September 1999/$5

AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION MAGAZINE

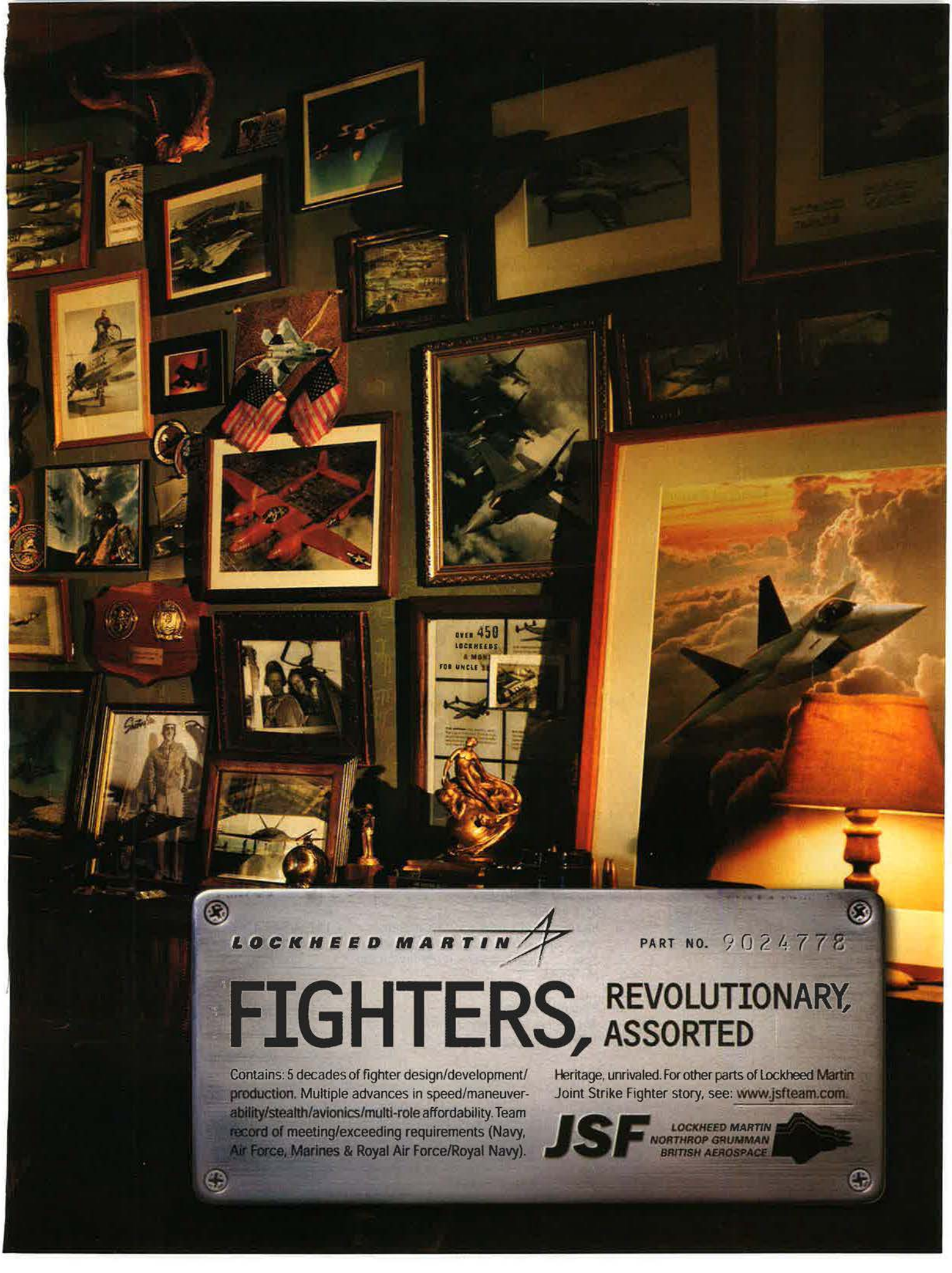
Misawa's Weasels

Military Lasers High and Low

Senator Stevens on Defense

Short's View of the Air Campaign


LOCKHEED



LOCKHEED MARTIN

PART NO. 9024778

FIGHTERS, REVOLUTIONARY, ASSORTED

Contains: 5 decades of fighter design/development/production. Multiple advances in speed/maneuverability/stealth/avionics/multi-role affordability. Team record of meeting/exceeding requirements (Navy, Air Force, Marines & Royal Air Force/Royal Navy). Heritage, unrivaled. For other parts of Lockheed Martin Joint Strike Fighter story, see: www.jsfteam.com.

JSF

LOCKHEED MARTIN
NORTHROP GRUMMAN
BRITISH AEROSPACE

September 1999, Vol. 82, No. 9

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

www.afa.org

6 **Letters**

14 **Aerospace World**

18 **Verbatim**

38 **Senior Staff Changes**

40 **Index to Advertisers**

72 **Industrial Associates**

85 **Valor**

115 **State Contacts**

118 **AFA/AEF National Report**

122 **This Is AFA**

125 **Unit Reunions**

126 **Bulletin Board**

128 **Pieces of History**

About the cover: F-16CJs from the 35th Fighter Wing at Misawa AB, Japan, carry on the "Wild Weasel" Suppression of Enemy Air Defenses mission. See "Misawa's Weasels," p. 56, Staff photo by Guy Aceto.

4 **Editorial: One by One**
By John T. Correll
If you think the arguments against the F-22 sound familiar, you're right.

43 **Washington Watch: Short's View of the Air Campaign**
By John A. Tirpak
What counted most for NATO's success in the Balkans was the reduction of strategic targets, not "tank plinking" in Kosovo.

50 **Military Lasers High and Low**
By John A. Tirpak
Battle lasers are rapidly moving from the realm of theory into operational reality.

56 **Misawa's Weasels**
Photography by Guy Aceto and Paul Kennedy
The 35th Fighter Wing is the vital link at a base combining elements of four US services and Japan's air self-defense forces.

66 **Technology and the Future of Warfare**
The Rudman–Hart Commission, working up to the next Quadrennial Defense Review, surveys the most probable trends and dangers.

74 **Stevens on Defense**
The Senate Appropriations Committee chairman talks about Kosovo, airpower, missile defense, cyberwar, and more.

78 **Around the World**
By C.V. Glines
Seventy-five years ago this month, Army Air Service biplanes touched down in Seattle after circumnavigating the Earth.

87 **Recruiters' Best**
These five recruiters are AFA's 1999 Team of the Year.

50

88 **USAF's Best in Operations**
AFA and the Air Force recognize the best crews, aerial tactician, and crew chief for their 1998 accomplishments.

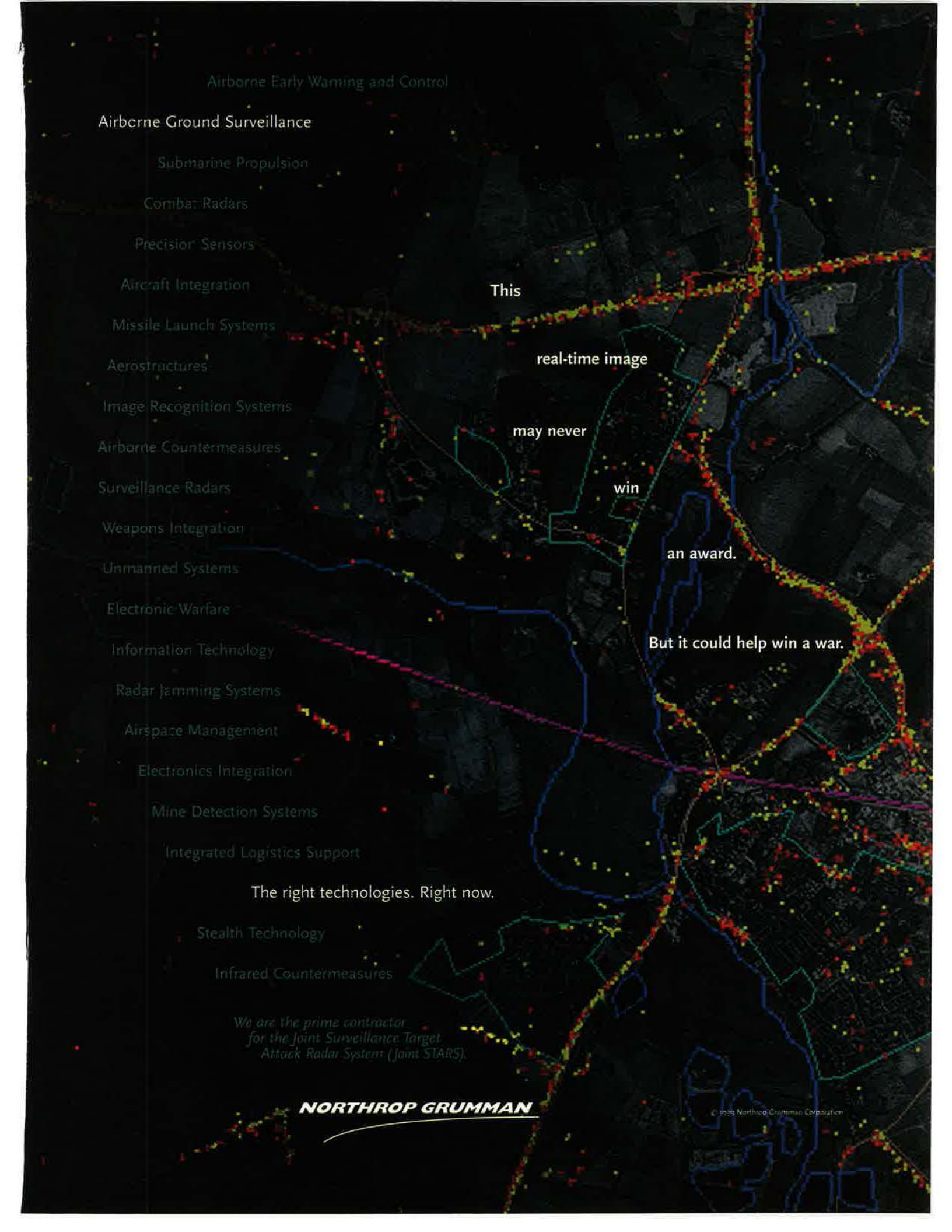
92 **Best of Guard and Reserve**
AFA and USAF recognize the best Guard and Reserve airmen, crews, and units for their 1998 accomplishments.

94 **Photochart of USAF Leadership**
Compiled by Chequita Wood
Air Force *Magazine's annual pictorial directory of Air Force leaders.*

105 **AFA/AEF Almanac**
Compiled by Frances McKenney
A compendium of facts and figures about the Air Force Association and the Aerospace Education Foundation.

117 **USAFA's Outstanding Squadron**
The Air Force Academy's top squadron for 1999.

AIR FORCE Magazine (ISSN 0730-6784) September 1999 (Vo 82, No. 9) is published monthly by the Air Force Association, 1501 Lee Highway, Arlington, VA 22209-1198. Phone (703) 247-5800. Second-class postage paic at Arlington, Va., and additional mailing offices. **Membership Rate:** $30 per year; $75 for three-year membership. **Life Membership (nonrefundable):** $450 single payment, $475 extended payments. **Subscription Rate:** $30 per year; $25 per year additional for postage to foreign addresses (except Canada and Mexico, which are $9 per year additional). Regular issues $3 each. Special issues (USAF Almanac issue and Anniversary issue) $5 each. **Change of address** requires four weeks' notice. Please include mailing label. **POSTMASTER:** Send changes of address to Air Force Association, 1501 Lee Highway, Arlington, VA 22209-1198. Publisher assumes no responsibility for unsolicited material.


Airborne Early Warning and Control
Airborne Ground Surveillance
Submarine Propulsion
Combat Radars
Precision Sensors
Aircraft Integration
Missile Launch Systems
Aerostructures
Image Recognition Systems
Airborne Countermeasures
Surveillance Radars
Weapons Integration
Unmanned Systems
Electronic Warfare
Information Technology
Radar Jamming Systems
Airspace Management
Electronics Integration
Mine Detection Systems
Integrated Logistics Support
The right technologies. Right now.
Stealth Technology
Infrared Countermeasures
We are the prime contractor for the Joint Surveillance Target Attack Radar System (Joint STARS).
NORTHROP GRUMMAN
This
real-time image
may never
win
an award.
But it could help win a war.
© 1999 Northrop Grumman Corporation

Editorial

By John T. Correll, Editor in Chief

One by One

In late June, the House Appropriations Defense Subcommittee decided to shoot down the Air Force's F-22 air superiority fighter. Details were worked out in secrecy over the next three weeks because the subcommittee did not want any advice or debate.

The Secretary of Defense and the Air Force were taken duly by surprise in July when the subcommittee voted against the $1.8 billion needed to purchase the first six F-22s.

Within days, the full appropriations committee and the House of Representatives concurred in the cut. The F-22's fate hangs on the Senate–House appropriations conference in September.

The chairman of the subcommittee, Rep. Jerry Lewis (R–Calif.), said he did not seek to kill the F-22, only to secure a "pause." The House approved $1.2 billion for continued development. However, restructuring and repricing the production program would add $6.5 billion to the overall cost and blow away the cost caps set by Congress. It would be difficult for the F-22 to survive.

In the case made by Lewis and his colleagues, two arguments stood out. They said that escalating cost has made the F-22 unaffordable, crowding other things out of the defense budget. They also said we do not need the F-22, that the current air superiority fighter, the F-15, is good enough.

The Air Force said that the MiG-29 and Su-27, which are deployed around the world in large numbers, are at near parity with the F-15, and that by 2005, the F-15 will be at a disadvantage to the Su-35 and export versions of the French Rafale and the European Consortium's Eurofighter. It is also vulnerable to late model surface-to-air missiles.

As for affordability, Secretary of the Air Force F. Whitten Peters said that "at peak production, the Air Force would spend about 6 percent of our budget on the F-22. This is about the same percentage of our budget that went toward developing and buying the F-15 nearly 30 years ago. This equates to less than 2 percent of America's national security budget."

The appropriations committee blamed "ambitious technical goals" and optimistic cost estimates for F-22 overruns, but three program cuts, from 750 aircraft to 339, also hurt. According to Loren Thompson of the Lexington Institute, more than 40 percent of the $3.5 billion increase in F-22 development cost is due to Congressional action.

If you think the arguments against the F-22 sound familiar, you're right.

Senate leaders said the House cut would be hard to walk back in conference because the "savings" were reallocated to politically popular procurements the Air Force did not request. These were promptly claimed as trophies by Congressmen in whose districts the largess fell.

If you think the arguments being made against the F-22 sound familiar, you're right. The pattern of the past 40 years is that major aircraft programs are regularly targeted, one by one, and attacked as unaffordable and unnecessary.

■ Twenty years ago, the Military Reform movement charged that the F-15 was too complex to operate or maintain, costing four times as much as a simple fighter that, used with "swarm" tactics, would be more effective than the F-15 and could even defeat it in combat. The reformers said the F-15 was justified only by "threat inflation," particularly by exaggerating the capabilities of the MiG-25 Foxbat.

The F-15 went on to become the classic air superiority fighter of all time and is now cited as a leading reason why the F-22 is not needed.

■ A 1974 headline in *The New Republic* called the E-3 Airborne Warning and Control System "The Plane That Would Not Die." It castigated the Air Force for keeping AWACS alive when there was no mission for it to perform. The General Accounting Office advised Congress to cancel procurement funds and continue the program only in R&D. A 1981 article in *The Wall Street Journal* called AWACS "a pre-eminent example of the Pentagon's disastrous high-tech procurement policies."

As it turned out, the only problem with AWACS is that there aren't enough aircraft to meet all the demands for its services.

■ The B-2 bomber was the most maligned weapon system in the history of military procurement. Congressional opponents tried repeatedly to kill it and complained of rising unit cost as the program was cut from 132 aircraft to 21. In 1997, misinterpreting a GAO report that was in itself flawed, news media spread the myth that B-2's stealth coatings melted in the rain.

The criticism has slackened off considerably since the B-2's spectacular performance in the Balkans.

Next through the chute will be the Joint Strike Fighter, a low-cost multimission aircraft designed primarily for ground attack. Its cost and performance depend on technology it inherits from the F-22. It relies on the F-22 for air superiority. If the F-22 goes down, the JSF takes a collateral hit.

In its turn, the JSF will be subjected to cuts and stretch-outs and criticized as costs go up. Existing aircraft will be declared sufficient to meet the need.

Looking back, the attacks on the F-15, AWACS, and the B-2 were not nearly as smart as they seemed to the attackers at the time.

In the appropriations conference in September, Congress has a historic opportunity to reverse the F-22 cut and avoid a monumental blunder. ■


OUR CUSTOMERS
HAVE LEARNED TO EXPECT
UNCOMPROMISING QUALITY
THE PRINCIPLES OF AVIATION
In the demanding field of aviation, quality is not merely an option, it is a must. Each instrument must meet the highest safety and reliability criteria. In tune with this approach, we have constantly optimized the functions on each of our chronographs. The launch of the EMERGENCY, the first watch to feature a built-in micro-transmitter, constituted an unprecedented technological breakthrough. This genuine survival instrument is worn by military and civilian pilots around the world as well as by members of the major national flight teams.
One simply does not become an aviation supplier by chance.
FREQ
CHR
BREITLING
EMERGENCY
121.5 MHZ
00 00 00
THE ESSENCE OF BREITLING
EMERGENCY. The wrist instrument worn by Bertrand Piccard and Brian Jones during their non-stop round-the-world balloon flight on BREITLING ORBITER 3.
BREITLING SA
TEL. +41 32 / 654 54 54 · FAX +41 32 / 654 54 00
P.O. BOX 1132 · 2540 GRENCHEN
SWITZERLAND
NOT AVAILABLE IN USA
INSTRUMENTS FOR PROFESSIONALS
www.breitling.com
BREITLING
1884

Letters

letters@afa.org

Airpower, Allied Force, and a Misperception

The pugnacious character of John Correll's July editorial, "Airpower and Its Critics," *[p. 3]* was wholly uncalled for. Correll apparently thinks it's an insult to USAF even to suggest the obvious: Modern warfare requires joint-service teamwork at every level.

The brilliant performance of our Air Force and its Allies brought Milosevic to the bargaining table. But this was not winning a war. It will be months or years before we know whether NATO actually accomplished its war goals (which is what most people mean by victory). Joint warfare would have produced a clear win, arguably with fewer civilian casualties and in fewer days of combat—surely with far less expenditure of ordnance. A credible threat of ground invasion might conceivably have won the battle before it started.

How much better it would have been for Kosovar and Serb alike if NATO had first massed, say, half a dozen armored divisions on the Hungarian border and put its airborne formations on full alert and then, as a joint ground–air operation, employed them as necessary. How much better it will be for America's future if our Air Force can truly embrace joint action and get over its outdated Douhetian fixation on "doing it all alone."

Col. David A. Appling,
US Army (Ret.)
Morgan Hill, Calif.

■ *Read the editorial again. You will find that it was not Correll but British historian John Keegan, long noted as a critic of airpower, who said that "the capitulation of Milosevic proved that a war can be won by airpower alone."—THE EDITORS*

News flash—We lost the war! Operation Allied Force was a brilliantly executed failure. Worse than simply a colossal waste of time and resources, NATO's war with Belgrade was an undeniable defeat of the most powerful military alliance in history by a racist thug and his relatively small and primitive forces. NATO's original objective was to prevent Serbian soldiers, police, and paramilitaries from "cleansing" the Kosovo province of its ethnic Albanian population. Two weeks into the bombing campaign, Milosevic had largely achieved his objective of killing or chasing away most of the Kosovars. Rather than prevent the tragedy, NATO's air attacks probably accelerated the process.

Unwilling to concede defeat, NATO instead revised its objective. The new aim of the Allies was to force the Serbs to allow the ethnic Albanians to return safely to their homes. Several weeks later, after the Serbian forces had finished destroying what they couldn't loot, Milosevic pulled his undestroyed army out of Kosovo, leaving behind mass graves, burned villages, and land mines galore.

It doesn't matter that we destroyed tens of billions of dollars' worth of buildings and bridges, while losing only two of our own aircraft. It doesn't matter that night after night our aircrews faced real danger with exceptional professionalism and courage. It doesn't matter that this was the most accurate and "humane" war ever fought. We failed to meet our objectives.

NATO's objective, now that it has stopped bombing, is to get the Serbs and ethnic Albanians to live together peacefully. We've never had much luck convincing people with ancient grievances to bury the hatchet. In fact, if we have as much success in the Balkans as we've had elsewhere in the world, we can look forward to maintaining a peacekeeping military presence in the region for the better part of the next century. Thank goodness we have the Russians there to help us.

Maj. Cory Bartholomew
Beale AFB, Calif.

I feel it is necessary to clarify something that I read in "Washington Watch" in the June issue *["The First Six Weeks," p. 27]*. In an otherwise well-written and insightful article analyzing the first six weeks of Operation Allied Force, [John A.] Tirpak writes, "Serbia's air force— inherited almost intact from the Warsaw Pact days of the former Yugoslavia—had been dramatically reduced."

This is an incorrect statement. Yugoslavia was never a member of the Warsaw Pact. This is a common misconception in the West that I believe is borne out of the fact the air force of Serbia–Montenegro (or what is left of it) has MiG-21s, MiG-29s, and other aircraft made in Warsaw Pact countries. The US sold a lot of defense equipment to the Yugoslavs (notably F-86s, RF-84s, and T-33s).

The fact that Yugoslavia was more economically developed than most countries in the Warsaw Pact and had better relations with the West illustrates the true tragedy and irony of the current situation in Serbia–Montenegro. Due to the nationalist policies carried out by Milosevic after 1989, Belgrade went from being the capital of a federation which was the envy of countries like Poland (now a full NATO member) to being the capital of an utterly devastated land that is now light years behind any other country in Europe.

Mark Lenzi
Member, US Peace Corps
Kielce, Poland

Do you have a comment about a current article in the magazine? Write to "Letters," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. (E-mail: letters@afa.org.) Letters should be concise and timely. We cannot acknowledge receipt of letters. We reserve the right to condense letters. Letters without name and city/base and state are not acceptable. Photographs cannot be used or returned.—THE EDITORS

The Future Force and Anthrax

After reading Correll's article on "Future Total Force" *[July, p. 28]* and Otto Kreisher's article "Hawley's Warning" *[July, p. 51]*, it is apparent that the Air Force is hemorrhaging pilots wholesale. The Air Force will continue to rely more and more on Air National Guard and Air Force Reserve pilots to pick up the slack.

Pilot retention will get worse before

When it comes to flight safety, the USAF is on a mission.

From the beginning, the Air Force's commitment to flight safety has been uncompromising. So it's no wonder they're equipping their transport aircraft with ETCAS, GPS and EGPWS. Which not only surpasses FAA commercial aircraft flight safety requirements, but also ensures compatibility with the requirements of GANS/ GATM, Freeflight worldwide. When you consider that the USAF transport fleet is larger than the three top commercial airlines combined, that's no small mission. As the world leader in flight safety technology, AlliedSignal is proud to help them accomplish it.

AlliedSignal
AEROSPACE

http://www.alliedsignal.com/aerospace
1-425-885-8719

AIR FORCE MAGAZINE
PUBLISHED BY THE AIR FORCE ASSOCIATION

Publisher
John A. Shaud

Editorial afmag@afa.org

Editor in Chief
John T. Correll

Executive Editor
Robert S. Dudney

Senior Editor
John A. Tirpak

Associate Editor
Tamar A. Mehuron

Contributing Editor
John L. Frisbee

Managing Editor
Suzann Chapman

Assistant Managing Editor
Frances McKenney

Director of Production
Robert T. Shaughness

Art Director
Guy Aceto

Assistant Art Director
Cathy Cavanaugh

Research Librarian
Pearlie M. Draughn

Editorial Associates
Chanel Sartor
Chequita Wood

Administrative Assistant & Staff Editor
Juliette Kelsey

Advertising adv@afa.org

Advertising Director
Patricia Teevan
1501 Lee Highway
Arlington, Va. 22209-1198
Tel: 703/247-5800
Telefax: 703/247-5855

Industry Relations Manager
Nicola C. Whitlock • 703/247-5800

US and European Sales Manager
William Farrell • 847/295-2305
Lake Forest, Ill.
e-mail: BFarr8078@aol.com

BPA Circulation audited by Business Publication Audit

it gets better. Both articles mentioned a 2,000-pilot shortage by 2002. Did these numbers include the 25 to 30 percent of pilots planning to resign or retire at each Guard and Reserve unit over the mandatory anthrax vaccination program? The Connecticut ANG already lost eight pilots. The Wisconsin ANG [lost] seven in July and Dover and Travis are preparing to lose 50 percent of their aviators. This is just the beginning.

The Air Reserve Components have been a safety net for the Total Force by handpicking the cream of the active duty pilots making an exodus for the airlines. Many of these active duty pilots still have a desire to fly and serve their country on a part-time basis while pursuing full-time careers with the airlines. This safety net is now in jeopardy with the mandatory anthrax vaccinations and the ever increasing ops tempos required of part-time Guard and Reserve pilots.

Lt. Col. Rob Koenig
Wisconsin ANG
Madison, Wis.

Hawley's Warning

[In the article "Hawley's Warning," the author states] that the Goldwater–Nichols legislation reduced the service chiefs' ability to control deployment rates. *[See July, p. 51]* [Gen. Richard E. Hawley told Congress,] "The result is a tendency for the geographic [Commanders in Chief] and their components to place unconstrained demands on scarce resources."

[According to Hawley,] the regional CINCs cannot balance their demands against the needs of other regions, and the services' force providers, such as [Air Combat Command], are prevented by Goldwater–Nichols from making those trade-offs.

I understood that the role of the [Joint Chiefs of Staff] and [Secretary of Defense] is to balance the needs of the regional CINCs against the needs of other regions. I can understand why ACC is not in a position to make those trade-offs. However, ACC is in a position to insist that the true readiness of their units be reported so that they are not available for further tasking. Many other major commands are also force providers and are also reporting official readiness far beyond the actual state of affairs. Truthful [readiness] ratings are the answer, not voluminous statistics regarding logistics, manning, etc.

The conventional answer to unconstrained demands is to require the user of such resources to budget and fund for their consumption. Hawley didn't recommend that, but that's worthy of consideration by the SecDef. Clearly, changing Goldwater–Nichols is not the answer. Reporting honest [readiness] ratings might make it easier for the JCS and SecDef to do their allocation job.

Bill Stringer
Beavercreek, Ohio

Honor Code Is Alive, Well, and Needed

I believe [David] Galvin's criticism of USAFA's honor code is way off target. *[See "Letters: First Class," August, p. 4.]* I'm curious why he would consider the honor code (I will not lie, cheat, or steal, nor tolerate among us anyone who does) nothing more than an "outdated" means for the commandant of cadets to "eradicate and dismiss any and all undesirable cadets." Was the requirement of maintaining a 2.0 minimum grade point average also just a dastardly plot of the dean's to eradicate undesirable cadets? Were the physical fitness tests just a sinister ploy by which the director of athletics also weeded out the undesirables? Of course not. Each of these requirements represented a standard of performance required of each and every cadet to maintain their good standing in the wing and to graduate with their class. Many cadets fall short of the standard set by the honor code as well as the academic, military, and physical standards of USAFA. There is no particular shame in this fact, but by no means is the failure of some an adequate reason to lower the bar as being idealistic and unreasonably high. Galvin may feel the honor code is outdated, but I maintain it's an essential element of what makes selection to (and graduation from) a service academy unique.

Maj. Mike Stewart
USAFA Class of 1987
Andrews AFB, Md.

I would like to say that [Galvin] is completely ignorant of the reason for and need to promote an honor code in the military academies and officer training programs. People in this world and the various societies within it are imperfect and only the moral and social laws enacted, and adhered to, by the citizens of those societies keep us from living in chaos and a state of anarchy. Every day, people ignore red lights and run stop signs; should we declare all traffic laws "outdated and idealistic"?

Galvin states that the code is used to dismiss undesirable cadets. I should

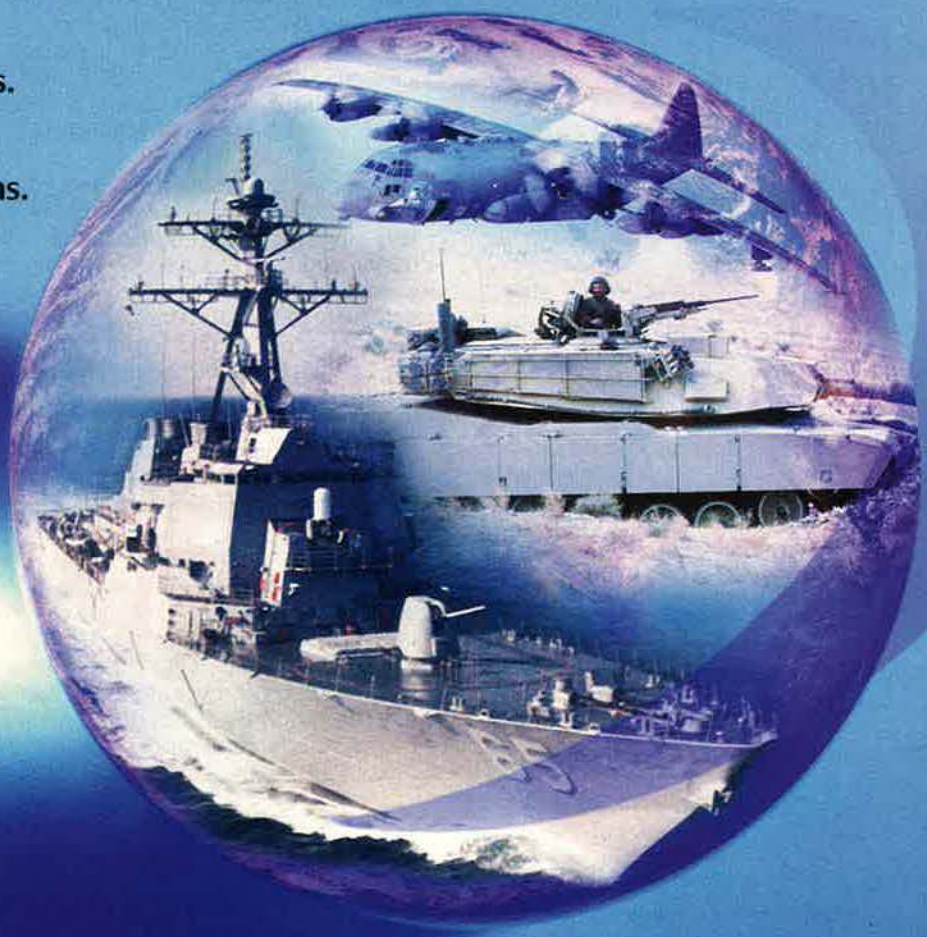
Global Security

Requires innovative solutions to global defense challenges.

Our advanced electronic systems provide leading edge solutions for many of the complex challenges facing defense modernization in the 21st century.

DRS is delivering high-performance, sophisticated electronic systems today for a safer world tomorrow.

Combat display systems.
Flight safety systems.
Data storage systems.
Electro-optical systems.



Global and Growing

DRS TECHNOLOGIES

Visit us at www.drs.com
973. 898.1500

Photo of DDG-65 courtesy of Ingalls Shipbuilding

See us in Booth 2625 at the AFA Aerospace Technology Exposition in Washington, D.C., September 13–15.

Air Force Association
1501 Lee Highway • Arlington, VA 22209-1198

Telephone: (703) 247-5800
Toll-free: (800) 727-3337

Press 1 *if you know your party's extension.*
Press 3 *for customer service.*
(For questions about membership, insurance, change of address or other data changes, magazine delivery problems, or member benefit programs, select the "Customer Service" option.)
Or *stay on the line for an operator to direct your call.*

Fax: (703) 247-5853

To select documents and receive them ***by fax:*** *(800) 232-3563*

Internet: http://www.afa.org/

E-Mail Addresses

Customer Service ..... **custserv@afa.org**
Field Services ..... **fldsvcs@afa.org**
Government Relations ..... **grl@afa.org**
Industry Relations ..... **irl@afa.org**
Information ..... **information@afa.org**
Policy & Communications/news media/ *Crossfeed* ..... **polcom@afa.org**

Magazine

Advertising ..... **adv@afa.org**
AFA/AEF Natl. Report ..... **afa-aef@afa.org**
Bulletin Board ..... **bulletin@afa.org**
Editorial Offices ..... **afmag@afa.org**
Letters to Editor ..... **letters@afa.org**
Reunion Notices ..... **reunions@afa.org**

Aerospace Education Foundation ..... **aefstaff@aef.org**
Eaker Institute ..... **eaker@aef.org**
Air Force Memorial Foundation ... **afmf@afa.org**

For individual staff members
first initial, last name, @afa.org
(example: jdoe@afa.org)

AFA's Mission

To promote aerospace power and a strong national defense.

To support the needs of the Air Force and Air Force people.

To explain these needs to the American people.

Letters

hope that it is. The officer corps doesn't need undesirable cadets becoming undesirable officers. Professional soldiers must hold themselves to a higher set of standards than the average citizen.

Maj. George V. Back,
USAF (Ret.)
Cleveland, Ohio

As a graduate of the first class, I can assure [Galvin] that I am one graduate who does not subscribe to his views. The USAFA honor code was one of the key factors in my four years at the academy and my 30 years in USAF. As a sidelight, I notice that Galvin's name does not appear in the USAFA Alumni Association Register of Graduates.

Col. Albert L Waters,
USAF (Ret.)
Graduate, USAFA Class of 1959
Pinehurst, N.C.

You may be assured that everyone attending the Air Force Academy is fully aware of the importance of the honor code. I also believe an overwhelming majority of graduating cadets have met its standard. Galvin presents a deeply mistaken viewpoint that implies that the honor code is misused "systematically." His hyperbole is not that of a thoughtful presenter of issues but someone who has an ax to grind.

The purpose of the honor code does not depend on perfection at the academy; even "perfect angels" make mistakes. The honor code is a lifetime reminder that in times of war or personal stress, only honesty can dispel the fog of misunderstanding. The code is not dispensible. It is a statement of values. Even if no single graduate met its standards, the code would still be the standard for conduct for graduates in all walks of life.

G. Wiley Burch
USAFA 1959
Concord, Mass.

[Galvin's] characterization of the USAFA honor code is both wrong and malicious. The honor code was the most important element of my experience at the academy, and it has guided my life ever since. The writer said there has never been a "perfect honor code class." We were not, in his words, "perfect angels," but, by God, I believe we were "perfect" in our adherence to the code. In that we are not alone. Subsequent classes have been equally committed to the code and have tried to meet the high standard it established. Some have failed, but the vast majority have succeeded. Fortunately, a high sense of honor and integrity is the norm for the Air Force professional, regardless of rank or position. Academy graduates are not unique. It is important, however, for all to understand that the Air Force Academy is meeting its responsibilities to the nation and the Air Force. The honor code is real and working.

Edward H. Josephson
USAFA Class of 1959
Brentwood, N.H.

I wish to thank Galvin for pointing out what the honor code is not and making me think of a way to explain what the code was to me. Initially it was simply one of the boundary conditions that I accepted along with all the rest of the "conditions of employment," so to speak. It was simple, comprehensive, and the consequences were explicit. In retrospect I see it as an essential element in what management consultant Stephen Covey calls "Principle-Centered Leadership." I would suggest Galvin get a copy.

John M. Howell,
New York City

■ *We have received more than 35 letters (still counting) supporting the USAFA honor code. There has not been one letter supporting reader Galvin's contention.—THE EDITORS*

First Class Photos

I hope that I'm not the first person to call your attention to the accuracy of the pictures you selected to accompany Bruce Callander's June 1999 article, "First Class" *[p. 56]*. When I first looked at the article I didn't notice that you were associating all those pictures with the Class of 1959. When I looked again at the picture on p. 57, I recognized first that it displayed the campus at Colorado Springs with the cadets wearing Fourth Class shoulder boards. When the members of Class of 1959 were Fourth Classmen, the building in your picture did not exist (at least in the state shown).

Next, when I turned to p. 60, I saw and read the caption under the picture of the wing dining at Mitchell Hall. There were more people in the picture than were in the entire Class of 1959. We didn't start to use Mitchell Hall until late summer 1958 when the Cadet Wing was moved from Lowry AFB to Colorado Springs.

Col. Jack Hauser,
USAF (Ret.)
Class of 1962, USAFA
Chesterfield, Mo.

■ *The photos were not all from the 1959 class. Some were simply pho-*

tos of early academy scenes; however we failed to make that clear in the captions.—THE EDITORS

Roadman on Tricare

I appreciate Lt. Gen. [Charles H.] Roadman's concerns with the adequacy of medical care for the military family. *[See "Roadman on Tricare," July, p. 64.]* There is no doubt that the military [health] facilities should receive the highest priority. We read a lot about the retiree being a part of the military family, but it is difficult to reconcile those statements with reality. We do not have medical care.

For years we have read about efforts on the part of the Military Coalition to reconcile these injustices. We have read about the "promised" medical benefits. In reality, there are none.

I was recently told by representatives at TriWest [Healthcare Alliance, the Tricare contractor for the Central Region] that they have negotiated a 17 percent reduction below what Medicare pays providers in our area. What quality physician would accept that? What we have is a bureaucratic, administrative nightmare, and those who are in positions to change it choose not to because they have vested interests in retaining the status quo.

If ever there were an argument against socialized medicine, this is the perfect example. Our Congress and the people of this country honestly believe they are providing for the medical care of the military family. Those outside our community that I talk to are shocked when they hear of the administrative bungling and exclusions that have continued for years.

I know many military retirees in this area. I do not know any who have chosen to accept and use the Tricare program. Of all the millions of dollars that Congress allocates to provide for the military family, most goes in the pockets of the administrators. I'd venture to say we could provide more care at less cost than the process which has been set up. But then if we procrastinate long enough, most of us won't be here. Think of the savings! Now, try to sell a military career to a young, observant person.

Lt. Col. Richard N. Doolittle,
USAF (Ret.)
Littleton, Colo.

Roadman could not have it more wrong on Tricare. In fact while Roadman was taking the controls of USAF health care and lauding Tricare, the retiring Army surgeon general blasted Tricare for its deterioration of military health care. One doesn't have to look further than the inadequate program funding, poor access to care cited by DoD, increased costs to service members and retirees, [and] to doctors who refuse participation in Tricare, to see the program's failures. DoD's failure to meet its health care obligation to its active duty and retired members is well-documented with facts, not anecdotes. Servicemembers deserve better, and the general should call Tricare what it is, a failure to implement "the good concept of managed care."

Capt. Mike Houghton
Barksdale AFB, La.

While our personal experience with Tricare Prime has been excellent with regard to availability of care, prescription services, and quality of service by health care providers, the reverse is true for the program management and billing process, availability of contractor help, and dispute resolution.

During the past three years, my wife has had major cancer surgery and a gall bladder removal. I have diabetes and have had cataract surgery. Our medical care has been readily available and excellent. But the program in the Austin, Texas, area is in serious difficulty. The two major providers of health care in this area have or are withdrawing from [Tricare] for lack of payment or severely delayed payment. The list of available providers has been reduced to few and far between and certainly not in locations easily accessible to most beneficiaries.

In correspondence with the Tricare Military Office in San Antonio, I get the usual nonresponsive answers to my questions.

We applaud the efforts to improve Tricare for those who will remain in the program and encourage Roadman to continue improvements. For those of us who are unceremoniously dumped into Medicare, we hope changes will be made to provide us with the kind of medical care promised when I elected to accept the regular commission offered in 1957. It was an interesting and enjoyable career. I'm only sorry now that I believed all the things promised.

Maj. Howard M. Chaikin,
USAF (Ret.)
Austin, Texas

Reversal on Pearl

In the July issue on p. 21 *["Aerospace World: Remember Pearl Harbor"],* I can't believe you relegated such a small, insignificant article to such an important event in the Senate. If the admiral [Adm. Husband Kimmel] and general [Army Gen. Walter Short] aren't responsible, who are? What was Gen. [Douglas] MacArthur doing when the attack occurred? What happened to the new

B-17 bombers and patrol planes he had in the Philippines? Is the radio petty officer who copied the "East Winds Rain" message still alive? Is MacArthur's flight group commander still alive? What's going on here?

Robert B. Kerr Sr.
Perkiomenville, Pa.

Fixing Housing

Good article on the improvements to the Air Force housing system *["To Fix Air Force Housing," July, p. 72].* Glad to see USAF is looking "outside" for assistance with the establishment of [Basic Allowance for Housing] rates. However, the approach lacks one critical element: direct input from those affected. Why not establish a Web site for members to provide voluntary feedback on where they presently live, zip code, duty location, average utility expenses, [and] whether or not they feel their current allowance is sufficient and why.

I'm single, one of three military in an office of 65 civilians, and my duty location is not within a reasonable proximity to a base to take advantage of the services provided. After being assigned to two of the most expensive areas in this country (Boston and Los Angeles), if given the opportunity, I feel as if I, and others, can help the Air Force (and DoD) reach the goal of 15 percent out-of-pocket expenses more quickly with better numbers.

1st Lt. Craig A. Parisot, USAF
Defense Contract Management Command
Canoga Park, Calif.

Corrections

In the August issue, the map on p. 58 of "Echoes From Allied Force" incorrectly shows Macedonia as part of present-day Yugoslavia.

In the July issue on p. 25 of "Washington Watch: Victory in Kosovo," the line that states "All bridges spanning the Danube River in Kosovo ..." should state, "... spanning the Danube River in Yugoslavia, excluding Belgrade ... ."

Great leaders *earn* their positions.

At Sabreliner, we believe a leadership position can't just be assumed...it must be earned.

Earned by providing decades of high quality service to the United States Government.

Earned by continuously improving our conveniently located facilities.

Earned by talented, seasoned professionals who value the importance of doing the job right.

Earned by accomplishing work correctly, on time, every time.

Earned from our constant dedication to controlling costs.

SABRELINER CORPORATION

Leadership earned through experience.

Phone (314) 863-6880 Fax (314) 863-6844

Aerospace World

By Peter Grier

USAF photo by TSgt. Lance S. Cheung

For about 60 seconds recently, it was brother against sister, as F-15 pilot 1st Lt. Katie Ekman, 67th Fighter Squadron, Kadena AB, Japan, flew in training against F-16 pilot Capt. Kenneth Ekman, 36th FS, Osan AB, South Korea. Their father, who also flew fighters, is retired USAF Col. Leonard "Lucky" Ekman.

The Big Switch: Ralston In ...

Air Force Gen. Joseph W. Ralston, vice chairman of the Joint Chiefs of Staff, was tapped to become Supreme Allied Commander Europe when that key NATO post comes open next spring.

If the past is a guide, he will at the same time become the commander of the multiservice US European Command.

Defense Secretary William S. Cohen's surprising move, disclosed July 27, would make Ralston the first Air Force officer in 38 years to head a major geographic warfighting command.

The only USAF officer to command NATO and USEUCOM was Gen. Lauris Norstad in 1956–62. *[See "Those Who Led Both NATO and USEUCOM," p. 27.]* Before him came two Army generals; after him came eight, the most recent being Gen. Wesley K. Clark, who commanded Operation Allied Force this year.

Elsewhere in the world, US Atlantic Command always has been led by Navy admirals, except for one Marine general; US Pacific Command by Navy admirals, with one exception—an eight-day stint by an Army lieutenant general; US Southern Command by Army generals and one Marine general; and US Central Command by either an Army or Marine general.

Ralston became vice chairman in 1996. He will complete his second term in February and had planned to retire. Ralston would have had to do so unless he moved to another post within 60 days. Cohen values Ralston's skills as a military and diplomatic troubleshooter and was eager to retain him.

Officials said that the NATO position—the most prestigious of regional commands—was the only one interesting to Ralston.

Ralston's most recent Air Force assignment was as commander of Air Combat Command, headquartered at Langley AFB, Va.

... And Clark Moves On

Gen. Wesley K. Clark, today's SACEUR, will have to relinquish his post prematurely—and amid much speculation about the reason. His nominal three-year tour at Supreme Headquarters Allied Powers Europe was supposed to end in July 2000. However, he was told to vacate the position in April instead.

Some said the step stemmed from the fact that Clark and Cohen did not see eye to eye on the Balkan War strategy, but Pentagon officials said that the timing of Clark's departure was dictated by a desire to move Ralston into the position. Pentagon spokesman Kenneth H. Bacon said: "He's obviously a proven warrior; he's a proven diplomat and a proven politician. He's got great skills in all those areas just as General Clark did."

Bacon said Cohen had recommended to President Clinton that Clark be considered for a high-level ambassadorship.

Clark confirmed on July 28 that he would step down three months early, but he turned aside suggestions that the move was due to actions during the Alliance's 11-week air campaign against Yugoslavia. When a Reuters reporter asked if his leaving was linked to his handling of the Kosovo conflict, Clark said, "Not that I know of."

However, no one disputes the unusual nature of the move. Clark would be the first European commander in decades to be told to retire before completion of a full three years. Six generals in his position have served longer than that.

For First Time, Woman Commands Shuttle

When the shuttle *Columbia* blasted into orbit July 23, it established at least two NASA firsts. It carried the heaviest payload a shuttle has yet lifted into orbit, the X-ray observatory Chandra. Perhaps more notably, it was also the first shuttle commanded by a woman—Air Force Col. Eileen M. Collins.

"I'm not too concerned that I'm the first woman shuttle commander," Collins said before liftoff. "What's important ... is that we fly a perfect mission. Whether you're commanding as a man or woman really doesn't matter when it comes to getting the mission done."

Continued on p. 25

Rolls-Royce

THE POWER OF CHOICE

Meeting just power and endurance goals are no longer enough. Value, reliability, cost performance and operational flexibility are now also key elements as aircraft re-engining becomes the best way to balance economic realities with the real life need to deliver troops, equipment, and supplies globally.

This is why Rolls-Royce, with the broadest turbine aero engine line available, provides two alternatives that both easily meet the requirements of the C-5 Galaxy Reliability Enhancement and Re-engining Program (RERP). At 37,000 hours on-wing and counting, the record setting RB211-535E4 is the best ***cost-performance*** option, while the state-of-the-art technology RB211-Trent 500 offers the best ***value*** approach. Not all missions, or their propulsion requirements, are created equal. Regardless of which Rolls-Royce engine is chosen to power the C-5 into the future, it will be the power of choice.

ADVANCED POWER SYSTEMS FOR TOMORROW'S WORLD

Rolls-Royce North America, 11911 Freedom Drive, Reston Virginia 20190. Rolls-Royce Allison, P.O. Box 420 Indianapolis, Indiana 46206. http://www.rolls-royce.com

GTP 7331 (99AFM)

Battle of the F-22

For a time, the Air Force and Lockheed Martin thought 1999 might be a quiet year for the F-22. Hearings in Congress had been tame. The Balkan War had demonstrated anew the value of advanced airpower. Lawmakers were talking about USAF budget *increases*, not cuts. As the key to future air dominance, the Raptor was in a strong position, officials concluded.

How wrong they were. In midsummer, the fighter program suddenly was thrown into turmoil as the House, following the lead of a small band of defense appropriators, struck a major blow. It voted July 23 to deny $1.8 billion needed to buy the first six F-22s and, at the same time, put the fighter on research-only life support. The F-22 soon found itself in a fight for survival.

The attack on the F-22 came as a thunderous surprise to Pentagon and USAF officials. Leaders of the Congressional defense establishment were similarly stunned. Seldom if ever had such a limited number of lawmakers moved so swiftly, successfully, and secretively against a major program so close to production.

"Maybe we should have seen it coming, but nobody did," maintained Tom Burbage, president of Lockheed Martin Aeronautical Systems, the F-22's prime contractor. "We thought this would be the first year that we wouldn't have a battle." Instead, Burbage noted, it turned out to be "the biggest we've ever had."

The battle for the F-22 quickly shifted to a House–Senate conference of negotiators charged with ironing out differences in their defense appropriation bills. The two sides started out far apart. Unlike the House, the Senate had fully funded the F-22—a fighter designed to be stealthy, maneuverable, supersonic without use of afterburner, and potent in air combat or ground attack.

Showdown and Solution?

As the showdown moved toward the fall, many predicted a House–Senate compromise that would preserve several F-22s, at the least. The Senate team included many staunch F-22 backers who were unlikely to give ground. The House team itself wavered. Even Rep. Jerry Lewis (R–Calif.), who had led the anti-F-22 charge, said he only wanted to slow the program, not kill it.

Until July 12, few had any inkling the fighter was in for trouble. Lewis, the chairman of the House Appropriations Defense Subcommittee, and Rep. John Murtha (D–Pa.), its ranking Democrat, then delivered the shocking news: The panel had zeroed out F-22 production funds, diverting that money to boost pay for pilots, study F-22 alternatives, and fund other aircraft.

Within a few days, the full appropriations committee and the full House had adopted the subcommittee position.

Why did the House appropriators strike at the F-22, USAF's top priority? The official reason given: fears that escalating F-22 costs were eating away at the service's general health.

A House report accompanying the panel's F-22 decision indicated that F-22 cost increases were becoming intolerable. The Air Force had at one time claimed it could acquire 750 F-22s for $67.5 billion, said the appropriators; now, approximately the same amount of money would pay for only 339 fighters.

Lewis charged that the F-22's unit cost (total program cost divided by the number of aircraft) had skyrocketed from about $90 million in the early 1990s to some $187 million today.

Moreover, House critics plainly doubted they had seen the end of cost growth. The panel report cited alleged problems with the Raptor's wings, brakes, fuselage, fuel lines, and engines, which might be costly to fix. The onboard computer was untested, appropriations members complained.

The panel noted with concern the F-22 was one of three huge fighter programs (others are the Navy's F/A-18E/F Super Hornet and the multiservice Joint Strike Fighter) currently under way. The implication was that the effort was excessive.

The Air Force was spending so much money on the F-22, Lewis charged, that other critical needs were being starved to death. The biggest problem, he said, was slack recruiting and retention. For the first time since 1979, USAF would miss a recruiting goal, and the service was already short 1,100 pilots. Lewis thought USAF needed to spend more in those areas.

The House appropriators also noted "critical shortfalls" in Air Force reconnaissance, airlift, air refueling capability, and advanced munitions.

"The Air Force has such tremendous needs in so many other areas ... that we believe it is imperative for them to reassess their priorities," Lewis said July 16.

At the same time, critics claimed, the F-22's military rationale had vanished. They contended that the Raptor had been designed to counter Soviet fighters which now would never be built in large numbers, and no nation would soon challenge USAF's dominance of the air. Typical of these claims was this statement in a July 22 *New York Times* editorial: "It makes no sense for the Pentagon to proceed with three separate advanced fighter programs when no other country has a chance of threatening America's air superiority in the foreseeable future."

Low-Cost Alternatives

Under those circumstances, House critics said, USAF had an obligation to take a serious look at low-cost alternatives to the F-22. Such alternatives did exist, claimed these critics.

Lewis, for one, contended that the F-15 could fill the air-superiority bill for decades more, well beyond current plans, and that the Air Force should study possible upgrades to keep that fighter going. Another suggestion: Let DoD accelerate production of the Joint Strike Fighter and use it to supplant the F-22 as the air-dominance fighter.

In the end, Lewis and his backers said they sought an indefinite pause in F-22 production. He explained that the Air Force could use the time-out to review its priorities and reconsider all options in a new context.

Needless to say, Air Force and Pentagon officials strongly disagreed with virtually every premise and conclusion put forward by the House critics and their supporters in the press. They said so frequently in the press, at public forums, and in private meetings on Capitol Hill.

What rankled many was what were viewed as distorted cost claims. For example, the proposed number of F-22s had indeed gone down, but the reductions came mostly from political decisions and not from massively rising costs. When the program began in the mid-1980s, USAF projected a need for 750 fighters. The Pentagon Bottom–Up Review, conducted in 1993 after the fall of the Soviet Union, trimmed the number to 442. The Quadrennial Defense Review in 1997 took the projected number down further, to 339. Not surprisingly, these steps drove up the cost per airplane because the cost of development—a constant—was spread over fewer fighters.

