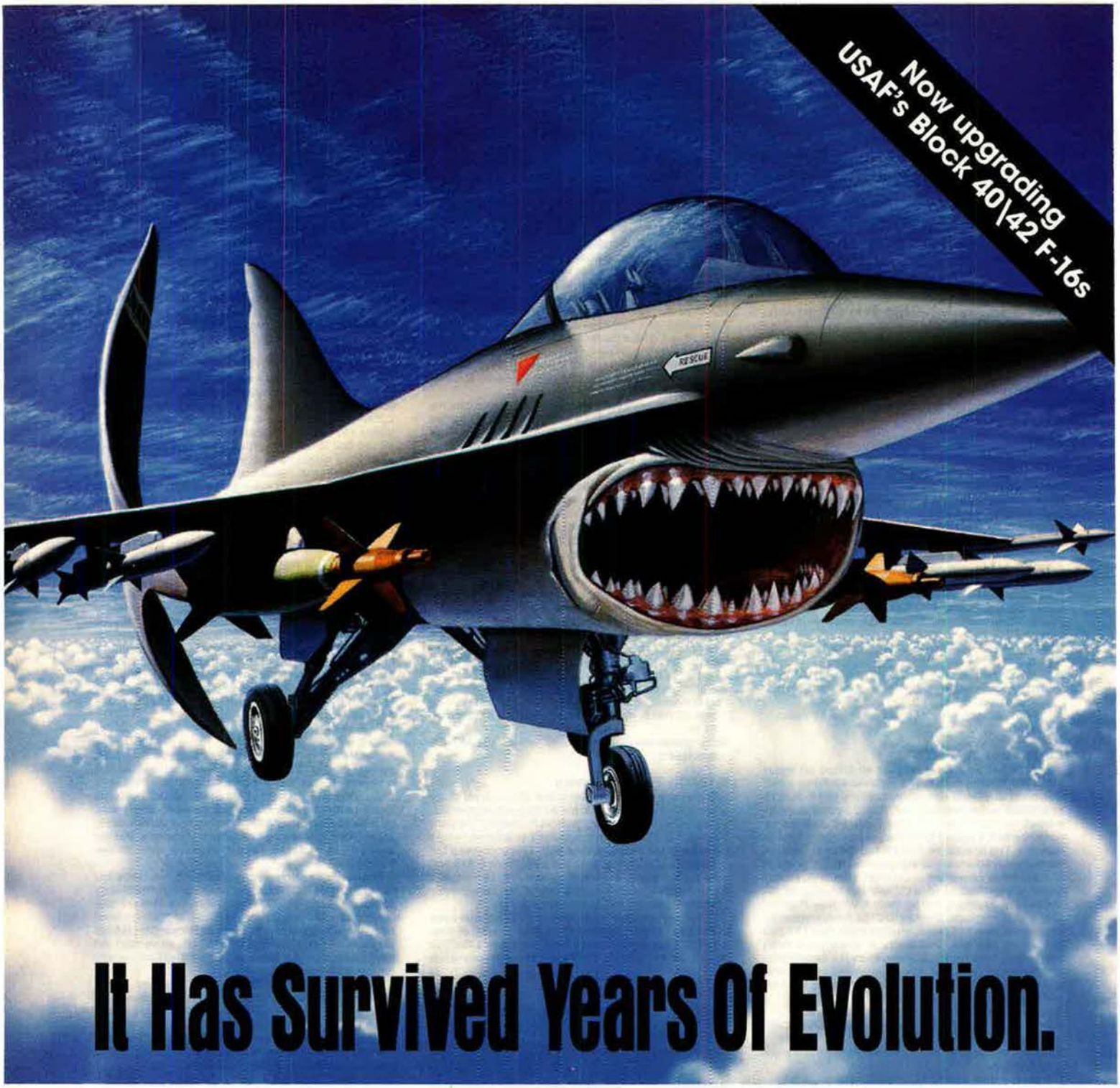
The Mirage IV bomber force was placed on strategic nuclear alert on October 1, 1964, and maintained this task until it was stood down on July 4, 1996, with disbandment of Squadron 2/91 *Bretagne* at Cazaux. Its sister unit, EB 1/91 *Gascogne* at Mont-de-Marsan, despite having lost its ASMP nuclear standoff missiles, continues in the strategic reconnaissance role. Recent duties have included regular missions over former Yugoslavia.

For low-level photography, the reconnaissance Mirage IV carries a CT 52 pod containing four OMERA 35 cameras (three with 75-mm lenses for forward and oblique use and one 75-mm vertical). In the high-level role, the configuration is three 600-mm OMERA 36 cameras and one 152-mm Wild RC 8F, all vertical. An SAT Super Cyclope linescan is a third option, usually for low-level missions.

Equipment includes Thomson-CSF Arcana pulse-Doppler radar, dual INS and, typically, a Thomson-CSF TMV 015 Barem self-protection jamming pod and a Bofors BOZ-103 chaff/flare pod on underwing pylons, plus two 436- or 660-gallon external fuel tanks. Thomson-CSF Serval RWRs are standard. Operational radius can be extended by in-flight refueling.
Contractor: Dassault Aviation, France.
Power Plant: two SNECMA Atar 9K-14 afterburning turbojets; each 14,840 lb st. Provision for 12 JATO rockets; total 11,000 lb st.
Dimensions: span 38 ft 10½ in, length 76 ft 5½ in, height 17 ft 8½ in.
Weights (approx): empty 31,965 lb, gross 72,750 lb.
Performance: max speed Mach 2 at high altitude, 745 mph IAS at low altitude, service ceiling 54,100 ft, radius of action 930 miles unrefueled.
Accommodation: crew of two, in tandem, on ejection seats.
Armament: none.

Mirage F1-CR-200

Standard tactical reconnaissance aircraft of the French Air Force is the Mirage F1-CR-200, which equips Squadrons 1/33 *Belfort* and 2/33 *Savoie*, based at Reims. It has a fixed in-flight refueling probe and differs from the basic F1-C fighter in being fitted with Cyrano IVMR radar (with additional ground mapping, contour mapping, air-to-ground ranging, and blind let-down modes), a SAGEM Uliss 47 inertial platform, and ESD 182 navigation computer. An SAT SCM2400 Super Cyclope infrared linescan reconnaissance system replaces the starboard gun, and an undernose bay



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houses either a 75-mm Thomson-TRT 40 panoramic camera or a 150-mm Thomson-TRT 33 vertical camera. FLIR is installed in the port gun bay. F1-CR-200s have a secondary ground-attack role and can also carry a centerline podded sensor in the form of a Thomson Raphaël TH SLAR or, from late 1994, an 880-lb Thomson-CSF Astac electronic reconnaissance system for detecting ground radars. Data from Raphaël can be downloaded in flight if within 400 miles of a SARA mobile ground station. A Barax ECM pod can be carried underwing, together with two wingtip-mounted Magic AAMs for self-defense and a flare dispenser in place of the brake-chute. *(Data as for Mirage F1-C, except length 50 ft 2½ in.)*

Mystère-Falcon 20

Small numbers of Mystère-Falcon twin-jet transports modified for ECM training and combat area duties are operated by the air forces of France and Norway. The Norwegian aircraft of 717 Squadron at Bodo are equipped for radar and communications intelligence and jamming duties. The Mystère-Falcons of the French *Centre d'Instruction Tactique* 339 at Luxeuil are fitted with the combat radar and navigation systems of various Mirage types for training interceptor, strike, and reconnaissance pilots. France, Portugal, and Spain also have Mystère-Falcon calibration aircraft in service, and Spain operates two ECM/elint versions designated TM.11.

Contractor: Avions Marcel Dassault-Breguet Aviation, France.
Power Plant: two General Electric CF700-2D2 turbofans; each 4,500 lb st.
Dimensions: span 53 ft 6 in, length 56 ft 3 in, height 17 ft 6¾ in.
Weights: empty 16,600 lb, gross 28,660 lb.
Performance: max cruising speed 490 mph at 40,000 ft, service ceiling 42,000 ft, range 2,180 miles.
Accommodation: flight crew of two; up to 10 other persons or 3,750 lb of equipment or cargo, according to role.

Nimrod R. Mk 1P

Nimrod R. Mk 1s of No. 51 Squadron of RAF Strike Command at RAF Waddington are specially equipped for elint missions, carrying four flight crew and up to 24 systems operators. They can be identified by the short tailcone that replaces the MR. Mk 2's MAD boom and by modifications to the wing leading-edge pods. The three original aircraft were fitted with an in-flight refueling probe between 1982 and 1988, thus becoming Mk 1Ps. BOZ-107 chaff/flare dispenser pods, modified with AN/AAR-47 missile approach warning systems, were added under the wings in 1990.

Early in 1995, one of the R. Mk 1Ps was recommissioned after being fitted with new E-Systems equipment under the Star Window project. This includes two high-speed search receivers, 22 pooled digital intercept receivers, wideband digital D/F system, color active-matrix consoles, and distributed digital maps, databases, and analytical tools. The second aircraft will be similarly upgraded, together with a converted MR. Mk 2 replacement for the third of the original aircraft that was lost after a safe ditching. *(Data generally as for Nimrod MR. Mk 2.)*

PD-808GE and RM

Together with its PD-808VIP and TA light jet transports, the Italian Air Force acquired six PD-808GEs for electronic warfare training, and four PD-808RMs for navaid calibration and other duties, in the 1970s. All are based at Pratica di Mare, the RMs with No. 8 Squadron. Conversion of two of the transports increased No. 71 Squadron to the current strength of six PD-808GE1s and two PD-808GE2s. Except for their specialized role equipment, they are similar to the PD-808TA, for which data follow.

Contractor: Rinaldo Piaggio SpA, Italy.
Power Plant: two Rolls-Royce Viper Mk 526 turbojets; each 3,360 lb st.
Dimensions: span over tiptanks 43 ft 3½ in, length 42 ft 2 in, height 15 ft 9 in.
Weights: empty 10,650 lb, gross 18,000 lb.
Performance: max speed at 19,500 ft 529 mph, service ceiling 45,000 ft, range 1,322 miles.
Accommodation: flight crew of two; up to nine other persons or 1,600 lb of equipment, according to role.

RF-4 Phantom II

Three NATO air forces in Europe continue to operate reconnaissance versions of the Phantom II. No. 348 *Matia* Squadron of the Hellenic Air Force operates 20 ex-German RF-4Es, as well as six of its original new-build aircraft, alongside the F-4Es of 110 Wing at Larissa. The Turkish Air Force also has RF-4Es in No. 113 Squadron at Eskisehir; these were augmented from April 1993 onward by 33 ex-German aircraft, which have also reequipped 173 Squadron at Erhac and a training flight (*Bora Filo*) at Eskisehir. Fourteen ex-USAF RF-4Cs (CR.12s) serve in No. 123 Squadron of the Spanish Air Force. Following the decision not to fit Spanish Hornets with reconnaissance equipment, the CR.12s have been upgraded with fixed in-flight refueling probes, APQ-172 radar (replacing APQ-99), 1553B digital databus and other improved avionics, plus chaff/flare dispensers and up to four self-defense AIM-9L Sidewinder AAMs. *(Data generally as for F-4 Phantom II.)*

Transall C-160 Gabriel, French Air Force

Tornado (Reconnaissance)

Tornado GR. Mk 1A cameraless reconnaissance aircraft equip Nos. 2 and 13 Squadrons of the RAF, based together at Marham, UK. The GR. Mk 1A has a BAe sideways-looking IR system, Vinten Linescan 4000 IR surveillance system, and Computing Devices signal processing and video recording system. Full attack capability is retained, except for the absence of guns. It is identifiable by the small underbelly blister fairing to the rear of its laser rangefinder pod. However, in 1995 the RAF acknowledged the limitations of electronic imagery in some forms of conflict or peacekeeping and launched an urgent search for a long-range optical camera pod.

Germany and Italy have jointly developed a reconnaissance pod to equip Tornados of the first squadron of MFG 2 of the German Navy and No. 155 Squadron of the Italian Air Force. Hung from the centerline pylon, the pod contains two Zeiss cameras, TV sensors, and a Texas Instruments RS-710 infrared linescan. Nine pods are assigned as interim equipment to 40 ex–German Navy Tornados, which formed Air Force reconnaissance wing AG 51 on January 1, 1994. A new podded reconnaissance system incorporating two Zeiss KS-153 optical cameras and an IR linescan is to be obtained in 1998 for these aircraft, which are based at Schleswig/Jagel.

The German Air Force also has 35 specially developed Tornado ECR versions of the Tornado IDS in two squadrons within JBG 32 at Lechfeld. Retaining an air-to-surface combat role, except for the removal of guns, the ECR is fitted with a ground emitter locator; a Honeywell/Sondertechnik infrared linescan; FLIR; onboard systems for processing, storing, and transmitting reconnaissance data; and advanced tactical displays for the pilot and weapons officer. It is normally configured to carry two HARMs, two Sidewinders, an active ECM pod, a chaff/flare dispenser pod, and two underwing 396-gallon fuel tanks. A Mk 105 version of the RB199 engine provides about 10 percent more thrust than the IDS's Mk 103. On September 1, 1995, Tornado ECRs supporting the international policing operation in former Yugoslavia flew the first Luftwaffe combat mission since 1945. Eight ECRs and six reconnaissance IDS aircraft of AG51 deployed to Piacenza, Italy, for duties over Yugoslavia, adopting the title of Einsatzgeschwader 1.

Italy intends to convert 15 of its existing Tornado IDSs to ECR configuration, with equipment similar to that of Germany, except for a Zeiss FLIR instead of linescan, addition of advanced radar warning equipment, and retention of Mk 103 engines. A prototype was completed in March 1992, and deliveries will begin to No. 155 Squadron at Piacenza this year. In April 1994, this squadron achieved IOC with the first of 20 Tornado IDSs that have been given interim HARM capability. *(Data generally as for Tornado IDS.)*

Transall Astarté and Gabriel

Four of the second-series Transall C-160s built for the French Air Force are equipped as communications relay aircraft on behalf of the nation's nuclear deterrent submarines. Designated Astarté (*Avion STAtion Relais de Transmissions Exceptionelles*) and operated under the Ramses (*Réseau Amont Maillé Stratégique Et de Survie*) program, each is equipped with a Collins VLF system of the kind fitted to the US Navy TACAMO E-6A Mercury. To ensure maximum survivability and effectiveness in a nuclear combat environment, they are able to operate as in-flight refueling tanker/receivers. Operating unit is No. 1/59 *Bigorre* Squadron at Evreux.

Two other Transalls, delivered to No. 1/54 *Dunkerque* Squadron at Metz in February 1989, are equipped as elint/comint aircraft and are designated Gabriel or C-160G. Also equipped as tanker/receivers, they have a row of large blade antennas above the forward fuselage, a retractable ventral Thomson-CSF radome, and slender wingtip pods with UHF/DF blade antennas. The crew includes at least seven systems operators. *(Data as for Transall C-160 transport.)*

Tristar Tankers

Six Lockheed L-1011-500 Tristar airliners purchased by the RAF from British Airways are operated as dual-role tanker/transports by No. 216 Squadron from Brize Norton, UK. Two of them were modified by Marshall Aerospace at Cambridge to Tristar K. Mk 1 standard, with an increased max takeoff weight of 540,000 lb. Each has twin Flight Refuelling Ltd Mk 17T hose drums (one a reserve) in the fuselage and seven tanks in the baggage compartments, raising total fuel capacity to 313,300 lb. Features include a refueling receiver probe over the flight deck, optional seating for 187 passengers, and closed-circuit TV to monitor refueling operations. The other four aircraft were converted by Marshall to KC. Mk 1 tanker/freighter configuration, with a large cargo door, strengthened cabin floor, and cargo handling system. Fuel capacity is as for the K. Mk 1, but optional seating can accommodate 196 to 266 passengers, and the KC. Mk 1s' refueling probes were removed in late 1991.

Contractor: Lockheed Aircraft Corporation, USA.
Power Plant: three Rolls-Royce RB211-254B4 turbofans; each 50,000 lb st.
Dimensions: span 164 ft 6 in, length 164 ft 2½ in, height 55 ft 4 in.
Weights: empty 242,864 lb, gross 540,000 lb.
Performance: max speed 545 mph at 30,000 ft, service ceiling 43,500 ft, range with max payload 4,310 miles.
Accommodation: crew of three.

VC10

All RAF VC10s are now dedicated or part-time tankers. No. 101 Squadron has five VC10 K. Mk 2s, converted by British Aerospace from ex-BOAC Model 1101s, and four VC10 K. Mk 3s converted from East African Airways Super VC10 Model 1154s. Each has a Flight Refuelling Ltd Mk 17B hose drum in the rear fuselage, a Mk 32 pod under each wing, a receiver probe on its nose, and closed-circuit TV to monitor refueling operations. Fuel tanks in the cabin give the K. Mk 2 a total capacity of 24,470 gallons and the K. Mk 3 a capacity of 26,455 gallons. Since April 1996, two Mk 2s have been based on the Falkland Islands, in the South Atlantic, to refuel the Tornado F. Mk 3 air defense flight.

A further five ex–British Airways Super VC10s have been converted to VC10 K. Mk 4 standard. Although having a fuselage-mounted Mk 17B hose drum unit and a Mk 32 pod under each wing, they have no extra fuel tanks in the fuselage. To supplement this 14-aircraft fleet, all 13 of the VC10 C. Mk 1 strategic transports serving with No. 10 Squadron at Brize Norton have been converted to C. Mk 1(K)s with only two wing pods and no additional fuel, thereby retaining full passenger/freight capability.

Contractor: British Aerospace Corporation, UK.
Power Plant: four Rolls Royce Conway 301 turbofans; each 22,500 lb st.
Dimensions: span 146 ft 2 in, length (K. Mk 2)166 ft 1 in, (K. Mk 3) 179 ft 1 in, height 39 ft 6 in.
Weights: gross (K. Mk 2) 313,933 lb, (K. Mk 3) 334,875 lb.
Performance (C. Mk 1): max speed at 30,000 ft 580 mph, service ceiling 42,000 ft, range with 24,000 lb payload 5,370 miles.
Accommodation (C. Mk 1): crew of four, 150 passengers, 76 stretcher patients and six attendants, or 57,400 lb of freight.

Tactical and Strategic Transports

Airbus

Three ex-airline Airbus A310-304s were taken over by the German government in October 1990 and transferred to the Air Force. Following conversion to military transport requirements, they entered service with the Special Air Missions Wing at Köln-Bonn Airport October 3, 1993, assuming many of the long-range transport tasks performed previously by the wing's four

Boeing 707s and two Tu-154Ms. A fourth was added this year, and three more are required. Also in 1993, three former airline A310-300s were acquired for France's long-range transport squadron, No. 3/60 *Esterel*, at Paris/Charles de Gaulle Airport, replacing two of four DC-8s. Modifications include a cargo door, 28-seat cabin, and two additional fuel tanks, increasing max weight from 337,300 to 346,125 lb. Conversion to optional tanker is planned.

In Canada, five ex-airline A310-304s are operated under the designation CC-150 Polaris. Replacing a similar number of Boeing 707s, they flew their first service January 22, 1993. *(Data for standard Airbus A310 multirole tanker/transport.)*

Contractors: Airbus Industrie, France; airframe prime contractors Aerospatiale, France; Daimler-Benz Aerospace Airbus, Germany; British Aerospace Airbus, UK; CASA, Spain.
Power Plant: two General Electric CF6-80C2A2 turbofans; each 53,500 lb st.
Dimensions: span 144 ft 0 in, length 153 ft 1 in, height 51 ft 10 in.
Weights: empty 178,200 lb, gross 346,125–361,557 lb.
Performance: typical cruising speed Mach 0.8, refueling speed 253–368 mph, normal range 5,523 miles, max range using transfer fuel 8,285 miles.
Accommodation: two crew on flight deck; others according to role. Palletized seats for up to 270 passengers available for tanker/transports. Standard fuel 105,690 lb; up 61,730 lb of transfer fuel in eight underfloor tanks.
Armament: none.