Air Force officials take issue with the committee's portrayal of the fighter's unit cost—$187 million. They pointed out that USAF already has expended more than $20 billion, a third of total program funds, developing the fighter. By factoring out that sunk cost, one arrived at a far lower "to go" sticker price—$85 million per airplane.

That was not much more than the cost of a new but far less capable F-15E. A recent Air Force fact sheet said: "An improved F-15 would only provide one-third the effectiveness of the F-22 at nine-tenths the cost."

Nor would the F-22 squeeze out spending on other critical needs, said the Air Force. As evidence, officials cited the fact that the Air Force, at peak production, will spend 6 percent of its budget on the F-22. This is about the same percentage share that was devoted to developing and buying the F-15.

Especially puzzling to Air Force officials was the House's relaxed attitude about future fighter threats to the nation's air superiority. USAF agrees that the aging F-15 can still do a good job today, as was seen in the recent Balkan air war. However, it insists that this Vietnam War–era fighter faces a real and increasing risk around the world.

Six to Worry About

In a July 24 *New York Times* article, Secretary of the Air Force F. Whitten Peters summarized the situation in this way: "At least six other aircraft—the Russian MiG-29, Su-27, and Su-35, the French Mirage 2000 and Rafale, and the European Consortium's Eurofighter—threaten to surpass the aging F-15, our current top-of-the-line air-to-air fighter." All are either in or near production today and are available for export.

There are mounting concerns, too, about today's advanced Surface-to-Air Missile systems such as Russia's SA-10, SA-12, and SA-20. "These lethal SAMs will overwhelm our current fighter force's ability to gain air superiority," said one recent Air Force paper.

Given this situation, the House recommendation to make do indefinitely with an updated F-15 or perhaps the new Joint Strike Fighter did not appeal to USAF officials or supporters on Capitol Hill, who viewed them as false alternatives. They pointed out that the F-15 fighter was already 25 years old and based on 1960s technology. The F-15 is not stealthy and cannot be made so. Its ability to absorb upgrades is diminishing.

As for the JSF: Defense officials explained that it is supposed to *complement* the F-22, not *replace* it. The two fighters do different things and would work in unison, as do today's F-15 and F-16 jets. The F-22 would provide high-end air superiority, while the JSF would act as the less expensive—and less capable—fleet workhorse at the lower end of the threat spectrum.

JSF's principal selling point—its relatively low cost—would quickly vanish if the F-22 program were to collapse, warned officials. The change could be so great, said Gen. Michael E. Ryan, Chief of Staff, that the Air Force might have to revamp its force structure.

"Our assumption is we are going to get the F-22 and the Joint Strike Fighter," Ryan said Aug. 3. "If that doesn't occur, then we are going to go back and rethink the whole program."

In explanation, officials noted that JSF was optimized for ground attack, not air combat. To turn JSF into an air-dominance fighter, its contractors would have to redesign it, which would add greatly to its cost, if it could be done at all.

Moreover, plans called for the later-developing JSF to piggyback on the Raptor for its advanced engines, avionics, and stealth technologies, meaning it could avoid the cost of developing them independently. Defense Secretary William S. Cohen told the Senate July 20, "The [F-22] stealth capabilities, the supercruise capability—all of that technology along with the avionics is going to be instrumental in terms of helping to keep the costs down on the Joint Strike Fighter."

Cover Story?

Some observers saw the House's declared reason for the "pause" as weak—so weak it might actually be a cover story. They suspect that the authors of the pause might have had a different goal—to force the Clinton Administration to propose breaking the defense spending caps imposed in recent years. The theory is that, to get the F-22, the White House (and Senate) would have to accept higher defense spending than otherwise permitted.

Whatever the motive, few dispute that the stakes are high. Maj. Gen. Bruce Carlson, the Air Force's director of operational requirements, said losing the F-22 would mean "we can no longer guarantee that we'll be able to dominate the sky," with all that that implies for US casualties and battle effectiveness.

In the drive to overturn the House action, F-22 supporters faced a tough task. The House subcommittee members broadened the political appeal of their action by shifting millions of F-22 dollars to the production of extra F-15s in Missouri (home state of the House Minority Leader Dick Gephardt), F-16s in Fort Worth, Texas (home state of several powerful Republican leaders), and C-130J transports in Marietta, Ga. (home state of the F-22's main Congressional backers).

However, the F-22's supporters also held some high cards.

For one thing, Ryan noted that the F-22 has overwhelming support of the nation's uniformed military leadership and "almost every living [former] Secretary of Defense." Those individuals who are "knowledgeable" about the threats emerging in the next 15 years "are convinced that this airplane is what the joint system needs," Ryan said.

On July 28, military leaders rallied to the F-22's cause, signing letters of support to Senate Majority Leader Trent Lott (R–Miss.) and House Speaker Dennis Hastert (R–Ill.).

In one letter, all six members of the Joint Chiefs of Staff asked for reinstatement of F-22 funds. Signing it (in addition to Ryan) were the JCS Chairman, Army Gen. Henry H. Shelton; the vice chairman, Air Force Gen. Joseph W. Ralston; the Army chief of staff, Gen. Eric K. Shinseki; the chief of naval operations, Adm. Jay L. Johnson; and the commandant of the Marine Corps, Gen. J.L. Jones.

"The F-22 is the aircraft we are counting on to guarantee control of the skies in the next century," they said. "[W]e speak with one voice on this issue: America needs the F-22."

Lott and Hastert received a second letter of F-22 support signed by all nine unified commanders, the four-star generals and admirals who lead US forces in geographic regions or in US–based support organizations.

"In every theater of operation and for every military task across the spectrum of conflict, there is an underlying need to control the skies," said the officers, who added that today's air superiority fighter, the F-15, is getting old and must be replaced by the F-22.

The Air Force made the point that blocking F-22 production could come back to haunt lawmakers in predictable ways.

Officials said the move would delay F-22 deployment by at least two years, jack up costs by $6.5 billion, and increase the risk that US pilots will face in the years ahead. That's the best case; USAF thinks it far more likely that the House cut would bring about the death of the F-22 program altogether.

On July 21, President Clinton threw his support behind the F-22, saying it would be a mistake for Congress to abandon plans to produce the next-generation stealth fighter and that he would fight for its production.

Meanwhile, Cohen publicly declared, "I cannot accept a defense bill that kills this cornerstone program." Cohen's words had been cleared by the White House and was viewed as an authorized White House threat to veto any defense bill that did not provide funds for F-22 fighters.

—By Robert S. Dudney

Verbatim: The F-22

"The committee believes that ... continued F-22 production is not justified at this time. The committee thus recommends an F-22 'production pause.' ... The committee specifically denies the $1.8 billion F-22 production funding requested for Fiscal Year 2000."***—House Appropriations Defense Subcommittee, final report on Fiscal 2000 Defense Appropriations, released July 12.***

"The committee remembers vividly how just two years ago the then–Chief of Staff of the Air Force explained ... how his service had consciously decided to give up force structure and manning levels in order to free up additional resources for modernization. Now, that gamble and others taken by this service have come home to roost, leading to what the committee believes is an Air Force personnel and readiness crisis, even while the Air Force still confronts a modernization crisis of considerable size and scope."***—House Appropriations Defense Subcommittee report, released July 12.***

"The F-22 ... made sense when we faced enemies who had the expertise to develop advanced aircraft and the ability to produce large numbers of them. But the events of the past eight years—most especially the engagements we have fought in the Persian Gulf and Kosovo—have made it clear that we must also address other needs that have become more pressing. The most urgent crisis facing the Air Force is finding a way to recruit and train the pilots and support crews who will fly and maintain the technologically advanced aircraft we already have in the air."***—Rep. Jerry Lewis (R–Calif.), subcommittee chairman, July 12.***

"Yesterday's subcommittee vote is totally unacceptable. ... To dominate the wars of the future, we will have to dominate the air. We cannot do that without the F-22."***—Sen. Max Cleland (D–Ga.), Senate Armed Services Committee (SASC), statement, July 13.***

"I have not said it's the end of the program, but there's no doubt that it will be the first step of a serious discussion about whether the F-22 is the answer to our air superiority problems or whether we shouldn't be looking in the final analysis to other alternatives."***—Lewis, Legis-Slate News Service (LNS), July 15.***

"This decision, if enacted, would for all practical purposes kill the F-22 program, the cornerstone of our nation's global airpower in the 21st century."***—Defense Secretary William S. Cohen, letter to Congressional committees, July 16.***

"That program was eating a huge hole in the ability of the Air Force to do anything else to deal with the real world. [USAF] will be afraid to fly it and afraid to lose it."***—Rep. David R. Obey (D–Wis.), LNS, July 15.***

"The Air Force has such tremendous needs in so many other areas—air tankers, airlift transports, aerial reconnaissance—that we believe it is imperative for them to reassess their priorities."***—Lewis, press release, July 16.***

"We need to concentrate on those things that work."***—Speaker of the House Dennis Hastert (R–Ill.), supporting continued funding of today's F-15s and F-16s rather than investing in the F-22,*** **New York Times (NYT),** ***July 17.***

"The Air Force's money and everything in the Air Force's mind is focused on the F-22. ... We need to fix it [the Air Force]. ... Now, can we fix it if we put all our money into one basket? No, we can't."***—Rep. C.W. "Bill" Young (R–Fla.), chairman of full House Appropriations Committee,*** **NYT,** ***July 17.***

"It's really a remarkable occurrence, one of the rarest imaginable. I'm absolutely amazed."***—Former Sen. Dale Bumpers (D–Ark.), a longtime F-22 critic,*** **NYT,** ***July 17.***

"We can no longer guarantee that we'll be able to dominate the sky [without the F-22]."***—Maj. Gen. Bruce Carlson, director of Air Force operational requirements,*** **NYT,** ***July 17.***

"I can assure that, if the F-22 is canceled, that technology, which is being developed [and] which would ... be incorporated in the Joint Strike Fighter, will send the costs of the Joint Strike Fighter much higher. ... And so the concept of having a high–low mix, so to speak, of having a very high-performance F-22 and a lower-performing but capable Joint Strike Fighter with a lower cost—that will be eliminated."***—Cohen, SASC testimony, July 20.***

"Neither I, nor anyone in this building, or anyone in the service ... was aware of the effort under way on the part of the committee. The purpose was quite obvious, I think, and that is to avoid any public discussion, public debate, and any ability of the Air Force or contractor to respond to questions raised about the system."***—Cohen, DoD news briefing, July 20.***

"There are many systems being produced today that can challenge the capabilities of the F-15. ... So if we want to give our pilots ... air dominance in the years 2005 to 2015, it seems to me that we ought to continue with the F-22."***—Cohen, news briefing, July 20.***

"As a career naval aviator who appreciates and knows firsthand the value of air superiority, this decision did not come easy for me. Nonetheless, I fully support the committee's decision, knowing that there are other priorities that are being squeezed out and because of the F-22's troubled past."***—Rep. Randy "Duke" Cunningham (R–Calif.), letter to House colleagues, July 21.***

"I consider this plane absolutely essential for America's inventory of fighter aircraft."***—Sen. John Warner (R–Va.), SASC chairman, remarks at a hearing, July 21.***

"There has been much discussion in the House about whether the Joint Strike Fighter could perform the same role [as that of the F-22], and the answer is, it really cannot."***—Then–acting Secretary of the Air Force F. Whitten Peters, SASC hearing, July 21.***

"If we were to take F-22 out of the inventory, we would be looking at a massive change of direction ... on Joint Strike Fighter."***—Peters, SASC hearing, July 21.***

"The Air Force has a deliberate planning process where we go out for ... a period of over 18 years, and we look at aircraft out of that period of time ...

Proven Payloads

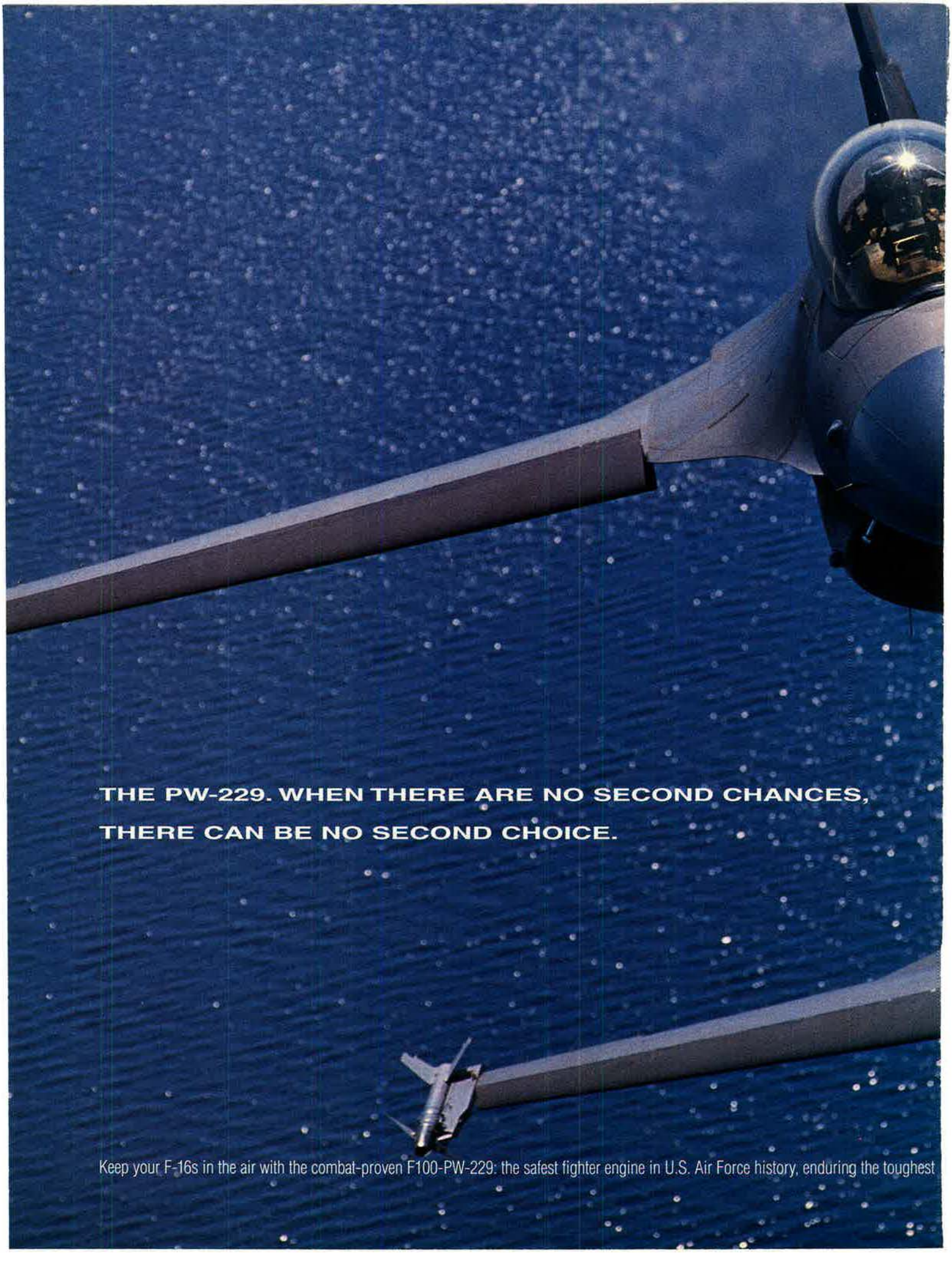
TRW's communications payloads exceeded customer expectations when we pioneered them four decades ago. They still do today. Our systems and components deliver reliable service to civil, military and commercial users around the globe.

Our payloads have grown from simple systems containing few parts and interfaces to complex multi-functional units that process data autonomously. TRW's advanced processing payloads and highly capable microelectronics have kept pace with ever expanding requirements, met demands for lower costs and performed with consistent reliability.

TRW: Communications you can count on

TRW

www.trw.com • ISO 9001 Registered


THE PW-229. WHEN THERE ARE NO SECOND CHANCES,
THERE CAN BE NO SECOND CHOICE.
Keep your F-16s in the air with the combat-proven F100-PW-229: the safest fighter engine in U.S. Air Force history, enduring the toughest


environments. Whenever you're ready, so is your engine. Pratt & Whitney. THE POWER OF READINESS.
Pratt & Whitney
A United Technologies Company

to see if they will fit within reasonable budget assumptions. And F-22 does, in fact, fit within those assumptions. By comparison, at its highest point F-22 will take no more of the Air Force budget than F-15 did in its day when it was being built up."***—Peters, SASC hearing, July 21.***

"If we go forward, the additional cost per airplane, on average, is about $85 million in '99 dollars. ... That price is less than the cost of the modern Eurofighter, Gripen, and similar airplanes that are coming out today which have less capability, which are in the $95 million to $100 million price range."***—Peters, SASC, July 21.***

"It is ironic that we're talking F-22 because the B-2 was the subject of these same discussions about killing the program, as was the C-17, as was the F-15, and as was the F-16—four platforms that proved to be so valuable in Kosovo."***—Peters, SASC hearing, July 21.***

"To me, the F-22 is the key to the strategy of airpower for the future. Without the F-22, we'd have to change the level of our forces. We would have to bring back the 'Wild Weasels' [aircraft equipped to jam enemy air defenses] and all the other systems that we let go out of production because we knew we were going to have the F-22."***—Sen. Ted Stevens (R–Alaska), chairman of Senate Appropriations Committee, LNS, July 21.***

"I must tell you that I cannot accept a defense bill that kills this cornerstone program."***—Cohen,* Defense Daily, *July 21.***

"We are not buying this airplane to fight a war in the year 2000. We are buying it to fight and win America's wars in 2010 and 2030 or beyond."***—Carlson,* Defense Daily, *July 21.***

"We can fund the F-22 without compromising the basic priorities of our national defense within the funds set aside and that is what I will fight to do. I think it would be a mistake to abandon the project. I think it has real potential to add to our national defense. I have always supported it, and I hope that it can be preserved."***—President Clinton, White House media briefing, July 21.***

"I think beyond any doubt, it will survive. It is a program that is essential for America's future defense. It's as simple as that."***—Warner, interview with Bloomberg News, July 21.***

"In today's environment, if you match airplane to airplane, we're at near parity with the MiG-29, the Su-27—the airplanes that are deployed around the world in large numbers."***—Carlson,* Fort Worth Star–Telegram, *July 22.***

"It makes no sense for the Pentagon to proceed with three separate advanced fighter programs when no other country has a chance of threatening America's air superiority in the foreseeable future."**—NYT, *editorial, July 22.***

"It's ironic ... that, coming out of what's been called the most successful air engagement in history, that Congress would even contemplate denying us the hardware that would allow us to maintain this dominance well into the next century."***—Pentagon spokesman Ken Bacon, press briefing, July 22.***

TECHNOLOGY ONLY MAKES A DIFFERENCE WHEN YOU BEGIN TO APPLY IT.

And nobody applies technology and outsourcing services with the creativity, commitment and innovation of DynCorp. With 16,000 employees working at more than 500 company and customer locations worldwide, DynCorp delivers unparalleled expertise in IT, outsourcing and technical services to a blue-chip list of public and private sector clients.

To see what a difference outstanding customer service coupled with the creative application of technology can make for you, call on the company that's raised it to an art form. **DynCorp.**

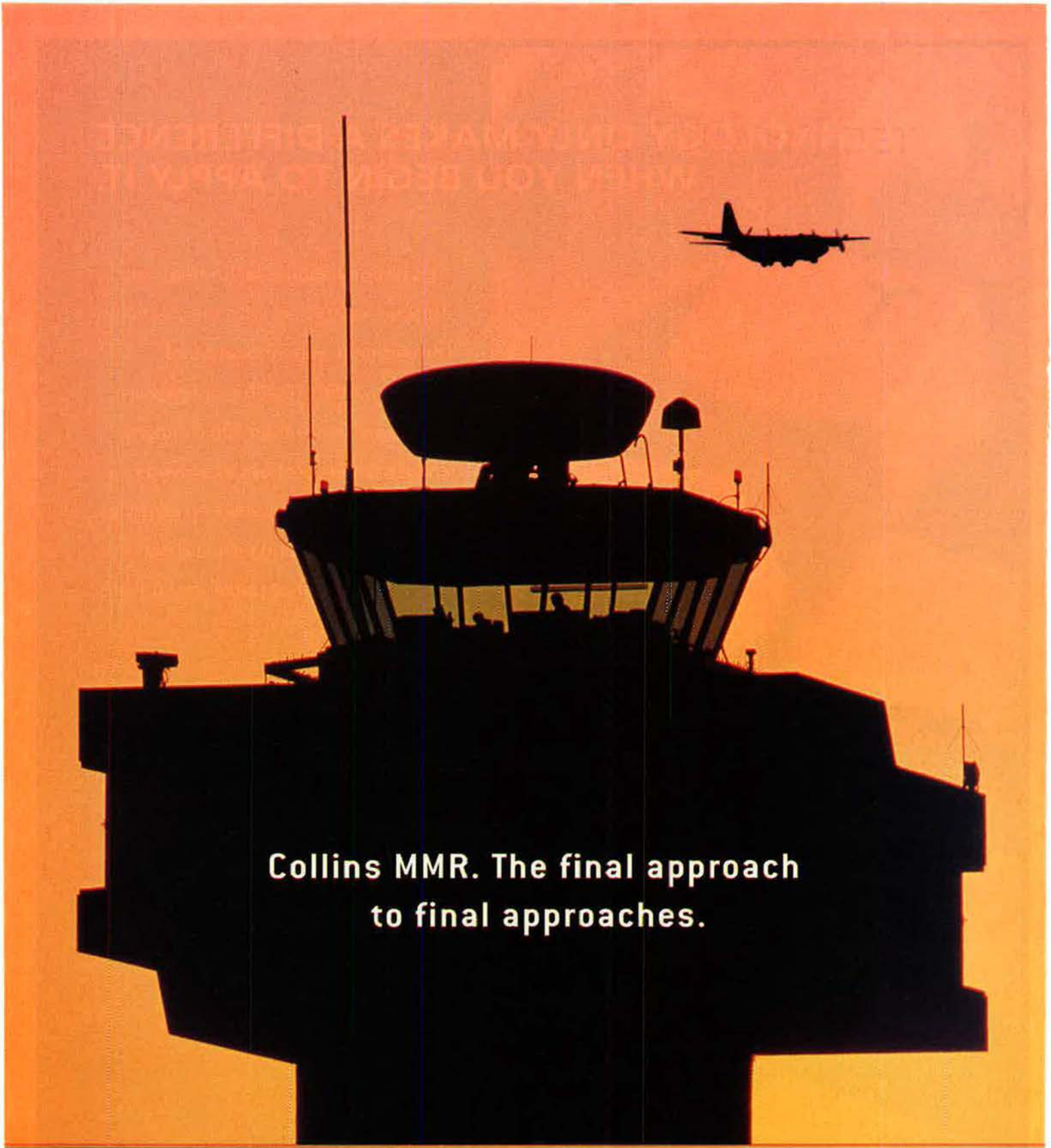
DynCorp

Information & Enterprise Technology
12750 Fair Lakes Circle
Fairfax, VA 22033
(703) 222-1500

Technical Services
One Ridgmar Centre
6500 West Freeway, Suite 600
P.O. Box 921004
Fort Worth, TX 76116
(817) 732-4481

www.dyncorp.com

THE ART OF TECHNOLOGY



ILS. MLS. GPS/GLS. The future is rapidly approaching. Bring it on. Collins Multi-Mode Receivers (MMRs) are ready. Our military MMRs come from a long line of proven, commercial TSO'd MMRs. They're designed to easily retrofit tankers, transports, fighters and other military aircraft. They're equipped to handle upgrades for future GANS/GATM/JPALS requirements. And they have the FM immunity required for operating at European airports today. Discover the final word in MMRs.

Call 319.295.5100

or fax 319.295.4777.

www.collins.rockwell.com/government-systems

Rockwell Collins

"Clearly, this is a very important weapon, and it's not just important to the Air Force. It's important to all forces that depend on air dominance as one of the keys to success."—***Bacon, press briefing, July 22.***

"I don't think we build planes to be cheap. We build planes to be effective."—***Bacon, press briefing, July 22.***

"Look at the C-17, now regarded by everybody as a huge success. The last story I wrote when I covered the Pentagon in 1980 for the *Wall Street Journal* was about whether the C-17 would be approved, whether it would ever be built because there was so much criticism both of its lack of ability and its high cost. Now we consider it indispensable to our operations. The B-2, obviously the focus of enormous debate for a number of reasons—cost, capability, need over the last couple of decades—has proved to be a decisive weapon in Operation Allied Force."—***Bacon* (Wall Street Journal *Pentagon reporter in the late 1970s and early 1980s), press briefing, July 22.***

"While many in the Air Force may question the decision, some of the most pro-defense members of the House are sending an important message. The Air Force has such tremendous needs in so many other areas—air tankers, airlift transports, aerial reconnaissance—that we believe it is imperative for the Air Force to reassess its priorities."—***Lewis, House floor statement, July 22.***

"The F-22, no doubt about it, is a beauty of an airplane. It is like a Jaguar or a Cadillac. It would be a great plane to have if we had all of the money in the world, but the problem is that its costs are taking off faster than the airplane is expected to if it is ever constructed."—***Obey, floor statement, July 22.***

"Make no mistake about it: ... If we cancel the F-22, we are making a decision to stake the lives of American soldiers on inferior equipment because some in Congress think they know more about air warfare than the United States Air Force."—***Rep. Bob Barr (R–Ga.), floor statement, July 22.***

"I flew the F-15 when I was active in the Air Force. That has been over 25 years ago. Can my colleagues believe that we are trying to retrofit an F-15 that will be in service for over 33 years by the time the F-22 achieves initial operational capability? If a 33-year-old aircraft had been used in Korea, we would have been fighting MiGs with Sopwith Camel biplanes. If a 33-year-old aircraft had been used in the Gulf War, we would have been fighting third-generation Soviet fighters with Vietnam–era F-4s."—***Rep. Sam Johnson (R–Texas), retired USAF colonel and Vietnam War POW, floor statement, July 22.***

"It is not enough to say that something better may be available in the future. Something better is always available in the future. Serious threats to American air superiority may arise sooner, and the nation's security cannot tolerate a loss of command of the air. Congress and the Administration must focus on this fundamental reality and fully fund the nation's only truly stealthy air superiority fighter."—***Letter from seven former defense secretaries—James Schlesinger, Donald Rumsfeld, Harold Brown, Caspar Weinberger, Frank Carlucci, Richard Cheney, and William Perry, quoted in floor debate, July 22.***

"Just as the Air Force is poised to field an aircraft capable of assuring air dominance through the first three decades of the next century, the Congress seems poised to snatch defeat from the jaws of victory by killing the F-22. This rash act will commit future generations of airmen to fight the air war with weapons no better than those of our foes."—***Gen. Richard E. Hawley, recently retired head of Air Combat Command,* Washington Times, *July 26.***

"If they take the production money out of the F-22, we have to go back and rethink the Joint Strike Fighter. ... If you bust that [relationship], you start questioning whether the Air Force needs the JSF at all."—***USAF Chief of Staff Gen. Michael E. Ryan,* Wall Street Journal, *July 27.***

"I cast aside almost out of hand the suggestion that this pause automatically kills this program. The fact that in a day's time they [Air Force officials] could come up with an added-on cost of $5 [billion] or $6 billion [resulting from a one-year pause in production] says that they will use almost any data, accurate or not, to support their position."—***Lewis,* Defense Daily, *July 28.***

"This airplane is not going to break the bank. In its most expensive year, the first year of high-rate production, it will consume less than 6 percent of the Air Force budget and only 1.7 percent of the DoD budget. That's very much in line with the amounts that were spent on the F-15 back in the late 70s, early 80s on the F-16. ... So these are well within the norm for fighter airplane procurement. And I think this debate has focused so much on costs that people have lost sight of the need for these high-end capabilities."—***Hawley, PBS "NewsHour," July 27.*** ■

Continued from p. 14

Female astronauts have come a long way since the Mercury program, when 13 women were picked for astronaut training but never flew into space. Twenty-five percent of NASA astronauts today are women—36 out of 144.

Only Collins is a shuttle commander, however. Two other women are pilots, the next highest astronaut rank.

NASA has now flown 11 consecutive shuttle flights with at least one female crew member, dating back to February 1997.

Columbia ended its mission on July 27. Collins took control of *Columbia* at about 30,000 feet, executed a 236-degree overhead turn, and landed the spacecraft like an airplane.

USAF Was the Training Ground

Shuttle Commander Collins got her start in 1978 as one of the first women to undergo undergraduate pilot training at Vance AFB, Okla. As a new lieutenant, she was inspired to shoot for a space career after seeing the first female astronaut candidates go through parachute training at Vance.

Collins spent her early Air Force years as an instructor pilot for T-38 trainers and C-141 transports. In Operation Urgent Fury in October 1983, she flew a C-141 with 200 troops of the 82nd Airborne Division into Grenada. She flew out carrying 36 US medical students who had been held captive on the island.

Collins went on to teach mathematics at the Air Force Academy and earn two master's degrees, one in operations research and one in space systems management. She was selected as an astronaut in January

1990 while attending USAF test pilot school at Edwards AFB, Calif.

She has logged more than 5,000 flying hours in 30 different aircraft, including two previous shuttle flights.

In the Air Force, "you need to learn how to work with people and use people to get the mission done effectively," Collins said at a preflight press conference. "I think all of that experience has really helped me with this job here."

Peters Gains Top Air Force Post

The Senate on July 30 confirmed F. Whitten Peters to be the new Secretary of the Air Force.

The confirmation moved up Peters from the post of service undersecretary, the No. 2 civilian job. He had been in that position since November 1997.

During those same 20 months, Peters also functioned as the acting Secretary of the Air Force. The office officially had been vacant since Nov. 1, 1997, when Sheila E. Widnall stepped down to return to academic life.

Peters, a former officer in the US Navy Reserve, is the 19th confirmed Secretary of the Air Force. There have been six acting Secretaries.

USAF Recruiting Falls Short

With the end of the fiscal year in sight, Air Force officials predict that it is likely they will miss their recruiting targets for the first time since 1979.

The goal for Fiscal 1999 (which ends Sept. 30) was to sign up 33,800 new Air Force men and women. As of midsummer, the Air Force Recruiting Service predicted the service would fall short of this number by about 2,500 people.

A major reason for the recruiting problem is that the booming economy has all the military services in a vise. Civilian jobs are luring veterans out of uniform, while keeping potential recruits from joining in the first place.

"There are a lot of other opportunities in today's job market. Competition is tough," Air Force Secretary F. Whitten Peters told recruiters recently. "Hopefully, working the retention side of the problem will help reduce the number of people recruiters need to bring in."

Already Air Force officials are looking to increase their emphasis on getting back prior-service members as a means to help plug recruit holes.

The Enlisted Prior-Service Program has been around for some time but has not been used extensively since the early 1980s, when it was drawing 1,000 to 3,000 former Air Force personnel back into the ranks annually. This year, officials doubled their target for prior-service recruits from 300 to 600. As of midsummer, 424 ex–Air Force men and women had returned to military life.

That number "doesn't seem very high unless one of those airmen is going out to a unit that's working 14 or 15 hours a day because they're one or two people short. Then, it's a lot," said CMSgt. Danny Roby, chief of enlisted accession policy for the Air Force.

Top Recruiting Target: Recruiters

In today's tough environment simply keeping recruiting offices open is tough enough.

Filling, and keeping filled, 1,209 non-prior-service recruiter positions across America is the No. 1 near-term priority for Air Force Recruiting

Service, says AFRS commander Brig. Gen. Peter U. Sutton.

Every year, Recruit the Recruiter teams travel to every Air Force installation, looking for top-notch senior airmen through master sergeants. The teams interview applicants and spread the word about the benefits of recruiter service, which include more money and greater control over living location.

"It's generally location, location, location," said CMSgt. James Williams, Recruit the Recruiter team leader, referring to the office location choices new recruiters value.

Pay is an additional $375 per month in special-duty assignment pay and an extra $192 in annual clothing allowance.

"Recruiters are in a unique position," said Williams. "Very often, they are the only Air Force representation in some towns and are generally their own bosses. They manage their own offices, and the level of their success depends greatly on the effort and commitment they put forth."

USAF Raises Flying Training Age Ceiling

For the first time in 45 years, the Air Force is raising the age limit for flying training. The change raises the upper bounds for entering pilot and navigator programs from 27 and a half years of age to 30 years of age and less than five commissioned years of service.

The change is being made to broaden the pool of qualified applicants and not because there is a shortage of those eager for coveted flying spots, said Air Force Chief of Staff Gen. Michael E. Ryan. "The age limit is being raised to provide maximum opportunity for otherwise qualified candidates," said the Chief. "It will increase the pool of highly motivated applicants who, for various reasons, started their Air Force careers slightly later in life, and allow the Air Force to pick the best of that group."

The new age limit of 30 was derived by balancing the need to provide greater opportunity with Air Force medical, safety, management, and warfighting standards, said Ryan.

Bomber or Cruise Missile?

In the aftermath of the Kosovo campaign, the Air Force is facing anew a question about which kind of next-generation long-range strike system to acquire: Bomber or cruise missile?

The first successful use of the B-2 in combat has caused some members of Congress to call for reopening the B-2 production line. B-2 booster Rep. Norm Dicks (D–Wash.) is pushing for another independent study of the bomber force, for instance. Dicks has long said he thinks the US should have 40 to 60 of the stealthy aircraft, not 21.

The Air Force would gladly accept new B-2s if provided, but officials have maintained that procurement priorities lie elsewhere. On the long-range strike question, the service has begun work on a next-generation cruise missile that might pre-empt calls for more B-2s or a B-3.

"Increasingly, the long-range precision missiles are the competitor for the bomber," Pentagon acquisition chief Jacques S. Gansler told defense reporters July 7.

Air Force officials are currently refining their requirements for the new standoff weapon. Several contractors have submitted preliminary proposals. It would enter the procurement cycle only after the joint air-to-surface standoff missile, a shorter-range cruise missile, enters production in 2000.

Combat operations over Kosovo nearly depleted Air Force stocks of Air Launched Cruise Missiles. Some 322 replacement ALCMs could be obtained by replacing the warheads on surplus nuclear-tipped ALCMs with conventional weaponry. Such missiles can be fired from 500 to 700 miles out. The Air Force would like its standoff cushion to be greater still.

Both bomber and cruise missile advocates make economic arguments for their favored systems. Dicks and others say that the precision guided weapons dropped by the B-2 are far cheaper than long-range cruise missiles. Thus the marginal cost of operations, once the initial investment in a bomber force has been made, is relatively low.

Cruise missiles can be fired from much less sophisticated and less costly aircraft, pointed out Gansler. Using the B-52 for decades more is considerably less expensive, up front than paying for a new generation of launch platforms.

Those Who Led Both NATO and USEUCOM

Gen. Matthew B. Ridgway,
Army, Aug. 1, 1952

Gen. Alfred M. Gruenther,
Army, July 11, 1953

Gen. Lauris Norstad,
Air Force, Nov. 20, 1956

Gen. Lyman L. Lemnitzer,
Army, Nov. 1, 1962

Gen. Andrew J. Goodpaster,
Army, May 5, 1969

Gen. Alexander M. Haig Jr.,
Army, Nov. 1, 1974

Gen. Bernard W. Rogers,
Army, June 27, 1979

Gen. John R. Galvin,
Army, June 25, 1987

Gen. John M. Shalikashvili,
Army, June 23, 1992

Gen. George A. Joulwan,
Army, Oct. 21, 1993

Gen. Wesley K. Clark,
Army, July 10, 1997

Gen. Joseph W. Ralston,
Air Force, is slated to join this list next spring.

The first SACEUR was General of the Army Dwight D. Eisenhower, who served until Aug. 1, 1952. The post of CINCEUR did not exist until that date.

Source: US European Command

C-141 Makes Daring Antarctic Drop

On July 16, a C-141 flight crew from McChord AFB, Wash., returned home to a hero's welcome after conducting a daring drop of emergency medical supplies to scientists at the Amundsen–Scott South Pole Station.

The station houses 41 National Science Foundation researchers. The supplies were for one of these scientists, herself a medical doctor responsible for station health, who had detected a lump in her breast.

The National Oceanic and Atmospheric Administration, the arm of the US government which runs the station, withheld the woman's name and further details of her condition out of respect for her privacy.

The Air Force airdrop was conducted in daunting weather conditions. From March through October, during the polar winter, airplanes are unable to land at the NOAA station's small airstrip. Residents of its geodesic dome are marooned.

Temperatures during the mid-July mission were so low that water bottles

Ryan on Fighters, Balkan War, EAF, Retention

Gen. Michael E. Ryan, the Air Force Chief of Staff, warned that any postponement of F-22 production would "probably kill the program." It would also force the service into a number of other expensive work-arounds USAF hadn't counted on, Ryan added.

Contrary to press reports, the Air Force is not "standing down" in the wake of the Balkan War, only reconstituting itself in a normal fashion, Ryan reported. In other remarks, he said today's Air Force is underequipped in airlift, intelligence, surveillance, and reconnaissance assets, bombers, and specific kinds of capabilities within fighters. And while the Air Force has been experiencing recruiting difficulties, the pilot retention picture has brightened.

Speaking with defense reporters in Washington Aug. 3, shortly after the House voted to lock the F-22 into a research-only mode, Ryan said that such action would unacceptably drive up the cost of the program, beyond Congressionally set caps.

Many vendors would be free to leave the program, requiring expensive certification of new vendors if Congress later wants the airplane built.

The Air Force has said such costs would add about $6.5 billion to the F-22 effort.

More importantly—and probably more expensively—Ryan said USAF would have to rethink many decisions about the size and type of forces it fields if the F-22 is absent from its future plans.

"We made decisions in the Air Force on the assumption that the F-22 comes on board," Ryan said. Those decisions about jamming capability, suppression of enemy air defenses, and maneuverability of the Joint Strike Fighter would all have to be reconsidered. The Air Force is counting on the F-22 to defend critical sensor platforms like the E-3 AWACS and E-8 Joint STARS aircraft, he said.

Without the F-22 to fend off attacks from high-flying, fast-moving threats like the Su-35, those leveraging capabilities like AWACS and JSTARS could be lost, and "we lose a lot in the synergism of our forces," said Ryan.

It is clearly not true that the JSF and F-22 are redundant, as some have suggested, Ryan added. The F-22 represents the high end of the Air Force's high–low mix, he said, while the low-end JSF comes nowhere close to meeting that level of performance. Loss of the F-22 would compel the Air Force to rethink the JSF's requirements, which have been so finely drawn that it, too, might be undone.

The F-22 is a technology pathfinder for the JSF, as well, Ryan noted. The JSF will depend on the F-22 to mature the F119 engine core, as well as avionics and stealth capabilities. The JSF price would go up if the F-22 were not around to help offset such costs.

He noted that the F-22s in flight test are flying very well, and the program as now structured is very executable.

Ryan said the Expeditionary Aerospace Force structure, which USAF was planning to move into before Operation Allied Force in Kosovo took place, will be up and running by Oct. 1. He took umbrage at reports in the press that the Air Force would be temporarily out of action because of the need to reconstitute after the Balkan air campaign.

"The Air Force is not standing down," he said, but he acknowledged there is a backlog of training that must be caught up before USAF is truly back at par. He predicted that, just as there was a 12 percent drop in combat readiness after Operation Desert Storm in 1991, there will be a similar short-term decline after Allied Force.

"It took us about a year [after the Gulf War to recover]," Ryan said. "We'll come back up faster this time."

The Yugoslavia operation highlighted the fact that the Air Force is not sized or structured to carry out two simultaneous Major Theater Wars, Ryan observed.

"On a day-to-day basis, we have sufficient airlift," but the national strategy calls for ability to manage two MTWs 90 days apart chiefly because of lift requirements, he said.

"I don't think we can afford to have a two–Major Theater War airlift force," he said. "That would drive the numbers completely out of the reality realm."

USAF, he said, can prosecute two MTWs nearly simultaneously. As long as the conflicts are 90 days apart, USAF can safely swing forces between them, he said.

"We have shortfalls in lots of areas," he acknowledged.

While he acknowledged that the Air Force is about to miss its recruiting quotas for "the first time in a long, long time," Ryan said the service never before made a big press in recruiting because, up until now, it met its goals.

"Now we need to," he said. There will be prime-time TV advertising, as well as a fuller roster of recruiters working at attracting enlistees. There will be additional bonuses for six-year enlistments in certain career fields, as well, but the service will not relax its educational standards.

Ryan also said there is heartening news on pilot retention, which by the end of the third quarter was running at 41 percent vs. 27 percent last year.

—By John A. Tirpak

in the cockpit froze. Outside windchill reached 150 degrees below zero.

To guide the incoming airplane, scientists lit 27 smudge pots in the shape of a large C, marking the drop zone. The C-141 roared in at 700 feet, with crew members pushing out two packages. Four more were dropped in a subsequent pass.

Besides medical supplies, the boxes contained fruits and vegetables and fresh-cut flowers for the endangered woman. One was covered with the entire flight crew's signatures and well wishes.

In an e-mail message posted on NOAA's Internet site, one station scientist wrote: "The aircraft was low enough that I actually saw a person at the side cargo door, arms and legs spread out, braced against each side of the door frame, body silhouetted by light from inside the airplane. He was obviously looking down to us, and we up to him. ... I was choking on the emotion."

MOOTW Draining US Forces, Warns GAO

The numerous peacekeeping and no-fly zone enforcement operations that the US military is now being called on to perform are wearing down key equipment and personnel, according to a new study by the Congressional General Accounting Office.

"There is a greater demand during peacetime for some military assets than the services can meet without degrading the readiness of these assets and causing lost training opportunities and reduced quality of life for personnel in these units," said the study, which was completed before the NATO air campaign against Yugoslavia but only recently released to the public.

USAF airplanes used in Military Operations Other Than War, primarily F-15Cs, F-16s, and A-10s, are running up more flight hours than planned and are encountering unexpected maintenance problems which lower their flight readiness ratings, said GAO.

The study cites the 1st Fighter Wing's deployment to Southwest Asia in December 1997. Deployed F-15Cs accounted for 35 percent of the wing's sorties but 60 percent of its flying hours. The wing was putting about two years' worth of wear on deployed aircraft in about six months, wing officials told GAO.

But more hours do not add up to

greater pilot skill. A-10 pilots told GAO that flight restrictions kept them at such high altitudes that they received only limited practice in their two primary missions, close air support and air-to-ground combat. F-16 pilots in Southwest Asia rated their opportunity to train in such key skills as Maverick missile employment to be poor.

C-17 Getting Dual-Row Airdrop Capability

Boeing and Air Force Materiel Command's Aeronautical Systems Center have developed a new, dual-row airdrop capability for the C-17 that increases the aircraft's cargo airdrop capacity by 266 percent.

The change largely relies on hardware already in place on the aircraft, plus a few minor modifications. The C-17 is the only US military aircraft with this capability. The first dual-row model was delivered to the Air Force in April. Among other things, the change will reduce the number of C-17s required by the Army's Strategic Brigade Airdrop, which calls for delivery of 2,400 troops and their support equipment.

"We will have an initial operational capability for the SBA by the fourth quarter of 2000," said Capt. Scott Shuttleworth, C-17 dual-row airdrop program manager.

The dual-row technique takes advantage of the airplane's existing set of rails. The airplane flies at a four-degree nose-high angle, and gravity—not a parachute—pulls cargo out the airplane's back door. A static line activates a drogue parachute, which in turn deploys main recovery parachutes. The method allows airdrop of eight

Sir Michael's Lament

In 1994, British Gen. Sir Michael Rose served as commander of the UN Protection Force in Bosnia. Last July 12, Rose became greatly annoyed at an article he read in *The Times* of London and responded with this letter, published July 14:

"I am surprised to see you [*The Times*] supporting the current propaganda campaign by NATO and British politicians who are repeatedly stating that NATO's air campaign over Kosovo met its campaign objectives. It manifestly did not.

"When NATO went to war on March 24, its objectives were, in the words of the Secretary General of NATO, 'to prevent more human suffering and more repression and violence against the civilian population of Kosovo.' Put another way by our own Ministry of Defence, the purpose of going to war was 'to curb the Serbs' capability to repress the Kosovo Albanian population—and thus avert a humanitarian catastrophe.'

"After 11 weeks of one of the most intensive air campaigns in the history of warfare, it is clear that NATO had tragically failed to accomplish these initial objectives, for thousands of people were brutally murdered and more than a million people were driven from their homes by the Serbs.

"The Alliance was thus compelled to redefine the purpose of the war as being that of allowing the safe return of the Kosovo Albanian people to their homes. Its success in achieving this lesser task should not be allowed to obscure the fundamental message that it is not possible to safeguard a people by bombing from 15,000 feet.

"Rather than engage in cynical propaganda exercises, NATO should examine how it is going to be able more effectively to fight humanitarian wars in the future. This will require the Alliance to develop better leadership and to demonstrate a greater preparedness to deploy troops on the ground. Sadly, both these critical elements seem to be missing at present."

THE SUCCESS OF PRESENT AND FUTURE WARRIORS IS OUR CONCERN

Currently, there is an emphasis on concepts of information-intensive warfare coupled with striking advances in weapons capabilities. In this context, managing and harmonizing the relation between force and protection assets and information assets becomes a topic of sharp interest.

BATTLE MANAGEMENT COMMAND & CONTROL IS OUR BUSINESS

LITTON DATA SYSTEMS

Litton

Technology. Solutions. Results.

For a ready-to-frame copy of this artwork, visit our website at www.littondsd.com/two

16-foot platform loads. Each load has a weight limit of 14,500 pounds.

New anchor cables and software for the mission computer were among the tweaks which make dual-row airdropping possible. Fourteen weeks of testing at Edwards AFB demonstrated it would work.

"We mainly worked on developing rigging procedures for the Humvees and Howitzer cannons," said Capt. Don Lytle, who served as the dual-row airdrop program manager during development. "We wanted to make sure we could get them secured and land safely."

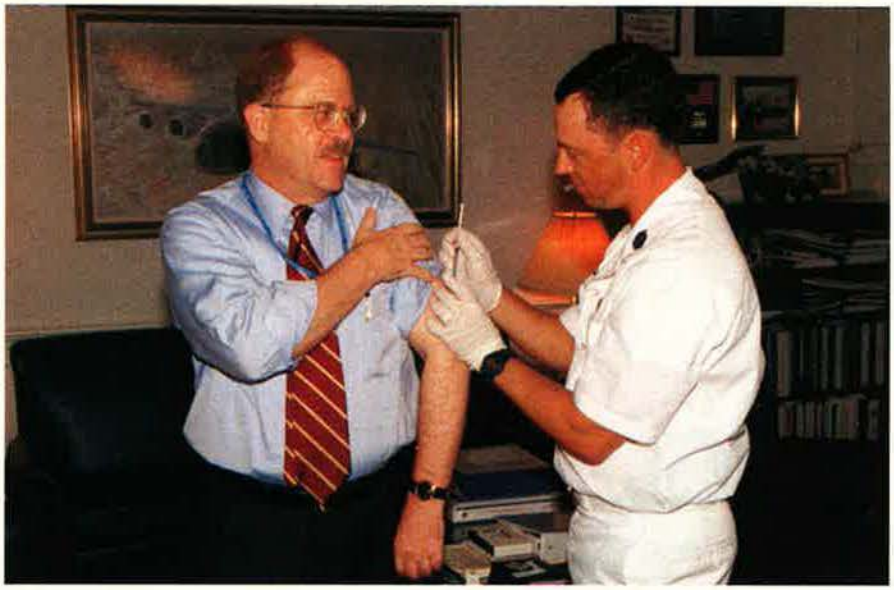
Pentagon Plumbs Kosovo Conflict

A panel co-chaired by Deputy Defense Secretary John J. Hamre and the vice chairman of the Joint Chiefs of Staff, Gen. Joseph W. Ralston, is overseeing the gathering of data for a Pentagon report on the military lessons learned from the Kosovo conflict.

The effort has three primary goals, Hamre told reporters July 8. One is to develop recommendations that will help the US fight better if it has to go to war again. A second is to decide whether anything new needs to be included in the next Pentagon budget, due to Kosovo concerns. The third is to put in place the foundation of knowledge for the next Quadrennial Defense Review.

Three major areas of effort will be to study the deployment and employment of forces, intelligence support for operations, and the results of Alliance and Coalition warfare.

The CINCs and services will all be asked to provide input. Early fall is the target date for a rough draft.



USAF photo by SSgt. Angela Stafford

Secretary of the Air Force F. Whitten Peters rolled up his sleeve and received his latest anthrax immunization in July in his Pentagon office. MSgt. James Frank, aeromedical technician from the Pentagon's flight medicine clinic, administered the shot. The complete anthrax immunization series consists of six injections.

Anthrax—the Official View

The Defense Department decision to require US troops to be immunized against anthrax has stirred fierce controversy. A July 12 *Air Force Times* editorial, "Stop Mandatory Anthrax Inoculations," drew this reaction from William S. Cohen, Secretary of Defense, and Gen. Henry H. Shelton, Chairman, Joint Chiefs of Staff:

"Your editorial ... may have been well-intentioned and designed to benefit men and women in uniform. In truth, the argument does them a significant disservice.

"Anthrax, as lethal as the Ebola virus, presents a clear and present danger to US service personnel. Anthrax is the weapon of choice for germ warfare. It is very easy to weaponize and almost always deadly.

"At least 10 potential adversaries have worked to develop the offensive use of anthrax against US forces.

"The anthrax vaccine now being administered to US servicemen and servicewomen has been licensed by the Food and Drug Administration for nearly 30 years and is highly effective.

"There are no known long-term side effects from the anthrax vaccine. The use of the anthrax vaccine has been endorsed by the Centers for Disease Control and Prevention, the World Health Organization, and the Institute of Medicine. It would be unconscionable not to protect our entire force with a safe and effective vaccine.

"To date, our servicemen and servicewomen have received nearly 1 million vaccinations. We have each taken five in the full series of six anthrax shots required by the FDA.

"Many other senior military and civilian leaders have begun the immunization process, including—[contrary to the assertion in the editorial]—Adm. Jay Johnson, chief of naval operations. ...

"In today's environment, active duty and reserve forces may be deployed at a moment's notice and be confronted with the threat of anthrax. Because the FDA–licensed vaccine requires multiple shots over many months, vaccination must begin prior to deployment in order to ensure full protection against the use of anthrax.

"Our commanders must know that all, not simply some fraction, of their forces are protected from this biological threat.

"Soldiers, sailors, airmen, and Marines fight in teams, and they need to know that all team members are protected from anthrax.

"Wearing helmets in battle isn't voluntary because everybody needs protection. The same is true of anthrax. Allowing a voluntary vaccination program is inadequate in the face of this deadly threat."

Tricare Dental Expands Overseas

Beginning Oct. 1, military families living anywhere overseas will have the option of obtaining care from host-nation dentists through the Tricare Family Member Dental Plan.

That option has been available to those living in remote military overseas locations since May 1.

"We're identifying host-nation providers and developing the infrastructure necessary to make this program successful in all locations around the world," said Navy Dr. (Capt.) Lawrence McKinley, senior consultant for dentistry at the Tricare Management Activity.

Tricare intends to identify host-nation dentists who speak English and practice dentistry to US quality standards, said McKinley.

"At nonremote locations, care will continue to be available in overseas

The CV-22 Tiltrotor. CSAR.

Flies like an airplane, lands like a helicopter. It offers a whole new approach to **Air Force Combat Search And Rescue.**

This expeditionary aircraft is fast. Survivable. And sure to get in, get the job done and get out.

Before you can say, "Mission accomplished."

BELL BOEING ROLLS-ROYCE ALLISON
The Tiltrotor Team
A JOINT SERVICE PROGRAM

With Tricare, Even the Boss Gets Confused

It's a familiar scene for many Tricare users.

A service member arrives home to find his or her spouse distraught over a surprisingly large medical bill which doesn't make sense but threatens to ding the family budget.

It even happened to the Army's top medical officer, Lt. Gen. Ronald R. Blanck. In an interview, Blanck recalled one recent evening being met by his wife waving a medical bill the Blancks received from a civilian hospital.

"This is what it's like," Blanck recalled her saying. "This is what your soldiers have to go through."

While away at college, Blanck's daughter had had her tonsils removed. Outpatient hospital services totaled $3,000. Tricare Standard, the military's fee-for-service insurance formerly known as CHAMPUS, would pay only $700. The Blancks, it seemed, were stuck for $2,300.

"I looked at the bill and said, 'Holy smokes!' " recalled Blanck. Perhaps even more than the typical American consumer, the instinct of military people is to pay their bills—and promptly. "Nobody wants to stand before their commanding officer or first sergeant as a debtor," said Blanck. "I had a credit card halfway out of my wallet when I looked at the bill again and said, 'Wait a minute. This isn't right.' "

As the Army surgeon general, Blanck could turn to his own expert staff for a refresher on Tricare payment rules. His staff reminded Blanck that a hospital that accepts Tricare Standard patients can't charge more than the Standard program deems allowable.

If that's the case, what was this hospital trying to do?

Blanck called the hospital for an explanation. The second doctor with whom he talked told him to just ignore the bill. "I'd turn them in for fraud if I could," Blanck said. "They're sending out incorrect bills, [looking] for someone stupid enough to pay in excess of what they have to."

For Blanck, the experience drove home two points:

•Tricare is too complex and needs to be simplified.

•Beneficiaries need to be aware of that complexity and take every opportunity to educate themselves on the system.

"I'm the stupid surgeon general, and I almost paid that bill," Blanck said. "How many soldiers are out there paying those [false] bills and then bad-mouthing Tricare?"

Blanck remains a Tricare advocate, saying the military needed a managed care system that requires enrollment, goes into partnerships with networks of civilian physicians, and emphasizes "getting seen early, even while healthy," so attention could be paid to habits and specialists can see whether early intervention might be needed.

The problems—particularly delays in getting appointments and errors and delays in the claims process—revolve around the system's administrative complexity, Blanck said. There are too many Tricare regions, too many civilian contractors, and too much disparity in the way regions operate. "If you're doing 25 million claims a year, and only 1 percent are wrong, you have 250,000 bad claims," said Blanck. "Boy, that's a lot of anecdotes."

Blanck said he would like to see Tricare evolve from 12 regions to perhaps three or even down to a partnership with a single network of providers. Any differences in contracts should be invisible to beneficiaries moving between assignments. While that's not the case now, he said, the surgeons general and Department of Defense health affairs officials are working hard toward that goal.

—by Tom Philpott

military dental treatment facilities, whether or not family members are enrolled in the Tricare Family Member Dental Plan," said McKinley.

The overseas extension of the plan will augment existing dental services where military facilities cannot provide the full range of services that Tricare members are used to back in the States.

Family members already enrolled in the dental plan will not have to re-enroll to participate in the plan overseas. Nor will costs increase, according to Tricare officials.

Washout Rate for F-15 Pilot Trainees Doubles

The failure rate for F-15 pilot trainees at the 325th Fighter Wing at Tyndall AFB, Fla., has more than doubled in the past year. The situation has reached the point where commanding officers are becoming concerned.

The failure rate is now 12 percent. Through mid-July, 10 pilots had washed out this year, compared to four in all of last year. Eighty-four F-15 pilots are expected to graduate in 1999, seven fewer than in 1998.

There is no link between the failures, say officials. Pilots are washing out for the same reasons they always have.

News Notes

■ On July 17, the B-2 stealth bomber celebrated the 10th anniversary of its first flight. Stealth AV-1 took to the skies July 17, 1989, at 6:38 a.m. at Palmdale, Calif. It flew two hours with landing gear down to Edwards AFB, Calif.

■ On July 14, the Air Force announced that it has no plans to rename the first four enlisted ranks. Air Education and Training Command recommended the renaming earlier this year in an effort to free up the term "airman" for more general use, in the same way that "soldiers" and "sailors" refer generically to members of the Army and Navy.

■ US Atlantic Command dedicated its new Joint Experimentation Directorate facility at Suffolk, Va., on July 16. The center will help define how joint forces will meet future challenges and maintain current superiority.

■ Lt. Col. Frank Leurquin, 25th Flying Training Squadron instructor pilot at Vance AFB, Okla., reached 6,000 hours of flying in the T-38 Talon early in July. He is the first pilot to reach this experience level in the trainer used to instruct future fighter pilots.

■ Pacific Air Forces served as the executive agent for a recent US Pacific Command humanitarian assistance planning mission to Russia's Primorskiy Kray region near Vladivostok. The five-part medical program will include testing for lead in the region's kindergarten schools, the donation of excess medical equipment, and the exchange of ideas for dealing with natural disasters.

■ A 12-man team, led by the 819th RED HORSE Squadron, Malmstrom AFB, Mont., drilled the deepest well ever dug by Air Force engineers this summer while deployed to Bolivia on a humanitarian exercise. The shaft cuts through 1,049 feet of rock, sand, and clay and provides water to Bolivia's remote southeastern Chaco region.

■ An F-16C from the 523rd Fighter Squadron, Cannon AFB, N.M., crashed eight miles northwest of Hobbs, N.M., on July 12. Capt. Jason Marshall ejected and returned to the base uninjured.

■ The March 30 crash of a USAF U-2S from the 5th Reconnaissance Squadron at Osan AB, South Korea, was caused by failure in an actuator cylinder, which led to loss of hydraulic pressure to the landing gear sys-

PEAK PERFORMANCE

By the Top Team

The Hughes team thanks the Air Force for the opportunity to participate in **Advanced EHF System** definition. You can count on us to deliver a superior end-to-end system for next-generation protected military satellite communications.

We have the experience, expertise, and teamwork to surmount challenges and reach the summit of high altitude performance.

The sky is not the limit.

HUGHES
SPACE & COMMUNICATIONS

www.hughespace.com

AEHF

Systems a Step Ahead

HUGHES
SPACE & COMMUNICATIONS

ITC

LOGICON

Raytheon

SAIC
An Employee-Owned Company

Please visit us at the AFA 1999 Aerospace Technology Exposition, Washington, D.C.
Booth 1802
Sept. 13 to 15

tem, according to a just-released accident investigation board report. When the aircraft landed, the main gear collapsed and the aircraft skidded 1,500 feet down the runway.

■ Capt. John Bean, a C-130 pilot assigned to the 39th Airlift Squadron, Dyess AFB, Texas, was awarded the 1998 Daedalian Exceptional Pilot award at the Order of Daedalians national convention June 5. Bean won the honor for bringing his Hercules safely home

S.C., received the 1999 Pitsenbarger Award from the Air Force Sergeants Association. Morrison was credited with decisive reaction when a phosphorous signal flare ignited in the interior of an airborne and troop-filled C-141B.

■ The recipient of the 1998 Koren Kolligian Jr. Trophy, awarded to an Air Force crew member who exhibits extraordinary skill in averting an accident, is Reserve Capt. Mark S. Barker, 459th Airlift Wing, Andrews AFB, Md. Barker landed a 300,000-pound C-141 loaded with 100,000 pounds of fuel in a 20-knot crosswind without nose-wheel steering or antiskid brakes.

■ Capt. Leif E. Eckholm of the 2nd Air Refueling Squadron, McGuire AFB, N.J., has won Air Mobility Command's 1998 Gen. P.K. Carlton Award for Valor. Eckholm was cited for exhibiting courage, dedication, and superb airmanship while supporting Navy operations during Operation Desert Fox.

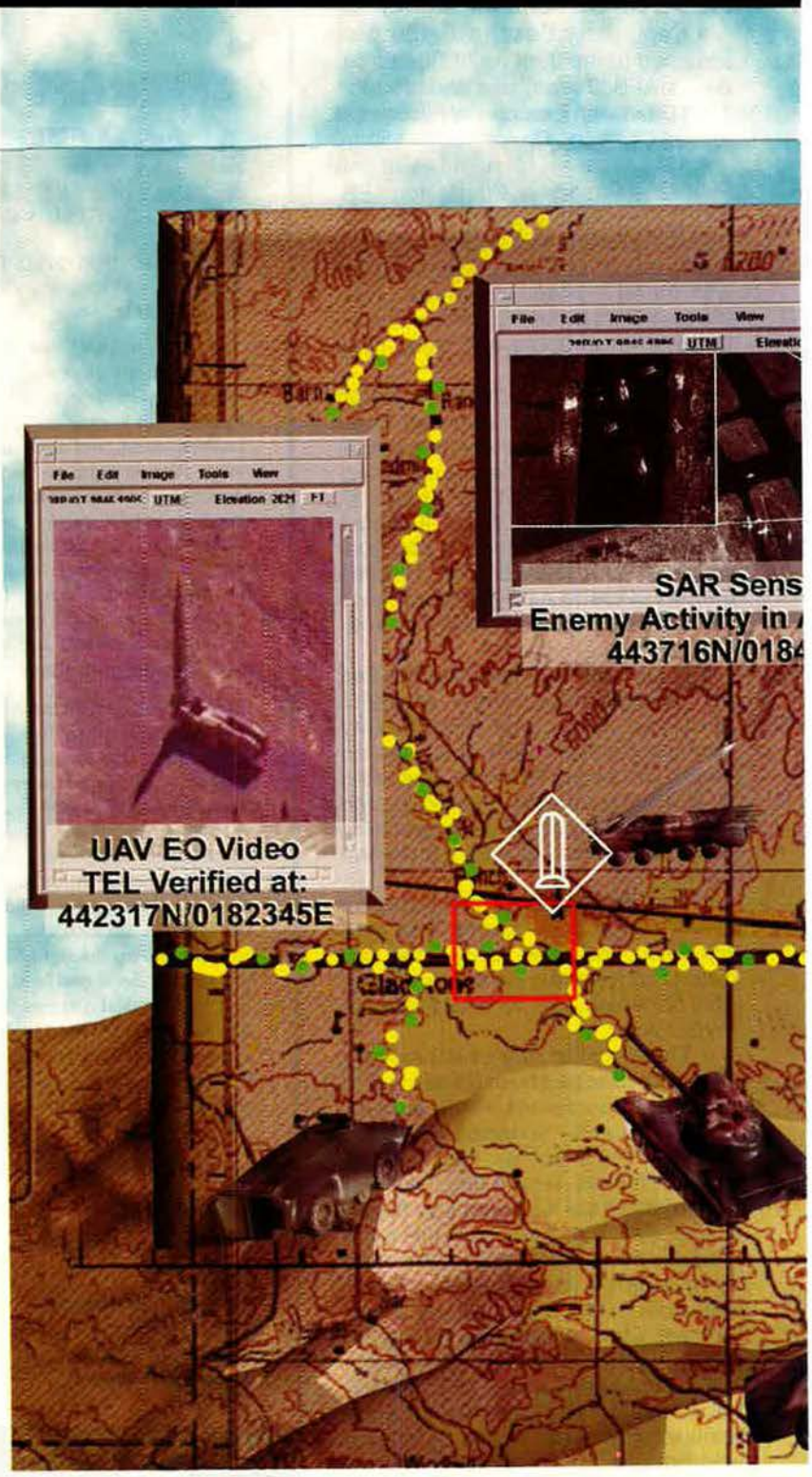
■ The V-22 Osprey flew with an all–Air Force crew for the first time June 25. The crew ferried the tiltrotor craft from Marine Corps Air Facility Quantico, Va., to NAS Patuxent River, Md.

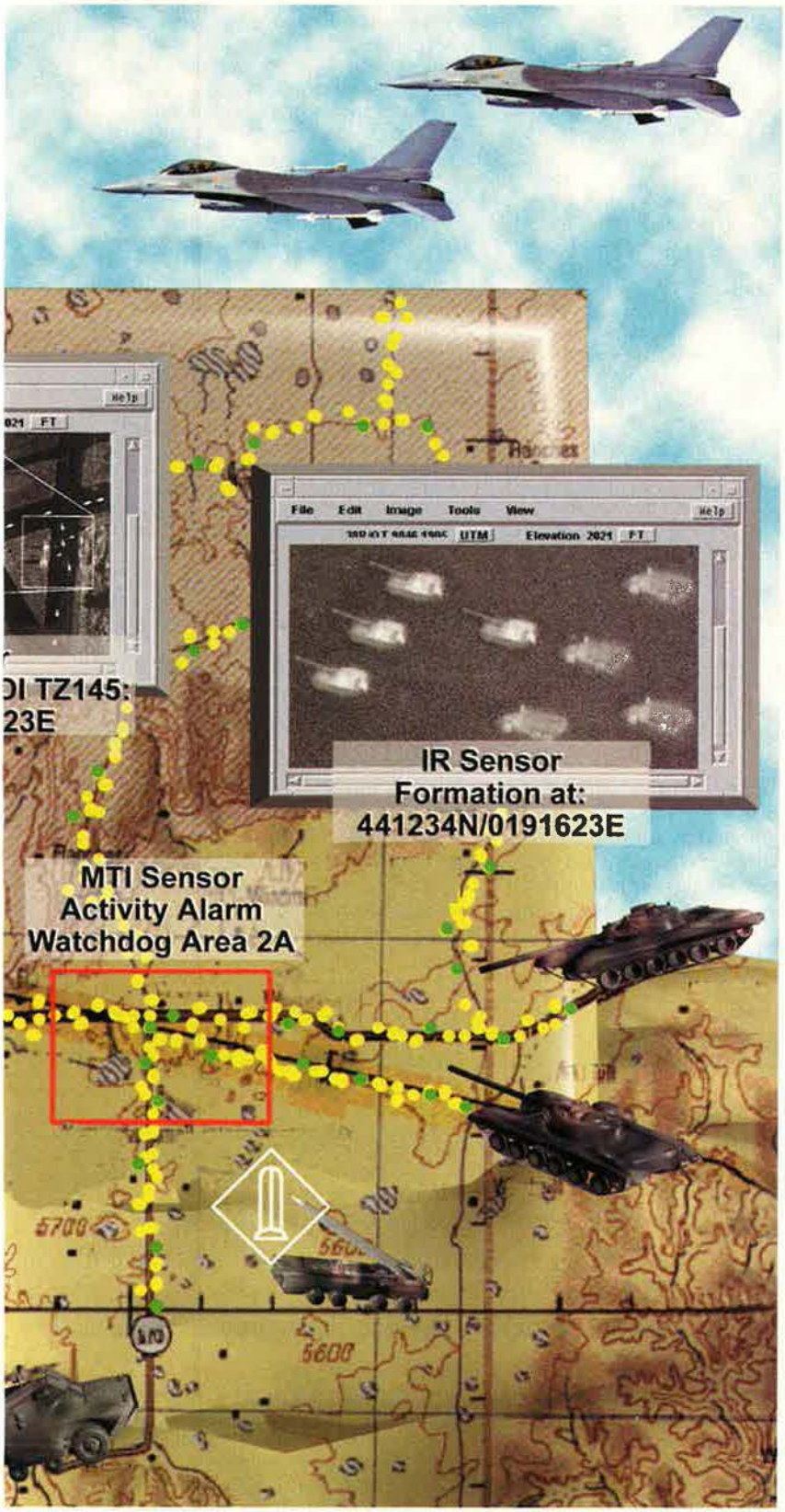
■ The smoking rate of US military members dropped from 32 percent in 1995 to 30 percent in 1998, according to a recently released Pentagon survey. That's not as low as DoD health officials would like. "Almost two-thirds of our smokers say they'd like to quit, but many of them have tried and been unsuccessful. We need to do a better job of helping them," said John F. Mazzuchi, deputy assistant secretary of defense for health affairs, clinical and program policy.

■ In mid-June, Eielson AFB, Alaska, housed and fed hundreds of Army families who were forced by raging wild fires to flee Ft. Greely, Alaska. The biggest challenge was pets, not people: An e-mail plea for pet carri-

THE POWER TO DECIDE...

Air Reconnaissance Low and overhead assets. All of these sensor platforms provide the combat commander with critical battlefield information to fight the fight. Now they can all be displayed in a single, integrated picture with the Motorola Joint Services Workstation (JSWS). The JSWS acquires, processes, displays and disseminates data from all of these sensors simultaneously. The result: a complete, integrated picture of the battlefield that enhances sensor-to-shooter capability. User applications for this system are seemingly endless. Easily deployable, the Joint Services Workstation provides near real-time





surveillance, reconnaissance, situation awareness, target development including targets of opportunity, theater missile defense and battlefield visualization. This means the system can support global missions—from small scale contingency operations to major conflict operations. Imagine going into these operations with battlefield awareness and intelligence. Seeing the battlefield as it is happening. The Joint Services Workstation enables commanders to dynamically access, plan and execute the battle with multiple sensor information. Your ability to make decisions will be taken to great new heights. For further information, call (480) 441-2277.

MOTOROLA

Pentagon Investigator Hit for Questions About Hart

A veteran DoD investigator was stripped of his badge and credentials and reassigned to a desk job after he asked colleagues of Gary W. Hart about the former Colorado senator's relationships with women.

Defense Security Service employee David Kerno asked the questions as part of a security-clearance review, following Hart's appointment to a national security commission by his old friend, Secretary of Defense William S. Cohen.

Did he cross the line and bring up inappropriate subject matter? Or do well-connected people get preferential treatment when undergoing clearance investigations?

Kerno "thought he was doing the right things," said his lawyer, Daniel Minahan, following disclosure of the incident by *USA Today* on July 14.

The story begins in 1998, when Hart was asked by Cohen to serve on the National Security Study Group. A panel of prominent Americans, the NSSG was tasked to conduct a comprehensive review of national security needs.

To Cohen, the former Colorado lawmaker seemed a natural choice. He served on the armed services and intelligence committees during his time in Washington and became something of a defense gadfly—although his mantra of buying large numbers of inexpensive lower-tech weaponry is no longer as fashionable as it once was.

Kerno was the field investigator assigned to vet Hart for clearance. Based in Lakewood, Colo., he is a Vietnam War veteran and a 19-year DSS employee who has never before ignited such a controversy.

Kerno informed his supervisor in advance that he intended to conduct a thorough review, given Hart's past conduct. Hart's 1988 Pesidential campaign imploded after he was caught in a compromising situation with part-time model Donna Rice. That the married Hart had previously dared the media to tail him, saying they would find nothing of interest, suggested a certain recklessness.

On Sept. 18, 1998, Kerno interviewed Hart's personal assistant and two attorneys, at Hart's Denver law firm. He asked them about the state of the ex-senator's marriage and the extent, if any, of his relationships with other women.

Kerno's subsequent accounts say no one seemed particularly put off by his inquiries. But Hart himself, whom Kerno never questioned, surely was.

After discovering what Kerno had done, Hart complained that day to Cohen's office. Though one document obtained by *USA Today* suggested he spoke to Cohen himself, he actually spoke with Cohen's chief of staff, Robert Tyrer, according to the Pentagon.

Tyrer says that Hart's point was that people would decline to serve on such panels if security clearances were inappropriate and intrusive.

Barely a day later, Kerno was stripped of his badge and job and reassigned to a desk. As of mid-July he was also facing a possible 30-day suspension without pay due to a disciplinary action filed by the same supervisor whom he originally informed of his plans.

Kerno's questioning was overly detailed and verged on the prurient, according to some Pentagon officials. But Kerno's defenders say he is being railroaded. They note that regulations say sexual behavior can be considered a security concern if it indicates a personality disorder or reflects lack of judgment or discretion.

Hart was granted his security clearance. Earlier this year he was named co-chair of the National Security Study Group, while Kerno still sat at his desk.

"Dave Kerno ... was asking the right questions about the wrong guy," Minahan told *USA Today*.

ers or backyards to contain evacuated dogs and cats led to more than 150 responses.

■ The first sergeant for the 347th Operations Support Squadron at Moody AFB, Ga., was recently selected as the recipient of the 1999 Air Force First Sergeant of the Year award. SMSgt. Anthony L. Bishop is being recognized for leadership and professionalism demonstrated during his former assignment with the 18th Civil Engineer Group at Kadena AB, Japan.

■ On July 9, Air Mobility Command announced the winners of the 1998 Gen. Robert "Dutch" Huyser awards for excellence. Winners were pilot Capt. William C. Summers, 37th Airlift Squadron, Ramstein AB, Germany; navigator Capt. Martin G. Oliver, 4th

Senior Staff Changes

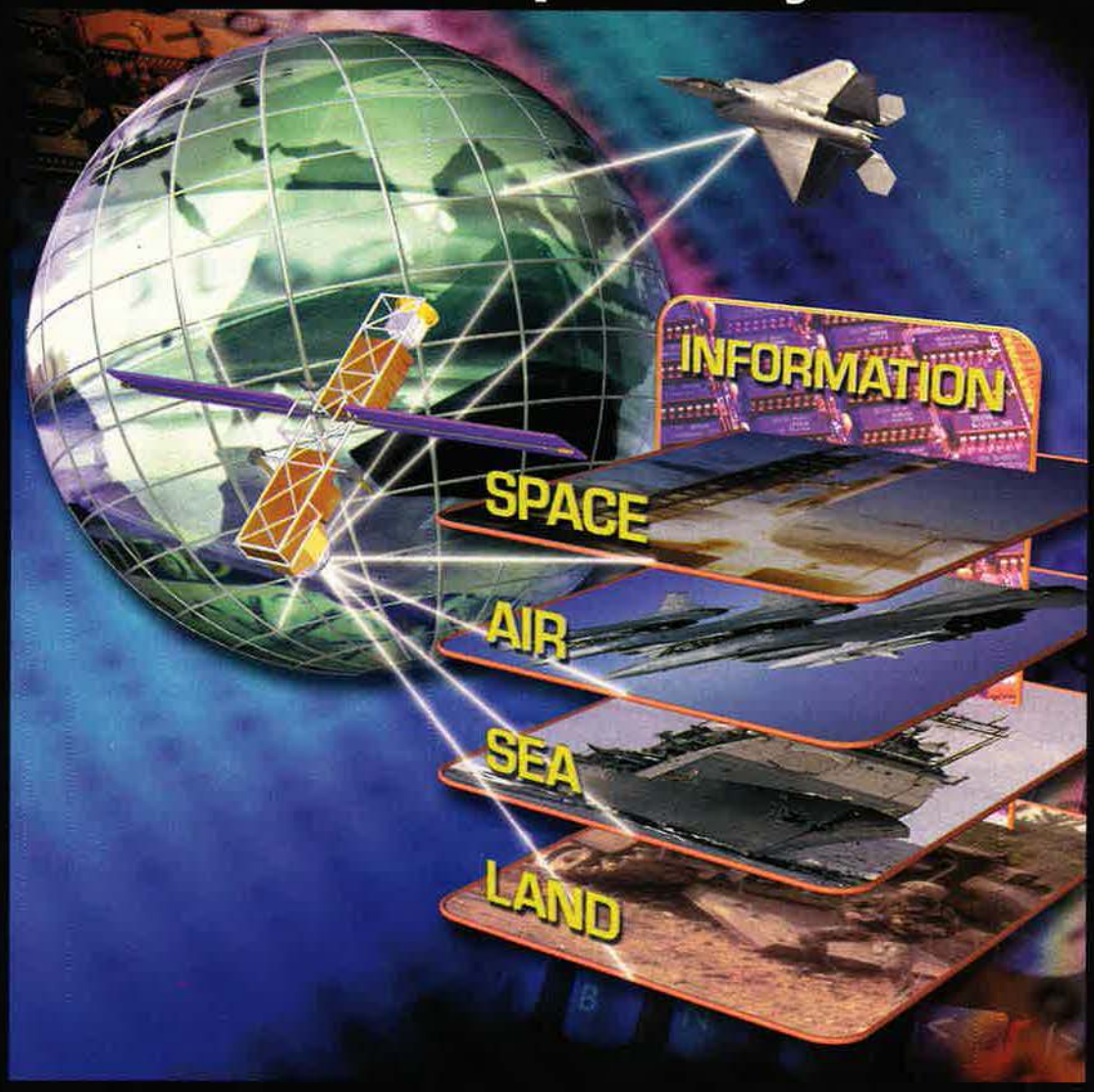
RETIREMENT: Maj. Gen. Jeffrey R. **Grime.**

CHANGES: Brig. Gen. Russell J. **Anarde,** from Dep. Dir. for Ops., NMCC, Jt. Staff, Pentagon, to Dir., P&P, AFSPC, Peterson AFB, Colo. ... Brig. Gen. Frank J. **Anderson Jr.,** from Dep. Asst. Secy. (Contracting), Asst. SECAF, Acq., Pentagon, to Commandant, Defense Systems Mgmt. College, Ft. Belvoir, Va. ... Brig. Gen. (sel.) James B. **Armor Jr.,** from Sys. Prgm. Dir., GPS JPO, Los Angeles AFB, Calif., to Vice Cmdr., Warner Robins ALC, Robins AFB, Ga. ... Brig. Gen. (sel.) Barbara C. **Brannon,** from Cmdr., 31st Medical Gp., USAFE, Aviano AB, Italy, to Dir., Medical Readiness and Nursing Svcs., Bolling AFB, D.C. ... Brig. Gen. Michael A. **Hamel,** from Vice Cmdr., SMC, AFMC, Los Angeles AFB, Calif., to Dir., Rqmts., AFSPC, Peterson AFB, Colo. ... Maj. Gen. Silas R. **Johnson Jr.,** from Vice Cmdr., 21st AF, AMC, McGuire AFB, N.J., to Cmdr., Air Mobility Warfare Ctr., AMC, Ft. Dix, N.J. ... Brig. Gen. (sel.) Gary H. **Murray,** from Command Surgeon, AFMC, Wright–Patterson AFB, Ohio, to Dir., Medical Force Mgmt., Bolling AFB, D.C. ... Brig. Gen. Donald P. **Pettit,** from Dir., P&P, AFSPC, Peterson AFB, Colo., to Cmdr., 45th Space Wg, AFSPC, Patrick AFB, Fla. ... Brig. Gen. Randall F. **Starbuck,** from Cmdr., 45th Space Wg, AFSPC, Patrick AFB, Fla., to Vice Cmdr., 21st AF, AMC, McGuire AFB, N.J. ... Maj. Gen. William **Welser III,** from Cmdr., Air Mobility Warfare Ctr., AMC, Ft. Dix, N.J., to Dir., Ops., AETC, Randolph AFB, Texas ... Brig. Gen. (sel.) Donald C. **Wurster,** from Cmdr., 16th SOW, AFSOC, Hurlburt Field, Fla., to IG, AMC, Scott AFB, Ill.

SENIOR EXECUTIVE SERVICE RETIREMENT: Charles H. **Hooper.**

SES CHANGES: Robert J. **Conner,** to Dir., Log. Mgmt., Oklahoma City ALC, Tinker AFB, Okla. ... Sandra G. **Grese,** to Special Asst. to Asst. SECAF, Manpower, Reserve Affairs, Installations, & Environment, Pentagon ... Margaret **Leclaire,** to Dir., Sys. Mgmt., ASC, Wright–Patterson AFB, Ohio ... Garry B. **Richey,** to Dep. Dir., Supply Mgmt., AFMC, Wright–Patterson AFB, Ohio ... Vipperla B. **Venkayya,** to Senior Scientist, Multidisciplinary Tech., AFRL, Wright–Patterson AFB, Ohio. ■

Information Superiority...



...the enabler of aerospace power

Booz·Allen, in partnership with the Air Force, is applying innovative approaches and a unique set of capabilities to ensure the seamless integration of Air and Space power.

- Information Operations
- Systems Engineering and Integration
- Strategic Planning
- Business Process Reengineering
- Training Systems
- Competitive Sourcing and Privatization

BOOZ·ALLEN & HAMILTON

International Management and Technology Consultants

8283 Greensboro Drive • McLean, VA 22102

www.bah.com

Missileer Punished for Not Working With Women

An otherwise exemplary junior Air Force officer has received a potentially career-crippling performance review for refusing to serve with women in the cramped confines of a nuclear missile launch center.

1st Lt. Ryan C. Berry, a West Point graduate and devout Catholic, believes that working alone with women, for 24 hours in a bus-sized underground room with little privacy, violates biblical teaching to avoid the appearance of sin.

"I hope Lieutenant Berry's moral stand can be seen to be a worthy response to the noble goal to which [the Air Force motto 'Integrity First'] challenges," wrote Archbishop Edwin F. O'Brien, whose diocese is the US military, in a June 23 letter to service leaders.

Berry's superiors do not see things quite that way. His commanding general, Maj. Gen. Thomas H. Neary, has endorsed a performance review which calls the junior officer's conduct "unprofessional."

An Air Force statement says that the service has attempted to personally accommodate Berry and his beliefs but that the needs of the service have resulted in an end to that accommodation.

"Berry's unwillingness to perform his duties as a missile combat crew member has been reflected in his officer performance report, and Berry has been assigned duties not requiring him to serve as a missile combat crew member," said the statement.

A missileer at Minot AFB, N.D., home of Minuteman III ICBMs, Berry was at first granted a religious accommodation for his beliefs. From May 1997 through December 1998, he worked only with men on the two-officer missile center watches.

His wing controls 150 Minuteman IIIs from 15 launch control centers, which are small capsules 60 to 90 feet deep that contain one bed and a small bathroom. Officers can work in the capsules up to 48 hours without relief.

But other officers, including at least one woman, saw this treatment as favoritism, and his exemption was revoked in December.

Berry has said he did not know he would be required to work in mixed-sex conditions when he opted for the missile career track. The Air Force disputes this, saying he was instructed on the possibility of serving on gender-integrated crews while training at Vandenberg AFB, Calif.

Berry's attorney, Henry Hamilton, charges that the whole thing boils down to a clash between feminist ideology and Catholic theology. He pointed out to the *Washington Times* that the Army allows the practice of witchcraft at Ft. Hood, Texas.

"The military can accommodate whatever they want to accommodate," Hamilton told the *Times*.

AS, McChord AFB, Wash.; flight engineer SSgt. Christopher E. Heppel, 21st AS, Travis AFB, Calif.; loadmaster SSgt. Thomas B. Mazzone, 3rd Aerial Port Squadron, Pope AFB, N.C.; and boom operator SSgt. Shannon B. Clark, 54th Air Refueling Squadron, Altus AFB, Okla.

Obituaries

Donald D. Engen, 75, director of the National Air and Space Museum, died in a motorized glider accident in Nevada July 13. He was a retired Navy vice admiral, a pilot for 57 years, a naval aviator in World War II, Korea, and Vietnam, and former head of the Federal Aviation Administration.

Engen had been director of the museum since 1996. His predecessor was driven from office after Congress blocked an attempt by museum curators to use the *Enola Gay,* the B-29 bomber that dropped the first atomic bomb on Hiroshima, as a prop in a politically distorted exhibit that would have depicted Japan as the victim rather than the aggressor in World War II.

Engen restored stability to the museum, an element of the Smithsonian Institution, and took it back to its basic charter, which is to collect, preserve, and display the nation's aerospace heritage. Much of his considerable energy went into a project leading toward a major museum annex at Dulles IAP in Virginia. Many historic airplanes now in storage, including the *Enola Gay,* will be on permanent display there.

Engen's deputy and friend, Donald S. Lopez, was named acting director of the museum until a new permanent director is chosen.

Charles "Pete" Conrad, former Apollo astronaut and the third man to walk on the moon, was killed in a

Index to Advertisers

AIAA	35
AlliedSignal	7
Anheuser Busch	127
ANSER	22
AT&T	86
Atlantic Research	103
Bell Helicopter	32
Boeing	64–65, 84, Cover IV
Booz•Allen	39
Breitling	5
CFM	42
Chase Durer	Cover III
DRS Technologies	9
DynCorp	23
Fairchild	77
First USA Bank	44
FMC	11
Hughes Space and Communications	34
IBP Aerospace Group	116
Israel Military Industries	41
Litton Data	30
Lockheed Martin	Cover II, 1
Mitchell Lang	41
Montgomery, Ala., Visitors Bureau	121
Motorola	36–37
Northrop Grumman	3, 71
Pratt & Whitney	20–21
PricewaterhouseCoopers LLP	29
Raytheon	48–49
Rockwell Collins	24
Rolls-Royce	15
Sabreliner	13
TEAC	73
Textron	12
TRW	19, 46
USAA	26
USPA&IRA	111
AFA Life Insurance	108
AFA Resumés	123
AFA Plaques	124
AFA Web	104

Federal Agents Seize CAP Records

Federal agents with search warrants seized Civil Air Patrol records, data, and computer files in five states July 21. The FBI and the Air Force Office of Special Investigations confiscated records at the CAP national headquarters at Maxwell AFB, Ala., and at wings in Kentucky, Texas, Florida, and West Virginia in conjunction with "the alleged misuse of appropriated funds by CAP personnel," said AFOSI spokesman Maj. Steve Murray.

The seizures were the latest development in a controversy that has gotten progressively worse since an Air Force audit in 1996 found significant problems in CAP financial management and accountability, flying safety, professionalism, and standards of conduct.

The CAP is a civilian auxiliary of the Air Force and receives about $28.3 million in federal funds each year through the Air Force budget.

In May, the Senate Armed Services Committee sought a reorganization of CAP, with a new board of directors to be appointed by the Secretary of the Air Force. An amendment to that bill postponed action until a year-long review of the matter was concluded.

According to Donna Leinwand of Gannett News Service, "The Air Force accused the 60,000-member group, known for its search and rescue operations, of mismanaging federal money, traveling first class on the taxpayer tab, retaliating against members who pointed out abuses, and losing track of its equipment. Auditors said they could not account for 70 percent of the federally purchased communications equipment in one branch of the group."

Civil Air Patrol officials have denied the allegations.

motorcycle accident July 8 near the town of Ojai, Calif.

He lost control of his Harley–Davidson on a curve and was thrown onto the pavement, said California highway authorities. He was 69.

A veteran of four spaceflights, Conrad's shining moment was when he commanded the second lunar landing, Apollo 12, on Nov. 19, 1969. He said, "Whoopee!" when his feet touched the moon's surface. He later commanded the Skylab 2 mission, which was forced to repair launch damage to the space station in three harrowing space walks. ■

cfm

THE POWER OF FLIGHT

"ARGUABLY THE MOST RELIABLE ENGINE IN THE HISTORY OF AVIATION"

U.S. NAVY

Our opinion. But not our words. Those belong to a U.S. Navy report, dated March 1998, as a CFM56-2A engine set a new military record for time on wing. Reliability is key. So on AWACS, tankers, transports and special mission aircraft, CFM56 engines provide unmatched readiness and unrivalled time on station. We set world records for reliability elsewhere too. On a civilian 737 a CFM56 engine recently exceeded 30,000 flying hours on wing. We're not only making engines, it seems we're also making history. Visit CFM now on www.cfm56.com

CFM International is a joint company of Snecma, France and General Electric Co., U.S.A.

Washington Watch

By John A. Tirpak, Senior Editor

Short's View of the Air Campaign

What counted most for NATO's success in the Balkans was the reduction of strategic targets, not "tank plinking" in Kosovo.

STRATEGIC attacks on Serbian centers of gravity, not the destruction of Serb tanks and troops in Kosovo, paved the way for NATO's victory in Operation Allied Force, according to the man who ran the air campaign.

Lt. Gen. Michael C. Short, who was NATO's joint force air component commander for the Balkan operation, said the massive and laborious tank plinking effort in Kosovo was in many ways a waste of airpower since, in his opinion, it did little to achieve NATO's stated goals. Only when NATO shifted its emphasis to attacking pivotal targets in and around Belgrade, the capital of Yugoslavia, did it finally compel Serb President Slobodan Milosevic to accept terms, he asserted.

"I never felt that the [Serb] 3rd Army in Kosovo was a center of gravity," Short said in an interview with *Air Force* Magazine regarding the conduct of the war and its implications for future operations.

In Short's mind, Milosevic had written the 3rd Army off. He went on, "And body bags coming home from Kosovo didn't bother [Milosevic], and it didn't bother the leadership elite [in Belgrade]."

A center of gravity in Air Force doctrinal terms is an asset of fundamental strategic, economic, or even emotional importance to an enemy, loss of which would severely undermine the enemy's will or ability to fight.

NATO authorities wanted to hit the 3rd Army because of a belief that the best way to stop ethnic cleansing was to destroy the instruments of ethnic cleansing directly. Short, however, didn't agree.

Total Weight of Effort

"I never felt we were going to be able to stop ethnic cleansing, and in fact we did not," Short said. "Most of the damage had been done before we ever started attacking targets on the ground." The way to force Milosevic's hand, he said, was not by mounting attacks in kind.

"I think it was the total weight of our effort that finally got to him," Short said.

Toward the end of the 78-day bombing campaign, said Short, Milosevic "hadn't had power in his capital for a number of days and wasn't going to have it for a number of days more. ... There was no fuel for his automobiles and his military, ... and communications infrastructure was being systematically destroyed." Most of the bridges over the Danube in Yugoslavia had been dropped, and, night by night, there was less for Milosevic to rule over.

"I am, quite frankly, a big fan of asymmetric warfare," Short said. The threat of destroying everything that kept the Serb leadership in power and comfort did the job, he asserted, not random bombing of military targets in Serbia that held little importance to Serb leaders.

Ground-power advocates have argued that the Kosovo Liberation Army served as a surrogate army for NATO, forcing the Serb units out of hiding and making them easier targets to hit. While the KLA did mount what by their standards passed as an offensive effort, and did in fact oblige Serb forces to come out in the open, making them predictable, their subsequent destruction made little difference in the outcome, Short said.

In a future conflict, he added, there would be little justification for trying to whittle down an enemy army "if we don't have an army in the field [or] unless we have defined the opposing army in the field as a center of gravity."

There was another reason NATO should not have given priority to hitting Serb troops in Kosovo: There were hundreds of thousands of Internally Displaced Persons, Short said. The presence of civilians on the battlefield—many forced to be "human shields" for Serb units—inevitably led to bombing mistakes that killed civilians.

"There's little doubt in my mind that Milosevic had no compunction at all about putting IDPs inside of what we felt to be valid military targets," Short asserted. "And in fact, a couple of times we struck those targets and then saw the results on CNN."

Short said he had not been given any instructions to accomplish battlefield preparation—that is, diminishing the enemy's forces by air to make them easier work for ground troops, as was done in the 1991 Gulf War. Army Gen. Wesley K. Clark, NATO Supreme Allied Commander, Europe, asked the North Atlantic Council repeatedly for permission to draw up plans for an invasion should one become necessary—or at least to keep Milosevic guessing—but was consistently denied such authorization.

If he had been given free rein, Short said he would have tried to stop ethnic cleansing by going "hard after Belgrade and the leadership targets and everything Milosevic held dear, and make it very clear to him that was exactly what we were doing." It would not be random bombing or demonstrating "NATO resolve," he added.

Heat for Flying High

Short took lots of heat from the press for ordering his fliers to stay above 15,000 feet when they attacked Serb forces in Kosovo. Flying lower, it was thought, would speed the process of destroying Serb armored vehicles and troops, while reducing the chance of hitting civilian targets. Short said he was urged by Clark, prior to the start of the conflict, to "get down amongst them."

According to Short, the SACEUR's "No. 1 priority, which he expressed to me every day on the [video-teleconference session], was the fielded forces in Kosovo. And we all understood that and followed the direction of the SACEUR." It meant that the

FIRST USA's "BLUE STAR BENEFIT"

SERVING THOSE WHO SERVE OUR NATION.

It takes a special order of courage and valor to go into harm's way. In appreciation, First USA has designed the "Blue Star Benefit" for military cardholders. Inspired by the World War II tradition of displaying a blue star in the window for each family member in service of their country, this program rebates all interest on purchases and fees charged during deployment in a military campaign. It's one more way we're meeting the unique needs of the men and women in uniform.

Call Today to Apply:
1-877-ARMED-FORCES

FIRST USA.
A BANK ONE COMPANY

† Blue Star Benefit is limited to U.S. service members entitled to a campaign ribbon or medal authorized by the U.S. Government.

bulk of the force was to be directed against targets in Kosovo.

Short, however, was determined to avoid losing airplanes and pilots if possible, and especially against the 3rd Army, as he believed it was a strategic dead end. The 15,000-foot lower limit would provide protection against the most unpredictable threats—shoulder-launched Surface-to-Air Missiles and anti-aircraft artillery—and still allow pilots to use their precision guided bombs with high accuracy.

He reported that he repeatedly asked Clark to shift gears and let aircraft go after targets in Serbia beyond the IADS—its Integrated Air Defense System.

Eventually, said Short, "we, the airmen of the Alliance, were able to convince General Clark that we could conduct sustained and parallel operations with the airpower we had available to us, ... that we could continue to attack that army in Kosovo while attacking other, ... more lucrative and compelling targets ... in Serbia proper."

At some point, he said, Clark "accepted that reasoning, and I was able to release much of the force that had been employed in Kosovo to go after other target sets in the Belgrade area, north of Belgrade, Novi Sad, Nis, et cetera."

Moreover, Short was able to use what he termed the "more high-tech" airplanes for targets better suited to their abilities in Serbia while retaining the "lower-tech" airplanes, such as the A-10, GR-7, and Etendard, against Serb forces in Kosovo. Up until that time, the only sorties being flown outside Kosovo were by US–only types of assets, such as the stealthy F-117 fighter and B-2 bomber, he reported.

At about the same time, Short said, operations shifted from night-only to 24 hours a day.

The Compelling Target Set

Short said he was trying to put enough weighted effort against the 3rd Army to satisfy the SACEUR's guidance, "while I used the rest of my assets to attack that target set that I genuinely believed to be compelling."

The act of destroying or disabling those targets—for example, Serbian lines of communication, petroleum stocks, and refining capabilities—was clearly legitimate in purely military terms, but it also served to make the civilian population angry and ready to blame Milosevic for their misery.

Looking back at the early part of the conflict, Short said he's "not so naive as to believe that politicians are ever just going to turn soldiers loose to do the job they think ought to be done." However, he said, "I think we were constrained in this particular conflict to an extraordinary degree and were prevented from conducting an air campaign as professional airmen would have wanted to conduct it."

Had he been free to structure the air effort as he wanted, Short would have arranged for the leaders in Belgrade to wake up "after the first night ... to a city that was smoking. No power to the refrigerator and ... no way to get to work." He believes that in very short order, Milosevic's staunchest supporters would have been demanding that he justify the benefits of ethnic cleansing, given the cost.

Instead, Short observed, "10 or 12 days into the war, ... they were holding rock concerts in downtown Belgrade because we had not yet been able to go after that target set."

The accidental strike on the Chinese Embassy put a number of targets off limits, Short noted.

"Toward the end of the air effort, we were restricted by enormous concern for collateral damage and unintended loss of civilian life." During the last days of the campaign, "that was the litmus that we used to pick a target."

Also hindering the targeting process was the 19-member NAC, which gave great weight to individual national sensibilities.

"At least one nation consistently refused to let us attack targets that we wished to target, so that made it even more difficult," Short said, declining to be more specific.

There have been reports from Kosovo recently that the damage to Serb forces there does not seem to match the reports of damage claimed by NATO intelligence, but Short insists there's no reason to believe the stated Serb loss statistics are out of line.

"I'm comfortable with the numbers that I was given by the Joint Analysis Center," Short said, quoting a figure of 50 percent of Serb tanks, armored personnel carriers, and mortar and artillery tubes destroyed by NATO strikes.

"I can't explain the discrepancy between what we destroyed and the number of hulks that have been found thus far. But I have no reason to doubt the ability of our intelligence and [bomb damage assessment] systems to verify that."

Short readily admits that NATO pilots did hit some decoys but claimed that it was fairly evident when that happened, and the pilots "became pretty adept at figuring out what was a decoy and what wasn't."

Nevertheless, Short insists, "I was never counting." A veteran of 276 combat missions in Vietnam, Short said he found body counts were "never compelling then, and I don't believe ... that the number of tanks we destroyed ... was compelling this time."

Because he was not in the mindset of preparing for an invasion, "I did not have a figure in my mind [of] what it was going to take to render the 3rd Army ineffective."

Success Story No. 1

The combination of the B-2 bomber and the Joint Direct Attack Munition was the "No. 1 success story" of the Balkan operation, Short said.

Every night of the war, he noted, in any kind of weather, he could expect "16 quality DMPIs [designated mean points of impact] from every one of those B-2s flying from Knob Noster, Mo., into Kosovo, into Serbia proper, dropping 16 JDAMs from 40,000 feet."

He called the B-2–JDAM combo the "absolute ultimate" in Global Reach, Global Power.

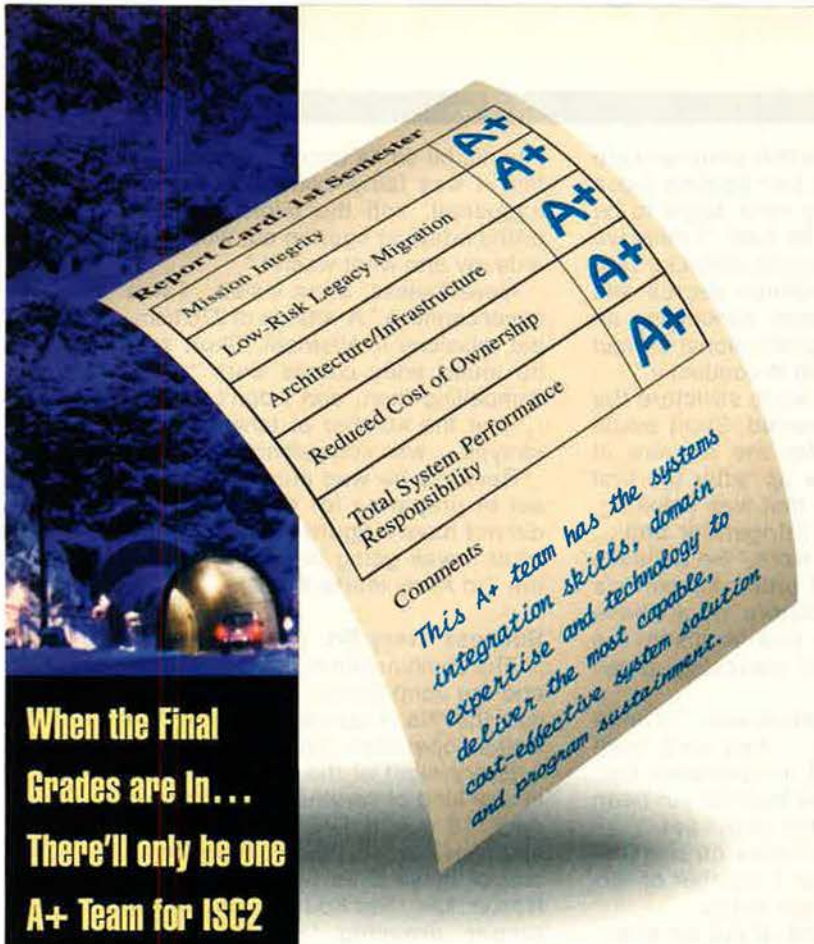
Short said villains around the world should now think less about where the nearest carrier group is and instead count takeoffs from Whiteman AFB, Mo., because that would be the acid test of whether the US was serious about coming after them. He confessed to being somewhat of a "parochial airman" on the subject of the B-2.

If he had it to do differently, Short said, he would have changed the NATO Air Tasking Order to reflect assets such as the B-2, F-117, and Tomahawk Land Attack Missile—which were called "US–only systems." In reviewing the ATO with Allied partners, Short said he constantly had to ask the other air chiefs "to trust me" about what those assets would be doing.

"And they've worked with us long enough that they just nod around the table," he said. "They know very well what we're employing."

To keep such assets off the ATO was somewhat pointless because the presence of F-117s at Aviano AB, Italy, the US 6th Fleet off the coast of Albania, and B-52s at RAF Fairford, UK, meant that F-117s, TLAMs, and conventional air launched cruise missiles would be involved in the battle.

"But we kind of go into our US–only



When the Final Grades are In... There'll only be one A+ Team for ISC2

TRW

Where Performance Counts

When all the scores are totaled, only the best get the highest grades.

TRW earned the ESD/SR Program Office Award for Excellence on the Command Center Processing and Display System Replacement (CCPDS-R). The US Air Force has entrusted TRW with the Total System Performance Responsibility (TSPR) for the nation's intercontinental ballistic missile (ICBM) weapon systems. It's this kind of performance that earns trust.

To address the Integrated Space Command and Control (ISC2) program, TRW has formed an impressive team of highly experienced, world-class companies. This team, the A+ Team, brings proven experience, long-range vision, a history of successful performance, and an unerring commitment to making the ISC2 program a success.

TRW. The A+ Team...making the grade.

A+ ISC2 TEAM

TRW Harris IBM ITT Oracle SAIC
ALPHATECH MRJ Predicate Logic SPARTA

defensive crouch and pretend they don't know what we're doing, and we're not going to tell them," he said.

While he feels it's important to protect mission planning and stealth secrets, Short said the absence of those assets from the NATO ATO led to some confusion when "suddenly things showed up [on NATO Airborne Warning and Control System radar] where they didn't expect them."

Short denied Clark had ordered him not to lose any airplanes or take any casualties. "I've seen that in the press several times," he said. "That's wrong."

Three Measures of Success

Instead, Clark would, after picking targets, give Short his guidance for the day, which contained, Short said, "essentially the three measures of success." The first was to protect NATO forces in the theater, including those in Bosnia as well as in Albania and Macedonia. The second was that the Coalition hold together. Finally, "clearly, it was a goal for us not to lose any airplanes or any pilots."

On that last point, Short said he doesn't know of "any air commander that doesn't enter a conflict with a goal of not losing any airplanes or any pilots." However, he fully expected that, in 78 days of operations, there would be some losses of aircraft and crews. The fact that he had been given a "no losses" goal "didn't change the way we did our business."

The 15,000-foot floor offered "our best opportunity to survive [in conjunction with night attack and precision guided weapons], and I continue to believe that," he maintained.

But after civilians were hit in the midst of a convoy, Short recognized that target identification could be a problem in similar circumstances. He then approved both weapons release and forward air control excursions below 15,000 feet—meaning pilots could descend to a lower level to use binoculars and "take a look at a target to see if it's tanks or tractors or buses," he said, and then quickly return to a safe altitude.

Even at 15,000 feet, NATO airplanes were not immune to SA-3 and SA-6 SAMs and relied on "the jammers and the [High-speed Anti-Radiation Missile] shooters to protect us."

The rules of engagement regarding altitude were "a balancing matrix ... of risk vs. benefit," Short explained. On any given mission, planners chose an altitude which "we felt certain would allow us to identify the targets with an acceptable level of risk, given the way we felt the Serbs were fighting at that point. And in my mind it turned out to be correct," he asserted. No airplanes were lost in Kosovo proper, "so I feel like we did that pretty well."

Short declined to discuss the loss of an F-117 fighter on the fourth night of the operation. But he did allow that, in the wake of the loss, "our approach to employing the 117 changed."

In Short's view, the biggest lesson of the Balkan conflict probably was a hard one learned by US Allies: Many of them have neglected their air forces and not invested in technology needed to conduct a modern air war.

Team A, Team B

"I don't think there's any question that we've got an A team and a B team now," Short said. Those nations that failed to invest in precision guidance or nighttime capabilities or beyond-visual-range systems were "relegated to doing nothing but flying combat air patrol in the daytime; that's all they were capable of doing," he said.

Around the table at the Combined Air Operations Center in Vicenza, Italy, it was clear "which Allies were capable of going downtown on the first night and who wasn't." He praised the consistent efforts of some nations, such as the Netherlands, which not only have kept their fighters up-to-date but can even provide some aerial tanking capability.

"The first night of the war, a MiG-29 was shot down by a Dutch F-16," Short noted.