Aviocar (C-212)

More than 50 Aviocars equip No. 37 Transport Wing of the Spanish Air Force at Valladolid, No. 461 Squadron of its Canaries Command, the Parachute School (at Alcantarilla), and three training squadrons under the designations T.12B/C. Each aircraft can accommodate up to 18 troops, 15 paratroops and a jumpmaster, or 4,410 lb of freight, including light vehicles, loaded via the rear ramp. Two medevac conversions (D.3As) can each carry up to 18 stretcher patients. Squadrons 502 (at Sintra) and part of 711 (at Lajes in the Azores) of the Portuguese Air Force fly standard C-212 tactical transports. Data are generally as for the maritime version, except for operational equipment.

Buffalo (CC-115)

Fifteen Buffalo medium transports were acquired for the Canadian Forces in 1967–68 for their ability to operate under all weather conditions in areas where short, rough, unprepared strips provide the only takeoff and landing surface. The final six are now assigned primarily to SAR missions, together with CH-113 helicopters, in No. 442 Squadron at Comox.
Contractor: The de Havilland Aircraft of Canada Ltd, Canada.
Power Plant: two General Electric CT64-820-3 turboprops; each 3,060 shp.
Dimensions: span 96 ft 0 in, length 79 ft 0 in, height 28 ft 8 in.
Weights: empty 24,500 lb, gross 41,000 lb.
Performance: max cruising speed 260 mph, service ceiling 25,000 ft, range 1,400 miles.
Accommodation: Crew of three; up to 41 troops, 24 stretchers, and six seated persons, or freight.

C-130 Hercules

Except for Germany, all NATO air forces operate transport versions of the Hercules. Canada has mainly C-130Es, with 4,050 ehp T56-A-7 engines, plus a few more-powerful C-130Hs. Designated CC-130 by Canadian Forces, these 30 aircraft are used for strategic airlift, tactical airdrop/airlift, aerial refueling (five CC-130H(T)s, each with a pair of FRL Mk 32B pods), and SAR from Edmonton, Greenwood, and Trenton. Belgium, Denmark, Greece, Italy, the Netherlands, Norway, Portugal, Spain, and Turkey all have small numbers of C-130Hs. Belgium is currently implementing (1995–97) an extensive avionics upgrade known as the Integrated Vehicle Mission Management System, which includes a two-person "glass" flight deck.

Twelve C-130Hs were delivered to France in 1987–91, including nine "stretched" C-130H-30s. The RAF acquired 66 C-130Ks, basically Hs with UK equipment, as Hercules C. Mk 1s. Thirty were lengthened to C-130H-30 standard, as Hercules C. Mk 3s, able to carry seven cargo pallets instead of five, four Land Rovers and trailers, 128 troops, 92 paratroops, or 97 stretcher patients. All 50 in current service have been fitted with an in-flight refueling probe, becoming C. Mk 1Ps and 3Ps, and current programs are adding ALR-66 RWR and ALQ-157 IR jammers to half the fleet. The Netherlands aircraft were delivered with a comprehensive missile/radar warning and jamming suite already installed.

RAF Hercules equip Squadrons 24, 30, 47, and 70 of Strike Command. In December 1994, the RAF became the first customer for the upgraded C-130J, placing an order for 25 of these Allison AE2100-powered aircraft for service early next year. Portugal's five C-130Hs are being "stretched" locally by OGMA to match a single new C-130H-30. *(Data for C-130H.)*
Contractor: Lockheed Martin Aeronautical Systems, USA.
Power Plant: four Allison T56-A-15 turboprops; each 4,508 ehp.
Dimensions: span 132 ft 7 in, length 97 ft 9 in, height 38 ft 3 in.
Weights: empty 76,469 lb, gross 175,000 lb.
Performance: max cruising speed at 20,000 ft 374 mph, service ceiling 23,000 ft, range with max payload 2,356 miles.
Accommodation: crew of five; up to 92 troops, 64 paratroops, 74 stretcher patients, or five 463L freight pallets.

CN-235 M

The first NATO military operator of this twin-turboprop transport was the Spanish Air Force, which acquired two as VIP transports under the current designation T.19A. Eighteen more (T.19Bs) were delivered to No. 35 Wing at Getafe. The French Air Force funded two in FY 1990 and six more in FY 1991, and 1/62 *Vercors* Squadron formed at Creil on August 1, 1993, with six, the other two going to replace Caravelle transports in Tahiti. Seven more were ordered in 1996 as offsets for a Spanish Army Cougar contract. Turkey has ordered 52 to replace veteran C-47s, 50 being built locally by Tusas following two delivered by CASA in early 1992. Initial operators are Nos. 221 and 223 Squadrons of 12 Wing at Erkilet/Kayseri and the VIP flights attached to the headquarters of the 1st and 2d Tactical Air Forces.

C-212 Aviocar, Spanish Air Force
(Paul Jackson)

Hercules C. Mk 1, Royal Air Force
(P. R. Foster)

Contractor: Aircraft Technology Industries (Airtech: CASA, Spain, and IPTN, Indonesia).
Power Plant: two General Electric CT7-9C turboprops; each 1,870 shp.
Dimensions: span 84 ft 8 in, length 70 ft 2½ in, height 26 ft 10 in.
Weights: empty 19,400 lb, gross 36,376 lb.
Performance: max cruising speed at 15,000 ft 286 mph, service ceiling 25,000 ft, range with max payload 1,102 miles, with max fuel 2,272 miles.
Accommodation: crew of three; up to 48 troops, 46 paratroops, 24 stretchers and four attendants, 13,227 lb of freight (loaded via rear ramp), or equipment for ASW/maritime patrol, EW, or photographic duties.

Fokker 50 and 60

The Royal Netherlands Air Force has only one transport squadron, No. 334 at Eindhoven, equipped until recently with 10 F27s. All will have been withdrawn by the end of this year, replaced in part by four Fokker 60 military transports and two basically similar Fokker 50 passenger aircraft. The F60 has a 64-in fuselage stretch, large cargo door on the forward starboard side, multipurpose rear door, reinforced floor, and integrated self-defense measures. Both F50s will be modified before delivery with the F60's flight deck and military avionics. *(Data for F60.)*
Contractor: Fokker Aviation BV, the Netherlands.
Power Plant: two Pratt & Whitney PW127B turboprops; each 2,750 shp.
Dimensions: span 95 ft 2 in, length 88 ft 2 in, height 27 ft 4¼ in.
Weights: empty 29,383 lb, gross 50,596 lb.
Performance: cruising speed 332 mph, service ceiling 25,000 ft, max range with freight 1,208 miles.
Accommodation: crew of two; 55 paratroops, 30 stretchers, or 17,231 lb of freight.

G222

The G222 equips two of the three transport squadrons of the Italian Air Force in its standard general-purpose (222TCM) form. Six quick-change kits are held, for field conversion to aeromedical configuration. The Air Force also has 10 G222SAA (Sistema Aeronautico Antincendio) fire-fighting aircraft, with a modular palletized pack carrying 1,585 gallons of water and retardant. These have been used extensively and successfully in many parts of Italy. It operates five G222s ordered by the Italian Ministry for Civil Defense as a rapid intervention unit for fire-fighting, oil slick dispersal, medevac, and airlift of supplies to earthquake and other disaster areas. A fleet upgrade was launched in 1992, when a G222 was modified with improved navigation equipment and new self-defense aids. *(Data for G222.)*
Contractor: Alenia (Aeritalia SpA), Italy.
Power Plant: two General Electric T64-GE-P4D turboprops; each 3,400 shp.
Dimensions: span 94 ft 2 in, length 74 ft 5½ in, height 34 ft 8¼ in.
Weights: empty 34,610 lb, gross 61,730 lb.
Performance: max speed at 15,000 ft 303 mph, service ceiling 25,700 ft, range with max payload 783 miles.
Accommodation: crew of three; 46 troops, 40 paratroops, 36 stretchers and four attendants, or 19,840 lb of freight, vehicles, and guns.

Transall C-160

The French Air Force received 50, and the German Air Force 90, of the original C-160s, which ended production in 1972. A second series was authorized in 1977, with updated avionics and an optional center-section fuel tank. Of 29 of these C-160NGs built for the French Air Force, eight are standard transports, 10 are equipped as probe-and-drogue in-flight refueling tankers, five others have provision for rapid conversion to tankers, and six are Astarté/Gabriel special mission aircraft (which see). All have an in-flight refueling receiver boom. Four squadrons of the French Air Force and four squadrons of the German Air Force fly C-160s, some of the French aircraft being on long-term loan to small units overseas. First-generation French aircraft began an avionics update in 1993, changing their designation from C-160F to C-160R. This involves the Alkan Spirit defensive aids system, an EFIS (electronic flight instrumentation system) optimized for NVGs, first pilot's HUD, ring-laser INS, and GPS. A similar upgrade is in prospect for second-generation French aircraft, and DASA is modifying German C-160Gs with a GEC air data computer, GPS, and Rockwell FMS-800 flight-management system. Twenty first-series C-160Ds equip No. 221 Squadron of the Turkish Air Force.
Contractor: Arbeitsgemeinschaft Transall (Aerospatiale and MBB); France and Germany.
Power Plant: two Rolls-Royce Tyne RTy.20 Mk 22 turboprops; each 6,100 ehp.
Dimensions: span 131 ft 3 in, length, excl probe, 106 ft 3½ in, height 38 ft 2¾ in.
Weights: empty 63,935 lb, gross 112,435 lb.
Performance: max speed at 16,000 ft 319 mph, service ceiling 27,000 ft, range with max payload 1,151 miles.
Accommodation: crew of three; 93 troops, 61–88 paratroops, 62 stretchers and four attendants, tanks, vehicles, or up to 35,275 lb of freight.

Tristar C. Mk 2/2A

In addition to the former British Airways Tristars that have been converted into tankers, the RAF purchased three similar passenger transports from Pan Am. These are operated by No. 216 Squadron as C. Mk 2 passenger aircraft with 267 seats, the third aircraft delivered April 2, 1993, being a Mk 2A—the only RAF Tristar with a full milspec communications fit.

Strategic Missiles

S3D (SSBS)

Two-stage ballistic missiles with thermonuclear warheads have constituted the second element of France's Forces Aériennes Stratégiques for the past quarter

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century. The 1st Strategic Missile Brigade of S3D *sol-sol balistique stratégique* (SSBS) missiles is based in hardened silos throughout 385 sq miles of the Plateau d'Albion, east of Avignon. Each of the two components of nine S3D second-generation missiles has its own fire-control center, with No. 1 PCT *(Poste Centrale de Tir)* at Rustrel and No. 2 at Reilhannette. In accordance with France's current strategic defense policy, the S3D force will stand down on September 16, 1996. *(Data are provisional.)*

Contractor: Aerospatiale SNI, Space and Strategic Systems Division, France.
Propulsion: first stage: SEP Type 902 solid-propellant motor; 99,200 lb thrust for 76 seconds. Second stage: SEP Hita II solid-propellant motor; 70,550 lb thrust for 52 seconds.
Guidance: inertial.
Warhead: thermonuclear (1.2 mT). Reentry vehicle is hardened against the effects of a high-altitude nuclear explosion by an ABM and carries penetration aids.
Dimensions: length overall 45 ft 11 in, diameter of first stage 5 ft 0 in.
Weight: 56,880 lb.
Performance: range more than 2,175 miles.

Air-Launched Missiles

ALARM

ALARM (Air-Launched Antiradiation Missile) was developed for use by RAF Tornado IDS aircraft against hostile gun and missile radars, as a replacement for the AS 37 Martel and AGM-45 Shrike. Its operational modes include direct attack and a loiter mode in which the missile climbs to height and deploys a parachute from which it remains suspended for several minutes until a suitable target has been identified. The parachute is then released, and the missile fires onto the target. First regular users were Tornado GR. Mk 1s of No. 9 Squadron, which are assigned to a pathfinding role and were declared officially operational January 1, 1993. A second unit has since converted.
Contractor: British Aerospace Defence, UK.
Propulsion: Bayern-Chemie dual-thrust solid-propellant rocket motor.
Guidance: passive homing, using GEC-Marconi seeker.
Warhead: high-explosive fragmentation type, with laser proximity fuze.
Dimensions: length 14 ft 1½ in, body diameter 8¾ in, wingspan 2 ft 4½ in.
Weight: 590 lb.
Performance: range 28 miles.

AMRAAM (AIM-120A/B)

The Advanced Medium-Range Air-to-Air Missile was developed to replace the AIM-7 Sparrow on all USAF and USN fighters and is suitable as primary armament of the Eurofighter 2000. It has been ordered to arm F-16s of the air forces of the Netherlands, Norway, and Turkey; German Phantoms; and Spanish Hornets. Compared with Sparrow, it offers increased average velocity, reduced miss distance, improved fuzing, increased warhead lethality, multiple target engagement capability, improved clutter rejection in low-altitude environments, improved ECCM capability, increased maximum launch range, reduced-smoke motor, and improved maintenance and handling.
Contractor: Hughes Missile Systems/Raytheon Company, USA.
Propulsion: two-stage solid-propellant rocket motor.
Guidance: inertial midcourse, with active radar terminal homing and active radar fuze.
Warhead: high-explosive fragmentation type; weight 48 lb.
Dimensions: length 12 ft 0 in, body diameter 7 in, span of tail control fins 2 ft 1 in.
Weight: 345 lb.
Performance: cruising speed approx Mach 4, range approx 30 miles.

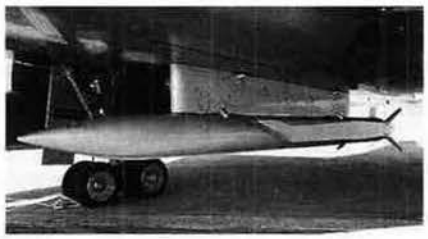
Apache

The Apache (*Arme Propulsée A CHarges Ejectables*) is a turbojet-powered container weapon system, with flip-out wings, adaptable to such modern French, German, and NATO combat aircraft as the Eurofighter, F-16, F/A-18, Mirage 2000, Rafale, and Tornado. A full-range test from a Mirage 2000 was completed successfully in 1994. The French version, carrying KRISS antirunway submunitions, will enter service in 1997, the German Apache-MAW in 1998, and antitank and mine-dispensing versions in 1999. A terrain-following version known as SCALP, with a range of up to 375 miles and low-observable design features, will follow.
Contractors: Matra and Aerospatiale, France.
Propulsion: Microturbo TRI 60-30 turbojet; 900 lb st.
Guidance: midcourse inertial, with active radar terminal homing.
Warhead: various submunitions.
Dimensions: length 16 ft 9 in, body width 2 ft 0¾ in, wingspan 8 ft 3¾ in.
Weight: 2,712 lb.
Performance: range 87 miles.

AS 30L

The AS 30L (for laser) ASM is designed for use against hardened targets on land and at sea, normally in conjunction with a Thomson-CSF Atlis 2 or CLDP target illuminating pod carried by the launch aircraft. The warhead's hard steel casing allows penetration of more than six feet of concrete before detonation, using a delayed fuze. The AS 30L is carried by French Air Force Jaguars and Mirage 2000Ds and is compatible with such types as the Rafale, AMX, Tornado and F-16.
Contractor: Aerospatiale SNI, Division Engins Tactiques, France.
Propulsion: two-stage solid-propellant rocket motor.
Guidance: inertial, with semiactive laser terminal homing using a Thomson-CSF Ariel seeker.

ALARM ARMs under fuselage of RAF Tornado



ASMP nuclear ASM *(Paul Jackson)*

Warhead: high-explosive type; weight 529 lb.
Dimensions: length 11 ft 11¾ in, body diameter 1 ft 1½ in, wingspan 3 ft 3¼ in.
Weight: 1,146 lb.
Performance: speed at impact above Mach 1.32, range 1.8–6.2 miles.

ASMP

The ASMP (*Air-Sol Moyenne Portée*) is primary armament of the French Air Force's Mirage 2000N nuclear strike aircraft and can also arm Super Étendard fighters of the French Navy. It is powered in supersonic cruising flight by a kerosene-burning ramjet, supplied with air by a pair of two-dimensional side intakes that also provide lift. Intended targets are airfields, command communication centers, and other heavily defended sites from standoff range.
Contractor: Aerospatiale SNI, Division Engins Tactiques, France.
Propulsion: SNPE solid-propellant booster is integrated in the combustion chamber of a kerosene-burning ramjet, forming a two-stage rocket-ramjet.
Guidance: SAGEM preprogrammed inertial system, with terrain-following capability.
Warhead: nuclear type; yield 150kT (TN80) or 300kT (TN81).
Dimensions: length 17 ft 8 in, body diameter 1 ft 3 in, finspan 3 ft 1¾ in.
Weight: 1,895 lb.
Performance: cruising speed Mach 2 at low altitude, Mach 3 at high altitude; range 50 miles after low-altitude launch, 155 miles after high-altitude launch.

Aspide

Aspide is interchangeable with the externally similar Sparrow on F-104S ASA Starfighters and Tornado F. Mk 3s of the Italian Air Force. It is an all-weather, all-aspect, air-to-air and surface-to-air weapon, suitable for air-launch at very low altitudes and offering multiple target engagement and resistance to advanced ECM, including home-on-jam capability. A version with active radar homing, known as Aspide Mk 2, received initial funding as insurance against rejection of AMRAAM for Italy's Eurofighter 2000s.
Contractor: Alenia, Italy.
Propulsion: single-stage solid-propellant rocket motor.
Guidance: semiactive CW radar guidance, employing monopulse techniques.
Warhead: high-explosive fragmentation type; weight 66 lb.
Dimensions: length 12 ft 1½ in, body diameter 8 in, wingspan 3 ft 3¼ in.
Weight: 485 lb.
Performance: cruising speed Mach 2 plus speed of launch platform, range 22–37 miles.

HARM (AGM-88)

The HARM (High-Speed Antiradiation Missile) has been delivered to the air forces of Germany and Italy to equip Tornados, to the Netherlands, Norway, Greece, and Turkey for F-16s, and to the Spanish Air Force for EF-18 Hornets. It can be launched at heights from sea level to 40,000 ft. The USN and USAF used it against Libya in 1986 and in the Persian Gulf War in 1991. The latest AGM-88C version has a seeker able to counter frequency-agile targets and a more lethal warhead containing tungsten alloy cubes.
Contractor: Texas Instruments, Inc, USA.
Propulsion: smokeless dual-thrust solid-propellant rocket motor.
Guidance: passive homing.
Warhead: high-explosive fragmentation type; weight 145 lb.
Dimensions: length 13 ft 8½ in, body diameter 10 in, wingspan 3 ft 8½ in.
Weight: 807 lb.
Performance: cruising speed supersonic, range 15.5 miles.

Harpoon (AGM-84)

During the 1982 Falklands War, some Nimrod maritime patrol aircraft of the RAF were given an attack capability with bombs and AGM-84A Harpoon antiship missiles. Retained for possible future use, the Harpoons are designed to follow a sea-skimming path after launch and can perform high-*g* maneuvers against fast maneuvering targets. ECCM features are installed. Spain has improved AGM-84C/D Harpoons for its Hornets; Portugal arms Orions with AGM-84As.
Contractor: McDonnell Douglas Missile Systems, USA.
Propulsion: Teledyne CAE J402-CA-400 turbojet; 660 lb st.
Guidance: inertial; active radar terminal homing.
Warhead: penetration high-explosive blast type; weight 488 lb.
Dimensions: length 12 ft 7½ in, body diameter 1 ft 1½ in, wingspan 3 ft 0 in.
Weight: 1,145 lb.
Performance: cruising speed high subsonic, range 75 miles.

Kormoran

The basic Kormoran 1 sea-skimming antiship missile, which entered service in 1977, can be operated in range-and-bearing and bearing-only modes, the latter being used when firing optically without use of radar. Deployed on Tornados of the German Navy and Italian Air Force, it is designed for maximum effectiveness against ships up to destroyer size and is largely immune to all contemporary types of ECM. The Kormoran 2 has a new radar seeker, a strapdown INS, and digital signal processing. Interchangeable with Kormoran 1 on the Tornado, it offers improved target engagement capability, advanced ECCM, a longer range (22 miles), better penetration capability, and increased warhead weight (485 lb) but is not yet in production. *(Data for Kormoran 1.)*
Contractor: DASA, Germany.
Propulsion: two built-in boosters and solid-propellant sustainer rocket motor.
Guidance: inertial midcourse guidance and active radar terminal homing.
Warhead: high-explosive fragmentation type; weight 364 lb.
Dimensions: length 14 ft 5 in, body diameter 1 ft 1½ in, wingspan 3 ft 3¼ in.
Weight: 1,320 lb.
Performance: cruising speed Mach 0.9, max range 18.5 miles.