He declined to say who he felt was on the B team, but he observed that the conflict highlighted the urgent need for some countries to upgrade. Some "are on the second team, and they know that." Perhaps the experience will translate into a political decision to invest in bringing their air forces up to modern standards, he said.

Asked what was toughest about the operation, Short noted several things. The first was the problem of "bringing together airmen from 14 different nations." Although English is supposed to be the language of aviation, for non-native-English–speaking pilots, "the first time you're shot at ... you probably don't say, 'Break right!' in English. You yell it out in your mother tongue," Short observed.

The weather also "just kicked our butts for the first 45 days," he reported. Many pilots had to return with their bombs, and some nights most missions were called off due to the weather.

While the Serbs "did not fight very smart, they presented a threat every night," and Short quoted a figure of 630 SAMs fired at NATO airplanes.

"You can't get complacent," he noted. "You can't decide that you're bulletproof and invisible after your first 10 sorties."

Finally, the political constraints made it very, very hard to conduct the operation, he said.

"It was not just apparent at the three-star level that we weren't following the classic air campaign that we'd all learned at Maxwell. It was just as apparent [at the captain and major level] that we were not using airpower the way we would have wished to use it." It was highly frustrating "that airpower [was] not being used as well as it could be and the way you have been taught to use it," Short asserted.

The most frustrating aspect was that, at the last minute, one or two nations could veto a target, causing airplanes already launched to be recalled, sometimes through a daisy chain of signals sent via AWACS and tankers, Short noted. "[This] plays havoc with a mission commander's plan, because now all of a sudden he's lost part of his train. And you don't want to send those kids in there if they're not going to drop."

As to what worked the best, Short noted that the war amounted to another "incredible success ... for the Total Force." Active duty, Guard, and Reserve personnel contributed "across the spectrum of what airpower is able to do," which he added, "[was] no surprise." The operation was "a verification of what we had invested in, the training that we had done. The Total Force that we had fostered and put together over the last 15 years, proved once again, as it did in Desert Storm, to be successful."

He also paid tribute to past Air Force leaders who championed the Air Force requirements program and the technology provided by US contractors who "produce reliable, solid weapon systems." The combination "did us a great service."

"Every bit of technology bought during the last 15 years was successful," Short said, noting the Predator and Joint Surveillance Target Attack Radar System as two relatively new systems that immediately proved their worth.

"We just didn't have failures in those systems that we bought, and it increased our survivability and our accuracy and made us a better Air Force, as we knew it would," he said. ■

Global Power

JSOW
Paveway Laser Guided Bombs
AIM 9X
AMRAAM
HARM
HARM Targeting System
Maverick
ALE 50
B-2, APQ-181 Radar
F-15, APG-63/70/63 (v) 1, Radars
F-16, Modular Mission Computer
F-22, APG-77 Radar and Common Integrated Processors (CIP)
F-117, IRADS Targeting System
Joint Strike Fighter Sensors and Processors

Information Dominance

U-2, Advanced Synthetic Aperture Radar
U-2, Senior Year Electro-Optical Reconnaissance System
Common Ground Segment Mission Planning
Joint SIGINT Avionics Family
Global Command & Control System
Air Force Mission Planning System
Rivet Joint
NATO AGS
AWACS Sensors
Global Broadcast Service
Joint STARS

Global Reach

Distributed Mission Training
CV-22, Radar and Infrared Systems
C-130, Autopilot and GCAS
C-130, Avionics Modernization Program
C-141, GPS Enhanced Navigation System

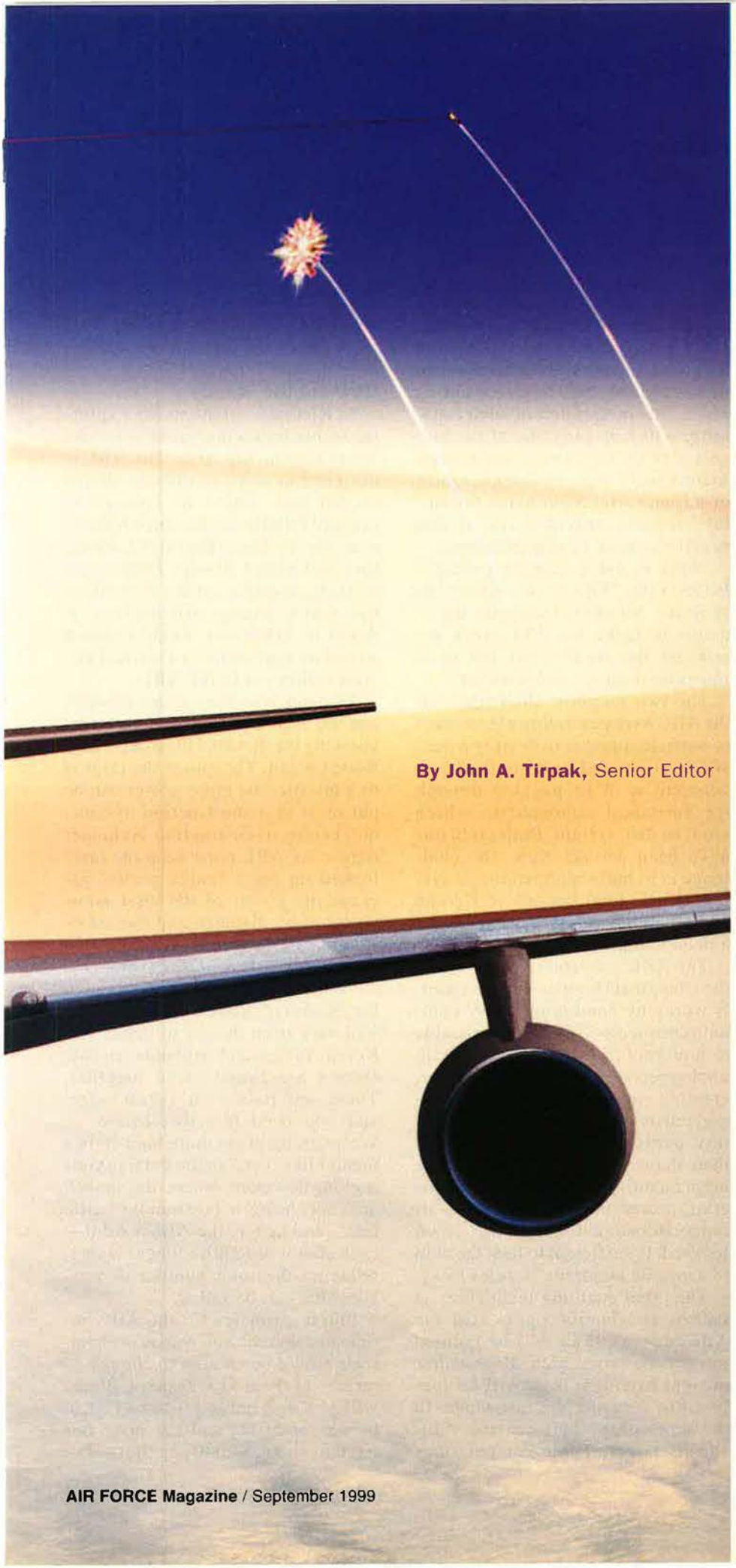
Ideas that matter.
www.raytheon.com/rsc

We are the big picture.

These are only a fraction of the systems we build. And building them is only a fraction of what we do. We know communications, sensors, control systems and weapons better than anyone else. And we know how to integrate them better with every other system, no matter what the mission: land, sea, air and beyond. Detailed information on our systems and systems solutions is on our website.

Raytheon **Raytheon Systems Company**

The AL-1 Airborne Laser will be the first line of defense against theater ballistic missiles, starting around 2004. Orbiting the sky near the edge of the battlefield, the AL-1 will detect missile launches with infrared devices, then use a trio of lasers to spot, track, and target the missile, as well as focus the massive battle laser in a nose turret. The missile will explode when the laser heats and ruptures its surface, causing the rocket fuel inside to explode. Debris—and the warhead—will fall back onto the launch area.



Battle lasers are rapidly moving from the realm of theory into operational reality.

Military Lasers High and Low

By John A. Tirpak, Senior Editor

THE first time that lasers accompanied US military forces into combat was in the Vietnam War, where they designated targets for laser-guided bombs. Since then, such devices have been used to determine distance to a target, to signal and communicate, and to disrupt optical devices of hostile forces.

The laser even has been used at times merely to frighten enemies; US troops can scare away "bad guys" by putting visible laser aiming "spots" on their chests at night.

In the next decade, however, lasers will take a dramatic step forward. No longer will they serve only as weapon enablers or as non-lethal systems. The lasers will themselves become hard-kill weapons. Megawatt-class devices will be put on the ground, in the air, and into space, where they will function as lightning-fast defensive systems.

"We can't even imagine" the ramifications of lasers as weapons, said Col. Michael W. Booen, director of USAF's Airborne Laser program. "It's tough to comprehend something that moves at the speed of light and what that means. We have a sense of the speed of ... airplanes or missiles but not the speed of light."

Of one thing, however, Booen is certain: Military lasers are destined to revolutionize airpower.

Laser weapons have long since departed the realm of the hypothetical. They are taking shape as real hardware, now, Booen said. The Airborne Laser is the nearest-term hard-kill laser weapon for the US military, and the Air Force ranks it just behind the F-22 air dominance fighter in its list of top equipment priorities.

The job of the ABL will be to orbit the skies near the forward edge of a battle area, watching with infrared search-and-track devices for the launch of enemy theater-range ballistic missiles. Once it spots one, the ABL platform—a militarized 747 freighter fitted with lasers for ranging, targeting, and attack—will get a lock on the target. When the missile rises above the clouds, the ABL will focus a beam of light 15 inches in diameter on the missile's skin. The skin will heat up and rupture, causing the volatile materials inside to explode. Debris—and the missile warhead—will rain down on the nation that launched it. This, it is thought, will serve as a deterrent to the use of theater ballistic missiles in the first place.

Blowback and Payback

As a bonus, the ABL will determine the launch location and then pass that information on to attack airplanes. This will help provide a missile-attack capability that is "better than anything we [have] now," Booen asserted. The strike aircraft can dash to the launch area and destroy other missiles on the ground before the enemy has a chance to fire them or move them to a new hiding place. The maturation of such capability will help plug one of the biggest gaps in US conventional power. In the Gulf War, for example, scores of unsuccessful Scud hunts for mobile missiles provided one of that conflict's most vexing problems.

"This is not a science project," Booen said. "This is an engineering project." All of the necessary ingredients to make the ABL work are now on the shelf. "Our job is to integrate these ... technologies."

The two toughest challenges for the ABL were generating a laser beam of sufficient power to destroy a missile in flight and keeping the beam coherent as it propagated through the turbulent atmosphere, which tends to distort light. Both problems have been solved. Now, the challenge is to make an operational system that is light enough to fly and hardy enough to last for years under a demanding deployment schedule.

The ABL's destructive element is the Chemical Oxygen–Iodine Laser. It works by combining fairly common chemicals—roughly comparable to household bleach and sink drain uncloggers—in a mixing chamber, creating energized oxygen. The energized oxygen generates photons—tiny particles of light—which are then shaped into a laser beam. The large quantity of chemicals can generate power in the multimegawatt range, Booen said. This power, when focused, is sufficient to heat the skin of a missile hundreds of miles away.

The other enabling technology is known as adaptive optics. On the ABL, a small laser will be pointed toward the target area. Backscatter of light from that laser will be analyzed to compute the turbulence in the atmosphere between the ABL and its target. These computations are translated to tiny pistons physically attached to the focusing mirror, which changes shape to cancel out the distortions and keep the attack beam focused.

In reverse, the technology can be used to focus ground-based telescopes—to correct for air turbulence and sharpen the image obtained. Such work is done at Kirtland AFB, N.M., where a large telescope at the Starfire Optical Range is used to capture images of satellites in orbit. This work paved the way for the ABL.

Down in the Weeds

At Kirtland, scientists are exploring technologies that promise to take lasers beyond the ABL. The ABL is designed to work at altitudes above 40,000 feet, where air pressure is low and turbulence is reduced. However, the Air Force Research Laboratory's Directed Energy Directorate is using adaptive optics to work in the much denser atmosphere at 8,000 to 9,000 feet. Such research would be applicable to a tactical aircraft follow-on to the ABL.

To determine how many missiles can be destroyed in one mission, knowing the distance to target is key, Booen noted. The closer the laser is to a missile, the more power can be put on it in a short period of time, quickening its destruction. At longer range, the ABL must keep the laser locked on for a longer period because the power of the laser is attenuated by distance and the atmosphere. A laser can stay locked on a target hundreds of miles away.

"What we typically have is enough for 20 shots," Booen noted, but this will vary from theater to theater. In Korea, forces and probable missile targets are found close together. There, said Booen, "it's short range, and you need less dwell-time. ... We're going to get more than 20 in a theater like that." In the Persian Gulf region, however, where the launch area may be quite far from the battle line—and hence, the ABL's orbit—each shot will require longer lasing, reducing the total number of missiles that can be killed.

Initial estimates for the ABL anticipated that each planeload of chemicals would be enough to engage 40 targets, at about $1,000 a shot. Booen will now only quote a figure of 20, to be conservative, and the price has risen to about $3,000 per shot—still

orders of magnitude less than the cheapest guided missiles.

Congress raised questions about the ABL in its last budget cycle, but those have been resolved to the satisfaction of the lawmakers, Booen reported. On Capitol Hill, he said, "It seems like ... we've got a growing basis of support ... and there's only one reason it's growing: Our performance on this program is exceptional."

He reported that the Air Force has completed more than 30 percent of the program and is within 1 percent of the cost and schedule goals set at the beginning. The development program will cost $1.6 billion overall, and it is fully funded throughout the Air Force's future years defense plan. Buying and operating the ABL fleet for 20 years will cost another $9.4 billion.

Booen said that Congress did recently ask for a program restructuring, but the end result was just more risk reduction. He explained, "We've doubled the test program ... and, so far, everyone we've shown the restructure to was pretty happy with it." The expanded testing added about a year to the program's schedule.

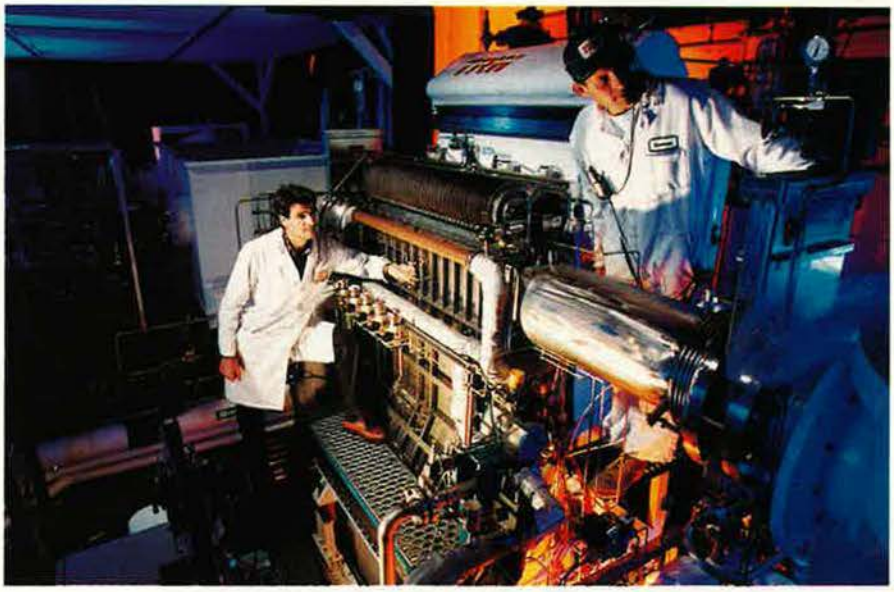
Not Paper, but Hardware

Moreover, that 30 percent of the program which has been completed does not entail building viewgraphs and briefings, Booen pointed out. "We've got whole bunches of hardware coming through the door."

A focusing mirror that started out as an unwieldy 2,000 pounds now weighs in at just 300 pounds, he noted. Last summer, the laser was tested to 110 percent of its design power for nearly five minutes. The first of the seven planned ABL airframes will be delivered around January. The aircraft—a brand-new, off-the-assembly-line commercial 747 freighter—will be flown from the Boeing factory in Washington state to Wichita, Kan., where Boeing will modify it over 16 to 17 months into the Attack Laser-1.

Booen pointed out that the airplane will be the first to be purchased and accepted after the turn of the century, and so it will be assigned tail No. 00-0001.

The first attack laser airplane will be a test platform, but eventually it will be converted into an all-up, deployable asset. During the testing phase, there will be some limited operational capability with the test airplane, much as the first two test models of the E-8 Joint Surveillance Target Attack Radar System were rushed into service for the 1991 Gulf War, years before official operational capability was declared.



The AL-1 uses a Chemical Oxygen–Iodine Laser, or COIL, and will be able to shoot down about 20 missiles per mission or until its chemicals run out. Future laser systems may rely on electric power with an unlimited number of shots.

Limited capability with ABL will be available about 2004. The first three all-up models will be in service and initial operational capability will be achieved in about 2007. The last seven airplanes are to be delivered by 2009.

The Air Force is not waiting to receive the airplane before working out how it will employ the ABL in combat, however.

Notional ABLs have participated in a number of exercises and wargames in the last few years—notably Roving Sands in New Mexico and Optic Windmill in Europe—to work out its role in the battlespace. Already taking shape are where it fits on the ATO, or Air Tasking Order that governs an air campaign, as well as an awareness of what the ABL can do, Booen reported. For example, an ABL might be ordered to stay airborne even after its laser fuel is exhausted, due to its abilities as a sensor platform. The airplane has capability for air refueling and could make extended missions.

In a typical scenario, five ABLs would deploy into a theater. Two would be kept aloft at all times to cover the area of operations. A mission would probably last about 12 hours, and requirements call for a combat turn time of six hours. Each ABL could deploy with a full load of chemical fuel and even fly directly to combat from home base. A single C-17 could resupply the ABL squadron with enough chemicals for 140 additional shots.

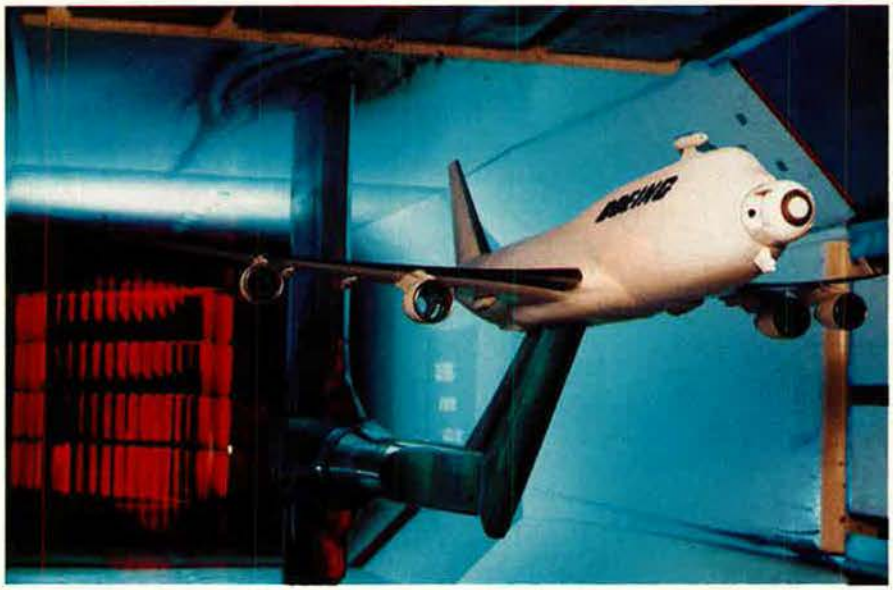
If the ABL somehow missed a ballistic missile, its onboard computers would calculate the likely impact point and then hand off the threat to terminal point defenses like the Patriot system.

Not in Space

The possibility of using the ABL to shoot down cruise missiles or even surface-to-air missiles is being looked at, but is not a prime mission, Booen said. Though the ABL could point its laser upwards and conceivably use it in some sort of anti-satellite mission, that hasn't been examined. "It's not something we're working on," said Booen.

To cover a wider area and offer the US homeland some protection from Intercontinental Ballistic Missile attack, the Air Force has shaped a different program, the Space-Based Laser.

The SBL is in many ways a vestige of the old Strategic Defense Initiative of the Reagan era. SDI officers once envisaged an orbiting constellation of laser battle stations that would instantly spot an enemy ICBM launch and then move to de-



The ABL is built into a new Boeing 747-400 commercial freighter, specially modified for the mission, seen here as a model in the wind tunnel. The first AL-1 will be the first aircraft delivered in the new century.

stroy the missile in flight. The SBL builds on the SDI research—as well as ABL research—and is geared to demonstrate the feasibility of such a system in a single spacecraft to be orbited in 2012.

SBL's operational concept calls for shooting down ICBMs while they are still in the boost phase, when the rocket's fuel is still burning brightly. Like the ABL, the SBL would work by directing laser energy on the missile's skin to cause the booster to explode. Also like the ABL, the SBL would detect the plume of exhaust and track it. The SBL, however, would be far higher above Earth's surface, cover a much larger area, and be able to shoot missiles far deeper within enemy territory.

The SBL would be part of the ballistic missile defense system of systems now being pursued by the Ballistic Missile Defense Office, according to Lt. Col. Randall Weidenheimer, SBL program director. "It should be complementary to the ABL [in boost-phase missile attack]," Weidenheimer said, "but ABL is much nearer-term."

Congress wants to accelerate a demonstration to show that a laser can kill a missile from space, he continued. He believes Congress will add funding to the $139 million SBL program next year to advance the demonstration six years, from 2012 to 2006. However, the best estimate of research organizations is that it will take at least a decade to design and launch such a complex spacecraft, Weidenheimer said. Congress' wish to go faster may be too optimistic, and they understand that, he added.

Three major defense contractors—Boeing, Lockheed Martin, and TRW—were competing to build the SBL, but the Air Force asked them to team up in a co-equal joint venture to pursue the SBL technology. Each company had strengths, Weidenheimer said, and this arrangement allows for later competition to build the constellation, should it proceed to that stage.

The team is to report back in October as to whether they believe the program can be accelerated and, if so, by how much.

"I should note that we've been directed to be treaty compliant with this demo," Weidenheimer said, referring to the need to remain within the strictures of the 1972 Anti-Ballistic Missile Treaty signed by the United States and the Soviet Union, which has since vanished. The treaty sets out strict rules about the pursuit of ABM technologies. In late June, US and Russian diplomats agreed to reopen discussion on the ABM Treaty's limits on testing and ways the two countries might cooperate in the area.

Many Challenges

The technical challenges facing the SBL are many. They are, in essence, tougher versions of the barriers that confront the ABL program. Weight is a critical issue; the SBL cannot take as much chemical fuel to orbit as the ABL. The rigors of launch demand a hardy, yet lighter-weight laser technology than that which will be on the ABL. To achieve longer range, a larger mirror might be needed, but it would have to be folded for launch.

"We are looking at ... how viable it would be to have deployable optics," Weidenheimer reported.

The SBL will also take cues from the Space-Based Infrared System, as well as from ground-based and airborne sensors, in addition to having its own onboard infrared search-and-track devices.

The contractors have suggested building a constellation of 30 to 40 SBLs held in 800-kilometer-high orbits to achieve global coverage. The baseline SBL effort calls for using a chemical laser, since today only a chemical reaction can supply the power needed to achieve a kill on a missile. The spacecraft would be designed for refueling on orbit, Weidenheimer explained. Hydrogen Fluoride is being investigated as the chemical fuel, since an HF laser would not be absorbed by the atmosphere.

The Air Force has set 2004 as a tentative date for ground demonstration of the laser and beam control system. However, testing of how the beam would propagate in space at the necessary ranges is something that can only be done in space. Testing of pieces of the SBL may be done in orbit prior to launching the whole system. Meanwhile, the spacecraft platform on which the laser would be mounted would probably undergo its critical design review in 2006.

The Army is also exploring lasers to deal with a missile threat but on a different scale and strictly from the ground.

The Army's Tactical High Energy Laser is an advanced concept technology demonstrator that is being developed in cooperation with Israel. The system would be fielded to provide defense against small rockets, such as the Russian–made Katyusha, in situations where return artillery fire isn't an option. Such a system would be especially useful when dealing with an enemy lodged in a dense urban area.

The THEL will employ the Mid-

Infrared Advanced Chemical Laser, MIRACL for short, using deuterium fluoride; it is another by-product of SDI. The Army's Space and Missile Defense Command awarded the THEL contract to TRW, which was working toward a late-summer demonstration by shooting down representative rockets at White Sands Missile Range in New Mexico. Plans call for testing to continue into 2001.

If successful, THEL would be mounted on a mobile platform and would be deployable in much the same way as the Army's Patriot air-defense system.

The ABL, SBL, and THEL are all "what we could call first-generation laser weapons," said R. Earl Good, director of AFRL's Directed Energy Directorate at Kirtland.

Enter the Zapper

At present, all the systems rely on chemical reactions to produce energy. However, the aircraft companies are telling the Air Force that they will, in a few years, be able to generate multimegawatt power using onboard generators, Good noted. Once that happens, he said, "we will enter the era of electric lasers."

Such lasers could be produced in the form of solid-state or fiber-optic systems, free of the need to carry vast quantities of chemicals around. This fact could make them applicable to aircraft as small as a fighter.

One such application, Good said, is the "Fotofighter," which would have fiber-optic lasers positioned around its airframe and wings to deal with incoming infrared-guided missiles. The lasers could blind the missiles or actually burn through their seeker arrays.

Fiber-optic lasers are at least a decade off, Good said, but it wouldn't be too long afterwards that they could be applied to aircraft defense.

"We've already talked with aircraft manufacturers about how you would run the [fiber-optic] cable through the airplane," he added.

Such systems probably represent the second generation of laser weapons, Good said. They will not arrive fast enough to be applicable to ABL or SBL but could be used on their successors.

The advantage of having a generator-supplied electric laser is that there would be an unlimited magazine of shots, he added.

Good said that lasers are not about to supplant bullets or bombs. He noted that, against a pressure vessel like a ballistic missile, lasers are uniquely useful. It would not be practical to achieve the same effect against an armored vehicle, especially when there are far cheaper ways to do it with conventional explosives, he noted.

"You're not going to burn a hole in a concrete wall or through a tank [with any of the lasers anticipated in the next 15 years]," Good said.

The promise of electric lasers won't halt research into chemical lasers, either. Miniature, pod-mounted versions of the COIL are also under study and could be tested within a few years. Such a pod would give an airplane like the F-15 a junior version of the ABL capability, with a range of hundreds of miles. The utility of such a weapon against incoming air-to-air missiles is obvious, and the technology could arrive within a decade.

It's good fortune that the ABL program is under way to help feed the SBL with technology, Good noted.

The advantage of having the ABL first as a kind of technology pathfinder is that "it lands periodically, and you do maintenance on it. So we'll learn a large amount about how a large chemical laser operates over an extended period of time," he said, and the lessons learned can be applied to the design of the SBL. Although the lasers themselves are very different with regard to their wavelengths, operating pressures, and other factors, cleaning up the beam, getting good propagation—these are engineering issues that won't require SBL to invent radically new technology, Good added.

It's still too early to assess the potential of laser weapons.

"We've just crossed the threshold, and we're just beginning [to size up the potential for speed-of-light weapons]," he said. He pointed out, though, that even the speed of light is finite. Because of the need to keep a beam tightly focused on a tiny spot on a fast-moving vehicle hundreds of miles away, even if the delay is only a few microseconds, "you've got to lead [the target], use Kentucky windage [to destroy it]."

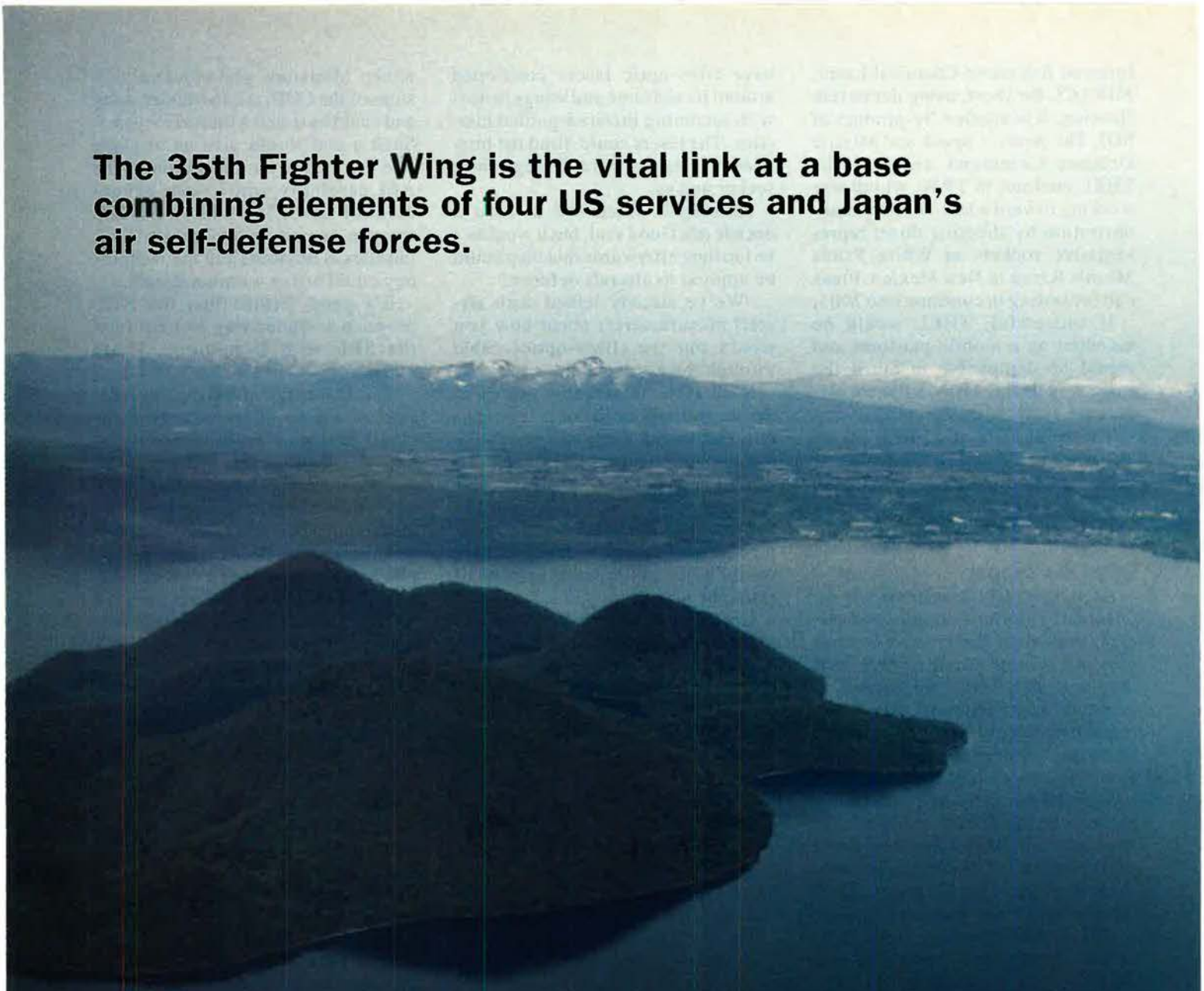
The technology that makes ABL an emerging reality and SBL possible did not just suddenly appear. "We've been working this for 20 years," Good said. "It is the next logical step [in weapons research]."

Asked if the Air Force is going out on a limb in investing so much in lasers now, Good said it is not.

"The Air Force is a very good steward, a very responsible agency," he noted. "We don't promise things that we can't deliver. Some people get impatient with us, but we want to make sure the technology works, ... step-by-step, crawl before you walk, walk before you run. ... In that sense, the Air Force is not getting too far out [on the technology]." ■

Correcting atmospheric optical distortions was key to making the ABL feasible. Deformable mirrors on this telescope at Kirtland AFB, N.M., paved the way for the ABL. The telescope can also image orbiting spacecraft with great clarity.

The 35th Fighter Wing is the vital link at a base combining elements of four US services and Japan's air self-defense forces.



Misawa's Weasels

Four of the 35th Fighter Wing's F-16s soar above the volcanic crater lake Toya, part of the Shikotsu-Toya National Park on the northern Japanese island of Hokkaido. The snowcapped extinct volcano Yotei-zan rises in the distance.

Staff photo by Guy Aceto

Photography by Guy Aceto, Art Director, **and Paul Kennedy**

Staff photo by Guy Aceto

Located along the northern edge of the Japanese island of Honshu, Misawa AB is home to more than 3,000 members of the Japan Air Self-Defense Force and members of each branch of the US military, with USAF's 35th Fighter Wing as host unit. It's a mix that makes Misawa the only combined-service installation in the western Pacific and an important air base on the Asian rim.

The wing has been integral to the effort to develop the weapons and tactics that are part of their current Suppression of Enemy Air Defenses mission. The F-16CJ aircraft that the wing flies today are direct descendents of the "Wild Weasel" F-105s and F-4s that were used at George AFB, Calif., in the early 1970s to train aircrews for SEAD operations in both the Pacific and European theaters.

At right, a Japanese policeman assists US security forces at the Misawa AB main gate. Japanese civilian guards assigned to the 35th Security Forces Squadron wear the distinctive USAF beret with security flash and the DoD Special Police badge.

Photo by Paul Kennedy

Staff photo by Guy Aceto

The job on the flight line is essentially the same no matter where you're stationed, but the Japanese culture and lifestyle make a three-year tour at Misawa—located in an agricultural area 400 miles north of Tokyo—unique for most airmen and their families. Service and support organizations have an important role, providing everything from language lessons to an award-winning commissary, dining facility, and outdoor-recreation organization. Misawa also uses a Spouses Together and Ready program. A STAR representative conveys to the squadron commander the concerns of family members and in turn passes along information.

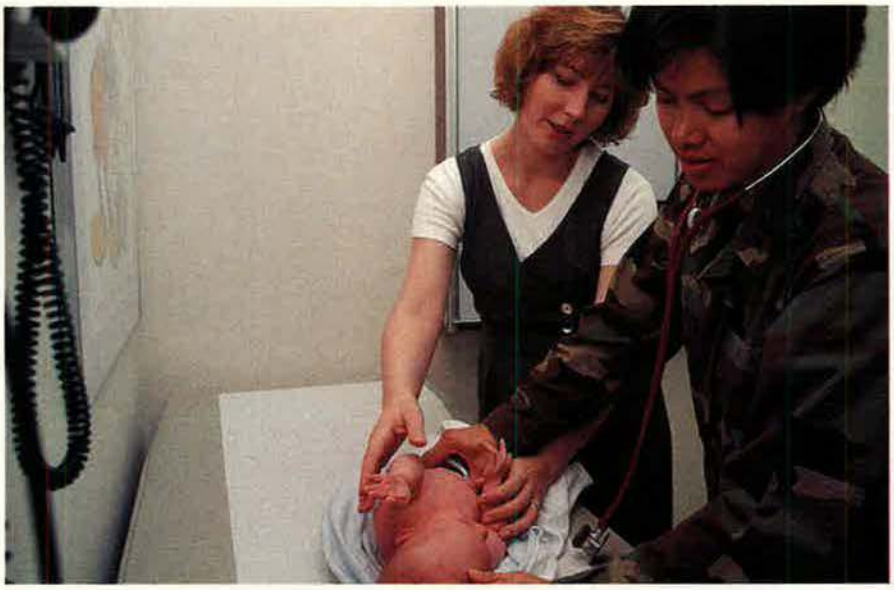
Staff photos by Guy Aceto

The 35th Fighter Wing originally was activated at Johnson AB, Japan, in August 1948 and, under several subsequent designations, participated in the Korean War and the Vietnam War. The wing was briefly inactivated in July 1971, then activated as the 35th Tactical Fighter Wing at George AFB in October 1971. Wing units participated in Operation Desert Storm in 1991.

The next year, with the closure of George AFB, the wing once again was inactivated for a short time. It was reborn in May 1993 as the 35th Wing at NAS Keflavik, Iceland, where members flew F-15s. In September 1994, the 35th inactivated once again, then a day later returned to Japan to activate as the 35th Fighter Wing at Misawa AB.

The 35th FW and JASDF units regularly participate in joint exercises like Cope North to enhance air operations. Whether training with local fire departments or using the capabilities of a Japanese E-3 Hawkeye airborne warning and control aircraft (left), Misawa's personnel demonstrate the value of an integrated force.

Photos by Paul Kennedy



At left, Capt. Valerie Tigno gives Dana McIntyre's son, Jackson, a checkup at Misawa's 25-bed medical facility.

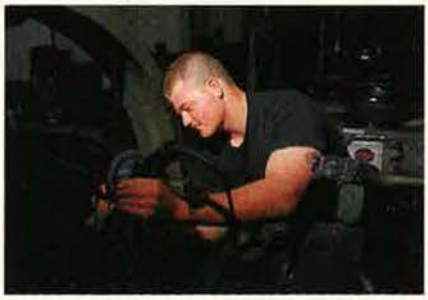
Besides accomplishing its daily medical care, the wing's medical group created the only USAF Class C laboratory licensed to process blood products. It also has DoD's only complete blood program, housing under one roof a donor center, transshipment center, and frozen blood depot. Additionally, the group has agreements with local medical facilities to provide diagnostic services, such as MRIs and CAT scans, for US personnel. This enables the unit to cut costs by about 30 percent while still providing necessary services to base personnel and their families.

Because of frequent deployments on top of regular flying activities, the survival equipment personnel keep busy. At right, Amn. Torin W. Cutsinger, a survival equipment apprentice, makes some repairs. Below, winter in northern Japan means a heavier anti-exposure flying suit. Misawa averages about 10 feet of snow annually.

At left, A1C Scott A. Wcld and SSgt. Dale E. Ludwig inspect an ejection seat's parachute and harness system. Regular and detailed inspection is important to make certain this equipment works as expected. The specialists in the survival equipment shop perform detail work that may go unnoticed—until an aircrew finds itself in an emergency.

Photos by Paul Kennedy

The 35th Maintenance Squadron originally was expected to support just the F-16s at Misawa. Today, it provides intermediate level F-16 engine support for "Vipers" from Kunsan and Osan ABs, South Korea, as well. The squadron's "hush house" (at top) is the most modern facility around and is able to test the engines more thoroughly than the other bases.



Responsible for more than 150 F-16 engines from the three air bases, squadron personnel take from 18 to 36 days to overhaul an engine, and on any given day they have about 20 in various stages of repair. These skilled and meticulous maintainers disassemble the engines, making upgrades or replacing parts, reassemble the engines, and test them in the hush house.

Above, A1C Rachel Keenan works on one of the huge engines. At far left, A1C Charles Blessing starts an inspection of one of the sets of fan blades. At left, A1C Jennifer Denton finds the next tool she'll need to finish the day's work.

Staff photos by Guy Aceto

An array of "golf balls" marks the Misawa Cryptologic Operations Center (left) and the 3rd Space Surveillance Squadron (below). An all-services operation, MCOC conducts information operations and supports the High-speed Anti-Radiation Missile targeting systems of the wing's F-16CJs. The 3rd SSS collects data to catalog and identify Earth–orbiting objects.

During a preflight mission briefing at the 13th Fighter Squadron, Capt. Steve Hickey points out where the next sortie will be headed. A number of instrumented ranges are available, including some on the Korean peninsula. Upgrades and realistic training help keep the teeth of the new Weasels sharp.

Photo by Paul Kennedy

Staff photo by Guy Aceto

The 35th FW is one of four fighter wings in USAF carrying out the Wild Weasel mission, and its SEAD expertise is much needed in today's hot spots. In March, eight F-16CJs and about 150 support people from the 14th FS and 35th Maintenance and Supply Squadrons deployed to Southwest Asia for Operation Southern Watch, enforcement of the no-fly zone over southern Iraq. It was the fourth time since 1996 that the wing had sent its jets into the Persian Gulf region. Because of the Balkan War, wing personnel stayed at Prince Sultan AB, Saudi Arabia, until June, when wing personnel from the 13th FS and 35th MXS traded places with them. At left is an F-16CJ, ready to go.

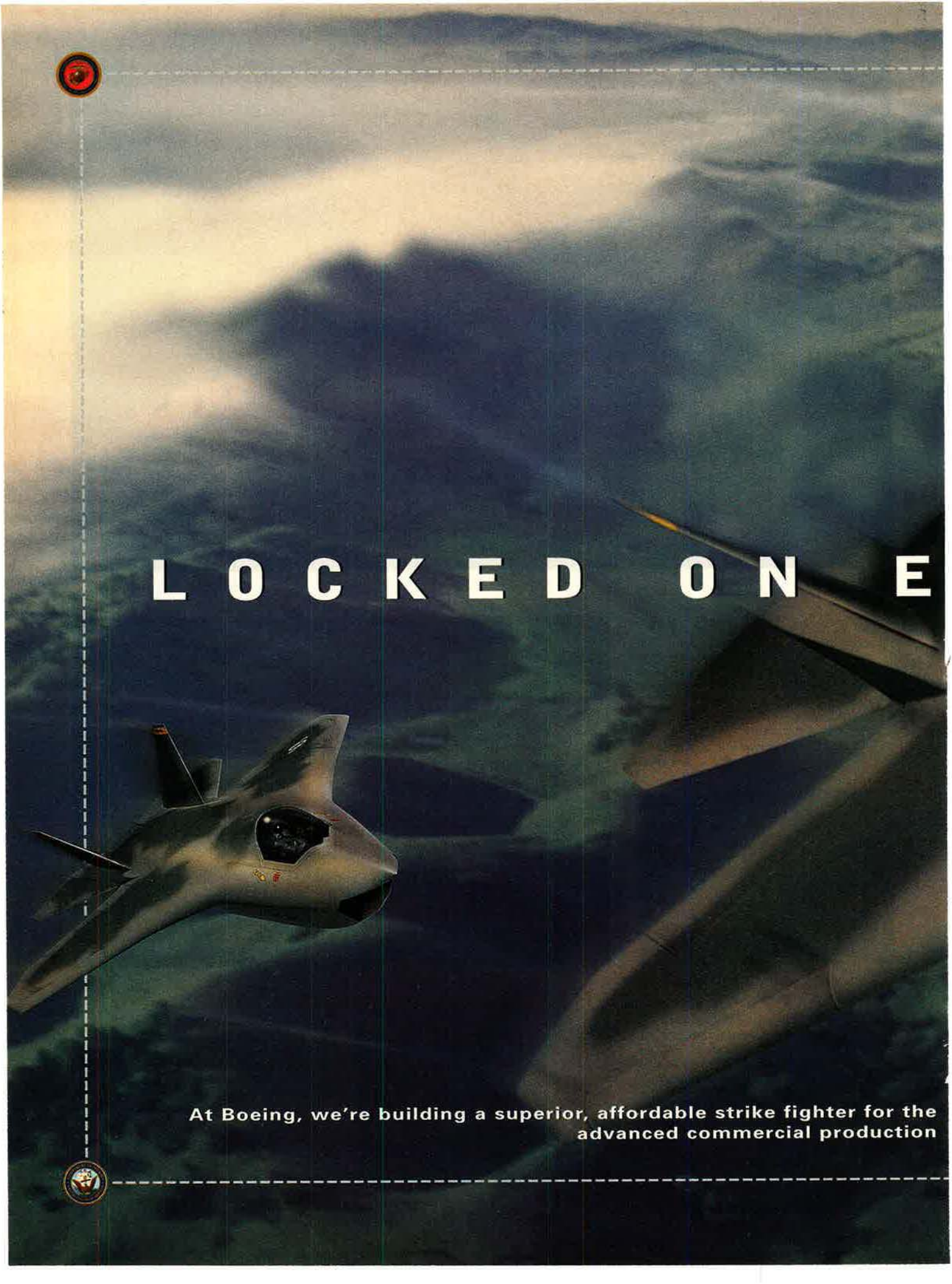
Staff photo by Guy Aceto

With more than half of one squadron's aircraft and personnel deploying to the Persian Gulf at one time, the 35th decided to consolidate the remaining squadron assets with its other fighter squadron to form a "super squadron." During the deployment, the home-based super squadron enabled the units to spread the workload at Misawa.

Photos by Paul Kennedy

Pilots from the 13th FS flew 14th FS aircraft and vice versa, and ground crews from the two squadrons worked together to turn jets. Another plus was that squadron members were able to share ideas more easily—enhancing and standardizing operations for both units.

The combat-ready 35th Fighter Wing and the joint services operations at Misawa play an important role in helping DoD project the forward presence that maintains stability in the Asian–Pacific region. ■


LOCKED ON E
At Boeing, we're building a superior, affordable strike fighter for the
advanced commercial production


VERY TARGET.
BOEING
USAF that will not yield to compromise. One backed by real-time costs and processes. After all, we know victory is about hitting targets. All of them.
USAF

The Rudman-Hart Commission, working up to the next Quadrennial Defense Review, surveys the most probable trends and dangers.

Technology and the Future of Warfare

IN 1998, Congress formed the National Security Study Group, a panel of defense experts and laymen now chaired by former Sens. Warren Rudman and Gary Hart. The panel was enjoined to take a hard look at political, economic, military, social, and technical trends in the world and then identify threats and opportunities the US can expect to encounter in the next 25 years. The group's conclusions could well have a major impact on the next Quadrennial Defense Review, expected in 2001.

Plans call for NSSG's work to unfold in three phases. Phase 1, conducted over the past year, ended in August. In this phase, NSSG focused on describing the security environment that is likely to exist in the 2000-25 period.

A key to NSSG's overall "environmental" assessment was its view on future technologies. In a paper entitled "Technology, Society, and National Security," recently made public, NSSG laid out its assumptions. Of particular interest to experts were two sections— "A Baseline Technology Prospectus Through 2025" and "Implications for National Security." Here's the text of those two sections:

Technology consists not only of things, or devices, but also the way that devices are combined and put to use. Hence, the following discussion is divided into a discussion of devices and of likely means of technological adaptation and integration.

Technology Devices

Microelectronics, Computer Networks, and Communications

● Cheap, high-density microelectronics will proliferate in all our tools and our physical environment. The number of transistors per chip will continue to double every 18 months until roughly 2005 or 2010, when we will run up against the physical limitations imposed by reaching the atomic scale. This physical limitation, however, need not signal the end of progress, for while today's chips carry an essentially two-dimensional architecture, future ones may be three-dimensional.

● As processing power continues to expand, it also decreases in cost. Today $1,000 buys about a billion computations per second. By the year 2025, $1,000 of computing will buy about 10 billion billion computations per second. Like processing power, memory capacity will continue to double roughly biennially, and prices will drop accordingly. In 1970 one megabyte of memory cost half a million dollars; in 1996 it cost $38; today it costs less than $3. Our ability to pack information into ever-smaller volume, and ever more inexpensively, will continue to increase. Nobel Prize winner Richard Feynman dramatized the phenomenon by noting that, theoretically, one could put the *Encyclopedia Britannica* on the tip of a pin. More important, such capacities will provide a basis for major changes in how business, education, and government handle information.

● Between now and 2025, fiber-optic capacity will surpass terabaud rates, which is to say, a thousand billion bits per second. As with electronics, greater power is matched by declining unit costs; cost per network node appears to drop by a factor of 10 every five years. Fiber optics will thus serve as the backbone of an integrated global communications network. Whereas optical fiber communications has until now been limited by the deterioration in the signal power over long distances, new fiber amplifiers will allow signal transmission over thousands of miles of optical fibers. Moreover, the number of signals traveling through a single fiber will increase greatly due to the ability to transmit multiple wavelengths (or colors). Fiber communications will probably be viable for residential use by 2010, as well.

● Between now and 2025, wireless communication systems (space-based and land-based) will be highly integrated with the fiber-optic backbone to provide specialized and niche services. Constellations of communications satellites will enable voice, e-mail, paging, and limited Internet service from any point on the globe to virtually any other point on the globe. Direct broadcast radio and television is already lifting the electronic silence of the developing world. Cellular and wireless local loops are augmenting telephone capacities worldwide. The implications of such capacities for the abilities of authoritarian regimes to cordon off their populations from information and news are enormous. Compared to the effects of the transistor radio in Africa and Asia in the 1950s and 1960s, and of the audio cassette in Iran in the 1970s, the impact of a fast-wired world on the clinging autocracies of the next century may be even more dramatic.

Microelectromechanical (MEM) Devices, Microfabrication, and Nano- or Molecular Fabrication

● Between now and 2025, MEMs (microelectromechanical devices) will become a major commercial industry. MEMs are microscopic devices in which sensors, transmitters, receivers, or actuators (switches that activate mechanical devices) have been miniaturized to the size of a transistor. The tools that make today's computer chips also make MEMs. MEMs are already being used to detect movement to activate air bags, but they can be constructed to detect a variety of visual, thermal, acoustic, and biochemical phenomena. Imagine trying to find a bugging device where you need a microscope to see it. MEMs have demonstrated usable microwatt transmissions, and miniature motors have power production capability with an energy density 10 times higher than the best batteries. New "smart" materials will be constructed with MEMs that have microscale features; for example, airplane wings with microstructures will change shape automatically to allow better control and flight efficiency.

● Other microfabrication techniques will allow the construction of matrix composites of great strength, low weight, high heat tolerance, and low cost. Ceramic composites will enter car and jet engines. Other microstructures have been exploited to develop "see-through" metals, substances that are hard and not brittle, but still transparent.

● Nano- or molecular fabrication—the taking of microtechnology down to the atomic scale or dimension—is now in its early stages. Applications will involve the manufacture of nanoscale structures that can be embedded on other electronic devices or on materials. Texas Instruments has already manufactured an array containing a half-a-million movable nanomirrors for a tiny high-resolution projector. In 1997 nanotechnology was an estimated $5 billion industry, and it is optimistically projected to double each year over the near term. Nanofabrication will be available commercially only to a limited extent by 2025, however.

Biotechnology

● Biotechnologies may eclipse information technologies after the year 2010 in terms of economic investment and economic impact. Both the commercial world and governments have sustained large R&D funding. This funding and the remarkable developments in genetic engineering, tissue-growth research, and the human genome project will spur rapid growth and innovation. Some of the key developments and indicators are:

—The mapping of the human genome offers the prospect of making significant strides on the link between genes and disease. Scientists are learning how life works and fails, to an ever finer level of detail, and they are learning with it the pathogenic and genetic correlates of disease. Gene therapies, even in the fetus, are likely. Cells that can normally replicate 50 times will be adapted to be able to replicate 200 times or more. This has started a debate on the possible discovery, and social implications, of a scientific-technical "fountain of youth."

—The mapping of animal and plant genetic makeup offers the capability to tailor animals to serve human needs. Agriculture will be transformed with the

promise of higher productivity, nutrition- and vaccine-enhanced foods, and greater plant resistance to (known) pests. "Farmaceuticals" will be readily available. Cows, pigs, and sheep with altered genes will provide proteins with medical value in their meat and milk. Bacteria are already being used for environmental remediation–for example, to clean up oil spills.

–Cloning human organs will be possible by 2025. Animal and human stem cells are now being grown in the laboratory. With the appropriate signals, stem cells can be converted to any specific cell. It is possible to extract one's own tissue and transfer the DNA to stem cells to generate transplant tissue that your body will not reject. Mouse heart cells have been created from stem cells. Overall, these developments will probably extend the average human life span to at least 85 years in the developed world within the next 25 years. At least theoretically, those born after 2020 may look forward to a life span considerably longer than that.

Technology Integration

Our use of technology has been revolutionized by the way we integrate and conceptualize its use and distribution throughout society. The following discussion highlights what we may expect from science and technology integration over the next 25 years.