Magic (R.550)

Magic 1 is a highly maneuverable short/medium-range dogfight missile that can be launched at ranges between 985 ft and 1.85 miles in the hemisphere

behind the target. The Magic 2 all-sector version is operational on Mirage 2000 aircraft of the air forces of France and Greece. It has a more sensitive infrared seeker with head-on capability and improved IR counter-countermeasures (IRCCM), including flare rejection, and can be slaved to the launch aircraft's AI radar or a helmet-mounted sight as an alternative to autonomous operation. It has been fired successfully from an F-16 flying at Mach 1.3 at 20,000 ft, during an 8.7 *g* turn. More than 10,000 Magics have been sold, 75 percent of them for export. They have been adapted to the A-4 Skyhawk, Alpha Jet, F-5, F-8E (FN) Crusader, F-16, Hawk, Jaguar, MiG-21, MiG-23, Mirage III, Mirage 5, Mirage F1, Mirage 2000, Super Etendard, Sea Harrier, and other types. *(Data for Magic 2.)*
Contractor: SA Matra, France.
Propulsion: single-stage solid-propellant rocket motor.
Guidance: infrared homing.
Warhead: high-explosive fragmentation type; weight 28.6 lb. Impact and RF proximity fuzes.
Dimensions: length 9 ft 0¼ in, body diameter 6¼ in, wingspan 2 ft 2 in.
Weight: 198 lb.
Performance: cruising speed above Mach 2, range 3.1 miles.

Martel (AS 37)

The Martel (Missile AntiRadar and TELevision) ASM was developed as a joint Anglo-French program. The all-weather antiradiation AS 37 version continues in use on Jaguars of the French Air Force.
Contractors: SA Matra, France, and British Aerospace, UK.
Propulsion: solid-propellant rocket motors by Aerospatiale and Hotchkiss-Brandt.
Guidance: passive homing, with seeker that homes on hostile radar emissions.
Warhead: high-explosive blast fragmentation type; weight 330 lb. Radar proximity fuze.
Dimensions: length 13 ft 9½ in, body diameter 1 ft 3¾ in, wingspan 3 ft 11¼ in.
Weight: 1,180 lb.
Performance: cruising speed subsonic, range 34 miles.

Maverick (AGM-65)

The air forces of Belgium, Germany, Greece, Portugal, Spain, and Turkey are European operators of this launch-and-leave ASM. The TV-guided version bought initially by Germany is the AGM-65B, with a "scene magnification" seeker that enables the pilot to identify and lock on to smaller or more distant targets than with the original AGM-65A. Germany subsequently bought AGM-65D imaging infrared versions and (with Belgium and Turkey) an improved version of this designated AGM-65G. *(Data for AGM-65B.)*
Contractor: Hughes Missile Systems Group/Raytheon Company, USA.
Propulsion: Thiokol TX-481 solid-propellant rocket motor.
Guidance: self-homing electro-optical system.
Warhead: high-explosive shaped charge; weight 125 lb. Impact fuze.
Dimensions: length 8 ft 2 in, body diameter 1 ft 0 in, wingspan 2 ft 4½ in.
Weight: 462 lb.
Performance: range 0.6–14 miles.

Penguin

The air-launched Penguin Mk 3 antiship missile arms F-16s of the Royal Norwegian Air Force, the normal load being one under each wing, although a maximum of four can be carried. It can be carried by aircraft flying at speeds up to Mach 1.2 and launched at any height between 150 and 30,000 ft. Target acquisition can be via the launch aircraft's radar or in a completely passive mode using the HUD. It is claimed to be immune to ECM and able to discriminate between real targets and decoys.
Contractor: Norsk Forsvarsteknologi A/S, Norway.
Propulsion: solid-propellant rocket motor.
Guidance: programmed inertial midcourse guidance; IR terminal homing.
Warhead: high-explosive semi–armor piercing type; weight 308 lb.
Dimensions: length 10 ft 5¼ in, body diameter 11 in, wingspan 3 ft 3¼ in.
Weight: 820 lb.
Performance: cruising speed above Mach 0.9, range more than 25 miles.

R-27 (NATO "Alamo")

Lt. Gen. Joerg Kuebart, former Chief of Staff of the German Air Force, stated that the R-27 has demonstrated the same capabilities as AMRAAM. Two versions were retained for the MiG-29s now in German Air Force service:

R-27R (AA-10 Alamo-A). Short-burn semiactive radar homing version for use over medium ranges.

R-27T (AA-10B Alamo-B). Short-burn infrared homing version.
Contractor: Vympel, Russia.
Warhead: expanding rod high-explosive; weight 86 lb.
Dimensions: length 13 ft 1½ in (A), 12 ft 1¾ in (B), body diameter 9 in, wingspan 3 ft 2¼ in.
Weight: 558 lb (A), 560 lb (B).
Performance: range 1,640 ft to 31 miles (A), 25 miles (B).

R-73A (NATO "Archer")

General Kuebart regarded the R-73A as being equal to the AIM-9L Sidewinder. Four thrust-vectoring control vanes in the rocket efflux and complex control surfaces confer great maneuverability, particularly when the missile is launched at large off-boresight target angles. R-73As arm the German Air Force's MiG-29 fighters.

Super 530D (left) and Magic AAMs on Mirage 2000

R-27T (Alamo-B) AAM
(Linda Jackson)

AIM-9L Sidewinder AAM
(Paul Jackson)

Contractor: Vympel, Russia.
Guidance: midcourse inertial, with all-aspect IR homing; active radar fuze.
Warhead: High-explosive fragmentation,16 lb.
Dimensions: length 9 ft 6¼ in, body diameter 6¾ in, span of tailfins 1 ft 8 in.
Weight: 243 lb.
Performance: range 985 ft to 18.6 miles.

Sea Eagle

Sea Eagle is an all-weather, day and night, fire-and-forget antiship missile. Prior to launch, the on-board microprocessor is supplied with target positional information from the carrier aircraft. The computer controls the flight path of Sea Eagle until the target is acquired by the radar seeker during the final sea-skimming phase of attack. This can be made from any selected bearing, with random maneuvers. The missile can discriminate among several potential targets and is designed to destroy or disable targets protected by sophisticated ECM and decoys, including heavy cruisers and aircraft carriers. A helicopter-launched version has a small additional boost motor. Sea Eagle has equipped two squadrons of RAF Tornados assigned to maritime roles since 1994. They normally carry two missiles under the fuselage, but four can be carried if drop tanks are not required.
Contractor: British Aerospace Defence, UK.
Propulsion: Microturbo TRI-60 turbojet; 787 lb st.
Guidance: inertial navigation, with active radar terminal homing.
Warhead: high-explosive semi–armor piercing type; weight more than 507 lb.
Dimensions: length 13 ft 7 in, body diameter 1 ft 3¾ in, wingspan 3 ft 11¼ in.
Weight: 1,320 lb.
Performance: cruising speed Mach 0.85, range 68 miles.

Sidewinder (AIM-9)

This pioneer IR homing AAM is used by all NATO air forces except that of France. Major current model in Europe is the third-generation AIM-9L, manufactured by a consortium of British, Italian, Norwegian, and German companies, under the leadership of Bodenseewerk; but significant numbers of AIM-9M, N, and P versions are also deployed. *(Data for AIM-9L.)*
Contractor: Bodenseewerk Gerätetechnik GmbH, Germany.
Propulsion: Mk 36 Mod 7/8 solid-propellant rocket motor.
Guidance: IR homing, with AM/FM conical scan and active laser proximity fuze.
Warhead: annular blast fragmentation high-explosive; weight 21 lb.
Dimensions: length 9 ft 5 in, body diameter 5 in, finspan 2 ft 1 in.
Weight: 192 lb.
Performance: cruising speed above Mach 2, range 5 miles.

Sky Flash

The "boost and coast" Sky Flash all-weather AAM has the same general configuration and dimensions as the AIM-7E Sparrow but is fitted with a British semiactive radar homing head of inverse monopulse design. The advanced radar proximity fuze is claimed to offer a high single-shot kill capability against targets flying at subsonic and supersonic speeds, singly and in formation, at high, medium, and low (250 ft) altitudes, in severe ECM environments, with home-on jam. Sky Flash is the primary weapon of the RAF Tornado F. Mk 3.
Contractor: British Aerospace Defence, UK.
Propulsion: Aerojet Mk 52 Mod 2 solid-propellant rocket motor.
Guidance: semiactive radar homing, by GEC-Marconi.
Warhead: high-explosive continuous rod type; weight 66 lb. Thorn EMI radar proximity fuze.
Dimensions: length 12 ft 0 in, body diameter 8 in, wingspan 3 ft 4 in.
Weight: 430 lb.
Performance: cruising speed above Mach 2, range 25 miles.

Sparrow (AIM-7)

The Sparrow AAM is in service with the air forces of Canada, Greece, Spain, and Turkey. Most widely used version is the AIM-7E, but the Spanish Air Force has AIM-7Ds and Fs, and the AIM-7M serves in Canada. Italy and the UK hold stocks of AIM-7Es in reserve. *(Data for AIM-7E.)*
Contractor: Raytheon Company, USA.
Propulsion: Rocketdyne Mk 38 Mod 2 solid-propellant rocket motor.
Guidance: semiactive CW radar homing.
Warhead: high-explosive type; weight 68 lb.
Dimensions: length 12 ft 0 in, body diameter 8 in, wingspan 3 ft 4 in.
Weight: 450 lb.
Performance: cruising speed above Mach 3.5, range 20 miles.

Super 530

Carried underwing by Mirage F1 interceptors, the basic Super 530F is an all-sector snap-up/snap-down all-weather AAM, with conical-scan semiactive radar seeker. The Mirage 2000 is armed with the Super 530D, with a monopulse CW Doppler semiactive seeker and digital microprocessing, making it considerably less susceptible to jamming. It is able to attack targets flying at speeds up to Mach 3 and at heights from 200 to 80,000 ft. *(Data for Super 530D.)*
Contractor: SA Matra, France.
Propulsion: dual-thrust solid-propellant rocket motor, by Thomson-Brandt.
Guidance: semiactive pulse-Doppler radar homing, by Dassault Electronique.
Warhead: fragmenting high-explosive type; weight 66 lb. Active radar proximity fuze.
Dimensions: length 12 ft 5½ in, body diameter 10¼ in, wingspan 2 ft 1¼ in.
Weight: 585 lb.
Performance: cruising speed Mach 4.5, range more than 25 miles. ■

Photochart of USAF Leadership (As of August 1, 1996)

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Compiled by Wendy Alexis Peddrick, Editorial Associate

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Hanscom AFB, Mass.

Human Systems Center
Brig. Gen. Robert P. Bellhar
Brooks AFB, Tex.

Space and Missile Systems Center
Lt. Gen. Lester L. Lyles
Los Angeles AFB, Calif.

Air Force Development Test Center
Maj. Gen. Stewart E. Cranston
Eglin AFB, Fla.

Air Force Flight Test Center
Maj. Gen. Richard L. Engel
Edwards AFB, Calif.

Arnold Engineering Development Center
Col. Michael P. Wiedemer
Arnold AFB, Tenn.

Ogden Air Logistics Center
Maj. Gen. Stephen P. Condon
Hill AFB, Utah

Oklahoma City Air Logistics Center
Maj. Gen. Charles H. Perez
Tinker AFB, Okla.

Sacramento Air Logistics Center
Maj. Gen. Eugene L. Tattini
McClellan AFB, Calif.

San Antonio Air Logistics Center
Maj. Gen. James S. Childress
Kelly AFB, Tex.

Warner Robins Air Logistics Center
Maj. Gen. Rondal H. Smith
Robins AFB, Ga.

Aerospace Maintenance and Regeneration Center
Col. Walter L. Mosher
Davis-Monthan AFB, Ariz.

Aerospace Guidance and Metrology Center
Col. Joseph M. Renaud
Newark AFB, Ohio

Cataloging and Standardization Center
Col. Thomas L. Shively*
Battle Creek, Mich.

Armstrong Laboratory
Dr. Brendan B. Godfrey
Brooks AFB, Tex.

Phillips Laboratory
Col. Michael L. Heil
Kirtland AFB, N. M.

Rome Laboratory
Col. Ted F. Bowlds
Rome, N. Y.

Wright Laboratory
Col. Richard W. Davis
Wright-Patterson AFB, Ohio

Air Force Office of Scientific Research
Col. Robert L. Herklotz
Bolling AFB, D. C.

Air Force Security Assistance Center
Maj. Gen. Walter T. Worthington
Wright-Patterson AFB, Ohio

Materiel Systems Group
Lt. Col. (Col. selectee) Charlotte L. Rea-Dix
Wright-Patterson AFB, Ohio

Joint Logistics Systems Center
Brig. Gen. David A. Herrelko
Wright-Patterson AFB, Ohio

Air Force Space Command

Hq. Peterson AFB, Colo.

Commander
Gen. Joseph W. Ashy

14th Air Force
Maj. Gen. David L. Vesely
Vandenberg AFB, Calif.

20th Air Force
Maj. Gen. Donald G. Cook
F. E. Warren AFB, Wyo.

Space Warfare Center
Brig. Gen. Glen W. Moorhead III
Falcon AFB, Colo.

Air Force Special Operations Command

Hq. Hurlburt Field, Fla.

Commander
Maj. Gen. James L. Hobson, Jr.

16th Special Operations Wing
Brig. Gen. Norton A. Schwartz
Hurlburt Field, Fla.

352d Special Operations Group
Lt. Col. (Col. selectee) Michael F. Planert
RAF Mildenhall, UK

353d Special Operations Group
Col. Thomas M. Beres
Kadena AB, Japan

720th Special Tactics Group
Col. Craig F. Brotchie
Hurlburt Field, Fla.

USAF Special Operations School
Col. Brian Maher
Hurlburt Field, Fla.

*As of September 1

Air Mobility Command

Hq. Scott AFB, Ill.

Commander
Gen. Walter Kross

15th Air Force
Lt. Gen. Bruce L. Fister
Travis AFB, Calif.

21st Air Force
Lt. Gen. Edwin E. Tenoso
McGuire AFB, N. J.

Air Mobility Warfare Center
Brig. Gen. Richard C. Marr
Fort Dix, N. J.

Tanker Airlift Control Center
Brig. Gen. William Welser III
Scott AFB, Ill.

Pacific Air Forces

Hq. Hickam AFB, Hawaii

Commander
Gen. John G. Lorber

5th Air Force
Lt. Gen. Ralph E. Eberhart
Yokota AB, Japan

7th Air Force
Lt. Gen. Ronald W. Iverson
Osan AB, South Korea

11th Air Force
Lt. Gen. Lawrence E. Boese
Elmendorf AFB, Alaska

13th Air Force
Brig. Gen. (Maj. Gen. selectee)
John R. Dallager
Andersen AFB, Guam

15th Air Base Wing
Col. Bruce A. Brown
Hickam AFB, Hawaii

United States Air Forces in Europe

Hq. Ramstein AB, Germany

Commander
Gen. Michael E. Ryan

3d Air Force
Maj. Gen. Tad J. Oelstrom
RAF Mildenhall, UK

16th Air Force
Lt. Gen. Richard C. Bethurem
Aviano AB, Italy

Field Operating Agencies

Air Force Audit Agency

Hq. Washington, D. C.

The Auditor General
Jackie R. Crawford

Air Force Base Conversion Agency

Arlington, Va.

Director
Alan K. Olsen

Air Force Center for Environmental Excellence

Hq. Brooks AFB, Tex.

Director
Gary M. Erickson

Air Force Civil Engineer Support Agency

Hq. Tyndall AFB, Fla.

Commander
Col. Peter K. Kloeber

Air Force Communications Agency

Hq. Scott AFB, Ill.

Commander
Col. Patrick M. Ryan

Air Force Cost Analysis Agency

Arlington, Va.

Commander
Lt. Col. (Col. selectee)
Eddie D. Weeks*

Air Force Doctrine Center

Hq. Langley AFB, Va.

Commander
Col. Robert D. Coffman

Air Force Flight Standards Agency

Andrews AFB, Md.

Commander
Col. Patrick F. Nolte

Air Force Frequency Management Agency

Arlington, Va.

Commander
Col. Kimberly J. Dalrymple

Air Force Historical Research Center

Hq. Maxwell AFB, Ala.

Commander
Col. Richard S. Rauschkolb

Air Force History Support Office

Washington, D. C.

Commander
Col. George K. Williams

Air Force Inspection Agency

Hq. Kirtland AFB, N. M.

Commander
Col. James C. Robertson III

Air Force Legal Services Agency
Hq. Bolling AFB, D. C.

Commander
Col. Jerald D. Stubbs*

Air Force Logistics Management Agency
Hq. Maxwell AFB, Gunter Annex, Ala.

Commander
Col. Clarence T. Lowry

Air Force Management Engineering Agency
Hq. Randolph AFB, Tex.

Commander
Col. Charles F. Dibrell, Jr.

Air Force Medical Operations Agency
Hq. Bolling AFB, D. C.

Commander
Maj. Gen. (Lt. Gen. selectee)
Charles H. Roadman II

Air Force Medical Support Agency
Brooks AFB, Tex.

Commander
Col. Sidney Brandler

Air Force News Agency
Hq. Kelly AFB, Tex.

Commander
Col. Joseph S. Panvini

Air Force Office of Special Investigations
Hq. Bolling AFB, D. C.

Commander
Brig. Gen. Francis X. Taylor*

Air Force Operations Group
Hq. Washington, D. C.

Commander
Col. Terry L. Simpson

Air Force Pentagon Communications Agency
Washington, D. C.

Commander
Col. Stephen E. Anno

Air Force Personnel Center
Hq. Randolph AFB, Tex.

Commander
Brig. Gen. Susan L. Pamerleau

Air Force Personnel Operations Agency
Hq. Washington, D. C.

Chief
Horst R. Kelly

Air Force Program Executive Office
Hq. Washington, D. C.

Air Force Acquisition Executive
Hon. Arthur L. Money

Air Force Real Estate Agency
Hq. Bolling AFB, D. C.

Director
William E. Edwards

Air Force Reserve
Hq. Robins AFB, Ga.

Chief
Maj. Gen. Robert A. McIntosh

Air Force Review Boards Agency
Andrews AFB, Md.

Director
Joe G. Lineberger

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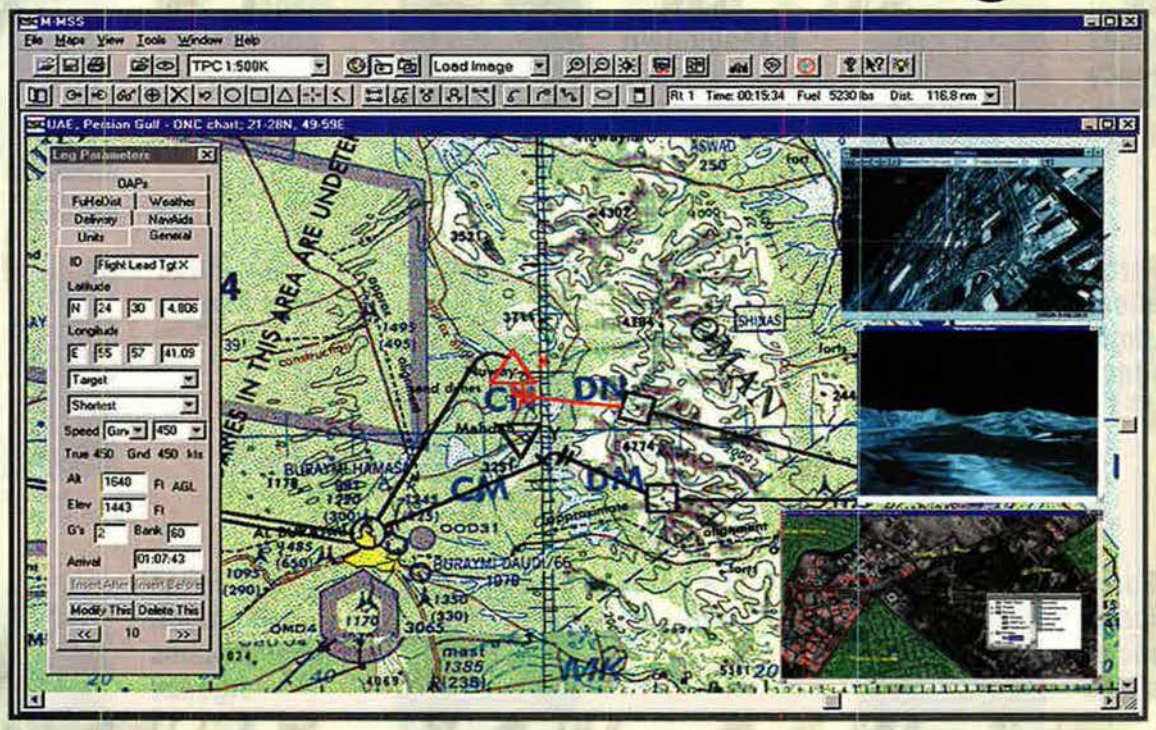

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Director
Brig. Gen. Orin L. Godsey

Air Force Security Police Agency
Hq. Kirtland AFB, N. M.

Commander
Col. Lawrence R. Mayes

Air Force Services Agency
Hq. San Antonio, Tex.

Commander
Col. Gary C. Bradham

Air Force Studies and Analyses Agency
Hq. Washington, D. C.

Commander
Col. Thomas L. Allen

Air Force Technical Applications Center
Hq. Patrick AFB, Fla.

Commander
Col. (Brig. Gen. selectee) Glen D. Shaffer

Air Intelligence Agency
Hq. Kelly AFB, Tex.

Commander
Maj. Gen. Michael V. Hayden

Air National Guard
Hq. Washington, D. C.

Director
Maj. Gen. Donald W. Shepperd

Air Reserve Personnel Center
Hq. Denver, Colo.

Commander
Col. Frank P. Cyr, Jr.

Air Weather Service
Hq. Scott AFB, Ill.

Commander
Col. Joseph D. Dushan

Joint Services Survival, Evasion, Resistance, and Escape Agency
Hq. Fort Belvoir, Va.

Commander
Col. John C. Chapman, Jr.

Direct Reporting Units

Air Force Operational Test and Evaluation Center
Kirtland AFB, N. M.

Commander
Maj. Gen. George B. Harrison

United States Air Force Academy
Colorado Springs, Colo.

Superintendent
Lt. Gen. Paul E. Stein

11th Wing
Bolling AFB, D. C.

Commander
Col. Peter U. Sutton

Senior Enlisted Advisors

CMSgt. F. J. Finch
Air Combat Command
Langley AFB, Va.

(Vacant)
Air Education and Training Command
Randolph AFB, Tex.

CMSgt. Marc A. Mazza
Air Force Materiel Command
Wright-Patterson AFB, Ohio

CMSgt. Richard G. Griffis
Air Force Space Command
Peterson AFB, Colo.

CMSgt. Mike Reynolds
Air Force Special Operations Command
Hurlburt Field, Fla.

CMSgt. Garland E. Gardner
Air Mobility Command
Scott AFB, Ill.

CMSgt. William L. Richardson, Jr.
Pacific Air Forces
Hickam AFB, Hawaii

CMSgt. Eric W. Benken
United States Air Forces in Europe
Ramstein AB, Germany

CMSgt. David I. Priest
Air Force Office of Special Investigations
Bolling AFB, D. C.

CMSgt. Carol Smits
Air Force Reserve
Robins AFB, Ga.

CMSgt. Edwin B. Brown
Air National Guard
Andrews AFB, Md.

CMSgt. David Hill
Air Intelligence Agency
Kelly AFB, Tex.

CMSgt. Otis L. Scott, Jr.
11th Wing
Bolling AFB, D. C.

CMSgt. Nicholas S. P. Davis, Jr.
United States Air Force Academy
Colorado Springs, Colo.

Air Force Generals Serving in Joint and International Assignments

Office of the Secretary of Defense

Maj. Gen. George K. Anderson
Deputy Ass't Secretary of Defense (Health Services, Operations, and Readiness)
Ass't Secretary of Defense (Health Affairs)
Under Secretary of Defense (Personnel and Readiness)
Washington, D. C.

Maj. Gen. Jeffrey G. Cliver
Deputy Ass't Secretary of Defense for Reserve Affairs (Readiness, Training, and Mobilization)
Ass't Secretary of Defense (Reserve Affairs)
Under Secretary of Defense (Personnel and Readiness)
Washington, D. C.

Maj. Gen. Robert S. Dickman
DoD Space Architect
Under Secretary of Defense for Acquisition and Technology
Washington, D. C.

Maj. Gen. John B. Hall, Jr.
Director East Asia and Pacific Region
Ass't Secretary of Defense (International Security Affairs)
Under Secretary of Defense for Policy

Maj. Gen. Kenneth R. Israel
Director Defense Airborne Reconnaissance Office and Ass't Deputy Under Secretary of Defense (Airborne Reconnaissance)
Under Secretary of Defense for Acquisition and Technology
Washington, D. C.

Brig. Gen. Orest L. Kohut
Deputy Director, Eighth Quadrennial Review of Military Compensation
Ass't Secretary of Defense (Force Management Policy)
Under Secretary of Defense (Personnel and Readiness)
Arlington, Va.

Brig. Gen. William F. Moore
Director, Special Programs
Under Secretary of Defense for Acquisition and Technology
Washington, D. C.

Brig. Gen. Robert T. Osterthaler
Principal Director, European and NATO Affairs
Ass't Secretary of Defense (International Security Affairs)
Under Secretary of Defense for Policy
Washington, D. C.

Department of Defense Agencies

Lt. Gen. Albert J. Edmonds
Director, Defense Information Systems Agency
Arlington, Va.

Lt. Gen. Kenneth A. Minihan
Director, National Security Agency
Fort Meade, Md.

Maj. Gen. Gary L. Curtin
Director, Defense Special Weapons Agency
Alexandria, Va.

Maj. Gen. Robert W. Drewes
Deputy Director, Acquisition Management, and Commander, Defense Contract Management Command
Defense Logistics Agency
Fort Belvoir, Va.

Maj. Gen. William P. Hallin
Deputy Director, Materiel Management
Defense Logistics Agency
Fort Belvoir, Va.

Brig. Gen. James R. Beale
Deputy Director, Operations (D-3)
Defense Information Systems Agency
Arlington, Va.

Brig. Gen. Curtis H. Emery II
Ass't Deputy for Theater Missile Defense Programs
Ballistic Missile Defense Organization
Washington, D. C.

Brig. Gen. Thomas E. Koenning, Jr.
Director, United States On-Site Inspection Agency
Washington, D. C.

Col. (Brig. Gen. selectee) John W. Meincke
Commander, Western Hemisphere
Defense Information Systems Agency
Arlington, Va.

Brig. Gen. John W. Rutledge
Deputy Director, Central Imagery Office
Washington, D. C.

Joint Chiefs of Staff

Gen. Ronald R. Fogleman
Chief of Staff, United States Air Force
Washington, D. C.

Gen. Joseph W. Ralston
Vice Chairman, Joint Chiefs of Staff
Washington, D. C.

Lt. Gen. (Gen. selectee) Howell M. Estes III
Director, Operations, J-3
Washington, D. C.

Lt. Gen. Richard B. Myers
Ass't to the Chairman, Joint Chiefs of Staff
Washington, D. C.

Brig. Gen. (Maj. Gen. selectee) Robert H. Foglesong
Deputy Director, Politico-Military Affairs, J-5
Washington, D. C.

Maj. Gen. Michael V. Hayden
Director, Joint Command and Control Warfare Center, J-3
Kelly AFB, Tex.

Brig. Gen. (Maj. Gen. selectee) John D. Hopper, Jr.
Vice Director, Logistics, and Deputy Director, Mobility, J-4
Washington, D. C.

Maj. Gen. (Lt. Gen. selectee) David J. McCloud
Director, Force Structure, Resources, and Assessment, J-8
Washington, D. C.

Brig. Gen. (Maj. Gen. selectee) Stephen B. Plummer
Deputy Director, Operations (Current Readiness and Capabilities), J-38
Washington, D. C.

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Limited Edition: 1911
Plating: 24-Karat Gold
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Honoring the noble and patriotic profession of arms, as exemplified by the U.S. Air Force!

All the enemies of the Free World in this century have heard the might roar and felt the powerful blast of "Old Forty-Five", the most powerful military-issued pistol in history.

Three generations of Americans fought with it - first against the Kaiser, then against the Fuhrer and the Emperor, and twice against the Communists.

If you were born between the late 1800's and 1968, it is the symbol of your time, your day, your age. And future Americans will look back on our time, with reverence, as the ".45 Era".

But "Old Slabsides" has recently been retired from the skies and the flightlines, replaced by the new 9mm pistol, so we can fire the same ammo as our NATO Allies.

How much longer will the .45 be made? No one knows. But, while it is, we're proud to salute the Americans it symbolizes by issuing this firing Commemorative .45 in honor of our air combat arm - the U.S. Air Force.

24-Karat Gold Plating

When you pick up this three-pound slab of steel and gold, you'll hold the finest, firing limited edition .45 ever made.

Custom-made grips, of fossilized ivory combined with polymers for split resistance, complement the mirror-polished slide, receiver and ten 24-Karat plated parts. As a proper memorial to the Air Force, patriotic symbols and inscriptions are deeply etched and 24-Karat Gold plated across the slide.

Your name or that of a family member can be engraved on the reverse side of the slide, along with other data to make this pistol a lasting, personal memorial.

Limited Edition; Fires .45 ACP

The worldwide edition limit is only 1,911 guns, in honor of the year it was adopted for military use. This highly restricted limit guarantees rarity and collector value. Even the serial numbers are special, numbered between 0001 and 1911, with the prefix "USAF".

This is the military-model M1911A1, and all parts are interchangeable with standard government issued guns; it fires .45 ACP ammo. It is even fitted with a rare and desirable lanyard with gold-plated mounts.

Each pistol is built by the gunsmiths of Thompson/ Auto-Ordnance, the company founded by General John T. Thompson, who developed the .45 auto-loading cartridge, helped develop the .45 pistol and who invented the Thompson Submachine Gun. NRA test firings of their .45 show accuracy "significantly better than the average military-issued M1911".

Your friends or relatives in other service branches might like to know that three other .45 Commemorative, honoring the U.S. Army, U.S. Marine Corps and U.S. Navy, are also available. Each has different exotic wood grips, historical etchings, medallions, lanyard case liner colors and serial number prefixes appropriate to each service branch, to make all our .45s distinctive.

To safely display your investment, a custom-built American Walnut Display Case with locking glass lid is available. Easily wall mounted or displayed flat, it features a form-fitted velvet lining and I.D. plaque. 14"x 9"x 4".

Personalized engraving available on right side of slide.

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This is available exclusively from The American Historical Foundation. When you reserve, you will be made a Member. If you do not have a Federal Firearms License, we will coordinate delivery through your local firearms dealer after your reservation is received here. If you have an FFL, send a signed copy with your reservation. Satisfaction is guaranteed or you may return it in 30 days for a full refund.

Your ownership and display of this museum-grade firearm today - and as a family heirloom tomorrow - says you're proud of our strong national defense.

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☐ My deposit (or credit card authorization) of $95 per pistol is enclosed. Please charge ☐ or ☐ invoice the balance due prior to delivery in eight monthly payments of $125 ☐ or in full ☐.

☐ My payment in full (or credit card authorization) of $1,095 per pistol is enclosed.

☐ Please send the optional custom-crafted American Walnut Display Case, adding $149 to my final payment.

If I cancel my reservation prior to delivery I will receive a full refund, less a commissioning fee of $95.

☐ Please personalize my pistol, at $29. Please send the Engraving Form.

☐ Check or money order enclosed.

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Maj. Gen. Joseph J. Redden
Commander, Joint Warfighting Center, J-7
Fort Monroe, Va.
Maj. Gen. David A. Sawyer
Director, Operational Plans and Interoperability, J-7
Washington, D. C.
Brig. Gen. David E. Baker
Deputy Director, Operations (National Systems Support), J-35
Washington, D. C.
Col. (Brig. Gen. selectee) Thomas F. Gioconda
Legislative Ass't to the Chairman, Joint Chiefs of Staff
Washington, D. C.
Brig. Gen. Roger R. Radcliff
Joint Chiefs of Staff Representative for Conference on Security and Cooperation in Europe, J-5
Washington, D. C.
Brig. Gen. Gary M. Rubus
Deputy Director, International Negotiations, J-5
Washington, D. C.
Brig. Gen. Tome H. Walters, Jr.
Deputy Director, Operations, National Military Command Center, J-3
Washington, D. C.

Joint Service Schools

Lt. Gen. Ervin J. Rokke
President, National Defense University
Fort McNair, D. C.
Brig. Gen. William R. Looney III*
Commandant, Armed Forces Staff College
National Defense University
Norfolk, Va.

US Atlantic Command

Gen. Richard E. Hawley
Commander, Air Force Component
Langley AFB, Va.
Maj. Gen. (Lt. Gen. selectee) John B. Sams, Jr.
Director, Plans and Policy, J-5
Norfolk, Va.
Brig. Gen. James A. Jaeger
Director, Intelligence, J-2
Norfolk, Va.

US Central Command

Lt. Gen. Carl E. Franklin
Commander, US Central Command Air Forces
Shaw AFB, S. C.
Maj. Gen. Kurt B. Anderson
Commander, Joint Task Force–Southwest Asia
Riyadh, Saudi Arabia
Maj. Gen. Otto K. Habedank
Chief, United States Office of Military Cooperation
Cairo, Egypt
Maj. Gen. Joseph E. Hurd
Director, Operations, J-3
MacDill AFB, Fla.
Maj. Gen. Arnold R. Thomas, Jr.
Deputy Commander, US Central Command Air Forces
Shaw AFB, S. C.
Brig. Gen. Harry D. Raduege, Jr.
Director, C4 Systems, J-6
MacDill AFB, Fla.

US European Command

Gen. Michael E. Ryan
Commander, Air Force Component
Ramstein AB, Germany
Gen. James L. Jamerson
Deputy Commander in Chief, US European Command
Stuttgart-Vaihingen, Germany
Maj. Gen. Michael J. McCarthy*
Director, Plans and Policy, J-5
Stuttgart-Vaihingen, Germany
Maj. Gen. John L. Welde
Chief, Office of Defense Cooperation to Turkey
Ankara, Turkey
Brig. Gen. Donald A. Lamontagne
Commanding General, Combined Task Force, Operation Provide Comfort
Incirlik AB, Turkey
Brig. Gen. James E. Miller, Jr.
Director, Intelligence, J-2
Stuttgart-Vaihingen, Germany
Brig. Gen. Buford R. Witt
Director, C3 Systems, J-6
Stuttgart-Vaihingen, Germany

US Pacific Command

Gen. John G. Lorber
Commander, Air Component
Hickam AFB, Hawaii
Lt. Gen. Lawrence E. Boese
Commander, Alaskan Command
Elmendorf AFB, Alaska
Lt. Gen. Ralph E. Eberhart
Commander, US Forces Japan
Yokota AB, Japan

Brig. Gen. Thomas O. Fleming, Jr.
Deputy Director, Plans and Policy, J-5
Camp H. M. Smith, Hawaii
Brig. Gen. Charles R. Holland
Commander, Special Operations Command Pacific
Camp H. M. Smith, Hawaii

US Southern Command

Lt. Gen. James F. Record
Commander, US Southern Command Air Forces
Davis-Monthan AFB, Ariz.
Maj. Gen. Nels Running
Vice Commander, US Southern Command Air Forces
Davis-Monthan AFB, Ariz.
Brig. Gen. Thomas J. Keck
Director, Strategy, Policy, and Plans, J-5
Quarry Heights, Panama
Brig. Gen. Antonio J. Ramos
Special Ass't to the Commander in Chief for Regional Negotiations
Quarry Heights, Panama
Brig. Gen. Randall M. Schmidt
Commander, US Southern Command Air Forces Forward
Howard AFB, Panama

US Space Command

Gen. Joseph W. Ashy
Commander in Chief, US Space Command
DoD Manager for Manned Spaceflight Support Operations
Peterson AFB, Colo.
Maj. Gen. William J. Donahue
Director, Command Control Systems, J-6
Peterson AFB, Colo.
Maj. Gen. (Lt. Gen. selectee) Roger G. DeKok
Director, Operations, J-3
Peterson AFB, Colo.
Maj. Gen. Raymond P. Huot
Commander, Cheyenne Mountain Operations Center
Cheyenne Mountain AS, Colo.
Maj. Gen. David L. Vesely
Component Commander, USAF Space Operations
Vandenberg AFB, Calif.

US Special Operations Command

Maj. Gen. James L. Hobson, Jr.
Commander, Air Force Component
Hurlburt Field, Fla.
Maj. Gen. Clinton V. Horn
Director, Operations, J-3
MacDill AFB, Fla.
Maj. Gen. James C. McCombs
Deputy Commander in Chief
MacDill AFB, Fla.
Brig. Gen. Maxwell C. Bailey
Deputy Commanding General, Joint Special Operations Command
Fort Bragg, N. C.

US Strategic Command

Gen. Eugene E. Habiger
Commander in Chief
Offutt AFB, Neb.
Lt. Gen. James F. Record
Commander, Air Force Component
Davis-Monthan AFB, Ariz.
Brig. Gen. (Maj. Gen. selectee) Donald G. Cook
Commander, ICBM (CTF-214) Task Force
F. E. Warren AFB, Wyo.
Maj. Gen. Ronald C. Marcotte
Director, Strategic Target Plans and Deputy Director, Plans and Policy, J-5
Offutt AFB, Neb.
Maj. Gen. Nels Running
Vice Commander, Air Force Component
Davis-Monthan AFB, Ariz.
Brig. Gen. Tito Kera
Director, Intelligence, J-2
Offutt AFB, Neb.
Brig. Gen. Thomas H. Neary
Director, Operations and Logistics, J-3/J-4
Offutt AFB, Neb.

US Transportation Command

Gen. Walter Kross
Commander in Chief
Scott AFB, Ill.
Maj. Gen. William J. Begert
Director, Operations and Logistics, J-3/J-4
Scott AFB, Ill.
Col. (Brig. Gen. selectee) John G. Jernigan
Command Surgeon
Scott AFB, Ill.

Brig. Gen. Stephen E. Kelley
Director, C4 Systems, J-6
Scott AFB, Ill.
Col. (Brig. Gen. selectee) Gilbert J. Regan
Chief Counsel
Scott AFB, Ill.

North Atlantic Treaty Organization

Gen. Michael E. Ryan
Commander, Allied Air Forces Central Europe
Ramstein AB, Germany
Lt. Gen. Richard C. Bethurem
Commander, Allied Air Forces Southern Europe
Aviano AB, Germany
Lt. Gen. Nicholas B. Kehoe III
Deputy Chairman, Military Committee
Brussels, Belgium
Maj. Gen. (Lt. Gen. selectee) Patrick K. Gamble
Ass't Chief of Staff, Operations and Logistics Division
Supreme Headquarters Allied Powers Europe
Mons, Belgium
Maj. Gen. William S. Hinton, Jr.
Deputy Commander, 6th Allied Tactical Air Force, Allied Air Forces Southern Europe
Izmir AS, Turkey
Maj. Gen. Hal M. Hornburg
Director, Combined Air Operations Center, Fifth Allied Tactical Air Force
Vicenza, Italy
Brig. Gen. (Maj. Gen. selectee) Timothy A. Kinnan
Deputy Commander, 5th Allied Tactical Air Force
Allied Air Forces Southern Europe
Vicenza, Italy
Maj. Gen. John F. Miller, Jr.
Chief of Staff
Allied Forces Northern Europe
Stavanger, Norway
Brig. Gen. William M. Guth
Ass't Chief of Staff, Operations
Allied Air Forces Northwestern Europe
RAF High Wycombe, UK
Brig. Gen. Robert M. Murdock
Deputy US Military Representative to Military Committee
Brussels, Belgium
Brig. Gen. Robert T. Newell III
Commander, E-3A Component Command, NATO Airborne Early Warning Force
Geilenkirchen AB, Germany
Brig. Gen. Ralph Pasini
Deputy Director, Allied Command Europe Reaction Force Air Staff
Kalkar, Germany
Col. (Brig. Gen. selectee) James N. Soligan
Special Ass't to Supreme Allied Commander Europe
Supreme Headquarters Allied Powers Europe
Mons, Belgium
Brig. Gen. Thomas C. Waskow
Chief of Staff, Allied Air Forces Southern Europe
Naples, Italy

North American Aerospace Defense Command

Gen. Joseph W. Ashy
Commander in Chief, North American Aerospace Defense Command
Peterson AFB, Colo.
Lt. Gen. Lawrence E. Boese
Commander, Alaskan NORAD Region
Elmendorf AFB, Alaska
Maj. Gen. William J. Donahue
Director, Command Control Systems, J-6
Peterson AFB, Colo.
Maj. Gen. Raymond P. Huot
Commander, Cheyenne Mountain Operations Center
Cheyenne Mountain AS, Colo.
Maj. Gen. Jeffrey R. Grime
Deputy Commander, Canadian NORAD Region
CFB North Bay, Ontario, Canada
Brig. Gen. Rodney P. Kelly
Director, Plans, J-5
Peterson AFB, Colo.