Communications, Sensors, and Transparency

● The Internet, new sensor capabilities, and global communications greatly facilitate both commercial and military intelligence gathering. Mature communications and sensor systems are allowing images, voices, and data from around the world to be gathered and shared. Small personal communications devices will allow point-to-point communications within a 50- to 100-mile radius; in short, the fabled Dick Tracy wristwatch of comic book imagination is now reality. Such a watch could include a GPS receiver to keep track of position. Portable communications devices will provide Internet entry throughout the world, allowing near-instantaneous and independent exchange of commercial and technical information, exhortations and complaints, political ideas and manifestos.

● Small cheap microphones, electro-optical compact disks, biochemical detectors, and pocket radars for military, security, biomedical, or controller applications will advance sharply. At least one, and perhaps several, commercial surveillance satellite will be able to image at or slightly below one-meter resolutions at optical wavelengths. Commercial all-weather imaging based on synthetic aperture radar at two-meter resolution may follow. Many satellite owners may be free of US "shutter control," which is to say that both collection and dissemination of such images will be beyond US management. Satellites are getting cheaper; they cost $50 million today and perhaps only $20 million within a few decades. A single commercial global data-relay network would suffice to take advantage of such systems anywhere.

● Sensor-equipped Unmanned Aerial Vehicles the size of small Frisbees are being tested. UAVs 30 kilometers aloft may supplement space capability, as soon as people learn to fly them reliably. Compared to satellites, UAVs offer near-constant dwell time, a closer look, and smaller power requirements for send/transmit devices. In benign realms, tethered balloons could tote near-weightless electronics high enough for cellular and surveillance applications.

● Once captured, data from any source can flow anywhere through the global information infrastructure. Copious data files are collected on everyone worldwide–from open sources, commercial firms, and governments. Technically proficient states (or anyone with enough money) will be able to selectively identify and track anyone who ventures into a public place. Today's devices can match a snapshot of a face to a person by using an imagery database. Constantly shed skin cells contain enough genetic material for accurate identification (even spectrographically read sweat or urine may provide clues). As a consequence, war could become much less anonymous; and it may be possible literally to link specific military acts with the actual warfighter.

Combining and Merging Existing with Cutting-Edge Technologies

● We are experiencing a revolution in the merging of existing and cutting-edge technologies, particularly micro-technologies, information and positioning technologies, fabrication, and biotechnologies. Combined or merged technologies often yield "emergent" capabilities in the following major developments:

The merging of macroscale technologies with microscale technologies. Mechatronics will be a major commercial driver. Computers and communications systems will have embedded MEM devices and will be network-ready right out of the box, and perhaps even network-seeking (i.e., when turned on, they look to link to any network they can find). Smart materials or material with special purpose microstructures will be available. Engines having parts made from, or coated with, micro heat shields may run hotter and propel objects faster.

The merging of information technologies and positioning technologies. Witness the explosion in commercial applications since the introduction of the Global Positioning System. With that technology, cargo and its transport can be tracked, leading to better logistical control. Harbors and airports control traffic using GPS. Farmers plow and plant crops using precision GPS. By 2025, monitoring and analysis of much of human and environmental activity will contribute toward the transparency described above.

The merging of human-interface technologies with other tools and with our environment. Speaker-independent voice recognition will be available. You will be able to talk to and instruct a wide range of appliances, your computer, and controls that manage your work and home environments. Machines will have sensor devices that will change behavior according to perceived human biofunction readings; for example, your car may not let you drive it if you are too intoxicated.

The merging of miniaturized power source technology with microelectromechanical devices. MEM devices will have embedded power sources allowing sustained stand-alone performance. Consider, for example, a MEM transmitter-receiver and biosensor that operates in a remote area for a week or more, which today would require much larger devices requiring more energy.

The merging of biotechnology with microelectronics. MEM sensor devices have been fused onto insects. Soon the direct interface of microelectronics and animal or even human tissue will be possible. Sensing and detection of the environment (biotoxins, pollution, and so forth) will be linked to the automatic transmission of data. It will no longer be a matter of science fiction on the one hand, or philosophical abstraction on the other, to say that humans and machines co-evolve.

Complexity Theory and Interactive Technological Systems

● Complex systems theory will significantly alter how we view and interact with the world. We will arm our computers and information technologies to use complexity theory to conceptualize the world in a more global, ecological, and dynamic perspective. Today we look more toward nature and naturally occurring complex systems to garner ideas about how to solve a variety of problems–e.g., ecological problems and network security problems. We now use the term "biomimicry" for the process by which ideas are obtained by imitating nature. Complexity theory is too new to know what its full implications may be, but it is already having a major impact on interdisciplinary studies. Some indicators are as follows:

–Adaptive agents are being developed. Adaptive agents are entities that exist in a computer that imitate human agents in some limited form. Computational genetic algorithms will be used extensively to explore or to solve a large variety of problems–from controlling electric and gas distribution systems to analyzing the effect of natural disasters on an economy. Computer programs that use genetic algorithms to create software that can solve problems better and faster than traditional programs have already been developed. In the future we may use software based on genetic algorithms to fly airplanes. New computer architectures will be developed based on human brain functions. Computer architectures that take advantage of the sort of parallelism characteristic of neurological functions in the brain have already been developed, and research is likely to lead to more human-like capabilities.

–Adaptive agents, or "knowbots," will garner any unprotected information we need on any network. The universal access to information, particularly tailored information, will create the need to maintain a robust monitoring of world developments. Complex Adaptive Systems theory, a subset of complexity theory, is being used to model social interactive systems. We are already developing land warfare models that simulate the interaction of enemies with specific characteristics. By 2015 we might have the prototype of a reconfigurable networked multisensor weapon system that adapts to enemy tactics automatically based on use of adaptive agents.

Implications for National Security

Technology manifests itself in society less through its absolute capabilities than through its interaction with the complex human systems. So complex is this relationship that we do not even know the specific course on which our own technological innovations have launched us. However, we can point out the issues and debate the environment that we will likely face within the next 25 years.

Anonymous intimacy will deepen because of globalized information.

● Technology will allow the typical Internet user to connect to the Web by "mouth and ear" in addition to "touch and sight." Any question in any major language may be met by an answer. Through artificial intelligence and adaptive agents the context of any question (and thus how to frame the answer) will be known automatically. This capability allows anyone anywhere to gain access to knowledge that can be used to the benefit or detriment of anyone, any group, any country, or to humanity as a whole. Global interconnectedness will give more people access to more information than ever before, aided by knowbots and high-accuracy universal translators; faster processors will give them new ways to work with it, as well. Among other things, this suggests a growing gap between those few individuals who can afford and use the technology and the mass of the world's population with limited access to it.

● The real world is becoming more intimate via the virtual world. Individuals will be linked to cyberspace through eyeglass attachments. Further linkages directly into their eyes, with contact lenses for example, are theoretically possible. By such means, direct sensor information (e.g., infrared, ultraviolet, light polarization) may be fused directly onto the visual sense, of which aviation head-up displays are but a simple precursor. At the same time, machines will become more sensitive to peoples' faces, the timbre of their speech, and their gestures. Some people will not like the results, but others may see in them a means of limiting still further interactions with other human beings, thus reifying class structures as well as educational and linguistic boundaries among social groups. For those who like human contact, the ability of computers to render others beyond arm's reach increasingly more vivid (e.g., as with very high-quality videophones with pheromones) may heighten the impact of virtual communities formed by those of similar social or ethnic background (e.g., the Kurdish or Armenian diasporas) or of similar interests (from animal rights activists to coin collectors). Obviously, some virtual communities will have more political content and salience than others.

● The uses to which we put information are difficult to foresee. On the one hand, the most commercially successful enterprise on the World Wide Web right now is pornography. On the other hand, there are indications that people are using the Internet to process information and solve problems in new ways. The global information network suggests many implications for improved intelligence, C^4ISR, knowledge management, training, and education of both the populace and the military.

Trustworthiness cannot be assumed in cyberspace.

● Technology could facilitate the spread of false images and information, while culture and governance will probably try to restrict access to personal data. There will continue to be competition between transparency and privacy, with technology serving both sides. Global interconnectedness, sensor technology, and improved information technology will increase the amount of information available on each of us, inevitably facilitating the misuse of it by some. Information networks will continue to be targets. So far, the attackers of such networks have yet to cripple a major system, but the battle is intensifying and the ability to hack into networks has been democratized. In 1999, over 10,000 Web sites offered information to novice hackers. Many of these had downloadable programs that automatically probed for weaknesses in networks and common operating systems such as Windows NT,

Windows 95/98, IBM's OS2, and UNIX. The ability to write computer code is no longer a prerequisite to perform mischief. The complexity of the systems involved makes accurate prediction impossible. The most exploitable element in networks and firewalls remains the procedures associated with user access codes. Biometrics will improve the security of user access codes in the future through user specific biological data.

● Total information security is not possible and global use of encryption will be limited by standardization protocols and government regulations. While encrypted communications may become the norm, it is unlikely because the impact of high encryption on overhead cost in money and efficiency, and the ability of high-end computers to crack low-end encryption, makes regularized encryption cost more than it is worth. Theoretically, the advantage lies with encryption; practically speaking, it may not.

In a transparent world, attempts to dominate neighbors through heavy metal face long odds.

● The winning edge of a modern conventional military may have shifted from the ability to mobilize forces, through the ability to mobilize fires, and on to the ability to mobilize information. The US military is on a course to being able to detect and defeat armored invasions within days using standoff fires. Better standoff weapons are in the cards. Even short-range missiles will improve range, accuracy, and guidance, which will increase the probability of target kill.

● Increased reliance on space systems is likely to create both new vulnerabilities and opportunities. Space offers an arena of international cooperation, but it also risks proliferation of technology. Placing weapons in space will be increasingly likely. If a gram can be put into orbit for one dollar rather than 10, then space-to-ground munition rounds may become cost-effective. Oft-touted ground-targeting lasers, high-power microwaves, and neutral particle beams are also possible. They offer near zero time between spotting and hitting a fleeting target, but they must be fielded in constellations to be in position when fleeting targets show up and atmospherics impede their use. Space weapons can also be provocative; it does not take much imagination to get the sense of foreboding that would come with looking up and constantly seeing enemy spacecraft that could kill you with absolutely no warning.

● Even without space weapons, supporting investments (e.g., sensor-to-weapon linkages) should take the US ability to halt "heavy metal" incursions from the calculus of warfighting toward the realm of conventional deterrence. Like nuclear war, conventional war as we have known it may be planned in total seriousness but without real expectation of being used. Unfortunately, the same logic puts the large ceramic, steel, or titanium boxes that US forces now field in similar peril. Precision guided munitions are proliferating. Commerce supplies most of the information technology behind observing, orienting, deciding, and coordinating actions, which are therefore available to anyone and for less money with every passing year. Stealth helps but it is expensive and therefore likely to be used for only a few platforms. Moreover, because anything that moves must disturb its environment, current stealth technology must ultimately fail before continual and exponential increases in the ability to collect and correlate data.

Future technologies may not prevent natural disasters.

● The impact of environmental degradation on international security depends on how people react to that degradation. The prospect of water shortages in India or China—both expected to be armed with nuclear-tipped ICBMs—may impel each to seize water-rich areas to their north. Just as likely, however, it may induce them to institute long-range planning to lower water usage and ease peasants from agriculture to urban occupations. Or it may provide the impetus for lacing Asia with water pipelines, thereby increasing mutual interdependence and inhibiting conflict.

Even with mediating technology, resource depletion and environmental degradation may increase the frequency and intensity of conflict. Purely natural disasters (e.g., Hurricane Mitch) could, in and of themselves, touch off a large exodus from affected areas that, in turn, destabilizes the broader region. A city used to absorbing 100,000 migrants a year may cope; one that sees little movement in a decade and then suddenly a million migrants after a drought may not. State failure brought on or exacerbated by disaster may complicate US efforts to combat organized crime or terrorism. For instance, disasters that force victims up against or across borders may increase international tension. Further pressure to migrate to the United States (or to its allies) would be a national security issue on its own.

● Environmental consciousness is already affecting the US military, which is not only responsible for remediating the effects of its own facilities but also using environment-friendly ammunition (e.g., replacing depleted uranium rounds). Meanwhile, potential opponents have shown a willingness to use environmental pollution as an offensive weapon—as when Saddam Hussein used oil fires to pollute the land and sea environment in Kuwait in February 1991.

To find the next apocalypse, think bugs, not bombs.

● Biotechnology holds great promise but also great risk. While there is no classic military use for biological weapons, they could be used by terrorists. A biological pathogen could also be released inadvertently. Biotechnology and the specter of cheap Weapons of Mass Destruction bring an increasing imperative to a search for new means of prevention or, lacking that, an appropriate defense. In the event of failure to prevent their use, a robust consequence management system is necessary.

● Weapons of Mass Destruction will become more easily available. Current biological weapons pose a special limited threat because they can be produced cheaply and without the level of expertise required for nuclear devices. They are also more difficult to keep outside our borders. The good news is that biotechnology may offer some antidotes and shields, and MEM technology is being directed toward defensive measures. One danger of which we must be aware is that the successful use of WMDs against a population center will likely create effects, such as panic and shock, disproportionate to the casualties it causes. Such an event could trigger changes beyond our ability to control. Consequence management needs to be carefully considered.

● More apocalyptic is the problem of a genetically engineered product—weaponized or not. Highly virulent, infectious, and "contagious" germs with long-latency and multiple drug-resistant characteristics could be developed. More sophisticated genetic weapons could also be constructed that selectively target plants or animals, including humans, with specific genetic traits. Whether such "bugs" were released on purpose or by accident may, in the end, be irrelevant. ●

The AN/APN-241

The best military airlifter radar for the toughest missions.

The AN/APN-241 navigation and weather radar supports all-weather, precision airdrops for the most challenging missions. Its unique high-resolution ground mapping and advanced weather and wind-shear prediction capabilities also guide aircraft to safe landings under adverse weather conditions. Even when navigation aids are limited, or unavailable. Operational with the USAF since 1993, the AN/APN-241 has successfully demonstrated its performance during the most demanding international peace-keeping missions. This compact, lightweight system can be installed in the C-130 or other airlifters in a matter of hours by your maintenance personnel. The AN/APN-241 is the clear choice for airlifter radar retrofit programs worldwide.

Northrop Grumman. The right technologies. Right now.

C-130

NORTHROP GRUMMAN

Industrial Associates

Listed below are the Industrial Associates of the Air Force Association. Through this affiliation, these companies support the objectives of AFA as they relate to the responsible use of aerospace technology for the betterment of society and the maintenance of adequate aerospace power as a requisite of national security and international amity.

3M/Federal Systems Dept.
AAI Corp.
Advanced Technical Products
Aerojet
Aerospace Corp.
Aerospatiale, Inc.
AIL Systems Inc., a subsidiary of Eaton Corp.
Alliant Techsystems, Inc.
AlliedSignal Aerospace Co.
Analytic Services, Inc. (ANSER)
Anheuser–Busch, Inc.
ARINC
Astronautics Corp. of America/Kearfott Guidance & Navigation
AT&T Federal Systems
Atlantic Research Corp.
Autometric, Inc.
Barber–Colman Aerospace & Power Controls Div.
Battelle Memorial Institute
BDM International, Inc.
Bell Helicopter Textron
Betac Corp.
Blue Chip Computers Co.
Boeing Co.
Boeing Defense & Space Group
Bombardier Inc., Canadair
Booz•Allen & Hamilton Inc.
Bose Corp.
British Aerospace, Inc.
Brown & Root Services Corp.
BTG, Inc.
Burdeshaw Associates, Ltd.
C3I
CACI, Inc.–Federal
Canadian Marconi Co.
Cessna Aircraft Co.
C.F.C. Reclamation
Charles Stark Draper Laboratory, Inc.
Cobham plc
Coltec Industries, Inc.
Computer Sciences Corp.
Computing Devices International
COMSAT Aeronautical Services
Contraves, Inc.
Cubic Corp.
Cypress International, Inc.
Daimler–Benz Aerospace of North America
Datatape, Inc.
Derco Aerospace, Inc.
DFI International
Dowty Aerospace
DRS Military Systems
Dynamic Concepts, Inc.
DynCorp
Eastman Kodak Co., C&GS
ECC International Corp.
EDO Corp., Government Systems Div.
EDS
EFW, Inc.
EG&G Defense Systems Group
E.I. du Pont de Nemours & Co.
Electronic Warfare Associates
ESCO Electronics Corp.
Evans & Sutherland
Exide Electronics
Firearms Training Systems, Inc.
FLIR Systems, Inc.
GE Aircraft Engines
GEICO
General Atomics
Gentry & Associates, Inc.
Georgia Tech Research Institute
Greenwich Air Services
GTE Government Systems Corp.
Gulfstream Aerospace Corp.
Harris Electronic Systems Sector
Harris Government Communications Systems Div.
Harris Government Support Systems Div.
Honeywell, Inc., Space and Aviation Control
Howell Instruments, Inc.
Hughes Space and Communications
IBP Aerospace
IMI Services USA
IMO Industries, Inc.
Information Technology Solutions
Ingersoll–Rand Co.
Innovative Technologies Corp.
Intergraph Corp.
Interstate Electronics Corp.
Israel Aircraft Industries International, Inc.
ITA Corp.
ITT Defense
Jane's Information Group
JGW International
Johnson Controls World Services, Inc.
Kollsman
Lear Siegler Services, Inc.
Litton–Amecom
Litton Applied Technology
Litton Data Systems
Litton Guidance & Control Systems
Litton Industries
Litton PRC
Lockheed Martin Corp.
Lockheed Martin Corp., Aeronautics Sector
Lockheed Martin Corp., Electronics Sector
Lockheed Martin Corp., Fairchild Systems
Lockheed Martin Corp., Federal Systems
Lockheed Martin Corp., Information & Services Sector
Lockheed Martin Corp., Space & Strategic Missiles Sector
Logicon, Inc.
Logistics Management Institute
Lucas Aerospace Inc.
Lucent Technologies, Inc.
Management Consulting & Research, Inc.
Marconi North America, Inc.
Martin–Baker Aircraft Co. Ltd.
MITRE Corp.
Mnemonics, Inc.
Motorola Inc., GSTG
MTS-3, Inc.
NavCom Defense Electronics, Inc.
NCI Information Systems
Nichols Research Corp.
Nortel Networks
Northrop Grumman Corp.
Northrop Grumman, Airborne Ground Surveillance & Battle Management Systems
Novalogic, Inc.
Orbital Sciences Corp.
Pemco Aeroplex, Inc.
Perry–Judd's, Inc.
Per Udsen Co.
PRB Associates, Inc.
Precision Echo, Inc.
PricewaterhouseCoopers LLP
Racal Communications, Inc.
Rafael USA, Inc.
RAND
Rational Software Corp.
Raytheon Aircraft Co.
Raytheon Systems Co.
RECON/OPTICAL, Inc.
Reflectone, Inc.
Robbins–Gioia, Inc.
Rockwell Collins Avionics & Communications Div.
Rolls–Royce Inc.
Sabreliner Corp.
Sargent Fletcher, a Cobham plc company
Science Applications International Corp.
SDS International, Inc.
Sensis Corp.
Sikorsky Aircraft
Smiths Industries, Aerospace & Defence Systems
Space Applications Corp.
Spectrum Astro, Inc.
SPRINT, Government Systems Div.
Sun Microsystems Federal, Inc.
Sundstrand Aerospace
Sverdrup Technology, Inc.
Symetrics Industries, Inc.
Synergy, Inc.
TEAC America, Inc.
Teledyne Brown Engineering
Teledyne, Inc.
Teledyne Ryan Aeronautical
Telephonics Corp.
Textron
Textron Defense Systems
Thiokol Corp.
Tracor, Inc.
Trident Data Systems
TRW Space & Electronics Group
TRW Systems & Information Technology Group
Ultra Electronics
Unisys Corp.
Universal Propulsion Co., Inc.
USAA
UTC, Hamilton Standard
UTC, Pratt & Whitney
UTC, Pratt & Whitney/Space Propulsion Operations
Veridian
Virtual Prototypes, Inc.
Wang Federal, Inc.
Whittaker, Electronic Systems
Williams International
W.L. Gore & Associates

Masters of Airborne Video Technology & More.

IT'S NOT A COINCIDENCE THAT WE FLY ON 75% OF THE WORLD'S FIGHTER AIRCRAFT. OR THAT THE RELIABILITY OF OUR airborne video tape recorder systems dramatically exceeds the nearest competitor. Or that we deliver the lowest life-cycle costs in the industry. TEAC engineering developed the technology specifically for the harsh cockpit environment. We didn't convert a living room VCR or a consumer video camcorder. TEAC engineers specifically developed our Hi-8mm technology for the harsh operational environment of fighter aircraft. And since we own our own technology, we guarantee production, configuration control, spares and logistics support for the life of your program. In airborne video, if it's worth a mission, it's worth a TEAC.

TEAC®
AIRBORNE PRODUCTS DIVISION

TEAC Airborne Products Division 7733 Telegraph Road, Montebello, CA 90640 (323) 727-4866, Fax (323) 727-7621 Web site: www.teac.com E-Mail: airborne@teac.com

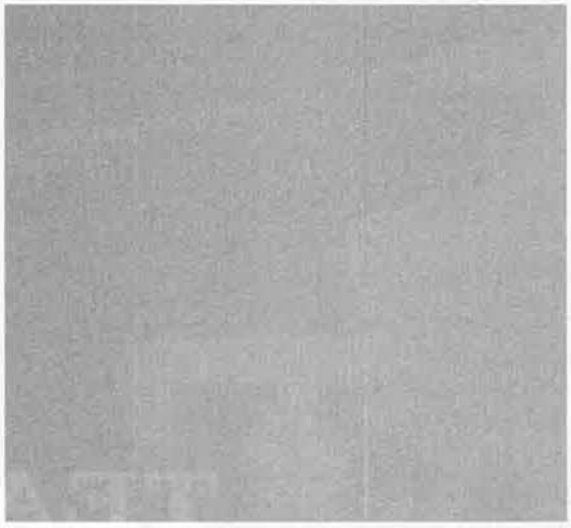
The Senate Appropriations Committee chairman talks about Kosovo, airpower, missile defense, cyberwar, and more.

Stevens ON DEFENSE

Sen. Ted Stevens, Republican of Alaska, chairs the full Senate Appropriations Committee and its defense subcommittee—the panel which actually funds for Pentagon activities. Stevens, who came to the Senate in 1968, met with the Defense Writers Group July 1 in Washington, D.C. Following are excerpts from the answers to questions asked by reporters.

Birth of a Commitment

"Clearly I expect an expanded Bosnia–Kosovo type of command structure that is going to be our basis for our consolidation of that peacekeeping effort and it is going to go on and on. I don't think anybody believes we can leave Bosnia now without that conflict erupting again. I think we are going to be in Kosovo for a substantial period of time. It remains to be seen whether we really get the commitment from the European Allies to be there and to gradually replace us and let us get out."



The B-2s: Great Job, But ...

"It [the B-2] did a wonderful job [in Operation Allied Force], no question about that. It did the job it was built for and it did it well. The largest percentage of the smart bombs that were dropped were from that platform, ... but I don't see reopening a B-2 line right now because there are so many other things that have the higher priority than that right now.

"I disagreed with the decision to limit the production line, there is no question about that. ... I would feel better for the future if we had more, but I don't put that as the No. 1 priority. ...

"We need something to replace [the Navy EA-6B Prowler standoff jammer]. We now know that [the Prowler fleet] is not totally sufficient, what they gave us. We need more than that for the future and that is what we are off on now. ... The Air Force is going to get a lot of procurement, but they are not going to get so much as to open up the B-2 line. The Army needs some and the Navy needs some and by God the Marines certainly need their new systems, too. ...

"I don't think we can afford to go back and open up the line and build more B-2s. We should be looking at the follow-on to the B-2 and I think we are."

The Decisiveness of Airpower?

"I am a pilot. I have always thought it would not be possible to end an engagement [with airpower alone]. But you've got to remember: We never had an engagement. They [Serbian forces] never came to war with us. We just bombed the hell out of them until they signed an agreement. We had 780 million people [the combined population of the 19 NATO nations] attacking 20 million [in Yugoslavia] and they finally came to their knees after we bombed for four months. What is the precedent out of that? There is no precedent out of that. ...

"I guess if you can find another country that is located like Serbia, where it was completely surrounded by people who were friendly to us, where we would have free access to it all the time, I guess you could bomb almost anyone into submission."

Guard and Reserve Stopgaps

"The only thing I think that might reduce those costs [of Balkan duty] is if we are able to get to the point where we can roll in the National Guard and have them have their annual duty there. ...

"I don't think we'd reach that way for some period of time because those [Guard and Reserve] people, while they are good, they are not trained and ready to take over in a place that is liable to erupt overnight. ... There is still potential for substantial eruption there, and, if it happens, our people are going to be right in the middle of it. I would say they would keep their top line forces there for some period of time. I don't think we have the cost yet, the total cost of what we've been involved in so far in Kosovo."

Reversing the Defense Decline

"I think a lot of people forget that defense gave at the office and gave at home already. If there is to be any further reallocation of money [within the federal budget] it has got to come to defense now.

"I've got some figures ... just to remind you. The [Fiscal] 2000 appropriation, in constant dollars, is 37 percent below the 1985 bill. We had a peak of procurement in 1985, and this year we are down to the point where we are 40 percent below on procurement. We have put $2.1 billion in the defense request for research and development; we now have $36.4 billion there. But that, too, is 25 percent less than the highest one, which was 1987. O&M [Operations and Maintenance] now is 21 percent below that high year, which was 1985.

"If you look at that, that is just the surface of it. If you look at the buying power now of defense dollars, it has eroded. There is not as much competition out there. As a matter of fact, there is not enough production effort out there, on an industrial basis. It has shrunk. And we have all of these new costs that we didn't have in those days, everything from health care [to] environmental compliance requirements. The total overhead of the defense budget has increased."

Guns vs. Butter Debate

"Currently [in the US public] there is not the balancing of priorities now between defense and all of the new things that our voters want to see us do. I think when we get the public at large, there are not as many women who support a national defense budget now as men. I really think there is a gender gap in the support for the large expenditures that are necessary to modernize our force. I personally get more questions from women saying, 'What do you spend all that money for? We have enough. We don't need any more military.' That is not true, if we are to prepare for the threats that we see over the horizon in this new millennium."

"Starving" the US Military

"Defense goes into the period of a balanced-budget era starved. If we are going to have a modernization take place, we are going to have to have an increasing budget. ...

"We've come through an Administration that came into office hating the military and suddenly going out and trying to look like it was the military hero. As a practical matter, it [the military] has been starved during the Clinton Administration. I don't think anyone can say that Bush and Reagan left the Defense Department on its knees, but it is crawling along now, that is for sure. People don't realize that."

Need for Modernization

"[Was] somebody around when we fought the fight to keep the C-17? Three times in three conference committees, [members of Congress] ... said they were going to kill the C-17. And three times Dan [Sen. Daniel K. Inouye, Democrat of Hawaii and ranking minority member of the Defense Appropriations Subcommittee] and I said, no, it is not going to happen. When we get to a period about midpoint 2006—right around there—that is our only transport.

"The problem is we have not made the long-range decisions we need to make to assure that there is continuity of a military capability."

Military Geriatrics

"[USAF F-16s] were built a long time ago and there is no visible replacement available. ... My point is, you can say that about almost every weapon system we've got. Go back to the main battle tank. Whatever you want. The Navy fighters. The same thing. We are in the situation now where almost every system we have is subject to the attrition of age. We can't replace them that fast. ... I don't think anyone has really given us a total study of that, but I think there is an attrition rate here that almost exceeds our replacement rate today and across the board. I am not going to single out fighters and say that is the Achilles' heel. Our Achilles' heel is age, period, of our military systems."

Troops Being Run Ragged

"We still have people in Haiti. We have still got them in Iraq and Kuwait and Saudi Arabia. My God, the largest air base we have got in the world is Sultan [Prince Sultan AB, Saudi Arabia]. They are still guarding the Saudis and the Kuwaitis, and we've still got people in Somalia. We've still got a semialert in South Korea, and we've got forces afloat now.

"I was talking to the Navy; they have had a higher level of sea duty in this period we've just been through than in any period of their history. You can't just look at the front page costs; look at the routine drudgery deployments that we've got."

National Missile Defense

"I am glad to see they [Clinton Administration officials] are spending the money Congress insisted that they have [for National Missile Defense]. They didn't request that money. We are spending more money on National Missile Defense and we've had a success, which was welcomed. Beyond that, we are clearly far behind the curve on National Missile Defense.

"I am going to Alaska now with two of the National Guard Bureau people. They will run the National Missile Defense system, as you know, and in all probability, that system will be in Alaska and North Dakota or one or the other. We don't know that yet. That has yet to be decided. But we are clearly on a course now to achieve the goal, provided the Administration doesn't get us so painted in a corner that we can only deploy a National Missile Defense with the Russians' consent. That is the big holdup there. I don't think the [1972 Anti-Ballistic Missile] Treaty ought to bar our proceeding with defense against the new threats against the United States, which are not of Soviet or Russian origin."

NMD Deployment Decision

"He [President Clinton] is required to make that decision [the decision next June on whether or not to proceed with deployment of an NMD system]. ... I don't think it is going to be a blip on the screen in the [2000] election because I don't think it has reached a point where ... it will become political [unless] the Administration puts so many caveats on it pertaining to Russia's agreement that they make it into a political issue. ...

"He could say no, [but] I don't see anyone today who is involved in the national scene that would say we do not need a national defense system."

Specialized Army Peacekeepers

"I think it is probably time that we put a portion of the Army into peacekeeping training, if this is going to be our national function. And if we are going to do that, [we] have to have more people. I think [Gen. Eric K.] Shinseki [the new US Army chief of staff] is right about the end strength; it is too low."

Warriors, Not Peacekeepers

"We continue to train people ... for combat. ... They are warriors, and we end up putting them at intersections in Haiti, the Balkans, Kuwait, and now Kosovo. We don't need those kind of people trained for peacekeeping forces. We ought to stand back and say, 'If the Army is going to do it, whoever is going to do it, let's train some people to be peacekeepers in the sense of being able to carry light arms and be able to defend themselves and be on the streets of Kosovo and Bosnia and Haiti and wherever the hell they want to put peacekeepers.' "

Military Morale Problems?

"I think the morale is going down now [among] people who believe that their job is warfighting. They have trained as warfighters and they end up by being peacekeepers, whether it is on the Sinai desert or wherever they are. The major emphasis now is on peacekeeping concepts. I am not saying that is all bad. I think if you prevent wars—ultimately, big wars—the policy is a success. ... Should we try to develop another entity which will be the peacekeeping people that we deploy, instead of military people? Obviously that is not going to happen, and so I think we ought to really start thinking about training peacekeepers within our system. ...

"We really don't need the guys who are Rambos walking around the streets of Bosnia and Kosovo. And they are not just guys anymore. Some of the women are just as great warriors as the men. But it is a warrior force, and I don't think they trained for this, but it is obvious now that in my opinion they should start training people for that duty. ... Everyone will tell you when you bring them back, you've got to put them into retraining. They are not ready for what they are on duty for."

Revisions to the ABM Treaty

"The ABM Treaty was written at ... the height of the Cold War between the Soviet Union and the United States. It was not written keeping in mind what do you do about cruise missiles and smart bombs that can carry chemical warfare [weapons], biological warfare [weapons], as well as nuclear weapons. I think the threats in the world are much different, now that the Soviets are gone, and we ought to have a new look at what we really need in terms of a worldwide agreement. ... I really don't see that this now ancient treaty ought to be a stumbling block for our being prepared for the next millennium. It is an interesting piece of paper, but that is what it is to me right now, a piece of paper. It has no real meaning except vis-à-vis the Russians. And that is not the threat that I see. On my screen it is not a threat."

Needed: Conventional Forces—and More

"We may be going into a new era [in which] the real threat against the United States is cyberwarfare, chemical warfare, biological warfare, and we are not really geared up for that yet. ...

"We are getting more costly fighters, more costly bombers, more costly submarines, more costly aircraft carriers. Those traditional means of defense—we are going to need them. There is no question about that, but I am not sure that is the total that we need. I really think these new areas of threat are going to require some substantial expenditures, particularly chemical and biological, and I don't know if anyone has decided where the cyberwarfare defense systems should rest. I am not sure if it would be a DoD cost."

Wars of the Future

"If you examine the wars of the past, the costs of the aggressor were normally greater than the defender and the damage was really proportionate almost to the force. If you look at the future, the cost to the aggressor is infinitesimal, [compared] to the costs of the defenders because of the specter of weapons of mass destruction. ...

"I do think we are going to have detractors out there and that they are going to be capable, at very little cost, of causing sizable damage within our own country. We used to talk about the probability of an attack against our shores again. This is not something anyone has nightmares about now. The nightmares are about the people who come into the country with substances or systems that can cause severe harm to large areas, and we have to find ways to defend against that if we are really preparing to have the defense our people will need when that materializes. I don't think it is that far away. I really don't." ■

FAIRCHILD DEFENSE: Provider of Avionics Solutions for Upgrades and New Military Vehicles

• Mass Memory Unit

• Fibre Channel Data Transfer Equipment

• High-Speed Solid State Recorders

• Modular Integrated Processors

• Data Voice/ Video/Solid State Recorders with PCM-CIA

• Digital Moving Map

• Mission Planning and Training

Orbital

FAIRCHILD DEFENSE

Seventy-five years ago this month, Army Air Service biplanes touched down in Seattle after circumnavigating the Earth.

Around the World

Among the airmen who attempted the first around-the-world flight were (l–r) TSgts. Arthur Turner and Henry Ogden; Lts. Leslie Arnold, Leigh Wade, and Lowell Smith; Maj. Frederick Martin; and SSgt. Alva Harvey.

By C.V. Glines

It has been 75 years since eight daring men of the US Army Air Service, flying in four single-engine, open-cockpit biplanes, took off from a lake near Seattle for a flight around the world. It was to be an ultimate test. If successful, it would stand as a historic milestone for aviation and especially for the young US flying service.

Early 1924 was a time of frail airplanes built of wood, wire, and cloth, with uncertain engines and wooden propellers. There were few instruments, and airports were mostly farmers' fields. Immediately following World War I, there had been a spirited national debate about the future of the armed services, which was resolved with the passage of the National Defense Act of 1920. It provided for a Regular Army, National Guard, and the Organized Reserves. It established the Air Service as a combatant arm of the Army.

The Air Service pilots who remained in uniform were encouraged to show that airplanes had a vital role in national defense. They began setting altitude, endurance, and speed records and were the first to cross the nation in less than a day, refuel in midair, and fly nonstop across the country. Each flight was

carefully planned and, although there were failures, the successes were newsworthy and expanded the range of possibilities for the airplane.

The announcement by the Air Service that eight of its airmen would attempt a round-the-world flight captured the public's attention.

Planning Begins

Maj. Gen. Mason M. Patrick, Chief of the Army Air Service, authorized his staff to begin intensive planning for such a world flight in the summer of 1923. There were scoffers who said it couldn't be done; others said that, if it were attempted, it certainly should not be at government expense. The obstacles to be overcome were formidable. Extremes in climate and the lack of facilities for aircraft posed the greatest threats to success.

The preparation was the most thorough that the Air Service had ever undertaken for a single mission. Working under then–Lt. Col. James E. Fechet (later Chief of Army Air Corps) was a 10-man committee headed by Lt. Robert J. Brown. Four basic decisions were recommended. Five two-place, open-cockpit biplanes with interchangeable wheels and floats should be built to Air Service specifications. One would be a prototype for testing, and four would actually make the flight, to improve the likelihood that at least one would succeed.

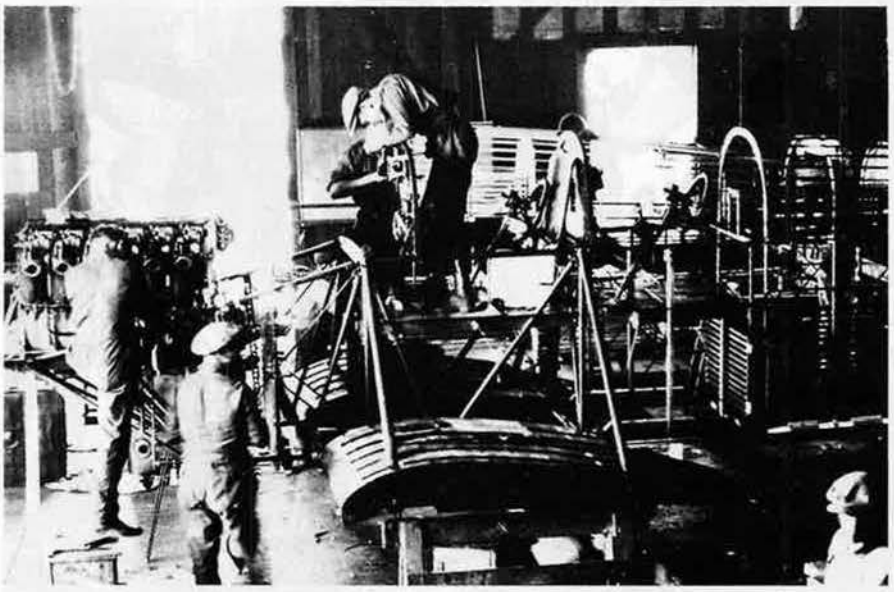
Second, it was decided that, with an early spring 1924 departure, the crew would fly westward to fly the safest route available. By flying against the prevailing winds, they would traverse Alaska before the arrival of intense spring fogs, advance through Japan and China ahead of the typhoon season, miss the monsoons in Burma and India, and cross the North Atlantic before Arctic winter weather arrived.

Third, other government agencies should be asked to support the effort. The State Department had to exert extensive diplomatic effort to arrange for visas and overflight permissions. The Navy, other Army branches, the US Coast Guard, the Commerce Department, the Aeronautical Chamber of Commerce, and American companies located in the

countries to be visited were to be asked to support the effort logistically and stand by for search and rescue assistance.

Last, the eight fliers were to be the most experienced Air Service airmen available, preferably experienced in long-distance flying. They would have to take training in operating seaplanes and be able to perform their own maintenance throughout the flight.

All recommendations were approved by the War Department by the fall of 1923. Lt. Erik H. Nelson drew up the specifications for the five aircraft, and Donald W. Douglas, a young aircraft manufacturer of seaplanes in Santa Monica, Calif., agreed to make them, based on his Navy DT-2 torpedo bomber but with significant changes for long-range operation.



The airplanes, called Douglas World Cruisers, were to be dual-controlled, have gas capacity increased to 644 gallons for a range of 2,200 miles, have a larger radiator for the 12-cylinder water-cooled 420-hp Liberty engine, increased rudder surface, strengthened bracing, increased upward visibility for the pilot, and the mechanic's seat in the rear moved closer to the pilot. They would each have engine instruments, altimeter, turn-and-bank indicator, drift indicator, and compass but no radio.

Preparing the Route

The route selected went from Sand Point on Lake Washington near Seattle through the Aleutians, across the Pacific to Japan, down the China coast, west to India, through the Middle East, across Europe and the Atlantic, and back to Seattle via Washington, D.C. The route was divided into six segments. Advance officers were assigned to inspect and set up the facilities for the airplanes' arrival at 68 locations. Aircraft parts, engines, and replacement wheels and pontoons were to be procured and placed in appropriate locations.

Capt. St. Claire Streett, who was responsible for the route planning, pored over maps and weather charts in Washington while Lt. Clarence Crumrine spent the summer and winter of 1923–24 exploring Greenland, Iceland, and the Faeroe Islands for the trans-Atlantic hop. Capt. Lorenzo L. Snow was assigned to make diplomatic arrangements. Lt. Clayton L. Bissell was the advance man for the flight from Seattle to Attu in the Aleutians. Lt. Clifford C. Nutt, was assigned to arrange for the Japanese stops, while Lt. Malcolm Lawton was responsible for the route through China and Southeast Asia to Calcutta, India. Lt. Harold A. Halverson departed to prepare for the segment from there through the Middle East. Maj. Carlyle Wash, assistant attaché for aviation in Paris, prepared for the European crossing.

Lts. Crumrine, Bissell, and LeClaire D. Shultz made preliminary arrangements for the trip across the Atlantic to Boston and Capt. Burdette S. Wright, the balance of the flight across the US to Seattle. They immediately departed for their respective areas. Maj. William R. Blair, Signal Corps meteorologist, began a search for worldwide weather information.

The other departments of government offered cooperation without hesitation. Despite the controversy over defense appropriations and the vigorous debate about the future role of the Army Air Service being stirred by Brig. Gen. William L. "Billy"

Top left, construction of the modified Douglas World Cruisers took place at Douglas facilities in Santa Monica, Calif. The aircraft were based on Navy torpedo bombers but received modifications for long-range operation. Above, near the end of the historic flight, the Cruisers fly over New York City Sept. 8, 1924.

Mitchell, deputy Air Service chief, the Navy furnished charts along coasts where water landings could be made and assigned ships to patrol positions along the ocean routes. The Coast and Geodetic Survey supplied maps of Canada, the Aleutians, and the Atlantic route. The Coast Guard and Bureau of Fisheries also assigned patrol ships along the Aleutians, and the National Geographic Society supplied additional regional information. Streett then prepared a detailed guidebook and maps covering the 28,000 miles of the planned route.

Personnel were selected based on recommendations from commanding officers throughout the Air Service. The leader chosen was Maj. Frederick L. Martin, 41, a Purdue University mechanical engineering graduate, then commanding the Air Service technical school at Chanute Field, Ill. Lt. Lowell H. Smith, 31, was recommended by Maj. Henry H. "Hap" Arnold. Lt. Leigh Wade, 27, who had trained with the RAF in Canada and had service in France, was the nominee from Bolling Field, D.C. The fourth pilot was Nelson, 35, a veteran of the 1920 flight to Nome, Alaska, and experienced in testing aircraft. The pilots then selected their "mechanicians." Martin chose SSgt. Alva L. Harvey; Smith selected TSgt. Arthur Turner; Wade chose TSgt. Henry H. Ogden (promoted to second lieutenant during the flight). Nelson requested Lt. John Harding Jr.

Building the Aircraft

During the winter of 1923–24, the pilots and mechanics stayed at the Douglas factory, monitoring the construction of the five airplanes. Nelson made several test flights in the prototype and recommended several minor changes to increase stability. He flew it to McCook Field, Ohio, and then to Langley Field, Va., where the pilots practiced operating with floats and took ground school courses in meteorology, navigation, and survival.

The crews returned to Santa Monica, tested the other four airplanes, and flew to Seattle, the official starting point, in mid-March 1924. There, they learned that Turner had a lung condition that disqualified him from flying. He was replaced by Lt. Leslie P. Arnold, 29, a pilot and mechanic. Meanwhile, 15 engines, 14 extra sets of floats, spare parts, and fuel were sent to advance positions in various parts of the world.

Enthusiastic crowds, like this one in Reykjavik, Iceland, greeted the aviation pioneers. Here,* New Orleans *is lifted from the water for an overhaul. It was still outfitted with pontoons which would be exchanged for wheels in Boston.

When the day of departure neared, the four airplanes were christened for American cities. Martin's airplane became *Seattle*; Smith's, *Chicago*; Wade's was named *Boston*; and Nelson's became *New Orleans*.

During this time of planning and preparation, the pilots of other nations were also attempting or planning to embark on world flights. British, Portuguese, French, Italian, and Argentine pilots announced their intentions to claim the coveted title of first to circumnavigate the globe. The press saw it as a race and began to follow the American preparations intensely. Some newspaper columnists predicted that none of them could win. The dangers were too great. Airplanes had not yet proven they were reliable enough to be operated over such long distances, especially over water, they said.

On the morning of April 6, 1924, the four rugged Douglas biplanes on pontoons lifted skyward and headed toward Alaska. The route took them northward to Sitka, Cordova, and Chignik, then westward to Dutch Harbor. However, Martin and Harvey, battling fog and high winds on the segment between Chignik and Dutch Harbor, became lost and crashed on a mountainside near Port Moller on the west side of the Alaska Peninsula. The Coast Guard immediately started a search.

Martin received minor injuries, but both managed to make a difficult 10-day hike to a cannery where they reported by radio that they were safe. They returned to the States on a fisheries steamer. Smith, next ranking man, was made acting commander and received orders at Dutch Harbor "to proceed to Japan at the earliest possible moment." The three remaining airplanes landed at Atka and Attu where they were delayed for several days because of the infamous Aleutian williwaws before continuing to Japan. Meanwhile, Navy ships carried fuel, spare parts, and supplies to the Japanese stops.

The three airplanes, en route to the Kuriles, had to deviate and land at Nikolskoye in the Komandorski Islands, forbidden Russian territory. Prevented from going ashore, they refueled from the US Coast Guard cutter *Eider* and continued to Japan where they made six stops and then three stops in China before proceeding to Hong Kong.

Ill Fortune for Some

While the Americans, favored by good planning and maintenance, were completing the first quarter of their itinerary, pilots of the other five nations were being defeated by inadequate logistics planning, poor maintenance, and accidents, so that all eventually failed in their quest to be first. As the World Cruisers edged into the tropics of Southeast Asia, engine problems developed and

Smith had to make a forced landing due to engine failure near Hue, French Indochina. A pre-positioned engine was brought from Saigon and installed. Pontoons still attached, the airplanes then made a risky shortcut flight over the impenetrable jungle of the upper Malay Peninsula from Saigon to Rangoon to save 800 miles.

During this southernmost part of the route, daily mishaps began to hound the crew members. At Rangoon, Arnold almost drowned, Smith collapsed from dysentery, and Nelson's airplane was rammed by a sampan. But these hindrances were overcome and the fliers continued to Calcutta by way of Akyab, Burma, and Chittagong, India (now Bangladesh), where the pontoons were exchanged for wheels. While in Calcutta, Smith also broke a rib when he fell into a hole.

Linton O. Wells, an Associated Press correspondent based in Japan who had been reporting the Pacific crossing, met the fliers in Calcutta. He was to return to Tokyo after the airplanes departed. However, Wells believed the big part of the story lay ahead and persuaded Wade to take him along so he could help by doing the injured Smith's work. He was not a stowaway as reported by some; permission had been requested from Washington but no reply had been received. Wade allowed Wells to squeeze in beside Ogden in the rear cockpit of *Boston* and flew from Calcutta to Karachi via Allahabad, Ambala, and Multan. It was a miserable flight in 120-degree heat and sand storms. At Karachi, a message was received denying Wells permission to fly in an Army airplane. By this time, all three airplanes needed engine changes which were made at a Royal Air Force depot by the Americans working 16-hour days.

The trio then flew to Chah Bahar and Bandar Abbas in Persia (now Iran) and Baghdad, Mesopotamia (now Iraq). Syria was next, then Constantinople (now Istanbul), Bucharest, Budapest, and Vienna. Although very exhausted by this point, the six fliers headed toward Paris to be there for the annual July 14 Bastille Day celebrations. Instead of rest, however, they had to attend luncheons, receptions, press interviews, radio broadcasts, autograph sessions, and an evening at the Folies Bergere where they all fell soundly asleep.

The Most Dangerous Leg

The Americans were escorted by French and English military and civilian airplanes on the next leg from Paris to London, where they stayed briefly before proceeding to Brough Airdrome on the Humber River near Hull. The next 13 days were spent changing engines and exchanging the wheels for pontoons. Meanwhile, the US Navy positioned several ships along a line from Scotland to Boston, considered the most dangerous leg of the trip.

The three airplanes left Brough for Kirkwall in the Orkneys where USS *Richmond,* the flagship of the armada, was waiting. Fog grounded the airplanes for several days, but when the weather was reported as favorable on Aug. 2, they took off together for Iceland, hoping to be able to remain in contact with the surface of the sea. But shortly after takeoff, they ran into a thick fog bank. *Chicago* and *Boston* climbed and came out on top, but Nelson in *New Orleans* nearly spun in when he lost control briefly. He recovered a few feet above the water and climbed to the top of the fog layer where he found himself all alone and continued to Iceland by dead reckoning.

Meanwhile, when Nelson was not sighted, Smith and Wade returned to Kirkwall to sound an alarm. Smith flew low over the town's main street and dropped a message:

Contact Richmond. Start search for Nelson.

The pair landed in the harbor to wait for word. Early that evening, a message arrived from Horna Fjord, Iceland:

Got into propeller wash and near tail spin Came out just above water past fog belt Arrived five thirty seven. Nelson

Wade and Smith departed for Horna Fjord the next day, but *Boston's* engine suddenly lost oil pressure between the Faeroe Islands and the Orkneys and Wade landed it safely. Seeing that Wade and Ogden were not injured, Smith decided not to land. He dropped a note to a Navy destroyer about Wade's landing and proceeded to Horna Fjord to join Nelson. Wade and Ogden spent about six hours drifting on a rapidly swelling sea. Their signal flares alerted a British fishing trawler and they were taken in tow until USS *Richmond* arrived. *Boston* was damaged during the trawler's tow and Wade and Ogden hoped they could repair it aboard *Richmond.* They drained the airplane's gas and oil, handed their tools to the deckhands, and climbed aboard. Wade described what happened next.

All Hell Breaks Loose

"We stood on the ship's deck [and] watched the crane swing over the side and drop its hook. ... The lift signal came and the *Boston* started rising out of the water. Then all hell broke loose. Five thousand pounds of

Flying* Seattle *in fog and high winds along the Alaskan peninsula soon after the around-the-world flight began, Martin (left) and Harvey crashed into a mountain and spent 10 days making their way back to civilization.

hoisting gear wrenched off its mooring and crashed down on the plane. The *Boston* was a broken mess."

When it was obvious that the airplane was so badly damaged it couldn't be repaired, Wade signaled to cut it loose and let it sink. "We bade farewell to our friend who had carried us so far around the globe," he said. "We headed for Iceland with heavy hearts."

Smith wired Washington about the loss of *Boston* while Wade and Ogden proceeded aboard *Richmond* to Iceland and then to Nova Scotia. *Chicago* and *New Orleans* flew to Reykjavik, Iceland, and Frederiksdal, Greenland. It was a harrowing 886-mile, 11-hour flight outside the shipping lanes and the naval escort. The last 300 miles were flown at wave-top level dodging mist-hidden icebergs.

President Calvin Coolidge (holding hat) and several Cabinet members greeted the world travelers when they stopped at Bolling Field, D.C. Shown (l–r) are Arnold, Ogden, Smith (shaking hands), and Wade. Although the* Seattle *and* Boston *cruisers were lost to accidents,* Chicago *and* New Orleans *are in museums today.

Chicago and *New Orleans* then flew on through fog and rain to Icy Tickle, Labrador. En route, *Chicago's* fuel pump failed and Arnold had to use the emergency hand pump for the rest of the flight. "I pumped until I thought I just couldn't pump any more," he said. "Then I'd look down at the cold water and start all over again."

Meanwhile, the prototype World Cruiser had been ordered to Pictou Harbor, Nova Scotia, and Wade and Ogden joined the other two airplanes in the hurriedly named *Boston II*. The three then proceeded to Mere Point, Maine, and Boston, where the pontoons were exchanged for wheels. Mitchel Field, N.Y., was next, then on to Bolling Field, where the crews were greeted by President Calvin Coolidge and Cabinet members.

After Washington, the three crews hopscotched across the country, stopping at 14 cities in nine states, where they were met by hordes of enthusiastic crowds. The reception at Santa Monica, home of the Douglas plant, was exceptionally vigorous and Wade received two broken ribs when an overeager greeter gave him a bear hug; it was his only injury on the trip.

This was not the end of the unprecedented journey since Seattle had been designated as the official starting point. The airplanes arrived there Sept. 28, 1924, 175 days after their departure. The official statistics show that two of the airplanes and their crews had flown 371 hours, 11 minutes, and covered 26,345 miles. They had flown over 28 different nations and colonial mandates and made 72 stops. In addition to being first to conquer the globe by air, the flight was the first across the Yellow Sea and first to cross both of the world's largest oceans during the same trip. A world orbit in an open-cockpit, single-engine airplane has never been duplicated.