United Nations Command Korea

Lt. Gen. Ronald W. Iverson
Deputy Commander in Chief, United Nations Command, Korea
Deputy Commander, US Forces Korea
Commander, Air Component Command, ROK/US Combined Forces Command
Osan AB, South Korea
Maj. Gen. George W. Norwood
Deputy Chief of Staff, United Nations Command, Korea
Deputy Chief of Staff, US Forces Korea
Seoul, South Korea

Departments of the Army and the Air Force

Maj. Gen. Allen D. Bunger
Commander, Army and Air Force Exchange Service
Dallas, Tex.

*As of September 1

PUT SOME FORCE BEHIND YOUR NEXT PROMOTION.

Over 2.5 members of the U.S. Air Force are ready to take your product to new heights during 1997. Come join the men and women of the US Air Force and their families as we observe our 50th Anniversary with a year of special, once-in-a-lifetime celebrations.

Air Force people have represented one of the most brand-loyal groups around for 50 years. You can reach this group easily and effectively with commercial sponsorship throughout this special 50th Anniversary year. Best of all, most of our Air Force Services MWR activities, events, or programs are eligible for financial or in-kind product support from commercial sponsors like you.

Product promotion opportunities will be available worldwide at hundreds of memorable events. You can help sponsor Services activities at Air Force-wide 50th Anniversary celebration air shows, local or national sporting events, annual crafts contests, or the famous TOPS IN BLUE Entertainment Showcase Tour. Your sponsorship will be recognized on signage featured at open houses, in clubs, fitness centers, golf and bowling centers, lodging, and dining areas all over the world. You may even sponsor educational programs in base child development centers, youth programs, and library reading programs.

There are numerous marketing benefits available during this 50th Anniversary year from logos on uniforms and product displays to direct mail and event advertising.

SERVICES CELEBRATES USAF 50 ANNIVERSARY

Don't let this unique opportunity fly by. There are over 2.5 million active duty military, reserve, guard, retiree, civilian, and family members in the Air Force community. Many people have proudly served in this outstanding branch of the United States military since it was first created 50 years ago. This substantial and available consumer market regularly uses our Services facilities, shops in military stores, and will be taking part in once-in-a-lifetime commemorative events at Air Force bases around the world throughout 1997.

The Air Force has 2.5 million brand loyal customers.

Call today for complete details. Let the men and women of the U.S. Air Force help take sales of your products sky-high. Find out now how commercial sponsorship can make you a part of this special USAF 50th Anniversary Gala today.

USAF SERVICES

For information, contact the Commercial Sponsorship Manager at HQ Air Force Services Agency, 10100 Reunion Place, Suite 402, San Antonio, TX, 78216-4138. Call (210) 652-4583 or FAX (210) 652-7033, SONNENBU @ AFSVA5.AFSV.AF.MIL

NO FEDERAL ENDORSEMENT OF SPONSORS INTENDED

The Hughes AIM-9X

The world's best dogfight missile for the world's best fighter pilot.

For over forty years, fighter pilots have transmitted "Fox 2" to signal that Sidewinder, one of the world's most successful air-to-air missiles, has been fired and is on its way to yet another combat victory.

Now, however, current threat missiles, aircraft and environments demand a new generation short range air-to-air missile... *Sidewinder* AIM-9X.

The Hughes AIM-9X Team presents a highly capable and affordable AIM-9X weapon system that reclaims the Sidewinder legacy of air combat victory.

HUGHES AIM-9X

Air Supremacy for the 21st Century

"Fox 2"

Committed To Our Customers' Success

HUGHES AIRCRAFT

A HUGHES ELECTRONICS COMPANY

AFA/AEF Almanac

AFA Units of the Year

YEAR	RECIPIENT(S)
1953	San Francisco Chapter (Calif.)
1954	Santa Monica Area Chapter (Calif.)
1955	San Fernando Valley Chapter (Calif.)
1956	Utah State AFA
1957	H. H. Arnold Chapter (N. Y.)
1958	San Diego Chapter (Calif.)
1959	Cleveland Chapter (Ohio)
1960	San Diego Chapter (Calif.)
1961	Chico Chapter (Calif.)
1962	Fort Worth Chapter (Tex.)
1963	Colin P. Kelly Chapter (N. Y.)
1964	Utah State AFA
1965	Idaho State AFA
1966	New York State AFA
1967	Utah State AFA
1968	Utah State AFA
1969	*(no presentation)*
1970	Georgia State AFA
1971	Middle Georgia Chapter (Ga.)
1972	Utah State AFA
1973	Langley Chapter (Va.)
1974	Texas State AFA
1975	Alamo Chapter (Tex.) and San Bernardino Area Chapter (Calif.)
1976	Scott Memorial Chapter (Ill.)
1977	Thomas B. McGuire, Jr., Chapter (N. J.)
1978	Thomas B. McGuire, Jr., Chapter (N. J.)
1979	General Robert F. Travis Chapter (Calif.)
1980	Central Oklahoma (Gerrity) Chapter (Okla.)
1981	Alamo Chapter (Tex.)
1982	Chicagoland-O'Hare Chapter (Ill.)
1983	Charles A. Lindbergh Chapter (Conn.)
1984	Scott Memorial Chapter (Ill.) and Colorado Springs/Lance Sijan Chapter (Colo.)
1985	Cape Canaveral Chapter (Fla.)
1986	Charles A. Lindbergh Chapter (Conn.)
1987	Carl Vinson Memorial Chapter (Ga.)
1988	General David C. Jones Chapter (N. D.)
1989	Thomas B. McGuire, Jr., Chapter (N. J.)
1990	General E. W. Rawlings Chapter (Minn.)
1991	Paul Revere Chapter (Mass.)
1992	Central Florida Chapter (Fla.) and Langley Chapter (Va.)
1993	Green Valley Chapter (Ariz.)
1994	Langley Chapter (Va.)
1995	Baton Rouge Chapter (La.)
1996	Montgomery Chapter (Ala.)

Profiles of AFA Membership

As of June 1996 (Total 167,450)

62% One-year members
14% Three-year members
24% Life Members

27% Active-duty military
39% Retired military
17% Former service
7% Guard and Reserve
6% Patron
2% Cadet
2% Spouse/widow(er)

Of AFA's service members (who account for about eleven percent of the US Air Force total strength):

60% are officers
40% are enlisted

Of AFA's retired military members:

75% are retired officers
25% are retired enlisted

AFA "Member of the Year" Award Recipients

State names refer to winner's home state at the time of the award.

YEAR	RECIPIENT(S)
1953	Julian B. Rosenthal (N. Y.)
1954	George A. Anderl (Ill.)
1955	Arthur C. Storz (Neb.)
1956	Thos. F. Stack (Calif.)
1957	George D. Hardy (Md.)
1958	Jack B. Gross (Pa.)
1959	Carl J. Long (Pa.)
1960	O. Donald Olson (Colo.)
1961	Robert P. Stewart (Utah)
1962	*(no presentation)*
1963	N. W. DeBerardinis (La.) and Joe L. Shosid (Tex.)
1964	Maxwell A. Kriendler (N. Y.)
1965	Milton Caniff (N. Y.)
1966	William W. Spruance (Del.)
1967	Sam E. Keith, Jr. (Tex.)
1968	Marjorie O. Hunt (Mich.)
1969	*(no presentation)*
1970	Lester C. Curl (Fla.)
1971	Paul W. Gaillard (Neb.)
1972	J. Raymond Bell (N. Y.) and Martin H. Harris (Fla.)
1973	Joe Higgins (Calif.)
1974	Howard T. Markey (D. C.)
1975	Martin M. Ostrow (Calif.)
1976	Victor R. Kregel (Tex.)
1977	Edward A. Stearn (Calif.)
1978	William J. Demas (N. J.)
1979	Alexander C. Field, Jr. (Ill.)
1980	David C. Noerr (Calif.)
1981	Daniel F. Callahan (Fla.)
1982	Thomas W. Anthony (Md.)
1983	Richard H. Becker (Ill.)
1984	Earl D. Clark, Jr. (Kan.)
1985	George H. Chabbott (Del.) and Hugh L. Enyart (Ill.)
1986	John P. E. Kruse (N. J.)
1987	Jack K. Westbrook (Tenn.)
1988	Charles G. Durazo (Va.)
1989	O. R. Crawford (Tex.)
1990	Cecil H. Hopper (Ohio)
1991	George M. Douglas (Colo.)
1992	Jack C. Price (Utah)
1993	Lt. Col. James G. Clark (D. C.)
1994	William A. Lafferty (Ariz.)
1995	William N. Webb (Okla.)
1996	Tommy G. Harrison (Fla.)

Air Force Association National Presidents

James H. Doolittle
1946–47

Thomas G. Lanphier, Jr.
1947–48

C. R. Smith
1948–49

Robert S. Johnson
1949–51

Harold C. Stuart
1951–52

Arthur F. Kelly
1952–53

George C. Kenney
1953–54

John R. Alison
1954–55

Gill Robb Wilson
1955–56

John P. Henebry
1956–57

Peter J. Schenk
1957–59

Howard T. Markey
1959–60

Thos. F. Stack
1960–61

Joe Foss
1961–62

John B. Montgomery
1962–63

W. Randolph Lovelace II
1963–64

Jess Larson
1964–67

Robert W. Smart
1967–69

George D. Hardy
1969–71

Martin M. Ostrow
1971–73

Joe L. Shosid
1973–75

George M. Douglas
1975–77

Gerald V. Hasler
1977–79

Victor R. Kregel
1979–81

John G. Brosky
1981–82

David L. Blankenship
1982–84

Martin H. Harris
1984–86

Sam E. Keith, Jr.
1986–88

Jack C. Price
1988–90

O. R. Crawford
1990–92

James M. McCoy
1992–94

Gene Smith
1994–

Air Force Association Chairmen of the Board

Edward P. Curtis
1946–47

James H. Doolittle
1947–49

C. R. Smith
1949–50

Carl A. Spaatz
1950–51

Thomas G. Lanphier, Jr.
1951–52

Harold C. Stuart
1952–53

Arthur F. Kelly
1953–54

George C. Kenney
1954–55

John R. Alison
1955–56

Gill Robb Wilson
1956–57

John P. Henebry
1957–58

James M. Trail
1958–59

Julian B. Rosenthal
1959–60

Howard T. Markey
1960–61

Thos. F. Stack
1961–62

Joe Foss
1962–63

Jack B. Gross
1963–64

W. Randolph Lovelace II
1964–65

George D. Hardy
1966–67

Jess Larson
1967–71

George D. Hardy
1971–72

Joe L. Shosid
1972–73

Martin M. Ostrow
1973–75

Joe L. Shosid
1975–76

Gerald V. Hasler
1976–77

George M. Douglas
1977–79

Daniel F. Callahan
1979–81

Victor R. Kregel
1981–82

John G. Brosky
1982–84

David L. Blankenship
1984–85

Edward A. Stearn
1985–86

Martin H. Harris
1986–88

Sam E. Keith, Jr.
1988–90

Jack C. Price
1990–92

O. R. Crawford
1992–94

James M. McCoy
1994–

AFA's Regions, States, and Chapters

These figures indicate the number of affiliated members as of June 30, 1996. Listed below the name of each region is the National Vice President for that region.

CENTRAL EAST REGION 14,747
George H. Chabbott

Delaware ... 895
Delaware Galaxy ... 658
Diamond State ... 191
Henlopen Area ... 46

District of Columbia ... 1,094
Nation's Capital ... 1,094

Maryland ... 3,163
Baltimore* ... 880
Central Maryland ... 452
College Park Airport ... 153
Thomas W. Anthony ... 1,678

Virginia ... 9,234
Danville ... 49
Donald W. Steele, Sr., Memorial ... 4,007
Gen. Charles A. Gabriel ... 1,117
Jack Manch ... 89
Langley ... 2,256
Leigh Wade ... 135
Lynchburg ... 131
Northern Shenandoah Valley ... 132
Richmond ... 496
Roanoke ... 290
Tidewater ... 362
William A. Jones III ... 170

West Virginia ... 361
Chuck Yeager ... 361

FAR WEST REGION 26,384
William A. Lafferty

Arizona ... 5,226
Barry Goldwater ... 199
Cochise ... 107
Frank Luke ... 1,237
Phoenix Sky Harbor ... 1,284
Prescott ... 161
Richard S. Reid ... 280
Tucson ... 1,958

California ... 17,296
Antelope Valley ... 683
Bakersfield ... 94
Bob Hope ... 1,069
David J. Price/Beale ... 619
Edward A. Stearn ... 957
Fresno* ... 472
General B. A. Schriever Los Angeles ... 1,094
General Doolittle Los Angeles Area* ... 2,059
General Robert F. Travis ... 1,597
Golden Gate* ... 950
High Desert ... 254
Maj. Gen. Charles I. Bennett, Jr. ... 394
Monterey Bay Area ... 319
Orange County/Gen. Curtis E. LeMay ... 1,063
Pasadena Area ... 429
Robert H. Goddard ... 974
Sacramento ... 2,111
San Diego ... 1,111
Tennessee Ernie Ford ... 1,047

Guam ... 232
Guam–Arc Light ... 232

Hawaii ... 1,294
Hawaii* ... 1,266
Maui ... 28

Nevada ... 2,336
Dale O. Smith ... 516
Thunderbird ... 1,820

GREAT LAKES REGION 17,852
Anton D. Brees

Illinois ... 4,476
Chicagoland-O'Hare ... 1,176
Greater Rockford ... 98
Illini ... 273
Land of Lincoln ... 214
Lee Cordell Memorial ... 452
Quad Cities ... 302
Scott Memorial ... 1,961

Indiana ... 1,815
Central Indiana ... 482
Columbus-Bakalar ... 46
Falls Cities ... 56
Fort Wayne ... 208
Grissom Memorial ... 211
Gus Grissom ... 151
Lawrence D. Bell Museum ... 325
Lester W. Johnston ... 36
P-47 Memorial ... 60
Southern Indiana ... 144
Terre Haute–Wabash Valley ... 96

Kentucky ... 797
Gen. Russell E. Dougherty ... 416
Lexington ... 250
West Kentucky ... 131

Michigan ... 2,546
Battle Creek ... 263
Huron ... 145
James H. Straubel ... 964
Kalamazoo ... 284
Lake Superior Northland ... 238
Lloyd R. Leavitt, Jr. ... 172
Mid-Michigan ... 86
Mount Clemens ... 305
PE-TO-SE-GA ... 89

Ohio ... 6,047
Capt. Eddie Rickenbacker Memorial* ... 675
Cleveland ... 445
Frank P. Lahm ... 593
Mid-Ohio ... 193
Steel Valley ... 237
Wright Memorial* ... 3,904

Wisconsin ... 1,371
Badger State ... 277
Billy Mitchell ... 713
Madison ... 381

MIDWEST REGION 7,033
Samuel M. Gardner

Iowa ... 752
Gen. Charles A. Horner ... 274
Lancer ... 161
Northeast Iowa ... 103
Richard D. Kisling ... 214

Kansas ... 1,281
Contrails ... 55
Lt. Erwin R. Bleckley ... 813
Major General Edward R. Fry ... 413

Missouri ... 2,344
Central Missouri ... 509
Harry S. Truman ... 627
Ozark ... 253
Spirit of St. Louis ... 955

Nebraska ... 2,656
Ak-Sar-Ben ... 2,366
Lincoln ... 290

NEW ENGLAND REGION 5,408
Dr. Phillip J. Sleeman

Connecticut ... 1,056
Central Connecticut ... 135
Charles A. Lindbergh ... 147
First Connecticut ... 155
Flying Yankees ... 154
General Bennie L. Davis ... 62
General George C. Kenney ... 82
Igor Sikorsky ... 113
Northern Connecticut ... 157
Sergeant Charlton Heston ... 51

Maine ... 428
Eastern Maine ... 233
Major Charles J. Loring, Jr. ... 103
Southern Maine ... 92

Massachusetts ... 2,558
Boston ... 224
Laurence G. Hanscom ... 193
Major John S. Southrey* ... 246
Minuteman ... 304
Otis ... 185
Paul Revere ... 839
Pioneer Valley ... 208
Taunton ... 173
Worcester* ... 186

New Hampshire ... 852
Amoskeag ... 318
Pease ... 534

Rhode Island ... 249
Metro Rhode Island ... 249

Vermont ... 265
Burlington ... 265

NORTH CENTRAL REGION 3,044
Vic Seavers

Minnesota ... 1,332
General E. W. Rawlings ... 1,075
Richard I. Bong ... 257

North Dakota ... 958
General David C. Jones ... 454
Happy Hooligan ... 146
Red River Valley ... 358

South Dakota ... 754
Dacotah ... 294
Rushmore ... 460

NORTHEAST REGION 11,028
James E. Callahan

New Jersey ... 3,307
Admiral Charles E. Rosendahl ... 156
Aerospace Founders ... 67
Atlantic City Area ... 196
Brig. Gen. Frederick W. Castle ... 224
Hangar One ... 166
Highpoint ... 91
Hudson* ... 93
John Currie Memorial ... 31
Mercer County ... 253
Passaic-Bergen* ... 250
Sal Capriglione ... 132
Teterboro-Bendix ... 34
Thomas B. McGuire, Jr. ... 1,183
Tri-County ... 72
Union Morris ... 290
Wings ... 69

New York ... 3,999
Albany–Hudson Valley* ... 414
Brooklyn "Key" ... 292
Chautauqua ... 64
Colin P. Kelly ... 358
Forrest L. Vosler ... 284
General Daniel "Chappie" James, Jr., Memorial ... 94
Genesee Valley ... 290
Iron Gate ... 217
L. D. Bell–Niagara Frontier ... 505
Lloyd Schloen–Empire ... 51
Nassau Mitchel ... 387
Queens ... 266
Suffolk County ... 303
Thomas Watson, Sr., Memorial ... 196
Westchester Falcon ... 278

Pennsylvania ... 3,722
Altoona ... 72
Beaver Valley ... 103
Brandywine ... 196
Colonel Stuart E. Kane, Jr. ... 157
Eagle ... 71
Erie ... 117
Freedom ... 405
Greater Pittsburgh* ... 501
Joe Walker–Mon Valley ... 128
Lehigh Valley ... 265
Lt. Col. B. D. "Buzz" Wagner ... 134
Metropolitan Philadelphia* ... 353
Mifflin County* ... 132
Olmsted ... 398
Pocono Northeast ... 229
Total Force ... 186
York-Lancaster ... 275

NORTHWEST REGION 8,067
I. Fred Rosenfelder

Alaska ... 1,327
Anchorage ... 1,030
Fairbanks Midnight Sun ... 297

Idaho ... 829
Boise Valley ... 531
Magic Valley ... 117
Snake River Valley ... 181

*These chapters were chartered prior to December 31, 1948, and are considered original charter chapters; the Major John S. Southrey Chapter of Massachusetts was formerly the Chicopee Chapter.