Just as the men were honored for their historic aviation "firsts" during their lifetimes, *Chicago* and *New Orleans* have also been venerated. *Chicago* holds a place of honor in the National Air and Space Museum in Washington, D.C. *New Orleans*, formerly in the US Air Force Museum at Wright–Patterson AFB, Ohio, is now located at the Museum of Flying at Santa Monica, the birthplace of the five Douglas World Cruisers. ■

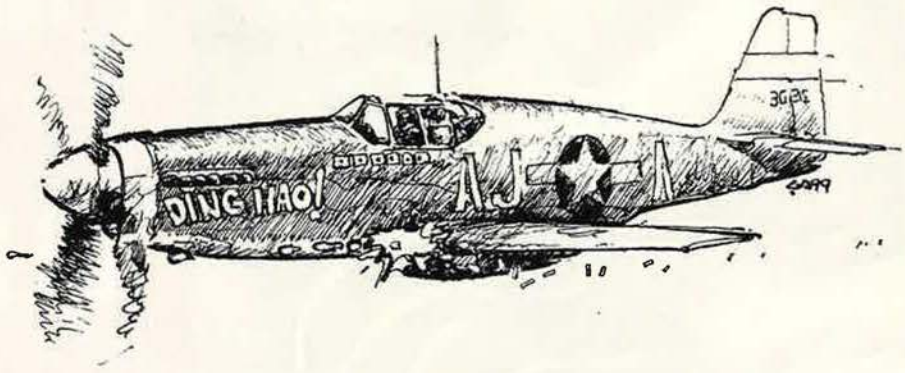
C.V. Glines is a retired Air Force colonel and longtime contributor to Air Force Magazine. *His 31st book, a biography of Col. Bernt Balchen, the famous polar aviator, will be published by Smithsonian Institution Press this month.*

Valor

By John L. Frisbee, Contributing Editor

One-Man Air Force

The odds against fighter pilot Jim Howard were 30-to-1 when he took on the Luftwaffe's best—and won.



WHEN James H. Howard arrived in China with Claire L. Chennault's American Volunteer Group, it was a homecoming of sorts. He had been born in China, where his father was an eye surgeon with the Rockefeller Foundation's hospital at Peking. Young Jim's 14 youthful years in the Far East were climaxed by an encounter with bandits while on a hunting trip with his father. Dr. Howard was captured and held prisoner for 10 weeks, but Jim, riding in another car, escaped.

Back in the States, young Howard graduated from Pomona College in California, became a naval aviator assigned to Fighting Squadron 6 aboard USS *Enterprise,* then resigned his commission in late 1941 to join Chennault. During the AVG's brief existence, Howard shot down six Japanese planes and was himself downed once by ground fire, again escaping capture by the skin of his teeth.

The AVG was disbanded in July 1942 to be succeeded by Fourteenth Air Force, and Jim Howard returned to the States to recuperate from dengue fever. A few months later, he was back in uniform, a captain in the Army Air Forces, assigned to the 354th Fighter Group as one of its two combat veterans. In the fall of 1943, the group moved to Boxted, England, and became the first AAF unit in the European theater to be equipped with long-range P-51 Mustangs. Although the 354th belonged to Ninth Air Force, it was under the operational control of VIII Fighter Command. Its job: long-range escort of Eighth Air Force B-17s and B-24s.

Less than two months after the 354th started flying escort, Jim Howard put on what retired Gen. T.R. Milton, then a lieutenant colonel assigned to the 91st Bombardment Group, describes as the greatest display of combat flying he witnessed during two tours in Eighth Air Force B-17s.

On Jan. 11, 1944, the Eighth sent three bombardment divisions against aircraft factories in the Brunswick (Braunschweig), Germany, area. While they were climbing up through 25,000 feet of solid overcast, the weather turned sour in England and the mission was recalled. The 1st Division, however, continued on toward its target at Oschersleben, about 100 miles west of Berlin, escorted by 50 of the 354th Fighter Group's P-51s, led by Maj. Jim Howard.

As the division, now in clear weather, approached its target, it came under exceptionally heavy attack by crack Luftwaffe day and night fighters concentrated for the defense of Berlin. Howard released squadrons and flights of his P-51s to defend the bomber stream while he climbed to meet attacks against the lead box of bombers. He immediately shot down a twin-engine Messerschmitt Bf-110 night fighter. After that initial engagement, he found himself alone, confronted by some 30 Luftwaffe fighters whose attacks were centered on the 401st Bombardment Group.

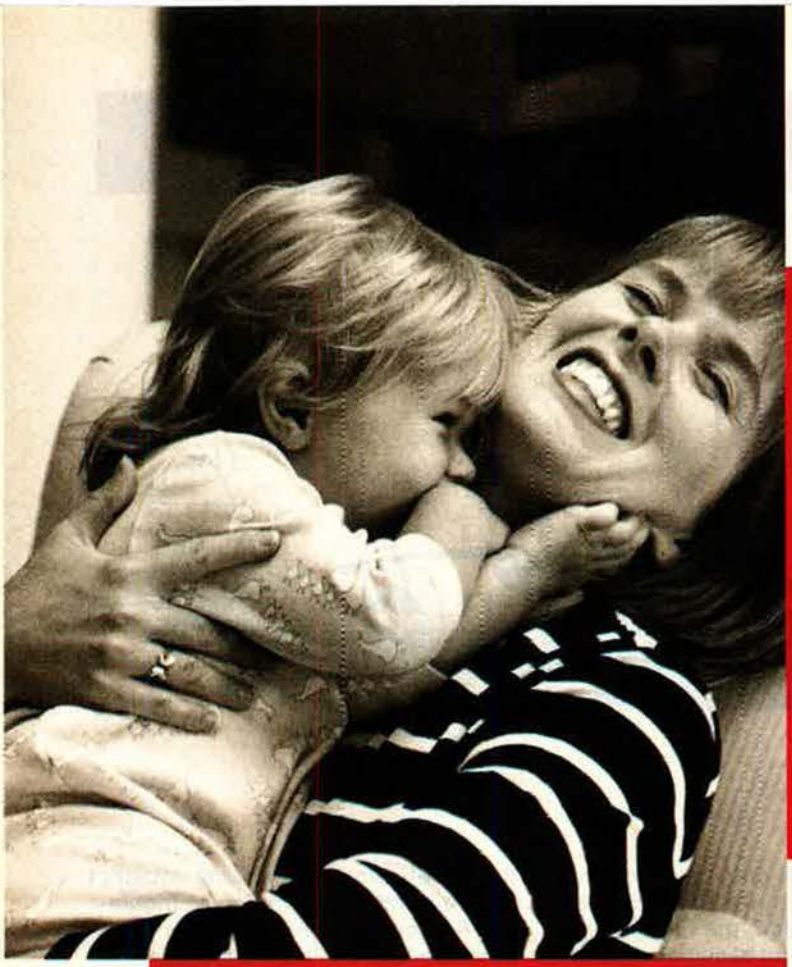
Rather than waiting to reassemble some of his P-51s, Howard took on the swarm of Bf-109s, FW-190s, and Bf-110s single-handed. In a violent, exhausting, climbing–diving melee that lasted for 30 minutes, he shot down three enemy aircraft, scored one probable, and damaged at least two others. Howard continued the fight until he was out of ammunition, then broke up enemy attacks on the bombers by diving at incoming fighters until his fuel was dangerously low and there were no more bandits in sight. By that time, the 401st had bombed its target successfully and had begun the long return flight to England. Not one of the group's B-17s was lost during Jim Howard's epic battle against overwhelming odds.

When Howard landed at Boxted, there was one bullet hole in the wing of *Ding Hao!*, his P-51, and that a stray .50 caliber from one of the B-17s.

The 401st Bombardment Group, whose crews were astounded by the skill and heroism of the "One-Man Air Force" who had defended them, finally ran down his identity and sent to Washington a recommendation for award of the Medal of Honor. Lt. Gen. Carl A. "Tooey" Spaatz, commander of US Strategic Air Forces in Europe, presented the medal to Jim Howard, the only fighter pilot in the European theater to receive the MOH.

Howard, an ace in China and again in Europe, later commanded the 354th, which led all fighter groups in the ETO with 701 aerial victories. After the war, the tall, quiet double ace formed his own research organization, later merged with Control Data. He remained in the Air Force Reserve, retiring as a brigadier general in 1966. ■

First appeared in November 1983 issue.



www.att.com/mil

Plan to stay united.

The Best Calling Card Plan For The Military.

AT&T global military saver plus

Our best military calling plan now joins forces with your long distance bill.

Here's a bit of good news for anyone in the military. Sign up for the AT&T **Global Military Saver Plus**[SM] Plan and all your AT&T long distance calls will be combined with your AT&T Calling Card calls on one monthly, itemized bill. Best of all, you can take the AT&T **Global Military Saver Plus** Plan with you when you go overseas. And you can receive a stand-alone bill if you prefer. Whichever way you choose, the plan works with an AT&T Calling Card to give you the lowest rates worldwide.* It's the easiest way to stay united, wherever the military may take you.

One plan. One world. One worldwide toll-free number to sign up: 1 800 551-3131, ext. 72256.

AT&T

*$3.00 monthly fee applies. To receive low rates, you must use **1 800 CALL ATT®** in the U.S. and **AT&T Direct®** Service when outside the U.S.

Recruiter's Best

(L–r) Birkholz, Thompson, Pliler, McCardell, and Bousson

This year's AFA Team of the Year Award spotlights the work of Air Force recruiters. In its quest to attract high-quality people, USAF faces serious challenges—competition from a red-hot civilian economy, lower propensity to serve among today's youth, and public concerns about service benefits and quality of life. As a result, Air Force recruiters find themselves playing a role more vital than ever in sustaining the force. Their goal in Fiscal 1999 was to bring in 33,800 new members—a tough task, given the range of serious problems they confront every day.

MSgt. Louis H. Birkholz, *128th Air Control Squadron, Camp Douglas, Wis., is a recruiter from the Air National Guard's Volk Field Combat Readiness Training Center, Wis. Birkholz averaged 3.6 accessions per month. He worked extensively with local media to spread ANG's story, obtaining airtime for free TV and radio public service announcements and ad space on 30 billboards. This work led to 42 enlistments in one year—staffing the unit to 108 percent.*

TSgt. Colette M. Bousson *serves with Air Education and Training Command's 341st Recruiting Squadron, Lackland AFB, Texas. Her management skills inspired her flight of rookie recruiters to exceed recruitment goals for Fiscal 1998. The flight produced five commitments to enlist in critical career slots, 15 referrals to officer accessions, and boosted minority placements into the Reserve Officer Training Corps.*

SrA. Carlos D. McCardell, *with AETC's 362nd Recruiting Squadron, San Diego, helped his flight in Fiscal 1998 earn first-time distinction as the top recruiting flight in the nation. His resourcefulness and drive netted 11 ROTC applications—the goal was only three. He also has never missed his Non-Prior-Service recruitment goal.*

MSgt. Gregory Pliler *serves with Air Force Reserve Command's 349th Air Mobility Wing at Hickam AFB, Hawaii. AFRC tapped him as the best line recruiter for Fiscal 1998. Pliler's efficiency and consistency enabled him to surpass his unit recruitment goal of 52 by 19 and Individual Mobilization Augmentee goal of seven by five. Out of his total effort, 37 percent were NPS enlistments attributable to his strong involvement with Junior ROTC units in his recruiting zone.*

SSgt. Larnell S. Thompson *is with AETC's 317th Recruiting Squadron, Portsmouth, Va. His emphasis on recruitment area canvassing brought in 39 percent of the unit's new business and visits to high schools and junior colleges, another 32 percent. Careful attention to applicants during and after recruiting produced a cancellation rate of just 5 percent, against the standard 14 percent rate. Thompson's work was key to the flight's selection as the squadron's best unit for four months out of 12.* ■

AFA and the Air Force recognize the best crews, aerial tactician, and crew chief for their 1998 accomplishments.

USAF's Best in Operations

Lt. Gen. Claire L. Chennault Award

Best Aerial Warfare Tactician

Capt. Eugene S. Anderson is flight commander and examiner and instructor weapon systems officer, 336th Fighter Squadron, 4th Fighter Wing, Seymour Johnson AFB, N.C. Anderson developed new F-15E tactics for attacking mobile Surface-to-Air-Missile sites, innovative fighter techniques for helicopter escort, and new techniques for smart weapons training and employment. While he was deployed to Turkey for Operation Northern Watch, he also devised a rapid targeting air campaign plan that tapped a range of possible combinations of air assets and thus allowed for various flexible punitive responses to Iraqi no-fly-zone violations.

Lt. Gen. William H. Tunner Award

Best Airlift Aircrew

When tensions escalated in Monrovia, Liberia, in September 1998, the crew of Shark-01, an MC-130H with the 7th Special Operations Squadron at RAF Mildenhall, UK, got into high gear. Their mission was to deliver a European Survey and Assessment Team to Freetown, Sierra Leone, for transfer to helicopters that would carry them to the US Embassy in Monrovia. The crew carried out the mission despite an extended duty day of 22 hours, overflight of seven nations, three en route stops, and dangerous weather that forced diversions from preplanned routes.

Crew members of Shark-01: Lt. Col. David H. Sammons; Majs. Thomas E. Bell and John J. Okrzesik; Capts. John C. Baker, Jesse J. Bourque, and Michael C. Fallert; 1st Lt. Paul S. Allen; CMSgt. Michael C. Jolly; TSgt. Ronald E. Grover; and SSgts. Gary L. Cline and Adam R. Wendel.

Gen. Curtis E. LeMay Award

Best Bomber Aircrew

Members of Slam-04 of the 28th Bomb Wing, Ellsworth AFB, S.D., made history Dec. 19, 1998, when they became the first B1-B crew members to drop conventional weapons in combat. The action came during Operation Desert Fox, the four-day raid on Iraqi targets. The crew was part of an integrated strike package (including Navy F-14s, F-18s, and EA-6Bs) whose mission was to strike Republican Guard barracks. Evading both radar-guided SAM sites and anti-aircraft artillery, the crew arrived at the target site on time, dropped its Mk 82s within 11 seconds of its planned on-target time, and safely left the target area. Bomb damage assessment later concluded that the target was destroyed.

The crew members were Capts. Randy L. Kaufman, Jeffrey Taliaferro, Joseph Reidy, and John Martin.

CMSAF Thomas N. Barnes Award

USAF's Best Crew Chief

SSgt. Dana T. Alexander, C-130E crew chief for the 37th Airlift Squadron, Ramstein AB, Germany, is a demanding leader, but he gets results: an 85.5 percent mission capable rate for these 30-year-old aircraft. His leadership enabled his crew to prepare 15 Hercules aircraft in 17 hours to support a NATO buildup in the Balkans. He also provided critical logistical support while deployed on 16 Operation Joint Guard and Joint Forge Bosnian resupply missions and three Operation Northern Watch missions. His performance led to his selection as representative for the 86th Airlift Wing as dedicated crew chief for AMC's Airlift Rodeo 1998.

Gen. Thomas S. Power Award

Best Missile Combat Crew

Capt. Brian G. Hollomon earned the 12th Missile Squadron's 1998 award for Commander of the Year and Capt. Bradley M. McAlpine, the Instructor of the Year. They both also earned the 341st Operations Group's Operations Excellence Award for outstanding duty performance. Their thoroughness in training resulted in missile combat crews sustaining a 98 percent evaluation pass rate, with 80 percent rated highly qualified. Under their leadership, the 12th Missile Squadron, Malmstrom AFB, Mont., was named the 341st CG's ICBM Squadron of the Year. They also helped develop the 341st Space Wing's Three Flight Concept Implementation Plan.

Capts. Brian Hollomon (left) and Bradley McAlpine.

Space Operations Award

Best Space Operations Crew

Members of the 2nd Space Warning Squadron, Buckley ANGB, Colo., detected, monitored, and reported 30 space/missile launches and some 300 other intelligence events in 1998. Their thorough reports, relied upon for strikes on enemy targets, earned praise from a national air intelligence analyst during Operation Desert Fox. When two unknown missile types were launched with no notice from the Commonwealth of Independent States, the crew processed the event without additional intelligence.

Pictured (l–r): Capt. Lloyd Buzzell; MSgt. Mike Martin; SSgt. Curtis Henley; Capt. Chris Musick; Amn. Jamie Booker; SrA. John Grissam; SSgts. Sandy Hughes, Perry Thornton, and John Pace; A1Cs Alicia Wisney, Eric Alderson, Chris Hajek, and Karl Hebert. Not pictured: Capts. Dave Chrisman and Shawn Jansen; TSgt. Bob Margetin; SSgt. Sean Kavanagh; and SrA. Jake Majerus.

Gen. Jerome F. O'Malley Award

Best Reconnaissance Crew

On Dec. 17, 1998, the day after Operation Desert Fox began, crew members of an RC-135 Rivet Joint from Offutt AFB, Neb., provided 47 tactical intelligence and situation reports on Iraqi missile threats, helping to ensure the safe passage of Navy and Coalition strike aircraft to Iraqi targets. Drawn from the 38th and 343rd Reconnaissance Squadrons and the 97th, 390th, and 488th Intelligence Squadrons, Offutt AFB, the 23 crew members detected and reported more than 20 mobile SAM sites, many in new locations. After warning a pilot of a SAM launch against his aircraft, the crew participated in a counterstrike against that site—a first for a Rivet Joint aircraft.

Pictured, top row (l–r): TSgt. T.J. Ludwick, Capt. Michael LaRocco, SSgt. Scott Anderson*, Maj. Stephen Ling, Lt. Col. Burton Vandenburg, MSgt. Kenneth Lehocky, Capt. Derek Gardner, TSgt. John Benner*, MSgt. Dean Thornton, 1st Lt. Walter Luther III, and SSgt. Mark Weinandt.*

Bottom row (l–r): Capt. Leslie Skinner, SrA. K.C. Middlebrooks, MSgt. Robert Torres, 1st Lt. Chad Chaffee, 1st Lt. Dorothy Martino, Maj. Mark Barnett, and SSgt. Lisa Bonhart.*

Not pictured: MSgts. Scott Cassell and Scot Clyde, TSgt. Gregory Dawes, SSgt. Chris Regan, and SrA. Aaron Attridge, John Dauteuil, Lawrence Diglio, Gregory England, Casey Hayden, Grant Hegner, and Russell Oswalt.

**Crew members who served in Operation Desert Fox but were not part of the O'Malley crew.*

Airborne Battle Management Crew of the Year

Best Crew of the Year

Quickly warning F-15s away from a SAM site, directing emergency refueling of a Rivet Joint aircraft, relaying critical air launched cruise missile targeting coordinates to B-52s when headquarters lost contact—these are just some of the crucial E-3 AWACS combat operations of the 963rd Airborne Air Control Squadron from Tinker AFB, Okla. Deployed to Prince Sultan AB, Saudi Arabia, in support of Operation Desert Fox, the crew flew 29.8 combat hours, choreographing command and control of more than 220 combat and support aircraft. Their consistent excellence prompted one veteran F-15 fighter pilot to write a letter crediting the crew with giving him "maximum flexibility and ensuring safety."

Pictured (back row, l–r): Capt. James S. Wildes, SrA. John P. Mothershead, A1C Ray S. Lee, Capt. Jeffrey T. Doyle, SSgt. Dustin L. Rayl, 1st Lt. Joseph R. Jones, TSgt. Johnny L. Lemons, Capt. Buck McHenry, and Capt. Richard Collins.

(Front row, l–r): Maj. Beau Grasse, SSgt. John Prieto, SrA. Michelle Wilson, TSgt. James R. Clark, A1C Sirese A. Hetrick, Capt. Gilbert W. Baker, and A1C Robert Hyman.

Brig. Gen. Ross G. Hoyt Award

Best Air Refueling Aircrew

Bass-01, a KC-10 tanker crew from McGuire AFB, N.J., was on temporary duty with the 763rd Expeditionary Air Refueling Squadron, United Arab Emirates, in support of US Navy combat operations during Operation Desert Fox. The crew flew the only aircraft in the area of operations equipped to refuel two probe-equipped aircraft simultaneously, crucial for refueling pre- and poststrike Navy aircraft. After several successful refuelings of Navy aircraft, the Bass-01 crew began to take on fuel itself when, suddenly, its supplying tanker began to vent massive amounts of fuel. Despite the danger, the crew continued taking on 90,000 pounds of fuel for the sake of the mission. Later, after responding to an urgent tanking request from fuel-starved Navy fighters and with a diminished fuel supply, Bass-01 refueled a Navy S-3B tanker, upon which other fighters relied for fuel to return to USS Enterprise. *What began as a six-hour, tanker-only mission had turned into a 12.7-hour sortie in which the crew dispensed more than 230,000 pounds of fuel to 41 aircraft.*

Pictured (l–r): MSgt. Ted J. Felder, Capt. Leif E. Eckholm, 1st Lt. Mark S. Robinson, and A1C Weston R. Kissel.

AFA and USAF recognize the best Guard and Reserve airmen, crews, and units for their 1998 accomplishments.

Best of Guard and Reserve

Best Air National Guard Unit

Top ANG Unit of the Year

The 129th Rescue Wing, Moffett Federal Airfield, Calif., demonstrated excellence throughout 1998 on many occasions. Deployed to Incirlik AB, Turkey, in support of Operation Northern Watch, HC-130 and HH-60 crews maintained a 24-hour-a-day combat search and rescue alert during heightened Iraqi provocations of Coalition aircraft patrolling the no-fly zone. In northern Japan, crews provided rescue coverage for F-16 night qualification training; in the Ukraine unit members helped that nation's air force improve its own rescue capabilities; and in Iceland they flew rescue alert missions. The 129th also performed key drug interdiction missions, seizing nearly $300 million worth of marijuana. During 1998, unit members saved the lives of seven people, including an Air Force helicopter crewman.

Best Air Force Reserve Unit

Top AFRC Unit of the Year

Members of the 440th Airlift Wing, General Mitchell IAP/ARS, Wis., surpassed all other AFRC units for the past two years in their operational readiness inspection, according to the Air Mobility Command inspector general. Besides scoring high in the inspection, the unit was fully engaged with training and real-world events. It sent aircraft, crews, and maintenance personnel for three multi-week deployments to support Operation Coronet Oak; flew humanitarian airlift missions for the State Department; provided the lead tanker airlift control element for a two-month NATO exercise; participated in Operation Joint Forge; and supported the Army in testing its short-range air launch target system. The wing exceeded its flying hours for the year and surpassed AFRC's mission capable rates.

President's Award

Best Air Force Reserve Aircrew

The ingenuity and resourcefulness of this C-5 crew of the 301st Airlift Squadron, Travis AFB, Calif., translated into the arrival of urgently needed firefighters and equipment, a day ahead of schedule, to battle fires sweeping Florida in summer 1998. The volunteer crew rushed personnel and equipment first to a contingency base of operations at Klamath Falls, Ore., and then to Florida. The pilot and crew got the aircraft with its equipment to Florida despite repeated problems with a cabin door that affected cabin pressure and forced the pilot to fly with visual flight rules through mountain valleys.

Crew members: Maj. Gregory Gibbs; Capts. William W. Barbour and Michael C. Casebeer; MSgts. David M. Cramer, Scott S. Kennedy, and Alejandro E. Paneda; TSgts. Douglas E. Brem and Steven L. Gramling; and SrA. Timothy M. Rosenau.

Photo by Paul Kennedy

Maj. Gen. Earl T. Ricks Award

Best Airmanship in the Air National Guard

The entire Air National Guard aircraft maintenance team distinguished itself by helping to achieve the lowest flight mishap rate—0.83 per 100,000 hours—in Air Force history, even as the Guard was supporting more than 700 contingencies and Joint Chiefs of Staff–directed exercises worldwide. ANG experienced no maintenance-related flight mishaps and no accidents, despite the expenditure of 210,000 bombs and two million rounds of ammunition during the year. Guardsmen replaced aircraft nose and main landing gear assemblies on ANG's fleet of aging F-15s and F-15s, a move that virtually eliminated gear-related mishaps.

CMSgt. Dick Red Award

Best ANG Aerospace Maintenance

CMSgt. John E. Hurst, 126th Logistics Group, O'Hare IAP/ARS, Ill., earned distinction by proposing and implementing an Instrument Landing System modification for all KC-135s. This change doubled the number of available frequencies, enabling KC-135s to use instrument approaches to airports with a 50 kHz ILS approach frequency. When the KC-135s with a new anti-skid system developed a braking problem, Hurst convinced Boeing to modify the system's control shield and test-fly it as a possible solution. As a result, the shields on all KC-135Es and Rs were modified and installed—at no cost to the Air Force.

Photochart of USAF Leadership (As of Sept. 1, 1999)

An *Air Force* Magazine Directory
Compiled by Chequita Wood, Editorial Associate

Office of the Secretary of the Air Force

Secretary of the Air Force
F. Whitten Peters

Asst. Secretary of the Air Force (Financial Management & Comptroller)
Robert F. Hale

Asst. Secretary of the Air Force (Space) and Director, NRO
Keith R. Hall

Asst. Secretary of the Air Force (Acquisition)
Lawrence J. Delaney

General Counsel
Jeh Charles Johnson

Asst. Secretary of the Air Force (Manpower, Reserve Affairs, Installations, & Environment)
Ruby B. Demesme

Administrative Asst. to the Secretary of the Air Force
William A. Davidson

Director, Public Affairs
Col. Ronald T. Rand

Undersecretary of the Air Force
Carol DiBattiste

Director, Legislative Liaison
Maj. Gen. T. Michael Moseley

Auditor General
Jackie R. Crawford

Inspector General
Lt. Gen. Nicholas B. Kehoe III

Deputy Undersecretary for International Affairs
Willard H. Mitchell

Director, Small & Disadvantaged Business Utilization
Anthony J. DeLuca

Military Asst. to the Secretary of the Air Force
Col. Stephen Cullen

The United States Air Force Air Staff

Chief of Staff
Gen. Michael E. Ryan

Asst. Vice Chief of Staff
Lt. Gen. William J. Begert

Chief Master Sergeant of the Air Force
CMSAF Frederick J. "Jim" Finch

Chief of Safety
Maj. Gen. Francis C. Gideon Jr.

Director, Security Forces
Brig. Gen. Richard A. Coleman Jr.

Director, Communications & Information
Lt. Gen. William J. Donahue

Air Force Historian
Richard P. Hallion

Vice Chief of Staff
Gen. Lester L. Lyles

Chief Scientist
Daniel E. Hastings

Chief of Air Force Reserve
Maj. Gen. James Sherrard III

Director, Air National Guard
Maj. Gen. Paul A. Weaver Jr.

Co-chair, USAF Scientific Advisory Board
William F. Ballhaus Jr.

Co-chair, USAF Scientific Advisory Board
Natalie W. Crawford

Judge Advocate General
Maj. Gen. William A. Moorman

Director, Test & Evaluation
John T. Manclark

Surgeon General
Lt. Gen. Charles H. Roadman II

Chief of Chaplain Service
Maj. Gen. William A. Dendinger

Deputy Chiefs of Staff

Deputy Chief of Staff, Air & Space Operations
Lt. Gen. Marvin R. Esmond

Director, Command & Control
Maj. Gen. Kenneth W. Hess

Director, Intelligence, Surveillance, & Reconnaissance
Brig. Gen. Glen D. Shaffer

Director, Joint Matters
Maj. Gen. Richard E. Brown III

Director, Nuclear & Counterproliferation
Brig. Gen. Timothy J. McMahon

Director, Operational Requirements
Maj. Gen. Bruce A. Carlson

Director, Operations & Training
Maj. Gen. Michael S. Kudlacz

Director, Weather
Brig. Gen. Fred P. Lewis

Director, EAF Implementation
Maj. Gen. William S. Hinton Jr.

Deputy Chief of Staff, Installations & Logistics
Lt. Gen. John W. Handy

Civil Engineer
Maj. Gen. (sel.) Earnest O. Robbins II

Director, Maintenance
Maj. Gen. Scott C. Bergren

Director, Plans & Integration
Susan A. O'Neal

Director, Supply
Brig. Gen. (sel.) Robert E. Mansfield Jr.

Director, Transportation
Brig. Gen. Quentin L. Peterson

Director, Services
Arthur J. Myers

Deputy Chief of Staff, Personnel
Lt. Gen. Donald L. Peterson

Director, Personnel Force Development
Elizabeth T. Corliss

Director, Personnel Force Management
Maj. Gen. Susan L. Pamerleau

Director, Personnel Resources
Brig. Gen. John F. Regni

Deputy Chief of Staff, Plans & Programs
Lt. Gen. Roger G. DeKok

Director, Programs
Maj. Gen. Stephen B. Plummer

Director, Strategic Planning
Maj. Gen. Norton A. Schwartz

Director, Manpower, Organization, & Quality
Brig. Gen. Michael C. McMahan

Air Force Acquisition System

Asst. Secretary of the Air Force for Acquisition
Lawrence J. Delaney

Principal Deputy Asst. Secretary of the Air Force for Acquisition
Lt. Gen. Gregory S. Martin

Principal Deputy Asst. Secretary for Acquisition & Management
Darleen A. Druyun

Program Executive Officers

Airlift & Trainers
Brig. Gen. Robert W. Chedister

Command & Control Programs
Brig. Gen. Craig P. Weston

Fighter & Bomber Programs
Maj. Gen. Claude M. Bolton Jr.

Logistics Information Systems
Oscar A. Goldfarb

Space Programs
Brent R. Collins

Weapons
Joseph G. Diamond

Mission Area Directors

Global Power
Maj. Gen. Raymond P. Huot

Global Reach
Maj. Gen. Arthur J. Lichte

Information Dominance
Brig. Gen. David A. Nagy

Space & Nuclear Deterrence
Brig. Gen. John L. Clay

Major Commands

Air Combat Command

Hq. Langley AFB, Va.

Commander
Gen. Ralph E. Eberhart

Vice Commander
Lt. Gen. Thomas J. Keck

1st Air Force (ANG)
Maj. Gen. Larry K. Arnold
Tyndall AFB, Fla.

8th Air Force
Lt. Gen. Ronald C. Marcotte
Barksdale AFB, La.

9th Air Force
Lt. Gen. Hal M. Hornburg
Shaw AFB, S.C.

12th Air Force
Lt. Gen. Lansford E. Trapp Jr.*
Davis–Monthan AFB, Ariz.

Air Warfare Center
Maj. Gen. Glen W. Moorhead III
Nellis AFB, Nev.

Aerospace Command & Control & Intelligence, Surveillance, & Recon. Center
Maj. Gen. Gerald F. Perryman Jr.
Langley AFB, Va.

*To be PACAF vice commander

Air Education and Training Command

Hq. Randolph AFB, Texas

Commander
Gen. Lloyd W. "Fig" Newton

Vice Commander
Lt. Gen. David W. McIlvoy

2nd Air Force
Maj. Gen. Andrew J. Pelak Jr.
Keesler AFB, Miss.

19th Air Force
Maj. Gen. Steven R. Polk
Randolph AFB, Texas

Air Force Recruiting Service
Brig. Gen. Peter U. Sutton
Randolph AFB, Texas

Air University
Lt. Gen. Lance W. Lord
Maxwell AFB, Ala.

Wilford Hall USAF Medical Center (59th Medical Wing)
Maj. Gen. Earl W. Mabry II
Lackland AFB, Texas

Air Force Materiel Command

Hq. Wright–Patterson AFB, Ohio

Commander
Gen. George T. Babbitt

Vice Commander
Lt. Gen. Stewart E. Cranston

Aeronautical Systems Center
Lt. Gen. Robert F. Raggio
Wright–Patterson AFB, Ohio

Air Armament Center
Maj. Gen. Michael C. Kostelnik
Eglin AFB, Fla.

Air Force Flight Test Center
Maj. Gen. Richard V. Reynolds
Edwards AFB, Calif.

Electronic Systems Center
Lt. Gen. Leslie F. Kenne
Hanscom AFB, Mass.

Space & Missile Systems Center
Lt. Gen. Eugene L. Tattini
Los Angeles AFB, Calif.

Arnold Engineering Development Center
Col. Michael L. Heil
Arnold AFB, Tenn.

Ogden Air Logistics Center
Maj. Gen. Richard H. Roellig
Hill AFB, Utah

Oklahoma City Air Logistics Center
Maj. Gen. Michael E. Zettler
Tinker AFB, Okla.

Sacramento Air Logistics Center
Brig. Gen. Michael P. Wiedemer
McClellan AFB, Calif.

San Antonio Air Logistics Center
Maj. Gen. Paul L. Bielowicz
Kelly AFB, Texas

Warner Robins Air Logistics Center
Maj. Gen. Richard N. Goddard
Robins AFB, Ga.

Air Force Research Laboratory
Maj. Gen. Richard R. Paul
Wright–Patterson AFB, Ohio

Aerospace Maintenance & Regeneration Center
Col. Gregory O. Stanley
Davis–Monthan AFB, Ariz.

Air Force Security Assistance Center
Maj. Gen. David R. Love
Wright–Patterson AFB, Ohio

Joint Logistics Systems Center
Lorna Estep
Wright–Patterson AFB, Ohio

Air Force Office of Scientific Research
Joseph F. Janni
Bolling AFB, D.C.

US Air Force Museum
Charles D. Metcalf
Wright–Patterson AFB, Ohio

Major Commands

Air Force Reserve Command

Hq. Robins AFB, Ga.

Commander
Maj. Gen. James E. Sherrard III

Vice Commander
Maj. Gen. David R. Smith

4th Air Force
Maj. Gen. Wallace W. Whaley
March ARB, Calif.

10th Air Force
Brig. Gen. John A. Bradley
NAS Fort Worth JRB, Carswell Field, Texas

22nd Air Force
Maj. Gen. John J. Batbie Jr.
Dobbins ARB, Ga.

Air Force Space Command

Hq. Peterson AFB, Colo.

Commander
Gen. Richard B. Myers

Vice Commander
Lt. Gen. (sel.) Donald G. Cook

14th Air Force
Maj. Gen. Robert C. Hinson
Vandenberg AFB, Calif.

20th Air Force
Maj. Gen. Thomas H. Neary
F.E. Warren AFB, Wyo.

Space Warfare Center
Brig. Gen. Gary R. Dylewski
Schriever AFB, Colo.

Air Force Special Operations Command

Hq. Hurlburt Field, Fla.

Commander
Lt. Gen. Maxwell C. Bailey

Vice Commander
Brig. Gen. David L. Johnson

16th Special Operations Wing
Brig. Gen. (sel.) Donald C. Wurster
Hurlburt Field, Fla.

352nd Special Operations Group
Col. John W. Zahrt
RAF Mildenhall, UK

353rd Special Operations Group
Col. Mike Byers
Kadena AB, Japan

720th Special Tactics Group
Col. Jeff Buckmelter
Hurlburt Field, Fla.

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

Air Mobility Command

Hq. Scott AFB, Ill.

Commander
Gen. Charles T. Robertson Jr.

Vice Commander
Lt. Gen. Walter S. Hogle Jr.

15th Air Force
Lt. Gen. John B. Sams Jr.
Travis AFB, Calif.

21st Air Force
Maj. Gen. John D. Hopper Jr.
McGuire AFB, N.J.

Air Mobility Warfare Center
Maj. Gen. Silas R. Johnson
Ft. Dix, N.J.

Tanker Airlift Control Center
Maj. Gen. (sel.) John D. Becker
Scott AFB, Ill.

Pacific Air Forces

Hq. Hickam AFB, Hawaii

Commander
Gen. Patrick K. Gamble

Vice Commander
Lt. Gen. Charles R. Heflebower*

5th Air Force
Lt. Gen. Paul V. Hester
Yokota AB, Japan

7th Air Force
Lt. Gen. Joseph E. Hurd
Osan AB, South Korea

11th Air Force
Lt. Gen. Thomas R. Case
Elmendorf AFB, Alaska

13th Air Force
Maj. Gen. Daniel M. Dick
Andersen AFB, Guam

United States Air Forces in Europe

Hq. Ramstein AB, Germany

Commander
Gen. John P. Jumper

Vice Commander
Lt. Gen. Charles R. Holland

3rd Air Force
Maj. Gen. Joseph H. Wehrle Jr.
RAF Mildenhall, UK

16th Air Force
Lt. Gen. Michael C. Short
Aviano AB, Italy

*To be 7th AF commander

Command Chief Master Sergeants

CMSgt. Kevin Estrem
Air Combat Command
Langley AFB, Va.

CMSgt. Kenneth E. Hair
Air Education and
Training Command
Randolph AFB, Texas

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

CMSgt. Billy Blackburn
Air Force
Reserve Command
Robins AFB, Ga.

CMSgt. Dennis L. Fritz
Air Force Space Command
Peterson AFB, Colo.

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

CMSgt. Kenneth F. Van Holbeck
Air Mobility Command
Scott AFB, Ill.

CMSgt. Ronald W. Crowl
Pacific Air Forces
Hickam AFB, Hawaii

CMSgt. Kenneth W. Casey
United States Air Forces
in Europe
Ramstein AB, Germany

CMSgt. Gary R. Broadbent
Air National Guard
Andrews AFB, Md.

CMSgt. Raymond G. Carter
Air Force Office of Special
Investigations
Andrews AFB, Md.

CMSgt. David Hill
Air Intelligence Agency
Kelly AFB, Texas

CMSgt. Larry D. Palmer
11th Wing
Bolling AFB, D.C.

CMSgt. Mike L. Myers
United States
Air Force Academy
Colorado Springs, Colo.

Field Operating Agencies

Air Force Agency for Modeling and Simulation
Orlando, Fla.

Commander
Col. Ricky R. Ales

Air Force Audit Agency
Washington

Auditor General
Jackie R. Crawford

Air Force Base Conversion Agency
Arlington, Va.

Director
Albert F. Lowas Jr.

Air Force Center for Environmental Excellence
Brooks AFB, Texas

Director
Gary M. Erickson

Air Force Center for Quality and Management Innovation
Randolph AFB, Texas

Commander
Col. Candace C. Abbott

Air Force Civil Engineer Support Agency
Tyndall AFB, Fla.

Commander
Col. Bruce R. Barthold

Air Force Cost Analysis Agency
Arlington, Va.

Executive Director
Joseph T. Kammerer

Air Force Flight Standards Agency
Andrews AFB, Md.

Commander
Col. Richard P. Packard

Air Force Historical Research Agency
Maxwell AFB, Ala.

Commander
Col. William E. Mathis

Air Force History Support Office
Washington

Commander
Col. Lynn Maggio

Air Force Inspection Agency
Kirtland AFB, N.M.

Commander
Col. Fred K. Wall

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

Commander
Col. James Swanson

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

Commander
Col. Richard M. Bereit

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

Commander
Maj. Gen. Paul K. Carlton Jr.

Air Force Medical Support Agency
Brooks AFB, Texas

Commander
Col. Sidney Brandler

Air Force News Agency
Kelly AFB, Texas

Commander
Col. Harold J. Smarkola Jr.

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

Commander
Brig. Gen. Francis X. Taylor

Air Force Operations Group
Washington

Commander
Col. Dave P. Jones

Air Force Personnel Center
Randolph AFB, Texas

Commander
Maj. Gen. Donald A. Lamontagne

Air Force Personnel Operations Agency
Washington

Commander
Brig. Gen. John F. Regni

Air Force Program Executive Office
Washington

Air Force Acquisition Executive
Lawrence J. Delaney

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

Director
William E. Edwards

Air Force Review Boards Agency
Andrews AFB, Md.

Director
Joe G. Lineberger

Air Force Safety Center
Kirtland AFB, N.M.

Commander
Maj. Gen. Francis C. Gideon Jr.

Air Force Security Forces Center
Lackland AFB, Texas

Commander
Brig. Gen. Richard A. Coleman Jr.

Air Force Services Agency
San Antonio

Commander
Col. Horace L. Larry

Air Force Studies and Analyses Agency
Washington

Commander
Col. Kurt A. Cichowski

Air Force Technical Applications Center
Patrick AFB, Fla.

Commander
Col. Harold J. Beatty

Air Force Weather Agency
Offutt AFB, Neb.

Commander
Col. Charles W. French

Air Intelligence Agency
Kelly AFB, Texas

Commander
Maj. Gen. John R. Baker

Air National Guard Readiness Center
Washington

Commander
Brig. Gen. Craig R. McKinley

Joint Combat Rescue Agency
Langley AFB, Va.

Commander
Col. Denver L. Pletcher

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

Commander
Col. J. Mike Bergstresser

Direct Reporting Units

Air Force Communications and Information Center
Washington

Commander
Lt. Gen. William J. Donahue

Air Force Doctrine Center
Maxwell AFB, Ala.

Commander
Maj. Gen. Timothy A. Kinnan

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

Commander
Maj. Gen. Jeffrey G. Cliver

United States Air Force Academy
Colorado Springs, Colo.

Superintendent
Lt. Gen. Tad J. Oelstrom

11th Wing
Bolling AFB, D.C.

Commander
Col. Duane W. Deal

Air Force Generals Serving in Joint and International Assignments

Office of the Secretary of Defense

Maj. Gen. James E. Andrews
DASD for Reserve Affairs (Readiness, Training, & Mobilization)

Maj. Gen. Wilfred Hessert
Executive Officer, Reserve Force Policy Board, and Military Advisor to the Chairman, RFPB

Maj. Gen. Herbert M. Ward
Director, Special Programs, USD Acquisition & Technology

Brig. Gen. (sel.) John H. Folkerts
DASD, Special Operations & Low Intensity Conflict, USD, Policy

Brig. Gen. John L. Hudson
Deputy Director, Joint Strike Fighter Program, USD, Acquisition & Technology

Brig. Gen. Howard J. Mitchell
National Security Space Architect, ASD, C³I

Department of Defense Agencies

Lt. Gen. Michael V. Hayden
Director, National Security Agency
Ft. Meade, Md.

Lt. Gen. Ronald T. Kadish
Director, Ballistic Missile Defense Organization

Maj. Gen. John H. Campbell
Vice Director, Defense Information Systems Agency
Arlington, Va.

Maj. Gen. Robert S. Dickman
Director, Office of Architectures, Assessments, & Aquisition, National Reconnaissance Office
Chantilly, Va.

Maj. Gen. Tiiu Kera
Chief of Staff, Operations Directorate, National Security Agency
Ft. Meade, Md.

Brig. Gen. (sel.) Frank G. Klotz
US Defense Attaché Designate
Moscow, Russia

Maj. Gen. Timothy P. Malishenko
Commander, Defense Contract Management Command
Defense Logistics Agency
Ft. Belvoir, Va.

Maj. Gen. William F. Moore
Deputy Director, Defense Threat Reduction Agency
Dulles, Va.

Brig. Gen. Richard W. Davis
Deputy for Theater Air & Missile Defense
Ballistic Missile Defense Organization

Brig. Gen. Gary L. Salisbury
Deputy Director, Engineering & Interoperability
Defense Information Systems Agency
Arlington, Va.

Brig. Gen. Mary L. Saunders
Commander, Defense Supply Center Columbus
Defense Logistics Agency
Columbus, Ohio

Brig. Gen. Andrew W. Smoak
Director, Customer Support Office
National Imagery & Mapping Agency
Reston, Va.

Brig. Gen. Joseph B. Sovey
Director, Imagery Systems Acquisition and Operations, NRO
Chantilly, Va.

Joint Chiefs of Staff

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

Gen. Michael E. Ryan
Chief of Staff, United States Air Force

Lt. Gen. Frank B. Campbell
Director, Force Structure, Resources, & Assessment

Lt. Gen. Robert H. Foglesong
Assistant to Chairman, Joint Chiefs of Staff
(To be 12th AF commander)

Lt. Gen. John L. Woodward Jr.
Director, Command, Control, Communications, & Computer (C⁴) Systems

Maj. Gen. John W. Brooks
Vice Director, Logistics

Maj. Gen. Robert A. McIntosh
Asst. to Chairman for Reserve Affairs

Maj. Gen. Garry R. Trexler
Vice Director, Joint Staff

Maj. Gen. Charles F. Wald
Vice Director, Strategic Plans & Policy

Brig. Gen. Patrick O. Adams
Director, Manpower & Personnel

Brig. Gen. Russell J. Anarde
Deputy Director, Operations, National Military Command Center

Brig. Gen. Richard B. Bundy
Vice Director, Operational Plans & Interoperability

Brig. Gen. Tommy Crawford
Deputy Director, Operations, National Systems Support

Brig. Gen. (sel.) Bob D. Dulaney
Asst. Deputy Director, Operations, Current Readiness, & Capabilities

Brig. Gen. Carol C. Elliott
Vice Director, Intelligence

Brig. Gen. Theodore W. Lay II
Deputy Director, Politico–Military Affairs

Brig. Gen. Michael G. Lee
Deputy Director, Operations, National Military Command Center

Brig. Gen. Bruce A. Wright
Deputy Director, Operations (Information Operations)

National Guard Bureau

Lt. Gen. Russell C. Davis
Chief, National Guard Bureau

Joint Service Schools

Maj. Gen. (sel.) Franklin J. Blaisdell
Commandant, Armed Forces Staff College
National Defense University
Norfolk, Va.

Maj. Gen. Richard L. Engel
Commandant, Industrial College of the Armed Forces
National Defense University
Ft. McNair, D.C.

Brig. Gen. Frank J. Anderson Jr.
Commandant, Defense Systems Management College (as of Sept. 30, 1999)
Ft. Belvoir, Va.

US Atlantic Command

Gen. Ralph E. Eberhart
Commander, Air Force Component
Langley AFB, Va.

Maj. Gen. John R. Baker
Director, Joint Command & Control Warfare Center
Kelly AFB, Texas

Maj. Gen. John F. Miller Jr.
Chief of Staff
Norfolk, Va.

Maj. Gen. Timothy A. Peppe
Director, Joint Experimentation
Norfolk, Va.

Brig. Gen. James W. Morehouse
Deputy Commander, Joint Warfighting Center
Ft. Monroe, Va.

US Central Command

Lt. Gen. Hal M. Hornburg
Commander, US Central Command Air Forces
Shaw AFB, S.C.

Maj. Gen. James E. Sandstrom
Director, Operations
MacDill AFB, Fla.

Maj. Gen. Randall M. Schmidt
Commander, Joint Task Force–Southwest Asia
Riyadh, Saudi Arabia

Brig. Gen. Hugh C. Cameron
Deputy Commander, US Central Command Air Forces
Shaw AFB, S.C.

Brig. Gen. John W. Meincke
Director, C⁴ Systems
MacDill AFB, Fla.

US European Command

Gen. John P. Jumper
Commander, Air Force Component
Ramstein AB, Germany

Maj. Gen. Robert J. Boots
Chief, Office of Defense Cooperation to Turkey
Ankara, Turkey

Maj. Gen. Ronald E. Keys
Director, Operations
Stuttgart–Vaihingen, Germany

Maj. Gen. Charles J. Wax
Director, Plans & Policy
Stuttgart–Vaihingen, Germany

Brig. Gen. Charles E. Croom Jr.
Director, C⁴ Systems
Stuttgart–Vaihingen, Germany

Brig. Gen. David A. Deptula
Commander, Combined Task Force–Operation Northern Watch
Incirlik AB, Turkey

Brig. Gen. Neal T. Robinson
Director, Intelligence
Stuttgart–Vaihingen, Germany

US Pacific Command

Gen. Patrick K. Gamble
Commander, Air Component
Hickam AFB, Hawaii

Lt. Gen. Thomas R. Case
Commander, Alaskan Command
Elmendorf AFB, Alaska

Lt. Gen. Paul V. Hester
Commander, US Forces Japan
Yokota AB, Japan

Brig. Gen. Jack R. Holbein Jr.
Commander, Special Operations Command, Pacific
Camp H.M. Smith, Hawaii

Brig. Gen. Christopher A. Kelly
Deputy Director, Strategic Planning & Policy
Camp H.M. Smith, Hawaii

US Southern Command

Lt. Gen. Lansford E. Trapp Jr.
Commander, US Southern Command Air Forces
Davis–Monthan AFB, Ariz.

Brig. Gen. Barry W. Barksdale
Vice Commander, US Southern Command Air Forces
Davis–Monthan AFB, Ariz.

Brig. Gen. James N. Soligan
Director, Strategy, Policy, & Plans
Miami, Fla.

US Space Command

Gen. Richard B. Myers
Commander in Chief and DoD Manager for Manned Spaceflight Support Operations
Peterson AFB, Colo.

Maj. Gen. Thomas B. Goslin Jr.
Director, Operations
Peterson AFB, Colo.

Maj. Gen. Robert C. Hinson
Commander, Air Force Component–Space Operations
Vandenberg AFB, Calif.

Maj. Gen. Harry D. Raduege Jr.
Director, Command Control Systems
Peterson AFB, Colo.

Brig. Gen. Robert H. Latiff
Commander, Cheyenne Mountain Operations Center
Cheyenne Mountain AS, Colo.

US Special Operations Command

Maj. Gen. Maxwell C. Bailey
Commander, Air Force Component
Hurlburt Field, Fla.

Brig. Gen. Richard L. Comer
Deputy Commanding General, Joint Special Operations Command
Ft. Bragg, N.C.

Brig. Gen. Gary W. Heckman
Director, Force Structure, Resources, Requirements, & Strategic Assessments Center
MacDill AFB, Fla.

US Strategic Command

Lt. Gen. Phillip J. Ford
Deputy Commander in Chief
Offutt AFB, Neb.

Lt. Gen. Ronald C. Marcotte
Commander, Air Force Component–Bombers
Barksdale AFB, La.

Lt. Gen. Lansford E. Trapp Jr.
Commander, Air Force Component–Battle Management
Davis–Monthan AFB, Ariz.

Maj. Gen. Charles R. Henderson
Director, Plans & Policy
Offutt AFB, Neb.

Maj. Gen. Thomas H. Neary
Commander, Air Force Component–ICBMs
F.E. Warren AFB, Wyo.

Brig. Gen. Barry W. Barksdale
Vice Commander, Air Force Component–Battle Management
Davis–Monthan AFB, Ariz.

Brig. Gen. Trudy H. Clark
Director, C⁴ Systems (as of Sept. 30, 1999)
Offutt AFB, Neb.

Brig. Gen. Thomas A. O'Riordian
Deputy Director, Operations
Offutt AFB, Neb.

Brig. Gen. Glenn C. Wallman
Director, Intelligence
Offutt AFB, Neb.

US Transportation Command

Gen. Charles T. Robertson Jr.
Commander in Chief
Scott AFB, Ill.

Maj. Gen. Charles H. Coolidge Jr.
Director, Operations & Logistics
Scott AFB, Ill.

Brig. Gen. Walter I. Jones
Director, C⁴ Systems
Scott AFB, Ill.

Brig. Gen. Thomas P. Kane
Inspector General
Scott AFB, Ill.

Brig. Gen. Gilbert J. Regan
Chief Counsel
Scott AFB, Ill.

Brig. Gen. Lee P. Rodgers
Command Surgeon
Scott AFB, Ill.

North Atlantic Treaty Organization

Gen. John P. Jumper
Commander, Allied Air Forces Central Europe
Ramstein AB, Germany

Lt. Gen. Michael C. Short
Commander, Allied Air Forces Southern Europe
Aviano AB, Italy

Maj. Gen. Robert F. Behler
Chief of Staff, Allied Forces North Europe
Stavanger, Norway

Maj. Gen. (sel.) Carrol H. Chandler
Chief of Staff, Allied Air Forces Southern Europe
Naples, Italy

Maj. Gen. John R. Dallager
Asst. Chief of Staff, Operations & Logistics
Supreme Headquarters Allied Powers Europe
Mons, Belgium

Maj. Gen. Gary A. Voelliger
Commander, NATO Airborne Early Warning Force
Mons, Belgium

Brig. Gen. Marion E. "Earnie" Callender Jr.
Deputy US Military Representative to the NATO Military Committee
Brussels, Belgium

Brig. Gen. Edward R. Ellis
Deputy Commander, 5th Allied Tactical Air Force, Allied Air Forces Southern Europe (as of Sept. 30, 1999)
Vicenza, Italy

Brig. Gen. Paul W. Essex
Deputy Director, Allied Command Europe Reaction Force Air Staff
Kalkar, Germany

Brig. Gen. Randall C. Gelwix
Director, Combined Air Operations Center, Fifth Allied Tactical Air Force
Vicenza, Italy

Brig. Gen. Donald J. Hoffman
Asst. Chief of Staff, Operations, Allied Air Forces Northwest Europe
RAF High Wycombe, UK

Brig. Gen. Richard B.H. Lewis
Deputy Commander, 6th Allied Tactical Air Force, Allied Air Forces Southern Europe
Izmir AS, Turkey

North American Aerospace Defense Command

Gen. Richard B. Myers
Commander in Chief
Peterson AFB, Colo.