Montana	**635**
Big Sky	511
Treasure State	124
Oregon	**1,378**
Eugene	349
Klamath Basin	147
Portland*	882
Washington	**3,898**
Greater Seattle	1,329
Inland Empire	996
Tacoma	1,573
ROCKY MOUNTAIN REGION	**7,900**
Daniel C. Hendrickson	
Colorado	**5,532**
Colorado Springs/Lance Sijan	3,162
Flatirons	220
General Robert E. Huyser	146
Longs Peak	316
Mel Harmon	146
Mile High	1,542
Utah	**1,831**
Ogden-Wasatch	731
Salt Lake	487
Ute–Rocky Mountain	613
Wyoming	**537**
Cheyenne Cowboy	537
SOUTH CENTRAL REGION	**10,293**
Henry W. Boardman	
Alabama	**2,906**
Birmingham	452
Gadsden	41
Mobile	329
Montgomery	1,757
Tennessee Valley	327
Arkansas	**1,559**
David D. Terry, Jr.	1,178
Ouachita	111
Razorback	270
Louisiana	**2,118**
Alexandria	164
Ark-La-Tex	1,188
Maj. Gen. Oris B. Johnson	370
Greater New Orleans Area	396
Mississippi	**1,594**
Golden Triangle	393
Jackson	216
John C. Stennis	985
Tennessee	**2,116**
Chattanooga	137
Everett R. Cook	495
General Bruce K. Holloway	586
General Dan F. Callahan	617
H. H. Arnold Memorial	281
SOUTHEAST REGION	**24,537**
James E. "Red" Smith	
Florida	**13,326**
Cape Canaveral	1,610
Central Florida	1,309
Citrus Belt	137
Colonel H. M. "Bud" West	324
Eglin	2,423
Falcon	383
Florida Gulf Coast	342
Florida Highlands	137
Gainesville	276
General James R. McCarthy	383
General Nathan F. Twining	527
Gold Coast	427
Hurlburt	651
Indian River	144
Jerry Waterman	1,085
John C. Meyer	174
John W. DeMilly, Jr.	286
Miami	422
Morgan S. Tyler	256
On Wings of Eagles	172
Panama City	961
Peace River	148
Southwest Florida	268
St. Augustine	79
West Palm Beach	402
Georgia	**4,754**
Athens	182
Atlanta	653
Carl Vinson Memorial	2,121
Chatahoochee Valley	85
Coosa Valley	65
Dobbins	893
Savannah	224
South Georgia	472
Southeast Georgia	59
North Carolina	**3,567**
Blue Ridge	333
Cape Fear	147
Eastern Carolina	86
First in Flight	59
Kitty Hawk	73
Piedmont	490
Pope	837
Roanoke Valley	34
Scott Berkeley	802
Tarheel	426
Triad	280
Puerto Rico	**182**
San Juan	182
South Carolina	**2,708**
Charleston	853
Columbia	491
Ladewig-Shine Memorial	243
Strom Thurmond	353
Swamp Fox	768
SOUTHWEST REGION	**22,966**
L. B. "Buck" Webber	
New Mexico	**2,691**
Albuquerque	1,611
Fran Parker	594
Llano Estacado	486
Oklahoma	**3,991**
Altus	557
Central Oklahoma (Gerrity)	2,206
Enid	726
Tulsa	502
Texas	**16,284**
Abilene	572
Aggieland	189
Alamo	5,349
Austin	1,442
Concho	424
Corpus Christi	163
Dallas	1,216
Del Rio	242
Denton	331
Fort Worth	2,286
Gen. Charles L. Donnelly, Jr.	802
Ghost Squadron	148
Heart of the Hills	192
Lee Glasgow–Waco	298
Lubbock	410
Northeast Texas	410
Panhandle AFA	162
Paso Del Norte	189
Permian Basin	134
San Jacinto	1,325

AFA's Network of Units Overseas

AFA UNIT	LOCATION
	United States Air Forces in Europe (USAFE)
Dolomiti	Aviano AB, Italy
Lufbery-Campbell	Ramstein AB, Germany
Spangdahlem	Spangdahlem AB, Germany
	Pacific Air Forces (PACAF)
Keystone	Kadena AB, Japan
Manila	Manila, the Philippines
Misawa	Misawa AB, Japan
Tokyo	Tokyo, Japan
	Supreme Headquarters Allied Powers Europe (SHAPE)
General Lauris G. Norstad	Mons, Belgium

AFA's First National Officers and Board of Directors

This panel of officers and directors acted temporarily until a representative group was democratically elected by membership at the first National Convention, in September 1947.

OFFICERS

President James H. Doolittle
First Vice President Edward P. Curtis
Second Vice President Meryll Frost
Third Vice President Thomas G. Lanphier, Jr.
Secretary Sol A. Rosenblatt
Assistant Secretary Julian B. Rosenthal
Treasurer W. Deering Howe
Executive Director Willis S. Fitch

BOARD OF DIRECTORS

John S. Allard	Rufus Rand
H. M. Baldridge	Earl Sneed
William H. Carter	James M. Stewart
Everett Cook	Forrest Vosler
Burton E. Donaghy	Benjamin F. Warmer
James H. Douglas, Jr.	Lowell P. Weicker
G. Stuart Kenney	C. V. Whitney
Reiland Quinn	J. H. Whitney

The Twelve Founders

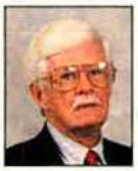
John S. Allard, Bronxville, N. Y.
Everett R. Cook, Memphis, Tenn.
Edward P. Curtis, Rochester, N. Y.
James H. Doolittle, Los Angeles, Calif.
W. Deering Howe, New York, N. Y.
Rufus Rand, Sarasota, Fla.
Sol Rosenblatt, New York, N. Y.
Julian B. Rosenthal, New York, N. Y.
James M. Stewart, Beverly Hills, Calif.
Lowell P. Weicker, New York, N. Y.
Cornelius Vanderbilt Whitney, New York, N. Y.
John Hay Whitney, New York, N. Y.

This Is AFA

PRESIDENT
Gene Smith
West Point, Miss.

BOARD CHAIRMAN
James M. McCoy
Omaha, Neb.

SECRETARY
Mary Anne Thompson
Oakton, Va.



TREASURER
Charles H. Church, Jr.
Lenexa, Kan.

NATIONAL VICE PRESIDENTS

Information regarding AFA activity within a particular state may be obtained from the vice president of the region in which the state is located.

Henry W. Boardman
10 Bayou Pl.
Gulfport, MS 39503
(601) 896-8836

South Central Region
Alabama, Arkansas, Louisiana, Mississippi, Tennessee

William A. Lafferty
1342 W. Placita Salubre
Green Valley, AZ 85614
(520) 625-9449

Far West Region
Arizona, California, Guam, Hawaii, Nevada

Anton D. Brees
23049 Bonnyriggs Court
Hawthorn Woods, IL 60047
(708) 259-9600, ext. 5104

Great Lakes Region
Illinois, Indiana, Kentucky, Michigan, Ohio, Wisconsin

I. Fred Rosenfelder
P. O. Box 59445
Renton, WA 98058
(206) 662-7752

Northwest Region
Alaska, Idaho, Montana, Oregon, Washington

James E. Callahan
6131 Meadowlakes Dr.
East Amherst, NY 14051
(716) 631-7721

Northeast Region
New Jersey, New York, Pennsylvania

Vic Seavers
4489 Lakeshore Terrace
Eagan, MN 55122
(612) 726-3601

North Central Region
Minnesota, North Dakota, South Dakota

George H. Chabbott
1915 Windswept Dr.
Dover, DE 19901
(302) 678-3276

Central East Region
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H. H. Arnold Award Recipients

Until 1986, AFA's highest Aerospace Award was the H. H. Arnold Award. Named for the World War II leader of the Army Air Forces, it was presented annually in recognition of the most outstanding contributions in the field of aerospace activity. In 1986, the Arnold Award was redesignated AFA's highest honor to a member of the armed forces in the field of National Security. It continues to be presented annually.

YEAR	RECIPIENT(S)
1948	Hon. W. Stuart Symington, Secretary of the Air Force
1949	Maj. Gen. William H. Tunner and the men of the Berlin Airlift
1950	Airmen of the United Nations in the Far East
1951	Gen. Curtis E. LeMay and the personnel of Strategic Air Command
1952	Sens. Lyndon B. Johnson and Joseph C. O'Mahoney
1953	Gen. Hoyt S. Vandenberg, former Chief of Staff, USAF
1954	Hon. John Foster Dulles, Secretary of State
1955	Gen. Nathan F. Twining, Chief of Staff, USAF
1956	Sen. W. Stuart Symington
1957	Edward P. Curtis, Special Assistant to the President
1958	Maj. Gen. Bernard A. Schriever, Commander, Ballistic Missile Division, ARDC
1959	Gen. Thomas S. Power, Commander in Chief, Strategic Air Command
1960	Gen. Thomas D. White, Chief of Staff, USAF
1961	Hon. Lyle S. Garlock, Assistant Secretary of the Air Force
1962	Dr. A. C. Dickieson and John R. Pierce, Bell Telephone Laboratories
1963	The 363d Tactical Reconnaissance Wing, TAC, and the 4080th Strategic Wing, SAC
1964	Gen. Curtis E. LeMay, Chief of Staff, USAF
1965	The 2d Air Division, PACAF
1966	The 8th, 12th, 355th, 366th, and 388th Tactical Fighter Wings and the 432d and 460th Tactical Reconnaissance Wings
1967	Gen. William W. Momyer, Commander, 7th Air Force, PACAF
1968	Col. Frank Borman, USAF; Capt. James Lovell, USN; and Lt. Col. William Anders, USAF, Apollo 8 crew
1969	*(No presentation)*
1970	Apollo 11 team (J. L. Atwood; Lt. Gen. Samuel C. Phillips, USAF; and astronauts Neil Armstrong, Col. Edwin E. Aldrin, Jr., USAF, and Col. Michael Collins, USAF)
1971	Dr. John S. Foster, Jr., Director of Defense Research and Engineering
1972	Air Units of the Allied Forces in Southeast Asia (Air Force, Navy, Army, Marine Corps, and the Vietnamese Air Force)
1973	Gen. John D. Ryan, USAF (Ret.), former Chief of Staff, USAF
1974	Gen. George S. Brown, USAF, Chairman, Joint Chiefs of Staff
1975	Hon. James R. Schlesinger, Secretary of Defense
1976	Sen. Barry M. Goldwater
1977	Sen. Howard W. Cannon
1978	Gen. Alexander M. Haig, Jr., USA, Supreme Allied Commander, Europe
1979	Sen. John C. Stennis
1980	Gen. Richard H. Ellis, USAF, Commander in Chief, Strategic Air Command
1981	Gen. David C. Jones, USAF, Chairman, Joint Chiefs of Staff
1982	Gen. Lew Allen, Jr., USAF (Ret.), former Chief of Staff, USAF
1983	Ronald W. Reagan, President of the United States
1984	The President's Commission on Strategic Forces (the Scowcroft Commission)
1985	Gen. Bernard W. Rogers, USA, Supreme Allied Commander, Europe
1986	Gen. Charles A. Gabriel, USAF (Ret.), former Chief of Staff, USAF
1987	Adm. William J. Crowe, Jr., USN, Chairman, Joint Chiefs of Staff
1988	The men and women of the ground-launched cruise missile team
1989	Gen. Larry D. Welch, Chief of Staff, USAF
1990	Gen. John T. Chain, Commander in Chief, Strategic Air Command
1991	Lt. Gen. Charles A. Horner, Commander, US Central Command Air Forces and 9th Air Force
1992	Gen. Colin L. Powell, USA, Chairman, Joint Chiefs of Staff
1993	Gen. Merrill A. McPeak, Chief of Staff, USAF
1994	Gen. John Michael Loh, Commander, Air Combat Command
1995	World War II Army Air Forces veterans
1996	Gen. Ronald R. Fogleman, Chief of Staff, USAF

John R. Alison Award Recipients

Established in 1992, the John R. Alison Award is AFA's highest honor for industrial leadership.

1992	Norman R. Augustine, Chairman, Martin Marietta Corp.
1993	Daniel M. Tellep, Chairman and Chief Executive Officer, Lockheed Corp.
1994	Kent Kresa, Chief Executive Officer, Northrop Grumman Corp.
1995	C. Michael Armstrong, Chairman and Chief Executive Officer, Hughes Aircraft
1996	Harry Stonecipher, President and Chief Executive Officer, McDonnell Douglas Corp.

Since 1986, AFA's highest honor to a civilian in the field of National Security has been the W. Stuart Symington Award. The award, presented annually, is named for the first Secretary of the Air Force.

W. Stuart Symington Award Recipients

YEAR	RECIPIENT
1986	Hon. Caspar W. Weinberger, Secretary of Defense
1987	Hon. Edward C. Aldridge, Jr., Secretary of the Air Force
1988	Hon. George P. Schultz, Secretary of State
1989	Hon. Ronald W. Reagan, former President of the United States
1990	Hon. John J. Welch, Assistant Secretary of the Air Force (Acquisition)
1991	Hon. George Bush, President of the United States
1992	Hon. Donald B. Rice, Secretary of the Air Force
1993	Sen. John McCain (R-Ariz.)
1994	Rep. Ike Skelton (D-Mo.)
1995	Hon. Sheila E. Widnall, Secretary of the Air Force
1996	Sen. Ted Stevens (R-Alaska)

Gold Life Member Card Recipients

Awarded to members whose AFA record, production, and accomplishment on a national level have been outstanding over a period of years.

Name	Year	Card No.
Gill Robb Wilson	1957	1
Jimmy Doolittle	1959	2
Arthur C. Storz, Sr.	1961	3
Julian B. Rosenthal	1962	4
Jack B. Gross	1964	5
George D. Hardy	1965	6
Jess Larson	1967	7
Robert W. Smart	1968	8
Martin M. Ostrow	1973	9
James H. Straubel	1980	10
Martin H. Harris	1988	11
Sam E. Keith, Jr.	1990	12
Edward A. Stearn	1992	13
Dorothy L. Flanagan	1994	14
John O. Gray	1995	15

Aerospace Education Foundation Presidents

John B. Montgomery
1963–64

Dr. Lindley J. Stiles
1964–66

Dr. B. Frank Brown
1966–67

Dr. Leon M. Lessinger
1967–68

Dr. L. V. Rasmussen
1968–71

Dr. Leon M. Lessinger
1971–73

Dr. Wayne O. Reed
1973–74

Dr. William L. Ramsey
1975–81

Dr. Don C. Garrison
1981–84

George D. Hardy
1984–86

Eleanor P. Wynne
1986–87

James M. Keck
1988–89

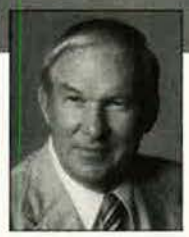
Gerald V. Hasler
1989–94

Thomas J. McKee
1994–

Aerospace Education Foundation Chairmen of the Board

Dr. W. Randolph Lovelace II
1963–64

Gen. Laurence S. Kuter, USAF (Ret.)
1964–66



Dr. Walter J. Hesse
1966–69

J. Gilbert Nettleton, Jr.
1969–73

George D. Hardy
1973–75

Sen. Barry M. Goldwater
1975–86

George D. Hardy
1986–89

James M. Keck
1989–94

Walter E. Scott
1994–

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1946–47

James H. Straubel
1948–80

Russell E. Dougherty
1980–86

David L. Gray
1986–87

John O. Gray
1987–88

Charles L. Donnelly, Jr
1988–89

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1989–90

Monroe W. Hatch, Jr.
1990–95

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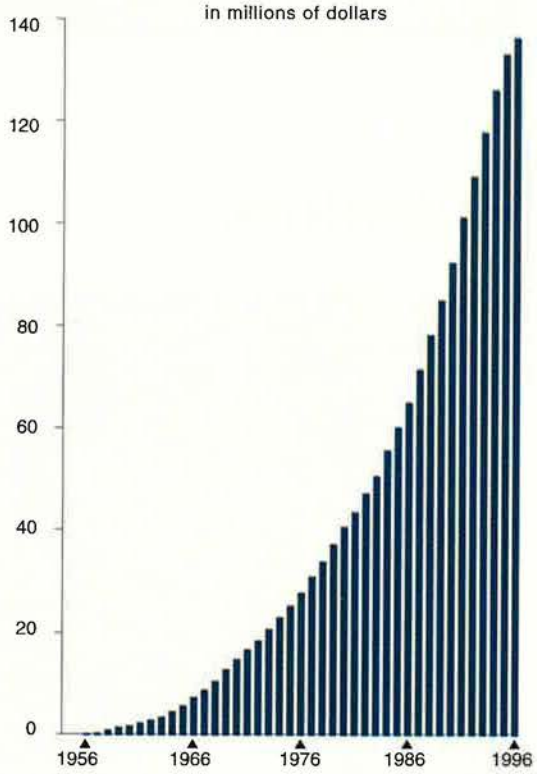
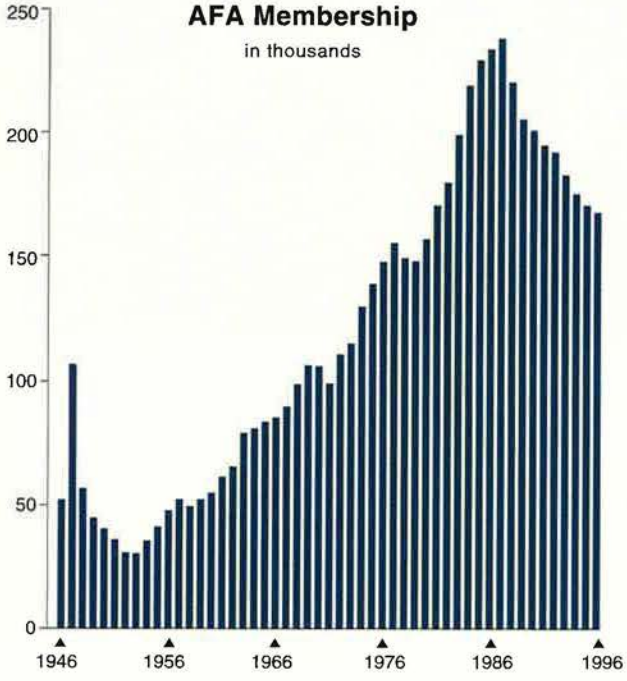
1995–

AFA Insurance Programs Cumulative Claim Payments



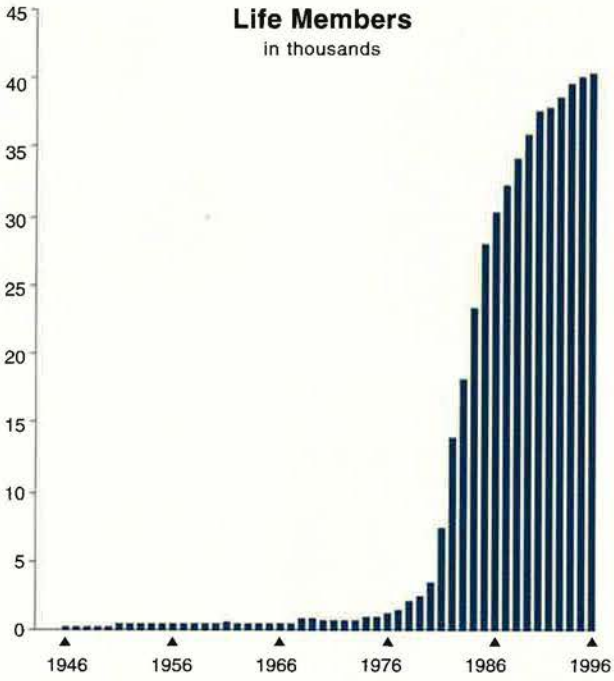
AFA insurance programs have grown steadily from modest beginnings in the 1950s. Through June 1996, cumulative claim payments totaled $136,729,910.

AFA Membership



Strong growth in the 1970s and 1980s reflects the remarkable success of the Base Drive membership program. As of June 30, 1996, AFA membership is 167,450.

Life Members



Life membership in AFA became increasingly popular in the 1980s. As of June 1996, Life Members account for twenty-four percent of total membership.

Outtakes

When **Air Force** *Magazine solicited photos from AFA members for its "Korean War Scrapbook," Lt. Col. John M. Lowery, USAF (Ret.), of El Dorado Hills, Calif., came up with the photo that appeared on the July issue's cover (left). The magazine's archives revealed that photo to be part of a series taken in 1953 when an elderly Korean, Kim Ho-Yong, visited the 4th Fighter-Interceptor Wing. He and F-86 pilot Lowery, then a lieutenant with the 334th Fighter-Interceptor Squadron, also exchanged headgear in a lighthearted moment during an otherwise grim war.*

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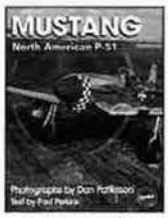

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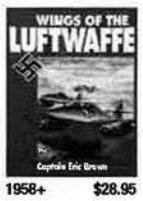

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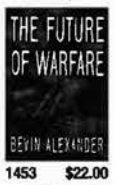

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AFM 10-11/96

AFA/AEF National Report

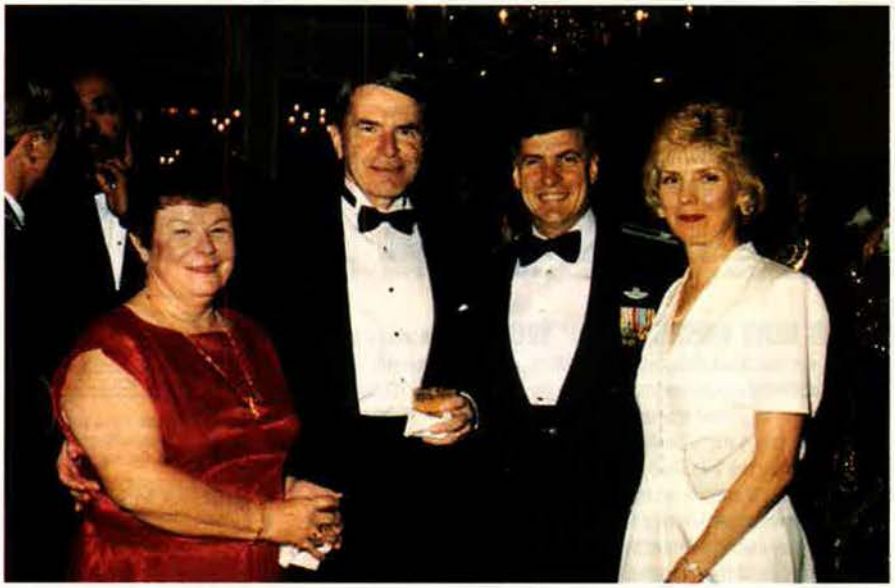
By Frances McKenney, Assistant Managing Editor

AFA Leader Visits Troops in Bosnia

At the invitation of the Department of Defense, AFA Chairman of the Board James M. McCoy joined representatives of eleven military and veterans organizations for a fact-finding mission to Europe and Bosnia-Hercegovina in June. He gained firsthand information on the future of NATO and on conditions and concerns of US troops in Bosnia.

The visit began at NATO headquarters in Brussels, Belgium, where officials briefed the group on peacekeeping operations in Bosnia. At Supreme Headquarters Allied Powers

AFA Chairman of the Board James M. McCoy met airmen at Chiévres AB, Belgium, on his way to visit US military sites in Bosnia. The former Chief Master Sergeant of the Air Force generated much interest among the troops and reported back to AFA on their concerns and living conditions.



Among the many special guests at the Langley (Va.) Chapter's annual Salute to Air Combat Command were National Director R. Donald Anderson and his wife, Rose Marie (left), and Col. Felix Dupre, 1st Fighter Wing vice commander, and his wife, Lin.

Europe, in Mons, Belgium, Mr. McCoy met Army Gen. George A. Joulwan, the NATO Supreme Allied Commander Europe, and also received a briefing. From there, the group traveled to Bosnia, meeting US troops at locations in Tuzla, in northeast Bosnia, and near Brko. They also stopped at a Russian IFOR encampment.

Mr. McCoy reported that the troops live in austere conditions but have the equipment needed for the job. He also noted that their presence prevented a major offensive among the warring factions in Bosnia this past spring.

In a meeting with Sen. Dirk Kempthorne (R-Idaho) in July (top photo, center), AFA National President Gene Smith and National Secretary Mary Ann Thompson enlisted his help in changing the taxable income provision of the Homeowners' Assistance Program. The two AFA national leaders also visited (above) Rep. James B. Longley, Jr. (R-Me.), to discuss providing Americans a better understanding of the Guard's and Reserve's roles in national security.

Can't Fool Mother Nature

The Mid-America Aerospace Education Foundation "Global Presence" Symposium and Ball of Mid-America was formerly held in August, but Stuart Symington, Jr., the event's honorary chairman, explained that it was moved up to May, "so that people wouldn't broil at the golf tournament." Mother Nature foiled them anyway, this time raining out the tournament. The eleventh annual symposium and fifteenth annual ball, though, were highly successful.

National Director Mary Ann Seibel headed a thirty-nine-member planning committee for the ball, held at the Ritz-Carlton Hotel in Clayton, Mo. The **Spirit of St. Louis (Mo.) Chapter** and the **Scott Memorial (Ill.) Chapter** hosted the events.

The symposium featured Lt. Gen. Charles T. Robertson, Jr., Air Mobility Command vice commander; Maj. Gen. David L. Vesely, 14th Air Force commander; Maj. Gen. William J. Begert, director of Operations and Logistics, US Transportation Command; Maj. Gen. Donald W. Shepperd, director of the Air National Guard; Brig. Gen. David S. Sibley, assistant vice commander of the Air Force Reserve; and Dr. Gene H. McCall, USAF Scientific Advisory Board chairman. Jeffrey H. Erickson, president and chief executive officer of Trans World Airlines, Inc.; Don Kozlowski, senior vice president and C-17 program manager at McDonnell Douglas; and Rajan Penkar of United Parcel Service provided civil airline and industry perspectives. Gen. Duane H. Cassidy, USAF (Ret.), the first commander in chief of USTRANSCOM and former CINC of Military Airlift Command, delivered the symposium's luncheon keynote address.

Bay State Convention

Massachusetts AFA held its State Convention and Awards Night at the Charlestown Navy Yard, Boston, Mass., in May. Rep. Peter G. Torkildsen (R-Mass.), a member of the House Na-

The John W. DeMilly, Jr. (Fla.), Chapter in June sponsored a program at the Florida Air National Guard Alert Facility, at Homestead ARS, to promote ANG's role in America's defense. About 200 guests attended the program, highlighted by an F-15 training scramble by Det. 1, 125th Fighter Wing (ANG).

tional Security Committee, delivered the main address. Lt. Gen. Charles E. Franklin, then commander of Electronic Systems Center, Hanscom AFB, Mass., was among the distinguished guests.

Dr. Donald Dressler of the **Minuteman Chapter** received the Person of the Year Award. The **Pioneer Valley Chapter** was honored as the state's Small Chapter of the Year. Massachusetts President's Exceptional Service Awards went to Lt. Col. C. O. Bost, Jr., AFRES, and Maj. James P. Joyce, AFRES, from the Pioneer Valley Chapter; Peter P. Colerico of the Minuteman Chapter; Angelo C. Sciarratta and John M. Franco of the **Boston Chapter;** and Robert Kennedy of the **Paul Revere Chapter.** For his work as Massachusetts State President 1994–95, Pioneer Valley's Winston S. Gaskins, who is now the state and the chapter vice president, received a Past President Award.

Lone Star Rewards

At the Texas State Convention in June, the **Concho Chapter** received the 1995 Chapter of the Year Award. Chapter President Robert Brewer said the group had nearly doubled the number of its Community Partners, met membership goals, boosted attendance at meetings, expanded the recognition program for Goodfellow AFB personnel, and promoted the Air Force and AFA on local television and through speeches.

Earlier in the year, the chapter held its awards dinner, where JROTC cadets Rhonda Tarver from Lake View High School, San Angelo, Tex., and John Pecarina from Central High School, San Angelo, received $250 scholarships. The chapter helped establish JROTC units at these schools in 1994 and 1993, respectively.

Oklahoma's Generosity

The **Central Oklahoma (Gerrity) Chapter** members credit a golf-tournament fund-raiser for its most recent donation of $1,000 to an Aerospace Education Foundation scholarship fund for the families of the twenty-four crew members who died in the crash of an Airborne Warning and Control System aircraft at Elmendorf AFB, Alaska, in September 1995.

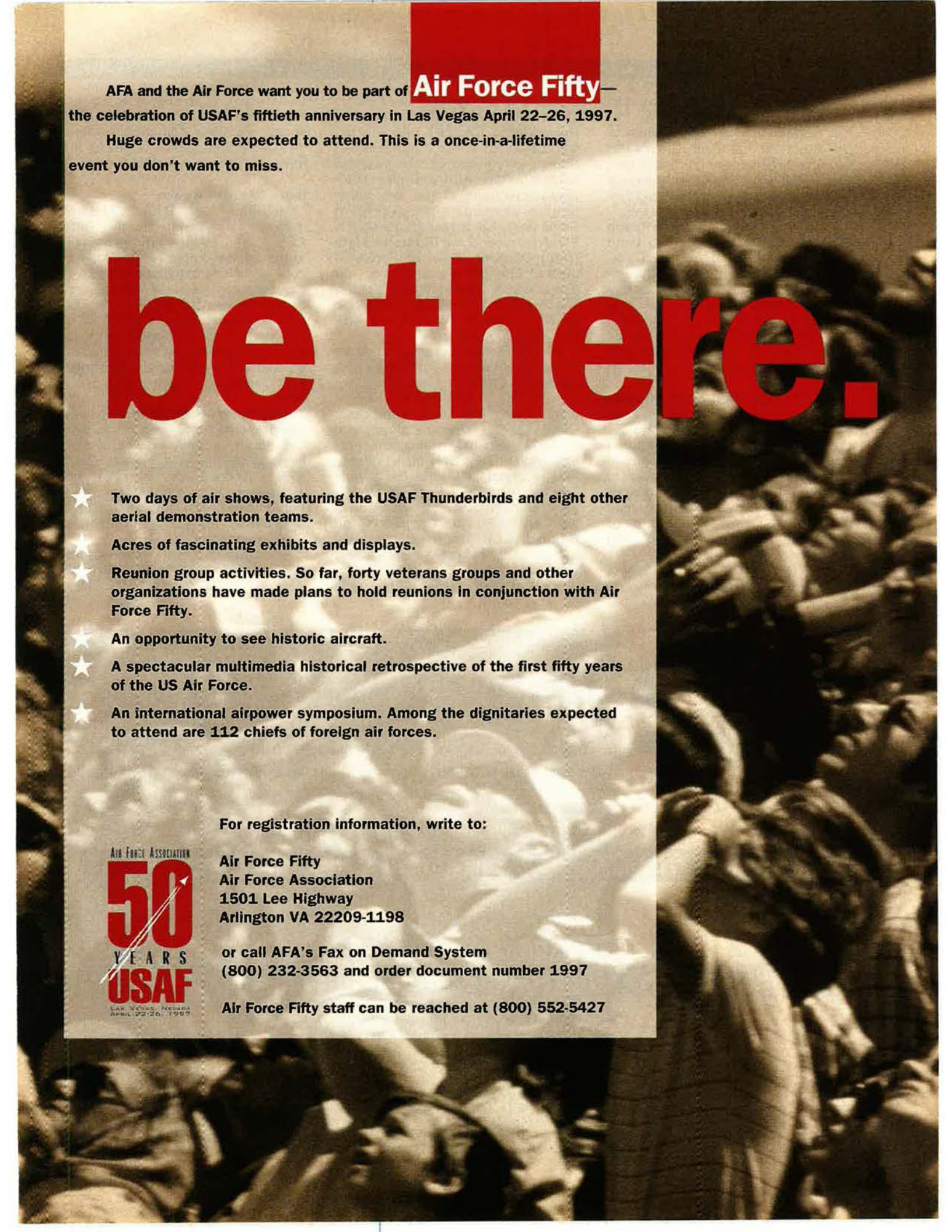
The fund is an initiative of **Anchorage (Alaska) Chapter** President Douglas A. Stark. The golf tournament, held at Tinker AFB, Okla, was organized by Lt. Col. Walter H. "Jay" Johnston, Jr., USAF (Ret.), of Edmond, Okla. Now a Northwest Airlines pilot, Mr. Johnston is not a chapter member but was a 552d Air Control Wing AWACS pilot at the time he organized the event. The $1,000 brings the Central Oklahoma Chapter's total contribution to the fund to more than $4,000.

In May, the chapter's vice president for Aerospace Education, USAF Col. Martin P. Jubelt, not only presented JROTC awards at Southeast High School, Oklahoma City, Okla., at end-of-year ceremonies but also received a Kitty Hawk Award from the cadets, as thanks for supporting their program. His educational outreach efforts have also included presentations to local elementary school classes on "Why Airplanes Fly."

From the Sunshine State

The **General Nathan F. Twining (Fla.) Chapter** honored Janice Press, from Northshore Elementary School in Oldsmar, Fla., as Aerospace Teach-

The Montgomery (Ala.) Chapter hosted a luncheon in conjunction with the Air Command and Staff College's "Gathering of Eagles." One "Eagle" who attended was former USAFE Commander in Chief Gen. William Kirk, USAF (Ret.), second from right. He was joined by (l–r) Alabama State President William Divin, ROTC cadet Kelly Overstreet, and Chapter President Roy Boudreaux.



AFA and the Air Force want you to be part of **Air Force Fifty**—the celebration of USAF's fiftieth anniversary in Las Vegas April 22–26, 1997.

Huge crowds are expected to attend. This is a once-in-a-lifetime event you don't want to miss.

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- ★ Two days of air shows, featuring the USAF Thunderbirds and eight other aerial demonstration teams.
- ★ Acres of fascinating exhibits and displays.
- ★ Reunion group activities. So far, forty veterans groups and other organizations have made plans to hold reunions in conjunction with Air Force Fifty.
- ★ An opportunity to see historic aircraft.
- ★ A spectacular multimedia historical retrospective of the first fifty years of the US Air Force.
- ★ An international airpower symposium. Among the dignitaries expected to attend are 112 chiefs of foreign air forces.

AIR FORCE ASSOCIATION
50 YEARS USAF
LAS VEGAS, NEVADA
APRIL 22-26, 1997

For registration information, write to:

Air Force Fifty
Air Force Association
1501 Lee Highway
Arlington VA 22209-1198

or call AFA's Fax on Demand System
(800) 232-3563 and order document number 1997

Air Force Fifty staff can be reached at (800) 552-5427

er of the Year and Brian Lau and Joshua Schumacher as Civil Air Patrol Cadets of the Year. Daniel J. Silvera, from the CAP Clearwater Composite Squadron, in Clearwater, Fla., received a $1,000 scholarship from the chapter. He is attending The Citadel in South Carolina this fall.

In southwestern Florida, the **Peace River Chapter** celebrated its tenth anniversary in June at Port Charlotte, Fla. At the gathering, Chapter President Paul G. Chace and Joseph Musil presented CAP Cadet Commander Christian Brandyberry with a $300 scholarship. The award is named for Mr. Musil, a chapter founder and retired Air Force chief master sergeant.

The **Florida Highlands Chapter** has put the JROTC cadets of Avon Park High School in Avon Park, Fla., on wheels. Secretary Roy P. Whitton persuaded local golf professional David Dunfee to donate an old cart to the JROTC unit. Chapter member Russell C. Hyatt overhauled the white cart, so the cadets can use it for transportation around the school and in parades.

Brig. Gen. William W. Spruance, USAF (Ret.), has established a $1,000 scholarship through AEF for AFROTC cadets at Embry-Riddle Aeronautical University in Daytona Beach, Fla., who belonged to the Kitty Hawk Air Society in high school. The award is named for Col. Karl V. Price, USAF (Ret.), chairman of the aerospace science department at Lake Worth Community High School in Lake Worth, Fla. A member of the **Diamond State (Del.) Chapter,** General Spruance lives in Florida for part of the year and is chairman emeritus of Embry-Riddle's board of trustees. He is also an AFA National Director and AEF Presidential Advisor.

Sixteen Florida AFA chapters sponsored the eighth annual Florida AFA AFJROTC Cadet Championship Drill Competition at Patrick AFB, Fla., in April. Thirty-one units competed. Cadet Lt. Col. Danny Cannon and Cadet Maj. Ervin Gonzalez from team one, Hialeah High School, in Hialeah, Fla., received the Overall Excellence Trophy, presented to them by National Director Tommy G. Harrison of the **Central Florida Chapter. Cape Canaveral Chapter** President David L. Pennoyer presented the Maj. Gen. Dan F. Callahan Drill Team Excellence trophy to Cadet Col. Arnold DeAsis from team one, N. B. Forrest High School, Jacksonville, Fla. Personnel from the 45th Space Wing, Patrick AFB, served as judges for the meet.

More Chapter News

Maj. Gen. Marvin R. Esmond, commander of Air Warfare Center, Nellis AFB, Nev., was the keynote speaker at the combined convention for Arizona and Nevada in June in Las Vegas, Nev. In state business meetings during the convention, Arizona AFA members elected Raymond D. Chuvala of the **Tucson Chapter** as state president, and the Nevada members elected Joel T. Hall of the **Thunderbird Chapter** as Nevada state president.

The **Thomas B. McGuire, Jr. (N. J.), Chapter**—AFA's largest in the Garden State—recently elected new officers at a picnic held at the McGuire AFB's Officers' Club. William A. Mann, Jr., was elected president; Joseph J. Schumacher, vice president; Geraldine Jones, secretary; and John L. Riley, treasurer.

The **Dale O. Smith (Nev.) Chapter** donated $450 to the Civil Air Patrol's Nevada Wing in Sparks, Nev.

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Reaches 100,000 elementary school students with the "Visions of Exploration" program, encouraging interest in math and science

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Unit Reunions

3d Troop Carrier Squadron. October 2–6, 1996, at the Perdido Beach Resort in Orange Beach, Ala. **Contact:** Fred S. Lieber, P. O. Box 1269, Fairhope, AL 36533-1269. Phone: (334) 928-1473.

5th Air Force Memorial Foundation. October 3–5, 1996, at the Ramada Inn Airport North in Dayton, Ohio. **Contact:** Col. J. Randy Forrester, 8275 Taffy Dr., West Chester, OH 45069-3734. Phone: (513) 777-6657.

20th Fighter Group Ass'n, AAF Station 367, including support units. September 26–29, 1996, at the Regal Maxwell House Hotel in Nashville, Tenn. **Contacts:** William W. Wells, 107 Boxwood Dr., Franklin, TN 37069. Phone: (615) 371-1683. Ken Ashbaugh, 6201 Ormada Dr., Kalamazoo, MI 49004-9538. Phone: (616) 342-8522.

Pilot Classes 36-A, 36-B, and 36-C (Randolph and Kelly Fields, Tex.). Sixtieth-anniversary re-

AFA/AEF National Report

The funds helped two CAP cadets attend a ten-day encampment, held at Stead Airport, Nev., in June. The facility was an Air Force base at one time; part of it is now an Air National Guard facility. During the encampment, the cadets visited the 152d Airlift Wing (AFRES) at Reno/Tahoe IAP, Nev., and received orientation flights on CH-47 Chinook helicopters flown by the Army National Guard's 1/113th Aviation Battalion.

Susan L. Roche, a sixth grade science teacher from Lounsberry Hollow Middle School in Vernon, N. J., achieved three firsts, according to the **Highpoint (N. J.) Chapter.** In early May, she received the first Teacher of the Year award granted by the chapter—and any chapter in New Jersey. Later that month, she received the first Northeast Region Teacher of the Year award at the New Jersey State Convention. Ms. Roche has traveled as far afield as Moscow, Russia, to take space science courses.

Richard S. Reid (Ariz.) Chapter representatives attended Memorial Day ceremonies at the Green Valley Cemetery and Memorial Park in Green Valley, Ariz.