Lt. Gen. Thomas R. Case
Commander, Alaskan NORAD Region
Elmendorf AFB, Alaska

Maj. Gen. Larry K. Arnold
Commander, CONUS Region
Tyndall AFB, Fla.

Maj. Gen. Harry D. Raduege Jr.
Director, Command Control Systems
Peterson AFB, Colo.

Brig. Gen. Thomas L. Baptiste
Director, Plans
Peterson AFB, Colo.

Brig. Gen. William F. Hodgkins
Deputy Commander, Canadian NORAD Region
Winnipeg, Canada

Brig. Gen. Robert H. Latiff
Commander, Cheyenne Mountain Operations Center
Cheyenne Mountain AS, Colo.

United Nations Command Korea

Lt. Gen. Joseph E. Hurd
Deputy Commander in Chief; Deputy Commander, US Forces Korea; and Commander, Air Component Command, ROK/US Combined Forces Command
Osan AB, South Korea

Maj. Gen. Michael M. Dunn
Deputy Chief of Staff and Deputy Chief of Staff, US Forces Korea
Seoul, South Korea

Maj. Gen. William A. Peck Jr.
Chief of Staff, Air Component Command, ROK/US Combined Forces Command
Osan AB, South Korea

Central Intelligence Agency

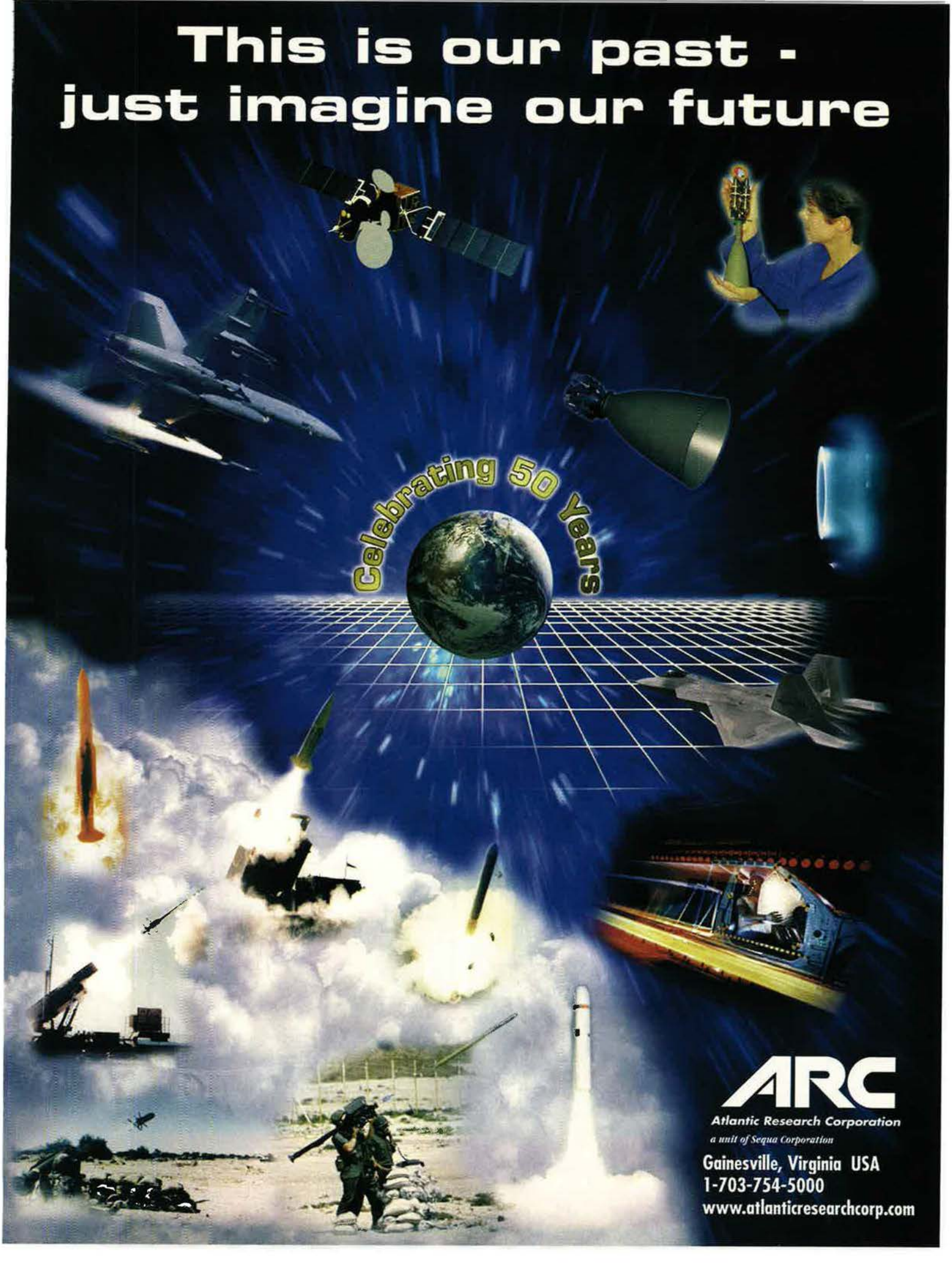
Gen. John A. Gordon
Deputy Director, Central Intelligence

Departments of the Army and the Air Force

Brig. Gen. Rodney W. Wood
Vice Commander, Army & Air Force Exchange Service
Dallas

Department of Energy

Brig. Gen. Thomas F. Gioconda
Principal Deputy Asst. Secretary for Military Application
Washington


This is our past -
just imagine our future
Celebrating 50 Years
ARC
Atlantic Research Corporation
a unit of Sequa Corporation
Gainesville, Virginia USA
1-703-754-5000
www.atlanticresearchcorp.com

Hate to shop till you drop?

Use AFA'S NEW Online Marketplace

It's easy. It's convenient. You save time and money.

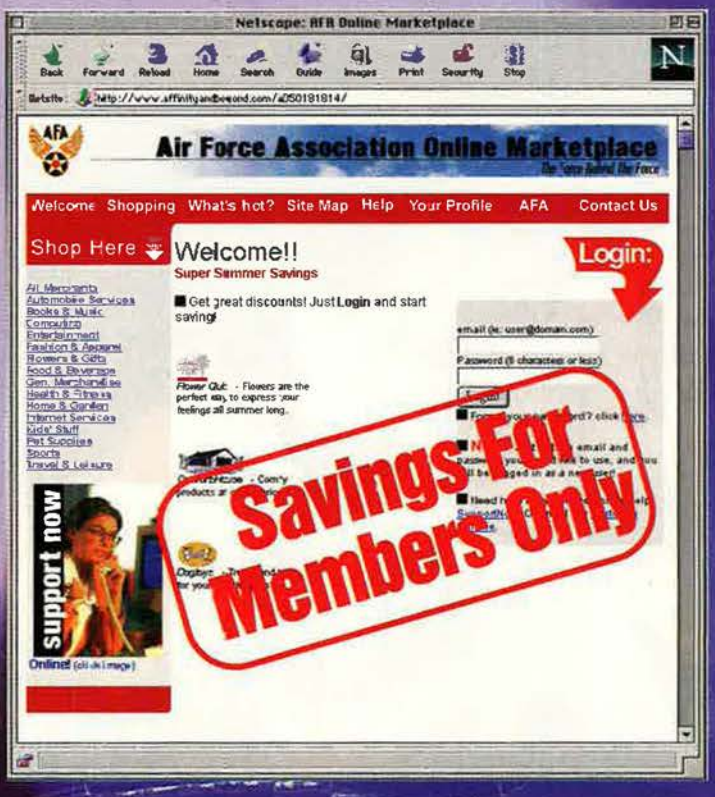
Imagine, from the comfort of your home, you can browse AFA's new Online Marketplace. Wise consumers compare and save. Now comparison shopping just got easier for AFA members.

Thinking about a new car? Check out AutoByTel. Want easy access to a huge selection of books and CDs? Try Amazon.com. Interested in perusing the largest selection of brand name personal computer products in the world? Visit Hardware Street and save 3%.

www.afa.org

Your choices are abundant on AFA's Online Marketplace including: clothing, jewelry, flowers and gifts, entertainment, food and beverages, kids' stuff, pet supplies, sporting goods, and much more. It's also a great place to start if you'd like to plan an economical vacation.

You'll save time and shoe leather. From a comfy seat you can visit more than 40 merchants, many of whom offer AFA members special discounts. With Christmas approaching, these savings could add up. To use the new Online Marketplace and other AFA online services, visit **www.afa.org**, click **MEMBERS ONLY** and follow the registration instructions to establish a **NEW USER ID** and **PASSWORD**.



Watch for our online Sweepstakes when you visit and register for the AFA Marketplace. You could win a new computer!

AFA/AEF Almanac

Compiled by Frances McKenney, Assistant Managing Editor

Chapters of the Year

YEAR	RECIPIENT(S)
1953	San Francisco Chapter
1954	Santa Monica (Calif.) Area Chapter
1955	San Fernando Valley (Calif.) Chapter
1956	Utah State AFA
1957	H.H. Arnold Chapter (N.Y.)
1958	San Diego Chapter
1959	Cleveland Chapter
1960	San Diego Chapter
1961	Chico (Calif.) Chapter
1962	Fort Worth (Texas) Chapter
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
1972	Utah State AFA
1973	Langley (Va.) Chapter
1974	Texas State AFA
1975	Alamo Chapter (Texas) and San Bernardino (Calif.) Area Chapter
1976	Scott Memorial Chapter (Ill.)
1977	Thomas B. McGuire Jr. Chapter (N.J.)
1978	Thomas B. McGuire Jr. Chapter (N.J.)
1979	Brig. Gen. Robert F. Travis Chapter (Calif.)
1980	Central Oklahoma (Gerrity) Chapter
1981	Alamo Chapter (Texas)
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	Gen. David C. Jones Chapter (N.D.)
1989	Thomas B. McGuire Jr. Chapter (N.J.)
1990	Gen. E.W. Rawlings Chapter (Minn.)
1991	Paul Revere Chapter (Mass.)
1992	Central Florida Chapter and Langley (Va.) Chapter
1993	Green Valley Chapter (Ariz.)
1994	Langley (Va.) Chapter
1995	Baton Rouge (La.) Chapter
1996	Montgomery (Ala.) Chapter
1997	Central Florida Chapter
1998	Ark–La–Tex Chapter (La.)
1999	Hurlburt Chapter (Fla.)

Profiles of AFA Membership

As of June 1999 (Total 150,706)

59%	One-year members
13%	Three-year members
28%	Life Members
21%	Active duty military
46%	Retired military
17%	Former service
6%	Guard and Reserve
6%	Patron
2%	Cadet
2%	Spouse/widow(er)

Of AFA's service members (who account for about 9 percent of USAF total strength):

63% are officers

37% are enlisted

Of AFA's retired military members:

75% are retired officers

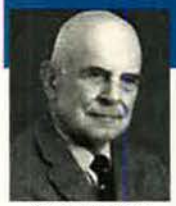
25% are retired enlisted

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 (Texas)
1964	Maxwell A. Kriendler (N.Y.)
1965	Milton Caniff (N.Y.)
1966	William W. Spruance (Del.)
1967	Sam E. Keith Jr. (Texas)
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 (Texas)
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 (Texas)
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.)
1997	James M. McCoy (Neb.)
1998	Ivan L. McKinney (La.)
1999	Jack H. Steed (Ga.)

Air Force Association National Presidents



Jimmy 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
1994–96

Doyle E. Larson
1996–98

Thomas J. McKee
1998–

Air Force Association Chairmen of the Board

Edward P. Curtis
1946–47

Jimmy 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
1994–96

Gene Smith
1996–98

Doyle E. Larson
1998–

If only life were so predictable.

Don't see long-term care in your future? Chances are you probably will. Three out of five people over age 65 require some type of long-term care.[1]

Long-term care is expensive. Exactly how expensive?

- The average nursing home stay can cost over $100,000.[2]
- Care at home could cost over $50,000 for the same period of time.[3]

You may think you're covered for long-term care, but the truth is you're not. Health plans, Medicare and disability insurance provide little or no coverage for long-term care.

AFA's customized program will provide comprehensive coverage at competitive group rates.

You can purchase this valuable protection for much less than you could on your own because it's a group plan. It's an affordable way to prepare for the unexpected.

The plan is tax qualified. As such:

- Long-term care benefits may not be taxable for federal income tax purposes.
- Premiums may be tax deductible.

AFA's Long-Term Care Program, underwritten by Hartford Life Insurance Company, is available to current and former military personnel who are AFA members, their spouses, parents and parents-in-law, and their adult children and spouses.

Don't leave your future and that of your loved ones to chance.

Watch your mail for further information.

1 Project Report for the Health Insurance Association of America, 1990.
2 Health Insurance Association of America, 1997.
3 Long Term Care Group, Inc., 1997.
*This program is subject to state availability.

Hartford Life
Underwritten by
Hartford Life Insurance Company

PA-8935-2a(4002)99

AFA's Regions, States, and Chapters

These figures indicate the number of affiliated members as of June 30, 1999. Listed below the name of each region is the region vice president for that region.

CENTRAL EAST REGION 13,596
John E. Craig II

Delaware 789
Delaware Galaxy 549
Diamond State 201
Henlopen Area 39

District of Columbia 927
Nation's Capital 927

Maryland 2,922
Baltimore* 846
Central Maryland 422
College Park Airport 165
Thomas W. Anthony 1,489

Virginia 8,605
Danville 47
Donald W. Steele Sr. Memorial 3,620
Gen. Charles A. Gabriel 1,213
Langley 1,927
Leigh Wade 159
Lynchburg 86
Northern Shenandoah Valley 204
Richmond 513
Roanoke 280
Tidewater 367
William A. Jones III 189

West Virginia 353
Chuck Yeager 353

FAR WEST REGION 23,934
Cheryl L. Waller

Arizona 4,746
Barry Goldwater 177
Cochise 102
Frank Luke 1,160
Phoenix Sky Harbor 1,277
Prescott 172
Richard S. Reid 204
Tucson 1,654

California 15,706
Antelope Valley 639
Bakersfield 106
Bob Hope 1,144
C. Farinha Gold Rush 1,972
David J. Price/Beale 586
Fresno* 405
Gen. B.A. Schriever Los Angeles 829
General Doolittle Los Angeles Area* 1,858
Brig. Gen. Robert F. Travis 1,363
Golden Gate* 886
High Desert 318
Maj. Gen. Charles I. Bennett Jr. 354
Monterey Bay Area 331
Orange County/Gen. Curtis E. LeMay 1,049
Palm Springs 517
Pasadena Area 426
Robert H. Goddard 951
San Diego 1,069
Tennessee Ernie Ford 903

Guam 178
Guam–Arc Light 178

Hawaii 1,126
Hawaii* 1,090
Maui 36

Nevada 2,178
Dale O. Smith 484
Thunderbird 1,694

GREAT LAKES REGION 15,244
W. Ron Goerges

Illinois 3,789
Chicagoland–O'Hare 1,414
Greater Rockford 97
Land of Lincoln 424
Richard W. Asbury 277
Scott Memorial 1,577

Indiana 1,722
Central Indiana 470
Columbus–Bakalar 39
Falls Cities 58
Fort Wayne 244
Grissom Memorial 181
Gus Grissom 152
Lawrence D. Bell Museum 293
Lester W. Johnston 35
Southern Indiana 178
Terre Haute–Wabash Valley 72

Kentucky 822
Gen. Russell E. Dougherty 542
Lexington 280

Michigan 2,371
Battle Creek 230
Huron 126
James H. Straubel 889
Kalamazoo 300
Lake Superior Northland 182
Lloyd R. Leavitt Jr. 150
Mid-Michigan 96
Mount Clemens 313
PE–TO–SE–GA 85

Ohio 5,222
Capt. Eddie Rickenbacker Memorial* 795
Cleveland* 401
Frank P. Lahm 582
Greater Cincinnati 204
Steel Valley 272
Wright Memorial* 2,968

Wisconsin 1,318
Badger State 308
Billy Mitchell 631
Madison 379

MIDWEST REGION 6,134
Robert M. Williams

Iowa 699
Gen. Charles A. Horner 266
Lancer 168
Northeast Iowa 99
Richard D. Kisling 166

Kansas 1,058
Contrails 66
Lt. Erwin R. Bleckley 701
Maj. Gen. Edward R. Fry 291

Missouri 2,226
Earl D. Clark Jr. 430
Harry S. Truman 622
Ozark 269
Spirit of St. Louis 905

Nebraska 2,151
Ak–Sar–Ben 1,862
Lincoln 289

NEW ENGLAND REGION 5,014
Francis F. Carmichael Jr.

Connecticut 977
Central Connecticut 111
Charles A. Lindbergh 133
First Connecticut 141
Flying Yankees 143
Gen. Bennie L. Davis 76
Gen. George C. Kenney 69
Igor Sikorsky 115
Northern Connecticut 131
Sgt. Charlton Heston 58

Maine 367
Eastern Maine 204
Maj. Charles J. Loring Jr. 93
Southern Maine 70

Massachusetts 2,329
Boston 166
Laurence G. Hanscom 161
Maj. John S. Southrey* 214
Minuteman 321
Otis 200
Paul Revere 723
Pioneer Valley 194
Taunton 171
Worcester* 179

New Hampshire 841
Amoskeag 293
Pease 548

Rhode Island 258
Metro Rhode Island 217
Newport Blue & Gold 41

Vermont 242
Burlington 242

NORTH CENTRAL REGION 2,692
George E. Masters

Minnesota 1,330
Gen. E.W. Rawlings 1,061
Richard I. Bong 269

North Dakota 767
Gen. David C. Jones 336
Happy Hooligan 162
Red River Valley 269

South Dakota 595
Dacotah 243
Rushmore 352

NORTHEAST REGION 9,517
Raymond Hamman

New Jersey 2,768
Adm. Charles E. Rosendahl 143
Aerospace Founders 64
Brig. Gen. E. Wade Hampton 203
Brig. Gen. Frederick W. Castle 190
Hangar One 148
Highpoint 101
Hudson* 74
John Currie Memorial 24
Mercer County 223
Passaic–Bergen* 209
Sal Capriglione 101
Teterboro–Bendix 24
Thomas B. McGuire Jr. 941
Tri-County 57
Union Morris 266

New York 3,641
Albany–Hudson Valley* 415
Chautauqua 77
Colin P. Kelly 292
Forrest L. Vosler 281
Francis S. Gabreski 282
Gen. Daniel "Chappie" James Jr. Memorial 145
Genesee Valley 264
Iron Gate 204
L.D. Bell–Niagara Frontier 431
Lloyd Schloen–Empire 152
Nassau Mitchel 403
Queens 247
Thomas Watson Sr. Memorial 188
Gen. Carl A. "Tooey" Spaatz 260

Pennsylvania 3,108
Altoona 67
Brandywine 181
Eagle 70
Greater Pittsburgh* 471
Joe Walker–Mon Valley 114
Lehigh Valley 256
Lt. Col. B.D. "Buzz" Wagner 130
Liberty Bell 662
Mifflin County* 124
Olmsted 366
Pocono Northeast 207
Total Force 186
York–Lancaster 274

NORTHWEST REGION 6,929
Barbara M. Brooks–Lacy

Alaska 1,169
Anchorage 866
Fairbanks Midnight Sun 303

Idaho 390
Magic Valley 115
Snake River Valley 275

Montana 556
Big Sky 448

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

Treasure State	108
Oregon	**1,245**
Willamette Valley	315
Klamath Basin	137
Portland*	793
Washington	**3,569**
Greater Seattle	1,227
Inland Empire	808
McChord	1,534
ROCKY MOUNTAIN REGION	**7,319**
Mark J. Worrick	
Colorado	**5,222**
Colorado Springs/Lance Sijan	2,885
Gen. Robert E. Huyser	157
Long's Peak	292
Mel Harmon	151
Mile High	1,737
Utah	**1,637**
Northern Utah	663
Salt Lake	470
Ute–Rocky Mountain	504
Wyoming	**460**
Cheyenne Cowboy	460
SOUTH CENTRAL REGION	**9,342**
Marleen E. Eddlemon	
Alabama	**2,619**
Birmingham	426
Mobile	302
Montgomery	1,530
Tennessee Valley	361
Arkansas	**1,418**
David D. Terry Jr.	1,016
Ouachita	146
Razorback	256
Louisiana	**1,927**
Ark–La–Tex	1,204
Maj. Gen. Oris B. Johnson	381
Greater New Orleans Area	342
Mississippi	**1,337**
Golden Triangle	389
Jackson	205
John C. Stennis	743
Tennessee	**2,041**
Chattanooga	142
Everett R. Cook	501
Gen. Bruce K. Holloway	609
Maj. Gen. Dan F. Callahan	557
H.H. Arnold Memorial	232
SOUTHEAST REGION	**21,773**
Jack H. Steed	
Florida	**12,117**
Cape Canaveral	1,414
Central Florida	1,539
Col. H.M. "Bud" West	316
Col. Loren D. Evenson	734
Eglin	1,923
Falcon	426
Florida Highlands	387
Gainesville	313
Brig. Gen. James R. McCarthy	403
Gen. Nathan F. Twining	509
Gold Coast	425
Hurlburt	488
Jerry Waterman	1,316
John C. Meyer	183
John W. DeMilly Jr.	359
Miami	400
On Wings of Eagles	276
Pensacola	139
Treasure Coast	164
West Palm Beach	403
Georgia	**4,124**
Carl Vinson Memorial	1,708
Dobbins	1,350
Savannah	315
South Georgia	329
South Metro	422
North Carolina	**3,115**
Blue Ridge	380
Cape Fear	221
Kitty Hawk	86
Piedmont	484
Pope	669
Scott Berkeley	635
Tarheel	640
South Carolina	**2,417**
Charleston	680
Columbia	448
Ladewig–Shine Memorial	242
Strom Thurmond	389
Swamp Fox	658
SOUTHWEST REGION	**20,112**
Thomas J. Kemp	
New Mexico	**2,222**
Albuquerque	1,441
Fran Parker	469
Llano Estacado	312
Oklahoma	**3,335**
Altus	467
Central Oklahoma (Gerrity)	1,805
Enid	556
Tulsa	507
Texas	**14,555**
Abilene	509
Aggieland	185
Alamo	4,937
Austin	1,441
Concho	427
Dallas	1,144
Del Rio	219
Denton	350
Fort Worth	2,219
Gen. Charles L. Donnelly Jr.	613
Ghost Squadron	137
Heart of the Hills	177
Lubbock	211
Northeast Texas	461
Panhandle AFA	132
Permian Basin	113
San Jacinto	1,280

AFA's Overseas Chapters

CHAPTER	LOCATION
	United States Air Forces in Europe (USAFE)
Dolomiti	Aviano AB, Italy
Lufbery–Campbell	Ramstein AB, Germany
Spangdahlem	Spangdahlem AB, Germany
United Kingdom	Lakenheath, UK
	Pacific Air Forces (PACAF)
Keystone	Kadena AB, Japan
Miss Veedol	Misawa AB, Japan
Tokyo	Tokyo, Japan
	Supreme Headquarters Allied Powers Europe (SHAPE)
Gen. 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 Jimmy 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

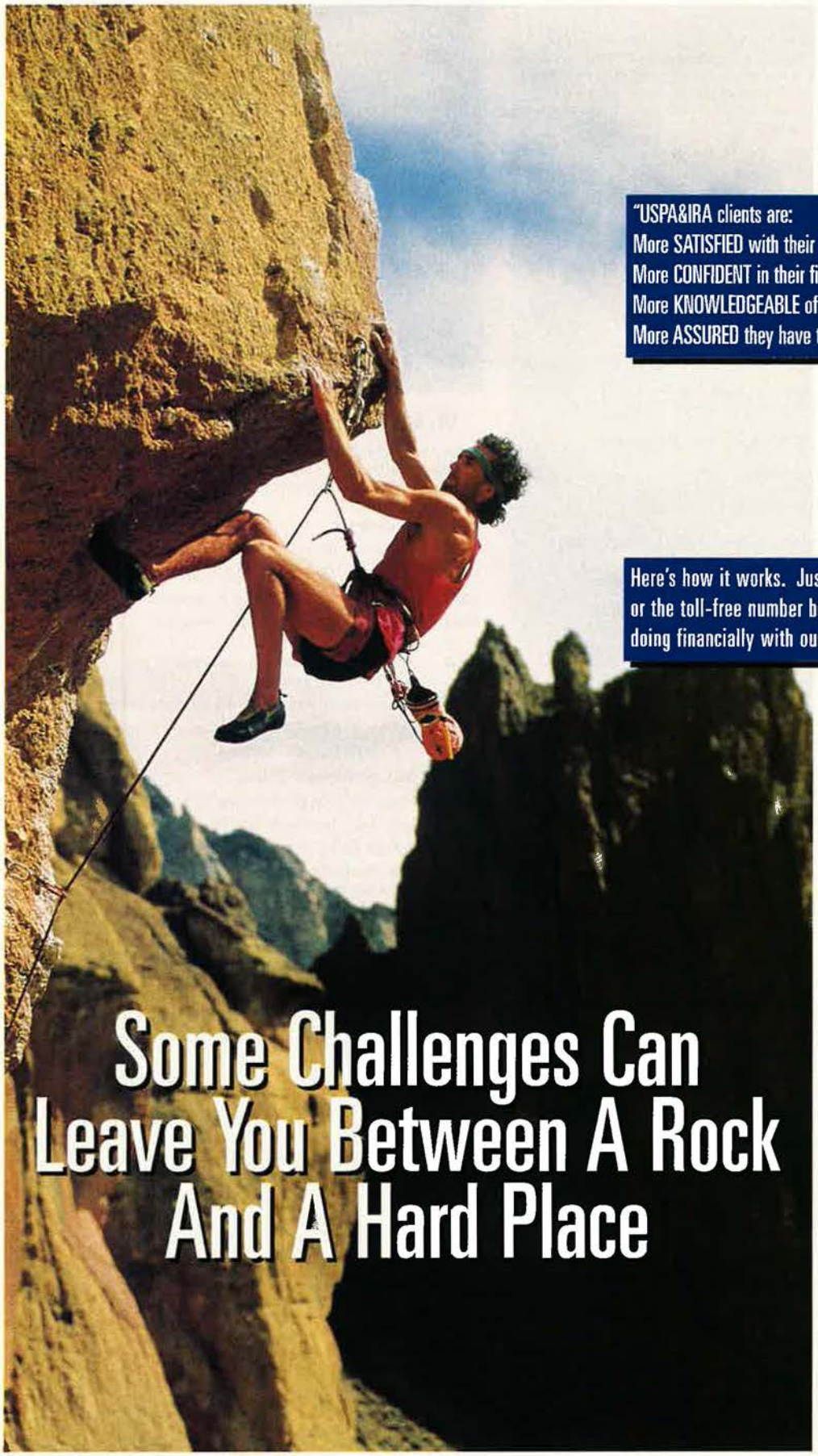
BOARD OF DIRECTORS

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

The Twelve Founders

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

USPA&IRA's Know-How Challenge Can Leave You Financially Independent.



Some Challenges Can Leave You Between A Rock And A Hard Place

A recent Louis Harris & Associates survey entitled, "Financial Preparedness Among Military Personnel" revealed what we at USPA&IRA have suspected for many years.

"USPA&IRA clients are:
More SATISFIED with their financial progress.
More CONFIDENT in their financial success.
More KNOWLEDGEABLE of financial matters.
More ASSURED they have the correct amount of life insurance."

So, how are you doing financially? We invite you to compare. In fact, we challenge you to.

THE USPA&IRA KNOW HOW CHALLENGE

Here's how it works. Just call one of our local offices or the toll-free number below and compare how you're doing financially with our typical client.

We're confident you'll learn what hundreds of thousands of professional military families just like yours have learned and what research now confirms. You can become financially independent.

But don't take our word for it — the facts are in. Take our challenge and compare.

USPA & IRA

Since 1958. Providing the opportunity for every professional military family to achieve financial independence.

1-800-443-2104

www.uspaira.com

Germany: 06172-488170
England: 01638-717700
Italy: 0434-565488
Guam: 734-2923

A financial program, by itself, cannot assure that all retirement or other financial goals will be met.

United Services Planning Association, Inc. (USPA)

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	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	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	Lyle S. Garlock, assistant secretary of the Air Force
1962	A.C. Dickieson and John R. Pierce, Bell Telephone Laboratories
1963	The 363rd Tactical Reconnaissance Wing, TAC, and the 4080th Strategic Wing, SAC
1964	Gen. Curtis E. LeMay, Chief of Staff, USAF
1965	The 2nd Air Division, PACAF
1966	The 8th, 12th, 355th, 366th, and 388th Tactical Fighter Wings and the 432nd 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	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	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	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
1997	Men and women of the United States Air Force
1998	Gen. Richard E. Hawley, commander, Air Combat Command
1999	Lt. Gen. Michael C. Short, commander, Allied Air Forces Southern Europe

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.
1997	Dennis J. Picard, chairman and chief executive officer, Raytheon Co.
1998	Phi ip M. Condit, chairman and chief executive officer, Boeing Co.
1999	Sam B. Williams, chairman and chief executive officer, Williams International Co., LLC

W. Stuart Symington Award Recipients

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.

YEAR	RECIPIENT
1986	Caspar W. Weinberger, Secretary of Defense
1987	Edward C. Aldridge Jr., Secretary of the Air Force
1988	George P. Schultz, secretary of state
1989	Ronald W. Reagan, former President of the United States
1990	John J. Welch, assistant secretary of the Air Force (acquisition)
1991	George Bush, President of the United States
1992	Donald B. Rice, Secretary of the Air Force
1993	Sen. John McCain (R–Ariz.)
1994	Rep. Ike Skelton (D–Mo.)
1995	Sheila E. Widnall, Secretary of the Air Force
1996	Sen. Ted Stevens (R–Alaska)
1997	William Perry, former Secretary of Defense
1998	Rep. Saxby Chambliss (R–Ga.) and Rep. Norman D. Dicks (D–Wash.)
1999	F. Whitten Peters, Secretary of the Air Force

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	1996	15
Jack C. Price	1997	16

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
1994–97

Walter E. Scott
1997–93

Jack C. Price
1998–

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
1994–97

Thomas J. McKee
1997–98

Michael J. Dugan
1998–

AFA Executive Directors

Willis S. Fitch
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

John O. Gray
1989–90

Monroe W. Hatch Jr.
1990–95

John A. Shaud
1995–

AFA National Secretaries

Sol A. Rosenblatt	1946–47
Julian B. Rosenthal	1947–59
George D. Hardy	1959–66
Joseph L. Hodges	1966–68
Glenn D. Mishler	1968–70
Nathan H. Mazer	1970–72
Martin H. Harris	1972–76
Jack C. Price	1976–79
Earl D. Clark Jr.	1979–82
Sherman W. Wilkins	1982–85
A.A. "Bud" West	1985–87
Thomas J. McKee	1987–90
Thomas W. Henderson	1990–91
Mary Ann Seibel	1991–94
Mary Anne Thompson	1994–97
William D. Croom Jr.	1997–

AFA National Treasurers

W. Deering Howe	1946–47
G. Warfield Hobbs	1947–49
Benjamin Brinton	1949–52
George H. Haddock	1952–53
Samuel M. Hecht	1953–57
Jack B. Gross	1957–62
Paul S. Zuckerman	1962–66
Jack B. Gross	1966–81
George H. Chabbott	1981–87
William N. Webb	1987–95
Charles H. Church Jr.	1995–

Year	Total	Life Members
1946	51,243	32
1947	104,750	55
1948	56,464	68
1949	43,801	70
1950	38,948	79
1951	34,393	81
1952	30,716	356
1953	30,392	431
1954	34,486	435
1955	40,812	442
1956	46,250	446
1957	51,328	453
1958	48,026	456
1959	50,538	458
1960	54,923	464
1961	60,506	466
1962	64,336	485
1963	78,034	488
1964	80,295	504
1965	82,464	514
1966	85,013	523
1967	88,995	548
1968	97,959	583
1969	104,886	604
1970	104,878	636
1971	97,639	674
1972	109,776	765

Year	Total	Life Members
1973	114,894	804
1974	128,995	837
1975	139,168	898
1976	148,202	975
1977	155,850	1,218
1978	148,711	1,541
1979	147,136	1,869
1980	156,394	2,477
1981	170,240	3,515
1982	179,149	7,381
1983	198,563	13,763
1984	218,512	18,012
1985	228,621	23,234
1986	232,722	27,985
1987	237,279	30,099
1988	219,195	32,234
1989	204,309	34,182
1990	199,851	35,952
1991	194,312	37,561
1992	191,588	37,869
1993	181,624	38,604
1994	175,122	39,593
1995	170,881	39,286
1996	161,384	39,896
1997	157,862	41,179
1998	152,330	41,673
1999	150,706	41,963

AFA State Contacts

Following each state name are the names of the communities in which AFA chapters are located. Information regarding these chapters or any of AFA's activities within the state may be obtained from the appropriate contact.

ALABAMA (Birmingham, Huntsville, Mobile, Montgomery): **Roy A. Boudreaux,** P.O. Box 1190, Montgomery, AL 36101-1190 (phone 334-241-2739).

ALASKA (Anchorage, Fairbanks): **Steven R. Lundgren,** P.O. Box 71230, Fairbanks, AK 99707 (phone 907-459-3291).

ARIZONA (Green Valley, Phoenix, Prescott, Sedona, Sierra Vista, Sun City, Tucson): **Angelo Di Giovanni,** 973 Vuelta Del Yaba, Green Valley, AZ 85614 (phone 520-648-2921).

ARKANSAS (Fayetteville, Hot Springs, Little Rock): **John L. Burrow,** 352 Rollston Ave. #1, Fayetteville, AR 72701-4178 (phone 501-751-0251).

CALIFORNIA (Apple Valley, Bakersfield, Edwards AFB, Fairfield, Fresno, Los Angeles, Merced, Monterey, Orange County, Palm Springs, Pasadena, Riverside, Sacramento, San Diego, San Francisco, Sunnyvale, Vandenberg AFB, Yuba City): **Paul A. Maye,** 1225 Craig Dr., Lompoc, CA 93436 (phone 805-733-5102).

COLORADO (Colorado Springs, Denver, Fort Collins, Grand Junction, Pueblo): **Howard R. Vasina,** 1670 N. Newport Rd., Ste. 400, Colorado Springs, CO 80916-2700 (phone 719-591-1011).

CONNECTICUT (Brookfield, East Hartford, Middletown, Storrs, Stratford, Torrington, Waterbury, Westport, Windsor Locks): **Joseph R. Falcone,** 14 High Ridge Rd., Ellington, CT 06029 (phone 860-875-1068).

DELAWARE (Dover, New Castle County, Rehoboth Beach): **Stephanie M. Wright,** 5 Essex Dr., Bear, DE 19701-1602 (phone 302-834-1369).

DISTRICT OF COLUMBIA (Washington): **Rosemary Pacenta,** 1501 Lee Hwy., Arlington, VA 22209-1198 (phone 703-247-5820).

FLORIDA (Avon Park, Broward County, Daytona Beach, Fort Walton Beach, Gainesville, Homestead, Hurlburt Field, Jacksonville, Leesburg, Miami, New Port Richey, Orlando, Palm Harbor, Panama City, Patrick AFB, Spring Hill, Tallahassee, Tampa, Vero Beach, West Palm Beach): **David R. Cummock,** 2890 Borman Ct., Daytona Beach, FL 32124 (phone 904-760-7142).

GEORGIA (Atlanta, Savannah, Valdosta, Warner Robins): **Zack E. Osborne,** 306 Lake Front Dr., Warner Robins, GA 31088 (phone 912-953-1460).

GUAM (Agana): **Thomas M. Churan,** P.O. Box 12861, Tamuning, GU 96931 (phone 671-653-0525).

HAWAII (Honolulu, Maui): **Norman R. Baker,** 1284 Auwaiku St., Kailua, HI 96734-4103 (phone 808-545-4394).

IDAHO (Mountain Home, Twin Falls): **Chester A. Walborn,** P.O. Box 729, Mountain Home, ID 83647-1940 (phone 208-587-9757).

ILLINOIS (Belleville, Chicago, Moline, Rockford, Springfield–Decatur): **John D. Bailey,** 6339 Cotswold Ln., Cherry Valley, IL 61016-9379 (phone 815-874-8024).

INDIANA (Bloomington, Columbus, Fort Wayne, Grissom ARB, Indianapolis, Lafayette, Marion, Mentone, New Albany, Terre Haute): **James E. Fultz,** 3915 Baytree Ln., Bloomington, IN 47401-9754 (phone 812-333-8920).

IOWA (Des Moines, Marion, Sioux City, Waterloo): **Donald E. Persinger,** 1725 2nd Ave., South Sioux City, NE 68776 (phone 402-494-1017).

KANSAS (Garden City, Topeka, Wichita): **William S. Clifford,** 2070 Milford Ln., Garden City, KS 67846 (phone 316-275-4317).

KENTUCKY (Lexington, Louisville): **Daniel G. Wells,** 313 Springhill Rd., Danville, KY 40422-1041 (phone 606-253-4744).

LOUISIANA (Baton Rouge, New Orleans, Shreveport): **William F. Cocke,** 1505 Gentilly Dr., Shreveport, LA 71105-5401 (phone 318-797-9703).

MAINE (Bangor, Caribou, North Berwick): **Peter M. Hurd,** P.O. Box 1005, Houlton, ME 04730-1005 (phone 207-532-2823).

MARYLAND (Andrews AFB, Baltimore, College Park, Rockville): **Raymond C. Otto,** 101 Blackbird Hill Ln., Laurel, MD 20724 (phone 703-607-2280).

MASSACHUSETTS (Bedford, Boston, East Longmeadow, Falmouth, Hanscom AFB, Taunton, Westfield, Worcester): **Thomas P. O'Mahoney,** 2 College Rd., Burlington, MA 01803-2708 (phone 617-221-7476).

MICHIGAN (Alpena, Battle Creek, East Lansing, Kalamazoo, Marquette, Mount Clemens, Oscoda, Traverse City, Southfield): **Terry L. Dankenbring,** 13749 Tallman Rd., Grand Ledge, MI 48837-9711 (phone 517-627-8030).

MINNESOTA (Duluth, Minneapolis–St. Paul): **Coleman Rader Jr.,** 6481 Glacier Ln. N., Maple Grove, MN 55311-4154 (phone 612-559-2500).

MISSISSIPPI (Biloxi, Columbus, Jackson): **Billy M. Boyd,** 107 N. Rosebud Ln., Starkville, MS 39759 (phone 601-434-2644).

MISSOURI (Kansas City, St. Louis, Springfield, Whiteman AFB): **Graham Burnley,** 112 Elk Run Dr., Eureka, MO 63025-1211 (phone 314-938-6113).

MONTANA (Bozeman, Great Falls): **William T. Rondeau Jr.,** 700 8th Ave., Apt. #3, Great Falls, MT 59405-2056 (phone 406-771-0979).

NEBRASKA (Lincoln, Omaha): **Densel K. Acheson,** 903 Lariat Cir., Papillion, NE 68128-3771 (phone 402-554-3793).

NEVADA (Las Vegas, Reno): **Albert S. "Sid" Dodd,** 1921 Dresden Ct., Henderson, NV 89014-3790 (phone 702-295-4953).

NEW HAMPSHIRE (Manchester, Portsmouth): **Terry K. Hardy,** 31 Bradstreet Ln., Eliot, ME 03903-1416 (phone 603-430-3122).

NEW JERSEY (Andover, Atlantic City, Camden, Chatham, Forked River, Ft. Monmouth, Jersey City, McGuire AFB, Newark, Old Bridge, Toms River, Trenton, Wallington, West Orange): **F.J. "Cy" LaManna,** 8 Elizabeth St., Caldwell, NJ 07007 (phone 973-423-0030).

NEW MEXICO (Alamogordo, Albuquerque, Clovis): **Charles G. Thomas,** 4908 Calle Del Cielo, Albuquerque, NM 87111-2912 (phone 505-845-3506).

NEW YORK (Albany, Binghamton, Buffalo, Rome, Jamestown, Nassau County, New York, Queens, Rochester, Staten Island, Syracuse, Westhampton Beach, White Plains): **Bonnie B. Callahan,** 6131 Meadowlakes Dr., East Amherst, NY 14051-2007 (phone 716-741-2846).

NORTH CAROLINA (Asheville, Charlotte, Fayetteville, Goldsboro, Kitty Hawk, Raleigh, Wilmington): **Bobby G. Suggs,** P.O. Box 53469, Fayetteville, NC 28305-3469 (phone 910-483-2221).

NORTH DAKOTA (Fargo, Grand Forks, Minot): **Gary H. Olson,** 725 Center Ave., Ste. 3, Moorhead, MN 56560 (phone 218-233-5130).

OHIO (Cincinnati, Cleveland, Columbus, Dayton, Mansfield, Youngstown): **J. Ray Lesniok,** 33182 Lakeshore Blvd., Eastlake, OH 44095-2702 (phone 440-951-6547).

OKLAHOMA (Altus, Enid, Oklahoma City, Tulsa): **William P. Bowden,** P.O. Box 620083, Oklahoma City, OK 73162-0083 (phone 405-722-6279).

OREGON (Eugene, Klamath Falls, Portland): **John Lee,** P.O. Box 3759, Salem, OR 97302 (phone 503-581-3682).

PENNSYLVANIA (Allentown, Altoona, Beaver Falls, Coraopolis, Drexel Hill, Harrisburg, Johnstown, Lewistown, Philadelphia, Pittsburgh, Scranton, Shiremanstown, Washington, Willow Grove, York): **Clair Smith,** 1509 Logan Ave., Tyrone, PA 16686-1725 (phone 814-684-3593).

RHODE ISLAND (Newport, Warwick): **Eugene M. D'Andrea,** P.O. Box 8674, Warwick, RI 02888 (phone 401-461-4559).

SOUTH CAROLINA (Charleston, Clemson, Columbia, Myrtle Beach, Sumter): **Guy R. Everson,** 9 McKay Rd., Honea Path, SC 29654 (phone 864-369-0891).

SOUTH DAKOTA (Rapid City, Sioux Falls): **Charles A. Nelson,** 1517 S. Minnesota Ave., Sioux Falls, SD 57105-1717 (phone 605-336-1988).

TENNESSEE (Chattanooga, Knoxville, Memphis, Nashville, Tullahoma): **William E. Freeman,** 2451 Stratfield Dr., Germantown, TN 38139-6620 (phone 901-755-1320).

TEXAS (Abilene, Amarillo, Austin, Big Spring, College Station, Commerce, Dallas, Del Rio, Denton, Fort Worth, Harlingen, Houston, Kerrville, Lubbock, San Angelo, San Antonio, Wichita Falls): **C.N. Horlen,** 11922 Four Colonies, San Antonio, TX 78249-3401 (phone 210-498-8083).

UTAH (Clearfield, Ogden, Salt Lake City): **Craig E. Allen,** 5708 West 4350 South, Hooper, UT 84315 (phone 801-774-2766).

VERMONT (Burlington): **Erwin R. Waibel,** 1 Twin Brook Ct., South Burlington, VT 05403-7102 (phone 802-654-0198).

VIRGINIA (Alexandria, Charlottesville, Danville, Langley AFB, Lynchburg, McLean, Norfolk, Petersburg, Richmond, Roanoke, Winchester): **Thomas G. Shepherd,** HCR 61 Box 167, Capon Bridge, WV 26711-9711 (phone 540-888-4585).

WASHINGTON (Seattle, Spokane, Tacoma): **Fred Rosenfelder,** P.O. Box 59445, Renton, WA 98058-2445 (phone 206-662-7752).

WEST VIRGINIA (Charleston): **Samuel Rich,** P. O. Box 444, White Sulphur Springs, WV 24986 (phone 304-536-4131).

WISCONSIN (Madison, Milwaukee, General Mitchell IAP/ARS): **Kenneth W. Jacobi,** 6852 Beech Rd., Racine, WI 53402-1310 (phone 414-639-5544).

WYOMING (Cheyenne): **Irene G. Johnigan,** 503 Notre Dame Ct., Cheyenne, WY 82009 (phone 307-773-2137).

"THE BEST OF BOTH WORLDS"

IBP

U.S. Russian Team Tests the K-36 in F-16 forebody
for the USAF at Holloman AFB

Zvezda

"THE K-36 FAMILY OF SEATS"

The U.S. Adapted K-36 Ejection Seat

The World's Cutting Edge Escape System Technology - Designed by World Acclaimed Russian Design Bureau (RD&PE Zvezda) - DoD tests prove the K-36 provides superior highspeed stability, windblast protection, and reduced occupant accelerations up to 729 KEAS - Adapted with U.S. Electronics and Pyrotechnics by IBP led U.S. Industrial Team - Produced in Hartford, Connecticut by *THE IBP Aerospace group, Inc.* *(a U.S. owned company).*

***IBP* offers the adapted K-36D-3.5A ejection seat and crew ensemble accommodating all 7 U.S. requirements for height and weight (103-245 lbs). The K-36D-3.5A is available for integration into the JSF, F-22, F-18, F-16 or as an upgrade for existing fighter/bomber aircraft to bring our aircrews home safely without injury.**

K-36 tests in the U.S.

K-36 tests in Russia

Over 12,000 K-36 ejection seats delivered with more than 9,000 currently operational worldwide

The IBP Aerospace Group, Inc. Washington, D.C. Office (703) 748-2136. Visit us at AFA Booth #2821

USAFA's Outstanding Squadron, 1999

At the US Air Force Academy, Cadet Squadron Three, known as "The Dogs of War," was named winner of the Air Force Association's Outstanding Squadron Trophy for 1999. CS Three ranked best among 40 squadrons at the academy in military leadership and academic and athletic achievements.

The squadron was honored at the 40th annual Outstanding Squadron Dinner held in Colorado Springs, Colo., in May. It was sponsored by AFA and the Colorado Springs/Lance Sijan Chapter, with support from the USAFA's Association of Graduates through a contribution from TRW. Representing all corporate sponsors was Dr. Joseph D. Mason, vice president, programs, TRW Information and Technology Group.

Accepting the trophy for CS Three were Cadet Lt. Col. Barry J. Burton, spring squadron commander, and Cadet Lt. Col. Coleman B. Cobb, fall squadron commander.

With cadet squadron commanders Burton (fourth from left) and Cobb (fifth from left) are (l–r) Charles H. Church Jr., AFA national treasurer, Thomas J. McKee, AFA national president, Debbie Canjar–White, Colorado Springs/Lance Sijan Chapter president, William D. Croom Jr., AFA national secretary, and Doyle E. Larson, AFA board chairman.

AFA/AEF National Report

By Frances McKenney, Assistant Managing Editor

AFA Joins Fight for the F-22

In mid-July, when the House Appropriations Subcommittee on Defense cut funding for the first six F-22 fighters, Air Force Association National President Thomas J. McKee immediately expressed AFA's strong opposition in a letter to every member of Congress. He also called on AFA leaders across the nation to contact their senators and representatives on Capitol Hill to urge them to restore the funding in subsequent Congressional action.

McKee's initial call to action went out by e-mail, reaching 900 AFA national, state, and chapter officials directly and all subscribers to the "Contact Congress" feature of the association's Web page. The call to action was posted on AFA's Web site and mailed to more AFA field leaders, assuring a steady flow of correspondence in the days leading up to a House–Senate conference committee meeting in September.

"Urge your members of Congress to restore full funding to the F-22 program," McKee wrote in this letter. "For our men and women in the armed forces, the F-22 means the difference between controlling the skies or being vulnerable to enemy fighters and missiles. It also means the difference between US troops being protected on the ground or US troops being attacked from the air by enemy aircraft—a situation our soldiers have not faced since the Korean War."

From Utah to Florida to New Jersey to Kansas and beyond, association members began writing to their representatives, as well as Sen. Ted Stevens (R–Alaska) and Rep. C.W. "Bill" Young (R–Fla.), who were responsible for working out funding levels during conference committee negotiations.

Jack H. Steed, region vice president (Southeast Region), sent letters to Airpower Caucus co-founder Rep. Norman D. Dicks (D–Wash.) and his own representative, Saxby Chambliss (R–Ga.). "Our forces must have available the best, most capable weapons systems possible," he wrote. "Expecting continued success during future conflicts without these capabilities is sheer folly."

Photo by Paul Kennedy

The Advanced Munitions Reception gave (l–r) AFA President Thomas McKee; Maj. Gen. Paul Hester, then director, Legislative Liaison; and Lt. Gen. Gregory Martin, USAF acquisition executive, a chance to talk about USAF weapons with Rep. Mike McIntyre (D–N.C.), a House Armed Services Committee member.

In stressing the need for the new tactical fighter, Raymond Otto, Maryland state president and, at the time, an Air National Guardsman, described his unit's aging F-16s and the effect of increased operations tempo and less experienced maintenance personnel. "Our missions are wearing our aircraft out much faster than anyone could predict," he wrote to Sen. Paul S. Sarbanes (D–Md.). "We have not failed yet, but our safety margins are diminishing."

On Capitol Hill, AFA representatives attended a meeting between the Military Coalition and Rep. Jerry Lewis (R–Calif.), chairman of the House Appropriations Defense Subcommittee, and met with Congressional staff who supported restoring the funds. In addition, AFA provided background material on the F-22 to the Airpower and Air Force Caucuses and worked to get the message out in the national media, including helping place opinion articles in support of the F-22.

Advanced Munitions

In June, the Air Force Association joined USAF's Office of Legislative Liaison in hosting the second in a series of educational receptions for the 106th Congress.

Conducted in a room full of information panels, models, and videos, the Advanced Munitions Reception brought together more than 20 Congressional representatives with senior Air Force officials and representatives from the defense industry.

Boeing, Raytheon, Lockheed Martin, and Textron set up in the Rayburn House Office Building displays on the joint air-to-surface standoff missile, joint standoff weapon, joint direct attack munition, sensor fuzed weapon, wind-corrected munitions dispenser, and conventional air launched cruise missile.

Among the more than 400 guests were Republican Reps. Floyd D. Spence (S.C.), Terry Everett (Ala.), Steve Buyer (Ind.), James V. Hansen (Utah), Howard "Buck" McKeon (Calif.), and James A. Gibbons (Nev.), who are members of the House Armed Services Committee.

Other attendees were Reps. Joe Skeen (R–N.M.) and Dicks, who are

Defense Appropriations Subcommittee members, and Republican Reps. Herbert H. Bateman (Va.), Howard Coble (N.C.), William F. Goodling (Pa.), Robin Hayes (N.C.), Steny H. Hoyer (Md.), Sam Johnson (Texas), Ralph Regula (Ohio), F. James Sensenbrenner Jr. (Wis.), John R. Thune (S.D.), and Charles H. Taylor (N.C.).

Democrats on hand to learn about USAF advanced weaponry were Reps. Charles A. Gonzalez (Texas), Mike McIntyre (N.C.), Donald M. Payne (N.J.), Earl Pomeroy (N.D.), and Gene Taylor (Miss.).

Then–acting Secretary of the Air Force F. Whitten Peters, USAF Chief of Staff Gen. Michael E. Ryan, and Vice Chief of Staff Gen. Lester L. Lyles headed the list of USAF leadership at the reception.