Pharmacy Discounts for Members

AFA now offers its members the Physicians R_x pharmacy card. After purchasing the card for $29.95, AFA members will be entitled to discounts on prescriptions at more than 35,000 pharmacies nationwide. Group purchasing power makes these discounts possible.

For information, contact AFA Member Services Office at (800) 727-3337, then choose selection eight.

AFA Membership Directory

As part of AFA's fiftieth-anniversary celebration this year and the Air Force's fiftieth anniversary next year, the Association will publish an AFA membership directory next spring.

Harris Publishing Co., publisher of the Association's two previous directories, sent out questionnaires this summer, requesting biographical information from all members. Only those who respond to the questionnaire will be listed. The directory will include a comprehensive chronology titled "Up From Kitty Hawk."

Have AFA/AEF News?

Contributions to "AFA/AEF National Report" should be sent to *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Phone: (703) 247-5828. Fax: (703) 247-5855. ■

An Air Force Association National Symposium

Annual Air Force Ball and Golf Day

The Beverly Hilton Hotel (310) 274-7277

National Symposium

October 18, 1996

An in-depth exploration of Air Force core competencies as we approach the twenty-first century. Invited participants to this national symposium, now in its twenty-first year, include the Secretary of the Air Force and the Chief of Staff, as well as other Air Force leaders from the major commands.

The Air Force Ball

The twenty-fifth Annual Air Force Ball will also be held this year at the Beverly Hilton Hotel. We will celebrate the Silver Anniversary of the Ball, as well as the Golden Anniversary of AFA. We will also recognize two individuals, one from the private sector and one from government, who have made significant advances in aerospace.

Air Force Symposium Golf Day

Please join us for Air Force Symposium Golf Day, which will be held at the Los Alamitos Navy Golf Course on Thursday, October 17. Tee times will be from 11:00 a.m. to 1:00 p.m. Attendance is limited, so be sure to register early.

Registration Information

Symposium: The cost to attend the Symposium is $300 for AFA members and $350 for nonmembers. The registration fee includes a continental breakfast, refreshments, and lunch. Additional luncheon tickets are available at $45 each. Call (800) 727-3337, ext. 5838, to register, or, for information twenty-four hours a day, call ext. 2030.

Air Force Ball: For additional information on the Ball and to reserve tickets and/or a table, please call Henry Sanders at (310) 645-3982.

Beverly Hilton Hotel: Please identify yourself as an AFA member when you call the Hilton at (310) 274-7277 (or 800-Hiltons) to make reservations at the special rate of $150 per night, single, or $170, double.

union, October 14–16, 1996, at the Menger Hotel in San Antonio, Tex. **Contact:** Maj. Gen. William E. Creer, USAF (Ret.), 2619 Burton Ave., Las Vegas, NV 89102-2171. Phone: (702) 870-6758.

Pilot Training Class 48-A "Guinea Pigs." September 22–26, 1996, at the Gold Coast Hotel and Casino in Las Vegas, Nev. **Contacts:** Joseph A. Buebe, 5258 Queens Wood Dr., Burke, VA 22015-1532. Phone: (703) 323-7974. John Harlan, (702) 456-7824.

Pilot Training Class 67-C (Craig AFB, Ala.), including instructors and wing staff. October 21–23, 1996, in Las Vegas, Nev. **Contact:** Maj. John E. Richardson, USAF (Ret.), P. O. Box 13551, Albuquerque, NM 87192. Phone: (800) 239-9305.

66th Fighter Squadron (World War II). October 10–12, 1996, at the Ramada Hotel in Tulsa, Okla. **Contact:** Lou Lederman, 8964 E. 57th St., Tulsa, OK 74145-7938. Phone: (918) 254-9724.

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.

87th/512th Fighter-Interceptor Squadron Ass'n (1954–58). October 10–13, 1996, at the Denver Marriott West in Golden, Colo. **Contact:** Jerry White, 10620 W. 76th Dr., Arvada, CO 80005. Phone: (303) 425-0134.

452d Bomb Group Ass'n. October 17–20, 1996, at the Holiday Inn Palo Verde in Tucson, Ariz. **Contacts:** Tamarac Travel Agency, Inc., 5853 N. University Dr., Tamarac, FL 33321-4633. Phone: (800) 228-9690 or (954) 724-8200. Fax: (954) 724-8211.

508th Air Refueling Squadron. October 24–26, 1996, at the Ramada Inn, Bossier City, La. **Contact:** Roy Livesay, Jr., 1565 Hillside Dr., Beavercreek, OH 45732-2514. Phone: (513) 429-0586.

701st Radar Squadron, Fort Fisher AFS, N. C., including military, civilian, and contract employees (1963–66). November 1–3, 1996, at Fort Fisher Air Force Recreation Area, Kure Beach, N. C. **Contact:** Col. Albert H. Schroetel, USAF (Ret.), 6812 Grey Fox Dr., Springfield, VA 22152-2616. Phone: (703) 917-7526.

735th Aircraft Control and Warning Squadron, Morocco (1952–60). October 27–30, 1996, at the Inn of the Hills River Resort in Kerrville, Tex. **Contact:** William K. Clark, 411 Meadow Ridge Dr., Kerrville, TX 78028-3824. Phone: (210) 895-1967. Fax: (210) 895-2817. ■

Bulletin Board

Seeking the whereabouts of **Capt. Wilbur T. "Bud" Hutchinson,** who served with the 27th Fighter-Interceptor Squadron, Griffiss AFB, N. Y., and possibly Elmendorf AFB, Alaska, in the mid-1950s. His last known address was in Sacramento, Calif. **Contact:** Maj. Jack Katz, USAF (Ret.), 6626 Norman Lane, San Diego, CA 92120-3949.

Seeking contact with **John E. Dougherty** or anyone else who knew **Austin A. Straubel** of Green Bay, Wis. **Contact:** Steven P. McNicoll, 1851 S. Sunkist Cir., DePere, WI 54115-3732.

Seeking a copy of the history of the **488th Bomb Squadron,** published in 1946 by E. B. Thomas of Boston, Mass. **Contact:** Gerald M. Rosenthal, 17261 La Rinconada Dr., Los Gatos, CA 95030.

Seeking information on **WB-47E and EB-47L** aircraft. **Contact:** Harold W. Arnold, Jr., 6685 US 51 S., Fulton, KY 42041.

Seeking the whereabouts of **Shirley Baker Taylor,** widow of Lt. Col. Kenneth P. Taylor, stationed with the 449th Fighter-Interceptor Squadron, Ladd AFB, Alaska. **Contact:** Col. Douglas K. Mang, USAF (Ret.), 6548 Parish Glebe Lane, Alexandria, VA 22315.

Seeking contact with personnel stationed at **RAF bases** during ninety-day deployments, 1947–54. **Contact:** R. M. Robinson, 37 Home Farm Rd., Houghton, Huntingdon, Cambridgeshire PE17 2BN, UK.

Seeking contact with the crew of a B-24 from the **735th Bomb Squadron,** 453d Bomb Group, that was hit by flak and crash-landed in Alsace, France, July 12, 1944. **Contact:** René Magnet, 11 rue des Coquelicots, 68120 Pfastatt, France.

For a museum, seeking information on the color number of the original Air Force **blue uniform,** issued in 1949. **Contact:** Col. Oscar D. Kulman, USAFR (Ret.), 2550 Dellwood Dr. N. W., Atlanta, GA 30305.

Seeking contact with crewmates of **Cpl. Clarence E. DeLong,** stationed at Sheppard Field, Tex., Chanute Field, Ill., and especially Weisbaden AB, Germany (with the 18th Weather Squadron from 1945 to 1948). Also seeking contact with **Regina Solari,** widow of Chief Warrant Officer Ralph L. DeLong, and **Lieutenant Roland,** who accompanied Chief DeLong's body from Fort Crook, Neb., to Lancaster, Ohio, in 1947. **Contact:** Dale R. DeLong, 6860 Bowers Rd., Amanda, OH 43102.

Seeking contact with **Stephen Pavlison,** a USAF pilot, from Cleveland, Ohio, stationed at RAF Sculthorp, UK, 1961–63. **Contact:** Debbie-Lee Pinching, 309 Flat A, West End Lane, West Hampstead NW6 1RD, UK.

Seeking contact with USAF personnel shot down near **Schleiz, Germany,** in early 1944, during

daylight raids by B-17 Flying Fortresses. **Contact:** A. Crook, Colly Farm, Bridport, Dorset DT6 5PU, UK.

Seeking contact with **Lieutenant Joe (Eric) McCormack,** an Army Air Corps reconnaissance pilot in Australia, 1944–45. He may have been from Seattle, Wash. **Contact:** Col. Herman C. Wood, USAF (Ret.), 11320 Clover Park Dr. S. W., Tacoma, WA 98499-1230.

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

Seeking the whereabouts of **Rudolph Marshall,** from Jamaica, stationed in England in the early 1960s. **Contact:** Elisabeth Renssen, Korenstraat 12, 6419 XM Heerlen, the Netherlands.

Seeking contact with personnel from Det. 2, 14th Communications Squadron, **848th Air Control and Warning Squadron,** and Det. 5, **1961st Communications Squadron,** Wallace AS, the Philippines, 1969–70. **Contact:** Col. Earl D. Honeycutt, Jr., AFRES, 1319 Westmoreland Ave., Norfolk, VA 23508-1320.

Seeking **military payment certificates** used overseas, 1946–73. **Contact:** Col. Nick Schrier, AFRES (Ret.), Box 60104, Sacramento, CA 95860.

Seeking contact with 482d Bomb Group personnel who remember **B-24H-2CF #41-29177 *Ginger*. Contact:** Albert R. Krassman, Jr., 177 Santa Anita Ct., Sierra Madre, CA 91024-2520.

Seeking members of the **450th Bomb Group,** the "Cottontails," stationed in Manduria, Italy, during World War II. **Contact:** Samuel Stein, 11 E. Vanston Rd., Stoughton, MA 02072-3036.

Seeking contact with or information on **Capt. William L. Stewart** of the 87th Air Transport Squadron, 27th Air Transport Group, Warton, UK, 1943–44. **Contact:** James O. Beaird, 5531 S. Joplin Ave., Tulsa, OK 74135-7562.

Seeking crash sites, wreckage, or parts of **Martin B-26 Marauders,** especially in the US. Also seeking Martin B-26 **patches,** photos, and memorabilia. **Contact:** Joe Sawicki, 2004 Stevens St., Belleville, IL 62223.

Seeking contact with relatives of **Capt. Jon Thomas Busch,** killed in the Vietnam War. In particular, seeking contact with his parents, Mr. and Mrs. Charles E. Busch. **Contact:** Jessie M. Shires, 354 Albemarle Ave. S. W., Roanoke, VA 24016-4622.

Seeking contact with fighter pilots who served in the Directorate of Fighter Operations, **Hq. Tactical Air Command,** 1966–70, while Col. Jack W. Hayes was director. **Contact:** Col. Jack W. Hayes, USAF (Ret.), 18135 Brittany Dr. S. W., Seattle, WA 98166-3809.

Seeking information on the last mission flown by **Maj. Thomas E. Reitmann,** on December 1, 1965, in an F-105 in Vietnam. **Contact:** Howard Chilton, 3306 Wiley Post Rd., Suite 106, Carrollton, TX 75006.

Seeking contact with an airman stationed at RAF Sculthorpe, UK, in the late 1950s, who knew **Pamela Chilvers. Contact:** Angela Christmas, 184 Clarence Rd., Millfield, Peterborough, Cambridgeshire PE1 2LE, UK.

Seeking contact with members of the **College Training Detachment, Gettysburg College,** Gettysburg, Pa., February to October 1943. **Contact:** CMSgt. Joseph P. Hellberg, USAF (Ret.), 34688 Tennessee Rd., Lebanon, OR 97355.

Seeking contact with **J. H. McClendon,** Pilot Training Class 42-F, or his relatives, to return his class ring, bought at an auction. **Contact:** Gideon Jones, 10403 Quiet Hill Rd., La Porte, TX 77571.

Seeking contact with **CMSgt. William Best,** of the 445th Fighter-Interceptor Squadron, Wurtsmith AFB, Mich., 1965–67. **Contact:** Franklin C. Crain, 230 Pine Needle Lane, Bigfork, MT 59911.

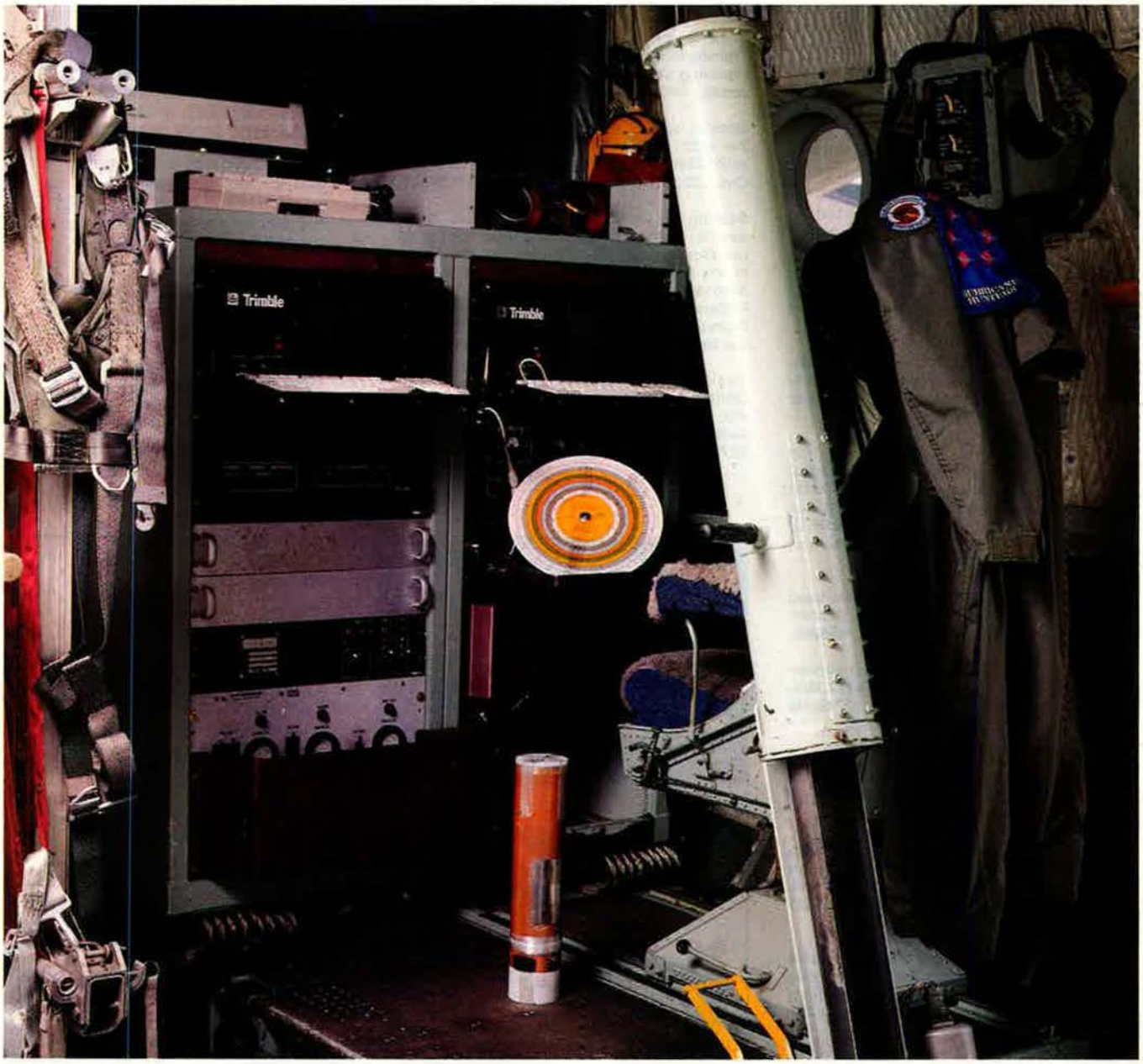
Seeking photos of the **B-47E-45-DT #0-32104** used for testing the GE TF34 engine, the **QB-47** used for Bomarc CIM-10B testing, and a picture of any **NB-47E, JB-47E, or NRB-47E** used by Aeronautical Systems Division Flight Test, Wright-Patterson AFB, Ohio, 1962–69. **Contact:** Col. Sigmund Alexander, USAF (Ret.), 12110 Los Cerdos Dr., San Antonio, TX 78233.

Seeking the whereabouts of **Lt. Wilson Christian's B-24 crew** of the 38th Bomb Squadron, 30th Bomb Group, 7th Air Force. **Contact:** James Kidder, 2915 54th St. S., Gulfport, FL 33707-5529. ■

Pieces of History

Photography by Paul Kennedy

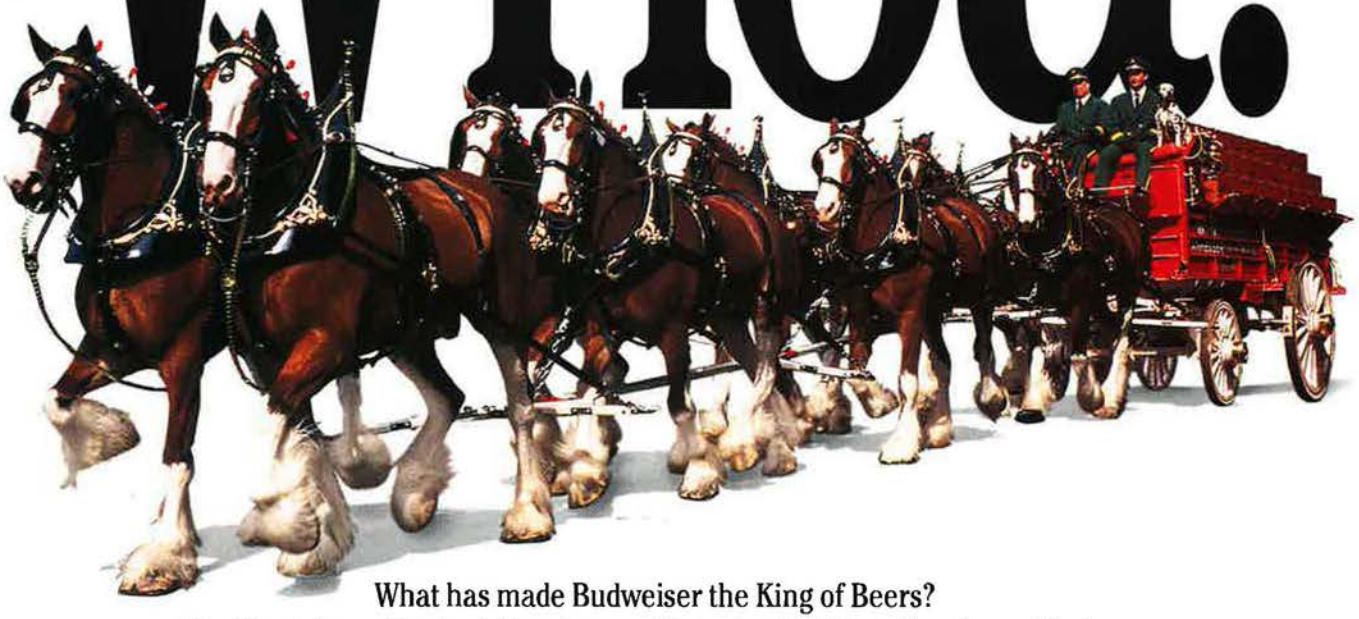
In the Eye of the Storm



Aircraft and equipment courtesy 53d Weather Reconnaissance Squadron, Keesler AFB, Miss.

When the weather is just right—hurricane winds, pouring rain—six Air Force Reserve members of the 53d Weather Reconnaissance Squadron, 403d Wing, jump into a WC-130 and rush into the fray. While the storm is ripping away rooftops and felling trees, the "Hurricane Hunters" enter the eye at up to 10,000 feet to gather data on its movement, wind speed, barometric pressure, and humidity. The 53d WRS, operating ten aircraft out of Keesler AFB, Miss., is the only unit routinely flying weather reconnaissance. The long tube above, located near the weather officer's position in the aircraft's rear, drops a parachute-borne sensor—a dropsonde (small tube at bottom center of photo)—that collects data from the storm.

Whoa.



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