Kristi Vetri was among those who received AEF fellowships at the Mid-America Ball, hosted by the Scott Memorial and Spirit of St. Louis Chapters. Jack Pledger, Scott Memorial Chapter president is at left, Robert Smith, ball committee chairman, at right. Vetri is a township supervisor and a longtime supporter of the ball.

Black Tie and Service Dress

In June, the **Scott Memorial (Ill.) and Spirit of St. Louis (Mo.) Chapters** hosted the 17th annual Ball of Mid-America and an AFA symposium, with a list of speakers led by Gen. Charles T. Robertson Jr., commander in chief of US Transportation Command and commander of Air Mobility Command at Scott AFB, Ill.

Robertson focused his remarks on AMC's Total Force approach, including the vital role of the Civil Reserve Air Fleet.

The symposium also featured Maj. Gen. James E. Sherrard III, chief of the Air Force Reserve, speaking on the Total Force; Maj. Gen. George N. "Nick" Williams, then director of plans and programs at AMC, who spoke on air mobility; and retired Maj. Gen. Donald Brown, a former commander of 22nd Air Force.

E. David Spong from Boeing's Airlift Tanker Programs; Terry A. Graham from Lockheed Martin Aeronautical Systems; Daniel A. Rodrigues from Systems and Electronics, Inc.; and Col. Richard E. Fitzhugh Jr., AMC's deputy director of personnel, were the other symposium speakers.

The Mid-America Ball opened with a welcome from Scott Chapter President Jack Pledger and the posting of the colors by the Elite Guard from Scott AFB. A1C Mary Beth Benham sang the national anthem, and the AMC Starlifter Band provided a musical interlude before aerospace education awards were presented.

Pledger and Scott Chapter Vice President Robert E. Smith—who was also the Ball of Mid-America Committee chairman—named Rita Hardy–Matlock and Kristi Vetri as Ira C. Eaker Historical Fellows. The honor means $1,000 will be donated in their names to the Aerospace Education Foundation. Hardy–Matlock has actively worked on Mid-America Ball activities for 12 years.

James F. Clavenna of the Spirit of St. Louis Chapter and the AMC Year of the Family Team were named Jimmy Doolittle Educational Fellows, with $1,000 donations presented in their names to AEF.

Along with the symposium and the black-tie gala, a golf outing on Cardinal Creek Golf Course at Scott AFB also helped raise funds during the two days of events. AEF, the Air Force Aid Society, the James S. McDonnell USO at Lambert–St. Louis IAP, Mo., and AMC's Year of the Family initiative benefitted from the funds raised.

Symposium in Utah

Utah State AFA and its three chapters—**Northern Utah, Salt Lake, and Ute–Rocky Mountain**—sponsored a Focus on Defense symposium at Hill AFB, Utah, in June.

A Speakers Social—organized to give the symposium speakers a chance to meet one another and AFA leadership before events got under way formally—opened four days of symposium activities. The dinner for about 60 guests was held at the home of Northern Utah Chapter Presicent Pat Condon. The speakers were joined by AFA officials including President McKee, National Secretary William D. Croom Jr., Region Vice President (Rocky Mountain Region) Mark J. Worrick, National Director Emeritus (and former Executive Director) Monroe W. Hatch Jr., Utah State President Craig E. Allen, and Utah State AEF President Boyd Anderson.

This year, the annual symposium was built around the theme "Logis-

A charity golf tournament in Utah raised $25,000 for AEF. Shown accepting the "check" are (l–r) Craig Allen, Utah state president; Robert Eckstrom, golf tournament chairman; Boyd Anderson, Utah's Aerospace Education Foundation president; Jack Price, AEF president; and Thomas McKee.

tics Support Concepts in the New Millennium" and delved into policy, legal, and program issues.

Speakers at the all-day symposium were F. Whitten Peters, then acting Air Force Secretary; Gen. George T. Babbitt, Air Force Materiel Command commander; Lt. Gen. Roger G. DeKok, USAF deputy chief of staff, plans and programs; Marine Corps Maj. Gen. Michael A. Hough, Joint Strike Fighter Program director; and James W. Evatt, executive vice president, Boeing Space and Communications Group.

Panel members were Col. Ben Overall, ICBM system program director, Stepher McElroy from Raytheon, Gary Hogarth from Lockheed Martin, and Michael Gauss from Scientech.

McKee served as speaker at a luncheon held between the morning and afternoon sessions of the symposium, attended by more than 250 people from government, industry, and the local community.

That evening, guests enjoyed a salmon barbeque, held at the Hill Aerospace Museum.

The 20th annual Charity Invitational Golf Tournament kicked off the next day, with 270 golfers playing at two sites in the area. Following a "Midcourse Correction" gathering at a local Marriott that evening, the players returned to the links the next day to wrap up the symposium events.

The tournament raised $25,000 for AEF, presented to Anderson at an awards banquet held at the Hill AFB Officers' Club. According to Kathi Dysert of the Northern Utah Chapter, the donation brought to $325,000 the total amount raised by this tournament over two decades.

Convention: New York

The 52nd annual New York State Convention, hosted by the **Thomas Watson Sr. Memorial Chapter,** welcomed as keynote speaker Lt. Gen. Lance W. Lord, then vice commander of Air Force Space Command, Peterson AFB, Colo.

Convention activities got under way in Owego, N.Y., with an afternoon golf tournament at a country club. A President's Reception hosted by Bonnie B. Callahan, New York state president, followed that evening, honoring AFA state leaders and special guests such as AFA President McKee; Raymond "Bud" Hamman, region vice president (Northeast Region); James E. Callahan, national director; William C. Rapp, national director emeritus; Clair Smith, Pennsylvania state president; and Eugene B. Goldenberg, Pennsylvania state chairman of the board.

Representatives from 13 chapters attended business sessions the next day, where the following were elected as AFA state leaders: Barry H. Griffith of the **L.D. Bell–Niagara Frontier Chapter,** president; William G. Stratemeier Jr. of the **Francis S. Gabreski Chapter,** vice president downstate region; Edward J. Hayes Jr. of the **Albany–Hudson Valley Chapter,** vice president central region; Bonnie Callahan of the L.D. Bell–Niagara Chapter, vice president western region; and Barbara C. Dunderale from the **Chautauqua Chapter,** secretary.

Robert C. Bienvenue of the L.D. Bell–Niagara Chapter takes over as treasurer from Gabreski Chapter's Walter N. Zywan, who had served for 21 years in that position. Zywan received a Special Recognition award for his outstanding service.

Awards luncheon keynote speaker McKee spoke about his recent outreach visit to AFA chapters in Hawaii

Lt. Gen. Maxwell Bailey (center) was featured speaker at the New Jersey State Convention. Other special guests were (l–r) Raymond Hammond, regional vice president (Northeast Region); "Cy" LaManna, state president; Ernest Seeling, Highpoint Chapter president; and Michael Wysong, state vice president, government relations.

and the Far East. He also helped in presenting awards.

The Thomas Watson Sr. Chapter took home the Chapter of the Year award. Chapter President John Dunderdale accepted the Community Partner Achievement award for the Chautauqua Chapter. He was also Person of the Year. Brother Leo Merriman of the Albany–Hudson Valley Chapter received an Exemplary Service Award for his years of service as AFA state chaplain. James Callahan received an Exceptional Service Award, and several awards were presented for meritorious achievement. Maria C. Freitag, a first-grade teacher at Forest Elementary School in Williamsville, N.Y., was formally presented with her award as Teacher of the Year.

Nearly 100 guests attended the evening's banquet, where Lord spoke on the theme of "Space—the High Ground."

Convention: New Jersey

Hosted by the state AFA organization, New Jersey held its state convention at Cape May, with Lt. Gen. Maxwell C. Bailey as keynote speaker for the evening banquet. Then commander of 21st Air Force at McGuire AFB, N.J., Bailey spoke about USAF operations in Kosovo.

Elected as state AFA officers at the convention were Ethel Mattson from the **Thomas B. McGuire Jr. Chapter,** president; John R. Weber, **Aerospace Founders Chapter,** vice president at large; Almalinda B. Fairlie and Vincent S. Fairlie, both from the **Mercer County Chapter,** vice president south, and treasurer, respectively; Robert E. Hodges, **Union Morris Chapter,** vice president north; and Sue–Ann Yustas, **Passaic–Bergen Chapter,** secretary.

Honored guests at the convention included Northeast Region Vice President Hamman and Flavio J. "Cy" LaManna, New Jersey state president.

Convention: Arizona

The Arizona–Nevada–New Mexico State Convention brought 80 AFAers together in Laughlin, Nev.

Convention speakers included Cheryl L. Waller, region vice president (Far West Region); Thomas J. Kemp, region vice president (Southwest Region); Gerald S. Chapman, national director; and James M. Trail, national director emeritus.

New state presidents elected were Kathleen Clemence of the **Dale O. Smith (Nev.) Chapter** and Peter D. Robinson of the **Albuquerque (N.M.) Chapter.** Angelo Di Giovanni from the **Richard S. Reid Chapter** was reelected Arizona state president.

Mohave High School of Bullhead City, Ariz., provided a color guard for the evening banquet, which featured Jack C. Price, president of AEF, as keynote speaker.

In awards presentations, the Richard S. Reid Chapter received the Arizona Chapter of the Year award, and Arthur W. Gigax from the **Phoenix Sky Harbor Chapter** took home the Arizona Member of the Year award.

Sales Approach

The **Montgomery (Ala.) Chapter** decided to launch a renewed drive for Community Partners at about the same time chapter member Lawrence R. Colletta was looking for more involvement in AFA activities. It turned out to be a perfect match.

At the time, Colletta worked in sales for a local hotel and had a wide variety of contacts in the area. He approached the challenge of signing up Community Partners as a sales task. He used a call list and whenever he hit the road for a sales call on behalf of the hotel, he also brought up the topic of AFA. He pointed out how inexpensive and cost-effective it was to be a Community Partner. And he was ready: He never made a sales call without an AFA brochure, and when a business wrote out a check on the spot to become a Community Partner, he went right out to his car trunk and pulled out a Community Partner plaque for presentation.

Between January and July, he rounded up 36 of the chapter's 83 Community Partners. For his efforts, Colletta, who is the chapter's director of community relations, recently received a special Superior Performance Award. A retired USAF major and now a residential services coordinator for a nonprofit association, Colletta said AFA is an easy product to sell because he believes in it.

He received his award from Chapter President Frederick A. Zehrer III at the Montgomery Chapter's formal luncheon honoring guests of the annual Gathering of Eagles at Maxwell AFB, Ala.

The "Eagles" are aerospace legends like Gens. Jimmy Doolittle and Curtis E. LeMay. Such distinguished guests have visited Montgomery annually for nearly 20 years to inspire students at Maxwell and Gunter Annex in their study of aviation history.

This year's Eagles included retired Gen. Bruce K. Holloway, retired Maj. Gen. William S. "Bill" Harrell from the Montgomery Chapter, retired Brig. Gen. David Lee "Tex" Hill, astronaut and retired Navy Capt. Pete Conrad, and Rep. Sam Johnson, a retired USAF colonel.

This Is AFA

PRESIDENT
Thomas J. McKee
Fairfax Station, Va.

BOARD CHAIRMAN
Doyle E. Larson
Burnsville, Minn.

SECRETARY
William D. Croom Jr.
Colorado Springs, Colo.

TREASURER
Charles H. Church Jr.
Lenexa, Kan.

REGION 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.

Central East Region
Delaware, District of Columbia, Maryland, Virginia, West Virginia

John E. Craig II
947 26th St. S.
Arlington, VA 22202
(202) 863-2306

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

Cheryl L. Waller
512 E. Church St.
Santa Maria, CA 93454
(805) 925-2265

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

W. Ron Goerges
4201 W. Enon Rd.
Fairborn, OH 45324
(937) 429-6070, ext. 102

Midwest Region
Iowa, Kansas, Missouri, Nebraska

Robert M. Williams
6014 Country Club Oaks Pl.
Omaha, NE 68152
(402) 572-7655

New England Region
Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

Francis F. Carmichael Jr.
14 Carmichael Way
West Wareham, MA 02576-1486
(508) 999-8642

North Central Region
Minnesota, North Dakota, South Dakota

George E. Masters
1029 6th Ave. S.W.
Minot, ND 58701-3606
(701) 723-6697

Northeast Region
New Jersey, New York, Pennsylvania

Raymond Hamman
9439 Outlook Ave.
Philadelphia, PA 19114-2617
(215) 677-0957

Northwest Region
Alaska, Idaho, Montana, Oregon, Washington

Barbara M. Brooks-Lacy
7315 N. Curtis Ave.
Portland, OR 97217
(503) 283-4541

Rocky Mountain Region
Colorado, Utah, Wyoming

Mark L. Worrick
3210 S. Oneida Way
Denver, CO 80224-2830
(303) 757-8565

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

Marleen E. Eddlemon
2309 Linda Ln.
Jacksonville, AR 72076-2814
(501) 982-9777

Southeast Region
Florida, Georgia, North Carolina, Puerto Rico, South Carolina

Jack H. Steed
309 Lake Front Dr.
Warner Robins, GA 31088-6064
(912) 329-3888

Southwest Region
New Mexico, Oklahoma, Texas

Thomas J. Kemp
3608 Kimberly Ln.
Fort Worth, TX 76133-2147
(817) 595-7644

Special Assistant Pacific

Gary L. McClain
Komazawa Garden House D-309
1-2-33 Komazawa
Setagaya-ku, Tokyo 154-0012
Japan
81-3-3405-1512

Special Assistant Europe

Frank M. Swords
PSC 3, Box 1469
APO AE 09021-1466
011-49-6308-7237

NATIONAL DIRECTORS

Edward C. Aldridge
Los Angeles
R. Donald Anderson
Poquoson, Va.
Henry W. Boardman
Gulfport, Miss.
Roy A. Boudreaux
Montgomery, Ala.
Dr. Dan Callahan
Warner Robins, Ga.
James E. Callahan
East Amherst, N.Y.
David J. Campanale
Gainesville, Va.
Robert J. Cantu
Universal City, Texas
Gerald S. Chapman
Oceanside, Calif.
Michael J. Dugan
New York
Charles G. Durazo
McLean, Va.
Ronald R. Fogleman
Durango, Colo.
Samuel M. Gardner
Garden City, Kan.
Daniel C. Hendrickson
Layton, Utah
Sam Johnson
Washington, D.C.
Sharon M. Johnson
Ravenna, Ohio
William A. Lafferty
Green Valley, Ariz.
Stephen M. Mallon
Hampton, Va.
James M. McCoy
Bellevue, Neb.
Ivan L. McKinney
Bossier City, La.
Raymond C. Otto
Laurel, Md.
Julie E. Petrina
Perry Hall, Md.
John J. Politi
Sedalia, Mo.
Jack C. Price
Pleasant View, Utah
Victor C. Seavers
Eagan, Minn.
Phillip J. Sleeman
Tolland, Conn.
James E. "Red" Smith
Princeton, N.C.
Lisa A. Smith
Fresno, Calif.
R.E. Smith
West Point, Miss.
William L. Sparks
Daytona Beach, Fla.
Max Stitzer
North Ogden, Utah
Mary Anne Thompson
Oakton, Va.
Walter G. Vartan
Chicago
L.B. "Buck" Webber
Fort Worth, Texas
Joseph A. Zaranka
Bloomfield, Conn.

ex officio

John A. Shaud
Executive Director
Air Force Association
Arlington, Va.
Donald J. Harlin
National Chaplain
Albuquerque, N.M.
Heidi Kaiser
National Commander
Arnold Air Society
Prescott, Ariz.

directors emeritus

John R. Alison
Washington, D.C.
Joseph E. Assaf
Mashpee, Mass.
Richard H. Becker
Oak Brook, Ill.
David L. Blankenship
Tulsa, Okla.
John G. Brosky
Pittsburgh
Dan F. Callahan
Nashville, Tenn.
Robert L. Carr
Pittsburgh
George H. Chabbott
Dover, Del.
O.R. Crawford
Austin, Texas
R.L. Devoucoux
Portsmouth, N.H.
Jon R. Donnelly
Richmond, Va.
Russell E. Dougherty
Arlington, Va.
George M. Douglas
Colorado Springs, Colo.
Joseph R. Falcone
Ellington, Conn.
E.F. "Sandy" Faust
San Antonio
Joe Foss
Scottsdale, Ariz.
John O. Gray
Washington, D.C.
Jack B. Gross
Harrisburg, Pa.
Martin H. Harris
Montverde, Fla.
Gerald V. Hasler
Albany, N.Y.
Monroe W. Hatch Jr.
Clifton, Va.
H.B. Henderson
Ramona, Calif.
John P. Henebry
Deerfield, Ill.
David C. Jones
Arlington, Va.
Arthur F. Kelly
Los Angeles
Victor R. Kregel
Colorado Springs, Colo.
Jan M. Laitos
Rapid City, S.D.
Frank M. Lugo
Mobile, Ala.
Nathan H. Mazer
Roy, Utah
William V. McBride
San Antonio
Edward J. Monaghan
Anchorage, Alaska
J.B. Montgomery
Piedmont, Calif.
Bryan L. Murphy Jr.
Fort Worth, Texas
J. Gilbert Nettleton Jr.
Los Angeles
Ellis T. Nottingham
McLean, Va.
William C. Rapp
Williamsville, N.Y.
Julian B. Rosenthal
Durham, N.C.
Peter J. Schenk
Pinehurst, N.C.
Walter E. Scott
Dixon, Calif.
Mary Ann Seibel
Clayton, Mo.
Joe L. Shosid
Fort Worth, Texas
William W. Spruance
Wilmington, Del.
Thos. F. Stack
San Mateo, Calif.
Harold C. Stuart
Tulsa, Okla.
James M. Trail
Oro Valley, Ariz.
A.A. West
Hayes, Va.
Sherman W. Wilkins
Issaquah, Wash.

Note: For information on state and local AFA contacts, see www.afa.org

An Ace for the Cadets

Retired Brig. Gen. Robin Olds, a triple ace who shot down 16 enemy aircraft in World War II and the Vietnam War, helped San Angelo, Texas, and the **Concho (Texas) Chapter** celebrate Cadet Appreciation Day.

Cadet Appreciation Day—officially proclaimed for April 16 by the town's mayor and city council—began with Olds speaking to a gathering of company grade officers at Goodfellow AFB, Texas. Concho Chapter officers then escorted Olds to Central High School, where he dedicated a mural designed by the school's JROTC unit. The Top Three Council for senior NCOs at Goodfellow was the next group to hear Olds' remarks on his career—which began with his 1943 graduation from the US Military Academy and included the famous "MiG Sweep" that downed seven North Vietnamese MiG-21s in one day.

That evening, Olds was the featured speaker at the fifth annual Cadet Appreciation Banquet hosted by the Concho Chapter.

Col. Toreaser A. Steele, 17th Training Wing commander at Goodfellow and a chapter member; wing staff members; chapter Community Partners; and more than 300 ROTC, JROTC, and Civil Air Patrol cadets turned out for the event, held at Lakeview High School.

ROTC cadet Dale Michael Lightfoot, JROTC cadets Evangelina Garcia and Michael Rodgers, and Civil Air Patrol cadet George Sen received Cadet of the Year awards. Garcia and Jaime Beltran also received $250 chapter scholarships. Two JROTC units in the area each received $250 grants from the chapter to help cadets attend summer leadership camps.

Under an Arch of Steel

The honored guests were introduced individually, each entering the Officers' Club banquet room under an arch of crossed sabers held by the 355th Wing Honor Guard from Davis–Monthan AFB, Ariz. It was the dramatic beginning to the 21st annual awards banquet hosted in May by the **Tucson (Ariz.) Chapter.**

More than 100 guests—including a 1998 USAF Outstanding Airman, CMSgt. (sel.) Pamela J. Lane—were on hand to recognize 16 award winners from 12th Air Force, 355th Wing, 305th Rescue Squadron (AFRES), and the 162nd Fighter Wing (ANG) from Tucson IAP, Ariz.

Among those receiving honors were Maj. Donald E. Offill of the 355th Operations Group, who was named Aviator of the Year; ANG MSgt. William J. Kelleman Jr. of the 162nd FW, Guardsman of the Year; and AFRES MSgt. Elizabeth A. Alcon, 305th Rescue Squadron, Reservist of the Year. The 42nd Airborne Command and Control Squadron won the Outstanding Squadron of the Year award for the second consecutive year. Tucson Chapter President James I. Wheeler noted that the squadron has had some of its aircraft and personnel deployed to Aviano AB, Italy, continuously for more than six years.

The 305th Rescue Squadron received a citation that recognized the unit's many accomplishments, including its first save in May 1994, when a

Pararescuemen (l–r) MSgt. Paul Hayden, TSgt. Brett Konczal, and MSgt. Victor Villasenor joined Col. Kent Clark, commander, in accepting an award on behalf of the 305th Rescue Squadron at the Tucson Chapter's awards dinner.

305th crew completed a night rescue to retrieve an injured Army specialist who had fallen onto a mountain ledge.

More Chapter News

■ Jack H. Steed, region vice president (Southeast Region), and other honorary commanders of the 93rd Air Control Wing at Robins AFB, Ga., put together a welcome home gala for crews of four tankers and two E-8C Joint STARS aircraft that returned home from Operation Allied Force in June. The honorary commanders, who are all AFA members, donated $50 each for food and refreshments, along with balloons and flags, to help roll out the red carpet for 15 busloads of airmen. Steed also arranged for a city fire truck to join a base fire truck in creating an arch of water for each incoming airplane to taxi under.

■ After a Corona Top meeting of top-level Air Force leaders at Wright–Patterson AFB, Ohio, in June, Gen. Ralph E. Eberhart, new commander of Air Combat Command, addressed a luncheon meeting of the **Wright Memorial (Ohio) Chapter.** He spoke to the group about the status of the Aerospace Expeditionary Force plans, the role of research and development in USAF, and the evolution of the Aerospace Force.

■ Rebecca Spaatz Nagel spoke in tribute to her father at a meeting of the **Gen. Carl A. "Tooey" Spaatz (N.Y.) Chapter** held, appropriately, on Father's Day. Nagel's daughter, DeDe Laver, also spoke. Nagel presented to the chapter 25 historical photos of Spaatz that she recently acquired from Bolling AFB, D.C. Other special guests at the meeting included AFA State Historian Maxine Donnelly of the **Lloyd Schloen–Empire (N.Y.) Chapter** and Richard Mayfield, a representative from the office of Rep. Benjamin A. Gilman (R–N.Y.).

■ The **Thomas W. Anthony (Md.) Chapter** held the annual Salute to the Armed Forces breakfast at Andrews AFB, Md., with CMSgt. Francis R. Estevez, command chief master sergeant of the 89th Airlift Wing, as guest speaker. Born in the Dominican Republic, Estevez was raised in New York City and has been in the Air Force since 1978. He has been the top enlisted representative for the 89th AW's approximately 7,000 enlisted service members since January. Chapter President Charles X. Suraci and chapter member Norman A. Marous presented Estevez with an AFA clock as a memento of his recognition during the Salute to the Armed Forces.

■ On behalf of the **Eagle (Pa.) Chapter,** Edmund J. Gagliardi presented Sara Brown with a cash award for science honors during a Senior Awards Night ceremony at Mechanicsburg Senior High School in Mechanicsburg, Pa.

■ **Enid (Okla.) Chapter** Secretary Oscar Curtis attended the JROTC banquet at Enid High School and presented cadet Kristoffer LeMoins with an AFA Award and $500—half coming from AEF and half matched by funds from the Enid Chapter.

■ **Klamath Basin (Ore.) Chapter** President Curtis D. Ritchie and member William L. Snell were invited to speak at Memorial Day ceremonies in Klamath Falls and White City, Ore., respectively. Many chapter members joined Snell at the event, held at Eagle Point National Cemetery.

■ Jack B. Gross, a national director emeritus, former chairman of the board (1963–64), and longtime supporter of the AEF, has made a generous donation to establish the Jack Gross Education and Emergency Assistance Fund. This fund will assist AFA staff members in obtaining post–secondary education credits and emergency housing and transportation. Gross has been a strong supporter of the staff and since 1992 has donated funds for the Staff Member of the Quarter and Staff Member of the Year awards. He is a member of the **Iron Gate (N.Y.) Chapter.**

Cadet Awards

From the US, Europe, and Japan, universities and high schools sent in reports all summer long about AFA Awards (citations and medals) given to AFROTC and AFJROTC cadets at ceremonies last spring.

AFROTC cadet Christopher M. Mehlhaff received an AFA Award at the University of Texas at Austin. John Stavast from the **Austin Chapter** presented the award.

At the University of Texas San Antonio campus, the AFA Award went to AFROTC cadet Mark S. Colwell. **Alamo Chapter** member Howard Hachida presented it at the Lackland Gateway Club on Lackland AFB. Col. John A. Barton, the AFROTC detachment commander at the university, wrote, "The fact that organizations such as yours choose to recognize [our cadets'] achievements serves to motivate them to reach higher goals."

Dacotah (S.D.) Chapter President Brian L. Vognild presented an AFA

Award to cadet Jason Haufschild at a dining-out and awards ceremony for South Dakota State University in Sioux Falls, S.D.

James A. Armstrong, vice president of the **Richard I. Bong (Minn.) Chapter,** presented the award to AFROTC cadet Philip Lancaster at the University of Minnesota–Duluth.

Austin Landry represented the **Birmingham (Ala.) Chapter** when cadet Elizabeth Stockwell received an AFA Award at Samford University in Birmingham.

Richard S. Reid (Ariz.) Chapter President Peter Morris presented an AFA Award to Rosa Cervantes, who was then a junior at Nogales High School in Nogales, Ariz. The school's five-year-old AFJROTC unit expects an enrollment of over 200 cadets—more than 15 percent of the school's population—for the 1999–2000 school year, reported chapter member James R. Greenwood.

Kathleen M. Wood, vice president of the **Pioneer Valley (Mass.) Chapter** and an Air Force Reserve chief master sergeant, attended the awards ceremony and luncheon at Roger L. Putnam Vocational/Technical High School in Springfield, Mass., to present an AFA Award to cadet Gail E. Gethins.

In Columbia, S.C., cadet Julius F. Priester received the award in a ceremony held at the Ft. Jackson NCO Club. Priester's Senior Aerospace Science Instructor was retired Col. Walter L. Watson Jr. of the **Columbia Chapter.**

Also in South Carolina, State Senator Addison G. "Joe" Wilson presented the award to cadet Amy Kearns at Dutch Fork High School in Irmo, S.C. The SASI at the school is retired Col. Douglas M. Senter from the Columbia Chapter.

Representing the **Mile High (Colo.) Chapter,** Jerald L. Cunningham presented the award to cadet David Leonard at an awards banquet for the Career Enrichment Park of Westminster, Colo.

Joan M. Boyd from the **Harry S. Truman (Mo.) Chapter** presented an AFA Award to cadet Tuggin Long from Blue Springs High School in Blue Springs, Mo. The awards banquet was held at the local American Legion Post. Long's SASI was AFA member retired Lt. Col. Charles A. Rikli.

At Socastee High School in Myrtle Beach, S.C., cadet Melissa A. Pinckney received the award from Hugh J. O'Brien of the **Ladewig–Shine Memorial Chapter.** Retired Col. James G. Wood Jr., of the chapter, is the high school's SASI.

Ak–Sar–Ben (Neb.) Chapter's Robert D. Lewallen presented an AFA Award to cadet Alexis Rodriguez at the fourth annual AFJROTC Awards Banquet at Abraham Lincoln High School in Council Bluffs, Iowa.

At West Orange High School in Winter Garden, Fla., Richard Ortega, state vice president for aerospace education, presented the award to Stephen Strobel. The school's SASI is retired Col. Harvey W.C. Shelton, a **Central Florida Chapter** member.

Egyptian Army retired Lt. Gen. Safwat Demian presented Brandon J. Herrmann with an AFA Award at the JROTC dining-out for Del Campo High School, Fair Oaks, Calif. The event was held at the McClellan AFB Officers' Club. Del Campo's cadets have won AEF's annual contest for videos on JROTC programs three times. They began their winning streak with an honorable mention in 1993 and for the next three consecutive years won first place. The SASI at the school is retired Col. Earl J. Farney of the **C. Farinha Gold Rush (Calif.) Chapter.**

Retired Col. John E. Ford III, the SASI at Hemet High School in Hemet, Calif., and a **Palm Springs Chapter** member, presented the award to Bryan P. Quinn.

Gerald Chapman of the **San Diego Chapter** was on hand to present the AFA Award to cadet Robin Weathers at Vista High School in Vista, Calif. Chapter member retired Col. Charles M. Swager was her SASI.

The Columbus High School gym in Columbus, Miss., was filled with students, teachers, and parents for the annual awards program, where David M. McIntosh, **Golden Triangle (Miss.) Chapter** president, presented David Mounsey with an AFA Award.

Sixty cadets and 90 family members and friends gathered at London Central High School in High Wycombe, UK, for an awards ceremony where AFA member and SASI retired Col. John E. Clark presented cadet Abby Mansfield with the award.

In Germany, AFA Special Assistant Europe Frank M. Swords attended the dining-out at Gen. H.H. Arnold High School in Wiesbaden to present an AFA Award to cadet Anna Braun.

In Japan, Maj. Steven W. Herman, new president of the **Miss Veedol Chapter,** joined Brig. Gen. Stephen G. Wood, 35th Fighter Wing commander at Misawa AB, in presenting an AFA Award to cadet Theresa Graziadei at Edgren High School in Misawa. ■

AFA Conventions

Sept. 11	**Delaware State Convention,** Dover AFB, Del.
Sept. 13–15	**AFA National Convention,** Washington, D.C.
Sept. 26	**New Hampshire State Convention,** Portsmouth, N.H.

Correction

In the photo on p. 90 of the July "AFA/AEF National Report," the individuals were misidentified. Standing (l–r) are Henry Bohler and Robert Cutler. Seated (l–r) are Clifford Marie Bohler, Jean Esquerre, Bernice Downing, and Alvin Downing.

Unit Reunions

reunions@afa.org

9th TCG, "Pathfinder," ETO (WWII). May 21–26, 2000, in New Orleans. **Contact:** L.F. Luck, 9220 SW, 14th St., #3108, Boca Raton, FL 33428-6841 (561-487-3844) (luckleon@email.msn.com).

17th and 38th Photo Recon Sqs and all related units. Sept. 16–18, 1999, in Tulsa, OK. **Contact:** John Rodolf, 2842 E. 32nd Pl., Tulsa, OK 74105 (918-747-6558) (jrodolf@worldnet.att.net).

22nd MilitaryAirlift Sq (TCS) Tachikawa AB, Japan. March 21–23, 2000, in Biloxi, MS. **Contact:** Glenn Teele, 1917 Tradewinds Dr., Gautier, MS 39553 (228-497-9681).

40th BS, 6th BW. Oct. 8–10, 1999, in Roswell, NM. **Contact:** Len Kunko, 1601 S. Kentucky Ave., Roswell, NM 88201 (505-622-7546) (lkunko98@prodigy.net).

40th FS, 35th FG, WWII, Korea and Japan. Sept. 30–Oct. 2, 1999, at the Crowne Plaza Hotel Galleria in Houston. **Contact:** C.E. Dannacher, 20150 Falcons Landing, #1103, Sterling, VA 20165 (703-406-0422) (cedanna@bellatlantic.net).

62nd Troop Carrier/Airlift Wg Assn. Aug. 2–5, 2000, at the Best Western Executive Inn in Fife, WA. **Contact:** George Phillips, 706 Pine St., Steilacoom, WA 98388-3100 (253-582-6059) (gphildc8@aol.com).

100th BW, Pease AFB, NH (B-47/KC-97). July

Unit Reunions

12–16, 2000, in Omaha, NE. **Contact:** Rod Hegarty, 1109 Hackney Dr., Papillion, NE 68046-2809 (402-339-5247) (mlheg@aol.com).

316th TCG, Ninth AF (WWII). May 4–7, 2000, at the Doubletree Hotel Dayton Downtown in Dayton, OH. **Contact:** Mark Smith, 7929 Tawna Dr., West Chester, OH 45069 (513-777-5549).

585th BS, 394th BG. Oct. 14–16, 1999, at the Holiday Inn Southgate Heritage Center in Southgate, MI. **Contact:** Charles Bray, 15224 Champaign Rd., Allen Park, MI 48101 (313-381-2253).

1254th Air Transport Gp, special missions alumni. Oct. 29–30, 1999, in Arlington, VA. **Contact:** Joseph Kuchinsky, 1254th ATG (SM) Alumni, 106 Ridge Point Pl., Gaithersburg, MD 20878 (303-948-8835).

A-7D Pilots, 355th TFW, Davis–Monthan AFB, AZ (1971–79). Nov. 2–5, 2000, at the Hilton Tucson East in Tucson, AZ. **Contact:** Bernie Conway, 5737 N. 79th Way, Scottsdale, AZ 85250-6103 (phone: 480-994-0440 or fax: 480-994-3350) (bcjc5737@doitnow.com).

AFROTC Det. 550 alumni. Oct. 15, 1999, at Rensselaer Polytechnic Institute in Troy, NY. **Contact:** Chris Mazzei, 117 Bean Hill Rd., Belmont, NH 03220 (603-528-5447) (mazzec @rpi.edu).

Assn of the AF Missileers. May 17–21, 2000, at the Doubletree Colorado Springs World Arena in Colorado Springs, CO. **Contact:** Charles G. Simpson, Executive Director, Association of Air Force Missileers, PO Box 5693, Breckenridge, CO 80424 (phone or fax: 970-453-0500) (afmissileers@compuserve.com).

Spectre Assn. Oct. 8–10, 1999, in Fort Walton Beach, FL. **Contacts:** Spectre Association, PO Box 707, Mary Esther, FL 32569-0707 or Pat Carpenter (904-243-0872) (www.spectre-association.org).

UPT Class 75-05, Craig AFB, AL. Jan. 14–15, 2000, at the Riverwalk Plaza Hotel in San Antonio. **Contact:** Bruce Hedlund (831-336-0424) (N70CE@msn.com).

US Army Air Corps Flying Cadet Class 1940-D. Oct. 24–27, 1999, at the Pine Inn in Carmel, CA. **Contact:** Harry Halbertstadt, 245 Live Oak Ln., Los Altos, CA 94022 (650-941-5541).

Seeking current and former members of the **35th FG/Wg** for a reunion in 2000 and to join the 35th FG/Wg Assn. **Contacts:** Rip Collins, 10039 Kemp Forest Dr., Houston, TX 77080 (713-462-4242) (maroon@hal-pc.org) or Aleck Holet, 190 Blaylock Mountain Rd., Cookeville, TN 38506 (931-839-3846) (holet@multipro.com).

Seeking members of **Pilot Class 53-A** who trained at Hondo AB, TX, for a reunion. **Contact:** Kyle Barnes, 2440 Foxhead Way, Clearwater, FL 33759 (phone or fax: 727-797-3881) (kdbarnes1@aol.com).

Seeking members of **Pilot Class 58-K** (April–September 1957), Bainbridge AB, GA. **Contact:** Jim M. Morrow, 718 S. Magnolia St., Mooresville, NC 28115 (704-664-3486).

Seeking members of **Pilot Class 63-A,** Moody AFB, GA, for a reunion. **Contact:** Ken Johnson, 1210 Armstrong Ct., Derby, KS 67037 (316-788-7193).

Seeking former members of the **67th Recon Tech Sq,** Yokota AB, Japan, 1959–71, for a reunion in 2000. **Contact:** Gil Taylor, 11400 Strand Dr., #108, Rockville, MD 20852-2942 (301-231-6397) (giltaylor@prodigy.net) (rkenkelly@aol.com) (peter_durnell@compuserve.com). ■

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.

Bulletin Board

bulletin@afa.org

Seeking contact with anyone who knew **Capt. George Edward Flynn III,** a Louisiana State University graduate, who was assigned to T-38 Class 62TZA; 4515th Combat Crew Training Sq (F-100), England AFB, LA, 1962–63; Eglin AFB AF Aux #9 A-1E Skyraider School; and 1st ACS, 34th Tactical Air Gp, Vietnam, 1964. He was flying a Skyraider from Bien Hoa AB, Vietnam, when he was shot down Sept. 23, 1964. **Contact:** Jonell Flynn, 809 Taft Pl., New Orleans, LA 70119.

Seeking information on **P-47D #95228,** having part #89 L 43. Specifically interested in squadron, date of crash, and the pilot's name. **Contact:** Daniel Christoph, 14 A rue Ambroise Thomas, Freyming–Merlebach, France 57800.

Seeking contact with **Majors Diler and Seigel, Captain Hood, Lieutenants Hoffman and Neighbours,** and anyone else associated with 40 US personnel killed in the crash of a converted B-17 #40-2072 at Bakers Creek, Australia, June 14, 1943. **Contact:** Gene Rossel (phone: 909-930-5700 or fax: 909-930-5710) (aircommando1 @earthlink.net).

Seeking film footage of the opening of the **US 3rd AF Dependent School,** once called Central High School, at Bushy Park, Teddington, UK, in 1952. Also seeking contact with the daughter of **General Seltzer** of the 7th Air Div., who was also there at the time. **Contact:** Wanda De Vary (devary@southernet.net).

Seeking information on or contact with **Helen J. Callahan, Margaret F. Crawford, Ruth E. Evans, and Gloria A. Sanchez,** members of USAF OCS Class 58-A. **Contact:** Merle Browning, HC 52, Box 611, Hemphill, TX 75948 (409-579-3121) (mbrow@sabinenet.com).

For alumni historical album, seeking contact with Michigan State University graduates who are/were career **AF officers** (active or reserve) and **AFROTC Det. 380** cadets and faculty members. **Contact:** AFROTC Det. 380, Attn: Lt. Kimberly Shurlow, 104 Bessey Hall, Michigan State University, East Lansing, MI 48824 (517-355-2168) (airforce@pilot.msu.edu).

Seeking information on **Sgt. John Emerson Elmore** of WV, who served in the AAC as a tail gunner/flight engineer, 1929–33. He was discharged in Hawaii and served as an instructor flight engineer, 1942–45. He may have been stationed in Texas, California, and the Pacific Theater. **Contact:** Helen Elmore Newton, 4141 S. Pickfair Rd., Springfield, IL 62703 (217-529-7094).

Seeking contact with or information on **Stanley J. Wiertel, "Nobby," or "Bobby,"** who was a sergeant in the AAC during WWII. He was married, with a boy and girl, and knew **Lilian May "Taffy" Jenkins** of Wales. **Contact:** Philippa Francis, 505 O'Farrell St., #512, San Francisco, CA 94102.

Seeking contact with or information on **James "Jimmy" Swany or Swannie,** who was stationed in Shirehampton, Bristol, UK, 1942–43. **Contact:** Desmond Taylor, 33 Butterfield Park, Clevedon, North Somerset, UK BS21 5ED.

Seeking Boy Scout **patches** containing names of USAF bases. **Contact:** Jim McEvoy, NV-941 AFJROTC, Durango High School, 7100 W. Dewey Dr., Las Vegas, NV 89113.

Seeking contact with anyone stationed at **Freeman Field, IN,** 1946–47, and **Las Vegas AAF** (now Nellis AFB), NV, 1940–46. **Contact:** Lou Thole, 11263 Marlette Dr., Cincinnati, OH 45249 (513-489-8025).

Seeking contact with **SSgt. Don Colburn,** who was stationed at Limestone AFB, ME, in 1954, and **SSgt. Emilio Afonso Ragucci** of Boston, who was in the Ohio ANG, Toledo Express Airport, OH, in 1962. **Contact:** Joe Detrick, 6136 Westcreek Dr., Ft. Worth, TX 76133.

Seeking color photos or drawings of Air Force organization **emblems,** specifically those for Strategic Air Command, Fifteenth AF, Eighth AF, 301st BW, and 55th Strategic Recon Wg. **Contact:** Mary Jo Harvey, 2154 North H St., Oxnard, CA 93030 (chubby@goldenwave.com).

Seeking contact with members of **Class 1944-D,** Williams Field, AZ. **Contact:** Lloyd Housh, 3146 Allen Way, Santa Clara, CA 95051-6718.

Seeking contact with **2nd Lt. Claude Spinks** of Atlanta, GA, whose Mustang was shot down near Eve, France, June 20, 1944. **Contact:** Roger Folliot, 211 rue de Fougères, Rennes, France 35700.

Seeking contact with **David S. Ackerman** of the Bronx, NY, who was a B-24 pilot with 344th Sq, 98th BG, Fifteenth AF, based in Lecce, Italy, during WWII. **Contact:** Edward Aymes, 10368 Sunset Bend Dr., Boca Raton, FL 33428 (561-487-9888).

Seeking information on and contact with female recipients of the **DFC** from all eras. **Contact:** Gale J. Raymond, PO Box 228, Sugar Land, TX 77487.

Seeking contact with members of the **18th TFW,** Kadena AB, Japan, December 1964–June 1967, who received a medal/award. **Contact:** Dean Hunter, 9818 DeKoven Dr. SW, Lakewood, WA 98499-1825. ■

If you need information on an individual, unit, or aircraft, or want to collect, donate, or trade USAF–related items, write to "Bulletin Board," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Items submitted by AFA members have first priority; others will run on a space-available basis. If an item has not run within six months, the sender should resubmit an updated version. Letters must be signed. Items or services for sale, or otherwise intended to bring in money, and photographs will not be used or returned.

Boxing Fans...
This Bud's for you.

http://www.budweiser.com

Pieces of History

Photography by Paul Kennedy

Grey Berets

Memorabilia courtesy 18th Weather Squadron, Ft. Bragg, N.C.

Whether the mission is a short daytime sortie to the local range or delivery of precision weapons in high-threat areas, success for Air Force warfighters can hinge on accurate weather prediction. USAF's combat weather personnel—specialists among the 3,000 Air Force members in the weather career field—must not only be skilled in forecasting and observing weather but could be called on to parachute, scuba dive, ski, or rappel from a helicopter, all in an effort to gather weather information. They wear a distinctive grey beret as a symbol of their unique career field. (The beret shown here sports a special badge worn until a few years ago.)

U.S. SPECIAL FORCES

AIR COMBAT TEAM

SEE CHASE-DURER WATCHES AT: **ARIZONA** ***Scottsdale*** SCHUBACH (480) 946-6000 **CALIFORNIA** ***Burbank*** TIMEPIECE (818) 559-9557 ***Costa Mesa*** JOSTYAR (714) 966-2661 ***Glendora*** GOLD'N'TIME (626) 857-0717 ***Granada Hills*** BOYADJIAN (818) 831-0753 / NORMAN'S FINE JWRLY (818) 831-0210 ***La Jolla*** C.J. CHARLES (800) 900-7296 ***Palm Springs*** GADI (760) 323-1838 ***Redondo Beach*** FINLEY'S (310) 791-3052 ***San Bernardino*** TEKIN BROS (909) 888-2369 ***San Diego*** LONDON GATE (619) 270-6565 ***San Dimas*** Y2K JEWELERS (909) 592-0666 ***San Pedro*** RON'S JEWELERS (310) 833-4024 ***Santa Clara*** COUNTY COMM (408) 244-4750 ***Tarzana*** DARVA (818) 881-4653 ***Toluca Lake*** GENERALES & GENERALES (818) 763-9768 ***Venice*** GOOD SEE CO. (310) 452-5357 ***Visalia*** JEWELRY CLUB (559) 625-3119 ***Yorba Linda*** DAVID HAYMAN (714) 996-9033 **COLORADO** ***Beaver Creek*** JEWELS BY SHILPI (970) 748-0441 ***Denver*** RIGHT TIME (303) 691-2521 ***Ft. Collins*** VINTAGE WATCH (888) 561-TIME **CONNECTICUT** **Stamford** PETER SUCHY (203) 327-3024 **FLORIDA** ***Clearwater*** ZOLTAN (727) 536-4478 ***Cocoa Beach*** BEACH JLRS (407) 783-3756 ***Palm Harbor*** MARC ANTHONY JLRS (727) 789-9005 ***Pinellas Park*** FLA JEWELRY (727) 521-0098 ***Sarasota*** SARASOTA GOLD & SILVER (941) 371-1644 ***St Petersburg*** GOLDEN SAILS (813) 381-1414 ***Tampa*** ALDO BRIONI (813) 253-2288 / G. ALLAN JLRS (727) 968-4834 / GOLD PALMS JLRS (813) 839-2496 ***Vero Beach*** DUBOSE & SONS (561) 770-9160 **GEORGIA** **Augusta** DORIS DIAMONDS (706) 733-6747 **ILLINOIS** ***Chicago*** SABRINA JLRS (773) 275-6291 ***Lake Forest*** CLOCKWORKS (847) 234-7272 **INDIANA** ***Zionsville*** JEWEL BOX (317) 873-5076 **MASSACHUSETTES** **Florence** MURDOFF'S (413) 586-0445 **MINNESOTA** ***Minneapolis*** THURSTON JWLRS (612) 823-0778 **MISSOURI** ***Liberty*** POLISHED EDGE (816) 781-6360 ***Asheville*** GALYEN JWLRS (823) 274-9014 ***Salisbury*** DEE'S JWLRS (704) 636-7110 **NEVADA** ***Las Vegas*** WORLD MERCHANT (702) 383-8333 **NEW JERSEY** ***Deptford*** WATCH WEAR (609) 853-4840 ***Elazibeth*** SALERMO JWLRS (908) 289-7791 ***Hamilton*** WATCH WEAR (609) 272-9444 ***Jersey City*** TIME SQUARE (201) 656-3326 / WEST SIDE (201) 332-5553 ***Pt Pleasant*** GOLD FEVER (732) 892-3535 ***Secaucus*** MAHTANI (201) 348-1667 ***South River*** GRECO (732) 254-6161 ***Westwood*** WATCH OUT (201) 358-1806 ***Upper Saddle River*** GREGORIO (201) 327-8920 **NEW YORK** ***Jackson Heights*** EMERALD (718) 478-8518 **Manhattan** MOVING TIME (212) 944-9064 / VINCENT GERARD (212) 732-6400 ***Staten Island*** BANDSTAND (718) 983-7996 / GOFF (718) 698-7075 **PENNSYLVANIA** ***Allentown*** SALOMON (610) 433-1511 ***Kennett Square*** 3OVE JLRS (610) 444-4525 ***Philadelphia*** GOVBERG (215) 557-1002 ***Stroudsberg*** STOECKEL (717) 421-0590 ***Wayne*** PRINS & VOLKHARDT (610) 687-8840 **RHODE ISLAND** ***Middletown*** WATCHES ETC (401) 847-4179 **VIRGINIA** ***Alexandria*** DOMINION JWLRS (703) 237-6918 **WASHINGTON** ***Spokane*** WATCH WORLD (509) 482-3743 **MEXICO** ***Mexico City*** CABO MAYOR (525) 580-6949 ..... **AND AT OTHER JEWELERS NEAR YOU**

SPO/Tritium Hands & Numbers Guaranteed To Glow For 20 Years

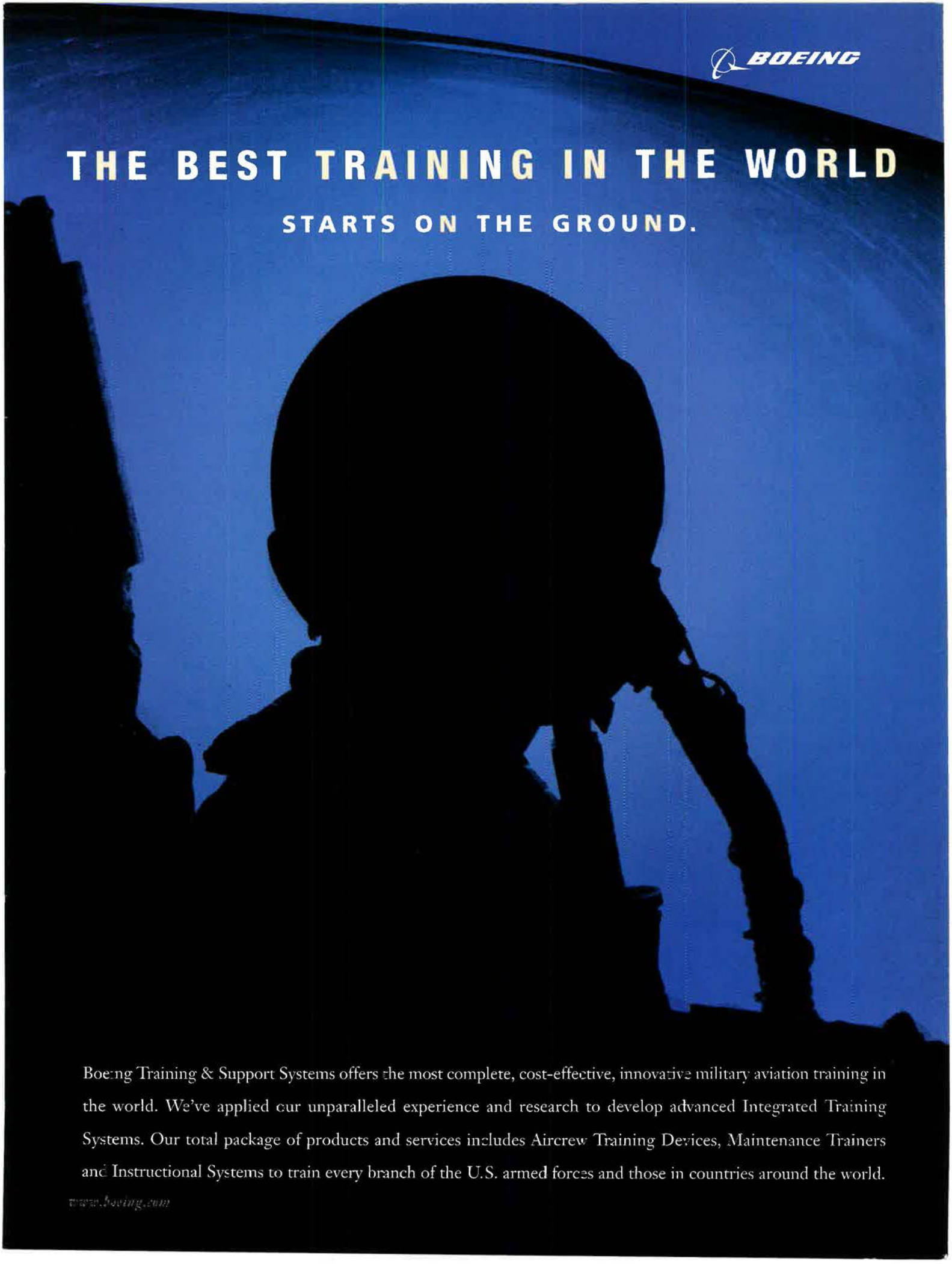
- Dual Time Zone
- Double Lock Secutiry Clasp
- Solid Black Steel Case
- 1/10th Split Sec Timing
- Date Window
- Mineral Crystal Lens
- **Precision 27 Jewel SWISS ETA Quartz Mov't**
- Solid Black Steel Band
- Screw In Crown & Back
- Flyback Sweep
- W/R to 330 Ft

$400 Value Now Only $189 + $9.95 s&h
WITH NYLON BAND. $249 WITH STEEL BAND AS SHOWN

30 DAY MONEY BACK GUARANTEE
24 HR SHIPPING • 5 YR LTD WARRANTY

Credit Card Orders Call:
800-544-4365
Ask for operator 216

Or send check or money order to: ***CHASE-DURER***
270 No. Canon Dr., PMB 1402-216 • Beverly Hills, CA 90210
310.550.7280 • **www.CHASE-DURER.com**


BOEING
THE BEST TRAINING IN THE WORLD
STARTS ON THE GROUND.
Boeing Training & Support Systems offers the most complete, cost-effective, innovative military aviation training in the world. We've applied our unparalleled experience and research to develop advanced Integrated Training Systems. Our total package of products and services includes Aircrew Training Devices, Maintenance Trainers and Instructional Systems to train every branch of the U.S. armed forces and those in countries around the world.
www.boeing.com